



Bring the Power of the Public Cloud into Your Own Data Center

Gain the flexible, scalable processes of cloud computing while addressing compliance and performance with the Microsoft Azure Stack* on-premises hybrid cloud solution running on reliable Intel® technologies

This solution brief describes how to solve business challenges through investment in innovative technologies.

If you are responsible for...

- **Business strategy:**
You will better understand how the Microsoft Azure Stack* hybrid cloud solution will enable you to successfully meet your business outcomes.
- **Technology decisions:**
You will learn how the Microsoft Azure Stack hybrid cloud solution works to deliver IT and business value.

Executive Summary

Cloud computing can provide the agility that is needed to rapidly adjust to changes in the marketplace to either gain or maintain a competitive advantage. But many enterprises, such as financial institutions or those with significant intellectual property or privacy concerns, may be reluctant to place workloads in the public cloud. Until now, those enterprises were missing out on the power of cloud computing, deeming it necessary to trade flexibility for control.

Microsoft Azure Stack* is a hybrid cloud solution that brings the advantages of cloud computing into on-premises data centers by using Microsoft Azure* cloud services. In this way, organizations have the flexibility to choose the right applications to run in the cloud and on-premises, with a single, consistent application development process. Microsoft Azure Stack, built on Intel® technologies, provides performance, control, and agility in a fast and easy-to-implement solution. With Azure Stack, IT leaders can regain confidence in investing in cutting-edge infrastructure while delivering the environment their development teams need to build modern applications that meet swiftly changing business and technical requirements.



Microsoft* Hybrid Cloud Solution

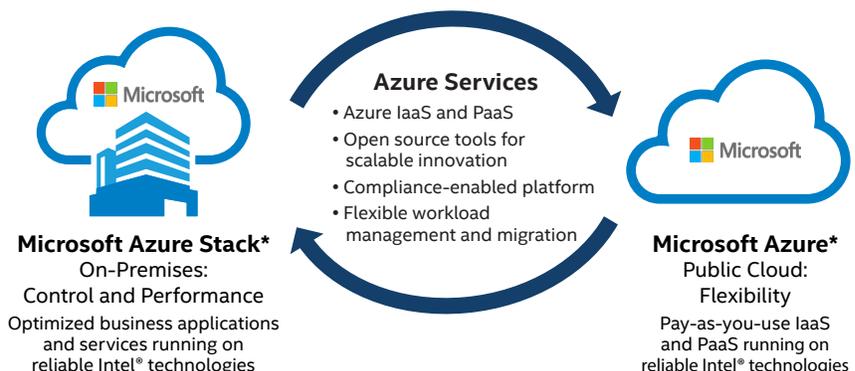


Figure 1. Microsoft Azure Stack* hybrid cloud gives enterprises the flexibility to choose the combination of public cloud and on-premises deployment models that meets their business needs.

Solution Benefits

The Microsoft Azure Stack* hybrid cloud solution offers the following advantages:

- Ability to choose the right mix of on-premises and public cloud environments to meet workload demands
- Enhanced developer productivity through a consistent hybrid application development environment
- Wide range of Microsoft Azure services available on-premises
- Purpose-built systems with Intel® technologies that provides operational excellence
- Access to continuous innovation by following the Azure planning cycle

Business Challenge: Legacy Infrastructure Often Hampers Agility

Gaining a competitive advantage today requires efficient use of technology with a flexible, scalable IT infrastructure. However, the speed at which new and more effective technology develops increases quickly, while most legacy infrastructure is not designed to accommodate rapid innovation and agility. Changing technology also contributes to a growing gap in the skills and experience of IT resources.

Many organizations are turning to cloud computing to meet these challenges. However, concerns about data security and regulatory compliance prevent some organizations from benefitting from the advantages public cloud offers. For example, in the United States, regulations such as the Health Insurance Portability and Accountability Act (HIPAA) and Payment Card Industry Data Security Standards (PCI-DSS) enjoin strict rules about how data is accessed and managed. In the European Union, the General Data Protection Regulation goes into effect in 2018, and represents significant restrictions regarding how personal data is managed. In many regions around the world, regulations exist that prevent data from being stored outside that region.

Investing in hybrid cloud can help organizations enhance competitive and regulatory compliance. Seventy percent of cloud users are considering a hybrid cloud strategy in the next 24 months.¹ But not all hybrid cloud implementations are the same and they can be challenging due to the following:

- **Complexity.** A combination of on-premises and off-premises infrastructure requires carefully planned management, the lack of which can result in difficulty controlling assets across systems.
- **Duplication.** Security policies and other processes can be duplicated, leading to inefficiency and unnecessary work.
- **Inconsistency.** Data and governance policies can quickly become out of sync between on-premises and off-premises systems if poorly managed.

The Microsoft Azure Stack* hybrid cloud solution, on the other hand, can help businesses overcome these challenges and speed time to market while supporting data security, privacy protection, and regulatory compliance.

Cloud Capabilities Off the Grid

Microsoft Azure Stack is also useful for industries besides enterprises concerned with regulatory compliance and data protection. For example, deep-water marine biologists conducting fish censuses or mapping long-term changes in ocean temperatures must voyage hundreds of miles off the coastline and into unpredictable and hazardous conditions where connectivity may not be reliable (Figure 2).

Research ships equipped with Azure Stack have the scalability and flexibility of the cloud for compute-intensive workloads, such as machine learning, while still being able to perform other tasks, such as deploying equipment and tracking submersibles, without interruption even when connectivity is lost. This allows scientists to access necessary infrastructure for high-demand workloads when connectivity is available and continue working when it is not.

Solution Value: Control, Flexibility, Performance, and Consistency

Intel and Microsoft combine cutting-edge hardware and innovative software to deliver an intelligent, scalable, and reliable hybrid cloud platform. Going far beyond the stereotypical hybrid cloud usages of burst capacity and disaster recovery, Microsoft Azure Stack streamlines the

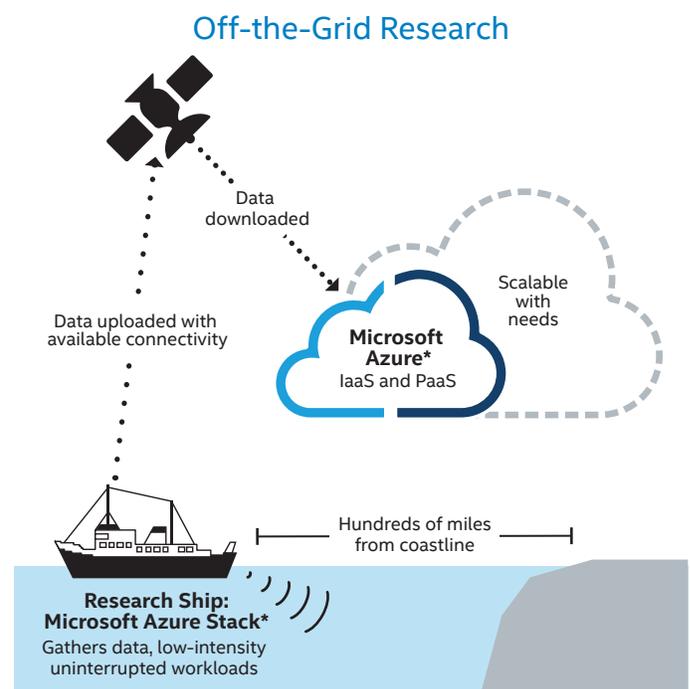


Figure 2. Deep-water research ships can use the compute-intensive flexibility of the cloud and yet ensure critical workloads continue when connectivity is not available.

Optimizing Development Operations

Microsoft Azure Stack* empowers developers to build and deploy applications consistently across hybrid cloud environments. Microsoft Azure Stack uses Azure Resource Manager*, which includes the same application model, self-service portal, and APIs as Microsoft Azure*. The common DevOps processes and tools provide a unified development experience with Visual Studio*, a continuous integration/continuous development (CI/CD) pipeline with open source tools, and fast new cloud application development through automation and a range of open source and community-driven software solutions, such as Visual Studio Team System* (VSTS*).

Organizations can adopt hybrid computing while gaining popular public cloud services and the flexibility to choose the right combination of on-premises and cloud deployment models. Optimizing business applications and services with integrated systems helps speed innovation and improve performance.

transition to a true hybrid cloud, enabling enterprises to seamlessly develop and run applications in the appropriate environment (on-premises or in the public cloud). Even on-premises applications can take advantage of a wide range of Microsoft Azure* services and third-party software solutions from the Azure Marketplace*, including Azure's Infrastructure as a Service (IaaS) and Platform as a Service (PaaS).

Microsoft Azure Stack uses a simple, cloud-inspired infrastructure, with purpose-built Intel® technology-based integrated systems from leading hardware vendors. These integrated systems offer the reliability and operational excellence necessary for mission-critical applications. Essentially, Azure Stack makes it easy to gain the power of cloud computing while maintaining local control over regulatory and privacy compliance.

With consistent processes and tools—regardless of whether an application is going to run on-premises or in the public Azure cloud—developer productivity is enhanced and enterprises can achieve the combination of cloud and on-premises deployments that meets their business and compliance needs. Developers can now build modern applications using a consistent, open set of Azure services that enhance business, technical, and regulatory compliance. An app developed to run on Azure Stack can be easily migrated to the public Azure cloud without any code changes. Microsoft and Intel's collaboration and commitment to advancing the hybrid cloud makes Azure Stack a great way to help future-proof a business, because every innovation that Microsoft implements in the Azure public cloud is immediately available to Azure Stack users.

When data volumes or workloads exceed on-premises capabilities, businesses can easily scale by adding capacity to a region, building infrastructure in additional regions, or leveraging Microsoft Azure data centers. Azure Stack's management tools simplify the arrangement and coordination of automated tasks across environments. Well-orchestrated processes allow for continuous integration and delivery, helping to improve delivery times and free up resources, gaining efficiency, velocity, and reliability. Enterprise-level support, multiple configuration options, and integration with monitoring and identity management solutions complete the Azure Stack package.

Solution Architecture

Microsoft Azure Stack (Figure 3) is a fully integrated system that is ready to run and comes with enterprise-grade support. Built on Intel® Xeon® processors and Intel® Solid State Drives (Intel® SSDs), this solution brings the power of cloud computing to the on-premises data center for increased control over regulatory compliance. With consistent tools and purpose-built hardware that is tested to deliver consistent hybrid cloud operations, Azure Stack helps organizations speed time to value, improve application lifecycle management, and take advantage of continuous innovation. With as few as four nodes, an enterprise can deploy Azure Stack and start reaping the advantages of consistent hybrid cloud operations and high-performance, mission-critical hardware architecture.

Depending on the hardware vendor, the Azure Stack system can include various models of the Intel Xeon processor E5 family. Memory options range from 256 GB to 768 GB; which option is best varies with the workloads to be run. In addition, the solution features Intel® SSD DC S3710 Series for caching.

Microsoft Azure Stack*

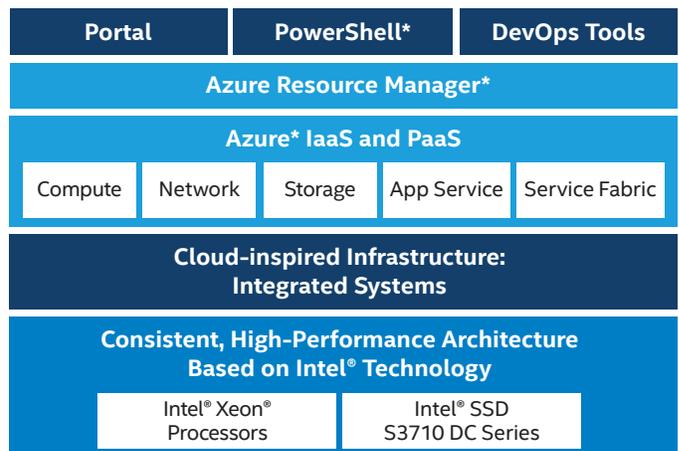


Figure 3. With purpose-built Microsoft Azure Stack* integrated systems, powered by Intel® technology, organizations quickly gain the power of cloud computing in the on-premises data center.

With Microsoft Azure Stack, users can access some of the Azure public cloud services. IaaS provides far more than traditional virtualization. For instance, Virtual Machine Scale Sets* enable rapid deployments with true auto-scaling for modern workloads (that is, containerized applications). Azure PaaS runs on high-performance Intel® hardware and enables hybrid deployment choice, consistency, and portability for cloud applications. Unlike traditional private clouds, Azure Stack offers a pay-as-you-use model where customers pay only for the Azure services used.

Conclusion

By extending the capabilities of Microsoft Azure public cloud to on-premises data centers, Microsoft Azure Stack helps organizations achieve agility while helping to enhance competitive and regulatory compliance. Built on trusted Intel technologies, the solution is unique in the industry and has the potential to significantly alter how data centers develop and manage modern large-scale applications in today's technology-driven landscape.

Find the solution that is right for your organization. Contact your Intel representative or visit intel.com/cloud.

Why Go Hybrid with Microsoft* Solutions?

- Use one single vendor throughout the entire enterprise customer cloud journey:
 - On-premises: virtualization, OS, and security features
 - Hybrid cloud: Microsoft Azure Stack*
 - Public cloud: Microsoft Azure*
- An easy-to-use, Microsoft-friendly environment is available in all scenarios.
- Security, identity, and access features from your current enterprise environment are easy to deploy either on Azure or Azure Stack.

Learn More

You may also find the following resources useful:

- [Microsoft Azure Stack](#)
- [Intel and Microsoft Accelerate Business Transformation](#)
- [Cloud Solutions Meet Changing Needs with a Competitive Advantage brief \(ask your Intel Representative\)](#)

Solution Provided By:



¹ The International Data Corporation (IDC) Multiclient Study, CloudView 2016, www.idc.com/getdoc.jsp?containerId=prUS41039416

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