



IT TRANSFORMATION

AN IMPERATIVE
FOR DRIVING
BUSINESS OUTCOMES

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Regional Director
Intel APJ

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“Digital Fusion” Across All Industries

**TRADITIONAL
ECONOMY**



**DIGITAL
ECONOMY**

“DIGITAL FUSION”

Blending of Traditional
and Digital Business



Smart
Agriculture



Artificial
Intelligence



Wearables
(Industrial/Lifestyle)



Robotic
Warehouse



Autonomous
Cars



Smart
Retail

The Industry is Changing

It's No Longer – “Business as Usual”

40%

of businesses in the top 20 of every industry will be disrupted by 2018.¹

50%

of the G2000 will see the majority of their business depend on digitally-enhanced products and services by 2020.²

THIS IS THE LEAST AMOUNT OF CHANGE WE WILL EVER SEE

1. PNC – Digital Disruption Challenges ([source](#)); 2. IDC FutureScape: Worldwide IT Industry 2017 Predictions ([source](#))

THE COMING FLOOD OF DATA

BY 2020

**AVG
INTERNET USER** ~**1.5 GB** OF TRAFFIC PER DAY

**SMART
HOSPITAL** **3,000 GB** PER DAY

**AUTONOMOUS
VEHICLES** **4,000 GB** PER DAY... EACH

**AIRPLANE
DATA** **40,000 GB** PER DAY

**SMART
FACTORY** **1,000,000 GB** PER DAY

Business Outcomes Rely on Digital Strategy



DATA DRIVEN

Trusted, Real-time Data



SMART DECISIONS

Speed time to insight to make better decisions



ON-DEMAND

Reduce IT/ Operational Technology Cost;
Increase Agility



TRUSTED

Security and privacy



CONNECTED EXPERIENCE

Connectivity and access anywhere
on any device



INNOVATIVE WORKFORCE

Workplace Transformation

Yet Business Cannot Compete on Old Infrastructure



SILO'D APPLICATIONS & DATA POCKETS



SLOW DEPLOYMENT OF NEW SERVICES



SECURITY EXPLOITS GROWING



NETWORK BOTTLENECKS



DATA INFLUX SWAMPING STORAGE



WORKFORCE SKILLS MISMATCH

Outdated infrastructures result in a **6X** slower rate for product innovation and time to market.¹

AT 4 YEARS

server performance drops **33%**

and maintenance costs climb **148%**²

1. The Enterprise Strategy Group, 2017; 2. IDC 2015 ([source](#))



BUSINESS SUCCESS NOW RELIES ON IT TRANSFORMATION

Yg 35.79900
 Zg 108.74200
 EG 52.62622

lieu -0.417402
 EF 47.994
 FG 40.49
 beta 0.8234405
 ksi -0.408038
 Ys 57.133 Yf 76.089318
 Ze 80.634 Zf 104.72575

psi5 -0.089355

$Y=Yo-r*\text{math.cos}(\text{alfa})$
 $Ze=Zo-r*\text{math.sin}(\text{alfa})$
 $R\text{SetPosition}(\text{"shatun_sbornka_group"}, Xg, Yg, Zg)$

$EG=\text{math.sqrt}((Yg-Ye)^2+(Zg-Ze)^2)$

$\text{tau}=\text{math.atan}((Yg-Ye)/(Zg-Ze))$
 $\text{beta}=\text{math.acos}((EF*EF + EG*EG - FG*FG)/(2*EF*EG))$
 $\text{ksi}=\text{tau}-\text{beta}$

$R\text{SetRotate}(\text{"shatun_sbornka_group"}, \text{ks}, 0, 0)$

$Yf=Ye-EP*\text{math.cos}(\text{ks}-\text{math.pi}/2)$
 $Zf=Ze-EP*\text{math.sin}(\text{ks}-\text{math.pi}/2)$

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 -0.118096 -0.175430
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 0.863195 0.650479
 0.863289 0.650174

-0.880873 -0.569782
 -0.880989 -0.800133
 0.880695 0.569516
 -0.101901 -0.152140
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0.101901 0.152140 0.201221
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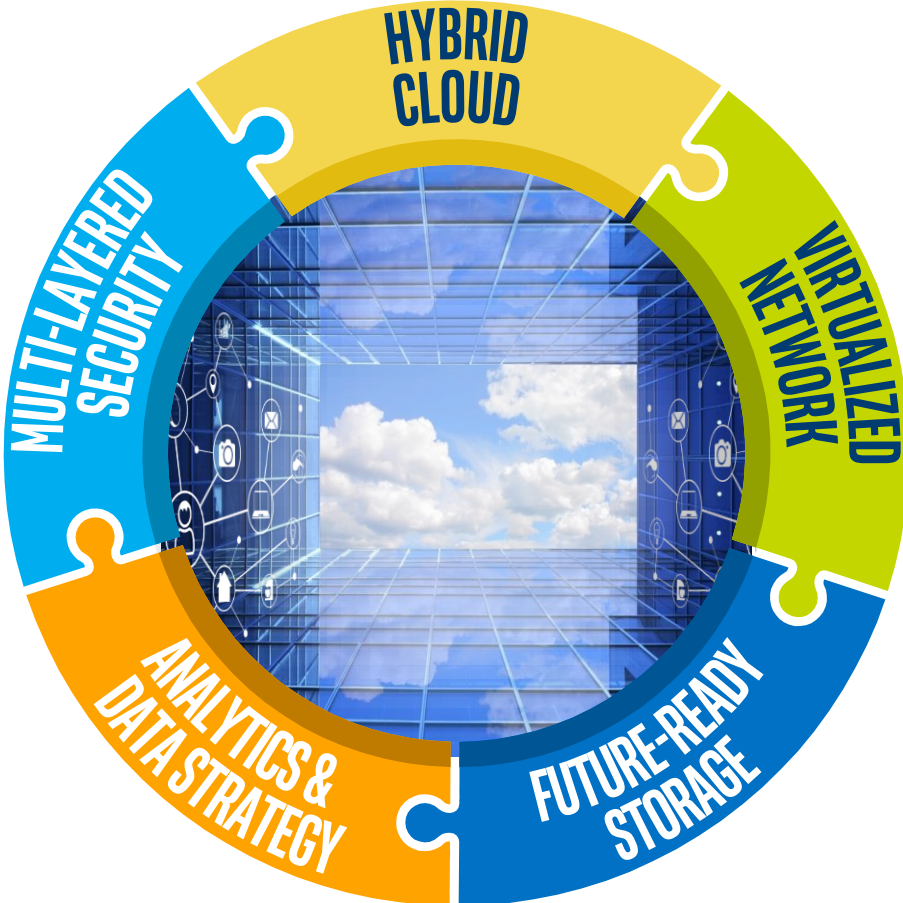
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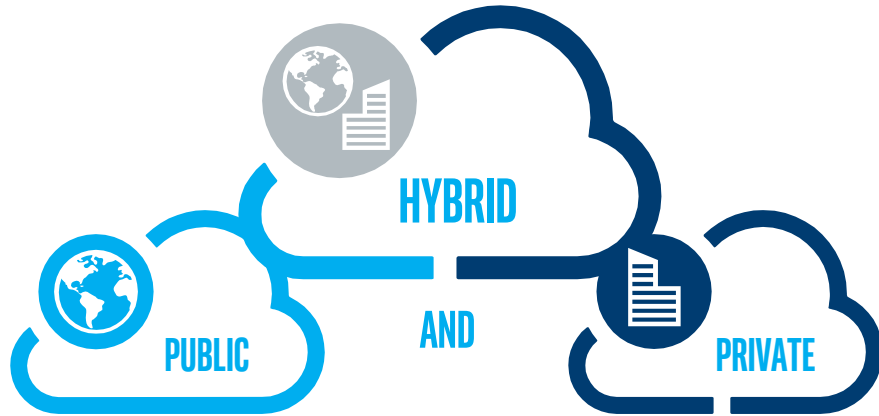
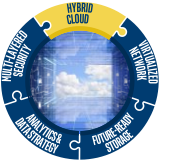
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 6 2.5663 6.28
 7 2.9864 7.24
 8 3.19 8.3967
 9 3.7758 8.5521
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Key Principles of IT Transformation



Hybrid Cloud

Holistic Cloud Plan Is Critical



40% of enterprises are using hybrid cloud today¹

60% of enterprises are testing or planning a hybrid cloud implementation within 24 months¹

Both public & private cloud make sense

Intel IT Examples

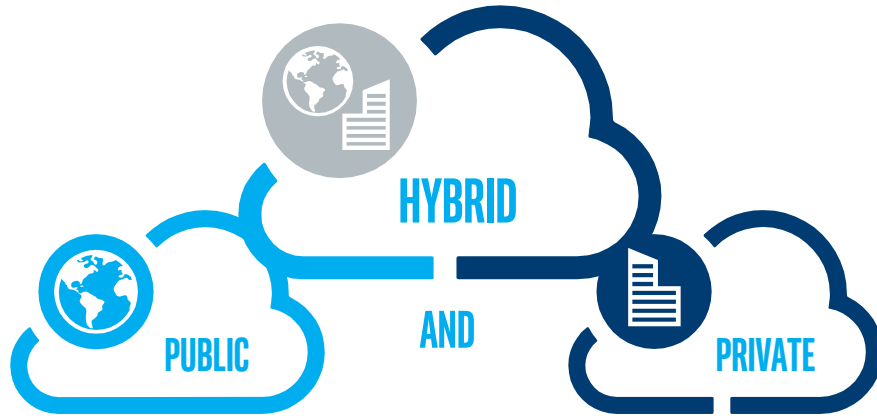
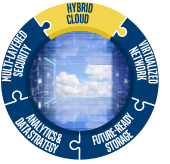
Deployed different workloads in both public and private clouds

On-prem IaaS: **>2X** savings vs public²

Off-prem SaaS solution: **73.6%** cost savings²

1. Forrester commissioned research 2017; 2. Cost savings based on Intel experience. Intel does not guarantee or warrant others will obtain similar results.

Hybrid Cloud



RECOMMENDATIONS



**EVALUATE & OPTIMIZE
WORKLOAD PLACEMENT**



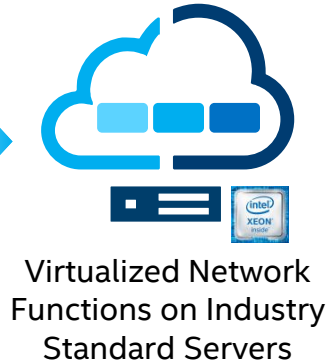
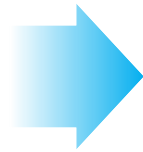
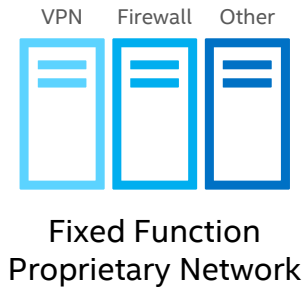
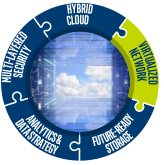
**APP INNOVATION AND OPTIMIZATION
WITH INTERNAL PAAS/DBAAS**



**KNOW WHAT'S UNDER THE
HOOD IN PUBLIC CLOUD**

Virtualized Network

Agile, Secure and Dynamic Provisioning



Enterprise IP traffic will grow **2X** from 2015 to 2020¹

Organizations are recognizing the critical role of network virtualization in IT Transformation

Bank Leumi Case Study²

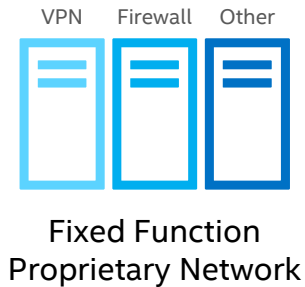
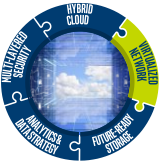
Deployed a private cloud based on a SDI model powered by Intel® technology

New services setup: **3 WEEKS** ▶ **3 HOURS**

Firewall policy defined: **8 HOURS** ▶ **15 MINS**

1. 2016 Cisco VNI Complete Forecast 2. Intel case study <https://builders.intel.com/docs/cloudbuilders/bank-leumi-launches-mobile-only-banking.pdf>

Virtualized Network



RECOMMENDATIONS



**VIRTUALIZE ON A COMMON
PLATFORM TO REDUCE TCO**



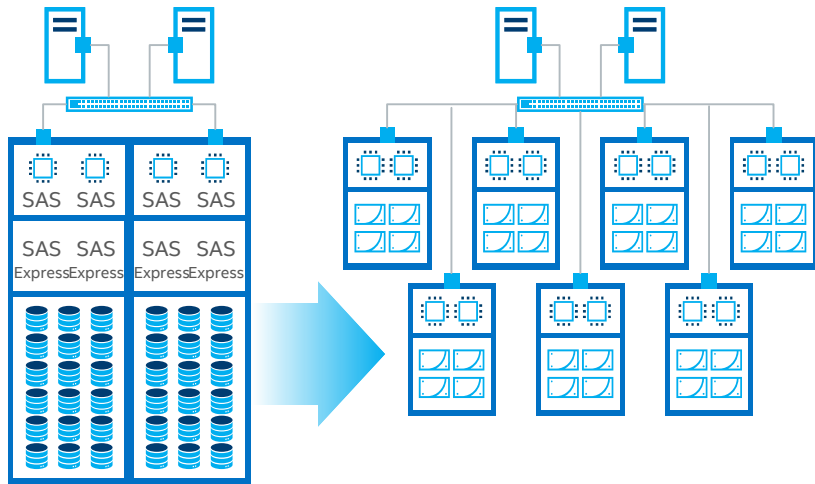
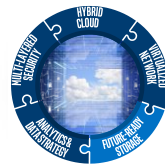
**DEPLOY NFV FOR
BETTER SECURITY & AGILITY**



**LEVERAGE INTEL® NETWORK
BUILDERS SOLUTIONS**

Future-Ready Storage

Agile, Efficient, Accessible



Data growth **>30%** CAGR while IT storage investment is **~3%** growth¹

Un-tiered data in legacy silos is inefficient to support data growth and drive better decision making

Large Grocery Retailer²

Deployed software-defined storage solution

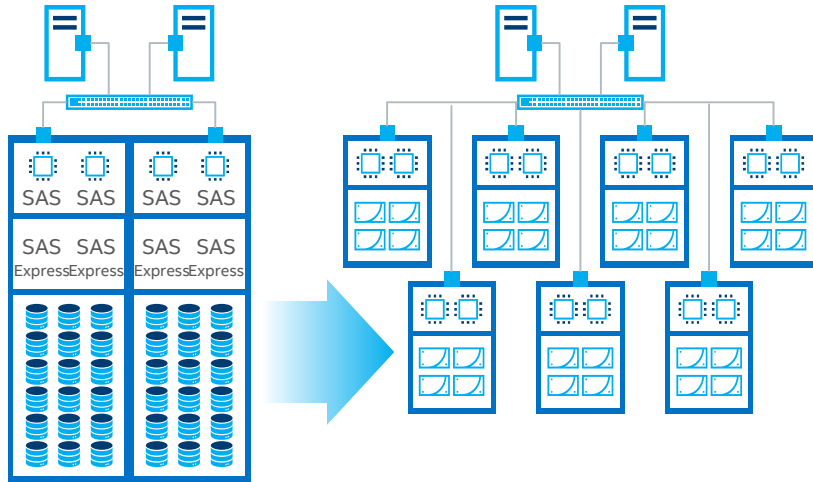
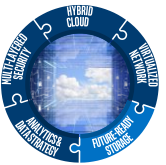
92% Performance gain

80% CapEx reduction

90% Footprint reduction

1. Worldwide Semiannual IT Spending Guide: Industry and Company Size, IDC February 2017; 2. Ken LeTourneau blog (Intel NSG) <https://itpeernetwork.intel.com/scaling-software-defined-storage-in-retail/>

Future-Ready Storage



RECOMMENDATIONS



INVENTORY CURRENT DATA ACROSS STORAGE ENVIRONMENT



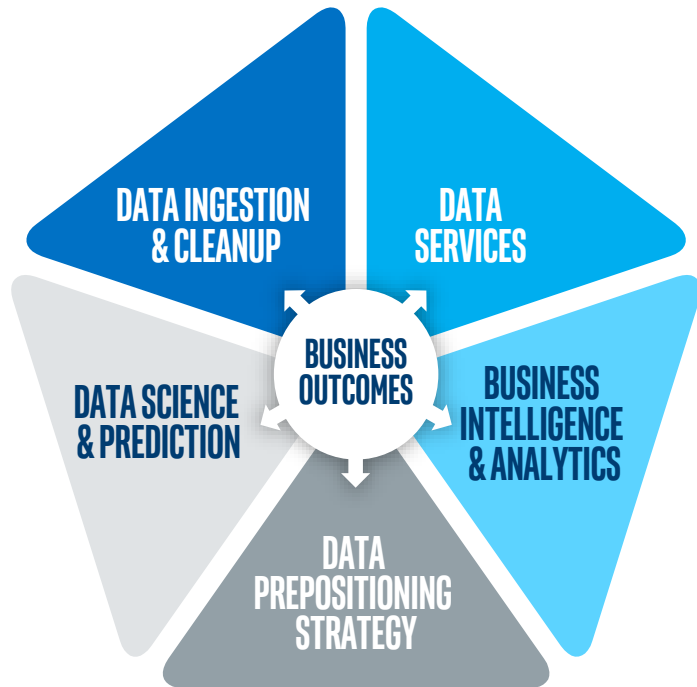
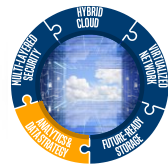
LEVERAGE RIGHT MEDIA FOR OPTIMIZED DATA TIERING



DEPLOY SOFTWARE DEFINED SCALE OUT STORAGE

Analytics & Data Strategy

Accelerate Your Insights



CIOs #1 Investment Priority¹

Goal is to reduce “time to insight” and drive competitive differentiation

Yet challenges exist:

- Data scattered, often unusable
- Shortage of skilled data experts
- Solution proliferation and complexity

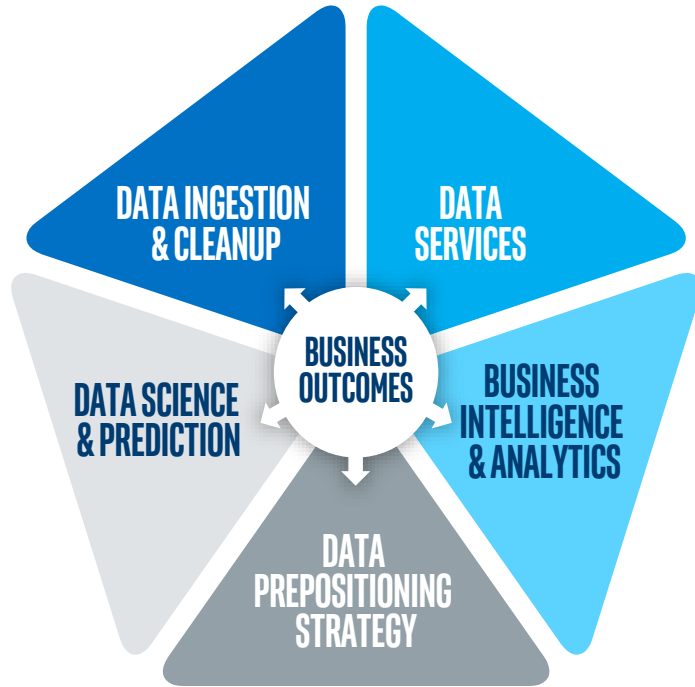
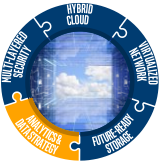
Caesars Entertainment Case Study

Implemented Hadoop environment with CDH on Intel® architecture:

- Reduced processing time **3 hours ▶ 45 minutes**
- Expanded capacity to **3 million records per hour**

1. Gartner CIO Survey 2017; 2. Case Study: <https://www.intel.com/content/www/us/en/big-data/xeon-entertainment-caesars-case-study.html>

Analytics & Data Strategy



RECOMMENDATIONS



BUSINESS OUTCOMES DRIVE YOUR INTELLIGENT DATA STRATEGY



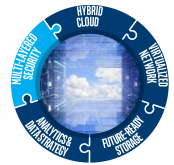
FUTURE-PROOF YOUR ANALYTICS INFRASTRUCTURE



DEMOCRATIZE ANALYTICS & CREATE A DATA CULTURE

Multi-layered Security

Defense in Depth



VIGILANCE WITH ANALYTICS



DATA PROTECTION
AT REST | IN-FLIGHT | IN USE



PLATFORM SECURITY
TRUST | RESILIENCE | CONTROL

\$2.1 TRILLION

projected cost of cyber crime
to business by 2019¹

**Effective security is built on
multi-layered trust & vigilance**

Barriers include:

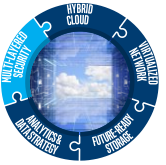
High cost of encryption due to reduced performance

Lack of solutions in the market that can
analyze high volume and varied data

High levels of human intervention required for threat
detection, analysis and remediation

1. Juniper Research 2015

Multi-layered Security



VIGILANCE WITH ANALYTICS



DATA PROTECTION
AT REST | IN-FLIGHT | IN USE



PLATFORM SECURITY
TRUST | RESILIENCE | CONTROL

RECOMMENDATIONS



**ENSURE HARDWARE-BASED
ROOT OF TRUST ON PLATFORM**



ENCRYPT EVERYTHING EVERYWHERE



**USE ANALYTICS FOR
TRANSPARENCY & CONTROL**

INTEL® XEON® SCALABLE PLATFORM



THE INDUSTRY'S
BIGGEST PLATFORM ADVANCEMENT
IN A DECADE

INTEL® XEON® SCALABLE PROCESSORS



BEST SCALABLE PERFORMANCE
HARDWARE-ENHANCED SECURITY
ADVANCED RAS

OPTIMIZED FOR WIDEST RANGE
OF EVOLVING/MULTI WORKLOADS

MISSION-CRITICAL, VIRTUALIZATION/CONSOLIDATION,
REAL-TIME ANALYTICS AND ARTIFICIAL INTELLIGENCE

MAINSTREAM



GREAT SCALABLE PERFORMANCE
MEMORY PERFORMANCE
ADVANCED RAS

WORKLOAD-OPTIMIZED +
EFFICIENCY & AGILITY

PERFORMANCE FOR GENERAL-PURPOSE
COMPUTE, STORAGE AND NETWORKING



GOOD SCALABLE PERFORMANCE
AT LOW POWER
STANDARD RAS

MODERATE TASKS

INTEL® TURBO BOOST TECHNOLOGY AND
INTEL® HYPER-THREADING TECHNOLOGY
FOR MODERATE WORKLOADS

EFFICIENT



ENTRY SCALABLE PERFORMANCE
HARDWARE-ENHANCED SECURITY
STANDARD RAS

LIGHT TASKS

ENTRY PERFORMANCE, PRICE SENSITIVE
FOR LIGHT WORKLOADS

ENTRY

INTEL® XEON® SCALABLE PLATFORM DELIVERS

PERFORMANCE

UP TO
1.65X
AVERAGE
GENERATIONAL
GAINS¹

SECURITY

UP TO
2X
DATA PROTECTION
PERFORMANCE
GEN OVER GEN²

AGILITY

4.2X
GREATER
VM CAPACITY
VS 4-YEAR-OLD SERVER³

65%
LOWER TOTAL
COST OF
OWNERSHIP
VS 4-YEAR OLD SERVER⁴

CLOUD

AI & ANALYTICS

5G

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information visit <http://www.intel.com/performance>.

1. Geomean based on Normalized Generational Performance going from Intel® Xeon® processor E5-26xx v4 to Intel® Xeon® Scalable processor (estimated based on Intel Internal testing of OLTP Brokerage, SAP SD 2-Tier, HammerDB, Server-side Java, SPECint_rate_base2006, SPECfp_rate_base2006, Server Virtualization, STREAM™ triad, LAMMPS, DPDK L3 Packet Forwarding, Black-Scholes, Intel Distribution for LINPACK).
2. 2X gains in Reed Solomon Erasure Code: Intel Xeon® Processor Scalable Family: Platinum 8180 Processor, 28C, 2.5 GHz, H0, Neon City CRB, 12x16 GB DDR4 2666 MT/s ECC RDIMM, BIOS PLYCRB1.86B.0128.R08.1703242666 Intel® Xeon® E5-2600v4 Series Processor, E5-2650 v4, 12C, 2.2 GHz, Aztec City CRB, 4x8 GB DDR4 2400 MT/s ECC RDIMM, BIOS GRNCRB1.86B.0276.R02.160620646. Operating System: Redhat Enterprise Linux 7.3, Kernel: 4.2.3, ISA-L2 1B, BIOS Configuration: P-States Disabled, Turbo Disabled, Speed Step Disabled, C-States Disabled, ENERGY PERFB, BIOS: EPIC PERFB.
3. Up to 4.28x more VMs based on server virtualization consolidation workload based on Intel® Internal estimates: 1-Node, 2 x Intel® Xeon® Processor E5-2690 on Romley-EP with 256 GB Total Memory on VMware ESXi® 6.0 GA using Guest OS RHEL6.4, glassfish3 1.2.2, postgres9.2. Data Source: Request Number: 1718, Benchmark: server virtualization consolidation, Score: 377.6 @ 21 VMs vs. 1-Node, 2 x Intel® Xeon® Platinum 8180 Processor on Wolf Pass SKX with 768 GB Total Memory on VMware ESXi6.0 U3 GA using Guest OS RHEL 6 64bit. Data Source: Request Number: 2563, Benchmark: server virtualization consolidation, Score: 1880 @ 90 VMs. Higher is better.
4. Up to 65% lower 4-year TCO estimate example based on equivalent rack performance using VMware ESXi® virtualized consolidation workload comparing 20 installed 2-socket servers with Intel Xeon processor E5-2690 (formerly "Sandy Bridge-EP") running VMware ESXi® 6.0 GA using Guest OS RHEL6.4 compared at a total cost of \$919,362 to 5 new Intel® Xeon® Platinum 8180 (Skylake) running VMware ESXi6.0 U3 GA using Guest OS RHEL 6 64bit at a total cost of \$320,879 including basic acquisition. Server pricing assumptions based on current OEM retail published pricing for 2-socket server with Broadwell based Intel Xeon processor systems—subject to change based on actual pricing of systems offered.

DELIVERING PERFORMANCE BEYOND BENCHMARKS

CLOUD

Baidu 百度
SEARCH

1.74X

CLICK-THROUGH-RATE¹

HUAWEI
FUSHIONSHERE

1.62X

ENTERPRISE CLOUD APPLICATIONS²

KINGSOFT
MYSQL CLOUD SERVICE

1.63X

OLTP DATABASE³

Neusoft
ACLOME

1.5X

CLOUD MONITORING⁴

Tencent 腾讯
CLOUD

1.72X

VIDEO STITCHING⁵

AI & ANALYTICS

IBM
DB2

1.47X

IN-MEMORY ANALYTICS⁶

IHS Markit
ANALYTICS RISK ENGINE

1.68X

ENTERPRISE RISK MANAGEMENT⁷

LAMMPS

1.72X

MOLECULAR DYNAMICS⁸

SAP
HANA

1.59X

DATABASE TRANSACTIONS⁹

sas

2X

BUSINESS ANALYTICS¹⁰

NETWORK

Asialfno
VERIS

2.21X

BUSINESS SUPPORT SYSTEM¹¹

eBrisk
EBLIVE

1.9X

HEVC VIDEO ENCODING¹²

ERICSSON
MEDIAFIRST

1.5X

VIDEO TRANSCODING¹³

sandvine
VIRTUAL SERIES

1.64X

PACKET INSPECTION¹⁴

Telefonica
VIRTUAL BNG

1.67X

ROUTING¹⁵

Other names and brands may be claimed as the property of others.
Software and hardware used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchase, including the performance of that product when combined with other products. For more complete information visit <http://www.intel.com/performance>.
1. Baidu Search Click-Through-Rate - Baidu (CPU); OS: CentOS Linux release 7.3.1611; Testing by Intel June 2017; 25 Intel® Xeon® processor E5-2699 v4 vs 25 Intel® Xeon® Platinum processor B180.
2. Huawei FusionSphere virtualized cloud Platform OS-BH41.7.2; Testing by Intel May 2017; 25 Intel® Xeon® processor E5-2699 v4 vs 25 Intel® Xeon® Platinum processor B180.
3. Kingsoft MySQL Cloud Service - MySQL Cloud Service OS: CentOS 7.3.1611; Testing by Intel May 2017; 25 Intel® Xeon® processor E5-2699 v4 vs 25 Intel® Xeon® Platinum processor B180.
4. Neusoft Aclome Search & Index workload for general performance workload for OAT OS: CentOS 7.3.1611; Testing by Intel and Neusoft May 2017; 25 Intel® Xeon® processor E5-2699 v4 vs 25 Intel® Xeon® Platinum processor B180.
5. Tencent Video Analytics - Video stitching workload OS: CentOS 7.3.1611 Linux kernel 4.8.18; Testing by Intel April 2017; 25 Intel® Xeon® processor E5-2699 v4 vs 25 Intel® Xeon® Platinum processor B180.
6. IBM DB2 11.1.1. The IBM Big Data Insights internal security Multiter Workload (DB2) is a complex database workload based on real environment; Testing by Intel and IBM April/May 2017; 45 Intel® Xeon® processor E7-8890 v4 vs 45 Intel® Xeon® Platinum processor B180.
7. IHS Markit Analytics Risk Engine internal synthetic portfolio OS: Windows server 2016; Testing by Intel and IHS Markit May 2017; 25 Intel® Xeon® processor E5-2699 v4 vs 25 Intel® Xeon® Platinum processor B168.
8. LAMMPS; Testing by Intel June 2017; 25 Intel® Xeon® processor E5-2699 v4 vs 25 Intel® Xeon® Platinum processor B168.
9. SAP HANA; T80.
10. SAS Business Analytics: SAS 9.4i.m4 application running the 30 session SAS Mixed Analytics workload OS: CentOS 7.2 kernel 3.10.0; Testing by Intel and SAS May 2017; 25 Intel® Xeon® processor E5-2699 v4 vs 25 Intel® Xeon® Platinum processor B180.
11. Asialfno Veris BSS Asialfno Veris BSS workload OS: RHEL 7.3; Testing by Intel & Asialfno May 2017; 45 Intel® Xeon® processor E7-8890 v4 vs 45 Intel® Xeon® Platinum processor B180.
12. eBrisk OS: Windows Server 2012 R2 Standard Build 9600; Test device: Intel® Media Server Video Intel®; Testing by Intel May 2017; 25 Intel® Xeon® processor E5-2699 v4 vs 25 Intel® Xeon® Platinum processor B180.
13. Ericsson Media First Video Processing LHD-HEVC transcoding workload OS: CentOS Linux 7.2 kernel 3.10.0; Testing by Ericsson in May 2017; 25 Intel® Xeon® processor E5-2699 v4 vs 25 Intel® Xeon® Platinum processor B168.
14. Sandvine Virtual Series OS: CentOS Linux release 7.3.1611 kernel Linux 3.10.0-514.el7.x86_64; HW: Intel® processor family Xeon; 128 GB RAM; Testing by Sandvine June 2017; 25 Intel® Xeon® processor E5-2699 v3 vs 25 Intel® Xeon® Gold processor B150.
15. Telefonica; Testing by Telefonica; 25 Intel® Xeon® processor E5-2600 v4 vs 25 Intel® Xeon® Platinum processor B168.

CONGRATS CISCO !!!

UCS M5 SERVERS

9

WORLD RECORDS

<https://blogs.cisco.com/datacenter/cisco-ucs-continues-its-world-record-tradition>

Summary

- ❑ Technology is transforming industries
- ❑ Business outcomes rely on Digital strategy
- ❑ 5 Key tenets of IT Transformation
 - ✓ Hybrid Cloud,
 - ✓ Virtualized Network,
 - ✓ Future-ready Storage,
 - ✓ Analytics/Big-data,
 - ✓ Multi-layered Security
- ❑ Intel Xeon Scalable Platform → Performance, Security, Agility & Lower TCO
- ❑ Cisco & Intel → Your Trusted Partners on IT Transformation

