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Managing operator networks as an outsourcing service

Rather than working with vendors to buy point products and solutions, communications service providers are increasingly looking at vendors as partners to help them provide a new generation of managed services to enterprise customers. This new trend extends the value chain and has advantages for customers, service providers and vendors that have the expertise on staff to handle increasingly complex network services.

This E-Guide will include expert advice for service providers on the following:

- The Growing Challenge of Network Operations

- Outsourcing Operations Management

- Operations Outsourcing and Network Integration Services

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Telecom network operations and infrastructure planning: Outsourcing the challenge

Editor's note: *Providing customers with flexible "experiences" rather than long-term services has changed the way telecom service providers connect their telecom infrastructure planning to service deployment. This E-Guide looks at why carriers need to change their network operations planning and management to fulfill the promise of next-generation networks. Author Tom Nolle also looks at how carriers are changing their network operations strategies and processes to get around a lagging standards process and address technology interoperability challenges.*

Telecom network operators have always faced the challenge of matching their technology and infrastructure to related services opportunities in order to generate revenue. But the Internet has changed the planning requirements for infrastructure and network operations planning, and service providers must adapt quickly.

In the past, the challenge of matching services to technology deployments was easier because the project lifecycles and capital cycles of telecom service providers were typically very long (seven-to-20 years), and the corresponding services evolved over a long period of time.

Consumer broadband changed telecom infrastructure and services balance

In terms of major change, the most important service lesson the Internet has taught is that consumer broadband services aren't long-lived extensions of traditional telecom services. Instead, consumer broadband services are linked to the creation and delivery of experiences. As such, services in the Internet era are linked to consumer market trends and fads that often develop and die within a year.

In fact, the Internet's worldwide reach created the perfect platform to develop and socialize new opportunities, which shortened the cycle of consumer interest and opportunity. Over-the-top (OTT) Internet companies evolved to meet customer needs and built a "soft" infrastructure made up of services and software.

This new structure was nimble and highly flexible, and as a result, most Internet opportunities went to the new players, creating "disintermediation" that cut traditional telecom carriers out of the revenue stream.

Traditional carriers face next-gen network operations issues

Today telecom carriers are competing with over-the-top companies that don't have enormous investments in infrastructure and are highly flexible. In light of these competitive pressures, the challenge for facilities-based carriers is to match customers' short-term demand cycles with infrastructure planning and capital cycles that can be 10 times as long as the demand for a service.

The solution is to integrate more IT resources into infrastructure—servers, software and service delivery platforms (SDPs)—and to create and sustain flexible service lifecycle processes that can provision long-lived enterprise services and support Web-delivered experiences that may last only a matter of hours or minutes.

The technology that can provide these capabilities is understood, and most operators are already deploying next-generation networks based on the paradigms of hosted service features and opportunity driven service plans. Sorting out telecom network operations issues are next on the agenda.

Tackling telecom network operations issues and rising costs

Direct telecom network operations costs worldwide average 1.22 times more than carriers' capital equipment costs, and operators report that between 25% and 45% of these costs are related to dealing with errors made by operations personnel while performing configuration management, problem resolution, upgrades and additions to infrastructure, and other routine network operations tasks.

As the infrastructure that can deal with the new pace of opportunity becomes more complex, these cost points can only rise. The new complexity demands a skill set that blends information systems technology and network technology with some hard experience and applies both to NGN problems. Those skills are in short supply.

Outsourced solutions for next-gen network integration and operations

Telecom operators are encountering new network integration and operations challenges in their next-generation services evolution, as discussed in Telecom network operations and infrastructure planning: Outsourcing the challenge. The statistics show how carriers are trying to improve network operations planning and management.

In the 1990s, only about 18% of telecom network infrastructure changes were coordinated by contractors that won outsourced contracts to manage carrier network integration projects. By 2008 integration outsourcing had grown to 63%.

What caused the increase? Operators have found that relying on standards development isn't sufficient in the complex and fast-paced world of next-generation network (NGN) deployment, even though it is the traditional way to insure interoperability among network components. By 2005, the pace of service opportunities had exceeded the pace of standardization, which further complicated the issue. For example, a standards-setting process started in 2006 to integrate IT technology at the service layer with traditional network technology. The standards aren't yet complete.

In addition, there are explosions in the cost of integrating the components of NGN infrastructure, in the cost of NGN operations, and in operations errors that are not only individually unacceptable, but collectively are a disastrous risk.

Outsourcing solutions helps reduce network integration risks

To reduce the risk of integration and operations disasters, operators are breaking with the tradition of waiting for standards completion taking steps that include the following:

>   1. Increasing the number of network integration contracts awarded in connection with major NGN deployments to make a single party accountable and responsible for the integration of the wide range of network technologies.

2. Dividing networks into technology procurement zones and selecting a small number of vendors within each zone, and naming the winners responsible not only for providing infrastructure components but for accepting and managing an integration contract within the zone. Vendors can partner with smaller players to achieve full technology solutions within a zone, which encourages vendors.

3. Requiring procurement zone winners to establish a network operations process for the life of the technology and update any existing processes as needed.

4. Outsourcing ongoing operations management to a suitable vendor where the pace of technology change, opportunity change, or both suggests that sustaining operations using service provider personnel will be problematic.

The notion of a global network operator outsourcing network operations to a third party seems radical, but it is a logical step from the network and technology integration contracts that have already become the rule in NGN deployment. The traditional problems in acquiring and retaining skilled personnel are exacerbated for next-generation network operations by the multiplicity of skills required. Furthermore, some tasks associated with NGN operations are so specialized that a given operator may not be able to justify full-time staff to perform them.

Outsourcing network operations – a plan that works

The real driver here is the bottom line – managing service opportunities rather than reducing costs. Operators report that outsourcing ongoing network operations actually facilitates the transition from deployment to live operations that serve customers and earn revenues.

The handoff from a managed installation to a self-supported ongoing operations state is tricky. Operators that have experienced the transfer of responsibility in a largescale network report that problems are more than twice as likely to emerge in this interval as in ongoing operations. This can result in customer complaints and a loss of credibility for new services.

That doesn't mean that network integration and operations outsourcing contracts can't also save money. Skilled operations personnel make fewer errors, and as noted earlier, errors can account for fully half of total network operations center costs. This is particularly true for Tier Two and Three providers that likely cannot draw the necessary skills from their local labor pools.

Where local skills are lacking, operators must resort to incident-based support from vendors or integrators. The cost of these services on an as-needed basis, combined with local labor costs, often exceeds the cost of outsourcing them. The magnitude of the potential savings increases with the complexity of the NGN project, the geographic scope of the network, and the range of services the network will support.

Next-generation network integration is a special skill that operators have already recognized they can't hope to maintain in house. It's becoming clear that NGN operations is also a special skill, and that operators will need to think seriously about the benefits of outsourcing operations much more in the future.

Telecom Outsourcing: Network Planning and operations guidelines

Telecom network operators worldwide are becoming more interested in outsourcing their network operations. This interest is concentrated in network operations center (NOC) activity, where the increasing complexity of next-generation networks (NGN) is threatening to create cost explosions and an ongoing problem finding skilled NOC staff.

While the justifications for outsourced network operations are many, here's a sampling of the telecom carrier reasoning:

• Networks are more complex than ever; there are multiple layers of devices (optical/physical, Ethernet, IP) and more devices per layer. Generally the complexity of operating a network is proportional to the number of device relationships in it, which can approach the square of the number of devices.

• The devices themselves are more complex. The number of parameters required to describe a simple interface is much larger than it was a decade ago, and there are more interfaces per device.

• Services are more complicated because they require coordinating the behavior of more devices than ever, and that means that there are more things to consider in capacity and performance management and more elements to investigate in fault management.

• Software and computer elements – part of the IT world -- are increasingly a part of the network, and these elements are not only far more complex to manage than network devices, but they introduce requirements for software updating and management, performance planning and problem troubleshooting that are totally different from those of network devices. Telecom network operations personnel normally have little experience with these new issues.

• The number of standards is exploding, and the number of standards with extensions and interpretations that may differ among vendors is growing even faster. As a result, maintaining stable network operations under all possible operating conditions is far more difficult to achieve and sustain than it used to be.

Network operations have always demanded a skilled, stable, labor pool from which to draw candidates, as well as effective policy for personnel retention and development. The increased IT focus of infrastructure investment, the expanding number of providers (including mobile, cable and over-the-top players) and growing competition from enterprises for skilled personnel has created a labor shortage that can be acute in some markets.

If an operator decides to outsource network operations, the process of evaluating outsourcing bids is time-consuming and expensive, and most operators require a qualification phase to reduce the number of bidders. This can be formal or informal and normally involves submitting a basic description of financial strength, available NOC facilities and staff to accommodate the project, references from other providers and sometimes a performance bond for at least the transitional phase of the project.

As addressed in parts two and three, it is critical to manage a network operations outsource project correctly, from the justification and value proposition, to the transition process and daily operations.

Network operations is a critical element in service deployment and customer support, and a failure can not only incur unnecessary costs in field service dispatch, it can reduce service credibility and increase customer churn.

Done correctly, network operations outsourcing can make the NOC a more responsive and powerful part of the overall Operation, Administration, Maintenance and Provisioning (OAM&P) process and a positive contributor to the network operator's revenue and profit.

Launching a network operations outsourcing project

Outsourcing is the solution to managing the increasing complexity of next-generation network operations, but like any project, it's important to launch and manage a network outsourcing project effectively to ensure a positive outcome.

Step One: Select one of the two basic models available:

> • The NOC-outsourcing model: The operator outsources network operations center (NOC) responsibility, including staff *and* facilities;

> • The staff-outsource model: Only the staff is outsourced. Except where an operator has a large and non-recoverable facilities investment, the NOC-outsource model is generally preferred because it will reduce risk the most.

Step Two: Develop a *transition plan.* While some operators prefer to have their own staff develop a transition plan, the best practice, based on outcome, is to have the transition plan developed by outsource bidders as a part of the proposal. Where outsource interest stems from a major NGN infrastructure project, it is best to have the transition plan developed as a part of the project.

If a network integration contract was awarded during the infrastructure project, the integration winner could prepare a plan, and should be encouraged to bid on the outsource project as well.

Creating effective network operations outsourcing plans

The major goal of a transition plan is to shift responsibility to the outsource provider in an orderly way. The transition plan must address the following points:

> 1. How will the new outsource staff be certified as qualified to take over support? This requires setting specific milestones with a specific timeline.

> 2. How will existing network management, business and operations support systems be linked into the new network operations center (NOC)? How will any new products or systems be accommodated over time?

3. What responsibilities will remain with the operator, if any? In some cases, outsource contracts explicitly target next-generation network (NGN) deployment and legacy systems remain in house. If this is the case, how are issues with NGN-over-legacy or other cross-technology issues going to be resolved?

4. What are the processes associated with transitioning out of the outsource arrangement if the operator decides not to renew it or change partners down the line?

Moving from transition to daily outsourced network operations

In addition to the transition plan, carriers need to create an operating plan for outsourced network operations that addresses basic ongoing plans to go into effect once the transfer is completed, including fees, contract terms and responsibilities.

Network operators should give special consideration to the following when working on a plan to outsource network operations:

• What are the outsource provider's specific responsibilities with respect to facilitating the introduction of new services and technologies, and the accommodation of new business and regulatory requirements?

• What specific response to problems can be expected under both "normal" conditions and in exceptional conditions? A natural disaster, for example, is likely to impact many of an outsourcer's customers and potentially load down the resources of the outsourcer's NOC.

• Is there a guarantee contract renewal at a fixed price or at a higher price for a specific number of additional contract periods?

• What are the remedies in the event of a default? Monetary payments are clearly a part of an outsourcing agreement, but a potentially more important question is the right of the customer to terminate the deal and either pull operations back in house or transfer responsibility to another partner. If this is done because of a breach of contract, what responsibility does the old provider have in facilitating the transfer?

• What specific external interfaces to network, business and operations systems does the outsource provider promise to support for integration of new products and services?

Creating outsourced network operations plans during network integration

As next-generation network (NGN) skills become more specialized and network complexity more daunting, network operators are turning to outsourcing as a means of fulfilling complex telecom network operations and integration tasks. The advantage is that outsourcing offers contractually guaranteed services at a fixed cost and frees the operator from hiring and sustaining a skilled staff.

The two main types of outsourced contracts are for network integration and network operations. These may appear to be separate issues, but the two have common drivers and useful points of cooperation and symbiosis between them.

The primary drivers for both network integration projects and network operations outsourcing are the same – the growing complexity of networks and services and the growing difficulties sustaining a qualified staff. It's just a matter of where these drivers create a critical mass that justifies a decision to outsource. For many operators, the answer will be "both places," and assuming that both forms of outsourcing are on the table can be of significant value at the beginning of any major NGN project.

An optimized network outsourcing project will require some technical preparation, particularly in terms of how the outsourced network operations center (NOC) services are linked into the current operations processes. The notion that standard interfaces solve this problem has long been disproved in practice, according to telecom operators, because there are too many standards and extensions.

Four main steps to an integrated operations outsourcing plan

If a carrier is thinking about a major NGN upgrade and using a prime vendor to lead the network integration project is part of the plan, then one goal of the integration project should be to prepare for a future network outsourcing plan, even if network outsourcing isn't an immediate plan.

Network operators should work through four main steps when creating an integrated network operations outsourcing plan during a network integration project.

> 1. Create an integrated operations plan as part of the network integration process during NGN infrastructure build-outs. This will assign specific roles to components of the operations support systems (OSS), billing support systems (BSS) and network managed services (NMS) chain. While it may seem that these roles are implicit in the names themselves, modern practices of feature virtualization and abstraction allow a "network manager" to present what are actually abstract services to the OSS/BSS layer, for example, or an OSS/BSS to create these abstract services.
>
> New industry trends have created special integration issues that relate to the ability of software elements to "model" their own and lower-layer facilities and thus to simplify software elsewhere. Virtualization and abstraction let a network layer create models of service components that are "reasonable" or "facile" to

layers above or around it. So a billing system or an activation system can produce an abstract structure that represents what it does. This abstract structure can simplify the processing in adjacent software components.

For example, a network management system can represent the complete structure of a service as a single device to an OSS. In that case, the OSS only knows about controlling the abstract or virtual device, and it's the NMS that creates the real network commands. In dealing with multiple software components that are increasingly virtual or abstractions, operators have to decide who "sees" the real complexity at any point, and how that complexity is represented abstractly and thus simply to the network components surrounding it.

Making a decision on an approach is critical for assuring that there are no holes in the operations automation process and no redundant features. This will reduce the cost and transitional issues in a future network outsource project.

2. Make black boxes out of the current operations systems. A "black box" is a technical element whose internal properties are abstracted by its interfaces alone. Creating an abstraction for OSS, BSS and NMS systems, and any other specialized activation or service-related systems, can link them to a central network operations process more easily. The process should also address how the current systems link to each other so the same set of interfaces and tools are used.

3. Test and refine coordination between the outsource firm and your own staff. Virtually no operator expects to outsource all network operations, particularly facility-based providers that dispatch technicians for installation and maintenance. Even those that might -- non-access providers and some mobile providers, for example -- will have to coordinate their outsourced network operations with the remainder of their Operation, Administration, Maintenance and Provisioning (OAM&P) processes.

Since these kinds of coordination requirements are almost certain to emerge during the transition phase of NGN deployment, and thus fall under an integration contract, the experiences here can be used to guide requirements-setting for a future decision to outsource network operations tasks.

4. The most significant step is to assess the skills of the network integration provider to certify them as a future network operations outsourcing provider. More than 80% of network operators believe both tasks would draw bidders from the same pool of vendors -- those with strong professional services organizations. Two-thirds say that they would likely make participation in network integration, at least at the bidding level, a mandatory requirement for bidding on a network operations outsource contract. There is also some evidence that having the same vendor provide both services creates a greater chance of overall project success and ongoing satisfaction with the results.

Network integration outsourcers need network operations know-how

The idea that network integrators make good future network operations outsourcers can be flipped around, as well. Network operators increasingly believe it is even more important that potential network integration bidders be strong network operations outsourcers.

An awareness of ongoing issues in network operations is paramount in being able to effectively integrate network components, as well as integrate the network into current practices and systems. Some providers have gone as far as to establish plans for a "professional services procurement zone" that would contract only with a small number of vendors to provide all professional services support needed for network installation and operation.

Operators are currently divided on whether professional services for network integration and operations should be provided by an equipment vendor or by a third-party. So far, the trend has been to promote equipment vendors in the role, giving preference to vendors with a broad enough product base to have strong representation in most areas of NGN infrastructure.

Vendors with a broad product base can be an asset even in the next-generation network (NGN) planning phase, and outsourcing transformation planning is increasingly interesting to operators as a result. In fact, the worldwide trend for network operators is to increase the use of outsourcing and professional services during all phases of NGN planning and deployment.

As this trend develops, the symbiosis between the professional support services aligned with the project phases will increase, and it is likely that professional services will be as significant an NGN planning and project area as equipment will be.

About the author: *Tom Nolle is president of CIMI Corporation, a strategic consulting firm specializing in telecommunications and data communications since 1982. He is the publisher of* Netwatcher*, a journal addressing advanced telecommunications strategy issues. Check out his SearchTelecom.com networking blog Uncommon Wisdom.*

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