

Maintain high availability and VoIP quality in Call or Contact Centers with Network Time Machine

Network Time Machine addresses the challenges associated with call centers and VoIP call management. Deployed by enterprises around the globe, Network Time Machine helps network engineers maintain high performance and availability.

Key attributes:

- High call volume capacity with detailed call-by-call visibility
- Multi-segment analysis for quick problem isolation
- Correlated SIP/H.323 call setup and quality analysis across multiple network segments
- Plug-and-play installation means quick deployment
- Troubleshooting reports

While often regarded as a customer support tool, many enterprises are leveraging call centers as a revenue-generating profit center. By integrating customer data, traditional business applications with the call center application, a successful call center can boost both revenue and customer satisfaction. Any availability or quality issues can lead to major headaches in these complex deployment scenarios.

To meet new demands, many call center service offerings are state-of-the-art VoIP systems that are scaled to meet demand while maintaining high levels of service. With advanced features and complex deployments, this is not easily achieved by most enterprises. With the massive growth in both the size and complexity of contact centers, network engineers and IT managers are faced with more challenges than ever.

Traditional Call Center Management Tools Can't Solve the Problem

Although most call center equipment and application vendors offer management software and tools, the advanced diagnostic features in call center infrastructure devices come at the high price of reduced performance. While most IT teams try to use traditional network or VoIP management tools, these solutions are targeted at efficiency, QoS monitoring and alarming. They are able to identify degradation in service level because of resource or bandwidth limitation, even down to resolution in seconds. However, they lack the transaction level granularity to isolate the source of performance or connectivity problems. This is because statistical information does not offer sufficient detail to programmers; equipment vendors and service providers to identify the root cause of the issue. Packets, with transactional level detail (with accurate timing) are needed to identify and resolve the problem.

“We reduced time to get to obtain relevant traffic from more than one hour (if it was even possible) to just a few minutes”

– Senior Network Analyst of a major call center



Network Time Machine

Top 4 Call/Call center challenges addressed by Network Time Machine

- 1. Voice quality caused by poor WAN/network quality**—When the VoIP monitoring system reports quality issues, it does not provide the source and destination IP address information of the calls that exhibited the issue. As a result, it is difficult to isolate the network or service provider that the calls transverse to isolate the issue.
- 2. Callers complain of Intermittent Problems**—When a user or an agent complain about call issues, it is difficult to identify the traffic flow that the user’s traffic came from. The user does not know their IP address, and it is difficult to track call progress when it transverses across proxy server/call managers that change the IP address of the caller/callee.
- 3. Call forwarding issues within the Call Center systems**—Many system components are involved in routing customer calls to the appropriate operator or application accurately and quickly. Some of these transactions involve more than just SIP - and include complex multi-tier transaction between servers. Having full visibility is important when isolating call forwarding issues.
- 4. Intermittent issues that appear after equipment firmware or hardware upgrade**—During system firmware upgrades in the contact center, problems may be caused by a bug in the new firmware. Or, hidden issues with other vendor’s devices suddenly come to light. Left unaddressed, these issues can escalate into cataclysmic call center events.

Network Time Machine for Contact/Call Center

More often than not, problems happen intermittently and are difficult to track down without a way to see what actually caused the problem when it happened. Most tools try to guess after the fact based on statistical information that offers clues, but in reality, many network engineers wished they had a network recorder so they could walk through the sequence of event that led to the problem.

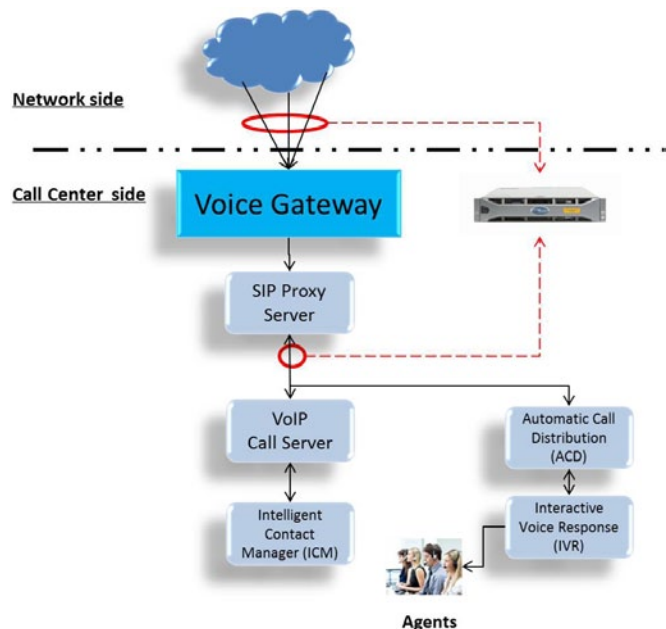
Network Time Machine (NTM) is a packet capture appliance with high performance stream-to-disk technology, 20 Gigabytes per second throughput, and up to 500+Terrabytes of storage capacity. In addition, it has the ability to conduct real-time statistical analysis of VoIP and Data traffic, and conduct packet level analysis using its embedded application analysis software, ClearSight Analyzer. This single tool can handle up to 10,000 concurrent calls with detailed analysis and QoS measurements of both voice and video.

Extensive filtering capability takes the raw data and provides detailed analysis so key performance indicators can be quickly extracted—for transaction and payload analysis of data applications, or detailed call-by-call analysis and replay for VoIP applications. That’s right, you can actually go back and track individual calls over time, regardless of when they occurred.

Maintaining High Availability and Quality with Network Time Machine

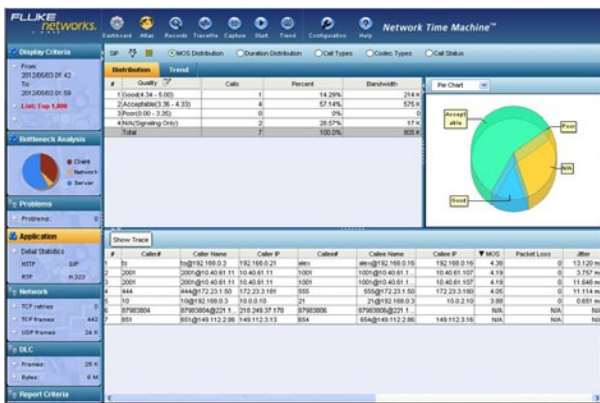
Deployment

The best place to deploy Network Time Machine is at each interface, to capture traffic before and after the call center gateway. If it is not possible to connect before the gateway, it can be connected to the Proxy server so that call forwarding transactions are retained.



Detail Back-in-time, Call-by-call evidence

Network Time Machine can conduct 24X7 analyses of all VoIP calls coming through the Gateway and signaling traffic going between the SIP Proxy to other servers, such as IVR. It can provide call by call MOS, call status and duration analysis offering in-depth quality-related KPIs, such as packet drop and jitter, for each call. With real-time analysis of thousands of concurrent calls (with statistics retained in 1 min resolution that can be stored for months), users can easily look up statistics based on time duration, caller/callee information to gained visibility to both SIP based signaling and RTP traffic on either side of the Voice Gateway, plus traffic that goes in and out of the SIP Proxy Server. Network Time Machine’s deep packet storage allows back-in-time analysis to troubleshoot events reported by the management system, as well as user level complaints that were overlooked.



4. User can use advance filter to filter calls by client site to isolate the IP address range that exhibited the issue. With the IP address range, it would be easy to determine which service provider’s WAN link the call comes through
5. For each call, KPI such as Jitter and packet loss is available to show the cause of MOS degrade
6. The call table can be exported into CSV for documentation. Packet level transaction can also be extracted to offer a proof to service provider such as problem can be resolved.
7. The above can be conducted with call setup issues using the call status distribution, instead of MOS distribution

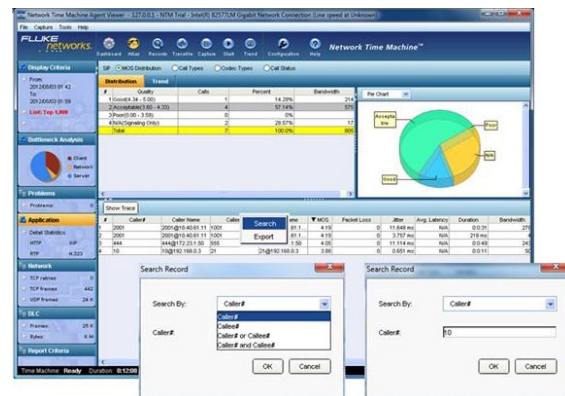
Responding to User Complaints that are Intermittent

Network Time Machine offers search functionality such that statistics can be retrieved based on caller/callee ID or their host name, when users complain about call setup or quality issues. With its high performance stream-to-disk functionality, each call can be analyzed by Network Time Machine along with the caller/callee number, host name and IP address pair information. In the figure below, calls from a specific time range are listed. The time range may be adjusted depending on when the problem was reported. A search on the caller number allows the related call to be isolated. The search may also be done using callee number or a combination of the two.

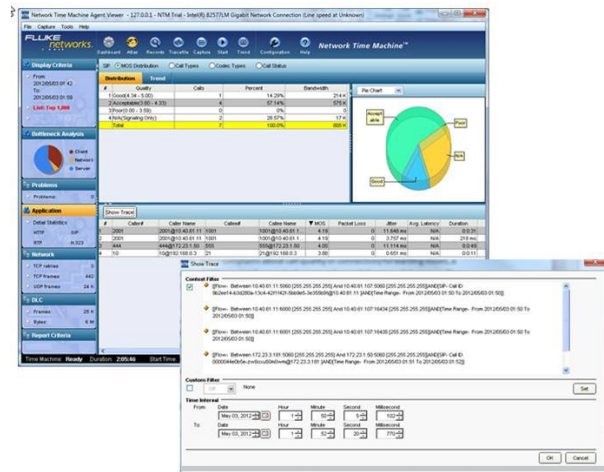
Isolation Voice Quality Caused by Poor WAN/Network Quality

Most call center management software generate alarms with QoS issues down to 5 second granularity. But they do not provide detail as to which of the thousands of calls, events or client sites had the problem. Network Time Machine reports calls by MOS distribution and its advanced filtering of the statistics and call table (exportable to CSV), provide all the information needed to analyze the problem. Typical workflow to isolate user complaints are as follows:

1. Show MOS trend over time, then zoom into period that MOS score degradation occurred
2. MOS score can be grouped by user defined range
3. Show Calls under the lower MOS range

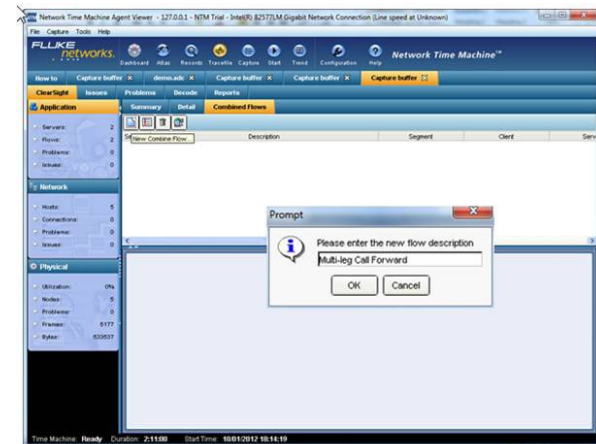
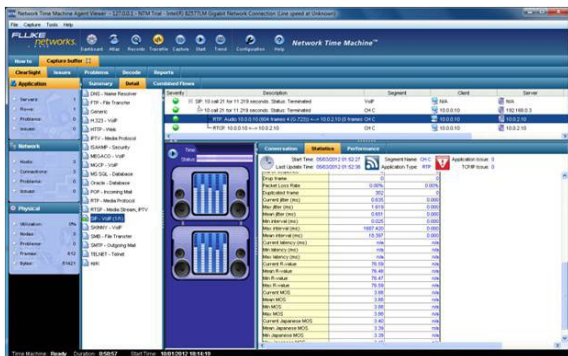


After the call is isolated, its associated MOS value is listed along with other attributes like packet loss and jitter. The call may be further isolated for further analysis by highlighting the filtered call and clicking on **Show Trace**.



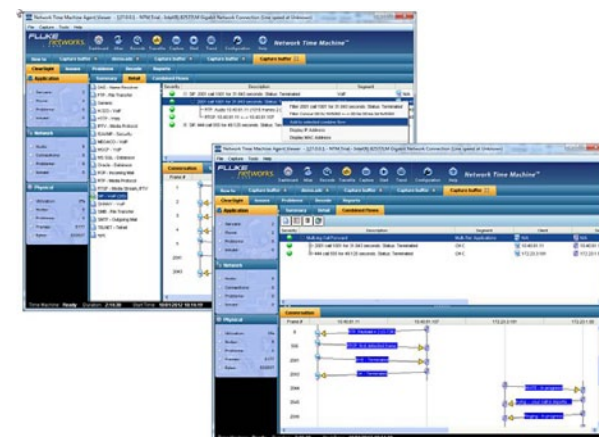
The individual calls will be listed in the SIP (or H.323) Application Summary screens. To combine the calls in one view, create a "Combined Flow".

This greatly reduces the time to isolate the issue, and it is easy to view and quickly analyze good or bad calls for the caller/callee in either the statistic view or packet level analysis view as shown below.



Resolving Call Forwarding Issues within the Call Center Systems

In VoIP systems with Call Forwarding issues, it may be beneficial to view the multiple legs of calls in one view. With Network Time Machine, this may be done by extending the procedure described above. Multiple calls may be selected in call listing and extracted by clicking on Show Trace. A context filter will be automatically applied to the subsequent trace file upon clicking OK.

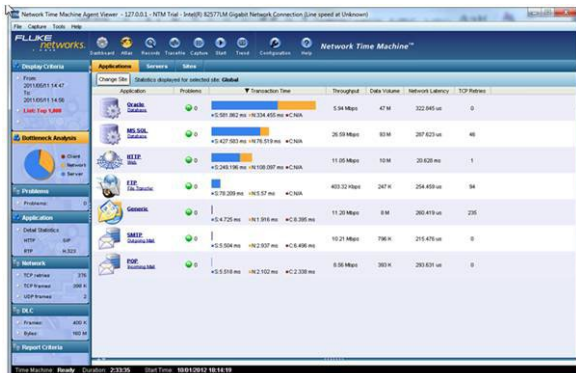


Isolating Intermittent Issues that Appear After Equipment Firmware or Hardware Upgrade

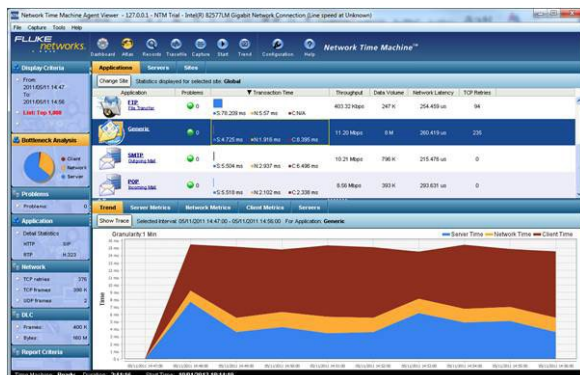
One of the major benefits of Network Time Machine is that it allows a network engineer to go back in time and view KPIs and transactions that may have been reported after equipment firmware or hardware have been applied to network components. Did the newly applied updates cause recent user reported failures? Network Time Machine can be used to prove this is the case...or not if it was also capturing related network traffic BEFORE and after the upgrades.

Intermittent issues related to interoperability or firmware compatibility are the most elusive. Even vendor's seasoned system engineers require detailed proof, most often packet level detail, to isolate and verify the issue so their R&D engineers can fix the bug. The plug and play, quick deployment use model and multiple interfaces of Network Time Machine, make it easy to deploy and capture traffic anywhere within the call center.

The various statistical analysis screens are easy to set up to display how network traffic performed before and after changes. For example, the Bottleneck Analysis screens may be used to view data application transaction trending.

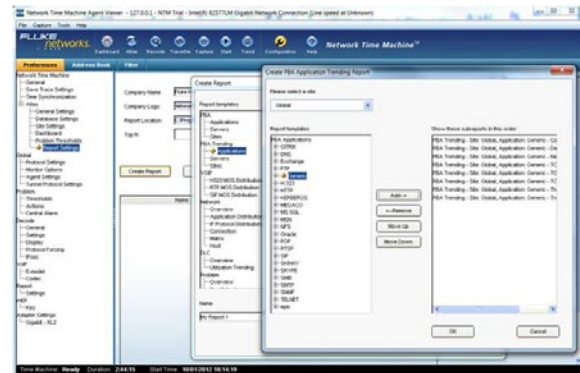


Or view Server, Network, or Client KPIs.



Troubleshooting Reports and Documentation

These screens may also be documented using Reports. These Report templates may be created in Network Time Machine's Configuration and applied to the "before" time range.



Since the user now has documentation on how the network and applications performed before the changes, it's simply a matter of repeating the same steps for a time range AFTER the issues appeared and comparing the data collected from the Bottleneck Analysis and related KPIs.

In addition, all tables under the statistic view can be exported to a CSV file for detail analysis or chart generation. Transaction level report can be easily generated to document troubleshooting findings.

Conclusion

With Network Time Machine's all in one, plug-and-play, back-in-time high performance VoIP and Application analysis, problems in call centers have nowhere to hide. Network Time Machine has been deployed in many of the most heavily loaded, mission critical service provider call centers across the world. Network Time Machine will keep your call center up and running with high availability.

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