Broadband Wireless Access - Enabling Broadband Qatar

BY

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Contents

Broadband Service Option

Wireline	Wireless
xDSL Fiber	3G 1x EVDO
Cable	Broadband Wireless • WiFi Hot Spot • WiFi Mesh • WiMAX Satellite

Wireless Concept

- Subscribers farther from the base station use lower modulation efficiency (adaptive modulation)
- Capacity depends on distribution of subscribers sharing the channel
- Range decreases as operating frequency increases
- Range greatly reduced in non-line-of-sight vs. line-of-sight
- Life gets much more complicated with mobile clients

Rural & Urban Requirement

Rural Needs

BWA for affordable broadband access
Little/no profit motive= Government involvement
Digital Divide

Urban Needs

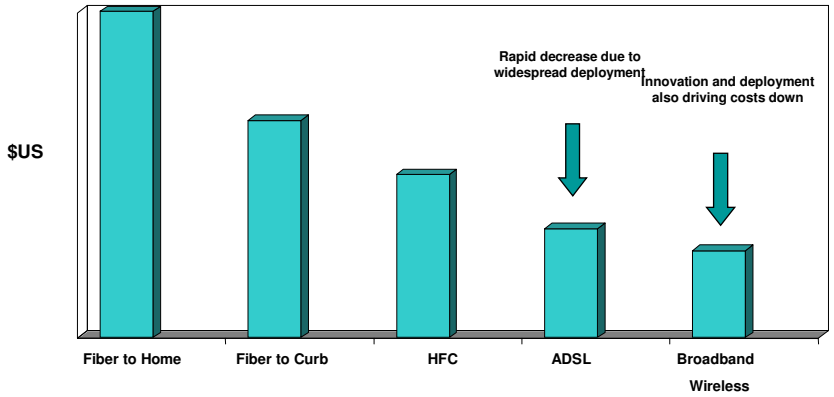
Wi-Fi, mesh
Focus on mobility and amenity, not access
WiMAX for backhaul
Profit motive for private operators
Government as catalyst
Digital Divide

Customer's Requirement

- Starved for Cheap Access
  - Costs are rising
    - 30-50% of WAN costs
    - Increases 5-10% / year
  - No access providers to choose from
    - More dependence on a single access provider (ILEC)
    - Less redundancy
- Next-generation access options are widely UNavailable
  - Metro dark fiber is nowhere
  - Ethernet WAN (VPLS) in early stage, and 2+ years to widespread availability

High Speed Access Technologies

Typical Whole network Cost/line for various technologies

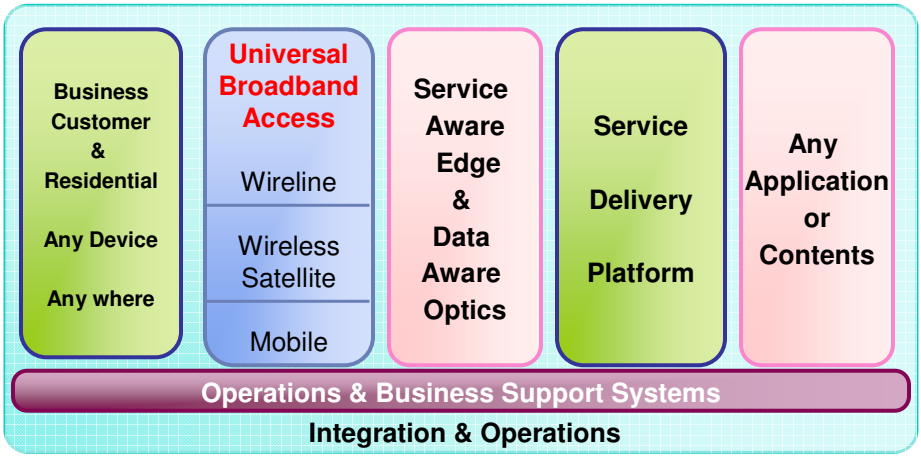


"Wireless technologies will eventually dominate the last mile of the telecommunications network" - *Aberdeen Group*

Why to Deploy BWA

- Where copper is prevalent "Wired ADSL" deployment will undoubtedly be the key technology access for broadband internet deployment, other technologies have complementary roles.
- The eventual mix of technologies used to deploy the access network for internet is unknown, but will dominated by Copper based ADSL.
- Wireless ADSL is the key complementary technology.
- Telco's without access to copper networks must invest in Wireless systems.
  - Or face losing market share to carriers who rollout "Wired" ADSL services
- Telco's with access to copper network must invest is Wireless Access systems.
  - To ensure that they can reach the 40-50% of users whose copper pairs are not suitable for "Wired ADSL".

Qtel vision of User-Centric Broadband Architecture



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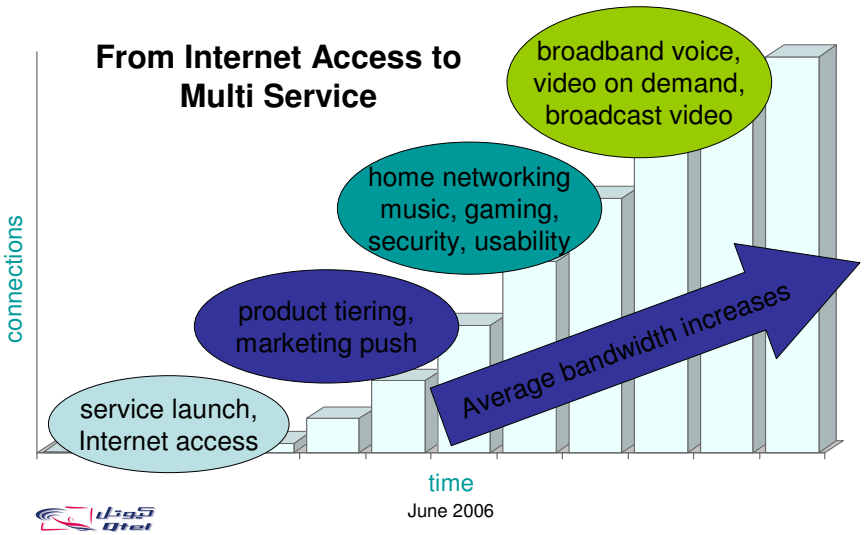
Service Offerings are Changing



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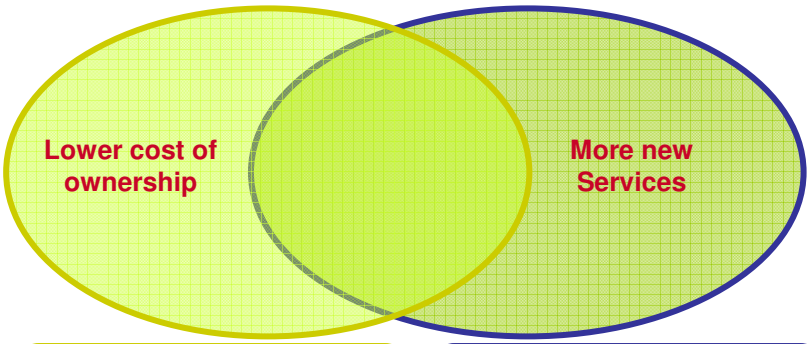
New Generation Point to Multi-point Radio (NGPMR)

Called Broadband Wireless in Access (BWA)
or Fixed Wireless Access (FWA)

NGPMR is a system that connects subscribers to the Public Switched Telephone Network (PSTN) and ISP using radio signals as a substitute for copper for all or part of the connection between the subscriber and the Switch/Router

NGPMR – Answering of Customers' priorities



- CAPEX/OPEX control
- Legacy networks end-of-life
- IP centric optimization

- New Revenues
- Better customer attraction
- Flexible service introduction

NGPMR Background

Prior to 2004	Why NGPMR
• Concept: – Convergence and future-proof – Customer loyality • Key Factors: – No Broadband & POTS features – Replacement of Outdated equipment – Vacation of frequency for 3G – No NMS • Timeline: – Started in April 04 – MC approved in May 2004 – Tender Evaluation submitted August 04 in favour of Airspan – MC has re-tendered due Business case – Approved in January 05 for Airspan • Scope of Work (15 BS & 1500 CPE): – Survey – Installation – Commissioning – Maintenance	• Voice (Service): – Toll Quality POTS – Transparency to Supplementary Services – Supports G3 and Super G3 Fax – Supports CLI – Operates when power is down • ADSL (Service): – Always-On Packet Data – 256/64 kbit/s – 512/128 kbit/s – 1.5 Mbit/s / 384 kbit/s – 2 Mbit/s / 512 kbit/s • Quality: – Latency less than 5ms – Availability Up to 99.99% • Deployment: – Internal Cabling – Simple to Install • Operation Range: – Supports Deployment beyond 3km – Better than 70% coverage if within range

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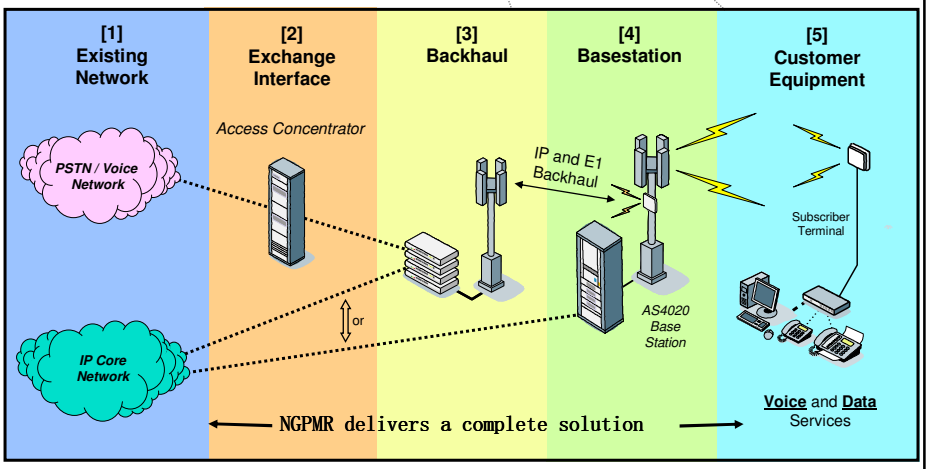
The NGPMR (BWA) Platform

Designed to deliver high quality voice and data services using the latest wireless radio technology



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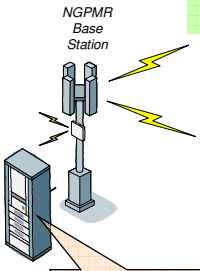
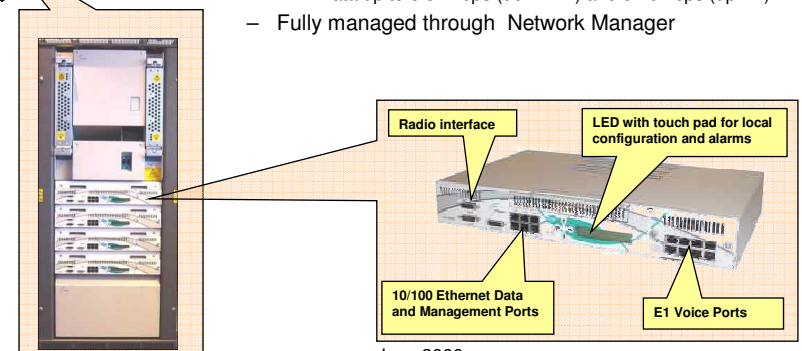
Base station



- NGPMR Base station
  - Designed for use over licensed spectrum
    - Reliable "interference free" service
    - Underpins operators end user Service Level Agreements [SLAs]
  - Delivers toll quality Voice and Data service to subscribers
    - Voice up to 36.1 Erlangs toll quality service
    - Data up to 8.52Mbps (downlink) and 5.26Mbps (uplink)
  - Fully managed through Network Manager



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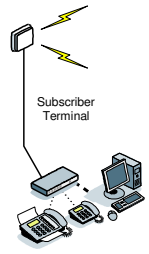
Customer Premises Equipment



Data = 2.3Mbps (Downlink)

- Internal Unit with Voice & Data Interfaces
  - **Voice: RJ11 POTS Connections (32k ADPCM or 64kPCM – provisioned via NMS)**
  - **Data: RJ45 10/100bT Ethernet Ports**
- Ports activated / deactivated via NMS if end user service mix changes
- Low power
- Unobtrusive wall or desk mount

- External Frequency dependent antenna unit
- Small, lightweight & discrete
- "Craftless" (low skill) installation process

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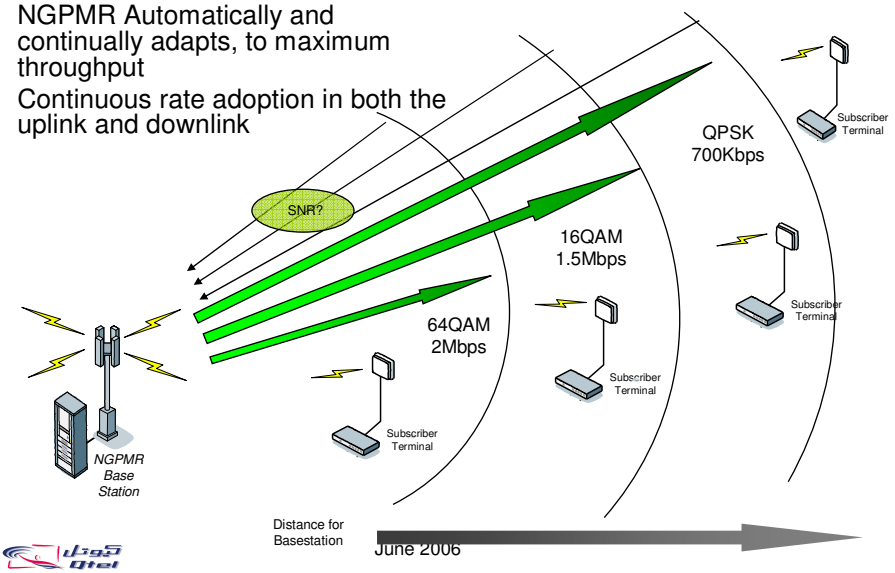
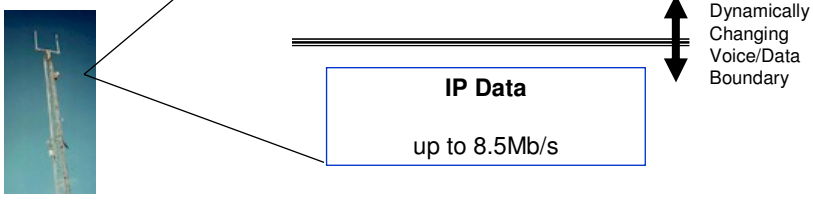
NGPMR – RF Interface

- NGPMR Automatically and continually adapts, to maximum throughput
- Continuous rate adoption in both the uplink and downlink

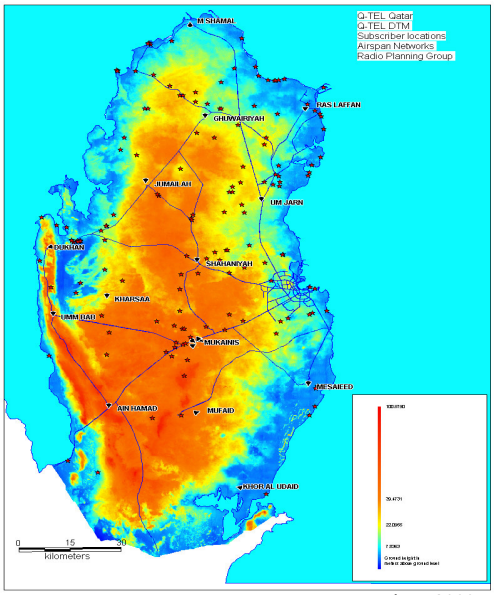


NGPMR – Mixed Voice & Data

- NGPMR Dynamically adjusts the boundary between Voice & Data to maximise Voice Pool.



Original Configuration and Customer base



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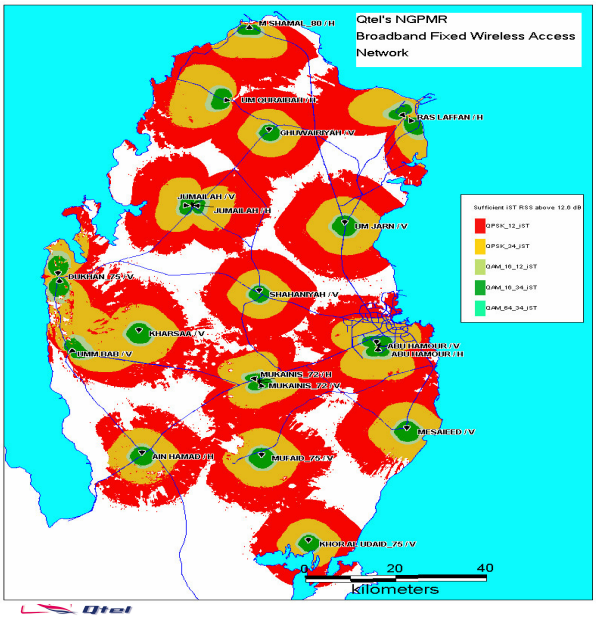
Original Configuration:
- 15 radio shelves
- 15 Omni/sectors
- 15 sites
- 7/8" coaxial feeder cables
- No fade margin
- ITU-R P.530-8
- Radio link availability not considered

Final Configuration as per Digital Map



Final Configuration:
- 23 radio shelves
- 21 Omni/sectors
- 16 sites
- 7/8" coaxial feeder cables
- 12.6 dB fading margin
- ITU-R P.530-8
- Radio link availability of 99.9%

Let's connect

Thanks