Call for Action: The Mobile Internet and IPv6

Jari Arkko
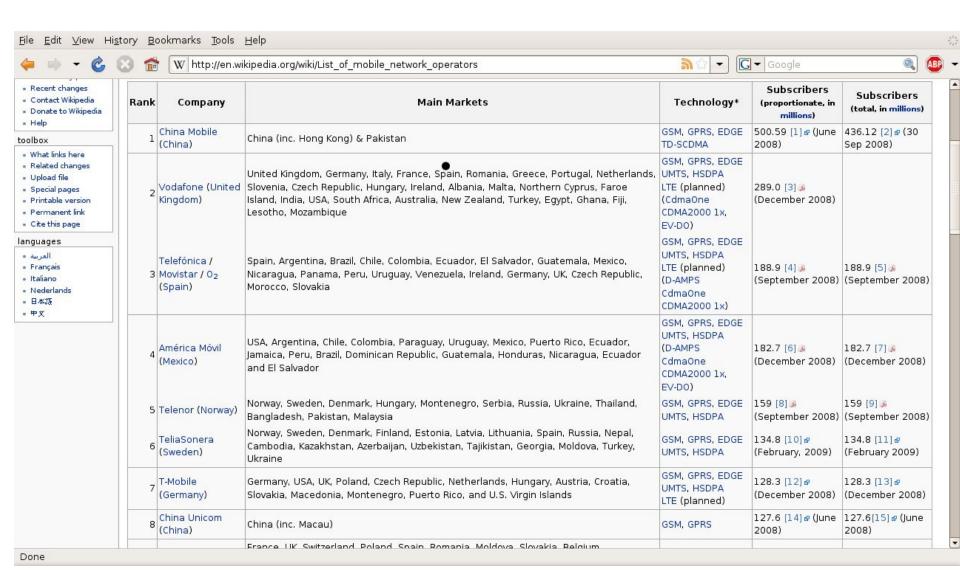
Ericsson Research

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IPv6 Status in Cellular Networks

- Typical deployment today involves either public IPv4 addresses or private addresses and a NAT

- But networks do support dual stack
  - Network products generally support IPv6 for end users
  - Some (coming) protocols are IPv6-only
  - Some terminals support IPv6

- Many, many trials but no commercially available service yet

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This Is Going to Have to Change

- Data users only a small fraction now, but growing rapidly 0.1% → 1% → 10% → 50% …

DNA Mokkula
E169

DNA Nettikaista 1M

DNA Nettikaista 1M on aito
DNA Liikkuva laajakaista -
liittymä!

+

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19 80/€/kk

Osta»

iPhone 3G
15,000 apps. And counting.

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- Data users only a small fraction now, but growing rapidly 0.1% → 1% → 10% → 50% …
- Number of users ~ 3.6 billion and growing

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Rank	Company	Main Markets	Technology*	Subscribers (proportionate, in millions)	Subscribers (total, in millions)
1	China Mobile (China)	China (inc. Hong Kong) & Pakistan	GSM, GPRS, EDGE TD-SCDMA	500.59 [1] (June 2008)	436.12 [2] (30 Sep 2008)
2	Vodafone (United Kingdom)	United Kingdom, Germany, Italy, France, Spain, Romania, Greece, Portugal, Netherlands, Slovenia, Czech Republic, Hungary, Ireland, Albania, Malta, Northern Cyprus, Faroe Island, India, USA, South Africa, Australia, New Zealand, Turkey, Egypt, Ghana, Fiji, Lesotho, Mozambique	GSM, GPRS, EDGE UMTS, HSDPA LTE (planned) (CdmaOne CDMA2000 1x, EV-DO)	289.0 [3] (December 2008)	
3	Telefónica / Movistar / O2 (Spain)	Spain, Argentina, Brazil, Chile, Colombia, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Peru, Uruguay, Venezuela, Ireland, Germany, UK, Czech Republic, Morocco, Slovakia	GSM, GPRS, EDGE UMTS, HSDPA LTE (planned) (D-AMPS CdmaOne CDMA2000 1x)	188.9 [4] (September 2008)	188.9 [5] (September 2008)
4	América Móvil (Mexico)	USA, Argentina, Chile, Colombia, Paraguay, Uruguay, Mexico, Puerto Rico, Ecuador, Jamaica, Peru, Brazil, Dominican Republic, Guatemala, Honduras, Nicaragua, Ecuador and El Salvador	GSM, GPRS, EDGE UMTS, HSDPA (D-AMPS CdmaOne CDMA2000 1x, EV-DO)	182.7 [6] (December 2008)	182.7 [7] (December 2008)
5	Telenor (Norway)	Norway, Sweden, Denmark, Hungary, Montenegro, Serbia, Russia, Ukraine, Thailand, Bangladesh, Pakistan, Malaysia	GSM, GPRS, EDGE UMTS, HSDPA	159 [8] (September 2008)	159 [9] (September 2008)
6	TeliaSonera (Sweden)	Norway, Sweden, Denmark, Finland, Estonia, Latvia, Lithuania, Spain, Russia, Nepal, Cambodia, Kazakhstan, Azerbaijan, Uzbekistan, Tajikistan, Georgia, Moldova, Turkey, Ukraine	GSM, GPRS, EDGE UMTS, HSDPA	134.8 [10] (February, 2009)	134.8 [11] (February 2009)
7	T-Mobile (Germany)	Germany, USA, UK, Poland, Czech Republic, Netherlands, Hungary, Austria, Croatia, Slovakia, Macedonia, Montenegro, Puerto Rico, and U.S. Virgin Islands	GSM, GPRS, EDGE UMTS, HSDPA LTE (planned)	128.3 [12] (December 2008)	128.3 [13] (December 2008)
8	China Unicom (China)	China (inc. Macau)	GSM, GPRS	127.6 [14] (June 2008)	127.6 [15] (June 2008)
		France, UK, Switzerland, Poland, Spain, Romania, Moldova, Slovakia, Belgium			

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- Number of users ~ 3.6 billion and growing
- Users employ data service only at times, but this is going to change 1% → 100%
  - Checking e-mail → chat, Google Maps, …
  - Data is "extra" → even voice runs on IP
    - The next generation (LTE) has no circuit switched voice

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- Do the math

"Houston, we have no address"

- In a few years, we need connectivity to ALL users at ALL times, for ~ 10 billion devices

- Clearly, we can't support everyone with public IPv4 addresses

- We could build NATs and control mechanisms to put everyone behind thousands of NATs and open ports from one to other when voice calls are made etc

- But its going to be horrible

The Action Plan

- Dual-stack should be turned on today
- As we move to pure IP networks, a good application for IPv6 is operator's own services
    - Reduces the pain from managing NATs and opening ports for two hosts to talk to each other
- Access to the global Internet requires IPv4 and NATs into the foreseeable future
    - But NAT64 and NAT44 burn the same # of ports
- Move some applications to IPv6
    - Bittorrent, "Google over IPv6" and others

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