



# IXP Developments

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**GPF 5.0**  
**April-13-2009**

# IXP evolution

## ▶ Observations

- ▶ Transit price so low that small traffic levels hardly justify IX connection anymore.
  - ▶ Smaller customers disconnect
  - ▶ Need to lower prices: but still
- ▶ IXP more and more distribution point.
  - ▶ Many un-even traffic profiles (either inbound or outbound)
  - ▶ Need for more and more and bigger connections

# IXP evolution

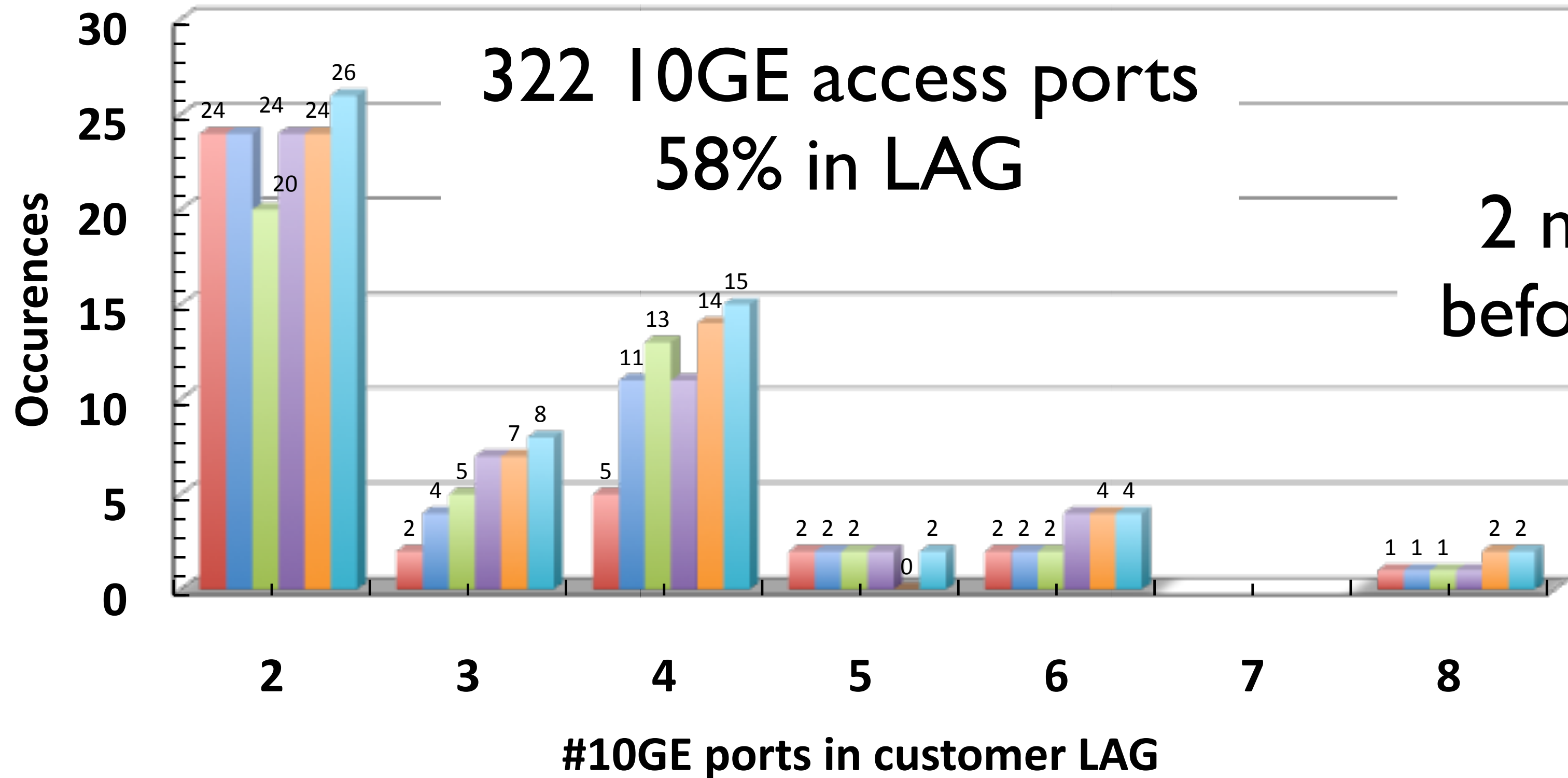
- ▶ Internet Exchange to IP interconnection
  - ▶ There is more than Internet traffic to exchange
    - ▶ GRX exchange at AMS-IX and others is an example
    - ▶ Mobile networks migrate to IP
      - ▶ GRX will evolve into (inter-)IPX exchange
        - ▶ Need: SLAs and the underlying infrastructure to support these
    - ▶ Other closed user groups that need inter-connection separate from Internet

# IXP Platform Developments

- ▶ Scaling beyond “simple” L2 infrastructure
  - ▶ MPLS/VPLS (among others AMS-IX)
  - ▶ Multichassis trunks ( DE-CIX )
  - ▶ Longer term:TRILL
    - ▶ Transparent Interconnection of Lots of Links
- ▶ Customer ports and Backbone trunks upscaling
  - ▶ multiple 10GE to (multiple) 100GE 2011 and beyond
- ▶ Standardisation process for follow up to 100GE starting
  - ▶ Best candidate 400GE
  - ▶ Possible 2015

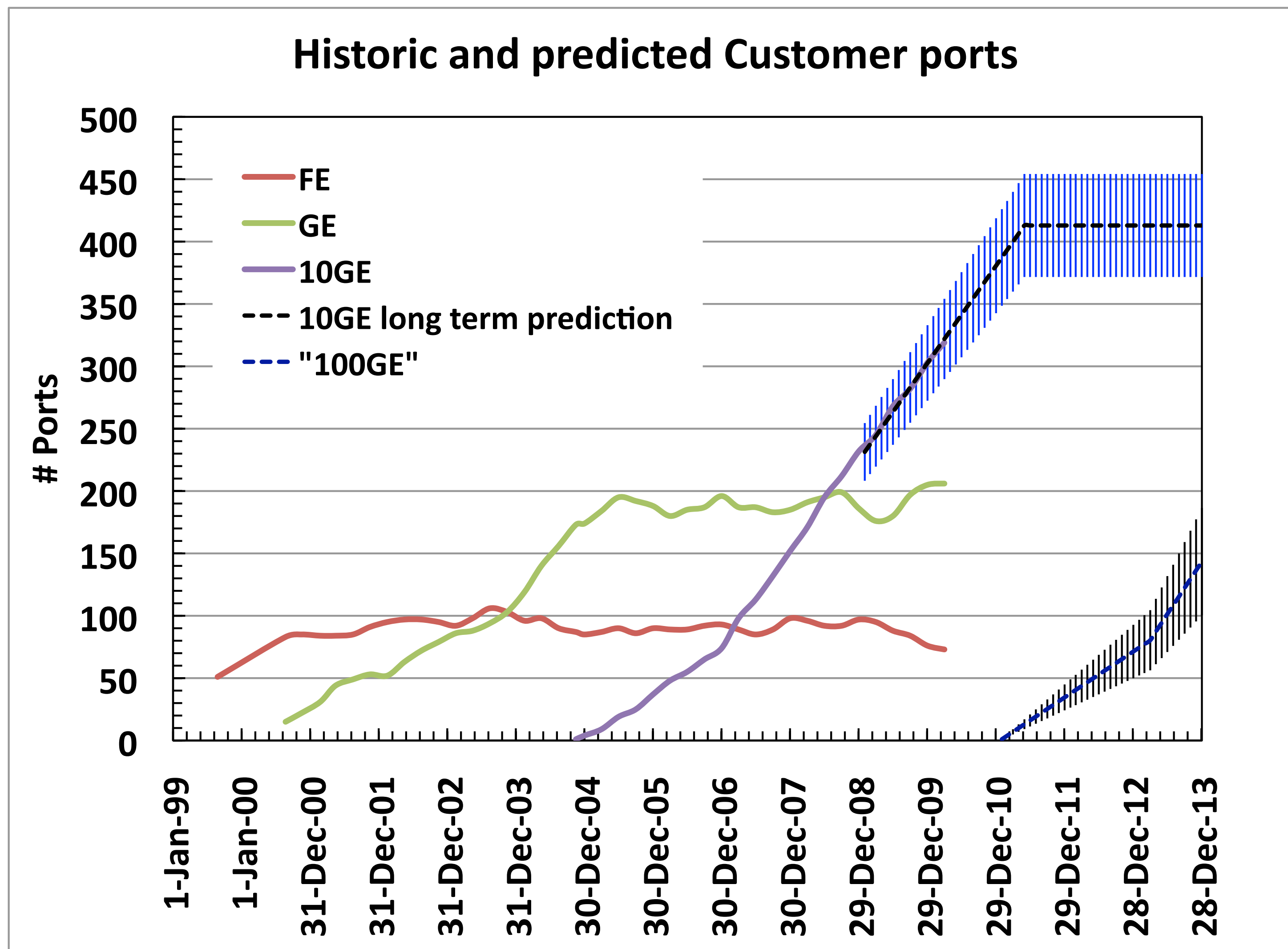
# 10GE LAG size distribution

■ Oct 21 2008  
 ■ Mar 21 2009  
 ■ Jun 10 2009  
■ Oct 16 2009  
 ■ Jan 20 2010  
 ■ Mar 29 2010



*100GE access taking up 20/1 and beyond*  
**Access Developments**





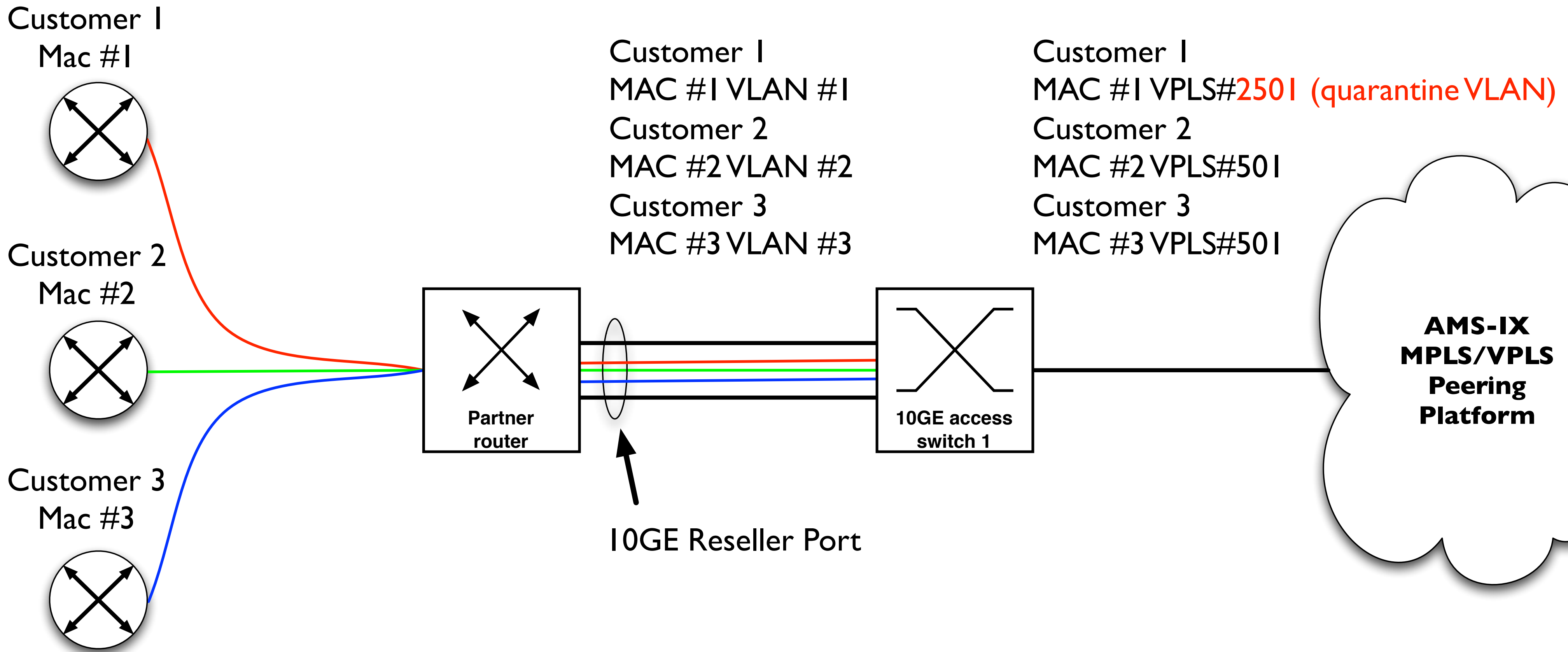
*100GE access taking up 2011 and beyond*

# Access Developments



# AMS-IX Service Developments

- ▶ MPLS/VPLS platform allows for new services
  - ▶ E.g. loosening of the “one mac (customer) per port” rule
    - ▶ Introduced to prevent loops in L2 platform
    - ▶ Also when allowing multiple MACs behind a single port in L2 platform, individual MACs difficult to manage.
    - ▶ VPLS allows different MAC/Qtag combinations behind single port to map to different VPLS instances.
      - ▶ Only allow one MAC per VLAN tag behind a port
        - ▶ enforce with L2 ACL and rate limiting
    - ▶ **New AMS-IX service based on this: Reseller port**
    - ▶ Cheap access for smaller companies
  - ▶ Direct one on one connections through VLLs or private VPLS instances



# AMS-IX reseller port Service Developments





# Conclusion

- ▶ Internet Exchange to IP Interconnection
- ▶ New architectures to support scaling core/backbone
- ▶ New architectures to support new “non traditional” services
- ▶ Higher access speeds ( $X * 10\text{GE} \Rightarrow Y * 100\text{GE}$ )

# Questions?

