



Using Intelligent Pipes to Maximize Network Value.

Special Moriana Report

February 2009

Monetizing Network Resources and Transactions with Intelligent, Dynamic Controls

Service providers are caught between the proverbial rock and hard place. The availability of network technologies for faster broadband networks, combined with consumer demand for bandwidth and competitive pressures, leaves little choice for operators. They simply must deploy faster networks. That's the rock.

The hard place is the financially driven mandate to avoid relegation within the value chain to being nothing more than a "dumb pipe." Disintermediation within the industry, and eroding profitability caused by increased usage without increased revenue, has created explosive demand for solutions that enable operators to control network and service utilization while more creatively monetizing that usage.

Service providers are addressing this challenge by deploying next generation policy management and billing capabilities to better monetize their network assets, while offering enhanced subscriber experience with personalized, innovative services. In order to avoid disintermediation and commoditization of their services, operators are bringing intelligence to their pipes and monetizing that intelligence to generate revenue that matches the value of the network resource utilization delivered to each subscriber. This enables sophisticated business models to drive new revenue streams while ensuring service providers can maximize the values of their networks. The integration of next generation policy and billing capabilities brings together control, monetization, and personalization that will enable service providers to become competitive and strategic players in the value chain.

There is a growing sense that the default options of best effort — indiscriminate routing of network traffic, simple over-provisioning, and building extra capacity — are not enough.

Market Overview

Service providers across all network infrastructures are grappling with a market landscape that is becoming increasingly complex and demanding. As core access services become commoditized, operators struggle with exploding demand for bandwidth. The increasing availability and usage of converged, IP-based applications, content, and devices not only offers new market opportunities but also increases demands on network capacity. There is a growing sense that the default options of best effort — indiscriminate routing of network traffic, simple over-provisioning, and building extra capacity — are not enough.

Within this environment, customers are becoming increasingly sophisticated, demanding more from their service providers — more competitive pricing, better quality of service (QoS), more control over their services, and better integration across different platforms and devices. Meanwhile, technology continues to advance, as network standards continue to evolve, bandwidth capabilities expand, and network and IT systems become ever more flexible and robust.

At the same time, many markets are experiencing unprecedented competition from both traditional and new breeds of players. Wireline operators are offering video services over their fiber optic networks, cable operators are adding wireless service to their bundles, wireless operators are providing high-speed data services via technologies such as WiMAX and LTE, and all three categories are seeing new competitors such as Mobile Virtual Network Operators (MVNO) and content providers edge into their market spaces. The result has been an intense pressure to differentiate. While the initial response has been to compete on price, more sophisticated service providers recognize that differentiating the quality and range of services offered represents a better value proposition.

In order to successfully face these challenges, some of the key policy management capabilities required by service providers include the ability to:

- Replace flat-rate data plans with tiered service plans based on speed, usage, prioritization, and/or time to more effectively meet the individual consumption needs of subscribers and match revenue with network utilization
- Offer personalized services (e.g., usage controls, time-of-day controls, subscriber-customized bundles, and compound account structures) that give subscribers real-time control over their services to enhance the customer experience
- Implement fair usage policies by enforcing usage allowances and allowing subscribers to purchase additional volume when limits are reached, in order to ensure optimal experience for all subscribers
- Prioritize traffic to and from specific sites to support revenue-sharing partnerships with third-party providers and distributors of content, applications, and services while offering subscribers a seamless, end-to-end experience.
- Offer innovative, convenient, and flexible ways for customers to buy and use their services (e.g., on-demand services, real-time upgrades, service passes, advice of charge alerts)
- Manage policy and charging controls across multiple networks, devices, and applications to meet the demand for convergent services

These capabilities are enabled by intelligent, real-time control over networks with subscriber- and service-aware policies delivered by next generation policy management and a tight integration with next generation billing capabilities, to further monetize network activities based on the value delivered to customers.

Next Generation Policy Management

Policy management historically referred to the systems and processes associated with ensuring that various types of network traffic receive the QoS they require. This first-generation policy was limited to the realm of network management. Using static policies that just controlled network resources, policy management solutions were not able to incorporate subscriber or session information when making policy decisions. In other words, first-generation policy utilized a “one-size-fits-all” network management function for QoS and traffic management.

On the other hand, next generation policy provides dynamic, convergent subscriber access, and network resource control that enables operators to govern bandwidth, throughput, and traffic priorities for individual users or groups of users. With next generation policy, policy management has extended up into the IT layer, acting as a bridge between network-focused operations support systems (OSS) and IT-focused billing support systems (BSS). By combining the subscriber-specific information located at the BSS layer with network resource information located at the OSS layer, next generation policy management becomes a valuable tool for customer management, enabling operators to control policy on an individual, as opposed to an aggregate, basis.

Next generation policy is a dynamic function in an operator network making real-time decisions by taking requests from the network via policy enforcement points over two general areas:

- 1) Subscriber access to services
- 2) Allocation of network resources

Policy decisions are made based on real-time access to a myriad of data. In essence, policy decisions are based on real-time triggers such as:

- Requests from network elements (e.g., Application Functions (AF) requesting resources for a specific premium service)
- Requests from backend OSS/BSS components (e.g., Change or Authorization (CoA) requests, Subscriber Profile Repository (SPR) updates regarding changes in subscriber parameters)
- Subscriber-, session- and application-aware policies

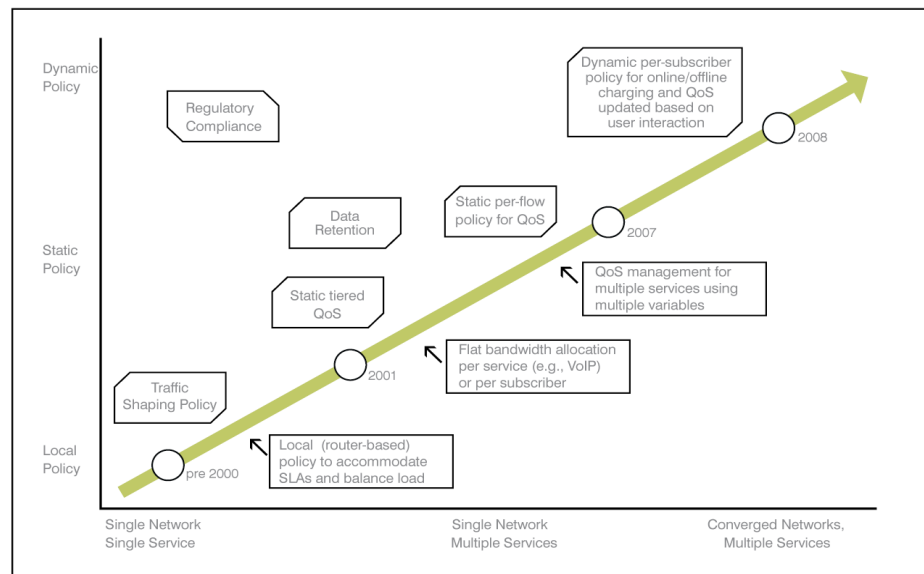


Figure 1:
Evolution of Policy – from static, traffic shaping policy to dynamic, strategic enabler

Examples of subscriber-aware information include location, billing plan, usage history, contract terms, and personalized usage and spending limits. Session information includes date/time, current network capacity, source of the traffic (internal vs. third-party application), and type of traffic (protocol or service type).

As subscribers turn to multiple devices and platforms for an integrated, seamless communications experience, operators must be able to manage policies across different networks. Next generation policy is convergent and works across all access network types, including:

- Voice (e.g., SMS) and data (e.g., HTTP) services
- Legacy and next generation (e.g., DSL, WiMAX, LTE, DOCSIS 3.0) networks
- Wireless, broadband, and cable television networks

The key to implementing effective policy management is tight integration with next generation billing capabilities, most notably a charging solution that allows the operator to not only control access and network resource allocation, but to monetize those capabilities through network edge quota management capabilities.

By seamlessly integrating policy management and next generation billing, service providers can create exciting new services, dynamically control network utilization, and offer personalized user experiences.

Next Generation Billing

Today's service providers frequently fail to align behavioral incentives of users, costs of this behavior to the network operator, and value delivered to subscribers and revenue. As data consumption varies greatly among subscribers, with some providers reporting that approximately 5 percent of subscribers generate 70 percent of traffic — and with demand starting to outpace supply, flat-rate price plans alone are no longer sustainable. Furthermore, operators are looking towards content providers, distributors, and other companies in the value chain to create new revenue-sharing opportunities.

In order to better match revenues with the value delivered to each subscriber, service providers can integrate next generation billing to support:

- Real-time upgrades, enabling subscribers to sign up or upgrade their service plans in real-time
- On-demand purchases to enable one-time purchases of a service, content, or application (e.g., charging for one-time bandwidth boost)
- Service passes enabling access to a service or application for a limited period of time, without a monthly subscription
- Third-party subsidies for use of a service by subscribers
- Pricing tiers to provide different pricing levels for services (e.g., first six hours cost \$10.99, each hour thereafter costs \$0.99)

In addition to innovative charging models, next generation billing also enables operators to offer:

- Flexible bundles (e.g., multi-service/application bundles or subscriber customized bundles)
- Flexible or compound account and payment plan structures
- Advice of charge to alert users of charges prior to service usage
- Creating and managing thresholds and balances

By seamlessly integrating policy management and next generation billing, service providers can create exciting new services, dynamically control network utilization, and offer personalized user experiences. Operators talk about their fear of being “just a dumb pipe.” This set of integrated technologies creates the ability to solve that problem —not by solely becoming an application or content developer or aggregator, but by making the pipe smart.

Standards Overview

Next generation policy is based on Third Generation Partnership Project (3GPP) standards. Originally focused on third generation (3G) wireless networks, 3GPP standards apply to all IP-CANs, such as wireless, broadband, and cable networks. Prior to 3GPP Release 7, policy was mainly viewed as a peripheral function in which static policy controls were implemented without centralization or unification. Introduced in Release 5, the Policy Decision Function (PDF) was used to determine simple policy rules in largely static networks.

Release 7 enables policy management to support sophisticated and complex policies in a dynamic environment. At the heart of this architecture is the Policy and Charging Rules Function (PCRF), which replaces the PDF to provide operators with the ability to manage both policy and charging rules within the same policy management environment (Figure 2).

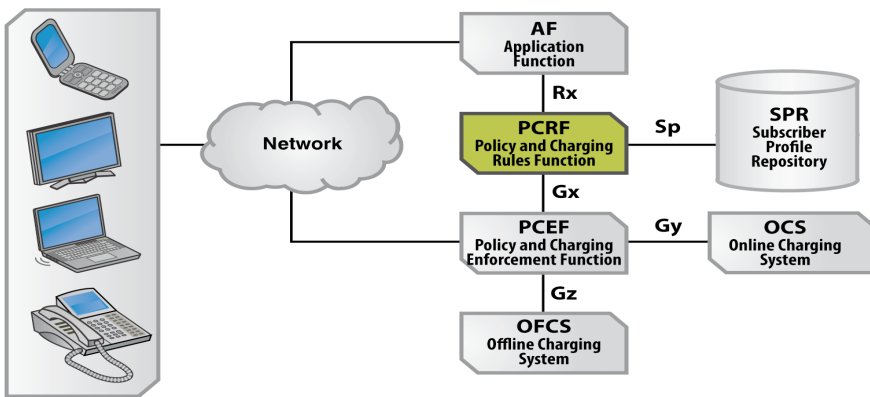


Figure 2: 3GPP Release 7 Policy and Charging Control (PCC) Architecture

In the latest release, 3GPP Release 8, a number of new capabilities has been added. Policy peering enables policy rules to follow subscribers whenever they roam or are utilizing visiting networks (Figure 3).

There is also increased support for non-3GPP interfaces, such as 3GPP2, DSL, and cable. Both of these capabilities are enabled with two newly created interfaces, the S9 and Gxx interfaces. Other new interfaces have been introduced which enhances the PCRF's awareness of network capacity and congestion to enhance QoS management.

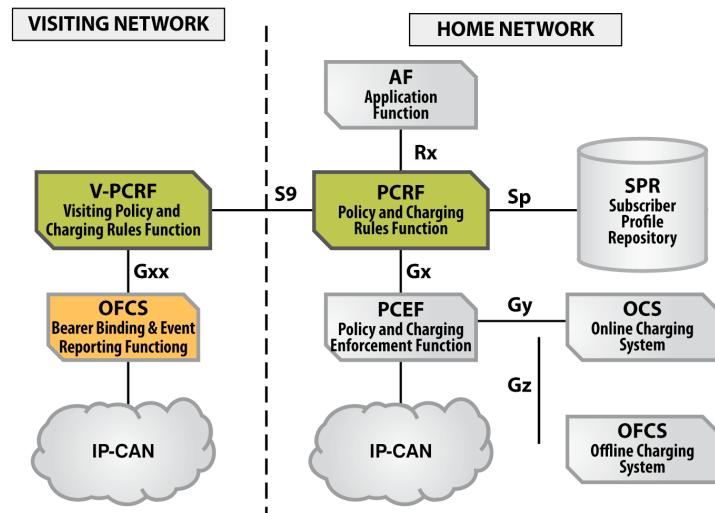


Figure 3: How roaming is handled in 3GPP Release 8

In order to gain competitive advantage and avoid disintermediation, service providers have a number of capabilities at their disposal with Next Generation Policy and Billing. This section provides examples and illustrations of how operators can use these capabilities to address some of the most prevailing needs that are facing them today.

Next Generation Policy and Billing Scenarios

Fair Usage

A number of fixed and mobile broadband operators today are turning towards next generation policy to implement fair usage policies. Subscribers have a monthly allowance in which usage volume is capped. Usage is measured for each subscriber and, upon reaching the cap, a number of actions can take place such as:

- Send a warning notification (e.g. SMS or email) indicating excessive usage
- Continue usage, but at slower speed or prioritization for the remainder of the billing period, or just during times of congestion
- Disallow bandwidth intensive services or applications during peak traffic hours
- Redirect web (HTTP) traffic to a landing page indicating that the usage limit has been exceeded, and provide options to sign up for temporary or permanent upgrade in service plan

Exceptions and allowances can be introduced into this scenario. Some examples of how a subscriber profile or history usage can be used to implement sophisticated policies include:

- Usage limit is only imposed upon customers who have reached the threshold twice over a six-month period
- Subscribers who have been a customer for more than 5 years are exempt from the usage limit except if they go over the limit three times over a six-month period
- Traffic to and from “preferred” partner applications is not counted towards the usage limit

With next generation billing capabilities, operators can implement charging and up-selling activities as part of the enforcement actions that are taken whenever a subscriber reaches his usage allowance. Examples include:

- Up-sell to higher class of service (e.g., from bronze to gold plan)
- Send an advice of charge with charges for extra usage
- Sell additional “buckets” of usage volume whenever monthly allowance reaches 95 percent

Integration with next generation billing enables operators to monetize their control over traffic prioritization while enhancing subscriber experience. For example, service providers can offer subscribers on-demand premium service quality options for a specified time period or applied to specific service or application based on network capacity, subscriber value, account history, and session type.

Service Classes

Increasingly, service providers are discovering that usage varies widely among subscribers, ranging from power users who excessively utilize network traffic to casual users who barely spend time on the Internet. In order to meet the individual needs of subscribers while maximizing revenue opportunities, service providers can package account plans with different classes of service using next generation policy. Service classes can be based on a number of different areas, such as:

- Usage (5GB, 10GB, 25GB)
- Speed (512Kbps, 1Mbps, more than 5Mbps)
- Time (day, month, week)
- Priority (consumer, business, government)
- Application Type (streaming video, HTTP, VoIP, P2P)
- Device Type (mobile phone with WAP, smart phone, broadband card/modem)
- Combination of any of these dimensions

With next generation billing, operators can further personalize service plans with flexible pricing and bundling options such as:

- Service bundles that subscribers can customize via a self-care portal that directly interfaces with the policy management server, to implement real-time controls and changes
- Customized pricing options in which subscribers can select different purchasing options (e.g., post- vs. pre-paid, purchase for just one month or for entire contract term)
- Pricing additional services or promotions based on a subscriber's class of service (e.g., premium plan customers pay less for additional services)
- Price services based on utilization, content, and/or service type

Dynamic Traffic Prioritization

Service providers can establish a “self-healing” network during times of congestion by using next generation policy to detect the state of congestion and prioritize network traffic based on a variety of business and technical parameters such as:

- Subscriber profile (e.g., usage history, customer type – consumer, business or government, preferences, SLAs)
- Account plan (e.g., tiered service plan, contract terms and conditions, premium service options)
- Traffic to and from “preferred” partner sites in support of revenue-sharing partnerships with third-party content providers and distributors
- Availability of network capacity
- Application type (e.g., music downloads, streaming video, HTTP, VoIP, P2P)
- Location (e.g., off-net/on-net sites, roaming versus non-roaming customers)

Account Controls

Customers are looking for more personalized services in which they can customize their services to meet their specific needs. With next generation policy and billing, service providers can enable subscribers to have direct control over their account usage. There are two illustrations of how account controls can be provided as a service to subscribers.

For residential customers, operators can offer a parental controls service to parent subscribers. With this service, examples of how parents can manage their children’s usage of data and mobile services include:

- Restricting access to content based on URL, content rating/categorization, black and white lists
- Browsing and SMS are only allowed before and after school hours
- Limiting number of SMS, time spent on gaming sites, and number of calls during school days
- Placing spending limits on children’s accounts
- Accessing detailed reports on children’s service usage

For commercial subscribers, service providers can offer corporate controls. Corporate administrators can use this service to govern employee use of data and mobile services for managing monthly spending and enforcing corporate acceptable usage policies. Examples of controls that can be placed include:

- Set monthly usage limits on the corporate account with other spending to a personal account.

This entails a single service bridging across two accounts, which is feasible with more flexible or compound account and payment plan structures enabled in next-generation billing systems

- No international calls
- No calls outside of business hours
- No usage of specific services
- No usage of specific content (P2P, video streaming, etc.)
- No usage of a broadband connection on PCs other than a specified MAC address

Conclusion

The network is rapidly becoming a commoditized asset even as demand for data services is growing at an explosive rate. To capitalize on this market growth and to avoid being displaced by content providers, distributors and other players, service providers must monetize their networks more effectively. With next generation policy management and billing, operators can dynamically control network activities based on subscriber- and service-specific information and leverage flexible billing models to fully monetize network transactions. In order to extract value from every transaction that occurs on their networks, optimize the customer experience, and become strategic participants in the value chain, service providers can turn to next generation policy and billing to leverage their networks into smart, profitable business models.

For more information on Openet, visit www.openet.com,
e-mail info@openet.com
+353 1 620 4600 (EMEA/APAC)
+1 703 480 1820 (North & South America)

About The Moriana Group

The Moriana Group is an independent industry analyst focused on the market segment of next generation telecom services and telecom service layer infrastructure. Our mission is to facilitate Internet-Telecom convergence and the creation of an open market for telecom services by enabling free information exchange between equipment and software vendors, application developers and service providers.

www.morianagroup.com