



Update of Internet in Bhutan

Jichen Thinley
Bhutan Telecom





Outline

1. Background of Bhutan Telecom
2. Internet Journey in Bhutan
3. Mobile journey in Bhutan
4. Road Ahead





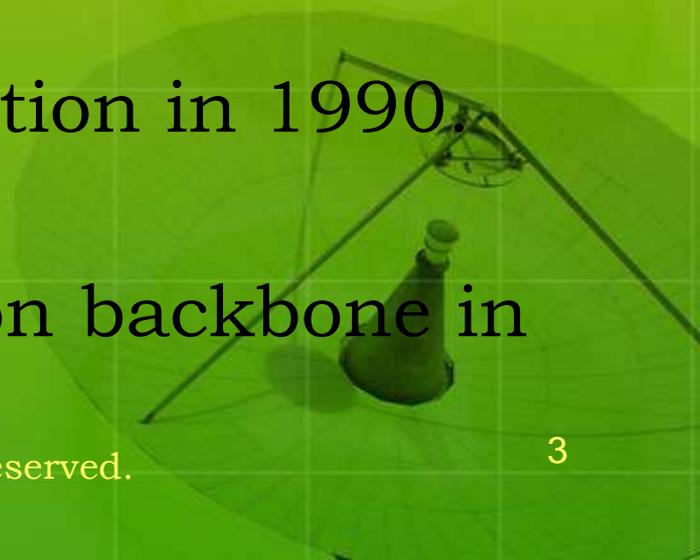
History

The Telecommunications Services (Phone) started in 1st May 1965. Open wire step x step exchange (Phuentsholing – Thimphu)

Microwave Link to India 1985

Standard A Satellite Earth Station in 1990.

Digital Microwave Transmission backbone in 1990-1995





Transmission Network

Fibre to all 20 Districts and major satellite Town (NGN 10G Network)

Provides backhaul to Internet and Mobile Services

Government laying Fibre to all 20 districts and 202 blocks (most completed), Balance work to be completed by June 2013.

Government installing CIC at the block level (Community Information Center) for G2C, B2B etc services



Service Providers In Bhutan

Bhutan Telecom Ltd

Fixed, Internet and Mobile Services.

Internet Operators

3 Private Internet Operators

Mobile Operator

1 Private Mobile Operator





Internet

Internet launched on 2nd June 1999.

256Kbps Link to British Telecom
CONCERT on satellite Link.

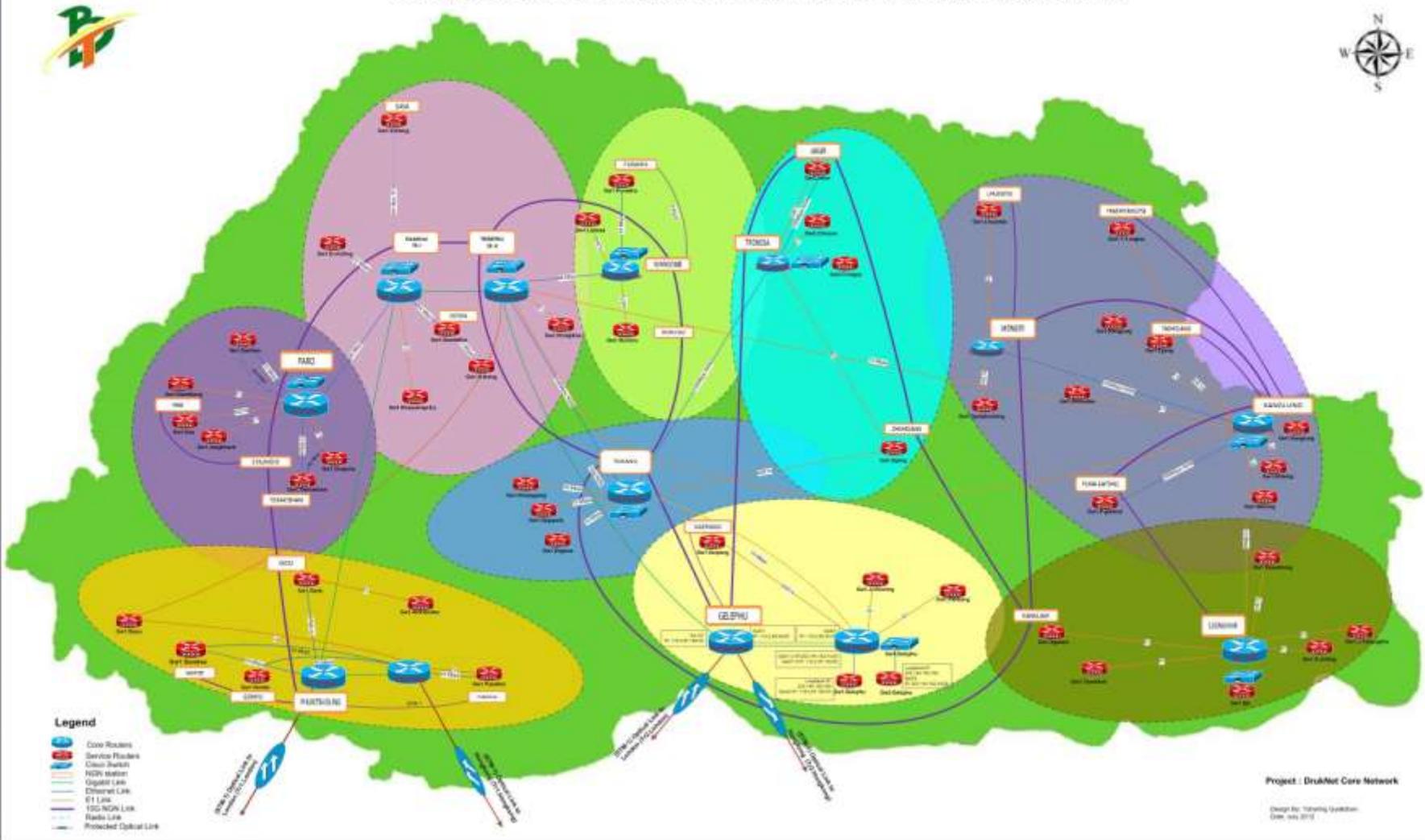
3 PoPs in the country catering Dial up
(56kbps) in the whole country and 5
lease Lines.



Internet today

Bhutan Telecom Ltd

DrukNet Core Network Diagram / Topology & Fiber NGN (SDH) NetworkTopology





BT Internet Circuit Capacity

2 STM-1 IPLC circuits each to our PoPs at LINX, London and at HKColo, Hongkong.

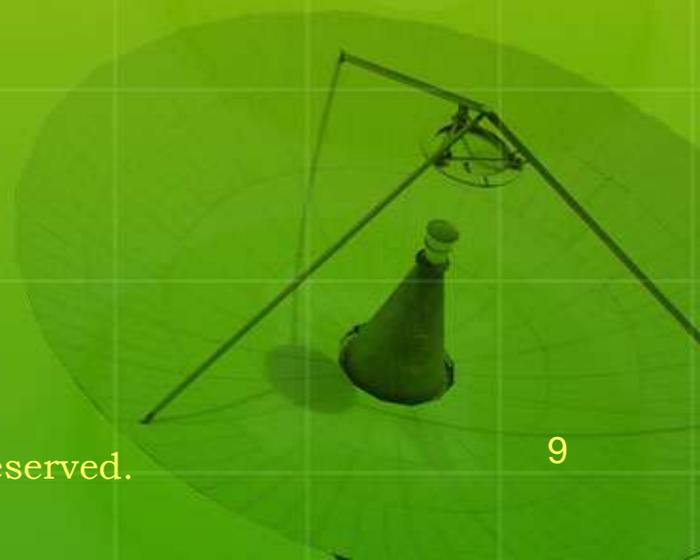
2 International Gateways from Bhutan
One From Phuentsholing South Western Bhutan (Dec2007) and Second one from Gelephu, Central Bhutan.(2011)





Bandwidth Intensive Services

1. ADSL/DSL 512Kbps on Copper and (FTTC, FTTB, FTTH) and Wireless.
2. Internet Lease Lines
3. P2P Circuits
4. IPVPN
5. IPLC





Peering and Transit

Peering at LINX, at London

- About 100Mps
- and IP Transit with Abovenet (To be upgraded to 400Mbps)

Peering at HKIX, HongKong,

- About 120Mbps
- And IP Transit from NTT

Google Cache traffic about 80Mbps



IPv4 and IPv6

APNIC Allocation:

AS NO 17660, 202.144.128.0/19, 119.2.96.0/19

2405:D000:: /32

Will be applying for IPv4 /22 last allocation.

IPv4 and IPv6 Dual Stack running on backbone
for about 6 years

Exchanging dual stack IPv4 IPv6 Traffics at LINX,
HKIX (Peering) and with NTT and Above Net IP
Transit Provider.

Implemented Dual stack IPv4 and IPv6 in BT, 4
college network.

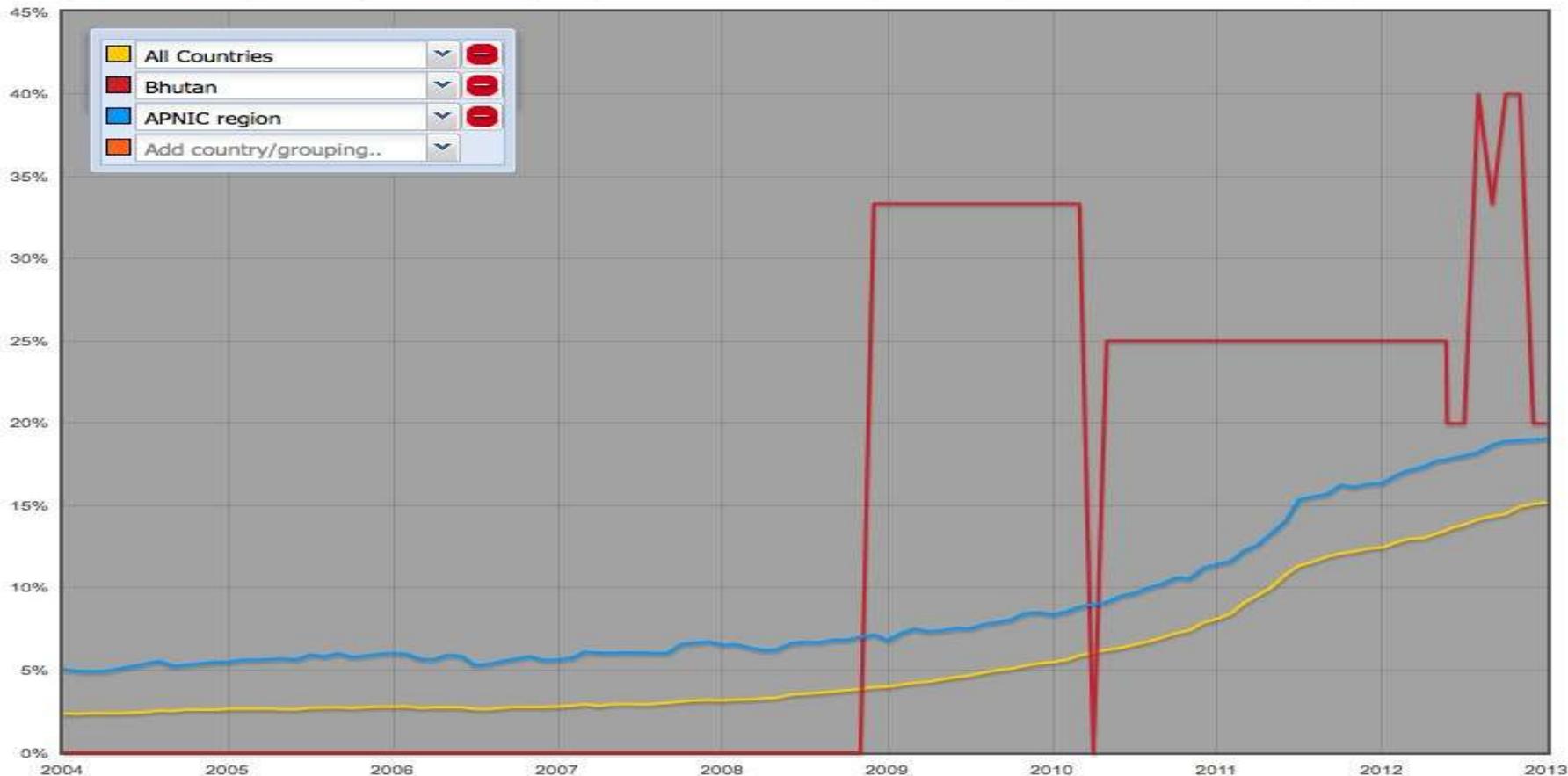
Will be rolling out IPv6 to ADSL/DSL customers
within this year (CPE Issue).



Bhutan Telecom IPv6 Usage

Source: <http://v6asns.ripe.net/v/6>

This graph shows the percentage of networks (ASes) that announce an IPv6 prefix for a specified list of countries or groups of countries



Methodology

For every date we sampled, we took a BGP table dump from the Routing Information Service (RIS) and counted the percentage of ASes that announced an IPv6 prefix, relative to the total number of ASes in this routing table. We mapped the ASes to country using the RIR stats files. To assess the accuracy of that mapping we compared it to geolocating all announced IPv4 space for an AS. Geolocation was done with the MaxMind geolocation database. We found that in 89% of ASes all IPv4 address space geolocated to the same country as RIR stats. An extra 5% of ASes geolocated to multiple countries, but the largest fraction of address space geolocated to the same country as RIR stats. Some countries do not show up in this graph, either because there are no ASes in the RIR stats for that country, or the ASes listed for the country are not announcing any address space.



BTNIC

BT also operates and maintain .bt ccTLD on behalf of BTNIC.

Provide Second and Third Level domains under .bt ccTLD

I Root Server in Bhutan (Courtesy APNIC and NetNod (Kurtis)



(Bmobile)Services since 2003

Provides GSM (GPRS and EDGE) services to all 20 Districts and 202 Gewogs(blocks) in the country.

3 G Services at Thimphu since 2007,Phuentsholing and Paro(2012)

Data Speed 21Mbps

Presently being installed at other major districts in the country giving focus to Colleges.

Bwallet (m commerce) Prepaid top up and also fund transfer in collaboration with Banks.



BT's Road Ahead

FTTC/FTTB/FTTH in major towns for Last Mile Access.

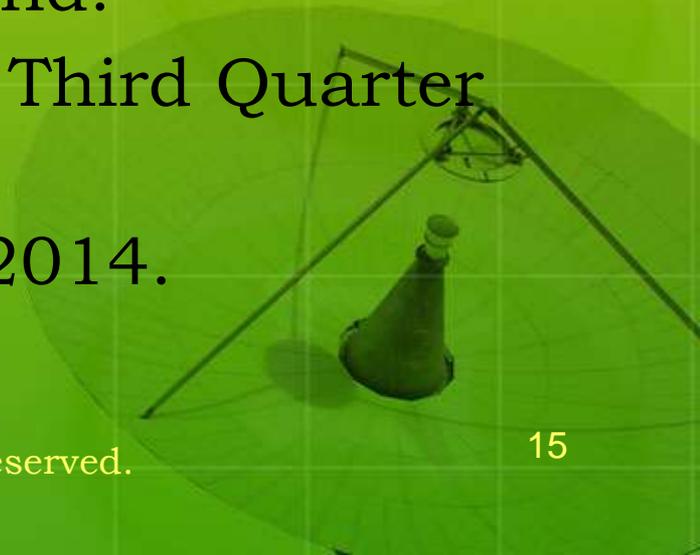
Soft switch for Fixed lines by Mid 2013.

2 LTE Nodes(40Mbps initially) to be installed this year at Thimphu as trail.

Internet Bandwidth to be upgraded to 1.2Gpbs within this month and to be upgraded to 5Gbps or 10Gbps by the year end.

Data Center at Phuentsholing by Third Quarter this year.

IPTV for customers within 2013-2014.





BT's Road Ahead

Establishment of BT IX (SASEC Project) under Govt - ADB Initiative.

BWallet – Payment of utilities bills online starting Telecom payments.

Exploring Fibre link to Cox Bazaar, Bangladesh to access Submarine cable. Discussion with BSNL, India for access from Bhutan-Bangladesh Border.



Bhutan Telecom Ltd

always there for you!

Thank you

