ПРИМЕРЫ ОПТИМИЗАЦИИ ОБЛАЧНЫХ ИНФРАСТРУКТУР ЗАКАЗЧИКОВ

Василий Лизунов
Менеджер по развитию бизнеса

THE DATA-CENTRIC WORLD

OVER
HALF
OF THE
WORLD'S DATA

WAS CREATED
IN THE LAST
2 YEARS

<2%
HAS BEEN
ANALYZED

(intel)

KEY INDUSTRY INFLECTIONS

5G Network
Transformation

Artificial
Intelligence

Intelligent
Edge

Cloudification

intel

UNLEASHING THE POTENTIAL OF DATA

MOVE FASTER

BAREFOOT
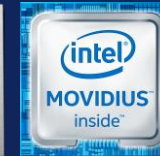NETWORKS | an Intel company

intel ETHERNET

intel SILICON PHOTONICS

STORE MORE
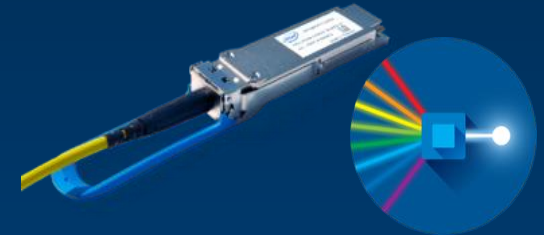
intel OPTANE »»
PERSISTENT MEMORY

intel OPTANE »»
SSD

intel 3D NAND SSD

PROCESS EVERYTHING

intel XEON PLATINUM inside

intel ATOM inside

intel AGILEX inside

intel eASIC inside

X^e

intel MOVIDIUS inside

SOFTWARE & SYSTEM LEVEL OPTIMIZED
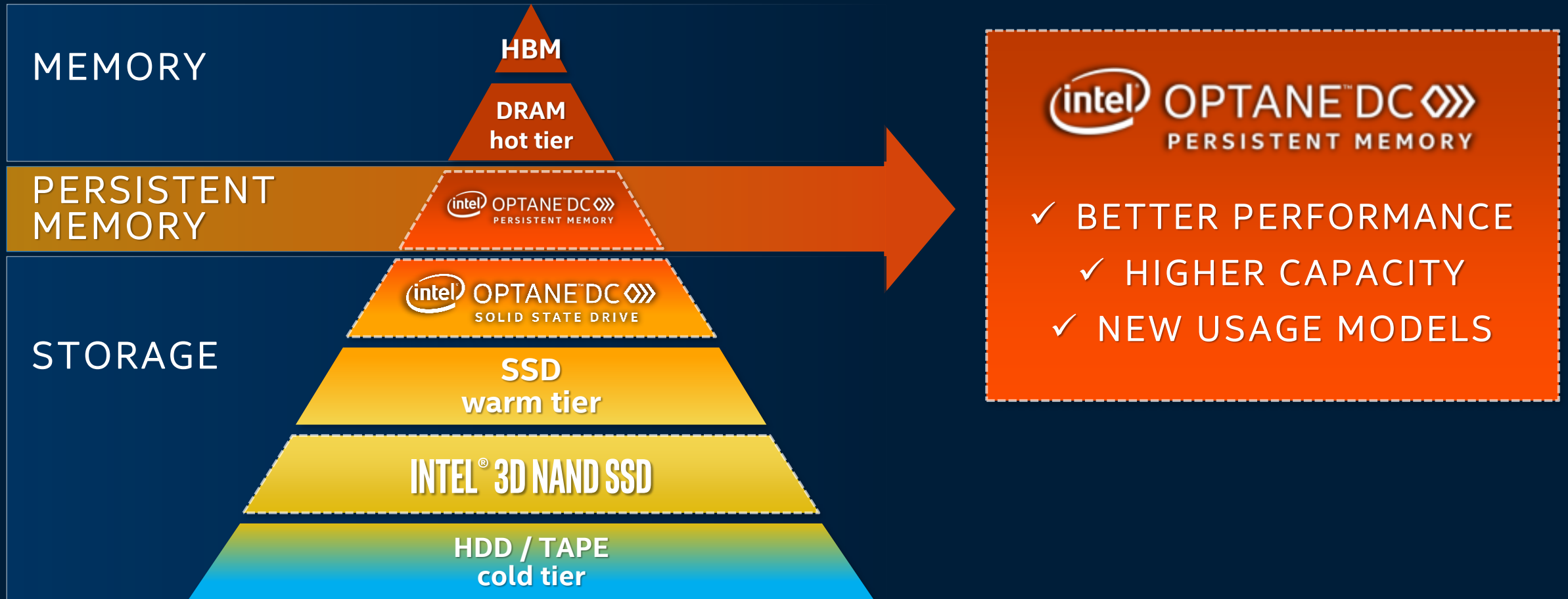
intel

PROCESS EVERYTHING
2ND GEN INTEL® XEON® SCALABLE PROCESSOR: CASCADE LAKE

Support For

Leadership Performance

Security Mitigations[1]

Optimized Cache Hierarchy

Higher Frequencies

Optimized Frameworks & Libraries

intel OPTANE DC PERSISTENT MEMORY

intel XEON PLATINUM inside

intel ATOM inside

+
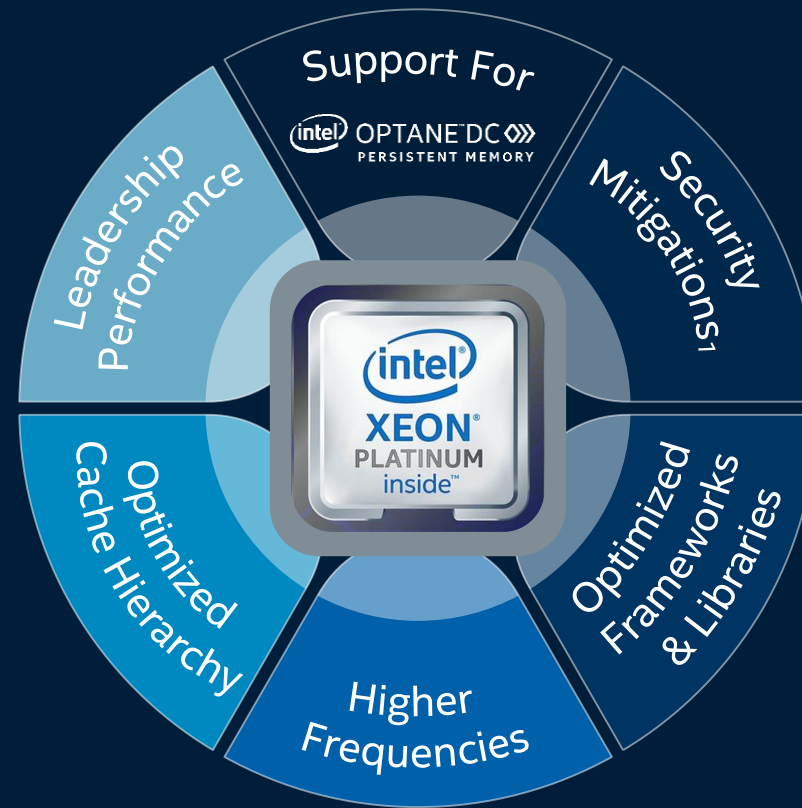
PERFORMANCE ENHANCEMENTS

INTEL® DEEP LEARNING BOOST: VECTOR NEURAL NETWORK INSTRUCTION (VNNI)

INTEL® OPTANE™ DC PERSISTENT MEMORY

1. No product or component can be absolutely secure

intel

18 June 2020 – Silicon & Software Launch
for AI & analytics

SOFTWARE & SOLUTIONS

oneAPI   OpenVINO   intel select solution

PROCESS

STORE

Intel Optane Persistent Memory 200 Series

LAUNCHING

3rd Gen Intel Xeon Scalable	GPU	Intel Stratix 10 NX	Gen 3 Intel Movidius VPU	Habana Gaudi & Goya
LAUNCHING	IN DEVELOPMENT	DISCLOSING	EARLY ACCESS	LIMITED SAMPLING

intel 3rd Gen Intel® Xeon® Scalable Processor

X^e

intel Stratix 10 NX

MOVIDIUS™ 3400VE L930NA14 QTD4b

habana An Intel Company
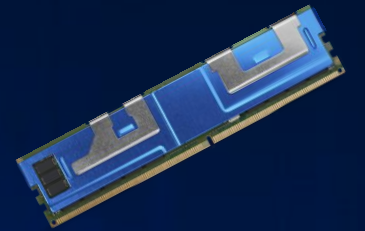
Intel SSD D7-P5500 Intel SSD P5600

LAUNCHING

INTEL 3D NAND SSD

CPU   GPU   FPGA   SPECIALIZED ACCELERATORS

WORKLOAD BREADTH   AI SPECIFIC

intel

3rd Gen Intel Xeon Scalable Processor

Built for today's AI-infused, data-intensive services

BUILT-IN AI ACCELERATION

Intel Deep Learning Boost
NEW: bfloat16*

1.9X
AVERAGE
PERFORMANCE GAIN
vs 5-YEAR-OLD PLATFORM

up to **1.98X**
HIGHER DATABASE
PERFORMANCE
vs 5-YEAR-OLD PLATFORM

intel
3rd Gen
Intel® Xeon®
Scalable Processor

BREAKTHROUGH MEMORY

Intel Optane Persistent Memory
200 series

FLEXIBILITY

Enhanced
Intel Speed Select Technology

TARGETED FOR 4S-8S SYSTEMS

Alibaba Cloud · AsiaInfo 亚信科技 5G 原力进化 · Bai<du>百度 · FACEBOOK · FUJITSU · GIGABYTE™ · 紫光集团 H3C · 海鑫科金 HISIGN TECHNOLOGY

Hewlett Packard Enterprise · HITACHI · HUAWEI · hyve solutions · inspur 浪潮 · Inventec Data Center Solutions · Lenovo

Neusoft · Quanta Computer · SAP · SAS · SUPERMICRO · Tencent Cloud · wiwynn® · ZTE

(intel)

Intel Xeon Scalable Roadmap

2019

2ND GEN
Intel Xeon Scalable

1-8
SOCKETS

Cascade Lake
PURLEY PLATFORM

2020

3RD GEN
Intel Xeon Scalable

4-8
SOCKETS

Cooper Lake
CEDAR ISLAND PLATFORM

LAUNCHING

1-2
SOCKETS

Ice Lake
WHITLEY PLATFORM

COMING LATER THIS YEAR

2021

NEXT GEN
Intel Xeon Scalable

1-8
SOCKETS

Sapphire Rapids
EAGLE STREAM PLATFORM

NEXT GEN DL BOOST: AMX

SILICON POWERED ON

(intel)

CSP ADOPTION
WITH 2ND GEN INTEL® XEON® SCALABLE PROCESSOR + INTEL® OPTANE™ DC PERSISTENT MEMORY

Google Cloud

Tencent Cloud

- MORE CAPACITY
- MINIMIZE DOWNTIME
- EXPECT LOWER TCO
- EXPECT IMPROVED TIME TO INSIGHTS
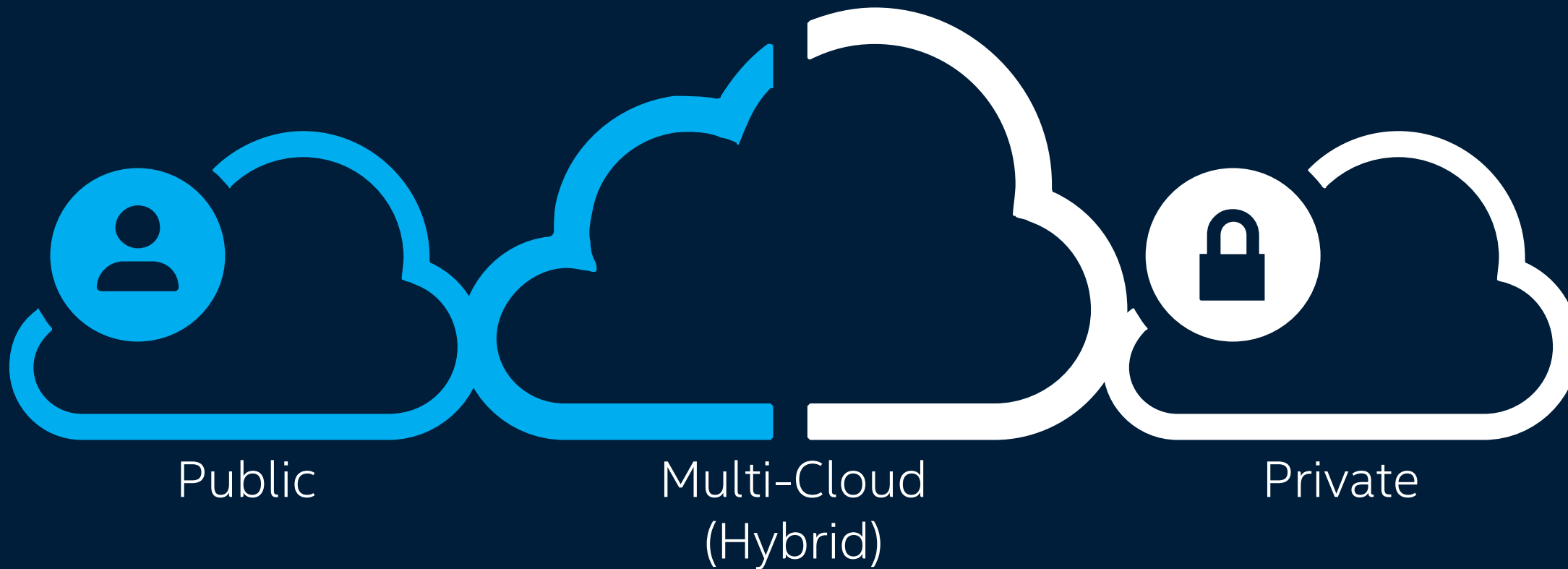
MODERN DATA CENTER SOLUTIONS

vmware®

SOLUTIONS

- vSphere
- vSAN – *Intel® Select Solution* ◆
- NSX
- VMware Cloud Foundation – *Intel Select Solution* ◆

RESOURCES

VMware DCG Resources Micro Site – NEW!

Microsoft

SOLUTIONS

- Windows Server
- WS2D & WSSD – *Intel Select Solution* ◆
- SQL Server – *Intel Select Solution* ◆
- Azure Stack – *Intel Select Solution* ◆

RESOURCES

Microsoft DCG Resources Micro Site – NEW!

redhat. IBM

SOLUTIONS

- Red Hat OpenShift Container - *Intel Select Solution* ◆
- Red Hat HCI
- Red Hat Cloud Forms Satellite ◆
- Red Hat NFVi - *Intel Select Solution*
- IBM Cloud Private

RESOURCES

Red Hat DCG Resources Micro Site – NEW!

HUAWEI Tencent 腾讯 Alibaba.com

SOLUTIONS

- Huawei FusionStorage - *Intel Select Solution* ◆
- Huawei FusionCube (HCI)
- Huawei FusionSphere - *Intel Select Solution* ◆
- Alibaba Apsara Stack (private)
- Tencent Virtual Private Cloud (VPC)

RESOURCES

Coming soon!

NUTANIX. Lenovo Hewlett Packard Enterprise inspur 浪潮

SOLUTIONS

- Nutanix Hyperconverged
- Cisco Hyperflex
- HPE Simplivity

RESOURCES

Coming soon!

openstack®

OPEN SDI

INDUSTRY-LEADING SOLUTIONS OPTIMIZED FOR INTEL® ARCHITECTURE

УХОД ОТ СТАНДАРТНОЙ ИНФАСТРУКТУРЫ (LEGACY IT)

CUSTOMER OPPORTUNITY:
BUILDING A DATA-CENTRIC FOUNDATION

Key partners who offer HCI:

vmware®   Microsoft

NUTANIX   HUAWEI

H3C   SANGFOR 深信服科技   CISCO

Multi-Cloud

Integrate Public Cloud

Modernize with HCI

Virtualize: On Prem Private Cloud

Start Here

Legacy Environment

УХОД ОТ ПОДРЯДЧИКА (OFF-PREM CLOUD)

CUSTOMER OPPORTUNITY:
BUILDING A DATA-CENTRIC FOUNDATION

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H3C   SANGFOR 深信服科技   cisco

Multi-Cloud

Integrate Public Cloud

Modernize with HCI

Modernize with HCI

Virtualize: On Prem Private Cloud

Integrate Private Cloud

Start Here

Legacy Environment

Start Here

Off-Prem Public Cloud

CSPs offering private cloud:

aws Outposts   Google Cloud Platform   Azure Stack

IBM   Tencent 腾讯   HUAWEI

金山KINGSOFT   Alibaba.com

ПРИМЕРЫ

Intel® Reference Solution for IBM Cloud Pak® Solutions on Red Hat® OpenShift®:

Cloud-Native Hybrid Cloud Platform

IBM Cloud Pak® for **Applications**	IBM Cloud Pak® for **Integration**	IBM Cloud Pak® for **Multicloud Management**	IBM Cloud Pak® for **Data**	IBM Cloud Pak® for **Automation**
Developer and DevOps Tools	API Lifecycle	Security/Compliance Management	Organize	Operational Excellence
Modernization Toolkit Frameworks and Runtimes	Messaging and Events App and Data Integration	App/Infrastructure Multicluster	Analyze Connect	Workflow and Decisions Content
Red Hat OpenShift Container Platform and Operational Services	**Red Hat** OpenShift Container Platform and Operational Services	**Red Hat** OpenShift Container Platform and Operational Services	**Red Hat** OpenShift Container Platform and Operational Services	**Red Hat** OpenShift Container Platform and Operational Services

IBM Cloud Pak Solutions on Red Hat OpenShift, Powered by Intel

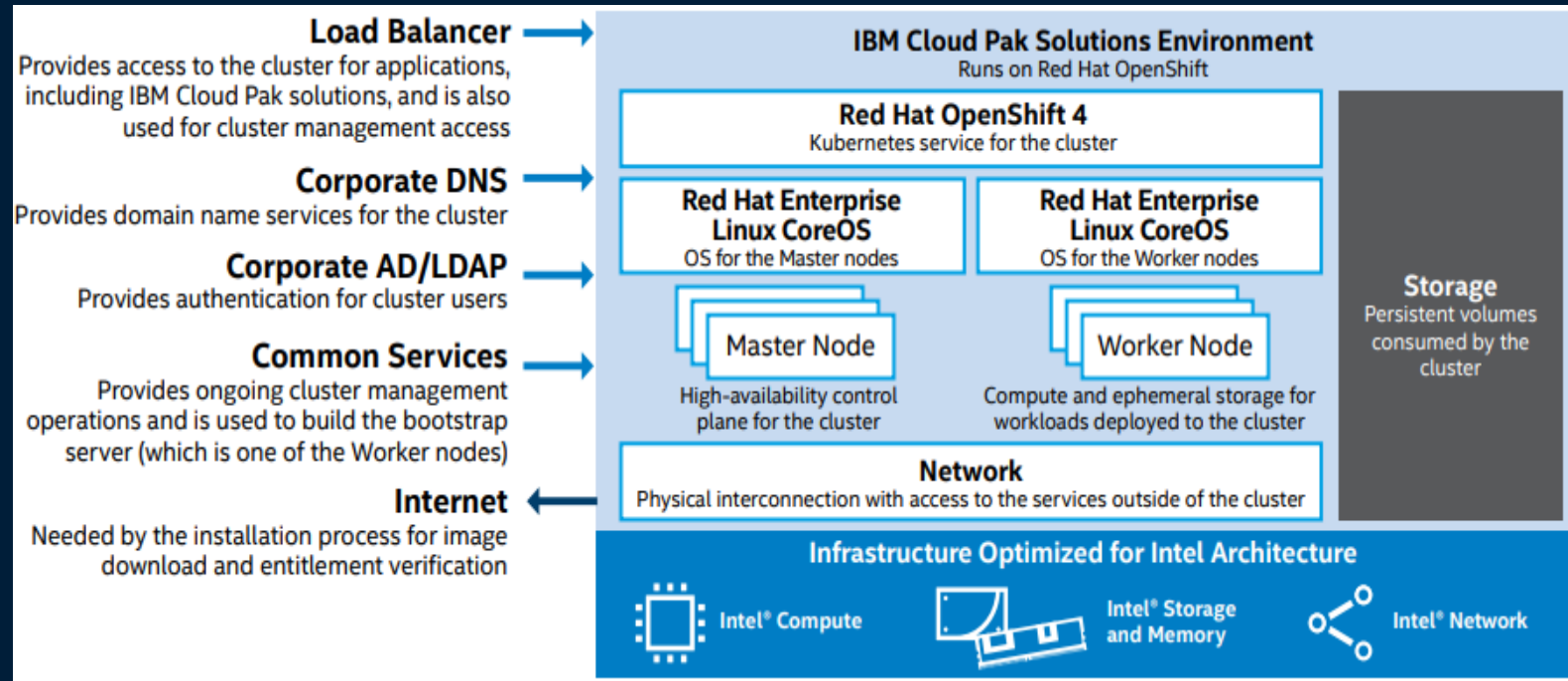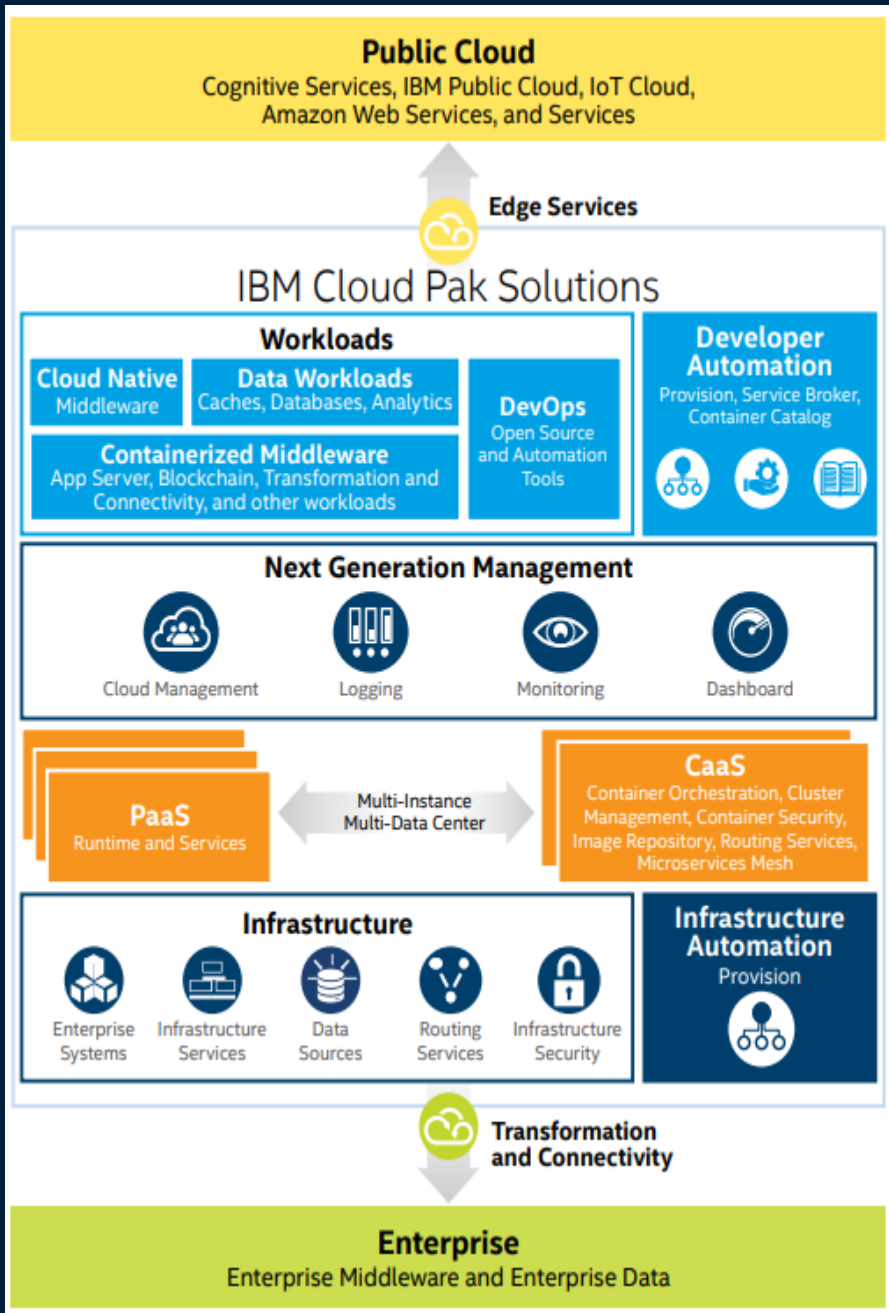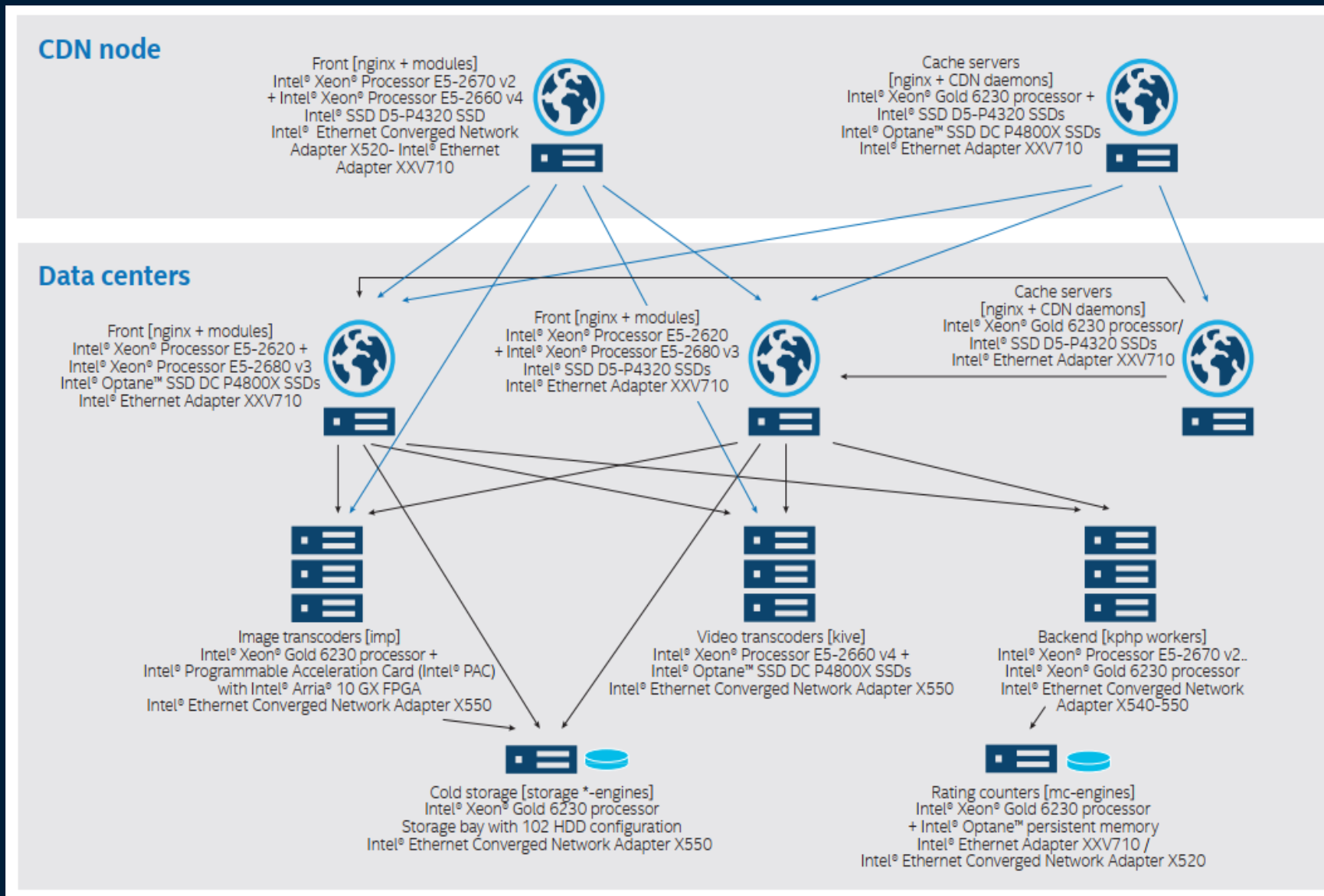A hybrid-multicloud solution that runs in the cloud, on-premises, or at the edge

Table A6. Hardware Bill of Materials for Virtualized Small, Large, and Edge Configurations

HARDWARE	INTEL® REFERENCE SOLUTION FOR IBM CLOUD PAK SOLUTIONS (Virtualized)		
	Small Configuration	Large Configuration	Edge Configuration
Physical Nodes	4	6	2
Processor	2x Intel® Xeon® Gold 6226R processor (2.9 GHz, 16 cores, 32 threads) or a higher number Intel Xeon Scalable processor	2x Intel Xeon Gold 6248R processor (3.0 GHz, 24 cores, 48 threads) or a higher number Intel Xeon Scalable processor	2x Intel Xeon Silver 4210R processor (2.4 GHz, 10 cores, 20 threads) or a higher number Intel Xeon Scalable processor
Memory	384 GB or higher (12x 32 GB DDR4-2400 MHz or 2666 MHz)	384 GB or higher (12x 32 GB DDR4-2666 MHz)	192 GB[a] or higher (6x 32 GB DDR4-2400 or 2666 MHz)
Boot Drive	2x Intel® SSD D3-S4510 Series 480 GB 2.5-inch RAID1	2x Intel SSD D3-S4510 Series 480 GB 2.5-inch RAID1	2x Intel SSD D3-S4510 Series 480 GB 2.5-inch RAID1
Cache Tier	2x 375 GB Intel® Optane™ SSD DC P4800X (2.5" PCIe)	2x 375 GB Intel Optane SSD DC P4800X (2.5" PCIe)	2x 375 GB Intel Optane SSD DC P4800X (2.5" PCIe)
Capacity Tier	4x 2 TB (or more) Intel SSD DC P4510 (2.5" PCIe 3.1)	6x 2 TB Intel SSD DC P4510 (2.5" PCIe 3.1)	4x 1.92 TB (or more) Intel SSD DC D3-S4510 (2.5" PCIe 3.1)
Persistent Memory	None (optional)	1 TB (8x 128 GB)	None (optional)
Data Network	1x 25 GbE Intel® Ethernet Converged Network Adapter XXV710-DA2 dual-port or above	1x 25 GbE Intel Ethernet Converged Network Adapter XXV710-DA2 dual-port or above	1x 10 GbE Intel Ethernet Converged Network Adapter X710-DA2 dual-port or above
Management Network	Integrated 1 GbE (per node)	Integrated 1 GbE (per node)	Integrated 1 GbE (per node)
Additional Components	2x Intel® 8-Port PCIe Gen3 x8 Switch AIC (AXXP3SWX08080)	2x Intel 8-Port PCIe Gen3 x8 Switch AIC (AXXP3SWX08080)	2x Intel 8-Port PCIe Gen3 x8 Switch AIC (AXXP3SWX08080)

[a] A cost-optimized configuration uses 512 GB RAM (2x CPU, 16x 32 GB 2666 MHz DDR4). However, this is an unbalanced configuration and will decrease memory-access performance.

ВКОНТАКТЕ – ЧТО СДЕЛАНО

• VK re-engineered its storage architecture to lower the cost of storage while meeting its demanding performance requirements.

• VK upgraded the storage for frequently accessed data in its content delivery network (CDN) to Intel® SSDs with 3D NAND technology, and moved the most frequently used data to Intel® Optane™ SSDs.

• VK introduced Intel Optane persistent memory for the rating counter servers that support the newsfeed, migrating data away from more expensive DRAM.

• Intel® field programmable gate arrays (Intel® FPGAs) will be used to convert images on-the-fly from a single high-resolution master copy to the resolution needed for each user – reducing requirement to store multiple image sizes and formats

CDN node

Front [nginx + modules]
Intel® Xeon® Processor E5-2670 v2
+ Intel® Xeon® Processor E5-2660 v4
Intel® SSD D5-P4320 SSD
Intel® Ethernet Converged Network
Adapter X520- Intel® Ethernet
Adapter XXV710

Cache servers
[nginx + CDN daemons]
Intel® Xeon® Gold 6230 processor +
Intel® SSD D5-P4320 SSDs
Intel® Optane™ SSD DC P4800X SSDs
Intel® Ethernet Adapter XXV710

Data centers

Front [nginx + modules]
Intel® Xeon® Processor E5-2620 +
Intel® Xeon® Processor E5-2680 v3
Intel® Optane™ SSD DC P4800X SSDs
Intel® Ethernet Adapter XXV710

Front [nginx + modules]
Intel® Xeon® Processor E5-2620
+ Intel® Xeon® Processor E5-2680 v3
Intel® SSD D5-P4320 SSDs
Intel® Ethernet Adapter XXV710

Cache servers
[nginx + CDN daemons]
Intel® Xeon® Gold 6230 processor/
Intel® SSD D5-P4320 SSDs
Intel® Ethernet Adapter XXV710

Image transcoders [imp]
Intel® Xeon® Gold 6230 processor +
Intel® Programmable Acceleration Card (Intel® PAC)
with Intel® Arria® 10 GX FPGA
Intel® Ethernet Converged Network Adapter X550

Video transcoders [kive]
Intel® Xeon® Processor E5-2660 v4 +
Intel® Optane™ SSD DC P4800X SSDs
Intel® Ethernet Converged Network Adapter X550

Backend [kphp workers]
Intel® Xeon® Processor E5-2670 v2..
Intel® Xeon® Gold 6230 processor
Intel® Ethernet Converged Network
Adapter X540-550

Cold storage [storage *-engines]
Intel® Xeon® Gold 6230 processor
Storage bay with 102 HDD configuration
Intel® Ethernet Converged Network Adapter X550

Rating counters [mc-engines]
Intel® Xeon® Gold 6230 processor
+ Intel® Optane™ persistent memory
Intel® Ethernet Adapter XXV710 /
Intel® Ethernet Converged Network Adapter X520

ВКОНТАКТЕ - РЕЗУЛЬТАТЫ

• Diverting data from dynamic random-access memory (DRAM) to SSDs and Intel Optane persistent memory running in memory mode **significantly cut the cost of storing the hottest data**, according to VK.

• VK reported that it was able to **consolidate servers at a ratio of 2:1** using the new storage solution, supporting the continued data growth, with storage of up to 0.408PB in 1U, reducing power and cooling costs.[1]

• Upgrading the processor from the Intel® Xeon® Gold 6230 processor to the Intel® Xeon® Gold 6238R processor **cut the compute cost by 40 percent and improved performance per watt by 72 percent**[1], according to VK