Cost Structures of Transport Networks

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29. September 2003
Networkshop 2003 in Gladbeck

Agenda

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• Overview of ASON/ASTN
  • Network Model and Interfaces
  • Control Plane Architecture
  • Functions of the Control Plane
• Value Chain und Value System [M. E. Porter]
• Network Operators’ Value Chain
• New Business Opportunities with ASON/ASTN
• Conclusion

ASON Automatic Switched Optical Network
ASTN Automatic Switched Transport Network
Motivation

- **Today’s typical path setup**
  - Connection ordering per telephone or fax
  - Negotiation of connection parameter
  - Leasing of bandwidth necessary?
  - Manual connection setup (patch-panel)
  - Verifying the connection parameter

- **Optical path setup in the future**
  - Introduction of ASON/ASTN (ITU)
  - Connection ordering and negotiation per UNI
  - Network interworking with I-NNI and E-NNI
  - Automatic connection setup by control plane
  - Customer ‘controls’ his connection on his own
  - Reduction of OPEX and CAPEX

⇒ Fast and flexible

Overview of ASON/ASTN

Network Model and Interfaces
Overview of ASON/ASTN

Control Plane Architecture

Management Plane
Centralized Network
Management

Control Plane
Distributed functionality
controlling the Network

Transport Plane
Data transmission
and -switching

User
Controller
Network
Controller
Router
Crossconnect

Overview of ASON/ASTN

Functions of the Control Plane

Inventory and Resource Management

1. Neighbor Discovery
2. Global Topology Dissemination

Management Plane

Control Plane

Transport Plane

Dynamic Provisioning

3. Signaling for Connection Provisioning
4. Routing (Path Calculation)

Resilience

5. Fault Localization
6. Distributed Recovery
Value Chain und Value System [M. E. Porter]

Value chain

Support Activities
- Firm Infrastructure
- Human Resource Management
- Technology Development
- Procurement
- Inbound Logistics
- Operations
- Outbound Logistics
- Marketing & Sales
- Service

Value system

Bandwidth (e.g. SDH or Packet)
- Customer / Retailer
- Carrier
- Transport Network Operator
- e.g. Fibers

Network Operators’ Value Chain

Support Activities
- Firm Infrastructure
- Human Resource Management
- Technology Development
- Procurement

Primary Activities
- Inbound Logistics
- Operations
- Outbound Logistics
- Marketing & Sales
- Service

Improved fault tolerance
- Automating the provisioning process
- Automating the delivering process
- Simplification of the sales
- Reducing storage costs
- Automating the procurement process
- Lower Capital expenditure (CAPEX)
- Lower Operation expenditure (OPEX)
- New Services: e.g.: Bandwidth on Demand Bandwidth brokerage
New Business Opportunities with ASON/ASTN

- Service-on-demand
  => Competitive advantages

- Virtual companies
  Synergetic coexistence of several companies forming an integrated value system
  Possibility for covering novel or geographically distinct market segments.
New Business Opportunities with ASON/ASTN

• Service-on-demand
• Virtual companies
• End-to-end Layer-1 Virtual Private Networking
  • secure and transparent connection with guaranteed QoS
  • e.g. OVPN

Conclusion

• ASON/ASTN simplifies the operating of Transport Networks
  ⇒ Acceleration of bandwidth procurement and delivery
  ⇒ Cost reduction in OPEX and CAPEX
• Value chain analysis identifies the improvement points for a network operator
• New Business Opportunities are available with the introduction of ASON/ASTN
• Further research, development and standardisation is necessary