[Initial Input for 802.16m project Goals]

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Purpose:

[Response to call for initial input regarding P82.16m Project.]

Outline

- Mitsubishi Introduction
- Envisioned 16m Usage/Applications
- Envisioned Requirements
  - Rate
  - Coverage

Information and Communication Systems Segment

Location and Time Verification Services

Maybe we can find a better slide to show MELCO Telecom business products – this is here as a place holder

Satellites

Mobile Handsets

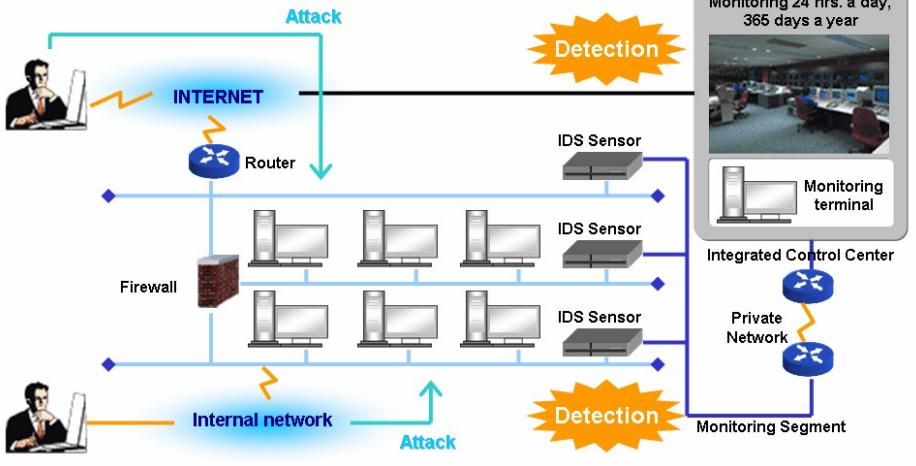
SCM*/ERP Solutions

CBB*

Optical Broadband Access Systems

Data Warehouse Solutions

Information Security (Network Security)



* CBB: Connexion by Boeing℠, SCM: Supply Chain Management, ERP: Enterprise Resource Planning, IDS: Intrusion Detection Systems

Goals

- Support existing voice and data services
  - Maintain minimum latency to support conversational type applications (voice)
- Compatibility with OFDMA TDD frame structure
- Improved data rate
- Improved spectral efficiency and reuse
  - 5 - 25 b/s/Hz required to offer new high rate services

802.16m usage

- Personal Use
  - Mobile Internet
    - New high bandwidth content (YouTube, MySpace,…)
  - Mobile entertainment
    - Access to digital content: music, video
  - Mobile Gaming
- Business Use
  - Mobile Office: Video conferencing, collaboration (application sharing)
  - Supply chain management
- Others
  - Telemedicine

It is expected that applications run on 16m will be similar to those on future wired networks (DSL/Cable/FTTH/Office) and therefore users will expect to be able to use existing applications and receive comparable performance from the 16m system

Mobile environment

- Stationary
  - Fixed wireless access
- Pedestrian
  - 5 km/hr
- Vehicular
  - 30 – 300 km/hr

Services

- Data Rate
  - Higher is better → support current and future applications
    - 1 Gb/s (peak) for stationary users
    - 100 Mb/s (peak) for highly mobile users
    - Peak data rate should scale linearly with spectrum allocation
- QoS
  - Support multiple classes of traffic with widely differing latency, error rate tolerance, …

802.16m Peak Data rate and QoS considerations

	Mobile Internet	**Mobile entertainment**	**Mobile Gaming**	**Mobile Office/Video Conferencing**
Stationary	•10 – 100 Mb/s •interactive	•10 – 100 Mb/s •Streaming/interactive	•10 - 100 Mb/s •Streaming/interactive	•10 – 100 Mb/s •Conversational
Pedestrian	•10 – 100 Mb/s •interactive	•10 – 100 Mb/s •Streaming/interactive	•10 - 100 Mb/s •Streaming/interactive	•10 – 100 Mb/s •Conversational
Vehicular	•1-10 Mb/s •interactive	•10 Mb/s – 20 Mb/s •Streaming/interactive	•10 Mb/s – 20 Mb/s •Streaming/interactive	•10 Mb/s •Conversational

Coverage

- Subscribers need service regardless of location.
  - ubiquitous coverage 99% of area in specified service areas
    - Rural → Multihop/relay for range extension
    - Urban (high subscriber density) → Greater Spectral efficiency
      - MIMO
      - Beam Forming
      - Interference Management/Avoidance

Geographic Considerations

- Improve cell edge bit rate – rate delivered to subscribers far from the base station

	Cell Size	Aggregate DL/UL
Rural	5-30 km	100 - 500 Mb/s / 50 - 100 Mb/s
Urban	1 – 5 km	100 - 500 Mb/s / 50 - 100 Mb/s
Dense Urban	300m – 1km	100 - 500 Mb/s / 50 - 100 Mb/s