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G.7718/Y.1709

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

Digital terminal equipments – Operations, administration
and maintenance features of transmission equipment

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

Internet protocol aspects – Operation, administration and
maintenance

Framework for ASON management

ITU-T Recommendation G.7718/Y.1709

ITU-T G-SERIES RECOMMENDATIONS
TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS

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

Framework for ASON management

Summary

This Recommendation 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.

Source

ITU-T Recommendation G.7718/Y.1709 was approved on 13 February 2005 by ITU-T Study Group 15 (2005-2008) under the ITU-T Recommendation A.8 procedure.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. 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.

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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, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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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 Rec. M.3010 and the ASON architecture principles specified in ITU-T Rec. G.8080/Y.1304. 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 Recommendation G.784 (1999), *Synchronous digital hierarchy (SDH) management*.
- ITU-T Recommendation G.803 (2000), *Architecture of transport networks based on the synchronous digital hierarchy (SDH)*.
- ITU-T Recommendation G.805 (2000), *Generic functional architecture of transport networks*.
- ITU-T Recommendation G.806 (2004), *Characteristics of transport equipment – Description methodology and generic functionality*.
- ITU-T Recommendation G.807/Y.1302 (2001), *Requirements for automatic switched transport networks (ASTN)*.
- ITU-T Recommendation G.872 (2001), *Architecture of optical transport networks*.
- ITU-T Recommendation G.874 (2001), *Management aspects of the optical transport network element*.
- ITU-T Recommendation G.7710/Y.1701 (2001), *Common equipment management function requirements*.
- ITU-T Recommendation G.7712/Y.1703 (2003), *Architecture and specification of data communication network*.
- ITU-T Recommendation G.7713/Y.1704 (2001), *Distributed call and connection management (DCM), plus Amd.1 (2004)*.

- ITU-T Recommendation G.7713.1/Y.1704.1 (2003), *Distributed call and connection management (DCM) based on PNNI*.
- ITU-T Recommendation G.7713.2/Y.1704.2 (2003), *Distributed call and connection management: Signalling mechanism using GMPLS RSVP-TE*.
- ITU-T Recommendation G.7713.3/Y.1704.3 (2003), *Distributed call and connection management: Signalling mechanism using GMPLS CR-LDP*.
- ITU-T Recommendation G.7715/Y.1706 (2002), *Architecture and requirements for routing in the automatically switched optical networks*.
- ITU-T Recommendation G.7715.1/Y.1706.1 (2004), *ASON routing architecture and requirements for link state protocols*.
- ITU-T Recommendation G.8080/Y.1304 (2001), *Architecture for the automatically switched optical network (ASON), plus Amd.1 (2003), Amd.2 (2005)*.
- ITU-T Recommendation M.3010 (2000), *Principles for a telecommunications management network*.
- ITU-T Recommendation M.3020 (2000), *TMN interface specification methodology*.
- ITU-T Recommendation M.3100 (2005), *Generic network information model*.
- ITU-T Recommendation M.3120 (2001), *CORBA generic network and network element level information model*.
- ITU-T Recommendation X.700 (1992), *Management framework for Open Systems Interconnection (OSI) for CCITT applications*.
- ITU-T Recommendation X.731 (1992), *Information technology – Open Systems Interconnection – Systems management: State management function*.

3 Terms and definitions

No new terms and definitions are defined in this Recommendation.

4 Abbreviations

This Recommendation uses the following abbreviations:

ASON	Automatically Switched Optical Network
CC	Connection Controller
CF	Control Plane Function
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 Node Interface

I-NNI	Internal Network Node Interface
ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
LAN	Local Area Network
LRM	Link Resource Manager
MP	Management Plane
NCC	Network Call Controller
NE	Network Element
NEF	Network Element Function
NMS	Network Management System
NNI	Network Node Interface
OAM	Operation Administration and Maintenance
OMG	Object Management Group
OS	Operations System
OSF	Operations System Function
OTN	Optical Transport Network
PC	Protocol Controller
RA	Routing Area
RC	Routing Controller
SC	Switched Connection
SCN	Signalling Communications Network
SDH	Synchronous Digital Hierarchy
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
UML	Unified Modelling Language
UNI	User Network Interface
UTRAD	Unified TMN Requirements, Analysis and Design
VCn	Virtual Container of Level n

5 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.

5.1 Relationship to management information modelling

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

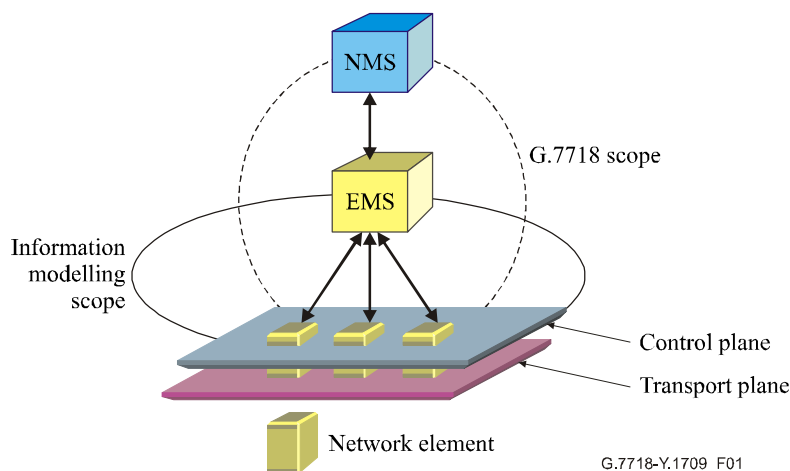


Figure 1/G.7718/Y.1709 – Scope of G.7718/Y.1709

5.2 Relationship to the ASON architecture

This Recommendation contains a management framework for ASON control planes as specified in ITU-T Rec. G.8080/Y.1304.

The G.8080/Y.1304 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 setup;
- 4) functional components that transform the abstract component interfaces into protocols on external interfaces.

The G.8080/Y.1304 control plane functional components manipulate transport network resources in order to set up, maintain, and release calls and connections.

Generically, every G.8080/Y.1304 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.

5.3 Relationship to technology specific Recommendations

The architectural specifications and functional requirements contained in ITU-T Rec. G.8080/Y.1304 are applicable to any layer network, including SDH transport networks, as defined in ITU-T Rec. G.803, and Optical Transport Networks (OTN), as defined in ITU-T Rec. G.872.

5.4 Relationship to the TMN architecture

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

ITU-T Rec. M.3010 defines the Logical Layered Architecture concept for organizing management functionality. The logical layers of interest in G.7718/Y.1709 include the Element Management Layer, the Network Management Layer and the Service Management Layer. As noted in ITU-T

