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

Digital transmission systems – Digital networks – SDH
network characteristics

Principles and guidelines for the integration of satellite and radio systems in SDH transport networks

ITU-T Recommendation G.861

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION G.861**PRINCIPLES AND GUIDELINES FOR THE INTEGRATION OF SATELLITE AND
RADIO SYSTEMS IN SDH TRANSPORT NETWORKS****Summary**

This Recommendation provides guidelines and principles for the integration of digital radio-relay and satellite systems into SDH based transport networks. It focuses on the functional and architectural aspects of the integration from a network perspective, with the objective of ensuring compatibility in terms of the information transfer capability of SDH signal elements and inter-system management commonality. It does not consider the internal composition, or implementation specific details of digital radio-relay and satellite systems, which are the subject of the relevant ITU-R Recommendations.

Source

ITU-T Recommendation G.861 was prepared by ITU-T Study Group 13 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 27th of August 1996.

FOREWORD

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The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 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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Recommendation G.861**PRINCIPLES AND GUIDELINES FOR THE INTEGRATION OF SATELLITE
AND RADIO SYSTEMS IN SDH TRANSPORT NETWORKS***(Geneva, 1996)***1 Introduction****1.1 Scope**

This Recommendation provides guidelines and principles for integrating digital radio-relay and satellite systems and equipment in SDH transport networks. It focuses on functional and architectural aspects of the integration from a G.803 network perspective. The objective is to ensure compatibility in terms of information transfer capability of SDH signal elements and inter-system management commonality.

A number of integration scenarios of radio/satellite systems with different roles and functions in the SDH transport network are described. They vary in transparency to G.707 synchronous transport module signals, or their payload (VCs) signals between the radio system interfaces.

This Recommendation addresses management aspects, including provision of and access requirements to SDH management facilities for radio and satellite systems in the G.784 SDH management subnetworks (SMS).

This Recommendation does not consider the internal composition, make-up and implementation specific details of the satellite and radio systems, which are the subject of pertinent ITU-R Recommendations.

1.2 Structure of this Recommendation

Clause 2 describes scenarios and architectural principles for the integration of radio systems as point-to-point digital sections in SDH. Clause 3 describes a scenario for satellite systems emulating synchronous Network Element (NE) functions at SDH network nodes, and utilizes the satellite unique capability of supporting multipoint configurations to client connections of SDH elemental signal(s) (VCs or TUs). Clause 4 provides guidelines for constructing sub-STM-1 signal multiplex structures, new degenerate HOVC and direct mapping of LOVCs in sub-STM-1 radio sections. Clause 5 addresses SDH management aspects to be taken into account in multiple transmission media SDH systems.

1.3 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; all 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.

- ITU-R Recommendation F.750-2 (1995), *Architectures and functional aspects of radio-relay systems for SDH-based networks*.

- ITU-R Recommendation F.751-1 (1994), *Transmission characteristics and performance requirements of radio-relay systems for SDH-based networks.*
- CCITT Recommendation G.703 (1991), *Physical/electrical characteristics of hierarchical digital interfaces.*
- ITU-T Recommendation G.707 (1996), *Network node interface for the Synchronous Digital Hierarchy (SDH).*
- ITU-T Recommendation G.774 (1996), *Synchronous Digital Hierarchy (SDH) management information model for the network element view.*
- ITU-T Recommendation G.774.1 (1996), *Synchronous Digital Hierarchy (SDH) performance monitoring for the network element view.*
- ITU-T Recommendation G.774.2 (1996), *Synchronous Digital Hierarchy (SDH) configuration of the payload structure for the network element view.*
- ITU-T Recommendation G.774.3 (1996), *Synchronous Digital Hierarchy (SDH) management of multiplex-section protection for the network element view.*
- ITU-T Recommendation G.774.4 (1996), *Synchronous Digital Hierarchy (SDH) management of subnetwork connection protection for the network element view.*
- ITU-T Recommendation G.784 (1994), *Synchronous Digital Hierarchy management.*
- ITU-T Recommendation G.803 (1993), *Architectures of transport networks based on the Synchronous Digital Hierarchy (SDH).*
- ITU-T Recommendation G.831 (1996), *Management capabilities of transport networks based on the Synchronous Digital Hierarchy (SDH).*
- ITU-T Recommendation G.832 (1995), *Transport of SDH elements on PDH networks – Frame and multiplexing structures.*
- CCITT Recommendation M.1520 (1992), *Standardized information exchange between Administrations.*
- ITU-T Recommendation M.3010 (1996), *Principles for a telecommunications management network.*
- ITU-T Recommendation M.3020 (1995), *TMN interface specification methodology.*
- CCITT Recommendation M.3300 (1992), *TMN management capabilities presented at the F interface.*
- CCITT Recommendation X.722 (1992), *Information technology – Open Systems Interconnection – Structure of management information: Guidelines for the definition of managed objects.*
- ITU-R Recommendation S.1149 (1997), *Network architecture and equipment functional aspects of digital satellite systems in the FSS forming part of SDH transport networks.*

1.4 Definitions

This Recommendation defines the following terms.

1.4.1 line termination (LT): Access to both standard MSOH and RSOH.

1.4.2 multiplex section (MS): Access to standard RSOH and MSOH.

1.4.3 network node interface (NNI): The basic, fully standardized open interface in the SDH. The NNI is a physical interface and can be associated with an Intra-Office Section (IOS), which is