

Upgrade Guide

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Overview

This document provides software upgrade instructions for:

- ♦ Cloud Tiering Appliance
- ♦ Cloud Tiering Appliance for High Availability
- ♦ Cloud Tiering Appliance/VE
- ♦ Cloud Tiering Appliance/VE for High Availability

It supplements the official EMC Cloud Tiering Appliance documentation set:

- ♦ *EMC Cloud Tiering Appliance and Cloud Tiering Appliance/VE Getting Started Guide*
- ♦ *EMC Cloud Tiering Appliance and Cloud Tiering Appliance/VE Release Notes*

NOTE: Before starting any upgrade, obtain copies of all official EMC Cloud Tiering Appliance documentation from EMC Online Support or <http://support.emc.com>.

Audience

This document is intended for use by storage management administrators when upgrading to Cloud Tiering Appliance version 10.0SP3.

With the release of version 7.5, Cloud Tiering Appliance (CTA) is the product name that replaced File Management Appliance (FMA).

Migration paths to CTA

The following table shows upgrade paths to CTA 10.0SP3:

Current Version	First Step	Second Step	Third Step
CTA 10.x (all builds)	10.0SP3	NA	NA
CTA 9.0 (all builds)	10.0SP3	NA	NA
CTA 7.5 (all builds)	10.0SP3	NA	NA
FMA 7.3 (builds 58, 63, 64)	7.5	10.0SP3	NA
FMA 7.3.1, 7.3.2 (all builds)	7.5	10.0SP3	NA
FMA 7.4	7.5	10.0SP3	NA
Pre FMA 7.3	7.3	7.5	10.0SP3

When upgrading to CTA 7.5, refer to the appendices.

NOTE: Because the upgrade software prior to FMA 7.3 is not available from EMC Online Support, this upgrade path requires customer support.

Upgrading to CTA 10.0SP3 from version 10.x

You can upgrade to CTA 10.0SP3 in a single step from an appliance running version 10.x:

- Perform a UPG upgrade - for CTA and CTA-VE

Overview of UPG upgrade

1. Backup the database and CTA configuration.
2. Download .upg file from EMC Online Support website at <https://Support.EMC.com>
3. Run the upgrade. NOTE: rfupgrade version 10.0 and later automatically extracts the latest rfupgrade script from the .upg file and runs it.
4. Monitor the upgrade process from putty session.
5. Verify that the upgrade completed.

CTA-HA and CTA-VE HA

1. Before upgrading the HA verify the CTA upgrade has completed and the CTA GUI is available for log in.
2. Download the .upg file for the CTA HA and run the upgrade.

Backup database and CTA configuration before upgrading

Before beginning the upgrade, ensure that you have a backup copy of the database files and the CTA configuration. These are necessary to restore the CTA in the event of a failure during an upgrade.

Use the following procedure to backup the database files and create a CTA backup.

1. From the CTA CLI, enter a screen session by typing:

```
#screen
```

Because the backup process can take some time, note the following instructions for screen mode including how to detach from the screen session without interrupting the backup task:

- To list the currently running screen sessions, type: **screen -ls**
- To detach from the screen session and safely disconnect from SSH, press **Ctrl-A + Ctrl-D**.

- To reattach to a screen session to verify the backup task status, type: **screen -x** if there is only one screen session shown by **screen -ls**; otherwise, use **screen -r <ID>**, where *ID* is obtained from the **screen -ls** output.

2. Stop the filemanagement service by typing:

```
#filemanagement stop
```

3. Create a backup of the CTA by typing:

```
#fmbackup
```

The following warning messages may appear:

```
Warning: file is missing:
/opt/rainfinity/filemanagement/conf/ccd.xml
Warning: file is missing:
/opt/rainfinity/filemanagement/conf/fcd.xml
Warning: file is missing:
/opt/rainfinity/filemanagement/conf/acd.xml
Warning: directory is missing:
/opt/rainfinity/filemanagement/conf/repositories
Warning: directory is missing:
/opt/rainfinity/filemanagement/conf/centera
```

In most cases, these messages can be ignored. Review the purpose of the configuration file to see if the warning can be ignored in your present environment. See EMC Knowledgebase article 74904 for more details.

<https://support.emc.com/kb/74904>

4. Once the backup of the database files and the `fmbackup` is complete, copy the resulting output files to a remote machine.
 - Verify that the remote machine has enough disk space.
 - Copy the files to remote storage off the appliance so they can be accessed in the event of a hardware or system failure during the upgrade.
5. Start the filemanagement service by typing:

```
#filemanagement start
```

UPG upgrade

This upgrade changes the core packages. If upgrading both a CTA and a CTA-HA, upgrade the CTA first. Following an upgrade, the CTA and CTA-HA must be running the same version of software.

The UPG upgrade supports CTA and CTA-VE.

1. If the CTA GUI is running, log out.
2. Copy the .UPG file to the root /var directory of the CTA using a SCP client such as PSCP or WinSCP.
 - For CTA or CTA-VE 10.0SP3, the file is cta_10.0-###SP3.x86_64.upg.

Where ### indicates the build number.

For example to upload the file for CTA 10.0SP3 build 120 on a CTA with IP address 10.64.29.37 go to the folder with the .UPG file and type:

```
#pscp cta-10.0-###SP3.x86_64.upg root@10.64.29.37:/var
```

3. Stop the filemanagement daemon if it is currently running.


```
#filemanagement stop
```
4. Start the upgrade.

- For CTA or CTA-VE 10.0 SP1, type:


```
/opt/rainfinity/filemanagement/bin/rfupgrade  
/var/cta_10.0-###SP3.x86_64.upg
```

If a screen session has not already been started, the script will automatically start a new session for the upgrade.

The upgrade process begins with a database pretest script that checks to see if the CTA databases are consistent between the old and new releases. If the pretest finds inconsistencies, the upgrade will exit with the error message: Failed to upgrade database. Contact EMC Customer Support to correct the problem before restarting the upgrade.

If no problems are encountered, the process upgrades the rpm files.

To exit the screen session once the database upgrade has started, press **Ctrl-A + Ctrl-D**.

NOTE: Do not attempt to start the filemanagement daemon during the upgrade.

IMPORTANT: The Upgrade will most likely require a reboot of the CTA. During the reboot, one last backup of the CTA database is performed. This can take up to an hour depending on the database size. The backup is performed before the CTA system has completed booting. SSH and the CTA GUI will not be available during this time. **The CTA is not hung! DO NOT REBOOT the CTA.** Please wait one hour for the CTA to finish this special one-time reboot.

5. Once the upgrade concludes, check if the callback daemons have started by typing:

```
#celerracallback status  
#atmoscallback status  
#fpolicycallback status
```

- If they are not running start the callback daemons by typing:

```
#celerracallback start  
#atmoscallback start  
#fpolicycallback start
```

6. To confirm a successful upgrade see Detailed Summary: Upgrade verification on page 20.

CTA-HA and CTA-VE HA

1. Before upgrading the HA verify the CTA upgrade has completed and the CTA GUI is available for log in.
2. Download the .upg file for the CTA HA and run the CTA HA upgrade following the steps above except there is no filemanagement to stop.

Upgrading to CTA 10.0SP3 from version 7.5 or 9.0

Upgrading to CTA 10.0SP3 from CTA version 7.5 or version 9.0 (all builds) requires a new installation and reconfiguration of CTA network and system settings. An upgrade script restores the backup of the previous version and updates the database to be compatible with CTA 10.0SP3. If you are upgrading both a CTA and a CTA-HA system, upgrade the CTA system first. Following the complete upgrade, the CTA and CTA-HA must be running the same version of software.

Perform a clean install on the HA server using the ISO or OVA file after verifying the CTA is upgraded.

NOTE: The CTA 10.0SP3 upgrade process references installation and configuration instructions provided in the *EMC Cloud Tiering Appliance and Cloud Tiering Appliance/VE Getting Started Guide*.

To upgrade to CTA 10.0SP3 in a single step, the appliance must be running either CTA 7.5 or CTA 9.0 (all builds). Upgrading from other variants of FMA and CTA requires multiple upgrade steps.

For information about upgrading to CTA 10.0SP3 from other FMA or CTA variants refer to:

- *Upgrading to CTA 7.5 or earlier*

Overview: Upgrading from CTA 7.5 or CTA 9.0 (all builds) to CTA 10.0SP3

1. Perform pre-upgrade steps when upgrading CTA 10.0SP3:
 - a) Save alert settings from the CTA 7.5 or 9.0 installation
 - b) Download the `fmbackup_for_upgrade` script:
 - c) Backup the CTA database and configuration information
 - d) Copy the backup to a remote location.
2. Download CTA 10.0SP3 software from EMC Online Support at:
<https://support.emc.com>
3. If upgrading to a new hardware appliance, power off the old appliance or shut down the old virtual machine.
4. Install the CTA 10.0SP3 software.
5. Configure the CTA 10.0SP3 system with the same interface settings as were previously configured (under CTA 7.5 or CTA 9.0).
6. Copy the backup files, to a directory under `/var`, from the remote location to the CTA 10.0SP3 system.
7. Run the appropriate upgrade script depending on your current CTA installation:
 - From CTA 7.5, run the `upgrade75To10` script, specifying the path to the backup file as a parameter.
 - From CTA 9.0, run the `upgrade90To10` script, specifying the path to the backup file as a parameter.
8. Reconfigure settings from the previous CTA configuration that were not automatically restored on the upgraded system.
9. Verify that the CTA system is upgraded and is working properly by recalling a file.
10. Perform a clean install on the HA server using the ISO or OVA file.

Estimating the upgrade process duration

For large databases, the CTA upgrade process can take an extended period of time. During this period, the CTA system can continue to serve recalls but the file management service will not start. Therefore no archiving, stub scanner, or orphan deletion tasks can take place until the upgrade process is complete.

Note: 10.0SP3 contains many upgrade performance improvements. The upgrade times below are shorter than previous releases and more accurate.

NOTE: Attempting to start the filemanagement service by typing **filemanagement start** or **filemanagement restart** will interrupt and corrupt the upgrade process.

Upgrade duration

Before starting the upgrade, consider the duration to ensure that it will complete within an acceptable timeframe. The following table provides some general estimates of the amount of time required to upgrade a sample database (including either 50 or 250 million entries) from CTA 7.5/CTA 9.0 to CTA 10.0SP3. Actual upgrade times may vary according to local conditions.

CTA migration path	Sample DB size	Approximate duration
CTA 7.5 to CTA 10.0SP3	50 million entries	6 hours
CTA 7.5 to CTA 10.0SP3	250 million entries	30 hours
CTA 9.0 to CTA 10.0SP3	50 million entries	5 hours
CTA 9.0 to CTA 10.0SP3	250 million entries	25 hours

Pre-upgrade steps for CTA 10.0SP3

Before upgrading to CTA 10.0SP3, perform the following steps on the CTA 7.5 or CTA 9.0 system that you want to upgrade:

1. Using the CTA GUI, manually record any customized alert settings.
 - a. Log in to the CTA GUI.
 - b. On the Configuration tab, select **Alert Settings**.
 - c. Select **Edit log alert Patterns**.
The Log Alert Patterns page appears.
 - d. Scroll the page and record the settings.
2. Go to the EMC Online Support website at:
<http://Support.EMC.com>
3. From the Support menu, select Downloads, find the Cloud Tiering Appliance or Cloud Tiering Appliance/VE product. Download the appropriate **fmbackup_for_upgradeXXX.zip** file.

NOTE:

If you are unable to find the Cloud Tiering Appliance or Cloud Tiering Appliance/VE product then on support.emc.com, you may not have registered the product to your account. You can register CTA or CTA/VE by expanding the selections under the Service Center to select **Register a Product**.

Follow prompts to register your product. The information is sent to the software registration team to verify that the site is entitled and updates the account.

For problems with registration of your product, contact EMC Customer Service at: software@EMC.com.

4. Copy the `fmbackup_for_upgradeXXX.zip` file to
`/opt/rainfinity/filemanagement/bin`.
5. Unzip the `fmbackup_for_upgradeXXX.zip` file by typing:

```
#unzip
/opt/rainfinity/filemanagement/bin/fmbackup_for_upgradeXXX
.zip
```

6. From the CTA CLI, enter a screen session by typing:

```
#screen
```

Because the backup process can take some time, note the following instructions for controlling screen mode while the process takes place:

- To list the currently running screen sessions, type:
screen -ls
- To detach from the screen session and safely disconnect from SSH without interrupting the backup task, press: **Ctrl-A + Ctrl-D**.
- To reattach to a screen session to verify the backup task status, type:
screen -r <ID>
where *ID* is obtained from the **screen -ls** output.

7. The filemanagement daemon must be running for the backup to work.

- Check the status of the filemanagement daemon by typing:
#filemanagement status
- If the filemanagement daemon is not running, start the daemon by typing:
#filemanagement start

8. Verify that the date and time on the CTA 7.5 or CTA 9.0 system is accurate, type: **date**. If the time is incorrect, use `rfhsetup` with option 1 to correct the date, time and time zone.

9. Create a backup by typing:

```
#fmbbackup_for_upgrade
```

IMPORTANT: use the correct `fmbbackup_for_upgrade` associated with the new version of the product you are upgrading to.

The following warning messages may appear:

```
Warning: file is missing: /opt/rainfinity/filemanagement/conf/ccd.xml
Warning: file is missing: /opt/rainfinity/filemanagement/conf/fcd.xml
Warning: file is missing: /opt/rainfinity/filemanagement/conf/acd.xml
Warning: directory is
missing:/opt/rainfinity/filemanagement/conf/repositories
Warning: directory is missing:
/opt/rainfinity/filemanagement/conf/centera
```

If you are running the correct `fmbbackup_for_upgrade` script you can ignore these messages in most cases. These warnings indicate that your CTA isn't using all destination server types and the associated recall daemons. `CCD.xml` is used by secondary Centera servers, `FCD.xml` is

used by Primary NetApp servers, and ACD.xml is used by cloud servers (Amazon S3, Atmos, or Azure). Review the warning messages to see if they can be ignored in your present environment. See EMC Knowledgebase article 74904 for more details.

<https://support.emc.com/kb/74904>

10. After the backup file is successfully created, stop the filemanagement daemon by typing:

```
#filemanagement stop
```

11. Stop the postgresql service by typing:

```
#service postgresql stop
```

12. Create a backup of the raw database files. Include the date of the backup in the name of the file.

```
#cd /var/lib/pgsql/  
#tar -zcvf pg_data_<date>.tgz data/
```

For example, **tar -zcvf pg_data_19_July_2012.tgz data/**

When the backup process completes, it creates the following output files:

Output path and file	Example
/var/fmbackup_<version>_<machine_name>_<date_time>.tgz	fmbackup_7.5_cta-dell2-75.Thu_10-07-12_21_22.tgz
/var/CTA_settings.txt	CTA_settings.txt
/var/lib/pgsql/pg_data_<date>.tgz	pg_data_19_July_2012.tgz

13. Copy the resulting backup output files to a remote machine.
 - Verify that the remote machine has enough disk space.
 - Copy the files to remote storage off the appliance so they can be accessed later during the upgrade procedure.

14. Restart the postgresql service by typing:

```
#service postgresql start
```

15. Restart the filemanagement daemon by typing:

```
#filemanagement start
```

Perform a CD clean install of CTA 10.0SP3 and upgrade previous CTA data

1. When transferring to Intel hardware such as CTA model CTA8-APL, power off the old hardware or the old virtual appliance.
2. Perform a clean install.
 - For the CTA or CTA-HA, perform a CD clean install on the appliance.
 - For the CTA-VE or CTA-VE HA, perform an .OVA installation on the virtual appliance.

Follow the installation instructions provided in the *EMC Cloud Tiering Appliance and Cloud Tiering Appliance/VE Getting Started Guide*.

3. If transferring to Intel hardware such as CTA model CTA8-APL, follow instructions provided in the *EMC Cloud Tiering Appliance and Cloud Tiering Appliance/VE Getting Started Guide* to enable network console management for Gen 8 models.
4. Use instructions in the *EMC Cloud Tiering Appliance and Cloud Tiering Appliance/VE Getting Started Guide* to configure the CTA network with your old CTA 7.5 or CTA 9.0 values.

The section <InterfaceConfig> <EthList> in CTA_settings.txt lists the interface settings.

5. Copy the CTA 7.5 or CTA 9.0 backup files from the remote location to the /var directory on the CTA 10.0SP3 system.
6. To verify that the date and time on the CTA 10.0SP3 system is accurate, type: **date**. If the time is incorrect, use rfhsetup with option 1 to correct the date, time and time zone.
7. Start the upgrade.

- If upgrading from CTA 7.5, type:


```
# /opt/rainfinity/filemanagement/bin/upgrade75To10.sh
/var/fmbackup_7.5_<machine_name>.<timestamp>.tgz
```
- If upgrading from CTA 9.0, type:


```
# /opt/rainfinity/filemanagement/bin/upgrade90To10.sh
/var/fmbackup_9.0_<machine_name>.<timestamp>.tgz
```

NOTE: Do not attempt to start the filemanagement daemon during the upgrade.

8. Check if the filemanagement daemon started, and start it if it is not running: #filemanagement start

Reconfigure previous settings for CTA 10.0SP3

The CTA 10.0SP3 upgrade automatically configures:

Hostname
 Domain
 DNS list
 TimeZone
 NTP Servers
 SendMail Configuration
 Log Rotation
 Log alert enable
 Log alert summary

The CTA 10.0SP3 upgrade *does not* automatically configure:

Appliance hardening
 Specific alerts
 SNMP settings
 VLAN interface
 Gateway entries

Settings that are not automatically configured require manual configuration.

To obtain:

Appliance hardening settings
 Alerts

Refer to:

<RfHarden> in CTA_settings.txt
 Manually recorded alerts from Step 1 of the Pre-upgrade Detailed Summary.

SNMP

<RfSNMP> in CTA_settings.txt

Refer to instructions in the *EMC Cloud Tiering Appliance and Cloud Tiering Appliance/VE Getting Started Guide* to configure settings that require manual configuration using either the CTA setup tool **rfhsetup** or the CTA GUI.

If needed, use the CTA GUI to reconfigure import providers for file list archiving. **NOTE:** The CTA 10.0SP3 upgrade does not migrate home directories of import providers.

Detailed Summary: Pre-upgrade steps

Step 1: Verify that there is sufficient space on the CTA

During the upgrade, a backup will be taken before the upgrade begins and after it completes. These backup files can grow significantly depending on the size of the CTA database. Additionally, the database upgrade will temporarily require additional space.

To check space on the CTA:

9. Open a putty session to the CTA.
10. [5] Exit to command line interface [!]
11. Type: **df -kh**
12. From the output that appears, verify that:

Filesystem	Mounted on	
Root	/	Use % is less than 50%
Var	/var	Avail shows 100 GB available If the database has not been vacuumed on a regular basis, more space in /var may be required.

Step 2: Cleanup space if required

If either the root or var filesystem does not have sufficient space, use CTA CLI commands to print a summary of the disk usage by typing:

```
du -sh /*
du -sh /var/*
```

Delete old files such as:

- ◆ log files
- ◆ backup files
- ◆ support diagnostic files
- ◆ core files from failed processes
- ◆ UPG files from previous software upgrades

For troubleshooting purposes, retain a previous fmsupportdump output and the most recent fmbackup file.

If you are unable to determine the files that can be safely removed from the CTA, contact EMC Customer Support.

Step 3: Verify that recalls are working in CTA-HA environments

While the CTA is being upgraded, recall services will be unavailable. A secondary appliance, such as a CTA-HA will service recall requests. Before starting the CTA upgrade, verify that recalls can be serviced properly by the CTA-HA. Recall services include:

celerracallback	For Celerra or VNX to Centera archiving
atmoscallback	For Celerra or VNX archiving to cloud storage (Atmos, Amazon S3, or Azure).
fpolicycallback	For NetApp archiving

To verify that recalls are working properly:

1. Check the status of callback daemons on the HA to verify that callback is running:

```
celerracallback status
atmoscallback status
fpolicycallback status
```

2. Stop the recall daemons for your type of archiving on the CTA:

```
celerracallback stop
atmoscallback stop
fpolicycallback stop
```

3. Once recall services are stopped, verify that the CTA-HA is processing recall requests so that access to archived data is uninterrupted. Attempt to recall a few archived files. Callback logs are:

For CTA 7.5 or later	/var/log/rainfinity/filemanagement/recall/CCD.log /var/log/rainfinity/filemanagement/recall/ACD.log /var/log/rainfinity/filemanagement/recall/FCD.log
For FMA 7.4 or earlier	/var/log/rainfinity/filemanagement/CelerraCallbackDaemon.stdout /var/log/rainfinity/filemanagement/AtmosCallbackDaemon.stdout /var/log/rainfinity/filemanagement/recall.log

4. Start the services on the CTA

```
celerracallback start
atmoscallback start
fpolicycallback start
```

5. Stop the recall daemons for your type of archiving on the CTA-HA.
6. Once recall services are stopped, verify that the CTA is processing recall requests so that access to archived data is uninterrupted. Attempt to recall a few archived files.

7. Start the services on the CTA-HA

```
celerracallback start
atmoscallback start
fpolicycallback start
```

NOTE: When upgrading from FMA 7.2.5 to FMA 7.3, if there is no FMA-HA available for the duration of the upgrade, downtime is typically required. These services cannot be started until the entire upgrade is complete. If downtime cannot be scheduled, contact EMC Customer Support for help with a workaround

When upgrading from FMA 7.3 to FMA 7.3.x and later, recall services restart automatically when the binary upgrade is complete. There is minimal recall downtime during the database upgrade.

Step 4: Verify that log rotation is working properly

Any error that occurs during the upgrade process is written to a log. If log rotation is not functioning properly, logs used to troubleshoot upgrade problems might not be updated. To ensure that there is enough space for new logs, compress and zip old log files with the command:

```
#!/usr/sbin/logrotate -v /etc/logrotate.conf
```

Step 5: Disable database tasks scheduled with cron or crontab

During the upgrade, all database related tasks such as fmbackup and database vacuum must be disabled. To list the tasks scheduled for the root user, type:

```
#crontab -l
```

If any database tasks are listed, disable or remove them from the /etc/crontab configuration file for the duration of the upgrade. To edit the crontab file, type:

```
#crontab -e
```

Step 6: Verify that the CTA database is functioning properly

Before beginning the upgrade, verify that the CTA database process is running without any error conditions or warnings.

- ♦ To verify the status of the database service, type:

```
#service postgresql status
```

- ♦ To verify the current CTA version, type:

```
#psql rffm rffm -c "select * from  
file_management.rffm_version;"
```

Review the database logs under `/var/lib/pgsql/data/pg_log/` to determine if there are any database errors or warnings. For example, if the error “transaction ID wraparound” is listed, refer to EMC Knowledgebase article 80406 to address this error and contact EMC Customer Support before performing the upgrade.

Step 7: Verify the current size of the CTA database

A large CTA database requires more time to upgrade. Before beginning the upgrade, check the size of the database and verify that it closely matches the number of archived files in the database.

1. To determine the number of files in the database, start the CTA GUI and click the Archived Files tab. Review the Current Archived Files count.

2. To display the size of the database, type:

```
# du -sh /var/lib/pgsql/data/base/
```

One million archived files in the CTA database require approximately 1 GB or less of disk space. If the database has grown significantly beyond this ratio, vacuum the database before performing an upgrade.

Step 8: Vacuum DB

Note: **Upgrades from 7.5 to 10.0SP3 require a clean installation, so `fmbackup` and `fmrestore` are not used** because when the CTA database is larger than 200GB, a database vacuum or `fmbackup` may fail. To reduce the size of the database, perform a backup of the CTA configuration and database using the `fmbackup` command. Then restore the backup, using `fmrestore` in a SCREEN session to avoid interruption. For more information on this procedure, refer to EMC Knowledgebase article 68554

To start a vacuum of the CTA database:

1. Run `fmbackup` and copy the `fmbackup` file to another location.
2. Run `rffm doDBMaintenance` from the CTA CLI.

```
# rffm doDBMaintenance
```

This command will:

- ♦ Stop all active CTA tasks
- ♦ Stop the postgresql database service
- ♦ Start a database vacuum
- ♦ Write output to
/opt/rainfinity/filemanagement/conf/DBMaintenance.log

The filemanagement daemon must be running when the `doDBMaintenance` command is issued.

When the vacuum is complete, services will be restarted. During this period, the CTA cannot be used for any tasks and the filemanagement daemon should not be started.

Monitor the following logs to verify the progress of the database maintenance task.

- ♦ /opt/rainfinity/filemanagement/conf/DBMaintenance.log
- ♦ /var/lib/pgsql/vacuum_<TIMESTAMP>.log

During the DB maintenance, recalls will continue to be serviced by the CTA and the recall services are unaffected by database activity.

Detailed Summary: Upgrade verification

Verify the upgrade completed successfully before using CTA.

Step 1: Monitor CTA logs during the upgrade

Once the CTA and its binary files are upgraded, the CTA may reboot if a firmware update is needed. Due to a known firmware bug in the PERC RAID controller on the Dell hardware for CTA models such as CTA-APL, FMA7-APL, and FMA6-APL, a firmware update may be required after the CTA software upgrade completes. To apply this update, the appliance is rebooted. The upgrade will continue automatically when the system is rebooted.

If a firmware update is not needed, the database upgrade will begin immediately. Check the different log files to monitor the progress of the upgrade.

1. If the UPG upgrade method is used, monitor the rfupgrade log to inspect the progress of the software upgrade segment of the upgrade process by typing:

```
#tail /var/log/rfupgrade.log
```

This log is also used to monitor the progress of the database upgrade once it starts automatically in a SCREEN session. It should also be used in conjunction with the database upgrade log files in step 2.

NOTE: In this log file you may see messages indicating a failure for stopping one or more recall services. This is expected if the recall service was not running when the upgrade was started or if it was never initialized.

- Once the CTA software has been upgraded, monitor the database upgrade logs. These files show the progress of updates to the CTA database. This is the longest stage of the upgrade process.

NOTE: For upgrades to 9.0, database upgrade logs appear after the clean install and database upgrade is complete.

Upgrade levels	Log
Upgrades from 7.3 to 9.0	#/opt/rainfinity/filemanagement/log/upgrade73To90.log
Upgrades from 7.3.1 to 7.5	# /var/lib/pgsql/pgupgrade731to74.log # /var/lib/pgsql/pgupgrade74to75.log
Upgrades from 7.3.2 to 7.5	# /var/lib/pgsql/pgupgrade732to75.log
Upgrades from 7.4 to 7.5	# /var/lib/pgsql/pgupgrade74to75.log
Upgrades from 7.5 to 10.0	#/opt/rainfinity/filemanagement/log/upgrade75To10.log
Upgrades from 9.0 to 10.0	#/opt/rainfinity/filemanagement/log/upgrade90To10.log

Check for entries in the appropriate log file with 'COMMIT' to determine that the database upgrade is progressing. These entries indicate a successful update to the database for a query and there may be numerous database updates required for a single upgrade based on the upgrade path.

- After the database upgrade begins, continue to monitor that the upgrade processes are running on a regular basis. To verify that the upgrade processes are active, type:

```
#ps -ef | grep filemanagement
```

Typical output that appears when the database upgrade is running is as follows:

```
root 4069 4048 0 Aug11 ? 00:00:00 /bin/sh
/opt/rainfinity/filemanagement/bin/upgrade_db74to75.sh
root 7763 4069 0 Aug11 ? 00:00:00 su -c
/opt/rainfinity/filemanagement/bin/updb_74to75.sh -
postgres
postgres 7765 7763 0 Aug11 ? 00:00:00 /bin/sh
/opt/rainfinity/filemanagement/bin/updb_74to75.sh
postgres 7800 7765 0 Aug11 ? 00:00:00 psql -U postgres -f
/opt/rainfinity/filemanagement/db/schema74to75.sql
```

4. When a database vacuum is started during the upgrade, inspect the vacuum log to monitor the progress:

```
#/var/lib/pgsql/vacuum.log
```

When the vacuum is completed, “Vacuuming successful” appears as the final line. Check the last modified timestamp of the vacuum.log file to confirm that updates are from the recent database vacuum and not from a previous vacuum.

This portion of the upgrade will be faster if a vacuum was previously performed.

If the database vacuum does not progress as expected for an extended period, it may be because an autovacuum process has started. For example, if the database verified is larger than expected and the database was not vacuumed, this process can start automatically and prevent the upgrade from progressing.

If this occurs, contact EMC Customer Support before attempting to interrupt the upgrade.

Step 2: Verify the upgrade completed successfully

1. Check the rfupgrade log to monitor the progress of the upgrade until it completes successfully. Log messages appear indicating success or failure during each phase of the upgrade. If any failures are logged or if you are unsure that the upgrade is continuing to progress, contact EMC Customer Support.
2. Check for screen sessions to see if the upgrade is still running. Use **screen -ls** to list any screen sessions still active. Then use **screen -r <ID>** to reconnect to each screen session and verify that the screen sessions are not performing an upgrade (<ID> are the values from the screen -ls output).
3. In addition to the logs, verify that the database version has been updated to the correct version after the upgrade. To determine the current database version, type the CTA CLI command:

```
#psql rffm rffm -c "select * from
file_management.rffm_version;"
```

4. To check the status of the filemanagement service after the upgrade to verify it has started properly, type:

```
#filemanagement status
```

Do not attempt to start the filemanagement service if you are unsure of the state of the upgrade. This can interrupt an on-going upgrade. Preserve the rfupgrade logs and contact EMC Customer Support.

If logs indicate that the upgrade has failed and is unrecoverable, use the fmbackup file created before the upgrade to restore the CTA database and configuration. The appliance must be running the same version of software that was used to create the backup file. Reload the appliance with the previous software version and restore the configuration with the CTA CLI command fmrestore. The steps to perform this operation are provided in the *EMC Cloud Tiering Appliance and EMC Cloud Tiering Appliance/VE Getting Started Guide*.

NOTE: Depending on the size of the CTA database to be restored, the restore operation can be time consuming. Approximately 20 minutes is required for every 1 million records to be restored. Start the restore in a new session using SCREEN to avoid any interruption to the process.

Detailed Summary: Post-upgrade steps

Step 1: Reboot the CTA after an upgrade

Depending on the upgrade required for CTA, kernel patches may be applied during the upgrade process and the CTA must be rebooted for the patches to take effect. Once the upgrade has successfully completed according to the previous section, schedule a reboot of the CTA. This will ensure the system is properly upgraded and any memory not previously released from processes before the upgrade will be released.

Step 2: Verify Archiving Tasks

After the upgrade is completed, run a few archiving tasks to verify that CTA is functioning as expected. If any issues are found with archiving tasks, review the *EMC Cloud Tiering Appliance Release Notes* to verify if it is a known issue. Otherwise, contact EMC Support to investigate the behavior.

Step 3: Review Schedule of Stub Scanner Tasks

1. If CTA is used to archive many primary filesystems and has many stub scanner tasks configured, review the configured schedules for the tasks. It may be necessary to reschedule the tasks so they run at different times so more than two stub scanner tasks do not run together at the same time.

This can be of particular importance if the stub scanner tasks run against large filesystems and take a long time to complete.

2. If possible, reschedule the stub scanner tasks to run on a monthly basis rather than a weekly basis if there are lots of configured tasks. This will be beneficial to distribute the load of the tasks throughout the month as they are very database intensive and should not be overlapping. If there is a requirement to run orphan management more often, it may not be possible to reschedule the tasks to run monthly instead of weekly because stub scanner must run within the week before orphan deletion.

Appendix A: Upgrading to CTA 7.5

You can upgrade to version 7.5 in a single step from an appliance running version 7.3 or later. To upgrade from an appliance running a version earlier than 7.3, first upgrade to version 7.3 by following the upgrade path as listed in Table 1.

Table 1

Current	First Step	Second Step
7.2.3 GA (build 233)	7.2.5 GA	7.3 SP1
7.2.3 HP1 (build 257, 258)	7.2.5 GA	7.3 SP1
7.2.3 HP2 (build 262)	7.2.5 GA	7.3 SP1
7.2.3 HP3 (build 265)	7.2.5 GA	7.3 SP1
7.2.3 HP4 (build 272)	7.2.5 GA	7.3 SP1
7.2.4 GA (build 254, 263, 273)	7.2.5 GA	7.3 SP1
7.2.5 GA (build 357)	7.3 SP1	
7.2.5 SP1 (build 360)	7.3 SP1	
7.2.5 SP1 (build 405)	7.3 SP1	
7.2.5 SP2 ((build 406)	7.3 SP1	

For versions 7.2.5 or earlier, contact EMC Customer Support to get information on upgrading to version 7.3 GA.

A complete list of release versions with build versions is available in the EMC Knowledgebase article 57268.

<https://support.emc.com/kb/57268>

There are two ways to upgrade:

- ◆ UPG upgrade – for CTA, CTA-HA, CTA-VE, and CTA-VE HA.
- ◆ CD full upgrade – for CTA and CTA-HA.

Note: Before upgrading FMA to version 7.3 or later

If a deployment includes more than one Celerra or VDM, and different FileMover API credentials are being used for each Celerra or VDM, additional steps are required before upgrading to version 7.3 or later.

For version 7.2, the username and password settings for the FileMover API used in archiving, and the Celerra Callback Agent used for recall, were separate settings on the Celerra Properties page and could be different as shown below:

FileMover Settings

Username:	<input type="text" value="dhsm_user"/>
Password:	<input type="password" value="•••••"/>

Celerra Callback Agent Settings

DNS Name:	<input type="text" value="ccd.interop.prv"/>
Username:	<input type="text" value="rffm"/>
Password:	<input type="password" value="•••••"/>

For version 7.3 or later, a simpler method of authentication verification has been implemented. The username and password settings for the FileMover API and the Celerra Callback Agent are the same.

When upgrading, the Celerra Callback Agent settings used for FMA version 7.2 are automatically applied to FMA version 7.3 or later. If multiple usernames and passwords were configured, only the first set will be preserved. This username and password will be the single set of credentials for recall.

To reduce any potential complication from the consolidation of these settings, before upgrading to FMA version 7.3 or later, use FMA version 7.2 to reconfigure the FileMover API settings and Celerra Callback Agent settings to a single set of credentials and apply the same settings to all Celerra file servers. When choosing the set to use, it is best to copy the Celerra Callback Agent settings to the FileMover settings.

FileMover API is reconfigured with the new username and password. To re-create the user, do the following:

Create the FileMover API user. Log in to the Celerra Control Station CLI as root and type the command:

```
#/nas/sbin/server_user <data_mover> -add -md5 -passwd <user>
```

For example: /nas/sbin/server_user server_2 -add -md5 -passwd rffm

If the Celerra Callback Agent settings are changed, it will not be possible to recall until the DHSM connections are re-created with the new username and password.

1. Delete the DHSM connections with the option recall_policy set to no.
2. Follow the steps in the section “Configuring manually created DHSM connections” in the *EMC Cloud Tiering Appliance and Cloud Tiering Appliance/VE Getting Started Guide*.
3. Use the single set of credentials to re-create the connections manually.

Overview of UPG upgrade

1. Backup the database and CTA configuration.
2. Download .upg file from EMC Online Support website at <http://Support.EMC.com>
3. Download the rfupgrade script from EMC Online Support.
4. Upload the .upg file to the CTA server
5. Upload rfupgrade script to the CTA server
6. Run the upgrade
7. Monitor upgrade process from a putty session
8. Verify upgrade completed.
9. Perform a clean install on the HA server using the ISO or OVA file.

Overview of CD full upgrade

1. Backup the database and CTA configuration.
2. Download .ISO file from EMC Online Support website at <http://Support.EMC.com>
3. Burn .ISO file onto CD.
4. Insert CD into CTA server.
5. Reboot server.
6. Choose upgrade options.
7. Monitor upgrade process with monitor attached.
8. Verify upgrade completed.

Backup database and CTA configuration before upgrading

Before beginning the upgrade, ensure that you have a backup copy of the raw database files and the CTA configuration. These are necessary to restore the CTA in the event of a failure during an upgrade.

Use the following procedure to backup the database files and create a CTA backup.

1. From the CTA CLI, enter a screen session by typing:

```
#screen
```

Because the backup process can take some time, note the following instructions for screen mode including how to detach from the screen session without interrupting the backup task:

- To list the currently running screen sessions, type: **screen -ls**
 - To detach from the screen session and safely disconnect from SSH, press **Ctrl-A + Ctrl-D**.
 - To reattach to a screen session to verify the backup task status, type: **screen -r <ID>**, where *ID* is obtained from the **screen -ls** output.
2. Stop the filemanagement service by typing:

```
#filemanagement stop
```

3. Create a backup of the CTA by typing:

```
#fmbbackup
```

The following warning messages may appear:

```
Warning: file is missing:
/opt/rainfinity/filemanagement/conf/ccd.xml
Warning: file is missing:
/opt/rainfinity/filemanagement/conf/fcd.xml
Warning: file is missing:
/opt/rainfinity/filemanagement/conf/acd.xml
Warning: directory is missing:
/opt/rainfinity/filemanagement/conf/repositories
Warning: directory is missing:
/opt/rainfinity/filemanagement/conf/centera
```

In most cases, these messages can be ignored. Review the purpose of the configuration file to see if the warning can be ignored in your present environment. See EMC Knowledgebase article 74904 for more details.

<https://support.emc.com/kb/74904>

4. Once the backup file is successfully created, stop the postgresql service by typing:

```
#service postgresql stop
```

5. Create a backup of the raw database files. Include the date of the backup in the name of the file.

```
#cd /var/lib/pgsql/
#tar -zcvf pg_data_<date>.tgz data/
```

For example, `tar -zcvf pg_data_19_July_2012.tgz data/`

6. Once the backup of the database files and the fmbbackups are complete, copy the resulting output files to a remote machine.
 - Verify that the remote machine has enough disk space.
 - Copy the files to remote storage off the appliance so they can be accessed in the event of a hardware or system failure during the upgrade.
7. Restart the postgresql service by typing:

```
#service postgresql start
```

8. Start the filemanagement daemon by typing:

```
#filemanagement start
```

Obtain the CTA software image and rfupgrade file

All software upgrade files are available from the EMC Online Support website (registration required) at:

<http://Support.EMC.com>

1. To store the files, create a folder named CTA_upgrade. For example: C:\CTA_upgrade.
2. From the Support menu, select Downloads, find the Cloud Tiering Appliance or Cloud Tiering Appliance/VE product.
 - If performing a UPG upgrade, download the UPG file and the latest version of the upgrade script.
 - If performing a CD full upgrade, download the .ISO file.
3. From Support by Product, find the Cloud Tiering Appliance or Cloud Tiering Appliance/VE product and select **Maintain, upgrade your software**. Download the release README file. This file contains md5sum values of all downloaded files to verify the files have properly copied to the server.
4. Expand the selections under the Service Center to select **Register a Product**.

Follow prompts to register your product. The information is sent to the software registration team to verify that the site is entitled and updates the account.

For problems with registration of your product, contact EMC Customer Service at: software@EMC.com.

NOTE: The latest version of CTA is available from the EMC Online Support site. If you require a CTA code version earlier than 7.3, contact EMC Customer Support.

UPG upgrade

This upgrade changes the core packages. The UPG upgrade is much faster than a full CD upgrade. If upgrading both a CTA and a CTA-HA, upgrade the CTA first. Following the complete upgrade, the CTA and CTA-HA must be running the same version of software.

The UPG upgrade supports CTA, CTA-HA, CTA-VE, and CTA-VE HA.

1. If the CTA GUI is running, log out.
2. Put the .UPG file in the root /var directory of the CTA using a SCP client such as PSCP or WinSCP.
 - For CTA 7.5, the file is rf_7.5-226.i686.upg.
 - For CTA-VE 7.5, the file is: rfve_7.5-226.i686.upg.

where ### indicates the build number.

For example to upload the file for CTA 7.5 build 220 on a CTA with IP address 10.64.29.37 go to the folder with the .UPG file and type:

```
#pscp rf_7.5-220.i686.upg root@10.64.29.37:/var
```

3. Copy the rfupgrade script that was downloaded in Obtain the CTA software image and rfupgrade file on page 30 to /opt/rainfinity/filemanagement/bin.
4. Confirm that this is the correct rfupgrade script by typing:

```
#cd /opt/rainfinity/filemanagement/bin
#mv rfupgrade rfupgrade.old
#cd /var
#md5sum rfupgrade.zip
#unzip rfupgrade.zip
#md5sum /var/rf_7.5-226.i686.upg
```

These commands:

- Copy the file to the /opt/rainfinity/filemanagement/bin directory.
- Rename the existing rfupgrade script to rfupgrade.old.
- Provide the md5sum of the rfupgrade.zip file.
- Unzip the rfupgrade.zip file.
- Provide the md5sum of the .upg file.

Compare the md5sum of the file to the value listed in Checksum on the Downloads page of the EMC Online Support website. If the md5sum does not match, download the file again. If the md5sum does match, then unzip the file.

5. Stop the filemanagement daemon if it is currently running.

```
#filemanagement stop
```

6. Start the upgrade.

- For CTA 7.5, type:

```
rfupgrade /var/rf_7.5-226.i686.upg
```

- For CTA-VE 7.5, type:

```
rfupgrade /var/rfve_7.5-226.i686.upg
```

If a screen session has not already been started, the script will automatically start a new session for the upgrade.

The upgrade process begins with a database pretest script that checks to see if the CTA databases are consistent between the old and new releases. If the pretest finds inconsistencies, the upgrade will exit with the error message: Failed to upgrade database. Contact EMC Customer Support to correct the problem before restarting the upgrade.

If no problems are encountered, the process upgrades the rpm files.

To exit the screen session once the database upgrade has started, press **Ctrl-A + Ctrl-D**.

NOTE: Do not attempt to start the filemanagement daemon during the upgrade.

7. Once the upgrade concludes, check if the callback daemons have started by typing:

```
#celerracallback status
#atmoscallback status
#fpolicycallback status
```

If they are not running start the callback daemons by typing:

```
#celerracallback start
#atmoscallback start
#fpolicycallback start
```

8. To confirm a successful upgrade see Detailed Summary: Upgrade verification on page 20. When confirmed, perform a clean install on the CTA-HA if applicable using the ISO or OVA file.

NOTE: When upgrading the HA, warning messages may report database initialization errors or problems starting the filemanagement daemon. Disregard these messages because the HA does not have a database and the filemanagement daemon does not run on the HA. Before performing a clean install on the HA system, verify the CTA upgrade has completed and the CTA GUI is available for log in.

CD full upgrade

The CD full upgrade refreshes all system software packages. If upgrading both a CTA and a CTA-HA, upgrade the CTA first. Following an upgrade, the CTA and CTA-HA must be running the same version of software. The latest version of CTA is available from the EMC Online Support site

Note: The CD full upgrade supports CTA and CTA-HA. It does not support CTA-VE or CTA-VE HA. To upgrade CTA-VE or CTA-VE HA . If you require a CTA code version earlier than 7.3, contact EMC Customer Support.

To perform the CD upgrade:

1. Burn the .ISO file that was downloaded in Obtain the CTA software image and rfupgrade file on page 30 on to a CD or DVD.
2. Attach a monitor and keyboard to the CTA server and log on using root username.
3. Insert the CD in to the drive.
4. Type reboot, the server will restart.

Note: To abort the upgrade, power down the node, remove the CD, and reboot.

5. When the boot prompt appears
 - For CTA upgrade type: **fm_upgrade**
 - Perform a clean install on the CTA-HA system

The CD installation is fully automatic. No user interaction is required.

6. When the installation is complete, the binary and server have been upgraded. Eject the CD and reboot when prompted.

After reboot the CTA database will be:

- backed up
- upgraded
- backed up again
- vacuumed

NOTE: Do not attempt to start the filemanagement daemon during the upgrade.

7. To confirm a successful upgrade see Detailed Summary: Upgrade verification on page 20. When confirmed, perform a clean install on the CTA-HA system using the ISO or OVA file if applicable.

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