

TV Anytime Forum & PVR 기술동향

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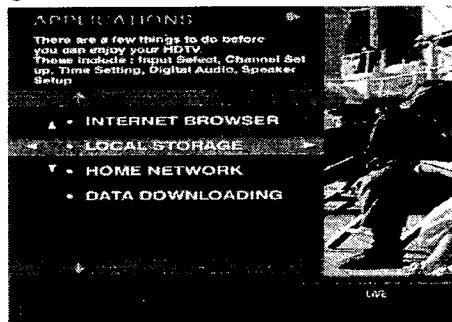
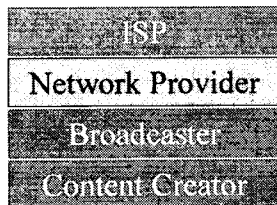
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 - Anytime Service
 - Introduction of TV Anytime Forum
 - 13th Sapporo Meeting 보고
 - 국내 TV Anytime 분과위원회 활동

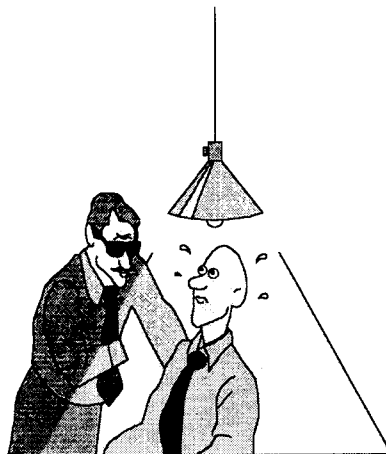
- 국내외 PVR 기술동향
 - Tivo
 - Replay TV
 - 국내 PVR 개발 현황

Anytime Service

- 사용자가 원하는 정보를 Search, Capture, Store하고 원하는 시간에 display해 줄 수 있는 서비스
- **Personal TV**
 - User Profile에 따른 맞춤형 멀티미디어 서비스
 - Contents Description
 - Rights Management
 - DTV 중심의 Home Networking



What is TV Anytime Forum?

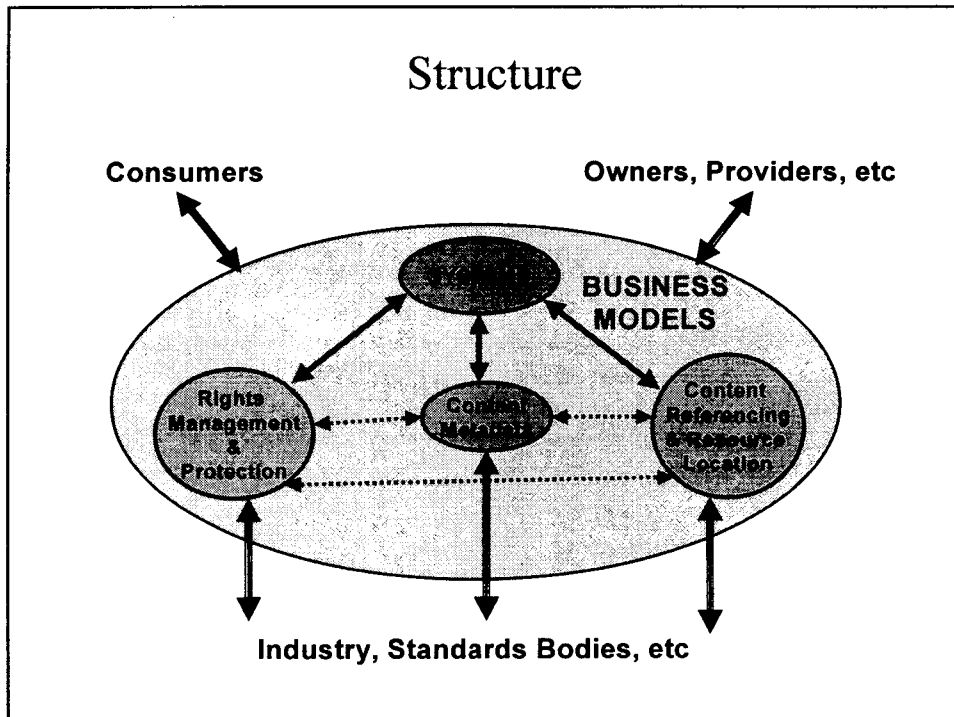


Introduction

- Start with “TV Anytime concept” of DAVIC
- Non-Profit Association
- Principle
 - Define specification to enable applications to exploit local storage in consumer platforms.
 - ‘Agnostic’ about the means for content delivery ; including various broadcast delivery mechanisms (e.g. ATSC, DVB, DirecTV etc.) and internet.
 - Develop specifications for interoperable and integrated system from content creators through service providers to consumer.
- Members
 - BBC, NHK, IBM, Nokia, Microsoft, Phillips, NTT, Sony, NDS, Hitachi, Intel, Canal+, Tivo, Divicom, Daewoo electronics, Samsung, LG, ETRI, Humax etc.

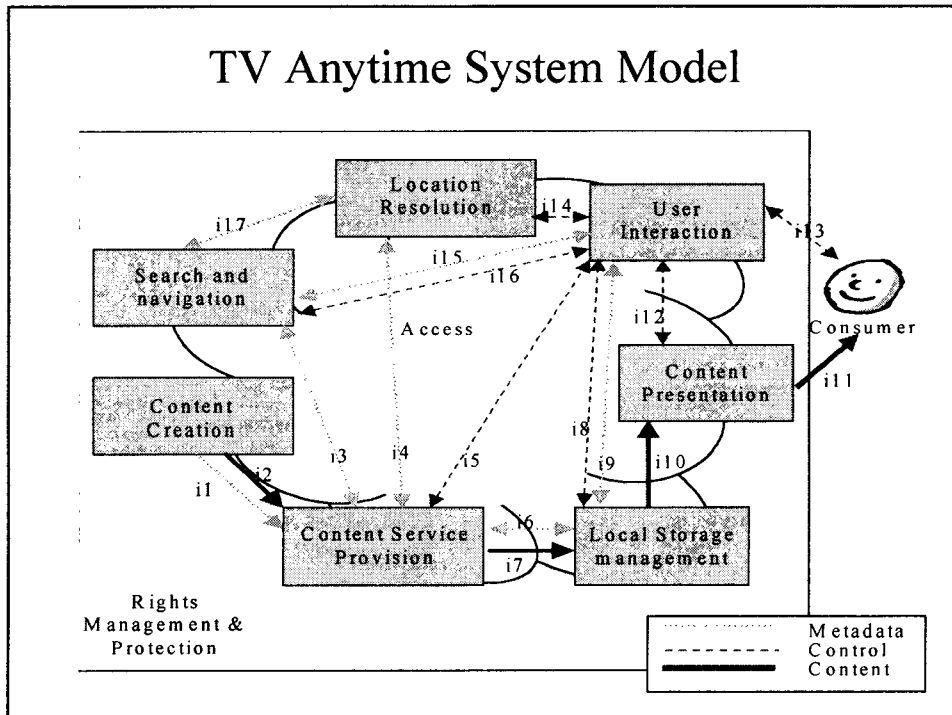
Organization

- Chair: Simon Parnall (NDS)
- Administrator: Jim Polizotto (Global Inventures Inc.)
- PR Officer: Stephan Heimbecher (IRT)
- Technical WG: Convenor: Henry Chadwick (IBM)
 - Business Models: Kellie McKeown (NDS)
 - System Design: Friz Klok (KPN)
 - Metadata: Jean Pierre Evain (EBU)
 - Rights Management: Skip Pizzi (Microsoft)
 - Content Referencing: Alex Ashley (Philips)
 - Interoperability: Chris Hibbert (ITV Digital)
 - RMPI Ad-hoc Group: Tetsuro Ito (Fuji TV), Kilroy Hughes (Microsoft)

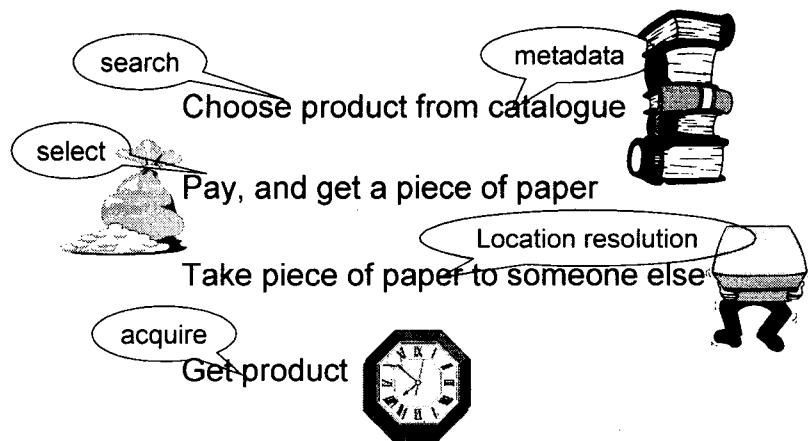


- ### Business Model
- **Model 1 - Basic 'Push' Model**
 - 1a - Basic 'Push' Model (Free TV via uni-directional delivery)
 - 1b - Basic 'Push' Model with CA (Free TV + Pay TV via uni-directional delivery)
 - **Model 2 - Consumer Response Model**
 - Free TV + Pay TV with return path
 - **Model 3 - Full Interactive Model**
 - Free TV + Pay TV with broadband Internet connectivity

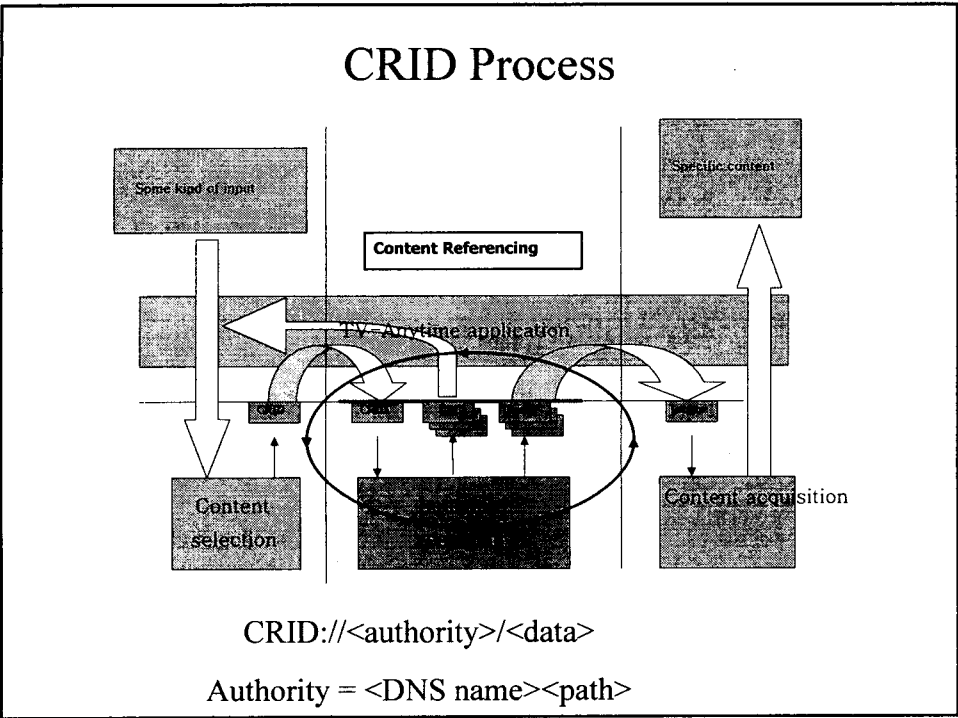
TV Anytime System Model



Content Referencing: Definition



(from the TV Anytime Forum material)

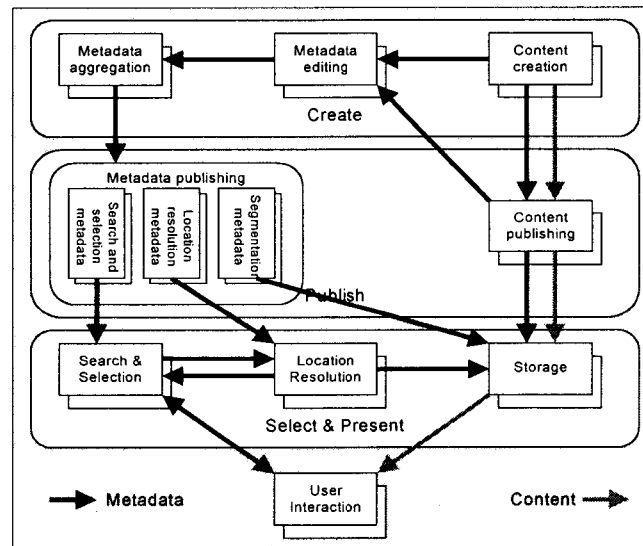


- ## CRID
- The syntax of the CRID:

CRID:// <authority> / <data>

 - <data> is a URI compliant free format string
 - Examples of CRID
 - CRID://company.com/foobar
 - CRID created by “company.com” authority, with a data part of “foobar”
 - crid://broadcaster.co.jp;comedy/wibble

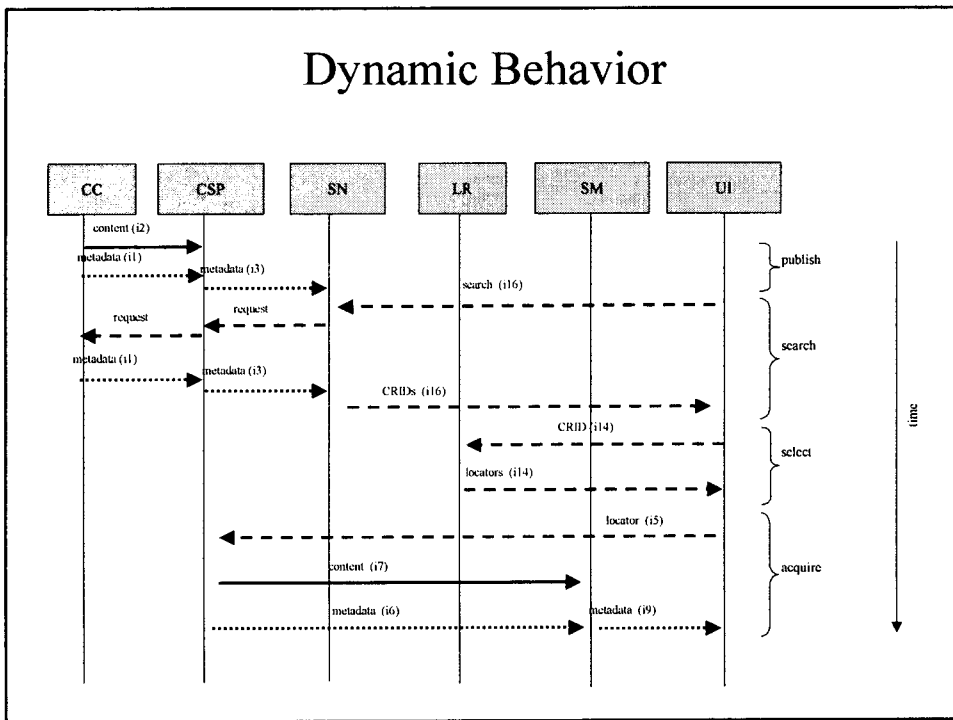
Metadata Process



Metadata Documents

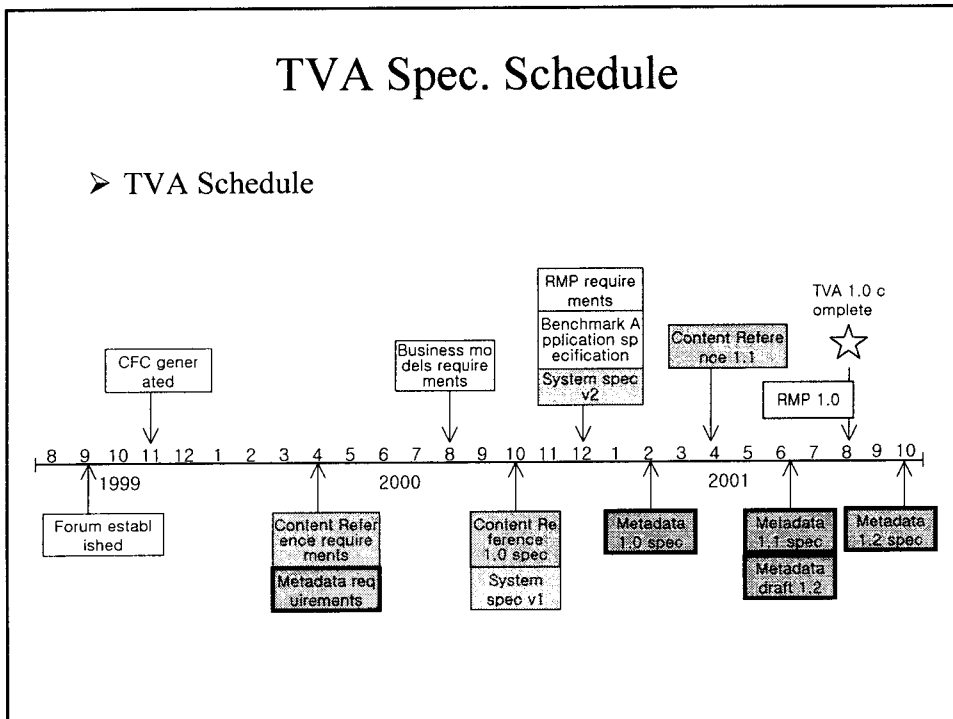
- Root element - TVAMain
 - Metadata is structured into self-contained docs.
 - Descriptive metadata
 - ✓ ProgramInformationTable
 - ✓ ProgramLocationTable
 - ✓ GroupInformationTable
 - ✓ ServiceInformationTable
 - ✓ CastMemberInformationTable
 - ✓ ProgramReviewTable
 - ✓ SegmentInformationTable
 - Consumer metadata
 - ✓ UserPreferences
 - ✓ UsageHistory

Dynamic Behavior



TVA Spec. Schedule

➤ TVA Schedule



Resolution of 13th Sapporo Meeting

- Vice Chair인 Sakae Okubo 사임: Kameyama
- Stephan Heimbecher: TVAF PR Officer
- Interoperability Group: TVAF Interoperability Test를 위한 Member들의 참여를 요구
- Annual membership fee: \$2700
- 86 paid members
 - 54 : 46 = paid member : pending member
- IBC2001: Sep. Amsterdam
- 15th meeting in Geneva: Dec. 4th ~ 7th by EBU
- 25th meeting in Korea?: Jul. 29th ~ Aug. 1st by ?

Works

- Business Model
 - Finalize phase I scenario
- System Design & Content Referencing
 - Locator ID issue: CFC
 - ATSC/SMPTE: Content Identification Liaison
 - V-ISAN Text
- MyTV Project
 - 2000.1 ~ 2001.12
 - For implementation TVA system using DVB and IP
 - Philipse, Nokia, BBC, NOB, UoL, NDS ..
 - Ending Feature: Personalize TV channel, Trailer recording, Group recording, Segmentation, Downloadable application, Browsing stored contents

Documents from the Meeting

- TV078r1, SP003V1.1, Metadata, as a final specification;
- TV089r1, SP001V1.1, Business Models, as a provisional specification;
- TV094, Corrigendum to SP004V1.1;
- TV088, CFC on Content Rights Management and Protection;
- TV095, CFC on Instance/Location Identification

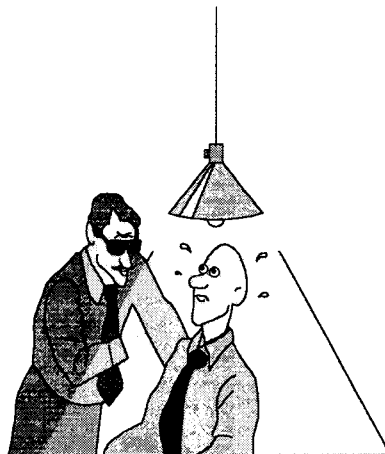
Liaisons

- Formal liaison established: ARIB, ATSC, DVB SB, MPA, SMPTE, Advanced Television Forum, Broadband Content Delivery Forum, Content ID Forum, EBU P/Meta
- Sending liaison statement from 13th Meeting: ARIB, ATSC, CIDF, DVB(RM), EBU P/Meta, MPEG, SMPTE(V-ISAN), OpenCable, ITU-T, ITU-R

TV Anytime 분과위원회

- 목적: TV Anytime Forum 활동의 진작 및 국내상황에 적합한 규격의 정리
- 회원: 대우전자, 삼성전자, LG전자, ETRI, KETI, KBS, MBC, Alticast, DST, 넷앤티비 ...
- 활동:
 - 2달에 한번씩 회의개최
 - 최근 TV Anytime Forum Meeting의 Issue 및 상황 소개
 - 올해 안에 국내 분과위 규격 1.0 완성 예정
- E-mail Reflector: tvaf-korea@video.etri.re.kr

국내외 PVR 기술동향



PVR의 시장동향

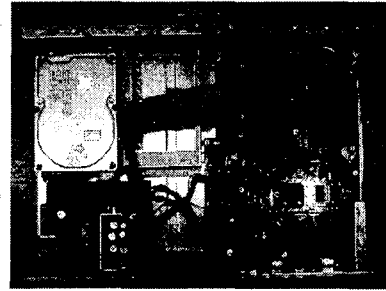
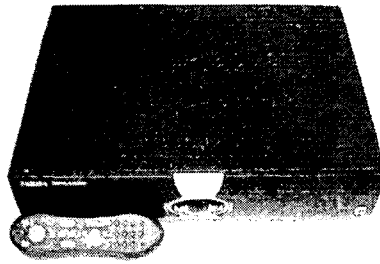
- 1999 중반 시장 Open
- TiVo와 ReplayTV가 시장 개척자
- EchoStar DVB Settop형 제품 출시
- 현재 미국에서 10여개 업체가 개발중
- 중국에서 몇 개 업체가 개발중
- 한국에서 몇 개 업체가 개발중
- 2001년 950,000대 예상*
- 2003년 8,000,000대 예상*

* : Cahners In-Stat Group

TiVo & ReplayTV

- TiVo
 - 1997. 8 설립
 - 1999. 판매개시(Philips생산판매)
 - \$500, 유료 TiVo Service 제공(\$10/월)
 - \$399, \$699 두 모델 판매
 - USA: Philips Personal TV Recoder, Sony Digital Network Recoder, DirecTV Recoder
 - UK: Thomson Scenium brand
- ReplayTV
 - 1997에 설립
 - \$700, 무료 ReplayTV Service 제공
 - 최근 NDR로의 전환(ReplayTV 4000)
 - ✓ Networked Digital Video Recorder with Broadband Connectivity

TiVo분석 - 외형



TiVo분석 - 기능

- Pause live TV during interruptions - up to 30 minutes
- Fast forward and rewind with three speeds: 6x, 12x and 60x
- Instant Replay button jumps you back 8 seconds
- Slow-motion at 1/4x speed
- Create your own instant replays: rewind and play back in slow motion
- Frame forward and frame backward
- Jump button catches you back to real time
- Program status bar displays where you are in the show for cached and real time
- All Trick Plays are digitally accurate

TiVo분석 - 사양

- Compression: Supports MPEG II - MP/ML for high quality digital television
- Advanced Processor: High performance Power PC running Linux
- Storage: 14 or 30 hours depending on configuration
- Inputs: Cable-Ready Tuner, S-Video and Composite Video support all US standards
- Outputs: RF, S-Video and two composite video outputs
- Remote Control: 30 button remote, programmable for TV/AV control
- Channel Control: Channel and power control of cable and satellite boxes with serial or IR
- Telephone: RJ-11 connection to telephone line
- Dimensions: 17 1/8" Width x 12 5/8" Depth x 4 1/8" Height
- Compatible with all Cable, Satellite (DBS), and Terrestrial Broadcast TV systems in the U.S.
- Latest encryption technology protects viewer privacy

TiVo분석 - OSD/EPG(1)

➤ OSD 특징

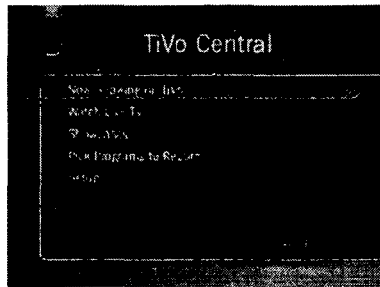
- 메뉴
 - ✓ 전체 화면
 - ✓ 동일한 인터페이스의 트리 구조
 - ✓ 방향키로만 메뉴 선택 가능
- 프로그램 배너
- Status Bar

➤ 기능상 특징

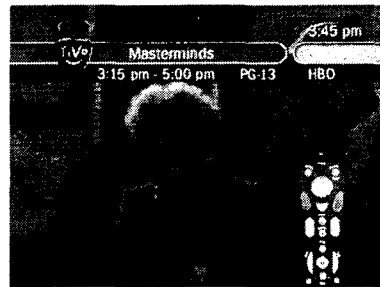
- Tivolution Magazine
- Network Showcase
- Tivo's Suggestion & Thumbs Up/Down
- 이름별, 채널별, 시간대별, 수동 녹화 지원
- 시간 기준으로 재생 목록 정렬

TiVo 분석 - OSD/EPG(2)

➤ 메인 메뉴

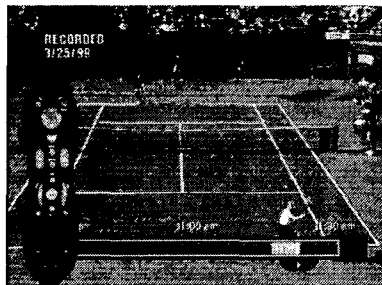


➤ 프로그램 배너

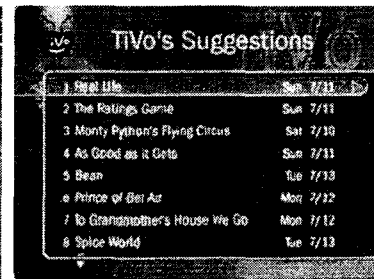


TiVo 분석 - OSD/EPG(3)

➤ Status Bar

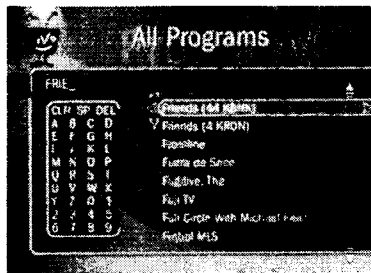


➤ TiVo's Suggestion

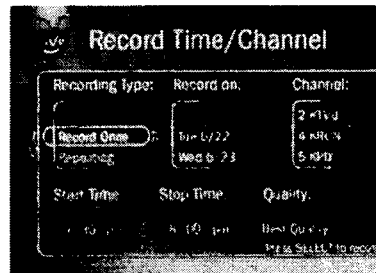


TiVo분석 - OSD/EPG(4)

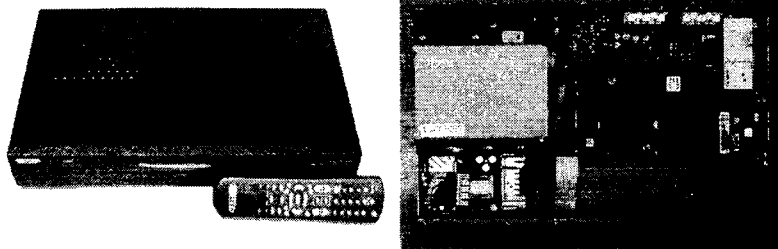
▶ 이름별 녹화



▶ 수동 녹화 예약



ReplayTV분석 - 외형



ReplayTV분석 - 기능

- On-demand personalized channels
- Pause live TV
- MPEG 2 compression
- Multispeed rewind and fast forward
- Instant Replay
- Simultaneously record and play
- User defined video-quality levels
- Free ReplayTV Service
- Integrated on-screen Channel Guide
- Automatic nightly clock set
- Compatible with cable, satellite and antenna programming feeds
- Multiple video feeds supported 3-source combined channel guide

ReplayTV분석 - OSD/EPG(1)

➤ OSD 특징

- 주메뉴가 화면에 Overlay
- 각 메뉴별로 각각의 인터페이스 화면 구성

➤ 기능 특성

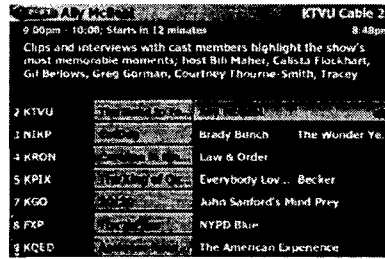
- 테마별, 채널-시간대별 녹화
- 테마 하나가 Replay Channel
- 시간 + Replay Channel 기준으로 재생 목록 정렬

ReplayTV 분석 - OSD/EPG(2)

➤ 메인 메뉴

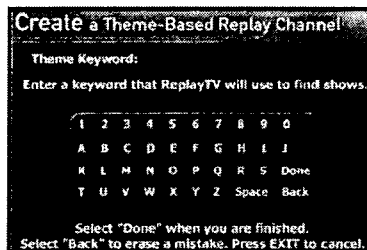


➤ 채널 가이드

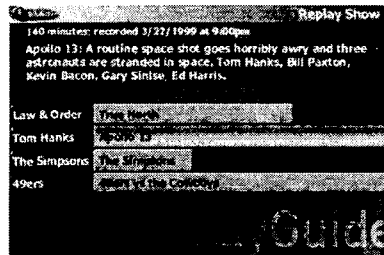


ReplayTV 분석 - OSD/EPG(3)

➤ 테마별 녹화



➤ Replay Guide



ReplayTV 4000

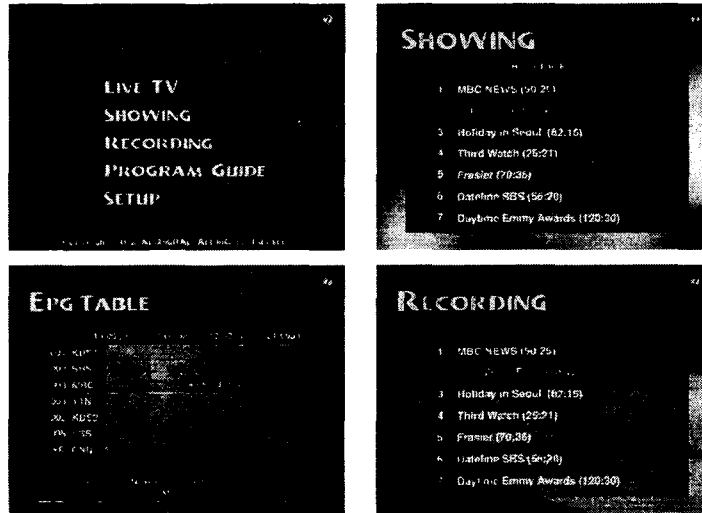
- Enjoy commercial free TV with Commercial Advance, also can use QuickSkip(30 Sec.)
- Room to Room Video Sharing with 2 ReplayTV
- Video Sharing over the Internet
- Home Networking with Ethernet Support
- Digital Photo Slideshows
- Screen Saver
- Progressive Output(480p)
- MyReplayTV: Program Guide
- iChannels: On demand service with broadband connectivity

IHT-300P



- 아나로그 공중파 방송(NTSC) 수신 및 디지털 녹화
 - DVD급 화질 16시간 녹화 기능(30GB 하드디스크인 경우)
- Time Shifting 기능
 - 고속검색/느린동작/순간재생/책갈피
- 방송프로그램가이드(EPG)정보 수신 및 처리
- 인터넷을 통한 원격녹화예약기능
- 인터넷 탐색 및 메시지 서비스
- 가전 및 방송수신기와의 연결
 - PVR에서 VTR로 녹화
 - IR 블래스터를 이용한 케이블 디코더, 위성셋톱박스 제어

OSD/EPG



IHT-300P의 사양

Software

OS : Embedded Linux
API : MicroWindows

Hardware

CPU : MIPS 300Mhz
Graphic : 16bit color processor
HDD : UDMA E-IDE 30GB
Data Bus : PCI

Memory

System memory : 32MB
Video memory : 2MB or more

Video

1x SCART / 2x Composite / 1x S-Video Out
1x Composite In

Audio

2x Analog Stereo Out
1x Analog Stereo Input

Network Interfaces

PAL/NTSC analog tuner
PSTN dial-up modem

External Interfaces

1x Serial port
1x IR receiver
1x RJ11 Telephone connector
1x IR blaster

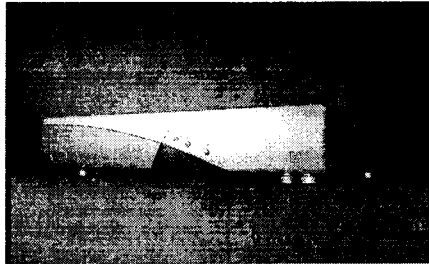
Input Devices

Remote controller
Optional Wireless Keyboard

Power Supply

110/230V Operation

IHT-210S



- DVB-S Digital Satellite Broadcasting Receiving
- MPEG-2 Streaming over IP over Satellite
- MPEG-4 Streaming over IP over Satellite
- Local Storage based VOD Terminal

IHT-210S의 사양

Software

OS : Windows CE 3.0
API : CE API & MFC

Hardware

CPU : MIPS 300Mhz
Graphic : 16bit color processor
HDD : UDMA E-IDE 30GB
Data Bus : PCI

Memory

System memory : 64MB
Video memory : 2MB or more

Video

1x SCART / 2x Composite / 1x S-Video Out

Audio

2x Analog Stereo Out

Network Interfaces

DVB-S Digital Satellite tuner
10/100 Ethernet Interface
V.90 Modem

External Interfaces

1x Serial port
1x IR receiver
1x RJ11 Telephone connector

Input Devices

Remote controller
Optional Wireless Keyboard

Power Supply

110/230V Operation

NiPC Home Terminal

➤ Basic Platform

- MPEG2 MP@HL/ML AV Decoding, NTSC 수신
- Web Browsing, TCP/IP/PPP, HTTP/POP3

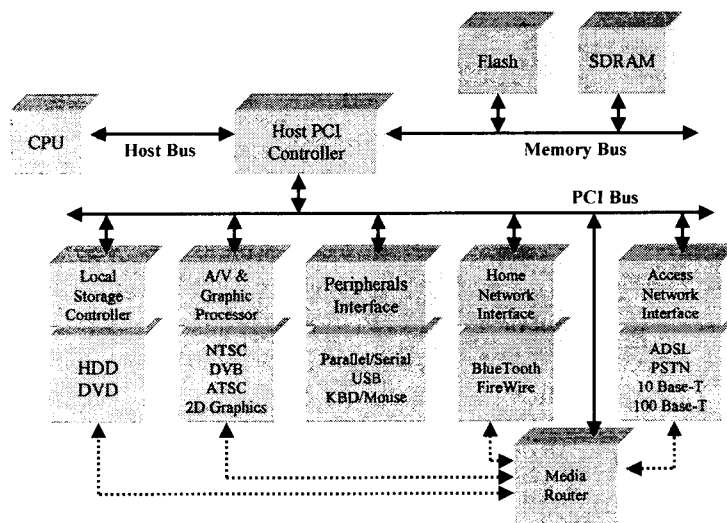
➤ Home Gateway

- NAT(Network Address Translation), DHCP(Dynamic Host Configuration Protocol), DDNS(Dynamic Domain Name System) 구현: Routing, Internet Access
- Intelligent Agent: Profile에 따른 Contents의 Capture & Store & Display

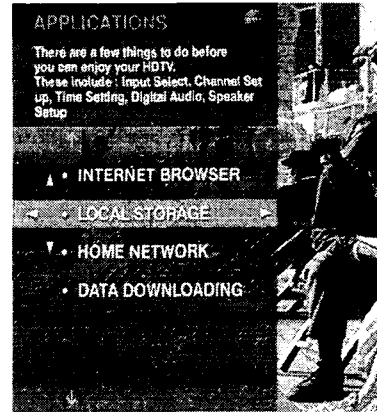
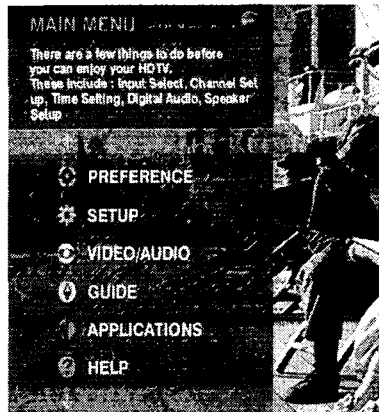
➤ Local Storage

- PVR Function: NTSC, MPEG2 MP@ML AV Recording, Live Pause
- EPG 연동

H/W Architecture



Graphic User Interface



Under Development

- 대우전자, LG전자, Humax, D&D 등 국내 유수의 업체들이 PVR, PDR 등을 개발 중
- iMS 맞춤형 Client
 - NTSC, MPEG2 MP@HL/ML AV Recoding, Live Pause
 - TV Anytime Forum compliant Metadata 연동
 - 대우전자, LG전자, 삼성전자
- On line EPG service
 - www.epg.co.kr
 - www.gentor.com

Thanks for listening -
Have a great time!

