

# PRIMEFLEX for Microsoft Azure Stack HCI

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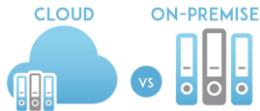
*CEO of NEMESI IT a Fujitsu partner*

*Senior Technical Sales Engineer – FINIX Technology Solutions*

- **1999** dall'unione di Siemens e Fujitsu nasce Fujitsu Siemens Computers, produttore di tecnologie IT
- **2009** nasce Fujitsu Technology Solutions, 100% di proprietà Fujitsu e diventa un player di riferimento nel mercato IT per Prodotti & Servizi
- **2019** il gruppo **Marperger** rileva il 100% del pacchetto azionario della filiale italiana di Fujitsu e nasce **FINIX Technology Solutions**



Aiutiamo i clienti a progettare la propria **infrastruttura**



Supportiamo le **StartUp** più innovative a raggiungere il successo nel mercato italiano

Le competenze e il nostro capitale umano sono la guida ideale per **creare valore** alle nuove aziende proiettate al futuro



The background features a large, abstract geometric shape in the center, composed of overlapping polygons in shades of red, orange, and blue, creating a tunnel-like effect. The background is filled with a pattern of thin, parallel lines in various colors (red, orange, blue, purple) that create a sense of depth and movement.

# Gianni Vagnoli

*Senior Technical Sales Engineer – FINIX Technology Solutions*

# Business needs meeting technology improvements



## Business Challenges



Improve agility  
to be competitive



Contain or  
reduce IT budgets

## Software-Defined Infrastructure



Enables speedier and  
flexible resource provisioning



Allows to run infrastructure  
with less OPEX

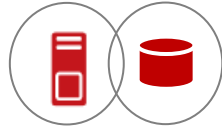
A software-defined infrastructure best supports a more business-centric IT approach

# Data Center Architecture in Transition



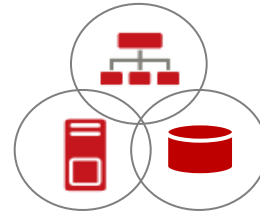
Software-defined  
Compute

Server Virtualization



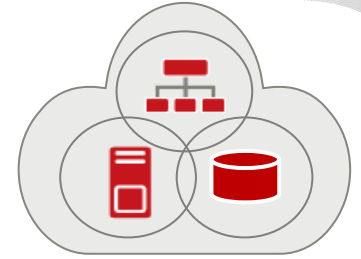
Software-defined  
Compute & Storage

Hyper-Converged IT



Software-defined  
Compute & Storage  
& Networking

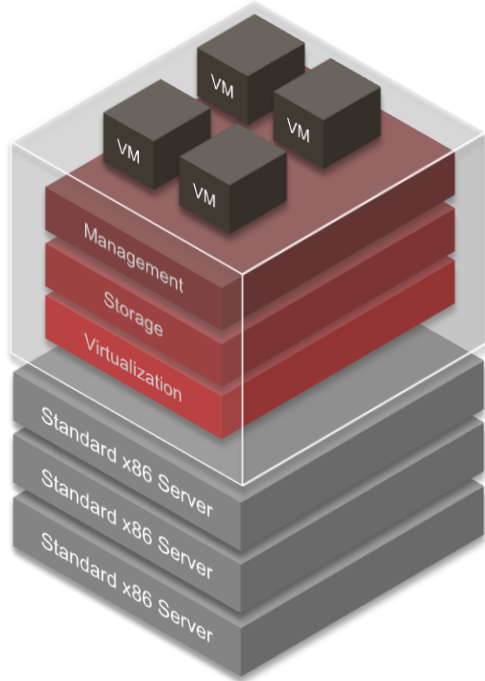
Software Defined  
Data Center



Software-defined Compute &  
Storage  
& Networking & Cloud

Hybrid Cloud

# Focus on Hyper-Converged Infrastructure (HCI): The ideal deployment model for a SDDC



Infrastructure with a modular and software-centric architecture that tightly integrates compute, storage, networking and virtualization resources and other technologies in a single x86-based system

- Consolidation - less components, space, energy and cooling
- Simple management - less admin efforts, less required skill
- Elastic, linear, non-disruptive scalability - grow as you go
- High performance - low latency storage

Provides the flexibility and operational efficiency that business demands from IT

Businesses are increasingly hosting applications in the public cloud. And yet, datacenters are here to stay at many organizations, because cloud hosting isn't always the best option for all virtualized workloads.

To support on-premises workloads, many enterprises are embracing hyperconverged infrastructure (HCI), the modern way to deploy servers in datacenters and to remote offices and the edge.



84 percent

of organizations have a multi-cloud strategy.<sup>1</sup>



By 2023, an estimated

70 percent

of enterprises will run hyperconverged infrastructure vs. 30 percent in 2019.<sup>2</sup>

But does HCI by itself address all your problems?



## Why HCI doesn't solve all your datacenter headaches



In 2025, 1 in 5 enterprises will still be operating traditional datacenters.<sup>3</sup> Adopting HCI to support your datacenter is the right move, because it can:



Lower costs



Simplify operations



Improve performance and availability



Branch office  
and edge



Virtual desktop  
infrastructure



High-performance  
SQL Server



Trusted enterprise  
virtualization



Scale-out  
storage

## Azure

Azure Portal, API, IaaS and PaaS, and cloud platform admin tools

Cloud compute, storage, and networking

Azure hardware

## Azure Stack Hub

Hyperconverged compute, storage, and networking

Industry standard hardware

## Azure Stack HCI



On-premises

## Extend on-premises into Azure

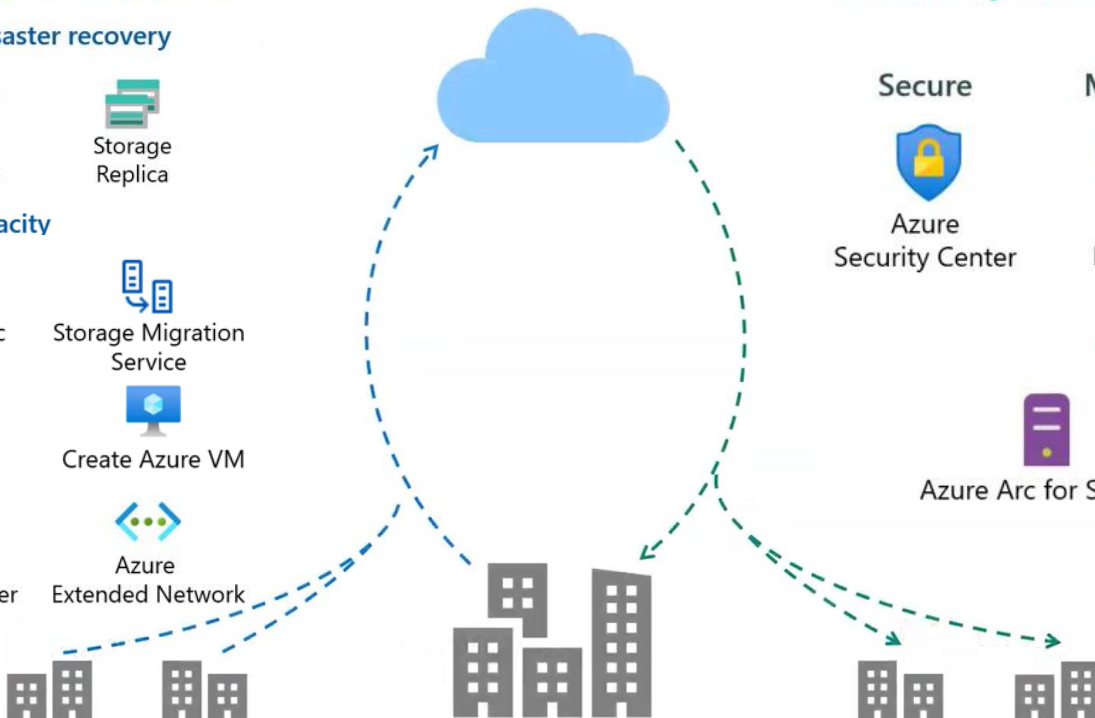
### Business continuity & disaster recovery



### Extend on-premises capacity



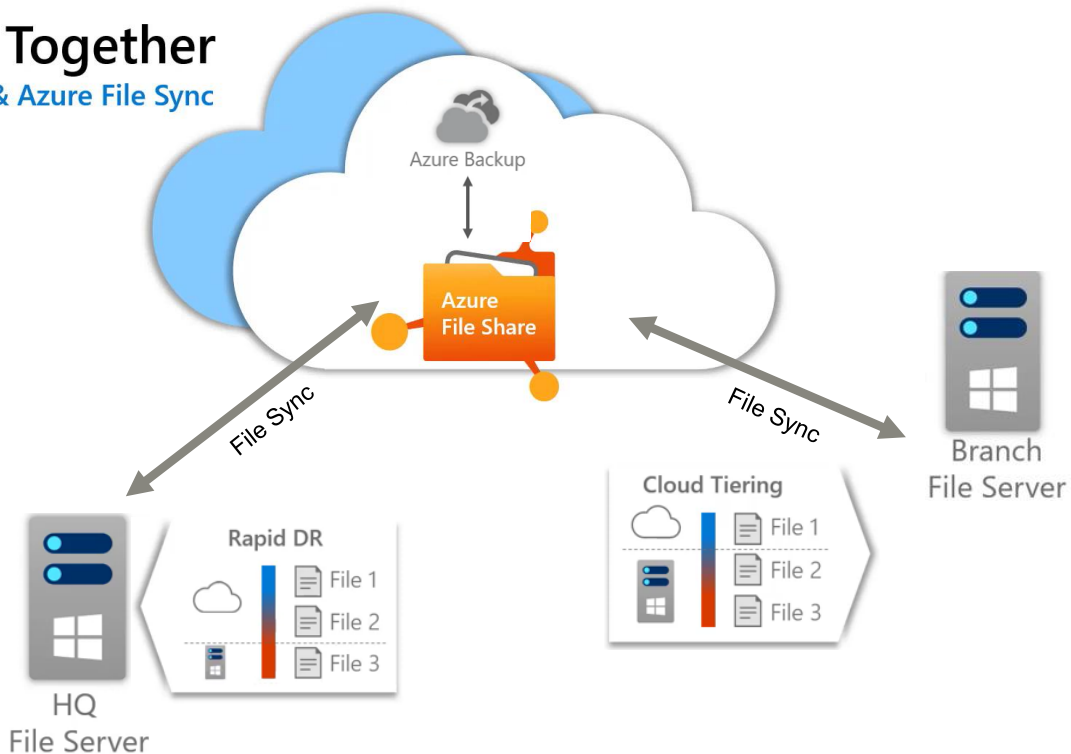
## Centrally manage from Azure



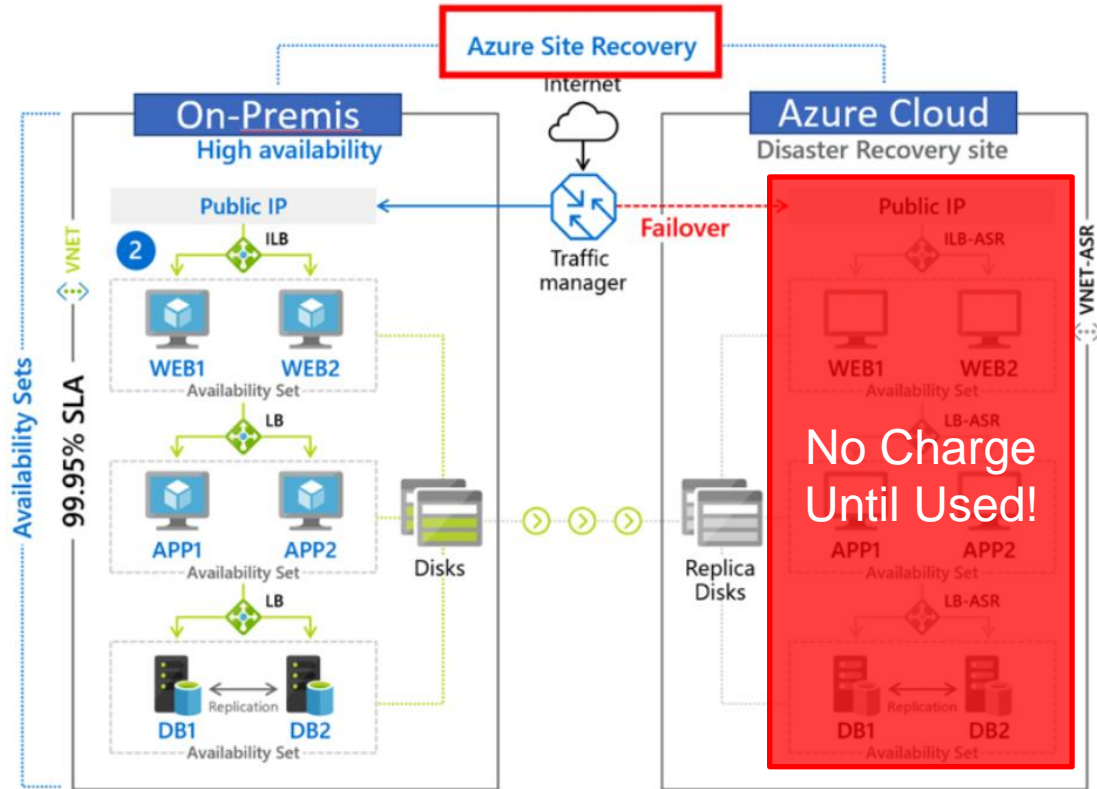
## File Storage Better Together

Windows Server 2019 File Server & Azure File Sync

- Multi-site Sync
- Cloud Tiering
- Cloud Backup
- Disaster Recovery



# Azure Site Recovery overview





## Get started FAST-

From running OS deploy cluster in under 15 minutes



## Store efficiently-

Get 10x more usable storage for free with deduplication and compression



## Unrivaled Performance -

150K+ IOPS per server with micro-second latency



## Save costs -

Reduce storage TCO by up to 50% versus traditional approaches



## Mitigate risk-

Built-in resiliency for multiple component failures - even in 2-node deployments



## Scale to size -

Start small with 2 servers and go up to 16 servers and 4 PB of raw storage



## Simplify management -

New purpose-built management tool for Windows Server - Windows Admin Center

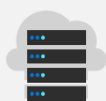


## Simplify path to hybrid IT -

Seamlessly connect to Azure cloud to extend your on-premises deployment



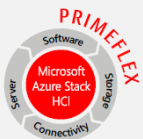
Azure Stack HCI is built on Microsoft Hyper-V, the same hypervisor that powers Microsoft Azure, to deliver efficient server virtualization.



Azure Stack HCI comes with Storage Spaces Direct (SDS), which consolidates all local drives in the infrastructure—whether solid-state devices (SSDs) or hard-disk drives (HDDs)—into a pool of software-defined storage (SDS) that is both fast and resilient.



A third element is Software Defined Networking (SDN), which enables you to centrally create, configure, and manage virtual network devices such as routers, switches, and gateways in your datacenter. As a result, you gain productivity and reduce infrastructure costs.



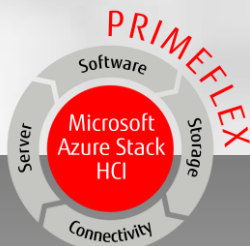
PRIMEFLEX for Microsoft Azure Stack HCI is a validated node hardware from Fujitsu, certified by Microsoft. It's the easiest way to extend your on-premises datacenter to the cloud with Azure Stack HCI.



Windows Server 2019:  
The operating system that bridges on-premises and cloud.



# Introducing PRIMEFLEX for Microsoft Azure Stack HCI



## Integrated system including ...

High-performance and energy-efficient Fujitsu hardware stack

Microsoft software-defined compute and storage

Range of certified server configurations

End-to-end infrastructure support services with single point of contact

The fast track to your Microsoft hyper-converged infrastructure

# Challenges in building the hardware foundation for HCI

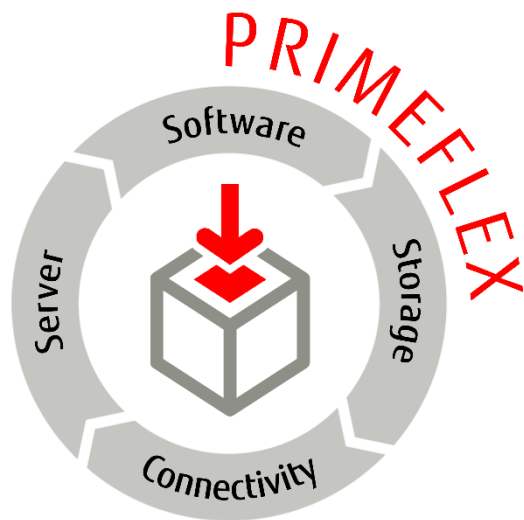
Which components fit best to our individual use case?

Do we have the staff resources to design, test and deploy?

<b>CPU</b>	<b>Memory</b>	<b>HDD</b>	<b>SSD</b>	<b>SAS-Controller</b>	<b>LAN-Controller</b>

DIY (Do-it-Yourself) can be error-prone, time-consuming, risky, expensive

# Integrated Systems PRIMEFLEX: Benefits



## Drive Simplicity –

Avoid trial and error testing

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## Save Time –

Reduce design, integration and deployment efforts

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## Reduce Risk –

Guarantee component compatibility and overall functionality

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## Increase Efficiency –

Reduce maintenance efforts

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## Save costs –

CAPEX and OPEX

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Reduce complexity, time, risk and costs - focus on business

# Why Fujitsu for your Microsoft HCI project



## Fujitsu Server PRIMERGY

Most complete x86-based server portfolio providing excellent virtualization performance and energy-efficiency

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## Fujitsu Data Protection Appliances

Broad range of backup and archiving solutions that perfectly integrate with all PRIMEFLEX systems

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## Fujitsu Infrastructure Manager

Converged, unified management for simplified IT operations

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## Fujitsu license consulting & agreement optimization

Helps maximize investments in MS SW, contain costs and keep compliance

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## Fujitsu Infrastructure Support Services

End-to-end support for Fujitsu Integrated Systems with single point of contact



## Fujitsu experience in MS HCI projects

Range of references demonstrating real-world customer benefits

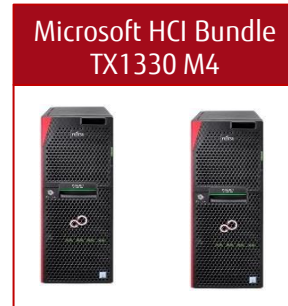
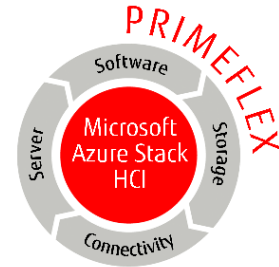
# Special offer: Fujitsu 2-node Microsoft HCI bundles



## Reference architectures for small Microsoft HCI deployments based on PRIMEFLEX for Microsoft Azure Stack HCI

- Provides a highly-available hyper-converged infrastructure at affordable costs
- Cost-optimized design with no external storage systems and LAN switches

HCI  
for under  
20K Euro



Windows Server 2019:  
The operating system that bridges on-premises and cloud.

Most cost-efficient infrastructure foundation for SMB, ROBO and IOT-Edge environments

# Fujitsu Software Infrastructure Manager

## Path to achieving software defined infrastructure



### Simplified IT operations

Converged, unified management across server, storage, networking and 3rd-party devices using a single user interface



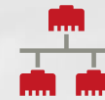
### Increased agility

Intuitive software providing actionable insights leading to reduced customer response time



### Accelerate growth and innovation

Streamlined delivery of IT services to speed the transition to hybrid cloud



23x faster  
troubleshooting






70% less OS  
installation time

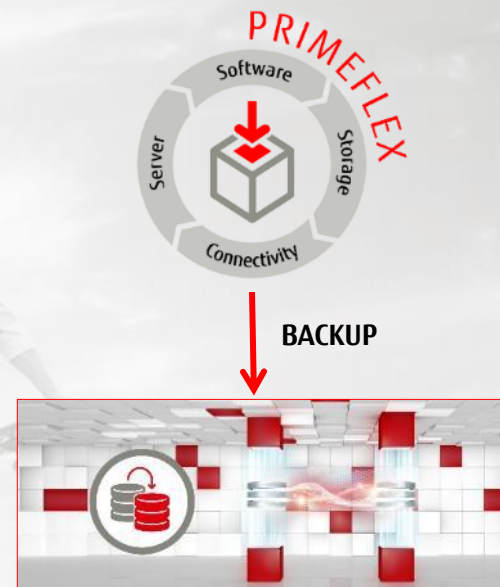
90% less time  
for FW updates

50% less power  
consumption

# FUJITSU Data Protection Portfolio - Backup for Integrated System PRIMEFLEX



-  **Modern Data Management and Protection** – Consolidate and protect data from anywhere, across all platforms
-  **Automated Backup and Recovery** – Protect everything, granular recovery, deep integration
-  **Rich Data Lifecycle Management** – Define storage policies, media mix (disk, flash, tape, cloud)
-  **Efficient Disaster Recovery** – Replication, deduplication, offline & remote backup
-  **Regulatory Compliance** – Long-term archiving, encryption, analytics, reporting



Protect your business against data corruption, deletion or cybercrime

## Fujitsu SolutionPacks in combination with Hardware and Software Support Packs

Single Point of Contact

Technical Solution Support

Software Support

Hardware Support

Reactive Services

Proactive Services

## Designed to deliver end-to-end support for Fujitsu Integrated Systems

Incident management and Single Point of Contact (SPOC) for support for the entire Fujitsu Integrated System

Technical Solution Support (TSS) providing fast access to experts who analyze and identify issues and coordinate failure elimination

Hardware and software support for all released products certified for the respective Fujitsu Integrated System

Optional proactive services like technical account management, system health check and patch information management

Reduce support complexity - increase infrastructure availability

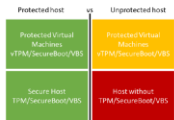


## AZURE STACK HCI: TRUSTED ENTERPRISE VIRTUALIZATION

### Overview of Trusted enterprise virtualization scenario

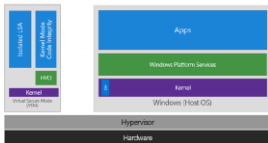
Virtualization-based security (VBS) is a key component of the [security investments in Azure Stack HCI](#) to protect hosts and virtual machines from security threats.

For example, the [Security Technical Implementation Guide \(STIG\)](#) is published as a tool to improve the security of Department of Defense (DoD) information systems, and lists VBS and hypervisor-protected-code integrity (HVCI) as general security requirements. It is imperative to use host hardware that is VBS and HVCI enabled, in order for the protected workloads on virtual machines to fulfill their security promise because protection of virtual machines is not guaranteed on a compromised host.



VBS uses hardware virtualization features to create and isolate a secure region of memory from the normal operating system. Windows can use this "virtual secure mode" to host a number of security solutions, providing them with greatly increased protection from vulnerabilities in the operating system, and preventing the use of malicious exploits which attempt to defeat protections.

VBS uses the Windows hypervisor to create this "virtual secure mode", and to enforce restrictions which protect vital system and operating system resources, or to protect security assets such as authenticated user credentials. With the increased protections offered by VBS, even if malware gains access to the operating system kernel the possible exploits can be greatly limited and contained, because the hypervisor can prevent the malware from executing code or accessing platform secrets.



### How to deploy VBS and HVCI-enabled Azure Stack HCI

#### 1. Plan Hardware Deployment

All the Azure Stack HCI solutions by Fujitsu are certified for the Hardware Assurance Additional Qualification, which tests for [all the functionality needed for VBS](#). However, VBS and HVCI are not automatically enabled in Azure Stack HCI and Step 2 will guide you on how to enable them.

Warning: Hypervisor-protected code integrity (HVCI) may be incompatible with devices not listed in the Azure Stack HCI catalog. Microsoft strongly recommends using an Azure Stack HCI validated solution from our hardware partners for the Trusted enterprise virtualization scenario.

Fujitsu recommends the PRIMERGY TX1330 M4 tower server system as the best fit for the trusted enterprise virtualization on Azure Stack HCI scenario. Please see below the configuration options that have been certified according to the Azure Stack HCI program.

Hybrid: SSD + HDD	
<b>Server</b>	PRIMERGY TX1330 M4(3.5")
<b>Scalability</b>	2 to 4nodes
<b>CPU</b>	1x Intel Xeon E-2124 or better (4-6cores)
<b>Memory</b>	64GB
<b>Drives</b>	<b>Cache</b>
	<b>Capacity</b>
<b>Network</b>	4-10x 3.5" SSD SAS/SATA (4.0TB per node or higher)
<b>RDMA / TPM 2.0</b>	1x PLAN EP MCX4-LX 25Gb 2p SFP28 LP
<b>HBA</b>	yes / yes Fujitsu PSAS CP400i SAS



## AZURE STACK HCI: VIRTUAL DESKTOP INFRASTRUCTURE

### How to deploy VDI on Azure Stack HCI

#### 1. Supported Configurations

Fujitsu recommends the 2U dual-socket PRIMERGY RX2540 M5 rack server system as the best fit for the virtual desktop infrastructure scenario. Please see below the configuration options that have been certified according to the Azure Stack HCI program.



Type	Hybrid: SSD+HDD	All-Flash: All-SSD	All-Flash: NVMe+SSD
<b>Server</b>	PRIMERGY RX2540 M5(2.5" or 3.5")		PRIMERGY RX2540 M5(2.5")
<b>Scalability</b>		2 to 16 nodes	
<b>CPU</b>		2x Intel Xeon Silver 4208 or better (16-56 cores)	
<b>Memory</b>		64GB to 3TB	
<b>Drives</b>	<b>Cache</b>	2-12x 2.5" or 2-6x 3.5" SSD SAS/ SATA (800 GB per node or higher)	2-4x 2.5" NVMe (3.2 TB per node or higher)
	<b>Capacity</b>	4-22x 2.5" or 4-10x 3.5" HDD SAS/SATA (2.4 TB per node or higher)	4-24x 2.5" SSD SAS/SATA (1.92TB per node or higher)
<b>Network</b>	2x PLAN EP QL41xxx	2x PLAN EP MCX4-LX 25Gb 2p SFP28 LP	
<b>RDMA / TPM 2.0</b>		yes / yes	
<b>HBA</b>		Fujitsu PSAS CP400i SAS	

[www.fujitsu.com/global/pf4ashci](http://www.fujitsu.com/global/pf4ashci)



Step by Step guide to [deploy Azure Stack HCI](#). Also install [Windows Admin Center \(WAC\)](#) for managing Azure Stack HCI.

From Windows Admin Center (WAC), set up **Azure Update Management** can quickly assess the status of available updates, schedule installation of required updates, and review deployment results to verify updates that apply successfully.



- Additionally, you can set up additional Azure hybrid services such as Backup, File Sync, Site Recovery, Point-to-Site VPN, Update Management, and Security Center in WAC.

#### 3. Enable VDI support

## AZURE KUBERNETES SERVICE ON AZURE STACK HCI

Azure Kubernetes Service on Azure Stack HCI

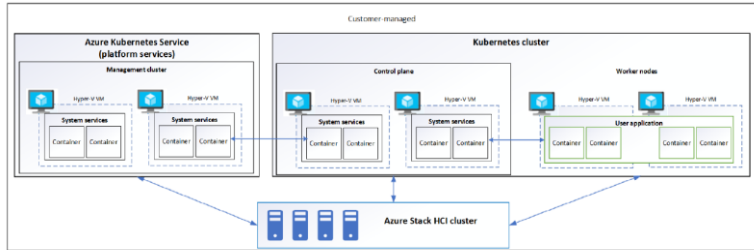


Figure 1 - High-level AKS-HCI Architecture

### AZURE KUBERNETES SERVICE ON AZURE STACK HCI



Figure 2 - Configuring an Azure Stack HCI Cluster in Windows Admin Center

**Step 1: Hardware and OS configuration for Azure Kubernetes Service on Azure Stack HCI**

Fujitsu recommends the 2U dual-socket PREMIER R32540 MS rack server system as the best fit for the Azure Kubernetes Service on Azure Stack HCI scenario. Please see below the configuration options that have been certified according to the Azure Stack HCI program.

Type	Hybrid, 800+ HDD	All Flash, All SSD	All Flash, 100% SSD
Server	PREMIER R32540 MS (2U)	PREMIER R32540 MS (2U)	PREMIER R32540 MS (2U)
Capacity	2.16 TB	2.16 TB	2.16 TB
Cache	2 x 16 GB L3	2 x 16 GB L3	2 x 16 GB L3
Drives	2 x 16 TB 7.2K RPM SAS 6Gbps	4 x 16 TB 7.2K RPM SAS 6Gbps	4 x 16 TB 7.2K RPM SAS 6Gbps
Capacity	4 x 16 TB 7.2K RPM SAS 6Gbps	16 x 16 TB 7.2K RPM SAS 6Gbps	16 x 16 TB 7.2K RPM SAS 6Gbps
Network	2 x 10GbE SFP+ ports	2 x 10GbE SFP+ ports	2 x 10GbE SFP+ ports
BIOS	UEFI BIOS	UEFI BIOS	UEFI BIOS
OS	Windows Server 2019	Windows Server 2019	Windows Server 2019

The wizard will walk you through selecting your nodes, joining the nodes to the domain, installing required roles and features, and updates, before moving on to configuring the physical and virtual networks, clustering and software defined storage. When the wizard is complete, you should see your new cluster in your **All connections** view within Windows Admin Center.

**Step 4: Prepare Windows Admin Center for AKS-HCI**

With your Azure Stack HCI cluster under management of Windows Admin Center, the next step is to add the Azure Kubernetes Service on Azure Stack HCI extension. You would then need to download when you registered for the preview. Please the extension file in a folder on your Windows Admin Center machine, such as C:\AKS-HCI, or an SMB share accessible to the Windows Admin Center machine. Once the extension file is downloaded, follow the steps in [this document](#).

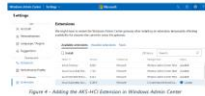


Figure 4 - Adding the AKS-HCI Extension in Windows Admin Center

**Step 5: Set up the Azure Kubernetes Service Host**



## AZURE STACK HCI: HIGH-PERFORMANCE MICROSOFT SQL SERVER

Step by Step guide to [deploy Azure Stack HCI](#).  
Install [Windows Admin Center \(WAC\)](#) for managing Azure Stack HCI.

- Set up Microsoft SQL Server on Azure Stack HCI  
Set up Windows Server or Linux VM
  - Install [SQL Server on Linux](#)
  - Install [SQL Server on Windows](#)

3. Monitoring and performance tuning  
To ensure performance and health of your Microsoft SQL Server instances on Azure Stack HCI it is important that appropriate [monitoring and tuning](#) is put in place. Additional SQL Server database engine tutorials are included [here](#). For tuning SQL Server 2016/2017 for high performance, the following [recommended practices](#) are provided.

- High Availability (HA)  
Azure Stack HCI leverages [Windows Server Failover Clustering \(WSFC\)](#) and can be utilized to support Microsoft SQL Server running in VMs (designed to help with hardware failure). Microsoft SQL Server also offers [Always On availability groups \(AG\)](#) which provides database-level high availability and is designed to help with application and software faults. In addition to WSFC and AG, Azure Stack HCI can also leverage [Always On Failover Cluster Instance \(FCI\)](#) based on using [Storage Spaces Direct](#) technology for shared storage. All of these options can leverage the Microsoft Azure [Cloud Witness](#) for quorum control. It is recommended that cluster [AntiAffinity](#) rules in WSFC be leveraged for the VMs to be placed on different physical nodes in order to maintain uptime for SQL Server in the event of host failures when you configure Always On availability groups.
- Set up Azure hybrid services  
[Azure Site Recovery](#) offers business continuity and disaster recovery (BCDR) strategy. [Set up disaster recovery for SQL Server](#) allows organizations to protect the SQL Server back end of an application to help keep your data safe, and your apps and workloads online, when planned and unplanned outages occur.

[Azure Backup](#) supports backing up and restoring Microsoft SQL Server with application consistency. [Install Azure Backup Server](#) to start backup of your on-prem SQL data.

Alternatively, you can also leverage [Azure Blob Storage service for SQL Server](#) to [backup and restore to Azure Blob Storage service](#). This is suitable for off-site archiving. To manage the Azure Blob Storage backups, you can leverage the [Managed SQL Backup](#) feature included in Microsoft SQL Server.

In addition to the backup scenario, you can setup other database services that Microsoft SQL Server (Microsoft SQL Server 2016/2017/2019) offers, connecting to Azure services such as (but not limited to) [Azure Data Factory](#) and [Azure Feature Pack for Integration Services \(SSIS\)](#).

**How to deploy Microsoft SQL Server on Azure Stack HCI**

1. Hardware and OS configuration for Azure Stack HCI  
Fujitsu recommends the 2U dual-socket PREMIER R32540 MS rack server system as the best fit for the High-performance Microsoft SQL Server scenario. Please see below the configuration options that have been certified according to the Azure Stack HCI program.

Type	Hybrid, 800+ HDD	All Flash, All SSD	All Flash, 100% SSD
Server	PREMIER R32540 MS (2U)	PREMIER R32540 MS (2U)	PREMIER R32540 MS (2U)
Capacity	2.16 TB	2.16 TB	2.16 TB
CPU	2x Intel Xeon Silver 4208 (16 cores)	2x Intel Xeon Silver 4208 (16 cores)	2x Intel Xeon Silver 4208 (16 cores)
Memory	2x 16 GB L3	2x 16 GB L3	2x 16 GB L3
Cache	2 x 16 GB L3	2 x 16 GB L3	2 x 16 GB L3
Drives	4 x 16 TB 7.2K RPM SAS 6Gbps	4 x 16 TB 7.2K RPM SAS 6Gbps	4 x 16 TB 7.2K RPM SAS 6Gbps
Capacity	16 x 16 TB 7.2K RPM SAS 6Gbps	16 x 16 TB 7.2K RPM SAS 6Gbps	16 x 16 TB 7.2K RPM SAS 6Gbps
Network	2 x 10GbE SFP+ ports	2 x 10GbE SFP+ ports	2 x 10GbE SFP+ ports
BIOS	UEFI BIOS	UEFI BIOS	UEFI BIOS
OS	Windows Server 2019	Windows Server 2019	Windows Server 2019

# Gianluca Tonellato

*CEO of NEMESI IT a Fujitsu partner*

- Nèmesi IT nasce a novembre 2000 dalla visione di alcuni tecnici sistemisti che volevano proporre l'informatica nelle aziende in un modo alternativo.
- « Vogliamo che i nostri clienti ci considerino come colleghi a cui rivolgersi per tutto quello che riguarda l'informatica... un PARTNER! ».
- Con un portafoglio di oltre 180 clienti attivi nel 2020, molti dei quali sono medie o piccole imprese, Nèmesi IT ha un ruolo di riferimento nel panorama della consulenza e assistenza per le imprese sui temi dell'Information and Communication Technology e Cyber Security.



- Nemesi IT è da sempre Partner Fujitsu con certificazione Select Expert.
- Abbiamo scelto di proporre Fujitsu per...
  - L'alta qualità dei prodotti
  - Il rispetto che riconosce ai Partner
  - Per il costante supporto efficace ed efficiente che ci danno



■ In particolare proponiamo la soluzione di Iperconvergenza Azure Stack HCI su piattaforma Primergy Fujitsu perché:

- Scalabile
- Affidabile. Nessun Point of Failure.
- Un'interfaccia conosciuta a tutti i sistemisti
- Gestione centralizzata tramite Admin Center
- Ottimo rapporto Prezzo/Funzionalità



# Case Study FOPE – Esigenze del cliente



- Storica azienda industriale con sede a Vicenza che opera nel settore della gioielleria di alta gamma.
- Produce esclusivamente in house, commercializza sui mercati internazionali attraverso una rete di gioiellerie concessionarie e alcune boutique monomarca.
- Presente direttamente sui mercati America, Inghilterra ed Emirati Arabi con proprie società controllate.
- Forte vocazione alla ricerca & sviluppo e utilizzo di tecnologia.
- Quotata dal 2016 alla Borsa di Milano segmento AIM.

VICENZA

FOPE

DAL 1929

## ■ Esigenze:

- Gestionale e Portale B2B sempre disponibile h24 7su7.
- Possibilità di espandere il sistema salvaguardando l'investimento fatto.
- Consolidamento e ampliamento dell'infrastruttura IT.

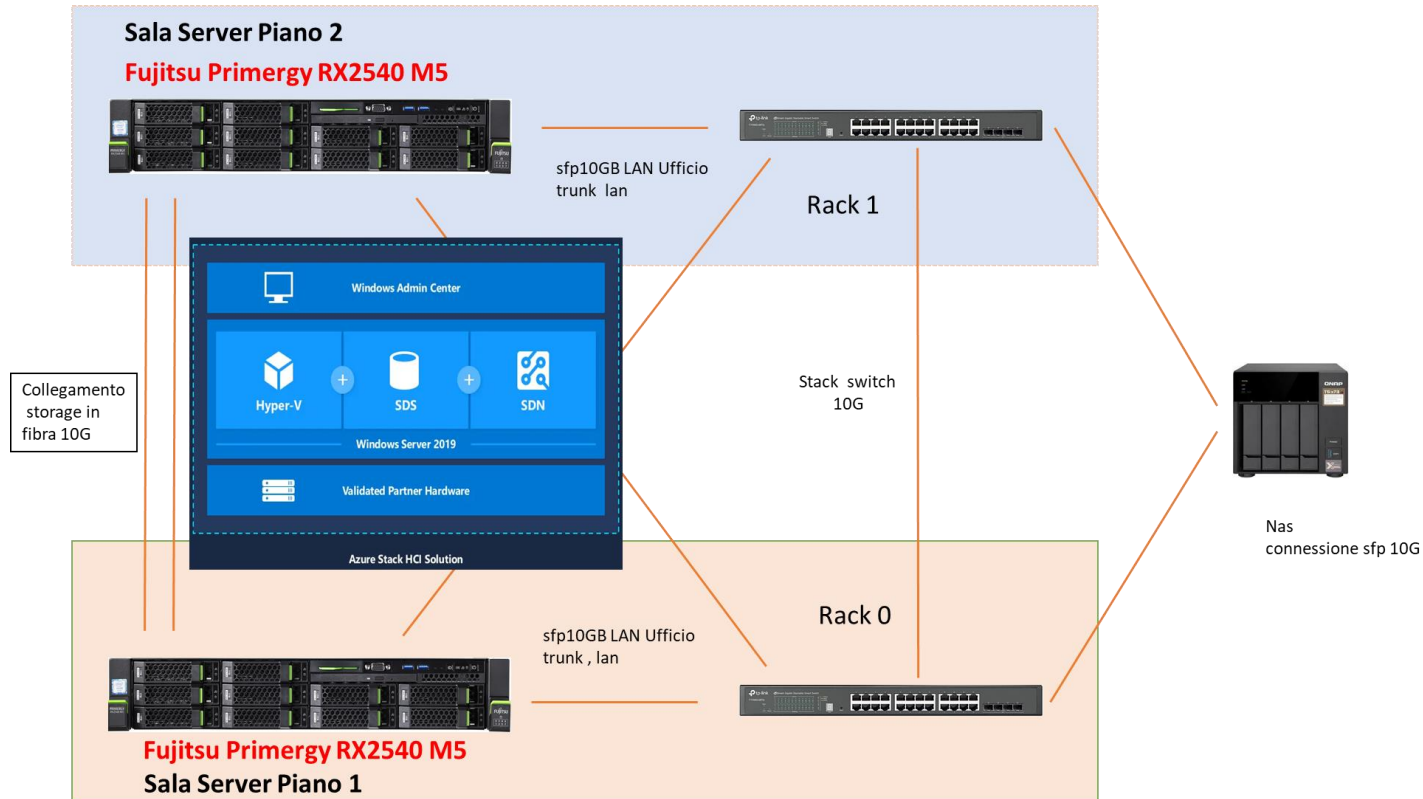
# Case Study FOPE - Realizzazione



- Due mini sale CED su piani diversi e sui due estremi dell'azienda.
- Collegamento in fibra 10G tra i due CED.
- 1 nodo per ogni sala CED.
- Interconnessione per replica storage connesso direttamente in 10Gb.
- Admin Center come servizio in cluster.
- Raddoppiate le prestazioni della soluzione precedente con una soluzione di dischi ibrida.



# Case Study FOPE - Realizzazione



# Key Takeaways



Be agile

Create  
business-centric IT  
Responsive  
Fast, flexible and reliable  
Easy, non-disruptive scalability



Be efficient

Reduce  
TCO  
Reduce storage costs  
Save floor space, power and cooling  
Streamline management



Be safe

Transform  
with confidence  
Reduce deployment risk  
Gain faster time to production  
Pay as you go



Windows Server 2019:  
The operating system that bridges on-premises and cloud.

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# Domande?

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