(HS/HG)

Trends of Home Server & Gateway Technology

(J. T. Kim)
(H. K. Park)
(E. H. Paik)

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.   II, III

IV

/   .   V

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/ (HS/HG)

I. 　　　　　　　　　　　　　.

(HS/
HG)

(HDS;
　　　　　　　　　　　　　　)[1]

(PLC) 　　　　　.

AV, 　　　, 　　　　　　　　　　　　.

IT

/

SDN/CDN

Satellite　xDSL
CATV　OPTIC

HomePNA

Ethernet

IEEE 1394

Storage

/ /		/		/ /

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(1)

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/   .

[2].

1.

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TV   ,   .   ,

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2.

TV,   ,   ,

,   ,   ,   , PDA

,   IP/Non- IP

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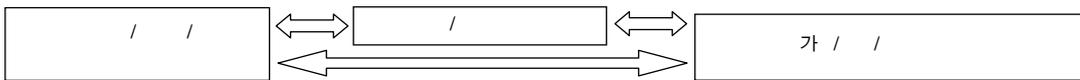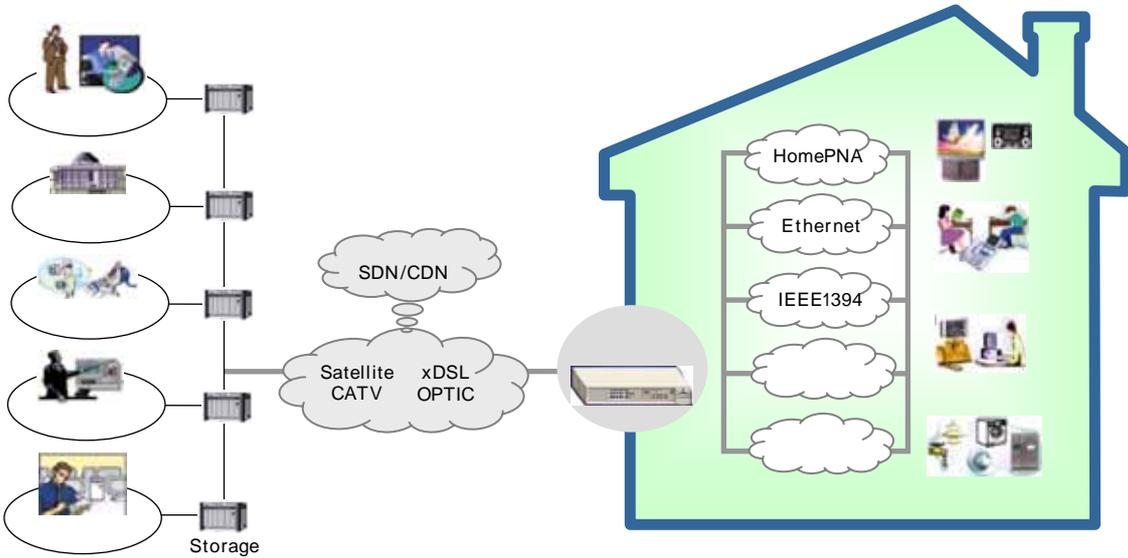
Ethernet, Home-
PNA, PLC, IEEE1394, USB,

,   Bluetooth, IEEE
802.11 WLAN, HomeRF, IrDA, UWB
1394   [3].

[4]
(physical layer)   ((2)   ).

< 1>

[5].

UWB   1394

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(2)
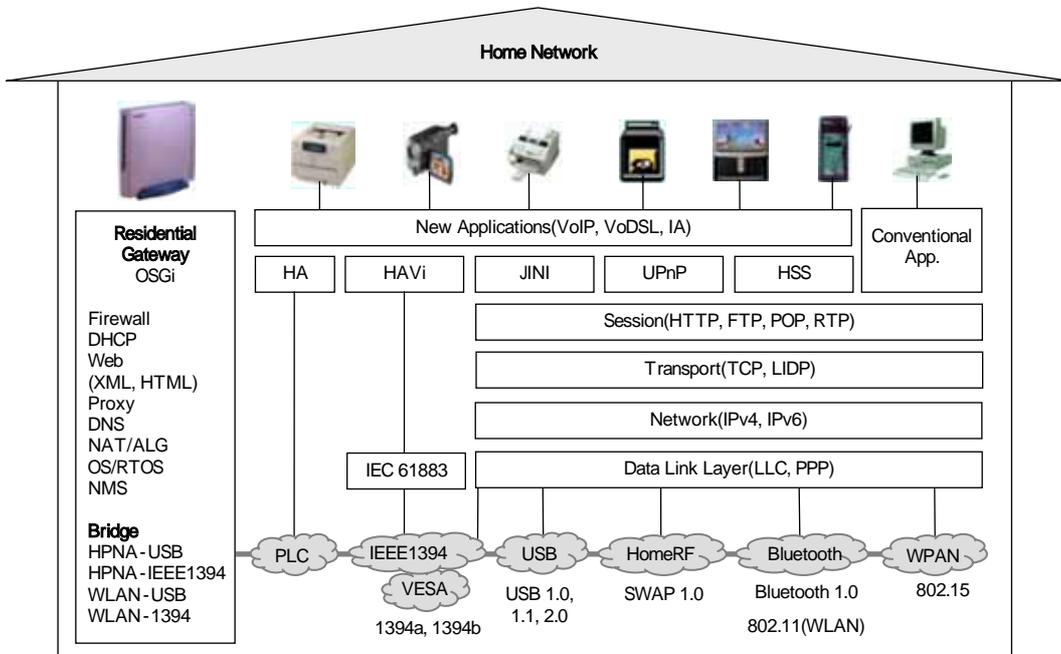
< 1>

HomePNA	HomePNA v2.0	1~2/10Mbps	150m
USB	USB v1.1	12Mbps	30m
Ethernet	IEEE802.3	10/100Mbps, 1Gbps	100m(UTP)
IEEE1394	IEEE1394	100~400Mbps	72m
	-	1~2Mbps	100m
Bluetooth	Bluetooth v1.0	720kbps	10m
HomeRF	SWAP v1.2	1~2Mbps	50m
IrDA	IrDA v1.3	4Mbps	1m
LAN	IEEE802.11	5.5~11Mbps	50m

3.   (HS) /   (HG)   .

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/   /

xDSL,   ,

. <   2>

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,   smart- chip COS,

IP   ,

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< 2>

LG	(HomeVita) (HomeNet)	PC
KT SKT	(EasyOn) TV (HomeN) TV (HomeCare) (IMAJU)	
		,
	(iHN- 1000) ( )	CCTV

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.

		2004	2005	2006	2007	2008	2009	2010	2011	2012
QoS		▣ ● 54Mbps QoS		■ ● QoS		■ ●		400Mbps		QoS
IPv6 Ad hoc			■ ● IPv4 Ocean- IPv6 Island				■ ● IPv6 Ocean- IPv4 Island			
			▣ ● WPAN ad hoc			▣ ●		pervasive		
			■ ◉ Cross- layer			▣ ●		&		
		■ ◉ FTTH(EPON 155Mbps)		■ ◉ FTTH(EPON 1Gbps)				■ ◉ FTTH(EPON 2.5Gbps)		
			■ ● VDSL(54Mbps)		■ ● Ethernet based VDSL					
		▣ ◉ HFC(DOCSIS)		▣ ◉ Extended HFC(100Mbps)				▣ ◉ Extended HFC(1Gbps)		

Research	Development	Standard	Outsourcing	Priority ■ ▣ □
				Probability ● ◉ ○

(3)

(l- zen),   IP   1.   (HG)
STB, iCROSS

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2.   xDSL

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FTTH

QoS, IPv6   .

(3)   PLC

[6].
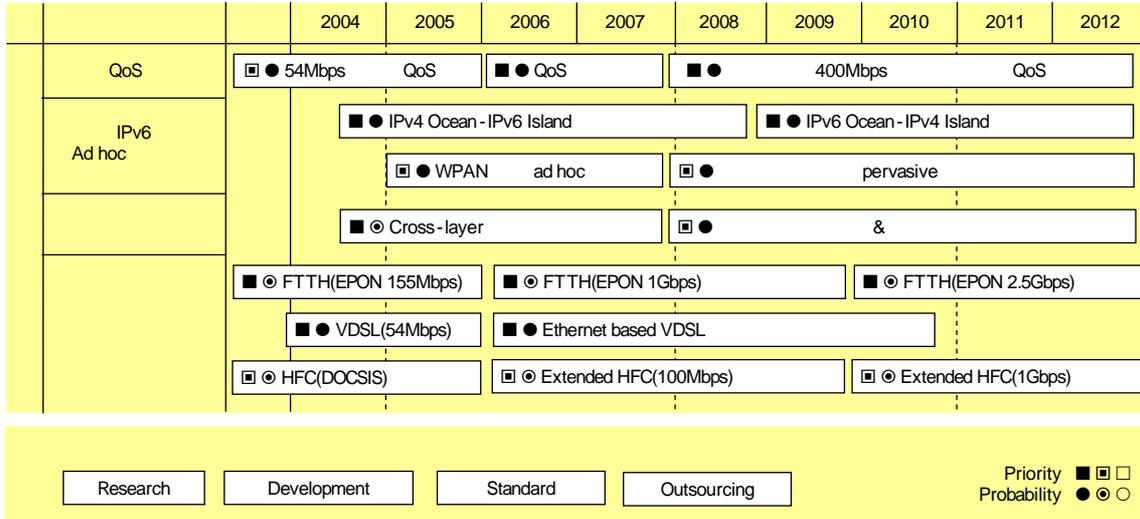
FTTH   ,

/   PLC

.   LonWorks   LG   LnCP

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.   ,

ADSL,   (DOCSIS)[1],

/   HomePNA   (   )

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1) Data Over Cable Service Interface Spec. Cable Home

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/   (HS/HG)

.   (EPON)
.   .
(ETRI)   FTTH
IPsec VPN
<   3>   .   .
<   3>   ,
I-TV   D-TV   OS   ,
embedded
,
<   3> FTTH   /
.

Processor	CPU 533MHz/Embedded Linux 2.4.20
Network Interface	- 1Gbps EPON(802.3ah) - Bigabit Ethernet(1000base-T,X) - Fast Ethernet, VDSL
Home Interface	- 6 ports fast & 1 port gigabit Ethernet - WLAN(802.11a/b/g) - Internet Telephone(G.711/713.1) - Video Door Phone
Services	- IP Broadcasting - SIP based Internet Telephone - Visitor Confirmation Service - Net-filtering Firewall - H/W Accelerated IPSec VPN

): E(WDM)-PON: Ethernet(Wavelength Division Multiplex) -
   Passive Optical Network
<   >: ETRI, 2004.

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. ETRI   HomePNA,
,   LAN
,
ION
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Entertainment Applications Box
Probably Located in the Entertainment Center

Home Media Server
Linux+ GUI+ BIG Hard Drive(MyDISK)

"Digital Express"
Alternative Rich Content Acquisition

Enet 1394 USB 1394 Enet

Wireless Bridge
Multimedia Distribution

Wireless LAN

802.11b NIC

802.11b Adapte

Cable/DBS
Traditional Broadcast

VideoCam
Spool to MyDisk

Camera
Upload to my web site

DTV
View from MyDisk

HomeLAN
"No New Wires"

HPNA NIC

PLC Bridge
Appliance Telemetry

Internet Home Gateway
Base Configuration   Platform for Services

USB HPNA E1 E2 E3 E4 V1 V2 WAN   Broadband

USB
"Legacy Free"

Internet Appliance
Proprietary Portal

Std Phone & Fax
Converted to VoIP

Infrastructure & Services Box
Probably Located in the Wiring Closetor Computer Armoire

(4)   (Cisco)

(Cisco)

(　　4)　　　　　　　　　　　(Internet home gateway)

(home media server)

，　　，　　　　　　　xDSL, HFC, B-WLL, Ethernet

[7].

2.　　　　(HS)

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PC

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TV

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MagicGate　　　　　，

，　　　　，Mobile SVR，　　，

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IT　　　　　MS, IBM, SONY

IT

MS　　　　，

.　　MS

，　　MS　HP，　，Dell

PC　　　　　　　Windows Media Con-nect(WMC)　UPnP/DLNA　　　　　PC


```
CATV ─┐
      │      ┌─────┐      ┌──────┐
      │  ⇄   │     │  ⇄   │  TV  │
  ────┤      │     │      └──────┘
      │      │     │      ┌──────┐
      │      │     │  ⇄   │ VHS  │
 ISDN │      └──┬──┘      ├──────┤
      │       (STB)       │  BS  │
 xDSL │         ↓↑        ├──────┤
      │                   │  CS  │
  LAN │      ┌─────┐      ├──────┤
      │      │     │      │ CATV │
      │      └─────┘      ├──────┤
      │                   │ DVD  │
                          ├──────┤
                          │      │
                          ├──────┤
                          │      │
                          └──────┘
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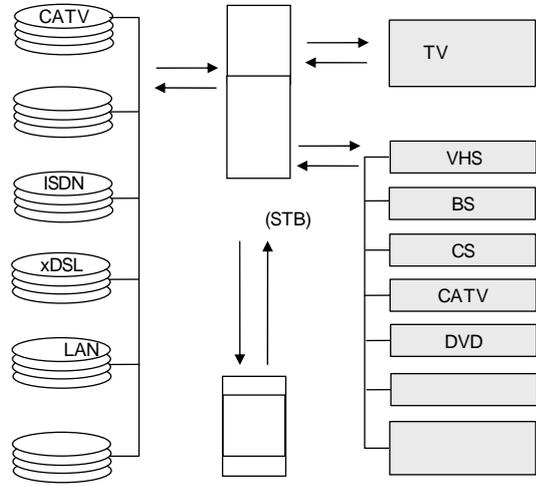
(　　5) Sony Play Station X(PSX)

Media Center Extender Technology(MCX)

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SONY　　　　　　　　(PVR)

(PS)　　　DTV, DVD,

. Play Sta-tion X(PSX)/PS3　DVD　　/　，PVR, BS

　　　/　/

((　　5)　　).

3. OS/

MS　　MCX, Longhorn　　　　　　　　　　　　.

A/S

.

，SQL

OS　　　　　　　　　　　.

OS

PLC LnCP

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UPnP, DLNA, JINI, OSGi, HAVi

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[8] IP

PC peer- to- peer

UPnP, IEEE1394

8 HAVi,

JAVA

JINI,

DLNA, OSGi

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MS MCX (

6) UPnP/DLNA

[9].

VESA EIA/CEA

775.1 HWW . PLC

LongWorks

. LG
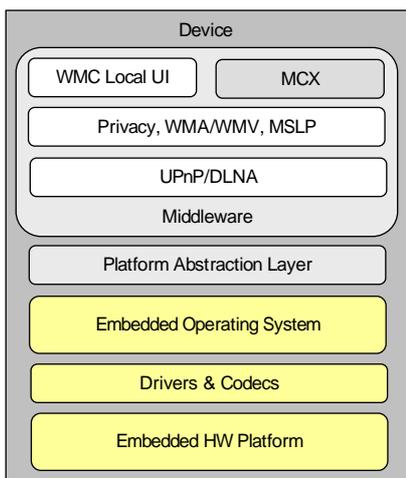
(6) MS Extender Device Software Architecture

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HAVi HWW IEEE1394

IP

. TCP/IP

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OSGi

API .

UPnP JINI OSGi Java

, API

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ETRI

(OHF)[2]

OSGi DLNA

. OHF

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, ,

IGRS Echo- net

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< 4>

, MP3, HDTV	/	HDTV , , VoD,
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		, ,
, , PDA,		, , ,
		, ,

< >: TTA Journal, 2005. 7.

[10]

< 4>
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(KT) (HomeN)
VOD, , SMS, IP- , OHF
, , .
All- IP IP-
, MMS/UMS, , ,
TV, T- COMMERCE, PVR, ,

. , PC, ,
WPAN(UWB, , IT
Zigbee)
RFID U- life(Ubiquitous life)
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, , ,
MEMS ,

. IPv6 All- IP
A/V (interac-
tive) TV

U- Life
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ADSL	Asymmetric Digital Subscriber Line
AV	Audio & Video
DLNA	Digital Living Networking Alliance
DTV	Digital television
DVD	Digital Versatile Disk
Echonet	Energy Conservation and HOmecare NETwork
FTTH	Fiber To The Home
HAVi	Home Audio and Video Interoperability
HDS	Home Digital Service

HFC	Hybrid Fiber Coaxial	LNCP	Living Network Control Protocol
HG	Home Gateway		
HomePNA	Home Phoneline Networking Alliance		
HomeRF	Home Radio Frequency		
HS	Home Server		
IGRS	Intelligent Group and Resource Sharing		
ION	Interoperability On		
IrDA	Infrared Data Association		
MEMS	Micro Electro Mechanical System		
MMS	Multimedia Messaging Service		
OHF	Open Homenetwork Framework		
OSGI	Open Service Gateway Initiative		
PLC	Power Line Communication		
PVR	Personal Video Recorder		
RFID	Radio Frequency IDentification		
SoC	System on Chip		
SQL	Structured Query Language		
STB	Set-Top Box		
VESA	Video Electronics Standards Association		
UMS	Unified Messagings System		
UPnP	Universal Plug and Play		
USB	Universal Serial Bus		
UWB	Ultra Wide Band		
WPAN	Wireless Personal Area Network		

[1]   , "Digital Life   Digital Home
          ," 2003.

[2]   , "   ,"
       , 2005. 4. 27.

[3]   , "   ," *TTA Journal*,
     Vol.88, 2003, p.59.

[4]   (KT), "   ,"

[5]   , "   ,"   , Oct. 2001,
     p.305.

[6]   ,   , "   ," HN Focus,
                  , Vol.5, 2005, p.9.

[7]   , "   ," KRnet, 2001.

[8]   , "IT839   -   ," *TTA
     Journal*, Vol.100, 2005, p.82.

[9] Mark Kraus, "Network Media Devices-MCE," MS,
     2004.

[10]   , "   ," *TTA Journal*,
     Vol.99, 2005, p.33.