

TF-NGN

*Hands-on evaluation
of new routers and switches
(activity 9.7)*

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Testing Possibilities (Cisco)

- **CRS-1 (IOS XR and features like In Service Software Upgrade)**
- **New line card and Xenpaks for CRS-1, 12000, 7600**
- **New Catalyst with 10GE uplinks**

NDA is necessary before more information is released

Testing Possibilities (Juniper)

- **Multi-chassis terabyte solution with 4 T640 routers connected with a TX optical matrix (available in Amsterdam only)**
- **Software features of existing routers (e.g. SDX service activation, logical routers etc.)**

Testing Possibilities

- **There are also some other possibilities but covered by NDA**

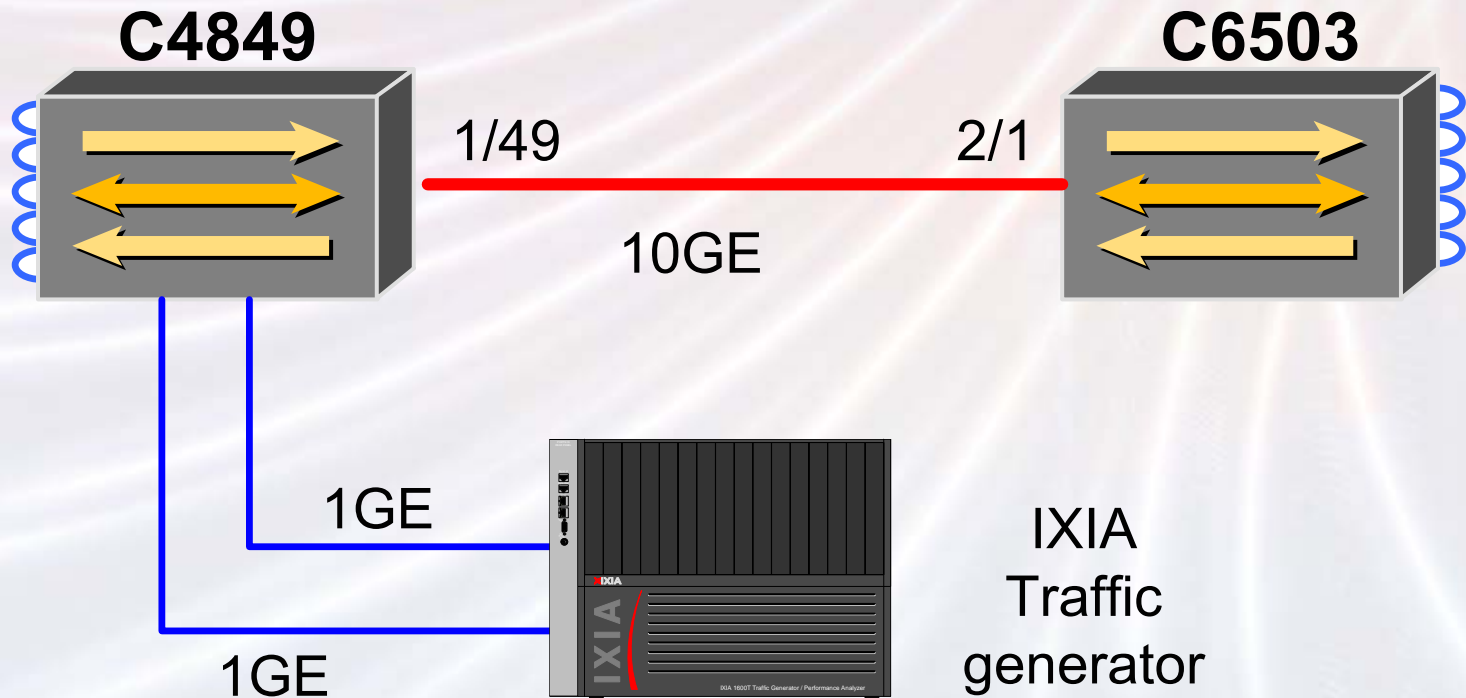
Your input is welcome

- **Areas of interest (for routers and switches)**
- **General testing plan**

First evaluation results

- **Catalyst 4948-10GE:**
 - **2 10GE ports (X2 optics)**
 - **48 10/100/1000 copper ports**
- **Switch orderable from Mid April**
- **Early Field Tests done by PSNC**
- **Tested as a L2 switch**
- **Many thanks to Cisco for loan of this switch**

C4948-10GE – the testbed



C4948-10GE – the results

Forwarding rate on 10/100/1000Mbps ports	✓ ok
Autosensing on 10/100/1000Mbps ports	✓ ok
Autonegotiation on on 10/100/1000Mbps ports	✓ ok
Traffic filtering basing on MAC address	○ fail
Traffic filtering basing on IP address	✓ ok
Bandwidth limiting on physical port (in/out)	✓ ok
Bandwidth limiting on vlan on port	○ fail
MAC address limiting on 10/100/1000 ports	✓ ok
MAC address limiting on 10GE ports	○ fail
Frame counters on 10/100/1000 Mbps and 10GE ports	✓ ok
Frame counters from vlan on single port	○ fail
Spanning Tree	✓ ok
L3 routing	✓ ok *

C4948-10GE – the results 1

- Forwarding rate on 10/100/1000Mbps ports
 - ✓ Test result - OK
 - ✓ 10 ports working at 1Gbps were tested. Forwarding speed on all ports - line-rate.
- Autosensing on 10/100/1000Mbps ports
 - ✓ Test result - OK
 - ✓ This feature was tested only between Cisco devices.
- Autonegotiation on on 10/100/1000Mbps ports
 - ✓ Test result - OK
 - ✓ This feature was tested only between Cisco devices.

C4948-10GE – the results 2

- Traffic filtering basing on MAC address

- Test result – FAIL

- Filters doesn't work if Ethernet frame contains IP packet.

!

```
interface GigabitEthernet1/2
switchport access vlan 304
switchport trunk encapsulation dot1q
switchport mode access
mac access-group denyall in
mac access-group denyall out
end
```

- Workaround:

- mac-address-table static 0000.69b1.b83e vlan 100 drop

- this command causes dropping of all the traffic to the destination MAC address

C4948-10GE – the results 3

- Traffic filtering basing on IP address
 - ✓ Test result - OK
 - ✓ Line-rate - without impact on forwarding performance

- Bandwidth limiting on physical port
 - ✓ Test result - OK
 - ✓ Inbound and outbound traffic limitation was tested.
 - ✓ Two access-lists and one aggregate policer needed (IP, noIP traffic)

C4948-10GE – the results 4

- Bandwidth limiting on vlan on port (per port per vlan)
 - Test result - FAIL
 - We tried to limit vlan traffic on a single port.
 - It is possible to limit traffic per vlan, but the traffic will be limited on all ports in vlan.
- MAC address limiting on 10/100/1000 ports
 - ✓ Test result - OK
- MAC address limiting on 10GE ports
 - Test result - FAIL
 - In most cases 10GE port will be used as trunk port. A secure port cannot be a trunk port.

C4948-10GE – the results 5

- Frame counters on 10/100/1000 Mbps and 10GE ports
 - ✓ Test result - OK
- Frame counters from vlan on single port
 - Test result - FAIL
 - It is impossible to count frames sent or received in a given vlan on a given port (trunk mode). It is not possible to get statistical information about traffic sent or received on a single vlan on a 10GE port (no sFlow or similar technology - SPAN/RSPAN is not acceptable on high speed interfaces)
- Spanning Tree
 - ✓ Test result - OK
 - ✓ MST/PVST
- L3 routing
 - ✓ Test result - OK
 - one exception - it is not possible to maintain full BGP table.

C4948-10GE – conclusions

- **No major problems**
- **Throughput – OK**
- **Some minor gaps in functionality**
- **Not tested as L3 router.**

Discussion