

Optimize performance and safeguard IT with IBM Power software

Jayen Shah

IBM AIX – Product Manager

IBM Systems Group

jaysha1@in.ibm.com

Ian Robinson

IBM Power Software Product Management Leader

idrobinson@us.ibm.com

Melanie Ullmer

Program Director, C/C++ & Fortran Compilers

melanie@ca.ibm.com

Namitha K

User Advocacy, IBM Software

namitha.k3@ibm.com



Agenda

AIX Technology Roadmap, AIX 7.3 Key Enhancements

IBM Compilers

AIX EE Bundle Software

AIX Roadmap Drivers

Enterprise Workload Value

- Performance and Scale
- High Availability
- Security
- Support for Multiple Power Generations
- Long Release Lifecycle
- Binary Compatibility
- Deep Platform Integration
- Hardware Accelerators

Core Strength

Hybrid Cloud

- Open-technology based Admin Tools
- Automation with Ansible
- Cloud Deployment Models

Modernization

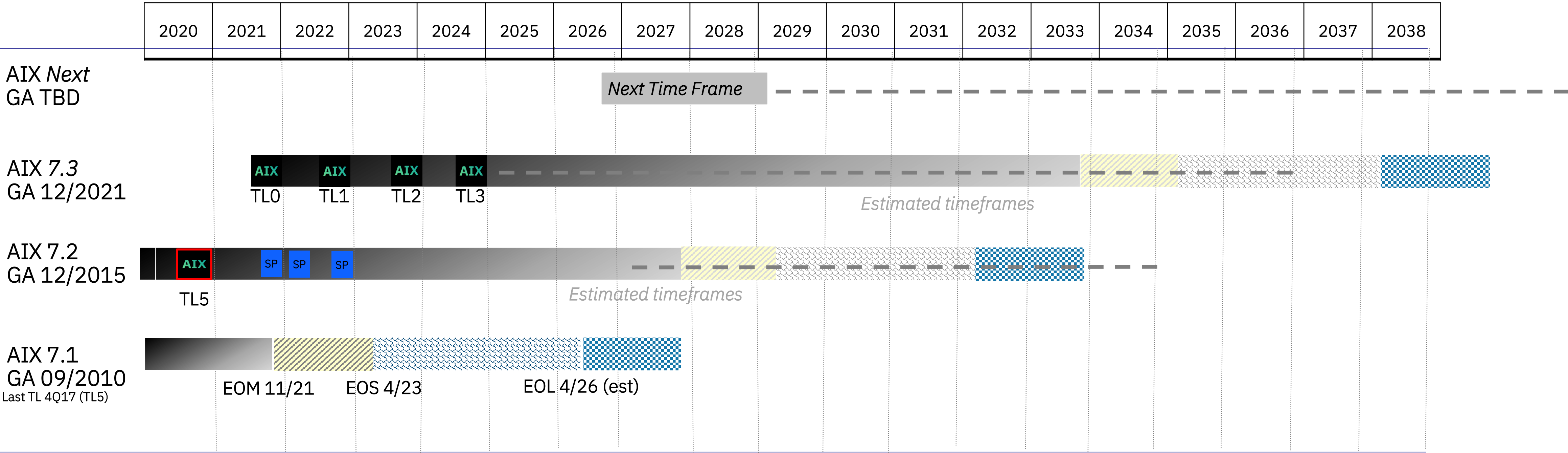
Enterprise AI

Power Optimized Open
Technology Stacks

Next Generation IBM compilers

IBM ESSL with Power10 MMA
Integration

AIX Release Streams



AIX 7.1, 7.2, and 7.3 are supported with POWER10

Marketed and serviced

Serviced only

Fee-based service extension

Web support only

AIX

Technology Level (TL)

AIX

Last TL for a release

SP

Service Pack

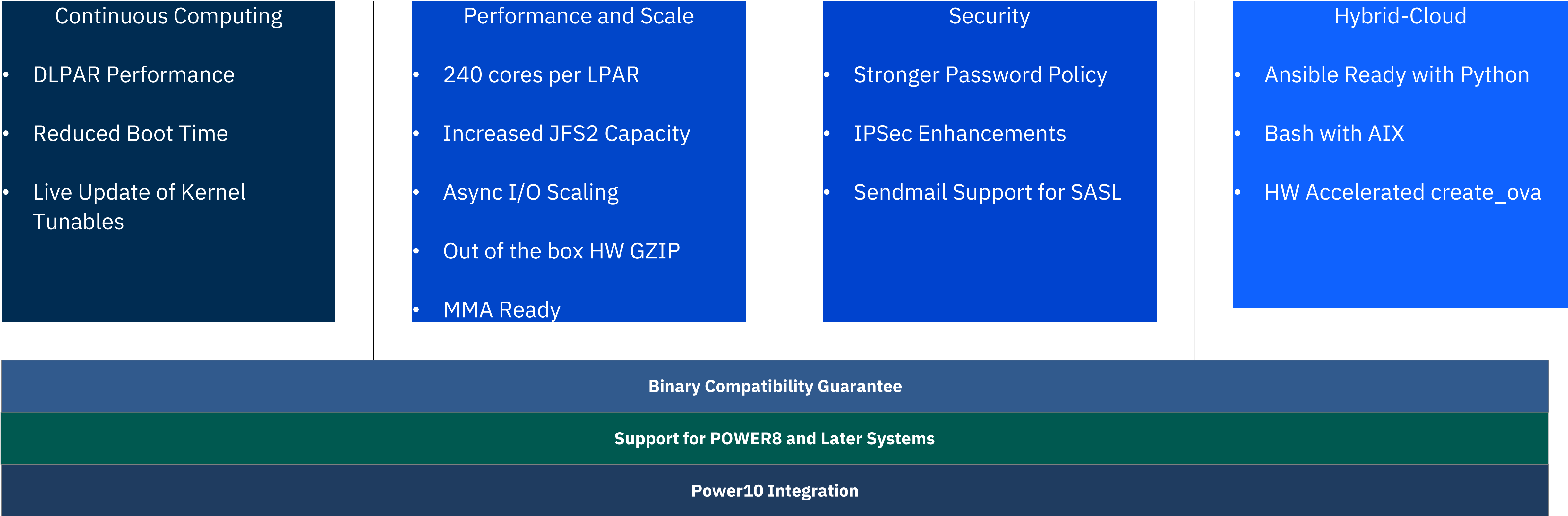
EOM = End of Market Availability

EOS = End of Standard Service

EOL = End of Life

Extend Power10 Value with AIX 7.3

Continuing innovation built on
a foundation of deep platform
integration and investment
protection



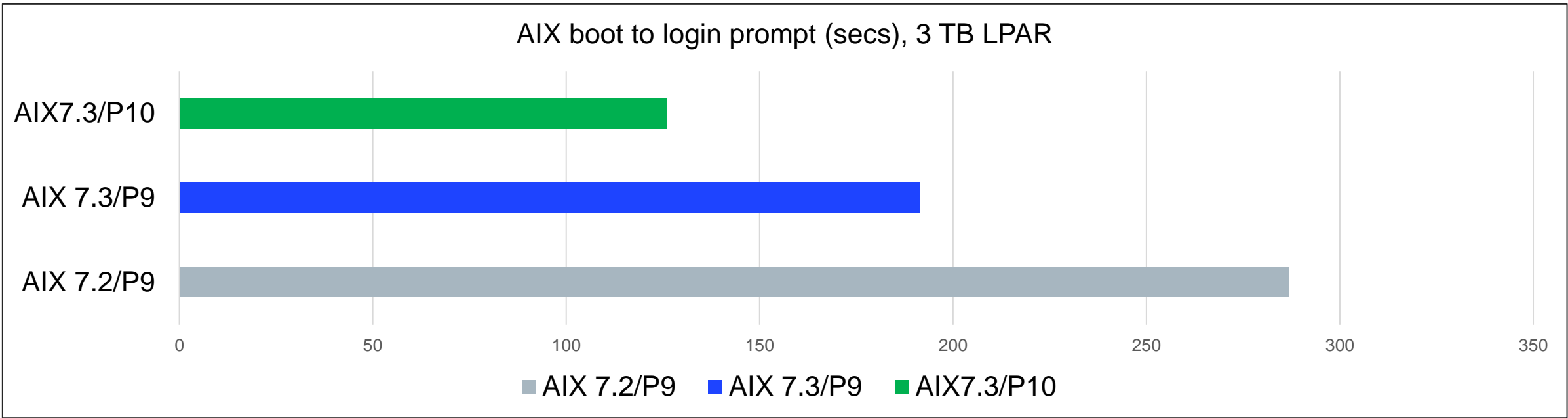
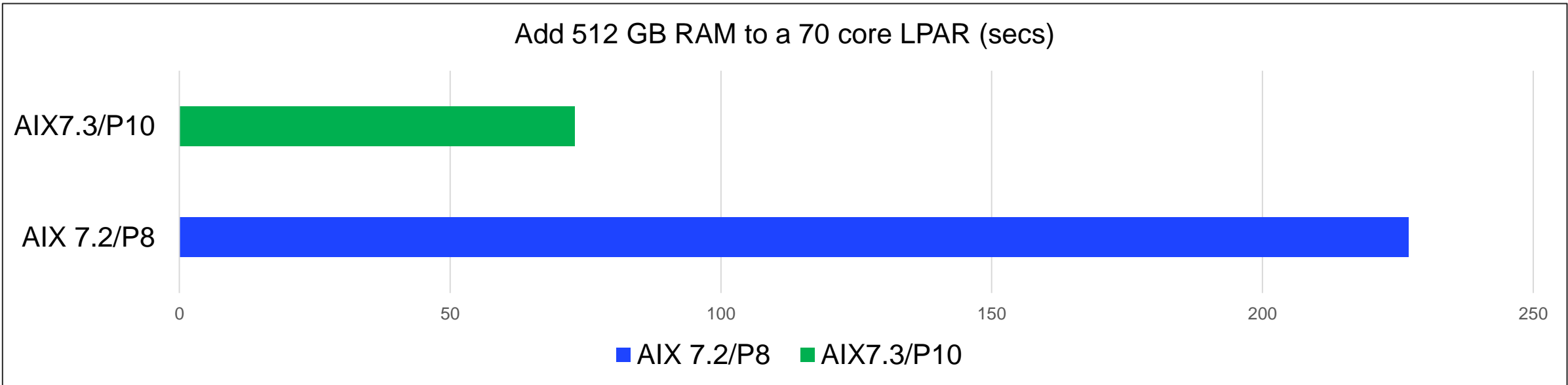
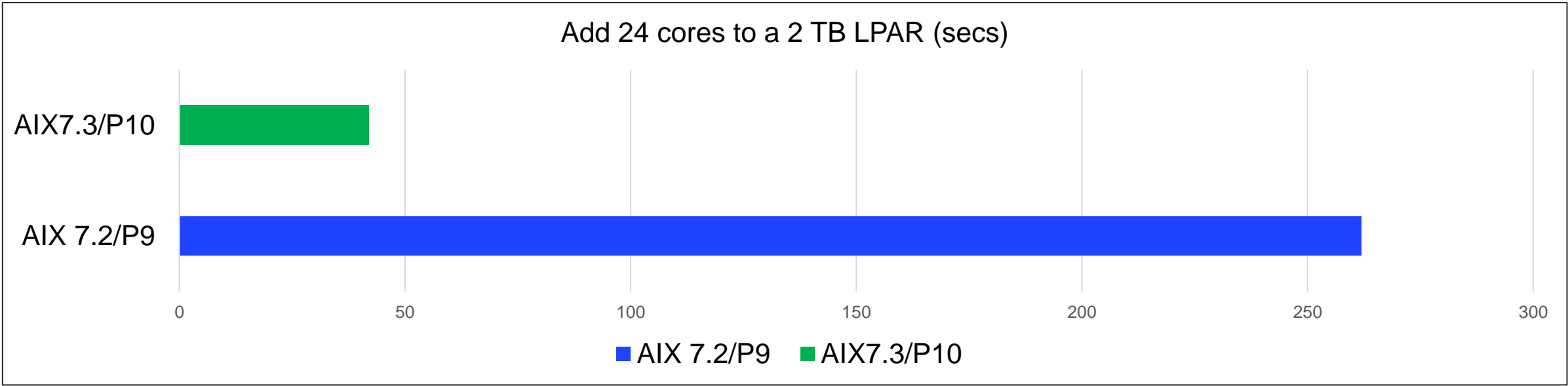
AIX 7.3 RFA: https://www.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_ca/8/897/ENUS221-328/index.html

AIX 7.3 Release Notes: <https://www.ibm.com/docs/en/aix/7.3?topic=notes-aix-73-release>

AIX 7.3 What's New: <https://www.ibm.com/docs/en/aix/7.3?topic=whats-new>

AIX 7.3 and Power10 for Innovation with Continuous Computing

- Up to 80% less time to add cores
- Up to 60% less time to add RAM
- Reduce AIX boot time by over 50%
- Use AIX Live Update to change AIX boot time settings



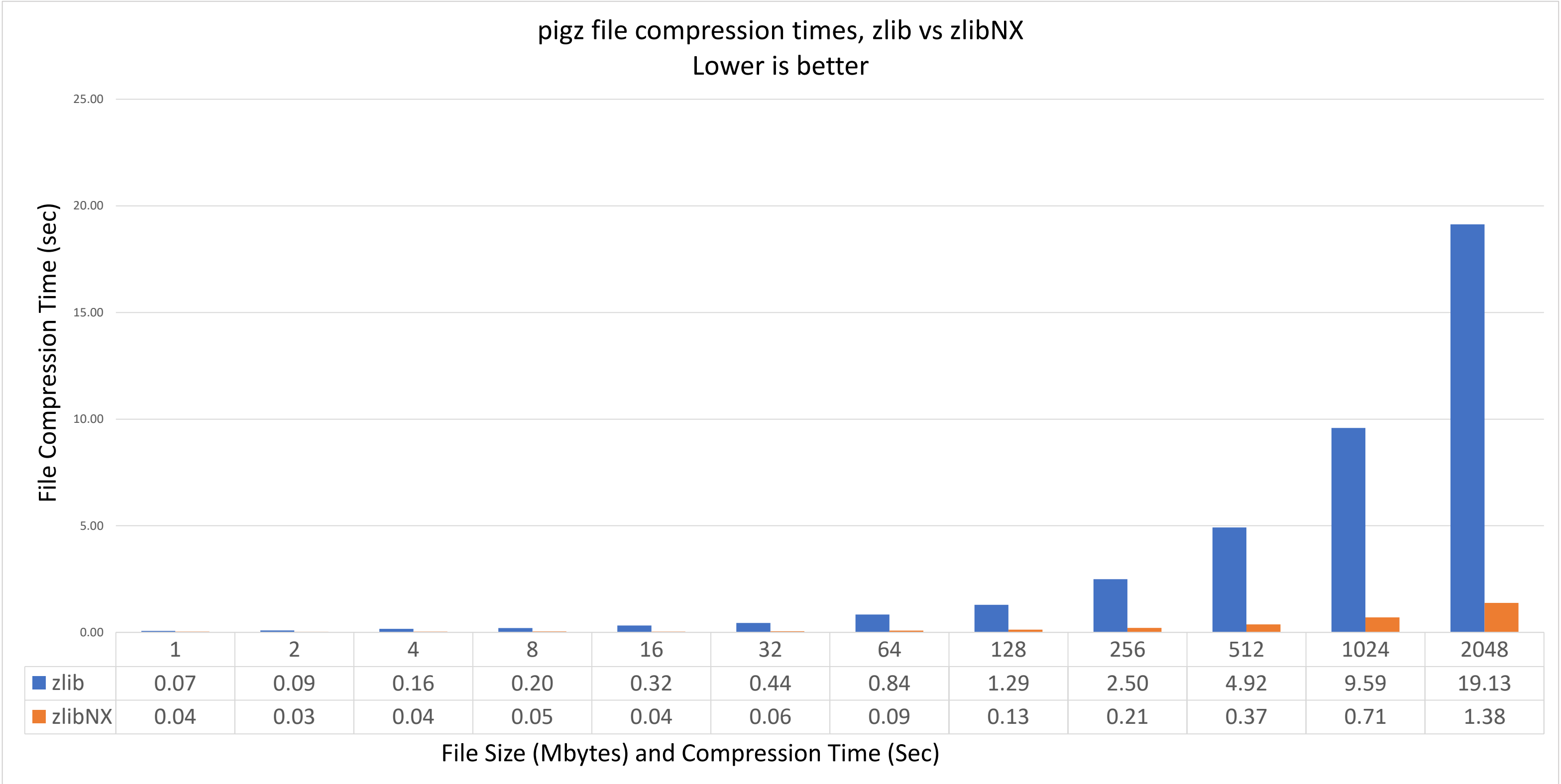
Exploitation of Power Hardware GZIP and AIX

AIX Components:

- AIX 7.3 create_ova
- OpenSSH version 8.1.102.2102 and later
- pigz

Other Software:

- Db2 backup and restore, version 11.5.7
- IBM Semeru Runtimes for Java



1 core in SMT8, Power10 3.55 GHz test system, AIX 7.3 TL0, files placed on a RAM disk

	OpenSSH 8.1.102.2101	OpenSSH 8.1.102.2102
1 GB File Transfer	120 sec	26 sec
2 GB File Transfer	255 sec	55 sec
4 GB File Transfer	510 sec	115 sec

AIX Flexibility with Power10

	AIX 7.1 TL5	AIX 7.2 TL5		AIX 7.3 TL0		
	P8 mode	P8 mode	P9 mode	P8 mode	P9 mode	P10 mode
I/O (Virtual, Physical)	V	V and P	V and P	V and P	V and P	V and P
Max HW threads per LPAR	1024	1536	1536	1920	1920	1920
Max RAM per LPAR (TB)	16	32	32	32	32	32
SMT default	8	8	8	8	8	8
In-core crypto	Yes	Yes	Yes	Yes	Yes	Yes
HW GZIP enabled	No	No	Yes	No	Yes	Yes
XIVE support	No	No	Yes	No	Yes	Yes
Power10 MMA support	No	No	No	No	No	Yes
P10 optimized memcpy	No	No	No	No	No	Yes

- Realize the benefits of Power10 with the flexibility to choose your AIX version and processor mode
- Move to AIX 7.3 for new possibilities in workload scale, infrastructure optimization, security, and accelerated AI

Managing AIX at Scale with Ansible Automation

The screenshot shows the Ansible Galaxy page for the 'power_aix' collection. At the top, the IBM logo is on the left, and the collection name 'power_aix' is in the center. To the right, it shows a score of 4.3 / 5 and 122,079 downloads. Below this are buttons for 'Login to Follow', 'Issue Tracker', 'Repo', 'Website', and 'Docs Site'. A navigation bar has 'Details', 'Read Me', and 'Content' tabs. The 'Details' tab is active, showing an 'Info' section with installation instructions: '\$ ansible-galaxy collection install ibm.power_aix'. A note states that installing with ansible-galaxy is only supported in ansible 2.9+. There is a 'Download tarball' link and a version dropdown set to '1.5.0 released 2 months ago (latest)'. Tags include 'infrastructure', 'ibm', 'power', and 'aix'. The description states: 'The IBM Power Systems AIX collection provides modules that can be used to manage configurations and deployments of Power AIX systems. The collection content helps to include workloads on Power platforms as part of an enterprise automation strategy through the Ansible ecosystem.' The 'Content Score' section shows a 'Community Score' of 4.3 / 5 based on 4 surveys. A table titled 'Tell us about this collection' has five rows: 'Quality of docs?', 'Ease of use?', 'Does what it promises?', 'Works without change?', and 'Ready for production?'. Each row has a set of five circles for rating, with 'Y' or 'N' in some circles.

Installation

```
$ ansible-galaxy collection install ibm.power_aix
```

NOTE: Installing collections with ansible-galaxy is only supported in ansible 2.9+

[Download tarball](#)

Install Version

1.5.0 released 2 months ago (latest) ▾

Tags

infrastructure ibm power aix

IBM Power Systems AIX Collection

The **IBM Power Systems AIX collection** provides modules that can be used to manage configurations and deployments of Power AIX systems. The collection content helps to include workloads on Power platforms as part of an enterprise automation strategy through the Ansible ecosystem.

Ansible Content for IBM Power Systems - AIX

IBM Power Systems is a family of enterprise servers that helps transform your organization by delivering industry leading resilience, scalability and accelerated performance for the most sensitive, mission critical workloads and next-generation AI and edge solutions. The Power platform also leverages open source technologies that enable you to run these workloads in a hybrid cloud environment with consistent tools, processes and skills.

Content Score

Community Score 4.3 / 5 ⓘ

Based on 4 surveys. [Show Details](#)

Tell us about this collection

Quality of docs?	-				+
Ease of use?	-				+
Does what it promises?	Y	N			
Works without change?	Y	N			
Ready for production?	Y	N			

https://galaxy.ansible.com/ibm/power_aix

- Over 175,000 downloads of the AIX module collection and growing
- Collections are also available in Red Hat Automation Hub with full Red Hat and IBM Support
- [IBM i](#), [HMC](#) and [VIOS](#) Ansible collections are also available
- IBM has also made Ansible roles available for [Oracle](#), [Oracle RAC](#), and [SAP](#) on AIX
- The Galaxy collection includes [demo playbooks](#)

AIX Collection Categories

Fix Management

- iFIX management
- Service Update Management Assistant (SUMA)
- Fix Level Recommendation Tool (FLRT)
- Generic Installation tools (geninstall)
- Individual Installation and updates of software

Filesystem Management

- Volume Group management
- Logical Volume management
- Backup for Volume Groups and Logical Volumes
- Filesystem Management
- Alternate rootvg disk management
- Backup of Volume

Inventory

- Logical Volume Manager information
- Filesystem or updates information
- Logical Partition information
- Multipath I/O device information
- Filesystem Management
- **Improvements in LPAR attribute, LLP, and fix information inventory collection**

Network Installation Manager (NIM)

- NIM operations (server setup, install packages, update SP or TL, service boots).
- NIM backups of LPAR and VIO Clients
- NIM for Fix Level Recommendation Tool (FLRT)
- NIM for SUMA.
- **Automated AIX migration using NIM Alternate Disk Migration (NIMADM)**

VIOS management via NIM

- Update a single or a pair VIOS servers.
- Backup root volume group
- Create/Clean an alternate rootvg
- Check if a pair of VIOS can be updated.
- Upgrade the VIOS software

Miscellaneous

- Devices Management
- System Management (reboot, boot list, smtctl)
- User Management
- Group Management
- Networking Management
- **Automation of kernel tuning parameters**

Recent Updates in bold blue

The AIX Toolbox for Open Source Software, ~400 Available Packages

New Areas of Exploration

- MMA optimized Python ML and inferencing stacks
- ONNX Runtime with Power10 MMA support
- GCC 11.X
- Python modules for ML (matplotlib, jupyter, flask)

Recent Additions and Updates

- | | | |
|-----------------------------------------|---------------|--------------------|
| •GCC 10.X/11.X with Power10 ISA support | •numpy | •tree |
| •OpenBLAS with Power10 MMA integration | •scipy | •mosh |
| •GDB-10 | •scikit-learn | •mod_auth_gssapi |
| •dnf | •pandas | •mod_auth_kerb |
| •createrepo_c | •SWIG | •requests-kerberos |
| | •fswatch | •php-mbstring |

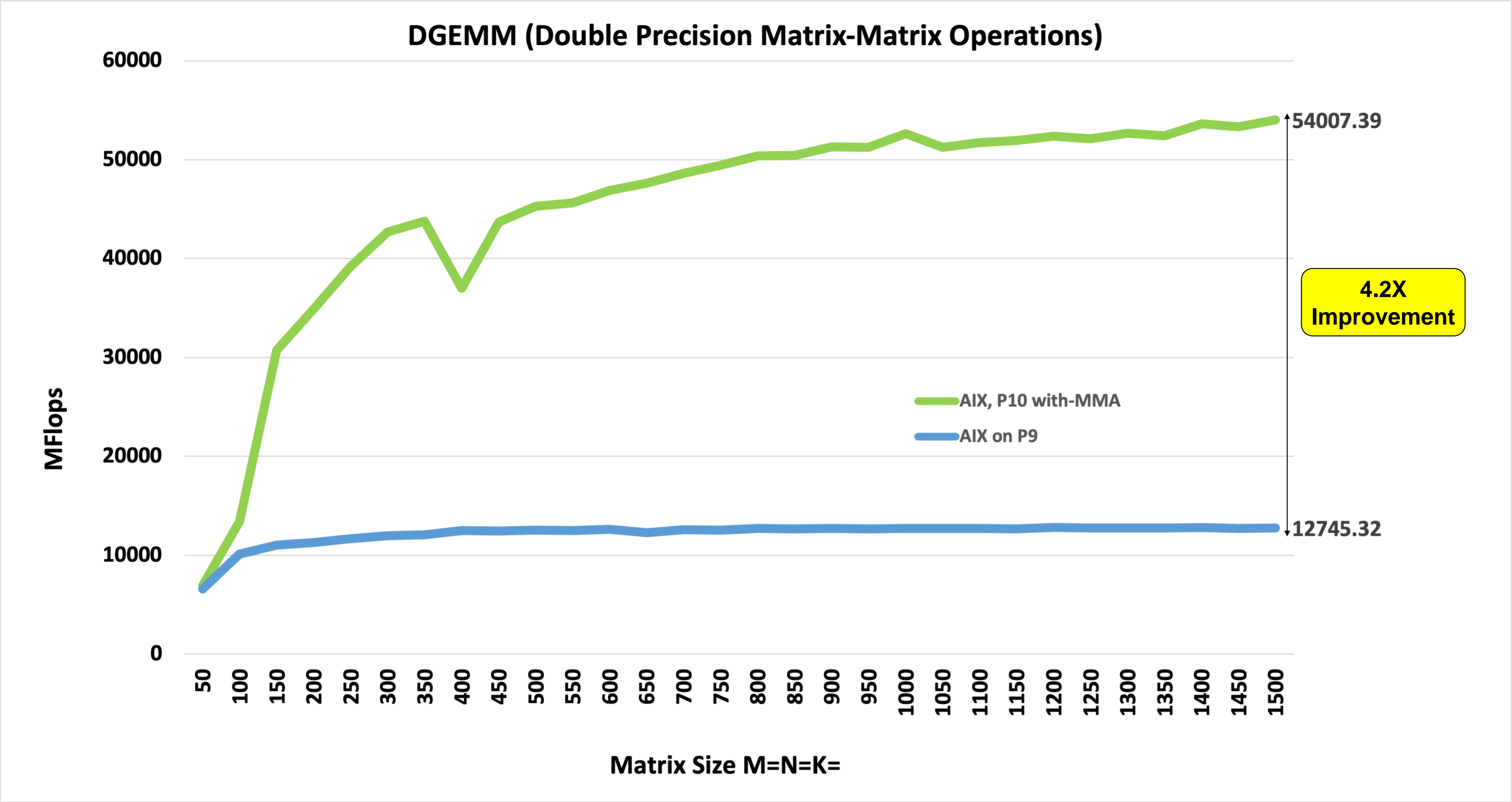
Security Related Updates

- Over 400 CVEs reviewed in recent months, roughly 70 packages updated due to security vulnerabilities
 - Fixes are picked up from the open-source community to integrate into AIX package ports

Toolbox Download Site –
<https://www.ibm.com/support/pages/aix-toolbox-open-source-software-downloads-alpha>

IBM Power Community Forum –
<https://community.ibm.com/community/user/power/communities/open-source-home>

Accelerating OpenBLAS - AIX and Power10 Innovation for Enterprise AI



[Read the developer blog](#)

AIX Common Criteria Certifications

Deutsches IT-Sicherheitszertifikat
erteilt vom Bundesamt für Sicherheit in der Informationstechnik

BSI-DSZ-CC-1165-2022 (*)
Operating System
IBM AIX 7.2.5
Service Pack 3 (SP3) Standard Edition (SE)
from IBM Corporation
PP Conformance: Protection Profile for General Purpose Operating Systems Version 4.2.1, 22 April 2019, CCEVS-VR-PP-0047, NIAP, Extended Package for Secure Shell (SSH), Version 1.0, 19 February 2016, CCEVS-VR-PP-0039, NIAP
Functionality: PP conformant
Common Criteria Part 2 extended
Assurance: Common Criteria Part 3 extended
ASE_CCL.1, ASE_ECD.1, ASE_INT.1, ASE_OBJ.2, ASE_REQ.2, ASE_SPD.1, ASE_TSS.1, ADV_FSP.1, AGD_OPE.1, AGD_PRE.1, ALC_CMC.1, ALC_CMS.1, ALC_TSU_EXT.1, ATE_IND.1, AVA_VAN.1

The IT Product identified in this certificate has been evaluated at an approved evaluation facility using the Common Methodology for IT Security Evaluation (CEM), Version 3.1 extended by Scheme Interpretations for conformance to the Common Criteria for IT Security Evaluation (CC), Version 3.1. CC and CEM are also published as ISO/IEC 15408 and ISO/IEC 18045.

(*) This certificate applies only to the specific version and release of the product in its evaluated configuration and in conjunction with the complete Certification Report and Notification. For details on the validity see Certification Report part A chapter 5.

The evaluation has been conducted in accordance with the provisions of the certification scheme of the German Federal Office for Information Security (BSI) and the conclusions of the evaluation facility in the evaluation technical report are consistent with the evidence adduced.

This certificate is not an endorsement of the IT Product by the Federal Office for Information Security or any other organisation that recognises or gives effect to this certificate, and no warranty of the IT Product by the Federal Office for Information Security or any other organisation that recognises or gives effect to this certificate, is either expressed or implied.

Bonn, 8 July 2022
For the Federal Office for Information Security

NIAP Community

Site Search

About Us Products Protection Profiles Resources FAQ

NIAP »» Product Compliant List »» Compliant Product

Compliant Product - IBM AIX 7.2.5, Service Pack 3 (SP3) Standard Edition (SE)

Certificate Date: 2022.07.08

Product Type: Operating System
Remote Access

Conformance Claim: Protection Profile Compliant

PP Identifier: Protection Profile for General Purpose Operating Systems Version 4.2.1
Extended Package for Secure Shell (SSH) Version 1.0

CC Testing Lab: atsec corp

[Validation Report](#)

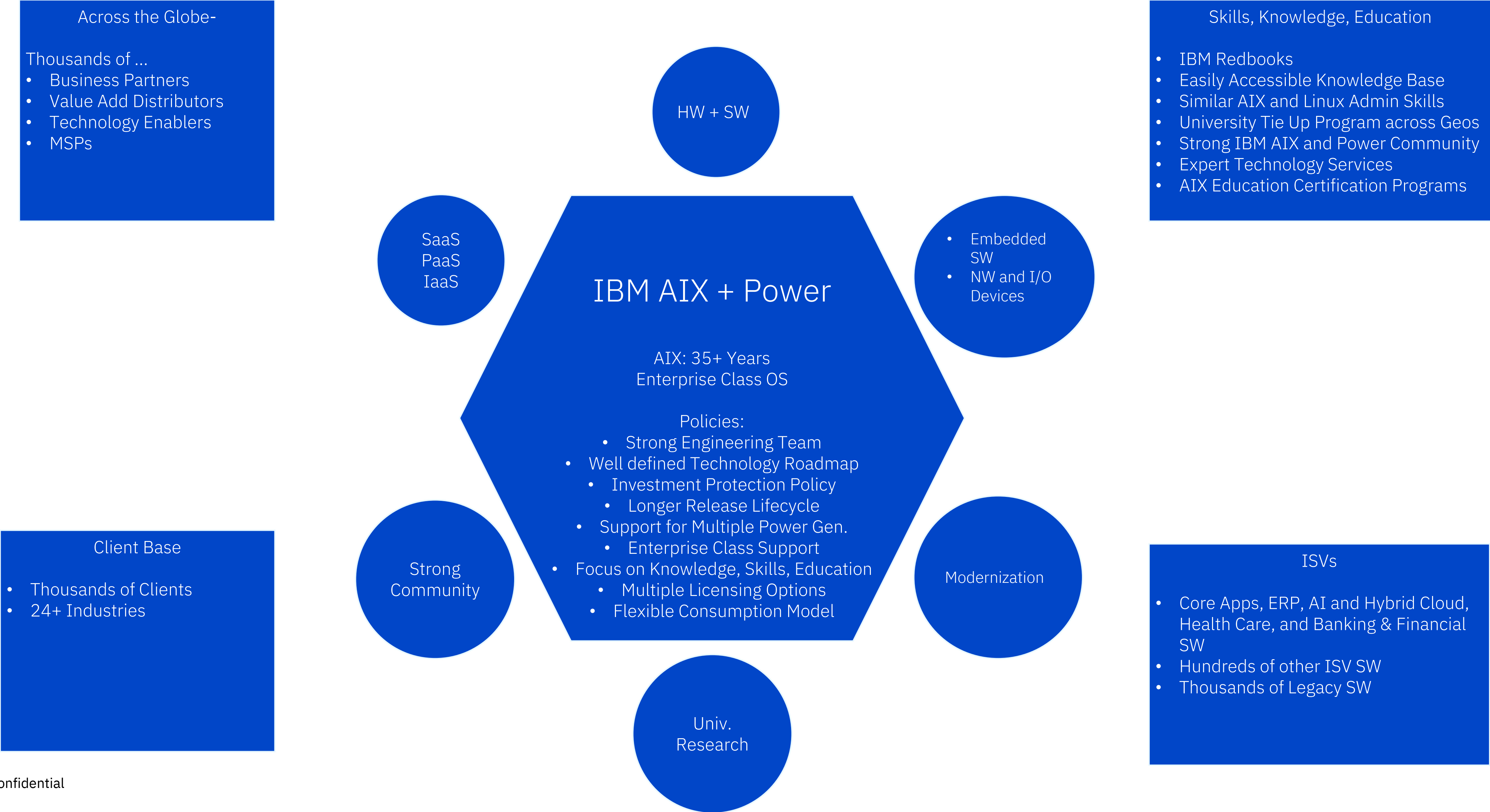
[Security Target](#)

[Assurance Activity](#)

[Administrative Guide](#)

- [AIX Common Criteria Admin Guide](#)
- [NIAP Org Link](#)
- [BSI Certification Link](#)

AIX and Power Ecosystem



AIX Power Solution at Glance

Common Workloads:

- Database (Oracle, DB2, ProgressDB)
- SAP Netweaver
- EPIC
- SAS “classic”
- Oracle is a significant AIX workload
- SAP is very common on AIX with Oracle

Key Markets/Industries:

- Finance
- Retail
- Health Care
- Manufacturing & distribution
- Insurance
- Government/Federal Sector

AIX-Power Value Propositions:

- High Availability
- Secure
- Scalable performance
- 0.05 to 240 cores and 1920 HW threads
- Enterprise virtualization with live migration
- Long release lifecycles and binary compatibility

ISVs on Power SW

- | | |
|--------------------|--------------------|
| • Cerner | • Spectrum Scale |
| • Intersystems | • Spectrum Protect |
| • Murex | • Cognos |
| • Dassault Systems | • Aspera |
| • Temenos | • SPSS |
| • Fiastra | • Maximo |
| • SWIFT | • Sterling |
| • FIS Fidelity | |
| • Finicle | |
| • Edgeverve | |
| • Guidewire | |
| • Freeman | |
| • Pagasystems | |
| • JDA | |
| • Progress DB | |
| • Jack Henry | |
| • Infor | |
| • IBM WAS | |

AIX Deep Integration with Power

- I/O Extended Error Handling
- HW memory protection keys
- Dynamic processor sparing
- Processor instruction retry
- 824 NX accelerator for AME
- NX encryption accelerator
- Dynamic LPAR
- Power10 MMA
- In-core crypto
- Live Partition Mobility (LPM)
- Transactional memory
- P9 NX gzip accelerator
- Processor Compatibility Mode Support
- FW assisted dump
- 4K, 64K, 1 GB, and16 GB page support
- Processor folding & intelligent threads
- Deep system topology awareness for cpu and memory affinity management

AIX World

- 117 Countries
- 60+ Languages
- Diverse deployments
- IBM i PASE is AIX based
- > 100,000 physical servers running AIX
- 50% of PowerVS Clients are running AIX
- 60% of PowerVS cores are running AIX
- AIX recently hit its 37th anniversary

AIX 2023 2Q – Enhancement Updates

Platform and I/O

- Up to 4 Port FC Adapters PCIE4
- Support for external NVMe Expansion Drawer

Protect Data from Core to Cloud

- Update AIX Toolbox Packages to use OpenSSL >1.1.1

Respond Faster to Business Demands

- ONNX available for AIX with Power10 MMA support
- Cloud InIt Update with Python 3 in AIX Toolbox –
- Bringing Cloud InIt up to date with OS Community

Client Benefits

AIX Services Releases in 2Q Facilitates . . .

- Clients with additional option of FC adapters, NVMe Expansion Drawer support, timely access to security fixes,
- MSPs, BPs, ISVs – Allows to create accelerated machine learning and inferencing solutions on AIX and Power
- Community – Brings Cloud InIt up to date with Python 3

AIX 7.1 Service Extension

- AIX 7.1 reaches EOS w.e.f 30/04/2023
- Link to AIX 7.1 SE announcement
https://www.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_ca/7/897/ENUS921-107/index.html
- 3 years Service Extension with Usage, Known and New Defect support
- Starting from 1st May 2023 till 30st April 2026
- SE can be contracted for 12 months max only, with option of 2 subsequent renewals.
- Available for P7/P7+,P8,P9,P10 as standard offering
- Availability on P6 via Special Bid on case-by-case basis

Thank You

IBM Open XL C/C++ and Fortran for AIX 17.1.1

Modern and highly optimizing compilers for business-critical applications

Generally available on Sep 16, 2022



Modern C++ language standards

- C++17 support
- Experimental C++20 feature

Faster build speed

- The adoption of LLVM infrastructure makes Open XL compilers build faster than the classic XL compilers
- Enterprise application built 4X faster with 17.1.1 compared with XL 16.1 using O2+LTO+PGO

Improved runtime performance

- Maximize Power10 hardware return of investment (ROI)
- Release to release runtime performance improvement: check the latest SPECint CPU2017 publish result on IBM® Power® E1050 with 17.1.1: [Link](#)

Power10 exploitation

- New compiler option “-mcpu=pwr10” to generate code exploiting Power10 instructions
- New builtin functions to unlock new Power10 functionalities, e.g., MMA
- New MASS SIMD and vector libraries for Power10

IBM Open XL C/C++ and Fortran compilers for Power servers

Running your code on Power10?
You need **IBM® Open XL compilers!**

IBM Open XL fully exploits the latest Power10 architecture and **maximizes** your hardware ROI!

150+

Power10
built-in functions

including

60+

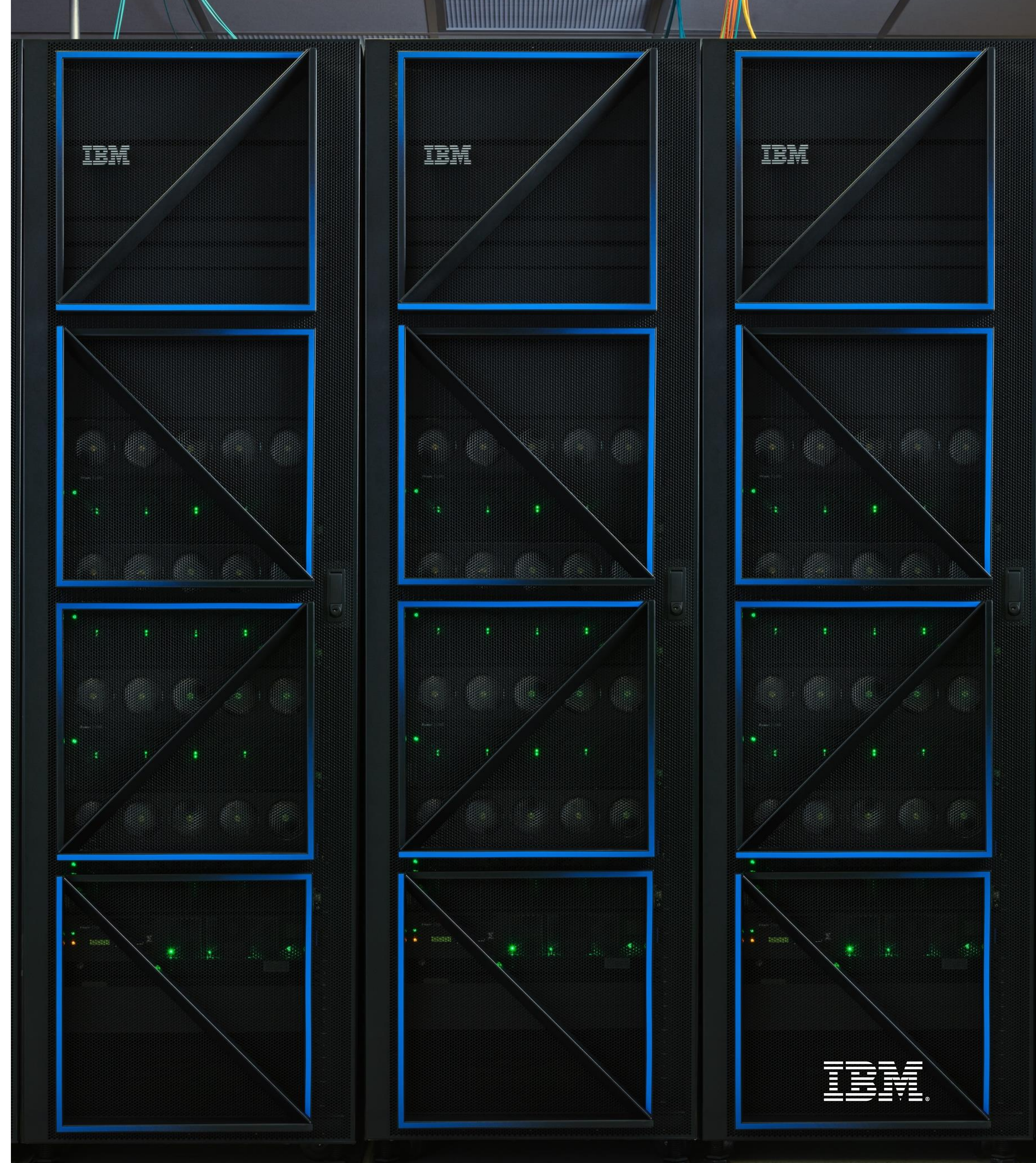
Matrix Multiply
Accelerator (MMA)
built-in functions

150+

MASS library functions
(SIMD, Vector, Scalar)
tuned for Power10

30+

Power10 specific
optimizations



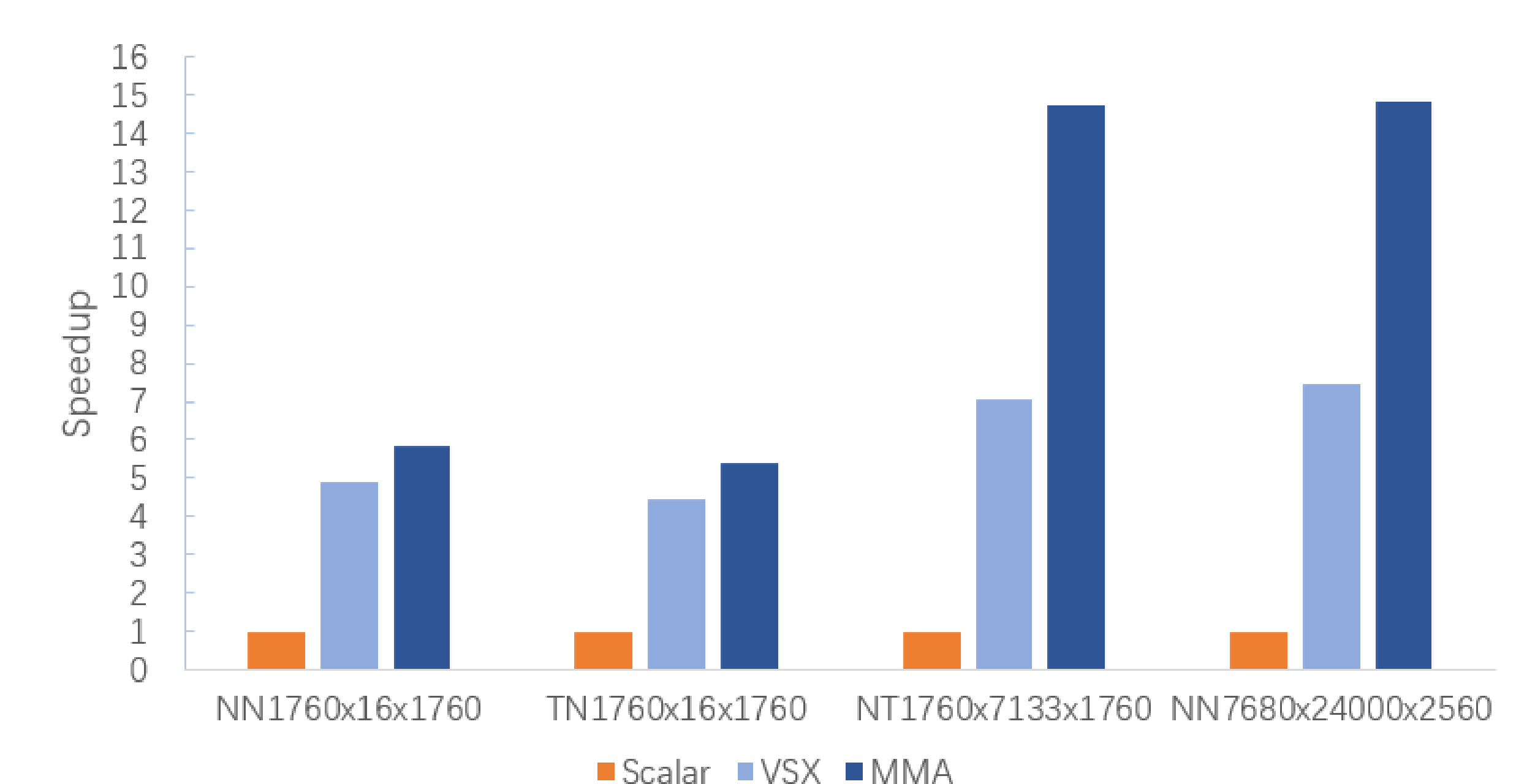
Power10 exploitation (Con.)

150+ new builtin functions implemented to unlock new Power10 functionalities, e.g., the embedded Matrix Multiply Accelerator (MMA)

Example of using MMA builtin functions:

cblas_sgemm (Single-Precision Matrix multiplication & addition)

- Using compiler built-ins to exploit MMA can get faster FP32, BFloat16 and INT8 calculations. e.g., for cblas_sgemm, up to **2x** speedup vs. VSX, and up to **14+x** speedup vs. scalar*
- This can also typically increase AI inference workloads' performance



NN: MatrixA NoTransposition * MatrixB NoTransposition
TN: MatrixA Transposition * MatrixB NoTransposition
NT: MatrixA NoTransposition * MatrixB Transposition

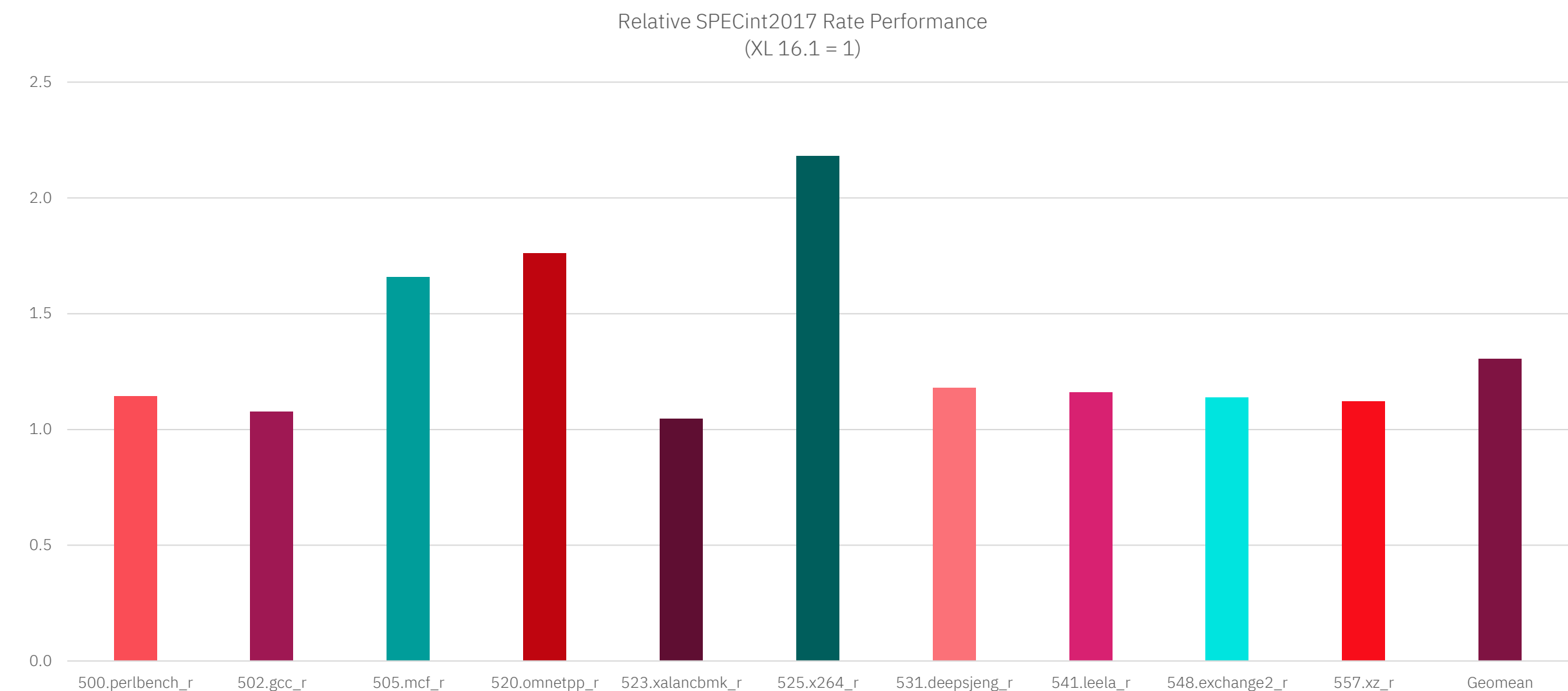
(*) Based on IBM internal measurements on Power10 AIX

Run faster

SPECint2017 Open XL

30%

faster than XL 16.1



SPECint2017 Power10 publish demonstrates **2.5x**
per core leadership vs. x86*, with new
Open XL 17.1 Compilers

(*) Source: SPEC CPU 2017 Integer Rate Results: [Link](#)

Rust

IBM SDK for
Rust on AIX

Alpha

Looking for participants

- Reliable and secure programming language available on AIX
- Free Alpha package for try-out! (contact: siyuan.zhang@cn.ibm.com)
 - ✓ Minimal O.S requirement: AIX 7.2 TL5 SP3, or AIX 7.3
 - ✓ 64-bit mode only
 - ✓ Include the compiler (rustc), the rust package manager (Cargo) and some essential rust libraries/packages

Thank You

IBM Power Software Bundles



AIX Enterprise Edition v1.9

5765-CD3 (AIX 7.2) / 5765-2E1

PowerVC for Private Cloud 2.1
(5765 – VCC)

IBM Tivoli Monitoring

PowerSC 2.1
(5765-SC2)

VM Recovery Manager HA 1.7
(5765-VRM)

Private Cloud Edition v1.9

5765-CBA (w/5765-ECA (with AIX 7) / 5765-2C1
(without AIX) / 5765-6C1

PowerVC for Private Cloud 2.1
(5765 – VCC)

Cloud Management Console 1.19
(5765-CMT)

IBM Tivoli Monitoring

PowerSC 2.1
(5765-SC2)

VM Recovery Manager HA/DR 1.7
(5765-DRG)

Virtualization management and self-service provisioning

Single pane monitoring of all Power Systems infrastructure

Application aware infrastructure monitoring and analysis

Security and compliance management of hybrid cloud environments with support for multi-factor authentication

Simplified HA/DR solution for Power private cloud deployments

MES Upgrade

AIX (5765-G98)

Perpetual, Monthly Term and Subscription Licenses

AIX (5765-G98)

Perpetual and Subscription Licenses

AIX (5765-G98)

Perpetual and Subscription Licenses

Subscription Licensing Options

- Lower up-front cost
- Includes license and support
- Customer number entitled (enables license mobility)
- Order via AAS (1 or 3 year terms)

Subscription License PIDS (1 or 3 Year terms)

5765-2B1 AIX Standard Edition

5765-2E1 AIX Enterprise Edition 1.9

5765-2C1 Private Cloud Edition 1.9 with AIX 7

5765-6C1 Private Cloud Edition 1.9

*New Licenses only, no transfers or conversions



Private Cloud Edition is included by default in Power10 server orders

A complete suite of Power value-added
software that is economically priced, and
available as either a traditional license or
subscription

PowerVC virtualization and private cloud management



PowerVC API provides integration with ecosystem partners



PowerVC

Key Features:

1. Deploy VMs in minutes
2. Full lifecycle management of VMs
3. Automated VM recovery
4. Single-click host evacuation
5. Automated cloud optimization
6. Multi-tenancy and resource isolation
7. OpenStack API enablement
8. Open integration with multi-cloud managers

PowerVC for Private Cloud

Key Features:

1. ***EVERYTHING in PowerVC ... plus ...***
2. Self-service, single-click deployment for cloud users and developers
3. Policies, metering and quota management to govern how the private cloud operates
4. Web-based portal for Power private cloud management
5. Import/export VMs to/from clouds

PowerVC: Complete lifecycle management for VMs



PowerVC provides comprehensive virtualization and private cloud management for Power servers and integration with multi-cloud managers

IBM PowerVC

ConfigurationMessagesDRO EventsRequests

root (ibm-default)

Home

Hosts

Host Groups

HMC Connections

Refresh

Add Host

Edit Host Connection

Remove Host

Maintenance Mode

Manage Existing Virtual Machines

Remotely Restart Virtual Machines

No filter applied

Name	Virtual Machines	Processors	Memory (GB)	State	Health	Host Connection
neo10NL	2	1 Used (20 Total)	8.5 Used (63.677 Total)	Operating	OK	neo10NL.pok.stglabs.ibm.c
neo17	2	1 Used (10 Total)	8.5 Used (255.379 Total)	Operating	OK	neo17.pok.stglabs.ibm.c
neo18	1	1 Used (10 Total)	8.5 Used (255.379 Total)	Operating	OK	neo18.pok.stglabs.ibm.c
neo42	1	2 Used (10 Total)	35.25 Used (64 Total)	Operating	OK	neo42.pok.stglabs.ibm.c NovaLink)
neo43	2	2 Used (10 Total)	35.25 Used (64 Total)	Operating	OK	neo43.pok.stglabs.ibm.c NovaLink)
neo50	26	2.3 Used (10 Total)	15 Used (63.759 Total)	Operating	OK	neo50.pok.stglabs.ibm.c
p740_11_fvt	2	5.5 Used (16 Total)	33 Used (256 Total)	Operating	OK	FVT HMC
p740_12_fvt	0	4.1 Used (16 Total)	24.25 Used (256 Total)	Operating	OK	FVT HMC

IBM PowerVC

ConfigurationMessagesDRO EventsRequests

pvcadmin (ibm-default)

Virtual Machines

Refresh

Start

Stop

Restart

Delete

Capture

Resize

Migrate

Edit Expiration Date

Attach Volume

Manage Existing

Filter

No filter applied

Name	Host	IP	State	Health	Owner	Expiration Date	Task
pvc02
pvc03

IBM PowerVC

ConfigurationMessagesDRO EventsRequests

root (ibm-default)

Dashboard

Overview

Resource Usage

Project Quotas

Verify Environment

Hosts

Health

160

75%

OK

Critical

Warning

Other

120

20

10

10

Storage

Health

5

80%

OK

Critical

Warning

Other

4

1

0

0

Virtual Machines

500

OK

Critical

Warning

Other

400

0

0

0

Memory (GB)

90%

Using 90 of 100

Managed

Unmanaged

Available

75

15

10

Processors

90%

Using 90 of 100

Managed

Unmanaged

Available

75

15

10

Used Capacity (GB)

60%

Using 600 of 1,000

Used

Available

600

400

Volumes

1,000

OK

Critical

Warning

Other

800

0

0

200

PowerVC for Private Cloud: Self-service portal



PowerVC for Private Cloud provides a simplified user experience for developers or other Power private cloud users requiring self-service VM provisioning and management

The PowerVC for Private Cloud self-service portal provides cloud users with capabilities that include:

- One-click deploy templates
- Approvals and expirations
- Role-based access control
- Project-based resource isolation (multi-tenancy)
- Metering and e-mail notifications

The screenshot displays the IBM PowerVC self-service portal interface. The top navigation bar includes links for Configuration, Messages, DRO Events, and Requests. The user is logged in as 'pvcadmin (ibm-default)'. The main heading is 'Deploy AIX72CloudVM'. The form is divided into several sections:

- General:** Includes fields for 'Virtual machine name' (set to 'orion'), 'Instances' (set to 1), and 'Description'.
- Deploy target:** Set to 'Default Group'.
- Storage connectivity group:** Set to 'Any host in xwing'.
- Collocation rule:** Set to 'None'.
- Key pair:** Set to 'None'.
- Specifications:** Includes a 'Compute template' dropdown set to 'Tiny' and a table of resources:

Resource	Value
* Processors	1
Processing units	0.5
* Memory (MB)	4,096

On the right side, there is a section titled 'Current and projected use:' which shows usage bars for 'Virtual machines (5)', 'Processor units (22.6)', 'Memory (343,808 MB)', and 'Disk size: xwing, VIOSSP (105 GB)'. The usage bars indicate current usage as a percentage of the total available resources.

PowerVC single-click server evacuation



Automatically relocate all VMs to other (healthy) servers, using LPM

- Use the PowerVC scheduler to determine the target host or manually select destination host
- Clears the system of VMs without excessive administrator work

Alternatively, 'fence off' physical host to stop VMs from being deployed or moved to that host

- Option to allow administrators greater control of relocation operation

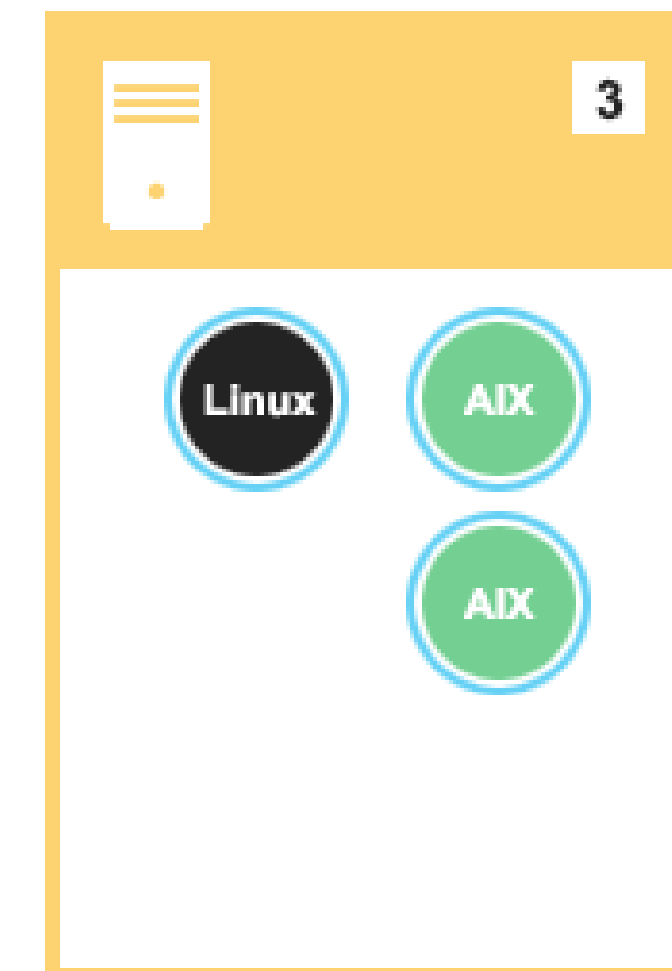
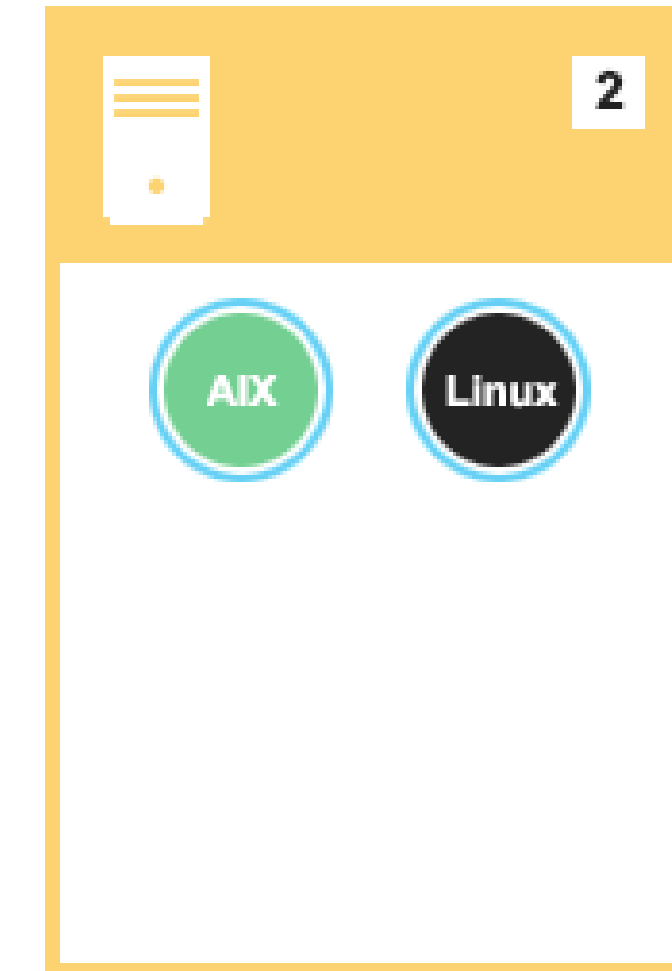
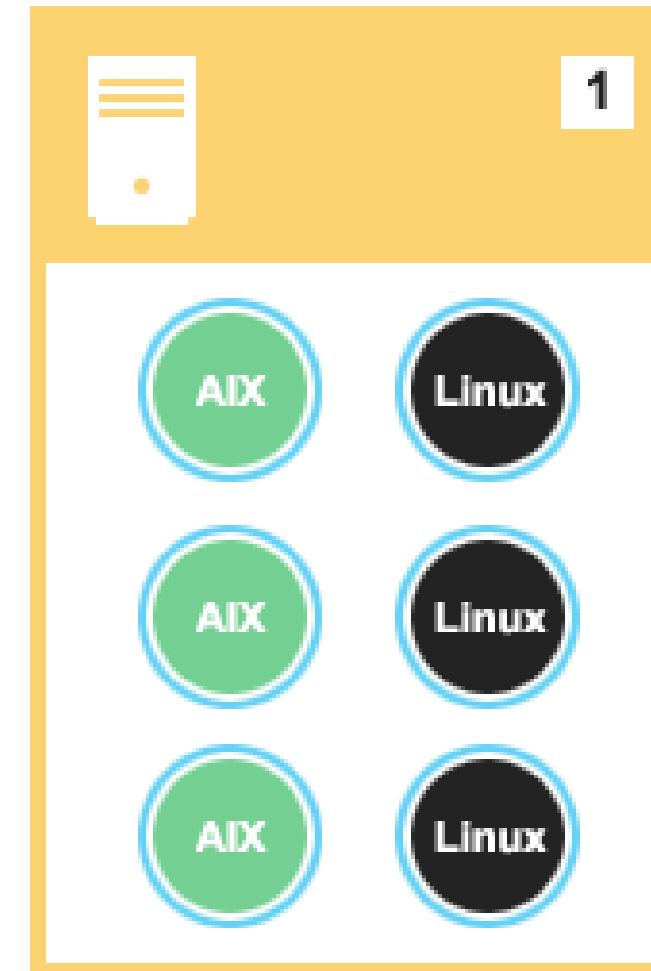


PowerVC Dynamic Resource Optimizer (DRO)



When workload activity spikes such that a Power server becomes over-utilized, VMs from that server can be automatically migrated to less-burdened servers within the same host group. As a result, PowerVC DRO provides a rebalancing capability that ensures optimal resource usage.

In this example, three Power servers are in a host group with PowerVC DRO enabled, and when Host #1 becomes overburdened, the VMs are automatically moved via LPM to other hosts in the host group.



PowerVC 2.0 Redbook



PowerVC

The Dashboard window from IBM PowerVC for Private Cloud Version 2.0.0 is shown in Figure 4-2. IBM PowerVC for Private Cloud Version 2.0.0 contains all functions available on IBM PowerVC Edition including the exclusive self-service portal (for example Quotas, Approvals, Enterprise policies, Email Server, Email template) highlighted in Figure 4-2.

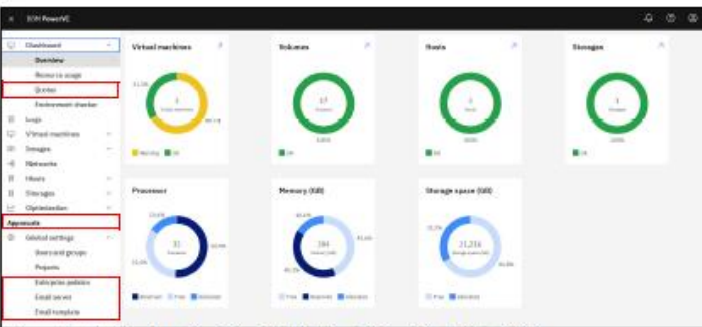


Figure 4-2 Additional functionalities with IBM PowerVC for Private Cloud 2.0.0

Functional highlights

The new PowerVC Version 2.0.0 user interface provides an ease-of-work in terms of the behavioral patterns. The following is a glimpse of the functional highlights:

- The new user interface is developed asynchronous in most places. When you trigger any resource action, the UI notifies that the action is being processed as shown in Figure 4-3. When an action is being processed, you can access other features without getting blocked.
- When you initiate an Add host or Remove host operation, you never get blocked by the spinning wheel (indicating progress of action). The action gets triggered on PowerVC and the task progress can be seen on the Alerts pane. The Alerts pane is a new feature on the UI that displays top 20 log messages in a chronological order.

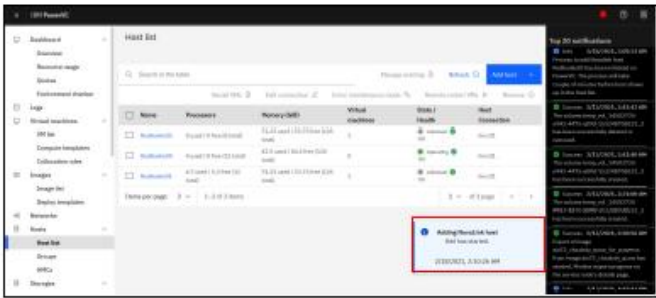


Figure 4-3 PowerVC 2.0.0 GUI notifications

ation

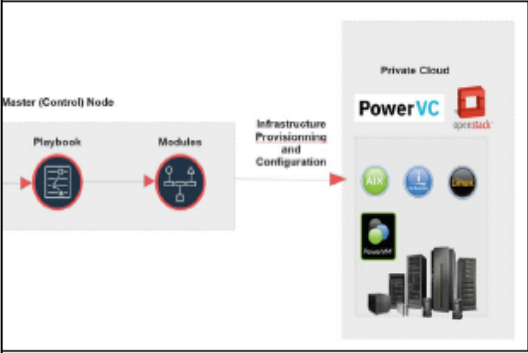
h source IT configuration management, deployment, and orchestration tool. divity gains via automation, to enable faster time-to-market for IT projects and consistent deployments. Ansible supports the orchestration of multi-tier ing infrastructure, networking, operating systems, applications, and services of nodes. Ansible's automation language Yet Another Markup Language in easy-to-understand Playbooks that allow your entire organization to mation.

less and performs actions on a set of servers from an Ansible control node e engine is installed. It communicates with your servers securely by using the ol.

uilt on top of OpenStack technology, you can use the available OpenStack e with Ansible to deploy VMs as illustrated in Figure 6-2.

les included with Ansible:

- to retrieve the image information
- to retrieve flavor information
- info to retrieve network information
- provision a new virtual machine (VM)
- provision a new volume
- lume to attach a volume to a VM



PowerVC and PowerVC

re Ansible

ible engine on the IBM PowerVC Server by following this instructions:


1. Enable the Ansible Engine repository

```
# subscription-manager repos --enable=ansible-2.9-for-rhel-8-ppc64le-rpms
Repository 'ansible-2.9-for-rhel-8-ppc64le-rpms' is enabled for this system.
```

Chapter 4. IBM PowerVC for managing IBM PowerVM 109

Chapter 6. IBM PowerVC integration with Terraform and Ansible 283

30 IBM PowerVC Version 2.0 Introduction and Configuration

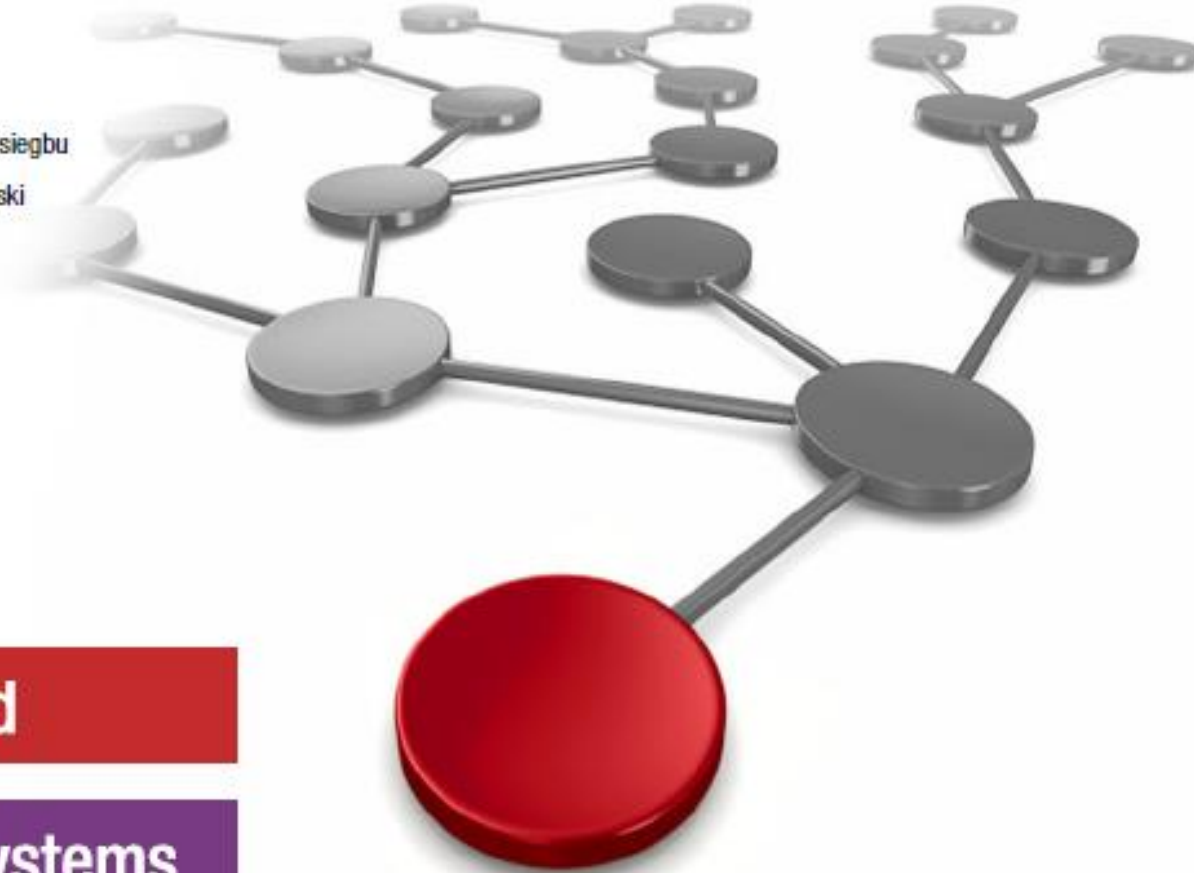


ibm.com/redbooks

IBM PowerVC Version 2.0



Introduction and Configuration

Sachin P. Deshmukh
Thierry Huché
Stephen Lutz
Ahmed Mashhour
Christopher Emefiene Osiegbo
Borislav Ivanov Stoymirski



Cloud

Power Systems



ISBN-10: 0738459739
ISBN-13: 9780738459738
IBM Form #: SG24-8477-00
(368 pages)

<https://www.redbooks.ibm.com/abstracts/sg248477.html?Open>

PowerSC provides a user-friendly, web-based UI to manage security and compliance

Compliance and Drift Analysis

- HIPAA, PCI, CIS, and more

Security

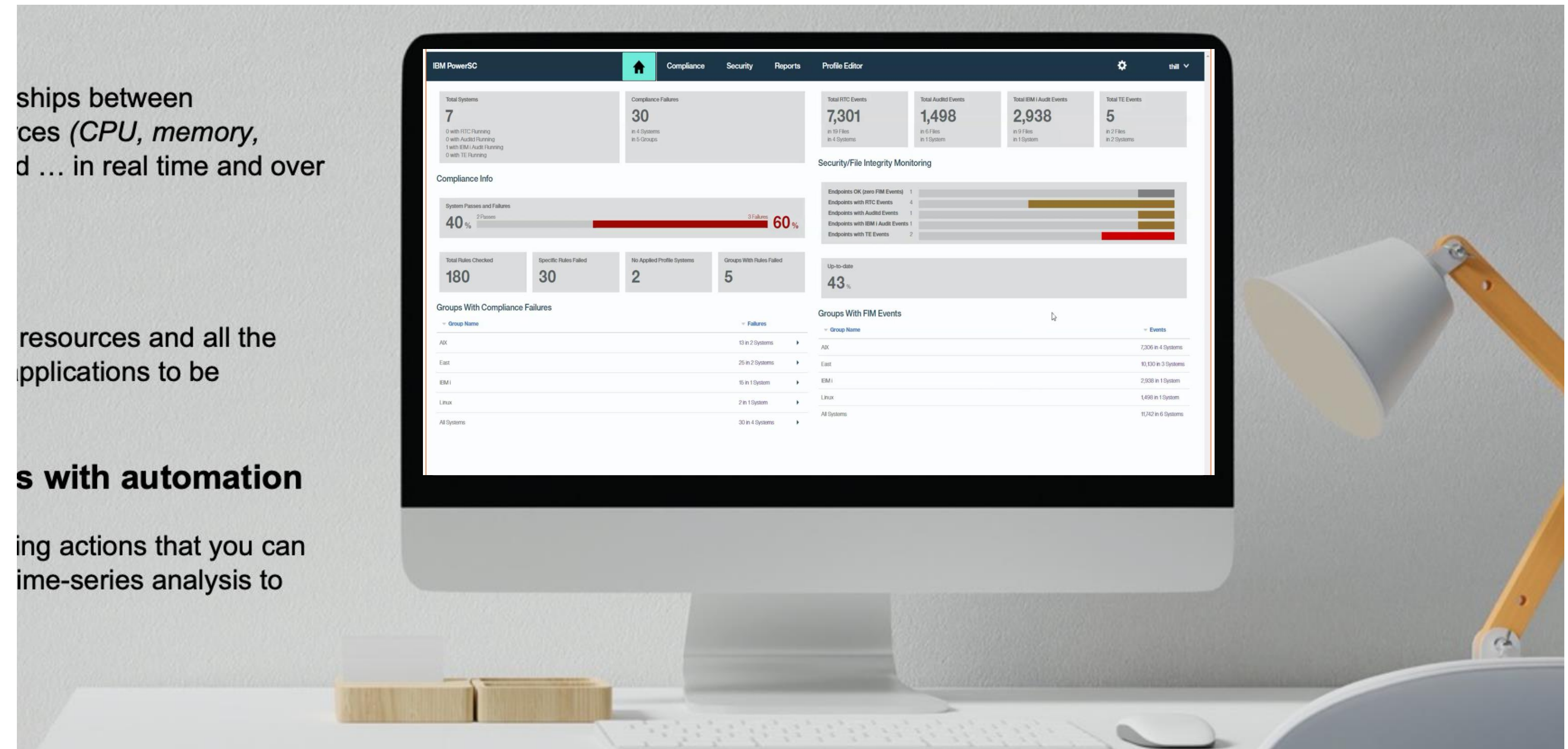
- File Integrity Monitoring (FIM)
- Allow/Block listing
- Endpoint Detection & Response

Patch Management

- Trusted Network Connect (TNC)
- Detect & alert policy issues
- Policy enforcement

Multifactor Authentication

- Policy-based and Centrally administered
- Simplified logins (Tokens and SSO)



PowerSC support for managed Power endpoints

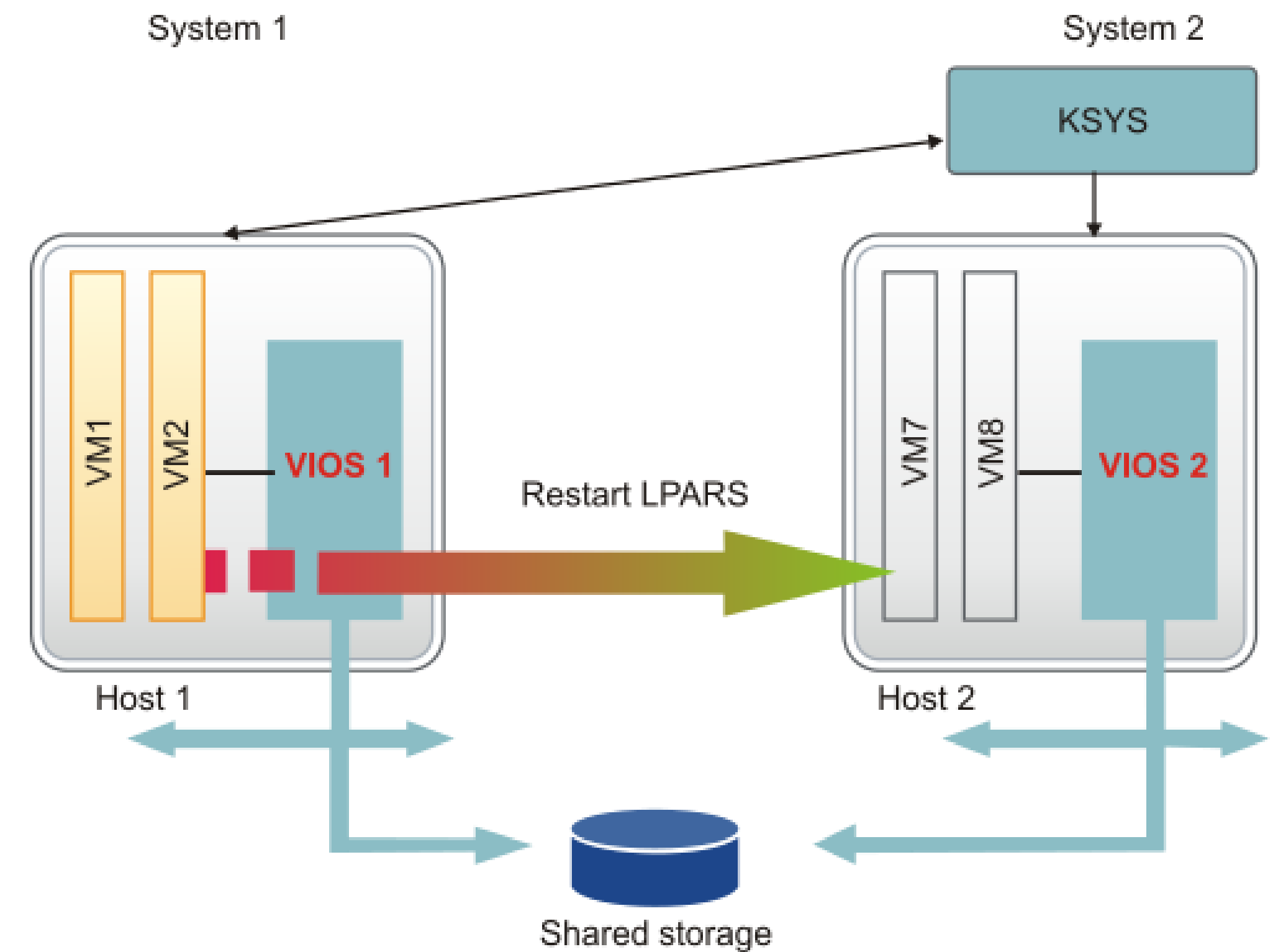


Security Capabilities	Endpoint types
Automated compliance	✓ Check and Apply
Compliance reporting capabilities (incl timelines)	✓ AIX, Linux, IBM i
File Integrity Monitoring	✓ AIX, Linux, IBM i
Allow Listing / Application Control	✓ AIX & Linux
Block Listing (hash search)	✓ AIX & Linux
Anti-Malware (virus DB)	✓ Linux
Patch management	✓ AIX & Linux
Containerization for easier delivery & automation	2022
Endpoint Detection and Response (EDR)	✓ Linux & AIX
Intrusion Detection Sys & Prevention / Firewall	✓ Linux / AIX
Log inspection and analysis	✓ Linux & AIX
Anomaly detection, correlation, & incident response	✓ Linux & AIX
Response / action triggers	✓ Linux & AIX
Event context and filtering	✓ Linux & AIX
Multifactor Authentication	✓ AIX, Linux, IBM i

VM Recovery Manager HA

Simplified HA solution for private cloud deployments

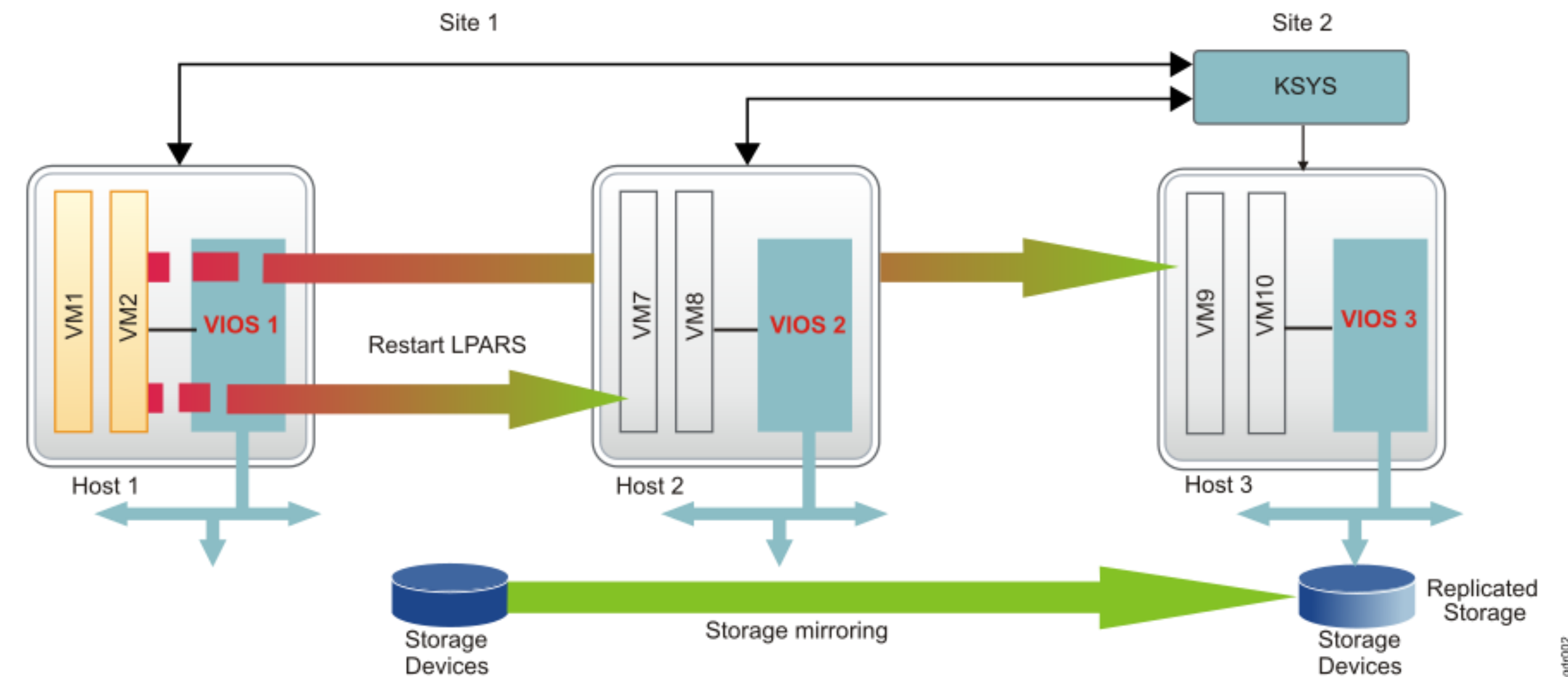
- Highly automated VM restart-based HA operations
- Includes agents for monitoring Db2, Oracle and SAP
- Monitor and manage HA from one intuitive UI
- Lowest cost of acquisition lowest cost of operations
- Supports AIX, i and Linux



VM Recovery Manager HA/DR

Simplified HA & DR solution for private cloud deployments

- Highly automated HA and DR operations
- Supports both VM restart HA and DR operations
- Manage HA and/or DR from one intuitive UI
- Eliminates dependency on specialized support
- Lowest cost of acquisition lowest cost of operations
- Supports AIX, i and Linux, complements PowerHA SE



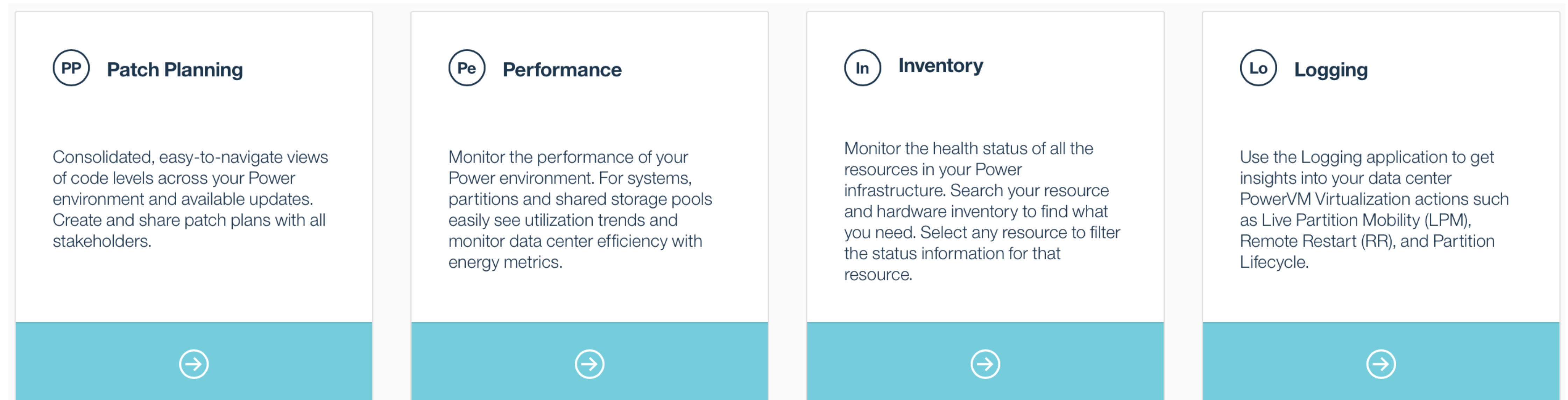
IBM Cloud Management Console (CMC)



The IBM Cloud Management Console (CMC) is a SaaS-based manager that provides a consolidated view of Power-based deployments, spanning multiple regions and datacenters.

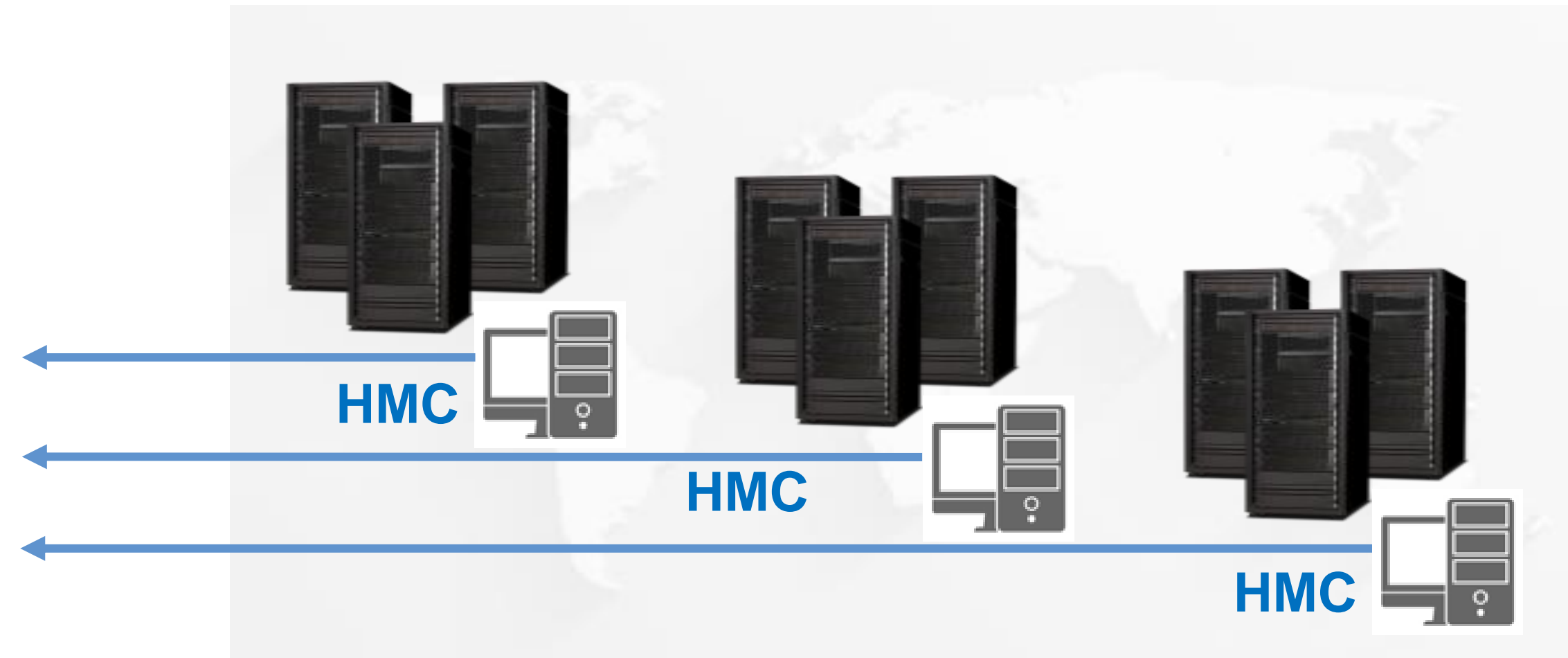
CMC provides a comprehensive inventory of systems and virtualized resources, consolidated performance data to optimize utilization and performance across multiple Power-based data centers, and aggregated logging information for additional insights.

Delivered as a SaaS offering from the IBM Cloud, CMC offers convenient pay-as-you-go multi-cloud management. A one-year CMC entitlement is included with Power E1080 servers.



CMC connects HMCs to the Cloud

Cloud-based microservices that can be accessed securely, anytime, anywhere for the entire enterprise



As data centers scale out and up, the need increases for a complete view of the Power infrastructure

Inventory Aggregation



- View all Power Systems, HMCs, VMs, etc. across the entire enterprise
- See basic health & state

Performance Monitoring



- Aggregated performance across Power enterprise
- Energy monitoring
- OS metrics

Log Trends



- Log aggregation
- Telemetry

Patch Planning

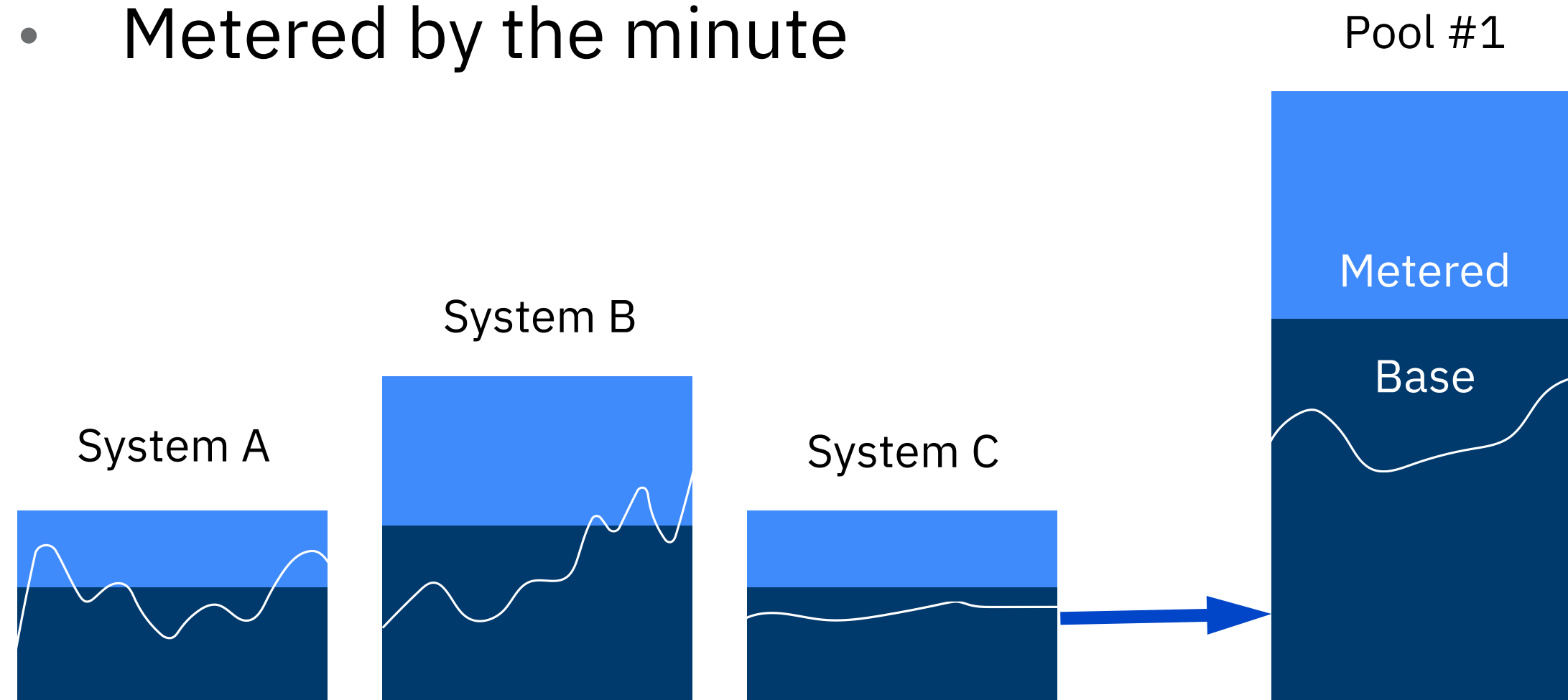


- Patch compliance reports for firmware, HMC, NovaLink, VIOS, and OS
- Scheduled maintenance plan management

IBM Power Shared Utility Capacity

Handle demand spikes across collections of Power servers with Base and Metered Capacity, which includes:

- Processor activations
- Memory activations
- Metered by the minute



**Optimize costs with dynamic, pay for use pricing.
All processor & memory resources are fully activated.**

How it works

Purchase servers with **Base** capacity.

Variable demand addressed by buying Capacity Credits for **Metered** capacity.

IBM Cloud Management Console with HMC automatically monitors and debits against Capacity Credits for actual resource usage by the minute.

Which servers?*

Deploy across a pool of Power9 or Power10 systems.



Thank You

Please support your profession!

**Write a review about your favorite
IBM products!**

It's fast and EASY!!

- **Reviews are anonymous** (*your name and your company name will not be published*)
- **10-15 minutes to complete**

Steps to a published review

- a) Use the QR CODE below, which takes you directly to the Gartner Peer Insights review platform
- b) Find your favorite IBM products
- c) You must register with either **a business email or a LinkedIn profile**. (Please check spam/junk folder for a request for confirmation from Gartner)
- d) Proceed with review. Reviews can take 3-5 business days to publish



AIX Resources

AIX Product Information

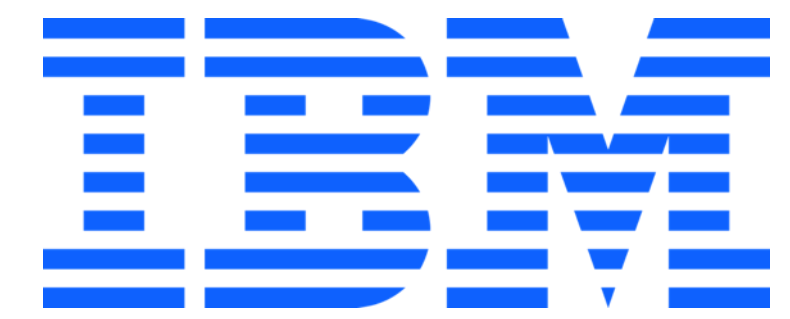
- [AIX Home Page](#)
- [AIX Power Community](#)
- [AIX Power Community Blogs](#)
- [AIX Open Source Community](#)
- [AIX Tool Box Repository](#)
- [AIX Data Sheet](#)
- [AIX Strategy Paper](#)
- [IDC Vendor Spotlight on AIX](#)
- [IBM Power Community](#)

AIX Blogs

- [Enterprise AI on AIX Blog](#)
- [Tech Channel Article](#)
- [Modernizing Oracle Database on IBM Power](#)
- [AIX 7.3 VPMEM Support](#)
- [Power Management and Frequency Monitoring on AIX](#)
- [OpenSSL 1.1.1 for AIX](#)
- [AIX integration with Power HW GZIP](#)
- [OpenSSH with Power HW GZIP](#)
- [A brief history of AIX](#)
- [AIX 7.3 Migration](#)
- [OpenBLAS with Power10 MMA Integration](#)

Announcements

- [AIX 7.3](#)
- [7.3 Announcement Blog](#)
- [AIX Enterprise Edition](#)
- [Enterprise Cloud Edition with AIX](#)
- [Oracle 19c Database Support for AIX 7.3](#)



Back Up

AIX 7.3 Overall Key Feature Enhancements

Respond faster to business demands <ul style="list-style-type: none">• Binary compatibility guarantee• Power8 and later platform support• 240 cores @ SMT8 per LPAR• Power10 native mode support• Power10 memcpy() optimization• Power10 MMA Ready• New Power10 I/O adapter support• 128 TB JFS2 filesystem and filesize• Async I/O scaling• Fork-exec scaling• Out of the box HW GZIP• pigz with Power HW GZIP 2022 <ul style="list-style-type: none">• NVME over fabrics with NPIV storage virtualization• NFS Client support for files larger than 32 TB• FDMI support for 16 Gb and faster FC adapters• AIX & VIOS install and boot from iSCSI storage	Protect data from core to cloud <ul style="list-style-type: none">• LVM encryption for rootvg• Stronger default password policy• Security aligned install defaults for networking components• IPSEC enhancements• Sendmail SASL support• Trace of channel 0 requires root privilege 2022 <ul style="list-style-type: none">• OpenSSL 3.X• Physical volume encryption, including SED drives• Support for ECDH ciphers in ftpd	Maximize availability and reliability <ul style="list-style-type: none">• CPU and RAM DLPAR performance• Reduced boot time• Live update of kernel tunables 2022 <ul style="list-style-type: none">• AIX dump exploitation of Power HW GZIP• Reduced alternate path fail-over times with 16 Gb and faster FC adapters• chpv command option to forcefully offline a poor performing physical volume	Management modernization and hybrid Cloud <ul style="list-style-type: none">• Python included for out of the box ansible automation• bash as an included alternate shell• create_ova with HW compression 2022 <ul style="list-style-type: none">• tar command support for the pax archive format• New Ansible use cases• AIX toolbox for open-source updates
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

AIX 7.3 Value Proposition

Overall Benefits: <ul style="list-style-type: none">• Innovations for Clients running business critical workloads that• demand high reliability,• strong security and enabling technology for workload modernization.	Security: <ul style="list-style-type: none">• Secure IT landscape : AIX 7.2 TL5 NAIP certified.• Adds raw disk encryption with hardware acceleration• Cryptographic management of PVs and Key Server Management	Performance and Availability <ul style="list-style-type: none">• Higher Performance, Reduced Latency and Parallel I/O through enhancements in FC-NVMe capabilities.• Improve the time for I/O failover to alternative paths - Support of 16 Gb and Faster FC Adpts• Improved AIX dump performance.• Automatically tune applications and processes in real time for performance gains.• Reduce the time to dynamically add/remove large memory in LPAR through AIX Virtual Mem. Mgmt.	Automation and Management and Modernization: <ul style="list-style-type: none">• New Ansible Use cases• Toolbox Updates
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------

Available Key ISV and IBM Software for Power10

Core Applications

- SAP HANA (E1080, E1050, S1024, S1022)
- Oracle Database Version 19c(AIX 7.2.5 & AIX 7.3.0)
- Oracle Fusion Middleware 12c (12.2.4.1.0 - AIX 7.3)
- Oracle WebLogic Server 12c & 14c (14.1.1.0.0 & 12.2.1.4.0 - AIX 7.3)
- Oracle GoldenGate 19c (19.1.0.0.220222 – AIX 7.3)
- Oracle Business Intelligence Enterprise Edition 12c (12.2.1.4.0 - AIX 7.3)
- IBM Db2, IBM Db2 pureScale (AIX 7.2 TL5, AIX 7.3)
- Enterprise DB, MongoDB Enterprise
- Fujitsu Enterprise Postgres (RHEL, SLES)
- [Informix Dynamic Server Enterprise Edition](#)
- Infosphere Data Replication (Q, SQL)
- [InfoSphere Information Server \(DataStage\)*](#)
- Filenet Content Manager, IBM Content Manager Enterprise
- [IBM Netcool Operations Insight](#)
- Spectrum Control, Scale, LSF, Protect
- [IBM Sterling B2Bi](#), [IBM Sterling Connect: Direct](#)
- [IBM Sterling Control Center](#), [IBM Sterling File Gateway](#)
- TSA Multi-Platforms, IBM Tivoli Monitoring
- [Aqua Security](#), HCL BigFix
- Security Guardium Key Lifecycle Manager
- InfoSphere Identity Insight
- [Rational ClearCase](#), [Rational ClearQuest](#), [UrbanCode Deploy](#)
- WebSphere App Server/Liberty
- IBM Java SDK , IBM Semeru Runtimes
- IBM License Metric Tool, IBM Compilers, ESSL, Node.js

AI / Hybrid Cloud

- App Connect Enterprise
- Cognos Analytics with Watson
- WebSphere Hybrid Edition
- IBM CP4MCM
- IBM CP4D (subset)
- IBM CP4I
- IBM CP4WAIOps
- IBM MQ
- WPS Analytics
- Veritas Infoscale
- SAS ML7

Banking / Financial

- IBM FTM (OCP, [AIX 7.3](#))
- Finacle*
- Jack Henry (HW sizing+cert)
- Calypso*, SWIFT*
- [Temenos\(T24, OCP\)](#)
- Oracle FLEXCUBE*
- Silverlake
- Clari5 (Financial Crime Management Solution Suite 4.9)
- Fiserv Premier (IBM i)
- FIS Profile
- Finastra Fusion Equation (IBM i)

Enterprise Resource Planning

- Infor
- Oracle E-Business Suite* (AIX 7.2.5, p8 mode only)
- Oracle: RPAS, JDE, Peoplesoft & Siebel (AIX 7.2.5)

Healthcare

- EPIC (2 CEC E1080, E1050, S1022, S1024)
- InterSystems

Coming Soon

- Fujitsu Enterprise Postgres (OCP)
- Fiserv Signature (OCP)
- [Profinch Atumverse \(OCP\)](#)

Updated: 3/31/2023
[Blue – Updates Since Jan-2023](#)

All future timelines are projections and subject to change without notice

* Binary compatibility support

Software Ecosystem Support for AIX 7.3

Available and Supported Examples – IBM SW

- [IBM Content Manager Enterprise Edition](#)
- [IBM Cognos Analytics with Watson](#)
- IBM Db2 11.5.8 & Db2 pureScale
- IBM Db2 Connect
- [IBM Data Replication \(SQL, Q\)](#)
- [IBM Financial Transaction Manager](#)
- IBM Java SDK & Semuru Runtimes
- IBM WebSphere App Server/Liberty
- IBM License Metric Tool
- [IBM Netcool Operations Insight](#)
- [IBM Sterling B2Bi, IBM Sterling Connect: Direct](#)
- [IBM Sterling Control Center, IBM Sterling File Gateway](#)
- [IBM Tivoli Monitoring](#)
- IBM Compilers, IBM ESSL
- [Rational ClearCase and Rational ClearQuest](#)
- [IBM UrbanCode Deploy](#)
- [IBM Security Guardium Key Lifecycle Manager](#)
- IBM Spectrum Scale Advanced Edition
- IBM Spectrum Protect 8.1.14

Available and Supported Examples – Major ISV SWs

- Oracle 19c Database, including RAC
- Oracle Fusion Middleware 12c
- Oracle WebLogic Server 12c & 14c
- Oracle GoldenGate 19c
- Oracle Business Intelligence Enterprise Edition 12c
- EdgeVerge Systems
- Jack Henry
- Calypso
- SWIFT
- Oracle Financial Services
- EPIC
- Temenos
- HCL BigFix
- IBM MQ
- IBM App Connect Enterprise
- SAP, SAP Notes 3104875 & 1780629
- SAP ASE (Sybase), SAP Note 1554717
- IBM FileNet Content Manager
- [Informix Dynamic Server Enterprise Edition](#)

Updated: 3/31/2023
[Blue – Updates Since Jan-2023](#)