

The Data Center Network for Next Generation

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Abstract— The data center network includes a collection of communication resources - switching, navigation, uploading measurement, analysis, etc. - to facilitate the storage and processing of applications and data. Modern data center network architecture enhances full stack network and security platforms that support a rich set of data services that connect everything from VMs, containers, and empty hardware applications while allowing centralized management and granular controls. The data center network model represents an important change from the normal communication model in data centers recently. From local servers, to virtualized infrastructure, to an integrated edge-to-cloud network and security model available wherever applications and data live, the data center connection has changed dramatically in a short period of time.

Keywords— Data Center Networks, VM mobility, Software Defined Networking.

I. INTRODUCTION

Over the past two decades, IT organizations have come under attack an escalating battle against adversity. As there are business needs increased, a lot of technology used trying to answer. Generally, the organic does not change growth has led to costly and complex data centers, with over-provided and siled physical configuration managers. Virtualization and cloud help prevent this waves, but even if they are interrupted by data center malfunctions, especially very small automation and orchestration in between parts of the data center.

Data centers are no longer blocked by four walls. Growing up, it is not a dynamic collection of clouds and noncloud resources that live in many visible areas as well have automation and mobility skills where they are what is needed to process applications properly. This is where the next generation data center is starting. It's an IT space simplified, flexible and responsive, flexible IT shifts time and attention from system maintenance to to establish business solutions. It is a combination of skills designed for fast moving world

Software defined environment in which IT resources are orchestrated dynamically and holistically, able to sense and respond to application demands in real time Hybrid environment where private and public clouds operate seamlessly with traditional systems Continuously available environment able to withstand component failures and maintain operations Cognitive computing environment where systems can learn and solve business problems using advanced analytics Global, managed ecosystem that integrates the elements of the IT and data center physical

infrastructure and provides uniform management through a single console.

Today's data centers are no longer just a collection of objects assets. Although virtualization and cloud computing have expanded data center and power limits of its living hardware, many IT organizations still have it very much hardware-centric view of the data center. The focus remains optimize components of each infrastructure - servers, storage, networks and resources (such as generators and UPS programs) —increasing IT efficiency and business value. I the problem is that you do not do well in these subjects consistently reduce the number of mentioned applications to worship.

While hardware components of the data center will do always provide the necessary foundation and never be reduced in completely flexible property components, arrival Software Defined technology makes sense to imagine change on the way. The next generation data center, growing percentage of critical performance and administrative tasks will be enabled in the software layer instead of sub-hardware. This will do let the organizations leave the current one in person targeted preparation to be effective, driven by policy configuration. The impact on IT will be huge, significantly reduces costs and risks while maximizing efficiency and level of service.

Changing the hardware-centric IT concept of a data center it is important to make this change and remove all the benefits made possible by software-defined software. However, this is not the case with hardware-centric replacement mindset with software-centric mindset. About seeing data center as a business center and service provider which develops the business and promotes renaming. It's about to create essential business services — applications such as email, customer relationship management and procurement — the focusing on the organization's efforts to improve IT. The business-focused business viewing center is in the middle to gain a large amount. That's the next generation data the center is about.

II. NEXT-GENERATION DATA CENTER

A fast-changing business and IT landscape is driving the need for a next-generation data center. New opportunities can't wait for services to be purchased in person again fixed. The answer needs to be immediate and visible to meet growing expectations of availability, rating and speed.

While virtualization and delivery models are based on four clouds they respond to the need for greater urgency, and they increase complexity and cost management. Moreover,

most IT provisioning and management tools require more staff and increasingly unable to deal with extremes operational requirements for today's workloads. The speed at which the DevOps model delivers new skills and updates make IT work inactivity is even better. And without organizations the best attempts to stop them, their exit increases, it shines brightness of safety, durability and compliance issues. Clearly, the need for more flexibility, always open properties are growing, developed by the flexible needs of mobility, big data and social business. These tasks are difficult to increase the numbers of modern data centers and increase the urgency of the need for a next-generation data center.

The next-generation data center provides a simpler, more adaptive infrastructure that is capable of responding to disruptive change, melting technology silos and integrating legacy and new architectures in a single, manageable ecosystem. The following attributes help define its predecessors.

- Innovation enabled
- Software defined environment
- Open standards
- Support for heterogeneous infrastructures
- Model integration and extensible APIs
- ITIL-based management
- Continuous availability
- Cognitive computing
- Integrated and active security

Innovation enabled

In a typical data center, development efforts are focused on it to improve IT metrics such as usage, response time and availability. In the next generation data center, the focus is on it developing services that keep the business going: sales and marketing, finance and accounting, procurement and so on. The vendor, for example, can use the cloud technology to improve marketing resources, not expansion scalability. The cloud will help the seller to bring more personal customer information and provide highly targeted marketing. Or firmness may be a possible outcome, does not drive a cloud feed decision.

Providing a service can greatly reduce performance costs and risks of services that are part of the business. Allows IT to downgrade system resources performance usually more than 65% of the IT1 budget and allocated additional resources to the establishment of the business. This it is important. With growth, new design is considered a priority self-defence against competitive threats.

Future services will be designed and enhanced by tapping in the immediate vicinity of the computer, storage and network services without the knowledge of sub-devices.

They will also benefit from DevOps, which will close the bridge the gap between IT performance and development teams, which they can better work together to do the same work delivery goal. New services can be installed faster and faster in an effective way. The next generation data center divides performance monsters and cultural barriers can enter the process of creation service development and improvement.

Software defined environment

In the next generation data center, IT infrastructure it cannot be controlled by creating controls hardware decisions. It will be controlled by software namely is programmed to make those decisions automatically. This software defined environment (SDE) upgrades computer, storage infrastructure, network and resources, making it easier completely to adapt flexibly to the type of work required. It transforms robust IT infrastructure into an intelligent resource, infrastructure that recognizes workload.

The software defined areas change the governing rules how resources are used, word-for-word editing the business objectives of the organization and to capture technical patterns to describe what those purposes will be met. These patterns are actually the best workload patterns shipping, stopping, merging and other complexities IT jobs filmed by topic professionals then assembled with templates so that they can be used again and again. Patterns include all the elements needed for automatic operation job evaluation, including the policies that govern it

Open standards

The next-generation data center is built on open standards. With support for platforms like OpenStack, Linux/KVM and Open Daylight, it enables organizations to achieve true interoperability between cloud and traditional models.

Support for heterogeneous infrastructures

It also facilitates integration of today's heterogeneous infrastructures, enabling organizations to bring their legacy systems into the software defined world. This allows them to preserve legacy applications, hardware, workflows, roles, procedures and data center practices so they can continue satisfying business needs while responding to growing cost pressures.

Model integration and extensible APIs

In the next generation data center, developers will continue Leveraging application programming interfaces (APIs) to combine the functionality of different service providers as well expand services to a growing list of mobile and other devices. They will also enable mixed cloud interaction within the community and private cloud services. While APIs are designed for facilitate integration of cloud models, ID APIs limited to certain bases can be difficult to integrate once slow down the pace of new development.

Instead of cloud-based cognitive supercomputing platform-based technology as a service, It is provided under

software as a service model as a software stack related to open APIs. building rich applications or performing truly complex calculations time. This means they can get on the front edge and yet dealing-technology very quickly and speeding up time to inform.

ITIL-based management

The organization served by multiple delivery models and a heterogeneous array of systems, service management is essential to achieving business benefits from IT at a controlled cost. IT initiatives are more likely to stay within budget, and service costs are less likely to spiral out of control. IT Infrastructure Library (ITIL) has long been associated with a service-focused approach to IT management, so it only stands to reason that ITIL-based service management, with metering and analysis for accurate trending, capacity management and chargeback, should be an integral element of the next-generation data center.

Continuous availability

High availability clusters and multisite disaster recovery capabilities used to be the gold standard in data center design. But social business, mobility and the continuing consumerization of IT are mandating even higher levels of availability.

Cognitive computing

Today's data center systems bring great productivity benefits of automation. Cognitive systems are represented the next wave of production, capable of imitating man the process of thinking at an unusual speed. They are powerful hearing, consulting and communicating with people in new ways. See can process large volumes of fast-moving data, see patterns, confusing discovery and complex decisions seconds. Their ability to adapt and learn over time and in the process natural language is what separates the principles of cognitive understanding traditional statistics.

In fact, cognitive systems enhance human capacity, to bring powerful information faster than what can happen to a person. They can help doctors diagnose and provide the target treatments by accessing medical literature available worldwide at once. They can help financial services companies make timely investment decisions with a lot of analysis data rates regarding trading patterns, credit risk and markets conditions. They can help cities explore the historical climate patterns against current locations and cutting resources the potential impact of the weather event and make a plan to answer.

Integrated and active security

Interconnectivity increases the risk of exposure, especially for businesses that are already compromised by rigid security architectures, manual controls and a multitude of dedicated security appliances. The next-generation data center lessens the risk by extending the software controlled environment to security and compliance.

Compared to 2020, there has been an increase use in almost all categories. Respondents are most likely to have already

included IT asset management (67%), followed with flash storage (59%), and cloud security (58%).

	2020	2021
Flash Storage	49%	59%
Multi-Cloud	37%	42%
Software-Defined Networking (SDN)	36%	42%
Hyperconverged Architecture (HCI, CI)	34%	37%

III. CONCLUSION

The next generation data center represents the next revolution of flexible IT infrastructure, where server, storage, network and virtualization services are shortened basic hardware and operating loads are very efficient the right combination of resources. The software provides the intelligence of flexible and comprehensive infrastructure management, based on for real-time job requirements. Next generation data center converts static IT infrastructure into dynamic, workload infrastructure that can anticipate demands and respond at an astonishing speed. To become a next-generation data center requires a change, no in the physical and operational aspects of the data center, but also organizationally and culturally. Evolution from hardware-centric considerations in service development are essential. Organizations that want to accelerate change will do so select software defined solutions that come fully integrated and is ready to plan the entire IT space.

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