NG Mobile and Wireless

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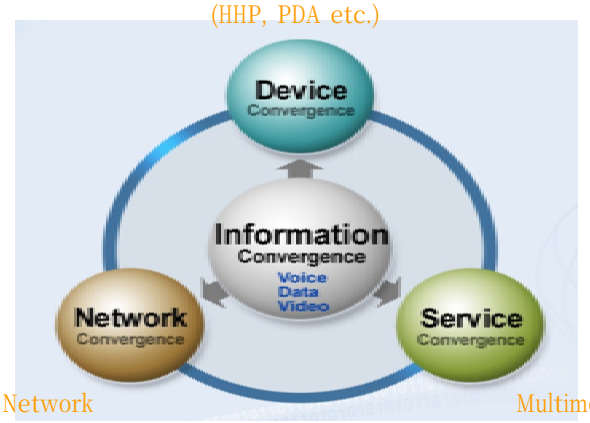
IT Mega-Trends

- Being Digital
  - Analog to Digital and Software
  - Media/Service convergence: Multimedia
- Being Networked
  - Narrow band to Broadband
  - Network convergence: All IP network (Internet)
- Being Mobile/Wireless
  - Being mobile, wireless and tether-less
  - Device convergence: Smart Personal Hub

IT Trends

NEXT

Smart Personal Hub
(HHP, PDA etc.)



All IP Network
(Internet)

Multimedia
(Voice, Data, A/V etc.)

Technology Trend (1): Being Digital

BACK

- Being Digital
  - Drivers: Moore's law and Learning curve
    - Number of transistors per a chip doubles every 18 months.
    - The more production, the less time and cost
  - ☞ Customer's computing power keeps growing enough.
    (About 10-100 Million times of computing power since 1960s)
    - Analog → Digital and RF → Digital
    - All in one CPU, SOC(System on a Chip)
    - Media Convergence: Multimedia (voice, audio/video, data)
    - Digital → software, IT → non-IT industries
- Paradigm shift
  - Network control power are moving from Service Providers(Centralized) to Customer(Distributed)
    - Data comm.: Main frame to Personal Computer
    - Telecom: Class 5 switch to Router

Technology Trend (2): Being Networked

BACK

- Being Networked
  - Drivers: Metcalfe's law and Reed's law
    - Total network value is proportional to N(Number of terminals)^2
    - Total communication group rises by $2^{N(\text{Network Size})}$
  - ☞ More terminals are getting more connected.
    - Fiber based Core network: Information superhighway
    - Access network is now the bottleneck
      - Still Communication cost >> Computing cost
      - Broadband solutions (Cable modem, A/VDSL, FTTx)
- Paradigm shift
  - Internet becomes an utility enabling "distance-free" life
    - Circuit switched (Data over) Voice network
      to Packet switched (Voice over) Data network
    - Internet protocol (TCP/IP) dominant

Technology Trend (3): Being Mobile/Wireless

BACK

- Being Mobile/Wireless
  - Drivers: Maxwell's law and Moore's law
    - Network are getting mobile and wireless
  - ☞ Mobile/Wireless access become the primary network.
    - Telecom
      Cellular system: 1G Analog, 2G Digital and 3G IMT-2000
    - Data comm.
      Wi-Fi W-LAN(802.11a/b/g) Frenzy
    - Wireless connectivity
      Zigbee, Bluetooth and UWB
- Paradigm shift
  - Network becomes "Any time, Anywhere" available
    - From Kbps somewhere → Mbps somewhere (wireline)
      to Kbps everywhere → Mbps everywhere (wireless)

Next Generation Mobile/Wireless

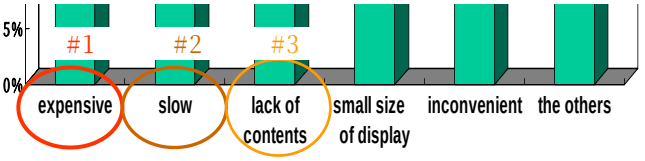
NEXT

- What's wrong with 3G (IMT-2000) ?
  - Technology-driven, Not Market-driven
  - Data over voice network: against mega-trend
- What customers complain?
  - Expensive
  - Slow
  - Lack of Contents
- Vision of Next Generation Mobile and Wireless
  - Personalized service
    - Open, not walled garden, service
  - All IP based network
    - Cellular + WLAN (+ WPAN)
  - Universal terminal
    - HHP, PDA, A/V devices, Wallet etc.
    - Being Personal Hub

What Customers Want ?

BACK

- Customer's complaints
  - Expensive
  - Slow: Connection and Transmission
  - Lack of Contents
- Operator's requirements
  - Enhance Profit
  - Open up New market



NG Mobile/Wireless Vision 2010: Service

BACK

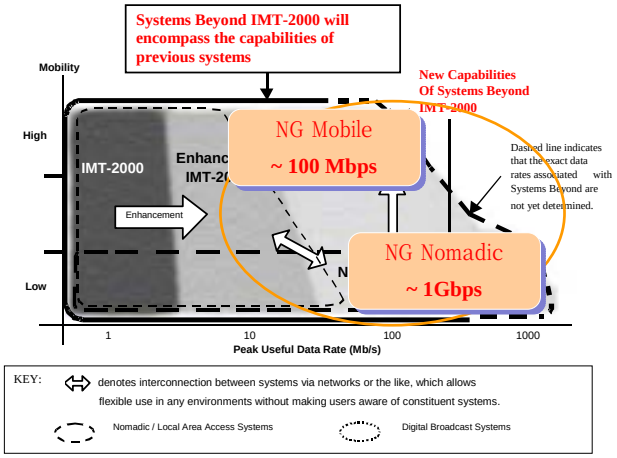
- Paradigm shift
  - Service provider-centric to Customer-centric Service
    - "Open" service provider (No More "Walled garden")
  - Broadband Access Service(wireline) & Mobile/Wireless Service
- Key features
  - WHO: Personalized Service
    - Personal Preference: Cost, Quality etc.
    - Terminal/Network-aware(independent) Service: GUI, location
  - WHEN: Always Best Connected Service
  - WHERE: Global roaming and Seamless Service
  - HOW: Secure, Easy to use and Inexpensive Service
- Service convergence
  - Communication: voice, (Instant) messaging and M2M connectivity
  - Entertainment: audio, image, video and (real time) game
  - Information: push service, location aware service
    Internet and Intranet access, and m-commerce
  - Well Being: life easiness to healthcare

NG Mobile/Wireless Vision 2010: Terminal

BACK

- Universal Personal Hub
  - Multiple Functionality
    - Terminal convergence: HHP, PDA, A/V device(TV), wallet etc.
    - User interface: speech, camera, key-board, display etc.
  - Key Characteristics
    - Enough processing power and memory with long lasting battery
    - Small and cheap device covering a wide range of market segmentation
- More friendly user interface
  - Always Best Connected
    - Learning and adapting environments: Network and Service
    - Network selection: W-WAN, W-MAN, W-LAN, W-PAN & Ad hoc network
    - Service awareness: service provider and ad hoc network
  - Personalized terminal
    - Personalization: ring-tone, personal screen etc.
    - Policy based service/network management

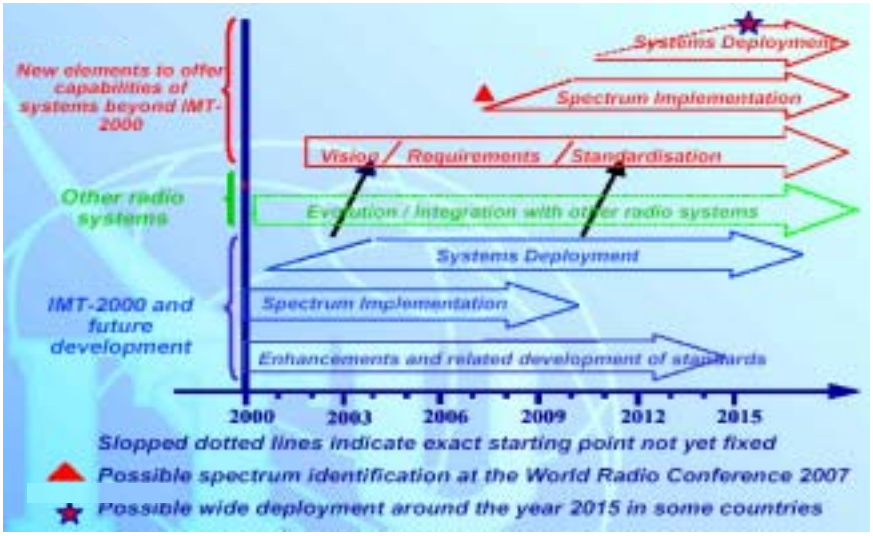
ITU Scope of 4G New Air interface



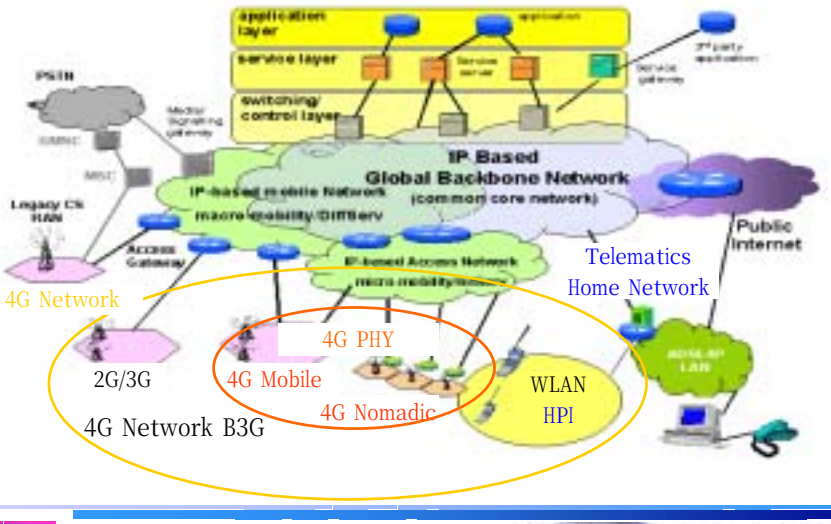
Why 100Mbps/1Gbps in 4G ?

- Enhance Profitability
  - Maximize capacity and throughput (Expensive)
    - Increase Spectral efficiency
    - Enhance Throughput of MAC
    - Minimize CAPEX and OPEX: 1/10 of 3G
  - Serve many high bit rate users simultaneously (Slow)
  - Minimize latency (Slow)
    - Connection delay and Transmission delay
- Open up New market
  - Enable new services (lack of contents)
  - Add new features
  - Seamless and ubiquitous services

ITU Roadmap



Definition of 4G Network



Next Generation Terminal

Q & A ?