

I n t e r n a t i o n a l T e l e c o m m u n i c a t i o n U n i o n

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

J.292

(11/2006)

SERIES J: CABLE NETWORKS AND TRANSMISSION
OF TELEVISION, SOUND PROGRAMME AND OTHER
MULTIMEDIA SIGNALS

Cable modems

Next generation set-top box media-independent architecture

ITU-T Recommendation J.292



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Next generation set-top box media-independent architecture

Summary

This Recommendation describes a core architecture that is not dependent on transport media for a next generation set-top box that will allow service providers to offer existing and new advanced services regardless of the transport media in the future. It is assumed in this Recommendation that all contents are transported on IP packets with an adequate QoS controlled mechanism. This Recommendation reflects key functional aspects of the next generation set-top box, such as network resource adaptability, secure two-way authenticated communication and session resource management and a QoS-control mechanism.

Source

ITU-T Recommendation J.292 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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Next generation set-top box media-independent architecture

1 Scope

This Recommendation describes the core architecture of a next generation STB that is not dependent on the transport media. Operators and equipment vendors MAY elect to follow in making network and product investment decisions. This architecture specifically defines network resource adaptability, secure two-way authenticated communication and session resource management and QoS-control mechanism over full-IP environments. This architecture is applicable to support the growth of on-demand video, high-definition digital TV, managed in-home networks connecting a wide range of consumer-provided devices, and IP multimedia services including IP voice, video telephony, and multiplayer gaming. The goal of this Recommendation is to provide core functionalities for next generation STB regardless of the transport media. In actual implementation of NG-STB-A functionalities, the Recommendation MUST be used with [ITU-T J.290]. This Recommendation contains some technical solutions as examples to help the reader's understanding, not for the specification for the media-independent STB. It should be noted that the future Recommendations will define technical solutions relevant to the media-independent STB.

2 References

None.

3 Definitions

This Recommendation defines the following terms:

- 3.1 content distribution network (CDN):** CDN contains a Core network and Access network where content delivery is controlled by identified packet routing and a QoS oriented mechanism.
- 3.2 customer premises equipment (CPE):** CPE covers subscriber video devices (SVD), residential gateway (RGW), and optional in-home networking devices.
- 3.3 IP multicast:** It is used for IP broadcasting in terms of bandwidth use efficiency of headend, CDN (Content Distribution Network), and CPE segment.
- 3.4 2-way authenticated communication channels:** These channels are used for renewable conditional access key management, remote management of SVD, downloadable firmware updates, private interactive application data, and reconfiguration of encryption algorithms between the headend and an SVD.
- 3.5 transport stream (TS):** The transport stream described in this Recommendation is delivered using a certain multicast flow, which is identified by multicast group address, UDP port number, etc.
- 3.6 portal services (PS):** A functional element that provides management and translation functions between the HFC and Home network.
- 3.7 zapping control:** The control mechanism for multicast group join and leave considering the IGMP/MLD protocol sequence is required in NG-STB compliant CPE devices.
- 3.8 residential gateway:** The device that provides interconnection functionalities between access network and home network as described in [b-ITU-T J.190].

NOTE – How to apply J.190 residential gateway functionality to various networks SHOULD be considered in the near future.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations:

ARQ	Automatic Repeat ReQuest
BE	Best Effort
BGP	Border Gateway Protocol
CA	Conditional Access
CAS	Conditional Access System
CDN	Content Distribution Network (in terms of the definition in [b-ITU-T J.282])
CoS	Class of Service
CPE	Customer Premises Equipment
DB	Database
DHCP	Dynamic Host Configuration Protocol
DiffServ	Differentiated Services Architecture for Network Traffic
DOCSIS	Data over Cable Service Interface Specification
DSCP	DiffServ Code Point
DSLAM	Digital Subscriber Line Access Multiplexer
DTV	Digital Television
EMM	Entitlement Management Message
FEC	Forward Error Correction
GigE	Gigabit Ethernet
HDTV	High-definition Television
HE	Headend
HGW	Home Gateway
IGMP	Internet Group Management Protocol
IP	Internet Protocol
Layer 3	Network layer 3 in OSI stack
LDPC	Low-Density Parity Check
MAC	Media Access Control
MLD	Multicast Listener Discovery
MPEG	Motion Picture Experts Group
NAT	Network Address Translation
NG-STB	Next Generation Set-Top Box
NG-STB-MI-A	Next Generation Set-Top Box Media-Independent Architecture
NIT	Network Information Table
OLT	Optical Line Terminal
OSPF	Open Shortest Path First
PCR	Program Clock Reference