

RSA Authentication Agent 7.0 for PAM—Installation and Configuration Guide for SUSE

The RSA SecurID solution provides two-factor authentication to protect access to data and applications. This access can be through remote dial-in connections, local access, domain and terminal services access, Internet and VPN connections, intranet and extranet applications.

The SecurID solution consists of an Authentication Manager server, an authentication agent that communicates with the server, and authenticators that generate the tokencode. The authentication agent initiates a SecurID authentication session when a user attempts to access a protected resource. It verifies data provided by the user against the data stored in the Authentication Manager server. Based on the result, the user is either allowed or denied access.

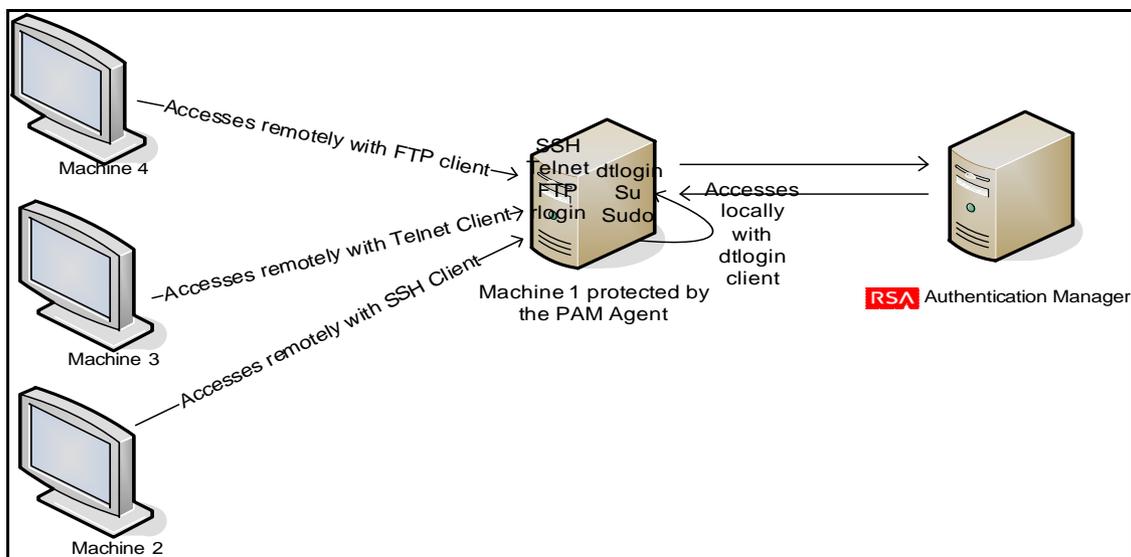
Overview of the RSA Authentication Agent 7.0 for PAM

The RSA Authentication Agent 7.0 for PAM (pluggable authentication module) enables RSA SecurID authentication on UNIX systems, using either standard or OpenSSH connection tools.

The PAM agent uses RSA customized shared libraries, and supports several forms of RSA SecurID authenticators for access to UNIX servers and workstations.

Agent Workflow

A machine protected by the PAM agent can be accessed either locally or remotely.



This section describes the working of the agent for PAM.

1. A user attempts to access a machine protected by the PAM agent, either locally or remotely:
 - If accessed locally, local logon tools supported such as login are used.
 - If accessed remotely, remote logon tools supported such as rlogin, telnet, ssh, and ftp are used.
2. The PAM infrastructure intercepts all logon requests, and using PAM configuration files, arrives at the RSA module:
 - If the user requesting access is not to be challenged by RSA SecurID, the RSA PAM module allows the request to proceed.
 - If the user requesting access is to be challenged by RSA SecurID, the agent continues the authentication process.
3. The agent prompts the user for the user name.
4. The agent requests the user for the passcode.
5. The agent sends the user name and passcode to Authentication Manager in a secure manner:
 - If Authentication Manager approves the request, the agent grants access to the user.
 - If Authentication Manager does not approve the request, the agent denies access and takes appropriate action.

In addition to providing basic access checks during standard authentication, agents also handle several security-related housekeeping tasks, such as those related to the Next Tokencode mode and the New PIN mode.

In the Next Tokencode mode, Authentication Manager requests for the next tokencode displayed on the user’s token. If the next tokencode is not sent to Authentication Manager, the authentication fails.

The Authentication Manager administrator determines if the user associated with a particular token requires a new PIN, and also the characteristics of the PIN. In the New PIN mode, the agent prompts the user for a new PIN, and sends the information to Authentication Manager.

System Requirements

This section describes the minimum software requirements for installing the agent.

Requirement	Support
Operating System	SUSE Enterprise Linux version 11 Intel Xeon: 32-bit and 64-bit. AMD Opteron: 32-bit and 64-bit VMWare ESX 4.0: 32-bit and 64-bit

Requirement	Support
RSA Authentication Manager	Versions 6.1.2, 7.1 SP2, and 7.1 SP3
Tools	<ul style="list-style-type: none"> • telnet • login • rlogin • su • ssh (ssh, sftp and scp) • sudo • ftp (limited to a single transaction) • gdm • xdm (limited to single transaction) • kdm (limited to single transaction)
OpenSSH (Optional)	5.5 P1
OpenSSH tools (Optional)	<ul style="list-style-type: none"> • ssh • sftp • scp

Prerequisites

You must ensure that you have the following, to be able to install the agent.

- ✓ You have root permissions on the agent host.
- ✓ You have created an installation directory on the machine on which you are installing the PAM agent.
- ✓ You have the latest version of the **sdconf.rec** file from RSA Authentication Manager stored in an accessible directory, such as **/var/ace**, on the agent host.
- ✓ The root administrator on the host has write permission to the directory in which the **sdconf.rec** file is stored.
- ✓ You have created an agent host record for the PAM agent in the Authentication Manager database. For more information, see the RSA Authentication Manager documentation.
- ✓ If you are using OpenSSH, you must have the additional software required for compiling source code. This software is available at www.OpenSSH.org. This web site contains important information about using open source software, such as the required compiling tools and other prerequisites.

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- ✓ The agent host IP address is specified. For more information see [“Specify the Agent Host IP Address”](#) on page 4.
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Installing the RSA Authentication Agent 7.0 for PAM

Installing the PAM agent involves setting up your environment and running the installation script. This section describes these tasks.

To install the agent, complete the tasks in the following table.

Task	Reference
Specify the agent host IP address	“Specify the Agent Host IP Address” on page 4
Configure OpenSSH (Optional)	“Configure OpenSSH” on page 4
Install the agent	“Install the PAM Agent” on page 5
Perform a test authentication	“Perform a Test Authentication” on page 5

Specify the Agent Host IP Address

To specify the agent host IP address:

1. On the agent host, use any text editor to create an **sdopts.rec** file in the path where the **sdconf.rec** file is saved.
2. Type:
`CLIENT_IP=x.x.x.x` where x.x.x.x is the IP address of the agent host

Note: Use only uppercase letters, and do not include any spaces.

3. Save the file.

The agent host uses the IP address that you specified to communicate with the Authentication Manager.

Configure OpenSSH

The PAM agent is compatible with OpenSSH. To display passcode authentication messages to users, the **sshd_config** file must be edited. To do this, you must have successfully downloaded and installed the OpenSSH software, and configured the PAM modules to work with OpenSSH. Refer to the OpenSSH documentation for any installation information.

To display passcode authentication messages to users:

1. Open the **sshd_config** file.
2. Set the UsePAM parameter to yes.

3. Set the PasswordAuthentication parameter to no.
This disables the OpenSSH password prompt so that the PAM agent is used instead. As a result, the user is prompted for an RSA SecurID passcode only.
4. Set the UsePrivilegeSeparation parameter to no.
5. Set the ChallengeResponseAuthentication parameter to yes.

Install the PAM Agent

To install the PAM agent:

1. Change to the PAM agent installer directory.
2. Untar the file by typing:

```
tar -xvf <filename.tar>
```
3. Run the install script by typing:

```
./<filename>/install_pam.sh
```
4. Follow the prompts until you are prompted for the **sdconf.rec** directory:
 - If the path is correct, press ENTER.
 - If the path is incorrect, enter the correct path.
5. For each of the subsequent installation prompts, press ENTER to accept the default value, or enter the appropriate value.

Note: After installation, check that VAR_ACE in the `/etc/sd_pam.conf` file points to the correct location of the **sdconf.rec** file. This is the path to the configuration files. The whole path must have `-rw----- root root` permission.

Perform a Test Authentication

You must perform a test authentication to ensure that the PAM agent is functioning properly. For information on how to perform a test authentication, see [“acetest”](#) on page 15.

Upgrading to the PAM 7.0 Agent

You can upgrade only from version 6.0. Back up the configuration files before overwriting to save the configuration settings, if required.

To upgrade to version 7.0 of the agent, complete the tasks in the following table.

Task	Description
1. Install the agent.	For more information, see “Install the PAM Agent” on page 5.

Task	Description
2. Overwrite the existing installation files.	When the installer prompts asking if you want to overwrite your current installation, type y.
3. Run the conversion utility.	For more information, see “Conversion Utility” on page 17.

Obtain the Agent Version Number

To obtain the version number of the installed agent for PAM:

1. Change to the `<PAM Agent Install Directory>\lib\<bit version>` directory.
2. Type the following line:

```
strings pam_secuid.so | grep "Agent"
```

 This returns the version number of the installed agent.

Configuring Tools

This section describes how to configure supported tools to work with the PAM agent.

- [Configure su](#)
- [Configure telnet](#)
- [Configure login](#)
- [Configure ssh and Related Tools](#)
- [Configure rlogin](#)
- [Configure ftp](#)
- [Configure sudo](#)
- [Configure gdm](#)

Configure su

To configure su to work with the PAM agent:

1. Change to `/etc/pam.d` directory.
2. Open the `su` file.
3. Comment any lines with "auth."
4. Add the line:

```
auth required pam_secuid.so
```

Configure telnet

To configure telnet to work with the PAM agent:

1. Change to the `/etc/pam.d` directory.
2. Open the `login` file.
3. Comment any lines containing "auth."
4. Add the line:
auth required pam_secured.so

Configure login

To configure login to work with the PAM agent:

1. Change to the `/etc/pam.d` directory.
2. Open the `login` file.
3. Comment lines containing "auth."
4. Add the line:
auth required pam_secured.so

Configure ssh and Related Tools

To configure ssh and related tools such as scp and sftp to work with the PAM agent:

1. Change to the `/etc/pam.d` directory.
2. Open the `sshd` file.
3. Comment lines containing "auth."
4. Add the line:
auth required pam_secured.so

Configure rlogin

To configure rlogin to work with the PAM agent:

1. Change to the `/etc/pam.d` directory.
2. Open the `rlogin` file.
3. Comment lines containing "auth."
4. Add the line:
auth required pam_secured.so

Configure ftp

To configure ftp to work with the PAM agent:

1. Change to the `/etc/pam.d` directory.
2. Open the `vsftpd` file.
3. Comment lines containing "auth."
4. Add the line:
`auth required pam_secured.so`

Configure sudo

To configure sudo to work with the PAM agent:

1. Change to the `/etc/pam.d` directory.
2. Open the `sudo` file.
3. Comment all the lines in the authentication section.
4. Add the line:
`auth required pam_secured.so`

Configure gdm

To configure gdm to work with the PAM agent:

1. Change to the `/etc/pam.d` directory.
2. Open the `gdm` file.
3. Comment all the lines in the authentication section.
4. Add the line:
`auth required pam_secured.so`

Configuring the Agent

You can customize the PAM agent configuration to use the agent features, and the UNIX features supported by the agent. Before you make any configuration changes, make backup copies of the original configuration files.

On Linux, multiple configuration files are located in the `/etc/pam.d` directory. Each file uses the name of the connection tool.

The following table lists the various features that can be configured on the agent.

Task	Reference
Enable debug output	“Enable Debug Output” on page 9

Task	Reference
Enable SecurID Trace Logging	“Enable SecurID Trace Logging” on page 9
Use stackable modules	“Configure Stackable Modules” on page 10
Use reserve passwords	“Use Reserve Passwords” on page 11
Enable Selected SecurID authentication	“Enable Selected SecurID Authentication” on page 11

Enable Debug Output

To enable debug output for the PAM agent, edit the configuration file by adding a debug argument as described below. For more information, see [“System Log Messaging”](#) on page 17.

To enable debug output for the PAM agent

1. Change to `/etc/pam.d`
2. Edit the appropriate file by adding a debug argument for the `pam_securid.so` module.
`auth required pam_securid.so debug`

Enable SecurID Trace Logging

To enable logging for the PAM agent and for the authentication utilities `acetest` and `acestatus`, set the following variables in the `/etc/sd_pam.conf` file.

`RSATRACELEVEL=<value>`

- This variable enables detailed agent logging and sets the level of logging. The default value is 0.

Value	Description
0	Disables logging
1	Logs regular messages
2	Logs function entry points
4	Logs function exit points
8	All logic flow controls use this (ifs)

Note: For combinations, add the corresponding values. For example, to log regular messages and function entry points, set the value to 3.

- `RSATRACEDEST=<filepath>`

Specify the file path where the logs must be redirected. By default this is blank. If you do not set this variable in `/etc/sd_pam.conf`, the logs go to standard error for authentication utilities `acetest` and `acestatus`, and no logs are generated for authentication tools, even if the `RSATRACELEVEL` value has been specified.

Note: Default values refer to values when the agent is installed.

Configure Stackable Modules

The PAM agent can be used in a stacked configuration. You can use the agent to integrate the RSA SecurID PAM authentication module with other PAM authentication modules in your environment. You can configure the priority of authentication challenges by editing the appropriate configuration file—`/etc/pam.d/<tool name>`.

In a stacked configuration, the password or passcode is passed from the previous authentication module. The agent also passes parameters to the next authentication module, and is qualified to work with the arguments—`use_first_pass` and `try_first_pass`:

use_first_pass. When this argument is used, the agent uses only the password or passcode passed from the previous module, and denies access if the credentials do not match. The user is not prompted for authentication again.

try_first_pass. When this argument is used, the agent uses the password or passcode passed from the previous module. If the credentials do not match, the user is prompted for authentication.

The following section describes how to configure a connection tool (login tool) in a stacked environment on SUSE Linux Enterprise Server 11.

To configure the connection tool (login) to work in a stacked environment:

1. Change to `/etc/pam.d/` and open the **login** file. The following lines are displayed:


```
auth required pam_securetty.so
auth include common-auth
auth required pam_nologin.so
account include common-account
password include common-password
session include common-session
session required pam_lastlog.so nowtmp
session required pam_resmgr.so
session optional pam_mail.so standard
session required pam_limits.so
```
2. Comment the following lines:


```
auth required pam_securetty.so
auth include common-auth
auth required pam_nologin.so
```

3. Add the following lines:

```
auth required pam_secuid.so
auth required pam_ldap.so
```

Use Reserve Passwords

The PAM agent allows reserve passwords to be used by root administrators only. Reserve passwords allow administrators access to hosts during unforeseen circumstances, such as loss of communication between the agent and Authentication Manager. In these situations, administrators have the ability to temporarily disable the agent, if users require immediate access to the hosted resources.

Note: The UNIX password serves as the reserve password.

To configure the tool to use reserve passwords:

1. Open the appropriate file in `/etc/pam.d`.
2. Add a reserve argument to the `pam_secuid.so` module.

```
auth required pam_secuid.so reserve
```

Enable Selected SecurID Authentication

You can configure the agent to selectively always prompt or never prompt users or groups for authentication.

Task	Reference
Enabling selective UNIX group authentication	“Enable Selective SecurID Authentication for UNIX Groups” on page 12
Enabling selective UNIX user authentication	“Enable Selective SecurID Authentication for UNIX Users” on page 12

When selective group support and selective user support are both enabled, selective user support is considered.

The following table lists the possible values which can be set in the `sd_pam.conf` file.

ENABLE_GROUPS_SUPPORT	ENABLE_USERS_SUPPORT	Result
0	0	Neither feature is enabled.
0	1	Selected User support is enabled.
1	0	Selected Group support is enabled.
1	1	Selected User support is enabled.

Enable Selective SecurID Authentication for UNIX Groups

You can configure the PAM agent to always prompt specific groups to authenticate with SecurID, or to never prompt specific groups to authenticate with SecurID.

Group members excluded from SecurID authentication can be authenticated either with UNIX credentials or through another PAM module in the stack. This can be configured with the `PAM_IGNORE_SUPPORT` parameter.

Note: Do not specify Authentication Manager groups. This feature is for UNIX groups only.

To enable selective SecurID Authentication for UNIX groups:

1. Change to the `/etc` directory, and open the `sd_pam.conf` file.
2. Set the `ENABLE_GROUP_SUPPORT` parameter to 1. The default value is 0.
3. Populate the `LIST_OF_GROUPS` parameter.
4. Set the value for the `INCL_EXCL_GROUPS` parameter.
The possible values are:
 - 0—Disable SecurID authentication for the listed groups.
 - 1—Enable SecurID authentication only for the listed groups.
 The default value is 0.
5. (Optional) Set the `PAM_IGNORE_SUPPORT` parameter.
The possible values are:
 - 0—Enable UNIX password authentication.
 - 1—Disable UNIX password authentication.
 The default value is 0.

Note: This parameter is applicable only to groups excluded from SecurID authentication.

6. Save the file.

Note: Default values refer to values when the agent is installed.

Enable Selective SecurID Authentication for UNIX Users

You can configure the PAM agent to always prompt specific users to authenticate with SecurID, or to never prompt specific users to authenticate with SecurID.

Users excluded from SecurID authentication can be authenticated either with UNIX credentials or through another PAM module in the stack. This can be configured with the `PAM_IGNORE_SUPPORT_FOR_USERS` parameter.

To enable selective SecurID Authentication for UNIX users:

1. Change to the `/etc` directory, and open the `sd_pam.conf` file.
2. Set the `ENABLE_USERS_SUPPORT` parameter to 1. The default value is 0.
3. Populate the `LIST_OF_USERS` parameter.
4. Set the value for the `INCL_EXCL_USERS` parameter.
The possible values are:
 - 0—Disable SecurID authentication for the listed users.
 - 1—Enable SecurID authentication only for the listed users.
 The default value is 0.
5. (Optional) Set the `PAM_IGNORE_SUPPORT_FOR_USERS` parameter.
The possible values are:
 - 0—Enable UNIX password authentication.
 - 1—Disable UNIX password authentication.
 The default value is 0.

Note: This parameter is applicable only to users excluded from SecurID authentication.

6. Save the file.

Note: Default values refer to values when the agent is installed.

Known Configuration Issues

This section describes known issues with tools on SUSE.

Tool	Known Issue
ftp	When you use SecurID to protect ftp, SecurID authentication prompts and error messages are not displayed to users. Only standard operating system (OS) prompts and error messages are displayed. Note the following: <ul style="list-style-type: none"> • Users enter their user name at the OS user name prompt, and their SecurID passcode at the OS password prompt. • If a user is uncertain as to the status of a token (for example, if the token is in the Next Tokencode mode, or the New PIN mode), instruct the user to authenticate with another connection tool, such as <code>rlogin</code> to verify that the PIN or tokencode is still valid.



Tool	Known Issue
ssh	After three unsuccessful SecurID authentication attempts are made in a single session, the connection is closed. You must terminate the session, and start another session.
rlogin	If the first attempt to process an rlogin request fails, the session is handed off to the login daemon. Therefore, if you configure Linux to use rlogin, you must configure the remote file in /etc/pam.d .
rlogin	If the PAM agent is the only authentication module used to protect rlogin (i.e., in a non stacked configuration) and the incorrect passcode is entered, the system prompts the user for the UNIX password and allows access if this is entered correctly.

Uninstall the RSA Authentication Agent 7.0 for PAM

This section provides information on how to uninstall the 7.0 agent for PAM.

Before you Begin

- Configure the RSA SecurID protected tools to use the standard PAM module provided with your operating system.
- Verify that you have root permissions on the host.

To uninstall the PAM agent:

1. Change to the PAM agent home directory.
2. Run the uninstall script. Type:
./uninstall_pam.sh

Next Step

Verify that the installation directory has been removed. If the directory still exists, you must remove it manually.

Troubleshooting

This section describes how to troubleshoot using the various utilities of the PAM agent.

Authentication Utilities

The authentication utilities are located in the following directories:

- 32-bit operating system: **<pam agent home>/bin/32bit**

- 64-bit operating system: `<pam agent home>/bin/32bit` and `<pam agent home>/bin/64bit`

Use these utilities to:

- Perform a test authentication. For more information, see [“acetest.”](#)
- Verify communication between the PAM agent and the Authentication Manager. For more information, see [“acestatus.”](#)

You can enable logging for these utilities. For more information, see [“Enable SecurID Trace Logging”](#) on page 9.

acetest

This utility checks that the agent is functioning properly, by performing a test authentication.

To perform a test authentication:

1. Change to the PAM agent authentication utilities directory.
2. Type:
`./acetest`
3. Enter a valid user name and passcode.

If you are repeatedly denied access, test the Authentication Manager status. For more information, see [“acestatus”](#) on page 15, or contact your Authentication Manager administrator.

acestatus

This utility checks the status of each Authentication Manager on which the PAM agent is registered as an agent host.

To check the Authentication Manager status:

1. Change to the PAM agent utilities directory.
2. Type:
`./acestatus`

This gives information on the Authentication Manager server including server name and address.

Note: If you have questions concerning any of the following information, contact your Authentication Manager administrator.

The following table lists the information displayed in the Authentication Manager section.

Returned Information	Description
Configuration Version	The version of the sdconf.rec file that is in use. For Authentication Manager 5.1 or later, this number is 14.
DES Enabled	If your configuration environment supports legacy protocols, YES is displayed.
Client Retries	The number of times the PAM agent sends authentication data to Authentication Manager before a time-out occurs.
Client Timeout	The amount of time (in seconds) that the PAM agent waits before resending authentication data to Authentication Manager.
Server Release	The version number of Authentication Manager.
Communication	The protocol version used by Authentication Manager and the PAM agent.

The following table lists the status information displayed in the Authentication Manager section.

Status Information	Description
Server Active Address	The IP address that the PAM agent uses to communicate with the server. This address could be the actual IP address of the server you have selected, or it could be an alias IP address assigned to the server. An IP address of 0.0.0.0 indicates that the agent has not yet received communication from the server.

The following table lists the server status information displayed in the Authentication Manager section.

Server Status	Description
Available for Authentications	This server is available to handle authentication requests.
Unused	The server has not yet received an authentication request.
For Failover only	The server is reserved for failover use only.

Server Status	Description
Default Server During initial requests	Only this server is available to handle requests at this time.

Conversion Utility

The conversion utility is used when:

- Upgrading to the 7.0 agent.
- The PAM agent co-exists with other SecurID agents.

ns_conv_util

The conversion utility `ns_conv_util` is located in the following directories:

- 32-bit operating system: `<pam agent home>/bin/32bit`
- 64-bit operating system: `<pam agent home>/bin/32bit` and `<pam agent home>/bin/64bit`

To run the conversion utility:

1. Change to the PAM agent utilities directory.
2. Type `./ns_conv_util`, and give the path to the existing SecurID file location in the machine as first parameter and new destination location of SecurID file as the second parameter.

```
./ns_conv_util <Existing_Securid_file_path>
<New_Securid_dir_path>
```

where:

- `Existing_Securid_file_path` is the path where the SecurID file exists.
- `New_Securid_dir_path` is the directory where the newly generated SecurID file should be stored.

For example:

```
./ns_conv_util /var/ace/secuid /var/ace_pam/
```

If the new destination location is not the same as the location pointed out by `VAR_ACE`, you must copy the new securid file to this location.

System Log Messaging

By default, several PAM agent authentication messages are recorded in the system log. For tracing purposes, you can configure your system log to record all PAM agent authentication log messages. See [“Enable Debug Output”](#) on page 9.

For information on making changes to the logging, refer to the `syslog-ng` documentation available with the SUSE 11 operating system.

PAM Agent Authentication Log Messages

The following table lists the authentication log messages.

Message	Description
Cannot locate sd_pam.conf file	The configuration file sd_pam.conf is not in the /etc directory; /etc must contain the correct configuration file so that the VAR_ACE can be set properly.
AceInitialize failed	AceInitialize is an API function call that initializes worker threads, and loads configuration settings from sdconf.rec . Verify that you have the latest copy of sdconf.rec from your Authentication Manager administrator and that the VAR_ACE is set properly.
Cannot communicate with RSA ACE/Server	Either the Authentication Manager brokers are not started, or there has been a network failure. Contact your Authentication Manager administrator or your network administrator.
Reserve password exceeds character limit	The maximum character limit for reserve passwords is 256 characters.
Invalid reserve password	The reserve password is the same as the system password for the host. You must know this password if Authentication Manager is unable to process authentication requests.
User name exceeds character limit	The maximum character limit for user names is 32 characters.
Reserve password not allowed. User is not root.	Verify that you have root permissions. Only administrators with root permissions can use the reserve password.

Critical File Information

In addition to the binaries (**pam_securid.so**, **acetest**, **acestatus**, and **ns_conv_util**), the PAM agent maintains the critical files listed in the following table.

File	Description
sdconf.rec	This file is generated by Authentication Manager server, and contains configuration information that controls the behavior of the PAM agent. This file permission should be -rw----- root root.
sdstatus.1	This file is generated by the authentication API to track the last known status of the SecurID Authentication Manager servers. This file permission should be -rw----- root root.
securid	This file contains a shared secret key used to protect the communication between the local machine and Authentication Manager. The name of this file is derived from the local system's configured protocol name for the port over which the agent communicates with Authentication Manager, usually via the "services" file. This file permission should be -r----- root root. However, it also depends on the OS Umask setting.
/etc/sd_pam.conf	Contains configuration settings that control behavior of the PAM agent. This file permission should be -rw-r--r-- root root.

Support and Service

RSA SecurCare Online	https://knowledge.rsasecurity.com
Customer Support Information	www.rsa.com/support
RSA Secured Partner Solutions Directory	www.rsasecured.com

RSA SecurCare Online offers a knowledgebase that contains answers to common questions and solutions to known problems. It also offers information on new releases, important technical news, and software downloads.

The RSA Secured Partner Solutions Directory provides information about third-party hardware and software products that have been certified to work with RSA products. The directory includes Implementation Guides with step-by-step instructions and other information about interoperation of RSA products with these third-party products.



Before You Call Customer Support

Make sure that you have direct access to the computer running the RSA Authentication Agent for PAM software.

Please have the following information available when you call:

- Your RSA Customer/License ID.
- RSA Authentication Agent for PAM software version number.
- The make and model of the machine on which the problem occurs.
- The name and version of the operating system under which the problem occurs.

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