Summary

Catalyst

Policy control and charging (PCC) has become the linchpin of service providers’ revenue and customer experience strategies. The technology and benefits of PCC have been understood for the last three to four years, but the full potential of such a powerful combination in the context of a broader IP-based ecosystem is yet to materialize. Thanks to standards bodies such as 3GPP and ETSI, the technical quality of PCC systems is consistent across a range of major and minor vendors. However, other factors may come into play when selecting the right vendor and product, for example the profile of the CSP and its target market segments, geography, and network type.

This Ovum Decision Matrix (ODM) examines the competitive dynamics for PCC solutions in the telecoms market, and provides telcos with analysis to inform the selection process based on the strength, strategy, and market impact of a vendor’s product. While the list of included vendors is not intended to be exhaustive, it is representative of the market, comprising both major BSS players with PCC in their portfolios and PCC specialists. This ODM is essential reading for telco executives looking to invest in a PCC solution over the next 12–18 months.

Ovum view

Competition among PCC software vendors has intensified in last three years, with major players competing internationally for broader market penetration and more widespread adoption within the telecoms vertical. Recognition that fully integrated policy control and online charging (OLC) would be at the core of IT infrastructure sparked a flurry of M&A activity during this period. Major BSS vendors acquired niche companies and in some cases larger ones, or invested internally to get a marketable, integrated policy control and OLC solution. Typical examples are Amdocs’ acquisition of Bridgewater, Oracle’s purchase of Tekelec, and CSG’s purchase of certain assets of billing vendor Volubill. In all these cases, the larger vendors were able to replace their internally developed policy control and rules function (PCRF) with the acquired technology.

While this M&A activity has slowed due to the dwindling number of smaller specialist vendors, there are some such as Alepo, Cerillion, and Orga that are successfully targeting lower-tier CSPs and emerging markets. At the other end of the scale, large vendors such as Amdocs, Ericsson, and NetCracker are offering end-to-end solutions that include a range of other functions, and are attracting customers as a result. Ovum believes that the market is being well served by PCC vendors across the board and anticipates that PCC will continue to be an exceptionally competitive market over the next two years.

However, the market will evolve. The use of policy for basic traffic management and quota management, usually referred to as Policy 1.0, has evolved into the increasingly familiar customer-facing policy 2.0, which when integrated with OLC can offer a vast array of service and bundling options when allied with a wide range of historical and realtime data. Ultimately, the goal is to offer upselling, cross-selling, discounting, and other marketing campaigns in real time. However, although such functionality is technically possible today, it is likely to be a year or two until this functionality is given the careful investment strategies most CSPs seem to be adopting.
Key findings

- Amdocs, Comverse, Ericsson, NetCracker, Openet, Oracle, and Redknee provide the most sophisticated and advanced PCC functionalities for CSPs. These vendors are the market leaders of this ODM, providing a strong breadth of functionality, industry-specific applications, and well-designed user interfaces.
- Alepo, AsiaInfo, Cerillion, CSG, Matrixx, and Orga Systems all offer compelling solutions that CSPs should consider, particularly when factoring in their unique needs or contexts that are not always met by the leading vendors.
- Ericsson is the overall leader with the highest overall score.
- Ericsson is also the leader in the technical assessment category, followed closely by NetCracker, Amdocs, and Oracle.
- Amdocs is the leader in the strategy assessment category, closely followed by Comverse and NetCracker.
- NetCracker has the highest score in the market impact category, followed by Comverse and Oracle.
- PCC solutions are technically on a par with one another, but differentiation exists in both strategic and market impact factors.

Market drivers and developments

PCC is at the core of the revenue management space

PCC is at the core of the revenue management space, which in many areas is in a period of flux. Renewal contracts for traditional billing platforms, of which many CSPs have several, are being replaced with billing and charging consolidation projects, and in some cases BSS transformational projects. The latter involves the complete replacement of conventional platforms as operators look to construct more horizontal BSS architectures across their voice, broadband, mobile, and IPTV portfolios. In addition, the introduction of PCC is consigning traditional billing platforms to an offline role, while at the same time making realtime rating and charging pivotal. PCC has become the core around which new services, pricing strategies, and marketing campaigns are being constructed. Although PCC will drive growth in areas such as data management, business intelligence, and BSS transformation, revenues overall will be tempered by a decline in demand for the large billing platforms that used to be the backbone of most CSPs’ BSS.

The need to integrate

When implemented separately, the Policy Control and Rules Function (PCRF) controls bandwidth resources and the OLC deals with charging. Although this arrangement is adequate to support basic tiered pricing, data caps, and fair usage, it does not offer the flexibility and sophistication of fully integrated components that, for example, enable personalized marketing campaigns and pricing plans. The logic behind integrating the PCRF and OLC, commonly referred to collectively as PCC, is that a direct interface between the two should make it possible to use charging rules and other data derived from the BSS layer to manipulate network resources and support more complex, customer-facing offerings. These could include:
realtime discounting based on customer preferences, buying habits, and time of day

cross-selling of services between fixed and mobile networks

dynamic pricing strategies depending on time of day, network conditions, and location

customer self-care and provisioning in real time

convergent billing and charging

settlement and interconnect

voucher management

highly targeted marketing campaigns

OTT and third-party service and content management.

The Sy interface

The most striking feature of the PCC market is the consistently excellent technical quality of the PCC products on offer across all the vendors taking part in this ODM. This is due at least in part to the development of standards, in particular the 3GPP-specified Sy interface, which has enabled much tighter integration and hence greater functionality.

For smaller vendors with standalone PCRFs or billing vendors offering OLC, establishing a truly independent standard has been of great importance. The ability to establish partnerships based on the integration of disparate components represents an important channel to market for these vendors and offers a counterweight to the argument that end-to-end systems from a single vendor are preferable. However, many of the larger vendors developed proprietary versions of Sy in order to meet the needs of a market that was developing far faster than the process of finalizing the standard.

The issue is declining in importance as the market for PCC continues to grow, although a standardized Sy interface is still important in this transition period in which some vendors need to add policy to an existing OLC installation or vice versa. However, vendors report that such installations tend to be short-lived arrangements and usually lead to the implementation of a fully integrated PCC platform sourced from a single vendor.

Vendor solution selection

Inclusion criteria

PCC is a very specific product within a vendor’s portfolio, and while many vendors may claim to have PCRF and online charging products, we have set the following criteria for inclusion in this ODM:

- The vendor must have significant mid-to-large PCC CSP customers.
- The vendor’s PCC products must possess significant brand awareness within CSPs in multiple geographies.
- The vendor may include PCC in their BSS portfolio, or may offer standalone PCC solutions
- The PCC solution must be based on Policy 2.0
- These products must target the telecoms industry directly, if not exclusively.

Exclusion criteria

- Vendors offering policy control exclusively for traffic management purposes.
- Vendors that do not have a fully integrated policy/OLC offering.
- Vendors that have a proof of concept but no commercial implementations.

Methodology

Technology assessment

PCC solutions based on Policy 2.0 have a very specific functionality and lie at the very heart of next-generation BSS. Ovum has identified six key features of PCC systems that affect the functionality and suitability of PCC from a CSP’s point of view. Some of these criteria also assess technical aspects of the offering that will engender confidence that the CSP is buying the right product for their specific needs. The criteria are as follows:

- **Product maturity** – The length of time that a PCC product has been in proven commercial operation. Recently launched products will lack the refinement garnered from multiple deployments, while products that are more than three years old may lack some of the more recently developed functionality. Therefore, the optimum product maturity is between 12 and 36 months.

- **Organic development** – PCC developed within the company, as opposed it being sourced externally, wholly or in part, via acquisition or partnership agreements. A PCC solution developed entirely in-house is less likely to incur integration challenges both in terms of physical integration with the host’s products and corporate integration of the two companies, and it therefore attracts a higher score.

- **Joint PCRF/OLC development** – PCC may have originally been developed as two separate products: as a policy function and a convergent or online charging function. In this case, integration between the two elements may have required something more than the development of the Sy interface, and will therefore require more integration at the point of implementation. As a result, jointly developed products represent a lesser option for CSPs.

- **Product roadmap** – A plan that includes the integration of elements such as a subscriber profile repository, analytical functions, and CRM suggests a vendor with foresight and imagination, and therefore one that is more likely to inspire confidence in CSPs. The product roadmap will also develop to include the relevant standards.

- **Standards compliant** – We expect that all the products reviewed will be compliant with 3GPP specifications, but conformance with other industry guidelines such as eTOM, SID, and Frameworx will give potential CSP buyers greater confidence in areas such as interoperability and low integration overheads.

- **Integration** – A measure of a vendor’s resources is whether or not it requires external systems integrators (SIs) to install its PCC solution. In general, a company with internal teams can do this at less cost to the CSP than if external SIs are required. However, Ovum recognizes that the deployment of external SIs may be advantageous in a number of scenarios.

Strategy assessment

In this assessment, we evaluate vendors’ strategies for taking their PCC products to market. The criteria are as follows:
Channels to market – The more channels to market a vendor has, the more likely it is to make a sale. Therefore, vendors with a range of channels score more highly.

Presence in other verticals – Products developed to be applicable across a range of verticals can be prone to compromise, and the requirements of the telecoms industry are very specific. As a result, vendors focusing exclusively on the CSP sector score more highly.

Software/services split – Services are by far the more lucrative way of distributing CSP support software, as they generate repeat revenues as opposed to sales, which by and large generate one-off earnings.

Managed service availability – As the complexity of BSS grows, managed services are becoming an increasingly important part of a vendor’s portfolio.

XaaS/cloud/virtualization – These categories are the future of BSS, and vendors ignoring them do so at their peril. Vendors that already offer these versions of their products will score highly, followed by those that have plans to develop their portfolios in these areas.

Consulting and training – This is a vital part of the support that vendors can offer to their customers. However, the level of consultancy and training depends on the vendor’s resources, which can vary from a small team to a training academy.

Market impact

The market impact assessment measures the vendor’s aspirations and focus in terms of market size and geography, and evaluates the company’s overall revenue growth, number of subscribers using PCC, and revenues derived from PCC. This is perhaps the most difficult section to evaluate as many vendors are contractually prohibited from revealing customer names and often unwilling to reveal commercially sensitive financial information. In these cases, we have applied a neutral score of 5/10. The criteria are as follows:

CSP segment focus – Vendors that aim to offer their PCC solution to all sizes of CSPs attract a higher score.

Geographic focus – Vendors aiming at a specific geographical region or market type do not score as highly as those aiming at the global market.

Number of customers using PCC – The highest scores for this category go to the vendors with the greatest number of commercial customers. Vendors that are unable to supply this information are awarded a neutral 5 points.

Revenue growth of the company as a whole – Highest scores go to those vendors with the highest overall percentage revenue growth for 2012–13. Vendors that are unable to supply this information are awarded a neutral 5 points.

Revenues derived from PCC – Vendors with the highest proportion/percentage of revenues attributed to PCC sales or services gain the highest scores. Vendors that are unable to supply this information are awarded a neutral 5 points.

Ovum ratings

Market leader – This category represents the leading solutions that are worthy of a place on most technology selection shortlists. The vendor has established a commanding market position with a product that is widely accepted as best-of-breed, and can offer suitable backup and support.
Market challenger – The solutions in this category have good market positioning, and the vendors are selling and marketing these products well, but they often target a specific telco segment or geography. The products offer competitive functionality and a good price-performance proposition, and should be considered as part of the technology selection.

Market follower – There are no market followers in this ODM.

Market and solution analysis

Ovum Decision Matrix: PCC 2014–15

Of the market leaders, Ericsson achieved the highest all-round score, just leading its rivals Amdocs, Comverse, NetCracker, Redknee, Openet, and Oracle. There are at most three points separating most of this group as the standard of technical excellence is so high, but strategic and marketing concerns have produced greater differentiation between the vendors.

AsiaInfo, Alepo, Cerillion, CSG, Matrixx, and Orga Systems make up the market challengers group, but it should be stressed that the difference between these vendors and the market leaders is small in most categories of assessment. The gaps are mainly due to the aspirations of the vendors in terms of the area and size of the market they are addressing, and/or their ability to offer a fully integrated end-to-end solution that includes, for example, CRM, analytics, and a subscriber profile repository (SPR).

There are no market followers in this ODM. This is due to the high standards by the featured vendors in every category assessed for this research, as well as the degree of consolidation that has occurred between vendors over the last few years.

Figure 1: Ovum Decision Matrix: PCC 2014–15

Source: Ovum
Market leaders: vendor solutions

The market leaders in PCC for telecoms are Ericsson, Amdocs, NetCracker, Redknee, Comverse Openet and Oracle. All of these vendors deliver a top-class solution capable of extending a CSP’s BSS layer to fully exploit the functionality of the PCC to become a complete end-to-end solution. They can do this in a single transformational project or by degrees, beginning with the PCC. They have an established presence in and commitment to the telecoms industry. These leaders gained high scores in the technology, strategy, and market impact assessments. Ovum strongly recommends that CSPs shortlist these vendors when selecting a PCC solution. However, as all the core PCCs reviewed are technically on a par with one another, it is useful to look at the background of the vendor and the level of experience and expertise they bring to their products.
Ericsson is a leader in this sector due to its strong heritage in OSS/BSS and its experience as both a leading network infrastructure vendor and a supplier of managed services. It has used its in-depth knowledge in these areas to produce a PCC designed specifically for the telecoms industry. Indeed, infrastructure vendor NSN might have been included in this list a couple of years ago, but circumstances dictated that Redknee, another leader in this market, would benefit from the Finnish company’s BSS experience. Thanks to its expertise in this area, Redknee has had a major impact on the revenue management market as a whole with its range of realtime charging and billing solutions, but most effectively with its PCC solution. NetCracker is essentially an OSS/BSS vendor, but it has strong backing from its parent company, NEC, which itself is a very experienced supplier of network infrastructure.

The other market leaders are all pure-play software vendors, so their places on the leaderboard are hardly a surprise. Amdocs has a very long history of supplying the BSS industry in particular, and although it acquired the component parts of its PCC product via acquisitions, it has successfully integrated them into its massive portfolio, which it updates with great regularity. Comverse also has a long history in the CSP IT industry, and has done some pioneering work in connecting the network and BSS domains in order to fully exploit the capabilities of its PCC solution to get innovative new services and use cases to market much faster than has ever been possible. Oracle has a very long history in IT, but its foray into telecoms OSS/BSS is relatively recent compared to its peers. That said, it firmly deserves its place as a market leader not only for the speed with which it has carved itself a slice of the market, but also because of its strong PCC offering, which can be easily integrated with its other products such as Salesforce.com, which is probably the strongest CRM brand in the IT industry and widely used across a range of verticals.

Openet is also a pure-play PCC vendor, and has already interfaced its PCC with every major vendor in the industry via a secure API gateway. In addition, it recently partnered with OpenCloud to offer support for legacy IN. It also offers its PCC as a managed service, and has recently released a virtualized version of its portfolio.

Market challengers: vendor solutions

As mentioned, the difference between the market leaders and the challengers is small, particularly in terms of technology, but differences do exist in their aspirations and the availability of additional in-house resources such as systems integrators and training facilities. Most sell both directly to the customer and through third-party channel partners, and most of them use a combination of in-house expertise and external systems integrators to deploy their products. It is these kinds of factors that CSPs should consider when deciding which PCC solution is the best fit for them. These vendors are equally worthy of consideration when procuring a PCC solution, particularly if a CSP is looking for something other than an end-to-end solution.

The market challengers are Alepo, AsiaInfo, Cerillion, CSG, Matrixx and Orga Systems, all of which market PCC solutions that conform to 3GPP standards. Barring CSG, all of the market challengers developed their PCC offerings in-house, from the ground up. CSG already had its own OLC when it purchased assets from billing vendor Volubill, and in the process acquired its realtime charging capability. The PCC products offered by the market challengers integrate readily with BSS elements from other vendors, although inevitably some bespoke integration usually has to be done to suit a specific CSP’s operating environment.
Matrixx has developed its own proprietary in-memory data processing technology for the realtime aspect of its PCC, and it comes with a pre-integrated SPR and a product/service catalog. The vendor guarantees performance across any use case, and offers low latency and low CPU usage compared to other systems. For some of the market challengers, differentiation is a matter of carefully chosen markets and specific types of CSPs. For example, while Alepo has a PCC and associated elements of BSS that appeal across the board, it sees its main chance among tier-2 and tier-3 CSPs in emerging markets such as Africa and Latin America. Nevertheless, it does count the likes of Orange, MTN, and Digicel among its customers.

Orga Systems takes what it calls an "embedded" approach to PCC and does not offer policy and charging as separate elements. The vendor sees opportunities in Latin America but also looks to Eastern Europe as a fertile market for its products. It also has sales and support offices in India and Turkey, having one eye on the MEA region.

Cerillion has a full portfolio of BSS on offer with its PCC, but it only has sales offices in London, Malta, and India. The company mainly targets tier-2 and tier-3 CSPs, although in common with many of the other challengers, it also targets the subsidiaries of the tier-1 CSPs via partnerships with larger IT companies such as IBM.

CSG has a long tradition of involvement in the realtime charging sector with its Singleview product. The acquisition of Volubill in 2013 bought with it a well-developed PCRF, and the company is now able to offer a complete portfolio of BSS solutions with PCC as an integral part of its flagship Singleview product.

AsiaInfo is a particularly interesting member of the challengers group because it has deployed its products across networks in China, which in some cases support more users than some European countries have in total. It has a great deal of experience providing the kinds of realtime services to Chinese networks that CSPs in other geographies are beginning to look for. However, barring a small number of contracts in other Asia-Pacific countries, it had until recently had little experience in other regions. However, its win with Telenor Denmark, which Ovum strongly suspects will be extended to other Telenor territories, and some very impressive demonstrations of realtime customer self-provisioning make the company an attractive proposition.
Market leaders

Market leaders: technology

Figure 3 is a clear demonstration of the overall quality of the PCC solutions reviewed in this ODM, with all the market leaders bunched toward the top end of each axis. Differentiation is minor and separation is mainly achieved through factors such as whether the PCC was developed in-house or elements of it were procured through acquisition. Compliance with standards is also universal among this group of vendors, who by and large subscribe to 3GPP and TeleManagement Forum Frameworx guidelines for a shared data model, and the eTOM, UTRAN, and ETSI specifications for fixed and mobile networks.
### Market leaders: strategic assessment

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Source: Ovum

In terms of strategy, there is far greater differentiation, with companies such as Amdocs earning far more from services than from direct sales of software, and companies such as Ericsson and Converse having a more even split. This picture may be somewhat distorted, however, as some vendors were unwilling to reveal the percentage split between software sales and services.

All of the market-leading vendors offer their PCC as a managed service, although some, such as Oracle, offer the service either in-house or via its partners. Similarly, Oracle stands out in the consulting category because it has an academy and recognized certificates in competency for training in the use of its products. None of the other vendors can match this, although the entire leading group does offer extensive pre- and post-sales consultation and training.

As far as channels to market are concerned, all of the top PCC vendors use both their internal sales departments and third parties to get their products into the market. However, their presence in other verticals tends to vary slightly according to the company, and does not seem to follow a pattern. Amdocs, Converse, and NetCracker are aiming their PCC offerings exclusively at the telecoms vertical, whereas Ericsson, Openet, and perhaps more predictably Oracle are aiming at other verticals as well.
Market leaders: market impact

The market impact of the leading group of PCC vendors is difficult to discern given the difficulties in obtaining accurate figures relating to what is a very strategic area of the industry. However, Ovum has made an educated guess in some instances. The market impact is largely predictable in areas such as what types of operators and geographies are targeted for PCC because all the market leaders have such massive resources, meaning they target all tiers of operators in all geographies. Perhaps the only real differentiator that is easily available in this area is the number of customers supported by each vendor’s PCC solution. On that basis, Ericsson comes in top with around 350 deployments. For overall revenue growth and revenues derived directly from PCC, we have included a score for the companies that declared figures and given a neutral score for those that did not.

Vendor analysis

Alepo: Challenger

Established in 2004, Alepo has 250 employees and is headquartered in Austin, Texas. It has offices in Buenos Aires, Argentina; Bogota, Colombia; Mumbai and Pune, India; Douala, Cameroon; and Paris, France. The company’s R&D facilities are based in Mumbai and Pune, and the development and marketing of its PCC product is shared between two departments: Product management and R&D. Product Management leads research and drives the product roadmap, prioritizing business-facing features. It also reviews and accepts the features developed by R&D. R&D oversees server-side development, including performance, reliability, integration, and interfaces. These two departments collaborate closely with each other and with sales and marketing teams to drive the product evolution.
In 2009, Alepo commercially launched a Radius-based PCC solution at African CSP MTN Cameroon for a fixed mobile convergent network. In 2010, the company announced its Diameter-based, 3GPP policy and charging control solution. Alepo’s first commercial launch with an LTE-ready 3GPP online charging system was with Latin American operator IBW, and was announced in 2011. The first LTE commercial launch for its pre-integrated PCC (PCRF + OCS) was with Spectranet, and was announced in early 2013.

Alepo’s legacy Radius-based policy and online charging solutions stemmed from its AAA infrastructure, and thus were developed from a single platform. Conversely, Alepo’s Diameter-based PCC products have been developed as single product lines that share a common set of design principles and frameworks. The PCC has been built from the ground-up by Alepo developers, employing open, best-of-breed technologies. These technologies include: an element management system (EMS): a web-based portal application that functions as the system user interface, which employs a Liferay portal framework; and its built-in reporting engine, which uses Tableau Business Intelligence tool for data visualization.

Alepo’s PCC offering supports the usual range of Policy 2.0 revenue and customer-centric use cases, such as toll-free apps, zero-rated data, and bandwidth on demand. It is designed to be service generic and flexible to adapt to new use cases as marketing teams invent them. In common with most other vendors, Alepo sees demand for out-of-the-box solutions for data monetization and customer experience. To make end-to-end solution delivery faster and easier, and to lower TCO, it has developed a PCC environment with ancillary components such as customer self-care mobile apps and smart marketing campaigns. The company is also adding support for new 3GPP interfaces as the standards become available.

Alepo’s PCRF and OCS can be delivered as a pre-integrated solution as part of the vendor’s modular BSS/OSS suite of products. However, the company advocates a “right fit” solution for individual network environments and business goals, whether that means delivering an internal SPR, bringing in a DPI partner, or integrating with a third-party CRM. Alepo uses standard web services APIs to integrate its own PCC and CRM with external CRMs, allowing customers to switch elements in or out as required.

Alepo claims short delivery times, saying it can deploy its “LTE in a Box” solution in 90 days. The solution consists of an LTE Evolved Packet Core with its PCRF, OCS, and BSS/OSS on a pre-integrated platform. Upgrade projects are typically shorter, while projects with complex customizations may require additional time. In most cases, however, Alepo says it can launch without delay and implement customizations on a rolling schedule.

The company calculates that about 20% of project timeline is spent on integration with third-party vendors, with three weeks being typical for integration if the vendor does not already have an established partnership/IOT with the other vendors. Integrations with existing vendor partners only require 1–2 days, in addition to some time for testing and fine-tuning. The CRM vendors that Alepo regularly integrates with on production deployments include Redknee, Microsoft Dynamics, Oracle Siebel, IBM ICMS, Ericsson BSCS, Horus CRM, and Guatetira CRM.

In common with most other PCC solutions, Alepo’s solution is highly scalable, which it achieves by adding more blades. Its scalability is clearly demonstrated by the fact that, although the company tends to focus mainly on smaller tier-2 and tier-3 CSPs, one of the its largest customers, Saudi
Telecom (STC), employs Alepo’s Convergent Charging and Billing platform to support more than five million prepaid and postpaid broadband subscribers.

**Recommendation: Consider**

Alepo’s technology is on a par with that of similar-sized companies offering PCC, and it has a good track record for delivery and reliability. It also has a complete BSS stack to complement its PCC offering, which includes Wi-Fi offload, an LTE package, and Diameter signaling control among other products. Alepo has yet to produce a virtualized portfolio, but the move is definitely on its development roadmap. However, the company has not made it a priority until recently, as it points out it has only just begun to receive questions about virtualization from its current customers. That said, Alepo is very clear about the markets it wants to address, namely tier-2 and tier-3 CSPs in emerging markets. CSPs looking for a PCC solution, but which have reservations about the larger vendors and might feel more comfortable doing business with a smaller company, should seriously consider Alepo.

**Figure 6: Alepo radar diagrams**

**Amdocs: Leader**

Amdocs focuses on the CSP market. It has focused on meeting the needs of CSPs with its BSS, OSS, revenue management, and network control product portfolios, and with professional services and managed services operations. It added a network optimization portfolio through the acquisition of Actix and Celcite in 2013. Established in 1982, Amdocs uses direct sales channels into CSPs and does not generally use partners or other channels to market. Although it is a publicly owned company, Amdocs does not declare revenues from specific parts of the business or geographical regions. It employs more than 22,000 people worldwide, and announced full-year 2013 revenues of $3,346m, up slightly on full-year 2012 revenues of $3,247m.
Amdocs’ PCC solution is led by two business units within the overall Amdocs Product Business Group. These are the Data Experience Business Unit, formerly Bridgewater, and the Revenue Management Business Unit. Amdocs acquired Bridgewater in August 2011 and with it gained a market-leading PCRF. Amdocs initially integrated this solution with its online charging as part of a Data Experience Solution, using a proprietary solution for the Sy interface in 2011. Subsequently, the PCC functionality was fully integrated to Amdocs CES 9 suite in 2013, with standards-based Sy integration, as well as integration with the Amdocs product catalog. Its best-in-class pre-integrated policy and charging/BSS solution is available as part of the customer experience solutions (CES) portfolio and as separate standalone solutions (PCRF and OLC). The PCC solution is fully compliant with 3GPP R11, as is Amdocs’ PCRF 3GPP Release 11. In addition, the company recently announced its alignment with the ETSI NFV MANO (management and orchestration) architecture with the introduction of a VNF Manager (Amdocs Network Control Manager), as well as support for the reference integration with orchestration engines. As a result, its PCRF is orchestration-ready (and can be orchestrated within a MANO architecture), orchestration-neutral, and hypervisor agnostic. On the charging side, Amdocs Convergent Charging is fully compliant with 3GPP Release 11, aligned with NFV guidelines, architecture, and directions, and fully certified with VMWare.

Amdocs’ PCRF is vendor-neutral and is integrated with all major equipment providers and specialists around packet gateways, DPI, and optimization. The Data Experience BU also has its own professional services and delivery organization to assist in the deployment of Amdocs’ policy solutions. This team is focused exclusively on network/policy control deployments, as distinct from the broader Amdocs delivery organization. In addition, Data Experience has a dedicated interoperability team to proactively conduct interoperability testing with other vendors’ products for rapid time to market. Both of these teams are integral to deployment and interoperability around both Amdocs PCRF and integrated PCC solutions.

The deployment options for Amdocs PCC include licensing, which is Amdocs’ main source of revenue from software products. In some instances, it has also been deployed as part of a managed services engagement. In May 2013 and July 2013, Amdocs announced what it claims is the industry’s first fully virtualized charging platform.

Today, scaling typically involves the addition of new blades or servers, depending on the extent of the scalability requirements. Recently, Amdocs announced its alignment with ETSI standards and the introduction of a VNF manager function called the Amdocs Network Control Manager. This allows new instances of PCRF to be implemented in minutes. The orchestration engine interfaces directly with the NFV infrastructure to create instances of virtual machines, and via the VNF manager to configure PCRF instances. For the charging component, scalability is achieved using Amdocs’ own internally developed techniques, which enable both in-server and out-of-server scalability by splitting the solution into domains that can scale indefinitely up to the customer’s requirements. Using the same software, Amdocs can support operations for both small and very large service providers.

**Recommendation: shortlist**

For CSP’s looking for a pure-play CSP support software vendor to take them through the transformational migration to all-IP working, Amdocs is an obvious choice for shortlisting. It is probably the longest-serving CSP IT vendor in the industry, having only ever offered BSS and OSS products. Its reputation as a top-tier billing systems vendor has carried forward into the new era of realtime charging, which it consolidated by purchasing Bridgewater. At the time of the purchase, Bridgewater had developed probably one of the best PCRF components on the market. While Amdocs’ fully
integrated, end-to-end approach may appeal to the majority of higher-tier operators, smaller CSPs should also consider Amdocs as an option, as scalability either up or down is no longer a major consideration given that most CSPs’ IT now runs on x86 blades.

**Figure 7: Amdocs radar diagrams**

Source: Ovum

**AsiaInfo: Challenger**

AsiaInfo, formerly AsiaInfo – Linkage, was formed in 1993 with the specific intention of addressing the Chinese OSS/BSS market. In the last few years, the company has expanded into other parts of Asia-Pacific and Europe, most notably winning a BSS transformation with the Telenor Group asset in Denmark. The company currently has offices in China, Pakistan, Singapore, Thailand, Malaysia, Nepal, the UK, Denmark, and Hungary.

The company’s PCC solution belongs to the vendor’s billing business unit. Billing is part of its international BSS product portfolio, which also includes CRM and business intelligence / Big Data analytics. AsiaInfo also sells OSS and security products in China.

AsiaInfo’s first PCC deployment in international markets was in Thailand in 2011. This was based on existing realtime technology widely deployed in China. The products were initially developed as an integrated solution, but later enhanced to enable OCS and PCRF components to be deployed standalone. The company has integrated PCC with its overall Veris BSS product portfolio, which includes unified product catalog, CRM (including core modules covering subscriber profile), billing, and analytics.

The PCC conforms to all the usual standards such as 3GPP (Gx, Gy, Rx, Sy) and IETF’s Requests For Change (RFCs) in the area of online charging and policy control, as well as TMF Frameworx, eTOM, SID, and TAM standards. For a full PCC deployment with PCEF/ network integration and
simple BSS integration, AsiaInfo allows 3–6 months, but the usual caveats around individual scopes of work apply.

AsiaInfo’s PCC solution has proven scalability in some of the largest CSPs in the world, and can be deployed on commercial off-the-shelf blades or traditional servers. AsiaInfo’s PCC customers include: AIS in Thailand; China Mobile, China Unicom, and China Telecom in multiple provinces; and Zong in Pakistan. It has more than 30 million customers on true realtime charging.

AsiaInfo plans greater integration of its PCC with operators’ broader ecosystems. In addition, the company recognizes that there will be a greater requirement for more integration with application functions in the IMS core to support better quality of service control over bandwidth-critical services. Also, the greater use of policy will improve the rating and charging capabilities and flexibility of the online service controller. AsiaInfo also states that its PCC solutions are fully virtualized and available with multi-tenancy on private cloud platforms. Although this delivery option has so far not been deployed for PCC, other components of the Veris product suite have been deployed at a large scale on private cloud infrastructure.

**Recommendation: Shortlist**

AsiaInfo has a wealth of knowledge to bring to the European BSS market, and its use case demonstrations are impressive. The company’s long-term dominance of the Chinese BSS market, in which many regional networks have more subscribers than some European countries, has given AsiaInfo experience of enabling and supporting realtime charging and mobile broadband services that is unmatched by most other vendors in the sector. However, although its technology is on a par with the best available at present, we consider the company a challenger because it still needs to make its mark outside China and the Far East. AsiaInfo has landed a significant European BSS transformation contract with Telenor for the group’s Danish operations, and if this proves successful and results in an expansion of the contract to Telenor’s other territories, or AsiaInfo scores more tier-1 wins, it would then be a major player in the BSS market.
Cerillion: Challenger

Cerillion employs 170 staff and is headquartered in the UK. It has offices in London, Malta, and India. The company operates two principal lines of business: Enterprise BSS/OSS under the name Cerillion CRM & Billing, and cloud billing and subscription management under the name Cerillion Skyline. The company’s PCC solution – the Cerillion Convergent Charging System (Cerillion CCS) – is part of its pre-integrated enterprise BSS/OSS suite and is also deployed as the charging engine for Cerillion Skyline. Cerillion CCS was launched in April 2012 and has been deployed across a number of customer installations, including UK-based Relish, a new 4G communications services provider and part of the PCCW Group.

Cerillion CCS has been built in-house from the ground up based on the 3GPP / Diameter charging specifications. The policy and OLC elements have been developed as an integral part of the product from the beginning, but the vendor has retained the option to interface with external PCRF solutions over the Diameter Sy interface when required, using embedded diameter signaling controllers (DSC) and diameter routing agents (DRA) from Diametriq.

Cerillion CCS can be offered "as a service" and as a managed service, as well as the more traditional on-premise deployments. In common with most other vendors, Cerillion says that further releases of its PCC platform will be upgraded in conjunction with future 3GPP releases.

CCS can be delivered as a standalone PCC solution, and is already incorporated within Cerillion’s pre-integrated end-to-end BSS/OSS solution. The Cerillion CRM & Billing solution uses a centralized product catalog for CRM and self-service access to account balances and controls, as well as business intelligence across the entire pre-integrated suite. Cerillion is an active member of the TM Forum and has taken steps to align its BSS/OSS product suite with Frameworx where appropriate.

Source: Ovum

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However, in the specific case of PCC, Cerillion has built its Convergent Charging System (CCS) from the ground up based on the 3GPP charging specifications, currently supporting Release 11.

On average, Cerillion can undertake a CCS implementation in 2–4 months, but clearly this depends on the scope, scale, and complexity of the project. The percentage of the total project implementation time spent on integrating CCS with other vendors’ products and legacy BSS systems can vary between 30% and 60%, depending on the level and type of upstream / downstream interfaces. Cerillion CCS is usually offered as an integrated solution, but the OLC element can be delivered standalone / integrated with an external PCRF over the Diameter Sy interface when required.

**Recommendation: Consider**

Cerillion is a highly competent vendor with a product portfolio designed to appeal to specific market segments. It has a long history in the area of billing. When selling direct, Cerillion’s natural market is the tier-2 and tier-3 CSP market, but it is willing to consider projects involving tier-1 operators. Geographically, Cerillion’s sales footprint is somewhat limited, with sales offices in London, Malta, and India, but it does have references in the Americas, as well as in Europe and Asia-Pacific, demonstrating a wider attraction for its products. Cerillion is worth consideration as a potential supplier to tier-2 and tier-3 operators looking for a vendor with a comprehensive, fully integrated PCC that has the agility of a smaller supplier.

**Figure 9: Cerillion radar diagrams**

![Cerillion radar diagrams](image)

Source: Ovum

**Comverse: Leader**

Founded in 1982 and headquartered in Wakefield, Massachusetts, Comverse has offices in more than 120 countries and employs in excess of 3,500 people. Its BSS Solutions business unit develops, sells, and deploys BSS solutions, including integrated policy and charging, as well as managed services.
Comverse pre-integrated its Comverse ONE BSS solution and Policy Manager solutions in 2012. The two products were developed and sold separately prior to 2012, but their roadmaps have been synchronized. Since launching the unified solution in 2012, more than half of Comverse ONE sales have included policy manager.

Comverse claims that its customers realize the greatest benefits from the combined solution, with customers seeing fast time-to-market for new use cases as the most important advantage.

The company has been something of a pioneer in this area, with the introduction of a system that pre-loads a series of templates that define the parameters of specific service or pricing characteristics. Once data plans are created using a GUI, they are automatically translated to a set of PCRF-related rules within the lower level policy creation environment, from where they can be applied in the network space. This accelerates the introduction of new data plans and promotions. The parameters of the templates are set with the agreement of IT staff, meaning that marketing staff will receive an error message if they attempt to exceed the limits defined in the templates. This ensures there is no negative impact on the network. Typically, this means that a data plan cannot be implemented if it will compromise the network in terms of available bandwidth – depending on factors such as time of day or local contention in the access network. The parameters expressed in the templates can be changed in consultation with IT staff, and the changes will be reflected in the user interface at the business user level. This approach reduces the required interaction between IT and business users of the system, and simplifies the process of rolling out new pricing and realtime charging strategies. As a result, it is likely to become a model for creating the heart of a policy-centric ecosystem.

Comverse Policy Manager also works with third-party OCS solutions using a standard Sy interface, and Comverse OCS works with any third-party policy management and policy enforcement solution using standard Gy and Sy interfaces. Comverse offers on- or off-premise BSS and policy solutions. The vendor offers two main types of PCC projects: standalone policy projects, with or without enforcement, and unified charging and policy projects, for which contracts are split 50/50 between the two types.

Standalone policy project requires integration with third-party BSS systems, and 20–30% of the implementation time is typically spent on such integration. In common with most vendors, Comverse offers extensive pre- and post-sale consulting, training, and support. This includes defining the need for PCRF and PCEF and the function of each in the network pre-sale, identifying the market and the matching data plans to maximize income post-sale, and both theoretical and hands-on training.

The PCC is targeted at all geographies, although Comverse sees greater demand coming from emerging markets in Eastern Europe, Asia-Pacific, and Latin America. These emerging markets tend to be more innovative with their propositions and tariffs, and standalone and integrated policy projects are popular.

**Recommendation: Shortlist**

Comverse is worth shortlisting as a vendor with a wealth of experience in a variety of markets and network types. Despite having something of a checkered history with a series of reorganizations and changes of ownership, the vendor has an impressive list of tier-1 customers, including Vodafone, AT&T, SingTel, Orange, Verizon, Telstra, and TeliaSonera. Comverse has a comprehensive portfolio backed up by a strong focus on the telecoms industry. Comverse’s PCC is an integral part of its portfolio, having been developed in part to bridge the gap between service rating and charging and service implementation.
CSG: Challenger

Headquartered in Englewood, Colorado, US, CSG International (CSG) has sales/support offices in the US, Canada, Brazil, India, Thailand, Malaysia, Philippines, Singapore, Australia, China, UK, Ireland, France, Germany, Denmark, Sweden, Poland, UAE, Russia, Lebanon, and South Africa.

The company was founded in 1994, spinning off from a division from First Data to address the data processing needs of the North American cable television provider market. Over time, CSG has grown its business as a provider of managed services for customer service and billing operations to the leading cable and satellite providers in the region, managing the accounts and customer experience for more than 50 million subscribers and generating billing statements for more than 60 million households in the US. In 2010, CSG acquired Intec Telecom Systems, a UK-based global provider of BSS software and services with a client base of more than 400 CSPs. The two companies were combined and CSG International was born as a global provider of software and professional and managed services for CSPs. The CSG BSS portfolio includes the following products:

- **Singleview**— Customer management, charging, billing, and policy management solutions.
- **Total Services Mediation**— Offline and online mediation solutions and service activation.
- **Wholesale Business Management Solutions**— Interconnect billing, roaming, network assurance, and partner management modules.
- **ACP** – CSG’s cable and satellite provider customer care and billing platform.

Since 2010, CSG has expanded its global BSS portfolio through the acquisition of Ascade in the wholesale interconnect and routing space, and Volubill for its policy management solutions.
CSG launched its Singleview integrated charging and policy solution in January 2011. Following the acquisition of the Volubill assets in December 2013, CSG moved immediately to expand its original solution by replacing the PCRF component, first supplied through a partnership with Tango Telecom, with its own policy management module from Volubill. The PCC solution is now fully owned and provided wholly from within the Singleview suite.

The Singleview product suite has a long heritage as an online charging platform, having supported most of the Hutchison Whampoa 3G operations for prepaid and postpaid subscribers since the "3" brand launched in markets in Europe and Asia-Pacific more than 10 years ago. The CSG PCRF component has been in use for more than five years and the Volubill acquisition brought a significant number of additional PCC references. In terms of deployment options, CSG provides a managed service option for all its solutions, either hosted by CSG or on the customer’s own premises.

CSG's current development plans for Singleview PCC are to use technologies such as cloud orchestration, hardware platforms, and in-memory databases to offer a lower TCO for CSPs. The vendor adheres to the most recent 3GPP standards and is developing applications for VoLTE, QoS, Wi-Fi offload, and LTE roaming. As part of the overall Singleview suite the PCC is already integrated with customer management, product catalog, and analytics, and CSG says it will continue to integrate other software assets from within its portfolio where it sees a market need.

Singleview has been certified against TM Forum’s Frameworx and conforms to 3GPP TS 23.203 policy and charging control architecture and other related specifications. Sy and Sp interfaces are supported for integration with other vendors’ OLS/SPR or PCRF components, as well as to be used for internal integration within the Singleview suite. Gx and Gy interoperability testing has been conducted with a number of major PCEF vendors.

CSG has a global professional services organization that integrates and implements the PCC, working also with third-party SIs and CSPs’ in-house implementation teams.

The Singleview PCC solution is sold directly by CSG, but it is also available through the vendor’s relationships with SI partners and in some cases through technology partners, such as PCEF vendors. CSG is not actively promoting its portfolio outside of the telecoms vertical, but it does offer it on an opportunistic basis where the need arises, for example in utilities and logistics.

Other modules of the Singleview suite, including Customer Management, Convergent Billing, and Business Explorer, are all compatible with the PCC. In addition, CSG’s digital content monetization platform, Content Direct, has been integrated with PCC in a proof of concept and will be further integrated over time as part of CSG’s unified portfolio.

**Recommendation: Consider**

CSG is another company with a somewhat checkered history that has seen a revival in its fortunes following the earlier sale of its software division to rival Converse in 2005. Until recently, the company had been operating mainly in its original core market serving the US cable industry. With the acquisition of Intec Telecoms Systems, CSG has been able to expand back into the wider BSS market with its Singleview platform, and has since seen its revenues grow steadily and its customer base expand. CSG should be given serious consideration as a possible supplier by CSPs of all sizes, but particularly those with a cable or fixed-line element to their operations, where CSG’s deepest expertise lies. That said, CSG’s winning of contracts for its PCC for mobile networks signals that the company has set its sights on serving a wider market. In addition, the vendor’s plan to embrace cloud
and virtualization in a big way shows a forward-thinking culture, which vendors and their customers will need necessary to achieve commercial success.

**Figure 11: CSG radar diagrams**

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Source: Ovum

**Ericsson: Leader**

Ericsson traces its roots as far back as 1876, when the company was first formed in Stockholm. With offices worldwide, the company has more than 117,000 employees as of September 2014.

Ericsson launched its first PCC product in 2011, following in-house development of the product. The company employed its own R&D product development for the two key functions of the PCC control plane, namely the PCRF and OCS (online charging system), in compliance with the 3GPP PCC standards. The vendor’s two product offerings in this area are the Ericsson SAPC (Service-Aware Policy Controller), and the Ericsson Charging System/Mobile Broadband Charging (CS/MBC).

Ericsson offers SAPC and CS/MBC under a pre-integrated end-to-end solution named Service Aware Charging & Control (SACC), also known as Ericsson Integrated Policy and Charging.

Ericsson SACC goes beyond the requirements of the 3GPP specification and complies with standards such as the Broadband Forum’s Broadband Policy Control Framework, the TISPAN Diameter-based Resource Admission Control Function, and the Wi-Fi Alliance’s HS2.0 for Wi-Fi roaming. Ericsson’s SACC integrates with a range of the company’s other products, including analytics, SDN, and IMS for VoLTE/Wi-Fi Calling. It also supports Catalog Manager and Order Manager for a fast time to market, along with Multiscreen Self-Care for customer interaction and CSP CRM. It also supports standalone PCEF (Policy Control Enforcement Function) and TDF functions, OCS, and PCRF from other vendors. The vendor also offers a number of deployment options that include PCC as a managed service, SaaS, and virtualized function.
Integration is generally carried out by Ericsson’s internal CSI team developed specifically for the task. Indeed, Ericsson Global Services has developed a complete service portfolio specifically for the rollout of PCC deployment. Furthermore, its regional Engagement Practices include PCC consultancy experts, while its global Competence Hubs come with certified solution architects specializing in PCC system integration services.

Ericsson’s integrated PCC is aimed at operators that want to personalize their offers and care based on network and customers in their data offers on top of their basic connectivity services. Ericsson claims its integrated PCC accelerates time to market for innovative services, allowing new sources of revenues, reducing churn, and significantly lowering opex for the solution.

In terms of geographical focus, Ericsson says it has not found a geographical pattern in terms of demand for PCC. From a demographic perspective, integrated PCC is more relevant for markets with low data ARPU and high prepaid penetration, mainly to provide segmentation that can attract users to mobile broadband data usage based on specific applications bundles. However, integrated PCC has been deployed in high data ARPU markets, dominated by postpaid penetration with good results, and the present and coming LTE deployments and other network types will increase the importance of the PCC solution for differentiating more demanding services such as TV and streaming media.

**Recommendation: shortlist**

Ericsson is undoubtedly a market leader in this field, not just because it has a long pedigree as a telecoms equipment and services vendor, but because it has had the foresight to see beyond the immediate demands of the market to the potential uses for a versatile PCC across a range of network types. Indeed, compliance with TISPAN and Wi-Fi Alliance standards demonstrates the breadth of Ericsson’s vision and the importance it places on the role of PCC in different network types. Ericsson has also covered all the deployment options and implementation strategies that are likely to arise from the differing requirements of CSPs globally, not only in terms of cross-vendor interoperability, but also with its managed services, SaaS, and virtualization options. CSPs looking for a solid CSP vendor that can provide everything they are likely to require for the foreseeable future should definitely shortlist Ericsson.
Figure 12: Ericsson radar diagrams

Matrixx Software: Challenger

Matrixx Software was established in 2008 and is headquartered in Mountain View, California. The vendor employs 95 staff and has sales and services offices in the UK, Australia, New Zealand, Malaysia, Singapore, and UAE.

It has a single product management and engineering organization that is responsible for both the core platform and all products. Most of the management team has a long history in real-time charging systems, having been the founders of Portal Software, which was acquired by Oracle in 2006.

Matrixx signed its first deal with Swisscom in 2012 and has since signed new clients in various geographies. It has on its books a number of MVNOs across Europe, two projects in Australia with Telstra, and one in New Zealand with Vodafone. The vendor is currently focused on expanding its presence in European, Asian, and Latin American markets. It has undergone three rounds of funding, raising approximately $35m to date. Along with its large venture capital funds, the company has received investment from large tier-1 CSPs such as Swisscom and Telstra Ventures. This highlights the more collaborative and partnership-led approach that the vendor has ingrained in its business model.

One of the key differentiations of Matrixx Software is its underlying technology, dubbed Parallel-Matrixx Technology, which the vendor claims offers unrivalled speed and scalability. The PCC was developed in-house by Matrixx using a number of patented technologies developed by the company since its formation in 2008.

Matrixx’s portfolio is extremely revenue management-centric, and includes online charging, policy management, centralized balance management, unified subscriber profile management, product
catalog, sharing and hierarchy management for consumer and enterprise, digital self-care support, and analytics enablement. In common with some of the other pure-play PCC vendors, Matrixx does not offer its own CRM, analytics, or product lifecycle management, preferring instead to concentrate on fully exploiting its core product.

**Recommendation: Consider**

Matrixx is well worth consideration by CSPs looking for powerful software from a very single-minded vendor, and for CSPs looking to inject strategic functionality into their existing stack, allowing them to gain a lot of technical and business capability without having to build a new BSS stack. MVNOs/MVNEs should also consider Matrixx for their realtime charging functionality, as there are few vendors that have developed charging packages specifically for this sector of the market.

**Figure 13: Matrixx radar diagrams**

Source: Ovum

**NetCracker: Leader**

NetCracker is a wholly owned subsidiary of NEC Corp. that operates independently of its parent company, which is focused on the communications and media industry.

Its PCC products span three teams working in conjunction with each other. These are:

- **Customer Management** – within solution delivery and rating & charging
- **Engineering** – responsible for product development and customer support
- **Product Management** – responsible for the overall direction and management of the product line.

In June 2012, NetCracker completed the acquisition of Convergys’s Information Management business, and with it gained aspects of its current PCC solutions. Previously, other components of its
PCC portfolio came from NEC acquiring NetCracker in 2008 and subsequently shifting its BSS technology portfolio into NetCracker’s portfolio. Indeed, the backing NetCracker receives from NEC, combined with the latter’s expertise in network infrastructure, puts NetCracker on a par with the likes of Ericsson in terms of experience and resources.

The first NetCracker PCC solution went live in 2011. NetCracker’s OLC component was developed years earlier to initially provide realtime authorization, balance management, and prepaid capabilities for telecoms. It was a natural evolution for the vendor’s OLC component to be fully integrated with PCRF – which was established a few years later than its OLC – to provide a complete in-house PCC solution.

NetCracker has an ongoing development project to integrate and evolve its charging, policy, and product catalog product lines. The company is extending its existing quota management functionality to provide a high-availability, low-latency solution that can be configured for a wide range of deployments. NetCracker’s solutions are designed to integrate with third-party vendors using industry standard interfaces and/or open Web APIs. The solution has been deployed in multi-vendor environments in many operator networks, interoperating with several third-party vendor products. NetCracker’s solutions support the eTOM/SID product model and the PCC architecture as defined by 3GPP Standards with Sy, Gy, Gx, Ro, and Rf interfaces.

NetCracker provides its own services that cover the integration and testing of its solutions with third-party vendors. In some cases, NetCracker has provided guidance and consulting to support third-party SIs that have been specifically contracted to perform the end-to-end integration on behalf of operators’ IT/network teams. In the context of a PCC implementation, a typical project consists of integration between the PCC architecture’s three core components: PCRF, OCS, and PGW. Roughly 25% of implementation time is spent integrating and testing the core components. In NetCracker’s experience a major portion of the implementation timeline consists of designing the policies and the basic data that needs to be set up to create, implement, deploy, and test the policies.

The OCS supports integration with other commercial policy control engines via SPR/UDR and Sy interfaces. The strength of the OCS is its support for rich and mature balance management functionality that is made available to the realtime network over the Sy interface. In addition, NetCracker has its own PCRF that it markets independently and currently deploys with several operators.

NetCracker has designed its integrated charging, policy, and rating portfolio to be useable across any telecoms operator’s domain. Network operators and service providers are no longer restricted to a single domain. Increasingly, services are being delivered over a combination of wireless and wireline assets using a diverse set of technology components. The NetCracker solution is therefore built with a common set of software modules that can be used easily by a wireless, wireline, or broadband operator. NetCracker has a diverse customer base with several cable, wireless, and 2ireline operators using the various NetCracker TOMS OSS/BSS suite. Its integrated charging, policy, and rating portfolio provides tools to address each of these operators’ specific business needs.

The primary drivers for policy-based charging and rating in Asia-Pacific and European markets seems to be the introduction of LTE networks and the associated shift toward data services, according to NetCracker. An added aspect of these markets seems to be the replacement or decommissioning of legacy IN/SCP systems as users are moved to LTE services.
NetCracker’s integrated charging, policy, and rating portfolio has been integrated with its TOMS Customer Information Management, Product Information Management, Product Lifecycle Management, Customer Billing Management, Service Information Management, and Resource Management modules, allowing operators to get a cohesive E2E view of their policy-enabled infrastructure.

**Recommendation: Shortlist**

NetCracker is a major force in the OSS/BSS sector and its strength in realtime charging and policy needs little explanation. With the backing of NEC Corporation and its experience in providing network infrastructure, NetCracker has been able to take a considerable slice of the OSS/BSS market, with a significant proportion of its revenues deriving from PCC. NetCracker has the necessary depth of experience and knowledge, and product portfolio, to make it a foregone conclusion to shortlist it as a potential PCC supplier for most CSPs looking to build future-proof support for their next-generation networks and services.

**Openet: Leader**

Openet was founded in 1999 and employs more than 800 people. It is headquartered in Ireland and has sales and support offices in Brazil, Ireland, Malaysia, and the US; these are all regional offices with a minimum of 100 staff in each office. It also has local sales in many other countries in different regions.

Openet has provided online charging since 2002. It launched policy management in 2008, and has integrated this with OLC since then. The solution has been built entirely in-house and from the ground up.
Openet prides itself on the innovation it has achieved by investing heavily in R&D and spending significant time and resources on think tanks and what it calls "ideation" processes to develop new use cases for PCC. Examples of use cases include the virtualization of its PCC systems and investment in development to provide new systems on the back of PCC, such as a realtime offer management system that uses the offer catalog in the PCC, or realtime data collection capabilities to provide realtime contextual aware upsell and marketing direct to the end-user device. In addition to this, Openet is heavily involved in standards bodies such as ETSI and 3GPP, and all Openet products are built and deployed on a common framework, ensuring integration with all relevant components is built into the design.

Over time, Openet has interfaced with every major vendor in the industry. Its PCC has a secure API gateway to ease integration with other vendor’s products and the company actively promotes an open ecosystem.

Projects typically last from six weeks to six months depending on their complexity, and the virtualization of all Openet products is further reducing the timescales for implementation. In addition to standard PCC products, Openet offers a preconfigured PCC offering called Revenue Express. This is designed to rapidly deliver the common business requirements of operators with reduced complexity and ease of operation. Openet Revenue Express implementations are pre-defined for rapid deployment (typically around 6 weeks), and have reduced risk and administrative costs.

Openet’s customers include a wide array of CSPs, ranging from the largest tier-1s to tier-3 operators. These include AT&T, Verizon Wireless, Bell Canada, Telus, Sprint, Nextel, US Cellular, CTBC (Brazil), Brighthouse, Videotron, BT, T-Mobile Netherland, Orange France, Vodafone Netherlands, Orange Poland, Orange Slovakia, Telekom Austria Group, VIP Net, VIP Mobile, Velcom, SiMobil, Mtel, A1 Telekom Austria, Eircom, Softbank, Sri Lanka Telecom, TeleGreenland, Time Warner Cable, Charter Communications, ViaSat, INWI, Telekom South Africa, Neotel, YTL, and Mobinil.

**Recommendation: Shortlist**

It is worth CSP shortlisting Openet when considering a PCC purchase because of the vendor’s reputation for being a forward-looking company with a strong pedigree in policy and charging. The company has demonstrated a holistic understanding of CSPs’ requirements, particularly in relation to rating and charging. The vendor’s recent tie-up with OpenCloud to support legacy IN alongside realtime, policy-driven charging demonstrates an understanding of some of the issues facing CSPs, particularly those with legacy issues. In addition, the decision to virtualize the company’s entire BSS stack demonstrates an appreciation of the need offer an attractive proposition in an increasingly competitive market. Openet does not have the clout of the market leaders, but for CSPs great and small, it is a vendor that punches well above its weight and is worthy of serious consideration.
Oracle: Leader

US IT giant Oracle was founded in 1977 and has offices worldwide, employing more than 120,000 people. The company’s Communications Global Business Unit (CGBU) is responsible for software, hardware, services, sales, engineering, and marketing within the telecoms market. PCC components, called collectively the Oracle Communications Convergent Charging and Policy (CCP) solution, fall under the domain of the CGBU business unit, although the unit is also responsible for PCC sales in other digital commerce verticals that fall outside of the traditional telecoms domain.

Oracle acquired a PCRF when it bought Tekelec in 2013, in addition to other capabilities such as Diameter Signaling Routing, the Eagle STP, and other network applications. Oracle already had an integrated PCC solution called Oracle Communications CCP, which it launched in 2011, with a PCRF developed internally by Oracle. In 2013, Oracle launched a version of PCC that incorporated the newly acquired Tekelec PCRF.

Policy and charging elements were developed separately and integrated using standard 3GPP interfaces. The Service Control Point (SCP) for SS7 connectivity, which is also included in the package, was acquired through the purchase of technologies from eServGlobal. Apart from on-site implementation, the Oracle PCC can be offered as a managed service direct from Oracle or through one of its partners.

Oracle’s CCP solution investment strategy focuses on helping service providers to optimize and innovate in an evolving IP network landscape. The company’s aim is to support low-cost, high-volume transaction processing in an always-available, network-grade deployment architecture by integrating charging, policy, and analytics. Development is driven in part by established programs within the
CGBU, such as the Customer Advisory Board (CAB), which it uses to solicit roadmap items for the CCP solution.

Oracle's current PCC solution integrates with analytics (Oracle Communications Data Model), CRM (Oracle’s Siebel CRM), network exposure (policy and charging partner connectivity through Oracle Communications Services Gatekeeper), and Oracle Communications Order and Service Management (OSM). The subscriber profile repository (SPR) is included within the PCC Oracle technology.

The Oracle Communications CCP solution conforms to 3GPP standards with respect to integration between the OCS and PCRF, specifically the Sy, Sp, Gx, and Gy interfaces. Components of the Convergent Charging and Policy solution, such as the Oracle Communications Data Model (OCDM) and Pricing Design Center (PDC), are TMF SID aligned and TMF Frameworx certified. In addition, extension of the CCP solution into the business layer, for example to CRM, is accomplished through the TMF Frameworx certified Oracle Unified BRM CRM and Rapid Offer Design and Order Delivery (RODOD) solutions. The standards-based approach and open APIs of the Oracle Communications CCP solution allow integrations with third-party vendor products.

The Oracle Communications CCP solution is pre-integrated by Oracle, and the company says that no third-party integrations are necessary for the pre-integrated solution itself. However, integrating the CCP solution into the larger solution provider IT and network environment is accomplished through an extensive network of certified system integration partners using the solution’s open, standards-based interfaces.

Oracle says implementation time varies greatly depending on the size of the operator, the complexity of the network and IT environment, and the required integrations. "Greenfield" implementations of the solution, including standards-based interfaces to network elements, can be accomplished within three to six months. While policy management (PCRF) and charging (OCS) functions are available as separate product elements, the PCC solution is pre-integrated using standard 3GPP interfaces.

The CCP solution is not aimed at a specific tier or type of CSP. Indeed, one of the strengths of the solution is that it is agnostic in terms of service types, networks, geographies, and size of service provider. The solution is sold directly by Oracle as well as through an extensive group of certified SI partners, and has also been sold to verticals outside the traditional telecoms space. Examples include cloud providers, media companies, M2M and telematics, and financial institutions.

**Recommendation: Shortlist**

Oracle’s experience in IT has led it to make some judicious choices in terms of acquisitions to complement its organic R&D investment strategy for its CCP solution, and it therefore has a very credible offering that is likely to have across-the-board appeal in the CSP community. It also has a widely recognized CRM brand that integrates with the CCP solution. Therefore, we highly recommend shortlisting Oracle.
Orga Systems was founded in 2003 and is headquartered in Paderborn, Germany. The company has sales and support offices in Brazil, Argentina, Germany, Italy, Ukraine, Russia, India, and Turkey and employs in excess of 500 people.

Originally a spin-off from a SIM-card supplier, Orga Systems launched into the billing market in 1994 with the world’s first prepaid system for GSM. Since then, the company has concentrated on developing its realtime capabilities. Following changes of ownership and a major refocusing of its strategy, Orga Systems launched its integrated PCC platform in 2010.

This PCC platform was a direct development of Orga Systems’ online charging capability and its then newly developed policy engine. Rather than build a completely new product from scratch, the two functions were combined by developing an interface layer as a separate capability. Both realtime charging and policy functions have since been fully integrated into Orga Systems’ Gold Convergent Charging and Billing (Gold CCB) product, and the PCC is now only offered as a single integrated function.

Orga Systems says that the unique feature of its PCC architecture is the embedded policy control, with there being no question of policy being separate or indeed implemented as a discreet component in the Orga Systems ecosystem. Orga Systems believes policy will be at the very heart of BSS in the future. Further development of the PCC is centered on integrating it with the vendor’s enhanced product and service catalogs, along with its order management platform, currently marketed as Gold Catalog and Order Management (Gold COM). Orga Systems also plans to virtualize its portfolio, although it does not currently offer its products as a managed service. At present, Orga Systems’ own
staff usually integrate the PCC into existing systems, although third-party systems integrators are employed for some customer-led projects.

Sales of the PCC and associated software are made mainly through channel partners, and are aimed at all tiers exclusively within the telecoms sector, in all geographic regions. However, most of its customer references are tier-2 CSPs, with the exception of Telecom Italia and America Movil Group.

**Recommendation: consider**

Orga Systems is worth considering as a potential supplier of PCC, not least for its long involvement in the development of realtime charging systems. In addition, Orga Systems has for the last few years concentrated on putting policy control at the heart of BSS, and it has been ahead of many of its competitors in terms of the application of policy control and realtime charging, making it something of an expert in the field.

**Figure 17: Orga systems radar diagrams**

![Radar Diagrams](image)

Source: Ovum

**Redknee: Leader**

Located in Canada, Redknee was founded in 1999 and employs over 1,500 people globally. Originally, Redknee’s policy solution, which it calls PCS, was developed independently from its convergent charging solution, and the two solutions were integrated and deployed for the first time in 2010. The product is currently in service at more than 60 operators worldwide.

Over the last few years, Redknee has grown both organically and through acquisitions – including Argent, Nimbus Systems, and most recently the business support system unit from Nokia Siemens Networks (NSN). Apart from spreading Redknee’s customer footprint, the NSN transaction has expanded the vendor’s realtime converged end-to-end billing BSS portfolio, allowing Redknee to provide solutions – on-premise, cloud-based, or as a service – to a claimed two billion plus
subscribers across the globe. Redknee is one of the leading vendors in the PCC sector, consistently topping the table of BSS vendors in Ovum’s OSS/BSS contracts tracker due to its number of publicly announced contract wins every quarter.

Redknee continues to invest in virtualization and cloud, not only from a cost-reduction perspective, but also for speed to market, which is what most CSPs are looking for at present. The company views PCC as key to monetizing the Internet of Things market, and sees a great opportunity for its solution to enable this emerging connected ecosystem to come to fruition.

Redknee’s PCC solution conforms to all relevant standards for policy control (3GPP, 3GPP2, GSMA IR92 (VoLTE)), relevant IETF standards (RFC 6733/RFC3588, ETSI, BBF Forum). In addition, Redknee is also planning to bring its PCC into line with Open Stack Forum and Open NFV. The product is also compliant with all other standard interfaces and gateways, including GGSN, SAE-GW, and P-GW, along with DPI via the standard Gx Interface. Integration is carried out either by Redknee or an approved channel partner on a case-by-case basis. Redknee estimates that, on average, a PCC deployment that includes installation, integration, and acceptance testing makes up between 20% and 30% of a typical BSS project, but this can vary depending on the complexity of the work required.

Redknee claims its PCC is scalable for any tier or type of CSP, and that it is finding traction in all geographic regions and markets. It currently claims to support more than 200 service providers in 90 countries.

**Recommendation: Shortlist**

Redknee should be on every CSPs shortlist as a PCC supplier because of its unwavering focus on policy and realtime charging. The company has also proved itself to be innovative and forward-looking with its development of cloud-based systems and virtualized BSS. Redknee has the usual portfolio of peripheral modules such as customer care and billing, but there are few vendors that are so focused on leveraging the benefits of realtime technology.
Appendix

Further reading


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Ovum Consulting

We hope that this analysis will help you make informed and imaginative business decisions. If you have further requirements, Ovum’s consulting team may be able to help you. For more information about Ovum’s consulting capabilities, please contact us directly at consulting@ovum.com.

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