
Manageability for Connectionless Network of NGN : Concept, Modeling and Application

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- **The problem of manageability for connectionless network**
 - **The revelation for management information model based on connection**
 - **Generic connectionless network information models**
 - **Application**

The problem of manageability for connectionless network

- NGN: network/service evolutions

- IP: an important part of NGN

- Challenge

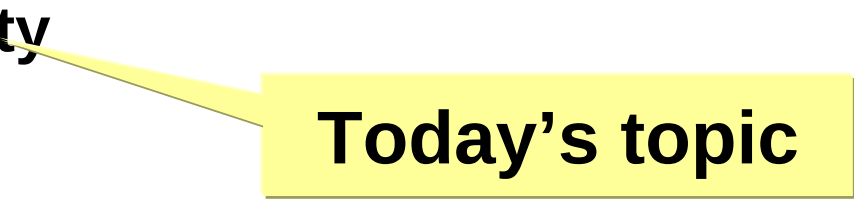
- Manageability

- Security

- Availability

- QoS

- -----



Today's topic

The problem of manageability for connectionless network

■ Problem?

- Many problems
- Which one is
 - Foundational
 - Basic
 - Key

■ Foundation challenge and opportunities

- Theoretical underpinnings
- Measurement, analysis and modeling
 - GENI Research Plan V4.5 (April 23, 2007)

The problem of manageability for connectionless network

■ Manageability

- Goal: Manageability of telecommunication level
- Example: Manageability of transport network in telecommunication

■ Foundation challenge and opportunities

- model
- modeling

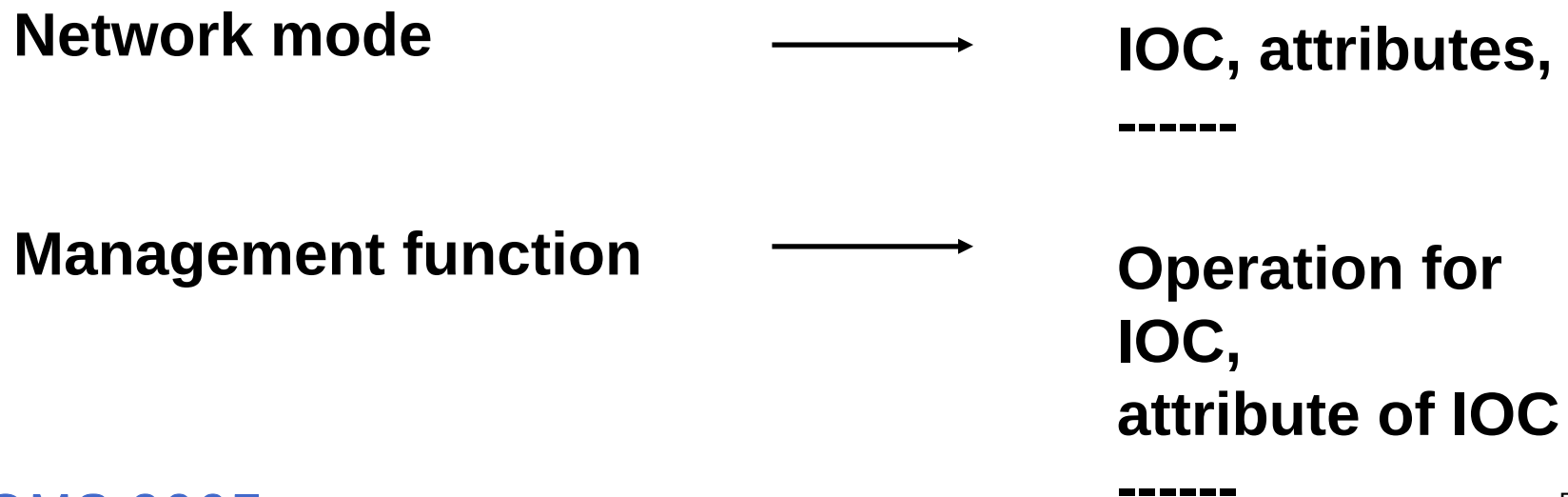
■ Revelation for model and modeling

- Manageability of Transport network in telecommunication
- Why?
- How?

The revelation for management information model based on connection

■ modeling for management information model based on connection

- Network modeling
- Management information modeling



■ Network modeling(1)

- Connection
- terminationPoint
- connectionTerminationPoint
- link linkTerminationPoint
- trail trailTerminationPoint
- subnetwork

■ Network modeling(2)

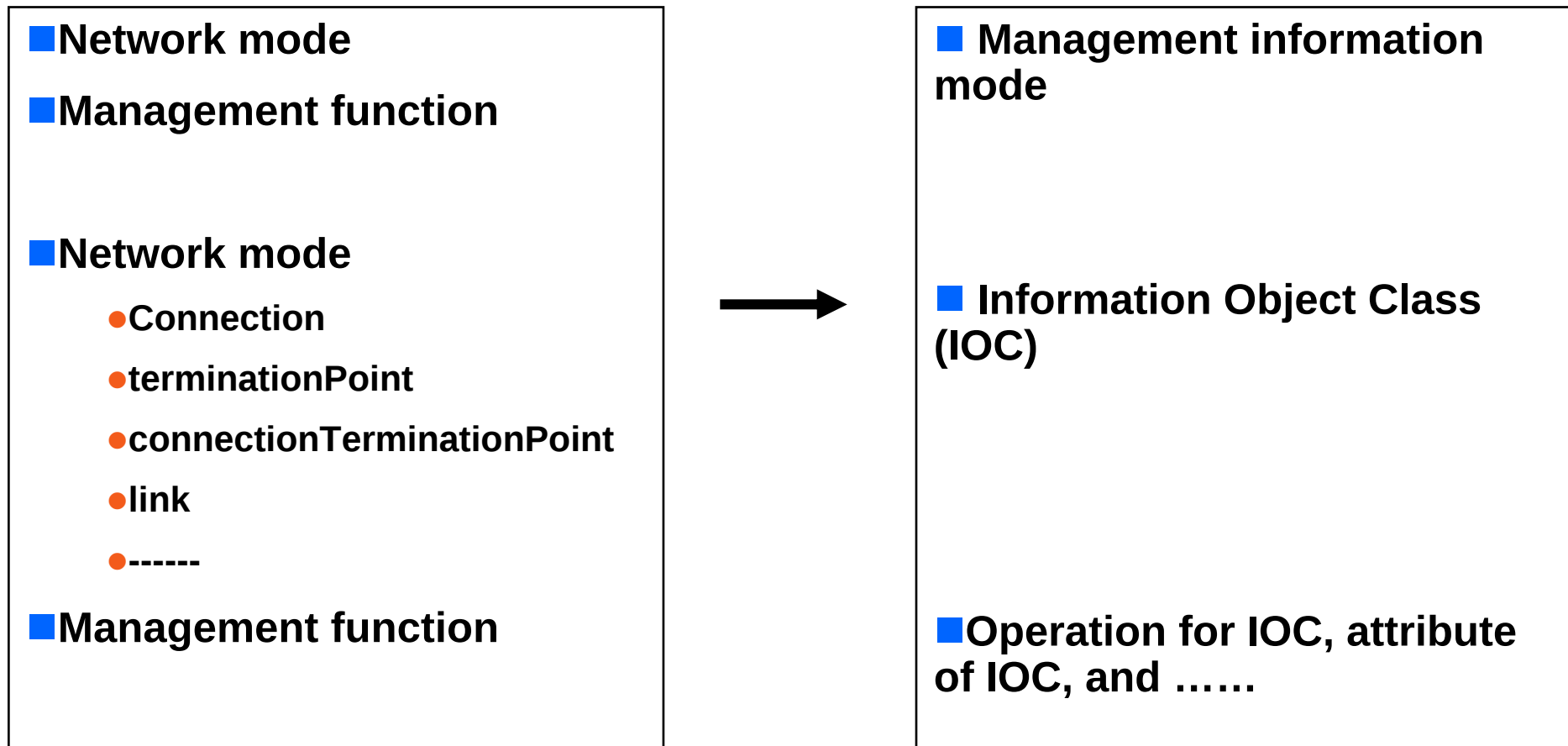
- **subnetwork**

- **subnetworkConnection**
- **subnetworkConnectionTerminationPoint**
- **subnetworkLink**
- **subnetworkLinkTerminationPoint**
- **subnetworkTrail**
- **subnetworktrailTerminationPoint**

- **layernetwork**

The revelation for management information model based on connection

management information modeling



■ Characteristics of management information mode

- Neutral technology
- Scalability
 - horizontal Scalability subnetwork
 - vertical Scalability layernetwork
- base of system development
 - Network management Interface
 - Network management system

The revelation for management information model based on connection

■ revelation

- manageability
- modeling
- model
- management information model
- network model
- **connection**



Foundation

The revelation for management information model based on connection

■ revelation for connectionless network

- manageability
- modeling
- model
- management information model
- network model
- **Connection?**

Foundation problem

■ Foundation challenge and opportunities

“connection” in connectionless network

Generic connectionless network information models

- **Flow**
 - **An aggregation of one or more traffic units with an element of common routing.**
- ITU-T G.809**
- **“connection” in connectionless network**

Generic connectionless network information models

- A flow has the following properties (**ITU-T G.809**) :
 - it is a unidirectional entity;
 - a flow can contain another flow. This is recursive until, for example, the limit of a single traffic unit is reached;
 - flows can be multiplexed together in the same layer network;
 - flows can be multiplexed together as part of adaptation to a server layer network;
 - a flow can be associated with one or more topological entities;
 - a flow can be defined in terms of a parameter such as its characteristic information, the address to which traffic units are directed or the address the traffic units have come from;
 - the aggregation of traffic units may be spatial or temporal.

■ Flow

- “connection” in connectionless network
- Flow
- FlowPointPoolLink
 - represents the topological relationship and available capacity between a pair of flow domains, or a flow domain and an access group, or a pair of access groups.
- ConnectionlessTrail
 - represents the transfer of monitored adapted characteristic information of the client layer network between connectionless trail termination points.

- **FlowPointSource**
- **FlowPointSink**
- **FlowTerminationPointSink**
- **FlowTerminationPointSource**
- **FlowDomain**
- **FlowDomainFragment**
- **LayerNetworkDomain**
- **ConnecitnolessPoint**

Generic connectionless network information models

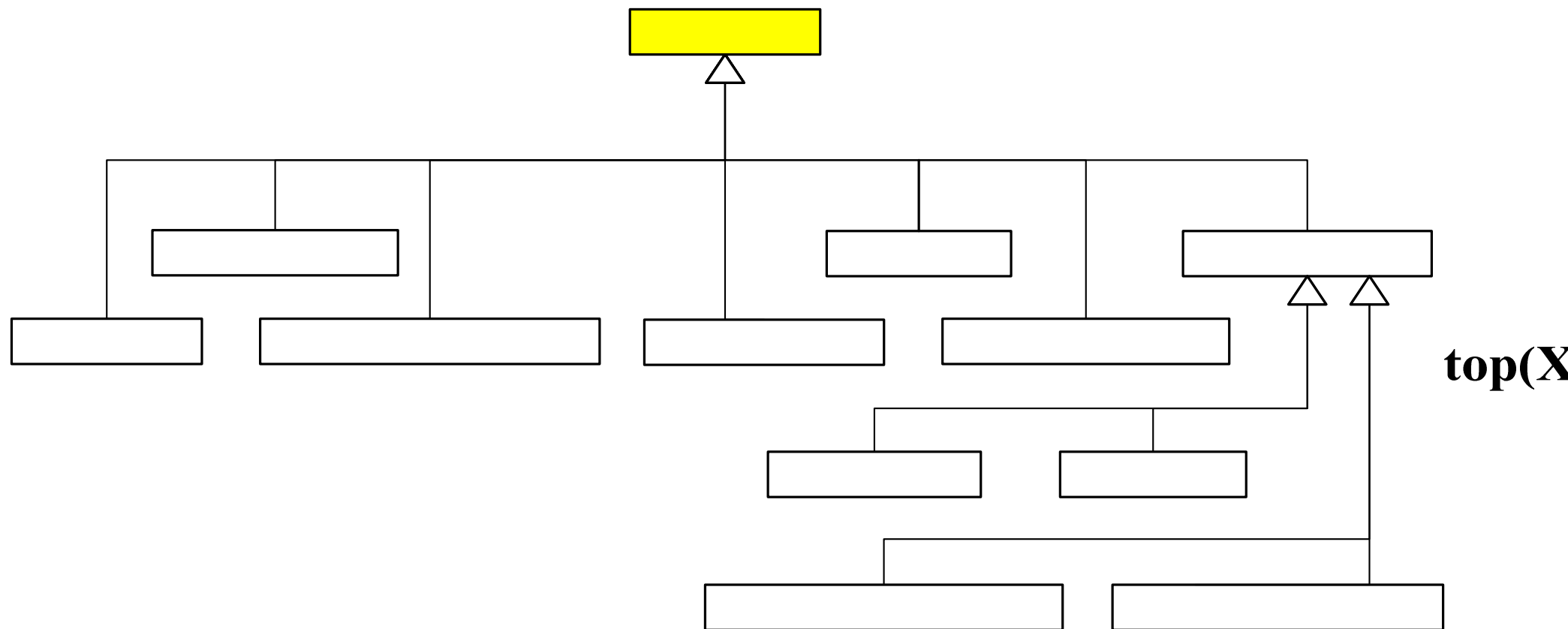
Link	FlowPointPoolLink
Unidirectional connection point	FlowPointSource FlowPointSink
Trail	ConnectionlessTrail
Trail termination sink	FlowTerminationPointSink
Trail termination source	FlowTerminationPointSource
Subnetwork	FlowDomain
Subnetwork connection	FlowDomainFragment
Layer network	LayerNetworkDomain
Network Termination Point	ConnecitnolessPoint

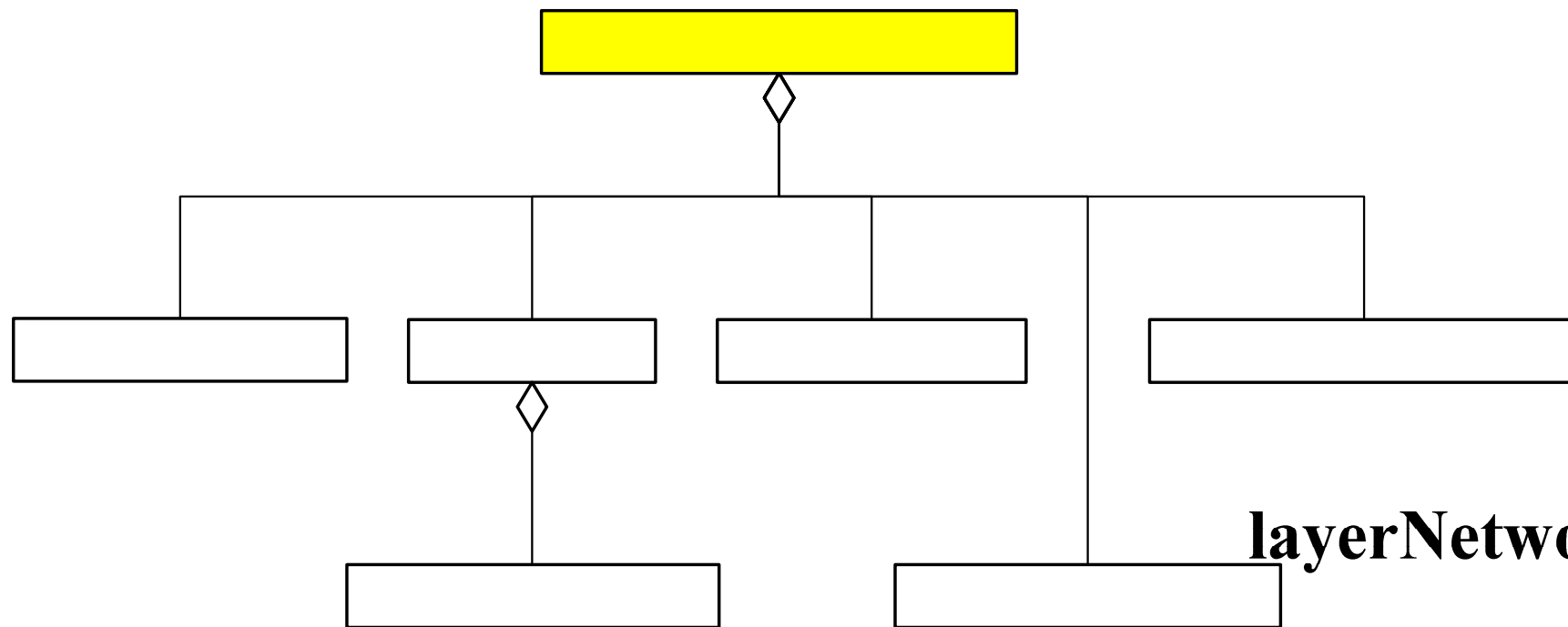
■ Application

- ITU-T Q.838.1, 2004,
Requirements and Analysis for
the Management Interface of
Ethernet Passive Optical
Networks
- ITU-T M.3100-neutral (draft),
2007, Generic connectionless
network information model

**BUPT's
contribution**

**BUPT's
contribution**





Containment Diagram for the network View

(M.3100-neutral (draft))

Thank you.

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