Engineering & Electronics Company Case Study

Virtual Instruments IPA service provides a key enabler for an autonomous driving simulation solution

Company Background
This Virtual Instruments customer is a multinational engineering and electronics company headquartered in Europe. Its core operating areas are spread across several business sectors with over 400 subsidiary companies; and it employs over 300,000 people worldwide. This division is a leader in automotive components and control, which it markets to global automotive manufacturers.

Environment / Overview
This company develops advanced driver assistance systems, encompassing solutions for emergency braking, parking assistance, collision avoidance, adaptive cruise control, and much more. Key to development of these applications is the capture and analysis of real-time sensor and video-captured data from test vehicles. Massive amounts of this captured data are ingested into very large Dell EMC Isilon clusters, for analysis and simulation building.

CASE STUDY

Benefits
Thanks to a combination of Virtual Instruments products and Professional Services expertise, the number of simulations was increased by over 50%, enabling the company to:

- Speed time-to-market, so critical to gaining market share
- Increase customer (automotive OEMs) satisfaction
- Respond much more quickly to new requirements and market opportunities

Additionally WorkloadWisdom enables the company to reduce performance and availability risks of changes to the storage infrastructure and understand the performance limits of their storage infrastructure.
The end-goal of this organization is to enable autonomous driving in all of its forms, from today’s lane assist and remote-controlled parking, to environments where cars can drive without any human interaction. Time-to-market for a completely vetted solution ahead of the competition means billions in won or lost revenues. And consumers benefit by faster access to more reliable and safer transportation solutions, more free time, and improvements to traffic and fuel efficiency. This is game-changing technology!

Challenges

The volume of data for developing and refining these applications is massive, requiring ultra-fast and reliable IT systems. Specifically, the clustered NAS storage systems are mission critical. The company’s customers and development partners rely on specified deliverables and deadlines. Millions of successful simulation/analysis minutes are promised. Failed or interrupted simulations can’t be recovered in time, in the race to market advantage. IT infrastructure problems and slowdowns will pressure or breach the deadlines.

Ideally, to run the simulations requires streaming data from the SMB-connected clusters to the simulation servers. But there were serious performance problems, so a two-stage solution, where the data was first captured to RAM storage, was implemented. This slowed the process significantly, so a solution to the SMB to server streaming problem was key.

The Solution Implementation

The Virtual Instruments Infrastructure Performance Assessment (IPA) is a comprehensive services engagement designed to measure the health, utilization and performance of the end-to-end host and (in this case) the NAS environment. Virtual Instruments specialists perform non-disruptive, agentless data collection, analyze the results, and perform data-driven simulations to make recommendations to improve the performance and availability of the environment.

This IPA service utilized a combination of VirtualWisdom to gather actual production workload behavior, and WorkloadWisdom to build I/O simulations, based on those workload profiles, for testing the Isilon clusters.
IPA Findings

The Virtual Instruments team discovered multiple infrastructure bottlenecks that were caused by misconfiguration, including issues with fabric extenders, using the captured workload data from VirtualWisdom and the WorkloadWisdom storage performance validation platform. By finding and resolving the performance bottleneck, the two-stage solution was eliminated, vastly increasing the number of simulations that could be completed in the required timeframes. The company tried using existing tools from their installed vendors, but these could not see the granularity of real workload behavior and were unsuccessful in solving the problem. Only Virtual Instruments was able to help them dramatically increase the efficiency of the simulation operations.

Additional Use Cases Now Being Added

Two common uses of WorkloadWisdom are to:

- Test changes to the storage infrastructure before deploying on live production systems. The company uses WorkloadWisdom to ensure that changes like firmware updates do not introduce unexpected behaviors into their simulation processes.

- Evaluate new storage technologies, which the company is already doing, to help make the best storage purchase decisions and to right-size the new configurations based on their own simulation and analytics requirements. With the scale of the storage being used, the potential savings will be in the millions, but the potential win from being the market leader could be measured in hundreds of millions.

Benefits of the Virtual Instruments Solutions

- Enables the company to respond much more quickly to new requirements and market opportunities
- Offloads company IT staff from taking the time and effort to become performance experts and allowed them to focus on increasing efficiency of their testing
- Accelerates time to market by streaming I/O from Isilon to simulation servers; gaining strategic market share
- Increases customer satisfaction by delivering more dependable and timely test results
- Reduces risk of storage infrastructure changes and eliminates performance surprises as they scale operations

Going Forward

The company plans to extend the infrastructure data capture through additional VirtualWisdom infrastructure integrations. This will enable them to proactively avoid issues, and to right-size their deployments, optimizing CAPEX. Additionally, they will continue to utilize Virtual Instruments professional services consultants, to allow internal IT team resources to do what they do best, improving OPEX.