What a Ride! The Last Decade of the Internet
What a Ride! The Last Decade of the Internet and a peep into the next

Geoff Huston
APNIC
Remember 2002?

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- Brazil defeats Germany to win the FIFA World Cup
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Still Struggling?
How about these?
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Worldcom files for bankruptcy with assets valued at $103B (the largest to date in the US)
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LACNIC was formed!
The Internet in 2002

569 million online users

900 million GSM users
The Internet in 2002

- 569 million online users
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- Web 2.0 Web Services were hot
- Web Portals were not
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Large PCs were a tiny bit yesterday
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Friendster had 3 million users

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Look Smart was dead
The Internet in 2002

- 569 million online users
- Web 2.0 Web Services were hot
- WAP was cool
- Laptops were cool
- Friendster had 3 million users
- Windows XP was the OS of the day

- 900 million GSM users
- Web Portals were not
- XML was not
- Large PCs were a tiny bit yesterday
- Look Smart was dead
- Mac OS was not
What's happened since then?
Who would've thought this possible?

Internet Users

More users

2002
9.1% of the world pop.

2012
33% of the world pop.

2.27 BILLION

569 MILLION
Total Websites

2002
3 million

2012
555 million

More to see
More time looking

2002
46 minutes a day

2012
4 hours a day

Internet Usage
Operating system statistics for 2002

- Windows XP: 29.10%
- Windows 2000: 41.90%
- Windows 98: 14.80%
- Windows NT: 6.60%
- Windows 95: 0.80%
- MAC OS: 1.80%
- Linux: 2.20%

Windows: 96%

Operating system statistics for 2012

- Windows 7: 40.32%
- Windows Vista: 6.61%
- Windows XP: 21.23%
- Windows (other): 1.40%
- OS X: 8.45%
- iOS: 9.89%
- Linux: 1.58%
- Android: 5.11%
- Other: 5.41%

Usage shares of operating systems as of September 2012

Windows: 70%
More browsers
The twitter-verse now runs at more than 340 million tweets per day.

**2002**
Friendster launched and had a whopping 3 million users.

**2012**
The #1 social network site is Facebook with 900 million users.
Winners and Losers
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Blockbuster – Video Rental
2002: Revenue $5.5B
2010: Bankrupt

Netflix – Online Video
2002: Revenue $150M
2012: Revenue $3.2B
Winners and Losers

Borders – Retail Books
2003: 1,249 stores worldwide, $3.2B sales
2011: Bankrupt

Amazon—Online Books and more
2002: $2.8B sales
2012: $18B sales
Winners vs Losers

Tower Records – Retail Music
2002: 200 Stores, $800M sales
2006: Bankrupt

iTunes – Online music
2003: Started
2012: 20 billion songs sold
$6B sales
All these changes point to a massive shift in online channels to retail sales for entertainment services.
And its not just online books and music...

• Free-to-air advertisement revenues are falling, and many TV broadcasters are in trouble

• Print media advertisements are falling, and print newspapers are in trouble
And all this happened in just 10 years...
But the real driver for change in the last decade was not the shift in advertising and retail business models.
The real shift was away from wires...
The real shift was achieved in a wireless device that just worked brilliantly...
And it has changed everything...
With desktop devices the Internet was a dedicated activity.
The Internet is now anywhere and everywhere. It's trivial, commonplace and blends into all our activities.
"We are now living in a post-PC world"
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Intel slides on PC slump

INTEL’S profit dropped 14 per cent in the third quarter, underscoring tough times for the personal computer sector amid competition from tablet-style devices and other headwinds.

The big chipmaker, whose microprocessors power most desktop PCs and laptops, said it was significantly scaling back production in the fourth quarter in response to weaker than expected demand. Intel said that move would cause it to take US$500 million ($485m) in charges for excess production capacity, triggering a big decline in its closely watched gross profit margin for the quarter.

As it turned out, Intel’s revenues in the third quarter came in a bit higher than the company predicted, and Intel said revenue should rise 1 per cent in the fourth quarter from the period ended in September. But analysts said they saw troubling signs in the current period, including the capacity charges and indications of pressures on chip prices.

The company reported net income for the period of US$2.97 billion, or 58c a share, down from a profit in the year-earlier period.

The Australian
18 October 2012
Where to from here?
It's a mobile world!

2011: 270 million mobile units shipped

Factors:

• Production volumes are bringing down component unit cost
• Android is bringing down software unit cost
• No need for new content - leverage off the existing web universe of content
• Shift away from the desktop and the laptop by the production industry seeking new markets for their production capability
In the next five years...

we have a choice...
In the next five years...

Everything gets squashed into HTTP, IPv4 and CGNs
And it's not yet clear which path the Internet will take!
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market forces
Can we look further out?
10 Years Out?
My personal view...by 2022

The Internet will be all IPv6 by 2022!

The market in IPv4 trading is a short term phase
CGNs also have near term limits under intense scaling pressure
There is no extended afterlife in store for CGNs + IPv4 if we make this transition to IPv6

(look at what happened to DECnet, SNA, Appletalk, X.25,...)
My personal view... by 2022

Radio spectrum will become even more of a scarce and highly valuable asset

well it is already, but the competition for spectrum in highly populous areas will continue

Fewer wide area services - more cellular / femtocell services backed by fibre backhaul to improve spectrum efficiency
Cloud / Data Centre services may well have peaked by 2022 and be on the decline again.

Innovative competitive pressure at this time may well come from highly distributed systems that do not rely on intense concentrations of computation and information storage.
20 Years Out?
My personal view...by 2032

This is extremely tough!

very little from the world of 1992 is still with us today

very little of today’s environment will be persistent for the next two decades

Why?
As the pace of technology adoption gets faster we cycle through successive generations of technologies at ever faster rates.
What's shaping our future?

You and I
What's shaping our future?

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We need to think about a post-PC world where computation, storage and communications are abundant commodities. It's innovative mass-produced consumer devices and services that will shape much of the Internet's future. And the innovative force here is one of constant technology refinement and evolution!
The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it...

- Mark Weiser 1991
Thank You!