



WiMax : The emergence of the wireless broadband

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What is WiMax ?

- Worldwide Interoperability for Microwave Access
- An access technology for broadband wireless products
- IEEE 802.16 standard



Need for WiMax

Cheap and fast broadband access

Replacement of wired technologies

Standardization

Inter-operability between wireless products

More area coverage – 5 to 6 miles



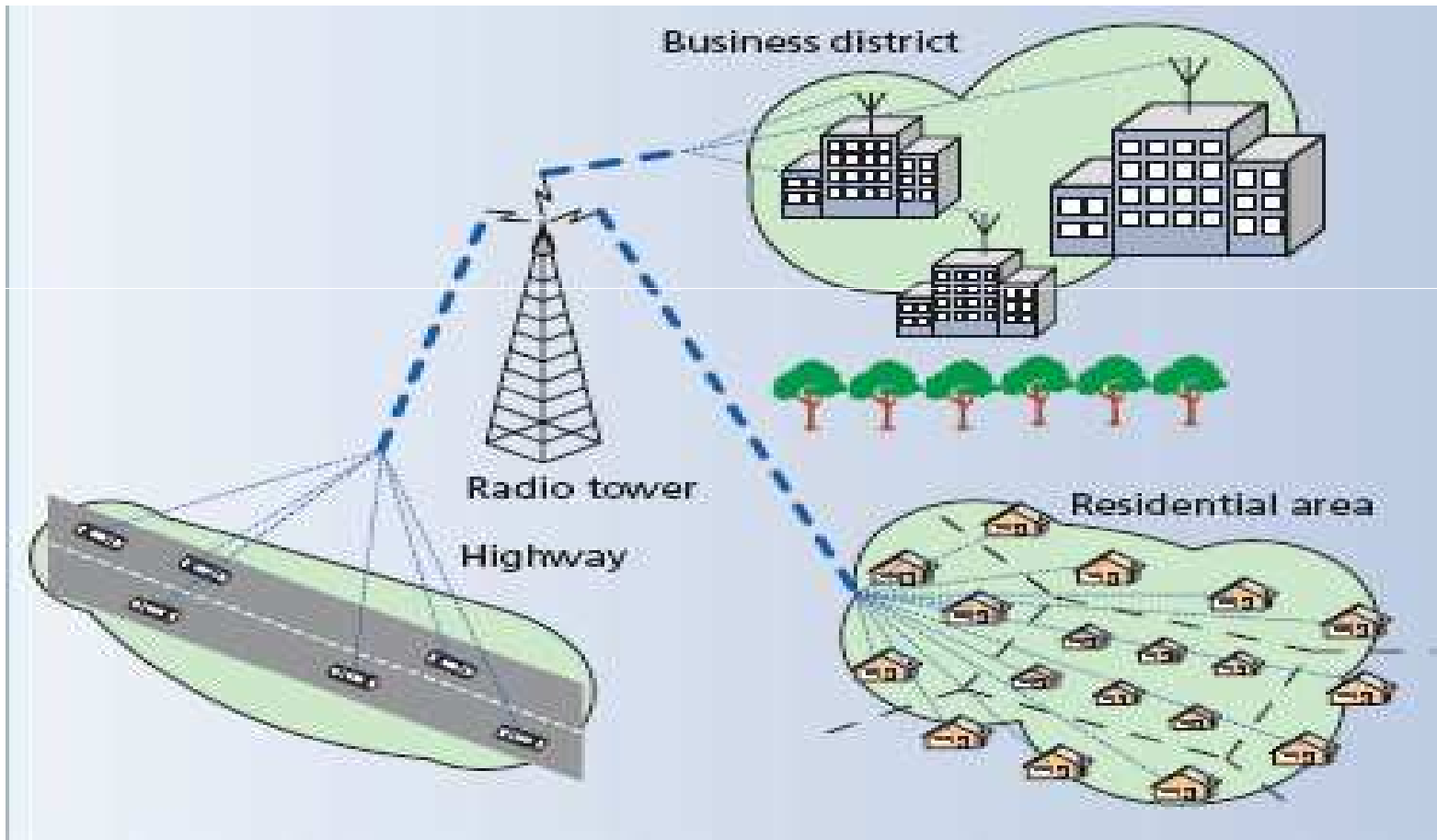
Classification

Fixed WiMax - Point to multipoint mode
Mesh mode

Mobile WiMax

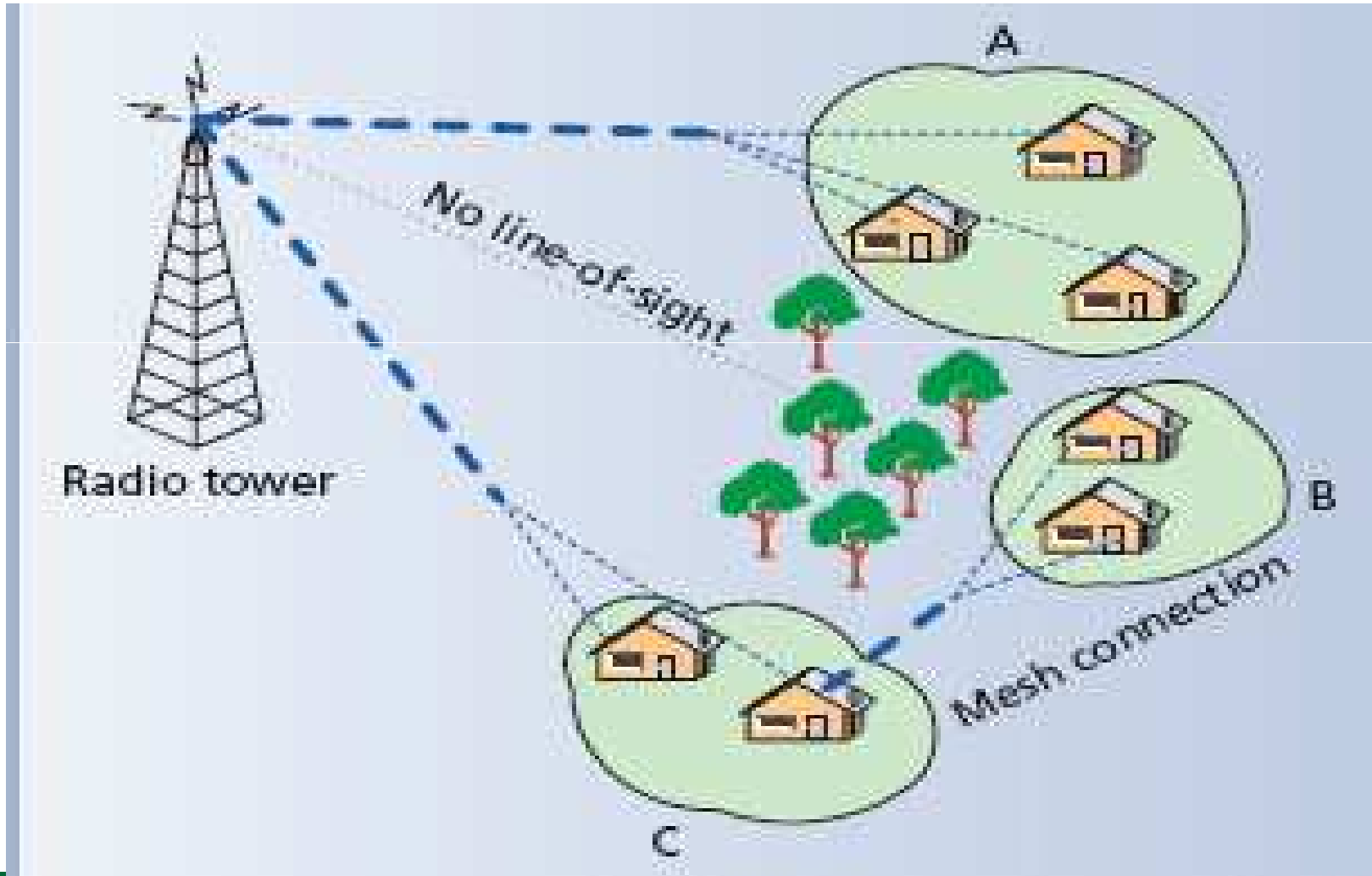


Point to multi point





Mesh





Applications

Cellular technology , DSL ,T1 replacement ,
disaster recovery



Specifications

Target range -31 miles , currently 5 to 6 miles

Target Rate > 100Mbps , currently 80 Mbps

Frequencies of Operation : 10 to 66 GHz
2 to 11 GHz



Physical layer specifications

10 to 66 GHz : 1 Air interface

2 to 11 GHz : 3 Air Interfaces

- WirelessMAN - SCa
- WirelessMAN - OFDM
- WirelessMAN - OFDMA



MAC layer

Stations do not need to listen

Contention – first time only

QoS – adaptive allocation of traffic

Supports IPv4 , IPv6 , ATM

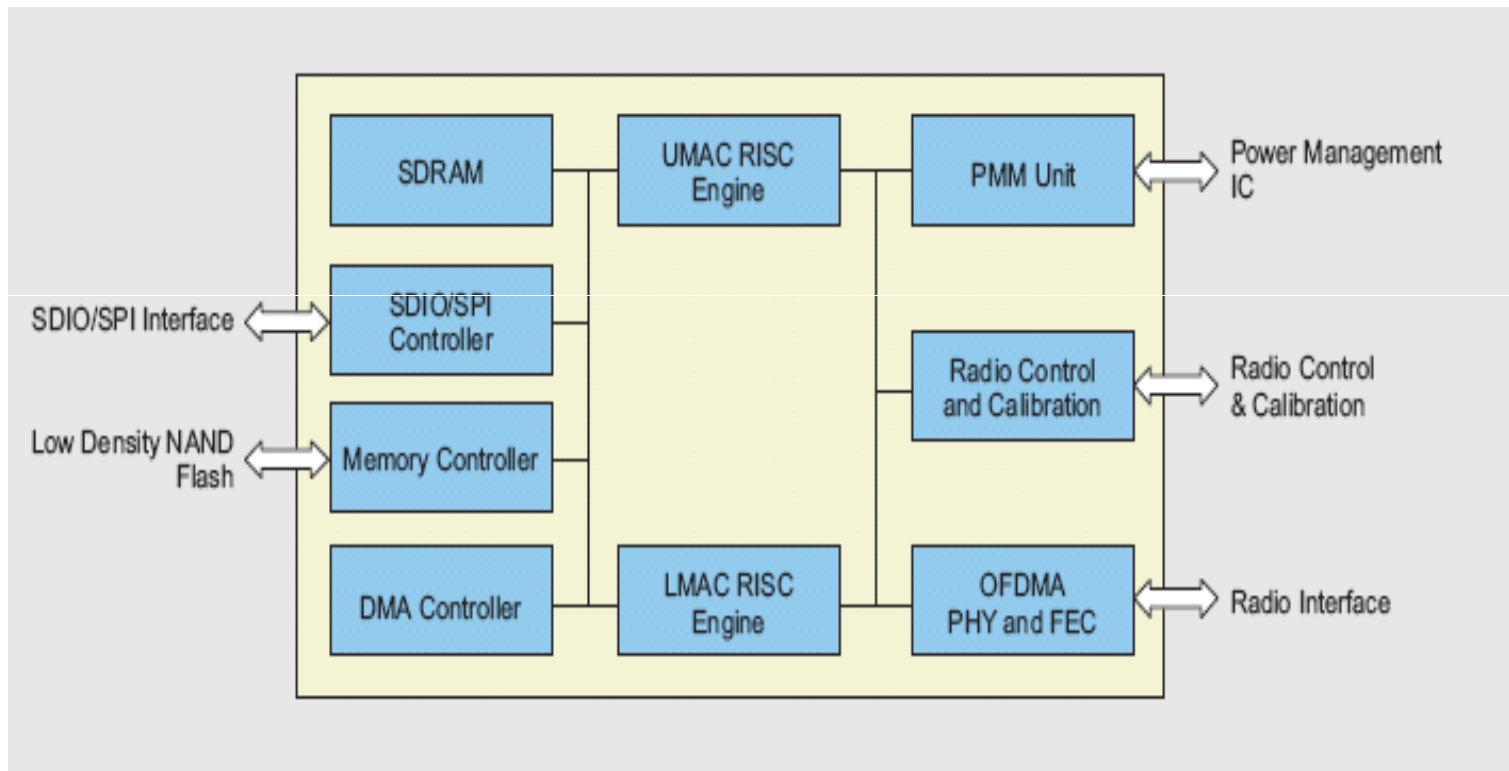


Mobile WiMax

- Standard - 802.16e
- Roaming upto vehicular speed of 75 mph
- 2.3 and 2.5 GHz band
- Power saving , sleep modes

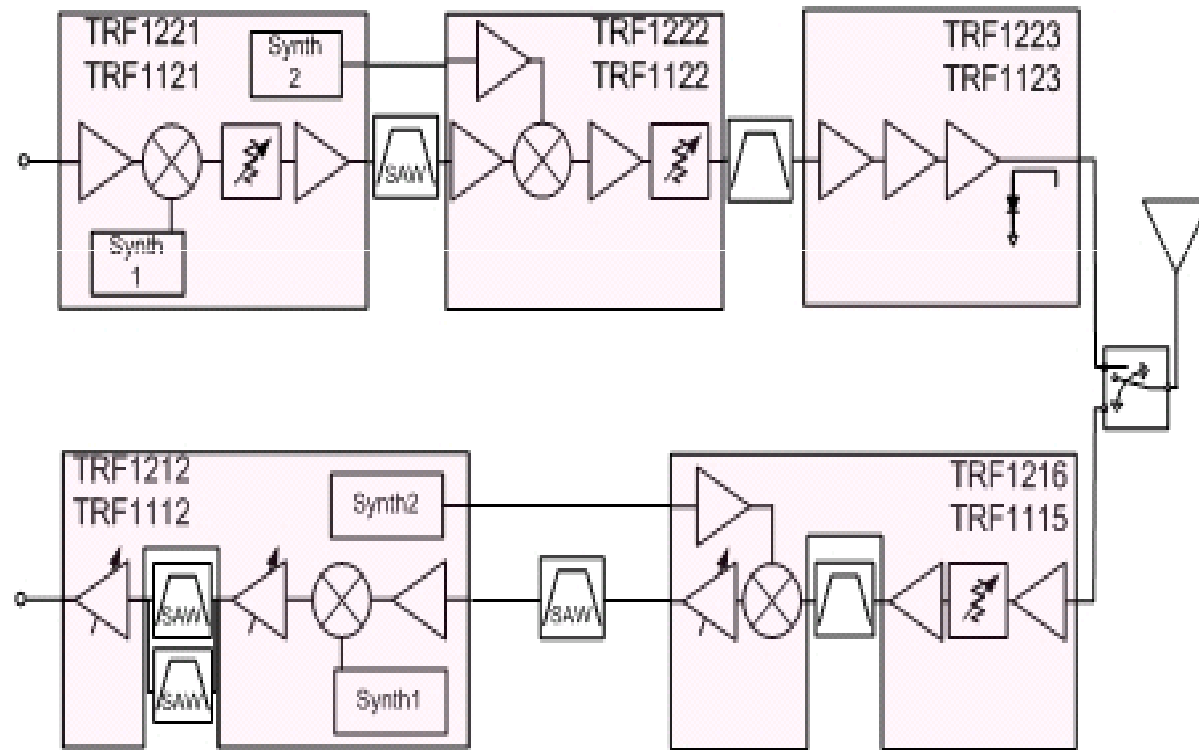


Wimax Chipset (Fujitsu)





WiMax Transceiver (TSW 5003)





802.16 protocol

- Defines the wireless MAN technology , also called WiMax
- Defines the air interface between subscriber's transceiver station and a base transceiver station
- Last mile connection
- 802.16-2004 (802.16d) - fixed WiMax
802.16-2005(802.16e) - mobile WiMax



Comparison with 802.11

Size of network

MAC : 802.11 – contention



Comparison of various standards

	Bluetooth	WiFi (a)	Wifi(b)	WiFi(g)	WiMax
Standard	802.15	802.11 a	802.11b	802.11g	802.16
Freq (GHz)	2.45	5	2.4	2.4	2 – 66
Speed (Mbps)	0.72	54	11	54	80
Range	10m	50m	100m	100m	50 km
Advantages	Low cost	Speed	Low cost	Speed	Speed, range
Disadvantages	Range	Cost	Speed	Cost,range	cost



802.20 – Threat to WiMax

- Rate > 1Mbps
- Freq < 3.6 GHZ
- Speeds upto 155 mph



References

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