Extracting Business Value at the Network Edge

Provider networks are becoming increasingly transactional. As few as three years ago, all pre-and post-paid voice and data services with even the largest tier one providers would produce just a few hundred million network transactions (mostly pre-paid voice and SMS authorizations)and event records of individual activity "reports" for the usage of a service per day. Today, tier one service providers produce billions of daily events and transactions in support of a growing number of data, content, and multimedia services targeted at an increasingly well-understood range of market segments.

In an era when subscriber acquisition rates are declining, the focus of service providers is on increasing profitability and competitiveness, which are largely dependent upon gaining visibility into and control over the events and transactions on their networks. In fact, network activity is a valuable resource that can be exploited to produce measurable business value by the savvy service providers that have the expertise and technology to extract that value from it.

To illustrate how such value can be leveraged to provide new services, one need only look at some recent trends. E.g., the marketing research firm Jupiter Research noted that owing to the success of viral marketing, 48 percent of marketers plan to use social networking techniques in the coming year. This opens up opportunities for a provider to partner with a social networking site, using information to identify when that site's members are using the provider's services, and offer a value-added service to the site's members.

However, to take advantage of new opportunities, service providers need to thrive in a world where billions of events are flowing over the network. In some cases this may mean thousands of events per second. To harness the true value of this resource, service providers need to evolve their business models and core competencies. This will require new approaches through their organizations.

An Evolution In Progress

Historically, service providers focused predominantly on growth and market share. Telecom service providers offered basic voice service with a small list of relatively simple enhanced capabilities, such as voice mail and caller ID. Internet service providers offered internet access and email. Cable operators offered television service. Services were mass-marketed. Each category of service providers had their "niche app"—voice, email, and television respectively. Subscribers were billed a flat rate on a monthly basis for services.

Today, life for service providers is not so simple. Business models are evolving and competition crosses the traditional category lines for wireless, wireline, and cable service providers. For instance, it is becoming increasingly common for a wireless subscriber to use an IP data service to select, pay for, download, and view third-party video content on their cellular phone. In 2005, just as the first handset-based 3G applications were being rolled out, providers had crossed the 10 percent average revenue per user (ARPU) level for such data services, according to IDC. At that time, IDC noted "the increasingly critical role of content and entertainment in driving data service revenue." In 2007, several wireless providers reported strong year-to-year growth in their data ARPU.

As new subscriber growth has been nearly tapped out, service providers today are focused on quickly and cost-effectively bringing new services to market—leveraging new technologies—in order to differentiate themselves from competitors by offering propositions that are more relevant to specific customer segments. This means:

- Availing themselves of convergent and higher-throughput networks
- Targeting discreet market segments
- Rapidly deploying more new data, content, and multimedia services
- Securing a piece of the resulting advertising revenue stream generated on their networks
- Managing an exponentially higher amount of network traffic and activity

And doing this all while simultaneously decreasing IT and network costs.

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>
> — Keith Willetts, chairman of the TeleManagement Forum

There are no more niche apps, no more mass markets. Marketers, financers, and other business entities must be more savvy and creative and have a greater impact on the technologies and infrastructures that are deployed to ensure their business objectives are met. Technologists must listen to their business counterparts for requirements, while also consolidating network and

back office infrastructure, and improving operational efficiency. The problem is that old systems will not support this new world. More flexibility, performance, and capacity are needed. What is also needed is network edge performance and scale, combined with back-office flexibility and control.

In particular, as users embrace and utilize a wider range of services, more frequently, service providers are faced with a new set of "network-edge" business challenges including:

- Deploy new services more quickly—gaining visibility into how subscribers are using services in order to improve them
- Create and rapidly improve pricing plans and promotions to maintain a competitive advantage; all while managing subscriber privacy and security
- Ensure content assets from third-party partners are protected.
- Share revenue in an increasingly complex value chain
- Identify more diverse sources of revenue leakage
- Comply with government security and financial mandates
- Help partners place relevant, highly-targeted advertisements and offers over multiple screens

The challenge is that delivering on this list of business objectives requires a disruptive evolution in service provider business models, processes, and infrastructure. The transition to accommodate multiple business and revenue and distribution/conveyance models to support new services creates significant technical and operational challenges.

The difficulty in doing this is the inflexibility of legacy Business Support Systems (BSS) and Operational Support Systems (OSS). The capacity and performance of those legacy systems is insufficient to handle the demands of the emerging and envisioned service models, which require dealing with significantly more transactional information than services of the past. That is because there is likely to be a major increase in the number of events per session and in the volume of data per transaction. Centralized handling of decision-making processes could overload network capabilities and turn off customers by introducing time delays when initiating a session.

At its very simplest, the new market place requires an exponential increase in demands on a providers' capacity to perform real-time collection, aggregation, and correlation of customer activity records. For more complex propositions, the policy and charging requirements will be make the challenge even harder. Multiple technology platforms need to feed into the decision-making and billing framework in close to real time—and this is a huge challenge. Revenue assurance requirements will also change radically as the provider will increasingly need a single data view of multiple customer activities.

EXECUTIVE SUMMARY

- Convergence and new data services are radically changing the playing field
- To stay competitive, providers must be able to quickly create, deploy, market, and manage new services often acting as an aggregator
- Third-party content must be provided through partnerships, all while offering customers a value-add that entices them to select the content from the provider—not the third-party directly
- All of these changes involve a significant increase in sessions and transactions on a provider's network
- Current OSS and BSS infrastructures have performance and flexibility limitations that hinder support for these new services
- Decision-making processes must be pushed to the edge of the network to accommodate performance and scalability requirements
- Providers need to use transactional intelligence from the edge of their networks to better understand and meet their customers' needs

Living On The Edge

To that point, in the early 1990s, providers added perhaps one or two services per year. Now, many add 40 or more offerings per year. And the content offerings and promotional programs offered by providers are becoming significantly more sophisticated. Additionally, the speed at which offerings are brought to market has accelerated. Where it used to take a multi-year effort to develop, launch, and market a new service, the entire process now is measured in months or sometimes weeks. It is a reality that competitive advantage accrues to those who can bring new services to market in weeks.

The convergence of these factors creates a requirement for OSS and BSS infrastructures to be more agile. Older, legacy systems are not. This point was noted in a 2006 BusinessWeek article1 on the business transformation of the telcos in 2007. "Transforming operations and cutting costs requires that providers adopt a 21st-century approach to correcting these problems," said Keith Willetts, chairman of the TeleManagement Forum. "Making this degree of change is not unlike turning around an oil tanker: it's a relatively slow process that requires long-term commitment."

1 "Putting the Back Office Front and Center," BusinessWeek, Special Section December 4, 2006 www.businessweek.com/adsections/2006/pdf/120402_telcos.pdf

When examining the changing nature of interactions with customers, one thing is clear: To support new business requirements and models, providers need to augment or vastly improve their OSS and BSS infrastructures. The systems must handle orders of magnitude, with more interactions in real time, from multiple changing sources, with complex business logic, decision-making, and credit implications than before.

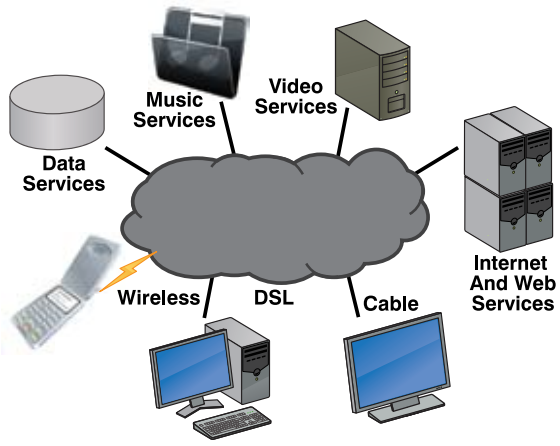
Legacy (older) systems are not designed to deliver this level of flexibility, and due to their proprietary nature, are costly to scale.

For this reason, it makes sense to consider shifting more of the intelligence burden to the network-edge. Such an approach helps prevent traffic bottlenecks and lowers latency that might occur as the volume of transactions increases. Additionally, moving services like charging and rating to the edge provides more flexibility and can support rapid service introductions and the dynamic environment required to fine-tune offerings.

To understand the need for change, one need only look at the difference between a traditional voice service and one of today's new data services. A call on a traditional telephone network would generate one call detail record (CDR). New data services generate dozens or more. This will only increase the amount and complexity of a session interaction.

One further aspect of the need for agile systems relates to third-party content and service providers. Providers with flexible systems will be able to attract and do business with such third parties—including provision of communications and data, transacting commerce, and lifestyle services. The providers who are easiest to deal with are those who are best placed to attract the widest pool of content partners. This, in turn, means a wider range of innovative offerings to the providers' end customers.

Meeting New Customer Demands
Providers must now deliver traditional services, new data services and third party content over their networks to customer PCs, TVs and mobile phones.



Requirements For Deploying New, Innovative Services

There are a number of technical prerequisites that must be available to deliver new services. In particular, there must be a combination of in-session transaction-management and post-session event-processing.

Transaction-management is likely to include such elements as authentication, authorization, bandwidth throttling, and dynamic content insertion. Event-processing is likely to take into account the aggregation of details about multiple network events that comprise a single user session. Together, these capabilities enable a provider to develop, deliver, and bill for quality services based on multiple business models.

E.g., as providers build out new services, they will need real-time transaction-processing. Traditional systems remain passive: they worked well when customers paid according to pre-determined plans or after the fact. But the key to offering new services will be the ability to quickly identify and authenticate a customer, provide real-time pricing information, collect the fees for the service, the content, and any other ancillary items. Additionally, with new offerings, providers must authorize use of the service; e.g., they must ensure subscribers are age-appropriate or a member of a group for which the content is being provided. If the responsibility of identifying content in this manner falls on the provider, one needs to ask whether current systems support such mandated restrictions.

Such capabilities are essential as new services come to rely on third-party content. With such offerings, customer authorization for use of the service and pricing rates must be available instantly. Additionally, information is often shared with third-party payment systems to authorize delivery.

Going hand-in-hand with real-time transaction processing is the need for service policy management. Intelligent elements within a network need to use the real-time transaction information to initiate service policy requests. For instance, a provider might offer higher performance guarantees to a customer selecting a premium movie or TV service, or the provider may be required to deliver service at a particular performance level for business customers.

Additionally, to deliver new, innovative services, providers need a solution that is highly scalable—one that can handle billions of transactions per day, with perhaps thousands of those transactions being carried out simultaneously in real time.

Adopting A New Approach At The Edge: Transactional Intelligence

Delivering new services will involve many network elements and applications, as well as data from multiple

databases. The key to offering new services will be the real-time management of transactions at the edge of a network. As such, service providers will need to call on more information to make intelligent decisions and support the delivery of services. Basically, what this requires is transactional intelligence.

Transaction intelligence enables new services based on next generation networks that combine content for multiple providers and deliver services over multiple platforms.

This can be highly complex when applied to content-based services—especially those coming from third parties. Many decisions need to be made in the ”call path” and at speeds that won’t impact quality of service. E.g., for a content-based download, a number of steps must be taken including:

- Does the service go on a bill or is it pre-paid?
- If pre-paid, is there enough credit in the account?
- If the subscriber has this as part of a service bundle, what rate should apply?
- Are any policy restrictions, such as parental limits, on using the service?

Once these steps are completed, authorization must then be granted so that the application server delivers the content. At the same time, an audit stream that assures that the third party it will get revenue share as per contractual obligations must be captured.

With such processes in mind, providers can take advantage of transactional intelligence to improve their offerings. In particular, service providers can make use of transactional intelligence to offer better services than competitors. E.g., a provider might offer quality of service guarantees or formal service level agreements to differentiate its offerings from those of a rival.

An example of how all of this interplays can be seen in the increasing availability of movies for downloading. A provider, who partners with a movie content company, might, when it recognizes one of its subscribers is selecting a movie from the third party, offer its customer a temporary boost in bandwidth for a nominal fee.

Transactional intelligence can be used to allow a subscriber to have multiple ways of paying for things. It can provide advice of charge capabilities to a subscriber before a transaction takes place. And it can be used to enforce account spending limits for bill pay customers. This allows bundles to be built and deployed.

Additionally, transactional intelligence can be leveraged customer usage patterns by offering bundles that include additional services for a particular customer, as part of a loyalty program, or to stimulate the customer to use the service more frequently.

In either case, the additional flexibility to act quickly can be used by marketing to personalize customer messages—by network planners to get an understanding of usage trends, and by business managers to develop new services.

Transactional intelligence can also be leveraged to ensure optimized use of a provider’s network. E.g., by spotting heavy demand in real time, a provider might quickly provision or reallocate resources to ensure high performance levels.

In another use, transactional intelligence can play an important role in preventing data loss and fraud and to minimize revenue leakage. It is estimated that service providers have lost between 3 and 12 percent of annual revenue due to billing, mediation, and other errors, according to the Telemanagement Forum. Transactional intelligence could be used to help detect such sources of revenue leakage.

These are all important areas that must be adequately addressed for providers to be competitive in the changing marketplace of converged services, where third-party content partnerships are essential and subscribers want more control and more choices in how they pay for and use services.

For service providers to be successful going forward, they will need to differentiate their offerings from competitors, have the agility to quickly develop and rollout services, and will need their operational and business interactions. For all of these reasons, providers need to shift to the edge of their networks.

Openet As Your Technology Partner

Openet is the network-edge solution expert. Its event-processing and transaction-management solutions are used by many of the world’s largest and most innovative service providers in the world, including AT&T, BT, Orange, Telstra, Verizon Wireless, and others, to leverage transactional intelligence and extract value from the activity on their diverse networks.

At the heart of its solution offerings is FusionWorks™, a platform for event-processing and transaction-management. FusionWorks is a modular software platform that delivers the performance, scalability, and flexibility required in today’s provider networks. The modules are preintegrated to ensure interoperability.

Currently, Openet solutions process more than 20 billion events and transactions every day and bill more than $10 billion in revenues each month.

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