May 2017

The Key to CSPs’ Digital Future: Operational Technology

Featuring Gartner Predict 2017 research and an in-depth look at drivers for Business Services success.

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Introduction

In this Intraway newsletter featuring Gartner research, we explore how CSPs’ digital initiatives are reshaping the operations model by transforming infrastructure, processes, skills, culture, and leadership. To stay ahead of the business curve, strategic providers will look towards capabilities and technology investments that will allow for rapid service integration, reduced go-to-market times and enhanced customer experiences.

In Predicts 2017: Operational Technology Transformation Is Key to CSPs’ Digital Future, Gartner takes a close look at pivotal opportunities CSPs have to stay on the forefront of the digital revolution. The four critical areas Gartner expands on are: Adopting new technology to deliver data, openly embracing cloud models, integrating service delivery mechanisms to align with business strategies and enhance customer experience, and increasing the adoption of DevOps and agile approaches to facilitate digitization and network virtualization.

Operational technology doesn’t only facilitate optimization of a provider’s operations and customer experience; it also plays an essential role to own new markets, such as Business Services. Intraway’s Business Services, the path for future growth in Cable takes a closer look at how to equip Business Services as a potential game-changer for provider’s bottom lines.

Even though SMBs and Enterprises spend about USD 150B on telecommunication services, Business Services only contribute approximately 8% of cable companies’ gross profit.

To increase revenue potential, Operations Support Systems (OSS) will need the ability to orchestrate complex dynamic service bundles and manual configurations on legacy system services. And we’ve got just the solution for that (see p. 21).

We hope you enjoy this publication and look forward to supporting your CSP in your journey as a key player in the global digital transformation.
CSPs’ digital initiatives are reshaping the operations model through deep transformation of infrastructure, processes, skills, culture and leadership. Continuous investment in capabilities and technologies is crucial for CSP technology strategy planners to enable competitiveness.

**Key Findings**

- As data is becoming the unifying medium for all types of services and applications, a growing number of CSPs are implementing infrastructures that deliver data agnostic of the underlying network and IT infrastructure.

- Most CSPs have been taking a conservative approach toward specific cloud models, with a tactical perspective of cost reduction, and focus mainly on a few common workloads such as CRM, resulting in slow capability development.

- New service delivery mechanisms (through NFV and SDN) offer CSPs greater ability to align the OT with business strategy and control over customer experience, thus, increasing the overall businesses’ value.

- Most CSPs with targeted digitalization and network virtualization objectives will need to increase the pace of adoption of DevOps and agile approaches across the network and IT.
**Recommendations**

For technology strategy planners at network-based CSPs:

- Focus on enterprise architecture with the goal of a unified cloud-based network and IT architecture, instead of pursuing piecemeal or incremental changes.

- Ensure that your roadmap for migration of applications to the appropriate cloud model (CSP cloud/cloud service provider) covers operational IT, as well as applications, for service delivery enabling cost-efficiency and partner ecosystem.

- Implement NFV for customer-centric services meeting enterprise demand for consumption-based offerings and greater flexibility through vCPE-as-a-CSP managed service.

- Adopt bimodal operations with DevOps along with partners. Tap open source to address the challenges of inflexibility and slow pace of network and IT capabilities improvement.

**Strategic Planning Assumptions**

By 2020, CSPs that standardize IT and network infrastructure and processes will improve their EBITDA by 10%.

By 2020, large CSPs worldwide will reduce their on-premises application software spending by 20% as a result of public cloud-based solutions.

By 2020, vCPE-as-a-CSP managed service running on CSP-branded/certified servers will capture 20% of the total enterprise CPE marketplace.

Through 2020, more than half of CSPs will have begun adopting DevOps for delivering and managing network and IT services, increasing business velocity by five times.

By 2020, 50% of Tier 1, network-based CSPs will have leveraged open-source communities and alliances for hybrid and virtual network management.

**Analysis**

Businesses across industry verticals are busy with their digital transformation efforts. As a result, the lines between information and communication technologies are blurring through increased adoption of cloud computing, data security and the IoT.

Network-based CSPs (herein, referred to as CSPs; see Note 1) view these as opportunities for upscaling their enterprise business, through in-house capabilities and/or acquisition of IT assets/companies. Despite the focus on enterprise business, most CSPs have seen only limited success.

Gartner research indicates CSPs’ pace of digitalizing their own operation has been affected by often incremental and/or fragmented effort. Nonetheless, multiple factors have started influencing technologies and processes that constitute CSP operations (see Figure 1). It is becoming clearer that for CSPs to play an active role in the digitalization of enterprises, their own operations have to be digitally transformed for better efficiency, added growth capabilities and stronger customer orientation. Doing so will only help develop credibility among the enterprises.
Adoption of cloud services across all regions is strong, with more than 90% of enterprises in each region indicating they had deployed a cloud service by the end of 2015. SMBs are not behind in their digitalization goals. However, CSPs continue to garner low confidence as a potential partner for digital transformation initiatives. Therefore, CSPs need to quickly transform their operational technology and accelerate their own digitalization efforts.

IT and communication technologies are different in cost structures, EBIT margins and service delivery mechanisms in CSP business. For CSPs to combine these for other businesses, their own operational transformation is most important. This transformation encompasses all aspects of telecommunications operations such as product management, customer management, service management and technology management. Each of these areas calls for more flexible and agile operations, greater computing and analytics capabilities, as well as ability to participate in the increasingly open market structure.

While CSPs have started migrating their on-premises IT applications to the cloud, in many instances, these represent only cost reduction initiatives. This trend is likely to accelerate during the next two to three years. However, to get the most out of cloud platforms, CSPs must dismantle their operational silos to allow end-to-end flow through processes. This not only will provide better cost take-out, but will enhance productivity and customer-centric metrics and enable broader integration with the digital ecosystem.

**Figure 1. Elements Reshaping CSP Operational Technology**

Source: Gartner (November 2016)
With increasing interest and adoption of software and virtualization technologies in network design and management, CSPs’ OT holds significant possibilities. These possibilities lie in agile network operations; exposure of computing, storage and networking capabilities to partners and the larger ecosystem; and gaining better control over customer services. Therefore, it promises to address some of the persistent challenges that CSPs have faced, such as inflexible and rigid standards-led networking gear and platforms. However, this transformation introduces a new level of complexity as it is not limited to technology. It is targeted at processes, people and capabilities, and needs visionary leadership to drive the change.

To harness the capabilities of partners in the ecosystem and to enable ICT as a platform for businesses, CSPs have to accelerate adoption of bimodal, open platform and open APIs. The current trend of the bimodal approach in IT has to move to overall business operations (including network management, product ideation and product design). DevOps practices have to support network operations. Agility in operations will come through continuous enhancement of features and functionalities in the computing environment and applications. This has been realized by the CSP industry, as seen through the increasing adoption of open-source solutions by product vendors, SIs and institutions driving NFV/SDN initiatives. However, these initiatives will have limited impact on CSPs until they embrace open source on a larger scale.

Future growth of CSPs lies in scaling with products and services into adjacent markets. To achieve this, CSPs have to demonstrate leadership in capabilities and technologies for their own operational transformation. We recommend CSP CTIOs to become a coach and a facilitator for their teams and individuals as they go through the challenging stages of transformation that may include uncertainty, doubt and fear.

**What You Need to Know**

CSPs’ operational transformation is a complex set of activities. CSPs have to quickly move to a structured approach for bimodal operational models. This move comprises many facets, as indicated above. In particular, CSPs must:

- Work toward effective integration of network and IT, with a roadmap to execute comprehensive operational transformation.

- Re-examine cloud strategy not just for cost-efficiencies, but to leverage virtualization for business model changes.

- Adopt NFV and SDN with the strategic goal of customer centricity, facilitating empowerment of end users.

- Start adopting bimodal practices widely across the organization leveraging DevOps in operations, with the goal of business process automation.

- Create/empower the enterprise architecture team with a fresh mandate for computing capabilities through a mix of in-house competence development, open-source leverage and partners.
These transformational goals would require executing many programs through the highest level of sponsorship in the organization.

**Strategic Planning Assumptions**

**Strategic Planning Assumption:** By 2020, CSPs that standardize IT and network infrastructure and processes will improve their EBITDA by 10%.

*Analysis by:* Jouni Forsman

**Key Findings:**

CSP digital transformation has three parts: self-service-oriented customer experience, new revenue streams and improved operations. They aim to deliver agility and cost-efficiency from optimized/standardized processes and infrastructure, and organizational culture.

The last one is the most difficult to accomplish, but it is a must-do for the other two to be sustainable.

The key reason transformation programs fail to deliver is that organizations do not change their internal culture and processes enough. For example, in our DevOps survey, respondents said that 50% of the challenge was related to people, and 37% to business process change. In other words, almost 90% of the barriers were around culture and processes.

In the specific case of CSPs, the most important internal interface is between the network and the IT. CSPs’ technology stack and resulting processes are fragmented:

- There are still separate IT vendors and network vendors.
- There are still separate IT data centers and network data centers being built.
- There are IT transformation and network transformation, but these are typically not well connected.

Digital customer experience that, for example, delivers only good network QoS or accurate billing information is not good enough. Likewise, a CSP IoT offering that only manages connectivity, but does not bring end-to-end analytics or vertically relevant IT applications to the picture does not address most of the possible IoT value.

The new IT-like and data-center-based network technology makes it possible for a CSP to take a holistic approach to infrastructure and standardize processes from network to IT. CSPs that make this a corporate goal will reap substantial benefits.

**Market Implications:**

CSPs that manage to optimize across internal organizational divides can:

- Consolidate spending — There is no need to build a network data center, an IT data center and a commercial data center. One data center can serve all three clouds.
- Automate tasks based on common processes and interfaces.
- Improve agility.
- Build end-to-end intelligence for fact-based and automated operations.
Build end-to-end intelligence for offering the right services.

Build end-to-end intelligence for understanding customers.

**Recommendations:**

- Start with two things: infrastructure and analytics.
  - The same data center for network and IT, whenever possible.
  - Analytics and intelligence impact across all three parts of digital transformation, and can improve IT and network.

- Start with a “small” problem to help with culture. For example, what could we do differently inside the organization to delight fixed-line SMB customers?

- Take that “small” problem and apply design thinking to it, that is, brainstorm practical and creative solutions across the organization in a team.

**Strategic Planning Assumption:** By 2020, large CSPs worldwide will reduce their on-premises application software spending by 20% as a result of public cloud-based solutions.

**Analysis by:** Norbert J. Scholz

**Key Findings:**

- CSP application software has been lagging behind other software solutions (such as ERP, HCM, CRM and others) in moving to the public cloud. CSP CIOs and CTOs now realize the benefits over on-premises solutions, including quicker product launches, lower implementation costs and faster project rollouts. Gartner defines AS as software used primarily by business operations such as BSS/OSS operations and the CIO office, business development and marketing, as well as customer service representatives. Major application software solutions include customer billing management and self-care. We estimate that in 2016, CSPs worldwide will spend about $10 billion on external application software.

- ASaaS will reduce CSPs’ annual AS TCO to less than 0.5% of CSP revenue compared with today’s TCO of 1% or more. Currently, there are no significant regional differences.

- Reduced ASaaS TCO might be offset by higher expenses for services relating to cloud migration, including data migration and cleansing, process changes and reconfiguration, integration, and user and support staff training.

**Market Implications:**

- ASaaS will have a “halo effect” on on-premises software expenses:
  - Not all AS savings will come from ASaaS. By 2020, less than 10% of all AS will be in the public cloud. However, the ASaaS pricing model will force lower charges for on-premises solutions.

- ASaaS is based mainly on charging CSPs a percentage of revenue processed on the platform, rather than charging by subscriber numbers. This
gives CSP CIOs and CTOs leverage to negotiate reduced prices for on-premises software.

- Availability of carrier-grade ASaaS solutions will expedite adoption:
  - CIO and CTO consideration of ASaaS as an alternative to on-premises software has led to commercial development of carrier-grade solutions that solve lingering concerns about security and scalability.
  - Currently, ASaaS is trialed mainly in POCs or on a limited scale. Suppliers that today offer only on-premises solutions will launch ASaaS solutions to prevent users from switching to another vendor, even though ASaaS will erode their software revenue.
  - By 2020, ASaaS will become a mainstream alternative to on-premises AS, as these solutions will have proved their ability to reliably support CSP operations.

**Recommendations:**

- Extend your calculations to the professional services necessary to migration off of your on-premises solution when estimating ASaaS TCO. It might be that ASaaS TCO is similar to that of an on-premises solution. If so, calculate the opportunity cost of not migrating to ASaaS.

- Resist being compelled to opt for the ASaaS solution of your existing on-premises solution vendor. There are an increasing number of new suppliers that can offer equally good or better technology. Staying with the same suppliers has shown to yield only marginal benefits.

- Start with small, short-term projects that support digital services and expand the scope and duration of the project, if it yields the expected financial and business benefits.

**Strategic Planning Assumption:** By 2020, vCPE-as-a-CSP managed service running on CSP-branded/certified servers will capture 20% of the total enterprise CPE marketplace.

**Analysis by:** Akshay Sharma

**Key Findings:**

Virtual customer premises equipment emerged as one of the first use case motivating network-based CSPs to implement NFV and SDN. While vCPE enables greater flexibility and efficiency in offering network functions to end users, leading CSPs have been exploring greater control of service delivery and customer experience through a combination of technical functionalities and operations models. These are:

- Greater control on the compute machines for vCPE — through a white/brite-box approach

- Added flexibility with service delivery of network functions — through probes and APIs in vCPE

This provides an opportunity to CSPs to offer managed vCPE services, avoiding vendor-specific challenges. It also allows the CSPs to target holistic service assurance to guarantee end-to-end quality of experience.
Apart from flexibility and control, vCPE provides CSPs newer revenue opportunities and creates possibilities for further innovation. With APIs and tighter integration with enterprise business applications and workflows, CSPs are exploring customer-friendly business models such as pay as you grow.

The remaining 80% of the total enterprise CPE market will be dominated by existing appliance-based solutions, or vCPE managed by the enterprises themselves or non-CSP providers, such as the equipment vendors themselves or channel partners such as SIs.

**Market Implications:**

CSP-branded/certified servers and managed service of network functions present an opportunity to disrupt the present value chain of enterprise networking. However, it is a significant shift in the way CSPs operate, in the sense that this approach will force CSPs’ return to developing and innovating some of the components themselves.

Broad deployment of CSP-managed/certified/branded brite-box switches in different models (such as on-premises, in CSP’s nano-data-centers [CORD], in CSP’s larger data centers or in partner’s data centers) has the potential for:

- Innovative services such as on-demand network functions through plug and play of VNFs, better empowerment to customers through policies and APIs
- Multiple commercial models such as pay as you grow
- Decreasing capex investment and adopting opex-based business models

The influence of vCPE on CSPs can be profound. It motivates CSPs to adopt agile service delivery models, re-engineer their business processes and can change their product catalog. It can also enable CSPs to become active participants in enterprise digital transformation through CSP-managed offerings such as:

- Security as a service with virtual firewalls, dynamic access controllers and virtual DPI for DLP as a service
- UCaaS with virtual SBC functions and SDN control of bandwidth for flexibility in on-demand service
- Load balancer as a service, with least-cost routing, and disaster recovery as a service across access networks

As end-user organizations move to digital businesses, with managed services, this 2017 prediction will impact network-based CSPs in how services are deployed, and how equipment vendors go to market with their solutions. As an example, equipment vendors may adopt a cloud-first strategy, for DIY deployments, SI-managed offerings and CSP-managed offerings, beyond appliance-based solutions.

Gartner research forecasts the end-user spending on enterprise network equipment (both physical and virtual). It is projected in this Predicts document that 50% will still be vendor-specific hardware solutions. Of the remaining 50% of the market, roughly 30% will be SIs or managed service providers other than CSPs managing it as a service (for example, Cisco and Hewlett Packard Enterprise), with CSPs managing up to 20% of the remaining marketplace.
Recommendations:

- Work closely with enterprise business leads to influence the design of service delivery, service assurance and customer empowerment processes.
- Augment SD-WAN with vCPE, to combat margin erosion of existing MPLS services.
- Provide innovative services on top of vCPE offerings to combat increasing DIY-based, low-cost alternatives (such as brite box); commoditized hardware adoption; or competing offerings from SIs as managed service providers.
- Look to vCPE solutions supporting multitenancy and PaaS, policy-based controls, pay-as-you-grow commercial model, and market-related API support for newer services.
- DevOps approaches can enable a radical change in IT culture, as they focus on rapid network and IT service delivery through adoption of agile and lean startup approaches. However, they challenge conventional thinking and processes.
- Increased adoption of DevOps is enabling CSPs to operate with increased business velocity, such as delivering solutions and services with faster TTM, increasing agility and flexibility, accelerating their adoption and implementation of open platforms and open APIs, and enabling them to accelerate their integration with the broader digital ecosystem.

Strategic Planning Assumption: Through 2020, more than half of CSPs will have begun adopting DevOps for delivering and managing network and IT services, increasing business velocity by five times.

Analysis by: Mentor Cana, Neil Osmond

Key Findings:

- The legacy task-driven mindset and siloed business units are challenges to CTIOs in achieving an outcome-based approach to delivering business value.
- Outdated organizational policies and processes are significant hurdles that CTIOs must address to enable adoption of DevOps across the organization.
- DevOps approaches can enable a radical change in IT culture, as they focus on rapid network and IT service delivery through adoption of agile and lean startup approaches. However, they challenge conventional thinking and processes.
- Increased adoption of DevOps is enabling CSPs to operate with increased business velocity, such as delivering solutions and services with faster TTM, increasing agility and flexibility, accelerating their adoption and implementation of open platforms and open APIs, and enabling them to accelerate their integration with the broader digital ecosystem.

Market Implications:

To successfully transform a network-based CSP to be ready for digital business and scale their digital transformation, CTIOs are increasingly implementing DevOps initiatives. Adoption of DevOps has implications for CSP internally, as well as how they collaborate and partner with SIs, vendors, other CSPs and the broader digital ecosystem players.

Internally, the shift from sequential waterfall approaches into DevOps requires talent reskilling, adoption of new tools and technologies (such as open APIs and open platforms, reusable and modular capabilities, end-to-end automation, and continuous delivery). Further, the shift requires IT governance retooling with outcome-based measures, as well as a shift in mindset and culture, and leadership transformation for CTIOs.

Externally, CSPs are increasingly starting to ask SIs and vendors about their DevOps capabilities, so that the transactional relationships of the waterfall age can
transform into relationships of co-creation, co-innovation and co-development. This, in turn, is driving the traditional CSP market players (mostly NEPs of OSSs, SDPs and BSSs) to also transform into agile and flexible partners, by morphing the CSP market itself into a communications ecosystem. This new ecosystem, where traditional players and pure digital players (such as CSPs, SI, vendors and digital natives) can collaborate and partner with faster TTM, is evolving.

**Recommendations:**

- Act as a visionary champion, and showcase the business value of agile and DevOps.
- Foster strong collaboration with your peers across the network, operations, support and business, as well as other business units.
- Adopt the necessary tools and technologies that make DevOps possible such as automation, continuous delivery, and open APIs and open platforms.
- Establish the environment and sharing culture for the newly built teams to practice the DevOps principles.
- Reach out to, and collaborate with, business decision makers (such as the CMO, product management, sales and marketing) to push for integration within the broader digital ecosystem, to enable co-creation, co-innovation and co-design of solutions with partners outside the company.

**Analysis by:** Neil Osmond, Amresh Nandan

**Key Findings:**

A number of technologies across industry verticals and applications are moving to leverage open-source software, as presented in “Hype Cycle for Open-Source Software, 2016.” For CSPs, motivation to do so is two fold:

- The need to address capability shortfalls in a cost-effective way, without vendor lock-in, with more agility and with more ability to influence the emerging ecosystem than the conventional approach affords.
- Accessing and influencing innovative solutions to meet the rapidly changing requirements for policy management, service and resource orchestration as they move to adopt VNF.

Leading CSPs in various geographies (mostly Tier 1, such as AT&T, BT, Orange and Telefónica) have realized the importance of developing specialized capabilities to orchestrate services and resources in virtualized network environments. This is because the effective orchestration of services and resources need far greater operational, management and maintenance control over orchestration engines. Established vendors are developing their products to support NFV, SDN and cloud. However, challenges of interoperability, proprietary implementation and roadmap visibility still continue. Such a scenario isn’t very helpful for CSPs.

CSPs know that it’s not practical to develop these capabilities from the ground up. This is where open-source constituent components come in. Initiatives

**Strategic Planning Assumption:** By 2020, 50% of Tier 1, network-based CSPs will have leveraged open-source communities and alliances for hybrid and virtual network management.
such as AT&T’s ECOMP and Telefónica’s OpenMANO are large-scale examples of CSP activities in this area. Even institutions responsible for standardization and specification development have embraced these concepts. Open Source Mano is an ETSI-hosted initiative to develop an open-source NFV management and orchestration software stack aligned with ETSI NFV.

AT&T has announced its intent to contribute to open source and has given ECOMP components to the Linux Foundation. Orange has already started testing AT&T’s open-source ECOMP platform for building SDN capabilities. It is expected that more CSPs and even some vendors will join hands toward developing open-source communities/alliances to speed up the adoption of NFV/SDN, while preventing the challenges related to interoperability. This will further boost opening up of development associated with NFV.

Adoption of open source is not limited to NFV/SDN in CSPs. A number of tools associated with data center management, databases and virtualized IT management are built on open source. Of late, these systems and tools have seen greater adoption by CSPs. These trends have also influenced many vendors, which see open-source adoption as a mechanism to address their own capability gaps and TTM requirements. However, most of these are yet to address CSPs’ core challenges with digital transformation.

**Market Implications:**

- Open-source adoption among CSPs influences their way of sourcing and developing IT. Further, it has implications on offerings of SIs and product vendors.
- To leverage open-source judiciously, CSPs will need to “own” their enterprise architecture. It calls for a critical evaluation of what can be sourced from open-source communities and how it fits into their architecture. It is also contingent on business strategy, where participation and contribution to specific open-source development may help develop growth avenues.
- The operational implication for CSPs lies in creating the developer mindset in their technology team to own and commit to a target architecture. This is feasible through a library/code level understanding of what can be achieved through open source, what is desirable and how to go about it. Therefore, it requires a team that understands open-source communities, licensing and usage mechanisms, as well as libraries and code. Another case is when CSPs own the code that is written through the entire life cycle onto production. Google pioneered this with roles such as site reliability engineers, who are developers supporting apps in production.
- Vendors and SIs with deeper understanding of open-source components can contribute effectively to CSPs. With increasing adoption of open source by CSPs, the SIs and product vendors will be expected to have capabilities to integrate and support such projects.
- Adoption of open source accelerates collaboration among CSPs and others in the ecosystem. Whereas before they had to work with standards and specification development bodies, a process that takes much longer to accomplish. With open
source, one or a few CSPs push hard to develop the technology and make it publicly available for open collaboration by others.

**Recommendations:**

- Develop open-source adoption and contribution strategy with larger and longer-term vision of business. Do not restrict to one or two components based on cost considerations only.

- Forge/extend partnerships with others in industry (such as CSPs, computing and internet companies) to learn and share best practices, and contribute to standardization and interoperability.

- Revisit your target enterprise architecture (with NFV/SDN deployment) with a view to understand the scope and applicability of open-source leverage.

- Understand the development in open-source communities and align your architecture components with what can/should be sourced from such communities. Select one or two areas to develop and contribute to.

- Develop knowledge of intellectual property laws, open-source licensing, packaging and usage to contribute and use effectively. This requires hiring/training key architects in the IT team.

**A Look Back**

In response to your requests, we are taking a look back at some key predictions from previous years. We have intentionally selected predictions from opposite ends of the scale — one where we were wholly or largely on target, as well as one we missed.

**Acronym Key and Glossary Terms**

- **API** application programming interface
- **AS** application software
- **ASaaS** application software as a service
- **BSS** business support system
- **capex** capital expenditure
- **CD** continuous delivery
- **CI** continuous integration
- **CIO** chief information officer
- **CORD** Central Office Re-architected as a Datacenter
- **CPE** customer premises equipment
- **CRM** customer relationship management
- **CSP** communications service provider
- **CT** communication technology
- **CTO** chief technology officer
- **CTIO** chief technology and information officer
- **DIY** do it yourself
- **DLP** data loss prevention
- **DPI** deep packet inspection
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>EBIT</td>
<td>earnings before interest and taxes</td>
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<td>EBITDA</td>
<td>earnings before interest, taxes, depreciation and amortization</td>
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<td>ECOMP</td>
<td>Enhanced Control, Orchestration, Management and Policy</td>
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<td>ERP</td>
<td>enterprise resource planning</td>
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<td>ETSI</td>
<td>European Telecommunications Standards Institute</td>
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<td>HCM</td>
<td>human capital management</td>
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<td>ICT</td>
<td>information and communication technology</td>
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<td>IM</td>
<td>instant messaging</td>
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<td>IoT</td>
<td>Internet of Things</td>
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<td>ISP</td>
<td>internet service provider</td>
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<td>IT</td>
<td>information technology</td>
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<td>MANO</td>
<td>management and orchestration</td>
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<td>MVNO</td>
<td>mobile virtual network operator</td>
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<td>MPLS</td>
<td>Multiprotocol Label Switching</td>
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<td>operating expenditure</td>
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<td>operations support system</td>
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<td>OTT</td>
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<td>PaaS</td>
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<td>SMB</td>
<td>small or midsize business</td>
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<td>total cost of ownership</td>
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Evidence
This Predicts report is based on a combination of CSP OT forecast assumptions, quarterly forecasts, input from CSP technology leaders during last year and analysis of several standardization/specification efforts.

Note 1. Communications Service Providers
In 2009, we first defined the communications service provider category. This definition included traditional telecom carriers and cable companies, multiservice operators, satellite operators, and independent internet service providers, among others. Today, the marketplace has become more diverse, with CSPs having different:

- Network infrastructure models (for example, MVNOs versus legacy telecom carriers, versus MSOs, versus next-generation CSPs)
- Cost structures and capital investment requirements (for example, asset-heavy CSPs versus asset-light CSPs)
- Strategic priorities and business models (for example, communications services may not be a CSP’s primary service)

Because of this evolving environment, we have defined subsegments of CSPs (see Figure 2). This CSP segmentation is based on the primary infrastructure deployed to support service offerings.

Figure 2. Communications Service Provider Segmentation

<table>
<thead>
<tr>
<th>Virtual CSPs</th>
<th>Cloud-Based CSPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset-light CSPs</td>
<td>CSPs that rely mainly on the cloud or internet to provide services. They are often disruptive to network-based CSPs. These include:</td>
</tr>
<tr>
<td>Asset-light CSPs that rely on the infrastructure of network-based or alternative network-based CSPs (typically, through wholesale agreement) to provide communications services. These include:</td>
<td>• IM providers (KakaoTalk, WhatsApp, Line and WeChat, for example)</td>
</tr>
<tr>
<td>• IoT-centric MVNOs (Kore, Airis and Essuye, for example)</td>
<td>• Content and application service providers such as OTT companies (Google, Yahoo and Facebook, for example) and vendors providing communications services (Microsoft and Cisco, for example)</td>
</tr>
<tr>
<td>• Mass market MVNOs (Lycamobile, Virgin Mobile, for example)</td>
<td></td>
</tr>
<tr>
<td>• VNOs (such as the former Reliance Yanco Group)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Network-Based CSPs</th>
<th>Alternative Network-Based CSPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legacy telecom carriers that own extensive network infrastructure to provide communications services. These include:</td>
<td>Other CSPs that own extensive network infrastructure* to provide communications services. These include:</td>
</tr>
<tr>
<td>• Fixed-line, mobile, wholesale or full-service telecom carriers</td>
<td>• Providers using alternative access/network technologies (Sigfox, Ingenu and Senet, for example) and/or are from nontelecom backgrounds (utilities and gas companies, for example)</td>
</tr>
<tr>
<td>• Enterprise network service providers (the business units of legacy telecom carriers offering communications services to enterprises)</td>
<td>• CATV operators/MSOs (Comcast and Time Warner Cable, for example)</td>
</tr>
<tr>
<td>• ISPs (typically, divisions/subsidiaries of legacy telecom carriers; most are no longer independent entities today)</td>
<td>• Satellite communications operators (Inmarsat and Intelsat, for example)</td>
</tr>
<tr>
<td></td>
<td>• Satellite broadcasting operators (Sky, for example)</td>
</tr>
</tbody>
</table>

* These networks may not be originally built for communications services, but these services are later offered through the network as part of a diversification strategy.

Source: Gartner Research Note G00316712, Amresh Nandan, Jouni Forsman, Norbert J. Scholz, Akshay K. Sharma, Mentor Cana, Neil Osmond, King Yew Foong, 10 November 2016

Source: Gartner (November 2016)
SMB and Enterprises spend about USD 150B on telecommunication services. In Cable companies, Business Services contributes around 8% of the gross profit. Considering the size of the market and the evolution of virtual services (NFV and SDN), it’s expected that Business Services contribution will grow exponentially.

“MSO commercial segment revenue has continued its steady rise, surpassing $12 billion in 2015.” SNL Kagan

For that to happen, major players are creating special teams to address the demands of a market in which the needs are not quite the same as residential. Comcast created its Comcast Business division, Spectrum (Charter, Bright House and TWC) created Spectrum Business and Cablevision created Lightpath.

As the key findings in “Predicts 2017: Operational Technology Transformation Is Key to CSPs’ Digital Future” clearly state, the new service delivery mechanisms (through NFV and SDN) will offer CSPs the possibility to address the business market and provide control over customer experience, thus, increasing the overall businesses’ value.
Business Services Made Simple: Unprecedented Agility

The current operations support systems (OSS) present in most operations were designed to run a few, closely related services.

When business services are added to the table, this is no longer true. A new layer is needed: a layer able to orchestrate complex dynamic service bundles including cloud/virtualized services and legacy system provisioning.

It must provide quality configuration assurance, which leads to a strict SLA between MSOs and SMB/enterprises, and many other interrelated services provided to a single demanding segment.

This is just the tip of the iceberg: the solution must be able to do this with a single touch. It must be simple and able to easily update the configured services to meet ever-changing requests.

“Today, CSPs’ need to orchestrate complex services becomes clear when various aspects of provisioning business services are brought together.”

– Patricio Latini SVP Engineering
The Four Key Drivers for a Successful Business Service Deployment

Capex Reduction by Tuning-Up Resource Utilization

CSPs need to optimize how they use network resources and they need to acquire new assets intelligently, only when necessary. Symphonica, together with virtual network technologies such as NFV and SDN, allows CSPs to reassign resources on demand. In other words, it allows them to be in control of their network and not be a slave of poor network design due to time limitations imposed by the manual configuration of legacy systems services.

Accelerate Time-to-Revenue

CSPs needs to accelerate time-to-revenue using an easy and flexible BPMN framework which includes preconfigured service packages based on market experience and best practices. Crafting complex new services has never been easier, thus having pre-built deploy packages reduces design times.

Off-the-shelf connectors and experienced professional services with deep understanding of the product allow CSPs to deploy new services and instantiate them rapidly. You can even deliver them to customers within days or even hours.

Moreover, Symphonica produces even greater reductions in time when the service that is delivered does not exactly match expectations. Symphonica allows services to be updated in minutes or seconds. This time reduction is even more significant when working with virtual services through NFV and SDN.

Reducing time in every step shortens the time-to-market and, even more so, the time-to-revenue.

Configuration Assurance – SLA Assurance

Quality of Service (QoS) is increasingly critical to differentiation. Service assurance has become crucial to competitiveness in the business market.

Specific features such as Fallout Management and Configuration Querying, along with a stateful design, allow service providers to ensure that SLA metrics and criteria are met and delivered, completing customers’ requests and meeting service delivery times.

Legacy Inventory Update

Inventory must be flexible, transparent to users, reconcilable, scalable, and available in real time. In that regard, the OSS orchestration layer must leverage legacy inventory by automatically updating every service in the network in real time, ensuring that reports are always up to date and accurate.

Agile Design Principles

Symphonica is a scalable service and management tool that is able to handle complex ecosystems from a single platform. It delivers the business agility that is necessary to succeed in today’s digital world by providing real-time, catalog-driven service fulfillment and resource provisioning. It reduces order-to-activate cycle times and time-to-market for end consumers and businesses, regardless of the underlying technology.

Service providers can easily create and instantiate new services, map them to network needs, and automatically decompose them into specific orders.

This allows them to start unlocking the full potential virtualization has to offer in order to provide the flexibility and agility that SMBs and enterprises are expecting today. Symphonica’s design allows service providers to reduce service implementation times from months to days and deployment time from weeks to minutes or even seconds.
Common Business Services Required Today

- Metro Ethernet Services
- Layer 3 Corporate VPN Services
- Layer 2 Services over SDN
- EPON/GPON
- DPoE
- Ethernet over DOCSIS
- Virtual Firewall
- Content Filtering
- Anti-DDoS
- Managed Data Center Services
- Managed Voice and Data
- vCPE
- Cell Backhaul
- Virtual Services (SDN/NFV)
- Fiber-Based Services

Source: Intraway
From Vision to Revenue in the Blink of an Eye with Symphonica for Business Services

SMBs and enterprises demand dynamic responses to meet their dynamic needs. They rely on business partners that can change service level agreements for high-season demand, interconnect a new branch to the enterprise network, upgrade the bandwidth in all their hotspots, and transition from legacy to virtual services, all on the spot. Time is key and Symphonica was conceived to overcome the most challenging barriers and boost business service growth with the fastest service integration times on the market.

Service providers recognize the value of responding in a timely manner to business users’ communication needs. They quickly launch the newest virtualized or SDN technologies in order to reduce service costs and improve Quality of Experience by giving the user control of their own services.

With Intraway Symphonica you can launch complex services within days by easily testing your work flows and integrating new service elements. You can automate service fulfillment, decreasing your time-to-revenue and even keep your network inventory up-to-date to optimize deployment costs.

To learn more about Symphonica and the rest of Intraway’s lifecycle service orchestration, customer experience and network management solutions, please visit www.intraway.com
About Intraway

Managing over 55 million devices deployed in 22 countries over three continents, our solutions have helped improve communications service providers’ profitability, time-to-market and customer experience since 2003. In other words, we unleash the full potential of networks by adding the latest, cutting-edge functionalities while reducing operational costs.

Not only do we empower communications companies with innovative, highly configurable, and ready-to-deploy solutions that enable seamless activations and orchestrations, first-rate customer experiences and assertive network management, we do it while guaranteeing Amazing Delivery. This means that from our first handshake through deployment and beyond – we are a trusted partner for the complete service lifecycle that is working side-by-side with you towards your success.

Join us and secure your position as key player in the global digital transformation.