# *Next Generation Traffic Exchange*

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# Outline

- Quick update on Telia's
- Latest Internet drivers
- Current Traffic Exchange models
- Next Generation Traffic Exchanges
- Telia Policies and Network structure
- Conclusions

# Telia's Internet Reach

- Facilities based in both USA and Europe
- One of the first non US based ISP with peering with all US ISP's.
- Focus on Wholesale IP and Facilities services  outside the Nordics
- VikingNet for Capacity in over 20 countries
- TeliaNet for IP services In Europe, US, and Asia

# Internet Traffic Exchange

- **Peering**
  - Where two providers exchange traffic destined to their end customers. There is no flow of money between the two providers.
- **Transit**
  - Where a downstream provider pays an upstream provider to gain access to the upstream provider's customers and peers. The money flows only upstream.

# Latest Internet drivers

# Abundance of Capacity

- **Due to overbuild of fiber networks in US and in Europe and in between the two continents**
  - European (Western Europe) and US Transit business has become a commodity
  - More cost efficient to buy Transit than to build for a  Pan European or a US Peering backbone for traffic exchange purposes
  - Transit price currently runs  between $100 –$375 US/Mbps for wholesale. Not very enticing to build national IP backbones.
  - Pricing includes cost for transatlantic capacity

# Pricing changes

- **In 1998**
  - Transit Prices into the US from Europe were 5-10 times higher then transit within and out of the US
  - Large Content providers were replicating US content in Europe
  - Majority of Traffic exchange with Asia and Latin America was happening in the US. Still the case today.

- **Currently**
  - In Western Europe Transit prices into the US are equivalent to US national and international transit prices
  - Content replication has been slower than expected. Traffic is unbalanced still. US continues to be on the heavier side of the scale
  - Content delivery providers have attempted to help cure the imbalance

# Interactive Two way Content

- Internet used to consist of Content seekers and Content providers
- Sever farms not very willing to share the revenues with the backbone providers. They are looking to either peer or buy low cost Transit.
- With interactive Content; NAPSTER like, Content seekers can also be Content providers
- Traffic imbalance created by server farms will be reduced especially as Backbone providers and Web Farms move closer together

# *Building an IP Backbone to offer IP transit on a "Best Effort Delivery" basis is no longer a viable business*

# Current Traffic Exchange models

# Current Traffic Exchange Models

- Most peering in the US is being aggressively moved  to private exchanges
- Most peering in Europe is still taking place at the public exchanges
- In all cases, Public or Private traffic exchanges currently lack QoS and SLA
- They are good enough for “Best Effort IP” delivery service; due to scale, looseness of agreements,  and bandwidth provisioning processes

# Current Internet traffic exchanges

- One of the main reasons for the growth of Internet is existing Traffic Exchanges and their “Free Spirit”

- It is the same reason that is holding back Next Generation IP Services though

  - **No** end-to-end Service **Quality**, **Reliability, Security** and **Performance**

  - Performance of traffic outside the borders of an ISP e.g., traffic handled by other network providers or peering partners, cannot be guaranteed.

  - QoS scheme deployed within a connecting ISP’s network cannot be honored across multiple ISPs or by the terminating ISP

***Lack of financial incentives for a Backbone and Regional or downstream provider to provide a high level of quality for traffic that doesn't impact originating traffic from their end customers***

# Some things never change

- Tier 1 backbones in the US have strict Peering policies
- US Tier 1's peering policies are becoming more strict about backbone size and spread, traffic volume,  and traffic balance. Might be hard to implement universally.
- Tier 1 status in the US, or free peering, is impossible to get without buying an early on Tier 1 provider. (C&W, Telia, WorldCom, Genuity, NTT)

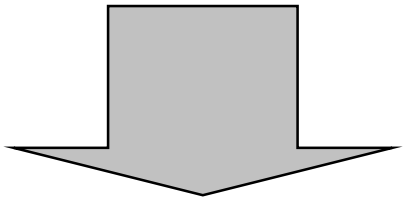
# Peering policy

***For Backbone providers, Peering is a Service issue and not a cost issue.***

# How do we evolve from the commodity of Basic IP Services?

- Squeeze an extra dollar out of our current customers whether it is service justified or not?
- Disqualify our peers (downstream ISPs) and shut down their peering sessions in order to push them to buy transit?
- Sell under cost and hope to be the last one standing. Then raise prices ten folds to recuperate our losses ?

# *Next Generation IP Services*



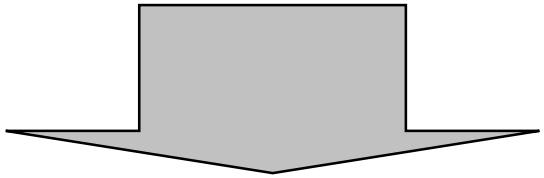
***Next Generation***
***Traffic Exchange***
***Turn downstream providers into channels***

# Next Generation IP Services

- Managed Services – VPN
- End to End QoS
- Multicast
- Mobile IP (3G)
- Streaming
- Quality Voice over IP

# Next Generation

- Integrated Services  (The IP Multiservice Platform)

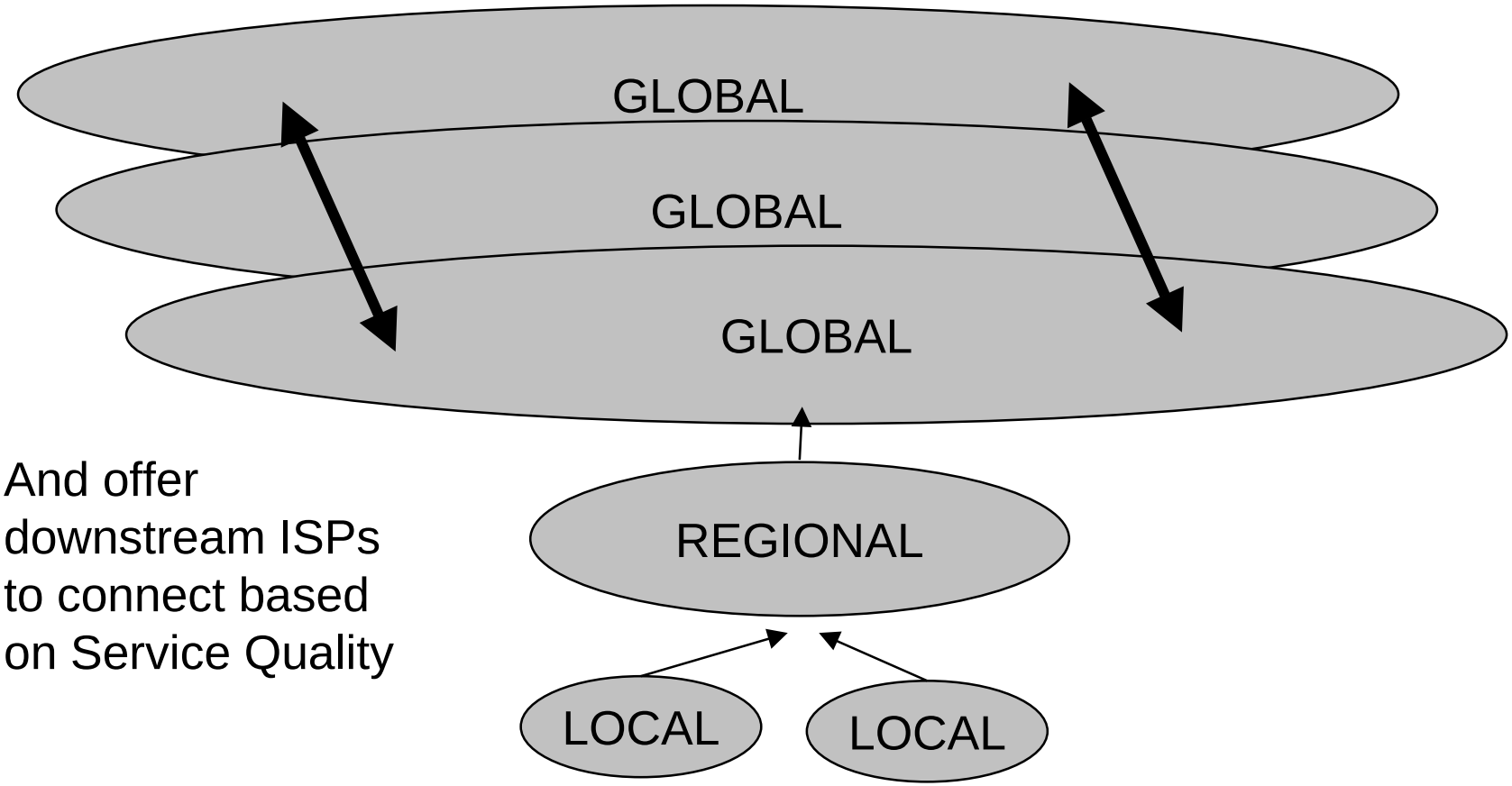


***End to End QoS and Traffic classes***

***Services drive the Peering Exchange Structure***

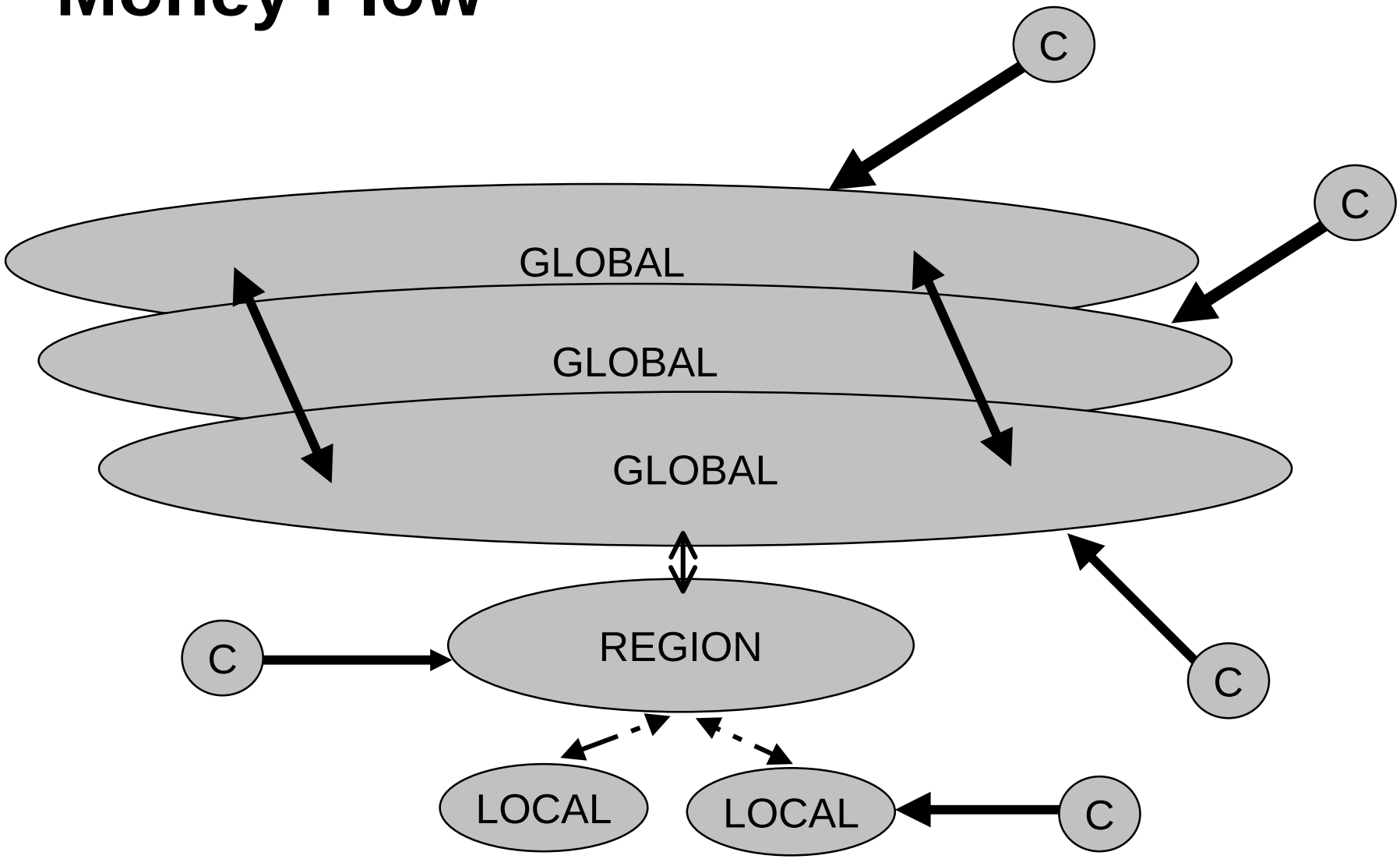
# QoS based Exchange Structure

Global Backbones agree on QoS

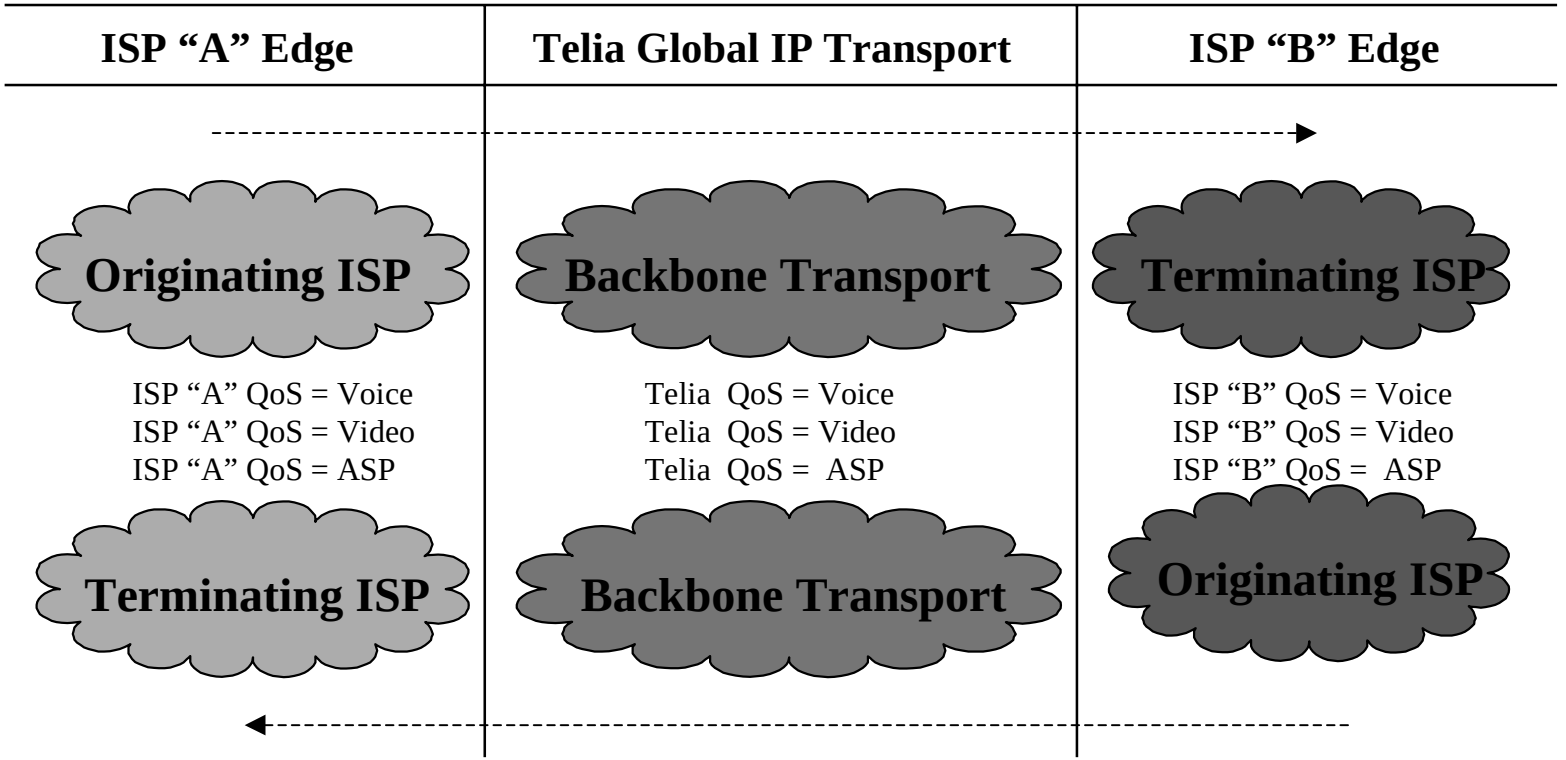



And offer downstream ISPs to connect based on Service Quality

# Money Flow



# Traffic Exchange Model



# What is needed for Next Generation Traffic Exchanges

- Agreements on Traffic Classes amongst ISPs and Backbone providers
- Measurement and accounting tools for Traffic Flows and Classes of Service
- Settlement resources must be embedded in the switching and routing platform
- **What we don’t need**
  - Large OSS/BSS should not be tolerated. We don’t want to create a monolithic platform PSTN like that requires hundreds of people to manage.

# *Telia's Peering Policy*
# *&*
# *Network Structure*

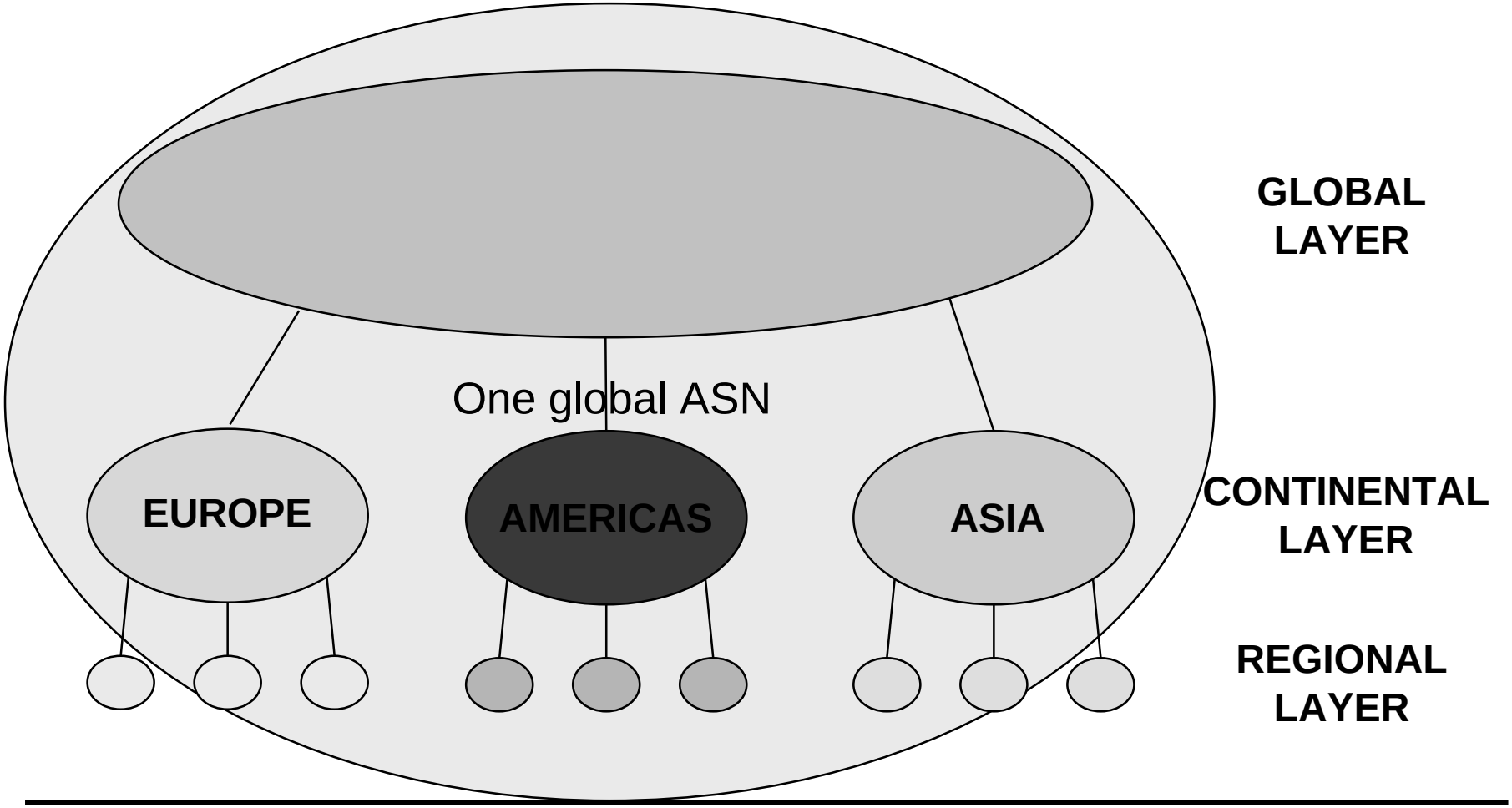
# Today's peering is based on today's services

- **Basic Transit Service**
  - Margins have been going down
  - Over the next 3 years bandwidth growth will be 115 % but revenue growth will only be 36%. This means that the predicted reduction in price will be almost three times. *(IDC)*
- **Peering**
  - Will Peer with every ISP that will meet us at 5 locations in each Continent with reasonable bandwidth
  - Peering partner should bring mutual value to the peering relationship

# Tomorrow's Peering Policy

- **Based on Next Generation IP Services**
  - Require End to End QoS and accounting per class of service
- **Peering**
  - Will peer with everyone that agrees on our QoS/ traffic classes and can entertain traffic Settlements

# Global AS with Community layers



**We realize this is not a one “Provider Show”. We need to work together with other providers, peers or not, in order to make this happen and move this IP business to the next level; a more profitable and fair level**

# *Conclusions*

# Conclusions

- Going forward, traffic exchange will be impacted by two way traffic and interactive Content
- New End to End QoS based Services will drive the structure of the traffic exchange
- End to End QoS can be achieved via financial incentives. Money should not always flow one way.