Telkom’s NGN

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The Telkom NGN Architecture

Media & Applications
- Content
- Voice
- Music
  - VoD
  - Email
  - Web

Service Enablers
- Hosting Security
- Soft-switch IMS SDP
- SMSC IN / ESP NIVR
- AAA DNS Cache

OSS & NGOSS
- Hosting
- Security
- Soft-switch IMS SDP
- SMSC IN / ESP NIVR
- AAA DNS Cache

IP Network
- Performance Core
  - High Speed, Reliable
- Transport Core Network
  - ASTN
  - NG-SDH
  - DWDM

Aggregation
- Metro Ethernet
- ATM

Wireless
- 3G (W-CDMA)
- WiFi
- Satellite
- WiMAX

Wireline
- PSTN
- Ethernet
- ATM
- DSL
- Diginet
- FTTx
- NGSDH & Metro WDM

Customer
- Mass Market
- Enterprise Market
- IT Market
- Wholesale Market
- Voice email
Our vision of how Telkom will serve our end-customers

Connecting Africa
- Fibre optic and satellite capacity

Connecting South Africa
- Managed secure IP-VPNs
- Fixed-line voice
- Data Centres/IT services
- W-CDMA

Connecting to the world
- MPLS-VPN to more than 700 cities in 70 countries via trusted partnerships

Connecting consumers
- Fixed line voice
- Broadband
- Mobile Data
Telkom’s Network of the Future
Your future...

• The goal … *a rejuvenated network for the future*

• Access network … *coverage and ubiquity*

• Transport capability … *creating capacity with resilience*

• Rich applications and services … *driving customer centric services*

• The ultimate goal of enabling converged services … *creating and delivering value to the customer*
The Rejuvenated Network of the Future

... with IP as the chosen fabric
Telkom’s network of the future

Logical network layers focused on service diversification

Access
Transport, Edge & Aggregation
Intelligence and Control
Enablers
Consumer Services
Data Centre
Network Services
IP over Everything and Everything over IP

Everything over Everything

IP

Core and Edge
Aggregation
Access and Devices

Applications and Services
The Network Core

… evolving from Mbit/s to Tbit/s
Transport Network building blocks – enhancing network capabilities

Value Added Services Offering

Managed capacity and optical layer resilience enabled by wavelength switching and integrated control plane

Network bandwidth optimization and services differentiation enabled bandwidth sharing mechanisms and CoS

SLA and customer security requirements enabled by MPLS

Dedicated and synchronized customer bandwidth

Managed capacity and optical layer resilience enabled by wavelength switching and integrated control plane

Network bandwidth optimization and services differentiation enabled bandwidth sharing mechanisms and CoS

SLA and customer security requirements enabled by MPLS

Dedicated and synchronized customer bandwidth

Evolution from kbit/s to Tbit/s throughput with resilience (self healing) and manageability (customer focussed)

Managed Services

Not Managed Services

IPNET

IPNET with MPLS

Metro/Carrier Ethernet with QoS

NG-SDH with ASTN

xWDM with ROADM/ASON

Fibre

Network Layers

L3

L2

L1
IP Network

- Rolling out new core – Carrier Support Carrier
- Improved security
- Upgrading the edges
- Caching
- Resilient network
- Capacity to increase in line with transport initiatives from 2.5G → 10G
## The Transport Network building blocks (and supported Network services)

<table>
<thead>
<tr>
<th>Value Added Services Offering</th>
<th>International Services Offering</th>
<th>Network Services Offering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managed</td>
<td>VPNS</td>
<td>Global VPN</td>
</tr>
<tr>
<td>SAN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metro LAN</td>
<td>Easy VPN</td>
<td>Dedicated p2p (TDM/Ethernet)</td>
</tr>
<tr>
<td>Ethernet Express</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Managed</td>
<td>Metro Clear</td>
<td>Global VPN</td>
</tr>
<tr>
<td>VPN Lite</td>
<td></td>
<td>Lan Connect</td>
</tr>
<tr>
<td>Managed</td>
<td>IPNET</td>
<td>Global VPN</td>
</tr>
<tr>
<td>IPNET with MPLS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metro/Clear Ethernet with QoS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managed</td>
<td>Metro/Clear Ethernet with QoS</td>
<td></td>
</tr>
<tr>
<td>xWDM with ROADM/ASON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fibre</td>
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</tr>
</tbody>
</table>
Metro Clear

- Metro Clear is a cost-effective layer 2 VPN solution that is designed to provide multipoint connectivity and allows a customer to have full control over the networking layer.

- Fibre connection will be managed by Telkom up to and including the NTU. The customer will be given a wide choice of bandwidths (4-600MB) and will be free to choose the QoS breakdown of the traffic.

- Service will be delivered on a standard electrical Ethernet port.

- Several classes of service.
Ethernet Express

- High demand for point-to-point solutions.
- Bandwidth is limited in current layer 2 point-to-point solutions.
- Some layer 2 point-to-point services inefficiently use fibres.
- Certain layer 2 point-to-point services have distance limitations.
- Ethernet Express is designed to offer the same and more than current layer 2 point-to-point solutions.
- Ethernet Express will be capable of offering software upgradeable bandwidth.
## Ethernet Express

<table>
<thead>
<tr>
<th>Product</th>
<th>Bandwidth Type</th>
<th>Bandwidth</th>
<th>Class of Service</th>
<th>International Access</th>
<th>Interface</th>
<th>Managed Service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shared</td>
<td>2 – 600 Mbps</td>
<td>RT, BB, GD</td>
<td>Yes</td>
<td>E1, Eth, STM1</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Dedicated</td>
<td>&gt; 155 Mbps</td>
<td>Not applicable</td>
<td>No</td>
<td>Eth, STMx</td>
<td>No</td>
</tr>
</tbody>
</table>

- **Bandwidth Type**: Dedicated vs. Shared
- **Bandwidth**: 2 – 600 Mbps for Shared, > 155 Mbps for Dedicated
- **Class of Service**: RT, BB, GD (Shared), Eth, STM1 (Shared), Eth, STMx (Dedicated)
- **International Access**: Yes for both Shared and Dedicated
- **Interface**: E1, Eth, STM1 (Shared), Eth, STMx (Dedicated)
- **Managed Service**: Yes for Shared, No for Dedicated
Ethernet Express

Global

Local

MCO

Market

Applications

Voice

Data

CoS with QoS

Dedicated
Regional and National networks – built with resilience and manageability

- ASTN Grooming Node
- Transparent Lambda Handover
- LH DWDM
- Metro/Regional
- Direct Fibre Connectivity
- International Link
- FIFA 2010 Stadium

Telkom National Network enhancements

- Overhead fibre replacement to reduce “accidental” fibre/route damage and ensure network stability
- “Legacy” DWDM replacement – gearing for 10Gbit/s service capability on National Network
- Regional network enhancement – providing managed capacity and consolidated network infrastructure
- Intelligence – managed control of restoration schemes across multiple fibre routes
Access Network

... coverage and ubiquity
• Evolving access media
  ➢ fuelled by optic and wireless revolution

• Telkom initiatives in support of ubiquitous coverage
  ➢ Evaluating developments and the business case for FTTP
  ➢ Tracking development of 4G, WiMAX e & m
The Access Network supports Wholesale Services

<table>
<thead>
<tr>
<th>Products</th>
<th>L2</th>
<th>Access</th>
<th>Network Layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADSL Resell</td>
<td>ATM</td>
<td>ADSL</td>
<td></td>
</tr>
<tr>
<td>Diginet</td>
<td></td>
<td>SHDSL</td>
<td></td>
</tr>
<tr>
<td>IP Stream</td>
<td></td>
<td>WiMAX (Fixed)</td>
<td></td>
</tr>
<tr>
<td>Etherlink</td>
<td></td>
<td>3G (W-CDMA)</td>
<td></td>
</tr>
<tr>
<td>Space Stream Africa</td>
<td></td>
<td>VSAT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Metro Ethernet with QoS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Copper</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wireless</td>
<td></td>
</tr>
</tbody>
</table>

- **ADSL**
- **SHDSL**
- **WiMAX (Fixed)**
- **3G (W-CDMA)**
- **VSAT**
- **Fibre**
- **Copper**
- **Wireless**
Etherlink Overview

- It is a guaranteed packet-based service.
- Utilises SHDSL.
- Point-to-Cloud Layer 2 service.
- Ethernet interface to customer.
- 64kbs – 2Mbs (Guaranteed).
- Metro Ethernet backhaul.
- From Wholesale perspective, Etherlink will be an enabler for the following retail products:
  - Stand alone point-to-point leased line services.
  - Access to IP VPNs, Internet and value added services.
  - Access to L2 VPNs, for example Metro Clear. (future)
Customer pays Telkom for line rental & POTS calls
With L2TP the backhaul is technology transparent (ME or ATM).
Services may be provisioned to customers on all Telkom DSLAMs.
More service layer control …

- IP address assignment – the operators can use static IP addresses.
- Timeouts – operators have full control over this aspect
- Authorisation, authentication and accounting (AAA)
- Service creation and design.
The Telkom Network of the Future in Practice

… “The FIFA solution”
South Africa – the country in 2010 ...
Telkom solutions designed to provide 99.99% availability with no single point of failure
What does this mean to the end customer?
Ultimate Goal

- Customer – *the centre of our universe*
- Any service – *uniquely profiled to the customer*
  - anywhere…
  - anytime…
  - on any appropriate device…
  - always on…
  - and always available
How do we do this?

By working together!