Industry engagement in developing ITU-T standards

- *A personal experience from the perspective of Q14/15*

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Objectives

- **To share the experience of industry engagement in the ITU-T standardization process**
  - From the perspective of the Rapporteur of ITU-T Q14/15
    - 1997 - 2023
- **To strengthen the cooperation and collaboration in worldwide ICT standardization**
  - ITU-T has many existing processes to enable industry engagement
  - Q14/15 is a driving force of agile industry engagement
    - The information & data modeling process used by Q14/15 supports fast turn-around & in-depth discussion (not just paper recommendations)
- **To bridge standardization gaps and speedily deliver ITU standards meeting ICT needs**

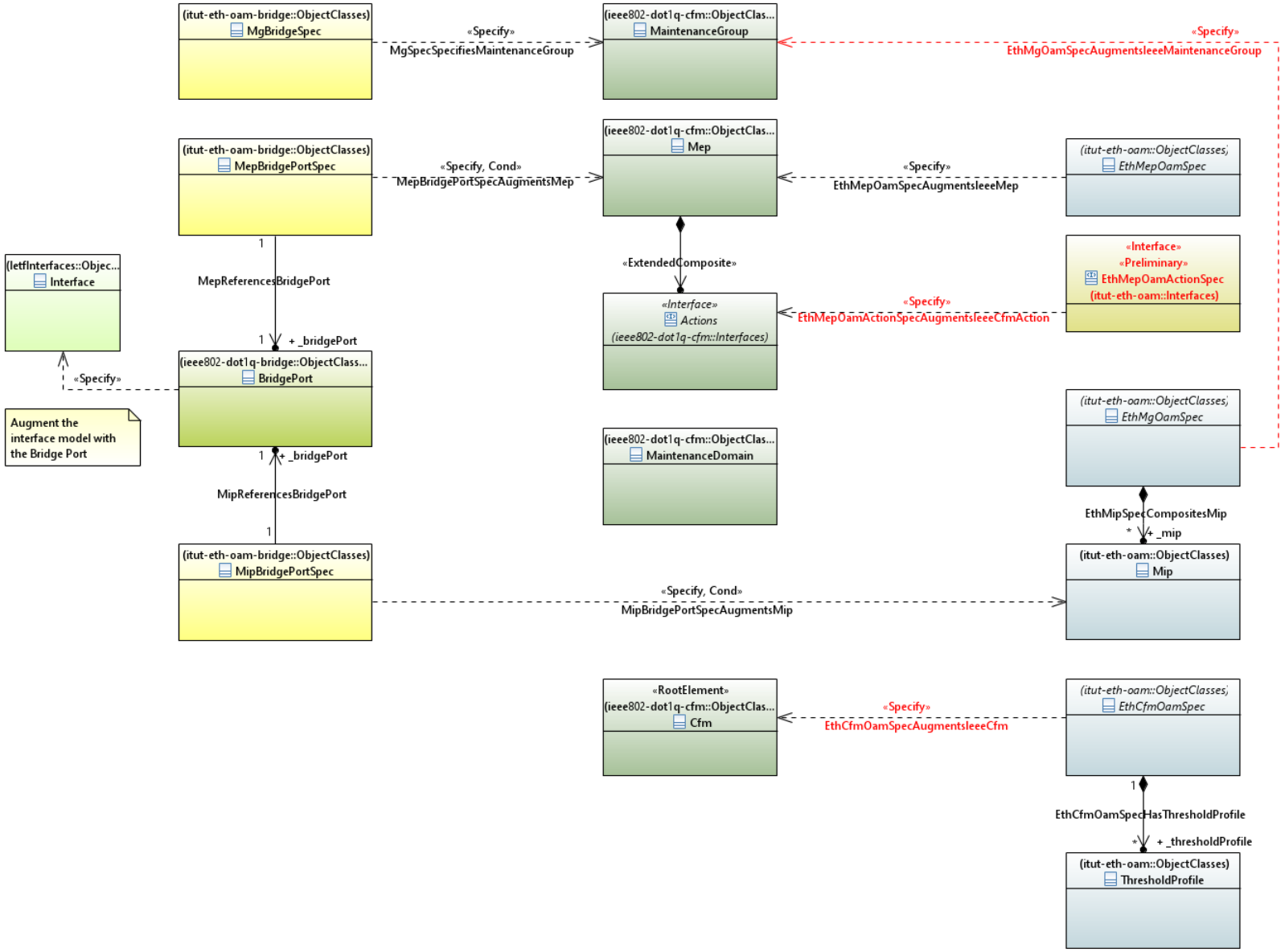
Industry engagement

- **It is necessary throughout the standard development lifecycle**
  - For exchanging
    - Input, result, view, comments, concerns, …
- **Mechanism**
  - Liaison statement (LS)
    - Normally at the plenary meetings and interim meetings
    - Long-standing mechanism,
      - E.g., In the early 2000, Control plane signaling
        - Q14/15: G.7713 (12/2001) & G.7713.2 (03/2003) – ASON DCM signaling requirements
        - with IETF CCAMP WG: RFC 3473 (01/2003) – GMPLS RSVP-TE
  - Representatives/ Liaison Rapporteur (LR)
    - 1997-2000, Representative to: SG4 (TMN)
    - 2001-2004, Representatives to: SG4 (TMN), IETF (TNM, CCAMP, Routing, GSMP)
    - 2005-2008, Representatives to: SG4 (TMN), SG13 (NGN), TMF (MTNM), IETF (TNM, CCAMP, Routing), OIF (Networking & Software)
    - …
  - Joint workshops
    - Joint IEEE 802 and ITU-T Study Group 15 Workshop
      - Long-standing collaboration and coordination between IEEE 802 and ITU-T Study Group 15 through discussion and information exchange on topics of common interest.
        - The 9th Joint Workshop in July 2024

Additional engagement initiatives (1)

- **IM-DM (Information model – Data model) modelling coordination**
  - Q14/15 Track-a Monthly eMeetings
  - Invited entities:
    - IEEE 1588, IEEE 802.1, IEEE 802.3, ONF, MEF, IETF (CCAMP, TEAS, NETMOD, IVY), BBF, TM Forum
  - Interworking topics addressed
    - IEEE 802.1Q Connectivity Fault Management (CFM) with
      - G.8052.1 Ethernet OAM
    - IEEE 1588 Precision Time Protocol (PTP) with
      - G.7721.1 Synchronization management & Q13/15 Recs
    - BBF Access nodes [TR-383] alarm management using RFC-8632 with
      - G.8052.1 Ethernet AM
    - IETF MPLS Static LSP YANG model with
      - G.8152.2 MPLS-TP Linear protection YANG model
    - IETF NETMOD YANG versioning, L1/L2/L3 YANG models

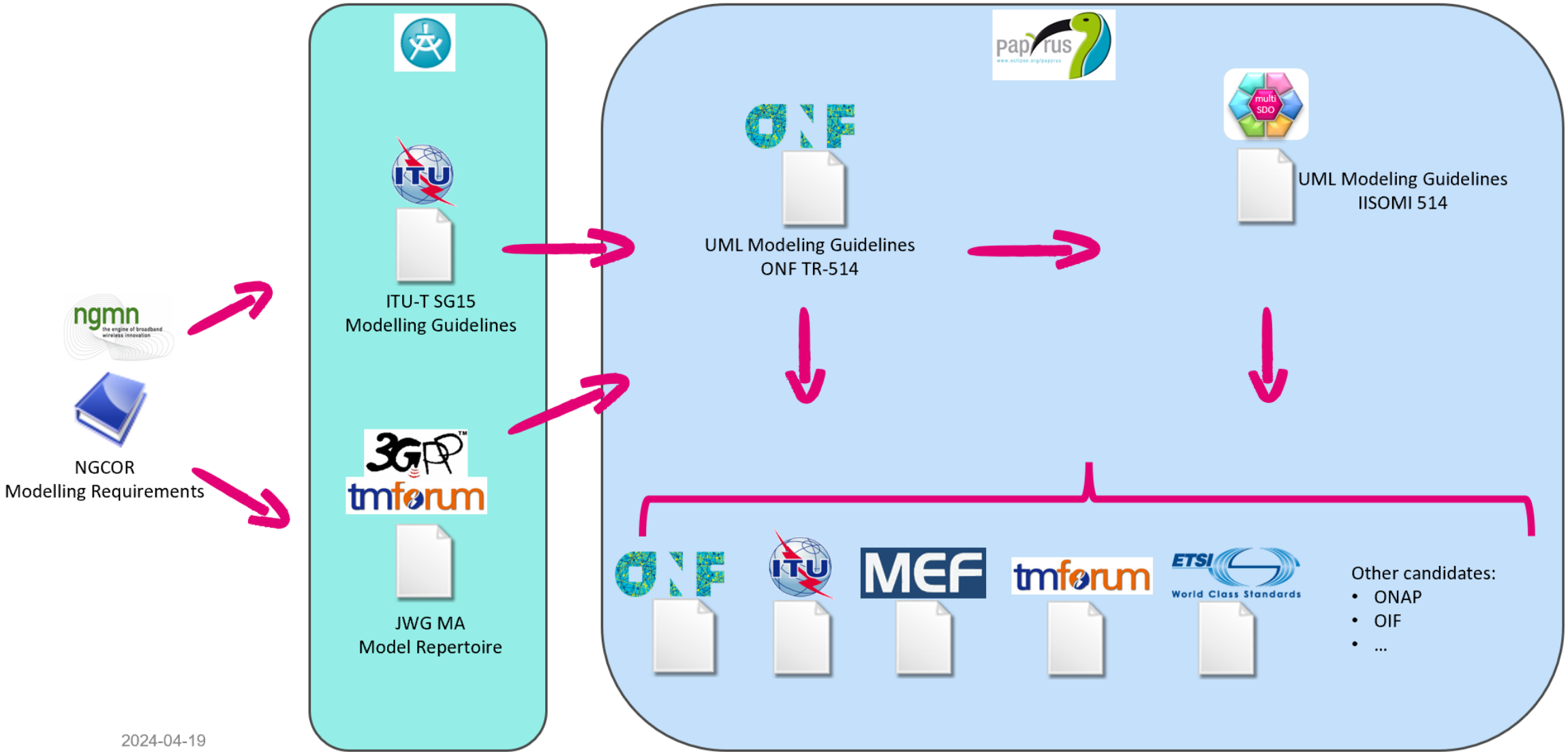
Interworking of G.8052.1 OAM with IEEE 802.1Q CFM



Additional engagement initiatives (*2*)

- **IISOMI (Informal Inter-SDO Open Modelling Initiative)**
  - Open-source project, weekly eMeetings since 2014, UML model designers from various SDOs,
  - Develop guidelines and tools for a harmonized modeling infrastructure
  - MC interface protocol-neutral guidelines
    - UML Modelling Guidelines (ONF TR-514 v1.3)
    - UML Profiles and Style Sheets
    - Papyrus Guidelines (ONF TR-515 v1.3)
    - GenDoc Guidelines
  - MC interface protocol-specific guidelines:
    - UML to YANG Mapping (Guidelines ONF TR-531 v1.1)
    - UML to ProtoBuf Mapping (Guidelines ONF TR-544 v1.0)
    - UML to OpenAPI Mapping (Guidelines ONF TR-543 v1.0)
  - UML to YANG Mapping Tool
    - Open-Source Tool *xmi2yang*
      - Initially developed in the ONF open-source project “EAGLE”
      - With requirements from IISOMI, including active participants from ONF TAPI, ITU-T SG15 Q14/15, MEF, TMF, …
        - Mapping Guidelines (rules): ONF TR-531 v1.0
      - Programming language: JavaScript
      - Running environment: node.js (downloadable from: https://nodejs.org/en/)
      - Validate the YANG codes at http://www.yangvalidator.com/ and get also the YANG Tree.
      - Has been heavily used by ITU-T Q14/15 and ONF TAPI for generating YANG codes for UML models

UML Modeling Guidelines evolution



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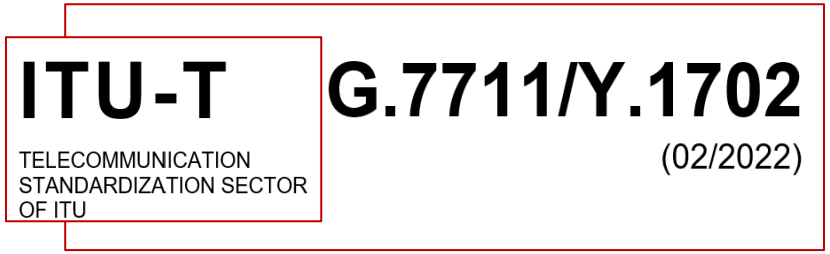
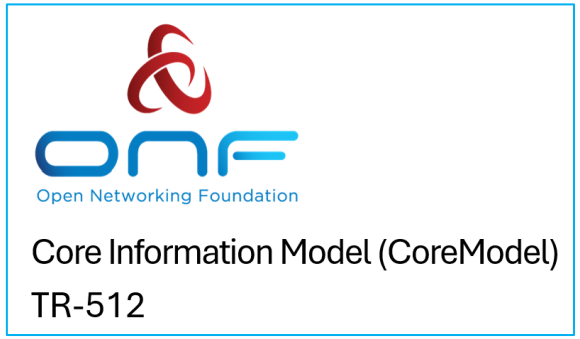
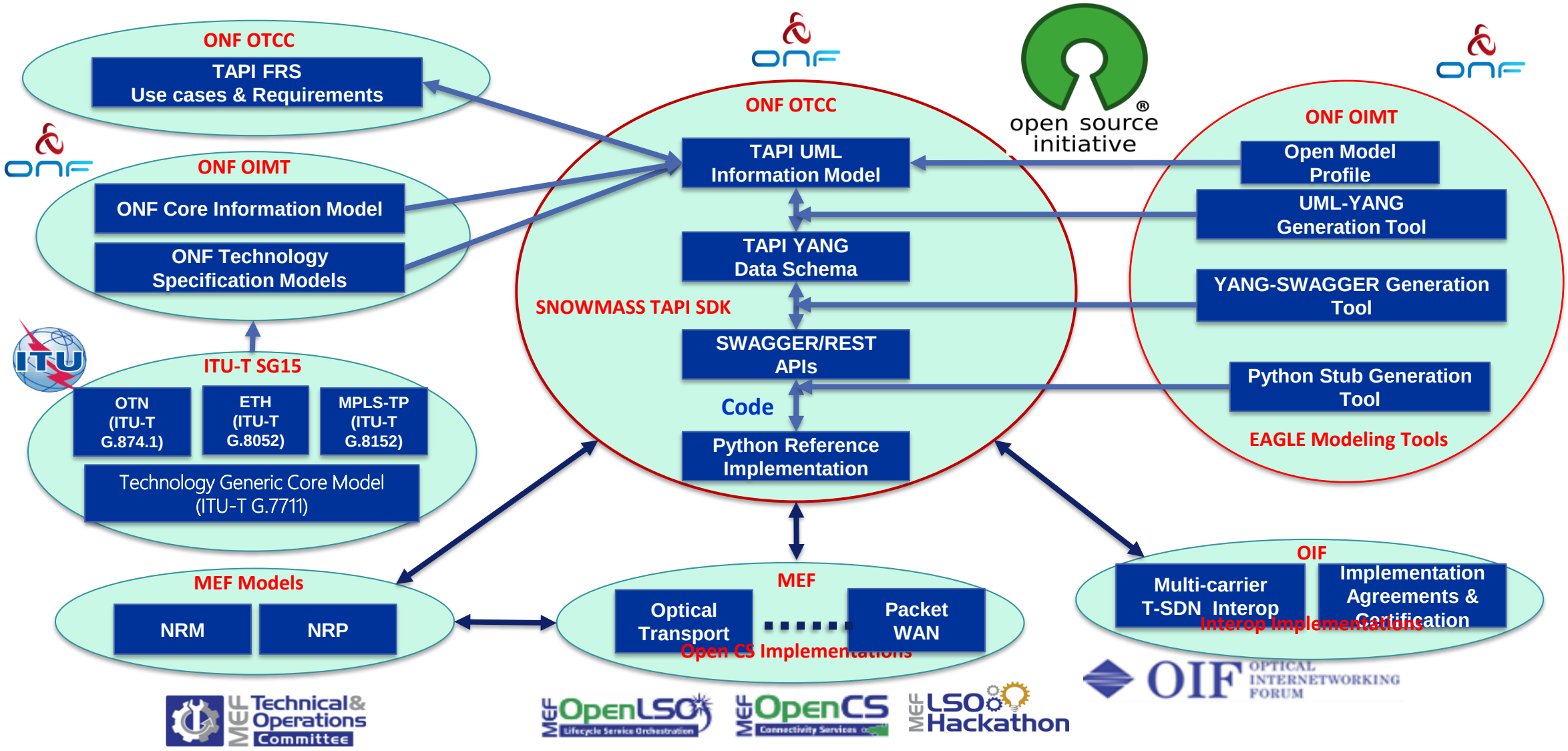
Additional engagement initiatives (*3*)

- **Core Information Model: G.7711 – ONF TR-512**
  - ITU-T SG15 has been in close collaboration with ONF OIMT since 2014 in the development of the Control Architecture and Core Information Model.
    - Formal exchange via liaison statements
    - Participation in numerous face-to-face meetings and weekly multiple conference calls by individual experts who are members of both ONF and ITU-T.
  - This close collaboration has resulted in close alignment of the Core Information Model in Recommendation ITU-T G.7711 with the Core Information Model in ONF TR-512
    - G.7711 v4.0 (02/2022) with ONF TR-512 v1.5 (09/2021).
    - Planned: G.7711 v5.0 (2025) with ONF TR-512 v1.6 (01/2024)
  - As a result of the recent merge of the ONF projects into the Linux Foundation, the ONF OIMT team has ceased operating on 31st January 2024.
  - Future evolution of the Core Information Model will continue in ITU-T SG15.

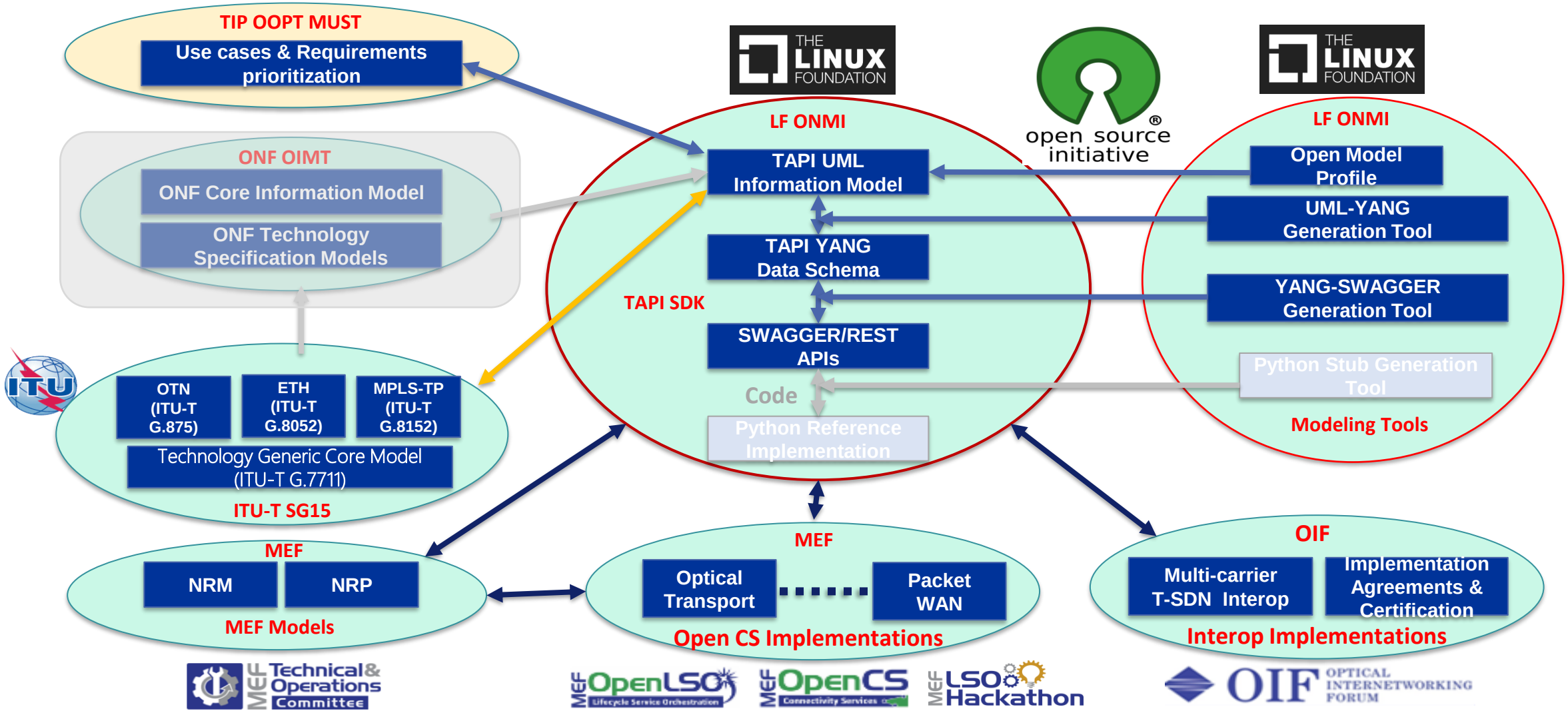




Influence Across Standards and Open Source (original)



Influence Across Standards and Open Source (current)



The value of having a slightly more rigorous process than is found in the open-source community would be a bonus.

- *Sustainability: GenDoc no longer maintained*
- *Traceability: Multiple tracks of xmi2yang*
- *Security: Wiki site protection*
- *…*

Thank you

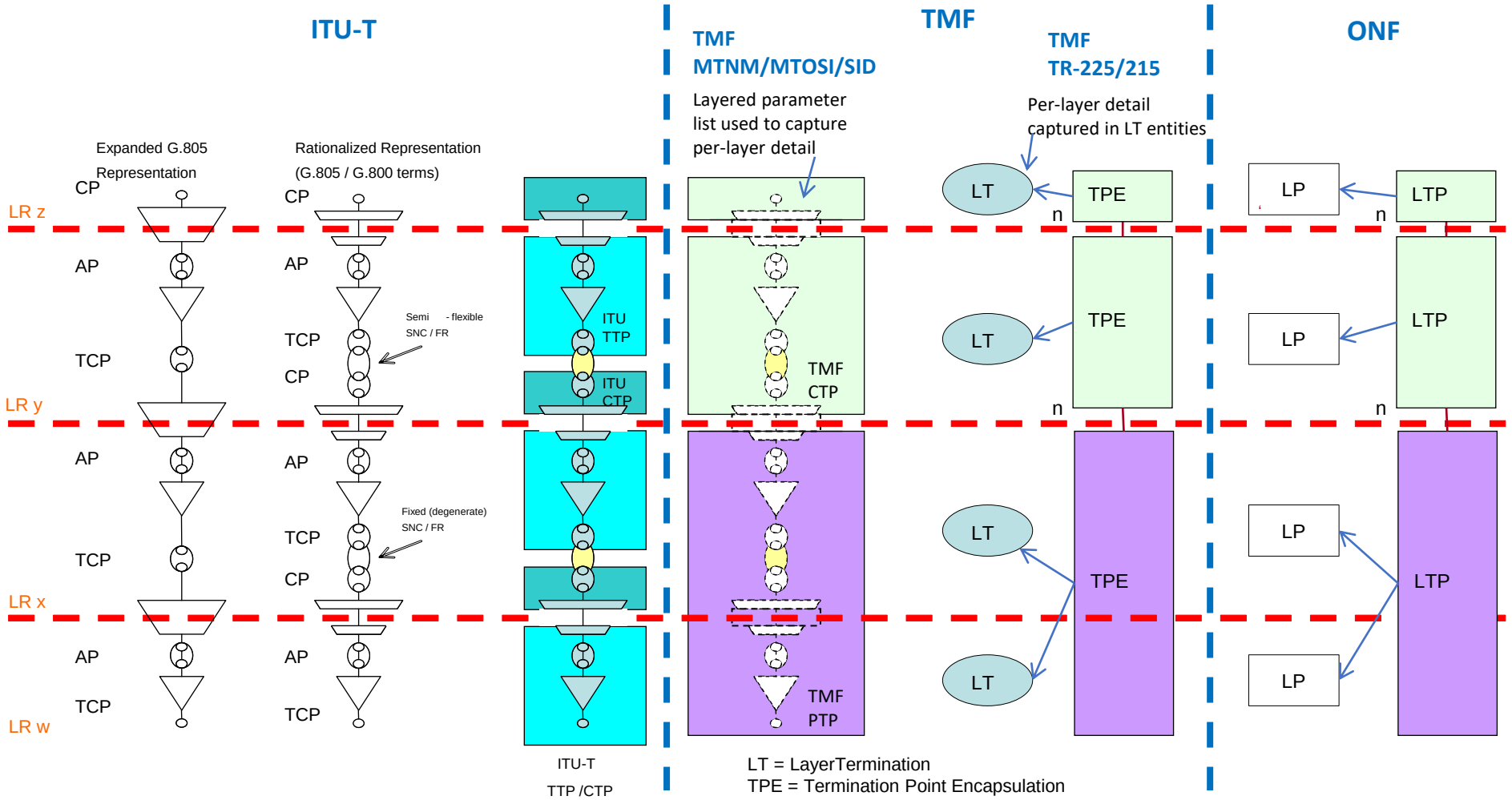
Backup

Background – Q14/15 standards

- **Q14/15 Mandate & Scope**
  - Management & control (MC) of transport systems and equipment
  - Technology architecture & function → MC requirement, information model, data model

	Generic	SDH	Media (L0)	OTN (L1)	Carrier Ethernet	MPLS-TP	MTN	Sync	MC
Q10 Q11 Q12 Q13 Architecture	G.800 G.805	G.803	G.807	G.872	G.8010	G.8110.1	G.8310	G.8260 G.826x G.827x G.781 G.81x	G.7701 G.7702 G.7703
Q10 Q11 Q12 Q13 Interface, Equipment Fn	G.806	G.783	G.698. 1-4	G.709.x G.798.x	G.8013 G.8021 G.8023	G.8112 G.8113.x G.8121.x	G.8312 G.8312.x G.8321		
Q14 Mgmt/Control Requirement	G.7710	G.784	G.876	G.874	G.8051	G.8151	G.8350	G.7721	G.7713.x G.7714.x G.7715.x G.7716 G.7718
Q14 Information Model	G.7711	G.774. 1-10 (CMISE)		G.875	G.8052	G.8152		G.7721.1	G.7719
Q14 Data Model	-		-	-	*G.8052.x*	*G.8152.1 G.8152.2*			

Derivation of LTP (Logical Termination Point) & LP (Layer Protocol) from Functional model



Information Model evolution