Miercom

Lab Testing Summary Report

December 2011

Report 111121

Product Category:

Unified Communications

Vendor Tested:

Aspect

Products Tested:

Unified IP 7

Miercom PERFORMANCE VERIFIED™

Key findings and conclusions:

- **Aspect Unified IP 7 successfully maintains call functionality during network and power outages**

- **Unified IP 7 solution proves to be a resilient high availability system, having little or no down time**

- **Software alerts supervisors and agents at their desktop of system failures with instructions for maintaining business processes**

- **Key components, such as the AQM and UCC that are fully redundant, remain functional during outages**

Aspect engaged Miercom to verify the high availability of their Unified IP 7 solution. The objective of the testing was to ensure that the Unified IP 7 solution maintained system uptime while subjected to network outages, power failures and virtual machine failure. During the outages system resiliency was verified by observing that contacts were maintained and agent and customer communications were continued. A basic security analysis proved the Unified IP solution to be resilient to attacks.

Aspect Unified IP 7 was able to maintain contacts and communications between agents and customers. The system proved to be resilient and provides the mission-critical high availability demanded for business telephony and customer interaction. Calls were not dropped between the agents and customers during any of the outages. Certain features were unavailable during outages, such as search and playback of voice recordings for quality improvement and training purposes, and supervisor functions such as real-time reporting and agent administration. These features were restored automatically when the

Figure 1: Aspect Unified IP 7 Switch Configuration Tool

Source: Miercom, December 2011

Unified IP Server Configurator Tool verifying that the primary server instance is active, and the backup is in standby.

impacted host returned online or when the supervisor logged into the redundant system. While the ability to view and replay recordings was temporarily unavailable to supervisors, the recordings themselves were not lost.

Additionally, the system provided real-time notification of system failure with desktop instructions for both agents and supervisors, as well as audio messages for incoming customer calls.

High Availability

For client applications such as financial firms and government agencies, constant uptime is critical. Active conversations between customers and agents must be maintained in the event of an outage, and customers in queue also need notification. Supervisors and agents must know of any change to system status. In our testing, we found that Aspect Unified IP 7 handled these issues satisfactorily.

Testing the high availability of the Unified IP 7 system consisted of creating and simulating network outages, power failures and application failures.

To cause a network outage, a network cable was disconnected from the server to the switch. During this process, we observed the system continue normal operation. Active contacts were not dropped, all contact statistics were preserved, and recordings were initiated.

To simulate a power failure, we disconnected the power cord. We confirmed that calls remained connected. Supervisors were still able to access the Aspect Quality Management Web client and Unified Command and Control.

Application failures were conducted by shutting down an individual virtual machine on a single host to verify that their features, such as graphic user interfaces and access to network devices, remained functional.

Network Outage

Host 2 consisted of five virtual components including the Reporting DataMart, Core (redundant), Unified Command and Control, Quality Management Backup/Web/Media, and the Quality Management Recording server. After verifying that the test bed was in its proper state, we unplugged the network cable from Host 2 to simulate a network outage. See *Figure 1* on page 1.

Host 2

Reporting DataMart
Core *redundant*
Unified Command and Control *redundant*
Quality Management *Backup/Web/Media*
Quality Management *Recording*

During the outage, audio was unaffected and agents could still process inbound and outbound calls. The screen and audio recordings were automatically load balanced across the three AQM Recording servers, one on each of the physical hosts. See test bed diagram. No recordings were lost when Host 2 lost network connectivity.

The only functionality that the supervisors lost was the ability to view and generate reports through dataviews. This function returned once the network connection was restored.

Supervisors connected to services on Host 2 were immediately notified via pop-up message that Host 2 was unavailable. We accessed the redundant system through a desktop shortcut. Supervisors connected to other hosts were unaffected. The high availability of the Unified 7 IP system proved to be efficient while an entire host with multiple critical components was disconnected from the network. Agents and customers did not experience any down time during the outage, maintaining normal system operation.

When Host 6 Telephony Media Server (TMS) has a network outage, the redundant TMS will process new calls. Calls that were connected to the first TMS were dropped but later reconnected to the redundant TMS. During the outage, we also observed recordings that ended, but were later picked back up when agents were reconnected to the secondary telephony media server.

All other features remained fully operational including allowing supervisors to search and play or view completed recordings through the AQM Web client; commit configuration changes in the Unified Command and Control administrator interface; review real-time reports via the Unified Command and Control RTR application; and review historical reports via dataviews.

QM Database Resiliency

The quality management database virtual machine (VM) on Host 3 was shut down to simulate an application failure. During the outage, no active contacts were dropped, all contact statistics were preserved and recordings were initiated. All four agents remained connected, completing inbound and outbound calls. Supervisors also maintained their management abilities, successfully viewing
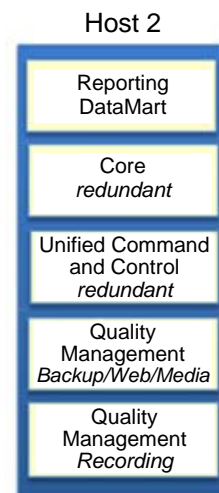
agent status and agent information through the Unified Command and Control administration Web GUI. Supervisors also had access to real-time reports via the Unified Command and Control Real-Time Reporting (RTR) application and historical reports via dataviews.

The one feature that could not be accessed was the ability to view and playback recordings. Once the quality management database was brought back online, recordings were once again accessible.

Power Failure

Host 1 had five components including the Primary Data-Mart, Core, Core Expansion, Quality Management Primary, and Quality Management Recording server. A power failure was simulated by dis-connecting the power cord while active calls were in place between agents and customers. Callers waiting in queue receive an automated message saying there is a temporary service disruption and to wait. When a new caller dialed in, the error notification was played and asked the caller to wait on the line.

Host 1

Reporting DataMart

Reporting DataMart

Core Expansion
redundant

Quality Management
Primary

Quality Management
Recording
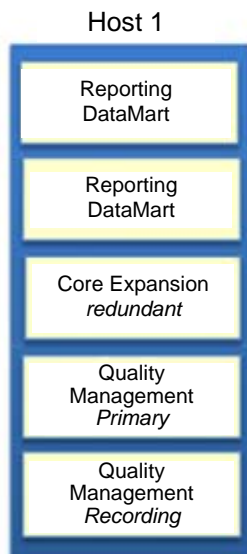
Agents also received a pop up message on their desktop that there was a problem with their work station or network connectivity.

In the recordings database, there were four recordings of only the agent screen, and audio recordings of concurrent calls were unavailable. Once the server was brought back online, the audio recordings were displayed. The ability to make configuration changes in the Unified Command and Control administration GUI was also unavailable while the server was down.

When Host 1 had power and restored the recovery process, agent desktop functionality returned. Agents were authenticated and then placed in idle state, ready to take new calls. All calls to agents remained up, and proper notifications of the failure were sent to agents and customers. The system recovered correctly, and operational functionality of all impacted components was restored.

Host 5 is the Advanced List Management (ALM) core. The ALM core allows a supervisor to view

and edit all information pertaining to call backs. When the ALM is unavailable due to a power outage, the secondary ALM server will take over its role. In our testing, the redundant ALM server successfully took over, leaving all features of the Unified IP system fully operational.

All connected calls during the outage remained connected, with new calls also being processed. All current recordings continued until completion, and new recordings initiated properly.

We also verified contacts and active queued calls were successfully maintained during a failure of the Advanced List Management server. All supervisor features continued to be available during and following the outage.

Security Tests

A security analysis was performed on the Unified IP 7 solution to discover if there are vulnerabilities or any flaws in protocol usage. Aspect hardened the components of the Unified IP 7 system in accordance with their recommended practices prior to our test run.

There were over 375,000 protocol mutation attacks run against the system's individual components. The Unified IP solution was resilient to the attacks and scans. No security flaws were detected within the standard protocols of the system. During the security attacks, supervisors maintained full system access without any loss of service. Calls between agents and customers remained connected.

Bottom Line

Unified IP 7 preserved active contacts between customers and agents during network, server and physical host outages, while providing real-time notification of failures to agents and supervisors. Instructions directing them to take corrective actions were supplied during these outages. Audio notifications were provided to callers in the inbound queue during an outage.

During our security analysis, Unified IP 7 also proved to be a robust implementation, preserving system functionality while thwarting attempts to compromise it.

Overall we found that Aspect Unified IP 7 is a robust and resilient Unified IP solution that lives up to the reputation and expectations that Aspect has developed for a variety of customer deployments over the past several decades.

Test Bed Diagram
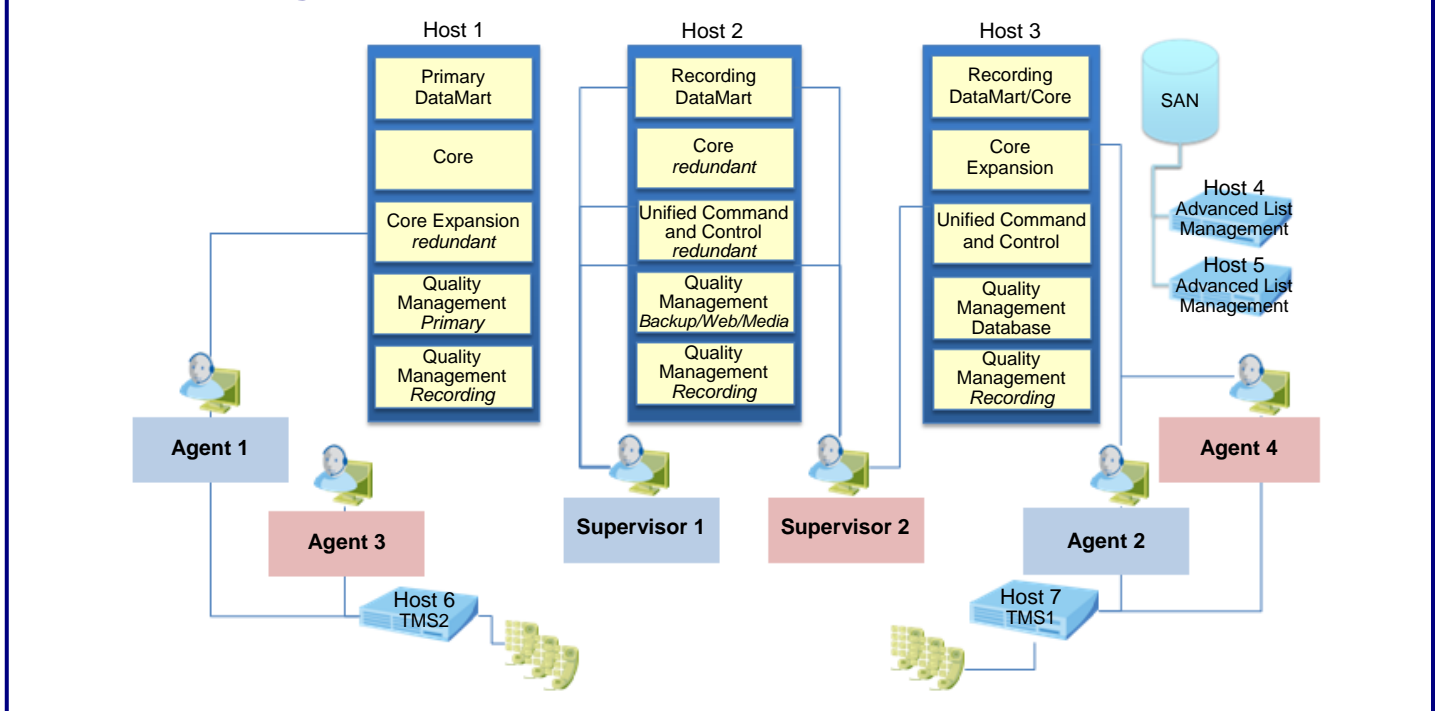
How We Did It

The test bed diagram depicts the deployment used for testing. The specific deployment scenario tested was a 250-user virtualized profile. This profile contains the major components that exist in all Aspect Unified IP deployments.

The general system requirements for the physical hosts are as follows:

- Hosts 1, 2 and 3 require 16 CPU cores and 32 GB RAM each. These physical hosts contain the virtualized Unified IP, Quality Management and Advanced List Management components.
- Hosts 4 and 5 require four CPU cores and 16 GB RAM each. These physical hosts contain Advanced List Management components.
- Hosts 6 and 7 are standalone devices containing the two Telephony Media Servers (TMS).

Prior to beginning each test, a short list of steps was initiated to ensure proper test results. We first verified that all the primary instances of any components using the active/backup high availability model were in the active state. *See Figure 1* on page 1. We then verified that clients were connected to the primary core machine, which was done utilizing the server configurator tool. Finally, we verified that the Aspect Quality Management (AQM) components were connected to the primary instance of other components with an active/backup high availability model. AQM gives supervisors access to recordings and live monitoring. Four agents were then logged in; two were assigned to inbound calls and the remaining two agents were assigned to outbound calls. This was done to ensure that the agents were evenly distributed across the core expansion servers and the Telephony Media Servers. There are six hosts total to manage the entire system.

Security testing was performed using the Miercom Security Analysis Suite, which includes passive scanning and mapping tools, as well as offensive attacks and exploits. Penetration test tools for running attacks/exploits, security scans including protocol interaction with mutated traffic, common vulnerability exploit tests, Denial of Service (DoS) and SIP server torture tests (RFC 4475) included proprietary test scripts and the open-source security assessment products, Offensive Security and Mu Dynamic's Mu-4000 Service Analyzer. Mu Dynamic's (http://www.mudynamics.com) Mu Service Analyzer provides a complete service assurance solution for determining the reliability, availability and security of IP-based applications and services.

The Mu-4000 Service Analyzer actively and methodically probes for vulnerabilities using attack vectors. These vulnerabilities may exist as the result of an insecure protocol implementation, a known security flaw or even a bug in the beta code of the product. The Mu-4000 Service Analyzer was used to perform protocol mutations, published vulnerabilities and also external attacks using test cases and custom scripts. The Mu solution is highly automated with lights-out fault isolation. It can help speed the remediation of software flaws by providing actionable reports and complete data on any fault.

The tests in this report are intended to be reproducible for customers who wish to recreate them with the appropriate test and measurement equipment. Current or prospective customers interested in repeating these results may contact reviews@miercom.com for details on the configurations applied to the system under test and test tools used in this evaluation. Miercom recommends customers conduct their own needs analysis study and test specifically for the expected environment for product deployment before making a selection.

Miercom Performance Verified

Aspect Unified IP 7 achieved the Performance Verified Award for demonstration of its high availability capabilities during network and server outages. The Unified IP 7 solution:

- Provides high availability by maintaining call processing and preserving contact lists during network, server and host outages

- Sends notifications and instructions to supervisors and agents at their desktop when a system failure occurs

- Maintains full system functionality in the event of a physical host failure

- Contains key components such as the AQM and UCC that are fully redundant, remaining functional during network and server outages

Unified IP 7

Aspect Software, Inc.
300 Apollo Drive
Chelmsford, MA 01824
1-978-250-7900
www.aspect.com

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