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"Ultimate Solution for Building Next Generation Network (NGN) & WiMAX for Nepal"

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Trends in Internet Technology

As much as business trends evolve and change all the time, so does Internet technology. If there is one segment of IT (Information Technology) that has had a lot of innovation and rapid developments in the last ten years, it is Internet technology. Today, there is almost nothing you can't do anymore online

Trends in Internet Technology

- Consumer demand for Internet-enabled services / products is strong
  - Strong tech hardware / infrastructure demand related to demand for likes of Yahoo!, eBay, Amazon.com, Google, PayPal, iTunes, MySpace, YouTube, Skype, Facebook, WiFi, 3G…
  - IP traffic should nearly double every two years through 2011...with consumer IP traffic growing at 58% and business IP traffic growing at 21%
  - Technology is evolving faster than most enterprises' ability to deploy new products / services

- Innovation in wireless products is accelerating
  - Apple iPhone, 3 Skype Phone, Amazon Kindle, Google 'GPhone'…
  - Japan's mobile data traffic nearly 50% higher than any region…by 2011, rest of Asia-Pacific should surpass Japan
  - 15-20% of mobiles have GPS, 50% within 5 years
  - Watch for new generation of Internet leaders to capitalize on growing access to fast Internet access on mobiles

Trends in Internet Technology

- Storage needs continue to ramp
  - iPOD with 60GB, iPhone with 32GB, High definition content presents next major step-up in storage capacity requirements
- Data center growth is robust
  - As users integrate digital technology into daily lives, number of access points increases as does importance of reliability + speed - IT effectiveness increasingly becomes competitive weapon
  - New compute / storage architectures emerging quickly – virtualization + data duplication + thin computing
- Emerging markets pacing next wave of technology adoption
- Enterprises may be coming out of relative purchasing mood
- Strong Internet user growth – fastest in non-US markets
- Strong broadband growth – with more upside
- Search continues to improve as content access tool
- Ongoing share gains to online from offline – large markets to tap
- High level Web 2.0 trends are compelling
- Turf wars increasing – google vs yahoo vs microsoft etc...

NGN- Next Generation Network

NGN can be thought of as a packet-based network where the packet switching and transport elements (e.g., routers, switches, and gateways) are logically and physically separated from the service/call control intelligence. This control intelligence is used to support all types of services over the packet-based transport network, including everything from basic voice telephony services to data, video, Multimedia, advanced broadband, and management applications, which can be thought of as just another type of service that NGNs support.

NGN – control intelligence over packet based transport network

- **HIGH SPEED BROAD-BAND**
- **Telephony, Internet Phone**
- **Multimedia - Television**

NGN- Next Generation Network

Voice Telephony –

NGNs will likely need to support various existing voice telephony services (e.g., Call Waiting, Call Forwarding, 3-Way Calling, various AIN features, various Centrex features, and various CLASS features). Note, however, that NGNs are not trying to duplicate each and every traditional voice telephony service currently offered. Rather, they will likely attempt to support only a small percentage of these traditional services, with an initial focus on the most marketable voice telephony features and the features required from a regulatory perspective.

NGN- Next Generation Network

Data Connectivity Services –

Data (Connectivity) Services – Allows for the real-time establishment of connectivity between endpoints, along with various value-added features (e.g., bandwidth-on-demand, connection reliability/resilient Switched Virtual Connections [SVCs], and bandwidth management/call admission control).

Multimedia Services –

Allows multiple parties to interact using voice, video, and/or data. This allows customers to converse with each other while displaying visual information. It also allows for collaborative computing and groupware.

NGN- Next Generation Network

Virtual Private Networks –

Virtual Private Networks (VPNs) – Voice VPNs improve the interlocation networking capabilities of businesses by allowing large, geographically dispersed organizations to combine their existing private networks with portions of the PSTN, thus providing subscribers with uniform dialing capabilities. Data VPNs provide added security and networking features that allow customers to use a shared IP network as a VPN.

Unified Messaging –

Unified Messaging – Supports the delivery of voice mail, email, fax mail, and pages through common interfaces. Through such interfaces, users will access, as well as be notified of, various message types (voice mail, email, fax mail, etc.), independent of the means of access (i.e., wireline or mobile phone, computer, or wireless data device).

NGN- Next Generation Network

Public Network Computing (PNC) –

Public Network Computing (PNC) – Provides public network-based computing services for businesses and consumers. For example, the public network provider could provide generic processing and storage capabilities (e.g., to host a web page, store/maintain/backup data files, or run a computing application). The public network provider would charge users for the raw processing and storage used, but would have no knowledge of the specific content/application. Alternatively, the public network provider could provide specific business applications (e.g., Enterprise Resource Planning [ERP], time reporting, vouchers, etc.) or consumer applications (e.g., TaxCut, kitchen remodeling program, etc.), with all or part of the processing/storage happening in the network. The public network provider could charge based on an hourly, daily, weekly, etc. licensing fee for the service (e.g., rent-an-app).

NGN- Next Generation Network

Information Brokering –

Information Brokering – Involves advertising, finding, and providing information to match consumers with providers. For example, consumers could receive information based on pre-specified criteria or based on personal preferences and behavior patterns.

Unified Messaging –

E-Commerce – Allows consumers to purchase goods and services electronically over the network. This could include processing the transactions, verifying payment information, providing security, and possibly trading (i.e., matching buyers and sellers who negotiate "trades" for goods or services). Home banking and home shopping fall into this category of services. This also includes business-to-business applications (e.g., supply-chain management and knowledge management applications).

NGN- Next Generation Network

Call Center Services –

Call Center Services – A subscriber could place a call to a call center agent by clicking on a Web page. The call could be routed to an appropriate agent, who could be located anywhere, even at home (i.e., virtual call centers). Voice calls and e-mail messages could be queued uniformly for the agents. Agents would have electronic access to customer, catalog, stock, and ordering information, which could be transmitted back and forth between the customer and the agent..

Unified Messaging –

Interactive gaming – Offers consumers a way to meet online and establish interactive gaming sessions (e.g., video games).

NGN- Next Generation Network

Distributed Virtual Reality –

Distributed Virtual Reality – Refers to technologically generated representations of realworld events, people, places, experiences, etc., in which the participants in and providers of the virtual experience are physically distributed. These services require sophisticated coordination of multiple, diverse resources.

Home Manager –

Home Manager – With the advent of in-home networking and intelligent appliances, these services could monitor and control home security systems, energy systems, home entertainment systems, and other home appliances. Imagine you're watching television and the doorbell rings – no problem – you just use the TV's remote to get a view of your front entrance to see who's there. Or imagine monitoring your house while you're away on a trip, or your in-house nanny watching your children while you're at work.

NGN- Next Generation Network

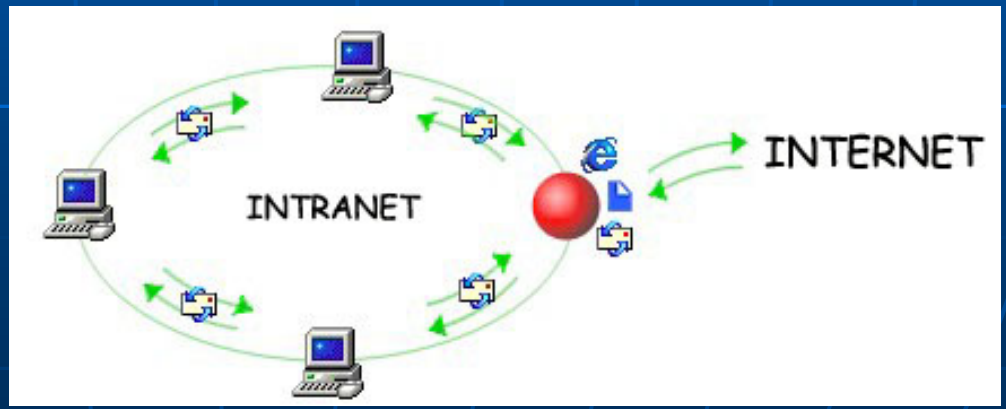
Feasible Platforms for Next Generation Network for Nepal

- **DSL**
- **Optical Fiber**
- **WiMAX**

technologies that provides digital data transmission over the wires of a local telephone network (pairs of copper wires). DSL can be used at the same time and on the same telephone line with regular telephone, as it uses high frequency bands, while regular telephone uses low frequency.

Challenges for High Speed Internet Access in Nepal

- High Speed Broadband vs. High Speed Internet Browsing/Surfing/Access
- Key to speed up the Internet access
  - Localization of the Contents
  - Better Utilization of Intranet and Internet
- World Scenario



Content Localization

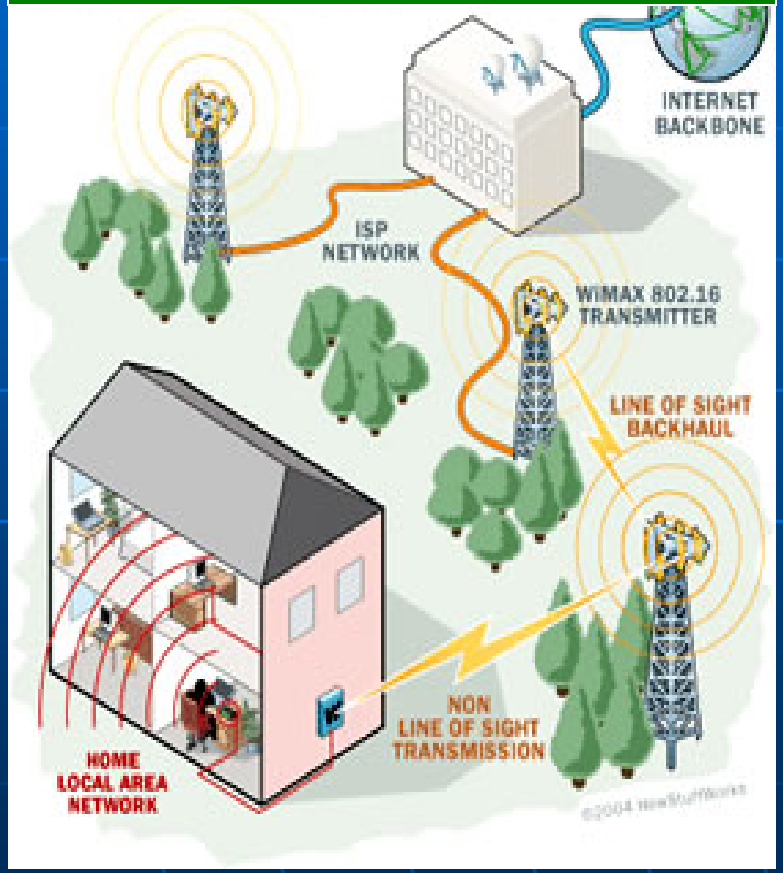
- What is Content? What is Localization?
- Popular well known public contents
  - google.com, yahoo.com, msn.com, facebook.com, twiter.com, youtube.com, hi5.com etc..
- Case Study - Nepal Internet Users and Contents
  - Around 500 to 600 MB download usage in average
  - Around 250 to 300 MB upload usage in average
  - More traffic (around 75%) comes from Cyber Center
  - 20 % Nepal contents & 80 % outside contents
  - Content access in world scenario
- Nepal based popular contents – cybersansar.com, meroclub.com
- Porn site are the most accessed content in Nepal (most of the traffice comes from government office and private office desk during office time). Cyber are open desk so chat sites, social sites, email sites traffic comes from most of the cyber cafe

Content Localization

- Issues and Challenges for localizing the contents
  - Business
  - Technology
  - Reliability on Facilities (Data-Center)
  - International Approach
- Production of Own Contents
- Simply Localizing the well established global contents
- Mirroring based Hosting Facility by Nepal based ISP in association with abroad IT Companies
- e-Governance

WiMAX & WiFi

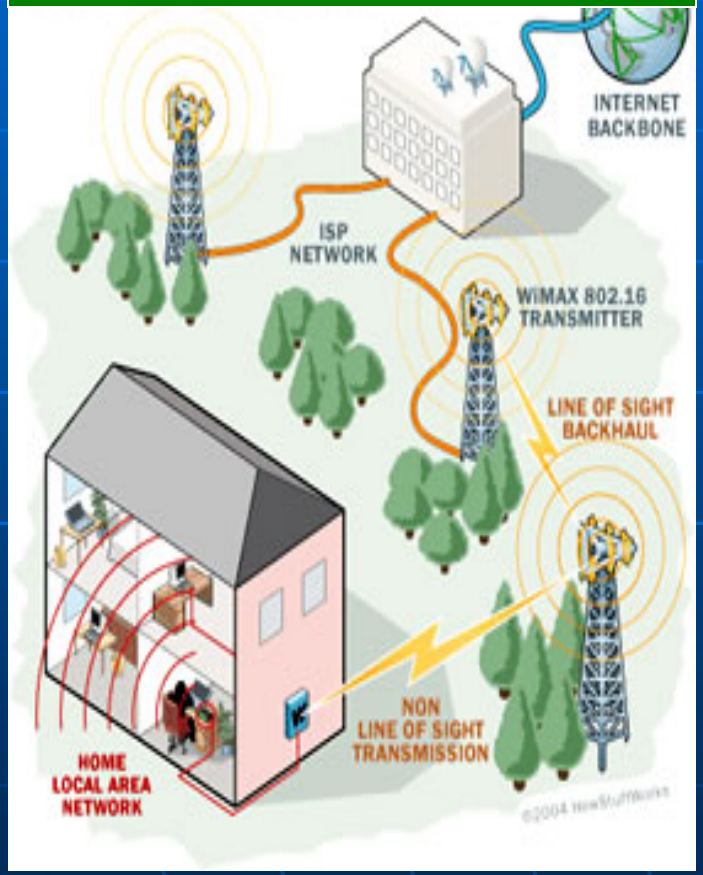
How WiMAX works?



How WiFi works?

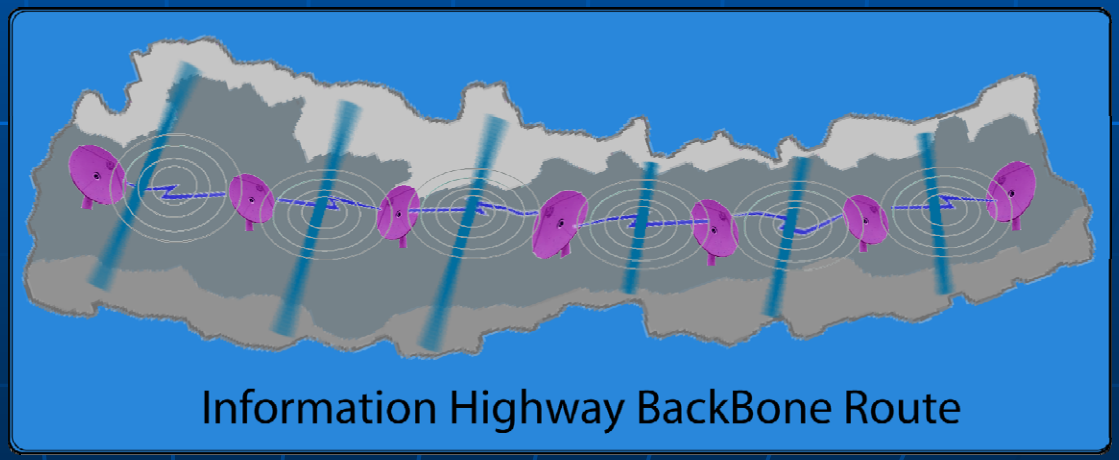
WiMAX & WiFi

How WiMAX works?



WiMAX – worldwide interoperability for microwave access, is a telecommunication technology that provides wireless transmission of data using a variety of transmission modes, from point to point links to portable internet access

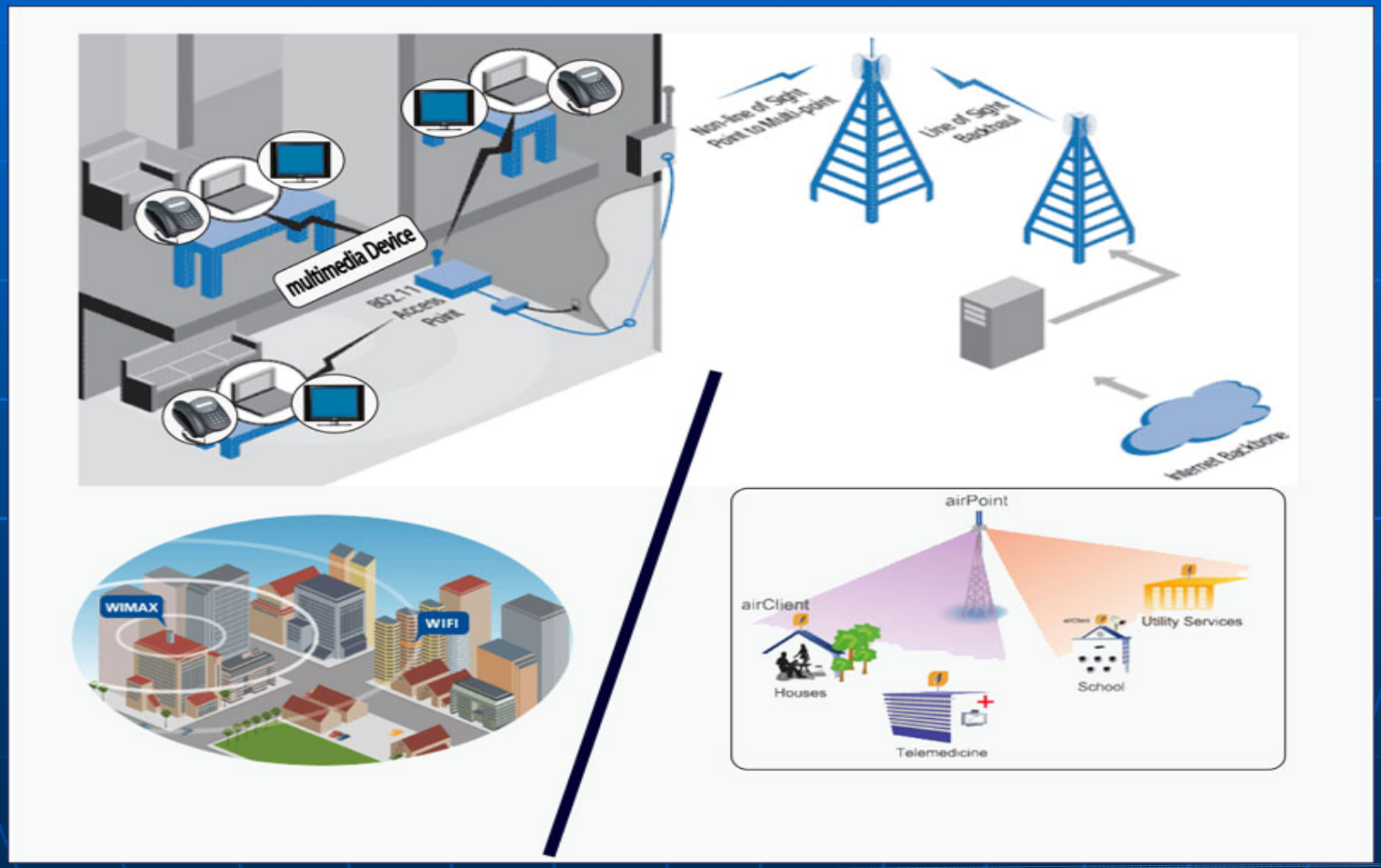
- Point to Multipoint broadband wireless access
- Operating in the 2.5 Ghz, 3.5 Ghz and 5.8 Ghz range
- Support both line of Sight & Non-line of sight



WiMAX & WiFi

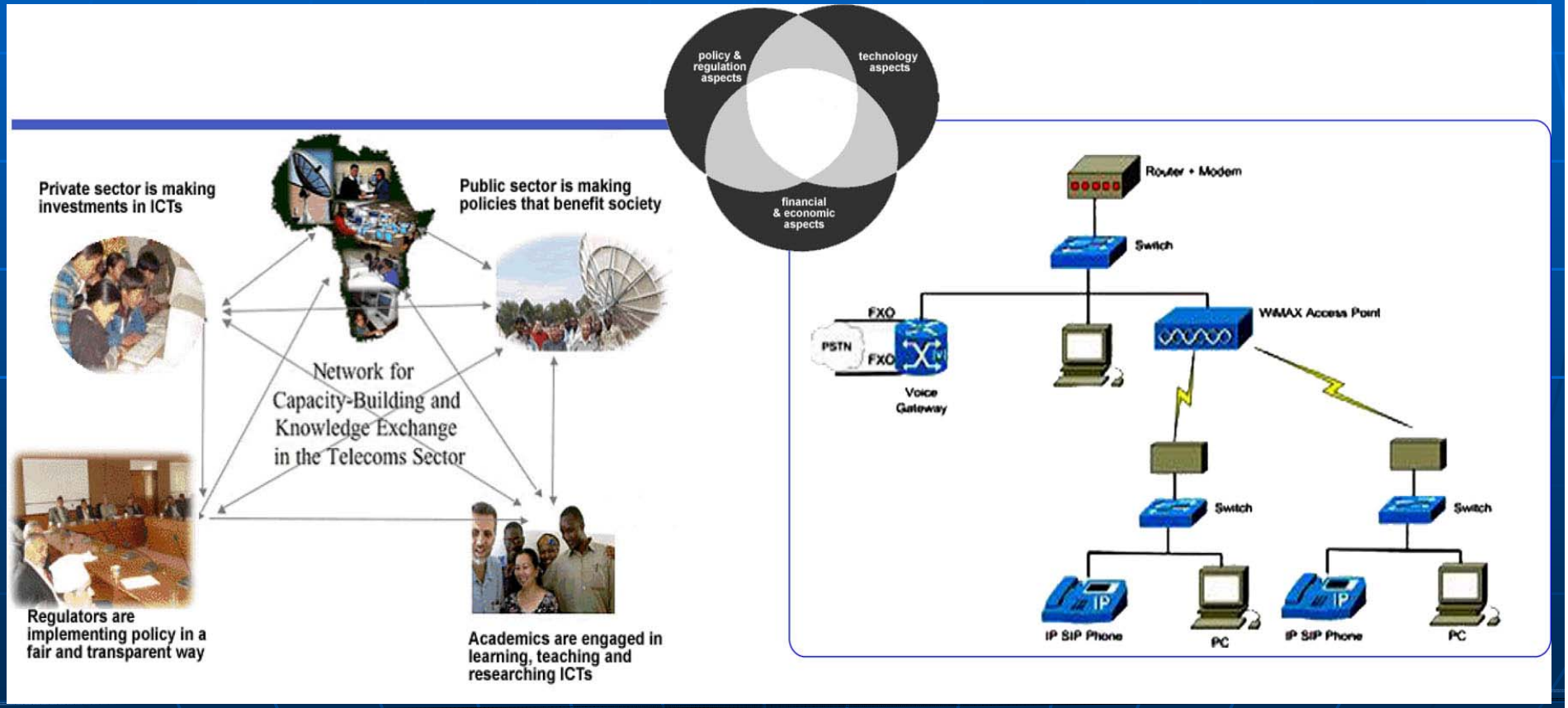
- Wimax uses IEEE 802.16 standard and provides the last mile of (MAN) Metropolitan Area high speed internet access, so it is often called 802.16, as compared to 802.11
- WiMax has the capability of covering wider areas than WiFi. While WiFi is a Wireless LAN networking technology, it can only reach a few hundred meters in the open air, WiMax is designed to be a MAN wireless internet access technology, it can cover an area of some 50 miles in diameter.
- WiMax provides a higher speed wireless internet access. Wimax can be running at a speed up to 70M, three times as fast as 3G networks.
- WiMax provides the last mile of internet access; it can connect WiFi hotspots to the Internet. And provide a wireless alternative to cables and DSL.
- WiMax provides multi-media and telecommunications services, it is securer and can be upgraded.
- Now while WiMax are becoming popular in EU countries and the North America, Asia, is also introducing WiMax technology as well. The goal for the long term evolution of WiMAX is to achieve 100 Mbit/s mobile and 1 Gbit/s fixed-nomadic bandwidth and can be expected to be one of the most widely usedwireless internet access technologies in the future.

WiMAX & WiFi


multimedia Device
802.11 Access Point
Non-line of Sight Point to Multi-point
Line of Sight Backhaul
Internet Backbone
WIMAX
WIFI
airPoint
airClient
Houses
Telemedicine
School
Utility Services

WiMAX & WiFi

- Business Model
- Implementation - Feasibility discussion



Thank You !

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