Fortune 500 Transportation Company Goes Full Steam Ahead with NETSCOUT and PacStar

vSCOUT Deployed on Ruggedized Servers Extends Visibility of Railway Services to Wayside Sites

OVERVIEW

Business Value

- Reliable communications between remote wayside sites and data center
- Lowered business risk and improved service performance 10-24 percent
- Delivered investment payback in less than three months through operational efficiencies

Business Assurance

- Continuous monitoring and real-time analysis of remote railroad wayside data
- Reduces time and resources required for system-level triage
- Granular insight into all service-delivery systems – picks out error codes, and finds issues that would have gone unnoticed using alternative solutions
- Military grade routers and servers that can withstand environmental extremes in wayside locations

Customer Profile

This Fortune 500 Transportation Company is one of North America's leading suppliers of rail-based freight transportation. With over 21,000 miles (34,000 km) of railroad track, the Company has business operations in 23 US states, the District of Columbia and two Canadian provinces, Quebec and Ontario.

Introduction

Railway services may be viewed as an "old economy" business but its day-to-day activities are supported by new economy technology. As one of America's leading transportation service companies, this large enterprise relies on its IT operations, requiring end-to-end visibility throughout its service-delivery infrastructure. And that infrastructure is massive with 4,000+ IP-connected locations and different IT groups handling the digital service needs of the organization.

A New Digital Transformation Challenge

Sometimes an "outside-the-box" solution is literally outside the box – and is a box. Such was the case for this railway company in its unique utilization of the software-based NETSCOUT® vSCOUT™ for application assurance. As a NETSCOUT customer for 20 years, the IT organization has deployed – and used – with success the NETSCOUT nGeniusONE® Service Assurance platform with the InfiniStream® appliances throughout its extensive operations. However, the company had a growing need for visibility at remote sites and vSCOUT was a great fit. According to an IT professional working primarily in the company's wayside and dispatch area, the company found it increasingly necessary to collect critical traffic data and leverage NETSCOUT's Adaptive Service Intelligence™ (ASI) technology at what are called wayside units, each with a purpose-built and business-critical system.

To achieve such real-time visibility at the remote wayside units, significant hurdles needed to be overcome. The Company needed to have real-time visibility at different wayside units. With over 6,000 wayside units spread over 21,000 miles (34,000 km) of train tracks, this was a significant challenge. What is a wayside unit? A wayside unit is a fixed signal for railway operations and is located along a train track right-of-way. Additionally, intermediate signal wayside boxes are called "control points" as they are used by dispatchers to activate an electronic switch causing the track to move – and route – a train safely from one track to another.

vSCOUT from NETSCOUT was available as software to cost effectively monitor critical business services and network operations needed at unattended wayside locations.

These wayside units range in size from a few square feet to 10x10 sized bungalows. Environmental challenges were a factor, too, as some wayside units are not climate controlled with the temperature in the units varying anywhere from 20 degrees below zero in winter (-28.89 Celsius) to 120 degrees (48.89 Celsius) in the summer. Vibration as well was a prime consideration. When trains rumble past wayside units, the consequent vibration is significant and could result in the malfunction of sensitive computer equipment. It was therefore an environment necessity that any hardware deployed be equipped to withstand the potential harsh environmental conditions of its location – equipment intended for rack mount office deployment would not suffice. While fluctuating environmental conditions are a significant factor, capturing traffic data and maintaining systems placed in wayside locations is also challenging due to the inherent remoteness of the wayside units.

Wayside Virtualization

What specific business intelligence did the Company need from its wayside locations? They needed to capture critical information about the train as it passed a wayside unit to be transmitted back to the data center for analysis and to maintain constant communications. According to the IT professional, "We had a need to validate how our infrastructure works during situations such as a primary-to-failover scenario; we needed to look at response times at a wayside unit coming to and from the back office." Voice communication with a train is another key monitoring element as well, as is the number of cars, brake temperature, temperature of the wheels, car weight, and current location of the train cars.

Assuring service delivery in a far ranging, complex and private virtualized environment by capturing traffic data manually with a laptop was problematic and a non-starter due to the time and resource costs to send someone out to each wayside location. This solution was inherently limiting as any traffic data captured would only be while the laptop was connected. Plus, leaving a laptop in a wayside station to collect packets was simply impractical and did not provide automatic discovery of service-delivery components and visualization of all interdependencies.

Security was also a problem and in some cases, it was difficult to secure the hardware within the smaller wayside units. Aside from the environmental factors, the technical challenge itself was formidable. The Company needed portability, wireless connectivity and real-time data integrated into existing application service monitors, and ideally the preferred solution would not require any major IT engineering or firewall changes either.

NETSCOUT and PacStar to the Rescue

While researching options, the IT organization learned that vSCOUT from NETSCOUT was available as software to cost effectively monitor critical business services and network operations needed at unattended wayside locations.

Still, there were other important technical considerations that had to be met. According to the IT professional leading the project, "We needed a device that was powerful enough to house VMware hypervisor. It also needed to have two Ethernet interfaces, one for management and one for traffic data capture. It had to be small enough where it could be placed inside a wayside bungalow and withstand harsh conditions that you may see in a box that may or may not have climate control, and it needed to connect to a wireless router seamlessly."

The IT team had an idea: marry the PacStar® 451 Small Server Module with the vSCOUT running on a virtual machine and a wireless router – and if both could withstand the environmental challenges – they would be able to capture, analyze and assure the critical data the company needed. For this idea to work, the PacStar 451 would be a critical component of this innovative configuration. The PacStar 451 is a rugged, compact and easily deployable high performance virtualized appliance or server module that is designed for the hosting of multiple tactical communication applications and services such as WAN acceleration, Unified Communications (UC), network routing and switching and more. Moreover, it is designed for a wide array of unconventional and challenging environments including emergency first responder situations – even in-theater war conditions.

The PacStar 451 is part of the PacStar 400-Series family of small communications modules that combine maximum capabilities and configuration flexibility with the smallest size, weight and power (SWaP) requirements possible. Each module is designed around the same compact form factor (5.3" x 7.1" x 1.7") with a modular design that makes adding or removing network functions as easy as working with building blocks. PacStar builds the 400-Series modules to MIL-SPEC 810G requirements for shock and vibration. Using a fan-less design for higher reliability, the modules can withstand extreme temperatures ranging from -20 to 70 C and offers built-in power conditioning and backup.

Figure 1: PacStar 451. The ideal platform for NETSCOUT solutions in wayside bungalows.

Clearly, with the integration of vSCOUT and the PacStar 451 server connected to a wireless router, the IT organization could have a mobile – and portable – platform with embedded service assurance functionality. For ramp up and testing, the project lead

thought, "If it worked as outlined, we could actually deploy it in a location where we need to see specific traffic data for a certain period of time. Then, if we get the data we need, we can then simply have it shipped to the next location and begin again." The IT lead had his solution – in theory. But could NETSCOUT vSCOUT and the PacStar 451 work synergistically together?

The next step was a rigorous POC with the first test site in Lumberton, North Carolina. The vSCOUT appliance converted in real-time the traffic flows and application data from the PacStar 451 into smart metadata about the services, which enabled the nGeniusONE platform to monitor VLAN, specific QoS groups, UC service and custom protocols.

With technical assistance from NETSCOUT, centering on potential system limitations and validation parameters, there were no compatibility problems with vSCOUT and the PacStar 451. Incredibly, the unit was up and running "in an hour." The IT team was ready to implement the POC.

Business Assurance with NETSCOUT

vSCOUT when combined with vSTREAM provides a highly scalable and affordable option for managing the complexities of applications deployed in hybrid IT environments. This combination expands the reach of ASI to places not feasible with physical instrumentation, thus overcoming visibility challenges. The nGeniusONE platform supports superior analytics from vSCOUT and vSTREAM. With the insights provided by this solution, time spent identifying and solving business-impacting application and service performance issues is dramatically reduced.

The NETSCOUT solution platform provides unparalleled system-level triage – which is exactly what the Company needed. But what were the results?

On the Right Track with NETSCOUT

From the beginning, the POC has been successful– with the results both quantifiable and measurable. After an initial successful run in Lumberton, North Carolina, the unit has been placed in Nashville and Chattanooga, Tennessee where it was successful as well. The vScout and PacStar 451 can be placed anywhere

Figure 2: Example of a wayside location.

on the 21,000 miles of train tracks that the Company has a wayside unit. Rather than a "big bang" rollout, the IT professional leading the project is considering a region-by-region deployment. "We designed it to allow us to simply drop the system at a wayside location and let it go to work.".

Among the results the Company was able to confirm were delays in NTP (Network Time Protocol). The IT professional said, "It helped confirm delays in NTP for synchronization due to, we believe, satellite routing whether it be synchronous or asynchronous. That would introduce some latency, which would result in some problems with that protocol." But that's not all. With NETSCOUT monitoring and real-time analysis at a wayside station, he saw some protocols from a wayside carrier unit that had not been seen before, saying, "Such insight is invaluable."

The Company was considering upgrading the wayside units and one of the unforeseen benefits of vSCOUT was that the IT team was able to see historical data. "The fact that we can go back in time if we needed to is outstanding and helpful," he added.

UC service performance monitoring was also a primary function to be tackled. And the NETSCOUT vSCOUT did not disappoint. They were able to see UC service-delivery problems like jitter, latency and packet loss; plus they identified and solved single direction calls and triage QoS issues. Using a top-down approach, NetOps used the nGeniusONE platform to visualize the service-delivery path and drill down into service, session and packet analysis. Additionally, they were able to see the local span traffic at a glance and view the voice payload if it were necessary. The IT professional used nGeniusONE in the past to find a QoS mismatch between a PBX (private branch exchange) and a voice recorder that it was sending packets to. That was something not seen before at the Company.

Other results achieved using NETSCOUT solutions, as confirmed by the IT professional through a recent TechValidate "Voice of the Customer" survey, include achieving a payback period of zero to three months with the improving and supporting of customer experience, operational efficiencies and new business models. Moreover, he rates NETSCOUT as "Best in Class" for virtualization and nGeniusONE with ASI technology for continuous application deployment performance monitoring as well. He said, "NETSCOUT nGeniusONE provides a terrific view of traffic data and picks out error codes and finds issues that would have gone unnoticed if only packet-trace viewing was used. It has saved numerous hours in assuring service delivery and device-to-device inspection."

It's Full Steam Ahead for the Transportation Company

The short-term intention for the Company's wayside group was to provide a deployable means of remote-location packet capture and integration with existing application service monitors. The Company needed to see vital data and required service monitoring and traffic visibility within virtualized remote wayside sites. It is now achieving that.

In the digital economy those companies who fail to embrace the accelerating pace of change will either fall by the wayside or go off the rails completely. Not so for this Fortune 500 company. They are making game-changing strides to improve traffic visibility and assure service delivery in its complex and highly automated IT environment.

Accordingly, the NETSCOUT nGeniusONE Service Assurance platform, coupled with vSCOUT running on PacStar's rugged server platforms, has provided unparalleled traffic visibility at remote sites – which is exactly what the Company needed. In today's connected world, success depends upon many factors, of course, with many disparate business functions needing to work in concert – but the flawless delivery of critical digital services has far-reaching implications for the data-driven enterprise. Moreover, those companies that best adapt to this new digital landscape will not just survive but thrive. And with the NETSCOUT nGeniusONE Service Assurance platform and vSCOUT, the Transportation Company will continue to be on the fast track.

Visit NETSCOUT's Voice of the Customer web site to find out what businesses like yours are doing to assure service delivery in complex, large-scale digital environments or call +1-800-309-4804 today.

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