

# Real-time Charging for Convergent Services: Practical help from the IMS Standards

While full IP Multimedia Subsystem (IMS) architectures may be years away, the standards organizations have created robust specifications for charging solutions in support of IMS that will deliver valuable capabilities to your network today, as well as provide a secure migration path to future IMS build-outs.

By *Susana Schwartz*

While a lot of buzz exists around IMS architectures, many service providers have approached its implementation somewhat conservatively. However, caution should not prevent innovation. Service providers can launch bundles and blended services over existing networks. Consumers want converged services as evidenced by Apple iPhone's combined voice, video and Internet capabilities, or Sony PSP's gaming device's messaging and voice services. Similarly, cable customers want attractively-priced service bundles that include Voice over IP telephony services and broadband with cable's traditional TV offerings. There's no reason for CSPs to consider IMS the only path to convergent services over wired, wireless or cable networks. Both telecom and cable providers can use what they have today to pioneer convergent services that boast unprecedented control over content, as well as new levels of personalization.

Regardless of the access networks, converged services pose many of the same charging-related questions as IMS-services:

- How can I ensure accurate and real-time billing?
- Can I minimize revenue leakage and fraud with real-time credit controls?
- How can I build and rate complex bundles?
- Can I authorize network resource usage requested by the user?
- Can I monitor resource usage in real time?
- Do I have the flexibility to support session- and event-based charging?
- How can I settle charges among third-party partner services?

While wireline, wireless, cable, Internet and equipment companies grapple with the "heavy lifting" aspects of their architecture evolution, the immediate need for in-session billing and credit controls cannot be ignored.

IMS Charging standards are now mature enough to provide a great starting point to any service provider looking to build out real-time charging capabilities. Taking a standards-driven approach is the best way for service providers to transform their charging infrastructure from tactically-created siloed capabilities, to a strategic asset that can be leveraged across all applications, regardless of the underlying networks and equipment.

As new services are launched and existing services modified, product managers, architects and engineers can utilize a comprehensive set of common charging functions for all applications. That will empower service providers to minimize costs, expedite time to market, and ensure that the infrastructure does not limit service, price plan or promotional innovation.

## EXECUTIVE SUMMARY

- Customers want converged services today
- Providers find they must deal with a plethora of charging-related challenges to offer these services
- Service providers need a way to implement new services without having to constantly modify billing systems or change equipment through time-consuming requests to vendors
- IMS architectures are years off, but IMS charging solutions standards can be used today
- Online charging systems (OCS) leverage these standards and offer a starting point for service providers seeking selection criteria for mediation and charging systems
- OCS enables IMS-like capabilities today and offers a migration path to IMS in the future

## ONLINE CHARGING: A PATH TO IMS

If service providers are to evolve to real-time authorizations so they can support hybrid business models within a session and personalize services, they need instant access to online account balances, credits and vouchers.

Some service providers—particularly those who paid millions on prepaid networks—have overextended their Intelligent Network (IN) systems to offer prepaid SMS. Subsequently, charging has evolved around “stovepipes,” which means different architectures are built around services. As a result, many environments consist of separate silos for messaging, VoIP, streaming video and other services. Given the proprietary nature of these systems, service providers have to rely on IN vendors to modify systems or to apply different prioritizations or treatments to certain traffic types.

Going forward, service providers have to implement new services without having to constantly modify billing systems, or change equipment through time-consuming requests to IN vendors. For example, operators should have the level of control to identify different short codes and treat traffic accordingly.

The silo approach has to give way to horizontal control planes that allow charging systems to work across multiple services. To get there, service providers have to align existing silos with processes, which will be built through the re-use of components comprised of standardized interfaces.

With that in mind, the 3rd Generation Partnership Project (3GPP), 3GPP2, TISPAN, Internet Engineering Task Force (IETF) and GSM Association have worked to create standards from which real-time charging can evolve. What has emerged is the OCS, or online charging system, which is replete with standards that represent a solid starting point for service providers seeking selection criteria for mediation and charging systems (see “The State of OCS Today” sidebar).

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## WHY OCS IS IMPORTANT

The beauty of the OCS work is that it can be utilized in non-IMS deployments, thus providing a stepping stone to an IMS core network. That is very important because it enables charging for convergent services whether a service provider is in the planning stages, or actually in the throes of a full or partial IMS implementation.

In effect, that means a charging software solution that spans multiple platforms or silos can set the stage for the

system reengineering required for wholesale IMS deployment.

Already the evidence of this transition is clear, as leading telecom and cable providers have begun to pioneer convergent services, such as IPTV, or video calling, or one-off Video on Demand services. These service providers already have incorporated “smart” controls and innovative bundles for parents, individuals and enterprises seeking unprecedented control over content. What is interesting is they are doing so without knowing fully what their best business model will be, and without actual IMS architecture in existence.

Rather than full-blown IMS, these carriers are incorporating the online charging models devised for IMS, such as session charging unit reservation (SCUR), event charging unit

## THE STATE OF OCS TODAY

The world's leading standards bodies have created, and continue to create, enormous amounts of documentation to collect, correlate and process online and off-line transactions through real-time, “online” charging. Those standards bodies have considered deeply the role the OCS will play in mediation of next-gen services.

The IETF, the GSM Association, 3GPP, 3GPP2 and TISPAN have drawn up active, real-time charging standards for their members.

In terms of charging-specific work, the standards mentioned below represent an excellent starting point for service providers looking for selection criteria for mediation and charging systems.

TS 23.125	HIGH-LEVEL FUNCTIONALITY ARCHITECTURE IMPACTS OF FLOW BASED CHARGING; STAGE 2
TS 23.203	AND CHARGING CONTROL ARCHITECTURE
TR 23.803	EVOLUTION OF POLICY CONTROL AND CHARGING
TR 23.815	CHARGING IMPLICATIONS OF IMS ARCHITECTURE

As this work takes place, the information for release 6 is being devised in Working Group 5 (SA5), which defines online charging principles from Rel.5 forward (<http://www.3gpp.org/TB/SA/SA5/SA5.htm>). Release 6 can be found at <http://www.3gpp.org/ftp/Specs/html-info/TSG-WG--S5.htm>.

reservation (ECUR) and immediate event charging (IEC).

These charging standards succeed to accommodate the common characteristics among services requiring session or event charging. For example, “in-session charging” from SCUR supports services that take place for indeterminate durations of time (i.e., VoIP, video conferencing or streaming video). Since a service provider doesn’t know in advance the length of the session, this charging model allows reservations to be made on an incremental basis. As VoIP sessions transpire, service providers can pre-authorize according to predetermined “units,” such as 10-minute increments or 10 MB increments (or any variables by which service providers can continuously “re-authorize” the service as it takes place).

Conversely, “event charging” can be handled with ECUR, which is designed for services where the duration is known in advance. ECUR allows the session authorization to be made before the event takes place so that service providers can accommodate prepaid video or ringtone downloads, for example. For events that only occur once, such as a 10-cent MMS or SMS, there is the IEC standard.

The point of each of these standards is to enable charging systems to foster IMS-like functionality around session and event charging using OCS standards. These standards work to create the “hooks” necessary to engender charging frameworks capable of collecting real-time charging requests from 2G, 2.5G, 3G/IMS, Application Servers, PSTN and IP networks. That gives service providers the flexibility they need to ultimately unify rating and charging across pre- and post-paid systems, which succeeds only if rating and charging are consistently delivered—regardless of access or network type. With consistency in service delivery, menus or feature sets can work across myriads of services and devices, whether dual-mode handsets, Wi-Fi, CDMA, PBX, or DSL.

### MIGRATION PATH TO IMS

Of course, the potential for IMS to create a common IP core for fixed and mobile networks has made for very exciting sales forecasts: In-Stat predicts that by 2011, wireless carrier revenues from IMS applications could reach \$14 billion in the U.S. market alone. Similarly, ABI Research forecasts IMS service revenue may be up to \$49.6 billion in that same time frame.

Service providers have to be ready for this; however, the sensible approach is to adopt IMS as part of an ongoing architectural evolution. A proper, timely and cross-organizational IMS planning effort is key to its success.

Systems built around OCS standards will possess more flexibility for transitioning from today’s session- or event-based services to tomorrow’s—such as evolving IPTV to include Video on Demand off of IPTV.

Designing an Online Charging System to leverage the capabilities of your existing network and to provide a

migration path to IMS are absolute “musts” for service providers who want truly convergent charging environments. Only then can they hope to span all types of services, payment methods and access networks with innovative offerings.

By adopting a standards-driven approach, service providers will be free to mix and match services, as well as retire systems as they choose. That will be a huge step up from being dependent on underlying network vendors to create interfaces among network elements and downstream systems.

### FINDING A TRUSTED PARTNER

Because online charging involves so many elements—the network, the mediation, the Business Support Systems (BSS)—it is important to seek out partners with proven track records with all elements of architecture.

Such expertise can help expedite the streamlining of processes, as well as normalization and reconciliation of data—prerequisites to inter-domain integration, and therefore IMS.

While some equipment vendors are conformant with OCS and, increasingly, the IMS standards, many still provide feature sets that are not “productized” or useful for what is needed today.

Those vendors demonstrating involvement and influence over IMS documentation within standards bodies are demonstrative of “good pedigree” in terms of OCS. That type of participation usually means products won’t revolve around an inflexible, proprietary version of the OCS.

### ENTER OPENET

Openet meets all of the above criteria, as it has contributed to the writing of the test specifications for the IETF’s Diameter work, which has since been incorporated into the 3GPP standard. Openet also co-authored CableLabs PacketCable 2.0 Accounting specifications.

“We want to be more than just conformant with the standards, so we are focusing on IMS-compliant OCS that provide features we think would be useful to our clients today,” says Joe Hogan, CTO of Openet, which has realized major customer wins with its passive mediation, online charging and rating products. With a customer base comprised of more than 60 customers—two-thirds of which are Tier 1s (including major U.S. wireless carriers and major European carriers), Openet has had the opportunity to incorporate practical features for use in today’s convergent charging solutions. (For example, see: <http://www.openet.com/ims>.)

Already, Openet Convergent Charging is an IMS-compliant OCS designed to support standardized fixed, mobile and IP interfaces. The solution when combined with Openet Network Edge Rating offers bundle management, promotion management and voucher management—all practical for today’s service provider environments.

“We thought offering those three features in a productized, rather than ad hoc manner, would make OCS usable in today’s multi-service environments,” says Hogan.

Since IMS-ready charging can be very confusing, Openet’s involvement with the standards not only helps incorporate them into Openet solutions, but ensures that customers can go above and beyond what the common denominator is for online charging today.

That goal is evidenced in the fact Openet possesses the capability today for bundle management, which helps service providers to offer customers flexible options for purchasing more of their preferred services, as opposed to being locked into static bundles.

Consumers in many markets are responding positively to the ability to bulk-buy SMS or IMs, which is becoming a key differentiator for service providers enabling that flexibility and personalization.

With OCS’ ability to accommodate promotions, operators and providers can further enhance flexibility by quickly changing pricing variables within a service, such as “percentage of cost” or “days of the week” according to subscriber and customer habits, locations and preferences.

“On a weekend, a service provider could market a service

for 20 percent of its normal cost to get people interested in the capability to maybe get traffic updates on their Blackberry, or local weather reports, sports or social networking messages,” says Hogan.

Similarly, voucher management can help operators transmit sponsored messages from the likes of Coca Cola or Disney in exchange for some free communication services.

The bottom line is that real-time handling of authorizations, pre-paid balance reservations, post-paid spending limit enforcement and other policy enforcement can be possible only with partners possessing a proven track record.

Openet’s family of solutions, including Openet Convergent Charging, Openet Network Edge Rating and Openet Convergent Mediation (for offline charging) are designed to provide “transactional intelligence” with the convergence of data and voice in mind. Even though IMS so far has proven itself to be a “slow burn”, Openet can help service providers evaluate their processes and data models to best determine the path by which they will get to online charging and ultimately to IMS. ■

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*About the author:* Susana Schwartz is a high-tech journalist specializing in emerging technologies and their impact on back-office systems, including inventory, provisioning, activation, mediation and billing.