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MULTIMEDIA SIGNALS

Digital transmission of television signals

Architecture of multi-channel video signal distribution over IP-based networks

ITU-T Recommendation J.282



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ITU-T Recommendation J.282

Architecture of multi-channel video signal distribution over IP-based networks

Summary

This Recommendation defines the architecture of IP-based video signal distribution systems. Because IP transmission technologies allow the use of various physical media due to their media-independent nature, this Recommendation describes some additional broadband access network technologies such as optical access network, xDSL and cable modem.

Source

ITU-T Recommendation J.282 was approved on 29 November 2006 by ITU-T Study Group 9 (2005-2008) under the ITU-T Recommendation A.8 procedure.

FOREWORD

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Introduction

This Recommendation defines the architecture of IP-based video signal distribution systems that satisfy the requirements defined in [b-ITU-T J.281]. Primary and secondary distribution of broadcasting programmes, the key services of CATV, are the goals of this architecture. Hence, some important issues, which are not derived from the requirements of generic video transmission service but are important in terms of broadcasting, such as area restriction and anonymous reception, are taken into account.

Because IP transmission technologies can be used with various physical media due to their flexibility, this Recommendation also introduces some additional broadband access network technologies, which are not covered in [b-ITU-T J.281], such as xDSL and cable modem.

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ITU-T Recommendation J.282

Architecture of multi-channel video signal distribution over IP-based networks

1 Scope

This Recommendation describes the architecture of IP-based video signal distribution systems that can provide functionalities and services equivalent to those of a conventional CATV system, including secondary distribution of broadcasts.

High quality video distribution over the IP network requires broadband access network technologies such as optical access network, xDSL and cable modem. This Recommendation describes the functionalities of the CDN and access network required for multi-channel video services. The CDN is under the obvious control of network operator(s). Programme distribution on a global basis is outside the scope of this Recommendation.

The service configuration is roughly equivalent to conventional CATV. HDTV is available as one part of the video service.

The two Internet protocols, IPv4 and IPv6, are basically the same with some differences such as the address architecture and multicast management protocol. This Recommendation does not define which protocol should or should not be used. The choice of Internet protocol is left to the operator.

IP technologies can be applied for contribution, primary and secondary distribution, and in-home transmission/distribution. This Recommendation focuses on primary and secondary distribution. The other usages, for example video on demand, may be added to the architecture 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 H.222.0] ITU-T Recommendation H.222.0 (2006) | ISO/IEC 13818-1 (2006),
Information technology – Generic coding of moving pictures and associated audio information: Systems.
- [ITU-T J.94] ITU-T Recommendation J.94 (1998), *Service information for digital broadcasting in cable television systems.*
- [ITU-T J.183] ITU-T Recommendation J.183 (2001), *Time-division multiplexing of multiple MPEG-2 transport streams over cable television systems.*
- [ITU-T J.290] ITU-T Recommendation J.290 (2006), *Next generation set-top box core architecture.*
- [ITU-T J.292] ITU-T Recommendation J.292 (2006), *Next generation set-top box media-independent architecture.*

3 Definitions

This Recommendation defines the following terms:

3.1 IP stream (IPS): A flow of IP packets that is identified by destination/source IP address and port number.

3.2 network termination (NT): Generic term for equipment that terminates an access network at the user side. NT includes ONU, cable modem and xDSL modem.

3.3 transport stream (TS): A TS is a data structure defined in [ITU-T H.222.0].

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

CAS	Conditional Access System
CATV	CABle TeleVision
CDN	Content Distribution Network
CPE	Customer Premises Equipment
DHCP	Dynamic Host Configuration Protocol
ECM	Entitlement Control Message
EMM	Entitlement Management Message
EPG	Electronic Programme Guide
FEC	Forward Error Correction
FTTB	Fibre To The Building
FTTH	Fibre To The Home
HDTV	High Definition TeleVision
IGMP	Internet Group Management Protocol
IP	Internet Protocol
IPS	Internet Protocol Stream
L2	Layer 2
MAC	Media Access Control
MLD	Multicast Listener Discovery
MPEG	Moving Picture Experts Group
NIT	Network Information Table
NT	Network Termination
ONU	Optical Network Unit
PC	Personal Computer
PES	Packetized Elementary Stream
PSI	Programme Specific Information
QoS	Quality of Service
RA	Router Advertisement
RTP	Real-time Transport Protocol