

IEEE ComSoc SCV Telecom and Networking Newsletter- Part II. C-Scape Conference

Alan J. Weissberger
IEEE ComSoc SCV Program Chair

Abstract: As the end of the year approaches and everyone is pressed for time, we are going to cover only a few sessions of this excellent conference: Big Picture Mega-Trends, Internet traffic growth, Cisco's WiMAX strategy resulting from their Navini Networks acquisition, and an informal chat about Cisco's Service Provider mobility strategy.

Note: Editorial comments or opinions are in *italics* font.

1. Big Picture Mega-Trends

Cisco CEO John Chambers kicked off the conference presentations by leading the audience through what he referred to as a "Disruptive Journey." Here are his key points:

- We are now in the second phase of the Internet, which is being driven by increased use of video, collaboration, and Web 2.0 technologies (social networking, P2P sharing, and wiki's).
- Globalization will continue to level the playing field and benefit developing countries. (Hence, Cisco sees those countries as important new markets).
- Personalization of content and information will transform business models.
- User behavior is driving collaboration and innovation. High quality video conferencing (e.g. Telepresence) is a good example of this.
- There is a blurring of the lines between users and consumers. It's important for a vendor/ service provider to deliver the maximum flexibility to enhance the user experience.

Cisco is thinking 3 to 5 years out for business opportunities. They are planting a lot of seeds and nurturing them. Trends they see stimulating growth:

- Telepresence is changing every aspect of how Cisco interfaces with customers and themselves. Video collaboration will dramatically transform business models and change the nature of business. Within three years, customer contact will be almost entirely virtual, according to Chambers. The network will change to enable new business models that will result from this dynamic.
- Social networking inside organizations will enable correlated information flows, which will result in higher performance.

- Virtualization will continue: any device to any format to any content to anywhere in the world, with security. This is what routing is all about, according to Chambers.
- Service providers must transition from supplying infrastructure-like basic services (e.g. pipes) to advanced new Web 2.0-like services. They will need to partner with content providers and pursue advertising based business models.
- Voice and video broadcasts will become free. New collaboration services will be added on top of those freebies. All services will be delivered over an IP network.
- Video is the killer application of Web 2.0: for both residential (IPTV and video sharing) and business (video conferencing) markets.

2. Global IP Traffic Trends and Service Provider Architectural Implications

- Global IP traffic will grow by a compound annual rate of 42% from 2006 to 2011.
- By 2011, there will be 30 Exabytes per month sent over networks (an Exabyte= all the worlds printed material; 5 Exabytes= all the words ever spoken).
- Consumer and IP video are driving traffic growth now. Mobility and 4G services will drive future growth, especially in emerging markets.
- Internet traffic is growing much faster than private network traffic, mostly because of video downloads and streaming videos.
- By 2011, core network traffic will triple, while metro traffic will quintuple. Cisco sees 18.5 E bytes/month for the core, 28.5 E bytes/month for metro, and 29.5 E bytes/month for the access network.
- AT&T's recent upgrade of their IP core network (via Cisco CRS-1 Routers) to 40G transport was due to the increase in Internet video traffic.
- Traffic is increasing in the Control Plane as well as the Data plane. Cisco believes they can distribute the Control Plane traffic amongst multiple BGP sessions, using their IOS based Routers. New software releases can be easily rolled out, resulting in a very scalable Control Plane.
- There are 3 types of video traffic: video delivery of stored content, real time video conferencing and broadcast video, any to any multimedia. There will be a lot of any to any multimedia applications coming within the next 3 to 5 year time period.

- Key question: Will Service Providers (SPs) continue to throw bandwidth at the problem of providing increasing video traffic, or will they use QOS and discriminate against some types of traffic and prioritize other (real time) traffic flows? Core will probably be over-provisioned, but converged access network will require QOS.
- SPs are now delivering increased amounts of bandwidth to homes (Verizon FIOS and AT&T U-Verse). Their goal is a converged infrastructure which includes broadband Internet, video, voice, and mobile communications. The NGN will enable this (*but who knows what the NGN will actually be?*).
- Network needs to be more service aware, and NGN will make that happen (*Cisco will face still competition from China's Huawei and others in the NGN equipment market*).
- Almost 60% of the traffic on any pipe is P2P traffic (*we find that hard to believe*). As IPTV is offered to more customers, that will change. *Presumably because IPTV broadcasts will be delivered via IP Multicast.*
- Traffic mix will change to be 50/50 upstream vs. downstream, because of large amounts of uploaded files and increased use of bi-directional video conferencing.
- France is the most sophisticated video market. Content providers are treated the same as ISPs.
- Hong Kong has very viable IPTV business models. PCCW was the first SP to adopt IPTV on a large scale.

3. WiMAX and Cisco's Mobility Strategy

Cisco has a very broad definition of mobility. It involves keeping a person connected irrespective of where they go or whether they have wireless or wire-line connectivity. This provides convenience and scalability for users to do whatever they want, wherever they are, using the best network available for the job. This will provide the "connected life" everywhere, according to Cisco.

WiMAX is seen as an enabler for "digital inclusion" in emerging market countries. There are over 2.7B people not yet connected to the Internet. Broadband wireless solutions and Internet communications have the potential to transform countries. This transformation includes: energy, finance, tourism, entrepreneurial, community and education. The network is seen as the platform to drive this transformation. Build multiple wireless network based apps to drive growth and create new opportunities.

WiMAX is important because of its all IP foundation and use of licensed spectrum. For more on this theme, please see slide 7 of Cisco's WiMAX presentation at:

<http://www.cisco.com/web/learning/le21/le34/cscape/2007/post/presentations/BRK1053.pdf>

Sriram Viswanathan of Intel Capital:

- Success of WiMAX will depend on the effort the entire ecosystem (i.e. WiMAX Forum companies) puts in.
- Every major network equipment company is developing mobile WiMAX (IEEE 802.16e) gear.
- We are early in WiMAX development- it's the 1st or 2nd inning. Highly data sensitive devices (not cell phones) will be needed for WiMAX to realize its full potential.
- At the Spring IDF, Intel announced the "Menlo platform" for low power, always connected, smaller (i.e. shirt pocket) size devices. Such devices could much better utilize WiMAX's video transport capabilities than a cell phone¹ could. The premise is to provide a rich user experience on a handheld device with mobile WiMAX built in. Then, new data and video services could be enabled and SPs economics would improve as notebook PCs and **Mobile Internet Devices (MIDs)** get integrated into the network.

3 Reasons why Cisco acquired Navini for its WiMAX technology:

- Build green field networks in emerging market countries
- With an open (standardized) broadband wireless network, more subscribers can use it to achieve a rich broadband fixed or mobile experience.
- Technology synergy to enable an end-to-end solution from one vendor. WiMAX is the right technology for emerging market countries at this time. ***One might expect Scientific Atlanta STBs, Linksys home networking gear, or even access Routers to support WiMAX in the future.***

Roger Dorf, CEO of Navini:

¹ According to the December 15th WSJ: Intel contends that high-end cell phones fall far short of delivering the full capabilities associated with Web use on a PC, such as playing videos, blogging and social networking. **The company hopes to promote slightly larger gadgets, using its chips, that fit in a jacket pocket but deliver a full Web experience.**

<http://online.wsj.com/article/SB119766800257230083.html>

- Emerging markets are users of desktop PCs and it will be that way for several years. Even with notebook PCs, users will be nomadic or portable, but not truly mobile.
- As a result, Fixed WiMAX will be used in place of cable or DSL in countries without wire-line infrastructure.
- Residential gateways with WiMAX air interfaces will attach to desktop devices via Ethernet (10/100 Base T) in coming years. This implies use of IEEE 802.16e in Fixed Mode.
- Many different devices will attach to WiMAX networks: desktop and notebook PCs, consumer electronic devices (e.g. digital cameras), smart phones, etc.

Larry Lang, VP of Cisco's Mobility SP Group:

- Cisco is likely to transfer the WiMAX technology to Linksys and Scientific Atlanta divisions.
- Unlicensed WiMAX operation, e.g. for wireless point-to-point backhaul, is not very attractive to Cisco. It will be a niche market technology at best (*we disagree as backhaul of WiFi hot spots and mesh WiFi muni networks will be important for developed market countries, like the U.S. and Europe*).
- Cisco is considering how to bring soft (VoIP) switch technology over WiMAX to provide voice as well as data services in emerging market countries.
- WiMAX is one of many technologies for cellular operators to choose from. Others include: 3G evolving to LTE, mesh WiFi, W-CDMA, HSPDA, EVDO, etc.
- With all these heterogeneous wireless access networks, Cisco sees an opportunity to build networks of networks or inter-networks.

4. Lunch-time tech chat with Jeff Spagnola, VP of World Wide SP Marketing, on **Cisco's SP Mobility Strategy**. Jeff said that SPs want:

- Pervasiveness and ubiquity
- To move IP from core network to edge and backhaul; expand IP to include radio environment with an open platform. SPs don't want a closed (single vendor dictated) architecture, so Cisco is involved in the 3GPP committee (controlled by Ericsson and Nokia). The open platform is one reason Cisco likes WiMAX.
- New services and new apps to gain revenue. Cisco will collaborate with SPs to do joint market build outs targeting commercial and SMB accounts. Objective is to help SP achieve accelerated revenues. As an example, Call Manager (Cisco's

IP PBX) hosted or CPE based packages for SPs to offer: mobile voice mail, voice mail to email conversion, FMC (dual mode phones- cellular and VoWiFi), unified communications, etc.