Financial Benefits of the Juniper Networks AIOps Solutions in Enterprises' Networks

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EXECUTIVE SUMMARY

The changing dynamics in the enterprise as a result of the COVID pandemic, migration to multicloud, and new application requirements have elevated the network to the status of essential infrastructure. High availability, performance, and security are essential features of a network that needs to adapt to constantly changing requirements. These trends have amplified the demand for enterprise IT to deliver high-availability, secure network services anywhere, anytime, and on any device.

Delivering services that meet or exceed users' expectations means that networks need to be highly flexible, automated, and efficient. This drives two key requirements for enterprise WAN, WiFi, wired LAN services, and security services:

- Common cloud management to simplify and streamline all network management functions
- Artificial intelligence for IT operations (AIOps) to perform event correlation, root-cause analysis, and automatic or semiautomatic problem resolution before problems arise

ACG Research developed a business case model for SD-WAN, WiFi, and wired LAN services. The total cost of ownership (TCO) model includes both capital expense (CapEx) and operation expense (OpEx) for two scenarios:

1. An enterprise's network with Juniper Networks wired, wireless, and SD-WAN driven by Mist AI
2. An enterprise's network without Juniper Networks wired, wireless, and SD-WAN driven by Mist AI

Table 1 presents the cumulative TCO results over five years. Our modeling shows that Juniper's network solutions results in an OpEx savings of 85% and a TCO savings of 28% over the five years. These savings are due to using AIOps in the Juniper Mist cloud platform for wired, wireless, and SD-WAN operations to reduce labor in network management activities.

	With WAN Assurance & MIST AI	Without WAN Assurance & MIST AI
CapEx	$46.4M	$43.4M
OpEx	$3.89M	$26.8M
TCO	$50.3M	$70.2M

Table 1. Cumulative Five-Year TCO Comparison of Networks with Wired, Wireless, and SD-WAN Driven by Mist AI and without Mist AI

Enterprises' Challenges

Enterprise networks are continuing to grow in complexity; therefore, performance and reliability are more important than ever. There are a number of key trends that are driving network growth and complexity:

- Hybrid and work-at-home models during COVID changed enterprise network connectivity requirements overnight

- Hybrid work has also accelerated the globalization of the workforce due the virtual work environment

- Return to work for many enterprises creates new challenges, and we do not yet know the results

- The great resignation is creating resource gaps in enterprises, and it is difficult and expensive to hire high-skilled staff

- Dramatic growth in video and cloud meetings (Zoom, MS Teams, WebEx, etc.)

- Security is extremely complex and increasingly important

- Internet of things and edge computing continue to grow in importance and complexity

- Users expect the network to be always on, work well for all applications and devices, ensure security

The remarkable changes in 2020 due to the COVID pandemic have dramatically changed the requirements for enterprises' networks. Employees now demand flexibility to work either in the office or remotely. A typical enterprise has WiFi everywhere, wired LANs, bring your own device,

guests, and workers with different requirements and varied levels of privileges. Security is required everywhere, and security requirements are becoming increasingly complex. Users expect the network to be always on and work well for all applications and devices. At the same time the great resignation is contributing to loss of IT resources and talent in many enterprises, which makes it difficult to meet these new requirements. In order to address these challenges enterprises must implement more intelligence in the network. Modern AIOps uses artificial intelligence and machine learning to assist IT in managing, troubleshooting, and fixing network problems. AIOps is becoming a key success factor in managing modern enterprise networks.

In this paper the key areas in the enterprise's network we will consider are:

- WAN

- WiFi

- Wired LAN

What Enterprises Need to Do to Be Successful

IT must deliver enterprise network services that have high availability and performance. They must support new and existing applications; users' expectations are high and quality of experience is critical. Networks and services must be flexible and agile, allowing for fast roll-outs for new offices, changes in business requirements, complexities of integrating corporate acquisitions, and changes to network policy, security, and application management. IT needs to continually reduce expenses while improving and expanding services. The only way to do this is to improve technology, analytics, visibility, and automation. A key enabler is AIOps and other automation tools. Enterprises need visibility into the WAN to track and tune application performance and plan for future growth and changing requirements.

Key Success Factors

For enterprises to be successful in managing network services there are some key capabilities that are required in the network to allow for scalability, high availability, performance, and security.

Cloud Management

All network elements (routers, WiFi access points (APs), switches, etc.) must be managed via the cloud. A solution using older on-site controllers is more expensive to operate, less scalable, and

less flexible. Cloud management gives the enterprise a single point of control for many different enterprises and sites. Alternatively, a solution that is not managed by the cloud requires custom installation, truck rolls, and results in increased network management expenses.

AIOps

WAN, wireless, and wired networks are complex, and manual human configuration, troubleshooting, and engineering do not scale to support large networks with diverse locations and requirements. The key reason for using artificial intelligence is to automate fault management and problem remediation. AIOps performs event correlation, root-cause analysis, and automatic or semiautomatic problem resolution before problems arise. Issues are resolved before the customer sees and reports them. In real networks we have seen trouble tickets reduced by 90%, which leads to a significant reduction in OpEx and increases service profitability while also improving users' experiences and customers' satisfaction.

Security

All network elements, software, and services need high levels of security. This means that both software and hardware need to go through rigorous hardening and security testing and must be patched to preclude vulnerabilities. Partnerships with vendors with strong security capabilities are key to achieving these goals.

Business Model Framework and Assumptions

ACG Research has developed a business model that calculates the key financial metrics of an enterprise SD-WAN, WiFi, and wired LAN service. The key objectives of business model are:

- Model a large enterprise with SD-WAN, WiFi, and Wired LAN services using Juniper's MIST-AI and SSR WAN Assurance
- Compare the Juniper network to similar network services using a noncloud, non AI approach
- Show the TCO and OpEx benefits of Juniper's WAN Assurance and MIST-AI solution

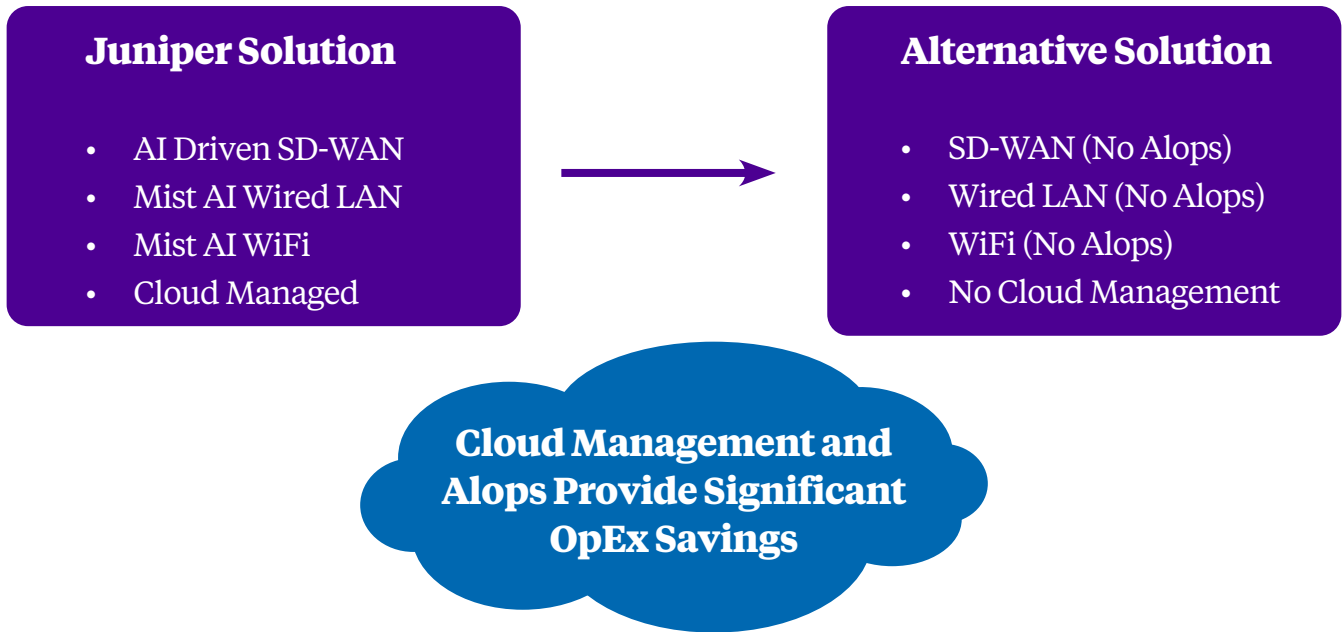The scenarios and comparisons are summarized in Figure 1:

Figure 1. TCO Comparison of Juniper's Solution with Alternative

Juniper Mist AI is a cloud-managed AIOps solution for WiFi, wired LAN solutions, and AI driven SD-WAN powered by SSR. A high-level summary of the characteristics and benefits of Mist AI is provided in Figure 2.
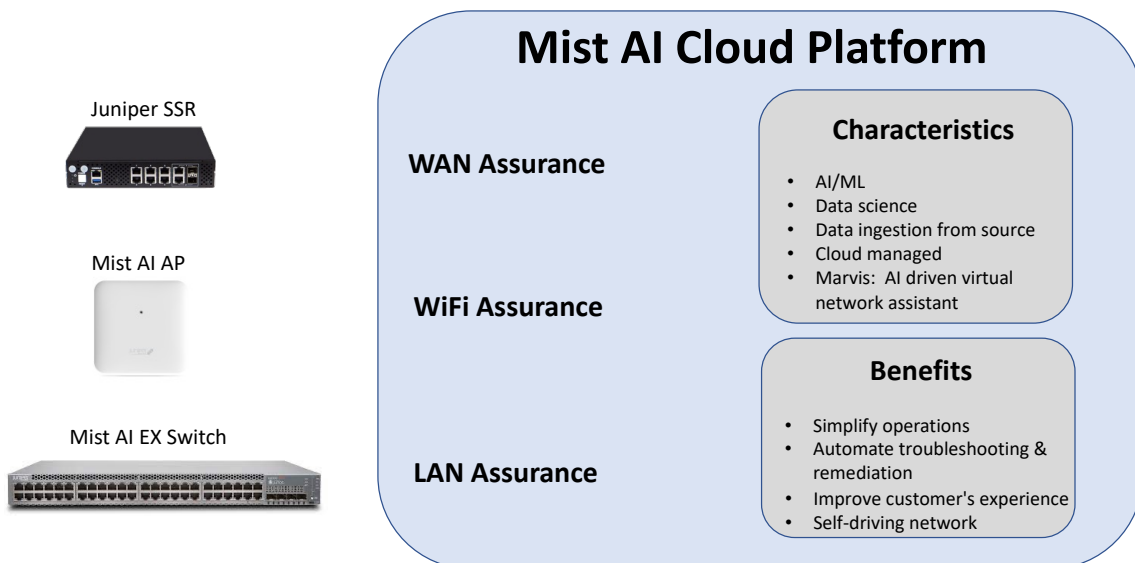

Figure 2. Definitions of WAN Assurance and Mist AI

ACG used its Business Analytics Engine (BAE)[1] to model the enterprise services network. Figure 3 presents the high-level structure of the model. There are three main categories of input to the business model:

1. Network architecture assumptions
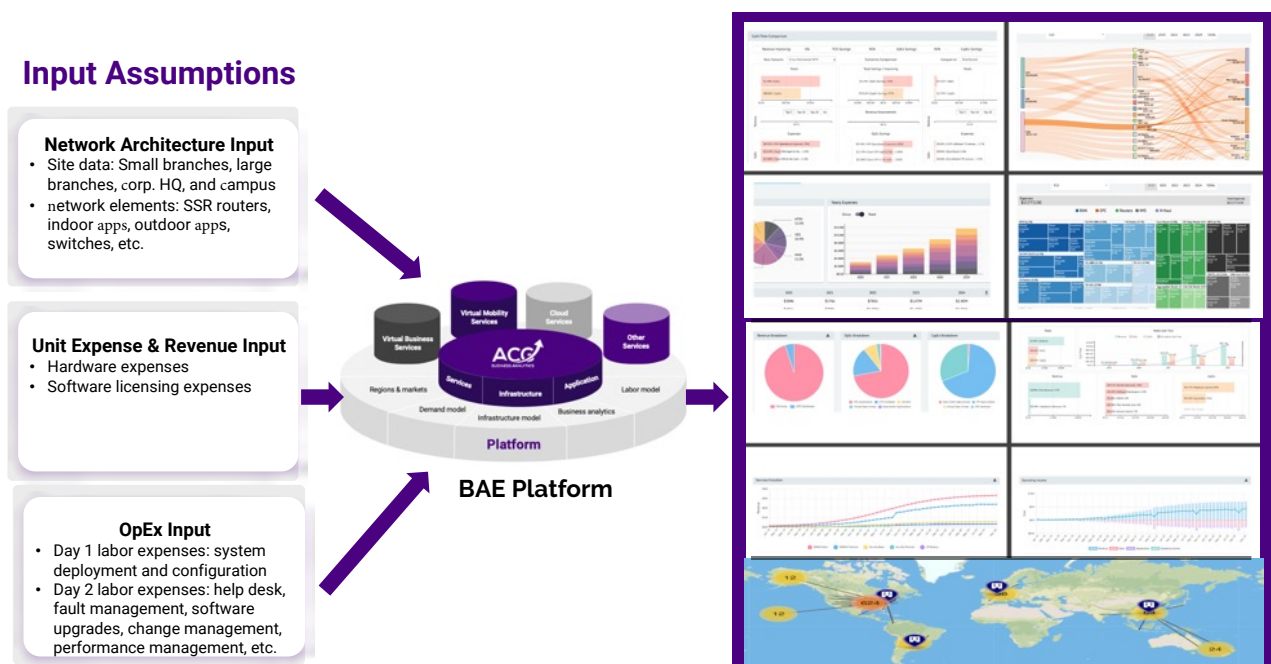2. Unit expense and revenue assumptions
3. OpEx labor assumptions

Figure 3. Structure of the Enterprise Services Business Model

Network Architecture Assumptions

In our model we assume a large enterprise providing network services to multiple sites:

- Small Branch Offices
- Large Branch Offices
- Corporate HQ
- Campus

The model grows the number of sites over time using an S-Curve or logistics function[2], which models early adoption, peak growth, and a flattening of the growth curve. The number and types of sites used in our model is presented in Table 2. These are buildings or campuses with the Juniper Networks SSRs for SD-WAN, wireless access points, and EX switches.

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[1] https://www.acgbae.com/

[2] https://en.wikipedia.org/wiki/Logistic_function

Each are enabled with cloud services and Mist AI. The initial quantity specifies the number of sites at the beginning of the model, and the terminal quantity specifies the number at the end of the model. The S-Curve is used to specify growth from the initial quantity to the terminal quantity.

	Tenant Name	Initial Quantity	Terminal Quantity	CAGR
☐	Small Branch Office	100	2000	-
☐	Corporate HQ	1	1	-
☐	Large Branch Office	1	50	-
☐	Campus	1	1	-

Table 2. Number of Sites at the Start and End of the Model

The number of network devices in each site is specified in Table 3. The devices are the Juniper SSR routers, wireless access points, and EX switches.

	Endpoint Name	Tenant Name	CPE Model	Initial Quantity	Terminal Quantity	CAGR	Delayed deployments
☐	Campus EX Switches	Campus		50	50	-	
☐	Campus Indoor APs	Campus		190	190	-	
☐	Campus Outdoor APs	Campus		50	50	-	
☐	Campus SSR HA Router	Campus	Lenovo SR530 - 8C 32...	1	1	-	
☐	Campus SSR Router	Campus	Lenovo SR530 - 8C 32...	1	1	-	
☐	Corporate HQ Access Switches	Corporate HQ		2	2	-	
☐	Corporate HQ APs	Corporate HQ		30	30	-	
☐	Corporate HQ SSR HA Router	Corporate HQ	Lenovo SR530 - 8C 32...	1	1	-	
☐	Corporate HQ SSR Router	Corporate HQ	Lenovo SR530 - 8C 32...	1	1	-	
☐	Large Branch Access Switches	Large Branch Office		4	4	-	
☐	Large Branch APs	Large Branch Office		50	50	-	
☐	Large Branch SSR HA Router	Large Branch Office	Lenovo SR530 - 8C 32...	1	1	-	
☐	Large Branch SSR Router	Large Branch Office	Lenovo SR530 - 8C 32...	1	1	-	
☐	Small Branch Access switches	Small Branch Office		1	1	-	
☐	Small Branch APs	Small Branch Office		5	5	-	
☐	Small Branch SSR Router	Small Branch Office	Silicom Madrid Desktop	1	1	-	

Table 3. Number of Network Devices for Each Site type

Unit Expense and Revenue Assumptions

The enterprise network use the Juniper SSR routers for SD-WAN, wireless access points for WiFi, and EX switches for wired access. Each component has been enabled with Mist Cloud services and AI for Day 1 and 2 operations. We select appropriate SSR routers, APs, and switches based on the type of sites and the quantity of devices.

OpEx Assumptions

In real customers' networks we have seen operations labor savings of 90% using Mist AI. These labor savings are because of:

- Day 0: Planning and design
- Day 1: Simplified system deployment and installation
- Day 2: AI automates fault management, performance management, change management, and remediation to reduce labor expenses

The specific OpEx labor categories modeled are:

- System deployment and configuration
- Help desk trouble tickets
- NOC fault management
- On-site fault management
- Software upgrades
- Change management
- Hardware replacement
- Performance management

CapEx Assumptions

We consider the cost of SSR routers, APs, and wired switches as CapEx in this model. In some cases the annual subscription costs are considered OpEx, but if subscriptions are for three years or five years, they can also be considered CapEx. Because many operators prefer the CapEx model, for the purposes of this analysis all hardware and software are considered CapEx. Although CapEx can vary between different vendors and architectures, we assume CapEx is the same for both scenarios. However, we do include additional CapEx for the Juniper AIOps software features. The key benefits conveyed in this analysis are labor savings, OpEx benefits, not CapEx benefits.

Business Model Results

The results of the model show that the Juniper network with wired, wireless, and SD-WAN solutions driven by Mist AI results in significant OpEx and TCO savings over a noncloud, non AI network. Table 4 presents the five-year cumulative OpEx and TCO savings of the Juniper network solution over an alternative network. Table 5 presents the five-year cumulative financial metrics for both scenarios. Figure 4 shows the year-by-year comparisons of TCO for the scenarios with the Juniper AIOps and without the Juniper AIOps.

Expense Type	WAN Assurance & MIST AI Savings
OpEx	85%
TCO	28%

Table 4. OpEx and TCO Savings of a Juniper Wired, Wireless, and SD-WAN Network Driven by Mist AI

	With WAN Assurance & MIST AI	Without WAN Assurance & MIST AI
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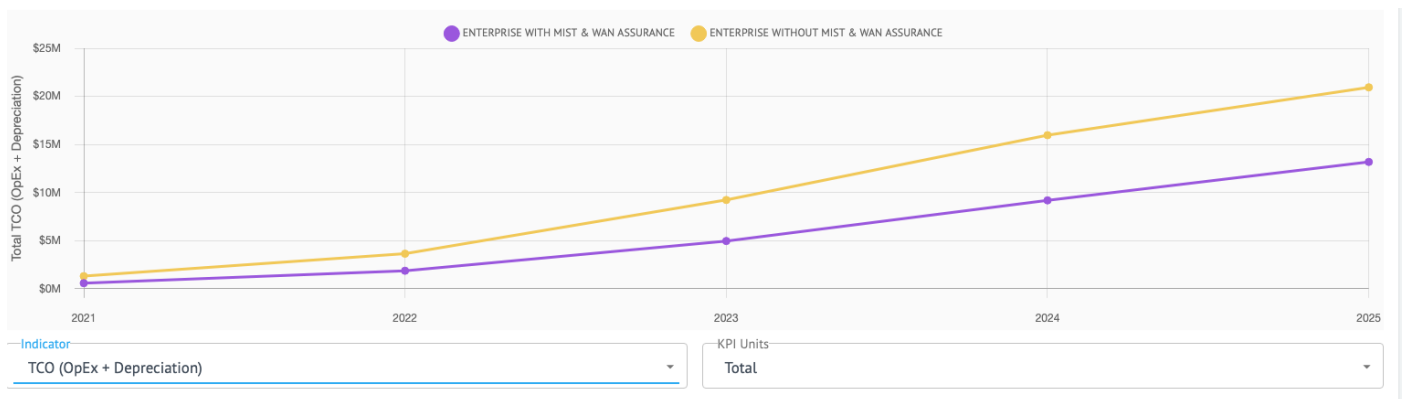**Table 5. Cumulative Five-Year Financial Results of the Business Model**

Figure 4. Year-by-Year Comparison TCO with Wired, Wireless, and SD-WAN Driven by Mist AI and without Mist AI Scenarios

Conclusion

The enterprise network is an essential network resource that must provide high levels of availability, performance, and security. The dramatic changes in remote work and hybrid work accelerated by the pandemic in 2020 and 2021 have created new challenges for enterprises' networks. To meet stringent demands by users, enterprise IT must use cloud-enabled AIOps in all parts of the network to reduce labor expenses and improve network quality and reliability. ACG Research's business case modeling has shown that the Juniper wired, wireless, and SD-WAN driven by WAN Assurance and Mist AI reduces OpEx by 85% and decreases TCO by 28%, which allows enterprise IT to do more with less.