UNDERSTANDING **HYPERCONVERGED** INFRASTRUCTURES

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In this whitepaper we examine the evolution of the data centre to HCI and Enterprise Cloud.

We are entering a new era in computing, which is very much cloud-driven. Businesses today desire the same flexibility, scalability and ease of management in their own datacentres as cloud-based organisations such as Facebook and Google. As well as it being impractical for today's enterprises to move their entire infrastructure to the cloud; legacy infrastructures are hindering, if not preventing this from happening. Hyperconverged Infrastructure (HCI), is a key step towards allowing enterprises to achieve this goal.

HCI simplifies data centre operations to create a more software-centric environment. With HCI, businesses have complete flexibility, scalability and crucially are cloud-ready. HCI is not only transforming legacy infrastructures, but is laying the foundations for the next generation of Cloud computing.

HCI MAINSTREAM IN FIVE YEARS

HCI will make up 24% of the Integrated Systems market by 2019.

Gartner, "Prepare for the Next Phase of Hyperconvergence." May, 2016

24%
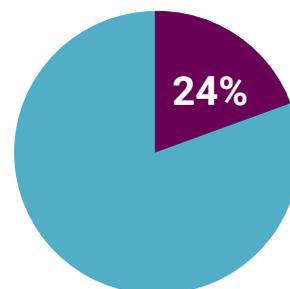
Over the years we've seen the emergence of the public cloud and then the private cloud, which has now led us to a fusion of the two to create hybrid cloud or seamless movement between data centre operations and the public cloud. Leading vendor, Nutanix, refers to this as Enterprise Cloud, whereby businesses harness the simplicity of the public cloud and the control over cost and security delivered by private cloud.

In this whitepaper we examine the evolution of the data centre to HCI and Enterprise Cloud. With momentum building around HCI this whitepaper aims to cut through the noise and explain, educate and inform CTOs and IT decision-makers about HCI and the emerging Enterprise Cloud landscape. We hope it goes some way to helping you better understand how to prepare and future-proof your IT infrastructure.

Today's businesses need speed, flexibility and the ability to control costs. Increasingly difficult to maintain business critical systems create huge problems for organisations.

The traditional hardware centric data centre is outdated. The days when applications and associated workloads are run on dedicated servers are long gone. Today's businesses need speed, flexibility and the ability to control costs. Increasingly difficult to maintain business critical systems create huge problems for organisations.
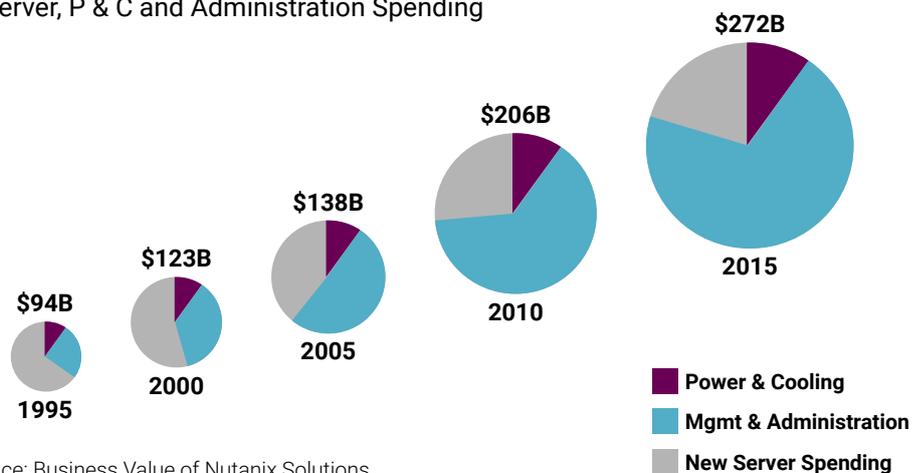
A hardware-centric approach creates inflexibility, systems can't easily be retro-fitted to meet new or changing requirements. Applications wholly dependent upon custom hardware can force premature rip and replace with potentially significant economic losses. Additionally, the constant need for hardware engineering to keep legacy infrastructures up to date inevitably drives up costs and these are unsurprisingly passed on to the customer.

At one time, businesses could be patient while IT departments got to grips with the latest technologies. However, today, IT departments must react quickly to new and changing business needs, but the problem is that the hardware and the tools used to manage legacy systems, don't always keep up with the pace demanded.

On average, one minute of data centre downtime costs $7,900 IDC,
'Quantifying the Business Value of Nutanix Solutions', IDC August, 2015.

CHANGING THE PERSPECTIVE
WW Server, P & C and Administration Spending

$272B
2015

$206B
2010

$138B
2005

$123B
2000

$94B
1995

Reference: Business Value of Nutanix Solutions

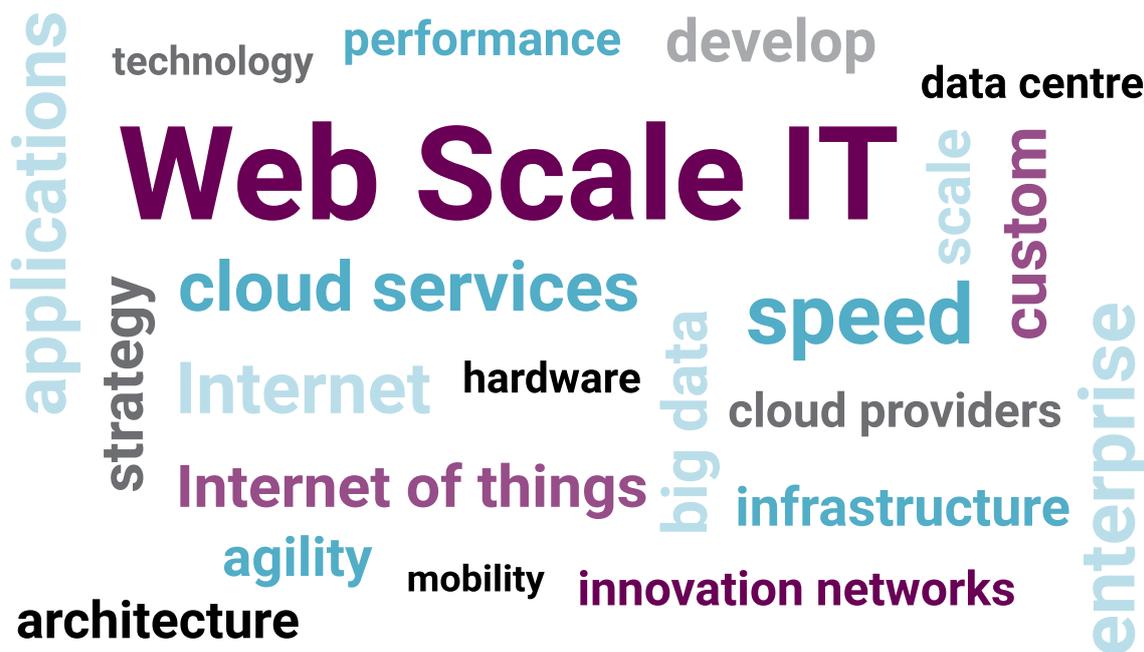■ Power & Cooling
■ Mgmt & Administration
■ New Server Spending

Today IT departments spend less proportionally on new servers and more on the management and administration and this trend is set to continue.

Businesses aspire to gain the efficiencies enjoyed by web scale organisations such as Google, Facebook, Amazon and Microsoft Azure.

The legacy approach is costly and inadaptable. It prevents easy integration among vendors, drives up long-term infrastructure costs, and ultimately slows innovation. Businesses aspire to gain the efficiencies enjoyed by web scale organisations such as Google, Facebook, Amazon and Microsoft Azure. Leading the way these 'always-on' organisations build easy-to-manage, software defined architectures, on top of commodity x86 hardware and rely on automation and self-healing techniques to drive efficiency and availability. Gone are the complexities of storage area networks (SANS) and other specialised hardware stacks.

technology performance develop data centre

Web Scale IT scale custom

applications strategy cloud services speed enterprise

Internet hardware big data cloud providers

Internet of things infrastructure

agility mobility innovation networks

architecture

HCI is currently seen as the modern breakthrough which will make this web-scale ideal a reality for ordinary businesses. The Nutanix Enterprise Cloud for example, integrates server, storage, virtualisation and networking in a hyperconverged platform to run any workload, at any scale, while removing the complexity of legacy infrastructure.

THE HISTORY OF
THE DATA CENTRE

1990

1990'S - the age of the siloed data centre & the .com boom. This was a hardware-centric period with dedicated servers & storage for specific apps.

1995

Around 44 million people globally had Internet access, but this had risen to nearly 300 million by the end of the 90's, fuelled largely by the .com boom.

The 00's. New technology puts increasing pressure on the data centre.

2006

Over 1 billion people now have internet access.

Welcoming the Cloud & HCI

2008

The Cloud goes public

2011

IT Departments now start to get a choice of public and private clouds, bringing peace of mind over data costs and security concerns

Critical mass: the complex data centre

The term Hyperconverged Infrastructure (HCI) was formed

2012

60% of European workers are using an iPad

2014

1.5 billion people are using smartphones. This was also a time of new technologies and the growth of laptops, smart phones and tablets. Not to mention big data and globalisation.

2016

3 billion people are now using smartphones.

This puts the data centre under enormous pressure, which leads to: more IT staff, more servers, more data, more files, more complexity.

IT organisations are in a state of transition as they modernise legacy infrastructure, tools and processes to keep pace with business demands. (Nutanix)

Hyperconverged Infrastructure (HCI) is software-centric architecture that tightly integrates compute, storage, networking and virtualisation resources - amongst other technologies – into a single box, all supported by a single vendor. HCI ensures multiple, integrated technologies can be managed as a single entity via a common toolset. It is highly scalable as nodes can be added to the base unit to allow you to add more storage or compute for example, so depending on your requirements you can scale your operation up (or down) delivering the flexibility today's businesses demand.

HCI simplifies data centre operations, streamlining the deployment, management and scaling of data centre resources by combining x86-based server and storage resources with intelligent software in a turnkey software-defined solution. Separate servers, storage networks and storage arrays can be replaced with a single hyperconverged solution to create an agile data centre that easily scales with your business.com.

THE SIMPLICITY OF HYPERCONVERGED SOLUTIONS

Virtualization

Servers

Storage
Networks

SAN
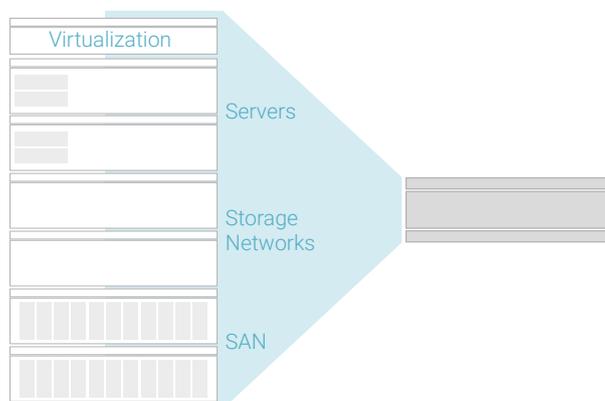
Past attempts at building private clouds have focused on the software layers that sit on top of infrastructure and deliver, for example, self-service, monitoring and billing capabilities. But unless infrastructure is built to scale out and without single points of failure, this approach does not deliver the flexibility and scalability of a truly cloud-like environment.

Nutanix pioneered the HCI space with the goal of minimising complexity and making the data centre easier to manage, and, more importantly, cloud-ready. Ultimately, businesses want to simplify their infrastructure to the point where it functions like the Cloud. HCI is the first step, or foundation layer towards achieving this.
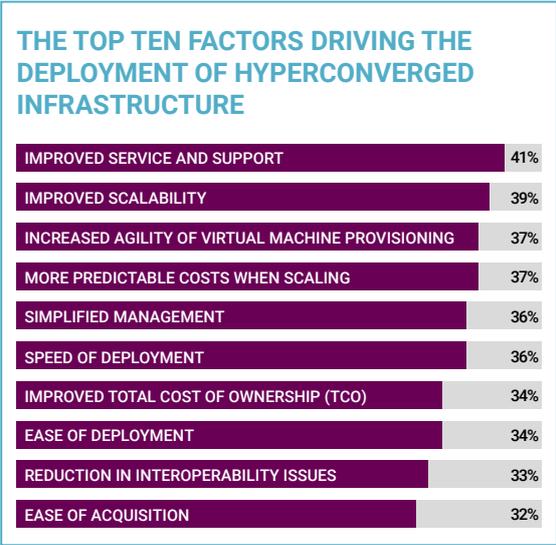
Hyperconvergence is currently seen as the modern breakthrough which will bring the web-scale ideal to ordinary businesses.

Not just confined to the IT department, technology is now seen as a management-level issue. Increasing business demands and spiralling IT costs are driving businesses to seek out more cost-effective solutions. According to the IDC, in 1996 the ratio of annual Server Operational Expenditure (OpEx) to annual Server Capital Expenditure (CapEx) was 33%. Now it's over 80%.
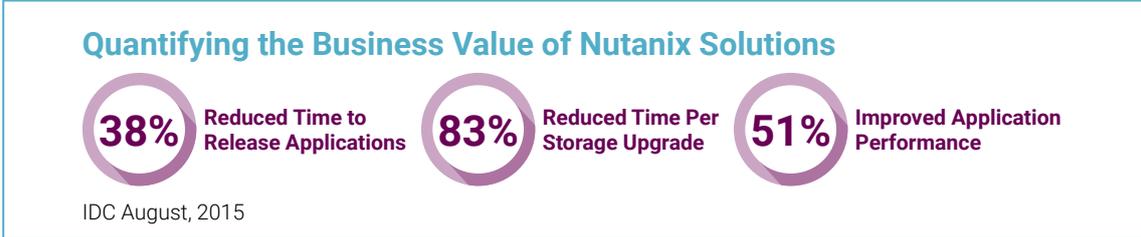
HCI vendor, Nutanix, for example has seen customers achieve TCO savings of up to 58% and up to 510% ROI over as little as 5 years.

Some of Nutanix' larger customers have also seen an 80% reduction in IT support, and 70% reduction in day-to-day management, leaving the tech team to focus on supporting and driving the IT business strategy, as opposed to firefighting and managing downtime. Furthermore, larger organisations have generated additional revenue of over $190,000 from reduced downtime, and nearly half a million from improved operations.

THE TOP TEN FACTORS DRIVING THE DEPLOYMENT OF HYPERCONVERGED INFRASTRUCTURE

Factor	%
IMPROVED SERVICE AND SUPPORT	41%
IMPROVED SCALABILITY	39%
INCREASED AGILITY OF VIRTUAL MACHINE PROVISIONING	37%
MORE PREDICTABLE COSTS WHEN SCALING	37%
SIMPLIFIED MANAGEMENT	36%
SPEED OF DEPLOYMENT	36%
IMPROVED TOTAL COST OF OWNERSHIP (TCO)	34%
EASE OF DEPLOYMENT	34%
REDUCTION IN INTEROPERABILITY ISSUES	33%
EASE OF ACQUISITION	32%

5 KEY BENEFITS OF HCI

✓ **IT staff productivity**
The tech team are able to work more efficiently due to simplified management of the infrastructure. Additionally shifting perceptions of the IT Department as barriers to change to being enablers and drivers of business tranformation.

✓ **Employee productivity**
Less downtime means more productive staff. Hyperconverged means updates, maintenance or installs are done quickly with minimal impact.

✓ **Scalability**
HCI can be rolled-out quickly and efficiently. In some cases, less than 1 hour (Nutanix)

✓ **Increased sales**
Advanced performance levels translates to better customer satisfaction, and, in turn, potential revenue increases.

✓ **Speed**
Improved speed means bulk jobs can be done more efficiently. A Nutanix customer has reduced batch processing (that could take a full eight hours) down to 1 -2 hours.
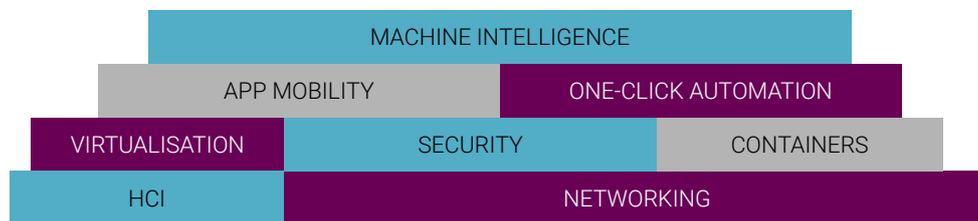
Quantifying the Business Value of Nutanix Solutions

38% Reduced Time to Release Applications

83% Reduced Time Per Storage Upgrade

51% Improved Application Performance

IDC August, 2015

Whilst HCI puts businesses back in control of their IT infrastructure it is still commonplace for organisations to turn to the cloud when looking for even more agility and scalability. However public cloud may not be the perfect solution. Concerns over data security, as well as ongoing challenges like unexpected costs from unforeseen or unpredicted data growth are real issues for businesses. Private clouds can give organisations more control and flexibility over security, data access and usage, whilst maintaining the benefits of the public cloud - such as rapid scalability, automation and self-service.

At the moment, the public and private worlds appear to be divided, but bringing them together is important for business. This is particularly the case when there are applications that have some elements on-site, but the rest in the public cloud. For example, an organisation may use the public cloud to test a product or service, but will then migrate back to a private environment when testing is complete or more secure. The vision for the future is to have 'hybrid' environments where the boundary between private and public disappears. Ultimately, there needs to be a more seamless experience between enterprise data centres and the public cloud – enter Enterprise Cloud.

THE BUILDING BLOCKS TO ENTERPRISE CLOUD

| MACHINE INTELLIGENCE		
APP MOBILITY		ONE-CLICK AUTOMATION
VIRTUALISATION	SECURITY	CONTAINERS
HCI	NETWORKING	

Wikibon* is predicting enterprise cloud spending is growing at a 16% compound annual growth (CAGR) run rate between 2016 and 2026.

Combining public and private clouds, to create Enterprise Cloud, means critical factors such as, scalability, agility, security and control remain within the organisation's data centre. So, for businesses with strict governance rules and regulations this is an ideal scenario that delivers the best of both worlds.

THE FUTURE OF HCI

Organisations are using multiple cloud models to meet their business needs, including private (62%), public (60%), and hybrid (26%).

62% Private Cloud
60% Public Cloud
26% Hybrid Cloud
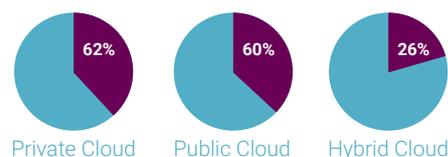
By 2018 the typical IT department will have the minority of their apps and platforms (40%) residing in on-premise systems.

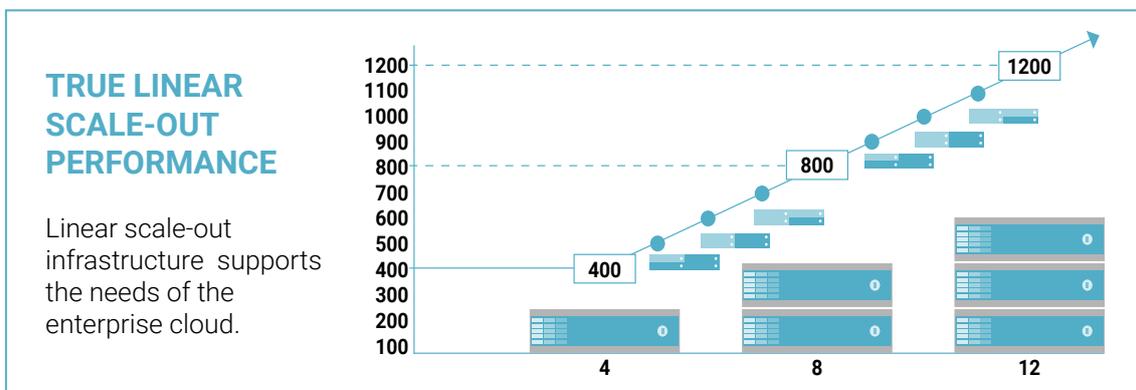IDG's Enterprise Cloud Computing Survey, 2016

The key benefits from Enterprise Cloud include, low, to no operational overheads, combined with pay-as-you-grow economics, which reduces the impact of unforeseen data growth and expenditure. Enterprise Cloud also offers control over location and platform choice, and more tailored SLAs for specific applications.

In addition predictable workloads can be kept on premise and less predictable workloads can be based in the cloud keeping costs balanced and controlled. Predictable workloads running long-term in the cloud end up being costly without enjoying many of the benefits of public cloud.

For vendors such as Nutanix, their Enterprise Cloud solution enables businesses to have more predictable performance, robust security, and seamless application mobility for all enterprise applications, at any scale. With Enterprise Cloud businesses can scale up and down on demand. The tech team simply calls the vendor, asks for another node, and then deploys it. A single software fabric means private and public clouds are unified, thereby delivering one-click simplicity in managing a multi-cloud environment.

Not only is Enterprise Cloud agile and scalable, but it also reduces risk due to its one-click operation, which means testing can be done simply without incurring additional spend. For some organisations, testing involves due-diligence, analysis and board-level discussion for example, but Enterprise Cloud reduces, if not, eliminates this process to give faster-turnaround and testing timeframes.

TRUE LINEAR SCALE-OUT PERFORMANCE

Linear scale-out infrastructure supports the needs of the enterprise cloud.

5 REASONS TO ADOPT ENTERPRISE CLOUD

1. **A brand new economic model:** Legacy infrastructure is not enough. With enterprise cloud, you can adopt the pay-as-you-grow characteristics of the public cloud, and have a common base to run legacy and new applications.

2. **Improved end-user focus:** A better picture of where current systems may need improving for employees or end-users, as well as control over what is being deployed, and where, within an organisation.

3. **Improved response times:** The IT department has the ability to respond and react within a faster timeframe to provide new infrastructure instantaneously.

4. **Refocusing IT on the business:** No longer a reactive environment, the tech team can now become a revenue-generator and help to meet and drive business requirements.

5. **Choice:** with Enterprise Cloud you can have any cloud, at any time. Workloads don't run the risk of getting trapped due to seamless movement or transition between public and private clouds.

CONCLUSION

HCI is fast emerging as a key enabler for businesses seeking to replace legacy infrastructures and / or update current systems or processes.

The evolution of the data centre and the resulting need for scalability has marked the end of hardware as the key focus. IT no longer belongs purely to the IT department. No longer a supporting player, IT is core to business strategy and at the heart of driving business transformation. Today's fast evolving businesses look up to the efficiencies and unsurpassed user experiences delivered by Facebook and Google, and increasingly demand this flexibility and scalability in their own IT environments.

The data centre still continues to change and evolve and this is due, in large part, to Hyperconverged Infrastructure, the touchstone to increased agility. With this foundation layer in place, businesses are able to scale, grow and transform their IT environments. When it entered the mainstream, public cloud transformed the tech industry, but it was still a way off from being the perfect solution for businesses. The perfect solution for organisations is likely to be a tailored blend of private cloud, but with the benefits of public cloud. This is where Enterprise Cloud becomes the next phase in data centre evolution with vendors such as Nutanix, once again, leading the way in this space.

This is the software-led era of the cloud, automation and one-click scalability, which is transforming businesses and revolutionising the data centre. It is an exciting time for organisations to look to the future, continue evolving and not get left behind.

GETTING STARTED

If your business needs to reduce complexity, improve automation and efficiencies and is considering harnessing the power of HCI or you simply wish to understand more about Enterprise Cloud and how it may benefit your business we have compiled a rich library of resources to support you:

✓ **Visit your HCI Hub:**
www.yourhcihub.com covers all things HCI and Enterprise Cloud, and is a good starting point to get familiar with these technologies. Your HCI Hub contains everything from dummies guides and explainer videos to infographics and whitepapers.

✓ **Book a consultation:**
Our experienced consultants can help you start your journey by looking at your business needs and requirements. What do you want to achieve? In what timescale and how can we support your journey?

✓ **Book a webinar:**
Get under the skin. A webinar will allow us to align your business priorities with outcomes, demonstrating the efficiency, scalability, ease of implementation and time-saving benefits of HCI.

NUTANIX
www.nutanix.com

Nutanix is on a mission to make data centre infrastructure invisible, elevating IT to focus on applications and services.

Nutanix is a global organisation that leverages a hybrid delivery model to capitalise on public cloud advantages while retaining the security and control of private data centres. The Nutanix Enterprise Cloud integrates server, storage, virtualisation and networking in a hyperconverged platform to run any workload, at any scale, while removing the complexity of legacy infrastructure.

The Nutanix Enterprise Cloud is a 100% software-driven infrastructure solution that natively converges storage, compute and virtualisation into a turnkey appliance that can be deployed in minutes to run any application out of the box. Data centre capacity can be easily expanded one node at a time with no disruption, delivering linear and predictable scalability with pay-as-you-grow flexibility. Nutanix eliminates complexity and allows IT to drive better business outcomes.

Nutanix is built with the same web-scale technologies and architectures that power leading Internet and cloud infrastructures, such as Google, Facebook and Amazon – and runs any workload at any scale. The Xtreme Computing Platform brings together web-scale engineering with consumer-grade management to make infrastructure invisible and elevate IT teams so they can focus on what matters most – applications.

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