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Bandwidth Shortage and Relevant Solutions: Myths and Facts

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The Current Situation

- Ubiquitous large-scale deployment of QoS mechanisms in IP networks has been abandoned
 - Limited DiffServ deployment for business customers
 - PSTN and 3G networks use IP transport but in a carefully provisioned manner that guarantees service characteristics
 - INPs/ISPs also use provisioning / traffic engineering for load balancing but IP traffic patterns are more unpredictable and network usage is constantly increasing (see next)
 - Constant capacity upgrading has become unsustainable given the “Internet access only” charging model, even for tier-1 ISPs
 - Containing traffic gave rise to throttling mechanisms, cooperation frameworks (e.g. P4P/ALTO) and more recently to Information Centric Networks (ICNs)

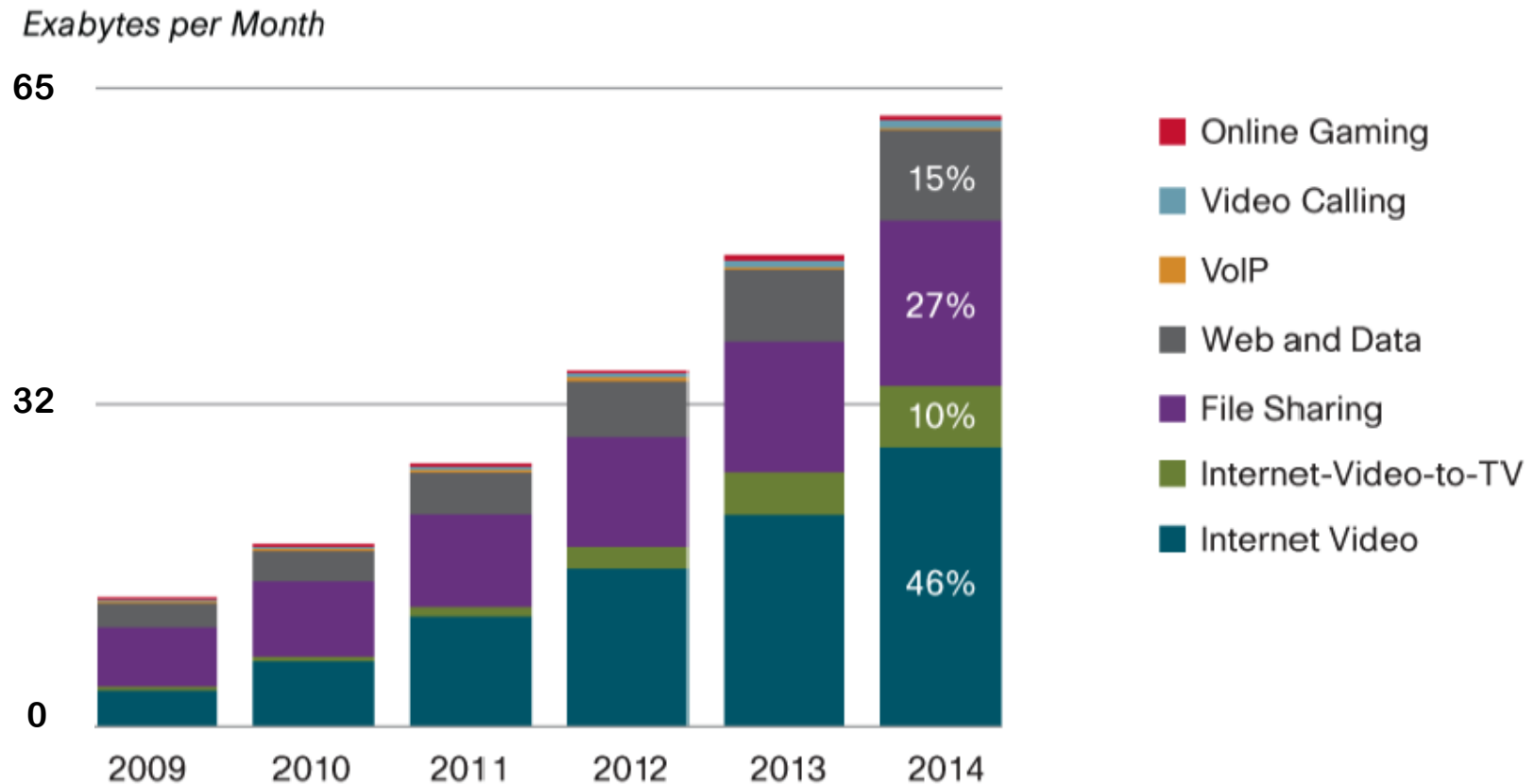


Expected IP Traffic Growth 2009-2014

- According to the Cisco Visual Networking Index 2010:
 - Global IP traffic will quadruple every year until 2014
 - **64 exabytes per month is expected by 2014**
 - Global Internet video traffic will surpass P2P traffic in 2010
 - Approx. 55% of the overall Internet traffic will be video by 2014
 - Global mobile data traffic will double every year until 2014
 - Approx. 65% of the overall mobile traffic will be video by 2014
- **Infrastructure evolution needs to be partnered with novel approaches and associated business models**



Expected IP Traffic Growth 2009-2014 (cont'd)



The Future?

- Do we need all these “bandwidth management” approaches or bandwidth shortage is a myth and ubiquitous optical core infrastructures will be the panacea?
 - There will always be bottleneck points, e.g. peering points, access networks
 - Traffic engineering / load balancing will be always necessary in order to postpone upgrading
 - Past experience has shown that with more network/access capacity new applications will emerge to “eat it up”
 - **Most important: plain traffic transport (“bit pushing”) by INPs/ISPs is not profitable enough to sustain upgrading, new business models and services are required**

