



The Cost of Your Network – Understanding Your True Costs

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Introduction

For years organizations have embarked on various digital transformation initiatives in order to better adapt their businesses to ever evolving needs and opportunities. In the process, many organizations are now taking a hard look at their network and evaluating whether their historical approaches are impacting their ability to drive real transformation. One area getting particular attention is the true costs of building and maintaining a network. Costs come from several different factors that extend well beyond the initial acquisition of network hardware and software, and even vary with the staff or service provider tasked with management. They're now evaluating the sundry of other expenses that accumulate over the lifespan of their network investment. This paper aims to identify and quantify those costs and tie back to a per user expense as organizations increasingly favor as-a-Service and subscription models.

Major Cost Components

There are four main costs in deploying the network. First is the actual equipment, cabling, maintenance, and warranty to create the physical network. Network planning and establishing initial connectivity (Day 0) is a mix of human-intensive activities like site surveys,

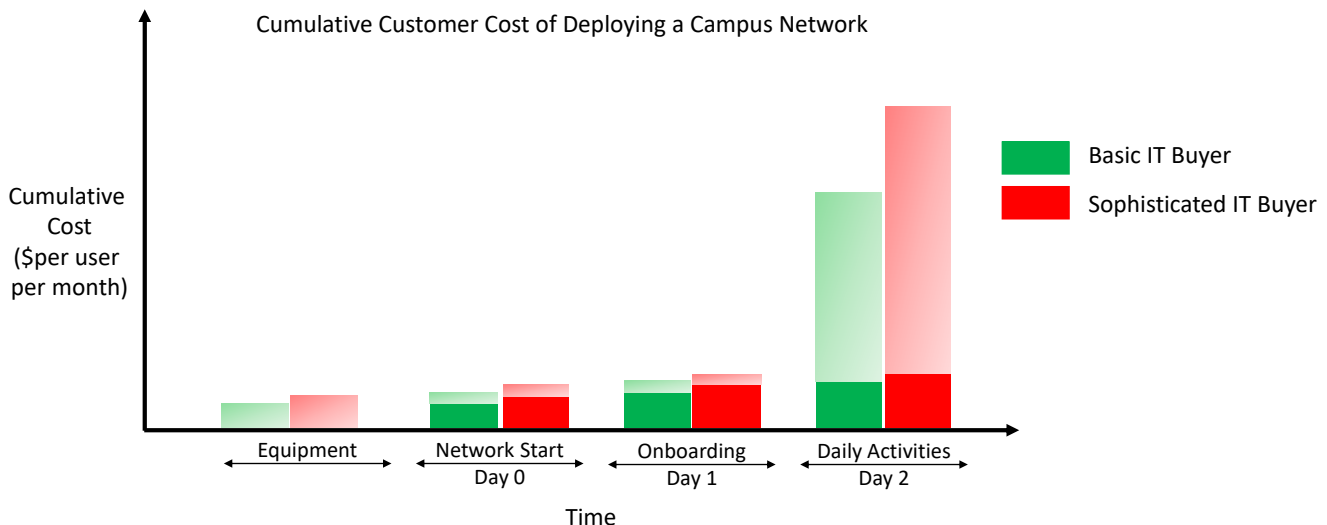
installation, and vendor evaluation. After that, the devices need to be onboarded and the user set up (Day 1). The most costly part of network operations occurs in the daily activities (Day 2) that occur for the years that the network is in service. Table 1 provides a total summary view of those expenses from Day 0 to Day 2 operations, and expressed as a per active user per month expense. The methodology behind these numbers is expanded on in Appendix 1.

	Basic IT Buyer	Sophisticated IT Buyer
Equipment	\$2-\$4	\$4-\$6
Day 0	\$0-\$1	\$1-\$2
Day 1	\$1-\$2	\$2-\$3
Day 2	\$57-\$78	\$61-\$136
Total	\$60-\$85	\$68-\$147

*Cost is shown on a per-user and per month basis

Procurement Costs

Initial costs include all the equipment and future capacity increases, including all maintenance and warranty contracts. Therefore, as an enterprise grows its business or a school adds footprint, it should be expected there will be additional CAPEX expenses incurred. Additional capacity would come in



hardware, such as new access switches, increasing the aggregation switch capacity, and more APs. The enterprise would see the extra cost as the additional users and devices that occupy that new footprint. Across most vendors, the high-end offerings include multigigabit Ethernet (2.5 Gbps or 5.0 Gbps) and 4x4 WiFi 6 Access Points. The aggregation layer and uplinks consist of 25 Gbps to provide enough throughput. These expenses account for redundancy which should be in place across all these layers as the network should have high availability where taking out one networking device does not deprecate the whole network. There are typically eight active connections per Access Point consuming significant bandwidth with 2X-5X more attached but moderate network load. An excellent example of high-bandwidth devices includes an employee's laptop or video conferencing system, while low-bandwidth devices may be idle tablets, badge readers, or smart thermostats. Vendors typically charge at least 10% for maintenance, and costs can increase depending on the level of service for sparring and help desk support. Additional procurement costs pop up with training, the help desk learning new equipment, and accessory items associated with the hardware equipment.

For a smaller enterprise, basic equipment costs for basic connectivity start in the thousands and can exceed \$10,000 for any deployment with redundancy and an aggregation layer. Larger deployments can quickly exceed \$100,000 or even \$1,000,000, depending on the number of employees on a site and the complexity of the security policy on the network. This is a sunk cost that most organizations depreciate over four to five years before starting the process again. Depending on an enterprise's density and business, the price for this equipment is between \$2 and \$6 per user per month¹. For example, most schools upgrade WLAN more frequently than every

four to five years, and these upgrades occur in summer, whereas a larger enterprise may replace purely on a depreciation cycle. Most enterprises find themselves in the top range of the \$2-6 per month estimate. While these costs can seem small, they add up quickly, and the quality of equipment chosen significantly impacts the rest of the cost of running a network. For example, spotty coverage drops traffic during busy times, or lack of guest access leads to severe and significant expenses as soon as network traffic flows. Network administrators often highlight quality; however, benchmarking quality is a challenge. The IT organization can measure SLAs to monitor quality and compare actual to expected performance. Equipment vendors do not offer SLAs; only those who operate networks can offer SLAs.

Network Planning and Start (Day 0)

Equipment procurement comes with several costs, including the site survey, cabling, configuration, setup, and installation. However, as these ancillary, non-vendor costs tend to be once every 4-5 years, organizations typically don't track these costs as closely as they do operating costs, especially with employee turnover. Instead, company knowledge and best practices in events that might occur as infrequently as 1-2 times a decade can benefit from third parties that build up a repository of knowledge from which the industry can benefit.

Site survey cost varies depending on the size of the facility and the quality of the firm performing the study. Simple site surveys for a remote branch location can be under \$2,000 and often can be a flat rate, burdening many SMBs. More extensive facilities typically have site surveys with both a fixed fee and hourly component and can quickly exceed \$10,000. As the number of network devices shifts towards wireless, fully understanding the facility and ensuring

¹ Source 650 Group Ethernet Switch – Campus, WLAN, Unified Access, and TCO Study reports – March 2022. Appendix 1 discusses methodology.

ample coverage become more important. Network topologies for many verticals suddenly emphasized outdoor and new spaces in response to COVID-19. Over the equipment's 4-5 year lifespan, many enterprises will likely repeat a site survey as they inevitably run into capacity and coverage issues. The additional site survey tends to be more WLAN AP driven as the switch often has a longer lifespan or won't need an upgrade because of adding additional WLAN APs.

Installation and configuration add to the cost and are often bundled in via the reseller; from installing a network to turning it on, it adds approximately \$1-\$2 per user per month².

User/Device Onboarding (Day 1)

Organizations constantly get bombarded with requests for new devices on the network. New device requests range from laptop upgrades, BYOD for a tablet/phone, new/terminating employees, guest access, and new IoT devices. The introduction of unknown devices creates a shadow-IT effect, which increases the complexity of running IT. It typically takes a network administrator 15 minutes to onboard a device from request entry through device activation. 15 minutes times 1,000s of devices leads to a backlog which can cause even more time onboarding a device as maintenance and configuration issues creep into onboarding. While making a configuration change does not take much time, interacting with users consumes significant IT resources.

Network administrators should expect streamlined and automated approaches to device onboarding. The guest network should be easy to administer with no organizational support. Shadow-IT devices should be immediately recognized and isolated, and onboarding should not take an employee's time cycles. These cost savings allow for a more agile organization that can

focus on more value-add tasks. The cost of onboarding a user/device ranges from \$1-3 per user per month³.

Daily Activities (Day 2)

This report highlights two broad customer segments as every organization is different. First, the IT-Lite organization which could be a school or smaller business where IT is a shared resource across employees and management. The second is a larger organization that has more sophisticated requirements and dedicated personnel and practices in place.

Basic IT Buyer

Many organizations suffer because employees spend a significant amount of time performing networking tasks instead of their actual job. For example, in many schools, the office manager or teacher also does WiFi troubleshooting, or employees volunteer their time and knowledge to try and keep the network up and performing well. These efforts are quantifiable when one measures their own time, but it may be unquantifiable when others spend time not directly noticed by the person tasked with evaluating costs. We all know the heroes in an organization that serve these important and secret networking administrator roles. Imagine a teacher that didn't need to troubleshoot the network and could instead engage with students, tutor a student in need of extra attention, or mentor a rising star. In addition, many basic IT buyers will leverage an outside source, such as a reselling partner, to perform maintenance upgrades. These costs are often not included when a Basic IT buyer looks at the price or shows up in other budget items. Modern as-a-Service consumption models should allow this by taking all network monitoring, general support, and advanced support off the plate of an organization.

² Source 650 Group Ethernet Switch – Campus, WLAN, Unified Access, and TCO Study reports – March 2022. Appendix 1 discusses methodology.

³ Source 650 Group Ethernet Switch – Campus, WLAN, Unified Access, and TCO Study reports – March 2022. Appendix 1 discusses methodology.

Given that a business owner tends to be on the higher-end of compensation scales, saving time and freeing up an individual is compelling. It can range between \$57-\$78 per employee per month⁴. This quickly adds up, and organizations that look towards improvement and the future tend to be willing to have an open conversation on how to enable this. There are many prominent examples of one company using the network to its advantage and the rest of its peers doing the same thing or losing market share.

Sophisticated IT Buyer

Sophisticated IT buyers have dedicated networking resources and processes in place. These organizations may also augment those dedicated resources with a managed network service provider for basic to advanced network management services, and/or for ad hoc maintenance needs such as configuration hygiene. Networking costs for these more sophisticated buyers can range between \$61-\$136 per user per month⁵. While there are no one-size price standards according to specific verticals, more regulated verticals, or work-intensive verticals such as financial services and healthcare tend to spend more on networking staff compared to verticals like education, manufacturing, and retail. High-tech enterprise is the exception to the rule as this vertical tends to be more automated than others. Staff location will also play a role as IT resources in more expensive, competitive markets will come at a premium to lower cost markets. Some modern approaches can accelerate the business's digitization process. An organization can also look to remove the network from in-house staff; these highly-trained resources can spend their time on further enhancing the business. IT, networking, and any business will always approach this as a multi-year journey. By offloading networks operations to a third party, this would allow in-house staff to work on higher-order issues next-

⁴ Source 650 Group Ethernet Switch – Campus, WLAN, Unified Access, and TCO Study reports – March 2022. Appendix 1 discusses methodology.

generation observability, automation, and security. This offloading could be a game-changer for the organization and would directly impact the company's competitiveness. An organization that doesn't embrace digitization and new technologies will likely see its opportunities diminish as others in their industry gain market share. An organization should allocate freed resources to higher-value services like observability and AI ops. Not dealing with mundane networking tasks allows an organization to free up those resources.

Additional resistance phenomena can range from someone not wanting to change ("I won't get fired for buying from my current vendor.") to personal fears associated with as-a-Service models ("I fear this could impact my job in the future."). The organization should push back against resistance. There is little downside for an organization to try the technology in a branch, floor, or building to understand the differences and see if changing the consumption model and vendor is the right fit in the future. Organizations in the "won't change" category will find it increasingly hard to buy equipment without a subscription component, especially as vendors begin to end-sale and end-of-support CAPEX-only models.

Super Charge the Organization

Everyone in IT can point to an organization that suddenly improved or worsened with a change in the personnel running the network. With a consistent user experience delivered through an as-a-Service model, backed by SLAs and performance monitoring, the organization is far more likely to get a higher-performing network service with limited downside and the upside potential of very consistent performance. While networking may be viewed as slow to move, look at how much change occurred from the first network installations where you only

⁵ Source 650 Group Ethernet Switch – Campus, WLAN, Unified Access, and TCO Study reports – March 2022. Appendix 1 discusses methodology.

had printers and PCs to today with 100's of different devices on the network. Surely the next ten years will not stay still as employees' demands change and organizations adjust to the changing environments.

Network-as-a-Service (NaaS)

Network markets are evolving towards subscription and NaaS-based offerings. Therefore, enterprises considering a network upgrade using NaaS must familiarize themselves with the contract terms, as they will differ from one service provider to another.

When evaluating a NaaS solution and comparing it to a subscription or a CAPEX solution, as a minimum, one should demand four characteristics:

1. Comprehensive monthly consumption model
 - Charging only for hardware on a monthly basis or moving part of the invoice to a subscription does not encompass a complete solution. There are other services that should be included like Day 0 services discussed earlier, such as site surveys.
2. Billing that rises/declines based on actual use
 - It is advantageous to compensate a NaaS provider for traffic and employee metrics. If a vendor offers fixed monthly payments, this is just vendor financing.
3. No extra costs
 - A proper NaaS solution will not have additional costs associated with installation and increasing capacity; instead, those costs are accounted for in the per-user and per-device subscription costs.
4. Guaranteed performance via measurable SLAs
 - NaaS has to be more than just economics. Customers will want assurance that they won't suffer in availability, security, and performance when switching from DIY to NaaS.

Conclusion

As companies look to next-generation offerings in security, observability, and AI-based networking operations, they should also discuss how networking evolves with relevant internal and external stakeholders. The procurement of the network, the lifeblood of every organization, should not stay static. Instead, it should evolve to allow the organization to invest in the future direction of a company. As a result, the consumption model of networking infrastructure needs to change.

About this report: 650 Group produced this report based on analyst opinion and its syndicated research reports. 650 group interviews over 100 vendors, customers, and end-users each quarter and that input forms a foundation for our research products.

Appendix 1: Methodology

Equipment Pricing is based on 650 Group’s syndicated 4Q21 research programs of Ethernet Switch – Campus, WLAN, and Unified Access. 650 Group published quarter reports that include vendors’ revenue, units, and ASPs. Each quarter 650 Group engages with over 100 companies to produce these reports. Each report contains 100,000 or more data points. Many organizations standardized on 650 Group research to measure themselves in the market. Customers range from switching vendors, WLAN vendors, Telco SPs, Cloud SPs, enterprisers, and Tier 1 sell-side and buy-side firms.

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Additionally, 650 Group performed a grounds-up TCO on the Equipment, Day 0 (Capturing the Customer through Network Start), Day 1 (User/Device Onboarding), and Day 2 (Daily Activities). To perform this TCO, 650 Group used publicly available pricing data and over 20 years of analyst experience talking to hundreds of end-customers to quantify costs associated with campus switching and WLAN networks. 650 Group then adjusted those costs to a per user per month data set to more closely align with the as-a-Service models that many Enterprise offerings are transitioning to. Again, a 4-5 year lifecycle was used alongside vendors’ high-end and enterprise-class equipment.

Equipment pricing is based on the January 2022 list pricing of premium Enterprise campus switches and

WLAN with appropriate discounting levels. Street pricing is equal to list pricing minus discounts and is reflective of the price that a customer will pay; additionally, Street pricing is what equipment vendors report in their financials and is also reported in our publications. This report uses Street pricing.

Ethernet switch network topologies were assumed to be redundant with multiple core/aggregation switches. WLAN network topologies include full coverage across the enterprise. As an organization increases in size, the IT equipment costs increase linearly to the number of users/devices and square footage for that organization.

IT personal costs vary greatly depending on the region of the world and type of organization. For example, IT individual prices for an NYC-based financial institution will be significantly higher than for a school in Wyoming. This report uses a range of IT personal costs to provide a range. We note that each organization will have slightly different prices based on organizational structure, location, and type of business. Organizations should use the guide to start a conversation about their actual costs and how they will shift as the industry evolves into as-a-Service models.

Given the change in network products and the move towards Cloud, 650 Group analyst opinion is that the campus network should be evaluated under different criteria going forward compared to the previous evaluation period.