Cable's Move to Network Automation:

Where, When, Why, Why Not & By Whom?

BROADBAND SUCCESS PARTNERS

Sponsored by

ciena

April 2019

Cable's Move to Network Automation:
Where, When, Why, Why Not & By Whom?

Introduction

With the increasing growth and complexity of networks to meet the ever-escalating demand for bandwidth and new services, the need for network automation has never been greater. To gain a deep understanding of how this need is evolving and viewed by Network Engineering, IT, Operations and Business Services executives at Tier 1 and Tier 2 MSOs across North America and in Europe, Ciena turned to Broadband Success Partners to conduct primary research with MSO executives. Tier 1s, for example, are amongst the top four in the US.

Before viewing the complete story, let's look at the headlines:

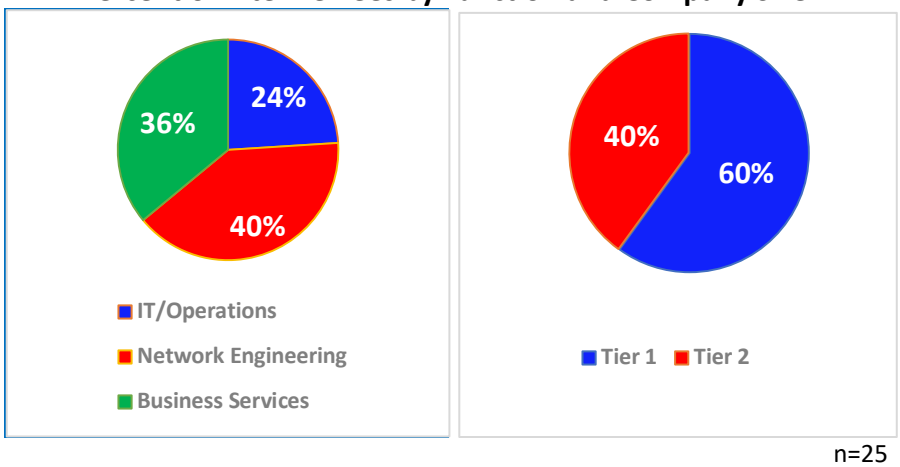
1. Tier 1 and Tier 2 Network Engineering, IT/Ops and Business Services executives all agree that the promise of improved efficiencies and lower operating expense is driving the move to automation. Improved customer experience is the next driver for IT/Ops and Business Services while Network Engineering cites reduced likelihood of human error.
2. The lack of hardware/software vendor interoperability is the greatest gap in achieving network automation for Tier 1 MSOs. For Tier 2 MSOs, it's that the network automation software is not advanced enough.
3. Network automation progress is impeded by decision-makers who are not convinced of the value of network automation and are unwilling to allocate sufficient funding for proposed network automation.

.

Research Methodology

Leveraging their sector relationships and knowledge, Broadband Success Partners interviewed 25 executives from 12 MSOs during the first quarter of 2019. As reflected in these charts, diverse perspectives, both within and across organizations, were captured.

Percent of Interviewees by Function and Company Size



n=25

To highlight real distinctions and importance, responses to the rank order questions (i.e. why, why not) are reported as top 2 box scores. In other words, the figures are shown as the percent who ranked the item as either the most significant (1) or next most significant (2). Because respondents first and second choices are tallied, the totals for each answer can exceed 100%.

Each interview started with this basic definition of Network Automation: *It's the process of automating the configuration, management and operations of a network. It includes a number of tools, technologies and methodologies used to automate network processes.*

The questions asked to gain a comprehensive picture of the "Where, When, Why, Why Not & By Whom" of network automation can be found near the start of each section.

Where & When?

Since the timing of network automation varies based on the area being automated, it's important to understand the "where and when" of these initiatives.

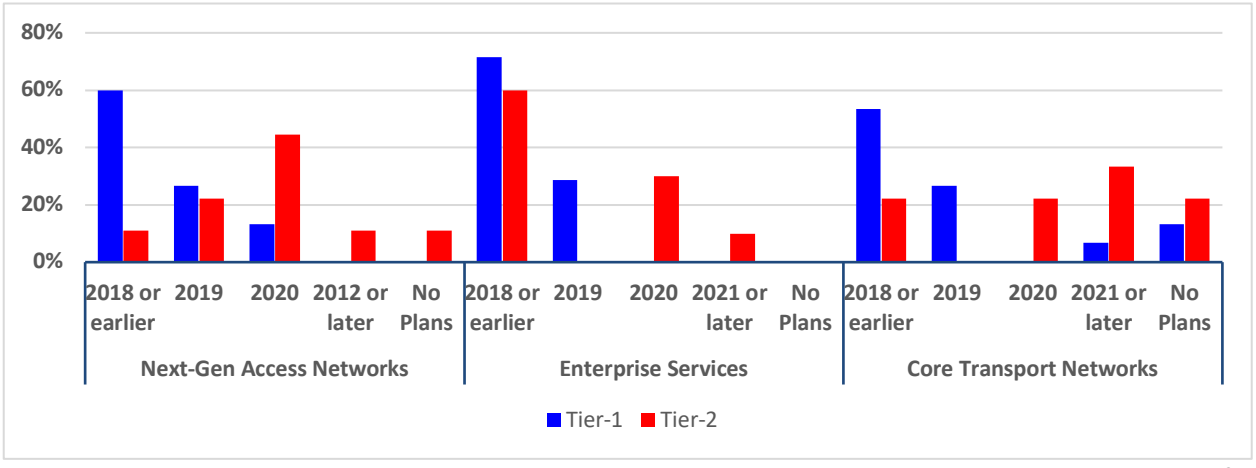
Q: Has your company implemented solutions that enable network automation in these areas? How far along are you?

- *Next Generation Access Networks (part of Distributed Access Architecture)*
- *In support of Enterprise Business Services*
- *Core Transport Network*

Across their Next Generation Access Networks, Core Transport Networks and in support of Enterprise Business Services, most Tier 1 executives indicated that network automation initiatives are under way or will be this year. Not surprisingly, the timing noted by Tier 2 executives lags in all three areas: considerably in Next-Gen Access Networks, and somewhat in Core Transport Network and in support of Enterprise Business Services. Lower levels of demand on the smaller (less urban) networks, is one reason for this difference in timing.

Timing of Network Automation by Area by Company Size

% of Interviewees

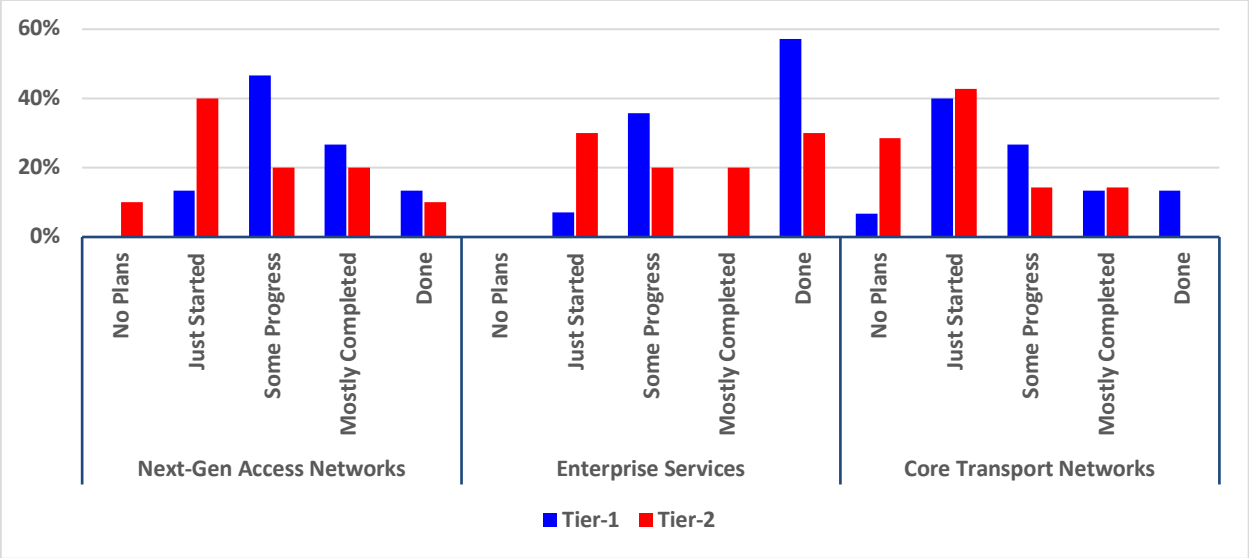


n=25

The slight Tier 2 lag is also evident in their answers to the question about how far along they are in their network automation. Another Tier 2 distinction visible here and above is that almost 30% of those interviewed have no plans to automate their core transport networks.

Network Automation Progress by Area by Company Size

% of Interviewees

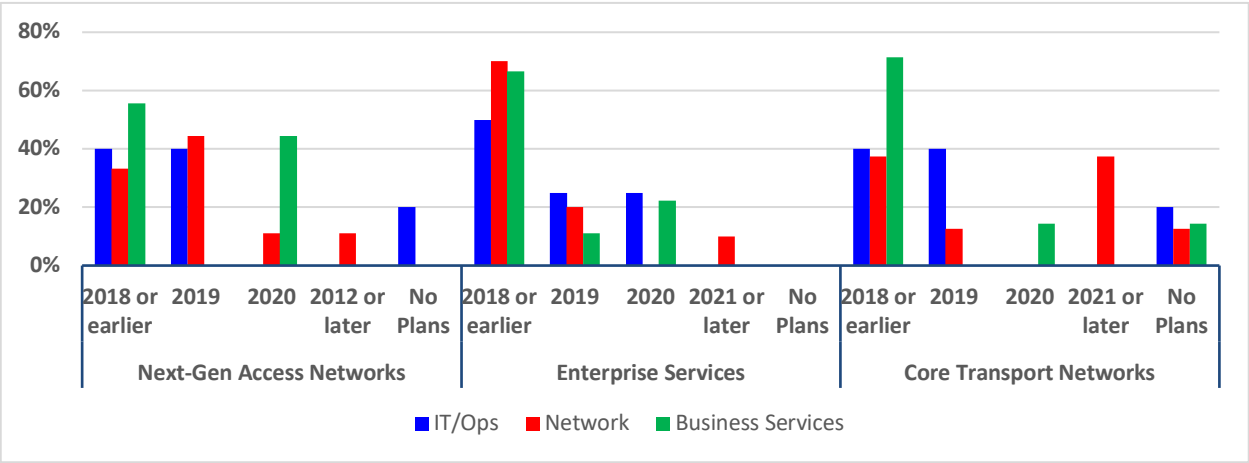


n=25

When viewing responses to the automation timeframe question by functional area, the data is generally consistent. However, close to 40% of Business Services executives believe that the automation of their Next-Gen Access Networks won't start until next year, and close to 40% of Network Engineering executives believe that the automation of their Core Transport Networks won't start until 2021 or later.

Timing of Network Automation by Area by Function

% of Interviewees



n=25

To further understand how these companies are pursuing network automation, we also asked these executives to identify examples of where they're investing in the areas bolded below. Here's a summary of the top answers. A complete list can be found in Appendix A.

Hardware and/or Software to Dynamically Adapt to Changes in Network State and Service Requirements

- Automation of configuring, network design. Traffic monitoring platform. NOC tool kits.
- Service Assurance for correct delivery of services.

Analytics Capabilities

- Business Intelligence (BI) platform which takes in arbitrary inputs, mash them together, and get insights. Simulate impact on network of changes, disruptions.
- Getting telemetry and building tooling to use it. Alerted internally to improve operations and externally to give customers information about environment.

Network Automation and Control Tools

- Performance-based network path decisions are part of the SD-WAN network retrofit.
- Multiple levels of orchestration and automation tools based on what's automated.

Why?

An understanding of the network automation drivers is critical. Knowing the primary reasons as to why a network automation is being pursued is a key ingredient in focusing the effort and measuring the impact.

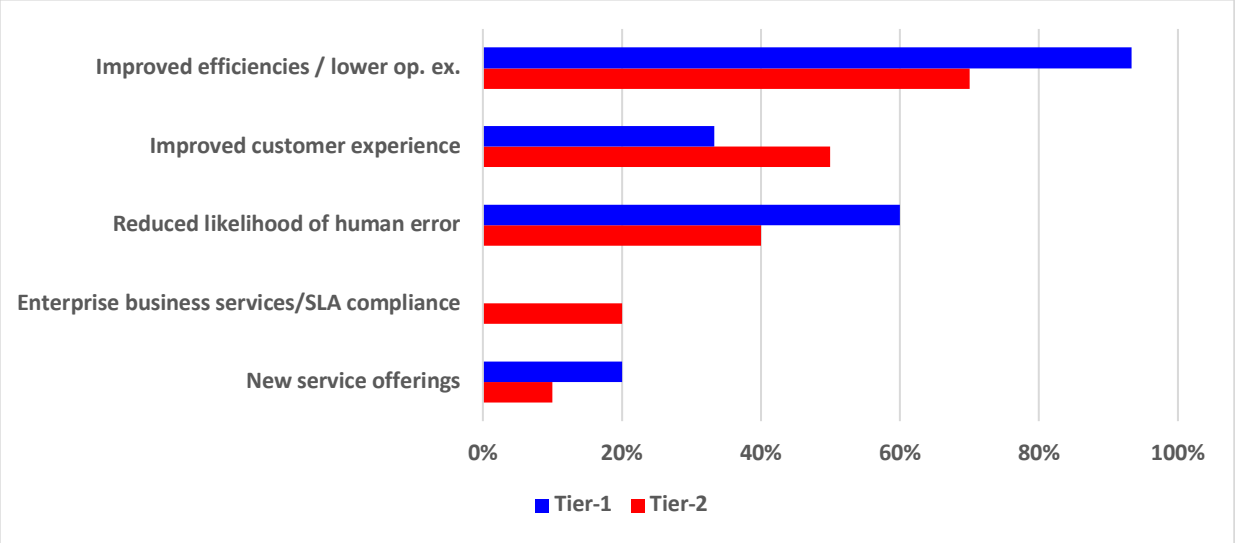
Q: What are the most significant drivers to moving toward a more automated network?

Is it the promise of improved efficiencies and lower operating expenses, reduced likelihood of human error, improved customer experience, new service offerings or enterprise business services including SLA compliance? Executives were asked to rank order these potential drivers from the most to the least significant. As noted earlier, responses to this question and subsequent ones are reported as Top 2 box scores.

Both Tier 1s and Tier 2s say that the move to network automation is primarily driven by the promise of improved efficiencies and lower operating expense. It's interesting to see that the next most significant driver diverges with Tier 1s choosing a reduced likelihood of human error, a "cousin" of improved efficiencies, while Tier 2s cite improved customer experience. The verbatims below reveal a strong rationale as to why these drivers were chosen.

Network Automation Drivers by Company Size

% who rate the driver as the 1st or 2nd most significant (top 2 box scores)

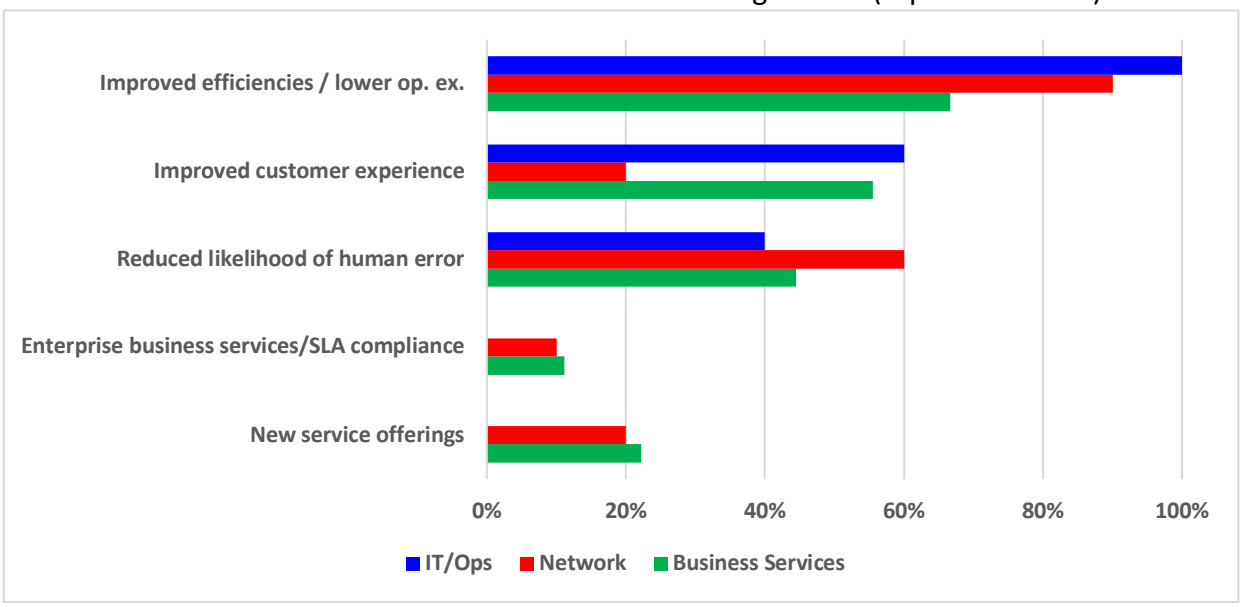


n=25

As with company size, all titles agree that the promise of improved efficiencies and lower operating expense is the main driver. Yet, there's a variance in next most important factor with executives in IT/Operations and Business Services citing improved customer experience and Network Engineering executives citing the reduced likelihood of human error. Lowering the risk of human error as a key driver is understandable given "swivel chair" concerns noted below.

Network Automation Drivers by Function

% who rate the driver as the 1st or 2nd most significant (top 2 box scores)



n=25

Here's why "improved efficiencies and lower operational expenses" is ranked so highly:

"This is the broadest benefit for company. Touches most things, systems, groups."
"We must address network complexity without adding sophisticated staff."
"We must eliminate swivel-chair order entry and associated errors."

As to why "improved customer experience" is an important driver:

"We're hyper-focused on customer service. It drives everything."
"If we do not focus on Customer Experience today, we won't have customers tomorrow."
"Customers have asked for this. They want visibility, flexibility and control."

Why not? What's standing in the way?

While motivated to pursue network automation, these executives face a number of gaps and obstacles which thwart the initiation or progress of these initiatives.

The Gaps

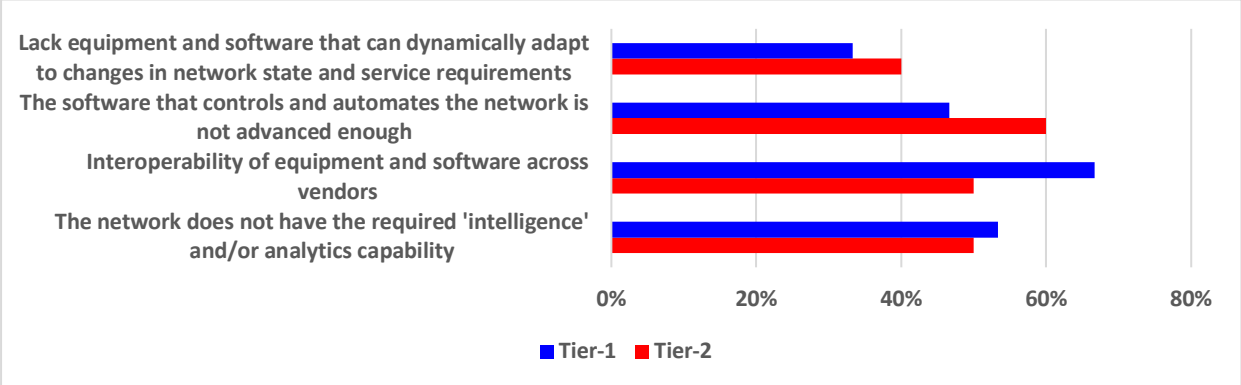
Q: What are the most significant gaps today in achieving a more automated network?

Not surprisingly, the most significant gap for Tier 1s is the problem triggered by the lack of interoperability across suppliers' different hardware and software. The overriding view is that each vendor striving to get all of a client's possible business is not motivated to deliver open solutions. As one executive put it, "Each vendor comes in with their own solution made with their own secret sauce." Some of the executives cited a "need to rely on standards." Others are looking for "a tool that will work with all vendors." In some cases, the problem is so severe that "the challenges with multi-vendor automation have kept our processes manual."

Tier 2 executives ranked "the network automation software is not advanced enough" as the greatest gap. As one executive explained, "A lot of legacy equipment doesn't have the reporting features necessary to specify the parameters required to make decisions. Another executive stated that he had "yet to find a product that can automate across the entire network."

Network Automation Gaps by Company Size

% who rate the gap as the 1st or 2nd most significant (top 2 box scores)



n=25

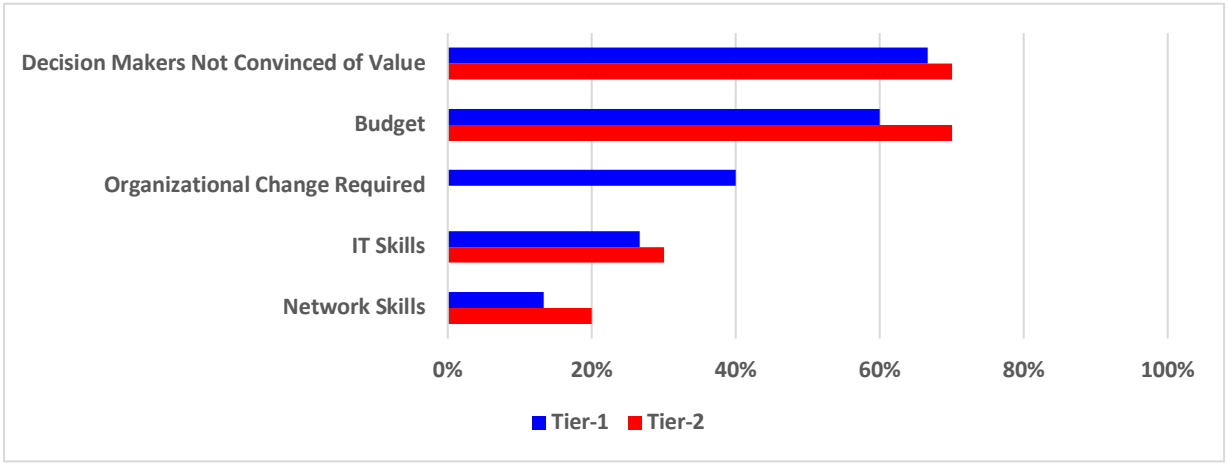
The Obstacles

Q: What are the most significant obstacles to achieving a more automated network?

No matter the type of function or size of the organization, these executives called out decision-makers (not yet convinced of the value) and budgets (they have yet to approve) as the greatest obstacles to achieving further or full network automation.

Network Automation Obstacle by Company Size

% who rate the obstacle as the 1st or 2nd most significant (top 2 box scores)

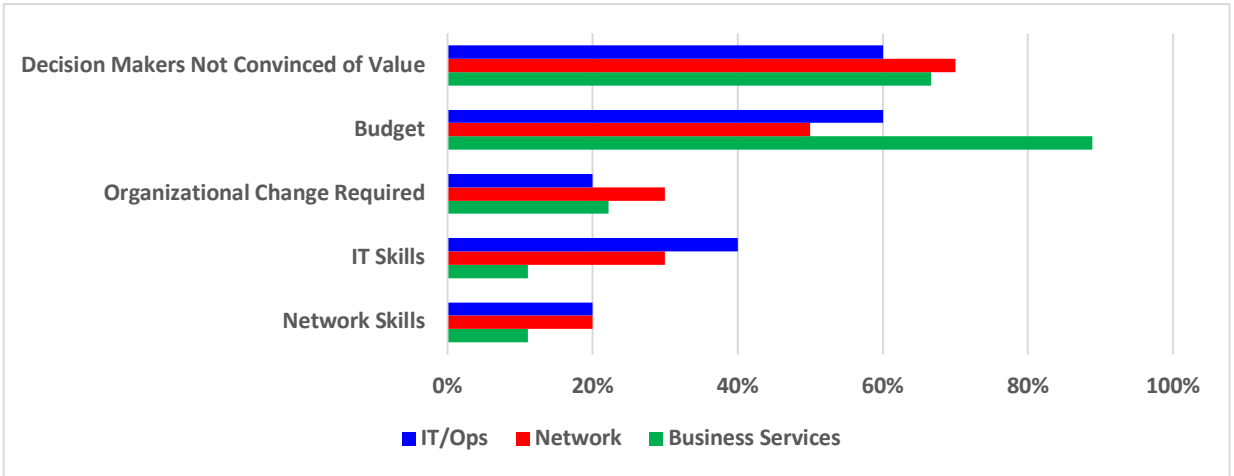


n=25

When viewed on the basis of function, the data reveals that over 80% of those in Business Services view the greatest obstacle as the lack of budget. According to one of these executives, "We've yet to find the tipping point for the financial justification."

Network Automation Obstacle by Function

% who rate the obstacle as the 1st or 2nd most significant (top 2 box scores)



n=25

The tie between the budget and the decision-maker is clear in a number of the comments. “Until decision-makers can see ROI, they’d rather focus on immediate priorities. Finance needs to prove ROI and convince decision-makers.” Several executives noted that “With customer journey, there’s a soft ROI. It’s tangible, but it’s not easy to measure the dollar value.”

One executive succinctly captured the reason her decision makers are balking. “Decision-makers won’t be convinced until there’s pain. We’ve operated a long time without automation.” Interestingly, the interoperability gap cited above is a factor as “We can’t convince management that multi-vendor solution can be implemented now.”

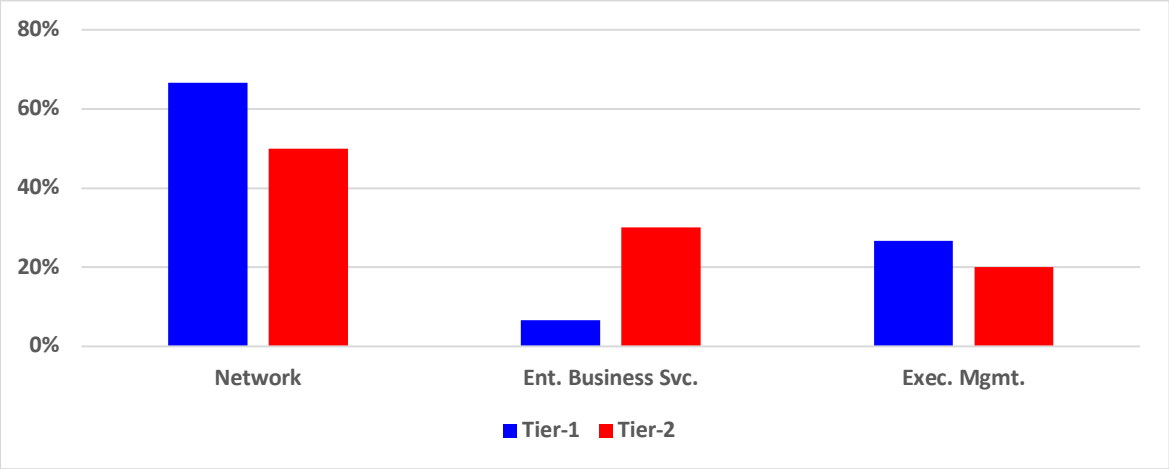
By Whom: Organization Influences

Without a clear understanding of which parts of the organization decide and influence network automation moves, these initiatives run the risk of not getting started or stalling.

Q: Organizationally, where is the most influence in the move to network automation?

No matter the size of the company, Network Engineering has the most influence in the move to network automation.

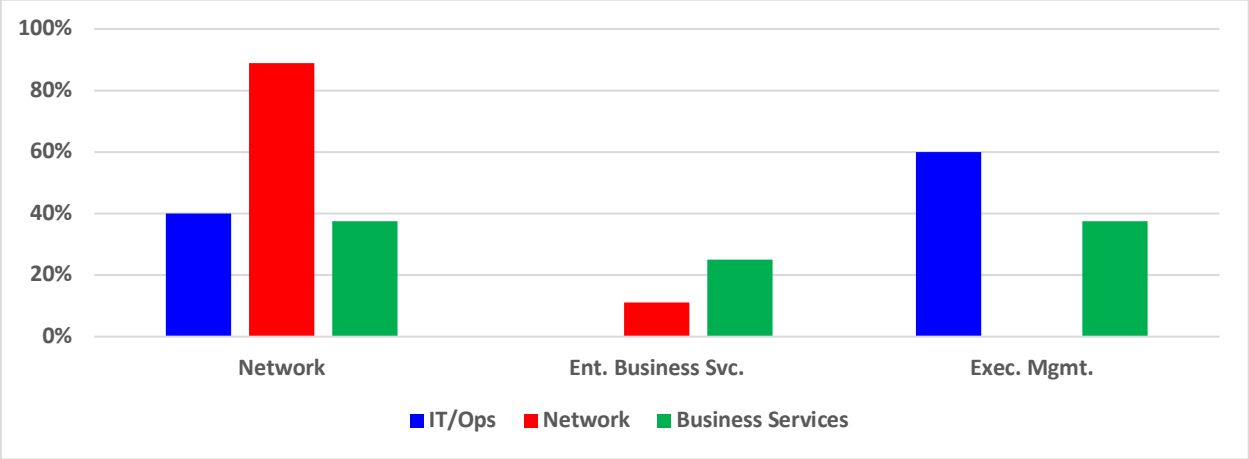
Organizational Area with Greatest Influence on Network Automation by Company Size
% of Interviewees



n=25

Network Engineering views themselves as having the greatest influence on the pursuit of network automation. In contrast, IT/ Operations and Business Services view Executive Management as the most influential. This "cross-function” comment by one executive sums it up for some of the executives we interviewed: “Network Engineering decides. Executive Management green lights. IT organization executes.”

Organizational Area with Greatest Influence on Network Automation by Function
% of Interviewees



n-25

Key Take-Aways

The research "headlines" are:

1. Tier 1 and Tier 2 Network Engineering, IT/Ops and Business Services executives all agree that the promise of improved efficiencies and lower operating expense is driving the move to automation. Improved customer experience is the next driver for IT/Ops and Business Services while Network Engineering cites reduced likelihood of human error.

2. The lack of hardware/software vendor interoperability is the greatest gap in achieving network automation for Tier 1 MSOs. For Tier 2 MSOs, it's that the network automation software is not advanced enough.

3. Network automation progress is impeded by decision-makers who are not convinced of the value of network automation and are unwilling to allocate sufficient funding for proposed network automation.

Recommendation

Now, that you've "heard" what 25 MSO executives have to say about their network automation journey, how can this help you?

If you've yet to begin your network automation journey, where should you start? Start with a holistic view. Develop a comprehensive automation framework. Since it's likely that your

organization will pursue initiatives in Next-Gen Access Network, the Core Transport Network and Enterprise Services, as this research reveals, it's more operationally and financially prudent to consider potential actions in these areas, together. Otherwise, you run the risk of creating inefficiencies with automation islands. One strategic approach and framework worthy of your consideration is the Adaptive Network approach from Ciena. Even if you've already started your network automation journey, it is not too late to step back and look at the bigger picture with an end-to-end perspective.

Within your network automation framework, prioritize your actions by determining where the need and potential return are greatest. Then, decide which investments are warranted: hardware and/or software to dynamically adapt to changes in network state and service requirements; analytics capabilities; network automation and control tools, and/or other areas such as back office. To give you some ideas about the initiatives to consider in each of these areas, please refer to Appendix A.

In order to calculate the ROI for a network automation initiative, every effort should be made to forecast the expected efficiency improvements, the operating expense reductions and the impact on the customer experience. Looked at another way, what's the opportunity cost? By not taking the steps required to automate the network within a specific timeframe, we will experience pain in these areas and our business will suffer or, at least, be sub-optimized. One way or another, the value of network automation must be proven to the decision-makers who control the purse strings. Seek input from other service providers who are further along the network automation journey. Ask your vendors, especially those committed to network automation, for data that will help you make the case.

Importantly, these vendors must be prepared to address the "elephant in the room." Namely, interoperability with the offerings of other vendors. They should play an active role in helping you solve this problem, both in the short-term and in the long-term.

With the framework and business case built, it's time to approach potential stakeholders who can make it a reality. As the main influencer, Network Engineering is a key player. However, network automation is a team sport that requires collaboration across Network Engineering, IT, Executive Management and other functions.

Network automation is both a necessity, given the network's escalating complexity, and an opportunity, given the promise of greater efficiency and manageable operating expense. It's also both a necessity and an opportunity when you consider the changing expectations of residential and business customers who desire the visibility, flexibility and control enabled by network automation. Looked at another way, MSOs that don't invest in network automation will at a competitive disadvantage.

We hope that the perspectives of these MSO executives and this related set of recommendations will make your network automation journey easier. Smooth travels.

BROADBAND
SUCCESS PARTNERS

Appendix A

Examples of Network Automation

Q: Can you cite examples where you're investing in these areas to enable automation?

- *Hardware and/or software to dynamically adapt to changes in network state and service requirements*
- *Analytics capabilities*
- *Network automation and control tools*
- *Other (e.g. back office)*

Hardware and/or Software to Dynamically Adapt to Changes in Network State and Service Requirements

- Automation of configuring, network design. Traffic monitoring platform. NOC tool kits.
- Service Assurance for correct delivery of services. Revert back if not operating properly.
- Customer troubleshooting flows; IVR can restart modems based on network outages.
- DDOS tooling. Responds to signatures. Rerouting of calls.
- SD-WAN auto-configuration out-of-the-box with current solution.
- Use of AI to do predictive analysis is in development for Core IP network.

Analytics Capabilities

- Business Intelligence (BI) platform which takes in arbitrary inputs, mash this together, and get insights. Simulate impact on network of changes, disruptions.
- Network and Data Center analytics to understand how apps are performing.
- Getting telemetry and building tooling to use it. Alerted internally to improve operations and externally to give customers information about environment.
- Give customers visibility to make changes.
- Analytics used for capacity and utilization planning.

Network Automation and Control Tools

- Intelligent rings – fail over / reroute. Tied to measurement and performance.
- Performance-based network path decisions are part of the SD-WAN network retrofit.
- Multiple levels of orchestration and automation tools based on what's being automated.
- Evolve DOCSIS. With remote PHY, auto-configuration core boxes.

Other (e.g. Back Office.)

- New billing system
- Redesigning OSS/BSS, microservices, etc. Full architecture.
- CPE automated.
- Many projects underway such as Call Center and MPLS-TE network inventory.