

ITU-T

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**SERIES G: TRANSMISSION SYSTEMS AND MEDIA,
DIGITAL SYSTEMS AND NETWORKS**

Data over Transport – Generic aspects – Transport
network control aspects

**SERIES Y: GLOBAL INFORMATION
INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS
AND NEXT-GENERATION NETWORKS**

Internet protocol aspects – Operation, administration and
maintenance

Framework for ASON management

Recommendation ITU-T G.7718/Y.1709

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TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS

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For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T G.7718/Y.1709

Framework for ASON management

Summary

Recommendation ITU-T G.7718/Y.1709 contains the framework for ASON management. It places ASON management within the TMN context and specifies how the TMN principles may be applied. A management view of the ASON control plane is developed. This view provides the bases for the ASON management requirements specified in this Recommendation. Identifier spaces needed in ASON management are specified. Examples of management system structures and ASON related management applications are contained in the appendices.

The 2010 version of this Recommendation adds the requirements to support permanent connection to soft permanent connection migration, configuration of routing controller adjacencies, call detail record for accounting management, and refresh of management plane and control plane views.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T G.7718/Y.1709	2005-02-13	15
2.0	ITU-T G.7718/Y.1709	2010-07-29	15

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

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Framework for ASON management

1 Scope

This Recommendation addresses the management aspects of the ASON control plane and the interactions between the management plane and the ASON control plane. This Recommendation follows the TMN principles specified in [ITU-T M.3010] and the ASON architecture principles specified in [ITU-T G.8080]. Included are:

- 1) identification of reference points and interfaces between the management plane and the control plane;
- 2) a description of the larger context of ASON network and service management;
- 3) requirements for the:
 - use of ASON constructs, e.g., routing areas, SNPP links, etc.;
 - management of calls and connections;
 - configuration, fault, performance, accounting and security management for ASON.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [ITU-T G.784] Recommendation ITU-T G.784 (2008), *Management aspects of synchronous digital hierarchy (SDH) transport network elements*.
- [ITU-T G.805] Recommendation ITU-T G.805 (2000), *Generic functional architecture of transport networks*.
- [ITU-T G.806] Recommendation ITU-T G.806 (2009), *Characteristics of transport equipment – Description methodology and generic functionality*.
- [ITU-T G.874] Recommendation ITU-T G.874 (2010), *Management aspects of optical transport network elements*.
- [ITU-T G.7710] Recommendation ITU-T G.7710/Y.1701 (2007), *Common equipment management function requirements*.
- [ITU-T G.7712] Recommendation ITU-T G.7712/Y.1703 (2008), *Architecture and specification of data communication network*.
- [ITU-T G.7713] Recommendation ITU-T G.7713/Y.1704 (2009), *Distributed call and connection management (DCM)*.
- [ITU-T G.7713.1] Recommendation ITU-T G.7713.1/Y.1704.1 (2003), *Distributed call and connection management (DCM) based on PNNI*.
- [ITU-T G.7713.2] Recommendation ITU-T G.7713.2/Y.1704.2 (2003), *Distributed call and connection management: Signalling mechanism using GMPLS RSVP-TE*.

- [ITU-T G.7713.3] Recommendation ITU-T G.7713.3/Y.1704.3 (2003), *Distributed call and connection management: Signalling mechanism using GMPLS CR-LDP*.
- [ITU-T G.7715] Recommendation ITU-T G.7715/Y.1706 (2002), *Architecture and requirements for routing in the automatically switched optical networks*, plus Amendment 1 (2007).
- [ITU-T G.7715.1] Recommendation ITU-T G.7715.1/Y.1706.1 (2004), *ASON routing architecture and requirements for link state protocols*.
- [ITU-T G.8080] Recommendation ITU-T G.8080/Y.1304 (2006), *Architecture for the automatically switched optical network (ASON)*, plus Amendment 1 (2008).
- [ITU-T M.3010] Recommendation ITU-T M.3010 (2000), *Principles for a telecommunications management network*, plus Amendment 1 (2003), and Amendment 2 (2005).
- [ITU-T M.3020] Recommendation ITU-T M.3020 (2009), *Management interface specification methodology*.
- [ITU-T M.3100] Recommendation ITU-T M.3100 (2005), *Generic network information model*.
- [ITU-T M.3120] Recommendation ITU-T M.3120 (2001), *CORBA generic network and network element level information model*, plus Amendment 1 (2002), and Amendment 2 (2003).
- [ITU-T X.700] Recommendation ITU-T X.700 (1992), *Management framework for Open Systems Interconnection (OSI) for CCITT applications*.
- [ITU-T X.731] Recommendation ITU-T X.731 (1992) | ISO/IEC 10164-2:1993, *Information technology – Open Systems Interconnection – Systems management: State management function*.

3 Definitions

No new terms and definitions are defined in this Recommendation.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations:

ASON	Automatically Switched Optical Network
CC	Connection Controller
CF	Control plane Function
COS	Class of Service
CP	Control plane
CTP	Connection Termination Point
DA	Discovery Agent
DCC	Data Communications Channel
DCM	Distributed Call and Connection Management
DCN	Data Communications Network
EMF	Equipment Management Function
EMS	Element Management System
E-NNI	External Network-Network-Interface

GOS	Grade of Service
I-NNI	Internal Network-Network-Interface
LAN	Local Area Network
LCAS	Link Capacity Adjustment Scheme
LRM	Link Resource Manager
MP	Management Plane
NCC	Network Call Controller
NE	Network Element
NEF	Network Element Function
NMS	Network Management System
NNI	Network-Network-Interface
OAM	Operation, Administration and Maintenance
OS	Operations System
OSF	Operations System Function
OTN	Optical Transport Network
PC	Protocol Controller
RA	Routing Area
RC	Routing Controller
SC	Switched Connection
SDH	Synchronous Digital Hierarchy
SMS	Service Management System
SNC	SubNetwork Connection
SNCP	SubNetwork Connection Protection
SNP	SubNetwork Point
SNPP	SubNetwork Point Pool
SPC	Soft Permanent Connection
SRG	Shared Risk Group
TAP	Termination and Adaptation Performer
TMN	Telecommunications Management Network
TP	Termination Point
TTP	Trail Termination Point
UML	Unified Modelling Language
UNI	User-Network-Interface
UNI-C	User-Network Interface – Client
UNI-N	User-Network-Interface – Network
UTRAD	Unified TMN Requirements, Analysis and Design



VCAT	Virtual Concatenation
VCn	Virtual Container of Level n

5 Conventions

None.

6 Context and background

This clause briefly relates the contents of this Recommendation to the fundamental Recommendations on the ASON architecture, transport network functional models, management principles, and interface specification methodology.

6.1 Relationship to management information modelling

Figure 1 describes the relationship between the scope of this Recommendation and the definition of management information models.

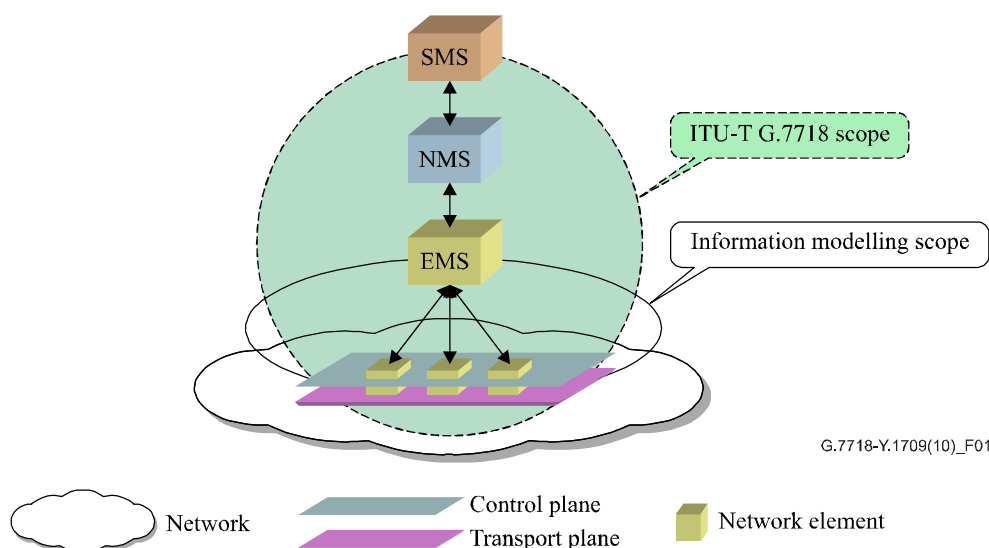


Figure 1 – Scope of ITU-T G.7718/Y.1709

6.2 Relationship to the ASON architecture

This Recommendation contains a management framework for ASON control planes, as specified in [ITU-T G.8080].

The ITU-T G.8080 reference architecture describes:

- 1) functional components of the control plane, including abstract interfaces and primitives;
- 2) interactions between call controller components;
- 3) interactions among components during connection set-up;
- 4) functional components that transform the abstract component interfaces into protocols on external interfaces.

The ITU-T G.8080 control plane functional components manipulate transport network resources in order to set up, maintain, and release calls and connections.

Generically, every ITU-T G.8080 control plane component has a set of special interfaces to allow for monitoring of the component operation, for dynamically setting policies, and for affecting internal behaviour. These interfaces are not mandatory and are provided on specific components only where necessary. Components are not assumed to be statically distributed.

6.3 Relationship to technology-specific Recommendations

The architectural specifications and functional requirements contained in [ITU-T G.8080] are applicable to connection-oriented circuit or packet transport networks, as defined in [ITU-T G.805].

6.4 Relationship to the TMN architecture

This Recommendation adheres to the TMN principles specified in [ITU-T M.3010].

[ITU-T M.3010] defines the logical layered architecture concept for organizing management functionality. The logical layers of interest in this Recommendation include the element management layer, the network management layer and the service management layer. As noted in [ITU-T M.3010], management objects defined for one layer may be used in others. Any management object may be used by any interface that requires it.

The element management layer is concerned with the information that is required to manage a network element (NE). This refers to the information required to manage the network element function (NEF), the control plane function (CF), and the physical aspects of an NE.

The network management layer is concerned with the information representing the network, both physically and logically. It is concerned with relationships among network elements, topographical connections, and configurations that provide and maintain end-to-end connectivity.

The service management layer is concerned with, and responsible for, the contractual aspects of services that are being provided to customers or available to potential new customers.

The layers of the logical layered architecture are used in this Recommendation to organize and to identify management requirements and management entities.

Figure 2 is based on Figure 2 of [ITU-T M.3010]. It illustrates the control plane function (CF), together with the traditional TMN function blocks. The CF represents the functions provided by the control plane components. It represents the functions within the control plane that permit the OSF to interact with and configure the control plane and permits the control plane to interact with the NEFs. It also supports the interaction between elements of the control plane itself. Additional information on interfaces is provided in clause 7.3.1 and in Figure 4.

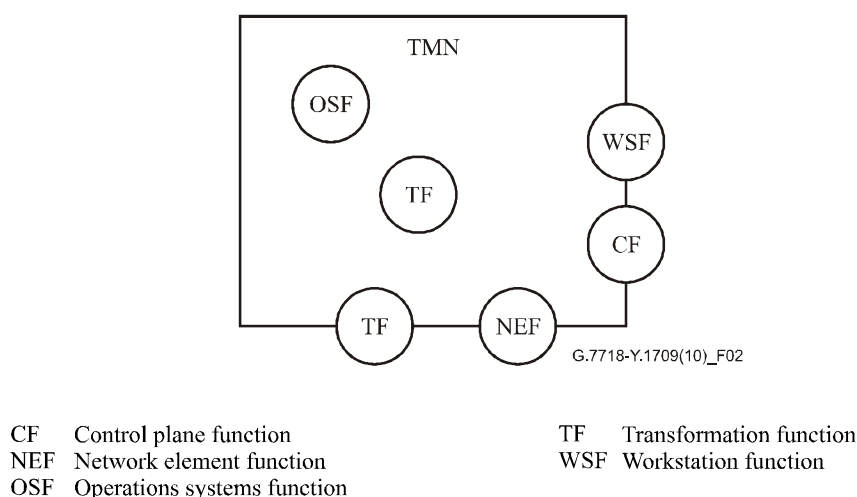


Figure 2 – Control plane function in TMN function blocks form

The CF block has been added to Figure 2 of [ITU-T M.3010] to emphasize the control plane functionality of interest in this Recommendation. In a more general setting, the CF function block can be considered to represent those functions not included in the NEF.