

AIX and VIOS Update & Roadmap

AIX



IBM Power

AIX Hits It's 40th Birthday !!

IBM unveils RISC System



"The machines operating systems, Advanced Interactive Executive, was developed in cooperation with Interactive Systems Corp. AIX is an expanded version of Unix System V and doubles to one million lines of code the usually hefty Unix operating system."

"An IBM analyst viewed the RT PC as "another IBM iceberg announcement", in that only the tip of the products capabilities was being revealed"

".....significant changes were made to the [Unix] operating system and that IBM's use of this implementation could solidify Unix's position in the mid-range field."

The price of the RT PC was between \$16,485 and \$19,730 not including the \$3,400 AIX Operating System

Computerworld, Jan 27, 1986

IBM Announcement Letter - Jan 21, 1986

AIX Solution – 40 Years of Enterprise Value

*AIX and Power –
mature and Battle tested
platform*

AIX

AIX-Power Deep Integration

- I/O Extended Error Handling
- HW memory protection keys
- Dynamic processor sparing
- Processor instruction retry
- 824 NX accelerator for AME
- NX encryption accelerator
- Dynamic LPAR
- Power10 MMA
- In-core crypto
- Live Partition Mobility (LPM)
- Transactional memory
- P9 NX gzip accelerator
- Processor Compatibility Mode Support
- FW assisted dump
- 4K, 64K, 1 GB, and 16 GB page support
- Processor folding & intelligent threads
- Deep system topology awareness for cpu and memory affinity management

Key Markets and Industries:

- Banking and Finance
- Healthcare
- Insurance
- Manufacturing & distribution
- Government/Federal Sector
- Telecom
- Retail

AIX and Power Value Prop.:

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

ISVs and IBM SW Examples

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

Install Base

- 22 Industries
- 117 Countries
- 60+ Languages
- Diverse deployments
- IBM i PASE is AIX based

Strategic Directions:

- Zero Planned Downtime
- Zero Tune Performance
- Zero Trust Security
- Zero Touch Automation
- Modernization

IBM AIX

Industry leading [Innovations, Performance, Reliability, and Security](#) – battle tested by world's leading enterprise class workloads and applications. We strive to achieve...

Zero



Planned Downtime

Maximize Business
Continuity & Cost Efficiency

- Minimal/No Operational Disruption
- Reduce IT Downtime
- Lower TCO

Zero



Tune Performance

Workload Optimization with
Out of the Box Performance

- Effortless Optimization
- Business Value unleashed Instantly
- Efficiency from Day One

Zero



Trust Security

Guarding future of Enterprises
with total protection

- Integrated & Advanced Security Capabilities
- Layered Security for Trust, Compliance, and Continuity
- Future-Ready Protection

Zero

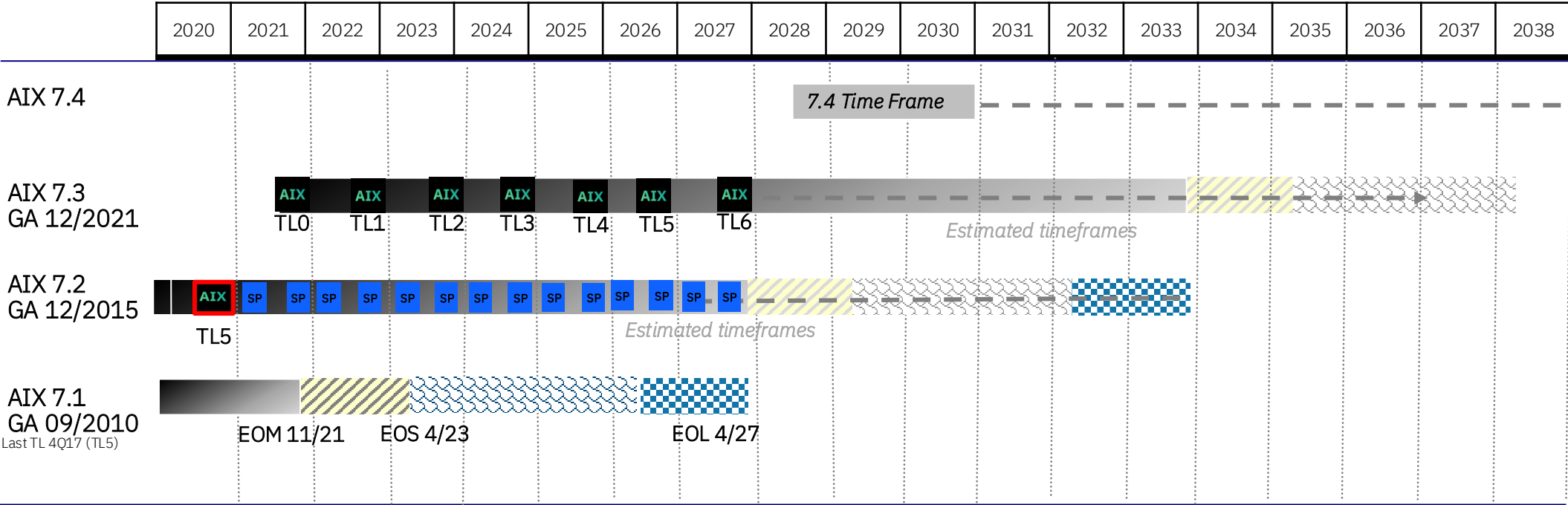


Touch Automation

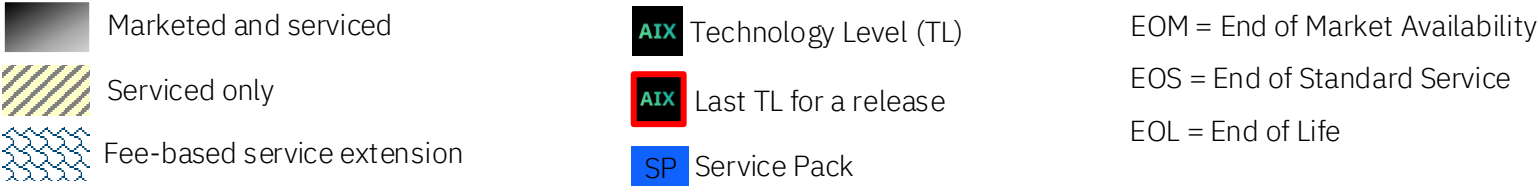
Extreme automation for
Administrative Efficiency

- Simplified Operations
- Lower Human Error, Smarter Resource Use
- Boost Productivity

AIX Release Streams



- All AIX releases run on Power10
- AIX 7.2 and 7.3 will support Power11
- Standard support for AIX Technology Levels is three years with the possibility of a special bid support extension
- See the IBM Support document for [Best Practices with AIX Maintenance](#)



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AIX and VIOS

Recent Enhancements & Future Focus



AIX Support Details for Power11

AIX minimum levels for Power11

- Virtual I/O only:

AIX 7.2 TL 5 SP 8 (2Q 2024) **

AIX 7.3 TL 2 SP 2 (2Q 2024) **

AIX 7.3 TL 3 SP0 (4Q 2024) **

- Physical or Virtual I/O

AIX 7.2 TL 5 SP 10 (3Q 2025)

AIX 7.3 TL 2 SP 4 (3Q 2025)

AIX 7.3 TL 3 SP 1 (3Q 2025)

Platform and I/O support highlights

- 3Q 2025 (AIX 7.3 TL3 SP1)

Power11 native mode support

4770 crypto adapter

vTPM 2.0 support

** Note, AIX levels prior to 3Q 2025 should download OpenSSL 3.0.15.1001 or later to preserve hardware accelerated performance on Power11

** Refer to [the IBM AIX Systems Maps](#) site for full details on AIX levels and Power11.

AIX Processor Modes with Power11

	AIX 7.2 TL5	AIX 7.3 TL2 and Later		
	P9 mode	P9 mode	P10 mode	Power11 mode ***
I/O (V irtual, P hysical)	V and P*	V and P	V and P	V and P
Max HW threads per LPAR	1536	1920	1920	1920 ****
Max RAM per LPAR (TB)	32	32	32	32
SMT default	8	8	8	8
In-core crypto	Yes	Yes	Yes	Yes
HW GZIP enabled	Yes	Yes	Yes**	Yes **
XIVE support	Yes	Yes	Yes	Yes
Power10 MMA support	No	No	Yes	Yes
P10 optimized memcpy	No	No	Yes	Yes

* AIX 7.2 TL5 SP 10 or later required for physical I/O

** Uses Power10 and Power11 direct access model for HW GZIP

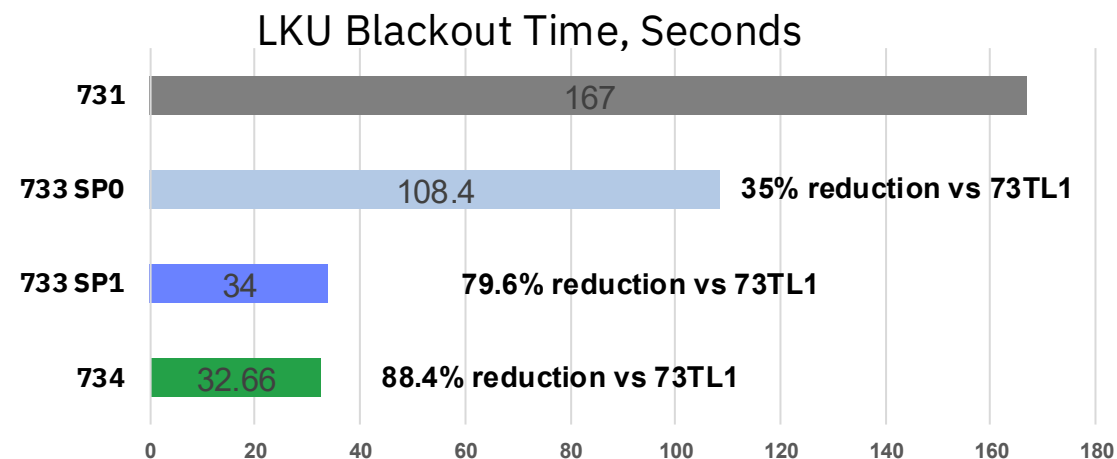
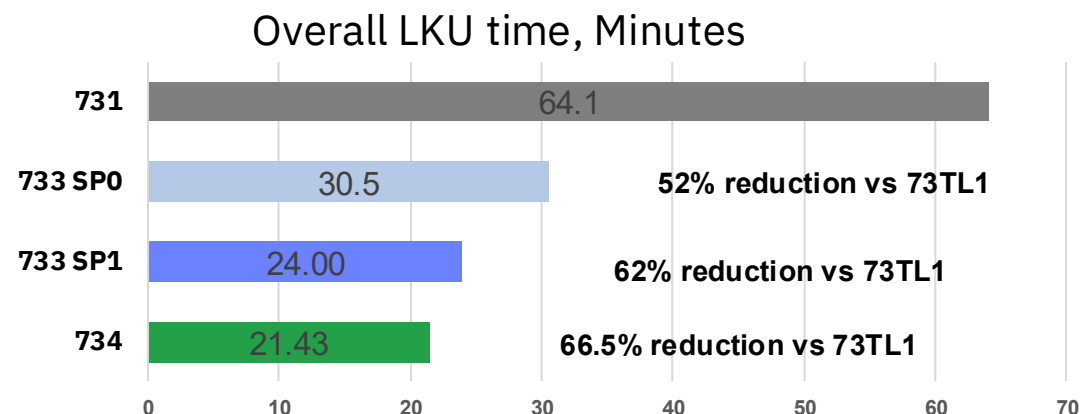
*** Requires AIX 7.3 TL3 SP1 or later

**** AIX 7.3 TL4 will increase the max supported hw threads per LPAR to 2048

AIX 2025 Highlights

AIX Live Kernel Update Optimization

- Overall LKU time reduced by 66.5% with AIX 7.3 TL4
- Blackout time is reduced more than 80% with AIX 7.3 TL4
- Further improvements are planned for AIX 7.3 TL5 (Dec 2026)



AIX Live Update Innovation with Live Library Update (LLU)

Live Update with Live Library Update (LLU)

- Live Library Update (LLU)

Provides for live activation of library updates without requiring application restarts

Controlled via the raso command or the LDR_CNTRL env var

Initial support covers libc and libpthreads

- Live Kernel Update (LKU) and LLU

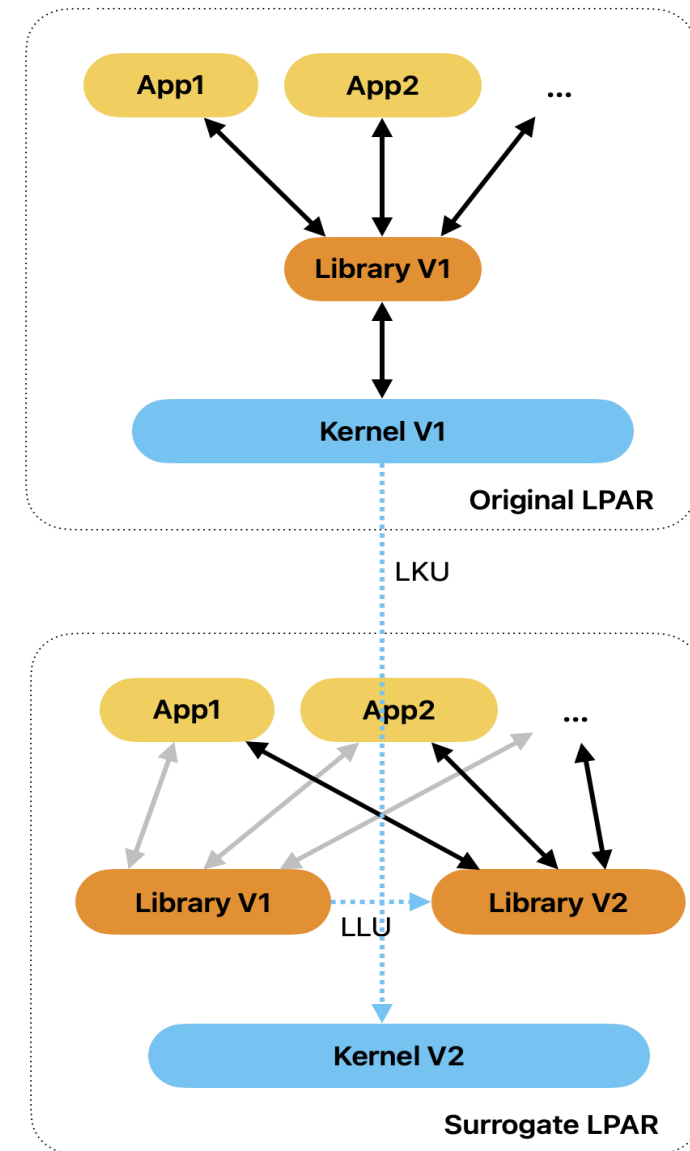
LKU and LLU can be performed together to live update both kernel and user space AIX components

LLU can also be used independently

- LLU extends LKU to allow for live update of AIX without AIX reboots or application restarts

Works with i-fixes, SPs, and new AIX TLs

Read the [LLU blog](#)

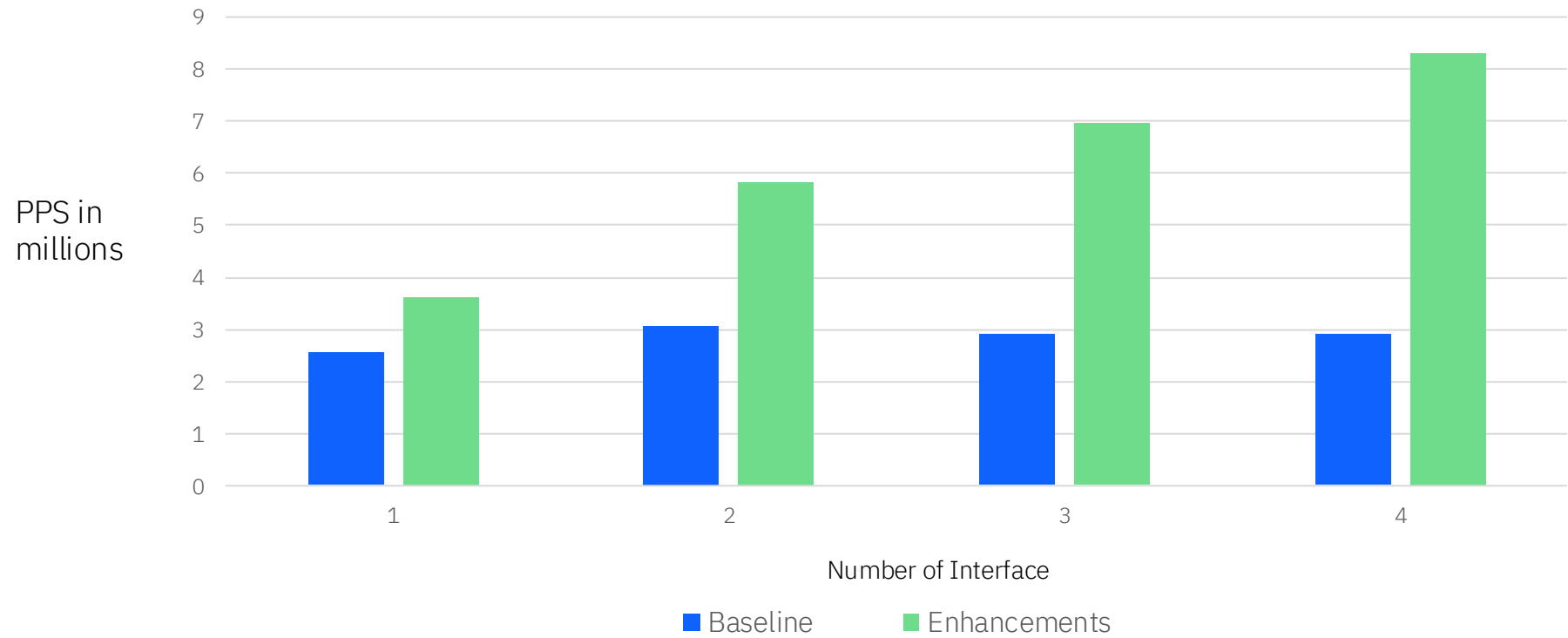


Network Performance Improvement

- TCP/IP improvements for reduced cache line contention
- AIX dispatcher enhancements to reduce SRAD cache contention

>160% Improvement in PPS
with 4 interfaces

TCP/IP Packets Per Second (PPS) Improvement



Server – 1080 with 80 cores
Network Adapter - 25G EC72
Adapter directly assigned to LPAR

Tunings:
flip_n_run=no
rx_max_pkts=4096
rx_comp_limit=512
rsp_kproc=yes

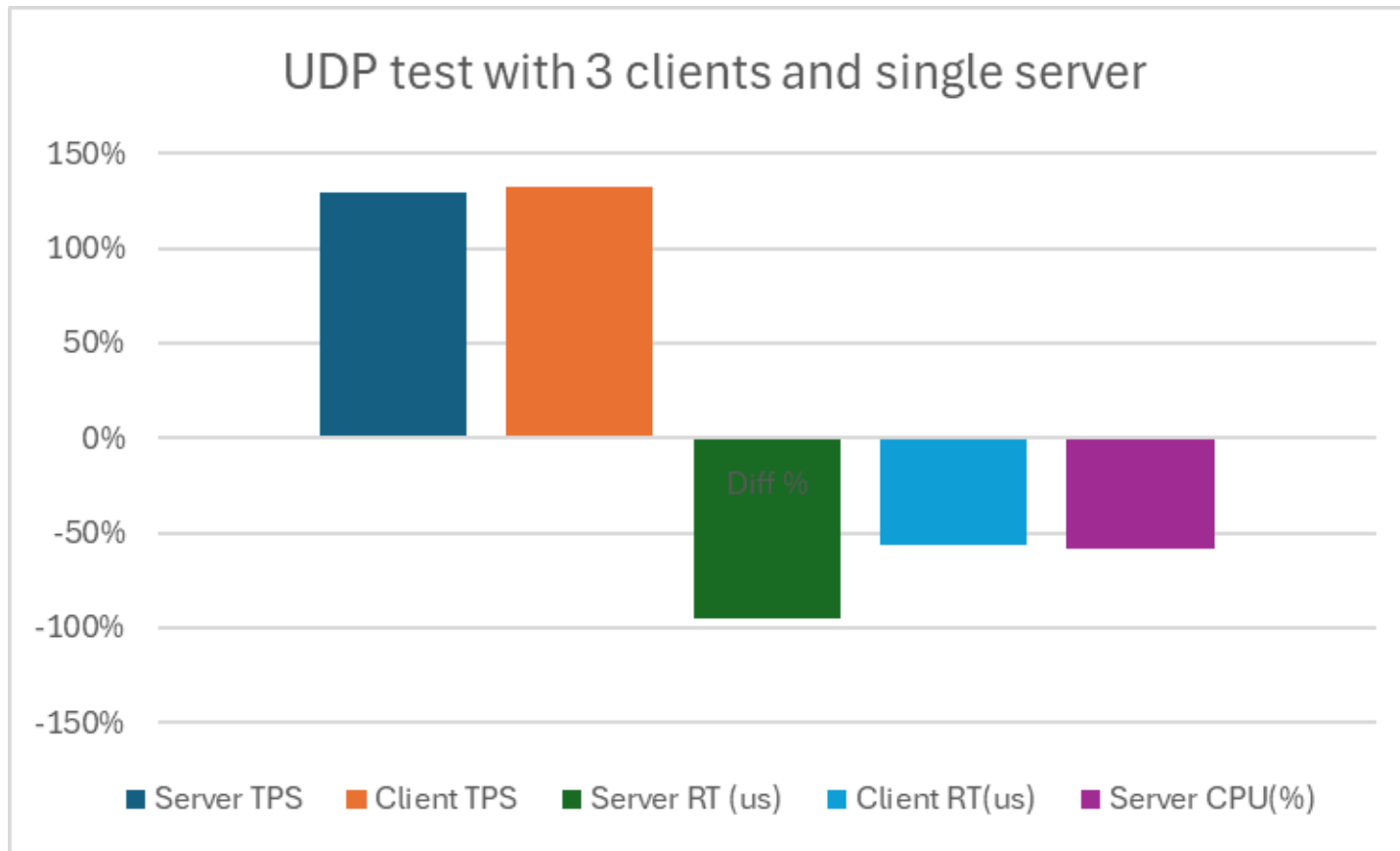
Note: Rx and Tx queues are adjusted to get best PPS

[Read the blog](#)

UPD Performance Improvement

- Multiple route caching per socket
- Improved cache route deletion/reallocation overhead

>100% Improvement in PPS



Planned AIX Changes for Software Update Access Keys

- **What is it**
 - AIX on Power10 and later server includes an AIX Update Access Key
 - The AIX Update Access Key (UAK) contains the SWMA expiration date
 - AIX verifies if an active Software Maintenance Agreement (SWMA) is present
 - Starting with AIX 7.3 TL4, updates and migrations will fail if the update image is beyond the SWMA expiration
- **User Impact**
 - Strict enforcement, updates & migrations are blocked if UAK is expired.
 - i-fixes are not affected
 - Action required, renew SWMA to maintain a valid UAK.

AIX 7.3 TL4 Summary (December 2025)

Reduced Downtime

- LKU improvements
 - Improve overall LKU time
 - Improved time estimator
 - Improved handling of /proc resources during LKU
 - Robust LKU for high-spawning processes
 - PV encryption support
- Live Library Update
 - Full GA 2025
- Faster NPIV failover

Workload Optimization

- Enhanced TCP/IP Performance
- Enhanced UDP Performance
- Support for 256 cores/2048 HW threads per LPAR
- NVMe over TCP w/ physical I/O (tech preview)

Optimized Security

- Platform KeyStore Manager with wrapping/unwrapping support (Power11)
- Improved Windows Active Directory compatibility
- FIDO authentication with SSH
- OpenSSL 3.0.16
- OpenSSH 9.9p2
- OpenSSL 3.5 (tech preview)

Administrative Efficiency & Modernization

- Bundle perfpmr tool into AIX
- Include rsync with AIX
- Include LLDB with AIX
- UAK active enforcement

See the Nov 11 AIX 7.3 TL4 [Announcement](#)

The AIX Ansible Collection

Available in [Ansible Galaxy](#) and RedHat Automation Hub

Over 800,000 downloads from Galaxy

AIX Collection Content

- Module Categories
 - Fix Management and NIM
 - Filesystem Management
 - Security
 - Inventory
 - Miscellaneous Management
- Roles
- Example Playbooks

New Modules in 2025

- sysdumdev
- errpt
- nmon
- paging space
- password_hash
- hdcrypt_auth
- nimclient
- LLU
- LKU rollback

Areas of Exploration

- Event Driven Ansible

Visit the [Automation with Power](#) topic in the IBM Power Community
Read the [Using Ansible for Automation in Power Environments Redbook](#)

AIX Toolbox for Open Source – 2025 Highlights

Packages are now digitally signed

Notable new packages and updates

- Rust
- GCC-13
- PyYAML
- cppcheck
- rclone
- wget2
- sleef
- ivykis
- cjose
- drpmsync
- syslog-ng
- google-authenticator
- Llama-cpp
- ONNX Runtime
- ONNX Runtime GenAI
- PyTorch
- FAISS

Resources

[Toolbox download site](#)

[AIX Toolbox community forum](#)

[Configuring DNF and local repositories](#)

AIX Toolbox migrated to Python 3.12

AIX 2026 Plan

AIX 7.3 TL 5 Plan (December 2026)

Reduced Downtime

- LKU improvements
 - Improve overall LKU time
 - Improve LKU backout time
 - Processor Compatibility Mode
 - Reduce LKU restrictions
 - PCI-DSS & CIS security policies
 - More than 64K FD support
 - Trustcheck support
- RoCE Packet Sniffer
- Faster dynamic add/delete CPU

Workload Optimization and I/O

- 12Gb SAS Tape Adapter
- Dual Monitor Graphics Adapter
- Enhanced UDP Performance
- 64TB Memory Enablement
- JFS CIO and AIO performance
- NVMe over TCP w/ physical I/O (GA)

Optimized Security

- AIX crypto discovery
- AIX LDAP Performance
- IPSEC Filter Performance
- IPSEC Key Overlap
- Quantum Safe openssl/openssh
- SASL with openssl 3.0

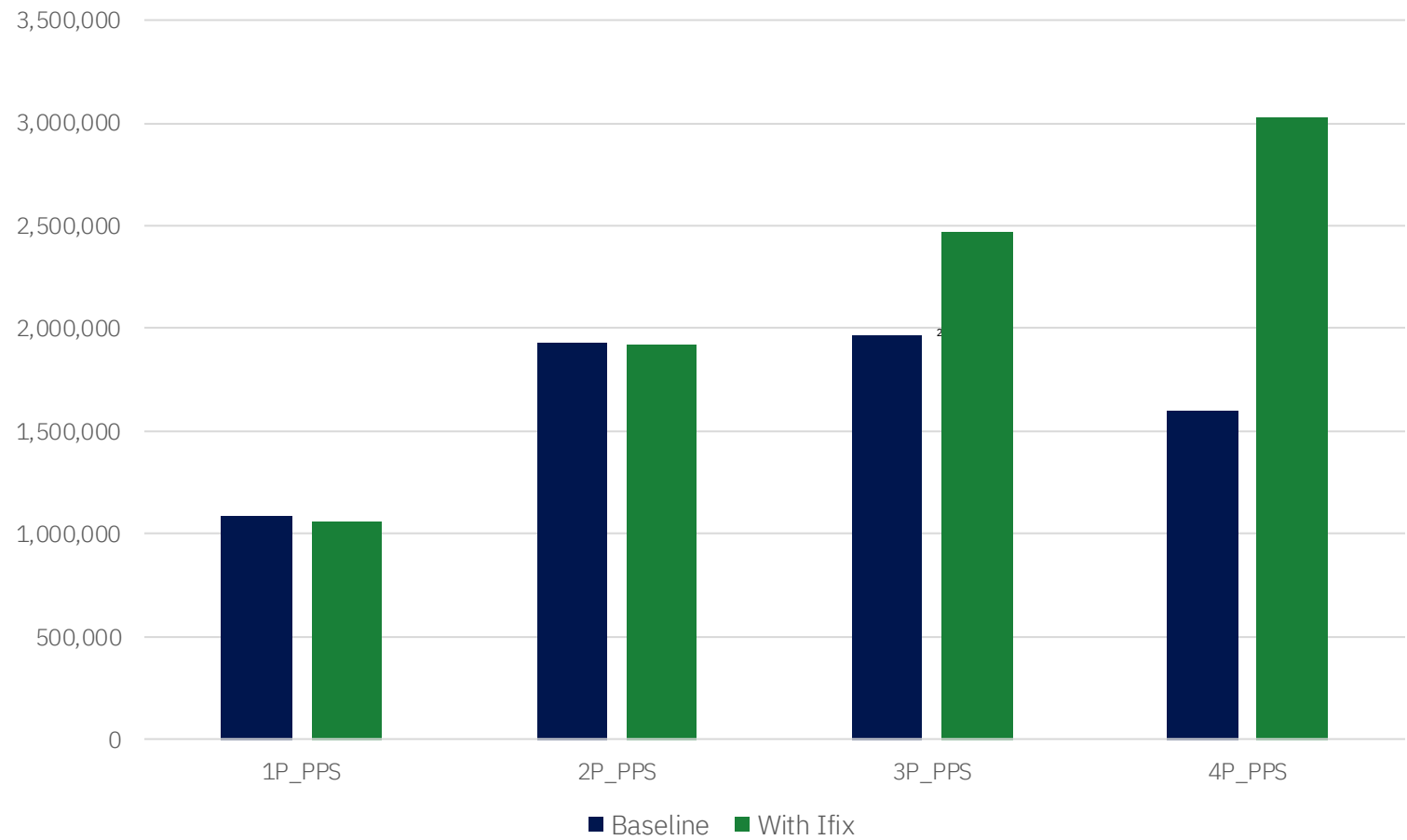
Administrative Efficiency & Modernization

- Simplify Diagnostic File Uploads from AIX Systems
- Dynamic detection of FC SCSI disks and paths
- sudo in base AIX
- ksh93u+m
- GLVM Resiliency
- Update opensource packages to latest Kerborose, perl, python, bind, rsyslog etc.

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UDP Performance Improvement

– UDP improvements for reduced contention



~100% Improvement in PPS with 4 interfaces

Server – 1080 with 59 cores
Network Adapter - 25G
Adapter directly assigned to LPAR

Note: Out of Box queue setting. Early lab results

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AIX 2027 and Beyond Focus

VIOS Update

VIOS Releases & Lifecycle

2021 2022 2023 2024 2025 2026 2027 2028 2029 2030

VIOS release / TL

New

VIOS 4.1.3
(Dec 2026)

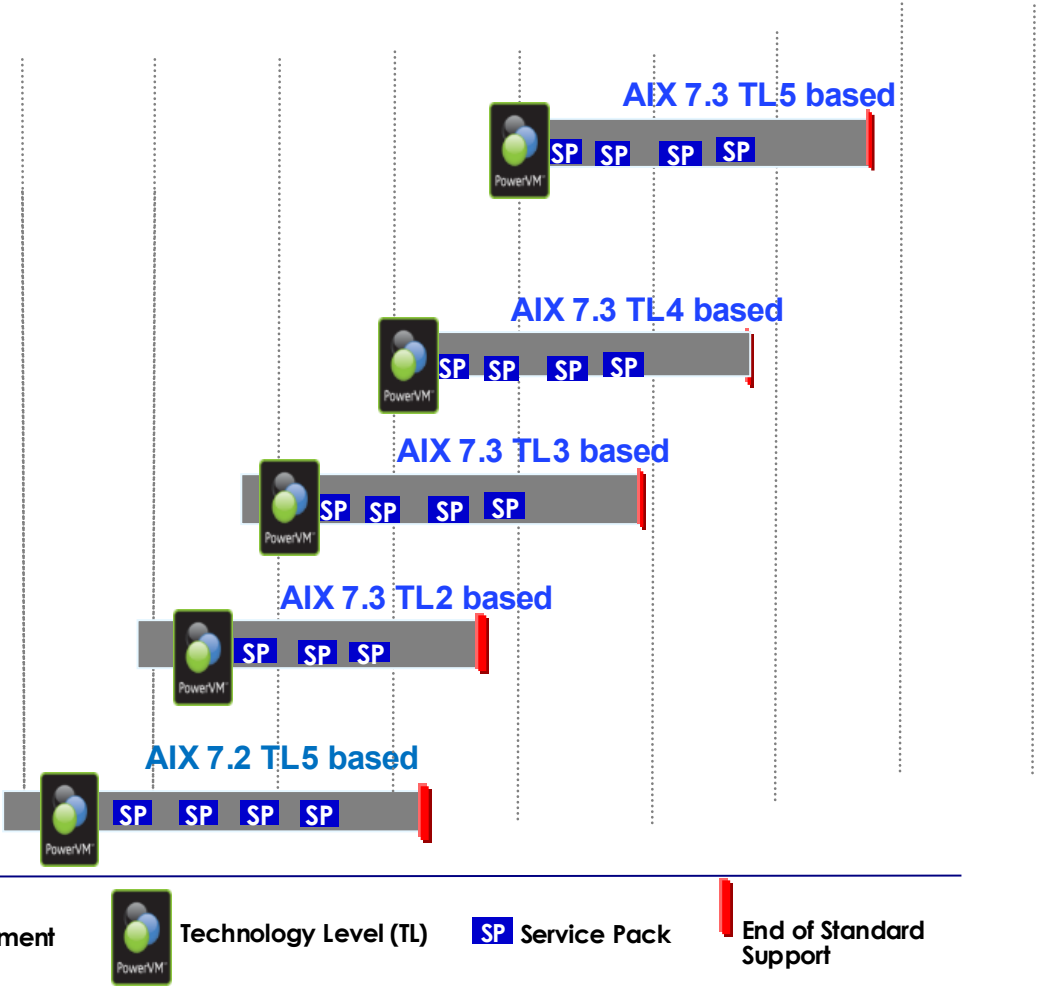
In Support

VIOS 4.1.2
(Dec 2025)

VIOS 4.1.1
GA: Dec 2024

VIOS 4.1.0
GA: Nov 2023

VIOS 3.1.4
GA: Nov 2022
EOS: Apr 2026



- A new VIOS Release / Technology Level is typically released once per year
- Service model is 3 years of standard support (service packs and i-fixes) for each VIOS release

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2025 VIOS Highlights (VIOS 4.1.1.10, VIOS 4.1.2.0)

Reduced Downtime

- Reduced VNIC failover times
- Reduced failover times to alternate NPIV paths
- New NPIV and VFC stats for IO latencies
- Bypass NPIV target port level validation at LPM

Workload Optimization

- NPIV QoS (tech preview)

Optimized Security

- Improvements to viosupgrade to better handle security attributes
- PowerVM-VIOS Virtual Protection Profile (VPP) certification
 - Power10 w/ FW 1060
 - Certification work completed, awaiting formal website post

Administrative Efficiency & Modernization

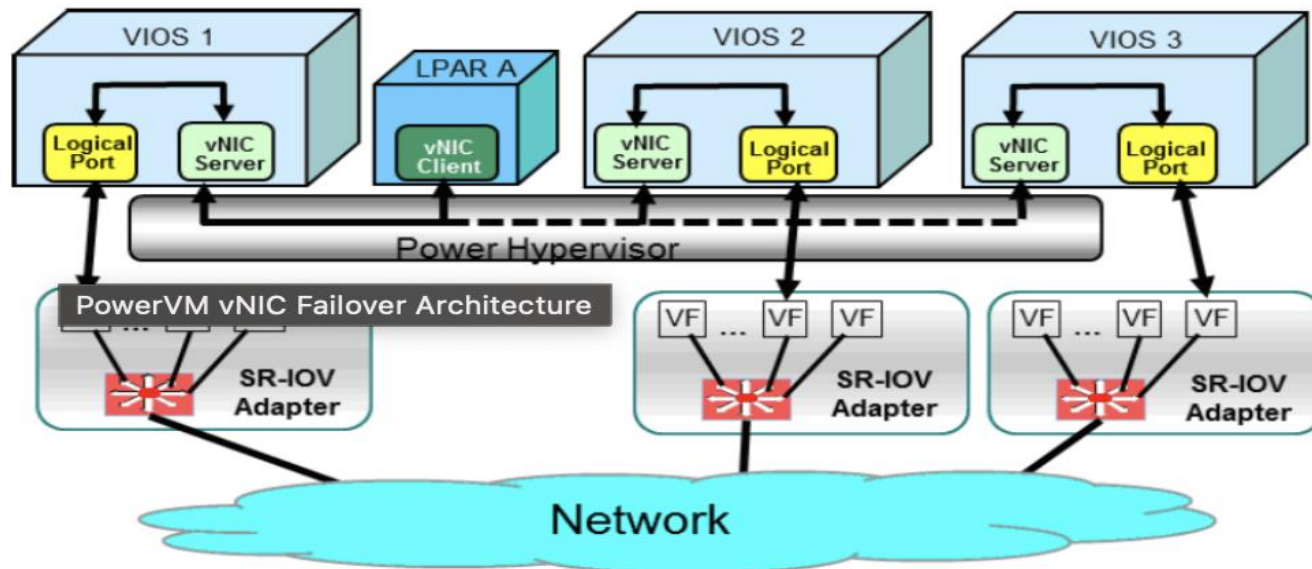
- Seamless updates to new SP levels, using updateios on alternate disk
- New Ansible modules

See the November 11 PowerVM [Announcement](#)

Read the developer [blog](#)

vNIC Failover Improvements

- vNIC server driver in VIOS enhanced to inform pHYP about VIOS shutdown and pHYP starts failover
- pHYP improvements for faster burning vNIC MAC on VF
- Backup Backing-VFs are partially opened on secondary VIOS, to reduce some amount of failover time.
- Users can tune heartbeats using ODM 'fo_heartbeat' for faster failover in unpanned outage.
- Benefit applies to all the clients



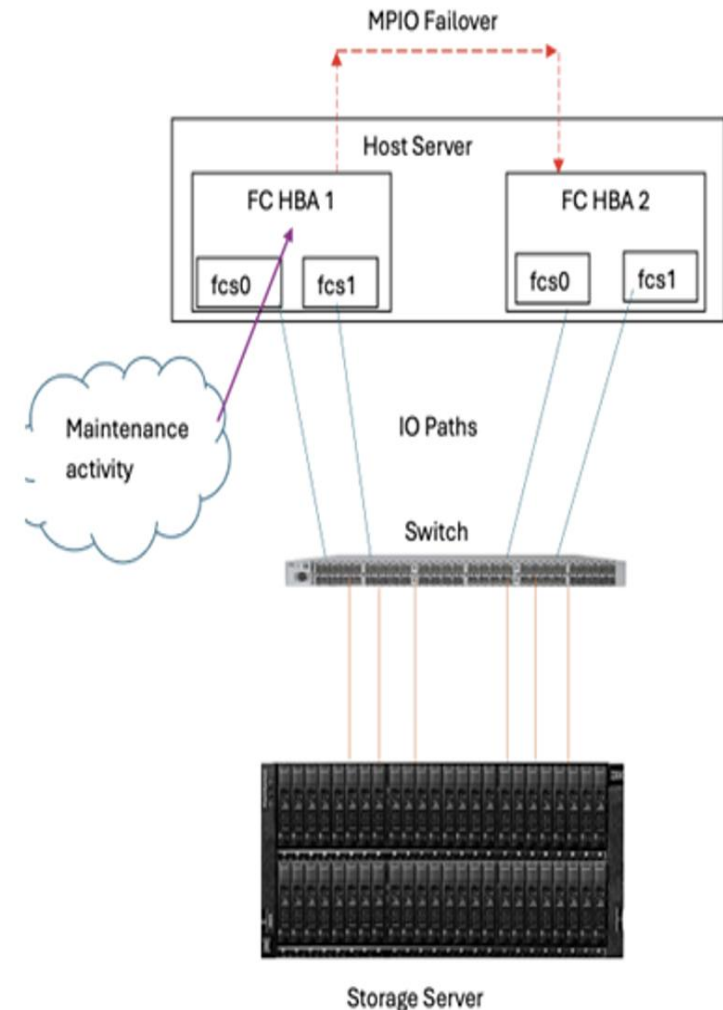
***50 vNICs failover time reduced to ~4 seconds from ~20 seconds

***Note – Experiment done in controlled lab environment with following configuration

- 2x100G adapter
- All primary backing VFs are from first port of adapter,
- All backup backing VFs are from second port of adapter

Quick IO Failover for FC HBA Activities

- Enhanced event notification from VIOS to client for different error/activities
- Client OS can failover IO faster to alternate FC/VFC paths depends on the events.
- It is applicable to both planned maintenance and unplanned error.
- Some of the events/activities
 - Adapter microcode update
 - EEH / Hardware Failure



2026 VIOS Plan

Workload Optimization

- NPIV QoS
- vETH Hardware MQ
- NPIV IOPS Improvement
- Larger DMA for vETH

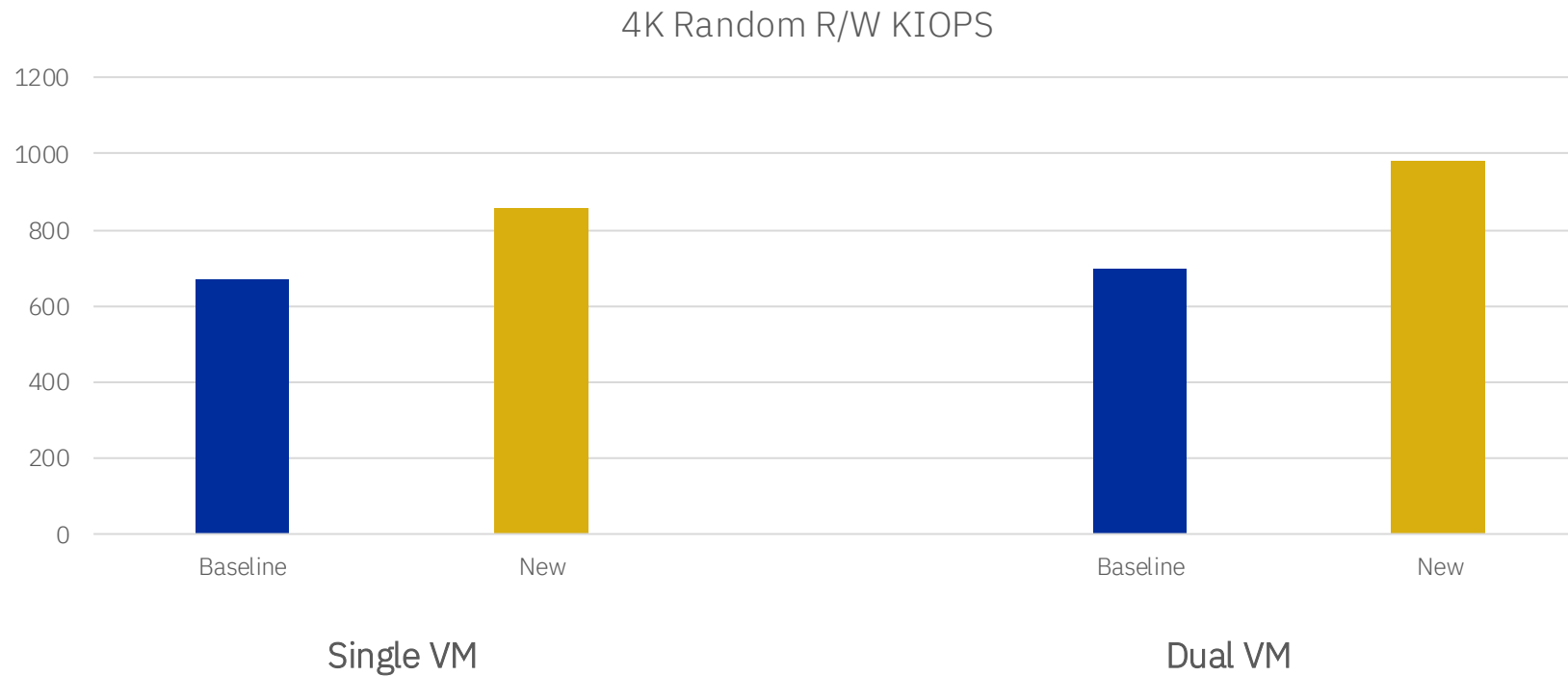
Reduced Downtime

- Network Validity Between MSPs
- LPM Balanced Path Placement
- Add/Delete vETH/VLAN in Sharing SEA mode
- NPIV RAS Improvements

NPIV IO Performance Improvement

- Hypervisor (FW 1130) and VIOS enhancements for more efficient DMA management
- Applicable to physical and Virtual IO
- More benefits to smaller IO size

Upto 40% IOPS Improvement



Information Resources

IBM Power Communities

- [Automation with Power](#)
- [AIX and IBM i open source](#)
- [HMC and CMC](#)
- [PowerVC](#)
- [PowerVM](#)
- [AIX](#)
- [Linux on Power](#)
- [PowerSC](#)

Linked-in

- [IBM AIX Technology Forum](#)
- [IBM PowerVM](#)
- [IBM PowerHA SystemMirror](#)
- [IBM VM Recovery Manager for Power Systems](#)
- [PowerVC](#)

Other Great Resources

- [Chris Gibson's AIX Blog \(lots of great blogs\)](#)
- [Nigel Griffiths YouTube channel \(A must view site for Power\)](#)

Thank You



