

Some data

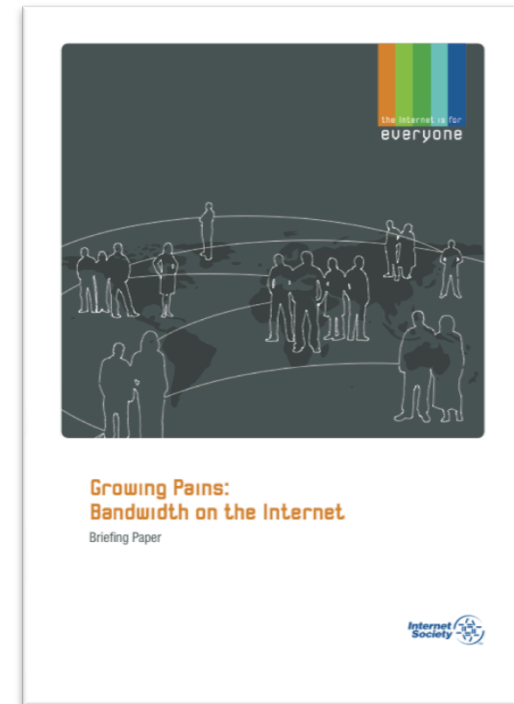
conex BoF

IETF77, Anaheim, CA

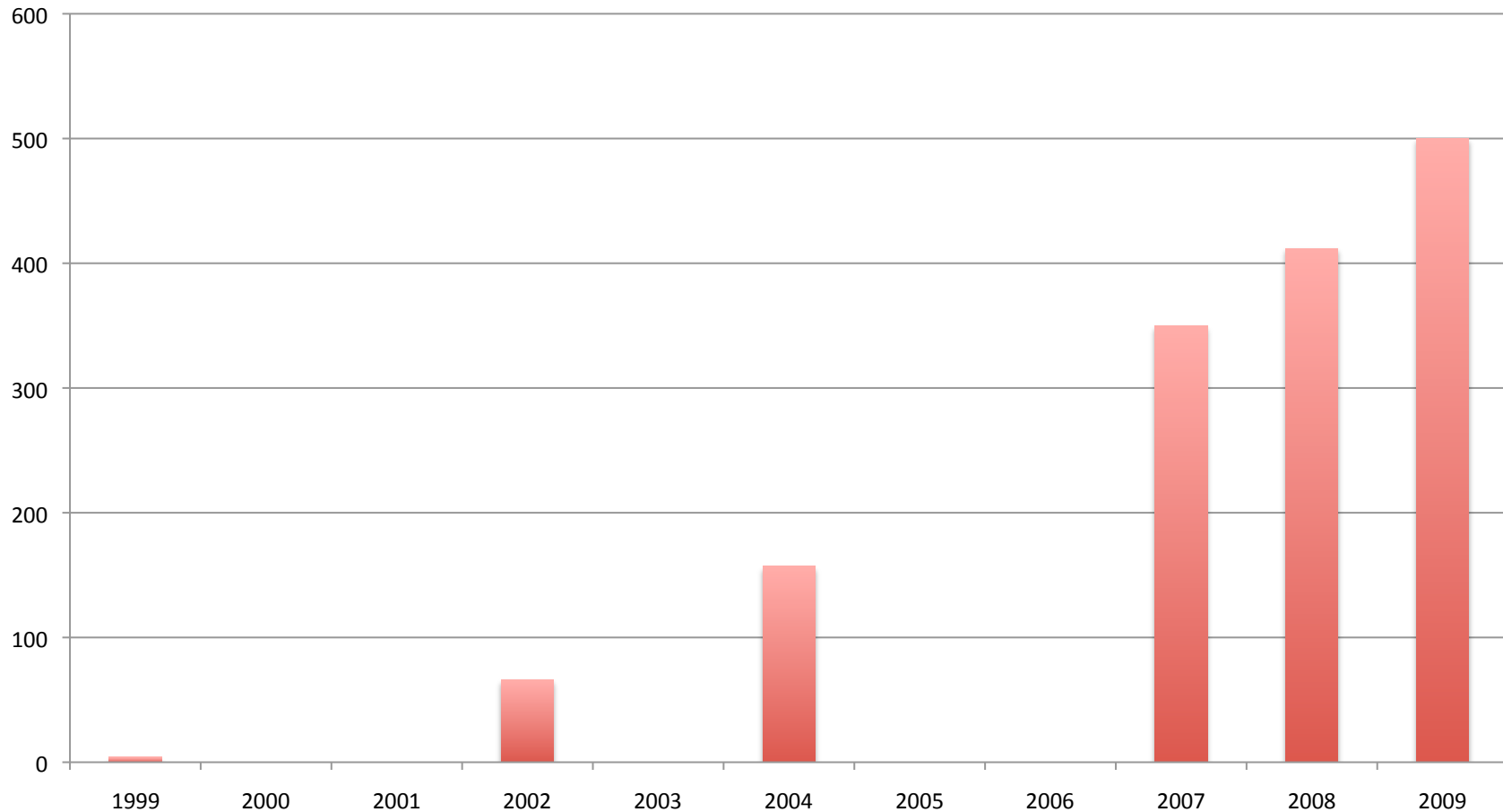
2010-03-24

Introduction

- Some data from an ISOC panel held during IETF76
- Internet Bandwidth Growth: Dealing with Reality
 - Slides, audio and transcript are available online - <http://isoc.org/bandwidth>
 - Briefing paper just published



Access networks are getting faster



Worldwide fixed broadband subscribers (millions) [ITU data]

Impact of broadband

- Dial-up links suppress user demand
- Broadband has made possible new applications that put pressure on access networks
- Higher access speeds make it possible for individual subscribers to have a significant impact on the network
- New OS features also have an impact

Growing consumption

- The Japanese example:

	2005	2009
Modal user download volume	32 MB per day	114 MB per day
Modal user upload volume	3.5 MB per day	6MB per day

Source: Kenjiro Cho et al.

- Average user download volume > 1GB per day (2009)
- Study based on data from 6 ISPs, covering 42% of Japanese Internet traffic

Shifting sands

- Internet Observatory Report discusses growing use of private peering to bring ‘big’ content closer to access
- There will also always remain a long-tail of ‘off-net’ content
- The former doesn’t mean congestion issues will not arise, the latter makes a generalised approach necessary

Pinch points

- Queues on the CPE
 - Typically no AQM
 - Upstream queues will impact interactive and real-time apps
- Queues on the broadband aggregation routers
 - Impact network neighbours
- Interconnects with other networks
 - Operators have limited/no control over these

Conclusions

- As access network speeds increase, potential impact of individual subscribers on bottleneck links increases
- More applications competing for available access network bandwidth
- Additional capacity may not be a cost-effective solution
- Current operator tools for dealing with the impact of broadband have serious limitations
- Alternative schemes need to be evaluated keeping relative costs in mind

Questions?

