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Maximizing SAP with Multi-Cloud: The Best of AWS, Azure, and GCP

Introduction

With the increasing complexity of IT landscapes, businesses are turning to multi-cloud strategies to enhance agility, resilience, and cost-effectiveness. SAP, a global leader in enterprise resource planning (ERP) solutions, is driving this shift by enabling organizations to integrate workloads across multiple cloud providers. By leveraging Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP), enterprises can unlock the best features of each platform to optimize performance, security, and innovation.

Enterprise workloads are no longer confined to a single cloud ecosystem. Organizations today require a multi-cloud approach to mitigate risks associated with vendor lock-in, improve disaster recovery capabilities, and enhance operational efficiencies. SAP workloads, which are often mission-critical, demand high availability, scalability, and seamless integration with other enterprise applications. Multi-cloud adoption allows businesses to strategically distribute their workloads across different cloud providers, ensuring that they leverage the unique strengths of each platform.

AWS offers unparalleled scalability and reliability, Azure provides deep integration with Microsoft enterprise solutions, and GCP stands out with its advanced AI and analytics capabilities. By deploying SAP in a multi-cloud environment, enterprises can achieve enhanced data interoperability, better compliance management, and cost-optimized cloud strategies tailored to their specific business needs.

A 2024 Gartner report indicates that over 85% of enterprises will adopt a multi-cloud strategy by 2026. Additionally, a Flexera study shows that 93% of enterprises already have a multi-cloud strategy in place, highlighting the rapid shift toward diversified cloud adoption. As businesses seek agility and scalability, leveraging SAP in a multi-cloud environment is becoming a critical success factor, enabling organizations to future-proof their IT infrastructure while driving digital transformation and innovation.

This blog explores why multi-cloud adoption is crucial for SAP, compares the strengths of AWS, Azure, and GCP, and provides real-world case studies of enterprises successfully leveraging this approach. You'll also find best practices for deploying SAP in a multi-cloud environment, helping you maximize efficiency, security, and cost savings.

Why Multi-Cloud for SAP?

Traditionally, enterprises have relied on a single cloud provider for their SAP workloads. However, this approach presents challenges such as vendor lock-in, limited redundancy, and restricted service flexibility. A multi-cloud approach addresses these concerns by enabling:

- **Resilience & Disaster Recovery:**

Hosting SAP workloads across multiple clouds ensures redundancy and minimizes downtime. By distributing workloads across AWS, Azure, and GCP, businesses can prevent single points of failure and ensure that their critical applications remain operational even if one provider experiences disruptions. Multi-cloud disaster recovery strategies, such as active-active or active-passive setups, enhance business continuity and minimize financial losses due to downtime.

- **Cost Optimization:**

Organizations can select the most cost-effective services from different providers. Cloud pricing structures vary across platforms, allowing enterprises to take advantage of competitive pricing models. For example, AWS may offer cost-efficient storage solutions, while Azure provides budget-friendly virtual machines. Organizations can optimize workload distribution based on cost by reducing their total cost of ownership (TCO) while maintaining high performance.

- **Performance & Latency Improvements:**

Regional availability zones allow businesses to place workloads closer to end-users. Cloud providers have data centers in multiple regions, enabling businesses to deploy SAP workloads in proximity to their customers or branch offices. This minimizes latency, accelerates transaction processing, and enhances the user experience for employees and clients interacting with SAP applications.

- **Advanced AI/ML & Analytics:**

Each cloud provider offers unique AI and analytics capabilities that can be integrated with SAP. For instance, GCP's Vertex AI excels in machine learning model deployment, while AWS SageMaker provides deep learning functionalities. Azure AI integrates seamlessly with Microsoft's enterprise tools for business intelligence. A multi-cloud setup allows organizations to combine these technologies, unlocking deeper insights from SAP data and driving data-driven decision-making.

A survey by IDC shows that **60% of enterprises** using multi-cloud strategies reported improved IT resilience and business agility.

Comparing AWS, Azure, and GCP for SAP

Each cloud provider offers distinct advantages for SAP workloads. Here’s a comparative analysis:

Feature	AWS	Azure	GCP
Market Share (2024)	31%	24%	11%
SAP-Certified Instances	X1, X2, R5	M-series, E-series	C2D, M2
Storage	S3, EBS	Azure Blob, Managed Disks	Cloud Storage, Filestore
AI/ML Capabilities	SageMaker	Azure AI	Vertex AI
Hybrid Integration	AWS Outposts	Azure Stack	Anthos
Security & Compliance	AWS Shield, IAM	Azure Security Center	Cloud Armor, IAM

AWS for SAP: Best for Scalability & Reliability

AWS has been a leader in the cloud market, providing 31% of global cloud infrastructure. AWS offers SAP-certified instances such as X1, X2, and R5, designed for high-performance computing. With services like AWS Lambda, S3 storage, and CloudWatch, businesses can ensure seamless SAP operations with automated monitoring, high availability, and backup capabilities.

AWS provides strong disaster recovery features, such as multi-region replication and Amazon RDS for SAP HANA, ensuring data integrity and business continuity. Additionally, AWS’s global presence with **32 availability regions** allows businesses to deploy SAP workloads closer to users, reducing latency and enhancing operational efficiency.

Key Benefits:

- Highly scalable storage (S3, EBS)
- AI/ML integration with SageMaker
- Strong global presence with 32 availability regions
- Automated disaster recovery and failover mechanisms

Azure for SAP: Best for Enterprise Integration

Microsoft Azure, with 24% market share, has deep integration with enterprise systems, making it an excellent choice for SAP workloads, particularly for businesses already using Microsoft 365, Dynamics 365, and Power BI. Azure's M-series and E-series instances provide high memory and processing power for SAP HANA workloads, ensuring high-speed transactions and data processing.

Azure also offers built-in security compliance with Azure Security Center, identity management through Azure Active Directory, and seamless connectivity with Microsoft Teams and Office 365, making collaboration and business processes more efficient. Its SAP on Azure Large Instances enables high-performance scaling, making it ideal for enterprises requiring extensive computing power.

Key Benefits:

- Seamless integration with Microsoft enterprise solutions
- Strong security compliance with Azure Security Center
- SAP-certified infrastructure with high availability zones
- Superior hybrid cloud capabilities with Azure Stack

GCP for SAP: Best for AI & Analytics

While GCP has a smaller market share (11%), it excels in data analytics and AI-driven automation. GCP's BigQuery and Vertex AI provide unmatched capabilities for real-time SAP data analytics, making it ideal for companies seeking predictive analytics and machine learning insights.

GCP also offers cost-effective computing with preemptible VMs, allowing businesses to reduce operational costs while maintaining high processing power. Additionally, Google's Anthos platform enables seamless multi-cloud orchestration across AWS and Azure, providing unparalleled flexibility and cloud interoperability.

Key Benefits:

- Superior AI/ML capabilities (Vertex AI, AutoML)
- Cost-effective computing with preemptible VMs
- Multi-cloud orchestration via Anthos
- Advanced real-time analytics with BigQuery

Multi-Cloud Best Practices for SAP Deployment

To maximize SAP in a multi-cloud environment, businesses should follow these best practices:

1. **Workload Segmentation:** Properly distributing SAP workloads across multiple cloud providers is essential to optimizing costs, performance, and compliance. Businesses should analyze the computational requirements of each SAP module and deploy them on the most suitable cloud. For instance, mission-critical SAP HANA workloads may benefit from Azure's high-memory instances, while AI-driven analytics could leverage GCP's BigQuery. Additionally, organizations should align workloads with regional compliance requirements, ensuring data sovereignty where necessary.
2. **Unified Management & Monitoring:** Managing SAP workloads across multiple clouds requires robust orchestration and monitoring tools. Platforms such as Terraform, Kubernetes, or SAP Cloud ALM enable businesses to maintain a consistent environment across cloud providers. Using multi-cloud dashboards like Google's Anthos or Azure Arc can provide centralized visibility and automation, ensuring smooth operations, performance tracking, and issue resolution. Implementing real-time monitoring through AWS CloudWatch, Azure Monitor, and GCP Operations Suite ensures proactive management of system health and performance.
3. **Data Security & Compliance:** Ensuring security across multiple cloud environments is critical for SAP workloads, which handle sensitive business data. Organizations should implement zero-trust security architectures, enforce IAM (Identity and Access Management) policies, and deploy end-to-end encryption for data at rest and in transit. Leveraging multi-cloud security solutions, such as AWS Security Hub, Azure Security Center, and Google Cloud Security Command Center, provides real-time threat detection and compliance monitoring. Additionally, businesses should ensure compliance with industry regulations like GDPR, HIPAA, and ISO 27001 by applying standardized security frameworks across cloud platforms.
4. **Hybrid & Edge Computing:** Many enterprises operate in hybrid environments where on-premises infrastructure coexists with cloud-based SAP workloads. Solutions like Azure Stack, AWS Outposts, and Google Anthos enable seamless connectivity between on-premises SAP deployments and cloud environments. This approach enhances operational flexibility, particularly for industries with strict latency and data residency requirements, such as finance.

and healthcare. Edge computing further helps by processing data closer to the source, reducing latency and bandwidth usage, making it an effective strategy for real-time SAP analytics and IoT-based SAP applications.

5. **Disaster Recovery & Backup:** Multi-cloud environments enhance disaster recovery (DR) capabilities by enabling cross-cloud redundancy. Businesses should implement multi-region replication and automated failover strategies to ensure high availability. AWS S3 Cross-Region Replication, Azure Site Recovery, and Google Cloud Backup and DR are key services that facilitate efficient recovery from outages. Automated backup solutions, including SAP HANA System Replication and cloud-native snapshot backups, can help ensure rapid data restoration in case of failures. Testing DR strategies regularly with simulated failover scenarios can further strengthen resilience against potential disruptions.

Success Stories of SAP in Multi-Cloud

1. Siemens – Global Manufacturing Firm

Challenge: Siemens, a global leader in industrial manufacturing, needed real-time analytics and cost optimization for its SAP S/4HANA systems while ensuring data security and high availability.

Solution: Siemens deployed SAP ERP on Microsoft Azure for seamless integration with its existing Microsoft infrastructure. Google Cloud Platform (GCP) was leveraged for AI-driven analytics and machine learning, enhancing predictive maintenance and supply chain optimization. AWS was used as a disaster recovery solution, ensuring business continuity in case of failures.

Results:

- 30% faster data processing through GCP's BigQuery analytics.
- 25% cost savings by distributing workloads based on price efficiency.
- Improved predictive maintenance, reducing unplanned downtime by 40%.

2. Walmart – Retail Chain with Multi-Cloud SAP

Challenge: Walmart needed a scalable and highly available infrastructure for its SAP-based retail operations while ensuring seamless demand forecasting and inventory management.

Solution: Walmart adopted a multi-cloud strategy:

- AWS was used to run its core SAP applications, ensuring high-speed transactions and operational reliability.

- GCP powered AI-driven demand forecasting and real-time customer analytics through Vertex AI.
- Azure was leveraged for identity management, security, and seamless integration with Microsoft 365 and Dynamics 365.

Results:

- 99.99% uptime, ensuring uninterrupted operations during peak retail seasons.
- 35% improvement in demand forecasting accuracy, reducing overstock and stockouts.
- Seamless integration of SAP with AI-driven insights, optimizing supply chain efficiency.

3. BMW – Automotive Giant’s Multi-Cloud SAP Strategy

Challenge: BMW, a global automotive company, required a flexible and robust cloud infrastructure to support its SAP-driven manufacturing processes, customer engagement, and real-time vehicle analytics.

Solution:

- **Azure** was chosen to run SAP S/4HANA for core business processes like supply chain management and financial operations.
- **AWS** supported connected vehicle data processing, leveraging IoT capabilities for real-time insights.
- **GCP** was used for AI-powered customer experience analytics and predictive maintenance of vehicles.

Results:

- 20% faster production cycle times, improving supply chain responsiveness.
- Enhanced customer insights, leading to a 15% increase in customer satisfaction.
- Cost-efficient cloud strategy, optimizing workloads based on performance needs.

Conclusion

Implementing a multi-cloud strategy for SAP has shifted from being a choice to an essential business requirement. Businesses leveraging AWS, Azure, and GCP can improve agility, reduce costs, and harness cutting-edge AI-driven analytics to stay competitive. Each provider brings distinct strengths to the table, and when combined, they create a powerful, scalable, and future-proof IT ecosystem.

Organizations that strategically implement multi-cloud for SAP will enjoy higher efficiency, better resilience, and greater innovation. Whether you’re looking to optimize costs, enhance security, or drive AI-powered insights, the right multi-cloud strategy can transform the way you run SAP.

Ready to Take Your SAP Strategy to the Next Level?

The future belongs to businesses that embrace multi-cloud innovation. Is your enterprise prepared? Start your SAP multi-cloud transformation today and unlock the full potential of your business with Cogent Infotech.

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