



Configuring the ONTAP Mediator service for unplanned automatic switchover

ONTAP MetroCluster

NetApp
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Configuring the ONTAP Mediator service for unplanned automatic switchover

Starting with ONTAP 9.7, the ONTAP Mediator service can assist the MetroCluster IP configuration in performing an automatic unplanned switchover by providing a physically separate repository for status information.

NOTE:

- The ONTAP Mediator service and MetroCluster Tiebreaker software should not both be used with the same MetroCluster configuration.
- The ONTAP Mediator service can support up to five MetroCluster configurations simultaneously.

Preparing to install the ONTAP Mediator service

Your environment must meet the following requirements. You may need to update your Linux version.

Network requirements for using Mediator in a MetroCluster configuration

To install the ONTAP Mediator service in a MetroCluster configuration, you must ensure that the configuration meets several network requirements.

- Round trip latency

Round trip latency must be no more than 25 ms.

- MTU

The MTU size must be at least 1400.

- Packet loss

Packet loss must be less than or equal to 0.01%.

- Bandwidth

The link between the Mediator service and the MetroCluster configuration must have at least 1 Gbps of bandwidth.

Firewall requirements for ONTAP Mediator

ONTAP Mediator uses a number of ports to communicate with specific services.

- If you are using a third-party firewall:
 - HTTPS access must be enabled.
 - It must be configured to allow access on ports 31784 and 3260.

When using the default Red Hat or CentOS firewall, the firewall is automatically configured during

Mediator installation.

The following table lists the ports that you must allow in your firewall:

Port/services	Source	Destination	Purpose
31784/tcp	ONTAP cluster management interfaces	ONTAP Mediator web server	REST API (HTTPS)
3260/tcp	ONTAP cluster	ONTAP Mediator iSCSI targets	iSCSI data connection for mailboxes


Guidelines for upgrading the ONTAP Mediator in a MetroCluster configuration

If you are upgrading the ONTAP Mediator you must meet the Linux version requirements and follow guidelines for the upgrade.

- The Mediator service can be upgraded from version 1.0 to 1.1.
- All Mediator versions are supported on MetroCluster IP configurations running ONTAP 9.7 or later.

Upgrading the host operating system and Mediator together

The following table provides the upgrade guidelines if you are upgrading from RHEL/CentOS 7.6 to a later RHEL/CentOS release in addition upgrading the Mediator version.

Target Linux version	Target Mediator version	Upgrade notes
RHEL/CentOS 7.7	1.1	<ul style="list-style-type: none"> The upgrade must be performed in the following order: <ul style="list-style-type: none"> a. Upgrade the operating system from RHEL/CentOS version 7.6 to 7.7. <div>  <p>The ONTAP Mediator and Mediator-assisted automatic unplanne d switchov er is not available during the operating system upgrade. The Mediator is offline until the Mediator version 1.0 to 1.1 upgrade process is complete.</p> </div> <ul style="list-style-type: none"> b. Reboot the host to apply the kernel module changes. c. Upgrade the Mediator from version 1.0 to 1.1. <p>Installing or upgrading the ONTAP Mediator service</p> <ul style="list-style-type: none"> The storage iscsi-initiator show command will report that the connection to the Mediator service is down during the upgrade. The ONTAP operating system will generate cf.mccip.med.auso.stDisabled EMS events during the upgrade.

Target Linux version	Target Mediator version	Upgrade notes
RHEL/CentOS 8.0 or 8.1	1.1	<p>There is no direct upgrade path. You must remove the 1.0 version and install the 1.1 version after the operating system upgrade:</p> <ol style="list-style-type: none"> 1. Delete the Mediator service from the ONTAP configuration: <code>metrocluster configuration-settings mediator remove</code> 2. Uninstall the 1.0 version of the Mediator service. Uninstalling the ONTAP Mediator service 3. Upgrade the Linux operating system to version 8.0 or 8.1. 4. Install the 1.1 version of the Mediator service. Installing or upgrading the ONTAP Mediator service 5. Add the Mediator service to the ONTAP configuration: <code>metrocluster configuration-settings add -addressmediator -1.1-ip-address</code>

After the upgrade

After the Mediator and operating system upgrade is complete, you should issue the `storage iscsi-initiator show` command to confirm that the Mediator connections are up.

Reverting from a Mediator 1.1 installation

A direct revert from Mediator version 1.1 to 1.0 is not supported. You must remove the 1.1 version and reinstall the 1.0 version.

1. Delete the Mediator service from the ONTAP configuration: `metrocluster configuration-settings mediator remove`
2. Uninstall the 1.1 version of the Mediator service.

[Uninstalling the ONTAP Mediator service](#)

3. Install the 1.0 version of the Mediator service.

[Installing or upgrading the ONTAP Mediator service](#)

4. Add the Mediator service to the ONTAP configuration: `metrocluster configuration-settings add`

-addressmediator-1.0-ip-address

Recovering from Linux kernel upgrades

The ONTAP Mediator requires the SCST kernel module. If the Linux kernel is updated, this dependency may lead to a loss of service. It is highly recommended that you rebuild the SCST kernel module when any kernel package changes are made.

NOTE:

- Upgrading from ONTAP Mediator version 1.0 to 1.1 rebuilds the SCST module.
- Kernel module changes are applied after the Linux kernel is rebooted.

You can use either of the following procedures to recover from a kernel upgrade that has resulted in loss of service for the Mediator.

Procedure	Steps
Remove and reinstall the SCST kernel module	<p>You must have the SCST tar bundle used by your version of Mediator:</p> <ul style="list-style-type: none"> • ONTAP Mediator 1.0 requires scst-3.3.0.tar.bz2 • ONTAP Mediator 1.1 requires scst-3.4.0.tar.bz2 <ol style="list-style-type: none"> 1. Uninstall the SCST module: <ol style="list-style-type: none"> a. Download and untar the SCST tar bundle required by your version of Mediator. b. Run the following commands inside of the scst directory: <pre data-bbox="963 594 1489 934">systemctl stop mediator-scst make scstadm_uninstall make iscsi_uninstall make usr_uninstall make scst_uninstall depmod</pre> 2. Reinstall the SCST module for your version of Mediator by issuing the following commands inside of the scst directory: <pre data-bbox="914 1098 1489 1522">make scst_install make usr_install make iscsi_install make scstadm_install depmod patch /etc/init.d/scst < /opt/netapp/lib/ontap_mediator/systemd/scst.patch reboot</pre>

Procedure	Steps
Remove and reinstall ONTAP Mediator + Note: This requires a reconfiguration of the Mediator in ONTAP.	<ol style="list-style-type: none"> 1. Delete the Mediator service from the ONTAP configuration: metrocluster configuration-settings mediator remove 2. Uninstall the Mediator service. Uninstalling the ONTAP Mediator service 3. Reinstall the Mediator service. Installing or upgrading the ONTAP Mediator service 4. Add the Mediator service to the ONTAP configuration: metrocluster configuration-settings add -addressmediator-ip-address

Installing or upgrading the ONTAP Mediator service

To install the ONTAP Mediator service, you must ensure all prerequisites are met, get the installation package and run the installer on the host.

Before you begin

You must meet the following prerequisites.

Mediator version	Supported Linux versions
1.3	Red Hat Enterprise Linux or CentOS 7.6, 7.7, 7.8, 7.9, 8.0, 8.1, 8.2, 8.3
1.2	Red Hat Enterprise Linux or CentOS 7.6, 7.7, 7.8, 8.0, 8.1

- 64-bit physical installation or virtual machine
 - 8 GB RAM
 - User: Root access The best practices for installing Red Hat Enterprise Linux or CentOS and the associated repositories on your system are listed below. Systems installed or configured differently might require additional steps.
 - You must install Red Hat Enterprise Linux or CentOS according to Red Hat best practices.
 - While installing the ONTAP Mediator service on Red Hat Enterprise Linux or CentOS, the system must have access to the appropriate repository so that the installation program can access and install all the required software dependencies.
 - For the yum installer to find dependent software in the Red Hat Enterprise Linux repositories, you must have registered the system during the Red Hat Enterprise Linux installation or afterwards by using a valid Red Hat subscription.

See the Red Hat documentation for information about the Red Hat Subscription Manager.

- The following ports must be unused and available for the Mediator:
 - 31784
 - 3260
- If using a third-party firewall: refer to [Firewall requirements for ONTAP Mediator](#)
- If the Linux host is in a location without access to the internet, you can either install the packages manually or you must ensure that the required packages are available in a local repository.

You can use the following link for information about setting up a repository.

If you are using Link Aggregation Control Protocol (LACP) in a Linux environment, you must correctly configure the kernel and make sure the `sysctl net.ipv4.conf.all.arp_ignore` is set to [2](#).

The following packages are required by the ONTAP Mediator service:

All RHEL/CentOS versions	Additional packages for RHEL/CentOS 7.x	Additional packages for RHEL/CentOS 8.x
<ul style="list-style-type: none">• openssl• openssl-devel• kernel-devel• gcc• libselinux-utils• make• redhat-lsb-core• patch• bzip2• python36• python36-devel• perl-Data-Dumper• perl-ExtUtils-MakeMaker• python3-pip	<ul style="list-style-type: none">• policycoreutils-python• python36-pip	<ul style="list-style-type: none">• elfutils-libelf-devel• policycoreutils-python-utils

- If signature verification is configured, it must be disabled. This can be done in one of two ways:
 - If the UEFI SecureBoot mechanism is configured, disable it.
 - Disable the signature verification mechanism by updating and regenerating the `grub.cfg` file:
 - i. Open the `/etc/default/grub` file.
 - ii. Add the string `module.sig_enforce=0` to the end of the `GRUB_CMDLINE_LINUX` statement.
 - iii. Regenerate the `grub.cfg` file to implement the change: `update-bootloader || update-grub || grub2-mkconfig -o /boot/grub2/grub.cfg`
 - iv. Reboot the host.

The Mediator installation package is a self-extracting compressed tar file that includes:

- An RPM file containing all dependencies that cannot be obtained from the supported release's repository.
- An install script.

A valid SSL certification is recommended, as documented in this procedure.

This procedure is used for an installation or an upgrade of an existing installation.

[Guidelines for upgrading the ONTAP Mediator in a MetroCluster configuration](#)

Enable access to the repositories

If your operating system is...	You must provide access to these repositories...
RHEL 7.x	rhel-7-server-optional-rpms
CentOS 7.x	C7.6.1810 - Base repository
RHEL 8.x	<ul style="list-style-type: none">• rhel-8-for-x86_64-baseos-rpms• rhel-8-for-x86_64-appstream-rpms
CentOS 8.0	kernel-devel

Enable access to the repositories listed above so Mediator can access the required packages during the installation process. Use the procedure below for your operating system.

If your operating system is **RHEL 7.x**:

1. Subscribe to the required repository: `subscription-manager repos --enable rhel-7-server-optional-rpms`

The following example shows the execution of this command:

```
[root@localhost ~]# subscription-manager repos --enable rhel-7-server-optional-rpms
Repository 'rhel-7-server-optional-rpms' is enabled for this system.
```

2. Run the yum repolist command.

The following example shows the execution of this command. The rhel-7-server-optional-rpms repository should appear in the list.

```
[root@localhost ~]# yum repolist
Loaded plugins: product-id, search-disabled-repos, subscription-manager
rhel-7-server-optional-rpms | 3.2 kB  00:00:00
rhel-7-server-rpms | 3.5 kB  00:00:00
(1/3): rhel-7-server-optional-rpms/7Server/x86_64/group
| 26 kB  00:00:00
(2/3): rhel-7-server-optional-rpms/7Server/x86_64/updateinfo
| 2.5 MB  00:00:00
(3/3): rhel-7-server-optional-rpms/7Server/x86_64/primary_db
| 8.3 MB  00:00:01
repo id                                repo name
status
rhel-7-server-optional-rpms/7Server/x86_64  Red Hat Enterprise Linux 7
Server - Optional (RPMs) 19,447
rhel-7-server-rpms/7Server/x86_64          Red Hat Enterprise Linux 7
Server (RPMs) 26,758
repolist: 46,205
[root@localhost ~]#
```

If your operating system is **RHEL 8.x**:

1. Subscribe to the required repository: `subscription-manager repos --enable rhel-8-for-x86_64-baseos-rpms`subscription-manager repos --enable rhel-8-for-x86_64-appstream-rpms`

The following example shows the execution of this command:

```
[root@localhost ~]# subscription-manager repos --enable rhel-8-for-x86_64-baseos-rpms
[root@localhost ~]# subscription-manager repos --enable rhel-8-for-x86_64-appstream-rpms
Repository 'rhel-8-for-x86_64-baseos-rpms' is enabled for this system.
Repository 'rhel-8-for-x86_64-appstream-rpms' is enabled for this system.
```

2. Run the `yum repolist` command.

The newly subscribed repositories should appear in the list.

If your operating system is **CentOS 7.x**:

1. Add the C7.6.1810 - Base repository. The C7.6.1810 - Base vault repository contains the kernel-devel package needed for ONTAP Mediator.
2. Add the following lines to `/etc/yum.repos.d/CentOS-Vault.repo`.

```
[C7.6.1810-base]
name=CentOS-7.6.1810 - Base
baseurl=http://vault.centos.org/7.6.1810/os/$
basearch/gpgcheck=1
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-7
enabled=1
```

3. Run the yum repolist command.

The following example shows the execution of this command. The CentOS-7.6.1810 - Base repository should appear in the list.

```
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
* base: distro.ibiblio.org
* extras: distro.ibiblio.org
* updates: ewr.edge.kernel.org
C7.6.1810-base | 3.6
kB 00:00:00
(1/2): C7.6.1810-base/x86_64/group_gz | 166
kB 00:00:00
(2/2): C7.6.1810-base/x86_64/primary_db | 6.0
MB 00:00:04
repo id repo name
status
C7.6.1810-base/x86_64 CentOS-7.6.1810 - Base
10,019
base/7/x86_64 CentOS-7 - Base
10,097
extras/7/x86_64 CentOS-7 - Extras
307
updates/7/x86_64 CentOS-7 - Updates
1,010
repolist: 21,433
[root@localhost ~]#
```

If your operating system is **CentOS 8.0.1905 or later builds**:

Because the latest version of the 8.0 (CentOS 8.0.1905) core resides in the CentOS Vault, you must provide access to the matching kernel-devel package to compile the needed kernel module. Issue the following command to directly install the kernel-devel package: `rpm -i http://vault.centos.org/8.0.1905/BaseOS/x86_64/os/Packages/kernel-devel-\$\(uname -r\).rpm`

If the system displays an error indicating that the package is already installed, remove the package and try again:

1. Remove the kernel-devel package: `yum remove kernel-devel`
2. Repeat the rpm command shown above.

Download the Mediator installation package

1. Download the Mediator installation package from the ONTAP Mediator page.

[ONTAP Mediator download page](#)

2. Confirm that the Mediator installation package is in the target directory: `ls`

```
[root@mediator-host ~]#ls
./ontap-mediator_1.3
```

If you are at a location without access to the internet, you must ensure that the installer has access to the required packages.

3. If necessary, move the Mediator installation package from the download directory to the installation directory on the Linux Mediator host.

Install the ONTAP Mediator installation package

1. Install the Mediator installation package and respond to the prompts as required: `./ontap-mediator_1.3`

The installation process proceeds to create the required accounts and install required packages. If you have a previous version of Mediator installed on the host, you will be prompted to confirm that you want to upgrade.

Example of a fresh ONTAP Mediator installation

The following example shows a fresh installation of the Mediator service:

```
[root@red-hat-enterprise-linux ~]# ./ontap-mediator_1.3
ONTAP Mediator: Self Extracting Installer

ONTAP Mediator requires two user accounts. One for the service (netapp),
and one for use by ONTAP to the mediator API (mediatoradmin).

Would you like to use the default account names: netapp + mediatoradmin?
(Y(es)/n(o)): y

Enter ONTAP Mediator system service account (mediatoradmin) password:

Re-Enter ONTAP Mediator system service account (mediatoradmin) password:
```

Checking for default Linux firewall

Linux firewall is running. Open ports 31784 and 3260? y(es)/n(o): y
success
success

#####

Preparing for installation of ONTAP Mediator packages.

Do you wish to continue? y(es)/n(o): y

+ Installing required packages.

Loaded plugins: product-id, search-disabled-repos, subscription-manager
epel/x86_64/metalink

| 17 kB 00:00:00

epel-extra

| 4.9 kB 00:00:00

ius

| 1.3 kB 00:00:00

rhel-7-server-rpms

| 3.5 kB 00:00:00

(1/3): ius/x86_64/primary

| 129 kB 00:00:00

(2/3): epel-extra/group_gz

| 88 kB 00:00:01

(3/3): epel-extra/primary_db

| 6.7 MB 00:00:06

ius

538/538

Package 1:make-3.82-23.el7.x86_64 already installed and latest version

.
.
.

=====
=====

Preparing for installation of ONTAP Mediator packages.

Do you wish to continue? y(es)/n(o): y

+ Installing required packages.

Loaded plugins: product-id, search-disabled-repos, subscription-manager


```

epel/x86_64/metalink
| 17 kB 00:00:00
epel-extra
| 4.9 kB 00:00:00
ius
| 1.3 kB 00:00:00
rhel-7-server-rpms
| 3.5 kB 00:00:00
(1/3): ius/x86_64/primary
| 129 kB 00:00:00
(2/3): epel-extra/group_gz
| 88 kB 00:00:01
(3/3): epel-extra/primary_db
| 6.7 MB 00:00:06
ius
538/538

```

Package 1:make-3.82-23.el7.x86_64 already installed and latest version

.
.

.

.

```

=====
Package                               Arch
Version                               Repository
Size
=====
===
Installing:
  bzip2                               x86_64
1.0.6-13.el7                          rhel-7-server-rpms
52 k
  gcc                               x86_64
4.8.5-36.el7_6.2                      rhel-7-server-rpms
16 M
  kernel-devel                       x86_64
3.10.0-957.el7                        rhel-7-server-rpms
17 M
  openssl-devel                       x86_64
1:1.0.2k-16.el7_6.1                  rhel-7-server-rpms
1.5 M
  patch                               x86_64
2.7.1-10.el7_5                       rhel-7-server-rpms
110 k
  perl-Compress-Raw-Zlib              x86_64
1:2.061-4.el7                        rhel-7-server-rpms

```

```

57 k
    perl-Digest-MD5
2.52-3.el7
                                x86_64
                                rhel-7-server-rpms
30 k
    perl-Digest-SHA
1:5.85-4.el7
                                x86_64
                                rhel-7-server-rpms
58 k
    perl-ExtUtils-CBuilder
1:0.28.2.6-294.el7_6
                                noarch
                                rhel-7-server-rpms
68 k
    perl-ExtUtils-MakeMaker
6.68-3.el7
                                noarch
                                rhel-7-server-rpms
275 k
    perl-JSON-PP
2.27202-2.el7
                                noarch
                                rhel-7-server-rpms
55 k
    python36
3.6.8-2.el7.ius
                                x86_64
                                ius
60 k
    python36-devel
3.6.8-2.el7.ius
                                x86_64
                                ius
206 k
    python36-pip
9.0.1-2.el7.ius
                                noarch
                                ius
1.7 M
    redhat-lsb-core
4.1-27.el7
                                x86_64
                                rhel-7-server-rpms
37 k

Updating:
    openssl
1:1.0.2k-16.el7_6.1
                                x86_64
                                rhel-7-server-rpms
493 k

Installing for dependencies:
    at
3.1.13-24.el7
                                x86_64
                                rhel-7-server-rpms
51 k
    avahi-libs
0.6.31-19.el7
                                x86_64
                                rhel-7-server-rpms
62 k
    bc
1.06.95-13.el7
                                x86_64
                                rhel-7-server-rpms
115 k
    cpp
4.8.5-36.el7_6.2
                                x86_64
                                rhel-7-server-rpms

```

6.0 M	
cups-client	x86_64
1:1.6.3-35.el7	rhel-7-server-rpms
151 k	
cups-libs	x86_64
1:1.6.3- 35.el7	rhel-7-server-rpms
357 k	
dwz	x86_64
0.11-3.el7	rhel-7-server-rpms
99 k	
ed	x86_64
1.9-4.el7	rhel-7-server-rpms
72 k	
gdbm-devel	x86_64
1.10-8.el7	rhel-7-server-rpms
47 k	
glibc-devel	x86_64
2.17-260.el7_6.6	rhel-7-server-rpms
1.1 M	
glibc-headers	x86_64
2.17-260.el7_6.6	rhel-7-server-rpms
684 k	
kernel-headers	x86_64
3.10.0-957.27.2.el7	rhel-7-server-rpms
8.0 M	
keyutils-libs-devel	x86_64
1.5.8-3.el7	rhel-7-server-rpms
37 k	
krb5-devel	x86_64
1.15.1-37.el7_6	rhel-7-server-rpms
271 k	
libcom_err-devel	x86_64
1.42.9-13.el7	rhel-7-server-rpms
31 k	
libdb-devel	x86_64
5.3.21-24.el7	rhel-7-server-rpms
38 k	
libkadm5	x86_64
1.15.1-37.el7_6	rhel-7-server-rpms
178 k	
libmpc	x86_64
1.0.1-3.el7	rhel-7-server-rpms
51 k	
libselinux-devel	x86_64
2.5-14.1.el7	rhel-7-server-rpms
187 k	

libsepol-devel	x86_64
2.5-10.el7	rhel-7-server-rpms
77 k	
libverto-devel	x86_64
0.2.5-4.el7	rhel-7-server-rpms
12 k	
m4	x86_64
1.4.16-10.el7	rhel-7-server-rpms
256 k	
mailx	x86_64
12.5- 19.el7	rhel-7-server-rpms
245 k	
mpfr	x86_64
3.1.1-4.el7	rhel-7-server-rpms
203 k	
pcre-devel	x86_64
8.32-17.el7	rhel-7-server-rpms
480 k	
perl	x86_64
4:5.16.3-294.el7_6	rhel-7-server-rpms
8.0 M	
perl-Carp	noarch
1.26-244.el7	rhel-7-server-rpms
19 k	
perl-Data-Dumper	x86_64
2.145-3.el7	rhel-7-server-rpms
47 k	
perl-Digest	noarch
1.17-245.el7	rhel-7-server-rpms
23 k	
perl-Encode	x86_64
2.51-7.el7	rhel-7-server-rpms
1.5 M	
perl-Exporter	noarch
5.68-3.el7	rhel-7-server-rpms
28 k	
perl-ExtUtils-Install	noarch
1.58-294.el7_6	rhel-7-server-rpms
75 k	
perl-ExtUtils-Manifest	noarch
1.61-244.el7	rhel-7-server-rpms
31 k	
perl-ExtUtils-ParseXS	noarch
1:3.18-3.el7	rhel-7-server-rpms
77 k	
perl-File-Path	noarch

2.09-2.el7	rhel-7-server-rpms
27 k	
perl-File-Temp	noarch
0.23.01-3.el7	rhel-7-server-rpms
56 k	
perl-Filter	x86_64
1.49-3.el7	rhel-7-server-rpms
76 k	
perl-Getopt-Long	noarch
2.40-3.el7	rhel-7-server-rpms
56 k	
perl-HTTP-Tiny	noarch
0.033-3.el7	rhel-7-server-rpms
38 k	
perl-IPC-Cmd	noarch
1:0.80-4.el7	rhel-7-server-rpms
34 k	
perl-Locale-Maketext	noarch
1.23-3.el7	rhel-7-server-rpms
93 k	
perl-Locale-Maketext-Simple	noarch
1:0.21-294.el7_6	rhel-7-server-rpms
50 k	
perl-Module-CoreList	noarch
1:2.76.02-294.el7_6	rhel-7-server-rpms
86 k	
perl-Module-Load	noarch
1:0.24-3.el7	rhel-7-server-rpms
11 k	
perl-Module-Load-Conditional	noarch
0.54-3.el7	rhel-7-server-rpms
18 k	
perl-Module-Metadata	noarch
1.000018-2.el7	rhel-7-server-rpms
26 k	
perl-Params-Check	noarch
1:0.38-2.el7	rhel-7-server-rpms
18 k	
perl-PathTools	x86_64
3.40-5.el7	rhel-7-server-rpms
83 k	
perl-Perl-OSType	noarch
1.003-3.el7	rhel-7-server-rpms
20 k	
perl-Pod-Escapes	noarch
1:1.04-294.el7_6	rhel-7-server-rpms

51 k	perl-Pod-Perldoc	noarch
3.20-4.el7		rhel-7-server-rpms
87 k	perl-Pod-Simple	noarch
1:3.28-4.el7		rhel-7-server-rpms
216 k	perl-Pod-Usage	noarch
1.63-3.el7		rhel-7-server-rpms
27 k	perl-Scalar-List-Utils	x86_64
1.27-248.el7		rhel-7-server-rpms
36 k	perl-Socket	x86_64
2.010-4.el7		rhel-7-server-rpms
49 k	perl-Storable	x86_64
2.45-3.el7		rhel-7-server-rpms
77 k	perl-Test-Harness	noarch
3.28-3.el7		rhel-7-server-rpms
302 k	perl-Text-ParseWords	noarch
3.29-4.el7		rhel-7-server-rpms
14 k	perl-Time-HiRes	x86_64
4:1.9725-3.el7		rhel-7-server-rpms
45 k	perl-Time-Local	noarch
1.2300-2.el7		rhel-7-server-rpms
24 k	perl-constant	noarch
1.27-2.el7		rhel-7-server-rpms
19 k	perl-devel	x86_64
4:5.16.3-294.el7_6		rhel-7-server-rpms
453 k	perl-libs	x86_64
4:5.16.3-294.el7_6		rhel-7-server-rpms
688 k	perl-macros	x86_64
4:5.16.3-294.el7_6		rhel-7-server-rpms
44 k	perl-parent	noarch
1:0.225-244.el7		rhel-7-server-rpms
12 k		

perl-podlators	noarch
2.5.1-3.el7	rhel-7-server-rpms
112 k	
perl-srpm-macros	noarch
1-8.el7	rhel-7-server-rpms
4.7 k	
perl-threads	x86_64
1.87-4.el7	rhel-7-server-rpms
49 k	
perl-threads-shared	x86_64
1.43-6.el7	rhel-7-server-rpms
39 k	
perl-version	x86_64
3:0.99.07-3.el7	rhel-7-server-rpms
84 k	
psmisc	x86_64
22.20-15.el7	rhel-7-server-rpms
141 k	
pyparsing	noarch
1.5.6-9.el7	rhel-7-server-rpms
94 k	
python-rpm-macros	noarch
3-24.el7	epel-extra
7.9 k	
python-srpm-macros	noarch
3-24.el7	epel-extra
7.3 k	
python3-rpm-macros	noarch
3-24.el7	epel-extra
6.9 k	
python36-libs	x86_64
3.6.8-2.el7.ius	ius
8.6 M	
python36-setuptools	noarch
39.2.0-4.el7.ius	ius
621 k	
redhat-lsb-submod-security	x86_64
4.1-27.el7	rhel-7-server-rpms
15 k	
redhat-rpm-config	noarch
9.1.0-87.el7	rhel-7-server-rpms
81 k	
spax	x86_64
1.5.2-13.el7	rhel-7-server-rpms
260 k	
systemtap-sdt-devel	x86_64

```

3.3-3.el7                                rhel-7-server-rpms
74 k
    time                                x86_64
1.7-45.el7                                rhel-7-server-rpms
30 k
    zip                                x86_64
3.0-11.el7                                rhel-7-server-rpms
260 k
    zlib-devel                        x86_64
1.2.7-18.el7                            rhel-7-server-rpms
50 k

```

Updating for dependencies:

```

    glibc                                x86_64
2.17-260.el7_6.6                        rhel-7-server-rpms
3.6 M
    glibc-common                        x86_64
2.17-260.el7_6.6                        rhel-7-server-rpms
11 M
    krb5-libs                            x86_64
1.15.1-37.el7_6                        rhel-7-server-rpms
803 k
    libgcc                                x86_64
4.8.5-36.el7_6.2                        rhel-7-server-rpms
102 k
    libgomp                            x86_64
4.8.5-36.el7_6.2                        rhel-7-server-rpms
158 k
    openssl-libs                        x86_64
1:1.0.2k-16.el7_6.1                    rhel-7-server-rpms
1.2 M

```

Transaction Summary

```

=====
=====

```

Install 15 Packages (+84 Dependent packages)

Upgrade 1 Package (+ 6 Dependent packages)

Total download size: 97 M

Is this ok [y/d/N]: y

Downloading packages:

Delta RPMs disabled because /usr/bin/applydeltarpm not installed.

.


```

      .
      .
      .
+ Installing ONTAP Mediator. (Log: /tmp/ontap_mediator.jx6UrF/ontap-
mediator/install.log)
+ Install successful. (Moving log to
/opt/netapp/lib/ontap_mediator/log/install.log)

[root@red-hat-enterprise-linux ~]#

```

Upgrading the ONTAP Mediator service

The following example shows an upgrade of the Mediator service:

1. Use the following steps to configure third-party certification.

Third-party certification is recommended. .. The certificate must be placed in the following directory:
/opt/netapp/lib/ontap_mediator/ontap_mediator/ server_config

+ You must overwrite the following files with your certificate, renaming the certificate files if necessary to
ontap_mediator_server.crt and ontap_mediator_server.key.

	#	SSL	Certificates	cert_path:
+				key_path:
			'/opt/netapp/lib/ontap_mediator/ontap_mediator/server_config/ontap_mediator_server.crt'	
			'/opt/netapp/lib/ontap_mediator/ontap_mediator/server_config/ontap_mediator_server.key'	

+ Note: You must be sure to follow security best practices for your operating system. If you are not using a third-party certificate, the Mediator installation process will create a self-signed certificate.

- a. Along with the server certificates, you must update the CA certificates as well.

You must overwrite the following files with your certificate, renaming the certificate files if necessary to:

- ontap_mediator_server.crt
- ontap_mediator_server.key
- ca.crt
- ca.key
- ca.srl

```
# SSL Certificates
cert_path:
'/opt/netapp/lib/ontap_mediator/ontap_mediator/server_config/ontap_mediator_server.crt'
key_path:
'/opt/netapp/lib/ontap_mediator/ontap_mediator/server_config/ontap_mediator_server.key'
ca_cert_path:
'/opt/netapp/lib/ontap_mediator/ontap_mediator/server_config/ca.crt'
ca_key_path:
'/opt/netapp/lib/ontap_mediator/ontap_mediator/server_config/ca.key'
ca_serial_path:
'/opt/netapp/lib/ontap_mediator/ontap_mediator/server_config/ca.serial'
```

Verify the installation.

Run the following command to view the status of the ONTAP Mediator services: `systemctl`

```
[root@scspr1915530002 ~]# systemctl status ontap_mediator mediator-scst

• ontap_mediator.service - ONTAP Mediator
   Loaded: loaded
   (/opt/netapp/lib/ontap_mediator/systemd/ontap_mediator.service; enabled;
   vendor preset: disabled)

   Active: active (running) since Thu 2020-06-18 09:55:02 EDT; 3
   days ago

   Main PID: 3559 (uwsgi)

   Status: "uWSGI is ready"

   CGroup: /system.slice/ontap_mediator.service

           \u251c\u25003559
/opt/netapp/lib/ontap_mediator/pyenv/bin/uwsgi --ini
/opt/netapp/lib/ontap_mediator/uwsgi/ontap_mediator.ini

           \u251c\u25004510
/opt/netapp/lib/ontap_mediator/pyenv/bin/uwsgi --ini
/opt/netapp/lib/ontap_mediator/uwsgi/ontap_mediator.ini
```

\u2514\u25004512

```
/opt/netapp/lib/ontap_mediator/pyenv/bin/uwsgi --ini  
/opt/netapp/lib/ontap_mediator/uwsgi/ontap_mediator.ini
```

```
Jun 18 09:54:43 scspr1915530002 systemd[1]: Starting ONTAP  
Mediator...
```

```
Jun 18 09:54:45 scspr1915530002 ontap_mediator[3559]: [uWSGI]  
getting INI configuration from  
/opt/netapp/lib/ontap_mediator/uwsgi/ontap_mediator.ini
```

```
Jun 18 09:55:02 scspr1915530002 systemd[1]: Started ONTAP  
Mediator.
```

```
• mediator-scst.service  
   Loaded: loaded  
   (/opt/netapp/lib/ontap_mediator/systemd/mediator-scst.service; enabled;  
   vendor preset: disabled)
```

```
   Active: active (running) since Thu 2020-06-18 09:54:51 EDT; 3  
   days ago
```

```
   Process: 3564 ExecStart=/etc/init.d/scst start (code=exited,  
   status=0/SUCCESS)
```

```
   Main PID: 4202 (iscsi-scstd)
```

```
   CGroup: /system.slice/mediator-scst.service
```

```
           \u2514\u25004202 /usr/local/sbin/iscsi-scstd
```

```
Jun 18 09:54:43 scspr1915530002 systemd[1]: Starting mediator-  
scst.service...
```

```
Jun 18 09:54:48 scspr1915530002 iscsi-scstd[4200]:  
max_data_seg_len 1048576, max_queued_cmds 2048
```

```
Jun 18 09:54:51 scspr1915530002 scst[3564]: Loading and  
configuring SCST[ OK ]
```

```
Jun 18 09:54:51 scspr1915530002 systemd[1]: Started mediator-
```

```
scst.service.
```

```
[root@scspr1915530002 ~]#
```

1. Confirm the ports the ONTAP Mediator service is using: netstat

```
[root@scspr1905507001 ~]# netstat -anlt | grep -E '3260|31784'
```

LISTEN	tcp	0	0 0.0.0.0:31784	0.0.0.0:*
LISTEN	tcp	0	0 0.0.0.0:3260	0.0.0.0:*
LISTEN	tcp6	0	0 :::3260	:::*

Result

The ONTAP Mediator service is now installed and running. Further configuration must be performed in the ONTAP storage system to use the Mediator features.

Configuring the ONTAP Mediator service from a MetroCluster IP configuration

The ONTAP Mediator service must be configured on the ONTAP node for use in a MetroCluster IP configuration.

Before you begin

- The ONTAP Mediator must have been successfully installed on a network location that can be reached by both MetroCluster sites.
- You must have the IP address of the host running the ONTAP Mediator service.
- You must have the username and password for the ONTAP Mediator service.
- All nodes of the MetroCluster IP configuration must be online.

About this task

- This task enables automatic unplanned switchover by default.
- This task can be performed on the ONTAP interface of any node in the MetroCluster IP configuration.
- A single installation of the ONTAP Mediator service can be configured with up to five MetroCluster IP configurations.

Procedure

1. Add the ONTAP Mediator service to ONTAP using the following command: metrocluster configuration-

settings mediator add -mediator-address ip-address-of-mediator-host

Note: You will be prompted for the username and password for the Mediator admin user account.

2. Verify that the automatic switchover feature is enabled: metrocluster show
3. Verify that the Mediator is now running.

```
Run: storage disk show -container-type mediator
```

```
ClusterA::> storage disk show -container-type mediator
```

Disk	Usable		Disk	Container	Container
Owner	Size	Shelf	Bay	Type	Name
NET-1.5	-	-	-	VMDISK	mediator
ClusterA-02					
NET-1.6	-	-	-	VMDISK	mediator
ClusterB-01					
NET-1.7	-	-	-	VMDISK	mediator
ClusterB-02					
NET-1.8	-	-	-	VMDISK	mediator
ClusterA-01					

```
Run the following command: set advanced
```

```
ClusterA::> set advanced
```

```
Run: storage iscsi-initiator show -label mediator
```

```

ClusterA::*> storage iscsi-initiator show -label mediator
(storage iscsi-initiator show)

Status
Node Type Label      Target Portal      Target Name
Admin/Op
-----
ClusterA-01
  mailbox
    mediator 1.1.1.1      iqn.2012-
05.local:mailbox.target.6616cd3f-9ef1-11e9-aada-00a098ccf5d8:a05e1ffb-
9ef1-11e9-8f68- 00a098cbca9e:1 up/up
ClusterA-02
  mailbox
    mediator 1.1.1.1      iqn.2012-
05.local:mailbox.target.6616cd3f-9ef1-11e9-aada-00a098ccf5d8:a05e1ffb-
9ef1-11e9-8f68-00a098cbca9e:1 up/up

```

Connecting a MetroCluster configuration to a different ONTAP Mediator instance

If you want to connect the MetroCluster nodes to a different ONTAP Mediator instance, you must unconfigure and then reconfigure the Mediator connection in the ONTAP software.

Before you begin

You need the username, password, and IP address of the new ONTAP Mediator instance.

About this task

These commands can be issued from any node in the MetroCluster configuration.

Procedure

1. Remove the current ONTAP Mediator from the MetroCluster configuration: `metrocluster configuration-settings mediator remove`
2. Establish the new ONTAP Mediator connection to the MetroCluster configuration: `metrocluster configuration-settings mediator add -mediator-address ip-address-of-mediator-host`

Changing the ONTAP Mediator password

After you have installed ONTAP Mediator service, you might want to change the password. You can change the password in two ways.

About this task

This task is performed on the Linux host on which the ONTAP Mediator service is installed.

If you are unable to reach this command, you might need to run the command using the full path as shown in the following example: `/usr/local/bin/mediator_change_password`

Procedure

Change the password by choosing one of the following options:

- Run the `mediator_change_password` command and respond to the prompts as shown in the following example:

```
[root@mediator-host ~]# mediator_change_password
Change the Mediator API password by entering the following values:
  Mediator API User Name: mediatoradmin
                        Old Password:
                        New Password:
                        Confirm Password:
The password has been updated successfully.
[root@mediator-host ~]#
```

- Run the following command: `MEDIATOR_USERNAME=mediatoradmin
MEDIATOR_PASSWORD=mediator1
MEDIATOR_NEW_PASSWORD=mediator2
mediator_change_password`

The example shows the password is changed from 'mediator1' to 'mediator2'.

```
[root@mediator-host ~]# MEDIATOR_USERNAME=mediatoradmin
MEDIATOR_PASSWORD=mediator1 MEDIATOR_NEW_PASSWORD=mediator2
mediator_change_password
The password has been updated successfully.
[root@mediator-host ~]#
```

Changing the ONTAP Mediator user name

After you have installed ONTAP Mediator service, you might want to change the user name. You can change the password in two ways.

About this task

This task is performed on the Linux host on which the ONTAP Mediator service is installed.

If you are unable to reach this command, you might need to run the command using the full path as shown in the following example: `/usr/local/bin/mediator_username`

Procedure

Change the username by choosing one of the following options:

- Run the command `mediator_change_user` and respond to the prompts as shown in the following example:

```
[root@mediator-host ~]# mediator_change_user
Modify the Mediator API username by entering the following values:
  Mediator API User Name: mediatoradmin
      Password:
New Mediator API User Name: mediator
The account username has been modified successfully.
[root@mediator-host ~]#
```

- Run the following command: `MEDIATOR_USERNAME=mediator MEDIATOR_PASSWORD=mediator2 MEDIATOR_NEW_USERNAME=mediatoradmin mediator_change_user` as shown in the following example:

```
[root@mediator-host ~]# MEDIATOR_USERNAME= mediator
MEDIATOR_PASSWORD='mediator2' MEDIATOR_NEW_USERNAME= mediatoradmin
mediator_change_user
The account username has been modified successfully.
[root@mediator-host ~]#
```

Changing the ONTAP Mediator user name

If necessary, you can remove the ONTAP Mediator service.

Before you begin

The Mediator must be disconnected from ONTAP before you remove the Mediator service.

About this task

This task is performed on the Linux host on which the ONTAP Mediator service is installed.

If you are unable to reach this command, you might need to run the command using the full path as shown in the following example: `/usr/local/bin/uninstall_ontap_mediator`

Procedure

Uninstall the ONTAP Mediator service as shown in the following example using the command: `uninstall_ontap_mediator`

```
[root@mediator-host ~]# uninstall_ontap_mediator
```

```
ONTAP Mediator: Self Extracting Uninstaller
```



```
+ Removing ONTAP Mediator. (Log:  
/tmp/ontap_mediator.GmRGdA/uninstall_ontap_mediator/remove.log)  
+ Remove successful.  
[root@mediator-host ~]#
```

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