

3GPP SA5 status

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3GPP SA5 Telecom Management ToR

- SA5 will specify the requirements, architecture and solutions for provisioning and management of the network (RAN, CN, IMS) and its services. The WG will define charging solutions in alignment with the related charging requirements developed by the relevant WGs, and will specify the architecture and protocols for charging of the network and its services.
- The WG will ensure its work is also applicable to the management and charging of converged networks, and potentially applicable to fixed networks. The WG will coordinate with other 3GPP WGs and all relevant SDOs to achieve the specification work pertinent to the provisioning, charging and management of the network and its services.

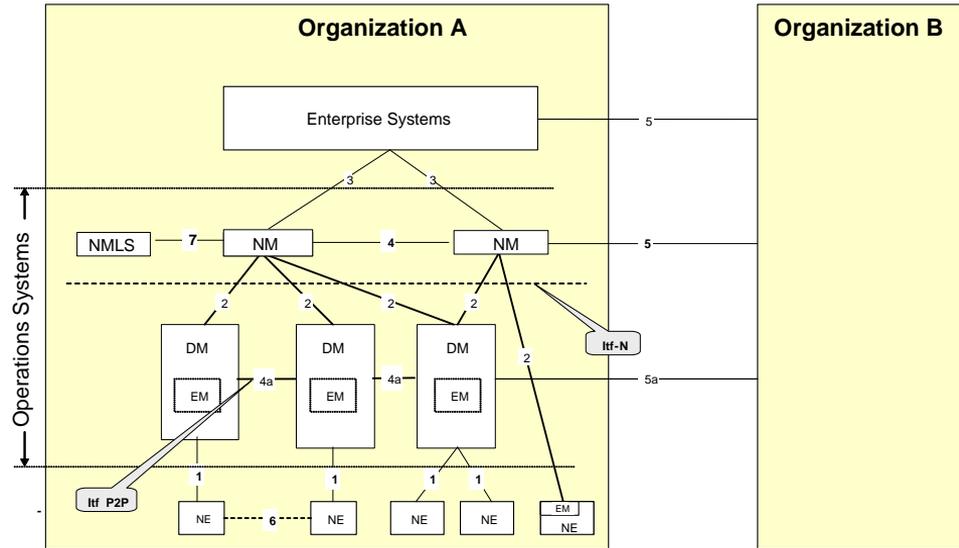
<http://www.3gpp.org/Specifications-groups/sa-plenary/56-sa5-telecom-management>

3GPP SA5 Leadership

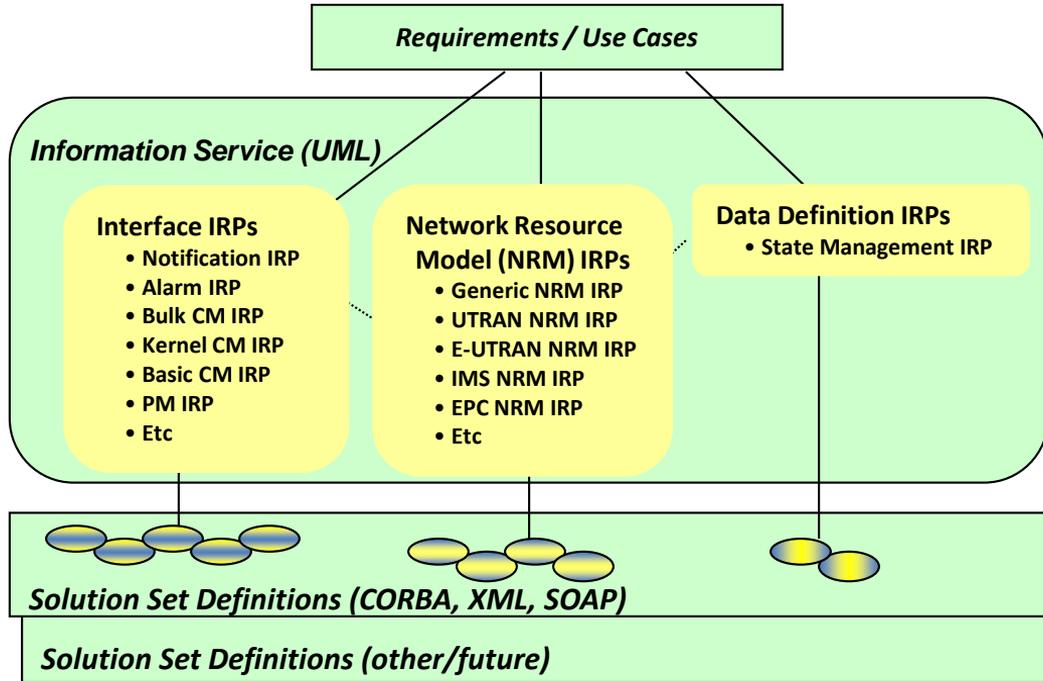
SA5	Thomas Tovinger (Ericsson)	Chair	since 08/2015
	Jean-Michel Cornily (Orange)	VC	since 08/2013
	Christian Toche (Huawei)	VC	since 08/2015
Charging Sub-Working Group (SWG)	Maryse Gardella (Nokia)	Chair	since 08/2013
	Robert Törnkvist (Ericsson)	VC	since 05/2016
	Chen Shan (Huawei)	VC	since 05/2016
OAM&P Sub-Working Group (SWG)	Christian Toche (Huawei)	Chair	since 01/2016

3GPP Management Reference Model (TS 32.101)

- 1: Between the Network Elements (NEs) and the Element Manager (EM) of a single broadband wireless network
- 2: Between the Element Manager (EM) and the Network Manager (NM) of a single broadband wireless network**
- 3: Between the Network Managers and the Enterprise Systems of a single broadband wireless network
- 4: Between the Network Managers (NMs) of a single broadband wireless network
- 4a: Between the Domain Managers (DMs) of a single broadband wireless network
- 5: Between Enterprise Systems & Network Managers of different broadband wireless networks
- 5a: Between the Domain Managers (DMs) of different broadband wireless networks
- 6: Between Network Elements (NEs)
- 7: Between the Network Management Layer Service (NMLS) and the Network Manager (NM).



3GPP SA5 Integration Reference Point (IRP) Concept (TS 32.150)

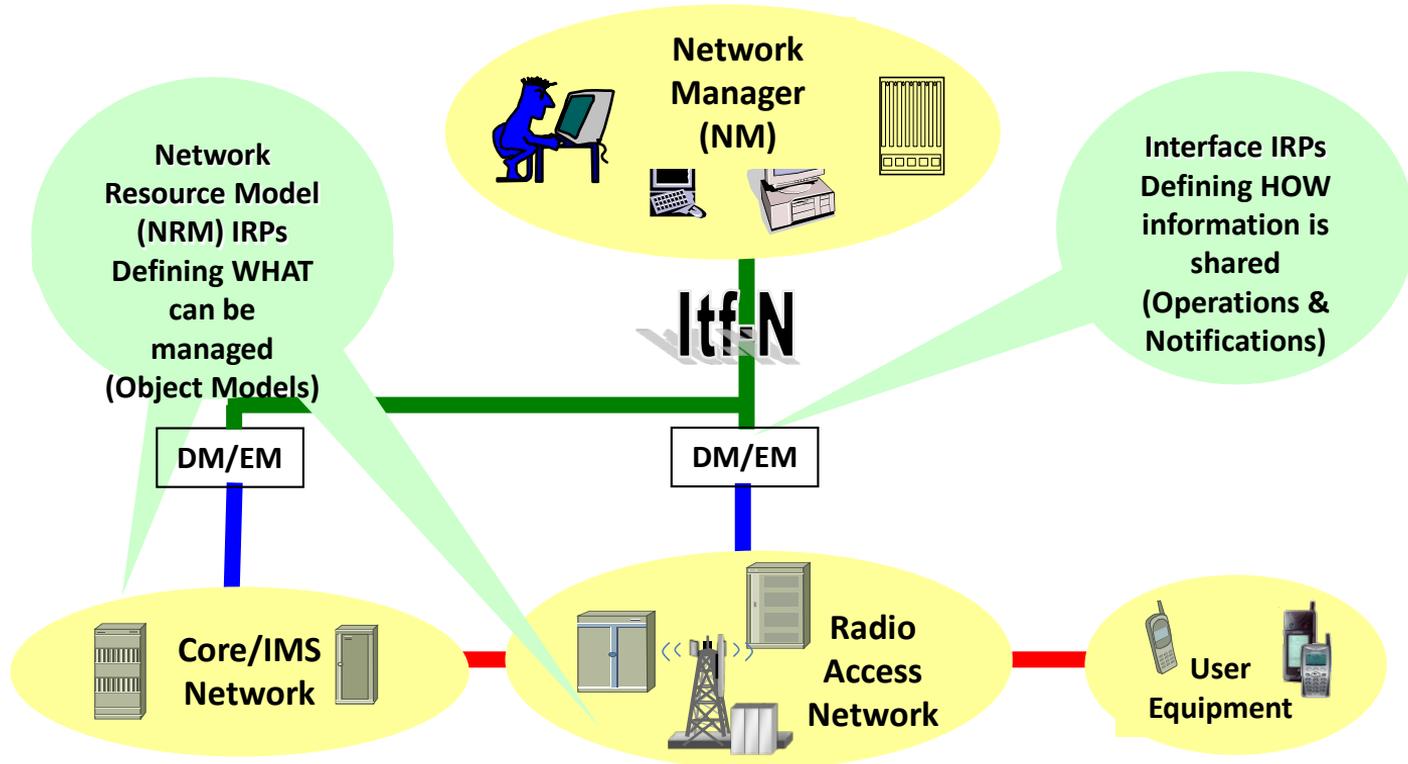


Relatively stable over long period of time

Change only with respect to functional addition and corrections

Change with new/better technologies

Interface IRP & NRM IRP

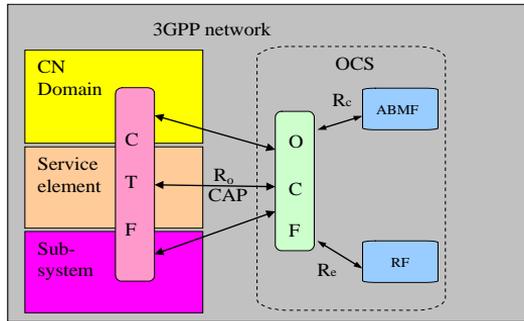


3GPP Charging Architecture and Principles (TS 32.240)

3GPP Charging mechanisms are specified to allow collection of resource usage:

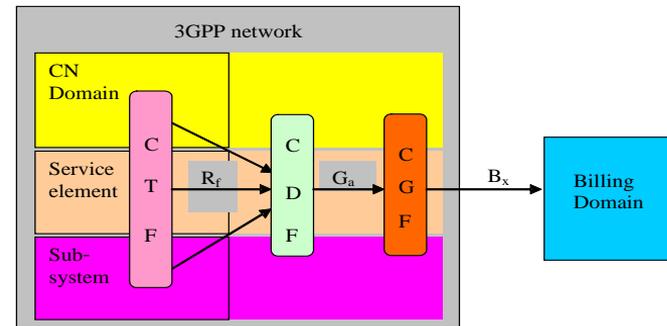
- in real-time interaction, affecting the service rendered (Online Charging).
- processing the collected data prior to delivery to the BSS (Offline Charging)

Online Charging



OCF: Online Charging Function
ABMF: Account Balance Management Function
RF: Rating Function

Offline Charging



CTF: Charging Trigger Function
CDF: Charging Data Function
CGF: Charging Gateway Function

Some cooperation between SA5 and other SDOs

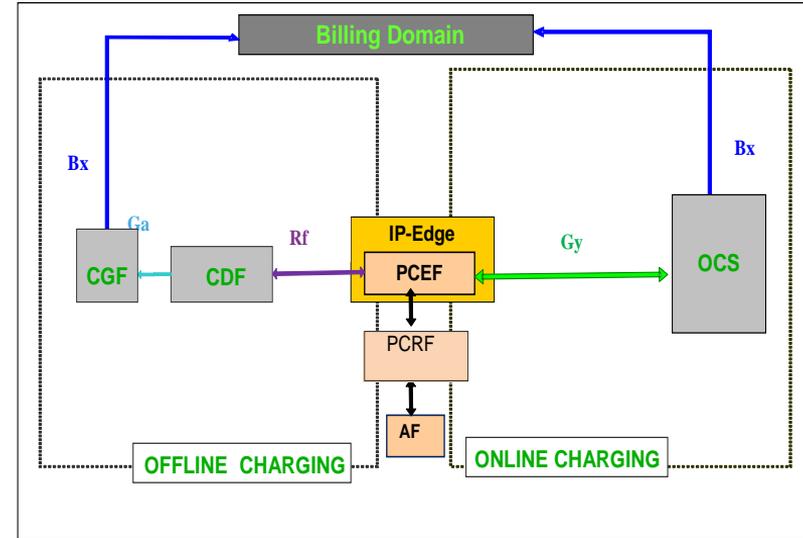
- 📶 Cooperation between SA5 and BBF on H(e)NB modeling from 2008
 - Adoption of TR-069 as H(e)NB management protocol for Type-1 interface
 - Specification of H(e)NB Network Resource Model IRP for Type-2 interface
- 📶 Cooperation between SA5, NGMN and TMF on converged management of fixed & mobile networks from 2010
 - Specification of umbrella model and federated model for Converged Management
 - Studied alignment of alarm management interface and measurement template
- 📶 Cooperation between SA5 and ETSI NFV on the management of virtualization function of 3GPP EPC and IMS from 2015
 - Specification of the interactions between 3GPP management system and MANO
 - Modeling of VNF for Mobile Networks

Cooperation between SA5 and BBF on H(e)NB

- SA5 is the single focal point within 3GPP for OAM input towards BBF and defines Stage 1, Stage 2, and Stage 3 for Type-1 interface
- BBF (Broadband BBHome) publishes the data model as TR-196 amendment based on requirements and information model from SA5
- Type-1 Interface
 - TS 32.452 Performance measurements Home Node B (HNB) Subsystem (HNS)
 - TS 32.453 Performance measurements Home enhanced Node B (HeNB) Subsystem (HeNS)
 - TSs 32.581/2/3/4 Type 1 interface HNB to HNB Management System (HMS)
 - TSs 32.591/2/3/4 Type 1 interface HeNB to HeNB Management System (HeMS)
- Type-2 Interface
 - TSs 28.671/2/3 Home Node B Subsystem NRM IRP
 - TSs 28.674/5/6 Home eNode B Subsystem NRM IRP
 - TSs 32.571/2 Type 2 interface models and mapping

3GPP Charging Architecture for the convergent scenario

- Support of Fixed Broadband Access by the 3GPP Charging Architecture in the Fixed-Mobile Convergent scenario is specified in 3GPP TS 32.240 Annex C.
- The solution is specified in 3GPP TS 32.251 Packet Switched (PS) domain charging Annex D.



Cooperation SA5, NGMN, TMF on FMC (1/4)

- 📶 Cooperation on Converged Management of Fixed and Mobile Networks
 - Established Joint Working Groups (JWG) on Model Alignment and Converged PM
 - All SA5 NRMs have been updated to the 28 series to use the new UIM in 28.620, implying the creation of 60 new specifications
- 📶 Outputs of Multi-SDO JWG on Model alignment
 - TS 32.107 Telecommunication management; Fixed Mobile Convergence (FMC) Federated Network Information Model (FNIM)
 - TS 28.620 Telecommunication management; Fixed Mobile Convergence (FMC) Federated Network Information Model (FNIM) Umbrella Information Model (UIM)
 - TS 32.156 Telecommunication management; Fixed Mobile Convergence (FMC) model repertoire
 - TR 32.854 Telecommunication management; Fixed Mobile Convergence (FMC) 3GPP / TM Forum concrete model relationships and use cases
 - TR 28.820 Telecommunication management; Fixed Mobile Convergence (FMC) Federated Network Operation Model (FNOM) Umbrella Operation Model (UOM)

Cooperation SA5, NGMN, TMF on FMC (2/4)

- TS 32.107 Fixed Mobile Convergence (FMC) Federated Network Information Model (FNIM)
 - The Federated Network Information Model allows a number of standards and specifications generated by different organizations to function together to bring greater coherence to the management of converged networks and hence reduce operations costs.
- TS 28.620 Fixed Mobile Convergence (FMC) Federated Network Information Model (FNIM) Umbrella Information Model (UIM)
 - The UIM is the part of the FNIM that represents the agreed model structures that 3GPP SA5 and TM Forum use (via “specific linkages” including inheritance, mappings and other derivations) for the definition of their respective Domain/Technology-specific concrete classes.
 - The use of UIM maximizes the probability of the Domain/Technology-specific concrete classes being semantically consistent, a necessary characteristic for FMC.

Cooperation SA5, NGMN, TMF on FMC (3/4)

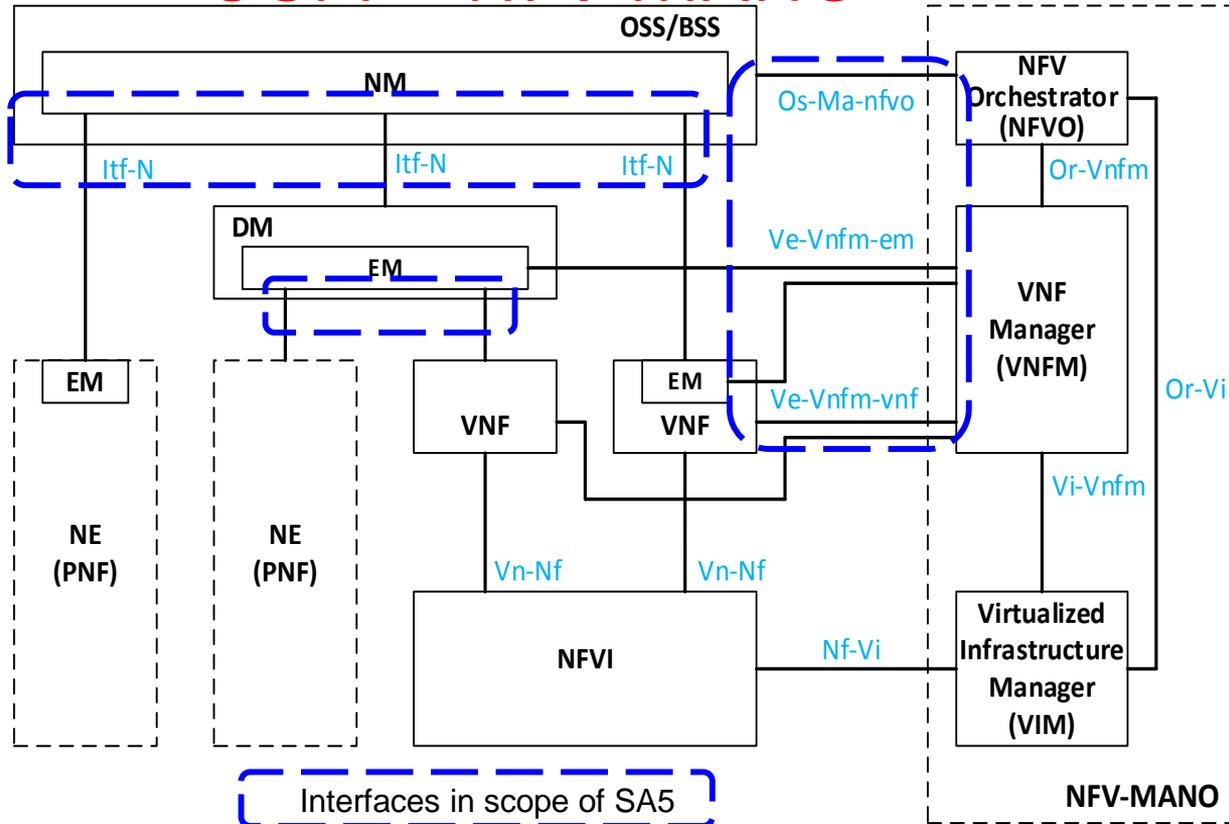
- TS 32.156 Fixed Mobile Convergence (FMC) model repertoire
 - This document defines how UML should be used to specify technology neutral Information Models (i.e. object classes, attributes, associations, association classes, stereotypes, data types) for Fixed Mobile Converged (FMC) management interfaces.
 - ITU-T SG2 have decided to include 32.156 in their Requirements/Analysis methodology which is aligned with SA5.
- TR 32.854 Fixed Mobile Convergence (FMC) 3GPP / TM Forum concrete model relationships and use cases
 - This document describes operator use cases and requirements requiring some harmonization between 3GPP and TM Forum models. Overlaps and gaps of the 3GPP and TM Forum models are highlighted.
- TR 28.820 Fixed Mobile Convergence (FMC) Federated Network Operation Model (FNOM) Umbrella Operation Model (UOM)
 - The Umbrella Information Model (UIM) define the common model artifacts that will be used by the SDOs as a basis for their specific Fixed Mobile Converged (FMC) model instances. In addition to the UIM containing common “super classes” (incl. their attributes and associations), this document contains the common “interface super classes” (incl. their operations and notifications).

Cooperation between SA5 and ETSI NFV on the management of virtualization function of 3GPP EPC and IMS

- 📶 3GPP SA5 and ETSI ISG NFV have defined guidelines for cooperation
- 📶 3GPP SA5 has defined the VNF for mobile networks that include virtualized network functions which can be part of EPC or IMS in TS 28.500
- 📶 ETSI ISG NFV has specified in IFA015 the NFV Information Model aligned with the application view in the 3GPP Network Resource Model
- 📶 LS exchanges on FCAPs aspects of NFV Interface and Architecture specifications
- 📶 LS exchanges on NFV-based solutions for next generation mobile networks
- 📶 LS exchanges on SOL WG work plan schedule for definition of stage 3 specifications

Network Management Framework

3GPP - NFV MANO



SA5 5G Roadmap

- SA5 has 3 ongoing Rel-14 studies on 5G that should be completed by March 2017
 - The outcome of the studies is recorded in TRs 28.800, 28.801, 28.802
- SA5 takes into account the inputs from other 3GPP WGs and other SDOs including 3GPP SA1, 3GPP SA2, RAN WGs, NGMN, ITU-T, ETSI ISG NFV
 - SA5 OAM SWG actively cooperates on OAM aspects with these groups when needed for the progress of 5G work
 - SA5 Charging SWG has initiated a study on charging architecture and solution for the 5G System Architecture Phase 1 defined by 3GPP SA2, and will keep alignment with SA2 ongoing normative work.
- The 5G management and orchestration normative work will target Release 15
 - Start from March or June 2017
 - Target closure date June 2018

ANNEXES

Requirements & Architecture Specifications

- 📶 TS 32.101 Principles and high level requirements
- 📶 TS 32.102 Architecture
- 📶 TS 32.103 Integration Reference Point (IRP) overview and usage guide

- 📶 TS 32.111-1 3G Fault Management requirements
- 📶 TS 32.140 SuM requirements
- 📶 TS 32.141 SuM architecture
- 📶 TS 32.300 Name convention for Managed Objects
- 📶 TS 32.401 Performance Management concept and requirements
- 📶 TS 32.500 SON concepts and requirements
- 📶 TS 32.511 ANR management concepts and requirements
- 📶 TS 32.541 SON self-healing concepts and requirements
- 📶 TS 32.551 Energy Saving Management concepts and requirements
- 📶 TS 32.600 Configuration Management concept and high-level requirements

IRP Methodology Specifications

- TS 32.150 Integration Reference Point (IRP) Concept and definitions
- TS 32.151 IRP Information Service (IS) template (applicable to 32-series IRPs)
- TS 32.152 IRP IS Unified Modelling Language (UML) repertoire (applicable to 32-series IRPs)
- TS 32.153 IRP technology specific templates, rules and guidelines
- TS 32.154 Backward and Forward Compatibility Concept and definitions
- TS 32.155 Requirements template
- TS 32.156 Fixed Mobile Convergence (FMC) Model repertoire (applicable for FMC)
- TS 32.157 IRP Information Service (IS) template (applicable for FMC)

Interface IRPs

Common Interface IRPs

- Notification IRP (32.30x)
- Generic IRP (32.31x)

CM-related IRPs

- Basic CM IRP (32.60x)
- Bulk CM IRP (32.61x)
- Kernel CM IRP (32.66x)

Other Interface IRPs

- Partial Suspension (32.38x)
- Delta synchronization (32.39x)

FM-related IRPs

- Alarm IRP (32.111-x)
- AAM IRP (32.12x)
- Test Mgmt IRP (32.32x)

SON-related IRPs

- Self-Configuration IRP (32.50x)
- Software Management IRP (32.53x)

PM-related IRPs

- PM IRP (32.41x)
- PM file format/collection (32.43x)
- Trace Mgmt (32.42x, 32.44x)

Supporting Interface IRPs

- Notification Log IRP (32.33x)
- File Transfer IRP (32.34x)
- Communication Surveillance IRP (32.35x)
- Entry Point IRP (32.36x)

Network Resource Model (NRM) IRPs

FMC model

- Umbrella Information Model (28.620)

Common NRM IRP

- Generic NRM IRP (28.621/2/3)

3GPP Core Network NRM IRPs

- Core NRM IRP (28.701/2/3)
- IMS NRM IRP (28.704/5/6)
- EPC NRM IRP (28.707/8/9)

3GPP Access Network NRM IRPs

- Generic RAN NRM IRP (28.661/2/3)
- GERAN NRM IRP (28.654/5/6)
- UTRAN NRM IRP (28.651/2/3)
- E-UTRAN NRM IRP (28.657/8/9)

Service Management NRM IRPs

- SuM NRM IRP (28.751/2/3)

3GPP H(e)NS NRM IRPs

- HNS NRM IRP (28.671/2/3)
- HeNS NRM IRP (28.674/5/6)

Non-3GPP access interworking NRM IRPs

- EPC and non-3GPP access interworking system NRM IRP (28.611/2/6)

SON NRM IRPs

- SON Policy NRM IRP (28.627/8/9)

WLAN NRM IRPs

- WLAN NRM IRP (28.681/2/3)

Supporting NRM IRPs

- Inventory Management NRM IRP (28.631/2/3)
- Transport Network NRM IRP (28.731/2/3)
- Signalling Transport NW IF NRM IRP (28.734/5/6)

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

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

Useful Links

- 📶 3GPP portal
<https://portal.3gpp.org/>
- 📶 3GPP SA5 home page
<http://www.3gpp.org/Specifications-groups/sa-plenary/56-sa5-telecom-management>
- 📶 3GPP SA5 specifications
<http://www.3gpp.org/ftp/Specs/html-info/TSG-WG--S5.htm>
http://www.3gpp.org/ftp/Specs/archive/32_series/
http://www.3gpp.org/ftp/Specs/archive/28_series/
- 📶 3GPP SA5 meeting documents
http://www.3gpp.org/ftp/tsg_sa/WG5_TM/
- 📶 3GPP SA5 email lists
http://list.etsi.org/3gpp_tsg_sa_wg5.html
http://list.etsi.org/3gpp_tsg_sa_wg5_oam.html
http://list.etsi.org/3gpp_tsg_sa_wg5_charging.html