

RAD-Series AAA Server Getting Started Guide

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About this Document

Welcome to RAD-Series AAA software. This guide will help you get started with:

- Installing the software
- Basic server configuration for a wired or wireless network
- Basic server administration

Consult the *RAD-Series Administrator's Guide* for advanced configuration and administration instructions.

Audience

This *Getting Started Guide* is for Network and Systems Administrators who must install and configure the RAD-Series AAA Server. It's assumed that you:

- Are familiar with basic Unix commands
- Have full installation privileges on the machines where you will install the software
- Know the hardware and software profiles of the server machines and other devices used throughout the network
- Know how you will store user profiles for those accessing the network
- For wireless, know the EAP methods and user name formats used

Notational Conventions

Text in this guide is marked in different styles to denote various things.

Text Marked...	Indicates...
<code>Fixed-width font</code>	This is code, a command, a file name, or a file parameter. Enter exactly what is shown.
<i>Fixed-width italic</i>	This is a variable. Enter what is correct for your installation, not what is shown.
<i>Normal italic</i>	This is the title of a book or other publication.
Bold	This is something noteworthy, so we emphasize it.
Blue underline	This is a hypertext link. Click the link to send e-mail to the account, or to open the document in your browser.

Preparation

Before installing the software:

- Be sure the host machine meets minimum system requirements
- Be sure that the system has a 64 bit OS installed.
- Bring all software up to required patch levels
- If upgrading, read the section on Upgrading below and decide how you will handle previously installed components

System Requirements

Each licensed copy of the RAD-Series AAA Server can be installed on one machine. The machine where the server is installed must have:

Specification	Requirement
Operating System/Platform	<p>The OS must be a 64 bit OS.</p> <p>Red Hat Enterprise Server Release 7 or 8 on Intel hardware.</p> <p>Note: We have yet to find a Linux distribution where the RAD-Series has any issues. Customers are running RAD-Series on other Linux distributions including CentOS, Ubuntu, and Fedora.</p>
Memory	<p>The RAD-Series AAA Server can run on any system built within the last ten years on one of the supported architectures.</p> <p>Interlink Networks tests the RAD-Series AAA Server on systems with as little as 128 MB of memory.</p> <p>The memory required for a particular application depends upon many factors including the transaction rate, authentication method and the number of simultaneous sessions supported.</p>
Disk Space	<p>About 100 MB of disk space is required to install the RAD-Series AAA Server.</p> <p>The disk space required for a particular application depends upon many factors including the transaction rate, the accounting record format and how long logfiles are retained on the system.</p>

Upgrading

Version 9.0.0 of the RAD-Series AAA Server software converts most previously installed binary and configuration files to version 9.0.0 formats during the installation process. You no longer

need to uninstall the software prior to upgrading. To take advantage of this feature, you must install all files into the same directories as your previous installation. For safety's sake you may want to copy your current install to new directories and install/upgrade the copies. Then when you have finished testing the new version, stop the radius server and server manager and copy all **but** the log directory to the permanent directories and restart the server.

Note: When converting, you don't have to perform a preliminary backup of configurations. The RAD-Series AAA Server installer automatically backs up your current configuration files to the subdirectory `backup_raddb.timestamp` in the configuration file directory.

As of 8.2.0, the dictionary file has been separated into multiple files. The dictionary files support an **%INCLUDE** directive, allowing the dictionary to be partitioned into multiple parts. This facilitates the isolation of custom modifications while allowing standard updates of other attributes.

The dictionary provided by Interlink Networks is distributed over multiple dictionary files. The main dictionary file contains the standard RADIUS attribute definitions. Each vendor's VSAs are defined in a separate vendor-specific dictionary file. Vendor attributes are incorporated into the server's complete internal dictionary from the `dictionary.VSAs` file, for example Interlink attributes are defined within a `dictionary.Interlink` file, and incorporated into the server's complete internal dictionary by the presence of a **%INCLUDE dictionary.Interlink** directive within the main dictionary file.

A `dictionary.custom` file is provided for defining customer-specific VSA definitions and any other additions that you need. You can use the **%INCLUDE dictionary.<vendor name>** in the `dictionary.custom` file to add a new vendor's VSAs.

Note: If you have modified your `dictionary` file, then after the upgrade you will need to take all of your changes and put them into the `dictionary.custom` file and copy `<ConfigurationDirectory>/fsm9.0/dictionary` to `<ConfigurationDirectory>/dictionary`. Your original dictionary file can be found in `<ConfigurationDirectory>/backup_raddb.timestamp/dictionary`. All future changes you need to make to the dictionary should be put in `dictionary.custom`. Please do not modify any other dictionary files since they are not upgraded, just replaced.

Finite State Machine (.fsm) files that have been modified from the installation default are not converted with the 9.0.0 installation. These files must be manually recreated in the 9.0.0 file format after installing the server.

Customizations

If you created custom plug-ins for your RAD-Series AAA Server, you'll have to recompile them using version 9.0.0 of the Software Developers Kit (SDK) to make them compatible with version 9.0.0 of the server.

Before Installing over an existing installation

- 1 Stop the server
- 2 If you choose to uninstall rather than convert files:
 - Back up accounting and log files.
 - Back up configuration files.
 - Manually delete ALL the files in the directories you installed the old version in.

After Installing

- 1 If you have modified your state table (.fsm) files you will need to re-make your changes you made since your previous installation.
- 2 If you saved configuration files and did not install over them, then copy them to the configuration directory.
- 3 Restart the server.

Certificates

The RAD-Series AAA Server software is delivered with a certificate, key file, and self-signed certificate authority list that can be used for preliminary testing. However, if your application requires certificates, you should replace these with your own files before the server goes into production.

The following authentication methods require a server-side certificate:

- PEAP-MSCHAP
- PEAP-MD5
- PEAP-GTC
- TLS
- TTLS
- TTLS-MD5
- TTLS-PAP
- TTLS-CHAP
- TTLS-MSCHAP

Installation

Installation Process

The RAD-Series AAA Server installation process is:

- 1 Install software components on server.
- 2 Test installation using the preset configuration.

At the conclusion of this process, you'll:

- Know that the server software is installed and working properly
- Be ready to go on to basic server configuration

Installing RAD-Series Software

To install the software:

- 1 **Note:** The RAD-Series Server does not need to be installed as root nor run as root unless it will be configured to access the Unix password system for authentication. If the RAD-Series Server is to be installed from, or run from, a user account other than root then that user account must have write privileges in the installation directories. Log on to the account that will run RAD-Series Server.

- 2 Run the installer:

```
# sh /<download directory path>/RAD-Series.9.0.0.linux.x86_64.bin
```

Note: The installer will prompt you for each step of the process. To exit the installer, enter `quit`.

- 3 Enter the **OPTIONAL** prefix for all directories, if you would like all the files installed with a common prefix to all directory names. If you want no common prefix to all directory names then leave it blank. If this installation is an upgrade from a prior version of RAD-Series which has a common prefix to all the directories, please specify any common prefix here. For example:

```
Enter the OPTIONAL prefix for all directories
-----
```

```
If you would like all the files installed in a common prefix
enter it here, or else leave it blank. If this
installation is an upgrade from a prior version of RAD-Series,
please specify any common prefix here.
```

```
Enter a new value or press <ENTER> to accept the default: []: /home/rad9.0
```

In this example, all the directories will be prefixed with `/home/rad9.0/`.

- 4 Enter the installation directory for each file type. To accept the default directory shown, just press Enter at each prompt. **Note:** If the RAD-Series Server is to be installed with a user account other than root then that user account must have write privileges in the installation directories.

If this is a fresh installation, then also:

- 5 Enter a shared secret. This is a code used to establish a trust relationship between the RAD-Series AAA Server and its test utilities. It cannot be more than 255 characters or contain spaces. The default is `secret`.
- 6 Enter a test user password. This password is used to test installation. The user password cannot have spaces or the backslash character. The default is `password`.

Installation Directories

As supplied, the RAD-Series software is installed into the following directories:

Directory	Contains
/opt/aaa/lib	Libraries
/opt/aaa/bin	Server programs and utilities
/opt/aaa/utl	Scripts to start the server and utilities after setting up the environment that is needed, including SD_LIBRARY_PATH
/opt/aaa/aatv	Plug-ins
/opt/share/aaa/man	MAN pages
/opt/share/aaa/doc	PDF documentation
/etc/opt/aaa	Configuration files (including dictionary and vendors files) *.fsm files: sample finite state machine (FSM) tables
/etc/opt/aaa/proldap	Schema files and sample LDIF files for LDAP authentication
/etc/opt/aaa/security	Certificates and keys for TLS, TTLS, and PEAP authentication
/etc/opt/aaa/fsm9.0	FSM, group, vendor and dictionary files for 9.0. They are copied to the configuration directory if this is a new install or the old files were not modified by you. If you have modified FSM files you will have to update them manually to be compatible with 9.0. Your vendors and dictionary files should be updated automatically during the installation process.

Uninstalling RAD-Series Software

To completely uninstall the RAD-Series software Just remove all the directories listed above.

Starting RAD-Series Server

To start the RAD-Series AAA Server:

- 1 Change directory to `<server utility path>` (`/opt/aaa/utl` by default).
- 2 Run `radiusd.sh start`

If the process fails to start:

- 3 Check the `logfile` (in `/var/opt/aaa/logs` by default).

If you see the message “(E): setupsock: Terminating. Could not bind socket. Interface(0.0.0.0) port(1813) errno(98='Address already in use')” the default port 1813 is already being used by another process.

- 4 To identify the process currently using port 1813, at your shell prompt, enter:

```
lsof -i :1813
```

- 5 Either change the Server ports, or kill the process using the ports.

Note: For other error messages, see the *9.0.0-Administrators-Guide.pdf*.

Changing the RAD-Series Server Ports

If you can't use the default ports of 1812/1813 for the RAD-Series Server:

- 1 In a text editor, open the file `envSetup.sh` (in `/opt/aaa/bin` by default)
- 2 Locate the following lines:


```
radAuthPort="-p 1812"
radAcctPort="-q 1813"
radAuthRelayPort="-pp 1812"
radAcctRelayPort="-qq 1813"
```
- 3 Change “1812” and “1813” to the ports you wish to use.
- 4 Save and close `envSetup.sh`.
- 5 Change directory to `<server utility path>` (`/opt/aaa/utl` by default).
- 6 Run `radiusd.sh restart`

Stopping RAD-Series Server

To stop the RAD-Series AAA Server program:

- 1 Change directory to `<server utility directory>` (in `/opt/aaa/utl` by default).

2 Run `radiusd.sh stop`.

Testing RAD-Series Server Installation

The RAD-Series AAA Server is delivered with a very simple wired network configuration designed to help you test that the server is installed and authenticating correctly (using password authentication). We recommend running this test before proceeding with server configuration.

1 Change directory to `<server utility directory>` (in `/opt/aaa/utl` by default).

2 Run `install-test.sh`

3 The following message should appear summarizing the tests done:

```
Checking status of radiusd:
```

```
Starting radiusd:
```

```
Running test authentications:
```

```
Authentication with 'test_user' and a good password passed
```

```
Authentication with 'test_user' and a bad password failed to
authenticate as expected
```

```
Authentication with unknown username of 'unknown_user_name' failed
to authenticate as expected
```

```
Checking status of radiusd:
```

```
Stopping radiusd:
```

```
Now that the installation tests have passed, we suggest that
you harden your server by removing the default test user.
```

```
Would you like to have the test user entry removed from the server
[y/N]?
```

```
We still advise you to harden this server before putting it into
production!
```

Note: Remove the `test_user` from the configuration before putting the server into production.

If you encounter problems while running the test, view the contents of the RAD-Series AAA Server logfile for errors. In addition you can search the Interlink Networks' Frequently Asked Questions page at www.interlinknetworks.com/category/faqs/.

Configuration

The topics in this section will help you begin to set up the server for your network. After completing them, see the *9.0.0-Administrators-Guide.pdf* to finish your server configuration.

Configuration Process

The basic configuration process is:

- 1 Change directory to `<server configuration path>` (`/etc/opt/aaa` by default)..
- 2 Define network access devices in the `clients` file.
- 3 Define local realms, including:
 - Realm name
 - Authentication method
 - Users
- 4 Restart the server to enable the new configuration.

By the end of this process, you'll have:

- At least one realm defined
- At least one user set up for authentication using your method

Basic Server Configuration

Before beginning server configuration, gather a list of all your network devices, and shared secrets and device vendors. You'll need this information to complete the server configuration.

Define Access Devices

Enter the IP address and a shared secret for each access point in your network.

You can enter any valid IP address (e.g.: 192.44.3.11) or fully-qualified DNS name (e.g.: nas.yourcompany.com).

The shared secret is the code that will be used to establish a trust relationship between the access device and the server. The shared secret can't exceed 1023 characters or contain spaces.

The Vendor field specifies which set of vendor-specific attributes to return in RADIUS message sent to this device. Use a "+" to specify multiple vendors. Use "none" if no vendor specific attributes should be sent to the NAS.

The format of a client entry is:

Name Secret type=Vendor:NAS Options [Optional-Fields]

Define Local Realms

For a complete description of the configuration files see `authfile`, `EAP.authfile` and realm files and default users files in the *9.0.0-Administrators-Guide.pdf*.

If any of your users are required to enter a realm name to log in to the network (e.g.: `@yourcompany.com`), enter the:

- Realm name—any realm you've defined, or a fully-qualified DNS name, provided it's what appears in the login string
- Authentication methods used by the realm
- User storage type
- User profiles, if using local storage

For non wireless case, the realms and user storage are defined in the `authfile`. Local user storage is defined in the users or realm users files. The `authfile` has this basic format:

realm-name -flags auth-type auth-parameter

So for a login name of `fred.jones@company.com`, password of `somepassword` and with users stored in a realm file, you would add this line to the `authfile`:

```
company.com iaaaFile company.com
```

Add this line to the file `company.com.users`:

```
fred.jones Password = "somepassword"
```

If users do **not** have to enter a realm name to log in, use the word `NULL` for the realm-name.

Enter as many realms as are needed.

Restarting the Server

The RAD-Series AAA Server can apply most configuration changes without having to first stop the server. Some server properties and server startup options require you to stop the server. See the *RAD-Series Administrator's Guide*.

- 1 Change directory to `<server utility directory>` (in `/opt/aaa/utl` by default).
- 2 Run `radiusd.sh restart`

Or you can HUP the `radiusd` process.

Securing the Server

We recommend doing the following to make the server more secure, before putting it into production. Instructions for each of these procedures are in the *9.0.0-Administrators-Guide.pdf*.

Remove the `test_user` from the default `users` file if you plan to keep this file in your configuration.

Following these guidelines will also improve server security:

- Don't install the RAD-Series AAA Server on user machines.
- Don't install the RAD-Series AAA Server on the same machine as other servers, like your web, FTP, and mail servers.
- Change the Current Directory of a server configuration to a secure location to prevent public access to a core dump.
- Where possible, store hashed passwords in user profiles.

Licensing

The RAD-Series license enables a base set of features and limits the number of concurrent user sessions that the software maintains. The license may also enable and disable optional modules that extend the base feature set.

Initially, the software operates under an evaluation license with the full RAD-Series feature set. The evaluation license lasts 30 days, during which you can review the user documentation and other advanced features of the server.

After this time, you must purchase a license to retain the functionality. Be sure to purchase the appropriate license for your needs. If you've configured functions or users during evaluation that are not supported by the license you purchase, they will be disabled during production use.

Contact sales using our WEB site, www.interlinknetworks.com, for more information about the different licensing options.

Ordering a License

When you're ready to purchase a licensed version of the RAD-Series software, contact your sales representative at:

Phone: 734-821-1228

Fax: 734-821-1235

WEB site: www.interlinknetworks.com

Installing the License

To install a license purchased for production use or to upgrade a feature set:

- 1 Backup any existing production licenses.
- 2 Copy the file `aaa.config.license` to your configuration directory (`/etc/opt/aaa` by default).
- 3 Change directory to `<server utility directory>` (in `/opt/aaa/utl` by default).
- 4 Run `radiusd.sh restart`

Technical Support

Web Site

In addition to our printed product documentation, we offer free and unlimited support information on our web site. Visit the Frequently Asked Questions page at:

www.interlinknetworks.com/category/faqs/

You'll find a continuously updated list of solutions to common problems, instructions for advanced configuration tasks, and inter operability information.

Help Desk

RAD-Series software is covered for a 30-day warranty period. During this time, you may contact our Help Desk for technical support at no additional charge.

To extend technical support beyond the 30-day warranty period, you can purchase a Software Maintenance Plan. Visit our WEB site to contact sales:

www.interlinknetworks.com

If you can't find the solution to your problem in our documentation or on the web site, and you're covered by a maintenance plan or the 30-day warranty, you can:

- E-mail support@interlinknetworks.com
- Phone 734-821-1222, Monday through Friday, 8:30 a.m. to 5:30 p.m. EST (except US holidays)

Be ready to provide the following information when you contact us:

- Version number of the RAD-Series AAA Server that you are using
- Operating system and its version
- Company name of licensee

Please don't e-mail any unsolicited log file or configuration file snippets longer than one hundred lines. We'll let you know if we need more information.