

# Final Presentation

## **Broadband Wireless Access Systems**

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2G1330 Wireless and Mobile Network Architectures

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*Broadband Wireless Access Systems*

# Overview

- Broadband Wireless Access Systems (BWA) & Networks
- Broadband: Definition, Need, Wireless
- Standards Related to BWA
- BWA Network Architectures
- Model for an Integrated BWA System



# What is Broadband ?

- Broadband is a generic term that refers to a type of wide bandwidth communication network that can carry signals occupying a large portion of the electromagnetic spectrum.
- A broadband communication system can simultaneously accommodate television, voice, data and many other services.
- In the 1980s and early 1990s, broadband referred to rates greater than 45 Mbps, and "wideband" referred to rates between 1.5 and 45 Mbps.



# What is broadband? .. *contd.*

- FCC, in its 2000 report on broadband deployment, defined an 'advanced telecommunications service' as one that is at least 200 kbps in each direction.
- Two Swedish governmental commissions adopted substantially higher -speed thresholds: symmetric 2 Mbps and 5 Mbps.
- The workable definitions of what constitutes broadband is interesting to a wide group including consumers, service providers, application and content developers, policy makers and public interest groups.



# Need of Broadband Wireless Access

- There is a need of variable rate medium for the Internet i.e. shifting the emphasis from capacity towards response time.
- ISDN offers constant rate bit pipe.
- Broadband systems are capable of instantaneous capacity allocation (ICA), so the user response time can be dynamically adjusted to meet the available capacity/demand ratio.
- Need for Wireless is a combination of technical and economical aspects and management considerations.



# Standardization

- The European Telecommunications Standards Institute (**ETSI**) Project “Broadband Radio Access Networks” (BRAN)
  - HIPERLAN/1: 20 Mbps 5 Ghz
  - HIPERLAN/2: 54 Mbps 5 Ghz
  - HIPERACCESS: 25 Mbps 5 km range
  - HIPERLINK: 155 Mbps

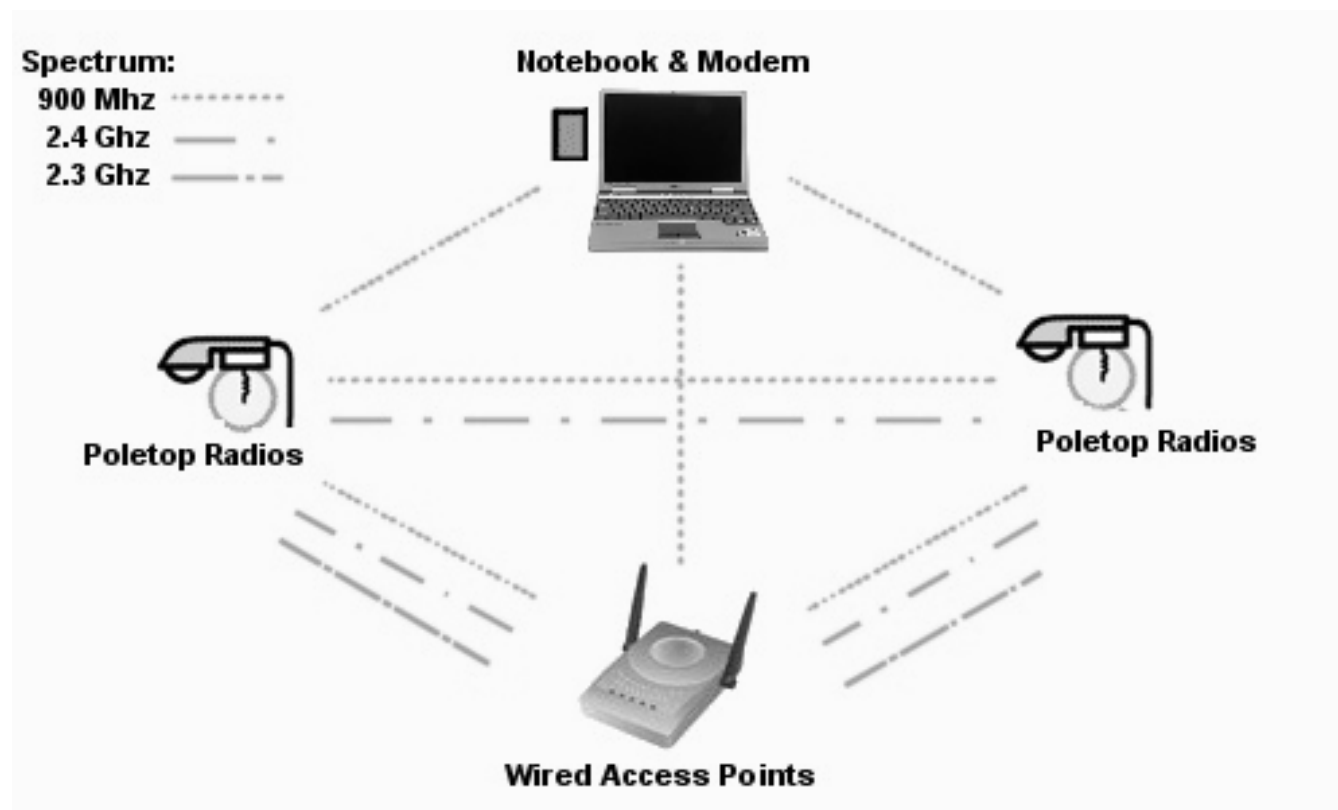
# Standardization .. *contd.*

- **IEEE 802.20**, the Mobile Broadband Wireless Access (MBWA) Working Group
  - Licensed bands below 3.5 Ghz
  - Peak data rate per user > 1 Mbps
- **IEEE 802.16** standard subcommittee
  - 10-66 Ghz bands - local multipoint distribution service (LMDS)
  - BWA solutions based on orthogonal frequency division multiplexing (OFDM) access (OFDMA) for Non-Line-of-Sight (NLOS) scenario



# BWA Network Architectures

- *The Ricochet© Network Architecture*



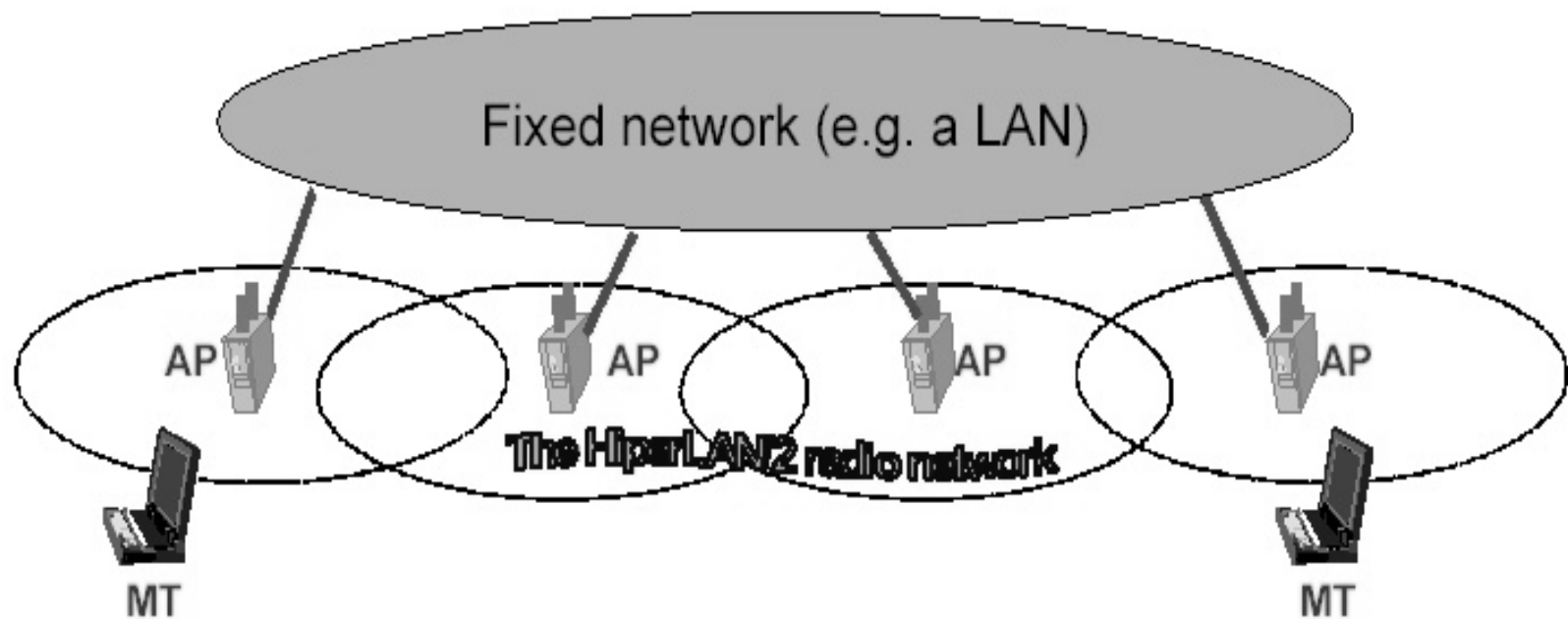
# BWA Network Architectures .. *contd.*

- ***Teledesic Internet-in-the-Sky® Network***
- Combination of low -Earth orbit (LEO) constellation of satellites, the flexibility and robustness of the Internet, and fiber-like Quality of Service (QoS)
- Licenced by FCC to make use of 500 MHz of domestic radio frequency in the 28 GHz band
- The network will provide 64 Mbps on the downlink and upto 2Mbps on the uplink. Broadband terminals will offer 64 Mbps of two-way capacity



# BWA Network Architectures .. *contd.*

- *HiperLAN2*



# BWA Network Architectures .. *contd.*

- ***Wireless Local Loop (WLL)***
  - Also termed radio in the loop (RITL) or fixed radio access (FRA)
  - Connects end-users to the (PSTN) using wireless
- ***3G GPRS/UMTS Network for Wireless Internet Access***
  - A study on applying GPRS/UMTS network model to the Internet as a next-generation wireless packet network.
- ***Local Multipoint Distribution Services (LMDS)***
  - A point-to-point broadband wireless access method
  - Operates in radio frequency spectrum above 25 Ghz
  - Speeds possible upwards of 155 Mbps for today



# Model for Integrated BWA Systems

## 3 Layer Proposed Model

1. Backbone
2. Services and Applications
3. Consumers or end-users



[http://vww.it.kth.se/~iw01\\_zkh/deliverables/Broadband\\_Wireless\\_Access\\_Systems.pdf](http://vww.it.kth.se/~iw01_zkh/deliverables/Broadband_Wireless_Access_Systems.pdf)

**Thank You**



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