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OF TELEVISION, SOUND PROGRAMME AND OTHER
MULTIMEDIA SIGNALS

Switched digital video over cable networks

Transmission specification for IP-based switched digital video using data over cable service interface specifications

Recommendation ITU-T J.1103

ITU-T

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Transmission specification for IP-based switched digital video using data over cable service interface specifications

Summary

Recommendation ITU-T J.1103 describes the transmission specifications of IP-based switched digital video (SDV) using data over cable service interface specifications (DOCSIS) in a digital cable network. The cable broadcasting system has been changed to use resources efficiently and to transmit said resources in such a way that the varying needs of subscribers are easily accommodated. The transmission specifications described in this Recommendation are defined according to Recommendation ITU-T J.1101, *Functional requirements for IP-based switched digital video using data over cable service interface specifications*. These specifications are designed to maintain quality of service (QoS) while using bandwidth effectively in a hybrid fibre/coaxial (HFC) network environment.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
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* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

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Recommendation ITU-T J.1103

Transmission specification for IP-based switched digital video using data over cable service interface specifications

1 Scope

This Recommendation defines the transmission specifications of the IP-based switched digital video (SDV) using data over cable service interface specification (DOCSIS). The transmission specifications described in this Recommendation are defined according to [\[ITU-T J.1101\]](#). The transmission specifications described in this Recommendation are defined as follows:

- multicast service flow processing transmission specifications
- multicast packet scheduling transmission specifications
- media access control (MAC) header processing transmission specifications
- MPEG-2 TS convergence transmission specifications.

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.

[\[ITU-T J.210\]](#) Recommendation ITU-T J.210 (2006), *Downstream RF interface for cable modem termination systems*.

[\[ITU-T J.222.1\]](#) Recommendation ITU-T J.222.1 (2007), *Third-generation transmission systems for interactive cable television services – IP cable modems: Physical layer specification*.

[\[ITU-T J.222.2\]](#) Recommendation ITU-T J.222.2 (2007), *Third-generation transmission systems for interactive cable television services – IP cable modems: MAC and Upper Layer protocols*.

[\[ITU-T J.1101\]](#) Recommendation ITU-T J.1101 (2012), *Functional requirements for IP-based switched digital video using data over cable service interface specifications*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following term defined elsewhere:

3.1.1 IP-based SDV [\[ITU-T J.1101\]](#): A service mechanism which provides interfaces and functionalities to enable cable television system operators to offer QoS-guaranteed broadcasting and multicasting.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

CCP	Channel Charge Protocol
CM	Cable Modem
CMTS	Cable Modem Termination System
CRC	Cyclic Redundancy Check
DA	Destination Address
DC	Downstream Channel
DCID	Downstream Channel Identifier
DEPI	Downstream External PHY Interface
DMPI	DOCSIS MAC-PHY Interface
DOCSIS	Data Over Cable Service Interface Specifications
DRFI	Downstream Radio Frequency Interface
DS	Downstream
DSID	Downstream Service Identifier
EH	Extended Header
EHDR	Extended MAC Header
FC	Frame Control
FEC	Forward Error Correction
FTP	File Transfer Protocol
GBE	Giga Bit Ethernet
HCS	Header Check Sequence
HFC	Hybrid Fibre/Coaxial
IGMP	Internet Group Management Protocol
IP	Internet Protocol
IPC	Inter Process Communications
MAC	Media Access Control
M-CMTS	Modular Cable Modem Termination System
MDD	MAC Domain Descriptor
MIB	Management Information Base
MPEG	Moving Picture Experts Group
MSB	Most Significant Bit
NSI	Network Service Interface
PDU	Protocol Data Unit
PHY	Physical Layer
PID	Packet Identifier
PUSI	Payload Unit Start Indicator

QAM	Quadrature Amplitude Modulation
QoS	Quality of Service
RPC	Remote Procedure Call
SA	Source Address
SDV	Switched Digital Video
SF	Service Flow
SFID	Service Flow Identifier
SID	Service Identifier
SIP	Session Initiation Protocol
STB	Set-Top Box
VSI	Video Service Interface

5 Conventions

In this Recommendation:

The keywords "**is required to**" indicate a requirement which must be strictly followed and from which no deviation is permitted if conformance to this document is to be claimed.

The keywords "**is recommended**" indicate a requirement which is recommended but which is not absolutely required. Thus this requirement need not be present to claim conformance.

The keywords "**is prohibited from**" indicate a requirement which must be strictly followed and from which no deviation is permitted if conformance to this document is to be claimed.

The keywords "**can optionally**" indicate an optional requirement which is permissible, without implying any sense of being recommended. This term is not intended to imply that the vendor's implementation must provide the option and the feature can be optionally enabled by the network operator/service provider. Rather, it means the vendor may optionally provide the feature and still claim conformance with the specification.

In the body of this Recommendation and its annexes, the words *shall*, *shall not*, *should*, and *may* sometimes appear, in which case they are to be interpreted, respectively, as *is required to*, *is prohibited from*, *is recommended*, and *can optionally*. The appearance of such phrases or keywords in an appendix or in material explicitly marked as *informative* are to be interpreted as having no normative intent.

6 IP-based SDV reference model

As shown in Figure 1, functionally IP-based SDV using the DOCSIS system can be categorized into three parts:

- the transmission function
- the subscriber function
- the control function.