

# 3GPP TSG SA WG5 Status on Converged Management of Fixed/Mobile Networks

Multi SDO Workshop  
Zurich

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# SA5 Study Item on Management of Converged Networks



## Objectives

- Collection of use cases on converged management and multi-technology networks.
- Identify the main operational problems to be addressed and provide a high level solution proposal for each of the main problems identified.

## Status

- TR 32.833 is progressing slowly due to limited number of contributing companies.
- TR 32.833 has been sent to NGMN NGCOR for comments, no feedback received so far.
- The objective is to close the study at TSG SA#57 Sep 2012 and continue with normative work.

# SA5 Work Item on IRP framework enhancements to support Management of Converged Networks



## Objectives

- New Stage 1 specification will capture the Requirements, benefits, context and use cases for the Management of Converged Networks.
- New Stage 2 specification will capture the list of NRM and Interface IRPs that support the requirements for Management of Converged Networks.

## Status


- Reviewed outputs of Resource Modelling Alignment (RMA) and Fault Management Harmonization (FMH) 3GPP/TM Forum JWG's, compiled the comments in a reply LS to RMA and a second reply LS to FMH.
- Reviewed and agreed the impacts of the RMA deliverables on 3GPP specifications, defined an implementation plan.
- Feedback from PCG on publication of JWG outputs (governance, intellectual property, etc) is expected at the end of April.

# SA5 Progress on NGMN Top OPE Recommendations



 Several study items and work items have been completed in SA5

- IRP Overview, Profiles & Usage Guide (first step)
- Alarm correlation and root cause analysis
- Inventory Management Network Resource Model enhancements

 Existing SA5 specifications fulfil a significant part of NGMN Requirements (see Annex 1)

- Detailed review of remaining gaps is ongoing in SA5; an action plan will address the open issues.
- Requirements which cannot be satisfied will be notified to NGMN with a clear status (out of scope, not feasible, etc).
- A compliance document will be produced to track all the work which was done in SA5.

# SA5 Contribution to NGMN NGCOR Requirements



## SA5 provided extensive feedback on NGCOR draft requirements


- First feedback was sent from SA5#78 meeting in August 2011.
- Additional feedback was sent from SA5#79 meeting in October 2011.
- SA5 participated in the NGMN partner meeting in Paris Sep. 7-8
- Closer cooperation between SA5 and NGMN is expected after approval of NGCOR requirements.

## A preliminary list of impacted SA5 specifications has been established (see Annex 2)

- A detailed gap analysis will be based on final NGCOR requirements.
- The objective is to ensure a timely completion of solutions/specifications satisfying the NGCOR requirements.

# SA5 Solution for NGCOR



 A new Sub-Working Group (SWG) has been created in SA5

- The scope is converged management of fixed/mobile networks.
- The SWG will formally meet from next SA5 meeting in May 2012.

 Concrete work on NGCOR has started in SA5

- Ongoing work on a FM solution profile for NGCOR; a dedicated Work Item will be considered by SA5 for this topic.
- NGCOR network/management sharing scenarios are being considered in the SA5 study on network sharing.

## SA5 Proposals for Multi-SDO

### Governance and working procedures

- Need simple cooperation principles.
- Participating companies are only bound by the rules of their respective SDO.
- Results and outputs of workshops are not binding to the participating SDOs.
- Outputs of workshops should be brought into SDOs following their respective working procedures.

### Proposed Multi-SDO projects by 3GPP

- Converged Management PM Interface definitions.
- Converged Management Model Alignment (Phase 2).
- 3GPP is fully committed to Multi SDO.
- Need clear commitment from other SDOs.



# Principles for Standardization of Converged Management



- Need to define how this standardization work will be done
  - Need to organize cooperation with concerned organizations in an open and transparent manner.
  - Need clear process and rules to avoid uncoordinated initiatives and creation of redundant or overlapping specifications.
  - Need to take into account the limited number of experts and the time needed to produce a real solution.
- Dependency on operators' requirements and involvement
  - Need further refinements on existing NGCOR requirements (as captured in last NGCOR partner meeting Turin January 2012).
  - Need development of new NGCOR requirements e.g. PM.
  - Need more participation from operators in standardization activities.
  - Need closer interactions with NGCOR during requirements development.

# Next Steps for Standardization of Converged Management



## Agree on Multi SDO projects

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

## “Todo” list for every project

- Agree on scope and objectives.
- Identify involved SDOs.
- Identify supporting companies.
- Identify deliverables.
- Define detailed working procedures.
- Define milestones/roadmap.

# Annex 1: SA5 Status on Top OPE Recommendations

# NGMN Top OPE Recommendations



1. Quality and Quantity of Alarms
2. Automatic Software Management
3. Energy Saving
4. Self Organizing Networks
5. Performance Management Enhancements
6. Enhancement of Trace Functionality
7. eNodeB Plug & Play - Self Commissioning
8. OSS Standard Itf-N
9. OSS Tool Support for Optimization & Operation
10. Automatic Inventory

# 1 - Quality and Quantity of Alarms

- 📶 Create a WI in SA5 to add alarm correlation and root cause analysis concepts in 32.111-1 and their implications in standards, including requirements on model alignment work. **DONE**
- 📶 Action item to SA5 to check existing definitions of severity and see whether modifications are needed (network facing and customer facing). **ONGOING**
- 📶 More generally, SA5 has to look at customer experience management, not necessarily FM only. Potential SI. **OPEN**
- 📶 Will need to study what needs to be done in the OSS domain (interfaces type 3 and 4 in 32.101). **OPEN**

## 2 - Automatic Software Management

📶 Current specs will be improved to address NE health-check requirement. **DONE**

📶 SA5 will study more in details automatic rollback scenarios and recommend appropriate solutions.  
**ONGOING**

📶 SA5 will check what is missing in the current upgrade result report and improve the report if needed.  
**ONGOING**


## 3 - Energy Saving


- 📶 The solutions to the NGMN requirements will be discussed in the context of the Rel-10 Energy Saving Management (ESM) WI. **DONE**
- 📶 The scope of Rel-10 ESM WI is LTE, the possible reuse for 2G/3G should be considered when defining the LTE solution. **DONE**
- 📶 SA5 has created a study item on OAM aspects of inter-RAT Energy Saving. **DONE**
- 📶 Missing measurements to monitor the state of the network in ES mode will be added if needed. **ONGOING**

## 4 - Self Organizing Networks

 New IRP introduced in Rel-9 to manage SON policies.

**DONE**

 The definitions of SON centralized and distributed architecture need to be clarified. **DONE**

 Extension of SA5 specs for ANR to support the multi-RAT requirement. **DONE for UTRAN ANR and Inter-RAT ANR**






## 5 - Performance Management Enhancements

- 📶 The PM IRP specification includes administration of performance measurements since Rel-6. **DONE**
- 📶 The PM IRP specification includes threshold mechanisms for performance measurements since Rel-6. **DONE**
- 📶 ASN.1 file format description includes a ASN.1 file format of PM data since Rel-4. **DONE**
- 📶 KPIs for E-UTRAN contains KPIs and what measurements they are comprising since Rel-8. **DONE**
- 📶 For automatic identification of network problems and error correction, Self Healing was specified in Rel-10. **DONE**
- 📶 32.412 offers the periodicities 5, 15, 30 minutes, and 1, 12, 24 hours for creation of a measurement job, 5 min minimum periodicity is deemed to be sufficient. **DONE**
- 📶 SA5 agreed a Study Item on PM harmonization. **DONE**




## 6 - Enhancement of Trace Functionality



-  Trace related specifications (TS 32.42x and TS 32.44x) completed and stable since Rel-8. **DONE**
-  Extension of Trace for the management of UE measurements (Rel-10 WI). **DONE**
-  Need to check whether some filter parameters should be added. **ONGOING**

## 7 - eNodeB Plug & Play - Self Commissioning



-  Need detailed common deployment scenarios from operators. **ONGOING**
-  Transport, RAN and security need alignment with the scenarios provided by operators. **ONGOING**
-  Impacts to Itf-N are not expected but this is to be confirmed based on the analysis of the scenarios. **ONGOING**

## 8 - OSS Standard Itf-N

- 3GPP SA5 Interface IRPs and NRM IRPs meet the requirements.
- SA5 specs are fully re-usable and extensible, this has been proven notably by 3GPP2 case (deployed solution). **DONE**
- Definition of IRP Overview, Profiles & Usage Guides will be covered by SA5 in Rel-10. **First step DONE Second step ONGOING**
- Conformance statements per IRP ensemble. **ONGOING**
- IRP Security definitions need enhancements for SOAP SS. **ONGOING**

## 9 - OSS Tool Support for Optimization & Operation



- 📶 The Load balancing and HO parameters optimization related requirements, NRM and targets have been completed in Rel-9 TS 32.521/32.522. **DONE**
- 📶 Rel-10 WI for OAM&P of Coverage and Capacity Optimization, some requirements have already been defined in Rel-9. **DONE**
- 📶 Rel-10 WI for OAM&P of RACH optimization, some requirements have already been defined in Rel-9. **DONE**
- 📶 Support of centralized / decentralized solution. **DONE**
- 📶 Coordination between SON functions is covered by Rel-11 SON WI. **ONGOING**
- 📶 Optimization for identified parameters shall be done within a value range, defined by the operator. **ONGOING**
- 📶 Optimization cycle should be configurable (periodically, event-based). **ONGOING**

## 10 - Automatic Inventory

- 📶 Create a Rel-10 WI in SA5 to extend the scope of Inventory NRM to capture inventory-type information for software, license, hardware and logical/physical resources. **DONE**
- 📶 Standardised interface for signalling information about changes performed in the Network. **ONGOING**
- 📶 Some further clarification is requested on the relationship between Inventory Information and Configuration Information. **ONGOING**

# Annex 2: SA5 Specifications related to NGCOR Requirements (preliminary view)

# SA5 specifications related to section 1 “INTRODUCTION TO NGMN NGCOR”



- 3GPP TS 32.101 Telecommunication management; Principles and high level requirements

[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.101/32101-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.101/32101-a00.zip)

- 3GPP TS 32.102 Telecommunication management; Architecture

[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.102/32102-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.102/32102-a00.zip)

- 3GPP TS 32.103 Integration Reference Point (IRP) overview and usage guide

[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.103/32103-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.103/32103-a00.zip)

- 3GPP TS 32.150 Integration Reference Point (IRP) Concept and definitions

[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.150/32150-a20.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.150/32150-a20.zip)








# SA5 specifications related to section 2 “HIGH LEVEL REQUIREMENTS FOR CONVERGED NETWORK OPERATIONS”



- 📶 3GPP TS 32.101 Telecommunication management; Principles and high level requirements  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.101/32101-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.101/32101-a00.zip)
- 📶 3GPP TS 32.102 Telecommunication management; Architecture  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.102/32102-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.102/32102-a00.zip)
- 📶 3GPP TS 32.103 Integration Reference Point (IRP) overview and usage guide  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.103/32103-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.103/32103-a00.zip)
- 📶 3GPP TR 32.828 Study on alignment of 3GPP generic Network Resource Model (NRM) Integration Reference Point (IRP) and the TeleManagement Forum (TMF) Shared Information/Data (SID) model  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.828/32828-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.828/32828-a00.zip)
- 📶 3GPP TR 32.829 Study on alignment of 3GPP alarm Integration Reference Point (IRP) and TeleManagement Forum (TMF) Interface Program (TIP) fault management  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.829/32829-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.829/32829-a00.zip)
- 📶 3GPP TR 32.831 Study on alignment of 3GPP Performance Management (PM) and TeleManagement Forum (TMF) Interface Program (TIP) Performance Management  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.831/32831-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.831/32831-a00.zip)
- 📶 3GPP TR 32.833 Study on Management of Converged Networks  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.833/32833-060.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.833/32833-060.zip)

# SA5 specifications related to section 3 “GENERIC NEXT GENERATION CONVERGED OPERATIONAL REQUIREMENTS”







-  3GPP TS 32.101 Telecommunication management; Principles and high level requirements  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.101/32101-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.101/32101-a00.zip)
-  3GPP TS 32.103 Integration Reference Point (IRP) overview and usage guide  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.103/32103-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.103/32103-a00.zip)
-  3GPP TS 32.150 Integration Reference Point (IRP) Concept and definitions  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.150/32150-a20.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.150/32150-a20.zip)
-  3GPP TS 32.151 Integration Reference Point (IRP) Information Service (IS) template  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.151/32151-a10.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.151/32151-a10.zip)
-  3GPP TS 32.152 Integration Reference Point (IRP) Information Service (IS) Unified Modelling Language (UML) repertoire  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.152/32152-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.152/32152-a00.zip)

# SA5 specifications related to section 4 “REQUIREMENTS FOR MODELLING AND TOOLING”








- 📶 3GPP TS 32.101 Telecommunication management; Principles and high level requirements  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.101/32101-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.101/32101-a00.zip)
- 📶 3GPP TS 32.103 Integration Reference Point (IRP) overview and usage guide  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.103/32103-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.103/32103-a00.zip)
- 📶 3GPP TS 32.150 Integration Reference Point (IRP) Concept and definitions  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.150/32150-a20.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.150/32150-a20.zip)
- 📶 3GPP TS 32.151 Integration Reference Point (IRP) Information Service (IS) template  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.151/32151-a10.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.151/32151-a10.zip)
- 📶 3GPP TS 32.152 Integration Reference Point (IRP) Information Service (IS) Unified Modelling Language (UML) repertoire  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.152/32152-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.152/32152-a00.zip)
- 📶 3GPP TS 32.153 Integration Reference Point (IRP) technology specific templates, rules and guidelines  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.153/32153-a10.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.153/32153-a10.zip)
- 📶 3GPP TS 32.154 Backward and Forward Compatibility (BFC); Concept and definitions  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.154/32154-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.154/32154-a00.zip)
- 📶 3GPP TS 32.155 Requirements template  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.155/32155-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.155/32155-a00.zip)
- 📶 3GPP TS 32.622 Generic network resources Integration Reference Point (IRP); Network Resource Model (NRM)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.622/32622-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.622/32622-a00.zip)
- 📶 3GPP TS 32.626 Configuration Management (CM); Generic network resources Integration Reference Point (IRP); Solution Set (SS) definitions  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.626/32626-a20.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.626/32626-a20.zip)
- 📶 3GPP TR 32.812 Itf-N Implementation Conformance Statement (ICS) template  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.812/32812-700.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.812/32812-700.zip)

## 3GPP/TM Forum JWG Model Alignment outputs related to section 4 “REQUIREMENTS FOR MODELLING AND TOOLING”

-  FMC Federated Network Model (FNM)  
[ftp://ftp.3gpp.org/TSG\\_SA/WG5\\_TM/Ad-hoc\\_meetings/Virtual-TMF-Align/S5vTMFa264.zip](ftp://ftp.3gpp.org/TSG_SA/WG5_TM/Ad-hoc_meetings/Virtual-TMF-Align/S5vTMFa264.zip)
-  FMC FNM Umbrella Model  
[ftp://ftp.3gpp.org/TSG\\_SA/WG5\\_TM/Ad-hoc\\_meetings/Virtual-TMF-Align/S5vTMFa265.zip](ftp://ftp.3gpp.org/TSG_SA/WG5_TM/Ad-hoc_meetings/Virtual-TMF-Align/S5vTMFa265.zip)
-  FMC 3GPP/TMF Model Relationships & UCs  
[ftp://ftp.3gpp.org/TSG\\_SA/WG5\\_TM/Ad-hoc\\_meetings/Virtual-TMF-Align/S5vTMFa266.zip](ftp://ftp.3gpp.org/TSG_SA/WG5_TM/Ad-hoc_meetings/Virtual-TMF-Align/S5vTMFa266.zip)
-  FMC FNM Model Repertoire  
[ftp://ftp.3gpp.org/TSG\\_SA/WG5\\_TM/Ad-hoc\\_meetings/Virtual-TMF-Align/S5vTMFa267.zip](ftp://ftp.3gpp.org/TSG_SA/WG5_TM/Ad-hoc_meetings/Virtual-TMF-Align/S5vTMFa267.zip)

## 3GPP Generic Interface IRPs related to section 4 “REQUIREMENTS FOR MODELLING AND TOOLING”



-  3GPP TS 32.302 Notification Integration Reference Point (IRP); Information Service (IS)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.302/32302-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.302/32302-a00.zip)
-  3GPP TS 32.332 Notification Log (NL) Integration Reference Point (IRP); Information Service (IS)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.332/32332-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.332/32332-a00.zip)
-  3GPP TS 32.342 File Transfer (FT) Integration Reference Point (IRP); Information Service (IS)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.342/32342-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.342/32342-a00.zip)
-  3GPP TS 32.602 Basic CM Integration Reference Point (IRP); Information Service (IS)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.602/32602-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.602/32602-a00.zip)
-  Note: only IS (stage 2) specifications are referenced for simplification - related SS (stage 3) specifications can be found at <http://www.3gpp.org/ftp/Specs/html-info/TSG-WG--S5.htm>

# SA5 specifications related to section 5





## “REQUIREMENT SPECIFICATION FOR FAULT MANAGEMENT INTERFACE”



- 📶 3GPP TS 32.111-1 Fault Management; Part 1: 3G fault management requirements  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.111-1/32111-1-a10.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.111-1/32111-1-a10.zip)
- 📶 3GPP TS 32.111-2 Fault Management; Part 2: Alarm Integration Reference Point (IRP): Information Service (IS)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.111-2/32111-2-a30.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.111-2/32111-2-a30.zip)
- 📶 3GPP TS 32.111-6 Fault Management; Part 6: Alarm Integration Reference Point (IRP): Solution Set (SS) definitions  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.111-6/32111-6-a40.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.111-6/32111-6-a40.zip)
- 📶 3GPP TS 32.302 Notification Integration Reference Point (IRP); Information Service (IS)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.302/32302-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.302/32302-a00.zip)
- 📶 3GPP TS 32.306 Notification Integration Reference Point (IRP): Solution Set (SS) definitions  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.306/32306-a20.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.306/32306-a20.zip)
- 📶 3GPP TS 32.332 Notification Log (NL) Integration Reference Point (IRP); Information Service (IS)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.332/32332-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.332/32332-a00.zip)
- 📶 3GPP TS 32.336 Notification Log (NL) Integration Reference Point (IRP): Solution Sets (SS) definitions  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.336/32336-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.336/32336-a00.zip)
- 📶 3GPP TS 32.122 Advanced Alarm Management (AAM) Integration Reference Point (IRP): Information Service (IS)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.122/32122-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.122/32122-a00.zip)
- 📶 3GPP TS 32.126 Advanced Alarm Management (AAM) Integration Reference Point (IRP); Solution Set (SS) definitions  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.126/32126-a10.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.126/32126-a10.zip)
- 📶 3GPP TR 32.832 Study on alarm correlation and alarm root cause analysis  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.832/32832-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.832/32832-a00.zip)






# SA5 specifications related to section 6 “HIGH LEVEL OSS REQUIREMENTS FOR INVENTORY MANAGEMENT” (1/2)



-  3GPP TS 32.692 Inventory Management (IM) network resources Integration Reference Point (IRP); Network Resource Model (NRM)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.692/32692-a10.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.692/32692-a10.zip)
  
-  3GPP TS 32.696 Inventory Management (IM) Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.696/32696-a20.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.696/32696-a20.zip)
  
-  3GPP TS 32.622 Generic network resources Integration Reference Point (IRP); Network Resource Model (NRM)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.622/32622-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.622/32622-a00.zip)
  
-  3GPP TS 32.626 Configuration Management (CM); Generic network resources Integration Reference Point (IRP); Solution Set (SS) definitions  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.626/32626-a20.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.626/32626-a20.zip)

# SA5 specifications related to section 6 “HIGH LEVEL OSS REQUIREMENTS FOR INVENTORY MANAGEMENT” (2/2)



-  3GPP TS 32.302 Notification Integration Reference Point (IRP); Information Service (IS)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.302/32302-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.302/32302-a00.zip)
-  3GPP TS 32.342 File Transfer (FT) Integration Reference Point (IRP); Information Service (IS)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.342/32342-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.342/32342-a00.zip)
-  3GPP TS 32.612 Bulk CM Integration Reference Point (IRP); Information Service (IS)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.612/32612-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.612/32612-a00.zip)
-  3GPP TS 32.662 Kernel CM Information Service (IS)  
[http://www.3gpp.org/ftp/Specs/archive/32\\_series/32.662/32662-a00.zip](http://www.3gpp.org/ftp/Specs/archive/32_series/32.662/32662-a00.zip)
-  Note: only IS (stage 2) specifications are referenced for simplification - related SS (stage 3) specifications can be found at  
<http://www.3gpp.org/ftp/Specs/html-info/TSG-WG--S5.htm>



# Thank you!