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New Pathways to Profit with Network Visibility

By David Heard

For network operators, the pace of growth in mobile communications is quite exciting. At the same time, however, it's also unnerving. The opportunity for innovation is huge, but succeeding in a new world of massive bandwidth demand involves substantial challenges. Operators must overcome the barriers to complete network visibility and convert network data into real, actionable intelligence.

To overcome these barriers, packet acquisition can be cost-effectively embedded in optical components throughout the network, and a cloud-based software application platform can access and manage critical network data. With a greater level of intelligence about traffic and applications running over a network, operators can create new classes of services; opening up new revenue and profit streams.

Seeing the Future of Bandwidth Demand

The volume of mobile data communication continues to grow relentlessly. Ericsson predicts that from 50 to 500 billion devices--phones, tablets, laptops, even devices such as smart meters--will connect to the web by 2020. It is an astounding number, and with more of our communications, commerce, and service industries depending on wireless services, network performance becomes of paramount importance.

It is not just the sheer number of devices--it is also the volume of traffic being carried over our wireless networks. In the last year, per-user data consumption amongst U.S. smartphone users jumped 80 percent. Recently, Cisco projected a 78 percent compounded annual global mobile data growth over the next five years. AT&T is also seeing its mobile data traffic grow 100 percent.

Smartphone applications are driving this growth, and streaming video is dominating web traffic. In just three years, video is likely to account for nearly 60 percent of all data traffic. As more and more consumers have smartphones and tablets, they increasingly will download videos from sites such as YouTube or Hulu. And, in addition to commercial content, they will record and share their own videos such as family events, concerts, and parties with friends.

Not only does video consume huge chunks of bandwidth on a network, it also increases the need for error-free transmission and greater speed. The race for speed is well underway in many markets throughout Asia, Europe, and North America, and huge investments are being made to upgrade networks to 4G/LTE. According to the Global Mobile Suppliers Association (GSA), 49 LTE operators have already launched commercial services. The GSA forecasts there will be 119 commercial LTE networks in more than 50 countries by the end of 2012. Investment this year in LTE infrastructure worldwide is expected to exceed $8 billion.

As with most technology upgrades, there will be significant bumps along the way, and minimizing service interruptions will be critical to retaining customers and reducing churn. Meanwhile, network operators are under constant pressure to reduce costs, maximize profits, guarantee quality of service, increase customer satisfaction, and support new and real-time applications--all while coping with ever-increasing bandwidth demands.

Network Visibility

Visibility--collecting and viewing data packets that describe the network environment--lets operators deal with these pressures and minimize service issues affecting customers. However, collecting packets at the edge of the network, where the majority of customer issues occur, is a significant challenge that isn't being met with current solutions. The methods used to access packets in an IP network have evolved over time, but the basic technique of deploying expensive appliances near the network core has remained the same.

Information is important, but intelligence is what drives profits.

Today's networks are far more complex with challenges such as dynamically re-routed traffic, priority queues, and class of services that change from device to device and link to link. The difficulty of meeting these challenges exponentially increases with higher bandwidth demands and real-time applications and services. Network intelligence and quality-determining decisions need to be made with data from the edge of the network--close to the actual customer experience.

Visibility Leads to Intelligence

Looking to the future, there is an obvious need for complete network visibility—not only visibility into the applications that customers are running on their smartphones and devices, but also visibility into varying bandwidth flows and demands—from a neighborhood to a business center to an entire community. To manage a network's performance, operators need reports on bandwidth in real-time. What all this really amounts to is a need for greater intelligence.

Information is important, but intelligence is what drives profits. With greater visibility, you have the intelligence to improve troubleshooting, create new products, and enhance the customer experience. To get this level of intelligence, you have to be able to collect the data at the edge of the network. In the case of a wireless network, that means

gathering data from cell towers and micro towers and compiling the data in real time through a cloud-based approach to intelligent collection and network management.

If you can cost effectively distribute packet collection throughout the network, and then distribute the data through a cloud-based network, you can dramatically reduce the cost, footprint, and complexity of capturing rich intelligence about the network, the content, and the customer experience.

Acquisition must be part of standard network components widely distributed at the network edge. Embedding intelligent packet acquisition using an integrated circuit in optical transceivers, such as Small Form factor Pluggables, quickly extends the data reach to virtually any optical link anywhere within a network. This kind of solution provides the following:

- **Dramatically lower operational expenses**--With an intelligent transceiver replacing a standard transceiver, no additional rack space or external power is required. It doesn't need an internal operating system or external configuration and maintenance. Using the host network for communications, no management or overlay networks are needed.
- **On-demand access**--Combining this type of packet access with a multi-user, multi-probe access platform means technicians do not need direct access to network elements to quickly and easily access the targeted data. Users will view any customer, service, or quality of experience on demand, leading to quick diagnoses and faster problem solving.
- **Ubiquitous visibility everywhere in the network**--This approach can be deployed into any pluggable transceiver port throughout a network. The increased visibility results in reduced mean time to fix problems, which in turn leads to increased customer satisfaction.
- **Customer intelligence**--The data captured for network monitoring extends to many different applications, such as Wireshark for network analysis or other applications for security or market and business intelligence, providing analytics and intelligence on customer usage and behavior.

The software component of this type of solution, a Smart Network Application Platform (SNAP), will provide ubiquitous, real-time access to critical network data, replacing traditional methods that can't scale to the growing number of connected devices.

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Unexpected Benefits: New Classes of Services

The beauty of the SNAP approach is that operators can run a range of applications from an open platform. And, beyond improving troubleshooting, there are new opportunities for carriers to create new classes of services based on customer needs and applications.

There is a substantial, largely untapped market for premium-level services. Just as airlines have created first-class travel for passengers willing to pay more for a higher level of service, the same is likely to be true for carriers. The old model is to offer wireless customers a package based on minutes or data usage, but the new model will be to create services with guaranteed quality of service levels.

Who will pay for higher, guaranteed service levels? More online gamers are playing on mobile devices. Consumers are watching movies and videos on smartphones. Nothing is more frustrating than long downloads or interruptions when viewing videos.

Many people see a future where most of our consumer transactions involve mobile phones and devices. The growth of wireless-enabled commerce will require higher levels of service.

Business travelers are another important customer base. They require guaranteed quality of service no matter where they travel. And, like the other groups, they will pay for this enhanced service.

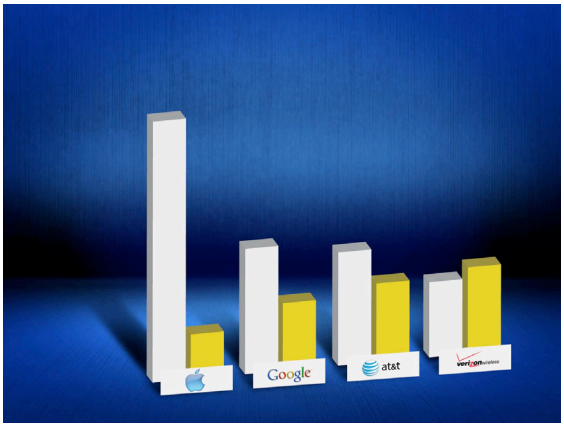
What makes these particular applications possible is the ability for service providers to verify the promised level of service that is received. Known as service level agreements, they are common in the data communications market for large enterprise users. There will likely be a considerable market for premium video access where a wireless provider can guarantee audio and video quality.

Maximizing Network Value

As with all industries, the future of networking belongs to companies that do the best job of maximizing their value. Operators can learn from

recent social media and tech successes and innovate like the world's most successful companies. For example, Apple created new classes of products with their iPhone and iPad and, in the process, created tremendous market value. Google is another good example. They have grown by offering consumers free services such as search and email but then mine this customer data to attract advertisers.

Look at the stock value of Apple and Google compared to much larger companies such as AT&T and Verizon. AT&T and Verizon have substantially greater revenues but much lesser market values.



Comparing revenues (yellow) and market values (white) of Apple, Google, AT&T, and Verizon Wireless

With greater intelligence on network applications and traffic, wireless operators can do the same as Apple and Google. With more and better data, operators can create new services, such as premium video access or service level agreements for the business traveler. They will be able to enhance the customer experience by improving troubleshooting and optimizing bandwidth at the customer application level.

Value comes from reducing churn, which is a huge issue in competitive markets, and in developing new, profitable services. Ultimately, it comes down to innovation. The social networking companies are innovation experts. Now is the time for wireless providers to fight fire with fire. It is time for a new era of innovation, driven by network visibility.