A HOLISTIC APPROACH TO

POLICY & CHARGING

Summary

The modern network landscape demands a holistic approach to policy - one that views policy and charging not as independent, siloed systems, but as complementary functions adding value to each other. Integration between policy and charging systems can unlock new services, revenue streams and customer markets and help to position fixed and mobile carriers as innovative and profitable market leaders.

This Alepo whitepaper discusses the advantages and challenges to policy and charging integration within a standard 3GPP network environment, including the latest use cases for integrated policy and charging, multiple integration scenarios and considerations.

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Introduction

In today's wireless marketplace, the soaring demand for mobile broadband does not guarantee soaring revenues for mobile operators. To combat the growing disparity between mobile data usage and profitability, operators are turning to intelligent policy solutions – solutions that not only offer tighter network control, but also work to boost revenue through **policy monetization**, **customer empowerment** and **service differentiation**.

Today's sophisticated policy solutions adopt a dynamic approach that extends beyond traditional network resource management to boost revenue and customer satisfaction through such uses as service tiers, smart caps, bandwidth on demand and more. In order to realize the full potential of next generation policy, **an effective interaction between policy and charging systems is required**, yet many operators are unsure how to integrate these systems in order to achieve maximum value.

The modern network landscape demands a holistic approach to policy - one that views policy and charging not as independent, siloed systems, but as complementary functions adding value to each other. Efficient integration between policy and charging systems can unlock new services, revenue streams and customer markets and help to position the operator as an innovative and profitable market leader.

In this white paper, we discuss the advantages and challenges to policy and charging integration within a standard 3GPP network environment, including the latest use cases for integrated policy and charging, multiple integration scenarios and operator considerations.

Create Synergy in the Core Network

As independent, siloed solutions, the PCRF and OCS each carry a long list of functionalities. On its own, the PCRF can handle basic gating control, QoS provisioning and enforce fair usage policies. However, when policy and charging merge, the outcome is not just a sum of each system's capabilities, but rather an exponential explosion of flexibility, granularity and feature-richness, lending itself to greater revenue, service innovation, customer satisfaction and network optimization. The following are advantages of policy and charging integration.

Create More Granular, Flexible Policy & Charging Rules

Policy and charging integration enables the PCRF to interact with both subscriber and charging databases, giving operators greater flexibility in constructing more nuanced rules based upon a broader set of parameters. This increased flexibility allows for the creation of innovative charging and billing strategies aimed at developing sustainable revenue growth.

With a broader set of tools for constructing policy and charging rules, operators are realizing the increased potential for policy to boost revenue through monetization, customer empowerment and service differentiation. The ability to implement creative and innovative policy solutions without delay allows operators to shift their focus from the network to the customer. This new paradigm allows IT departments to collaborate with their marketing counterparts to develop exciting, future-ready policy solutions.

Explore New, Innovative Use Cases

To remain relevant and profitable in today's volatile mobile market, operators must be able to differentiate service offerings and meet diverse customer demands. Policy and charging integration enables operators to evolve beyond one-dimensional business plans to deliver a wealth of innovative, feature-rich use cases that speak to customers' lifestyles and boost ARPU. Below is a sample of the latest, most popular use cases that can be achieved through efficient policy and charging integration.

Smart Caps

Smart Caps afford greater flexibility in handling overage services, which can generate higher ARPU and customer satisfaction. Traditional usage caps simply cut off overactive users, resulting in missed revenue and churn. With smart caps - enabled by policy & charging integration - operators may charge a different rate based on a customer's real-time account balance or accumulated usage. For example, once a user reaches his monthly volume quota of 3GB, each additional GB is charged at a higher overage rate.

A tightly coupled or pre-integrated policy & charging solution adds a new dimension to the idea of smart caps, making it possible to apply a different QoS or bandwidth speed based on real-time balances or usage.

Common Factors of Policy & Charging Rules

When integrated with charging systems and subscriber databases, the PCRF can provision QoS based on a combination of a number of parameters, including:

→ Billing plan i.e. pre or post-paid
→ Volume
→ Session Duration
→ Quality of Service
→ Application type
→ Type of device
→ Subscriber Profile
→ Content category
→ URL/Domain
→ Content – video, mark-up etc.
→ Service – voice, data etc.
→ Location
→ Time–of-day or Day-of-Week
→ Rate plan

For example, once a user reaches his monthly volume quota of 3GB, he receives a reduced bandwidth speed or peak bandwidth limit in lieu of or in addition to overage costs. Polling data indicates customers greatly prefer these enhanced smart caps over traditional ones.

	NORMAL USAGE	OVERAGE USAGE
Usage Cap: No PCC Integration	$25 for 3GB / Month	None. User is barred from service.
Smart Cap: Loosely Coupled PCC	$25 for 3GB / Month	$15 / GB
Smart Cap: Tightly Coupled PCC	$25 for 3GB / Month	$7.50 / GB + Peak Bandwidth Limit

Smart Caps allow operators to differentiate the policy & charging for normal and overage usage.

Bandwidth on Demand (Turbo Button)

Bandwidth on Demand empowers users to easily and instantly change their bandwidth speed as needed, boosting it for bandwidth-intensive services like video streaming and online gaming, and lowering it for non-mission-critical services like SMS and email.
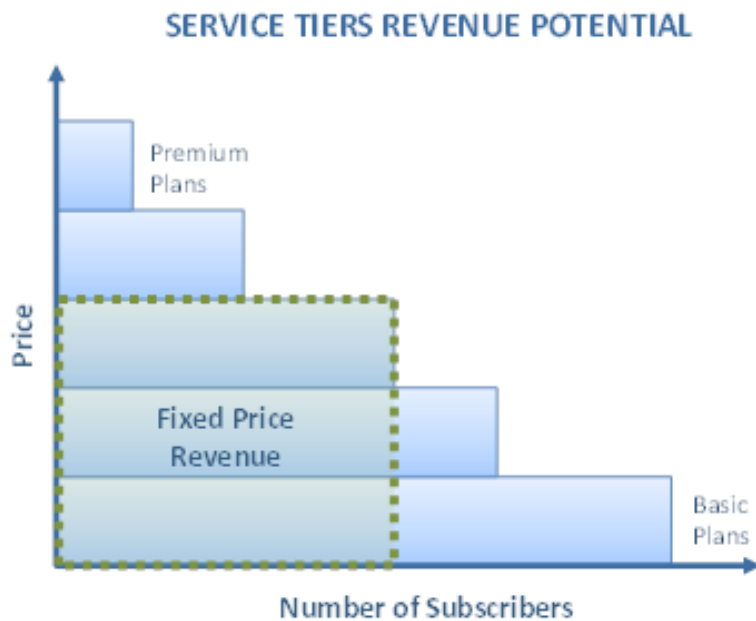
Mobile bandwidth needs tend to be situational and require dynamic policy control in the hands of subscribers. A user playing an interactive online game might choose to pay more for additional bandwidth for the duration of that session. Similarly, a subscriber who wishes to watch a live sporting event on a mobile phone might choose to optimize video streaming by purchasing a temporary bandwidth boost. Depending on the device, a customer may access the "turbo button" through a subscriber dashboard or a custom mobile application, such as Alepo's Bandwidth on Demand mobile app.

Giving subscribers greater control over their QoS level in real-time amplifies customer transparency and satisfaction. This feature adds another dimension of granularity to online charging, which was traditionally limited to time and volume. By associating policy and charging systems, dynamic bandwidth speed selection can be monetized, resulting in smarter revenue and better allocation of network resource.

Service Tiers

As mobile operators look to move away from flat-rate plans, service tiers emerge as an attractive option to boost ARPU, offer differentiated services and attract new subscribers. Flat-rate pricing only accounts for a single price point along the demand curve and can risk price wars and commoditizing services. In reality, many subscribers are willing to pay a premium price for premium services, such as higher data volume limits and maximum bandwidth speeds. Further add-ons and promotions, such as unlimited access to a particular social media website or premium video streaming during off-peak hours, could also be offered in order to increase customer satisfaction and empowerment.

A close relationship between policy and charging gives operators a flexible, future-ready policy platform from which new and innovative business plans can be quickly constructed in response to customer, network and market demands.

Fixed-priced or one-size-fits-all plans miss revenue from subscribers willing to pay more for premium plans or less for more basic plans.

Service / Day Passes

Service passes present another opportunity for mobile operators to increase revenue and attract new subscribers. The worldwide explosion of the mobile data market means that operators can now reach more customers than ever on more devices than ever. Service passes, either

purchased by the subscriber or offered as a promotional voucher, provide customers with more flexible service offerings while creating additional revenue streams and up-sell opportunities for mobile operators.

Service passes can be designed to grant users conditional access to certain services for a pre-defined volume limit or period of time. For a current voice subscriber considering a data plan, the purchase of a one-week data service pass might be an attractive trial option before signing a long-term contract.

Today, customers own and access services from multiple devices, including secondary tablets and laptops. Service passes can effectively capitalize on this emerging trend by offering more flexible, pay-as-you-go service options.

Congestion Management

With the surging usage of mobile broadband, network congestion is a reality that mobile operators must face. Policy-centric solutions can help prioritize network resources according to the needs and contributions of different user classes. A combination of real-time network congestion management and service tiers allows operators to funnel network resources to premium subscribers at the moment when a network becomes congested, helping operators maintain SLA agreements across all types and tiers of subscribers.

Additionally, combining service tiers and congestion management allows for the creation of rules that downgrade QoS if a subscriber's usage reaches a pre-defined limit at a certain time of day (e.g. peak hours). Smart caps with charging integration also help ease network congestion by downgrading a user's peak bandwidth once they exceed a monthly volume limit. Furthermore, this real-time integration between policy and charging allows operators to throttle-back bandwidth for users that fall below a certain value. For example, once a user falls below $5 in their account, video streaming could be disallowed. Apart from helping to ease network congestion, this provides an incentive for users to consistently maintain a positive balance.
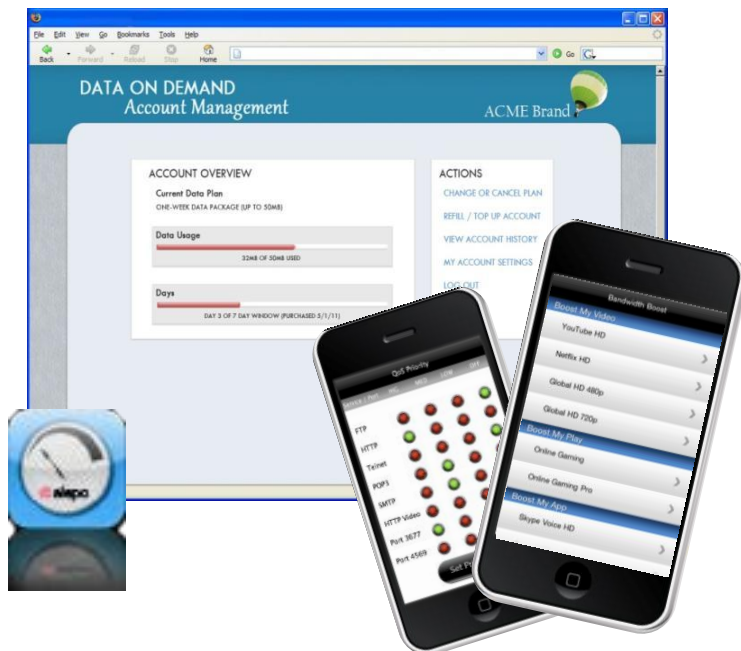
Subscriber Dashboard

A subscriber dashboard accessible on laptops and mobile phones can offer users a real-time view of their usage and account balances. User-initiated policy changes are pushed to both the PCRF and the OCS and go into effect instantly. Via this dashboard, users may:

→ Top up or refill their accounts
→ Change plans
→ Set spending limits and parental control levels
→ Boost bandwidth speeds
→ Purchase application packages, service passes or bolt-ons

One of the greatest advantages of policy-driven business plans is the ability to empower customers to manage their own accounts, including usage and policy. This can lead to a boost in both revenue and customer loyalty.   Additionally,   increasing   customer   awareness   of   data consumption and bandwidth can help to balance finite network resources.

A subscriber dashboard increases transparency and puts policy in the hands of the subscribers by empowering them to manage their accounts independently online.   A centralized self-care portal, where users can make policy changes, monitor usage in real time, and pay account balances, increases customer satisfaction while reducing the costs and workload of customer care centers.

Challenges & Considerations

While the advantages and benefits of integration are made apparent by the use cases above, the fact remains that integrating policy, charging and subscriber databases can be a major challenge for operators. In fact, operators often report that **integration with charging and billing is the number one obstacle in deploying policy solutions.**

Operators recognize the potential for policy management as a driver of revenue and customer satisfaction, and they realize that it requires some relationship with charging and subscriber database systems. The big question still remains: What does this relationship look like?

Consider Multiple Factors & Variables

One reason that policy and charging integration may seem daunting is that there is no single blueprint for deployment. Rather, the solution architecture is largely determined by the motivational factors underlying its deployment.

Along with each operator's unique blend of goals and priorities, network integration with legacy systems will also help determine the optimal method for implementing policy and charging solutions. Ultimately, the best solution is the solution that works best for you.

Existing Network Infrastructure
Is there a legacy charging system or CRM system that you want to retain and integrate with? What are the scalability requirements?

Services
What key services do you offer today and plan to offer in the future?

Access Technologies
Will the core network serve multiple 3G / 4G access technologies? Will this require interworking or handover between the technologies?

Timeline & Budget
Is the need immediate or planned for a future rollout? What sort of capital expenditures do you intend to invest in the policy solution? Time and costs usually increase with the complexity of the integration.

Customer Demands & Regulatory Requirements
Are use cases such as bill shock and parental controls a concern?

*"Operators often report that integration with charging and billing is the **number one obstacle** in deploying policy solutions."*
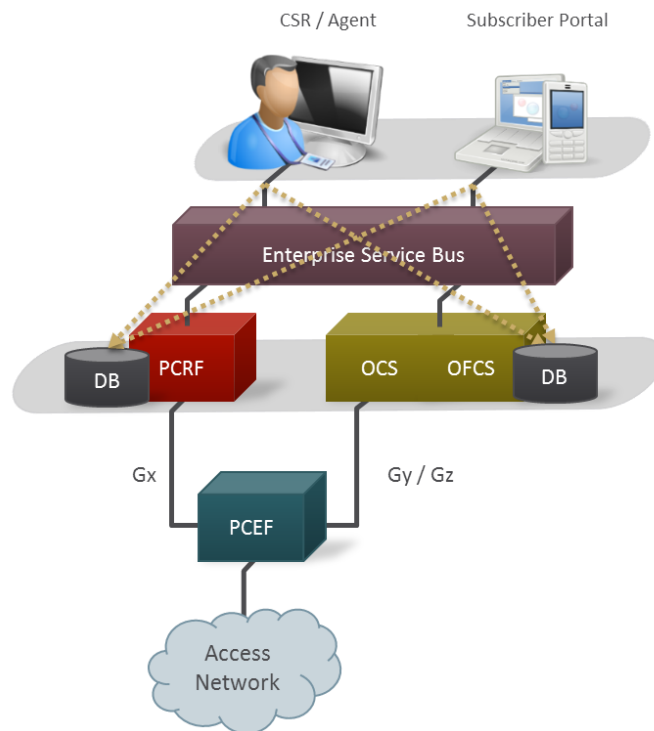
Choose the Best Option for You

There is no universal method for implementing policy and charging solutions in your network. Instead, the optimal method of integration depends upon a variety of factors that vary from operator to operator.

At a fundamental level, however, there are three main types of policy and charging integration. Each type of integration possesses its own advantages, challenges and unique considerations.
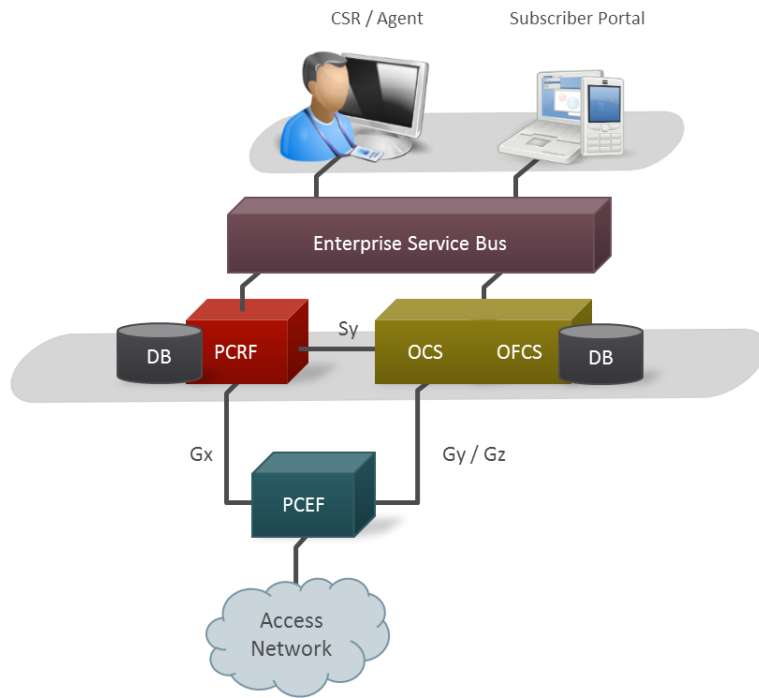
Loosely Coupled Policy and Charging

At a subscription level of integration, both the charging and policy systems hold relevant subscriber information, either internally or externally. The introduction of a middleware or ESB allows the network to maintain separate systems that can still associate policy and charging information within the subscription or business plan. Additionally, subscription changes can be pushed to both entities in real time. Those changes could be made by either a customer care agent or the end user through a subscriber portal. This capability allows for the creation of policy-driven business plans, enabling operators to create personalized and differentiated service offerings that boost ARPU and customer satisfaction.

Tightly Coupled Policy and Charging - Integrated

When policy and charging systems are tightly coupled through a direct, real-time association, the PCRF can use real-time account balance information to make policy decisions. With this tight integration, customer QoS can be changed based upon individual spending limits. The result is policy control with scalability and extensibility that exceeds Policy 2.0. The PCRF and OCS can be integrated through an external interface, either the 3GPP standard Sy interface that is in development or a proprietary API.
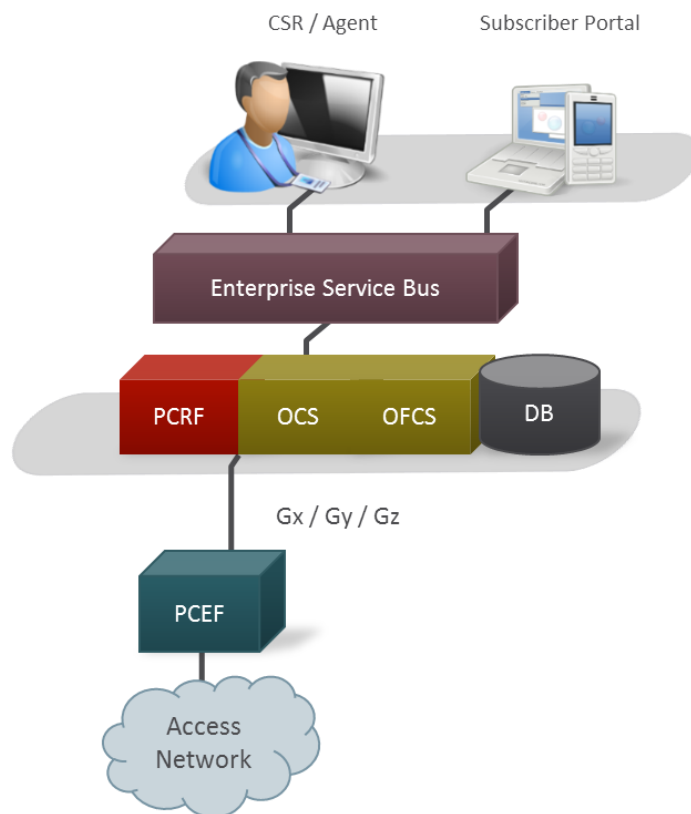

Tightly Coupled Policy and Charging - Pre-integrated

A pre-integrated policy and charging solution affords some distinct advantages. First, it eliminates a number of integration points, which in turn eliminates possible points of failure. Since a pre-integrated PCRF and OCS solution does not rely on the Sy interface, it is available and deployable today. This can result in a rapid, lower risk deployment since complicated integration can be costly and time-consuming.

A pre-integrated policy and charging solution reduces load on the PCEF by eliminating the many redundant logical data flows that result from overlap in Gx and Gy information. Streamlining the network topology decreases the costs required to configure, manage and maintain multiple systems. A pre-integrated solution can lower OpEx most

notably in the areas of training, operations and management consulting, policy development support and network care.

When seeking out this type of integration, operators should look for a robust and flexible solution that allows for granular policy and charging management at the subscriber level, based on service, application, location, session or any other parameter contained in the policy, charging, or subscriber database. The solution should be compliant to 3GPP standards and easily integrate with other network elements, including the PCEF.

About Alepo

At Alepo, we turn next-generation data opportunities into reality. Our software and services power operations and billing for digital service providers, enabling them to accelerate revenue growth, market share, and business success.

Through a lean and agile approach to digital transformation, we empower businesses to:

• Welcome disruptive technologies
• Orchestrate a unique customer experience
• Grow, adapt, and evolve with confidence in the network's performance, reliability, and security

Our award-winning technology has helped make Alepo the go-to partner for all things data at leading national service providers like Orange, Saudi Telecom, Digicel. We provide cutting-edge monetization models with business-focused user experiences that allow service providers to tap new markets and revenue sources, while delivering more value to their customers.

Our mature and proven solutions include advanced policy and charging control, convergent charging and billing, customer relationship management, device management, WiFi monetization, WiFi offload, AAA, and more. We offer expert professional services: consulting and design, managed services, training, and support – our solution integration team has a success record that is the envy of our peers.

With its corporate headquarters in Austin, Texas, Alepo has a presence in all regions of the world, including offices and representatives in Latin America, North America, Asia Pacific, Africa, the Middle East, and India.

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