CASE STUDY

AI-BASED NETWORK ANALYTICS PLATFORM HELPS CUT WI-FI CLIENT ISSUES BY 50%, USER WEB PERFORMANCE PROBLEMS BY 35%

Experiencing erratic Web performance when accessing cloud-based apps, employees at Lululemon Athetica's offices in Vancouver were annoyed. Always the whipping boy, Wi-Fi was blamed.

IT staff tried to diagnose the problem using conventional network monitoring tools. But these tools provided little to no visibility into the client network experience or a complete end-to-end view across the infrastructure to pinpoint where problems were hiding and why.

When employees complained about application performance, network operations determined the problem could be anywhere. Different tools provided by different vendors for different parts of the network provided some relief but nothing definitive or actionable. Meanwhile, many questions loomed.

Was it a Wi-Fi problem? A network service issue? Over utilization of a WAN link? And if so, when did these problem manifest? How many clients were impacted and what was the root cause?

Defining or quantifying the issue was nearly impossible as there was no way to tell if this was perception or a real problem. Faced with an intermittent problem that had been going on for over a year, it was nearly impossible to validate fixes because there was no way to measure the problem across the network.

The network engineering team at Lululemon is responsible for ensuring a consistently high-quality level of wired and wireless network performance for four corporate sites, warehouses and retail outlets with thousands of employees using a diversity of devices.

TOO MUCH DATA, TOO LITTLE TIME

"There are so many client interactions within our network that it has become impossible measure and track them all to understand how the network is really performing for users," said Amit Pindoria, Senior Network Engineer at Lululemon.

> "We simply didn't have a single source of network truth that could give us the complete user perspective."
>
> **– Amit Pindoria, Network Engineering. Lululemon**

So Lululemon sought out a new generation of infrastructure management technology that could do more than provide volumes of out of context infrastructure data or simply alert IT if infrastructure elements were up or down, working or not.

They wanted something purpose-built for the task, using Web scale technology, big data network analytics and artificial intelligence. It needed to provide actionable insights that could be easily quantified . Most important, Lululemon required a platform that gave them a true, end-to-end understanding of how every client device was behaving with all the different applications and network services across the full stack. They didn't want to solution tied to any single infrastructure vendor's products.

Another key requirement was the ability to deliver quantifiable justification about the end user experience impact of any network change made. The problem was that no such solution existed.

USE CASES

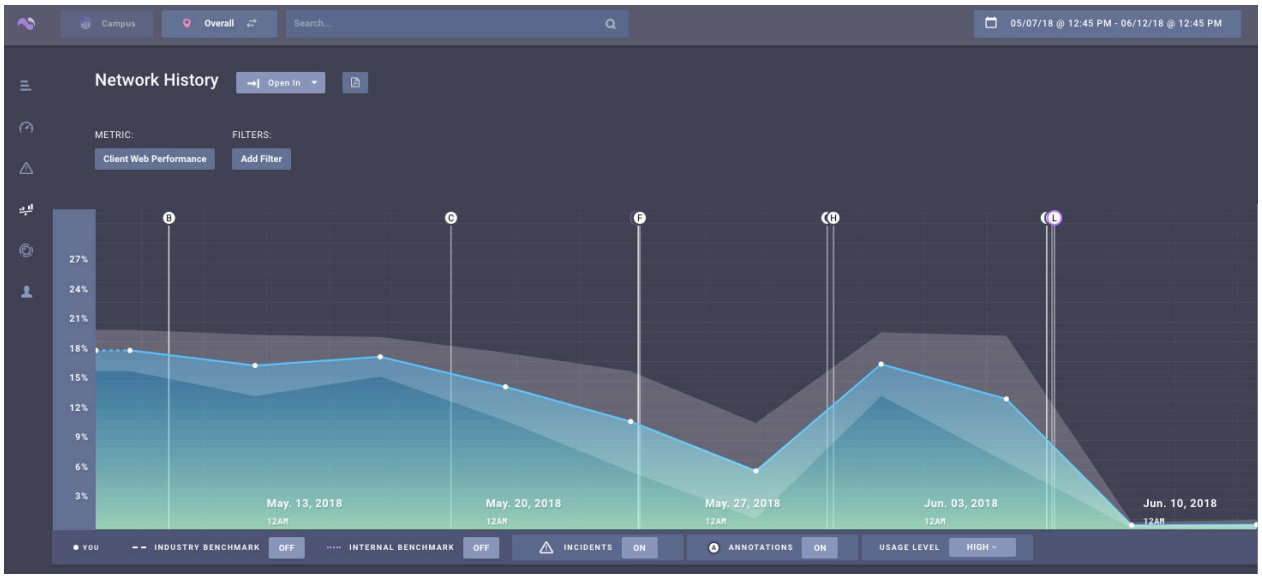
- Wired and wireless performance management
- Justifying impact of infrastructure changes
- Improving slow client Web performance
- Proactive network remediation
- Wi-Fi optimization for 5GHz users

REQUIREMENTS

- Analysis of every client network interaction
- Insight into end-to-end user performance
- Vendor-agnostic data analytics platform
- Ability to baseline all network services & apps
- Web-scale technology
- Automate network data analysis

RESULTS

- Identified firewall design/configuration problems
- Improved Web performance by 35%
- Reduced TCP retransmits by 4X
- Cut 5GHz Wi-Fi client issues by half



ABOVE: *Nyansa's Voyance showed high levels of TCP retransmissions and a 50% drop after firewalls were reconfigured.*

ENTER VOYANCE

Within the first month, Voyance alerted Lululemon network engineering to high levels of TCP retransmissions. Pindoria was surprised by the issue. Neither he nor his team members had experienced any connectivity problems. Still, the numbers Voyance reported were so surprisingly high that he started looking into affected clients

QUANTIFIABLE RESULTS

Quickly, Pindoria noticed that affected clients were primarily located at 2 out of 4 sites. He realized the two sites shared a distinct internal firewall configuration. With Voyance pointing the way, Pindoria shifted one of the wireless VLANs onto a core switch away from the internal firewall. He quickly saw L2 retransmission rates drop by 50%.

BELOW:

Nyansa's Voyance shows the drop in Wi-Fi issues after Lululemon institutes channel width configuration change.

Pindoria also discovered that a quirk in the default firewall configurations was causing the high TCP retransmissions. Voyance allowed the Lululemon team to quickly identify a topology problem that was causing issues for clients using the guest and corporate Wi-Fi networks. Only by having a panoramic view into the network were Pindoria and his team able to correlate a variety of different data sources and bring TCP retransmissions down from 35% to 7%.

> "I can't imagine running a network without Voyance. That's how important this platform has become to us."
>
> **– Amit Pindoria, Network Engineering. Lululemon**

Essential to understanding the impact of infrastructure changes as well as being able to justify upgrades. Lululemon points to the ability within Voyance to baseline network service behavior (i.e. what is the norm for your network) and automatic annotations that are made to each baseline when an infrastructure change is performed,

With the company's corporate offices situated in a high-density area, designing and improving Wi-Fi architecture is a constant challenge.

Since Voyance tracks channel distribution, frequency, AP distribution, and more, Pindoria and his team have been able to make several concrete recommendations that have substantially improved Wi-Fi quality before any potential user complaints.

To improve the network experience for 5Ghz Wi-Fi users, Pindoria recommended moving from 80 to 20 MHz channels and dropping MCS rates down to 24 Mbps. In turn, Wi-Fi issues on 5 GHz decreased 50%.

"The beauty of Voyance is that if we change, upgrade, or if something is "broken" (i.e. ISP issue, hardware, etc.), we can not only see the difference, but quantify it to senior management. I can't do that on an end-to-end basis with any other solution today."

For network engineering at Lululemon, Voyance has become the defacto standard for triaging every network, client or application issue.

"We no longer have to pull log data from firewalls and switches, NetFlow data from routers or client/AP metrics from WLAN controllers and then try to figure out what's really happening," says Pindoria.

With Voyance, Lululemon now has a historic time line of every client network transaction, allowing them to go back to the time and date the issue occurred and see actual data from different data sources.

The network engineering team at Lululemon now has access to all wired and wireless data for every client device in a single, intuitive platform. They are proactively redesigning Wi-Fi configurations across all four corporate sites, reducing time to remediation, and quantifying the value of network upgrades.