Release B - Build/Run

This page describes how to get the release B version of Non-RT RIC up and running locally with two separate Near-RT RIC simulator docker containers providing OSC_2.1.0 version of A1 interface.

All four components of the Non-RT RIC (from three different repos) run inside docker containers and communicate via a docker network. Details of the architecture can be found from Release B page.

- Project Requirements
- Build Code
    - Build nonrtric containers
        - Configure policy-agent
        - update policy-agent/Dockerfile:
        - ADD /config/application_configuration.json /opt/app/policy-agent/data/application_configuration.json_example
        - ADD /config/application_configuration.json /opt/app/policy-agent/data/application_configuration.json
        - Build the code and create docker images
    - Build near-rt-ric-simulator container
        - Create docker image
    - Build NONRTRIC / A1 Policy control panel container
        - Verify controlpanel configuration
        - Build the code and create docker image
- Run A1 Controller Docker Container
    - Open Daylight GUI
- Run Near-RT RIC A1 Simulator Docker Containers
- Run Policy-agent Docker Container
    - policy-agent Swagger API
- Run Non-RT RIC Control Panel Docker Container
    - Open NONRTRIC / A1 Policy Control Panel UI

Project Requirements

- Java 11 (make sure that JAVA_HOME environment variable points to correct Java version)
- Maven 3.6
- Docker and docker-compose (latest)

Build Code

Build nonrtric containers

- Download the nonrtric repo (defaults to master branch):

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

Configure policy-agent

To support local test with two separate Near-RT RIC simulator instances:

- create a new **nonrtric/policy-agent/config/application_configuration.json** with the configuration below
- The controller hostname and port values come from and must match those defined in nonrtric/sdnc-a1-controller/oam/installation/src/main/yaml /docker-compose.yml
- any defined ric names must match the given docker container names in near-RT RIC simulator startup - port is always the simulator's internal 8085

application_configuration.yaml

```
{
   "config": {
      "//description": "Application configuration",
      "controller": [
         {
            "name": "controller1",
            "baseUrl": "http://a1-controller-container:8181",
            "userName": "admin",
            "password": "Kp8bJ4SXszM0WXlhak3eHlcse2gAw84vaoGGmJvUy2U"
         }
      ],
      "ric": [
         {
            "name": "ric1",
            "baseUrl": "http://ric1:8085/",
            "controller": "controller1",
            "managedElementIds": [
               "kista_1",
               "kista_2"
            ]
         },
                {
            "name": "ric2",
            "baseUrl": "http://ric2:8085/",
            "controller": "controller1",
            "managedElementIds": [
               "kista_3",
               "kista_4"
            ]
         }
      ]
   }
}
```

update policy-agent/Dockerfile:

ADD /config/application_configuration.json /opt/app/policy-agent/data/application_configuration.json_example

to

ADD /config/application_configuration.json /opt/app/policy-agent/data/application_configuration.json

Build the code and create docker images

To build docker images of sdnc-a1-controller and policy-agent:

```
cd nonrtric
mvn clean install -Dmaven.test.skip=true
```

Build near-rt-ric-simulator container

Download the near-rt-ric-simulator repo (defaults to master branch):

```
git clone "https://gerrit.o-ran-sc.org/r/sim/a1-interface"
```

Create docker image

To create docker image near-rt-ric-simulator (note that the given image name must match the name given in docker startup later):

```
cd a1-interface/near-rt-ric-simulator
docker build -t near-rt-ric-simulator:latest .
```

Build NONRTRIC / A1 Policy control panel container

Download the nonrtric repo (defaults to master branch):

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

Verify controlpanel configuration

⚠️ Note that **nonrtric-controlpanel/webapp-backend/src/main/resources/application.properties** default property value **policycontroller.url.prefix = http://policy-agent-container:8081** assumes that policy agent is started with name policy-agent-container and exposes port 8081 (as is done below)!

Build the code and create docker image

```
cd nonrtric-controlpanel
mvn clean install -Dmaven.test.skip=true
```

Run A1 Controller Docker Container

- A1 Controller must be started first to set up docker network
- Change directory:
  `cd nonrtric/sdnc-a1-controller/oam/installation/src/main/yaml`
- Run docker container using the command below
  `docker-compose up a1-controller`
  - the container is ready once message "Healthcheck Passed in XX seconds." appears
  - note that certificate-related errors "cp: can't stat '/opt/opendaylight/current/certs/*': No such file or directory" and "Error: File not found in path entered" can be ignored
- The Karaf logs of A1 controller can be followed e.g. by using command
  `docker exec a1-controller-container sh -c "tail -f /opt/opendaylight/data/log/karaf.log"`

Open Daylight GUI

- For troubleshooting/verification purposes the Open Daylight GUI can be accessed by pointing web-browser to this URL:
  http://localhost:8282/apidoc/explorer/index.html
  Username/password: admin/Kp8bJ4SXszM0WXlhak3eHlcse2gAw84vaoGGmJvUy2U

Run Near-RT RIC A1 Simulator Docker Containers

- Start docker containers for each ric defined in **nonrtric/policy-agent/config/application_configuration.json** in previous steps (in this example for ric1 and ric2) and providing A1 interface version OSC_2.1.0 with the following commands::

```
docker run -p 8085:8085 -p 8185:8185 -e A1_VERSION=OSC_2.1.0 -e ALLOW_HTTP=true --network=nonrtric-docker-net --name=ric1 near-rt-ric-simulator:latest
docker run -p 8086:8085 -p 8185:8185 -e A1_VERSION=OSC_2.1.0 -e ALLOW_HTTP=true --network=nonrtric-docker-net --name=ric2 near-rt-ric-simulator:latest
```

- Change directory:
  `cd a1-interface/near-rt-ric-simulator/test/OSC_2.1.0/jsonfiles`
- Put an example policy_type into the started near-rt-ric-simulator instances by running these curl commands (in this example to ric1 exposed to port 8085 and ric2 exposed to port 8086):

```
curl -X PUT -v "http://localhost:8085/a1-p/policytypes/123" -H "accept: application/json" \
 -H "Content-Type: application/json" --data-binary @pt1.json
curl -X PUT -v "http://localhost:8086/a1-p/policytypes/123" -H "accept: application/json" \
 -H "Content-Type: application/json" --data-binary @pt1.json
```

Run Policy-agent Docker Container

- Run docker container using this command once A1 Controller and simulators have been fully started:
  `docker run -p 8081:8081 --network=nonrtric-docker-net --name=policy-agent-container o-ran-sc/nonrtric-policy-agent:2.0.0-SNAPSHOT`

- Once policy-agent is up and running, it establishes connections to all configured Near-RT RICs
- (Note: In Bronze Maintenance verioisn it will be possible to point docker to use a different configuration file than the version included inside the container - e.g. to add additional near-RT-RICs)
- If policy-agent-container is configured to log at DEBUG level, the following logs should appear to log to show that connection to the configured RICs has been established successfully via A1 Controller.

SDNC A1 Client

```
$ docker logs policy-agent-container | grep "protocol version"
2020-04-17 11:10:11.357 DEBUG 1 --- [or-http-epoll-1] o.o.policyagent.clients.A1ClientFactory  : Established
protocol version:SDNC_OSC_OSC_V1 for Ric: ric1
2020-04-17 11:10:11.387 DEBUG 1 --- [or-http-epoll-1] o.o.policyagent.clients.A1ClientFactory  : Established
protocol version:SDNC_OSC_OSC_V1 for Ric: ric2
```

policy-agent Swagger API

For troubleshooting/verification purposes you can view/access the policy-agent swagger API from url: http://localhost:8081/swagger-ui.html

Run Non-RT RIC Control Panel Docker Container

Run docker container using this command:

```
docker run -p 8080:8080 --network=nonrtric-docker-net o-ran-sc/nonrtric-controlpanel:2.0.0-SNAPSHOT
```

Open NONRTRIC / A1 Policy Control Panel UI

Dashboard UI can be accessed by pointing the web-browser to this URL:

http://localhost:8080/