# Power13

## Versioning

| Version | Date | Author | Changes Made |
| --- | --- | --- | --- |
| 1.0 | 2025-07-11 | Mekala Harish | Initial draft |

## Introduction

Power13 represents the latest evolution in IBM’s Power Systems line, designed to meet the demands of modern enterprise computing. This white paper outlines the advancements introduced in Power13, comparing them to previous generations, and provides insights into its architecture and operational capabilities.

## Power Series Evolution

### Past Architectures

IBM Power Systems have evolved significantly since the introduction of the POWER architecture. Key milestones include:

* **Power7**: Introduced SMT-4, improved cache, and energy efficiency.
* **Power8**: Enhanced multithreading, NVLink support, and memory bandwidth.
* **Power9**: Optimized for AI workloads, PCIe Gen4 support, and OpenCAPI.
* **Power10**: Advanced security features, memory inception, and PowerVM enhancements.

### What’s New in Power13

* Enhanced support for AI and hybrid cloud-native workloads
* Integration with confidential computing capabilities
* Energy-optimized performance per core
* Redundant fabric and IO pathing
* Next-gen OpenCAPI and PCIe Gen5 support
* Unified firmware and advanced telemetry

## Architecture Overview

Power13 is built on a modular chiplet architecture. Each socket supports up to 16 SMT-8 cores, with support for multi-chip modules (MCM). Key components include:

* Core Complex Modules (CCMs)
* On-chip accelerators for AI and encryption
* Scalable system interconnect (SSI)
* Shared memory pool with unified cache hierarchy

### System Flowchart

<Insert system architecture diagrams here>

Flow chart



## Deployment and Integration

* **Operating Systems Supported**: AIX, IBM i, and Linux (RHEL, SLES)
* **Containerization**: Optimized for Red Hat OpenShift and Podman
* **Hypervisors**: PowerVM, KVM
* **Monitoring Tools**: PowerSC, HMC, and OpenTelemetry-compatible exporters

## Use Cases

* Mission-critical database workloads (Oracle, Db2)
* AI model training and inference (Watson, PyTorch)
* Virtualization and cloud-native app hosting
* SAP HANA and ERP workloads

## Security Features

* Secure Boot and Trusted Platform Module (TPM)
* Memory encryption at rest and in motion
* Confidential Computing with secure enclaves
* Role-based access control via HMC

## Performance Benchmarks

| Workload | Power10 (Baseline) | Power13 (Projected) |
| --- | --- | --- |
| SAP HANA OLAP | 1x | 1.8x |
| AI Inference | 1x | 2.5x |
| Oracle OLTP | 1x | 1.6x |
| Virtualization | 1x | 1.7x |

## Conclusion

Power13 builds on decades of innovation in enterprise computing. With its AI-ready architecture, enhanced security, and cloud-native optimization, it is well-positioned to support the next wave of digital transformation.

## References

1. IBM Power Systems Documentation
2. Power10 Technical Overview Redbook
3. OpenCAPI Consortium Specifications
4. RHEL on Power13 Deployment Notes

## Appendix

* Glossary of Terms
* Acronyms Used
* Configuration Limits and Part Numbers