



@ FILE NAME: M_CTC_ID_019.txt

@ TEST SCOPE: M PLANE O-RAN CONFORMANCE

@ Software Release for Garuda: v4.2.0

Test Description : This scenario is MANDATORY for an O-RU supporting the Hybrid M-plane architecture model.

This test validates that the O-RU correctly implements NETCONF Access Control security aspects.

The scenario corresponds to the following chapters in [3]:

3.3 SSH Connection Establishment

3.4 NETCONF Access Control

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STEP 1. The TER NETCONF Client establishes a connection with the O-RU NETCONF Server.

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******* Connect to the NETCONF Server *******

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> listen --ssh --login operator

Waiting 60s for an SSH Call Home connection on port 4334...

The authenticity of the host '::ffff:192.168.208.37' cannot be established.

ssh-rsa key fingerprint is c0:7c:63:5d:4b:85:e7:27:e0:7e:f0:44:38:4e:ab:83

Interactive SSH Authentication done.

> status

Current NETCONF session:

ID : 4

Host : 192.168.208.37

Port : 830

Transport : SSH

Capabilities:

urn:ietf:params:netconf:base:1.0 urn:ietf:params:netconf:base:1.1 urn:ietf:params:netconf:capability:writable-running:1.0

urn:ietf:params:netconf:capability:candidate:1.0 urn:ietf:params:netconf:capability:rollback-on-error:1.0

urn:ietf:params:netconf:capability:validate:1.1 urn:ietf:params:netconf:capability:startup:1.0 urn:ietf:params:netconf:capability:xpath:1.0

urn:ietf:params:netconf:capability:with-defaults:1.0?basic-mode=explicit&also-supported=report-all,report-all-tagged,trim,explicit

urn:ietf:params:netconf:capability:notification:1.0 urn:ietf:params:netconf:capability:interleave:1.0

urn:ietf:params:xml:ns:yang:ietf-yang-metadata?module=ietf-yang-metadata&revision=2016-08-05

urn:ietf:params:xml:ns:yang:1?module=yang&revision=2017-02-20

urn:ietf:params:xml:ns:yang:ietf-inet-types?module=ietf-inet-types&revision=2013-07-15

urn:ietf:params:xml:ns:yang:ietf-yang-types?module=ietf-yang-types&revision=2013-07-15

urn:ietf:params:netconf:capability:yang-library:1.1?revision=2019-01-04&content-id=61

urn:sysrepo:plugind?module=sysrepo-plugind&revision=2020-12-10

urn:ietf:params:xml:ns:yang:ietf-netconf-acm?module=ietf-netconf-acm&revision=2018-02-14

urn:ietf:params:xml:ns:netconf:base:1.0?module=ietf-netconf&revision=2013-09-29&features=writable-running,candidate,rollback-on-error,validate,startup,url,xpath urn:ietf:params:xml:ns:yang:ietf-netconf-with-defaults?module=ietf-netconf-with-defaults&revision=2011-06-01

urn:ietf:params:xml:ns:yang:ietf-netconf-notifications?module=ietf-netconf-notifications&revision=2012-02-06

urn:ietf:params:xml:ns:yang:ietf-netconf-monitoring?module=ietf-netconf-monitoring&revision=2010-10-04

urn:ietf:params:xml:ns:netconf:notification:1.0?module=notifications&revision=2008-07-14

urn:ietf:params:xml:ns:netmod:notification?module=nc-notifications&revision=2008-07-14

urn:ietf:params:xml:ns:yang:ietf-x509-cert-to-name?module=ietf-x509-cert-to-name&revision=2014-12-10

urn:ietf:params:xml:ns:yang:iana-crypt-hash?module=iana-crypt-hash&revision=2014-08-06 urn:notification_history?module=notification_history

urn:ietf:params:xml:ns:yang:iana-if-type?module=iana-if-type&revision=2017-01-19

=====

> subscribe

=====

Ok

=====

#####Step 2 and 3 O-RU NETCONF server replies by silently omitting data nodes#####

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> get --filter-xpath /o-ran-usermgmt:users/user

=====

```
<?xml version="1.0" ?>
<data xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
  <users xmlns="urn:o-ran:user-mgmt:1.0">
    <user>
      <name>oranuser</name>
      <account-type>PASSWORD</account-type>
      <enabled>true</enabled>
    </user>
    <user>
      <name>operator</name>
      <account-type>PASSWORD</account-type>
      <enabled>true</enabled>
    </user>
    <user>
      <name>observer</name>
      <account-type>PASSWORD</account-type>
      <enabled>true</enabled>
    </user>
    <user>
      <name>installer</name>
      <account-type>PASSWORD</account-type>
      <enabled>true</enabled>
    </user>
    <user>
      <name>operator5310619424927220</name>
      <account-type>PASSWORD</account-type>
      <enabled>true</enabled>
    </user>
    <user>
      <name>operator42009256600399182198</name>
      <account-type>PASSWORD</account-type>
      <enabled>true</enabled>
    </user>
    <user>
      <name>operator900036241939705</name>
      <account-type>PASSWORD</account-type>
      <enabled>true</enabled>
    </user>
    <user>
      <name>operator7131913</name>

```

```
<account-type>PASSWORD</account-type>
<enabled>true</enabled>
</user>
<user>
<name>operator97206</name>
<account-type>PASSWORD</account-type>
<enabled>true</enabled>
</user>
<user>
<name>operator62794098482</name>
<account-type>PASSWORD</account-type>
<enabled>true</enabled>
</user>
<user>
<name>operator2904805</name>
<account-type>PASSWORD</account-type>
<enabled>true</enabled>
</user>
<user>
<name>operator9803</name>
<account-type>PASSWORD</account-type>
<enabled>true</enabled>
</user>
<user>
<name>operator9980120562102938045276</name>
<account-type>PASSWORD</account-type>
<enabled>true</enabled>
</user>
<user>
<name>operator6553383621</name>
<account-type>PASSWORD</account-type>
<enabled>true</enabled>
</user>
<user>
<name>operator49141736406</name>
<account-type>PASSWORD</account-type>
<enabled>true</enabled>
</user>
<user>
<name>operator6014549415</name>
<account-type>PASSWORD</account-type>
<enabled>true</enabled>
</user>
<user>
<name>operator4273528410327242</name>
<account-type>PASSWORD</account-type>
<enabled>true</enabled>
</user>
</users>
```

</data>

=====

SYSTEM LOGS

=====

Apr 14 05:31:38 garuda daemon.info netopeer2-server[859]: Trying to connect via IPv4 to 192.168.208.15:4334.

Apr 14 05:31:38 garuda daemon.info netopeer2-server[859]: getsockopt() error (Connection refused).

Apr 14 05:31:38 garuda daemon.info netopeer2-server[859]: Trying to connect via IPv4 to 192.168.208.15:4334.

Apr 14 05:31:38 garuda daemon.info netopeer2-server[859]: getsockopt() error (Connection refused).

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: Trying to connect via IPv4 to 192.168.208.15:4334.

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: getsockopt() error (Connection refused).

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: Trying to connect via IPv4 to 192.168.208.15:4334.

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: Successfully connected to 192.168.208.15:4334 over IPv4.

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: Session 133 (user "root", CID 1) created.

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: Received an SSH message "request-service" of subtype "ssh-userauth".

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: Received an SSH message "request-auth" of subtype "password".

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: User "operator" authenticated.

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: Received an SSH message "request-channel-open" of subtype "session".

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: Received an SSH message "request-channel" of subtype "subsystem".

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: Call Home client "default-client" session 4 established.

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: Session 134 (user "root", CID 1) created.

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: There are no subscribers for "ietf-netconf-notifications" notifications.

Apr 14 05:31:39 garuda daemon.info netopeer2-server[859]: Generated new event (netconf-session-start).

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Published event "rpc" "/ietf-netconf:get" with ID 9 priority 0 for 1 subscribers.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Processing "/ietf-netconf:get" "rpc" event with ID 9 priority 0 (remaining 1 subscribers).

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Trying to connect via IPv4 to 192.168.208.15:4334.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: getsockopt() error (Connection refused).

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Successful processing of "rpc" event with ID 9 priority 0 (remaining 0 subscribers).

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Event "rpc" with ID 9 priority 0 succeeded.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Session 4: thread 2 event new RPC.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Published event "rpc" "/ietf-netconf:get" with ID 10 priority 0 for 1 subscribers.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Processing "/ietf-netconf:get" "rpc" event with ID 10 priority 0 (remaining 1 subscribers).

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Published event "operational" "/o-ran-software-management:software-inventory" with ID 4.

Apr 14 05:31:40 garuda user.notice fw_manager[936]: RPC #4 recieved. xpath -> /o-ran-software-management:software-inventory

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Event "operational" with ID 4 succeeded.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: There is no leafref

"/ietf-hardware:hardware/ietf-hardware:component/o-ran-hardware:product-code" with the value "STL=O-RU", but it is not required.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: There is no leafref

"/ietf-hardware:hardware/ietf-hardware:component/o-ran-hardware:product-code" with the value "", but it is not required.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: There is no leafref

"/ietf-hardware:hardware/ietf-hardware:component/o-ran-hardware:product-code" with the value "STL=O-RU", but it is not required.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Successful processing of "rpc" event with ID 10 priority 0 (remaining 0 subscribers).

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Event "rpc" with ID 10 priority 0 succeeded.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: There is no leafref

"/ietf-hardware:hardware/ietf-hardware:component/o-ran-hardware:product-code" with the value "STL=O-RU", but it is not required.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: There is no leafref

"/ietf-hardware:hardware/ietf-hardware:component/o-ran-hardware:product-code" with the value "", but it is not required.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: There is no leafref

"/ietf-hardware:hardware/ietf-hardware:component/o-ran-hardware:product-code" with the value "STL=O-RU", but it is not required.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Session 4: thread 4 event new RPC.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Published event "rpc" "/ietf-netconf:get-config" with ID 7 priority 0 for 1 subscribers.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Processing "/ietf-netconf:get-config" "rpc" event with ID 7 priority 0 (remaining 1 subscribers).

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Successful processing of "rpc" event with ID 7 priority 0 (remaining 0 subscribers).

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Event "rpc" with ID 7 priority 0 succeeded.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: There is no leafref

"/ietf-hardware:hardware/ietf-hardware:component/ietf-hardware:name" with the value "ru-port0", but it is not required.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: There is no leafref

"/ietf-hardware:hardware/ietf-hardware:component/ietf-hardware:name" with the value "ru-port0", but it is not required.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: There is no leafref

"/ietf-hardware:hardware/ietf-hardware:component/ietf-hardware:name" with the value "ru-port0", but it is not required.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Session 4: thread 1 event new RPC.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Published event "rpc" "/notifications:create-subscription" with ID 4 priority 0 for 1 subscribers.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Processing "/notifications:create-subscription" "rpc" event with ID 4 priority 0 (remaining 1 subscribers).

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Successful processing of "rpc" event with ID 4 priority 0 (remaining 0 subscribers).

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Event "rpc" with ID 4 priority 0 succeeded.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Session 4: thread 4 event new RPC.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Published event "rpc" "/ietf-netconf:get-config" with ID 8 priority 0 for 1 subscribers.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Processing "/ietf-netconf:get-config" "rpc" event with ID 8 priority 0 (remaining 1 subscribers).

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Successful processing of "rpc" event with ID 8 priority 0 (remaining 0 subscribers).

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Event "rpc" with ID 8 priority 0 succeeded.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Resolving unresolved data nodes and their constraints...

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: All data nodes and constraints resolved.

Apr 14 05:31:40 garuda daemon.info netopeer2-server[859]: Session 4: thread 4 event new RPC.

Apr 14 05:31:41 garuda daemon.info netopeer2-server[859]: Trying to connect via IPv4 to 192.168.208.15:4334.

Apr 14 05:31:41 garuda daemon.info netopeer2-server[859]: getsockopt() error (Connection refused).

Apr 14 05:31:42 garuda daemon.info netopeer2-server[859]: Trying to connect via IPv4 to 192.168.208.15:4334.

Apr 14 05:31:42 garuda daemon.info netopeer2-server[859]: getsockopt() error (Connection refused).

Apr 14 05:31:43 garuda daemon.info netopeer2-server[859]: Trying to connect via IPv4 to 192.168.208.15:4334.

Apr 14 05:31:43 garuda daemon.info netopeer2-server[859]: getsockopt() error (Connection refused).

Apr 14 05:31:44 garuda daemon.info netopeer2-server[859]: Trying to connect via IPv4 to 192.168.208.15:4334.

Apr 14 05:31:44 garuda daemon.info netopeer2-server[859]: getsockopt() error (Connection refused).

Apr 14 05:31:44 garuda user.notice SYNCMNGR[1182]: Received message from S-Plane

Apr 14 05:31:45 garuda daemon.info netopeer2-server[859]: Trying to connect via IPv4 to 192.168.208.15:4334.

Apr 14 05:31:45 garuda daemon.info netopeer2-server[859]: getsockopt() error (Connection refused).

Apr 14 05:31:46 garuda daemon.info netopeer2-server[859]: Trying to connect via IPv4 to 192.168.208.15:4334.

Apr 14 05:31:46 garuda daemon.info netopeer2-server[859]: getsockopt() error (Connection refused).

Apr 14 05:31:46 garuda daemon.info netopeer2-server[859]: Session 4: thread 4 event new RPC.

Apr 14 05:31:46 garuda daemon.info netopeer2-server[859]: Session 4: thread 4 event session terminated.

Apr 14 05:31:46 garuda daemon.info netopeer2-server[859]: There are no subscribers for "ietf-netconf-notifications" notifications.

Apr 14 05:31:46 garuda daemon.info netopeer2-server[859]: Generated new event (netconf-session-end).

Apr 14 05:31:46 garuda daemon.info netopeer2-server[859]: Call Home client "default-client" session terminated.

Apr 14 05:31:46 garuda daemon.info netopeer2-server[859]: Trying to connect via IPv4 to 192.168.208.15:4334.

Apr 14 05:31:46 garuda daemon.info netopeer2-server[859]: getsockopt() error (Connection refused).

Apr 14 05:31:46 garuda auth.info sshd[5022]: Accepted password for operator from 192.168.208.15 port 41572 ssh2

Apr 14 05:31:46 garuda authpriv.info sshd[5022]: pam_unix(sshd:session): session opened for user operator by (uid=0)

Expected Result : The O-RU NETCONF server replies by silently omitting data nodes and their descendants to which the client does not have read access from the <rpc-reply> message

=====
***** **Actual Result** *****
=====

=====
Access Control Sudo (negative case) = SUCCESS
=====