Standards and the Wireless Network Landscape in Asia

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Richard B. Dasher, Ph.D.

Director, US-Asia Technology Management Center
Executive Director, Center for Integrated Systems

Stanford University

Outline

- Wireless network businesses and the technology stack
- Update: standards for wireless networks
- How do standards affect the outlook in Asia?

Main areas of wireless network businesses

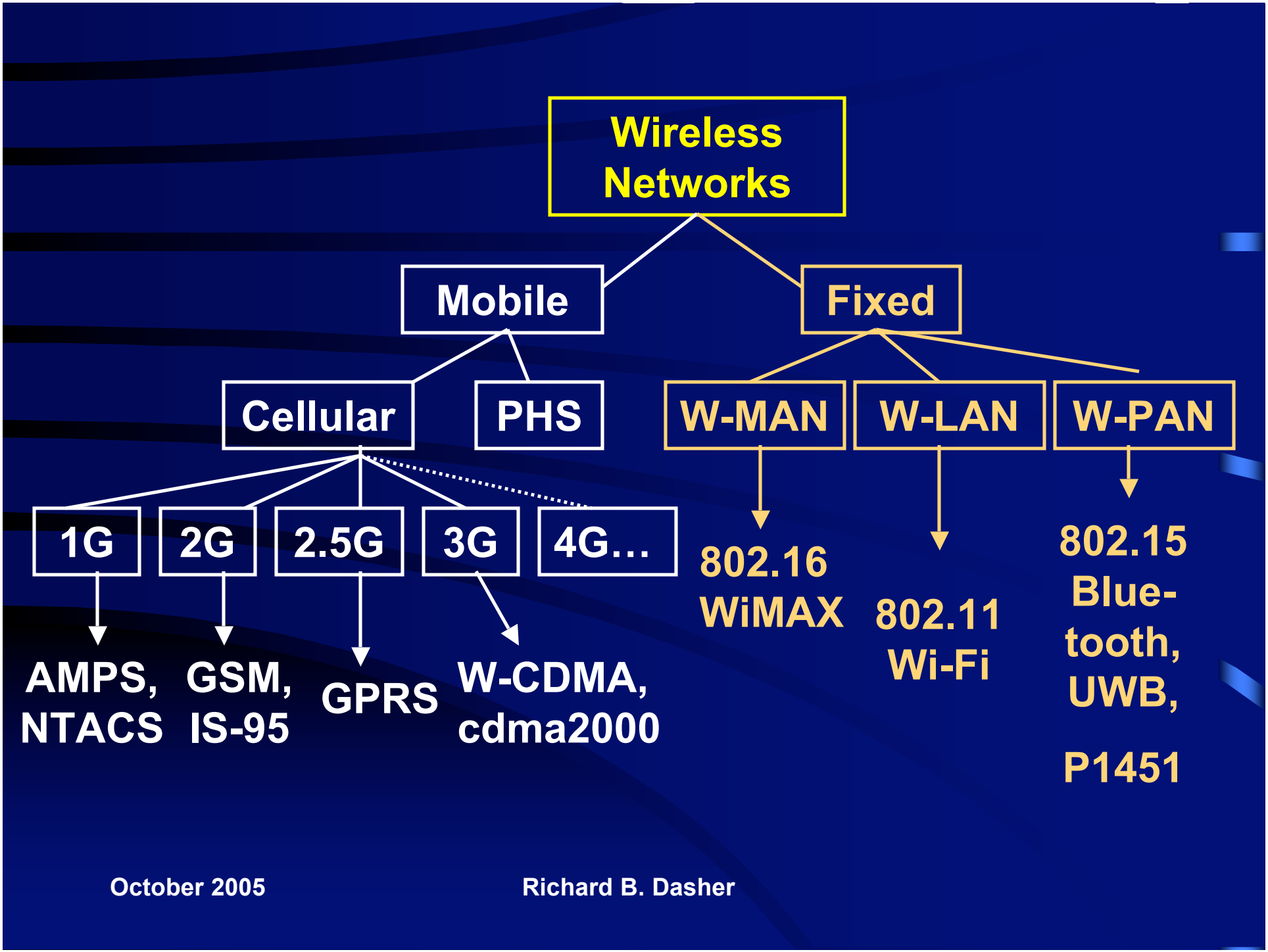
Value-added service providers	News, email, ringtones, games, online shopping…	Various applications companies
Basic service providers	Voice comm, Internet access, stand-alone ntwks	Telecom co's (carriers, operators)
Technology providers	Network	Chips, some SW, equipment (handsets, …)

Distinctive characteristics of network businesses

- Value-added service (applications) providers
  - Depend on access via telecom companies
  - Need to know about upcoming new techs and standards
- Basic service providers
  - Looking for new higher profit-margin businesses
  - Need to minimize high capital investment costs
  - Still able to delay deployment of new technologies
- Technology providers
  - High cost of R&D -- debugging requires deploying first
  - Must be very concerned with standards-setting (interoperability is paramount)

The network technology stack

Application/ profiles	Typically user-defined
Application/ framework	Specs of common functional devices for interoperability
Network/comm /security	Routing, topologies, encryption, session mgmt,…
MAC (medium access control)	How nodes transmit; handling simultaneous signals,…
PHY (physical)	Basic transmission scheme, frequencies, node types,…


Wireless Networks
Mobile
Fixed
Cellular
PHS
W-MAN
W-LAN
W-PAN
1G
2G
2.5G
3G
4G…
AMPS, NTACS
GSM, IS-95
GPRS
W-CDMA, cdma2000
802.16 WiMAX
802.11 Wi-Fi
802.15 Blue-tooth, UWB, P1451

W-LAN standards

- IEEE “802.11” plus suffixed letters for amendments through “w”
  - 802.11a in 5 GHz
  - 802.11b in 2.4 GHz, with 802.11g increased data rate in 2.4 GHz
  - 802.11i for security
- Matched by “Wi-Fi Alliance”
  - 200+ member companies
  - Certification program
- Broad acceptance, but China …

W-MAN standards

- IEEE “802.16” plus variations
  - MAC in 10-66 GHz and also 2-11 GHz bands for multiple physical layers
- Supported by “WiMAX Forum”
  - Also supports European (ETSI) HiperMAN

W-PAN Standards

- IEEE 802.15 early versions from Bluetooth initiative
  - Up to 2 Mbps in 2.45 GHz band
  - Lacked native support for IP
- IEEE 802.15.3 “ultra-wideband” (UWB)
  - Physical/RF layer, may allow for extensions of other W-LAN, W-PAN technologies
- IEEE 802.15.4 for toys, sensors, automation (up to 200 kbps)

Other “fixed” wireless standards

- IEEE P 1451 wireless sensor networks
  - Defines transducer electronic data sheets, interfaces, protocols
  - By the “Wireless Sensor Working Group” (old website)
- ZigBee Alliance: PHY, MAC and above for wireless sensors
- More to come
  - 802.20 for automotive telematics
  - P 1073.0 wireless communication for med apps

What are the problems with standards?

- Susceptible to undue influence by existing large companies, national regulators
  - May actually slow down innovation in some cases
- Takes a lot of time/money to keep up with the negotiations, promote acceptance
- Not clear "who's in charge"
  - Requires worldwide understanding of various local conditions

The situation with China

- Currently seven standards initiatives competing with international efforts, e.g.:
  - Software operating systems
  - Audio/video coding (replace MPEG 4)
  - WAPI (Wireless Authentication & Privacy Infrastructure) to win out over 802.11i
    - Chinese delegation walked out of ISO meeting in 2005
    - Refused to disclose all technical specs to ISO
- China complaint: participated in setting only 1% of 16,000 world standards