Technologies That Will Matter

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Who Am I?

Edited DSL Prime
reporting on broadband since 1999
Wrote *DSL* (Wiley, 2002) and
Web Video (Peachpit, 2008) with Jennie Bourne
A geek, not a wonk
ASSIA (on panel) and other tech companies
buy ads in my publications, etc.
Worked with Vermont Tel
on Broadband Proposal

DSL Tech That Matters

VDSL is in production up to 100 meg upstream and down very short distances
DSL repeaters very cheap way to bring “up to 6 meg” longer distances (~$200). Cut “unserved” by half.
Dynamic Spectrum Management improves rate/reach perhaps 25% today, reaching 10-30% of unserved.
Bonding doubles speed, important to extend reach
DSM vectoring potentially doubles DSL rate/reach in next few years by reducing noise
(ASSIA is on this panel)

Cable Tech That Matters

30M homes can now get 50 meg down DOCSIS 3.0
60% of U.S. will be covered in 2010-2011
85+% in 2013-2014
Upstream 50 meg at Comcast starting in months
Specification designed to go to a shared gigabit
95-99% reliable speed; balance still over 10 megabits
Policy issues: Get last 10%, speed up first 80%,
get upstream deployed
< $100/home, fast to deploy
Remarkable interactive and individual TV coming

Fiber Tech That Matters

GPON 200 meg both directions
$200-400 gear
Active point to point costs perhaps $100 more (varies widely) Better for sharing, more future performance
Verizon FiOS 200 meg <$700/home passed
Costs dropping with bendable fiber, training
$20K/mile to run fiber – raises cost for low density

Wireless Tech That Matters

LTE or WiMAX 4-10 megabit typical
95% of U.S. 2013 (McAdam, VZ)
Shared 30-120 meg, so heavy HD TV use a problem
Nearly everyone will carry a phone better than today's iPhone, as Moore's Law brings down costs
Extraordinary opportunities to create spectrum in many ways, starting with “use it or lose it” renewals and femtocells, then expanding non-interference to many more bands. (White space throughout)

Middle Mile Backhaul Tech That Matters

Crucial to rural broadband cost.
Depending on location/competition 1 megabit can cost as much as $110+ while it goes for $5-15 in most areas and is dropping rapidly.
No fiber shortage except occasional islands, Alaska, etc. because WDM and other techniques allow fiber to be upgraded to almost any capacity required
No exaflood/congestion problem. Routers/switches dropping in cost as fast as traffic increases.
Crucial political choice: $10's of billions to overbuild more fiber or use special access to reduce markups from 1000% to 100%.

Other Key Tech

“High cost switches” disappeared years ago. Cheap softswitches cost less to buy than the maintenance on the old stuff and work better. Support ten ot more exchanges each. Smallest carriers can buy switching as service. (save hundreds of millions)

HD voice really is great and costs little more. Switchover difficult to create.

Many other costs dropping from improved techniques, including call centers, OSS, and administration.

Biggest steps to broadband for all

1: Bring down backhaul cost by special access or overbuild
2- Identify the last 5-10% and the particular problems
3- Reach 50-70% of “unserved” for under $400/home. That's easy: 30-40% of “unserved” can get cable TV but not data and are cheap upgrades. Many of rest can be reached with new towers or DSL repeaters. Do these first.
4- Do not heavily subsidize what would be provided without subsidy. Biggest dollar is home equipment and installs, which are only necessary if there's a customer paying. Similar for routers/switches. Cellular radios are cheap enough they will be installed on any tower with backhaul.

Biggest policy needs

1- Establish standard costs for broadband subsidies. Typical RUS project costs 2-5 times what similar private projects costs. Real scandal.
2- Decide whether the last 1-2% get subsidies in the $10K+/home range or better satellite?
3- Choose special access or overbuild for middle mile
4- Cell site exemption eliminated to encourage more 4G companies.
5- Understand “incidence of subsidy.” Is money – such as lifeline broadband – going to the public purpose or company profits.