Lenovo 定義未來趨勢，
朝向雲端機房邁進.

Agenda:

1. Lenovo Introduce.
2. Trust Platform and Reference Site.
3. Cloud data Exploding.
4. SDDC & HPC
5. Why choice Lenovo?

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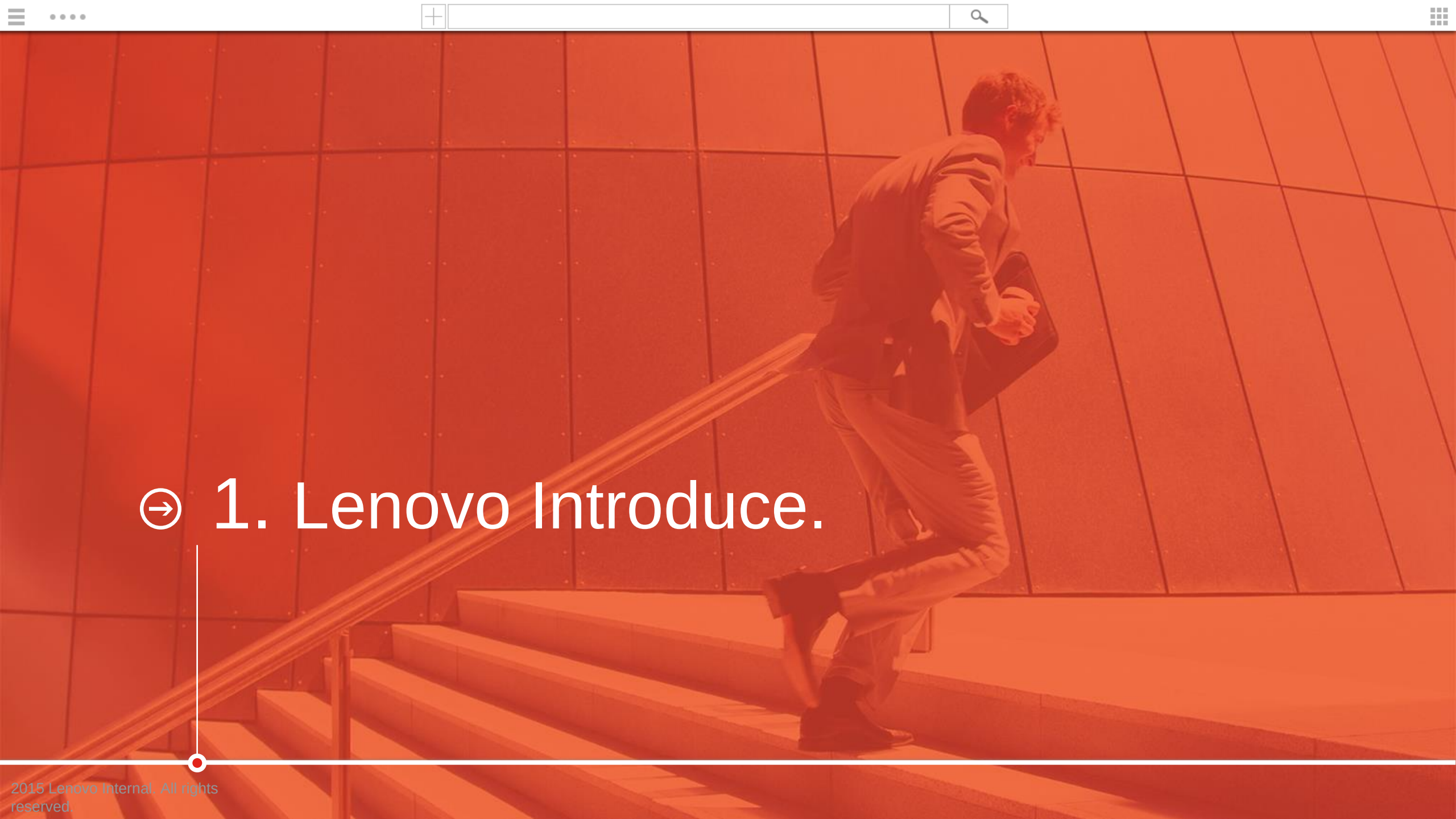

1. Lenovo Introduce.

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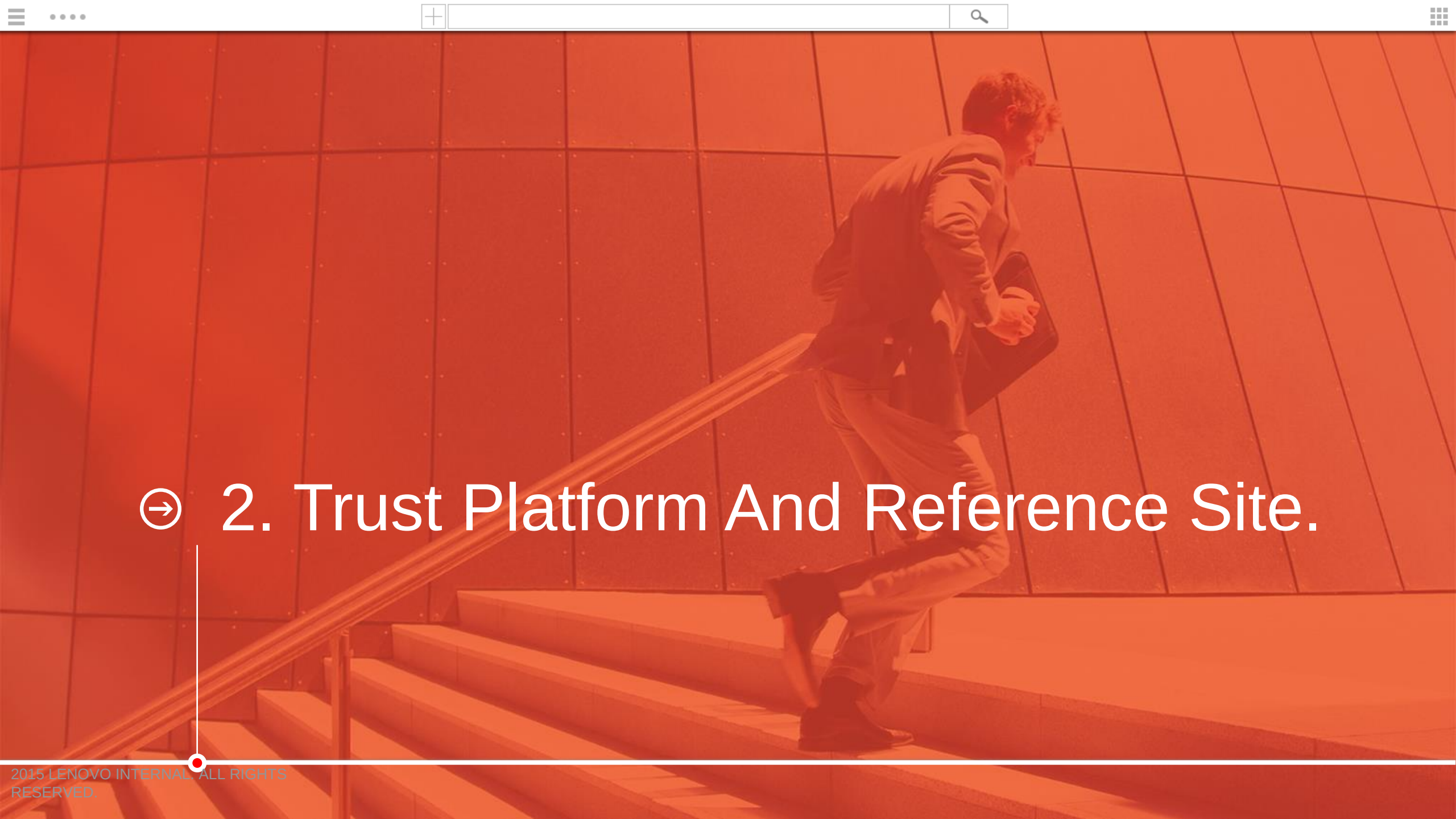
http://beta.fortune.com/global500/list

Lenovo™

Lenovo 在台北(南港軟體園區約400名 RD)、美國、日本和中國擁有領先全球的技術研發中心，並擁有超過160多個銷售據點和營運中心

http://www.ithome.com.tw/news/98772



2. Trust Platform And Reference Site.

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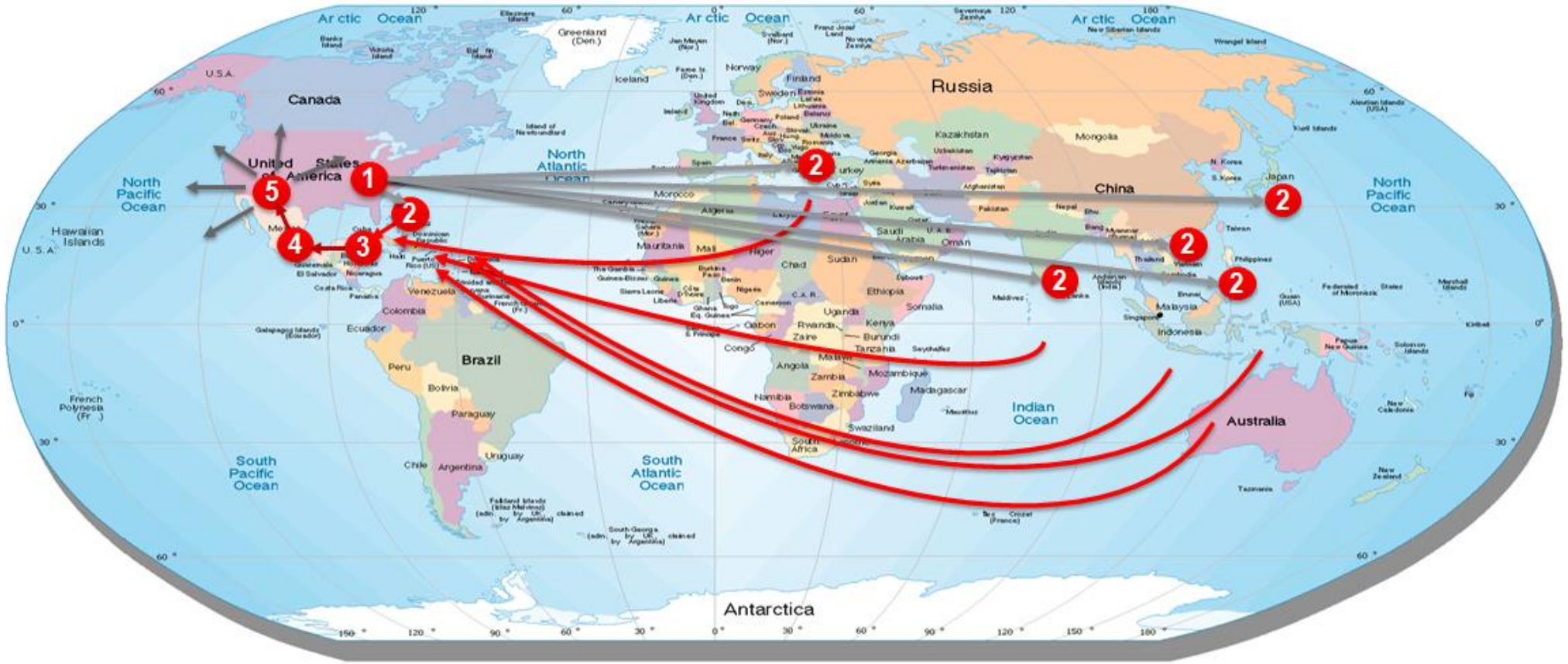
業界領先：韌體研發與發佈流程

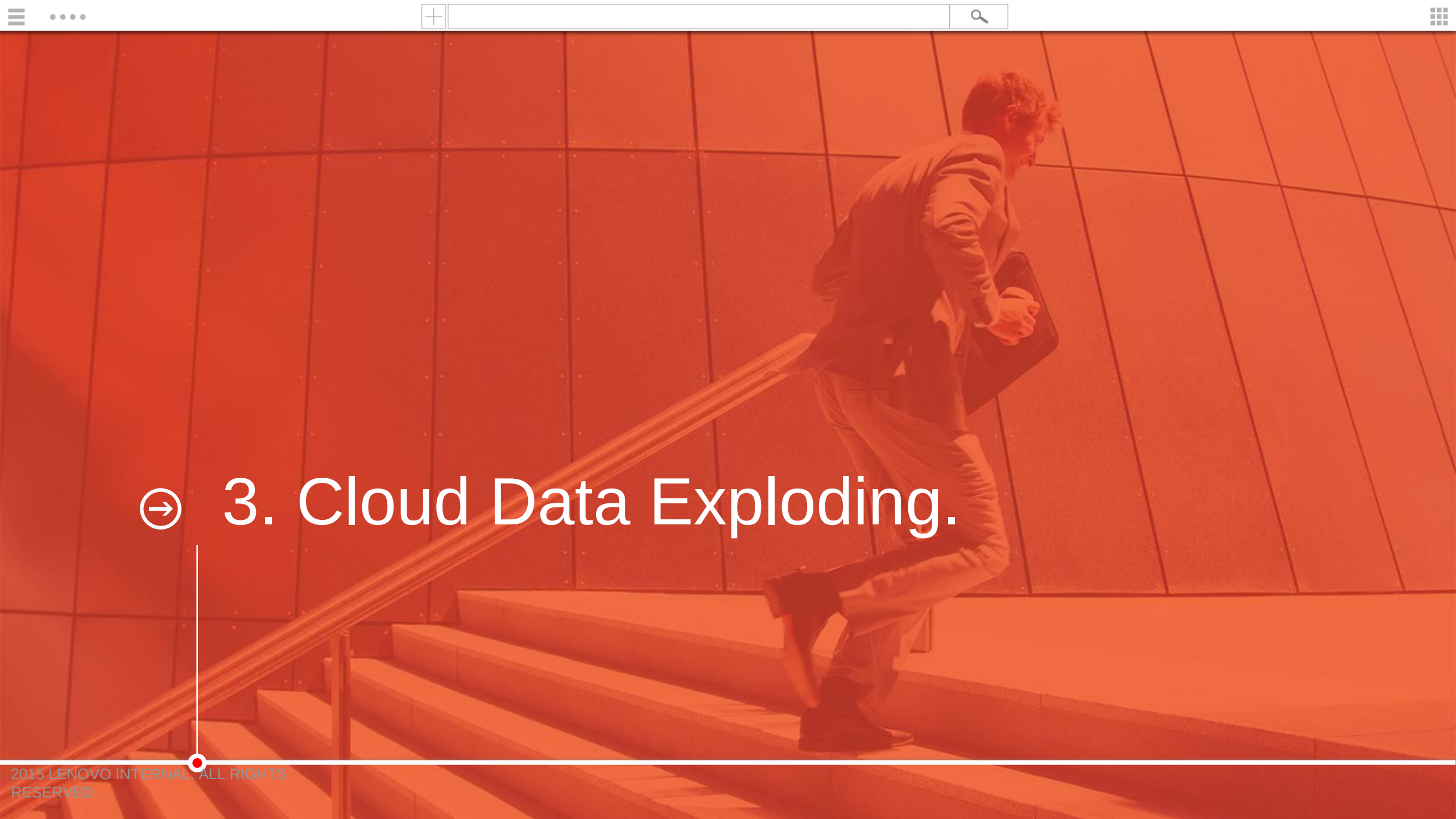
1. 於美國進行韌體安全架構設計
2. 全球原始碼研發
3. 在美國保存原始碼與編譯
4. 程式碼在美國進行簽章與認證
5. 全球透過 Lenovo.com 發布

Lenovo System x 韌體發布安全流程



Lenovo 將會更進一步研發並提升現有在美國所使用為提供誠信與品質程式的流程.

- 包含只在美國的美國員工執行的程序與流程
- 的品質保證與可監督的安全流程



3. Cloud Data Exploding.

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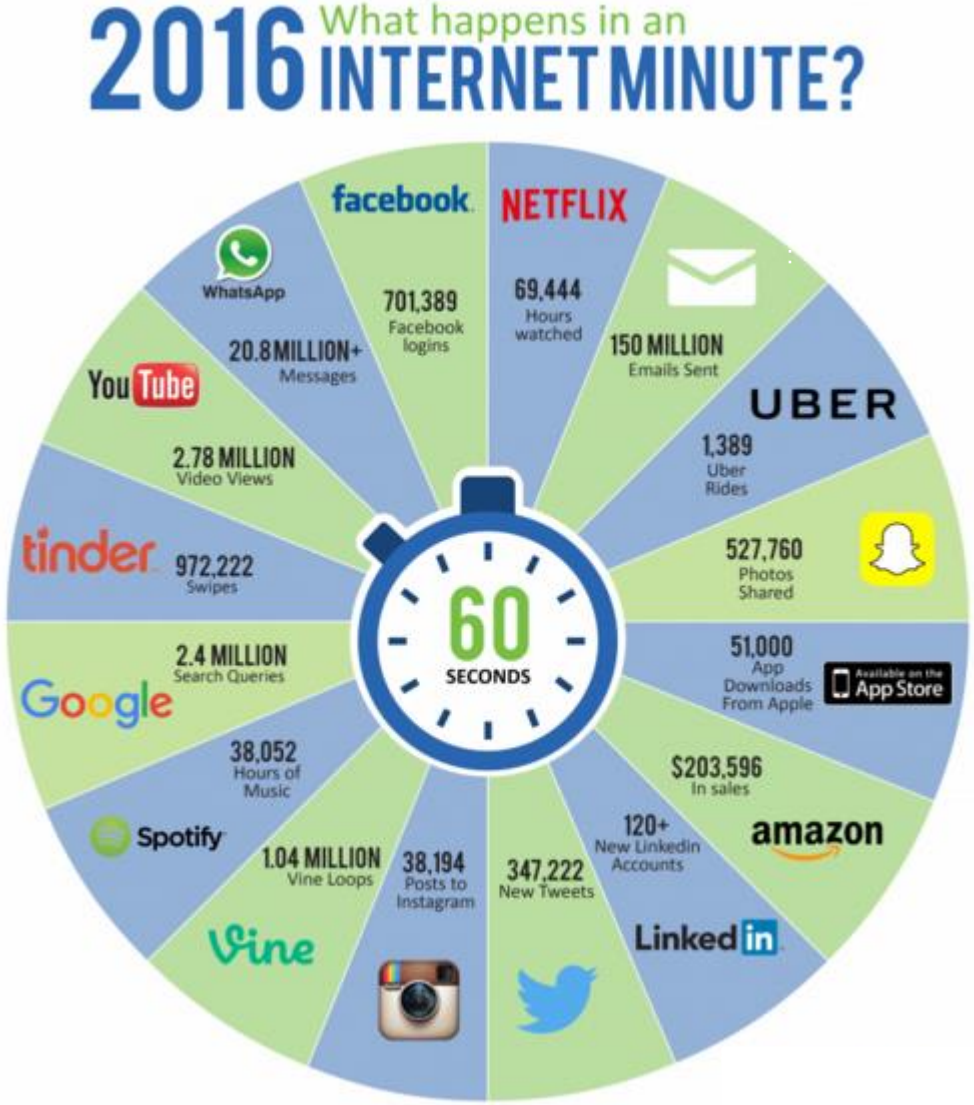
Information is exploding



120 HOURS

VIDEO UPLOADED TO YOUTUBE

51,000

APPS DOWNLOADED

150

MILLION E-MAILS SENT

Every Minute Every Day

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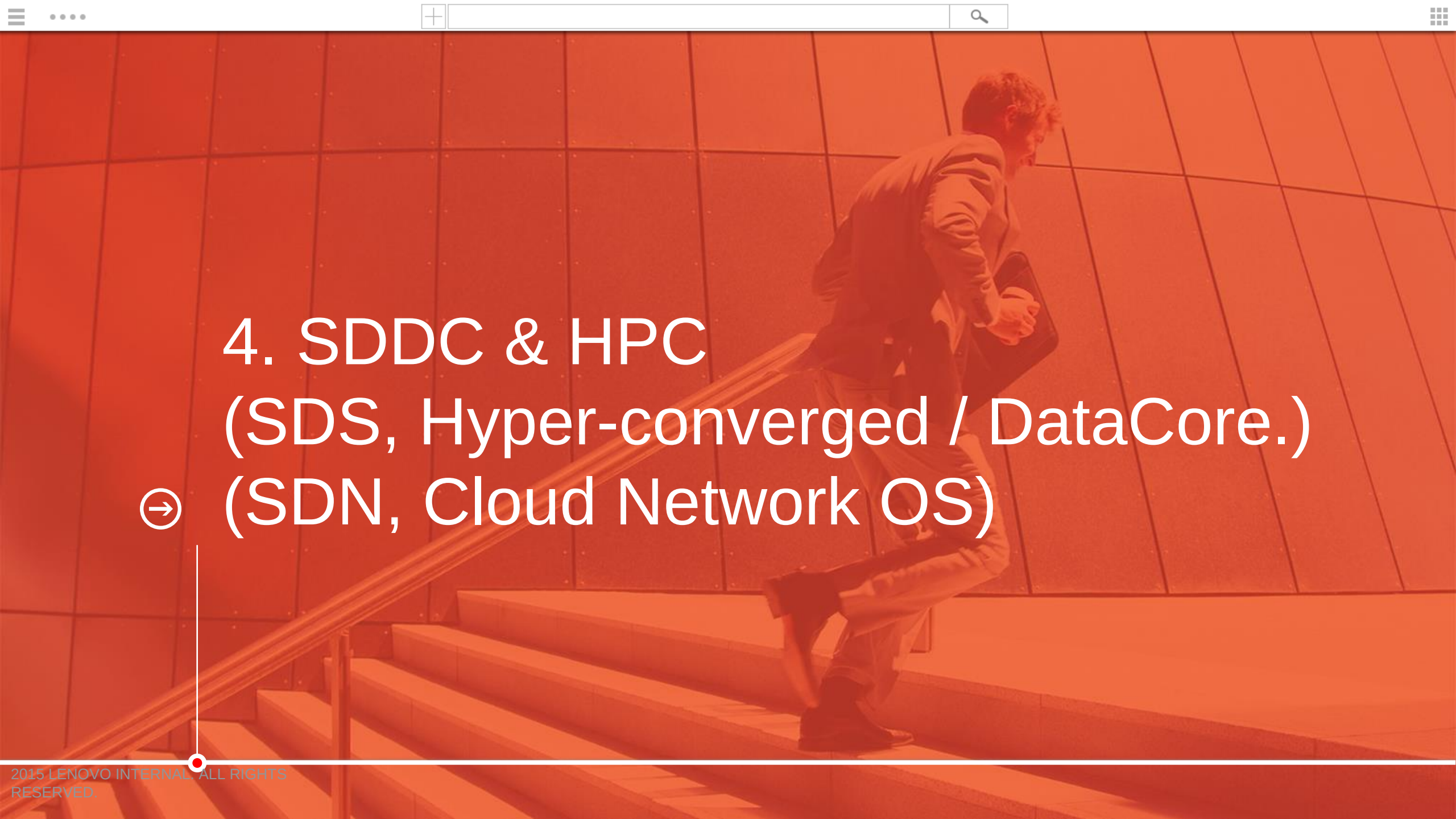

4. SDDC & HPC
(SDS, Hyper-converged / DataCore.)
(SDN, Cloud Network OS)

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Data Center Challenges

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Lenovo can help you save across all 3 Data Center tiers

First tier (Public) Cloud
Front office applications

ThinkServer
RS140
TS140
TS150
X3100 M5
TS440
TS450

System x
x3250 M5
x3250 M6

Second tier (Private / Hybrid) Cloud
Business applications

Converged HX Series
HX1310
HX2310-E, HX2710-E
HX3310, HX3510-G, HX3710,
HX3310-F, HX3710-F
HX5510, HX5510-C
HX7510

Flex System
- **Enterprise** — FlexSystem Enterprise
- **Telco** — FlexSystem Carrier Grade

ThinkServer
RD350, RD450, TD350

Compute Nodes
- EX-2P, 4P, 8P — x280 X6, x480 X6, x880 X6
- EP-4P — x440 M5 E5 4600v2
- EP-2P — x240 M5 E5 2600v3, x240 M5 E5 2600v4

Solutions
HPC
Cloud
Database
Converged Systems
Client Virtualization
Business Applications
Big Data & Analytics

Third tier (In Enterprise)
Back-office applications

ThinkServer
RD550
RD650

System x
x3550 M5
x3650 M5
x3500 M5

Mission-Critical X6 Series
x3850 X6
x3950 X6

NeXtScale

6U12N
- **Air Cool** — nx360 M5, PCIe NeX, Storage Nex, N1200 Enclosure
- **Water Cool** — nx360 M5 WCT, n1200 WCT Enclosure

2U4N
- **ThinkServer sd350** — n400 enclosure, sd350 node

Storage
- **SAN** — **S Series:** S3200, S3300; **V Series:** Resell: V7000, V5000 / V3700,V3500
- **NAS** — N461, N3310
- **Software-Defined Storage** — DX8200C (Cloudian), DX8200N (nexenta)

Expansion — **JBOD** E1012, E1024; **EBOD** E1012, E1024, D1024 (SAP HANA)

Fiber Channel Switches

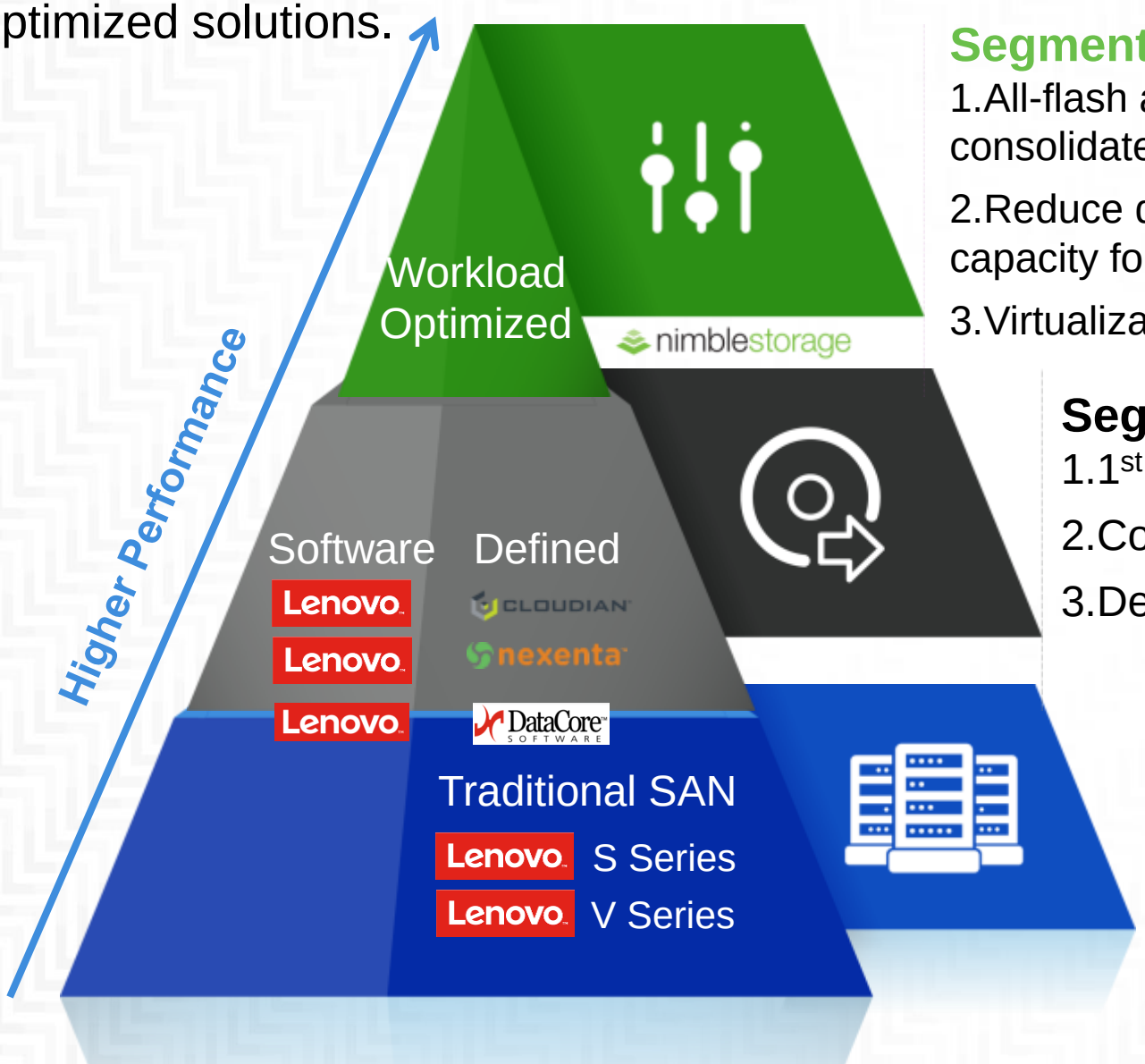
Networking
- 40GB Ethernet
- 100GB Ethernet
- 1GB Ethernet
- 10GB Ethernet

Services
- Solutions Services
- Implementation Services
- Technology Services

Technology Innovation Will Transform Storage

Lenovo Storage strategy optimized by segment

Data needs are evolving to Performance, Automation, and Scale. Move to scalable use case optimized solutions.



Segment Strategy

1. All-flash and hybrid workload-optimized architecture to consolidate storage and scale on demand
2. Reduce data center footprint by 5x, predictive analytics, capacity forecasting & visualization dashboards
3. Virtualization, Database, ERP

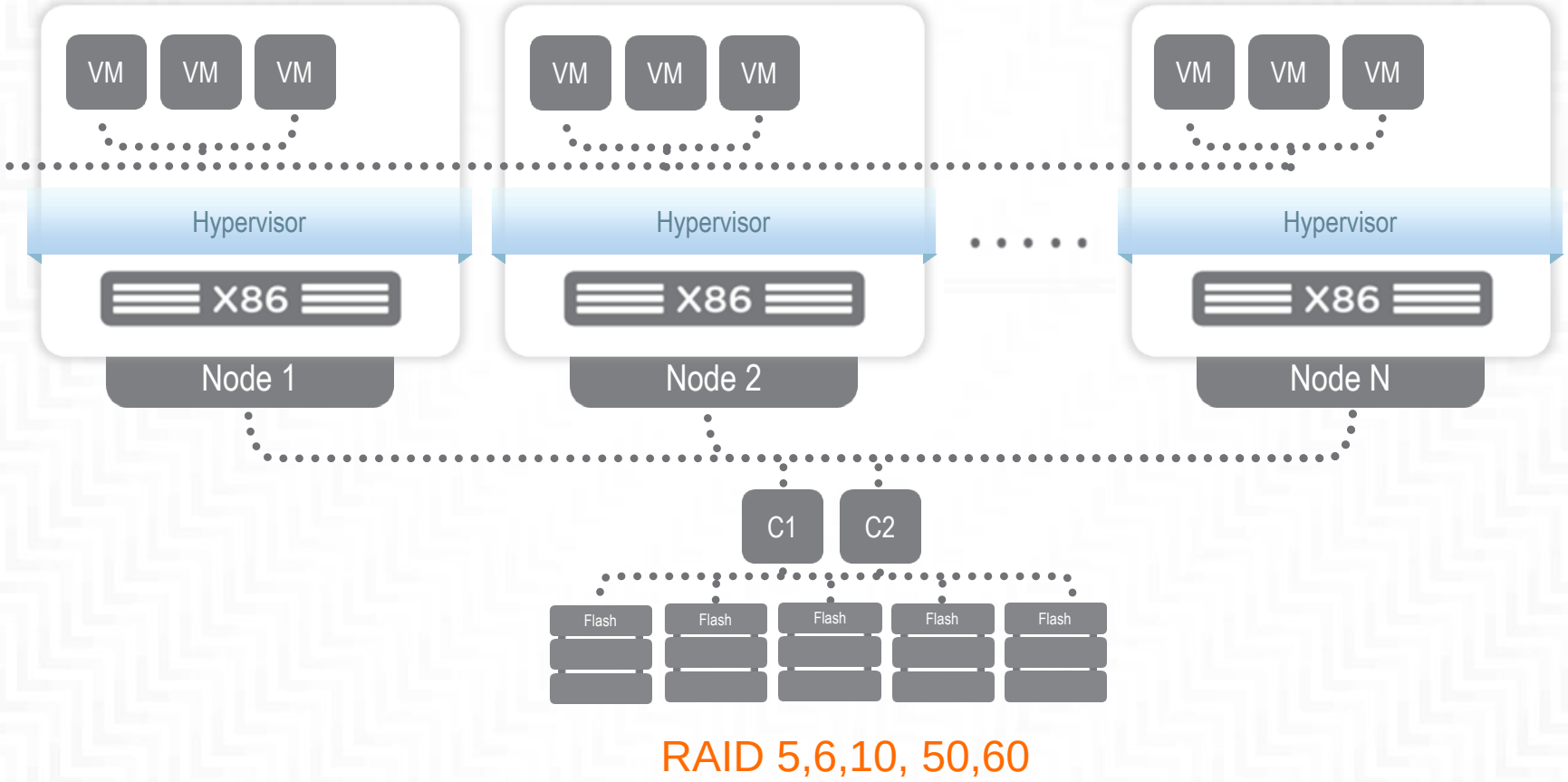
Segment Strategy

1. 1st to market with object and file SDS appliances
2. Cost effective, massively scalable storage
3. DevOps, Backup, Archive, Repository

Segment Strategy

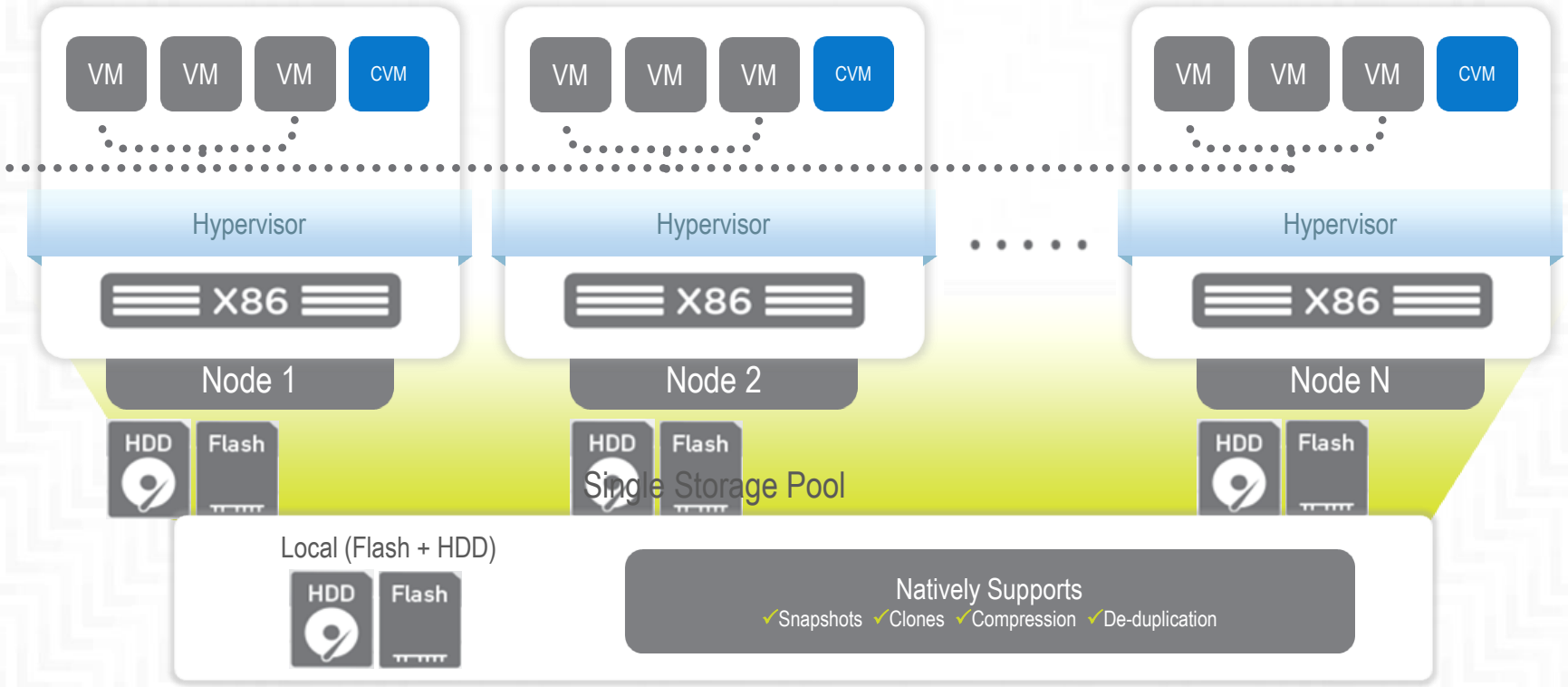
1. Deliver unbeatable price-to-performance
2. Simplicity and ease of use
3. Virtualization, Media, General Purpose

Evolution Of Infra Structure

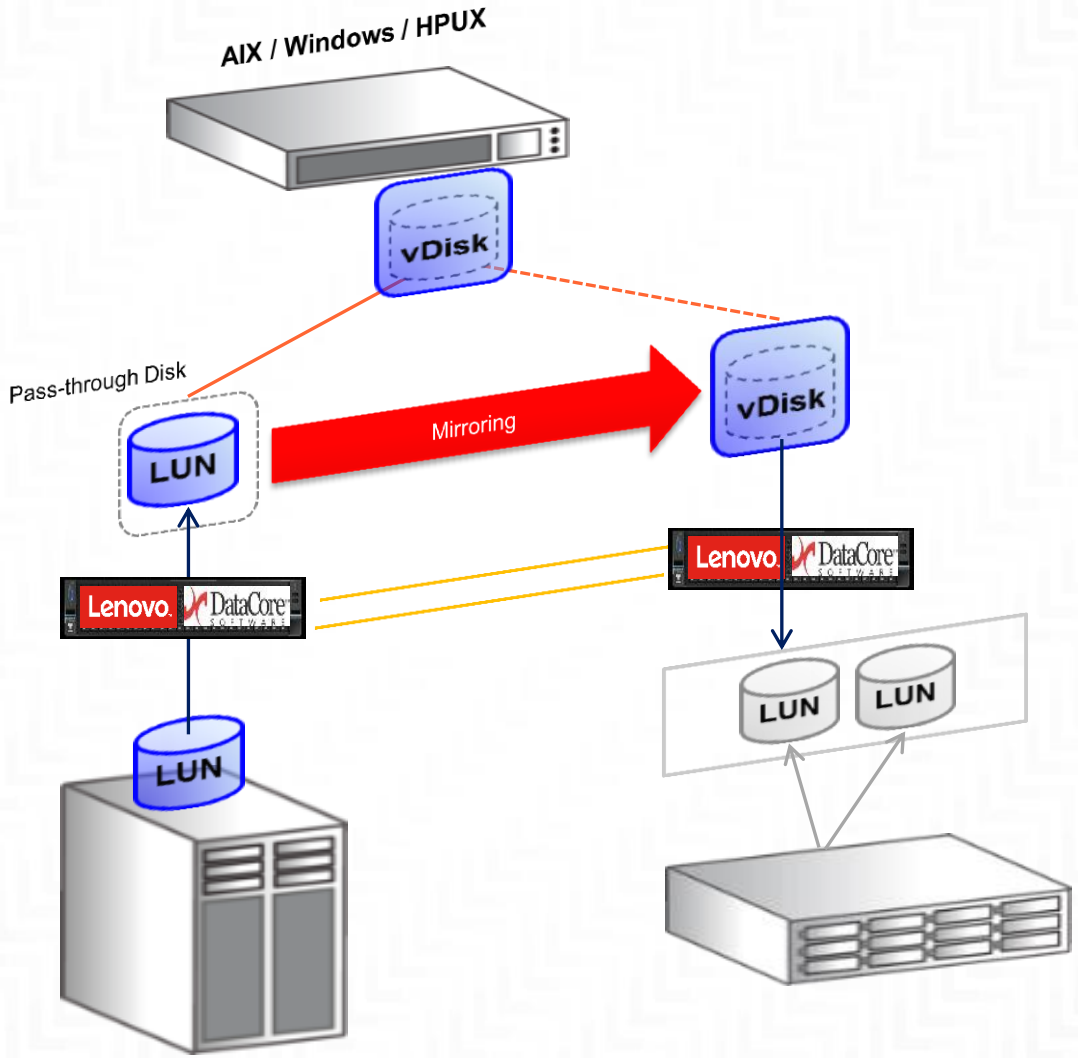


RAID 5,6,10, 50,60

Lenovo HX – Hyper converged



Lenovo SDS Power By DataCore



Storage Performance Council

Defining, administering, and promoting industry-standard, vendor-neutral benchmarks to characterize the performance of storage products

DataCore SOFTWARE Lenovo

SPC-1 Results - "Top Ten" by Performance

new #1, #5, #6

DataCore SOFTWARE Lenovo

SPC-1 Reported Data	
Tested Storage Product (TSP) Name: DataCore Parallel Server *(Dual Node, Fibre Channel SAN)*	
Metric	**Reported Result**
SPC-1 IOPS™	5,120,098.98
SPC-1 Price-Performance™	$0.10/SPC-1 IOPS™
Total ASU Capacity	11,880.000 GB
Data Protection Level	Protected 1 *(Mirroring)*
Total Price	$506,525.24
Currency Used	U.S. Dollars
Target Country for availability, sales and support	USA

Priced Storage Configuration
24 – QLogic QLE2692 16 Gb dual-port HBAs
2 – Brocade 6510 Fibre Channel Switches *(48 ports enabled on each switch)*
DataCore Parallel Server ***(Dual Node, Fibre Channel SAN)*** *(2 copies of the product, one on each storage server)*
1 – Lenovo X3650 M5 Server (storage servers), each with:
2 – Intel® Xeon® 2.30 GHz E5-2696 v3 processors each with 18 cores, 45 MB Intel Smart Cache
1,536 GB main memory *(1.25 TB configured for DataCore Parallel Server)*
Windows 2012 R2 Standard Edition
PCIe
6 – 4-port QLE2694 16Gb HBAs *(24 – 16Gb ports total and used)*
1 – Server RAID M1215 SAS/SATA Controller *(internal)*
1 – Server RAID M1215 SAS/SATA Controllers *(external)*
1 – Avago 9300-8E HBA *(8 – 12 Gb SAS 3.0 x1 ports total, 2 – 12 GB SAS 3.0 x4 wide ports total and used)*
1 – System Disk (*connected to the internal controller*) Seagate Savvio 10K.4 600 GB HDD
15 – 480 GB, 6 Gb SATA SFF SSDs *(Samsung SM863 MZ-7KM480E) (connected to the internal controller)*
3 – 480 GB, 6 Gb SATA SFF SSDs *(Samsung SM863 MZ-7KM480E) (connected to the external controller)*
4 – 300 GB, 12 Gb, 15K SAS SFF HDDs *(HGST Ultrastar C15K600) (connected to the external controller)*

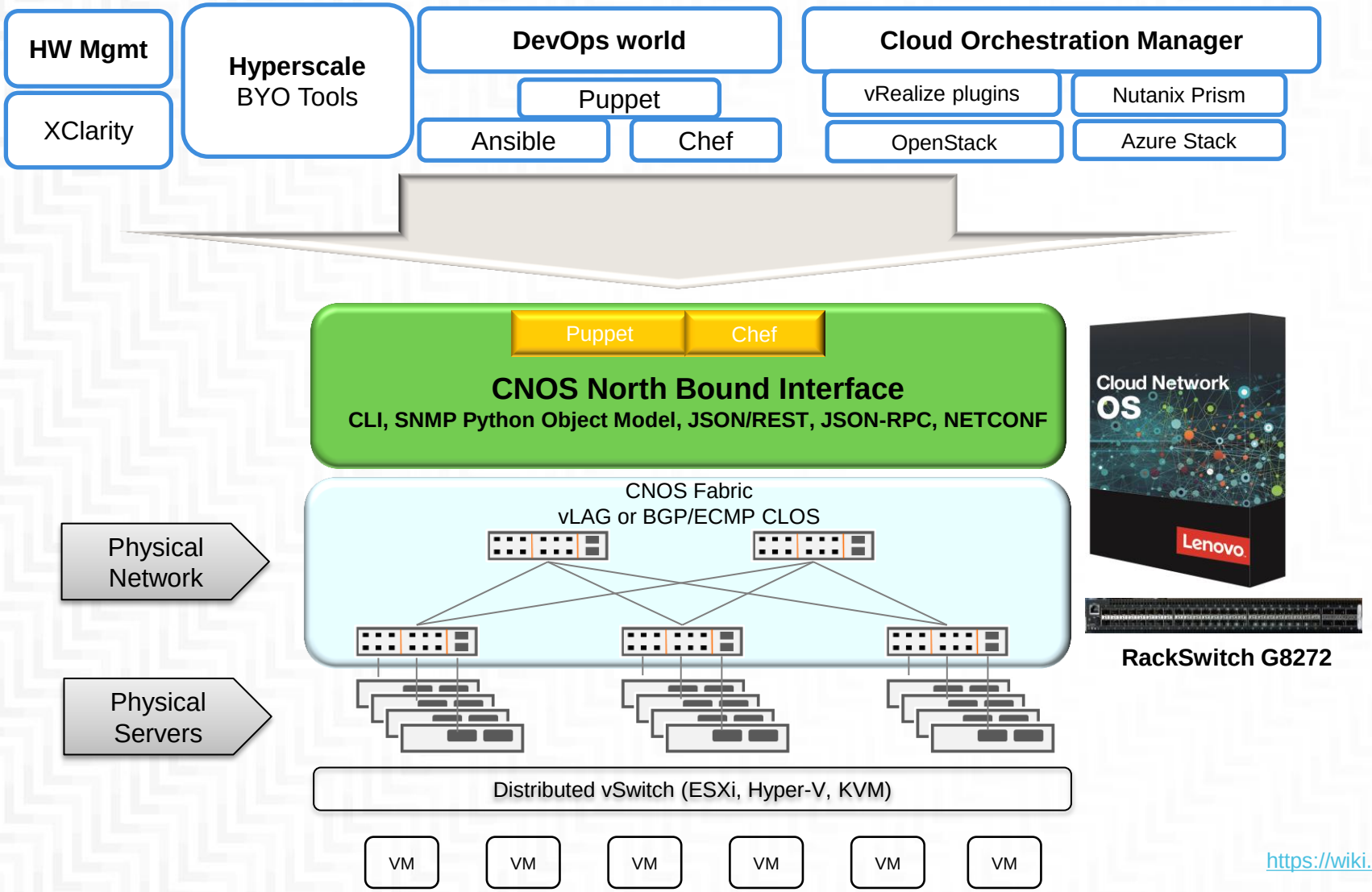
#1 **World Record SPC-1 IOPS** **5,120,098.98**

DataCore IOPS Benchmark SPC-1 Testing Result

http://www.storageperformance.org/benchmark_results_files/SPC-1/DataCore/A00179_DataCore_Parallel-Server_DN-FC-SAN/a00179_DataCore_Parallel-Server_DN-FC-SAN_SPC-1_full-disclosure-report_r1.pdf

Lenovo

Cloud Network OS in the Software-Defined Datacenter (SDDC)



RackSwitch G8272

SDDC Requirements
CNOS Key Benefits

- Resilient, Reliable NOS
- Highly Scalable
- Automated provisioning and configuration
- Orchestration workloads
- Programmable interfaces
- Interoperability
- Programmable Linux shell (2017)
- Integrated server solutions (2017)
- Event-driven, multi-process design for Improved overall performance

https://wiki.openstack.org/wiki/Neutron/ML2/LenovoML2Mechanism

Reliable, Simple, Automated

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Lenovo Leading HPC Provider Worldwide

First

WARM WATER
COOLED SUPER COMPUTER

Leibniz-Rechenzentrum
der Bayerischen Akademie der Wissenschaften

Co-Innovation with LRZ

Largest

OMNI-PATH
CLUSTER IN THE WORLD

CINECA

Co-designed with Cineca

http://www.cineca.it/en/comunicatistampa/new-cineca-supercomputer-%E2%80%98marconi%E2%80%99-now-available-italian-and-european-research

Fastest

GROWING
TOP 500 HPC VENDOR

TOP500® SUPERCOMPUTER SITES

#2 WW
#1 China

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NeXtScale nx360 M5 Water Cooled HPC Node

Boost performance with Top BIN E5-2600 v4 processor and up to 512GB of DDR4 2400MHz memory

40%
Energy Savings
in Datacenter

10%
Energy Savings
per Node

85-90%
Heat Recovery
for reuse

Water Chillers
not Required

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XClarity Integration Value-add to Customers

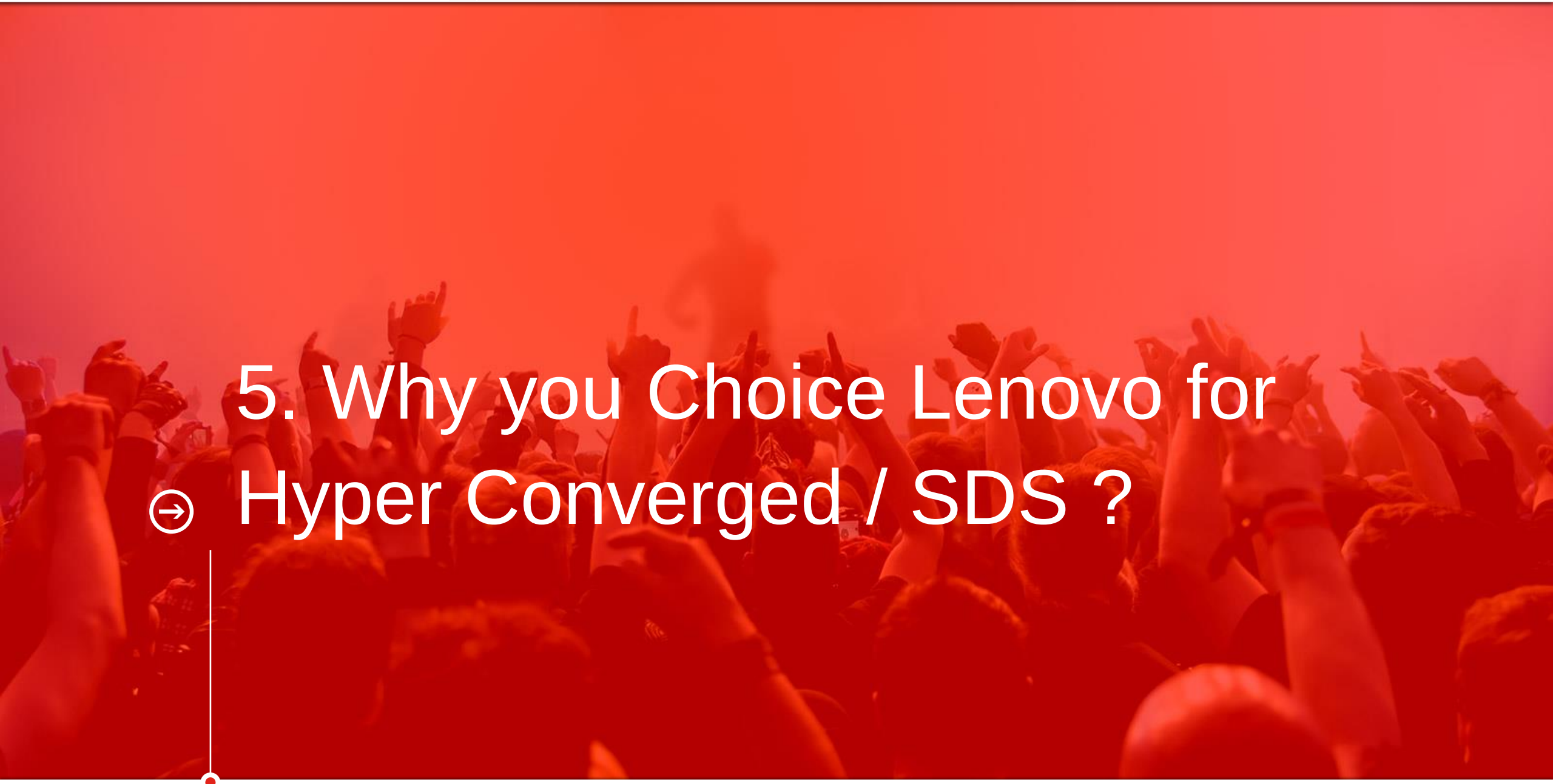
- **Reduced downtime for applications using predictive indicators** – Workload can be migrated based on predictive alerts, instead of waiting for servers to fail

- **Seamless firmware updates** – Workload migrated off of systems, firmware updated, workload migrated back through single UI.

- **More accurate hardware health reporting** – Take into account additional alerts

- **Detailed inventory view** – Improved views of hardware being managed

Lenovo XClarity



5. Why you Choice Lenovo for Hyper Converged / SDS ?

The World Record of Performance

1. Claim based on non-clustered best published Two-socket, Four-socket, Eight socket TPC benchmark*E at www.tpc.org/4076, http://www.tpc.org/tpce/results/tpce_results.asp

2. Claim based on best published Two-socket SPECvirt_sc2013 benchmark at http://spec.org/virt_sc2013/results/res2016q2/virt_sc2013-20160419-00049-perf.html

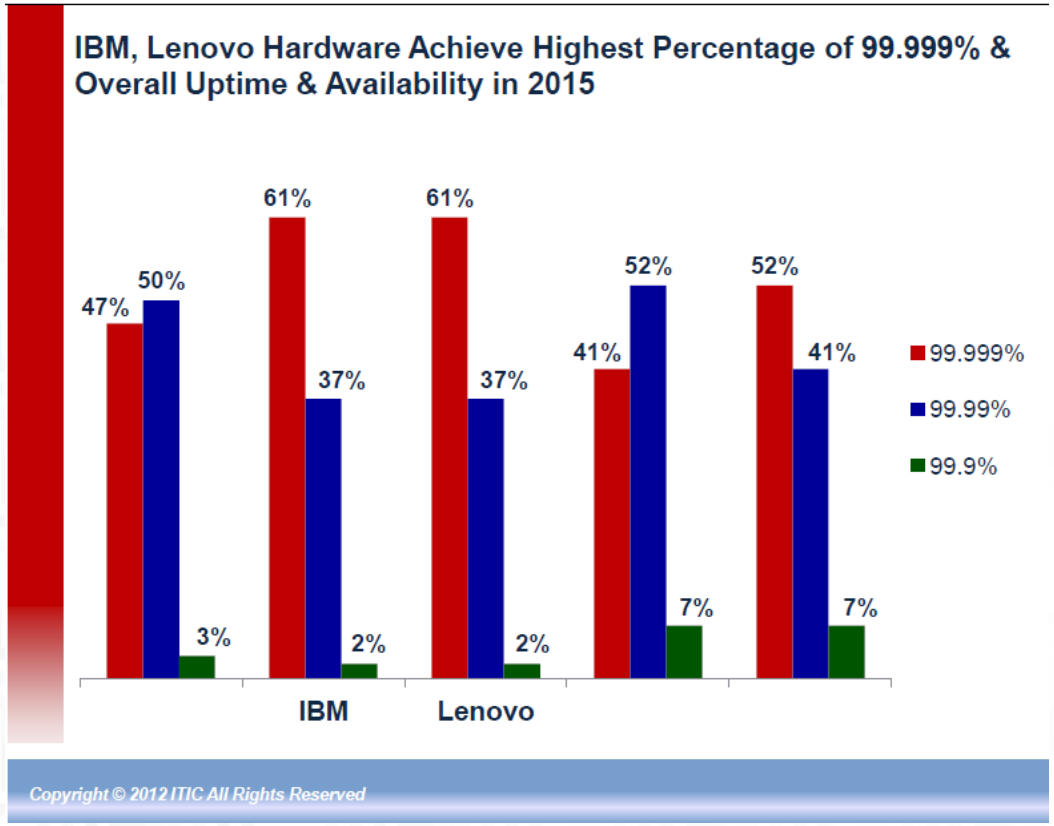
Why Lenovo? Lenovo/Nutanix Differentiation Factor

http://www.lenovo.com/images/products/system-x/pdfs/white-papers/idc_why_lenovo_hyperconverged_wp.pdf
Page 5th

Lenovo Servers Achieve Highest Reliability Rating

Lenovo: #1 of 11 3 years running[1]

Exhibit 1: IBM Power Systems, Lenovo System x Most Reliable Servers



Information Technology Intelligence Consulting

ITIC

ITIC Global Server Hardware, Reliability Report- 2015-2016

[1] ITIC 2015-2016 Reliability Survey, July 2015
http://www.lenovo.com/images/products/system-x/pdfs/white-papers/itic_2015_reliability_wp.pdf

Lenovo Delivers Industry-Best Service and Support

Customer Satisfaction Rating

TBR Customer Satisfaction Survey, April 2015[2]

Lenovo Continues to Lead in all areas of TBR Customer Satisfaction Study

TBR
TECHNOLOGY BUSINESS RESEARCH, INC.

4Q15 | TBR – x86-based Servers Customer Satisfaction Study

©2016 Technology Business Research Inc.

	Lenovo
Phone Support Availability	1
Phone Support Technical Expertise	1
On-site Response Time	1
On-site Technical Expertise	1
Online Technical Support	1
Ongoing Services and Maintenance	1
Replacement Parts Availability	1
Self-support/Automated Support	1
Social Media Support	1

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MERCI БЛАГОДАРЯ TAKK
ありがとう СПАСИБО GRAZIAS
GRAZIE DZIĘKUJĘ DANKE
OBRIGADO GRACIAS 謝謝

THANK YOU

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