@ FILE NAME: M_CTC_ID_021.txt

@ TEST SCOPE: M PLANE O-RAN CONFORMANCE

@ Software Release for Garuda_RevD: v5.0.2

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 user

privileges.

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

3.4 NETCONF Access Control

===
********** Initial Get ***********
===
> connect --ssh --host 192.168.4.40 --port 830 --login operator
          Interactive SSH Authentication
          Type your password:
          Password:

===
> get --filter-xpath /o-ran-usermgmt:users/user
===
```xml
<?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>operator363904219774937034226</name>
   <account-type>PASSWORD</account-type>
   <enabled>true</enabled>
  </user>
  <user>
   <name>operator0534452414116716545446</name>
   <account-type>PASSWORD</account-type>
   <enabled>true</enabled>
  </user>
  <user>
   <name>operator6163823880175</name>
   <account-type>PASSWORD</account-type>
   <enabled>true</enabled>
```

```
  </user>
 </users>
</data>
```

===

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

===

===

STEP 1 TER NETCONF client establishes a connection using a user account with fm-pm privileges.

===

> connect --ssh --host 192.168.4.40 --port 830 --login observer

Interactive SSH Authentication

Type your password:

Password:

> status

Current NETCONF session:

ID   : 30

Host   : 192.168.4.40

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 TER NETCONF client attempts to get the configuration of the o-ran-processing.yang model.
==

==
> edit-config --target running --config --defop replace
==

==
******* Replace with below xml ********
==

```
<processing-elements xmlns="urn:o-ran:processing-element:1.0">
<transport-session-type>ETH-INTERFACE</transport-session-type>
<ru-elements>
 <name>element0</name>
 <transport-flow>
  <interface-name>eth0.100</interface-name>
  <eth-flow>
   <ru-mac-address>98:ae:71:01:64:d8</ru-mac-address>
   <vlan-id>100</vlan-id>
   <o-du-mac-address>64:9d:99:b1:7e:63</o-du-mac-address>
  </eth-flow>
 </transport-flow>
</ru-elements>
</processing-elements>
```

==
Step 3 NETCONF server replies rejecting the protocol operation with an 'access-denied' error.
==

```
ERROR
    type        :    protocol
    tag         :    access-denied
    severity    :      error
    path        :    /o-ran-processing-element:processing-elements/ru-elements/transport-flow/eth-flow/o-du-mac-address
    message     :      Access to the data model "o-ran-processing-element" is denied because "observer" NACM authorization failed.
```

==
SYSTEM LOGS
==
Aug 19 12:31:54 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:31:54 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:31:54 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:31:54 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:31:55 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:31:55 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:31:55 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:31:55 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:31:56 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:31:56 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:31:56 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:31:56 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:31:57 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:31:57 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:31:57 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:31:57 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:31:58 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:31:58 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:31:58 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:31:58 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:31:59 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:31:59 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:31:59 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:31:59 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:00 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:00 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:00 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:00 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:01 garuda user.notice SYNCMNGR[1176]: Received message from S-Plane

Aug 19 12:32:01 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:01 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:01 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:01 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:02 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:02 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:02 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:02 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: Accepted a connection on :::830.

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: Session 1684 (user "root", CID 1) created.

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: Received an SSH message "request-service" of subtype "ssh-userauth".

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: Received an SSH message "request-auth" of subtype "password".

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: User "observer" authenticated.

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: Received an SSH message "request-channel-open" of subtype "session".

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: Received an SSH message "request-channel" of subtype "subsystem".

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: Session 1685 (user "root", CID 1) created.

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: There are no subscribers for "ietf-netconf-notifications" notifications.

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: Generated new event (netconf-session-start).

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:03 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Resolving unresolved data nodes and their constraints...

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: All data nodes and constraints resolved.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Resolving unresolved data nodes and their constraints...

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: All data nodes and constraints resolved.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Published event "rpc" "/notifications:create-subscription" with ID 6 priority 0 for 1 subscribers.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Processing "/notifications:create-subscription" "rpc" event with ID 6 priority 0 (remaining 1 subscribers).

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Successful processing of "rpc" event with ID 6 priority 0 (remaining 0 subscribers).

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Event "rpc" with ID 6 priority 0 succeeded.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Session 30: thread 0 event new RPC.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Resolving unresolved data nodes and their constraints...

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: All data nodes and constraints resolved.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Resolving unresolved data nodes and their constraints...

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: All data nodes and constraints resolved.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Published event "rpc" "/ietf-netconf:edit-config" with ID 4 priority 0 for 1 subscribers.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Processing "/ietf-netconf:edit-config" "rpc" event with ID 4 priority 0 (remaining 1 subscribers).

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: edit-config error-option "stop-on-error" not supported, rollback-on-error will be performed.

Aug 19 12:32:04 garuda daemon.err netopeer2-server[853]: Access to the data model "o-ran-processing-element" is denied because "observer" NACM authorization failed.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Failed processing of "rpc" event with ID 4 priority 0 (remaining 1 subscribers).

Aug 19 12:32:04 garuda daemon.err netopeer2-server[853]: Access to the data model "o-ran-processing-element" is denied because "observer" NACM authorization failed.

Aug 19 12:32:04 garuda daemon.warn netopeer2-server[853]: Event "rpc" with ID 4 priority 0 failed (User callback failed).

Aug 19 12:32:04 garuda daemon.err netopeer2-server[853]: Failed to send an RPC (User callback failed).

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Session 30: thread 3 event new RPC.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Session 30: thread 3 event reply error.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Session 30: thread 3 event new RPC.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Session 30: thread 3 event session terminated.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: There are no subscribers for "ietf-netconf-notifications" notifications.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Generated new event (netconf-session-end).

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:04 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:05 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:05 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:05 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:05 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:06 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:06 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:06 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:06 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:07 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:07 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:07 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:07 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:08 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:08 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:08 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:08 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:09 garuda daemon.info netopeer2-server[853]: Trying to connect via IPv4 to 192.168.4.15:4334.

Aug 19 12:32:09 garuda daemon.info netopeer2-server[853]: getsockopt() error (Connection refused).

Aug 19 12:32:09 garuda authpriv.debug sshd[11400]: pam_unix(sshd:account): account observer has password changed in future

Aug 19 12:32:09 garuda auth.info sshd[11400]: Accepted password for observer from 192.168.4.15 port 34998 ssh2

Aug 19 12:32:09 garuda authpriv.info sshd[11400]: pam_unix(sshd:session): session opened for user observer by (uid=0)

Expected Result : The NETCONF server replies rejecting the protocol operation with an

"access-denied" error.

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


================================================================================
```
Access Control FM-PM (negative case)   =   SUCCESS
```

================================================================================
```