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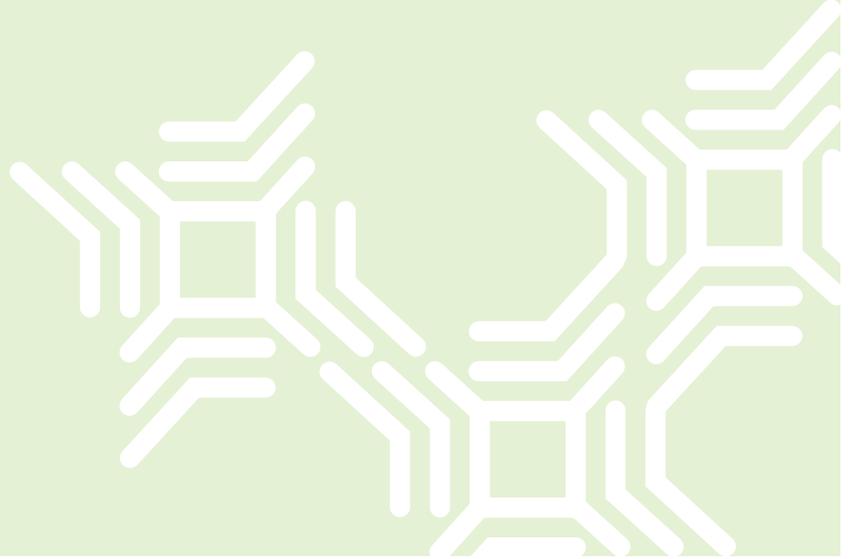
Testing Best Practices

Following the best-practice testing methodologies before rolling out new IP and contact center solutions is vital to ensuring an enhanced customer experience, greater agent productivity and lower operational costs.

Read this paper to discover:

- Test preparation methods
- Test planning methods
- Test execution methods

Overview

Following a best practices, comprehensive testing methodology before rolling out new contact center solutions is vital to ensuring that your customers' experience is enhanced, agent productivity is increased, and costs are lowered. With this in mind, you would think that testing in the pre-production phase would be a standard procedure. Unfortunately, the reality is that many contact center roll-outs get delayed because of lack of proper testing procedures. In fact, poor or no testing increases delay and costs in 79% of all projects[1].

Overruns in projects to refresh contact center technology, introduce new services, or build new contact centers can quickly grow into vast cost increases. Issues that are not handled in the pre-production stage have a direct negative impact – lowering customer satisfaction levels and your company's reputation, while increasing the chance that customers will take their business to your competitors.

You need to ensure that your technology investment delivers the expected customer experience. Committing to a best practice testing program enables you to consistently reduce costs and implementation timelines, confidently make technical and service improvements, maximize ROI, mitigate deployment risks, and ensure a great customer experience. Following best practices means planning for testing, understanding the types of tests available, and using an automated, layered, end-to-end approach to testing – think of it as preempting issues in order to save your organization's time, money, and reputation, while providing a superior customer experience.

Plan to Include Testing

When you are developing your project proposal, make sure you consider all the aspects of adding testing into your plan. In today's world, testing is no longer optional. Budget, timeline, personnel, and infrastructure needs all must be taken into account from the very start. Note that Empirix offers a corresponding paper (Perform: Monitor to Assure a Great User Experience), where you can learn about keep performance running at optimal levels by consistently monitoring your communication systems.

Justify the Cost

As a guideline, estimate that 5-10% of your project's budget will go toward testing expenses. It sounds counter-intuitive – spend so you can save.

However, Gartner reports that "up to 70% of enterprises that do not perform or have adequate network assessments will experience service problems, additional costs, and time delays of their IP telephony implementations." The reason for this is fairly straightforward.

Today's infrastructures are extremely complicated, including interdependencies between components and mixed vendor environments. These issues create a situation that makes it challenging to validate the environment without the use of a comprehensive automated testing solution. Keeping this in mind, make sure you plan to test not just individual, siloed components, but the complex multi-vendor, multi-application, multi-channel environment as a whole.

◘ **Fine Tuning**

A result of not getting it right the first time, implementations become expensive, requiring a series of fine-tuning exercise

◘ **Additional Infrastructure**

When all else fails because of not getting it right, add more hardware

◘ **Fundamental Rebuild**

Failed projects result in very high cost overruns

Develop Timeline

With a comprehensive, end-to-end approach to testing, you can identify the source of issues in a matter of hours or days instead of weeks. So while you are adding a short amount of time onto the front end, you are saving enormous amounts of time in the long run. In other words, you can either get it right and invest in a testing process early on, or you can pay even more in time and money to fix issues – or worse, suffer system failures later – once the solution has

been brought into the production environment. Therefore, be sure to include an appropriate amount of time for testing as you develop your roll-out plan.

Select the Right Personnel

Selecting key personnel to develop and perform the tests is critical. The most successful testing processes are performed when both internal and external experts are integrated into the plan. Adding external testing expertise provides third-party validation that all bases are covered, so you can move forward with confidence. In addition, make sure you have the key experts available to diagnose issues discovered. This effort should, once again, involve both internal and third-party experts to speed the process of understanding the exact origin of an issue and the best way to resolve that issue.

Understand Your Environment

Your testing personnel should have a thorough understanding of your environment. There are a few basic steps that should be performed in order to accomplish this goal:

- Map all network elements and voice, video, and data applications.
- Understand user behaviors to gain a picture of capacity, topology, and scale needs.
- Simulate your environment to clarify how traffic from one area (e.g., streaming video) impacts another (e.g., web access).

- Understand all of your routing requirements.

Use a Common Set of Metrics

Devising a set of consistent and reliable measurements and scores for your testing system is of vital importance. These metrics will allow you to repeatedly assess the impact of applications on the network infrastructure. In addition, a common set of metrics enables you to anticipate what the user experience will be like once network changes are in place and voice, video, and data are shared over a single network infrastructure. Testing measurements can include understanding how many calls per minute the system can handle, what level voice quality is acceptable, what is the time to connect or greet, how quickly screen-pops appear, how well the system responds to vulnerability tests, and more.

Plan the Tests

Below are a few examples of the wide range of test categories that provide insight into contact center implementations. You may select just one or, more likely, a combination of these tests to ensure that you can roll out your multi-service communication technologies with confidence.

Network Testing

Most contact center applications are deployed over an IP network. Network testing enables you to measure the performance of all network elements,

including peripheral gateways, media gateways, network configuration, and so forth. In addition, you should be testing to understand the carrier, both fixed line and mobile. These assessments help you better understand if there are any bandwidth issues, jitter, or packet loss – all issues that can have a negative impact on communication.

Functional Testing

Automated functional testing is used to evaluate the complete customer experience, from the network carrier through the start of the call (PBX/ACD) through the automated voice response system (IVR) and all the way to the agent desktop. Functional testing identifies and isolates issues, as well as ensures customers do not experience dropped calls, wrong prompts, or information delays.

This kind of testing involves simulating calls that emulate real caller and agent behavior. Automated systems are used to dial into the contact center, speak account and/or PINs, ensure that the right prompt responses are played, measure system/network response times for each function, etc. In addition, these tests ensure that the routing is correct – for example, when a call goes through the IVR and an option is selected, is the call sent to the right place?

Load Testing

Automated load testing also emulates real caller/agent behavior, simulating

hundreds or thousands of calls into a system simultaneously. This process ensures that the environment will work as designed for anticipated normal call volumes, as well as peak call volumes. The kind of testing also ensures two-way voice quality under load, as well as lack of clipping, jitter, and latency for both customer-agent and customer-IVR interactions.

Vulnerability Testing

According to a Ponemon Institute report, the average cost of a security breach is $5.5 million[2]. Avoiding that cost through vulnerability testing makes clear business sense.

Once you move into an IP environment, voice and data share the same infrastructure. Within that environment, vulnerabilities in one area (e.g., data security vulnerabilities like a denial of service attack) can have repercussions that affect areas across the network (e.g., causing poor voice and/or video quality). Vulnerability testing provides you with protection against malicious attacks, such as traffic floods, and can provide support for regulatory requirements that require that data be handled securely.

Perform the Tests

Take advantage of the automated testing solutions available on the market today. They can send large amounts of calls and data at rates that no one could ever perform manually. Automated tests are also easily replicable, so they can be run under a variety of scenarios, repeated to see if the issues occur more than once, and repeated again once issues have been fixed to ensure that the problems have truly been resolved.

Test Through the Layers

Real-world, end-to-end testing is extraordinarily effective for enabling your company to avoid project pitfalls. Testing through the layers is a basic best practice that should be followed in order to accomplish this goal. This process involves first validating foundational elements (carrier to IP network), and then each technology layer (IVR, CTI, CRM, presence, chat, etc.) successively, all the way out to the desktop screen-pop. The procedure is accomplished by automating actual calls into a call center in a controlled manner and measuring the results at every stage. Isolating performance issues at the tested layer enables you to more easily discover the source of issues.

Work Through a Variety of Test Cycles

Every layer of the pre-production environment should experience a series of test cycles in order to ensure that everything is working correctly. First, perform a low volume functional test to assure that all contact center elements are working as expected in the steady state. These test results can be used as a baseline to validate other types of behavior and traffic.

Next, steadily increase the test call volume in order to identify at what level of stress a problem – such as low PSTN capacity or incorrectly sized licenses – might occur. Following this test, stress the system at maximum capacity for a limited period of time in order to reveal issues that might occur during peak customer interaction periods. Finally, stress the system at maximum voice and data volume for an extended period to uncover any memory leaks or problems with resource allocation.

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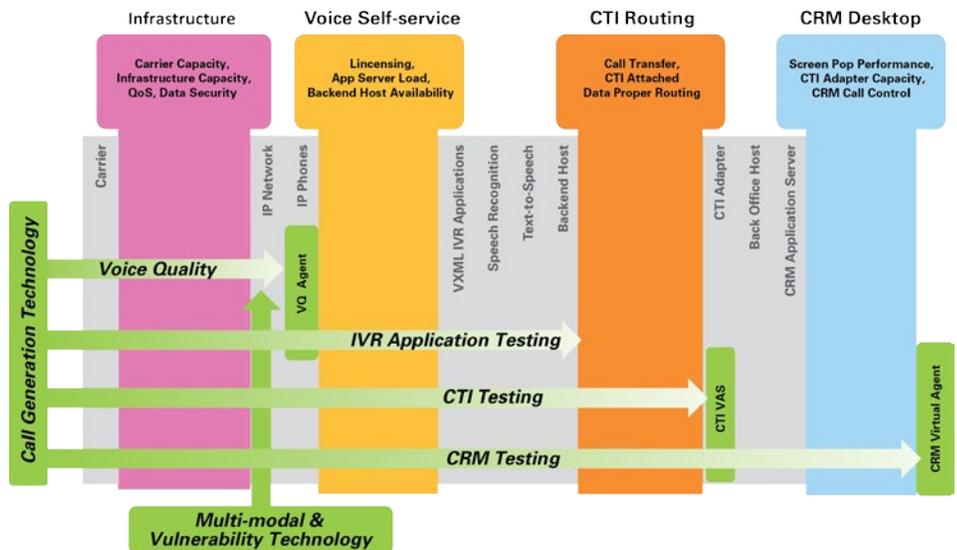
Conclusion

If you plan for testing, understand which tests are appropriate for your situation, and perform the tests using best practices methodology, you will be able to preempt issues from occurring, saving time and money, as well as improving your company's reputation for an excellent customer communication experience.

At the same time, remember that over time, customer needs will change, new technologies will be incorporated into the environment, and upgrades will occur. Therefore, it is critical to test every change before it is rolled out. In addition, you should proactively monitor the environment to keep performance at peak levels, as well as perform analytics in order to predict where issues could occur in the future and handle them before customers, business, and profits are affected.

[1] Customer Experience Foundation report

[2] "U.S. Cost of a Data Breach" released by Ponemon Institute and Symantec, released in March 2012