

## Networks are on an Evolutionary Path;

How can Service Providers Head in the Right Direction?

By Jay Klein

Charles Darwin claimed that intelligence was a key part of the evolutionary journey. The more we learn to use and expand our intelligence the better positioned we are to be in the group that survives. This theory is especially significant in today's intensely competitive Communications Service Provider (CSP) market.

All CSPs today have vast amounts of intelligence traveling through their networks. Tapping this intelligence and understanding how best to utilize it is necessary for service providers to reach the end of their own evolutionary path.

“This point in time will be looked back upon as an evolutionary ‘turning point or ‘threshold’.”

One area of extreme growth is mobile broadband. Whether it is Web browsing via mobile, social networking, or live streaming media, all of the demand from new applications and mobile devices is creating increased strain on mobile networks. And this network demand can only grow as more devices and ways to access mobile applications come to market.

Yet, it is important to point out that Mobile Broadband means many things to many people:

- For teens it means the ability to share details of their day-to-day lives with their peers through social networking apps such as Facebook, MySpace, and Twitter to name a few.
- Business people utilize mobile broadband to take their offices on the go without forgoing any of their essential tools—email and office applications.
- Health care patients' use of Mobile Telemonitoring can have significant improvement on their quality of life.



The question for CSPs is how can they collect the required intelligence, understand it, and implement the functions that need to be in place in the network in order to deliver personalized offerings to their customers.

Essentially, a multidimensional approach is required for both the collection of the information as well as for a service provider's evolution. In all of the cases above, CSPs must gather information about the application, device, network topology and subscriber in order to offer services that are truly personalized. This information needs to be collected in real-time and made available to all facets within the network. This real-time synergy of information is key to making decisions in critical areas from policy and resource allocation to charging, billing and provisioning. The CSP can get a complete picture of what is happening across their network and make important decisions from alleviating pressure in some parts of the network to identifying new application-based revenue opportunities for different subscriber groups.

Here is a closer look at the different kinds of information that can be gathered about the application, device, network topology and subscriber:

- Application – which applications are currently being used? Web browsing, for example, requires very different network resources than video. CSPs need to understand the requirements of each type of application and the value each of those applications represents to their business and to their customers.
- Device – with the plethora of Mobile Internet Devices (MIDs) already available to consumers (smartphone, ebooks, netbooks, dongles, health care devices, etc...), it is important to understand that not all devices are created equal; therefore, the user experience, expectations, and offered ‘plans’

or 'packages' will be different. In some cases the CSP will limit a specific offering to a specific device (e.g., unlimited web browsing using a phone versus unlimited data using an USB modem dongle).

- Network topology – not all parts of the network are created equal—nor are they all upgraded at the same time. Load can be heavier in some parts of the network than others. It is essential that CSPs have real-time intelligence on where congestion occurs or can potentially occur in their network. Delivery of service can in some cases literally be a case of life or death (as with Mobile Telemonitoring) and provisions need to be made for changes in network policy when the network is experiencing congestion.

- Subscriber - Lastly but most importantly, the subscriber is looking for an Internet experience that combines all of the above into a service plan that makes sense for him or her. Whether they are interested in gaming, social networking, watching video or TV online—subscribers are looking for a service plan that suits their own online lifestyle at the right price.

How do Service Providers leverage all of the data gathered?

OSS/BSS systems in many cases become the policy master—aggregating information from many other

sources. The OSS /BSS function deals with all aspects of subscriber and service plan provisioning. This can include real-time management of tasks such as the notification of a quota breach, or a self-service plan upgrade. These critical functions place OSS/BSS in a central role with regards to policy aggregation and distribution.

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In addition to centralizing policy decisions, the OSS/BSS function also centralizes the in-bound gathering of data for metering, charging, and billing. The additional intelligence collected allows the OSS/BSS to incorporate this information both on the policy decision side and on the charging/billing side. This results in more granular, personalized policies and billing. A CSP could, for example, give a full, detailed disclosure to each subscriber of his or her usage

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“It is through the combination of PCEF and PCRF technologies that service providers can identify new revenue opportunities.”

over the billing period including a breakdown by the application used. Subscribers would be in favor of this type of disclosure (customer loyalty is always tough), and in turn, it may identify opportunities for CSPs to up sell or customize other services and plans.

When trying to achieve personalized policies and billing in the mobile world the 3GPP standard defines the Policy Control and Charging Function (PCCF). Policy and Charging Enforcement Function (PCEF) and Policy and Rules Charging (PCRF) are components of the PCCF and essential to its implementation in 3G/LTE networks. The PCRF deals with the provisioning of subscribers and their relevant policies and the PCEF is essentially tasked with implementing these higher-level policies on the network. In general the PCEF and PCRF communicate using the DIAMETER protocol using a Gx interface. In simple terms, the PCRF understands subscribers and the PCEF

understands the network—the challenge is to get them speaking the same language. In addition to its enforcement function, the PCEF can also collect the intelligence required directly from the network and make it available to the PCRF for policy decisions (Gx Interface) and charging decisions (Gy/Gz interfaces). It is through the combination of these technologies that service providers can identify new revenue opportunities.

BSS and OSS systems can utilize the granularity of the information gathered to create new service plans for customers. Some plans may be quite simple: based on a throughput speed and a bandwidth cap or quota resulting in tiered service plans (Gold, Silver, or Bronze). Other plans may be more personal: a customer that is an avid gamer may want dedicated bandwidth with a guaranteed QoS service and he will be willing to purchase a gaming plan specifically for this. Some operators are already offering guaranteed Skype (VoIP) plans across their network to enhance the experience of that particular application.

As the industry moves from an ‘all you can eat’ mentality, it is essential for the consumer to understand what he or she is getting within any given plan. Most likely, a user will not understand when allowed a certain number of Gigabytes or Megabits per second. The tailored plans need to



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evolutionary ‘turning point’ or ‘threshold’. And, those that make it through will go on to thrive while those that don’t will be running the risk of extinction.

clearly communicate that a plan will come with free Web-based video or 10 audio books per month, for example.

There are many different cases beginning to appear in this market. We have recently seen AT&T in the U.S. move from a flat-fee pricing scheme to a tiered pricing plan, with some operators matching the move almost immediately. Others will hold out a little longer but they will have little choice but to follow or be left by the wayside.

The network has always held the key to a wealth of information. Service Providers now have the tools to gather network intelligence and insightfully use this information to launch new service packages based on events, profiles and network availability.

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