

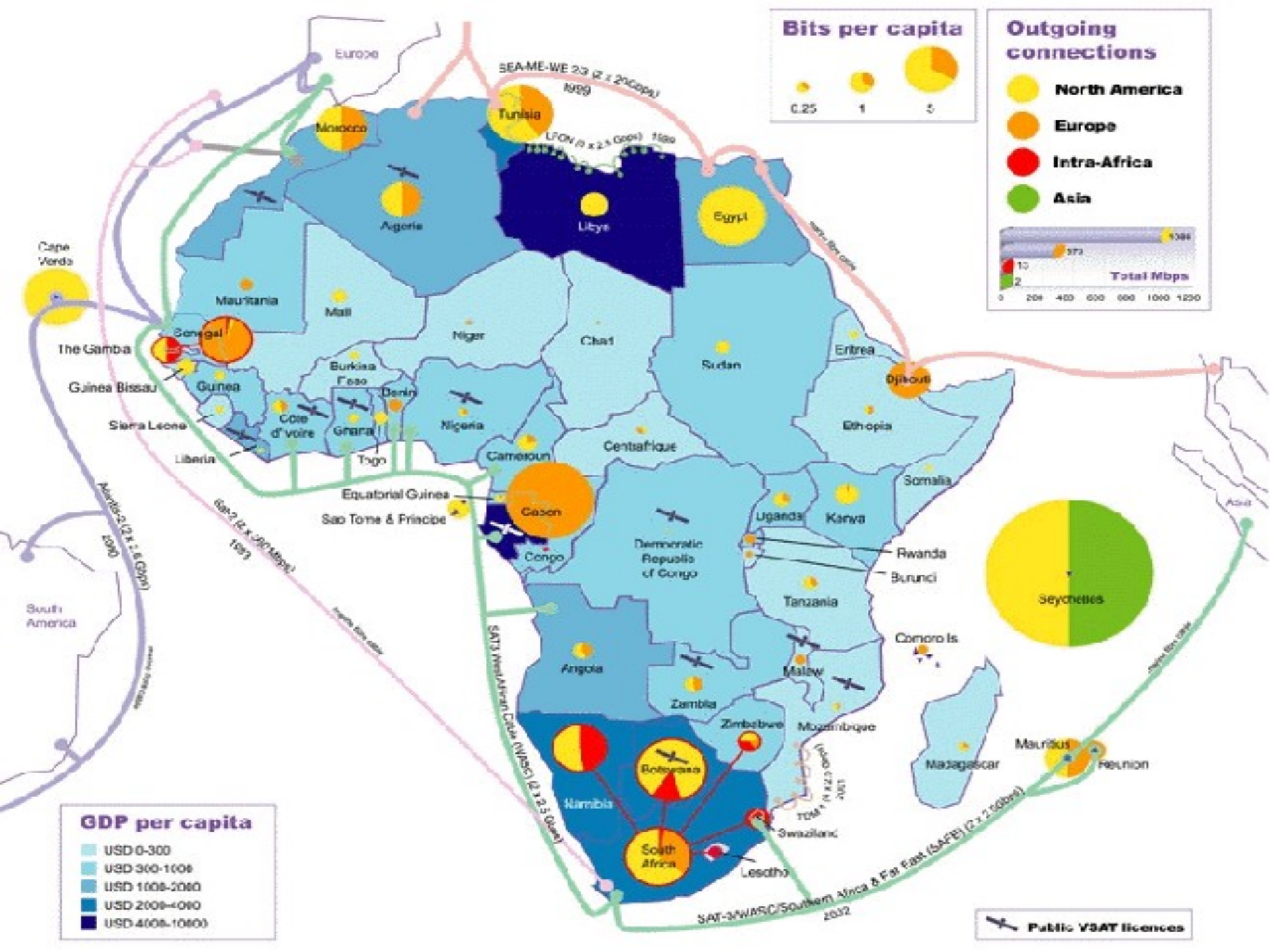
Internet Development in Africa

SANOG XIII – Lahore, Pakistan

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Legend:

-  Existing
-  Scheduled
-  Underconstruction
-  Necessary Terrestrial connections
-  Necessary submarine connections

Mobile Stats

Figure 1: Africa – Mobile Subscribers and Penetration (2002-2012)

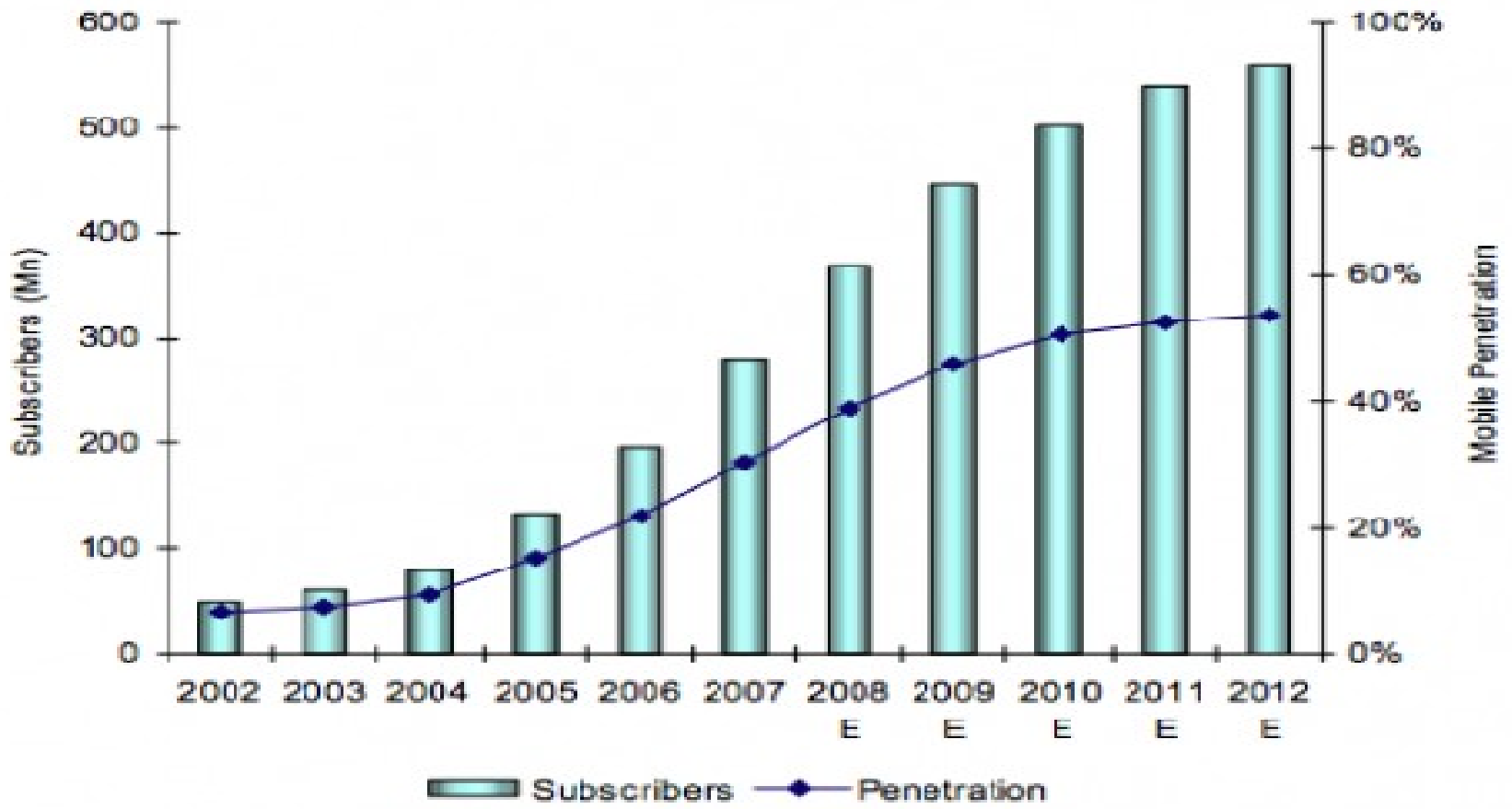
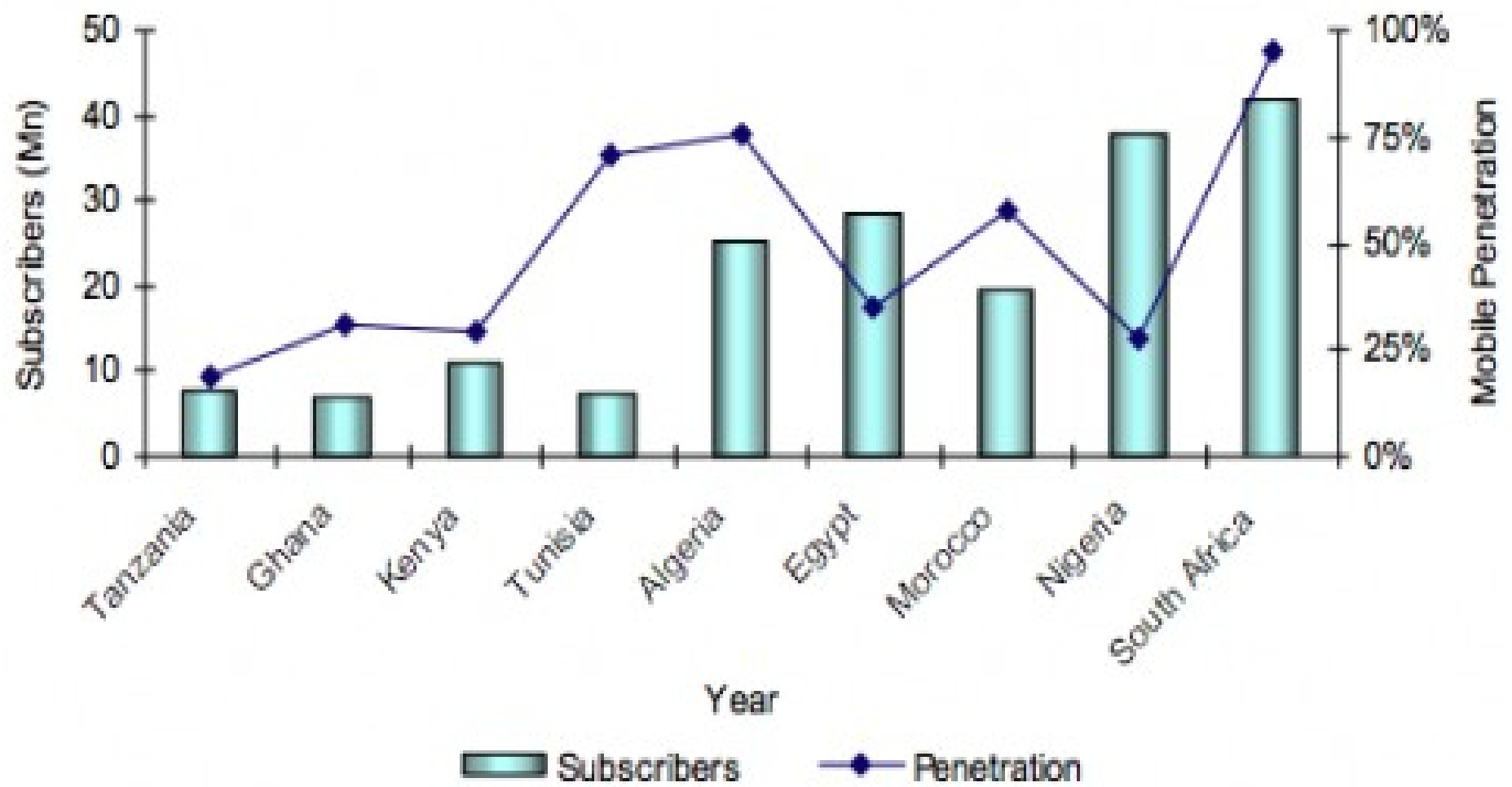
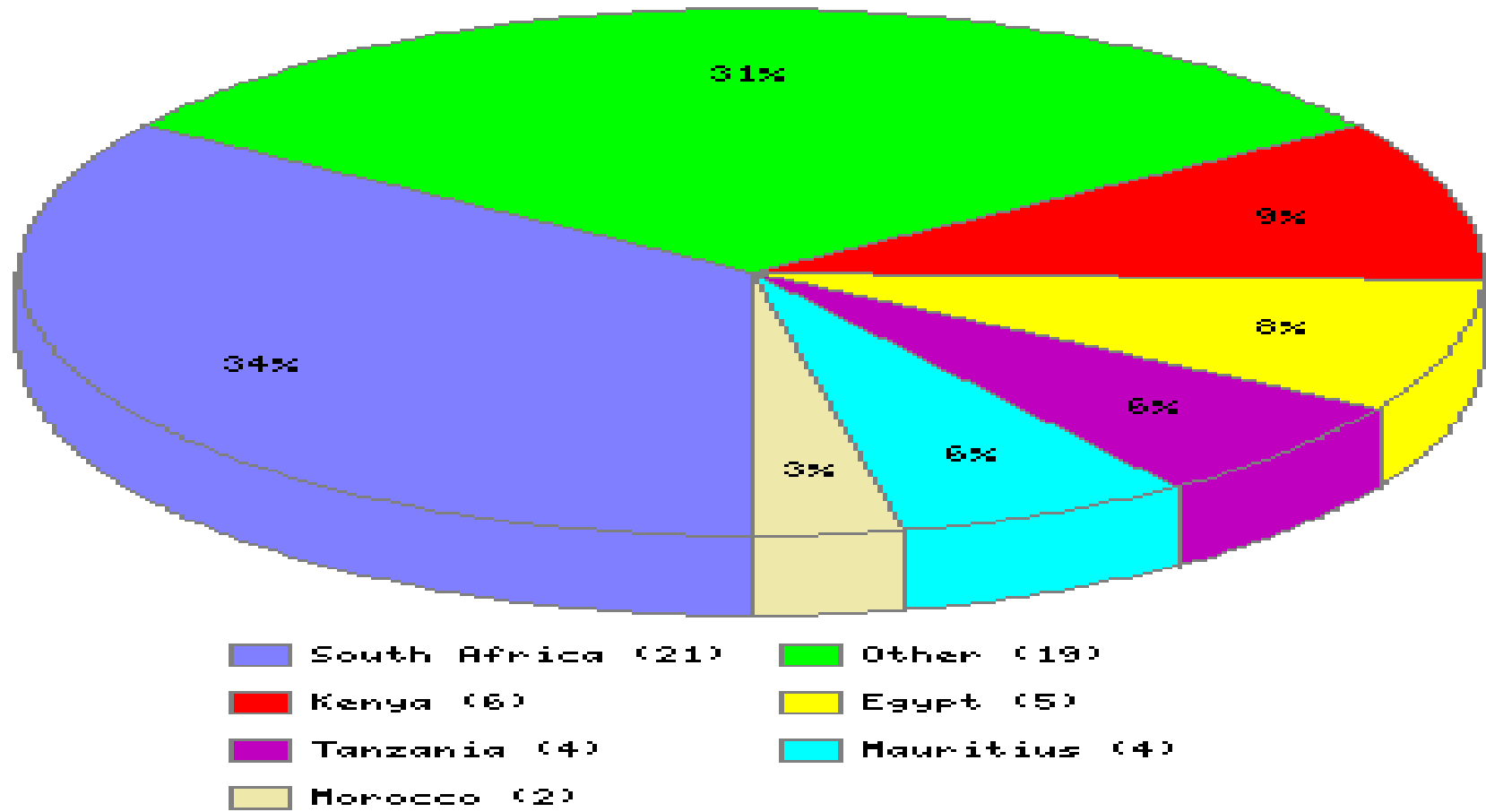


Figure 4: Africa – Major Mobile Markets (3Q 2007)



IPv6 Deployment

IPv6 Addresses By Country



Source: AfrINIC

Countries with IXPs in Africa

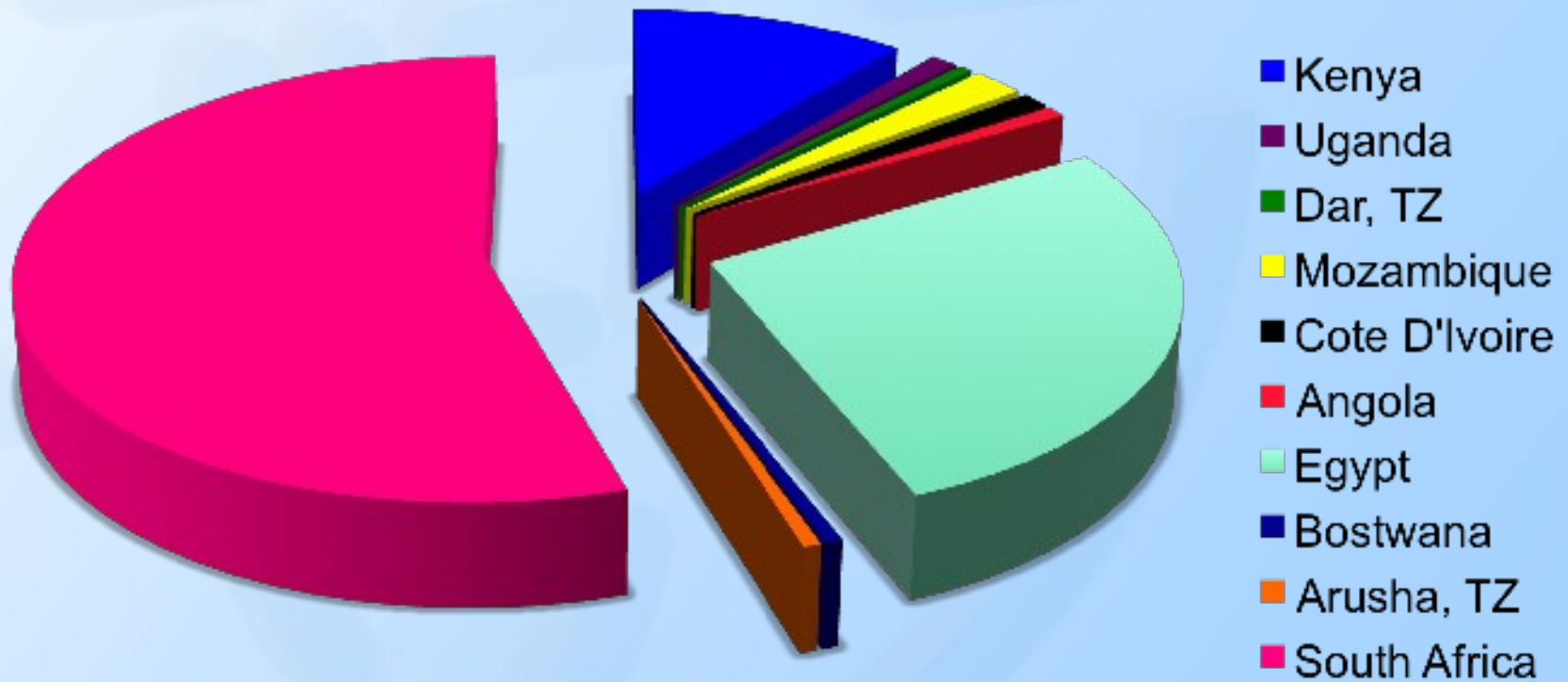


There are 18 IXPs in 16 Countries

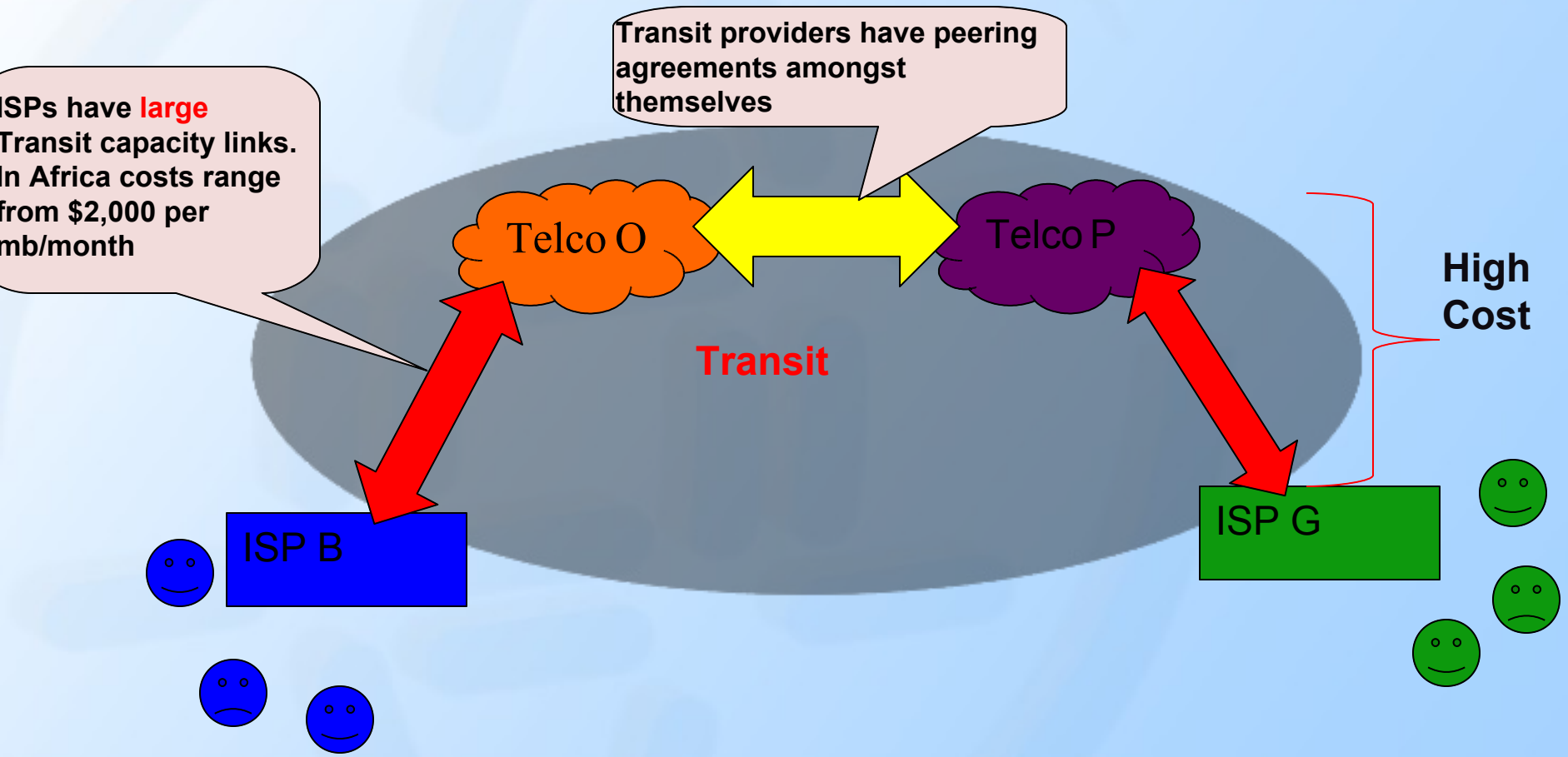
Source:
www.nsrc.org

Traffic distribution across 10 African IXPs

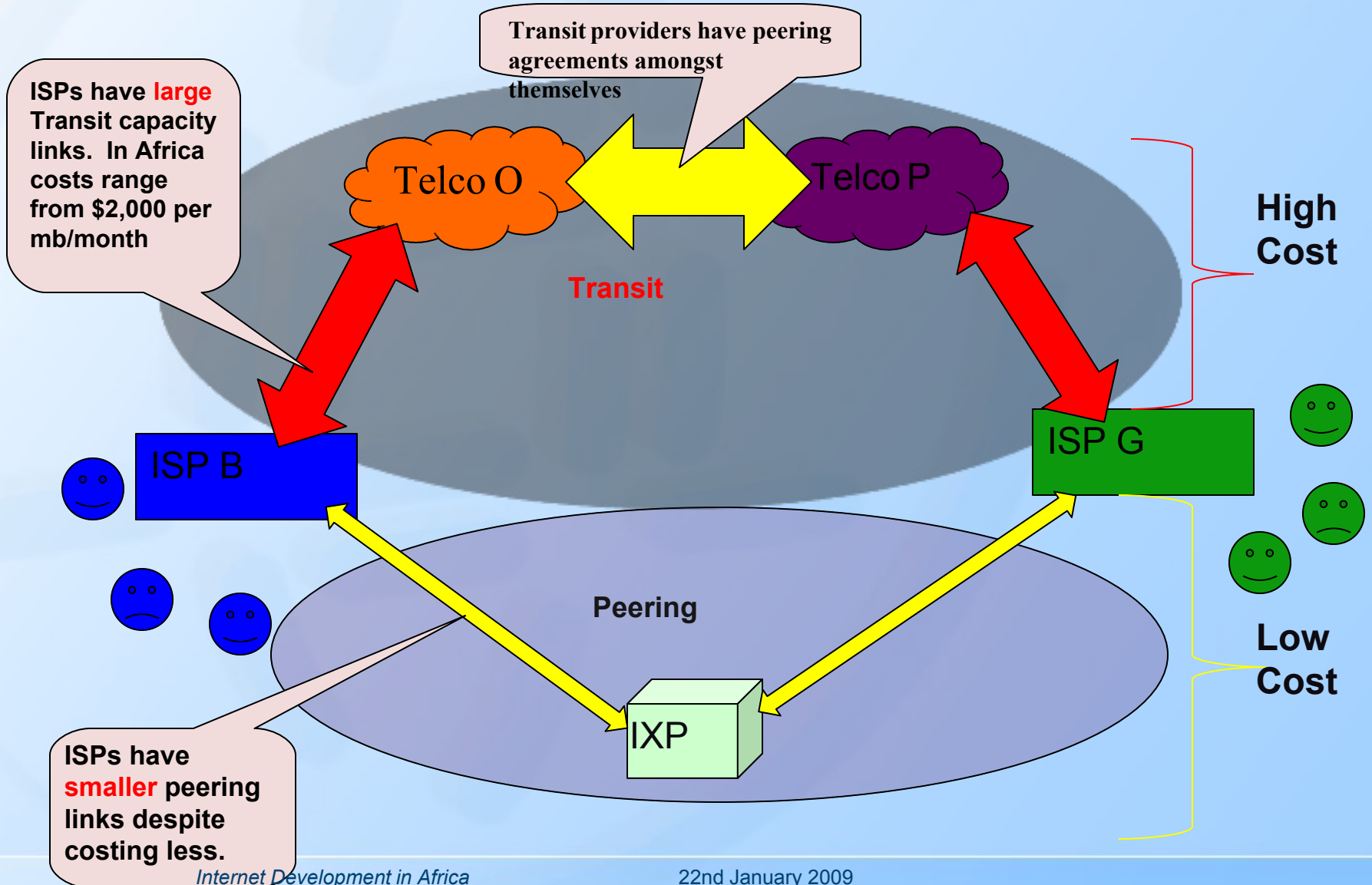
Total 364.5 Mbps



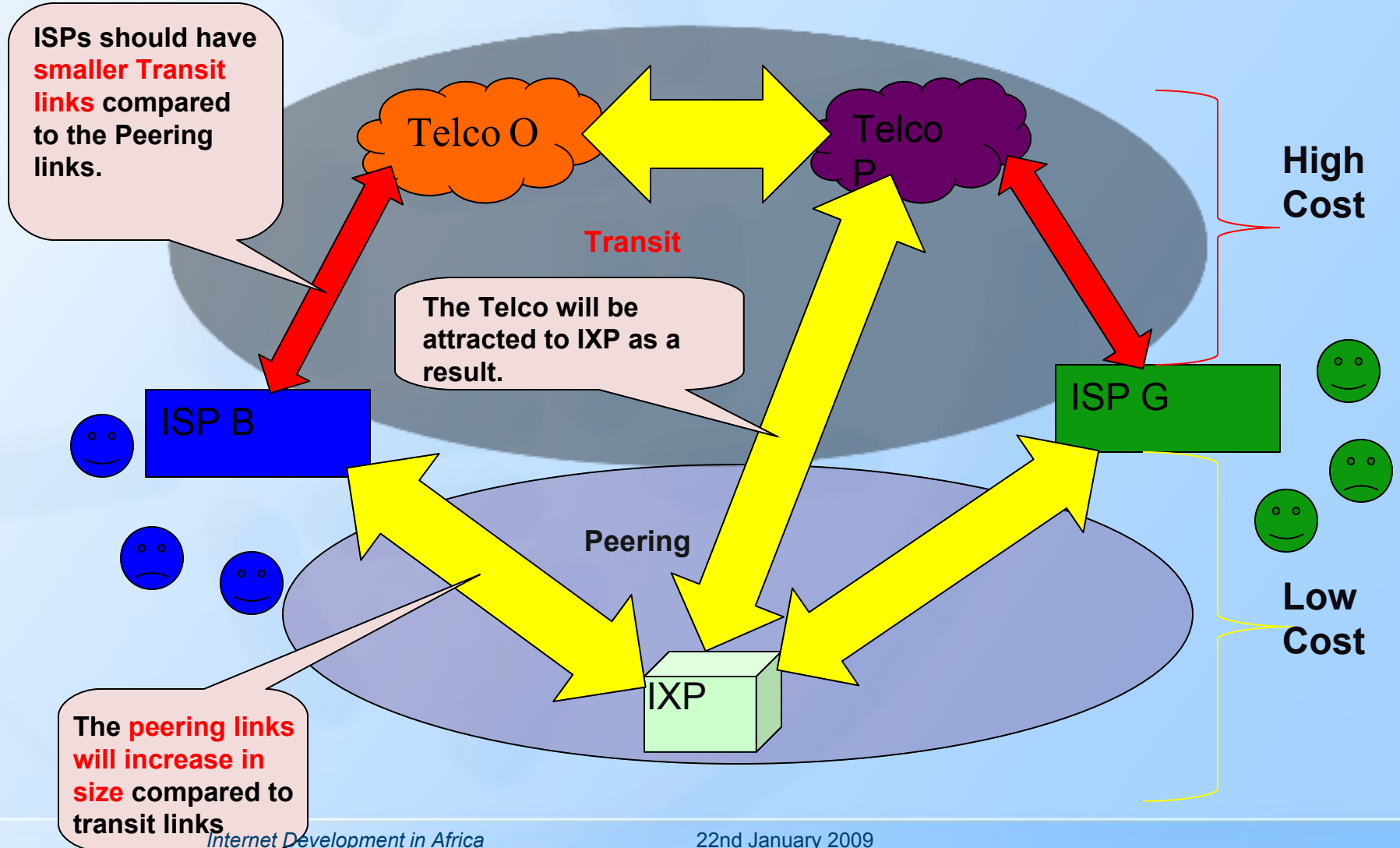
The common model



The emerging model



The future model



The building blocks

- IXP location **neutrality**
- The **peering policy** – multilateral vs bilateral
- The economics – **pricing, QoS**
- **Stability** and resilience – power, cooling, security,
- Value added services – technical support, Internet resources

The KIXP Case

- A review of the IXP policy to allow non-traditional members i.e **non-ISPs**
- **Mandatory Multi-lateral Peering** – aimed at addressing a social peering issue of big vs. small
- Implementation of IXP **Value Added Services** increase resilience and autonomy for participants
- Reduced the entry barrier **fees** to <\$400 and monthly at \$250
- **Outreach and awareness** processes – This requires resources (full-time staff)

26 KIXP Members

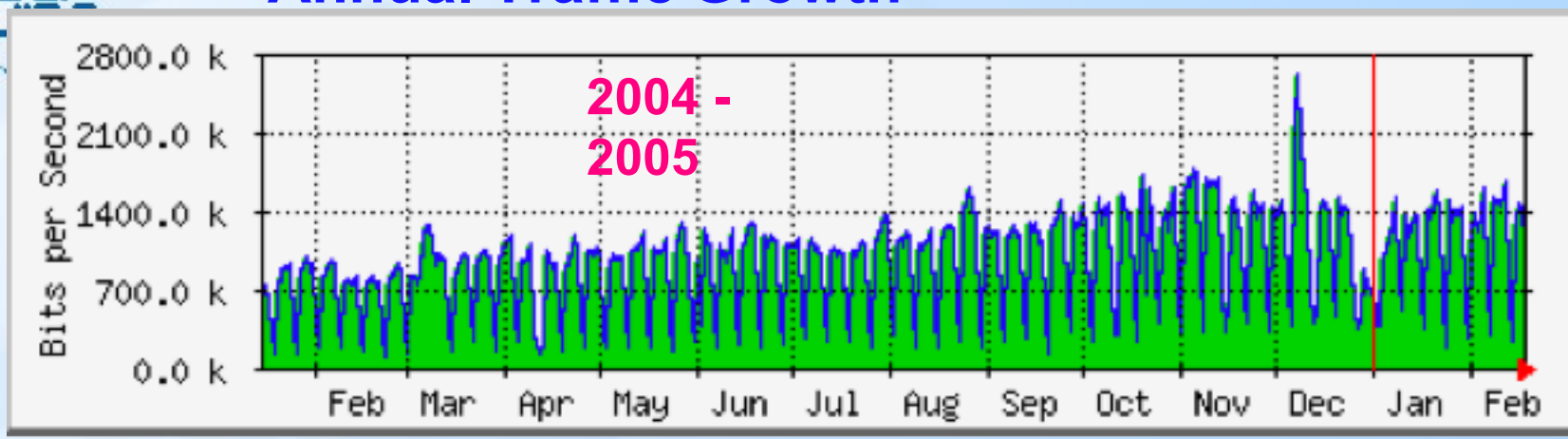
- **16 ISPs** networks
- **3 Internet backbone/Gateway providers** including the incumbent Telkom
- **1 E-Govt** - Kenya Revenue Authority (KRA) - online customs clearing system
- **NREN** - National Research & Education Network
- Kenyan **ccTLD** Registry – KENIC
- **1 local loop** Voice and data operator (LLO)
- **1 Commercial Bank**
- **2 Mobile operators** - for 3G/edge/gprs data services

Value Added Services

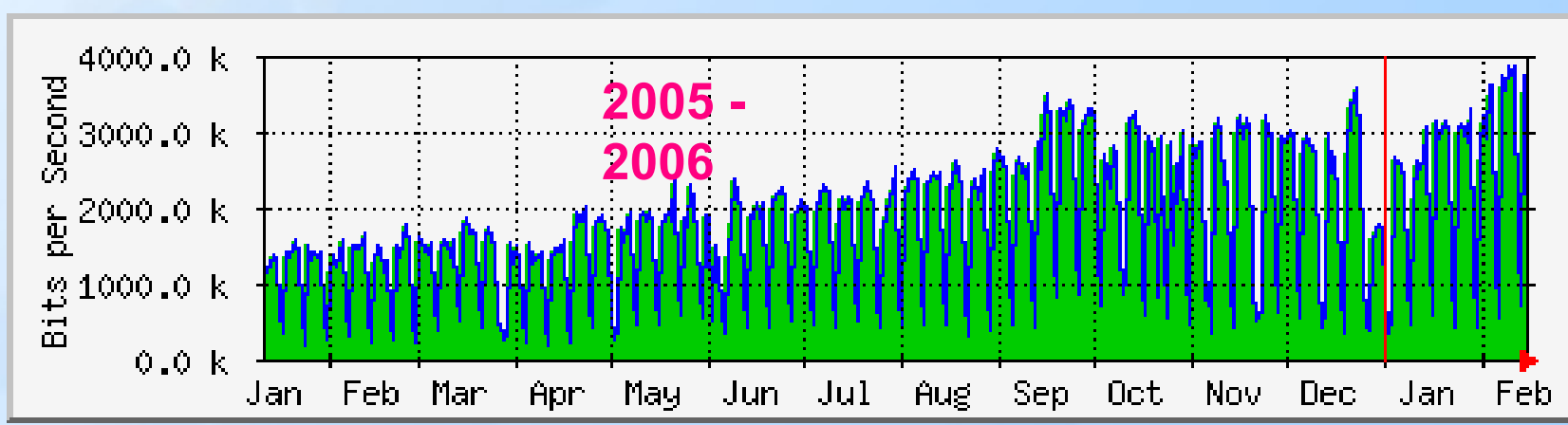
- **F & J Root** Servers mirror instances
- **.Com & .NET** gTLD Root Server mirror instances
- **.KE & 37 other ccTLDs** – PCH Anycast network
-
- Public GPS based **Network Time (NTP)** Server
- Public Looking glass - **Route-views**

Annual Traffic Growth

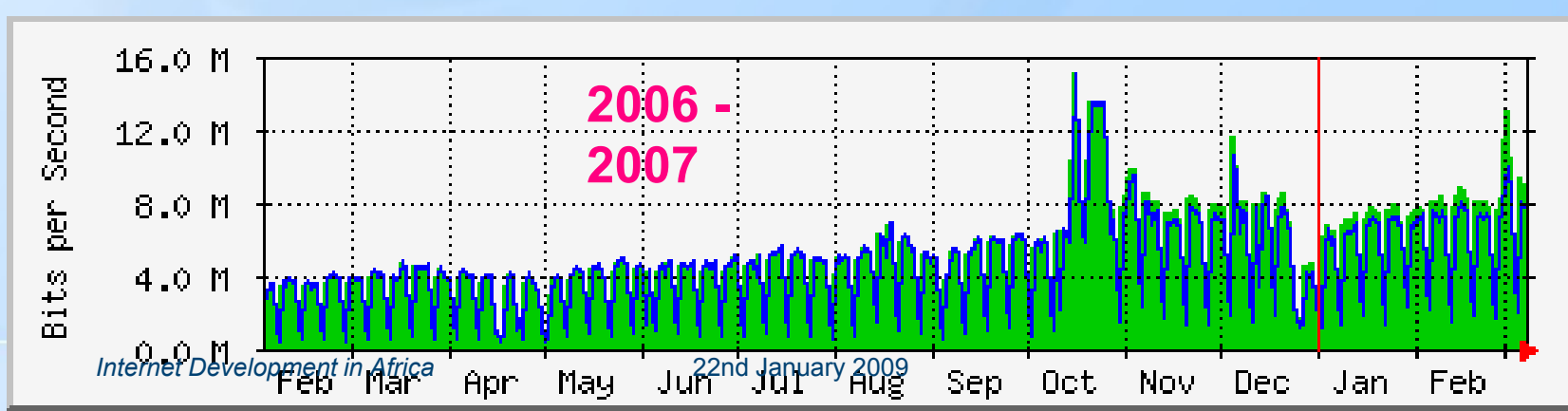
Growth Rate
77.8%



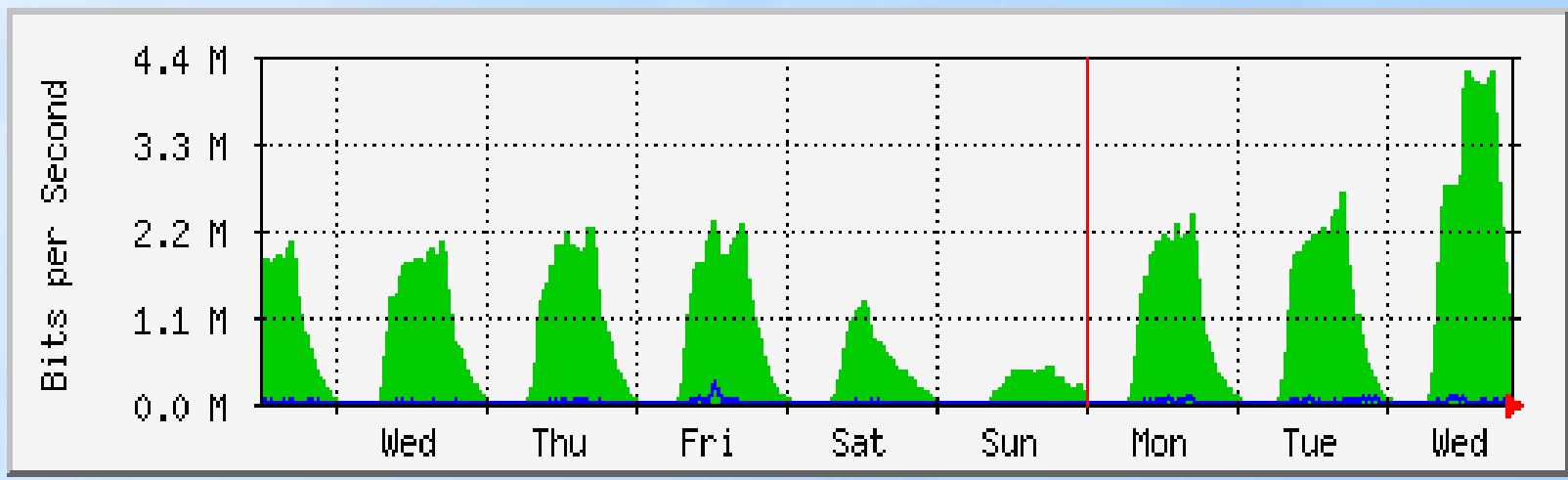
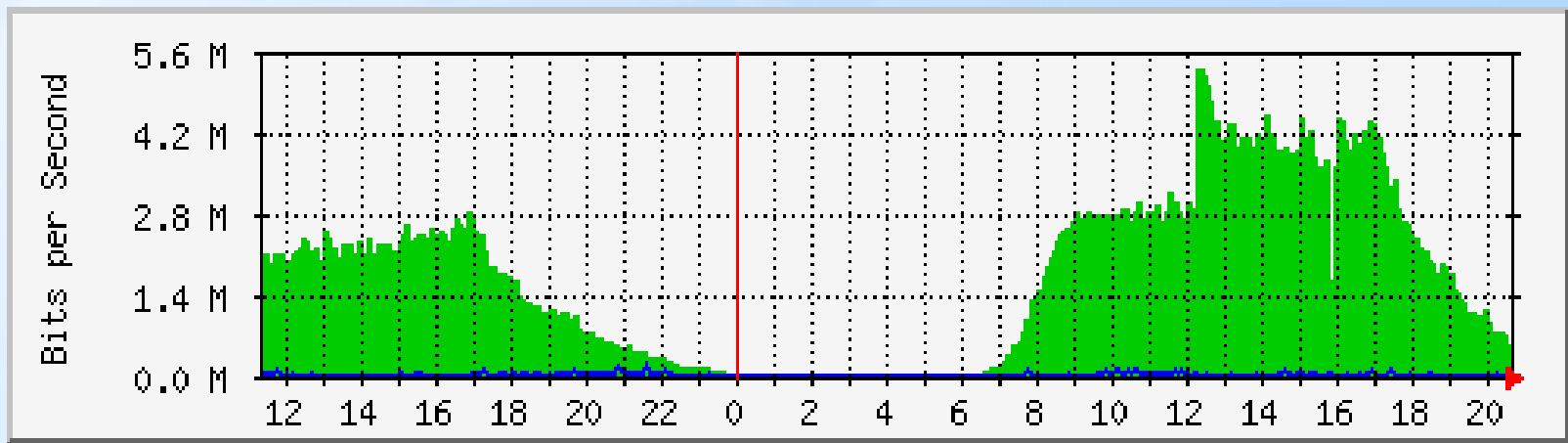
Growth Rate
137.6%



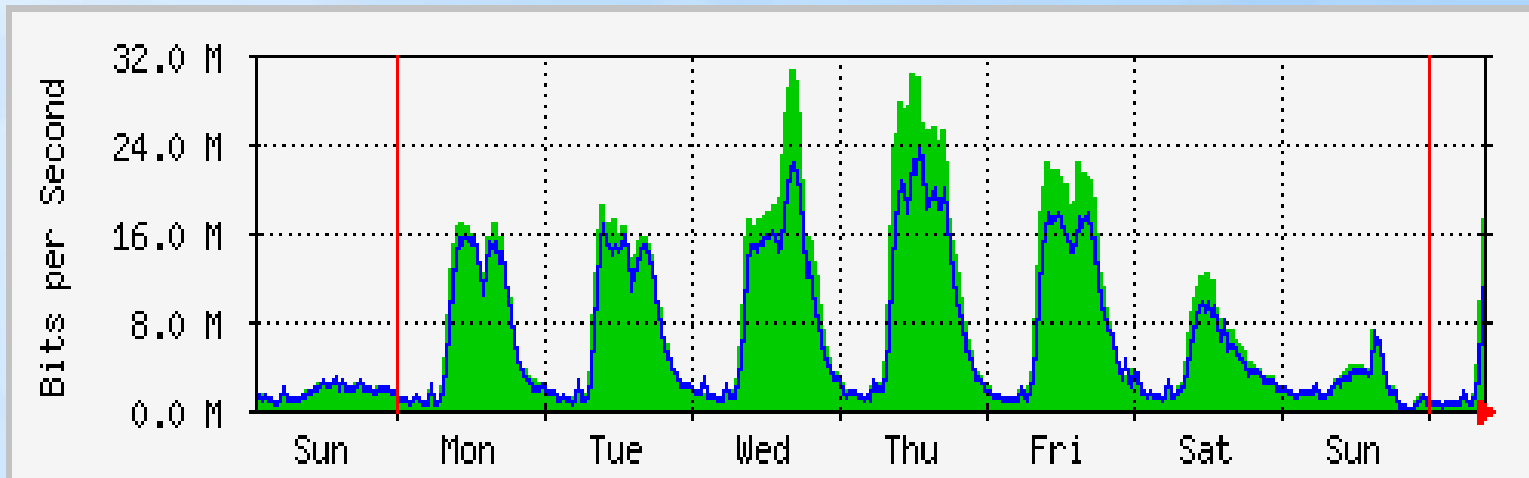
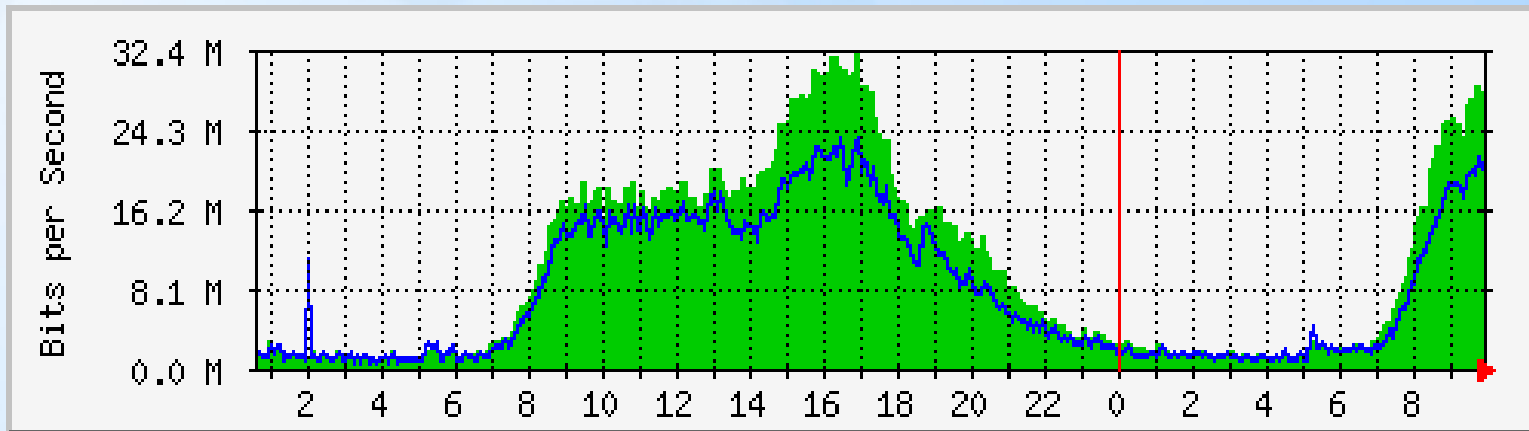
Growth Rate
110.5%



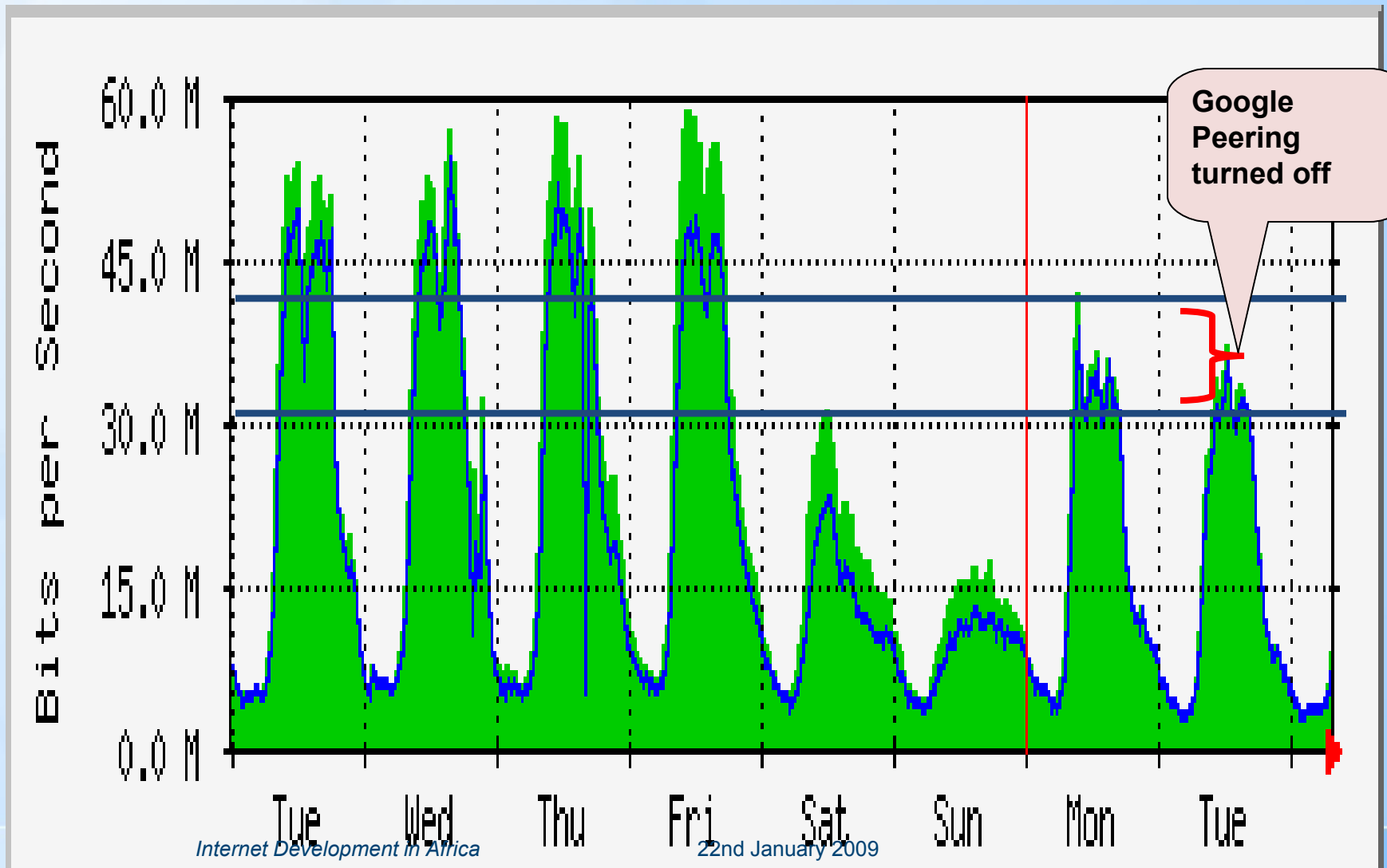
2007 Valentines day - Free SMS Website



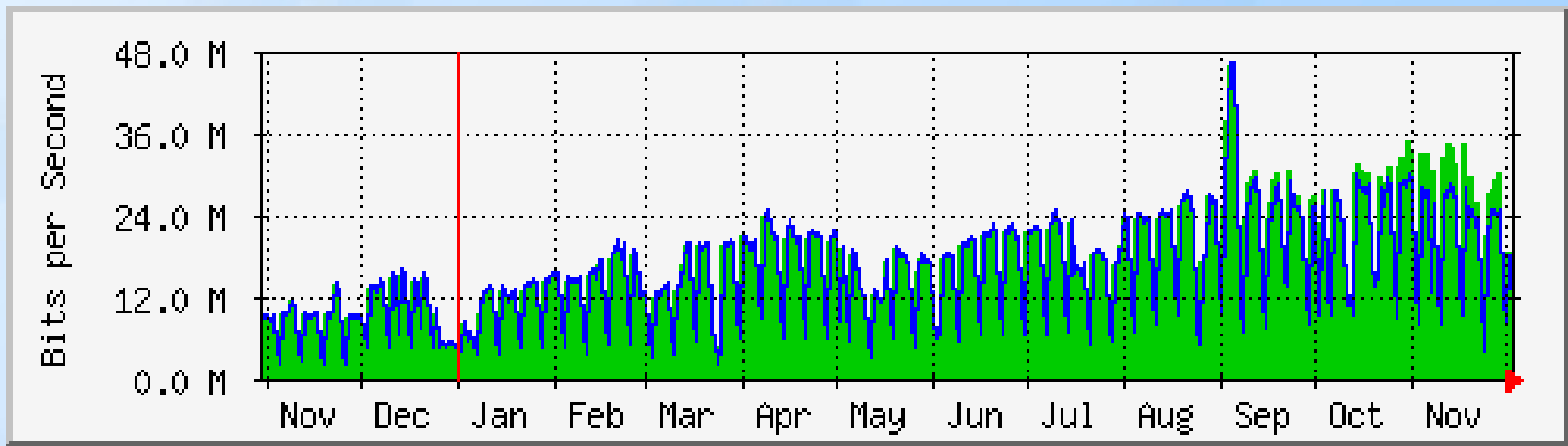
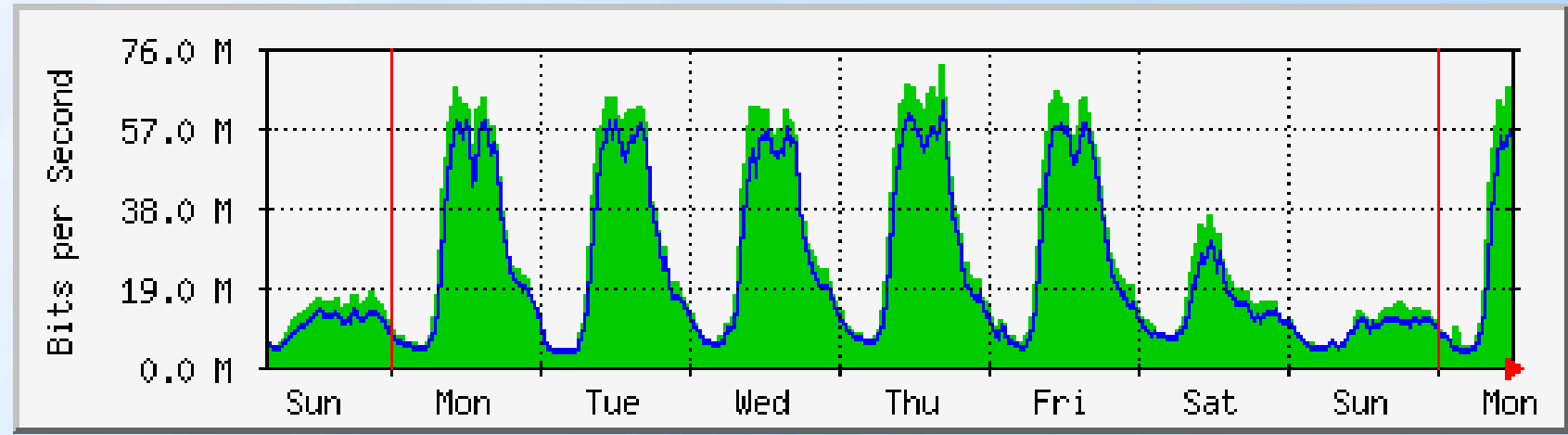
2007-8 National Secondary Schools Examination Results



Google Global Cache and Peering



2008 Stats



Thank you!