

Introduction of Digital Data Broadcasting Service in Korea



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- ❑ What is Data broadcasting ?
- ❑ Data Broadcasting Standard in Korea
- ❑ Service Status & Deployment in Korea
- ❑ Development Status of Data Broadcasting System in Korea

What is data broadcasting?

□ The era of digital

- Digitization of program production and studio systems
- Transmission digitization
- Need pertinent technical standards and commercial system production

□ Provide clearer and sharper, cinema-like pictures as well as multi-channel, CD-quality sound

Data Broadcasting Service

- ❑ Provides high definition resolution video and high quality sound with **rich and useful multimedia contents**
- ❑ Supports **interaction** between user and multimedia contents
- ❑ Therefore, TV will play **informational role** of the media for the public
 - ❑ Killer Applications: T-commerce, T-government, etc.

What we can play at TV



Data Application



AV Program



Data Broadcasting

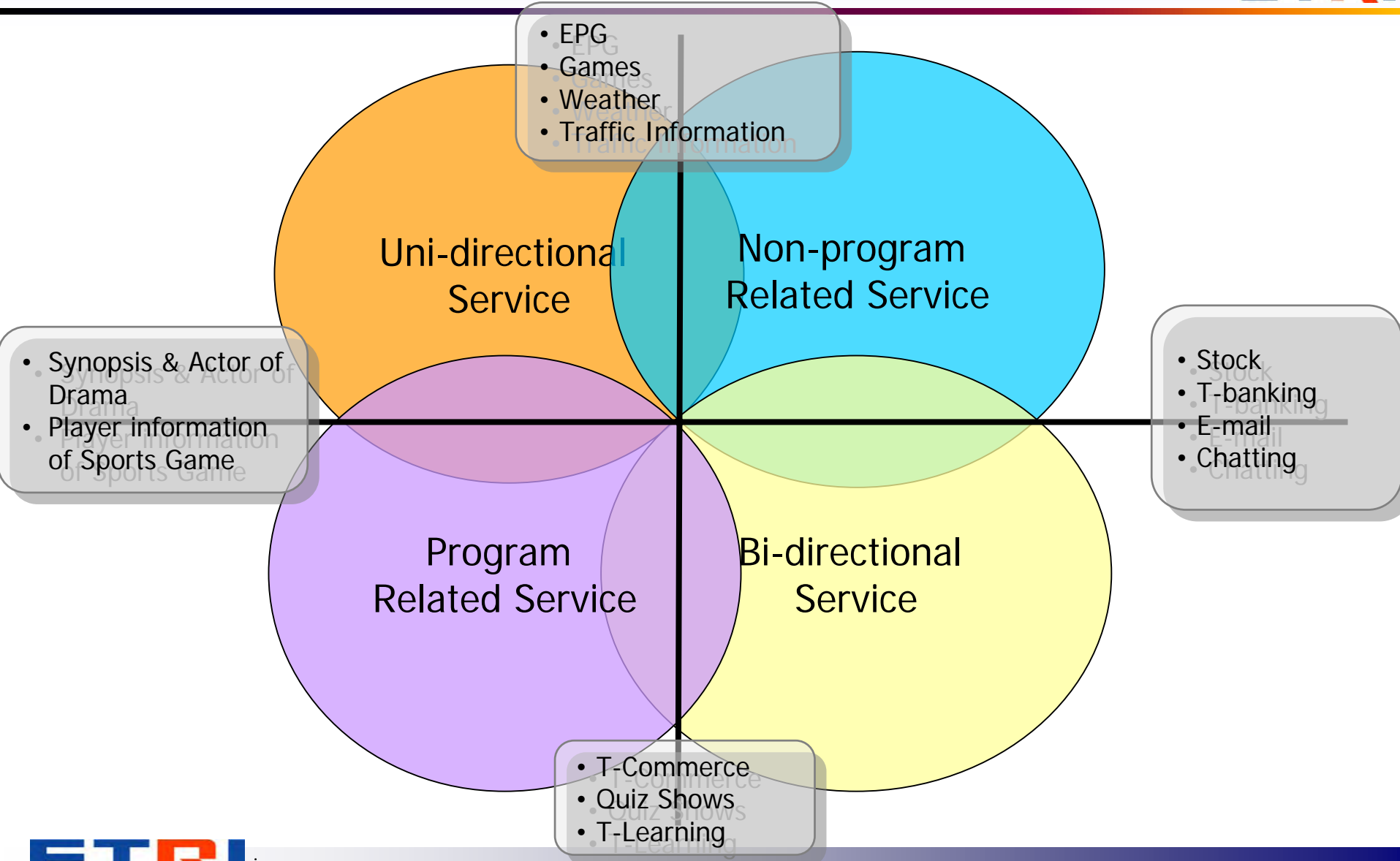
□ Relationship Between AV Program and Data Application

- Program Related Data Broadcasting Service
 - Related to AV Program
- Non Program Related Data Broadcasting Service
 - Irrelevant to AV Program

□ Existence of Interaction Channel

- Uni-directional Data Broadcasting Service
 - Downloads data applications through **Broadcasting network channel**
- Bi-directional Data Broadcasting Service
 - Downloads data applications through **Broadcasting channel network** and Uploads user responses through **Interaction (or return or back) channel network**

Relationship between Data Application Types



Program Related Data Service

부산 아이콘스

1	정유석	GK
5	심재원	DF
20	이일생	DF
15	윤희준	DF
17	류병훈	DF
38	김태민	MF
8	노정윤	MF
3	시미치	MF
4	우르모브	MF
44	토미	FW
9	곽경근	FW

선수 정보

8 노정윤 (MF/1971.3.28)
-신체치수 : 170cm/72kg
-94,98 월드컵 대표

KBS 축구 INTERACTIVE

경기정보 실시간 정보 K-리그 예측게임

리모콘의 컬러버튼을 눌러주세요

Player information of Soccer Game

Questions of Quiz Show for a user

KBS 퀴즈 INTERACTIVE

권현기님
0점
현재순위
0
45,333
총참여자
대상역표

■ 참여방법
프로그램의 퀴즈 진행과 동일합니다.
문제와 보기가 나오면 제한 시간 내 리모콘으로 정답을 선택 하세요.

■ 점수 계산법
정답 시 + 100 오답 시 - 50

■ 보너스 퀴즈
정답 시 해당 상품을 드립니다

확인

1 ?명 2 ?명 3 ?명 4 ?명

----- 리모콘의 숫자버튼을 사용하여 퀴즈를 푸세요 -----

퀴즈도움방
나가기

Non-program Related Data Service



Initial Menu for News, Game, Traffic Information of Talk Show

News Information of Talk Show



Uni-directional Data Service





Data broadcasting Standard

Data broadcasting Standard of World Wide

	ATSC-ACAP	OCAP	DVB-MHP	ARIB-BML
Region	North America	North America (Cable)	Europe	Japan
Abbreviation	•Advanced Common Application Platform	•OpenCable Common Application Platform	•Multimedia Home Platform	•Broadcasting Markup Language
Standardization Body & Status	•ATSC-T3/S2 •ATSC Proposed Standard	•CableLabs •SCTE(Society of Cable Television Engineers) adopt	•DVB-MHP •ETSI approval	•ARIB (Association of Radio Industries and Business)
Contents	•Java •XDML(optional)	•Java base on MHP	•Java •DVB- HTML(optional)	•BML

Data Broadcasting Standards in Korea

- Standardization strategy of data broadcasting in Korea
 - Open and global standard
 - Reusability of contents in any broadcasting network
 - Extensibility for the advanced broadcasting technology in the future
 - Flexibility for the market needs

- Adoption of open & global standards
 - Terrestrial: ACAP (Followed by ATSC DASE)
 - Satellite: MHP (2001)
 - Cable: OCAP (2002)

Service Status & Deployment

Terrestrial

Television

- Service provider : 11
(KBS1.2, MBC, EBS, MBC, SBS...)
- Station: 110

Radio

- Service provider : 12
(KBS, MBC, SBS, EBS...)
- Station: 242

Cable/Satellite

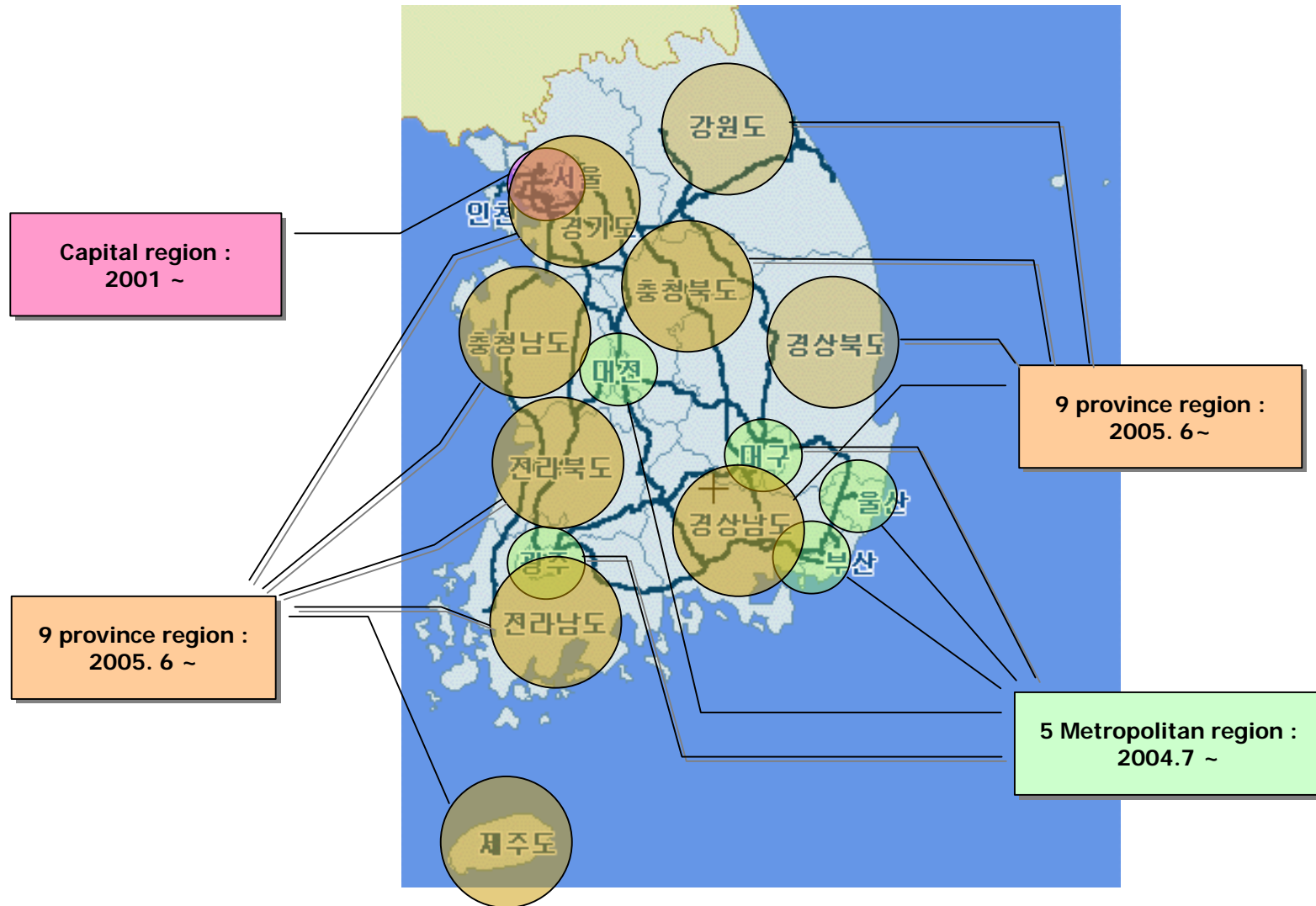
Cable

- MSO : 12(SO 75)
- DMC : 5(SO 65)

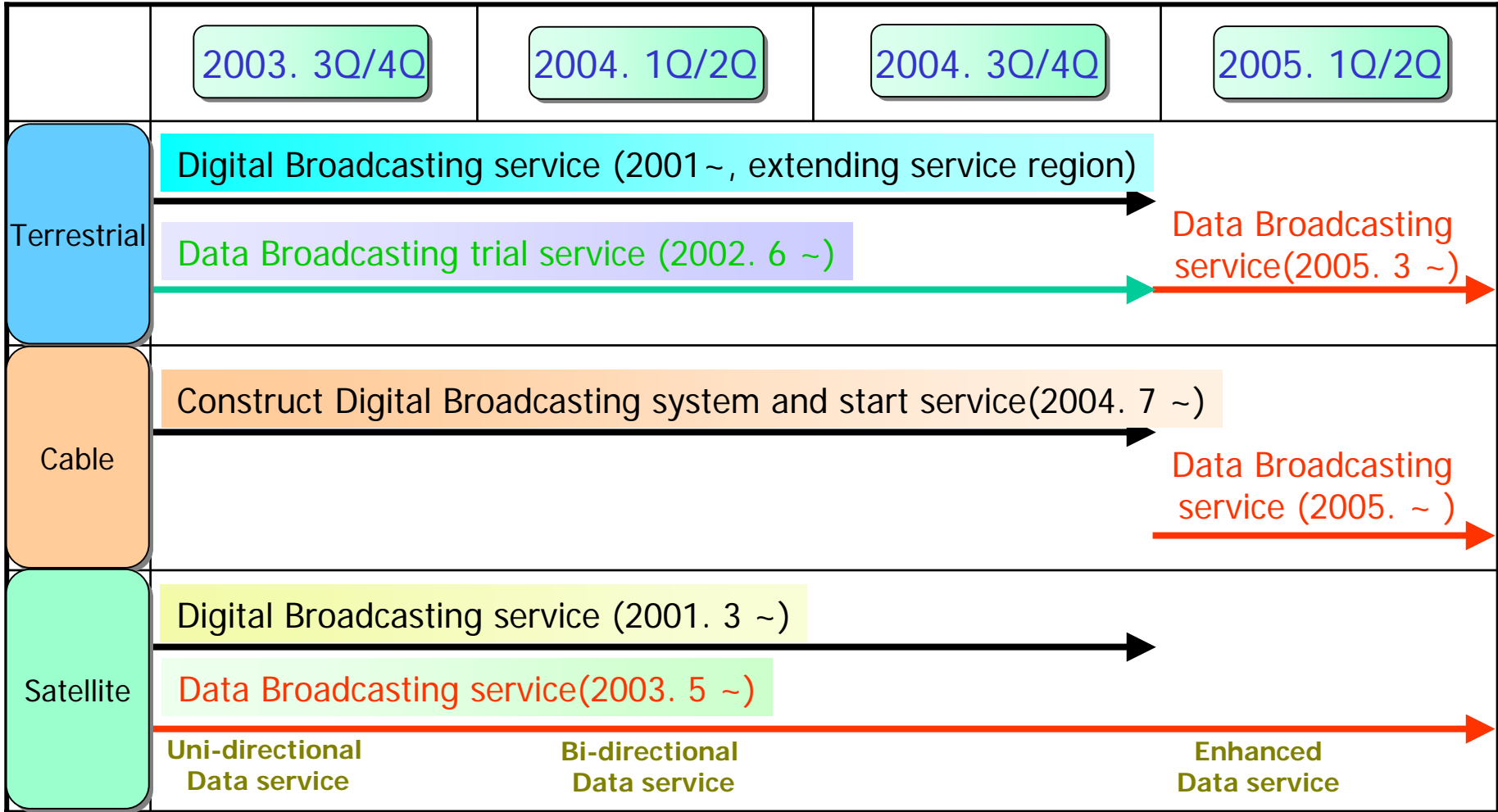
Satellite

- Service provider: 1 (Skylife)

Terrestrial digital broadcasting service deployment schedule in Korea



Data broadcasting service deployment schedule in Korea



□ Terrestrial data broadcasting service

- DASE trial service was successfully carried out in 2002 FIFA Korea/Japan WorldCup Game and 2002 Pusan ASIAN game
 - World-first data broadcasting service based on DASE
 - Participants
 - Broadcasters: KBS, MBC, SBS, EBS
 - Transmission System Developer : Aircode, Alticast
 - Application Authoring Company : Aircode
 - Settop-box Manufacturer : Samsung, LG, Daewoo
 - Research Institute : ETRI
- Transition from DASE to ACAP has almost been completed
 - Construction of Data Broadcasting system is almost completed.
 - ACAP trial service has been performing on air by KBS and EBS since 2004 2Q.
 - Commercial launch based on ACAP targeting March, 2005

2002 WorldCup application



» 출전선수정보

포르투갈		◀▶를 사용 확인 선택	
15. 넬슨	GK	22. 베투	DF
5. F. 코투	DF	18. 프레사우트	DF
13. J. 안드라데	DF	11. S. 콘세이상	FW
4. 카네이라	DF	17. P. 벤투	MF
3. 아벨샤비에르	DF	6. P. 소사	MF
23. 루이조르제	DF	▶▶ 한국선수정보 ◀◀	



5 페르난두 코투 (DF / 1969. 8. 2)
 *신체지수 : 186cm/78kg *소속 : 라치오 (이탈리아)
 *A매치 기록 : 82회 6득점 *예선 기록 : 6회

- 데이터방송처음
- TV 화면 확대
- 나가기

Project 2002 World cup

When 2002

Screen HD, 16:9

- Key points
- Real time update
 - Game included
 - Enhanced application



» 월드컵 경기결과



3.4 위차
 대한민국 vs 터키
 경기일정
 ▶를 사용 확인 선택

6/20 대구	대한민국	2 : 3	터키
이름용 / 1번 8분	득점선수	하인슈루프 / 7번 1분	데이터방송처음
송중국 / 후반 47분		말린만시즈 / 7번 73분	TV 화면확대
		말린만시즈 / 후반 93분	나가기
		경고 및 퇴장	
		투기이 경고 / 후반 4분	



» 월드컵 경기일정



경기일정
 확인 선택

준결승	6/25(화)	독일 1 : 0 대한민국	서울	20:30	KBS07V2	데이터방송처음
	6/26(수)	브라질 1 : 0 터키	사이타마	20:30	KBS07V2	TV 화면확대
3.4위차	6/29(토)	대한민국 3 : 0 터키	대구	20:00	KBS07V2	나가기
결승전	6/30(일)	독일 : 브라질	요코하마	20:00	KBS07V1	



» 슈팅 예측게임



빙고판에 들어갈 선수들 선택하세요

슈팅	프리킥	슈팅
김남일	최시	송중국
프리킥	골	프리킥
슈팅	반칙	슈팅
슈팅	슈팅	슈팅

대한민국	MF 김남일	MF 이영표	MF 송중국	데이터방송처음
대한민국	MF 코지민스키	FW A. 비크	FW 주리브스키	TV 화면확대
폴란드				나가기

2002 Pusan Asian Game application



Project 2002 Asian game application

When 2002

Screen HD, 16:9

Key points

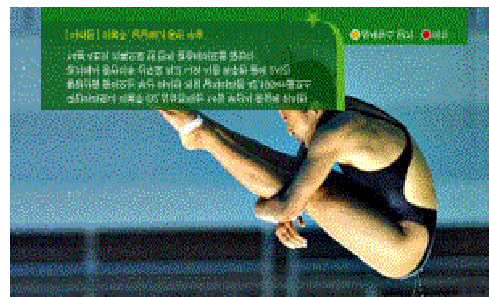
- real time status update
- Enhanced application

순위	국기명	1	2	3
1	중국	7	4	5
2	일본	6	4	2
3	한국	2	5	4
4	북한	0	0	0
4	태국	0	0	0
4	대만	0	0	0
4	홍콩	0	0	0
4	러오스	0	0	0
4	레바논	0	0	0

2003 Universiad



- Project 2003 Universiad
- KBS
- When 2002
- Screen HD, 16:9
- Key points
 - Real time update
 - Enhanced application



Provided by Aircode

□ Cable data broadcasting service

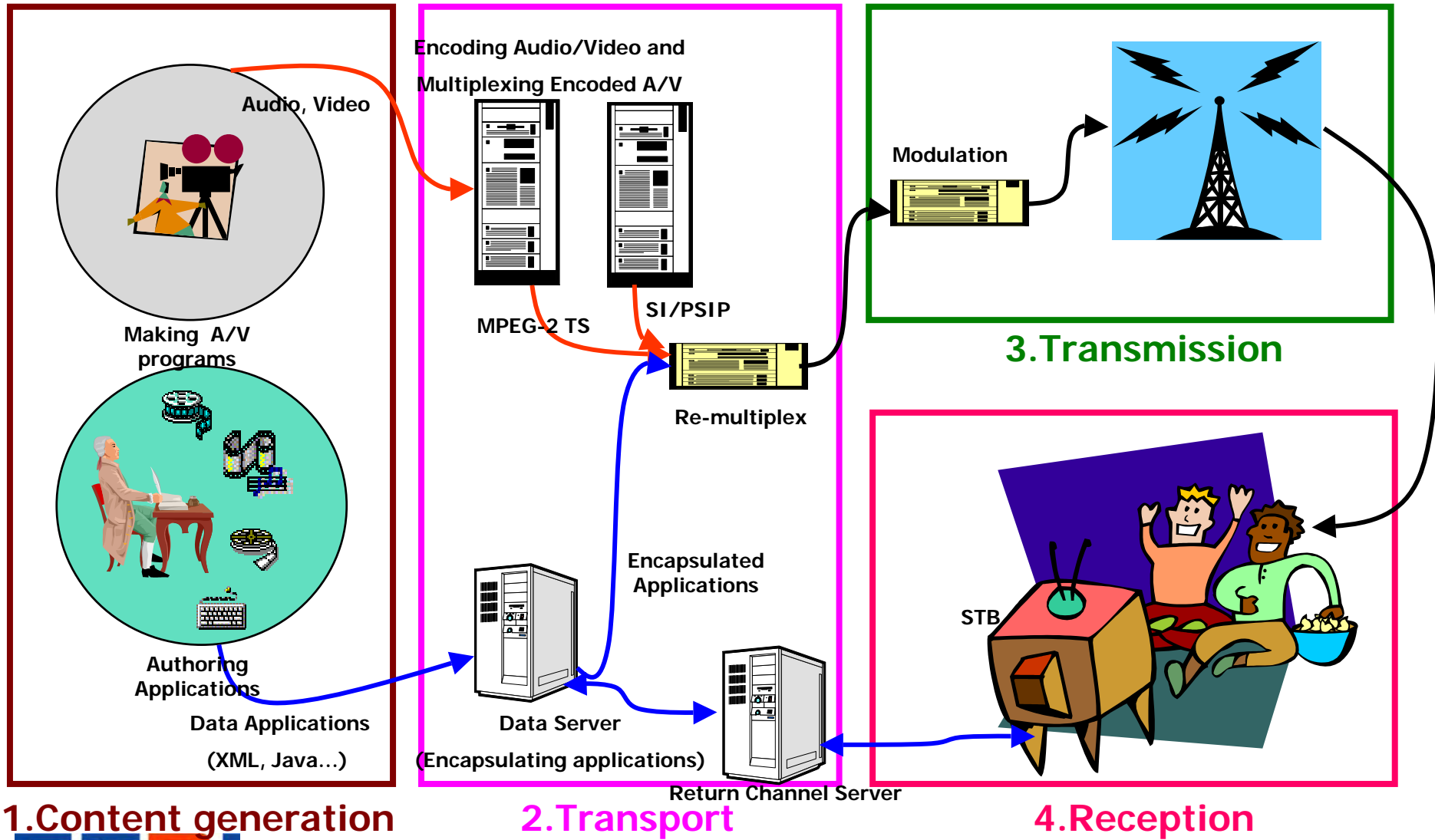
- Construction of Digital Broadcasting system is in progress
- Digital Broadcasting service will be started in the end of 2004
- Data Broadcasting trial service based on OCAP started in 2004 4Q and Commercial service in 2005

□ Satellite data broadcasting service

- SkyLife provides SkyTouch more than 20 data broadcasting services in portal, based on MHP since 2003
 - Uni-directional service provided in 2003
 - Bi-directional service provided in 2004 1Q
- Enhanced Data Broadcasting service will be started in 2005
 - Program connected data service (Drama summary, ...)
 - Participative data service (Voting, Quiz show, ...)
 - Other (Shopping, Game, Betting, Chatting, ...)

Development status of Data Broadcasting System in Korea

Overview of Data Broadcasting System



1. Content generation

2. Transport

3. Transmission

4. Reception

ITV Solution Vendors in Korea

- ❑ Middleware (ACAP, OCAP, MHP)
 - ❑ Alticast, Samsung Electronics, LG Electronics, I-Set
- ❑ ITV H/E
 - ❑ Aircode, Alticast
- ❑ Authoring Tool
 - ❑ Aircode, Alticast
- ❑ SI/PSIP Server
 - ❑ Aircode, Alticast
- ❑ STB
 - ❑ Samsung Electronics, LG Electronics, Humax, Joohong, etc.

Issues of retransmission for terrestrial data broadcasting service over cable in Korea

□ Video resolution

- Terrestrial(HD) → Cable(HD): Possible
- Terrestrial(HD) → Cable(SD): Possible
 - down-converting

□ Data resolution

- Terrestrial(HD) → Cable(HD): Possible
 - Should consider OOB RC/DSG RC and monitor application on cable data broadcasting environment
- Terrestrial(HD) → Cable(SD): Impossible

□ Middle specification










- Terrestrial(ACAP) → Cable(OCAP): Possible
 - ACAP and OCAP are based on GEM
 - But, ACAP is still a proposed standard and not yet verified on field

□ EPG specification

- Terrestrial(PSIP) → Cable(PSIP): Possible
 - must be converted TVCT with CVCT
- Terrestrial(PSIP) → Cable(SI): Impossible
 - except for a profile-6 of cable SI

ETRI Trial Retransmission for terrestrial

- Assumption of trial retransmission for ACAP terrestrial data broadcasting service over cable
 - Audio, video and data are same between terrestrial and cable
 - System Information uses only PSIP on both of terrestrial and cable
 - In-Band (optional) : cable PSIP
 - Only VCT (Virtual Channel Table) of PSIP make a difference between terrestrial and cable

Table	Required for Broadcast?	Required for Cable?
STT		
MGT		
VCT	 (TVCT)	 (CVCT)
RRT		
EIT	 (EIT-0, -1, -2, -3) (all others optional)	<i>optional</i>
ETT	<i>optional</i>	<i>optional</i>

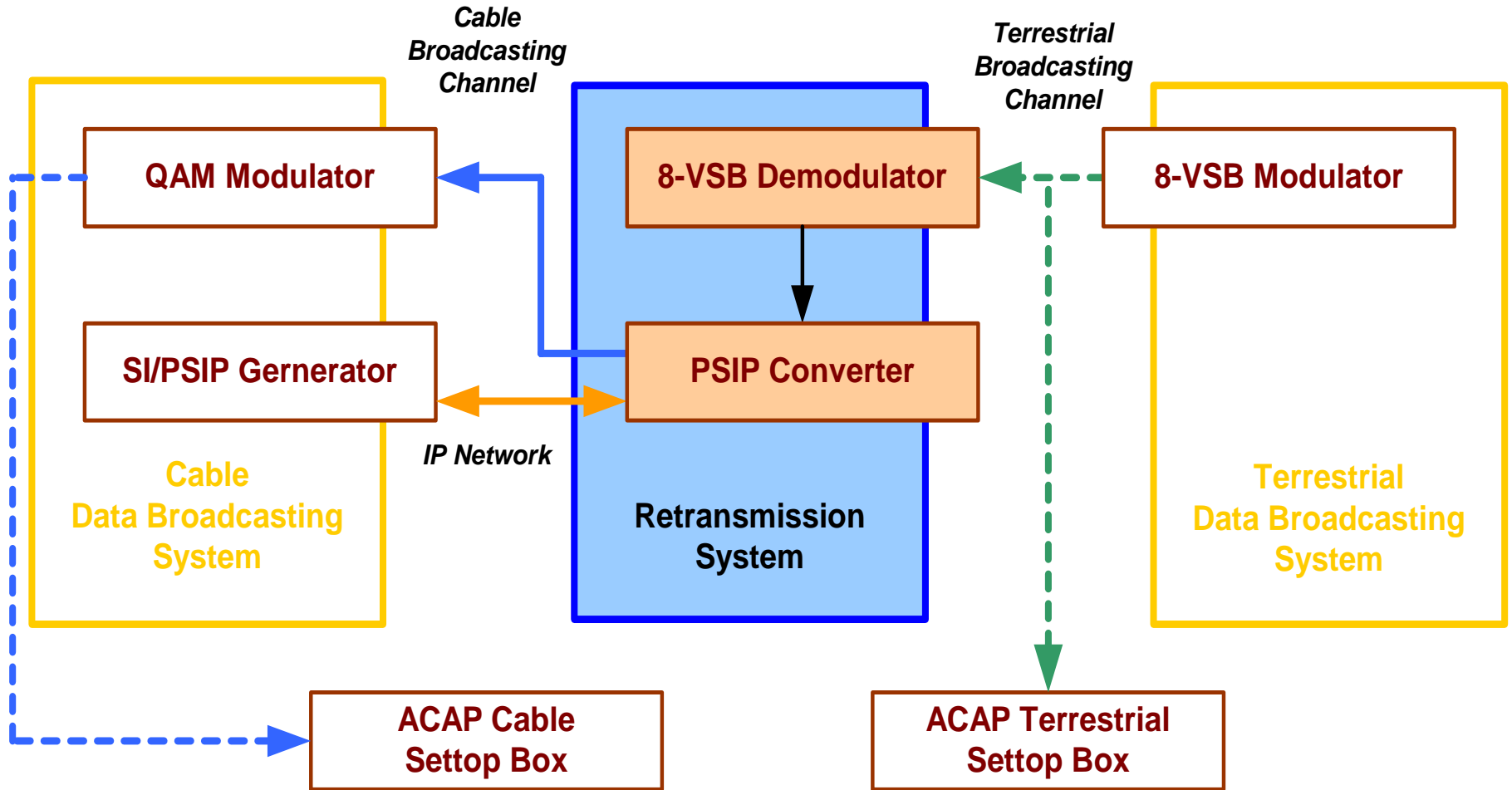
- Out-Of-Band (mandatory) : cable SI
 - Cable SI is different with PSIP of terrestrial except only for profile-6 of Cable SI

Trial Retransmission of ETRI

□ Profiles for cable SI

		Profile 1	Profile 2	Profile 3	Profile 4	Profile 5	Profile 6
Table Section	table ID	Baseline	Revision Detection	Parental Advisory	Standard EPG Data	Combination	PSIP only (a)
Network Information Table	0xC2						
Carrier Definition Subtable		M	M	M	M	M	-
Modulation Mode Subtable		M	M	M	M	M	-
Network Text Table	0xC3						
Source Name Subtable		O	O	O	M	M	-
Short-form Virtual Channel Table	0xC4						
Virtual Channel Map		M	M	M	M	M	-
Defined Channels Map		M	M	M	M	M	-
Inverse Channel Map		O	O	O	O	O	-
System Time Table	0xC5	M	M	M	M	M	M
Master Guide Table	0xC7	-	-	(b)	M	M	M
Rating Region Table	0xCA	-	-	(c)	(c)	(c)	(c)
Long-form Virtual Channel Table	0xC9	-	-	-	-	M	M
Aggregate Event Information Table	0xD6	-	-	-	M	M	M
Aggregate Extended Text Table	0xD7	-	-	-	O	O	O

Structural diagram of Retransmission system for terrestrial data broadcasting service



□ I/O interface specification

	Input	Output	Note
AV	MPEG-2 Video & AC3 Audio	MPEG-2 Video & AC3 Audio	Bypass
Data	ACAP Contents	ACAP Contents	Bypass
EPG	Terrestrial PSIP	Cable PSIP & SI	Necessary to convert

□ Description of sub-modules

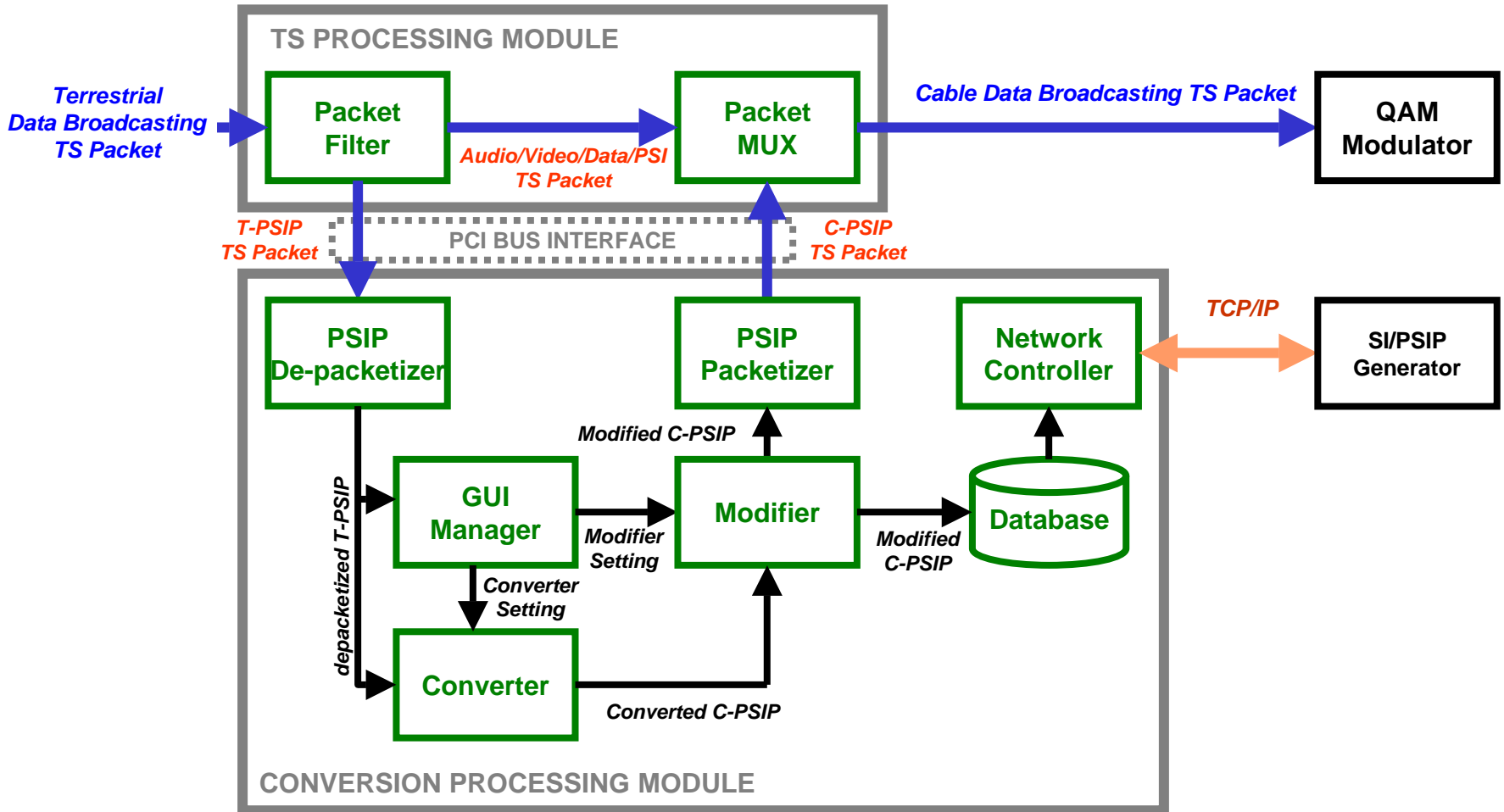
□ 8-VSB Demodulator

- Extract MPEG-2 TS on a terrestrial broadcasting channel
- Interface
 - Input: 8-VSB (ATSC), Output: DVB-ASI

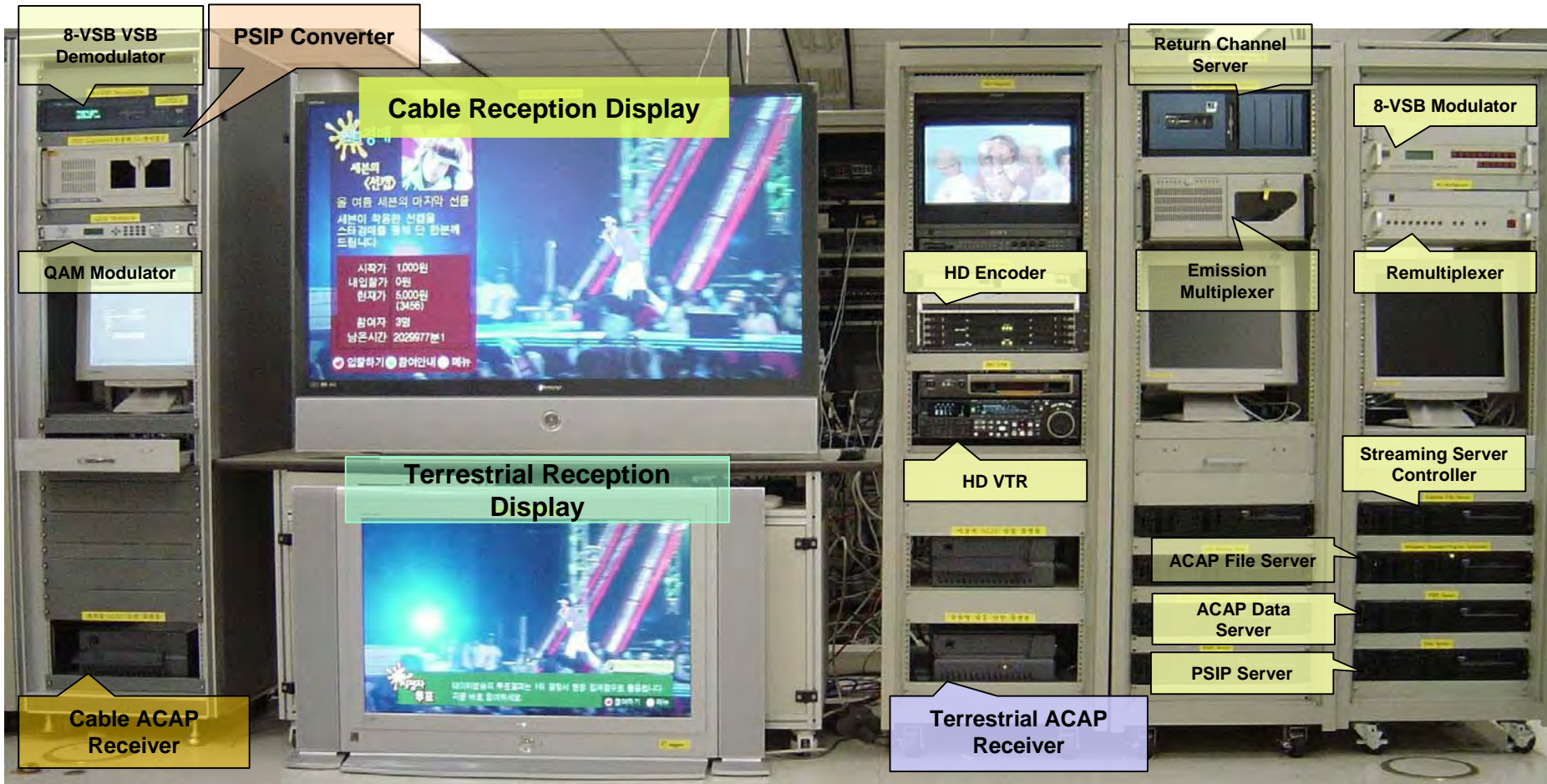
□ PSIP Converter

- Edit and convert a channel information of PSIP in real-time (Ex: TVCT → CVCT)
- Edit AV events and data events (Ex: start time, duration time and so on)
- Interface
 - Input: DVB-ASI (ATSC), Output: DVB-ASI or TCP/IP

PSIP Converter



ETRI Test-bed for ACAP Data Broadcasting System



- ❑ Data broadcasting service can easily provide everyone more rich and useful information in Digital Broadcasting Era
- ❑ On many manufacturers, broadcasters, institute participating in development of data broadcasting technology, It has been continuing and improving since 2001
- ❑ The digital broadcasting service of KOREA is in very stable stage and will provide more various types of service in the next year
- ❑ As the convergence between data broadcasting service and other service goes on, we can consider to accomplish new service (anytime, anywhere etc on)

Snapshots of Data Service

KBS : T-Commerce mobile download

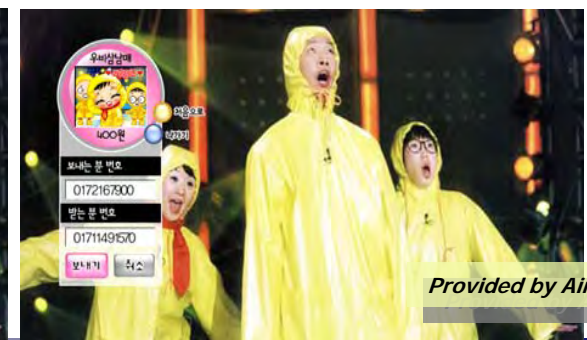


Project T-Commerce mobile download

When 2003

Screen HD, 16:9

- Key points
- purchasing mobile contents through return path
 - Enhanced application



Provided by Aircode

KBS : Interactive Quiz Show

KBS QUIZ INTERACTIVE

권현기님
200점

현재순위
350

45,333

총참여자
대성적표

1 202명 2 31,203명 3 9,450명 4 599명

----- 리모콘의 숫자버튼을 사용하여 퀴즈를 푸세요 -----

■ 참여방법
프로그램의 퀴즈 진행과 동일합니다.
문제와 보기가 나오면 제한 시간 내 리모콘으로 정답을 선택 하세요.

■ 점수 계산법
정답 시 + 100 오답 시 - 50

■ 보너스 퀴즈
정답 시 해당 상품을 드립니다

달기

Project **KBS interactive quiz**

When **2003**

Screen **HD, 16:9**

Key points **□Real time and enhanced**

KBS QUIZ INTERACTIVE

권현기님
0점

현재순위
0

45,333

총참여자
대성적표

1 회덕 2 호법 3 남이 4 단포

Q 경부선과 호남선이 만나는 고속도로 분기점은?

1 ?명 2 ?명 3 ?명 4 ?명

----- 리모콘의 숫자버튼을 사용하여 퀴즈를 푸세요 -----

퀴즈도움방

KBS QUIZ INTERACTIVE

"누구나 퀴즈 앞에 도전할 수 있습니다."
지금 참여하세요
최종 점수는 적당규모로
현재참여인원 45,333명

1 회덕 2 호법 3 남이 4 단포

Q 경부선과 호남선이 만나는 고속도로 분기점은?

1 ?명 2 ?명 3 ?명 4 ?명

----- 리모콘의 숫자버튼을 사용하여 퀴즈를 푸세요 -----

퀴즈도움방

KBS QUIZ INTERACTIVE

고객포드와 비밀번호를 입력해 주세요

고객포드: [redacted]
비밀번호: [redacted] 확인

리모콘 숫자 버튼으로 입력 후 [redacted] 선택

1 회덕 2 호법 3 남이 4 단포

Q 경부선과 호남선이 만나는 고속도로 분기점은?

1 ?명 2 ?명 3 ?명 4 ?명

----- 리모콘의 숫자버튼을 사용하여 퀴즈를 푸세요 -----

퀴즈도움방

Provided by Aircode

KBS : Poll-Entertainment



- Project **KBS : Poll-Entertainment**
- KBS**
- When **2003**
- Screen **HD, 16:9**
- Key points
 - Poll application with return required
 - Enhanced application



KBS : Education



- 처음놀러왔어요
- 바로놀러갈래요
- 나가기

TV이 놀자! KBS KIDS INTERACTIVE

Project **KBS interactive education**

When **2003**

Screen **HD, 16:9**

- Key points
- Personal education
 - Managing Return path personal information
 - Enhanced application



Provided by KBS

Skylife : Kid I TV channel (Satellite; MHP)



Project	KIDi contents
When	2002 ~
Screen	SD, 4:3
Key points	<input type="checkbox"/> Virtual channel application <input type="checkbox"/> for kids

Provided by Aircode

Skylife : T-Commerce, real time purchase, currently on air test (Satellite; MHP)



Project **Hyundai homeshopping (Sky T) / Interactive contents**

When **2003**

Screen **SD, 4:3**

Key points **Virtual channel application**

EBS : Program Related Data Service



악기의 모양을 알아볼까요?

악기 만들기
악기 만들기
악기 만들기
악기 만들기

EBS Data Broadcasting 나가기

악기의 모양을 알아볼까요?

감각놀이를 통한 자기 행동의 결과의식

악기를 움직여 소리를 내봄으로써 악기의 소리를 탐색하고 크고 작은 소리를 만들어 보는 활동으로, 악기를 움직이는 행동의 결과로 소리가 만들어지고 소리의 크기가 달라짐을 알 수 있는 프로그램입니다.

● 처음으로 ● 나가기

놀이까꿍

* 놀이방법 > 엄마랑 까꿍

▶ 어느 부분일까요?

준비물

꽃, 나비를 그린 그림 카드 각 두 장씩.

동물 그림을 보고 빠진 부분이 어디인지 찾아보는 활동이에요. 먼저 토끼와 코끼리의 모습을 보여준 후, 그 특징을 기억하고 있는지, 토끼와 코끼리의 특징적인 부분을 찾아보도록 해요. 그림을 보고 없는 부분에 대해 명칭을 말로 하거나, 동작으로 표현할 수 있도록 유도해 주세요. 없는 부분에 그림을 붙여 동물의 모습이 제대로 갖추어지면 그 동물의 특징적인 부분을 어떻게 표현하는지.

1/2

● 처음으로 ● 나가기

교구만들기

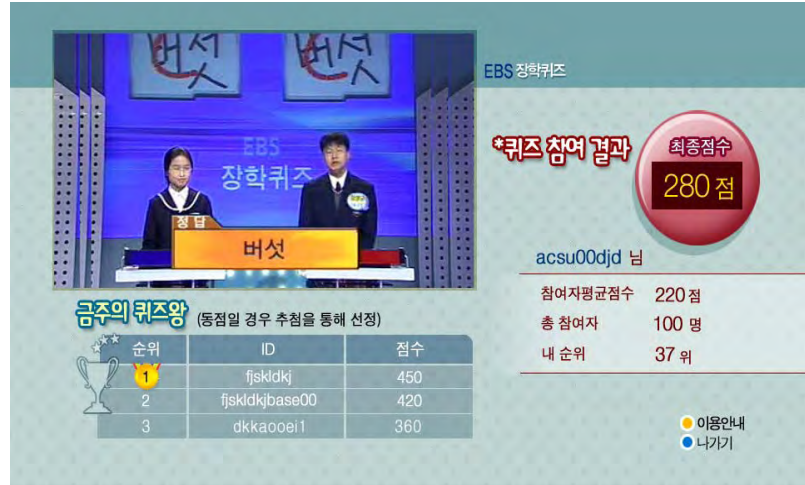
빙글빙글 퍼즐통

준비물 : 투명테이프 속심 2cm (3개), 5cm(3개) or 테이프 속심 2cm(3개), 스키치테이프 속심3개

1. 테이프 속심에 그림을 그려 붙인다.
2. 5cm통에는 어미(뿔), 2cm통에는 새끼(병아리)그림을 맞추어 끼워본다.

● 처음으로 ● 나가기

EBS: Bi-directional Data Service



Thank you.

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