Tech Mahindra Access Registrar 10.3 Installation Guide

Tech Mahindra connected in 70+ countries worldwide.
Addresses, phone numbers, and fax numbers are listed on the Tech Mahindra website at
www.techmahindra.com/go/contact-us.

Table of content

Chapter 1

Overview

This chapter provides an overview of the software installation process. You can install the Tech Mahindra Access Registrar software on a machine for the first time, or you can upgrade the existing Tech Mahindra Access Registrar software to a latest version.

Tech Mahindra Access Registrar software can be downloaded from the techmahindra.com website. "Downloading Tech Mahindra Access Registrar Software" section provides detailed information about downloading the Tech Mahindra Access Registrar 10.3 software.

Before you install the Tech Mahindra Access Registrar 10.3 software, you must copy a license file to the location where you will install the software. You will receive the license file as an e-mail attachment. "Tech Mahindra Access Registrar 10.3 Licensing" section provides detailed information about the new licensing mechanism in Tech Mahindra Access Registrar.

Note Before you begin the software installation, ensure that your server has the recommended patches. A dedicated server should be allocated for Tech Mahindra Access Registrar installation, and it is recommended to run Tech Mahindra Access Registrar as a standalone application. Installing any other application(s) in the same server is not supported.

This chapter contains the following sections:

About Tech Mahindra Access Registrar

Tech Mahindra Access Registrar is a 64-bit, 3GPP-complaint RADIUS (Remote Authentication Dial-In User Service)/Diameter server that enables multiple dial-in Network Access Server (NAS) devices to share a common authentication, authorization, and accounting database.

Prerequisites

Before you install Tech Mahindra Access Registrar, ensure that:

- You have the recommended hardware and software requirements (Refer "System Requirement" section).
- You have a valid Tech Mahindra Access Registrar license.
- You have installed JDK 17
- You have installed MySQL latest version.
- You have the 64-bit rpm files for the relevant RHEL and Cent OS versions while installing Tech Mahindra Access Registrar. For the list of required rpms for the relevant OS versions, see Required 64-bit rpms for Relevant RHEL OS Versions.

  Note: You must install the rpm versions relevant to the RHEL OS versions before installing Tech Mahindra Access Registrar. Otherwise, Tech Mahindra Access Registrar will not be installed.

- Before enabling the SIGTRAN-M3UA remote server, ensure that you restart the Tech Mahindra Access Registrar server whenever you make any SIGTRAN-M3UA configuration changes.
- Do not use the default HOSTNAME (localhost.localdomain). Ensure that you assign a new HOSTNAME and update the same with IP Address in the **/etc/hosts** file. An example is given below:

```
[root@TMAR-LNX-1 bin]# hostname
TMAR-LNX-1
[root@TMAR-LNX-1 bin]# cat /etc/hosts
127.0.0.1   localhost localhost.localdomain localhost4 localhost4.localdomain4
::1         localhost localhost.localdomain localhost6 localhost6.localdomain6

10.197.66.98 TMAR-LNX-1 TMAR-LNX-1.techmahindra.com
```

rpm	RHEL OS Version 8.x required 64-bit	RHEL OS Version 9.x required 64-bit
Brotli	Yes	Yes
c-ares	Yes	Yes
cyrus-sasl-lib	Yes	Yes
chkconfig	No	Yes
glibc	Yes	Yes
glib2	Yes	Yes
initscripts	No	Yes
json-c	Yes	Yes

rpm	RHEL OS Version 8.x required 64-bit	RHEL OS Version 9.x required 64-bit
keyutils-libs	Yes	Yes
krb5-libs	Yes	Yes
libbson	Yes	Yes
libcom_err	Yes	Yes
libcurl	Yes	Yes
libicu	Yes	Yes
libidn2	Yes	Yes
libgcc	Yes	Yes
libmongocrypt	Yes	Yes
libnghttp2	Yes	Yes
libnsl	Yes	Yes
libnsl2	No	Yes
libpsl	Yes	Yes
libselinux	Yes	Yes
libssh	Yes	Yes
libstdc++	Yes	Yes
libtool-ltdl	Yes	Yes
libunistring	Yes	Yes
libxcrypt	Yes	Yes
libxml2	Yes	Yes
libzstd	Yes	Yes
lksctp-tools	Yes	Yes
mongo-c-driver-libs	Yes	Yes
ncurses-libs	Yes	Yes
nss-softokn-freebl	Yes	Yes
nss-util	Yes	Yes
nspr	Yes	Yes
nss	Yes	Yes
openldap	Yes	Yes
openssl-libs	Yes	Yes
pcre	Yes	Yes
pcre2	Yes	Yes
pcre-cpp	Yes	Yes
snappy	Yes	Yes

rpm	RHEL OS Version 8.x required	RHEL OS Version 8.x required
sqlite-libs	Yes	Yes
Sharutils	Yes	Yes
tcl	Yes	Yes
unixODBC	Yes	Yes
xz-libs	Yes	Yes
zlib	Yes	Yes

Note SCTP module is not installed by default from RHEL 8.x. Therefore, non-root users cannot load these components as they are block listed by default. To use one of these kernel modules, the system administrator must install the rpm and explicitly remove the module block list. For more details, see https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/8/html-single/8.0_release_notes/index.

System Requirements

This section describes the system requirements to install and use the Tech Mahindra Access Registrar software.

Table 1-1 lists the system requirements for Tech Mahindra Access Registrar 10.3.

Table 1-1 Minimum Hardware and Software Requirements for Tech Mahindra Access Registrar Server

OS version	RHEL 8.x and 9.x CentOS 7.x
Model	X86
CPU type	Intel Xeon CPU 2.30 GHz
CPU Number	4
CPU speed	2.30 GHz
Memory (RAM)	8 GB
Swap space	10 GB
Disk space	1*146 GB

Tech Mahindra Access Registrar supports JDK versions 17.x and 21.x. Also, Tech Mahindra Access Registrar is qualified with VMWare ESXi 7.0 Update 3, OpenStack Xena.

Note: These are the minimum system requirements to have Tech Mahindra Access Registrar up and running. This may vary based on the deployments. Please contact your BU team to know the specific system requirements for your deployment.

Installation Dialog Overview

Tech Mahindra Access Registrar 10.3 uses the RedHat Package Manager (RPM) and installs as a script. When you begin the software installation, the installation process uses a dialog to determine how to install the software.

Installation Location

The first question in the installation dialog asks, "Where do you want to install?" The default location to install the software is **/opt/TMar**. You can choose to specify another location by entering it at this point. That directory would then be the base install directory, sometimes referred to as **$INSTALL** or **$BASEDIR**.

License File Location

The installation dialog asks for the location of the license file.

```
    Tech Mahindra Access Registrar requires license file to
    operate. A list of space delimited license files or
    directories can be supplied as input; license files must have
    the extension ".lic".

Where are the license files located? [] [?,q]
```

You should copy the license file to the Tech Mahindra Access Registrar server before you begin the software installation. You can copy the license file to **/tmp** or another directory you might prefer. The installation process will copy the license file to the install location that you have provided, for example **/opt/TMar/license**.

See "Tech Mahindra Access Registrar 10.3 Licensing" section for more detailed information about the Tech Mahindra Access Registrar license file requirements.

Java Runtime Environment

The installation dialog asks for the location of the Java Runtime Environment (JRE). Tech Mahindra Access Registrar provides a web-based GUI that requires JRE Version 17 to be installed on the Tech Mahindra Access Registrar server.

```
    Where is the J2RE installed?
```

If you already have a Java Version 17 or Version 21 platform installed, enter the directory where it is installed. If you need the JRE, you can download it from one of the following websites:

http://java.sun.com

http://openjdk.java.net

Open Database Connectivity

The installation dialog asks for the location of the Oracle installation directory required for OCI configuration. The installation process uses this information to set the ORACLE_HOME variable in the **/opt/TMar/bin/arserver** script.

If you are not using OCI, press **Enter** to skip this step.

Note: Tech Mahindra Access Registrar is qualified with the latest oracle servers 18c and 19c. This requires a compatible client to be installed or placed as per oracle recommendations. All oracle client library files must be placed under $ORACLE_HOME/lib.

Example Configuration

The installation dialog asks if you want to install the example configuration. You can use the example configuration to learn about Tech Mahindra Access Registrar and to understand the Tech Mahindra Access Registrar configuration.

You can delete the example configuration at any time by running the command:

/opt/TMar/bin/aregcmd -f /opt/TMar/examples/cli/delete-example-configuration.rc

Running Tech Mahindra Access Registrar as Non-root User

Tech Mahindra Access Registrar can be run as a non-root user as well. Make sure that you have an existing non-root user account. If you wish to run Tech Mahindra Access Registrar as a non-root user, and the user does not exist, choose to exit the installation.

```
Do you want TMAR to be run as non-root user? [n]: [y,n,?,q] y

Enter the username that is to be used to run TMAR processes: test
Enter the usergroup of the above username: adm
User test exists.
```

Configuration Changes as non-root User

If you install Tech Mahindra Access Registrar as a non-root user, ensure that you perform all operations within Tech Mahindra Access Registrar as a non-root user. Otherwise, log files will be created in root mode. To avoid this, run the following script:

```
[root@ar-lnx-vm056 bin]# cat arstartup
        #! /bin/sh
        su test -c "/opt/TMar/bin/arserver $1"
[root@ar-lnx-vm056 bin]# ./arstartup restart
Waiting for these processes to die (this may take some time):
Tech Mahindra AR RADIUS server running       (pid: 15824)
Tech Mahindra AR Server Agent running        (pid: 15811)
Tech Mahindra AR MCD lock manager running    (pid: 15814)
Tech Mahindra AR MCD server running          (pid: 15822)
Tech Mahindra AR GUI running                 (pid: 15825)
Sigtran Process m3ua-stackmgr running      (pid: 15826)
Sigtran Process m3ua-cliclient running     (pid: 15827)
4 processes left.3 processes left..0 processes left
```

```
Tech Mahindra Access Registrar Server Agent shutdown complete.
Sigtran processes shutdown complete.
Starting Tech Mahindra Access Registrar Server Agent...completed.
```

Connection Between Tech Mahindra Access Registrar and OCI

If you install Tech Mahindra Access Registrar as a non-root user, you must have access permissions to the oracle client libraries. If you do not have access permissions to the oracle client libraries, Tech Mahindra Access Registrar will not be able to load the oracle client libraries at run time and will display the error message **OCILIB is not initialized** in name_radius_1_log.

Follow the below steps to resolve the issue:

Step 1 Run the following command:

```
chown -R <non-root user>:<non-root user group> <Oracle user home directory>
```

Example:
chown -R tmaradm:tmaradm /opt/oracle

Where, **/opt/oracle** is the oracle user home directory if ORACLE_HOME path in arserver script is "/opt/oracle/12.1.0/client_1"

Step 2 Verify $ORACLE_HOME/lib directory is accessible by non-root user (user who controls the Tech Mahindra Access Registrar application.)

Step 3 Append "$ORACLE_HOME/lib" in **/etc/ld.so.conf** (at the bottom) and run the **ldconfig** command as root user.

Note: Replace $ORACLE_HOME by its value. Example: **/opt/oracle/12.1.0/client_1/lib.**

Step 4 Execute the following command:

```
ldconfig -v | less
```

Check if it lists the oracle client library path that you added in **/etc/ld.so.conf.**

Step 5 After executing the above four steps, login as non-root user and run the **ldconfig** command as non-root user.

Step 6 Repeat **Step 4**.

Step 7 Restart Tech Mahindra Access Registrar as non-root user using the following command:

```
/techm-ar/bin/arstartup restart
```

Now, Tech Mahindra Access Registrar will be able to initialize the OCILIB properly.

Continue with Installation

Before executing the library files and other packages, a confirmation message stating that “Do you want to continue with the installation of <TMar>?” is displayed. Enter **Y** or **yes** to continue with the installation. No further user input is required.

Downloading Tech Mahindra Access Registrar Software

Tech Mahindra Access Registrar software is available for download at:

https://tmar.techmahindra.com/TMAR_resource_ui/TMAR_Resources.html

All versions of Tech Mahindra Access Registrar software available for download are listed.

From release 10.1 onwards, Tech Mahindra Access Registrar software is available for RHEL 8.x:

- TMar-10.1.0.0-RHEL8x-lnx86_64-install.sh

Complete the following steps to download the software.

Step 1 Create a temporary directory, like **/tmp**, to hold the downloaded software package.

Step 2 Enter the URL to the techmahindra.com website for Tech Mahindra Access Registrar software:

https://tmar.techmahindra.com/TMAR_resource_ui/TMAR_Resources.html

Step 3 Click on the link for Tech Mahindra Access Registrar software:

- TMar-10.1.0.0-RHEL8x-lnx86_64-install.sh.

The Software Center Download Rules page appears. You should read these rules carefully.

Warning **Before downloading this software please ensure that each of the following licenses and agreements are in place with Tech Mahindra Limited or a Tech Mahindra Limited authorized reseller.**

These rules require you to acknowledge the following:

- A software license
- A valid service agreement

By clicking **Agree**, you confirm that the download of this file by you is in accordance with the requirements listed and that you understand and agree that Tech Mahindra Limited reserves the right to charge you for, and you agree to pay for, any software downloads to which you are not entitled. All Tech Mahindra Limited Operating System and application software licenses and downloads are governed by Tech Mahindra Limited' applicable End User License Agreement/Software License Agreement. By clicking **Agree** you further agree to abide by the terms and conditions set forth in Tech Mahindra Limited' End User License agreement/Software License Agreement and your service agreement.

If you click **Agree**, the End User License Agreement / Software License Agreement is displayed.

Step 4 Read the End User License Agreement / Software License Agreement carefully, and if you accept the terms, click **Accept**.

The software Download page appears. In few seconds, a File Download dialog box appears. If it does not appear, click the link provided in the page.

Step 5 Click **Save** and indicate where to save the file on your computer, such as **/tmp**, then click **Save** again.

Tech Mahindra Access Registrar 10.3 Licensing

In Tech Mahindra Access Registrar 10.3, licensing is based on transactions per second (TPS) or concurrent online/active subscribers/devices sessions (SUB). TPS is calculated based on the number of packets flowing into Tech Mahindra Access Registrar. In Session based licensing model, the license is managed based on the number of sessions that reside in Tech Mahindra Access Registrar. During Tech Mahindra Access Registrar startup, either TPS based licensing or session-based licensing model should be loaded.

The Remote Authentication Dial-In User Service (RADIUS) transaction in TMAR constitutes:

- Access-Request/Access-Accept pair
- Access-Request/Access-Reject pair
- Access-Request/Access-Challenge pair
- Accounting-Request/Accounting-Response pair

Each pair (request and its response) is one transaction. In a proxy scenario, the additional traffic created by the proxy request from Tech Mahindra Access Registrar and its response will not be considered as a different transaction. However, only those requests from the RADIUS client/NAS are taken as a transaction.

The Diameter transaction constitutes a complete Diameter-Request and Diameter-Answer.

Tech Mahindra Access Registrar can be deployed in an active/stand-by server combination (with RHEL clustering solution). The active server performs all the AAA functionality. Only if the active server goes down, RHEL cluster will trigger the stand-by server.

Tech Mahindra Access Registrar can optionally be deployed in a two-tier architecture front end and back-end server. The front-end server performs AAA functions. The back-end server performs session management functions.

License Slabs

Greenfield customers can purchase Tech Mahindra Access Registrar 10.3 version by purchasing the required part numbers. Tech Mahindra Access Registrar is also available by e-delivery; with e-delivery, the licenses are obtained electronically. The licenses need to be ordered using the part numbers in Table 2.

Table 2 Tech Mahindra Access Registrar Ordering Information

Part Number	Description
PAR-TPS	Tech Mahindra Access Registrar Base license; support for RADIUS; required for each region, supports 100 transactions per second
PAR-NG-TPS	Tech Mahindra Access Registrar Next Generation Base license; required for each region, support for RADIUS, Diameter, and IPv6; supports 100 transactions per second
PAR-DIR-BASE	Tech Mahindra Access Registrar Director Base license; intelligent AAA proxy, and Accounting write support; Includes RADIUS support; required for each region; supports 2000 transactions per second

PAR-DIR-2KTPS	Tech Mahindra Access Registrar Director Additional license; supports 2000 transactions per second
PAR-ADD-TPS	Tech Mahindra Access Registrar Additional License; supports 100 TPS, 200 TPS, 500 TPS, 1000 TPS etc. up to 2k TPS.
PAR-SUB	Tech Mahindra Access Registrar Subscriber Base license; required for each region; support for RADIUS; supports up to 100,000 concurrent active sessions
PAR-NG-SUB	Tech Mahindra Access Registrar Next Generation Subscriber Base license; required for each region; support for RADIUS, Diameter, and IPv6; supports up to 100,000 concurrent active sessions
PAR-ADD-SUB	Tech Mahindra Access Registrar Additional Subscriber License region; supports 100,000, 200000, 500000, 1M up to 2M concurrent active sessions.
PAR-RDDR-TRX	Tech Mahindra Access Registrar License for RADIUS<->Diameter translations framework
PAR-HSS	Tech Mahindra Access Registrar License for interaction with HSS and EAP-SIM / EAP-AKA / EAP-AKA' authentication
PAR-SIG-TPS	Tech Mahindra Access Registrar Base license with SIGTRAN enabled; support for RADIUS only; supports 100 transactions per second
PAR-SIG-NG-TPS	Tech Mahindra Access Registrar Next Generation Base license with SIGTRAN enabled; RADIUS, Diameter, and IPv6; supports 100 transactions per second
PAR-SIG-ADD-TPS	Tech Mahindra Access Registrar Additional License with SIGTRAN enabled. supports 100 TPS, 200 TPS, 500 TPS, 1K TPS up to 2K TPS.
PAR-SIG-SUB	Tech Mahindra Access Registrar Subscriber Base license with SIGTRAN enabled; support for RADIUS; supports up to 100,000 concurrent active sessions
PAR-SIG-NG-SUB	Tech Mahindra Access Registrar Next Generation Subscriber Base license with SIGTRAN enabled; required for each region; support for RADIUS, Diameter, and IPv6; supports up to 100,000 concurrent active sessions
PAR-SIG-ADD-SUB	Tech Mahindra Access Registrar Additional Subscriber License with SIGTRAN enabled; supports 100,000,200000, 500000, 1M up to 2M concurrent active sessions
PAR-IPAL-1K	Tech Mahindra Access Registrar License for enabling Enhanced IP Allocation feature with the capacity of 1,000 IP allocations. For details about the Enhanced IP Allocation feature, refer to the *Tech Mahindra Access Registrar 10.1 Administrator Guide*.
PAR-ADD-IPAL	Tech Mahindra Access Registrar Additional License with Enhanced IP Allocation enabled; supports 10,000, 100000, 1M, 2M IP allocations

Getting a Tech Mahindra Access Registrar 10.3 License

When you order the Tech Mahindra Access Registrar product, a text license file will be sent to you by e-mail. If you are evaluating the software, Tech Mahindra will provide you with an evaluation license.

If you decide to upgrade your Tech Mahindra Access Registrar software, a new text license file will be sent to you by e-mail.

Note While upgrading, the licenses of previous versions cannot be used with Tech Mahindra Access Registrar 10.3. Backward compatibility support in terms of license will not be available in this version.

Installing Tech Mahindra Access Registrar 10.3 Licenses

You must have a license in a directory on the Tech Mahindra Access Registrar machine before you attempt to install Tech Mahindra Access Registrar software. If you have not installed the Tech Mahindra Access Registrar license file before beginning the software installation, the installation process will fail.

You can store the Tech Mahindra Access Registrar license file in any directory on the Tech Mahindra Access Registrar machine. During the installation process, you will be asked the location of the license file, and the installation process will copy the license file to the **/opt/TMar/license** directory, or **$INSTALL/license** directory if you are not using the default installation location.

The license file might have the name **tmar.lic**, but it can be any filename with the suffix ".lic". To install the Tech Mahindra Access Registrar license file, you can copy and paste the text into a file, or you can simply save the file you receive in e-mail to an accessible directory.

Sample License File

The following is an example of a Tech Mahindra Access Registrar license file.

```
appname=APP_SESSION11
macaddress=10.53.193.14
instanceid=IN1
typeoflicense=session
secrettoken=nGCfpCuc5spR5g==
licensethreshold=5
```

Displaying License Information

Tech Mahindra Access Registrar provides two ways of getting license information using **aregcmd**:

- **aregcmd** command-line option
- Launching **aregcmd**

aregcmd Command-Line Option

Tech Mahindra Access Registrar provides a **-l** command-line option to **aregcmd**. The syntax is:

aregcmd -l directory_name

where *directory_name* is the directory where the Tech Mahindra Access Registrar license file is stored. The following is an example of the **aregcmd -l** command:

```
aregcmd -l /opt/TMar/license
```

```
Tech Mahindra Access Registrar 10.1.0.0 Configuration Utility
Copyright (C) 2023-2024 by Tech Mahindra Limited. All rights reserved.

 Licensed Application: Tech Mahindra Access Registrar (Standard
 Version)

 Following are the licensed components:

                          NAME      VERSION                 COUNT
                           ====      =======               ========
                     PAR-NG-TPS          9.0                  100
```

Launching aregcmd

The Tech Mahindra Access Registrar server displays license information when you launch **aregcmd**, as shown in the following:

aregcmd

```
[root@tmar11-rhel8-vm01 bin]# ./aregcmd -s
Tech Mahindra Access Registrar 10.1.0.0 Configuration Utility
Copyright (C) 2023-2024 by Tech Mahindra Limited. All rights
reserved.
Logging in to localhost

[ //localhost ]
    LicenseInfo = PAR-NG-TPS 9.0(100TPS)
                  PAR-HSS 9.0()
    Radius/
    Administrators/

Server 'Radius' is Running, its health is 10 out of 10
```

Related Documentation

For a complete list of Tech Mahindra Access Registrar 10.3 documentation, see the *Tech Mahindra Access Registrar 10.1 Documentation Overview*.

Note We sometimes update the documentation after original publication. Therefore, you should also review the documentation on tmar.techmahindra.com for any updates.

Chapter 2

Installing Tech Mahindra Access Registrar 10.3

This chapter provides information about installing Tech Mahindra Access Registrar software. The software can be downloaded from the tmar.techmahindra.com website.

Note Tech Mahindra Access Registrar can be used with Red Hat Enterprise Linux (RHEL) 8.x, 9.x or CentOS 7.x operating system. Also, Tech Mahindra Access Registrar is qualified with VMWare ESXi 7.0 Update 3, OpenStack Xena.

This chapter contains the following sections:

Note For installing Tech Mahindra Access Registrar, we have set **/opt/TMar** as the install location. However, you can change the install location as required.

Installing the Tech Mahindra Access Registrar 10.3 License File

You must have a license file in a directory on the Tech Mahindra Access Registrar machine before you attempt to install Tech Mahindra Access Registrar software. After purchasing Tech Mahindra Access Registrar, you will receive a license file in an e-mail attachment. Save or copy this license file to a directory on the Tech Mahindra Access Registrar workstation. If you have not installed the Tech Mahindra Access Registrar license file before beginning the software installation, the installation process will fail.

You can store the Tech Mahindra Access Registrar license file in any directory on the Tech Mahindra Access Registrar machine. During the installation process, you will be asked the location of the license file, and the installation process will copy the license file to the **/opt/TMar/license** directory or to the base installation directory you specify when you install the software if you are not using the default installation location

The license file might have the name **tmar.lic**, but it can be any filename with the suffix **.lic**. To install the Tech Mahindra Access Registrar license file, you can copy and paste the text into a file, or you can simply save the file you receive in e-mail to an accessible directory.

Installing Tech Mahindra Access Registrar 10.3 Software

This section describes the software installation process when installing Tech Mahindra Access Registrar software for the first time. This section includes the following subsections:

- Deciding Where to Install
- Installing Downloaded Software
- Common Installation Steps

Tips Before you begin to install the software, check your workstation's **/etc/group** file and make sure that group ***adm*** exists. The software installation will fail if group staff does not exist before you begin.

Deciding Where to Install

Before you begin the software installation, you should decide where you want to install the new software. The default installation directory for Tech Mahindra Access Registrar software is **/opt/TMar**. You can use the default installation directory, or you can choose to install the Tech Mahindra Access Registrar software in a different directory.

Installing Downloaded Software

This section describes how to uncompress and extract downloaded Tech Mahindra Access Registrar software and begin the software installation.

Step 1 Log into the Tech Mahindra Access Registrar workstation as a root user.

Step 2 Change directory to the location where you have stored the uncompressed tar file.

```
cd /tmp
```

Step 3 Change the permissions of the TMar-10.3.0.0-RHEL8x-lnx86_64-install.sh file to make it executable.

```
chmod 775 TMar-10.3.0.0-RHEL8x-lnx86_64-install.sh
```

Step 4 Run set SELinux to permissive mode:

```
setenforce 0
```

Note The above command will set SELinux to permissive mode temporarily until you reboot the system. To start the system in permissive mode permanently, edit /etc/selinux/config and change SELINUX=enforcing to SELINUX=permissive and reboot the system.

Step 5 Proceed to "Common Installation Steps" section

Common Installation Steps

This section describes how to install the downloaded Tech Mahindra Access Registrar software for Linux and begin the software installation.

Note The Tech Mahindra Access Registrar Linux installation automatically installs **aregcmd** and **radclient** as setgid programs in group **adm**.

Step 1 Log into the Tech Mahindra Access Registrar workstation as a root user.

Step 2 Copy mysql_lm.sql and sqltest.sh files into TMAR installation server's /opt path

Step 3 Install MySQL Database with sqltest.sh file as shown in Figure 2-1. This script will download packages, install, create DB table and it will add TMAR license entry

Figure 2-1 MySQL Database installation with sqltest.sh file sample screen

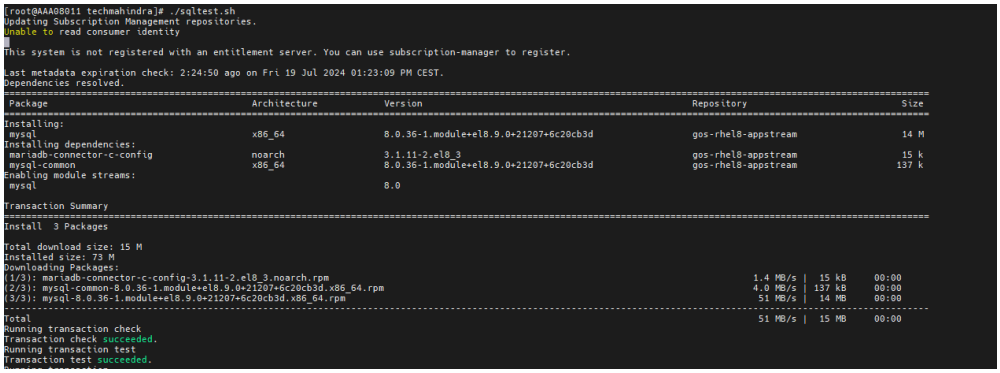
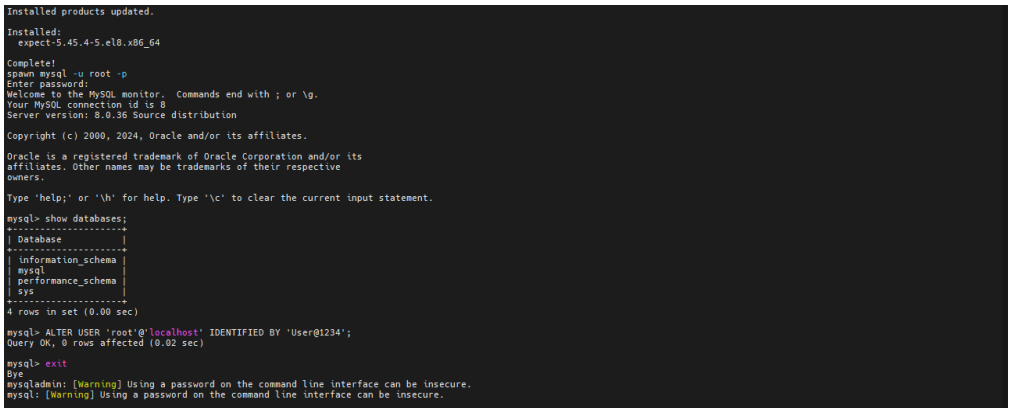


Figure 2-2 MySQL Database installation with sqltest.sh file sample screen (continued)



After the successful execution of sqltest.sh script, we can login to the database and check that the database lm_sql is created and updated with the license entry.

Figure 2-3 MySQL Database login sample screen

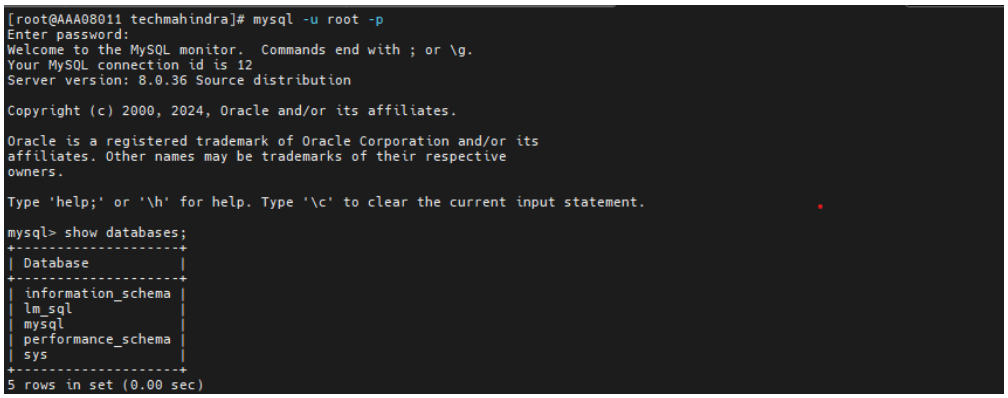


Figure 2-4 MySQL Database login sample screen (Continued)

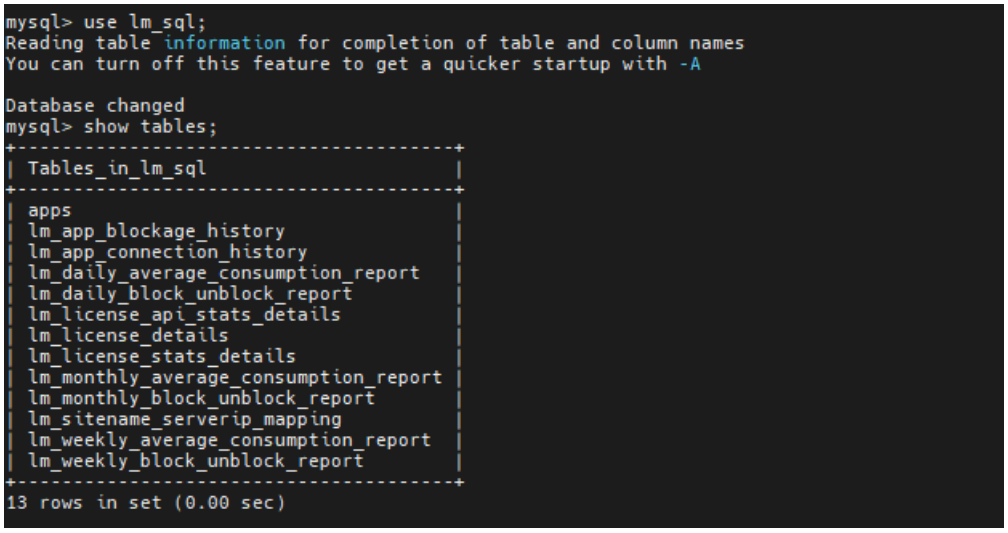
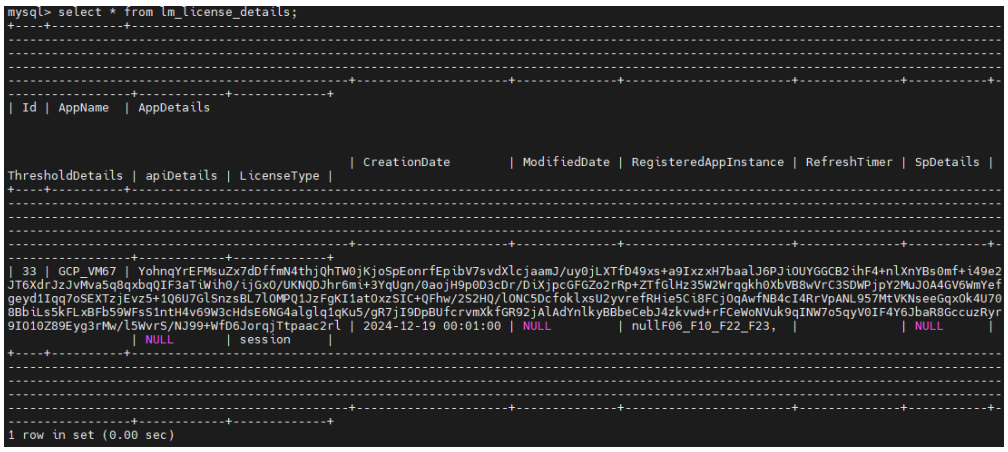


Figure 2-5 MySQL Database login sample screen (Continued)



Step 4 Change the directory to the location where you have stored the **TMar-10.3.0.0-RHEL8x-lnx86_64-install.sh** file.

cd /tmp

Step 5 Enter the name of the script file to begin the installation:

./TMar-10.1.0.0-RHEL8x-lnx86_64-install.sh

```
Name        : TMar
Epoch       : 1
Version     : 10.1.0.0
Release     : 1724226666
Group       : Applications/Internet
Build Date  : Wed 21 Aug 2024 01:49:38 PM IST
Build Host  : Rhel84-168-122-132
Relocations : /opt/TMar
Vendor      : Tech Mahindra Ltd
Summary    : Tech Mahindra Access Registrar, a carrier-class RADIUS server
Description :
Tech Mahindra Access Registrar is a carrier-class AAA server,
implementing a robust, extensible, high-performance RADIUS
authentication, authorization, and accounting server.
build_tag: [Linux-4.18.0, official]

Copyright @2024 Tech Mahindra Limited. All rights Reserved
This program contains proprietary and confidential information.
All rights reserved except as may be permitted by prior written consent.

Where do you want to install <TMar>? [/opt/TMar] [?,q]
```

Step 6 Press **Enter** to accept the default location of **/opt/TMar**, or enter a different directory to be used as the base installation directory.

```
Tech Mahindra Access Registrar requires license file to operate.
A list of space delimited license files or directories can be supplied
as input; license files must have the extension ".lic".


Do you want to enable smartlicensing?[y/n] [n]: [y,n,?,q]n

Tech Mahindra Access Registrar requires license file to operate.
A list of space delimited license files or directories can be supplied
as input; license files must have the extension ".lic".

Tech Mahindra Access Registrar provides a Web GUI. It requires J2RE
version 1.8.* or 11.* to be installed on the server.

If you already have a compatible version of J2RE installed, please
enter the directory where it is installed.  If you do not, the
compatible J2RE version can be downloaded from:

        http://java.sun.com/

Where is the J2RE installed? [] [?,q] /opt/jdk-17.0.18
```

Step 7 The J2RE is required to use the Tech Mahindra Access Registrar GUI. If you already have a Java 2 platform installed, enter the directory where it is installed as mentioned above.

Note If you do not provide the JRE path, or if the path is empty or unsupported, the installation process exits. Tech Mahindra Access Registrar requires either JDK 17.

```
If you are not using ORACLE, press Enter/Return to skip this
step. ORACLE installation directory is required for ODBC
and OCI configuration. ORACLE_HOME variable will be set in
/etc/init.d/arserver script
```

```
Where is ORACLE installed? [] [?,q]
/opt/oracle/oracle-client-19c/product/19.0.0/client_1/
```

Note For OCI related services, install Oracle client version 11g - 19c. Oracle Instant Client libraries are not supported by OCI services.

Step 8 Enter the location where you have installed Oracle as mentioned above, otherwise press **Enter**.

```
Do you want to install SIGTRAN-M3UA functionality now? [n]: [y,n,?,q] n
```

Step 9 Specify whether you want to install SIGTRAN_M3UA. If you select the option 'Y', SIGTRAN-M3UA process will run.

```
Tech Mahindra Access Registrar can be run as non-root user also.
This requires the libcap-2.16-5.5 rpm to be installed. If the kernel
version is 2.6.24 or later, libcap is already available Please ensure
that you have an existing non-root user created prior to this.

If you require to run TMAR as non-root user, and the user does not
exist, please choose to exit installation.  Once the non-root user
is created, you may install TMAR.

Do you want TMAR to be run as non-root user? [n]: [y,n,?,q]
```

Step 10 Specify whether you want to run Tech Mahindra Access Registrar as a non-root user.

```
You will be requested for the non-root user information. Ensure that the non-root user account
exists.

Enter the username that is to be used to run TMAR processes: test
Enter the usergroup of the above username: eng
User test exists.
```

Step 11 To enable SystemD service, enter Y as mentioned below after providing the non-root user details:

```
Do you want TMAR arserver service to be run as non-root user while OS startup? [n]:
[y,n,?,q] y
```

You can check whether the startup service is enabled or not using the following commands. The first two commands below are used to set environment variables for systemctl command:

```
# loginctl enable-linger <TMAR_USERNAME>
# export XDG_RUNTIME_DIR=/run/user/$(id -u <TMAR_USERNAME>)
# su <TMAR_USERNAME> -c 'systemctl --user list-unit-files arserver.service'
# su <TMAR_USERNAME> -c 'systemctl --user status arserver'

[root@RHEL82-95-175 ~]# su TechMahindra -c 'systemctl --user status arserver'
? arserver.service - systemctl: Tech Mahindra Access Registrar startup script runlevel
is 345
   Loaded: loaded (/techm-ar/bin/arserver; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2024-08-23 03:13:17 IST; 9min ago
     Docs: man:systemctl(1)
  Process: 635073 ExecStop=/techm-ar/bin/arserver stop (code=exited, status=0/SUCCESS)
  Process: 635114 ExecStart=/techm-ar/bin/arserver start (code=exited,
status=0/SUCCESS)
       CGroup: /user.slice/user-1001.slice/user@1001.service/arserver.service
               ??635200 /opt/TMar/.system/arservagt -T 256 -A10000000 -N2 -d
           ??635203 /opt/TMar/.system/arlockmgr -d -a aiclkmgr
           ??635210 /opt/TMar/.system/armcdsvr -Z 0 -Alogsize=10000000,nlogs=2 -L -P
config/mcd/1 -A id=0
           ??635212 /opt/TMar/.system/radius -Z 3 -C servers/name/radius/1 -S
servers/name/radius/1 -B /opt/TMar/ -P RHEL82-95-175.techmahindra.com/name/radius/1 -A
id=3,thre>
           ??635213 /opt/ jdk-17.0.18/bin/java
-Djava.util.logging.config.file=/opt/TMar/apache-tomcat-10.1.54/conf/logging.properties
-Djava.util.logging.manager=org.apa>
```

Note This feature is supported from RHEL version 8.0.

```
If you want to learn about Tech Mahindra Access Registrar by following
        the examples in the Installation Guide, you need
        to populate the database with the example configuration.

        NOTE: If you are using DIRECTOR/DIRECTOR NEXT GEN Licenses,
        please do not try installing Example configuration, Give the
        option for Example configuration as "n"

    Do you want to install the example configuration now? [n]: [y,n,?,q] y
```

Step 12 When prompted whether to install the example configuration now, enter **Y** or **N** to continue.

Note You can delete the example configuration at any time by running the command **/opt/TMar/usrbin/aregcmd -f /opt/TMar/examples/cli/delete-example-configuration.rc**.

```
unpack the rpm file done
Verifying...                          ################################## [100%]
Preparing...                          ################################## [100%]
Updating / installing...
   1:TMarui-add-10.1.0.0-1724226666    ################################## [100%]
# setting up the web server...........
# configuring the web server...........
# extracting the web application...........
# extracting the rest application...........
# extracting LM application.................
Verifying...                          ################################## [100%]
Preparing...                          ################################## [100%]
Updating / installing...
   1:TMar-1:10.1.0.0-1724226666        ################################## [100%]
relink tech mahindra arserver
JAVA ROOT /opt/jdk-17.0.18
JAVA_HOME /opt/jdk-17.0.18
# setting ORACLE_HOME and JAVA_HOME variables in arserver
ORACLE_HOME
JAVA_HOME /opt/jdk-17.0.18
set JAVA_HOME
# flushing old replication archive
# creating initial configuration database
Rollforward recovery using "/opt/TMar/data/db/vista.tjf" started Wed Aug 28 02:50:31 2024
Rollforward recovery using "/opt/TMar/data/db/vista.tjf" finished Wed Aug 28 02:50:31 2024

# add-example-config y
calling gen-tomcat
openssl utility not found in application. Using the default /usr/bin/openssl
using OPENSSL=/usr/bin/openssl
Making sure the cert directory exists: /techm-ar/certs/tomcat
Calling gen-ss-cert to create the cert
openssl utility not found in application. Using the default /usr/bin/openssl
We will now generate an RSA key-pair and self-signed certificate that
may be used for test purposes
Generating a RSA private key
.................+++++
...........+++++
writing new private key to '/techm-ar/certs/tomcat/server-key.pem'
-----
Server self-signed certificate now resides in /techm-ar/certs/tomcat/server-cert.pem
Server private RSA key now resides in /techm-ar/certs/tomcat/server-key.pem

Remember to install additional CA certificates for client verification
Tomcat private RSA key now resides in /techm-ar/certs/tomcat/server-key.pem
Synchronizing state of arserver.service with SysV service script with /usr/lib/systemd/systemd-sysv-
install.
Executing: /usr/lib/systemd/systemd-sysv-install enable arserver
Tech Mahindra Access Registrar Service Status : active
Starting Tech Mahindra Access Registrar by installer......
```

```
[root@tmar-rhel8-vm15 opt]# cd TMar/bin/
[root@tmar-rhel8-vm15 bin]# ./aregcmd -s
Tech Mahindra Access Registrar 10.1.0.0 Configuration Utility
Copyright (C) 2023-2024 by Tech Mahindra Limited. All rights reserved.
Logging in to localhost
Enter a new passphrase:
Confirm new passphrase:
```

Note After the installation process, run the command **service iptables stop** to disable the iptables firewall.

Configuring SNMP

If you choose not to use the SNMP features of Tech Mahindra Access Registrar, the installation process is completed. To use SNMP features, complete the configuration procedure described in "Configuring SNMP" section in the "Configuring Tech Mahindra Access Registrar" chapter of the *Tech Mahindra Access Registrar 10.1 Administrator Guide.*

Registering Tech Mahindra Access Registrar as a Service in RHEL SystemD Service Management

With this feature, Tech Mahindra Access Registrar is added as a service in SystemD service management.

After successful installation, Tech Mahindra Access Registrar gets registered as a service in SystemD unit, after

which you can execute the below commands to start, stop, or restart Tech Mahindra Access Registrar and to find

the status of the Tech Mahindra Access Registrar server:

- **systemctl start arserver**
- **systemctl stop arserver**
- **systemctl restart arserver**
- **systemctl status arserver**

After successful registration of Tech Mahindra Access Registrar as a service in SystemD, you should refrain from using the older method of starting, stopping, or restarting the server using arserver script (/techm-ar/bin/arserver start, etc.).

When the installer enables Tech Mahindra Access Registrar as SystemD service, the following logs will be printed in the console towards the end of successful installation. A sample of the log is provided below:

```
Created symlink from /etc/systemd/system/multi-user.target.wants/arserver.service to
/usr/lib/systemd/system/arserver.service.
arserver service status : active
Tech Mahindra Access Registrar started by arserver Service .....
```

Sample Output

Following is the sample output upon running the **systemctl status arserver** command:

```
[root@tmar-rhel8-vm15 bin]# systemctl status arserver
● arserver.service - systemctl: Tech Mahindra Access Registrar startup script runlevel is 345
   Loaded: loaded (/techm-ar/bin/arserver; enabled; vendor preset: disabled)
```

```
   Active: active (running) since Wed 2024-08-28 02:52:17 EDT; 5min ago
     Docs: man:systemctl(1)
  Process: 3024090 ExecStop=/techm-ar/bin/arserver stop (code=exited, status=0/SUCCESS)
  Process: 3024129 ExecStart=/techm-ar/bin/arserver start (code=exited, status=0/SUCCESS)
    Tasks: 455 (limit: 22921)
   Memory: 1.0G
   CGroup: /system.slice/arserver.service
           ├─3024220 /opt/jdk-17.0.18/bin/java -Djava.util.logging.config.file=/opt/TMar/apache-
tomcat2-10.1.54/conf/logging.properties -Djava.util.logging.manager=org>
           ├─3024313 /opt/TMar/.system/arservagt -T 256 -A10000000 -N2 -d
           ├─3024318 /opt/TMar/.system/arlockmgr -d -a aiclkmgr
           ├─3024324 /opt/TMar/.system/armcdsvr -Z 0 -Alogsize=10000000,nlogs=2 -L -P config/mcd/1
-A id=0
           ├─3024325 /opt/TMar/.system/radius -Z 3 -C servers/name/radius/1 -S
servers/name/radius/1 -B /opt/TMar/ -P tmar-rhel8-vm15/name/radius/1 -A id=3,threads=256
           └─3024326 /opt/jdk-17.0.18/bin/java -Djava.util.logging.config.file=/opt/TMar/apache-
tomcat-10.1.54/conf/logging.properties -Djava.util.logging.manager=org.>

Aug 28 02:50:52 tmar-rhel8-vm15 systemd[1]: arserver.service: Succeeded.
Aug 28 02:50:52 tmar-rhel8-vm15 systemd[1]: Stopped systemctl: Tech Mahindra Access Registrar
startup script runlevel is 345.
Aug 28 02:50:52 tmar-rhel8-vm15 systemd[1]: Starting systemctl: Tech Mahindra Access Registrar
startup script runlevel is 345...
Aug 28 02:51:40 tmar-rhel8-vm15 SmartAgent[3024325]: Wed Aug 28 02:51:40 2024
                                                     %SMART_LIC-6-EXPORT_CONTROLLED:Usage of
export controlled features is not allowed
Aug 28 02:51:40 tmar-rhel8-vm15 SmartAgent[3024325]: Wed Aug 28 02:51:40 2024
                                                     %SMART_LIC-6-AGENT_READY:Smart Agent for
Licensing is initialized
Aug 28 02:52:17 tmar-rhel8-vm15 arserver[3024129]: Starting Tech Mahindra Access Registrar Server
Agent.....completed.
Aug 28 02:52:17 tmar-rhel8-vm15 systemd[1]: Started systemctl: Tech Mahindra Access Registrar
startup script runlevel is 345.
```

Chapter 3

Uninstalling Tech Mahindra Access Registrar

This chapter provides information about uninstalling Tech Mahindra Access Registrar software.

The following sections are included:

- Software Pre-Uninstallation Tasks

- Uninstalling Tech Mahindra Access Registrar

Software Pre-Uninstallation Tasks

This section describes the tasks that must be followed before uninstalling the Tech Mahindra Access Registrar software. This section consists of the following subsections:

- Backup Copy of data and scripts directory
- Backup MCD File
- Backup SNMP Configuration

Backup Copy of data and scripts directory

As a prerequisite for uninstallation, copy the directories /opt/TMar/data and /opt/TMar/scripts to a temporary location such as /home, before the Tech Mahindra Access Registrar software is uninstalled for future use.

Backup MCD File

Make sure to take a backup of the MCD file as a prerequisite using the following command before uninstalling TMAR.

```
/techm-ar/bin/mcdadmin -e <path>
```

Backup SNMP Configuration

To use SNMP features, complete the configuration procedure described in "Configuring SNMP" section in the "Configuring Tech Mahindra Access Registrar" chapter of the *Tech Mahindra Access Registrar 10.1 Administrator Guide.*

If you have modified the **snmpd.conf** file in the **/techm-ar/ucd-snmp/share/snmp** directory, you must back up this file before doing the uninstallatio. Uninstallation of Tech Mahindra Access Registrar removes the **snmpd.conf** file, even if it has been modified.

Uninstalling Tech Mahindra Access Registrar 10.3 Software

Tech Mahindra Access Registrar software includes the **uninstall-ar** program in **/opt/TMar/bin** that is used to remove Tech Mahindra Access Registrar software on Linux machines.

Step 1 Log into the Tech Mahindra Access Registrar workstation as a root user.

Step 2 To remove the Linux version of Tech Mahindra Access Registrar software, change directory to **/opt/TMar/bin** and stop the server.

cd /opt/TMar/bin

arserver stop

```
Waiting for these processes to die (this may take some time):
Tech Mahindra AR RADIUS server running       (pid: 1403)
Tech Mahindra AR Server Agent running        (pid: 29310)
Tech Mahindra AR MCD lock manager running    (pid: 29320)
Tech Mahindra AR MCD server running          (pid: 29317)
Tech Mahindra AR GUI running                 (pid: 29441)
5 processes left.2 processes left.0 processes left
Tech Mahindra  Access Registrar Server Agent shutdown complete.
```

Step 3 Run the **uninstall-ar** program as shown below:

uninstall-ar

```
Are you sure you want to remove TMar-10.3.0.0-RHEL8x-lnx86_64 and TMarui-10.1.0.0-
RHEL8x-lnx86_64? [y/n]:
```

Step 4 Enter **Yes** or **Y** to continue removing the Linux software

```
Are you sure you want to remove TMar-10.1.0.0-RHEL8x-lnx86_64 and TMarui-10.1.0.0-
RHEL8x-lnx86_64? [y/n]: y
Nothing running, no need to shutdown.
host root bin###
```

Chapter 4

Upgrading Tech Mahindra Access Registrar Software

Tech Mahindra Access Registrar 10.3 supports software upgrades from previously installed Tech Mahindra Access Registrar software while preserving the existing configuration database.

Note Configuration for Prepaid billing servers will no longer work in Tech Mahindra Access Registrar 10.3. If you have been using a Prepaid billing server in Cisco Prime Access Registrar and are upgrading your software to Tech Mahindra Access Registrar 10.3, you must remove the Prepaid billing server configuration before installing the Tech Mahindra Access Registrar 10.3 software. See "Chapter 16, Using Prepaid Billing" in the *Tech Mahindra Access Registrar 10.3 User Guide* for detailed instructions on configuring Prepaid billing services for Tech Mahindra Access Registrar.

Caution When upgrade is performed from 32-bit to 64-bit, Tech Mahindra Access Registrar loses all session information.

This chapter contains the following sections:

Software Pre-Upgrade Tasks

This section describes the tasks that must be followed before upgrading the Tech Mahindra Access Registrar software. This section consists of the following subsections:

Disabling Replication

If you are using the Tech Mahindra Access Registrar replication feature, you must disable it before you begin the upgrade process otherwise the upgrade will fail. When completed, see "Restarting Replication" section for the correct way to restart replication.

To ensure that replication is disabled, complete the following steps:

Step 1 Log in as admin and launch **aregcmd**.

Step 2 Change directory to /radius/replication and examine the RepType property.

cd /radius/replication

```
[ //localhost/Radius/Replication ]
RepType = None
RepTransactionSyncInterval = 60000
RepTransactionArchiveLimit = 100
RepIPAddress = 0.0.0.0
RepPort = 1645
RepSecret = NotSet
RepIsMaster = FALSE
RepMasterIPAddress = 0.0.0.0
RepMasterPort = 1645
Rep Members/
```

Make sure that RepType is set to None.

Step 3 If you make changes, execute the **save** command, then exit the **aregcmd** command interface.

Step 4 Restart the server.

Backup Copy of Original Configuration

The upgrade process displays a message like the following to indicate where a copy of your original configuration has been stored.

Note Configuration files, like the tcl script file, are replaced with default files on upgrade. Hence, before upgrading, back up the existing file to prevent any loss of data. After upgrading, replace the **/opt/TMar/scripts/radius/tcl/tclscript.tcl** with the backup file.

```
##################################################################

# A backup copy of your original configuration has been
# saved to the file:
#
#    /opt/TMar/temp/10062.origconfig-backup
#
##################################################################
```

Backup MCD File

Tech Mahindra Access Registrar will prompt you to upgrade from 32-bit to 64-bit architecture, when you upgrade from any earlier version to Tech Mahindra Access Registrar 10.3. For successful upgrade from 32-bit to 64-bit, MCD backup is required. You must ensure that you take a backup of the MCD file using the following command before uninstalling the previous version:

```
/techm-ar/bin/mcdadmin -e <path>
```

Backup SNMP Configuration

To use SNMP features, complete the configuration procedure described in "Configuring SNMP" section in the "Configuring Tech Mahindra Access Registrar" chapter of the *Tech Mahindra Access Registrar 10.1 Administrator Guide.*

If you have modified the **snmpd.conf** file in the **/techm-ar/ucd-snmp/share/snmp** directory, you must back up this file before doing the upgrade process. Uninstallation of Tech Mahindra Access Registrar removes the **snmpd.conf** file, even if it has been modified.

Upgrading Tech Mahindra Access Registrar

This section describes the upgrade processes on the same server and on a different server. This section consists of the following subsections:

- Upgrading Tech Mahindra Access Registrar on the Same Server
- Upgrading Tech Mahindra Access Registrar on a New Server

Upgrading Tech Mahindra Access Registrar on the Same Server

To upgrade the software on the same server:

Step 1: Ensure that you back up a copy of your original configuration.

See the "Backing Up the Database" section of the *Tech Mahindra Access Registrar 10.3 User Guide*.

Step 2: Ensure the replication is disabled.

See "Disabling Replication" section.

Step 3 If you have installed Tech Mahindra Access Registrar with SIGTRAN_M3UA process, ensure that the host name is not set in the HostName/SourceIPAddress field as part of the SIGTRAN_M3UA server properties. Only IP address must be set as part of the server properties.

Step 4 If you have modified the **snmpd.conf** file in the **/techm-ar/ucd-snmp/share/snmp** directory, you must back up this file before doing the upgrade process. Uninstallation of Tech Mahindra Access Registrar removes the **snmpd.conf** file, even if it has been modified.

Note If you currently use the 3.5.2 Linux version, the **uninstall-ar** program removes **/opt/TMar/data**. Before you run the **uninstall-ar** program, copy the **/opt/TMar/data** directory to a temporary location such as **/home**. After you install the upgrade software, move the data directory back to **/opt/TMar/data**.

Step 5 If you have added any scripts or modified any existing scripts in **/techm-ar/scripts/radius** directory, you must back up those files before doing the upgrade process.

Step 6 Remove the old software using the **uninstall-ar** command.

For detailed information about using the **uninstall-ar** command to remove Tech Mahindra Access Registrar software, see "Uninstalling Tech Mahindra Access Registrar 10.1 Software" section.

Step 7 If you plan to use the Tech Mahindra Access Registrar SNMP features, disable the current SNMP daemon and prevent the SNMP daemon from restarting after a reboot.

Step 8 Decide where to install the Tech Mahindra Access Registrar software.

The default installation directory for Tech Mahindra Access Registrar 10.3 software is **/opt/TMar**.

Note If you wish to install Tech Mahindra Access Registrar in a different directory, you must create a softlink in the default directory to point to the installation directory.

Step 9 Decide if you want to preserve your existing configuration database.

Preserving your existing configuration database is a compelling reason to upgrade rather than to start a new. The upgrade procedure in this chapter assumes you want to preserve your existing configuration.

Step 10 Copy the Tech Mahindra Access Registrar license file to a location on the Tech Mahindra Access Registrar workstation directory such as **/home**.

Step 11 Install the Tech Mahindra Access Registrar software. For more information, see Common Installation Steps.

Step 12 During the installation process, you will be prompted to provide the following information for software upgrade:

- Whether to upgrade from 32-bit to 64-bit architecture. If you upgrade from any earlier version (prior to Cisco Prime Access Registrar 7.x) to Tech Mahindra Access Registrar 10.3, the response must be **y** (Yes).

  Note Sessions will not be upgraded when you upgrade Tech Mahindra Access Registrar from 32-bit to 64-bit architecture.

- The location of the MCD backup file. For successful upgrade from 32-bit to 64-bit, MCD backup is required, and you must specify the location of the backup file.

Step 13 If you configured Tech Mahindra Access Registrar to use SNMP prior to upgrading, after installing Tech Mahindra Access Registrar 10.3 software, you must copy the backed up **snmpd.conf** file back to the **/techm-ar/ucd-snmp/share/snmp** directory.

Step 14 After installing Tech Mahindra Access Registrar, you must copy back the scripts to **/techm-ar/scripts/radius** directory.

Step 15 Restart the Tech Mahindra Access Registrar server using the following command:

/etc/init.d/arserver restart

Upgrading Tech Mahindra Access Registrar on a New Server

To upgrade the Linux software on a new server, follow the following tasks:

Tasks in the Existing Server

Step 1 Ensure that you back up a copy of your original configuration.

See the "Backing Up the Database" section of the *Tech Mahindra Access Registrar 10.3 User Guide*.

Step 2 Ensure the replication is disabled.

See "Disabling Replication" section.

Step 3 If you have installed Tech Mahindra AR with SIGTRAN_M3UA process, ensure that the host name is not set in the HostName/SourceIPAddress field as part of the SIGTRAN_M3UA server properties. Only IP address must be set as part of the server properties.

Step 4 If you have modified the **snmpd.conf** file in the **/techm-ar/ucd-snmp/share/snmp** directory, you must back up this file before doing the upgrade process. The **pkgrm** removes the **snmpd.conf** file, even if it has been modified.

See Backup SNMP Configuration.

Step 5 If you have added any scripts or modified any existing scripts in **/techm-ar/scripts/radius** directory, you must back up those files before doing the upgrade process. The **uninstall-ar** removes some of the scripts, even if it has been modified in the existing script.

Note Configuration files, like the tcl script file, are replaced with default files on upgrade. Hence, before upgrading, back up the existing file to prevent any loss of data. After upgrading, replace the /opt/TMar/scripts/radius/tcl/tclscript.tcl with the back up file.

Step 6 Remove the old software using the **uninstall-ar** command.

For detailed information about using the **uninstall-ar** command to remove Tech Mahindra Access Registrar Linux software, see "Uninstalling Tech Mahindra Access Registrar 10.3 Software" section.

Step 7 Tar the **/opt/TMar/data** directory to a temporary location such as **/home**. Also, tar the **/opt/TMar/temp** directory.

Tasks in a New Server

Step 8 Untar the backup of **/opt/TMar/data** and **/opt/TMar/temp** directories. Copy the SNMP file, PKI directory, and the scripts to the installed base directory (**/opt/TMar/**).

Step 9 Decide where to install the Tech Mahindra Access Registrar software.

Step 10 Copy the Tech Mahindra Access Registrar license file to a location on the Tech Mahindra Access Registrar workstation directory such as **/home**.

For detailed information about the Tech Mahindra Access Registrar license and how to install the license, see "Tech Mahindra Access Registrar 10.3 Licensing" section.

Step 11 Install the Tech Mahindra Access Registrar software. For more information, see Common Installation Steps.

Step 12 During the installation process, you will be prompted to provide the following information for software upgrade:

- Whether to upgrade from 32-bit to 64-bit architecture. If you upgrade from any earlier version (prior to Cisco Prime Access Registrar 7.x) to Tech Mahindra Access Registrar 10.3, the response must be **y** (Yes).

Note Sessions will not be upgraded when you upgrade Tech Mahindra Access Registrar from 32-bit to 64-bit architecture.

- The location of the MCD backup file. For successful upgrade from 32-bit to 64-bit, MCD backup is required and you must specify the location of the backup file.

Step 13 If you configured Tech Mahindra Access Registrar to use SNMP prior to upgrading, after installing Tech Mahindra Access Registrar 10.3 software, you must copy the **snmpd.conf** file back to the **/techm-ar/ucd-snmp/share/snmp** directory.

Step 14 After installing Tech Mahindra Access Registrar, you must copy back the scripts to **/techm-ar/scripts/radius** directory.

Step 15 Restart the Tech Mahindra Access Registrar server using the following command:

/etc/init.d/arserver restart

Software Post-Upgrade Tasks

This section provides information about the tasks involved in the Tech Mahindra Access Registrar software upgrade process. This section consists of the following subsections:

- Removing Old VSA Names
- VSA Update Script
- Configuring SNMP
- Restarting Replication

Removing Old VSA Names

The upgrade process provides an analysis of the configuration database, addition of new database elements, and a search for obsolete VSA names. When this is complete, a message like the following is displayed:

```
############################################################
#
#    Sometimes VSAs get renamed from version to version of Tech Mahindra AR.
#    The upgrade process does not automatically remove the
#    old names. The upgrade process has generated a script
#    to remove the old names. The script is in:
#
#        /opt/TMar/temp/10062.manual-deletes
#
#    Review the script to make sure you are not using any of
#    these old VSAs. Modify your configuration and your
#    scripts to use the new names before you attempt to run
#    the script.
#
#    To run the removal script, type:
#
#        aregcmd -f /opt/TMar/temp/10062.manual-deletes
#
############################################################
```

At this point, you should examine the script produced by the upgrade process to make sure that your site is not using any of the old VSAs. In the example above, the script can be found at **/opt/TMar/temp/10062.manual-deletes**.

Note The number preceding **manual.deletes** is produced from the PID of the upgrade process.

Modify your configuration and your scripts to use the new names before you attempt to run the script generated by the upgrade process.

VSA Update Script

The upgrade process builds a script you can use to update VSAs in your system.

```
############################################################
#
#    VSAs for the old Tech Mahindra AR version are not updated
#    automatically. The upgrade process generated a script
#    to perform the update. The script is located in:
#
#        /opt/TMar/temp/10062.manual-changes
#
#    Review the script to make sure it does not conflict with
#    any of your VSA changes. Make sure you modify the script,
#   if necessary, before you attempt to run it.
#
#    To run the update script, type:
#
#        aregcmd -f /opt/TMar/temp/10062.manual-changes
#
############################################################
```

Step 1 Review the script and make sure that the changes it will make do not conflict with any changes you might have made to the VSAs. Modify the script if necessary.

Step 2 Record the location of the upgrade messages for future reference.

```
############################################################
#
#  These upgrade messages are saved in:
#
#       /opt/TMar/temp/10062.upgrade-log
#
############################################################
```

Configuring SNMP

After installing Tech Mahindra Access Registrar 10.3 software, you must copy the already copied **snmpd.conf** file back to the **/techm-ar/ucd-snmp/share/snmp** directory. Restart the Tech Mahindra Access Registrar server using the following command:

/etc/init.d/arserver restart

Restarting Replication

Before you enable replication, you must first upgrade all replication slave servers to the same version of Access Registrar software as the master server. Do not enable replication on the master server until all slave servers have been upgraded.

Use the same process you used to upgrade the master server to upgrade any slave servers. If you retained your configuration on the master, retain the configuration on the slaves, too.

After the same version of Tech Mahindra Access Registrar software has been installed on all slave servers, you can enable replication on the master server again. After enabling replication on the master server, you can enable replication on each of the slave servers.

To ensure that replication is restarted, complete the following steps:

Step 1 Log in as admin and launch aregcmd.

Step 2 Change directory to /radius/replication and examine the RepType property.

cd /radius/replication

```
[ //localhost/Radius/Replication ]
RepType = SMDBR
```

Make sure that RepType is set to None.

Step 3 If you make changes, issue the save command, then exit the aregcmd command interface.

Step 4 Restart the server.

Chapter 5

Installation Worksheet

This chapter describes the basic configuration information that you need to ensure for a successful installation of Tech Mahindra Access Registrar. Table 5-1is a worksheet that you can use to record the information specific to the installation.

Table 5-1 Tech Mahindra Access Registrar Installation Parameters

Prompt	Description	Default Value
Home Directory	Directory to install Tech Mahindra Access Registrar	/opt/TMar
License File	Location of the license file	None
JRE Directory	Location of JRE	None
Open Database Connectivity	Location required for OCI configuration	/opt/TMar/bin/arserver

Appendix A

Hardening Guidelines

This appendix contains the following section:

Hardening Guidelines

If you consider hardening the system, you should consider the following hardening guidelines:

- Refer to the host platform's hardening guides:
  - CentOS 7.x:

    https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/7/pdf/Security_Guide/Red_Hat_Enterprise_Linux-7-Security_Guide-en-US.pdf
  - RHEL 8.x:

    https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/8/pdf/security_hardening/Red_Hat_Enterprise_Linux-8-Security_hardening-en-US.pdf

Note The above links reference external websites and Tech Mahindra is not responsible for keeping them up to date. They are provided for reference only. If you find that the content is outdated or if you cannot access the links, please contact the website owner for updated information.

- Disable or block the ports that are not used by Tech Mahindra Access Registrar. The Tech Mahindra Access Registrar documentation outlines the default port usage.

  For a list of ports used by Tech Mahindra Access Registrar, see the *"Ports" section in the "Overview" Chapter of the Tech Mahindra Access Registrar 10.1 Reference Guide*. Note that some are defaults and may have been changed during install or configuration.

INDEX

I

J

L