The Internet of the Future: Looking Forward, Not Backward

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Thank you, IETF…

The Internet was not an accident
How we got here...
How we got here…

“There is in our opinion no good reason why by the early part of the next century virtually the whole of mankind should not be within easy reach of a telephone and of all the benefits this can bring.”

The Maitland Report, 1984
Connectivity in the mid-1980s

**Fixed Telephone Lines in 1985**
~ 403 million fixed telephone lines worldwide (8.3% of world pop of 4.8b)

**Mobile Telephones in 1985**
~ 750,000 mobile subscriptions (340,000 in the US)

**Personal Computers:**
~ 8.2 percent of households in the US had a personal computer in 1984

*Source: ITU/ICT Statistics Database Dec. 2011*

Apple II: 1977  
IBM 5150: 1981  
Apple Macintosh: 1984
Connectivity today

Global Stats:
- Over 2.2bn Internet Users (33% of total population)
- 5.9bn mobile-cellular subscriptions (87% of world population)
- 1.2bn mobile broadband subscriptions (twice as many as fixed-wired broadband subscriptions)

Impact:
- In 2010: The Internet for the G-20 countries, the Internet “amounted to 4.1 percent of GDP, or $2.3tr…”
- By 2016, it will be $4.2tr. “If it were a national economy, the Internet economy would rank in the world’s top five.”
- In some countries, the Internet is contributing up to 8 percent of GDP.

Source: ITU, 2011
Source: BCG, 2012

Incremental Annual GDP Growth from Every Ten Percent Points Difference in ICT Penetration

Source: World Bank, 2009
Anyone Remember Steve Deering’s 2001 Presentation?

![Diagram showing network protocols](image-url)
The Networking Martini Glass

Foundational Application Protocols

- SMTP, SIP, HTTP, LDAP, HTML, XMPP, XML, RTP, H.264, X.509

The stable center, including the routing infrastructure

- TCP-IP
- MPLS
- Ethernet, SONET, GSM, 3G, LTE, WiFi, WiMax
IETF Has Been Critical to Internet’s Success

- Nearly 2.3 billion Internet users
- Over 200 million registered domains
- 6,566 RFCs
- Individuals and Industry working together in spite of government
“Unregulation” of the Internet Not an Accident

- 1970s-1980s, The Computer Inquires
  - Data processing not subject to common carrier reg
- 1984: No access charges for enhanced service providers
- 1996, Telecommunications Act: affirmed distinction for Information Service
Economic Implications

Total Economic Impacts

(GDP growth, productivity increases, the Internet Economy, competitive benefits to firms, consumer surplus, social development & increases to govt efficiency)

> International Telecommunications Accounting Revenue

(much greater than)
Comparing International Message Billing (US Payout to Foreign Carriers) v. increasing Internet penetration - One Example

Increasing country X's 2007 Internet penetration rate 10 percentage points from 21% to 31% would result in an annual increase of US$11bn.

In 2007, US carriers paid US $678m to carriers in country X for International Telephone Service.

1.12% of Country X's 2007 GDP of US$1tr.
The Internet of the Future:
Looking Forward, Not Backward
Old Assumptions from the World of Telecom

- The product is voice
- The metric is minutes
- Distance matters
- Duration matters
- Location matters
New Realities in a World of Flat IP Networks

- The product is connectivity
- The metric is bandwidth/throughput
- Distance insensitive
- Time insensitive
- Location insensitive
Challenges as the Internet Grows Up

- Old assumptions/new realities
- Extending the Internet to everyone
  - Following the “mobile miracle” with broadband
  - Access for people with disabilities
- Security
- Preventing illegal behavior and catching bad guys
- And more….
Challenges as the Internet Grows Up  
But approach should remain the same  

But, we need to do more…  
An Example
Call to action

- Don’t create a vacuum
- Address issues before they become “problems”
- Leverage the multi-stakeholder Internet technical community… we can’t just talk to ourselves
- Ensure the future and freedom of the Internet
- It really matters
Thank you.