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testing VoIP performance

Your key to long term success

by Peter Higgins

THE MIGRATION to VoIP is not without its challenges, especially for large scale deployments where there is significant investment in legacy equipment. Governments transitioning to VoIP have had to be strategic in their implementation and rollout methodologies in order to maximize the benefits, while preserving the integrity of their current infrastructures as much as possible.

VoIP systems do present some specific challenges for network managers, however. For example, they must meet exceptionally high quality and performance standards. Unlike data, there is no margin for error or delays in delivery. In addition, any network changes could affect either the quality of your voice – or other mission-critical – applications.

Factors that affect VoIP performance can be caused by problems on the network or servers, or in some cases, by environmental conditions. In these cases, voice transmissions could be lost or delayed, IP phones may not work, or the call quality is simply not up to standard.

To mitigate these problems, a well-planned deployment should take into account the proper assessment, monitoring and troubleshooting requirements. In order to that you require specialized network monitoring and troubleshooting that are designed to address VoIP

issues. The more effort you put into the planning and installation phases, the lower the risk of running into problems further down the line.

Assessment

It is important to get a clear picture of your current capabilities before making major investments in equipment overhauls. That is why an assessment is the most critical stage of any deployment.

Surprisingly, even large enterprises will overlook this stage or minimize the value of an assessment. This is a short-sighted approach, since this process is integral to increasing the probability of success for a VoIP deployment. Even if you are working to expand an existing VoIP installation, there is no guarantee that your network is capable of handling the increased traffic. An assessment will help you understand that before you start.

An assessment provides the ideal opportunity for you to establish your expectations, document results and realistically determine your hardware/software requirements. It can also help you understand where integration with existing PBX systems makes sense, and where it doesn't.

Additionally, an assessment will help you to reduce costs and complexities, because it allows you to uncover potential network issues before they happen and avoid the risk of post-deployment failures. An added advantage is that the tools used to perform a network assessment can also be applied to troubleshooting and monitoring after deployment.

Some of the questions asked during this phase of a VoIP initiative include:

- Is my network ready?
- What are my real-time requirements?
- What do I need in place to effectively manage remote sites?
- How will I measure performance
- How will I measure success?
- What are my data and security needs and can I meet them?
- How do I optimize end-user quality of experience?

On a more technical level, during the assessment phase you need to look at a number of specific criteria: for example, determining the number of VoIP calls that can be carried across the network while meeting quality requirements. You must also determine the most efficient means to establish site connectivity and routing; as well as determine how to configure a network to achieve quality of service (QoS) goals. Understanding all this will allow you to build a roadmap to meet your VoIP goals in a cost-effective and efficient way.

Monitoring

Once a VoIP network is installed, it is critical to monitor its performance and capabilities on an ongoing basis to ensure all is as it should be. There are dedicated test tools that allow managers to monitor all VoIP traffic across any given cable and provide a visual perspective of uptime and performance levels in real time.

In the event there is a problem – such as degradation, jitter, latency or packet loss on the network – monitoring tools will help you pinpoint its location. Tools for doing this include performance managers for measuring traffic volumes and availability; and probes for establishing call quality, traffic pattern, utilization and volume.

Managers can use these tools to track specific sites, links or calls. They can also be used to measure overall utilization and call volumes, to ensure that your infrastructure is properly configured, as well as determine the impact of adding new applications. The ability to capture and identify problems as they happen can also speed troubleshooting and resolution when a problem does occur.

Troubleshooting

While monitoring can guide you to a problem, troubleshooting tools will help you drill deeper into the performance of specific elements of your network during and post-installation. For example, you can start by checking routers, switches and other devices for higher-than-

normal utilization, mismatches, etc. Troubleshooting can be performed when your VoIP application is first deployed, or any time after the fact.

When an IP phone is first connected to a VoIP network for example, common problems that may have an impact on performance include no voltage (this could mean a cabling problem or improperly configured port), no communication with a server, or invalid IP addresses for the call server.

During calls, signs of potential problems can include no dial tone, inability to receive calls or other calling limitations (e.g. no long distance), and poor voice quality. The solutions for these issues could be rooted in a number of areas, such as a faulty phone, call server problems, or traffic being filtered/blocked on the network.

Planning for VoIP

Government agencies and enterprises alike are well aware of the benefits of VoIP as a means to reduce cost, streamline management of resources and manage change. At the same time, VoIP demands perfection and specific skill sets in order to be successful. The key to maximizing your investment, as well as the benefits of this technology, is ensuring you have done your homework before deployment, and continue to monitor your network after the fact.

Whether you are planning a phased transition, or wholesale replacement, it is important to not underestimate the value of having the proper planning procedures and test tools in place. By staying on top of your VoIP initiative – pre, during and post-installation – you will leave no margin for error.

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