

Power 11 HW Announcements

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IBM Power11: Full stack innovation and optimization

AI Acceleration



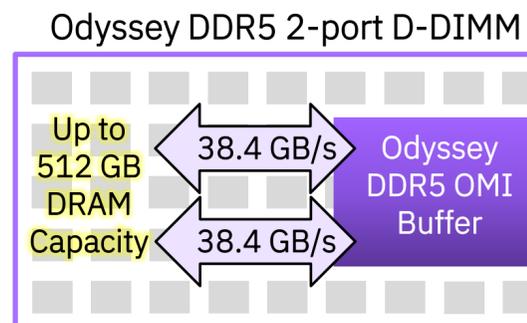
MMA
IBM Spyre Accelerator
Optimized for Inference

Platform Capabilities



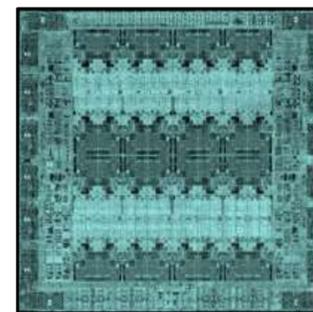
Uptime, Energy Management,
Quantum-safe security

Memory Architecture
Energy / Thermal Infrastructure



Agnostic, 3x Pipes, 2x Capacity
Advanced Cooling Technology

Processor Architecture
Socket-level Packaging
Semiconductor Technology



Improved Thread, Core, Capacity
2.5D Stacking: Energy Optimization
Samsung Foundries Enhanced 7nm

Power11 Portfolio and Innovation

An Edge to Cloud platform with core innovation by design

New Energy Efficient operating mode that optimizes power consumption without compromising SLAs

New 2.5D Integrated Stacked Capacitor and innovative thermal technologies to optimize power consumption

Improved performance through workload isolation with Resource Groups

Next-generation memory with 3X DDR bandwidth delivers performance to larger, memory-intensive applications

New off-chip AI acceleration based on IBM Spyre planned for 4Q25



P11 1-socket coming soon



S1122 & L1122



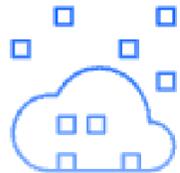
S1124 & L1124



E1150



E1180



PowerVS

Power11 availability on Day-1¹

¹ Day 1 availability is planned for the United States and Spain only.

Power11 Value Drivers

High Level Capability	Feature	Power10 Capability	Power11 Capability	Notes
Zero Planned Downtime	Non-disruptive Update	X	X	
	Automated Update w/ Evacuation		X	
	Automated Update w/o Evacuation		X	
	Preserve Resource Groups during Evacuation		X	
Security	Power Cyber Vault	X	X	
	Inventory Scanning for Quantum Safe	X	X	PowerSC required
	Security at the Core (MFA)	X	X	MFA for BMC
	Quantum Safe Boot		X	
	Quantum Safe LPM		X	
Autonomous Error Resolution	Automated Case File Creation		X	
	Automated Data Collection and Transfer		X	
IT Efficiency - Energy	Monitoring and Reporting (Energy, etc)	X	X	
	Partition-level Monitoring	X	X	
	Energy Efficient Mode		X	
	Mode Scheduling		X	
IT Efficiency – Performance	Performance Utilization Guarantee	X	X	+5pts for Power11 DCM-based systems
	Resource Groups		X	
AI	MMA (on-chip acceleration)	X	X	
	Spyre Drawer Attachment		X	

Power11 Portfolio Highlights

- Architectural technology Improvements
 - Increased Core Counts
 - Increased Processor Frequencies
 - Increased Memory Frequencies
- Simplified Scale-out Portfolio
- High-End System upgrades available to Power E1180 from Power E1080
 - Now extended to Mid-range E1150 platform from Power E1050
 - Memory DIMM and I/O can migrate over to preserve investment
- Power11 systems support Power Enterprise Pools with Mobile or Shared Utility Capacity
 - Power11 & Power10 systems can interoperate and share resources in a single pool
 - Streamlined activation structure and pricing (single price for all activations)
 - Hybrid billing of Pools 2.0 Metered Capacity & PowerVS consumption
- Improved resiliency
 - Spare cores and stack availability for improved unplanned and planned downtime
 - Cyber Resiliency



IBM Power E1180

The industry's most scalable server for consolidating database and mission critical workloads



Single Node



IBM Power E1150

Built for large data & memory intensive workloads.

IBM Power Entry

Enterprise-class reliability, security



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Power11 Portfolio Specs Overview

Model(s)	Footprint Capacity	Notes
High-End (4S+): IBM Power E1180	<ul style="list-style-type: none"> •4 nodes (5U CEC) with 4 processors each •Up to 16 cores per socket/module •64 TB – DDR5 based memory 	<ul style="list-style-type: none"> •In-place upgrades with serial number preservation.
Mid-Range (4S4U): IBM Power E1150	<ul style="list-style-type: none"> •2-4 processors in a 4U form factor •Up to 30 cores per socket/module •Up to 16 TB – DDR5 based memory 	<ul style="list-style-type: none"> •In-place upgrades with serial number preservation.
Scale-Out 2S4U: IBM Power S1124 IBM Power L1124	<ul style="list-style-type: none"> •Up to 2 processors in a 4U form factor •Up to 30 cores per socket/module •Up to 8 TB – DDR5 based memory 	
Scale-Out 2S2U: IBM Power S1122 IBM Power L1122	<ul style="list-style-type: none"> •2 processors in a 2U form factor •Up to 30 cores per socket/module •Up to 4 TB – DDR5 based memory 	<ul style="list-style-type: none"> •Integrating the eSCM models into the S1122 family



IBM Power E1180

The industry's most scalable server for consolidating database and mission critical workloads



Single Node



IBM Power E1150

Built for large data & memory intensive workloads.

IBM Power Entry & Edge
Enterprise-class reliability,
security



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Power9 to Power10 to Power 11 Upgrade Options



S914
9009-41G

- 1-socket, 4U Rack & Tower
- 4,6,8 cores/socket
- **Max 8 cores**
- 16 IS RDIMM slots
- **1TB memory**

S922 / H922
9009-22G / 9223-22H

- 1,2-socket, 2U
- 1, 4, 8, 10, 11, cores/socket
- **Max 22 cores**
- 32 IS RDIMM slots
- **4TB memory**

L922
9223-22H

- 1,2-socket, 2U
- 4, 8, 10, 11 cores/socket
- **Max 22 cores**
- 32 IS RDIMM slots
- **4TB memory**

S924 / H924
9009-41G / 9223-42H

- 1-socket, 4U Rack
- 8,10,11,12 cores/socket
- **Max 24 cores**
- 16 IS RDIMM slots
- **4TB memory**

E950
9040-MR9

- 2, 3, 4-socket, 4U Rack
- 8,10,11,12 cores/socket
- **Max 48 cores**
- 32 IS RDIMM slots
- **16TB memory, 4TB/socket**

E980
9080-M9S

- 1 to 4 CEC 5U + 2U SCU
- **Max 192 cores**
- 8,10,11,12 cores/socket
- **64TB memory, 16TB /drawer**



S1012
9028-21B

- 1-socket, 2U rack and tower
- 1.4, 8 cores / SMT8 socket
- **Max 8 cores**
- 4 DDIMM slots
- **256 GB of memory (64 GB 1 and 4 Core)**

S1014
9105-41B

- 1-socket, 4U rack and tower
- 4, 8 cores / SMT8 socket
- **Max 8 cores**
- 8 DDIMM slots
- **1 TB of memory (64 GB 4 Core)**

S1022S
9105-22B

- 1,2-socket, 2U rack
- Up to 16 cores per system
- 4, 8 cores / SMT8 socket
- **Max 16 cores**
- 16 DDIMM slots
- **2 TB of memory**

S1022 & L1022
9105-22A / 9786-22H

- 1,2-socket, 2U rack
- 12, 16, 20 cores SMT8 / socket
- **Max 40 cores**
- 32 DDIMM slots
- **4 TB of memory**

S1024 & L1024
9105-42A / 9786-42H

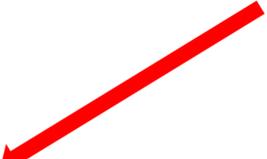
- 1,2-socket, 4U rack
- 12, 16, 24 cores SMT8 / socket
- **Max 48 cores**
- 32 DDIMM slots
- **8 TB of memory**

E1050
9043-MRX

- 2, 3, 4-socket, 4U
- 12, 18, 24 cores SMT8 / socket
- **Max 96 cores**
- 64 DDIMM slots
- **16 TB of memory**

E1080
9080-HEX

- 1 to 4 CEC 5U + 2U SCU
- **Max 240 cores**
- 10,12,15 cores SMT8 / socket
- **64TB memory, 16TB /drawer**



Future Power System

S1122 & L1122
9824-22A / 9856-22H

- 2-socket, 2U rack
- 4, 10, 16, 24, 30 cores SMT8 / socket
- **Max 60 cores**
- 32 DDIMM slots
- **4 TB of memory**

S1124 & L1124
9824-42A / 9856-42H

- 1,2-socket, 4U rack
- 16, 24, 30 cores SMT8 / socket
- **Max 60 cores**
- 32 DDIMM slots
- **8 TB of memory**

E1150
9043-MRU

- 2, 3, 4-socket, 4U
- 16, 24, 30 cores SMT8 / socket
- **Max 120 cores**
- 64 DDIMM slots
- **16 TB of memory**

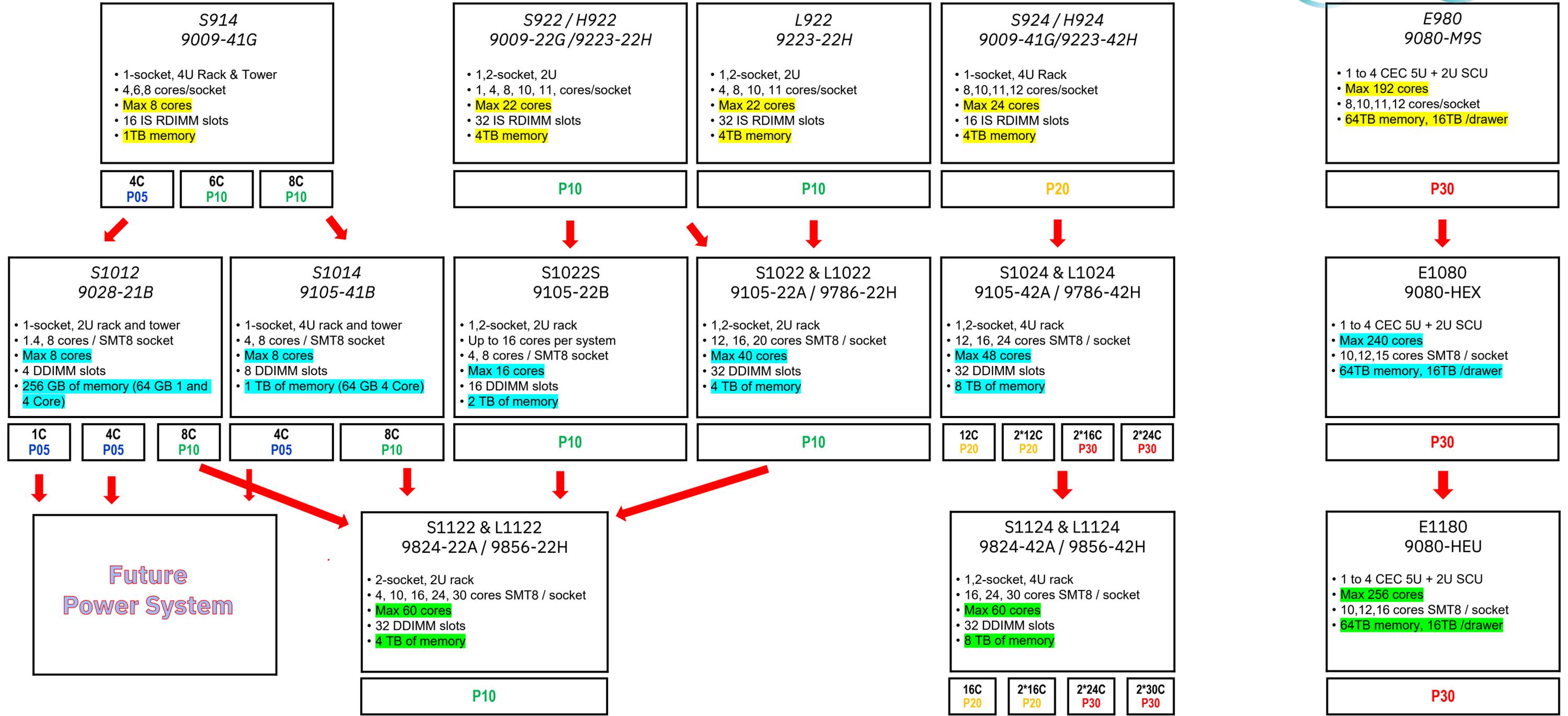
E1180
9080-HEU

- 1 to 4 CEC 5U + 2U SCU
- **Max 256 cores**
- 10,12,16 cores SMT8 / socket
- **64TB memory, 16TB /drawer**

AIX IBMi Linux Red Hat OpenShift

PowerVM

Power9 to Power10 to Power 11 Upgrade Options – IBM i SW Tiers



AIX
IBMi
Linux
Red Hat OpenShift

PowerVM

P05 P10 P20 P30 IBM i group processor

Introducing Power11: E1180



Hardware

- Power E1180 16-core SCM system with 64 – 256 Power11 processor cores (3.8-4.30 GHz)
- Power E1180 12-core SCM system with 48 – 192 Power11 processor cores (3.9-4.4 GHz)
- Power E1180 10-core SCM system with 40 – 160 Power11 processor cores (3.9-4.2 GHz)
- Up to 64TB DDR5 memory (DDR4 is supported if migrated from Power10)

Software Requirements

- AIX 7.2 & 7.3 or later
- IBM i 7.4, 7.5 & 7.6 or later
- RHEL 8.6, 9.4, 9.6, and 10
- SLES15 & 16 (4Q25)
- OCP 4.19 and later
- VIOS 3.1.4 (EOS is 4/2026), VIOS 4.1.0, VIOS 4.1.1 (GA 12/2024)

AIX

Power E1180 rPerf Projections (SMT8)					
Offerings	Max. Cores	1-node	2-node	3-node	4-node
E1180/16c	256-core	2285	4571	6856	9141
E1180/12c	192-core	1849	3698	5546	7395
E1180/10c	160-core	1500	3000	4500	5999

IBM i

Power E1180 CPW Projections (SMT8)					
Offerings	Max. Cores	1-node	2-node	3-node	4-node
E1180/16c	256-core	1,572,800	3,145,600	4,718,400	6,291,200
E1180/12c	192-core	1,290,000	2,580,100	3,870,200	5,160,300
E1180/10c	160-core	1,049,100	2,098,300	3,147,500	4,196,600

Based on published results as of 7/8/2025 available at <https://www.ibm.com/downloads/documents/us-en/10c31775c5d40fed>

Introducing Power11: E1150



Hardware

- Power E1150 30-core DCM system with 60 – 120 Power11 processor cores (3.0-4.1 GHz)
- Power E1150 24-core DCM system with 48 – 96 Power11 processor cores (3.3-4.2 GHz)
- Power E1150 16-core DCM system with 32 – 64 Power11 processor cores (3.5-4.2 GHz)
- Up to 16TB DDR5 memory

Software Requirements

- AIX 7.2 & 7.3 or later
- RHEL 8.6, 9.4, 9.6, and 10
- SLES15 & 16 (4Q25)
- OCP 4.19 and later
- VIOS 3.1.4 (EOS is 4/2026),
VIOS 4.1.0, VIOS 4.1.1 (GA 12/2024)

AIX

Power E1180 rPerf Projections (SMT8)				
Offerings	Max. Cores	2-socket	3-socket	4-socket
E1150/30c	120-core	1797	2650	3504
E1150/24c	96-core	1564	2307	3050
E1150/16c	64-core	1154	1703	2251

Introducing Power11: S1124



Hardware

- The S1124 will be offered with up to 2-sockets of DCM's
- 30-core DCM system with 2 sockets and 60 Power11 processor cores (2.8-3.95 GHz)
- 24-core DCM system with 2 sockets and 48 Power11 processor cores (3.05-4.15 GHz)
- 16-core DCM system with 1-2 sockets and 16-32 Power11 processor cores (3.4-4.2 GHz)
- Up to 8TB DDR5 memory

Software Requirements

- AIX 7.2 & 7.3 or later
- IBM i 7.4, 7.5 & 7.6 or later
- RHEL 8.6, 9.4, 9.6, and 10
- SLES15 & 16 (4Q25)
- OCP 4.19 and later
- VIOS 3.1.4 (EOS is 4/2026),
VIOS 4.1.0, VIOS 4.1.1 (GA 12/2024)

AIX

Power S1124 rPerf Projections (SMT8)		
Offerings	Max. Cores	2-socket / 1-socket
S1124/30c	60-core	1737 / NA
S1124/24c	48-core	1529 / NA
S1124/16c	32-core	1117 / 559

IBM i

Power S1124 CPW Projections (SMT8)		
Offerings	Max. Cores	2-socket / 1-socket
S1124/30c	60-core	1,345,900 / NA
S1124/24c	48-core	1,118,500 / NA
S1124/16c	32-core	823,000 / 433,200

Introducing Power11: S1122



Hardware

- S1122 will be offered with 2-sockets of DCM or eSCM modules and flexible consumption
- Power S1122 30-core DCM system with 60 Power11 processor cores (2.4-3.95 GHz)
- Power S1122 24-core DCM system with 48 Power11 processor cores (2.65-4.15 GHz)
- Power S1122 16-core DCM system with 32 Power11 processor cores (3.00-4.20 GHz)
- Power S1122 10-core eSCM system with 20 Power11 processor cores (3.05-4.00 GHz)
- Power S1122 4-core eSCM system with 8 Power11 processor cores (3.60-4.00 GHz)
- Up to 4TB DDR5 memory

AIX

IBM i

Software Requirements

- AIX 7.2 & 7.3 or later
- IBM i 7.4, 7.5 & 7.6 or later
- RHEL 8.6, 9.4, 9.6, and 10
- SLES15 & 16 (4Q25)
- OCP 4.19 and later
- VIOS 3.1.4 (EOS is 4/2026),
VIOS 4.1.0, VIOS 4.1.1 (GA 12/2024)

Power S1122 rPerf Projections (SMT8)		
Offerings	Max. Cores	2-socket
S1122/30c	60-core	1532
S1122/24c	48-core	1358
S1122/16c	32-core	1040
S1122/10c	20-core	627
S1122/4c	8-core	293

Power S1122 CPW Projections (SMT8)		
Offerings	Max. Cores	2-socket (part. Size)
S1122/30c	60-core	117,100 (4c)
S1122/24c	48-core	123,800 (4c)
S1122/16c	32-core	123,800 (4c)
S1122/10c	20-core	123,400 (4c)
S1122/4c	8-core	236,400 (8c)

Announcing IBM Power11

Autonomous IT built
for the AI era



Automated Platform Maintenance -
Eliminate Business Disruptions with
Zero Planned Downtime

IBM Power11

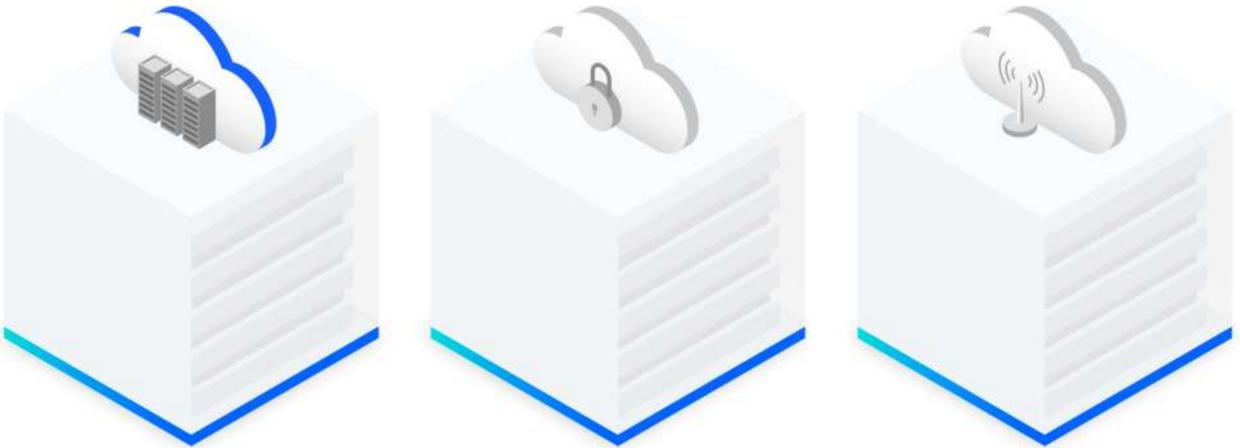
Engineered to accelerate enterprises into the AI era

Hybrid Cloud Platform

Operating Systems & Firmware

Computing Hardware

Silicon Technology



planned downtime with end-to-end automation¹

<1min

guaranteed ransomware detection with automated response and recovery within minutes²

5X

increase in business process rate with AI integration into existing enterprise workflows³

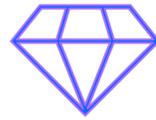
... Built on a foundation of performance, availability, and security

1. Based upon IBM internal testing of system upgrade scenarios; many (i.e. VIOS, hot plug adapters, I/O adapter FW, and concurrent system firmware updates) can be done in-place while some (i.e. non-concurrent system FW and HW maintenance) may require Live Partition Mobility (LPM) support.

2. This guarantee covers only the displaying of an alert in less than one minute. Remediation is in the form of drive replacement up to the cost of the Covered Product. Terms and conditions apply; full details can be found here. (Coming to IBMi in 4Q 2025, Roadmap for PowerVS)

3. Geis-group.eu, Uwe Rempel, head of ZSI department, Geis Group *. Measured in staging system.

Average annual cost of planned downtime



\$5.6M *

- Typical maintenance window is several hours.
- Multiple maintenance windows each year

Average amount of time spent by IT team managing maintenance



25-40% **

- Understanding & testing required maintenance levels
- Planning for maintenance windows, including navigating business priorities.
- Executing upgrades, often during nights & weekends

*. Forrester: <https://www.ibm.com/downloads/documents/us-en/10a99803f5afd8c1>
**. Ponemon: <https://adaptiva.com/hubfs/Reports/The-State-of-Patch-Management.pdf>

Be a leader in core banking uptime with Zero Planned Downtime

Ensure banking services are always available

Increase customer satisfaction and trust with no planned service disruptions

Enhance compliance and regulatory posture

Install critical security fixes quickly and seamlessly with agile platform updates



“We’re thrilled about the transformative value that IBM Power11 with Zero Planned Downtime delivers to our Finacle Core Banking customers. Harnessing Power11’s extreme automation, customers can perform platform maintenance without disrupting their core banking applications, ensuring near continuous application availability. This innovation enables our customers to match consumer demands for modern AI-first experiences while redefining the standard for system uptime.”

Girish G Kamath
AVP, Senior Product Line Manager, Infosys Finacle

Close the operational efficiency gap



Extreme Automation

Minimize application downtime

- 0 planned downtime with end-to-end maintenance¹

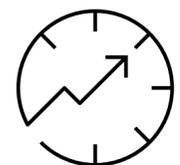
Automate data collection for faster error resolution



Reduced Costs

Enhance energy efficiency

- 2x better performance per watt vs x86²
- 28% better server efficiency with Energy-Efficient mode³



Optimized Workloads

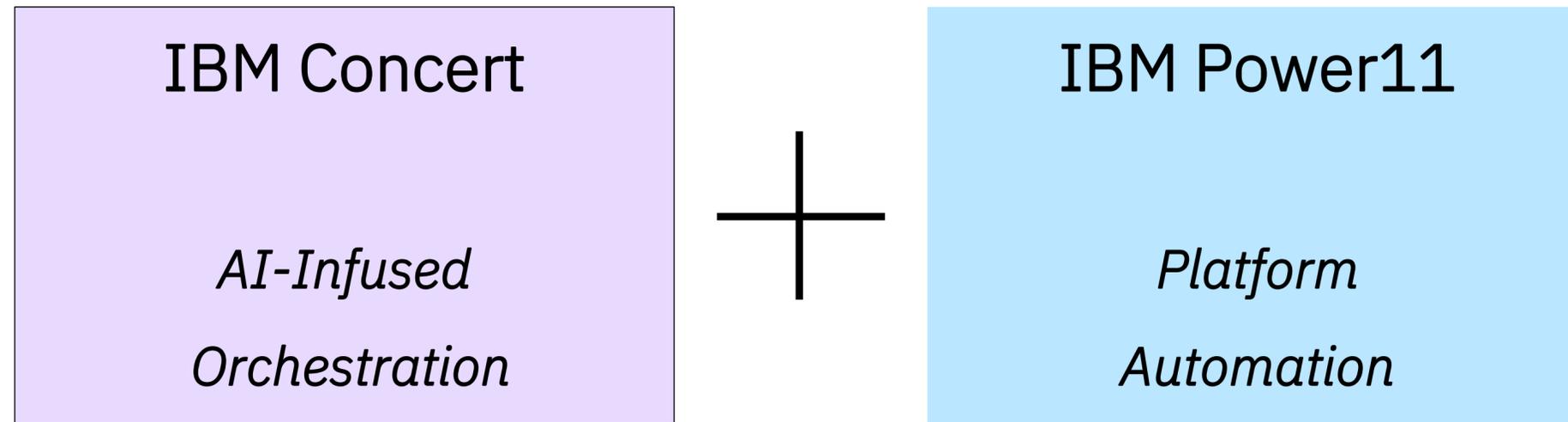
Improve performance and TCO

- 51% lower 3-year solution cost for payment apps vs. x86⁴
- 4X performance per core for core banking with OpenShift⁵
- Up to 15% improved out-of-box performance for commercial ERP⁶

1. Based upon IBM internal testing of system upgrade scenarios; many (i.e. VIOS, hot plug adapters, I/O adapter FW, and concurrent system firmware updates) can be done in-place while some (i.e. non-concurrent system FW and HW maintenance) may require Live Partition Mobility (LPM) support.
2. Based upon Quantitative Performance Index (QPI) data as of May 15, 2025, from IDC available at <https://www.idc.com/about/qpi> and utilization. IBM Power E1150 (4x30c Power11 at 3.0-4.1GHz) QPI of 241,000E versus HPE Compute Scale-up Server 3200 (4x60-core Intel cores at 1.9GHz) QPI of 208,898 and utilizations of 75% for E1150 based on IBM Power Performance Utilization Guarantee and 40% for x86. Energy consumption is based on maximum input power: IBM Power E1050 with maximum power of 5,200 W HPE Compute Scale Up Server 3200 with maximum power of 4,740 W
3. Based upon IBM measurements of performance per watt on servers comparing Maximum Performance Mode to Energy-Efficient Mode while running compute-, disk-, and memory-based workloads on Power11 systems with fully configured sockets and memory as follows: E1180 with 4x10c / 64x64GB DDIMM, E1150 with 4x16c / 64x32GB DDIMM, S1124 with 2x16c / 32x32GB DDIMM, S1122 with 2x16c / 32x32GB DDIMM
4. Based on IBM internal testing for FTM v4.0.6 Check data ingest. Transactions per second were measured for Red Hat OpenShift Container Platform 4.16 worker nodes running FTM v4.0.6 High Value Payments. Results valid as of May 29, 2025, and conducted under laboratory conditions, individual results can vary based on workload size, use of storage subsystems and other conditions. Comparison is based on an IBM Power S1122 (2x30-core/1TB) with 45 worker cores and 10 Db2 cores versus Intel Xeon x86 (2x72-core/1TB) with 108 worker cores and 22 Db2 cores. Tests were run with FTM High Value Payments accessing Db2 databases on AIX on a Power S1122 system and on RHEL on Intel Xeon server. Total cost of ownership (TCO)/solution cost is defined as hardware, software, and maintenance costs over a period of three years and price-performance is performance/3-yr TCO where hardware list pricing is based on IBM Power S1122 <https://www.ibm.com/products> and extrapolated industry standard x86 list pricing based on IBM internal industry knowledge and software list pricing available at [here](#)
5. Based on IBM internal testing for Temenos Transact core banking workload (transactions per second) accessing Linux EDB databases each running 2,560,256 transactions using JMeter V5.6.3, the error ratio was kept under 1%. Results valid as of June 25, 2025, and conducted under laboratory conditions, individual results can vary based on workload size, use of storage subsystems and other conditions. Comparison is based on an IBM Power E1180 (16x16 core) with 32 worker cores versus Intel Xeon x86 (4x60 core) with 128 worker cores. Tests were run with Red Hat Enterprise Linux 9.6 on the OpenShift Container Platform Helper, Red Hat OpenShift 4.18.13 and EDB 17.5.0 on both servers.
6. Based on IBM internal testing of multi-instance SAP NetWeaver running on an E1080 (8x12 core) compared to E1180 (8x12 core) at various utilization levels. Both systems utilized AIX and SAP best practices and no additional performance tuning.



Zero-planned downtime enabled with IBM Power11...
and enhanced with IBM Concert



And delivering essential **business outcomes**

Reduced Risk

Increased
Productivity

Improved
Business Continuity



Zero Planned Downtime can be executed by:

IBM Concert + IBM Power11

or

IT Admin at the Power11 HMC

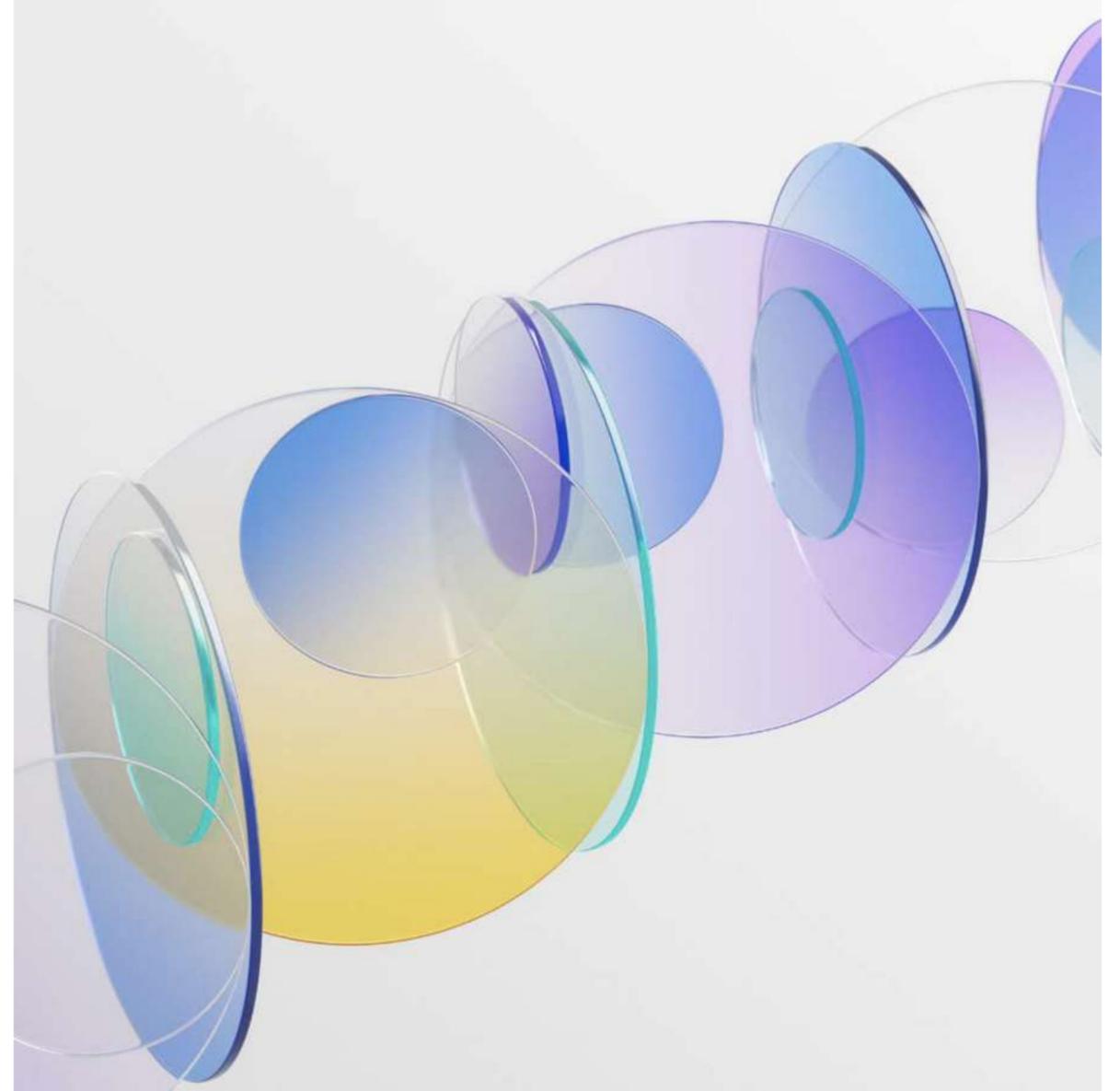
What you are about to see:

1. Security Patch management & remediation with IBM Concert + IBM Power, including
 - **Discovery** of potential vulnerabilities
 - **Understanding** of risks
 - **Recommendations** for remediation
 - Ability to **act** by triggering Power11's automated maintenance workflow
2. Power 11's built-in automated maintenance that enables platform maintenance without application impact.



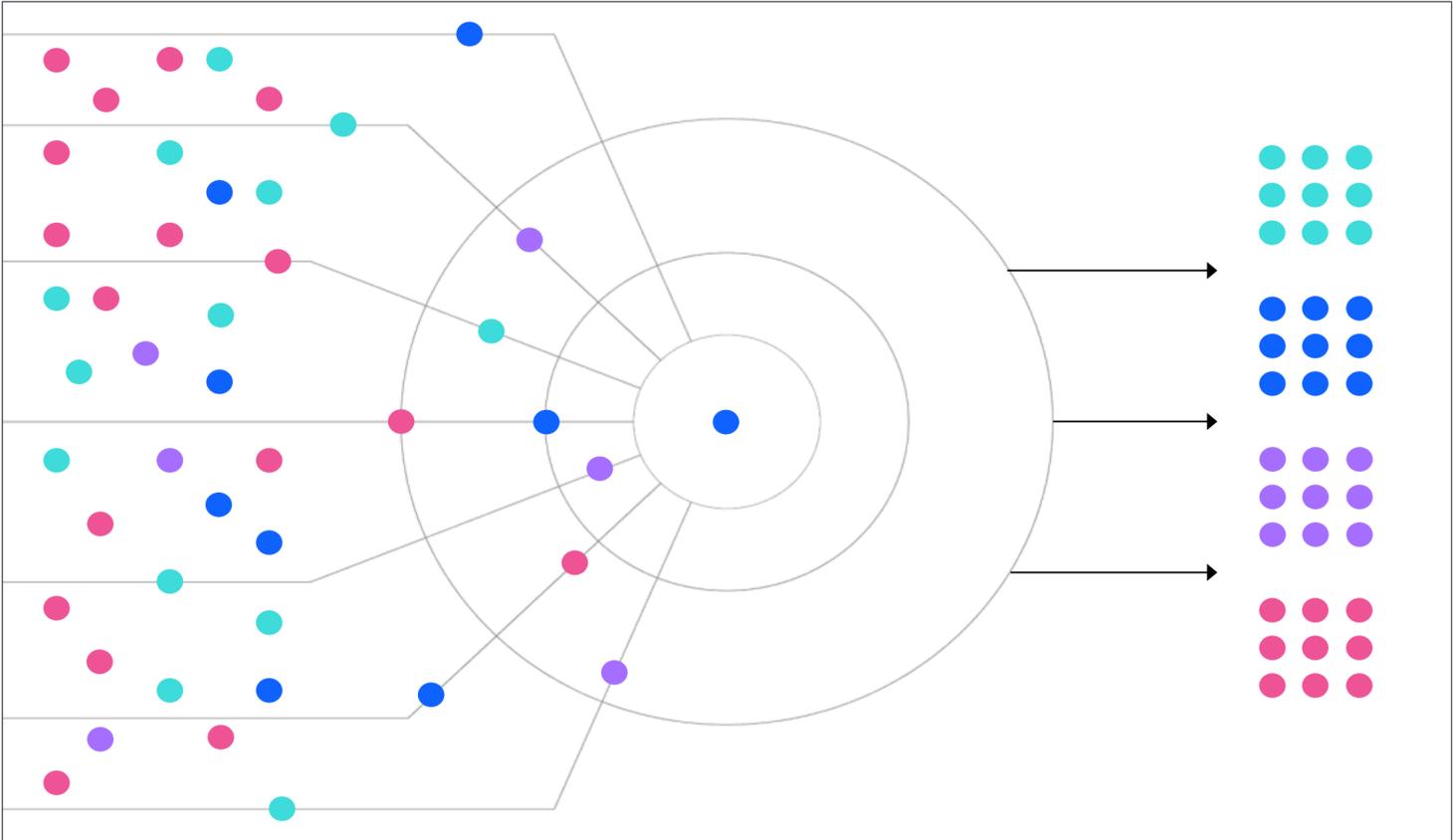
IBM Concert 2.0

Automating the practice of IT resilience



What is IBM Concert?

IBM Concert is an AI-powered resilience IT operations center that transforms how organizations manage resilience at scale by aggregating siloed data and insights and automating best practices into repeatable workflows.



How IBM Concert Works



Discover

Seamless integrations with your existing tools, from development to operations.

AI-driven discovery of hidden connections in previously siloed data



Recommend

Context-aware recommendations tailored to each use case, helping teams focus on what matters most.

Gen AI-powered insights, including deep dives and visual dependency maps.



Understand

App 360 view powered by watsonx, revealing dependencies and critical insights.

Visualize insights in the Arena View or explore them through a natural language chatbot.



Act

Automate workflows to remediate issues, integrate with connected tools, and reduce manual effort.

Leverage generative AI to instantly take action-whether upgrading a package or rotating a certificate.



Uptime is king

Even brief periods of downtime can significantly impact **revenue** and **customer satisfaction**.

“**41%** of enterprises say hourly downtime costs **\$1 million to over \$5 million.**”

“Outages of even a few minutes duration cause business and productivity to grind to a halt; negatively impact **reliability** and **security** and place companies at **higher risk** for **regulatory compliance** as well as civil and even criminal **penalties.**”

IBM Concert automates the practice of IT resilience

Concert automates IT resilience to help *proactively*:

 Prevent outages

 Reduce risk

 Improve compliance

Shift left: Address architectural and configuration issues *before* they become problems

How Concert can help:

Server failures

✓ Identifies and fixes technical deficiencies

CVE exploitations

✓ Remediates CVEs early to prevent exploitations

Expired certificates

✓ Automates certificate tracking and rotation

Open-source risks

✓ Identifies risky and out-of-date open-source packages

Resource limits

✓ Provides guidance for applying resource limits on Kubernetes clusters

Kubernetes misconfigurations

✓ Provides best practices for applying Kubernetes configurations

Java runtime settings

✓ Recommends best practices to optimize Java performance

Regulatory non-compliance

✓ Ensures incident response practices meet control requirements

Why IBM Concert?

Problem

- Enterprises have a **fragmented tech stack**, with disparate teams utilizing various tools from a variety of vendors
- These **teams operate in silos**, utilizing different and unconnected solutions
- These data silos result in data discrepancies, **hampering operational efficiency** and hindering decision making

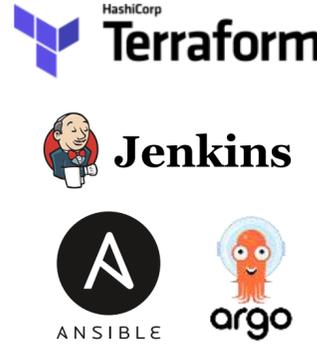
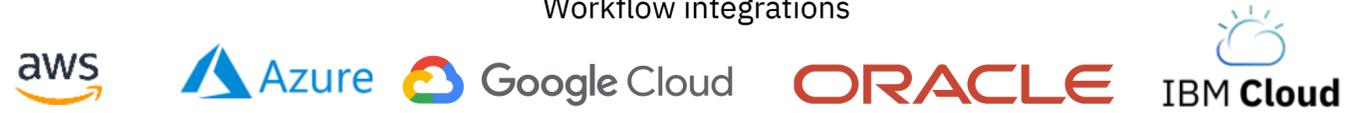
This translates into higher costs, longer time to resolution, greater risk (i.e., data breaches), more manual effort and redundant work

Solution

IBM Concert **breaks down data silos** and brings data from multiple application tools together, offering four core benefits:

- ✓ Improve information sharing across teams, allowing decision making to be accelerated with **contextualized and correlated insights**
- ✓ Save time and cost by using the power of **gen AI** to assist in the understanding and resolution of issues
- ✓ Reduce risk by identifying problems earlier and prioritizing issues based on their potential impact to the business
- ✓ Increase operational efficiency by **automating repetitive tasks** using auto-remediation gen AI

Concert provides a 360-degree view of your applications

<h3>Observability, logging and automation</h3> <p>Direct integrations</p>  <hr/> <p>Workflow integrations</p> 	<h3>Security and vulnerability scanning</h3> <p>Direct integrations</p>  <hr/> <p>Workflow integrations</p> 	<h3>Certificates</h3> <p>Direct integrations</p>  <hr/> <p>Workflow integrations</p> 	<h3>SAST & DAST</h3> <p>Direct integrations</p>  <hr/> <p>Workflow integrations</p> 	<h3>Build and development</h3> <p>Direct integrations</p>  <hr/> <p>Workflow integrations</p> 
<h3>Cloud and infrastructure environments</h3> <p>Direct integrations</p>  <hr/> <p>Workflow integrations</p> 		<h3>Service management and ticketing</h3> <p>Direct integrations</p>  <hr/> <p>Workflow integrations</p> 	<h3>Alerting</h3> <p>Direct integrations</p>  <hr/> <p>Workflow integrations</p> 	

How Concert ingests data

Ingesting data through auto-discovery

Auto-discovery is a method of automatically ingesting data into Concert through direct integrations.

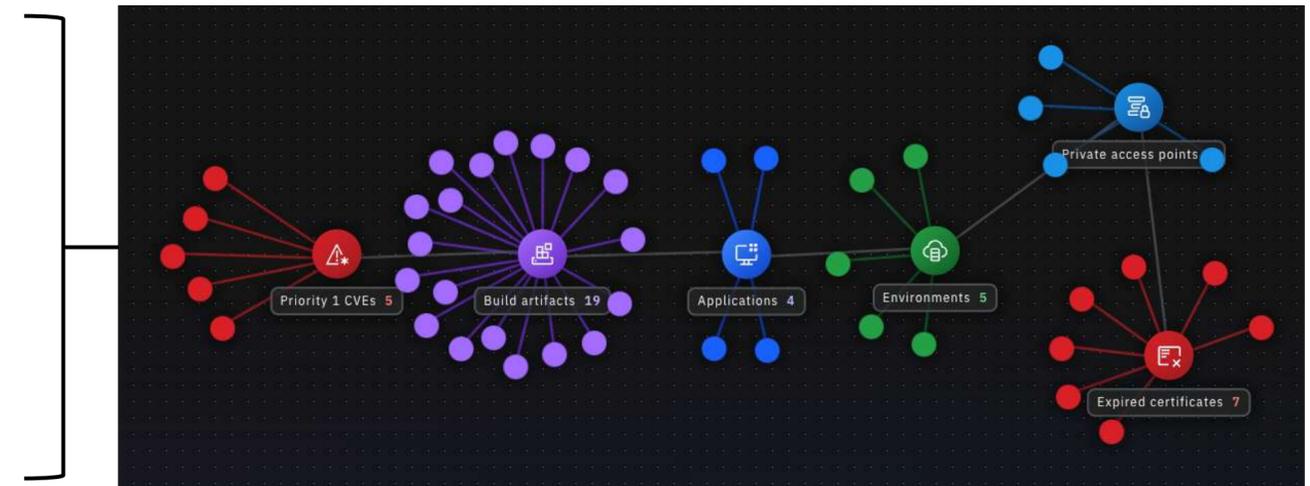
Auto-discovery integrations in Concert 2.0:

- Managed Kubernetes Services:
 - Amazon Elastic Kubernetes Service
 - Amazon Web Services Red Hat OpenShift Service
 - IBM Cloud Kubernetes Service
 - IBM Red Hat OpenShift Kubernetes Service
- Red Hat OpenShift
- Open-source Kubernetes
- Java applications
(can auto-discover everything except CVEs and certificates)
- Containerized applications (Docker/Podman)
(can auto-discover everything except CVEs and certificates)



Data that can be auto-discovered:

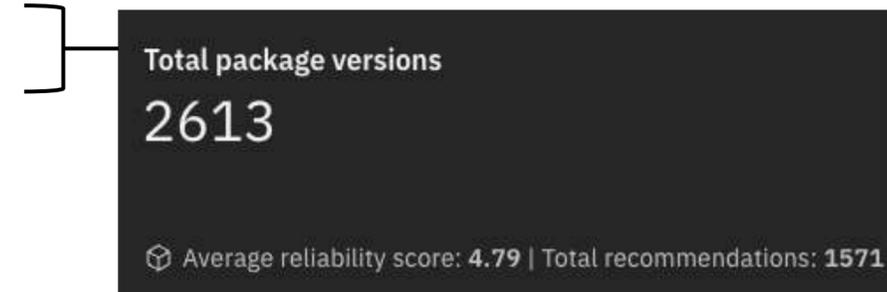
- Applications
- Environments
- Images
- Endpoints
- CVEs
- Certificates



- Resilience data

NFR	NFR type	Target score	Assessed score
Workloads Running as Root User	Security	100	20
Containers in Privileged Mode	Security	100	20
Workload Liveness Initial Delay	Usability	100	20
Workloads with Service Account Defined	Security	100	80

- Software packages



Ingesting data through pre-built workflows

Concert includes pre-built workflows to ingest data for vulnerability management, application resilience, certificates and compliance.

Vulnerability management	Application resilience	Certificate management	Compliance
<p>Load vulnerabilities from:</p> <ul style="list-style-type: none"> • AWS Inspector • Nessus • Microsoft Defender • Qualys • Container registries • S3 Buckets 	<p>Ingest metrics from:</p> <ul style="list-style-type: none"> • IBM Instana • Datadog • Dynatrace • ServiceNow • Jira • Java • Containers 	<p>Discover certificates from:</p> <ul style="list-style-type: none"> • AWS Certificate Manager • AWS Secrets Manager • IBM Secrets Manager • Kubernetes CLI • Kubernetes API • Windows servers • Linux keystore 	<p>Ingest assessments from:</p> <ul style="list-style-type: none"> • Red Hat OpenShift • Red Hat Enterprise Linux • CyberSaint



Ingesting data through a CI/CD pipeline

Concert can integrate with a customer's existing CI/CD pipeline to ingest more complex data sources.

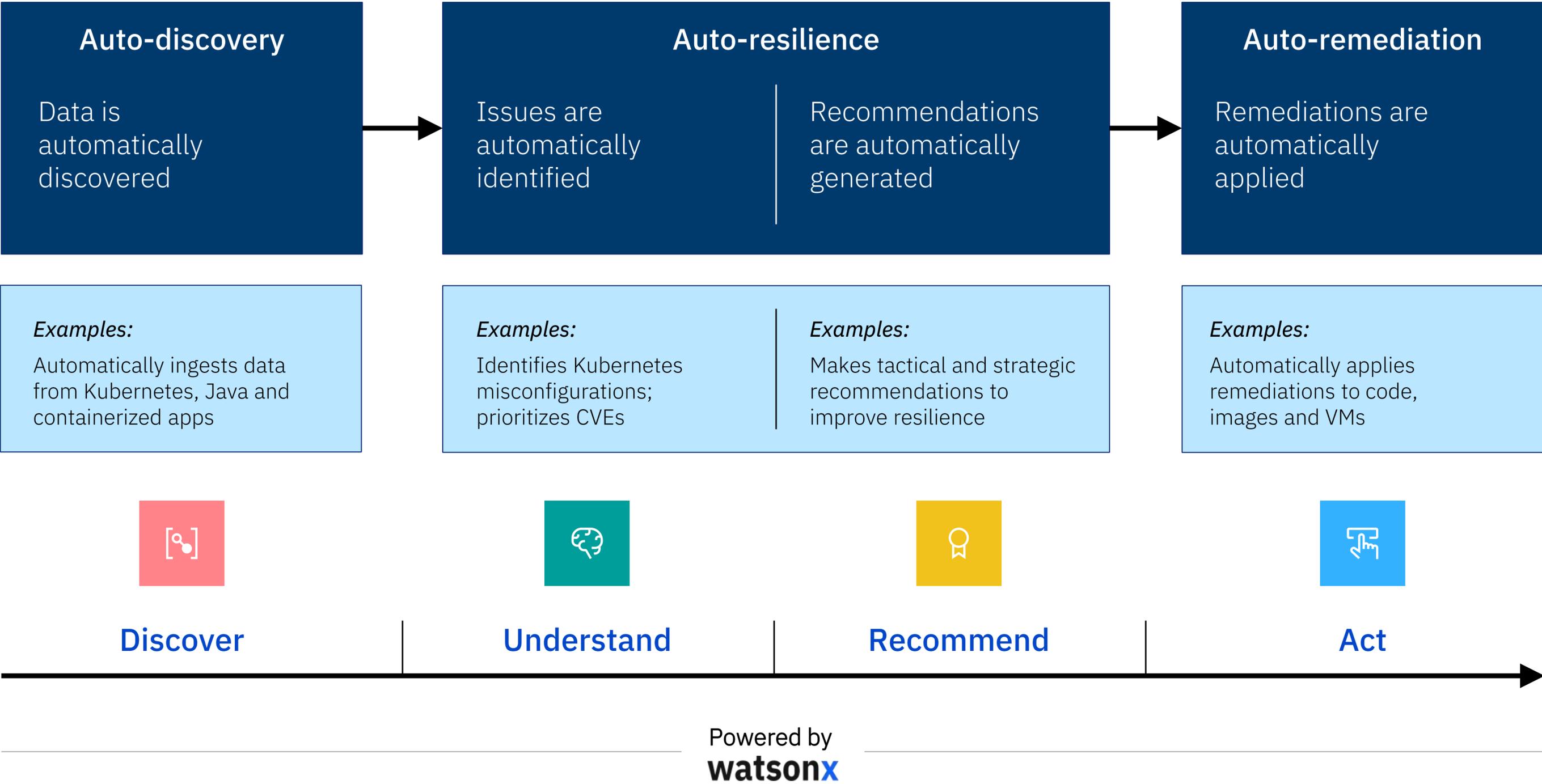
SBOM details

- An inventory of all open source and 3rd-party components in a codebase
- Includes the licenses that govern the components, the versions of the components and their patch status
- SBOMs can be compared to track changes and drifts across software releases
- SBOMs are machine-readable, enabling automation and tool integration

Use case	Data source	File format
Application data	Application-definition SBOM	JSON (ConcertDef)
Application vulnerability	Vulnerability scan of images	JSON, CSV, XLS, XLSX, VDR
	Vulnerability scan of source-code	JSON (CycloneDX 1.5+), CSV, XLS, XLSX
	Static Application Security Testing (SAST) scan	JSON, CSV, SARIF
	Dynamic Application Security Testing (DAST) scan	JSON, CSV, XLS, XLSX
Software composition analysis (SCA)	Package SBOM	JSON (CycloneDX 1.5+)
Compliance	Continuous compliance scanner	JSON (OSCAL)

SBOMs enable a Shift-Left approach by capturing an inventory of all software dependencies at each build, helping detect security risks before software is released

Automating the practice of resilience – from discovery through remediation



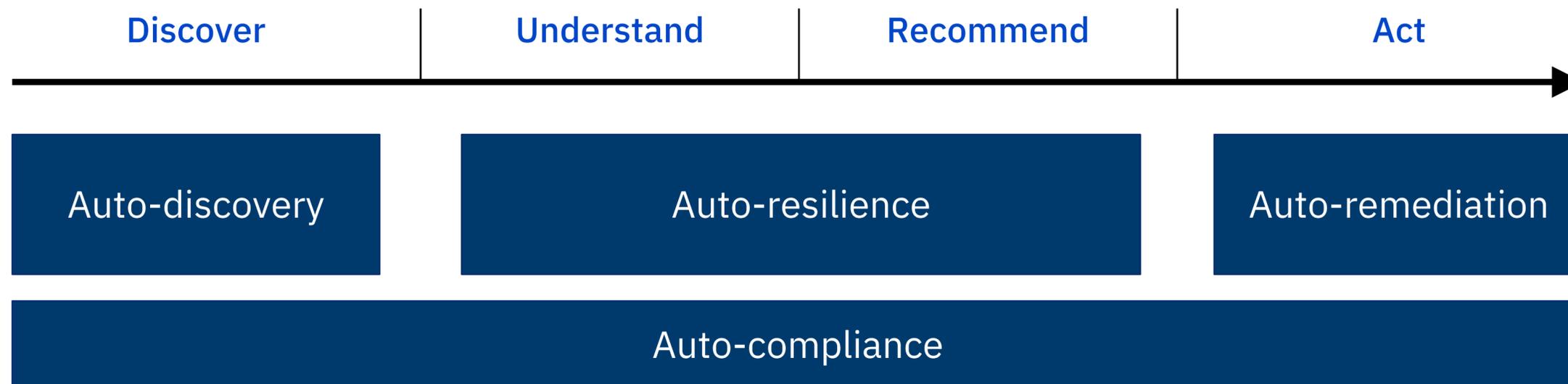
How does Concert work?

1. Automates the end-to-end resilience process from discovery to remediation



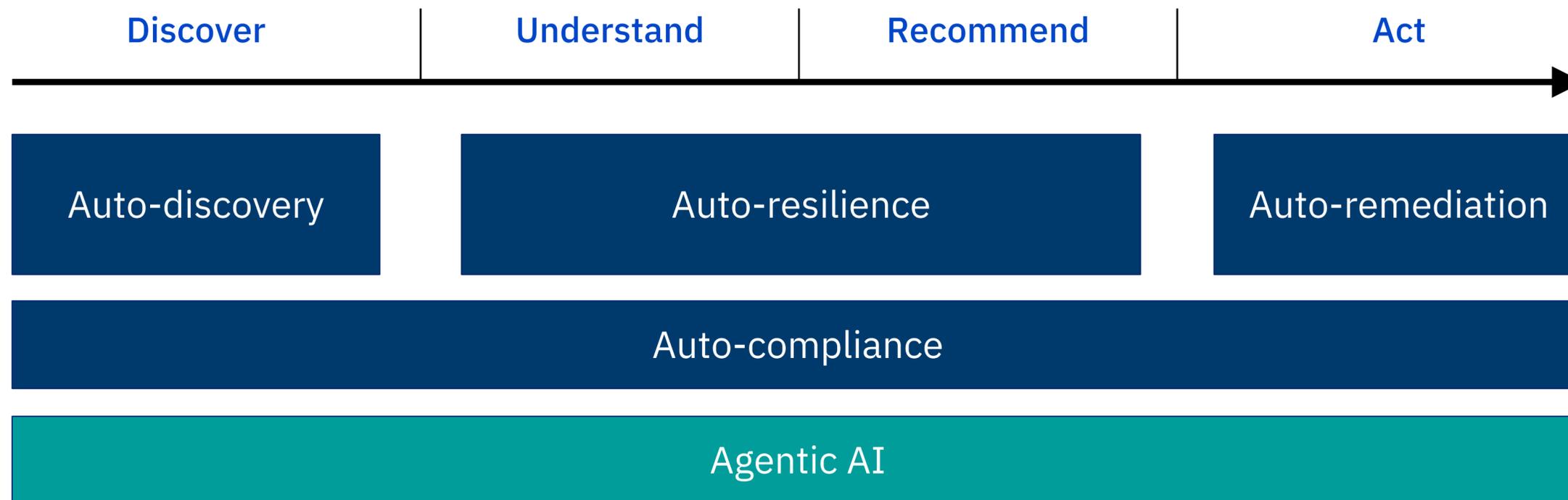
How does Concert work?

1. Automates the end-to-end resilience process from discovery to remediation
2. Automates compliance to ensure alignment with regulatory frameworks



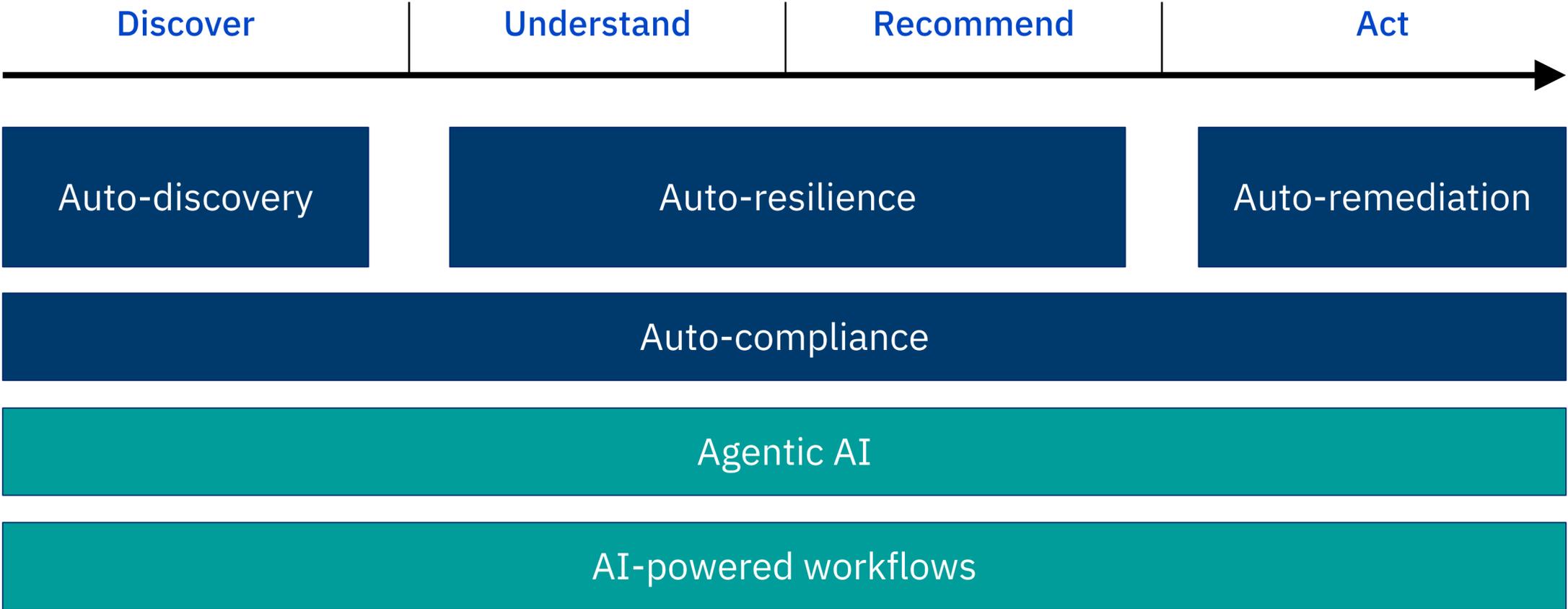
How does Concert work?

1. Automates the end-to-end resilience process from discovery to remediation
2. Automates compliance to ensure alignment with regulatory frameworks
3. Uses Agentic AI to autonomously manage resilience and risk



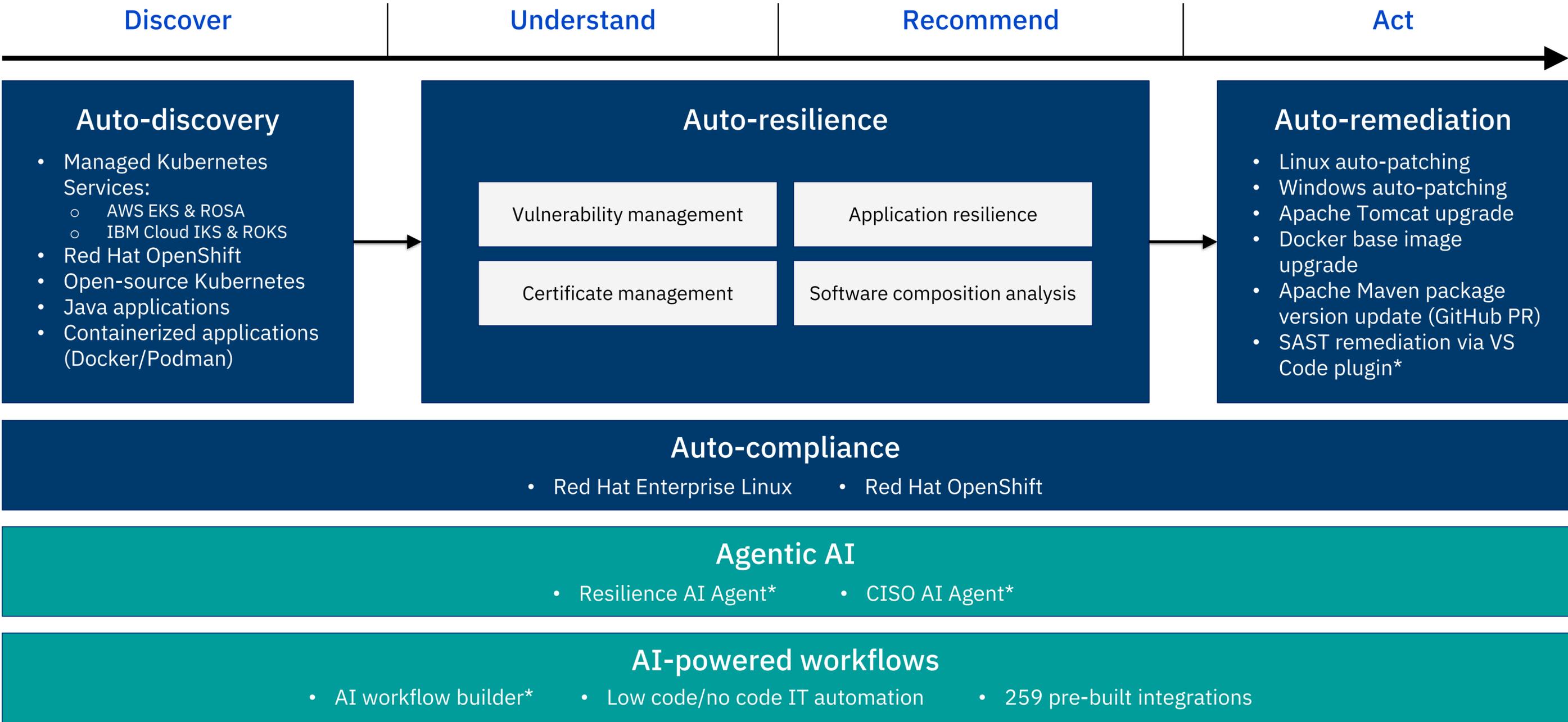
How does Concert work?

- 1. Automates the end-to-end resilience process from discovery to remediation
- 2. Automates compliance to ensure alignment with regulatory frameworks
- 3. Uses Agentic AI to autonomously manage resilience and risk
- 4. Uses AI-powered low-code workflows to automate repetitive tasks



Concert 2.0 at a glance

Using automation and AI to *proactively* prevent outages, minimize risk and improve compliance



Tech previews

Agentic AI in IBM Concert (tech preview)

Purpose-built AI agents in Concert 2.0



Resilience AI Agent

- Parses documentation to extract key dependencies and non-functional requirements
- Summarizes resilience goals (i.e., uptime, failover readiness, scalability)
- Recommends relevant metrics and thresholds
- Generates reusable profiles for dashboards, alerts and governance



CISO AI Agent

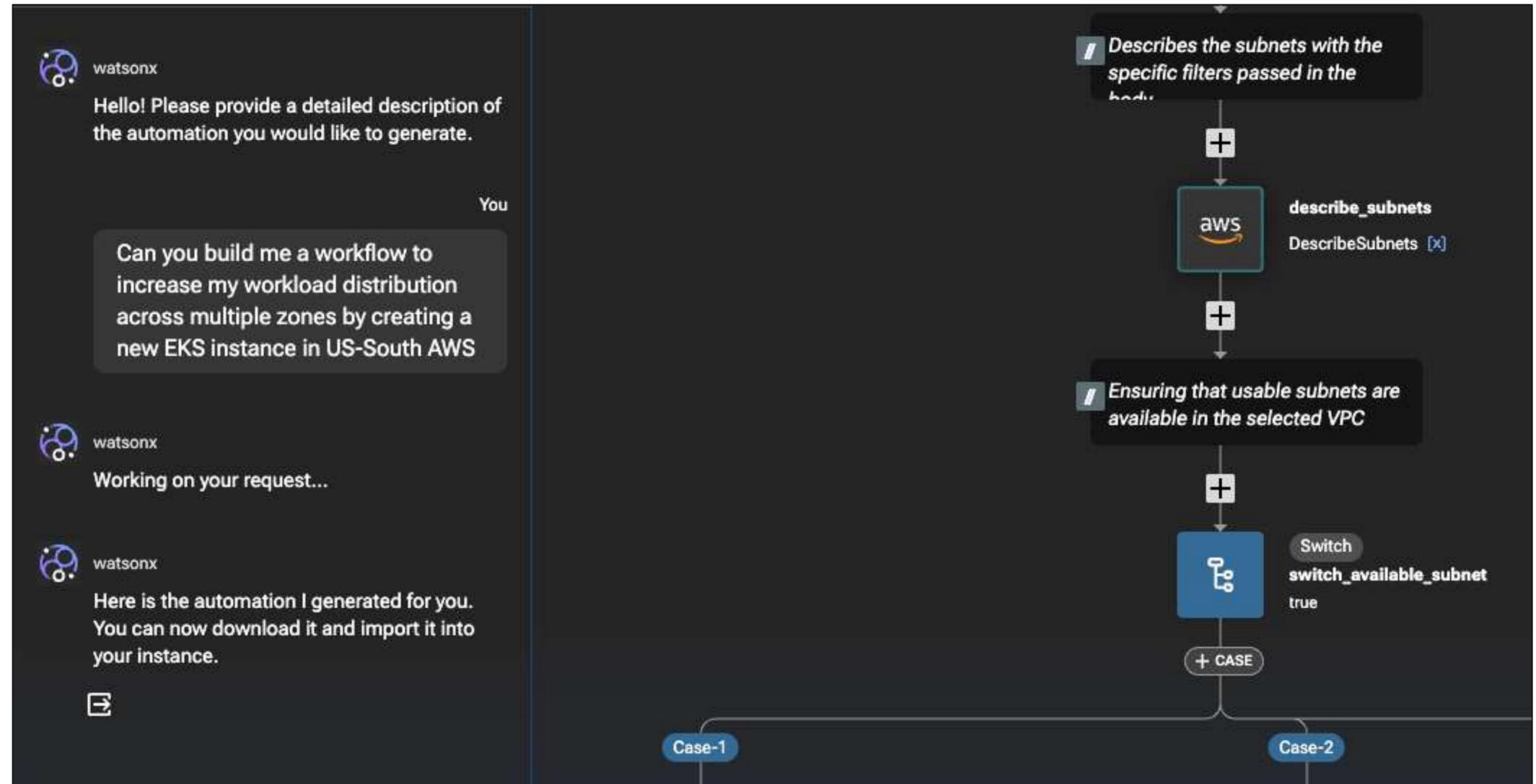
- Reads and interprets compliance standards (e.g., NIST, ISO, CIS, internal policies)
- Generates compliance-as-code using Ansible, Open Policy Agent (OPA), Kyverno and Python
- Schedules and runs assessments, including posture scoring and remediation recommendations
- Creates audit-ready artifacts that populate Concert dashboards and evidence stores

AI-powered workflows (tech preview)

IBM Concert enables customers to use natural language to accelerate workflow creation.

Benefits

- **Lower skill requirement**
Non-technical users can easily build workflows
- **Faster workflow creation**
Quickly prototype and automate ideas
- **Embedded knowledge of >10,000 potential actions**
watsonx.ai understands the API calls, scripts and functions that can be invoked through 240 integrations
- **Flexibility**
AI-powered workflows can be combined with manual edits in the low-code editor



Use cases

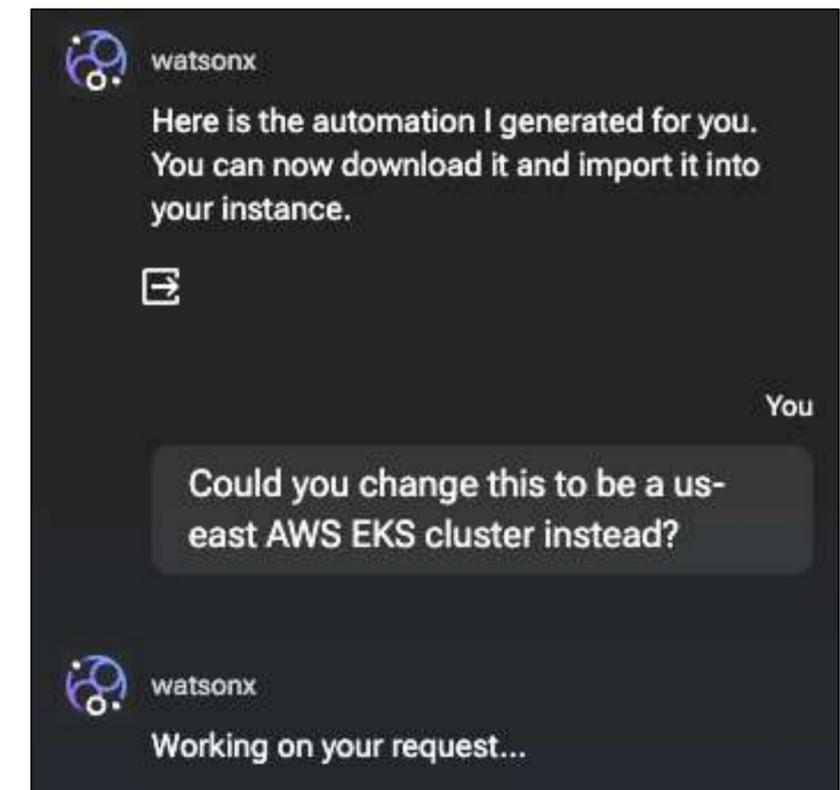
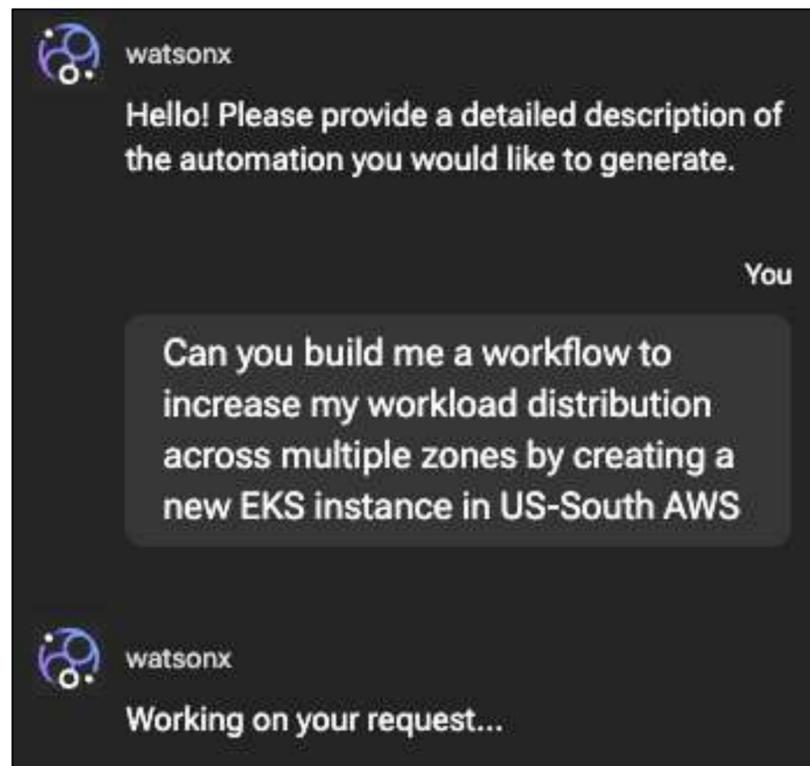
- **Resilience:** Generate actions based on resilience assessment recommendations
- **Vulnerabilities:** Generate patch automation to remediate CVEs
- **Certificates:** Generate certificate discovery or rotation workflows based on a customer's environment
- *More to come*

AI-powered workflows in action (tech preview)

1 Users describe the workflow they want to create in **plain language**

2 watsonx.ai **auto-generates** a candidate workflow

3 Users request **real-time enhancements** through the chat until workflow is correct



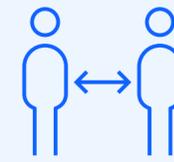
Get started with IBM Concert today



Try it for free

The IBM Concert free trial offers a 30-day, fully provisioned experience of our application management platform. Explore the platform's features with sample data or upload your own for a personalized trial.

[Start your free trial →](#)



Request a demo

Get a customized demonstration to understand the capabilities of IBM Concert and the transformational impact they can have on your business.

[Book an appointment →](#)

IBM Concert for IBM Power

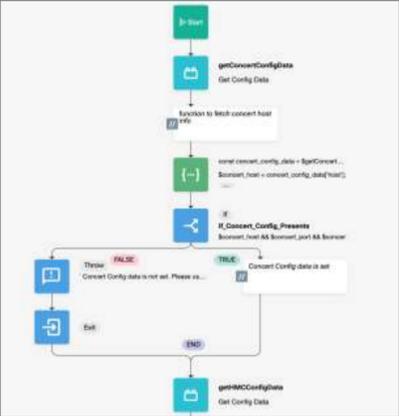
Support for IBM Power

How Concert manages vulnerabilities for IBM Power systems:

- Keeps an inventory of IBM Power systems
- Reduces risk exposure by tracking CVEs and which Power system they relate to
- Provides watsonx.ai-generated remediation guidance steps
- Auto-remediates OS vulnerabilities against Power systems

Discover

- [Power Inventory workflow](#) discovers Power systems and component versions



Analyze

- Concert maps CVEs to systems, recommending precise remediation actions
- CVEs are prioritized based on CVSS scores

CVEs	CVSS ⓘ	Severity	Component type
CVE-2022-35643	9.1	Critical	VIOS
CVE-2023-52881	5.9	Medium	Firmware

Act

- Review, approve and schedule updates (HMC, firmware, VIOS)
- Updates are applied via HMC APIs with built-in validations using a [Power Patch scheduler workflow](#)

Actions	Applied to
Patch	VIOS
Patch	VIOS
Patch	VIOS

ever62bmc

Last updated on: Jun 20, 2025 5:12 PM

CVEs Actions

Total unique CVEs

5

0 CVEs
Firmware

5 CVEs
VIOS

Most severe CVEs



Find by CVE

CVEs	CVSS ?	Component type	Affected component name	Current version
CVE-2022-49043	5.5	VIOS	ever62bmc-vios1	4.1.0.21
CVE-2024-47102	5.5	VIOS	ever62bmc-vios1	4.1.0.21
CVE-2024-52906	5.5	VIOS	ever62bmc-vios1	4.1.0.21
CVE-2024-56171	5.5	VIOS	ever62bmc-vios1	4.1.0.21
CVE-2024-56346	5.5	VIOS	ever62bmc-vios1	4.1.0.21

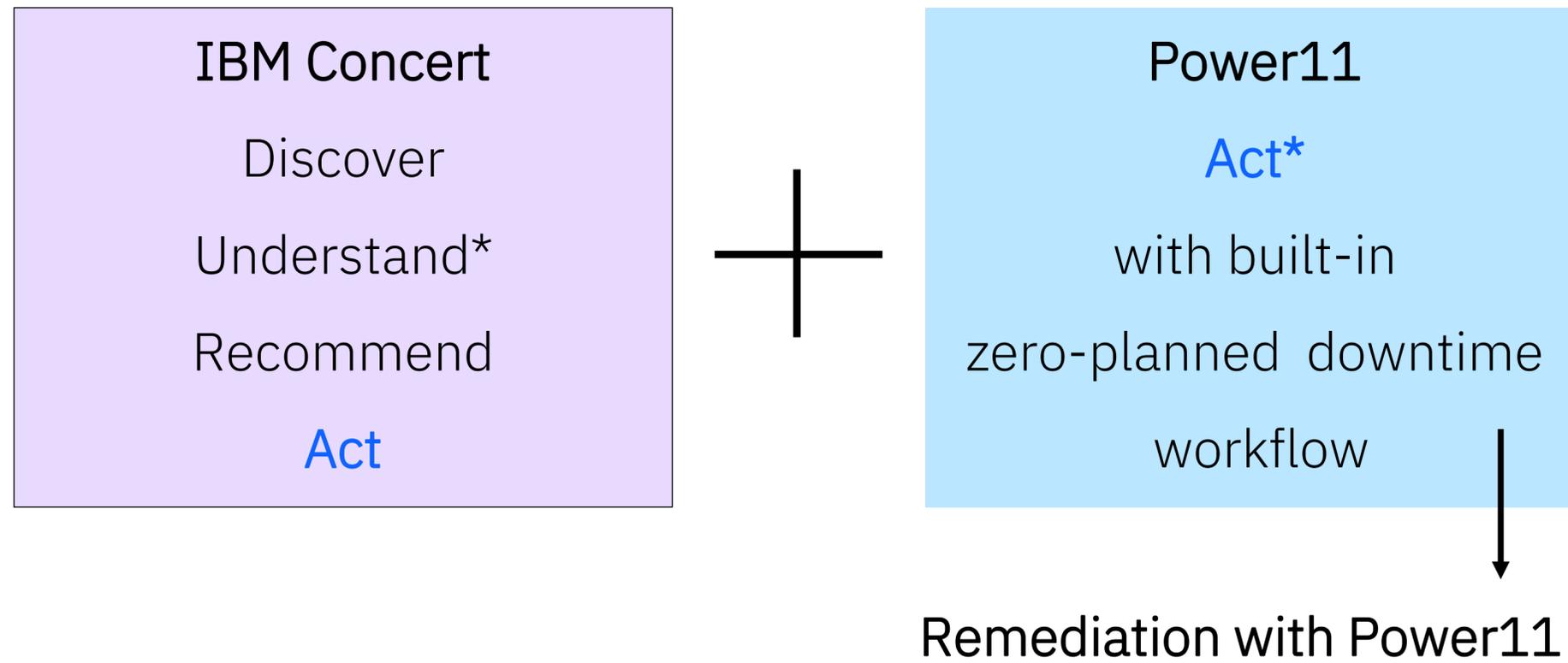
Items per page: 50

Items 1-5

Page 1

What you just saw...AI-infused orchestration with IBM Concert + IBM Power11

First use case: Vulnerability Management & Remediation



- Can be triggered directly from the HMC
- End-to-end automation for platform updates, including automated movement of workloads, with zero application downtime
- Available for firmware, VIOS, and I/O updates

* --- Requires outbound connection from Concert and HMC to IBM Websites



System capability

Power HMC

Search for a system, partition, VIOS, tag or cluster

Systems /

ria

Operating Physical attention LED off

System actions

Partitions

Virtual I/O servers

System settings

Processor, memory, I/O

Persistent memory

Virtual networks

Virtual NICs

Virtual storage

Hardware virtualized I/O

Resource groups new

Shared processor pools updated

Power modes new

System profiles

Backup profile data

CoD resources

Elastic CoD

Trial CoD

CoD history log

Licensed capabilities

Licensed capabilities history log

Dumps

Licensed capabilities

[Learn more](#) [Apply Activation code](#)

PowerVM licensed capabilities

- X Active memory sharing
- ✓ Live partition mobility
- ✓ Micro-partitioning
- ✓ PowerVM partition simplified remote restart
- ✓ SR-IOV
- ✓ Virtual I/O server
- ✓ **Advance automation and monitoring**

Other licensed capabilities

- ✓ Active memory expansion
- ✓ Active memory mirroring for hypervisor
- X AIX enablement for 256-core partition
- ✓ Coherent accelerator processor interface(CAPI)
- ✓ Dynamic platform optimization
- ✓ IBM i
- ✓ IBM i 5250 application
- ✓ IBM i native I/O

Launch point

- System should have latest 1110 firmware installed.
- “Advance automation and monitoring”, a new license capability introduced.
- “Update system, VIOS, adapter levels”, a new action menu introduced under Firmware.
- Above menu option can also be accessible upon clicking System name -> System actions.

The screenshot shows the 'Systems' page in the Power HMC interface. The page has a search bar at the top right and a 'Systems' header with a count of 14. Below the header is a table with columns for 'Details', 'Usage', 'Resources', and 'Levels'. The table lists various systems with their IP addresses, connection status, and firmware levels. A context menu is open over the 'ria' system, showing options like 'Check readiness', 'View system firmware levels', 'Update system, VIOS, adapter levels' (highlighted with a red box), 'Update system firmware', 'View IO firmware levels', 'Update IO firmware', 'View SR-IOV firmware levels', 'Update SR-IOV firmware', 'Import updates', 'Edit next IPL flash side', 'Apply deferred updates', and 'Delete files from import location'.

Details	Usage	Resources	Levels
1 item selected	Add tag +	Create v	Connections and operations v
Performance v	Firmware ^	Service v	CoD
<input type="checkbox"/> 10.48.3.237	No connection	10.48.3.238	9080-HEU
<input type="checkbox"/> 172.16.222.42	Version mismatch	172.16.222.42	8286-42A
<input type="checkbox"/> BMC-0000-BMC_1921682406	No connection	192.168.240.6	0000-BMC
<input type="checkbox"/> BMC-0000-BMC_1921682407	No connection	192.168.240.7	0000-BMC
<input type="checkbox"/> BMC-9105-42A_13E0A80	No connection	172.16.222.41	9105-42A
<input type="checkbox"/> bumblebee	Operating	10.48.4.102	9824-42A
<input type="checkbox"/> fuji	Operating	10.48.4.149	9043-MRU
<input type="checkbox"/> mcperf	Operating	10.48.4.248	9080-HEU
<input type="checkbox"/> miracle	Operating	10.48.3.29	9080-HEU
<input checked="" type="checkbox"/> ria	Operating	10.48.0.186	9105-42A
<input type="checkbox"/> star	Operating	10.48.0.245	9080-M9S
<input type="checkbox"/> zen	Operating	10.48.0.230	9040-MR9
<input type="checkbox"/> zep	Error	10.48.0.188	9040-MR9

Choose details and check readiness

- “Import files to HMC filesystem and perform update” option downloads the image first from the selected source location to HMC and then start update process automatically.
- “Import files only” option only downloads the image from the selected source location to HMC. Same image can be used to update later.
- System readiness check is not required for “Import files only” option .
- System needs to be in ”Ready” state in order to proceed with update process.
- Warning/Error message will be displayed in “Messages” column, if system is not in “Ready” state.

Update system, VIOS, adapter levels new

System name
ria

Accept license agreement
Choose details and check readiness
Choose target levels
Choose process
Apply updates

Choose details and check readiness

Import update file options

Import files to the HMC filesystem and perform the update
 Import files only

System readiness check
Verifies that the system is in a valid state and the code update readiness status is 'Ready'

Search

Readiness state	Resource name	Resource type	LIC type	Number VIOSs	Messages
✓ Ready	ria	system	Primary	2	

Cancel Previous Next

Choose details and check readiness

- Option to select the source file location from where the image will get download to HMC.
- Source file location can be also selected for individual resource(System/SRIOV/VIOS/IO) from corresponding table row.
- Option to select “Update/Upgrade/Resume” type. IO device can only be updated.
- “Resume” is only applicable for system firmware.
- “HMC USB port” source file location will not be visible for virtual HMC.
- Target levels will be populated automatically based on selected source file location and update/upgrade type.
- IO device owned by logical partition can not be updated.
- “Do not update” need to be selected for resource for which no update/upgrade required.

Update system, VIOS, adapter levels new

System name
ria

- Accept license agreement
- Choose details and check readiness
- Choose target levels
- Choose process
- Apply updates

Choose target levels

Source files location

Choose an option

Search resource, resource type, resource identifier or active/current level

Resource	Resource type	Resource identifier	Active/current level	Source file location	Update type
ria	System	9105-42A*13E0B00	fw1110.00(048) 01RB1110 (EC level)	Choose an option	Update
1.6TB NVMe Gen4 U.2 SSD	IO device	U78DB.ND0.WZS001T-P1-C2			
800GB NVMe Gen3 U.2 Slim SSD	IO device	U78DB.ND0.WZS001T-P1-C1			
6.4TB NVMe Gen4 U.2 SSD	IO device	U78DB.ND0.WZS001T-P1-C0			
PCIe3 2-Port 16Gb FC Adapter	IO device	U78DB.ND0.WZS001T-P0-C0			
Universal Serial Bus UHC Spec	IO device	U78DB.ND0.WZS001T-P0-T18			
NVMe JBOF Card	IO device	U78DB.ND0.WZS001T-P0-C10			
riav1	VIOS	2	VIOS 4.1.1.10	Choose an option	Update
riav2	VIOS	3	VIOS 4.1.1.10	Choose an option	Update

Source file location

Update system, VIOS, adapter levels new

System name
ria

- ✓ Accept license agreement
- ✓ Choose details and check readiness
- Choose target levels
- Choose process
- Apply updates

Choose target levels

Source files location

Choose an option ^

Choose an option

IBM website

HMC filesystem

SFTP server

NFS server (mount point)

HMC USB port

	SSD	IO device	U78DB.ND0.WZS001T-P1-C1			
	6.4TB NVMe Gen4 U.2 SSD	IO device	U78DB.ND0.WZS001T-P1-C0			
	PCIe3 2-Port 16Gb FC Adapter	IO device	U78DB.ND0.WZS001T-P0-C0			
	Universal Serial Bus UHC Spec	IO device	U78DB.ND0.WZS001T-P0-T18			
	NVMe JBOF Card	IO device	U78DB.ND0.WZS001T-P0-C10			
>	riav1	VIOS	2	VIOS 4.1.1.10	Choose an option v	Up
>	riav2	VIOS	3	VIOS 4.1.1.10	Choose an option v	Up

Cancel

Previous

Next

Inputs for source locations

Edit source file location

Source files location

SFTP server

Authentication type

Password Keyfile

SFTP server hostname or IP address

sftpsvr.in.ibm.com

Firmware and IO remote directory (required)

fw_update/new_image

User ID

root

Password

.....

VIOS update directory (optional)

viosupdate

VIOS update file names (optional)

update.iso

VIOS update name

test_update

Cancel Save

Edit source file location

Source files location

NFS server (mount point)

NFS server hostname or IP address

nfssvr.in.ibm.com

Firmware and IO remote directory (optional)

fw_update/new_image

Mount location

/nfwmount

Mount options (optional)

vers=4

VIOS update directory (optional)

viosupdate/new_update

VIOS update file names (optional)

update.iso

VIOS update name

test_update

Cancel Save

Edit source file location

Source files location

HMC USB port

USB device for system and/or IO adapters

Choose an option

Refresh

USB device for VIOSs

/dev/sdb1 [Unknown]

Refresh

VIOS update name

test_update

Cancel Save

Source locations for individual resource

Update system, VIOS, adapter levels new

System name
ria

- Accept license agreement
- Choose details and check readiness
- Choose target levels**
- Choose process
- Apply updates

Choose target levels

Source files location
Choose an option

Search resource, resource type, resource identifier or active/current level

Resource	Identifier	Active/current level	Source file location	Update/upgrade type [?]	Target level
ria	13E0B00	fw1110.00(048) 01RB1110 (EC level)	<input type="button" value="↻"/>	Update <input type="button" value="↻"/>	
1.6TB NVMe Gen4 U.2 SSD	3DB.ND0.WZS001T-P1-C2				
800GB NVMe Gen3 U.2 Slim SSD	3DB.ND0.WZS001T-P1-C1				
6.4TB NVMe Gen4 U.2 SSD	3DB.ND0.WZS001T-P1-C0				
PCIe3 2-Port 16Gb FC Adapter	3DB.ND0.WZS001T-P0-C0				
Universal Serial Bus UHC Spec	3DB.ND0.WZS001T-P0-T18				
NVMe JBOF Card	3DB.ND0.WZS001T-P0-C10				
riav1		VIOS 4.1.1.10	Choose an option <input type="button" value="↻"/>	Update <input type="button" value="↻"/>	
riav2		VIOS 4.1.1.10	Choose an option <input type="button" value="↻"/>	Update <input type="button" value="↻"/>	

Cancel Previous Next

Select update/upgrade type

Update system, VIOS, adapter levels new

System name
ria

- Accept license agreement
- Choose details and check readiness
- Choose target levels**
- Choose process
- Apply updates

Choose target levels

Source files location
Choose an option

Search resource, resource type, resource identifier or active/current level

Resource	Identifier	Active/current level	Source file location	Update/upgrade type	Target level
ria	13E0B00	fw1110.00(048) 01RB1110 (EC level)	Choose an option	<input checked="" type="checkbox"/> Update <input type="checkbox"/> Upgrade <input type="checkbox"/> Do not update	
1.6TB NVMe Gen4 U.2 SSD	8DB.ND0.WZS001T-P1-C2				
800GB NVMe Gen3 U.2 Slim SSD	8DB.ND0.WZS001T-P1-C1				
6.4TB NVMe Gen4 U.2 SSD	8DB.ND0.WZS001T-P1-C0				
PCIe3 2-Port 16Gb FC Adapter	8DB.ND0.WZS001T-P0-C0				
Universal Serial Bus UHC Spec	8DB.ND0.WZS001T-P0-T18				
NVMe JBOF Card	8DB.ND0.WZS001T-P0-C10				
riav1		VIOS 4.1.1.10	Choose an option	Update	
riav2		VIOS 4.1.1.10	Choose an option	Update	

[Cancel](#) [Previous](#) [Next](#)

Update system, VIOS, adapter levels new

System name
ria

- Accept license agreement
- Choose details and check readiness
- Choose target levels
- Choose process
- Apply updates

ria		9105-42A*13E0B00	fw1110.00(048) 01RB1110 (EC level)	Choose an option	Update
1.6TB NVMe Gen4 U.2 SSD		U78DB.ND0.WZS001T-P1-C2			
800GB NVMe Gen3 U.2 Slim SSD		U78DB.ND0.WZS001T-P1-C1			
6.4TB NVMe Gen4 U.2 SSD		U78DB.ND0.WZS001T-P1-C0			
PCIe3 2-Port 16Gb FC Adapter		U78DB.ND0.WZS001T-P0-C0			
Universal Serial Bus UHC Spec		U78DB.ND0.WZS001T-P0-T18			
NVMe JBOF Card		U78DB.ND0.WZS001T-P0-C10			
riav1		2	VIOS 4.1.0.10	Choose an option	Update
1 Gigabit Ethernet (UTP) 4 Port Adapter PCIE-4x/Short		U78DB.ND0.WZS001T-P0-C3 ent0,ent1,ent2,ent3	10240310	Choose an option	Update
PCIe3 2 PORT 25/10 Gb NIC&ROCE SFP28 ADAPTER		U78DB.ND0.WZS001T-P0-C4 ent4,ent5	001400321010	Choose an option	Update
PCIe3 4-Port 16Gb FC Adapter		U78DB.ND0.WZS001T-P0-C8 fcs0,fcs1,fcs2,fcs3	00014000020062400010	Choose an option	Update
PCIe3 2-Port 32Gb FC Adapter		U78DB.ND0.WZS001T-P0-C9 fcs4,fcs5	00014000020062400010	Choose an option	Update
3.2TB NVMe Gen4 U.2 SSD		U78DB.ND0.WZS001T-P1-C3 nvme0	53543435	Choose an option	Update
PCIe4 1.6TB NVMe Flash Adapter x8		U78DB.ND0.WZS001T-P0-C1 nvme1	53503432	Choose an option	Update
riav2		3	VIOS 4.1.1.10	Choose an option	Update

- Choose an option
- IBM website
- HMC filesystem
- SFTP server
- NFS server (mount point)
- HMC USB port

Cancel

Previous

Next

Update system, VIOS, adapter levels new

System name
ria

- Accept license agreement
- Choose details and check readiness
- Choose target levels
- Choose process
- Apply updates

ria		9105-42A*13E0B00	fw1110.00(048) 01RB1110 (EC level)	Choose an option	Update
1.6TB NVMe Gen4 U.2 SSD		U78DB.ND0.WZS001T-P1-C2			
800GB NVMe Gen3 U.2 Slim SSD		U78DB.ND0.WZS001T-P1-C1			
6.4TB NVMe Gen4 U.2 SSD		U78DB.ND0.WZS001T-P1-C0			
PCIe3 2-Port 16Gb FC Adapter		U78DB.ND0.WZS001T-P0-C0			
Universal Serial Bus UHC Spec		U78DB.ND0.WZS001T-P0-T18			
NVMe JBOF Card		U78DB.ND0.WZS001T-P0-C10			
riav1		2	VIOS 4.1.0.10	Choose an option	Update
1 Gigabit Ethernet (UTP) 4 Port Adapter PCIE-4x/Short	ce	U78DB.ND0.WZS001T-P0-C3 ent0,ent1,ent2,ent3	10240310	Choose an option	Update
PCIe3 2 PORT 25/10 Gb NIC&ROCE SFP28 ADAPTER	ce	U78DB.ND0.WZS001T-P0-C4 ent4,ent5	001400321010	Choose an option	Update
PCIe3 4-Port 16Gb FC Adapter	ce	U78DB.ND0.WZS001T-P0-C8 fcs0,fcs1,fcs2,fcs3	00014000020062400010	Choose an option	Update
PCIe3 2-Port 32Gb FC Adapter	ce	U78DB.ND0.WZS001T-P0-C9 fcs4,fcs5	00014000020062400010	Choose an option	Update
3.2TB NVMe Gen4 U.2 SSD	ce	U78DB.ND0.WZS001T-P1-C3 nvme0	53543435	Choose an option	Update
PCIe4 1.6TB NVMe Flash Adapter x8	ce	U78DB.ND0.WZS001T-P0-C1 nvme1	53503432	Choose an option	Update
riav2		3	VIOS 4.1.1.10	Choose an option	Update

Update
 Upgrade
 Do not update

Cancel

Previous

Next

Choose VIOS update image from HMC

Update system, VIOS, adapter levels new

System name
ria

- Accept license agreement
- Choose details and check readiness
- Choose target levels
- Choose process
- Apply updates

ria		fw1110.00(048) 01RB1110 (EC level)	Choose an option	Update
1.6TB NVMe Gen4 U.2 SSD	1-C2			
800GB NVMe Gen3 U.2 Slim SSD	1-C1			
6.4TB NVMe Gen4 U.2 SSD	1-C0			
PCIe3 2-Port 16Gb FC Adapter	0-C0			
Universal Serial Bus UHC Spec	0-T18			
NVMe JBOF Card	0-C10			
riav1		VIOS 4.1.0.10	HMC filesystem	Update
1 Gigabit Ethernet (UTP) 4 Port Adapter PCIE-4x/Short	01T-P0-C3	10240310	Choose an option	Update
PCIe3 2 PORT 25/10 Gb NIC&ROCE SFP28 ADAPTER	01T-P0-C4	001400321010	Choose an option	Update
PCIe3 4-Port 16Gb FC Adapter	01T-P0-C8	00014000020062400010	Choose an option	Update
PCIe3 2-Port 32Gb FC Adapter	01T-P0-C9	00014000020062400010	Choose an option	Update
3.2TB NVMe Gen4 U.2 SSD	01T-P1-C3	53543435	Choose an option	Update
PCIe4 1.6TB NVMe Flash Adapter x8	01T-P0-C1	53503432	Choose an option	Update
riav2		VIOS 4.1.1.10	Choose an option	Update

✓ Choose an option
jfd
test_img

Cancel Previous Next

Choose VIOS upgrade image from HMC

Update system, VIOS, adapter levels new

System name
ria

- Accept license agreement
- Choose details and check readiness
- Choose target levels
- Choose alternate disk for VIOS
- Choose process
- Apply updates

SSD						
6.4TB NVMe Gen4 U.2 SSD	1-C0					
PCIe3 2-Port 16Gb FC Adapter	0-C0					
Universal Serial Bus UHC Spec	0-T18					
NVMe JBOF Card	0-C10					
riav1		VIOS 4.1.0.10	HMC filesystem	▼	Update	▼
			test_img	▼		
1 Gigabit Ethernet (UTP) 4 Port Adapter PCIE-4x/Short	01T-P0-C3	10240310	Choose an option	▼	Do not update	▼
PCIe3 2 PORT 25/10 Gb NIC&ROCE SFP28 ADAPTER	01T-P0-C4	001400321010	Choose an option	▼	Do not update	▼
PCIe3 4-Port 16Gb FC Adapter	01T-P0-C8	00014000020062400010	Choose an option	▼	Do not update	▼
PCIe3 2-Port 32Gb FC Adapter	01T-P0-C9	00014000020062400010	Choose an option	▼	Do not update	▼
3.2TB NVMe Gen4 U.2 SSD	01T-P1-C3	53543435	Choose an option	▼	Do not update	▼
PCIe4 1.6TB NVMe Flash Adapter x8	01T-P0-C1	53503432	Choose an option	▼	Do not update	▼
riav2		VIOS 4.1.1.10	HMC filesystem	▼	Upgrade	▼
			vios_upgrade	▼		
1 Gigabit Ethernet (UTP) 4 Port Adapter PCIE-4x/Short	01T-P0-C7	10240310	Choose an option	▼	Update	▼
PCIe2 16Gb 2-Port Fibre Channel Adapter	01T-P0-C11	00012000040025700030	Choose an option	▼	Do not update	▼
PCIe3 6.4TB NVMe Flash Adapter III x8	01T-P0-C2	4d413235	Choose an option	▼	Do not update	▼

Cancel
Previous
Next

Choose process of updates

- System/VIOS can be drag and drop for altering the update sequence.
- If all the resources (System/VIOS/IO) selected to update and the update is disruptive, VIOS update sequence should be first before disruptive system firmware.
- **Partition migration and return** checkbox enables to migrate the partition to the selected target location and revert after the update is complete.
- **Return partitions to the original system after update** switch enables to return the partition to the system where the partitions were present before the update.

Update system, VIOS, adapter levels new

System name
ria

- Accept license agreement
- Choose details and check readiness
- Choose target levels
- Choose alternate disk for VIOS
- Choose process**
- Apply updates

Choose process

Update sequence

- riav1 VIOS will reboot
- riav2 VIOS will reboot

Partition migration and return

Cancel Previous Next

Choose process – Partition migration

- **Remote HMC** switch enables to migrate the partitions to a system managed by remote HMC. When selected partitions are not automatically migrated back to the system after the update.
- By default, all the partitions are selected for migration. Partitions can be individually selected to migrate by toggling **Server evacuation** switch.
- In case of selected partitions for migration, partition migration sequence can be specified for a set of partitions that needs to be migrated initially.

Update system, VIOS, adapter levels new

System name
ria

- Accept license agreement
- Choose details and check readiness
- Choose target levels
- Choose alternate disk for VIOS
- Choose process**
- Apply updates

Partition migration and return

Return partitions to the original system after update

Target location

Target system	Available processors	Available memory
fuji	81.7	3992.750 GB

Target system
fuji(9043-MRU*78077CY) Refresh

If the system you want is not listed, verify that it is capable and compatible with the partition migration

Remote HMC

Partition placement
17 total partitions | 17 Selected partitions | Evacuate all partitions | Click toggle to turn on/off server evacuation

Partition migration order
Partition migration order is not applicable when quick evacuation is enabled

Cancel Previous Next

Migration – Server evacuation

Update system, VIOS, adapter levels new

System name
ria

- Accept license agreement
- Choose details and check readiness
- Choose target levels
- Choose alternate disk for VIOS
- Choose process
- Apply updates

Partition placement

17 of 17 partitions

Total allocated cores
21.00

Total allocated memory
931.500 GB

Server evacuation

Server evacuation rapidly migrates all migration capable partitions to a target system. partition migration order is not applicable with this option.

! One or more partitons can not be migrated
View the message column to get information on the partition migration ability.

Search partitions

<input checked="" type="checkbox"/>	Partition	ID	State	RMC State	Processors	Memory(GB)	Messages
<input checked="" type="checkbox"/>	faithseck3-test	15	● Not activated	⌘ Inactive	0	0.000	
<input checked="" type="checkbox"/>	fujishankar5	33	✔ Running	⌘ Active	0.5	4.000	
<input checked="" type="checkbox"/>	gangabackupldap	21	● Not activated	⌘ Inactive	0	0.000	
<input checked="" type="checkbox"/>	gangaldap01	19	✔ Running	⌘ Active	0.1	2.000	
<input checked="" type="checkbox"/>	gangaldap02	20	● Not activated	⌘ Inactive	0.1	1.000	

Cancel

Previous

Next

Migration – Selected partition migration

Update system, VIOS, adapter levels new

System name
ria

- Accept license agreement
- Choose details and check readiness
- Choose target levels
- Choose alternate disk for VIOS
- Choose process**
- Apply updates

Server evacuation
Server evacuation rapidly migrates all migration capable partitions to a target system. partition migration order is not applicable with this option.

! One or more partitons can not be migrated
View the message column to get information on the partition migration ability.

Search partitions

Partition	ID	State	RMC State	Processors	Memory(GB)	Messages
<input type="checkbox"/> fujishankar5	33	Running	Active	0.5	4.000	
<input type="checkbox"/> gangaldap01	19	Running	Active	0.1	2.000	
<input type="checkbox"/> Nousheen_vhmc	6	Running	Active	8	16.000	
<input type="checkbox"/> NousheenP11	18	Running	Active	4	12.000	
<input type="checkbox"/> rockettestvhmc	8	Running	Active	3	16.000	
<input type="checkbox"/> rexNATsrv1	7	Open firmware	Inactive	1	4.000	Partitions in 'open firmware state cannot be migrated.
<input type="checkbox"/> faithseck3-test	15	Not activated	Inactive	0	0.000	
<input type="checkbox"/> gangabackupldap	21	Not activated	Inactive	0	0.000	
<input checked="" type="checkbox"/> gangaldap02	20	Not activated	Inactive	0.1	1.000	

Cancel Previous Next

Migration – Select partition migration order

Update system, VIOS, adapter levels new

System name
ria

- Accept license agreement
- Choose details and check readiness
- Choose target levels
- Choose alternate disk for VIOS
- Choose process
- Apply updates

<input type="checkbox"/>	Partition	Memory (GB)	Processors	Not activated	Inactive	Processors	Memory (GB)
<input type="checkbox"/>	mcperflPAR	12		●	⌘	0.1	1.000
<input type="checkbox"/>	Nousheen_withstorage	9		●	⌘	2	12.000
<input type="checkbox"/>	Partition-Vpmem	1		●	⌘	1	855.500
<input checked="" type="checkbox"/>	rainbowhmc1	13		●	⌘	0.5	2.000
<input type="checkbox"/>	rexshankar2	30		●	⌘	0	0.000
<input type="checkbox"/>	riashankar1	10		●	⌘	0.5	4.000

Partition migration order

List of partitions

Search partitions

<input type="checkbox"/>	Partition	Memory(GB)	Processors
<input type="checkbox"/>	gangaldap02	1.000	0.1
<input type="checkbox"/>	gangaldap04	1.000	0.1
<input checked="" type="checkbox"/>	rainbowhmc1	2.000	0.5

Partition migration priority

rainbowhmc1

Cancel Previous Next

Apply updates - progress

Update system, VIOS, adapter levels new

System name
ria

- ✓ Accept license agreement
- ✓ Choose details and check readiness
- ✓ Choose target levels
- ✓ Choose alternate disk for VIOS
- ✓ Choose process
- 🔄 Apply updates

Apply updates

Prevalidating...

Continue with update

- 🔄 Validate readiness of the VIOS for maintenance : riav1 Duration : 10 seconds 093 milliseconds
- 🔄 Update VIOS readiness : riav1 Duration : 10 seconds 093 milliseconds
- 🔄 Validate readiness of the VIOS for maintenance : riav2 Duration : 10 seconds 684 milliseconds
- 🔄 Upgrade VIOS readiness : riav2 Duration : 10 seconds 684 milliseconds
- 🔄 Migration validation of the selected partitions Duration : 08 seconds 127 milliseconds

Migration validation details

🔍 Search partitions

Partition	ID	Target system	Validation status	Messages
gangaldap02	20	fuji	🔄 Validating	
gangaldap04	5	fuji	🔄 Validating	
rainbowhmc1	13	fuji	🔄 Validating	

Close

Apply updates – prevalidation, download, LPM validation

- During VIOS upgrade /update or partition migration prevalidation is done. If the validation is successfully completed, **Continue with update** enables to download the images.
- If there are errors during validation, click **Try again** can be used to validate again after fixing the errors.
- If the validation is completed successfully and the update images are downloaded, the updates are applied.
- **View details** helps to view more details about the operation.

The screenshot shows the 'Apply updates' interface for system 'ria'. The left sidebar contains a progress list with 'Apply updates' selected. The main area is titled 'Apply updates' and shows a 'Prevalidation errors' section with two buttons: 'Try again' and 'Continue with update'. Below this is a list of operations with their durations and 'View details' links. The 'Migration validation details' section includes a search bar and a table of partitions.

Partition	ID	Target system	Validation status	Messages
gangaldap02	20	fuji	Validated	Messages
gangaldap04	5	fuji	Validated	Messages

The close-up shows the error message for 'Update VIOS readiness : riav1'. The message text is: 'HSCLC46F The Virtual I/O Server (VIOS) riav1 is part of a shared storage pool cluster. To continue with the update either remove the VIOS partition from the cluster or stop the cluster service on the VIOS.'

Prevalidation – VIOS Maintenance validation

Validate readiness of the VIOS for maintenance : riav1 new

System name
ria

All(0) Errors(0) Warnings(0)

Virtual SCSI storage validation

Virtual fibre channel validation

Virtual NIC validation

Virtual LAN validation

Audit trail

-----Virtual SCSI Validation Results-----

Ignoring the virtual SCSI storage mapping with vhost7 as it does not have any storage mapped to it.

Ignoring the virtual SCSI storage mapping with vhost6 as it does not have any storage mapped to it.

Ignoring the virtual SCSI storage mapping with vhost5 as it does not have any storage mapped to it.

The Physical Volume hdisk38 assigned to Logical Partition gangaldap01 has redundant connection from Virtual IO Server riav2.

Ignoring the virtual SCSI storage mapping with vhost3 as it does not have any storage mapped to it.

Ignoring the virtual SCSI storage mapping with vhost2 as it does not have any storage mapped to it.

Ignoring the virtual SCSI storage mapping with vhost1 as it does not have any storage mapped to it.

Ignoring the virtual SCSI storage mapping with vhost0 as it does not have any storage mapped to it.

The Logical Unit SSPVolume_1 assigned to Logical Partition Nousheen_vhmc has redundant connection from Virtual IO Server riav2.

Close

Update platform – migrate, update and reverse migration

Update system, VIOS, adapter levels new

System name
fuji

- Accept license agreement
- Choose details and check readiness
- Choose target levels
- Choose process
- Apply updates**

Partition migration details ✓

✓ Migrating partitions Duration : 16 seconds

Search partitions

Partition	ID	Target system	Migration status	Messages
lpar1	3	ria	✓ Migrated	Messages
lpar2	5	ria	✓ Migrated	Messages

Apply updates successful ✓

- ✓ Prepare VIOS for maintenance fujiv1 [View details](#) Duration : 8 seconds
- ✓ Update VIOS fujiv1 [View details](#) Duration : 1.28 minutes

Reverse partition migration details ✓

✓ Reverse partition migration Duration : 17 seconds

Search partitions

[Close](#)

To recap: Unmatched Business Resiliency

Reduced Risk

Enables **faster & more frequent maintenance updates**, keeping systems secure, stable, and compatible with evolving software and hardware requirements, **lowering risks** of performance degradation, security breaches or unplanned downtimes.

Increased Productivity

Automate and **simplify complex IT tasks** reduces time on task and the need for **specialized skills and enables easier, faster, and non-disruptive updates**.

Improved Business Continuity

Minimize disruptions to business processes and mission-critical applications caused by maintenance windows while ensuring compliance with Service Level Agreements.

P11 Streamlined IBM Power support with Automated First Failure Data Capture

The Challenge

- Opening a support case and sending diagnostic data
=> **manual and time-consuming.**
- Requires interaction with **multiple tools and interfaces.**
- Involves **lengthy back-and-forth with IBM Support.**



Keeping Business Running: The Demand for Automated Error Resolution in Hybrid IT

TOP 3 CHALLENGES

Rising Complexity: 82% of enterprises use hybrid cloud environments, increasing operational complexity for Power System¹

Support Overload: Manual error resolution overwhelms IT teams, with 60% of organizations reporting insufficient staff for incident management²

Escalating Costs: The average cost of an hour of downtime is \$336K³

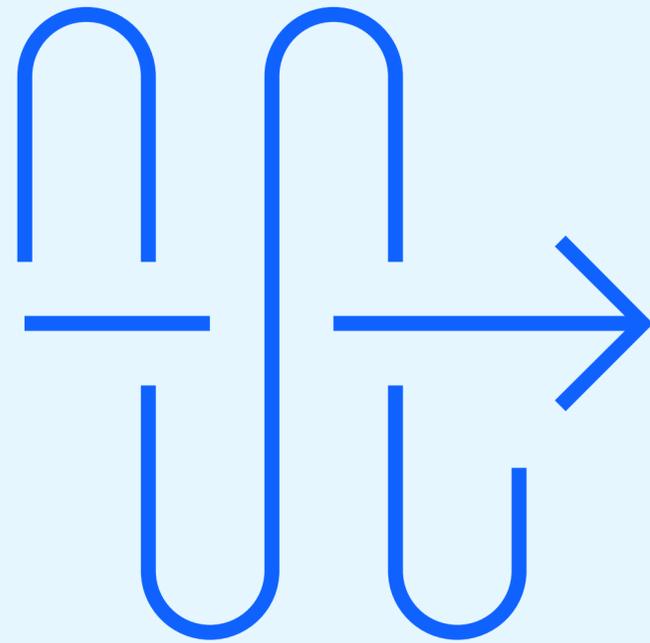


¹ IBM Cloud Survey, 2024

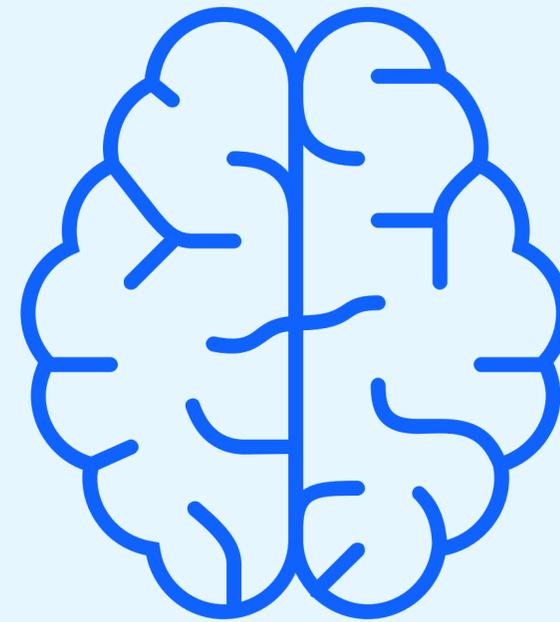
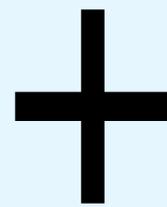
² PurpleSec, 2024

³ Gartner, 2023

IBM Power's Vision: Deliver Autonomous IT through...



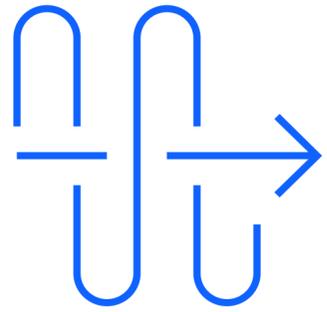
Extreme
Automation



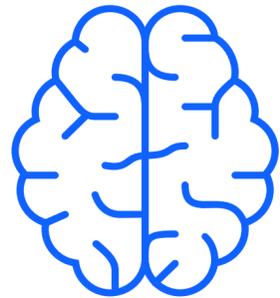
AI-Infused
Workflows



Faster error resolution delivered through Platform Automation & AI-Infused Workflows



Extreme Automation built into Power 11 to accelerate support case creation and log collection.



AI-Infused Workflows used by IBM Support to speed root cause analysis and remediation recommendations.



Automated FFDC Log Transmission

IBM Power

sfp04.aus.stglabs.ibm.com

HMC date and time : January 31, 2025 7:42 AM UTC

Refresh 

Last refresh 1 minute ago

Resource summary

[Systems](#)  

3  0 Error  0 Warning  3 Normal

[Partitions](#)  

6  0 Error  0 Warning  6 Normal

[Vios](#)  

3  0 Error  0 Warning  3 Normal

Quick links

118  Serviceable events 4  Active users 0  Power enterprise pools 0  Shared storage pool clusters

HMC details

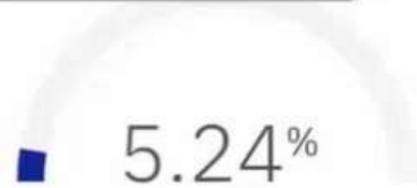
[HMC settings](#) 

HMC name: sfp04.aus.stglabs.ibm.com Machine type: 7063 - CR2
Level/version: V11 R1 SP1110 Serial number: 787DC9D
Date of last update: January 27, 2025
Date of last reboot: January 29, 2025 (2 day(s) ago)
Cloud connector status:  unavailable

Processor and memory summary across all systems



65
Total available processors



1152.23
Total available GB memory



HARIGANESH MURALIDHARAN

With Power 11...

every support case is resolved faster,
saving staff time, minimizing downtime and reducing costs for your organization.

Address Complexity

Power 11 simplifies the process of creating a support case, lowering the knowledge barrier to create the case and automating the selection, collection and transfer of the necessary log files to the IBM support team.

Reduce IT Admin Overload

Power 11 reduces the administrator work required to submit and resolve new support cases, saving hours per case and improving productivity.

Minimize costs due to business disruption

IBM TLS AI-infused workflows shorten the time to resolve support cases which in turn reduces the risk of business impact.

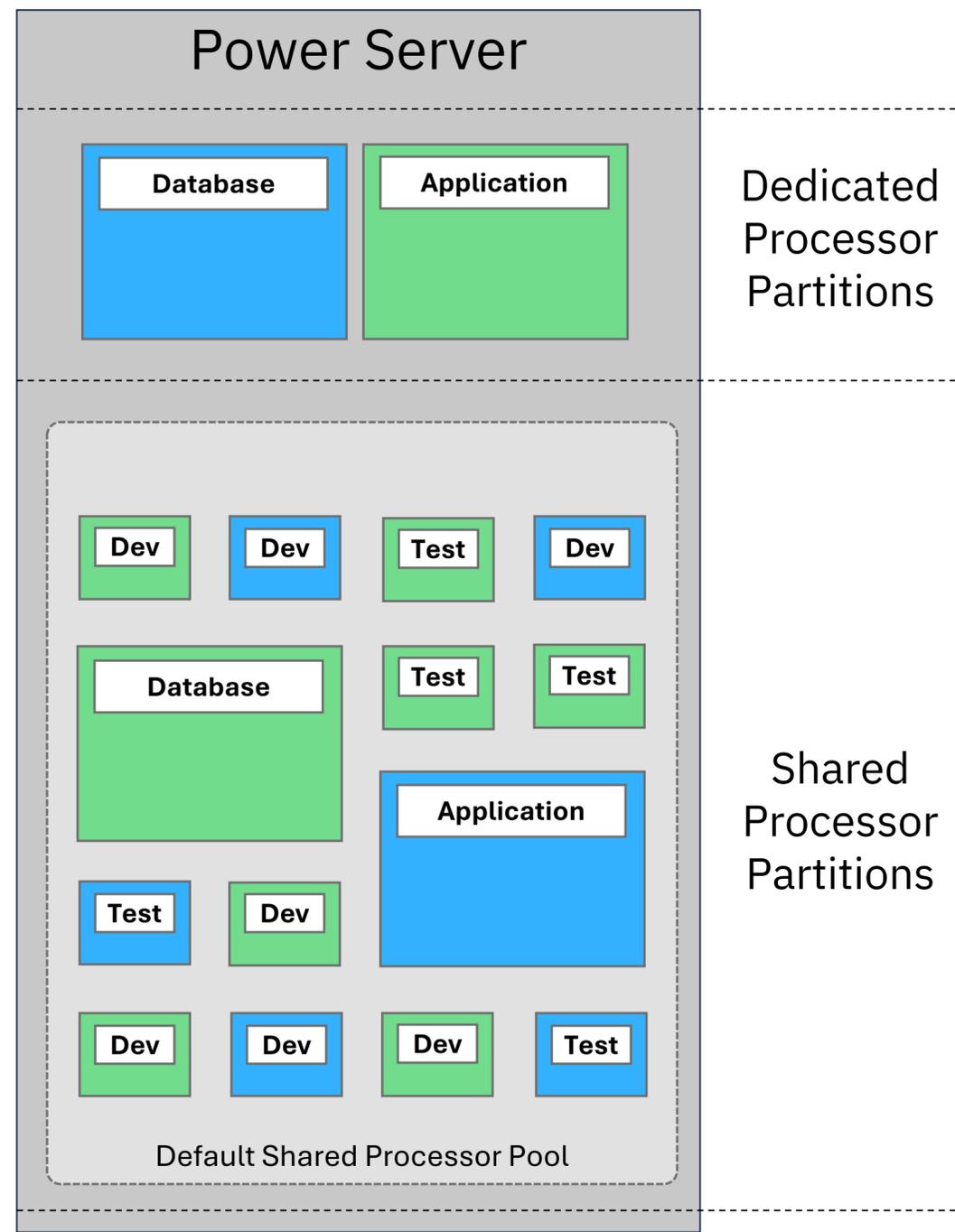
Resource groups



Business value for clients

- Predictable Performance
- Cost Optimization
- Simplified Management
- Operational Agility and Reliability

Power Virtualization Concept - *Dedicated vs Shared*



Simplified configuration illustration

■ Department A LPARs ■ Department B LPARs

Dedicated Processor Partitions

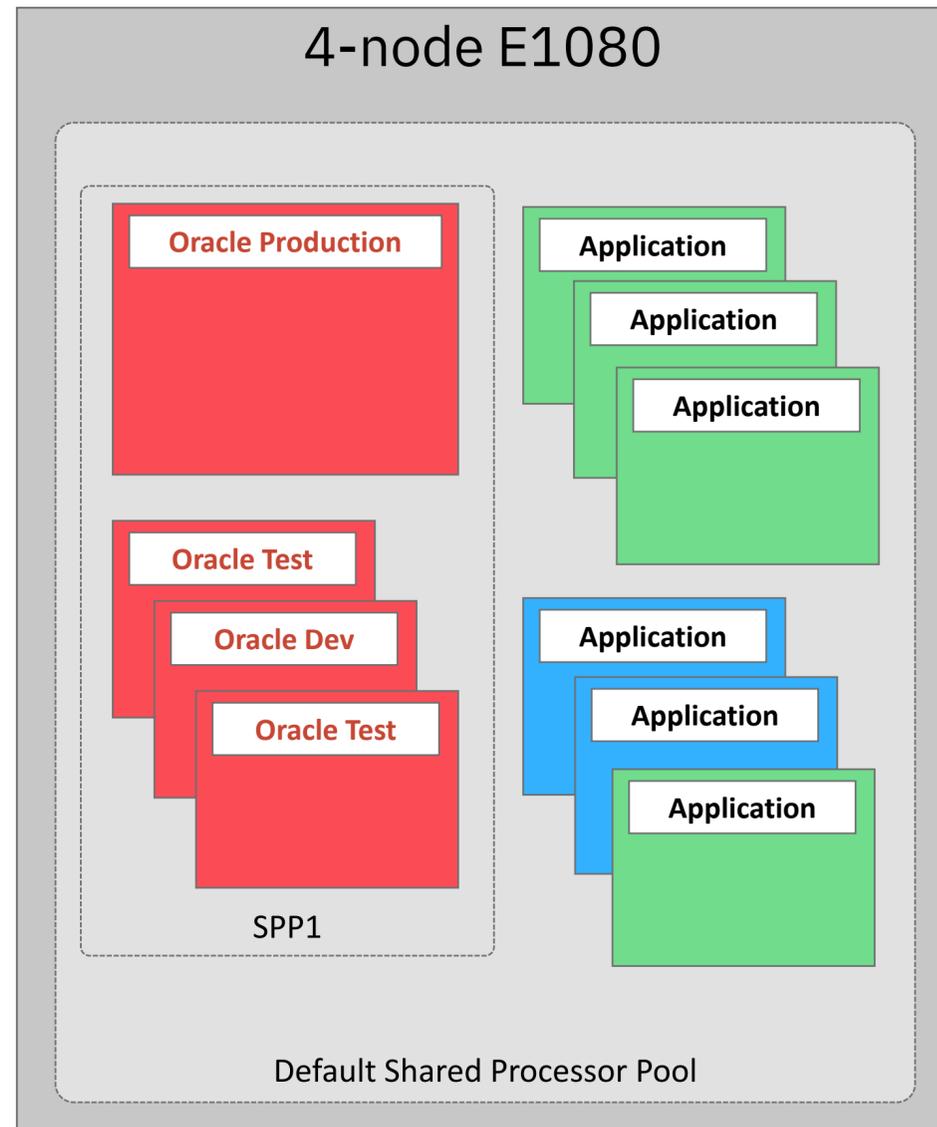
- Whole physical cores are assigned to dedicated processor partitions
- One to one association between virtual processors and assigned cores
- Unused core cycles can be donated to shared processor partitions

Shared Processor Partitions

- Virtual Processors and Processing Units (Entitled Capacity) are assigned to shared processor partitions
 - Processing Units is guaranteed amount of processing capacity
 - Can have more Virtual Processors than Processing Units
- Configured as capped or uncapped
 - Capped are limited to their assigned processing units
 - Uncapped can utilize core cycles beyond the assigned processing units
- Compete for excess (uncapped) core cycles with other shared processor partitions
- Dispatched by the hypervisor on any shared physical core in the system



Power Virtualization Concept - Shared Processor Pools



Power10

Simplified configuration illustration

Shared Processor Pools (SPP)

- Pool of processor capacity shared between a group of shared processor partitions
- Configured with maximum processing units
- Allow a user to limit the total number of core cycles consumed by the set of shared processor partitions assigned to the pool
- Can have more Virtual Processors than maximum processing units assigned

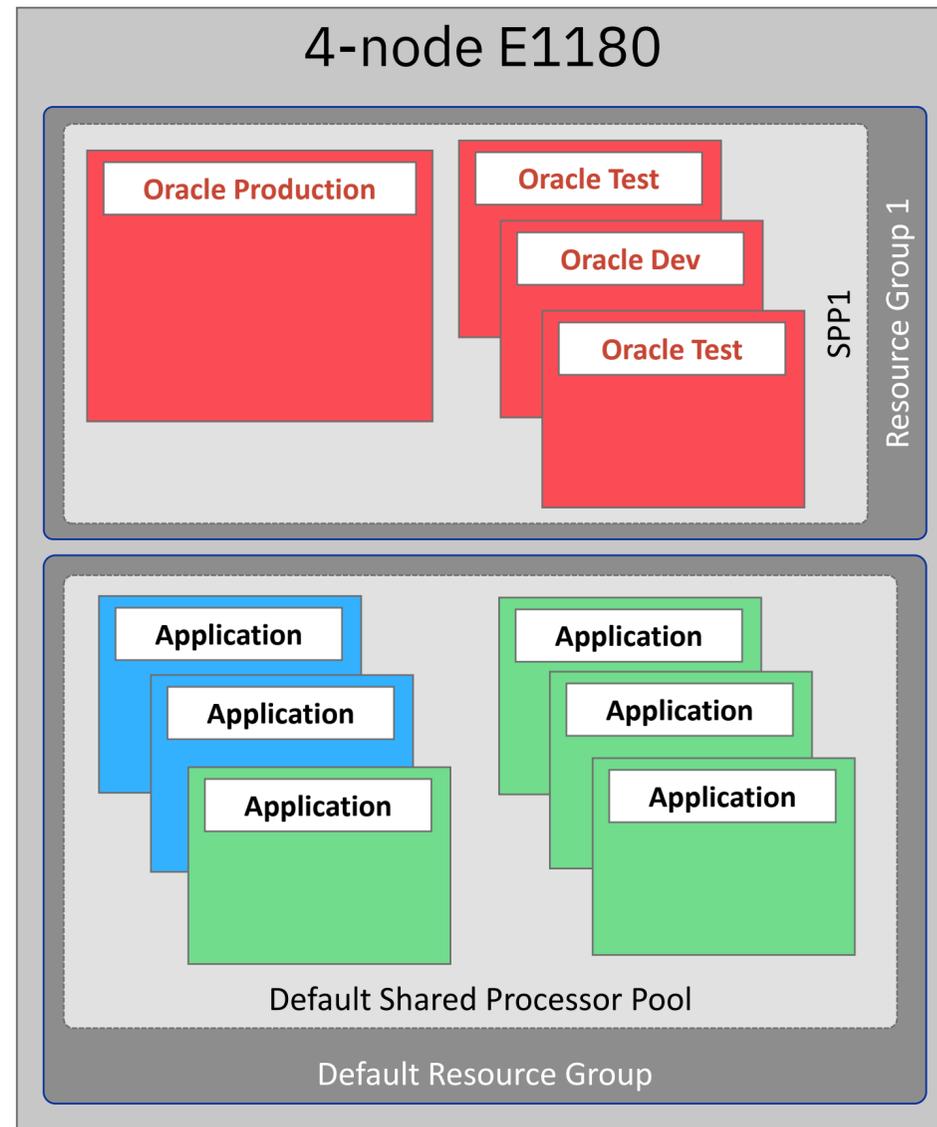
Usage

- Control software licensing cost by limiting the amount of processing units available to shared processor partitions

Limitation

- Dedicated processor partitions cannot be part of a SPP
- Using a SPP has no impact on partition placement
- SPP does not prevent noisy neighbor impact





*Power11 Resource Groups
Simplified configuration illustration*

Resource Groups (RG)

- Provides isolation for assigned cores
- Can contain dedicated and shared processor partitions
- Can be used in conjunction with Shared Processor Pools
- Can show significant performance and isolation improvements

Performance Improvements

- Reduce/eliminate noisy neighbor impact
- Improve efficiency through per Resource Group shared processor dispatching
- Can prevent off-node dispatches of virtual processors

Use cases

- Large number of use cases
 - Key use cases covered in the following slides



Resource Groups

IBM Power11 with Resource Group capability delivers up to 25% improved performance

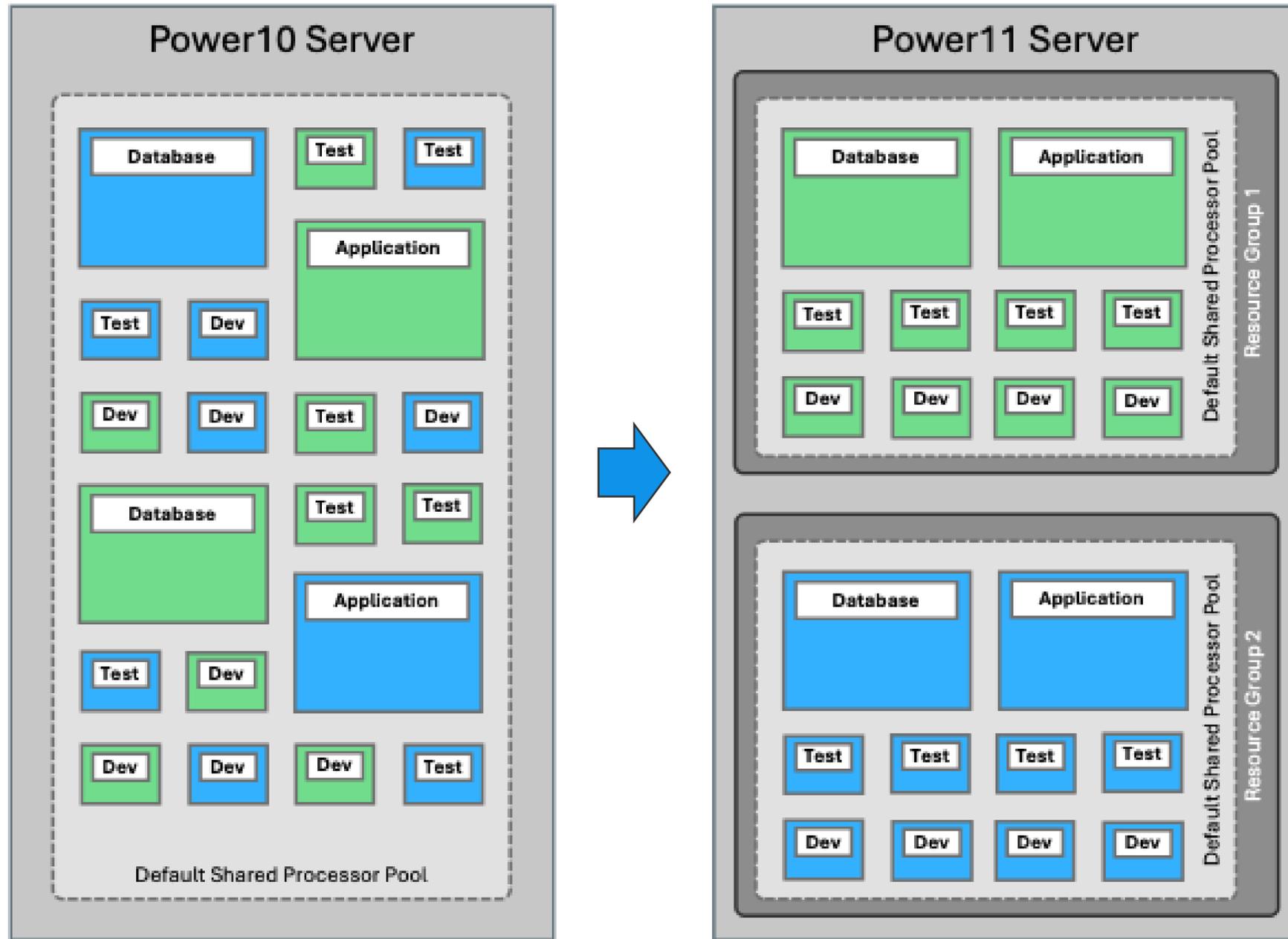
- Improved workload isolation
- Consolidation Scaling and Efficiency

Resource Group Use Cases:

- Consolidation across multiple lines of business
- Isolation of production workloads from test/dev workloads
- Improved application performance by grouping workload tiers into resource groups
- System-level isolation in multi-server consolidation scenarios
- Improved performance by mapping Shared Processor Pools into Resource Groups



Consolidation across multiple lines of business



Simplified configuration illustration

■ Department A LPARs ■ Department B LPARs

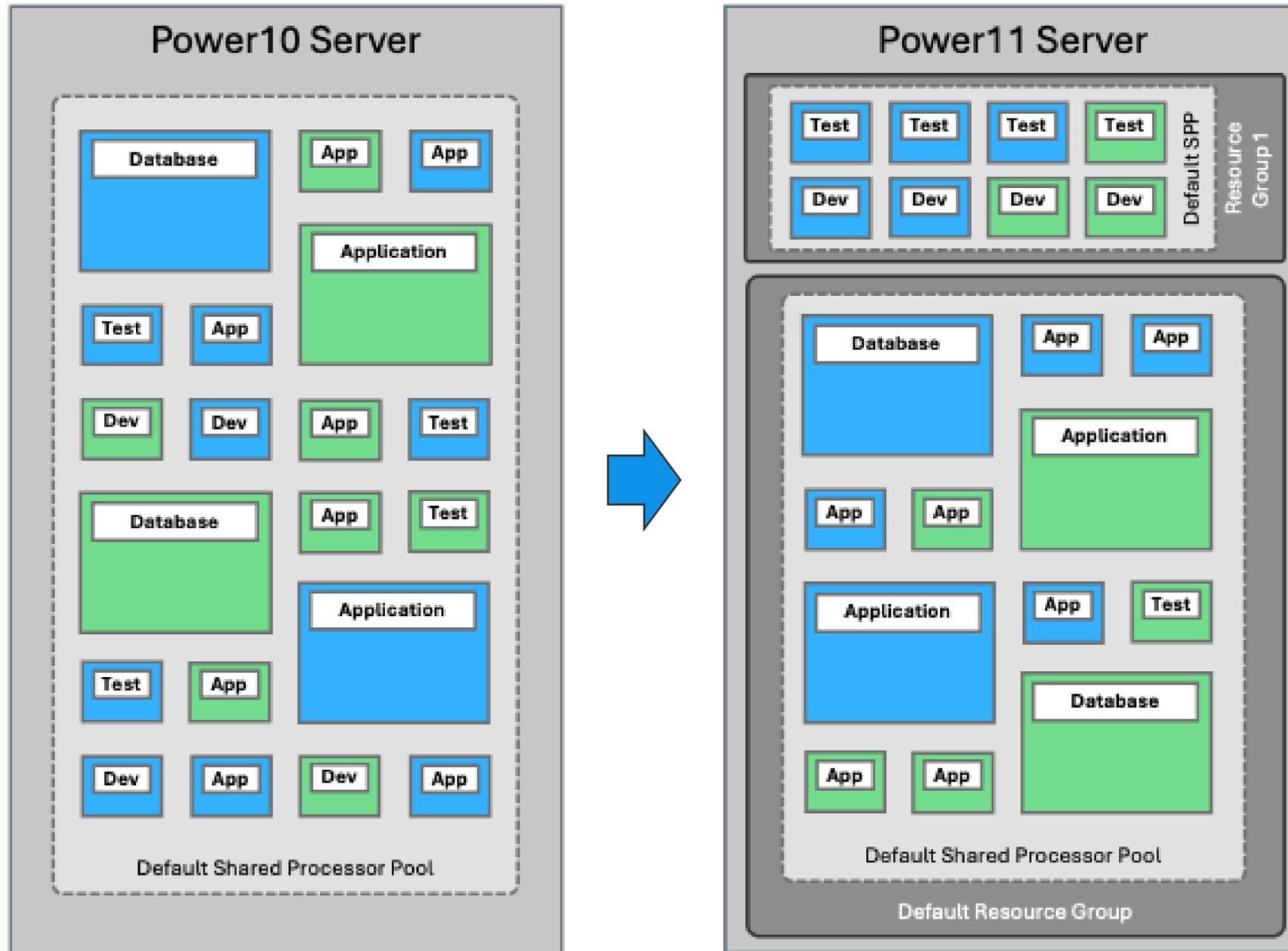
- Customer Private Cloud
- Department A (green) and B (blue)
- Power10
 - CPUs are shared across departments
- Power11 with Resource Groups
 - CPUs shared within a Resource Group
 - CPUs cannot be shared across Resource Groups

Actions

- Create Resource Group 1 and Resource Group 2
- Migrate partitions

Note: Enough space is required to create Resource Groups

Isolation of production workloads from test/dev workloads



Simplified configuration illustration

■ Department A LPARs ■ Department B LPARs

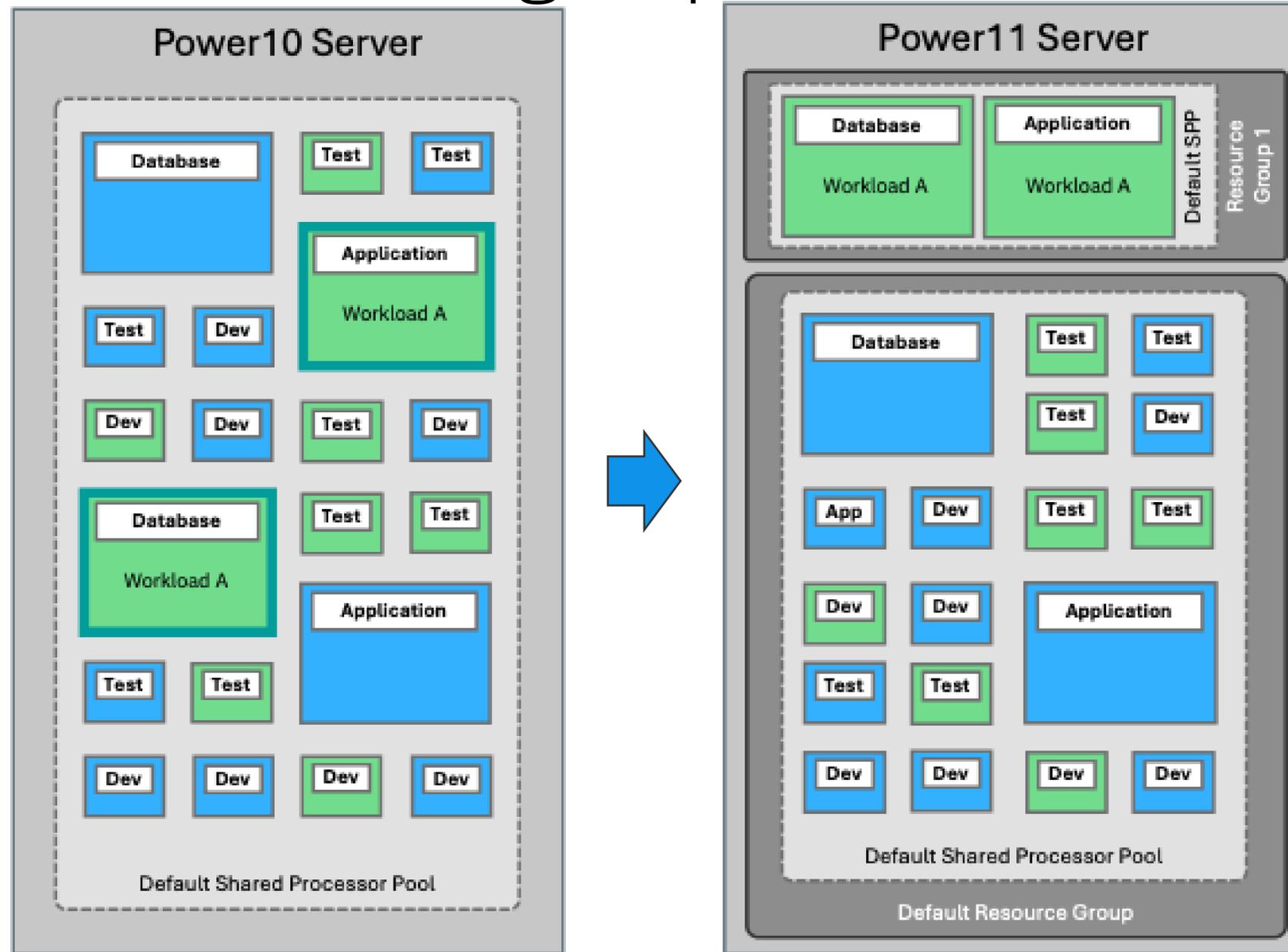
- Department A (green) and B (blue)
- Power10
 - CPUs are shared across departments
- Power11 with Resource Groups
 - CPUs (test/dev) shared within a Resource Group
 - CPUs (test/dev) not shared across Resource Groups
- What happens in the Resource Group stays in the Resource Group

Actions

- Migrate performance critical partitions first
- Create Resource Group 1
- Migrate all other partitions



Improved application performance by grouping workload tiers into resource groups



Simplified configuration illustration

■ Department A LPARs ■ Department B LPARs

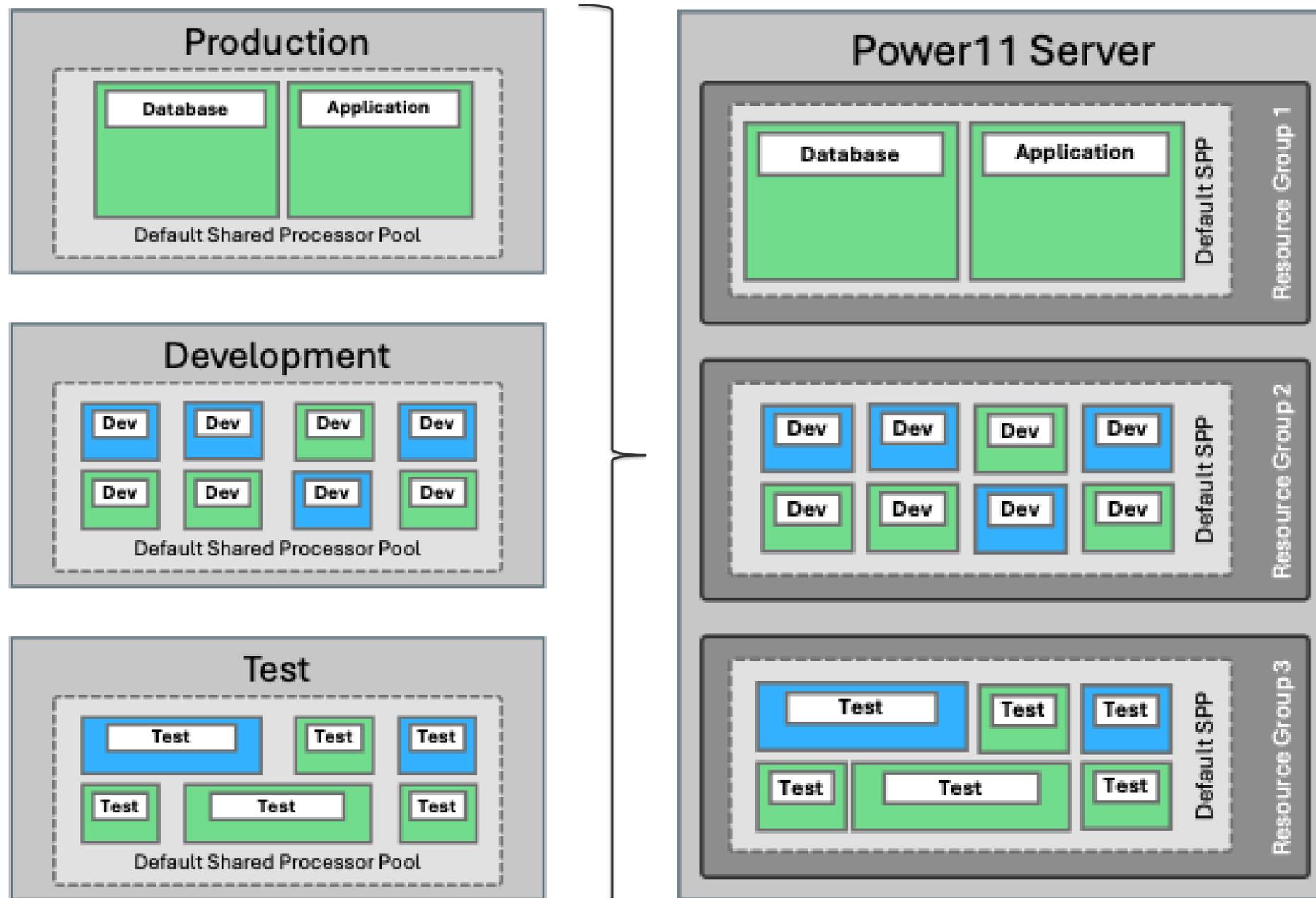
- Department A (green) and B (blue)
- Workload A (green) consists of a database and application server
 - Data is shared through virtual Ethernet
- Improved performance through better affinity between database and application server

Actions

- Migrate performance critical partitions first
- Create Resource Group 1
- Migrate Workload A partitions



System-level isolation in multi-server consolidation scenarios



Simplified configuration illustration

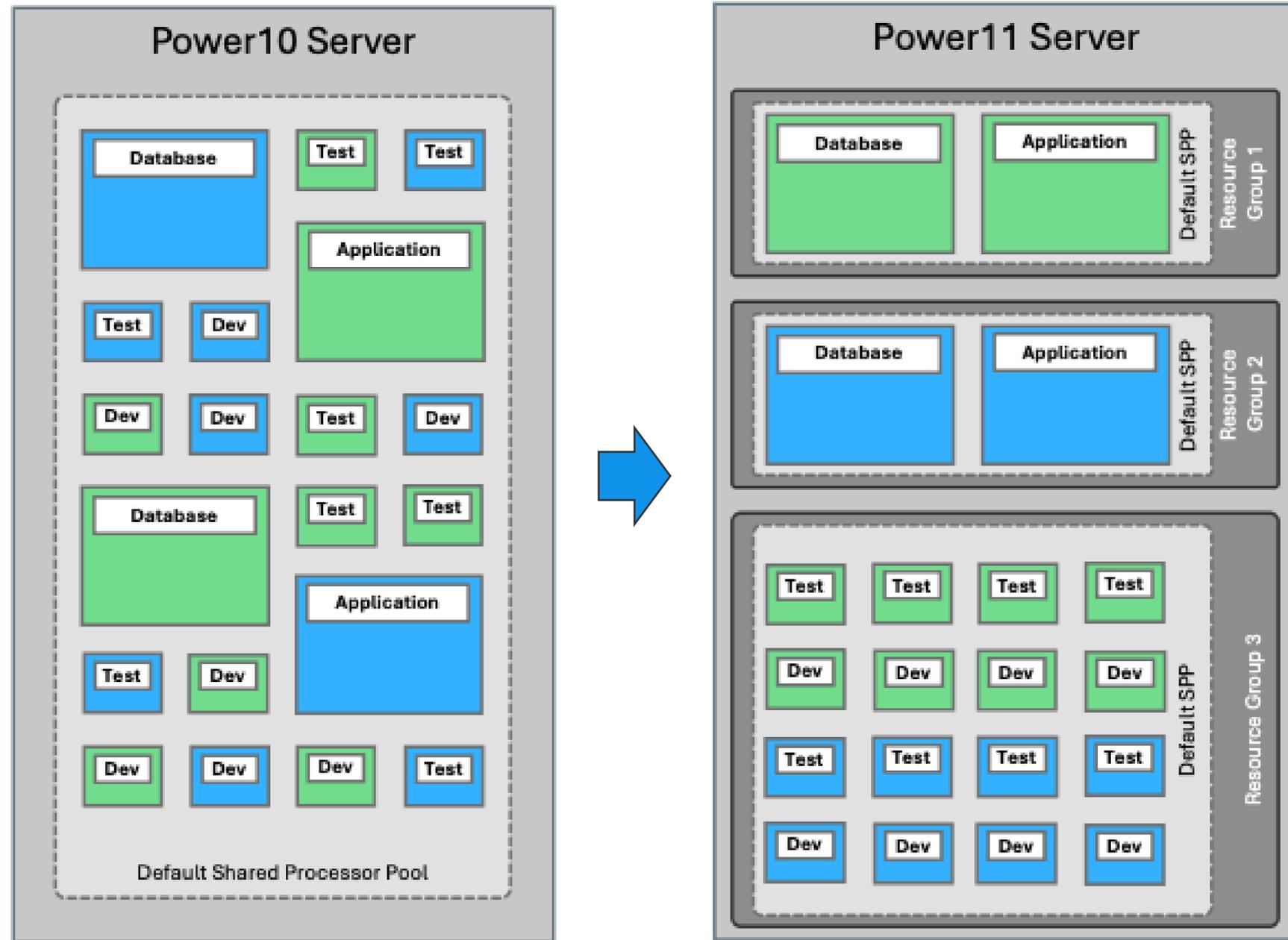
■ Department A LPARs ■ Department B LPARs

- Department A (green) and B (blue)
 - Separate Systems for production, development, and test
- Consolidate multiple smaller servers into a larger Power11 system
- Using Resource Groups to isolated the “systems” in their new home

Actions

- Create Resource Group 1 first, then Resource Groups 2 and 3
- Migrate partitions - performance critical partitions first

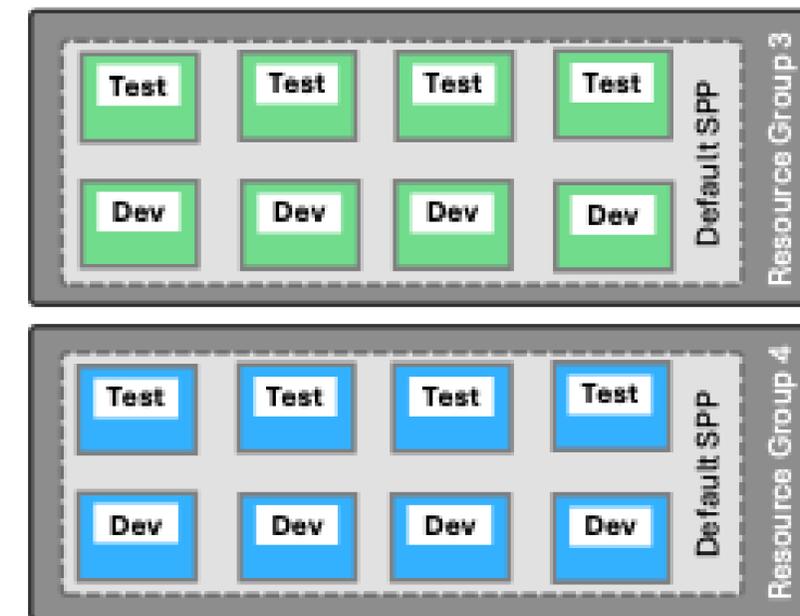
Combining use cases



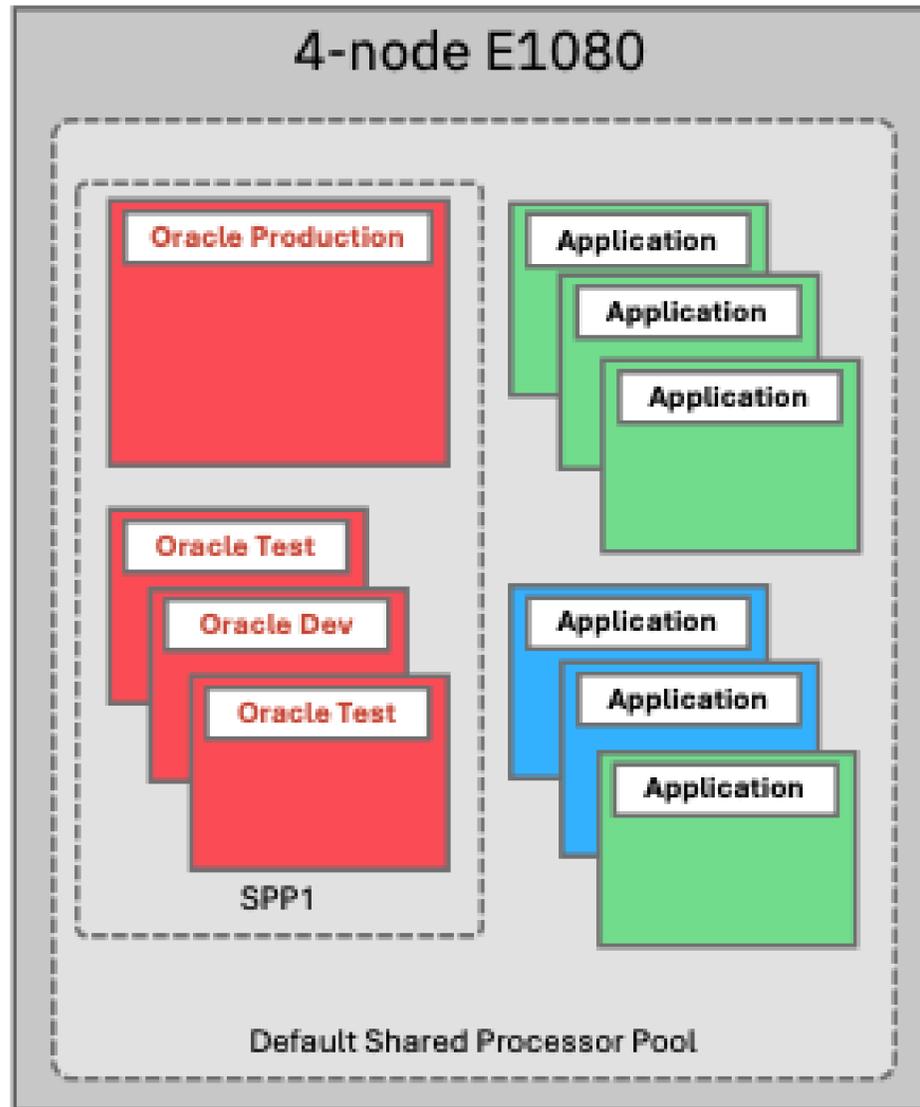
Simplified configuration illustration

■ Department A LPARs ■ Department B LPARs

- Department A (green) and B (blue)
- Resource Group use cases are not limited to one or the other
- Example - combine
 - Consolidation across multiple lines of business
 - Isolation of production workloads from test/dev workloads
 - Add more isolation for dev/test

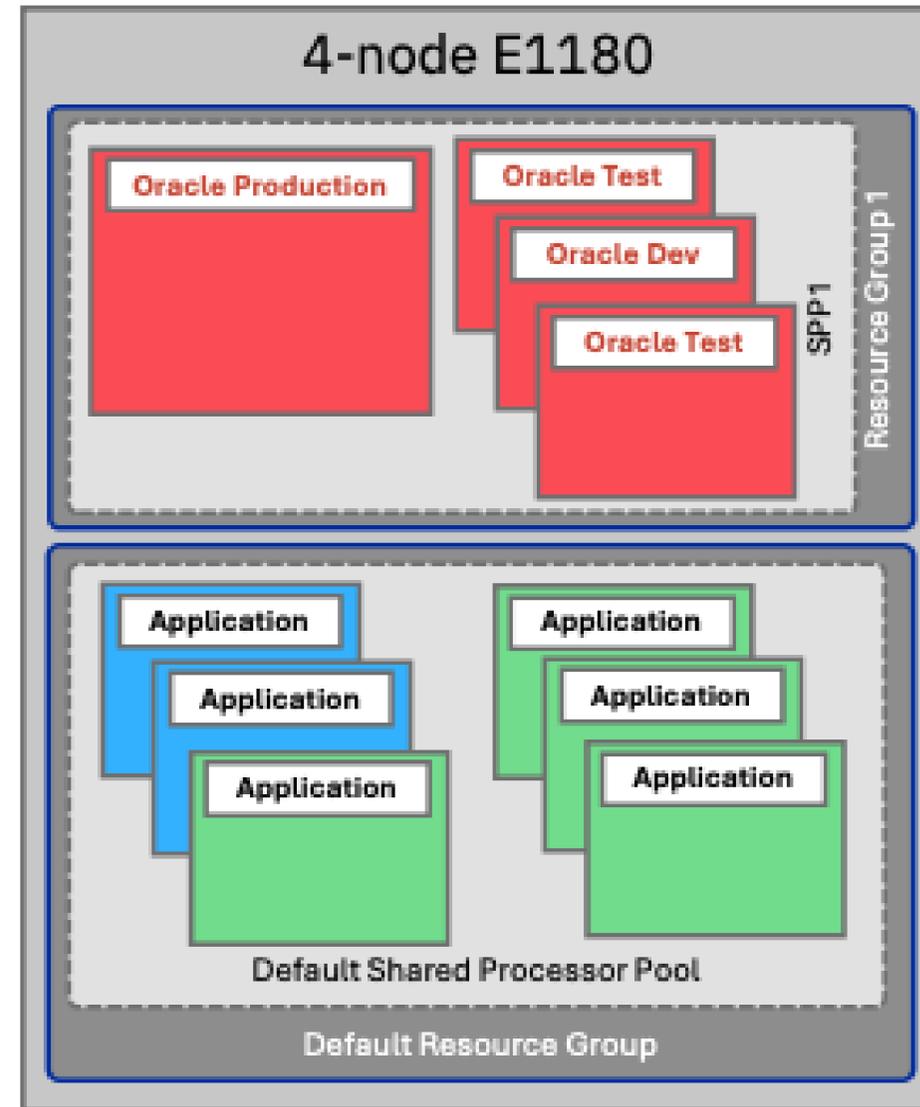


Improved performance by mapping Shared Processor Pools into Resource Groups



Power10

Simplified configuration illustration



Power11 Resource Groups

Simplified configuration illustration

■ Department A LPARs ■ Department B LPARs

Up to 25% improved performance

Workload Improvements

Resource Groups -> improved workload isolation & consolidation scaling efficiency

SW Improvements

Scaling, Affinity, Efficiency

HW Innovation

Frequency, Capacity, DDR5, PHYP



Resource Groups - Client Values Summary

Workload Isolation

- Separate workloads from department A from department B (Private Cloud)
- Separate production from test and development workloads
- Grouping tiered workloads
- System Level Isolation when consolidating workloads
- Improve workload running in Shared Processor Pools
- Better control over CPU resource

Performance

- Improved Virtual Processor Dispatching
- Workload Affinization
- Consolidation without compromise



Power11 Performance – Resource Groups with Oracle Licensing

\$750K lower 3-year TCO

Power E1180 vs E1080
(4-nodes, 16x12cores)

25% improvement in per core performance delivering lower TCO by leveraging Resource Groups for shared processor configurations

Workload Improvements <i>Resource Groups</i>
SW Improvements <i>Scaling, Affinity, Efficiency</i>
HW Innovation <i>Frequency, DDR5, PHYP</i>

Better performance / \$

- 20% fewer Oracle licenses for same capacity
- Activate fewer cores



What is the Resource Group Advisor?

- A web-based tool to provide advice on resource group configuration

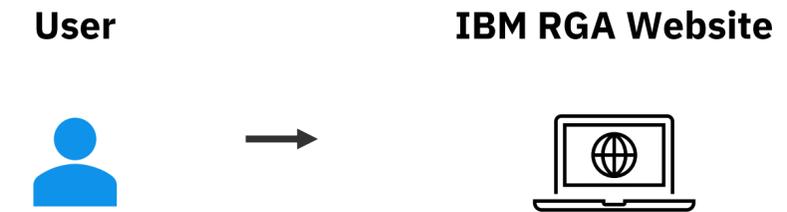
Initial Version

- Enables validation of resource group configuration
- Supports multiple input formats (csv, SPT, WLE)

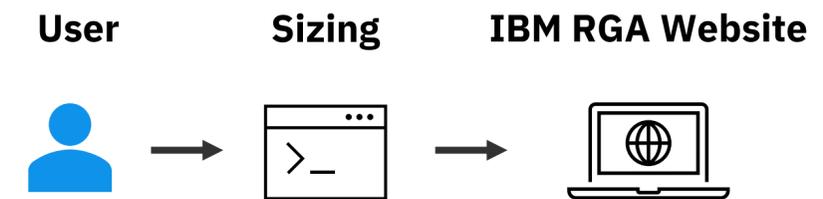
Potential Enhancements

- Considering Supports SPP and non-SPP configuration with automated configuration + CPU consumption data collection
- +

Use case



Migrating to Power11



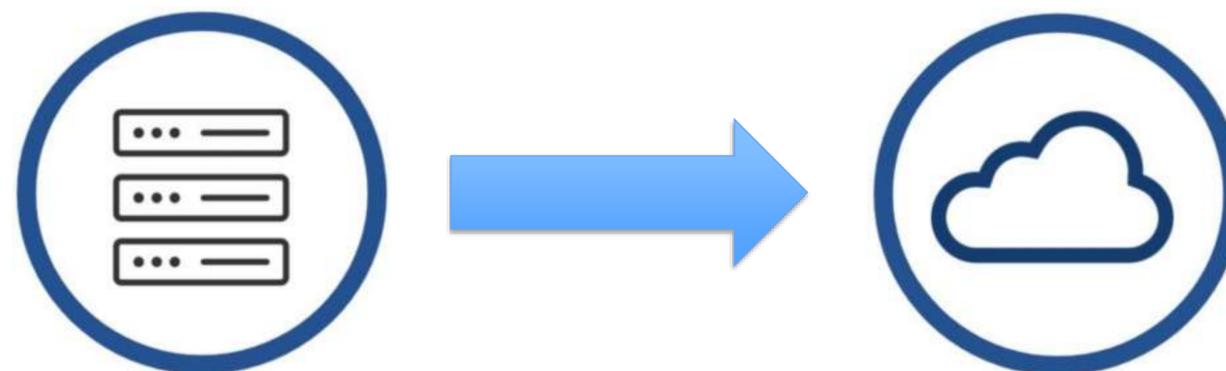
IBM i Migrate While Active



IBM i Migrate While Active

Easily migrate from on premise to Power Virtual Server or another on-premise server

- IBM i standardized tooling to **migrate while active** with minimal impact to production
- Production downtime reduced from days to minutes/hours
 - Dependent on total data size, change rate and network bandwidth
- Automation to reduce the time it takes to seed the base copy
 - Eliminates multiple tools and manual processes for multi-step SAVE/RESTORE
- Production on premise remains available while changes are synchronized in real-time to the target system
 - Eliminates third party replication tools or multiple point in time SAVE/RESTORE iterations



IBM i Migrate While Active Demo

The screenshot displays the IBM Db2 Mirror for i web interface. At the top left, the title "IBM Db2 Mirror for i" is visible. A navigation sidebar on the left contains "Dashboard" and "Single Node Dashboard" options. A notification banner at the top center reads "Success: Deconfigured Nodes" with a green checkmark icon. The main workspace features a diagram of a migration setup. On the left, a "Source" node labeled "DEMOSRC" is represented by four blue server icons. On the right, a "Copy" node labeled "unknown" is represented by four grey server icons. A central gear icon with a refresh symbol is positioned between the two node groups, connected by a horizontal bar with a binary code background, indicating the migration process.

IBM i Migrate While Active

News

Abstract

Available starting on December 13th 2024, IBM i Migrate While Active provides the capability to safely and easily migrate an IBM i partition. A new instance of the IBM i partition, otherwise known as the copy node, is established and maintained by Migrate While Active until such time that a client decides to finalize the migration.

This wiki page aggregates resources and enhancements for IBM i Migrate While Active.

Content



IBM i Technology Updates > IBM i Migrate While Active >

IBM i Migrate While Active orchestrates the migration of an IBM i logical partition (LPAR) to a different location. That location can be within the same server, same data center, or to a remote location such as IBM Power Virtual Server in IBM Cloud.

The process starts with taking a source LPAR at IBM i 7.4, IBM i 7.5, or higher, making a copy of that LPAR, and migrating data from the source to the copy. While the source node is still active, changed data will be continuously migrated to the copy node. When the two nodes are "in sync", a cutover to the new node can be performed, which completes the migration.

Migrate While Active is optimized for migration where a physical tape cannot be used for a traditional D-Mode IPL and restore. It handles the save to optical media so a network install may be performed.

Migrate While Active begins with System Migration, which establishes the copy node, as denoted by the number 1 in in the figure below.

Migrate While Active includes the capability to continuously synchronize the copy node. This is denoted by the number 2 in in the figure below.

The Migrate While Active user decides when to end the continuous synchronization and allow the copy node to be promoted into a state where it can be used. This is denoted by the number 3 in the figure below.

<https://lnkd.in/gErMkPT7>

<https://www.ibm.com/support/pages/ibm-i-migrate-while-active>

IBM i Migrate While Active

Last Updated: 2024-12-13

IBM® i Migrate While Active provides the capability to safely and easily migrate an IBM i partition.

– [PDF files for IBM i Migrate While Active](#)

You can view and print a PDF file of this information.

– [What's new for IBM i 7.5](#)

IBM i Migrate While Active was announced in October 2024. This topic was added to IBM Documentation at that time.

– [Introduction](#)

IBM i Migrate While Active orchestrates the migration of an IBM i logical partition (LPAR) to a different location. That location can be within the same server, same data center, or to a remote location such as IBM Power® Virtual Server in IBM Cloud®.

– [Concepts](#)

This section contains an explanation of the fundamental pieces of IBM i Migrate While Active.

– [System migration stage](#)

The system migration stage consists of the steps required to set up the IBM i Migrate While Active environment. This includes configuring migration settings, saving the source node, transferring the save, and then restoring the save onto the copy node. At the end of the system migration stage, the environment is ready for data synchronization to begin.

– [Data synchronization stage](#)

Once the system migration to the copy node has completed, IBM i Migrate While Active will enter what is known as the data synchronization stage. During this stage, changes to objects within SYSBAS are tracked using the integrated file system and library tracking lists. These tracking lists are used by Migrate While Active to understand which objects need to be migrated to the copy node.

– [Cutover stage](#)

The cutover stage is the point where migration to the copy node is finalized, and the relationship between the source and copy node is severed. When the cutover stage is complete, the source node will no longer interact with the copy node and the copy node is fully capable of being used as an independent instance of an IBM i.

– [Managing and monitoring IBM i Migrate While Active](#)

Managing and monitoring Migrate While Active varies greatly depending upon the migration stage.

– [Work with Migration Status \(WRKMIGSTS\) command](#)

The Work with Migration Status (WRKMIGSTS) CL command provides a menu-driven interface to interact with Migrate While Active. The WRKMIGSTS command must be used when the source or copy node is in restricted state since it is not possible to use the Db2® Mirror GUI during this time.

– [IBM i Migrate While Active services](#)

SQL services provide the interfaces used to configure, monitor, and manage a migration using IBM i Migrate While Active.

<https://www.ibm.com/docs/en/i/7.5?topic=availability-i-migrate-while-active>

<https://www.ibm.com/docs/en/i/7.4?topic=availability-i-migrate-while-active>

PDF files for IBM i Migrate While Active

Last Updated: 2024-12-13

You can view and print a PDF file of this information.

To view or download the PDF version of this document, select [IBM® i Migrate While Active](#).

Additional PDFs describe the steps to be run while in restricted state. These documents can be downloaded from within the Db2® Mirror GUI, or from the following links:

- [IBM i Migrate While Active - Saving the source node](#)
- [IBM i Migrate While Active - Installing and restoring the copy node](#)
- [IBM i Migrate While Active - Final synchronization](#)

Saving PDF files

To save a PDF on your workstation for viewing or printing:

1. Right-click the PDF link in your browser.
2. Click the option that saves the PDF locally.
3. Navigate to the directory in which you want to save the PDF.
4. Click **Save**.

Downloading Adobe Reader

You need Adobe Reader installed on your system to view or print these PDFs. You can download a free copy from the [Adobe Web site](#) (<http://get.adobe.com/reader/>).

Parent topic:

→ [IBM i Migrate While Active](#)

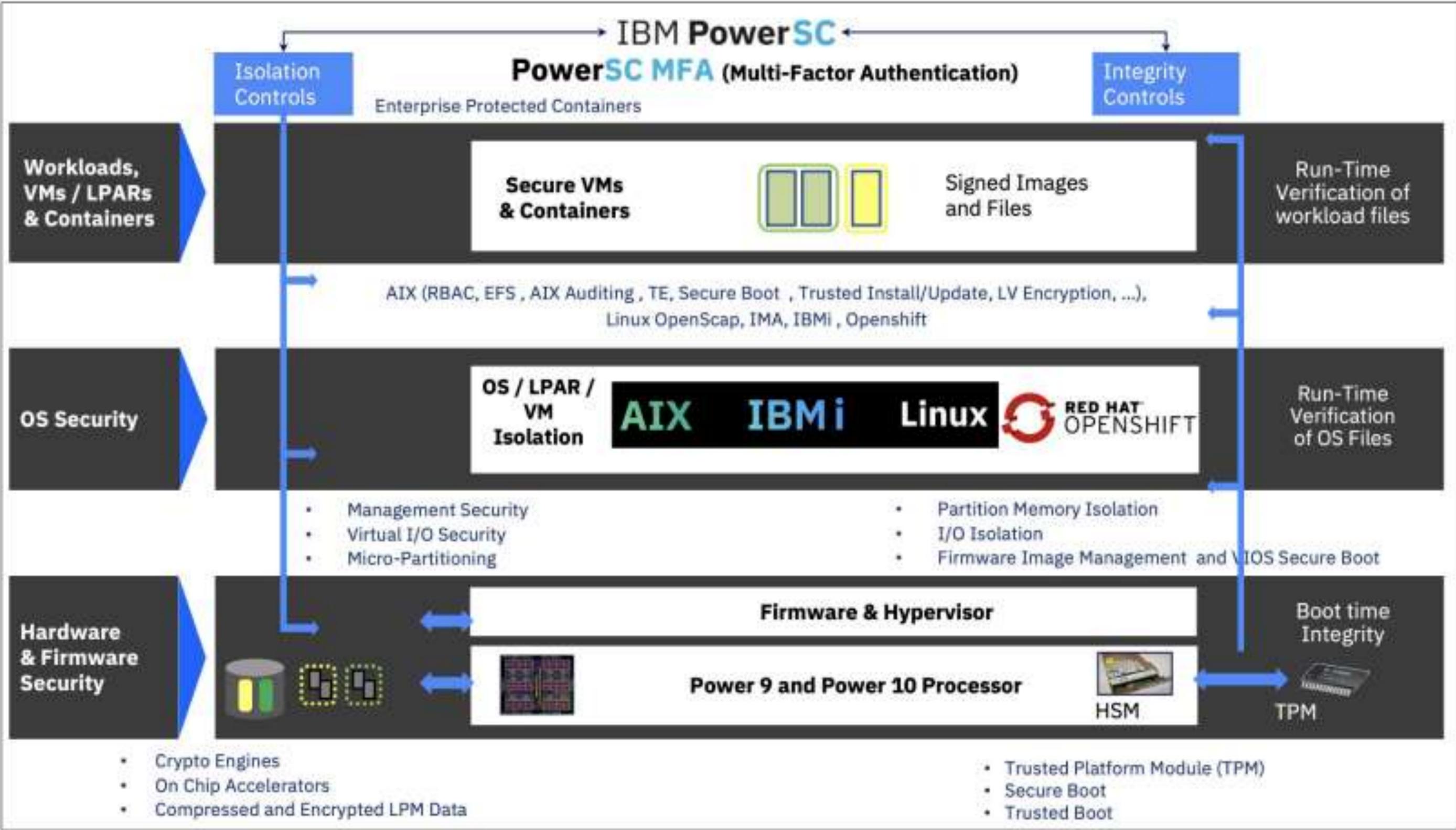
<https://www.ibm.com/docs/en/i/7.5?topic=active-pdf-files-i-migrate-while>

<https://www.ibm.com/docs/en/i/7.4?topic=active-pdf-files-i-migrate-while>



IBM PowerSC Overview

PowerSC manages the Security & Compliance of the System



PowerSC provides a user-friendly, web-based UI to manage Security & Compliance

Compliance and Drift Analysis

- HIPAA, PCI, CIS, and more

Security

- File Integrity Monitoring (FIM)
- Allow/Block listing
- Anti-virus support (ClamAV)
- Integration with IBM QRadar
- Integration with IBM Safeguarded Copy
- Endpoint Detection & Response (EDR)

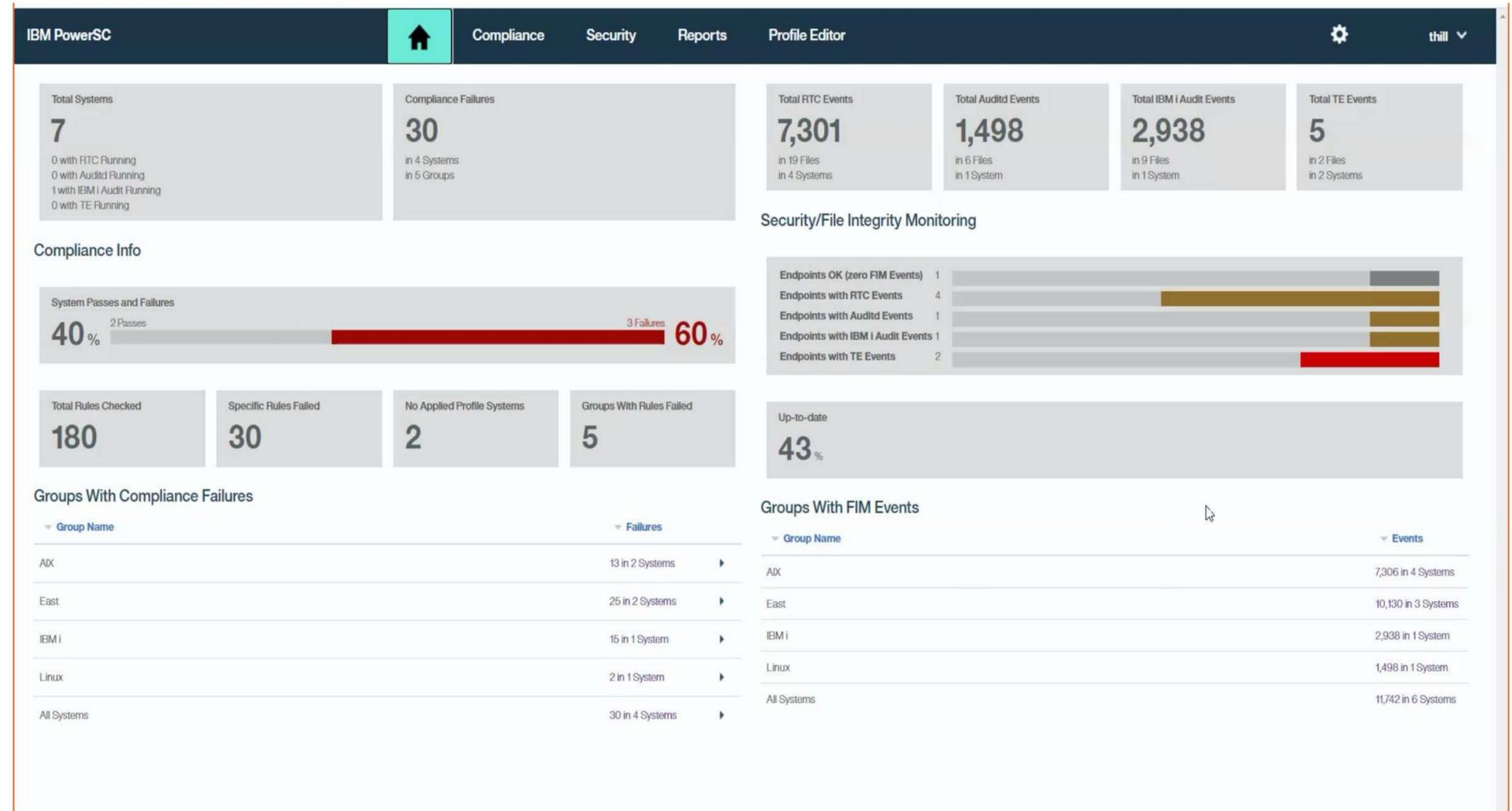
Patch Management

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

Multifactor Authentication

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

Single pane of glass to manage AIX, Linux, and IBM i endpoints



Automation

- Rest API Support
- Swagger Support
- Built in Security Reporting

PowerSC Security Dashboard

- Real-time security dashboard
- Security overview status
- Endpoint description
- Event categories
- Drill down to event types



Security

Security Tab

Security Overview

Endpoints

System Name	RTC	Auditd	IBM I Audit	TE	Up-to-date	OS
p52n72.pbm.ihost.com	-	1498	-	-	✓	SUSE Linux
p52n73.pbm.ihost.com	7189	-	-	-	-	IBM AIX
p52n77.pbm.ihost.com	-	-	-	-	✓	Red-Hat Linux
p52n78.pbm.ihost.com	3	-	-	-	-	IBM AIX
RTC configuration change was requested						
p52n86.pbm.ihost.com	4	-	-	2	-	IBM AIX
p52n87.pbm.ihost.com	x	x	2938	x	✓	IBM I
p52n92.pbm.ihost.com	105	-	-	3	-	IBM AIX

Monitor security from a single dashboard

PowerSC Compliance Dashboard



Compliance

- Compliance dashboard
- Compliance overview status
- Automated enforcement
- Profile check and simulation
- Failure analysis
- Profile customization

Compliance Tab

Compliance Overview

Endpoints

System Name	Last Applied Type	Applied Timestamp	Checked Timestamp	Compliance Status	#Failed Rules	#Passed Rules	OS
p62n72.pbm.host.com	SAPHANA_Less	6/9/2020, 8:30:47 PM	7/24/2020, 4:08:59 PM	Failed	2	11	SUSE Linux
p62n73.pbm.host.com	PCiv3_DLS	7/24/2020, 4:20:31 PM	-	Failed	10	72	IBM AIX
p62n77.pbm.host.com	N/A	-	-	-	0	-	Red-Hat Linux
p62n78.pbm.host.com	N/A	-	-	-	-	-	IBM AIX
p62n86.pbm.host.com	ILS	7/24/2020, 3:53:29 PM	-	Passed	3	47	IBM AIX
p62n87.pbm.host.com	IBMBP_Custom	6/8/2020, 11:35:48 AM	-	Failed	15	20	IBM i
p62n92.pbm.host.com	MLS	7/24/2020, 4:02:15 PM	11/3/2020, 6:24:27 AM	Passed	0	0	IBM AIX

Alerts sent for non-compliance

PowerSC Compliance Profiles

AIX Profiles

GDPR

PCI

CIS

HIPAA

NERC

DoD STIG

SAP Hardening

Oracle Systems Hardening



Compliance

Linux Profiles

GDPR

PCI

SAP Hardening

CIS

HMC Hardening

IBM i Profiles

IBM i hardening

CIS

Compliance profiles can be customized

Power11 Future-proof IT
with out-of-the-box
Quantum-Safe compliance

Cryptography is used in trillions of transactions on billions of devices

Internet

- Domain name system (DNS)
- Hypertext Transfer Protocol Secure (HTTPS)
- SSH File Transfer Protocol (FTP)

Digital signatures

- Electronic identification and trust services (eIDAS)
- PDF advanced electronic signature (PAdES)
- Advanced electronic signatures

Critical infrastructure

- Code updates
- Control systems
- Car systems

Financial systems

- Payment systems

Enterprise

- Email
- Identity management
- LDAP
- PKI services
- Bespoke applications

Documents that needs to stay secure for a long period of time

Passports: 10 years from issue



Road vehicles: 15–20 years



Aircraft/rail: 25–30 years



Some critical infrastructure: 50+ years



Data needs to stay secure for a long time

HIPAA: 6 years from last use per Security Rule



Tax records: 7–10 years in most countries; Sarbanes-Oxley Act set the precedent in the US



Legitimate interest under GDPR: 20+ years



Much of today's cryptography relies on hard mathematical problems.

The most powerful classical computer today **would take millions of years to find the solution.**

However, Quantum Computers will break this problem within hours.

Quantum Computers are bringing a new challenge

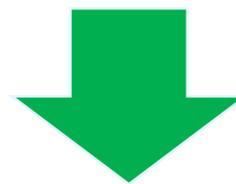
Quantum Computers...



IBM Quantum System 1



IBM Quantum System 2

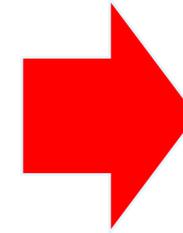


...are able to solve some classes of problems orders of magnitude faster than classical computers



... and at the same time able to break most of the world's existing cryptographic algorithms
“Quantum Attacks”

- Any system that uses current algorithms is at risk of exposing (customer) data
- According to various reports this will take place around 2030.
 - See [NIST report](#) and [IBM Quantum Safe Cryptography](#) for details



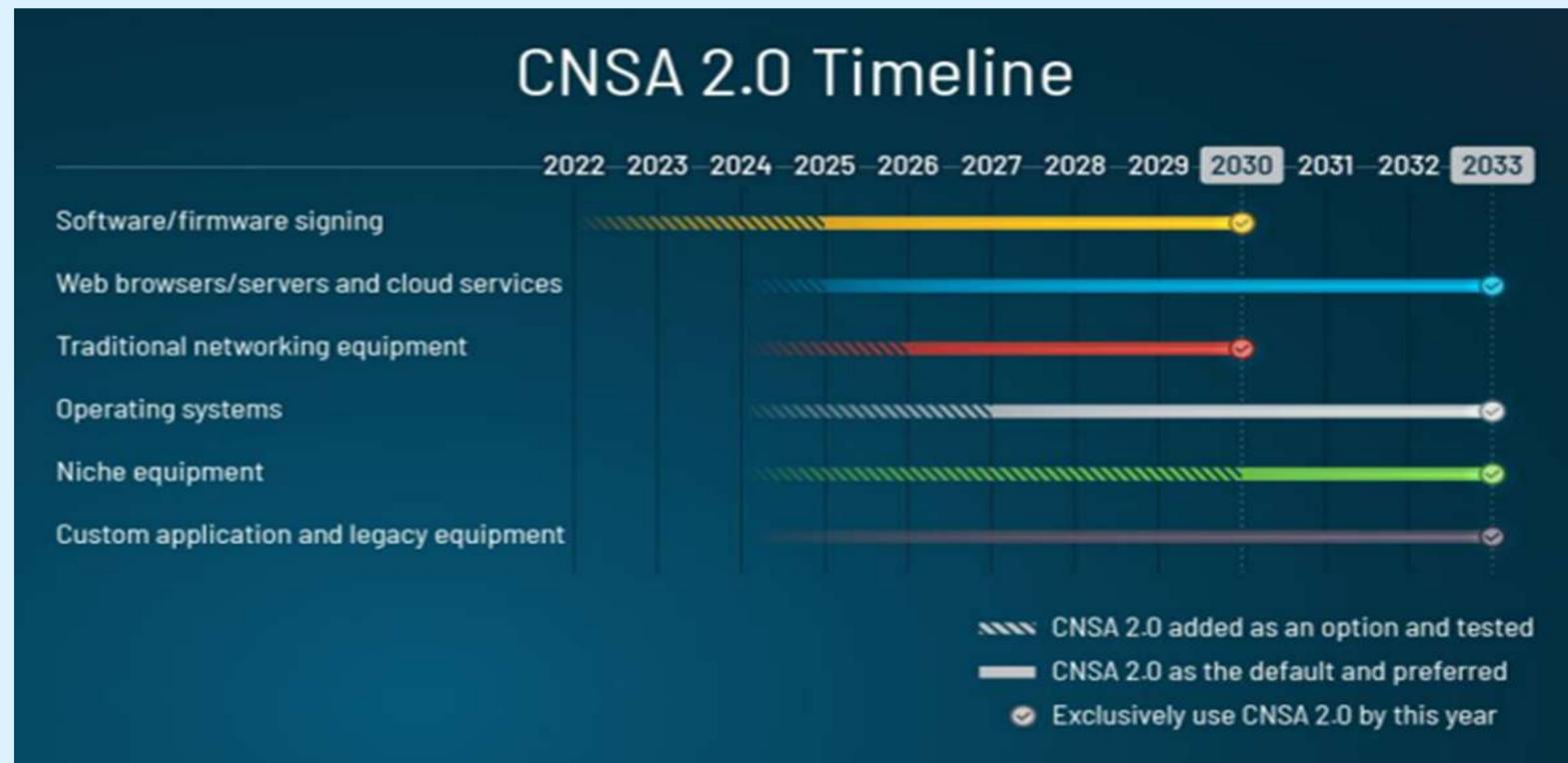
Market Landscape: Transition from Classical to Quantum-Safe Crypto

- Classical Computer Cryptography is projected to reach USD 3.0 billion by 2028, at a CAGR of 41.2% from 2023 to 2028, according to a new report by MarketsandMarkets™
- Gartner: By 2025, 50% of organizations with crypto-agility projects will create pilot programs to harvest value from quantum-safe cryptography.
 - New use cases, new partnerships and new ISV's addressable for Power

Quantum Safe is a **\$450M** Addressable Market by 2027...

Government Mandates puts heightened focus on Quantum Safe

US Government mandate for quantum-safe federal agencies



[CNSA 2.0](#): Quantum-safe standards are preferred for national security systems by the mid-2020s and required by the early 2030s to defend against quantum computing threats.

PRESS RELEASE | Publication 23 June 2025

EU reinforces its cybersecurity with post-quantum cryptography

The EU Member States, supported by the Commission, issued a roadmap and timeline to start using a more complex form of cybersecurity, the so-called post-quantum cryptography.

Designed with complex algorithms, this is a key milestone to deflect advanced cyber threats.

Henna Virkkunen, Executive Vice-President for Technological Sovereignty, Security and Democracy, said:

“As we enter the quantum era, post-quantum cryptography is essential to ensure a high level of cybersecurity, fortifying our systems against future threats. The post-quantum cryptography roadmap provides a clear direction to ensure the robust security of our digital infrastructure.”

<https://digital-strategy.ec.europa.eu/en/news/eu-reinforces-its-cybersecurity-post-quantum-cryptography>



AdobeStock © ipopba

Related topics

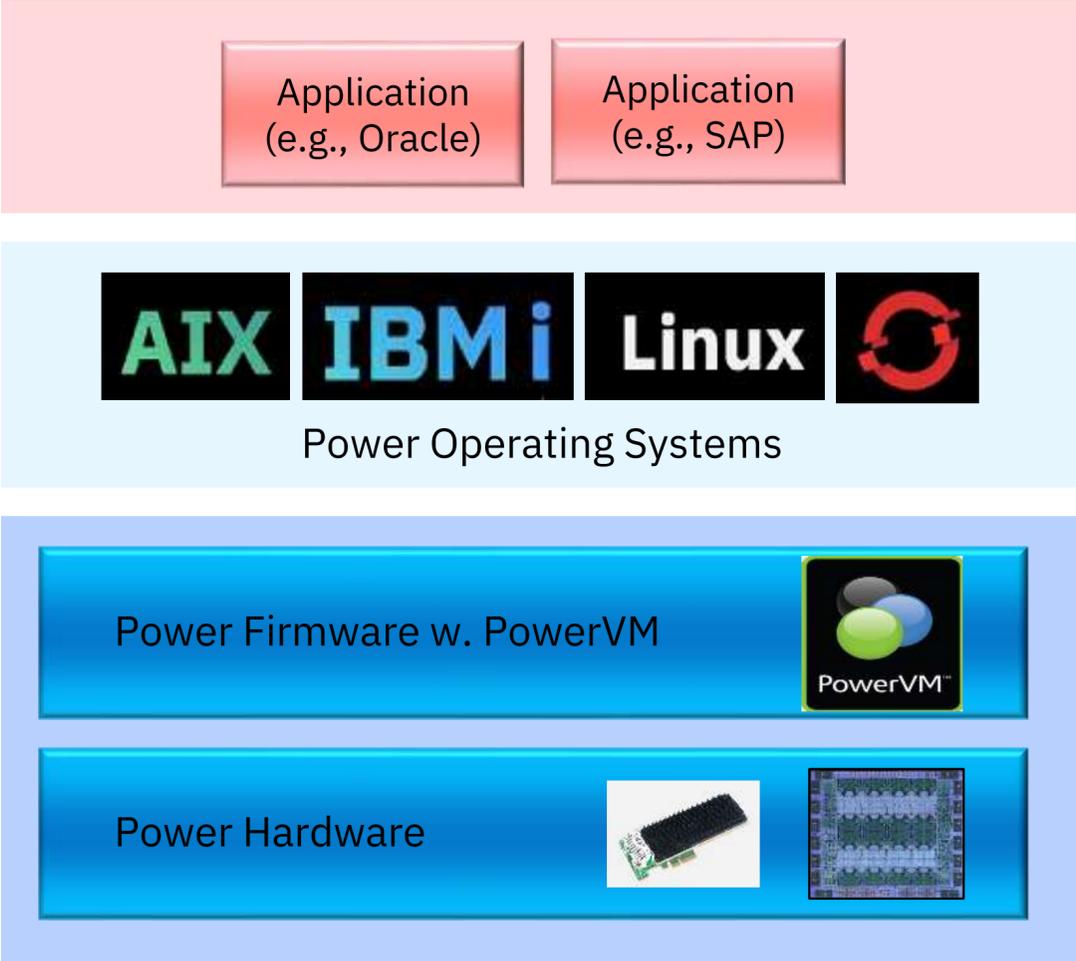
Cross-Stack Quantum Safety Requirements

A Quantum Safe System must *holistically* address all domains where cryptography is being used.

- Includes 4 Major Domains: Protection of data in transit, at rest, protection of platform integrity, protection of management systems

Implementing Quantum Safety across all these domains requires changes across the stack.

- Hardware (Processor, Peripherals), Firmware, Operating Systems, Applications, Cryptographic Libraries (embedded in OS and/or Applications)
- It has dependencies on (additional) standards and partners, including Open-Source Communities





Quantum Compliance migration is a *Journey*

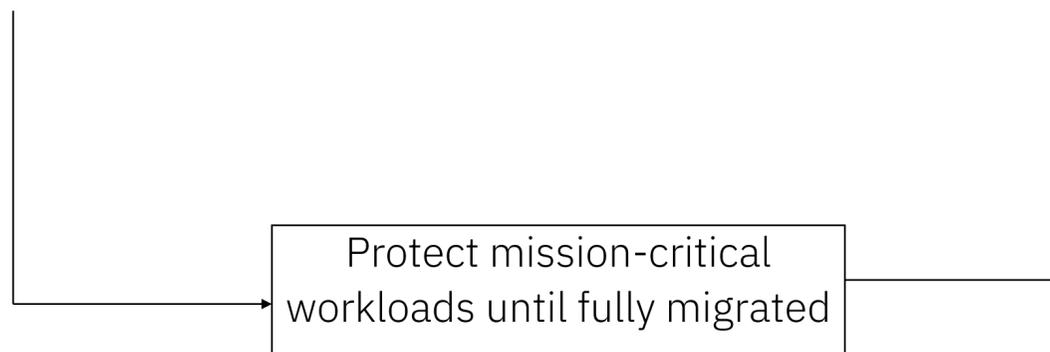
Inventory Discovery & Risk Prioritization



Migrate to Quantum Algorithm



Manage



Future Proof your Workloads and Data

- *Turnkey 100% compliance with applicable (SW+FW Signing) CNSA requirements.*
- *One click discovery and risk prioritization within minutes to accelerate quantum safe migration.*

Quantum Safe firmware signing, consistent with [NSA recommendations](#) to protect firmware integrity

Introducing IBM Crypto Express Card, [4770](#), with built in support of ML-KEM and ML-DSA Quantum Safe algorithms, for workloads demanding the highest levels of FIPS validation

Quantum Safe encryption of Live Partition Mobility (LPM) traffic to protect from “capture now, decrypt later” attacks (Power differentiation)

One click cryptographic inventory discovery and risk prioritization within minutes with [PowerSC](#), accelerating the quantum safe migration

Quantum Safe IBM Crypto Express Card, 4770

Provides highest level of security certifications

Introducing New Capabilities

- Containers support (Linux on Power): run software accessing Crypto Express Card (CEC) from Containers
- Multi-container support: use across multiple containers
 - For containers that are part of the same trust domain and can share single resource and key hierarchy
- Adds PKCS11 API via OpenCryptoKey Open-Source Library extending card use cases, e.g., Oracle Transparent Data Encryption (TDE)

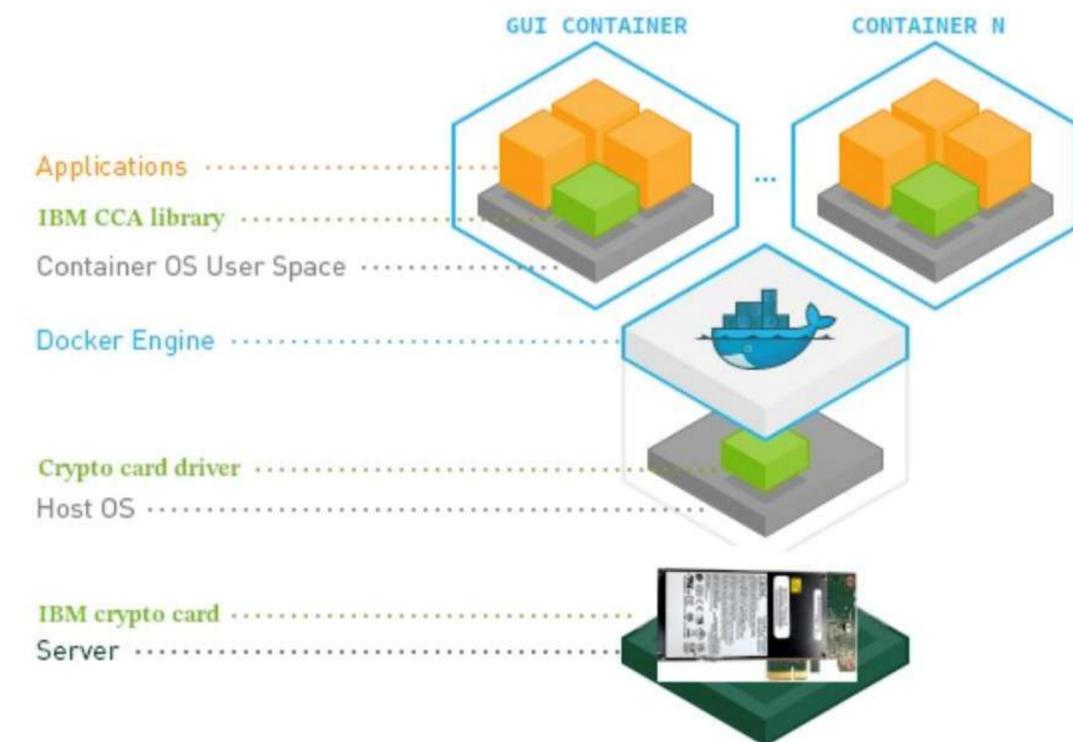
Supporting Security Certification

FIPS 140-2 Level 4 – Highest cryptographic security level available.

- FIPS 140 defines security requirements for cryptographic modules. It is issued by the U.S. National Institute of Standards and Technology (NIST) and is widely used as a measure of the security of HSMs.

PCI HSM

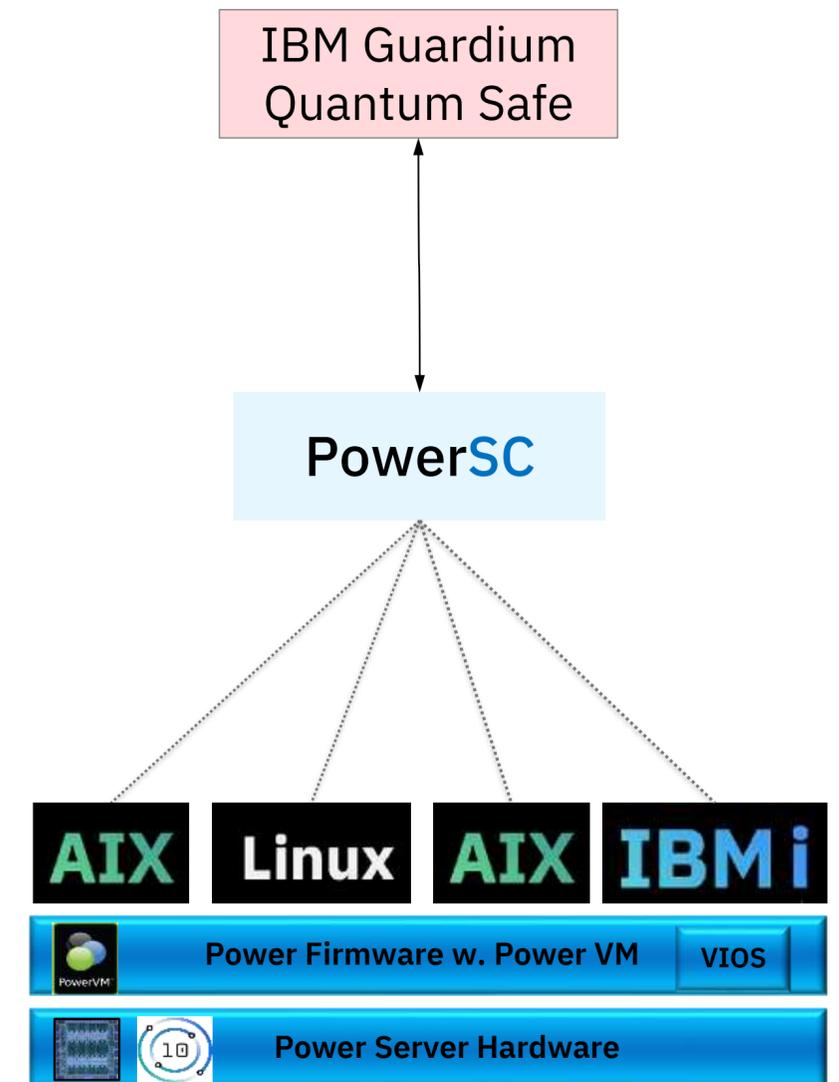
- PCI HSM is the "Payment Card Industry Hardware Security Module" standard issued by the PCI Security Standards Council. It defines physical and logical security requirements for HSMs that are used in the finance industry. PCI HSM is one of the standards in the PCI PIN Transaction Security (PTS) device group.



PowerSC Cryptographic Inventory Discovery and Risk Prioritization

Leveraging and Extending PowerSC Capabilities

- **Leverages existing compliance monitoring capabilities for cryptographic protocol configuration:** with compliance profiles such as CIS, PCI-DSS, DoD STIG.
- **Expands capabilities with general custom file system scanning capabilities across all Power Operating Systems**
- **Integrate with IBM Guardium Quantum Safe:** share discovered cryptographic inventory for further analysis and remediation
- **Augment capabilities w. input from additional tools, e.g., vulnerability scanners (e.g., Nessus, Qualys)**
- **Ensure Cryptography that PowerSC uses is Quantum Safe:** update PowerSC cryptographic libraries used to manage endpoints (TLS, SSH, etc.)



IBM Power Quantum Safety Solution

Dimitrios Pendarakis – Distinguished Engineer
Kavita Sehgal – Program Director
Tim Hill – Rocket Software
Erica Albert – Design lead



Protect your
business with
IBM Power
Cyber Vault

Average total cost of a
data breach in 2024

\$4.88
million

Increase from 2024

+11%

Worldwide regulation

United States

- Interagency paper 'Sound Practices to Strengthen Operational Resilience'
- National Cybersecurity Strategy
- SEC Proposed Ruling for Cybersecurity Risk Management Rule 10

Brazil

- Brazilian General Data Protection Law ("Lei Geral de Proteção de Dados" or "LGPD")
- Resolution 4.502/2016
- Central Bank of Brazil ('BACEN') Resolution 4.893/2021

Europe

- Digital Operational Resiliency Act (DORA)

South Africa

- South African Reserve Bank Prudential Authority 'Principles for operational resilience'

United Kingdom

- FCA PS21/3 Building operational resilience policy statement
- Bank of England Operational resilience Statement of policy

Global

- Basel Committee on Banking Supervision issued 'Principles for Operational Resilience' and 'Principles on Outsourcing'

Singapore

- Monetary Authority of Singapore 'Guidelines on Risk Management Practices – Operational Risk'

Australia

- Prudential Standard CPS 230 - Operational Risk Management

Cyber Security and Cyber Resilience

Cyber Security

Cyber security is about prevention; it's about trying to keep the bad actors out of your environment

Cyber Resilience

Cyber resilience is about an organizations ability to continue operations and rapidly recover despite a cyber-incident

Organizations need to be both cyber secure and cyber resilient

Traditional resiliency solutions will not protect you from cyber attack

	Traditional Approaches	What's required for Cyber Resiliency
Data Replication	Backups or clones stored in secondary storage	Immutable, point in time copies stored in an isolated environment
Error detection	System and application outages are detected immediately	Proactive data validation on point in time copies to allow rapid response
Recovery points	System and application outages are detected immediately	Multiple recovery points to account for corruption from cyberattacks
Recovery Scope	Continuous availability and disaster recovery	Forensic, surgical or catastrophic recovery capabilities
Anomaly Detection	Rely on SIEM and EDR systems, which have high false positive rates	Multi-layer malware and ransomware detection technologies to spot attacks faster and more accurately

Ensure business continuity with cyber resilience that stops ransomware fast, protects critical data, and gets you back up and running quickly

- Proactive protection with immutable copies

- Guaranteed Detection of ransomware within <1 min

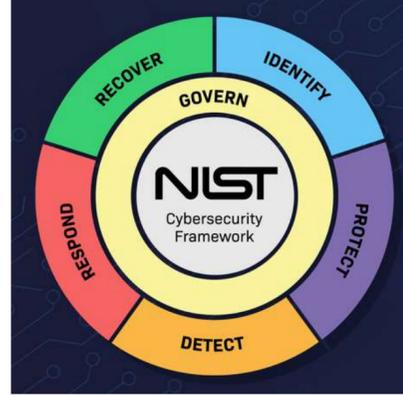
- Automated Response

- Rapid Recovery to meet predictable Recovery Point Objective (RPO) and Recovery Time Objective (RTO) requirements



IBM Power Cyber Vault solves for that

CyberVault provides the full scope of resiliency aligned to the recognized NIST Cyber Resiliency Guidance Framework



Identify risks

Know your assets and risks – gathering intelligence is the first step with a personalized workshop



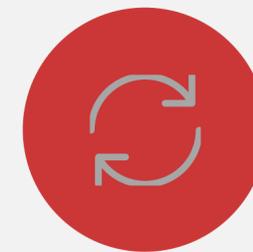
Protection

Schedule and store immutable copies to protect workloads against cyber corruption and encryption



Detection

Use integrated, AI-enhanced, multi-layer malware and ransomware detection technologies to spot attacks faster and more accurately and to limit damage



Response

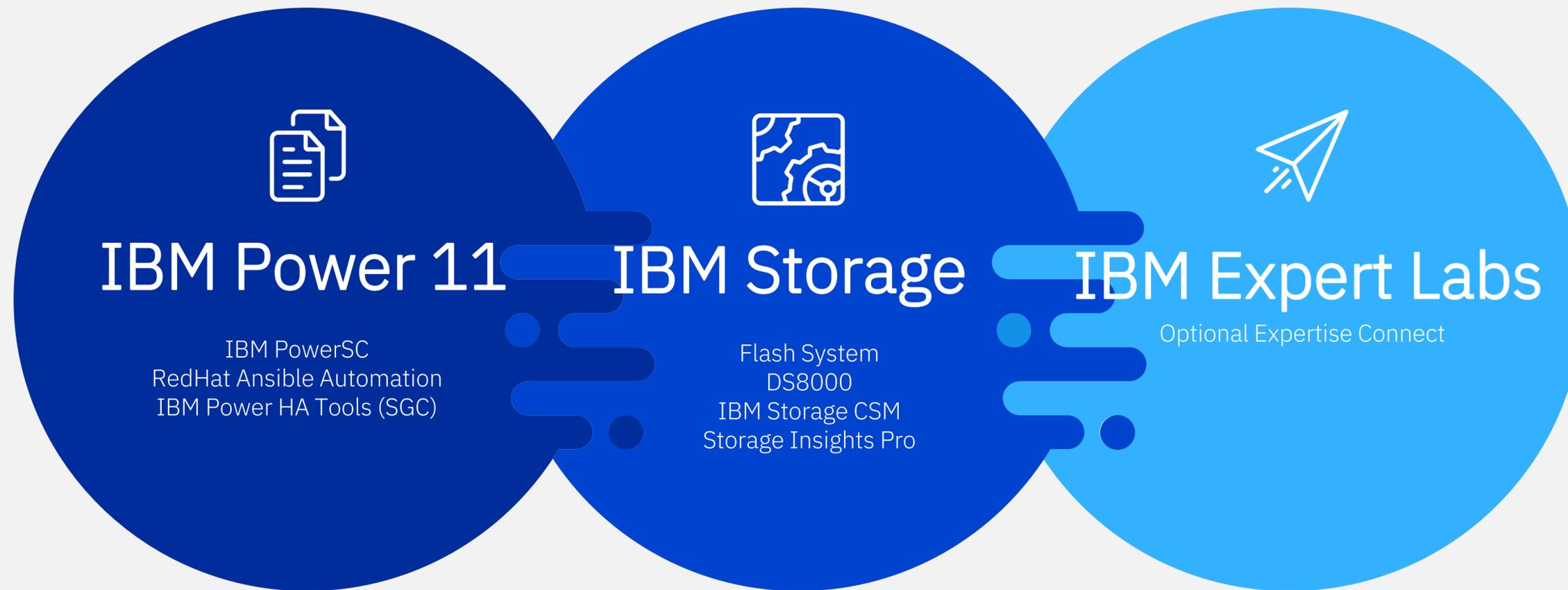
Every Minute Counts: Use cyber vault clean room automated technology for testing and recovery to meet return to operations requirements



Recovery

IBM Power Cyber Vault solves for that

A fully integrated cyber resilience solution with in-line threat detection and automated response and quick recovery designed to maximize business continuity and minimize risk and complexity



IBM i + IBM Power Cyber Vault

IBM Power Cyber Vault with

- ✓ IBM i
- ✓ PowerSC
- ✓ Power HA Tools - Safeguarded Copy

in a complete Cyber Resilient Solution*.

IBM Power Cyber Vault Solution

Identify

IBM Technology Expert Labs
Power Cyber Vault Deployment

- **Design Workshop** for client specific requirements
- **Power Cyber Vault Deployment** to customize and enable the unified Power Cyber Vault to meet client needs

Protect

IBM Storage

- **Immutable Copies** for Data Protection
- **Ransomware Detection** for real-time threat detection
- **Flash copy-speed recovery** for rapid restore of snapshot data
- **Storage Insights Pro** for comprehensive reporting

Detect

IBM i on IBM Power 11 Server

- IBM i v 7.4, 7.5, 7.6
- **Alerts on active attacks** and reports to PowerSC via Storage Insights Pro
- **Secure Boot and Memory Encryption** built in
- **Scalable and Flexible Architecture** from Entry to Enterprise servers

Respond and Recover

Automated response to attacks, creating Power Cyber Vault clean rooms for testing and validation

Automated multi-level testing and validation of Power Cyber Vault images to **accelerate system recovery**

The diagram illustrates the IBM Power Cyber Vault solution as a unified cyber resilient solution. It features a blue header with the text 'IBM Power Cyber Vault' and a subtitle: 'A unified cyber resilient solution to detect evolving cyber threats, respond with quick recovery and meet predictable RPO and RTO requirements'. Below the header, five circular icons represent the solution's phases: Identify risks, Protection, Detection, Response, and Recovery. Each icon is accompanied by a brief description of its function. The 'Identify risks' icon is an eye, 'Protection' is a shield, 'Detection' is a target, 'Response' is a refresh symbol, and 'Recovery' is a circular arrow. At the bottom left, there is a small copyright notice 'IBM Power Security ©2025'. At the bottom right, it says 'On-Prem and PowerVS - Delivered by IBM and Partner'.

IBM Power Cyber Vault

A unified cyber resilient solution to detect evolving cyber threats, respond with quick recovery and meet predictable RPO and RTO requirements

- Identify risks**
Know your assets and risks – gathering intelligence is the first step with a personalized workshop
- Protection**
Schedule and store immutable cyber vault backups or snapshots to protect workloads against cyber corruption and encryption
- Detection**
Spot threats fast to respond quickly from threats detected on servers, storage, or from SIEM notifications
- Response**
Every Minute Counts: Use cyber vault clean room automated technology for testing and recovery to meet return to operations requirements
- Recovery**

IBM Power Security ©2025

On-Prem and PowerVS - Delivered by IBM and Partner

IBM Power Cyber Vault: Protect and Detect Flow

Protect

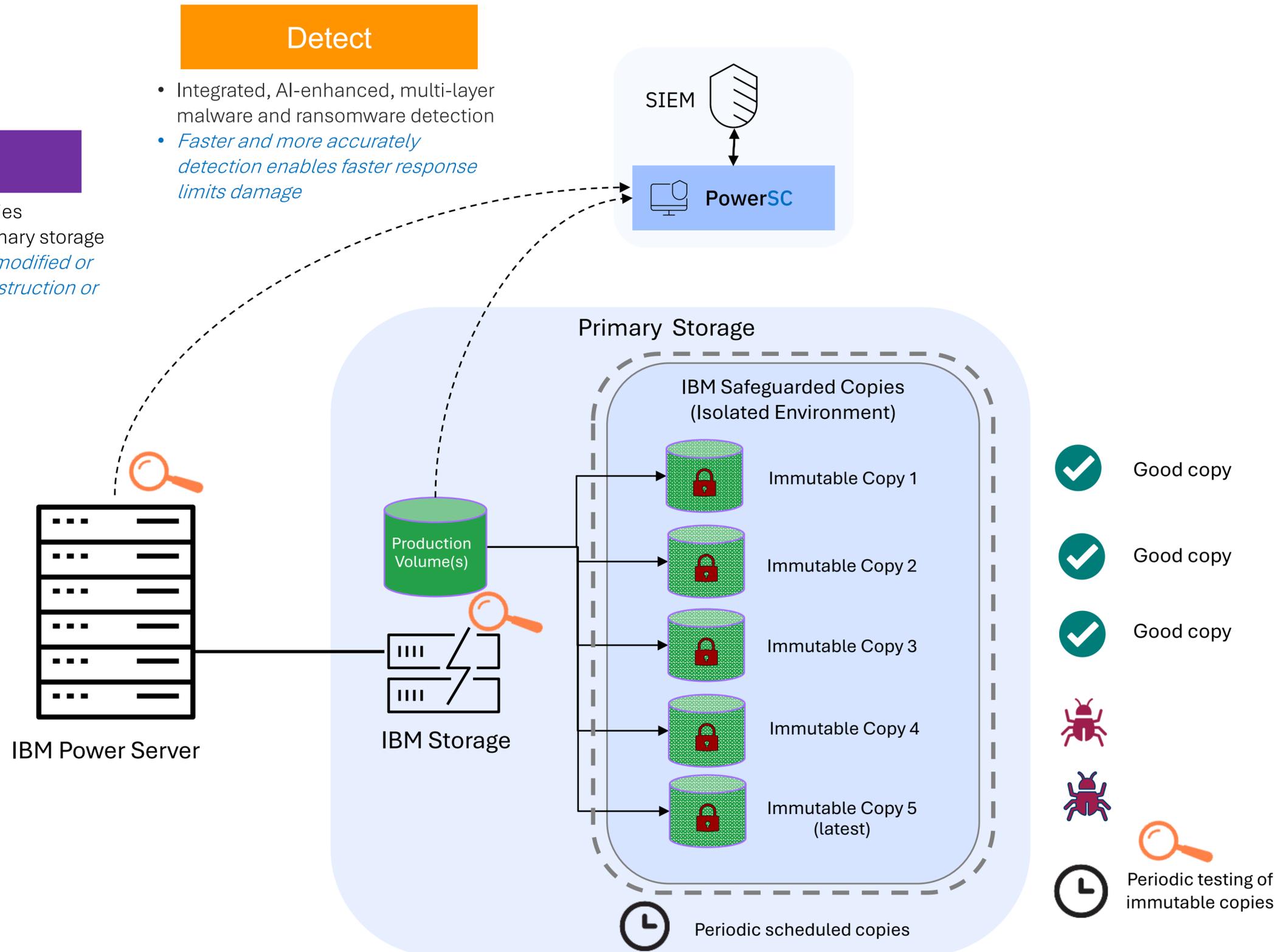
Detect

Protect

- Periodic, immutable copies (snapshots) saved in primary storage
- *Protect data from being modified or deleted due to errors, destruction or ransomware*

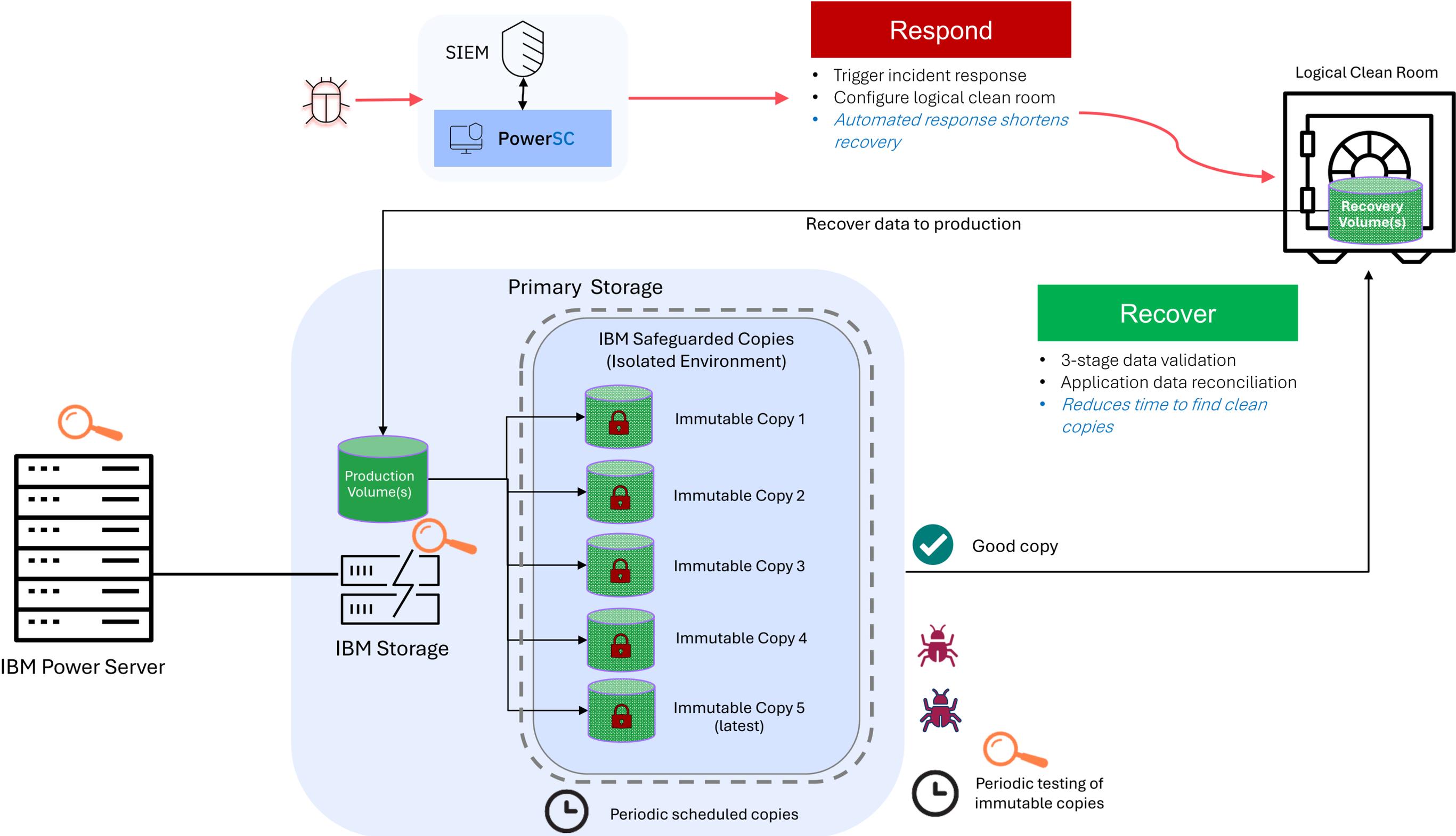
Detect

- Integrated, AI-enhanced, multi-layer malware and ransomware detection
- *Faster and more accurately detection enables faster response limits damage*



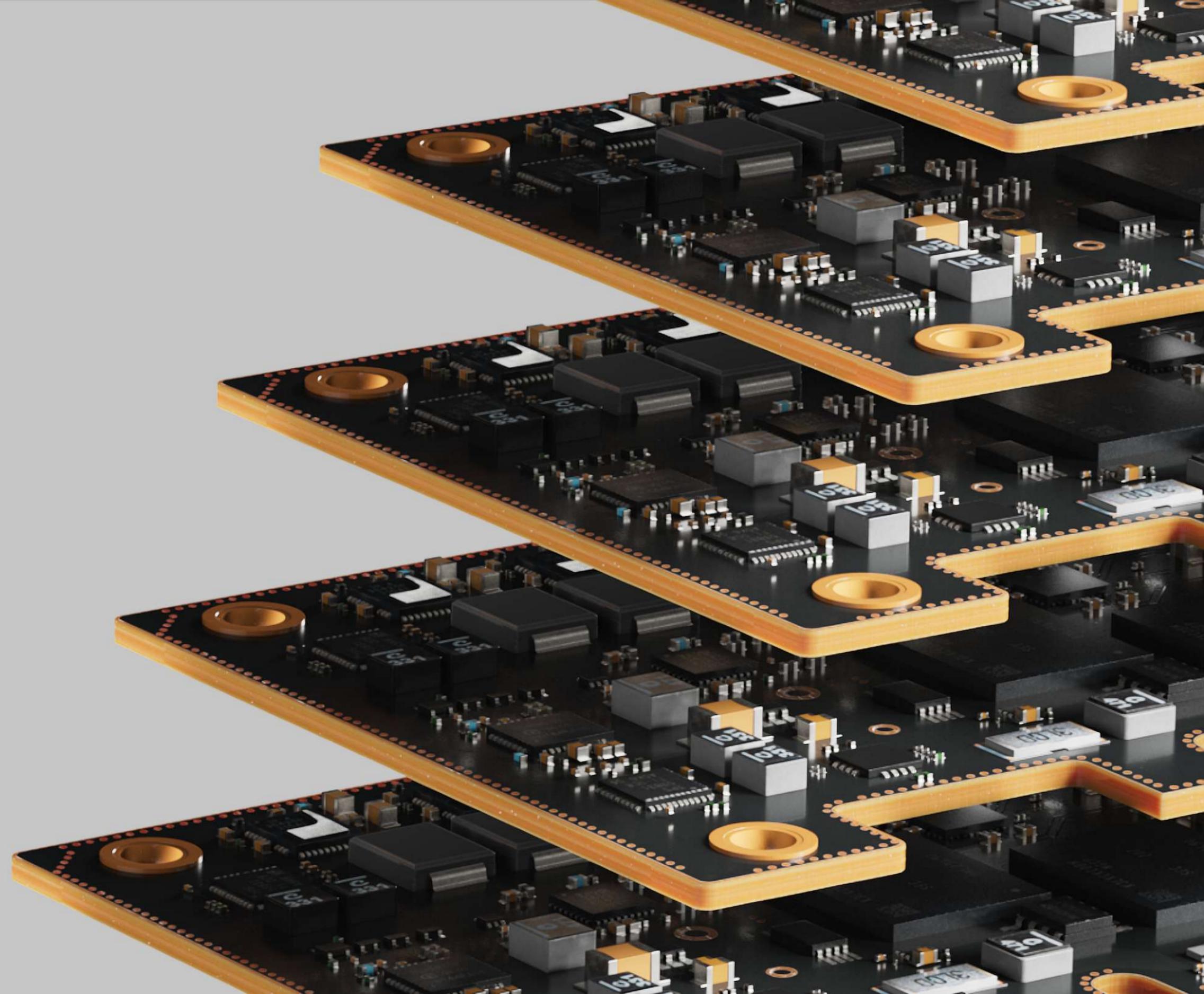
IBM Power Cyber Vault: Respond and Recover flow

Respond
Recover



Introducing
IBM Spyre™
for Power...

Turnkey AI
for enterprise
workflows.

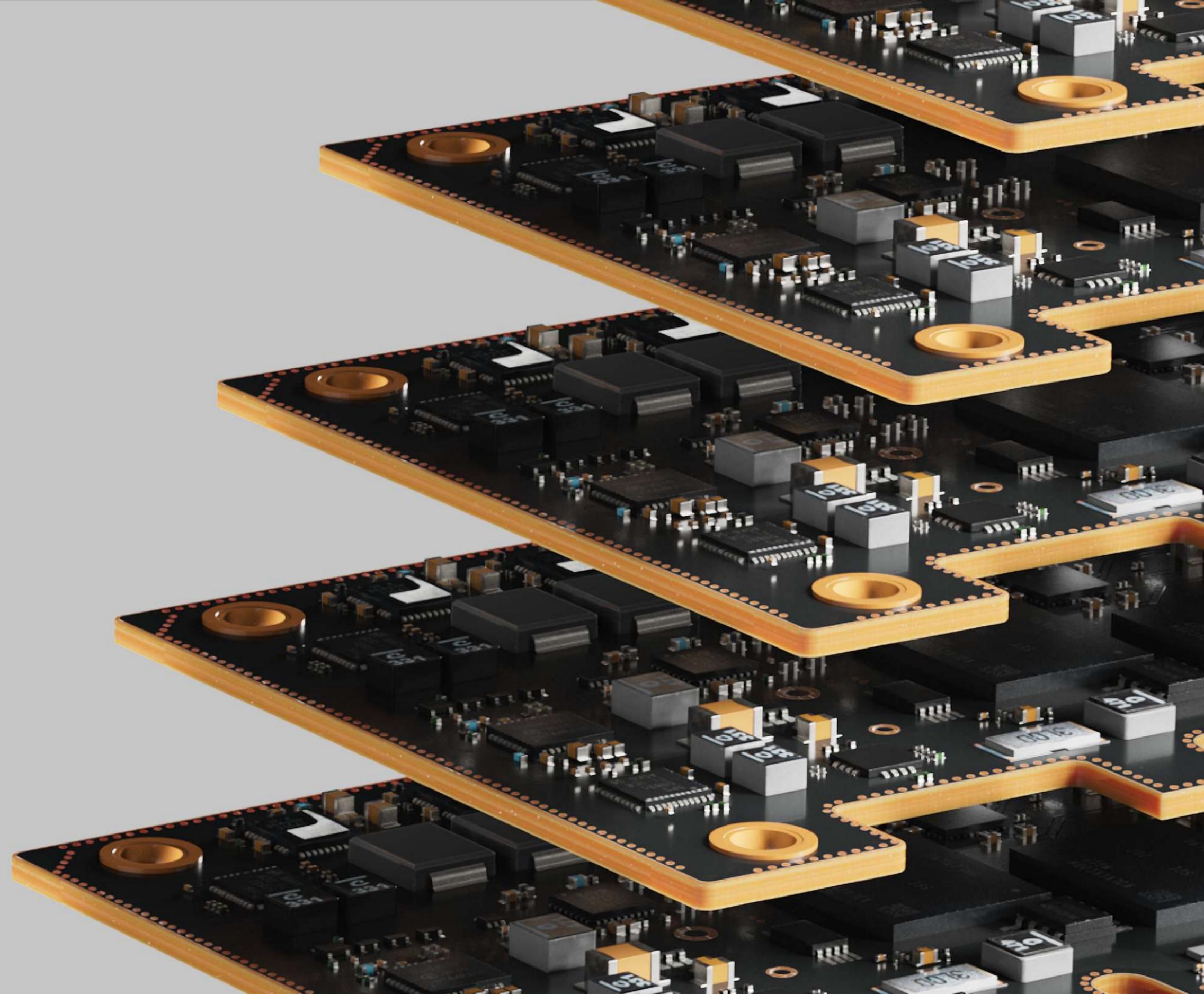


Designed to handle
generative AI use cases

8 cards in I/O drawer
form a logical cluster

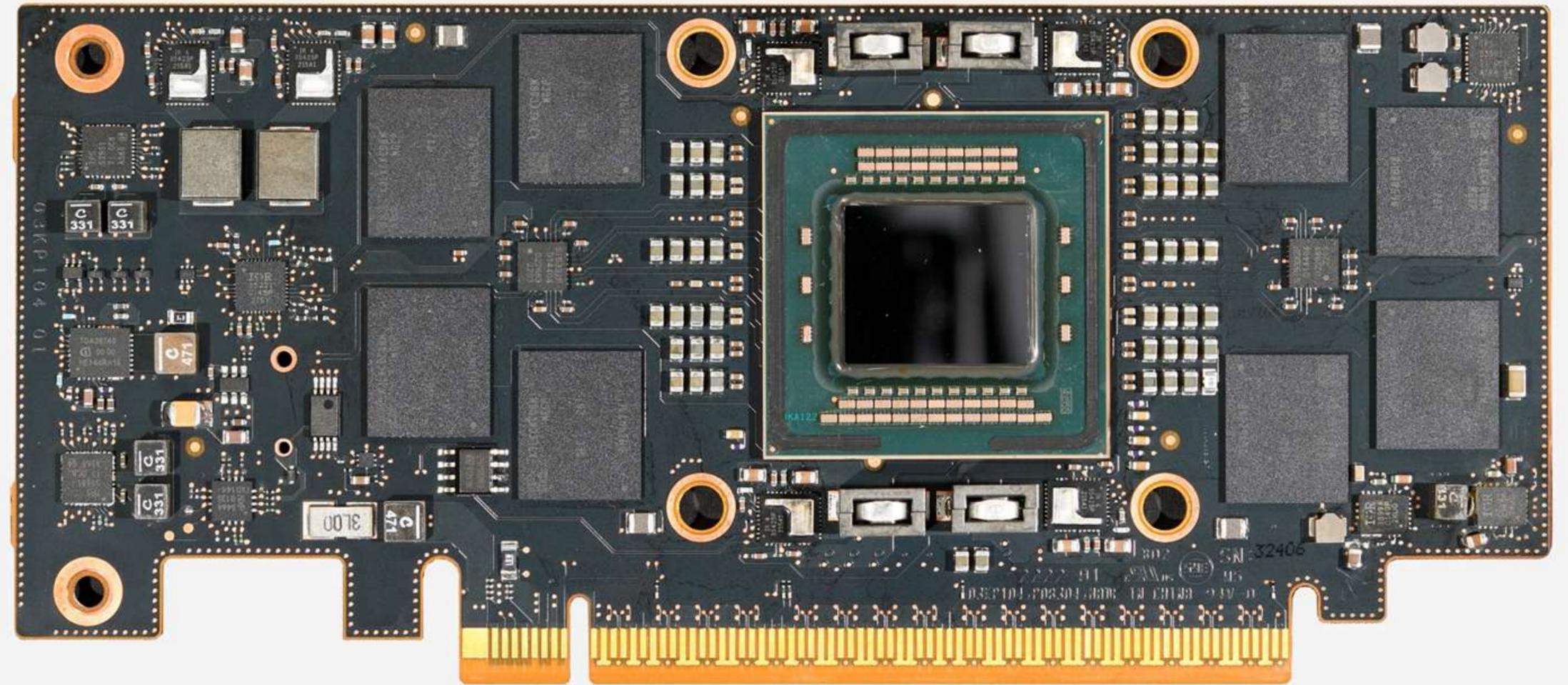
1TB of memory

1.6TB per second
aggregate memory
bandwidth



IBM Spyre™ Accelerator PCIe attached card

- 300+ TOPS
- 75W PCIe gen5 x16 adapter
- 128GB of LPDDR5 memory

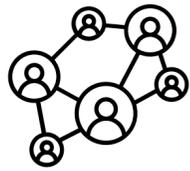


Turnkey AI

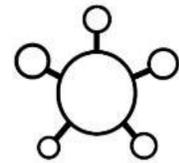
for enterprises
with IBM Spyre™ for Power

1B

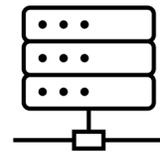
*new applications are expected by 2028¹
...and enterprises are drowning in complexity*



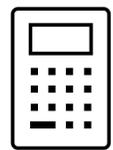
Silos



Data



Outages



*Cost
Optimizations*



*Skills
Shortages*

...which makes keeping critical systems continually running a near impossible task...

...and these challenges will only intensify as enterprises strive to remain competitive in the AI era

Highly resilient organizations will achieve business success in the AI era

yet

70%

of business leaders say their tech architecture creates confusion, conflict and disagreement

65%

of business leaders say their tech architecture is critical to how they use IT to improve business performance

and

92%

of executives agree that their organization's workflows will be digitized and will leverage AI-enabled automation by 2025

Nearly all enterprise pilots are stuck at the starting line

with only...

5%

...see ROI from AI.

The time for scaling AI is now
but enterprises face **obstacles**.



TOP 3 OBSTACLES



Data & integration complexity



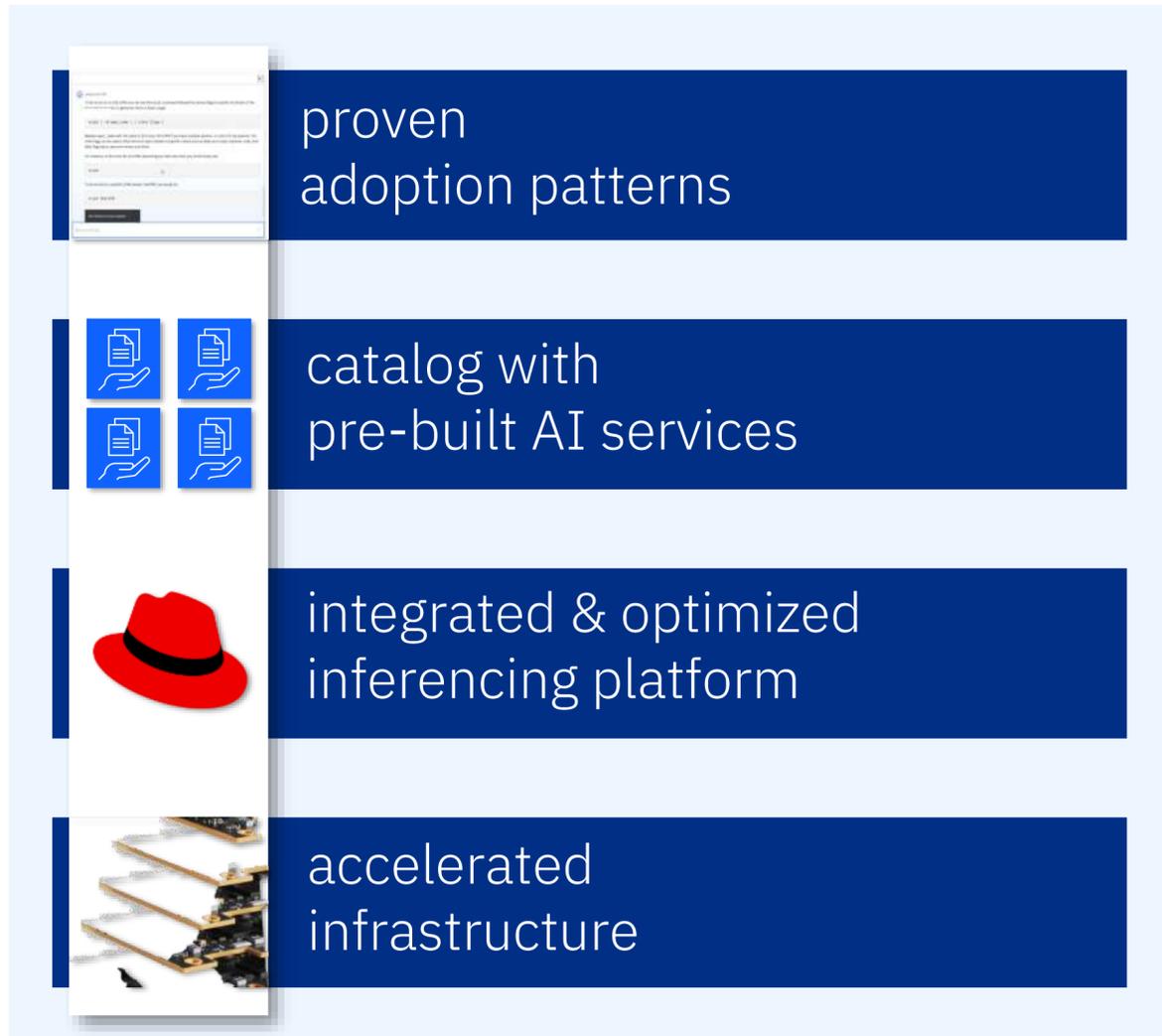
Skills



Security & compliance

IBM Spyre™ for Power

Turnkey AI for enterprise workloads.



-  proven adoption patterns
-  catalog with pre-built AI services
-  integrated & optimized inferencing platform
-  accelerated infrastructure

1 click

...to install AI services from the IBM-supported catalog.¹

1 configuration

...to move AI services of the IBM-supported catalog between IBM Power & IBM Power Virtual Server.²

> 8 million/hour

...document embeddings for knowledge base integration using IBM Spyre™ Accelerator for Power with batch and prompt sizes of 128.³

Disclaimer: 1: AI services of the IBM-supported catalog are delivered as one or a set of containers that can be deployed with a single deployment command. The provided UI for the catalog executes such commands in the backend based on a single click within the UI page of the respective AI service. 2: A single configuration is enabled by exposed industry standard APIs to decouple services at the top and the backing inferencing service for all AI services that are part of the IBM-supported catalog. Any service that requires AI inferencing capabilities can connect inferencing services that provide OpenAI API or watsonx.ai API compliant inferencing endpoints (Spyre endpoint, RH AI Inferencing Server, IBM Cloud, OpenAI, Azure, AWS, GCP, ...). Services can run either on IBM Power or on IBM Power Virtual Server. 3: Based upon internal testing running 1M unit data set with prompt size 128, batch size 128 using 1-card container. Individual results may vary based on workload size, use of storage subsystems and other conditions.

Enterprise use cases

IT Ops Development	Enterprise Resource Planning	Banking and Finance	Healthcare	Insurance	Public	Other
Code Assistant	Detect & Fix Agent	Forecast & Plan Capacity Assistant	IT Service Desk Assistant			

Adoption patterns

Data & Content Management	Deep Process Integration	Digital Assistant	Forecasting	Fraud Detection	Image & Video Analytics	Recommender System
---------------------------	--------------------------	-------------------	-------------	-----------------	-------------------------	--------------------

Pre-built AI services

Digitize Documents	Extract & Tag Information	Generate Reports	Knowledge Management	NLP to SQL	Q&A	Serve Models	Similarity Search
Transcribe	Translate & Summarize						

Install services

Support Agent



watsonx 8:57 PM

Hi, I'm your IT Support Assista

Type something...

EDSVÄRD

*“By integrating our digital assistant, Charlie, with IBM Spyre for Power, we’ll be delivering a **truly plug-and-play AI solution** integrated with proprietary data on the IBM Power platform that maintains strict data compliance and, ultimately, accelerates our business forward.”*

– Alexander Edsvärd, CEO, Edsvärd Hållbarhet AB

*“With IBM Spyre for Power, we can host our digital AI assistant locally in Sweden. This enables us to serve a wide range of clients, including the ones who demand the highest **data protection standards and compliance with European and national regulations.**”*

– Lars Nylund, CEO, BanFast Förvaltning AB



Disclaimer: BanFast is a real estates company and a client of Edsvärd, using their digital AI assistant Charlie. Edsvärd and BanFast have tested IBM Spyre™ for Power as part of a Tech Preview program. Edsvärd uses the OpenAI API standard to connect their digital assistant Charlie to AI inferencing services. The IBM Spyre™ for Power endpoint also provides OpenAI APIs (via Red Hat AI Inferencing Server). The IBM Spyre™ for Power stack allowed Edsvärd to move to IBM Spyre™ for Power in a plug-and-play fashion. Strict data compliance covers protecting sensitive information, such as personal data and credit card information, from unauthorized access or data breaches according to the most common data compliance regulations and standards such as HIPAA, GDPR, and CCPA and is achieved through an on-premises deployment in a protected IBM Power environment. The IBM Spyre™ for Power stack does not require additional networks to be setup that potentially increase attack vectors because all IBM Spyre™ for Power Accelerators are connected through PCIe cables (and not via network), ensuring protection against network attacks.

Digital assistants

being validating in IBM Spyre™ for Power Tech Preview program.

Cross-industry

ITOps | Development

- System house DACH
- IT service desk assistant
- Code assistants (RPG, Ansible, ...)
- Detect & fix incidents agent
- Forecast & plan capacity assistant

Enterprise Resource Planning

- BI & HR assistant
- Supply chain forecasting
- Order processing assistant
- Product sales assistant

Industry-specific

Banking & Finance

- Analyst assistant (frauds, NPAs, ...)
- Predict NPAs
- Open account agent
- Anti-money laundering

Healthcare

- Medical assistant
- Medical transcription assistant
- Claims & EHR matching agent
- Medical image analysis assistant

Insurance

- Claims & policy management agent
- Predict risk & underwrite assistant

Public

- Gov. client DACH
- Private documents assistant
- 360-degree view assistant

...and more

- SEMICON INDIA
- Agriculture assistant
- BanFast
- Real estate assistant

proven Adoption patterns

- Digital assistant (RAG, ...)
- Data & content management
- Recommender system
- Deep process integration
- Fraud detection
- Forecasting
- Image & video analytics

pre-built AI services

- Manage knowledge (VectorDBs)
- Serve models
- Digitalize documents (manual, invoice,...)
- Find similar items
- Q&A
- Translate & summarize
- Generate reports
- Extract & tag information (PII, meta data, ...)
- Transcribe (meetings, phone calls, ...)
- NLP to SQL (Db2, Oracle, SAP HANA, ...)

Deep process integrations

being validating in IBM Spyre™ for Power Tech Preview program.

Cross-industry

ITOps | Development

- IT service desk assistant
- Code assistants (RPG, Ansible, ...)
- Detect & fix incidents agent
- Forecast & plan capacity assistant

Enterprise Resource Planning

- BI & HR assistant
- Supply chain forecasting
- Order processing assistant** (Global Logistics)
- Product sales assistant

Industry-specific

Banking & Finance

- Analyst assistant (frauds, NPAs, ...)
- Predict NPAs
- Open account agent** (CREST)
- Anti-money laundering

Healthcare

- Medical assistant
- Medical transcription assistant
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Public

- Private documents assistant
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...and more

- Agriculture assistant
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proven Adoption patterns

- Digital assistant (RAG, ...)
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- Transcribe (meetings, phone calls, ...)
- NLP to SQL (Db2, Oracle, SAP HANA, ...)

Real-life example:
Extract ordering
details in the order
process automatically

Hans Geis, a logistics provider
running their core ERP system
on IBM i, integrates AI for a...

*“5x increase in business
process rate with AI
integration into existing
enterprise workflows.”*

– Uwe Rempel, head of ZSI department, Geis Group¹

Disclaimer: 1: “We achieve a 5x increase in business process rate with AI integration into our existing processes on IBM Power leveraging on-chip accelerator (MMA and SIMD) technology.” - Uwe Rempel, head of ZSI department, Geis Group. Measured in staging system of Hans Geis. Without AI it takes a senior employee 2 minutes / mail = 120 seconds / mail; with AI, they can completely automate 80% with 0 minutes processing time: (80%*0 minutes+20%* 2 minutes) / mail = 24 seconds / mail; leading to a factor of 5x: 120/24 = 5.



Global Logistics

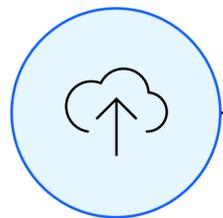
- 190 branches
- 13 countries
- 8k+ employees



Simplify AI on-boarding

by moving between cloud & on-premises seamlessly.

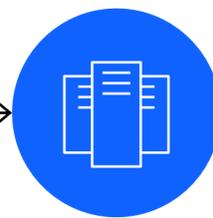
Explore.



minutes
change one configuration

Explore cloud-based AI services
IBM Cloud, AWS, Azure, GCP, OpenAI, ...

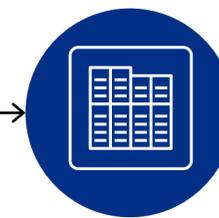
Test.



minutes
change one configuration
(when Spyre™ infrastructure is available)

Co-locate AI services with system of records
IBM Power on-chip acceleration

Launch.



Promote to production
IBM Power11
+ IBM Spyre™ for Power

Document Library

Templates

Recent Documents

My Favourites

Current Edits

More

Folders

- > Energy Company
- > Ministry of Innovation
 - > 01. Contracts and Agreeme...
 - > 02. Research Papers
 - > Test Site

← → ▾ > Ministry of Innovation > 02. Research Papers

Search Files and Folders

+ New Document ▾ + New Folder ▾

<input type="checkbox"/>	Name ↑	Title	Version	Status	Modified By	Modified Time
<input type="checkbox"/>	resume_sample_student8e...	Sample resume - student	1.0		Hemant Prasad	in a few seconds
<input type="checkbox"/>	Resume-Sample-ICT.pdf	Sample Resume Informal	1.0		Hemant Prasad	a minute ago
<input type="checkbox"/>	Example-CV-and-Covering...		1.0		Hemant Prasad	3 minutes ago
<input type="checkbox"/>	Record-Management-2-1-v...		1.0		Hemant Prasad	24 minutes ago
<input type="checkbox"/>	Digital Records and Legal A...		1.0		Hemant Prasad	7 hours ago
<input type="checkbox"/>	Digital Records and Legal A...	Electronic Records and L	1.0		Hemant Prasad	7 hours ago
<input type="checkbox"/>	Indiana Rules of Evidence.d...	Indiana Rules of Evidenc	1.0		Hemant Prasad	7 hours ago
<input type="checkbox"/>	05d - Internal Audit Report...		1.0		Hemant Prasad	7 hours ago
<input type="checkbox"/>	9.03_SELF-AUTHENTICATI...		1.0		Hemant Prasad	7 hours ago
<input type="checkbox"/>	model_erec_policy_state_2...	Sample Electronic Recorc	1.0		Hemant Prasad	7 hours ago

*“Personally Identifiable Information (PII) redaction helps to **protect against data breach & ransom scenarios**, which can cause fines on banks, insurance and other customer facing organizations, leading to loss of trust and reputation.*

*We are planning to leverage IBM Spyre for Power for PII redaction, which we believe will decrease the amount of manual work by an organization, improving their ability to **onboard customers faster and more efficiently.**”*

– Hemant Prasad, Chief Executive Officer, Crest Infosolutions



Deep process integrations

being validating in IBM Spyre™ for Power Tech Preview program.

Cross-industry

ITOps | Development

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...and more

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- Real estate assistant

proven Adoption patterns

- Digital assistant (RAG, ...)
- Data & content management
- Recommender system
- Deep process integration**
- Fraud detection
- Forecasting
- Image & video analytics

pre-built AI services

- Manage knowledge (VectorDBs)
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- Translate & summarize
- Generate reports
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- Transcribe (meetings, phone calls, ...)
- NLP to SQL (Db2, Oracle, SAP HANA, ...)

Client examples & demos

aligned with core workloads; not restricted to Spyre™.

Cross-industry

ITOps | Development

 System house DACH IT service desk assistant	 MR WILLIAMS More Than A Convenience Store Distributor Code assistants (RPG, Ansible, ...)
 Detect & fix incidents agent	 Forecast & plan capacity assistant

Enterprise Resource Planning

 BI & HR assistant	 Large retailer US Supply chain forecasting
 Order processing assistant	 Large retailer US Product sales assistant

Industry-specific

Banking & Finance

 Demo TechXchange 2024 Analyst assistant (frauds, NPAs, ...)	 Infosys Finacle Predict NPAs
 Open account agent	 Anti-money laundering

Healthcare

 SHIBUYA BY PULSEN Medical assistant	 SiPH Medical transcription assistant
 Claims & EHR matching agent	 SiPH Medical image analysis assistant

Insurance

 Demo TechXchange 2025 Claims & policy management agent
 Predict risk & underwrite assistant

Public

 Gov. client DACH Private documents assistant
 360-degree view assistant

...and more

 SEMICON INDIA Agriculture assistant	 MIDRANGE
 BanFast Real estate assistant	

proven Adoption patterns

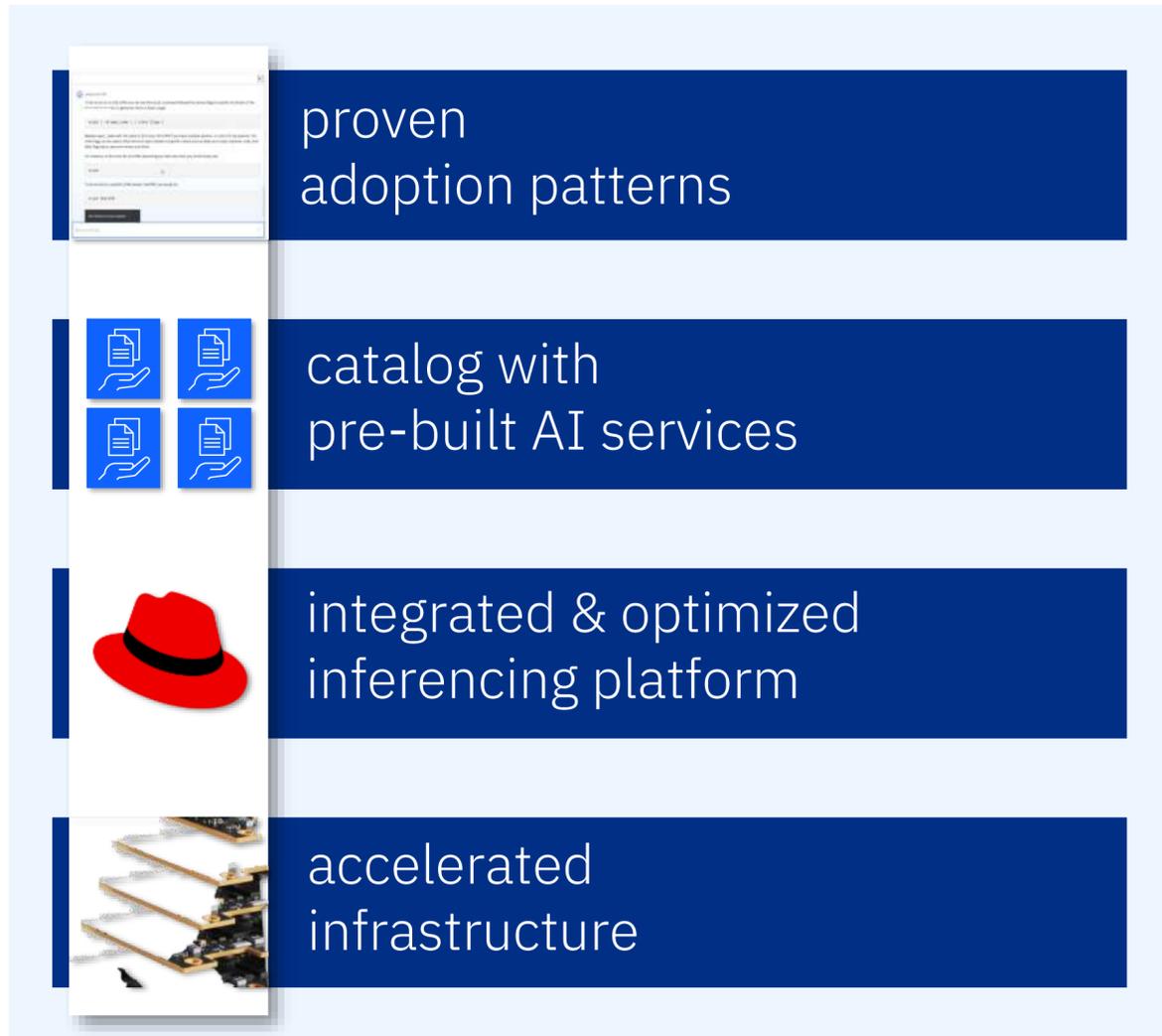
 Digital assistant (RAG, ...)	 Data & content management	 Recommender system	 Deep process integration	 Fraud detection	 Forecasting	 Image & video analytics	
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pre-built AI services

 Manage knowledge (VectorDBs)	 Serve models	 Digitalize documents (manual, invoice,...)	 Find similar items	 Q&A	 Translate & summarize	 Generate reports	 Extract & tag information (PII, meta data, ...)	 Transcribe (meetings, phone calls, ...)	 NLP to SQL (Db2, Oracle, SAP HANA, ...)	
--	-------------------------	--	-------------------------------	--------------------	--------------------------------------	-----------------------------	---	---	---	--

IBM Spyre™ for Power

Turnkey AI for enterprise workloads.



- proven adoption patterns
- catalog with pre-built AI services
- integrated & optimized inferencing platform
- accelerated infrastructure

1 click

...to install AI services from the IBM-supported catalog.¹

1 configuration

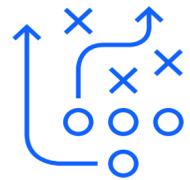
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> 8 million/hour

...document embeddings for knowledge base integration using IBM Spyre™ Accelerator for Power with batch and prompt sizes of 128.³

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Discover turnkey AI with IBM Spyre™ for Power.



INFORM YOURSELF

Explore AI on IBM Power yourself:

ibm.com/products/power/ai

30 minutes or less

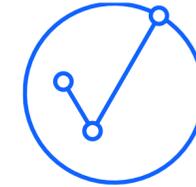


GET BRIEFED

Meet with an IBM AI expert for custom [demonstrations of IBM Spyre™](#).

Understand where AI can help boost productivity & drive growth [without long pilots](#).

2 – 4 hours



SEE VALUE

Run a [use case alignment workshop](#), try AI services for your use cases [at the same day](#), and plan the enterprise integration.

1 day

Deploy enterprise AI across critical processes

Scale AI across the enterprise

- Transform enterprise processes with simplified AI integration
- Boost productivity with assistants and agents
- Unlock enterprise data with data fabric and platforms

5x

Increase in business process rate with AI integration into existing enterprise workflows^a
Uwe Rempel, head of ZSI department, Geis Group

18x

Increase in developer productivity with AI-powered code assistant^b
Jasmine Kaczmarek, VP Technology, MR Williams

23%

lower TCO while meeting GenAI performance requirement vs competition^c
Martin Rydén, Head of Architecture & Projects, Shibuya

Ecosystem

Equitus.ai | Rocketgraph | Finacle | Wallaroo.AI

Assistants and Agents

watsonx Code Assistant for i¹

Data Fabric

watsonx.data² | IBM DataStage | IBM Knowledge Catalog

AI Foundation

Red Hat OpenShift AI³ | Python Ecosystem for IBM Power

Infrastructure

IBM Spyre Accelerator⁴ | IBM Concert

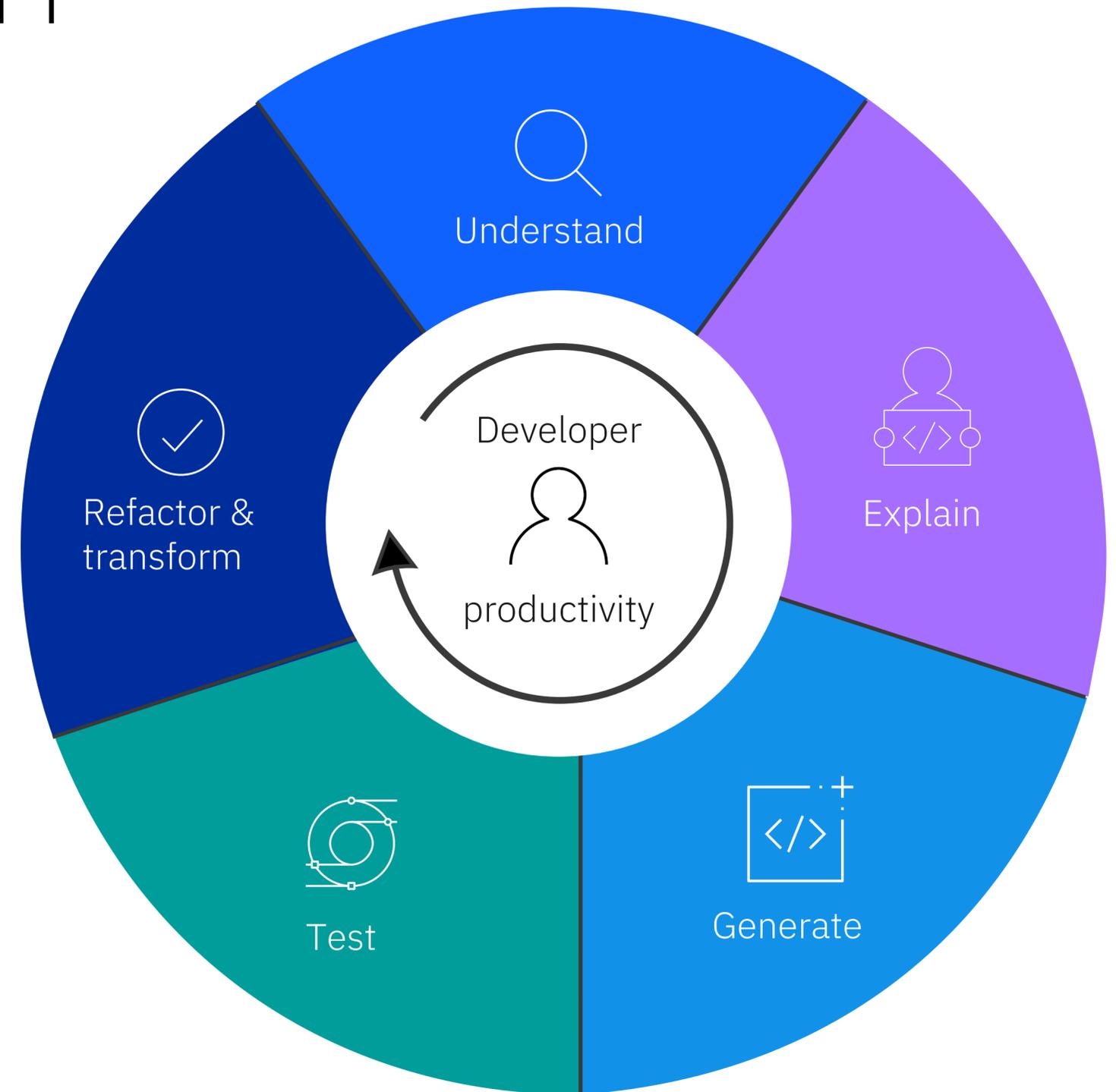
a. [Geis-group.eu](https://www.geis-group.eu), "We achieve a 5x faster business process throughput by integrating AI into our existing processes on IBM Power leveraging on-chip accelerator (MMA and SIMD) technology."* - Uwe Rempel, head of ZSI department, Geis Group *: Measured in staging system.
b. [MR Williams](#), "I only had 20 minutes to spare, and with the code assistant, I was able to investigate a report, trace how the field was populated, understand the calculation, and fix the issue. A senior developer had spent six hours on it the day before without finding a solution. It was super easy." Jasmine Kaczmarek, VP Technology, MR Williams
c. [Shibuya](#), "We've offered a Gen AI translation service responding in less than 6 seconds for prompts with up to 1,000 input tokens to our customers. On IBM Power10, we can offer this service at 23% lower TCO compared to a GPU-accelerated x86 environment. With IBM Power11, we will become even more competitive." - Martin Rydén, Head of Architecture & Projects, Shibuya

1. Public Preview
2. GA 4Q '25
3. Tech Preview, SoD GA (MMA) 4Q '25, GA (Spyre) 1Q'26
4. Tech Preview

IBM watsonx™ Code Assistant for i

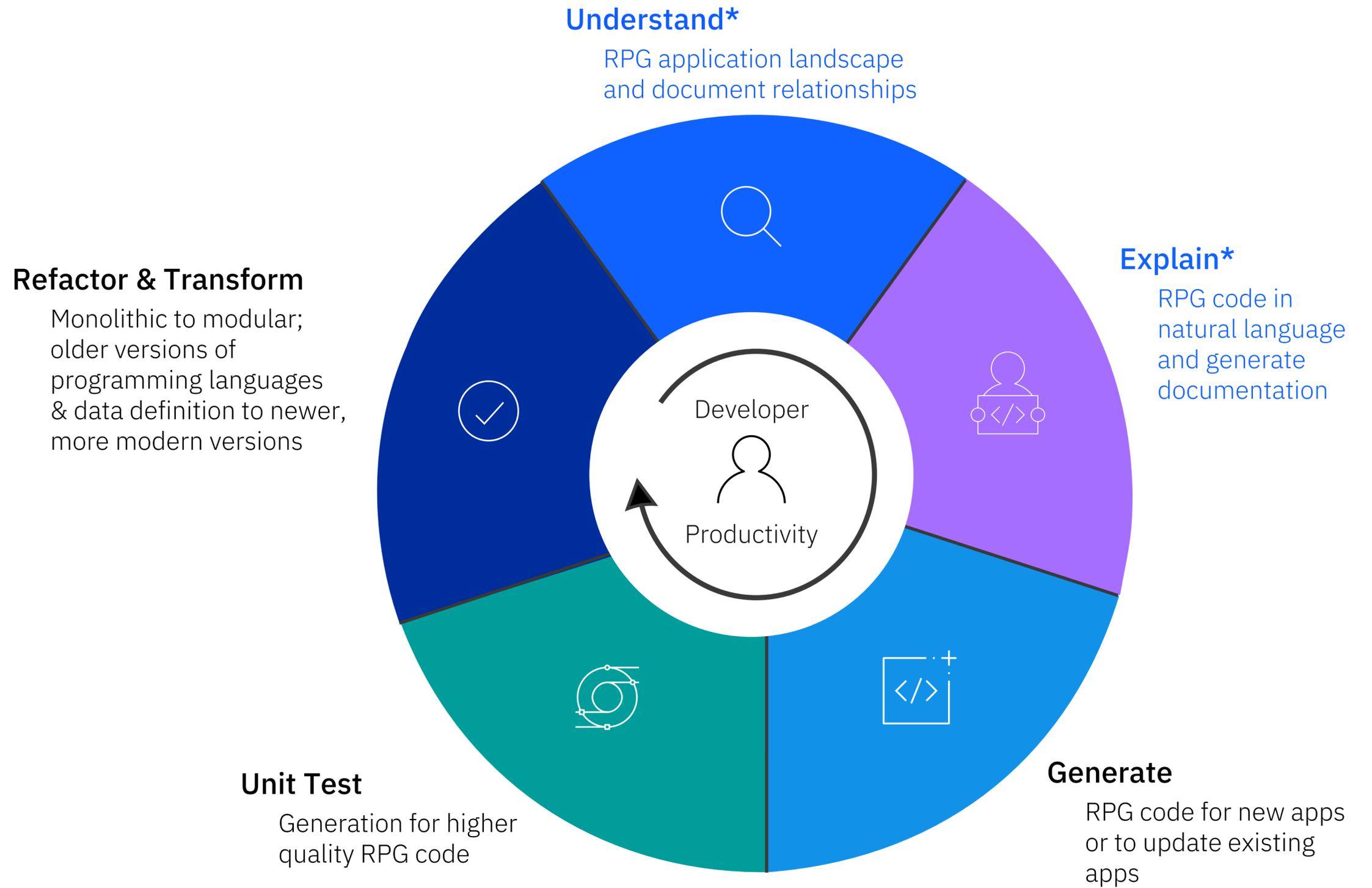
accelerating the developer journey for modernizing IBM i applications

- ✓ Increase productivity of new and experienced developers
- ✓ Improve code quality and maintainability
- ✓ Simplify and speed-up maintenance of older RPG programs
- ✓ Increase use of modern DevOps and programming techniques



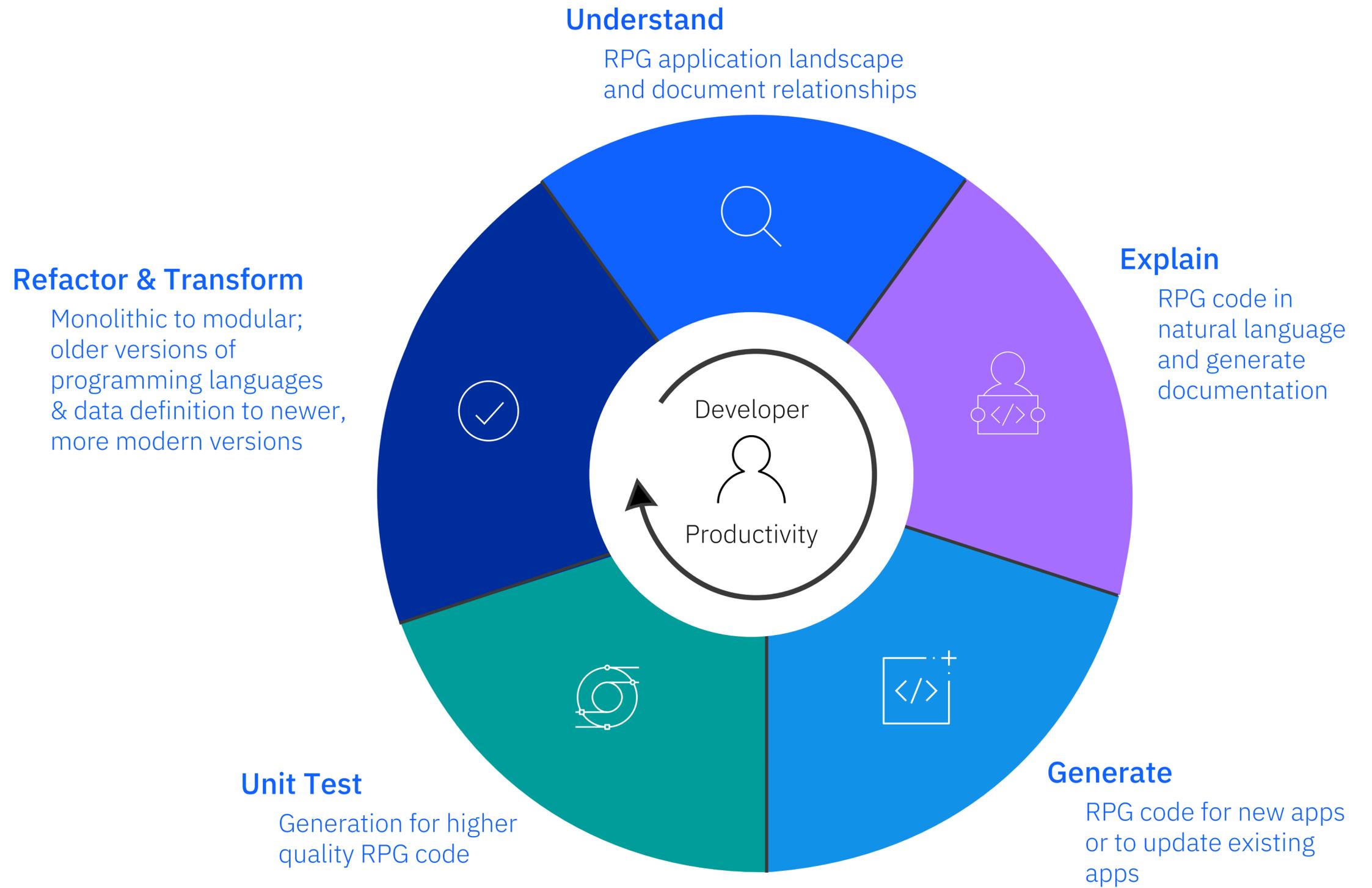
Generative AI-assisted RPG application lifecycle

Features & initial focus



*First release

Features & initial focus



Introducing

IBM Bob



The screenshot displays the IBM Bob interface for a Java modernization project. At the top, a progress bar titled "Modernization plan" shows three stages: "Analyze" (completed with a green checkmark), "Upgrade" (current stage with a blue circle), and "Validate" (pending with a grey circle). Below the progress bar, a "Getting started" section is expanded to show three sub-steps:

- 1.1 Prerequisite check**: This step checks for required tools and configurations. It lists two successful checks: "Workspace is a Java project" and "SDKMAN is installed". A blue "Check" button is located at the bottom of this section.
- 1.2 Analyze Java project**: This step involves analyzing the current state of the Java project. A text input field labeled "Project path:" contains the path "/Users/askowronski/Projects/Java-LLM-Sandbox". A blue "Analyze project" button is positioned below the input field.
- 1.3 Select Java modernization type**: This step prompts the user to select a modernization type. The first option, "Liberty Replatforming", is shown with a radio button and the description "Project is not using any application server".



[Click Bob to Return to Main Page](#)

Project Bob and IBM i



IBM i

Explain

1. [Explain a Simple RPG Application](#)
2. [Explain a 1980 era ERP Application complete with Diagrams](#)
3. [Impact Analysis Report for File Level Access and Change](#)

Refactor

1. [Refactor Variable Names to be Self Describing](#)
2. [Extract Procedures and Create Service Program](#)
3. [Remove Un-Used Variables](#)
4. [Convert O-Spec to Print File](#)

Transform

1. [RPGII to Modern Free Format ILE RPG with Readable Variable Names](#)
2. [RPG Fixed to Free Conversion](#)
3. [Database - Replace Record Level Access Database Access with Embedded SQL Access](#)
4. [Transform 2Digit year to Real Date Field](#)

Generate

1. [Generate Comments in Free Form RPG Program](#)
2. [Generate a brand new Vechile Management App – SQL, RPG, Python](#)
3. [Literate Mode for Code Completion in Line](#)
4. [Create Unit Testcases Leveraging RPGUNIT](#)

[Click to Launch Video](#)

EXPLORER



- IMI
- co/country
- dssrc
- OU200D.DSPF
- COU301D.DSPF
- COUNTR1.LF
- COUNTRY.PF
- qilesrvsrc
 - FCOUNTRY.ILESRVPGM
 - qrpglesrc

OUTLINE

TIMELINE

PROJECT EXPLORER



Show All Commands   P

Go to File  P

Toggle Terminal  

Start Debugging  F5

Open Settings  

Recent Tasks  85%



SEPTEMBER 8, 3:47 PM

clear previous tasks

18.9k 49.5k 49.5k 1.0k 0.10 63.7 kB

SEPTEMBER 8, 1:56 PM

refactor

@/qrpglesrc/CUS200.PGM.SQLRPGLE to ...

16.4k 94.9k 94.9k 6.1k 0.18 229 kB

SEPTEMBER 8, 1:50 PM

Provide a summary of the code in this workspace including an architecture ...

80.0k 538.4k 538.4k 11.0k 0.63 263 kB

View all tasks

Auto-approve:  

Type your task here... 

(@ to add context, / for commands, hold shift to drag in files/images) 

USER

SRC
OSSRC

> QPNLGRPSRC
> RPGSRC

> OUTLINE
> TIMELINE
> PROJECT EXPLORER
> SOURCE IMPACTS



- Show All Commands   
- Go to File  
- Find in Files   
- Open Settings  
- Toggle Terminal  

BOB

Recent Tasks 

78%



Auto-approve:   

Type your task here... 

(@ to add context, / for commands, hold shift to drag in files/images) 

Advanced premium  



- hnb
- p.json
- event
- s
- ssrc
- COU301D.DSPF
- Rules.mk
- SAMREF.PF
- qilesrvsrc
- qprotosrc
- qrpglesrc
- COU300.RPGLE
- COU301.RPGLE
- Rules.mk
- qsqsrc
- .env
- architecture.md
- iproj.json
- Rules.mk

- OUTLINE
- TIMELINE
- PROJECT EXPLORER
- country-manag...

- SOURCE IMPACTS
- COU300.MODULE...

```

1  *%METADATA
2  * %TEXT Functions Country
3  *%EMETADATA
4  h nomain
5
6  You, 16 hours ago | 1 author (You)
7  FCOUNTRY  if  e          k disk  usropn
8
9  /copy COUNTRY
10
11 You, 3 weeks ago | 1 author (You)
12 d chainCOUNTRY  pr
13 D P_COID          2A  value
14
15 D K_COID          S          LIKE(COID)
16
17 C   kf            klist
18 C          KFLD          K_COID
19
20 *-----*
21 PGetCountryName  B          export
22 DGetCountryName  PI         like(countr)
23 D P_COID          2A  value
24 /free
25   chainCOUNTRY(P_COID
26   | | | | );
27   return COUNTR;
28 /end-free
29 pGetCountryName  e
30 *-----*
31 PGetCountryIso3  B          export
32 DGetCountryIso3  PI         like(coiso)
33 D P_COID          2A  value
34 /free
35   chainCOUNTRY(P_COID
36   | | | | );
37   return COISO;
38 /end-free
39 pGetCountryIso3  e
40 *-----*

```

```

... Filter GitLens
2025-09-26 08:36:30.690 [info] [2025-09-26 12:36:30.186] Warning(/usr/bin/git -c core.quotePath=false
* branch lab/2-dds-ddl -> FETCH_HEAD
[2025-09-26 12:36:30.186] [GIT *689ms] [/Users/reinhard/Documents/git/techIBMi] git fetch origin
lab/2-dds-ddl [*689ms] (slow)
2025-09-26 08:36:36.865 [info] [2025-09-26 12:36:36.364] [GIT ] [/Users/reinhard/Documents/
git/techIBMi] git merge-base --fork-point lab/2-dds-ddl origin/lab/0-baseline • Command failed with
exit code 1 [31ms]
[2025-09-26 12:36:36.364] Git.exec
Error: Command failed with exit code 1
2025-09-26 08:37:43.570 [info] [2025-09-26 12:37:43.068] [GIT ] [/Users/reinhard/Documents/

```



- delete the branch lab-2-dds-ddl from both local and origin
A minute ago · 0.33
- push the lab/1-explain local branch to a new remote branch with the same name
43 minutes ago · 0.22
- /ibmi-convert-dds-ddl
2 hours ago · 0.18

[View all tasks](#)

```

COMMANDS
/ibmi-convert-dds-ddl
/ibmi-convert-fixed-free
/ibmi-convert-rpgle-sqlrpgle
This command convert IBM I's RPGLE code to Embedded SQL
/ibmi-explain-sql-erd
This command will use to create ER Diagram or Flow charts for Database Design of Db2 for i SQL
/ibmi-explain-sql
This command will give answer related to Db2 for i SQL Code Explanation, and instruction should be followed as given below.
/ibmi-explain
Use this command to explain a given ILE RPG, RPG3, RPG2 programming language code
/ibmi-generate-comment <selected-rpg-code-block>
Generate meaningful comments for ILE RPG code.
/ibmi-generate-sql-ddl
/ib

```





TBM i Comment Generator

command that automatically generates and enhances comments for RPG and SQLRPGLE source code on IBM i systems.

5 ## Overview

6
7 The `ibmi-generate-comment` command analyzes RPG source code and automatically generates meaningful comments to improve code documentation and readability. It helps developers understand legacy RPG code more quickly and maintains better documentation standards for new development.

9 ## Features

- 11 - Automatically identifies procedures, subroutines, and key logic blocks
- 12 - Generates descriptive comments based on code analysis
- 13 - Documents parameter lists and return values
- 14 - Identifies and explains complex calculations and business logic
- 15 - Maintains consistent comment formatting across the codebase
- 16 - Works with both traditional RPG and modern free-format RPG

18 ## Benefits

- 20 - Improves code maintainability
- 21 - Reduces onboarding time for new developers
- 22 - Enhances knowledge transfer for legacy applications
- 23 - Promotes consistent documentation standards
- 24 - Saves development time by automating documentation tasks

26 ## Usage

```
27 ```  
29 ibmi-generate-comment [selected-rpg-code-block]  
30 ```  
31 argument passed : <selected-rpg-code-block>
```



```
/ibmi-generate-comment adminfltm.rpgle:232-290
```

57 seconds ago · 0.07

```
/ibmi-generate-comment adminfltm.rpgle:292-308
```

2 minutes ago · 0.07

```
/ibmi-generate-comment adminfltm.rpgle:292-308
```

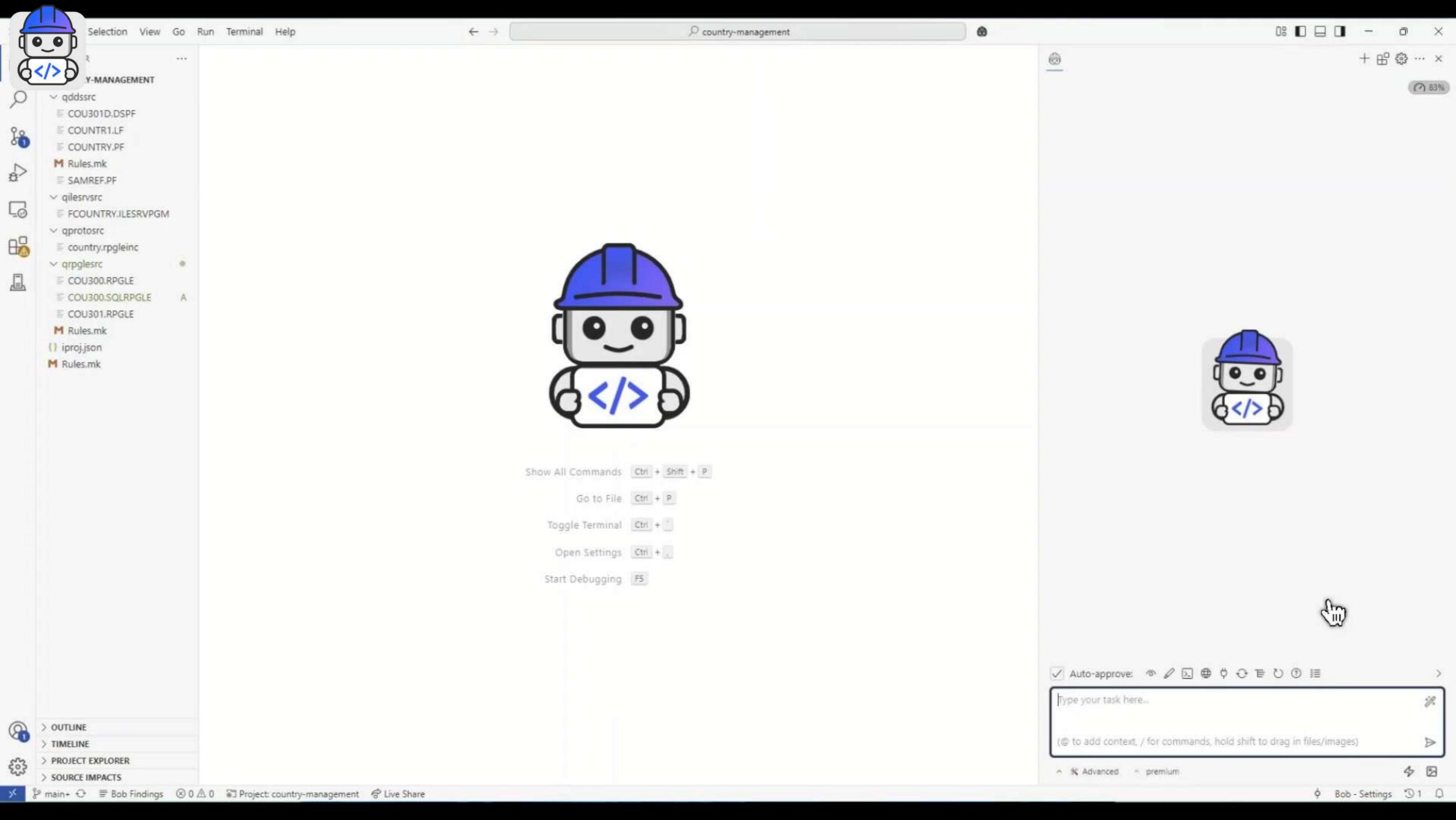
6 minutes ago · 0.05

[View all tasks](#)

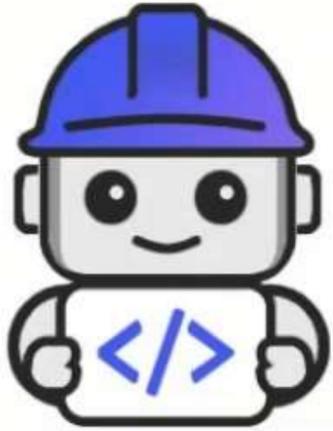
Auto-approve:   

Type your task here...





- country-management
- qddssrc
 - COU301D.DSPF
 - COUNTR1.LF
 - COUNTRY.PF
 - Rules.mk
 - SAMREF.PF
- qilesrvsrc
 - FCOUNTRY.ILESRVPGM
- qprotosrc
 - country.rpgleinc
- qrpglesrc
 - COU300.RPGL
 - COU300.SQLRPGL A
 - COU301.RPGL
 - Rules.mk
- iproj.json
- Rules.mk



- Show All Commands **Ctrl + Shift + P**
- Go to File **Ctrl + P**
- Toggle Terminal **Ctrl + `**
- Open Settings **Ctrl + ,**
- Start Debugging **F5**



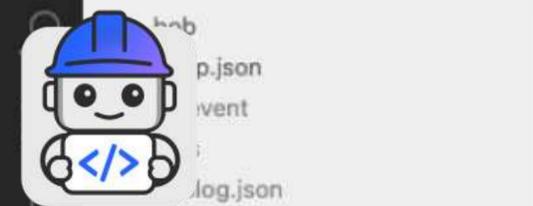
Auto-approve: [icons]

Type your task here...

(@ to add context, / for commands, hold shift to drag in files/images)

Advanced premium

- OUTLINE
- TIMELINE
- PROJECT EXPLORER
- SOURCE IMPACTS



File Explorer sidebar showing project files:

- p.json
- vent
- .log.json
- qrpglesrc_COU301_RPGLE.spif
- qddsrc
- COU301D.DSPF
- Rules.mk
- SAMREF.PF
- qilesrvsrc
- qprotosrc
- qrpglesrc
 - COU300.RPGLE
 - COU301.RPGLE
 - Rules.mk
- qsqsrc
- .env
- architecture.md
- iproj.json
- Rules.mk

```
1 1 **free
2 2 //%%METADATA
3 3 // %TEXT Functions Country
4 4 //%%EMETADATA
5 5 ctl-opt nomain;
6 6
7 7 dcl-f COUNTRY disk keyed usropn;
8 8
9 9 /copy COUNTRY
10 10
11 11 dcl-pr chainCOUNTRY;
12 12 | P_COID char(2) value;
13 13 end-pr;
14 14
15 15 //=====
16 16 // Get country name from country code
17 17 //=====
18 18 dcl-proc GetCountryName export;
19 19 | dcl-pi *n like(countr);
20 20 | P_COID char(2) value;
21 21 end-pi;
22 22
23 23 chainCOUNTRY(P_COID);
24 24 return COUNTR;
25 25 end-proc;
26 26
27 27 //=====
28 28 // Get IS03 code from country code
29 29 //=====
30 30 dcl-proc GetCountryIso3 export;
31 31 | dcl-pi *n like(coiso);
32 32 | P_COID char(2) value;
33 33 end-pi;
34 34
35 35 chainCOUNTRY(P_COID);
36 36 return COISO;
37 37 end-proc;
38 38
39 39 //=====
40 40 // Check if country code exists
41 41 //=====
```

Terminal output:

```
PROBLEMS 20 OUTPUT TERMINAL IBM I JOB LOG DEBUG CONSOLE PORTS BOB FINDINGS GITLENS IBM I
Running Action: makei build (1:02:07 PM)
Working directory: /home/reinhard/builds/country-management
Commands:
    makei build
> /QOpenSys/pkgs/bin/make -k BUILDVARSMKPATH="/tmp/tmprdzysuqa" -k BOB="/QOpenSys/pkgs/lib/bob" -f "/QOpenSys/pkgs/lib/bob/src/mk/Makefile" all
== Creating RPG module [COU301.RPGLE]
ctrtrpgmod module(REINHARD/COU301) srcstmf('/home/REINHARD/builds/country-management/qrpglesrc/COU301.RPGLE') AUT
() DBGVIEW(*ALL) OPTIMIZE() OPTION(*EVENTF) OUTPUT(*PRINT) TEXT('%TEXT Select a Country code') TGCCSID(*JOB) TG
TRLS() INCDIR('qprotosrc') DEFINE()
✓ COU301.MODULE was created successfully!

Objects:          0 failed 1 succeed 1 total
Build Completed!
```

Chat interface with a user named Bob:

Bob wants to read this file:
qrpglesrc/COU301.RPGLE

Now I can see the current content of the file. The issue is with line 10:

```
dcl-f cou301d workstn usage(*update) infds(INF0)
```

The `usage(*update)` parameter is incorrect. For a combined format file (CF in fixed format), the correct usage parameter should be `usage(*input:*output)`. Let me fix this.

Now I'll fix the invalid usage parameter for the cou301d file in COU301.RPGLE.

Checkpoint Current

Bob wants to edit this file:
qrpglesrc/COU301.RPGLE

Task Completed

I've successfully converted both RPG files to fully free format:

- For COU301.RPGLE:
 - Added `**free` directive
 - Converted H-spec to `ctl-opt` statement
 - Properly converted F-specs using modern keywords:
 - Used `keyed` keyword for database files
 - Used `usage(*input:*output)` for the combined format display file
 - Removed redundant specifications that are defaults in free format
 - Converted all D-specs to proper `dcl-ds`, `dcl-s`, and `dcl-c` statements
 - Maintained the program's logic and structure
- For COU300.RPGLE:
 - Updated the F-spec declaration from `if e k` to `keyed`
 - Removed redundant specifications that are defaults in free format

Both files now use proper free-format RPG syntax with modern keywords and conventions.

Auto-approve:

Start New Task

`/ibmi-convert-rpgle-sqlrpgle`



REFININGGROUP

- > Q36SRC
- > QDDSSRC
- > QSRC
- ① README.MD

- > OUTLINE
- > TIMELINE
- > PROJECT EXPLORER
- > SOURCE IMPACTS



- Show All Commands **Ctrl + Shift + P**
- Go to File **Ctrl + P**
- Start Debugging **F5**
- Open Settings **Ctrl + ,**
- Find in Files **Ctrl + Shift + F**



Auto-approve:

Type your task here...

(@ to add context, / for commands, hold shift to drag in files/images)

^ Architect ^ premium



DE-REFACTOR-...
LE1
input
CMFILE1.rpgle
output

CMFILE1.rpgle X
CMFILE1 > input > CMFILE1.rpgle > ...

```
1  **Free
2  // PROJECT NAME: CMFILE
3  // THE PURPOSE OF THIS PROJECT IS TO IMPLEMENT VARIOUS CHARACTER
4  // FUNCTIONS TO THE PROGRAM.
5  //-----Control options
6  Ctl-opt Option(*Nodebugio);
7  //-----File Declarations
8  Dcl-f CSCSTP  Disk      Usage(*Input);
9  Dcl-f CMPRT1  Printer Usage(*Output) Ofind(Endofpage);
10
11 //-----Constant declarations
12 Dcl-c Editp  '0( ) - ' ;
13 Dcl-c Editz  '(0'' - '' )';
14
15 Dcl-c Lowercase 'abcdefghijklmnopqrstuvwxyz';
16 Dcl-c Uppercase 'ABCDEFGHIJKLMNOPQRSTUVWXYZ';
17
18 //-----Data Structure declarations
19
20
21 //-----Standalone variable declarations
22 Dcl-s PHONE    ZONED(11:0);
23 Dcl-s MyDate   VarChar (8);
24 Dcl-s USERNO  CHAR (6);
25 Dcl-s RUFFN    CHAR (10);
26 Dcl-s RUFLN   CHAR (15);
27 Dcl-s RFFN     CHAR (1);
28 Dcl-s RFLN     CHAR (1);
29 Dcl-s NUMZIP   PACKED (9:0);
30
31 Dcl-s Endofpage Ind Inz(*On);
32
33 //-----Main Procedure
34 Read CSCSTP;
35 Dow Not %Eof;
36 ////////////////Convert name and charactes to correct case
37 RUFFN = %XLATE(Uppercase:Lowercase:CFNAME);
38 RUFLN = %XLATE(Uppercase:Lowercase:CLNAME);
39 RFFN = %XLATE(Lowercase:Lowercase:RUFFN);
40 RFLN = %XLATE(Lowercase:Lowercase:RUFLN);
41 USERNO = %Char(CUSTNO); //Convert Custno to a string
42
43 USERID = %Trim(RUFFN) + ',' + %Trim(RUFLN) + ',' + USERNO; //Define User ID
44
45
46 PASSWORD = %Trim(RFFN) + %Trim(RFLN) + USERNO + '!'; //Generate Password
47
48 ////////////////Generates a Name
49 NAME = %XLATE(Lowercase:Uppercase:RFFN) + %Trim(%Subst(RUFFN:2)) + ' '
50 + %XLATE(Lowercase:Uppercase:RFLN) + %Trim(%Subst(RUFLN:2));
```



Auto-approve:

Type your task here...

@ to add context, / for commands, hold shift to drag in files/images

Advanced premium



page (#Enter to co...

Commit

```

65 65 //=====
66 66 // Select a Country code
67 67 //=====
68 68 dcl-proc sltcountry export;
69 69   dcl-pi *n           like(coid);
70 70   paramCountryCode  like(coid);
71 71 end-pi;
72 72
73 73   dcl-s returnCountryCode  like(coid);
74 74   dcl-s processStep        char(3) inz(PREPARE_STEP);
75 75   dcl-s f8KeyPressed       ind;
76 76   dcl-s optionSelected     ind;
77 77   dcl-s savedRecordNumber  int(5);
78 78   dcl-s recordCounter      int(5);
79 79   dcl-s errorFound         ind;
80 80   dcl-s selectionMade      ind;
81 81   dcl-s searchByCode      like(coid);
82 82   dcl-s savedCode          like(coid);
83 83   dcl-s paramDesc          like(countr);
84 84   dcl-s searchByDesc       like(countr);
85 85   dcl-s savedDesc          like(countr);
86 86   dcl-s moreRecordsExist  ind;
87 87
88 88 // SQL cursor for countries ordered by code
89 89 exec sql
90 90   DECLARE C_COUNTRY_BY_CODE CURSOR FOR
91 91   SELECT COID, COUNTR
92 92   FROM COUNTRY
93 93   WHERE COID >= :searchByCode
94 94   ORDER BY COID
95 95   FOR READ ONLY;
96 96
97 97 // SQL cursor for countries ordered by description
98 98 exec sql
99 99   DECLARE C_COUNTRY_BY_DESC CURSOR FOR
100 100  SELECT COID, COUNTR
101 101  FROM COUNTRY
102 102  WHERE COUNTR >= :searchByDesc
103 103  ORDER BY COUNTR
104 104  FOR READ ONLY;
105 105
106 106 if not %open(cou301d);
107 107   open cou301d;

```

- > GRAPH
 - > GITLENS
 - BRANCHES (14)
 - > lab/6_modularize...
 - > lab
 - > 5-rename-vars 2 ...
 - Publish lab/5-rena...
 - Compare lab/5-ren...
 - > Use more descripti...
 - > Put the ...
 - > Convert the record ...
 - > Convert...
 - > made d...
 - > save ge...
 - > Fix .giti...
 - > Buildable by Better...
 - > Baseline ... You, 24 ...
- Over a week ago

PROBLEMS 18 OUTPUT TERMINAL IBM | JOB LOG DEBUG CONSOLE PORTS BOB FINDINGS ...

Working directory: /home/reinhard/builds/country-management
 Commands:
 make build

```

> /QOpenSys/pkgs/bin/make -k BUILDVARSMPKPATH="/tmp/tmpxv5dl55h" -k BOB="/QOpenSys/pkgs/lib/bob" -f "/QOpenSys/pkgs/lib/bob/src/mk/Makefile" all
== Creating SQLRPGLE module [COU301.SQLRPGLE]
crtsqlrpgi obj(REINHARD/COU301) srcstmf('/home/REINHARD/builds/country-management/qrpglesrc/COU301.S
QLRPGLE') COMMIT(*NONE) OBJTYPE(*MODULE) OPTION(*EVENTF) OUTPUT(*PRINT) TEXT('%TEXT Select a Countr
y code') TGTRLS() DBGVIEW(*SOURCE) RPGPOPT(*LVL2) COMPILEOPT('TGCCSID(*JOB) OPTIMIZE() INCDIR(''qp
rotosrc''))
✓ COU301.MODULE was created successfully!

```

Objects: 0 failed 1 succeed 1 total

zsh
 zsh techIBMI
 make build

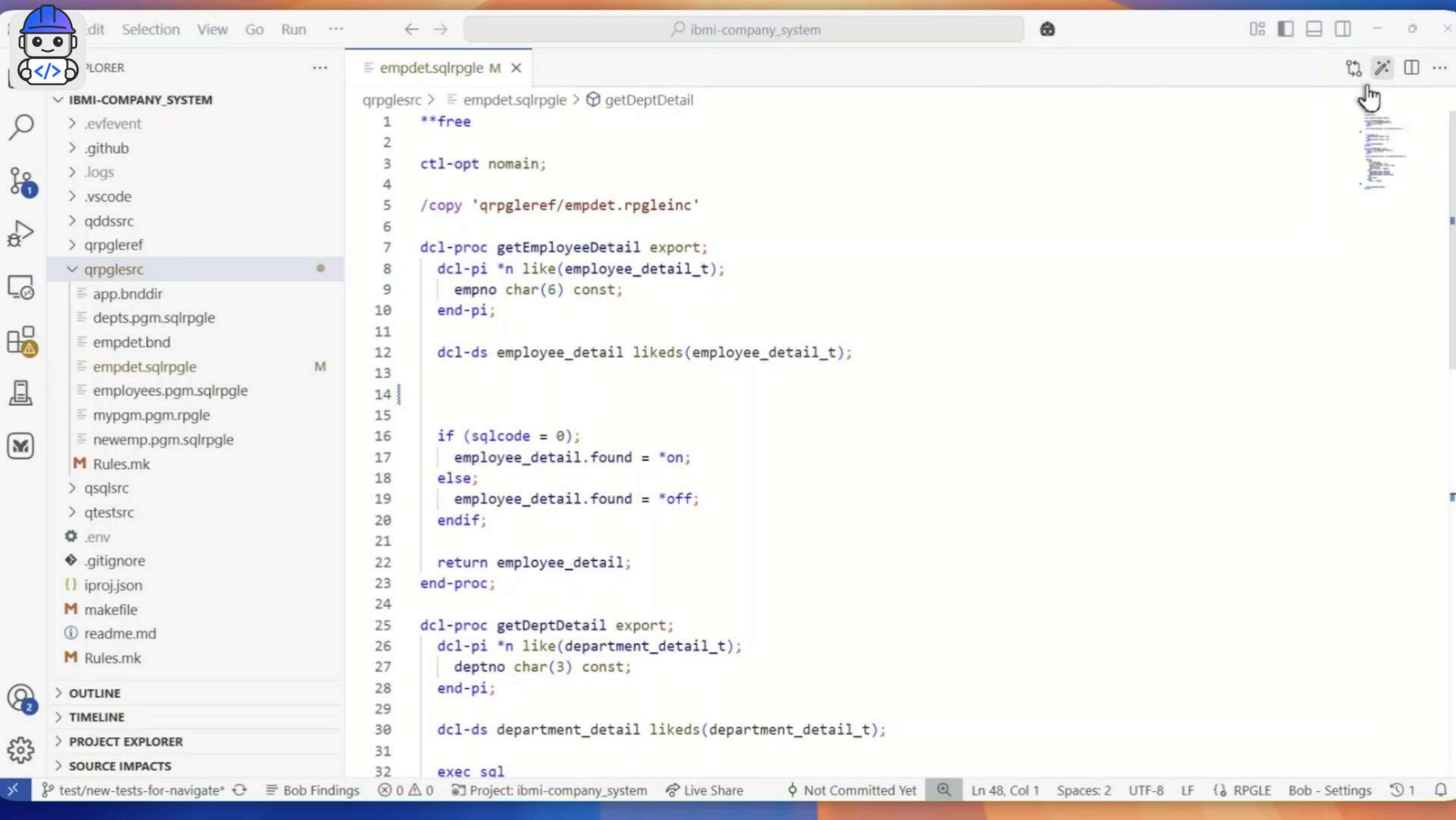


- Remove any unused variables, use the VS Code Diagnostics to identify them
Just now · 0.19
- Fix any issues in the following code from file path qrpglesrc/COU301.SQLRPGLE:182-182
...
2 hours ago · 0.38
- rename the branch lab/5-rename-vars to lab/6_modularize on both local and remote git
3 hours ago · 0.11

View all tasks

Auto-approve:

Type your task here...



PLORER ... empdet.sqlrpgle M X

- IBMI-COMPANY_SYSTEM
 - > .evfevent
 - > .github
 - > .logs
 - > .vscode
 - > qddsrc
 - > qrpgleref
 - ▼ qrpglesrc
 - ≡ app.bnmdir
 - ≡ depts.pgm.sqlrpgle
 - ≡ empdet.bnd
 - ≡ empdet.sqlrpgle M
 - ≡ employees.pgm.sqlrpgle
 - ≡ mypgm.pgm.rpgle
 - ≡ newemp.pgm.sqlrpgle
 - M Rules.mk
 - > qsqlsrc
 - > qtestsrc
 - .env
 - .gitignore
 - iproj.json
 - makefile
 - readme.md
 - Rules.mk
 - > OUTLINE
 - > TIMELINE
 - > PROJECT EXPLORER
 - > SOURCE IMPACTS

```

qrpglesrc > empdet.sqlrpgle > getDeptDetail
1  **free
2
3  ctl-opt nomain;
4
5  /copy 'qrpgleref/empdet.rpgleinc'
6
7  dcl-proc getEmployeeDetail export;
8  | dcl-pi *n like(employee_detail_t);
9  |   empno char(6) const;
10 | end-pi;
11
12 | dcl-ds employee_detail likeds(employee_detail_t);
13 |
14 |
15 |
16 | if (sqlcode = 0);
17 |   employee_detail.found = *on;
18 | else;
19 |   employee_detail.found = *off;
20 | endif;
21
22 | return employee_detail;
23 | end-proc;
24
25 | dcl-proc getDeptDetail export;
26 | dcl-pi *n like(department_detail_t);
27 |   deptno char(3) const;
28 | end-pi;
29
30 | dcl-ds department_detail likeds(department_detail_t);
31 |
32 | exec sql

```





p100s.rpg36

Ganepola, 4 months ago | 1 author (Sanjula Ganepola)

F*
H P064 B AP100S
F*

```

4 0007 F* PROMPTS TO SELECT THE A/P VOUCHER PROCESS
5 0008 FSCREEN CP F 512 WORKSTN
6 0010 E MSG 1 1 40
7 0013 ISCREEN NS 01 1 CS 2 C1
8 0014 I* FORMAT-AP100SRD
9 0015 I 3 8 SELECT
10 0023 I NS 09
11 0028 I UDS
12 0039 I*
13 I 129 134 KYCANC
14 I 170 175 SELECT
15 0040 I 509 510Y2KCEN 19
16 0041 I 511 512Y2KCMP 80
17 0042 C*****
18 0047 C SETOF 81 90
19 0048 C MOVEL*BLANKS MSG40 40
20 0049 C*
21 0050 C KG MOVEL 'CANCEL ' KYCANC 10
22 0051 C KG SETON LR
23 0052 C KG SETOF 0109 Sanjula Ganepola, 4 months ago * A
24 0053 C*
25 0054 C 09 EXSR ONETIM
26 0055 C*
27 C 01 EXSR S1
28 0057 C*****
29 0058 C***** * * * * *
30 0059 CSR ONETIM BEGSR ONETIM
31 0060 C*
32 0061 C*
33 C MOVEL*BLANKS SELECT
34 0081 C* SET UP DEFAULTS
35 0086 C SETON 81
36 0087 CSR ENDSR
37 0088 C***** * * * * *
38 0089 CSR S1 BEGSR S1
39 0090 C*
40 0136 C*
41 0137 C* VALIDATE SELECTION
42 0138 C SELECT COMP 'NORMAL ' 1010
43 0139 C 10SELECT COMP 'ARGLMS' 1010
44 0139 C 10SELECT COMP 'PAPER ' 1010
45 0139 C 10SELECT COMP 'FLEXI ' 1010
46 0141 C 10 SETON 819054
47 0142 C 10 MOVELMSG,1 MSG40
48 0143 C 10 GOTO ENDS1
49 0144 C*****
50 0158 CSR ENDS1 ENDSR ENDS1

```



Recent Tasks

40%



You are a senior System 36 RPG programmer, please explain the @/QSRC/ap100s.rpg36 program and explain how the RPG cycle will loop through the program and how different sets of input specs will be used....

12 minutes ago · 0.23

Explain the code in @/QSRC/ap100.rpg36 and how it interacts with the database and other programs. Explain the algorithm and show a diagram of the database access and record formats

50 minutes ago · 1.56

Explain the code in @/QSRC/ap100.rpg36 and how it interacts with the database and other programs. Explain the algorithm and show a diagram of the database access and record formats

21 hours ago · 0.33

[View all tasks](#)

Auto-approve:

Type your task here...

(@ to add context, / for commands, hold shift to drag in files/images)

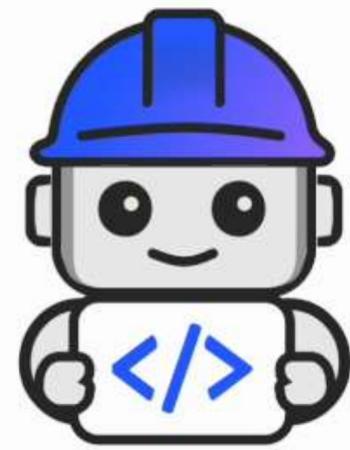
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ER
AR-LOT



- > OUTLINE
- > TIMELINE
- > PROJECT EXPLORER
- > SOURCE IMPACTS



- Show All Commands   P
- Go to File  P
- Toggle Terminal  
- Open Settings  
- Start Debugging  F5

BOB



66%



Auto-approve: 

Generate an ILE RPG application that will manage the inventory of cars at a used car lot. The SQL database should track the make, model, trim, odometer, condition, price acquired and price sold. A CRUD service program should manage the database. A business logic layer would be able to retrieve information like the profit on a car, the profit on all cars within a date range, the number of cars sold within a date range. These service programs should be unit tested with 100% code coverage using the RPGUNIT test framework. Do not duplicate functionality in this framework. Generate these unit tests in free form ILE RPG. A report program should generate a report that will summarize the number of cars sold and the profit earned by month for the last year. A green screen program for managing the inventory of cars and also a separate screen for reporting of the cars sold and profit for a time period, and also the list of cars not sold and the amount of cash tied up in inventory. A python program that will interface to the same business logic service programs but provide a browser interface to provide the same functions should be generated. Keep it very lean, no extra logging, no security, no over-architecting. Just enough files, programs, and display/printer screens to Select mode for interaction lock data.

Architect premium



- ULTECHSERVICES
- 3SRC
- PC003R.RPG
- PC004R.RPGLE
- APC005R.RPGLE
- APC006R.RPG
- APC007R.RPG
- APC060R.RPGLE
- APC060R1.RPG
- APC060R2.RPGLE
- APC061R.RPGLE
- APC061R1.RPG
- APC070R2.RPGLE
- APC071R.RPGLE
- APC071R1.RPGLE
- APC100R.RPG**
- APC101R.RPG
- APC119R.RPG
- APC120R.RPG
- APC120RP.RPGLE
- APC121R.RPG
- APC121R1.RPG
- APC121R3.RPGLE
- APC122R.RPG
- APC123R.RPG
- APC131R.RPG
- APC135D.DSPF
- APC135R.RPG
- APC136R.RPG
- APC140R.RPG
- APC150R.RPGLE
- APC151R.RPGLE
- APC151R1.RPGLE
- APC155R.RPGLE
- APC155R1.RPGLE
- APC160R.RPGLE
- APC161R.RPGLE
- APC161R1.RPGLE
- APC170R.RPGLE
- APC200R.RPGLE
- APC200RP.SQLRPGLE

```

RPGSRC > APC100R.RPG
248 20 JAK1 I I 'COM' 85 115 EML2X
249 249 C READ APCSUPSP 98
250 250 C *IN98 IFEQ *OFF
251 251 C MOVE LAPCOUT HDING
252 252 C RECH IFEQ 'H'
253 253 C Z-ADDTOTVH TOTL
254 254 C ENDF
255 255 C ELSE
256 256 C MOVE LHING APCOUT
257 257 C WRITE APCSUPSR
258 258 C ENDF
259 259 C *.
260 260 C ENDSR
261 261 C *.
262 262 C *.
-----
263 263 OAPC100RTE 106 HDR
264 264 0 'APC100RT'
265 265 0 73 'Coordinated Accounts Pa'
266 266 0 + 0 'yable File'
267 267 0 PAGE Z 132
268 268 0 128 'PAGE'
269 269 0 E 2 HDR
270 270 0 'Date:'
271 271 0 DTE + 1 ' / / '
272 272 0 STIM + 2 ' : '
273 273 0 AP + 0
274 274 0 73 'Vendor Supplier Send Fi'
275 275 0 + 0 'le Detail'
276 276 0 122 'User Id: '
277 277 0 WSID 132
278 278 0 E 1 HDR
279 279 0 10 'SUPPLIER'
280 280 0 121 'CLASS'
281 281 0 E 0 HDR
282 282 0 10 'NUMBER '
283 283 0 26 'SUPPLIER NAME'
284 284 0 59 'STREET ADDRESS'
285 285 0 81 'CITY'
286 286 0 103 'STATE'
287 287 0 108 'ZIP'
288 288 0 121 'CODE '
289 289 0 E 1 HDR
290 290 0 10 '_____'
291 291 0 26 '_____'
292 292 0 59 '_____'
293 293 0 81 '_____'
294 294 0 103 '_____'
295 295 0 108 '_____'
296 296 0 121 '_____'
297 297 0 E 1 DTL
298 298 0 AVVEND 10
299 299 0 AVVNAM + 3

```

Analyze current date handling in APC100R.RPG 0/11

Bob wants to read this file:
RPGSRC/APC100R.RPG

Now that I've examined the code, I can see that this is an RPG program (APC100R) that creates a supplier information file to be sent to Dana. Let me analyze the date handling in this code to understand what needs to be updated for Y2K compliance:

- Date handling in the code:
 - Lines 238-243: There's Y2K logic that checks if the year is less than 50, it assumes it's 20xx, otherwise 19xx
 - Line 239: Uses UDATE (which is a 6-digit date format MMDDYY)
 - Line 74-79: There's a date data structure with fields DCC (century), DYR (year), DT1, and DTE

The task requires me to:

- Convert the legacy code to ILE RPG fixed format
- Transform to free format RPG
- Implement robust date handling with RPG built-in date data types and functions

Let me create a todo list to track these steps.

Let me create a todo list to track our systematic approach to enhancing the date handling in this program.

- Todo List Created
- Analyze current date handling in APC100R.RPG
 - Convert legacy code to ILE RPG fixed format
 - Verify fixed format code functionality
 - Transform fixed format to modern free format RPG
 - Verify free format code functionality
 - Implement robust date handling with RPG built-in date types
 - Replace manual date calculations with RPG date/time BIFs
 - Implement %DATE, %TIME for system date/time retrieval
 - Ensure date comparisons and formatting use native date capabilities
 - Verify date ranges work correctly across century boundaries
 - Final testing and documentation

I'm working on it...

Auto-approve:

Cancel

Type a message...
(@ to add context, / for commands, hold shift to drag in files/images)

EXPLORER

ULTECHSERVICES

DSSRC

ME46FM.DSPF

.MEREQ.PF

AMFILEP.PF

AMIPDLFM.DSPF

AMIREQ.PF

AMISNI0D.DSPF

AMJREQ.PF

AMQREQ.PF

AMV18FM.DSPF

AMVWVC0D.DSPF

AMZREQ.PF

AP107P0.PF

AP107PL1.LF

AP1099.PF

AP1099D.DSPF

APAGING.PF

APC060RD.DSPF

APC061RD.DSPF

APC071RD.DSPF

APC100R.PRTF U

APC130D.DSPF

APC131D.DSPF

APC140RD.DSPF

APC150D.DSPF

APC151D.DSPF

APC155D.DSPF

APC160D.DSPF

APC161D.DSPF

APC200B.DSPF

APC200D.DSPF

APC250D.DSPF

APCCHKRP.PF

APCINVRP.PF

APCINVSP.PF

APCOPLT1.LF

APCOPLTP.PF

APCREGN1.LF

APCREGNP.PF

APCSUPRP.PF

```

QDDSSRC > APC100R.PRTF
1+  A* PRINTER FILE: APC100R - C00
2+  A* PURPOSE: MAIN REPORT FOR SU
3+  A*
4+  A          R HDR
5+          'APC100RT'
6+  A          73 'Coordinated Accounts Pa-'
7+  A          'yable File'
8+  A          PAGE Z 132
9+  A          128 'PAGE'
10+ A          R HDR2
11+ A          'Date:'
12+ A          DTE   9' / / '
13+ A          STIM 14' : '
14+ A          AMPM 16
15+ A          73 'Vendor Supplier Send Fi-'
16+ A          'le Detail'
17+ A          122 'User Id: '
18+ A          WSID 132
19+ A          R HDRTITLE1
20+ A          10 'SUPPLIER'
21+ A          121 'CLASS'
22+ A          R HDRTITLE2
23+ A          10 'NUMBER '
24+ A          26 'SUPPLIER NAME'
25+ A          59 'STREET ADDRESS'
26+ A          81 'CITY'
27+ A          103 'STATE'
28+ A          108 'ZIP'
29+ A          121 'CODE '
30+ A          R HDRLINE
31+ A          10 '_____'
32+ A          26 '_____'
33+ A          59 '_____'
34+ A          81 '_____'
35+ A          103 '_____'
36+ A          108 '_____'
37+ A          121 '_____'
38+ A          R DTL
39+ A          AVVEND 10
40+ A          AVVNAM 43
41+ A          AVVAD1 78
42+ A          AVVCTY 103
43+ A          AVVSTA 105
44+ A          AVVZIP 115
45+ A          AVCLS1 121
46+ A          R TOT
47+ A          TOTL Z 10
48+ A          '* TOTAL READY TO SEND'
  
```

BOB

Let's enhance the date handling in this program for Y2K compliance throu... 102k / 200k 1.81

Todo List 11/12

- Analyze current date handling in APC100R.RPG
- Convert legacy code to ILE RPG fixed format
- Verify fixed format code functionality
- Transform fixed format to modern free format RPG
- Verify free format code functionality
- Implement robust date handling with RPG built-in date types
- Replace manual date calculations with RPG date/time BIFs
- Implement %DATE, %TIME for system date/time retrieval
- Ensure date comparisons and formatting use native date capabilities
- Verify date ranges work correctly across century boundaries
- Final testing and documentation
- Convert O-specs to external printer files**
- Implement robust date handling with RPG built-in date types
- Replace manual date calculations with RPG date/time BIFs
- Implement %DATE, %TIME for system date/time retrieval
- Ensure date comparisons and formatting use native date capabilities
- Verify date ranges work correctly across century boundaries
- Final testing and documentation
- Convert O-specs to external printer files

Now I'll create the external printer files and update the RPG program to use them. Let me start with creating the printer files.

First, I'll create APC100R.PRTF for the main report:

Let me create the external printer files and update the RPG program to use them. I'll start with the printer file definitions.

Checkpoint Current

Bob wants to create a new file:

QDDSSRC/APC100R.PRTF

Auto-approve: 🔔

Save Reject

Type a message...

(@ to add context, / for commands, hold shift to drag in files/images)

IBM

