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**SERIES G: TRANSMISSION SYSTEMS AND MEDIA,
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Digital terminal equipments – Operations, administration
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ASON routing architecture and requirements for link state protocols

ITU-T Recommendation G.7715.1/Y.1706.1

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ITU-T Recommendation G.7715.1/Y.1706.1

ASON routing architecture and requirements for link state protocols

Summary

This Recommendation provides architecture and requirements for a link-state realization of ITU-T Rec. G.7715/Y.1706. It identifies protocol-neutral requirements for hierarchical link state routing derived from ITU-T Recs G.8080/Y.1304 and G.7715/Y.1706 in a distributed environment. The distribution of the architectural components is defined in ITU-T Rec. G.8080/Y.1304, and this Recommendation is one realization of the ASON routing architecture.

Source

ITU-T Recommendation G.7715.1/Y.1706.1 was approved on 22 February 2004 by ITU-T Study Group 15 (2001-2004) under the ITU-T Recommendation A.8 procedure.

FOREWORD

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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.

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ASON routing architecture and requirements for link state protocols

1 Introduction

ITU-T Recs G.807/Y.1302 and G.8080/Y.1304 specify the requirements and architecture for a dynamic, automatically switched optical network (ASON) in which connection services are provided using a control plane. ITU-T Rec. G.7715/Y.1706 specifies the requirements and architecture for the ASON routing functions used for the establishment of switched connections and soft permanent connections.

This Recommendation provides protocol-neutral requirements for a hierarchical link state routing protocol derived from ITU-T Recs G.8080/Y.1304 and G.7715/Y.1706 in a distributed environment. The distribution of the architectural components is defined in ITU-T Rec. G.8080/Y.1304, and this Recommendation is one realization of the ASON routing architecture. The support of multilevel hierarchical routing is a key function within this instantiation of ITU-T Rec. G.7715/Y.1706.

The requirements for link-state routing protocols supporting control plane communication (i.e., SCN) is not within the scope of this Recommendation.

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.803 (2000), *Architecture of transport networks based on the synchronous digital hierarchy (SHD)*.
- ITU-T Recommendation G.805 (2000), *Generic functional architecture of transport networks*.
- ITU-T Recommendation G.807/Y.1302 (2001), *Requirements for the automatic switched transport networks (ASTN)*.
- ITU-T Recommendation G.872 (2001), *Architecture of optical transport networks*.
- 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)*.
- ITU-T Recommendation G.7715/Y.1706 (2002), *Architecture and requirements for routing in the automatically switched optical networks*.
- ITU-T Recommendation G.8080/Y.1304 (2001) and Amendment 1 (2003), *Architecture of the automatically switched optical network (ASON)*.

3 Terms and definitions

Terminology	Definition
Connection Point	See ITU-T Rec. G.805
Link Resource Manager	See ITU-T Rec. G.8080/Y.1304
Protocol Controller	See ITU-T Rec. G.8080/Y.1304
Routing Area	See ITU-T Rec. G.8080/Y.1304
Routing Controller	See ITU-T Rec. G.8080/Y.1304
Routing Database	See ITU-T Rec. G.7715/Y.1706
Routing Performer	See ITU-T Rec. G.7715/Y.1706
Shared Risk Groups	See ITU-T Rec. G.7715/Y.1706
Signalling Communication Network	See ITU-T Rec. G.7712/Y.1703
Subnetwork Point	See ITU-T Rec. G.8080/Y.1304
Subnetwork Point Pool	See ITU-T Rec. G.8080/Y.1304
Termination Connection Point	See ITU-T Rec. G.805

4 Abbreviations

This Recommendation uses the following abbreviations:

CC	Connection Controller
CP	Connection Point
IE	Information Element
LRM	Link Resource Manager
PC	Protocol Controller
RA	Routing Area
RC	Routing Controller
RDB	Routing Information Database
RP	Routing Performer
SCN	Signalling Communication Network
SNP	Subnetwork Point
SNPP	Subnetwork Point Pool
SRG	Shared Risk Groups
TCP	Termination Connection Point

5 Architecture framework for ASON link state routing

The architectural framework of ITU-T Rec. G.7715/Y.1706 provides a starting point for further architectural analysis. Figure 1 illustrates a Routing Area (RA) in which the Routing Performer (RP) is instantiated via multiple Routing Controllers (RCs) that belong to the same RA. In this example, two RCs are shown for simplicity. The interaction of functional and G.8080/Y.1304 architectural components related to routing for this RA, described in ITU-T Rec. G.7715/Y.1706, are illustrated. No distinction is made between nodes that may have further internal details