

YANG Modules Project Re-scope

Goals and Objectives

Project: YANG Modules for MEF Services

Purpose of Contribution: Project ~~Proposal~~ Re-scope

Abstract: ~~This project proposes to define YANG Modules for MEF Services using the GE Information Model developed in MEF 7.3 as the basis. These YANG Modules can be used over management interfaces such as NETCONF (RFC 6241). The work will also incorporate or point to the YANG modules developed in other SDOs such as IEEE, ITU-T, and IETF.~~ This contribution proposes to re-scope the existing project (5 2024_004_YANG Modules-v4_Jethanandani.pdf approved in 2015Q1-Denver-TC) to develop YANG models to work on service-level models

Motion: Yes. ~~To approve the creation of this project~~ To approve the re-scoping of the existing project to work on service-level YANG models

Project Title

New Project Proposal

YANG Modules for MEF Services

About this template (delete this panel in the final proposal)

(This template includes slides from TC approved Template: 00004_000_New Project Proposal Template_Florit.pptx located in TC Admin > TC RulesAndProcedures. Note: Each 'panel' in this wiki page is the content of the slide in the ppt template.)

- The goal of this deck is to present to the membership a set of criteria which will influence the decision to start a project or not. The criteria will be presented to the membership during plenary meetings. The proposal should be evaluated as a whole even if some criteria need further assessment by someone's standards.
- **All criteria must be evaluated.** If one is not applicable, don't remove it, indicate why it's N/A instead.
- Next slides list all criteria in tables. Additional slides should be inserted after the tables if more information is required.
- When evaluating the scope criterion, be specific, this will be the reference for the entire life of the project.

For examples see other approved project proposals in [TC ActiveProjectsScope](#)

Criterion	Description
Motivation	Describe why we want to address the issue
Scope	Detailed description/boundaries of the problem we will address. Be as specific as possible.
Broad Market Potential	Broad sets of applicability Multiple vendors and numerous users Marketing Committee input here is welcome. Economic feasibility: high level market potential numbers, investment vs. return
Compatibility	Impact on other specs and projects in progress Once completed, spec must not contradict existing MEF specs already released
Distinct Identity	From existing MEF specs/projects If overlaps with other SDOs then must specify why we should proceed here at the MEF and how we would do things differently
Technical Feasibility	Feedback from both vendors and SPs required: Vendors should indicate the level of difficulty to implement (easy, medium, hard), SPs should validate Operational use impacts as (viable or difficult)
Sponsorship	Project proposal must include names of companies willing to contribute content, attend conference calls, comment in SBs. The more the better
Schedule	Estimate of how much time & SB are required to completion

Motivation

YANG Modules are expected to be used to model configuration, operational status and any notifications.

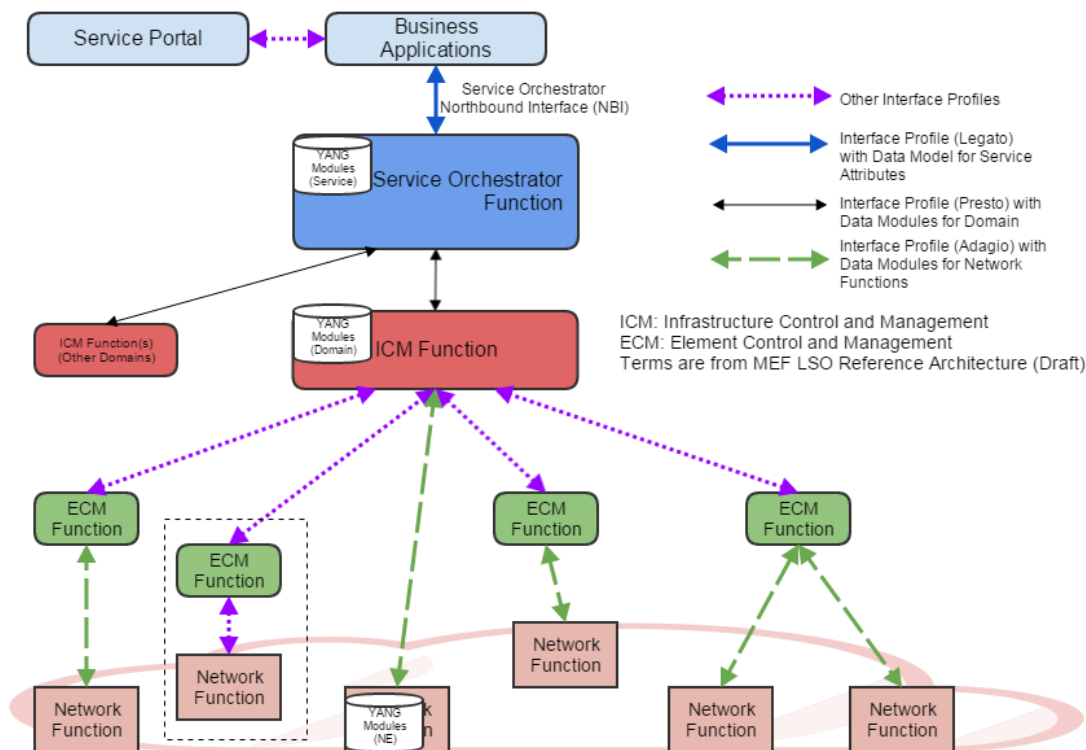
As early as 2002, Internet Architecture Board (IAB) of IETF recommended that IETF/IRTF should spend resources on the development and standardization of XML-based device configuration and management technologies (RFC 3535, Section 6. Recommendation 5). Subsequently RFC 6241 was written and uses an Extensible Markup Language (XML)-based data encoding for the configuration data as well as the protocol messages.

As stated in abstract of RFC 6020, YANG is a data modeling language used to model configuration and state data manipulated by the Network Configuration Protocol (NETCONF), NETCONF remote procedure calls, and NETCONF notifications. Additionally, IETF had sent a liaison statement to MEF ([49000_001_IETF-MIBmodule-statement_Ranganathan.pdf](#)) notifying that "IETF working groups are therefore encouraged to use the NETCONF/YANG standards for configuration, especially in new charters". Therefore, it would be good for MEF to align its data model effort with that of IETF.

Furthermore, industry efforts such as OpenDaylight are using YANG modules to manage various network services.

~~**MEF has defined a suite of services (MEF 6.2, MEF 33, MEF 28, MEF 43 etc.) for which YANG modules, at the management system (EMS or NMS) and NE, do not exist. However, MEF has defined YANG modules for OAM i.e. MEF 38 (FM) and MEF 39 (PM). The YANG modules are expected to be used for interfaces such as NMS-NE, and EMS-NE (see also Figure 1 in MEF 40).**~~

The YANG modules defined in this project are for the management of service-related attributes. ~~that would complement the current SOAM PM/FM YANG modules defined in MEF 38/39.~~ The new YANG modules are intended to standardize the data representation of objects in support of EVC, OVC, UNI and ENNI service attributes **for the interface between the business applications and the Service Orchestrator function, also known as the Legato interface in the LSO Management Reference Architecture and Framework draft specification (SOC project - Work in Progress) .** ~~for the southbound interface (SBI) between Element Management Layer (EML) and Network Elements (NE) using a TMN model, the SBI between the Network Controller and NEs per the ETSI NFV MANO model, or the SBI between an SDN Controller and NEs per the ONF architecture.~~ This work will complement the SOC's Carrier Ethernet Service Configuration and Activation Framework draft specification (work in progress) that defines ~~API for EVC, OVC, UNI and ENNI service attributes for the northbound interface (NBI) between EML and Network Management Layer (NML), the NBI between Network Controller and NFV Orchestrator, and the NBI on an SDN Controller~~ the interface between Service Orchestrator function and the ICM, also known as the Presto interface in the LSO Management Reference Architecture draft specification, and other resource level data models.



Scope

The scope of this project would be to develop **service-level YANG modules specifications that are residing in the Service Orchestrator function, where it is the server and, for example, the Business Applications is the client.** This project will focus on the definition of the data model residing in the server and also specify the interface profile between the Service Orchestrator function and the Business Applications. ~~at the management system (EMS or NMS) and NE,~~ in support of the attributes defined for the following:

- EVC based services as defined by MEF 6.2 and EVC Service Attributes as defined in 10.3.
- OVC based services as defined in MEF 51 (OVC services), and OVC and ENNI service attributes defined in the draft of MEF 26.2 (ENNI and OVC attributes, work in progress) ~~28(UTA)~~, MEF 33(E-Access).
- ~~Relevant aspects of services using MEF 43 vNID function, excluding data carried over the RMI channel.~~
- ~~Functions such as LLB (MEF 46), and SAT PDU & Control Protocol.~~
- Appendices might be added to describe, as example, complete modules that incorporate modules from other SDOs.

~~Individual sub-modules will be defined for the functional elements that could be assembled to realize a specific service behavior at a given interface in the NE, e.g. to enable an interface to behave as a MEF UNI.~~

The modules will ~~use relevant aspects of~~ align with Information Model specified in MEF 7.3 project and propose additions to the Information Model as necessary ~~(e.g. as shown in Figure 5.6 and 5.7 in published specification MEF 7.2). and any additional Managed Objects definitions in MEF 40 and MEF 42.~~ In addition, the MEF YANG modules will reference and/or align with modules, objects and ~~functions~~ data types from other SDOs (IETF, ITU-T, IEEE) as needed. As an example, MEF might need to co-develop a YANG module with another SDO such as IETF.

Broad Market Potential

Carrier Ethernet services continue to grow and gain popularity with 10Gbps and 100Gbps Ethernet services to grow 300% by 2018 according to Infonetics Research (<http://www.infonetics.com/pr/2014/Ethernet-and-IP-MPLS-VPN-Services-Market-Highlights.asp>).

Carrier Ethernet is growing at double digit rates in every region of the world according to Vertical Systems Group (<http://www.verticalsystems.com/vsgpr/carrier-ethernet-services-3-million-ports-worldwide-by-2018/>). In the five-year period between 2014 and 2018, telecom operators are expected to spend \$147B on carrier Ethernet equipment according to Infonetics (<http://www.infonetics.com/pr/2014/Carrier-Ethernet-Market-Highlights.asp>).

YANG has become a popular data modeling language in several open networking initiatives and in particular is **also** supported by the popular OpenDaylight SDN controller. Similarly, IETF is defining IP VPN service models using YANG for use by an orchestrator. Having YANG models will also facilitate the evolution of MEF Carrier Ethernet services to be able to deliver Carrier Ethernet Network-as-a-Service (CE NaaS) which is a key part of the MEF's new Third Network Vision to deliver agile, assured and orchestrated services.

Finally, this implementation comes at the behest of operators who are demanding such a solution.

Compatibility

~~The YANG modules are for MEF defined services.~~ These modules are aligned with MEF 7.3 information model. These are not expected to change any existing specifications defined by MEF.

A Data Model is required for standard interface definitions (e.g., RESTCONF, NETCONF, etc.). However, this project will not seek definition of such interfaces.

MEF has specified YANG modules for FM (MEF 38) and PM (MEF 39). This project will not supersede either of them but might reference data models within those modules.

The output of this project would be complementary to the ongoing work (Service Configuration and Activation Specification] in Service Operations Committee].

This project will also be aligned with development of YANG modules in other SDOs.

Distinct Identity

The YANG modules in this project are for MEF defined services. This project is distinct from other projects as no similar project has been undertaken for these services in MEF. For example, the ongoing work (Service Configuration and Activation Specification) in Service Operations Committee] is focused on a different data model.

There is work being done in other SDOs on the definition of YANG modules, for example, non-MEF services, equipment and protocols. This project will be aligned with development of YANG modules in other SDOs.

However, not all aspects of MEF services are being covered by other SDOs. Definition of YANG modules not being developed elsewhere will be covered by this project.

Technical Feasibility

Most ~~networking~~ vendors including OSS, NMS, Service Orchestration, SDN Controllers, etc. developers that we are aware of, have either implemented YANG modules, or are implementing them. The difficulty of development of YANG modules is ~~related to the alignment with MEF 7.3 and not in the development of YANG module itself.~~ medium.

The Service Provider might find the operational impacts to be viable.

Sponsorship

- Cisco (**Mahesh Jethanandani**)
- Amdocs (**Michael Rehder**)
- Ciena Corporation (**Ashesh Mishra**)
- Comcast (**Mehmet Toy**)
- Coriant (**Weiyang Cheng**)
- Deutsche Telekom (**Frank Huang**)
- Fujitsu (**Ralph Santitoro**)

If you are interested in sponsoring this project, please contact me at [Mahesh Jethanandani](#).

Schedule

• Deliverable 1:

- Yang modules for EVC based services (MEF 6.2)
- [Technical Specification](#)
- Machine readable file (including a UML Interface definition)
- Ballots Schedule:
 - Project start Q4 2015
 - At least two CfCB (2015Q4, 2016Q2)
 - (Target) Letter ballot Q4 2015 6 (October-July)

• Deliverable 2 - (May be Revision of Deliverable 1):

- Yang modules for OVC based services (~~OVC Services~~, MEF 51, MEF 28, MEF 33, MEF 43)
- [Technical Specification](#)
- Machine readable file (including a UML Interface definition)
- Ballots Schedule:
 - Project start Q3 2015 (May start earlier if parallel effort is useful)
 - At least two CfCB
 - (Target) Letter ballot Q2 2016 (~~April~~ October)

• ~~Deliverable 3:~~

- ~~Yang modules for LLB (MEF 46) and SAT PDU & Control Protocol.~~
- ~~Machine readable file~~
- ~~Ballots Schedule:~~
 - ~~Project start Q1 2016 (May start earlier if parallel effort is useful)~~
 - ~~At least two CfCB~~
 - ~~(Target) Letter ballot Q4 2016 (October)~~

The modules may be in one specification.

Outline of the document (Optional)

~~(Similar to MEF 38 Table of Contents)~~

~~1. Abstract~~

~~2. Terminology and Acronyms~~

~~3. Scope~~

~~4. Compliance Levels~~

~~5. Introduction~~

~~6. YANG Overview~~

~~7. YANG Requirements~~

~~8. YANG MODULE~~

~~9. References~~

1. List of Contributing Member Companies
2. Abstract
3. Terminology and Acronyms
4. Scope
5. Compliance Levels
6. Introduction
7. Use Cases
8. Information Model Fragment (MEF 7.3 model)
9. YANG Module Architecture and Tree Views
10. Requirements
11. YANG Modules
12. References

Document Type
<ul style="list-style-type: none">• Technical Specifications (TS),• Machine Readable File

Motion

Approve a project to do X, Y, Z

Moved:

Seconded:

Voting

Yes:

No:

Abstain: