Preparing for Convergence

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Topics

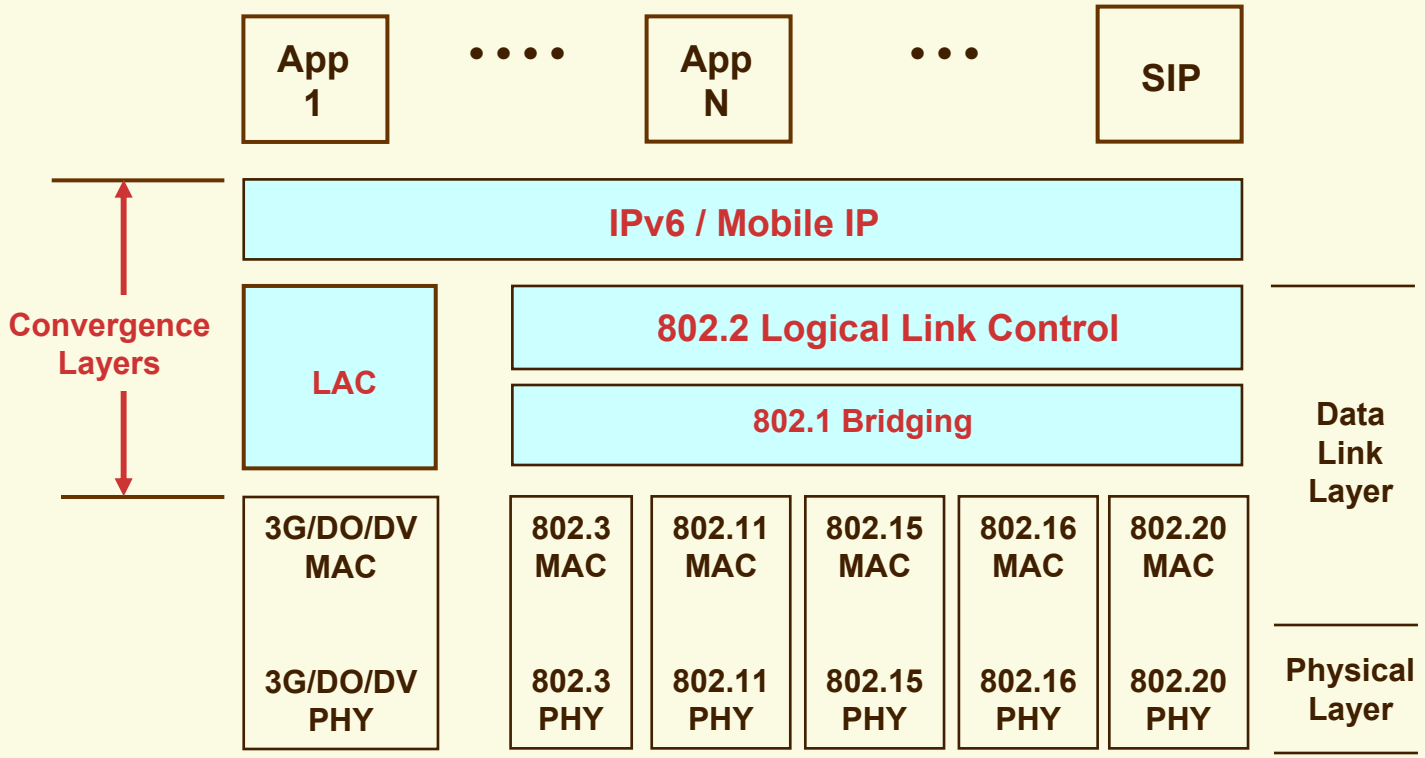
- Proposed Requirement
- Rationale
  - Ubiquitous Services
  - Wireless World
  - Business / Market Environment
  - Use Case Scenarios
  - Planned Converged Solutions
- Considerations

Proposed Requirement

- The system shall provide the capability to handoff a call session from one 802.20 BTS to another 802.20 BTS based on system loading, signal strength, capacity and tier of service. Additional weighting factors may also include back haul loading, least cost routing, location, velocity.
- The 802.20 system shall provide the capability to bridge networks at Layer 2 per IEEE 802.1 Logical Link Control (IEEE 802.2).
- The system shall provide the capability to interoperate with other wireless networks (e.g., GSM/EDGE, CDMA2000, 1XEV/DO, etc.) in order to transfer a call session between an 802.20 BTS and an access point (i.e., BTS) in the other network. The interworking between networks shall be based on Mobile IP.

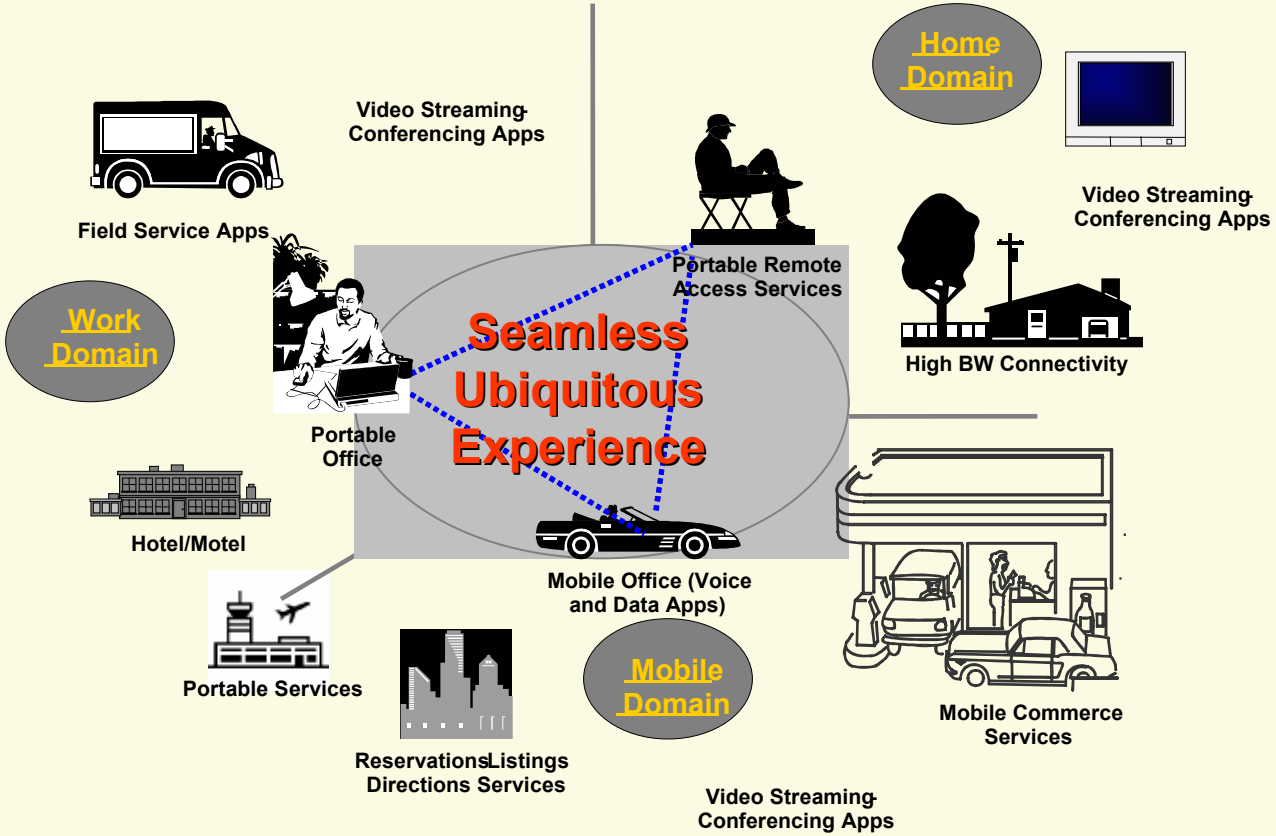
Model for Convergence & Interoperability

Convergence / Interworking at Layer 2



Rationale: Ubiquitous Experience

IEEE802.20 Objective:



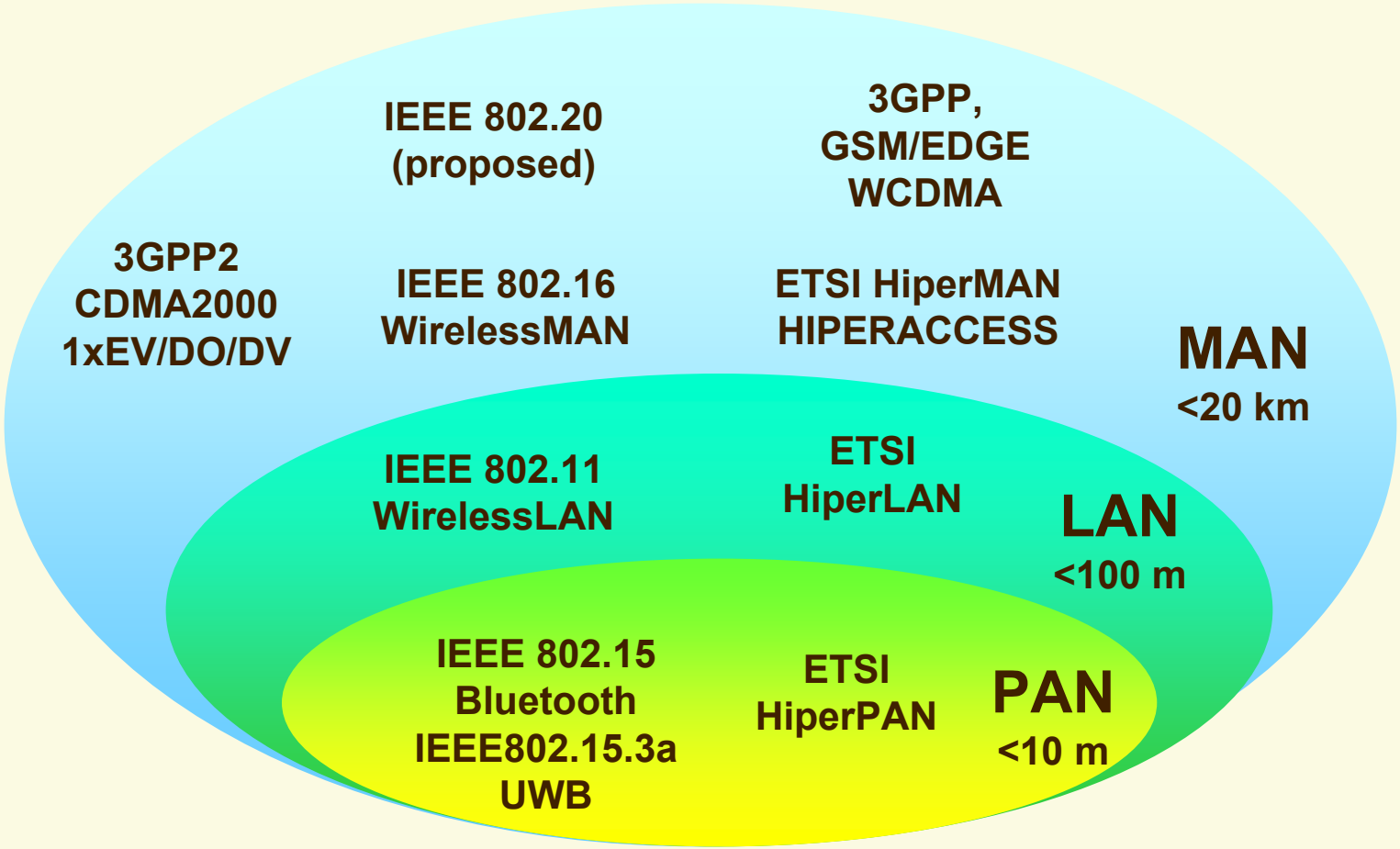
Rationale: Market / Business Environment

- **Ubiquitous experience ⇒ Convergence of services**
  - **Multiple air interfaces will be available**
  - **No one air interface will provide ubiquitous experience**
  - **Expect to support for cellular services on the WLAN segment**
  - **'*Handoff*' from high-cost macro-network ⇔ WLAN/WPAN**
- **Providers need flexible deployment options**
  - **Limited initial 802.20 coverage**
  - **Convergence (interworking?) expected with '*existing*' services**
  - **Options for more advanced interworking**

Rationale: Market / Business Environment

- Vendors need well-defined requirements
  - High volume for low cost
  - HO / interworking signaling support common across vendors
  - Interoperability + compliance testing a “must”

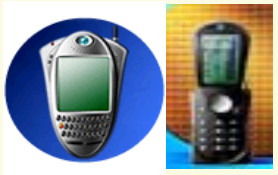
Rationale: Global Wireless Standards



Rationale: Planned Converged Solutions

- Marketplace is moving to converged solutions
  - GSM/EDGE + WiFi
  - GSM + Bluetooth
  - CDMA2000 +WiFi
  - IP-Based PBX + WiFi
  - IP-Based PBX + CDMA2000
  - IP-Based PBX + CDMA2000 + WiFi

Use Case: Wireless Platforms

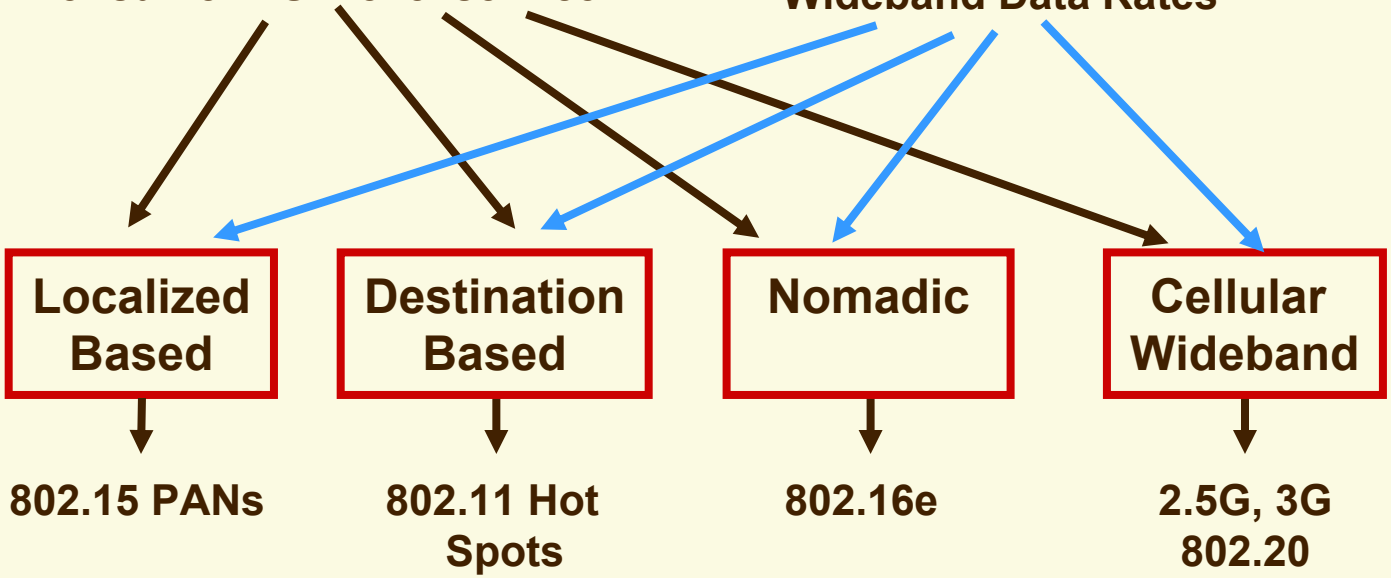


Portable

Licensed and Unlicensed
Consumer DSL level service

Mobile

Licensed
Wideband Data Rates



Use Case: Nomadic / Mobile Scenario

802.11
Connection

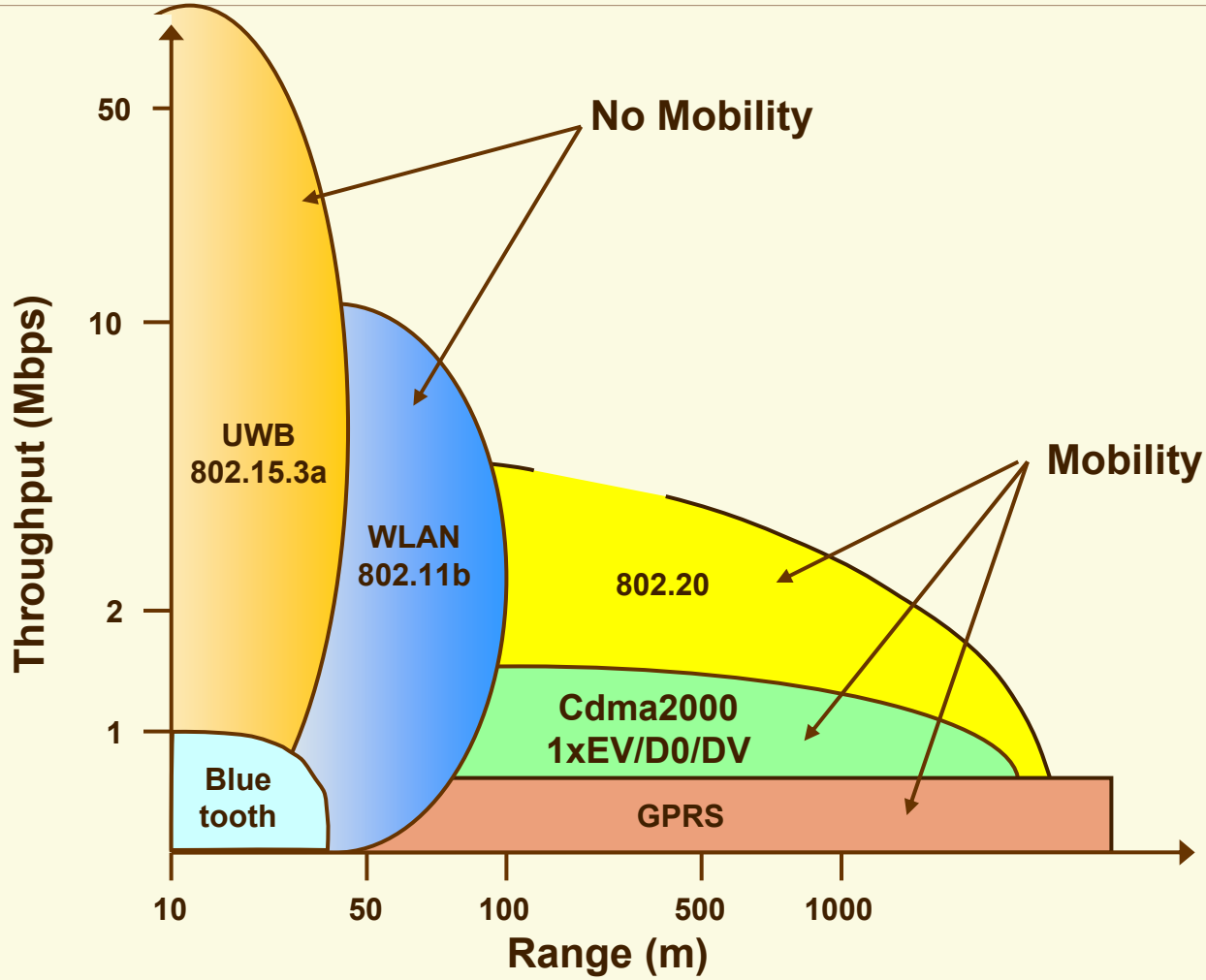
CDMA2000

802.20

SEEKS BEST CONNECTION

INTERNET BACKBONE

Use Case: Coverage Domains and Throughput



Considerations: High Throughput and Mobility

- Higher throughput at longer ranges
  - **Better bits/second/Hz at longer ranges**
- Scalable system capacity
  - **Interoperability provides easy addition of channels to maximize cell capacity**
  - **Flexible channel bandwidths accommodate allocations for *both* licensed and unlicensed spectrum**
- Quality of Service
  - **Connection oriented MAC supports data, voice and video**
  - **Definable service levels**
  - **Ubiquitous coverage support**
    - **Interoperable with other IEEE802 air interfaces**
    - **Interoparable with other macro-cell networks**
- Cost & Investment Risk
  - **Interoperable equipment lets operators purchase equipment from more than one vendor**
  - **A stable, standards-based platform improves OpEx by sparking innovation in services, coverage, applications, convergence**

Considerations: Support Recommendations

- Define MAC functionality
  - MAC sub-layers must be clearly defined
  - Separate control block must be included in the MAC which controls the establishment of channels
  - Define bidirectional primitives (MAC ⇔ PHY) for triggering handoffs
  - Define timing parameters and allowed latency for primitives
- Define LLC functionality
  - Common LLC is used across all the 802.xx family of standards
  - Provide hooks in LLC for better interoperability with handoff management
  - Use same hooks for the LLC and the MAC
- Define addressing principles
- Define interface requirements to upper layers
- Define triggers and supporting algorithms

Considerations: Definitions

- Plan for multiple AT vendors and interoperability + compliance testing
- Plan for multiple AP/Node-B vendors and interoperability + compliance testing
- Access terminal decides HO / Interworking action

Support for ubiquitous network - Always Best Connected