



Harmonization & Convergence of Evolving IMT-2000 Networks

*ITU-BDT Seminar, Sofia
22-24 January 2003*

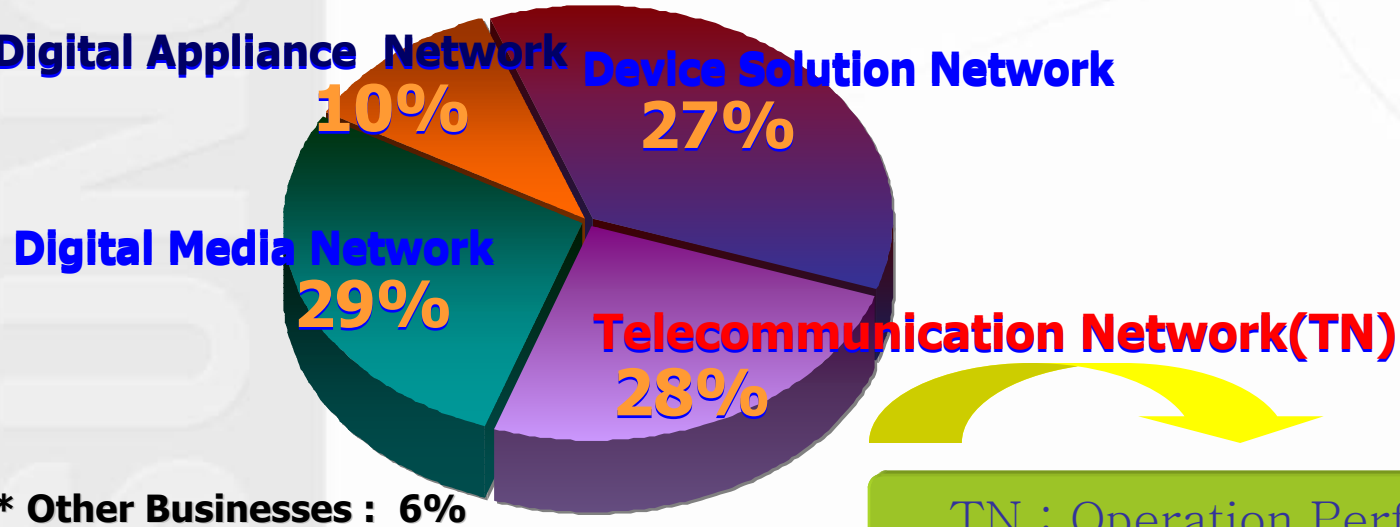
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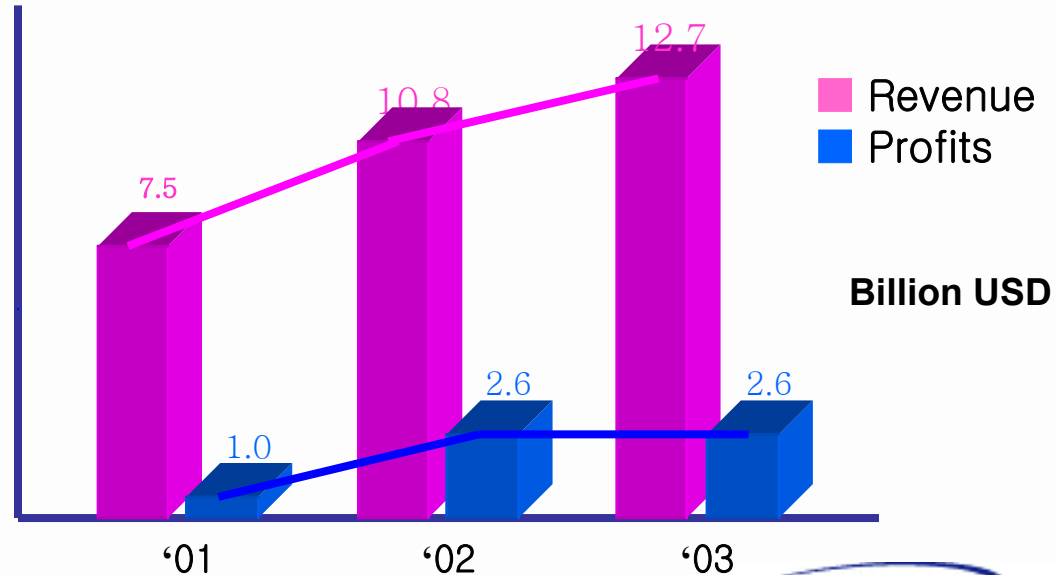
- **Overview of Samsung Electronics**
- **Mobile Market Trends**
- **Harmonization of Core Networks**
- **Convergence of Fixed and Wireless Networks**
- **Conclusion Remarks**

Samsung Electronics

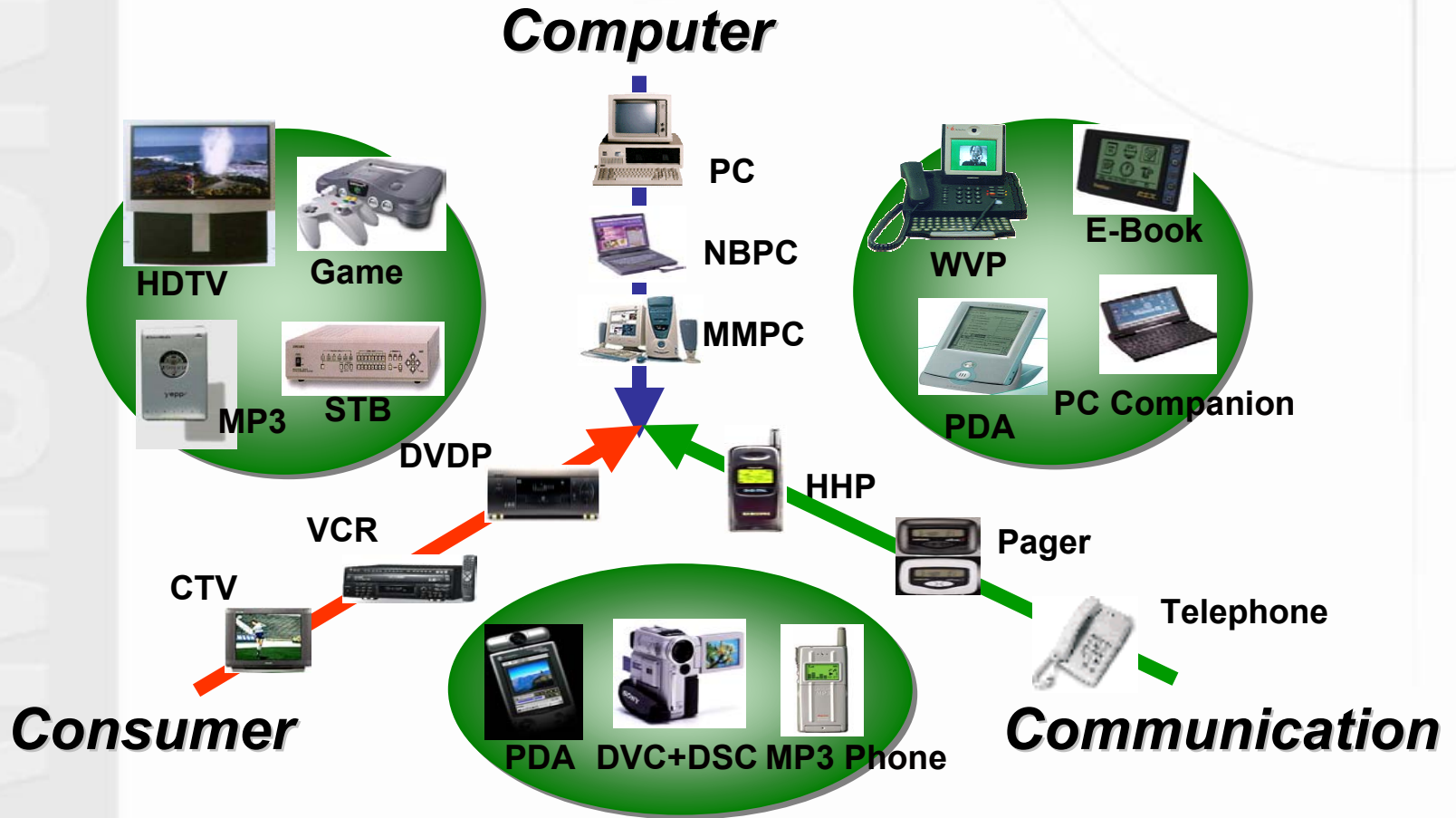
Organization & Sales Breakdown



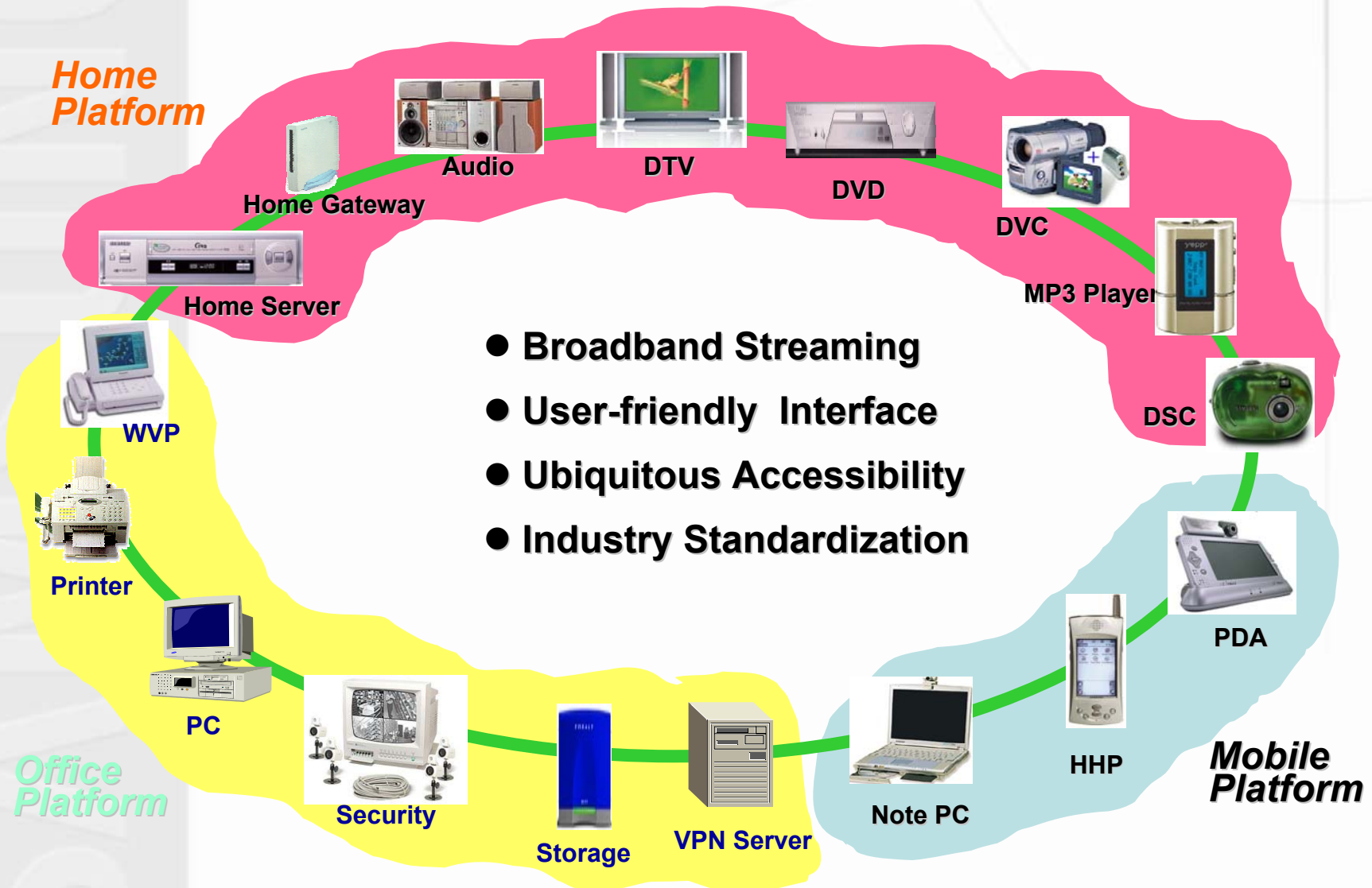
TN : Operation Performance



Digital Convergence



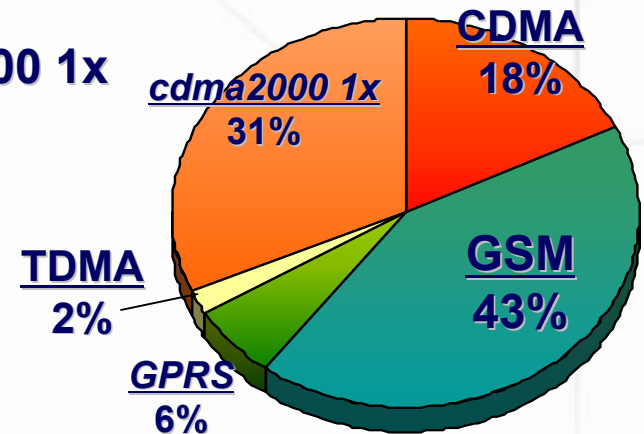
Providing Seamless Digital Network



Handsets Business

■ World Rank No.3 in Handset Sales('02)

- Volume increase of GSM/GPRS and cdma2000 1x in overseas market
- Maintain leading position with high-speed multimedia phones in domestic market



■ Operating margins are strong

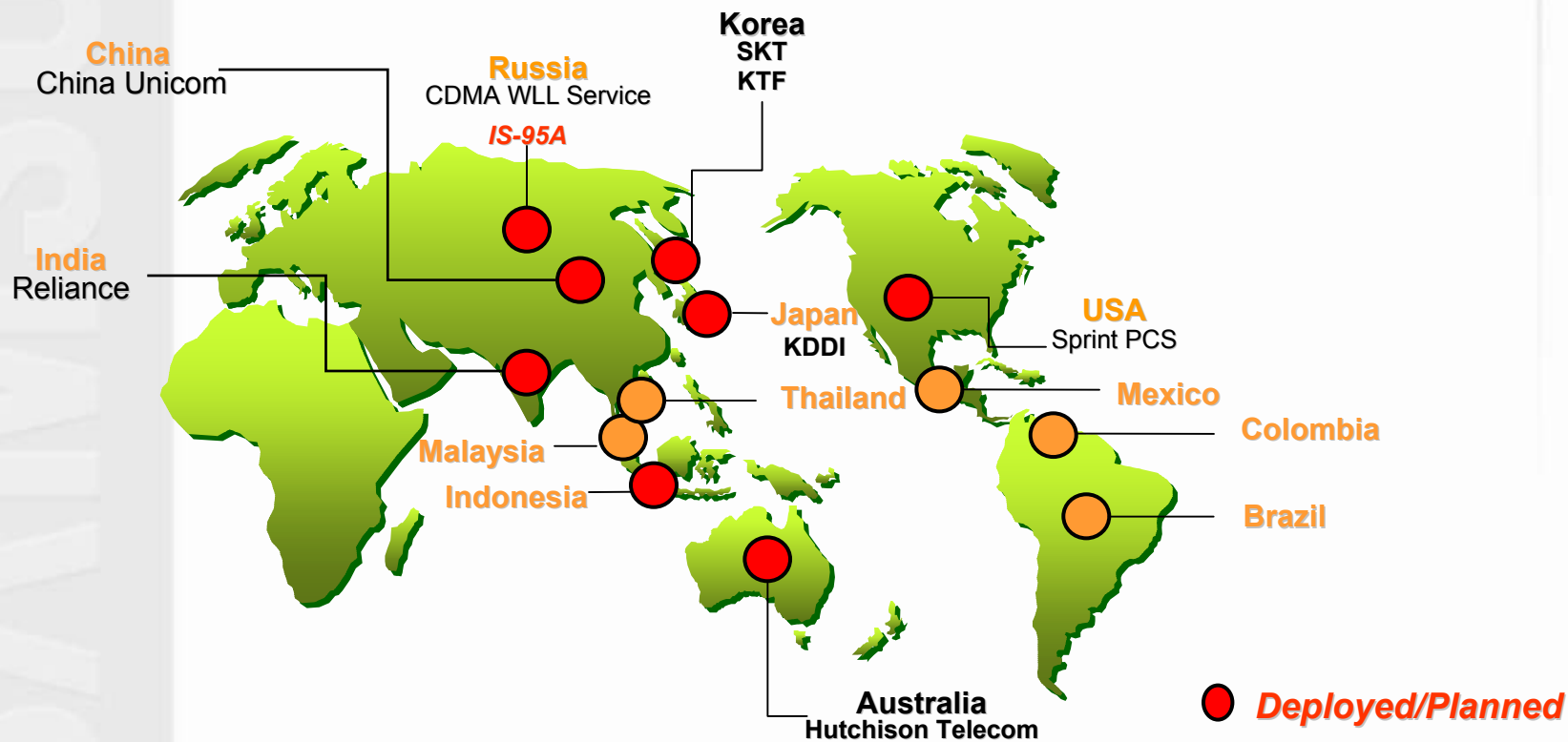
- New features such as Color TFT-LCD, 40 Polyphonic, MMS, Camera, etc help to improve ASP for handsets
- Replacement demand for new featured phone is growing as the migration to 3G services begins accelerating

Telecomm Network : Business Overview

Mobile Networks

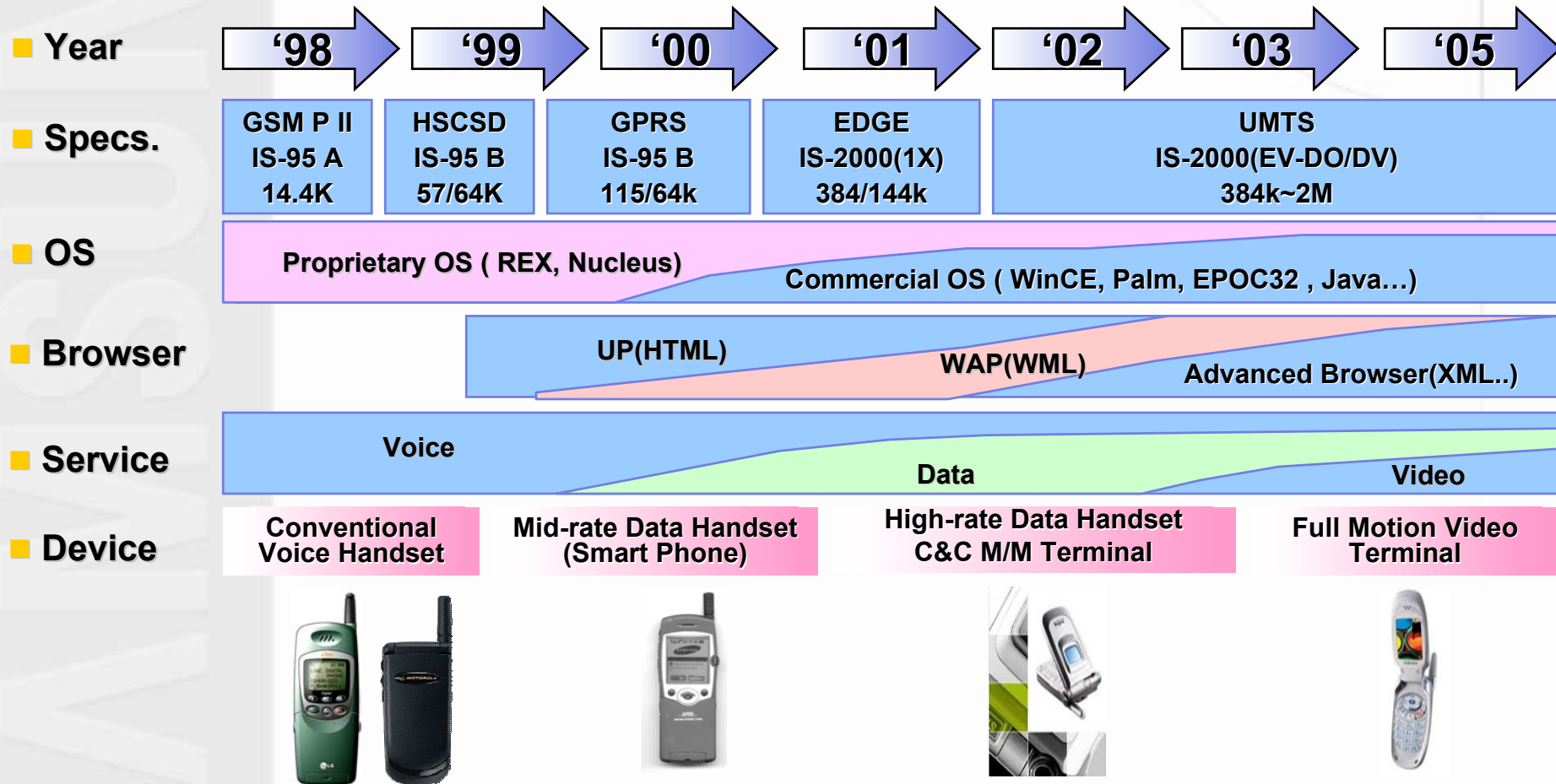
- Domestic : cdma2000 1x full expansion and upgrade to EV-DO (Feb, 2002)
UMTS deployment with SKT (June, 2003)
- Overseas : Increasing adoption of CDMA technology worldwide

Global CDMA deployment



Telecomm Network : Technology Roadmap

Roadmap: Wireless Communications



IT Power in Korea

What is going on in Korea?

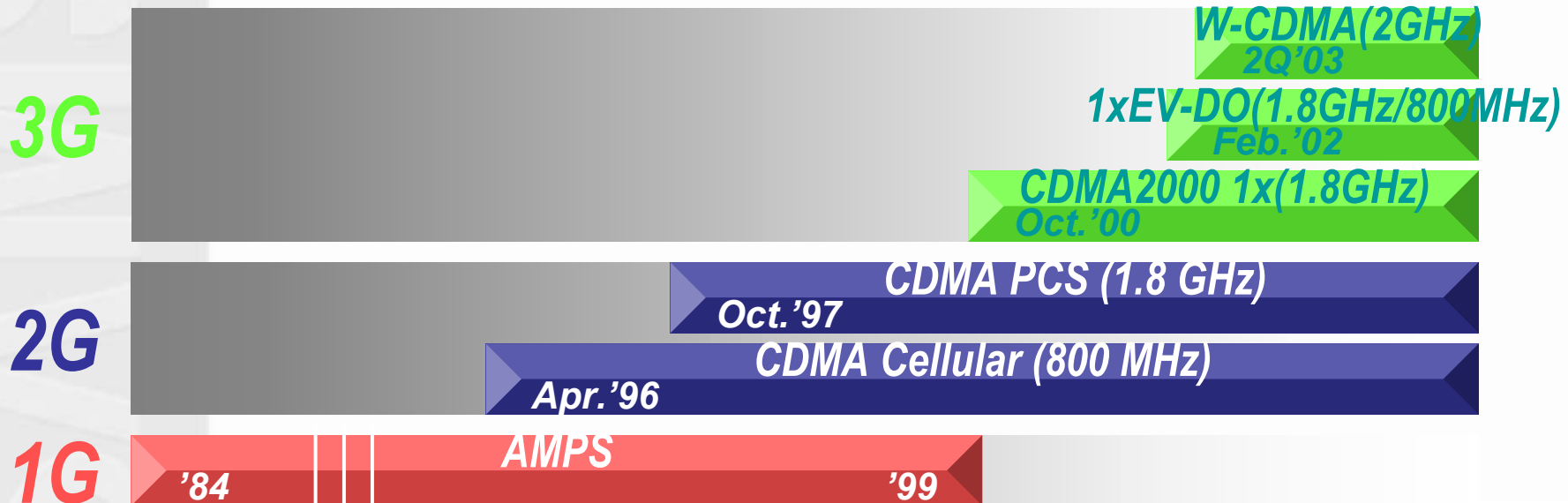
■ Dynamic & Explosive Market

- World No.1 Broadband subscriber penetration rate (51%)
- World No.8 Mobile Subscribers (32 Mil., penetration rate 63%)
- Mobile exceeded Wireline Subscribers in 1999

Korea in the forefront

■ Rapid Transition to Multimedia Mobile Service

- Early adoption of new technology
- 1G → 2G : 12 Years 2G → 3G : 4 Years



Wireless Industry Trend

- **3G systems are evolving to provide enhanced capabilities to meet end user needs**
- **3G IP core networks are migrating towards a common packet switched architecture using IETF protocols**
- **Service providers are moving towards support for an IP based multimedia service concept**
- **Convergence of fixed and wireless networks provides additional synergy**

Harmonization of Core Networks

- **W-CDMA and CDMA2000 core networks have lots of commonalities but have different architectures**
- **Harmonization of CN can foster global roaming across evolving IMT-2000 networks**
- **Facilitate cost-effective IMT-2000 networks deployment based on the standardized open interfaces**
- **Harmonized IP CN should give network operators ability to deploy new services without adverse impact on other common systems**

Drivers for IP CN Harmonization

■ Extended Service Opportunity

- Harmonized CN is needed by operators to provide the opportunity of service transparency, seamless roaming and common application
- Service can be extended and enhanced without impact and additional investment on existing IP CN

■ IP based Trend

- Service creation over IP based CN could become easier
- Abundant Internet services can be easily provided and accessible
- Direction is moving toward IP based multimedia service

■ Promising Aspect of Access Transparency

- Increasing heterogeneity of access technologies give rise to the strong need for an IP based CN
- Long-term investment in IP CN is possible regardless of fast access technologies development

Benefits of CN Harmonization

■ For Users

- Easy roaming
- Variety of services
- Reduced user cost

■ For System Vendors

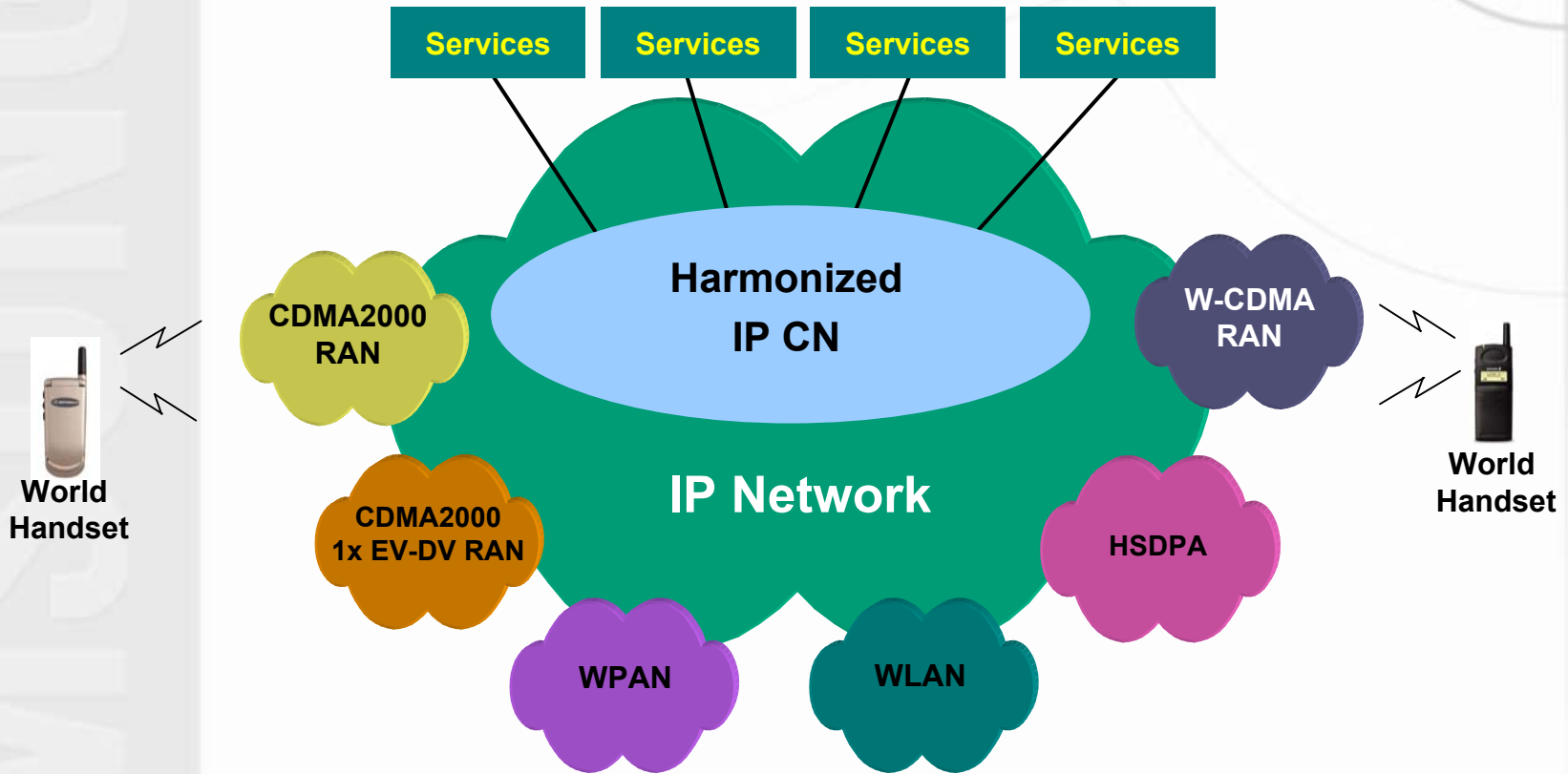
- Open architecture
- Single platform

■ For Network Operators

- Reduced deployment cost
- Facilitate service transparency
- Provide high commonality and feasibility that will accelerate deployment of IP multimedia services



Harmonized IP Core Network



Concept of a common IP CN designed to ensure service transparency between evolving IMT-2000 systems and access technologies through IP-based network

Standards Progress for CN Harmonization

- **IP CN workshop in Toronto (3-4 April 2002) recommended following points:**

- **IP Multimedia Service (IMS) for CN Harmonization area**
- **Alignment of 3GPP IMS and 3GPP2 MMD was recognized**
- **Interactions among 3GPPs and IETF are anticipated**

3GPP

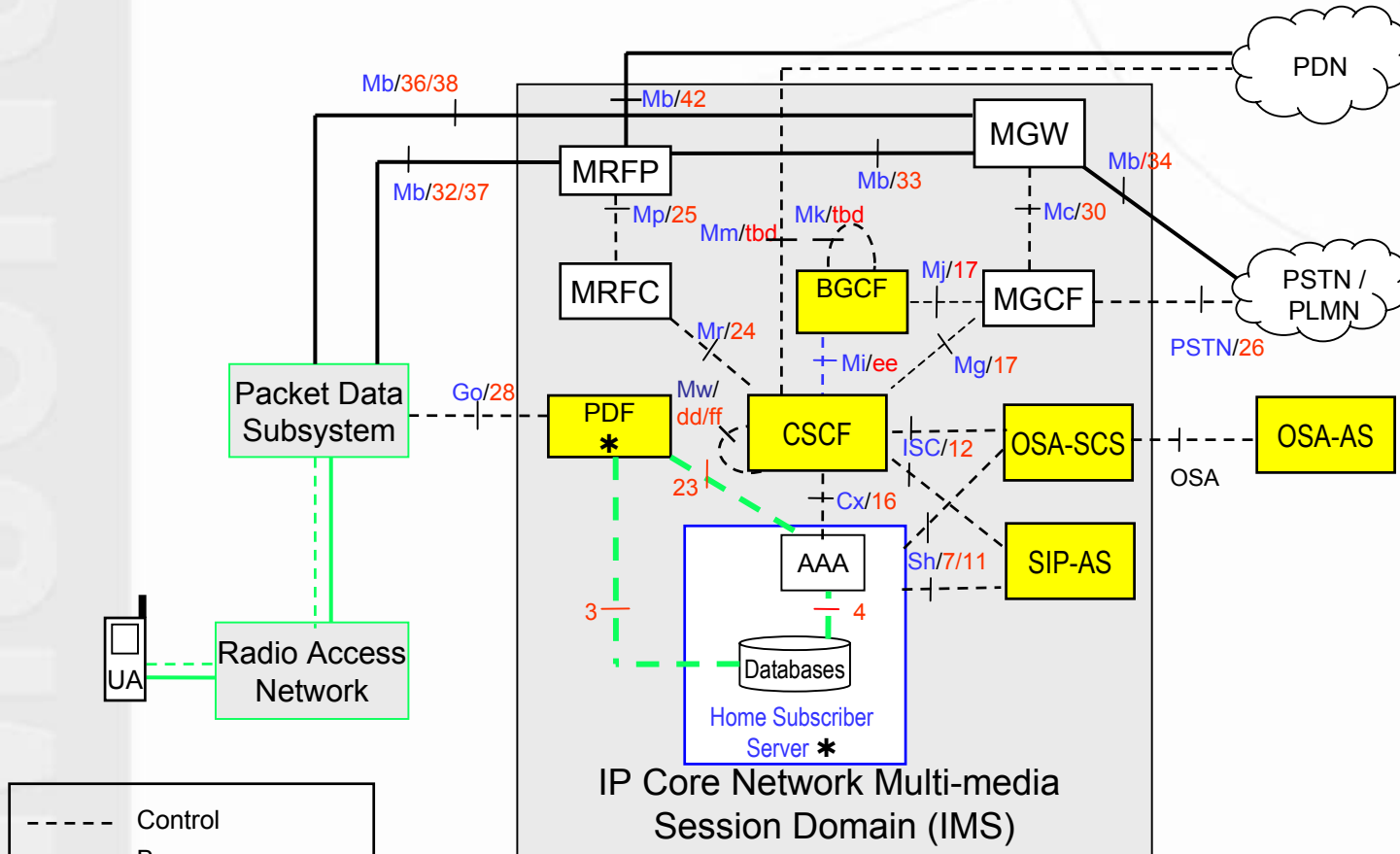
- **Recognize the need of a common all IP architecture and working on the commonality and Interoperability between IMS CNs at 3GPP SA WG2**

- **3GPP2**

- **Harmonization issue is studied in TSG-S Vision ad-hoc group and WG2(architecture)**

IP CN Harmonization Reference Model

IMS (IP Multimedia Service) Domain



- * For 3GPP, the PDF is within the P-CSCF. For 3GPP2, the PDF is a network entity of it's own.
- * For 3GPP the HSS also contains HLR functionality which is not shown here. For 3GPP2 the AAA function shown in the HSS is a stand-alone entity.
- * Additional interfaces exist in both the 3GPP and 3GPP2 reference models but are not included in this proposal for harmonization.

Convergence of Fixed and Wireless Networks

ITU-T SSG Q.7 Issues

- **Global roaming for the users irrespective of the access mechanism or the technology**
- **Extend 3G services to other areas where 3G radio technology is not available**
- **Access of the same set of services that a user gets in his home network, depending on the fixed terminal capability like no terminal mobility**
- **Development of mechanisms to support a foreign subscriber's registration and authentication and access to the service profile server of the home network by the visiting fixed network**
- **Common architecture of fixed and wireless based on IP packet network**

Converged Fixed and Wireless Network

■ Service Aspects

- Mobile and W-LAN can be converged and provided as one service with one subscription

■ Network Aspects

- New access technologies and services can be easily adapted in IP based common core network

■ Application and Contents Aspects

- Application and contents can be provided regardless of access technology

■ Personal Network Aspects

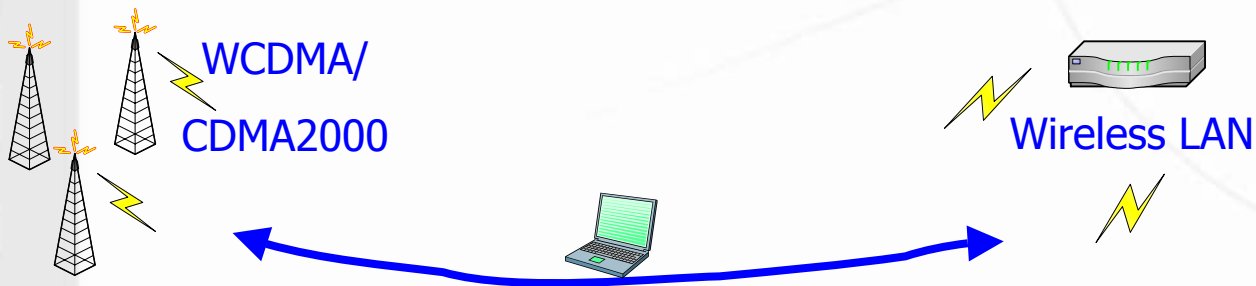
- User can use personalized service in virtual environment regardless of network and access technology

Drivers for Convergence

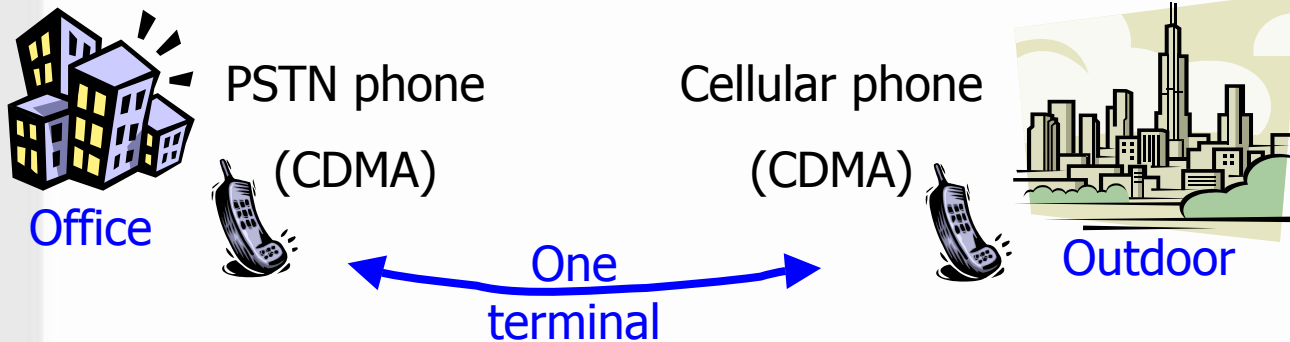
- **Internet has begun the wave of Convergence**
 - **Internet Traffic is carried over all types of medium and technologies**
 - **Supporting a wide variety of applications:**
 - **Phone calls over wired/wireless Internet**
 - **Video conferencing over wired/wireless Internet**
 - **Wired Homes: Interactive Gadgets controlled through wired/wireless Internet**
 - **Interactive TV over wired/wireless Internet**

Early Step in Convergence of Fixed and Wireless network

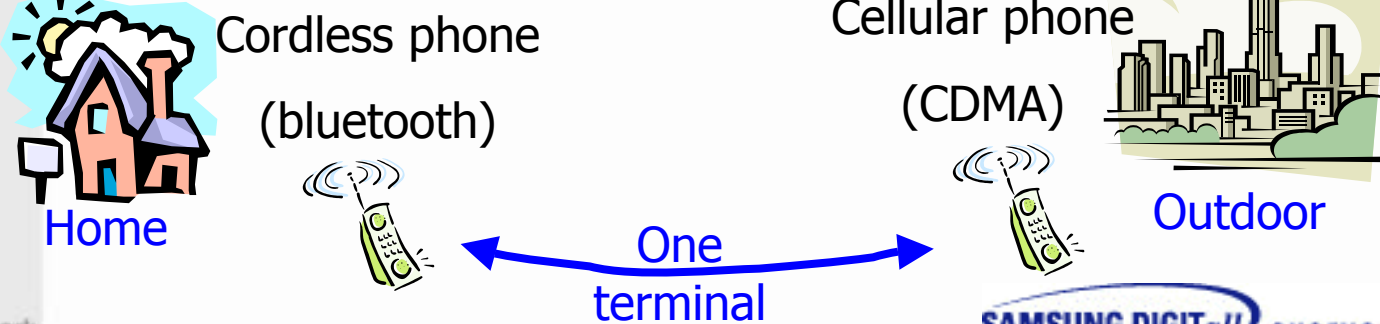
Mobile-WLAN interworking



Infomobile (Wireless PBX)



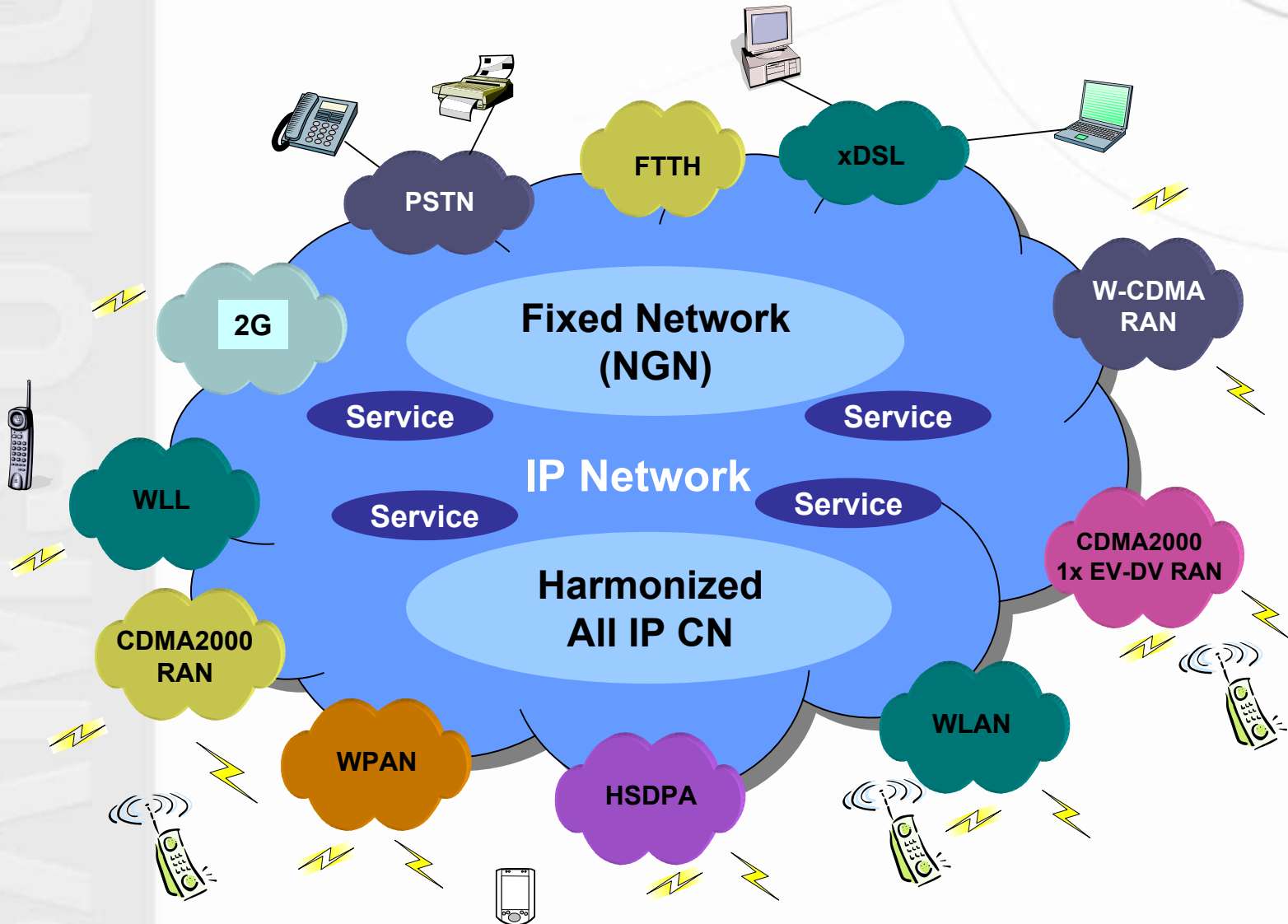
One phone



Core Technologies of Convergence

- **Open API Gateway**
 - Parlay/OSA/JAIN API based Gateway
- **Wired/Wireless converged Softswitch**
 - IP based Multimedia call control of PSTN, Mobile, WLAN
- **Virtual Switch/Router**
 - IPv6 Processing Engine and wired/wireless network control
- **Multi-band broad wireless access technology**
 - Multi-band Transceiver
- **Wired/Wireless converged terminal core tech.**

Conceptual Architecture for Converged network



Conclusion Remarks

- All the evolved 3G network services and applications will be migrating to all-IP based core network
- Core networks are to be harmonized and converged for users to provide seamless services regardless of access technologies
- Operators can adapt new access technologies as plug & play based on IP based harmonized core network
- Converged network can provide users seamless roaming between fixed and wireless networks and a unified personalized service
- Beyond 3G network strategy is needed to promote future universal terminals that can balance and optimize the converged fixed and wireless networks with a global economy of scale