

IETF Hackathon:

YANG Data Model for Network Interconnect Tester

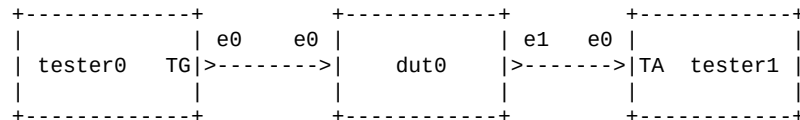
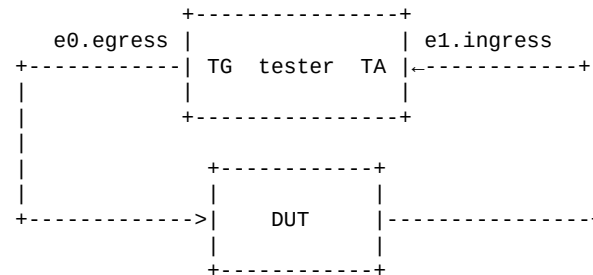
- IETF 104
- 23-24 March, 2019
- Prague



Background

- Problem:

- MDN enabled tester
 - “Model Defined Networking”
- Interoperable tester
- Simulatable MDN network



- New draft:

draft-vassilev-bmwg-network-interconnect-tester-00

Details

```
module: ietf-traffic-generator
augment /if:interfaces/if:interface:
  +--rw traffic-generator {egress-direction}?
    | +--rw (type)?
    | | +--:(single-stream)
    | | | +--rw frame-size          uint32
    | | | +--rw (frame-data-type)?
    | | | | +--:(raw-frame-data)
    | | | | +--rw frame-data?      string
    | | | +--rw interframe-gap     uint32
    | | | +--rw interburst-gap?    uint32
    | | | +--rw frames-per-burst?  uint32
    | | | +--rw src-mac-address?   yang:mac-address {ethernet}?
    | | | +--rw dst-mac-address?   yang:mac-address {ethernet}?
    | | | +--rw ether-type?        uint16 {ethernet}?
    | | +--:(multi-stream)
    | ...
    ...
```

```
#Connect to network
```

```
net=tnptapi.connect("topology.xml")
```

```
# Start traffic
```

```
net.node("tester0").edit(
  "create /interfaces/interface[name='e0']/traffic-generator -- frame-size=64 interframe-gap=20")
```

```
net.commit()
```

Details 2

Automated self-test script for devices implementing the network-interconnect-tester draft:

Usage:

```
./test-network-interconnect-tester.py --config=../topology.xml --interface=analyzer.ge0 --interface=analyzer.xe0 \  
  --interface=local.ge15 --interface=local.xe2 --interface=local.xe3 --test-internal-loopback=true --test-analyzer=true
```

Output:

Port \ Run	1	2	3	4	5	6	7	8	9
NORM	98.70	76.19	50.00	50.00	5.00	50.00	5.00	10.00	76.19
analyzer.ge0	101.40	76.45	50.18	51.34	5.02	50.94	5.02	10.02	76.62
local.ge15	101.37	76.41	50.16	51.33	5.01	50.98	5.02	10.05	76.66
local.xe3	97.85	55.10	76.91	56.40	12.65	72.83	12.52	13.32	55.27
local.xe2	97.91	55.12	76.96	56.43	12.65	72.88	12.53	13.33	55.30
analyzer.xe0	101.37	76.41	50.16	51.32	5.01	50.92	5.02	10.02	76.59

Simulation

- Another implementation of the drafts
 - Using open source simulation tool
- With a small translator script
- Input in XML format, conforming to YANG models:
 - ietf-network, ietf-network-topology
 - ietf-interfaces, ietf-interfaces-ethernet-like
 - ietf-network-bridge-flows*, ietf-network-bridge-scheduler*
 - ietf-traffic-generator*, ietf-traffic-analyzer*, ietf-loopback*

*: DRAFT
- Output is a NED file, with the same config
 - The own DSL of the simulation tool

Simulation

topology-with-config.xml:

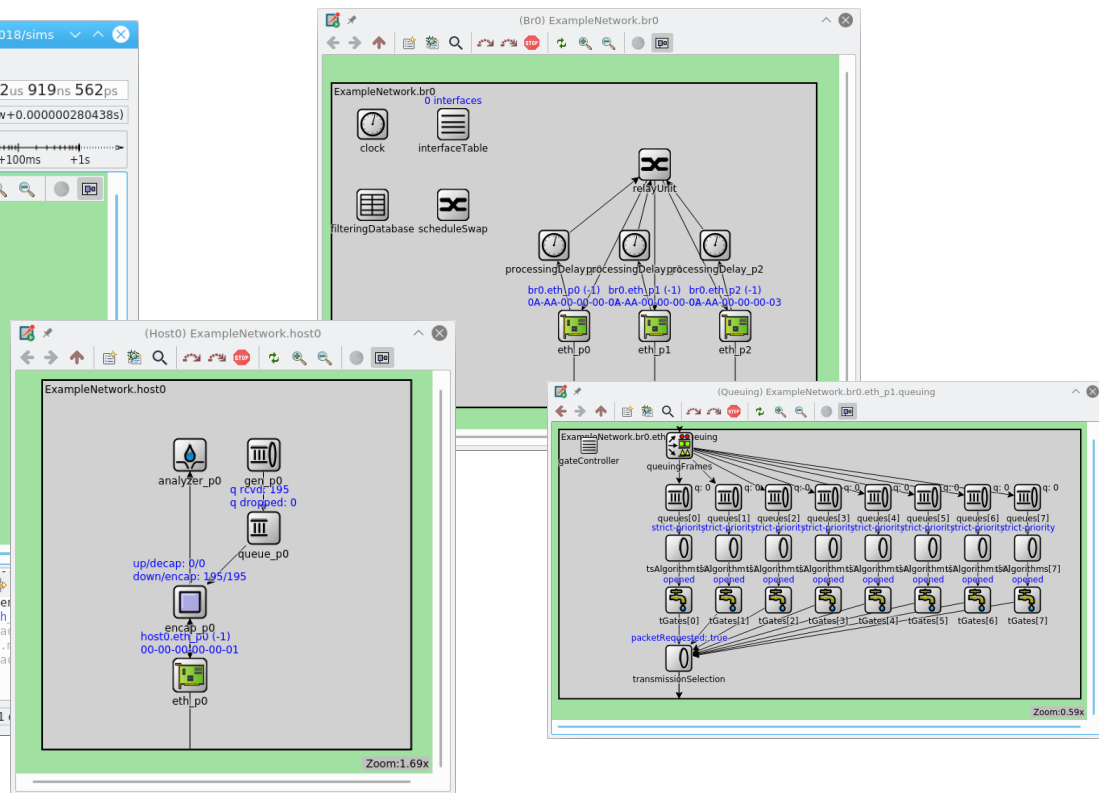
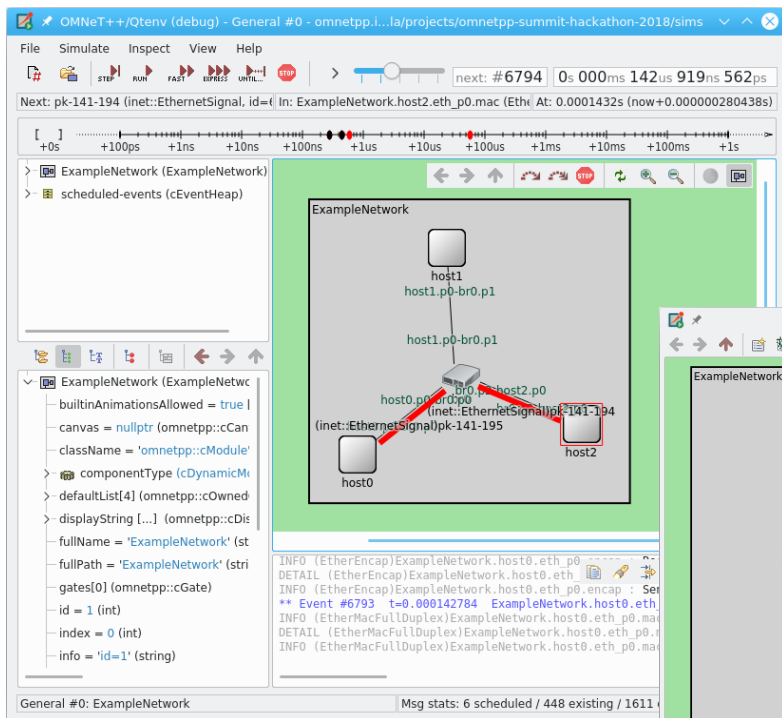
```
<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">
  <node>
    <node-id>host0</node-id>
    <termination-point
      xmlns="urn:ietf:params:xml:ns:yang:ietf-network-topology">
      <tp-id>p0</tp-id>
    </termination-point>
    <config xmlns="urn:tntapi:netconf-node">
      <interfaces xmlns="urn:ietf:params:xml:ns:yang:ietf-interfaces">
        <traffic-generator
          xmlns="urn:ietf:params:xml:ns:yang:ietf-traffic-generator">
          <frame-size>64</frame-size>
          <interframe-gap>20</interframe-gap>
          <dst-mac-address>00:00:00:00:00:03</dst-mac-address>
```

Simulation

topology-with-config.ned:

```
module Host0 {  
    parameters:  
        eth_p0.address = "00:00:00:00:00:01";  
    gates:  
        inout p0;  
    submodules:  
        eth_p0: VLANEthernetInterfaceHost;  
        analyzer_p0: TrafficAnalyzer;  
        gen_p0: TrafficGenerator {  
            frameSize = 64B;  
            interFrameGap = 20B;  
            destAddress = "00:00:00:00:00:03";  
        }  
    connections:  
        encap_p0.upperLayerOut --> analyzer_p0.in;  
        queue_p0.in++ <-- gen_p0.out;  
        encap_p0.upperLayerIn <-- queue_p0.out;  
        eth_p0.upperLayerOut --> encap_p0.lowerLayerIn;  
        eth_p0.upperLayerIn <-- encap_p0.lowerLayerOut;  
        P0 <--> eth_p0.phys;  
}
```

Simulation



Wrap Up

Team members:

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Transpacket AS

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OpenSim Kft.

First timers @ IETF/Hackathon:

Attila Török

References

- <https://www.ietf.org/id/draft-vassilev-bmwg-network-interconnect-tester-00.txt>
- <https://www.ietf.org/id/draft-vassilev-netmod-network-bridge-01.txt>
- <https://github.com/torokati44/ietf-hackathon104>
- <https://github.com/vlvassilev/litenc/tree/master/tntapi/example/ietf-network-interconnect-tester>