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Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Requirements definition study; Introduction to service and network management

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Technical Report

Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; Requirements definition study; Introduction to service and network management

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Foreword

This Technical Report (TR) has been produced by ETSI Project Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON).

1 Scope

The objective of ETSI Project TIPHON is the specification of interoperability mechanisms and related parameters to enable multimedia communications (particularly voice) to take place, to a defined quality of service, between switched circuit networks (SCN) and Internet Protocol (IP) based networks and their associated terminal equipment.

The present document presents an overview of the interactions between the Management Plane and the TIPHON Application Plane and TIPHON Transport Plane. It introduces the framework for the TIPHON Service and Network Management for ETSI TIPHON releases, capable of supporting TIPHON service capabilities.

The TIPHON network architecture [5] defines real-time operations associated with service control. The management plane must be capable of managing these services. The framework is based on the TMN model (ITU-T Recommendation M.3010 [1]) and upon the TeleManagement Forum's Business Process Model for Telecom Operations. This model includes the well-known "FCAPS" processes - Fault, Configuration, Accounting, Performance, and Security, structuring them into a form commonly used by service providers.

2 References

For the purposes of this Technical Report (TR) the following references apply:

[1] ITU-T Recommendation M.3010: "Principles for a Telecommunications management network".

[2] ETSI TR 101 307: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Requirements for service interoperability; Phase 2".

[3] ITU-T Recommendation M.3020: "TMN Interface Specification Methodology".

[4] ITU-T Recommendation M.3013: "Considerations for a telecommunications management network".

[5] ETSI TS 101 314: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Network architecture and reference configurations; TIPHON Release 2".

[6] TS 101 329-3: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; End-to-End Quality of Service in TIPHON Systems; Part 3: Signalling and Control of end-to-end Quality of Service.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

administrative domain: network controlled by a single operator (it encompasses both network and management domains)

management domain: collection of one or more management systems, and zero or more managed systems and management sub domains that is administered by a single operator

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

BML	Business Management Layer
CMIP	Common Management Information Protocol
CMISE	Common Management Information Service Element
EML	Element Management Layer
IP	Internet Protocol
NE	Network Element
NML	Network Management Layer
OMG	Object Management Group
QoS	Quality of Service
SCN	Switched Circuit Networks
SML	Service Management Layer
TNM	Tiphon Network Management
UML	Unified Modelling Language

4 Objectives and roadmap

Given the broad scope of the service and network management framework, a roadmap is needed to show the sequence of deliverables and their content for the TIPHON releases. For TIPHON release 4, this roadmap indicates objectives for TIPHON Network Management (TNM) Framework.

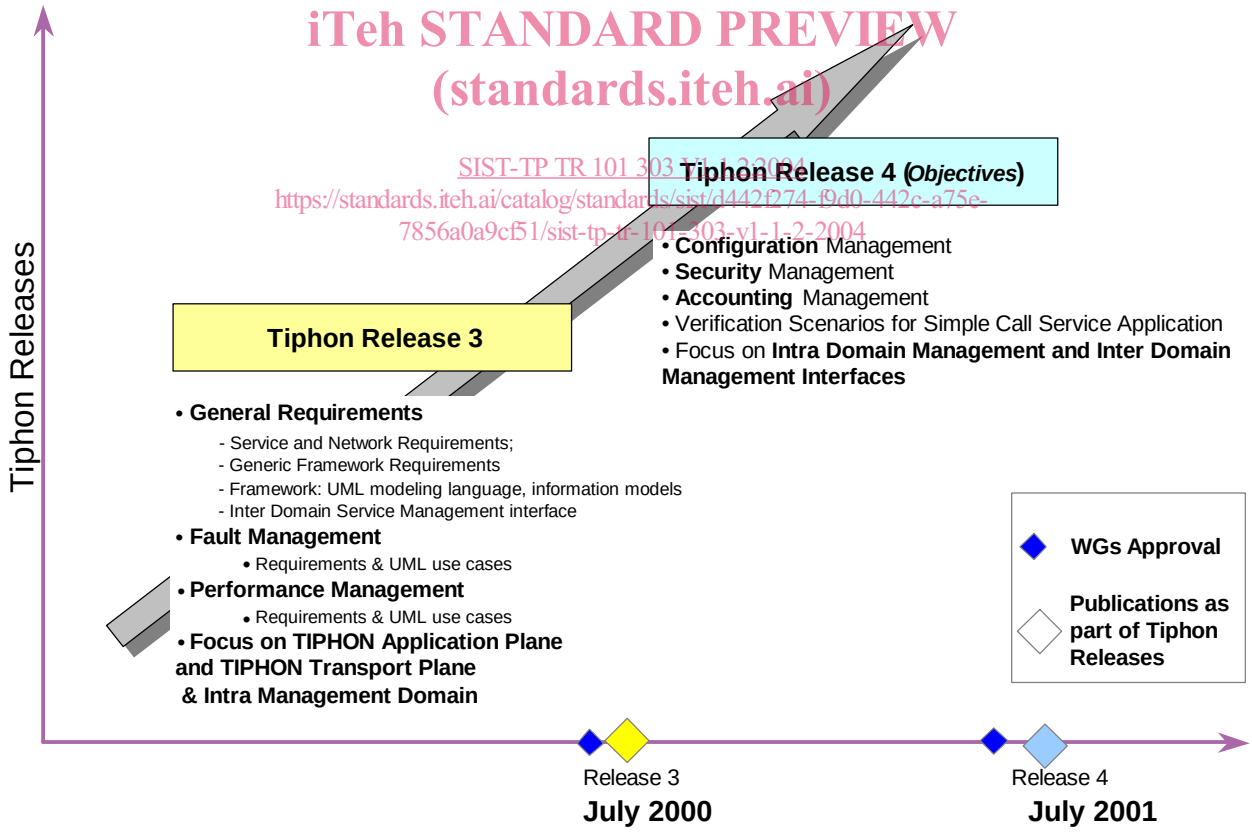

Figure 1: Tiphon network management roadmap

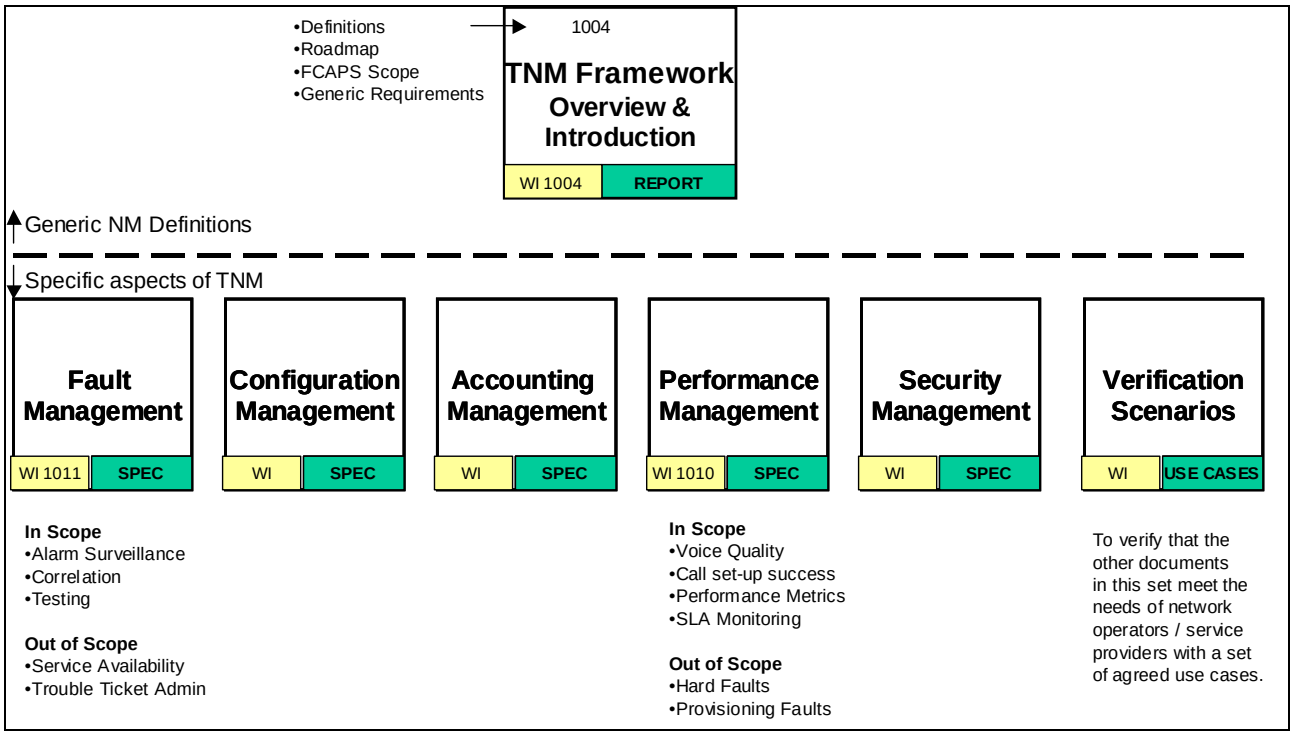

Figure 2: Tiphon network management document structure

5 Generic requirements

5.1 TNM framework

The architecture and functional decomposition of TIPHON Network Management shall be based on ITU-T Recommendation M.3010 [1]. The interface definition methodology for TIPHON management systems shall be based upon ITU-T Recommendations M.3020 [3] and M.3013 [4].

The TNM framework shall include:

- the TMN layer structure;
- FCAPS processes (Fault, Configuration, Accounting, Performance, Security);
- the definition of information flows between layers, functions and domains;
- the use of a formal methodology for modelling of the management information based upon the OMG's Unified Modelling Language (UML).

The TNM framework shall also include:

- the definition of information interfaces between TIPHON systems and management systems;
- the definition of Management Information Bases (MIB) based on the UML models.

It shall include:

- the use of Q interfaces unless considered inappropriate.

It shall not include:

- the use of TMN management communication services and protocols based on CMIP/CMISE unless considered appropriate.

The TNM will exploit wherever possible:

- the business and service processes as defined by the Telecommunications Management Forum;
- the management communication protocols and information bases already defined by IETF and ITU-T.

5.2 Relationship between TNM and Tiphon architecture

The TIPHON network architecture and reference configurations specification [5] identifies 4 functional planes. The Management plane contains the service and network management functionality as defined in TMN M.3000 documents. This clause shows the interactions between the management plane and the functional layers with the TIPHON Application Plane and the TIPHON Transport Plane (figure 4).

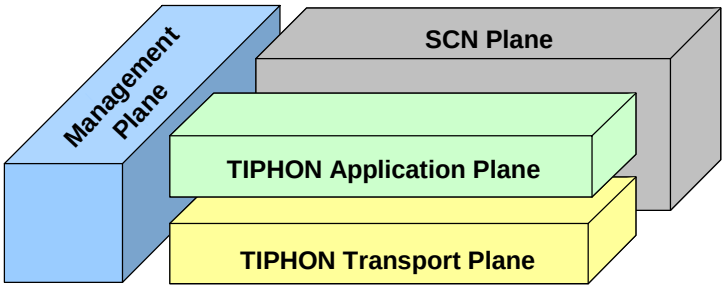

Figure 3: Tiphon Planes

The information flows represented by the A reference points in figure 4 are aligned with the A reference points shown in figure 8. The content of the information flows exchanged at each reference point depends on the primitives within the functional layers.

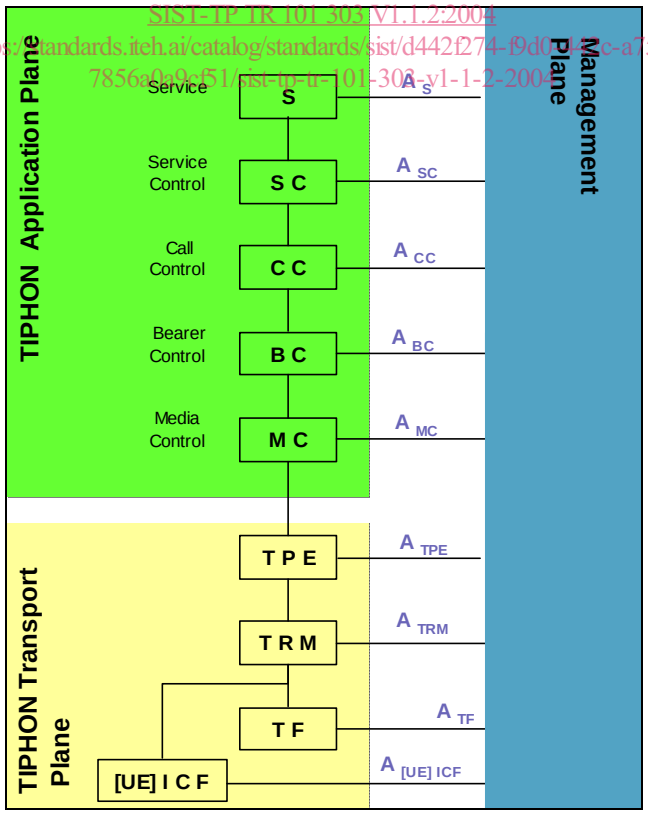

Figure 4: TNM Reference Points

5.3 Relationship between TNM and Tiphon functional entities

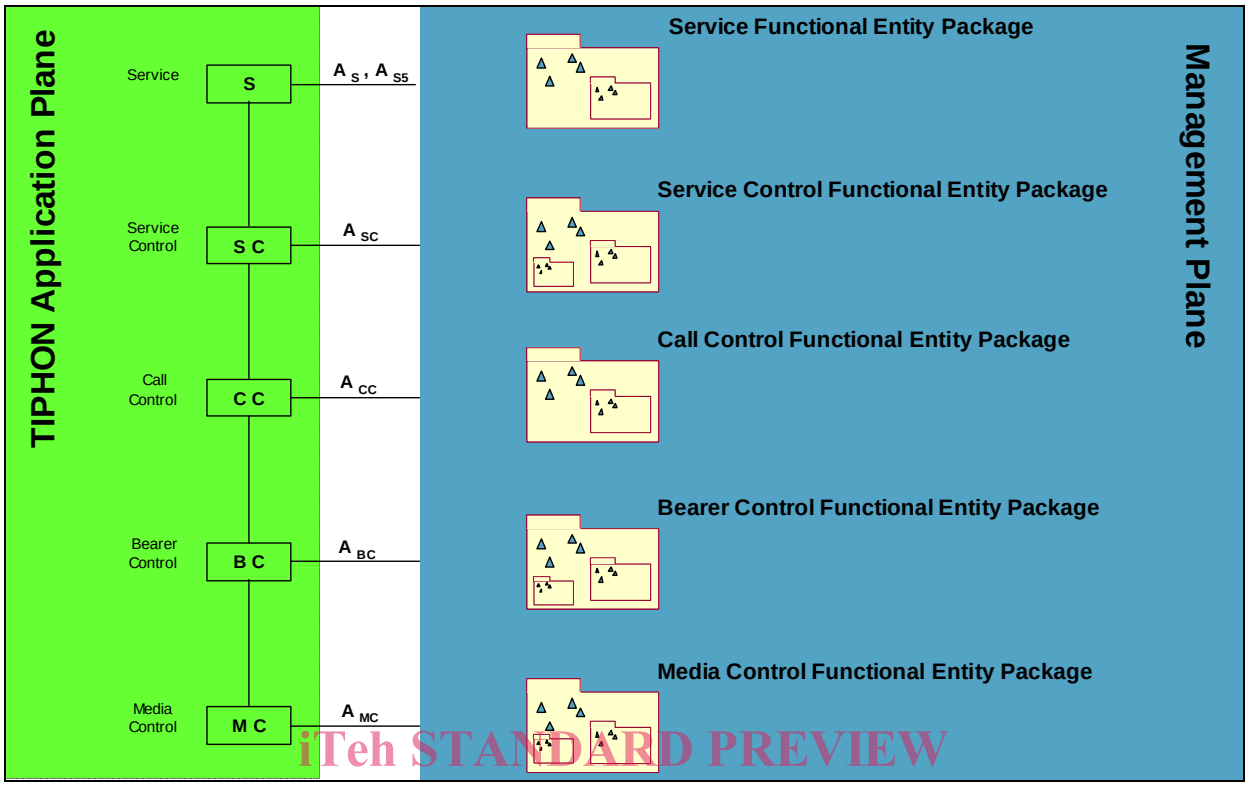

Figure 5: TNM packages

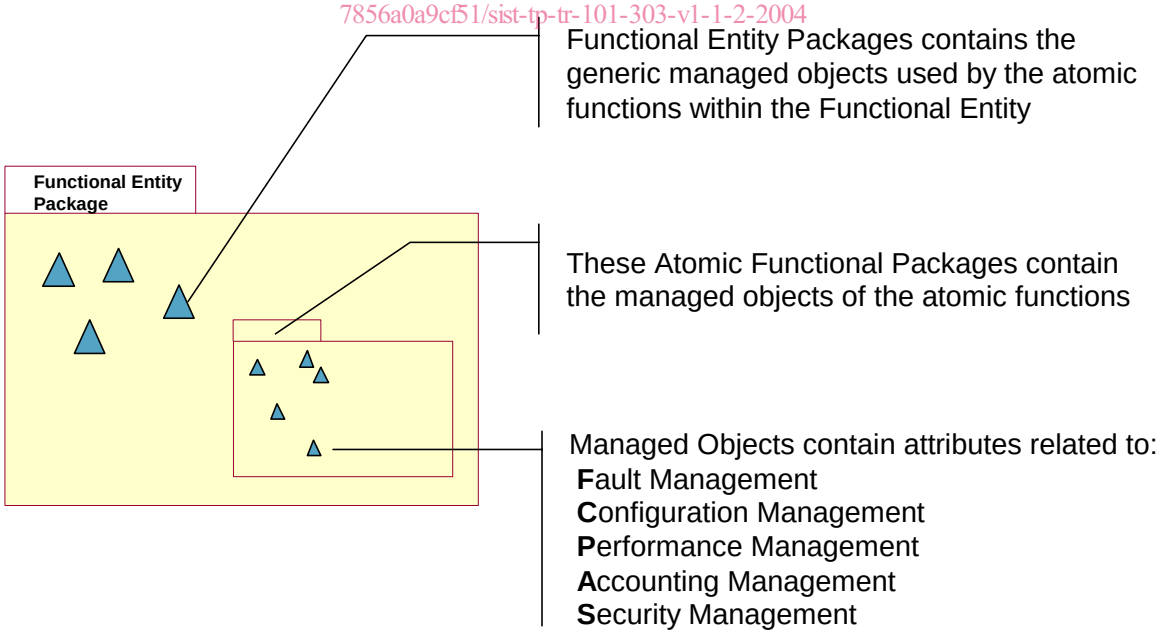

Figure 6: TNM package decomposition