Network Performance Monitoring

Lab 2 : SolarWinds & NetPath

EL HAKOUNI Yassin
01/06/2025

1. Introduction

In modern enterprise environments, ensuring network performance and availability is crucial. This project focuses on leveraging SolarWinds Network Performance Monitor (NPM) to monitor network health, configure alert mechanisms, and visualize communication paths through the NetPath module.

The goal was to deploy a complete monitoring workflow for a network node (Student11RTR), from device discovery and SNMP setup to NetPath configuration, dashboard customization, and alert automation. Throughout the process, key metrics such as latency, availability, and response time were captured and visualized to simulate real-world monitoring tasks that network engineers face daily.

This report outlines the entire process, including:

- Setting up SNMP polling to monitor Cisco devices,
- Running a discovery scan to import devices and interfaces,
- Creating a custom NetPath service to trace and analyze network paths,
- Building a custom monitoring dashboard,
- Configuring alerts to track high response time or packet loss.

Each step reflects practical skills in enterprise-grade monitoring and demonstrates the ability to deploy and manage a reliable network observability system. Carefully selected screenshots are included throughout the report to illustrate key configurations and highlight functional results in a clear and concise manner.

2. Environment Setup and Objectives

The goal of this practical lab was to configure SolarWinds NPM to monitor network performance, focusing on response time and packet loss between a Windows probe and a Cisco router (Student11RTR). Through this setup, I aimed to:

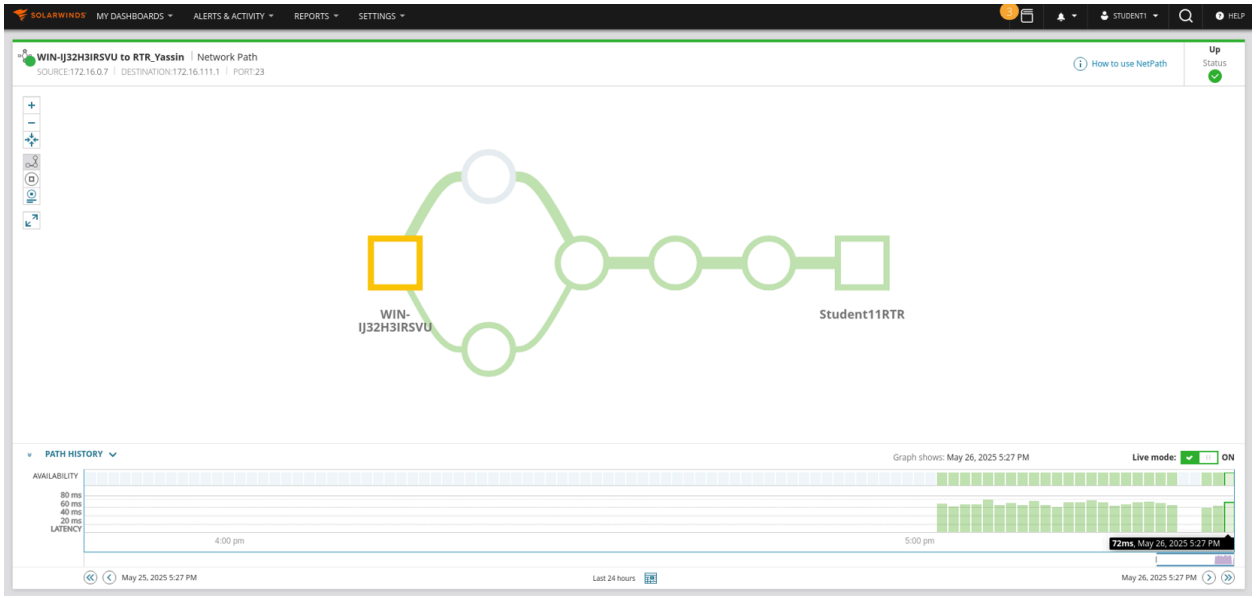
- Deploy a probe on a Windows machine to monitor a target Cisco device.
- Measure network performance over time using relevant metrics.
- Visualize the path and latency variations with NetPath.
- Configure alerts and dashboards to monitor anomalies.

The testbed consisted of:

- A Windows host (`WIN-IJ32H3IRSVU`) acting as a probe.
- A Cisco router (`Student11RTR`) with IP `172.16.111.1`.
- SolarWinds Platform 2025.1.1, hosted on a secured internal network.

The monitoring was designed to reflect real-world scenarios, where an IT department proactively tracks latency issues, network health, and availability through automated visualization and alerts.

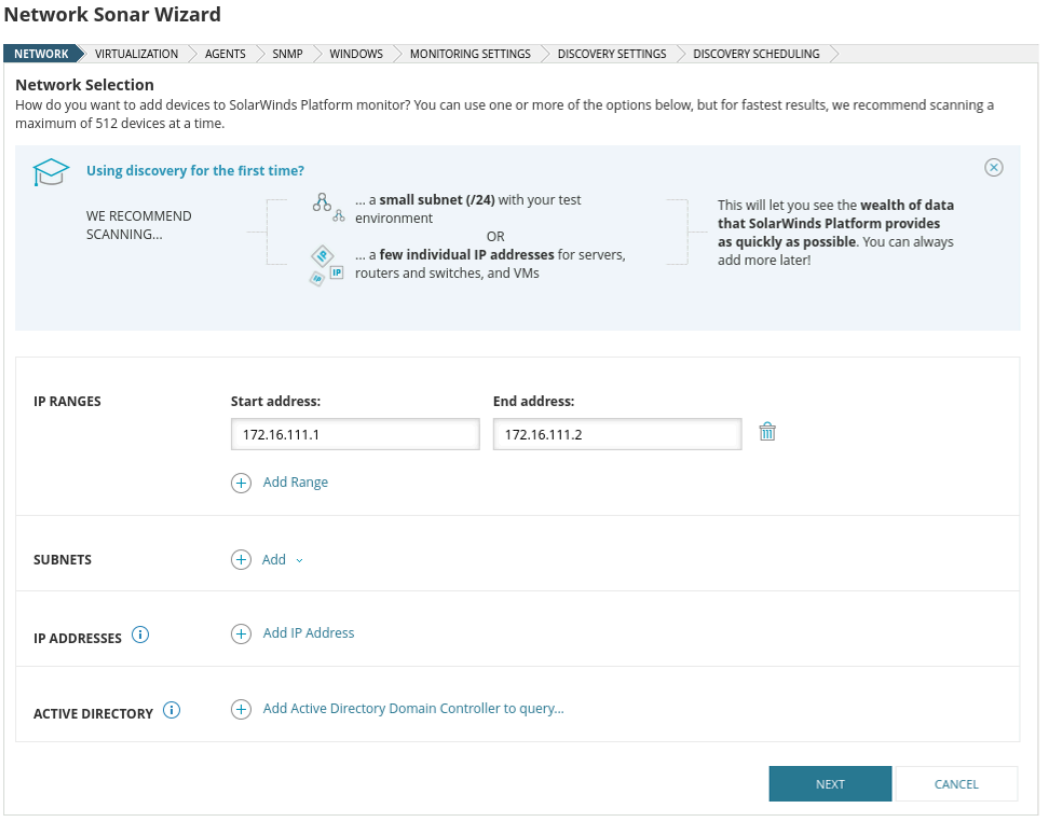
This capture shows the network path visualization between the probe and the router, with a consistent flow and measurable latency history :



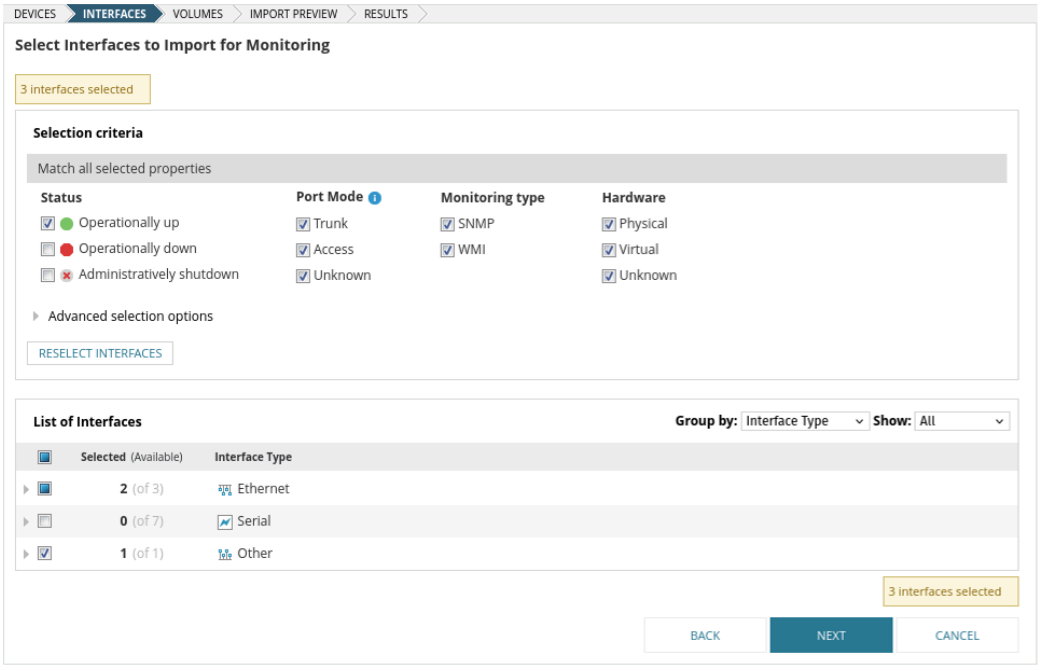
3. Probe Deployment and Device Discovery

To enable end-to-end monitoring of the Cisco router, I started by deploying a probe on a Windows machine (WIN-IJ32H3IRSVU). This probe acts as the central point of measurement, continuously collecting response time and availability data from the target device.

Once the probe was assigned, I used the Network Sonar Wizard to discover and import the router (Student11RTR) into SolarWinds NPM. The discovery was scoped to a specific IP range (`172.16.111.1` to `172.16.111.2`) to reduce noise and ensure only the relevant device was included in the monitoring scope :



After successful discovery, I configured SNMP credentials (`public` and `private`) to allow SolarWinds to retrieve detailed interface-level data from the router. Once the router was detected, I proceeded to import its interfaces into the monitoring system. I filtered by operational status and selected only the relevant Ethernet and logical interfaces :



The final result was a fully discovered and monitored Cisco router, ready for performance tracking and alert configuration.

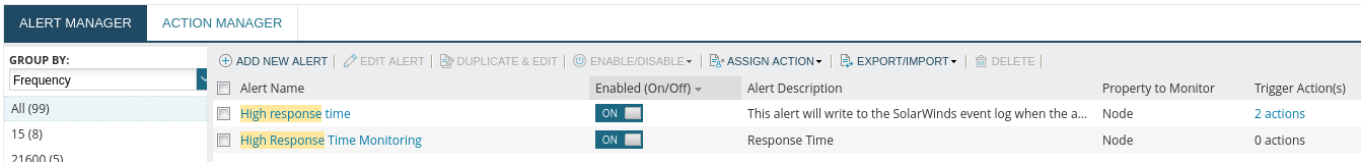
4. Alerts and Custom Dashboards

With the probe and router successfully monitored, the next step was to configure real-time alerts and visualize performance data through custom dashboards.

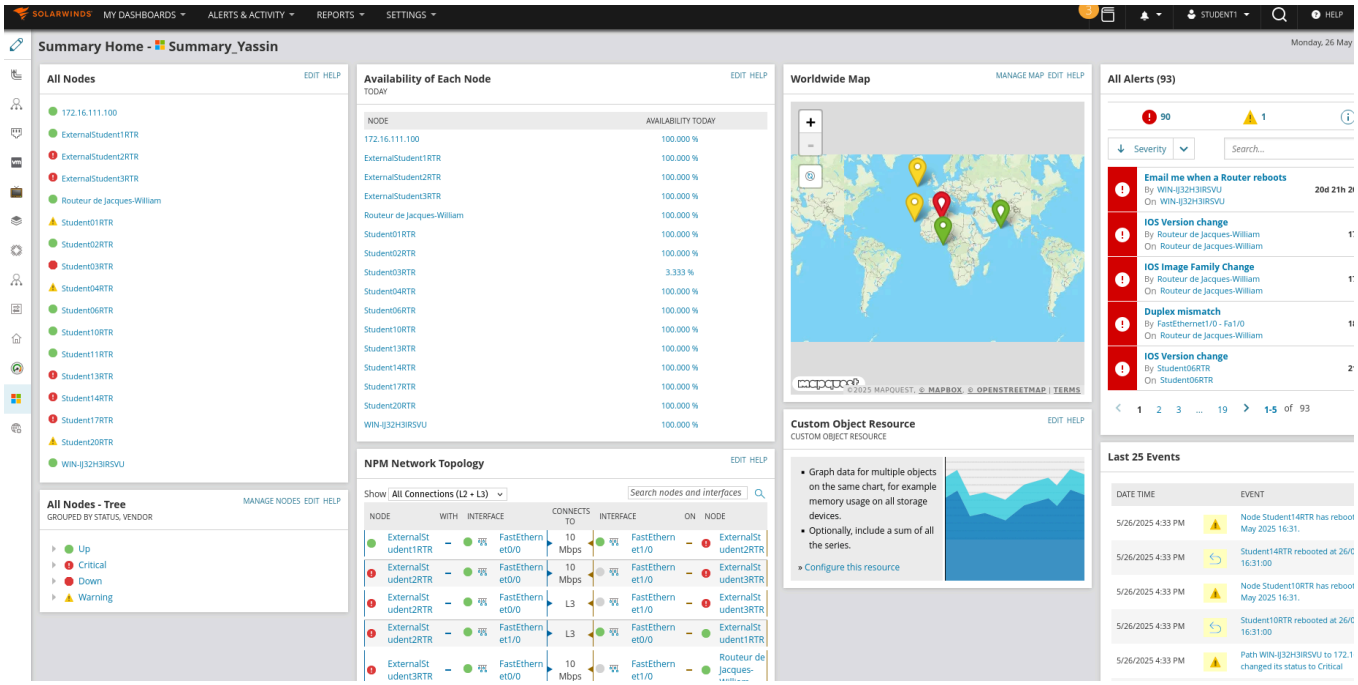
4.1 Alert Configuration

Using SolarWinds Alert Manager, I set up a high-priority alert to detect any increase in response time from the router **`Student11RTR`**. The condition was based on predefined thresholds, allowing the system to trigger an alert when the average response time exceeded the expected baseline.

This kind of alert enables proactive troubleshooting by automatically notifying the operations team when performance degradation occurs.



I also reviewed the active alerts to verify that the system had correctly registered the status of my test environment :

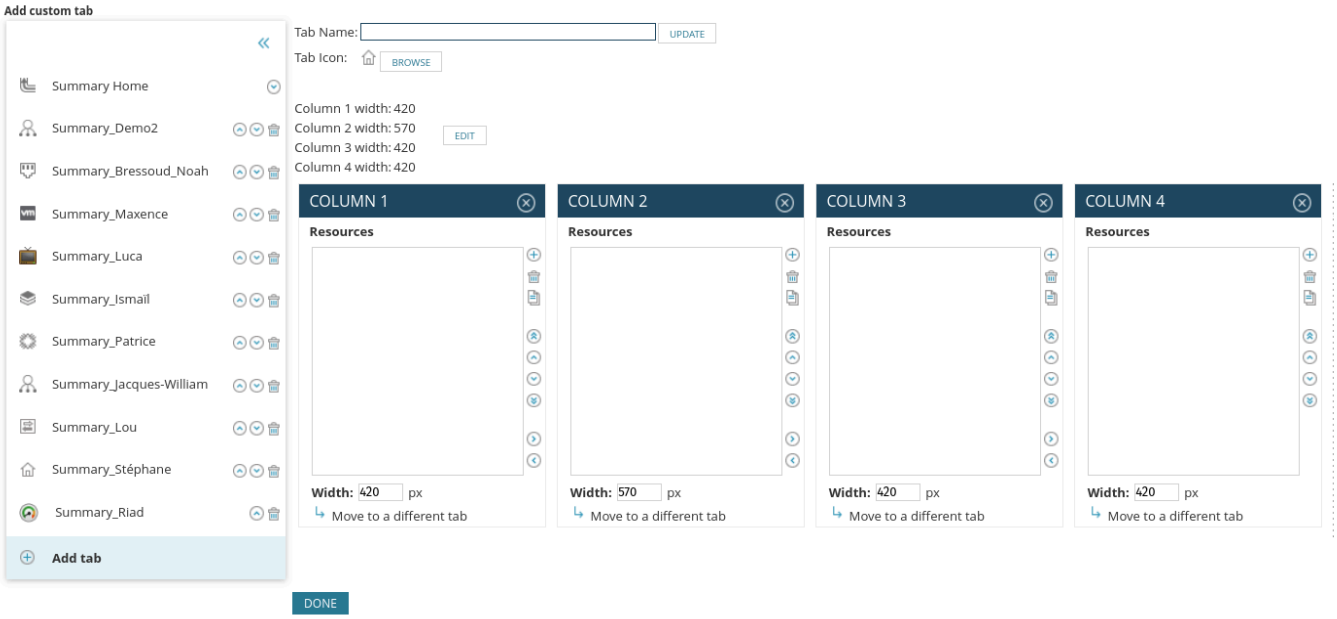


4.2 Dashboard Customization

To centralize key monitoring data, I created a personalized summary tab named **`Summary_Yassin`**. This dashboard included widgets for:

- Node availability (daily uptime)
- Topology overview
- World map view for location tagging
- Custom object resources (e.g. average response time charts)

This tailored view helps in quickly identifying bottlenecks and visualizing the state of the network from a single interface.

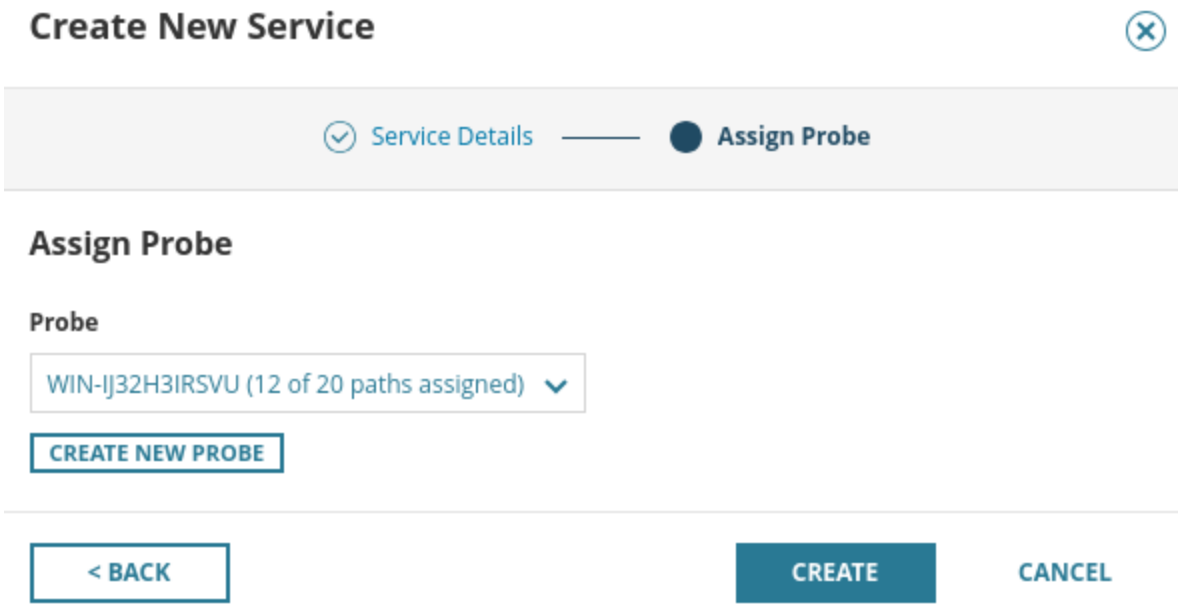


5. NetPath Setup and Visualization

To provide end-to-end visibility into the communication between the monitoring probe and the Cisco router, I configured the NetPath service within SolarWinds NPM. NetPath enables the visualization of all intermediate network hops, latencies, and potential disruptions along the route between a source and destination.

I began by creating a new NetPath service and assigning the Windows probe (WIN-IJ32H3IRSVU) as the monitoring source. The target destination was the Student11RTR router, reachable on TCP port 23. Once configured, NetPath began tracing the communication path and collecting data

such as hop latencies and availability percentages.



This visualization provided a clear and interactive view of the network path, including redundant routes and transit nodes. I was able to observe real-time response times and availability variations directly on the NetPath graph, allowing for fast correlation between performance degradation and the network layer responsible for it.

NetPath also offers historical visibility, which is essential for trend analysis. This ability to correlate issues with specific time windows empowers IT teams to investigate degradation patterns and anticipate future problems based on recurring anomalies.

6. Conclusion

This project demonstrated a complete deployment of network monitoring capabilities using SolarWinds NPM, from initial device discovery to advanced visualization with NetPath and automated alerting.

Through each stage of the configuration, I applied critical network monitoring practices that mirror real enterprise workflows:

- Accurate SNMP-based polling and interface tracking,
- Precise NetPath service setup to visualize hop-level latency and availability,
- Targeted alerts to detect anomalies in response time,
- Dashboard customization to enhance network observability.

By working through these steps, I not only deployed a fully functional monitoring system but also gained practical experience in diagnosing network health, identifying performance bottlenecks, and building proactive alert mechanisms.

The result is a modular, scalable setup that can be adapted to larger infrastructures. The ability to monitor latency trends, view hop-by-hop paths, and receive automated alerts reflects core skills expected from network engineers and system administrators in production environments.

This hands-on project helped sharpen my understanding of :

- Network telemetry collection and visualization
- Infrastructure observability
- Proactive monitoring via alert thresholds
- Performance analysis based on real traffic data

This experience allowed me to turn technical configurations into actionable monitoring insights, reinforcing my understanding of network operations in a practical context.