O-RU Fronthaul Recovery usecase

There are four versions of implementations for the "Hello World" O-RU Fronthaul Recovery usecase. This page describes how to run them.

Standalone script version

The standalone script version of the usecase is implemented in python. With this version Helm charts are provided to run the usecase.

Prerequisits

The following need to be installed to run the script according to these instructions:

- Docker
- Kubernetes
- Helm 3

Run

To run the script for the O-RU & O-DU Fronthaul Recovery use case with necessary simulators, download the repo (defaults to master branch):

```
git clone "https://gerrit.o-ran-sc.org/r/admin/repos/nonrtric"
```

```
git checkout dawn --track origin/e-release
```

Go to the folder:

```
cd nonrtric/test/usecases/oruclosedlooprecovery/scriptversion/helm
```

Run the following command:

```
./start.sh
```

This will build the script and the simulators and then start them all.

Apex Policy version

This version is run in the stand-alone ONAP policy framework and uses an apex policy.

Assumption

It is assumed that the DMaaP Message Router is already running as a docker container with the hostname "onap-dmaap" and connected to the docker network named "nonrtric-docker-net". It is also assumed that a topic named "unauthenticated.SEC_FAULT_OUTPUT" has already been created in the Message Router.

Start the ONAP Policy framework

The ONAP Policy framework can be run in a stand-alone mode using the docker-compose in OSC nonrtric repo:

```
git clone "https://gerrit.o-ran-sc.org/r/nonrtric"
git checkout e-release --track origin/e-release
cd nonrtric/docker-compose/docker-compose-policy-framework
```

Start all the containers by running this command:

```
docker-compose up -d
```

Run SDNR-simulator

The apex policy will make a REST call to the SDNR-simulator for sending the configuration messages. The code for SDNR simulator is available in the nonrtric repo. Run the following commands to build the docker image for SDNR-simulator:

```
cd nonrtric/test/usecases/oruclosedlooprecovery/scriptversion/simulators
docker build . -f Dockerfile-sdnr-sim -t sdnr-simulator:1.0.0
```

The SDNR-simulator can then be started using the following command:

```
docker run --rm --name sdnr-sim --network nonrtric-docker-net -e MR-HOST="http://onap-dmaap" -e MR-PORT="3904"
sdnr-simulator:1.0.0
```

Create/Deploy apex policy for O-RU & O-DU use case

All the ingredients of apex policy designed for O-RU & O-DU use case are available here:

```
cd nonrtric/test/usecases/oruclosedlooprecovery/apexpolicyversion/LinkMonitor
```

In order to deploy the apex policy with default config, only the contents under /deployment directory are needed. However, if something needs to be changed in the policy config, refer to the section named "Workflow for updating the policy config" at the end of this page.

- Before creating the apex policy, it is good to perform a healthcheck call:

```
curl -u 'healthcheck:zb!XztG34' -X GET "http://localhost:6868/policy/pap/v1/components/healthcheck"
```

This should give the following response:

{"pdps":{"xacml":[{"instanceId":"policy-xacml-pdp","pdpState":"ACTIVE","healthy":"HEALTHY"}],"drools":[],"apex":[{"instanceId":"policy-apex-pdp","
pdpState":"ACTIVE","healthy":"HEALTHY","message":"Pdp Heartbeat"}]},"healthy":false,"api":{"name":"Policy API","url":"https://policy-api:6969/policy/api/v1
/healthcheck","healthy":true,"code":200,"message":"alive"},"pap":{"name":"Policy PAP","url":"https://policy-pap:6969/policy/pap/v1/healthcheck","healthy":
true,"code":200,"message":"alive"}}

Make sure that the policy-apex-pdp, api and pap are healthy.

Note: It might take a few minutes before the policy-apex-pdp reports its health status. If health is not reported after waiting for a few minutes, check the logs of policy-apex-pdp docker container to find any error messages.

- Create the policy via Policy API:

```
curl -u 'healthcheck:zb!XztG34' -X POST "http://localhost:6869/policy/api/v1/policytypes/onap.policies.native.
Apex/versions/1.0.0/policies" -H "Accept: application/json" -H "Content-Type: application/json" -d @./deployment
/ToscaPolicy.json
```

- Make sure that the following REST call returns the policy:

```
curl -u 'healthcheck:zb!XztG34' -X GET "http://localhost:6869/policy/api/v1/policytypes/onap.policies.native.
Apex/versions/1.0.0/policies/onap.policies.native.apex.LinkMonitor/versions/1.0.0"
```

- Deploy the policy to apex-pdp via Policy PAP:

```
curl -u 'healthcheck:zb!XztG34' -X POST "http://localhost:6868/policy/pap/v1/pdps/policies" -H "Accept:
application/json" -H "Content-Type: application/json" -d @./deployment/DeployPolicyPAP.json
```

This should give the following response:

{"message":"Use the policy status url to fetch the latest status. Kindly note that when a policy is successfully undeployed, it will no longer appear in policy
status response.","uri":"/policy/pap/v1/policies/status"}

- Check the status of deployed policy:

```
curl -u 'healthcheck:zb!XztG34' -X GET "http://localhost:6868/policy/pap/v1/policies/status"
```

This should give the following response:

```
[{"pdpGroup":"defaultGroup","pdpType":"apex","pdpId":"policy-apex-pdp","policy":{"name":"onap.policies.native.
apex.LinkMonitor","version":"1.0.0"},"policyType":{"name":"onap.policies.native.Apex","version":"1.0.0"},"
deploy":true,"state":"SUCCESS"},{"pdpGroup":"defaultGroup","pdpType":"xacml","pdpId":"policy-xacml-pdp","
policy":{"name":"SDNC_Policy.ONAP_NF_NAMING_TIMESTAMP","version":"1.0.0"},"policyType":{"name":"onap.policies.
Naming","version":"1.0.0"},"deploy":true,"state":"SUCCESS"}]
```

- Send the LinkFailureEvent to DMaaP Message Router:

```
curl -X POST -H accept:application/json -H Content-Type:application/json "http://localhost:3904/events
/unauthenticated.SEC_FAULT_OUTPUT/" -d @./events/LinkFailureEvent.json
```

- The SDNR-simulator should receive the following call if the apex policy is working:

```
"PUT /rests/data/network-topology:network-topology/topology=topology-netconf/node=HCL-O-DU-1123/yang-ext:mount
/o-ran-sc-du-hello-world:network-function/du-to-ru-connection=ERICSSON-O-RU-11225 HTTP/1.1" 200
```

- The logs of policy-apex-pdp docker container should show some messages exchanged related to the LinkFailureEvent that was sent.

```
docker logs policy-apex-pdp
```

Workflow for updating the policy config

In case some changes need to be made in the policy config (located in /config directory), a new ToscaPolicy.json file (located in /deployment directory) has to be generated for deploying the apex policy. The new file can be created by using the apexCLIToscaEditor.sh script in the policy-apex-pdp docker container via the following steps:

- Run the policy-apex-pdp docker container and mount the LinkMonitor directory (located in the nonrtric repo) into the docker container:

```
docker run -it --rm --name policy-apex-pdp --network nonrtric-docker-net -v <<Path_to_nonrtric_repo>>/nonrtric
/test/usecases/oruclosedlooprecovery/apexpolicyversion/LinkMonitor/:/home/apexuser/examples/LinkMonitor/ nexus3.
onap.org:10001/onap/policy-apex-pdp:2.5.4
```

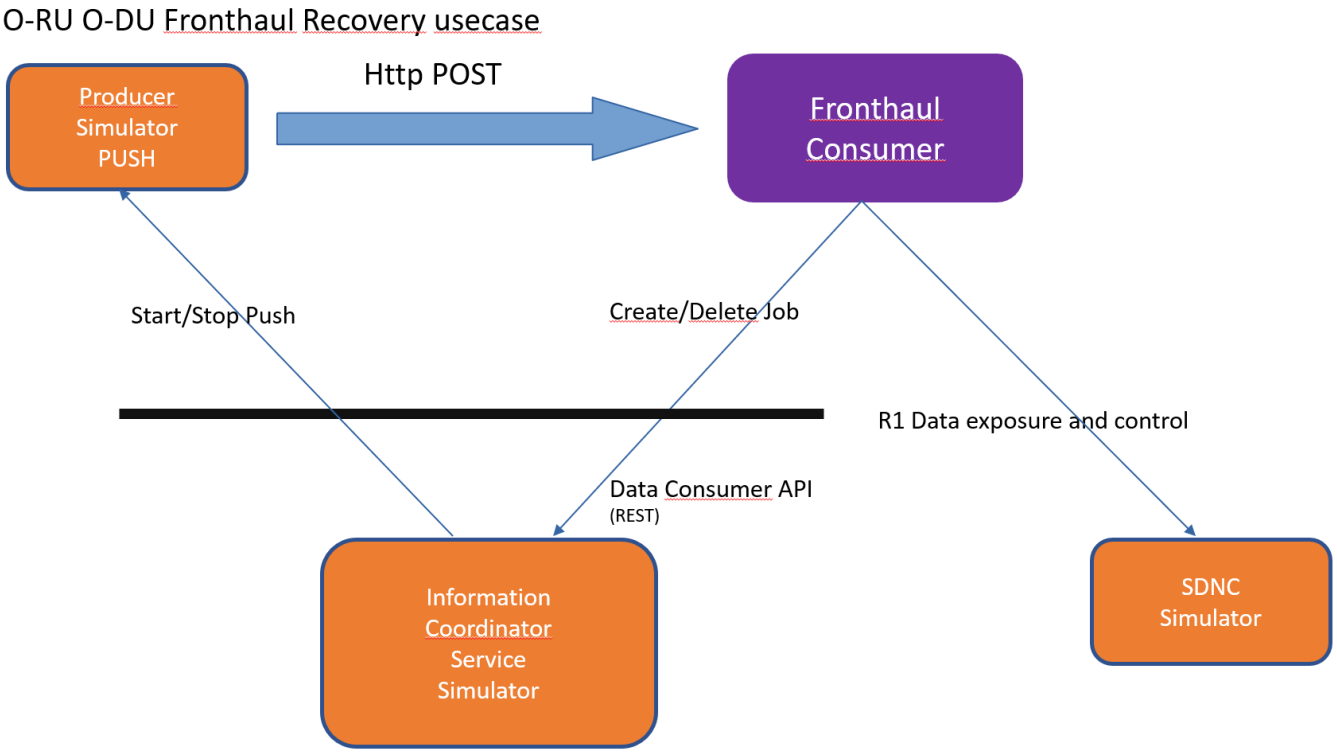
- The above command will get the user into the docker container where the following command is run to create the updated ToscaPolicy.json file:

```
/opt/app/policy/apex-pdp/bin/apexCLIToscaEditor.sh -c /home/apexuser/examples/LinkMonitor/models
/LinkMonitorModelJavascript_0.0.1.apex -ot /home/apexuser/examples/LinkMonitor/deployment/ToscaPolicy.json -ac
/home/apexuser/examples/LinkMonitor/config/LinkMonitorConfigDmaap2RestJsonEvent.json -t /home/apexuser/examples
/LinkMonitor/tosca/ToscaTemplate.json
```

- After running the above command, the ToscaPolicy.json file is automatically updated in the /deployment directory of nonrtric in the host where docker is running.

Information Coordinator Job consumer version in Go

This version of the usecase is implemented as an Information Coordinator Service (ICS) job consumer, and is implemented in Go. It provides three simulators, shown in the picture below.



To start the simulators and the consumer, pull the nonrtric repo, https://gerrit.o-ran-sc.org/r/admin/repos/nonrtric and follow the instructions in the `dmaap-mediator-producer/README.md` file.

Information Coordinator Job consumer version in Java

This version of the usecase is implemented as an Information Coordinator Service (ICS) job consumer, and is implemented in Java. To run the usecase, start the simulators according to the instructions for the Go version and then start the consumer by following the instructions in the `dmaap-adaptor-java/README.md` file.