Service Control EasyApp - Quota Services Architecture

Abstract

The Cisco® Service Control Engine (SCE) is commonly used by operators of mobile and fixed networks to implement quota-based services. This paper provides a high-level overview of the network technologies involved in implementing such a service offering.

EasyApp Category	Service Creation	**SCE equipment and software version**	**Hardware:** Cisco SCE 2000 and 8000 Series **Software:** Release 3.5 or later
Type of Effort	Implementing a quota-based solution requires service and marketing planning as well as network-level design, implementation, and testing.		

What Are Quota-Based Services?

A common way by which ISPs create tiers of service to increase average revenue per user (ARPU) is by installing quota-based services. In this model, customers have a periodic volume quota which, once depleted, requires them to either purchase an additional allowance or revert to a more basic service. While the concept is used for fixed-line broadband services, it is particularly popular for mobile and other wireless-based services, where users are familiar with per-use billing models.

Figure 1. Tiered Service Model

Application and Service Tiers

	Basic	Casual	Pro	Mobile	Mobile Plus	Mobile Max
Allowance	1 GB	2 GB	2 GB	1 GB	3 GB	10 GB
VoIP	✓	×	×	×	×	✓
IM	✓	×	×	×	✓	✓
P2P	✓	×	✓	×	✓	✓
FTP	✓	×	✓	×	✓	✓
Media Stream	✓	×	✓	×	✓	✓
Web Browsing	✓	✓	✓	✓	✓	✓
Downloads	✓	×	✓	✓	✓	✓
Emails	✓	✓	✓	✓	✓	✓
Handset as modem	✓	×	✓	×	✓	✓

Weekly allowance and speed-adjust

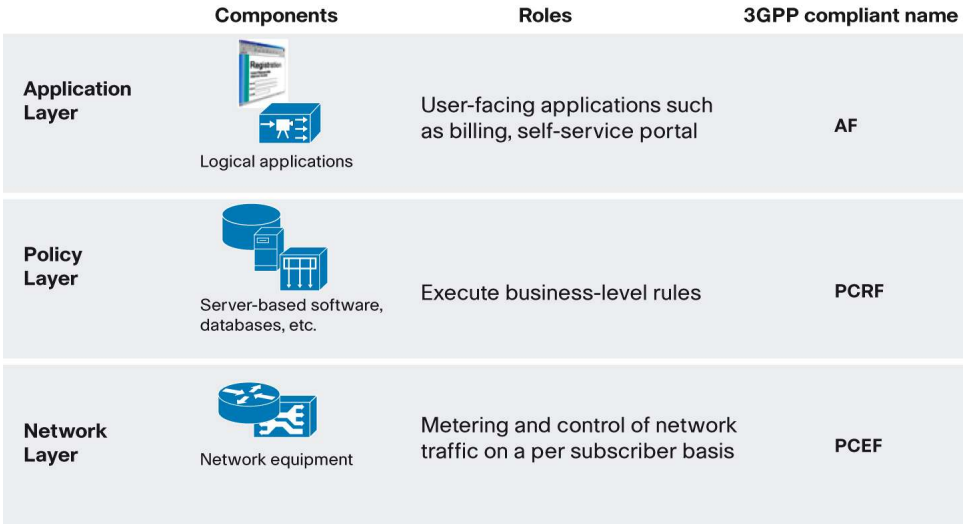
	Up to 2.8 GB	Up to 4.2 GB	Up to 5.6 GB	Over 5.6 GB
White Zone	-	-	256 kbps	256 kbps
Grey Zone	-	128 kbps	64 kbps	48 kbps
Black Zone	48 kbps	28 kbps	28 kbps	16 kbps

Note: For additional reading about the concept of fair usage policies in broadband networks, read “EasyApp - Fair Usage Policies.” Visit: http://www.cisco.com/go/servicecontrol

Three Tiers of a Quota-Based Services Architecture

A network implementation of quota-based services is best described as a three-tier solution (Figure 2). Understanding the tiers and their relationships can help you plan and execute your implementation. It is also helpful to understand the parts of the solution provided by different vendors and the relationships between them.

Figure 2. Three-Tiered Services Architecture



Cisco provides enabling technologies in the **network tier** (GGSN, routing, and PCEF/DPI equipment) and has a wide range of solution partners addressing the policy and application tiers. Cisco and our partners use interfaces based on industry standards and are active participants in the expansion of those standards to address emerging requirements. Our goal is to provide customers with maximum flexibility and efficiency while eliminating "vendor tie-in" and reducing implementation costs of quota-based services. Cisco Advanced Services and many third-party service integrators can provide local design, implementation, and support services for your quota-based services implementation.

Network Tier

An element in the network that provides these quota-based functions is called a Policy Control and Enforcement (PCEF) component. It communicates with the policy tier by providing information on network activity and enforcing the appropriate action on each user's traffic stream.

PCEF technologies differ in the flexibility of policies they can support (for example, whether they can differentiate between file sharing, video conferencing, voice, and web traffic); how much they scale (how many sessions and subscribers they support); and network insertion options (some are standalone components while others can be integrated into other networking equipment).

The Cisco SCE 8000, 2000, and 1000 Series Service Control Engines are PCEF components that are used by hundreds of service providers to implement a quota-based system. The Cisco SCE Family supports comprehensive Deep Packet Inspection (DPI) functionality that can be used to create application-aware quotas, resulting in a rich set of service plans that can be customized to accommodate the needs of different markets. The Cisco SCE Family scales to support hundreds of Gbps of traffic and millions of subscribers. The service control engines are standalone appliances that can be deployed without changing the network's architecture or replacing existing equipment.

Policy Tier

The policy tier is server-based software that enforces the various business rules necessary to implement the quota-based services. Policy servers are called Policy Control and Charging Rules Functions (PCRFs). The policy tier is responsible for collecting usage data from the network, determining if a subscriber has exceeded the predetermined quota, and what the appropriate action is. It then updates the appropriate subsystems (network enforcement, billing, etc.) on the expected action they must take to fulfill the service.

Technologies in the policy tier differ in scale, redundancy, flexibility, and ease of use. Different products in this space cater to different network sizes and type. Some provide a simple “out of the box” solution while others are more generic in their nature.

Application Tier

Applications use the policy tier to deliver the end application. For example the billing system and customer-facing web portal are considered applications. Applications use the API and interfaces provided by the policy tier to react to certain conditions in response to events and user actions.

For More Information

The short, easy-to-follow **Cisco Service Control EasyApp guides** provide new and experienced Cisco SCE customers with information on how to best utilize the platform in their network. The guides contain practical, actionable advice on the SCE platform that will help you learn more about network usage patterns and how to reduce costs and optimize the network’s behavior to provide a superior experience for its users. Browse the full selection of **Cisco Service Control EasyApp guides** on http://www.cisco.com/go/servicecontrol to improve your network today.

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