

3GPP / TM Forum JWGs

Results, Status, Next Steps ... and Lessons Learned

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3GPP/TM Forum Approach

Resource Model Alignment

Fault Management Harmonization

Lessons Learned

What's Next?

History

- 2009: 3GPP SA5 initiating study on Management of Converged Networks
- 2009: Creation of the TM Forum NGWW initiative
- 2009/2010: Liaisons between 3GPP SA5 and TM Forum NGWW leads to the creation of common study items
- 2010: Formation of two Joint Working Groups (JWGs)
 - Model Alignment
 - Fault Management Harmonization (*FM chosen as test case for further management interface harmonization*)
- 2010: Open Letter by major equipment vendors to use 3GPP IRP Framework for Type 2 of Converged Management
 - Not accepted → leading to continuation of interface silo development
- 2010: Open Letter by major operators “Position paper on cooperation between 3GPP and TM Forum”

3GPP/TMF JWG's

- Model Alignment (RMA)
 - Chaired by NSN; participated by Ericsson, Ciena, DT, NSN, Huawei, ALU, ZTE, as well as TMF staff
 - Goals:
 - Common “umbrella” model, applicable to mobile & transport models
 - Modeling of the “touch points” between mobile & mobile transport (backhaul) models to allow for navigation & alarm correlation (initial use case) as well as related configuration aspects (future)
 - Consideration for backward compatibility
- Fault Management Harmonization (FMH)
 - Chaired by ALU; participated by Ericsson, HP, DT, ALU, NSN, Huawei
 - Goals:
 - Initial goal: single Alarm interface silo → failed end of 2010, TMF continued developing TIP (including TIP RAM)
 - Adjusted goal: semantic alignment between 3GPP Alarm IRP and (the newly created) TIP RAM Interface

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Model Alignment documents & status (1/2)

FMC Federated Network Information Model (FNIM) V2.1

- Provides: Overall concepts and architectural approach for converged management models
- Status: Sent for Review end of January 2012; Comments resolution phase on-going

FNIM Umbrella Information Model (UIM) V2.1

- Provides: common object classes applicable to mobile & transport models, including their relationships and attribute definitions; is based on existing model artifacts from 3GPP & TMF
- Status: Sent for Review end of January 2012; Comments resolution phase on-going

FMC Model Repertoire V2.1

- Provides: meta model artefacts to be applicable to converged management models, though proposed to be used also as common tool box for all Type 2 models; based on 3GPP UML Repertoire and significantly enhanced via NGCOR Model requirements and TMF inputs
- Status: Sent for Review end of January 2012; Comments resolution phase on-going

Model Alignment documents & status (2/2)

FMC 3GPP/TMF Concrete Model Relationships V2.1

- Provides: discussion on FM use cases on the border between mobile & transport networks; proposal for “interconnecting” the mobile model with the transport model
- Status: Sent for Review end of January 2012; Comments resolution phase on-going

Initial Model Alignment Working Procedures V2.0

- Provides: internal Model Alignment JWG working procedures
- Status: completed (reflecting current activities; might be enhanced to address review/approval aspects, if needed); not subject to external reviews

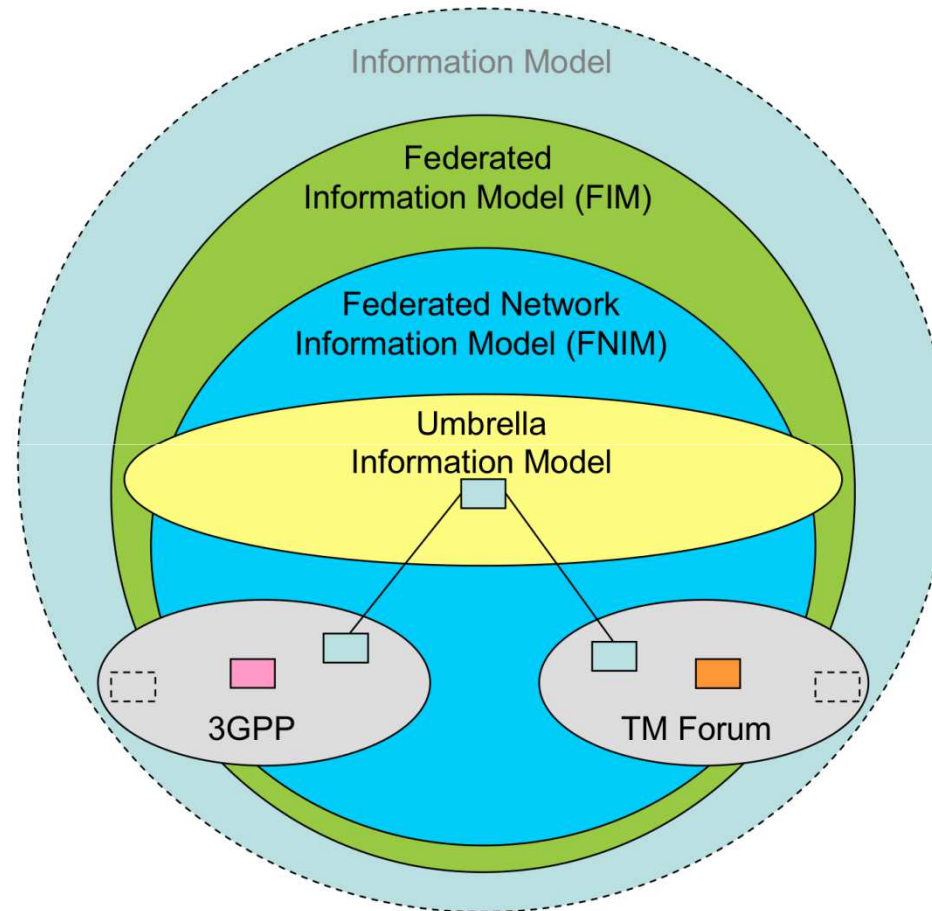
Document storage

- *All Joint 3GPP/TMF Model Alignment Group contributions are available via AND at <http://webapp.etsi.org/MeetingCalendar/MeetingDetails.asp?mid=28916>*

Ongoing procedural issues

- *Feedback from PCG on publication of JWG outputs (governance, intellectual property, etc) is expected at the end of April.*

FNIM – Information Model Relationships



Source: FMC Federated Network Information Model (FNIM) V2.1

FNIM - Characteristics & Features

The network (resource) model for use in FMC network management environment is “large scale” in the following sense:

- Different authorities (SDOs or standard organizations including expert group) are responsible for the development, maintenance and evolution of their own domain specific model.
- Operators may use the whole or part of the FNIM depending on their own business cases.
- Vendors can supply products using part of the FNIM depending on their own business cases.
- The FNIM needs to hold thousands of inter-related modelled entities. Different versions of modelled entities can co-exist in FNIM.

Features:

- Model partitioning
- Ability to navigate among instances of different model components
- Ability to import models designed elsewhere
- Independence of tool and platform
- Independence of solution technology and access protocol design
- Model components release handling

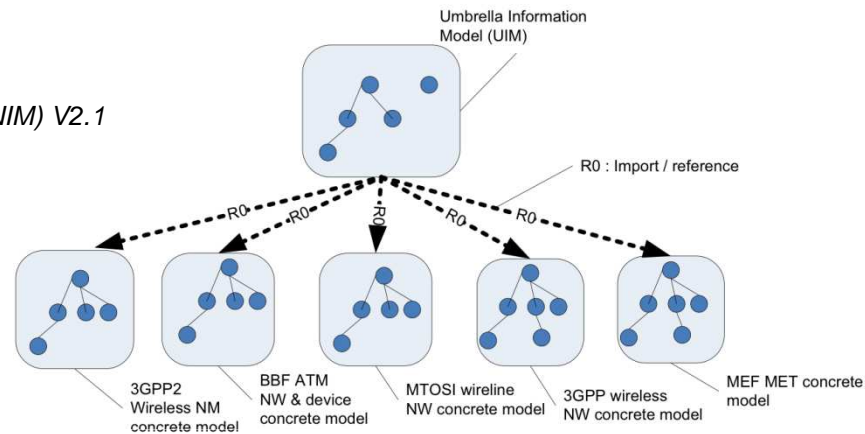
FNIM - Elements & Relationships ^(1/2)

- **FNIM** is a Federation of Models for the purpose of End-to-End Management, consisting of an Umbrella Information Model and a series of Domain/Technology-specific Concrete Models.
- The **Umbrella Information Model (UIM)** provides abstract definitions applicable across Domain/Technology-specific Concrete Models to enable end-to-end consistency of such definitions (it is described as 'abstract' in the sense that its components are inherited by Domain/Technology-specific Concrete Models, and that it is not designed for the purpose of partial or full instantiation of its components and therefore not sufficient to provide meaningful network management service).
- **Domain/Technology-specific Concrete Models** are described as 'concrete models' in the sense that their instantiation is necessary to provide meaningful management services. These Domain/Technology-specific Concrete Models inheriting common definitions from the Umbrella Model for the purpose of end-to-end consistency of management information semantics. In addition, these Domain/Technology-specific Concrete Models have defined relationships between each other to enable end-to-end monitoring and management of a converged network.

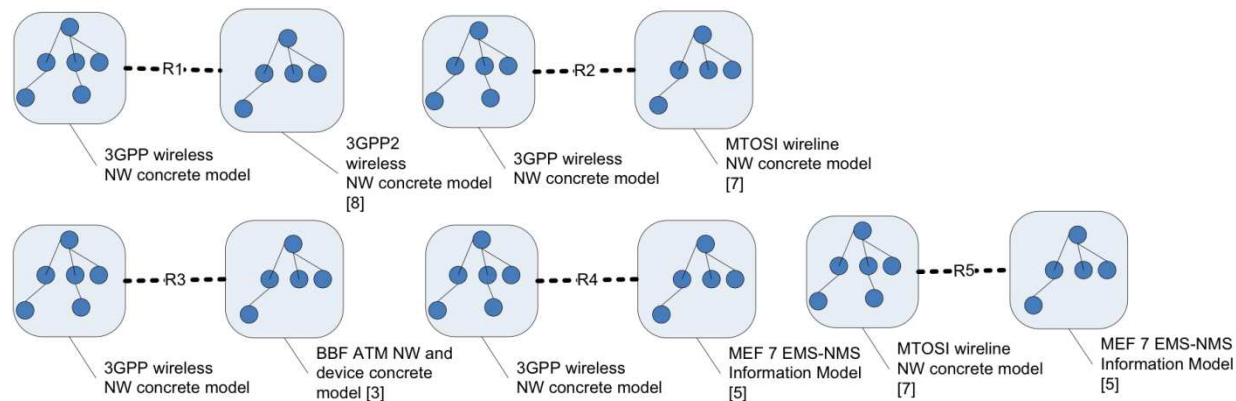
FNIM - Elements & Relationships (2/2)

- Relation between fragments and Umbrella:

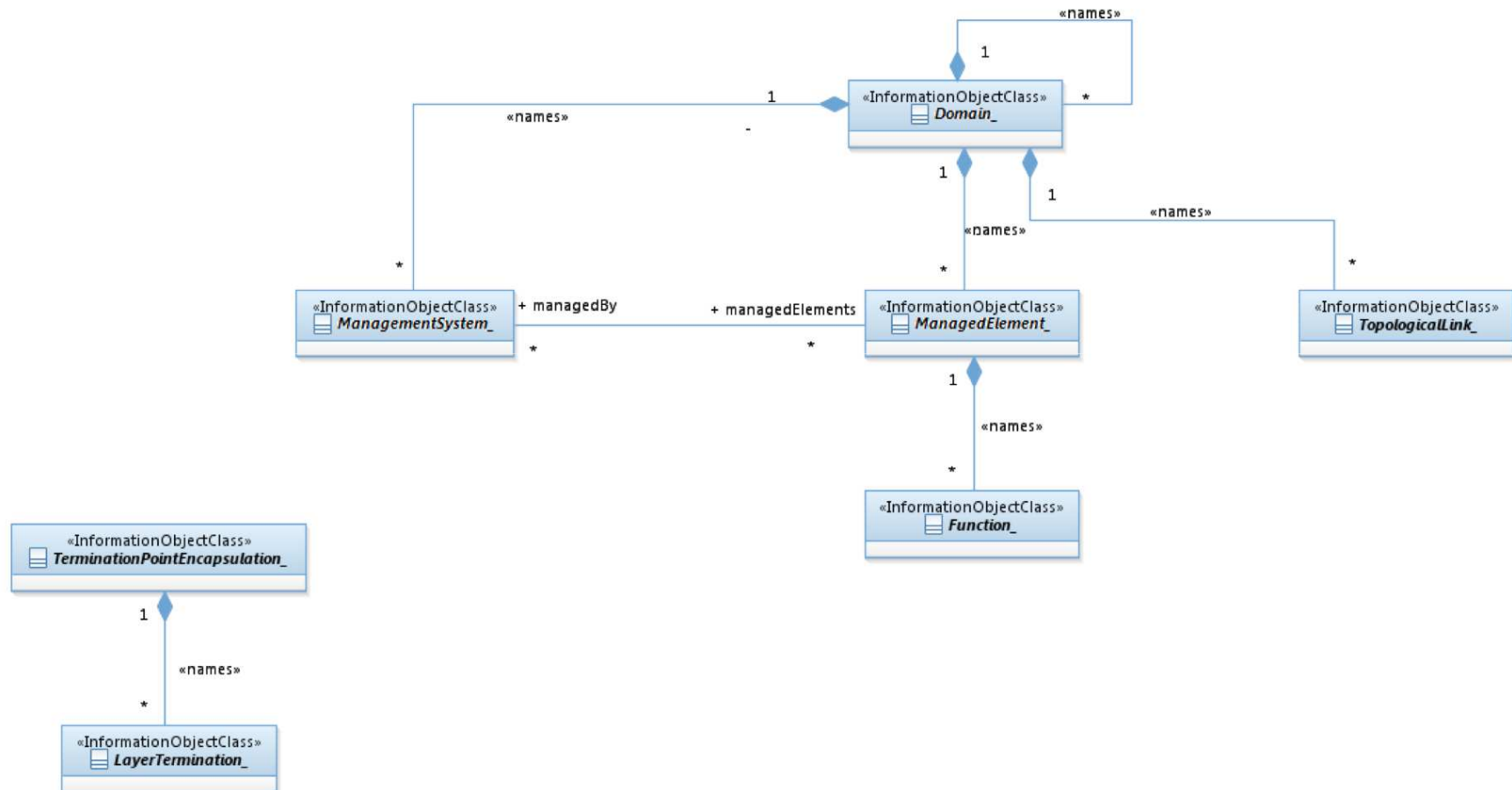
Source:
FMC Federated Network Information Model (FNIM) V2.1



- Relations among pairs of model components:



Umbrella Information Model (UIM) – Class Diagram



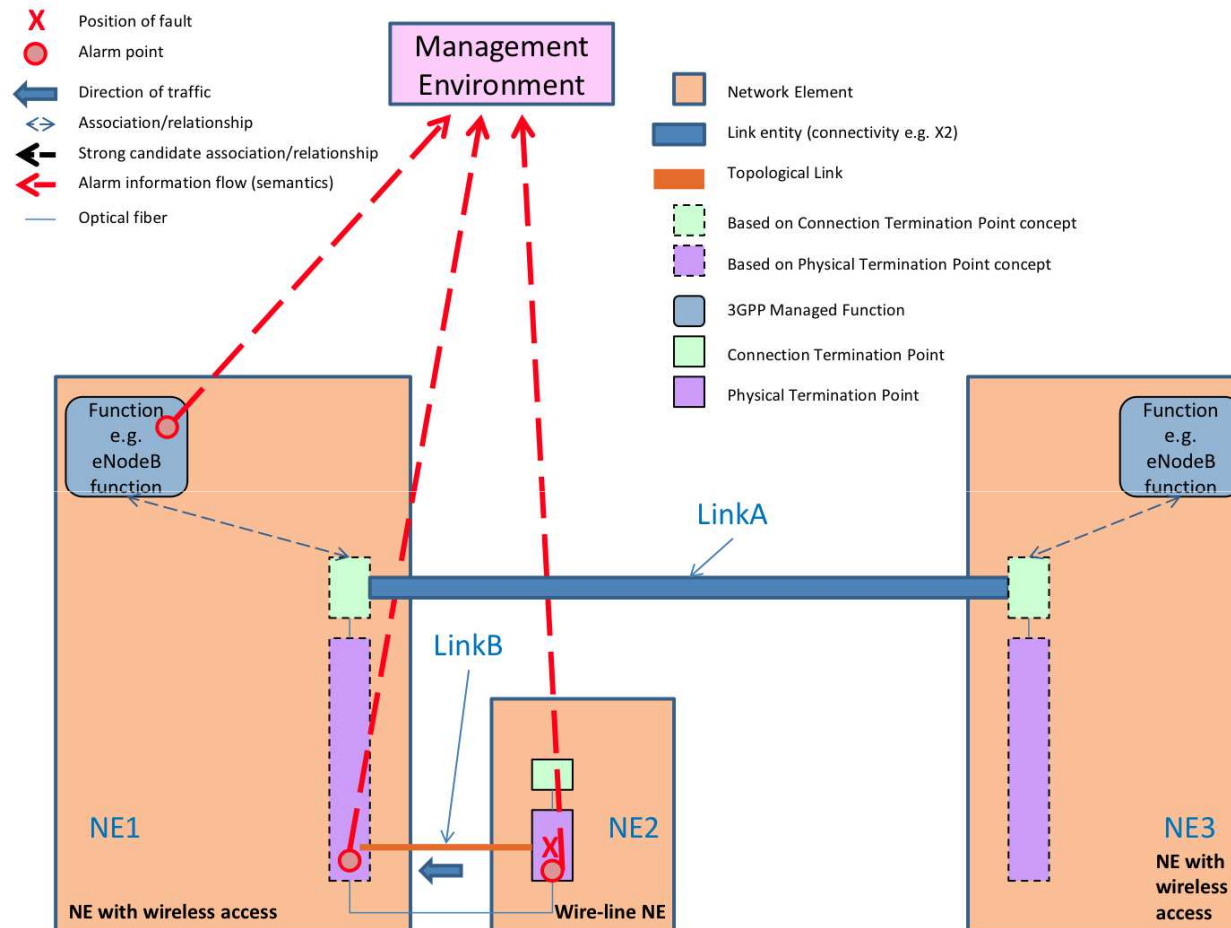
Source: FMC FNIM Umbrella Information Model (UIM) V2.1

Model Repertoire – Attribute Properties

Property name	Description	Legal values
documentation	Contains a textual description of the attribute. Should refer (to enable traceability) to the specific requirement.	Any
ordered	For a multi-valued multiplicity; this specifies whether the values of this attribute instance are sequentially ordered. See section 7.3.44 and its Table 7.1 of [2].	True, False (default)
unique	For a multi-valued multiplicity, this specifies whether the values of this attribute instance are unique (i.e., no duplicate attribute values). See section 7.3.44 and its Table 7.1 of [2].	True (default), False
read	Specifies that this attribute can be read by the manager.	True (default), False
write	Specifies that this attribute can be written by the manager under the conditions specified in Annex B.	True, False (default)
type	Refers to a predefined (see section 5.4.3) or user defined data type (see section 5.3.4. See also section 7.3.44 of [2], inherited from StructuralFeature.	NA
isInvariant	Attribute value is set at object creation time and cannot be changed under the conditions specified in Annex B.	True, False (default)
allowedValues	Identifies the values the attribute can have.	Dependent on type
notification	Identifies whether a notification has to be sent in case of a value change.	True (default), False
defaultValue	Identifies a value at specification time that is used at object creation time under conditions defined in Annex B.	Dependent on type
multiplicity	Defines the number of values the attribute can simultaneously have. See section 7.3.44 of [2]; inherited from StructuralFeature.	See 5.2.8 Default is 1
supportQualifier	Identifies the required support of the attribute. See also section 6.	M, O (default), CM, CO, C

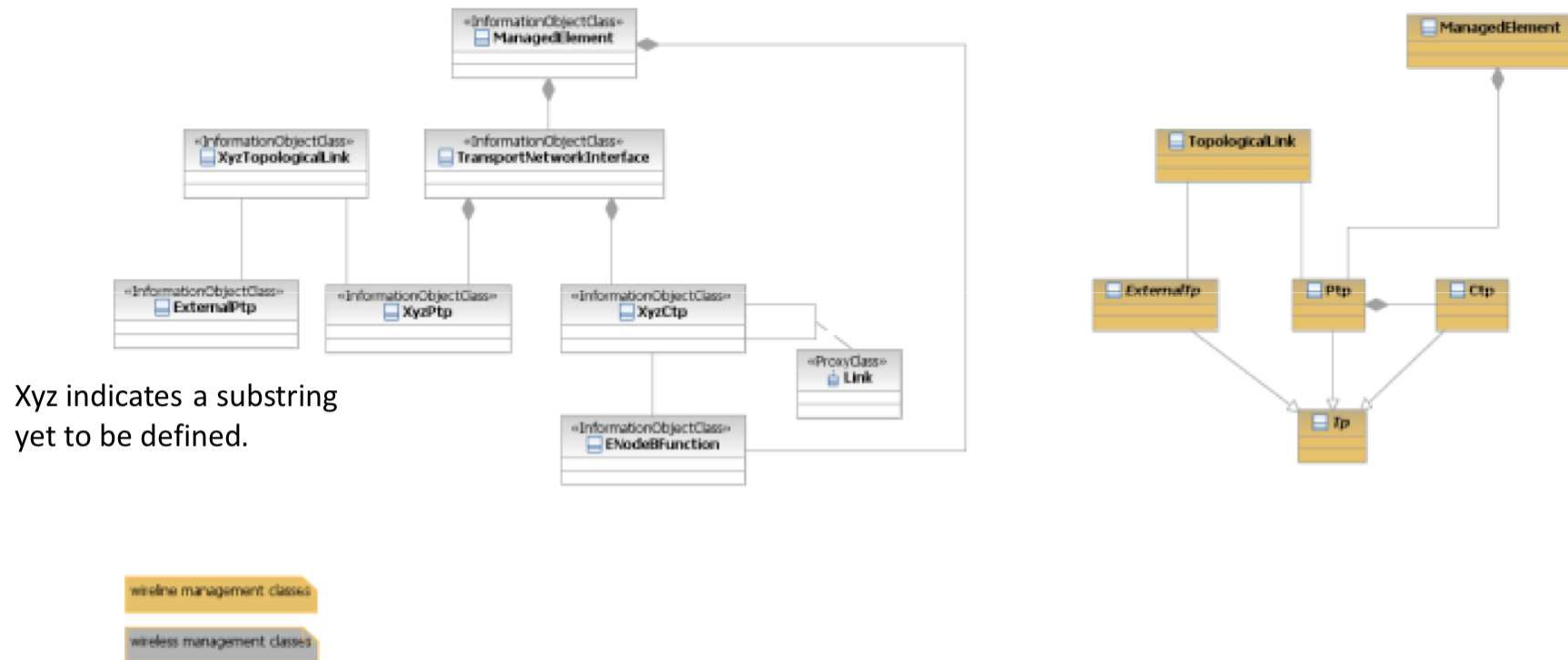
Source: FMC Model Repertoire V2.1

Model Relationship – Context Diagram FM UC



Source: 3GPP/TM Forum Concrete Model Relationships and Use Cases V2.1

Model Relationship – Class Diagram



Source: 3GPP/TM Forum Concrete Model Relationships and Use Cases V2.1

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What's Next?

FMH documents & status (1/2)

Current Scope

- Since failing to agree on a single interface, the FMH JWG concentrated on semantically align the (existing) 3GPP Alarm IRP and the (newly developed) TIP RAM Interface

Semantic Alignment

- Alignment of the meaning of data structure (or data elements) as well as operational capabilities (instructions) on information level
- Does allow different encoding on protocol-level of data structures (or data elements) and instructions to be transferred over an interface
- Advantages: Applications, databases and user-interfaces can rely on working with the semantically identical data structures (or data elements) and operational capabilities even if information is transferred over interfaces using different encodings

FMH Final Report V1.1 (*“Living List”*)

- Document containing the comparison of the differences between the two interfaces, and providing recommendations on how to resolve such ... *or identified the items for which a resolution could not be found.*

FMH documents & status (2/2)

Current situation

- All semantic differences are documented and recommendations are provided
- While many aspects are aligned, continued “differences” exist
 - Use of unique Notification Id vs unique Alarm Id (relates to different notification mechanisms in TIP, while also Log is not supported by TIP yet)
 - OSS-OSS interfaces, where TIP RAM uses new “CreateAlarm” operations instead of reuse of “NotifyNewAlarm”
 - No support in TIP RAM for correlation of a) alarm with non-alarm (events) and b) non-alarm (events)
 - Settable attributes from Manager to Agent within alarm information (supported by TIP, objected by 3GPP)
 - Different methods used for handling alarm correlation
- Conclusion: given that FM was the test case for how interface harmonization is possible across the industry, a semantically aligned interface approach is the proposed way forward for converged management interfaces – and such could be applied also to other areas (e.g. PM/CM)
- Status: Sent for Review end of January 2012; Comments resolution phase on-going

Document storage

- *All 3GPP/TMF FMH JWG contributions are available via AND at http://webapp.etsi.org/meetingDocuments/ViewDocumentList.asp?MTG_Id=28677*

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Lessons learned (1/2)

How did we get there

- RMA: 30+ conference calls, 5 F2F meetings in 2011 (FMH only slightly less)
 - F2F meetings enabled significant progress
 - Conf calls are ok during establishment phase and to complement F2F meetings, but difficult as stand-alone solution, too many time-zones to cover (6am-8amAZ, 9pm-11pmCN)
 - Initial difficulties due to cultural & organizational differences AND different organizational interests → resulting into a lengthy “learning” phases
 - Unclear goals/objectives (or changing goals/objectives) made progress difficult at times (especially in FMH)
 - Early interactions with NCGOR on FMH topics would have been advantageous
 - Established working procedures (documented by RMA) enabled a better “working together”
 - Utilizing TM Forum conference call facilities & 3GPP document management tools (ADN) – great support from TM Forum & 3GPP MCC staff
 - Self-funded F2F meetings, hosted by participating companies (aligned with SDO meetings if possible to save costs)
 - Frequent interaction with participating organizations helped progress & avoided “surprises”
 - Limited resources; differences in expectations vs constraints/reality on project plan
 - Requires Expert Resources have to be present – always!
- ✓ Besides all difficulties, both JVGs (RMA & FMH) delivered excellent results – and provided the foundation for future work between the involved organizations

Lessons learned (2/2)

Recommendations for future projects

- Clear goal & objectives setting, understood and agreed by participating organizations
- Identify supporting companies/resources
- Establish project plan with realistic time goals
- Planning needed for F2F meetings from day 1 (while utilizing already planned SDO meeting if possible); use conference calls as complementary meeting
- Build on existing working methods (procedures, tools); ensure that work is contribution driven
- Build on existing working relationships (if possible)
- Improve operator guidance (e.g. early interactions w/ NGCOR requirements work)
- Ensure frequent interaction with participating organizations to enable rapid adoption
 - Consider partial adoption before projects are finalized (if applicable)
- Consideration for Expert Resources is essential

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What's Next

Current 3GPP/TMF JWG's

- Resolving comments provided by the respective organization; readying the material for approval; provide guidance for maintenance & enhancements
- Subsequent publication and adoption within the specifications of 3GPP & TMF
- After publication, the JWG's are either dissolved or continue as part of another Multi-SDO project (with an enhanced scope of work)

3GPP

- Adoption of the JWG output within 3GPP specifications

TM Forum

- Adoption of the JWG output within TMF specifications

Multi-SDO Projects [*Proposals*]

- Converged Management Model Alignment (Phase 2)
- Converged Management PM Interface definitions