

TV Anytime 표준화 및 서비스

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DAEWOO Electronics Co., Ltd.**

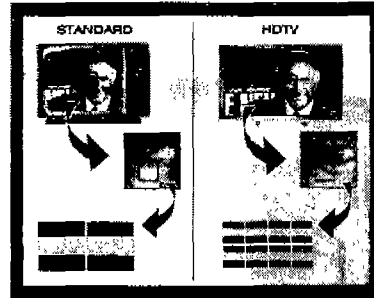
Contents

- **Interactive Service of Digital TV**
- **TV Anytime Forum**
- **Local Storage based System**
 - **Tivo**
 - **Replay TV**
- **Related Project**
 - **iMS**
 - **iPCTV**
 - **NiPC**

Digital 방송 환경

- 방송규격: ATSC 및 DVB
- 초기에는 주로 A/V에 초점
 - HD(High Definition) TV- 16:9
 - SD(Standard Definition) TV- 4:3
- 한국, DTV(HD) 시험방송 시작 (2000년 9월)

디지털방송 (A/V)



Digital Data 방송 환경

- 방송규격: ATSC-DASE, ATVEF, DVB-MHP
- 데이터방송, T-Commerce
- 한국, 2000년 말 데이터방송 규격 선정
- 한국, 데이터방송 시험방송 예정 (2002년)
- IPTV, 국내 데이터방송의 가능성 타진

데이터방송 (D)

디지털방송 (A/V)



Example 1



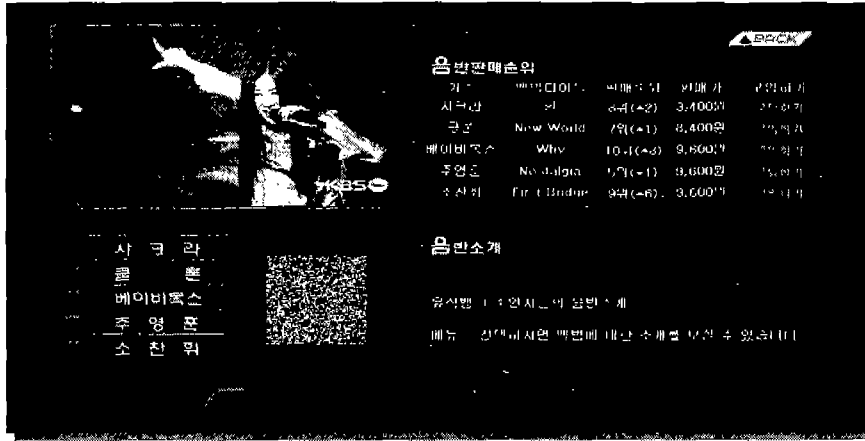
- 선수 프로필을 보여주는 예

Example 2



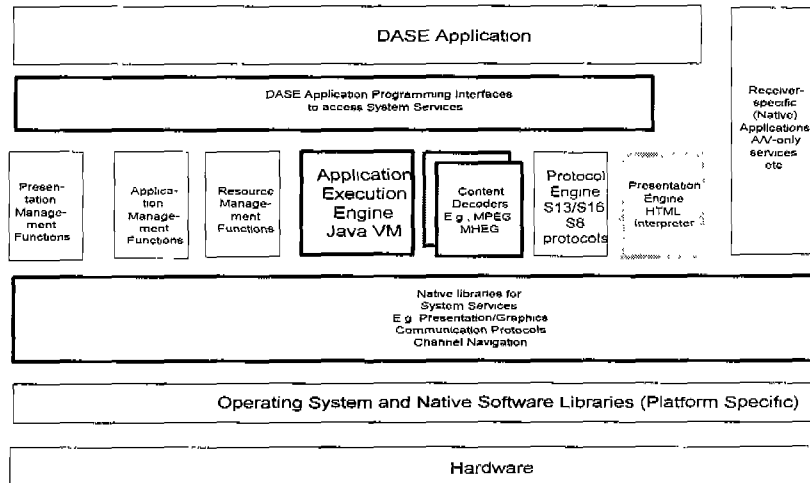
- 전국 날씨 내용

Example 3

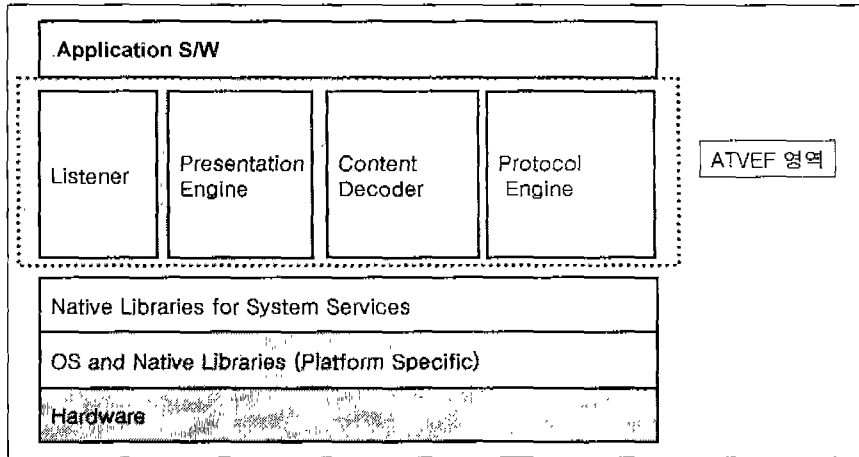


- 음반 구매 내용 양방향 서비스

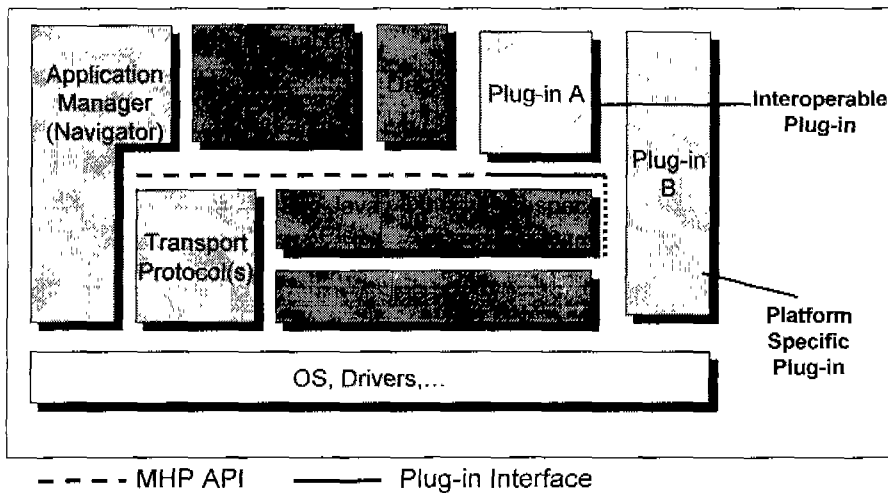
DASE Software Architecture



ATVEF Software Architecture

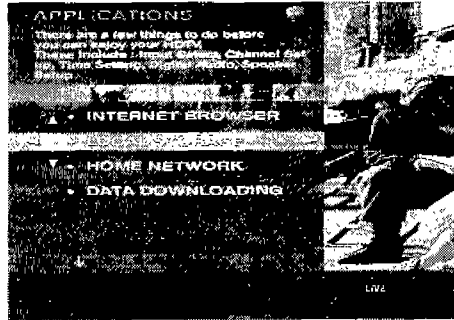
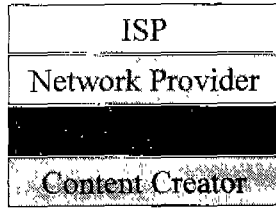


DVB-MHP Software Architecture

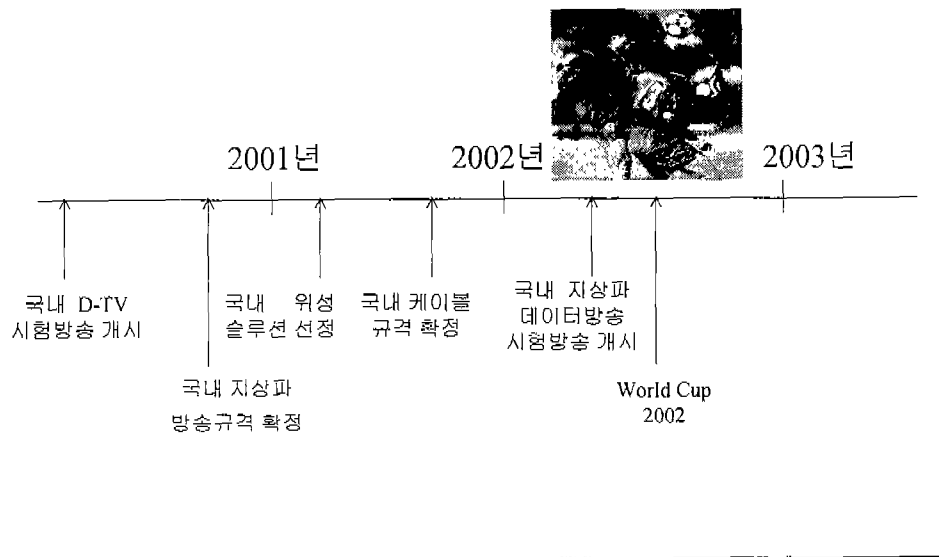


Anytime Service

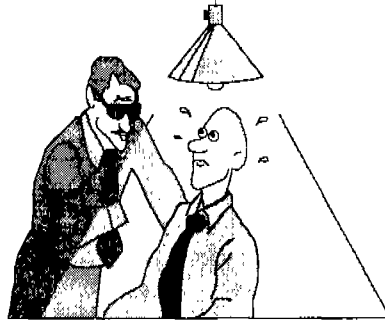
- 사용자가 원하는 정보를 **Search, Capture, Store**하고 원하는 시간에 **display**해 줄 수 있는 서비스
- **Personal TV**
 - User Profile에 따른 맞춤형 멀티미디어 서비스
 - Rights Management
 - DTV 중심의 Home Networking



국내 디지털 방송 Roadmap



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 (157)**
 - BBC, NHK, IBM, Nokia, Microsoft, Phillips, NTT, Sony, NDS, Hitachi, Intel, Canal+, Tivo, Divicom, Daewoo electronics, Samsung, LG, ETRI, Humax etc.

The Technology is Ready

- **Disk drives enabling local storage, retrieval and manipulation of audio, video and data are increasing in capacity and falling in price.**

Year	Conservative - assuming capacity doubles every 18 months	Realistic - assuming capacity doubles every 10 months
2000	4 hours	4 hours
2005	40 hours	240 hours
2010	400 hours	14,400 hours

Video content stored on disk for \$100

- **Digital broadcast content allows descriptive information to be associated with the video stream, enabling the identification, location and acquisition of multimedia content.**
- **The ubiquitous Internet provides low cost connectivity anywhere.**

Organization

- **Chair : Simon Parnall (NDS)**
- **Working Procedure WG - Convenor: Arian Koster (KPN)**
- **Technical Workplan WG - Convenor: Sakae Okubo (Telecommunication Advancement Organization of Japan)**
- **Publicity - Stephan Heimbecher(IRT)**
- **Technical Requirement WG - Convenor: Henry Chadwick (IBM)**

Technical Requirement WG

- **Business Models - Gary Hayes (BBC)**
- **System Design - Friz Klok (KPN)**
- **Metadata - Jean-Pierre Evain (EBU)**
- **Rights Management – Skip Pizzy (Microsoft)**
- **Content Referencing – Alex Ashley (Phillips)**

Status of Works and Events

- **Requirements Documents: Released**
- **Specification**
 - **Business Model: Ver.1.0 (informative)**
 - **System Design: Ver.1.1 (normative)**
 - **Metadata: Ver.1.1 (normative)**
 - **Content Referencing: Ver.1.0 (normative)**
 - **Rights Managements: Draft Ver.1.0 (normative)**
- **Exhibition in NAB 2001 (April 2001)**
- **Exhibition in IBC 2001 (Sep. 2001)**
- **12th Meeting in Seattle by Microsoft: June 5th ~ 8th**

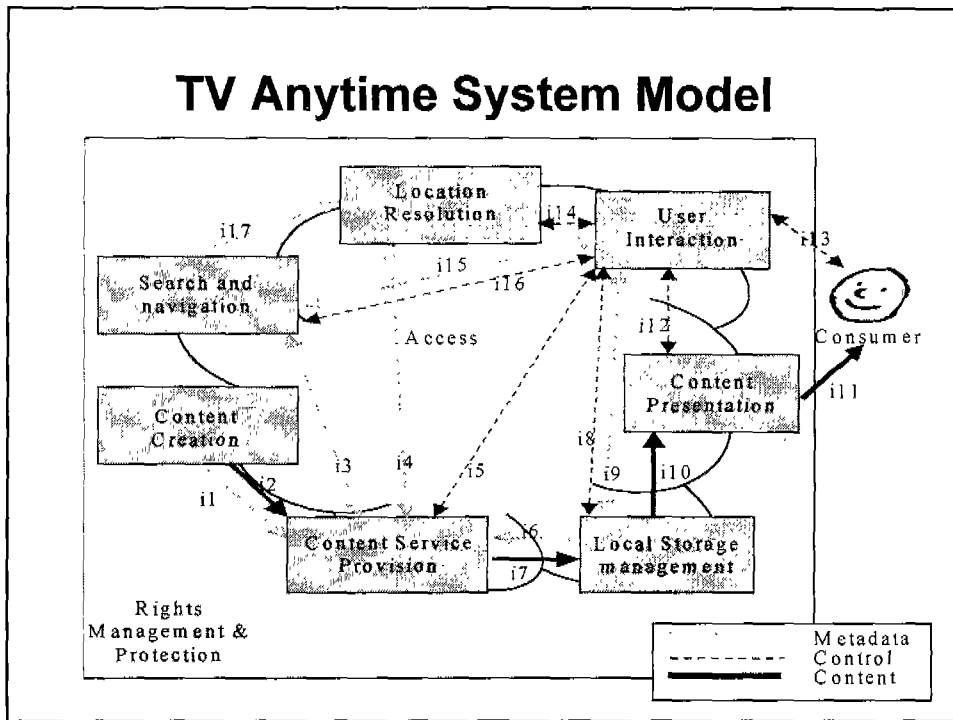
Liaisons

- **ATSC T3/S8: Submit S-3 in response to CFP**
- **MPEG: Submit R-5 for MPEG-21**
- **Formal liaison established: ARIB, ATSC T3, DVB SB, MPA, SMPTE, Advanced Television Forum, Broadband Content Delivery Forum, Content ID Forum, EBU P/Meta**
- **Informal liaison established: DVB TAM, ATSC T3/S17**

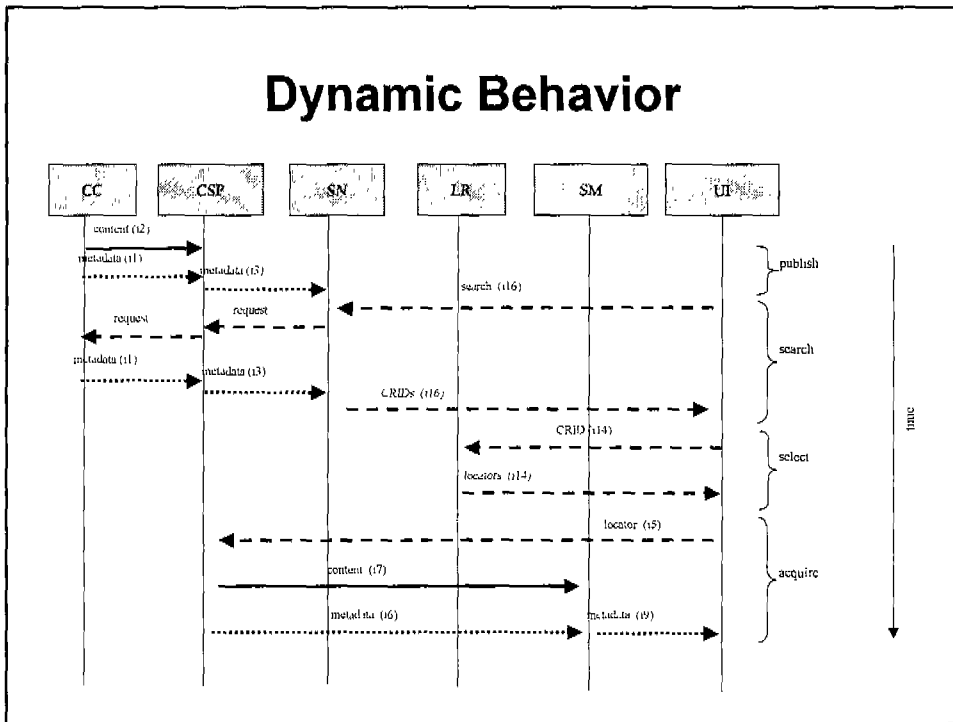
Business Model

- **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**

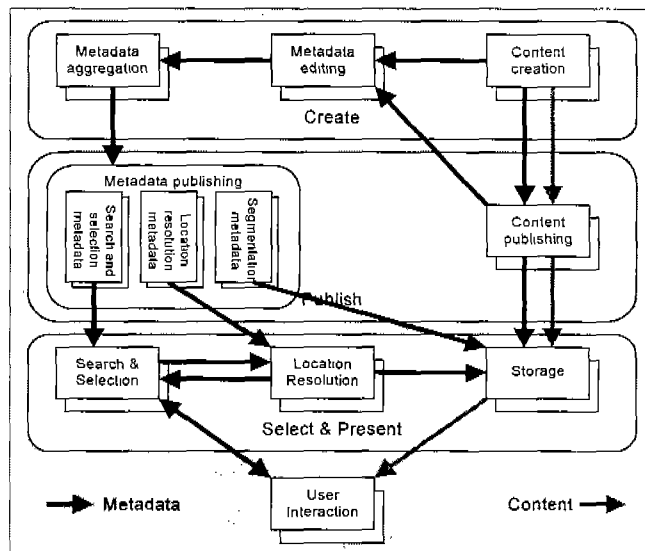
TV Anytime System Model



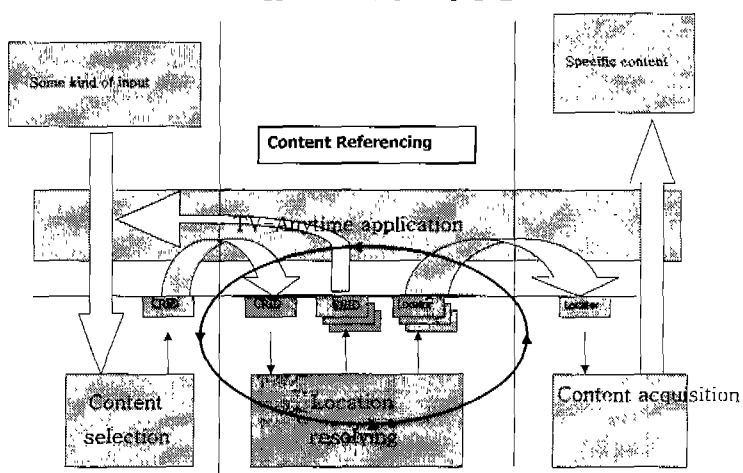
Dynamic Behavior



Metadata Process



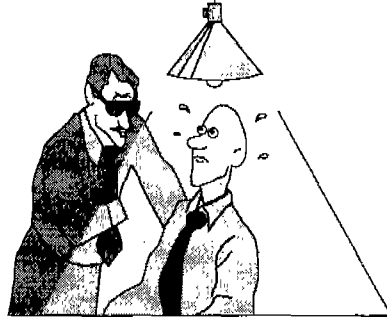
CRID Process



CRID://<authority>/<data>

Authority = <DNS name><path>

PVR 동향



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*

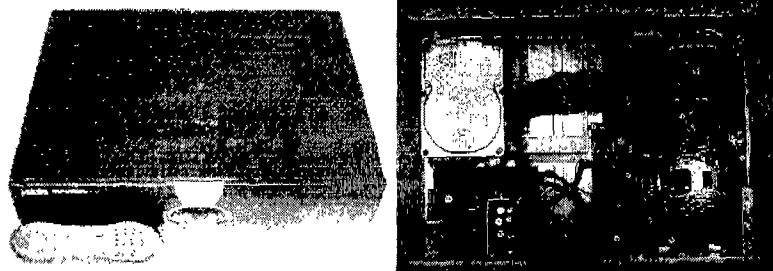
* : Cahners In-Stat Group

TiVo와 Replay TV

- **TiVo**
 - 1997. 8 설립
 - 1999. 판매개시(Philips생산판매)
 - \$500, 유료 TiVo Service 제공(\$10/월)
 - \$399, \$699 두 모델 판매(현재)

- **Replay TV**
 - 1997에 설립
 - \$700, 무료 ReplayTV Service 제공

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(1)

- **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 - 부품구성

- IBM PPC403GCX
- Sony CXD1922Q MPEG-2 Video Encoder
- IBM MPEG-2 A/V Decoder
- TiVo ASIC chip
- ADSP2183 as Audio Encoder
- Micronas MSP3430G Sound Processor
- Philips SAA7114 NTSC Decoder
- Philips SAA7120 NTSC Encoder
- Conexant 33.6K Modem
- Quantum Fireball CX 13.6GB

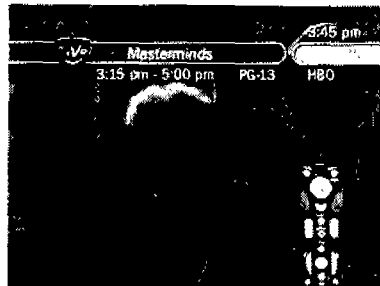
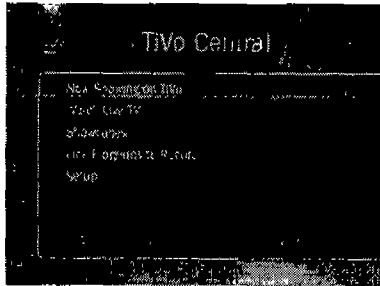
TiVo분석 - OSD/EPG(1)

- | | |
|--|---|
| <ul style="list-style-type: none">➤ OSD 특징<ul style="list-style-type: none">➤ 메뉴<ul style="list-style-type: none">➤ 전체 화면➤ 동일한 인터페이스의 트리 구조➤ 방향키로만 메뉴 선택 가능➤ 프로그램 배너➤ Status Bar | <ul style="list-style-type: none">➤ 기능상 특징<ul style="list-style-type: none">➤ 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

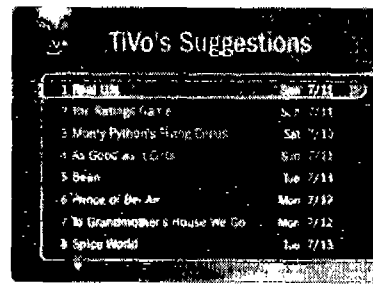
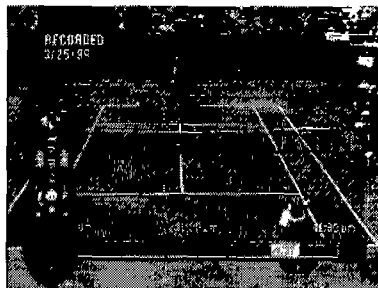
➤ 프로그램 배너



TiVo 분석 - OSD/EPG(3)

➤ Status Bar

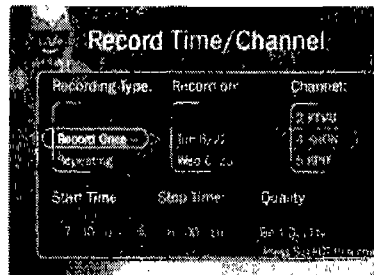
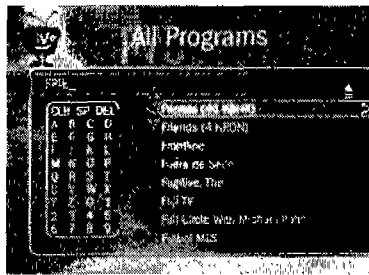
■ TiVo's Suggestion



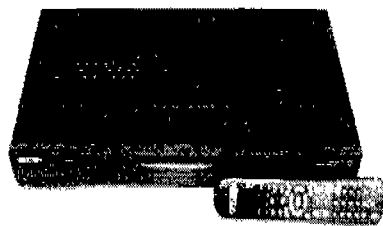
TiVo 분석 - OSD/EPG(4)

▶ 이름별 녹화

▶ 수동 녹화 예약



ReplayTV 분석 - 외형



ReplayTV 분석 - 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

ReplayTV 분석 - 부품구성

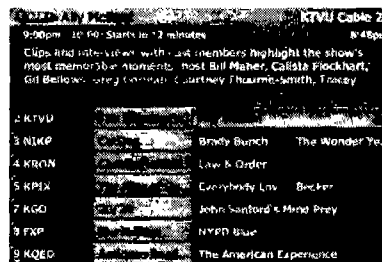
- Philips SAA7214 Demux with Mips PR3001
- Philips SAA7201 MPEG-2 Decoder
- Sony CXD1922Q MPEG-2 Video Encoder
- ADSP 2185 as MPEG-2 Audio Encoder
- Micronas 3430G Sound Processor
- Philips SAA7114 NTSC Decoder
- Philips SAA7121 NTSC Encoder
- Quantum Fireball CX 13.6GB
- Lattice FPGA as IDE controller
- Rockwell 33.6K Modem

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

ReplayTV분석 - OSD/EPG(2)

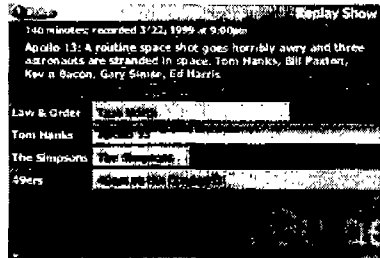
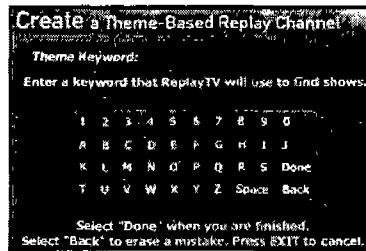
- > 메인 메뉴
- > 채널 가이드



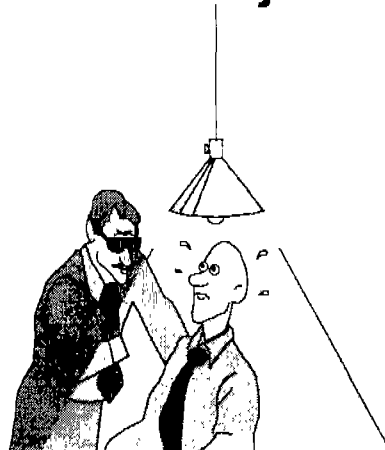
ReplayTV 분석 - OSD/EPG(3)

▶ 테마별 녹화

▶ Replay Guide



관련 Project

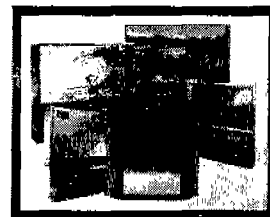


Interactive Media Solution

2000.12 ~ 2003.8

개요

- iMS-A: Client/Server Architecture, Killer Applications
- iMS-B: Authoring Tool, T-Commerce, EPG, MPEG-4/7
- iMS-C: Personalized TV Agent, MPEG-4/7, TVNet

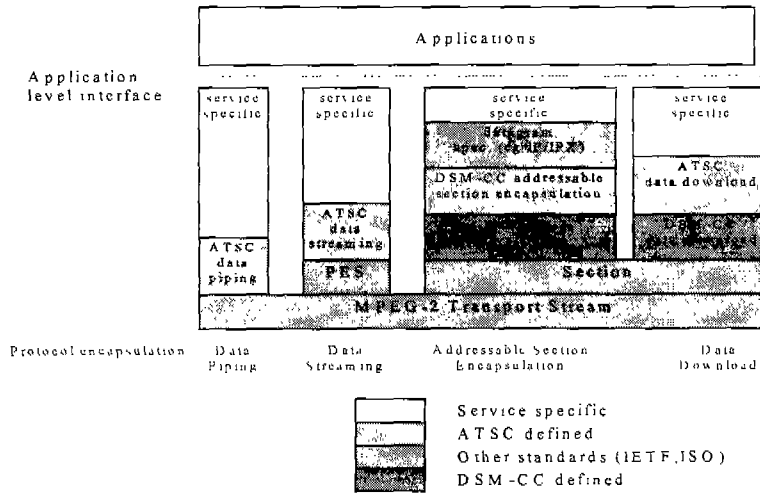


iPCTV (intelligent PC TV):
양방향 데이터 방송 시스템
1997.10 ~ 2000.9

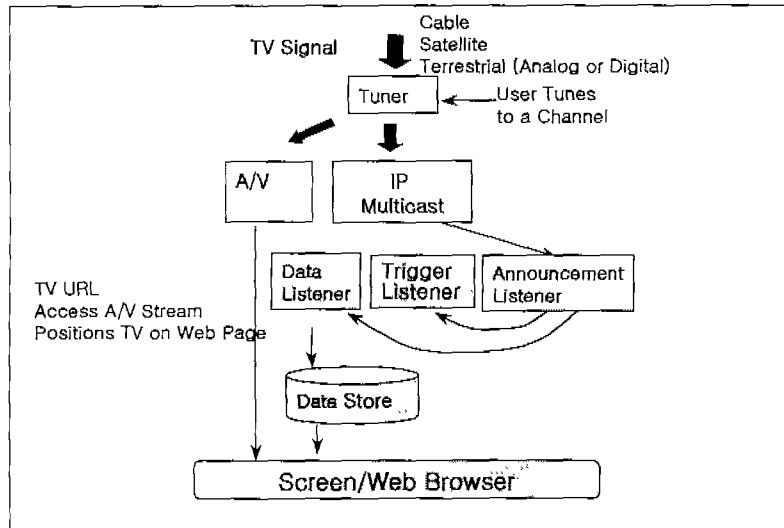
구현 내용

- **PSIP(Program and System Information Protocol), DVB-SI(service information)**
- **Data Broadcasting**
 - **DSM-CC Data Carousel**
 - **Datagram Section**
- **Presentation Engine**
 - **Browser**
 - **HTML 4.0, SSL3.0, CSS1.0, Javascript1.3, HTTP1.1**
 - **Graphic & Audio**
 - **GIF, Animated GIF, JPEG, AU/WAVE/SND**

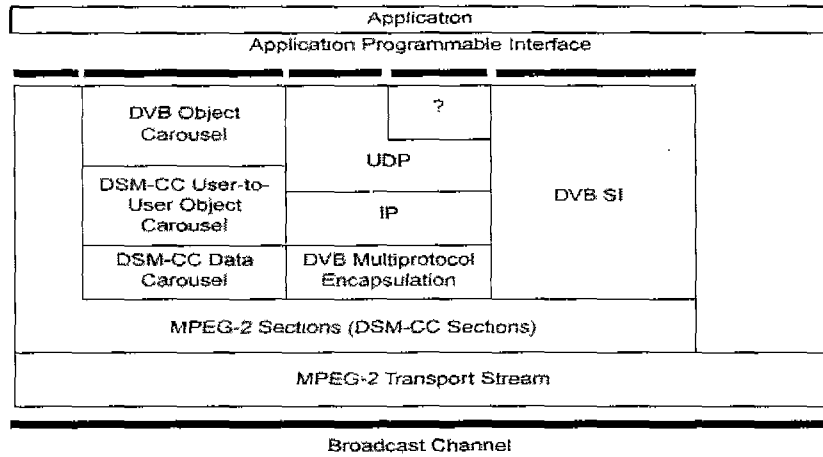
ATSC Data Broadcasting



ATVEF Data Flow

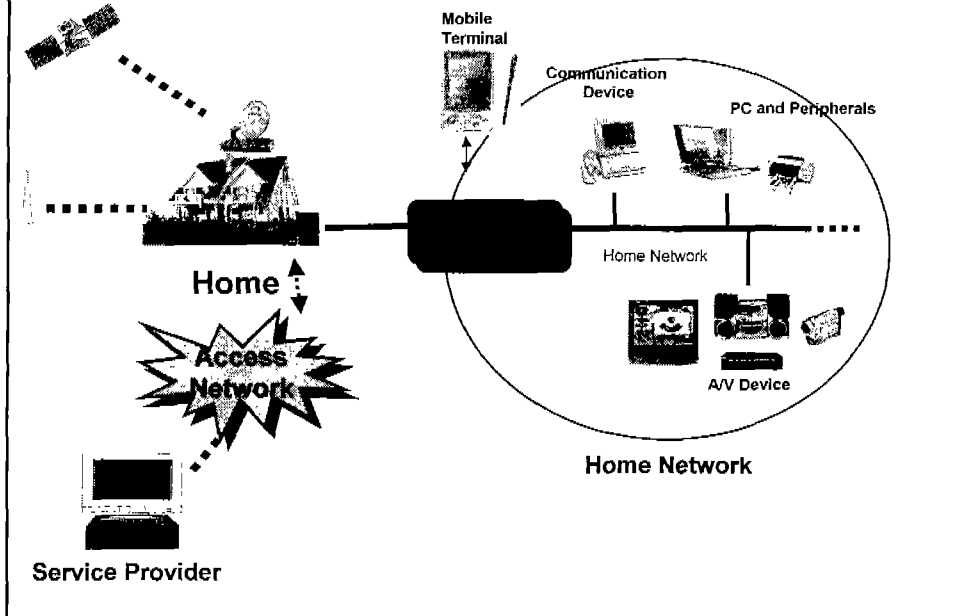


DVB Data Broadcasting

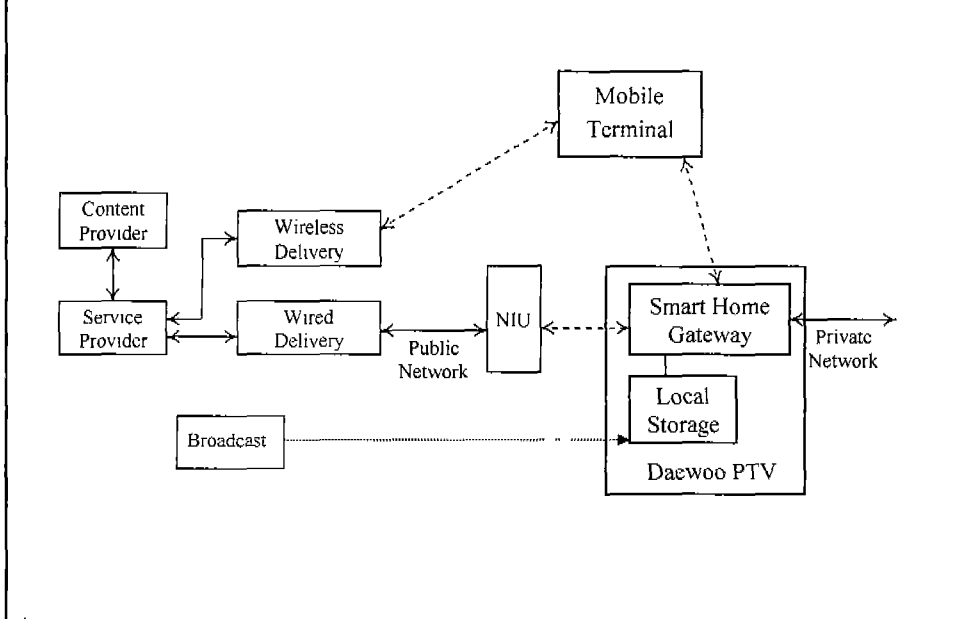


NiPC (Network Integrated PC Client)
1999.12 ~ 2001.9

Conceptual Model of NiPC



Simple Network of NiPC



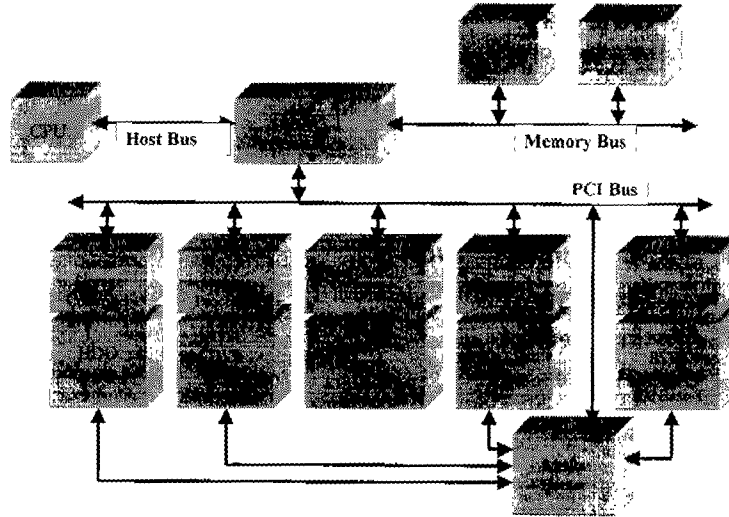
Functional Requirements of NiPC

- **Home Gateway**
 - 외부망과 덕내망을 **Seamless**하게 연결하는 기능
- **Home Server**
 - 정보통신: **Internet**
 - 방송수신: **Digital Broadcasting (T, S, C)**
 - 컴퓨터: **Memo, Simple Computing**
 - 원격제어: **Home Networking**
- **Local Storage**
 - **Anytime Service**
 - **User Profile Control**

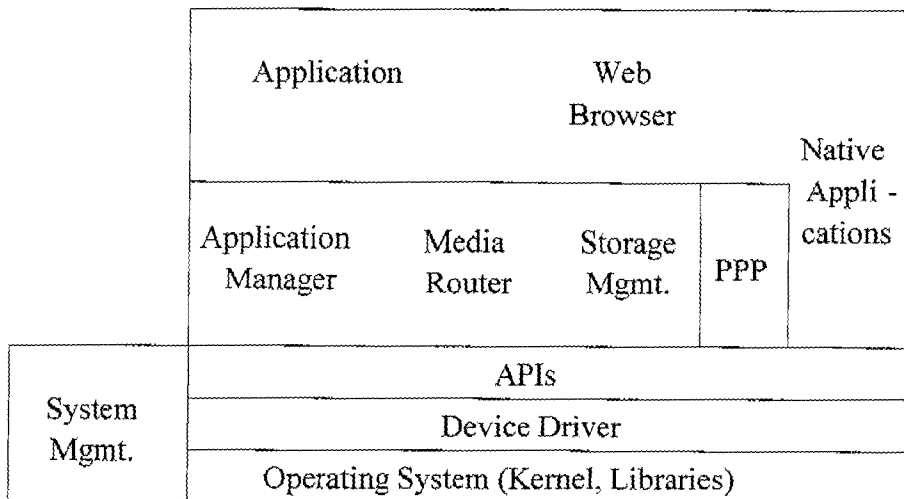
Technical Requirements of NiPC

- **High Performance CPU**
- **MP@HL/ML Decoder**
- **Access Network Interface**
- **Home Network Interface**
- **Media Router**
- **Internet Browser**
- **GUI**
- **Intelligent Agent for Profile Control**
- **Local Storage Management**
- **Rights Management**

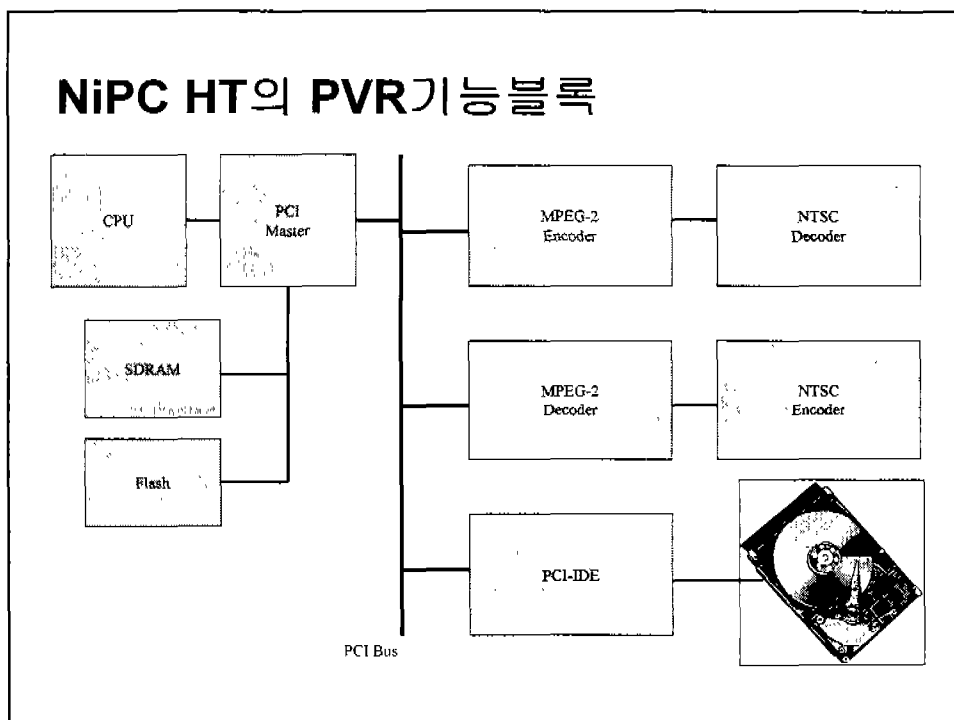
H/W Architecture



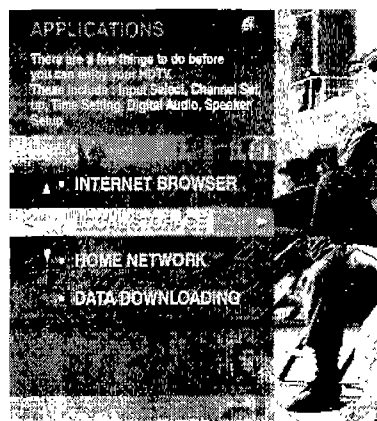
S/W Architecture



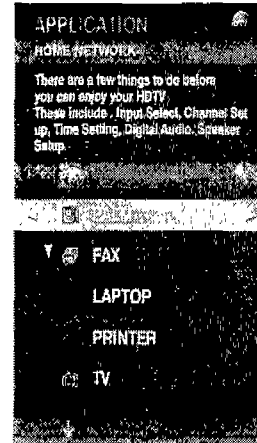
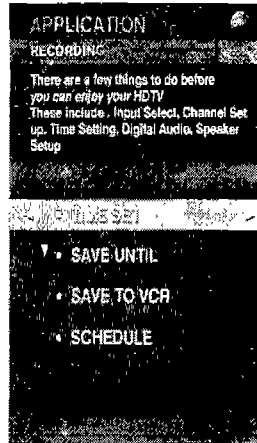
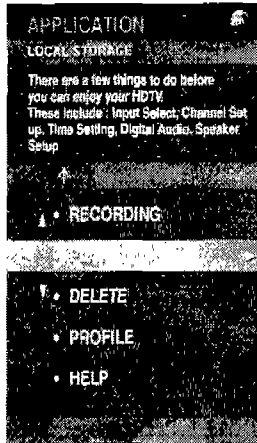
NiPC HT의 PVR기능블록



GUIs of Daewoo P-TV (1)



GUIs of Daewoo P-TV (2)



Thanks for listening -
Have a great time!

