



# BeyondTrust

## **Endpoint Privilege Management for Unix and Linux 23.1 Policy Language Guide**

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# Endpoint Privilege Management for Unix and Linux Policy Language


## IMPORTANT!


*This guide applies to both Endpoint Privilege Management for Unix and Linux (EPM-UL) and Endpoint Privilege Management for Linux (EPM-L). Content that doesn't apply to EPM-L is noted as such.*

This guide provides detailed information regarding the security policy file programming language for the BeyondTrust Endpoint Privilege Management for Unix and Linux (EPM-UL) software. This language is used to create security policy files that are used by EPM-UL to:

- Control the tasks a user or group of users may perform
- Control the systems from which a task may be submitted
- Control the systems from which a task may be run
- Determine when a specific task may be run (day and time)
- Determine where a task may be run from
- Determine if secondary security checks, such as passwords or checksums, are required to run a task
- Determine if one or more supplemental security programs are run before a task is started

 **Note:** *This guide assumes that you have a basic understanding of Unix or Linux system administration and some experience with a scripting or other computer language. We recommend that you have experience in these areas before you attempt to create or modify security policy files.*

 **Note:** *Endpoint Privilege Management for Unix and Linux or EPM-UL, refers to the product formerly known as PowerBroker for Unix and Linux. Endpoint Privilege Management for Linux or EPM-L, refers to the new SaaS (cloud) product.*

 **Note:** *Specific font and line spacing conventions are used to ensure readability and to highlight important information, such as commands, syntax, and examples.*

## IMPORTANT!

*The BeyondInsight integration for Endpoint Privilege Management for Unix and Linux is no longer supported. Instead, EPM-UL uses BeyondInsight for Unix & Linux and ElasticSearch.*

**IMPORTANT!**

*Both **pbguid** and **pbsguid** are deprecated as of EPM-UL version 22.3.0.*

## Sample Policy Files

When you receive the EPM-UL install media, there are sample EPM-UL policy files in the **/examples** folder. These sample policy files include detailed explanations of what they do. You can use these files to learn how policy files are typically written for various scenarios. A **readme\_samples** text file in that directory includes a brief description of each sample file.

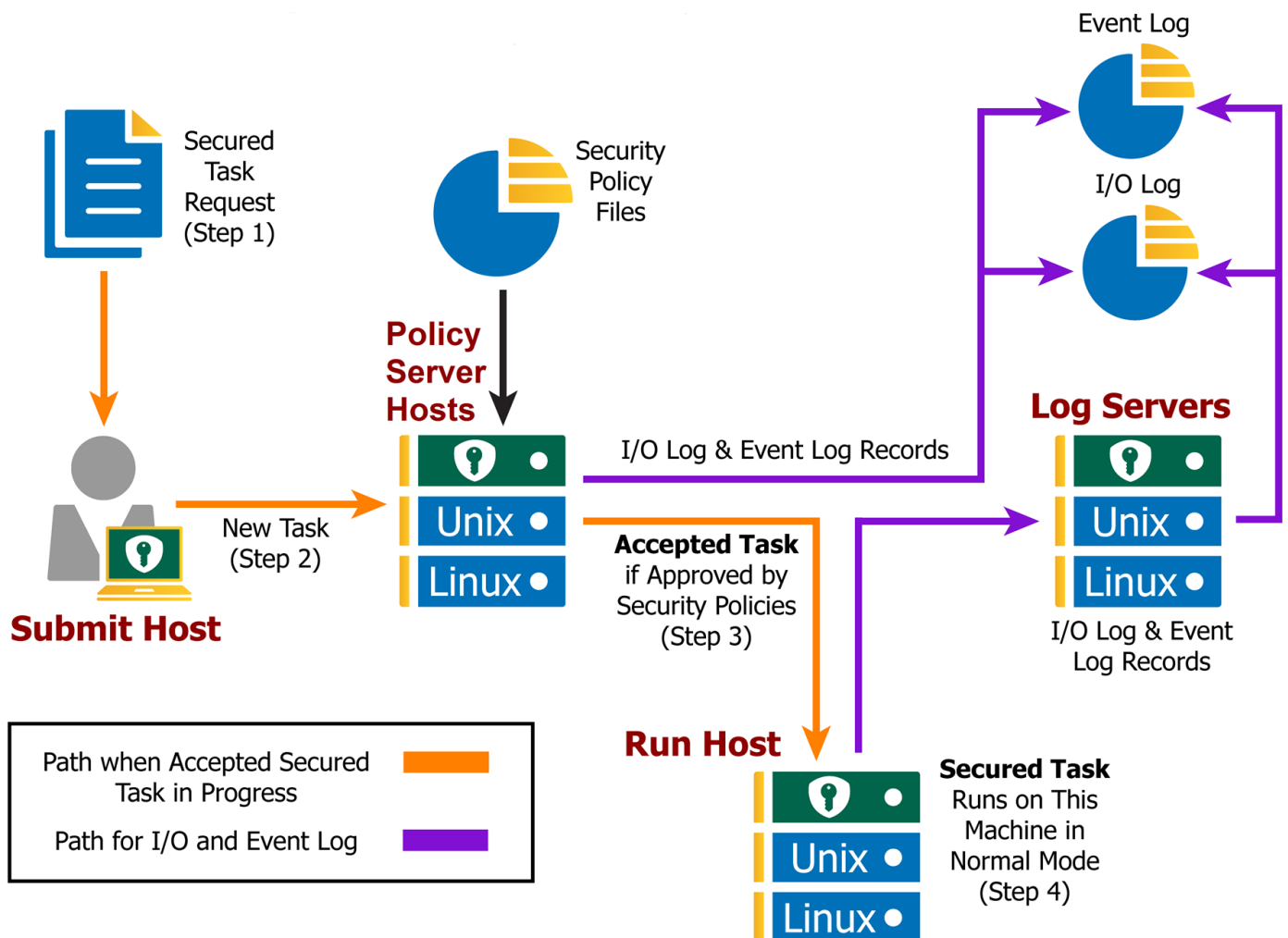
# Endpoint Privilege Management for Unix and Linux Overview

To write effective Endpoint Privilege Management for Unix and Linux security policy files, it is helpful to understand how Endpoint Privilege Management for Unix and Linux works. A typical Endpoint Privilege Management for Unix and Linux configuration consists of the following primary components: **pbrun**, **pmasterd**, **pblocald**, and **pblogd**. Each of these components is described below. It is possible to install all of these components on a single machine or distribute them among different machines. For optimal security, the Policy Server host and log hosts should be separate machines that are isolated from normal activity.

## Endpoint Privilege Management for Unix and Linux Components

As shown in the figure below, the machine from which a task is submitted is referred to as the *submit host*. The machine on which security policy file processing takes place is referred to as the *policy server host*. The machine on which a task actually executes is referred to as the *run host*. The machine on which event log records and I/O logs are written is referred to as the *log host*. (Although we highly recommend the use of **pblogd**, it is an optional component.)

### How Endpoint Privilege Management for Unix and Linux Works





## Endpoint Privilege Management for Unix and Linux Task Processing

In the context of Endpoint Privilege Management for Unix and Linux, there are two types of task requests: secured and unsecured.

Secured task requests must undergo security validation processing before they can be run. Endpoint Privilege Management for Unix and Linux must process these tasks.

Unsecured tasks do not undergo security validation processing. These tasks do not represent a potential threat to the system and so do not fall under a company's security policy implementation. The operating system handles unsecured tasks. Endpoint Privilege Management for Unix and Linux is not involved in the processing of unsecured tasks.

### Secured Task Submission to SSH-Managed Devices - **pbssh**

Secured tasks can also be submitted through **pbssh**. **pbssh** is the Endpoint Privilege Management component used to access SSHmanaged devices where Endpoint Privilege Management is not installed (routers, firewalls, Windows devices, or Unix/Linux devices where Endpoint Privilege Management is not installed). **pbssh** connects to the target device using the SSH configuration.

### Task Submission - **pbrun**

All secured tasks must be submitted through **pbrun**, the Endpoint Privilege Management for Unix and Linux component that receives task requests. A separate **pbrun** process starts for each submitted secured task request. Any task that needs to undergo Endpoint Privilege Management for Unix and Linux security processing (that is, a secured task) must be submitted through **pbrun**. A company's security policy implementation may be compromised if the use of **pbrun** for secured tasks is not enforced.



**Note:** ***pbrun** must be installed on any machine from which a user can submit a secured task request.*

### Security Policy File Processing - **pblogd**

**pblogd** is responsible for applying the security rules as defined in the Endpoint Privilege Management for Unix and Linux security policy files that make up a company's network security policy. In other words, it is **pblogd** that performs security verification processing to determine if a request is accepted (that is, allowed to execute) or rejected (that is, not allowed to execute), based on the logic in the Endpoint Privilege Management for Unix and Linux security policy files. If a request is rejected, then the result is logged and processing terminates. If a request is accepted, then it is immediately passed to **pblocald** for execution.

If the **pblogd** component (below) is not used, then **pblogd** waits for the **pblocald** process to complete. If **pblogd** is used, then **pblogd** terminates after the request is passed to **pblocald**. A separate **pblogd** process starts for each secured task request that is submitted.



**Note:** *During security verification processing, the first "accept" or "reject" condition that is encountered causes security policy file processing to terminate immediately. No further security verification processing is performed.*

### Task Execution - **pblocald**

**pblocald** is normally responsible for executing task requests that have passed security verification processing and have been accepted by **pblogd** on the run host (when the run host is a different host than the submit host). After a task request is accepted, it is immediately passed from **pblogd** to **pblocald**. By default, **pblocald** executes the task request as the user that is specified in the policy variable **runuser**. This is typically a privileged user such as **root**, a database administrator, or a web server administrator. All task

input and output information is piped back to **pbrun**. In addition, **pblocald** logs pertinent task information to the Endpoint Privilege Management for Unix and Linux Event Log using **pbmasterd** or **pblogd**. This depends on how Endpoint Privilege Management for Unix and Linux has been deployed. The run host can also record task keystroke information to an Endpoint Privilege Management for Unix and Linux I/O log and again through **pbmasterd** or **pblogd**. Again, this depends on how Endpoint Privilege Management for Unix and Linux has been deployed.

## Task Execution - pbrun

When the run host and submit host are on the same machine, **pbrun** can directly execute a secured task. This optimizes out the extra network connections to **pblocald**.

## Logging - pblogd

**pblogd** is responsible for writing event and I/O log records. **pblogd** is an optional Endpoint Privilege Management for Unix and Linux component. If **pblogd** is not installed, then **pbmasterd** writes log records directly to the appropriate log files rather than passing them off to **pblogd**. In addition, without **pblogd** installed, **pbmasterd** must wait for the **pblocald** process to complete. If the **pblogd** component is used, then **pbmasterd** normally terminates when task execution starts and **pblocald** sends its log records directly to **pblogd**.

Using **pblogd** optimizes Endpoint Privilege Management for Unix and Linux processing by:

- Centralizing the writing of log records in a single, dedicated component
- Eliminating the need for the **pbmasterd** process to wait for task execution to complete

# Create Policy Files in Endpoint Privilege Management for Unix and Linux

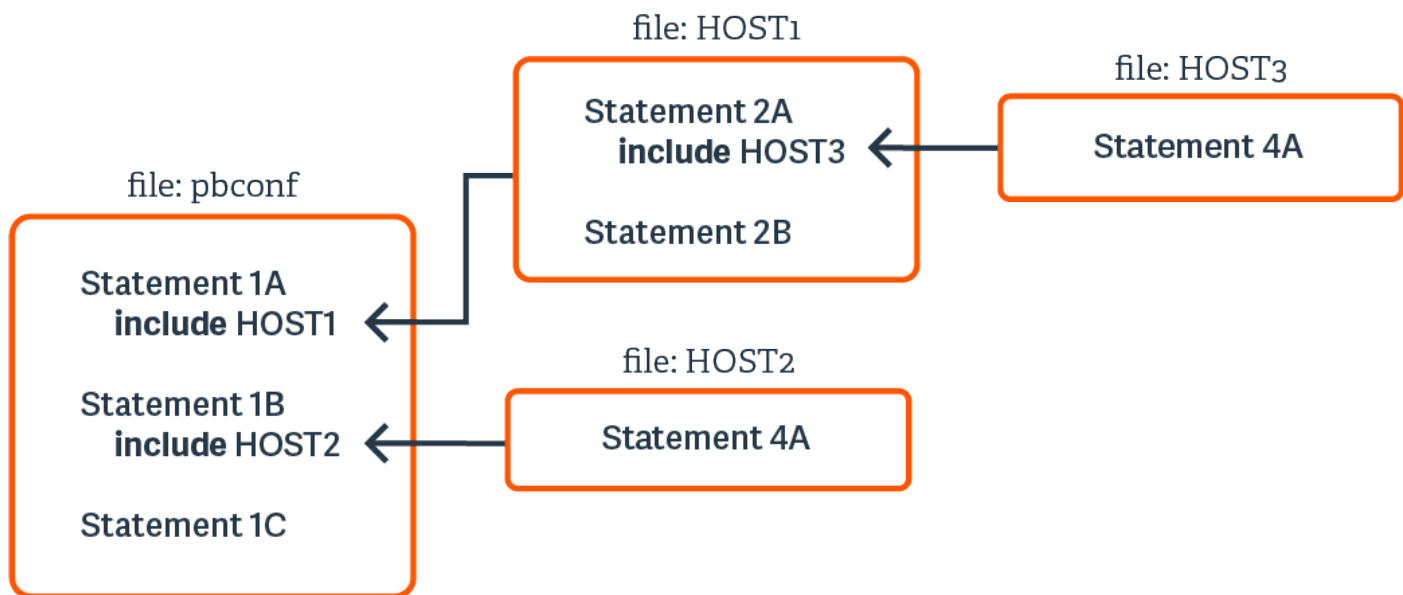
A security policy file is a collection of instructions that define the system security rules that Endpoint Privilege Management for Unix and Linux applies during task verification processing. These instructions are written using Endpoint Privilege Management for Unix and Linux Security Policy Scripting Language.

The default name of the primary Endpoint Privilege Management for Unix and Linux security policy file is **pb.conf**. This file is analogous to the **main()** function in a C program. It is possible to add Security Policy Scripting Language statements directly to **pb.conf** or to use security policy subfiles. Security policy subfiles are separate, individual security policy files invoked at runtime using the **include** statement (using the syntax **include "subfilename"**).



**Note:** We strongly recommend that you use security policy subfiles.

Conceptually, the **include** statement can be thought of as a placeholder.



At run time, Endpoint Privilege Management for Unix and Linux replaces **include** statements with the actual contents of the specified include file. This process occurs in computer memory and does not alter the physical files in any way.

The use of security policy subfiles enables you to organize a site's security policy implementation in a modular fashion. Using this method, each security policy subfile can focus on a specific area of security policy implementation. This compartmentalizes security policy implementation, making it much easier to maintain and enhance over time.

A common way to organize security profile files is by type of user and system access requirements.

**root** should own the security policy files and their permissions should be set to **400** or **600**. Place the files in the same directory (we recommend **/opt/pbul/policies**) for convenience. The **/opt/pbul/policies** directory is the default location. A different directory can be specified with the **policydir** setting in the **pb.settings** file. To insure security policy file integrity, Endpoint Privilege Management for Unix

and Linux does not process a security policy file if users other than **root** has security permissions that allow them to modify or delete the file. In other words, only **root** should have read/write permissions for these files, and the directories in which these files are stored should have security permissions that prevent users other than root from reading, modifying, or deleting them.

Security policy files are usually created with a standard text editor. They are saved as plain text files. By default, Endpoint Privilege Management for Unix and Linux uses a **.conf** file name suffix for security policy files, but this is not a requirement.

When naming security policy files, any file suffix may be used, or the suffix may be omitted. Starting with v9.0, a new Role Based Policy mechanism has been implemented that allows administrators to maintain their policy in a database with an option 'change management' functionality.

## Default Policy

Starting with version 8.0, a default policy is installed by default if an existing policy does not exist. The files **pbul\_policy.conf** and **pbul\_functions.conf** are created in a **/opt/pbul/policies** directory (from v9.4.3+ and in **/etc/pb** prior to v9.4.3) by default. **pbul\_policy.conf** are then included in the main policy (by default **/opt/pbul/policies/pb.conf** from v9.4.3+ and **/etc/pb.conf** prior to v9.4.3).

This default policy contains the following roles:

### Helpdesk Role

Enabled by default, when invoking **pbrun helpdesk** it allows any user in **HelpdeskUsers** (default **root**) to initiate a helpdesk menu as root on any host in **HelpdeskHosts** (default **submithost** only). The helpdesk menu of actions contains:

- List of processes (**ps -ef**)
- Check if a machine is up (**ping <host>**)
- List current users on this host (**who -H**)
- Display host's IP settings (**ifconfig -a**)

### PBTest

Enabled by default, for all users on all hosts, **pbrun pbtest** allows checking connectivity and policy.

### Controlled Shells

Enabled by default, allows users in **ControlledShellUsers** (by default the **submituser**), for runhosts in **ControlledShellHosts** (by default only **submithost**), to enable iologging for **pbksh/pbsh**. iologs are created by default in **"/tmp/pb.<user>.<runhost>.<YYYY-MM-DD>.[pbksh|pbsh].XXXXXX"**. This role has a list of commands (empty by default) to elevate privileges for, as well as a list of commands (empty by default) to reject.

### Admin role

Enabled by default, allows users in **AdminUsers** (by default **root**) to run any command on runhosts in **AdminHosts** (by default only **submithost**).

## Demo role

Disabled by default, allows users in **DemoUsers** (default all users) to run commands in **DemoCommands** (default **id** and **whoami**) as **root** on any host in **DemoHosts** (default all hosts).

The policy ends by allowing all users to run any command as themselves without any privilege escalation.

This policy is meant to be used as a starting point for your own policy. You can enable or disable any of the roles listed above by simply setting the corresponding "**Enable<rolename>Role**" to **true** or **false**. Or you can completely delete the policy and use your own. If you choose to continue with the default policy as a starting point, you can add more users, hosts and commands to the various lists used for each role, for example you can take **ControlledShellRole** further by adding users to **ControlledShellUsers**, and hosts to **ControlledShellHosts**, and commands to **ControlledShellRejectedCmds** and **ControlledShellPrivilegedCmds**.

## Splunk role

Disabled by default. If enabled, only when **pbrun** is invoked, enables iologging (creating iologs in **/pbiologs**), sets default ACA rule, enables aca session history and sets **iologcloseaction** to a script sending records to Splunk.

## Sudo Role

Disabled by default, allows users in **SudoUsers** (only **root**, by default) to run any command on runhosts defined in **SudoHosts** (default **submithosts**).

This serves as a demo policy for the sudo wrapper which requires policy modification before it is installed. It illustrates what changes to start with to make all the sudo wrapper options available.

**i** For more information on the sudo wrapper, see "Sudo Wrapper" in the [Endpoint Privilege Management for Unix and Linux Administration Guide](https://www.beyondtrust.com/docs/privilege-management/unix-linux/admin/index.htm) at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/admin/index.htm>.

## Role Based Policy Database Schema

Role Based Policy has been implemented to simplify the definition of policy for administrators. Policies are kept within structured records in a database, simplifying maintenance, decreasing system load, increasing throughput, and providing a comprehensive REST API to integrate policy management with existing customer systems and procedures, including simplified bulk import/export of data. Once the customers' data is held within the Role Based Policy database it is much easier to provide management information, such as user entitlement reports. The policy data is grouped into users, hosts, commands, time/dates and roles detailed in the schema below.

## User Groups

User groups define groups of users and/or wildcard patterns that match usernames:

```
CREATE TABLE usergrp (  
  id INTEGER PRIMARY,  
  name TEXT UNIQUE,  
  description TEXT,  
  disabled INTEGER CHECK(disabled BETWEEN 0 AND 1), -- 0=enabled, 1=disabled  
  type CHAR(1) CHECK (type IN ('I','E')), -- I=internal, E=external  
  extinfo TEXT -- external lookup info  
);  
CREATE TABLE userlist (  
  id INTEGER REFERENCES usergrp(id),  
  user TEXT, -- "glob" wildcard  
  PRIMARY KEY(id,user)  
);
```

Each user group has multiple user list entries that specify names, wildcards, or both, that match both submit and run user names when matched by the role.

### USER GROUP

1. User Group ID (key, unique)
2. User Group Name (unique)
3. User Group Description
4. Disabled
5. Group Type (internal/external)
6. External Group connection info (encoded - json ?)

### MEMBERSHIP LIST

1. User Group ID (foreign key)
  2. Member String (glob/regex)
- } Composite Key

## Host Groups

Host groups define groups of hosts, wildcard patterns, or both, that match hostnames:

```
CREATE TABLE hostgrp (  
  id INTEGER PRIMARY,  
  name TEXT UNIQUE,  
  description TEXT,  
  disabled INTEGER CHECK(disabled BETWEEN 0 AND 1), -- 0=enabled, 1=disabled  
  type CHAR(1) CHECK (type IN ('I','E')), -- I=Internal, E=external  
  extinfo TEXT -- external lookup info  
);  
CREATE TABLE hostlist (  
  id INTEGER REFERENCES hostgrp(id),  
  host TEXT, -- "glob" wildcard  
  PRIMARY KEY(id,host)  
);
```

Each host group has multiple host list entries that specify names and/or wildcards that match both submit and run host names when matched by the role.

### HOST GROUP

1. Host Group ID (key, unique)
2. Host Group Name (unique)
3. Host Group Description
4. Disabled
5. Group Type (internal/external)
6. External Group connection info (encoded - json ?)

### HOST LIST

1. Host Group ID (foreign key)
  2. Host String (glob/regex)
- } Composite Key



## Command Groups

Command groups define groups of commands, wildcard patterns, or both, that match commands:

```
CREATE TABLE cmdgrp (
  id INTEGER PRIMARY,
  name TEXT UNIQUE,
  description TEXT,
  disabled INTEGER CHECK(disabled BETWEEN 0 AND 1)-- 0=enabled, 1=disabled
);
CREATE TABLE cmdlist (
  id INTEGER REFERENCES cmdgrp(id),
  cmd TEXT, -- "glob" wildcard
  rewrite TEXT, -- new command (see below)
  PRIMARY KEY(id,cmd)
);
```

Each command group has multiple command list entries that specify commands and/or wildcards that match the submitted command name when matched by the role, and a rewrite column to rewrite the command that is executed. The rewrite is in a similar format to Bourne/Bash shell arguments, for example, **\$0**, **\$1**, **\$\***, **\$#** etc. Rewrite uses the original command to substitute arguments into the new rewritten command.

### COMMAND GROUP

1. Command Group ID (key, unique)
2. Command Group Name (unique)
3. Command Group Description
4. Disabled

### COMMAND LIST

1. Command Group ID (foreign key)
  2. Command String (glob/regex)
  3. Command re-write
- } Composite Key

## Time/Date Groups

Time/date groups define groups of times/dates and/or wildcard patterns that match times/dates:

```
CREATE TABLE tmdategrp (
  id INTEGER PRIMARY,
  name TEXT UNIQUE,
  description TEXT,
  disabled INTEGER CHECK(disabled BETWEEN 0 AND 1)-- 0=enabled, 1=disabled
);

CREATE TABLE tmdatelist (
  id INTEGER REFERENCES tmdategrp(id),
  tmdate TEXT, -- json format - see below
  PRIMARY KEY(id,tmdate)
);
```

Each time/date group has multiple time/date list entries that specify times/dates, wildcards, or both, that match the submitted command name when matched by the role, and a rewrite column to rewrite the command that is executed. Each individual time/date is specified in JSON format, and can be one of two different formats:

- From/To specific date range: both from and to are specified in epoch seconds:

```
'{ "range" : { "from" : 1415851283, "to": 1415887283 } }'
```

- Day of the week: each day is specified as an array of hours.

Each hour is a number representing 15 minute intervals defined as a binary mask:

```
1 1 1 1
  ^ 0 to 14 minutes of the hour
  ^-- 15 to 29 minutes of the hour
  ^---- 30 to 44 minutes of the hour
  ^----- 45 to 59 minutes of the hour
Therefore the values range from 0 to 15:
'
  "mon" : [0,0,0,0,0,0,0,15,15,15,15,15,15,15,15,15,15,15,15,15,15,3,0,0,0,0,0,0],
  "tue" : [0,0,0,0,0,0,0,15,15,15,15,15,15,15,15,15,15,15,15,15,15,3,0,0,0,0,0,0],
  "wed" : [0,0,0,0,0,0,0,15,15,15,15,15,15,15,15,15,15,15,15,15,15,3,0,0,0,0,0,0],
  "thu" : [0,0,0,0,0,0,0,15,15,15,15,15,15,15,15,15,15,15,15,15,15,3,0,0,0,0,0,0],
  "fri" : [0,0,0,0,0,0,0,15,15,15,15,15,15,15,15,15,15,15,15,15,15,3,0,0,0,0,0,0],
  "sat" : [0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0],
  "sun" : [0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0]
}'
```

## TIME/DATE GROUP

1. Time/Date Group ID (key, unique)
2. Time/Date Group Name (unique)
3. Time/Date Group Description
4. Disabled

## TIME/DATE LIST

1. Time/Date Group ID (foreign key)
  2. Time/Date/Day (json encoded)
- } Composite Key

## Roles

Roles are the entities that tie all the other entities together to define a role.

```
CREATE TABLE role (
  id INTEGER PRIMARY,
  name TEXT UNIQUE,
  rorder INTEGER, -- rule order for matching
  description TEXT,
  disabled INTEGER CHECK(disabled BETWEEN 0 AND 1), -- 0=enabled, 1=disabled
  risk INTEGER CHECK(risk >= 0),
  action CHAR(1) CHECK (action IN ('A','R')), -- A=Accept, R=Reject
  iolog TEXT, -- iolog template
  script TEXT -- pbparse script
  tag TEXT DEFAULT NULL -- Arbitrary tag that will allow grouping of roles
  comment TEXT DEFAULT NULL -- Arbitrary comment field that can contain anything
  message TEXT DEFAULT NULL -- Accept/reject message (templated)
  variables TEXT DEFAULT NULL -- Contains JSON formatted Policy Script variables to set
  (templated)
  varmatch TEXT DEFAULT NULL -- Contains JSON formatted Policy Script variables to match
  auth TEXT DEFAULT NULL -- Contains JSON formatted array of authentication methods (templated)
  rpt INTEGER DEFAULT 1 -- 1=on, 0=off, include Role in Entitlement Report
);
CREATE TABLE roleusers (
  id INTEGER REFERENCES role(id),
  users INTEGER REFERENCES usergrp(id),
  type CHAR(1) CHECK (type IN ('S','R')), -- S=Submit, R=Run User
  PRIMARY KEY (id,users,type)
);
CREATE TABLE rolehosts (
  id INTEGER REFERENCES role(id),
  hosts INTEGER REFERENCES hostgrp(id),
  type CHAR(1) CHECK (type IN ('S','R')), -- S=Submit, R=Run User
  PRIMARY KEY (id,hosts,type)
);
CREATE TABLE rolecmds (
  id INTEGER REFERENCES role(id),
  cmds INTEGER REFERENCES cmdgrp(id),
  PRIMARY KEY (id,cmds)
);
CREATE TABLE roletmdates (
  id INTEGER REFERENCES role(id),
  tmdates INTEGER REFERENCES tmdategrp(id),
  PRIMARY KEY (id,tmdates)
);
```

Each role has multiple users, hosts, commands and time/dates. When the Policy Engine matches against roles, complete records are selected from the database as fully populated roles, sorted by the role attribute **rorder**. Once the first record has been matched, the attributes of the role are applied to the session, and the Policy Engine accepts or rejects the session. The **iolog** template is the normal script format log file, for example `/var/log/io_log.XXXXXX`. The script is a full Endpoint Privilege Management for Unix and Linux script that is called if the role has been accepted. This script can carry out extra processing to authorize the session (and can therefore override the accept/reject status with an implicit command), and can carry out extended environment configuration as would normal Endpoint Privilege Management for Unix and Linux script.

## ROLE

1. Role Group ID (key, unique)
2. Role Name (unique)
3. Role Order
4. Role Description
5. Disabled
6. Risk
7. Accept/Reject
8. I/O Log Template
9. Script
10. Tg
11. Comment
12. Message Template
13. Policy Script Variables
14. Varmatch
15. Authentication Methods
16. Include in Entitlement Report

## SUBMIT/RUN USER LIST

1. Role ID (foreign key)
  2. User Group ID (foreign key)
  3. Type (submit/run)
- } Composite Key

## COMMAND LIST

1. Role ID (foreign key)
  2. Command Group ID (foreign key)
- } Composite Key

## SUBMIT/RUN HOST LIST

1. Role ID (foreign key)
  2. Host Group ID (foreign key)
  3. Type (submit/run)
- } Composite Key

## TIME/DATE LIST

1. Role ID (foreign key)
  2. Time/Date Group ID (foreign key)
- } Composite Key

## Role "Auth" Attribute

A new column holding a JSON formatted configuration provides the flexibility of the multiple authentication methods that script policy currently employs. The applicable functions are then called by Role Based Policy authorization functions in a similar way as the script based policy.

A new database column, formatted in JSON format provides extra authentication options. The column is a JSON array of methods that are called in order, and REJECT when the first one fails. Each array element is a JSON object with a *method* and attributes:

```
{ "method" : "getstringpasswd", "passwd" : <string>, "prompt": "<string>", "message": "<string>", "rejectMessage": "<string>", "tries": <num> }
```

passwd	Base64 encoded SHA256 password to match
prompt	The prompt string
message	Message to display if the authentication fails
rejectMessage	The Reject message that is logged against the event
tries	The number of password attempts

```
{ "method" : "getuserpasswd", "user": <string>, "fname" : <string>, "prompt": "<string>", "message": "<string>", "rejectMessage": "<string>", "tries": <num>, "period" : <num> }
```

user	Username to check
fname	The unique filename used to cache the password authentication
prompt	The prompt string
message	Message to display if the authentication fails
rejectMessage	The Reject message that is logged against the event
tries	The number of password attempts
period	The maximum duration before the user has to reauthenticate

```
{ "method" : "getuserpasswdpam", "user": <string>, "service" : <string>, "fname" : <string>, "prompt": "<string>", "message": "<string>", "rejectMessage": "<string>", "tries": <num>, "period" : <num> }
```

user	Username to check
service	The PAM service string
fname	The unique filename used to cache the password authentication

prompt	The prompt string
message	Message to display if the authentication fails
rejectMessage	The Reject message that is logged against the event
tries	The number of password attempts
period	The maximum duration before the user has to reauthenticate

```
{ "method" : "submitconfirmuser", "user":<string>, "fname" : <string>, "prompt": "<string>",
  message": "<string>", "rejectMessage": "<string>", "tries": <num>, "period" : <num> }
```

user	Username to check
fname	The unique filename used to cache the password authentication
prompt	The prompt string
message	Message to display if the authentication fails
rejectMessage	The Reject message that is logged against the event
tries	The number of password attempts
period	The maximum duration before the user has to reauthenticate

```
{ "method" : "submitconfirmuserpam", "user":<string>, "service" : <string>, "fname" : <string>,
  "prompt": "<string>", message": "<string>", "rejectMessage": "<string>", "tries": <num>, "period" :
  <num> }
```

user	Username to check
service	The PAM service string
fname	The unique filename used to cache the password authentication
prompt	The prompt string
message	Message to display if the authentication fails
rejectMessage	The Reject message that is logged against the event
tries	The number of password attempts
period	The maximum duration before the user has to reauthenticate

There are also three other variables (namely **runconfirmuser**, **runconfirmmessage**, **runconfirmpasswdservice**) that affect reauthentication. However, because these are policy script variables as opposed to functions, these are implemented in a similar way. In this respect, these variables should be set in the **Variables** column, and are templated in a similar manner.

**Example:**

```
{ "runconfirmuser" : "%user%" }
```

## Matching Endpoint Privilege Management for Unix and Linux Variables for a Role

A new JSON formatted column has been introduced that allows the matching of roles based upon variables submitted by the client, for example **pbclientmode**. Matched values are wildcarded using normal glob(3) rules.

The format of the object is similar to:

```
{ "varmatch" : { "pbclientmode" : "pbrun", "year" : "201[678]" }}
```



## Role Based Policy, Change Management Events

There are two different approaches to maintaining the Role Based Policy database. The first, simple method is to access the tables using **pbdbutil** at the command line. Each change is individual, and instantaneous, and is immediately *live*. Although for smaller organizations this is adequate, larger organizations have a more controlled procedural access method.

Role Based Policy database *change transactions* can be enabled using the `pb.setting` **rbptransactions**. Once enabled, before changes can be made, the administrator must begin a change transaction, specifying a reason why the change is being made. This is logged and the whole Role Based Policy database is then locked for update - only that administrator can continue to make changes. These changes will NOT be mirrored in the *live* authorization process and can continue to be made by that administrator alone, and when completed can be *committed* or *rolled back*. Once the changes are committed they are all applied to the database as one update, and a change management event is generated. If the changes are rolled back, they are discarded and nothing changes.

If, for whatever reason, a change transaction is begun, and the administrator leaves it open and fails to close the transaction, any other administrator with access can force the rollback of the changes. Once again, this requires a reason specifying, and logs a change management event. The change transactions are necessary once the GUI policy updates are implemented to force database integrity. See the section below for Change Transaction Command Line options.

To enable the logging of change management events each client needs the `pb.setting` **changemanagementeventsm yes** and log servers will need to defined the **eventdb <path>** and need the REST `pbrest` service running.

The following settings are used and need to be set when Role Based Policy and Change management is implemented and used:

### policydb <path>

- The path to the Role Based Policy Database.
- There is no default for this setting.

### pbresturi <string>

- The partial REST url string between the hostname and /REST.
- There is no default for this setting.

### pbrestport <port#>

- The REST port.
- Default value is the base port + 6.

### rolebasedpolicy <yes/no>

- Enabled/Disable Role Based Policy checking.
- The default is **no**.

### eventdb <path>

- The path to the Change Management Event Database.
- There is no default for this setting.

## **rbptransactions <yes/no>**

- Enable the use of Role Based Policy Transactions to ensure integrity.
- The default is **no**.

## **changemanagementevents <yes/no>**

- Enable/Disable the logging of Change Management Events when maintaining databases.
- The default is **no**.

## **pbresttimeskew <num>**

- The maximum time in seconds that hosts are mis-matched by (it is recommended that the customer uses a time synchronization service).
- The default is **60 seconds**.

## Role Based Policy Entitlement Reports

Endpoint Privilege Management for Unix and Linux v10.1.0 introduced Role Based Policy Entitlement reports. These reports are available to the user from the **pbrun** command using **-e**, or to the administrator as an overall report using **pbdbutil --rbp -R**. They provide a comprehensive report on what users can access commands on which hosts, and when they are allowed to run them.

### pbdbutil: Role Based Policy Options

The pbdbutil Role Based Policy options introduced in Endpoint Privilege Management for Unix and Linux v10.1.0 are described below.

```
pbdbutil --rbp [<options>] [ <file> <file> ...]
-R { json param } Report user entitlements from the database
  -R Add option to display commands
    -R Add option to display time/date restrictions
      -R Add option to display additional role options
-E { json param } List user entitlements data from the database
where { json param } is one or more of:
  "submituser" : "user1" Specify submit user or wildcard
  "submithost" : "host1" Specify submit host or wildcard
  "runuser"    : "user1" Specify run user or wildcard
  "runhost"   : "host1" Specify run host or wildcard
  "command"   : "command" Specify command or wildcard
```

### pbrun Options

Endpoint Privilege Management for Unix and Linux v10.1.0 introduced the following options that are available only when Role Based Policy is enabled:

<b>pbrun -e</b>	Returns the entitlement report for the current user at level 1.
<b>pbrun -e 1</b>	Returns the entitlement report for the current user at level 1.
<b>pbrun -e 4</b>	Returns the entitlement report for the current user at level 4.
<b>pbrun --entitlement=4</b>	Returns the entitlement report for the current user at level 4.



#### Example:

```
Level 1 report
=====
Endpoint Privilege Management for Unix and Linux Role Based Policy Entitlement Report -
Level 1
-----
Date/Time: 2018-06-18 09:07:23
User: root
Belongs to the following Roles:
Admin
```



```

=====
Role Order:      1
Name:            Admin
Description:     Super users and admins
Action:         allowed
Tag:
Membership:     Admins
Submit Host(s): Any PBUL Host
Run Host(s):    Any PBUL Host
Commands may be executed as user(s): root,admin,user*
Please use the '-u' flag to select user at run time.
eg: pbrun -u runuser command [arguments]
User may request the following commands using pbrun:
/bin/find *,/usr/bin/ls,/bin/ls,/bin/cat *,/bin/ls *,/usr/bin/ls *,/usr/bin/rm *,
/usr/bin/cat *,/usr/bin/find *,/sbin/shutdown *,/bin/more *,/bin/id,/usr/bin/more *,
/usr/bin/mount *,/bin/lm *,/bin/mount *,/bin/rm *,/usr/sbin/shutdown *,
/usr/bin/lm *,/usr/bin/id,/sbin/ifconfig *,/usr/sbin/ifconfig *
=====
    
```


**Example:**

```

Endpoint Privilege Management for Unix and Linux Role Based Policy Entitlement Report -
Level 2
-----
Date/Time: 2018-06-18 09:07:28
User: root
Belongs to the following Roles:
Admin
=====
Role Order:      1
Name:            Admin
Description:     Super users and admins
Action:         allowed
Tag:
Risk:            1
Membership:     Admins
Submit Host(s): Any PBUL Host
Run Host(s):    Any PBUL Host
Commands may be executed as user(s): root,admin,user*
Please use the '-u' flag to select user at run time.
eg: pbrun -u runuser command [arguments]
User may request the following commands using pbrun:
Command Group: User Commands
Description:     Common UNIX Commands
/bin/ls          executes: /bin/ls
/bin/ls *        executes: /bin/ls *
/usr/bin/ls      executes: /usr/bin/ls
/usr/bin/ls *    executes: /usr/bin/ls *
/bin/cat *       executes: /bin/cat *
    
```



```

/usr/bin/cat *           executes: /usr/bin/cat *
/bin/find *             executes: /bin/find *
/usr/bin/find *        executes: /usr/bin/find *
/bin/more *            executes: /bin/more *
/usr/bin/more *        executes: /usr/bin/more *
/bin/rm *              executes: /bin/rm -i $*
/usr/bin/rm *          executes: /usr/bin/rm -i $*
/bin/ln *              executes: /bin/ln *
/usr/bin/ln *          executes: /usr/bin/ln *
/bin/id                executes: /bin/id
/usr/bin/id            executes: /usr/bin/id
Command Group: Admin Commands
Description: Common Superuser Commands
/sbin/shutdown *       executes: /sbin/shutdown *
/usr/sbin/shutdown *   executes: /usr/sbin/shutdown *
/bin/mount *           executes: /bin/mount *
/usr/bin/mount *       executes: /usr/bin/mount *
/sbin/ifconfig *       executes: /sbin/ifconfig *
/usr/sbin/ifconfig *   executes: /usr/sbin/ifconfig *
    
```


**Example:**

```

Level 3 report
=====
Endpoint Privilege Management for Unix and Linux Role Based Policy Entitlement Report -
Level 3
-----
Date/Time: 2018-06-18 09:07:30
User: root
Belongs to the following Roles:
Admin
=====
Role Order:      1
Name:            Admin
Description:     Super users and admins
Action:          allowed
Tag:
Risk:            1
Membership:      Admins
Submit Host(s): Any PBUL Host
Run Host(s):    Any PBUL Host
Commands may be executed as user(s): root,admin,user*
Please use the '-u' flag to select user at run time.
eg: pbrun -u runuser command [arguments]
User may request the following commands using pbrun:
Command Group:  User Commands
Description:    Common UNIX Commands
/bin/ls         executes: /bin/ls
/bin/ls *      executes: /bin/ls *
    
```



```

/usr/bin/ls                executes: /usr/bin/ls
/usr/bin/ls *             executes: /usr/bin/ls *
/bin/cat *                executes: /bin/cat *
/usr/bin/cat *            executes: /usr/bin/cat *
/bin/find *               executes: /bin/find *
/usr/bin/find *           executes: /usr/bin/find *
/bin/more *               executes: /bin/more *
/usr/bin/more *           executes: /usr/bin/more *
/bin/rm *                 executes: /bin/rm -i $*
/usr/bin/rm *             executes: /usr/bin/rm -i $*
/bin/ln *                 executes: /bin/ln *
/usr/bin/ln *             executes: /usr/bin/ln *
/bin/id                   executes: /bin/id
/usr/bin/id               executes: /usr/bin/id
Command Group: Admin Commands
Description: Common Superuser Commands
/sbin/shutdown *          executes: /sbin/shutdown *
/usr/sbin/shutdown *      executes: /usr/sbin/shutdown *
/bin/mount *              executes: /bin/mount *
/usr/bin/mount *          executes: /usr/bin/mount *
/sbin/ifconfig *          executes: /sbin/ifconfig *
/usr/sbin/ifconfig *      executes: /usr/sbin/ifconfig *
Date and Time restrictions for Role 'Admin':
Time/Date Group: Any Time
Description: Any Time
Monday: 01:00am to 12:14pm
Tuesday: 01:00am to 12:14pm
Wednesday: 01:00am to 12:14pm
Thursday: 01:00am to 12:14pm
Friday: 01:00am to 12:14pm
Saturday: 01:00am to 12:14pm
Sunday: 01:00am to 12:14pm
    
```


**Example:**

```

Level 4 report
=====

Role Based Policy Entitlement Report - Level 4
-----

Date/Time: 2018-06-18 09:07:32
User: root
Belongs to the following Roles:
Admin
=====

Role Order:    1
Name:          Admin
Description:    Super users and admins
Action:        allowed
    
```



```

Tag:
Risk:          1
Membership:    Admins
Submit Host(s): Any PBUL Host
Run Host(s):   Any PBUL Host
Commands may be executed as user(s): root,admin,user*
Please use the '-u' flag to select user at run time.
eg: pbrun -u runuser command [arguments]
User may request the following commands using pbrun:
Command Group: User Commands
Description:    Common UNIX Commands
/bin/ls                executes: /bin/ls
/bin/ls *              executes: /bin/ls *
/usr/bin/ls            executes: /usr/bin/ls
/usr/bin/ls *          executes: /usr/bin/ls *
/bin/cat *             executes: /bin/cat *
/usr/bin/cat *         executes: /usr/bin/cat *
/bin/find *            executes: /bin/find *
/usr/bin/find *        executes: /usr/bin/find *
/bin/more *            executes: /bin/more *
/usr/bin/more *        executes: /usr/bin/more *
/bin/rm *              executes: /bin/rm -i $*
/usr/bin/rm *          executes: /usr/bin/rm -i $*
/bin/lm *              executes: /bin/lm *
/usr/bin/lm *          executes: /usr/bin/lm *
/bin/id                executes: /bin/id
/usr/bin/id            executes: /usr/bin/id
Command Group: Admin Commands
Description:    Common Superuser Commands
/sbin/shutdown *      executes: /sbin/shutdown *
/usr/sbin/shutdown *  executes: /usr/sbin/shutdown *
/bin/mount *           executes: /bin/mount *
/usr/bin/mount *       executes: /usr/bin/mount *
/sbin/ifconfig *      executes: /sbin/ifconfig *
/usr/sbin/ifconfig *  executes: /usr/sbin/ifconfig *
Date and Time restrictions for Role 'Admin':
Time/Date Group: Any Time
Description:        Any Time
Monday: 01:00am to 12:14pm
Tuesday: 01:00am to 12:14pm
Wednesday: 01:00am to 12:14pm
Thursday: 01:00am to 12:14pm
Friday: 01:00am to 12:14pm
Saturday: 01:00am to 12:14pm
Sunday: 01:00am to 12:14pm
Additional Role Options:
Additional Authentication Required: no
Session Recording Enabled: yes
Extended Script Policy: no
Custom accept/reject message: no
    
```



```
Level 1 report, with "command" filter
pbdbutil -P --rbp -R '{ "command":"/usr/bin/*"}'
=====
Endpoint Privilege Management for Unix and Linux Role Based Policy Entitlement Report -
Level 1
-----
Date/Time: 2018-06-18 09:09:10
User: *
Belongs to the following Roles:
Admin,users
=====
Role Order:      1
Name:            Admin
Description:     Super users and admins
Action:         allowed
Tag:
Risk:           1
Membership:     Admins
Submit Host(s): Any PBUL Host
Run Host(s):    Any PBUL Host
Commands may be executed as user(s): root,admin,user*
Please use the '-u' flag to select user at run time.
eg: pbrun -u runuser command [arguments]
User may request the following commands using pbrun:
/usr/bin/ls,/usr/bin/mount *,/usr/bin/ls *,/usr/bin/cat *,/usr/bin/find *,
/usr/bin/rm *,/usr/bin/ln *,/usr/bin/more *,/usr/bin/id
=====
Role Order:      4
Name:            users
Description:     Normal users
Action:         allowed
Tag:
Membership:     Users
Submit Host(s): nfs.company.com,build.company.com,staging.company.com
Run Host(s):    nfs.company.com,build.company.com,staging.company.com
Commands will execute as user: user*
User may request the following commands using pbrun:
/usr/bin/ls,/usr/bin/ls *,/usr/bin/find *,/usr/bin/cat *,/usr/bin/ln *,
/usr/bin/rm *,/usr/bin/more *,/usr/bin/id
```

**Example:**

```
Level 4 report with "command" filter
=====
Endpoint Privilege Management for Unix and Linux Role Based Policy Entitlement Report -
Level 4
-----
Date/Time: 2018-06-18 09:09:26
User: *
Belongs to the following Roles:
```





```

Admin,users
=====
Role Order:      1
Name:            Admin
Description:     Super users and admins
Action:         allowed
Tag:
Risk:           1
Membership:     Admins
Submit Host(s): Any PBUL Host
Run Host(s):    Any PBUL Host
Commands may be executed as user(s): root,admin,user*
Please use the '-u' flag to select user at run time.
eg: pbrun -u runuser command [arguments]
User may request the following commands using pbrun:
Command Group: Admin Commands
Description:    Common Superuser Commands
/usr/bin/mount *          executes: /usr/bin/mount *
Command Group: User Commands
Saturday:       01:00am to 12:14pm
Description:    Common UNIX Commands
/usr/bin/ls             executes: /usr/bin/ls
/usr/bin/ls *          executes: /usr/bin/ls *
/usr/bin/cat *         executes: /usr/bin/cat *
/usr/bin/find *        executes: /usr/bin/find *
/usr/bin/more *        executes: /usr/bin/more *
/usr/bin/rm *          executes: /usr/bin/rm -i $*
/usr/bin/lm *          executes: /usr/bin/lm *
/usr/bin/id            executes: /usr/bin/id
Date and Time restrictions for Role 'Admin':
Time/Date Group: Any Time
Description:     Any Time
Monday:         01:00am to 12:14pm
Tuesday:        01:00am to 12:14pm
Wednesday:     01:00am to 12:14pm
Thursday:      01:00am to 12:14pm
Friday:        01:00am to 12:14pm
Saturday:      01:00am to 12:14pm
Sunday:        01:00am to 12:14pm
Additional Role Options:
Additional Authentication Required: no
Session Recording Enabled: yes
Extended Script Policy: no
Custom accept/reject message: no
=====
Role Order:      4
Name:            users
Description:     Normal users
Action:         allowed
Tag:
Risk:           1
    
```



```

Membership:      Users
Submit Host(s): build.company.com,nfs.company.com,staging.company.com
Run Host(s):    build.company.com,nfs.company.com,staging.company.com
Commands will execute as user: user*
User may request the following commands using pbrun:
Command Group:  User Commands
Description:    Common UNIX Commands
/usr/bin/ls          executes: /usr/bin/ls
/usr/bin/ls *       executes: /usr/bin/ls *
/usr/bin/cat *      executes: /usr/bin/cat *
/usr/bin/find *     executes: /usr/bin/find *
/usr/bin/more *     executes: /usr/bin/more *
/usr/bin/rm *       executes: /usr/bin/rm -i $*
/usr/bin/lm *       executes: /usr/bin/lm *
/usr/bin/id         executes: /usr/bin/id
Date and Time restrictions for Role 'users':
Time/Date Group: Working Week
Description:      Working Week
Monday:  01:00am to 12:14pm
Tuesday: 01:00am to 12:14pm
Wednesday: 01:00am to 12:14pm
Thursday: 01:00am to 12:14pm
Friday:  01:00am to 12:14pm
Saturday: none
Sunday:  none
Additional Role Options:
Additional Authentication Required: no
Session Recording Enabled: no
Extended Script Policy: no
Custom accept/reject message: no
    
```


**Example:**

```

Level 4 report with "command" filter
=====
Endpoint Privilege Management for Unix and Linux Role Based Policy Entitlement Report -
Level 4
-----
Date/Time: 2018-06-18 09:09:26
User: *
Belongs to the following Roles:
Admin,users
=====
Role Order:      1
Name:            Admin
Description:     Super users and admins
Action:          allowed
Tag:
Risk:            1
    
```



```

Membership:      Admins
Submit Host(s): Any PBUL Host
Run Host(s):    Any PBUL Host
Commands may be executed as user(s): root,admin,user*
Please use the '-u' flag to select user at run time.
eg: pbrun -u runuser command [arguments]
User may request the following commands using pbrun:
Command Group: Admin Commands
Description:    Common Superuser Commands
/usr/bin/mount *          executes: /usr/bin/mount *
Command Group: User Commands
Saturday:      01:00am to 12:14pm
Description:    Common UNIX Commands
/usr/bin/ls              executes: /usr/bin/ls
/usr/bin/ls *            executes: /usr/bin/ls *
/usr/bin/cat *           executes: /usr/bin/cat *
/usr/bin/find *          executes: /usr/bin/find *
/usr/bin/more *          executes: /usr/bin/more *
/usr/bin/rm *            executes: /usr/bin/rm -i $*
/usr/bin/ln *            executes: /usr/bin/ln *
/usr/bin/id              executes: /usr/bin/id
Date and Time restrictions for Role 'Admin':
Time/Date Group: Any Time
Description:      Any Time
Monday:          01:00am to 12:14pm
Tuesday:         01:00am to 12:14pm
Wednesday:       01:00am to 12:14pm
Thursday:        01:00am to 12:14pm
Friday:          01:00am to 12:14pm
Saturday:        01:00am to 12:14pm
Sunday:          01:00am to 12:14pm
Additional Role Options:
Additional Authentication Required: no
Session Recording Enabled: yes
Extended Script Policy: no
Custom accept/reject message: no
=====
Role Order:      4
Name:            users
Description:     Normal users
Action:          allowed
Tag:
Risk:            1
Membership:     Users
Submit Host(s): build.company.com,nfs.company.com,staging.company.com
Run Host(s):    build.company.com,nfs.company.com,staging.company.com
Commands will execute as user: user*
User may request the following commands using pbrun:
Command Group: User Commands
Description:    Common UNIX Commands
/usr/bin/ls              executes: /usr/bin/ls
    
```



```

/usr/bin/ls *          executes: /usr/bin/ls *
/usr/bin/cat *        executes: /usr/bin/cat *
/usr/bin/find *       executes: /usr/bin/find *
/usr/bin/more *       executes: /usr/bin/more *
/usr/bin/rm *         executes: /usr/bin/rm -i $*
/usr/bin/lm *         executes: /usr/bin/lm *
/usr/bin/id           executes: /usr/bin/id

```

Date and Time restrictions for Role 'users':

```

Time/Date Group: Working Week
Description:      Working Week
Monday: 01:00am to 12:14pm
Tuesday: 01:00am to 12:14pm
Wednesday: 01:00am to 12:14pm
Thursday: 01:00am to 12:14pm
Friday: 01:00am to 12:14pm
Saturday: none
Sunday: none
Additional Role Options:
Additional Authentication Required: no
Session Recording Enabled: no
Extended Script Policy: no
Custom accept/reject message: no

```

Level 4 report with "command" filter

```

=====
Endpoint Privilege Management for Unix and Linux Role Based Policy Entitlement Report -
Level 4
-----

```

Date/Time: 2018-06-18 09:09:26

User: \*

Belongs to the following Roles:

Admin,users

```

=====
Role Order:      1
Name:            Admin
Description:     Super users and admins
Action:         allowed
Tag:
Risk:            1
Membership:     Admins
Submit Host(s): Any PBUL Host
Run Host(s):    Any PBUL Host
Commands may be executed as user(s): root,admin,user*
Please use the '-u' flag to select user at run time.
eg: pbrun -u runuser command [arguments]
User may request the following commands using pbrun:
Command Group:  Admin Commands
Description:    Common Superuser Commands
/usr/bin/mount *          executes: /usr/bin/mount *
Command Group:  User Commands
Saturday: 01:00am to 12:14pm

```



```

Description:    Common UNIX Commands
/usr/bin/ls          executes: /usr/bin/ls
/usr/bin/ls *        executes: /usr/bin/ls *
/usr/bin/cat *       executes: /usr/bin/cat *
/usr/bin/find *      executes: /usr/bin/find *
/usr/bin/more *      executes: /usr/bin/more *
/usr/bin/rm *        executes: /usr/bin/rm -i $*
/usr/bin/lm *        executes: /usr/bin/lm *
/usr/bin/id          executes: /usr/bin/id
Date and Time restrictions for Role 'Admin':
Time/Date Group: Any Time
Description:    Any Time
Monday:    01:00am to 12:14pm
Tuesday:   01:00am to 12:14pm
Wednesday: 01:00am to 12:14pm
Thursday:  01:00am to 12:14pm
Friday:    01:00am to 12:14pm
Saturday:  01:00am to 12:14pm
Sunday:    01:00am to 12:14pm
Additional Role Options:
Additional Authentication Required: no
Session Recording Enabled: yes
Extended Script Policy: no
Custom accept/reject message: no
=====
Role Order:    4
Name:          users
Description:   Normal users
Action:        allowed
Tag:
Risk:          1
Membership:    Users
Submit Host(s): build.company.com,nfs.company.com,staging.company.com
Run Host(s):   build.company.com,nfs.company.com,staging.company.com
Commands will execute as user: user*
User may request the following commands using pbrun:
Command Group: User Commands
Description:   Common UNIX Commands
/usr/bin/ls          executes: /usr/bin/ls
/usr/bin/ls *        executes: /usr/bin/ls *
/usr/bin/cat *       executes: /usr/bin/cat *
/usr/bin/find *      executes: /usr/bin/find *
/usr/bin/more *      executes: /usr/bin/more *
/usr/bin/rm *        executes: /usr/bin/rm -i $*
/usr/bin/lm *        executes: /usr/bin/lm *
/usr/bin/id          executes: /usr/bin/id
Date and Time restrictions for Role 'users':
Time/Date Group: Working Week
Description:    Working Week
Monday:    01:00am to 12:14pm
Tuesday:   01:00am to 12:14pm
Wednesday: 01:00am to 12:14pm
    
```



```
Thursday: 01:00am to 12:14pm
Friday: 01:00am to 12:14pm
Saturday: none
Sunday: none
Additional Role Options:
Additional Authentication Required: no
Session Recording Enabled: no
Extended Script Policy: no
Custom accept/reject message: no
```

## Policy File Format

In most cases, the order of the instructions in a security policy file is not important. The user's security requirements determine the rules that the file contains.

### User-Written Functions and Procedures

To help simplify security policy implementation, the Endpoint Privilege Management for Unix and Linux Security Policy Scripting Language enables the security administrator to write custom functions and procedures (that is, user-written functions and procedures).



**Note:** For the remainder of this discussion, the term "function" refers to both user-written functions and procedures. The differences between the two are discussed in "[Functions and Procedures](#)" on page 98.

Think of functions as stand-alone units of security code that perform specific programming tasks. After a function is written, the function can be invoked from within any security policy file to perform its specific task or function. It is a good idea to write functions for repetitive programming tasks. Doing so enables the policy instructions to be written once and utilized in multiple places.

Another benefit of using functions is that any needed changes can be made in only one place. By centralizing the logic for a repetitive type task in one place (that is, a single function), all of the security policy files that call the function automatically benefit from any updates that are made to the function. The following figure illustrates the basic structure of a function.

When a user-written function is used within a security policy file, the code for that function is placed at the top of the security policy file that first references it. In other words, the overall structure of a security policy file is all user-written functions first, followed by security policy code.

file: pb.conf

```
function FUCNTIONNAME(arguments)
{
    function statements go here
    _____
    FUCNTIONNAME=value
}
```

A good way to manage and organize user-written functions is to logically group all functions that perform similar types of tasks in a security policy file. Now, add **include** statements for each of these sub files to the beginning of the **pb.conf** file. These **include** statements should come before anything else. When this is done, the functions that are contained within these sub files can be called from within any security policy file.



For more information on creating functions and procedures, see "[Functions and Procedures](#)" on page 98.

## Variable Scope

Security policy variables are global. In other words, after a variable has been implicitly defined, it can be referenced from any security policy file. The use of a variable is not limited to the security policy file in which it was implicitly defined (that is, used for the first time).

If a variable is implicitly created in one security policy file and referenced by another, both files access and modify the same variable.



## Syntax Checking

Always check the syntax of a security policy file before putting it into production. If a request encounters a security policy file syntax error, then the task that causes the error is immediately rejected. The Reject event is logged in the Endpoint Privilege Management for Unix and Linux event log.

Syntax checking is done with **pbcheck**, an Endpoint Privilege Management for Unix and Linux utility program. It performs two functions:

- Security policy file syntax validation
- Simulates security processing for test task requests to determine if that task request would be accepted or rejected during production processing



For more information on how to use **pbcheck**, see the [Endpoint Privilege Management for Unix and Linux Administration Guide](https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm) at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>.

## Policy Debugging

Policies can be debugged via the **pbadmin --poldbg** command.



For more information, see the [Endpoint Privilege Management for Unix and Linux Administration Guide](https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm) at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>.

## Environment Variable Processing Considerations

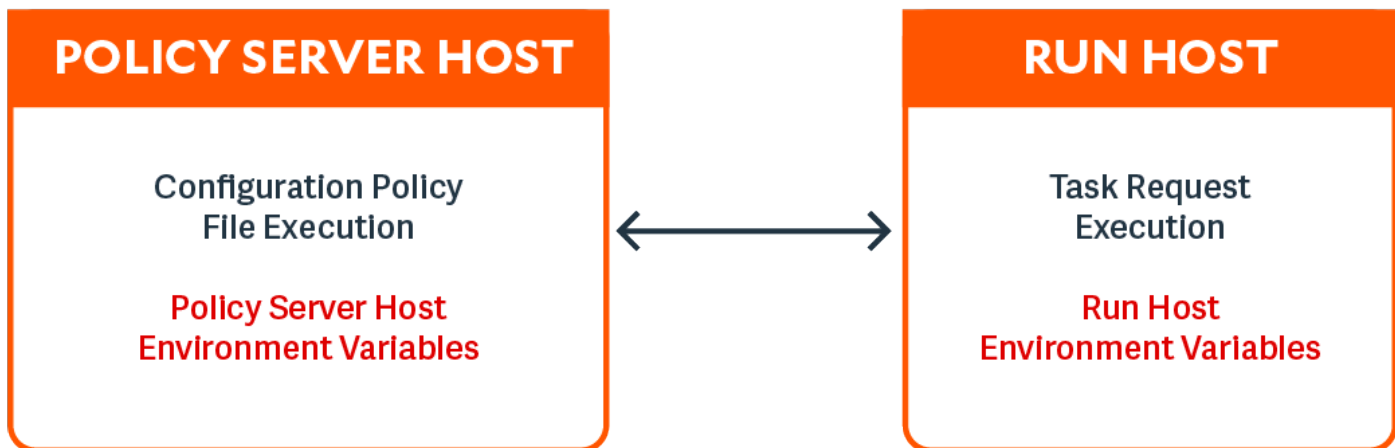
As discussed earlier, it is possible to install **pbrun**, **pbmasterd**, **pblocald**, and/or **pblogd** on different machines (that is, the submit host, policy server host, run host, and log host may represent different physical machines). When this is the case, each of these separate machines can have its own set of users, groups, and environment variables, which can differ from host to host.



**Note:** If **pbrun**, **pbmasterd**, and/or **pblocald** are installed on different machines, then the environment variables on those machines can contain different values.

For instance, a user might have one home directory on the submit host and another on the run host. In another example, a user group list on policy server host can be different from the same user group list on the run host. This situation might arise if the policy server host is not an NIS client or has fewer entries in its `/etc/passwd` file.

As shown in the following figure, security policy file processing always takes place on the policy server host machine, while task execution takes place on the run host machine. When the policy server host and run host represent different machines, by default, it is the user and group information on the policy server host machine that is accessed during security profile file processing. If it is necessary to access users or groups only on the run host machine, then special pass-through values must be used. When these values are encountered during security profile file processing, **pbmasterd** passes through the value to the run host machine to be resolved when the task is run.



**Note:** The `execute_via_su` mechanism enables the runhost's environment for the runuser, overriding the run environment that the policy on the policy server has set up. Note also that the `runenvironmentfile` feature can also be used to add runhost specific environment variables.



For more detailed information on using pass-through values, see ["Task Information Variables" on page 110](#).

## Support for Multiple-Byte Character Sets

The Endpoint Privilege Management for Unix and Linux policy language supports the processing of UTF-8 encoded multiple-byte character strings. In addition, several variables (indicated by **i18n\_** in their names) format UTF-8 encoded date and time values according to the operating system's locale settings.

# Security Policy Scripting Language Definition

The Security Policy Scripting Language is an interpreted programming language. Its syntax is similar to the C language. Like C, it is case-sensitive. This chapter contains detailed information about using the Endpoint Privilege Management for Unix and Linux Security Policy Scripting Language.

## Variables and Data Types

A variety of variables and data types are available in the Endpoint Privilege Management for Unix and Linux Security Policy Scripting Language. These are described in the following sections.

### Variables

Endpoint Privilege Management for Unix and Linux uses predefined system variables to store both system and task-specific information. These variables are a valuable resource to the Security Administrator because they can be accessed and manipulated from within security policy files with the Security Policy Scripting Language. The information in these variables can play a critical role in determining whether a task request should be accepted or rejected. System variables can also be used to set runtime properties, including logging options, for a specific task request.

In addition to predefined system variables, the Security Administrator can create and manipulate user-defined variables to assist with security policy file processing. User-defined variables are implicitly defined, meaning the interpreter automatically allocates storage for a user-defined variable the first time that variable is referenced. In the Endpoint Privilege Management for Unix and Linux Security Policy Scripting Language, there is no need to formally declare a variable before using it. Consequently, the language does not provide a mechanism for explicitly defining a variable type. A variable's type is implicitly defined by the information that is stored in that variable. After a variable has stored a specific type of information, it cannot store information of a different data type.

Observe the following rules when creating user-defined variables:

- Variable names can be any length.
- The first character of a variable name must be a letter or an underscore character. The remaining characters can be letters, numerals, or underscores.
- Variable names are case sensitive. For example, the variable names **currentuser** and **CurrentUser** represent two different and unique variables.



#### Example:

```
MyVariable = "123"; # Create a user-defined variable.
LoopCounter = 1; # Create a user-defined variable.
_CurrentUser = "Tom"; # Create a user-defined variable.
runuser = "SysAdm"; # Set a predefined system variable.
```

## Variable Scope

With the exception of function parameters, all Endpoint Privilege Management for Unix and Linux variables are global in scope. (In this context, the function name inside a function behaves like a function parameter.) This means that if a user-defined variable is implicitly defined in a security policy file and referenced in another security policy file, both files access the same variable.

Function parameters, also called function arguments, do not work differently from other variables. Function argument storage for a specific security policy function is deleted when that security policy function completes execution.

## Variable Data Types

The data type, or type of information that is stored in a variable, determines the type of operations you can perform on the variable. Endpoint Privilege Management for Unix and Linux supports the following data types:

- Character strings
- Integers
- LDAP connections
- LDAP messages
- List of character strings

### Character String

The character string, or string, data type is a sequence of zero or more characters, enclosed by single or doublequotation marks. It is important to note that arithmetic functions cannot be performed on character strings. For instance, the character string **"123"** cannot be used in an arithmetic operation although it contains numeric characters. As another example, the character string **"12"** is not the same as the number **"12"**. A value that is enclosed in quotation marks is always stored as a character string. In other words, the Security Policy Scripting Language interpreter treats numeric values and numeric character strings differently. They are not interchangeable.

The following table lists character string examples and how they are interpreted.

Example	Interpreted As
"abc"	Character string
""	Empty character string
"0123456789"	Numeric character string
'abc'	Character string

### Integer

Integers are numeric values used to perform arithmetic operations. It is important to note that the value **12**, which is a numeric value, is not the same as the value **"12"**, which is a character string. The Security Policy Scripting Language interpreter treats numeric values and numeric character strings differently. They are not interchangeable.

The integer data type can store any integer value (that is, the set of both positive and negative whole numbers). An octal number (base 8) is specified by prefixing the octal value with a leading zero (for example, **022**). A hexadecimal number (base 16) is specified by preceding the hexadecimal value with **"0x"** (for example, **0x5A**).

The following table lists the valid integer characters.

Basic	Valid Characters
Octal	0, 1, 2, 3, 4, 5, 6, 7
Decimal	0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Hexadecimal	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
-------------	--

The policy language does not support fractional (or floating-point) values. Integer values cannot include characters such as commas, dollar signs, or decimal points.

The integer values **0** and **1** have special meaning within the Security Policy Scripting Language. The integer value of **0** represents the Boolean **false** value. The integer value of **1** is represents the Boolean **true** value.

The following table provides several examples on the use of integer variables.

Example	Result
RejectCount = 0;	Sets <b>RejectCount</b> to 0
UserLimit = 10;	Sets <b>UserLimit</b> to 10
OctNumber = 022;	Sets an octal variable to 18
HexNumber = 0x7a;	Sets an integer to a hexadecimal value of 122

**i** For more information on Boolean values, see ["Boolean True and False Variables" on page 100](#).

## LDAP Connection

The LDAP connection is a special data type that is used solely for passing parameters to and from the Endpoint Privilege Management for Unix and Linux LDAP functions.

**i** For more information on Endpoint Privilege Management for Unix and Linux LDAP functions, see ["LDAP Functions" on page 394](#).

## LDAP Message

The LDAP message is a special data type. It is used only to pass parameters to and from the Endpoint Privilege Management for Unix and Linux LDAP functions.

**i** For more information on Endpoint Privilege Management for Unix and Linux LDAP functions, see ["LDAP Functions" on page 394](#).

## List of Character Strings

A list of character strings, also called a list, is an ordered group of character strings, separated by commas and surrounded by curly braces {}. It has the syntax:

```
{ string-one, string-two, ...}
An empty list is represented as { }
```

```
Assignment to a list has the syntax:  
name = { string-one, string-two, ...}  
Assignment to an element of a list can be done by:  
name[1] = "string-three"
```

Think of a list as a one-dimensional array consisting of zero or more elements (refer to the example). A list can contain only character string data (that is, a list cannot contain integer values, LDAP related types, or other lists).

Individual list elements are accessed using an index number. Square brackets enclose the index number and postfix the list name (see the following example).

Index numbering starts at 0. This means that the first element in a list has an index of 0, the second element has an index of 1, and so on. For example, the fifth element in a list has an index number of 4.

**Example:**

```
UserList = {"JWhite", "BSmith", "CDent"};
```

*results in the following:*

```
UserList[0] is "JWhite"  
UserList[1] is "BSmith"  
UserList[2] is "CDent"
```

**Example: Assume the following:**

```
TrustedUsers = {"JWhite", "BSmith"};  
User1 = TrustedUsers [0];  
User2 = TrustedUsers [1];  
MyString = { "a", "b", "c" }[1];
```

*In this list,*

```
User1 = TrustedUsers [0]; sets User1 to "JWhite"  
User2 = TrustedUsers [1]; sets User2 to "BSmith"  
MyString = { "a", "b", "c" }[1]; sets MyString = "b"
```

## Constants

A constant is a value that is not modified during security policy file execution. The following table contains examples of the different constant types.

Constant Type	Examples
Integer Constant	12, 54, -100, 08, 0x1a
List Constant	{"user1", "user2", "user3"}
String Constants	"12", "ABCD"

## Operators

An operator is a symbol that performs a specific mathematical, relational, or logical function. The Security Policy Scripting Language supports the types of operators that are listed in the following table.

Operator Type	Symbols
Arithmetic Operators	<code>*</code> , <code>/</code> , <code>+</code> , <code>-</code> , <code>%</code> , <code>++</code> , <code>--</code> , <code>+=</code> , <code>-=</code> , <code>*=</code> , <code>/=</code> , <code>%=</code>
Logical Operators	<code>&amp;&amp;</code> , <code>  </code> , <code>!</code>
Relational Operators	<code>&gt;</code> , <code>&gt;=</code> , <code>&lt;</code> , <code>&lt;=</code> , <code>==</code> , <code>!=</code>
Special Operators	<code>()</code> , <code>[]</code> , <code>+</code> , <code>?:</code> , <code>in</code> , <code>,</code>

Every operator has an intrinsic precedence order associated with it. The precedence order determines the evaluation order for expressions containing more than one operator. The operator with the highest precedence evaluates first. In most cases, operators of the same precedence are evaluated left to right. The following table lists the operator precedence.

Precedence	Operator	Associativity
Highest	<code>{ }</code>	Left to right
	<code>( )</code>	Left to right
	<code>in</code>	Left to right
	<code>!+--</code>	Right to left
	<code>- (unary)</code>	Left to right
	<code>*/%</code>	Left to right
	<code>+-</code>	Left to right
	<code>&lt;&gt;&lt;=&gt;=</code>	Left to right
	<code>==!=</code>	Left to right
	<code>&amp;&amp;</code>	Left to right
	<code>  </code>	Left to right
	<code>?:</code>	Right to left
	<code>+=-=*=/=%=</code>	Right to left
Lowest	<code>,</code>	Left to right





**Example:** Following the rules of operator precedence, the statement

```
5 + 6 - 3 * 4 + 8 / 4
```

is resolved as:

```
Step 1: 3*4 = 12  
Step 2: 8/4 = 2  
Step 3: 5 + 6 - (12) + (2)  
Result: 1
```

Modifying the operator precedence order as shown here can change the result produced in the example above.

```
(5 + 6 - 3) * (4 + 8) / 4
```

The statement is resolved as follows:

```
Step 1: 5 + 6 - 3 = 8  
Step 2: (4 + 8) = 12  
Step 3: 8 * 12 / 4  
Result: 24
```

## Arithmetic Operators

The Endpoint Privilege Management for Unix and Linux Security Policy Scripting Language supports the arithmetic operators shown in the following table.

Operator	Description
++	Prefix autoincrement
--	Prefix autodecrement
++	Postfix autoincrement
--	Postfix autodecrement
*	Multiplication
/	Division
%	Modulus
+	Addition
-	Subtraction
+=	Addition self assignment
-=	Subtraction self assignment
*=	Multiplication self assignment
/=	Division self assignment
%=	Modulus self assignment

The subtraction, addition, multiplication and division operators perform arithmetic operations. The default evaluation order for arithmetic operators is:

- Multiplication, division, and modulus division, left to right
- Addition and subtraction, left to right



### Example:

```
result = 6 * 4 / 2 - 4 + 2;
```

*result contains the integer value 10.*

## Prefix Autoincrement Operator

### Description

The prefix autoincrement operator (++) adds one to a variable and returns the result.

**Example:**

```
a = 3;  
b = ++a;
```

*In this example, both **a** and **b** are equal to 4.*

## Prefix Autodecrement Operator

### Description

The prefix autodecrement operator (`--`) subtracts one from a variable and returns the result.

**Example:**

```
a = 3;  
b = --a;
```

*In this example, both **a** and **b** are equal to 2.*

## Postfix Autoincrement Operator

### Description

The postfix autoincrement operator (`++`) returns the value of a variable and adds one to the variable.

**Example:**

```
a = 3;  
b = a++;
```

*In this example, **a** is equal to 4 and **b** is equal to 3.*

## Postfix Autodecrement Operator

### Description

The postfix autodecrement operator (`--`) returns the value of a variable and subtracts one from the variable.

**Example:**

```
a = 3;  
b = a--;
```

In this example, **a** is equal to 2 and **b** is equal to 3.

## Addition Operator

### Description

The addition operator ( + ) adds two numbers.

**Example:**

```
result = 5 + 3;
```

## Subtraction Operator

### Description

The subtraction operator ( - ) subtracts two numbers.

**Example:**

```
result = 5 - 3;
```

## Multiplication Operator

### Description

The multiplication operator ( \* ) multiplies two numbers.

**Example:**

```
result = 5 * 3;
```

## Division Operator

### Description

The division operator ( / ) divides two numbers.



#### Example:

```
result = 5 / 3;
```

## Modulus Operator

### Description

The modulus operator ( % ) returns the remainder of integer division.



#### Example:

```
result = 5 % 3;
```

In this example, **result** contains the integer value 2. Dividing 5 by 3 yields a result of 1 and a remainder of 2. The remainder portion of the answer, in this case 2, becomes the result of the modulus division operation.

## Addition Self-assignment Operator

### Description

The addition self-assignment operator ( += ) adds a value to a variable and stores the result in the variable.



#### Example:

```
a += 3;
```

In this example, 3 is added to **a** and the result is stored in **a**.

## Subtraction Self-assignment Operator

### Description

The subtraction self-assignment operator ( -= ) subtracts a value from a variable and stores the result in the variable.

**Example:**

```
a -= 4;
```

In this example, 4 is subtracted from **a** and the result is stored in **a**.

## Multiplication Self-assignment Operator

### Description

The multiplication self-assignment operator (**\*=**) multiplies a variable by a value and stores the result in the variable.

**Example:**

```
a *= 5;
```

In this example, **a** is multiplied by 5 and the result is stored in **a**.

## Division Self-assignment Operator

### Description

The division self-assignment operator (**/=**) divides a variable by a value and stores the result in the variable.

**Example:**

```
a /= 6;
```

In this example, **a** is divided by 6 and the result is stored in **a**.

## Modulus Self-assignment Operator

### Description

The modulus self-assignment operator (**%=**) divides a variable by a value and stores the modulus in the variable.

**Example:**

```
a %= 5;
```



*In this example, a is divided by 5 and the remainder is stored in a.*

## Logical Operators

The Endpoint Privilege Management for Unix and Linux Security Policy Scripting Language supports a standard set of logical operators.

Operator	Action
&&	<p><b>AND</b></p> <p>In Endpoint Privilege Management for Unix and Linux versions 3.2 and earlier, logical expressions containing the <b>&amp;&amp;</b> operator are evaluated before determining the result.</p> <p>Beginning with Endpoint Privilege Management for Unix and Linux version 3.5, logical expressions containing the <b>&amp;&amp;</b> operator stop evaluation when a <b>false</b> value is found.</p>
	<p><b>OR</b></p> <p>In Endpoint Privilege Management for Unix and Linux versions 3.2 and earlier, logical expressions containing the <b>  </b> operator are evaluated before determining the result.</p> <p>Beginning with Endpoint Privilege Management for Unix and Linux version 3.5, logical expressions containing the <b>  </b> operators stop evaluation when a <b>true</b> value is found.</p>
!	<b>NOT</b>

### AND Operator

#### Description

The **AND** operator ( **&&** ) considers the relationship between two values. Both values must be **true** for a **true** result to be returned. If both values are **true**, an integer value of **1 (true)** is returned. Otherwise, an integer value of **0 (false)** is returned.

In Endpoint Privilege Management for Unix and Linux 3.2 and earlier, all parts of logical expressions containing **&&** operators are evaluated before determining the result.

Beginning with Endpoint Privilege Management for Unix and Linux 3.5, logical expressions containing **&&** operators are evaluated from left to right until their truth can be determined (like in the C language).



#### Example:

```
if (UserOkay && Bkup) accept;
```

*If both **UserOkay** and **Bkup** are non-zero, the current task request is accepted.*

### OR Operator

#### Description

The **OR** operator ( **||** ) considers the relationship between two values. At minimum, one of the two values must be **true** for a **true** result to be returned. If either the first or second value is **true**, an integer value of **1 (true)** is returned. Otherwise, an integer value of **0 (false)** is



returned.

In Endpoint Privilege Management for Unix and Linux 3.2 and earlier, all parts of logical expressions that contain `||` operators are evaluated before determining the result.

Beginning with Endpoint Privilege Management for Unix and Linux 3.5, logical expressions that contain `||` operators are evaluated from left to right until their truth can be determined (like in the C language).

**Example:**

```
if (UserOkay || Bkup) accept;
```

If either **UserOkay** or **Bkup** are non-zero, the current task request is accepted.

## NOT Operator

### Description

The **NOT** operator (`!`) takes the inverse of a value. If a value is **false**, an integer value of **1 (true)** is returned. Otherwise, an integer value of **0 (false)** is returned.

**Example:**

```
if (!UserOkay) reject;
```

If **UserOkay** is equal to **0**, the current task request is rejected.

## Relational Operators

The Endpoint Privilege Management for Unix and Linux Security Policy Scripting Language supports a standard set of relational operators.

Operator	Description
==	Equal To
>	Greater Than
>=	Greater Than or Equal To
<	Less Than
<=	Less Than or Equal To
!=	Not Equal To

### Equal To Operator

#### Description

The **Equal** operator ( `==` ) compares two values. If the first value is equal to the second value, an integer value of **1 (true)** is returned. Otherwise, an integer value of **0 (false)** is returned.



#### Example:

```
if (UserCount == 10) reject;
```

*If **UserCount** is equal to **10**, the current task request is rejected.*

### Greater Than Operator

#### Description

The **Greater Than** ( `>` ) operator compares two values. If the first value is greater than the second value, an integer value of **1 (true)** is returned. Otherwise, an integer value of **0 (false)** is returned.



#### Example:

```
if (UserCount > 10) reject;
```

*If **UserCount** is greater than **10**, the current task request is rejected.*

## Greater Than or Equal To Operator

### Description

The **Greater Than or Equal To** ( $\geq$ ) operator compares two values. If the first value is greater than or equal to the second value, then an integer value of **1 (true)** is returned. Otherwise, an integer value of **0 (false)** is returned.



*Example: In this example, if **UserCount** is greater than or equal to **10**, then the current task request is rejected.*

```
if (UserCount >= 10) reject;
```

## Less Than Operator

### Description

The **Less Than** operator ( $<$ ) compares two values. If the first value is less than the second value, an integer value of **1 (true)** is returned. Otherwise, an integer value of **0 (false)** is returned.



*Example:*

```
if (UserCount < 10) reject;
```

*If **UserCount** is less than **10**, the current task request is rejected.*

## Less Than or Equal To Operator

### Description

The **Less Than or Equal** operator ( $\leq$ ) compares two values. If the first value is less than or equal to the second value, an integer value of **1 (true)** is returned. Otherwise, an integer value of **0 (false)** is returned.



*Example:*

```
if (UserCount <= 10) accept;
```

*If **UserCount** is less than or equal to **10**, the current task request is accepted.*

## Not Equal To Operator

### Description

The **Not Equal To** operator (**!=**) compares two values. If the first value is not equal to the second value, an integer value of **1 (true)** is returned. Otherwise, an integer value of **0 (false)** is returned.



#### Example:

```
if (UserCount != 10) reject;
```

*If **UserCount** is not equal to **10**, the current task request is rejected.*

## Special Operators

The Endpoint Privilege Management for Unix and Linux Security Policy Scripting Language supports the special operators.

Operator	Description
+	Concatenation
[ ]	List index
in	List member
()	Precedence (that is, parentheses)
?:	Ternary conditional
,	Evaluates terms from left to right; returns the value of the last expression

### Concatenation Operator

#### Description

The **Concatenation** operator **+** is used to concatenate a series of one or more strings. It should not be confused with the **Addition** operator used in arithmetic expressions. Although both of these operators are represented by the **+** symbol, the **Addition** operator works only on integer values.

The **Concatenation** operator concatenates, or appends, one item to another item. If a series of strings are concatenated, they are returned in a newly created string.



#### Example:

```
FirstName = "Sandy";
LastName = "White";
UserName = FirstName + " " + LastName;
```

**UserName** would contain the character string **"Sandy White"**.

### List Index Operator

#### Description

The **List Index** operator **[ ]**, also referred to as *square brackets*, is used to specify a list element index number. The value of a specific list element is returned.

The first element in a list always has an index number of **0**, and the second list element has an index of **1**, etc. The general formula for calculating an index number is **index number = element number - 1**.

**Example:**

```
UserList = {"Adm1", "Adm2", "Adm3", "Adm4", "Adm5"};
CurrentUser = UserList[3];
```

**CurrentUser** contains the character string **"Adm4"**.

**Example:**

```
UserList[1] = "Adm10";
Userlist[1] is set to "Adm10".
```

## List Member Operator

### Description

This list member operator, **in**, searches the specified list for the given string. If the string is present in the list, the result is **true (1)**. If the string is not present, it returns **false (0)**. Shell-style wildcards can be used in the string argument. The syntax for using this operator is **result = string in list**;

**Example:**

```
AdminList = {"Adm1", "Adm2", "Adm3", "root", "sys"};
runuser = (user == "sysadmin")? "root" : "sys";
test1 = "Adm1" in AdminList; # True
test2 = "sys" in AdminList; # True - matches sys in AdminList
test3 = "system" in AdminList; # False
test4 = "Adm" in AdminList; # False - only a partial match
# single character
```

Each string is tested to see if it is a member of a list.

## Precedence Operator

### Description

The **Precedence** operator ( **)**, also referred to as *parentheses*, is used to modify the default operator precedence. In other words, parenthesis characters force a specific expression evaluation order.

**Example:**

```
result = (6 + 4) * 2 - 4;
```

*result contains the integer value 16.*

**Example:**

```
result = 6 + 4 * 2 - 4;
```

*The **Precedence** operators are removed, and the **result** contains the integer value 10.*

## Ternary Conditional Operator

### Description

The **Ternary** operator, represented by `?:`, is a special operator that provides a compact alternative to **if** statements where only an expression is required.

The **Ternary** operator has the syntax:

```
result = condition ? if-true-expression : if-false-expression;
```

The ternary operator works as follows:

- If **condition** evaluates to **true**, then the **if-true-expression** is returned.
- If **condition** evaluates to **false**, then the **if-false-expression** is returned.

The Ternary operator can be used as an alternative to simple **if** statements. The **condition** corresponds to the **if condition**. The **if-true-expression** corresponds to the assignment in the true part of the **if** statement, and the **if-false-expression** corresponds to the else part of the **if** statement.

**Example:**

```
runuser = (user == "sysadmin") ? "root" : "sys";
```

*If **user** is equal to **sysadmin**, then **root** is returned. Otherwise, **sys** is returned.*

*Another way to accomplish the same thing would be to use the following **if** statement:*



```
if (user == "sysadmin")
runuser = "root";
else
runuser = "sys";
```

## Comma Operator

### Description

The **Comma** operator (,) causes expressions to be evaluated from left to right and returns the value of the last expression. This operator is primarily used in loops.



#### Example:

```
for (a=0, b=1, c=2; a < 0 ; a++) <any statement>;
```

The **Comma** (,) operator causes the assignment of the three variables **a**, **b**, and **c** at a spot which looks for a single expression.



## Expressions

An expression is a combination of constants, variables, and operators. Expressions are evaluated according to operator precedence rules. Most expressions follow the general rules of Algebra in regards to operator precedence.



**Example:**

```
TotalTasks = RejectedCount + AcceptedCount;
```

In Endpoint Privilege Management for Unix and Linux 3.2 and earlier, expressions and variables could not be used interchangeably. Beginning with Endpoint Privilege Management for Unix and Linux 3.5+, assignments can be performed anywhere expressions are found.



For more information on operator precedence, see ["Constants" on page 55](#).

## Program Statements

There are two types of program statements in the Endpoint Privilege Management for Unix and Linux Security Policy Scripting Language, executable and non-executable.

### Executable Program Statements

Executable program statements allow security administrators to define and implement security rules. These types of statements have two major functions:

- Set the environment in which security profile files run
- Control the logic flow within security policy files

The following table summarizes the executable program statements:

Statement	Description
<b>accept</b>	Terminates security policy file processing and passes control to <b>pblocald</b> . <b>Version 4.0 and earlier:</b> statements do not support ACL. <b>Version 5.0 and later:</b> statements support ACL.
<b>Assignment</b>	Used to assign a value to a variable.
<b>break</b>	Terminates the processing of cases within a loop and exits the loop. <b>Version 3.2 and earlier:</b> statements are limited to ending a <b>case</b> clause in a <b>switch</b> statement. <b>Version 3.5 and later:</b> statements are expanded for use within loops.
<b>continue</b>	Allows the remaining loop body to be skipped. Returns to the next iteration of the loop.
<b>do-while</b>	Creates <b>do-while</b> loops which follow the C language syntax.
<b>for</b>	C-style <b>for</b> . Used to create <b>for</b> loops which follow the C language syntax.
<b>for-in</b>	Creates loops that execute the loop body for each element in an argument list.
<b>function</b>	Stand-alone subroutines that are used to modularize a company's security policy file.
<b>if</b>	Determines which program statement to execute next based on whether an expression is <b>true</b> or <b>false</b> .
<b>include</b>	Passes the flow of control to another file.
<b>procedure</b>	Stand-alone subroutines used to modularize a company's security policy files.
<b>readonly</b>	Freezes the value of a variable so it cannot be changed by a security policy file.
<b>reject</b>	Immediately terminates security policy file checking and cancels the current job request before it can execute. <b>Version 4.0 and earlier:</b> statements do not support ACL. <b>Version 5.0 and later:</b> statements support ACL.

<b>switch</b>	Provides a way to execute a specific set of program statements based on an expression value.
<b>while</b>	Builds <b>while</b> loops which follow the C language syntax.

Type your executable program statements in lowercase because the Security Policy Scripting Language interpreter is case sensitive. For example, the word **If** is recognized as a variable name by the interpreter whereas the word **if** is recognized as an executable program statement.

Some general rules for creating program statements are as follows:

- Terminate program statements with a semicolon.
- A single statement can be multiple lines.
- Multiple statements can be included on one line if each statement terminates with a semicolon.
- Enclosing groups of program statements within curly brackets creates a compound statement. Each statement within the group must terminate with a semicolon.

Executable program statements have a special meaning to the Security Policy Scripting Language interpreter. Therefore, you cannot use them for other purposes. For instance, using an executable program statement as a variable name generates an error.

Many administrators desire a nonprogrammatic way of using Endpoint Privilege Management for Unix and Linux. To accomplish this goal, the Endpoint Privilege Management for Unix and Linux policy language was extended in Endpoint Privilege Management for Unix and Linux version 5.0 to include an **Access Control List** structure. This structure extends the **accept** and **reject** statements to provide a simple nonprogrammatic way of specifying access data. It can be used exclusively to provide control, or it can be used in combination with the rest of the Endpoint Privilege Management for Unix and Linux policy language to provide greater control.



*For more information, see the following:*

- ["Expressions" on page 73](#)
- ["Functions and Procedures" on page 98](#)

## accept Statement

- **Version 4.0 and earlier:** **accept** statement does not support ACL.
- **Version 5.0 and later:** **accept** statement supports ACL.

### Description

When an **accept** statement is encountered, security policy file processing terminates immediately, **pblocald** starts, and the secured task is executed by **pblocald**.

### Syntax

All versions:

```
accept;
```

Version 5.0 and later:

```
accept [from ["user"][, ["submithost"][, ["command"]  
[, ["runhost"]]]]] [when conditional-expression]  
[with optional-statements-before-execution];
```

### Definition

- **user** is a user name, list of user names, or left blank to imply any user.
- **submithost** is a submit host name, list of submit hosts, or left blank to imply any submit host.
- **command** is a command, list of commands, or left blank to imply any command.
- **runhost** is a run host, list of run hosts, or left blank to imply any run host.
- **conditional-expression** is an expression that evaluates **true** or **false**.
- **optional-statements-before-execution** is one or more Endpoint Privilege Management for Unix and Linux Policy Language statements that executes before the requested command is executed. For multiple statements, separate each statement with a comma.


### Examples

All versions:



**Example:**

```
if (user == "HelpDesk1") accept;
```

 If **user** is equal to **HelpDesk1**, the task is accepted and allowed to execute. Security policy file processing immediately terminates. **pblocald** starts, and the information is sent from the policy server for **pblocald** to start the executable specified in the variable **runcommand**. It is run by **pblocald** with the arguments specified in the **runargv** variable and run as the user specified in the **runuser** variable. Other run variables can be set.


**Version 5.0 and later:**

 **Example:** Accept all commands for **user1** from any submit host and for any run host:


```
accept from "user1";
```

 **Example:** Accept all commands for **user1** when the request comes from submit host **host1** for any run host:


```
accept from "user1", "host1";
```

 **Example:** Accept the **date** command from **user1** from any submit host and for any run host:


```
accept from "user1", "date";
```

 **Example:** Accept all commands from **user3**, from any submit host and for any run host, when the time is between 9:00 A.M. and 5:00 P.M.:

```
accept from "user3" when timebetween(900, 1700);
```

 **Example:** Accept a **sh** command from **user1** or **user3**, from any submit host and for any run host, and turn on I/O logging:

```
accept from {"user1", "user3"}, "sh" with iolog = "/var/log/pb.iolog.sh";
```

 **Example:** Accept all commands from all users, from any submit host and for any run host, when the time is between 9:00 A.M. and 5:00 P.M.:

```
accept when timebetween(900, 1700);
```

## Assignment Statement

### Description

An assignment statement assigns a value to a variable. An assignment can be used whenever an expression is expected, and multiple assignments can be done in a single statement.

In Endpoint Privilege Management for Unix and Linux 3.2 and earlier, assignments are not expressions and cannot be cascaded.

Beginning with Endpoint Privilege Management for Unix and Linux 3.5+, assignments are expressions and can be cascaded anywhere an expression occurs.

### Syntax

```
list[n] = expression;
```

An expression can be a constant, variable, or complex equation.

```
var1 = var2 = var3 ... = value;
```

**var1**, **var2**, and **var3** are assigned values.



#### Example:

```
IntegerString = "1234";  
StringList = {"User1", "User2", "User3"};  
Counter = 1;  
TotalUsers = 5;  
CurrentUsers = 3;  
InactiveUsers = TotalUsers - CurrentUsers;  
userString = user;  
runuser = "root";  
list1 = {"a1", "a2", "a3"};  
list2 = list1;  
list2[0] = "l1"
```

*The following occurs:*

```
InactiveUsers is set to 2 (5 - 3)  
userString = user; sets userString to the submitting user.  
runuser = "root"; sets runuser to root.  
list2[0] = "l1" causes list1 to still be {"a1", "a2", "a3"}, list2 has the value of  
{"l1", "a2", "a3"}
```



#### Example:

```
a = b = c = d = 0;
```



*The variables **a**, **b**, **c**, and **d** are cascaded and assigned the same value (0).*

## break Statement

### Description

The **break** statement exits loops and terminates cases. In Endpoint Privilege Management for Unix and Linux 3.2 and earlier, the break statement is used only to end a case clause in a **switch** statement.

Beginning with Endpoint Privilege Management for Unix and Linux 3.5, the break statement is used within loops as well as to end a clause in a **switch** statement.

### Syntax

```
break;
```



#### Example:

```
for (a = 1 ; a <= 10; a++) {  
  if (a > 5) break;  
  print (a);  
}
```

*The statement prints the numbers between 1 through 5.*



For more information, see the following:

- ["continue Statement" on page 81](#)
- ["do-while Statement" on page 82](#)
- ["for Statement" on page 83](#)
- ["for-in Statement" on page 86](#)
- ["while Statement" on page 96](#)



## continue Statement

### Description

The **continue** statement is used in the body of a C-style **for**, **while**, or **do-while** statement to skip the rest of statements in the body.

### Syntax

```
continue;
```



#### Example:

```
for (a = 1 ; a <= 10; a++) {  
  if (a % 2 != 0) continue;  
  print (a);  
}
```

*The statement prints the even numbers between 1 and 10.*



For more information, see the following:

- ["break Statement" on page 80](#)
- ["do-while Statement" on page 82](#)
- ["for Statement" on page 83](#)
- ["for-in Statement" on page 86](#)
- ["while Statement" on page 96](#)

## do-while Statement

### Description

The C-style **do-while** statement is used to execute a loop. The body that follows the **while** statement can be a single statement or set of statements inside braces ( `{` and `}` ). This statement is executed as follows:

1. The body is executed.
2. If a **break** statement is encountered in the body, the loop terminates.
3. The test expression is evaluated.
4. If the test expression is **false** (0), the loop terminates.
5. If the test expression is **true** (non-zero), steps 1 through 4 are repeated until a **break** statement is encountered or the test expression becomes **false**.

The body is always executed at least once.

### Syntax

```
do body while (test_expression);
```



#### Example:

```
a = 1;
do print(a++);
while (a <= 10);
```

*The statement prints the numbers 1 through 10.*



For more information, see the following:

- ["break Statement" on page 80](#)
- ["continue Statement" on page 81](#)
- ["for Statement" on page 83](#)
- ["for-in Statement" on page 86](#)
- ["while Statement" on page 96](#)

## for Statement

### Description

The **for** statement provides a mechanism to loop through or to repeat a series of program statements. In Endpoint Privilege Management for Unix and Linux 2.8 and earlier, the **for** statement always terminates with an **end** statement. This is no longer necessary in Endpoint Privilege Management for Unix and Linux 3.0+.

### Syntax

```
for ControlValue = StartValue to StopValue [step Increment]
{executable program statements}
```

The **for** statement works in the following manner:

1. The first time through the **for** statement, **ControlValue** is set to **StartValue**.
2. **ControlValue** is immediately compared to **StopValue**.
3. After an execution of the **for** statement has been completed and all associated program statements have been executed, **StartValue** is incremented by the **step** value.
4. If a **step** value is not specified, a default **step** value of **1** is used. **ControlValue** is again compared to **StopValue** and the result of this comparison determines if the **for** statement executes again.

The comparison of **ControlValue** to **StopValue** works as follows:

1. When the **Increment** value is positive, the **for** statement is executed as long as **ControlValue <= StopValue** evaluates to **true**.
2. When the **Increment** value is negative, the **for** statement is executed as long as **ControlValue >= StopValue** evaluates to **true**.
3. When the **Increment** value is **0**, the **for** statement executes forever. An **accept** or **reject** is required to break out of the loop.
4. If an **Increment** is not specified, **1** is used as the increment value.



**Note:** The **for** statement loop condition is tested at the top of the loop, and there is no guarantee the **for** loop will execute.



**Example:** In the **for** statement

```
for LoopCounter = 0 to 10 step 1
{counter = counter + 1;
counter2 = counter2 + 2;
}
```

The statement continues to loop as long as **LoopCounter** is less than or equal to **10**.

**Example:**

```
for LoopCounter = 0 to -5 step -1  
{counter = counter + 1;  
counter2 = counter2 + 2;  
}
```

The **for** statement continues to loop as long as **LoopCounter** is greater than or equal to **-5**.

## C-style for Statement

### Description

The C-style **for** statement is used to execute a loop. The body which follows the **for** statement can be either a single statement or set of statements inside braces ( `{` and `}` ). This statement executes as follows:

1. The **start\_expression** is evaluated.
2. The **test\_expression** is evaluated.
3. If the **test\_expression** is **false** (0), execution ends.
4. If the **test\_expression** is **true** (non-zero), the body is executed.
5. If a **break** statement is encountered in the body, the loop terminates.
6. The **step\_expression** is evaluated.

Repeat steps 2 through 6 until the **test\_expression** is **false**, or a **break** statement is encountered.

If the **test\_expression** is **false** the first time it is tested, then the step expression and body are not executed.

### Syntax

```
for (start_expression; test_expression; step_expression ) body
```



#### Example:

```
for (a=1; a <= 5; a+=1) print(a);
```

The statement prints the numbers from 1 to 5 until the test expression is **false**.



For more information, see the following:

- ["break Statement" on page 80](#)
- ["continue Statement" on page 81](#)
- ["do-while Statement" on page 82](#)
- ["for Statement" on page 83](#)
- ["for-in Statement" on page 86](#)
- ["while Statement" on page 96](#)

## for-in Statement

### Description

The **for-in** statement is used to execute a loop for each element in a list. The body that follows the list can be either a single statement, or set of statements inside braces ( `{` and `}` ). This statement executes as follows:

1. A variable is set to the first or next element of the list.
2. The body executes. If a **break** statement is encountered in the body, the loop terminates.
3. Steps 1 and 2 are repeated while there are elements left in the list or until a **break** statement is encountered.

When the loop is complete, the **variable** contains the last value assigned to it.

### Syntax

```
for variable in list body;
```



#### Example:

```
for name in {"one", "two", "three"}  
print(name);
```

*The statement prints each element in the list.*



For more information, see the following:

- ["break Statement" on page 80](#)
- ["continue Statement" on page 81](#)
- ["do-while Statement" on page 82](#)
- ["for Statement" on page 83](#)
- ["while Statement" on page 96](#)

## if Statement

### Description

The **if** statement is used to make a decision based on whether an expression evaluates to **true** or **false**. The decision determines what program statement is executed next. When **expression** evaluates to a non-zero value (true), the executable program statement immediately following the expression executes. When **expression** evaluates to **0 (false)**, the executable program statement immediately following the **else** statement is executed. When the chosen executable statement finishes, control flows to the next statement after the **if** statement. The **else** component of the **if** statement is optional.

Only one executable program statement can be inserted after the **if** expression or **else** statement. If multiple executable program statements are required, enclose them in curly braces `{}` to make a single compound statement.

### Syntax

```
if (expression)
executable program statement;
else
executable program statement;
```



#### Example:

```
# Make an accept or reject decision based on
# CurrentUserType
if (CurrentUserType == 1)
{
    # if CurrentUserType is equal to 1, do these statements
    RunCheck = true;
    accept;
}else
{
    # if CurrentUserType is not equal to 1, perform these statements:
    RunCheck = false;
    reject;
}
```

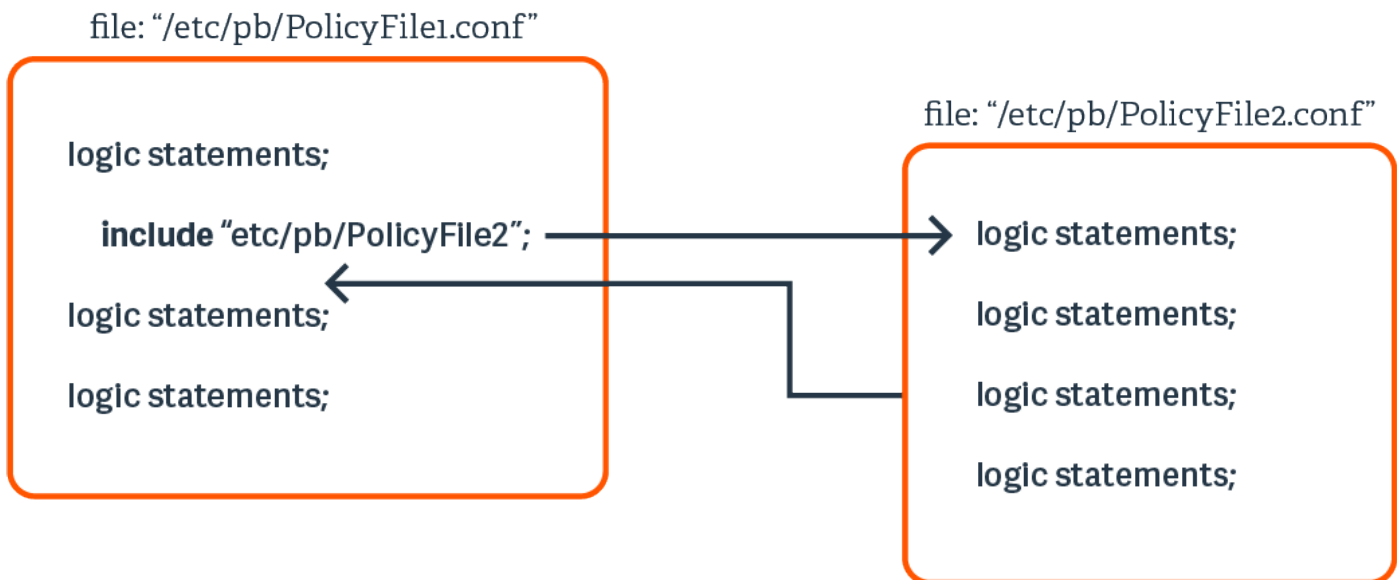


For more information, see "[switch Statement](#)" on page 94.

## include Statement

### Description

The **include** statement is very powerful. It enables a security policy file to embed another security policy file called a security policy subfile. When an **include** statement is encountered, the flow of control jumps to the included file. When the included file has completed execution, the flow of control returns to the statement immediately following the **include** statement in the original file. The following figure demonstrates this concept.



When specifying **file-name**, the specified file name must be either a string enclosed in quotation marks or a variable that contains a string. If a relative or absolute path is not specified, Endpoint Privilege Management for Unix and Linux looks for the file in the default security policy file directory. If a relative path name is specified, it is treated as relative to the security policy file directory that is specified in the **policydir** setting in **pb.settings**.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
include file-name;
```

where **file-name** can be a variable containing a string or a string constant enclosed in quotation marks.



**Example:**

```
include "/opt/pbul/policies/SupportStaffPolicies.conf";  
include "/opt/pbul/policies/"+user+".conf";
```



**Note:** Use `stat()` to verify the existence of a file before adding an include statement that calls the file. Security policy subfile specifications that contain a variable may not be checked by `pbcheck` when checking the including file.

## readonly Statement

### Description

The **readonly** statement freezes a variable. After a variable is marked as read only, a security policy file cannot change its value. In essence, the variable ceases to behave as a variable and becomes a constant.

The **readonly** statement has a global scope.

### Syntax

```
readonly { "variable1" [, "variable2", ...] };
```



**Example:** Do not allow changes to the following variables:

```
readonly { "CurrentUser", "CurrentCommand", "TargetHost" };
```

## reject Statement

- **Version 4.0 and earlier:** **reject** statements do not support ACL.
- **Version 5.0 and later:** **reject** statements support ACL.

### Description

The **reject** statement immediately terminates security policy file checking and cancels the current job request without allowing it to execute. Depending on the parameters that are selected, the user sees a default message, custom reject message, or no message.

In Endpoint Privilege Management for Unix and Linux 5.0, the Endpoint Privilege Management for Unix and Linux policy language was extended to include an **Access Control List** structure. This structure extends the **accept** statement to provide a simple nonprogrammatic way of entering access data.

### Syntax

#### Version 4.0 and earlier:

```
reject ["reject-text"];
```

#### Version 5.0 and later:

```
reject ["reject-text"] [from ["user"][, ["submithost"]
[, ["command"][, ["runhost"]]]]]
[when conditional-expression];
```

- **reject-text** is the text to display to the user.
- **user** is a user name, list of user names, or left blank to imply any user.
- **submithost** is a submit host name, list of submit hosts, or left blank to imply any submit host.
- **command** is a command, list of commands, or left blank to imply any command.
- **runhost** is a run host, list of run hosts, or left blank to imply any run host.
- **conditional-expression** is an expression that evaluates **true** or **false**.

## reject Statement Display Text

The **reject** statement has an optional **reject-text** expression in its argument. The meaning of the expression is as follows:

<b>blank</b>	Not specifying a parameter results in the display of the default <i>request rejected by Policy Server...</i> message.
<b>""</b>	An empty string suppresses the default <i>request rejected by Policy Server...</i> message.
<b>"string"</b>	Replaces the default <i>request rejected by Policy Server...</i> message with a message specified by <b>string</b> .

### Examples

#### Version 4.0 and earlier:

**Example:**

```
if (user == "User1") reject;
```

If the current user is **User1**, reject the task request and immediately terminate security policy file processing.

**Example:**

```
reject;
```

The **reject** statement has no parameter, causing the default request rejected by Policy Server... message to appear.

**Example:**

```
reject "";
```

The **reject** statement used with the **null** ("") argument. This suppresses the default request rejected by Policy Server... message.

**Example:**

```
reject "You may not do that";
```

The **reject** statement is used with string parameter "**You may not do that**", resulting in the message "**You may not do that**" being displayed.

**Version 5.0 and later:****Example:**

```
reject from "user4";
```

Reject all commands from **user4**, from any submit host, and for any run host.

**Example:**

```
reject when timebetween (1700, 900);
```

Reject all commands, from any user and any submit host, and for any run host, when the time is between 5:00 P.M. and 9:00 A.M.

**Example:**

```
reject "Permission denied" from {"user5", "user6"},,, "host5";
```

Reject all commands from **user5** or **user6**, from any submit host, for run host **host5**, with the display message *Permission denied*.



For more information, see ["accept Statement" on page 76](#).

## switch Statement

### Description

The **switch** statement provides a way to execute a specific set of program statements based on an expression value. Each set of program statements has a value associated with them. A **case** statement represents this value. If the **switch** statement expression matches a case statement, then the logic that is associated with that **case** statement executes.

When a switch expression-case statement match is found, execution begins at the statement immediately following the **case** statement. Execution continues through each statement following the **case** statement until a break statement is encountered. The **break** statement forces an immediate exit from the switch statement.

When a **break** statement is encountered, execution immediately jumps to the first statement following the end of the switch statement. The **break** statement is optional.

If an expression / **case** statement match is not found, the logic associated with the **default** case executes. The **default case** is optional.



**Note:** The case labels must evaluate as strings.

### Syntax

```
switch (string-expression)
{
    case string1:
        statement1a; [statement1b; ...] [break;]
    case string2:
        statement2a; [statement2b; ...] [break;]
    default:
        default-stmt1; [default-stmt2; ...] [break;]
}
```

**statement1a**, **statement1b**, **statement2a**, **statement2b**, **default-stmt1**, and **defaultstmt2** all represent executable program statements.



**Example:** Check to see if the current user name is valid. Valid users are **admin** and **helpdesk**. If the user is not valid, reject the request.

```
switch (user)
{
    case "admin":
        hostmachine = "AdminHost"; break;
    case "helpdesk":
        hostmachine = "HelpDeskHost";break;
    default:
        reject;
}
```



For more information, see ["if Statement" on page 87](#).

## while Statement

### Description

The **while** statement is used to execute a loop. The body that follows the **while** statement can be a single statement or set of statements inside braces ( { and } ). This statement executes as follows:

1. The **test\_expression** is evaluated.
2. If the **test\_expression** is **false** (0), the loop terminates.
3. If the **test\_expression** is **true** (non-zero), the body executes.
4. If a break statement is encountered in the body, the loop terminates.

Repeat steps 1 through 4 until the **test\_expression** is **false** or a **break** statement is encountered.

If the **test\_expression** is **false** the first time it is tested, the body is not executed.

### Syntax

```
while (test_expression) body
```



#### Example:

```
a = 1;
while (a <= 10) {
    print(a);
    a += 1;
}
```

The statement prints the numbers 1 through 10 while a <=10.



For more information, see the following:

- ["break Statement" on page 80](#)
- ["continue Statement" on page 81](#)
- ["do-while Statement" on page 82](#)
- ["for Statement" on page 83](#)
- ["for-in Statement" on page 86](#)



## Non-Executable Program Statements

A non-executable program statement helps organize security policy files. Because non-executable program statements have a special meaning to the Security Policy Scripting Language interpreter, they are not used for any other purpose. For instance, using a non-executable program statement as a variable name generates an error.

The non-executable program statement consists of the **Comment** statement.

### Comment Statement

#### Description

Comment statements document the inner workings of individual security policy files. Comment text is nonexecutable code that is ignored by the interpreter during execution.

Comment statements must begin with the # character and continue to the end of the current line. No end character is necessary. This type of comment statement may not span multiple lines.

#### Syntax

```
# Comment text goes here.
```



#### Example:

```
# This is a comment statement
```

## Functions and Procedures

The Security Policy Scripting Language supports both **functions** and **procedures**. Functions and procedures are stand-alone subroutines that help modularize a company's security policy files. Functions and procedures are programming building blocks that execute specific tasks. These functions and procedures can be called whenever there is a need to perform that task. Functions and procedures are especially useful for repetitive type tasks.

The difference between functions and procedures is that functions return values while procedures do not.

Endpoint Privilege Management for Unix and Linux functions and procedures do not support the same notion of scope as C functions. In other words, after a variable is implicitly defined, any function can use it. Its use is global and not limited to the function where it was originally defined.

If a variable is implicitly created in one function and referenced by another function, both functions can access and modify the same variable. The same holds true for procedures.

Endpoint Privilege Management for Unix and Linux provides a number of built-in functions and procedures to help automate the process of creating security policy files.

When adding user-written functions to a security policy file, the code for inline functions is placed at the top of the security policy file that first uses the function. Beginning with Endpoint Privilege Management for Unix and Linux 3.0, **end** statements are no longer required for functions, procedures, and loops. However, Endpoint Privilege Management for Unix and Linux still supports policy files that use end statements.



For more information, see the following:

- ["Built-in Functions and Procedures" on page 353](#)
- On using user-written functions and procedures, see ["User and Password Functions" on page 482](#)

## function Statement

### Description

A function name can be any length. Its name can consist of any alpha or numeric characters, but it must start with an alphabetic character or an underscore.

The method of returning a value from a function is similar to that used in Pascal. The value is returned in a variable with the same name as the function.

A function must return a value. Otherwise, an error occurs.

### Syntax

```
function FunctionName (argument-list)
{
statements;
FunctionName = expression;
}
```

**Example:**

```
function square (x)
{
square = x * x;
}
```



For more information, see ["procedure Statement" on page 99](#).

## procedure Statement

### Description

A procedure name can be any length. It can consist of any alpha, underscore, or numeric characters, but it must start with an alphabetic character or an underscore.

Procedures do not return a value. If a value is returned, an error occurs.

### Syntax

```
procedure ProcedureName (argument-list)
{
statements;
}
```

**Example:**

```
procedure print_message (message)
{
print (message);
}
```



For more information, see ["function Statement" on page 98](#).

## Other Programming Considerations

This section describes other programming considerations. These consist of:

- Boolean **true** and **false** variables
- Format commands
- Regular expression patterns
- Wildcard search characters
- Special characters

### Boolean True and False Variables

Many program statements rely upon conditional tests to determine the next program statement to execute. The **if** program statement is an example.

Conditional tests generally evaluate to either a **true** or **false** value. Although any positive, non-zero integer can represent a **true** value, the integer **1** is normally used. The integer **0** represents a **false** value.

The following are some Boolean true and false variable examples:



**Example:**

```
LoopControl = false; #sets LoopControl to 0
```



**Example:**

```
LoopControl = true; #sets LoopControl to 1
```

## Format Commands

Format commands insert values into character strings known as variable substitution. These commands specify where to insert the character string and how to format it. Format commands begin with a percent (%) sign followed by a format code. There are two categories of format commands: **Character** format and **Time** format.

### Character Format Commands

The `sprintf()` function AND `fprintf` and `printf` procedures use character format commands. The following table describes the commands.

Character	Format Command
<code>%d</code>	Decimal value
<code>%i</code>	Integer value
<code>%o</code>	Octal value
<code>%s</code>	String of characters
<code>%u</code>	Unsigned decimal value
<code>%x</code>	Character hexadecimal value without a leading zero and with letters in lowercase (that is, 0x87a4)
<code>%X</code>	Character hexadecimal value without a leading zero and with letters in uppercase (that is, 0X87A4)
<code>%%</code>	Percent sign



**Example:** This demonstrates how character format commands work. Given the following character string,

```
I have x dogs, y cats, and z fish
```

The character format commands can be used to insert actual numeric values for *x*, *y* and *z*. This is done as follows:

```
printf ("I have %d dogs, %d cats, and %d fish", DogCount, CatCount, \FishCount);
```

***DogCount***, ***CatCount*** and ***FishCount*** are variables containing numeric values.

The interpreter sequentially replaces each format command with one of the provided variables.

The replacement is done in sequential order. The first format command gets the first variable, and the second format command gets the second variable, etc.

Format commands can also use field modifiers to specify field width and whether to left justify a field.

### Minimum Field-Width Modifier

An integer placed between the percent sign and the command character determines the minimum width of a field. By default, the pad character is a blank. To pad with zeros instead of spaces, place a zero before the minimum field-width specifier.

For example, `%04d` pads an integer value with zeros if the integer value is less than four digits in length.

## Maximum Field-Width Modifier

A decimal point, followed by a maximum field width determines the maximum width of a field. If the value is longer than the specified maximum length, the value truncates on the right.

For example, `%2.4d` generates a field with a minimum length of two digits and a maximum length of four characters.

## Left-Justification Field Modifier

By default, all output is right-justified. To left-justify a field, place a minus sign directly after the percent sign.

For example, `%-2.4d` generates a left-justified field with a minimum length of two digits and a maximum length of four digits.

## Time Format Commands

The `strftime()` function uses time format commands. The following table describes the commands.



**Note:** Time format commands can vary based on the operating system. We recommend that you consult the `strftime` manual pages for your local `pbmasterd` system.

Character	Command
<code>%a</code>	The abbreviated weekday name according to the current locale.
<code>%A</code>	The full weekday name according to the current locale.
<code>%b</code>	The abbreviated month name according to the current locale.
<code>%B</code>	The full month name according to the current locale.
<code>%c</code>	The preferred date and time representation for the current locale.
<code>%C</code>	The century number (year/100) as a two-digit integer.
<code>%d</code>	The day of the month as a decimal number (range 01 - 31).
<code>%D</code>	Equivalent to <code>%m/%d/%y</code> .
<code>%e</code>	Like <code>%d</code> , the day of the month as a decimal number, but space replaces a leading zero.
<code>%E</code>	Modifier. Use alternative format.
<code>%g</code>	Like <code>%G</code> but without the century, (that is, with a 2-digit year, 00-99).
<code>%G</code>	The ISO 8601 year with century as a decimal number. The four-digit year that corresponds to the ISO week number (see <code>%V</code> ). This has the same format as <code>%y</code> except that if the ISO week number belongs to the previous or next year, that year is used instead.
<code>%h</code>	Equivalent to <code>%b</code> .
<code>%H</code>	The hour as a decimal number using a 24-hour clock (00-23).

<b>%l</b>	The hour as a decimal number using a 12-hour clock (01-12).
<b>%j</b>	The day of the year as a decimal number (001-366).
<b>%k</b>	The hour (24-hour clock) as a decimal number (0-23). A blank precedes single digits. See also <b>%H</b> .
<b>%l</b>	The hour (12-hour clock) as a decimal number (1-12). A blank precedes single digits. See also <b>%I</b> .
<b>%m</b>	The month as a decimal number (01-12).
<b>%M</b>	The minute as a decimal number (00-59).
<b>%n</b>	A new line character.
<b>%O</b>	Modifier. Use alternative format.
<b>%p</b>	Either AM or PM according to the given time value or the corresponding strings for the current locale. Noon is PM and midnight is AM.
<b>%P</b>	Like <b>%p</b> but in lowercase: <b>am</b> or <b>pm</b> or a corresponding string for the current locale.
<b>%r</b>	The time in AM or PM notation.
<b>%R</b>	The time in 24-hour notation ( <b>%H:%M</b> ). For a version that includes seconds, see <b>%T</b> .
<b>%s</b>	The number of seconds since the Epoch.
<b>%S</b>	The second as a decimal number (00-61).
<b>%t</b>	A tab character.
<b>%T</b>	The time in 24-hour notation ( <b>%H:%M:%S</b> ).
<b>%u</b>	The day of the week as a decimal (1-7) with Monday being 1.
<b>%U</b>	The week number of the current year as a decimal number (00-53) starting with the first Sunday as the first day of week 01.
<b>%V</b>	The ISO 8601:1998 week number of the current year as a decimal number (01-53) where week 1 is the first week that has at least four days in the current year and Monday as the first day of the week.
<b>%w</b>	The day of the week as a decimal (0-6) with Sunday being 0.
<b>%W</b>	The week number of the current year as a decimal number (00-53) starting with the first Monday as the first day of week 01.
<b>%x</b>	The preferred date representation for the current locale without the time.
<b>%X</b>	The preferred time representation for the current locale without the date.
<b>%y</b>	The year as a decimal number without a century (00-99).
<b>%Y</b>	The year as a decimal number including the century.
<b>%z</b>	The time zone as hour offset from GMT.

<b>%Z</b>	The time zone name or abbreviation.
<b>%+</b>	The date and time in date(1) format.
<b>%%</b>	A % character.

The time format commands work in the same manner as character format commands.



## Regular Expression Patterns

The Endpoint Privilege Management for Unix and Linux Security Policy Scripting Language supports extended regular pattern matching. Use these for pattern searches as well as forbidden and warning keystroke patterns.

**i** For more information on regular expressions, see the following:

- ["grep" on page 428](#)
- ["egrep" on page 425](#)

Pattern	Example	Description
.		Matches any character.
	abc.d	Match the string <b>abc</b> followed by any single character then <b>a d</b> .
[ ]		Defines the beginning and end of a character class.
[jJ]*		Match an uppercase or lowercase <b>j</b> followed by any number of characters.
[a-z]		Match any lowercase characters <b>a</b> through <b>z</b> .
^		Not character (when used inside square brackets).
[^a-z]		Match any character except lowercase characters <b>a</b> through <b>z</b> .
*		Match zero or more occurrences of the last pattern.
	abc*	Matches the string <b>ab</b> followed by zero or more <b>c</b> 's.
?		Match zero or one occurrences of the last pattern.
	abc?	Match either <b>ab</b> or <b>abc</b> .
+		Match one or more occurrences of the last pattern.
	abc+	Match the string <b>ab</b> followed by one or more <b>c</b> 's.
{m}		Match exactly <b>m</b> occurrences of the last pattern.
	abc{3}	Match the string <b>abccc</b> .
{m,}		Match <b>m</b> or more occurrences of the last pattern.
	abc{3,}	Match <b>abccc</b> , <b>abccccc</b> , etc.
{m,n}		Match at least <b>m</b> , but no more than <b>n</b> , occurrences of the last pattern.
	abc{3,5}	Match <b>abccc</b> , <b>abccccc</b> , or <b>abcccccc</b> .
()		Group several characters or patterns together and treat as a single group.
	a(bc)+	Match <b>abc</b> , <b>abcbc</b> , <b>abcbcbc</b> , and so forth.

		Match either of two patterns.
	<b>ab c</b>	Match either <b>ab</b> or <b>ac</b> .
^		Match beginning of line (when outside square brackets).
	<b>^abc</b>	Match <b>abc</b> only if it appears at the beginning of a line.
\$		Match end of line.
	<b>abc\$</b>	Match <b>abc</b> only if it appears at the end of a line.
[alnum:]		Matches alphanumeric characters.
[alpha:]		Matches alpha characters.
[blank:]		Matches spaces or tabs.
[boundary:]		Matches a word's boundaries.
[cntrl:]		Matches control characters.
[digit:]		Matches decimal digits.
[graph:]		Matches graphical characters.
[lower:]		Matches lowercase characters.
[print:]		Matches printable characters.
[punct:]		Matches punctuation marks.
[space:]		Matches any white space.
[upper:]		Matches uppercase characters.
[xdigit:]		Matches hexadecimal digits.

## Wildcard Search Characters

The Endpoint Privilege Management for Unix and Linux Security Policy Scripting Language supports the standard set of shell-style, wildcard search characters. These are used for searches by the in operator and for forbidden and warning keystroke patterns.

Character	Example	Description
*		Matches any number of characters. Case is not considered.
	j*	Match <b>j</b> followed by any number of characters.
	j*e	Match a string starting with <b>j</b> and ending with <b>e</b> , with any number of characters between <b>j</b> and <b>e</b> .
?		Matches any single character. Case is not considered.
	j?	Match <b>j</b> followed by any single character.
	j?e	Match a string starting with <b>j</b> and ending with <b>e</b> , with any single character between <b>j</b> and <b>e</b> .
[]		Match characters. Case is considered.
	[jJ]*	Match upper or lowercase <b>j</b> followed by any number of characters.
	[a-z]	Match any lowercase characters <b>a</b> through <b>z</b> .
		Not character.
	[^a-z]	Match any character except lowercase characters <b>a</b> through <b>z</b> .

## Special Characters

The Security Policy Scripting Language supports a standard set of special characters. Use special characters in place of characters that are impossible to enter using the keyboard or have other meanings in policy language strings. These characters can be used in the same way as any other single character, and they should be enclosed in either single or double quotation marks.

Character	Command
\a	Alert
\b	Backspace
\n	Newline
\r	Carriage return
\t	Tab character
'	Single quotation mark
"	Double quotation mark
\	Backslash



### Example:

```
Tab = '\t';
```

*This sets the variable with the **Tab** character.*



### Example:

```
StringExample = "start a new line \n";
```

*This adds a new line character at the end of the string.*

## Endpoint Privilege Management for Unix and Linux Variables


Endpoint Privilege Management for Unix and Linux uses its own set of predefined variables to store information. These can be broken down into the following general categories:

- Task information variables
- Command line parsing variables
- Logging variables
- System variables
- Host identification variables
- X11 session capture variables


The Endpoint Privilege Management for Unix and Linux variables are a valuable resource to security administrators because some of them can be queried from within security policy files. The information in Endpoint Privilege Management for Unix and Linux variables can play a critical role in determining whether a specific request should be accepted or rejected. Endpoint Privilege Management for Unix and Linux variables can also be used to set run time properties for a task request.

## Task Information Variables

Endpoint Privilege Management for Unix and Linux uses task information variables to store information about a specific task request. Using the Security Policy Scripting Language, a security administrator can query this information and use it to make security decisions about a task request. These values are logged in the event logs and I/O logs.

 **Note:** The run variables do not apply to **pbssh**. If these run variables are present in the policy, they do not have any effect on **pbssh** and are ignored.

The following table lists these variables.

Task Information Variable	Run Version of Variable	Description
<b>argc</b>	---	Number of arguments that are supplied with the current command.
<b>argv</b>	<b>runargv</b>	Argument values that are associated with the current command.
<b>bkgd</b>	<b>runbkgd</b>	Controls whether background command ignores HUP signals.
<b>browserhost</b>	---	The host name of the machine that connects to <b>pbguid</b> .
<b>clienthost</b>	---	The name of the client (submit) host as resolved on the client host. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>command</b>	<b>runcommand</b>	Name of the current command.
<b>cwd</b>	<b>runcwd</b>	Full path of the current working directory.
<b>env</b>	<b>runenv</b>	List of environment variables that are associated with the current task.
<b>group</b>	<b>rungroup</b>	Name of user's primary group.
<b>groups</b>	<b>rungroups</b>	List of all groups the current user belongs to.
<b>host</b>	<b>runhost</b>	Name of the machine that the task executes on.
---	<b>runhostip</b>	IP address of the run host.
<b>localmode</b>	<b>runlocalmode</b>	Controls whether the secured task replaces <b>pbrun</b> on the submit host, for local tasks. <b>pblocald</b> is not invoked.  <b>Note:</b> With the exception of <b>pbsh</b> and <b>pbksh</b> , <b>localmode</b> is deprecated in favor of optimized run mode.
<b>logaccept_utc</b>		Log server UTC time, in 'YYYY-MM-DDTHH:MM:SS.000Z' format, when logging accept
---	<b>logcksum</b>	Indicates which checksum value is added to the event log.
<b>logfinish_utc</b>		Log server UTC time, in 'YYYY-MM-DDTHH:MM:SS.000Z' format, when logging finish.

<b>logkeystroke_utc</b>		Log server UTC time, in 'YYYY-MM-DDTHH:MM:SS.000Z' format, when logging keystroke events.
<b>logreject_utc</b>		Log server UTC time, in 'YYYY-MM-DDTHH:MM:SS.000Z' format, when logging reject events.
<b>logserver_utcoffset</b>		Log server timezone offset from UTC, in hours
<b>master_utcoffset</b>		Policy server timezone offset from UTC, in hours
<b>mastertimelimit</b>		Specifies a time limit, between <b>pbmasterd</b> and <b>pblocald</b> , for a task request. <b>Version 4.0 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>mastertimeout</b>		Specifies the amount of idle time in seconds, between <b>pbmasterd</b> and <b>pblocald</b> . <b>Version 4.0 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
---	<b>logservers</b>	A list of log hosts for <b>pblocald</b> to use for event and I/O logging. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>nice</b>	<b>runnice</b>	Nice values for the secured task.
<b>optimizedrunmode</b>	<b>runoptimizedrunmode</b>	Controls whether optimized run mode is allowed for this task.
---	<b>pblocaldnoglob</b>	Stops <b>pblocald</b> from expanding arguments to the target program.
---	<b>pbrisklevel</b>	Risk rating that is passed to BeyondInsight.
---	<b>pidmessage</b>	Optional message to issue when a job starts.
<b>requestuser</b>	---	The user that is specified in the <b>pbrun -u</b> argument.
<b>rlimit_as</b>	<b>runrlimit_as</b>	Controls the maximum memory that is available to a process. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>rlimit_core</b>	<b>runrlimit_core</b>	Controls the maximum size of a core file. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>rlimit_cpu</b>	<b>runrlimit_cpu</b>	Controls the maximum size CPU time of a process. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>rlimit_data</b>	<b>runrlimit_data</b>	Controls the maximum size of a process' data segment.

		<p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>rlimit_fsize</b>	<b>runlimit_fsize</b>	<p>Controls the maximum size of a file.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>rlimit_locks</b>	<b>runlimit_locks</b>	<p>Controls the maximum number of file locks for a process.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>rlimit_memlock</b>	<b>runlimit_memlock</b>	<p>Controls the maximum number of bytes of virtual memory that can be locked.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>rlimit_nofile</b>	<b>runlimit_nofile</b>	<p>Controls the maximum number of files a user may have open at a given time.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>rlimit_nproc</b>	<b>runlimit_nproc</b>	<p>Controls the maximum number of process a user may run at a given time.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>rlimit_rss</b>	<b>runlimit_rss</b>	<p>Controls the maximum size of a process' resident set (number of virtual pages resident at a given time).</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>rlimit_stack</b>	<b>runlimit_stack</b>	<p>Controls the maximum size of the process stack.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>runfinish_utc</b>		<p>runhost time, in 'YYYY-MM-DDTHH:MM:SS.000Z' format, when request has finished.</p>
<b>runstart_utc</b>		<p>runhost utc time, in 'YYYY-MM-DDTHH:MM:SS.000Z' format, when request is received.</p>
<b>selinux</b>		<p>Indicates whether <b>pbrun</b> is confined by SELinux.</p> <p><b>Version 5.2 and earlier:</b> variable not available.</p> <p><b>Version 6.0 and later:</b> variable available.</p>
<b>---</b>	<b>runchroot</b>	<p>Name of the special file system root directory; see the <b>chroot</b> manual page for more information.</p>




---	<b>runcksum</b>	Contains a checksum value for the current task.
---	<b>runcksumlist</b>	Contains a list of checksum values for the current task.
---	<b>runconfirmmessage</b>	Password prompt that is used by <b>pblocald</b> for a final verification of the user.
---	<b>runconfirmuser</b>	Controls whether final verification requires a password.
---	<b>runeffectivegroup</b>	Controls the effective group ID (egid) of the requested job.
---	<b>runeffectiveuser</b>	Controls the effective user ID (euid) of the requested job.
---	<b>runenablerlimits</b>	<p>When <b>true</b>, use the <b>runlimit_*</b> variables to set up ulimits for the secured task.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
---	<b>runenvironmentfile</b>	<p>Specifies an environment file that contains environment variables to be incorporated into the run environment.</p> <p><b>Version 5.2 and earlier:</b> variable not available.</p> <p><b>Version 6.0 and later:</b> variable available.</p>
---	<b>runptyflags</b>	Flags that are used internally for pty settings; reserved for internal use.
---	<b>runsecurecommand</b>	<p>Checks that the <b>runcommand</b> is writable only by <b>root</b> or the runuser.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
---	<b>runmd5sum</b>	Contains an MD5 checksum for the current task.
---	<b>runmd5sumlist</b>	Contains a list of MD5 checksum values for the current task.
---	<b>runtime limit</b>	The number of seconds that the job may execute.
---	<b>runtimeout</b>	Maximum allowed idle time.
---	<b>runutmpuser</b>	<b>utmp</b> user name.
---	<b>shellallowedcommands</b>	<p>Contains a list of strings that contain commands that may be run without any further authorization.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
---	<b>shellcheckbuiltins</b>	<p>If <b>true</b>, directs the shell to check shell built-in commands as if they were standard commands</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
---	<b>shellcheckredirections</b>	If <b>true</b> , directs the shell to authorize I/O redirections; if <b>false</b> , always allows I/O redirection.

		<p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
	<b>shellforbiddencommands</b>	<p>Contains a list of strings that specify commands for <b>pbksh</b> and <b>pbsh</b> to reject without consulting an Endpoint Privilege Management for Unix and Linux policy server daemon.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
	<b>shellloginincludefiles</b>	<p>Controls if the contents of included (sourced) shell scripts should be recorded in the I/O logs.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
	<b>shellreadonly</b>	<p>Contains a list of environment variables that <b>pbsh</b> and <b>pbksh</b> set to read-only at startup time.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
	<b>shellrestricted</b>	<p>Controls whether Endpoint Privilege Management for Unix and Linux shells run in restricted mode.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>solarisproject</b>	<b>runsolarisproject</b>	<p>Specifies a Solaris project that the secured task should be associated with on a Solaris 9 or higher runhost.</p> <p><b>Version 6.0 and earlier:</b> variable not available.</p> <p><b>Version 6.1 and later:</b> variable available.</p>
<b>submithost</b>	---	Name of the machine from which the current request is submitted.
<b>submithostip</b>	---	IP address of the machine from which the current request is submitted.
<b>taskpid</b>	---	The PID of the secured task launched by <b>pbrun</b> .
<b>taskttyname</b>	---	<p>Name of the tty device associated with the secured task.</p> <p>This variable is only available after the secured task is launched and cannot be used in the policy. This is a read-only variable.</p> <p><b>Version 6.2.0 and earlier:</b> variable available.</p> <p><b>Version 6.2.6 and later:</b> variable available.</p>
<b>timezone</b>	---	Standard representation of timezone on <b>submithost</b> .
<b>ttyname</b>	---	Name of the tty device from which the current request is submitted.
<b>umask</b>	<b>runumask</b>	The user's <b>umask</b> values.

<b>user</b>	<b>runuser</b>	Specifies the user ID that is associated with the login name of the user that submitted the current task.
-------------	----------------	---


Within Endpoint Privilege Management for Unix and Linux, each secured task has its own set of task information variables. Other secured task requests do not share the information in these variables.

Two copies of task information variables are created and maintained for each task request that Endpoint Privilege Management for Unix and Linux processes. One set is read-only. These read-only variables contain the original, unmodified information about a task request. The other set, known as run variables, have information identical to their corresponding read-only versions; however, their values can be modified. The information in the modifiable variables is the information that Endpoint Privilege Management for Unix and Linux actually uses to execute a request once it is accepted. The modifiable task information variables have the same names as their read-only counterparts except they have the prefix **run**.

 **Note:** These run variables do not apply to **pbssh**. If these run variables are present in the policy, they do not have any effect on **pbssh** and are ignored.

There are some special pass-through values that are available for the run versions of some task information variables. These special values are needed when the policy server host and run host represent different systems. In this scenario, processing some functions may fail because the values for those variables need to be retrieved from the run host system rather than the policy server host. The following functions are affected: **gethome()**, **getgroup()**, **getgroups()**, and **getshell()**.

Value	Description	Example
<b>!g!</b>	Returns the run user's run group on run host.	<b>rungroup = "!g!";</b>
<b>!G!</b>	Returns all groups that the run user belongs to on run host.	<b>rungroups = {"!G!"};</b>
<b>!~!</b>	Returns the run user's home directory on run host.	<b>runcwd = "!~!";</b>
<b>!!!</b>	Returns the run user's default shell on run host.	<b>runcommand = "!!!";</b>

 For more information, see the following:

- On when and how to use special run variable values, "[Environment Variable Processing Considerations](#)" on page 50
- On the **gethome()**, **getgroup()**, **getgroups()**, and **getshell()** functions, "[Built-in Functions and Procedures](#)" on page 353

## argc

### Data Type

Integer, read-only

### Description

The **argc** variable contains the number of arguments that are supplied with the current command. The command name is treated as an argument. Thus, the actual number of user supplied arguments, not including the command name itself, is **argc - 1**.

There is not a run version of this variable.

### Valid Values

A positive integer.

**i** For more information, see the following:

- ["argv" on page 117](#)
- ["runargv" on page 117](#)
- ["command" on page 123](#)
- ["runcommand" on page 123](#)

## argv

### Run Version

#### runargv



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Data Type

List. **argv** is read-only. **runargv** is modifiable.

### Description

The **argv** and **runargv** variables contain the list of argument values that are associated with the current command. The first argument value, with index **0**, is the name of the command. Use the **run** version of this variable to change an argument value.

### Syntax

```
runargv = list;
```

### Valid Values

A list in which the first element contains the name of the current command, as entered by the submitting user. The remaining list elements contain the command arguments, as entered by the submitting user. **argv** is a read-only variable whose value comes from the **pbrun** command line. The default value of **runargv** is the value of **argv**.



#### Example:

```
runargv = {"uname", "-a"};
```



For more information, see the following:

- ["argc" on page 116](#)
- ["command" on page 123](#)
- ["runcommand" on page 123](#)

# bkgd

## Run Version

### runbkgd



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

## Data Type

Boolean. **bkgd** is read-only. **runbkgd** is modifiable.

## Description

The **bkgd** and **runbkgd** variables indicate whether to run a task in the background with HUP signals ignored. Endpoint Privilege Management for Unix and Linux sets both variables when the user executes **pbrun** with a **-b** switch. To change whether a task actually runs in the background with HUP signals ignored, set the **runbkgd** variable.



**Tip:** In this context, the function name inside the function behaves like a function parameter.

When its parent process terminates, HUP refers to the hangup signal that is sent to a child process by the operating system. If the child process was set to ignore HUP signals, the child process continues to run even though its parent process was terminated.



**Tip:** This feature can be useful for applications running in the background.

## Syntax

```
runbkgd = boolean;
```

## Valid Values

<b>true</b>	Ignore HUP signals.
<b>false</b>	Do not ignore HUP signals.

**bkgd** is read-only and defaults to **true** when **pbrun -b** is used. Otherwise, it defaults to **false**. **runbkgd** defaults to the value of **bkgd**.

**Example:**

```
runbkgd = true;
```

## browserhost

### Data Type

String, read-only

### Description

The host name of the machine connected to **pbguid**. This is usually a browser or a proxy.

### Valid Values

A string as described above.

**i** For more information, see "[browserip](#)" on page 121.



## browserip

### Data Type

String, read-only

### Description

The IP address of the machine connected to **pbguid**. This is usually a browser or a proxy.

### Valid Values

A string as described above.



For more information, see "[browserhost](#)" on page 120.

## clienthost

- **Version 3.5 and earlier:** `clienthost` variable is not available.
- **Version 4.0 and later:** `clienthost` variable is available.

### Data Type

String, read-only

### Description

The name of the client (submit) host as resolved on the client host.

### Valid Values

A string as described above.



*For more information, see the following:*

- ["host" on page 132](#)
- ["submithost" on page 223](#)

## command

### Run Version

#### runcommand



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Data Type

String. **command** is read-only. **runcommand** is modifiable.

### Description

The **command** and **runcommand** variables contain the name of the current command request. If specified, command arguments are stored in **runargv** and are not stored in **command** or **runcommand**. To change the current command, set the **runcommand** variable.



**Note:** Setting the run version of this variable also sets **runargv[0]**; however, setting **runargv** does not set **runcommand**.

### Syntax

```
runcommand = string;
```

### Valid Values

A string containing the name of the current task request command as entered by the submitting user. **command** is a read-only variable. **runcommand** defaults to the value of **command**.



#### Example:

```
runcommand = "/bin/ls";
```



For more information, see the following:

- ["argc" on page 116](#)
- ["argv" on page 117](#)
- ["runargv" on page 117](#)

## cwd

### Run Version

#### runcwd



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Data Type

String. **cwd** is read-only. **runcwd** is modifiable.

### Description

The **cwd** and **runcwd** variables contain the full path of the working directory on the submit host from which the current task request is being initiated. To cause the requested program to execute in a different directory on a run host, set the **runcwd** variable. Depending on how Endpoint Privilege Management for Unix and Linux is deployed, submit host and run host might be different machines with different directory structures.



**Note:** If Endpoint Privilege Management for Unix and Linux cannot set this variable and **enforceRunCwd** is set to **No**, the task request runs in the **/tmp** directory on the run host.

### Syntax

```
runcwd = string;
```

### Valid Values

A string specifying the run host working directory for the current task request. **cwd** is a read-only variable. Also, **cwd** is the directory from which the command originated. **runcwd** defaults to **cwd**.



#### Example:

```
runcwd = "/home/username";
```



For more information, see ["runchroot" on page 190](#).

## env

### Run Version

#### runenv



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Data Type

List. **env** is read-only. **runenv** is modifiable.

### Description

The **env** and **runenv** variables contain the name and value pairs of each Unix or Linux environment variable that is present when the current task request is submitted. Each environment variable is stored as an element within **env**. Each of these elements has the format **NAME=Value**, where **NAME** is the name of the environment variable and **Value** is the value that is stored in that variable.

The value of an environment variable is modified by setting **runenv**.

The **getenv()**, **setenv**, **keepenv**, and **unsetenv** functions and procedures can access the values within **env**.

### Syntax

```
runenv = list of strings;
```

### Valid Values

A list in which each element has the format **NAME=value** where **NAME** is the name of the Unix or Linux environment variable and **value** is the value stored in that variable. This list defaults to the run time environment of the **pbrun** command.



For more information, see the following:

- ["getenv" on page 471](#)
- ["keepenv" on page 472](#)
- ["logomit" on page 253](#)
- ["setenv" on page 473](#)
- ["unsetenv" on page 474](#)

## execute\_via\_su

### Data Type

Boolean

### Description

The run environment for the secured task is normally dictated by the Endpoint Privilege Management for Unix and Linux policy server policy. It may be desirable to have the runhost dictate the run environment for the secured task. Endpoint Privilege Management for Unix and Linux version 7.1 and above can use the **su** - command to create a login shell for the secured task, thus allowing the login mechanism to setup the run environment. The Endpoint Privilege Management for Unix and Linux policy server host keyword **execute\_via\_su** in **/etc/pb.settings** globally enables using **su** - to execute the secured task. This keyword can be overridden by the policy variable with the same name **execute\_via\_su**. The **execute\_via\_su** variable's initial value is based on the keyword setting's value. When **execute\_via\_su** is used, any run environment setup in the policy affect the execution of **su** - rather than the execution of the secured task. This includes the use of **runcwd**, **setenv()**, **keepenv()**, etc., as well as **!g!**, **!G!**, etc. Entitlement reports do not indicate that **su** - is used, however the Accept events in the event log show if **su** - was used to invoke the secured task. This feature does not work for runusers whose login is disabled (for example, using **/sbin/nologin** or **/bin/false**).

Settings Keyword	Policy Variable	Result uses su -?
unset	unset	no
	TRUE	YES
	FALSE	no
No	unset	no
	TRUE	YES
	FALSE	no
Yes	unset	YES
	TRUE	YES
	FALSE	no

### Valid Values

- 0
- 1
- true
- false

## Default

```
unset
```



For more information, see the following:

- ["runcommand" on page 123](#)
- ["runuser" on page 231](#)
- ["runargv" on page 117](#)
- ["runenvironmentfile" on page 204](#)
- ["setenv" on page 473](#)
- ["keepenv" on page 472](#)
- ["Environment Variable Processing Considerations" on page 50](#)

## group

### Run Version

#### rungroup



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Data Type

String. **group** is read-only. **rungroup** is modifiable.

#### Description

The **group** and **rungroup** variables contain the name of the submitting user's primary group. To temporarily change the submitting user's primary group, set the **rungroup** variable.



**Note:** If the **rungroup** does not exist on the run host, the run host refuses to execute the command.

### Syntax

```
rungroup = string;
```

### Valid Values

A string that contains the name of the submitting user's primary group. **group** is a read-only variable. The default value of **rungroup** defaults to the value of **group**.



#### Example:

```
rungroup = "bin";
```



For more information, see the following:

- ["groups" on page 130](#)
- ["rungroups" on page 130](#)
- ["getgroup" on page 484](#)
- ["getgrouppasswd" on page 485](#)



**i**

- ["getgroups" on page 486](#)
- ["innetgroup" on page 446](#)
- ["inusernetgroup" on page 447](#)
- ["runeffectivegroup" on page 197](#)

## groups

### Run Version

#### rungroups



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Data Type

List. **groups** is read-only. **rungroups** is modifiable.

### Description

The **groups** and **rungroups** variables contain the list of groups the submitting user belongs to. To temporarily modify the list of groups, set the **rungroups** variable.

If one of the **rungroups** does not exist on the run host, the run host issues a warning before executing the command.

### Syntax

```
rungroups = list;
```

### Valid Values

The **groups** variable contains the name of each group the submitting user belongs to on the submit host.

The value of the **rungroups** variable defaults to the value of the **groups** variable.



#### Example:

```
rungroups = {"bin", "wheel"};
```



For more information, see the following:

- ["group" on page 128](#)
- ["rungroup" on page 128](#)
- ["getgroup" on page 484](#)
- ["getgrouppasswd" on page 485](#)

**i**

- ["getgroups" on page 486](#)
- ["innetgroup" on page 446](#)
- ["inusernetgroup" on page 447](#)

## host

### Run Version

#### runhost



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Data Type

String. **host** is read-only. **runhost** is modifiable.

### Description

**submithost** is the name of the machine that executed **pbrun**. **host** is the value that is passed to **pbrun** with the `-h` switch. If a `-h` switch is not used, then the value of **host** is taken from **submithost**. If the value of **runhost** is not explicitly set in the policy, then its value comes from **host**.

Setting **runhost** in the policy has no effect when the task is run in local mode (that is, when **pbrun** is executed with the `-l` option, or if the **runlocalmode** policy variable is set to **true**).

### Syntax

```
runhost = string;
```

### Valid Values

A string that contains the fully-qualified name of the run host machine. **host** is a read-only default value and is the name of the submit host. The default value of **runhost** is the value of **host**.



#### Example:

```
runhost = "tad";
```



For more information, see the following:

- ["ipaddress" on page 433](#)
- ["localmode" on page 134](#)

**i**

- ["runlocalmode" on page 134](#)
- ["masterhost" on page 280](#)
- ["pid" on page 294](#)
- ["requestuser" on page 156](#)
- ["runconfirmuser" on page 196](#)
- ["subprocuser" on page 298](#)
- ["submithost" on page 223](#)
- ["submithostip" on page 224](#)
- ["uniqueid" on page 301](#)

## localmode

### Run Version

#### runlocalmode



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Data Type

Boolean. **localmode** is read-only. **runlocalmode** is modifiable.

### Description

The **localmode** and **runlocalmode** variables indicate if the submitting user specified that the current task request run in local mode. When a task runs in local mode, **pbmasterd** returns control to **pbrun** rather than **pblocald**. After the task is accepted, **pbrun** replaces itself with the current task request. The result is that **localmode** cannot be used with Advanced Control and Audit (ACA), and the current task request is processed without the benefit of any further event logging (the exit status is not logged) or keystroke actions.

Regarding **pbrun**, the **localmode** mechanism is deprecated in favor of Optimized Run Mode, in which all features are available.

The Endpoint Privilege Management shells **pbsh** and **pbksh** normally operate in **localmode**. This can be disabled by setting **runlocalmode=false**.

Endpoint Privilege Management for Unix and Linux sets the **localmode** variables when the user executes **pbrun** with a **-l** switch, or when the **runlocalmode** variable is set to **true** in the policy.

### Syntax

```
runlocalmode = boolean;
```

### Valid Values

<b>true</b>	Run local mode. The default value is <b>true</b> if <b>pbrun -l</b> is used, <b>false</b> otherwise.
<b>false</b>	Disable local mode.

**localmode** is a read-only variable with a value of **true** if **pbrun -l** is used, **false** otherwise.

**runlocalmode** defaults to **localmode**. If the **allowlocalmode** setting is **false**, then **runlocalmode** is set to read-only and has a value of **false**.

**Example:**

```
runlocalmode = false;
```



For more information, see the following:

- ["bkgd" on page 118](#)
- ["runbkgd" on page 118](#)
- ["noreconnect" on page 283](#)
- *pblocald* in the [Endpoint Privilege Management for Unix and Linux Administration Guide](#) at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>.
- ["Task Submission - pbrun" on page 17](#)
- *allowlocalmode* in the [Endpoint Privilege Management for Unix and Linux Administration Guide](#) at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>.

## logaccept\_utc

- **Version 22.1 and earlier:** `logaccept_utc` variable not available.
- **Version 22.1 and later:** `logaccept_utc` variable available.

### Data Type

String, read-only

### Description

The UTC time, in `YYYY-MM-DDTHH:MM:SS.000Z` format, when logging accept events.

### Valid Values

Any valid date and time.



## logcksum

- **Version 7.5 and earlier:** `logcksum` variable not available.
- **Version 8.0 and later:** `logcksum` variable available.

### Data Type

String, modifiable

### Description

When `runcksum`, `runcksumlist`, `runmd5sum`, or `runmd5sumlist` are present in the policy, the run host verifies that the checksum of the `runcommand` matches the values specified in those variables. The `logcksum` variable allows the checksum of the `runcommand` to be recorded in the event log for analysis.

There is no read-only version of this variable.

### Syntax

```
logcksum = string_value
```

### Valid Values

<b>cksum</b>	Save the runtime-generated application checksum in the <code>cksum</code> variable and record it in the event log. This is the value that would be compared to the <code>runcksum</code> or <code>runcksumlist</code> user-defined policy variable (if available).
<b>md5</b>	Save the runtime-generated application MD5 checksum in the <code>md5sum</code> variable and record it in the event log. This is the value that would be compared to the <code>runmd5sum</code> or <code>runmd5sumlist</code> user-defined policy variable (if available).
<b>all</b>	Record both runtime-generated checksum values ( <code>cksum</code> and <code>md5sum</code> variables) in the event log.



#### Example:

```
logcksum = "cksum";
```



#### Example:

```
logcksum = "md5";
```

**Example:**

```
logcksum = "all";
```



For more information, see the following:

- ["runcksum" on page 192](#)
- ["runcksumlist" on page 193](#)
- ["runmd5sum" on page 201](#)
- ["runmd5sumlist" on page 202](#)

## logfinish\_utc

- **Version 22.1 and earlier:** `logfinish_utc` variable not available.
- **Version 22.1 and later:** `logfinish_utc` variable available.

### Data Type

String, read-only

### Description

The UTC time, in `YYYY-MM-DDTHH:MM:SS.000Z` format, when logging finish events.

### Valid Values

Any valid date and time.

## logkeystroke\_utc

- **Version 22.1 and earlier:** logkeystroke\_utc variable not available.
- **Version 22.1 and later:** logkeystroke\_utc variable available.

### Data Type

String, read-only

### Description

The UTC time, in **YYYY-MM-DDTHH:MM:SS.000Z** format, when logging keystroke events.

### Valid Values

Any valid date and time.

# logpid

## Data Type

Number, read-only

## Description

The **logpid** variable contains the PID of the log server daemon logging the accept.

This read-only variable is not available during the processing of the policy, because it is created after the policy performs an accept. This variable is available in the event log.

There is no run version of this variable.

## Valid Values

A number that contains a PID.

This is a read-only variable.

**i** For more information, see the following:

- ["pid" on page 294](#)
- ["runpid" on page 207](#)
- ["submitpid" on page 225](#)
- ["taskpid" on page 226](#)

## logreject\_utc

- **Version 22.1 and earlier:** `logreject_utc` variable not available.
- **Version 22.1 and later:** `logreject_utc` variable available.

### Data Type

String, read-only

### Description

The UTC time, in `YYYY-MM-DDTHH:MM:SS.000Z` format, when logging reject events.

### Valid Values

Any valid date and time.

## logserver\_utcoffset

- Version 22.1 and earlier: `logserver_utcoffset` variable not available.
- Version 22.1 and later: `logserver_utcoffset` variable available.

### Data Type

String representing an integer, read-only

### Description

The logserver timezone offset from UTC, in hours.

### Valid Values

-12 to 14



For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)
- ["runstart\\_utc" on page 180](#)
- ["runfinish\\_utc" on page 179](#)
- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["master\\_utcoffset" on page 145](#)

## logservers

### Data Type

List

### Description

A list of log hosts for **pblocald** to use for event and I/O logging. The policy variable overrides the settings keyword when the **logservers** keyword in the settings file is enabled. In other words,

```
/etc/pb.settings:  
.  
.  
logservers name0  
/opt/pbul/policies/pb.conf:  
...logservers={"name1", "name2"};  
...
```

The log servers that are used are **name1** and **name2**.

### Syntax

```
logservers = {list};
```



#### Example:

```
logservers = {"name1", "name2"};
```



## master\_utcoffset

- **Version 22.1 and earlier:** `master_utcoffset` variable not available.
- **Version 22.1 and later:** `master_utcoffset` variable available.

### Data Type

String representing an integer, read-only

### Description

The policy server timezone offset from UTC, in hours.

### Valid Values

-12 to 14



For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)
- ["runstart\\_utc" on page 180](#)
- ["runfinish\\_utc" on page 179](#)
- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)

## mastertimelimit

- **Version 4.0 and earlier:** `mastertimelimit` variable not available.
- **Version 5.0.1 and later:** `mastertimelimit` variable available.

### Data Type

Integer, modifiable

### Description

The `mastertimelimit` variable specifies a time limit, in seconds, between `pbmasterd` and `pblocald`, for a task request. If the job does not finish within the specified number of seconds, it is terminated.

`mastertimelimit` is similar to `mastertimeout`, but it is based on total time rather than idle time.

`mastertimelimit` is similar to `runtimelimit`, from the `pbmasterd` point of view, and is useful only when there is no log server.



**Note:** The `mastertimelimit` variable is not honored in local mode.

### Syntax

```
mastertimelimit = number;
```

### Valid Values

- **number:** Enable time limit checking.
- **0:** Disable time limit checking. This value is the default.



**Example:**

```
mastertimelimit = 3600;
```



For more information, see the following:

- ["mastertimeout" on page 147](#)
- ["runtimelimit" on page 210](#)
- ["runtimeout" on page 212](#)
- ["submittimeout" on page 297](#)

## mastertimeout

- **Version 4.0 and earlier:** `mastertimeout` variable not available.
- **Version 5.0.1 and later:** `mastertimeout` variable available.

### Data Type

Integer, modifiable

### Description

The `mastertimeout` variable specifies the amount of idle time, in seconds, between `pbmasterd` and `pblocald`. If the job is idle for the specified number of seconds, then it is terminated. `mastertimeout` is similar to `runtimeout`, from the `pbmasterd` point of view, and is useful only when there is no log server.



**Note:** The `mastertimeout` variable is not honored in local mode.

### Syntax

```
mastertimeout = number;
```

### Valid Values

- **number:** Enable idle checking.
- **0:** Disable idle checking. This value is the default.



**Example:**

```
runtimeout = 3600;
```



For more information, see the following:

- ["mastertimelimit" on page 146](#)
- ["runtimelimit" on page 210](#)
- ["runtimeout" on page 212](#)
- ["submittimeout" on page 297](#)

## nice

### Run Version

#### runnice



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Data Type

Integer. **nice** is read-only. **runnice** is modifiable.

### Description

The **nice** and **runnice** variables contain the **nice** value for the current task request. The **nice** value controls task execution priority. To modify task execution priority, set **runnice**.

### Syntax

```
runnice = number;
```

### Valid Values

An integer value that represents a task execution priority. This variable has no default value.



#### Example:

```
runnice = 20;
```



For more information, see the *Unix or Linux manual page for the **nice** command*.

## noexec

### Data Type

Integer. **noexec** is modifiable.

### Description

This variable does not apply to **pbssh**. If it is present in the policy, and set to **1**, **pbrun**, **pblocald**, **pbsh**, and **pbksh** will attempt to prevent the secured task from performing an exec to launch a new program (for example, prevent vi's shell escape `#!/bin/bash`).

This mechanism uses the **LD\_PRELOAD** or equivalent mechanism to load an Endpoint Privilege Management for Unix and Linux shared library that intercepts the exec family of library calls.

The **noexec** feature requires Endpoint Privilege Management for Unix and Linux 8.5.0 **runhosts**. Any previous version of **runhost** silently ignores the **noexec** feature.



**Note:** Care should be used when enabling **noexec** for shell scripts (these normally exec other programs).

### Restrictions

- The **noexec** feature works only for binaries that are dynamically linked, on operating systems that support the **LD\_PRELOAD** or equivalent mechanism.
- The **noexec** feature supports **setuid** programs only on Linux and Solaris run hosts.
- The **noexec** feature cannot execute shell scripts that lack the **#!/path/shell** specification.
- The **noexec** feature currently does not support the Endpoint Privilege Management for Unix and Linux **execute\_via\_su** feature.
- HP-UX 11.11 requires linker patch PHSS\_22535 or newer.

### Syntax

```
noexec=1;
```

### Valid Values

Valid values are **0** and **1**. This variable has default value of **0**.



**Example:**

```
noexec=1;
```

**i** For more information, see the *Unix/Linux manual pages for the `ld.so` (Linux), `ld.so.1` (Solaris), `ld` (HP-UX), and `dld.sl` (HP-UX) commands.*

## optimizedrunmode

- **Version 4.0 and earlier:** `optimizedrunmode` variable not available.
- **Version 5.0 and later:** `optimizedrunmode` variable available.
- **Version 6.0 and later:** `runoptimizedrunmode` variable available.

## Run Version

### runoptimizedrunmode



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

## Data Type

Boolean. `optimizedrunmode` is read-only. `runoptimizedrunmode` is modifiable.

## Description

`optimizedrunmode` indicates whether the task can be executed using Endpoint Privilege Management for Unix and Linux's optimized run mode feature. A value of `true` indicates that optimized run mode has not been disabled for this task by command line switch or Endpoint Privilege Management for Unix and Linux settings.

Setting `runoptimizedrunmode` to `false` can be used to prevent a task from being executed using Endpoint Privilege Management for Unix and Linux's optimized run mode feature.



**Note:** If optimized run mode is disabled in the policy server host's settings file, the submit host's settings file, or by a command line option on either `pbrun` or `pbmasterd`, then setting `runoptimizedrunmode` to `true` has no effect.

## Syntax

```
runoptimizedrunmode = Boolean;
```

## Valid Values

<code>true</code>	Non-zero. Enable optimized run mode.
<code>false</code>	Zero. Disable optimized run mode.

**Example:**

```
runoptimizedrunmode = false;
```



For information about optimized run mode and related settings, see the [Endpoint Privilege Management for Unix and Linux Administration Guide](https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm) at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>.



## pblocaldnoglob

### Data Type

Boolean, modifiable

### Description

**pblocaldnoglob** stops **pblocald** from expanding arguments to the target program. By setting this variable to a non-zero value, you can duplicate the way version Endpoint Privilege Management for Unix and Linux 2.6 and earlier pass arguments.

There is no read-only version of this variable.

### Syntax

```
pblocaldnoglob = boolean;
```

### Valid Values

true	Non-zero. Stop <b>pblocald</b> from expanding arguments to the target program.
false	Zero. Allow <b>pblocald</b> to expand arguments to the target program. This setting is the default.



#### Example:

```
pblocaldnoglob = true;
```

## pbrisklevel

### Data Type

Number, modifiable

### Description

The **pbrisklevel** variable specifies a risk rating that is passed to BeyondInsight. The data is displayed in the BeyondInsight Endpoint Privilege Management for Unix and Linux grid and **Agent Details** grid.

There is no read-only version of this variable.

### Syntax

```
pbrisklevel = number;
```

### Valid Values

- A whole number in the range of 0 - 9
  - 9 means highest risk
  - 0 means no risk

### Default Value

If **pbrisklevel** is not explicitly set in the policy, the risk level setting defaults to zero (0).



#### Example:

```
pbrisklevel = 3;
```

## pidmessage

### Data Type

String, modifiable

### Description

The **pidmessage** variable contains an optional string that causes the process ID of the task on the run host to print out at the start of the task.

There is no read-only version of this variable.



**Note:** If Endpoint Privilege Management for Unix and Linux is running as local mode, it ignores **pidmessage**.

### Syntax

```
pidmessage = string;
```

### Valid Values

Any string. The default value is empty.



**Example:** The following example produces output similar to *This is job: sparky 9876* before the target command runs.

```
pidmessage = "This is job: ";
```

## requestuser

### Data Type

String, read-only

### Description

The **requestuser** variable contains the value that is specified by the **pbrun -u** argument. When a user runs **pbrun** with the **-u** username option, the value is placed in **requestuser**. The policy then determines whether or not to honor the request. If the **-u** command option is not used, then **requestuser** contains the same value as **user**.

There is no run version of this variable.

### Valid Values

A string as described above.



*For more information, see the following:*

- ["Task Submission - pbrun" on page 17](#)
- ["user" on page 231](#)
- ["runuser" on page 231](#)

## rlimit\_as

- **Version 3.5 and earlier:** `rlimit_as` and `runrlimit_as` variables not available.
- **Version 4.0 and later:** `rlimit_as` and `runrlimit_as` variables available.

## Run Version

### runrlimit\_as



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

## Data Type

Number. `rlimit_as` is read-only, `runrlimit_as` is modifiable.

## Description

These variables control the maximum memory available to a process in bytes as a 32-bit number. These variables are equivalent to `vmem` on some systems. `rlimit_as` is the read-only value for the user who invokes Endpoint Privilege Management for Unix and Linux. `runrlimit_as` is the modifiable value for the target secured task.



**Note:** To enable `runrlimit_as` functionality, set `runenablerlimits` to a value of 1.

## Syntax

```
runrlimit_as = number;
```

## Valid Values

Vary according to platform.



**Example:**

```
runrlimit_as = 1000;
```



For more information, see the following:

**i**

- ["rlimit\\_core" on page 159](#)
- ["rlimit\\_cpu" on page 161](#)
- ["rlimit\\_data" on page 163](#)
- ["rlimit\\_fsize" on page 165](#)
- ["rlimit\\_locks" on page 167](#)
- ["rlimit\\_memlock" on page 169](#)
- ["rlimit\\_nofile" on page 171](#)
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- ["runrlimit\\_core" on page 159](#)
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- ["runrlimit\\_nproc" on page 173](#)
- ["runrlimit\\_rss" on page 175](#)
- ["runrlimit\\_stack" on page 177](#)

## rlimit\_core

- **Version 3.5 and earlier:** `rlimit_core` and `runrlimit_core` variables not available.
- **Version 4.0 and later:** `rlimit_core` and `runrlimit_core` variables available.

## Run Version

### runrlimit\_core



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

## Data Type

Number. `rlimit_core` is read-only. `runrlimit_core` is modifiable.

## Description

These variables control the maximum size of a core file in bytes as a 32-bit number. `rlimit_core` is the read-only value for the user who invokes Endpoint Privilege Management for Unix and Linux. `runrlimit_core` is the modifiable value for the target secured task.



**Note:** To enable `runrlimit_core` functionality, set `runenablerlimits` to a value of `1`.

## Syntax

```
runrlimit_core = number;
```

## Valid Values

Vary according to platform.



**Example:**

```
runrlimitcore = 1000;
```



For more information, see the following:

**i**

- ["rlimit\\_as" on page 157](#)
- ["rlimit\\_cpu" on page 161](#)
- ["rlimit\\_data" on page 163](#)
- ["rlimit\\_fsize" on page 165](#)
- ["rlimit\\_locks" on page 167](#)
- ["rlimit\\_memlock" on page 169](#)
- ["rlimit\\_nofile" on page 171](#)
- ["rlimit\\_nproc" on page 173](#)
- ["rlimit\\_rss" on page 175](#)
- ["rlimit\\_stack" on page 177](#)
- ["runrlimit\\_as" on page 157](#)
- ["runrlimit\\_cpu" on page 161](#)
- ["runrlimit\\_data" on page 163](#)
- ["runrlimit\\_fsize" on page 165](#)
- ["runrlimit\\_locks" on page 167](#)
- ["runrlimit\\_memlock" on page 169](#)
- ["runrlimit\\_nofile" on page 171](#)
- ["runrlimit\\_nproc" on page 173](#)
- ["runrlimit\\_rss" on page 175](#)
- ["runrlimit\\_stack" on page 177](#)



## rlimit\_cpu

- **Version 3.5 and earlier:** `rlimit_cpu` and `runrlimit_cpu` variables not available.
- **Version 4.0 and later:** `rlimit_cpu` and `runrlimit_cpu` variables available.

## Run Version

### runrlimit\_cpu



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

## Data Type

Number. `rlimit_cpu` is read-only. `runrlimit_cpu` is modifiable.

## Description

These variables control the maximum size CPU time of a process in seconds as a 32-bit number. `rlimit_cp` is the read-only value for the user who invokes Endpoint Privilege Management for Unix and Linux. `runrlimit_cpu` is the modifiable value for the target secured task.



**Note:** To enable `runrlimit_cpu` functionality, set `runenablerlimits` to a value of 1.

## Syntax

```
runrlimit_cpu = number;
```

## Valid Values

Vary according to platform.



**Example:**

```
runrlimit_cpu = 1000;
```



For more information, see the following:

**i**

- ["rlimit\\_as" on page 157](#)
- ["rlimit\\_core" on page 159](#)
- ["rlimit\\_data" on page 163](#)
- ["rlimit\\_fsize" on page 165](#)
- ["rlimit\\_locks" on page 167](#)
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- ["rlimit\\_nofile" on page 171](#)
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- ["rlimit\\_rss" on page 175](#)
- ["rlimit\\_stack" on page 177](#)
- ["runrlimit\\_as" on page 157](#)
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- ["runrlimit\\_memlock" on page 169](#)
- ["runrlimit\\_nofile" on page 171](#)
- ["runrlimit\\_nproc" on page 173](#)
- ["runrlimit\\_rss" on page 175](#)
- ["runrlimit\\_stack" on page 177](#)

## rlimit\_data

- **Version 3.5 and earlier:** `rlimit_data` and `runrlimit_data` variables not available.
- **Version 4.0 and later:** `rlimit_data` and `runrlimit_data` variables available.

## Run Version

### runrlimit\_data



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

## Data Type

Number. `rlimit_data` is read-only. `runrlimit_data` is modifiable.

## Description

These variables control the maximum size of a process' data segment as a 32-bit number. `rlimit_data` is the read-only value for the user who invoked Endpoint Privilege Management for Unix and Linux. `runrlimit_data` is the modifiable value for the target secured task.



**Note:** To enable `runrlimit_data` functionality, set `runenablerlimits` to a value of 1.

## Syntax

```
runrlimit_data = number;
```

## Valid Values

Vary according to platform.



**Example:**

```
runrlimit_data = 100;
```



For more information, see the following:

**i**

- ["rlimit\\_as" on page 157](#)
- ["rlimit\\_core" on page 159](#)
- ["rlimit\\_cpu" on page 161](#)
- ["rlimit\\_fsize" on page 165](#)
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- ["runrlimit\\_as" on page 157](#)
- ["runrlimit\\_core" on page 159](#)
- ["runrlimit\\_cpu" on page 161](#)
- ["runrlimit\\_fsize" on page 165](#)
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- ["runrlimit\\_memlock" on page 169](#)
- ["runrlimit\\_nofile" on page 171](#)
- ["runrlimit\\_nproc" on page 173](#)
- ["runrlimit\\_rss" on page 175](#)
- ["runrlimit\\_stack" on page 177](#)

## rlimit\_fsize

- **Version 3.5 and earlier:** `rlimit_fsize` and `runrlimit_fsize` variables not available.
- **Version 4.0 and later:** `rlimit_fsize` and `runrlimit_fsize` variables available.

## Run Version

### runrlimit\_fsize



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

## Data Type

Number. `rlimit_fsize` is read-only. `runrlimit_fsize` is modifiable.

## Description

These variables control the maximum size of a file in bytes as a 32-bit number. `rlimit_fsize` is the read-only value for the user who invokes Endpoint Privilege Management for Unix and Linux. `runrlimit_fsize` is the modifiable value for the target secured task.



**Note:** To enable `runrlimit_fsize` functionality, set `runenablerlimits` to a value of `1`.

## Syntax

```
runrlimit_fsize = number;
```

## Valid Values

Vary according to platform.



### Example:

```
runrlimit_fsize = 1000;
```



For more information, see the following:

**i**

- ["rlimit\\_as" on page 157](#)
- ["rlimit\\_core" on page 159](#)
- ["rlimit\\_cpu" on page 161](#)
- ["rlimit\\_data" on page 163](#)
- ["rlimit\\_locks" on page 167](#)
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- ["rlimit\\_nofile" on page 171](#)
- ["rlimit\\_nproc" on page 173](#)
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- ["rlimit\\_stack" on page 177](#)
- ["runrlimit\\_as" on page 157](#)
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- ["runrlimit\\_rss" on page 175](#)
- ["runrlimit\\_stack" on page 177](#)

## rlimit\_locks

- **Version 3.5 and earlier:** `rlimit_locks` and `runrlimit_locks` variables not available.
- **Version 4.0 and later:** `rlimit_locks` and `runrlimit_locks` variables available.

## Run Version

### runrlimit\_locks



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

## Data Type

Number. `rlimit_locks` is read-only. `runrlimit_locks` is modifiable.

## Description

These variables control the maximum number of file locks for a process as a 32-bit number. `rlimit_locks` is the read-only value for the user who invokes Endpoint Privilege Management for Unix and Linux. `runrlimit_locks` is the modifiable value for the target secured task.



**Note:** To enable `runrlimit_locks` functionality, set `runenablerlimits` to a value of 1.

## Syntax

```
runrlimit_locks = number;
```

## Valid Values

Vary according to platform.



**Example:**

```
runrlimit_locks = 1000;
```



For more information, see the following:

**i**

- ["rlimit\\_as" on page 157](#)
- ["rlimit\\_core" on page 159](#)
- ["rlimit\\_cpu" on page 161](#)
- ["rlimit\\_data" on page 163](#)
- ["rlimit\\_fsize" on page 165](#)
- ["rlimit\\_memlock" on page 169](#)
- ["rlimit\\_nofile" on page 171](#)
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- ["runrlimit\\_memlock" on page 169](#)
- ["runrlimit\\_nofile" on page 171](#)
- ["runrlimit\\_nproc" on page 173](#)
- ["runrlimit\\_rss" on page 175](#)
- ["runrlimit\\_stack" on page 177](#)



## rlimit\_memlock

- **Version 3.5 and earlier:** `rlimit_memlock` and `runrlimit_memlock` variables not available.
- **Version 4.0 and later:** `rlimit_memlock` and `runrlimit_memlock` variables available.

## Run Version

### runrlimit\_memlock



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

## Data Type

Number. `rlimit_memlock` is read-only. `runrlimit_memlock` is modifiable.

## Description

These variables control the maximum number of bytes of virtual memory that may be locked at a given time as a 32-bit number. `rlimit_memlock` is the read-only value for the user who invokes Endpoint Privilege Management for Unix and Linux. `runrlimit_memlock` is the modifiable value for the target secured task.



**Note:** To enable `runrlimit_memlock` functionality, set `runenablerlimits` to a value of 1.

## Syntax

```
runrlimit_memlock = number;
```

## Valid Values

Vary according to platform.



**Example:**

```
runrlimit_memlock = 1000;
```



For more information, see the following:

**i**

- ["rlimit\\_as" on page 157](#)
- ["rlimit\\_core" on page 159](#)
- ["rlimit\\_cpu" on page 161](#)
- ["rlimit\\_data" on page 163](#)
- ["rlimit\\_fsize" on page 165](#)
- ["rlimit\\_locks" on page 167](#)
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- ["runrlimit\\_as" on page 157](#)
- ["runrlimit\\_core" on page 159](#)
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- ["runrlimit\\_fsize" on page 165](#)
- ["runrlimit\\_locks" on page 167](#)
- ["runrlimit\\_nofile" on page 171](#)
- ["runrlimit\\_nproc" on page 173](#)
- ["runrlimit\\_rss" on page 175](#)
- ["runrlimit\\_stack" on page 177](#)

## rlimit\_nofile

- **Version 3.5 and earlier:** `rlimit_nofile` and `runrlimit_nofile` variables not available.
- **Version 4.0 and later:** `rlimit_nofile` and `runrlimit_nofile` variables available.

## Run Version

### runrlimit\_nofile



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

## Data Type

Number. `rlimit_nofile` is read-only. `runrlimit_nofile` is modifiable.

## Description

These variables control the maximum number of files a user may have open at a given time as a 32-bit number. `rlimit_nofile` is the read-only value for the user who invokes Endpoint Privilege Management for Unix and Linux. `runrlimit_nofile` is the modifiable value for the target secured task.



**Note:** To enable `runrlimit_nofile` functionality, set `runenablerlimits` to a value of 1.

## Syntax

```
runrlimit_nofile = number;
```

## Valid Values

Vary according to platform.



**Example:**

```
runrlimit_nofile = 1000;
```



For more information, see the following:

**i**

- ["rlimit\\_as" on page 157](#)
- ["rlimit\\_core" on page 159](#)
- ["rlimit\\_cpu" on page 161](#)
- ["rlimit\\_data" on page 163](#)
- ["rlimit\\_fsize" on page 165](#)
- ["rlimit\\_locks" on page 167](#)
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- ["runrlimit\\_as" on page 157](#)
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- ["runrlimit\\_locks" on page 167](#)
- ["runrlimit\\_memlock" on page 169](#)
- ["runrlimit\\_nproc" on page 173](#)
- ["runrlimit\\_rss" on page 175](#)
- ["runrlimit\\_stack" on page 177](#)

## rlimit\_nproc

- **Version 3.5 and earlier:** `rlimit_nproc` and `runrlimit_nproc` variables not available.
- **Version 4.0 and later:** `rlimit_nproc` and `runrlimit_nproc` variables available.

## Run Version

### runrlimit\_nproc



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

## Data Type

Number. `rlimit_nproc` is read-only. `runrlimit_nproc` is modifiable.

## Description

These variables control the maximum number of process a user may run at a given time as a 32-bit number. `rlimit_nproc` is the read-only value for the user who invokes Endpoint Privilege Management for Unix and Linux. `runrlimit_nproc` is the modifiable value for the target secured task.



**Note:** To enable `runrlimit_nproc` functionality, set `runenablerlimits` to a value of `1`.

## Syntax

```
runrlimit_nproc = number;
```

## Valid Values

Vary according to platform.



**Example:**

```
runrlimit_nproc = 1000;
```



For more information, see the following:

**i**

- ["rlimit\\_as" on page 157](#)
- ["rlimit\\_core" on page 159](#)
- ["rlimit\\_cpu" on page 161](#)
- ["rlimit\\_data" on page 163](#)
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- ["runrlimit\\_as" on page 157](#)
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- ["runrlimit\\_cpu" on page 161](#)
- ["runrlimit\\_data" on page 163](#)
- ["runrlimit\\_fsize" on page 165](#)
- ["runrlimit\\_locks" on page 167](#)
- ["runrlimit\\_memlock" on page 169](#)
- ["runrlimit\\_nofile" on page 171](#)
- ["runrlimit\\_rss" on page 175](#)
- ["runrlimit\\_stack" on page 177](#)

## rlimit\_rss

- **Version 3.5 and earlier:** `rlimit_rss` and `runlimit_rss` variables not available.
- **Version 4.0 and later:** `rlimit_rss` and `runlimit_rss` variables available.

## Run Version

### runlimit\_rss



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

## Data Type

Number. `rlimit_rss` is read-only. `runlimit_rss` is modifiable.

## Description

These variables control the maximum size of a process' resident set (number of virtual pages that are resident at a given time) as a 32-bit number. `rlimit_rss` is the read-only value for the user who invokes Endpoint Privilege Management for Unix and Linux. `runlimit_rss` is the modifiable value for the target secured task.



**Note:** To enable `runlimit_rss` functionality, set `runenablerlimits` to a value of `1`.

## Syntax

```
runlimit_rss = number;
```

## Valid Values

Vary according to platform.



**Example:**

```
runlimit_rss = 1000;
```



For more information, see the following:

**i**

- ["rlimit\\_as" on page 157](#)
- ["rlimit\\_core" on page 159](#)
- ["rlimit\\_cpu" on page 161](#)
- ["rlimit\\_data" on page 163](#)
- ["rlimit\\_fsize" on page 165](#)
- ["rlimit\\_locks" on page 167](#)
- ["rlimit\\_memlock" on page 169](#)
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- ["runrlimit\\_data" on page 163](#)
- ["runrlimit\\_fsize" on page 165](#)
- ["runrlimit\\_locks" on page 167](#)
- ["runrlimit\\_memlock" on page 169](#)
- ["runrlimit\\_nofile" on page 171](#)
- ["runrlimit\\_nproc" on page 173](#)
- ["runrlimit\\_stack" on page 177](#)



## rlimit\_stack

- **Version 3.5 and earlier:** `rlimit_stack` and `runlimit_stack` variables not available.
- **Version 4.0 and later:** `rlimit_stack` and `runlimit_stack` variables available.

## Run Version

### runlimit\_stack



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

## Data Type

Number. `rlimit_stack` is read-only. `runlimit_stack` is modifiable.

## Description

These variables control the maximum size the process stack in bytes as a 32-bit number. `rlimit_stack` is the read-only value for the user who invokes Endpoint Privilege Management for Unix and Linux. `runlimit_stack` is the modifiable value for the target secured task.



**Note:** To enable `runlimit_stack` functionality, set `runenablerlimits` to a value of 1.

## Syntax

```
runlimit_stack = number;
```

## Valid Values

Vary according to platform.



**Example:**

```
runlimit_stack = 1000;
```



For more information, see the following:

**i**

- ["rlimit\\_as" on page 157](#)
- ["rlimit\\_core" on page 159](#)
- ["rlimit\\_cpu" on page 161](#)
- ["rlimit\\_data" on page 163](#)
- ["rlimit\\_fsize" on page 165](#)
- ["rlimit\\_locks" on page 167](#)
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- ["rlimit\\_rss" on page 175](#)
- ["runrlimit\\_as" on page 157](#)
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- ["runrlimit\\_cpu" on page 161](#)
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- ["runrlimit\\_fsize" on page 165](#)
- ["runrlimit\\_locks" on page 167](#)
- ["runrlimit\\_memlock" on page 169](#)
- ["runrlimit\\_nofile" on page 171](#)
- ["runrlimit\\_nproc" on page 173](#)
- ["runrlimit\\_rss" on page 175](#)

## runfinish\_utc

- **Version 22.1 and earlier:** runfinish\_utc variable not available.
- **Version 22.1 and later:** runfinish\_utc variable available.

### Data Type

String, read-only

### Description

The UTC time, in **YYYY-MM-DDTHH:MM:SS.000Z** format, when the request has finished.

### Valid Values

Any valid date and time.

## runstart\_utc

- **Version 22.1 and earlier:** runstart\_utc variable not available.
- **Version 22.1 and later:** runstart\_utc variable available.

### Data Type

String, read-only

### Description

The UTC time, in **YYYY-MM-DDTHH:MM:SS.000Z** format, when request is received.

### Valid Values

Any valid date and time.

## false

### Data Type

Boolean, read-only

### Description

The **false** variable is a read-only variable with a predefined value of **0**.

Many program statements rely upon conditional tests to determine what program statement should be executed next. The **if** statement is an example of this. Conditional tests evaluate to either a **true** value or a **false** value. In the Security Policy Scripting Language, a **true** value is represented by any positive, non-zero integer, but is usually represented by the integer value **1**. A **0** represents **false**.

Because **true** and **false** values are used so frequently within security policy files, the variable **true** may be used in place of a numeric value **1** and the variable **false** may be used in place of a **0** value when evaluating a conditional expression or initializing a variable.

### Valid Values

**0**. Constant, cannot be changed.

**i** For more information, see ["true" on page 300](#).

## hour

### Data Type

Integer, read-only

### Description

The **hour** variable contains the current hour, taken from the policy server host, in HH format.

### Valid Values

An integer ranging from 0 - 23 (inclusive) from the policy server host.



*For more information, see the following:*

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 183](#)
- ["i18n\\_day" on page 184](#)
- ["i18n\\_dayname" on page 185](#)
- ["i18n\\_hour" on page 186](#)
- ["i18n\\_minute" on page 187](#)
- ["i18n\\_month" on page 188](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)

## i18n\_date

### Data Type

UTF-8 encoded string, read-only

### Description

The **i18n\_date** variable contains the current date, taken from the policy server host. It is formatted according to the operating system's locale settings.

### Valid Values

A UTF-8 encoded string that contains a date.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_day" on page 184](#)
- ["i18n\\_dayname" on page 185](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)

## i18n\_day

### Data Type

UTF-8 encoded string, read-only

### Description

The `i18n_day` variable contains the current date, taken from the policy server host. It is formatted according to the operating system's locale settings.

### Valid Values

A UTF-8 encoded string that contains a day value.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_dayname" on page 185](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)



## i18n\_dayname

### Data Type

UTF-8 encoded string, read-only

### Description

The **i18n\_dayname** variable contains the current day of the week, taken from the policy server host. It is formatted according to the operating system's locale settings.

### Valid Values

A UTF-8 encoded string that contains a value for the day of the week.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)

## i18n\_hour

### Data Type

UTF-8 encoded string, read-only

### Description

The **i18n\_hour** variable contains the current hour, taken from the policy server host. It is formatted according to the operating system's locale settings.

### Valid Values

A UTF-8 encoded string that contains an hour value.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 183](#)
- ["i18n\\_day" on page 184](#)
- ["i18n\\_dayname" on page 185](#)
- ["i18n\\_minute" on page 187](#)
- ["i18n\\_month" on page 188](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)

## i18n\_minute

### Data Type

UTF-8 encoded string, read-only

### Description

The `i18n_minute` variable contains the minute portion of the current time, taken from the policy server host. It is formatted according to the operating system's locale settings. The month, day, date, and year variables can be used together to determine the current date, per the policy server host. The hour and minute variables can be used together to determine the current time, per the policy server host.

### Valid Values

A UTF-8 encoded string that contains a minute value.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)

## i18n\_month

### Data Type

UTF-8 encoded string, read-only

### Description

The **i18n\_month** variable contains the current month, taken from the policy server host. It is formatted according to the operating system's locale settings. The month, day, date, and year variables can be used together to determine the current date per the policy server host. The hour and minute variables can be used together to determine the current time per the policy server host.

### Valid Values

A UTF-8 encoded string that contains the month value

## selinux

- **Version 5.2 and earlier:** **selinux** variable not available.
- **Version 6.0 and later:** **selinux** variable available.

### Data Type

Integer, read-only

### Description

The **selinux** variable indicates whether the **pbrun** client that is requesting the secured task is running confined in the SELinux environment. This variable is not present when the submit host is not integrated with SELinux. You can use the **isset()** function to determine if **pbrun** is running confined.

### Valid Values

An integer, as described above. If **pbrun** is running unconfined, the variable is not present.



#### Example:

```
if (isset("selinux")
{
print ("SELINUX: ", selinux);
}
```

# runchroot

## Data Type

String, modifiable

## Description

The **runchroot** variable contains the name of the user's root directory. A secured task can access only those files that reside within that root directory. To change the root directory for the current task, set **runchroot**.

There is no read-only version of this variable.



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

To use Endpoint Privilege Management for Unix and Linux with the directory that is specified in the **runchroot** variable, the following files must be copied into that directory:

Files	Target Directory
<code>/etc/pb.settings</code>	<code>runchroot/etc</code>
Key files in <code>/etc</code> (if using Endpoint Privilege Management for Unix and Linux encryption)	<code>runchroot/etc</code>
<code>/usr/lib/symark/pb/*</code> (if using Kerberos, SSL, or LDAP)	<code>runchroot/usr/lib/symark/pb</code>

In addition, if the **pbrunlog** setting has a value, you must create a corresponding directory under the directory that is specified in **runchroot**. For example, if **pbrunlog** is set to `/var/log/pbrun.log`, then create a `runchroot/var/log` directory.

## Syntax

```
runchroot = string;
```

## Valid Values

A string that contains a valid absolute path specification. The default value is empty, which implies that the entire run host's file system is accessible.



**Example:**

```
runchroot = "/usr/local/newroot";
```



*For more information, see the following:*

- ["cwd" on page 124](#)
- ["runcwd" on page 124](#)

## runcksum

### Data Type

String, modifiable

### Description

The **runcksum** variable stores a checksum value. By default, **runcksum** is an empty string. Populate it by running the Endpoint Privilege Management for Unix and Linux utility program **pbsum**, which generates application and file checksum values.

Use checksum values to determine if a file or application has changed by establishing a baseline checksum and then comparing that baseline checksum against a checksum that is generated during security policy file processing. If the checksum values are different, then the file or application has changed since generation of the baseline checksum, and Endpoint Privilege Management for Unix and Linux will refuse to run it.

Application checksum values can be used to determine if a virus has infected an application or if the file has been changed.

There is no read-only version of this variable.



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Syntax

```
runcksum = string;
```

### Valid Values

A string that contains a checksum value that is generated by **pbsum**. The default value is empty, which specifies no checksum checking.



**Example:**

```
runcksum = "2f9777ff";
```



For more information, see **pbsum** in the *Endpoint Privilege Management for Unix and Linux Administration Guide* at <https://www.beyondtrust.com/docs/privilege-management/documents/unix-linux/pmul-admin.pdf>



## runcksumlist

### Data Type

List

### Description

The **runcksumlist** variable contains a list of checksum values. By default, **runcksumlist** is an empty list. Populate it by running the Endpoint Privilege Management for Unix and Linux utility program **pbsum**, which generates application and file checksum values.

Use checksum values to determine if the target files or applications have changed by establishing baseline checksum values and then comparing those baseline checksum values against a checksum that is generated during security policy file processing. If the checksum value that was generated during security policy file processing does not match any of the values in **runcksumlist**, then the file or application has changed since generation of the baseline checksum, and Endpoint Privilege Management for Unix and Linux refuses to run it.

Application checksum values can be used to determine if a virus has infected an application or if the file has been changed.

There is no read-only version of this variable.



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Syntax

```
runcksumlist = list of checksum values;
```

### Valid Values

A list of strings that represents checksum values generated by **pbsum**. The default value is empty, which specifies no checksum checking.



#### Example:

```
runcksumlist={"b3b156bc", "59bf4a99"};
```



For more information, see the following:

- *pbsum* in the *Endpoint Privilege Management for Unix and Linux Administration Guide* at <https://www.beyondtrust.com/docs/privilege-management/documents/unix-linux/pmul-admin.pdf>
- "*runcksum*" on page 192

## runconfirmmessage

### Data Type

String, modifiable

### Description

The **runconfirmmessage** variable contains the prompt that is displayed when the submitting user is required to enter a password. If a prompt is not set in **runconfirmmessage**, then the following default prompt is used: *type in the user's password*.

The Endpoint Privilege Management for Unix and Linux variable **runconfirmuser** determines if a password is required.

There is no read-only version of this variable.

### Syntax

```
runconfirmmessage = string;
```

### Valid Values

A string containing a user-password prompt. The default value is empty, which defaults to *type in the user's password*.



#### Example:

```
runconfirmmessage = "Please enter the password for pat";
```



For more information, see "[runconfirmuser](#)" on page 196.

## runconfirmpasswdservice

### Data Type

String, modifiable

### Description

The **runconfirmpasswdservice** variable stores the name of the PAM password service which will be used to perform password authentication and account management for the user named by the **runconfirmuser** variable. It overrides **pampasswordservice** in **pb.settings** of the run host.

There is no read-only version of this variable.

### Syntax

```
runconfirmpasswdservice = pam_password_service;
```

### Valid Values

A string that contains a name of a valid PAM password service that is present on the run host. There is no default value. If this variable is not defined, the server setting **pampasswordservice** (if set) is used.



#### Example:

```
runconfirmpasswdservice = "pbul_pam_stack";
```



For more information, see the following:

- ["runconfirmuser" on page 196](#)
- ["runhost" on page 132](#)
- On **pampasswordservice**, [Endpoint Privilege Management for Unix and Linux System Administration Guide at https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm](https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm)

## runconfirmuser

### Data Type

String, modifiable

### Description

The **runconfirmuser** variable controls whether or not a user must correctly enter a password before the current task request is executed. When this variable is set, the submitting user is prompted for the password that is associated with the run host user name that is set in this variable.

The variable **runconfirmmessage** determines the password prompt that is displayed to the user after the policy is finished, but before the run host starts the command request. When setting **runconfirmuser**, it is a good idea to set **runconfirmmessage**.

If the user fails in three attempts to submit the correct password, the secured task request is not executed. Because the secured task has already been accepted, the Endpoint Privilege Management for Unix and Linux event log records an exit status of *ConfirmUser <username> failed*.

There is no read-only version of this variable.



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Syntax

```
runconfirmuser = user;
```

### Valid Values

A string that contains a user name that is present on the run host (as specified in the **runhost** variable), for which a password must be supplied before the current task request can be run. The default value is empty, which indicates this password check will not be performed.



**Example:**

```
runconfirmuser = "sandy";
```



For more information, see the following:

- ["runconfirmmessage" on page 194](#)
- ["runhost" on page 132](#)

## runeffectivegroup

### Data Type

String, modifiable

### Description

**runeffectivegroup** provides control over the effective group ID (egid) of the secured task. Setting this to a group name makes that group the effective group for the task. If **runeffectivegroup** is not set, then the value of **rungroup** specifies the effective group.

Any change to the **rungroup** variable resets **runeffectivegroup** to the same value. If you want **runeffectivegroup** to be different from **rungroup**, then set **runeffectivegroup** after **rungroup**.

There is no read-only version of this variable.



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Syntax

```
runeffectivegroup = group;
```

### Valid Values

A string that contains a valid group name. The default value is the value of **rungroup**.



**Example:**

```
runeffectivegroup = "bin";
```



For more information, see the following:

- ["pblogdreconnection" on page 291](#)
- ["pbrunreconnection" on page 292](#)
- ["rungroup" on page 128](#)
- ["runuser" on page 231](#)

# runeffectiveuser

## Data Type

String, modifiable

## Description

**runeffectiveuser** provides control over the effective user ID (euid) of the requested job. Setting this variable to a user name makes that user the effective user for the job. If it is not set, the value of **runuser** specifies the effective user.

Any change to the **runuser** variable resets **runeffectiveuser** to the same value. If you want **runeffectiveuser** to be different from **runuser**, then set **runeffectiveuser** after **runuser**.

There is no read-only version of this variable.



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

## Syntax

```
runeffectiveuser = string;
```

## Valid Values

A string containing a valid user name. The default value is the value of **runuser**.



**Example:**

```
runeffectiveuser = "bin";
```



For more information, see the following:

- ["pblogdreconnection" on page 291](#)
- ["pbrunreconnection" on page 292](#)
- ["runeffectivegroup" on page 197](#)

## runenablerlimits

- **Version 3.5 and earlier:** `runenablerlimits` variable not available.
- **Version 4.0 and later:** `runenablerlimits` variable available.

### Data Type

Boolean

### Description

This variable determines if the `runrlimit` variables are used on the run host. This variable must be set to a value of `1` to enable the functionality of the following variables: `rlimit_as`, `rlimit_core`, `rlimit_cpu`, `rlimit_data`, `rlimit_fsize`, `rlimit_locks`, `rlimit_memlock`, `rlimit_nofile`, `rlimit_nproc`, `rlimit_rss`, `rlimit_stack`.



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

### Syntax

```
runenablerlimits = boolean;
```

### Valid Values

<b>true</b>	Use the <code>runrlimit_*</code> values on the run host.
<b>false</b>	Ignore the <code>runrlimit_*</code> values and use the run host native <code>ulimits</code> . The default is <b>false</b> .



**Example:**

```
runenablerlimits = true;
```



For more information, see the following:

- ["rlimit\\_as" on page 157](#)
- ["rlimit\\_core" on page 159](#)
- ["rlimit\\_cpu" on page 161](#)
- ["rlimit\\_data" on page 163](#)
- ["rlimit\\_fsize" on page 165](#)

**i**

- ["rlimit\\_locks" on page 167](#)
- ["rlimit\\_memlock" on page 169](#)
- ["rlimit\\_nofile" on page 171](#)
- ["rlimit\\_nproc" on page 173](#)
- ["rlimit\\_rss" on page 175](#)
- ["rlimit\\_stack" on page 177](#)



## runmd5sum

### Data Type

String, modifiable

### Description

The **runmd5sum** variable stores an MD5 checksum value. By default, **runmd5sum** is an empty string. Populate it by running the Endpoint Privilege Management for Unix and Linux utility program **pbsum -m <file names>**, which generates the application and file MD5 checksum values.

Use checksum values to determine if a file or application has changed by establishing a baseline checksum and then comparing that baseline checksum against a checksum that is generated during security policy file processing. If the checksum values are different, then the file or application has changed since the generation of the baseline checksum, and Endpoint Privilege Management for Unix and Linux refuses to run it.

Application checksum values can be used to determine if a virus has infected an application or if the file has been changed.

There is no read-only version of this variable.



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Syntax

```
runmd5sum = string;
```

### Valid Values

A string containing a checksum value generated by **pbsum**. The default value is empty, which specifies no checksum checking.



#### Example:

```
runmd5sum = "dda5b3a11ac4e203190fbf0643722a05";
```



For more information, see **pbsum** in the [Endpoint Privilege Management for Unix and Linux Administration Guide](https://www.beyondtrust.com/docs/privilege-management/documents/unix-linux/pmul-admin.pdf) at <https://www.beyondtrust.com/docs/privilege-management/documents/unix-linux/pmul-admin.pdf>

## runmd5sumlist

### Data Type

List

### Description

The **runmd5sumlist** variable contains a list of MD5 checksum values. By default, **runmd5sumlist** is an empty list. Populate it by running the Endpoint Privilege Management for Unix and Linux utility program **pbsum -m <file names>**, which generates application and file MD5 checksum values.

Use MD5 checksum values to determine if the target files or applications have changed by establishing baseline checksum values and then comparing those baseline checksum values against a checksum that is generated during security policy file processing. If the checksum value that was generated during security policy file processing does not match any of the values in **runmd5sumlist**, then the file or application has changed since generation of the baseline checksum, and Endpoint Privilege Management for Unix and Linux refuses to run it.

Application MD5 checksum values can be used to determine if a virus has infected an application or if the file has been changed.

There is no read-only version of this variable.



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Syntax

```
runmd5sumlist = list of checksum values;
```

### Valid Values

A list of string that represents MD5 checksum values generated by **pbsum -m <file names>**. The default value is empty, which specifies no checksum checking.



#### Example:

```
runmd5sumlist={"478cd2ea4b868c459d3fcd3132b00853",  
"38a0b33c1f5fa6a2ababf0ce386a2494"};
```



For more information, see the following:

- On **pbsum**, the [Endpoint Privilege Management for Unix and Linux Administration Guide](https://www.beyondtrust.com/docs/privilege-management/documents/unix-linux/pmul-admin.pdf) at <https://www.beyondtrust.com/docs/privilege-management/documents/unix-linux/pmul-admin.pdf>.



- ["runmd5sum" on page 201](#)

## runenvironmentfile

- **Version 5.2 and earlier:** `runenvironmentfile` not available.
- **Version 6.0 and later:** `runenvironmentfile` available.

### Data Type

String

### Description

The `runenvironmentfile` variable enables you to specify the absolute path and file name of an environment file. Endpoint Privilege Management for Unix and Linux can incorporate the environment variables that are specified in the environment file into the run environment. These environment variables are applied on the run host after the Accept event has been logged.

The `runenvironmentfile` variable overrides the `environmentfile` setting in the `pb.settings` file on the run host.

There is no read-only version of this variable.

The environment file must consist of the following:

- Comment lines, which have a `#` character in the first non-whitespace position.
- Blank lines.
- Bourne shell compatible environment variable setting lines with the form **NAME=VALUE**.

Each line in the file must contain less than 1024 characters. Line continuation is not supported. This file must not contain any shell commands or constructs other than the setting of environment variables. Comments must not appear on the same line as an environment variable.

### Syntax

```
runenvironmentfile = string;
```

### Valid Values

A string that contains the absolute path and file name of an environment file. The default value is empty.



#### Example:

```
runenvironmentfile = "/etc/environment";
```

## runpamsessionsservice

### Data Type

String, modifiable

### Description

The **runpamsessionsservice** variable stores the name of the PAM service which is used to perform account management and session setup and teardown to manage task requests on a run host. It overrides **pamsessionsservice** in **pb.settings** of the run host.

There is no read-only version of this variable.

### Syntax

```
runpamsessionsservice = pam_password_service;
```

### Valid Values

A string that contains a name of a valid PAM session service that is present on the run host. There is no default value. If this variable is not defined, the run host's **pb.setting pamsessionsservice** (if set) is used.



#### Example:

```
runpamsessionsservice = "pbul_pam_stack";
```



For more information, see the following:

- ["runhost" on page 132](#)
- On **pamsessionsservice**, [Endpoint Privilege Management for Unix and Linux Administration Guide at https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm](https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm)

## runpamsetcred

### Data Type

Integer, modifiable

### Description

The **runpamsetcred** variable enables the **pam\_setcred()** function, which is used to establish possible additional credentials of a user. It overrides **pamsetcred** in **pb.settings** of the run host.

There is no read-only version of this variable.

### Syntax

```
runpamsessionservice = pam_password_service;
```

### Valid Values

1 or true	Enable <b>pam_setcred()</b> .
0 or false	Do not enable <b>pam_setcred()</b> .



#### Example:

```
runpamsetcred = 1;
```



For more information, see the following:

- ["runhost" on page 132](#)
- On **pamsetcred**, [Endpoint Privilege Management for Unix and Linux Administration Guide at https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm](https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm)

## runpid

### Data Type

Number, read-only

### Description

The **runpid** variable contains the PID of the Endpoint Privilege Management for Unix and Linux module processing the secured task. In the case of optimized run mode, this PID (for **pbrun**) is the same as the **submitpid**. Otherwise, this contains the PID of **pblockd**.

This read-only variable is not available during the processing of the policy, because it is created after the policy performs an accept. This variable is available in the event log.

There is no run version of this variable.

### Valid Values

A number that contains a pid.

This is a read-only variable.



*For more information, see the following:*

- ["logpid" on page 141](#)
- ["pid" on page 294](#)
- ["submitpid" on page 225](#)
- ["taskpid" on page 226](#)

## runptyflags

- **Version 3.5 and earlier:** **runptyflags** not available.
- **Version 4.0 and later:** **runptyflags** available.

### Data Type

Internal

### Description

Flags that are used internally for pty settings; reserved for internal use.



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.



## runsecurecommand

- **Version 3.5 and earlier:** `runsecurecommand` variable not available.
- **Version 4.0 and later:** `runsecurecommand` variable available.

### Data Type

Boolean

### Description

The `runsecurecommand` variable enables you to perform an extra check on the security of the requested command. This check helps ensure that someone other than root or the runuser (for example, `sys` or `oracle`), could not have compromised the command.

When set to `true`, the run command and all directories above it are checked to see if anyone other than root or the run user has write permission. If the command file or any of the directories above it are writable by anyone other than root or the runuser, then the run host refuses to run the command. The `runsecurecommand` setting can be set to `yes` on the run host for the same effect.



**Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

### Syntax

```
runsecurecommand = boolean;
```

### Valid Values

<code>true</code>	Non-zero. Check that the <code>runcommand</code> is writable only by <code>root</code> or the runuser.
<code>false</code>	Zero. No check is performed. The default is <code>false</code> .



#### Example:

```
runsecurecommand = true;
```

## runtime-limit

- **Version 3.5 and earlier:** `runtime-limit` variable not available.
- **Version 4.0 and later:** `runtime-limit` variable available.


### Data Type

Integer, modifiable

### Description

The `runtime-limit` variable specifies a time limit for a task request. If the job does not finish within the specified number of seconds, then it is terminated. This is similar to `runtimeout`, but is based on total time rather than idle time.

 **Note:** The `runtime-limit` variable is not honored in local mode.

 **Note:** This run variable does not apply to `pbssh`. If it is present in the policy, it does not have any effect on `pbssh` and is ignored.

### Syntax

```
runtime-limit = number;
```

### Valid Values

positive number	Enable time limit checking.
0 or negative number	Disable time limit checking. This setting is the default.

 **Example:**

```
runtime-limit = 3600;
```

 For more information, see the following:

- ["runtimeout" on page 212](#)
- ["submittimeout" on page 297](#)
- ["runtimewarn" on page 440](#)



- ["runtimewarnlog" on page 441](#)

## runtimeout

### Data Type

Integer, modifiable

### Description

The **runtimeout** variable specifies the amount of idle time, in seconds, that the submitting user is allowed before the run host terminates the current request. To change the idle time specification, set **runtimeout**.

There is no read-only version of this variable.



**Note:** The **runtimeout** variable is not honored in local mode.



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Syntax

```
runtimeout = number;
```

### Valid Values

**positive number**

Enable idle checking.

**0 or negative number**

Disable idle checking. This setting is the default.



**Example:**

```
runtimeout = 600;
```



For more information, see the following:

- "[runtimeout](#)" on page 210
- "[submittimeout](#)" on page 297
- On **runtimeout** and **runtimeoutoverride**, *Endpoint Privilege Management for Unix and Linux Administration Guide* at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>

# runutmpuser

## Data Type

String, modifiable

## Description

The **runutmpuser** variable contains the User Id that appears in the **utmp** logs on the run host. By default, **runutmpuser** is set to the value of the **user** variable. To change the name of the user that appears in **utmp**, set **runutmpuser**. If user does not exist on the run host, then **runutmpuser** is set to the value of the **runuser** variable.

There is no read-only version of this variable.



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

## Syntax

```
runutmpuser = string;
```

## Valid Values

A string that contains the **utmp** User Id. The default value is the value of the **user** variable.



**Example:**

```
runutmpuser = "root";
```



**Example:**

```
runutmpuser = "runuser";
```



For more information, see the following:

- ["requestuser" on page 156](#)
- ["runuser" on page 231](#)
- ["user" on page 231](#)

## shellallowedcommands

- **Version 3.5 and earlier:** `shellallowedcommands` variable not available.
- **Version 4.0 and later:** `shellallowedcommands` variable available.

### Data Type

List

### Description

This variable contains a list of strings that contain commands that may be run without any further authorization. Each element of the list can contain either a command basename or absolute path. Shell template characters can be used at any point. This variable is used by `pbsh` and `pbksh` at startup time.

### Syntax

```
shellallowedcommands = list;
```

### Valid Values

A list of strings containing commands.



#### Example:

```
if (pbclientmode == "shell start")
shellallowedcommands = {"date", "/bin/df", "/usr/local/bin/*"};
```



For more information, see the following:

- ["pbclientmode" on page 288](#)
- ["shellcheckbuiltins" on page 215](#)
- ["shellcheckredirections" on page 216](#)
- ["shellforbiddencommands" on page 217](#)
- ["shellloginincludefiles" on page 218](#)
- ["shellreadonly" on page 219](#)

## shellcheckbuiltins

- **Version 3.5 and earlier:** `shellcheckbuiltins` variable not available.
- **Version 4.0 and later:** `shellcheckbuiltins` variable available.

### Data Type

Boolean

### Description

When set to **true**, this variable directs the shell to check shell built-in commands as if they were standard commands. This variable is used by **pbsh** and **pbksh** at startup time.

### Syntax

```
shellcheckbuiltins = boolean;
```

### Valid Values

<b>true</b>	Endpoint Privilege Management for Unix and Linux shells authorize and log shell built-in commands.
<b>false</b>	Endpoint Privilege Management for Unix and Linux shells do not authorize or log shell built-in commands.

#### Example:

```
shellcheckbuiltins = true;
```

#### For more information, see the following:

- ["pbclientmode" on page 288](#)
- ["shellallowedcommands" on page 214](#)
- ["shellcheckredirections" on page 216](#)
- ["shellforbiddencommands" on page 217](#)
- ["shellloginincludefiles" on page 218](#)
- ["shellreadonly" on page 219](#)

## shellcheckredirections

- **Version 3.5 and earlier:** `shellcheckredirections` variable not available.
- **Version 4.0 and later:** `shellcheckredirections` variable available.

### Data Type

Boolean

### Description

When set to **true**, this variable directs the shell to authorize I/O redirections (for example, `<`, `>`, `>>`). When this variable is set to **false**, I/O redirection is always allowed. **pbsh** and **pbksh** use this variable at startup time.

### Syntax

```
shellcheckredirections = boolean;
```

### Valid Values

<b>true</b>	Endpoint Privilege Management for Unix and Linux shells authorize and log shell I/O redirection requests.
<b>false</b>	Always allows I/O redirection.

#### Example:

```
shellcheckredirections = true;
```

#### For more information, see the following:

- ["pbclientmode" on page 288](#)
- ["shellallowedcommands" on page 214](#)
- ["shellcheckbuiltins" on page 215](#)
- ["shellforbiddencommands" on page 217](#)
- ["shellloginincludefiles" on page 218](#)
- ["shellreadonly" on page 219](#)



## shellforbiddencommands

- **Version 3.5 and earlier:** `shellforbiddencommands` variable not available.
- **Version 4.0 and later:** `shellforbiddencommands` variable available.

### Data Type

List

### Description

This variable contains a list of strings that specify commands that will be rejected by **pbksh** and **pbsh** without consulting an Endpoint Privilege Management for Unix and Linux policy server daemon. Each element of the list can contain either a command basename or absolute path. Shell template characters can be used at any point. This variable is used by **pbsh** and **pbksh** at startup time.

### Syntax

```
shellforbiddencommands = list;
```

### Valid Values

A list of strings as described above.



#### Example:

```
if (pbclientmode == "shell start")
shellforbiddencommands = {"/etc/*", "/usr/sbin/*",
"format", "/sbin/umount"};
```



For more information, see the following:

- ["pbclientmode" on page 288](#)
- ["shellallowedcommands" on page 214](#)
- ["shellcheckbuiltins" on page 215](#)
- ["shellcheckredirections" on page 216](#)
- ["shellloginincludefiles" on page 218](#)
- ["shellreadonly" on page 219](#)

## shellloginincludefiles

- **Version 3.5 and earlier:** `shellloginincludefiles` variable not available.
- **Version 4.0 and later:** `shellloginincludefiles` variable available.

### Data Type

Boolean

### Description

This variable controls whether the contents of included (sourced) shell scripts should be recorded in the I/O logs.

This is effective only if I/O logging for the shell is enabled. This variable is used by **pbsh** and **pbksh** at startup time.

### Syntax

```
shellloginincludefiles = boolean;
```

### Valid Values

<b>true</b>	Endpoint Privilege Management for Unix and Linux shells authorize and log files that shell scripts and profiles include (source).
<b>false</b>	Contents of included shell scripts are not recorded in I/O logs.



#### Example:

```
if (pbclientmode == "shell start") shellloginincludefiles = true;
```



For more information, see the following:

- ["pbclientmode" on page 288](#)
- ["shellallowedcommands" on page 214](#)
- ["shellcheckbuiltins" on page 215](#)
- ["shellcheckredirections" on page 216](#)
- ["shellforbiddencommands" on page 217](#)
- ["shellreadonly" on page 219](#)

## shellreadonly

- **Version 3.5 and earlier:** `shellreadonly` variable not available.
- **Version 4.0 and later:** `shellreadonly` variable available.

### Data Type

List

### Description

The variable `shellreadonly` contains a list of environment variables that `pbsh` and `pbksh` set to read-only at startup time. If the variable does not exist at start up time, then its entry is ignored. `pbsh` and `pbksh` use this variable at startup time.

### Syntax

```
shellreadonly = list;
```

### Valid Values

A list of environment variables.



#### Example:

```
if (pbclientmode == "shell start")
shellreadonly = {"PATH", "IFS", "SHELL", "ENV"};
```



For more information, see the following:

- ["pbclientmode" on page 288](#)
- ["shellallowedcommands" on page 214](#)
- ["shellcheckbuiltins" on page 215](#)
- ["shellcheckredirections" on page 216](#)
- ["shellforbiddencommands" on page 217](#)
- ["shellloginincludefiles" on page 218](#)

## shellrestricted

- **Version 3.5 and earlier:** `shellrestricted` variable not available.
- **Version 4.0 and later:** `shellrestricted` variable available.

### Data Type

Boolean

### Description

Controls whether Endpoint Privilege Management for Unix and Linux shells run in restricted mode. Restricted mode has the following limitations:

- The `cd` command is disabled.
- The environment variables **SHELL**, **ENV**, and **PATH** are read-only.
- Command names cannot use absolute or relative paths.
- The `-p` option of the built-in command is disabled.
- I/O redirections (`>`, `>|`, `>>`, and `<>`) that create files are disabled.

### Syntax

```
shellrestricted = boolean;
```

### Valid Values

<b>true</b>	Runs Endpoint Privilege Management for Unix and Linux shells in restricted mode.
<b>false</b>	Disables restricted mode. The default is <b>false</b> .



#### Example:

```
shellrestricted = true;
```



For more information, see the following:

- ["shellallowedcommands" on page 214](#)
- ["shellcheckbuiltins" on page 215](#)
- ["shellcheckredirections" on page 216](#)

**i**

- ["shellforbiddencommands" on page 217](#)
- ["shellloginincludefiles" on page 218](#)
- ["shellreadonly" on page 219](#)

## solarisproject

- Version 6.0 and earlier: **solarisproject** not available.
- Version 6.1 and later: **solarisproject** available.

## Run Version

### runsolarisproject



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

## Data Type

String, **solarisproject** is read-only. **Runsolarisproject** is modifiable.

## Description

The **solarisproject** and **runsolarisproject** variables specify a Solaris project that the secured task should be associated with on a Solaris 9 or higher runhost. These variables initially contain the project specified on the **pbrun** commandline, or the empty string "" if not specified on the **pbrun** commandline. If the project has not been specified (**runsolarisproject** equals ""), the default project (as defined by Solaris) will be associated with the secured task. If set to a non-valid project name for the runuser, or specified for a non-Solaris runhost, the secured task is not executed.

## Valid Values

A string containing a valid Solaris project on a Solaris runhost.



**Example:**

```
runsolarisproject group.acctng
```



**Example:**

```
runsolarisproject user.database
```

## Backwards Compatibility

Earlier versions of **pbmasterd** do not set the **solarisproject** and **runsolarisproject** variables; however, the policy can set the **runsolarisproject** variable.

## submithost

### Data Type

String, read-only

### Description

The **submithost** variable contains the name of the machine from which the current task request was submitted (that is, the submit host). **submithost** is what the policy server considers the client name to be (based on the current **submithost** network interface).

The **submithost** and **host** and **runhost** variables are closely related. By default, the host and runhost variables are set to **submithost**, unless the user requests a specific run host by using the **-h** argument of the **pbrun** command.

There is no run version of this variable.

### Valid Values

A string that contains the fully qualified name of the submit host machine. This is a read-only variable.



For more information, see the following:

- ["host" on page 132](#)
- ["runhost" on page 132](#)
- ["ipaddress" on page 433](#)
- ["masterhost" on page 280](#)
- ["Task Submission - pbrun" on page 17](#)
- ["pid" on page 294](#)
- ["subprocuser" on page 298](#)
- ["submithostip" on page 224](#)
- ["timezone" on page 228](#)

## submithostip

### Data Type

String, read-only

### Description

The **submithostip** variable contains the IP address of the machine from which the current task request was submitted (that is, the submit host).

There is no run version of this variable.

### Valid Values

A string that contains a valid IP address. This is a read-only variable.

**i** For more information, see the following:

- ["host" on page 132](#)
- ["ipaddress" on page 433](#)
- ["masterhost" on page 280](#)
- ["Task Submission - pbrun" on page 17](#)
- ["pid" on page 294](#)
- ["runhost" on page 132](#)
- ["submithost" on page 223](#)
- ["subprocuser" on page 298](#)
- ["timezone" on page 228](#)



## submitpid

### Data Type

Number, read-only

### Description

The **submitpid** variable contains the PID of the client (**pbrun**, **pbsp**, **pbsp**) submitting the task request.

This read-only variable is available during the processing of the policy, and in the event log.

There is no run version of this variable.

### Valid Values

A number that contains a PID.

This is a read-only variable.

**i** For more information, see the following:

- ["logpid" on page 141](#)
- ["pid" on page 294](#)
- ["runpid" on page 207](#)
- ["taskpid" on page 226](#)

## taskpid

### Data Type

Number, read-only

### Description

The **taskpid** variable contains the PID of the secured task launched by **pbrun**, or the session associated with **pbksh/pbsh** if **iologging** is on.

This variable is populated when the secured task is executed, and has no value until a session starts and therefore cannot be used in the policy. This variable is shown in the Finish event of the **eventlog** only when a **logserver** is used. It can also be used in the new 7.0 syslog formatting settings, **syslogsession\_start\_format** and **ssyslogsession\_finish\_format**.

For **pbksh** and **pbsh**, this variable is only populated if **iologging** is turned on.

### Valid Values

A number that contains a PID. This is a read-only variable.



**Example:** *pb.settings:*

```
syslogsession_finished_format "Endpoint Privilege Management for Unix and Linux finished  
%command% pid:%taskpid% on %date% at %hour%:%minute%."
```

## taskttyname

### Data Type

String, read-only

### Description

The **taskttyname** variable contains the name of the TTY device (that is, the terminal) associated to the secured task launched by **pbrun**, or the session associated with **pbksh/pbsh** if **iologging** is on.

This variable is populated when the secured task is executed, and has no value until a session starts and therefore cannot be used in the policy. This variable is shown in the Finish event of the **eventlog** only when a **logserver** is used. It can also be used in the new 7.0 syslog formatting settings, **syslogsession\_start\_format** and **syslogsession\_finish\_format**.

For **pbksh** and **pbsh**, this variable is only populated if **iologging** is turned on.

### Valid Values

A string that contains a TTY name. This is a read-only variable.

## timezone

### Data Type

String, read-only

### Description

The **timezone** variable contains a standard representation of the time zone on the machine from which the current task request was submitted (that is, the submit host). The **timezone** variable is relevant for users working in a cross-platform environment in which that submit host is a Sun machine that has its time zone set to a geographic region rather than the usual **timezone** file. Note that this variable applies to Solaris installations. The format of the **timezone** variable is dependent upon the operating system configuration parameters.

There is no run version of this variable.

### Valid Values

A string that contains the standard representation of the time zone. The format of the **timezone** variable is dependent upon operating system configuration parameters. This is a read-only variable.



For more information, see

- ["submithost" on page 223](#)
- ["runstart\\_utc" on page 180](#)
- ["runfinish\\_utc" on page 179](#)
- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## ttyname

### Data Type

String, read-only

### Description

The **ttyname** variable contains the name of the TTY device (that is, the terminal) from which the current task request was submitted on the submit host. If the client is running in pipe mode, then the value is **null**.

There is no run version of this variable.

### Valid Values

A string that contains a TTY name. This is a read-only variable.

# umask

## Run Version

### runumask



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

## Data Type

Number. **umask** is read-only. **runumask** is modifiable.

## Description

The **umask** and **runumask** variables contain **umask** values for the submitting user. The **umask** value determines the default file permissions mask (read, write, execute) for newly created files. To change the **umask** values for the secured task, set **runumask**.



For more information on **umask**, refer to the Unix/Linux manual page for **umask**.

## Syntax

```
runumask = number;
```

## Valid Values

A string value containing valid **umask** values for the submitting user. These variables have no default values. The **pbrun** command environment initializes these variables.



### Example:

```
runumask = 022;
```

## user

### Run Version

#### runuser



#### IMPORTANT!

This run variable does not apply to **pbssh**. If it is present in the policy, it could produce undesirable results.

### Data Type

String. **user** is read-only. **runuser** is modifiable.

### Description

The **user** and **runuser** variables specify the user name that is associated with the login name of the user that submitted the current task request (that is, the submitting user). By default, the current task runs under this user ID.

To change the user ID the current task runs under, set the **runuser** variable.

### Syntax

```
runuser = string;
```

### Valid Values

A string that contains a valid user name on the run host. **user** is a read-only variable and therefore has no default value. The default value of **runuser** is empty.



#### Example:

```
runuser = "root";
```



For more information, see the following:

- ["requestuser" on page 156](#)
- ["runeffectivegroup" on page 197](#)
- ["runutmpuser" on page 213](#)

## Command Line Parsing Variables

These variables support the `getopt()`, `getopt_long()`, and `getopt_long_only()` policy language functions. These functions examine the read-only task information variable `env`. The following table summarizes the command line parsing variables.

Variable	Description
<code>optarg</code>	Contains the parameter for the last argument or an empty string if none was found. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<code>opterr</code>	Determines whether to print errors from the <code>getopt()</code> , <code>getopt_long()</code> , and <code>getopt_long_only()</code> functions. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<code>optind</code>	Contains the current argument list index. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<code>optopt</code>	Contains the letter of the last option that had a problem. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<code>optreset</code>	Set this to <b>true</b> to restart the <code>getopt</code> functions from the start. The next time a <code>getopt</code> function is called, <code>optind</code> is set to <b>1</b> . <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<code>optstrictparameters</code>	The <code>getopt_long()</code> function provides strict interpretation of argument parameters. In particular, arguments with optional parameters are accepted only in the form <b>--argument=parameter</b> . Some non-compliant programs allow <b>--argument</b> parameter. To make <code>getopt_long()</code> recognize the latter form, set <code>optstrictparameters</code> to <b>false</b> . <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.



## optarg

- **Version 3.5 and earlier** : **optarg** variable not available.
- **Version 4.0 and later**: **optarg** variable available.

## Data Type

Integer, read-only

## Description

Used with **getopt** functions. Contains the parameter for the last argument or an empty string if none was found.

## Valid Values

A positive integer.



### Example:

```
if (option == "f") filename = optarg;
```



For more information, see the following:

- ["getopt" on page 476](#)
- ["getopt\\_long" on page 478](#)
- ["getopt\\_long\\_only" on page 480](#)
- ["opterr" on page 234](#)
- ["optind" on page 235](#)
- ["optopt" on page 236](#)
- ["optreset" on page 237](#)

## opterr

- **Version 3.5 and earlier:** `opterr` variable not available.
- **Version 4.0 and later:** `opterr` variable available.

## Data Type

Boolean

## Description

Used with the `getopt` functions. Determines whether to display errors from these functions.

## Valid Values

<code>true</code>	<code>getopt</code> function errors are displayed.
<code>false</code>	<code>getopt</code> function errors are not displayed.



### Example:

```
if (opterr == false) accept;
```



For more information, see the following:

- ["getopt" on page 476](#)
- ["getopt\\_long" on page 478](#)
- ["getopt\\_long\\_only" on page 480](#)
- ["optarg" on page 233](#)
- ["optind" on page 235](#)
- ["optopt" on page 236](#)
- ["optreset" on page 237](#)

## optind

- **Version 3.5 and earlier** : **optind** variable not available.
- **Version 4.0 and later**: **optind** variable available.

## Data Type

Integer

## Description

Used with **getopt** functions. Contains the current argument list index.

## Syntax

```
optind = integer;
```

## Valid Values

An integer between **0** and **argc**.



### Example:

```
if (optind < argc) accept;
```



For more information, see the following:

- ["getopt" on page 476](#)
- ["getopt\\_long" on page 478](#)
- ["getopt\\_long\\_only" on page 480](#)
- ["optarg" on page 233](#)
- ["opterr" on page 234](#)
- ["optopt" on page 236](#)
- ["optreset" on page 237](#)

## optopt

- **Version 3.5 and earlier:** `optopt` variable not available.
- **Version 4.0 and later :** `optopt` variable available.

### Data Type

String, read-only

### Description

Used with `getopt` functions. Contains the letter of the last option that had a problem.

### Valid Values

A string.



#### Example:

```
if (error) print ("Bad option", optopt);
```



For more information, see the following:

- ["getopt" on page 476](#)
- ["getopt\\_long" on page 478](#)
- ["getopt\\_long\\_only" on page 480](#)
- ["optarg" on page 233](#)
- ["opterr" on page 234](#)
- ["optind" on page 235](#)
- ["optreset" on page 237](#)

## optreset

- **Version 3.5 and earlier:** `optreset` variable not available.
- **Version 4.0 and later:** `optreset` variable available.

## Data Type

Boolean

## Description

Used with `getopt` functions. Set this to `true` to restart the `getopt` functions from the start. The next time a `getopt` function is called, `optind` is set to 1.

## Syntax

```
optreset = boolean;
```

## Valid Values

<code>true</code>	Sets <code>optind</code> to 1; the next call to <code>getopt()</code> , <code>getopt_long()</code> , or <code>getopt_long_only()</code> starts from the beginning of the <code>argv</code> list.
<code>false</code>	<code>getopt</code> functions are not restarted from the beginning of the <code>argv</code> list.



### Example:

```
optreset = true;
```



For more information, see the following:

- ["getopt" on page 476](#)
- ["getopt\\_long" on page 478](#)
- ["getopt\\_long\\_only" on page 480](#)
- ["optarg" on page 233](#)
- ["opterr" on page 234](#)
- ["optind" on page 235](#)
- ["optopt" on page 236](#)

## optstrictparameters

- **Version 3.5 and earlier:** `optstrictparameters` variable not available.
- **Version 4.0 and later:** `optstrictparameters` variable available.

### Data Type

Boolean

### Description

The `getopt_long()` function provides strict interpretation of argument parameters. In particular, arguments with optional parameters are accepted only in the form `--argument=parameter`. Some non-compliant programs allow `--argument parameter`. To make `getopt_long()` recognize the latter form, set `optstrictparameters` to `false`.

### Syntax

```
optstrictparameters = boolean;
```

### Valid Values

<b>true</b>	Allows <code>getopt_long()</code> 's strict interpretation of argument parameters. The default is <code>true</code> .
<b>false</b>	Makes <code>getopt_long()</code> recognize <code>--argument</code> parameter specifications.

#### Example:

```
optstrictparameters = false;
```

#### For more information, see the following:

- ["getopt" on page 476](#)
- ["getopt\\_long" on page 478](#)
- ["getopt\\_long\\_only" on page 480](#)
- ["optarg" on page 233](#)
- ["opterr" on page 234](#)
- ["optind" on page 235](#)
- ["optopt" on page 236](#)
- ["optreset" on page 237](#)

## Logging Variables

Endpoint Privilege Management for Unix and Linux uses logging variables to store both system and task-specific information. Using the Security Policy Scripting Language, the Security Administrator can query this information and use it to make security-related decisions about the current task request.

The following table summarizes the logging variables.

Variable	Description
<b>event</b>	Specifies the type of Endpoint Privilege Management for Unix and Linux event that is currently logged. This is a global variable.
<b>eventlog</b>	Contains the absolute path specification for the current Endpoint Privilege Management for Unix and Linux event log.
<b>exitdate</b>	Contains the completion date for the current task request.
<b>exitstatus</b>	Contains the task completion code, also called the return code, for the current task request.
<b>exittime</b>	Contains the time, in HH:MM:SS format, of completion for the current task request.
<b>forbidkeyaction</b>	Obsolete. Defines the action taken when a forbidden key sequence is entered during the execution of the current request.
<b>forbidkeypatterns</b>	Obsolete. Defines the forbidden keystroke sequences, patterns, or both. An element in the <b>forbidkeypatterns</b> list represents each forbidden keystroke pattern or sequence.
<b>i18n_exitdate</b>	Contains the UTF-8 encoded completion date for the current task request.
<b>i18n_exittime</b>	Contains the UTF-8 encoded completion time for the current task request.
<b>iolog</b>	Contains that absolute path specification for the current I/O log file.
<b>logmaximumfailures</b>	Controls the maximum number of log failures for a job.
<b>lognopassword</b>	Determines whether non-echoed input, such as passwords, is written to the I/O log file when I/O logging is active.
<b>logomit</b>	Specifies which Endpoint Privilege Management for Unix and Linux variables to omit from the event log. Use this user-defined variable to reduce the disk space that is used by the event log.
<b>logstderr</b>	Specifies whether error output from the current task request is recorded in the I/O log.
<b>logstderrlimit</b>	Places a limit on the number of bytes from the standard error stream that Endpoint Privilege Management for Unix and Linux writes to the I/O log at a time.
<b>logstdin</b>	Specifies whether input from the current task request is logged to the I/O log.
<b>logstdinlimit</b>	Places a limit on the number of bytes from the standard input stream that Endpoint Privilege Management for Unix and Linux writes to an I/O log at a time.
<b>logstdout</b>	Specifies whether normal output from the current task request is logged to the I/O log.
<b>logstdoutlimit</b>	Places a limit on the number of bytes from the standard output stream that Endpoint Privilege Management for Unix and Linux writes to the I/O log at a time.

**passwordloggingprompts**Specifies the password prompts to be recognized when the **lognpassword** variable is set.



## event

### Data Type

String

### Description

The event variable specifies the type of Endpoint Privilege Management for Unix and Linux event that is currently logged. This is a global variable.

### Valid Values

<b>accept</b>	The current task request has passed security policy file validation criteria.
<b>finish</b>	The task has completed execution.
<b>keystroke</b>	The current task was terminated because of a forbidden keystroke pattern.
<b>reject</b>	The current task request did not pass security policy file validation criteria and was not executed.

This variable appears only in the event log.

**i** For more information, see *Accept/Reject Logging* in the *Endpoint Privilege Management for Unix and Linux Administration Guide* at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>.

## eventlog

### Data Type

String

### Description

The **eventlog** variable contains the absolute path specification for the current event log. The default value comes from the settings file or depends on the operating system, but this policy variable always supercedes those other definitions. Any parent directory in the path is automatically created.

Beginning in version 10.3.0, new event log formats, such as SQLite DB and ODBC, were introduced. However, the filename specified by the **eventlog** variable in the policy is always created in the original proprietary flat file format.

### Syntax

```
eventlog = <absolute filename >
```

### Valid Values

A string that contains the absolute path specification for the event log for the current secured task.



**Example:** In the following example, the path defined by the **eventlog** policy variable overrides the default value in the settings file.

```
eventlog = '/var/log/pmul/hr001/pb.eventlog';
```



For more information, see the sections for the **eventdestinations** and **eventlog** settings keywords in the [Endpoint Privilege Management for Unix and Linux Administration Guide](https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm) at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>.

## exitdate

### Data Type

String, read-only

### Description

The **exitdate** variable contains the completion date from the policy server for the current task request. The date is in YYYY/MM/DD format.

### Valid Values

A string that contains the task completion date, in YYYY/MM/DD format, for the current task request. This is a read-only variable and appears only in the event log.

**i** For more information, see the following:

- ["exitstatus" on page 244](#)
- ["exittime" on page 245](#)
- ["i18n\\_exitdate" on page 248](#)
- ["i18n\\_exittime" on page 249](#)

## exitstatus

### Data Type

String, read-only

### Description

The **exitstatus** variable contains the task completion code, also called the return code, for the current task request.

### Valid Values

"The command exited with a status of x"	Where <b>x</b> is the status code that is returned by the current task request.
"Command caught signal ## (XXXX)"	A signal that terminated the current task request.
"Idle Timeout Reached"	The current task request terminated because it exceeded the maximum idle time. The <b>runtimeout</b> variable sets the maximum idle time.
"Exec failed"	The command that is associated with the current task request was not found.
undefined	Endpoint Privilege Management for Unix and Linux was unable to execute the command that is associated with the current task request. In this case, the <b>exitstatus</b> variable is undefined (that is, it has a string length of 0). This status indicates that the task may still be running, or aborted due to a network or other crash.

This variable appears only in the event log.



For more information, see the following:

- ["exitdate" on page 243](#)
- ["exittime" on page 245](#)
- ["runtimeout" on page 212](#)

## exittime

### Data Type

String, read-only

### Description

The **exittime** variable contains the completion time (that is, the time of day that the task completed), for the current task request, from the policy server in HH:MM:SS format.

### Valid Values

A string that contains the completion time for the current task request, in HH:MM:SS format. This is a read-only variable and appears only in the event log.

**i** For more information, see the following:

- ["exitdate" on page 243](#)
- ["exitstatus" on page 244](#)
- ["i18n\\_exitdate" on page 248](#)
- ["i18n\\_exittime" on page 249](#)
- ["runstart\\_utc" on page 180](#)
- ["runfinish\\_utc" on page 179](#)
- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## forbidkeyaction

### Data Type

String

### Description

Obsolete. The **forbidkeyaction** variable defines the action to take if a forbidden key sequence is entered during the execution of the current request.

### Syntax

```
forbidkeyaction = action;
```

### Valid Values

<b>reject</b>	Immediately terminate the current task request.
<b>ignore</b>	Take no action; continue with task processing.
<b>Alert or any other string</b>	Log the event in the event log with the specified string and continue with task processing.

The default value is empty and no action is taken.



#### Example:

```
forbidkeyaction = "reject";
```



#### Example:

```
forbidkeyaction = "alert";
```



For more information, see the following:

- ["forbidkeypatterns" on page 247](#)
- ["setkeystrokeaction" on page 467](#)

## forbidkeypatterns

### Data Type

List

### Description

Obsolete. The **forbidkeypatterns** variable defines the forbidden keystroke sequences, patterns, or both. An element in the **forbidkeypatterns** list represents each forbidden keystroke pattern or sequence.

Wildcard search characters, along with other special characters, can be used to create a keystroke sequence or pattern.

The Endpoint Privilege Management for Unix and Linux Security Policy Scripting Language supports the standard set of shell-style, wildcard search characters. These are used for searches by the in operator and for forbidden and warning keystroke patterns.

### Syntax

```
forbidkeypatterns = {"pattern1", "pattern2", "pattern3", ...};
```

### Valid Values

A list in which each element represents a forbidden keystroke sequence or pattern. This variable has no default value.



#### Example:

```
forbidkeypatterns = {"*/bin/rm*", "*rm *", "*xterm*"};
```



For more information, see the following:

- ["forbidkeyaction" on page 246](#)
- ["setkeystrokeaction" on page 467](#)
- ["Wildcard Search Characters" on page 107](#)

## i18n\_exitdate

### Data Type

UTF-8 encoded string, read-only

### Description

The **i18n\_exitdate** variable contains the completion date from the policy server for the current task request. It is formatted according to the operating system's locale settings.

### Valid Values

A UTF-8 encoded string that contains the task completion date for the current task request. This read-only variable appears only in the event log.

**i** For more information, see the following:

- ["exitstatus" on page 244](#)
- ["exittime" on page 245](#)
- ["i18n\\_exittime" on page 249](#)



## i18n\_exittime

### Data Type

UTF-8 encoded string, read-only

### Description

The `i18n_exittime` variable contains the completion time (that is, the time of day that the task completed), for the current task request. It is formatted according to the operating system's locale settings.

### Valid Values

A UTF-8 encoded string that contains the completion time for the current task request. This read-only variable appears only in the event log.

**i** For more information, see the following:

- ["exitdate" on page 243](#)
- ["exitstatus" on page 244](#)
- ["i18n\\_exitdate" on page 248](#)
- ["runstart\\_utc" on page 180](#)
- ["runfinish\\_utc" on page 179](#)
- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

# iolog

## Data Type

String

## Description

The **iolog** variable contains the absolute path specification for the current I/O log file. The default value for this variable is undefined, which does no I/O logging. The **iolog** file can log standard input, standard output, and standard error information that is associated with the current task request. Any parent directory in the path is automatically created.

## Syntax

```
iolog = string;
```

## Valid Values

A string that contains the absolute path specification for the current **iolog** file. The default value is undefined.



### Example:

```
iolog = "/var/log/sample.log";
```



For more information, see the following:

- ["logmktemp" on page 373](#)
- ["mktemp" on page 374](#)

## logmaximumfailures

### Data Type

Integer

### Description

Controls the maximum number of log failures for a job. When the maximum number of failures is exceeded, the secured task terminates.

The default is **25**. If **logmaximumfailures** is set to **0**, Endpoint Privilege Management for Unix and Linux will keep trying to log data no matter how many failures occur.

### Syntax

```
logmaximumfailures = non-negative-integer;
```

### Valid Values

0 to max\_int.



#### Example:

```
logmaximumfailures = 20;
```



For more information, see the following:

- ["eventlog" on page 242](#)
- ["iolog" on page 250](#)
- ["logservers" on page 144](#)

# lognopassword

## Data Type

Boolean

## Description

The **lognopassword** variable determines whether non-echoed input, such as passwords, is written to the I/O log file when I/O logging is active.

Starting with version 7.0.0, all input and output is logged until a password prompt is recognized on **stdout**. Password prompts to recognize must be listed in the policy language list variable **passwordloggingprompts** which defaults to {"**Password:**", "**password:**", "**Passwd:**", "**passwd:**"} for v7.0.0 to v7.5.0, and to {"**Password**", "**password**", "**Passwd**", "**passwd**"} for v7.5.1 and later.

After a password prompt is recognized, non-echoed **stdin** is not logged until a newline is received, or until input exceeds 80 characters.

## Syntax

```
lognopasswd = boolean;
```

## Valid Values

<b>true</b>	Do not log passwords (or other non-echoed input).
<b>false</b>	Log all input keystrokes. This setting is the default.

The initial **lognopassword** value comes from the settings file. If **passwordlogging** is set to **never**, **lognopassword** is set to **true** and becomes read-only.



### Example:

```
lognopassword = true;
```



For more information, see "[passwordloggingprompts](#)" on page 260.

# logomit

## Data Type

List

## Description

The **logomit** variable specifies which Endpoint Privilege Management for Unix and Linux user-defined variables to omit from the event log. Use this variable to reduce the disk space that is used by the event log. Metacharacter patterns can be used. By default, this variable is undefined, which means that all Endpoint Privilege Management for Unix and Linux variables are written to the event log. Beginning with Endpoint Privilege Management for Unix and Linux 4.0, **logomit** can accept templates.

## Syntax

```
logomit = list;
```

## Valid Values

A list in which each element names an Endpoint Privilege Management for Unix and Linux user-defined variable to omit from the event log. The default value is undefined.



### Example:

```
logomit = {"a", "b"};
```



For more information, see the following:

- ["env" on page 125](#)
- ["runenv" on page 125](#)

## logstderr

### Data Type

Boolean

### Description

The **logstderr** variable specifies whether error output from the current task request is logged to the I/O log. The default value is **true**.

### Syntax

```
logstderr = boolean;
```

### Valid Values

<b>true</b>	Log task error information from <b>stderr</b> . This value is the default.
<b>false</b>	Do not log task error information from <b>stderr</b> .



#### Example:

```
logstderr = true;
```



For more information, see "[logstderrlimit](#)" on page 255.

# logstderrlimit

## Data Type

Integer

## Description

The **logstderrlimit** variable places a limit on the number of bytes from the standard error stream that Endpoint Privilege Management for Unix and Linux writes, at a time, to the I/O log. When data appears on any of the other channels, this variable is reset to zero. A value of **0** results in no limit to the amount of **stderr** data sent to the I/O log. To turn off the logging of task standard error data, set the **logstderr** variable to **false**.

## Syntax


```
logstderrlimit = number;
```

## Valid Values

<b>integer</b>	An integer specifying the maximum number of bytes.
<b>0</b>	No limit on the number of bytes. This setting is the default.

### Example:

```
logstderrlimit = 4096;
```

 For more information, see "[logstderr](#)" on page 254.

# logstdin

## Data Type

Boolean

## Description

The **logstdin** variable specifies whether input from the current task request is logged to the I/O log. The default value is **true**.

## Syntax

```
logstdin = boolean;
```

## Valid Values

<b>true</b>	Log task input information from <b>stdin</b> . This value is the default.
<b>false</b>	Do not log task input information from <b>stdin</b> .



### Example:

```
logstdin = false;
```



For more information, see "[logstdinlimit](#)" on page 257.



# logstdinlimit

## Data Type

Integer

## Description

The **logstdinlimit** variable places a limit on the number of bytes from the standard input stream that Endpoint Privilege Management for Unix and Linux writes, at a time, to the I/O log. When data appears on any of the other channels, the this variable is reset to zero. A value of **0** has the effect of placing no limit on the amount of **stdin** data sent to the I/O log. To turn off the logging of standard input data to the I/O log, set the **logstdin** variable to **false**.

## Syntax


```
logstdinlimit = number;
```

## Valid Values

positive integer	An integer specifying the maximum number of bytes.
0	No limit on the number of bytes. This value is the default.

### Example:

```
logstdinlimit = 512;
```

 For more information, see "[logstdin](#)" on page 256.

# logstdout

## Data Type

Boolean

## Description

The **logstdout** variable specifies whether output from the current task request is logged to the I/O log. The default value is **true**.

## Syntax

```
logstdout = boolean;
```

## Valid Values

<b>true</b>	Log task output information from <b>stdout</b> . This value is the default.
<b>false</b>	Do not log task output information from <b>stdout</b> .



### Example:

```
logstdout = 1;
```



For more information, see "[logstdoutlimit](#)" on page 259.

# logstdoutlimit

## Data Type

Integer

## Description

The **logstdoutlimit** variable places a limit on the number of bytes from the standard output stream that Endpoint Privilege Management for Unix and Linux writes to the I/O log at a time. When data appears on any of the other channels, this variable is reset to zero. A value of **0** has the effect of placing no limit on the amount of **stdout** data sent to the I/O log. Set the **logstdout** variable to **false** to turn off the logging of standard output data to the I/O log.

## Syntax

```
logstdoutlimit = number;
```

## Valid Values

positive integer	An integer specifying the maximum number of bytes.
0	No limit on the number of bytes. This value is the default.



### Example:

```
logstdoutlimit = 200;
```



For more information, see ["logstdout" on page 258](#).

## passwordloggingprompts

- **Version 6.2 and earlier:** `passwordloggingprompts` variable not available.
- **Version 7.0 and later:** `passwordloggingprompts` variable available.

### Data Type

List

### Description

The `passwordloggingprompts` variable controls the `lognopassword` feature. When passwords should not be logged, all input and output are logged until a password prompt is recognized on `stdout`. Password prompts to recognize must be listed in the `passwordloggingprompts` variable. When a password prompt is recognized, non-echoed `stdin` is not logged until a newline is received, or until input exceeds 80 characters.

### Syntax

```
passwordloggingprompts = list;
```

### Valid Values

A list of character values.

The default list for v7.0.0 to v7.5.0 is `{"Password:", "password:", "Passwd:", "passwd:"}`.

The default list for v7.5.1 and later is `{"Password", "password", "Passwd", "passwd"}`.



*Example: Set the list to a single prompt to recognize:*

```
passwordloggingprompts = {"Enter ANY string:"};
```



*Example: Set the list to three prompts to recognize:*

```
passwordloggingprompts={"Enter ANY string:", "password:", "passwd:"};
```



*Example: Append the prompt "Enter key:" to the list.*

```
passwordloggingprompts={passwordloggingprompts,"Enter key:"};
```



For more information, see ["lognpassword" on page 252](#).

## System Variables

Endpoint Privilege Management for Unix and Linux system variables contain information that pertains to all Endpoint Privilege Management for Unix and Linux task requests. The following table summarizes the system variables.

Variable	Description
<b>date</b>	Contains the current date, taken from policy server host, in <b>YYYY/MM/DD</b> format.
<b>day</b>	Contains the current date, taken from policy server host, in <b>DD</b> format.
<b>dayname</b>	Contains the current day of the week, as a three-character abbreviation for the day of the week, taken from policy server host.
<b>false</b>	A read-only variable with a predefined value of <b>0</b> . May be used in place of a 0 value when evaluating a conditional expression or initializing a variable.
<b>hour</b>	Contains the current hour, taken from policy server host, in <b>HH</b> format.
<b>i18n_date</b>	Contains the UTF-8 encoded current date, taken from policy server host.
<b>i18n_day</b>	Contains the UTF-8 encoded current day, taken from policy server host.
<b>i18n_dayname</b>	Contains the UTF-8 encoded current day of the week, taken from policy server host.
<b>i18n_hour</b>	Contains the UTF-8 encoded current hour, taken from policy server host.
<b>i18n_minute</b>	Contains the UTF-8 encoded minute portion of the current time, taken from policy server host.
<b>i18n_month</b>	Contains the UTF-8 encoded current month, taken from the policy server host.
<b>i18n_time</b>	Contains the UTF-8 encoded current time, taken from the policy server host.
<b>i18n_year</b>	Contains the UTF-8 encoded current year taken from the policy server host.
<b>lineinfile</b>	Contains the file name of the security policy file that triggers the accept or reject condition for the current task request.
<b>linenum</b>	Identifies the specific line number, within a security policy file, that triggers the accept or reject event for the current task request.
<b>lognoreconnect</b>	The <b>lognoreconnect</b> variable controls how Endpoint Privilege Management for Unix and Linux optimizes network traffic between <b>pblogd</b> and <b>pblocald</b> . This optimization involves reconnecting <b>pblocald</b> directly to <b>pblogd</b> , thus bypassing <b>pbmasterd</b> for log related I/O streams.
<b>masterhost</b>	Contains the fully qualified name of the policy server host machine (that is, the machine running <b>pbmasterd</b> ).
<b>minute</b>	Contains the minute portion of the current time, taken from policy server host, in <b>MM</b> format.
<b>month</b>	The <b>month</b> variable contains the current month, taken from the policy server host machine, in <b>MM</b> format.
<b>noreconnect</b>	Controls how Endpoint Privilege Management for Unix and Linux optimizes network traffic between <b>pbrun</b> and <b>pblocald</b> . This optimization involves reconnecting <b>pbrun</b> directly to <b>pblocald</b> , thus bypassing <b>pbmasterd</b> for I/O streams processing.

<b>optimizedrunmode</b>	<p>Indicates whether the policy server has optimized <b>pblocald</b> out of the connection.</p> <p><b>Version 4.0 and earlier:</b> variable not available.</p> <p><b>Version 5.0 and later:</b> variable available.</p>
<b>outputredirect</b>	<p>Determines if Endpoint Privilege Management for Unix and Linux prompt output is written to the standard error stream (<b>stderr</b>) or the standard output stream (<b>stdout</b>).</p>
<b>pbclientcertificateissuer</b>	<p>Contains the certificate issuer line from the client program.</p>
<b>pbclientcertificatesubject</b>	<p>Contains the certificate subject line from the client program.</p>
<b>pbclientkerberosuser</b>	<p>Contains the name of the client user's principal when Kerberos is used.</p>
<b>pbclientmode</b>	<p>Specifies the specific mode for a request.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>pbclientname</b>	<p>Contains the name of the Endpoint Privilege Management for Unix and Linux component from which the current task request originated.</p>
<b>pblogdreconnection</b>	<p>Affects the formation of the reconnection between <b>pblogd</b> and <b>pblocald</b>.</p>
<b>pbrunreconnection</b>	<p>Affects the formation of the reconnection between <b>pbrun</b> and <b>pblocald</b>.</p>
<b>pbversion</b>	<p>Contains the version of Endpoint Privilege Management for Unix and Linux that is being run.</p>
<b>pid</b>	<p>An integer that represents the <b>pbmasterd</b> process ID.</p>
<b>ptyflags</b>	<p>Reserved for internal use.</p>
<b>status</b>	<p>Contains the return code from the last system command that was run by the policy.</p>
<b>submittimeout</b>	<p>Specifies the amount of idle time that the submitting user is allowed before the submit host terminates the current request.</p>
<b>subprocuser</b>	<p>The <b>subprocuser</b> variable contains the user name under which all policy server host (that is, <b>pbmasterd</b>) sub-processes run (for example, commands that are run using the <b>system()</b> function).</p>
<b>time</b>	<p>Contains the current time, taken from the policy server host, in <b>HH:MM:DD</b> format (for example, <b>08:24:52</b>).</p>
<b>true</b>	<p>A read-only variable that has a predefined value of <b>1</b>. May be used in place of a numeric value <b>1</b> when evaluating a conditional expression or initializing a variable.</p>
<b>uniqueid</b>	<p>Contains a 12-character or longer string that is guaranteed to be unique across the entire Endpoint Privilege Management for Unix and Linux system (that is, policy server host, submit host, run host and log host). Use this value to guarantee a unique identification in the event log files and to generate unique filenames.</p>
<b>year</b>	<p>Contains the current year taken from the policy server host, in <b>YYYY</b> format.</p>

## date

### Data Type

String, read-only

### Description

The **date** variable contains the current date, taken from the policy server host, in **YYYY/MM/DD** format.

### Valid Values

A string that contains a date, in **YYYY/MM/DD** format, from the policy server host.

**i** For more information, see the following:

- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)
- ["runstart\\_utc" on page 180](#)
- ["runfinish\\_utc" on page 179](#)
- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)



# day

## Data Type

Integer, read-only

## Description

The **day** variable contains the current date, taken from the policy server host, in **DD** format.

## Valid Values

An integer that contains a value from 1 - 31 (inclusive) from the policy server host. This is a read-only variable and therefore has no default value.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
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- ["runstart\\_utc" on page 180](#)
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- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## dayname

### Data Type

String, read-only

### Description

The **dayname** variable contains the current day of the week, as a three-character abbreviation, taken from the policy server host.

### Valid Values

A character string from the policy server host that contains one of the following values: **Mon**, **Tue**, **Wed**, **Thu**, **Fri**, **Sat**, or **Sun**.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
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- ["runstart\\_utc" on page 180](#)
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- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## false

### Data Type

Boolean, read-only

### Description

The **false** variable is a read-only variable with a predefined value of **0**.

Many program statements rely upon conditional tests to determine what program statement should be executed next. The **if** statement is an example of this. Conditional tests evaluate to either a **true** value or a **false** value.

In the Security Policy Scripting Language, a **true** value is represented by any positive, non-zero integer, but is usually represented by the integer value **1**. A **0** represents **false**.

Because **true** and **false** values are used so frequently within security policy files, the variable **true** may be used in place of a numeric value **1** and the variable **false** may be used in place of a **0** value when evaluating a conditional expression or initializing a variable.

### Valid Values

**0**. Constant, cannot be changed.

**i** For more information, see ["true" on page 300](#).

## hour

### Data Type

Integer, read-only

### Description

The **hour** variable contains the current hour, taken from the policy server host, in **HH** format.

### Valid Values

An integer ranging from **0** to **23** (inclusive) from the policy server host.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)

## i18n\_date

### Data Type

UTF-8 encoded string, read-only

### Description

The `i18n_date` variable contains the current date, taken from the policy server host. It is formatted according to the operating system's locale settings.

### Valid Values

A UTF-8 encoded string that contains a date.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)
- ["runstart\\_utc" on page 180](#)
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- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## i18n\_day

### Data Type

UTF-8 encoded string, read-only

### Description

The `i18n_day` variable contains the current date, taken from the policy server host. It is formatted according to the operating system's locale settings.

### Valid Values

A UTF-8 encoded string that contains a day value.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
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- ["runstart\\_utc" on page 180](#)
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- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## i18n\_dayname

### Data Type

UTF-8 encoded string, read-only

### Description

The **i18n\_dayname** variable contains the current day of the week, taken from the policy server host. It is formatted according to the operating system's locale settings.

### Valid Values

A UTF-8 encoded string that contains a value for the day of the week.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
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- ["runstart\\_utc" on page 180](#)
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- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## i18n\_hour

### Data Type

UTF-8 encoded string, read-only

### Description

The `i18n_hour` variable contains the current hour, taken from the policy server host. It is formatted according to the operating system's locale settings.

### Valid Values

A UTF-8 encoded string that contains an hour value.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)
- ["runstart\\_utc" on page 180](#)
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- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)



## i18n\_minute

### Data Type

UTF-8 encoded string, read-only

### Description

The **i18n\_minute** variable contains the minute portion of the current time, taken from the policy server host. It is formatted according to the operating system's locale settings. The month, day, date, and year variables can be used together to determine the current date, per the policy server host. The **hour** and **minute** variables can be used together to determine the current time, per the policy server host.

### Valid Values

A UTF-8 encoded string that contains a minute value.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)
- ["runstart\\_utc" on page 180](#)
- ["runfinish\\_utc" on page 179](#)
- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## i18n\_month

### Data Type

UTF-8 encoded string, read-only

### Description

The **i18n\_month** variable contains the current month, taken from the policy server host. It is formatted according to the operating system's locale settings. The month, day, date, and year variables can be used together to determine the current date per the policy server host. The **hour** and **minute** variables can be used together to determine the current time per the policy server host.

### Valid Values

A UTF-8 encoded string that contains the month value.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
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- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## i18n\_time

### Data Type

UTF-8 encoded string, read-only

### Description

The `i18n_time` variable contains the current time, taken from the policy server host. It is formatted according to the operating system's locale settings.

### Valid Values

A UTF-8 encoded string that contains the current time.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
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- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## i18n\_year

### Data Type

UTF-8 encoded string, read-only

### Description

The `i18n_year` variable contains the current year, taken from the policy server host. It is formatted according to the operating system's locale settings.

### Valid Values

A UTF-8 encoded string that contains a year value.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
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- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## lineinfile

### Data Type

String, read-only

### Description

The **lineinfile** variable contains the file name of the security policy file that triggers the accept or reject condition for the current task request. Note that only the file name, rather than the entire path specification, is contained in this variable.

### Valid Values

A character string that contains the name of the security policy file in which an accept or reject event was triggered for the current task request.

This variable appears only in the event log.



For more information, see "[linenum](#)" on page 278.

# linenum

## Data Type

Integer, read-only

## Description

The **linenum** variable identifies the specific line number, within a security policy file, that triggers the accept or reject event for the current task request. This number is a line number within the security policy file identified by **lineinfile**.

## Valid Values

An positive integer. This variable appears only in the event log.



For more information, see ["lineinfile" on page 277](#).

# lognoreconnect

## Data Type

Boolean, modifiable

## Description

The **lognoreconnect** variable controls how Endpoint Privilege Management for Unix and Linux optimizes network traffic between **pblogd** and **pblocald**, and **pblocald** and **pbrun**. This optimization involves reconnecting **pblocald** directly to **pblogd** and **pbrun**, thus bypassing **pbmasterd** for log-related I/O streams.

When set to **true**, all **pblocald** to **pblogd** communications are routed through **pbmasterd**, as is **pbrun** to **pblocald** communications.

In Optimized Run Mode, this has no affect.

## Syntax


```
lognoreconnect = boolean;
```

## Valid Values

<b>true</b>	Disable optimization.
<b>false</b>	Enable optimization. This value is the default.

### Example:

```
lognoreconnect = false;
```

 For more information, see ["noreconnect" on page 283](#).

## masterhost

### Data Type

String, read-only

### Description

The **masterhost** variable contains the fully qualified name of the policy server host machine (that is, the machine that is running **pbmasterd**).

### Valid Values

A string that contains the fully qualified name of the policy server host.

**i** For more information, see the following:

- ["host" on page 132](#)
- ["runhost" on page 132](#)
- ["submithost" on page 223](#)
- ["submithostip" on page 224](#)



# minute

## Data Type

Integer, read-only

## Description

The **minute** variable contains the minute portion of the current time, taken from the policy server host, in **MM** format. The month, day, date, and year variables can be used together to determine the current date, per the policy server host. The **hour** and **minute** variables can be used together to determine the current time, per the policy server host.

## Valid Values

An integer that ranges from 0 - 59 inclusive.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)
- ["runstart\\_utc" on page 180](#)
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- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

# month

## Data Type

Integer, read-only

## Description

The **month** variable contains the current month, taken from the policy server host, in **MM** format. The month, day, date, and year variables can be used together to determine the current date per the policy server host. The **hour** and **minute** variables can be used together to determine the current time per the policy server host.

## Valid Values

An integer ranging from 1 - 12, inclusive.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["time" on page 299](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)
- ["runstart\\_utc" on page 180](#)
- ["runfinish\\_utc" on page 179](#)
- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## noreconnect

### Data Type

Boolean, modifiable

### Description

The **noreconnect** variable controls how Endpoint Privilege Management for Unix and Linux optimizes network traffic between **pbrun** and **pblocald**. This optimization involves reconnecting **pbrun** directly to **pblocald**, thus bypassing **pbmasterd** for I/O stream processing.

### Syntax

```
noreconnect = boolean;
```

### Valid Values

<b>true</b>	Disable optimization.
<b>false</b>	Enable optimization. This value is the default.



#### Example:

```
noreconnect = true;
```



For more information, see "[lognoreconnect](#)" on page 279.

## outputredirect

### Data Type

String, modifiable

### Description

The **outputredirect** variable determines whether Endpoint Privilege Management for Unix and Linux prompt output is written to the standard error stream (**stderr**) or to the standard output stream (**stdout**). The main use for this feature is to allow prompts to appear on the user's monitor even if it is running in a pipeline. When run in a pipeline, prompts normally go to that pipeline. By setting **outputredirect**, you can force the output to the monitor.

### Syntax

```
outputredirect = string;
```

### Valid Values

<b>stderr</b>	Write Endpoint Privilege Management for Unix and Linux prompt output to the standard error file.
<b>stdout</b>	Write Endpoint Privilege Management for Unix and Linux prompt output to the standard output file.

The default value is empty.



#### Example:

```
outputredirect = "stderr";
```



For more information, see the following:

- ["iolog" on page 250](#)
- ["logstderr" on page 254](#)
- ["logstderrlimit" on page 255](#)
- ["logstdin" on page 256](#)
- ["logstdout" on page 258](#)
- ["logstdoutlimit" on page 259](#)

## pbclientcertificateissuer

### Data Type

String, read-only

### Description

This variable contains the issuer line from the client program (**pbrun** or **pbguid**). This variable is available only while the policy is running.

### Valid Values

A string that contains the certificate issuer line from the client program.

**i** For more information, see the following:

- ["pblocalcertificateissuer" on page 319](#)
- ["pblogdcertificateissuer" on page 326](#)
- ["pbmasterdcertificateissuer" on page 333](#)
- ["pbclientcertificatesubject" on page 286](#)

## pbclientcertificatesubject

### Data Type

String, read-only

### Description

**pbclientcertificatesubject** contains the subject line from the client program (**pbrun** or **pbguid**). This variable is available only when the policy is running.

### Valid Values

A string that contains the certificate subject line from the client program.

**i** For more information, see the following:

- ["pblocaldcertificatesubject" on page 320](#)
- ["pblogdcertificatesubject" on page 327](#)
- ["pbmasterdcertificatesubject" on page 334](#)

## pbclientkerberosuser

### Data Type

String, read-only

### Description

**pbclientkerberosuser** contains the name of the client (**pbrun** or **pbguid**) user's principal when Kerberos is used.

### Valid Values

A string that contains the name of the client user's principal.

## pbclientmode

- **Version 3.5 and earlier:** `pbclientmode` variable not available.
- **Version 4.0 and later:** `pbclientmode` variable available.

### Data Type

String, read only

### Description

`pbclientmode` specifies the specific mode for a request. It is set as shown in the following table.

How Invoked	pbclientmode Value
<code>pbrun</code>	<code>run</code>
<code>pbssh</code>	<code>pbssh</code>
<code>pbguid</code>	<code>pbguid</code>
<code>pbksh</code> or <code>pbsh</code> startup	<code>shell start</code>
Shell built-in from <code>pbksh</code> or <code>pbsh</code>	<code>shell builtin</code>
Command from shell command line or argument	<code>shell command</code>
Redirection in a shell command ( <code>&lt;</code> , <code>&gt;</code> , or <code>&gt;&gt;</code> )	<code>shell redirect</code>

### Valid Values

A string as described above.



#### Example:

```
if (pbclientmode == "shell start") shellcheckbuiltins = true;
else if (pbclientmode == "shell redirect" && argv[1] == "/dev/null")
reject;
```



For more information, see the following:

- ["shellallowedcommands" on page 214](#)
- ["shellcheckbuiltins" on page 215](#)
- ["shellcheckredirections" on page 216](#)





- ["shellforbiddencommands" on page 217](#)
- ["shellreadonly" on page 219](#)
- ["shellloginincludefiles" on page 218](#)

## pbclientname

### Data Type

String, read-only

### Description

The **pbclientname** variable contains the name of the Endpoint Privilege Management for Unix and Linux component from which the current task request originated.

### Valid Values

<b>pbrun</b>	The current task request originated from <b>pbrun</b> .
<b>pbguid</b>	The current task request originated from the Endpoint Privilege Management for Unix and Linux Web user interface.
<b>pbsh</b>	The current task request originated from the <b>pbsh</b> Endpoint Privilege Management for Unix and Linux shell.
<b>pbksh</b>	The current task request originated from the <b>pbksh</b> Endpoint Privilege Management for Unix and Linux shell.

## pblogdreconnection

### Data Type

Boolean, modifiable

### Description

This variable affects the formation of the reconnection between **pblogd** and **pblocald**. If the value is missing or **false**, then **pblogd** listens for connections that are initiated by **pblocald** under the control of **pmasterd**. If **pblogdreconnection** is set to **true**, then **pblocald** listens for connections that are initiated by **pblogd** under the control of **pmasterd**.

There is no read-only version of this variable.

### Syntax

```
pblogdreconnection = boolean;
```

### Valid Values

<b>true</b>	<b>pblocald</b> listens for connections that are initiated by <b>pblogd</b> under the control of <b>pmasterd</b> .
<b>false</b>	<b>pblogd</b> listens for connections that are initiated by <b>pblocald</b> under the control of <b>pmasterd</b> . This value is the default.



#### Example:

```
pblogdreconnection = true;
```



For more information, see the following:

- ["pbrunreconnection" on page 292](#)
- ["runeffectivegroup" on page 197](#)
- ["runeffectiveuser" on page 198](#)

## pbrunreconnection

### Data Type

Boolean, modifiable

### Description

This variable affects the formation of the reconnection between **pbrun** and **pblocald**. If the value is missing or **false**, then **pbrun** listens for connections that are initiated by **pblocald** under the control of **pbmasterd**. If **pbrunreconnection** is set to **true**, **pblocald** listens for connections that are initiated by **pbrun** under the control of **pbmasterd**.

There is no read-only version of this variable.

### Syntax

```
pbrunreconnection = boolean;
```

### Valid Values

<b>true</b>	<b>pblocald</b> listens for connections that are initiated by <b>pbrun</b> under the control of <b>pbmasterd</b> .
<b>false</b>	<b>pbrun</b> listens for connections that are initiated by <b>pblocald</b> under the control of <b>pbmasterd</b> . This value is the default.



#### Example:

```
pbrunreconnection = true;
```



For more information, see the following:

- ["pblogdreconnection" on page 291](#)
- ["runeffectivegroup" on page 197](#)
- ["runeffectiveuser" on page 198](#)

## pbversion

### Data Type

String, read-only

### Description

The **pbversion** variable contains the version number of Endpoint Privilege Management for Unix and Linux that is being run.

### Valid Values

A string that contains the Endpoint Privilege Management for Unix and Linux version number.

## pid

### Data Type

Integer, read-only

### Description

The **pid** variable contains the Unix or Linux process ID number for **pbmasterd** on the policy server host.

### Valid Values

An integer that represents the **pbmasterd** process ID.

**i** For more information, see "[masterhost](#)" on page 280.

## ptyflags

### Data Type

Internal, read-only

### Description

Reserved for internal use.

## status

### Data Type

Integer, read-only

### Description

The **status** variable contains the return code from the last **system()** command that was run by the policy.

### Valid Values

An integer that contains the return code from a call to the **system()** function. The value before the first **system ()** call is undefined.

**i** For more information, see "[system](#)" on page 442.



## submittimeout

### Data Type

Integer

### Description

This variable specifies the idle time, in seconds, that is allotted to the submitting user before the submit host terminates the current request.



**Note:** The `submittimeout` variable is not honored in local mode.

### Syntax

```
submittimeout = number;
```

### Valid Values

**positive integer**

Enables idle checking; specifies the idle time in seconds.

**0 or negative integer**

Disables idle checking. This value is the default.



**Example:** Here the submitting user is allotted 300 seconds before the request is terminated.

```
submittimeout = 300;
```



For more information, see ["runtimeout" on page 212](#).

## subprocuser

### Data Type

String, modifiable

### Description

The **subprocuser** variable contains the user name under which all policy server host (that is, **pbmasterd**) **subprocesses** run (for example, commands that are run using the **system()** function). By default, all policy server host sub-processes run as root.

### Syntax

```
subprocuser = string;
```

### Valid Values

A string that specifies a user name. The default value is **root**.



#### Example:

```
subprocuser = "user";
```



For more information, see ["system" on page 442](#).

## time

### Data Type

String, read-only

### Description

The **time** variable contains the current time, taken from the policy server host in **HH:MM:DD** format (for example, **08:24:52**).

### Valid Values

A string containing the current time in **HH:MM:SS** format.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["year" on page 302](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)
- ["runstart\\_utc" on page 180](#)
- ["runfinish\\_utc" on page 179](#)
- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## true

### Data Type

Boolean, read-only

### Description

The **true** variable is a read-only variable with a predefined value of **1**.

Many program statements rely upon conditional tests to determine what program statement should be executed next. The **if** statement is an example of this. Conditional tests generally evaluate to either a **true** or **false** value. In the Security Policy Scripting Language, any positive, non-zero integer can represent a **true** value, but **1** is normally used. A **0** represents a **false** value.

Because **true** and **false** values are frequently used when creating security policy files, the variable **true** may be used in place of a numeric value **1** and the variable **false** may be used in place of a **0** value when evaluating a conditional expression or initializing a variable.

### Valid Values

1. Constant, cannot be changed.



For more information, see ["false" on page 267](#).

## uniqueid

### Data Type

String, read-only

### Description

The **uniqueid** variable contains a 12-character or longer string that is guaranteed to be unique across the entire Endpoint Privilege Management for Unix and Linux system (policy server host, submit host, run host and log host). This value is used to guarantee a unique identification in the event log files and can be used to generate unique file names.



**Example:**

```
iolog="usr/adm/pblog" + uniqueid;
```

### Valid Values

A 12-character or longer string value that is unique across the entire Endpoint Privilege Management for Unix and Linux system.



For more information, see the following:

- ["ipaddress" on page 433](#)
- ["masterhost" on page 280](#)

## year

### Data Type

Integer, read-only

### Description

The **year** variable contains the current year, taken from the policy server host, in **YYYY** format.

### Valid Values


An integer that contains a year in **YYYY** format.

**i** For more information, see the following:

- ["date" on page 264](#)
- ["day" on page 265](#)
- ["dayname" on page 266](#)
- ["hour" on page 268](#)
- ["minute" on page 281](#)
- ["month" on page 282](#)
- ["time" on page 299](#)
- ["i18n\\_date" on page 269](#)
- ["i18n\\_day" on page 270](#)
- ["i18n\\_dayname" on page 271](#)
- ["i18n\\_hour" on page 272](#)
- ["i18n\\_minute" on page 273](#)
- ["i18n\\_month" on page 274](#)
- ["i18n\\_time" on page 275](#)
- ["i18n\\_year" on page 276](#)
- ["runstart\\_utc" on page 180](#)
- ["runfinish\\_utc" on page 179](#)
- ["logaccept\\_utc" on page 136](#)
- ["logreject\\_utc" on page 142](#)
- ["logkeystroke\\_utc" on page 140](#)
- ["logfinish\\_utc" on page 139](#)
- ["logserver\\_utcoffset" on page 143](#)
- ["master\\_utcoffset" on page 145](#)

## Host Identification Variables

The host identification variables identify the characteristics of the various Endpoint Privilege Management for Unix and Linux machines. The following table summarizes these variables.

Variable	Description
<b>masterlocale</b>	The locale setting on the policy server host. <b>Version 6.0.1 and earlier:</b> variable not available. <b>Version 6.1 and later:</b> variable available.
<b>runlocale</b>	The locale setting on the run host. <b>Version 6.0.1 and earlier:</b> variable not available. <b>Version 6.1 and later:</b> variable available. <div style="border: 1px solid black; background-color: #e1f5fe; padding: 5px; margin-top: 10px;">  <b>Note:</b> This run variable does not apply to <b>pbssh</b>. If it is present in the policy, it does not have any effect on <b>pbssh</b> and is ignored.                     </div>
<b>submitlocale</b>	The locale setting on the submit host. <b>Version 6.0.1 and earlier:</b> variable not available. <b>Version 6.1 and later:</b> variable available.
<b>pbguidmachine</b>	The machine type ID from <b>uname</b> on the GUI host. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>pbguidnodename</b>	The nodename from <b>uname</b> on the GUI host. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>pbguidrelease</b>	The operating system release from <b>uname</b> on the GUI host. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>pbguidsysname</b>	The system name from <b>uname</b> on the GUI host. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>pbguidversion</b>	The operating system version from <b>uname</b> on the GUI host. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>pbkshmachine</b>	The machine type ID from <b>uname</b> on the <b>pbksh</b> machine.

	<p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>pbkshnodename</b>	<p>The nodename from <b>uname</b> on the <b>pbksh</b> machine.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>pbkshrelease</b>	<p>The operating system release from <b>uname</b> on the <b>pbksh</b> machine.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>pbkshsysname</b>	<p>The system name from <b>uname</b> on the <b>pbksh</b> machine.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>pbkshversion</b>	<p>The operating system version from <b>uname</b> on the <b>pbksh</b> machine.</p> <p><b>Version 3.5 and earlier:</b> variable not available.</p> <p><b>Version 4.0 and later:</b> variable available.</p>
<b>pblocaldcertificateissuer</b>	The issuer string from the <b>pblocald</b> certificate.
<b>pblocaldcertificatesubject</b>	The subject string from the <b>pblocald</b> certificate.
<b>pblocaldmachine</b>	The machine type ID from <b>uname</b> on the run host.
<b>pblocaldnodename</b>	nodename from <b>uname</b> on the run host.
<b>pblocaldrelease</b>	The operating system release from <b>uname</b> on the run host.
<b>pblocaldsysname</b>	The system name from <b>uname</b> on the run host.
<b>pblocaldversion</b>	The operating system version from <b>uname</b> on the run host.
<b>pblogdcertificateissuer</b>	The issuer string from the <b>pblogd</b> certificate.
<b>pblogdcertificatesubject</b>	The subject string from the <b>pblogd</b> certificate.
<b>pblogdmachine</b>	The machine type ID from <b>uname</b> on the log host.
<b>pblogdnodename</b>	The nodename from <b>uname</b> on the log host.
<b>pblogdrelease</b>	The operating system release from <b>uname</b> on the log host.
<b>pblogdsysname</b>	The system name from <b>uname</b> on the log host.
<b>pblogdversion</b>	The operating system version from <b>uname</b> on the log host.
<b>pbmasterdcertificateissuer</b>	The issuer string from the <b>pbmasterd</b> certificate.
<b>pbmasterdcertificatesubject</b>	The subject string from the <b>pbmasterd</b> certificate.
<b>pbmasterdmachine</b>	The machine type ID from <b>uname</b> on the policy server host.



<b>pbmasterdnodename</b>	The nodename from <b>uname</b> on the policy server host.
<b>pbmasterdrelease</b>	The operating system from <b>uname</b> on the policy server host.
<b>pbmasterdsysname</b>	The system name from <b>uname</b> on the policy server host.
<b>pbmasterdversion</b>	The operating system from <b>uname</b> on the policy server host.
<b>pbrunmachine</b>	The machine type ID from <b>uname</b> on the submit host.
<b>pbrunnodename</b>	The nodename from <b>uname</b> on the submit host.
<b>pbrunrelease</b>	The operating system release from <b>uname</b> on the submit host.
<b>pbrunsysname</b>	The system name from <b>uname</b> on the submit host.
<b>pbrunversion</b>	The operating system version from <b>uname</b> on the submit host.
<b>pbshmachine</b>	The machine type ID from <b>uname</b> on the <b>pbsh</b> machine. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>pbshnodename</b>	The nodename from <b>uname</b> on the <b>pbsh</b> machine. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>pbshrelease</b>	The operating system release from <b>uname</b> on the <b>pbsh</b> machine. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>pbshsysname</b>	The system name from <b>uname</b> on the <b>pbsh</b> machine. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.
<b>pbshversion</b>	The operating system version from <b>uname</b> on the <b>pbsh</b> machine. <b>Version 3.5 and earlier:</b> variable not available. <b>Version 4.0 and later:</b> variable available.

## masterlocale

- **Version 6.0.1 and earlier:** `masterlocale` variable not available.
- **Version 6.1 and later:** `masterlocale` variable available.

### Data Type

String, read-only

### Description

The locale setting on the policy server host.

### Valid Values

A string that contains the locale setting (such as `zh_CN.utf8`) on the policy server host.

## runlocale

- **Version 6.0.1 and earlier:** **runlocale** variable not available.
- **Version 6.1 and later:** **runlocale** variable available.

### Data Type

String, read-only

### Description

The locale setting on the run host.



**Note:** This run variable does not apply to **pbssh**. If it is present in the policy, it does not have any effect on **pbssh** and is ignored.

### Valid Values

A string that contains the locale setting (such as **zh\_CN.utf8**) on the run host.

## submitlocale

- **Version 6.0.1 and earlier:** `submitlocale` variable not available.
- **Version 6.1 and later:** `submitlocale` variable available.

### Data Type

String, read-only

### Description

The locale setting on the submit host.

### Valid Values

A string that contains the locale setting (such as `zh_CN.utf8`) on the submit host.

## pbguidmachine

- **Version 3.5 and earlier:** `pbguidmachine` variable not available.
- **Version 4.0 and later:** `pbguidmachine` variable available.

### Data Type

String, read-only

### Description

The machine type ID from `uname` on the GUI host.

### Valid Values

A string that contains the machine GUI host hardware from the `uname` command.

## pbguidnodename

- **Version 3.5 and earlier:** `pbguidnodename` variable not available.
- **Version 4.0 and later:** `pbguidnodename` variable available.

### Data Type

String, read-only

### Description

The nodename from `uname` on the GUI host.

### Valid Values

A string that contains the GUI host name from the `uname` command.

## pbguidrelease

- **Version 3.5 and earlier:** `pbguidrelease` variable not available.
- **Version 4.0 and later:** `pbguidrelease` variable available.

### Data Type

String, read-only

### Description

The operating release from `uname` on the GUI host.

### Valid Values

A string that contains the GUI host operating system version from the `uname` command.

## pbguidsysname

- **Version 3.5 and earlier:** `pbguidsysname` variable not available.
- **Version 4.0 and later:** `pbguidsysname` variable available.

### Data Type

String, read-only

### Description

The system name from `uname` on the GUI host.

### Valid Values

A string that contains the GUI host operating system implementation string from the `uname` command.



## pbguidversion

- **Version 3.5 and earlier:** `pbguidversion` variable not available.
- **Version 4.0 and later:** `pbguidversion` variable available.

### Data Type

String, read-only

### Description

The operating system version from `uname` on the GUI host.

### Valid Values

A string that contains the GUI host operating system version string from the `uname` command.

## pbkshmachine

- **Version 3.5 and earlier:** **pbkshmachine** variable not available.
- **Version 4.0 and later:** **pbkshmachine** variable available.

### Data Type

String, read-only

### Description

The machine type ID from **uname** on the **pbksh** machine.

### Valid Values

A string that contains the machine hardware ID from the **uname** command.

## pbkshnodename

- **Version 3.5 and earlier:** `pbkshnodename` variable not available.
- **Version 4.0 and later:** `pbkshnodename` variable available.

### Data Type

String, read-only

### Description

The nodename from `uname` on the `pbksh` machine.

### Valid Values

A string that contains the nodename from the `uname` command.

## pbkshrelease

- **Version 3.5 and earlier:** `pbkshrelease` variable not available.
- **Version 4.0 and later:** `pbkshrelease` variable available.

### Data Type

String, read-only

### Description

The operating system release from `uname` on the `pbksh` machine.

### Valid Values

A string that contains the operating system version from the `uname` command.

## pbkshsysname

- **Version 3.5 and earlier:** `pbkshsysname` variable not available.
- **Version 4.0 and later:** `pbkshsysname` variable available.

### Data Type

String, read-only

### Description

The system name from `uname` on the `pbksh` machine.

### Valid Values

A string that contains the operating system implementation string from the `uname` command.

## pbkshversion

- **Version 3.5 and earlier:** `pbkshversion` variable not available.
- **Version 4.0 and later:** `pbkshversion` variable available.

### Data Type

String, read-only

### Description

The operating system version from `uname` on the `pbksh` machine.

### Valid Values

A string that contains the operating system version from the `uname` command.

## pblocalcertificateissuer

### Data Type

String, read-only

### Description

The issuer string from **pblocald**'s certificate. This value is stored in the event log, but is not available during policy execution.

### Valid Values

A string that contains **pblocald**'s certificate issuer line.

**i** For more information, see the following:

- ["pbclientcertificateissuer" on page 285](#)
- ["pblogdcertificateissuer" on page 326](#)
- ["pbmasterdcertificateissuer" on page 333](#)

## pblocaldcertificatesubject

### Data Type

String, read-only

### Description

The subject string from the **pblocald** certificate. This value is stored in the event log, but is not available during policy execution.

### Valid Values

A string that contains the **pblocald** certificate subject line.



*For more information, see the following:*

- ["pbclientcertificatesubject" on page 286](#)
- ["pblogdcertificatesubject" on page 327](#)
- ["pbmasterdcertificatesubject" on page 334](#)



## pblocaldmachine

### Data Type

String, read-only

### Description

The machine type ID from **uname** on the run host. This value is stored in the event log, but is not available during policy execution.

### Valid Values

A string that contains the run host machine hardware from the **uname** command.

## pblocaldnodename

### Data Type

String, read-only

### Description

The nodename from **uname** on the run host. This value is stored in the event log, but is not available during policy execution.

### Valid Values

A string that contains the run host node name from the **uname** command.

## pblocaldrelease

### Data Type

String, read-only

### Description

The operating system release from **uname** on the run host. This value is stored in the event log, but is not available during policy execution.

### Valid Values

A string that contains the run host operating system version from the **uname** command.

## pblocaldsysname

### Data Type

String, read-only

### Description

The system name from **uname** on the run host. This value is stored in the event log, but is not available during policy execution.

### Valid Values

A string that contains the run host operating system implementation string from the **uname** command.

## pblocaldversion

### Data Type

String, read-only

### Description

The operating system version from **uname** on the run host. This value is stored in the event log, but is not available during policy execution.

### Valid Values

A string that contains the run host operating system version string from the **uname** command.

## pblogdcertificateissuer

### Data Type

String, read-only

### Description

The issuer string from **pblogd**'s certificate. This value is stored in the event log, but is not available during policy execution.

### Valid Values

A string that contains the **pblogd** certificate issuer line.



*For more information, see the following:*

- ["pbclientcertificateissuer" on page 285](#)
- ["pblocaldcertificateissuer" on page 319](#)
- ["pbmasterdcertificateissuer" on page 333](#)

## pblogdcertificatesubject

### Data Type

String, read-only

### Description

The subject string from **pblogd**'s certificate. This value is stored in the event log, but is not available during policy execution.

### Valid Values

A string that contains the **pblogd** certificate subject line.



*For more information, see the following:*

- ["pbclientcertificatesubject" on page 286](#)
- ["pblocaldcertificatesubject" on page 320](#)
- ["pbmasterdcertificatesubject" on page 334](#)

## pblogdmachine

### Data Type

String, read-only

### Description

The machine type ID from **uname** on the log server. This value is stored in the event log, but is not available during policy execution.

### Valid Values

A string that contains the log host machine hardware from the **uname** command.



## pblogdnodename

### Data Type

String, read-only

### Description

The nodename from **uname** on the log server. This value is stored in the event log, but is not available during policy execution.

### Valid Values

A string that contains the log host node name from the **uname** command.

## pblogdrelease

### Data Type

String, read-only

### Description

The operating system release from **uname** on the log server. This value is stored in the event log, but is not available during policy execution.

### Valid Values

A string that contains the log host operating system version from the **uname** command.

## **pblogdsysname**

### **Data Type**

String, read-only

### **Description**

The system name from **uname** on the log server. This value is stored in the event log, but is not available during policy execution.

### **Valid Values**

A string that contains the log host operating system implementation string from the **uname** command.

## pblogdversion

### Data Type

String, read-only

### Description

The operating system version from **uname** on the log server. This value is stored in the event log, but is not available during policy execution.

### Valid Values

A string that contains the log host operating system version string level string from the **uname** command.

## pbmasterdcertificateissuer

### Data Type

String, read-only

### Description

The issuer string from the **pbmasterd** certificate.

### Valid Values

A string that contains the **pbmasterd** certificate issuer line.

For more information, see the following:

**i** For more information, see the following:

- ["pbclientcertificateissuer" on page 285](#)
- ["pblocaldcertificateissuer" on page 319](#)
- ["pblogdcertificateissuer" on page 326](#)

## pbmasterdcertificatesubject

### Data Type

String, read-only

### Description

The subject string from the **pbmasterd** certificate.

### Valid Values

A string that contains the **pbmasterd** certificate subject line.

**i** For more information, see the following:

- ["pbclientcertificatesubject" on page 286](#)
- ["pblocaldcertificatesubject" on page 320](#)
- ["pblogdcertificatesubject" on page 327](#)

## pbmasterdmachine

### Data Type

String, read-only

### Description

The machine type ID from **uname** on the policy server host.

### Valid Values

A string that contains the policy server host machine hardware from the **uname** command.

## pbmasterdnodename

### Data Type

String, read-only

### Description

The node name from **uname** on the policy server host.

### Valid Values

A string that contains the policy server host node name from the **uname** command.



## pbmasterdrelease

### Data Type

String, read-only

### Description

The operating system release from **uname** on the policy server host.

### Valid Values

A string that contains the policy server host operating system version from the **uname** command.

## pbmasterdsysname

### Data Type

String, read-only

### Description

The system name from **uname** on the policy server host.

### Valid Values

A string that contains the policy server host operating system implementation string from the **uname** command.

## pbmasterdversion

### Data Type

String, read-only

### Description

The operating system from **uname** on the policy server host.

### Valid Values

A string that contains the policy server host operating system version string level string from the **uname** command.

## pbrunmachine

### Data Type

String, read-only

### Description

The machine type ID from **uname** on the submit host.

### Valid Values

A string that contains the submit host machine hardware ID from the **uname** command.

## pbrunnodename

### Data Type

String, read-only

### Description

The node name from **uname** on the submit host.

### Valid Values

A string that contains the submit host node name from the **uname** command.

## pbrunrelease

### Data Type

String, read-only

### Description

The operating system release from **uname** on the submit host.

### Valid Values

A string that contains the submit host operating system version from the **uname** command.

## **pbrunsysname**

### **Data Type**

String, read-only

### **Description**

The system name from **uname** on the submit host.

### **Valid Values**

A string that contains the submit host operating system implementation string from the **uname** command.

## pbrunversion

### Data Type

String, read-only

### Description

The operating system version from **uname** on the submit host.

### Valid Values

A string that contains the submit host operating system version string from the **uname** command.



## pbshmachine

- **Version 3.5 and earlier:** `pbshmachine` variable not available.
- **Version 4.0 and later:** `pbshmachine` variable available.

### Data Type

String, read-only

### Description

The machine type ID from `uname` on the `pbsh` machine.

### Valid Values

A string that contains the `pbsh` host machine hardware ID from the `uname` command.



*For more information, see the following:*

- ["pbshnodename" on page 346](#)
- ["pbshrelease" on page 347](#)
- ["pbshsysname" on page 348](#)
- ["pbshversion" on page 349](#)

## pbshnodename

- **Version 3.5 and earlier:** `pbshnodename` variable not available.
- **Version 4.0 and later:** `pbshnodename` variable available.

### Data Type

String, read-only

### Description

The nodename from `uname` on the `pbsh` machine.

### Valid Values

A string that contains the `pbsh` host node name from the `uname` command.

## pbshrelease

- **Version 3.5 and earlier:** **pbshrelease** variable not available.
- **Version 4.0 and later:** **pbshrelease** variable available.

### Data Type

String, read-only

### Description

The operating system release from **uname** on the **pbsh** machine.

### Valid Values

A string that contains the **pbsh** host operating system version from the **uname** command.

## pbshsysname

- **Version 3.5 and earlier:** **pbshsysname** variable not available.
- **Version 4.0 and later:** **pbshsysname** variable available.

### Data Type

String, read-only

### Description

The system name from **uname** on the **pbsh** machine.

### Valid Values

A string that contains the **pbsh** host operating system implementation string from the **uname** command.

## pbshversion

- **Version 3.5 and earlier:** **pbshversion** variable not available.
- **Version 4.0 and later:** **pbshversion** variable available.

### Data Type

String, read-only

### Description

The operating system version from **uname** on the **pbsh** machine.

### Valid Values

A string that contains the **pbsh** host operating system version string from the **uname** command.

## X11 Session Capture Variables

The X11 variables are used to capture X Windows sessions.

### xwincookie

#### Data Type

String, read-only

#### Description

The **xwincookie** variable contains the X Windows Authentication cookie from the client and is available for logging.

There is no run version of this variable.

#### Valid Values

A string

#### See Also

```
xwindisplay, xwinproto, xwinforward, xwinreconnect
```

### xwinproto

#### Data Type

String, read-only

#### Description

The **xwinproto** variable contains the X Windows Authentication protocol from the client and is available for logging.

There is no run version of this variable.

#### Valid Values

A string

#### See Also

```
xwncookie, xwindisplay, xwinforward, xwinreconnect
```

## xwindisplay

### Data Type

String, read-only

### Description

The **xwindisplay** variable contains the X Windows Authentication DISPLAY string from the client and is available for logging.

There is no run version of this variable.

### Valid Values

A string

### See Also

```
xwncookie, xwinproto, xwinforward, xwinreconnect
```

## xwinforward

### Data Type

Boolean, modifiable

### Description

The **xwinforward** variable controls whether Endpoint Privilege Management for Unix and Linux will forward X Windows applications through to the client X Server.

### Syntax

```
xwinforward = Boolean;
```

### Valid Values

<b>true</b>	Enable X Windows forwarding. This value is the default.
<b>false</b>	Disable X Windows forwarding.

## See Also

`xwncookie`, `xwindisplay`, `xwinproto`, `xwinreconnect`

## xwinreconnect

### Data Type

Boolean, modifiable

### Description

The `xwinreconnect` variable contains how Endpoint Privilege Management for Unix and Linux optimizes X Windows network traffic between `pbrun` and `pblocald`. This optimization involves reconnecting `pblocald` directly to `pbrun` for X Windows forwarding, thus bypassing `pbmasterd` for I/O streams.

### Syntax

```
xwinreconnect = Boolean;
```

### Valid Values

<code>true</code>	Enable reconnection between <code>pbrun</code> and <code>pblocald</code> . This value is the default.
<code>false</code>	Disable reconnection between <code>pbrun</code> and <code>pblocald</code> .

## See Also

`xwncookie`, `xwindisplay`, `xwinproto`, `xwinforward`



## Built-in Functions and Procedures

The Security Policy Scripting Language provides built-in functions and procedures to help simplify security policy implementation. Built-in functions and procedures are stand-alone subroutines that perform specific tasks. The difference between a function and a procedure is that a function returns a value while a procedure does not.

Taking advantage of Endpoint Privilege Management for Unix and Linux built-in functions and procedures can dramatically speed the implementation time of a company's security policy implementation.

Endpoint Privilege Management for Unix and Linux built-in functions are divided into the following groups:

- Date and time functions
- File and path functions
- Format and conversion functions
- Input and output functions and procedures
- LDAP functions
- List functions
- Miscellaneous functions
- NIS functions
- Policy environment functions and procedures
- String functions
- Task control procedures
- Task environment functions and procedures
- User and password functions
- PAM policy functions
- Advanced Control and Audit (ACA) procedure

## Advanced Control and Audit

Advanced Control and Audit (ACA) provides the ability to control and audit file system activity. The ACA language targets specific actions, such as **open/read/write/exec**, defines whether each action can or cannot be performed on a file, and can also specify the auditing level. The files for each rule are specified using shell-style file patterns to match files.

ACA auditing requires iologging to be enabled for the session. If ACA statements are included in the policy and iologging is not enabled, for versions prior to 10.3, the request proceeds with ACA controls, but without auditing. Beginning in 10.3, if all ACA statements have a log level of 0 (zero), the task continues without logging as before. If any ACA statement contains a loglevel greater than zero, the requested task is rejected with the error: *"1008.02 ACA audit logging requires an iolog to be specified."* ACA only affects the targeted process and child processes and poses no threat to the operating system as a whole. It can also be configured to not apply to specific child processes to ensure that services can be restarted without ACA being applied.

Each specified action is intercepted and processed to determine if the action is allowed and if auditing is required. Where an audit level is specified, the relevant data is sent back to the originating client to be written to an iolog. When ACA is enabled, the iolog contains both iologging and auditing information. The **pbreplay -A (--audit)** command line option is used to display the audit records from an iolog.

When the allowed action is an execute action, the ACA policy is passed-on to the new child task to enable ACA policy to continue to be enforced. This enables complete logging and control over a shell session. For example, Endpoint Privilege Management for Unix and Linux can be configured to control a bash shell and allow execution of **vi** while allowing the user to shell escape to another bash shell or to any other allowed program while still enforcing the ACA policy defined for **vi** and all subsequent executions.

ACA should not be used to audit daemons as this results in very large sets of audit data and network traffic and adds little to no security to the non-interactive daemon. ACA rules can be specified to disable ACA for daemon launching mechanisms. In the case that a daemon needs to be executed within an ACA controlled shell session and that session is subsequently terminated, the controlling **pbrun** or **pblocald** forks a new process (owned by init) to continue processing ACA auditing.

ACA should also not be used on programs that manipulate logical volumes.

When processing symbolic links, each link in a link chain is evaluated against the ACA policy. If the requested permission is blocked in any part of the chain, the requested permission is denied.

ACA errors such as the inability to read the ACA policy, inability to audit, or out of memory are logged to **syslog** and **stderr**. ACA also uses **pbrestcall** to send any error messages to a policy or log server using the REST interface. This requires that the **adminpath** keyword is set in the client's **pb.settings**. On the log server running **pbconfigd**, the keyword **eventdestinations** must be used to send ACA **errlog** data to syslog or to a database.



**Example:** *pb.settings* on the client

```
adminpath /usr/sbin
```



**Example:** *pb.settings* on the log server

```
eventdestinations errlog=syslog chgmt=db
```



**Example:** *To disable central logging, in the policy, set the variable **pbulacacentrallogging** to 0.*

```
pbulacacentrallogging=0;
```

## Important Considerations

The ACA is currently enabled for file-specific operations like **stat**, **access**, **open**, **read**, **write**, **truncate**, **link**, **unlink**, **rename**, **chmod**, and **chown**. Socket and memory operations are not supported. Furthermore, the ACA does not restrict access to critical operating system files, directories, and devices that are required for normal user activity.

For instance, **read** access to the following locations is protected: **/proc**, **/dev/null**, **/dev/zero**, **/dev/tty**, **/dev/urandom**, terminal, and time zone data.

By default, ACA denies all actions. All allowed actions must be specified explicitly.



**Example:** If you only have the following ACA rule in the policy:

```
aca("file", "/etc/resolv.conf", "read");
```

Since there is no rule for any other actions, only read actions on **/etc/resolv.conf** are allowed, all other actions on all other files are disallowed. With the above rule in the policy,

```
pbrun cat /etc/resolv.conf
```

works, however, the following actions fail even as root:

```
pbrun ls /var
pbrun cat /home/myfile
```



**Note:** Many simple commands may operate correctly because they perform operations the ACA does not intercept. Commands such as **id**, **date**, **pwd**, and **echo** may not call any file-related functions such as **open()**, thus those commands work even though it appears ACA should deny all access. Caching daemons may also affect whether the file-related function calls are used. For example, **nsd** may cache user data from **/etc/passwd**, so **id** may function without read access to **/etc/passwd**.

ACA allows for the provisioning of a rule to cover other actions **not** specifically matched by the file specifications in subsequent ACA calls. It must be the first ACA rule in the policy. To define this rule you use **unmatched** as the **filespec**, this matches all files not matched by other ACA commands.



**Example:**

```
aca("file", "unmatched", "all", "DEFAULT Rule");
```

```
aca("file", "/etc/*", "!all", "Protect /etc");
```

The first rule provides a default for the **filesystem**, allowing all access to all file actions and for all non-matched files, as long as the **runuser** has the correct file permissions required. The second rule disallows all access, including **read**, **write**, **rename**, **chmod**, **truncate**, and **open** on files in **/etc**.

## Other Considerations

- ACA does not apply to **pbksh** and **pbsh**.
- ACA has no control over **stdin**, **stdout**, or **stderr**, because they are opened before ACA begins processing.
- Creating links requires ACA read permissions for the existing file, and ACA link permissions for the new link.
- ACA recognizes Endpoint Privilege Management for Unix and Linux binaries to ensure that a permissions loop does not occur, which is when a process running ACA tries to launch a process with ACA.
- The system fails to work properly if you add the ACA shared libraries to the system **/ect/ld.so.preload** or equivalent file. The ACA shared libraries require policy data read from a file descriptor provided by the parent **pbrun** or **pblocald**. The system cannot provide that file descriptor (or the EPM-UL ACA policy), so every binary executed fails.
- As of Endpoint Privilege Management for Unix and Linux 21.1.0, ACA no longer supports HP-UX PA-RISC binaries.
- ACA is disabled, by the operating system, on Linux for “Capabilities” enabled binaries (see man setcap).

When ACA is specified and an older client on versions 8.5 or below performs an Optimized Run Mode (ORM) request, the policy server rejects requests.

ACA rules are processed within a secured task after pbrun has executed that secured task. For example, If an ACA rule denies execution of vi, but normal policy allows vi, and the secured task is vi (e.g. pbrun vi), pbrun will execute vi, then that vi process and its children cannot exec a new vi process (vi can shell out to a prompt but that shell cannot run vi). Certain ACA operations do take place before executing the initial secured task, such as determining the binary type, whether it is affected by Linux “capabilities” or is setuid on AIX or HP-UX.

## aca

### Description

Trap file system related library calls, such as **open/read/write/exec**, allow, disallow, and audit the calls and specify actions that can or cannot be performed on a file using shell style file patterns to match files. It also specifies an auditing level.





**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).


### Syntax

```
aca( control_type, filespec, action permissions and auditing [, tag]);
```

### Arguments

<b>controle_type</b>	Currently always set to <b>file</b> filespec. Shell style file specification which matches one or more files.
<b>filespec</b>	<p>The shell style specification includes wildcards * and ?, character classes where [ and ] delineate a class, and ! being the first character in the class negates the other characters in the class, ranges in a class where - between two characters define the range. A - at the beginning or end of a class matches the -, and a ] at the beginning of a class matches a [. (See 'man 7 glob' on Linux.) Wildcards, ranges, and classes may appear within any path or file name portion of the filespec, however it must start with a /. For example, */whoami will not work.</p> <p>Filespecs that begin with a slash / will match all slashes only with a slash (for example, will not match with wildcard expression such as *, ?, or [...]). Fully specifying all the slashes in a path protects against, for example, /usr*/bin/date from matching /usr/local/directory1/evil/date.</p> <p>Filespecs that begin with * will allow wildcards to match any slash in the path. This allows for example, */reboot to match /usr/bin/reboot, /usr/sbin/reboot, /bin/reboot, /sbin/reboot, and /usr/local/bin/reboot.</p> <p>The special filespec <b>unmatched</b> is used to match all files <b>not matched by other filespecs</b> that have been defined.</p> <p>Prior to version 10.3.0, <b>default</b> was used with filespec in the policy. In version 10.3.0 and later, unmatched is used in place of default. For backward compatibility, <b>default</b> will continue to work.</p> <div style="border: 1px solid #2c3e50; background-color: #e6f2ff; padding: 5px; margin-top: 10px;">  <p><b>Note:</b> /tmp/banned/* matches files and sub-directories within /tmp/banned, However, access to the directory itself still works. /tmp/banned/ disables the whole directory and all contents.</p> </div> <p>Other than "unmatched", the ACA filespec definitions are processed in the order they were defined, and the first match is used; subsequent matches are ignored.</p> <div style="border: 1px solid #2c3e50; background-color: #e6f2ff; padding: 5px; margin-top: 10px;">  <p>For more information, see "<a href="#">Important Considerations</a>" on page 355.</p> </div>

<b>action permissions and auditing</b>	<ul style="list-style-type: none"> <li>One or more of the following action names, separated by the pipe   symbol.</li> <li>Spaces are not allowed in permissions.</li> <li>The appearance of an action name enables that action.</li> <li>Preceding the action name with a ! is used to disallow the action.</li> <li>Each action name may be followed by an optional loglevel, specified as <b>:log=[0-9]</b> before the pipe.</li> <li>The final <b> log=level</b> applies to action names that do not have individual loglevels. This allows different loglevels for each action name for a given filespec.</li> </ul>
<b>Tag</b>	An optional text string used to arbitrarily group, organize, or identify output in the ACA reports.

Action	Description
all	Allow all permissions. The <b>all</b> permission must precede any other permissions.
read	<p>For a normal file, this allows <b>read()</b>. For a directory with read and execute bits set for the runuser, this allows <b>chdir()</b> and <b>opendir()</b>. Note that this affects the ability to open a file or directory with read permissions, however <b>read()</b>s are not intercepted nor audited.</p> <div style="border: 1px solid black; background-color: #e6f2ff; padding: 10px; margin-top: 10px;"> <p> <b>Note:</b> Prior to version 9.4, <b>stat()</b> calls were trapped and audited as part of the "read" permissions.</p> <p>Starting in 9.4, <b>stat()</b> calls are no longer trapped nor audited.</p> </div>
write	For a normal file, this allows <b>open()</b> with create or update, and <b>write()</b> . For a directory, this allows <b>mkdir()</b> . Note that this affects the ability to open a file with write permissions, however <b>write()</b> s are not intercepted nor audited.
unlink	For a normal file, this allows <b>unlink()</b> . For a directory, this allows <b>rmdir()</b> .
mknod	This allows <b>mknod()</b>
exec	Allows execution of non-setuid programs that use shared libraries.
execsetuid	Allows execution of setuid binaries on platforms that support <b>LD_PRELOAD</b> with setuid binaries. Not supported on AIX and HP-UX.
execstatic	Allows execution of statically linked binaries (disables ACA for that process and any children)
disable	Disables ACA, upon an <b>exec</b> , for the specified file pattern; and any children of that process. The disable permission should not be used with the unmatched filespec.
chmod	Allows changing of rwx permissions and the sticky bit.
chmodpriv	Allows changing of <b>setuid</b> and <b>setgid</b> permissions
chown	Allows changing of <b>setuid</b> and <b>setgid</b> permissions
link	Allows creation of hard and soft links using <b>link()</b>
owner	Allows above operation only if runuser is the file owner

<b>log=level</b>	Audits access at the specified level (0-9)
------------------	--

- Loglevel zero , or no log=level specified, specifies that no auditing (logging) of the call is performed.
- Loglevel 1 performs the minimal auditing, recording only the call, permission, and path.
- LogLevel 2 indicates that **exec** calls will additionally log the **argv**, and open calls for read, write, or both will additionally log the **device/inode/mode/uid/gid** of the file.
- LogLevel 3 indicates that **exec** calls will additionally log the environment supplied.

ACA can derive a shell's command history by logging additional information. This is enabled with the procedure **enablesessionhistory()**.

Interactions of **exec**, **execstatic**, **execsetuid**:

- **exec** means execution of a dynamically linked **non-setuid** not **setgid** binary is allowed.
- **execstatic** means execution of a statically linked **non-setuid** not **setgid** binary is allowed.
- **execsetuid** means execution of a dynamically linked **setuid/setgid** binary is allowed but not a **nonsetuid/setgid** binary.
- **execstatic|execsetuid** means any **setuid** binary or any static binary including a setuid static binary, a setuid dynamic binary, or a static binary.

In other words, this allows execution of any non-dynamic binary.

- **exec|execstatic|execsetuid** allows any execution.

AIX and HP-UX do not support **LD\_PRELOAD** or equivalent for setuid/setgid programs. Similarly, Linux does not support **LD\_PRELOAD** for programs with capabilities assigned. Beginning in EPM-UL 21.1.0, when an ACA controlled process (e.g. a shell) attempts to exec a setuid/setgid or capabilities-enabled binary (on the affected operating system), a warning is issued to the user, and (if configured) sent to the log server's **eventdestination** for **errlog**. ACA is disabled, and the setuid/setgid/capability program is executed. PMUL ACA Policy should be written to disable ACA, or deny execution for each specific setuid/setgid/capability binary, thus avoiding the warning message, and assuring proper security for setuid/setgid/capability binaries.



**Example:** Example to deny execution:

```
aca("file", "/bin/su", "all|!execsetuid|!exec|log=2");
```



**Example:** Example to allow execution with ACA disabled:

```
aca("file", "/bin/su", "execsetuid|disable|log=2");
```

## Return Values

None

## Examples

```
aca("file", "unmatched", "all|log=1");
```

Allows all access to all files not matched by other AC rules, auditing every action at level 1.

<code>aca("file", "/bin/*", "!all");</code>	Disables access of files and subdirectories within /bin, however access to /bin for ls, etc, is still allowed
<code>aca("file", "/bin/", "!all");</code>	Disables all access of /bin and its files and subdirectories. ls, etc, are also not allowed. Auditing is not enabled.
<code>aca("file", "/bin/*", "!all exec:log=2");</code>	Allows exec for all files in /bin. Disallows all other actions for those files. Audits the execs at level 2
<code>aca("file", "/bin/umount", "!all log=9");</code>	Ignored due to above /bin/* pattern
<code>aca("file", 'unmatched', 'all: log=1 exec:log=2 execstatic:log=2 execsetuid:log=2', 'DEFAULT');</code>	
<code>aca("file", '/sbin/*', 'all: log=1 !write:log=2 exec:log=2 execstatic:log=2 execsetuid:log=2', 'Protect sbin files');</code>	
<code>aca("file", "/sbin/lvm", "all disable log=2");</code>	Disable ACA for Linux lvm (note there are more to disable)
<code>aca("file", "/sbin/service", "all disable log=2");</code>	Disable ACA for Linux daemon mechanism
<code>aca("file", "/etc/init.d/*", "all disable log=2"); ;</code>	Disable ACA for Linux daemon mechanism
<code>aca("file", "...", "...log=2");</code>	When an audit log is requested but not set in the rule, a message is displayed that an iolog must be set in the rule.



## enablesessionhistory

### Description

The **enablesessionhistory()** procedure is used to set the internal read-only variable **pbulacasesessionhistory**. This is used for iologged, ACA controlled shell sessions (for example, bash). The **enablesessionhistory()** procedure takes a Boolean argument. Values of **1** or **true** will enable session history. Values of **0** or **false** will disable session history.

When enabled, the ACA preload library will audit additional information for the secured task (presumably a shell), giving **pbreplay** the ability to interpret the shell "history", within certain limitations.

Note that **iolog** must be set, and ACA must be enabled with at least one `aca(. . .)` statement.

ACA normally exits when it encounters certain errors. When ACA is used only for session history, and no files or operations are blocked, an optional parameter can be used to cause ACA to continue when those errors are encountered. This results in the task being allowed to continue, however the session history recorded will be incomplete.

The relevant portion of the policy should be similar to:

```
aca("file", "default", "all");
enablesessionhistory( true, true);
iolog=<file>;
```



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Known limitations

This mechanism cannot capture or reproduce:

- Shell internals, such as if/then/else, while, math, variable setting or testing
- Which builtin was used
- 2>&1 redirection and ordering
- Complex redirection
- Exact quoting of **argv**
- (complex) | (pipelines)
- Exact shell history numbering

This feature adds the new **--history** option to **pbreplay**, to replay the shell's "history" from the `aca iolog`. The **--history** option cannot be used in conjunction with the **-A** option).

### Syntax

```
enablesessionhistory( enable_history [, continue_on_error] );
```

## Arguments

<code>enable_history</code>	Required Boolean <b>true</b> or <b>1</b> to enable or <b>false</b> or <b>0</b> to disable.
<code>continue_on_error</code>	Optional <b>true</b> or <b>1</b> to enable or <b>false</b> or <b>0</b> to disable. Defaults to <b>false</b> .

## Example

```
enablesessionhistory( true );  
enablesessionhistory( true, true );
```

## See also

```
aca ( )
```

**i** For more information about **pbreplay**, see the [Endpoint Privilege Management for Unix and Linux Administration Guide](https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm) at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>.

## Date and Time Functions

These functions perform operations and comparisons on dates and times. The following table summarizes the date and time functions.

Function	Description
<code>datecmp()</code>	Compares two dates and returns the results of the comparison
<code>strftime()</code>	Formats the current date and time, as defined on the Policy Server host, per the supplied format string
<code>timebetween()</code>	Determines if the current time, as defined on Policy Server host, is between <b>time1</b> and <b>time2</b> , inclusive

# datecmp

## Description

The `datecmp()` function compares two dates and returns the results of the comparison.

The two input parameters, `date1` and `date2`, contain the date strings to compare. These fields should have the format `YYYY/MM/DD`, where:

<b>YYYY</b>	A year numeric character string such as <b>2001</b> . If the specified year is only two digits, then that value is automatically concatenated with <b>19</b> to form a year between 1900 and 1999, inclusive. For example, if the value <b>01</b> is supplied for year, the actual year value is processed as 1901.
<b>MM</b>	Month between <b>1</b> and <b>12</b> inclusive
<b>DD</b>	Day between <b>1</b> and <b>31</b> inclusive.

Use the forward slash character (`/`) as a field separator. Zeros or spaces can be used as leading pad characters for the year, month, or day.

## Syntax

```
result = datecmp (date1, date2);
```

## Arguments

<b>date1</b>	Required. Character string containing a date formatted as <code>YYYY/MM/DD</code>
<b>date2</b>	Required. Character string containing a date formatted as <code>YYYY/MM/DD</code>

## Return Values

<b>Negative Integer</b>	A negative integer is returned if <code>date1</code> is less than <code>date2</code> ( <code>date1 &lt; date2</code> ).
<b>0</b>	Zero is returned if <code>date1</code> is equal to <code>date2</code> ( <code>date1 == date2</code> ).
<b>Positive Integer</b>	A positive integer is returned if <code>date1</code> is greater than <code>date2</code> ( <code>date1 &gt; date2</code> ).

## Example

In the example,

```
date1 = "2001/01/21";
result = datecmp (date1, "2002/01/21");
```

**datecmp** compares the value in **date1** against the date January 21, 2002. The result is returned in **result**. Because **date1** contains the date **2001/01/21**, the result of **datecmp** is a negative integer because **date1** is less than **date2**.

# strftime

## Description

The **strftime()** function formats the current date and time, as defined on Policy Server host, per the supplied format string.

**i** For more information on how to create a format string, see ["Time Format Commands" on page 102](#).

Note that different operating systems may provide different options for their own native **strftime()** function. Consult your operating system's **strftime()** manual page for more information.

## Syntax

```
result = strftime (formatstring);
```

## Arguments

**formatstring**

Required. Character string that contains the format command characters that specify how the current date should be formatted

## Return Values

**strftime()** returns a formatted character string containing the current date and time from the Policy Server host.

## See Also

```
date, day, dayname, hour, minute, month, time, year
```

## timebetween

### Description

The `timebetween()` function determines whether the current time, as defined on the Policy Server host, is between `time1` and `time2`, inclusive.

The `time1` and `time2` parameters contain integer time values. These time values should be specified in military time (**HHMM**) format, where:

<b>HH</b>	A number from <b>0</b> to <b>23</b> , inclusive, that represents the hour
<b>MM</b>	A number between <b>0</b> to <b>59</b> , inclusive, that represents the minutes

If `time2 < time1`, the comparison crosses the midnight boundary.

### Syntax

```
result = timebetween (time1, time2);
```

### Arguments

<b>time1</b>	Required. An integer containing a time value formatted as <b>HHMM</b>
<b>time2</b>	Required. An integer containing a time value formatted as <b>HHMM</b>

### Return Values

<b>true</b>	The current time is between <code>time1</code> and <code>time2</code> or the current time is equal to either <code>time1</code> or <code>time2</code> .
<b>false</b>	The current time is either less <code>time1</code> or greater than <code>time2</code> .

### Example

In the example,

```
result = timebetween (1100, 1500);
```

the following times set result as follows:

- **08:00** result set to **false**
- **11:00** result set to **true**
- **12:30** result set to **true**

- **15:00 result** set to **true**
- **15:01 result** set to **false**



## File and Path Functions

File and path functions are used to verify, return, and generate information about directories, file paths, names, and file names. The following table summarizes the file and path functions.

Function	Description
<code>access()</code>	Verifies the existence of a path and/or file
<code>basename()</code>	Returns the file name portion of a path
<code>dirname()</code>	Returns the directory portion of a path
<code>logmktemp()</code>	Generates a unique file name on the log host
<code>mktemp()</code>	Generates a unique file name on the Policy Server host
<code>stat()</code>	Returns information about a directory or file

## access

### Description

The **access()** function verifies the existence of a path and/or file on the Policy Server host. path should contain a fully qualified name, starting with a forward slash character (/).



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = access (path);
```

### Arguments

**path** Required. String that contains the name of the path and/or file to verify.

### Return Values

<b>true</b>	The directory or file exists on the Policy Server host.
<b>false</b>	The directory or file does not exist on the Policy Server host.

### Example

In the example,

```
result = access ("/tmp/user.txt");
```

result contains true if **/tmp/user.txt** exists on Policy Server host. result contains false if **/tmp/user.txt** does not exist on the Policy Server host and is not accessible to the superuser.

### See Also

```
logmktemp(), mktemp(), stat()
```

## basename

### Description

The **basename()** function returns the file name portion from the provided path. **basename** actually works by searching the provided string for the rightmost token. A forward slash character (/) delimits tokens. **basename** ignores any number of trailing slash characters.

For example, given the string **/one/two/three**, **basename** returns the rightmost token, which in this case is **three**.

Given the string **/one/two/**, **basename** would ignore the trailing slash and return **two**.

### Syntax

```
result = basename (path);
```

### Arguments

**path** Required. Character string containing a file path and file name.

### Return Values

**result** contains the rightmost token (that is, the file name) of the supplied character string (that is, the path name). An empty character string ("") is returned if no token is found.



#### Example:

```
result = basename ("/var/adm/pblog.txt");
```

In this example, **result** contains the file name **pblog.txt**.



For more information, see ["dirname" on page 372](#).

## dirname

### Description

The **dirname()** function returns the path component of path. **dirname()** searches the provided string for the rightmost token and returns everything but the rightmost token. Tokens are delimited with the forward slash character (/). **dirname** ignores all trailing slashes.

For example, given the string **/one/two/three**, **dirname** returns everything but the rightmost token. In this example, result contains **/one/two/**.

Given the string **/one/two/three/**, **dirname** ignores the trailing slash and result contains **/one/two**.

### Syntax

```
result = dirname (path);
```

### Arguments

**path**

Required. Character string that contains a path and file name

### Return Values

**result** contains the contents of path, minus the rightmost token (that is, the file name). If a token is not found, a . is returned.

### Example

In the example,

```
result = dirname ("/var/adm/pblog.txt");
```

**result** contains the directory **/var/adm/**.

### See Also

```
basename ()
```

# logmktemp

## Description

The `logmktemp()` function returns a file name that is guaranteed to be unique on the log host.

This function requires a full path template. Do not save lologs to temp directories.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
result = logmktemp (template);
```

## Arguments

**template**

Required. Character string that contains a file name template. Within template, characters forming a unique identifier replace six trailing **X** characters. Many, but not all, user systems require precisely six **X** characters, which must be the trailing characters. Five **X** character `ss`, or **X** character `ss` in the middle of a template, might work on some systems, but this behavior is not guaranteed.

## Return Values

**result** contains the generated file name. If a unique file name cannot be generated from template, then **result** contains a blank character string (`""`).

## Example

In this example,

```
result = logmktemp ("/var/adm/iolog.XXXXXX");
```

**result** contains the file name `/var/adm/iolog.XXXXXX`, where `XXXXXX` is replaced by a unique identifier that is generated by the operating system.

## See Also

```
mktemp(), stat()
```

# mktemp

## Description

The `mktemp()` function returns a file name that is guaranteed to be unique on the Policy Server host.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
result = mktemp (template);
```

## Arguments

**template**

Required. Character string that contains a file name template. Within template, characters forming a unique identifier replace six trailing **X** characters. Many, but not all, user systems require precisely six X characters, which must be the trailing characters. Five X character ss, or X character ss in the middle of a template, might work on some systems, but this behavior is not guaranteed

## Return Values

**result** contains the generated file name. If a unique file name cannot be generated from **template**, **result** contains a blank character string ("").

## Example

In the example,

```
result = mktemp ("/var/adm/iologXXXXXX");
```

**result** contains the file name `/var/adm/iolog.XXXXXX`, where **XXXXXX** is replaced by a unique identifier that is generated by the operating system.



**Note:** In order to have an I/O log created in this manner, the **iolog** variable must be set to the result of `logmktemp()`. For example:

```
iolog = logmktemp("/var/adm/iolog.XXXXXX");
```

## See Also

```
logmktemp(), stat()
```

## stat

### Description

The **stat()** function returns general information, from the operating system, about the requested file or directory on the policy server host. **result** contains an empty list (that is, with length equal to **0**) if the specified file or directory is not found. The **length()** function can be used to determine whether **result** is empty.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = stat (path);
```

### Arguments

**path** Required. Character string containing a path and/or file name.

### Return Values

**result** is a list that contains file and/or directory information. Each element in the list contains a different piece of information, as shown below. Each list element is a character string. An empty list is returned (that is, with list length equal to **0**) if the specified file or directory does not exist. If **result** is empty, then the specified path or file was not found.

**result** elements:

- **result [0]** = file size
- **result [1]** = file owner
- **result [2]** = file group
- **result [3]** = file permissions
- **result [4]** = file access time
- **result [5]** = file creation time
- **result [6]** = file modification time
- **result [7]** = file access date
- **result [8]** = file creation date
- **result [9]** = file modification date
- **result [10]** = file access time in seconds
- **result [11]** = file creation time in seconds
- **result [12]** = file modification time in seconds
- **result [13]** = inode number
- **result [14]** = device number



**Example:**

```
result = stat ("/etc");
```

In the example, **result** might contain the following elements:

```
result [0] = 7144
result [1] = bin
result [2] = bin
result [3] = 755
result [4] = 101
result [5] = 101
result [6] = 101
result [7] = 1970/01/01
result [8] = 1970/01/01
result [9] = 1970/01/01
result [10] = 1
result [11] = 1
result [12] = 1
result [13] = 20
result [14] = 2
```



For more information, see the following:

- ["access" on page 370](#)
- ["length" on page 416](#)

## Format and Conversion Functions

The following table summarizes the format and conversion functions.

Function	Description
<code>atoi()</code>	Converts a character string to an integer value
<code>sprintf()</code>	Formats the supplied arguments and returns them as a single character string

# atoi

## Description

The **atoi()** function converts a character string to an integer value.

## Syntax

```
result = atoi (string);
```

## Arguments

**string**

Required. Character string that contains the numeric character string to convert to an integer value.

## Return Values

**result** contains the converted integer value.

## Example

In this example,

```
result = atoi ("123");
```

**result** contains the integer value **123**.

# sprintf

## Description

The **sprintf()** function creates a character string by formatting the supplied arguments according to the formatting commands in a format control string. The resulting character string is returned in **result**.

The format control string controls the formation of the character string that is returned in **result**. It consists of two types of information: actual content and format command characters. The format command characters are used to insert and format the supplied arguments. The number of format command characters in the format control string must match the number of supplied arguments. In other words, if there are three formatting commands in the format control string, then three function arguments must be supplied. Otherwise, an error is generated.

**i** For more information on format command characters, see "[Format Commands](#)" on page 101.

## Syntax

```
result = sprintf (controlstring [,expression1, ...]);
```

## Arguments

<b>controlstring</b>	Required. Character string that contains the format control string that is used to generate the formatted string.
<b>expression1 -</b>	Optional. Character string and integer values to substitute into the format control string.

## Return Values

**result** contains the formatted character string.

## Example

In this example,

```
result = sprintf ("System administrator Ids: %s %s %s", "Adm1", "Adm2", "Adm3");
```

the character string **System administrator Ids: Adm1 Adm2 Adm3** is assigned to **result**.

## See Also

```
fprintf, print(), printf, syslog
```

## Input/Output Functions and Procedures

The following table summarizes Endpoint Privilege Management for Unix and Linux's input/output functions and procedures.

Function/ Procedure	Description
<b>fprintf()</b>	Formats and appends a character string to a file
<b>input()</b>	Prompts the user for a single line of input
<b>inputnoecho()</b>	Similar to the <b>input()</b> function, <b>inputnoecho()</b> prompts the user for a single line of input, but does not display the input on the screen as it is entered
<b>print()</b>	Displays a single line of information on the user's screen. The line terminates with the newline character.
<b>printf()</b>	Displays a formatted character string on the user's screen
<b>printnln()</b>	Similar to the <b>print</b> procedures, <b>printnln</b> displays a single line of information on the user's screen, but the line is not terminated with the newline character
<b>printvars()</b>	Prints all Endpoint Privilege Management for Unix and Linux variables to the user's terminal
<b>readfile()</b>	Returns the entire contents of a file in a character string
<b>syslog()</b>	Writes a formatted message to the syslog facility

# fprintf

## Description

The **fprintf** procedure is similar to the **print** procedure, except that the created formatted character string is appended to a file, rather than being displayed at the user's terminal.

See the discussion on **printf** for a more detailed discussion on how to create use format command characters within the format control string.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
fprintf (filename, controlstring [,expression1, ...]);
```

## Arguments

<b>filename</b>	Required. Character string that contains the name of a file. A fully qualified path name, starting with a forward slash character (/).
<b>controlstring</b>	Required. The character string, including format command characters, that is written to <b>filename</b> .
<b>expression1...</b>	Optional. Values to substitute into <b>controlstring</b> , based on the specified format command characters.

## Return Values

Because **fprintf** is a procedure, no return value is set.

## Example

In this example,

```
fprintf ("/var/adm/pblog.txt", "System administrator Ids: %s %s %s", "Adm1", "Adm2", "Adm3");
```

the character string **System administrator Ids: Adm1 Adm2 Adm3** is appended to the file **/var/adm/pblog.txt**.

## See Also

```
print, printf, sprintf(), syslog
```

# input

## Description

The `input()` function prompts the user for a single line of input. There is no default prompt. If the user attempts to enter more than a single line of input, then the excess input is ignored.

## Syntax

```
result = input (prompt);
```

## Arguments

**prompt** Required. Character string that contains the prompt displayed to the user.

## Return Values

**result** is a character string that contains the single line of input that is typed by the user.



### Example:

```
result = input ("Please enter your first and last name:");
```

In this example, the prompt **Please enter you first and last name:** is displayed to the user. The resulting input is stored in **result**.



For more information, see the following:

- ["inputnoecho" on page 384](#)
- ["readfile" on page 391](#)

# inputnoecho

## Description

The `inputnoecho()` function prompts the user for a single line of input. There is no default prompt. It ignores excess input if the user supplies more than one line of input.

The `inputnoecho()` function works like the `input()` function, except that the input that is typed by the user is not shown on the terminal. This function is useful when prompting the user for a password or other types of confidential information.

## Syntax

```
result = inputnoecho (prompt);
```

## Arguments

**prompt** Required. Character string containing the prompt displayed to the user.

## Return Values

**result** is a character string that contains the single line of input that is typed by the user.



### Example:

```
result = inputnoecho ("Please enter your first and last name:");
```

*In this example, the prompt **Please enter your first and last name:** is displayed to the user. The resulting input is stored in **result**.*



For more information, see ["input" on page 383](#).



# print

## Description

The **print** procedure writes one or more expressions to the user's terminal as a single line. The line terminates with a newline character. A comma separates each argument. If an integer is supplied as an argument, then its value is automatically converted to a character string. If a list is supplied, then it prints as a series of quoted strings with the entire series between braces.

The **print** and **printnnl** procedures work in the same manner. The only difference is that **print** terminates the generated character string with a newline character, whereas **printnnl** does not.

## Syntax

```
print (expression1 [, expression2, ...]);
```

## Arguments

<b>expression1</b>	Required. A value that is displayed to the user.
<b>expression2, ...</b>	Optional. Additional values that are displayed to the user.

## Return Values

Because **print** is a procedure, no return value is set.

## Example

In the first example,

```
print ("Your task request has been accepted.", "Thank you.");
```

writes the following to the user's terminal:

```
Your task request has been accepted. Thank you.
```

This line terminates with a newline character.

The second example,

```
TrustedUsers = {"JWhite", "TBrown", "SBlack"};  
print ("The trusted users are:", TrustedUsers);
```

writes the following on the user's terminal:

```
The trusted users are: {"JWhite", "TBrown", "SBlack"}
```

This line terminates with a newline character.

## See Also

```
fprintf, outputredirect, printf, printnln, sprintf(), syslog
```

# printf

## Description

The **printf** procedure creates a character string by formatting the supplied arguments according to the formatting commands in a format control string. The resulting character string is written to the user's terminal.

The format control string controls the generation of the character string that is written to the user's terminal. It consists of two types of information: actual content and format command characters. The format command characters are used to insert and format the supplied arguments. The number of format command characters in the format control string must match the number of supplied arguments. In other words, if there are three formatting commands in the format control string, then three function arguments are needed. Otherwise, an error is generated.

**i** For more information on format command characters, see "[Format Commands](#)" on page 101.

## Syntax

```
printf (controlstring [,argument1, ...]);
```

## Arguments

<b>controlstring</b>	Required. Character string that contains the format control string that is used to generate the formatted string that is returned in <b>result</b>
<b>argument1 ...</b>	Optional. Character strings and/or integer values to substitute into the formatted string

## Return Values

Because **printf** is a procedure, no return value is set.

## Example

In this example,

```
printf ("System administrator Ids: %s %s %s\n", "JWhite", "TWhitman", "EPipes");
```

the following string is printed:

```
System administrator Ids: JWhite TWhitman EPipes
```

## See Also

`fprintf`, `outputredirect`, `print`, `sprint()`, `syslog`

# printnnl

## Description

The **printnnl** procedure writes one or more expressions to the user's terminal as a single line. The line does not terminate with a new line character. A space separates each argument.

The **print** and **printnnl** procedures work in the same manner. The only difference being that **print** terminates the generated character string with a newline character, whereas **printnnl** does not.

## Syntax

```
printnnl (expression1 [, expression2, ...]);
```

## Arguments

<b>expression1</b>	Required. An expression that contains the information to display to the user
<b>expression2 ...</b>	Optional. Additional expressions to display to the user.

## Return Values

Because **printnnl** is a procedure, no return value is set.

## Example

In the example below,

```
printnnl ("Your task request has been accepted."); print ("Thank you.");
```

writes the following to the user's terminal:

```
Your task request has been accepted. Thank you.
```

The text that is printed by **printnnl** is not terminated with a newline character, so the text that is printed with **print** appears on the same line.

## See Also

```
fprintf, outpuredirect, print, printf, sprintf(), syslog
```

## printvars

### Description

The **printvars** procedure prints all user and Endpoint Privilege Management for Unix and Linux variables to the user's terminal. This function is often useful when debugging security policy files.

### Syntax

```
printvars();
```

### Arguments

There are no arguments.

### Return Values

Because **printvars** is a procedure, no return value is set.



#### *Example:*

```
printvars();
```

## readfile

### Description

The **readfile()** function returns the contents of a file in a character string. Any file type can be processed. The entire file is placed in a single character string. The **length()** function can be used to determine the length of the returned character string.

Additionally, **readfile** checks whether the file passed as argument is in the configuration database (**/etc/pb.db**), and if it is, reads the file from the database. If the file is not in the database, **readfile** reverts to check if the file is in the filesystem.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
readfile (filename);
```

### Arguments

**filename** Required. Character string that contains the complete path and file name of the file to read.

### Return Values

Character string that contains the contents of the specified file.



**Example:**

```
result = readfile ("/var/adm/pblog.txt");
```

If the **/path/file** is imported to the config database, then **readfile** gets the file from the config database:

```
# pbadmin -cfg -i /path/file
```



For more information, see the following:

- ["length" on page 416](#)
- ["split" on page 422](#)

# syslog

## Description

The **syslog** procedure enables you to send diagnostic messages to the **syslog** facility. It creates a character string by formatting the supplied arguments according to the formatting commands in a format control string. The resulting character string is written to the system's **syslog**.

The format control string controls the formation of the character string that is written to the system's **syslog** facility. It consists of two types of information: actual content and format command characters. The format command characters are used to insert and format the supplied arguments. The number of format command characters in the format control string must match the number of supplied arguments. In other words, if there are three formatting commands in the format control string, then three function arguments are required. Otherwise, an error is generated.

Starting with version 7.0.0, as an alternate to the use of **syslog()** function in the policy, you can use the settings **syslog\_accept\_format**, **syslog\_reject\_format**, **syslogsession\_start\_format**, **syslogsession\_start\_fail\_format**, and **syslogsession\_finished\_format** in the **pb.settings** file. These settings format **syslog** messages for Accept and Reject events, and the session events Start, Finish, and Start\_Fail.

**i** For more information about these settings, see *Customized Syslog Formatting in the Endpoint Privilege Management for Unix and Linux Administration Guide* at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>.

**i** For more information on format command characters, see *"Format Commands" on page 101*.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
syslog (controlstring [,expression1, ...]);
```

## Arguments

<b>controlstring</b>	Required. Character string that contains the control string that is used to generate the formatted string that is passed to the <b>syslog</b> facility
<b>expression1 ...</b>	Optional. Expressions to substitute into the formatted string

## Return Values

Because **syslog** is a procedure, no return value is set.



## Example

In this example,

```
syslog ("System administrator Ids: %s %s %s", "Adm1", "Adm2", "Adm3");
```

the message

```
System Administrator Ids: Adm1 Adm2 Adm3
```

is written to **syslog** (the **syslog** daemon, typically **syslogd**, and Endpoint Privilege Management for Unix and Linux must be configured for this to work).

## See Also

```
fprintf, print, printf, sprintf(), PowerBroker syslog setting
```

## LDAP Functions

Endpoint Privilege Management for Unix and Linux LDAP support is based on the LDAP version 2 API, as defined in RFC 1823. Specific parts of the LDAP API are mapped to a series of Endpoint Privilege Management for Unix and Linux functions.

The following table summarizes the Endpoint Privilege Management for Unix and Linux LDAP functions.

Function	Description
<code>ldap_attributes()</code>	Returns the attributes that are associated with an LDAP entry.
<code>ldap_bind()</code>	Binds an open LDAP connection to a user.
<code>ldap_dn2ufn()</code>	Converts a DN to a user-friendly naming format.
<code>ldap_entry_count()</code>	Returns the number of entries that are returned by an LDAP search.
<code>ldap_explodedn()</code>	Returns the components of a DN in a list.
<code>ldap_firstentry()</code>	Returns the first entry that is returned by a search.
<code>ldap_getdn()</code>	Returns the DN of an LDAP entry.
<code>ldap_getvalues()</code>	Returns values that are associated with an LDAP entry.
<code>ldap_init()</code>	Connects to an LDAP server. <b>Version 3.5 and earlier:</b> function available. <b>Version 4.0 and later:</b> function deprecated.
<code>ldap_nextentry()</code>	Returns the next entry that is returned by a search.
<code>ldap_open()</code>	Opens a connection to an LDAP server.
<code>ldap_search()</code>	Opens a connection to an LDAP server.
<code>ldap_search()</code>	Searches an LDAP tree.
<code>ldap_unbind()</code>	Unbinds and disconnects a connection from an LDAP directory.

## Perform an LDAP Search

The general process for performing an LDAP search is outlined below.

1. Use the `ldap_open()` function to establish an LDAP server connection.
2. Bind the LDAP server connection to the user by using the `ldap_bind()` function.
3. Use the function `ldap_search()` to search an LDAP directory.
4. Use the `ldap_entry_count()` function to determine the number of entries that were found by the query.
5. Loop through the entries that were found by the query by using the `ldap_firstentry()` and `ldap_nextentry()` functions.
6. Use the function `ldap_attributes()` to obtain a list of attributes that are available for an entry.
7. Use the `ldap_getvalues()` function to retrieve the actual attribute values that are associated with an entry.

8. Process the next entry. Repeat steps 5 through 7 until all entries are processed.
9. Use the function `ldap_unbind()` to unbind and close the LDAP Server connection.

 *For more information on using LDAP, refer to your LDAP documentation.*

## ldap\_attributes

### Description

The `ldap_attributes()` function returns a list that contains all of the attributes that are associated with the specified LDAP entry. Each element in result contains an attribute name.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = ldap_attributes (LDAPEntry);
```

### Arguments

LDAPEntry

Required. A unique LDAP entry that is generated by `ldap_firstentry()`, `ldap_nextentry()`, or `ldap_search()`.

### Return Values

A list in which each element contains an attribute name. On error, it returns an empty list.



**Example:**

```
result = ldap_attributes (LDAPEntry);
```

In this example, **result** might look like the following:

```
{"firstname", "lastname", "department", "jobcode"}
```



For more information, see the following:

- ["ldap\\_firstentry" on page 402](#)
- ["ldap\\_nextentry" on page 406](#)
- ["ldap\\_search" on page 408](#)

## ldap\_bind

### Description

The `ldap_bind()` function binds an existing LDAP server connection using the specified DN and password. If the DN is not specified, an anonymous bind is attempted.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = ldap_bind (ConnectionId, dn [,Password]);
```

### Arguments

<b>ConnectionId</b>	Required. LDAP server connection that is generated by the <code>ldap_open()</code> function.
<b>dn</b>	Required. User's DN. May be an empty string.
<b>Password</b>	Optional. String that contains the password for <b>dn</b> .

### Return Values

<b>0</b>	Bind operation successful.
<b>1</b>	Bind operation failed.



#### Example:

```
result = ldap_bind (ldapConnection, "");
```

In this example, an anonymous bind is performed using the LDAP server connection that is specified in `ldapConnection`.



For more information, see the following:

- ["ldap\\_open" on page 407](#)
- ["ldap\\_unbind" on page 410](#)

## ldap\_dn2ufn

### Description

The `ldap_dn2ufn()` function converts the supplied DN into a more user-friendly form by stripping off the type names. The resulting character string is returned in result.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = ldap_dn2ufn (dn);
```

### Arguments

<b>dn</b>	Required. A string that contains a DN (Distinguished Name).
-----------	---

### Return Values

<b>string</b>	A character string that contains a DN name with type names removed.
---------------	---

<b>Empty string</b>	Error.
---------------------	--------



#### Example:

```
result = ldap_dn2ufn (dn);
```

In this example, **result** contains the specified DN name without type names.



For more information, see "[ldap\\_explodedn](#)" on page 400.

## ldap\_entry\_count

### Description

The `ldap_entry_count()` function returns the number of entries that exist in a specific LDAP message. The `ldap_search()` function generates `LDAPEntry`.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = ldap_entry_count (LDAPEntry);
```

### Arguments

**LDAPEntry**

Required. LDAP message that is generated by `ldap_search()`.

### Return Values

**integer**

The number of entries that are contained in the specified LDAP message.

**0**

If zero entries or on error.



**Example:**

```
result = ldap_entry_count (LDAPEntry);
```

In this example, **result** contains the number of entries in the LDAP message that is identified by `LDAPEntry`.



For more information, see "[ldap\\_search](#)" on page 408.

## ldap\_explodedn

### Description

The `ldap_explodedn()` function splits the supplied DN into its separate subcomponents. Each subcomponent is called a relative distinguished name (RDN).

The **notypes** argument specifies whether the RDNs are returned with only values or both values and attributes. Setting **notypes** to **false** returns both values and attributes. Setting **notypes** to **true** returns only values.

The RDNs are returned in a list. If only values were requested, then each list element contains one value. If both values and attributes have been requested, each result list element has the format "**attribute=value**".



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = ldap_explodedn (dn, notypes);
```

### Arguments

<b>dn</b>	Required. A string that contains a Distinguished Name (DN).
<b>notypes</b>	Required. An integer that represents a <b>true</b> or <b>false</b> value.

### Return Values

**result** is a list containing the DN subcomponents (that is, the RDNs). If only values are requested, then the list has the following format:

```
{"value", "value", ...}
```

If both values and attributes are requested, then the list has the following format:

```
{"attribute=value", "attribute=value", ...}.
```



#### Example:

```
result = ldap_explodedn (dn, false);
```

In this example, **result** is a list containing DN subcomponents. Both values and attributes are returned in this case.





For more information, see "[ldap\\_dn2ufn](#)" on page 398.

## ldap\_firstentry

### Description

The `ldap_firstentry()` function returns the first entry in the specified LDAP message that is returned from `ldap_search()`.

The first entry message is needed to retrieve successive entries from the specified LDAP message by using the `ldap_nextentry()` function.

The `ldap_firstentry()` function does not retrieve values. It returns a unique entry. The result can be used in a function such as `ldap_getvalues()` to actually retrieve attribute values.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = ldap_firstentry (LDAPEntry);
```

### Arguments

LDAPEntry	Required. LDAP message. <code>ldap_search()</code> generates LDAP messages.
-----------	---

### Return Values

LDAPEntry	An LDAP entry.
Empty String	Error.



#### Example:

```
result = ldap_firstentry (LDM);
```



For more information, see the following:

- ["ldap\\_nextentry" on page 406](#)
- ["ldap\\_search" on page 408](#)

## ldap\_getdn

### Description

The `ldap_getdn()` function returns the DN for the specified LDAP entry.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = ldap_getdn (LDAPEntry);
```

### Arguments

LDAPEntry

Required. An LDAP entry. `ldap_firstentry()`, `ldap_nextentry()`, and `ldap_search()` generate LDAP entries.

### Return Values

string

A DN.

Empty string

Error condition.



**Example:**

```
result = ldap_getdn (LDAPEntry);
```



For more information, see the following:

- ["ldap\\_firstentry" on page 402](#)
- ["ldap\\_nextentry" on page 406](#)
- ["ldap\\_search" on page 408](#)

## ldap\_getvalues

### Description

The `ldap_getvalues()` function returns the values that are associated with the specified attribute. The values are returned in a list where each list element represents a value. The `length()` function can be used to determine the number of elements that are returned in result. If `ldap_getvalues()` is successful, result has the format {"value", "value", ...}.

The `ldap_getvalues()` function is typically used after a call to `ldap_search()`, `ldap_firstentry()`, or `ldap_nextentry()` to retrieve attribute values for the entry that is currently being processed.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = ldap_getvalues (LDAPEntry, attributeName);
```

### Arguments

<b>LDAPEntry</b>	Required. An LDAP entry that is created by <code>ldap_firstentry()</code> , <code>ldap_nextentry()</code> , or <code>ldap_search()</code> .
<b>attributeName</b>	Required. String that identifies the attribute for which a value should be returned.

### Return Values

<b>list</b>	If successful, then a list of character strings is returned. Each element in the list contains a value.
<b>empty list</b>	Error condition, list length is set to zero.



**Example:**

```
result = ldap_getvalues (LDAPEntry, "uid");
```



For more information, see the following:

- ["ldap\\_firstentry" on page 402](#)
- ["ldap\\_getvalues" on page 404](#)
- ["ldap\\_nextentry" on page 406](#)
- ["ldap\\_search" on page 408](#)

## ldap\_init

- **Version 3.5 and earlier:** `ldap_init()` function available.
- **Version 4.0 and later:** `ldap_init()` function deprecated.

### Description

Initializes a connection to an LDAP database. This function supersedes `ldap_open()` and `ldap_init()`.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
ldap_initialize (ldap_url [, 2 | 3])
```

### Arguments

<b>ldap_url</b>	Required, string. An LDAP URL pointing to the desired LDAP database.
<b>version</b>	Optional, number. The LDAP database version. Either a 2 or 3. If the version is not included, then a version 2 connection is created.

### Return Values

On success, an LDAP Connection is returned. On failure, null is returned.



**Example:**

```
connection = ldap_initialize("ldap://ldaphost");
```



For more information, see the following:

- ["ldap\\_init" on page 405](#)
- ["ldap\\_open" on page 407](#)

## ldap\_nextentry

### Description

The `ldap_nextentry()` function returns the next LDAP entry in the specified LDAP message.

The `ldap_nextentry()` function does not retrieve values. It returns a unique entry. The result can be used in a function like `ldap_getvalues()` to actually retrieve attribute values.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = ldap_nextentry (LDAPEntry);
```

### Arguments

<b>LDAPEntry</b>	Required. An LDAP entry that is returned by the previous <code>ldap_firstentry()</code> or <code>ldap_nextentry()</code> .
------------------	--

### Return Values

<b>LDAP_Entry</b>	An LDAP entry.
<b>empty string</b>	Error condition.



**Example:**

```
result = ldap_nextentry (LDAPEntry);
```



For more information, see the following:

- ["ldap\\_firstentry" on page 402](#)
- ["ldap\\_search" on page 408](#)

## ldap\_open

### Description

The `ldap_open()` function establishes a connection to the LDAP server that is specified in **ServerName**. The connection is made through the port number in port (if specified).



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = ldap_open (ServerName [,port]);
```

### Arguments

<b>ServerName</b>	Required. Character string that contains the host name of an LDAP server.
<b>port</b>	Optional. Integer that contains a port number. The default port number is 389.

### Return Values

<b>LDAP_Connection</b>	If the open operation is successful, an LDAP server connection is returned in <b>result</b> .
------------------------	---



#### Example:

```
result = ldap_open ("mycompany.ldap.server1", 200);
```

In this example, if the open operation is successful, **result** contains an LDAP server connection ID for **mycompany.ldap.server1** on port **200**. If the connection is not successful, **result** contains a null string.



For more information, see the following:

- ["ldap\\_bind" on page 397](#)
- ["ldap\\_init" on page 405](#)
- ["ldap\\_unbind" on page 410](#)

## ldap\_search

### Description

The `ldap_search()` function searches the LDAP directory below the baseDN, using the search criteria that are specified in the search filter. The scope argument defines the scope, or boundaries, of the search.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = ldap_search (ConnectionId, baseDN, scope, searchfilter, attributeList, attributeFlag);
```

### Arguments

<b>ConnectionId</b>	Required. LDAP Server Connection.
<b>baseDN</b>	Required. String that contains the base DN for the search.
<b>scope</b>	Required. String that contains a search scope value. Value entries are <b>subtree</b> (search the baseDN and the entire directory below), <b>onelevel</b> (search the <b>baseDN</b> and one level below), and <b>base</b> (search the <b>baseDN</b> only).
<b>searchfilter</b>	Required. String that contains search criteria.
<b>attributeList</b>	Required. List that identifies the attributes that should be returned. Each list element must be an attribute name. An empty list defaults to all attributes.
<b>attributeFlag</b>	Required. Integer that represents either <b>true</b> or <b>false</b> . If set to <b>true</b> , only attribute types are returned. If set to <b>false</b> , both attribute types and values are returned.

### Return Values

<b>LDAP message</b>	The search operation was successful.
<b>empty string</b>	Unsuccessful search.



#### Example:

```
result = ldap_search (ConnectionId, "dc=beyondtrust, "dc=com", subtree", "jobcode=mgr", {}, 0);
```



**i** For more information, see the following:

- ["ldap\\_attributes" on page 396](#)
- ["ldap\\_entry\\_count" on page 399](#)
- ["ldap\\_firstentry" on page 402](#)
- ["ldap\\_getvalues" on page 404](#)
- ["ldap\\_nextentry" on page 406](#)

## ldap\_unbind

### Description

The `ldap_unbind()` function unbinds and closes an existing LDAP server connection.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = ldap_unbind (LDAP_Connection);
```

### Arguments

<b>LDAP_Connection</b>	Required. An LDAP Server Connection that was created by <code>ldap_open()</code> .
------------------------	--

### Return Values

<b>0</b>	Unbind operation successful.
<b>-1</b>	Unbind operation failed.



#### Example:

```
result = ldap_unbind (ldapConnection);
```

In this example, an unbind and close are performed on the LDAP server connection ID specified in `ldapConnection`.



For more information, see the following:

- ["ldap\\_bind" on page 397](#)
- ["ldap\\_open" on page 407](#)

## List Functions

The following table summarizes the available Endpoint Privilege Management for Unix and Linux list functions.

Function	Description
<code>append()</code>	Creates a new list by appending one or more strings or lists to the end of another list.
<code>insert()</code>	Creates a new list by inserting additional strings or lists into a specific position (indicated by an integer index) in the original list.
<code>join()</code>	Creates a new string by concatenating each element of a specified list separated by a delimiter character. This is the opposite of the <code>split()</code> function.
<code>length()</code>	Returns the number of elements in a list.
<code>range()</code>	Creates a new list from a specific range of elements from an existing list.
<code>replace()</code>	Creates a new list by deleting a specific range of elements from an existing list. Replacement elements can be inserted into the new list in positions where original elements were deleted.
<code>search()</code>	Searches a list for a specific pattern.
<code>split()</code>	Creates a new list by splitting the contents of a string into individual list elements. This is the opposite of the <code>join()</code> function.

# append

## Description

The **append()** function creates a new list by concatenating the supplied arguments to the end of **list1** in sequential order.

## Syntax

```
result = append (list1, list-or-string1 [,list-or-string2, ...]);
```

## Arguments

<b>list1</b>	Required. Contains the list to which the specified arguments are appended.
<b>list-or-string1</b>	Required. Contains either a character string or a list. This argument is appended to <b>list1</b> .
<b>list-or-string2 ...</b>	Optional. Contains additional character strings and/or lists. These additional arguments are appended to <b>list1</b> .

## Return Values

The newly created list.



### Example:

```
TrustedUsers = {"JWhite", "TBrown", "SBlack"};
NewList = append (TrustedUsers, "RRoads");
```

In this example, **result** contains the following list:

```
{"JWhite", "TBrown", "SBlack", "RRoads"}
```



### Example:

```
List1 = {"JWhite", "TBrown"};
List2 = {"SBlack", "RRoads"};
NewList = append (List1, "RGreen", List2);
```

In this example, **result** contains:

```
{"JWhite", "TBrown", "RGreen", "SBlack", "RRoads"}
```

**i** For more information, see the following:

- ["insert" on page 414](#)
- ["join" on page 415](#)

# insert

## Description

Returns a list constructed by inserting the strings or lists into a specific position (indicated by an integer index) in the specified list. Note that **0** is the start of the list, **1** is between the first and second elements in the list, and so on.

If you specify an index number that is larger than the specified list, then the strings are placed at the end of the list.

## Syntax

```
result = insert (list, index, list-or-string1 [, list-or-string2, ...])
```

## Arguments

<b>list</b>	Required. The original list.
<b>index</b>	Required. The integer index.
<b>list-or-string1</b>	Required. The list or string to insert.
<b>list-or-string2</b>	Optional. The subsequent list(s) or string(s) to insert.

## Return Values

A list.



### Example:

```
trustedusers={"jamie", "cory", "tom"};  
a=insert(trustedusers, 1, "leslie");
```

The example above sets the following to the list:

```
{"jamie", "leslie", "cory", "tom"}
```



For more information, see the following:

- ["append" on page 412](#)
- ["join" on page 415](#)
- ["replace" on page 419](#)

## join

### Description

The `join()` function creates a string by concatenating all of the elements in a list. The specified delimiter character separates each element in the generated string. If a delimiter character is not specified, then a blank is used as the delimiter.

### Syntax

```
result = join (list [,delimiter]);
```

### Arguments

<b>list</b>	Required. The list whose elements are to be concatenated into a new character string.
<b>delimiter</b>	Optional. If specified, the delimiter character is used as a separator character between list elements as they are concatenated together.

### Return Values

**result** Contains the new character string.



#### Example:

```
TrustedUsers = {"Fred", "John", "George"};  
NewString = join (Trustedusers, ",");
```

In this example, **NewString** contains the character string: **Fred, John, George**.



For more information, see ["split" on page 422](#).

## length

### Description

The `length()` function returns the number of elements in the specified list. The index number for the first element in a list is always `0`. The index number for the last list element is always the list length - `1`.

### Syntax

```
result = length (list1);
```

### Arguments

**list1** Required. The list for which the number of elements is determined.

### Return Values

**result** Contains the number of elements in **list1**.



#### Example:

```
list1 = {"Fred", "George", "Sally"};  
result = length (list1);
```

In this example, **result** contains the integer value **3**.



For more information, see the following:

- ["append" on page 412](#)
- ["insert" on page 414](#)
- ["join" on page 415](#)
- ["range" on page 417](#)
- ["split" on page 422](#)



## range

### Description

The **range()** function generates a new list from the elements in a list, starting at the element number that is specified by **index1** and ending with the element number that is specified by **index2**.

The first element in a list always has an index value of **0**. An index number that is larger than the last index in the list is treated as the last element. In the case where **index1** is larger than the last index in the list, an empty list is returned (that is, with a list length equal to **0**).

### Syntax

```
result = range (list1, index1, index2);
```

### Arguments

<b>list1</b>	Required. The list from which a new list is extracted.
<b>index1</b>	Required. The element number, in <b>list1</b> , at which the extraction should begin.
<b>index2</b>	Required. The element number in <b>list1</b> at which the extraction should end, inclusive.

### Return Values

**result** Contains the new list that was extracted from **list1**.



#### Example:

```
list1 = {"JWhite", "SBrown", "RRoads"};  
result = range (list1, 1, 2);
```

In this example, **result** contains the following list:

```
{"SBrown", "RRoads"}
```



For more information, see the following:

- ["append" on page 412](#)
- ["insert" on page 414](#)
- ["join" on page 415](#)

**i**

- ["length" on page 416](#)
- ["replace" on page 419](#)
- ["split" on page 422](#)

# replace

## Description

The **replace()** function replaces elements in a list, thereby creating a new list. The list elements in the specified range are deleted and those that are specified by the string arguments are inserted in their place. If replacement arguments are not supplied, then the appropriate elements are deleted without being replaced.

## Syntax

```
result = replace (list1, index1, index2, list-or-string1 [, list-or-string2, ...]);
```

## Arguments

<b>list1</b>	Required. The list from which list elements are removed, and optionally, replaced by new elements
<b>index1</b>	Required. The first element in the range of elements to delete or replace.
<b>index2</b>	Required. The last element in the range of elements to delete or replace.
<b>string1..n</b>	Optional. The list(s) or character string(s) that will replace the list elements that are being deleted.

## Return Values

<b>result</b>	Contains the new list that is created by deleting or replacing elements from the original list.
---------------	---



### Example:

```
list1 = {"Adm1", "Adm2", "Adm3", "Adm4"};
result = replace (list1, 2, 3, "SysAdm1", "SysAdm2");
```

In this example, **result** contains the following list:

```
{"Adm1", "Adm2", "SysAdm1", "SysAdm2"}
```

For more information, see the following:



For more information, see the following:

- ["append" on page 412](#)
- ["insert" on page 414](#)

**i**

- ["join" on page 415](#)
- ["length" on page 416](#)
- ["range" on page 417](#)
- ["split" on page 422](#)

## search

### Description

The **search()** function searches a list for the first element that is found to match a specific pattern. The search is case sensitive and wildcard characters can be used within the pattern.

**i** For more information on using wildcard characters, see "[Wildcard Search Characters](#)" on page 107 and "[quote](#)" on page 437.

### Syntax

```
result = search (list1, pattern);
```

### Arguments

<b>list1</b>	Required. The list to search.
<b>pattern</b>	Required. The pattern to search for.

### Return Values

An integer value is returned. If a match is found, then **result** contains the element number of the first pattern match in the list. If no match is found, result is set to **-1**.

### Example

In this example,

```
list1 = {"ADM1", "ADM2", "ADM3", "SYSADM1", "SYSADM2", "USER1", "USER2"};  
result = search (list1, "SYS*");
```

**result** is set to **3** as **list1[3]** is the first element in the list to match the search pattern.

### See Also

```
append(), insert(), join(), length(), range(), replace()
```

# split

## Description

The **split()** function creates a list from a string. The string is broken up into separate list elements based on the characters in the specified delimiter string. If a delimiter string is not specified, then a string containing space, tab (**\t**), and newline (**\n**) is used. If none of the delimiter characters are encountered, then a list that contains one element (that is, the entire string) is returned.

## Syntax

```
result = split (string1[,delimiter[,omit_empty_elements]]);
```

## Arguments

<b>string1</b>	Required. The string to separate into list elements.
<b>delimiter</b>	Optional. The <b>delimiter</b> string that is used to break the string into separate elements. If <b>delimiter</b> is not specified, then <b>\t\n</b> is used as the delimiter string.
<b>omit_empty_elements</b>	Optional. Boolean value that determines whether empty elements of the resulting list are omitted ( <b>true</b> ) or included ( <b>false</b> ). If <b>omit_empty_elements</b> is not specified, it defaults to <b>true</b> .

## Return Values

**result** contains the new list.



### Example:

```
UserList = "user1,user2,user3,,user4";
result = split (UserList,",");
```

In this example, **result** contains the following list:

```
{"user1", "user2", "user3", "user4"}
```



### Example:

```
UserList = "user1,user2,user3,,user4";
result = split (UserList,",",false);
```

In this example, **result** contains the following list:



```
{"user1", "user2", "user3", "", "user4"}
```



*For more information, see the following:*

- ["append" on page 412](#)
- ["insert" on page 414](#)
- ["join" on page 415](#)
- ["length" on page 416](#)
- ["range" on page 417](#)
- ["replace" on page 419](#)

## Miscellaneous Functions and Procedures

Miscellaneous functions and procedures (refer to the following table) do not fit into any other category.

Function/ Procedure	Description
<code>egrep()</code>	Runs the policy server host's <b>egrep()</b> command using the provided arguments and files, and returns the result as a string. <b>Version 4.0 and earlier:</b> function not available. <b>Version 5.0 and later:</b> function available.
<code>fgrep()</code>	Runs the policy server host's <b>fgrep</b> command using the provided arguments and files, and returns the result as a string. <b>Version 4.0 and earlier:</b> function not available. <b>Version 5.0 and later:</b> function available.
<code>glob()</code>	Matches a string to a pattern.
<code>grep()</code>	Runs the policy server host's <b>grep</b> command using the provided arguments and files, and returns the result as a string. <b>Version 4.0 and earlier:</b> function not available. <b>Version 5.0 and later:</b> function available.
<code>iologcloseaction runhost()</code>	Executes a specified program on the <b>runhost</b> when the session is ended and the iolog is closed. <b>Version 9.3 and earlier:</b> procedure not available. <b>Version 9.4 and later:</b> procedure available.
<code>ipaddress()</code>	Returns a machine's IP address.
<code>isset()</code>	Checks a variable to see if it has a value.
<code>quote()</code>	Encloses a string in quotation marks.
<code>remotesystem()</code>	Runs a command on a specified Endpoint Privilege Management for Unix and Linux <b>runhost</b> .
<code>runtimewarn()</code>	Warns the user on <b>stderr</b> that the session has exceeded the time limit. <b>Version 9.3 and earlier:</b> procedure not available. <b>Version 9.4 and later:</b> procedure available.
<code>runtimewarnlog()</code>	Records to logserver's <b>syslog</b> that a user's session has exceeded the time limit. <b>Version 9.3 and earlier:</b> procedure not available. <b>Version 9.4 and later:</b> procedure available.
<code>system()</code>	Runs a command.
<code>unset</code>	Removes temporary variables from the event and I/O log files.



## egrep

- **Version 4.0 and earlier:** `egrep()` function not available.
- **Version 5.0 and later:** `egrep()` function available.



*Note: Not supported in Endpoint Privilege Management for Linux (EPM-L).*

## Description

The `egrep()` function runs the policy server host's `egrep()` command using the provided arguments and files, and returns the result as a string.

## Syntax

```
egrep ([egrep-arguments, ] search-pattern, filename-or-template [, filename-or-template ...]);
```

## Arguments

<b>egrep-arguments</b>	Optional. Switch arguments to the policy server host's <code>egrep</code> command. Refer to the policy server host's <code>grep</code> documentation for specifics.
<b>search-pattern</b>	Required. The regular expression to search for.
<b>filename-or-template</b>	Required. A file name, possibly with wildcards, to search for the <code>search-pattern</code> .

## Return Values

A string that contains the output of `egrep()`.



### Example:

```
result = egrep ("-w", "word", "filename");
result = egrep ("pattern", "manynames*");
```



For more information, see the following:

- ["fgrep" on page 426](#)
- ["grep" on page 428](#)

## fgrep

- **Version 4.0 and earlier:** `fgrep()` function not available.
- **Version 5.0 and later:** `fgrep()` function available.

### Description

The `fgrep()` function runs the policy server host's `fgrep` command using the provided arguments and files, and returns the result as a string.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
fgrep ([fgrep-arguments, ] search-pattern, filename-or-template [, filename-or-template ...]);
```

### Arguments

<b>fgrep-arguments</b>	Optional. Switch arguments to the policy server host's <code>fgrep</code> command. Refer to the policy server host's <code>fgrep</code> documentation for specifics.
<b>search-pattern</b>	Required. The regular expression to search for.
<b>filename-or-template</b>	Required. A file name, possibly with wildcards to search for the <code>search-pattern</code> .

### Return Values

A string that contains the output of `fgrep`.



**Example:**

```
result = fgrep ("-w", "word", "filename");
result = fgrep ("pattern", "manynames*");
```



For more information, see the following:

- ["egrep" on page 425](#)
- ["grep" on page 428](#)

# glob

## Description

The **glob()** function searches a character string for a specific shell-style pattern. **glob()** is often used to match patterns to file names because the patterns that are used are the same patterns that are used by the Unix/Linux shell file name matching algorithms.

**i** For more information on creating search patterns, see "[Wildcard Search Characters](#)" on page 107 and "[quote](#)" on page 437.

## Syntax

```
result = glob (pattern, string);
```

## Arguments

<b>pattern</b>	Required. The search pattern
<b>string</b>	Required. The string to search

## Return Values

<b>true</b>	A pattern match was found
<b>false</b>	A pattern match was not found

## Example

```
result = glob (pattern, logfilename);
```

## grep

- **Version 4.0 and earlier:** `grep()` function not available.
- **Version 5.0 and later:** `grep()` function available.

### Description

The `grep()` function runs the policy server host's `grep` command using the provided arguments and files, and returns the result as a string.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
grep ([grep-arguments, ] search-pattern, filename-or-template [, filename-or-template ...]);
```

### Arguments

<b>grep-arguments</b>	Optional. Switch arguments to the policy server host's <code>grep</code> command. Refer to the policy server host's <code>grep</code> documentation for specifics.
<b>search-pattern</b>	Required. The regular expression to search for.
<b>filename-or-template</b>	Required. A file name, possibly with wildcards, to search for the <b>search-pattern</b> .

### Return Values

A string containing the output of `grep`.



**Example:**

```
result = grep ("-w", "word", "filename");  
result = grep ("pattern", "manynames*");
```



For more information, see the following:

- ["egrep" on page 425](#)
- ["fgrep" on page 426](#)

## iologcloseaction

### Description

**iologcloseaction()** is used to specify a program to be executed on the log server (or policy server, if no log server ) when an iolog is closed.

This can be used, for example, to execute scripts that can send IOlog or ACA data to Splunk or other systems. When Endpoint Privilege Management for Unix and Linux is installed, an example Perl script called **closeactionsplunk.pl**, that sends ACA data from the IOlog to Splunk is installed in **/opt/pbul/scripts**.

Note that unlike the **iologcloseactionrunhost()** procedure, this does not include the ability to specify **runuser**, **runcwd**, **environment**, **timeout**, or command line arguments.

IOLogs with a **closeaction** specified, or when Solr is used, are placed in a queue, rather than acted upon immediately.

**pbconfigd** monitors the queue and launches **pbreplay** to handle both Solr and **iologcloseaction** activity.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
iologcloseaction( command );
```

### Arguments

#### command

Required string specifying the **/full/path/to/external/program**.

The syntax for the script or program must be **/path/to/external/program /path/to/iolog.log**.

The program should exit 0 if successful, should exit 255 (or -1) to have Endpoint Privilege Management for Unix and Linux log that the script failed, and should exit 254 (-2) to have Endpoint Privilege Management for Unix and Linux requeue the item and have the queue mechanism pause. This can be used, for example, to indicate that a destination host is not reachable, and additional closeaction activity should not take place immediately.



#### Example:

```
iologcloseaction("/opt/pbul/scripts/closeactionsplunk.pl");
```



For more information, see the following:

**i**

- ["iolog" on page 250](#)
- ["iologcloseactionrunhost" on page 431](#)
- The "iologactionqueuetimelimit," "iologactionmaxprocs keywords," and "pbdbutil --iologidx" sections in the [Endpoint Privilege Management for Unix and Linux System Administration Guide](#) at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>

## iologcloseactionrunhost


### Description

`iologcloseactionrunhost()` is used to specify a `/path/filename` to be executed on the runhost when the iolog is closed. The specified `/path/filename` can be a shell script or binary. The user to run the program as, environment, arguments, and working directory are specified in the function call. `Stdin`, `stdout`, `stderr` are redirected to `/dev/null`. The timeout (specified in seconds) is mandatory. A timeout value of zero indicates no timeout. Note that a timeout value greater than zero causes the end user's invocation of `pbrun` to pause while the close action takes place or until the timeout expires. Any runtime errors such as invalid user, `cwd`, or command are logged via `syslog`, and to the appropriate Endpoint Privilege Management for Unix and Linux log (for example, `pbrunlog`, `pblocaldlog`) if specified in `pb.settings`.

### Syntax

```
iologcloseactionrunhost( user, environment, timeout, cwd "/path/command and arguments");
```

### Arguments

<b>User</b>	The user to run the command. This user must exist on the runhost.
<b>Environment</b>	ENV settings to execute the command with. If an empty list is specified, <code>su -</code> is used to create a login environment.
<b>Timeout</b>	Required integer. When set to <code>0</code> , no timeout is used, and the specified command could potentially run forever. When set to <code>&gt; 0</code> , specified the number of seconds for a timeout. If the timeout is reached, the command is terminated using <code>SIGTERM</code> , and if needed, by a <code>SIGKILL</code> .
<b>Cwd</b>	Required string to specify the working directory. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <b>Note:</b> With an empty environment list, this directory may be changed via the login shell.                 </div>
<b>command</b>	Required string specifying the fully qualified command, and its arguments. This is passed to <code>su</code> using <code>su's -c</code> option.



#### Example:

```
iologcloseactionrunhost( "jsmith", {"PATH=/bin", "TMPDIR=/tmp/", "PBUL=PBULTEST"}, 20,
"/tmp", "/usr/local/bin/closeaction -a -b" );
```

**Example:**

```
iologcloseactionrunhost( "root", {}, 0, "/tmp", "/usr/local/bin/closeaction -a -b" );
```



For more information, see ["iolog" on page 250](#).



## ipaddress

### Description

The `ipaddress()` function returns the IP address of the machine that is specified by `hostname`. `hostname` should be a fully qualified machine name.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = ipaddress (hostname);
```

### Arguments

`hostname` Required. A fully qualified host name.

### Return Values

`result` contains the IP address of the specified machine. If the IP address cannot be determined, a blank string is returned (that is, `length = 0`).



**Example:**

```
result = ipaddress (hostname);
```

In this example, **result** contains the IP address of the machine specified in **hostname**.

## isset

### Description

The `isset()` function determines whether a variable has been set. A variable with a blank or zero value returns **true**, because blank and zero are considered values.

### Syntax

```
result = isset (string);
```

### Arguments

**string** Required. A string that contains a variable name.

### Return Values

<b>true</b>	Integer. The specified variable has a value.
<b>false</b>	Integer. The specified variable does not have a value.



#### Example:

```
runhost = "beyondtrust1";  
result = isset ("runhost");
```

In this example, **result** contains an integer value of 1 (**true**) because the **runhost** variable has a value of **beyondtrust1**.



For more information, see ["unset" on page 444](#).

## policytimeout

### Description

The new Endpoint Privilege Management for Unix and Linux 8.0.2 **policytimeout()** procedure adds an overall policy timeout mechanism so that **pbmasterd** can abort the request when the policy processing takes an inordinate amount of time.

For example, when **submitconfirmuser()** is used, but the submitting user (or process) does not enter a password.

This prevents **pbmasterd** processes that appear to be unresponsive when the policy is waiting for user input which may never arrive. When the policy timeout is encountered, the request is rejected, with the **exitstatus** set to:

```
policy timeout (<seconds> seconds) reached for <submitting user> on host <submithost> for command <command and args>
```

That message is also logged to **pbmasterd.log**.

This timeout mechanism terminates **pbmasterd** any time that the policy processing takes longer than the timeout value specified.

This includes any user input functions, infinite loops, long running external programs run with **system()** and **remotesystem()**, DNS and NFS hangs, and lengthy policies.

When the **policytimeout()** procedure is called at the beginning of the policy it applies to the entire policy. If called later, it applies to the rest of the policy.

If the function is not called, or called with a value of **0**, there is no timeout and **pbmasterd** processes the entire policy (including waiting for user input) before terminating.

The **policytimeout()** procedure can be called many times, each time overriding the value previously set.

This timeout is canceled when an accept or reject is encountered (for example, the policy is completed). Note that this timeout does not affect the **runconfirmuser** mechanism, which is processed after an accept. This timeout does not affect the secured task once accepted. For example, this cannot protect against a user not providing username/password input for **pbrun telnet <host>**. **pbmasterd** informs Endpoint Privilege Management for Unix and Linux 8.0.2 clients (**pbrun**, **pbksh**, **pbsh**, **pbssh**) of the timeout, and those clients also timeout. Note that the exact timing of **pbmasterd** timing out and the client timing out is not exact.

**pbmasterd** and the client process the timeout independently, and either may terminate before the other. Older clients cannot process such a timeout, and may appear unresponsive when **pbmasterd** terminates during expected user input. **pbmasterd** does not have a mechanism to interrupt an older client that is expecting input.

When **remotesystem()** is used with the **submithost**, the policy timeout is independent of the timeout specified in the **remotesystem** function call. The first of those timeouts to be encountered is the one that is processed.

When **remotesystem()** is used with a host other than the **submithost**, only the timeout specified in the **remotesystem** function call is used. If that is **0** (meaning no timeout), and the policy server encounters the policy timeout, the remote host may have a *hung plocald* process.

### Syntax

```
policytimeout( <timeout_value_in_seconds> );
```

## Arguments

**timeout\_value\_in\_seconds** Required. Specifies the policy timeout value in seconds.

## Return Values

Not applicable



### Example:

```
policytimeout (25);  
submitconfirmuser (user);  
accept;
```



### Example:

```
tmout=2;  
policytimeout (tmout);  
submitconfirmuser (user);  
accept;
```



### Example:

```
policytimeout (25);  
...  
policytimeout (40);  
...  
policytimeout (0);  
...
```



For more information, see ["remotesystem" on page 438](#).

# quote

## Description

The **quote()** function encloses a string in the specified character. It also inserts a backslash character (\) in front of any special characters that are contained in the string, to indicate that these characters should be taken literally (that is, treated as special characters). The **quote()** function is useful when parsing arguments into commands that are shell scripts.

**i** For more information on special characters, see "[Special Characters](#)" on page 108.

## Syntax

```
result = quote (string1, quotechar);
```

## Arguments

<b>string1</b>	Required. The string to enclose in the specified <b>quotechar</b>
<b>quotechar</b>	Required. The character to use as the enclosing character

## Return Values

**result** contains the quoted string.

## Example

In the example:

```
result = quote ("Hello, Hello, Hello", "*");
```

**result** is assigned:

```
"*Hello, Hello, Hello*"
```

## remotesystem

### Description

Introduced in Endpoint Privilege Management for Unix and Linux 7.1, **remotesystem()** is used to run commands on a host other than the policy server host (any Endpoint Privilege Management for Unix and Linux runhost) as part of the policy. This can be called as a procedure (command output is shown on **pbrun**'s terminal) or as a function (command output is captured into a policy variable). This is similar to the **system()** function/procedure, however the command is run on a different host. The Endpoint Privilege Management for Unix and Linux variable status is set to the return code of the command upon exit. Input to the command comes from the user's keyboard or from the **inputstring** argument if it is present. Output goes to the user's screen or to the result string variable, if present.

If the specified host is the same as the **submithost**, the requesting program (**pbrun**, **pbksh**, **pbsh**) executes the command. If the specified host is not the **submithost**, **pblocald** is used to execute the command.

This is primarily intended to be used as a function, without interactive keyboard or screen I/O. Limited I/O is allowed, however programs such as vi are not supported.

This policy function requires Endpoint Privilege Management for Unix and Linux 7.1 clients (**pbrun**, **pbsh**, **pbksh**, **pbssh**, **pblocald**).



**Note:** Do not use **remotesystem()** as a procedure (without the **result** variable) in a policy that is processing **pbguid** requests.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
[result =] remotesystem( hostname, user, environment, timeout, cwd, "command and arguments"
[,inputstring]);
```

### Arguments

<b>hostname</b>	Required. The host on which to run the command. This can be short name, FQDN, or IP address.
<b>user</b>	Required. The user to execute the command as.
<b>environment</b>	Required. A list specifying the environment variables to execute the command with.
<b>timeout</b>	Required. The maximum time in seconds that the remote command is allowed to take. A timeout of zero indicates no timeout.
<b>cwd</b>	Required. Directory from which to execute the command.
<b>command</b>	Required. The command (possibly including path) and arguments to run.
<b>inputstring</b>	Optional. Command input, formatted into a single character string

## Return Values

If the result variable is specified, **remotesystem()** acts as a function returning the output of the command. If the result variable is not specified, the output from the command that is executed by the **remotesystem()** procedure appear on **stderr** of the requesting program (**pbrun**, **pbsh**, **pbksh**, **pbssh**).

The Endpoint Privilege Management for Unix and Linux variable status is set to the return code. In general, a return code of **0** means the command completed successfully. For a description of non-zero return codes, see the documentation for the command that is being run. A status of **-15** indicates a timeout.



### Example:

```
processlist = remotesystem( submithost, "root", {"PATH=/bin","TMPDIR=/tmp/"}, 20, "/tmp",  
"ps -ef", "" );
```

In this example, the **processlist** variable is assigned the output from the **ps** command executed on the **submithost**. Note that the optional input argument is a set of empty quotes, meaning that the command is not given any input.



### Example:

```
processlist = remotesystem( submithost, "root", {"PATH=/bin","TMPDIR=/tmp/"}, 20, "/tmp",  
"bash -c 'ps -ef | grep ^" +user+"'");
```

In this example, again, the **processlist** variable is assigned the output from the **ps** command executed on the **submithost**. Note that the optional input argument is not provided, meaning that the submituser's keyboard is connected through to the command. Note that **bash -c** is used to allow for a shell to process the multiple commands (**ps** and **grep**).



For more information, see the following:

- ["system" on page 442](#)
- ["status" on page 296](#)


## runtimewarn

### Description

After the specified number of minutes, a message is written to the user's **stderr**. If the optional message argument is not specified, the default message is: *WARNING: You have exceeded the maximum allowed session time.*

Internally, this feature makes use of the new read-only policy variables **runtimewarn** and **runtimewarnmsg** to communicate the details from the policy server to the run host.

This feature might typically be used to warn a user of an upcoming timeout specified by the **runtime-limit** variable.

 **Note:** The **runtimewarn** time limit is specified in minutes (within a procedure), while **runtimeout** is specified in seconds (as a variable).


This feature may also be used with the new **runtimewarnlog()** procedure described below.

### Syntax

```
runtimewarn( minutes [, message] );
```

### Arguments

<b>Minutes</b>	Required positive integer specifying the timeout in minutes.
<b>Message</b>	Optional string specifying a message to issue to the user on <b>stderr</b> .

 **Example:**

```
runtimewarn(20);
runtimewarn(20, "Warning, your session will expire soon!");
```

 For more information, see the following:

- ["runtime-limit" on page 210](#)
- ["runtimewarnlog" on page 441](#)



## runtimewarnlog

### Description

This feature requires an I/O log. After the specified number of minutes, a message is written to the log server's **syslog**. This message allows variable substitution using the **%variable%** syntax. Any variable recorded in the Accept event can be incorporated into the message. When the finish event is logged, the new **timelimitexceeded** variable is set to **1**. If the time limit is not exceeded, the **timelimitexceeded** variable is not recorded in the finish event. If the optional message argument is not specified, the default message is: *user:%user% exceeded time limit as %runuser%@%runhost% for %runargv%*

Internally, this feature makes use of the new read-only policy variables **runtimewarnlog** and **runtimewarnlogmsg** to communicate the details from the policy server to the run host.

This feature might typically be used to create log entries of the longer sessions, possibly after warning a user using **runtimewarn()** of an upcoming timeout specified by the **runtime-limit** variable.



**Note:** The **runtimewarnlog** time limit is specified in minutes (within a procedure), while **runtimeout** is specified in seconds (as a variable).

### Syntax

```
runtimewarnlog( minutes [, message] );
```

### Arguments

<b>Minutes</b>	Required positive integer specifying the timeout in minutes.
<b>Message</b>	Optional string specifying a message to <b>syslog</b> on the log server.



#### Example:

```
runtimewarnlog(20);
runtimewarnlog(20, "user:%user% exceeded session time limit");
```



For more information, see the following:

- ["runtime-limit" on page 210](#)
- ["runtimewarn" on page 440](#)

# system

## Description

The **system()** function is used to run commands on the policy server host as part of the policy. The Endpoint Privilege Management for Unix and Linux variable status is set to the return code of the command upon exit. By default, commands that are run by the **system()** function are run as root. However, commands can be run as different users by setting the Endpoint Privilege Management for Unix and Linux variable **subprocuser**.

Input to the command comes from the user's keyboard or from the **inputstring** if it is present. Output goes to the user's screen or to the result string variable, if present.



**Note:** Do not use **system()** without the **result** variable in a policy that is processing **pbguid** requests.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
[result =] system (command [,inputstring]);
```

## Arguments

<b>command</b>	Required. The command to run.
<b>inputstring</b>	Optional. Command input arguments, formatted into a single character string.

## Return Values

**result** contains the output of the command. If the result variable is not specified, the output from the command that is executed by the **system()** function appears on **stderr** of the requesting program (**pbrun**, **pbsh**, **pbksh**).

The Endpoint Privilege Management for Unix and Linux variable status is set to the return code. In general, a return code of **0** means the command completed successfully. For a description of non-zero return codes, see the documentation for the command that is being run.



### Example:

```
result = system ("echo date");
```

In this example, **result** is assigned **date\n** because the echo command outputs the string **date** with a newline character.



For more information, see the following:

**i**

- ["policygetenv" on page 453](#)
- ["policysetenv" on page 454](#)
- ["policyunsetenv" on page 455](#)
- ["status" on page 296](#)
- ["subprocuser" on page 298](#)

# unset

## Description

The **unset** procedure is used to remove temporary variables from the event and I/O log files when the variables are no longer needed. Variables that are required for the functioning of an Endpoint Privilege Management for Unix and Linux daemon may not be unset.

## Syntax

```
unset (variable);
```

## Arguments

**variable** Required. The temporary variable to remove.

## Return Values

Not applicable



### Example:

```
unset ("xyz");
```

In this example, removes the temporary variable **xyz** from the log files.



For more information, see the following:

- ["isset" on page 434](#)
- ["logomit" on page 253](#)

## NIS Functions

NIS functions are used to access the network information system. They are summarized in the following table.

Function	Description
<code>innetgroup()</code>	Determines if a machine is a member of a specific netgroup.
<code>inusernetgroup()</code>	Determines if a user is a member of a specific netgroup.

# innetgroup

## Description

The `innetgroup()` function determines if a specific machine is a member of a netgroup.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
result = innetgroup (netgroup, host [, user [, domain]])
```

## Arguments

<b>netgroup</b>	Required. Name of the netgroup to query.
<b>host</b>	Required. The name of the machine in question.
<b>user</b>	Optional. The user name.
<b>domain</b>	Optional. The user name.

## Return Values

<b>true</b>	The specified machine is a member of the specified netgroup.
<b>false</b>	The specified machine is not a member of the specified netgroup.



### Example:

```
result = innetgroup ("myhosts", "machine1");
```

In this example, **result** contains an integer value of **1 (true)** if **machine1** is a member of the netgroup **myhosts**. **result** contains an integer value of **0 (false)** if **machine1** is not a member of the netgroup **myhosts**.



For more information, see ["inusernetgroup"](#) on page 447.

# inusernetgroup

## Description

The `inusernetgroup()` function determines if a user is a member of a specific netgroup.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
result = inusernetgroup (netgroupname, username);
```

## Arguments

<b>netgroupname</b>	Required. Name of the netgroup to query.
<b>username</b>	Required. Name of the user in question.

## Return Values

<b>true</b>	The specified user is a member of the specified netgroup.
<b>false</b>	The specified user is not a member of the specified netgroup.



### Example:

```
currentuser = "sysadm1";  
result = inusernetgroup ("myhosts", currentuser);
```

In this example, **result** contains an integer value of **1 (true)** if **sysadm1** is a member of the netgroup **myhosts** or **0 (false)** if **sysadm1** is not a member of the netgroup.



For more information, see ["innetgroup" on page 446](#).

## Policy Environment Functions and Procedures

Policy environment functions and procedures are used to get, set, and unset the values of environment variables on the policy server host during the run of a policy. The following table summarizes these functions and procedures.

Function/ Procedure	Description
<code>getlistsetting()</code>	Returns the value of a list setting in the current policy server host settings file. <b>Version 4.0 and earlier:</b> function not available . <b>Version 5.0 and later:</b> function available.
<code>getnumericsetting()</code>	Returns the value of a numeric setting in the current policy server host settings file. <b>Version 4.0 and earlier:</b> function not available. <b>Version 5.0 and later:</b> function available.
<code>getstringsetting()</code>	Returns the value of a string setting in the current policy server host settings file. <b>Version 4.0 and earlier:</b> function not available. <b>Version 5.0 and later:</b> function available.
<code>getyesnosetting()</code>	Returns the value of a yes/no setting in the current policy server host settings file. <b>Version 4.0 and earlier:</b> function not available. <b>Version 5.0 and later:</b> function available.
<code>policygetenv()</code>	Sets the value of a local variable to that of an environment variable on the policy server host.
<code>policysetenv</code>	Enables the user to locally set an environment variable on the policy server host.
<code>policyunsetenv</code>	Used to locally unset the value of an environment variable on the policy server host.



## getlistsetting

- **Version 4.0 and earlier:** `getlistsetting()` function not available.
- **Version 5.0 and later:** `getlistsetting()` function available.

### Description

The `getlistsetting()` function returns the value of a list setting in the current policy server host settings file.

### Syntax

```
getlistsetting (setting-name)
```

### Arguments

<b>setting-name</b>	Required. The list setting to retrieve.
---------------------	---

### Return Values

A list that contains the value of the specified setting.

#### Example:

```
submitMasterList = getlistsetting("submitmasters");
```

#### For more information, see the following:

- ["getnumericsetting" on page 450](#)
- ["getstringsetting" on page 451](#)
- ["getyesnosetting" on page 452](#)

## getnumericsetting

- **Version 4.0 and earlier:** `getnumericsetting()` function not available.
- **Version 5.0 and later:** `getnumericsetting()` function available.

### Description

The `getnumericsetting()` function returns the value of a numeric setting in the current policy server host settings file.

### Syntax

```
getnumericsetting (setting-name)
```

### Arguments

<b>setting-name</b>	Required. The numeric setting to retrieve.
---------------------	--

### Return Values

A number that contains the value of the specified setting.

#### Example:

```
delayTime= getnumericsetting("masterdelay");
```

#### For more information, see the following:

- ["getlistsetting" on page 449](#)
- ["getstringsetting" on page 451](#)
- ["getyesnosetting" on page 452](#)

## getstringsetting

- **Version 4.0 and earlier:** `getstringsetting()` function not available.
- **Version 5.0 and later:** `getstringsetting()` function available.

### Description

The `getstringsetting()` function returns the value of a string setting in the current policy server host settings file.

### Syntax

```
getstringsetting (setting-name)
```

### Arguments

<b>setting-name</b>	Required. The string setting to retrieve.
---------------------	---

### Return Values

A string that contains the value of the specified setting.

#### Example:

```
policyDirectory = getstringsetting("policydir");
```

#### For more information, see the following:

- ["getlistsetting" on page 449](#)
- ["getnumericsetting" on page 450](#)
- ["getyesnosetting" on page 452](#)

## getyesnosetting

- **Version 4.0 and earlier:** `getyesnosetting()` function not available.
- **Version 5.0 and later:** `getyesnosetting()` function available.

### Description

The `getyesnosetting()` function returns the value of a yes/no setting in the current policy server host settings file.

### Syntax

```
getyesnosetting (setting-name)
```

### Arguments

<b>setting-name</b>	Required. The yes/no setting to retrieve.
---------------------	---

### Return Values

A number containing the value of the specified setting.

- **0** False. A **no** value
- **1** True. A **yes** value

#### Example:

```
useRNS=getyesnosetting("registrynameservice");
```

#### For more information, see the following:

- ["getnumericsetting" on page 450](#)
- ["getstringsetting" on page 451](#)

## policygetenv

### Description

The `policygetenv()` function sets the value of a local variable to that of an environment variable on the policy server.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = policygetenv (variable);
```

### Arguments

**variable**

Required. The environment variable on the policy server host that is used to set the value of the local variable.

### Return Values

The value of the specified environment variable.



**Example:**

```
termtype = policygetenv("TERM");
```

In this example, the local variable `termtype` is set equal to the `TERM` variable on the policy server.



For more information, see the following:

- ["policysetenv" on page 454](#)
- ["policyunsetenv" on page 455](#)
- ["system" on page 442](#)

# policysetenv

## Description

The `policysetenv` procedure is used to locally set an environment variable on the policy server host.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
policysetenv(variable, value)
```

## Arguments

<b>variable</b>	Required. The environment variable on the policy server host to set.
<b>value</b>	Required. The value to set the variable to.

## Return Values

Not applicable



### Example:

```
policysetenv("PATH", "/bin:/usr/bin:/usr/sbin");
```

In this example, the policy server host's `PATH` variable is set to `/bin:/usr/bin:/usr/sbin`.



For more information, see the following:

- ["policyunsetenv" on page 455](#)
- ["system" on page 442](#)

## policyunsetenv

### Description

The `policyunsetenv` procedure is used to locally unset an environment variable on the policy server.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
policyunsetenv(variable)
```

### Arguments

**variable**

Required. The environment variable to be unset on the policy server.

### Return Values

The value of the environment variable.



**Example:**

```
policyunsetenv("OLDPATH");
```

In this example, the environment variable **OLDPATH** is removed from the policy server's environment.



For more information, see "[policysetenv](#)" on page 454.

## String Functions

String functions are used to manipulate and handle string variables. The following table summarizes the available string functions.

Function	Description
<code>charlen()</code>	Returns the number of single-byte or multiple-byte characters in a string. <b>Version 6.0.1 and earlier:</b> function not available. <b>Version 6.1 and later:</b> function available.
<code>gsub()</code>	Replaces all occurrences of a pattern within a source string.
<code>length()</code>	Returns the number of bytes in a string.
<code>pad()</code>	Pads a string with a specified pad character.
<code>sub()</code>	Replaces the first occurrence of a pattern within a source string.
<code>substr()</code>	Extracts part of a string.
<code>tolower()</code>	Returns a copy of a string, converted to all lowercase. <b>Version 4.0 and earlier:</b> function not available. <b>Version 5.0 and later:</b> function available.
<code>toupper()</code>	Returns a copy of a string, converted to all uppercase. <b>Version 4.0 and earlier:</b> function not available. <b>Version 5.0 and later:</b> function available.



# charlen

## Description

The **charlen()** function returns the number of characters (single-byte or multiple-byte) in the argument string.

By contrast, the **length()** function returns the number of bytes in a string, which equals the number of characters only for single-byte character encodings. Also in contrast to the **length()** function, the **charlen()** function does not accept a list as an argument.

## Syntax

```
result = charlen (string)
```

## Arguments

**string**

Required. A character string in single-byte or multiple-byte encoding.

## Return Values

**result** Contains an integer that indicates the number of characters in **string**.



### Example:

```
string = "BeyondTrust Software";  
howLong = charlen(string);
```

In this example, the **howLong** variable contains the integer value **20**.



For more information, see ["length" on page 459](#).

# gsub

## Description

The `gsub()` function replaces all occurrences of the pattern within the source string.

## Syntax

```
result = gsub (pattern, replacement, sourcestring);
```

## Arguments

<b>pattern</b>	Required. The regular expression pattern to search for.
<b>replacement</b>	Required. The replacement string.
<b>sourcestring</b>	Required. The source string to search for all occurrences of pattern.

## Return Values

The resulting string.



### Example:

```
newstring = gsub("abc", "xyz", startingstring)
```

In this example, **xyz** replaces all occurrences of **abc** in **startingstring**.



For more information, see "[sub](#)" on page 461.

# length

## Description

The **length()** function returns the length, in bytes, of the specified string. Note that for multiple-byte character sets, the number of bytes is not the same as the number of characters; use the **charlen()** function instead.

## Syntax

```
result = length (string1);
```

## Arguments

**string1**

Required. The string for which a length value is determined.

## Return Values

**result** is set to the length (as an integer value) of **string1**.



### Example:

```
currentuser = "John Stone";  
result = length (currentuser);
```

In this example, **result** is an integer with a value of **10**.

# pad

## Description

The `pad()` function creates a new string from `string1` based on the specified length (`length`) and pad character (`padchar`). If `string1` is shorter than the specified length, then it is padded by adding the appropriate number of the specified pad character to the end of the string. If `string1` is longer than the specified length, then it is truncated and pad characters are not added. If the length of `string1` is equal to the specified length, no changes are made and the original contents of `string1` are returned in `result`.

The `pad()` function supports both single-byte and multiple-byte character sets.

## Syntax

```
result = pad (string1, length, padchar);
```

## Arguments

<b>string1</b>	Required. The string field to pad using the specified pad character.
<b>length</b>	Required. The length (number of characters) of the new string.
<b>padchar</b>	Required. The pad character that is used to pad <code>string1</code> , if <code>string1</code> is shorter than the value specified in <code>length</code> .

## Return Values

`result` contains the new string.



### Example:

```
string = "Jim White";
result = pad (string1, 10, "123");
```

In this example, `result` contains `Jim White1`.



### Example:

```
string1 = "書策搜";
result = pad (string1, 4, "文");
```

In this example, `result` contains the value `書策搜文`.

## sub

### Description

The `sub()` function replaces the first occurrence of the pattern within the source string.

### Syntax

```
result = sub (pattern, replacement, sourcestring);
```

### Arguments

<b>pattern</b>	Required. The regular expression pattern to search for.
<b>replacement</b>	Required. The replacement string.
<b>sourcestring</b>	Required. The source string to search for the first occurrence of <b>pattern</b> .

### Return Values

The resulting string



#### Example:

```
newstring = sub("\n$", "", textstring)
```

*In this example, the first occurrence of a trailing new line is replaced with nothing, effectively chopping it off.*



For more information, see ["gsub" on page 458](#).

## substr

### Description

The **substr()** function extracts a substring from the specified string variable (**string1**) based on the provided starting position (**start**) and optional length (**length**). The first character in **string1** is position **1**. If the optional length is not specified, then **substr()** returns all characters from the starting position through the end of the string.

An error is generated if a negative starting position is given or if the starting position is past the end of the string (for example, if **string1** is 10 characters long and the specified starting location is **12**).

The **substr()** function supports single-byte and multiple-byte character strings. In either case, the starting position and length are in units of characters, not bytes.

### Syntax

```
result = substr (string1, start [, length]);
```

### Arguments

<b>string1</b>	Required. The string from which a substring is extracted.
<b>start</b>	Required. Specifies the substring starting position within <b>string1</b> . The first character in <b>string1</b> is position <b>1</b> .
<b>length</b>	Optional. Specifies the maximum length of the substring.

### Return Values

**result** contains the new substring.



#### Example:

```
UserList = "User1, User2, User3";  
result1 = substr (UserList, 8, 5);  
result2 = substr (UserList, 8);
```

In this example, **result1** contains the value **User2**, and **result2** contains **User2, User3**.



#### Example:

```
UserList = "書策搜書策搜書策搜書策搜書策搜書策搜書策搜";  
result = substr (UserList, 8, 5);
```



In this example, **result** contains the value 策搜書策搜.

## tolower

- **Version 4.0 and earlier:** `tolower()` function not available.
- **Version 5.0 and later:** `tolower()` function available.

### Description

The `tolower()` function returns a copy of a string, converted to all lowercase.

The `tolower()` function supports both single-byte and multiple-byte character sets. If the character set for the locale does not distinguish uppercase and lowercase characters, the original string is returned unchanged.

### Syntax

```
tolower (string)
```

### Arguments

<b>string</b>	Required. The string to convert to lowercase.
---------------	---

### Return Values

A string that contains a lowercase copy of the argument.



#### Example:

```
result = tolower (variableName);  
result = tolower("String Constant");
```



For more information, see ["toupper" on page 465](#).



## toupper

- **Version 4.0 and earlier:** `toupper()` function not available.
- **Version 5.0 and later:** `toupper()` function available.

### Description

The `toupper()` function returns a copy of a string, converted to all uppercase.

The `toupper()` function supports both single-byte and multiple-byte character sets. If the character set for the locale does not distinguish uppercase and lowercase characters, the original string is returned unchanged.

### Syntax

```
toupper (string)
```

### Arguments

**string**

Required. The string to convert to uppercase.

### Return Values

A string that contains an uppercase copy of the argument.



#### Example:

```
result = toupper (variableName);  
result = toupper ("String Constant");
```



For more information, see ["tolower" on page 464](#).

## Task Control Procedures

The task control procedures are used to control the execution of the secured task. These functions are summarized in the following table.

Procedure	Description
<b>setkeystrokeaction</b>	Used in a policy to override <b>forbidkeypatterns</b> and <b>forbidkeyaction</b> , which will be discontinued at a future date

# setkeystrokeaction

## Description

The **setkeystrokeaction** procedure looks for a keystroke pattern in the input stream and performs the specified action. It extends the functionality of the **forbidkeypatterns** list and **forbiddenkeyaction** string. If used in a policy, **setkeystrokeaction** overrides **forbidkeypatterns** and **forbidkeyaction**, which will be discontinued at a future date.



*Note: The **setkeystrokeaction** function is not supported in local mode.*

## Syntax

```
setkeystrokeaction(pattern, patterntype, action [, message]);
```

## Arguments

<b>pattern</b>	Required. The pattern to match. This can be a shell-type template or regular expression.
<b>patterntype</b>	Required. The type of search, specified by the pattern argument. Valid values are <b>shell</b> for shell-style pattern matching or <b>re</b> for regular expression matching.
<b>action</b>	Required. The action to take if the pattern is found. If set to <b>reject</b> , the program aborts and the action is logged in the Endpoint Privilege Management for Unix and Linux event log and syslog (if in use). A value of <b>ignore</b> results in no action being taken when the pattern is encountered. Any other value is used to tag the keystroke event in the event log.
<b>message</b>	Optional. Add an optional message to display when keystrokes are rejected.  The policy server, submithost, and runhost components must be at version 22.3 for the message feature to work.  In EPM-UL 22.2 and earlier, the secured task is terminated but the user sees: "3005 Request ended unexpectedly" followed by the normal shell prompt, but not aligned.  When the optional message is used, the message replaces the "3005 Request ended unexpectedly" and the output is aligned.


## Return Values


None



*Example:*


```
setkeystrokeaction("*rm*", "shell", "reject");
```

 In this example, **setkeystrokeaction** is set to terminate the current job if the pattern **rm** is found anywhere in the input stream. This would react to **rm**, **/bin/rm**, **disarm**, and **alarm**.

 **Example:**


```
setkeystrokeaction("*rm*", "shell", "warn");
```

In this example, if **rm** is found anywhere in the input stream, **setkeystrokeaction** is configured to record the keystroke event with a **warn** tag in the event log.

 **Example:**


```
setkeystrokeaction("rm", "re", "reject");
```

In this example, the job is terminated if the pattern **rm** is seen anywhere in the input.

 **Example:**

```
setkeystrokeaction("[[:boundary:]]rm[[:boundary:]]", "re", "user ran rm");
```

In this example, the **setkeystrokeaction** procedure logs a keystroke event and tags it with **user ran rm** if **rm** is seen as an entire word. It ignores words that contain the letters **rm** (for example, **disarm** or **alarm**) but would react to **rm** and **/bin/rm**.

 **Example:**

```
setkeystrokeaction("*fdisk*", "shell", "reject", "Illegal command has been reported");
```

In this example, the **setkeystrokeaction** logs a reject event and displays an error using the message option.

 For more information, see the following:

- ["forbidkeyaction" on page 246](#)
- ["forbidkeypatterns" on page 247](#)

## Task Environment Functions and Procedures

Task environment functions are used to manage task environment variables. The task environment functions and procedures are summarized in the following table.

Function/ Procedure	Description
<b>keystrokeactionprofile</b>	Provides advanced control over remote SSH and Telnet sessions.
<b>getenv()</b>	Retrieves an environment variable from <b>env</b> .
<b>keepenv</b>	Keep only the listed variables. Clear all others from <b>runenv</b> .
<b>setenv</b>	Sets the value of an environment variable in <b>runenv</b> .
<b>unsetenv</b>	Delete an environment variable from <b>runenv</b> .

All task environment functions and procedures act upon the Endpoint Privilege Management for Unix and Linux environment variables **env** and **runenv**.

**env** and **runenv** are list variables that contain all of the environment variables that are defined for the current request. **env** is a read-only variable that contains task information from the initial task request on the submit host. **runenv** is a modifiable variable that contains the task information that is actually used during task execution on the run host.

**env** and **runenv** have the following format:

```
{"variable-name=value", "variable-name=value", ...};
```

**i** For more information on **env** and **runenv**, see ["Task Information Variables" on page 110](#).

# keystrokeactionprofile

## Description

The Advanced Keystroke Action component was introduced in Endpoint Privilege Management for Unix and Linux version 9.4.2 and provides advanced control over remote SSH and Telnet sessions.

## Syntax

```
keystrokeactionprofile="profile";
```

## Arguments

profile

## Required

A configured Advanced Keystroke Action profile

## Return Values

None



### Example:

```
keystrokeactionprofile="demo";
```



For more information on Advanced Keystroke Action, see *Advanced Keystroke Action in the [Endpoint Privilege Management for Unix and Linux Administration Guide](https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm)* at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>.

# getenv

## Description

The `getenv()` function returns the value of the environment variable that is specified in the name parameter.

Values that are returned by `getenv` are unaffected by the `setenv`, `keepenv`, and `unsetenv` procedures, because `getenv` accesses the user's original, read-only task environment variable information that is stored in the `env` variable from the client on the submit host.

## Syntax

```
result = getenv (name, value);
```

## Arguments

<b>name</b>	Required. A string that contains the name of a task environment variable.
<b>value</b>	Optional. A string that contains the value to use if the environment variable name does not exist in <code>env</code> .

## Return Values

If the specified task environment variable is found, then `result` contains its value.

If the specified task environment variable is not found, then the value returns as a string. If `value` is not specified, then an empty string is returned.



### Example:

```
result = getenv ("TZ");
```

*In this example, the value of the environment variable **TZ** is retrieved from `env` and stored in **result**. If **TZ** is not found, then **result** is empty.*



For more information, see "[setenv](#)" on page 473.

## keepenv

### Description

The **runenv** variable is a list in which each element contains an environment variable. The format of a **runenv** element is **name=value**, where name is the name of an environment variable and value is the current value of that variable.

The **keepenv** procedure modifies the **runenv** variable so that it contains only the variables that are listed as input parameters. All other environment variables that are stored in the **runenv** variable are deleted.

**keepenv** is typically used to limit the set of environment variables that are available to the current task during execution.

### Syntax

```
keepenv (name1, [,name2, ...]);
```

### Arguments

<b>name1</b>	Required. String that contains the name of a task environment variable that should be stored in <b>runenv</b> .
<b>name2</b>	Optional. String that contains the name of a task environment variable that should be stored in <b>runenv</b> .

### Return Values

Because **keepenv** is a procedure, no return value is set.



#### Example:

```
keepenv ("TERM", "CWD", "PS1");
```

In this example, **runenv** contains the environment variables **TERM**, **CWD**, and **PS1**. All other environment variables are deleted from **runenv**.



For more information, see "[setenv](#)" on page 473.



## setenv

### Description

The **setenv** procedure sets the value of an environment variable in **runenv**.

### Syntax

```
setenv (name, value);
```

### Arguments

<b>name</b>	Required. String that contains the name of the variable to set in <b>runenv</b> .
<b>value</b>	Required. String that contains the value of the specified variable.

### Return Values

Because **setenv** is a procedure, no return value is set.



#### Example:

```
setenv ("SHELL", "/bin/sh");
```

In this example, the **SHELL** environment variable that is stored in **runenv** is set to **/bin/sh**.



For more information, see ["keepenv" on page 472](#).

## unsetenv

### Description

The **unsetenv** procedure deletes environment variables from **runenv**.

### Syntax

```
unsetenv (name1 [, name2, ...]);
```

### Arguments

<b>name1</b>	Required. A string or a list of character strings that contain the names of <b>runenv</b> environment variables to delete.
<b>name2</b>	Optional. A string or a list of character strings that contain the names of <b>runenv</b> environment variables to delete.

### Return Values

Because **unsetenv** is a procedure, no return value is set.



#### Example:

```
unsetenv ("IFS", "USER");
```

*In this example, the **runenv** environment variables **IFS** and **USER** are deleted.*



For more information, see "[keepenv](#)" on page 472.

## Command Line Parsing Functions

Endpoint Privilege Management for Unix and Linux provides functions to facilitate the parsing of command arguments. The following table summarizes these functions.

Function	Description
<code>getopt()</code>	Examines a list of arguments for short options. <b>Version 3.5 and earlier:</b> function not available. <b>Version 4.0 and later:</b> function available.
<code>getopt_long()</code>	Examines a list of arguments for any combination of short or long-style options. <b>Version 3.5 and earlier:</b> function not available. <b>Version 4.0 and later:</b> function available.
<code>getopt_long_only()</code>	Examines a list of arguments long-style options. <b>Version 3.5 and earlier:</b> function not available. <b>Version 4.0 and later:</b> function available.

## getopt

- **Version 3.5 and earlier:** `getopt()` function not available.
- **Version 4.0 and later:** `getopt()` function available.

### Description

Breaks up command lines for easy parsing and to check for legal options. This function examines a list of arguments for short options.

A short option consists of a dash followed by a single letter and possibly a parameter. For example, in the command **command -a -b name -c**, **-a** and **-c** are short options with no extra parameter, and **-b** is a short option with the parameter name.

On the first invocation, **getopt()** examines the first argument. On subsequent invocations, it picks up where it left off and examines the next argument.

### Syntax

```
result = getopt (argc, argv, short-option-string)
```

### Arguments

<b>argc</b>	Required. Number. The number of entries that are in the argument array list <b>argv</b> .
<b>argv</b>	Required. List. The argument array to process.
<b>short-option-string</b>	Required. A string that contains valid options. This list contains the letters for the short options. Each letter can be followed by a single colon (:) to indicate a required argument if the option is found. Each letter can be followed by two colons (::) to indicate an optional argument to the option. The leading characters of the short option string can modify the search characteristics as follows: A leading <b>+</b> stops parsing as soon as the first non-option parameter is found that is not an option argument. All other parameters are treated as non-option strings. A leading <b>-</b> returns non-option parameters at the place where they are found.

### Return Values

If a valid option is found, then the function returns that option. If an optional or required argument is associated with the option, then the policy variable **optarg** contains the value of that argument.

If no valid option is found or if a required argument is missing, then a question mark (?) is returned. The variable **optchar** is set to the letter of the problem option.

When the end of the argument list is found, an empty string, "", is returned.

The variable **optind** is set to the subscript of the next string in the **argv** list.

**Example:**

```
result = getopt(argc, argv, "ab:c");
```

This example examines the list of augments in **argv** looking for **-a** or **-c** without a parameter, or **-b** with a parameter.



For more information, see the following:

- ["getopt\\_long" on page 478](#)
- ["getopt\\_long\\_only" on page 480](#)
- ["optarg" on page 233](#)
- ["opterr" on page 234](#)
- ["optind" on page 235](#)
- ["optopt" on page 236](#)
- ["optreset" on page 237](#)

## getopt\_long

- **Version 3.5 and earlier:** `getopt_long()` function not available.
- **Version 4.0 and later:** `getopt_long()` function available.

### Description

Breaks up command lines for easy parsing and to check for legal options. This function examines a list of arguments for any combination of short-style or long-style options.

A short option consists of a dash followed by a single letter and possibly a parameter. For example, in the command **command -a -b name -c**, **-a** and **-c** are short options with no extra parameter, and **-b** is a short option with the parameter name.

A long option consists of two dashes followed by a name and possibly a parameter. For example, in the command **command --option1 --option2=2 --option3 parameter --option4**, **--option1** and **--option4** are long options with no parameters, and **--option2** and **--option3** are options with extra parameters.

On the first invocation, it examines the first argument. On subsequent invocations, it picks up from where it left off and examines the next argument.

### Syntax

```
result = getopt_long(argc, argv, short-option-string, long-option-list)
```

### Arguments

<b>argc</b>	Required. Number. The number of entries that are in the argument array list <b>argv</b> .
<b>argv</b>	Required. List. The argument array to process.
<b>short-option-string</b>	Required. A string that contains valid options. This list contains the letters for the short options. Each letter can be followed by a single colon (:) to indicate a required argument if the option is found. Each letter can be followed by two colons (::) to indicate an optional argument to the option. The leading characters of the short option string can modify the search characteristics as follows: A leading <b>+</b> stops parsing as soon as the first non-option parameter is found that is not an option argument. All other parameters are treated as non-option strings. A leading <b>-</b> returns non-option parameters at the place where they are found.
<b>long-option-list</b>	Required. List. A list of strings that contains the long options. Each parameter can be followed by a single colon (:) to indicate it has a required parameter, or two colons (::) to indicate that it may have an optional parameter.

### Return Values

If a valid option is found, then the function returns that option. If an optional or required argument is associated with the option, then the policy variable **optarg** contains the value of that argument.

If no valid option is found, or if a required argument is missing, then a question mark (?) is returned. The variable **optchar** is set to the letter of the problem option.

When the end of the argument list is found, an empty string, "", is returned.

The variable **optind** is set to the subscript of the next string in the **argv** list.

**Example:**

```
result = getopt_long(argc, argv, "ab:c", {"long1", "long2:"});
```

*This example examines the list of arguments in **argv** looking for **-a** or **-c** without a parameter, **-b** with a parameter, **--long1** without a parameter, or **--long2** with a parameter.*



For more information, see the following:

- ["getopt" on page 476](#)
- ["getopt\\_long\\_only" on page 480](#)
- ["optarg" on page 233](#)
- ["opterr" on page 234](#)
- ["optind" on page 235](#)
- ["optopt" on page 236](#)
- ["optreset" on page 237](#)
- ["optstrictparameters" on page 238](#)

## getopt\_long\_only

- **Version 3.5 and earlier:** `getopt_long_only()` function not available.
- **Version 4.0 and later:** `getopt_long_only()` function available.

### Description

Breaks up command lines for easy parsing and to check for legal options. This function examines a list of arguments for long-style options only.

A long option usually consists of two dashes followed by a name and possibly a parameter. When using the long-only version of **getopt**, the function also recognizes a single dash at the front of an option. For example, in the command **command --option1 --option2=2 --option3 parameter --option4**, **--option1** and **--option4** are long options with no parameters, and **--option2** and **--option3** are options with extra parameters.

On the first invocation, it examines the first argument. On subsequent invocations, it picks up from where it left off and examines the next argument.

### Syntax

```
result = getopt_long_only (argc, argv, short-option-string, long-option-list)
```

### Arguments

<b>argc</b>	Required. Number. The number of entries in the argument array list <b>argv</b> .
<b>argv</b>	Required. List. The argument array to process.
<b>short-option-string</b>	Required. Although this function does not process short options, the entry is still available to specify the leading control modifiers. The leading characters of the short option string may modify the search characteristics as follows: A leading <b>+</b> stops parsing as soon as the first non-option parameter is found that is not an option argument. All other parameters are treated as non-option strings. A leading <b>-</b> returns non-option parameters at the place where they are found.
<b>long-option-list</b>	Required. List. A list of strings that contains the long options. Each parameter can be followed by a single colon (:), to indicate it has a required parameter, or two colons (::) to indicate that it may have an optional parameter.

### Return Values

If a valid option is found, then the function returns that option. If an optional or required argument is associated with the option, then the policy variable **optarg** contains the value of that argument.

If no valid option is found, or if a required argument is missing, then a question mark (?) is returned. The variable **optchar** is set to the letter of the problem option.

When the end of the argument list is found, an empty string, "", is returned.

The variable **optind** is set to the subscript of the next string in the **argv** list.



**Example:**

```
result = getopt_long_only (...)
```



For more information, see the following:

- ["getopt" on page 476](#)
- ["getopt\\_long" on page 478](#)

## User and Password Functions

User and password functions are used to verify passwords and provide password control. The following table summarizes the user and password functions.

Element	Description
<b>getfullname()</b> function	Returns the specified user's full name.
<b>getgroup()</b> function	Returns the specified user's primary group.
<b>getgrouppasswd()</b> function	Prompts for a user and the password of one of the members of the group specified as argument to the function.
<b>getgroups()</b> function	Returns all groups the specified user is in.
<b>gethome()</b> function	Returns the specified user's home directory.
<b>getshell()</b> function	Returns the specified user's default login shell.
<b>getstringpasswd()</b> function	Prompts the user for a special password.
<b>getuid()</b> function	Returns the user's uid.
<b>getuserpasswd()</b> function	Prompts the user for the password belonging to the specified user.
<b>ingroup()</b> function	Determines whether a user belongs to a specific group.
<b>submitconfirmuser()</b> function	Controls if a user must enter a password before the current task request can be accepted.
<b>runconfirmuser</b> variable	Controls whether a user must enter a password before the current task request can be executed.
<b>runconfirmmessage</b> variable	Contains the prompt that is displayed when the submitting user is required to provide a password.

# getfullname

## Description

The `getfullname()` function retrieves the full name of the specified user. This information is taken from the `gecos` field of `/etc/passwd` on the policy server host or the password map in NIS.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
result = getfullname([user]);
```

## Arguments

**user**

Optional. The name of the user ID for which a full name is retrieved. The value of the `runuser` variable is used when this argument is not specified.

## Return Values

The full name of the user as specified in the `gecos` field of `/etc/passwd` or the NIS password map. An error is returned if the user is null or invalid.



**Example:**

```
result = getfullname();
```

In the example, **result** is assigned the full name of the `runuser`.



**Example:**

```
result = getfullname("user1");
```

In this example, **result** is assigned the full name of `user1`.

# getgroup

## Description

The `getgroup()` function retrieves the first occurrence of the group name that is associated with the GID to which the specified user belongs. This information is taken from the `gecos` field of `/etc/passwd` on the policy server host or the password map in NIS.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
result = getgroup([user]);
```

## Arguments

**user**

Optional. The name of the user for which the group should be retrieved. If this argument is not specified, the value of the `runuser` variable is used.

## Return Values

If the user is found, **result** contains the first occurrence of the group name that is associated with the GID to which the specified user belongs as found in `/etc/passwd` or the NIS password map. An error is returned if the user is null or invalid.



**Example:**

```
result = getgroup("SysAdm001");
```

In this example, if `SysAdm001` is found, **result** contains the first occurrence of the group name that is associated with the GID to which the specified user belongs.



For more information, see ["getgroups" on page 486](#).

# getgrouppasswd

## Description

The `getgrouppasswd()` function prompts first for a user (member of the specified group) then for the password of that user.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
result = getgrouppasswd(group[, prompt[, attempts]]);
```

## Arguments

<b>group</b>	Required. The name of the group for which a username and password must be entered.
<b>prompt</b>	Optional. The password prompt that is displayed to the user. If a prompt is not provided, then the following default prompt is displayed: <b>Enter the username and group of someone in the &lt;group name&gt; group.</b>
<b>attempts</b>	Optional. Number of attempts that the user gets to enter the correct password. If the user does not enter the correct password in the specified number of attempts, then the task request is rejected. If the number of attempts is not specified, then the default value of <b>3</b> is used.

## Return Values

<b>true</b>	Password matched the user password.
<b>false</b>	Password did not match the user password.



### Example:

```
result = getgrouppasswd("HelpDeskUsers", "Please enter HelpDesk Password:", 1);
```

In this example, a user has one attempt to enter a correct username and password for a member of the **HelpDeskUsers** group. If the correct password is not entered in one attempt, then **result** contains **0**. If the correct password is entered in one attempt, then **result** contains **1**.

## getgroups

### Description

The **getgroups()** function retrieves a list of all groups to which the specified user belongs. This information is taken from the **/etc/groups** file on the policy server host or the group map in NIS.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = getgroups([user]);
```

### Arguments

**user**

Optional. The name of the user for which the secondary group names should be retrieved. If this argument is not specified, then the value of the **runuser** variable is used.

### Return Values

A list of character strings that contains all of the groups that the user belongs to. An error is returned if the user is invalid or null.



**Example:**

```
result = getgroups(runuser);
```



For more information, see "[getgroup](#)" on page 484.

# gethome

## Description

The `gethome()` function retrieves the home directory for the specified user. This information is obtained from the home directory field of `/etc/passwd` or the NIS password map.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
result = gethome([user]);
```

## Arguments

**user**

Optional. The name of the user for which home directory information should be retrieved. If this argument is not specified, then the value of the `runuser` variable is used.

## Return Values

A string that contains the specified user's home directory from the home directory field of `/etc/passwd` or the NIS map. If the user is not found, then `result` contains a blank string.



**Example:**

```
result = gethome("JSmith");
```

In this example, the home directory for the user `JSmith` is returned in `result`. For example, `/home/JSmith`.

# getshell

## Description

The `getshell()` function retrieves the default login shell of the specified user. This information is obtained from the shell field of `/etc/passwd` or the NIS password map.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
result = getshell([user]);
```

## Arguments

**user**

Optional. The name of the user for which shell information should be retrieved. If the user is not specified, then the value of the `runuser` variable is used.

## Return Values

A string that contains the default login shell for the specified user from the shell field of `/etc/passwd` or the password NIS map. If the username is not found or is invalid, then the policy is rejected with an error code.



**Example:**

```
result = getshell("JSmith");
```

In this example, the default shell information for the account `JSmith` is returned in **result**. For example, `/bin/sh`.



## getstringpasswd

### Description

The `getstringpasswd()` function prompts the user for a password and compares the answer against the previously encrypted password.



**Note:** The user's failure to provide the correct password does not automatically result in a rejection of the secured task request. The policy should examine the result of the `getstringpasswd()` function and respond accordingly.

### Syntax

```
result = getstringpasswd(encryptedpassword[, prompt [, attempts]]);
```

### Arguments

<b>encryptedpassword</b>	Required. An encrypted password, which can be generated by <code>pbpasswd</code> . The clear text form of this password is the password that the user is expected to enter.
<b>prompt</b>	Optional. A user prompt that describes the desired password. If none is specified, then the default prompt <b>Password:</b> is used.
<b>attempts</b>	Optional. Number of attempts the user gets to specify the correct password. The default value for attempts is <b>3</b> .

### Return Values

<b>true</b>	The answer matched the password.
<b>false</b>	The answer did not match the password.



#### Example:

```
result = getstringpasswd(<encrypted string>, "Please enter the Backup Task Password: ", 2);
```

In this example, **result** contains **true** if the user enters the correct Backup Task Password. If the correct password is not entered in two attempts, the function sets **result** to **false**.

# getuid

## Description

The `getuid()` function returns the user ID number for the specified user. This information is taken from the `gecos` field of `/etc/passwd` on the policy server host or the password map in NIS.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

## Syntax

```
result = getuid([user]);
```

## Arguments

**user**

Optional. The name of the user for which a user ID number should be returned. If this argument is not specified, then the value of the `runuser` variable is used.

## Return Values

**result** contains the uid of the specified user of `/etc/passwd` or the NIS password map. An error is returned if the user is null or invalid.



**Example:**

```
result = getuid("root");
```



For more information, see the following:

- ["getfullname" on page 483](#)
- ["getgroup" on page 484](#)
- ["gethome" on page 487](#)
- ["getshell" on page 488](#)

# getuserpasswd

## Description

The `getuserpasswd()` function prompts the user for the password that belongs to the specified user on the policy server. The password is not echoed to the screen as it is typed.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).



**Note:** The user's failure to provide the correct password does not automatically result in a rejection of the secured task request. The policy should examine the result of the `getuserpasswd()` function and respond accordingly.

## Syntax

```
result = getuserpasswd(user[, prompt[, attempts[, name, time]]]);
```

## Arguments

<b>user</b>	Required. The user whose password must be entered.
<b>prompt</b>	Optional. The prompt to display to the user.
<b>attempts</b>	Optional. The number of attempts that the user has to enter the correct password. The default value for attempts is <b>3</b> .
<b>name</b>	Optional. The name of a file or persistent variable whose age/expiration determines the re-authentication grace period. If the value starts with a dollar sign (\$), it is treated as a persistent variable, otherwise it is treated as a filename. If name is specified, the <b>time</b> parameter (below) is required.
<b>time</b>	Required if <b>name</b> argument (above) is specified). The time/expiry date (number of seconds) after which a prompt is forced. <code>getuserpasswd()</code> returns <b>true</b> without prompting the user for a password if one of the following is true: <ol style="list-style-type: none"> <li>1. The file defined by the <b>name</b> argument exists, and has not been modified in the last <b>time</b> seconds.</li> <li>2. The persistent variable defined by the <b>name</b> argument exists and its expiry date, defined by <b>time</b>, has not been exceeded.</li> </ol>

## Return Values

<b>true</b>	Password matched.
<b>false</b>	Password did not match.

**Example:**

```
result = getuserpasswd(runuser, "Please enter " + runuser _ "'s Password:");
```

In this example, **result** contains **true** if the user enters the password for the **runuser**. If the correct password is not entered in three attempts, then the function sets **result** to **false**.

**Example:**

```
getuserpasswd(user, "Passwd for "+user+": ", 3, "/opt/pbul/gp001", 300);
```

In this example, the file **/opt/pbul/gp001** is created at initial successful user authentication and for 5 minutes (300 seconds) thereafter, the user is not prompted for a password as long as the file is not modified.



For more information, see the following:

- ["submitconfirmuser" on page 494](#)
- ["runconfirmuser" on page 196](#)
- ["getstringpasswd" on page 489](#)
- ["Persistent Variable Functions and Procedures" on page 500](#)

# ingroup

## Description

The `ingroup()` function determines whether the specified user is a member of the specified group.

## Syntax

```
result = ingroup(user, group);
```

## Arguments

<b>users</b>	Required. A username.
<b>group</b>	Required. A group name.

## Return Values

<b>true</b>	User is a member of group.
<b>false</b>	User is not a member of group or the user or group is null or invalid.



### Example:

```
result = ingroup("user1", "admggroup");
```

In this example, **result** contains an integer value **1** if **user1** belongs to the group **admggroup**. **result** contains an integer value **0** if **user1** does not belong to group **admggroup**.



For more information, see the following:

- ["getgroup" on page 484](#)
- ["getgroups" on page 486](#)

## submitconfirmuser

### Description

The **submitconfirmuser()** function controls whether or not a user must enter a password before the current task request is accepted. When this function is set, the user submitting the request is prompted for the password that is associated with the submit host username set in this function.



**Note:** The user's failure to provide the correct password does not automatically result in a rejection of the secured task request. The policy should examine the result of the **submitconfirmuser()** function and respond accordingly.

### Syntax

```
result = submitconfirmuser(user[, prompt[, attempts[, name, time]]]);
```

### Arguments

<b>user</b>	Required. A string that contains a username that exists on the submit host.
<b>prompt</b>	Optional. The prompt text for the password. The default is <b>Enter password for &lt;user&gt;</b> .
<b>attempts</b>	Optional. The number of attempts that the user has to enter the correct password. The default value for attempts is <b>3</b> .
<b>name</b>	Optional. The name of a persistent variable whose expiration determines the reauthenticate grace period. The value must start with a dollar sign (\$), otherwise no grace period is set and <b>submitconfirmuser()</b> automatically prompts for a password.  If <b>name</b> is specified, the <b>time</b> parameter (below) is required.
<b>time</b>	Required if <b>name</b> argument (above) is specified). The expiry date (number of seconds) after which a prompt is forced. <b>submitconfirmuser()</b> returns true without prompting the user for a password if the persistent variable, defined by the <b>name</b> argument, exists and its expiry date, defined by <b>time</b> , has not been exceeded.

### Return Values

<b>true</b>	Password matched.
<b>false</b>	Password did not match.

**Example:**

```
result = submitconfirmuser(user, "Please enter the user's password:", 3);
if (result != 1) {
  reject;
}
```

In this example, the prompt "Please enter the user's password:" is displayed and the user is allowed three login attempts.

**Example:**

```
submitconfirmuser(user, "Passwd for "+user+": ", 3, "$gpvar5", 300);
```

In this example, a persistent variable **gpvar5** is created at initial successful user authentication and for 5 minutes (300 seconds) thereafter, the user is not prompted for a password.



For more information, see the following:

- ["getgrouppasswd" on page 485](#)
- ["getstringpasswd" on page 489](#)
- ["getuserpasswd" on page 491](#)
- ["runconfirmuser" on page 196](#)
- ["runconfirmmessage" on page 194](#)
- ["Persistent Variable Functions and Procedures" on page 500](#)

## PAM Policy Functions

### getuserpasswdpam

- **Version 8.0 and earlier:** `getuserpasswdpam()` function not available.
- **Version 8.5 and later:** `getuserpasswdpam()` function available.

### Description

The `getuserpasswdpam()` function uses PAM password authentication on the policy server host for the specified user.

It is similar to using the `getuserpasswd()` function with the `pampasswordservice` keyword in the policy server host's `/etc/pb.settings`.

When used, this policy function overrides the `pampasswordservice` setting in the policy server host's settings file and works even if the PAM setting is set to `no`.

The `getuserpasswdpam()` function prompts the user for the password that belongs to the specified user on the policy server. The password is not echoed to the screen as it is typed.



**Note:** The user's failure to provide the correct password does not automatically result in a rejection of the secured task request. The policy should examine the result of the `getuserpasswdpam()` function and respond accordingly.



**Note:** Not supported in Endpoint Privilege Management for Linux (EPM-L).

### Syntax

```
result = getuserpasswdpam(user, pampasswordservice[, prompt[, attempts[, name, time]]]);
```

### Arguments

<b>user</b>	Required. The user whose password must be entered.
<b>pampasswordservice</b>	Required. The name of the PAM service that you want to use for PAM password authentication and account management.
<b>prompt</b>	Optional. Extra text that appears before the PAM prompt that displays for the user. Enter a null argument (""") if you do not want to add text before the PAM prompt.
<b>attempts</b>	Optional. The number of attempts that the user has to enter the correct password. The default value for attempts is <b>3</b> .
<b>name</b>	Optional. The name of a file or persistent variable whose age/expiration determines the re-authentication grace period. If the value starts with a dollar sign (\$), it is treated as a persistent variable, otherwise it is treated as a file name.  If <b>name</b> is specified, the <b>time</b> parameter (below) is required.



**time**

Required if **name** argument (above) is specified). The time/expiry date (number of seconds) after which a prompt is forced. **getuserpasswdpam()** returns **true** without prompting the user for a password if one of the following is true:

1. The file defined by the **name** argument exists, and has not been modified in the last **time** seconds.
2. The persistent variable defined by the **name** argument exists and its expiry date, defined by **time**, has not been exceeded.

## Return Values

**true**

Password matched.

**false**

Password did not match or invalid password service.



### Example:

```
result = getuserpasswdpam(runuser, "pbulpass", "Please enter " + runuser + "'s Password:");
```

In this example, **result** contains **true** if the user enters the password for the **runuser**. If the correct password is not entered in three attempts, then the function sets **result** to **false**.



### Example:

```
getuserpasswdpam(user, "pbulpass", "Passwd for "+user+": ", 3, "/opt/pbul/gp001", 300);
```

In this example, the file **/opt/pbul/gp001** is created at initial successful user authentication and for 5 minutes (300 seconds) thereafter, the user is not prompted for a password as long as the file is not modified.



For more information, see the following:

- ["getuserpasswdpam" on page 496](#)
- ["submitconfirmuser" on page 494](#)
- ["runconfirmuser" on page 196](#)
- ["getstringpasswd" on page 489](#)
- ["Persistent Variable Functions and Procedures" on page 500](#)
- On **pampasswordservice**, the [Endpoint Privilege Management for Unix and Linux System Administration Guide at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>](#)

## submitconfirmuserpam

- **Version 8.0 and earlier:** `submitconfirmuserpam()` function not available.
- **Version 8.5 and later:** `submitconfirmuserpam()` function available.

### Description

The `submitconfirmuserpam()` function controls whether or not a user must enter a password before the current task request is accepted. Password authentication and account management is performed by PAM and name of the PAM service must be provided. When this function is set, the user submitting the request is prompted for the password that is associated with the submit host user name set in this function.

When used, this policy function overrides the `pampasswordservice` setting in the submit host's settings file and works even if the PAM setting is set to `no`.



**Note:** The user's failure to provide the correct password does not automatically result in a rejection of the secured task request. The policy should examine the result of the `submitconfirmuserpam()` function and respond accordingly.

### Syntax

```
result = submitconfirmuserpam(user, pampasswordservice[, prompt[, attempts[, name, time]]]);
```

### Arguments

<b>user</b>	Required. A string that contains a user name that exists on the submit host.
<b>pampasswordservice</b>	Required. The name of the PAM service that you want to use for PAM password authentication and account management.
<b>prompt</b>	Optional. The prompt text for the password. The default is <b>Enter password for &lt;user&gt;</b> .
<b>attempts</b>	Optional. The number of attempts that the user has to enter the correct password. The default value for attempts is <b>3</b> .
<b>name</b>	Optional. The name of a persistent variable whose expiration determines the reauthenticate grace period. The value must start with a dollar sign (\$), otherwise no grace period is set and <code>submitconfirmuserpam()</code> automatically prompts for a password.  If <b>name</b> is specified, the <b>time</b> parameter (below) is required.
<b>time</b>	Required if <b>name</b> argument (above) is specified). The expiry date (number of seconds) after which a prompt is forced. <code>submitconfirmuserpam()</code> returns <b>true</b> without prompting the user for a password if the persistent variable, defined by the <b>name</b> argument, exists and its expiry date, defined by <b>time</b> , has not been exceeded.

## Return Values

<b>true</b>	Password matched.
<b>false</b>	Password did not match or invalid password service.



### Example:

```
result = submitconfirmuserpam(user, "pbulpass", "Please enter the user's password:", 3);
if (result != 1) {reject;}
```

In this example,

```
submitconfirmuserpam(user, "pbulpass", "Passwd for "+user+": ", 3, "$gpvar5", 300);
```

a persistent variable **gpvar5** is created at initial successful user authentication and for 5 minutes (300 seconds) thereafter, the user is not prompted for a password.



For more information, see the following:

- ["submitconfirmuser" on page 494](#)
- ["Persistent Variable Functions and Procedures" on page 500](#)
- On **pampasswordservice**, see the [Endpoint Privilege Management for Unix and Linux Administration Guide at <https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm>](#).

## Persistent Variable Functions and Procedures

Persistent variables are a method of setting variables that persist for a specified time and are synchronized across all of the policy servers in the enterprise. Procedures are provided to list, get, set and delete persistent variables.

Function/Procedure	Description
<b>listpersistentvars()</b>	Returns a list of the current persistent variables. <b>Version 9.4.4 and earlier:</b> function not available. <b>Version 9.4.5 and later:</b> function available.
<b>setpersistentvar()</b>	Sets a persistent variable in the database. <b>Version 9.4.4 and earlier:</b> function not available. <b>Version 9.4.5 and later:</b> function available.
<b>getpersistentvarint()</b>	Returns an integer value persistent variable. <b>Version 9.4.4 and earlier:</b> function not available. <b>Version 9.4.5 and later:</b> function available.
<b>getpersistentvarstring()</b>	Returns a string value persistent variable. <b>Version 9.4.4 and earlier:</b> function not available. <b>Version 9.4.5 and later:</b> function available.
<b>getpersistentvarlist()</b>	Returns a List value persistent variable. <b>Version 9.4.4 and earlier:</b> function not available. <b>Version 9.4.5 and later:</b> function available.
<b>delpersistentvar()</b>	Delete a persistent variable from the database. <b>Version 9.4.4 and earlier:</b> function not available. <b>Version 9.4.5 and later:</b> function available.

## listpersistentvars

- **Version 9.4.4 and earlier:** `listpersistentvars()` function not available.
- **Version 9.4.5 and later:** `listpersistentvars()` function available.

### Description

The `listpersistentvars()` procedure returns a list of currently active persistent variables. Variables that expire are not retrieved.

### Syntax

```
Var = listpersistentvars(wildcard)
```

### Arguments

wildcard

Optional. A **glob(3)** wildcard limiting the returned values to those matched.

### Return Values

A list that contains the current active persistent variables.



#### Example:

```
vars = listpersistentvars("a*");
```



For more information, see the following:

- ["setpersistentvar" on page 502](#)
- ["getpersistentvarint" on page 503](#)
- ["getpersistentvarstring" on page 504](#)
- ["getpersistentvarlist" on page 505](#)
- ["delpersistentvar" on page 506](#)

## setpersistentvar

- **Version 9.4.4 and earlier:** `setpersistentvar()` function not available.
- **Version 9.4.5 and later:** `setpersistentvar()` function available.

### Description

The `setpersistentvar()` procedure sets a persistent variable in the local database, and synchronizes the value to other specified policy servers. If **Registry Name Service** is enabled, it synchronizes to all of the other policy servers in the **Service Group**. If **Registry Name Service** is not enabled, it synchronizes to all of the other policy servers specified by the `submitmasters` setting on the current policy server.

### Syntax

```
boolean setpersistentvar(name,value,[expiry])
```

### Arguments

<b>name</b>	Required. The name of the variable to be set. This can be any text string.
<b>Value</b>	Required. The value of the variable. This can be an integer, string, or list values.
<b>Expiry</b>	Optional. This is the UNIX epoch (in seconds) of the expiry date of the variable. Suitable values can be calculated using <code>unixtimestamp</code> with additional seconds calculated using <code>Date/Time</code> functions.

### Return Values

A boolean indicating success or failure of the procedure.

#### Example:

```
setpersistentvar("flag_" + submituser,true,unixtimestamp+300)
```

#### For more information, see the following:

- ["listpersistentvars" on page 501](#)
- ["getpersistentvarint" on page 503](#)
- ["getpersistentvarstring" on page 504](#)
- ["getpersistentvarlist" on page 505](#)
- ["delpersistentvar" on page 506](#)

## getpersistentvarint

- **Version 9.4.4 and earlier:** `getpersistentvarint()` function not available.
- **Version 9.4.5 and later:** `getpersistentvarint()` function available.

### Description

The `getpersistentvarint()` procedure retrieves a persistent variable from the local database. If the variable does not exist, or has expired, it returns the default `0`.

### Syntax

```
int getpersistentvarint(name)
```

### Arguments

**name**

Required. The name of the variable to be retrieved. This can be any text string.

### Return Values

An integer containing the variable contents, or zero if the variable does not exist or has expired.



#### Example:

```
myflag = getpersistentvarint("flag_" + submituser)
```



For more information, see the following:

- ["listpersistentvars" on page 501](#)
- ["setpersistentvar" on page 502](#)
- ["getpersistentvarstring" on page 504](#)
- ["getpersistentvarlist" on page 505](#)
- ["delpersistentvar" on page 506](#)

## getpersistentvarstring

- **Version 9.4.4 and earlier:** `getpersistentvarstring()` function not available.
- **Version 9.4.5 and later:** `getpersistentvarstring()` function available.

### Description

The `getpersistentvarstring()` procedure retrieves a persistent variable from the local database. If the variable does not exist, or has expired, it returns the default empty string "".

### Syntax

```
string getpersistentvarstring(name)
```

### Arguments

**name**

Required. The name of the variable to be retrieved. This can be any text string.

### Return Values

A string containing the variable contents, or an empty string ("" ) if the variable does not exist or has expired.



#### Example:

```
mystr = getpersistentvarstring("msg_" + submituser)
```



For more information, see the following:

- ["listpersistentvars" on page 501](#)
- ["setpersistentvar" on page 502](#)
- ["getpersistentvarint" on page 503](#)
- ["getpersistentvarlist" on page 505](#)
- ["delpersistentvar" on page 506](#)



## getpersistentvarlist

- **Version 9.4.4 and earlier:** `getpersistentvarlist()` function not available.
- **Version 9.4.5 and later:** `getpersistentvarlist()` function available.

### Description

The `getpersistentvarlist()` procedure retrieves a persistent variable from the local database. If the variable does not exist, or has expired, it returns the default empty list `{}`.

### Syntax

```
list getpersistentvarlist (name) sna
```

### Arguments

**name**

Required. The name of the variable to be retrieved. This can be any text string.

### Return Values

A list containing the variable contents, or an empty list if the variable does not exist or has expired.



#### Example:

```
mylist = getpersistentvarlist("hosts_" + submituser)
```



For more information, see the following:

- ["listpersistentvars" on page 501](#)
- ["setpersistentvar" on page 502](#)
- ["getpersistentvarstring" on page 504](#)
- ["getpersistentvarint" on page 503](#)
- ["delpersistentvar" on page 506](#)

## delpersistentvar

- **Version 9.4.4 and earlier:** `delpersistentvar()` function not available.
- **Version 9.4.5 and later:** `delpersistentvar()` function available.

### Description

The `delpersistentvar()` procedure deletes a persistent variable from the local database. This deletion is synchronized to the other specified policy servers.

### Syntax

```
boolean delpersistentvar(wildcard)
```

### Arguments

name	Required. A <b>glob(3)</b> wildcard limiting the deleted variables to those matched.
------	--

### Return Values

A boolean indicating success or failure of the procedure.



#### Example:

```
delpersistentvar("flag*")
```



For more information, see the following:

- ["listpersistentvars" on page 501](#)
- ["setpersistentvar" on page 502](#)
- ["getpersistentvarstring" on page 504](#)
- ["getpersistentvarlist" on page 505](#)
- ["getpersistentvarint" on page 503](#)

## Glossary

<b>accept</b>	The term that is used to indicate that a secured task request has passed all security checks and may now be executed.
<b>built-in function</b>	Predefined function that comes with Endpoint Privilege Management for Unix and Linux.
<b>character string list</b>	A sequence of zero or more characters enclosed in double (") or single (') quotation marks.
<b>character string list</b>	An ordered list of character strings separated by commas and enclosed in curly braces ({}).
<b>checksum</b>	A unique value that is derived from an application. It can be used to determine if an application has been modified since the checksum value was created.
<b>constant</b>	A value that cannot be modified. A read-only variable is an example of a constant.
<b>decimal integer</b>	Base 10 numeric value (0, 1, 2, 3, 4, 5, 6, 7, 8, 9).
<b>event log</b>	The file that Endpoint Privilege Management for Unix and Linux uses to record information about each user task request that Endpoint Privilege Management for Unix and Linux processes.
<b>environment variable</b>	One of a set of Unix/Linux variables that define the environment that is passed to child processes.
<b>false</b>	A read-only Endpoint Privilege Management for Unix and Linux variable that is equal to an integer value of 0.
<b>format command character</b>	Used to insert variable values into character strings. Format command characters specify not only where to insert values, but also how to format the inserted values.
<b>function</b>	A stand-alone unit of security verification logic that performs a specific task. Procedures are generally used to implement repetitive tasks. The difference between a function and a procedure is that a function returns a value, whereas a procedure does not.
<b>function scope</b>	Determines whether a variable that is defined in one security policy function or procedure can be used by another security policy function or procedure. In Endpoint Privilege Management for Unix and Linux, functions and procedures have a global scope, meaning that variables that are used in one function or procedure can be used by any other function or procedure.
<b>global variable</b>	an Endpoint Privilege Management for Unix and Linux variable that applies to the Endpoint Privilege Management for Unix and Linux system, rather than to a specific task request.
<b>hexadecimal integer</b>	Base 16 integer value (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F).
<b>index</b>	A number that is used to access a specific element within a list variable.
<b>integer</b>	A numeric value; a member of the set of both positive and negative whole numbers.
<b>I/O log</b>	an Endpoint Privilege Management for Unix and Linux log that captures the input (keystroke), output, and error streams for an interactive Unix/Linux session.
<b>LDAP connection</b>	A special data type that is used to pass parameters to and from Endpoint Privilege Management for Unix and Linux LDAP functions.
<b>LDAP message</b>	A special data type that is used to pass parameters to and from Endpoint Privilege Management for Unix and Linux LDAP functions.

<b>logging variables</b>	Contain information that controls Endpoint Privilege Management for Unix and Linux logging activities.
<b>log host</b>	Machine on which the Endpoint Privilege Management for Unix and Linux log server runs. See <b>pblogd</b> .
<b>manual accept</b>	A task request can bypass security policy file processing and be manually accepted from the Endpoint Privilege Management for Unix and Linux web user interface.
<b>octal integer</b>	Base 8 integer value (0, 1, 2, 3, 4, 5, 6, 7).
<b>operator</b>	A symbol that performs a specific mathematical, relational, logical or other special function.
<b>pblogald</b>	The Endpoint Privilege Management for Unix and Linux daemon that is responsible for initiating task execution. See <b>run host</b> .
<b>pblogd</b>	When used, <b>pblogd</b> is responsible for saving log records to the appropriate event log files and I/O log files. <b>pblogd</b> is not a required Endpoint Privilege Management for Unix and Linux component. If <b>pblogd</b> is not used, then the policy server host and the run host write their own log records. See <b>log host</b> .
<b>pbmasterd</b>	The main Endpoint Privilege Management for Unix and Linux daemon. <b>pbmasterd</b> is responsible for determining whether requests should be allowed to run (accepted) or be terminated (rejected). See <b>policy server host</b> .
<b>pbrun</b>	The Endpoint Privilege Management for Unix and Linux daemon that intercepts task requests and determines if the task is subject to security policy rules. If so, then <b>pbrun</b> passes the request on to the policy server host. See <b>submit host</b> .
<b>policy server host</b>	Machine on which the main Endpoint Privilege Management for Unix and Linux daemon ( <b>pbmasterd</b> ) runs. See <b>pbmasterd</b> .
<b>policy server security policy file</b>	The security policy files invoked by policy server host to start security validation processing for a task.
<b>procedure</b>	A stand-alone unit of security verification logic that performs a specific task. Procedures are generally used to implement repetitive tasks. The difference between a function and a procedure is that a function returns a value, whereas a procedure does not.
<b>read-only variable</b>	A variable whose value cannot be changed; also known as a constant.
<b>reject</b>	The term used to indicate that a secured task request did not pass all security checks and so may not be executed.
<b>run host</b>	Machine on which the Endpoint Privilege Management for Unix and Linux task-execution daemon is run. See <b>pblogald</b> .
<b>run variable</b>	Modifiable version of a task information variable. These variables contain properties that affect task execution.
<b>secured activity</b>	An activity that is checked against Endpoint Privilege Management for Unix and Linux security policy files, before it is executed, to verify that it adheres to all security policy rules. See <b>secured task</b> .
<b>secured task</b>	A task that is checked against Endpoint Privilege Management for Unix and Linux security policy files, before they are executed, to verify that they adhere to all security policy rules. See <b>secured activity</b> .

<b>security administrator</b>	The person who is responsible for implementing a company's network security policy.
<b>security policy file</b>	A file that contains the actual security checks that are used to determine whether a specific task should be accepted or rejected.
<b>Security Policy Scripting Language</b>	A C-like, interpreted programming language that is used to create security policy files.
<b>security policy sub-file</b>	A security policy file that is included by another security policy file. Security policy sub-files generally focus on specific areas of security verification processing.
<b>security verification processing</b>	The process of checking a task request against security policy files to determine if that task adheres to all security policy rules. The Policy Server host controls task verification processing.
<b>special characters</b>	Character combinations that are used in place of characters that cannot be typed directly with a keyboard.
<b>submit host</b>	Machine on which the Endpoint Privilege Management for Unix and Linux task-receiving component runs. See <b>pbrun</b> .
<b>syslog</b>	An interface that enables Endpoint Privilege Management for Unix and Linux to access the Unix/Linux logging daemon.
<b>submitting user</b>	The user who submitted the current task request.
<b>task information variable</b>	One of a set of variables that contain information about the current task. There are two types of task information variables: read-only variables and run variables.
<b>task verification processing</b>	The process of checking a task request against security policy files to determine if that task adheres to all security policy rules. The Policy Server host controls task verification processing.
<b>task request</b>	Any request to run a job.
<b>true</b>	A read-only Endpoint Privilege Management for Unix and Linux variable that is equal to an integer value of <b>1</b> .
<b>unsecured task</b>	A task request that is not checked against Endpoint Privilege Management for Unix and Linux security policy files. Unsecured task requests are allowed to execute without first undergoing Endpoint Privilege Management for Unix and Linux task verification processing.
<b>user-defined variable</b>	Variable that is used within a security policy file to store information during task security verification processing.
<b>user-written function</b>	A stand-alone unit of security verification logic that performs a specific task. These units of code are written using the Security Policy Scripting Language. They are generally used to implement repetitive tasks. The difference between a function and a procedure is that a function returns a value, whereas a procedure does not.
<b>user-written procedure</b>	A stand-alone unit of security verification logic that performs a specific task. These units of code are written using the Security Policy Scripting Language. They are generally used to implement repetitive tasks. The difference between a function and a procedure is that a function returns a value, whereas a procedure does not.
<b>variable data type</b>	Defines the type of information that can be stored in a variable, as well as the types of operations that can be performed on a variable.

**variable scope**

Determines whether another security policy file can use a variable that is defined in one security policy file. In Endpoint Privilege Management for Unix and Linux, all variables have a global scope, meaning that after they are created, any security policy file can reference them.