
ASON/GMPLS Field Tests at Verizon

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OTN Control Plane (CP) Outline

- ◆ **Field Trial – Key Objectives**
 - Evaluate maturity of technology
 - Develop operation experience
- ◆ **Key Capabilities**
- ◆ **OTN Platforms with CP capabilities**
- ◆ **CP and BoD Provisioning**
- ◆ **Gaps**
- ◆ **Summary**

OTN Control Plane

Key Capabilities

■ **Auto-Discovery & Self-Inventory**

- High quality DBs for attributes on nodes/links/ports, network topology, and services across the network

■ **Dynamic Provisioning and Service Activation**

- Fast end-to-end circuit design based on real-time resource map
- Fast circuit provisioning and service activation via user-network signaling or customer service portals

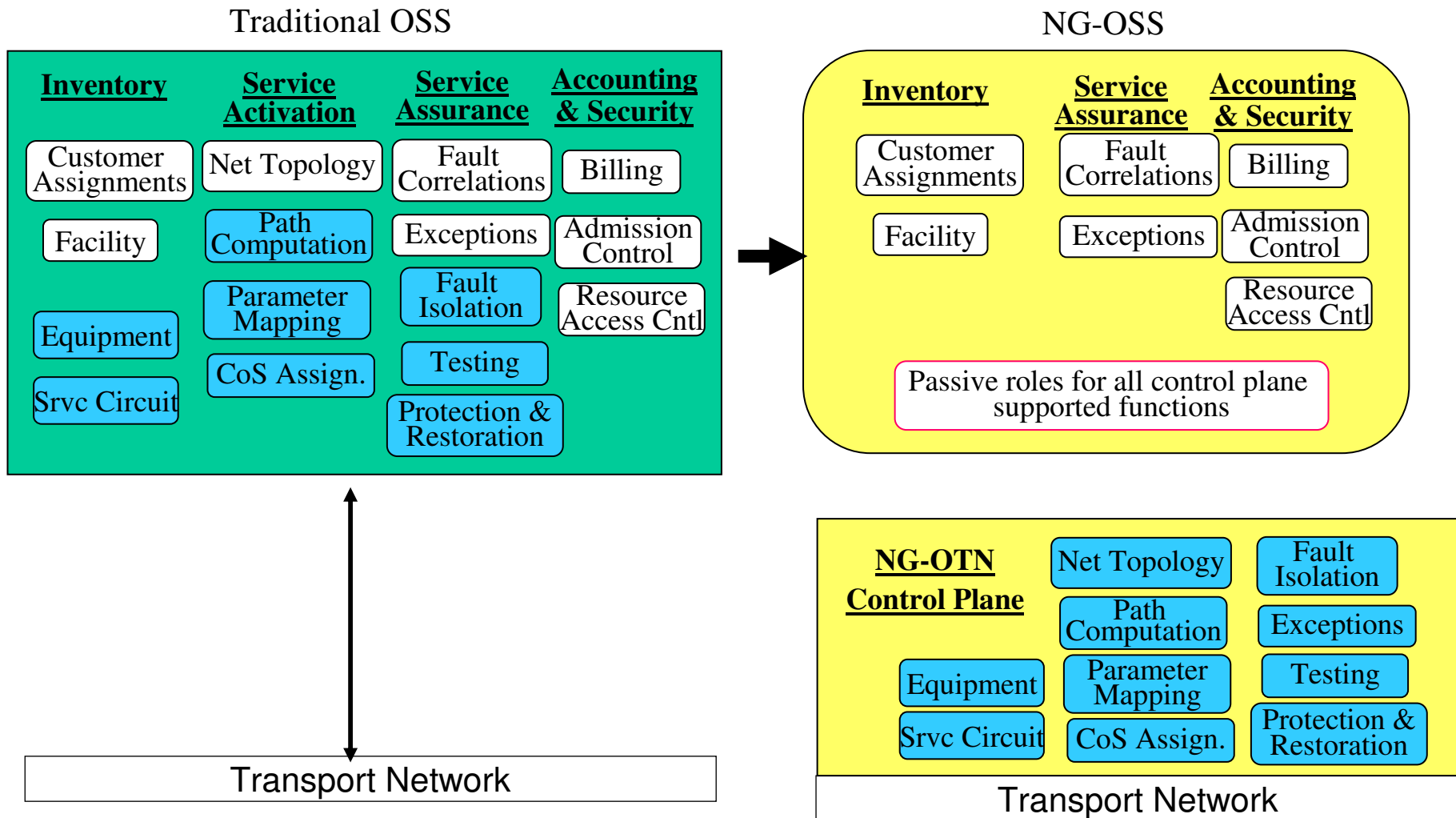
■ **Traffic Engineering**

- Improved routing efficiency and resource utilization
- Rapid service configuration adjustment

■ **Protection & Restoration (P&R) for Mesh**

- Improving network resilience and supporting COS (class of service)
- Offering additional P&R options besides traditional UPSR and BLSR rings

OTN Control Plane Component OSS Simplification



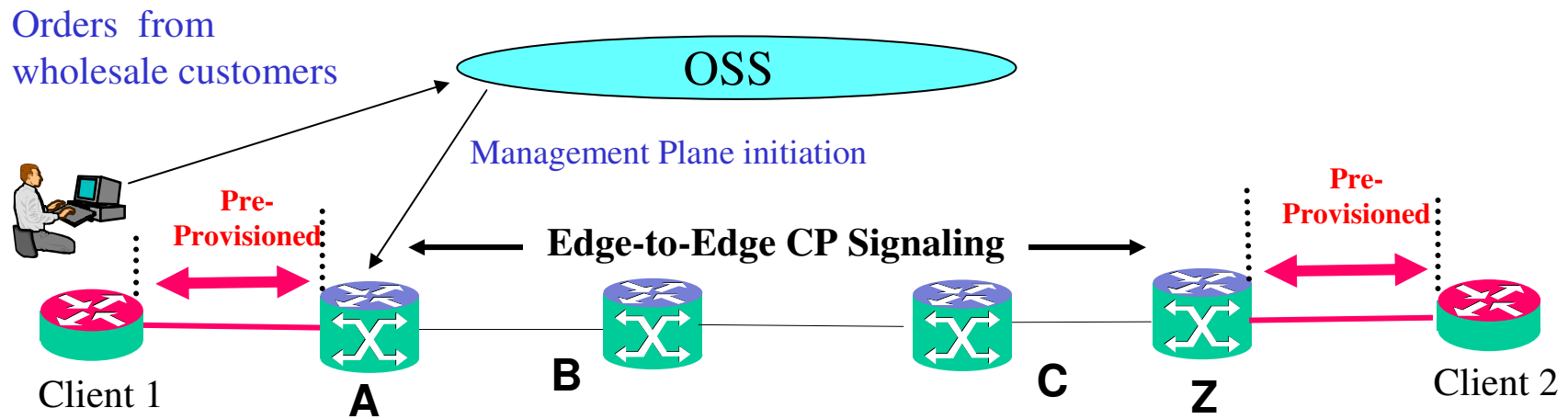
OTN Control Plane Application BoD 'Just-in-Time' (JiT) Provisioning

- **DS-3, OC-n and Ethernet private line services**
 - **Standard Access Request (ASR) process for new services, changes and removals**
 - **Within a selected MSA**
- **Objectives**
 - **Reduced provisioning intervals (Minutes)**
 - **Leverage OTN control plane intelligence**
 - **Simplified provisioning process**
 - **Distributed processing by NEs**

OTN Control Plane for BoD

Soft Permanent Connection

Soft Permanent Connection (SPC) – Initiated by management plane action

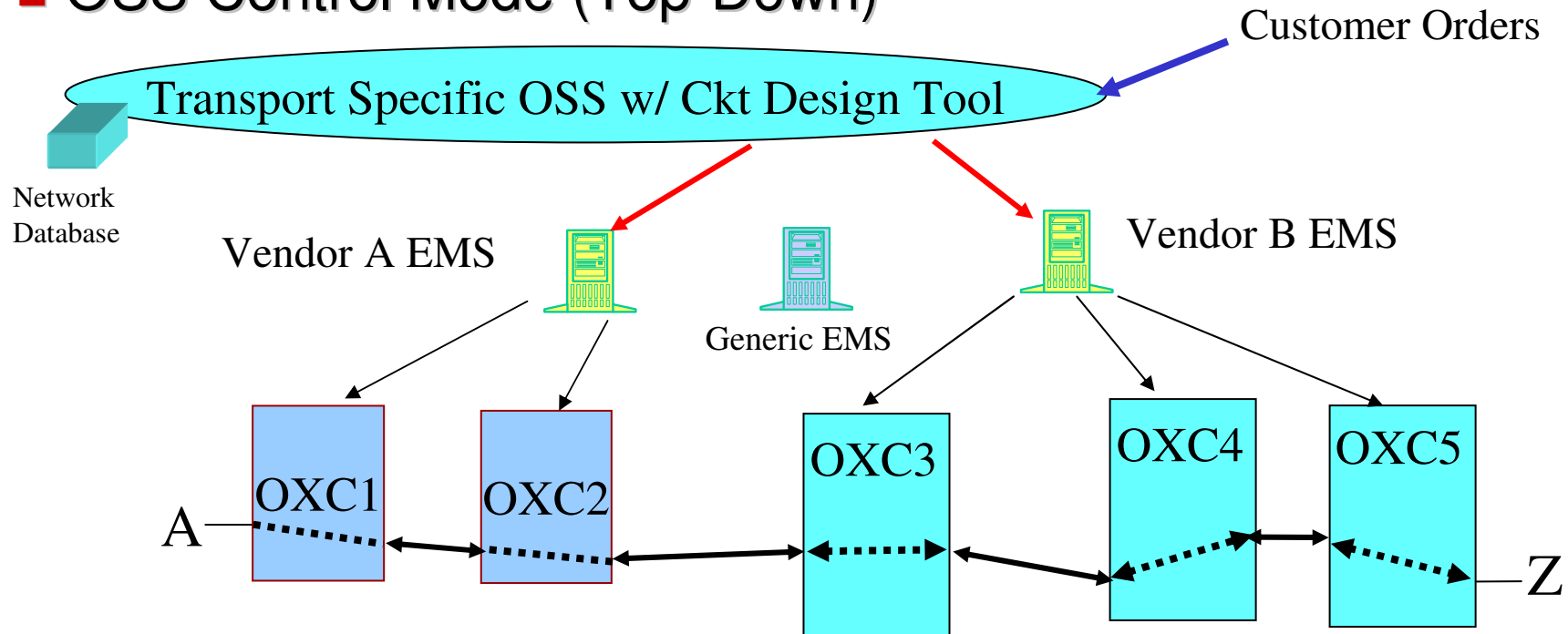


A Soft Permanent Connection

JiT Provisioning

Approach 1 – Traditional Flow-Thru

■ OSS Control Mode (Top-Down)

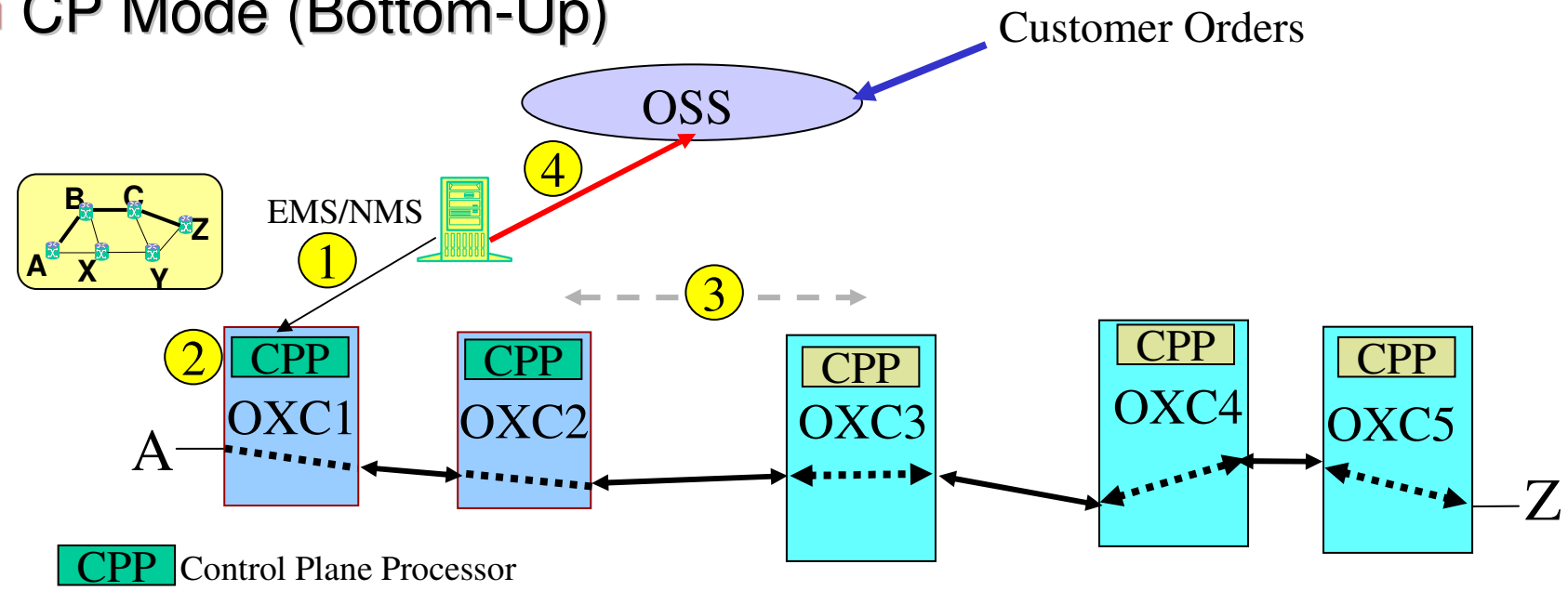


- Create network-wide databases at OSS
- Provisioning staffs provide end points A and Z to OSS.
- OSS design tool consults databases and comes up with a circuit design.
- OSS passes the design to the vendors' EMS to provision the circuit A-Z by configuring each NE individually.

JiT Provisioning

Approach 2 – Control Plane Based

■ CP Mode (Bottom-Up)



- (1) Either OSS or EMS/NMS sends a service request to A's access node(OXC1) with point A and point Z address info.
- (2) The CPP in OXC1 designs the A-Z circuit (i.e., an explicit route) using the network topology and resource databases.
- (3) The CPP in OXC1 triggers a signaling process to downstream nodes according to the circuit design
- (4) Upon completion of circuit setup, EMS/NMS report status and path info to OSS.



Vendor Roadmap (example)

Platforms										
Control Plane										
I-NNI (GA date)	2Q07	★	Unknown	Proxy	Unknown	★	Unknown	★	★	Proxy
E-NNI (GA date)	2Q07	Unknown	Unknown	Proxy	Unknown	Nov 06	Unknown	2007	Unknown	Proxy
UNI (GA date)	2Q07	Unknown	★	Proxy	Unknown	★	Unknown	2007	Unknown	Proxy

★ GA: Now

Gaps

- ◆ **Vendor control plane roadmap plans**
- ◆ **Status of standards and industry**
- ◆ **OSS support and systems solutions**
- ◆ **Paradigm shift**
 - Process change
 - Change in network design philosophy
 - Change in engineering & capacity planning
- ◆ **Training and education**

Summary

- ◆ **CP simplifies and automates many OSS process**
- ◆ **Enables Verizon to provide new bandwidth services expeditiously**
- ◆ **CP Technology is available from many vendors**