intel | **Google** Cloud

SAP Migration on Google Cloud powered by Intel® Xeon® Processors

Partner Enablement Package

The business benefits of migrating SAP to Google Cloud powered by Intel technology

Contents

- Market Overview
- Intel SAP GCP Overview
- Choosing the Right Instance
- SAP RISE
- Edge Platform-as-a-Service
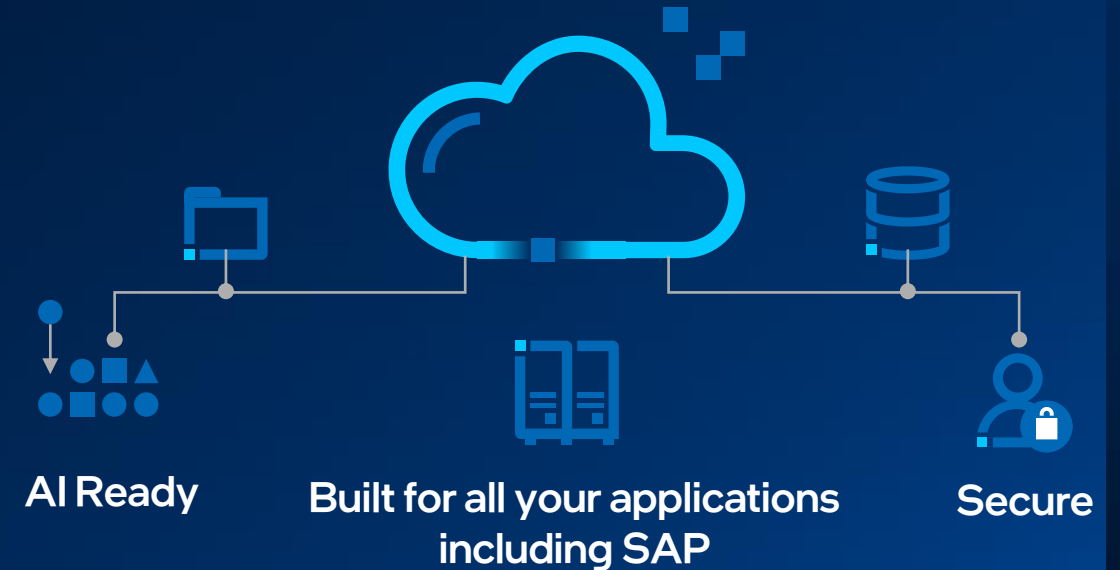- Call to Action
- Resources

Key Takeaways

Cloud Accelerates SAP Business Transformation

Businesses are migrating their SAP workloads to the cloud to improve scalability, performance, and cost efficiency, and to accelerate insights and innovation.

Google Cloud and Intel continue to provide state of the art instances, **optimized for SAP landscapes.**

Business Opportunity

- **99 of world's 100** largest companies are SAP customers[1]
- SAP customers generate **87% of total global commerce**[1]

AI Ready

Built for all your applications including SAP

Secure

1 "SAP Corporate Fact Sheet." April 22, 2024.

Key Takeaways

Meet mission-critical business needs with Google Cloud instances on 4th Gen Intel® Xeon® processors*

Google Cloud instances powered by Intel® Xeon® processors provide the opportunity to optimize your SAP landscape

C3 & C4 Instance

X4 Instance

M3 Instance

Modernize your SAP landscape onto S / 4HANA with the agility, insights and innovation from running it on Google Cloud, powered by Intel® Xeon® processors

Current Market Landscape

5 Cloud Predictions and Opportunities for 2024

Cloud computing is set for a transformative year. Navigate trends, future decisions, and customer conversations with these top cloud predictions.

1

Security, cloud and AI will be top focus areas in 2024

In a recent Intel survey, tech executives, developers, and architects selected their top priorities for 2024.

27%[1] Meet security requirements

27%[1] Adopt cloud services and solutions

22%[1] Adapt to new technology

17%[1] Adopt artificial intelligence (AI) / machine learning (ML)

11%[1] Improve efficiency and performance

2

Decision-makers will increasingly take a "cloud first" approach.

Enterprises are investing in cloud technology to pursue digital transformation and AI opportunities and overwhelmingly prefer cloud solutions when making new purchases.[2]

Investment in public cloud services is soaring

(US $1.1 trillion by 2027) and is notably higher than on-premises data center systems spending (US $275 billion).[2]

SaaS and cloud services are the top choices

For new application workloads, growing from 77% in 2022 to 91% in 2023.[3]

3

Enterprises will embrace a mix of workload locations

Organizations are staying flexible with their infrastructure and aren't afraid to distribute workloads.

Decision makers report that workloads are typically distributed by function:

89% choose cloud for **email, collaboration, and content**[1]

71% choose on-premises or public cloud for **security and confidential computing**[1]

12% choose edge or remote locations for **application development and deployment**[1]

In the last year, 17% of organizations moved at least one workload, service or application back on-premises from cloud, citing:

62% Cost savings

42% Latency

35% Security Concerns

intel

6

5 Cloud Predictions and Opportunities for 2024

Cloud computing is set for a transformative year. Navigate trends, future decisions, and customer conversations with these top cloud predictions.

4

AI and ML investment will drive new business opportunities

AI and ML continue to gain attention with signs pointing to fast growth of this segment.

More than 70% of CSPs and enterprises predict that **AI/ML will gain importance** for their companies in the next 3-5 years.[1]

Markets with potential for **high AI/ML platform spend** include banking (US $15 Billion), professional services (US $12 Billion), and retail (US 8 Billion).[1]

Cloud solution architects are especially interested in **generative AI**, with 97% already using in in some capacity and 61% interested in gaining certifications.[1]

5

Edge as a Service is the future

Edge as a Service – processing, analyzing, and storing data closer to where it's generated – is gaining increased interest among developers.

76% of developers are already using or planning to use Edge as a Service offerings in the next 12 to 18 months.[1]

Top drivers for adopting Edge as a Service include privacy and security requirements or concerns (55%), regulatory requirements (50%), and resilience to network faults(47%).[1]

81% of Edge as a Service offerings are preferred through public and cloud providers like Amazon Web Services (AWS) Azure, and Google.[1]

intel

Cloud Accelerates SAP Business Transformation

Innovate, integrate, orchestrate, and manage across your **SAP Cloud Infrastructure**, with **Intel technology**

- Intel-based cloud instances are available across Google Cloud instances. RISE with SAP is standardized on Intel® Xeon® processors

- Meet your SAP landscape's needs with a range of powerful SAP-certified, Intel-based instances in the cloud

- Move data to, from, and between your servers with minimal latency and zero cost

- Get the flexibility, speed, and agility to innovate without jeopardizing security

Today's clouds are powered by Intel

Through co-engineering and business relationships with top CSPs, Intel has delivered five generations of custom silicon built for cloud scale.[1]

intel®
XEON®

AI ready

Accelerates innovation with your data, all of it, creating new insights with AI

Built for all your applications including SAP

Intel architecture guides your cloud journey, allowing you to modernize and extend existing applications and build new cloud native apps
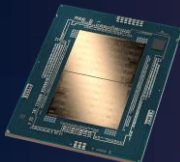
Secure

The cloud, powered by Intel, is a secure and trusted foundation for computing

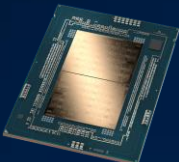# Intel® Xeon® Scalable Platforms

4th Gen Intel® Xeon® processor

Scalable Platform
up to
16S/32TB
SAP HANA Optimized

Performance Platform
up to
1.2x
vs. 2nd Gen Intel Xeon
SAP HANA Analytical (OLAP) Performance[1]

Business Application Platform
up to
2.3x
vs. 2nd Gen Intel Xeon
Higher SAPS[2]

5th Gen Intel® Xeon® processor

Scalable Platform
up to
2S / 4TB*
SAP Business Applications & HANA

Performance Platform
up to
1.8x
vs. 2nd Gen Intel Xeon
SAP HANA Analytical (OLAP) Performance[3]

Business Application Platform
up to
4.1x
vs. 2nd Gen Intel Xeon
Higher SAPS[4]

*) HANA TDI up to 6TB, subject to the OEM partner's offering
1 and 3 - See backup slide 46; 2 and 4, see slide 47 for details. Results may vary.

intel   9

Intel | SAP | Google Cloud
A Winning Combination

A Winning Combination

Proven Leadership, Certified Scalability, Performance Assurance

> Google Cloud is an early adopter of next gen Intel technologies

> Intel® platforms are tuned and certified for SAP workloads at GCP

intel.

SAP

Google Cloud

Why Intel and SAP in the Cloud?

Certified SAP Instances Running Intel® Technology Allow You to design for performance and/or TCO.

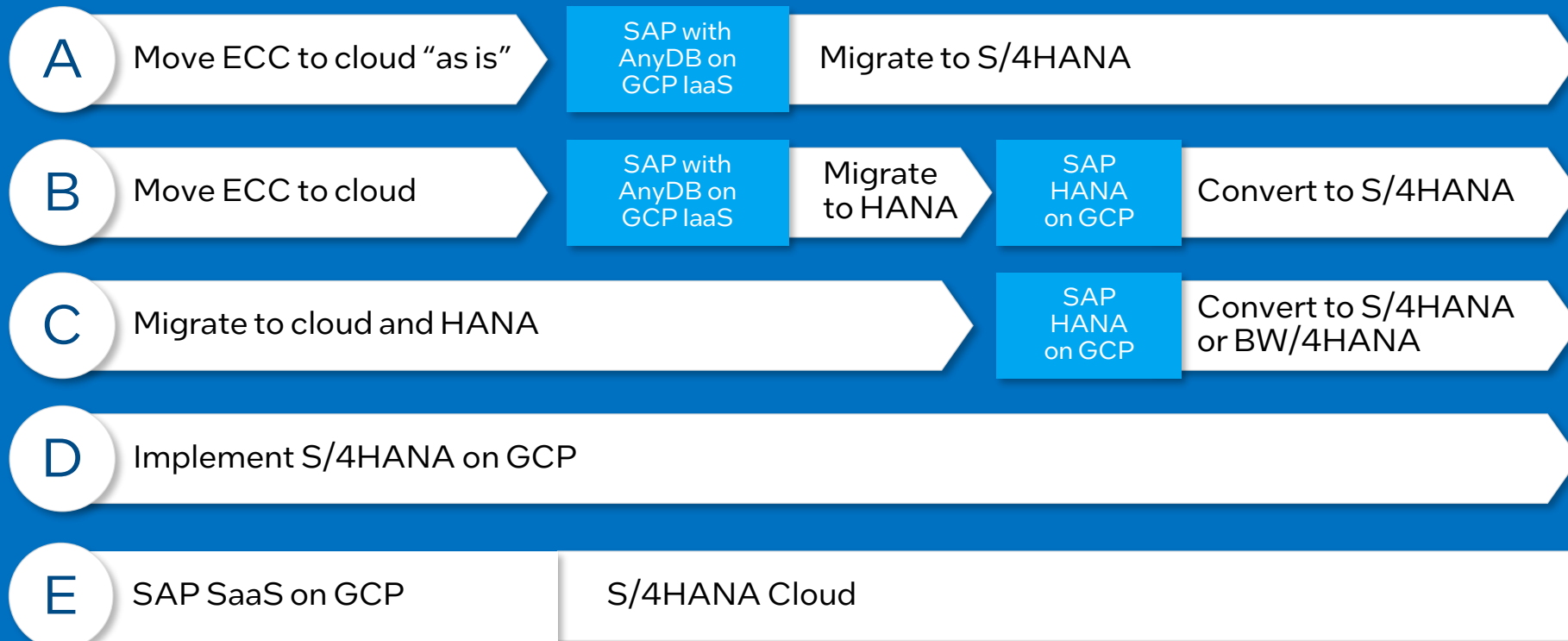|		
Enable a single source of truth	Grow business value from faster insights	With massive memory capacity, enable near-real-time analysis at the source without having to make multiple copies of data. Get closer to your goal of a single source of truth.
Run on pre-validated, certified SAP HANA cloud instances	Safe, future-proof cloud investment	Reassurance that your cloud instances are running on modern Intel® technology that has been validated for SAP HANA workloads to perform more optimally and securely.
Simplify your SAP HANA landscape	Achieve high return on your cloud investment	Consolidate your server footprint to realize operational efficiencies for quality assurance (QA), high availability (HA), disaster recovery (DR), and business intelligence (BI). Consolidate your Application Server Landscape.

intel

SAP Software on Google Cloud Platform

Accelerate decision-making with high-performance SAP HANA instances running on the latest Intel® technologies.

This certification is the result of a close partnership with SAP and extensive development work, stringent testing, and thorough configuration optimization.

Accelerate your SAP journey

- Digital transformation: SAP-certified VMs from a public cloud provider (up to 32TB)

- Business continuity: Run business-critical SAP workloads
  - Zero-downtime maintenance
  - Low-latency global network
  - Artificial intelligence (AI)-enhanced security
  - Expert SAP enterprise support
  - Reduced complexity in managing SAP infrastructure

- New X4 instances series based on 4th Gen Intel® Xeon® Scalable processors includes three new bare metal instance types to address extra-large in-memory databases such as SAP HANA up to 32TB.

- New C4 instances based on 5th Gen Intel® Xeon® Scalable processors deliver significantly improved performance and capacity for SAP HANA and SAP NetWeaver applications.
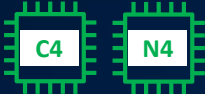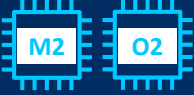
Moving to SAP S/4HANA
Moving an SAP ERP landscape to GCP

A — Move ECC to cloud "as is" → SAP with AnyDB on GCP IaaS → Migrate to S/4HANA →

B — Move ECC to cloud → SAP with AnyDB on GCP IaaS → Migrate to HANA → SAP HANA on GCP → Convert to S/4HANA →

C — Migrate to cloud and HANA → SAP HANA on GCP → Convert to S/4HANA or BW/4HANA →

D — Implement S/4HANA on GCP →

E — SAP SaaS on GCP → S/4HANA Cloud

S/4HANA on GCP
- Industry solutions
- Cloud analytics
- S/4HANA
- HANA

Choosing the Right Instance

intel

Intel® Architecture Instance Types   18+ GCP Families

	General Purpose	Compute Optimized	Memory Optimized	Storage Optimized
	General purpose instances provide a balance of compute, memory and networking resources, and can be used for a variety of diverse workloads.	Compute Optimized instances are ideal for compute bound applications that benefit from high performance processors.	Memory optimized instances are designed to deliver fast performance for workloads that process large data sets in memory.	Storage optimized instances are designed for workloads that require high, sequential read and write access to very large data sets on local storage.
5th Gen Xeon (Emerald Rapids)	C4 N4			
4th Gen Xeon (Sapphire Rapids)	C3	H3	X4	Z3
3rd Gen Xeon (Ice Lake)	N2		M3	
2nd Gen Xeon (Cascade Lake)	N2	C2	M2 O2	
1st Gen Xeon (Skylake)	N1		M1	

SAP-Certified Google Cloud Instances
Not exhaustive – focused on latest Intel® Xeon® processor-based instances

Balanced workloads at best Price/Performance

Compute-intensive, HPC, data lakes

High performance databases, in-memory databases

General Purpose

C4 (new)
Up to 176 vCPU with 2/4/8GB per vCPU
Total of up to 1.4TB / VM
5th Gen Intel® Xeon® Processor &
Intel IPU (SmartNIC)

C3
Up to 176 vCPU with 2/4/8GB per vCPU
Total of up to 1.4TB / VM
4th Gen Intel® Xeon® Processor &
Intel IPU (SmartNIC)

N2
Up to 128 vCPU with 8GB per vCPU
Total of up to 864GB / VM
3rd Gen Intel® Xeon® Processor

N1
Up to 96 vCPU with 6.5GB per vCPU
Total of up to 624GB / VM
1st Gen Intel® Xeon® Processor

Compute Optimized

C2
Up to 60 vCPU with 4GB per vCPU
Total of up to 240 GB / VM
2nd Gen Intel Xeon Processor

Memory Optimized

M3
Up to 128 vCPU with 30.5GB per vCPU
Total of up to 3.8TB / VM
3rd Gen Intel Xeon Procsesor

M2
Up to 416 vCPU with 30.5GB per vCPU
Total of 6-12TB / VM
2nd Gen Intel Xeon Processor

M1
Up to 160 vCPU with 15GB per vCPU
Total of 1-4TB / VM
1st Gen Intel Xeon Processor

X4 (new)
Baremetal Platforms
Up to 1920vCPU & up to 17GB per vCPU
Up to 32TB Memory
4th Gen Intel Xeon Processor

O2
Baremetal Platforms
Up to 896vCPU & up to 27GB per vCPU
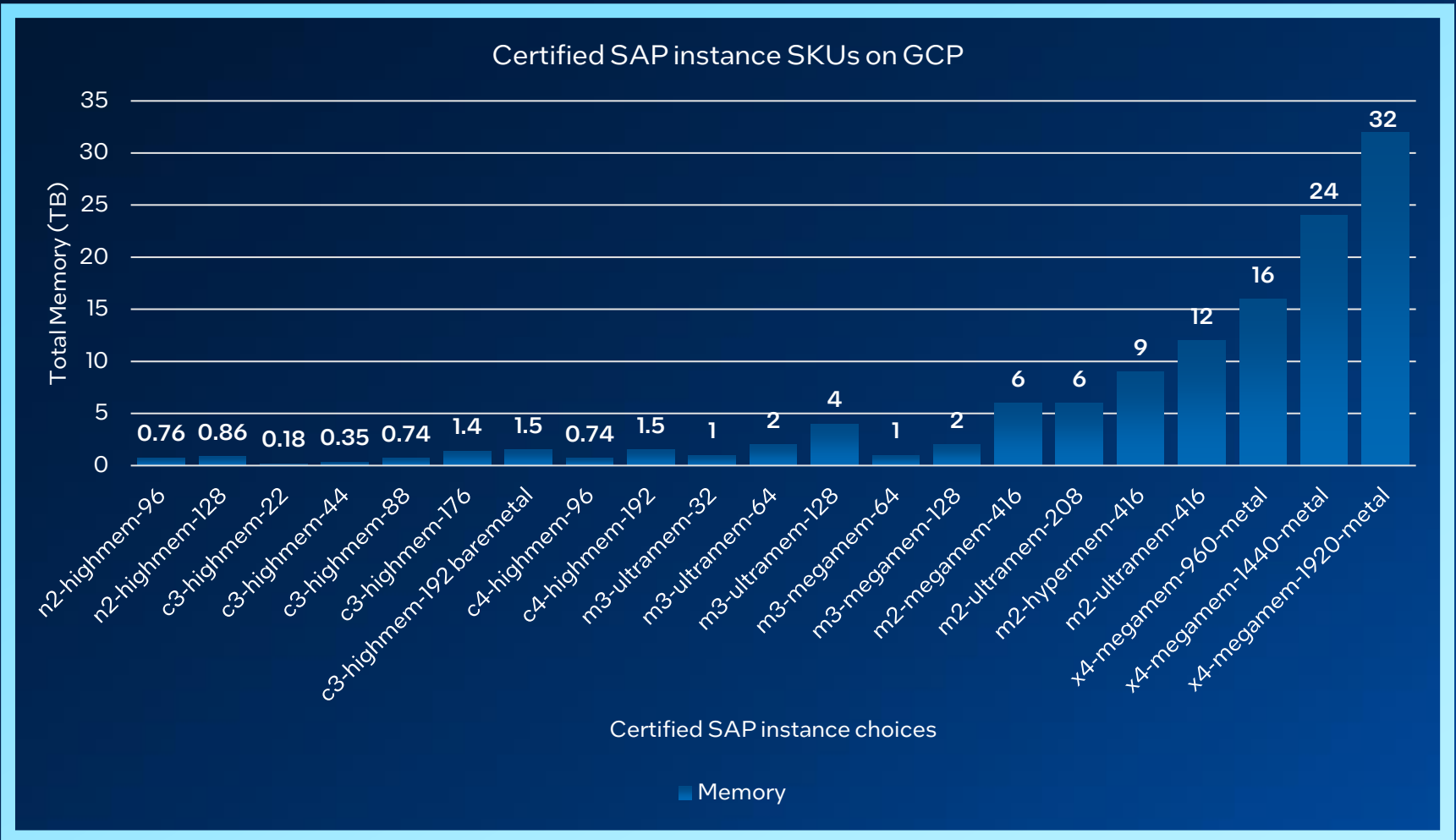Up to 24TB Memory
2nd Gen Intel Xeon Process

See https://cloud.google.com/compute/docs/machine-resource for all variations.

SAP-Certified Google Cloud Instances

Supports different types of SAP workloads OLTP/OLAP/SAP Business One

Customers can choose from multiple VM instance types **up to 12 TB per node**

Bare metal instances provide **up to 32 TB** for SAP HANA Database

Certified SAP instance SKUs on GCP

Instance	Total Memory (TB)
n2-highmem-96	0.76
n2-highmem-128	0.86
c3-highmem-22	0.18
c3-highmem-44	0.35
c3-highmem-88	0.74
c3-highmem-176	1.4
c3-highmem-192 baremetal	1.5
c4-highmem-96	0.74
c4-highmem-192	1.5
m3-ultramem-32	1
m3-ultramem-64	2
m3-ultramem-128	4
m3-megamem-64	1
m3-megamem-128	2
m2-megamem-416	6
m2-ultramem-208	6
m2-hypermem-416	9
m2-ultramem-416	12
x4-megamem-960-metal	16
x4-megamem-1440-metal	24
x4-megamem-1920-metal	32

Certified SAP instance choices

■ Memory

intel

Large Memory Capacity to Run & Scale SAP
M3: Memory Optimized for SAP HANA

Optimized for Large in-memory databases and In-memory data analytics.

Cloud Agile: Faster instances at lower cost

- Pricing of M3 VMs per vCPU hour and per GB of memory are the same as for M1
- M3 provides up to 128vCPUs and 3,904 GB RAM

Reliability: Reliable VMs for your most business-critical applications

- Memory Poisoning Recovery

SAP Certified

Consistent performance

- Numa locality for consistent performance
- Simultaneous multi-threading (SMT) for VMs

Local SSD

Advanced networking

Lowest cost/GB among VM families

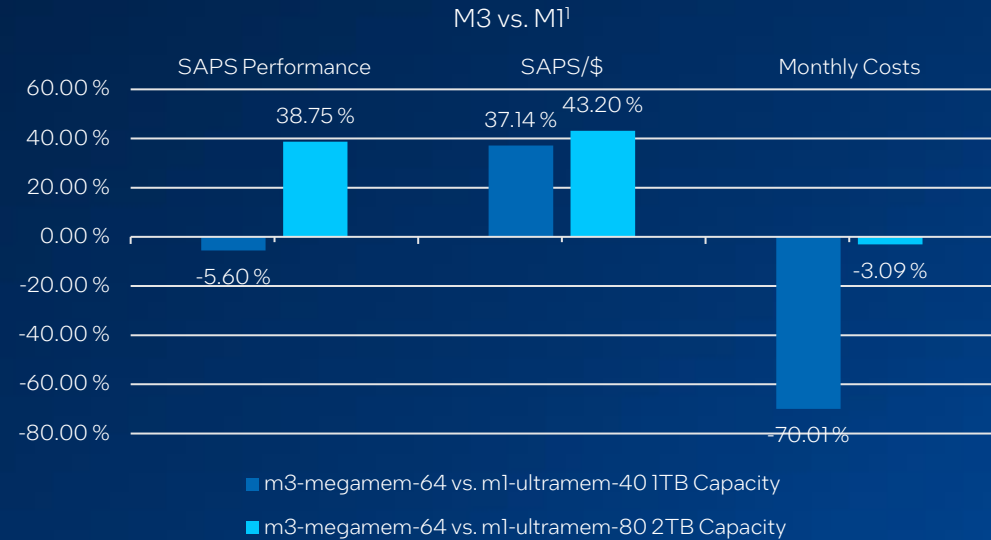| Machine types	vCPUs	Memory (GB)	Default egress bandwidth (Gbps)*	Tier 1 egress bandwidth (Gbps)[†]
m3-ultramem-32	32	976	32	N/A
m3-ultramem-64	64	1,952	32	50
m3-ultramem-128	128	3,904	32	100
m3-megamem-64	64	976	32	50
m3-megamem-128	128	1,952	32	100

M3 – Family
Cost Saving Opportunity & Performance Improvements over previous generations

Cloud Agile: Faster instances at lower cost

- M3-megamem-64 with 1TB capacity delivers 37% more SAPS/$ while Monthly Cost are reduced by 70% (3 years committed usage) at similar performance (SAPS)

- M3-megamem-64 with 2TB capacity delivers 38% more SAPS, 43% better SAPS/$ (3 years committed usage) at similar monthly price

- M3 provides up to 4TB and up to 188.000 SAPS

Instance	vCPU	Memory	SAPS*
m3-ultramem-32	32	976	47835
m3-ultramem-64	64	1,952	95670
m3-ultramem-128	128	3,904	184800
m3-megamem-64	64	976	99170
m3-megamem-128	128	1,952	187620

M3 vs. M1[1]

	SAPS Performance	SAPS/$	Monthly Costs
	-5.60 % / 38.75 %	37.14 % / 43.20 %	-70.01 % / -3.09 %

■ m3-megamem-64 vs. m1-ultramem-40 1TB Capacity
■ m3-megamem-64 vs. m1-ultramem-80 2TB Capacity

60.00 %
40.00 %
20.00 %
0.00 %
-20.00 %
-40.00 %
-60.00 %
-80.00 %

[1] See backup slide 24 for workloads and configurations. Results may vary.

intel   20

Introducing Google C4 Family
Powered by 5th Gen Intel® Xeon® Processor

Optimized for Small / Medium size SAP Landscapes

SAP Netweaver, AnyDB and SAP HANA Certified to deliver price-performance and enterprise-grade reliability*

- Powered by 5th Gen Intel® Xeon® Processor with High Performance DDR5 Memory
- Optimized NUMA architecture to deliver consistent performance
- Utilize Intel / Google co-developed Infrastructure Processing Unit (IPU) to offload networking and enable Hyperdisk
- Delivering high performance block-storage through Google Hyperdisk
- Improved ML training and inference performance through Intel AMX (Advanced Matrix Extension) enabled in C4 family
- Local SSD Support with up to 12TB (available in coming months)
- Scale up to 192 vCPU
- Available Now: C4-standard with up to 720GB and C4-highmem with up to 1.5TB
- The C4 family is available in the following zones and regions

C4-highmem for SAP HANA

- SAP HANA Scale-Up certification with up to 1.5TB SAP HANA DB Capacity

Instance	vCPU	Memory
c4-highmem-32	32	248
c4-highmem-48	48	372
c4-highmem-96	96	744
c4-highmem-192	192	1488

C4-standard for SAP Application Tier

- SAP Netweaver certification with up to 720GB Memory Capacity

Instance	vCPU	Memory
c4-standard-32	32	120
c4-standard-48	48	180
c4-standard-96	96	360
c4-standard-192	192	720

Google C4 Family for SAP Landscape
More SAPS Performance at lower costs

C4 family delivers up to 35%[1] increased SAPS performance with an additional, up to 25%[1] better SAPS/$ ratio compared to C3 family

Instance Type:
C4
c4-highmem-48

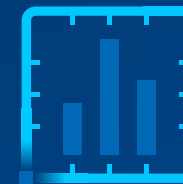## Up to 35%
more SAPS/instance
with similar memory size
Compared to c3-highman-44 (Previous Gen)

Instance Type:
C4
c4-highmem-48

Up to 25%
more SAPS/$
with similar memory size
Compared to c3-highman-44 (Previous Gen)

C4 Family Advantage
Outperforms AMD Instances c3d and n2d[1]

C4 Instance are the most performant GCP instances available today

Intel based C4 family vs. AMD N2d family

Instance Type:
C4
c4-highmem-8

Up to 62%
more SAPS/instance
with similar memory size
Compared to n2d (AMD Milan)

Instance Type:
C4
c4-highmem-8

Up to 41%
more SAPS/$
with similar memory size
Compared to n2d (AMD Milan)

Intel based C4 family vs. AMD C3d family

Instance Type:
C4
c4-highmem-16

Up to 19%
more SAPS/instance
with similar memory size
Compared to C3d (AMD Milan)

Instance Type:
C4
c4-highmem-16

Up to 11%
more SAPS/$
with similar memory size
Compared to C3d (AMD Milan)

Introducing Google X4 Family
Entering the new SAP HANA Scale Up & Performance Era

# 2.1x higher performance for SAP HANA*

SAP HANA Certified platforms offering the largest Scale-Up Option with up to 32TB*

- Powered by 4th Gen Intel ® Xeon® Processor with High Performance DDR5 Memory
- Optimized NUMA architecture to deliver consistent performance
- Utilize Intel / Google co-developed Infrastructure Processing Unit (IPU) to offload networking and enable Hyperdisk
- Utilize Intel / Google co-developed Infrastructure Processing Unit (IPU) to offload networking and enable Hyperdisk
- High performance computing for SAP Landscapes

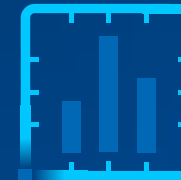| Instance	vCPU	Memory	SAPS
x4-megamem-960-metal	960	16,384	1.389.200
x4-megamem-1440-metal	1,440	24,576	n/a
x4-megamem-1920-metal	1,920	32,768	n/a

Instance Type:
X4
X4-megamem-960
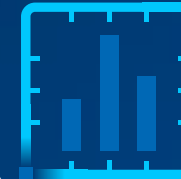
Up to 2.1x
more SAPS/instance with similar memory size
Compared to O2 (Previous Generation)

Instance Type:
X4

33%
more SAP HANA DB Capacity Per Node
Compared to O2 (Previous Generation)

The Right Instance for the Right Workload

SAP NetWeaver Applications (ECC, S/4)

Instance Family	vCPU	Memory (GB)	Supported for NetWeaver[1]	Supported for HANA
C4-standard	2-192	7-720	Yes	No
C2-standard	4-60	16-240	Yes	No
N2-standard	2-128	8-512	Yes	No

Small/Medium SAP HANA (up to 1.5TB)

Instance Family	vCPU	Memory (GB)	Supported for NetWeaver[1]	Supported for HANA
C4-highmem	2-192	15-1488	Yes	Yes
N2-highmem	2-128	16-844	Yes	Yes
M1-megamem	96	1,433	Yes	Yes

Large SAP HANA (1TB – 32TB)

Instance Family	vCPU	Memory (GB)	Supported for NetWeaver[1]	Supported for HANA
M3	32-128	1024 - 4096	Yes	Yes
M2	208-416	5,888-11,776	Yes	Yes
X4[2]	960-1920	16,364-32,768	No	Yes

[1] NetWeaver applications include ECC, S4, BW and typically run on separate application instances from HANA. Check SAP Note 2456432 for details.
[2] Bare-Metal Systems.

intel

25

Consolidate SAP Application Server
from N1 to C4 Instances

Old

					Total
N1-standard-8	N1-standard-8	N1-standard-8	N1-standard-8	N1-standard-8	
8 vCPU / 30GB	8 vCPU / 30GB	8 vCPU / 30GB	8 vCPU / 30GB	8 vCPU / 30GB	40 vCPU / 150GB
8360 SAPS	8360 SAPS	8360 SAPS	8360 SAPS	8360 SAPS	41800 SAPS
$576,70/Month	$576,70/Month	$576,70/Month	$576,70/Month	$576,70/Month	$2883,50/Month

1st Gen Intel® Xeon® Processor

New

		Total
C4-standard-16		
16 vCPU / 60GB	69% Reduced Costs · Equivalent SAPS Performance	16 vCPU / 60GB
39380 SAPS		39380 SAPS
$876,50/Month		$876,50/Month

Additional TCO Savings with Dev/Test Tier Consolidation

5th Gen Intel® Xeon® Processor

xeon PLATINUM

No sacrifice; Consolidate SAP AppTier

Optimize & Reduce your SAP Landscapes

Utilize Latest GCP C4 Family for SAP

intel

Consolidate SAP Application Server
from N2 to C4 Instances

Old

N2-standard-4	N2-standard-4	N2-standard-4	N2-standard-4	N2-standard-4	Total
4 vCPU / 16GB	4 vCPU / 16GB	4 vCPU / 16GB	4 vCPU / 16GB	4 vCPU / 16GB	20 vCPU / 80GB
5263 SAPS	5263 SAPS	5263 SAPS	5263 SAPS	5263 SAPS	26315 SAPS
$389,99/Month	$389,99/Month	$389,99/Month	$389,99/Month	$389,99/Month	$1949,95/Month

3rd Gen Intel® Xeon® Processor

New

C4-standard-16	55% Reduced Costs	50% SAPS additional Headroom	Total
16 vCPU / 60GB			16 vCPU / 60GB
39380 SAPS			39380 SAPS
$876,50/Month			$876,50/Month

Additional TCO Savings with Dev/Test Tier Consolidation

5th Gen Intel® Xeon® Processor

intel xeon PLATINUM

No sacrifice; Consolidate SAP AppTier

Optimize & Reduce your SAP Landscapes

Utilize Latest GCP C4 Family for SAP

Run Your Business on SAP HANA in Google Cloud on Intel

- Purpose built for mission-critical SAP workloads
  SAP HANA certified and supported

- SAP resources in - 29 Regions and 88 Zones

40 REGIONS

121 ZONES

187 NETWORK EDGE LOCATIONS

AVAILABLE IN 200+ COUNTRIES AND TERRITORIES

COMING SOON! Google Cloud will continue expanding into the following regions: Mexico, Malaysia, Thailand, New Zealand, Greece, Norway, Austria and Sweden.

Strategic Collaboration:
Intel and SAP RISE

Strategic Collaboration: Intel and SAP RISE

Intel and SAP RISE announced a strategic collaboration to deliver a more powerful and sustainable SAP® software landscapes in the cloud. Designed to help customers derive greater scalability, agility and consolidation of existing SAP software landscapes, the collaboration deepens Intel's focus on delivering extremely powerful and secure instances for SAP, powered by Intel® Xeon® processors.

Intel embarks on the SAP RISE Journey in the coming years with the migration to S/4HANA

LEARN MORE

RISE with SAP
Powered by Intel Technology

1 Migrate to S/4HANA

Intel XEON PLATINUM

All Options require SAP Certified Infrastructure

- SAP Certified Appliances (OEMs)
- SAP Certified IaaS (CSPs)
- SAP Certified Hypervisor on Intel x86 (Broadcom/VMWare, Nutanix, SUSE KVM)

Intel powers the worldwide largest ecosystem of SAP certified Infrastructure

SAP RISE Commercial Framework

1 RISE with SAP – S/4HANA Cloud – **Private Edition**

Private cloud within Hyperscalers (Azure, AWS, GCP, Alibaba) or SAP DataCenter

2 RISE with SAP S/4HANA – Private Edition – **Customer Data Center Option**

Moving Customers to cloud, without moving their data center

Private cloud within Customer Data Center (HPE Greenlake, Dell Apex, Lenovo TruScale, Fujitsu uSCALE)

3 S/4HANA / SAP ECC

Customer Data Center or Partner IaaS or DCaaS with Co-Location

Intel XEON PLATINUM

Intel Supports your Journey to SAP S4/HANA

A — Re-host / Re-platform SAP ECC

SAP ECC with AnyDB — Migrate to S/4HANA

SAP ECC with AnyDB — Migrate to Suite on HANA → **SAP Suite on HANA** — Migrate to S/4HANA

B — Migrate from SAP ECC → **SAP Suite on HANA** — Migrate to S/4HANA

C — Migrate with SAP RISE from SAP ECC → **SAP RISE** — Migrate to S/4HANA

D — New S/4HANA or BW/4HANA

E — New on SAP RISE
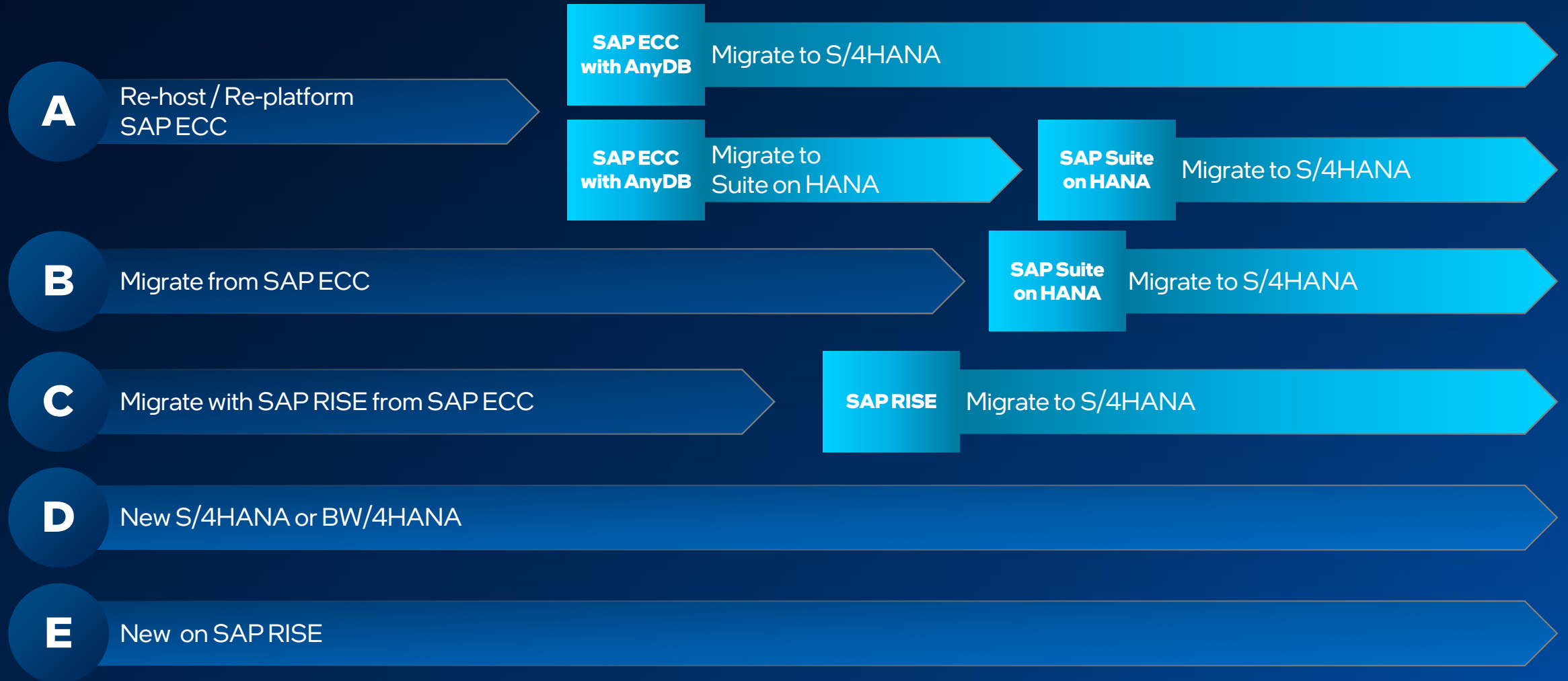
Intel® Xeon® Scalable Platform - 360° Support for SAP

Re-Host/Re-Platform/Transform

ECC EP 8

Supported until 2030

Releaed in 2004

Microsoft

SAP

Oracle

IBM

Greenfield/ Migrate

Suite on HANA

SAP

Releaed in 2012

Supported until 2030

S/4HANA

Supported until 2040

Releaed in 2015
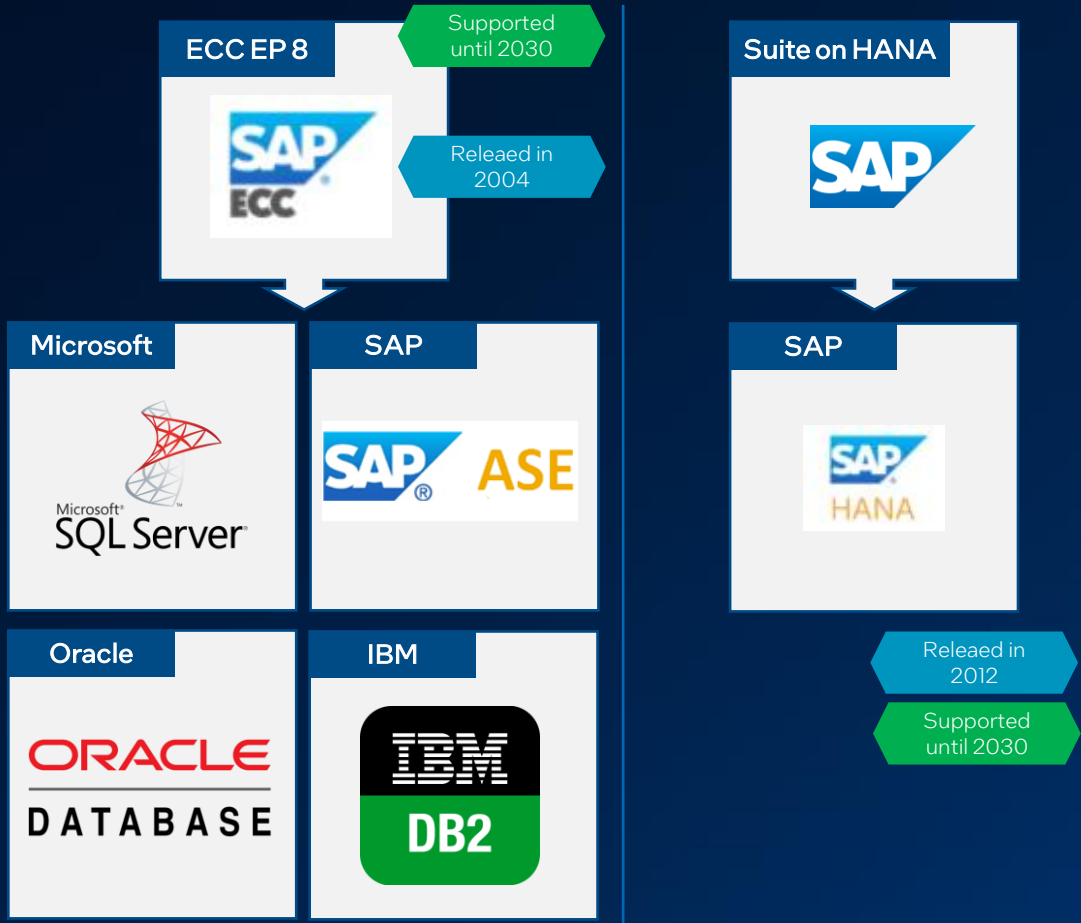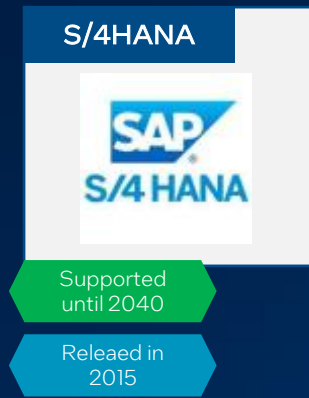
- Intel Xeon Platform powers the SAP Landscape for the last 2 decades

- Benefit from Intel's partnership with SAP, Microsoft, Oracle and IBM to deliver highest performance, resilience at lower TCO for their database products

- Intel enables an open ecosystem of SAP hardware and software vendors to provide highest flexibility

- Future Proof Investment in case you Re-Host or Re-Platform your existing SAP Landscape or start your migration to S4/HANA

- Scale-Up to 32TB SAP HANA and consolidate your SAP Landscape with Intel® Xeon® scalable processors to optimize TCO and help meet your sustainability goals

Edge Platform-as-a-Service (PaaS) from SAP and Intel
Enabled by SAP RISE & SAP BTP

intel

Introducing Edge Platform-as-a-Service from SAP and Intel

Intel's new commercial software platform enabling enterprises to build, deploy, run, and manage scalable edge and AI solutions on standard hardware with cloud-like simplicity

A Modular Platform for Network and Edge Transformation

Foundational components that drive network and edge transformation

Industry Solutions
AI-enabled edge end-solutions optimized for various use-cases
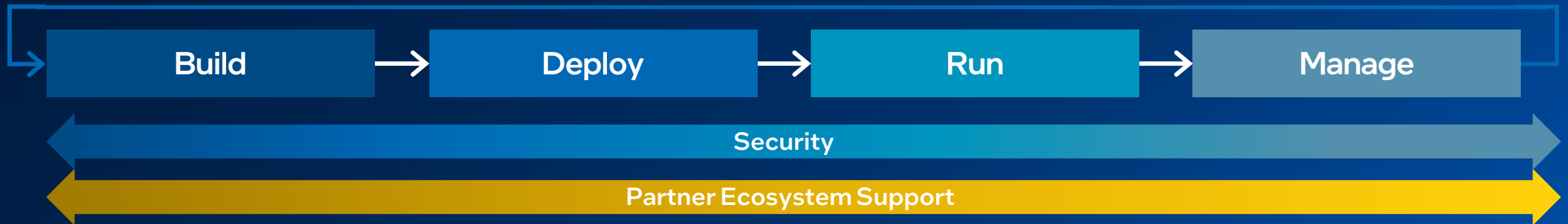
AI and Applications
Tools to build and deploy edge-native application software and AI

Infrastructure Software
Secure infrastructure software for edge-to-cloud hybrid implementations

Foundational HW built for the edge
Platform Hardware built for the edge (CPUs, GPUs, network accelerators)

Build → Deploy → Run → Manage

Security

Partner Ecosystem Support
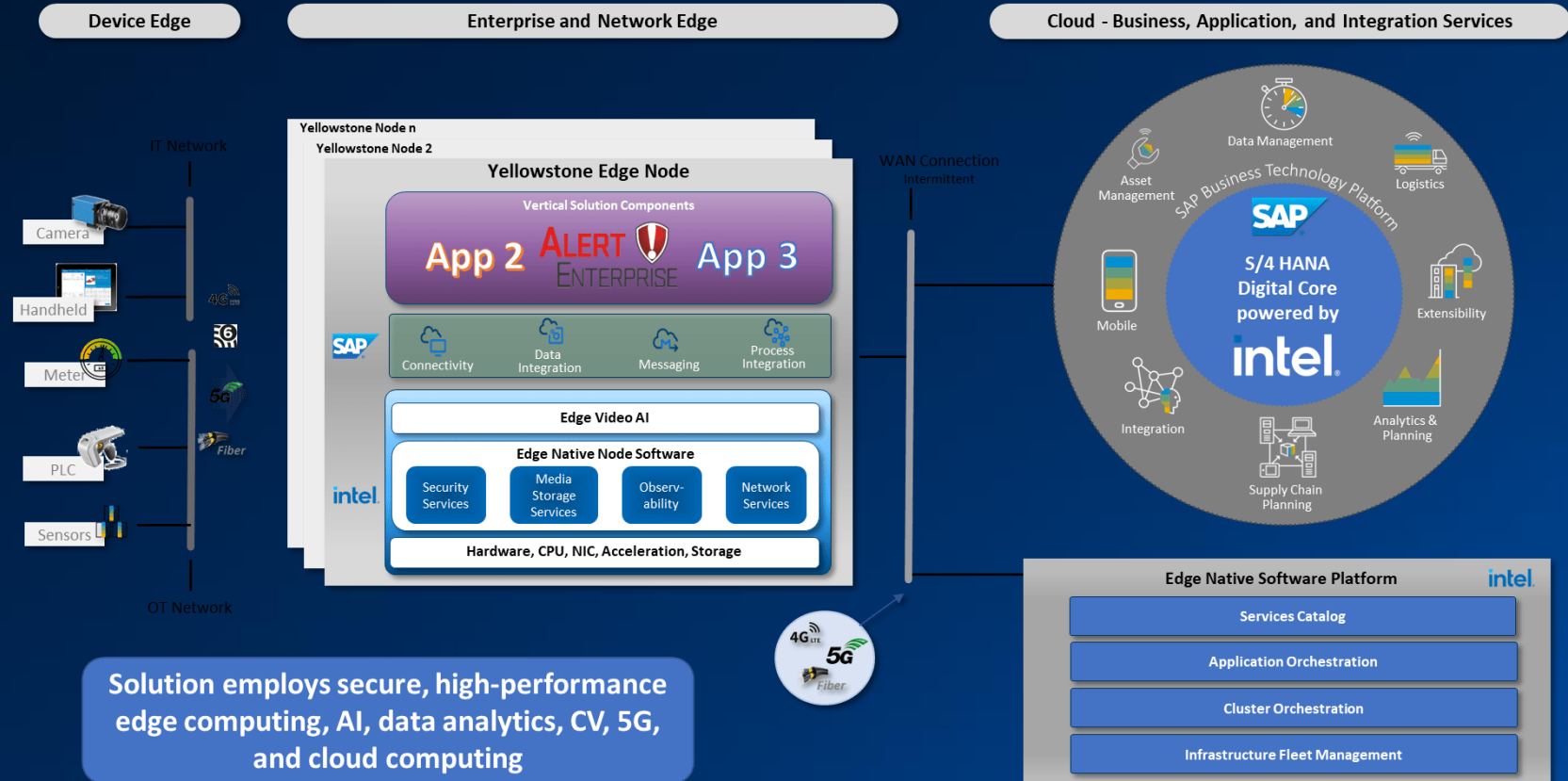
SAP/Alert Enterprise Solution – Edge PaaS

Solution Overview

Cyber-Physical Security Governance Risk and Compliance – "Cyber Physical GRC" for Utilities

Based on Intel Xeon, Core, Edge Platform

Alert Enterprise Prevents, Detects & Mitigates Electrical Substation Threats

SAP S/4 Hana Delivers Enterprise to Edge Vertical Solutions

Device Edge

IT Network

Camera
Handheld
Meter
PLC
Sensors

4G LTE
5G
Fiber

OT Network

Enterprise and Network Edge

Yellowstone Node n
Yellowstone Node 2

Yellowstone Edge Node

Vertical Solution Components

App 2 ALERT ENTERPRISE App 3

Connectivity | Data Integration | Messaging | Process Integration

Edge Video AI

Edge Native Node Software

Security Services | Media Storage Services | Observ-ability | Network Services

Hardware, CPU, NIC, Acceleration, Storage

WAN Connection Intermittent

4G LTE 5G Fiber

Solution employs secure, high-performance edge computing, AI, data analytics, CV, 5G, and cloud computing

Cloud - Business, Application, and Integration Services

Data Management
Asset Management
SAP Business Technology Platform
SAP
S/4 HANA Digital Core powered by intel
Mobile
Logistics
Extensibility
Integration
Analytics & Planning
Supply Chain Planning

Edge Native Software Platform intel

Services Catalog

Application Orchestration

Cluster Orchestration

Infrastructure Fleet Management

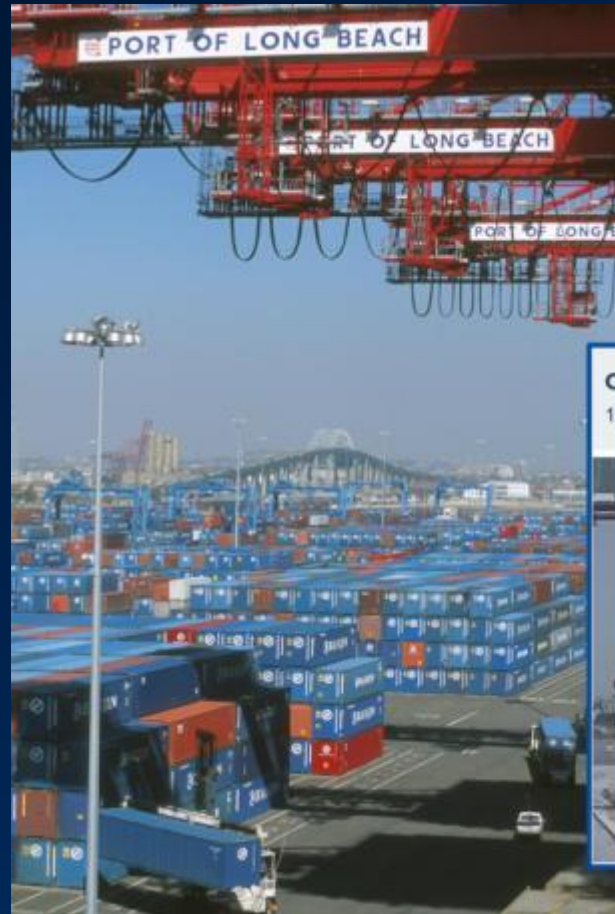# SAP/QuayChain Solution – Edge PaaS

Solution Overview

Drives Value for Ports, their Supply Chain Stakeholders, Communities and the Environment

Based on Intel® Xeon®, Core, Edge Platform

QuayChain Edge Devices (QEDs):
- Computer Vision
- Machine Learning/AI
- Local Edge Compute
- Environmental Sensors
- Dynamic Physical Sensors 5G Connectivity
- End to end encryption

Call to Action

Modernize your SAP Landscape with 4th Gen Intel® Xeon® Processors* leveraging the largest SAP certified ecosystem for improved performance and optimized TCO on Google Cloud

*5th Gen Intel® Xeon® Processor-based SAP-certified GCP instances COMING SOON

Migrate to SAP S4 / HANA with support from SAP RISE - powered by Intel® Xeon®. Support your journey to SAP RISE and benefit from the SAP and Intel partnership delivering better performance, scalability and resiliency for your business-critical processes.

Connect with an Intel representative to learn more about the Edge Platform-as-a-Service from SAP and Intel, integrated with SAP RISE and SAP BTP, enables new business cases already integrated into SAP landscapes for faster adoption and improved efficiencies.

In Summary

GCP & Intel partnership is continuing the innovation around instances for SAP Landscapes

GCP c4-standard family provides optimization opportunity for SAP Netweaver Application Server

GCP c4-highmem family provides up to 1.5TB HANA database capacity at highest performance class. Transition from N2-highmen to C4-highmen for your scale-up scenarios

Consider c4-family for your SAP Landscape to optimize for cost and performance

Scale-up to 32TB with the new X4 bare metal series for extra large SAP HANA systems

intel

Training: Take the Intel Partner University Business Transformation for SAP Software competency course.

intel
partner
solution pro

Business Transformation for SAP*

SAP is one of the leading global providers of business software solutions. These solutions can be found in many enterprise and public sector organizations, including many of your customers. SAP and Intel have a two-decade-long relationship, with SAP software solutions optimized on Intel® technologies, including server processors, memory, storage, and AI acceleration.

Explore SAP software solutions and how they work with Intel® technologies will help you deliver digital transformation services to your customers. This curriculum will help explain the value of SAP on Intel data center technologies. Delve into topics such as Business Transformation, Digital Disruptions, and Key Market Trends. Gain skills and insights about SAP software system requirements, benchmarks and sizing, and deployment options.

Become an SAP Sales Pro today >>> Business Transformation for SAP Software

Additional Resources

Work with your Intel Representative to help identify the best path to differentiate your SAP solutions and Intel resources to help support your journey.

Intel & SAP Partnership Information - Intel.com/SAP

Intel & Google Partnership Information - Intel.com/googlecloud

Announcement of C4 family

Announcement of C3 bare metal and X4 instances

Google CoreMark performance Scores

SAP Notes

GCP SAPS Certification

GCP Pricing

Additional Resources

[Google Cloud & Intel Alliance](#)

[Google Cloud and Intel Alliance N4 and C4 Machine Series on 5th Gen Intel Xeon](#)

Notices and Disclaimers

Performance varies by use, configuration, and other factors. Learn more at www.intel.com/PerformanceIndex.

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See backup for configuration details. No product or component can be absolutely secure.

Your costs and results may vary.

Intel technologies may require enabled hardware, software, or service activation.

Intel does not control or audit third-party data. You should consult other sources to evaluate accuracy.

All product plans and roadmaps are subject to change without notice.

intel

Performance Business Warehouse Benchmark (slide 10)

Nb.	SAP-Benchmark	Processor	Memory	Datasets	Phase 2 Query per Hour	Perf Gain
1	2020046	8280L (2nd Gen)	1536 GB	1.3	10106	
2	2023017	8480+ (4th Gen)	1024 GB	1.3	15198	1.50x

	SAP-Benchmark	Processor	Memory	Datasets	Phase 2 Query per Hour	Perf Gain
3	2020046	8280L (2nd Gen)	1536 GB	1.3	10106	
4	2023075	8592+ (5th Gen)	1536 GB	1.3	17846	1.77x

	SAP-Benchmark	Processor	Memory	Datasets	Phase 2 Query per Hour	Perf Gain
5	2018043	8176	6144 GB	2.6	4383	
6	2023076	8592+ (5th Gen)	1536 GB	2.6	13410	3.06x

Performance – SD Benchmark (slide 10)

Nb.	SAP-Benchmark	Processor	Memory	Benchmark User	SAPS	Perf Gain (SAPS)
1	2022012	8280 (2nd Gen)	1536 GB	23.600	129.020	
	2021026	8380 (3rd Gen)	1024 GB	48.000	261.970	2.03x (vs. 2nd Gen)
2	2023067	8488C (4th Gen)	1536 GB	53.645	296.200	2.30x (vs. 2nd Gen) 1.13x (vs. 3rd Gen)
3	2023077	8592+ (5th Gen)	1536 GB	96.740	528.550	4.10x (vs. 2nd Gen) 2.02x (vs. 3rd Gen) 1.78x (vs. 4th Gen)

Reference Slide 21

	m1 (Broadwell) Certified for Netweaver Certified for SAP HANA	vCPU	Memory	SAPS	Paygo onDemand/Hour	SAPS/$	EC2 Saving Plans 3 years Reserve / No Upfront	m3 (Cascade Lake) Certified for Netweaver Certified for SAP HANA	vCPU	Memory	SAPS	Paygo onDemand/Hour	SAPS/$	EC2 Saving Plans 3 years Reserve / No Upfront	Perf Improvement SAPS	Perf/$ SAPS/$	Monthly Costs
	Analysis based on public pricing from GCP for US Central-1 (Iowa) on 10/19/2023: https://cloud.google.com/products/calculator (SLES 15 for SAP, 2 Threads, Standard Disk, 3 Years Comitted), 730h/months																
	m3 (Icelake) performance relative to m1-highmem (Cascade Lake)																
M1 vs M3	m1-ultramem-40	40	961	34475	$ 6,7031 /hour	5143	$ 1486,23 /month	m3-ultramem-32	32	976	47835	$ 6,50121 /hour	7358	$ 1441,95 /month	38,75 %	43,06 %	-2,98%
	m1-ultramem-80	80	1922	68950	$ 12,99621 /hour	5305	$ 2864,71 /month	m3-ultramem-64	64	1952	95670	$ 12,5924 /hour	7597	$ 2776,16 /month	38,75 %	43,20 %	-3,09%
	m1-ultramem-160	160	3844	137900	$ 25,5824 /hour	5390	$ 3264,38 /month	m3-ultramem-128	128	3904	184800	$ 24,77479 /hour	7459	$ 5444,57 /month	34,01%	38,38 %	66,79%
	m1-megamem-96	96	1433	105050	$ 11,06216 /hour	9496	$ 5621,67 /month	m3-megamem-64	64	976	99170	$ 7,61479 /hour	13023	$ 1686,07 /month	-5,60 %	37,14 %	-70,01%
	m1-megamem-96	96	1433	105050	$ 11,06216 /hour	9496	$ 5621,67 /month	m3-megamem-128	128	1952	187620	$ 14,8196 /hour	12660	$ 3264,38 /month	78,60 %	33,32 %	-41,93%
	m1-ultramem-40	40	961	34475	$ 6,7031 /hour	5143	$ 1486,23 /month	m3-megamem-64	64	976	99170	$ 7,61479 /hour	13023	$ 1686,07 /month	-5,60 %	37,14 %	-70,01%
	m1-ultramem-80	80	1922	68950	$ 12,99621 /hour	5305	$ 2864,71 /month	m3-ultramem-64	64	1952	95670	$ 12,5924 /hour	7597	$ 2776,16 /month	38,75 %	43,20 %	-3,09%
per vCPU	m1-megamem-96	1	15	1094	$ 0,11523 /hour	9496	$ 58,56 /month	m3-megamem-64	1	15	1550	$ 0,11898 /hour	13023	$ 26,34 /month	41,60 %	3,25 %	-55,01%
	m1-megamem-96	1	15	1094	$ 0,11523 /hour	9496	$ 58,56 /month	m3-megamem-64	1	15	1550	$ 0,11898 /hour	13023	$ 26,34 /month	41,60 %	3,25 %	-55,01%

References – Slide 23

C3-highmem (4th Gen Xeon) for SAP HANA	vCPU	Memory	SAPS	Paygo	SAPS/$	c4-highmem (5th Gen Xeon) for SAP HANA	vCPU	Memory	SAPS	Paygo	SAPS/$	Perf Change	Perf/$ change
c3-highmem-44	44	352	76150	$2,91	26161,41	c4-highmem-48	48	372	102600	$3,1281	32799,09	35%	25%

References – Slide 24

c3d (AMD Milan)	vCPU	Memory	SAPS	Paygo	SAPS/$	c4-(Emerald Rapids)	vCPU	Memory	SAPS	Paygo	SAPS/$	Perf Change	Perf/$ change
c3d-highmem-16	16	120	33227	$0,9798	33910,64	c4- highmem-16	16	124	39380	$1,0427	37766,90	19%	11%
n2d-highmem-8	8	64	12641	$0,4559	27726,36	c4- highmem-8	8	62	20450	$0,5214	39224,64	62%	41%

References – Slide 25

o2 (Intel Cascade Lake)	vCPU	Memory	SAPS	x4 (Intel Sapphire Rapids)	vCPU	Memory	SAPS	Perf Change
o2-ultramem-672-metal	672	18 TB	669.202	x4-megamem-960-metal	960	16384	1389200	108%