

Handsets for Advanced Mobile Multimedia

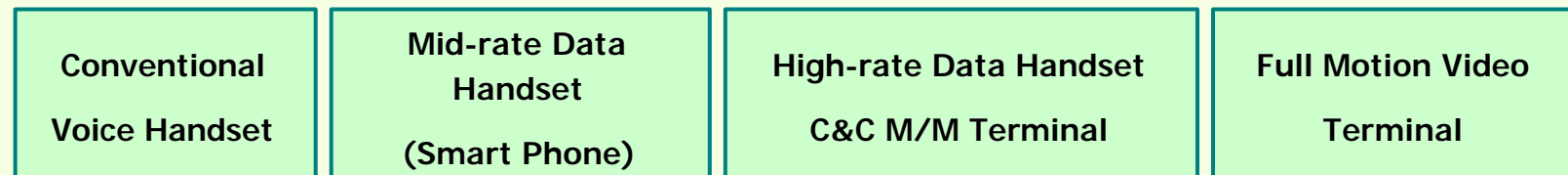
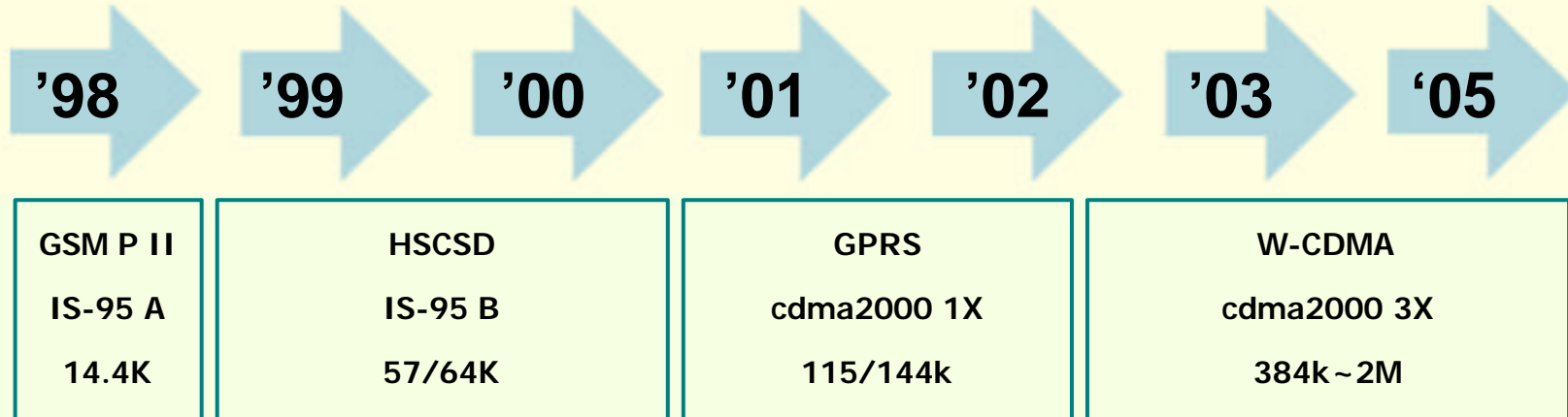
Presented
at
ITU-T Workshop on IMT-2000 and Beyond Systems
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Sr. Vice President
Samsung Electronics

Contents

- **Market Trends**
- **Overview of Korea Wireless Market**
- **Updates on Mobile Video Standards**
 - ✍ 3GPP
 - ✍ 3GPP2
- **Future Mobile Handsets**

Product & Technology Trend



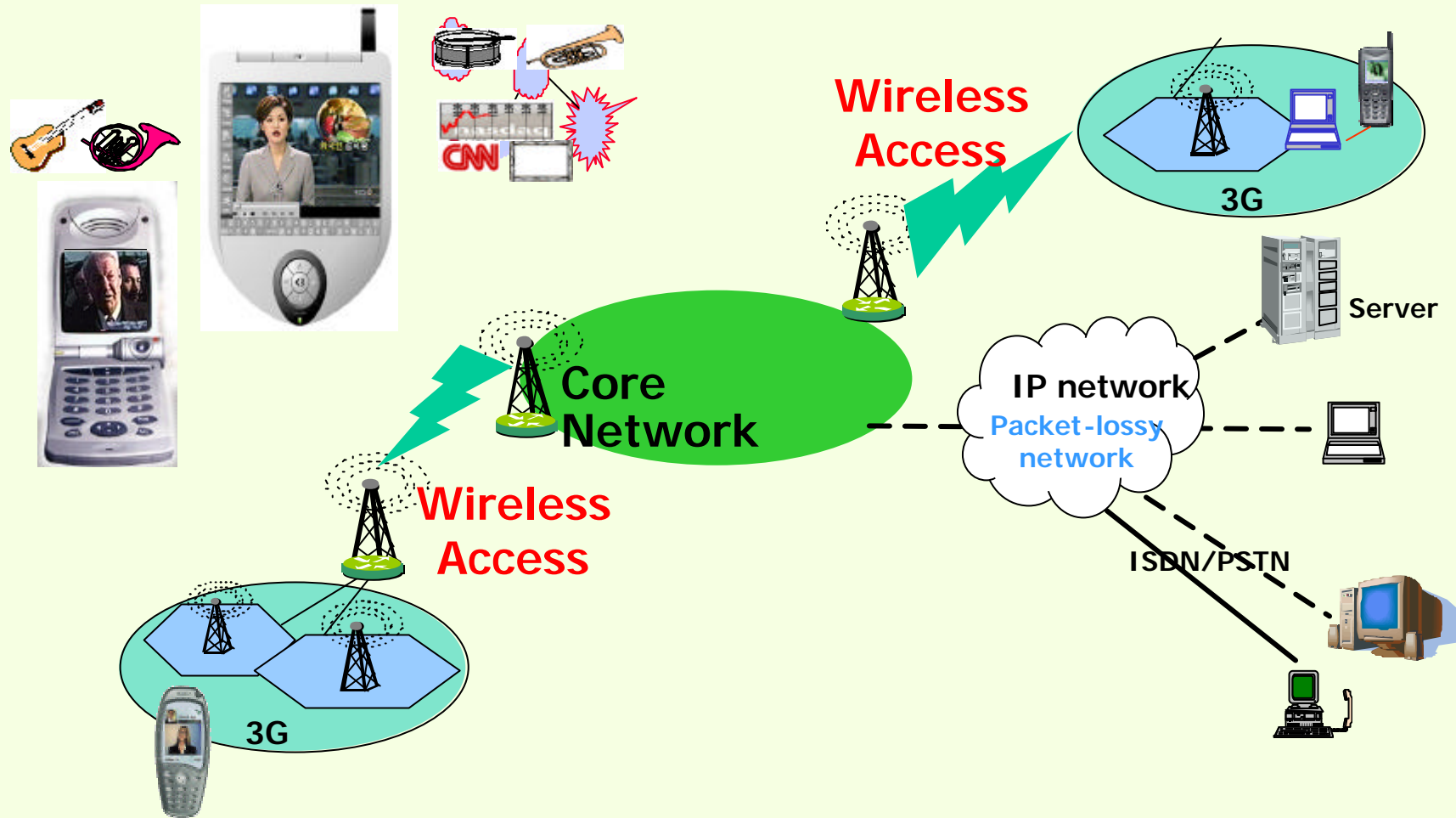
Change of Mobile Concepts

Status	~ 1999	2000 ~	2002 ~
Key Word	<ul style="list-style-type: none"> • Voice Communication 	<ul style="list-style-type: none"> • Mobile Internet 	<ul style="list-style-type: none"> • M-Commerce • Digital Convergence
Core Technologies	<ul style="list-style-type: none"> • CDMA,GSM,TDMA 	<ul style="list-style-type: none"> • WAP Browser • High Speed Data (cdma2000 1xEV-DO, GPRS) 	<ul style="list-style-type: none"> • IMT 2000 • Plug in S/W for Mobile Multimedia (Voice,Video)
Key Benefits to Customers	<ul style="list-style-type: none"> • Voice Communication at Anytime 	<ul style="list-style-type: none"> • Information Communication by Mobile • Easy & Fast Acquisition of Information 	<ul style="list-style-type: none"> • MM on Mobile • Getting Information at Anytime, Anyplace

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Emerging Mobile Multimedia Streams



Mobile Internet Subscribers in Korea (as of May 2001)

✎ Mobile Internet Subscribers: 12.5 M

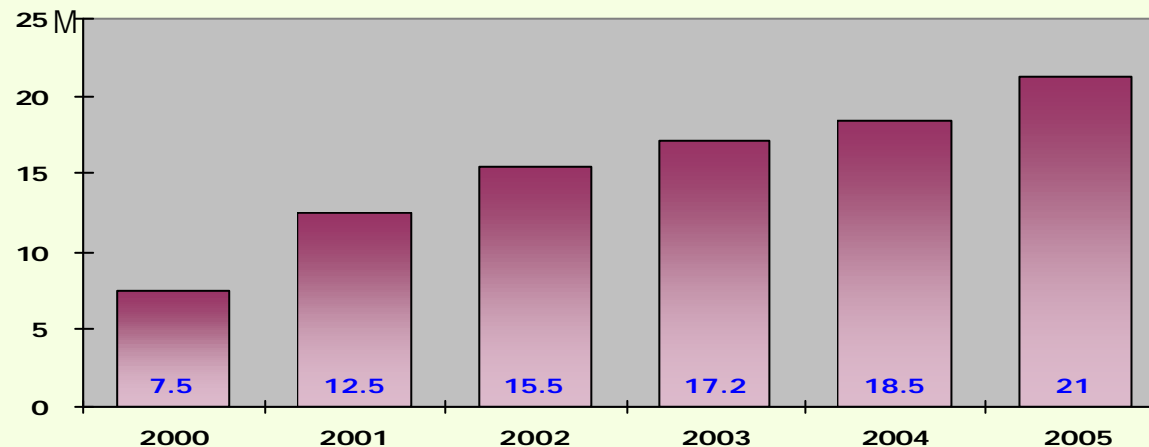
✎ Wireless subscribers ? 27M

✎ SMS service ? 8.3M, Browser service (WAP/HTTP) ? 10M

✎ Wired line Internet Subscribers: 18 M

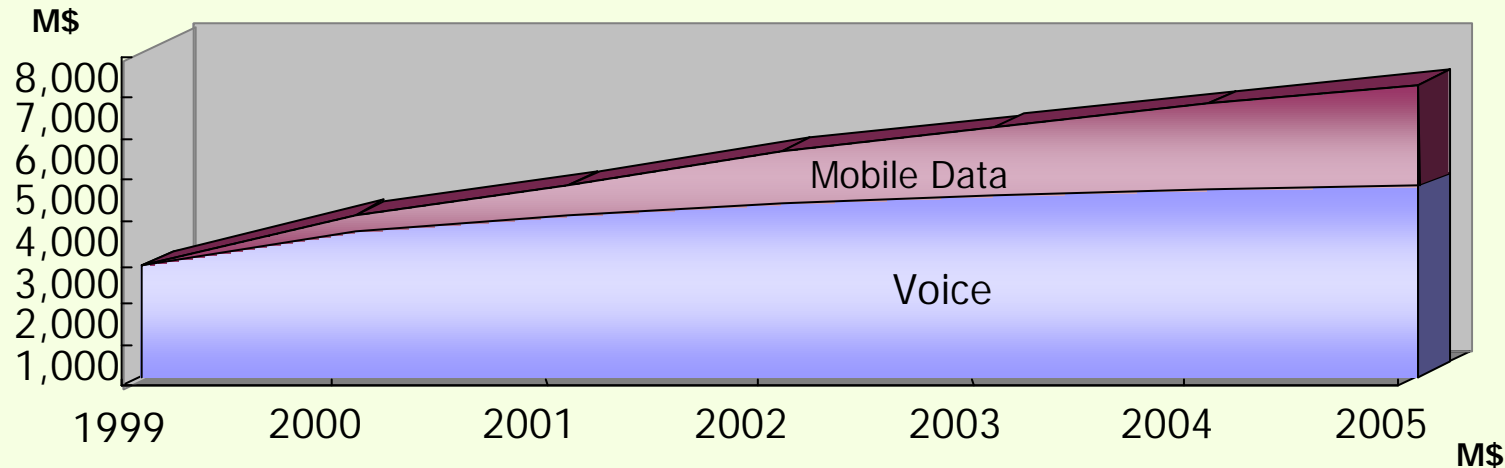
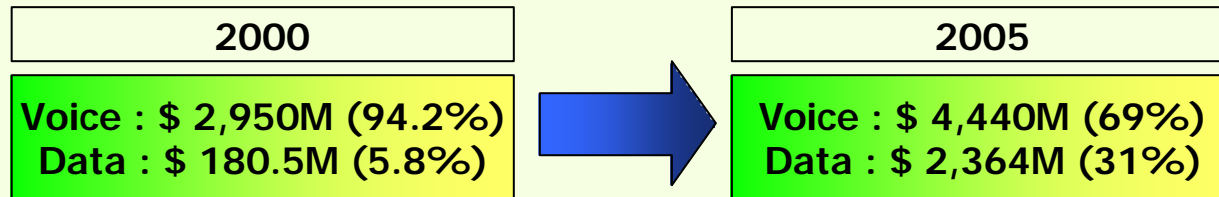
✎ ADSL subscribers > 7M

✎ Wired line subscribers ? 24M



[Source: "Korea Mobile Internet Market" 2001 by ETRI]

Mobile Data Market in Korea



	1999	2000	2001	2002	2003	2004	2005
Mobile Data	10	180	585	1050	1315	1496	2364
Voice	2700	2950	3920	4210	4300	4400	4440

[Source: "Korea Mobile Internet Market" 2001 by ETRI]

Products for Basic Multimedia Services

Watch Phone



- ✍ Wrist-worn Phone
- ✍ Weight : 50g
- ✍ Voice-activated dialing

TV Phone



- ✍ TV + Phone
- ✍ 1.8-inch Color
- ✍ TFT-LCD
- ✍ Clam Shell Type

PDA Phone



- ✍ Palm O/S
- ✍ Organizer
- ✍ UP 4.1
- ✍ HotSync

Products for Advanced Multimedia Services

MP3 Phone



MP3 Player + Phone
32Mb (8 Songs)
Data Storage Available

Camera Phone



Digital Camera + Phone
1.5-inch Color TFT-LCD
20 Pictures(350K pixels)

IMT - 2000 Phone



Video Telephony
High Speed Data
(Synchronous Mode)

World First cdma2000 1X commercialization

Basic System Design

April 1997

1Q 1999

Basic System Functionality Test

2Q 1999

1Q 2000

SprintPCS cdma2000 1X Trial (in US)

1Q 2000

3Q 2000

Field Trial in Korea

2Q 2000

3Q 2000

Commercialization in Korea

Oct. 2000

World First cdma2000 1X commercialization

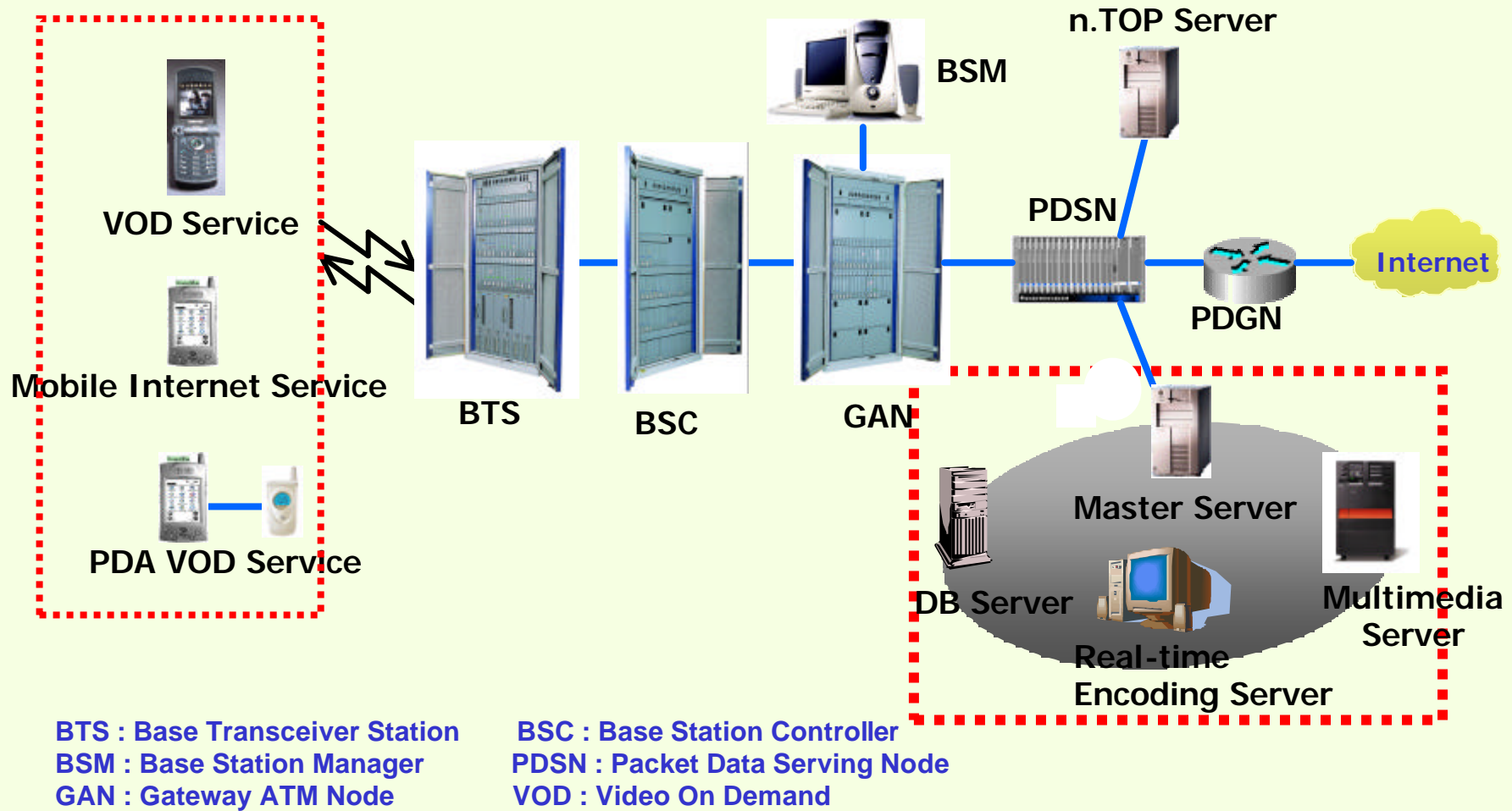


World First VOD Handset & Service

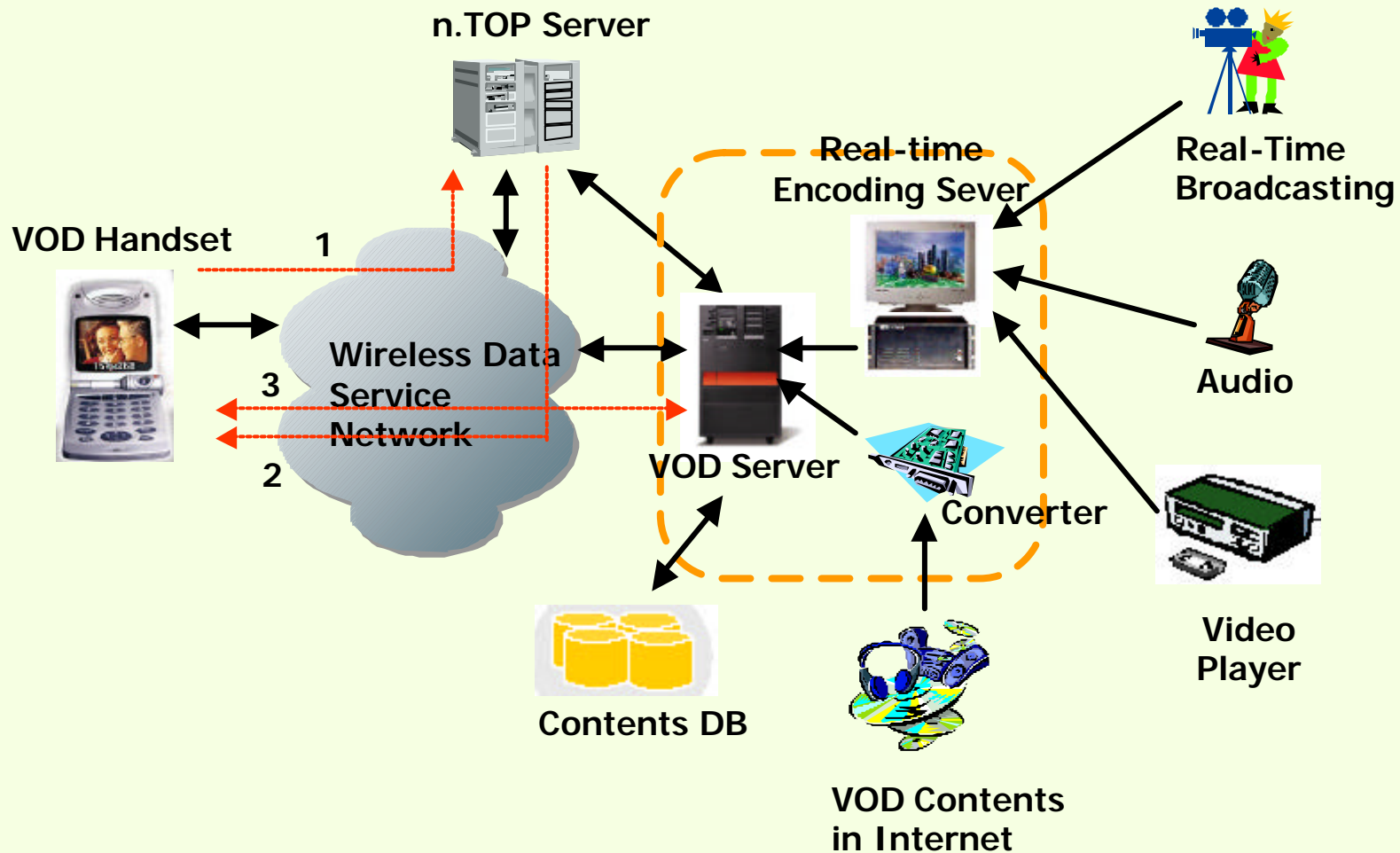


Model Name	SCH-X200 (VOD Phone)	SCH-X100 (Voice Only)
Launch Date	6/2001	11/2000
LCD	2' Color TFT LCD (12-line)	7-Line 4-Gray LCD
Battery	650mAh	520mAh
Battery Life (Small Size)	Talk: 133 min Online VOD: 100 min Standby: 180 hr	Talk: 135 min - Standby: 140 hr
Dimension	86.5(L) X 49(W) X 22.5(H)mm	85(L) X 45(W) X 19.7(H)mm
Weight	112 g	80 g
Key Features	Max 144Kbps data service WAP Browser VOD Player(MPEG4/AAC) Color GUI	Max 144Kbps data service WAP Browser Outside LCD displays Caller ID
Street Price	\$ 540.00	\$ 350.00

VOD Application Environments



VOD Application Server Functionality



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Current Status in 3GPPs

✍ 3GPP

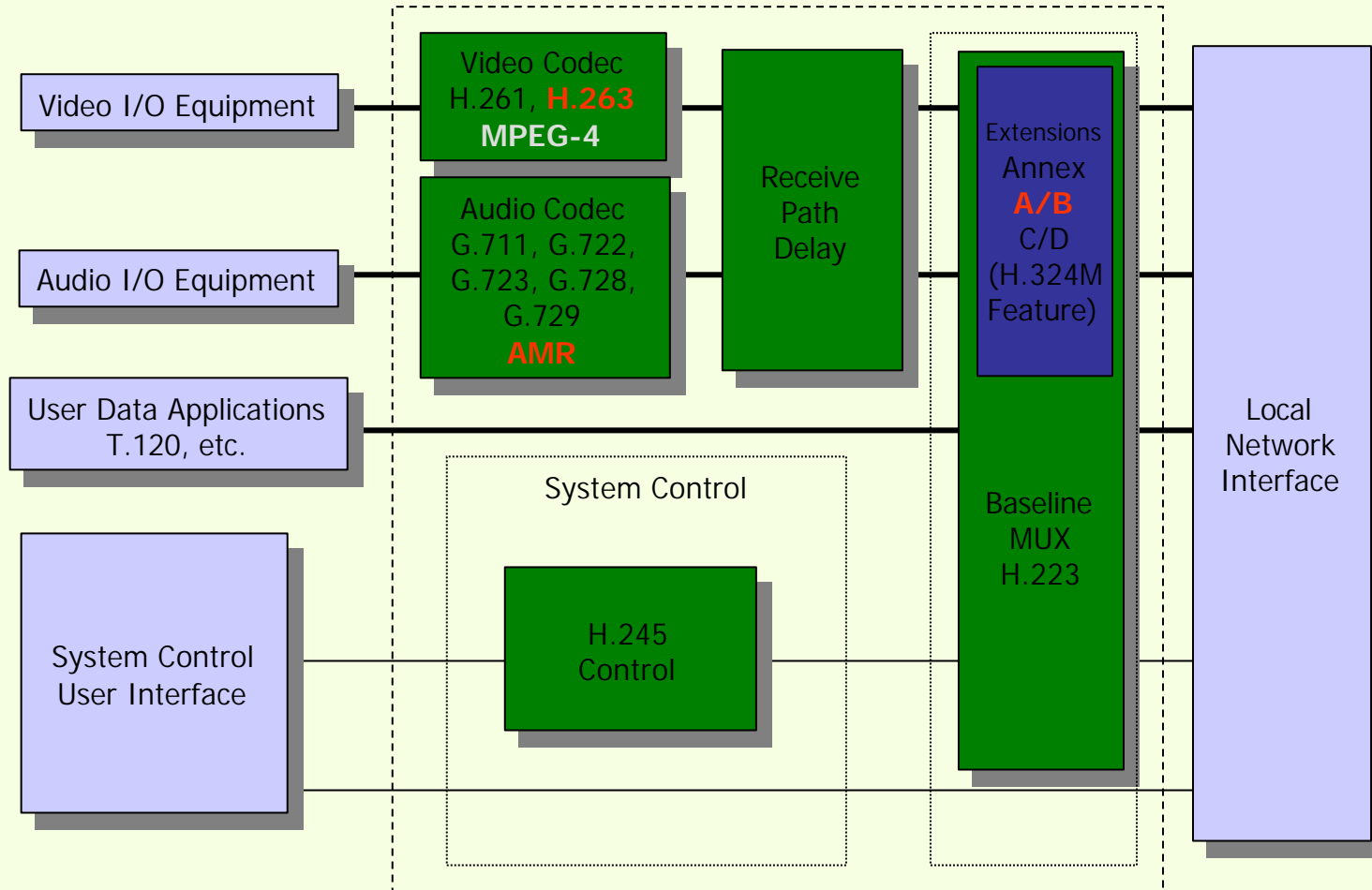
- ✍ Circuit Video Conferencing (frozen)
- ✍ Packet Video Conferencing (almost done)
- ✍ Video Streaming (under progress)
- ✍ Broadcasting (just started to work on Requirement)

✍ 3GPP2

- ✍ Video Streaming (ready to ballot)
- ✍ Circuit Video Conferencing (almost ready to ballot)
- ✍ Packet Video Conferencing (under progress)
- ✍ Broadcasting (just started to work on Requirement)

Circuit Video Conferencing in 3GPP

Scope of H.324 (ITU-T H.324M in blue box, 3GPP-mandated in red)



Note: 3GPP2 version is being discussed to fully take into account compatibility with 3GPP terminals

Protocol Stack (Circuit Video Conferencing in 3GPP2)

Video Codec

both MPEG-4 SP@L0 and H.263 base line

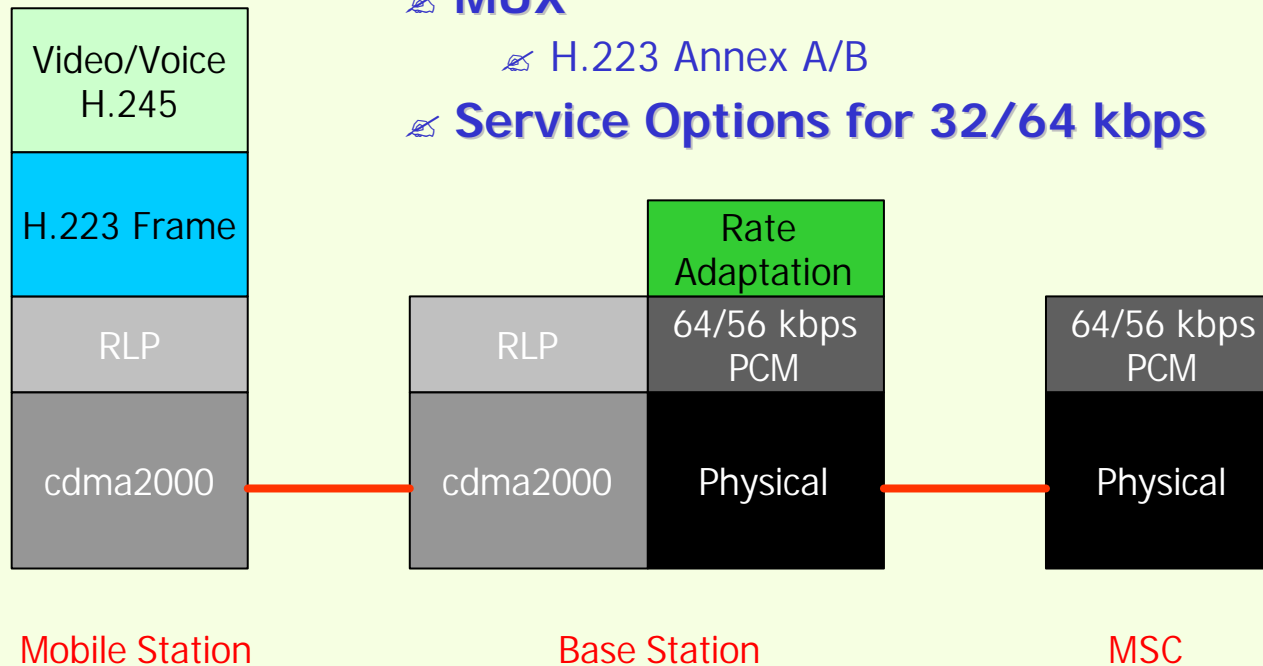
Speech Codec

No mandatory codec

MUX

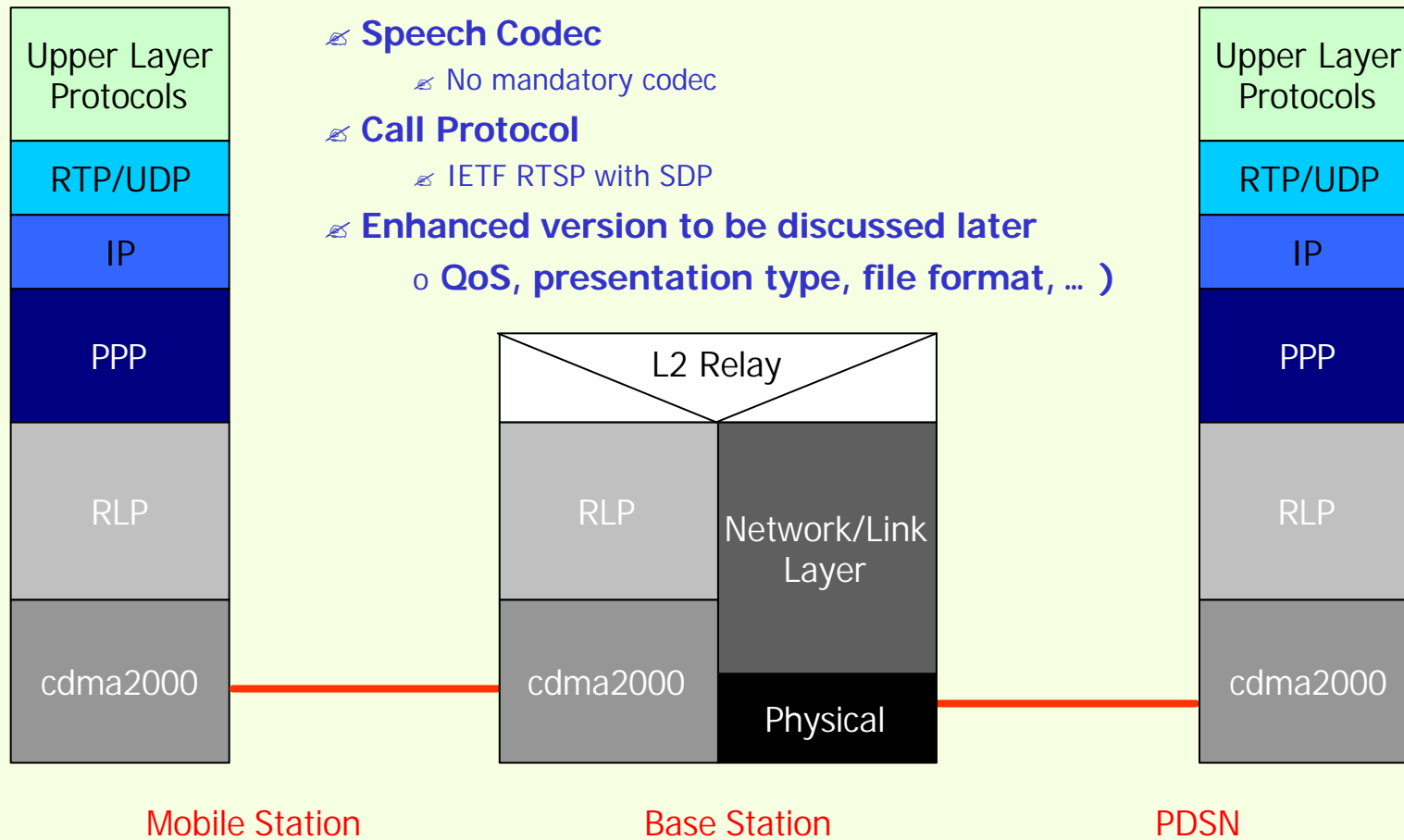
H.223 Annex A/B

Service Options for 32/64 kbps

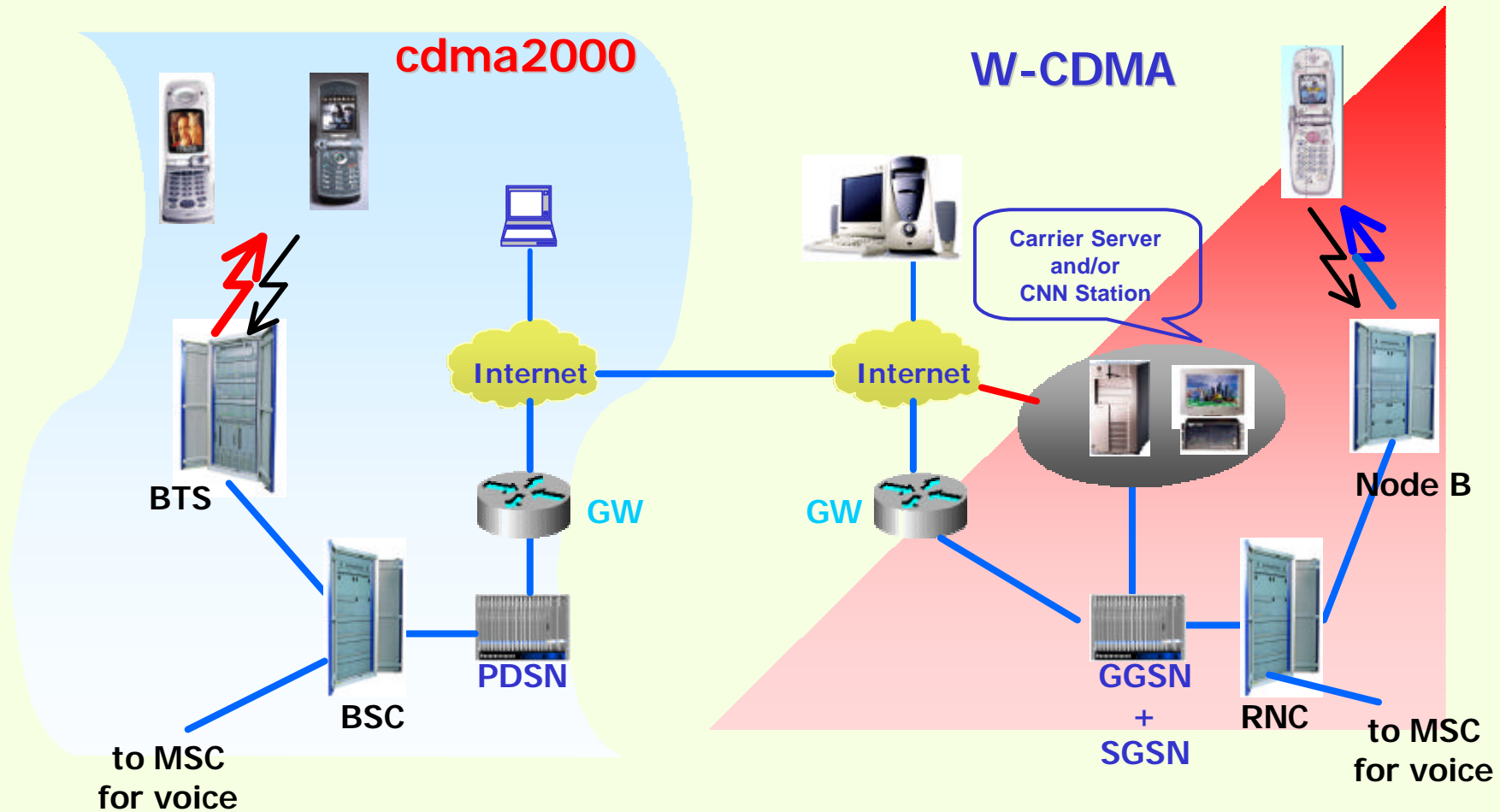


Protocol Stack (Video Streaming in 3GPP2)

- ✎ **Video Codec**
 - ✎ MPEG-4 SP@L0
- ✎ **Speech Codec**
 - ✎ No mandatory codec
- ✎ **Call Protocol**
 - ✎ IETF RTSP with SDP
- ✎ **Enhanced version to be discussed later**
 - o QoS, presentation type, file format, ...)





(Video) Broadcasting Environments





Issues on Broadcasting in 3GPPs

In 3GPP

-  Has been identified as work item in TSG-SA1
-  Requirements have been discussed

In 3GPP2

-  Stage 1 Document (=requirement) is close to approval
-  Potential technical issues include:
 - : 1x vs. 1xEV-DO for target framework
 - : Physical CH for broadcasting
 - : Message flow
 - : Optimizing IP layer (header compression, encryption)

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Issues on Mobile Video Applications

✍ Service Perspective

- ✍ Brand-new services in line with quality-life
- ✍ Security/billing

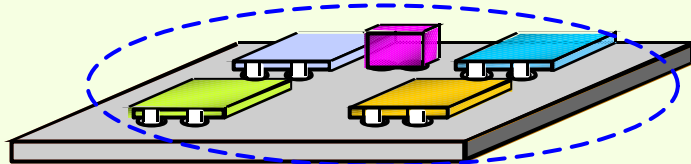
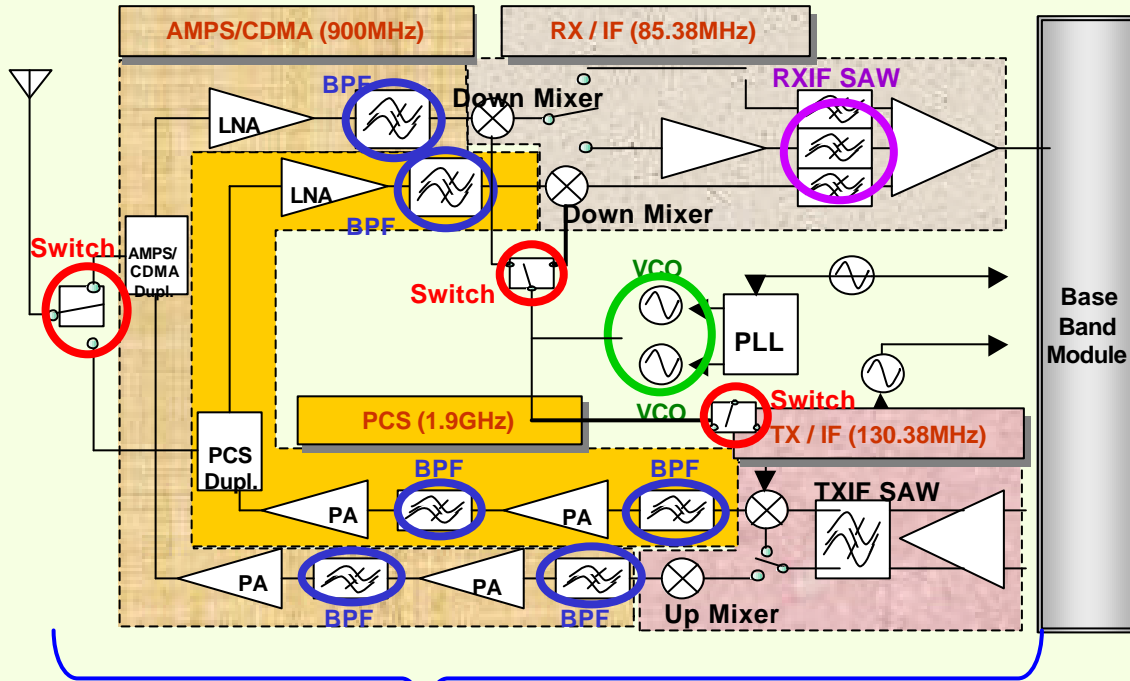
✍ Standard Perspective

- ✍ Normal mode: Selection of application layer features
- ✍ Aggressive mode: Try to optimize lower layer also
 - ✍ New physical CH and associated signaling, physical frame size, end-to-end QoS, etc.
- ✍ Backward compatibility with previous versions (recommended)

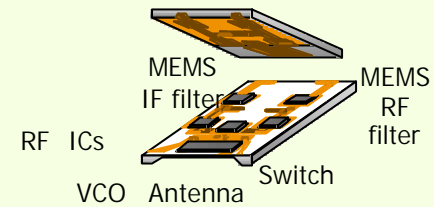
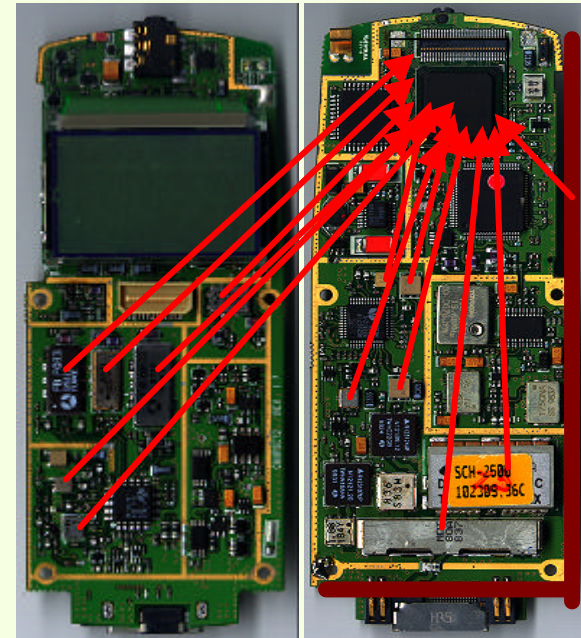
✍ Terminal Development Perspective

- ✍ HW-SW co-design for high speed and low power operation
- ✍ Multi-mode, Multi-band Operation
- ✍ Intelligent error-robust operation against lossy mobile (packet) links
- ✍ Battery life time
- ✍ High quality display

RF MEMS



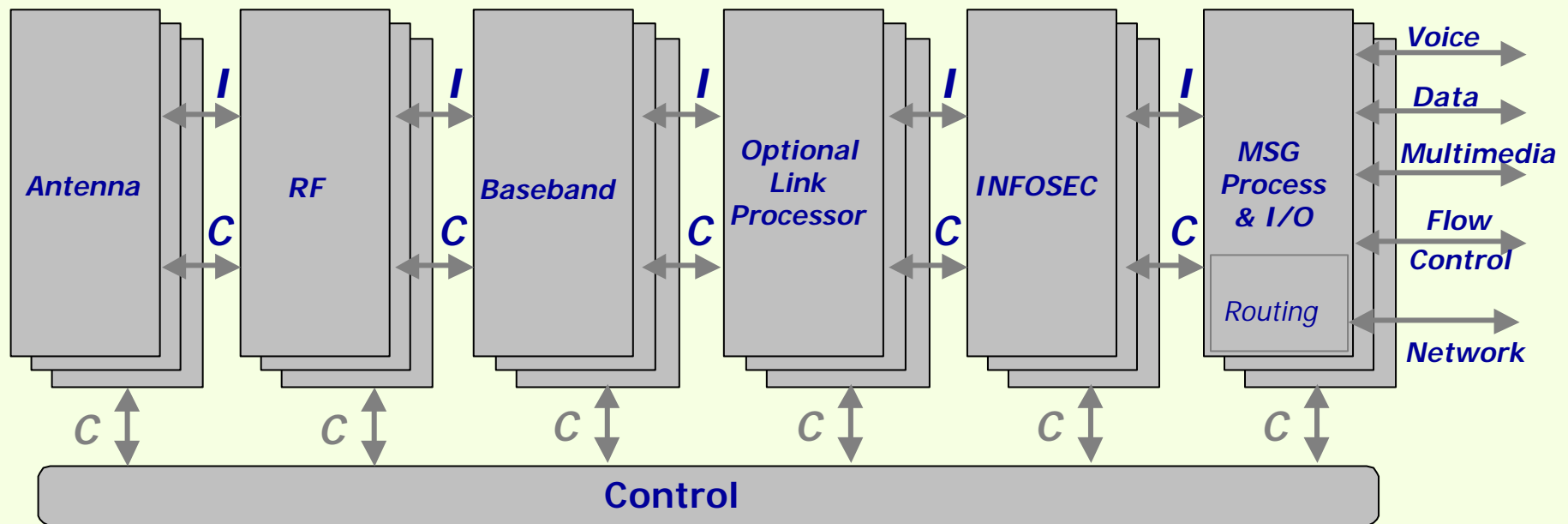
PCB - Implementation
 (~40X50 mm)



Tranceiver On Chip
 (< 15X15 mm)

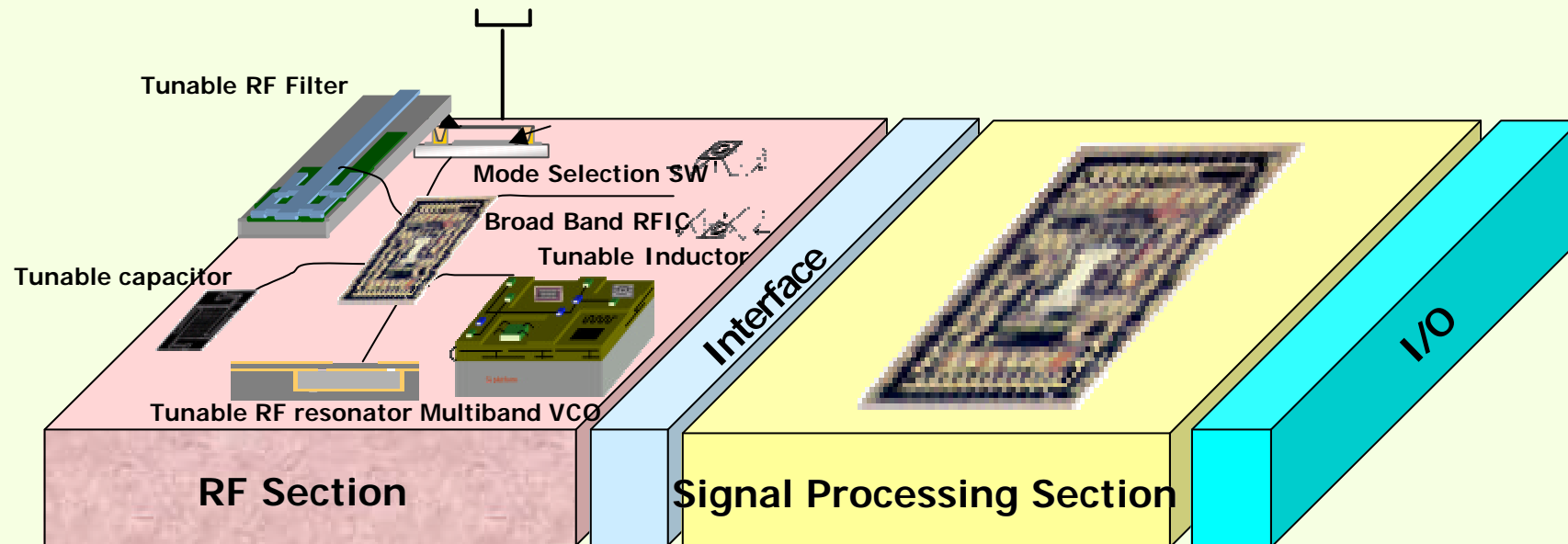
SDR

- ✎ Modular hardware and software
- ✎ Hardware reconfigurability and software programmability



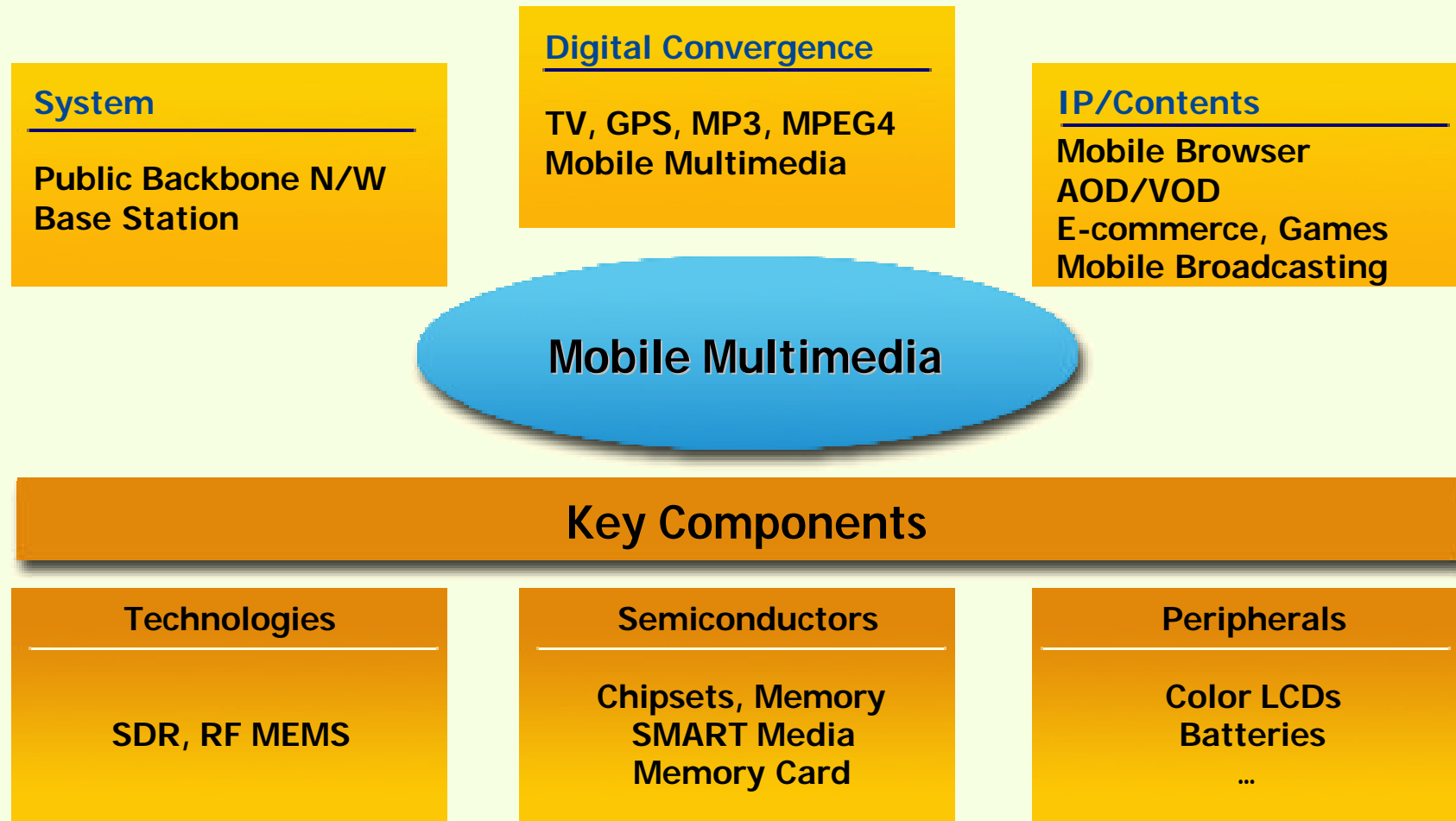
Future Mobile Handsets

RF MEMS + SDR



Single Packaging!!

Synergy by Vertical Integration



SAMSUNG DIGIT*all*
everyone's invited™

Thank You !

