

Usage Management: Overview

Power revenue growth with standards-based service innovation

Sandvine's Usage Management allows you to increase revenue and achieve competitive differentiation by rapidly introducing a wide range of high-value subscriber services.

The possibilities are - quite literally - endless, but here's a selection of use cases:

- [Zero-rated and sponsored data promotions](#)
- [Bolt-ons and add-ons](#)
- [Bite-size internet plans and data passes](#)
- [Roaming services and WiFi passes](#)
- [Internet as a public service and Free Basics by Facebook](#)
- [Shared data and data rollover offerings](#)
- [Prepaid and postpaid data offerings](#)

No matter your access technology (or combination of access technologies), your billing models, and your market maturity, Usage Management can help you reach your revenue goals, with real-time usage metering and quota enforcement.

Proven in the Real World

Usage Management has proven itself in the real-world, by powering many of the world's most innovative subscriber services, including:

Key Benefits

Usage Management has a number of benefits for communications service providers, including:

- **Increased Revenue:** Usage Management lets you create more things to sell, and gives you more ways to sell them; plus, our features and technologies provide revenue assurance, so you get paid fairly for the services you deliver.
- **Competitive Differentiation:** Attract new subscribers by being the first or only operator in your market to offer interesting and unique subscriber services.
- **Reduced Churn:** Retain the subscribers you've got, with unique services, timely promotions, and an unmatched quality of experience.
- **Unmatched Versatility:** Run circles around the competition and quickly respond to competitive threats with flexible, configurable solutions.



[Telefónica](#) created new revenue streams with the "World's Best Implementation of Tiered Data Pricing."



[Smart](#) delivered the world's first mobile internet store, allowing subscribers to choose the perfect bite-size data bundle.



[O2](#) deployed innovative roaming plans that maximized revenue by catering to subscribers' wide range of needs.



[Econet](#) rolled out a series of fixed-price application-based plans that took the market by storm, growing revenue and the subscriber base.



[Vox](#) successfully experimented with sponsored data promotions, and likely offered the world's first data rollover for fixed-access services.



[Digicel](#) disrupted competitors by rapidly introducing new services, without needing to spend time integrating across multiple vendors.

Key Features of Usage Management

Quota Manager

Create incredible subscriber service plans through a combination of real-time usage metering and measurement, rich configuration options, and policy control. Quota Manager contains many powerful features, including:

ServiceDesigner Integration: [ServiceDesigner](#) is a graphical service creation tool within the Sandvine Control Center. Quota Manager integration within ServiceDesigner allows operators to visually create or adjust service plans using a drag-and-drop logical block diagram structure.

Plans: Plans contain subscriber entitlements, which include factors such as speed, quota limits, add-ons, etc.

Quota Wheels: Quota Manager uses the concept of a quota wheel, which maps a subscriber's service tier or plan to an associated usage cap. To facilitate an infinitely flexible set of subscriber services, Quota Wheels have rich configuration options and features:

- Byte- (volume) or time-based volumes
- Billing cycle management (daily, weekly, monthly), with automatic reset
- Recurring (i.e., subscription) or non-recurring (e.g., prepaid or one-time data pass)
- Sliding window (rolling quota): tracks usage within a sliding time window
- Multiple quota wheels per subscriber: create rich plans with many separate counters
- Shared quotas: between multiple subscribers, devices, and radios

Quota Reservation: Enables enhanced charging accuracy when consuming usage information over the 3GPP Diameter Gx interface in PCRF deployments. With this feature, Quota Manager determines the optimum granted usage units per Gx usage Monitoring Key by managing buckets of reserved units for each quota wheel.

Real-Time Reauthorization: Control whether a 3GPP Diameter Gx Reauthorization (RAR) message is triggered due to SOAP provisioning changes such as applying top-ups and plan changes, data rollover, or due to simple plan evaluation.

Billing Cycle Management: Operators can provision subscribers with a specific time of month, day of week, or hour of day on which quota is to be renewed, and quota automatically resets at the beginning of each billing cycle.

Time-of-Day Charging: Quota Manager can be configured to only count usage (e.g., bytes, events, time) that happens within a specific time period; usage outside of this period is zero-rated.

Zero-Rating: Allows for usage of particular applications, URLs, etc., or usage at designated times, to not count against a subscriber's quota. Zero-rating can be a feature of a service plan, or could comprise a bolt-on/add-on purchased or enabled separately.

Quota Top-Ups: Allows subscribers to top-up their plans when their usage approaches or exceeds a quota limit; top-ups can be used multiple times in a single billing cycle, and can be configured to expire at the end of the billing cycle, at some fixed time in the future, or to not expire at all.

Event Thresholds: A level to which Quota Manager counts before triggering a designated response (e.g., apply a fair use policy, send a bill-shock prevention notification, prompt for a top-up, etc.). A single billing cycle can have multiple thresholds (e.g., notify at 50% usage, 80%, 90%, and 100%).

Bolt-on Chaining: Configure advanced use cases with chained/stacked service bolt-ons to augment existing plans and introduce new service features.

Multi-PCEF/TDF Quota Management: Consume usage from multiple PCEF/TDF components simultaneously for a single subscriber session. For instance, in multi-access deployments Quota Manager can consume usage over 3GPP Diameter Gx, from IPDR, from Sandvine's Rf+ interface, and other custom data sources.

Quota Management in DOCSIS Cable Environments: Multi-PCEF/TDF Quota Management can be used to provision gates on a CMTS and to count quota using IPDR.

Multiple Provisioning Options: Quota Manager can be provisioned in a number of ways, including SOAP-based provisioning on the Sandvine Service Delivery Engine (SDE) or Subscriber Policy Broker (SPB), LDAP provisioning, auto-provisioning (i.e., derived from data present during the initial session creation), or file-based mass provisioning.

500+ Rating Groups: Provide operators with the flexibility to develop hundreds of unique data offerings that meet the needs of their customers.

Online Charging

Delivers true layer-7 application metering, allowing CSPs to deploy rich, differentiated, real-time charging use cases. Online Charging offers many powerful features, including:

Session-Based Charging: Charge for subscriber sessions via 3GPP Diameter Gy. Importantly, to ensure accurate charging and to prevent revenue leakage, Sandvine's Gy implementation is:

- **Direct:** The PTS and the OCS are connected directly (i.e., no intermediary function or element)
- **Real-Time:** Charging is processed in real-time, with no delays

Immediate Event Charging: Allows subscriber services with pay-per-click billing (e.g., for ringtones, videos, etc.). Immediate Event Charging authorizes one-time events by sending charging information to the OCS over the 3GPP Ro interface (3GPP TS 32.299 V10.10.0 and IETF RFC 4006).

3GPP Compliant: Gy component complies with 3GPP Release 10 (TS 32.399 V10.10.0) standard; Termination Action complies with 3GPP Release 11 (TS 32.299) standard.

Vendor-Specific Attribute Value Pairs (VSAs): Simplifies implementation of many use cases by manipulating attributes and values, for instance:

- Implement subscriber spending limits
- Have the OCS send price plan information to the PTS without an intermediary PCRF
- Have the OCS send the PTS dynamic parameters (e.g., promotional URLs, subscriber categories, etc.) before quota is exhausted

Subscriber Self-Activation: Enables subscribers to change their subscription plans and bolt-ons, and to top-up their data quotas through a browser.

Dynamic OCS Selection: Allows selection of the OCS based on PCRF rules or based on local policies. Online Charging can interact with one or more OCS platforms and vendors, and supports more than one realm.

Deep Reporting KPIs for Gy: Includes a wealth of metrics in the form of SandScript functions that can be used to analyze the performance of the charging operation and revenue collection capabilities of the OCS. Operators can create specific reports that examine Gy signaling and the rating and revenue collection capabilities of the OCS.

Free Basics by Facebook: Launch Free Basics with Sandvine's standardized API. The API provides CSPs with a turnkey solution to enable Free Basics initially, and to update the list of free services available under the plan.

Policy Enforcement and Application Monitoring

Leverages a set of 3GPP and IETF standards to implement policy enforcement use cases in multi-access, multi-vendor networks:

Standards Support: Implements policy and enforcement standards to ensure interoperability (full list of validated systems is available upon request).

- 3GPP TS 29.212 Gx, Sd Interface Standard based on Release 12 specifications
- IETF 4006 Diameter Credit Control Application (CCA) and IETF 3588 Diameter Base
- IETF 3576 RADIUS Change of Authorization (CoA)

Flexible Rule Definition and Enforcement Logic: Leverages SandScript to enable advanced and complex use cases in a fraction of the PCC rules required by traditional means.

Usage Monitoring: Enables volume reporting to the PCRF from the PTS on a per-application basis by utilizing service and session-level monitoring keys.

Controlling the Gy Session: Allows the PCRF to enable and to control differentiated charging offerings with the OCS through signaling PCC rules over the Gx interface.

Fast Gy Initiation: Allows parallel activation of the Gx and the Gy interfaces upon session initiation signaling (subscriber session mapping), so that the charging process over the Gy interface is able to quickly capture usage, to eliminate the risk of revenue leakage.

Dynamic OCS Selection: Lets operators configure policies to dynamically select the OCS (host and realm) at the beginning of a session and to dynamically terminate an ongoing OCS charging session according to configured policies. For instance, the policy can be terminated based on the installation of a specific PCC rule, at a specific time of day, or user location; then, once the charging session is terminated, the OCS charging session can be restarted with a new set of parameters - all without impacting data traffic.

Policy-Driven Gx Triggers: Enables operators to initiate a Gx interface trigger towards the network's PCRF, to notify the PCRF about changes that are not signaled directly from the core network components over RADIUS or GTP-C. With this feature, it is possible to define any vendor-specific trigger value and send it towards the PCRF.

High-Scale Diameter Capabilities: Enhanced scalability, load balancing, reliability, and error handling.

Deep Reporting KPIs for Gx: Includes a wealth of metrics in the form of SandScript functions that can be used to analyze the functionality and the performance of the Gx interface with the PCRF. These capabilities allow the operator to create specific reports on the efficiency of the PCC rules.

Record Generator

Produces highly scalable usage detail/data records (UDRs) on a subscriber-basis, based on time or volume thresholds. Driven by customer-centric business logic configured through service definitions, the PTS counts and aggregates subscriber consumption data, including HTTP transaction details. Using an enhanced version of Diameter Rf+, the PTS sends the information to the SDE for processing.

Based on the usage format the data record consumers (e.g., big data systems for business and operational intelligence, billing audit elements for revenue assurance, offline charging systems, etc.) require, the SDE manipulates the information into configurable-format UDRs.

Record Generator includes a large number of features and configuration options:

Usage Reporting with Custom Keys: Define one or more custom keys in SandScript (by service, all protocols, and HTTP) that provide granular usage reporting for billing, auditing, and big data.

Multi-Application Grouping: Supports multiple applications (Network Analytics, Quota Manager) running simultaneously on the same SDE with the ability to define different configurations for destination realm, service categorization, and service reporting.

Unmapped Subscriber UDRs: Supports the reporting of non-subscriber usage in situations where the subscriber information is not present (for in-bound roaming or auditing purposes).

Cumulative UDRs: Enables the operator to generate partial UDRs during the data session to reflect the cumulative usage from the beginning of the session.

All Protocols Mode: Reports usage and applies the service parameters to all defined protocols for a given subscriber.

Device-Based UDRs: Provides protocol usage broken down by device type and device instance in environments where devices are located behind a Network Address Translation (NAT) device.

Record Push: Record Generator can push files towards B/OSS systems (rather than needing a pull).

HTTP Audit: Audits all HTTP transactions in a flow, for detailed insight, including URLs and HTTP-specific information (e.g., URLs, HTTP server responses, cookies, usage per URL, etc.). Depending upon the level of granularity required by the use case, HTTP auditing can be applied on: first request, first request and response, or full trail with all transactions within the same HTTP flow. HTTP Audit can be configured to omit certain file types (e.g., .js, .css).

Multi-Dimensional Reporting: Enables the operator to report on active time within a reporting period. This provides insight on how subscribers use data and on their quality of experience (e.g., if usage is reported every 15 minutes and a subscriber streams 30MB of video in 4 minutes, Record Generator will report 30MB of usage and 4 minutes of active time for the reporting period).

Subscriber Engagement

The Sandvine platform is completely subscriber-aware, allowing CSPs to engage subscribers with personalized messages, to augment services with information (e.g., with confirmations of purchase, notifications of use, bill-shock prevention, etc.) and to enable subscriber self-service (e.g., ordering and configuring services). Usage Management can be configured to work closely with Sandvine OutReach to deliver a rich level of subscriber engagement.

Carrier-Grade Performance

The Sandvine platform scales to support the world's largest networks, so you can enjoy the benefits of Usage Management no matter the scale.

Audit Records and Historic Reporting

Performance measurements, subscriber usage information, and other statistics are logged and can be used for audit purposes or examined for business and operational intelligence.

Data can be exported into third-party systems, or viewed in Sandvine's business intelligence and operational systems (e.g., Control Center, Network Demographics, and Network Analytics).

