3GPP SA5 Update for Multi-SDO Information Modelling Workshop
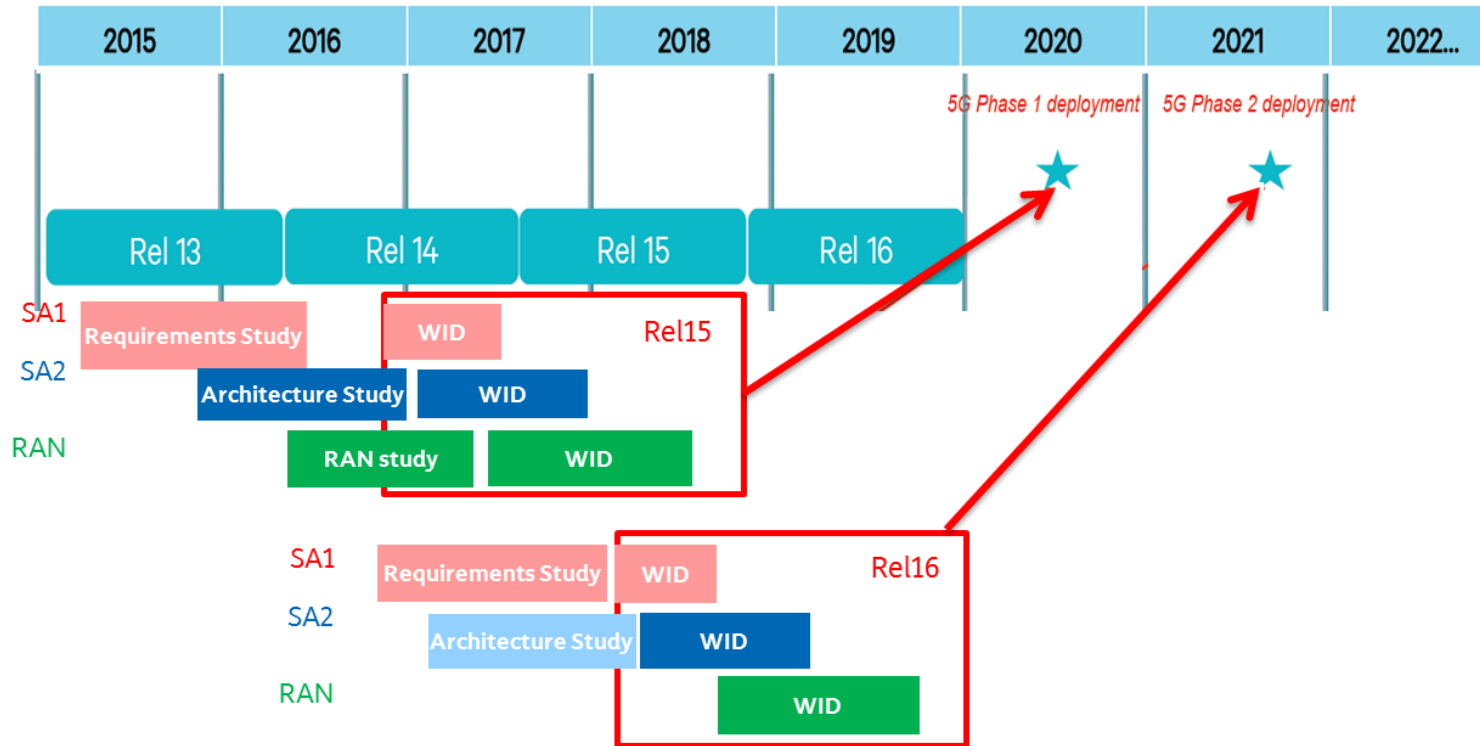
December 8-9, 2016

Zou Lan (Huawei)

Contents

- 3GPP SA5 Progress in 2016
  - Launch of 5G network and service management and orchestration studies
  - Continued collaboration with ETSI ISG NFV on Information Model

- 3GPP SA5 recommendations on Information modelling

5G network and service management and orchestration

3GPP 5G Roadmap

3GPP SA5 work on 5G:

- SA5 will take into account the outcome from other 3GPP WGs and other SDOs including 3GPP SA1, 3GPP SA2, RAN WGs, NGMN, ITU-T, ETSI ISG NFV
- The ongoing SA5 Release 14 studies should be completed by March 2017
- The normative work will target Release 15

Release 14 Study on Management and Orchestration Architecture of Next Generation Network and Service

- Scope of the study (TR 28.800)
  - Clarify the terminology and use cases
  - Support of network operational features such as real-time, on demand, automation etc. as evolution from 4G management aspects
  - Support of vertical applications (e.g. V2X)
  - Support of the scenario in which the applications are hosted close to the access network
  - Support of management and orchestration aspect of E2E user services
  - Potential reuse of existing 3GPP management architecture and architectural framework defined by ETSI ISG NFV

Release 14 Study on Management and Orchestration of Network Slicing

Scope of the study (TR 28.801)

- Define terminology, use cases and requirements for management and orchestration of network slicing

- Management of network function sharing in the context of network slicing

- Impacts to management when a slice instance is shared between multiple parties

- Isolation of management data between different parties within a slice instance if needed

- Automation of management and orchestration of network slice instances and the related policy configurations

- Management and orchestration mechanisms to support the isolation/separation of mobile network resources used by different network slice instances

- Study solution for management and orchestration of network slicing and how it affects the existing SA5 specifications

Release 14 Study on Management Aspects of Next Generation Network Architecture and Features

- Scope of the study (TR 28.802)

  - Identify the use cases for management aspects of the next generation network in terms of network architecture and high level features such as mobility on demand and QoE/QoS

  - Investigate the potential impact of the next generation network architecture and high level features to the functional blocks of 3GPP management system

  - Figure out the location and role of management functionality to support next generation network architecture

  - Study and develop the potential management related requirements for the next generation network in terms of network architecture and high level features

  - Study the possible solutions to support the management requirements brought from the end to end next generation network architecture

  - Study the possible solutions of management aspects to support the key features of the next generation network

Release 15 Study on management aspects of virtualized network functions that are part of the NR (New Radio)

- Scope of the study (TR 32.864)

  - Study the management use cases and potential management requirements for the virtualized network functions that are part of the NR, and their relations with non-virtualized part of the RAN from management perspective, based on the management solutions of mobile networks that include virtualized core network functions (EPC or IMS).

  - Identify the use cases and potential requirements which cannot be supported by the management solutions of mobile networks that include virtualized core network functions (EPC or IMS).

  - Study the potential solutions for the identified use cases and requirements.

  - Provide recommendations on the feasibility of extending the scope of the normative specifications for management of mobile networks that include virtualized network functions to also cover management of virtualized network functions that are part of the NR.

Progress of IM collaboration with ETSI

IM collaboration between 3GPP SA5 and ETSI ISG NFV (1/3)

3GPP SA5 view at the beginning of collaboration
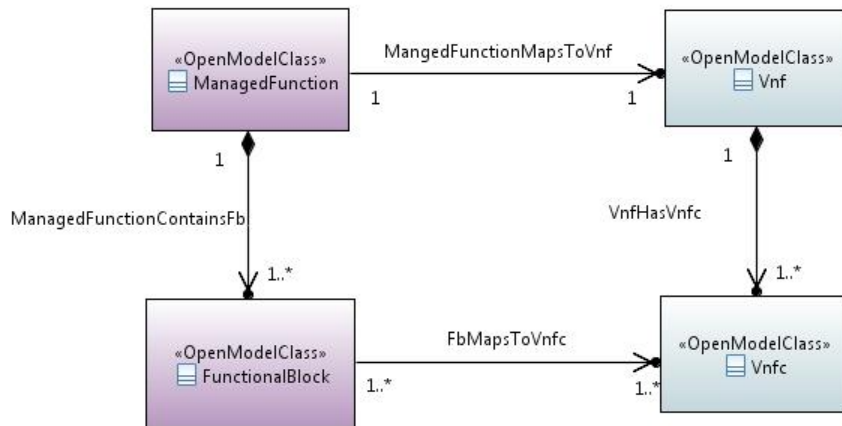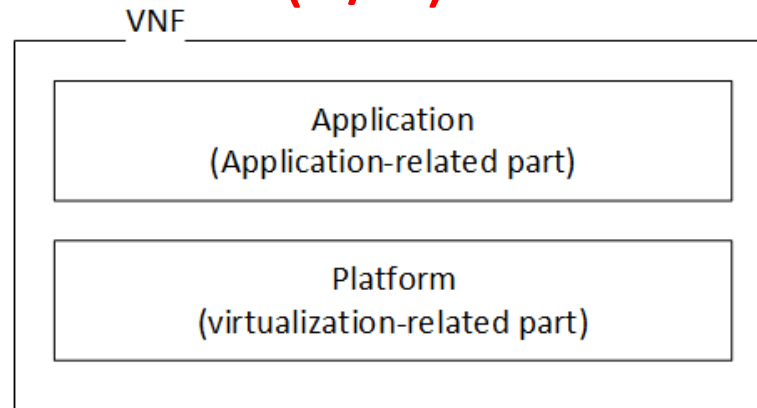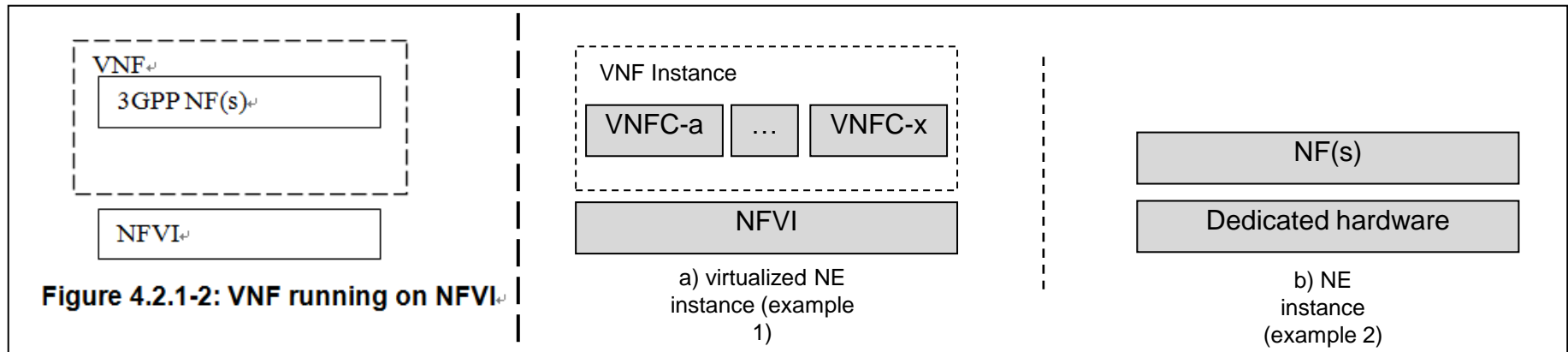
Result after the collaboration
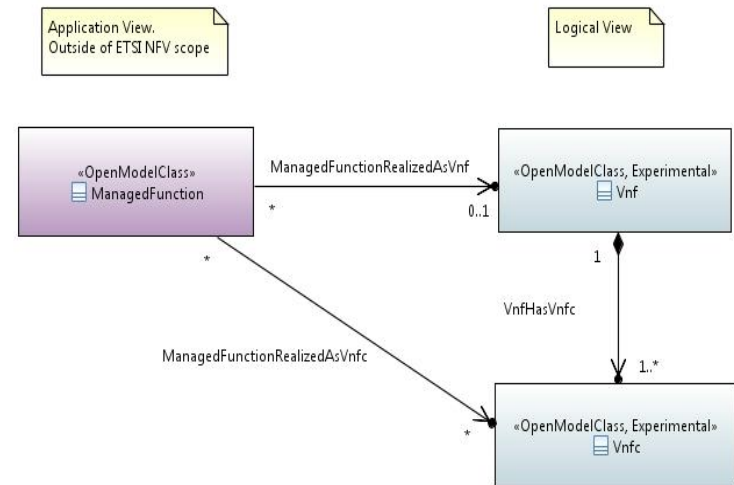
ETSI ISG NFV has updated IFA015 to achieve closer alignment between 3GPP Network Resource Model (used as "Application View Outside of ETSI NFV scope") and NFV Information Model as stated in "LS from ETSI ISG NFV on informing about update to application view in IFA015" (S5-166044/NFV(16)000252).

- The FunctionalBlock class has been removed as it does not exist in 3GPP NRM;
- The association verb on the relationship between 3GPP ManagedFunction and ETSI NFV Vnf/Vnfc has been changed to RealizedAs which reflects better the association.
- The cardinalities of the relationship between ManagedFunction and Vnf classes have been changed from "1:1" to "* : 0..1" as ManagedFunction is part of at most one Vnf.
- The cardinalities of the relationship between ManagedFunction and Vnfc classes have been changed from "1..*" to "* : *" as this relationship is considered vendor specific.

IM collaboration between 3GPP SA5 and ETSI ISG NFV (2/3)

3GPP SA5 view at the beginning of collaboration

VNF

Application (Application-related part)

Platform (virtualization-related part)

Result after the collaboration

VNF
3GPP NF(s)

NFVI

Figure 4.2.1-2: VNF running on NFVI

VNF Instance

VNFC-a ... VNFC-x

NFVI

a) virtualized NE instance (example 1)

NF(s)

Dedicated hardware

b) NE instance (example 2)

3GPP SA5 updated the VNF definition for mobile networks that include virtualized network functions which can be part of EPC or IMS in TS 28.500 as result of incoming ETSI ISG NFV LS (S5-165193/NFV(16)000245)

IM collaboration between 3GPP SA5 and ETSI ISG NFV (3/3)

- 3GPP SA5 and ETSI ISG NFV have agreed on the guidelines for co-operation guideline in April, 2016
    - LS from 3GPP SA5 on the guideline for co-operation(S5-161234)
    - Reply LS from ETSI NFV (S5-162037)
    - Further reply LS from 3GPP SA5 (S5-162246)
- Ongoing collaboration related to operations via the LSs:
    - Use of un-instantiated VNF instance ID in UpdateNS operation
        - LS from ETSI NFV (S5-166396/NFV(16)000347)
    - NFV Interface and Architecture specifications
        - LS from ETSI NFV (S5-166042/NFV(16)000245)
        - Reply LS from 3GPP SA5 (S5-166424)
    - NFV-based solutions for next generation mobile networks
        - LS from ETSI NFV (S5-166051/NFV(16)000324r4)
        - Reply LS from 3GPP SA5 (S5-166464)
    - SOL WG work plan schedule
        - LS from ETSI NFV (S5-166220/NFV(16)000316r2)
        - Reply LS from 3GPP SA5 (S5-166465)

3GPP SA5 recommendations

3GPP SA5 recommendations (1/2)

- ETSI NFV is responsible for modelling the ETSI logical view.

    -> Agreed between 3GPP SA5 and ETSI ISG NFV.

- 3GPP SA5 is responsible for modelling the "application-specific aspects" of all 3GPP defined VNFs. 3GPP SA5 will use the current 3GPP SA5 methodology for the production and maintenance of 3GPP SA5 specifications for management of mobile networks that includes VNFs.

    -> Agreed between 3GPP SA5 and ETSI ISG NFV.

- 3GPP SA5 does not recommend to conduct model harmonization work between 3GPP SA5 defined managed function (e.g. VNF) application-specific model and all other SDO-defined application-specific models.

    -> As stated in January 2016

3GPP SA5 recommendations (2/2)

- 3GPP SA5 recommends to harmonize views on the following aspects among ETSI ISG NFV, 3GPP SA5 and all other related SDOs:
    - Relation-1 (relation between ManagedFunction and Vnf)
    - Relation-2 (relation between ManagedFunction and Vnfc)

    -> Agreed between 3GPP SA5 and ETSI ISG NFV.

- 3GPP SA5 recommends to have a clear separation of the management protocols and the information that the protocols carry (as done in 3GPP SA5 IRP methodology).

    -> As stated in January 2016

- 3GPP SA5 recommends SDOs to use the 3GPP-TM Forum Umbrella Information Model as the base for SDOs' model harmonization work.

    -> As stated in January 2016

Thank You !

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Annexes

5G network and service management study technical reports

- TR 28.800 Study on management and orchestration architecture of next generation network and service
- TR 28.801 Study on management and orchestration of network slicing for next generation network
- TR 28.802 Study on management aspects of next generation network architecture and features
- TR 32.864 Study on management aspects of virtualized network functions that are part of the New Radio (NR)

3GPP SA5 specifications: http://www.3gpp.org/ftp/Specs/html-info/TSG-WG--S5.htm

SA5 NFV Specifications (1/2)

- TS 28.500 Concept, architecture and requirements for mobile networks that include virtualized network functions

- TS 28.510 Configuration Management (CM) for mobile networks that include virtualized network functions; Requirements
- TS 28.511 Configuration Management (CM) for mobile networks that include virtualized network functions; Procedures
- TS 28.512 Configuration Management (CM) for mobile networks that include virtualized network functions; Stage 2
- TS 28.513 Configuration Management (CM) for mobile networks that include virtualized network functions; Stage 3

- TS 28.515 Fault Management (FM) for mobile networks that include virtualized network functions; Requirements
- TS 28.516 Fault Management (FM) for mobile networks that include virtualized network functions; Procedures
- TS 28.517 Fault Management (FM) for mobile networks that include virtualized network functions; Stage 2
- TS 28.518 Fault Management (FM) for mobile networks that include virtualized network functions; Stage 3

3GPP SA5 specifications: http://www.3gpp.org/ftp/Specs/html-info/TSG-WG--S5.htm

SA5 NFV Specifications (2/2)

- TS 28.520 Performance Management (PM) for mobile networks that include virtualized network functions; Requirements
- TS 28.521 Performance Management (PM) for mobile networks that include virtualized network functions; Procedures
- TS 28.522 Performance Management (PM) for mobile networks that include virtualized network functions; Stage 2
- TS 28.523 Performance Management (PM) for mobile networks that include virtualized network functions; Stage 3

- TS 28.525 Life Cycle Management (LCM) for mobile networks that include virtualized network functions; Requirements
- TS 28.526 Life Cycle Management (LCM) for mobile networks that include virtualized network functions; Procedures
- TS 28.527 Life Cycle Management (LCM) for mobile networks that include virtualized network functions; Stage 2
- TS 28.528 Life Cycle Management (LCM) for mobile networks that include virtualized network functions; Stage 3

3GPP SA5 specifications: http://www.3gpp.org/ftp/Specs/html-info/TSG-WG--S5.htm