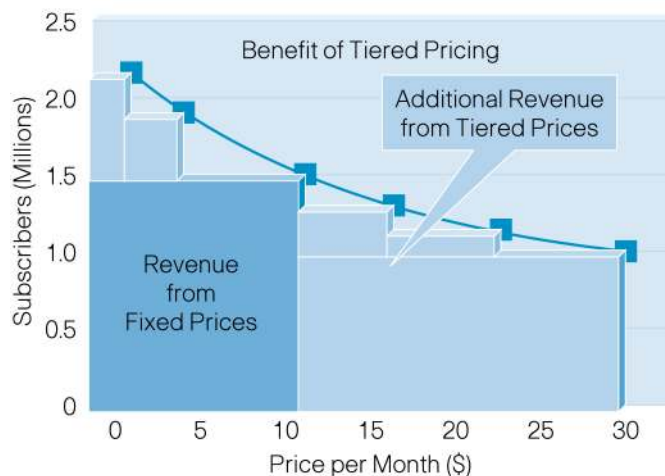


Enhanced Charging: Provide Flexible Billing While Reducing Costs

The explosion of mobile data traffic is creating a financial burden for mobile operators as network costs outpace the growth in revenue. To maximize the return on your network investments, you will need to charge subscribers based on the content of specific services or other unique usage characteristics.

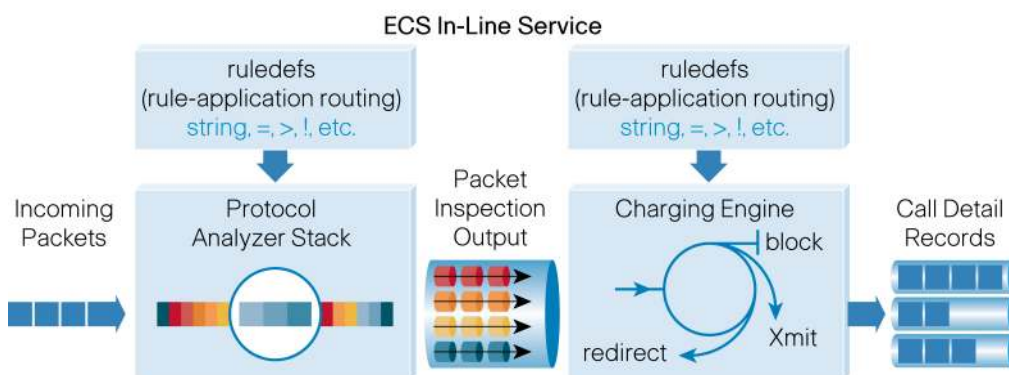
Cisco's Enhanced Charging Service (ECS) helps ensure that the prices you charge reflect the value of your services, the subscriber's willingness to pay, and the competitive landscape. The Unified Reporting feature provides detailed insight into service usage to assist in network planning and targeted marketing. Figure 1 shows how tiered billing can increase revenue on a per-subscriber basis while also increasing the number of subscribers accessing data services. Figure 2 is a functional diagram of the Enhanced Charging Service within the ASR 5000 Gateway.

Figure 1. Tiered Billing Model ([excerpt from TCO white paper](#))



Enhanced Charging Service

Cisco's Enhanced Charging Service (ECS) is an In-line Service in the ASR 5000 Multimedia core platforms. It is integrated within the platform, reducing billing-related costs and giving mobile operators the ability to offer tiered, detailed, and itemized billing to subscribers. Using deep packet inspection (DPI), ECS allows operators to charge subscribers based on actual usage, number of bytes, premium services, location, etc. ECS also generates charging records for postpaid and prepaid billing systems.

Figure 2. ECS In-line Service Processing

How It Works

Incoming traffic goes into a protocol analyzer for packet inspection. Routing rules definitions are applied to determine which packets to inspect. This traffic is then sent to the charging engine where charging rules definitions are applied to perform actions such as block, redirect, or transmit.

Charging rules definitions can be based on the following:

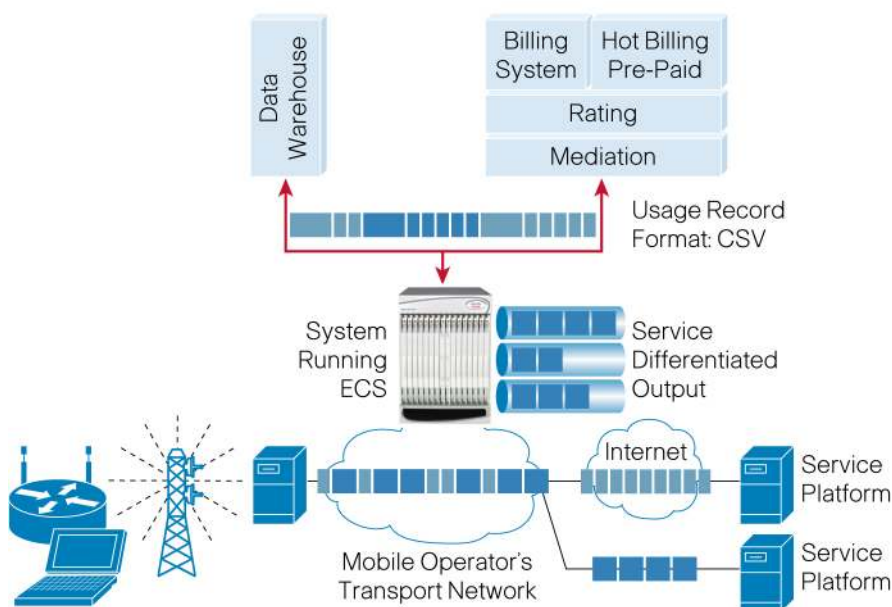
- Duration and time of day – minutes used, peak/off-peak, in network/out-of-network
- Volume – packet amount, number of bytes, per destination
- Content – messaging, email, MP3, video or application download
- Event – quantity of file downloads or actual video streaming play time
- Destination – partner website, special offers
- Applications – video, VoIP, instant messaging

Key Features and Benefits

- ECS integrates with best-in-class solutions from third-party categorization providers
- Traffic analysis is performed with the use of shallow or deep packet inspection (including stateful inspection) to correlate packets with configured rules
- IP Re-addressing enables redirecting of unknown gateway traffic to known/trusted gateways
- HTTP Header Enrichment gives the ability to append subscriber information to HTTP header to be used by end application, such as mobile advertising insertion (MSISDN, IMSI, IP address, user-customizable)
- Credit control/quota reservation is provided for prepaid services
- ECS redirects subscriber to a top-up site if credit is exhausted
- Advice of charge and user notification redirect subscribers to information page when accessing high-value content
- Supports G-CDRs, eG-CDRs, EDRs, and UDRs for usage-data generation
- QoS optimization manages data rate of particular traffic to help ensure fair usage of bandwidth among subscribers
- In-line Services enable real-time charging with no risk of revenue leakage that may occur with out-of-band offerings

Figure 3 illustrates how, integrated within the multimedia core platform, ECS provides a highly efficient solution.

Figure 3. ECS Solution Overview

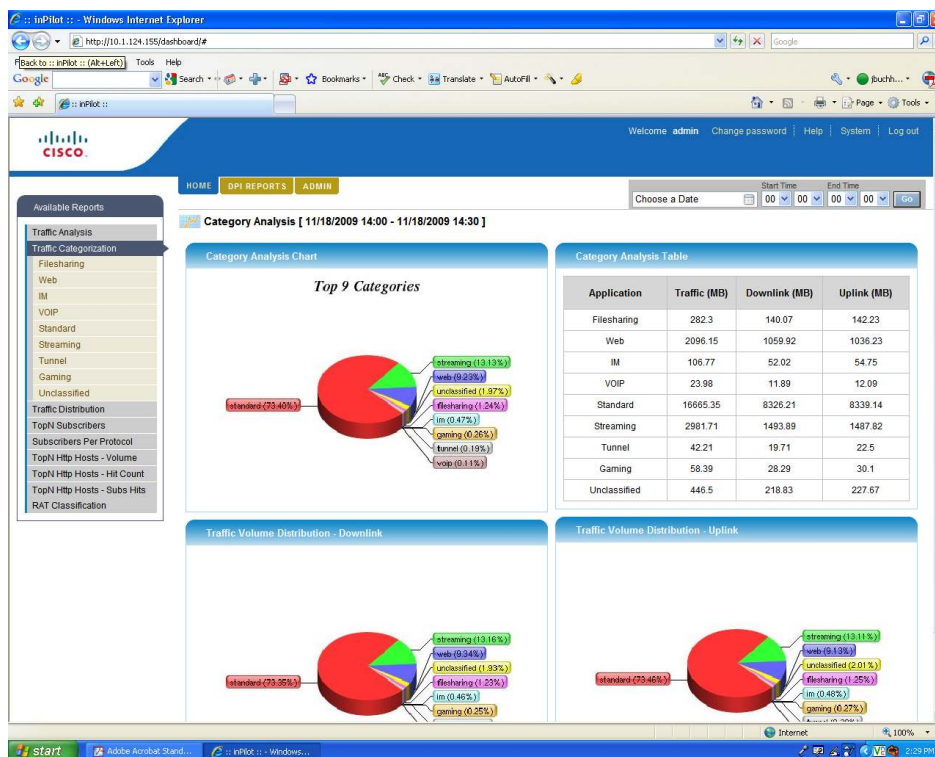


Unified Reporting

Unified Reporting provides a comprehensive set of real-time statistics and customized reports. This information can be very powerful for marketing organizations to identify usage patterns and groups to target for tiered services. It is also used for network planning and traffic management planning. Figure 4 shows how traffic categorization reports allow the viewer to see connections, throughput, bandwidth, and more.

Report examples include:

- Real-time statistics per site, per category, and per subscriber, as well as global statistics
- Number of bytes/packets on a per-session/content-type/application basis
- The percentage of traffic (in bytes/packets) by a particular content-type, as compared to total traffic to and from the mobile node
- Data reported as a function of "on-net" and "off-net" traffic
- Report on any subscriber whose percentage of a particular application traffic (such as third-party voice or video) exceeds 30 percent of their total traffic in terms of bytes/packets

Figure 4. Granular Traffic Analysis with Unified Reporting**Table 1.** Technical Specifications

Description	Specification
Protocols	<ul style="list-style-type: none"> • DNS • FTP • HTTP • ICMP • ICMPv6 • IMAP • IPv4 • IPv6 • MMS • POP3 • RTCP • RTP • RTSP • SDP • SIP • SMTP • TCP • UDP • WSP • WTP
Account interfaces for postpaid service	<ul style="list-style-type: none"> • RADIUS • GTP (GGSN only)
Account and charging interface for prepaid service	<ul style="list-style-type: none"> • RADIUS Prepaid Credit Control interface • Diameter Prepaid Credit Control Application (DCCA) interface • Gx interface with Diameter (GGSN only)

Description	Specification
Charging records postpaid and prepaid charging	<ul style="list-style-type: none">• GGSN-Call Detail Records (G-CDRs)• Enhanced GGSN-Call Detail Records (eG-CDRs)• Event Detail Records (EDRs)• Usage Detail Records (UDRs)
Standards compliance	<ul style="list-style-type: none">• 3GPP Flow-Based Charging standard including enhanced G-CDRs (eG-CDR) and the Gy Diameter Credit Control charging interface

For More Information

For more information, visit <http://www.cisco.com/go/mobileinternet>.

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