

# Install a Trust Router on Debian/Ubuntu/Raspbian

On this page you will find instructions on how to set up a Trust Router on Debian, Ubuntu or Raspbian.

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## 1. System Preparation

### 1.1. Install Debian/Ubuntu/Raspbian

The first thing that is required is a Debian machine - this can be physical or virtual.

1. Install the operating system via usual mechanism (e.g., netboot CD, ISO in VMware/VirtualBox or the DVD image).
2. Choose the following server install options: "Debian desktop, SSH server, Standard system utilities".
3. Create/choose a secure root password and an initial system user account.
4. Once installed, make sure you run an `apt-get update` and `apt-get upgrade` to ensure your system is fully up to date.



#### Tip

*We would recommend using LVM when disk partitioning to allow easier partition/disk expansion on a live system.*



#### Warning

After install, you will want to secure/lockdown the server as best practice dictates - for both the server and any extra software installed. This is beyond the remit of this guide but there are many guides available that provide information on securing your Debian servers and applications.

### 1.2. Configure Debian/Ubuntu/Raspbian

Next, there are a few Debian configuration options that need to be set in advance.

#### 1.2.1. Networking configuration

For production deployments, it is recommended that the machine be assigned a static IP address.



For Debian networking information please refer to the Debian documentation: <https://wiki.debian.org/NetworkConfiguration>

#### 1.2.2. Firewall configuration

The following ports are required to be accessible from the outside world, both in the local firewall and in any external firewalls:

- 2083/tcp (for RadSec connections to other Moonshot entities)
- 12309/tcp (for Trust Router client connections - if using the Trust Router to broker trust relationships between entities)

Here are sample firewall rules that establish incoming and outgoing rules to both the Test and Live (Jisc Assent) Moonshot trust router infrastructures. If you connect to another Trust Router, adjust these rules to suit:

### IP Tables sample firewall rules (Jisc Assent)

```
-A INPUT -m state --state NEW,ESTABLISHED,RELATED -m tcp -p tcp -s 0/0 --dst <IdP/RP Proxy IP address> --dport 2083 -j ACCEPT
-A OUTPUT -m state --state NEW,ESTABLISHED,RELATED -m tcp -p tcp -s <IdP/RP Proxy IP address> --dst 0/0 --dport 2083 -j ACCEPT
-A INPUT -m state --state NEW,ESTABLISHED,RELATED -m tcp -p tcp -s 212.219.179.130,212.219.179.131,212.219.179.138,212.219.179.146 --dst <IdP/RP Proxy IP address> --dport 12309 -j ACCEPT
-A OUTPUT -m state --state NEW,ESTABLISHED,RELATED -m tcp -p tcp -s <IdP/RP Proxy IP address> --dst 212.219.179.130,212.219.179.131,212.219.179.138,212.219.179.146 --dport 12309 -j ACCEPT
```

### IP Tables sample firewall rules (Test Network)

```
-A INPUT -m state --state NEW,ESTABLISHED,RELATED -m tcp -p tcp -s 0/0 --dst <IdP/RP Proxy IP address> --dport 2083 -j ACCEPT
-A OUTPUT -m state --state NEW,ESTABLISHED,RELATED -m tcp -p tcp -s <IdP/RP Proxy IP address> --dst 0/0 --dport 2083 -j ACCEPT
-A INPUT -m state --state NEW,ESTABLISHED,RELATED -m tcp -p tcp -s 13.79.134.211,13.79.128.103,52.169.31.104 --dst <IdP/RP Proxy IP address> --dport 12309 -j ACCEPT
-A OUTPUT -m state --state NEW,ESTABLISHED,RELATED -m tcp -p tcp -s <IdP/RP Proxy IP address> --dst 13.79.134.211,13.79.128.103,52.169.31.104 --dport 12309 -j ACCEPT
```

## 1.3. Add the Moonshot Repository

### Supported versions

At the moment, we support Debian/Raspbian (9 and 10) and Ubuntu (16.04, 18.04, and 20.04).

1. Add the Moonshot Debian repository to your system. To do this, run the following command (as root, or using sudo):

#### Debian 9

```
wget https://repository.project-moonshot.org/debian-moonshot/moonshot-repository.debian9.deb
dpkg -i moonshot-repository.debian9.deb
```

#### Debian 10

```
wget https://repository.project-moonshot.org/debian-moonshot/moonshot-repository.debian10.deb
dpkg -i moonshot-repository.debian10.deb
```

#### Raspbian 9

```
wget https://repository.project-moonshot.org/raspbian/moonshot-repository.raspbian9.deb
dpkg -i moonshot-repository.raspbian9.deb
```

#### Raspbian 10

```
wget https://repository.project-moonshot.org/raspbian/moonshot-repository.raspbian10.deb
dpkg -i moonshot-repository.raspbian10.deb
```

#### Ubuntu 18.04

```
wget https://repository.project-moonshot.org/debian-moonshot/moonshot-repository.ubuntu18.deb
dpkg -i moonshot-repository.ubuntu18.deb
```

## Ubuntu 20.04

```
wget https://repository.project-moonshot.org/debian-moonshot/moonshot-repository.ubuntu20.deb
dpkg -i moonshot-repository.ubuntu20.deb
```

This installs the apt repository, the current Moonshot GPG key, and a package that can update both. This is the preferred method of deploying repository information.



### Verifying the Moonshot GPG key

If you wish to verify the Moonshot GPG key's validity and integrity, please see the [Packaging GPG Key](#) for further details.

3. Update the apt cache with the new repository information:

```
apt-get update
```

## 2. Install Trust Router

We're now ready to install the Trust Router software and its required dependencies. Install the software by running the following command:

```
apt-get install moonshot-trust-router moonshot-noshib
```

## 3. Configure Trust Router

Next, we need to configure the Trust Router.

### 3.1. RadSec

#### 3.1.1. APC TLS

First, you will need a copy of a client key and certificate (and appropriate CA) from the APC(s) that your Trust Router serves. Copy them onto the filesystem of your Trust Router.



You can put these files anywhere on the file system, but this guide assumes you put them in `/etc/pki/tls`. If you place them in a different location you will need to change the locations below as appropriate.

#### 3.1.2. Connection to APC

Next, we need to configure the RadSec configuration for the APC. We do this by creating a file at `/etc/radsec.conf` with the following:

```
realm gss-eap {
    type = "TLS"
    cacertfile = "/etc/pki/tls/tr-ca.crt"
    certfile = "/etc/pki/tls/tr-client.pem"
    certkeyfile = "/etc/pki/tls/tr-client.key"
    disable_hostname_check = yes
    server {
        hostname = "apc.moonshot.ja.net"
        service = "2083"
        secret = "radsec"
    }
}
```

Then check the file and the certificates can be read by the Trust Router user:

```
sudo -u trustrouter cat /etc/radsec.conf /etc/pki/certs/tr-*.*/etc/pki/private/tr-*.*
```

## 3.2. Trust Router

### 3.2.1. Daemon Configuration

Your Trust Router will need to have a few core configuration items set. To do this:

1. Open the default instance's main configuration file at `/etc/trust_router/conf.d/default/main.cfg` for editing.
  - a. Change the hostname to the (fully qualified) hostname of your Trust Router.



If the `/etc/trust_router` directory does not exist, you may need to create it yourself, along with the subdirectories mentioned.

### 3.2.2. Moonshot Configuration

Moonshot, you say? Yes, Trust Router uses Moonshot to authenticate and secure all communications between Trust Router clients and servers. So, you will need to configure the trust router user to make use of the Moonshot flatstore (i.e. telling Moonshot that this is a special system account, not a regular user account), and you will need to import a set of credentials for your Trust Router to use.

1. Import it using the `moonshot-webp` command (as the `trustrouter` user):

```
su - --shell=/bin/bash trustrouter
moonshot-webp -f [path to credential file]
```



The credentials file will be given to you by the administrator of the APC.

### 3.2.3. Shibboleth



This step is only required if you use the default Moonshot packages. Using the `moonshot-noshib` packages will not require this step.

Shibboleth, you say? Yes, Shibboleth is used by the Moonshot components to be able to deal with incoming SAML. However, this feature typically isn't used in Trust Router, but its logging will appear in your Trust Router's log files. So, to simplify your log files, it is recommended that you silence the Shibboleth logging. To do this:

1. Open `/etc/shibboleth/console.logger` for editing.
2. Change `WARN` to `NONE` on the first line, i.e.

```
log4j.rootCategory=NONE, console
```

### 3.2.4. Default Peer



If your Trust Router is going to run in its own, standalone, trust network, then you can skip this step.

If your Trust Router is going to run in a wider trust network, then you can configure your Trust Router's default peer - i.e. the Trust Router it sends its clients to when they ask it to locate a Moonshot entity that your Trust Router doesn't know about. To do this:

1. Open `/etc/trust_router/conf.d/default/peering.cfg` for editing. Change the content as follows:

```
{
  "default_servers": [
    "[hostname of trust router]"
  ]
}
```



### Example

If you were configuring your default Trust Router peer to be Janet's Trust Router at `tr.moonshot.ja.net`, its `peering.cfg` file would look like this:

```
{
  "default_servers": [
    "tr.moonshot.ja.net"
  ]
}
```

## 3.2.5. Configure your Trust Router

A trust router requires a trust configuration to function correctly. See [the trust configuration file](#) for more information.

Place an appropriate `trusts.cfg` file into the `/etc/trust_router` directory and symbolically link it into the default configuration directory:



You can find a Trust Router configuration suitable for a Trust Router connecting to `tr1.moonshot.ja.net` at [sample Trust Router Client configuration](#)

## 3.2.6. Start your Trust Router

You are now ready to start your Trust Router and test it. To do this:

1. As root, start the Trust Router daemon:

```
systemctl start trust_router
```

## 4. Testing

To test your trust router, you should attempt a TIDC request on a Moonshot service connected to your trust router. The TIDC request will take a little longer, but it should succeed.

If it fails, please contact us.

## 5. Next Steps

At this point, you now have a Trust Router.

### 5.1. Automatically start the software

#### 5.1.1. Trust Router

To automatically start Trust Router, issue the following command (as root):

```
systemctl enable trust_router
systemctl start trust_router
```

