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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Broadband and triple-play multimedia services –
Broadband multimedia services over VDSL

Full-Service VDSL – Operations, Administration Maintenance & Provision aspects

ITU-T Recommendation H.611

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ITU-T Recommendation H.611

Full-Service VDSL – Operations, Administration Maintenance & Provision aspects

Summary

This Recommendation defines service provisioning, service assurance, network build and data management requirements for video, data and voice services on an end-to-end Full-Service VDSL platform. It also specifies the functionality of the Element Management System and the management interfaces of the platform.

Source

ITU-T Recommendation H.611 was approved by ITU-T Study Group 16 (2001-2004) under the ITU-T Recommendation A.8 procedure on 14 July 2003.

FOREWORD

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ITU-T Recommendation H.611

Full-Service VDSL – Operations, Administration Maintenance & Provision aspects

1 Scope

This Recommendation addresses service provisioning, service assurance, network build and data management requirements for services on an end-to-end Full-Service VDSL platform. It defines operational requirements from an operator perspective that enable the provisioning of bundled services in a reliable way with minimal user intervention and at a cost compatible with mass market deployment. It also gives functional requirements for the Element Management System and the management interfaces of the platform.

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.

2.1 Normative references

- ITU-T Recommendation G.993.1 (2001), *Very high speed digital subscriber line foundation*.
- ITU-T Recommendation G.997.1 (1999), *Physical layer management for digital subscriber line (DSL) transceivers*.
- ITU-T Recommendation H.610 (2003), *Full-Service VDSL – System architecture and customer premises equipment*.
- ITU-T Recommendation I.610 (1999), *B-ISDN operation and maintenance principles and functions*.
- ANSI T1.424 – Part-1-2000, *Very high-bit-rate Digital Subscriber Line (VDSL) Metallic Interface, Part 1: Functional Requirements and Common Specification*.
- ETSI TS101 270-1 (2003), *Transmission and multiplexing (TM); Access Transmission systems on metallic access cables; Very high speed Digital Subscriber line (VDSL); Part 1: Functional requirements*.
- ETSI TS101 270-2 (2003), *Transmission and multiplexing (TM); Access Transmission systems on metallic access cables; Very high speed Digital Subscriber line (VDSL); Part 2: Transceiver specification*.
- IETF RFC 1157 (1999), *A Simple Network Management Protocol (SNMP)*.
- IETF RFC 1213 (1991), *Management Information Base for Network Management of TCP/IP-based internets: MIB-II*.

2.2 Non-normative references

- IETF draft-ietf-adslmib-vdsl-03.txt, *Definition of Managed Objects for VDSL Lines*, June 2002.

3 Definitions

This Recommendation defines the following terms:

3.1 access network domain: The Access Network Domain encompasses the domain between the U-R and V interface of the system reference model (Figure 1).

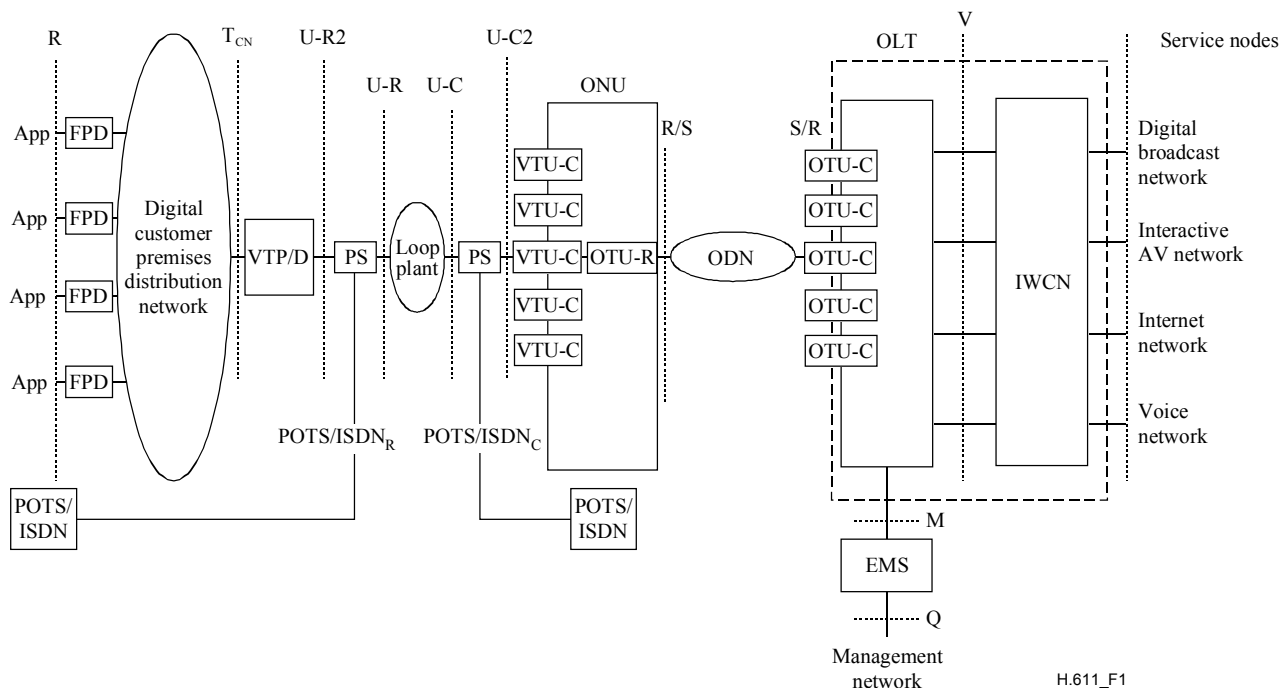


Figure 1/H.611 – FS-VDSL reference model

3.2 core network domain: The Core Network Domain is beyond the V interface and the OLT physical interface.

3.3 the platform: The platform is the hardware and software that comprises the Access Network and its Element Manager.

3.4 network operation domain: The Network Operation Domain comprises the entities that manage the end-to-end network, including the Operations Systems Functions of the Network Management Layer, the technicians who install and repair network elements and the back office people who deal with network issues.

3.5 service operation domain: The Service Operation Domain includes the physical equipment of multiple or single service nodes that interface the Core/AN and provide users access to various services including data connection, broadcast video, VoD, and voice, and the Operations Systems Functions of the Service Management Layer used to manage the services and service nodes.

3.6 Functional Processing (FP): A point of signal transformation or processing.

3.7 Functional Processing and Decoding (FPD): Typically terminals performing the application layer processing of video, audio and data, e.g., Set top box (STB).

3.8 VDSL Termination Processing (VTP): Refers to the unit that operates the VDSL modem termination and protocol processing functions. A device that implements the VTP functions includes Ethernet based layer-2 interface to the in-home Network.

3.9 VTP and Decoding (VTPD): Refers to a unit that operates the video decoding function as well as the VTP functions and interfaces.

3.10 VTP/D: When mentioned in this Recommendation, refers to both the VTP and the VTPD.

3.11 auto-discovery: the process of the platform detecting when new hardware or software entity has been added to it, identifying the entity and extracting any relevant parameters from it.

3.12 EMS-NMS interface: The interface between the FS-VDSL platform element manager and the full service broadband network management system as shown in Figure 2.

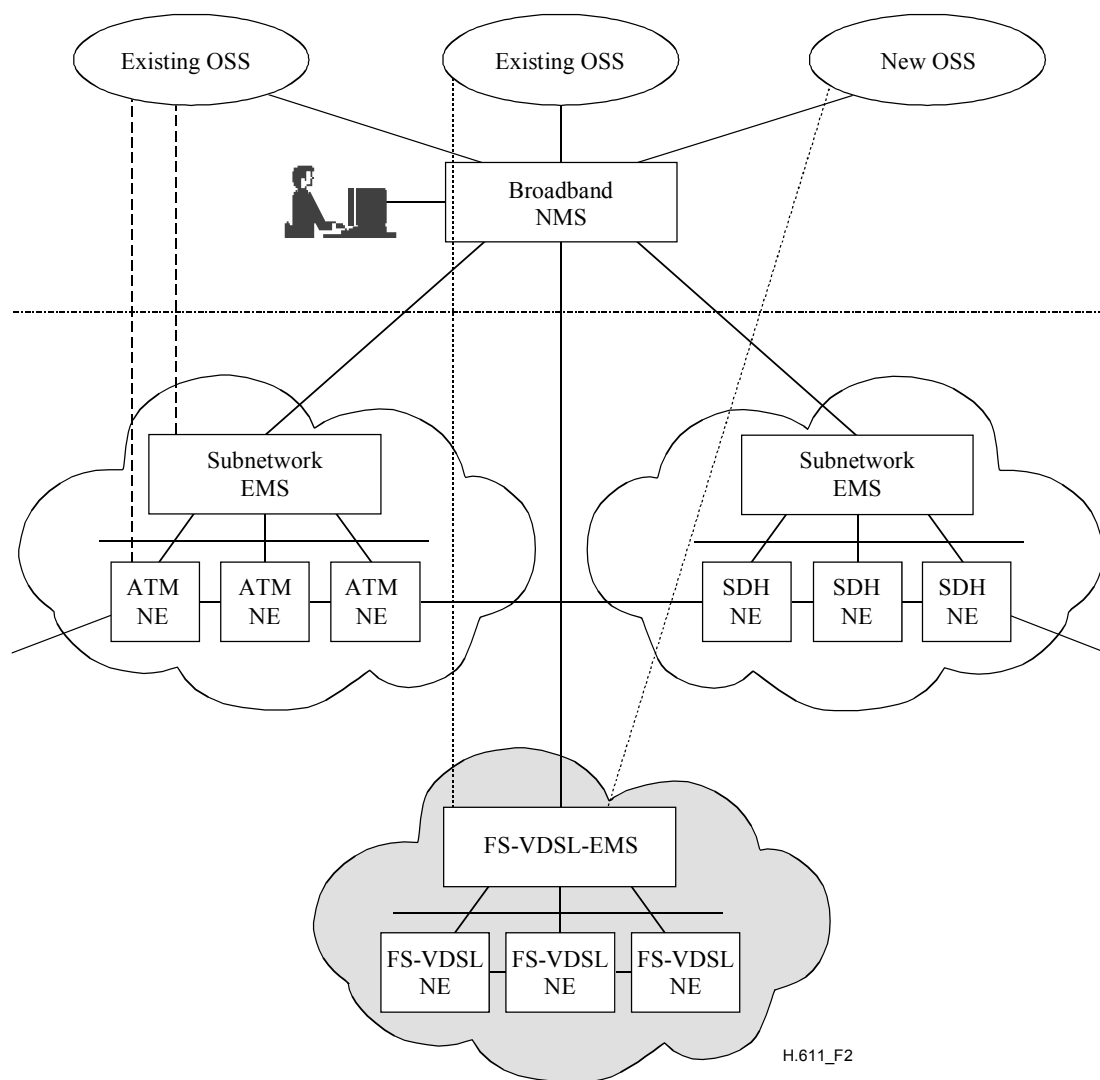


Figure 2/H.611 – Management architecture

4 Abbreviations

This Recommendation uses the following abbreviations:

AAL2	ATM Adaptation Layer 2
ADSL	Asymmetric Digital Subscriber Line
ANSI	American National Standards Institute
ATM	Asynchronous Transfer Mode
AWG	American Wire Gauge

B-ISDN	Broadband Integrated Services Digital Network [ITU-T]
BLES	Broadband Loop Emulated Service
BOOTP	Bootstrap Protocol [IETF]
CBR	Constant Bit Rate
CMISE	Common Management Information Service Element [ISO]
CO	Central Office
CORBA	Common Object Request Brokerage Architecture
CPE	Customers' Premises Equipment
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check
dBm	Decibels in milliwatts
DCT	Digital Communications Tester
DRP	Disaster Recovery Plan
DS0	Digital Signal level 0
DSL	Digital Subscriber Line
DSLAM	Digital Subscriber Line Access Multiplexer
DSM-CC	Digital Storage Media – Command and Control
EMS	Element Management System
ETSI	European Telecommunications Standards Institute
F4	Flow 4 [ATM]
F5	Flow 5 [ATM]
FP	Functional Processing
FPD	Functional Processing and Decoding
FRU	Field Replaceable Unit
FS-VDSL	Full Service Access Network – Very high speed Digital Subscriber Line
FTTC	Fibre To The Cabinet
FTTEx	Fibre To The Exchange
FTTK	Fibre To The Kerb
GUI	Graphical User Interface
HAM	Amateur Radio Operator
HTML	HyperText Mark-up Language
HTTP	HyperText Transfer Protocol
IETF	Internet Engineering Task Force
IGMP	Internet Group Management Protocol [IETF]
ILMI	Integrated Local Management Interface
IP	Internet Protocol [IETF]
ISDN	Integrated Services Digital Network

LAN	Local Area Network
LED	Light-Emitting Diode
MAC	Media Access Control
MDU	Multi-Dwelling Unit
MIB	Management Information Base
MPEG	Moving Picture Experts Group
NE	Network Element
NML	Network Management Layer
NMS	Network Management System
NO	Network Operator
OAM&P	Operations, Administration, Maintenance and Provisioning
ODN	Optical Distribution Network
OF	Optical Fibre
OLT	Optical Line Termination
ONU	Optical Network Unit
OSS	Operational Support System
PCI	Protocol Control Information
PON	Passive Optical Network
POTS	Plain Old Telephone Service
PPPoA	Point-to-Point Protocol over Asynchronous Transfer Mode
PPPoE	Point-to-Point Protocol over EtherNet
PPV	Pay Per View
PSD	Power Spectral Density
PSTN	Public Switched Telephone Network
QoS	Quality of Service
RFC	Request for Comment
SNMP	Simple Network Management Protocol
SNR	Signal to Noise Ratio
SP	Service Provider
STB	Set Top Box
TOM	Telecom Operations Model
UBR	Unspecified Bit Rate
UDP	User Datagram Protocol [IETF]
USB	Universal Serial Bus
VC	Virtual Channel
VCC	Virtual Circuit Connection
VCI	Virtual Channel Identifier

VDSL	Very high speed Digital Subscriber Line
VoD	Video on Demand
VoDSL	Voice over Digital Subscriber Line
VP	Virtual Path
VPC	Virtual Path Connection
VPI	Virtual Path Identifier
VPL	Virtual Path Link
VTP	VDSL Termination Processing
VTP/D	VDSL modem with Protocol processing and Decoding
VTU	VDSL Terminal Unit
WAN	Wide Area Network

5 Conventions

In this Recommendation, the following conventions are used:

- "shall" indicates a mandatory requirement;
- "should" indicates a suggested but optional course of action;
- "may" indicates an optional course of action rather than a recommendation that something take place.

6 Functional diagram

The linkage between the processes and the functions that relate to the FS-VDSL platform are shown in Figure 3. The diagram is divided by a continuous line, below the line are four functional areas, Network Provision, Network Data Management, Service Quality Management and FS-VDSL Maintain and Restore that are specific to the platform. Above the line are the functions that are required, but are not FS-VDSL specific, and would be implemented in the Network Operation domain or Service Operation Domain. It also identifies the interfaces between these specific and non-specific functions.