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SHOWCASE

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The NetScaler Platform Evolution

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Abstract: Modern application environments have evolved to become highly distributed as a result of digital transformation initiatives. However, this evolution can lead to a number of new challenges related to complexity and the ability to deliver positive experiences. Like modern application environments, NetScaler has also evolved and now provides a flexible platform that supports both traditional three-tier and modern microservices-based applications in data centers and public clouds.

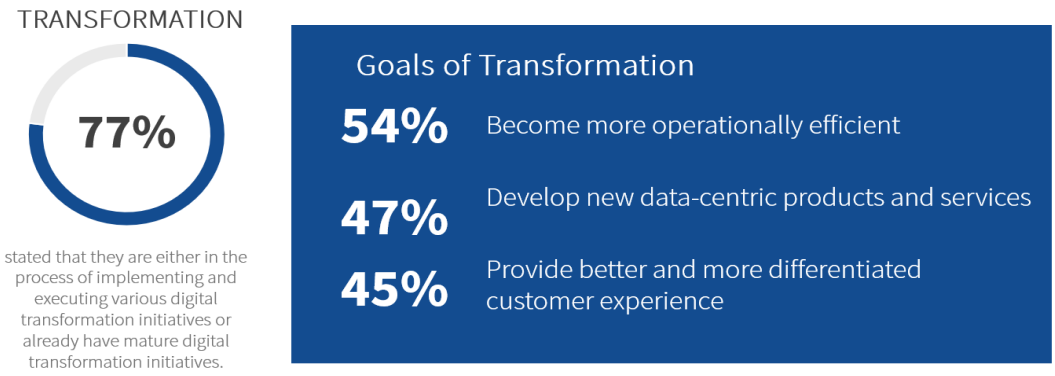
Modern Application Environments Are Highly Distributed

To compete in a digital economy, organizations have to be agile and responsive to changing market demands. Application architectures have evolved, as have the locations of application deployments. Gone are the days of an organization keeping all of its monolithic or three-tier applications in the corporate data center (castle) and protecting it with perimeter security (moat). In contrast, modern application environments are highly distributed, with applications deployed in private data centers, multiple public clouds, and edge locations.

Digital transformation initiatives and microservices architectures have enabled businesses to evolve to better support customers and drive agility. Organizations are embracing this, and research from TechTarget's Enterprise Strategy Group indicates that over three-quarters of respondents stated that they are either in the process of implementing and executing various digital transformation initiatives or already have mature digital transformation initiatives.[1] While a distributed application environment delivers greater business agility, it also creates more complexity for the IT teams supporting it. That is why the most cited IT objective for digital transformation initiatives for the last five years has been to become more operationally efficient. This year that top objective was followed by the ability to develop new data-centric products and services and provide better and more differentiated customer experiences. It should be noted that the transition to becoming more digitally mature also requires organizations to evolve their security posture to accommodate the distributed application environment and ensure there is comprehensive end-to-end visibility.

[1] Source: Enterprise Strategy Group Research Report, *2023 Technology Spending Intentions Survey*, November 2022. All Enterprise Strategy Group research references in this showcase are from this research report unless otherwise noted.

Figure 1. Digital Transformation Progress and IT Goals



Source: Enterprise Strategy Group, a division of TechTarget, Inc.

The research also supports the shift to highly distributed application environments, with 95% of organizations reporting that they use two or more public cloud providers.[2] Given that this creates an increased attack surface due to the applications becoming more distributed, it is no surprise that strengthening cybersecurity is the top business initiative driving IT spending.

Distributed Application Environments Create Challenges

While distributed application environments provide several benefits, they also create challenges for the IT teams that must support them. Primarily, these environments are more complex as they span multiple different sites, but there are other challenges as well.

For each new cloud provider, operations teams must learn a different tool or function, which requires time and skilled resources. Even once the team has become proficient in a specific cloud vendor tool, the operations teams then must contend with troubleshooting an environment with multiple, different screens (often referred to as *swivel chair management*) and performing manual correlation of the information provided in each portal. These tasks can be error prone, delay remediation, and impact service.

Organizations also struggle with ensuring an optimal level of application performance to consistently provide positive experiences when delivering applications across distributed locations, especially when relying on the public internet to provide connectivity between the users and these locations. The internet is a blind spot for application delivery over which IT has no visibility or control. In distributed environments, issues related to either where the application is located or where it is being delivered to a user that go undetected can impact application performance and the time to fix the problem, which negatively impact customer experiences.

Security becomes even more difficult in distributed environments because there is no perimeter to protect. Also, organizations are often using different WAF security tools for on-premises (ADC) and cloud-based environments (a different WAF solution per cloud provider) that can lead to gaps or discrepancies in the security. This makes it difficult to ensure consistent and correct policy deployments across hybrid environments. This is only exacerbated by the lack of available cyber skills. According to Enterprise Strategy Group research, organizations most often reported skills shortage in cybersecurity (45%). This is problematic, as the increased attack surface requires security solutions to be distributed as close as possible to the applications, wherever they reside, and not just at the perimeter of the data center.

[2] Source: Enterprise Strategy Group Research Report, *Distributed Cloud Series: The Mainstreaming of Cloud-native Apps and Methodologies*, July 2023.

The NetScaler Platform Has Evolved to Support Modern Distributed Application Environments

Fortunately, technology vendors are aware of the challenges that come with digital transformation and have evolved their solutions to enable organizations to fully leverage modern distributed application environments. Formerly part of Citrix, NetScaler has been acquired by the Cloud Software Group. While acquisitions can be distracting, NetScaler has remained focused on supporting its customers and evolving its technology to better support highly distributed application environments.

To ensure that NetScaler customers can accelerate the adoption of modern distributed application environments, it provides a flexible platform that enables organizations to support both traditional three-tier applications and microservices-based applications regardless of where they reside—data center, public cloud, or edge location. Instrumental to this capability is NetScaler's use of a single operating system and management plane that simplifies configuration and deployment across any form factor—physical, virtual, bare metal, and containerized.

Application, DevOps, and network operations teams leveraging the NetScaler platform only need to learn and use one management console to manage application delivery and security across hybrid and multi-cloud environments. In addition, to ensure tight integration with public cloud providers, NetScaler has partnered with major cloud providers such as AWS, Azure, GCP, IBM Cloud, and Oracle Cloud Infrastructure.

NetScaler has focused on three key areas: helping organizations to deliver superior application performance, achieve enhanced application security, and gain deep visibility into their highly distributed environments. More specifically:

- **Performance**. To optimize application experiences, NetScaler ensures that application end users are always accessing the best-performing resources. To deliver high performance at scale, NetScaler leverages a proprietary one-pass architecture for lowest latency traffic processing even while performing multiple functions simultaneously, such as performing both network and security inspections.

  NetScaler architecture enables the processing of optimized layer 7 throughput up to 6.4 Tbps for hardware ADCs and up to 3.2 Tbps for software ADCs so there are no delays to impact or degrade the application end-user experience.

  NetScaler also includes real-time internet state awareness that is used to ensure requests are sent to the best performing resource for each individual user. Intelligent Traffic Management (ITM) factors in reachability data for applications and content wherever it is deployed—private DC, public cloud, and CDN, for example. It does this by collecting user data across 50,000 internet service provider (ISP) networks globally on a daily basis. The ITM system provides operators with real-time and historical insights from this data and will automatically route client requests to the optimal location to ensure the best user experience for each individual user. This includes the ability to mitigate internet outages that could affect application delivery. This is also highly effective for environments using global server load balancing (GSLB) for applications distributed worldwide.

  Organizations can use NetScaler to automate application delivery at scale by using an infrastructure-as-code (IaC) approach to deploying application delivery controllers (ADCs). To accelerate time to value, organizations can use Terraform or Ansible to automate configuration and deployment cycles using NetScaler.

- **Security.** To secure highly distributed application environments, NetScaler provides integrated security functions, including single sign-on capabilities, web application firewall protection, bot protection, and SSL/TLS offloading. It also provides zero-trust network access (ZTNA) for both internal and external applications.

  NetScaler also offers API protection that is augmented with API traffic monitoring and the ability to create API policies based on multiple criteria to block or allow traffic. Advanced analytics enable organizations to identify potential vulnerabilities and attacks, including SQL injection, cross-site scripting, and request forgery.

- **Observability.** To ensure complete visibility, NetScaler can provide detailed information related to application performance and security. This includes providing insights into applications and APIs, as well as the network and IT infrastructure. Organizations can take advantage of the detailed data (10 billion data points daily from ITM) to understand latency across the entire stack, traffic patterns, protocol errors, and application dependencies including last-mile visibility. Security information contains details on vulnerabilities, SSL certificates, and API analytics. For the network and infrastructure, telemetry data is used to provide health state as well as to determine the root cause of any problems.

  NetScaler gathers all this data leveraging all four observability pillars—metrics, events, logs, and traces. This includes real-time metrics and event alerts. Log data includes transaction logs, syslogs, and others related to health and licensing. The trace information is especially helpful for tracking down issues in microservices environments. The data can be accessed using the NetScaler GUI (NetScaler Console) or CLI, and imported into an observability tool of choice leveraging APIs. Currently NetScaler supports Elasticsearch, Grafana, Kafka, LogicMonitor, Prometheus, Splunk, SolarWinds, and others using a REST-based API.

Organizations will also benefit from participating in the well-established NetScaler community, where operations teams can take advantage of the vast knowledge base generated by their peers and NetScaler experts to accelerate the time to value or strengthen NetScaler skills.

Conclusion

Modern application environments are known for being highly distributed, with applications deployed across multiple public clouds, on-premises data centers, and edge locations. While this provides numerous benefits to the business in terms of agility and responsiveness, it can create challenges for IT teams.

Primarily, these distributed application environments are far more complex to manage than the centralized data center-based applications. Leveraging the internet to connect to distributed applications can lead to blind spots that negatively impact application performance and the application end-user experience and that place organizations at greater risk of a cyber attack.

NetScaler has evolved to support hybrid and multi-cloud application delivery in environments that span on-premises data centers, multiple public clouds, CDN, colocation facilities, and edge locations. The NetScaler platform enables organizations to deliver superior application performance and end-user experiences, augmented with integrated security capabilities and full-stack observability.

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