



# **Mediator service for MetroCluster and SnapMirror Business Continuity**

## **ONTAP 9**

NetApp  
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# Mediator service for MetroCluster and SnapMirror Business Continuity

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

### About this task

- Beginning with ONTAP 9.7, you can use any version of ONTAP Mediator to monitor a MetroCluster IP configuration.
- Beginning with ONTAP 9.8, you can use any version of ONTAP Mediator to monitor an SM-BC relationship.

### Before you begin

You must meet the following prerequisites.

| Mediator version | Supported Linux versions   |
|------------------|--|
| 1.5              | <ul style="list-style-type: none"><li>• Red Hat Enterprise Linux: 7.6, 7.7, 7.8, 7.9, 8.1, 8.2, 8.3, 8.4, 8.5</li><li>• CentOS: 7.6, 7.7, 7.8, 7.9</li></ul> |
| 1.4              | <ul style="list-style-type: none"><li>• Red Hat Enterprise Linux: 7.6, 7.7, 7.8, 7.9, 8.1, 8.2, 8.3, 8.4, 8.5</li><li>• CentOS: 7.6, 7.7, 7.8, 7.9</li></ul> |
| 1.3              | <ul style="list-style-type: none"><li>• Red Hat Enterprise Linux: 7.6, 7.7, 7.8, 7.9, 8.1, 8.2, 8.3</li><li>• CentOS: 7.6, 7.7, 7.8, 7.9</li></ul>           |
| 1.2              | <ul style="list-style-type: none"><li>• Red Hat Enterprise Linux: 7.6, 7.7, 7.8, 8.1</li><li>• CentOS: 7.6, 7.7, 7.8</li></ul>                               |



The kernel version must match the operating system version.

- 64-bit physical installation or virtual machine
- 8 GB RAM
- User: Root access

## Upgrade the host operating system and then the Mediator

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 |
|----------------------|-------------------------|---------------|
|----------------------|-------------------------|---------------|

|   |     |  |
|---|-----|--|
| <ul style="list-style-type: none"> <li>Red Hat Enterprise Linux: 7.6, 7.7, 7.8, 8.1</li> <li>CentOS: 7.6, 7.7, 7.8</li> </ul>                               | 1.2 | <ul style="list-style-type: none"> <li>The upgrade must be performed in the following order:               <ol style="list-style-type: none"> <li>Upgrade the operating system from RHEL/CentOS version.</li> <li>Reboot the host to apply the kernel module changes.</li> <li>Upgrade the Mediator from the immediately prior version to the current version.</li> </ol> </li> <li>For MetroCluster:               <ol style="list-style-type: none"> <li>The storage iscsi-initiator show command will report that the connection to the Mediator service is down during the upgrade.</li> <li>The ONTAP operating system will generate the following EMS events:                   <ol style="list-style-type: none"> <li>cf.mccip.med.auso.stDisabled during the upgrade</li> <li>cf.mccip.med.auso.stEnabled when automatic unplanned switchover is re-enabled</li> </ol> </li> </ol> </li> </ul> |
| <ul style="list-style-type: none"> <li>Red Hat Enterprise Linux: 7.6, 7.7, 7.8, 7.9, 8.1, 8.2, 8.3</li> <li>CentOS: 7.6, 7.7, 7.8, 7.9</li> </ul>           | 1.3 | <ol style="list-style-type: none"> <li>Upgrade the operating system from RHEL/CentOS version.</li> <li>Reboot the host to apply the kernel module changes.</li> <li>Upgrade the Mediator from the immediately prior version to the current version.</li> </ol>   |
| <ul style="list-style-type: none"> <li>Red Hat Enterprise Linux: 7.6, 7.7, 7.8, 7.9, 8.1, 8.2, 8.3, 8.4, 8.5</li> <li>CentOS: 7.6, 7.7, 7.8, 7.9</li> </ul> | 1.4 | <ol style="list-style-type: none"> <li>Upgrade the operating system from RHEL/CentOS version.</li> <li>Reboot the host to apply the kernel module changes.</li> <li>Upgrade the Mediator from the immediately prior version to the current version.</li> </ol>   |
| <ul style="list-style-type: none"> <li>Red Hat Enterprise Linux: 7.6, 7.7, 7.8, 7.9, 8.1, 8.2, 8.3, 8.4, 8.5</li> <li>CentOS: 7.6, 7.7, 7.8, 7.9</li> </ul> | 1.5 | <ol style="list-style-type: none"> <li>Upgrade the operating system from RHEL/CentOS version.</li> <li>Reboot the host to apply the kernel module changes. If you do not reboot the host, an error message appears prompting you to perform a reboot.</li> <li>Upgrade the Mediator from the immediately prior version to the current version.</li> </ol>  |

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. Due to end-of-life support for CentOS 8.x versions, compatible versions of CentOS 8.x are not recommended.
- 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 must ensure that the required packages are available in a local 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 8.x   |
|---|---|--|
| <ul style="list-style-type: none"><li>• openssl</li><li>• openssl-devel</li><li>• kernel-devel</li><li>• gcc</li><li>• libselinux-utils</li><li>• make</li><li>• redhat-lsb-core</li><li>• patch</li><li>• bzip2</li><li>• python36</li><li>• python36-devel</li><li>• perl-Data-Dumper</li><li>• perl-ExtUtils-MakeMaker</li><li>• python3-pip</li></ul> | <ul style="list-style-type: none"><li>• policycoreutils-python</li><li>• python36-pip</li></ul> | <ul style="list-style-type: none"><li>• elfutils-libelf-devel</li><li>• policycoreutils-python-utils</li></ul> |

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.

## 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"><li>• rhel-8-for-x86_64-baseos-rpms</li><li>• rhel-8-for-x86_64-appstream-rpms</li></ul> |

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.

- Procedure for [RHEL 7.x](#) operating system.
- Procedure for [RHEL 8.x](#) operating system.
- Procedure for [CentOS 7.x](#) operating system.

### Procedure for RHEL 7.x operating system

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

#### Steps

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 ~]#
```

## Procedure for RHEL 8.x operating system

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

### Steps

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.

## Procedure for CentOS 7.x operating system

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



The following examples are showing a repository for CentOS 7.6 and may not work for other CentOS versions. Use the base repository for your version of CentOS.

### Steps

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 ~]#

```

## Download the Mediator installation package

### Steps

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 current working directory:

```
ls
```

```

[root@mediator-host ~]#ls
ontap-mediator-1.5.0.tgz

```



For ONTAP Mediator versions 1.4 and earlier, the installer is named `ontap-mediator`.

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.

#### 4. Unzip the installer package: `tar xvfz ontap-mediator-1.5.0.tgz`

```
[root@scs000099753 ~]# tar xvfz ontap-mediator-1.5.0.tgz
ontap-mediator-1.5.0/
ontap-mediator-1.5.0/ONTAP-Mediator-production.pub
ontap-mediator-1.5.0/tsa-prod-chain-ONTAP-Mediator.pem
ontap-mediator-1.5.0/tsa-prod-ONTAP-Mediator.pem
ontap-mediator-1.5.0/csc-prod-ONTAP-Mediator.pem
ontap-mediator-1.5.0/csc-prod-chain-ONTAP-Mediator.pem
ontap-mediator-1.5.0/ontap-mediator-1.5.0
ontap-mediator-1.5.0/ontap-mediator-1.5.0.sig.tsr
ontap-mediator-1.5.0/ontap-mediator-1.5.0.tsr
ontap-mediator-1.5.0/ontap-mediator-1.5.0.sig
```

## Verify the ONTAP Mediator code signature

You should verify the ONTAP Mediator code signature before installing the Mediator installation package.

### Before you begin

Before verifying the Mediator code signature, your system must meet the following requirements.

- openssl versions 1.0.2 to 3.0 for basic verification
- openssl version 1.1.0 or later for Time Stamping Authority (TSA) operations
- Public internet access for OCSP verification



The following files are included in the download package:

- `ONTAP-Mediator-development.pub` | The public key used to verify the signature
- `csc-prod-chain-ONTAP-Mediator.pem` | The public certification CA chain of trust
- `csc-prod-ONTAP-Mediator.pem` | The certificate used to generate the key
- `ontap-mediator-1.5.0` | The product installation executable for version 1.5.0
- `ontap-mediator-1.5.0.sig` | The SHA-256 hashed, then RSA-signed using the csc-prod key, signature for the installer
- `ontap-mediator-1.5.0.sig.tsr` | The revocation request for use by OCSCP for the installer's signature
- `tsa-prod-ONTAP-Mediator.pem` | The public certificate for the TSR
- `tsa-prod-chain-ONTAP-Mediator.pem` | The public certificate CA Chain for the TSR

### Steps

1. Perform the revocation check on `csc-prod-ONTAP-Mediator.pem` by using Online Certificate Status Protocol (OCSP).
  - a. Find the OCSP URL used to register the certificate as developer certificates might not provide a uri.

```
openssl x509 -noout -ocsp_uri -in csc-prod-chain-ONTAP-Mediator.pem
```

- b. Generate an OCSP request for the certificate.

```
openssl ocsp -issuer csc-prod-chain-ONTAP-Mediator.pem -CAfile csc-prod-chain-ONTAP-Mediator.pem -cert csc-prod-ONTAP-Mediator.pem -reqout req.der
```

- c. Connect to the OCSP Manager to send the OCSP request: `openssl`

```
openssl ocsp -issuer csc-prod-chain-ONTAP-Mediator.pem -CAfile csc-prod-chain-ONTAP-Mediator.pem -cert csc-prod-ONTAP-Mediator.pem -url ${ocsp_uri} -resp_text -respout resp.der
```

2. Verify the trust chain of the CSC and expiration dates against the local host: `openssl verify`



The `openssl` version from the `PATH` must have a valid `cert.pem` (not self-signed).

```
openssl verify -untrusted csc-prod-chain-ONTAP-Mediator.pem -CApath ${OPENSSLDIR} csc-prod-ONTAP-Mediator.pem # Failure action: The Code-Signature-Check certificate has expired or is invalid. Download a newer version of the ONTAP Mediator.
openssl verify -untrusted tsa-prod-chain-ONTAP-Mediator.pem -CApath ${OPENSSLDIR} tsa-prod-ONTAP-Mediator.pem # Failure action: The Time-Stamp certificate has expired or is invalid. Download a newer version of the ONTAP Mediator.
```

3. Verify the `ontap-mediator-1.5.0.sig.tsr` and `ontap-mediator-1.5.0.tsr` files using the associated certificates: `openssl ts -verify`



.tsr files contain the time stamp response associated with the installer and the code signature. Processing confirms that the time stamp has a valid signature from TSA and that your input file has not changed. The verification is performed locally on your machine. Independently, there is no need to access TSA servers.

```
openssl ts -verify -data ontap-mediator-1.5.0.sig -in ontap-mediator-1.5.0.sig.tsr -CAfile tsa-prod-chain-ONTAP-Mediator.pem -untrusted tsa-prod-ONTAP-Mediator.pem
openssl ts -verify -data ontap-mediator-1.5.0 -in ontap-mediator-1.5.0.tsr -CAfile tsa-prod-chain-ONTAP-Mediator.pem -untrusted tsa-prod-ONTAP-Mediator.pem
```

4. Verify signatures against the key: `openssl -dgst -verify`

```
openssl dgst -sha256 -verify ONTAP-Mediator-production.pub -signature  
ontap-mediator-1.5.0.sig ontap-mediator-1.5.0
```

## Example of Verifying the ONTAP Mediator code signature (console output)

```
[root@scspa2695423001 ontap-mediator-1.5.0]# pwd
/root/ontap-mediator-1.5.0
[root@scspa2695423001 ontap-mediator-1.5.0]# ls -l
total 63660
-r--r--r-- 1 root root      8582 Oct 19 15:02 csc-prod-chain-ONTAP-
Mediator.pem
-r--r--r-- 1 root root      2373 Oct 19 15:02 csc-prod-ONTAP-
Mediator.pem
-r-xr-xr-- 1 root root 65132818 Oct 20 15:17 ontap-mediator-1.5.0
-rw-r--r-- 1 root root      384 Oct 20 15:17 ontap-mediator-1.5.0.sig
-rw-r--r-- 1 root root      5437 Oct 20 15:17 ontap-mediator-
1.5.0.sig.tsr
-rw-r--r-- 1 root root      5436 Oct 20 15:17 ontap-mediator-1.5.0.tsr
-r--r--r-- 1 root root      625 Oct 19 15:02 ONTAP-Mediator-
production.pub
-r--r--r-- 1 root root      3323 Oct 19 15:02 tsa-prod-chain-ONTAP-
Mediator.pem
-r--r--r-- 1 root root      1740 Oct 19 15:02 tsa-prod-ONTAP-
Mediator.pem
[root@scspa2695423001 ontap-mediator-1.5.0]#
[root@scspa2695423001 ontap-mediator-1.5.0]#
/root/verify_ontap_mediator_signatures.sh
++ openssl version -d
++ cut -d '"' -f2
+ OPENSSLDIR=/etc/pki/tls
+ openssl version
OpenSSL 1.1.1k  FIPS 25 Mar 2021
++ openssl x509 -noout -ocsp_uri -in csc-prod-chain-ONTAP-Mediator.pem
+ ocsp_uri=http://ocsp.entrust.net
+ echo http://ocsp.entrust.net
http://ocsp.entrust.net
+ openssl ocsp -issuer csc-prod-chain-ONTAP-Mediator.pem -CAfile csc-
prod-chain-ONTAP-Mediator.pem -cert csc-prod-ONTAP-Mediator.pem -reqout
req.der
+ openssl ocsp -issuer csc-prod-chain-ONTAP-Mediator.pem -CAfile csc-
prod-chain-ONTAP-Mediator.pem -cert csc-prod-ONTAP-Mediator.pem -url
http://ocsp.entrust.net -resp_text -respout resp.der
OCSP Response Data:
  OCSF Response Status: successful (0x0)
  Response Type: Basic OCSP Response
  Version: 1 (0x0)
  Responder Id: C = US, O = "Entrust, Inc.", CN = Entrust Extended
Validation Code Signing CA - EVCS2
  Produced At: Oct 28 05:01:00 2022 GMT
```

Responses:

Certificate ID:

Hash Algorithm: sha1

Issuer Name Hash: 69FA640329AB84E27220FE0927647B8194B91F2A

Issuer Key Hash: CE894F8251AA15A28462CA312361D261F8FE78

Serial Number: 511A542B57522AEB7295A640DC6200E5

Cert Status: good

This Update: Oct 28 05:00:00 2022 GMT

Next Update: Nov 4 04:59:59 2022 GMT

Signature Algorithm: sha512WithRSAEncryption

3c:1d:49:b0:93:62:37:3e:c7:38:e3:9f:9f:62:82:73:ed:f4:  
ea:00:6b:f1:01:cd:79:57:92:f1:9d:5d:85:9b:60:59:f8:6c:  
e6:f4:50:51:f3:4c:8a:51:dd:50:68:16:8f:20:24:7e:39:b0:  
44:94:8d:b0:61:da:b9:08:36:74:2d:44:55:62:fb:92:be:4a:  
e7:6c:8c:49:dd:0c:fd:d8:ce:20:08:0d:0f:5a:29:a3:19:03:  
9f:d3:df:41:f4:89:0f:73:18:3f:ac:bb:a7:a3:96:7d:c5:70:  
4c:57:cd:17:17:c6:8a:60:d1:37:c9:2d:81:07:2a:d7:a6:02:  
ee:ce:88:16:22:db:e3:43:64:1e:9b:0d:4d:31:66:fa:ab:a5:  
52:99:94:4a:4a:d0:52:c5:34:f5:18:c7:15:5b:ce:74:c2:fc:  
61:ea:55:aa:f1:2f:82:a3:6a:95:8d:7e:2b:38:49:4f:bf:b1:  
68:7b:1b:24:8b:1f:4d:c5:77:f0:71:af:9c:34:c8:7a:82:50:  
09:a2:19:6e:c6:30:4f:da:a2:79:08:f9:d0:ff:85:d9:2a:84:  
cf:0c:aa:75:8f:72:c9:a7:a2:83:e8:8b:cf:ed:0c:69:75:b6:  
2a:7b:6b:58:99:01:d8:34:ad:e1:89:25:27:1b:fa:d9:6d:32:  
97:3a:0b:0a:8e:a3:9e:e3:f4:e0:d6:1a:c9:b5:14:8c:3e:54:  
3b:37:17:1a:93:44:84:8b:4a:87:97:1e:76:43:3e:d3:ec:8b:  
7e:56:4a:3f:01:31:c0:e5:58:fb:50:ce:6f:b1:e7:35:f9:b7:  
a3:ef:6b:3b:21:95:37:a6:5b:8f:f0:15:18:36:65:89:a1:9c:  
9b:69:00:b4:b1:65:6a:bc:11:2d:d4:9b:b4:97:cc:cb:7a:0c:  
16:11:c1:75:58:7e:13:ab:56:3c:3f:93:5b:95:24:c6:54:52:  
1f:86:a9:16:ce:d9:ea:8b:3a:f3:4f:c4:8f:ad:de:e8:3e:3c:  
d2:51:51:ad:33:7f:d8:c5:33:24:26:f1:2d:9d:0e:9f:55:d0:  
68:bf:af:bd:68:4a:40:08:bc:92:a0:62:54:7d:16:7b:36:29:  
15:b1:cd:58:8e:fb:4a:f2:3e:94:8b:fe:56:95:cc:24:32:af:  
5f:71:99:18:ed:0c:64:94:f7:54:48:87:48:d0:6d:b3:42:04:  
96:03:73:a2:8e:8a:6a:b2:af:ee:56:19:a1:c6:35:12:59:ad:  
19:6a:fe:e0:f1:27:cc:96:4e:f0:4f:fb:6a:bd:ce:05:2c:aa:  
79:7c:df:02:5c:ca:53:7d:60:12:88:7c:ce:15:c7:d4:02:27:  
c1:ab:cf:71:30:1e:14:ba

WARNING: no nonce in response

Response verify OK

csc-prod-ONTAP-Mediator.pem: good

This Update: Oct 28 05:00:00 2022 GMT

Next Update: Nov 4 04:59:59 2022 GMT

+ openssl verify -untrusted csc-prod-chain-ONTAP-Mediator.pem -CApath

```

/etc/pki/tls csc-prod-ONTAP-Mediator.pem
csc-prod-ONTAP-Mediator.pem: OK
+ openssl verify -untrusted tsa-prod-chain-ONTAP-Mediator.pem -CApath
/etc/pki/tls tsa-prod-ONTAP-Mediator.pem
tsa-prod-ONTAP-Mediator.pem: OK
+ openssl ts -verify -data ontap-mediator-1.5.0.sig -in ontap-mediator-
1.5.0.sig.tsr -CAfile tsa-prod-chain-ONTAP-Mediator.pem -untrusted tsa-
prod-ONTAP-Mediator.pem
Using configuration from /etc/pki/tls/openssl.cnf
Verification: OK
+ openssl ts -verify -data ontap-mediator-1.5.0 -in ontap-mediator-
1.5.0.tsr -CAfile tsa-prod-chain-ONTAP-Mediator.pem -untrusted tsa-
prod-ONTAP-Mediator.pem
Using configuration from /etc/pki/tls/openssl.cnf
Verification: OK
+ openssl dgst -sha256 -verify ONTAP-Mediator-production.pub -signature
ontap-mediator-1.5.0.sig ontap-mediator-1.5.0
Verified OK
[root@scspa2695423001 ontap-mediator-1.5.0]#

```

## Install the ONTAP Mediator installation package

### About this task

- Beginning with ONTAP Mediator 1.4, the Secure Boot mechanism is enabled on UEFI systems. When Secure Boot is enabled, you must take additional steps to register the security key after installation:
  - Follow instructions in the README file:  
`/opt/netapp/lib/ontap_mediator/ontap_mediator/SCST_mod_keys/README.module-signing` to sign the SCST kernel module.
  - Locate the required keys:  
`/opt/netapp/lib/ontap_mediator/ontap_mediator/SCST_mod_keys`



After installation, the README files and key location are also provided in the system output.

### Steps

- Run the installer and respond to the prompts as required: `./ontap-mediator-1.5.0/ontap-mediator-1.5.0 -y`

```
[root@scs000099753 ~]# ./ontap-mediator-1.5.0/ontap-mediator-1.5.0 -y
```

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 ONTAP Mediator 1.5 installation (console output)

```
[root@scs000099753 ~]# ./ontap-mediator-1.5.0/ontap-mediator-1.5.0 -y
ONTAP Mediator: Self Extracting Installer

+ Extracting the ONTAP Mediator installation/upgrade archive
+ Performing the ONTAP Mediator run-time code signature check
  Using openssl from the path: /usr/bin/openssl configured for
CApath:/etc/pki/tls

+ Unpacking the ONTAP Mediator installer
ONTAP Mediator requires two user accounts. One for the service
(netapp), and one for use by ONTAP to the mediator API (mediatoradmin).
Using default account names: netapp + mediatoradmin

Enter ONTAP Mediator user account (mediatoradmin) password:

Re-Enter ONTAP Mediator user account (mediatoradmin) password:

+ Checking if SELinux is in enforcing mode

+ Checking for default Linux firewall
success
success
success

#####
Preparing for installation of ONTAP Mediator packages.

+ Installing required packages.

Last metadata expiration check: 0:25:24 ago on Fri 21 Oct 2022 04:00:13
PM EDT.
Package openssl-1:1.1.1k-4.el8.x86_64 is already installed.
Package gcc-8.4.1-1.el8.x86_64 is already installed.
Package python36-3.6.8-2.module+el8.1.0+3334+5cb623d7.x86_64 is already
installed.
Package libselinux-utils-2.9-5.el8.x86_64 is already installed.
Package perl-Data-Dumper-2.167-399.el8.x86_64 is already installed.
Package efibootmgr-16-1.el8.x86_64 is already installed.
Package mokutil-1:0.3.0-11.el8.x86_64 is already installed.
```



Package python3-pip-9.0.3-19.el8.noarch is already installed.  
 Package polycoreutils-python-utils-2.9-14.el8.noarch is already installed.  
 Dependencies resolved.

```
=====
```

| Package                                | Architecture | Repository  |
|--|--------------|-------------|
| Version                                |              |             |
| Size                                   |              |             |
| =====                                  |              |             |
| =====                                  |              |             |
| Installing:                            |              |             |
| bzip2                                  | x86_64       |             |
| 1.0.6-26.el8                           |              | rhel-8-for- |
| x86_64-baseos-rpms                     | 60 k         |             |
| elfutils-libelf-devel                  | x86_64       |             |
| 0.186-1.el8                            |              | rhel-8-for- |
| x86_64-baseos-rpms                     | 60 k         |             |
| kernel-devel                           | x86_64       |             |
| 4.18.0-348.el8                         |              | rhel-8-for- |
| x86_64-baseos-rpms                     | 20 M         |             |
| make                                   | x86_64       |             |
| 1:4.2.1-11.el8                         |              | rhel-8-for- |
| x86_64-baseos-rpms                     | 498 k        |             |
| openssl-devel                          | x86_64       |             |
| 1:1.1.1k-7.el8_6                       |              | rhel-8-for- |
| x86_64-baseos-rpms                     | 2.3 M        |             |
| patch                                  | x86_64       |             |
| 2.7.6-11.el8                           |              | rhel-8-for- |
| x86_64-baseos-rpms                     | 138 k        |             |
| perl-ExtUtils-MakeMaker                | noarch       |             |
| 1:7.34-1.el8                           |              | rhel-8-for- |
| x86_64-appstream-rpms                  | 301 k        |             |
| python36-devel                         | x86_64       |             |
| 3.6.8-38.module+el8.5.0+12207+5c5719bc |              | rhel-8-for- |
| x86_64-appstream-rpms                  | 17 k         |             |
| redhat-lsb-core                        | x86_64       |             |
| 4.1-47.el8                             |              | rhel-8-for- |
| x86_64-appstream-rpms                  | 45 k         |             |
| Upgrading:                             |              |             |
| cpp                                    | x86_64       |             |
| 8.5.0-10.1.el8_6                       |              | rhel-8-for- |
| x86_64-appstream-rpms                  | 10 M         |             |
| elfutils-libelf                        | x86_64       |             |

|  |       |        |             |
|--|-------|--------|-------------|
| 0.186-1.el8                            |       |        | rhel-8-for- |
| x86_64-baseos-rpms                     | 229 k |        |             |
| elfutils-libs                          |       | x86_64 |             |
| 0.186-1.el8                            |       |        | rhel-8-for- |
| x86_64-baseos-rpms                     | 295 k |        |             |
| gcc                                    |       | x86_64 |             |
| 8.5.0-10.1.el8_6                       |       |        | rhel-8-for- |
| x86_64-appstream-rpms                  | 23 M  |        |             |
| libgcc                                 |       | x86_64 |             |
| 8.5.0-10.1.el8_6                       |       |        | rhel-8-for- |
| x86_64-baseos-rpms                     | 80 k  |        |             |
| libgomp                                |       | x86_64 |             |
| 8.5.0-10.1.el8_6                       |       |        | rhel-8-for- |
| x86_64-baseos-rpms                     | 207 k |        |             |
| libsemanage                            |       | x86_64 |             |
| 2.9-8.el8                              |       |        | rhel-8-for- |
| x86_64-baseos-rpms                     | 168 k |        |             |
| mokutil                                |       | x86_64 |             |
| 1:0.3.0-11.el8_6.1                     |       |        | rhel-8-for- |
| x86_64-baseos-rpms                     | 46 k  |        |             |
| openssl                                |       | x86_64 |             |
| 1:1.1.1k-7.el8_6                       |       |        | rhel-8-for- |
| x86_64-baseos-rpms                     | 709 k |        |             |
| openssl-libs                           |       | x86_64 |             |
| 1:1.1.1k-7.el8_6                       |       |        | rhel-8-for- |
| x86_64-baseos-rpms                     | 1.5 M |        |             |
| platform-python-pip                    |       | noarch |             |
| 9.0.3-22.el8                           |       |        | rhel-8-for- |
| x86_64-baseos-rpms                     | 1.6 M |        |             |
| policycoreutils                        |       | x86_64 |             |
| 2.9-19.el8                             |       |        | rhel-8-for- |
| x86_64-baseos-rpms                     | 374 k |        |             |
| policycoreutils-python-utils           |       | noarch |             |
| 2.9-19.el8                             |       |        | rhel-8-for- |
| x86_64-baseos-rpms                     | 253 k |        |             |
| python3-libsemanage                    |       | x86_64 |             |
| 2.9-8.el8                              |       |        | rhel-8-for- |
| x86_64-baseos-rpms                     | 128 k |        |             |
| python3-pip                            |       | noarch |             |
| 9.0.3-22.el8                           |       |        | rhel-8-for- |
| x86_64-appstream-rpms                  | 20 k  |        |             |
| python3-policycoreutils                |       | noarch |             |
| 2.9-19.el8                             |       |        | rhel-8-for- |
| x86_64-baseos-rpms                     | 2.2 M |        |             |
| python36                               |       | x86_64 |             |
| 3.6.8-38.module+el8.5.0+12207+5c5719bc |       |        | rhel-8-for- |

```

x86_64-appstream-rpms                19 k
Installing dependencies:
  annobin                             x86_64
10.29-3.el8                           rhel-8-for-
x86_64-appstream-rpms                117 k
  at                                  x86_64
3.1.20-11.el8                         rhel-8-for-
x86_64-baseos-rpms                   81 k
  bc                                  x86_64
1.07.1-5.el8                         rhel-8-for-
x86_64-baseos-rpms                   129 k
  cups-client                        x86_64
1:2.2.6-38.el8                       rhel-8-for-
x86_64-appstream-rpms                169 k
  dwz                                x86_64
0.12-10.el8                          rhel-8-for-
x86_64-appstream-rpms                109 k
  ed                                  x86_64
1.14.2-4.el8                         rhel-8-for-
x86_64-baseos-rpms                   82 k
  efi-srpm-macros                    noarch
3-3.el8                              rhel-8-for-
x86_64-appstream-rpms                22 k
  esmtplib                           x86_64
1.2-15.el8                           EPEL-8
57 k
  glibc-srpm-macros                  noarch
1.4.2-7.el8                          rhel-8-for-
x86_64-appstream-rpms                9.4 k
  go-srpm-macros                     noarch
2-17.el8                             rhel-8-for-
x86_64-appstream-rpms                13 k
  keyutils-libs-devel                x86_64
1.5.10-6.el8                         rhel-8-for-
x86_64-baseos-rpms                   48 k
  krb5-devel                         x86_64
1.18.2-14.el8                       rhel-8-for-
x86_64-baseos-rpms                   560 k
  libcom_err-devel                   x86_64
1.45.6-2.el8                         rhel-8-for-
x86_64-baseos-rpms                   38 k
  libesmtplib                        x86_64
1.0.6-18.el8                         EPEL-8
70 k
  libkadm5                           x86_64
1.18.2-14.el8                       rhel-8-for-

```

|                       |       |        |             |
|-----------------------|-------|--------|-------------|
| x86_64-baseos-rpms    | 187 k |        |             |
| libblockfile          |       | x86_64 |             |
| 1.14-1.el8            |       |        | rhel-8-for- |
| x86_64-appstream-rpms | 32 k  |        |             |
| libselinux-devel      |       | x86_64 |             |
| 2.9-5.el8             |       |        | rhel-8-for- |
| x86_64-baseos-rpms    | 200 k |        |             |
| libsepol-devel        |       | x86_64 |             |
| 2.9-3.el8             |       |        | rhel-8-for- |
| x86_64-baseos-rpms    | 87 k  |        |             |
| libverto-devel        |       | x86_64 |             |
| 0.3.0-5.el8           |       |        | rhel-8-for- |
| x86_64-baseos-rpms    | 18 k  |        |             |
| m4                    |       | x86_64 |             |
| 1.4.18-7.el8          |       |        | rhel-8-for- |
| x86_64-baseos-rpms    | 223 k |        |             |
| mailx                 |       | x86_64 |             |
| 12.5-29.el8           |       |        | rhel-8-for- |
| x86_64-baseos-rpms    | 257 k |        |             |
| ncurses-compat-libs   |       | x86_64 |             |
| 6.1-9.20180224.el8    |       |        | rhel-8-for- |
| x86_64-baseos-rpms    | 328 k |        |             |
| ocaml-srpm-macros     |       | noarch |             |
| 5-4.el8               |       |        | rhel-8-for- |
| x86_64-appstream-rpms | 9.5 k |        |             |
| openblas-srpm-macros  |       | noarch |             |
| 2-2.el8               |       |        | rhel-8-for- |
| x86_64-appstream-rpms | 8.0 k |        |             |
| pcre2-devel           |       | x86_64 |             |
| 10.32-2.el8           |       |        | rhel-8-for- |
| x86_64-baseos-rpms    | 605 k |        |             |
| pcre2-utf16           |       | x86_64 |             |
| 10.32-2.el8           |       |        | rhel-8-for- |
| x86_64-baseos-rpms    | 229 k |        |             |
| pcre2-utf32           |       | x86_64 |             |
| 10.32-2.el8           |       |        | rhel-8-for- |
| x86_64-baseos-rpms    | 220 k |        |             |
| perl-CPAN-Meta-YAML   |       | noarch |             |
| 0.018-397.el8         |       |        | rhel-8-for- |
| x86_64-appstream-rpms | 34 k  |        |             |
| perl-ExtUtils-Command |       | noarch |             |
| 1:7.34-1.el8          |       |        | rhel-8-for- |
| x86_64-appstream-rpms | 19 k  |        |             |
| perl-ExtUtils-Install |       | noarch |             |
| 2.14-4.el8            |       |        | rhel-8-for- |
| x86_64-appstream-rpms | 46 k  |        |             |

|                        |       |        |             |
|------------------------|-------|--------|-------------|
| perl-ExtUtils-Manifest |       | noarch |             |
| 1.70-395.el8           |       |        | rhel-8-for- |
| x86_64-appstream-rpms  | 37 k  |        |             |
| perl-ExtUtils-ParseXS  |       | noarch |             |
| 1:3.35-2.el8           |       |        | rhel-8-for- |
| x86_64-appstream-rpms  | 83 k  |        |             |
| perl-JSON-PP           |       | noarch |             |
| 1:2.97.001-3.el8       |       |        | rhel-8-for- |
| x86_64-appstream-rpms  | 68 k  |        |             |
| perl-Math-BigInt       |       | noarch |             |
| 1:1.9998.11-7.el8      |       |        | rhel-8-for- |
| x86_64-baseos-rpms     | 196 k |        |             |
| perl-Math-Complex      |       | noarch |             |
| 1.59-421.el8           |       |        | rhel-8-for- |
| x86_64-baseos-rpms     | 109 k |        |             |
| perl-Test-Harness      |       | noarch |             |
| 1:3.42-1.el8           |       |        | rhel-8-for- |
| x86_64-appstream-rpms  | 279 k |        |             |
| perl-devel             |       | x86_64 |             |
| 4:5.26.3-419.el8_4.1   |       |        | rhel-8-for- |
| x86_64-appstream-rpms  | 599 k |        |             |
| perl-srpm-macros       |       | noarch |             |
| 1-25.el8               |       |        | rhel-8-for- |
| x86_64-appstream-rpms  | 11 k  |        |             |
| perl-version           |       | x86_64 |             |
| 6:0.99.24-1.el8        |       |        | rhel-8-for- |
| x86_64-appstream-rpms  | 67 k  |        |             |
| platform-python-devel  |       | x86_64 |             |
| 3.6.8-41.el8           |       |        | rhel-8-for- |
| x86_64-appstream-rpms  | 249 k |        |             |
| python-rpm-macros      |       | noarch |             |
| 3-41.el8               |       |        | rhel-8-for- |
| x86_64-appstream-rpms  | 15 k  |        |             |
| python-srpm-macros     |       | noarch |             |
| 3-41.el8               |       |        | rhel-8-for- |
| x86_64-appstream-rpms  | 15 k  |        |             |
| python3-pyparsing      |       | noarch |             |
| 2.1.10-7.el8           |       |        | rhel-8-for- |
| x86_64-baseos-rpms     | 142 k |        |             |
| python3-rpm-generators |       | noarch |             |
| 5-7.el8                |       |        | rhel-8-for- |
| x86_64-appstream-rpms  | 25 k  |        |             |
| python3-rpm-macros     |       | noarch |             |
| 3-41.el8               |       |        | rhel-8-for- |
| x86_64-appstream-rpms  | 14 k  |        |             |
| qt5-srpm-macros        |       | noarch |             |

|                                      |       |        |             |
|--------------------------------------|-------|--------|-------------|
| 5.15.2-1.el8                         |       |        | rhel-8-for- |
| x86_64-appstream-rpms                | 11 k  |        |             |
| redhat-lsb-submod-security           |       | x86_64 |             |
| 4.1-47.el8                           |       |        | rhel-8-for- |
| x86_64-appstream-rpms                | 22 k  |        |             |
| redhat-rpm-config                    |       | noarch |             |
| 125-1.el8                            |       |        | rhel-8-for- |
| x86_64-appstream-rpms                | 87 k  |        |             |
| rust-srpm-macros                     |       | noarch |             |
| 5-2.el8                              |       |        | rhel-8-for- |
| x86_64-appstream-rpms                | 9.3 k |        |             |
| spax                                 |       | x86_64 |             |
| 1.5.3-13.el8                         |       |        | rhel-8-for- |
| x86_64-baseos-rpms                   | 217 k |        |             |
| systemtap-sdt-devel                  |       | x86_64 |             |
| 4.6-4.el8                            |       |        | rhel-8-for- |
| x86_64-appstream-rpms                | 86 k  |        |             |
| time                                 |       | x86_64 |             |
| 1.9-3.el8                            |       |        | rhel-8-for- |
| x86_64-baseos-rpms                   | 54 k  |        |             |
| unzip                                |       | x86_64 |             |
| 6.0-46.el8                           |       |        | rhel-8-for- |
| x86_64-baseos-rpms                   | 196 k |        |             |
| util-linux-user                      |       | x86_64 |             |
| 2.32.1-28.el8                        |       |        | rhel-8-for- |
| x86_64-baseos-rpms                   | 100 k |        |             |
| zip                                  |       | x86_64 |             |
| 3.0-23.el8                           |       |        | rhel-8-for- |
| x86_64-baseos-rpms                   | 270 k |        |             |
| zlib-devel                           |       | x86_64 |             |
| 1.2.11-17.el8                        |       |        | rhel-8-for- |
| x86_64-baseos-rpms                   | 58 k  |        |             |
| Installing weak dependencies:        |       |        |             |
| perl-CPAN-Meta                       |       | noarch |             |
| 2.150010-396.el8                     |       |        | rhel-8-for- |
| x86_64-appstream-rpms                | 191 k |        |             |
| perl-CPAN-Meta-Requirements          |       | noarch |             |
| 2.140-396.el8                        |       |        | rhel-8-for- |
| x86_64-appstream-rpms                | 37 k  |        |             |
| perl-Encode-Locale                   |       | noarch |             |
| 1.05-10.module+el8.3.0+6498+9eecfe51 |       |        | rhel-8-for- |
| x86_64-appstream-rpms                | 22 k  |        |             |
| perl-Time-HiRes                      |       | x86_64 |             |
| 4:1.9758-2.el8                       |       |        | rhel-8-for- |
| x86_64-appstream-rpms                | 61 k  |        |             |

## Transaction Summary

Install 69 Packages

Upgrade 17 Packages

Total download size: 72 M

Is this ok [y/N]: y

Downloading Packages:

(1/86): perl-ExtUtils-Install-2.14-4.el8.noarch.rpm

735 kB/s | 46 kB 00:00

(2/86): libesmtplib-1.0.6-18.el8.x86\_64.rpm

1.0 MB/s | 70 kB 00:00

(3/86): esmtplib-1.2-15.el8.x86\_64.rpm

747 kB/s | 57 kB 00:00

(4/86): rust-srpm-macros-5-2.el8.noarch.rpm

308 kB/s | 9.3 kB 00:00

(5/86): perl-ExtUtils-Manifest-1.70-395.el8.noarch.rpm

781 kB/s | 37 kB 00:00

(6/86): perl-CPAN-Meta-2.150010-396.el8.noarch.rpm

2.7 MB/s | 191 kB 00:00

(7/86): ocaml-srpm-macros-5-4.el8.noarch.rpm

214 kB/s | 9.5 kB 00:00

(8/86): perl-JSON-PP-2.97.001-3.el8.noarch.rpm

1.2 MB/s | 68 kB 00:00

(9/86): perl-ExtUtils-MakeMaker-7.34-1.el8.noarch.rpm

5.8 MB/s | 301 kB 00:00

(10/86): ghc-srpm-macros-1.4.2-7.el8.noarch.rpm

317 kB/s | 9.4 kB 00:00

(11/86): perl-Test-Harness-3.42-1.el8.noarch.rpm

4.5 MB/s | 279 kB 00:00

(12/86): perl-ExtUtils-Command-7.34-1.el8.noarch.rpm

520 kB/s | 19 kB 00:00

...

15 MB/s | 1.5 MB 00:00

Total

35 MB/s | 72 MB 00:02

Running transaction check

Transaction check succeeded.

Running transaction test

```

Transaction test succeeded.
Running transaction
  Preparing      :
1/1
  Running scriptlet: openssl-libs-1:1.1.1k-7.el8_6.x86_64
1/1
  Upgrading       : openssl-libs-1:1.1.1k-7.el8_6.x86_64
1/103
  Running scriptlet: openssl-libs-1:1.1.1k-7.el8_6.x86_64
1/103
  Upgrading       : libgcc-8.5.0-10.1.el8_6.x86_64
2/103
  Running scriptlet: libgcc-8.5.0-10.1.el8_6.x86_64
2/103
  Upgrading       : elfutils-libelf-0.186-1.el8.x86_64
3/103
  Installing      : perl-version-6:0.99.24-1.el8.x86_64
4/103
  Installing      : perl-CPAN-Meta-Requirements-2.140-396.el8.noarch
5/103
  Upgrading       : libsemanage-2.9-8.el8.x86_64
6/103
  Installing      : zlib-devel-1.2.11-17.el8.x86_64
7/103
  Installing      : python-srpm-macros-3-41.el8.noarch
8/103
  Installing      : python-rpm-macros-3-41.el8.noarch
9/103
  Installing      : python3-rpm-macros-3-41.el8.noarch
10/103
  Installing      : perl-Time-HiRes-4:1.9758-2.el8.x86_64
11/103
  Installing      : perl-ExtUtils-ParseXS-1:3.35-2.el8.noarch
12/103
  Installing      : perl-Test-Harness-1:3.42-1.el8.noarch
13/103
  Upgrading       : python3-libsemanage-2.9-8.el8.x86_64
14/103
  Upgrading       : polycoreutils-2.9-19.el8.x86_64
15/103
  Running scriptlet: polycoreutils-2.9-19.el8.x86_64
15/103
  Upgrading       : python3-polycoreutils-2.9-19.el8.noarch
16/103
  Installing      : dwz-0.12-10.el8.x86_64
17/103

```



```

Installing      : ncurses-compat-libs-6.1-9.20180224.el8.x86_64
18/103
Installing      : libesmtplib-1.0.6-18.el8.x86_64
19/103
Installing      : mailx-12.5-29.el8.x86_64
20/103
Installing      : libkadm5-1.18.2-14.el8.x86_64
21/103
Upgrading       : libgomp-8.5.0-10.1.el8_6.x86_64
22/103
Running scriptlet: libgomp-8.5.0-10.1.el8_6.x86_64
22/103
Upgrading       : platform-python-pip-9.0.3-22.el8.noarch
23/103
Upgrading       : python3-pip-9.0.3-22.el8.noarch
24/103
Upgrading       : python36-3.6.8-
38.module+el8.5.0+12207+5c5719bc.x86_64
25/103
Running scriptlet: python36-3.6.8-
38.module+el8.5.0+12207+5c5719bc.x86_64
25/103
Upgrading       : cpp-8.5.0-10.1.el8_6.x86_64
26/103
Running scriptlet: cpp-8.5.0-10.1.el8_6.x86_64
26/103
Upgrading       : gcc-8.5.0-10.1.el8_6.x86_64
27/103
Running scriptlet: gcc-8.5.0-10.1.el8_6.x86_64
27/103
Installing      : annobin-10.29-3.el8.x86_64
28/103
Installing      : unzip-6.0-46.el8.x86_64
29/103
Installing      : zip-3.0-23.el8.x86_64
30/103
Installing      : perl-Math-Complex-1.59-421.el8.noarch
31/103
Installing      : perl-Math-BigInt-1:1.9998.11-7.el8.noarch
32/103
Installing      : perl-JSON-PP-1:2.97.001-3.el8.noarch
33/103
Installing      : make-1:4.2.1-11.el8.x86_64
34/103
Running scriptlet: make-1:4.2.1-11.el8.x86_64
34/103

```

```

Installing      : libcom_err-devel-1.45.6-2.el8.x86_64
35/103
Installing      : util-linux-user-2.32.1-28.el8.x86_64
36/103
Installing      : libsepol-devel-2.9-3.el8.x86_64
37/103
Installing      : pcre2-utf32-10.32-2.el8.x86_64
38/103
Installing      : pcre2-utf16-10.32-2.el8.x86_64
39/103
Installing      : pcre2-devel-10.32-2.el8.x86_64
40/103
Installing      : libselinux-devel-2.9-5.el8.x86_64
41/103
Installing      : patch-2.7.6-11.el8.x86_64
42/103
Installing      : python3-pyparsing-2.1.10-7.el8.noarch
43/103
Installing      : systemtap-sdt-devel-4.6-4.el8.x86_64
44/103
Installing      : spax-1.5.3-13.el8.x86_64
45/103
Running scriptlet: spax-1.5.3-13.el8.x86_64
45/103
Installing      : m4-1.4.18-7.el8.x86_64
46/103
Running scriptlet: m4-1.4.18-7.el8.x86_64
46/103
Installing      : libverto-devel-0.3.0-5.el8.x86_64
47/103
Installing      : bc-1.07.1-5.el8.x86_64
48/103
Running scriptlet: bc-1.07.1-5.el8.x86_64
48/103
Installing      : at-3.1.20-11.el8.x86_64
49/103
Running scriptlet: at-3.1.20-11.el8.x86_64
49/103
Installing      : keyutils-libs-devel-1.5.10-6.el8.x86_64
50/103
Installing      : krb5-devel-1.18.2-14.el8.x86_64
51/103
Installing      : time-1.9-3.el8.x86_64
52/103
Running scriptlet: time-1.9-3.el8.x86_64
52/103

```

```

Upgrading      : polycoreutils-python-utils-2.9-19.el8.noarch
80/103
Installing     : elfutils-libelf-devel-0.186-1.el8.x86_64
81/103
Upgrading      : elfutils-libs-0.186-1.el8.x86_64
82/103
Upgrading      : mokutil-1:0.3.0-11.el8_6.1.x86_64
83/103
Upgrading      : openssl-1:1.1.1k-7.el8_6.x86_64
84/103
Installing     : kernel-devel-4.18.0-348.el8.x86_64
85/103
Running scriptlet: kernel-devel-4.18.0-348.el8.x86_64

...

85/103
Installing     : bzip2-1.0.6-26.el8.x86_64
86/103
Cleanup        : polycoreutils-python-utils-2.9-14.el8.noarch
87/103
Cleanup        : python3-polycoreutils-2.9-14.el8.noarch
88/103
Cleanup        : python36-3.6.8-
2.module+el8.1.0+3334+5cb623d7.x86_64
89/103
Running scriptlet: python36-3.6.8-
2.module+el8.1.0+3334+5cb623d7.x86_64
89/103
Cleanup        : elfutils-libs-0.185-1.el8.x86_64
90/103
Cleanup        : openssl-1:1.1.1k-4.el8.x86_64
91/103
Cleanup        : python3-libsemanage-2.9-6.el8.x86_64
92/103
Running scriptlet: gcc-8.4.1-1.el8.x86_64
93/103
Cleanup        : gcc-8.4.1-1.el8.x86_64
93/103
Running scriptlet: polycoreutils-2.9-14.el8.x86_64
94/103
Cleanup        : polycoreutils-2.9-14.el8.x86_64
94/103
Cleanup        : mokutil-1:0.3.0-11.el8.x86_64
95/103

```

```

Cleanup      : python3-pip-9.0.3-19.el8.noarch
96/103
Cleanup      : platform-python-pip-9.0.3-19.el8.noarch
97/103
Cleanup      : openssl-libs-1:1.1.1k-4.el8.x86_64
98/103
Running scriptlet: openssl-libs-1:1.1.1k-4.el8.x86_64
98/103
Cleanup      : libsemanage-2.9-6.el8.x86_64
99/103
Running scriptlet: cpp-8.4.1-1.el8.x86_64
100/103
Cleanup      : cpp-8.4.1-1.el8.x86_64
100/103
Cleanup      : libgcc-8.5.0-3.el8.x86_64
101/103
Running scriptlet: libgcc-8.5.0-3.el8.x86_64
101/103
Running scriptlet: libgomp-8.4.1-1.el8.x86_64
102/103
Cleanup      : libgomp-8.4.1-1.el8.x86_64
102/103
Running scriptlet: libgomp-8.4.1-1.el8.x86_64
102/103
Cleanup      : elfutils-libelf-0.185-1.el8.x86_64
103/103
Running scriptlet: elfutils-libelf-0.185-1.el8.x86_64
103/103
Verifying    : esmtp-1.2-15.el8.x86_64
1/103
Verifying    : libesmtp-1.0.6-18.el8.x86_64

...

Upgraded:
  cpp-8.5.0-10.1.el8_6.x86_64                                elfutils-
libelf-0.186-1.el8.x86_64      elfutils-libs-0.186-1.el8.x86_64
gcc-8.5.0-10.1.el8_6.x86_64
  libgcc-8.5.0-10.1.el8_6.x86_64                                libgomp-
8.5.0-10.1.el8_6.x86_64      libsemanage-2.9-8.el8.x86_64
mokutil-1:0.3.0-11.el8_6.1.x86_64
  openssl-1:1.1.1k-7.el8_6.x86_64                                openssl-
libs-1:1.1.1k-7.el8_6.x86_64      platform-python-pip-9.0.3-22.el8.noarch
policycoreutils-2.9-19.el8.x86_64
  policycoreutils-python-utils-2.9-19.el8.noarch                python3-
libsemanage-2.9-8.el8.x86_64      python3-pip-9.0.3-22.el8.noarch

```

```

python3-policycoreutils-2.9-19.el8.noarch
python36-3.6.8-38.module+el8.5.0+12207+5c5719bc.x86_64
Installed:
annobin-10.29-3.el8.x86_64 at-
3.1.20-11.el8.x86_64 bc-1.07.1-5.el8.x86_64
bzip2-1.0.6-26.el8.x86_64
cups-client-1:2.2.6-38.el8.x86_64 dwz-0.12-
10.el8.x86_64
ed-1.14.2-4.el8.x86_64
efi-srpm-macros-3-3.el8.noarch elfutils-libelf-
devel-0.186-1.el8.x86_64
esmtplib-1.2-15.el8.x86_64
ghc-srpm-macros-1.4.2-7.el8.noarch go-srpm-macros-2-
17.el8.noarch
kernel-devel-4.18.0-348.el8.x86_64
keyutils-libs-devel-1.5.10-6.el8.x86_64 krb5-devel-1.18.2-
14.el8.x86_64
libcom_err-devel-1.45.6-2.el8.x86_64
libesmtplib-1.0.6-18.el8.x86_64 libkadm5-1.18.2-
14.el8.x86_64
libblockfile-1.14-1.el8.x86_64
libselenium-devel-2.9-5.el8.x86_64 libsepol-devel-2.9-
3.el8.x86_64
libverto-devel-0.3.0-5.el8.x86_64 m4-
1.4.18-7.el8.x86_64 mailx-12.5-
29.el8.x86_64
make-1:4.2.1-11.el8.x86_64
ncurses-compat-libs-6.1-9.20180224.el8.x86_64 ocaml-srpm-macros-
5-4.el8.noarch
openblas-srpm-macros-2-2.el8.noarch
openssl-devel-1:1.1.1k-7.el8_6.x86_64 patch-2.7.6-
11.el8.x86_64
pcre2-devel-10.32-2.el8.x86_64
pcre2-utf16-10.32-2.el8.x86_64 pcre2-utf32-10.32-
2.el8.x86_64
perl-CPAN-Meta-2.150010-396.el8.noarch
perl-CPAN-Meta-Requirements-2.140-396.el8.noarch perl-CPAN-Meta-
YAML-0.018-397.el8.noarch
perl-Encode-Locale-1.05-10.module+el8.3.0+6498+9eecfe51.noarch
perl-ExtUtils-Command-1:7.34-1.el8.noarch perl-ExtUtils-
Install-2.14-4.el8.noarch
perl-ExtUtils-MakeMaker-1:7.34-1.el8.noarch
perl-ExtUtils-Manifest-1.70-395.el8.noarch perl-ExtUtils-
ParseXS-1:3.35-2.el8.noarch
perl-JSON-PP-1:2.97.001-3.el8.noarch
perl-Math-BigInt-1:1.9998.11-7.el8.noarch perl-Math-Complex-

```

```

1.59-421.el8.noarch
perl-Test-Harness-1:3.42-1.el8.noarch
perl-Time-HiRes-4:1.9758-2.el8.x86_64 perl-devel-
4:5.26.3-419.el8_4.1.x86_64
perl-srpm-macros-1-25.el8.noarch
perl-version-6:0.99.24-1.el8.x86_64 platform-python-
devel-3.6.8-41.el8.x86_64
python-rpm-macros-3-41.el8.noarch
python-srpm-macros-3-41.el8.noarch python3-pyparsing-
2.1.10-7.el8.noarch
python3-rpm-generators-5-7.el8.noarch
python3-rpm-macros-3-41.el8.noarch python36-devel-
3.6.8-38.module+el8.5.0+12207+5c5719bc.x86_64
qt5-srpm-macros-5.15.2-1.el8.noarch
redhat-lsb-core-4.1-47.el8.x86_64 redhat-lsb-submod-
security-4.1-47.el8.x86_64
redhat-rpm-config-125-1.el8.noarch
rust-srpm-macros-5-2.el8.noarch spax-1.5.3-
13.el8.x86_64
systemtap-sdt-devel-4.6-4.el8.x86_64
time-1.9-3.el8.x86_64 unzip-6.0-
46.el8.x86_64
util-linux-user-2.32.1-28.el8.x86_64
zip-3.0-23.el8.x86_64 zlib-devel-1.2.11-
17.el8.x86_64

```

Complete!

OS package installations finished

+ Installing ONTAP Mediator. (Log: /tmp/ontap\_mediator.JixKGP/ontap-mediator-1.5.0/ontap-mediator-1.5.0/install\_20221021155929.log)

This step will take several minutes. Use the log file to view progress.

Sudoer config verified

ONTAP Mediator rsyslog and logging rotation enabled

+ Install successful. (Moving log to /opt/netapp/lib/ontap\_mediator/log/install\_20221021155929.log)

+ WARNING: This system supports UEFI

Secure Boot (SB) is currently disabled on this system.

If SB is enabled in the future, SCST will not work unless the following action is taken:

Using the keys in

/opt/netapp/lib/ontap\_mediator/ontap\_mediator/SCST\_mod\_keys follow instructions in

/opt/netapp/lib/ontap\_mediator/ontap\_mediator/SCST\_mod\_keys/README.module-signing

to sign the SCST kernel module. Note that reboot will be

needed.

SCST will not start automatically when Secure Boot is enabled and not configured properly.

+ Note: ONTAP Mediator uses a kernel module compiled specifically for the current

OS. Using 'yum update' to upgrade the kernel might cause service interruption.

For more information, see /opt/netapp/lib/ontap\_mediator/README  
[root@scs000099753 ~]# cat /etc/redhat-release  
Red Hat Enterprise Linux release 8.5 (Ootpa)  
[root@scs000099753 ~]#

## Verify the installation

### Steps

1. Run the following commands to view the status of the ONTAP Mediator services:

a. Run: `systemctl status ontap_mediator`

```
[root@scspr1915530002 ~]# systemctl status ontap_mediator

ontap_mediator.service - ONTAP Mediator
Loaded: loaded (/etc/systemd/system/ontap_mediator.service; enabled;
vendor preset: disabled)
Active: active (running) since Mon 2022-04-18 10:41:49 EDT; 1 weeks 0
days ago
Process: 286710 ExecStop=/bin/kill -s INT $MAINPID (code=exited,
status=0/SUCCESS)
Main PID: 286712 (uwsgi)
Status: "uWSGI is ready"
Tasks: 3 (limit: 49473)
Memory: 139.2M
CGroup: /system.slice/ontap_mediator.service
├─286712 /opt/netapp/lib/ontap_mediator/pyenv/bin/uwsgi --ini
/opt/netapp/lib/ontap_mediator/uwsgi/ontap_mediator.ini
├─286716 /opt/netapp/lib/ontap_mediator/pyenv/bin/uwsgi --ini
/opt/netapp/lib/ontap_mediator/uwsgi/ontap_mediator.ini
└─286717 /opt/netapp/lib/ontap_mediator/pyenv/bin/uwsgi --ini
/opt/netapp/lib/ontap_mediator/uwsgi/ontap_mediator.ini

[root@scspr1915530002 ~]#
```

b. Run: `systemctl status mediator-scst`

```
[root@scspr1915530002 ~]# systemctl status mediator-scst
Loaded: loaded (/etc/systemd/system/mediator-scst.service;
enabled; vendor preset: disabled)
Active: active (running) since Mon 2022-04-18 10:41:47 EDT; 1
weeks 0 days ago
Process: 286595 ExecStart=/etc/init.d/scst start (code=exited,
status=0/SUCCESS)
Main PID: 286662 (iscsi-scstd)
Tasks: 1 (limit: 49473)
Memory: 1.2M
CGroup: /system.slice/mediator-scst.service
└─286662 /usr/local/sbin/iscsi-scstd

[root@scspr1915530002 ~]#
```

2. Confirm the ports the ONTAP Mediator service is using: `netstat`

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

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           :::*             LISTEN
```

## 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:

- To use the ONTAP Mediator service in a MetroCluster IP configuration, see [Configuring the ONTAP Mediator service from a MetroCluster IP configuration](#)
- To use SnapMirror Business Continuity, see [Install ONTAP Mediator Service and confirm the ONTAP cluster configuration](#)

## Manage the ONTAP mediator service

After you have installed ONTAP Mediator service, you may change the user name or password. You may also uninstall the ONTAP Mediator Service.

### Change the user name

#### About these tasks

These 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
```

```
[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 ~]#
```

## Change the password

### 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 ~]#
```

## Uninstall the ONTAP Mediator service

### Before you begin

If necessary, you can remove the ONTAP Mediator service. 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
```

### Step

1. Uninstall the ONTAP Mediator service:

```
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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