Building the Internet's Future

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APNIC

A quick look back: 20 years ago

The High Frontier of Computers in 1993: The Mainframe

The flagship of Digital's technology of the time, that turned out to be a commercial flop. Anyhow, it's still a true mainframe, in that: the system takes up a whole room, it consumes electricity as if it was free, and generates heat like hell. All this is due the fact that it's built out of ECL components, which are very fast (CMOS wasn't even close to that at that time), but draws significant power (the whole system takes around 20 kW). It was designed to have water-cooling, but that didn't work, so they modified it to air-cooling, the name however remained: "Aquarius". There were different models, with performances varying from 40 to 157 VUPs (125 MFLOPS). The I/O-memory-CPU interconnect is switched (with a frequency of 1 GHz), which was a totally new concept at that time. There were only a few dozen 9000's ever made.

A quick look back: 20 years ago

The end of the mainframe dinosaur

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A quick look back: 10 years ago

Ugly, aren't they!

Why was the personal computer such a revolutionary change?

2000 - The Personal Computer on every Desktop

it altered the model of computing from a share resource where each "user" had a partition to that of a dedicated resource which was not shared at all

This was the start of the shift in computing resources from scarcity to abundance

Ugly, aren't they!

The new iPad

Why was the personal tablet such a revolutionary change?

It altered the model of data from a dedicated resource where each "user" held all their data on their PC to that of a distributed model where data is accessed, not stored

This is the start of a shift in communications from scarcity to abundance

"We are now living in a post-PC world"

With desktop devices the Internet was a dedicated activity

reliable power   lighting

privacy

large view screens

dedicated worktop

wired bandwidth

dedicated storage

dedicated chair

Dedicated comms

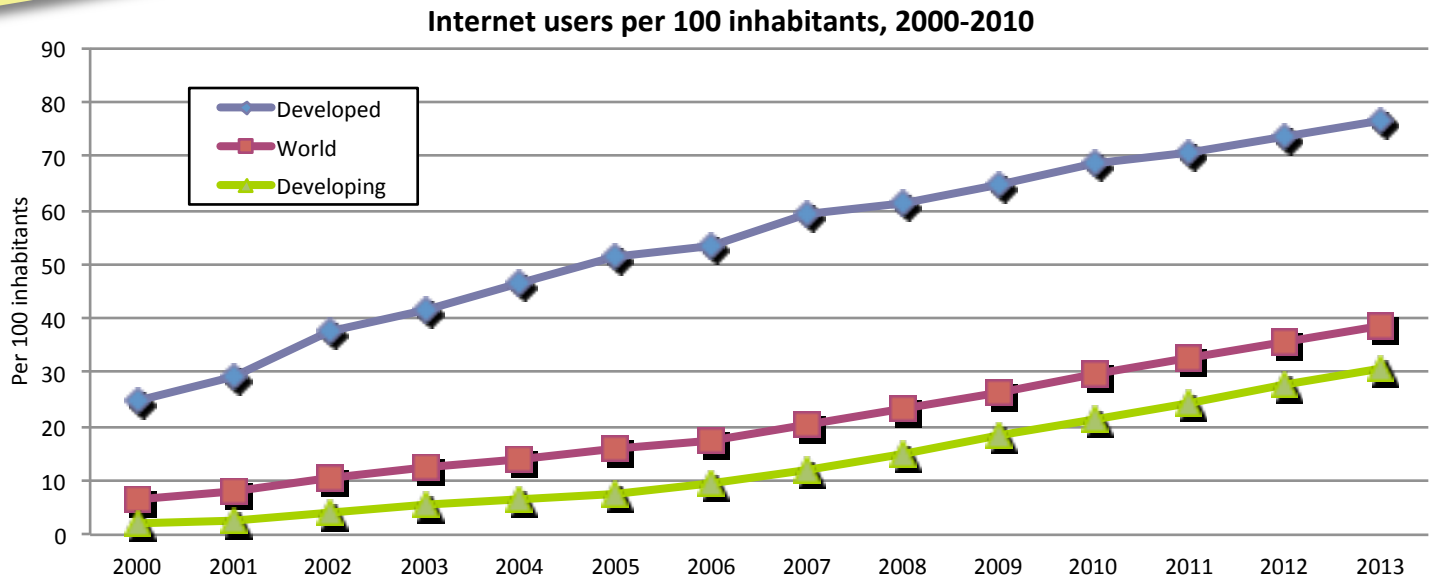The Internet is now anywhere and everywhere

radio connectivity

Thumb operated

hand sized

battery power

Its trivial, commonplace and blends into all our activities

Counting Users...

There are 2.7 billion internet users today

Internet users per 100 inhabitants, 2000-2010

Counting Users...

There are internet us... And 6.8 billion mobile users!

Mobile cellular subscriptions per 100 inhabitants, 2000-2010
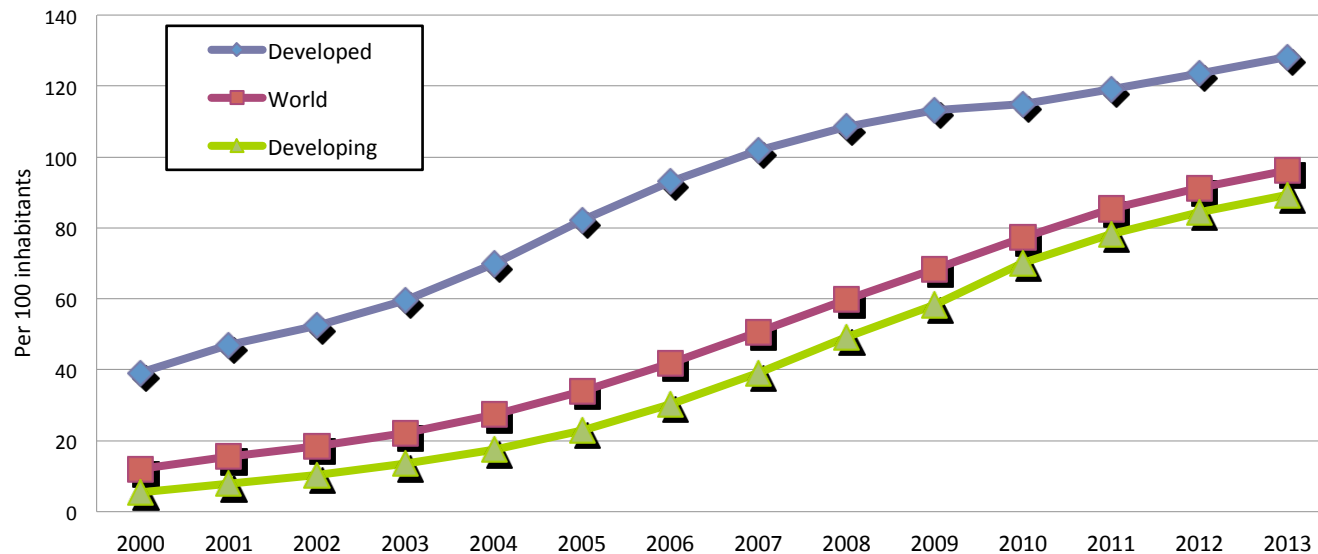
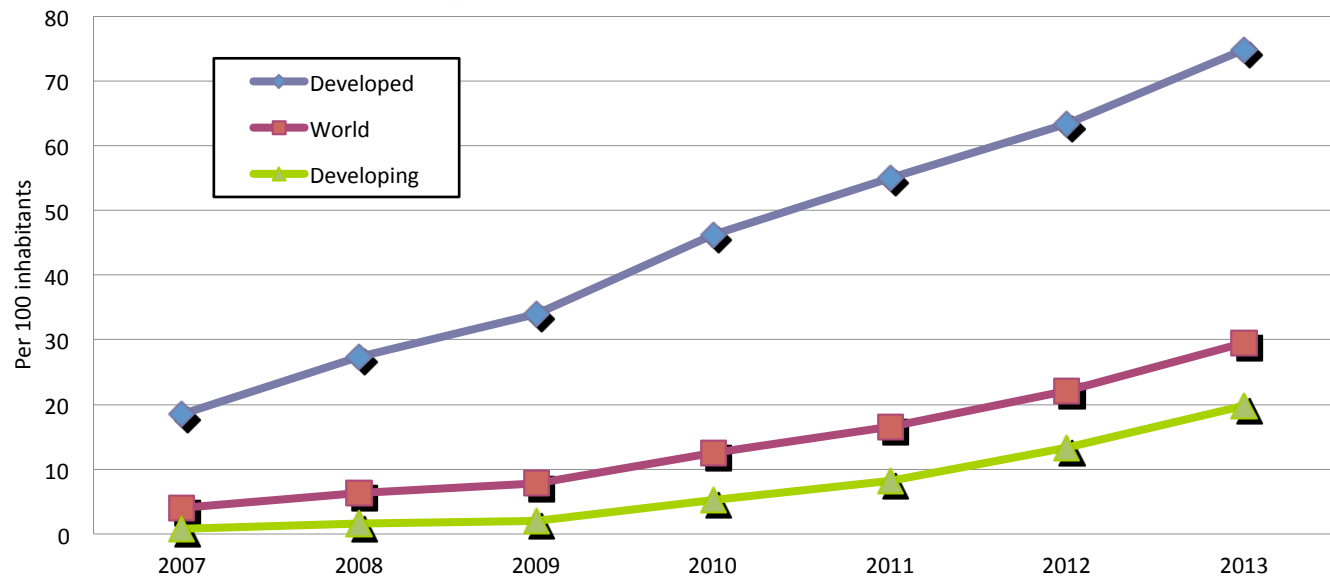The developed/developing country classifications are based on the UN M49, see:
http://www.itu.int/ITU-D/ict/definitions/regions/index.html
Source: ITU World Telecommunication /ICT Indicators database

Counting Users...

There are internet use...

And 5...

And 2 billion mobile internet users!

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Source: ITU World Telecommunication /ICT Indicators database

Tomorrow's Users and Usage

Gartner Says Worldwide PC, Tablet and Mobile Phone Shipments to Grow 5.9 Percent in 2013 as Anytime-Anywhere-Computing Drives Buyer Behavior

Traditional PC Shipments to Decline 10.6 Percent in 2013, While Tablet Shipments Increase 67.9 Percent
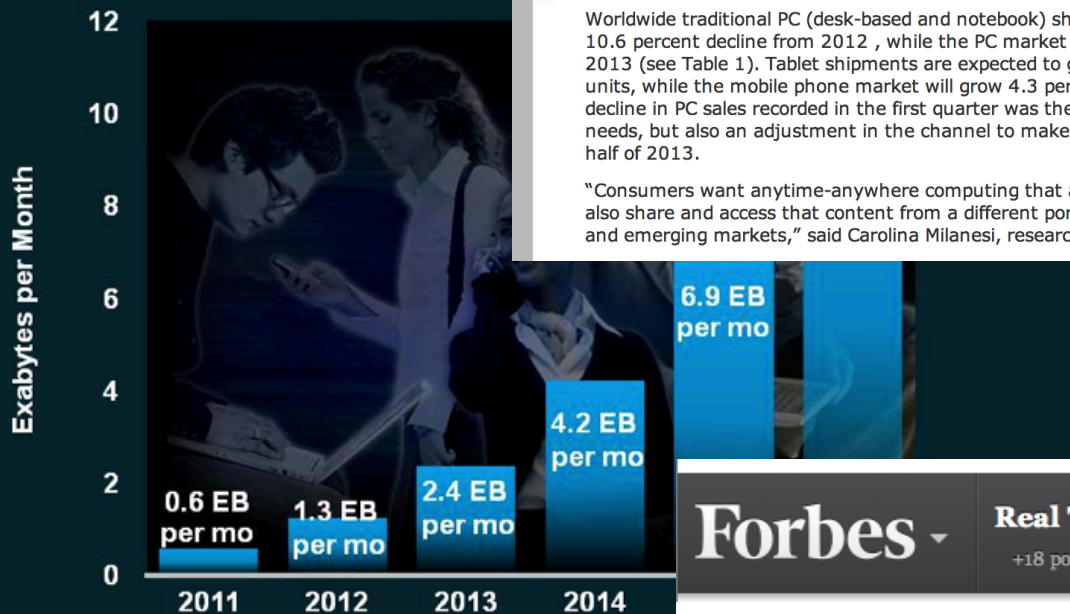
Worldwide devices (the combined shipments of PCs, tablets and mobile phones) are projected to reach 2.35 billion units in 2013, a 5.9 percent increase from 2012, according to Gartner, Inc. The market is being driven by sales in tablets, smartphones, and to a lesser extent, ultramobiles, as PC shipments are on the decline.

Worldwide traditional PC (desk-based and notebook) shipments are forecast to total 305 million units in 2013, a 10.6 percent decline from 2012 , while the PC market including ultramobiles is forecast to decline 7.3 percent in 2013 (see Table 1). Tablet shipments are expected to grow 67.9 percent, with shipments reaching 202 million units, while the mobile phone market will grow 4.3 percent, with volume of more than 1.8 billion units. The sharp decline in PC sales recorded in the first quarter was the result in a change in preferences in consumers' wants and needs, but also an adjustment in the channel to make room for new products hitting the market in the second half of 2013.

"Consumers want anytime-anywhere computing that allows them to consume and create content with ease, but also share and access that content from a different portfolio of products. Mobility is paramount in both mature and emerging markets," said Carolina Milanesi, research vice president at Gartner.

Global Mobile Data Traf
Global Mobile Data Traffic will Incr

Exabytes per Month

- 12
- 10
- 8
- 6
- 4
- 2
- 0

0.6 EB per mo (2011)
1.3 EB per mo (2012)
2.4 EB per mo (2013)
4.2 EB per mo (2014)

6.9 EB per mo

Forbes ▾

Real Time — +18 posts this hour

Popular — 89 Cliches For MBAs

Lists — The World's Billionaire

Vide — Sell Yo

TECH | 4/24/2012 @ 4:40PM | 32,913 views

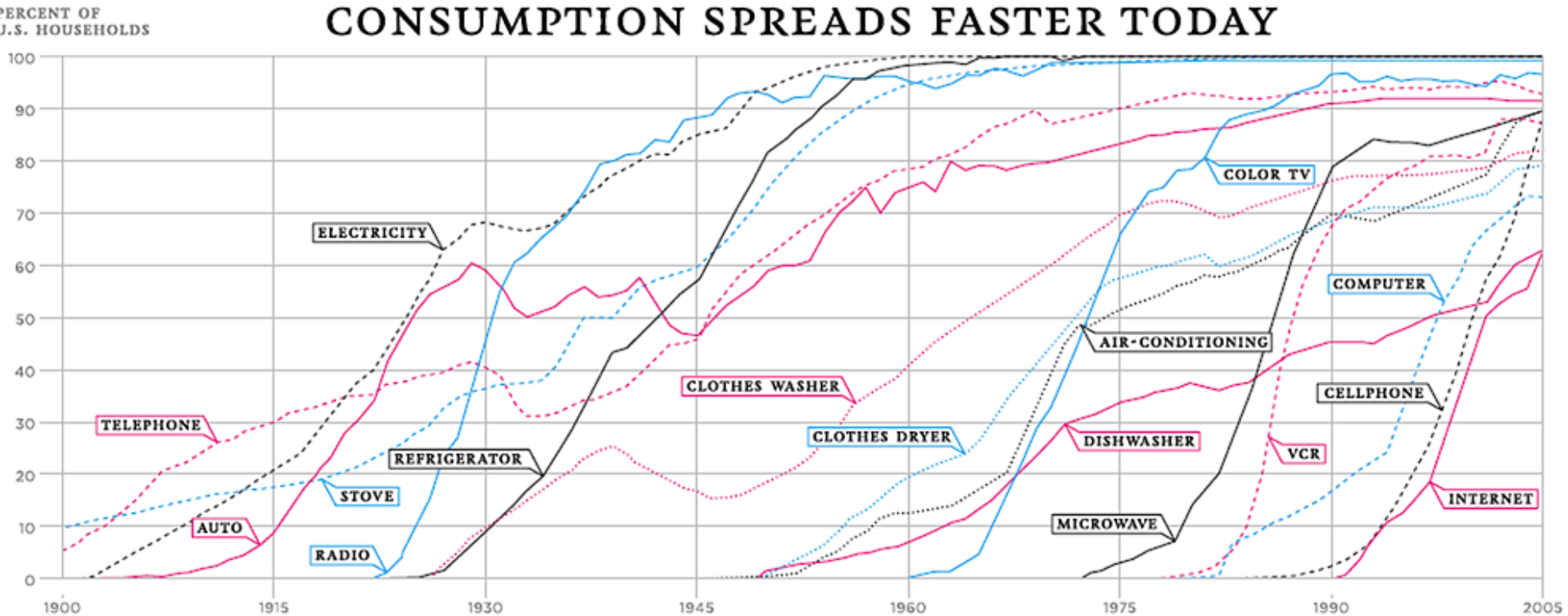# Apple Results Top Estimates as iPhone Sales Soar

Where to from here?

5 Years Out

As the pace of technology adoption gets faster
we cycle through successive generations of
technologies at ever faster rates

CONSUMPTION SPREADS FASTER TODAY

Five Year Plans are Really Hard!

The intersection of "refining what we already do" and "constant innovation and challenge" is a constantly shifting battleground, littered with failed ideas and discarded plans!

In this business, planning for 5 years out is really really hard!

What were your plans 5 years ago?

Even so, some changes are likely

Print Newspapers – are they finished?

Broadcast Television – will they implode?

Broadcast Radio – where are the listeners?

Mobile connected devices – will they continue to dominate?
   if so, then is it spectrum, that is the critically scarce common resource?

But much is clouded

WiFi vs 3/4/5 G
licensed exclusive use spectrum vs shared
spectrum models of mobile services

Cloud vs Dedicated
Privacy, cost, utility, and security make this an
uncertain area

Human Networking vs Sensor Networking
Embedded processing and communications are
now gearing up

What should we do?

Talk some more?

Or

Do something!

What can we do?

in the next five years...

we have a choice

in the next five years...

Everything gets squashed into HTTP, iPv4 and CGNs

iPv6

And its not yet clear which path the internet will take!

And its not yet clear which path the ~~internet~~ will take!

~~market forces~~
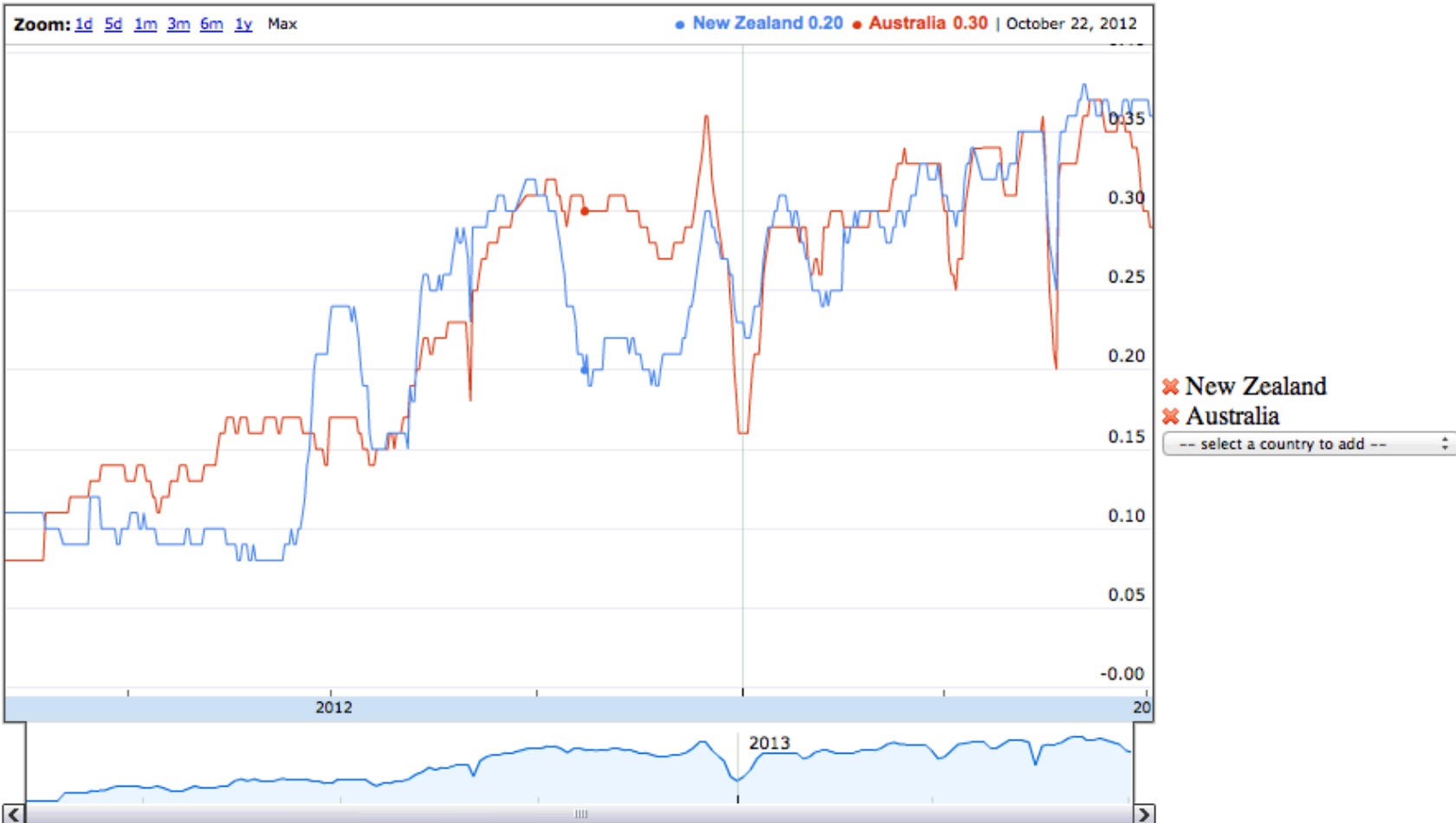
Maybe we can do something here...

Maybe we can do something here...

like developing a local internet infrastructure that makes extensive use of iPv6

Comparison of IPv6 IPv6-Enabled Web Browsers (courtesy Google) in Different Countries

IPv6-Enabled Web Browsers (courtesy Google)

Metric to display: allocated prefixes - announced prefixes - alive prefixes - IPv6 web browsers (Google) - IPv6 web servers

Zoom: 1d 5d 1m 3m 6m 1y Max   ● New Zealand 0.20 ● Australia 0.30 | October 22, 2012

✗ New Zealand
✗ Australia
-- select a country to add --

2012

2013

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✖ New Zealand
✖ Greece
✖ Australia

-- select a country to add --

0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0

Feb 13   Mar 13   Apr 13   May 13   Jun 13

2013

www.vyncke.org/ipv6status/compare.php?metric=p&countries=nz,gr,au,ro

Reader

Comparison of IPv6 IPv6-Enabled Web Browsers (courtesy Google) in Different Countries

IPv6-Enabled Web Browsers (courtesy Google)

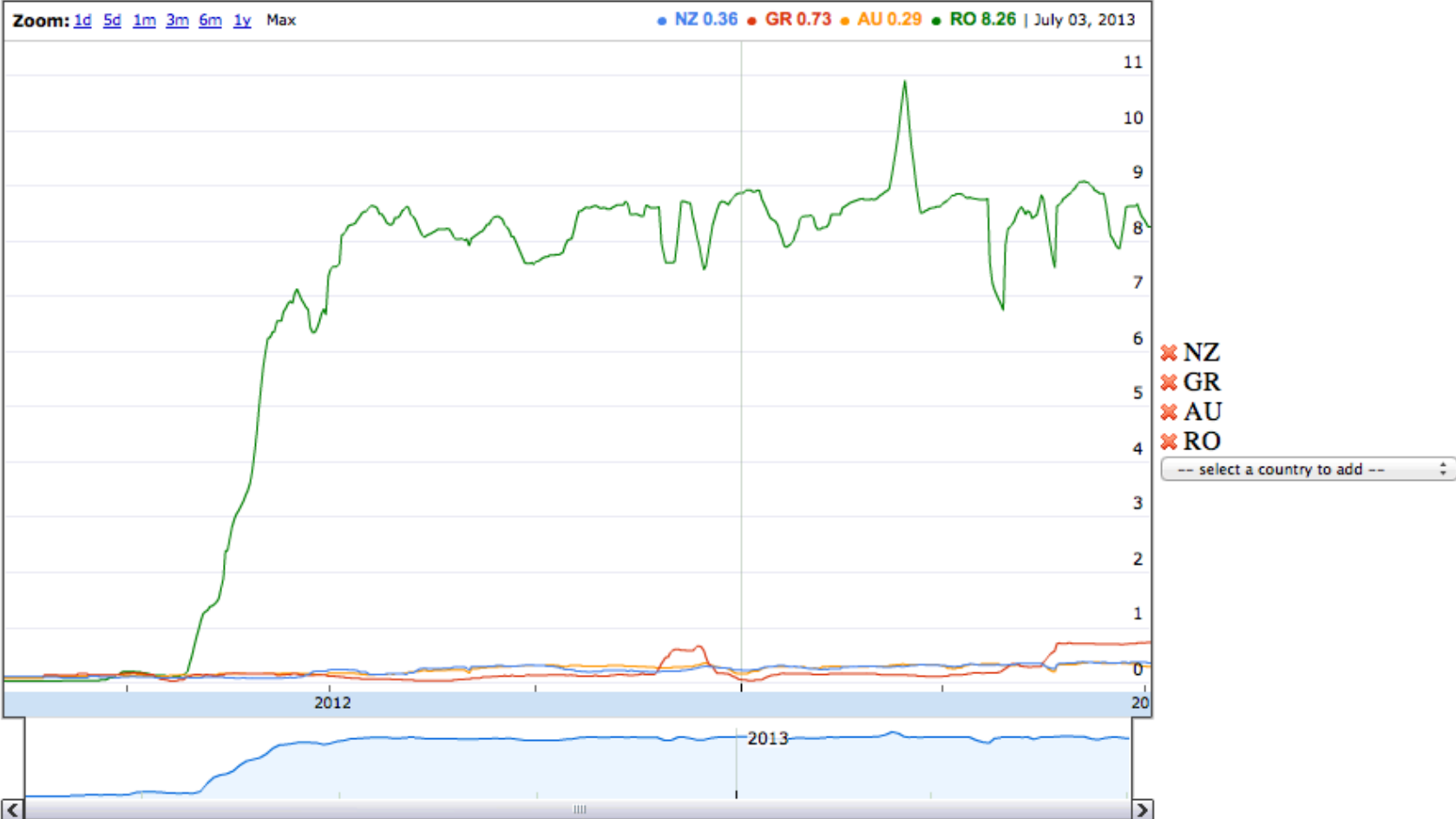Metric to display: allocated prefixes - announced prefixes - alive prefixes - IPv6 web browsers (Google) - IPv6 web servers

Zoom: 1d 5d 1m 3m 6m 1y Max   ● NZ 0.36 ● GR 0.73 ● AU 0.29 ● RO 8.26 | July 03, 2013

✖ NZ
✖ GR
✖ AU
✖ RO

-- select a country to add --

2012

2013

Maybe we can set ourselves a modest target here...

Like a 1 percent iPv6 deployment rate by the end of 2013?

While we're on a roll, we might want to do something else here as well...

like improving the security of the DNS

DNSSEC Use - June 2013

	DNSSEC?		Country	
Yes	**sort of**	**No**		
1.08%	23.82%	75.11%	NZ	New Zealand
1.04%	9.69%	89.26%	AU	Australia

The good news - New Zealand is way ahead of Australia here!

DNSSEC Use - June 2013

| Rank	Yes	DNSSEC? sort of	No		Country
1	55%	22%	23%	SE	Sweden
2	49%	12%	38%	SI	Slovenia
3	34%	12%	54%	LU	Luxembourg
4	31%	10%	60%	CZ	Czech Republic
5	29%	10%	60%	VN	Vietnam
. . .					
111	1%	6%	93%	SG	Singapore
112	**1%**	**24%**	**75%**	**NZ**	**New Zealand**
113	**1%**	**10%**	**89%**	**AU**	**Australia**
114	1%	3%	96%	TT	Trinidad and Tobago

The bad news - Australia is not doing all that well either!

Maybe we can set ourselves another modest target here...

Like a 20 percent DNSSEC use rate by the end of 2013?

Why pick these two?

Because if we can get the basics right, and keep the underlying network simple, robust and flexible then can we support massive innovation in applications and services
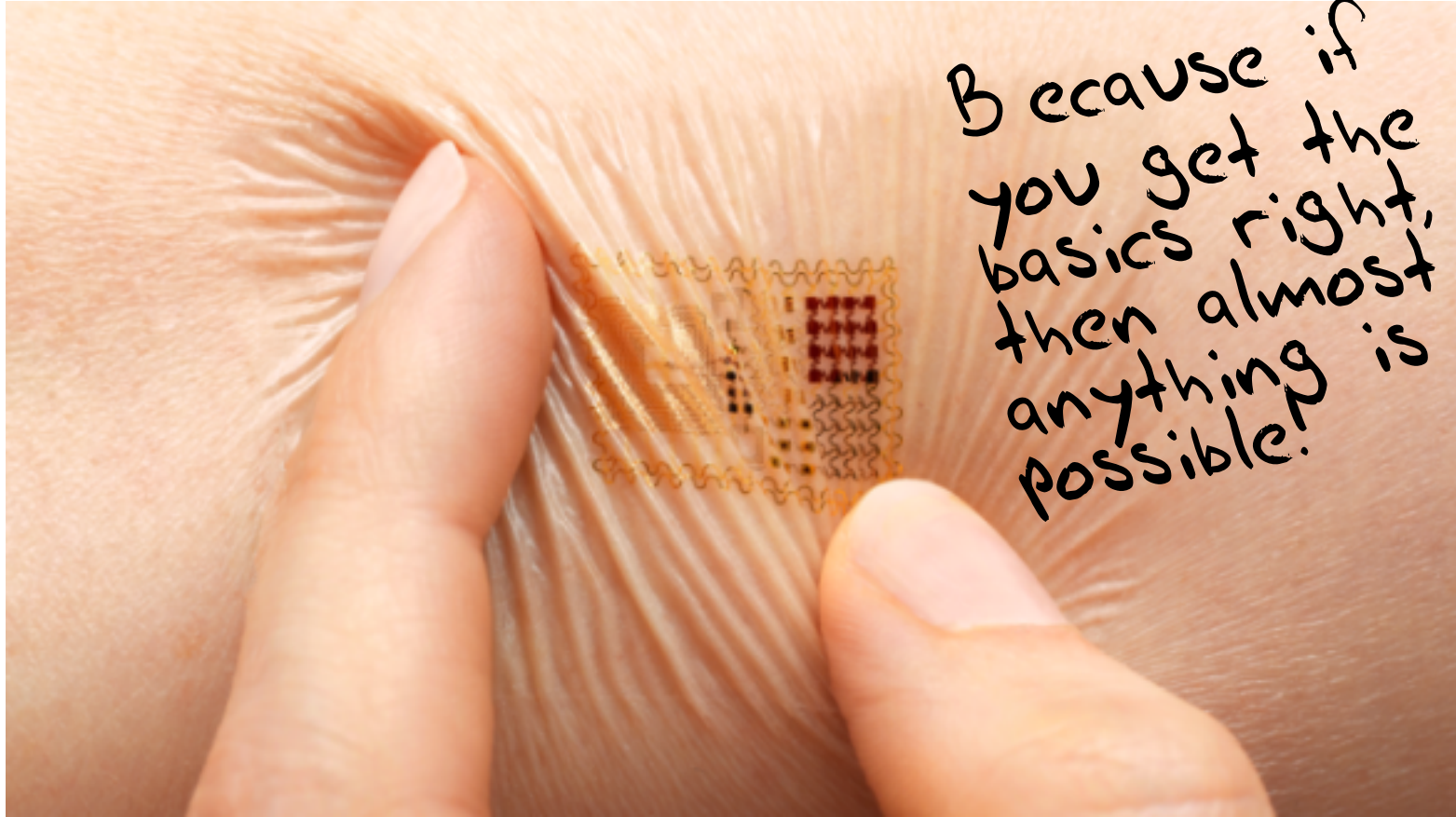
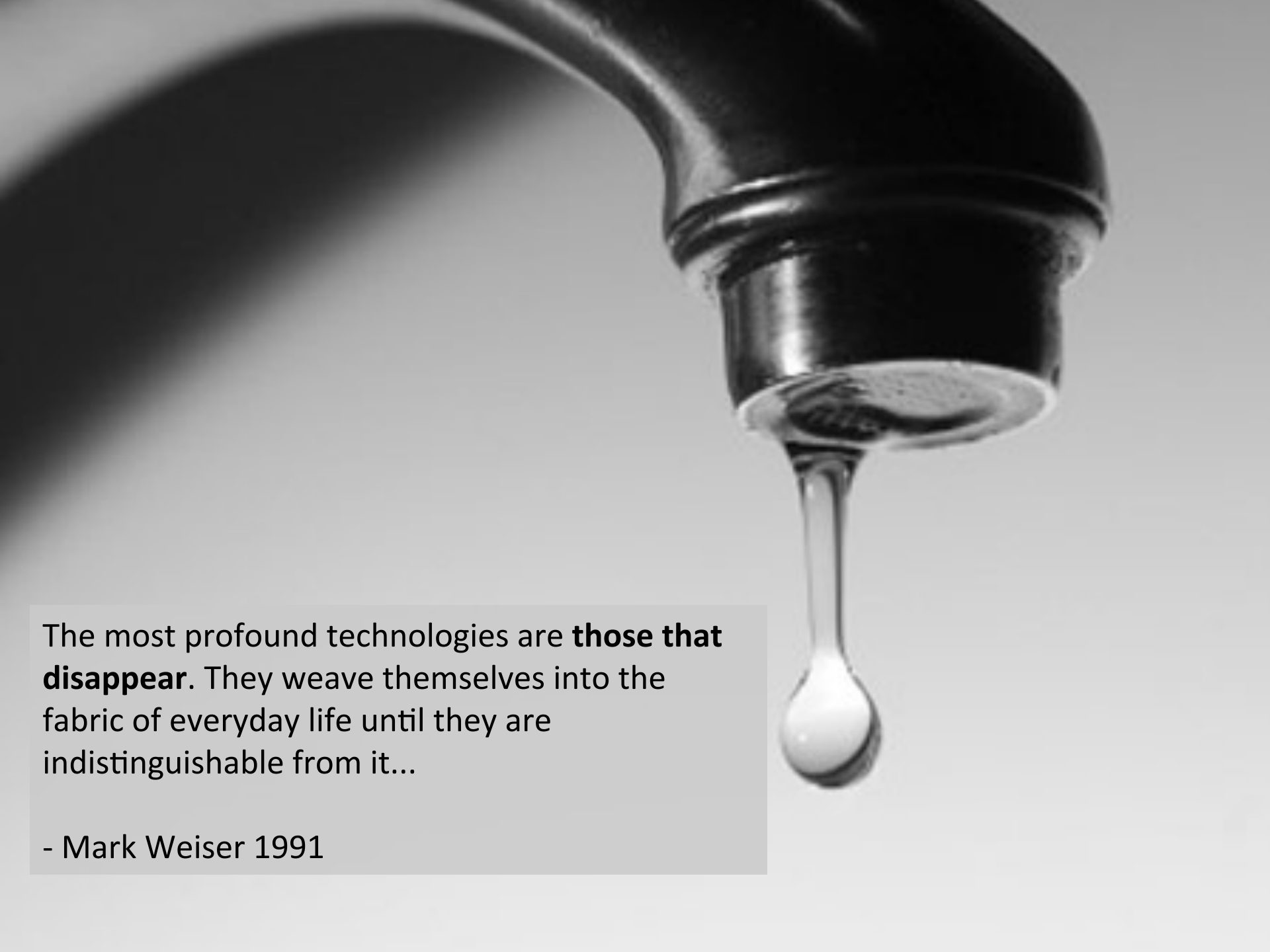Because if you get the basics right, then almost anything is possible!

What's shaping our future?

You and i!

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You and i!

We need to think about a post-PC world where computation, storage and communications are abundant commodities. It's innovative 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