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# Management and DCN

**Dark fibre workshop, Copenhagen 02.03.2007**



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Management

DCN

# Management

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- Current setup
  - 4 servers (HP-UX rp3440)
  - 4 applications
  - 100 Mb of PDF
  - 2 OSI/IS-IS/CLNS routers
  
- Only  $\approx$  60 network elements

WHATS GOING ON?

# Applications

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- EMS – Element Management System
  - Corrective maintenance
  - Equipment provisioning
  - Transmission/Synchronization provisioning
  - Performance Monitoring (PM)
  - Network Supervision and Administration
  - System Administration

# Applications

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- NMS – Network Management System
  - Remote supervision and control of network and circuits carrying traffic (including monitoring, preventive maintenance, fault detection and localization to help field maintenance staff) with advanced path management including "point-and click" centralized path provisioning across complex network topologies
  - Network and system administration (performance monitoring data management for higher service quality, network inventory data management for planning activity, service information)

# Applications

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- Data Service Manager
  - Ethernet management of Transport Service Switch (TSS)
  - Quality of Service, traffic classification, Metro Ethernet Forum alignment enhancements management
  - Remote supervision and control of network and lines carrying data traffic (including monitoring, preventive maintenance, fault detection and localization to help field maintenance staff) with advanced data management including "point-and click" centralized provisioning across complex packet network topologies
  - Network and system administration (performance monitoring data management for higher service quality, network inventory data management for planning activity, service information)

# Applications

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- High Availability – Geographical redundancy
  - The Product is based on 1+1 active-standby paradigm, in that a replica system - a 100% redundant remote system - is remotely backing up the Network Operation Center (NOC).
  - OS Resilience can be operated to cope with from full automatic to manual only operation mode; automatism can be enabled or permanently disabled at installation time.
  - The resilient configuration represents also a plus for NORDUnet, because of the availability of extra-servers for maintenance.

# Management

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- Organisation
  - Server administrator
  - Application administrator
  - Super users from a transmission point of view
  - Regular users

# DCN

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- **DCN - Data Communication Network**
  - **CLNS - Connectionless Network Service.**
  - **CLNP - Connectionless Network Protocol**
  - **IS-IS - Intermediate System to Intermediate System**
  - **NSAP - Network Service Access Point**

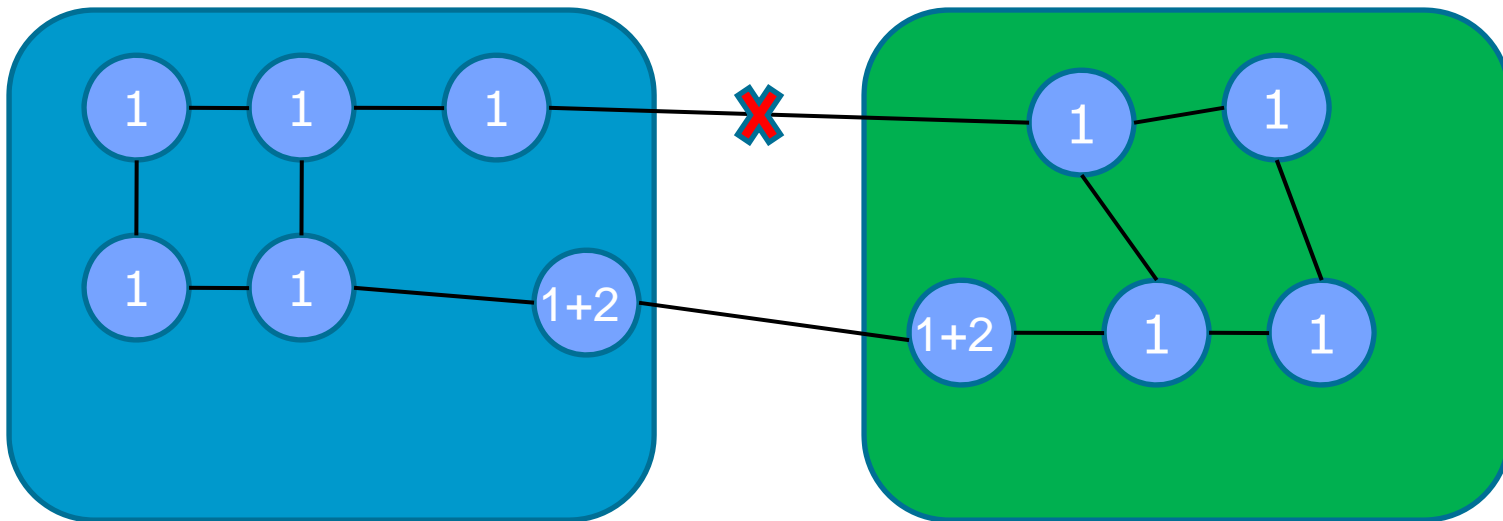
# DCN

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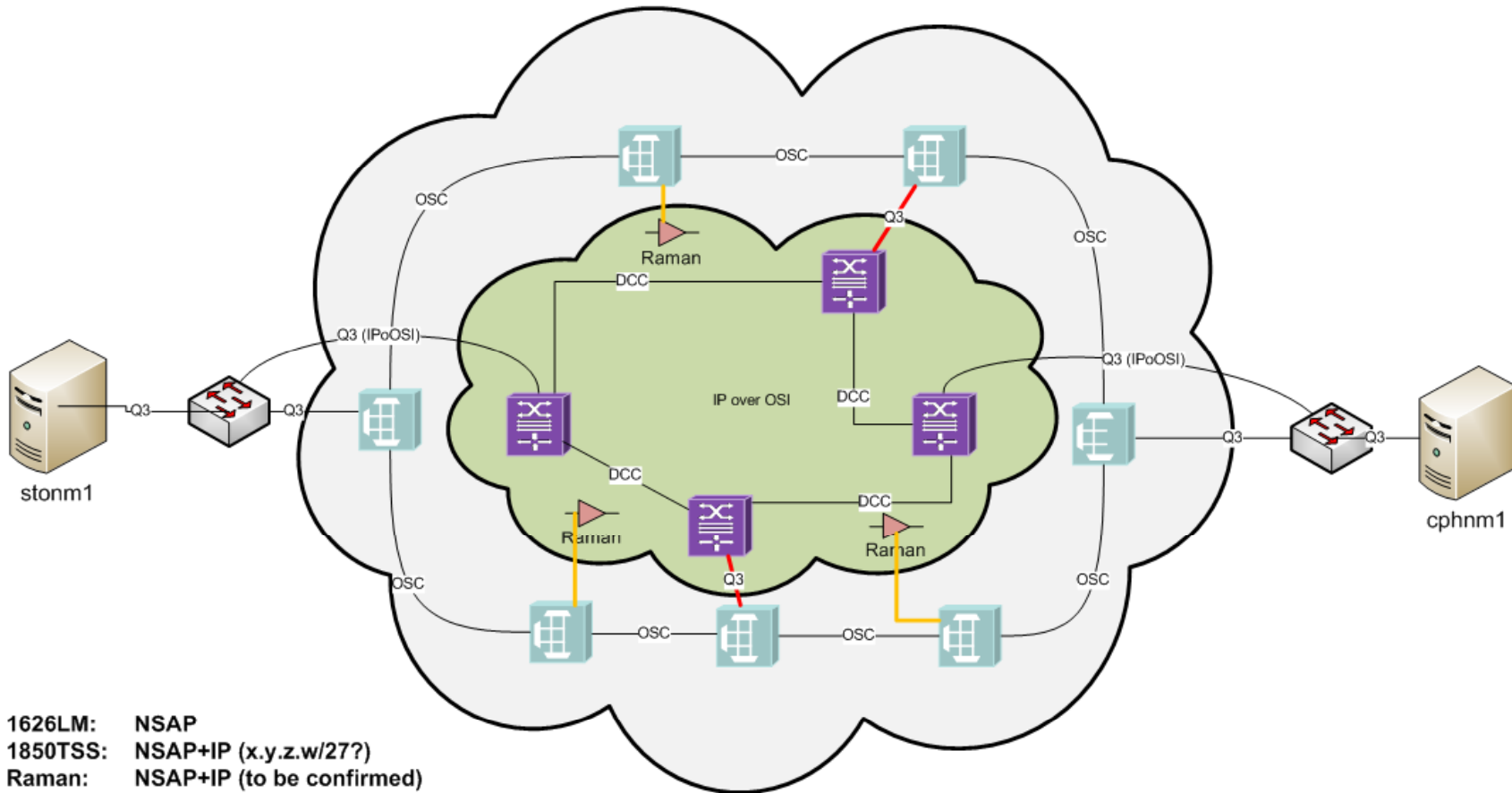
- “Plug and play” but dangerous
- The network is self discovering through IS-IS which is a link-state routing protocol, meaning that it operates by reliably flooding topology information throughout a network of routers. Each router then independently builds a picture of the network's topology. Packets or datagrams are forwarded based on the best topological path through the network to the destination.
- Trivial scenario results in a full mesh routing table

# DCN

- Building "large" networks 60 – 1000 NEs requires control of the routing table size. (large is vendor specific!)
- Split the network in areas
  - Level 1 routers intra-area
  - Level 2 routers interarea
  - Level 1+2 routers



— ONE AREA: 47.0023.0000.0001.0001.0001  
 70+ nodes all running L1 OSI routing



1626LM: NSAP  
 1850TSS: NSAP+IP (x.y.z.w/27?)  
 Raman: NSAP+IP (to be confirmed)

1850TSS uses a combination of NSAP and IP in order to manage both SDH and Ethernet part of the NE. The IP is by default encapsulated in OSI, thus handled by the surrounding OSI network – adding resilience ect. (1850 tech handbook DATA p.57-61) The communication from the NM is handled by an "internal" ip-port which isn't accesible from the general management/ip net. It could be considered to use RFC 1918 addresses in this instance as the 1850TSS never should be reachable from anything than the NM's!

It is expected that the Raman's behave the same way, Alcatel just mentioned that they needed an IP as well!

