

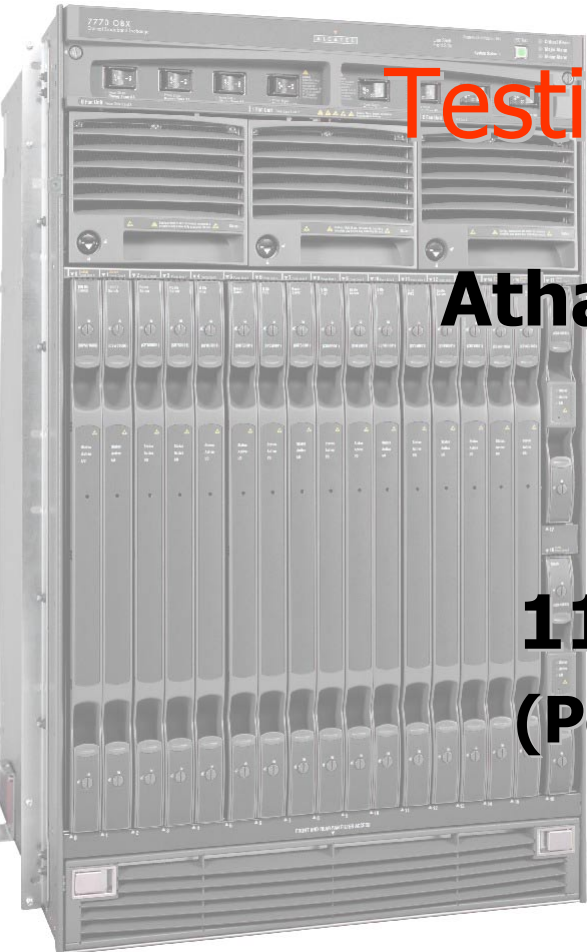
# Testing Alcatel A7770 OBX

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## Disclaimer

- The following presentation ...
  - ... is not a product overview of A7770 OBX but presents some of its interesting, IMHO, features.
  - ... is limited due to a NDA agreement.
- Speaker did not participate to the tests himself.

# Design Objectives\*

- **“BIG/SCALABLE/WIRESPEED/  
CARRIER GRADE”**

# A7770 OBX

Single Shelf: (HxWxD)  
98 x 58 x 60 cm  
38.5 x 23 x 23.6"

Line Cards  
with Distributed Forwarding  
(slots 3 to 12)

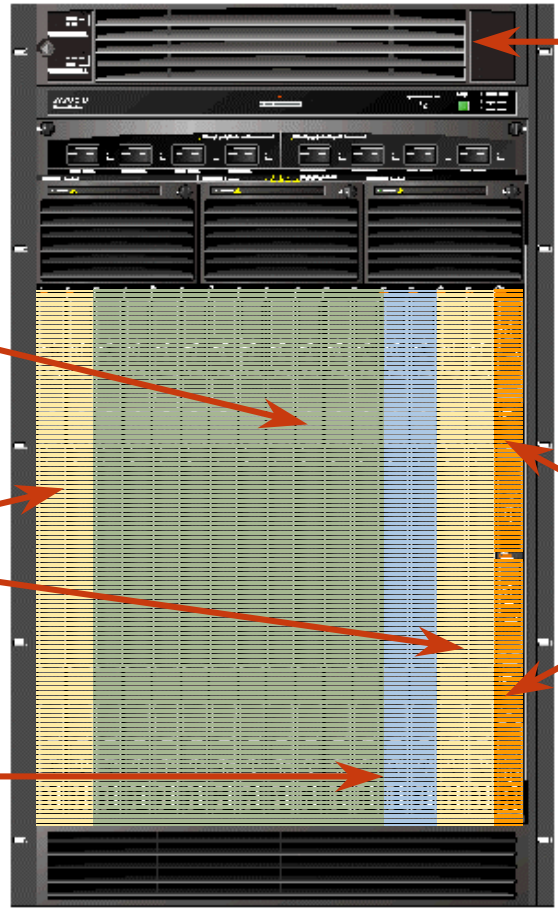
Switching Fabric  
(slots 1, 2, 15 and 16)

Route Server Modules  
(slots 13 and 14)

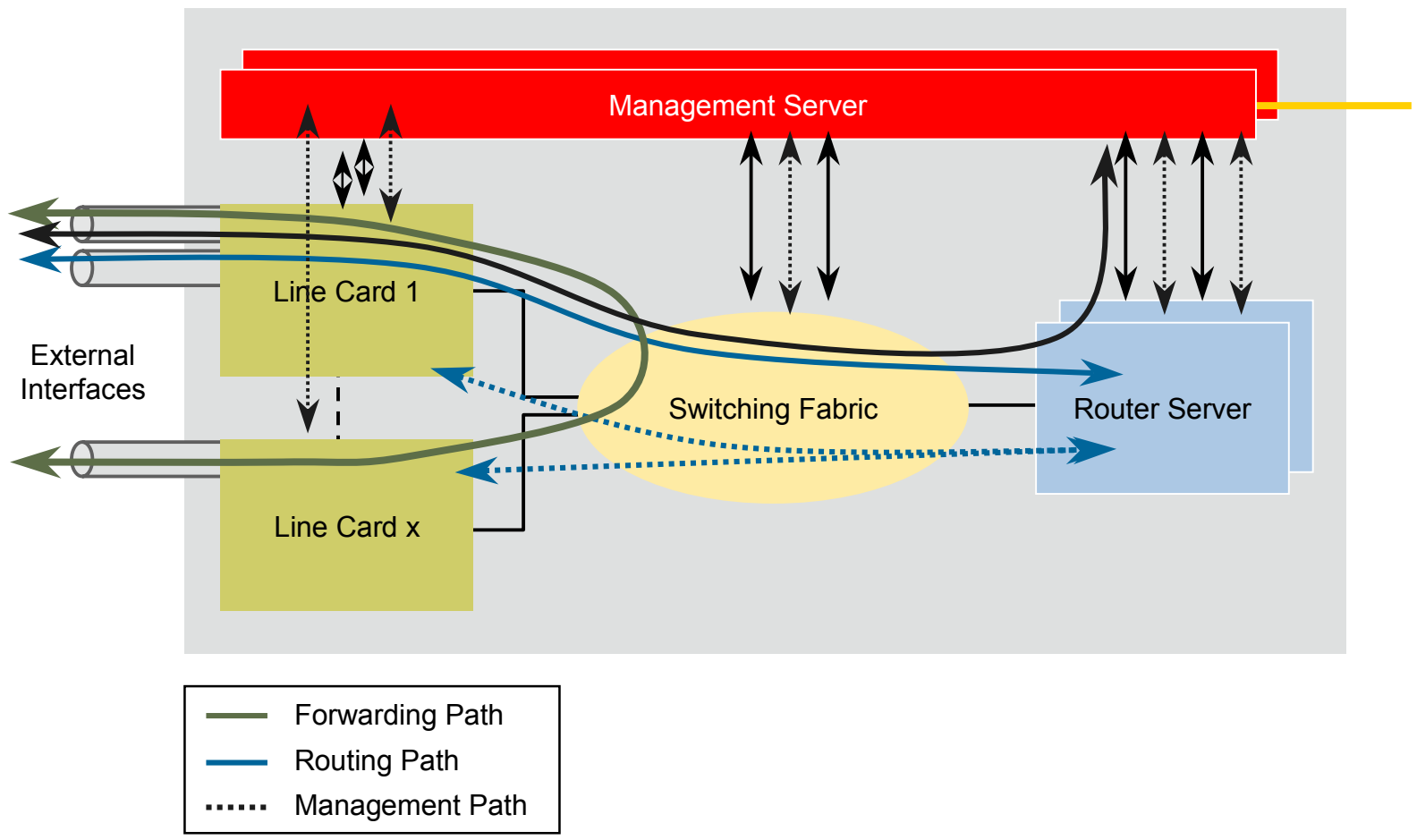
Control Shelf with  
Redundant Management  
Servers

Clock and Synchronization  
Modules

DC Powered  
NEBS Level 3 Compliant



# Architecture\*



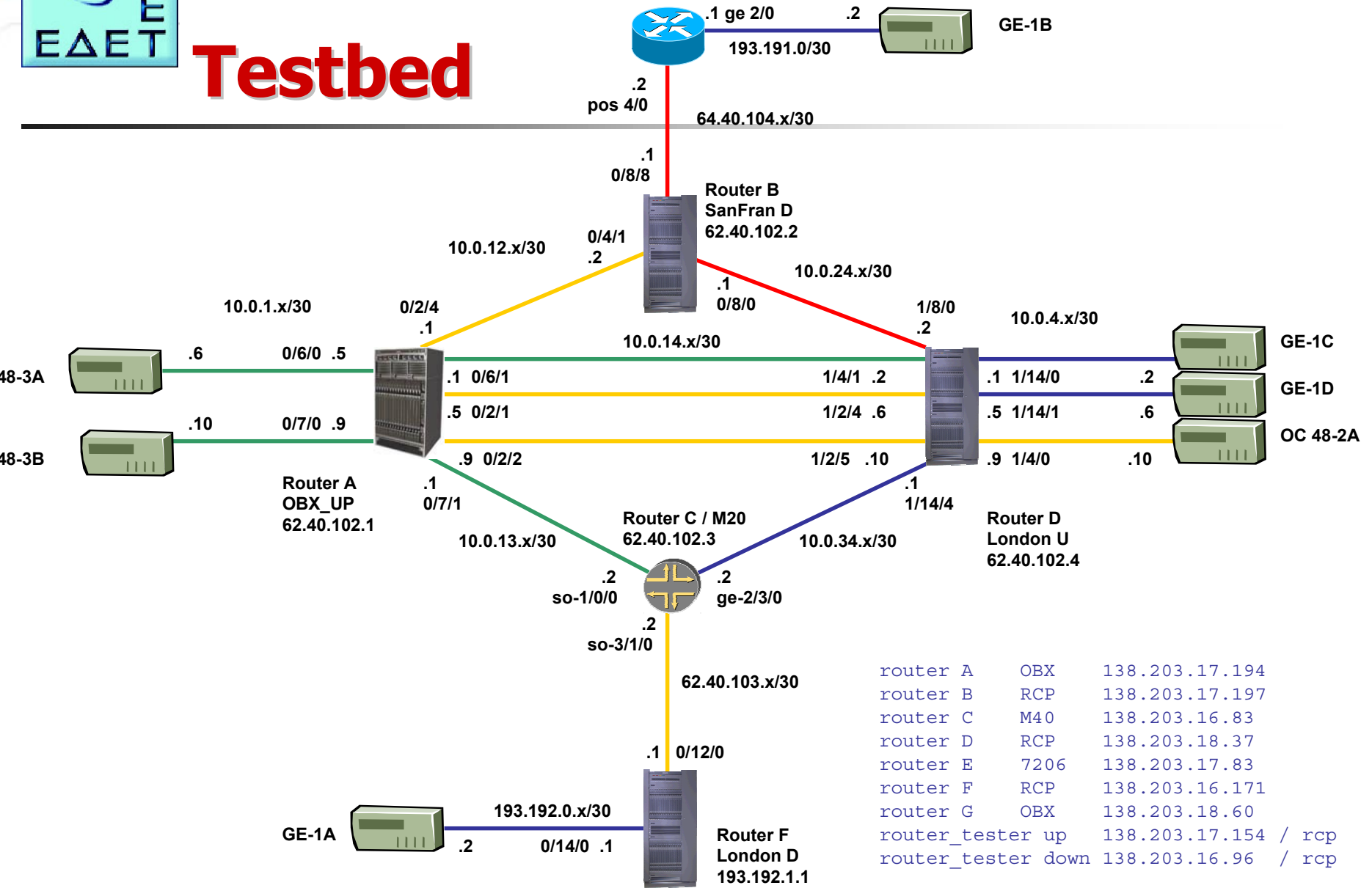
## Logistics ...

- Testing event was hosted by Alcatel at its premises in Antwerp, 24-28 March 2003
- Participating members: DANTE, GRNET
- Multi-vendor lab (Cisco 7206, Juniper M20), traffic generators, protocol analyser, etc

# Objectives

- Acquaintance with the router architecture, design principles, advanced functionality
- Test basic functionality, such as routing, QoS features and management
- Interoperability tests with other vendors routers
- Gain hands-on experience

# Testbed



# Performance

- “Pure” IPv4 packet forwarding in line rate was achieved.
  - GigE interfaces
    - 890Kpps (714Mbps) – 100bytes/packet
    - 81Kpps (975Mbps) – 1500bytes/packet
- Increased startup latency\*\*
  - Calculate the bandwidth of a pipe
    - Parameters: queue length, scheduling rate, arrival rate of packets

## IS-IS

- Basic ISIS configuration between different vendor routers
  - check adjacencies, databases, metrics
- Measure convergence time with different metrics
- Route redistribution of static routes with specific metric
- LSP and Hello Authentication (MD5)
- *Similar tests were performed with OSPF\*\**

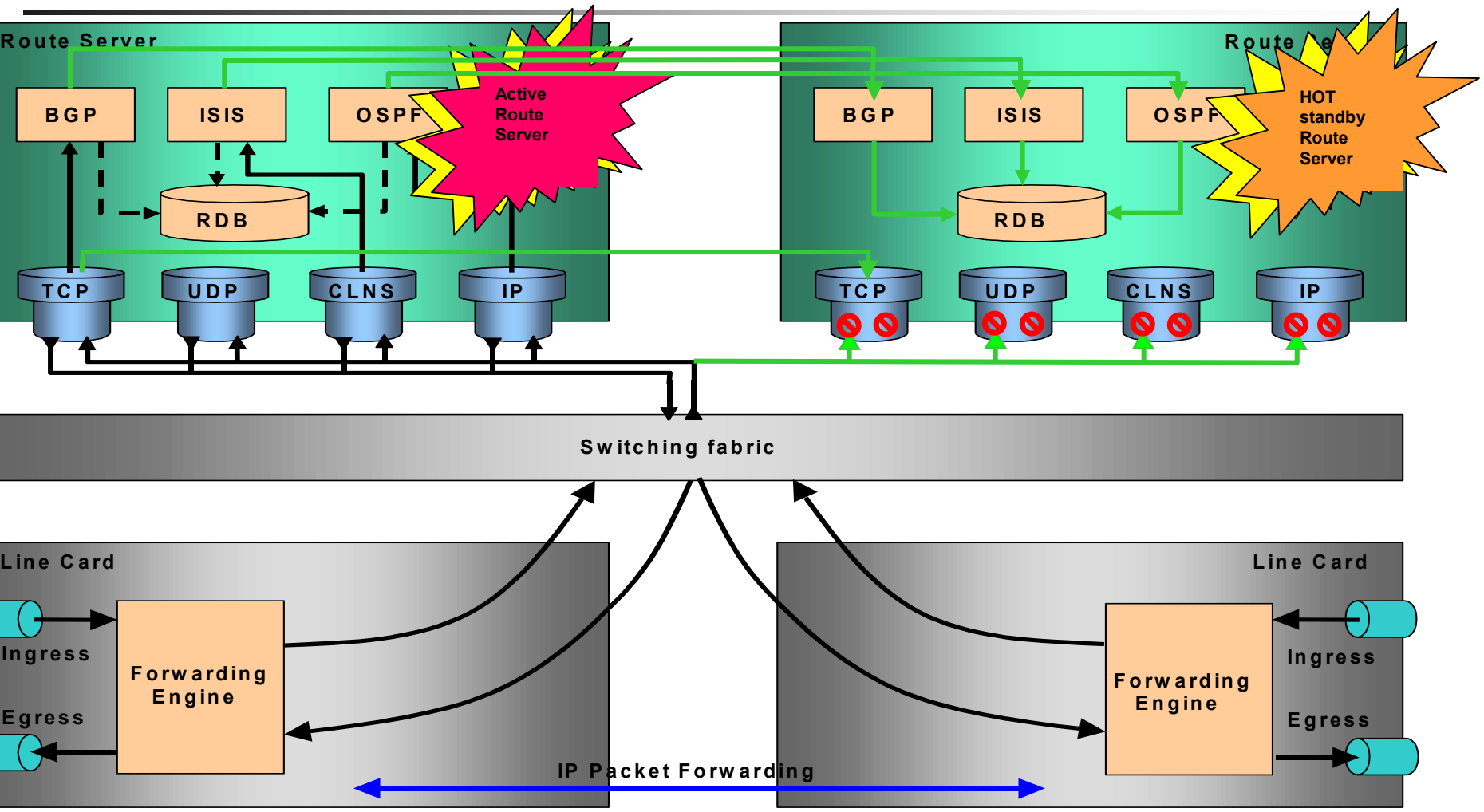
# BGP

- Basic configuration between different vendor routers
  - check adjacencies, database, route selection
- Authentication – MD5
- Communities
- Route filtering & route redistribution static routes
- Convergence time – Max FIB size
  - Successful tests with 100k, 300k routes but not with 500k routes (some configuration changes is required).
- *Flap dampening, Route Reflector\*\**

# Management

- Support SNMP v1,v2,v3
- Routers may be fully managed by SNMP, apart from CLI
- Configuration output in XML
- Some improvements are required in the CLI interfaces, e.g. no "include" or "less" command
- Syslogs, user-configured alarms supported
- RSH not available yet
- Radius but not tacacs

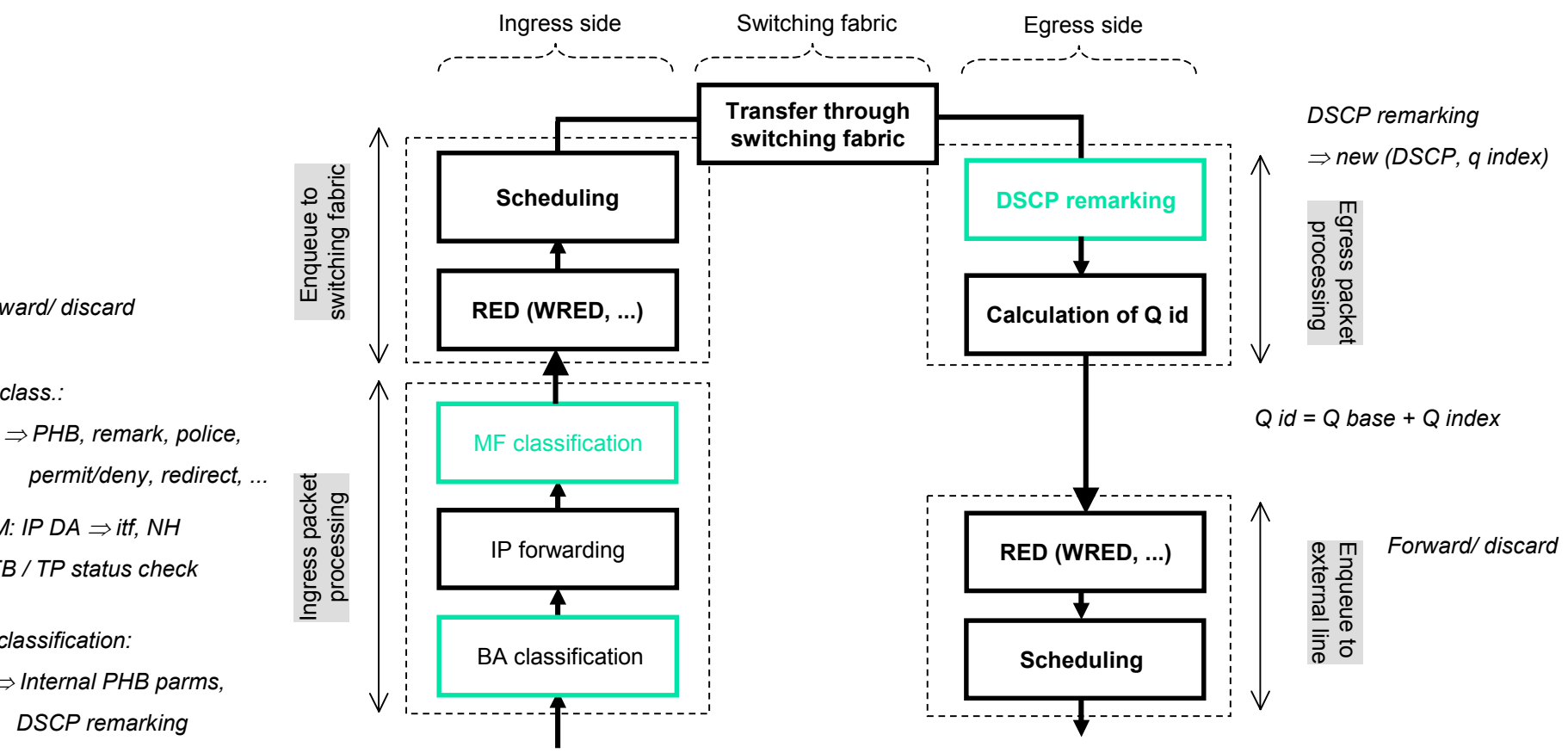
# Availability\*



# Redundancy

- Redundancy in software
  - Modular OS, different software modules for BGP, IGP, SNMP, line cards
- Simplex / Duplex operation

# QoS mechanisms\*



# QoS functionality\*

- MF classification
  - Input key is a 144-bit pattern composed of multiple fields in the packet
    - ingress context, egress context
    - key fields can be specified as value/ mask pairs, ranges or wildcards
  - Each MF classification “rule” consist of multiple “basic rules”. Up to 4000 basic rules are supported in hardware

Dst IP addr	Src IP addr	Prot- ocol	Dest Port	Src Port	In TOS	TCP Flgs	In Cxt	Out Cxt	DiffServ, MPLS,...
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# QoS functionality

- Main filter actions\*
  - permit/deny, redirection to control point, redirect to LSP, DSCP remark, policing (leaky bucket meters with selectable parameters and algorithms), count packets
- Tests with 12 queues
  - BE, AF1, AF2, ...EF.
- Tests with GEANT service classes
  - Implement Premium IP, BE, LBE, DWS

## IPv6 functionality

- Demo version tested, as IPv6 is not officially supported.
  - ISIS, BGP+ in experimental stage, OSPFv3 not currently supported
- “Pure” packet forwarding in line rate was achieved without MF classification
- No other testing performed

## Not tested ...

- Multicast, e.g. MBGP, PIM-SM, etc
- MPLS functionality, e.g. MPLS VPNs, Traffic Engineering
- Accounting, e.g. Netflow

# A7770 OBX Roadmap

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- Protected with NDA