



HexaBuild

White Paper - Business Impacts of IPv6 on Mergers and Acquisitions Strategy

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White Paper Summary

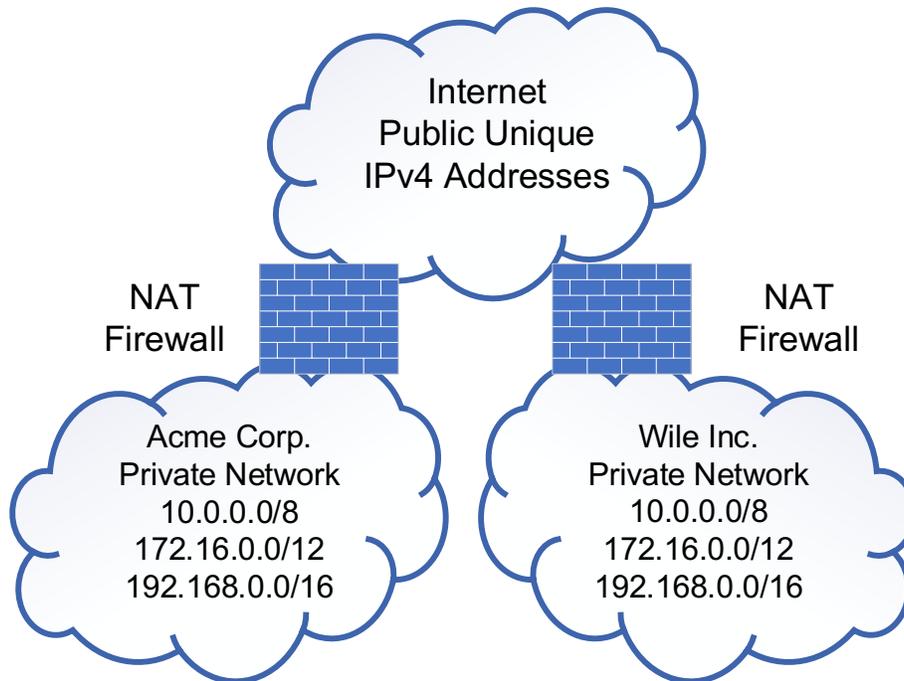
This paper will cover the business and technical use case of leveraging IPv6 to help address many challenges companies face in doing mergers and acquisitions. The goal is to outline how IPv6 provides a technical solution not possible when utilizing the legacy IPv4 protocol. Because of this unique capability, IPv6 should be a strategic technology adopted to help address mergers and acquisitions by any company leveraging this business technique for growth and expansion.

HexaBuild is uniquely positioned to help companies learn, design and deploy IPv6 with a focus on Cloud, IoT and Security. With over 40 years of combined IPv6 experience our co-founders have designed, deployed, operated and worked on IPv6 since the innovator to early adopter phase of the innovator's adoption lifecycle. As we enter the early majority phase, enterprise customers are starting to realize they lack the skills and expertise to adopt IPv6. HexaBuild is here to help your team get IPv6 up and working in your environment so you can continue to participate on the public Internet as it transitions to IPv6. You can download the HexaBuild IPv6 Adoption report at <https://www.hexabuild.io/downloads.html> for more information about the current shift happening on the Internet to IPv6.

Merger and Acquisition Strategy Challenges

Overview

The complexity and risk to business operations inherent in merging two (or more) enterprise IT networks is among the most significant challenges a company must meet when attempting to grow using a merger or acquisition strategy. Often, there are significant difficulties encountered when integrating the core technical or business functions of each company and this is especially true of the network. For instance, it is typical for each company to be sharing common RFC 1918 ([Private](#)) IPv4 address space. Both companies are likely using overlapping IPv4 addresses 10.0.0.0/8, 172.16.0.0/12, and 192.168.0.0/16. In this example scenario, we have Acme Corp. and Wile Inc. which both have a private corporate enterprise network connected to the Internet.



This very common scenario requires time-consuming and costly solutions, such as the readdressing of the network and/or the use of network address translation (NAT). Either solution has significant limitations and costs, including the addition of technical debt and operational complexity to the network as well as the extensive time and effort IT administrators must expend in changing the way the network is addressed. Renumbering can also greatly increase the risk of network downtime for some or all of the network, resulting in loss of productivity. These costs in increased technical debt and operational expense must be repaid with each new merger or acquisition and each subsequent IT network requiring integration. Such costs can add up to a substantial expense for any company intending to expand through an M&A strategy.

Natural Limitations of IPv4

Among the most significant limitations with IPv4 are the costly enterprise wide IPv4 readdressing plan often required to maintain in perpetuity. Such costly readdressing may need to be completed multiple times over the lifetime of an enterprise network. This requirement to readdress the network results from the limited private IPv4 address space available for operators to use in their internal networks: IPv4 lacks sufficient unique public address space to provide corporate networks with enough addresses to more easily and cost-effectively expand their networks.

In fact, even before the IPv6 protocol was formally certified in 1998, the Internet had exceeded the capacity of IPv4 to meet its explosive growth. This fundamental characteristic of IPv4 (a theoretical maximum of 2^{32} – or approximately 4.3 billion addresses) limits its ability to provide

unique addressing to continue to scale both the Internet as well as the enterprise networks connected to it. IPv6 was invented to address this shortcoming. Vint Cerf (often cited as the father of the Internet) [has publicly stated that IPv6 is the way forward](#). At just shy of 50% of all the Internet traffic in the US, IPv6 is on the verge of being the new de facto networking protocol. You can get more details in the [HexaBuild State of IPv6 Adoption Report](#) which provides data and analysis of current adoption rates, markets and the overall impact on the industry.

What Does IPv6 Provide?

One of the fundamental characteristics of IPv6 is the massive unique global address space the protocol provides. This practically unlimited global unicast address space makes connecting and building networks that are uniquely addressed very easy. In fact, due to the large address space there is no need for technical workarounds like Network Address Translation (NAT) (typically deployed to preserve or reuse private IPv4 address space) to be implemented. While it is still possible (and prudent) to provide Stateful Packet Inspection (SPI) firewalling, the need to reuse the same IPv4 address space over and over goes away with IPv6. This means the same security posture and functionality can be achieved but with IPv6's globally unique (i.e., never overlapping) address space.

Because of the very large address space in IPv6 it is possible (and typical) for the Regional Internet Registries (RIRs) to allocate a virtually inexhaustible supply of network prefixes to any company (with the same initial prefix allocation size held in reserve for future use should the first allocation prove insufficient). This means that companies growing with an M&A strategy can obtain an abundance of IPv6 addresses with zero risk of ever again needing to manage either duplicate address space or insufficient public addressing. Each company and division they bring into the network can be globally and uniquely addressed. The need to provide IPv4 address space and NAT or to renumber the network goes away entirely. The simple step of providing unused IPv6 address space to the company being acquired solves the problem. And while a project to deploy the new IPv6 address space within the acquired company may seem to require the same time and personnel commitment to complete as a renumbering plan for IPv4 would (assuming there is sufficient private IPv4 address space to number in to!), in the case of an IPv6 deployment the problem is permanently fixed (versus the need to do the work of renumbering or NAT reconfiguration several more times as is common when using IPv4).

The Technical Challenges of M&A

HexaBuild has identified the following primary challenges many technical teams face when dealing with mergers and acquisitions within their company:

1. Network connectivity interface problems between companies

2. Lack of technical team resources assigned from either company to complete the M&A work for integration of systems, data centers, cloud providers, data and applications
3. Skills of the technical team at either company to understand the environment and architecture
4. The need to maintain operational independence of systems up until the M&A is completed (due to security or compliance requirements)
5. Identity provider integration (Active Directory on-premises to cloud identity as a service (IDaaS) provider)
6. Disparate technical standards among groups, specifically around security, systems, third-party integration and compliance

Unfortunately, IPv6 cannot remediate all these challenges. However, it can help reduce delays and architectural challenges that teams will encounter while doing the work for an M&A project. More specifically, it can free up time and personnel that would otherwise have been committed to renumbering or NAT reconfiguration to overcome IPv4 address supply limitations. Let's look at the specific areas IPv6 can help with so there is a better understanding of how the protocol can be leveraged to help an M&A project succeed.

Network Connectivity Scenario – IPv4 and NATs

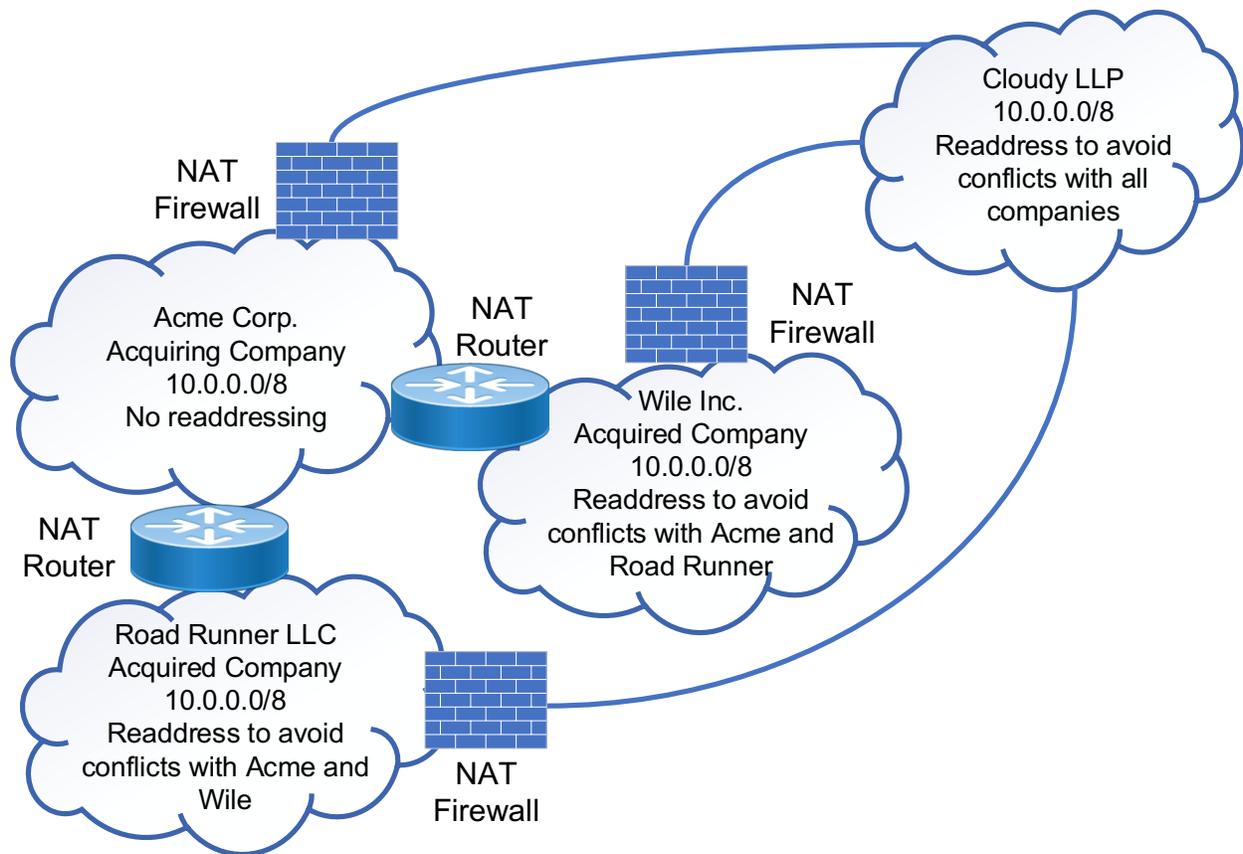
Companies that want to compete effectively require a global network connectivity strategy and resulting set of objectives. Many enterprises have three main business strategies that their network needs to accommodate. These are organic growth, growth through acquiring other companies, or to be sold or acquired themselves. While IPv4 as a useful protocol has gone through several iterations and standards changes to fit these needs, it has long outlived its intended lifespan or purpose. It is no longer a tool that allows flexibility and creativity in meeting the business needs of a company network. IPv4 is now a constraint that many must spend time and money to work around its limitations.

The vast majority of the world's enterprises need to have networks that facilitate communications with their own employees, customers, partners, suppliers, as well as external services such as cloud computing infrastructure. Therefore, enterprises are required to have permeable network perimeters allowing communications to flow in and out of the corporate network dynamically. This basic need and the changing landscape of Internet services and technologies have driven the need for a more flexible and dynamic networking protocol.

Let's go through a simple scenario that covers the technical challenges of M&A activity as related to the network infrastructure. Assuming the complete integration of all IT infrastructure following a merger or acquisition is the primary goal, let's build out what such a scenario might look like. We will call the acquiring company "Acme Corp" and the first acquired company "Wile Inc." Acme Corp is a large enterprise and as a result has a small team that works on M&A

projects. Meanwhile, Wile Inc. is a much smaller corporation by comparison and has only two individuals who run their corporate IT.

During the time when Acme was completing the network integration with Wile Inc, Acme Corp just completed the second acquisition of "Road Runner LLC". Now they must readdress their IPv4 data center and five corporate office locations as part of the integration project. All these companies are also using a Cloud Service Provider (CSP) named Cloudy LLP. The following high-level diagram shows this scenario along with the IPv4 address space currently in use by Acme Corp, Wile Inc, Road Runner LLC, and Cloudy LLP.



Note that in this example network topology diagram, Acme Corp is acquiring both Wile, Inc. as well as Road Runner LLC. Each company is using the private IPv4 address space 10.0.0.0/8 in their internal networks. This address range provides the largest contiguous block of IPv4 addresses and as a result, some or all of it is deployed in all or nearly all IT networks and corporate LANs. When Acme first acquires or merges with Wile, the first required step is to set up a high-speed router to perform network address translation (NAT) bidirectionally. This facilitates immediate connectivity between the two networks but does not solve the address uniqueness problem (i.e., overlapping addresses or address ranges in both networks) and the resulting application issues of NAT. Wile, Inc. then proceeds with the time/labor/risk-intensive

step of changing their IPv4 address to a portion of the private IP address space that does not conflict with Acme's 10.0.0.0/8 addresses currently in use.

In the meantime, Acme acquires Road Runner LLC and immediately installs another NAT44 router. As with Wile, Inc.'s required renumbering, Road Runner LLC will also need to re-address their networks (in the same time/labor/risk-intensive fashion) to avoid conflicting with both Acme's and Wile's addresses. Furthermore, Wile Inc. now needs to adjust their numbering plan and related IT strategy to avoid address conflicts with both Road Runner and Acme.

Further complicating this scenario is that all three companies involved in the M&A use the same cloud infrastructure provider, Cloudy LLP. Each of them is using a hybrid-cloud architecture to support their applications and virtual networks and have carefully curated their cloud network infrastructure to avoid addressing conflicts with their internal corporate networks. This further complicates these, and future acquisitions given the need to integrate applications and critical business data into the Cloud LLP hybrid-cloud.

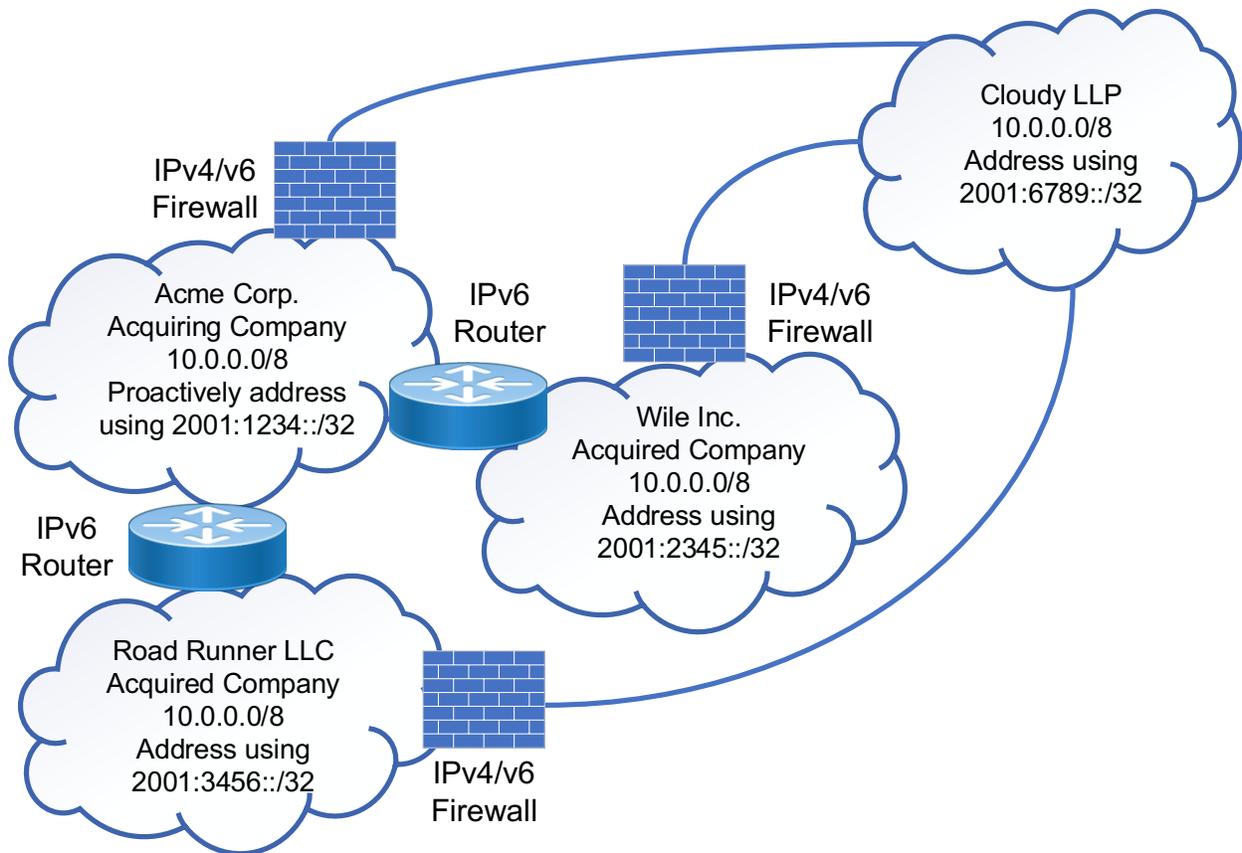
Imagine if Acme were to acquire ten companies over the course of three years. Their acquired company's IT teams could conceivably spend all their available time performing IPv4 readdressing activities that do nothing to enhance the value of the IT strategy developed to support of the company's core business strategies and efforts to create competitive advantage. In addition to the painstaking steps required to re-address the networks, all involved IT teams would need to make additional configuration adjustments to DNS, firewall rules, and applications to avoid any downtime or negative end-user impact. This sunk-cost in the form of person-hours spent renumbering and reconfiguring the network must be spent exclusively on paying down the technical debt that the combined companies have perpetuated by using legacy IPv4.

Network Connectivity Scenario – IPv6

Now consider instead this alternative scenario and network topology diagram. Acme Corp has proactively deployed IPv6 using the example IPv6 address range of 2001:1234::/32. Acme Corp proceeds to purchase Wile Inc. and Road Runner LLC, just as before. But rather than proceed with the time-consuming and potentially risky step of IPv4 renumbering, now the strategy is instead to configure IPv6 addresses 2001:2345::/32 on Wile's networks (a new IPv6 address range acquired specifically to use for Wile's networks) and connect the networks using an IPv6-enabled router. Acme and Wile are now able to communicate natively using IPv6 without any address overlaps. Wile can continue to use their legacy 10.0.0.0/8 internally but use IPv6 when collaborating with their new Acme Corp parent company. Note that no reconfiguration of, or interruption to, the existing IPv4 network may be required with this approach: IPv6 can quickly and easily be added to most existing networks.

Now when Acme Corp purchases Road Runner LLC, they deploy another IPv6 router and add use the 2001:3456::/32 IPv6 range (acquired specifically to use for Road Runner's networks) to provide addressing for the new acquisition. Now Road Runner does not need to spend countless hours re-addressing their IPv4 networks. Furthermore, Road Runner's IPv6 range does not overlap with Acme's or Wile's and all three companies can connect and collaborate natively using IPv6.

In addition, Acme can deploy IPv6 in their Cloud LLP infrastructure using a range acquired exclusively for this purpose (in our example, 2001:6789::/32) and use this vast amount of IPv6 address space to integrate any additional acquisitions or mergers into the cloud. Wile and Road Runner would also utilize addressing from the 2001:6789::/32 range to integrate their cloud infrastructure, thus avoiding any addressing overlap and speeding up integration of their critical business applications.



Financial Calculation

There are multiple ways to calculate the financial cost considerations of M&A. In the case of IPv6 for M&A the considerations are the recovery of time and repeated efforts. In addition, one of the major financial advantages to leveraging IPv6 is faster time to market as there are no conflicting address issues as with IPv4. Financial considerations are divided into hard costs (recovery of time and repeated on-going efforts) and soft costs (time to market and reduced risk) and each company will have to evaluate the potential advantages and impacts of the soft costs on their business.

Hard Costs:

Each company will need to calculate hard costs associated with M&A to better understand any impacts. The following list outlines some of the tasks required to continue to renumber using IPv4 address space, because of overlapping private addresses. These common criteria and tasks to consider include:

- Number of companies being acquired
- Number of sites the acquired company operate
- Number of data centers the acquired company operate
- Public clouds used by the acquired company
- Number of users per site
- Annual OTE of staff doing migration/renumbering work
- Estimated hours to re-address a site, company, data center or cloud service

Each additional company added requires repeating the same work and resources used in the initial renumbering effort. This is the primary problem with attempting to use IT staff's "time" to solve this issue. The financial costs to the company become progressively higher and higher and the technical debt becomes so large as to become unmanageable.

Often, companies give up doing network integration and continue to operate acquired companies as stand-alone entities due to the technical debt and challenge of integrating them fully on the network. If a company reaches this point, they may no longer achieve any savings from economies of scale the parent company can provide. This reduces the value of any acquisition. While many of the financial models used to justify an acquisition use the consolidation argument, as we have shown this often does not become reality.

Soft Costs:

Important soft costs that should be considered include:

- Time to market

- Competitive advantage
- Employ satisfaction
- Reducing future risk

If a company has, as part of its growth plan, mergers and acquisitions as a key pillar of that plan then how quickly the company can integrate and operate any acquired company becomes increasingly important. The time required to merge networks is greatly increased by IPv4 overlapping address space and the need for multiple NAT functions. IPv6 eliminates both these technical issues. This means that upon acquiring a company, a simple IPv6 adoption project could be done to guarantee that the acquired company is integrated fully into the company from a technical perspective. If either company is already running IPv6 then the process will take even less time to complete. This is a competitive advantage both in time to market but also for financial management and cash flow. It also improves employee morale and satisfaction as they are not working on the same issues over and over related to IPv4 readdressing (and may instead focus on projects that further reduce IT as a cost center). Finally, the company is reducing risk associated with successfully integrating an acquired company from a technical basis.

Engaging an Independent Integration Team

During an M&A, company IT staff has limited time to perform the integration. Therefore, it may be beneficial to contract with a capable consulting company, like HexaBuild, to guide and assist with the M&A plan and implementation. Also, M&A activity utilizing IPv6 requires specialized skills that HexaBuild possesses.

HexaBuild will function as an independent organization preparing the connectivity and avoiding address overlaps. HexaBuild will operate an independent party to the M&A and will preserve the confidentiality of all companies involved during the M&A. It will be prudent to have HexaBuild sign NDAs with all M&A parties and operate impartially. When the work is completed, HexaBuild wraps up, documents the design and processes and procedures, and disengages, thus minimizing ongoing costs.

Skills, Education and Training

Most enterprises have not invested significant time or money into training their existing IT teams on the IPv6 protocol and how it should be configured. The current IT teams are unprepared to create an enterprise wide IPv6 addressing plan in preparation of M&A activities.

HexaBuild offers IPv6 training and education services to help the corporate IT teams become knowledgeable about IPv6 and able to configure and maintain the IPv6 networks. HexaBuild offers a wide variety of IPv6 courses customized for various IT team roles and responsibilities.

Technical Standards

Enterprise teams with little to no experience with IPv6 will struggle to come up with appropriate IPv6 standards. Having well established IPv6 standards of practice, design and architecture will ease the work any IT will have in implementing and adopting IPv6. This is critical for all acquiring companies to set the ground rules in how to interface with them. HexaBuild has decades of IPv6 experience and can help organizations avoid pitfalls and follow industry best practices. HexaBuild can guide the organization to execute this strategy correctly the first time and every time after that. HexaBuild can help empower the corporate IT teams by documenting the design and practices that they can follow on their own during future acquisitions.

Engaging HexaBuild for the Solution

If your company is planning on pursuing an acquisition strategy in the coming years, then it will pay dividends to have the plan in place prior to the first acquisition. It is critical to perform the planning step now. It is easier and less costly to perform this planning now rather than wait until you are ready for a M&A to start this process. Failure to prepare for this ahead of time could potentially delay the first acquisition. If your company is like Acme Corp, you want to have the IPv6 core network already deployed before the first M&A event. There will not be enough time to complete the addition of IPv6 when the M&A occurs. Your organization needs to be proactive if you know that M&A activity will be imminent in the next 12 months. HexaBuild is here to help and ready to engage with you to streamline your M&A networking strategy.

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