

# BSS in the Cloud



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## Key points

- Research suggests that the trend towards cloud-based BSS is being driven by convergent operators looking to reduce capital expenditure and operating costs.
- 34% of the respondents to Informa’s survey said they were already using some form of cloud-based BSS and a further 33% said they were currently evaluating the idea.
- Cloud-based BSS is already an option for CSPs but initial take-up is led by billing and revenue management services.
- Almost half of the survey respondents said they preferred to pay for cloud-based BSS on a “pay-as-you-go” basis.
- Security and data privacy are top among the factors which could possibly inhibit the uptake of cloud-based BSS.
- There is a strong preference for the private cloud model for mission-critical operations such as BSS.
- 80% of survey respondents said they were seeing cloud-based BSS products coming to market which met their needs and expectations.

## Overview

The BSS market has changed radically in recent years as the telecoms industry has adopted new technologies such as HSPA and, more recently, LTE. All-IP networks that have opened the way for more sophisticated services have resulted in a need for increasingly complex support systems. To a degree, these requirements have been fulfilled by the use of outsourcing and third-party service management; however, the appearance of a new business model – cloud-based BSS – is promising to offer communication service providers (CSPs) an alternative to existing solutions.

Though difficult to define, cloud-based BSS is essentially a blanket term for a centralized software stack which supports everything from billing, sales management, customer-service management, and customer databases. It is fundamentally different from a managed service in that CSPs generally only access and pay for specific functions as and when needed and the stack is not necessarily owned or accessed by a single CSP.

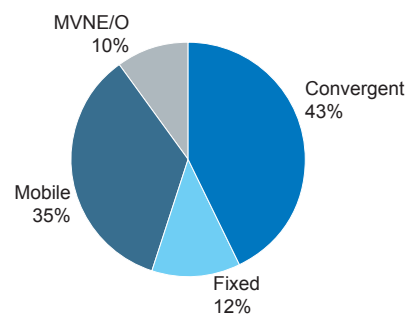
Therefore, cloud-based BSS offers a way of exploiting the best of new technologies at a time when CSPs are under extreme pressure to deliver higher QoS, and customer expectations are greater than they have ever been. Cloud-based BSS addresses issues of capex and opex while meeting the need for innovative pricing strategies, billing, charging and service management. Not every vendor offers a complete stack – indeed, at the time of writing very few do. However, BSS vendors have either developed or are in the process of developing individual cloud-compatible components which can populate the BSS cloud in much the same way they do in the conventional BSS stack.

In June 2013, Informa Telecoms & Media conducted an online global survey of key industry executives. Its purpose was to explore the degree to which cloud-based BSS has been adopted thus far, what prospects there are for widespread adoption and which factors are likely to influence CSPs’ propensity towards using cloud-based BSS as an alternative to current usage models in the future.

In total, 100 CSPs responded to the survey: 43% described themselves as “convergent” operators and over a third as mobile operators; the remainder were fixed operators and MVNE/Os (see fig. 1).

This white paper summarizes the conclusions from the survey

**Fig. 1: Survey question: Which of the following describes your company?**



N=100  
Source: Informa Telecoms & Media

and the subsequent in-depth interviews with a number of key industry executives including some representing equipment and software vendors.

### CSPs' business challenges

One of the most pressing challenges facing CSPs of all sizes and in most markets around the world is that of cost reduction. In a time of global financial difficulty, CSPs that have just invested in procuring spectrum licenses and rolling out new mobile-broadband technologies are realizing that further and significant outlay on new or improved BSS will be required if they are to get a return on their investments so far. Initial outlay on new software support systems is not the whole problem, however; the cost of maintaining BSS which support next-generation services is likely to be an ongoing burden as the mobile-broadband market develops and the need for more sophisticated functionality increases.

Another issue which CSPs must address is that of churn. Retaining customers in an increasingly competitive market is proving progressively more difficult as new technologies and services come on stream. To offset the pressure on customers to churn, CSPs not only need to offer innovative pricing bundles and real-time discounts, but they must also look for ways to create a much closer relationship with their customers through personalized usage alerts and accurately targeted marketing messages.

It is also through using these abilities that CSPs can address the problem of differentiation. In both mature and emerging markets, it is

becoming increasingly difficult for CSPs to formulate marketing and pricing strategies which clearly set them apart from their competitors in the eyes of their customers and this is a problem that will only increase with time.

### The benefits of cloud-based BSS

These challenges currently facing operators can almost all be addressed by many BSS software stacks currently available commercially. Functions such as real-time charging, policy control, convergent and IN prepaid charging are already widely available; however, the ability to tie these functions together and combine them with Big Data, analytics and near-real-time processing is beginning to add up to a hefty chunk of investment at a time when CSPs can least afford it and with only what at present is a theoretical return on investment.

In addition, CSPs need a cost-effective means of addressing an issue which has been an elusive goal since the inception of GSM a couple of decades ago – a fast service rollout. Achieving this goal requires massive investment in order-to-cash systems, product catalog and service-design systems along with customer self-provisioning and the point-of-sale front-end platforms required to achieve the required scope and flexibility to support innovative and – above all else – fast service rollout.

The search for a solution to these problems in the past would most likely have led CSPs to a managed or outsourced strategy. However, although some of the arguments for outsourcing also apply to

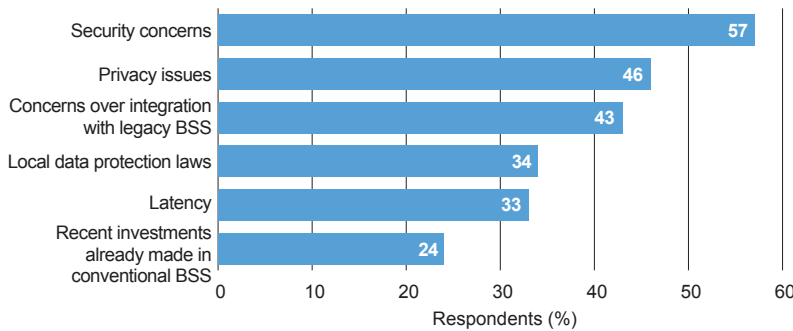
cloud-based BSS, the latter has a distinct advantage. Both managed and cloud-based BSS offer greatly reduced capex and automatic software upgrades instead of change requests and neither requires the CSP to have a high degree of in-house IT skills. However, cloud-based BSS provides the potential to offer more flexible costing models which allow CSPs to pay either according to the number of subscribers they have or according to the number of times a particular service is used. Traditionally, managed-service providers charge irrespective of usage and, although the managed-services model has moved towards risk-sharing and business-based KPIs, cloud-based BSS promises to be more flexible.

The survey results showed that “pay-as-you-go” was by far the most popular method of accessing or potentially accessing cloud-based BSS: 49% of respondents said they preferred to pay according to usage compared with 23% that were in favor of paying according to the number of subscribers they had on the system. The remainder expressed a preference for an “all you can eat” solution (18%) or no particular preference. Indeed, the “pay-as-you-go” model represents a very efficient way of using support software because there is a direct correlation between traffic levels and running costs, meaning CSPs are not paying for resources they are not using.

### Inhibiting factors

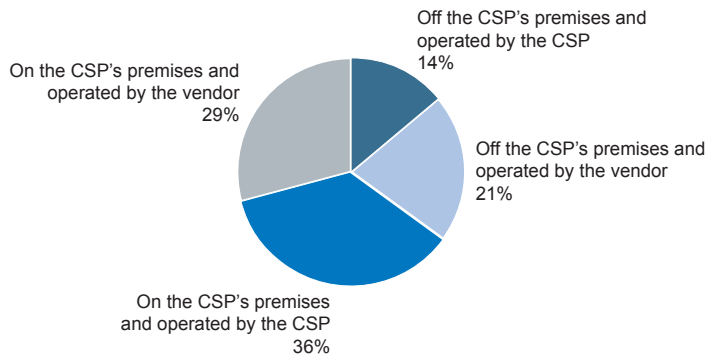
Cloud-based BSS is still in its infancy. Take-up is patchy and the concept is still viewed in some quarters with a degree of skepticism, if not suspicion. Reasons for this early reticence

**Fig. 2: Survey question: Which factors would inhibit your decision to move to cloud-based BSS?**



Note: N=100  
Source: Informa Telecoms & Media

**Fig. 3: Survey question: Where do you think your cloud BSS should be located and who should be responsible for operations?**



Note: N=100  
Source: Informa Telecoms & Media

given by survey respondents were varied, but centered mainly on security and privacy issues (see fig. 2); however, other and rather different concerns were not far behind.

Security is a relative term and is an issue which is kept to the fore by regular reports of hacking attacks, often involving millions of customer records. While such concerns are not unique to cloud-based services, as a relatively new business model, it is particularly important for vendors to reassure CSPs that cloud-based BSS is at least as safe as any other model where sensitive and valuable data may be processed by third-party systems. In response, vendors

are keen to point out that their products comply with the relevant IT governance standards such as ISO27001 and therefore their systems are as secure as is currently possible.

Privacy is a slightly different issue so far as cloud-based BSS is concerned because some CSPs are unhappy with the notion of a multi-tenancy cloud. While guarantees that absolute separation of data belonging to different CSPs is assured, operators are currently voting with their feet and the majority of those responding to the survey (36%) expressed a preference for operating their own cloud-based BSS on their own premises (see fig. 3). Even the 29%

of respondents who were willing to site the cloud infrastructure on premises other than their own still wanted to keep control of the operation, suggesting that there is, for the time being at least, a strong preference for the private cloud model for mission-critical operations such as BSS.

A big incentive to structure cloud-based systems so that data remains local to the operational center are local data privacy laws which, although varying from one country to another, generally prohibit the movement of data outside the customer's home country. While this is not an issue for operators with a single geographical footprint, it is a potential difficulty for international operators with multinational footprints looking to centralize their telecoms IT systems. Anecdotally, some vendors have said they are working on systems which define templates for business processes centrally and then export them to their regional operations so that, while data processing is carried out locally, it is done according to a common format but without transgressing data protection legislation.

Other concerns, such as latency and integration between cloud and legacy systems, are probably best addressed on a case-by-case basis as there are a number of factors which could have a bearing on cost and efficiency. Acceptable latency in a real-time environment, for example, can vary according to what customers are already used to on their existing network. For some on older networks, this will mean delays of one or two seconds or more before receiving charging information or some other

kind of response are perfectly acceptable, whereas in networks being upgraded from, for example, HSPA to LTE, anything more than a few milliseconds could prove frustrating for end users.

The ease with which cloud-based BSS can integrate with a CSP's existing stack is again a case-by-case issue. One of the main factors which could affect relatively trouble-free integration is the choice of cloud vendor. The crucial criterion could be if the CSP has already sourced legacy BSS from the same vendor and can therefore take advantage of proprietary interfaces. Alternatively, sourcing from a vendor that has developed

interfaces or data-abstraction interfaces for a wide range of BSS elements from most major suppliers, or which guarantees conformity to TeleManagement Forum Framework standards, could also be an effective way of negating integration issues.

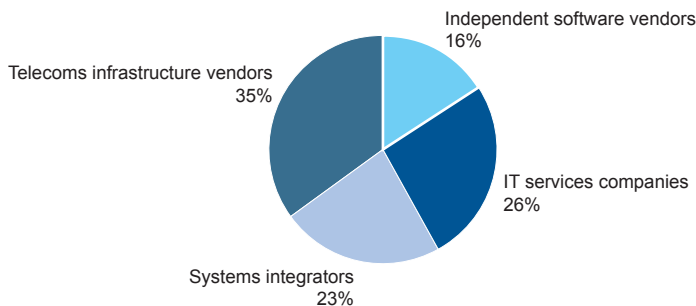
In more general terms, so far as the issues around security and privacy are concerned, there is a historical lesson to be learned from managed services here and it is that trust between the vendor and the customer has to be established. This, however, takes time to develop and could be the logic behind CSPs' preference to source cloud-based BSS

from telecoms infrastructure vendors (35%) as opposed to IT services companies (26%), systems integrators (23%) or independent software vendors (16%) (see fig. 4). This could also be a sign that, although BSS is now far more IT-oriented than it has ever been, CSPs still feel there is some advantage to be gained from sourcing cloud-based BSS from established telecoms infrastructure vendors. A factor here may be that infrastructure vendors also tend to offer discounts on software to CSPs that are using their proprietary hardware; however, this conclusion is purely speculative.

### Cloud-based BSS drivers

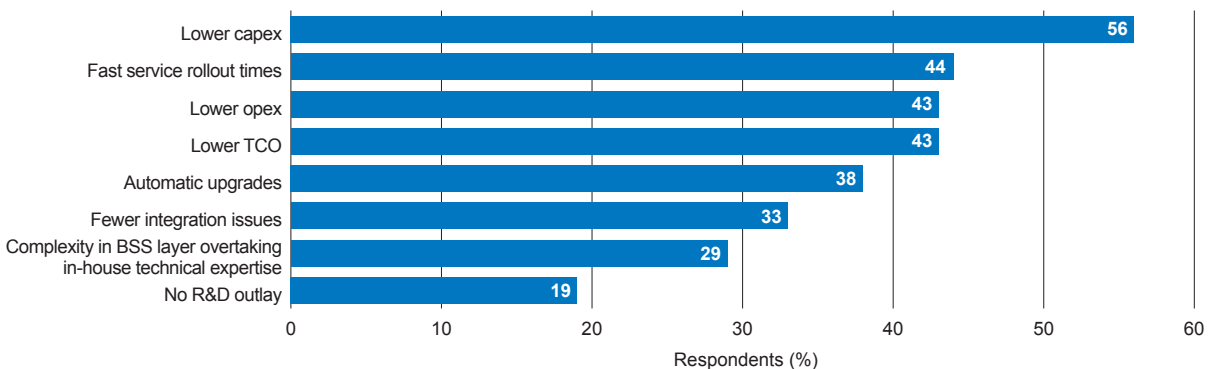
As mentioned earlier, reduced capex and opex are both attractive features of cloud-based BSS and indeed these are the two of the top reasons cited by respondents to the survey for considering adoption – 56% and 43%, respectively (see fig. 5). These reasons were split, however, by the need for fast service rollout (44%). It is worth noting at this point that, although there is nothing intrinsic in cloud-based BSS which enables fast

**Fig. 4: Survey question: From which category of vendor are you most likely to source cloud-based BSS?**



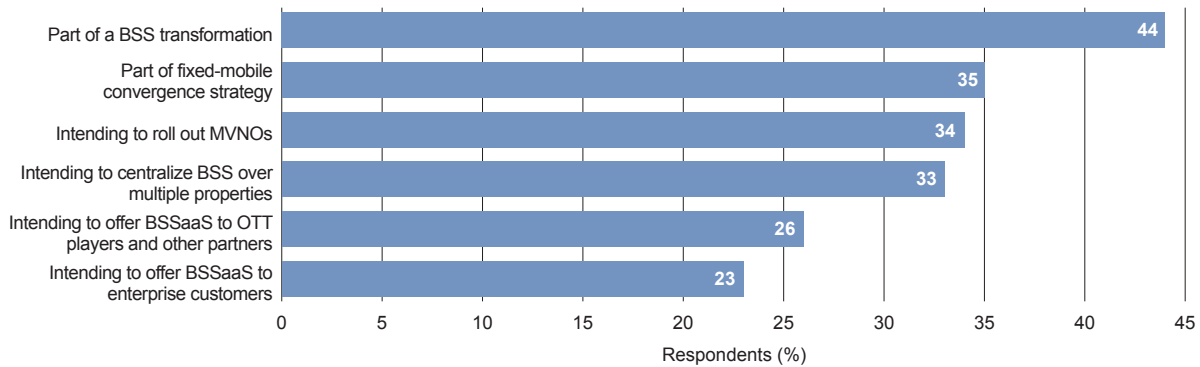
N=100  
Source: Informa Telecoms & Media

**Fig. 5: Survey question: For which reasons would you adopt – or have already adopted – cloud-based BSS as a replacement/extension of your existing BSS? (Please tick more than one)**



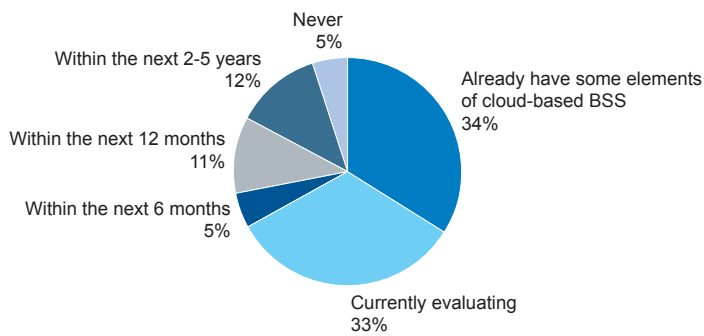
Note: N=100  
Source: Informa Telecoms & Media

**Fig. 6: Survey question: For which reasons would you – or have already – find cloud-based BSS an attractive proposition?**



Note: N=100  
Source: Informa Telecoms & Media

**Fig. 7: Survey question: When do you intend to adopt elements of cloud-based BSS?**



N=100  
Source: Informa Telecoms & Media

about why these changes are taking place by underlining the desire to centralize BSS in order to expand the range of services offered by CSPs: Transformation and centralization are strategies aimed at improving rollout times and reducing capex and opex. However, the survey question also reveals that the areas CSPs are looking to for increased revenue include more MVNO activity, services to OTT players and BSS as a service to their enterprise customers.

service rollout in comparison with a conventional, CSP-owned stack, it features so high in this list because today's cloud-based BSS offers package all the necessary components for service design, fulfillment and activation to the CSP as part of the business model and they do not have to be considered – and implemented – separately. It is no longer something to be striven for but is literally available as a service.

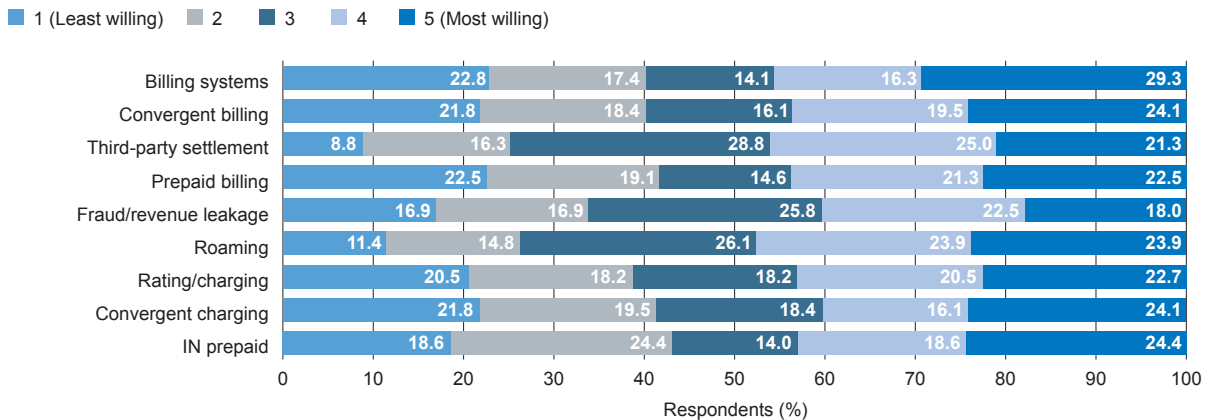
Interestingly, almost 30% of respondents said that another reason for considering or adopting cloud-based BSS was that the increasing complexity in the BSS layer was becoming greater than

their in-house skills could cope with. While it may be true that BSS requirements are outstripping skills, there is a strong possibility that growth in the managed-service sector has also contributed to this skill shortage as most outsourcing deals tend to involve a transfer of staff to the managed-service provider.

The transformation of the BSS layer and the move towards fixed/mobile convergence are the main drivers for the move towards cloud-based BSS at present both for those CSPs that have adopted the strategy and those that are still evaluating the idea (see fig. 6). The responses to this question are very revealing

The goal CSPs want to achieve does not necessarily dictate the ways in which they go about achieving them, however, and there does not appear, at this point in time at least, to be a wholesale rush towards adopting cloud-based BSS. Perhaps surprisingly, only just over a third of the survey respondents said they had already adopted some elements of cloud-based BSS (see fig. 7). Almost half said they were either currently evaluating the idea or thinking about adoption within the next year and 12% were thinking about adoption in the next 2-5 years. Significantly, only 5% said they would never consider using cloud-based BSS.

**Fig. 8: Survey question: Please indicate your willingness for respondents to source the following BSS components in the cloud.**



Note: Rank from 1 to 5, 1 = least likely to, 5 = most likely to  
Source: Informa Telecoms & Media

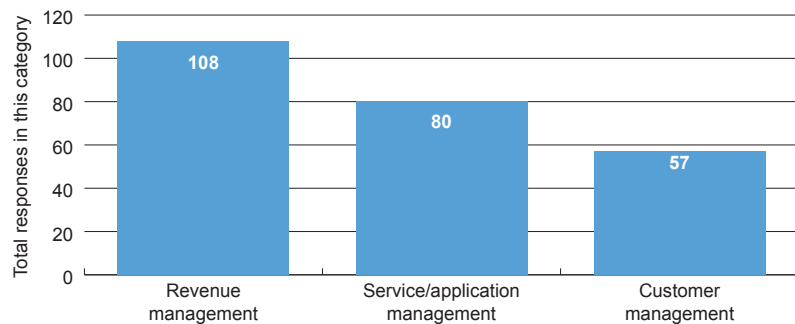
Apart from timescales, there is also the issue of which parts of their BSS stack CSPs are willing to source as a service from the cloud. Responses to this question (see fig. 8) indicated that CSPs thought that revenue management was the area most likely to be sourced in this way, with billing systems and roaming management emerging as the areas within overall revenue management that CSPs are most likely to access as cloud-based services.

### Current usage

Having examined the pros and cons of cloud-based BSS, the question remains as to what it is currently being used for and how is it likely to develop in the future.

The functions being used by the 34% of respondents to the survey who said they were already using cloud-based BSS, strongly correlated to the areas CSPs overall said they were willing to consider using longer term. It seems that most areas of billing, settlement and charging will be services of choice for some time to come and that a pattern has already

**Fig. 9: Current usage of cloud-based BSS across all categories**



Notes: Revenue management (see fig. 10).  
Service/application management = Service provisioning, service activation, service fulfillment, service creation, product catalog and applications management  
Customer management = CRM, business analytics, content management, business intelligence, call-center management and customer experience management  
Source: Informa Telecoms & Media

been set. Smaller numbers said they were using elements of service management, customer experience management and CRM, but it was the various forms of revenue management that were definitely the most popular (see fig. 9).

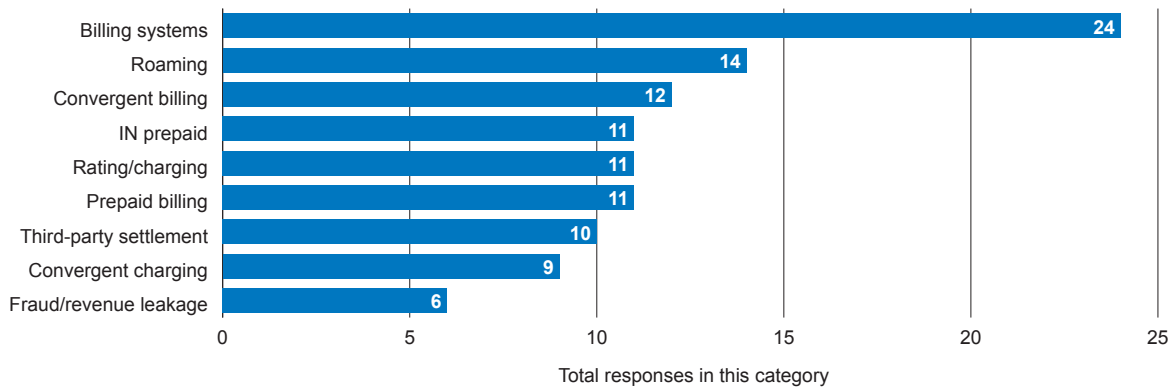
24 survey respondents said they were using cloud-based billing systems in mid-2013 (see fig. 10). This follows on from the tendency in recent years to consolidate billing systems into horizontal structures spanning multiple services, driven by the need to

standardize billing procedures and fully exploit customer data by making it available across the entire CSP's operation. The response is also likely to reflect the fact that billing is still essentially an off-line function and as such is largely unaffected by issues such as latency.

Most respondents who were using cloud-based billing also had additional cloud-sourced revenue-management functions and it is likely that the popularity of these additional functions reflects the



**Fig. 10: Survey question: Does your company currently use any of the following revenue-management elements in the cloud? (Tick all that apply)**



*Note: Total responses 108*  
Source: Informa Telecoms & Media

relative ease with which they can be implemented, as well as their importance to the CSP's business operation. Roaming settlement came next in popularity after billing, albeit with a much lower score, but this can potentially lead to significant revenue leakage if not managed efficiently. Convergent billing also scored significantly, reflecting the fact that the majority of survey respondents (43%) described their companies as convergent operators.

### The vendor landscape

There are very strong indications that vendors are successfully meeting the needs of CSPs with cloud-based BSS products, on the short term at least. When asked if they were seeing cloud-based BSS products coming to market which met their needs and expectations, a massive 80% of respondents said they were. This will obviously be encouraging news for the vendors involved in this field and will give

impetus to those whose products are still in development.

Some vendors, even a few well-known names in the BSS sector, admitted privately that, at the time of the survey, they did not have products commercially available, although development was under way. Some of them said that, rather than develop completely new products for use in the cloud, they were concentrating on building connectors and/or developing data abstraction techniques in order offer standard interfaces to other BSS vendors' products as well as to legacy systems. It is tempting to conclude, therefore, that investment in developing cloud-based offerings could be better spent in other areas, particularly given the slow growth Informa is predicting over the next four years or so. In reality, it is likely that cloud-based BSS will represent a significant portion of the market in years to come and those vendors with mature products will be best-

placed to take advantage of an upswing in demand.

Another area still under development by many vendors is that of charging and billing for cloud usage. Although techniques for carrying this out have largely been developed already by the non-telecoms IT sector, a detailed assessment of the topic is beyond the scope of this white paper.

For the foreseeable future, the vendor landscape will consist of much the same companies that populate the conventional BSS space as most of them already have or are planning a cloud-based portfolio of their products. As suggested earlier, CSPs are more likely to go with companies they know and trust for the larger and more comprehensive installations. However, those vendors simply offering products which are compatible with the cloud environment could also score with smaller operators.

## Conclusions and recommendations

- Cloud-based BSS will be particularly attractive to a wide range of operators for a number of different reasons. For larger operators, it will offer the opportunity to centralize their BSS. For smaller operators, particularly start-ups, those in emerging markets and CSPs with a predominantly prepaid customer base, cloud-based BSS will offer quick and relatively cheap access to some very sophisticated functionality.
- Cloud-based BSS is still at a nascent stage and Informa is predicting only modest growth over the next five years from an estimated US\$260 million in 2013 to US\$468 million in 2017. It is likely that concerns expressed over security and systems hosted in multi-tenancy clouds could be major factors in restraining growth.
- As with managed service providers, it will be incumbent on vendors to build strong and trusting relationships with customers and demonstrate that they are in the market for the long term. The need for the latter is particularly vital as over the last few years the BSS sector has been the subject of considerable consolidation. Despite assurances to the contrary, CSPs have expressed concerns over continuing support from companies that have acquired their existing suppliers.
- Vendors should also focus on developing products addressing specific areas of BSS such as billing, rating and charging, service management and CRM. Not all CSPs will want to switch to a completely cloud-based BSS stack. While there may be some Tier-1 CSPs that choose this tactic, most of the others will go for a piecemeal approach over a long period of time.

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