Carta's Ultimate Guide for Building a Modern Foundation in the Connected Economy

NS1.

The Digital Enterprise Evolves

In the swiftly changing world we live in, digital technologies are advancing at a rapid pace. Applications have become the lifeblood of every organization as they help us connect, innovate, inform, educate, and move the world forward. Creating positive application experiences for external and internal audiences is essential to the success of any business.

To support our growing dependence on applications, organizations are undergoing widespread digital transformation or IT modernization initiatives. Agile DevOps teams are creating highly distributed and dynamic applications that are delivered through a diverse mix of on-premises, public, and private clouds, content delivery networks (CDNs), and microservices platforms.

Yet, traditional network infrastructures weren't built to support the deployment, connectivity, and delivery of applications at the scale we're seeing today. These outdated foundational technologies, including appliance-based DNS and DDI (DNS, DHCP, and IPAM) solutions, are impeding enterprise modernization initiatives by hindering automation, performance, and scaling.

Primary Concern

IDC reports that DNS modernization ranks as a top challenge for organizations seeking digital transformation. Other essential issues include migrating workloads to public clouds, internal data integration issues, network latency and system performance, and lack of infrastructure automation.[1]

The Network Advances: Addressing Today's Challenges

Data centers and applications can be anywhere, including on premises, in the cloud, or in a multi-cloud environment. When an organization uses a legacy networking model, one resulting issue is siloed application and network infrastructures that can't adapt to cloud-scale. This frequently results in far greater complexity because an enterprise needs disparate sets of tools and technologies to operate effectively and efficiently. Adding to the problem, these ad hoc tools don't address latency, resiliency, elasticity, and flexibility requirements adequately because they aren't designed to work together to optimize the overall IT environment.

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Today, a network can't address applications as monolithic entities. It must be intelligent and adaptive; it must be able to accommodate microservices, automation, and APIs. It must also support three major elements:

- **New deployment surfaces that extend into different environments, including private, public, and hybrid clouds.** There's a need to tie everything together and manage various systems consistently. A lack of integration leads to performance degradation, as well as to higher costs and weaker cybersecurity.

- **Automation workflows — including deployment and orchestration — along with highly distributed application, network, device, and workforce architectures.** It's critical to address microservices, edge, serverless environments, and the convergence of IT and operational technology (OT).

- **Disparate groups of users with everything from laptops and smartphones to IoT devices.** Not only are these devices most likely spread across different geographies, they require different technologies to connect and exchange data effectively and securely.

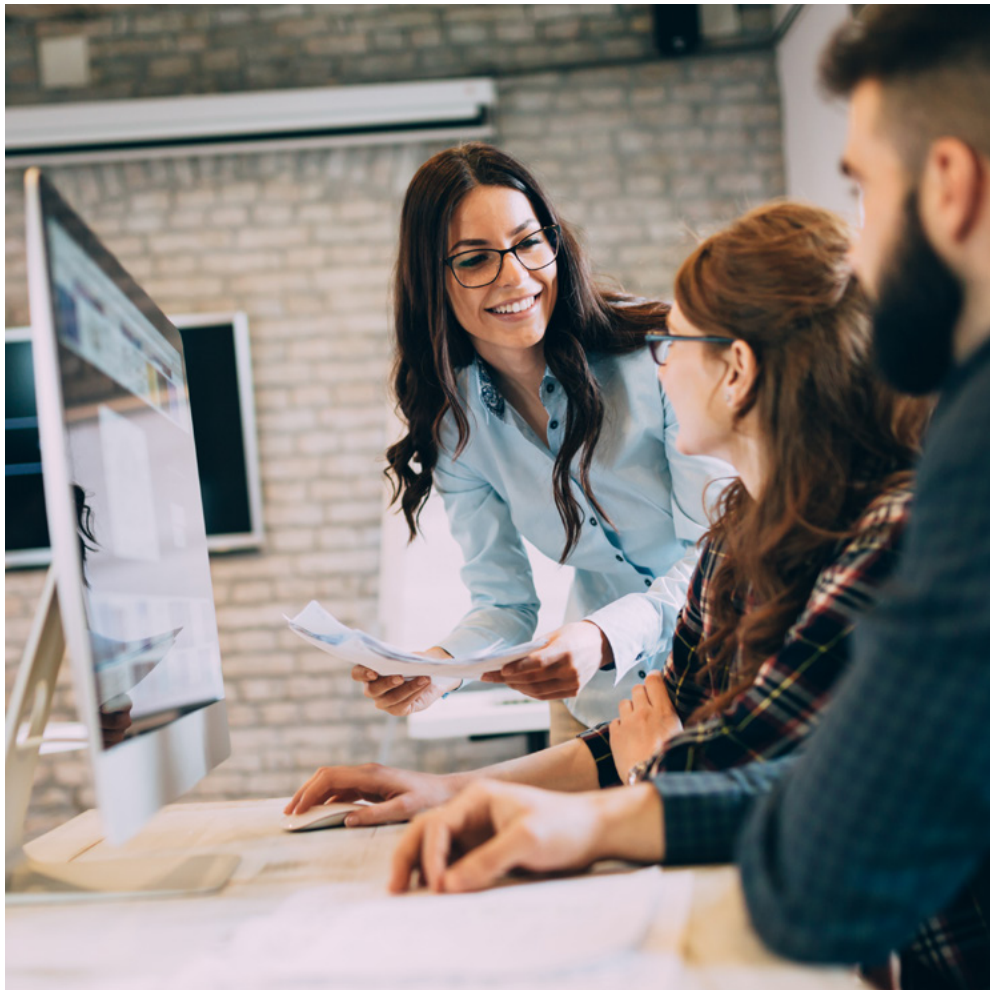
Unfortunately, legacy systems and frameworks present other formidable problems. For example, they don't adequately support mission critical initiatives like DevOps, NetOps, and DevSecOps. They also create challenges for IT teams that have traditionally been involved with connectivity and what happens inside the network, rather than today's microservice-centric architectures. These groups often lack the tools and expertise to adopt a more sophisticated approach.

A good example of the challenges presented by legacy networks occurs when there's a high-priority need to push computing closer to the edge. Since it's impossible to deploy a piece of hardware in a public cloud, it's suddenly necessary to containerize a DDI infrastructure on a public cloud. **But without a modern foundation — with applications, tools, and other resources siloed — it's impossible to build a high-performance IT framework**, one that's agile and flexible enough to accommodate changes.

A Better Way

The convergence of applications and networks opens the door to a new ecosystem of products, architectures, and operating models that addresses today's challenging networking requirements. The current business and IT environment demands a set of requirements and a DNS-based delivery mechanism that more effectively tie together applications and elements.

This approach — which seeks to optimize infrastructure, bandwidth, and other resources — delivers resilient, cloud-ready, intelligent DNS/DDI to connect and deliver applications at global scale, helping your system function as an ecosystem rather than as linked components. It delivers the best application experience for users, while providing employees with immediate and reliable access to the resources they need anytime and anywhere. A container-based, lightweight, flexible deployment optimally utilizes available compute resources, extends traffic and policy management to the edge, and avoids the overhead and limitations of additional appliances.



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Migrating to a modern foundational technology also pays other dividends. Organizations rein in manual processes, complexity, overlap, and infrastructure spending, while boosting IT performance. It's able to tie together multiple datacenters and CDNs, steer traffic intelligently, simplify third-party integrations through APIs, and gain granular and data-driven control over application data. It also eliminates single points of failure that can cripple an enterprise and allows the network to hold up during peaks and valleys in traffic. The high level of integration also means that fewer security gaps occur.

Key Reasons to Use Managed DNS

- Improve speed, reliability, and resiliency.
- Improve the breadth of platform, including the number of POPs.
- Boost performance and reduce latency.
- Tap technical expertise to constantly evolve.
- Establish continuous management of a network and multiple CDNs.
- Unleash more advanced features that more tightly integrate with DNS, such as traffic awareness and application state monitoring.[2]

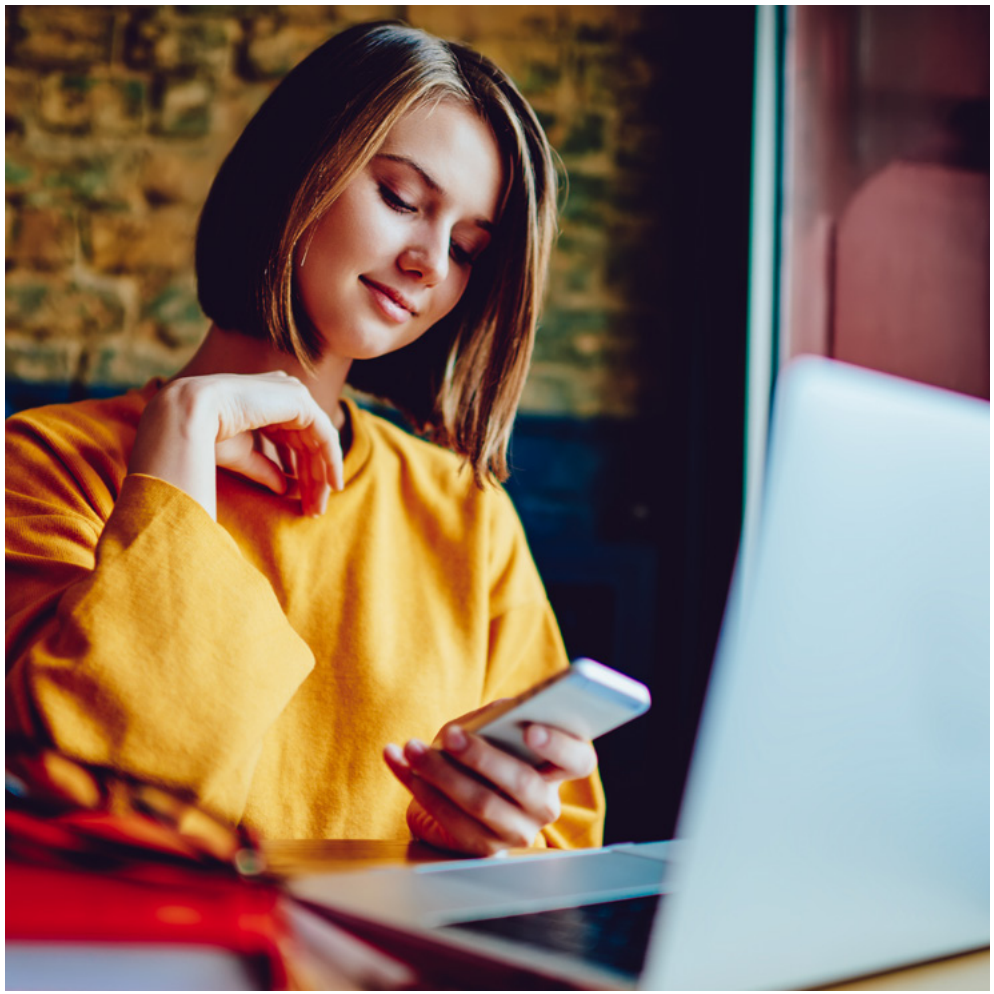
What to Consider Before Modernizing Your Foundational Technology

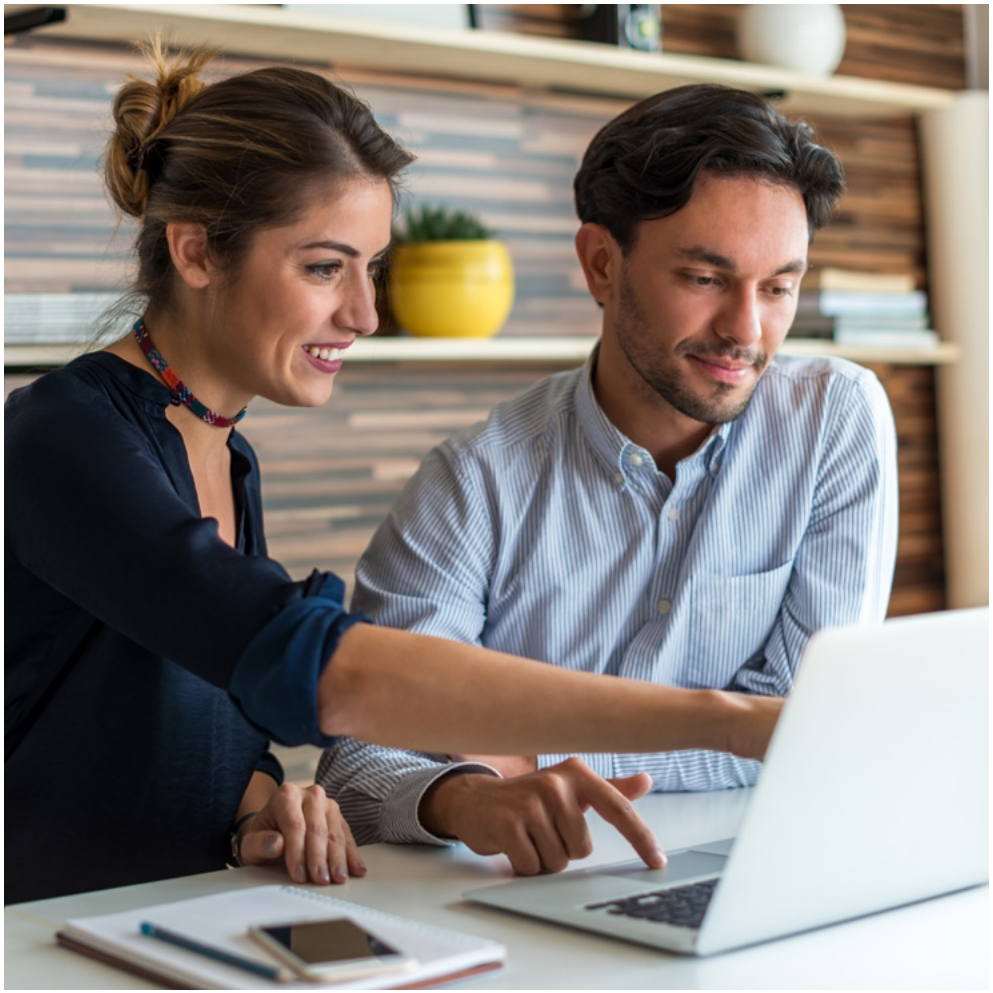
The journey to a more modern network infrastructure doesn't have to be an exercise in frustration. With the right strategic framework and tactical approach in play, it's possible to move to an advanced digital foundation with minimal disruption.

A starting point for this process is to ask a basic but critical question:

How can we modernize elements of our technology foundation around external DNS, internal DNS, DHCP, IPAM, traffic management, and traffic steering requirements in order to support the convergence of applications and networks?

At the center of everything is the need to operate an IT infrastructure at the protocol layer, which is a natural fit for the intersection of both application and access networking. This, in turn, supports a platform that's API-first, SDK-driven, and containerized as well as software- and service-based. This modular approach supports maximum agility and flexibility.





The goal is to coordinate and integrate everything within an ecosystem. Comprehensive managed DNS connects the internal aspects of a network, including users, devices, applications, and microservices, to each other. Ultimately, this approach fuels application delivery to create exceptional user experiences. Intelligent traffic orchestration and management for applications is at the center of the enterprise — regardless of where applications and traffic reside.

Top Challenges:
Digital Experience Management

- Identifying root causes of problems: **30%**
- Capturing how often and by whom services are used: **28%**
- Communicating business impact of IT services to lines of business: **28%**
- Measuring true end-user satisfaction: **26%**
- Understanding performance impact of third-party services such as cloud providers or CDNs: **26%**[3]

The Practical Steps to Modernizing Your Foundational Technology

The move to a modern IT foundation is an ongoing process. It requires the right thinking and actions in order to define and adopt the most suitable systems and tools that will work with your existing and future tools. What's more, it's important to address cultural components and the organizational impact of the initiative.

1

Analyze your current environment.

Identify how and where modern foundational technology can support the type of change that's necessary. The goal is to achieve an infrastructure with no single point of failure and a framework that makes it easier to implement and integrate systems with the rest of the stack. It typically includes things like intelligent traffic steering, automated infrastructure deployments, configuration management, and orchestration. In addition, understand the requirements for each specific use case. This includes infrastructure, traffic patterns, and when and how periodic bursts occur. The objective is to gain granular, data-driven control over application data and make infrastructure data actionable.

2

Build a roadmap for change.

Identify what's required to make the transition to a modern technology foundation and a single pane of glass that delivers deep visibility and controls. Map the needs to tools and solutions, then look for a vendor that offers strong automation, particularly in regard to DDI, and can introduce best practices and establish industry standards.

A modern infrastructure should allow you to make changes through the API and have them propagate instantly. It should also include enterprise-ready security and management capabilities, including logging, DNSSEC, and statistics. Also understand the financial model for the initiative, including transitioning from a CAPEX model to an OPEX model. Finally, don't ignore cultural issues regarding how a change in infrastructure will impact different groups, particularly in regard to their independence and autonomy.

3

Establish a specific plan.

Develop a strategy for moving to a more modern foundational technology framework. No two companies are the same, and many organizations require a phased approach. This may mean initially moving a single location or a segment of the infrastructure or a set of applications. On the other hand, some organizations will benefit from a rip-and-replace approach; still others, such as new enterprises or organizations starting a new line of business, may adopt a greenfield approach.

4

Evaluate your product needs and find the right solution provider.

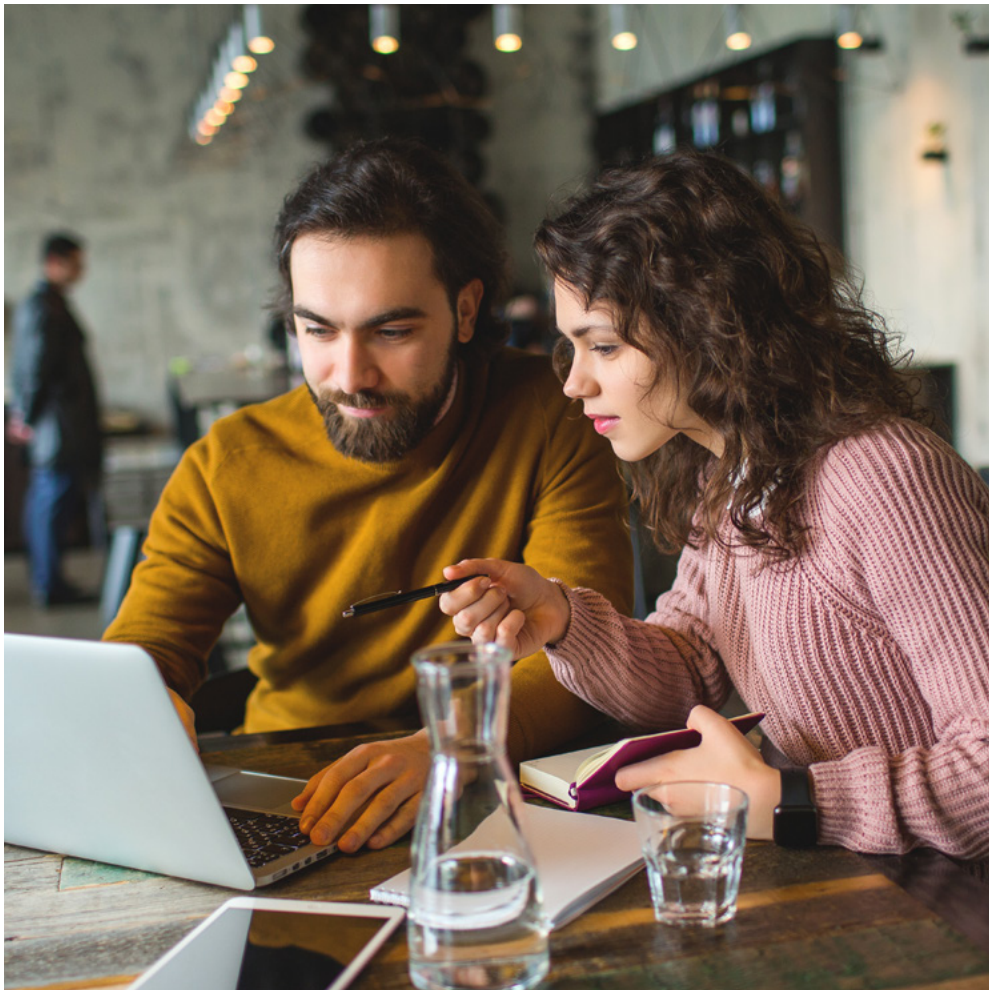
When it comes to your product needs, there are many elements to address, but DDI and DNS are two of the most critical factors. Ideally, a product should offer ultra-fast response times; unified service discovery and global traffic management; intelligent traffic steering; real-time propagation and provisioning; real-time monitors and delivery alerts; dynamic routing; and simplified workload management across multiple data centers, cloud environments, and heterogenous systems. This approach also boosts security by minimizing attack surfaces, introducing greater flexibility when dealing with outages and attacks, and enabling zero-trust security postures. What's more, an API-first design integrates with existing vendors and supports DevOps workflows — all through a single portal and API.

5

Embark on the initiative.

Once the changes are in place, you should have a flexible deployment model along with the ability to introduce multiple datacenters/cloud providers and CDNs and, ultimately, put applications and data closer to end user. However, the task of modernizing your technology platform is an ongoing process. It's important to set realistic expectations and build a system that supports further changes in the months and years ahead.

Key Metrics to Keep an Eye On



Here are some of the factors you should be focusing on when you're ready to modernize your network:

- Time required to spin infrastructure up or down (manual vs. programmatically)
- Percentage of uptime and SLA attainment
- Performance for end users. This includes latency, load-times, increased throughput, and milliseconds saved.
- Migration speed (time to value)
- Number of application-impacting security incidents/fires reduced
- Percentage of improvement for key KPIs such as revenue, churn, conversions, engagement, and NPS score

Case Studies

Here are two organizations that have benefited from a more advanced foundational framework:

Media Company: USA Today Network

Problem

The Pulitzer prize-winning news outlet needed to better manage content delivery on a global scale, with more than 500 digital products reaching 110 million people per month. Speed and velocity of delivery were critical.

Solution

The firm turned to NS1's Dedicated DNS solution. It facilitated continuous integration, boosted automation, and delivered far greater resiliency.

Browsing and Content Sharing Platform: Imgur

Problem

With about 4.5 billion page views a month, Imgur ranks as one of the 50 most popular websites in the world. The company needed to better manage a high volume of rapidly changing content.

Solution

Imgur adopted NS1's Managed DNS platform to intelligently deliver content to their users with low levels of latency.

Final Thoughts

Today's hyper-connected world runs on applications, and success increasingly hinges on connecting and delivering applications at global scale. Agility, flexibility, and resiliency aren't negotiable. In fact, they're at the center of digital transformation. The migration to a modern foundational technology framework enables cloud-enabled networks, users, applications, and services to operate faster, smarter, and better. It's a critical element in taking an enterprise network to the next level.

Learn more about how NS1 can help you modernize the foundational infrastructure of your application network.

[1] "A Modern DNS for Modern infrastructure Challenges," IDC. June 2018.
[2] "If External DNS Fails, So Does Your Digital Business," Gartner, 2015.
[3] "A Recommended New Approach to Improve Digital Application Performance," EMA. May 2018.

Request a demo.

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