

# Wimax technology History, Status & challenges

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# Broadband Wireless

- What is desired?
- DSL like capability
  - Benefits
    - Mobility
    - Lower infrastructure costs, faster rollouts
    - Wireless Video
- Wimax is one technological solution
  - Others such as 3G LTE & HSDPA already discussed

# Requirements for BWA

- Range of 2-5 km
- 90% + coverage
- Data rates to individual subscriber bursts of 1-2 Mbps
  - Aggregate cell wide data rates of 20-30 Mbps
- Data oriented rather than voice oriented
  - Eg: Low latency [ping times]
- Support for Mobility

# Core Technology differentiators: Adaptability

- Ability to deal with environmental factors
  - Rapidly react to Link errors -
- Rapidly changing channel conditions
  - Adapt to the channel conditions to extract most out of current situation
    - Rapidly change the modulation
    - Rapidly change the coding
- High Spectral efficiency
  - Try to extract most from the spectrum
  - [bits/hz]
- Robustness to Interference


# Wimax Key Technological features

- MIMO OFDMA
  - Intent: highly spectral efficient
  - MIMO – can support multiple antenna's
    - Transmit diversity [ superior resiliency to Multipath]
    - Spatial Multiplexing [ higher data rates]
  - OFDMA
    - Divides the channel into multiple small subcarriers
      - Gives better multipath capability and resilience against delay spread
      - Can choose a subset of the sub-carriers for communication

# Wimax – key technological features

- Hybrid ARQ – a rapid error control mechanism
- Potential for wide adaptability
  - variety of advanced coding modes
  - and modulation choices
  - that can exist simultaneously

# Issues for India

- Spectrum 
- Equipment availability – *its always One quarter away!*
- How to control costs – 10GB at Rs 250 a month
- Encourage competition
  - Encourage new large players to enter the market
  - Let them choose most cost optimal technologies to serve the market