Managing the VoIP Service Rollout:

Why Service Assurance is Key to the Success of Converged Services

A White Paper

Brix™ Networks

Overview

No one wants customers complaining about bad service. What's worse is learning that problems were built into the network before those customers even signed up.

Over the next several years, a broad spectrum of carrier, cable, and telecommunications companies will make significant capital investments to support real-time, next-generation services, such as Voice over Internet Protocol (VoIP) and IP-based video. But when rolling out an advanced service like VoIP, how will planners know they're making the right investment decisions? Will they use a try-it-and-see-if-it-works approach? Or will they adopt an evaluate-as-you-grow approach – assuring themselves at each stage of their rollout that service levels and offerings are properly aligned with what customers expect and want?

That's where service assurance solutions come into play. Applying service assurance at each stage of an offering's rollout allows for incremental course correction, improving the odds that successive stages will go smoothly. And in any VoIP deployment, each stage represents its own "once-in-a-rollout" opportunity to resolve particular technical, operational, or customer service issues. If these issues are not addressed at that particular stage, it could mean re-architecting or rebuilding parts of the infrastructure later, with all the waste, missed revenue, and customer churn that would result.

Applying service assurance early in a VoIP rollout also means that the service itself will be ready when the network is. Operators will be trained. Metrics will be relevant. Critical parameters will be captured and analyzed. Workflows in response to issues will be efficient and proactive. The key is identifying the critical phases of a rollout and understanding how best to leverage service assurance management tools at each stage.

Stages of a VoIP Rollout

Each stage of a VoIP rollout correlates well with a particular set of service assurance roles and opportunities (see Figure 1). Engineering, for example, uses service assurance tools heavily prior to deployment to test how the service will likely perform later for customers, when engineering will be less involved. By contrast, customer care, which is not involved during initial service test, will use service assurance monitoring more and more as higher numbers of customers come online – from an initial few (the "friendlies") to general availability.

A service rollout typically progresses from stage to stage with each stage building on the progress achieved in the preceding stage. Starting another rollout, to add another new service (say, IPTV), brings you back to the beginning of the rollout process. That doesn't mean rebuilding the infrastructure from scratch, but it does mean finding and filling in whatever gaps exist between the current infrastructure and the infrastructure needed by the new service – in technology, configuration, human resources, workflows and other components. Those gaps would be filled in the same logical progression.

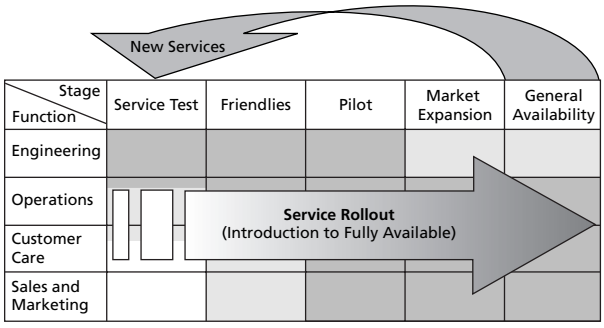

FIGURE 1: Example stages of a VoIP service rollout mapped against the key functions that support it. Darker shading indicates a function's greater degree of involvement at that particular stage.

Different providers may organize the stages of their rollouts somewhat differently, but all go through an evolution of stages similar to these five:

1. **Service Test**

   VoIP rollouts start small, usually with a few phones or terminals on a limited number of switches within a controlled environment partitioned off from the production network. The goal is to gain experience deploying and using the new components to see how those affect existing services, and catch and fix glitches before venturing out into the marketplace.

   One component that makes VoIP different from data is signaling transport. This transport carries call management information for tasks like call setup, teardown, and routing, and is in addition to the media transport that carries the actual voice call. Signaling also provides value-added services, like call forwarding, caller ID, and conferencing. For a data-only provider, setting up this signaling transport is a new challenge, as is handling interaction between the two transports. These details must be worked out and tested.

   Data-only service providers must also learn the various techniques and standards for moving phone numbers to the IP world and handling them once they're there. Phone numbers from the Public Switched Telephone Network (PSTN) must be translated properly into IP routing tables. And Access Control Lists (ACLs) must be accurate, properly formatted, and synchronized with database services.

   There's also another big difference: voice and IP video are much less tolerant than data of network performance issues. Packet delays, missing packets, packet retransmits, and other events that have a minimum impact on the user's experience when accessing e-mail or downloading a file can make phone and IP video service garbled and completely unacceptable.

   These and other factors mean that, if not properly architected from the start, VoIP networks will under-perform the circuit switched networks they replace and be competitively disadvantaged as a result. To head off service problems, providers must qualify networks under different usage scenarios *before* deployment to the pilot stage and eventually to the general market at large.

2. **Friendlies**

   The next step is to go beyond the controlled network of the service test phase and expand deployment to a number of additional users so that the implementation is more lifelike. These new users are called "friendlies" because they are willing to try out the new services with low risk to the service provider's reputation should anything go wrong. Visibility into service monitoring and active testing of the network infrastructure are essential at this stage to predict and understand how the network will perform with actual users, and to anticipate any additional engineering that may be required to expand the VoIP deployment.

3. **Pilot**

   The next stage is to deploy the service in a small market – a pilot project – to add users, increase traffic, and uncover previously unanticipated glitches that would not occur in the controlled environment of the lab or among the friendlies. Unlike friendlies, however, customers in the pilot stage are paying, so there are billing issues involved and a higher standard of service quality to meet. However, overall risk at this point is still less than in later stages. Operations staff can now use service assurance tools to monitor the service quality of live subscriber calls, and operations and customer service can institute and troubleshoot the workflows they'll use for issue isolation and resolution when the service really does go "live." Engineering can also characterize the network's response to increasingly more realistic loads and traffic patterns

4. **Market Expansion**

   At this stage, the service is now considered "ready for prime time." However, that still doesn't mean that it will be rolled out everywhere overnight. The service provider builds the subscriber base at

a measured pace, applying service assurance tools along the way to make sure the implementation is truly industrial-strength before proceeding to the next phase.

5. **General Availability**
   When a service becomes generally available, new customers, new regions, and new applications now come online as a matter of routine. The priority is to run the existing network profitably while creating new business opportunities. Service assurance tools can empower every part of the business to foster growth in all sorts of ways: by giving top customers self-care portals; by creating differentiated service guarantees; by identifying customers to up-sell from "gold" packages to "platinum" packages; and by helping define what services those packages include.

Each service rollout stage builds off the knowledge gained in the preceding stages, so it's particularly important the individual stages don't become silos, which is an important reason to use the same service assurance solution throughout the entire rollout. VoIP experts routinely talk about "end-to-end" visibility of the network. Equally important is end-to-end visibility of the rollout – from initial service testing to general availability and beyond.

Visibility Across Functional Areas

Using the same service assurance solution across all of these rollout stages is more likely to happen if the same toolset can be shared by different functions, i.e., engineering, operations, customer care, sales, and marketing. All users, regardless of role, are looking at the same VoIP service so their solutions should also align, and stay aligned, as the rollout progresses. In addition, the data presented should be relevant, complete, and effectively conveyed in a way that best supports each task for which a particular role is responsible. Table 1 identifies key VoIP assurance applications and the tasks where they should excel.

An engineer, for example, may want performance data sliced by network interface during initial test. Later, during market expansion, a support representative may require the same data sliced by customer. At that point there may be a lot more data to slice; however, both versions should be sliced from the same source – and the application that does the "slicing" should also be the same – even though it presents the data differently to an engineer than it would to a customer care representative. Without this type of alignment, consistency cannot be guaranteed, either from one functional area of the rollout to another, or from one stage of the rollout to another.

VoIP Assurance Application	Tasks Performed	Benefits to Providers
Continuous Monitoring, Troubleshooting, and Root-Cause Correlations	Find and fix performance problems before customers are impacted	• Reduces costly outages and service degradations • Less Mean Time To Repair (MTTR)
Customer Care	Assist customers in identifying and repairing service problems	• Prevents expensive truck rolls • Isolates problems in the customer equipment and subscriber environment, or access and service network
Service Level Agreement (SLA) Management	Guarantee performance and share visibility with customers	• Increases customer satisfaction and retention • Provides ability to market and compete on quality, not just price
Subscriber Prequalification	Validate a subscriber's network quality prior to signup	• Ensures qualified subscribers and avoids "trouble-ticket generators" • Protects company's reputation by minimizing negative word-of-mouth comments from disappointed subscribers
Baseline	Help operators understand the quality and capability of their networks	• Permits faster time to market with the right services • Achievable SLAs that showcase the network's strengths

TABLE 1: Key VoIP Service Assurance Applications, Tasks Performed, and their Benefits to Providers

This division of labor, as well as the various overlaps and handoffs, occur over and over again during the roll-out. Customer care is a high priority during market expansion and especially after general availability starts. That's when sales and marketing use the customer care application. At the same time, operations will be using troubleshooting tools when service issues do occur. Keeping trouble from occurring is why operations will use SLA management tools – to proactively correct issues before customers experience them (and bring them into the customer care queue). During these late stages, engineering may step in only when an issue triggers root cause analysis, employing the same troubleshooting tools as operations, but probably at a more robust or detailed level.

Where All Service Assurance Applications Meet

Getting different applications to align even though the tasks they support are different is possible because all service assurance tasks rely on a hierarchy of four core functions:

- **Measure**
  Captures the data accurately from strategic points in the network that indicate traffic flows, usage demands, and the status of various network hardware and software assets.
- **Aggregate**
  Consolidates data to enable scalable performance visibility across network boundaries, such as caller-to-caller, or caller-to-network edge.
- **Analyze**
  Converts parametric data to meaningful information about operational status, events, data correlation, and other items monitored or to take corrective action.
- **Visualize**
  Displays the information in such a manner so that the stakeholders managing the service can make intelligent decisions – trends, relationships, alarms, and other views of greatest value to the particular user category.

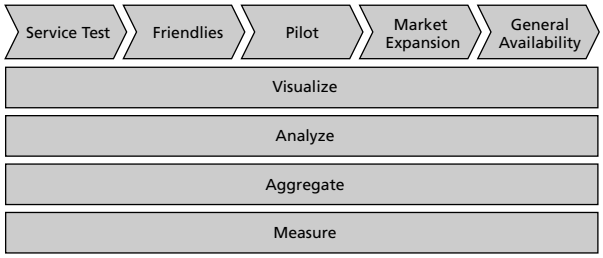

FIGURE 2: Applications supply a common set of core functions and value to all users across all stages of the rollout.

In the service rollout, each stage relies on the one before it. In the hierarchy of the four core functions (see Figure 2), each layer relies on the one below it. Unlike the stages, however, the core functions are not once-in-a-rollout events. Measurement, aggregation, analysis, and visualization are all ongoing. This is key to unifying service assurance tasks among multiple applications within a single, integrated solution set. Different roles benefit from different views, but *all* users need visualization, just as they all need the other core services. If all these views flow from the same analysis engine (and the same aggregation and measurement engines), then consistency across user roles and across rollout stages will be the natural result.

Business and Technical Benefits

But having a service assurance solution that can manage your rollout throughout its life stages only helps if you let it. If you wait until the rollout is over, at that point service quality problems will literally be built into the network itself. On the other hand, if service assurance is built in, then so will be a number of important advantages:

- **Reduced Churn**
  The service will be ready for prime time on day one allowing you to target new customers rather than expend resources stemming losses.

- **Incremental Risk**
  Managing service quality as you deploy in stages means that you only have to face the limited risk of going into the next stage.
- **The Right Service**
  One of the things you want to "assure" is that the service you get is the service you planned for.
- **The Right Network**
  The right service requires the right network supporting it. Are assets, like routers and gateways, deployed where they need to be? Are they configured appropriately? Are databases populated correctly? Is there sufficient bandwidth? Are operations and Help Desk workflows in sync?
- **Reduce Waste**
  Unlike the "try-it-and-see-if-it-breaks" approach, consistently applying service assurance competencies reduces rework, duplication of effort, miss-application of effort, and misspending of funds. It also reduces time-to-market, which means revenue and profits happen sooner.

Conclusion

A profitable VoIP or IP video service is more than just one that avoids quality problems. It is also one that fits the market in terms of what customers want, in what numbers, and at what prices. Ultimately, the big payoff of lifecycle service assurance comes in the form of sound capital expenditure decisions. Are expenditures aligned properly against market realities, or is the network over-provisioned in some areas and under-provisioned in others? Given the right service assurance solution set, planners will have the right answers *before* VoIP or IP video services are deployed and funds committed.

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