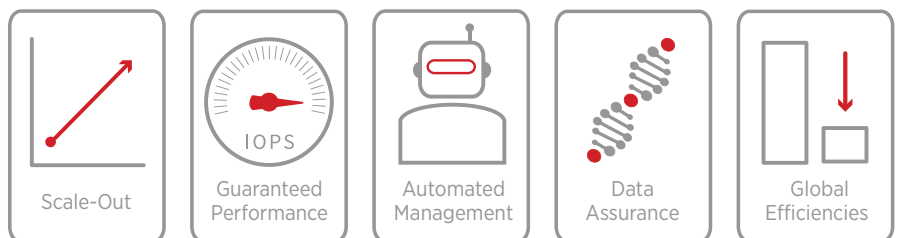# NetApp

A SolidFire Article

5 Principles That Enable Service Providers to Grow

Today's service provider landscape is highly competitive, and to remain relevant in an evolving market, service providers must primarily focus on understanding their customers' needs and then demonstrate their ability to fulfill them.

The rapid elasticity, high efficiency, and cost containment required by today's market is very difficult to achieve using traditional scale-up infrastructures. This need drives the innovation required to implement a web-scale next generation data center (wNGDC) architecture.

The architecture that service providers are migrating toward is based on five core principles that are implemented across each layer of the data center framework — affecting the software, processes, and people that support the entire delivery stack.

These five principles are summarized below, and once implemented, they can enable drastic change in a service provider's market penetration and profitability.

Scale-Out	Guaranteed Performance	Automated Management	Data Assurance	Global Efficiencies

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Principle #1

Scale-Out Architecture: For the service provider, being able to horizontally expand compute and storage resources across the entire data center — in a nondisruptive manner — is an essential element to meet the customer requirement of providing resources on-demand. The wNGDC model meets this need by using a heterogeneous scale-out architecture that allows independent storage and performance pools to be transparently created and linearly scaled to meet customer expectations (e.g.. no interruption of service, no offline maintenance). With this element in place, the need for service providers to project business needs two, three, or even five years out becomes a non issue with the scale-out architecture expanding incrementally as customer requirements change.

Principle #2

Guaranteed, Predictable Performance: Raw performance is a key component of the wNGDC, but it is not the "silver bullet" to solve all woes. End users are looking for guaranteed performance; the combination of raw performance and comprehensive Quality of Service (QoS) controls that can be applied granularly to individual applications across the entire storage array. Application stability requires that resources such as CPU, memory, bandwidth, and storage capabilities are all dynamically managed — this includes the control of both maximum and minimum performance levels. When guaranteed performance is implemented, the wNGDC can better monetize available storage by hosting multiple applications in a multi-tenant environment — yet providing the predictable user experience of a single-application, single-tenant architecture.

> "The wNGDC can host multiple applications in a multi-tenant environment — yet provide the predictable user experience of a single-application, single-tenant architecture."

Principle #3

Automated Management: The core business goal of service providers is to enable innovation and enterprise growth. The automation of manual tasks and orchestration of workflows is a fundamental requirement for service providers if SLAs are to be met when operating at scale. The wNGDC architecture employs extensive software automation and comprehensive APIs to handle the traditionally mundane or manual tasks of the data center and thus changes the paradigm of physical hardware limitations to the almost limitless design capabilities of software. The automation harnessed by the service provider will allow end users to implement policy-driven provisioning, allocate resources, and eliminate endpoint-centric administration — all of which allows them to focus on delivering higher value, higher margin services.

Principle #4

Data Assurance: Engineering the next generation data center for data assurance can be likened to designing buildings for earthquakes; there is no building that is guaranteed to withstand all earthquake activity, but earthquake-resistant structural design dramatically reduces the probability of disaster. With this in mind, wNGDC architects plan for failure while mitigating its likelihood of occurrence by implementing a self-healing, fault-tolerant, shared-nothing architecture — one that can transparently rebuild drives in a matter of minutes or an entire node in less than an hour ... and not losing high availability of data in the process.

Principle #5

Global Efficiencies: The traditional data center model was built on the premise that more capabilities would require more resources — whether they be physical, financial, or human. In a service provider's wNGDC, this premise is not necessarily true. Enabling global efficiencies through the implementation of compression, in-line deduplication, and thin provisioning allows service providers to improve utilization and purchase less storage. More capabilities doesn't necessarily mean needing more resources.

Conclusion

In an era where service providers are expected to support production-grade infrastructure while their customers deploy a huge array of applications, it is clear that existing legacy infrastructure is not able to keep pace. A web-scale next generation data center model needs to be adopted by service providers so that they can thrive in such a challenging market.

The wNGDC applies a software-defined everything (SDx) architecture to a traditionally hardware-centric business that enables service providers to gain a significant business advantage over its competitors in a highly transitive market.

For a more detailed explanation of these topics and how to differentiate your business in the service provider market, see the NetApp SolidFire White Paper: A Service Provider's Perspective: Designing the Next Generation Data Center available for download at solidfire.com/sp-designing-the-ngdc.