Future-proofing Linux and PostgreSQL workloads in Azure cloud

Understanding the benefits of innovating with Linux and PostgreSQL workloads in a hyperscale cloud – and how Microsoft, Presidio, and AMD can help.

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To stay nimble in today's fast-paced business climate, enterprises are drawn to the resiliency, scalability, and heightened security advantages of an open, unified, elastic, and resilient cloud. Yet the complexities of the current IT landscape, heightened by the limitations of on-premises environments, can create roadblocks that undermine the value and cadence of cloud migration and modernization.

Organizations racing to get ahead are eyeing infrastructure and ecosystems that will enable innovation via AI. The Microsoft Azure cloud delivers cost-effective access to critical resources like graphics processing units, cloud-enabled virtual machines (VMs), and a rich portfolio of native services. All of these are essential for powering next-generation AI workloads.

According to IDC, investments in AI solutions and services will have a global impact of $22.3 trillion by 2030, with every new dollar spent on these technologies anticipated to generate an additional $4.90 for the global economy.

Motivation to move

Apart from AI adoption, organizations must prioritize migration and modernization of on-premises Linux applications and workloads to an open and elastic cloud for additional reasons. Facing rising costs, cash flow challenges, and technical debt, organizations are looking for an off-ramp to traditional data center strategies. The goal: Achieve more reasonable licensing terms and improve economies of scale.

An expanding threat landscape and limited IT resources are other motivators for recasting traditional on-premises strategies in favor of a secure cloud foundation for future growth. According to IDC and Microsoft research, 27% of on-premises Linux workloads are expected to migrate to the cloud over the next 12 to 24 months.

At the same time, PostgreSQL has emerged as the preferred open source database for modern applications due to its robust SQL-like interface

and high levels of flexibility, according to the [Stack Overflow survey](#). Here as well, on-premises deployments are hitting a wall as PostgreSQL data volumes grow and need scale. Enterprises are finding it difficult to balance the demands of database management with broader business needs. While developers are eager to tap secure and scalable enterprise-grade tools to build PostgreSQL databases and applications, they don't want to be saddled with the expensive licensing fees that typically characterize on-premises deployments.

The benefits of migration and modernization

Migrating and modernizing Linux and PostgreSQL applications and workloads in the Microsoft Azure cloud presents an opportunity to mitigate all of these challenges. By running Linux in the Azure cloud, enterprises can lower costs, innovate faster, and maintain compliance and control, all while boosting their ability to differentiate with AI.

With Linux running in Azure-based VMs and with access to fully managed databases like Azure Database for PostgreSQL, enterprises can

orchestrate a seamless cloud transition, especially when guided by a trusted and expert digital transformation partner such as Presidio.

Other benefits of shifting on-premises Linux and PostgreSQL applications and workloads to Azure cloud and Azure Database for PostgreSQL include:

- **Improved cost efficiencies** garnered by reduced infrastructure expenses, pay-as-you go, and reserved pricing models, as well as the elimination of license and support costs.

- **Improved performance and agility** via accelerated deployment, dynamic scaling, and enhanced development velocity.

- **Enterprise readiness** that ensures reliable operations through measures such as built-in high availability and disaster recovery capabilities, geo-redundant backups, and advanced security features.

This eBook details the benefits of running Linux infrastructure and PostgreSQL database workloads in the Azure cloud while highlighting how the synergies of the Microsoft/Presidio partnership can facilitate the journey.

Migrating and modernizing Java and .NET applications on Microsoft Azure

Data-driven business is now the North Star for competitive differentiation, leading to exponential data growth, rapidly scaling systems, and integration of core technologies like AI and the internet of things (IoT). This trifecta of change is accelerating IT complexity and creating challenges for on-premises Linux and PostgreSQL environments.

According to research from Enterprise Strategy Group (ESG), 60% of organizations say their IT environments are more complex than two years ago, with many harboring expectations that IT should perform its role at least 50% faster. Contributing to growing complexity are cybersecurity challenges (42%), the integration of emerging technologies like AI and analytics (36%), and managing higher data volumes and varied data sources (31%), the research found.

On-premises PostgreSQL environments have their own issues. IT organizations are challenged by overprovisioning to meet peak demands, expanding compliance requirements, and the need to integrate modern AI and analytics tools.

These challenges highlight the potential for a cloud-based solution offering elastic scalability, advanced security, higher performance, and a full array of advanced services. Microsoft Azure and Azure Database for PostgreSQL are ideally suited to address these pain points. They can help organizations reduce operational overhead, improve resource utilization, and refocus efforts on driving business value instead of managing IT and database infrastructure.

For example, migrating Ubuntu Linux workloads from on-premises infrastructure to Azure will realize benefits adding up to $13.36 million per year, per organization, according to an IDC assessment. Generally, organizations realize 29% lower infrastructure costs and find their IT infrastructure teams are 37% more efficient when running Ubuntu Linux workloads in Azure cloud. By running Ubuntu Linux workloads on Azure, IT organizations save significant time on patching, maintenance, and monitoring duties. This allows them to redirect efforts to more innovative activities.

Improved agility is another key benefit of migrating and modernizing Ubuntu workloads in the Azure cloud. The IDC study found IT teams could reduce average deployment times for compute by 63% and storage resources by 70%. Respondents that shifted Ubuntu workloads from on-premises infrastructure to the Azure cloud achieved an average three-year return on investment of 306% with payback in 11 months, according to IDC calculations.

Azure Database for PostgreSQL, a fully managed, AI-ready, open source relational database, ushers in a different set of advantages, specifically related to database workloads. Developed with the latest open source PostgreSQL database, the solution offers enhanced security, scalability, and management of enterprise workloads compared to the on-premises version. Among its core benefits:

- **Fully managed and intelligent open source PostgreSQL.** Azure Database for PostgreSQL supports the latest open source database versions, ensuring automatic maintenance, patching, and updates. Free from these time-intensive tasks, developers can turn attention to application innovation versus IT and database management. They can also significantly bolster development velocity, achieving faster application release cycles that drive additional revenue growth.
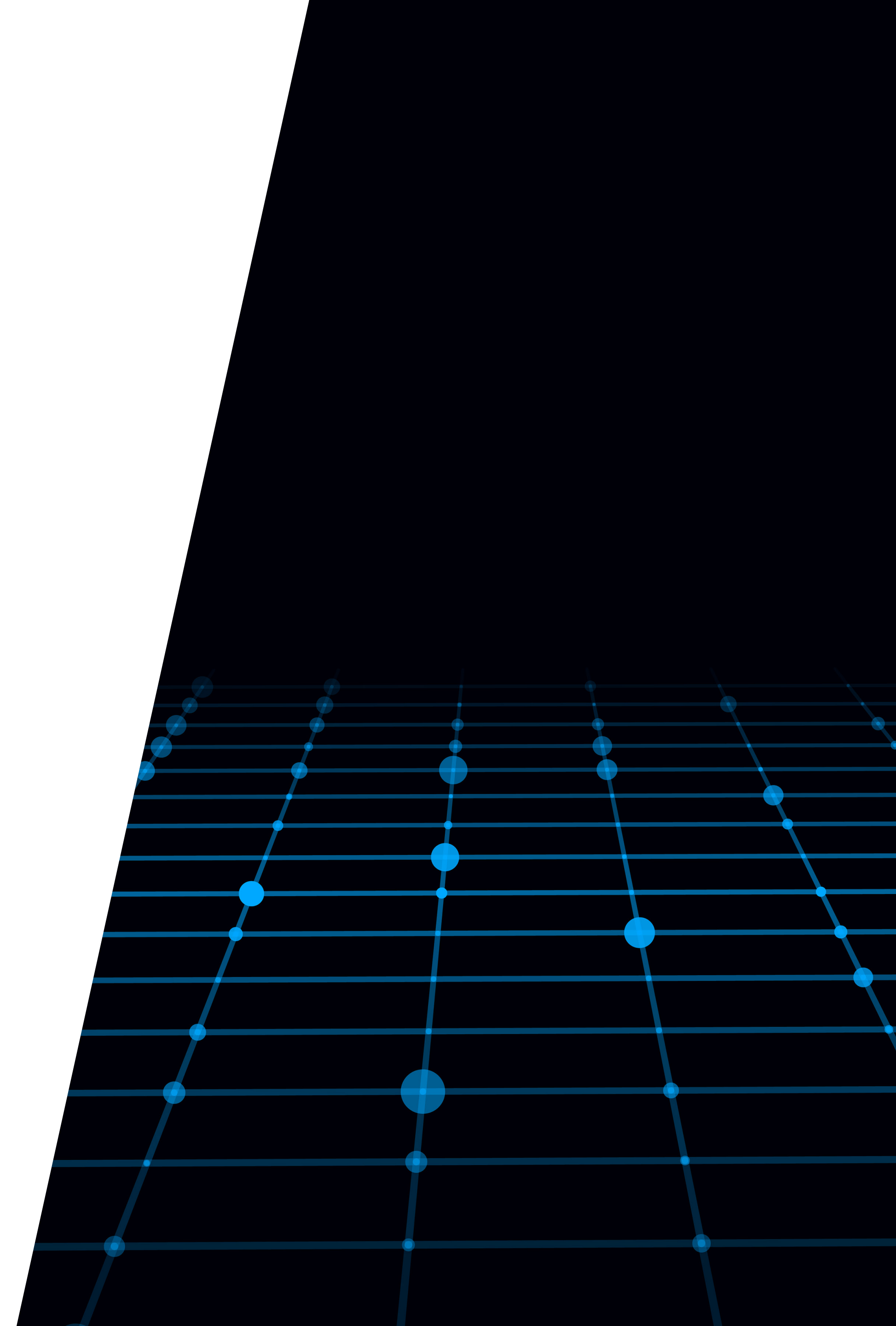
  Azure Database for PostgreSQL's intelligent recommendations provide custom analysis and suggestions to help teams eliminate bottlenecks and ensure peak performance tuning. Ease of migration is another upside, accomplished through backwards compatibility, no requirements for code changes, and built-in migration tooling. ESG estimates that database

performance is improved up to 65% with Azure Database for PostgreSQL, and database migrations can take place in hours, not weeks.

- **Highly available and scalable services.** Reliable operations are assured through Azure Database for PostgreSQL's Flexible Server, which can be provisioned to deliver a highly available database with 99.99% service level agreements and a choice of zones for geo-redundant backups. These capabilities help safeguard against ransomware attacks, ensure quick retrieval of lost data, and help maintain business continuity.

  Database monitoring and optimization tools ensure compute and storage can be independently and dynamically scaled depending on enterprise workload needs. Elastic clusters further enhance scalability, allowing organizations to scale data horizontally across a distributed PostgreSQL server architecture.

- **Lower total cost of ownership.** Through such capabilities as stop/start features along with burstable and reserved instances, enterprises can easily optimize the value of Azure Database for PostgreSQL and achieve lower total cost of ownership—around a 58% savings over traditional on-premises installations, according to ESG findings.

Moreover, Azure Database for PostgreSQL aids in reducing—or eliminating entirely—the licensing costs associated with hypervisors, middleware, and third-party monitoring tools. This can help reduce operational expenses. Enterprises can leverage recommendations from Azure Advisor to improve performance, availability, and cost-effectiveness of database workflows, helping gain additional value from Azure cloud-based implementations. With Azure's flexible pay-as-you-go and reserved pricing models, organizations only pay for what they use while benefiting from scalable and predictable pricing.

- **Trusted data security and compliance.** Azure Database for PostgreSQL protects data with enterprise-grade security and built-in compliance that covers regulations, including HIPAA, PCI DSS, FedRAMP, and ISO. Developers can tap into the enhanced security capabilities of Microsoft Defender and gain access to double encryption capabilities such as custom keys and Transport Security Layer for data both in transit and at rest. Integration with Microsoft Entra ID, a cloud-based identity and access management platform, lets enterprises easily manage database user identities and other Microsoft services in a centralized location.

- **Enterprise-level tools and features.** Developers can leverage the full spectrum of Azure native tools for database workflows. This includes Azure Data Factory to facilitate data management and transformation and/or Microsoft Defender for Azure to deliver advanced threat detection and security protections.

2 Reimagining your Linux and PostgreSQL applications with AI

Organizations are looking to AI to accelerate innovation, promote more intelligent decision-making, and push automation and productivity to new heights. IDC estimates that generative AI (GenAI) usage surged from 55% in 2023 to 75% of respondents in 2024. The majority of initiatives aimed at boosting employee productivity and top-line growth, IDC says.

As a platform-as-a-service solution, Azure Database for PostgreSQL is designed from the ground up as a trusted and AI-ready foundation, primed to propel next-generation workflows and services. The platform facilitates AI innovation through seamless integration to Azure AI Services as well as its own set of built-in AI capabilities. Azure Database for PostgreSQL integrates with Azure's powerful AI and machine learning services through the Azure

AI extension, simplifying the process of integrating large language models in Azure OpenAI and Azure Cognitive Services into PostgreSQL databases and applications.

Vector indexing capabilities, a cornerstone technology for the new generation of AI agents, also takes a leap forward with Azure Database for PostgreSQL. The platform includes new vector indexing technology that complements existing vector type and query operations to enable cost-efficient scaling for larger workloads. Microsoft Research's GraphRAG, an advanced retrieval-augmented generation (RAG) technique, can be tapped to improve the quality of RAG system responses.

In addition to an array of AI services and tools, Azure and Azure Database for PostgreSQL are tightly integrated with popular frameworks and languages, including Ruby on Rails and Python with Django. This can help boost productivity and simplify the end-to-end development and deployment experience. Integration with Azure Kubernetes Service and Azure App Service helps accelerate time to market of AI applications and innovations.

The power of AMD and Microsoft Azure

On the hardware front, AMD offers a range of VMs, powered by different processors, to help enterprises transition on-premises workloads to the Azure cloud. Azure offers four generations of AMD EPYC™ CPUs and other AMD technologies powering over 40 unique Azure VMs with Linux support. The wide variety of options gives customers flexibility in mapping the appropriate computing horsepower to their specific workload and application needs.

The newest Azure VMs based on 4th Gen AMD EPYC CPUs provide significant performance benefits. This ensures customers running Linux-based workloads like Redis can save nearly 22% in cloud operational expenses with general purpose VMs and nearly 49% with compute-optimized VMs compared to other x86 options available.[1]

If performance is not a concern, cost is another reason to choose an AMD option for Linux in the Azure cloud. AMD chips are often the most cost effective for running Linux, with the most recent v6 general purpose and memory-optimized VMs costing nearly 9% and 11% less than other x86 options.[2]

Customers can find AMD-based infrastructure in nearly every Azure region, which ensures they can deploy Linux efficiently and effectively anywhere across the globe.

The Presidio/ Microsoft partnership

Cloud migration and modernization can be a complex journey, and Presidio and Microsoft have forged a partnership to help organizations navigate the route that will best meet their needs and core business objectives.

As a top 5% Microsoft Cloud Partner, Presidio has expansive proficiency in management, architecture design, and optimization tuned for the Azure cloud. As a Microsoft Technology Partner and seasoned digital journey guide, Presidio's expert team consults enterprises on their Azure cloud transformation from the onset of formalizing strategy and innovation objectives through the hands-on work of engineering and software development.

Presidio helps organizations bridge the gap between foundational IT services in areas like networking, converged and hyper converged infrastructure,

and applications development with the new AI-enabled cloud. The team brings expertise in DevOps & Automation, containers, AI & GenAI, and application and operating system migrations.

Presidio and Microsoft are closely aligned to support Azure and Azure Database for PostgreSQL migrations. Presidio's deep bench of experts are equipped with more than 140 Azure Fundamentals Certifications along with 300+ Azure technical certifications. Data & AI is a particular area of focus with Presidio's team with top-notch fluency in the Microsoft Azure AI Platform as well as building and modernizing AI apps in Azure.

The companies' collaboration is also enhanced through joint development and customer work. Presidio team members sit on Microsoft's Partner Advisory Council, and the companies work in concert to help organizations accelerate hybrid cloud innovation and adoption.

Presidio has offices and consultants worldwide, with over 3,700 team members across 50+ global locations.

![Presidio logo] | Microsoft Azure | AMD

The bottom line

The benefits of running Linux infrastructure and PostgreSQL database workloads in the Azure cloud are clear. And the unique partnership between Microsoft, Presidio, and AMD offers the right experts, knowledge, and depth of experience to turn challenges with on-premises infrastructure and workloads into migration and modernization success. The result: a future-proof IT ecosystem that facilitates AI innovation and bottom-line benefits for the business.

To learn more, visit https://www.presidio.com/partners/microsoft/

References
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[2] Microsoft, Linux Virtual Machines Pricing, https://azure.microsoft.com/en-us/pricing/details/virtual-machines/linux/#pricing