robust NETCONF
<draft-cole-netconf-robust-config-02.txt>

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22 Mar 2010 / IETF-Anaheim

objectives and benefits

Definitions:

- Validation - checking against a set of rules, e.g., all checks prior to moving configuration to <running/>.
- Verification - measuring behavior (of <running/>) against expectations.

Objectives:

- Minimize faulty configuration,
- Minimize disconnects in networks with no 'out-of-band' access, e.g., MANETs or DTNs, and
- Develop inter-operable mechanisms for verification testing.
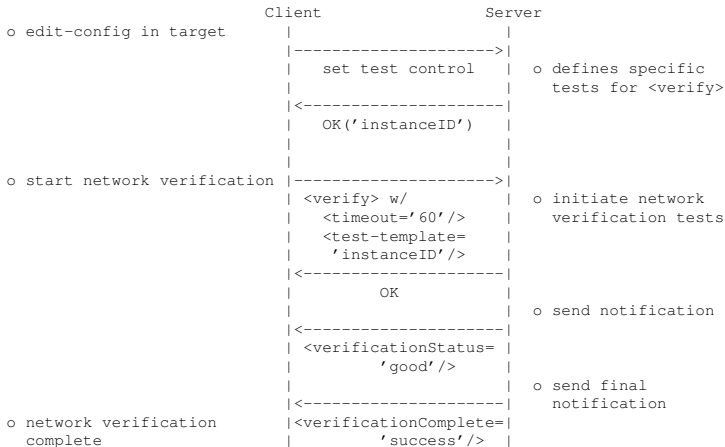
changes from 01 to 02

- Version 01 had originally proposed to couple verify with <commit> through a <verified-commit> operation.
- It was proposed on the mailing list (i.e., M. Bjorklund) to decouple the verify operation, which we have done in ver-02.
- ver-02 defines the new verify.yang module which is to be advertised according to the YANG specification [2].
- The module verify.yang defines:
  - Operations - <verify>, <cancel-verify>, and <complete-verify>,
  - Notifications - <verificationStatus> and <verificationComplete>, and
  - Requirements - on inter-operable test.yang modules.

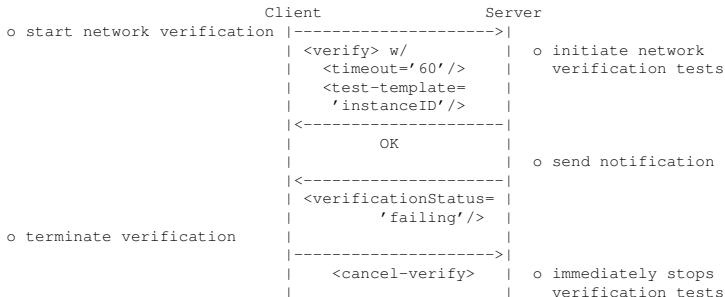- Pushes verification testing to the server.
- Multi-stage operation, i.e., $<$verify$>$, $<$complete-verify$>$ and $<$cancel-verify$>$
- *'Verification test suite'* comprised of multiple *'test sets'* per $<$verify$>$ operation.
- Multiple parameters, i.e., test-templates instanceIds, verbose reporting and test period.
- Multiple notifications, i.e., <verificationStatus> and <verificationComplete>.

$<$verify$>$ example

```
                          Client              Server
o edit-config in target     |                  |
                            |---------------------->|
                            |    set test control  | o defines specific
                            |                  |     tests for <verify>
                            |<----------------------|
                            |    OK('instanceID')  |
                            |                  |
                            |                  |
o start network verification|---------------------->|
                            | <verify> w/      | o initiate network
                            |   <timeout='60'/>|     verification tests
                            |   <test-template=|
                            |    'instanceID'/>|
                            |<----------------------|
                            |        OK        |
                            |                  | o send notification
                            |<----------------------|
                            | <verificationStatus=|
                            |        'good'/>  |
                            |                  | o send final
                            |<----------------------|     notification
o network verification      |<verificationComplete=|
  complete                  |        'success'/>  |
```

- A simple <verify> test example.

<cancel-verify> operation

```
                              Client              Server
o start network verification |--------------------->|
                             | <verify> w/          | o initiate network
                             |    <timeout='60'/>    |    verification tests
                             |    <test-template=    |
                             |     'instanceID'/>    |
                             |<---------------------|
                             |          OK          |
                             |                      | o send notification
                             |<---------------------|
                             | <verificationStatus= |
                             |        'failing'/>    |
o terminate verification     |                      |
                             |--------------------->|
                             |    <cancel-verify>   | o immediately stops
                             |                      |    verification tests
```

- A <verify> test gone bad.
- Client issues a <cancel-verify> operation to immediately terminate tests.

example ping.yang

Defined an example, simple test module for discussion

- ping.yang module defined in appendix of draft
- verify.yang places requirements on the development of inter-operable test modules as identified in the draft, i.e.,
    - Test sets contained in a leaf-list indexed via instanceID.
    - Pass/fail determinations of Test Set results and test suite results.
    - Raw results contained in leaf-list.
- ping.yang represents an extremely simple example; extensible test.yang modules being developed.

Questions

- ?

Next Steps

- Flesh out more extensive test modules in YANG.

References

1. Cole, R.G., Romascanu, D. and A. Beirman, *Robust NETCONF*, IETF Draft, <draft-cole-robust-netconf-02.txt>, March 2010.

2. Bjorklund, M., *YANG - A data modeling language for NETCONF*, IETF Draft, <draft-ietf-netmod-yang-11.txt>, February 2010.