Route Origin Validation Lab

Part-1: Installing RPKI Validator (Fort)

Login Details

- Username `apnic` and password `training`.

Preinstalled packages

To save time, the following essential package(s) have been preinstalled on the containers:

- `rsync`

Lab Setup

For this lab, we will use FORT from NIC México as the RPKI validator.

1. Login to your server (SSH from the jumphost to your container using the `username` and `password` given above), where `X` is your VM number:

   ```
   ssh apnic@192.168.30.X
   ```

2. Update the repository

   ```
   sudo apt update && sudo apt upgrade
   ```

- ***NOTE:*** Please note that FORT has the following dependencies:
  - jansson
  - libcrypto (LibreSSL or OpenSSL >=1.1)
  - rsync
- To install the dependencies:

```
sudo apt install openssl libjansson-dev -y
```

- Verify the OpenSSL version

```
openssl version -a
```

```
tashi@fort:~$ openssl version -a
OpenSSL 1.1.1  11 Sep 2018
```

3. Download and install the validator (we will install from the debian package)

```
wget https://github.com/NICMx/FORT-validator/releases/download/v1.2.1/fort_1.2.1-1_amd64.deb
```

and install:

```
sudo apt install ./fort_1.2.1-1_amd64.deb
```

- Note:
  - there are other install options listed in the vendor documentation
  - the debian package comes with a systemd service, which allows us to run it as a daemon

4. Edit the configuration file to define the server address, RTR port number, etc:
`sudo nano /etc/fort/config.json`

```
{
        "tal": "/etc/fort/tal",

        "server": {
                "address": "192.168.30.X",
                "port": "8323",
                "interval": {
                        "validation": 900,
                        "refresh": 900,
                        "retry": 600,
                        "expire": 7200
                }
        },
        "output": {
                "roa": "/tmp/fort/fort.csv"
        }
}
```

- Note:
  - ***validation***: time (in seconds) the Validator should wait after updating and validating the ROA cache before updating again from the global repo.
  - ***refresh***: time (in seconds) the RTR client (router) has to wait before trying to poll the Validator cache (RFC8210 default 3600 seconds).
  - ***retry***: time (in seconds) the RTR client should wait before retrying after a failed refresh of the cache (RFC8210 default 600 seconds).
  - ***expire***: time (in seconds) the RTR client can use its validated ROA cache if cannot refresh the data, after which it should discard (RFC8210 default 7200 seconds).
  - ***output***: print validated ROAs to a CSV file

5. Fort validator ships with all RIR TALs except ARIN's. You need to agree to be bound by ARIN's Relying Party Agreement (RPA) before using it:

   - Download ARIN's TAL into the `/etc/fort/tal` directory (used `sudo` where needed)

     ```
     cd /etc/fort/tal
     sudo wget https://www.arin.net/resources/manage/rpki/arin-rfc7730.tal -O a
     rin.tal
     cd
     ```

   - verify your TALs

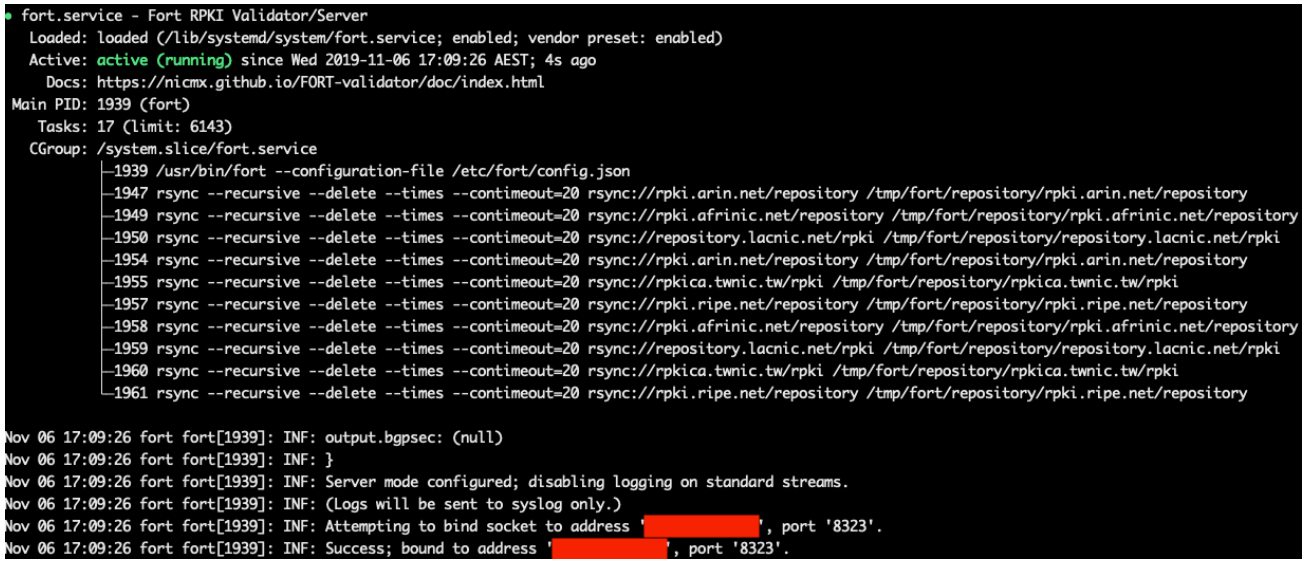
     ```
     ls /etc/fort/tal
     ```

     ```
     tashi@fort:~$ ls /etc/fort/tal
     afrinic.tal  apnic.tal  arin.tal  lacnic.tal  ripe.tal
     ```

6. Start the validator (RTR server):

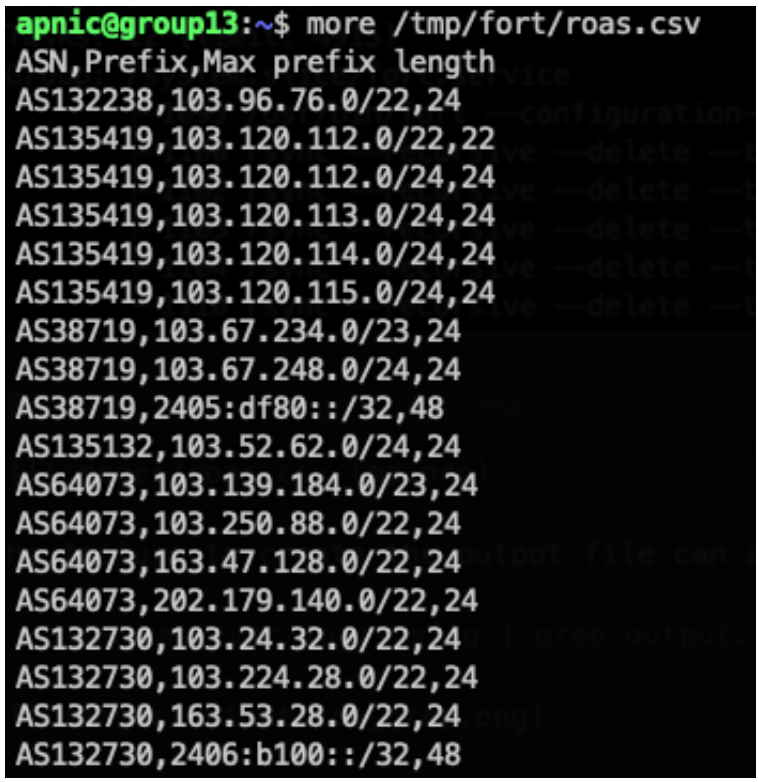
```
sudo service fort start
```

   - will start in server mode by default using the parameters defined in the configuration file (`/etc/fort/config.json`)
   - you can check the status with `sudo service fort status`



   - Have a look at the validated ROA payload (*Origin ASN, Prefix, Max prefix length*):

```
more /tmp/fort/fort.csv
```



        - If there is no output yet, it means Fort is still working through the initial process of fetching ROAs from the repos and validating, which generally takes a while.

    - **NOTE**: If you still do not have any output, stop and restart Fort by explicitly specifying the file where ROAs will be printed `output.roa=FILE`

      ```
      sudo service fort stop
      sudo service fort start --output.roa="/tmp/fort/fort.csv"
      ```

7. **[Optional]** If you have two separate Validators installed (for redundancy/code diversity), compare the validated ROA payload outputs for consistency:

    - But before you compare the VRPs, you need to sort the output. Example belowing using `sort` to sort alphanumerically:

      ```
      sort /tmp/fort/fort.csv > fort_sorted.csv
      ```

        - Now you can compare the validated ROA outputs, for example Routinator and Fort:

          ```
          diff -u rout_sorted.csv fort_sorted.csv
          ```

        - Discuss any differences with your group mates and instructor.

Now your validator is ready to feed the validated cache to BGP speaking routers through the RTR (RPKI-to-Router) protocol.

Part-2: RTR session

Validator side

Fort can act as an RTR server, to allow RPKI enabled routers to connect to it and fetch the validated cache (ROA cache).

- Based on the configuration file (`/etc/fort/config.json`), the RTR server is listening on `192.168.30.X` (where X is your VM number) and port `8323`
- The timers can be tweaked to suit your need (RFC8210 has recommendations).