

Standardization of B-PON OSS-IF

- Report of FSAN OAM-WG activities -

APNOMS2003 in Fukuoka
October 3rd, 2003

NTT

Access Network Service Systems
Laboratories

Kenji Nakanishi

nakanisi@ansl.ntt.co.jp

NTT-AT

Transport Network Division

Tatsuhiko Yoshida

tyoshida@trans.ntt-at.co.jp

Intents of standardization

APNOMS2003

Internationally standardized specifications
(ex. ITU-T Recommendations)



Operators can purchase equipments
from any vendors
↳ reduction of investment

Vendors can sell equipments
to any operators
↳ reduction of risk



Cost reduction in a worldwide scale

Useful OSS-IF standards

- describing principles
- specialized for a particular system

Basic principle of PON

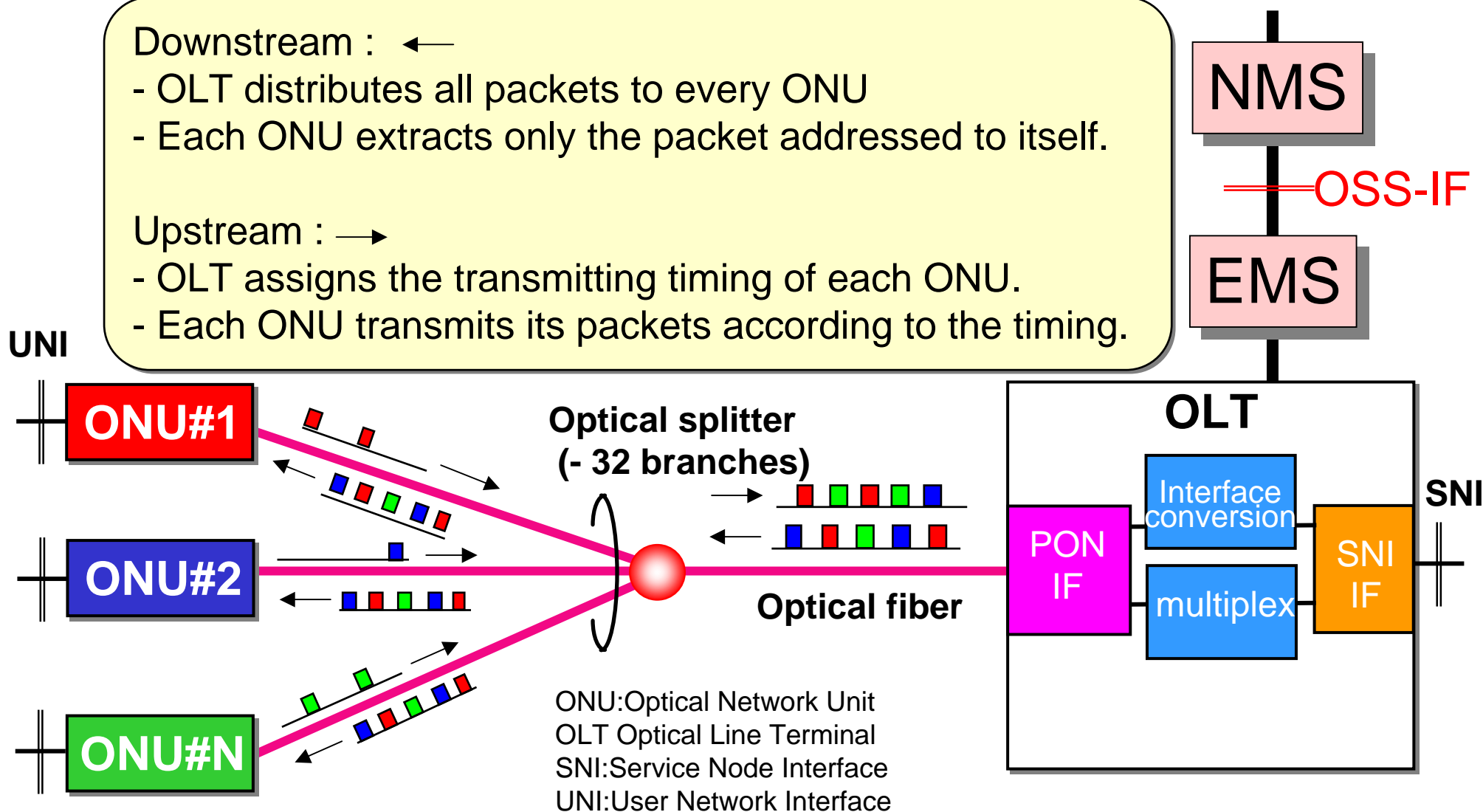
APNOMS2003

Downstream : ←

- OLT distributes all packets to every ONU
- Each ONU extracts only the packet addressed to itself.

Upstream : →

- OLT assigns the transmitting timing of each ONU.
- Each ONU transmits its packets according to the timing.

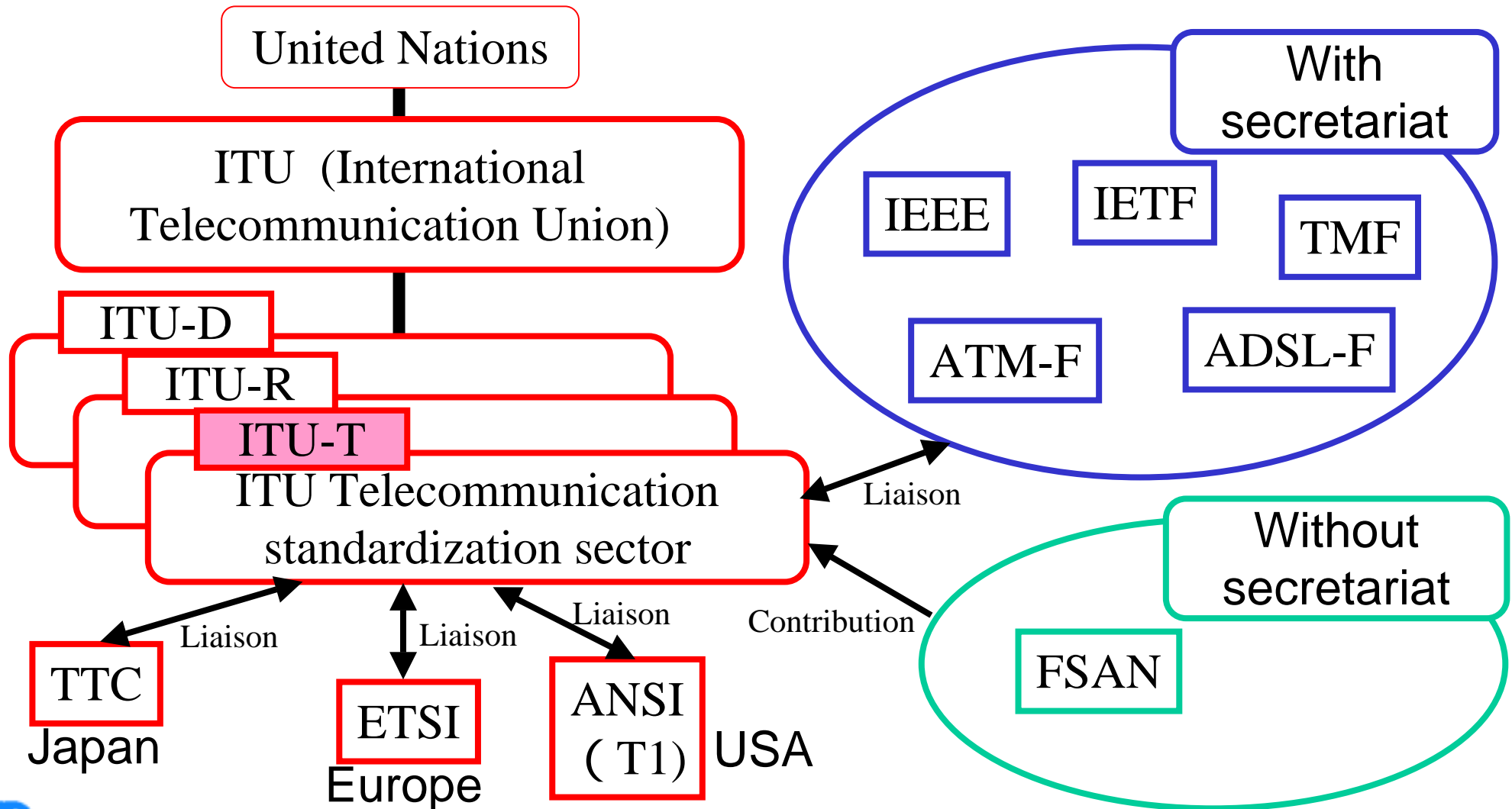


International standardizing bodies

APNOMS2003

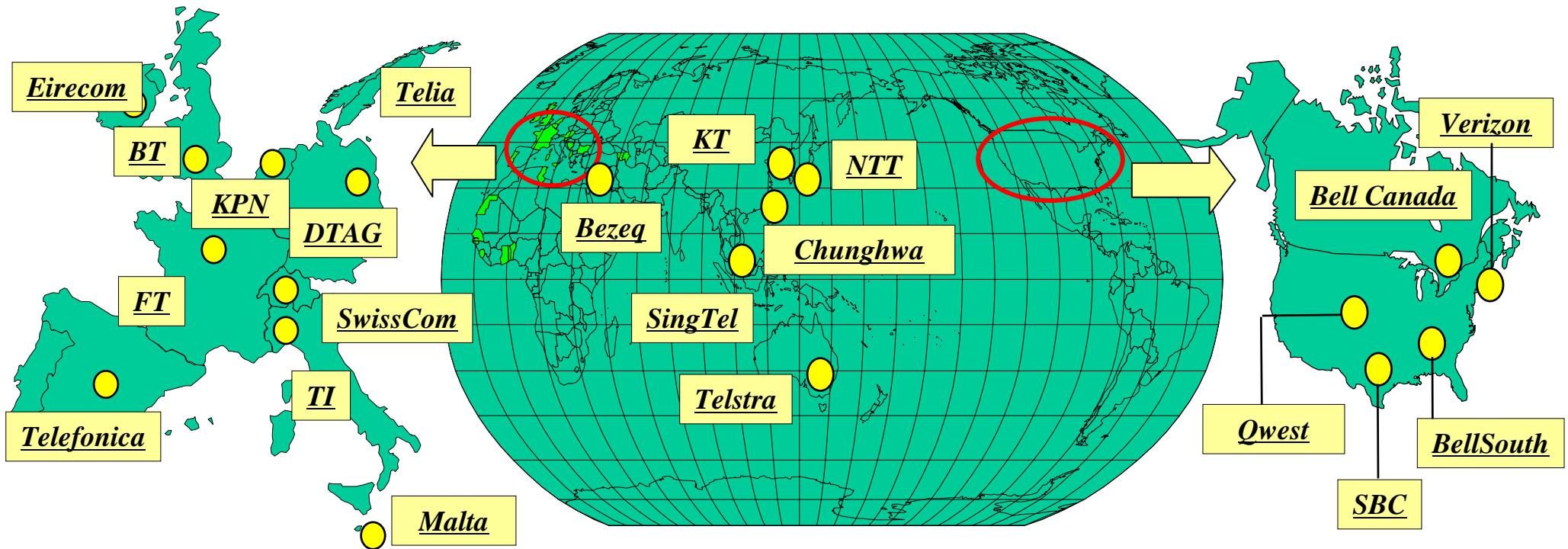
Public organization

Private organization



Participants to FSAN

APNOMS2003

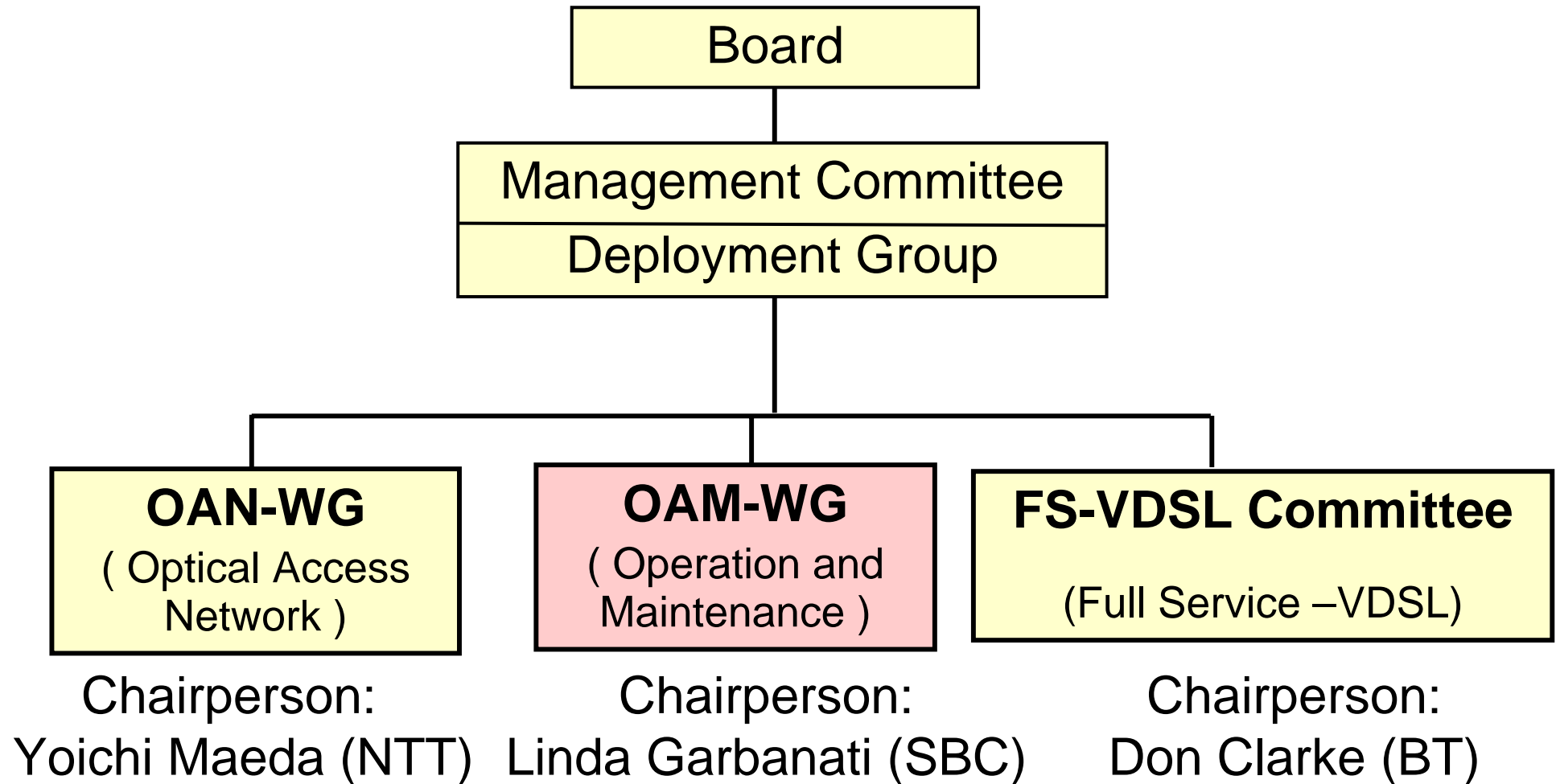


21 operators and 29 vendors, as of Sep. 2003

AFC	Agere	Alcatel	Broadcom	BroadLight	CISCO	Entrisphere
Ericsson	FlexLight	Fujitsu	Hitachi	Iamba	Infineon	INOVIA/ECI
Intel	Lucent	Marconi	Mitsubishi / Pacion	Motorola	NEC	
Nortel	OFN / Oki	Optical Solutions	Quantum Bridge			
ST Microelectronics	Samsung	Terawave	Vinci	Zonu		

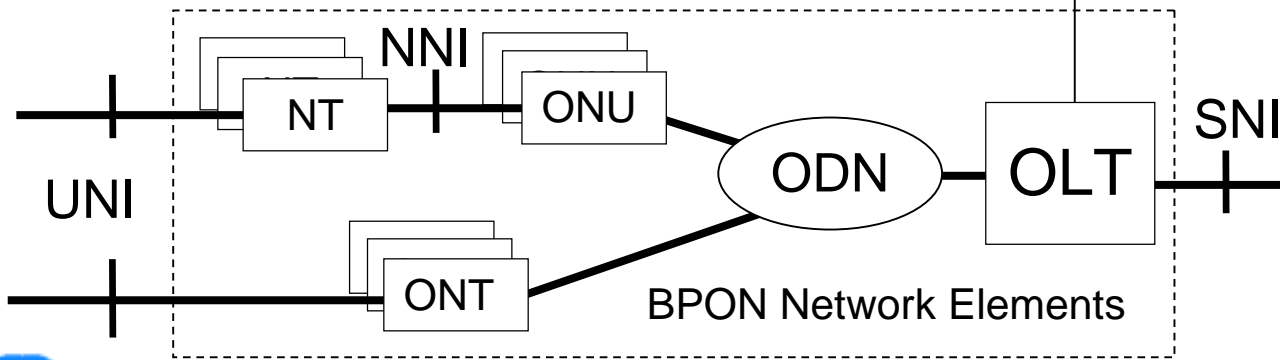
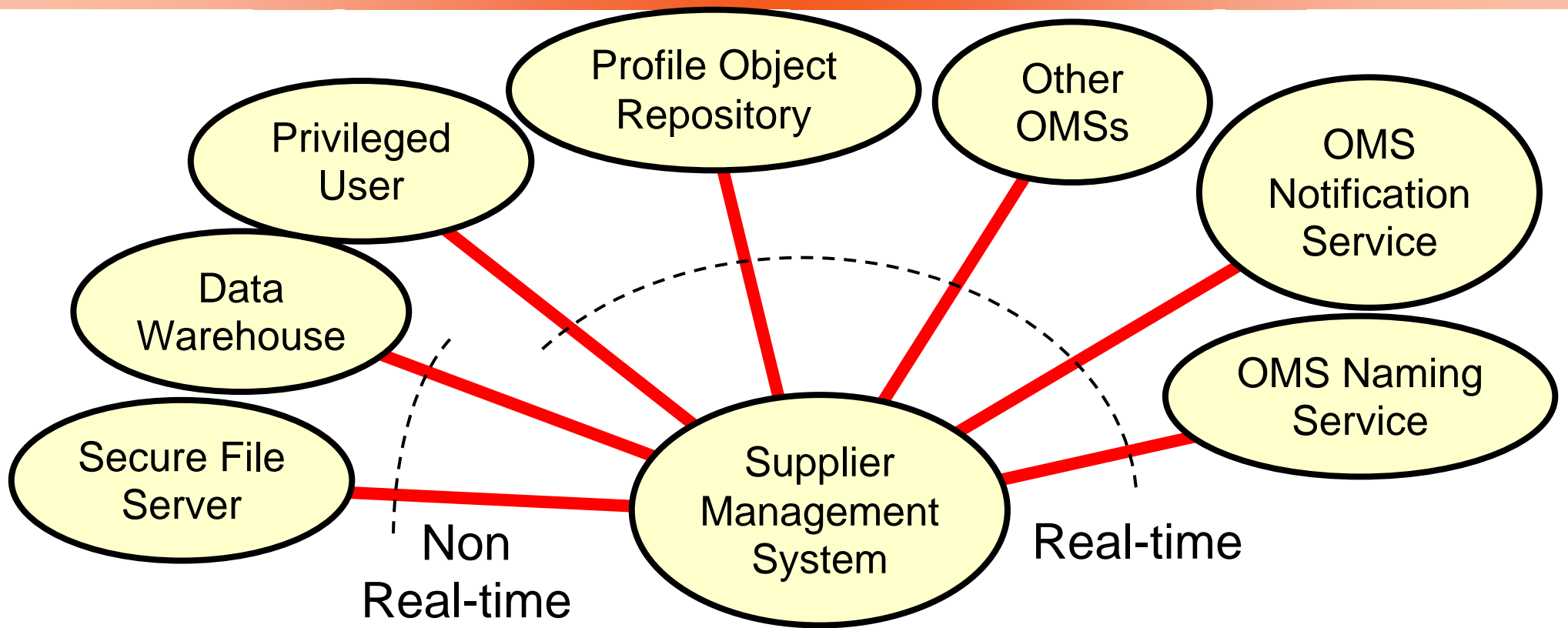
Organization of FSAN

APNOMS2003



WG : Working Group

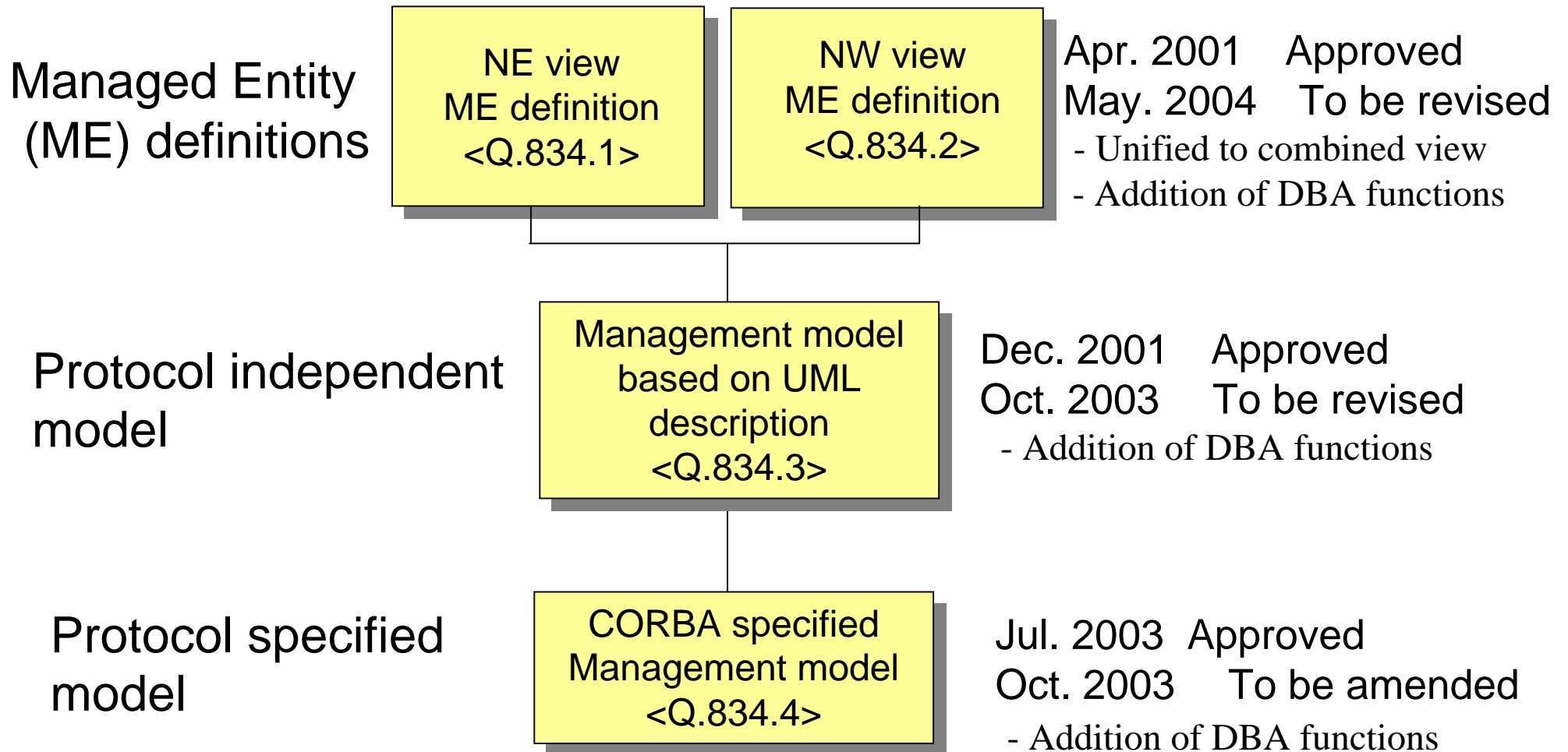
OSS-IF of B-PON



B-PON OSS-IF Recommendations

APNOMS2003

The specifications are based on UML (Unified Modeling Language)



Combining NE view and NW view

APNOMS2003

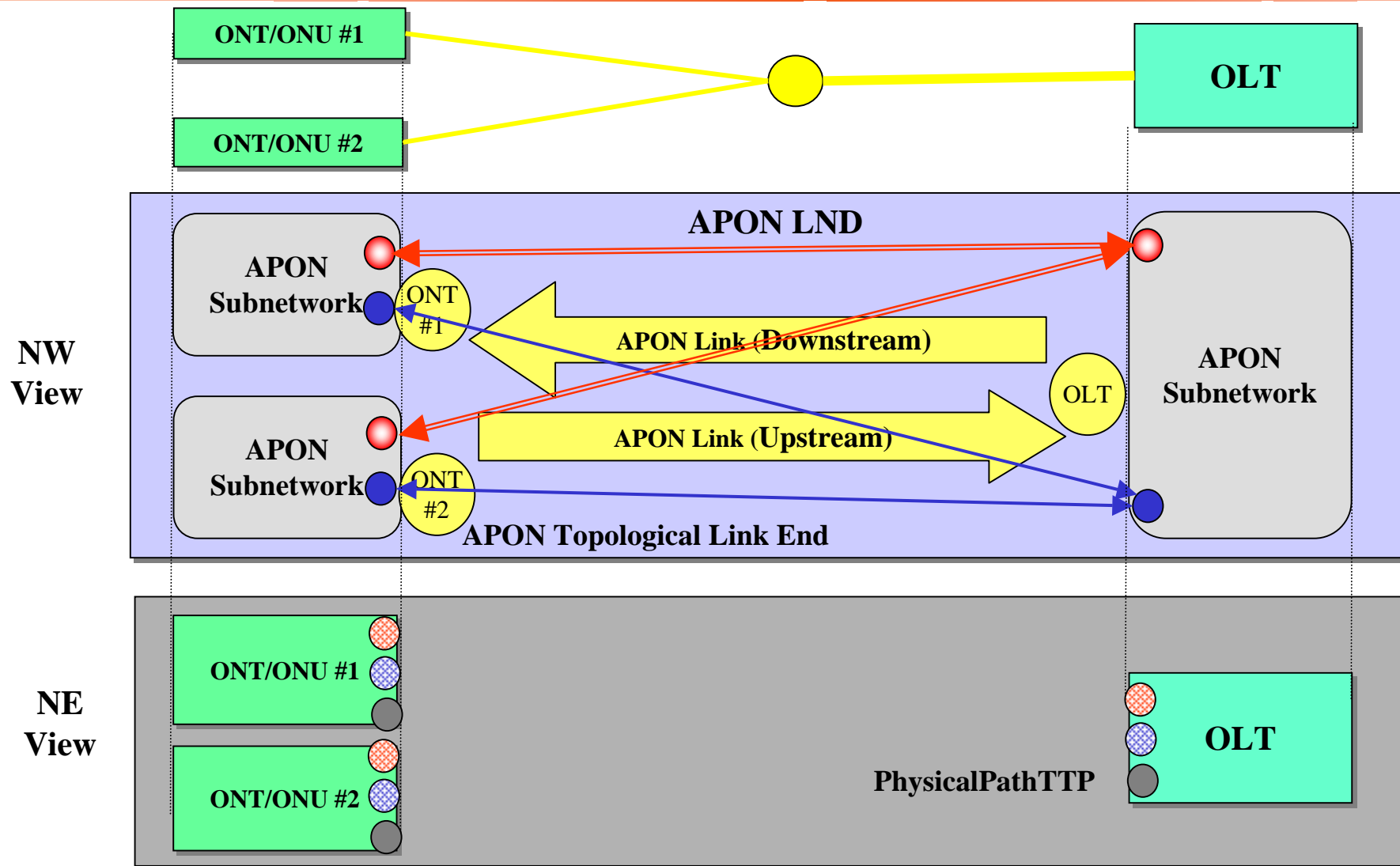
NE view is useful in case of maintenance and testing

NW view is convenient in case of provisioning

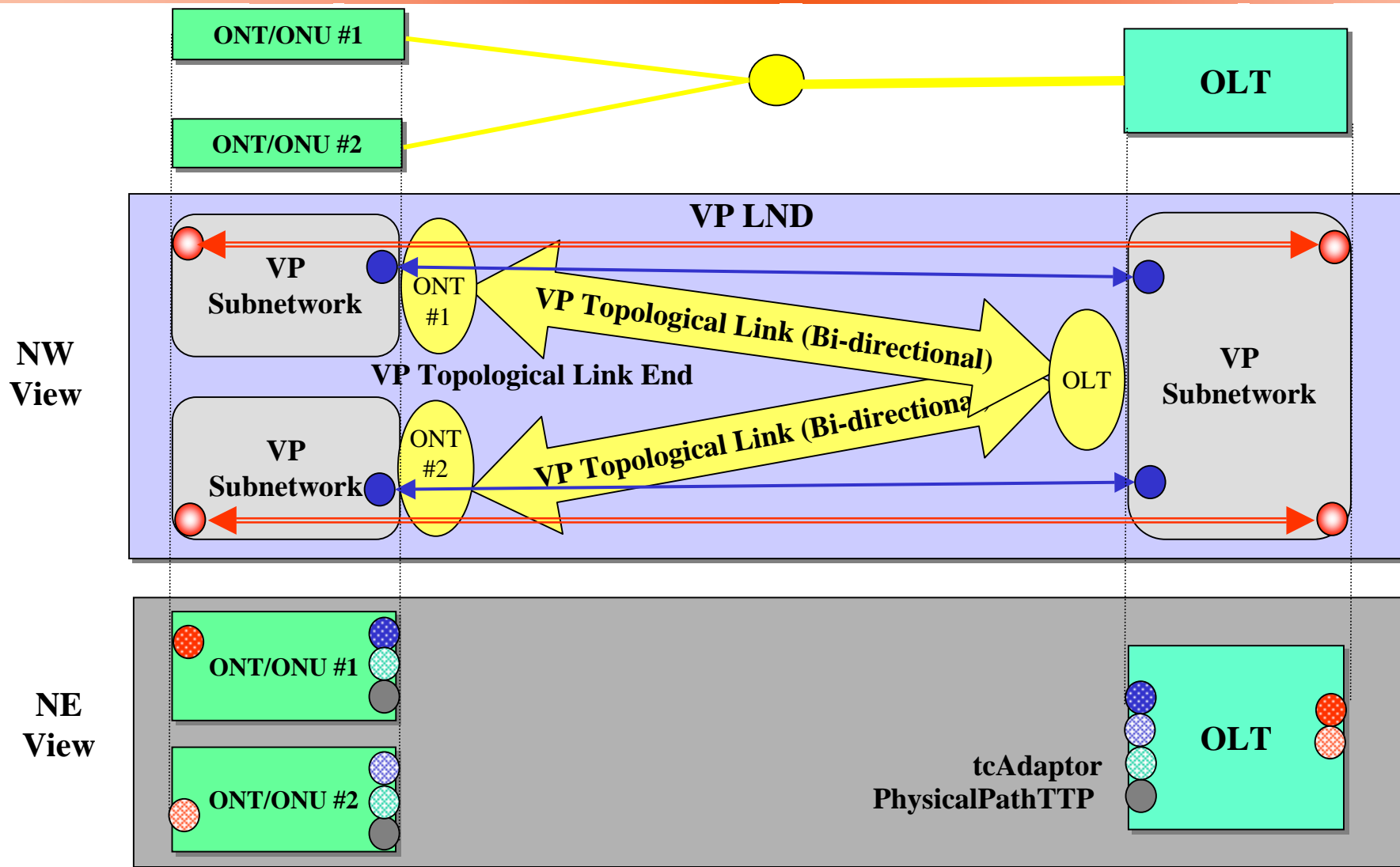
FSAN proposed a new view that combines the both views

- The existing Recommendations are divided into NE view (Q.834.1) and NW view (Q.834.2)
- The existing Q.834.1 and Q.834.2 realize a combined view in deed by relating managed entities of both views using pointers
- A revised Q.834.1 will integrate the existing Q.834.1 and Q.834.2, and will combine NE view and NW view in deed as well as in name.

Combined view model (PON layer)



Combined view model (VP layer)



● VP NetworkTTP
 ● VP NetworkCTP

↔ VP Trail
 ↔ VP Link Connection

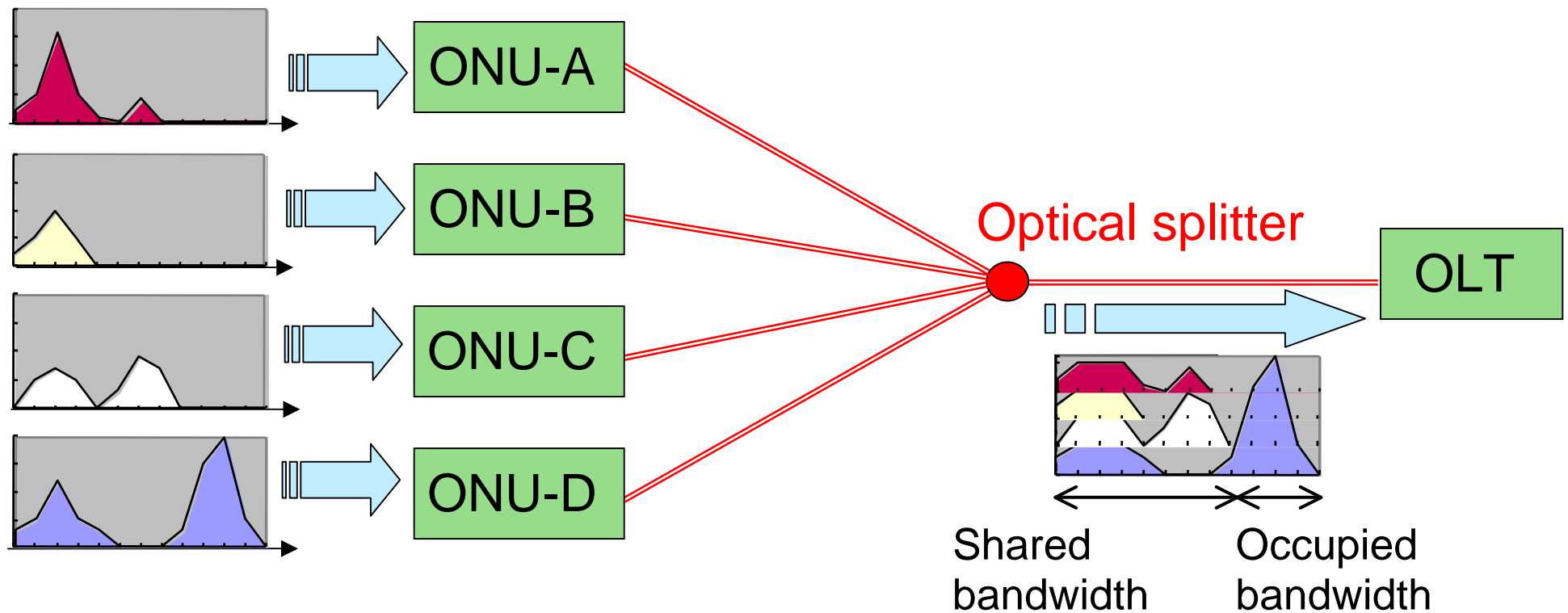


Dynamic Bandwidth Assignment

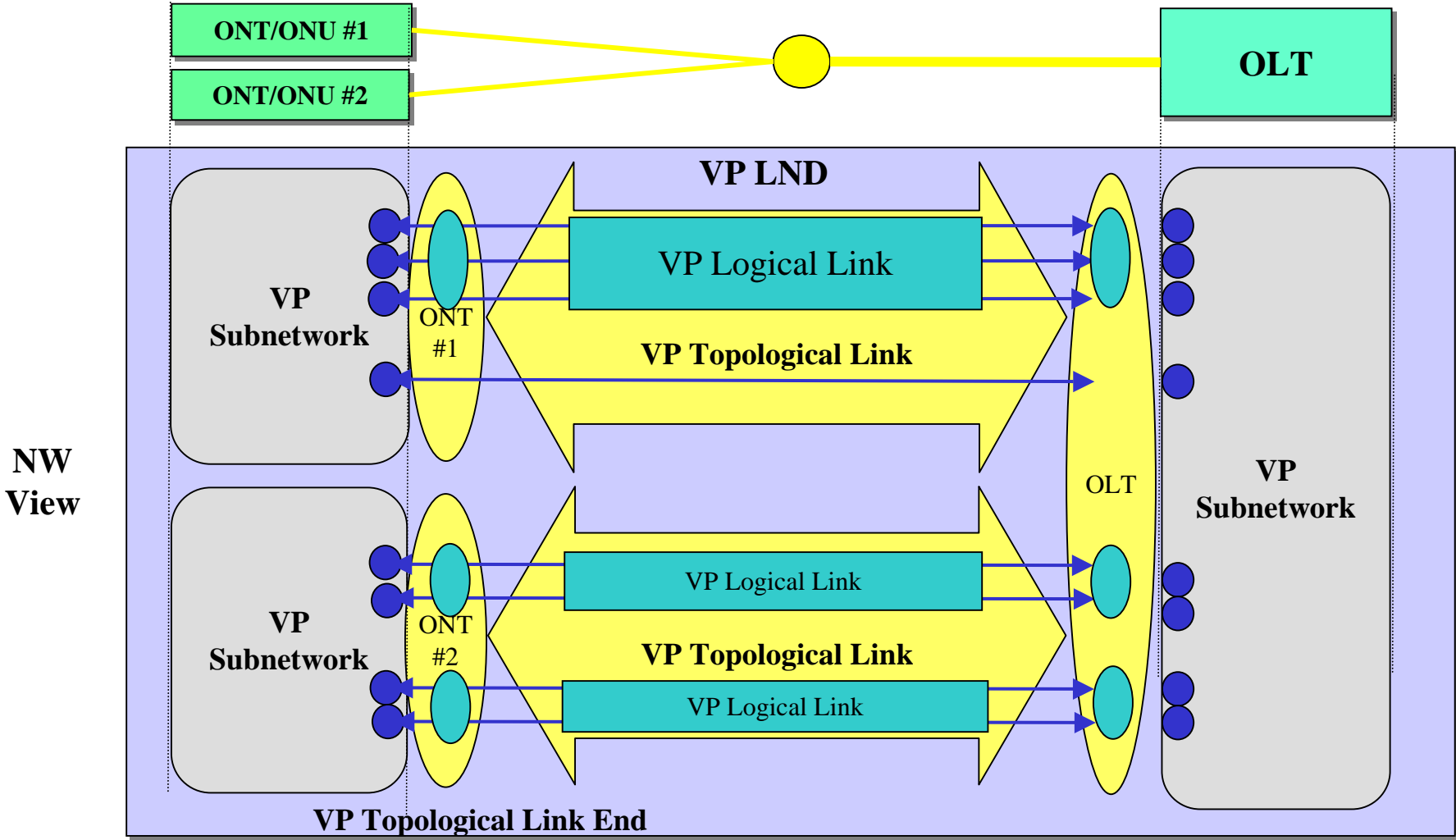
APNOMS2003

DBA: Dynamic Bandwidth Assignment

- Adopting to upstream direction of PON.
- Sharing bandwidth between optical splitter and OLT.
- ONU can transmit upstream packets as much as the bandwidth permits



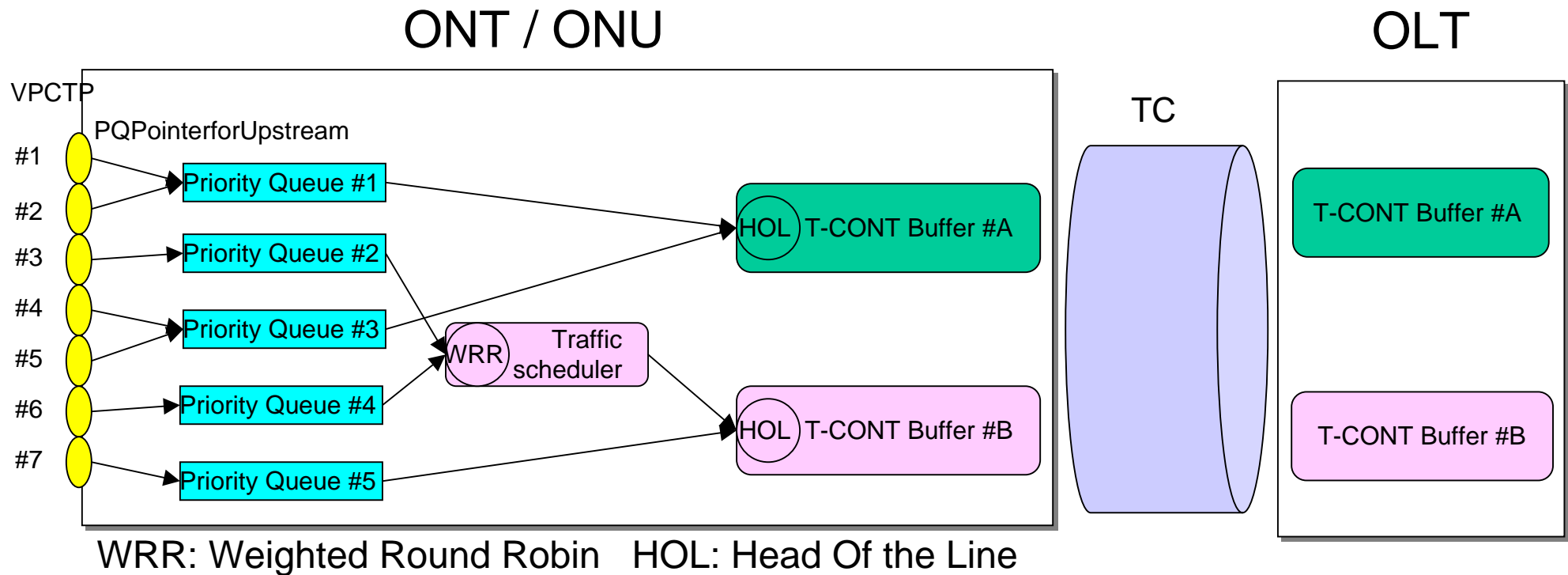
NW view for DBA



 TCONT (a subclass of Logical Link End)
  VP NetworkCTP
  VP Link Connection

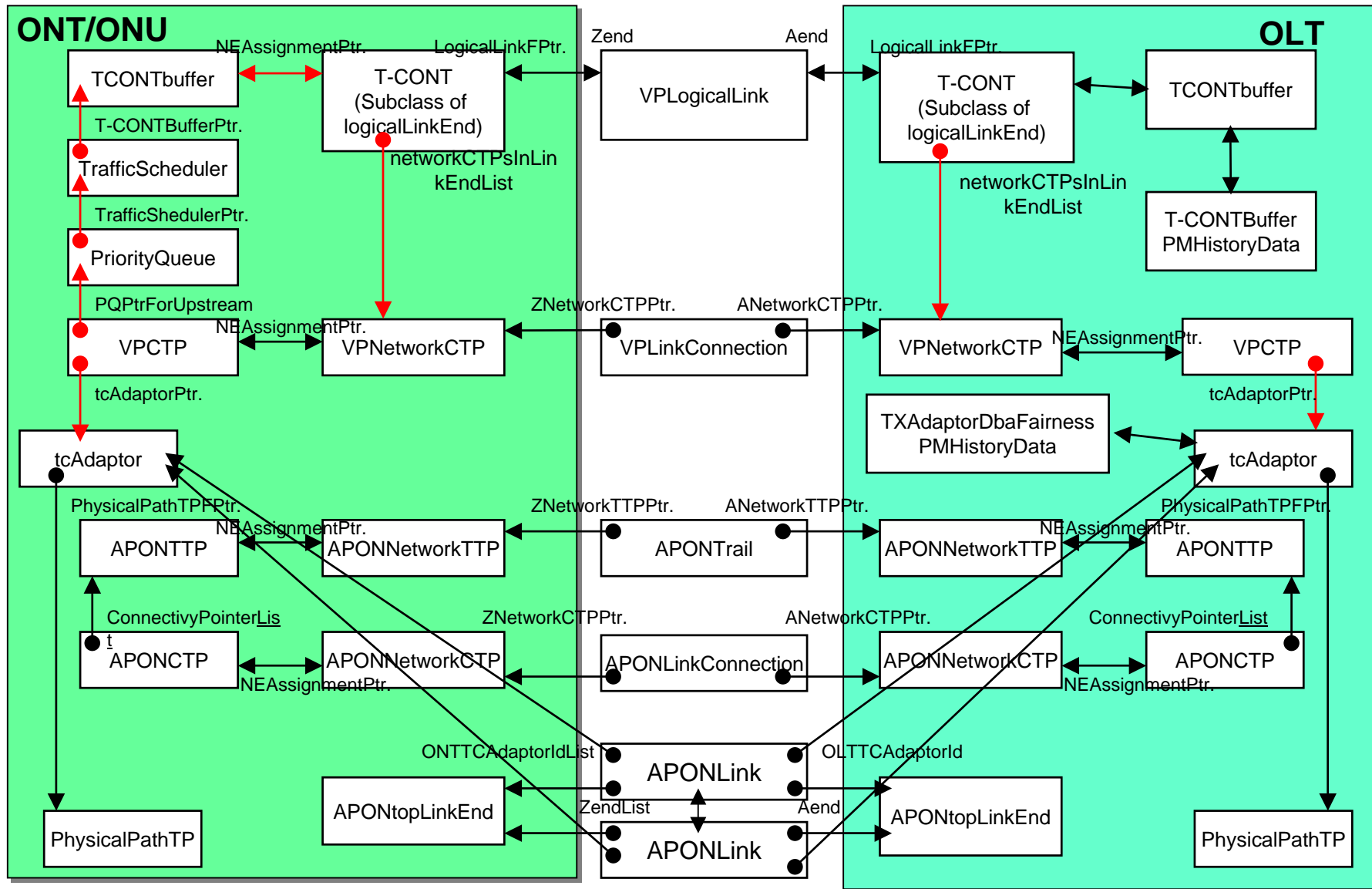
NE view for DBA

- Some managed entities exist only in ONU for arranging packets.
- Priority Queue stores VP packets according to their priority.
- Output from Priority Queue will be pressured by WRR if needed, then accommodated in T-CONT buffer in order by HOL.



ME relationship diagram

APNOMS2003



UML description

APNOMS2003

UML: Unified Modeling Language

Suitable description of object-oriented systems and software development



Use case diagram

Relationship between OSS and its external environments (High level requirements for OSS)

Sequence diagram

Time ordered event description for each use case

Class diagram

Detailed relationship between managed entities

Q.834.3 is the first ITU-T Recommendation that describes scenarios using UML strictly

Advantages of UML

Modeling is necessary for

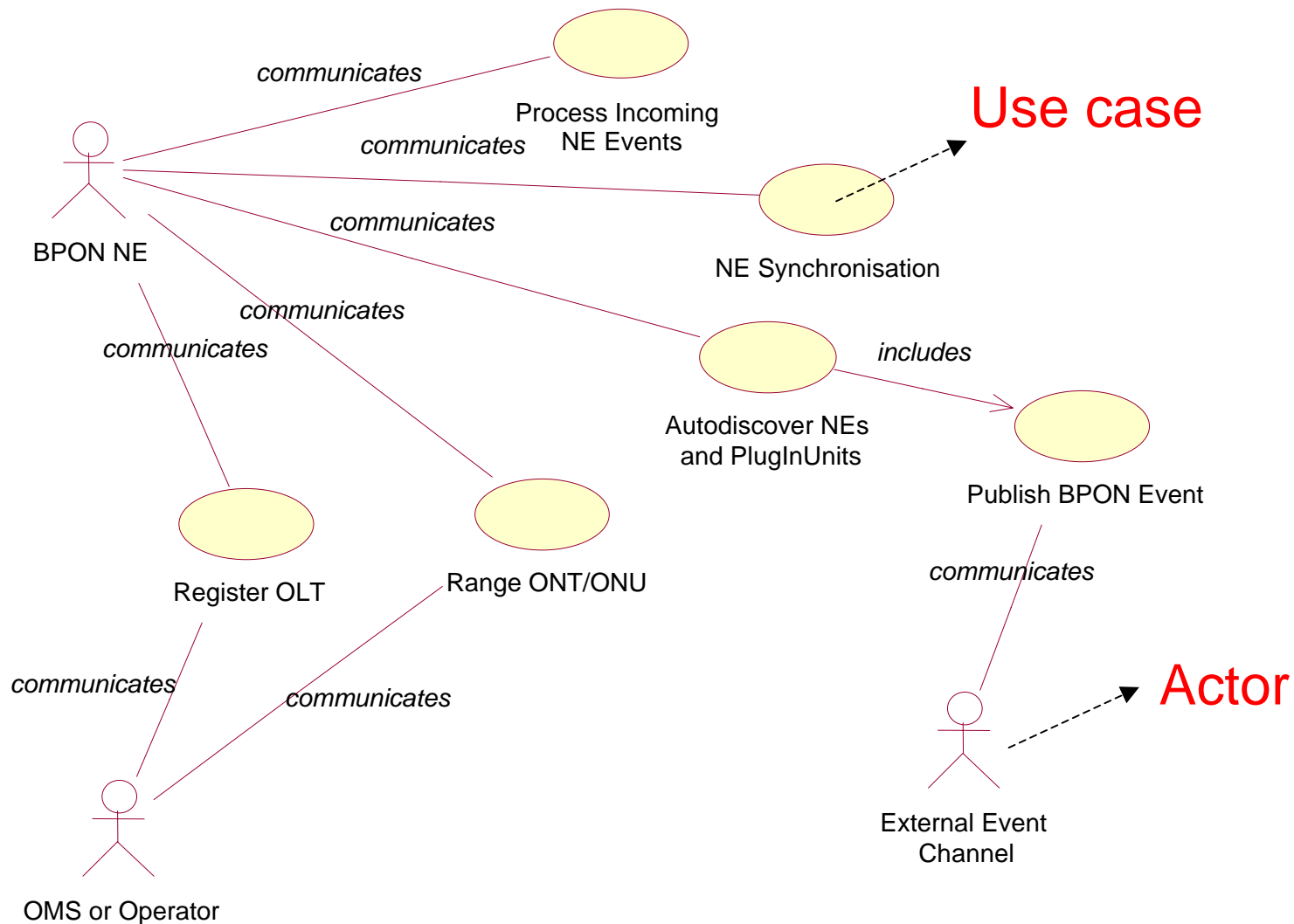
- key component of developing systems
- omitting non-essential details, reducing complexity and facilitating understanding
- offering multiple views with separation of concerns



UML helps to design models with

- intuitional and intelligible diagrams
- minimum and plain notations

Example of use case diagram

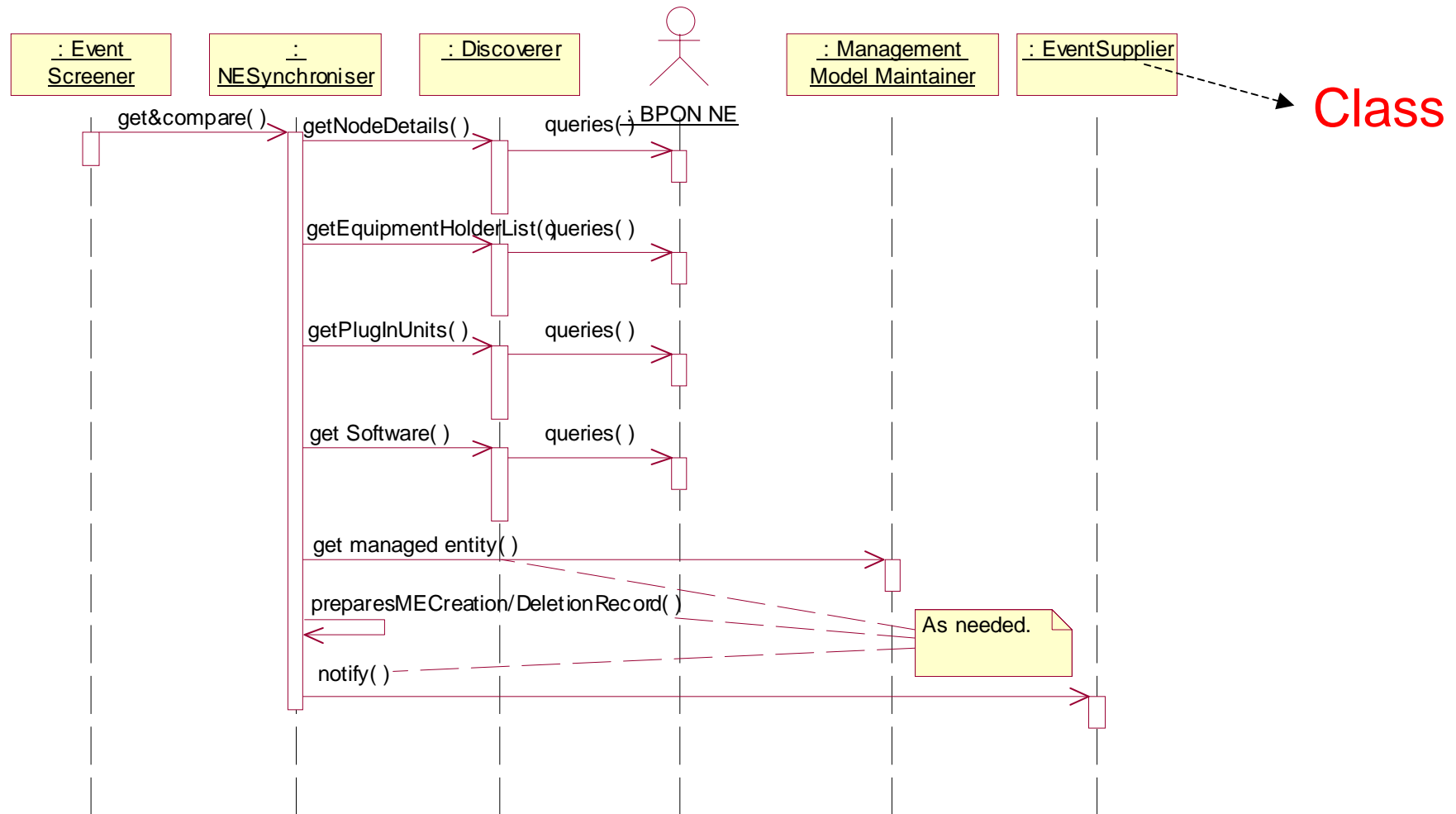


Installation

[From ITU-T Q.834.3 Figure 5-8]

Example of sequence diagram

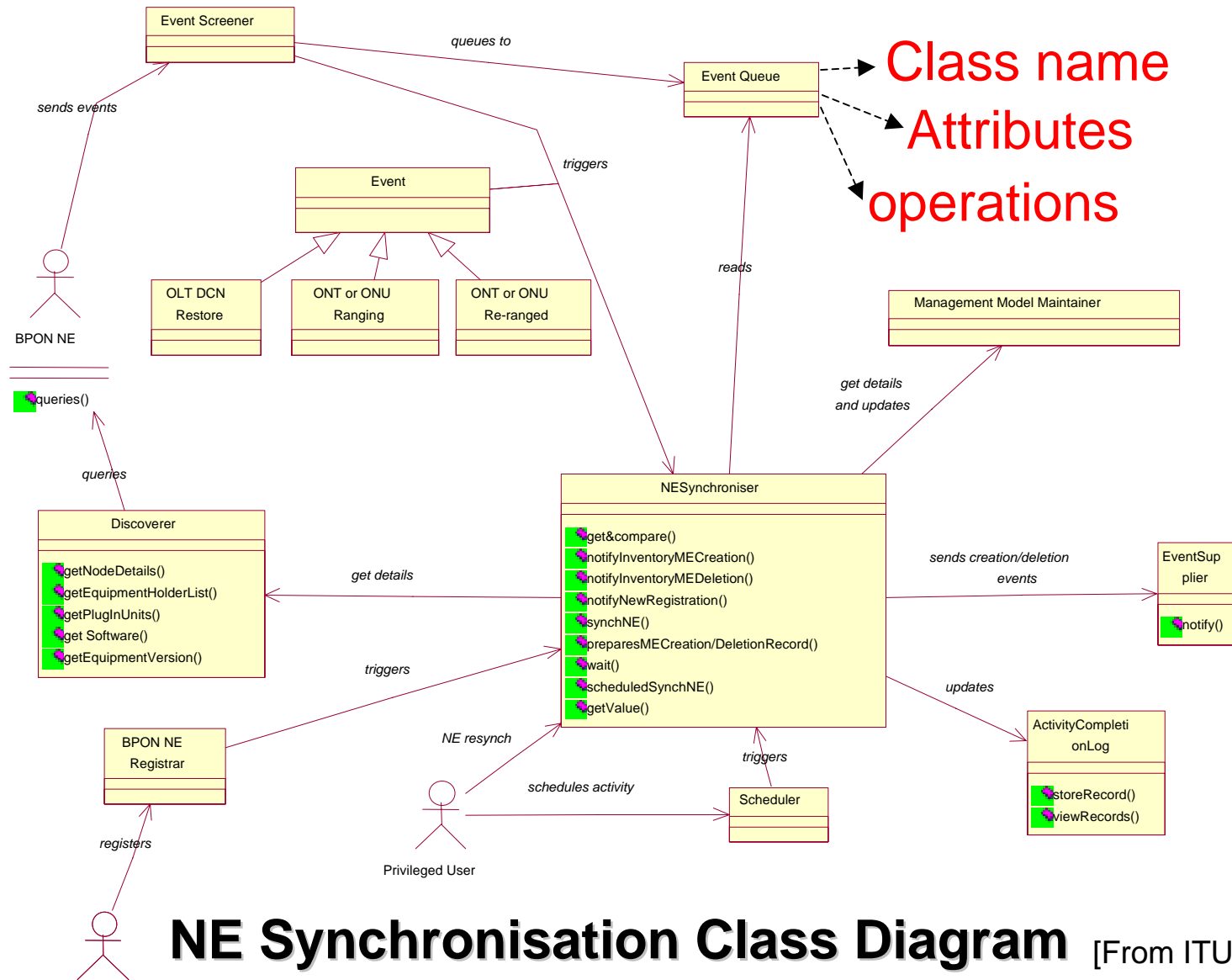
APNOMS2003



Event Triggered NE Synchronisation Sequence Diagram

[From ITU-T Q.834.3 Figure 5-59]

Example of class diagram



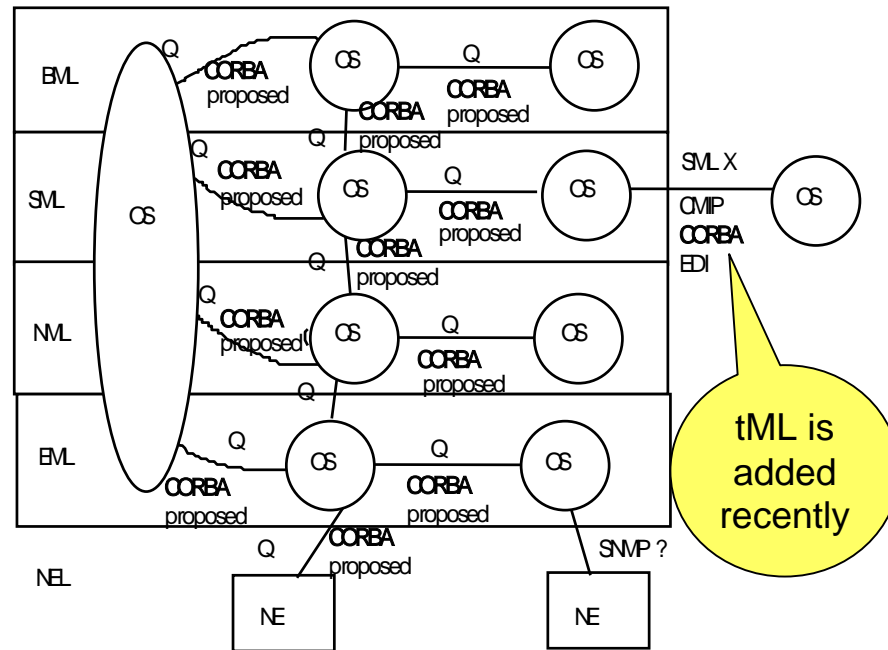
NE Synchronisation Class Diagram [From ITU-T Q.834.3 Figure 5-58]

CORBA framework in ITU-T

APNOMS2003

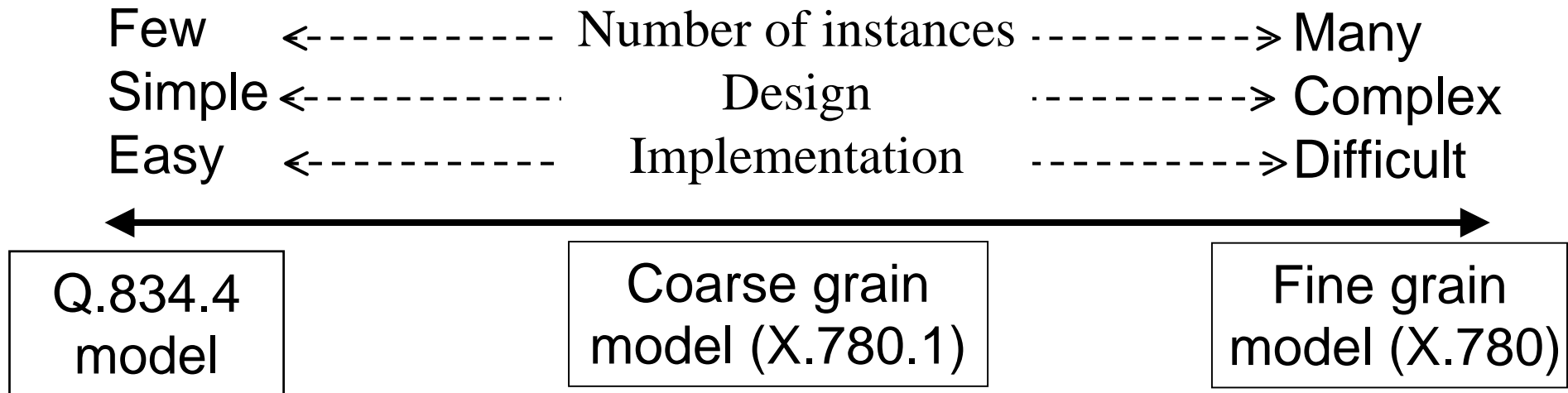
-A first draft of “Framework for corba-based telecommunications management interfaces“ were proposed in August 1999 for the purpose of adapting CORBA into Q interface.

-A fine grain model of the draft was approved in January 2001 as **X.780**, and a coarse grain model was approved in July 2001 as **X.780.1**.



CORBA framework and Q.834.4

APNOMS2003



-Q.834.4 specifies CORBA interface for PON, and X.780 and X.780.1 describe CORBA framework in ITU-T.

- Q.834.4 model is based on service and system management, and can implement more easier than CORBA framework models which are based on network resources.

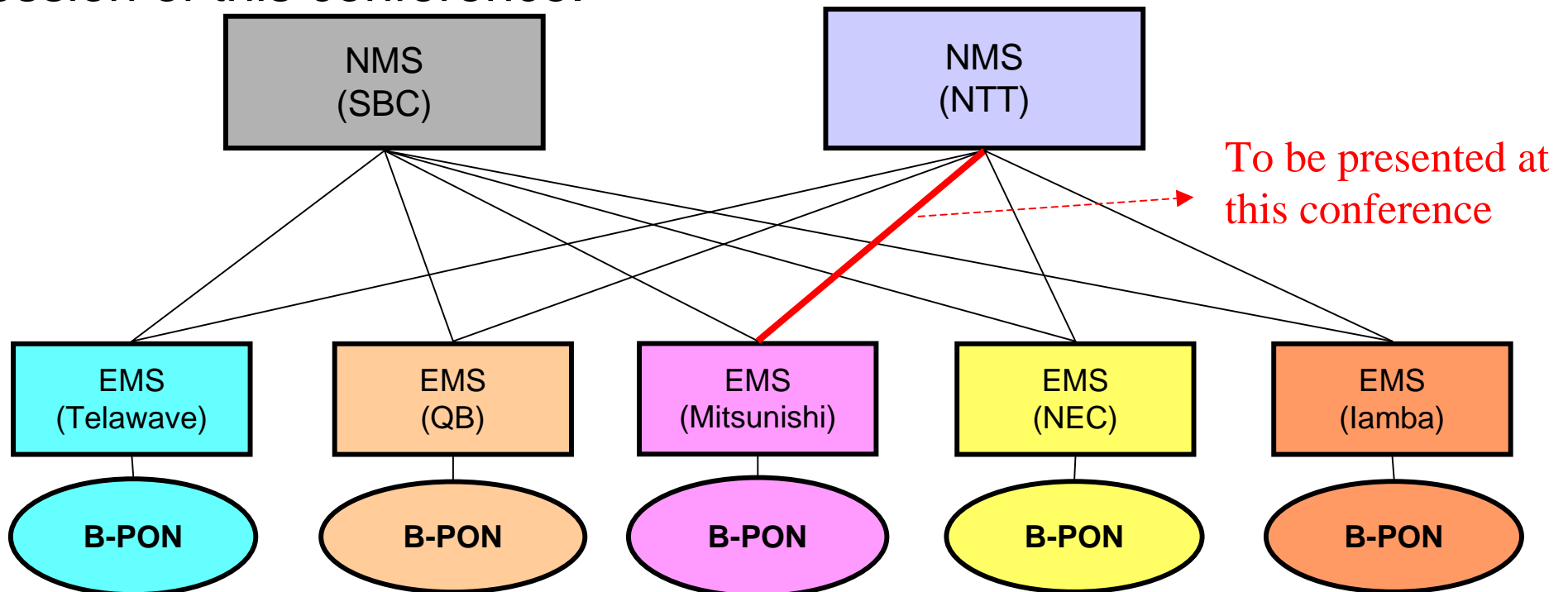


Q.834.4 refers X.780 and X.781, and adds some general interface specifications using its own model.

OSS-IF interoperability test

APNOMS2003

- FSAN OAM-WG plans interoperability test between operator's NMS and vendor's EMS based on Q.834.4.
- 2 operators and 5 vendors will participate in the test.
- The test result between Mitsubishi and NTT is presented at another session of this conference.



Future plan of FSAN OAM-WG

APNOMS2003

- Proposing revision and amendment of Q.834 series reflecting DBA function
- Interoperability test of OSS-IF based on Q.834.4

- The remaining issues should be completed in this year
- The WG meeting will go into recess in the next year
- The meeting will be reactivated when FSAN members require

Thank you



*The beckoning cat, Maneki Neko,
brings Luck.*