White Paper

Which virtualization stack is right for you?

The virtualization market is witnessing significant shifts driven by mergers and acquisitions, the emergence of new players, and evolving partnership dynamics. Given this dynamic landscape, many companies may reassess their virtualization strategies and explore alternatives. Based on a broad portfolio and partnerships with all major virtualization vendors, Fujitsu is in a unique position to assist you in shaping your future virtualization strategy. We can show the big picture and provide you with unbiased advice.

Key acquisitions such as the latest one of VMware by Broadcom and the subsequent sell of VMware's End-User Computing Division to the private equity firm Omnissa or the acquisition of Citrix by Cloud Software Group, have been reshaping the competitive landscape.

Apart from these acquisitions, the market has also seen a notable surge in strategic partnerships. Nutanix, for instance, has forged collaborations with RedHat on containers, with Citrix on VDI, and with Cisco on HCI following the End-of-Life of Cisco's hyper-converged Hyperflex solution.

Amidst all these changes, some smaller alternative vendors like PROXMOX, Vates, Virtuozzo or Scale Computing are gaining traction, introducing virtualization solutions based on Open-Source technology.

From a portfolio strategy standpoint, industry leaders such as VMware, Citrix, Nutanix, and Microsoft are progressively realigning their portfolios to encompass containerization, cloud, and edge computing. This shift involves transitioning towards subscription-based licensing models and bundling products into comprehensive packages to deliver added value to customers. However, it's worth noting that such transitions may result in price hikes and customers acquiring products beyond their specific needs.

Migrating from one vendor to another can be a multifaceted endeavor, particularly when multiple products from the same vendor, beyond the basic hypervisor, are in use. While migrating workloads between hypervisors may seem straightforward, several crucial considerations must be addressed before embarking on a migration project:

- Are you able to re-use all your existing hardware, i.e. are all systems listed on the new software vendor's Hardware Compatibility List?
- Are all workloads within scope supported on the alternative hypervisor, i.e. SAP, which is only supported on vSphere and KVM?
- What about integration with network infrastructure or data protection and security solutions?
- How does interoperability with public clouds factor into hybrid scenarios?
- Is there a need to adapt existing automation or operational processes, i.e. monitoring or lifecycle management?
- What migration tools are available?
- Is there a necessity to re-skill operational admin staff?

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Fujitsu Portfolio Options for Virtualization

Fujitsu provides a broad array of options to its customers and is therefore well positioned to act as a trusted advisor capable of guiding customers through the evolving virtualization terrain. The following sections give an overview of the major virtualization vendors available through Fujitsu.

Commercial Vendors

	VMware	Microsoft Windows Server	Microsoft Azure Stack HCI	Nutanix
General Vendor Comparison				
Hypervisor	vSphere	Hyper-V	Hyper-V	AHV, vSphere
HCI Solution	vSAN	Storage Spaces Direct	Storage Spaces Direct	AOS
Network Virtualization	NSX	SDN/Network Controller	SDN/Network Controller	Flow (only with AHV)
Central Management	vCenter	WAC, SC	WAC, SC	Prism
Container-Management	Tanzu	AKS	AKS	Nutanix Kubernetes Engine
VDI Solution	Horizon	AVD	AVD	Frame from Dizzion, Citrix
Migration Tools	VMware Converter	SC VMM Azure Migrate	SC VMM Azure Migrate	Nutanix Move (vSphere, Hyper-V, AWS, Azure to AHV)
Public Cloud Connectivity	AWS, Azure, GCP via HCX	Azure via Azure Arc	Azure via Azure Arc	AWS, Azure, GCP via Nutanix Cloud Manager
License Model	Subscription vSphere: per phys. CPU-Core vSAN: per storage capacity (TiB)	Perpetual Per phys. CPU-Core	Subscription Per phys. CPU-Core	Subscription AOS: per phys. CPU-Core
Fujitsu Integration, Deployment and Support Options				
Server Management Integration	ISM integration in vCenter, vLCM, Aria Orchestrator / Operations	ISM integration in WAC / SC OM / SC VMM	ISM integration in WAC / SC OM / SC VMM	iRMC integration in Nutanix Prism/LCM
Deployment Options	- Bespoke Deployment - Integrated System incl. Implementation Pack	- Bespoke Deployment - Integrated System incl. Implementation Pack	- Bespoke Deployment - Integrated System incl. Implementation Pack	- Bespoke Deployment - Integrated System incl. Implementation Pack
Support Options	- Support Pack / Service Contract Hardware - Support Pack Software - Infrastructure Support (TSS, SPOC) for vSAN-based Integrated System	- Support Pack / Service Contract Hardware - Support Pack Software - Infrastructure Support (TSS, SPOC) for Integrated System	- Support Pack / Service Contract Hardware	- Support Pack / Service Contract Hardware - Infrastructure Support (SPOC) for Integrated System

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VMware by Broadcom

Despite the prevailing uncertainties in the market following the Broadcom acquisition, it's crucial to emphasize that Fujitsu will continue the successful 20+ years of strategic partnership with VMware.

- After signing a new OEM agreement, Fujitsu will be one of a select few VMware Value Added OEM (VAO) partners authorized to sell the new VMware vSphere Foundation (VVF) and the VMware Cloud Foundation (VCF) packages in conjunction with PRIMERGY servers to VMware's entire customer base, including its strategic customers.
- The VMware virtualization software stack (vSphere, vSAN) included in the VMware vSphere Foundation package is certified and supported on selected PRIMERGY systems. For more information, please see the current PRIMERGY OS release matrix and the VMware Compatibility Guide for PRIMERGY vSAN Ready Nodes (OSA / ESA). According to VMware VMmark benchmarks, the PRIMERGY RX2540 M7 system is the best-performing 2-socket Intel-based server platform for VMware environments.
- For server management, the Fujitsu Infrastructure Manager (ISM) integrates with VMware vCenter.
- Fujitsu offers an Integrated System that allows customers to implement a converged infrastructure based on VMware vSphere with external storage or a hyper-converged infrastructure based on VMware vSAN storage (vSAN Ready Nodes). For more information on the Fujitsu PRIMEFLEX Integrated System offering for VMware, please see here.
- In the future, the VCF package will also be available as an Engineered Solution. An Engineered Solution is a certified and quality-assured complete solution consisting of PRIMERGY servers, the VCF software and infrastructure management.
- PRIMEFLEX Integrated Systems may include specific optional deployment and infrastructure support services. For availability, please check the Fujitsu ImplementionPacks and Infrastructure Support pages.
- Since July 2024, the former VMware EUC portfolio including Horizon is available through a new company Omnissa owned by the global investment firm KKR. Fujitsu is in regular contact with Omnissa to sign a global contract. Horizon is currently only available via reselling in countries via a local VMware Distributor and only in direct business without a partner in between.

Nutanix

- The Nutanix virtualization software stack (AHV, AOS) is certified and supported on selected PRIMERGY systems. For more information, please see this data sheet.
- For server management, the Nutanix Life Cycle Manager in Prism directly integrates with the iRMC in the PRIMERGY systems, i.e. for firmware updates.
- Fujitsu offers an Integrated System that allows customers to implement a Nutanix hyper-converged infrastructure. For more information on the Fujitsu PRIMEFLEX Integrated System offering for Nutanix, please see here.
- Fujitsu as an OEM partner of Nutanix is integrating and providing the software based on the Nutanix Cloud Platform packages without any restrictions.
- PRIMEFLEX Integrated Systems may include specific optional deployment and infrastructure support services. For availability, please check the Fujitsu ImplementionPacks and Infrastructure Support pages.
- The Nutanix VDI solution FRAME was acquired by Nutanix several years ago but sold-off again end 2023 to a company called Dizzion. While Dizzion is still available with Nutanix, the recommend VDI solution by Nutanix is now based on Citrix. For more information on Citrix on Nutanix, please see here.

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Microsoft

- The Microsoft virtualization software stack based on Windows Server OS or Azure Stack HCI OS (Hyper-V and Storage Spaces Direct) is certified and supported on selected PRIMERGY systems. For more information, please see the current PRIMERGY OS release matrix and the Azure Stack HCI solutions catalog.
- For server management, the Fujitsu Infrastructure Manager (ISM) integrates with the following Microsoft management systems: Microsoft Windows Admin Center (WAC), Microsoft System Center Operations Manager (SCOM), Microsoft System Center Virtual Machine Manager (SCVMM).
- Fujitsu offers two Microsoft-based Integrated System solutions that allow customers to implement a Microsoft hyper-converged infrastructure based on the Windows Server or on the Azure Stack HCI operating system. For more information on the Fujitsu PRIMEFLEX Integrated System offering for Microsoft, please see here.
- Fujitsu is an OEM partner of Microsoft offering Microsoft Windows Server OS OEM/ROK. For Azure Stack HCI the license needs to be purchased direct at Microsoft or via a Microsoft partner.
- PRIMEFLEX Integrated Systems may include specific optional deployment and infrastructure support services. For availability, please check the Fujitsu ImplementionPacks and Infrastructure Support pages.
- The Microsoft VDI solution “Azure Virtual Desktops” is available also for on-premises deployments on Windows Server or Azure Stack HCI.

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Commercial Open-Source Vendors

	SUSE	RedHat	Citrix
General Vendor Comparison			
Hypervisor	Xen, KVM, KubeVirt	KVM, KubeVirt	XenServer
HCI Solution	Harvester	OpenShift add-ons: Virtualization plus Data Foundation	--
Network Virtualization	3rd-party	3rd-party	3rd-party
Central Management	Harvester GUI	OpenShift GUI	XenCenter
Container-Management	SUSE Rancher	OpenShift	Container Management Supplemental Pack for XenCenter
VDI Solution	3rd-party	3rd-party	Citrix Virtual Apps and Desktops
Migration Tools	3rd-party	Migration Toolkit for Virtualization (MTV): vSphere to OpenShift container	XenServer Conversion Manager (vSphere to XenServer)
Public Cloud ConnectivitY	AWS, Azure and GCP via SUSE Manager	AWS, Azure and GCP via OpenShift	AWS, Azure and GCP via Citrix DaaS
License Model	Subscription - SLES: per phys. CPU-socket-pair or instance-pair for VMs - Rancher / Harvester: per node	Subscription - RHEL: per phys. CPU-socket-pair or instance-pair for VMs OpenShift: per phys CPU or vCPUs	Subscription -XenServer: per phys. CPU-socket
Fujitsu Integration, Deployment and Support Options			
Server Management Integration	Monitoring/LCM via iRMC / ISM	Monitoring/LCM via iRMC / ISM	Monitoring/LCM via iRMC / ISM
Deployment Options	- Bespoke Deployment	- Bespoke Deployment	- Bespoke Deployment
Support Options	- Support Pack / Service Contract Hardware - Support Pack / Service Contract Software	- Support Pack / Service Contract Hardware - Support Pack / Service Contract Software	- Support Pack / Service Contract Hardware

RedHat and SUSE

The RedHat Enterprise Linux (RHEL) and SUSE Linux Enterprise Server (SLES) operating systems including the hypervisor (KVM) are certified and supported on selected PRIMERGY systems. This means that these server systems have met the OS Partner Certified/Logo program requirements and Fujitsu provides technical support for the system-specific server drivers and ISM management software that are compatible with the operating system. RHEL and SLES are both available as OEM offerings from Fujitsu. For details on the range of RedHat and SUSE products for which Fujitsu provides software support, please see the data sheets on the Fujitsu Software Support Pages.

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Citrix

The Citrix XenServer hypervisor is also certified on selected PRIMERGY systems, but Fujitsu doesn't provide any technical support for drivers and server management software.

While being leading in virtual desktops and apps, Citrix has expanded their horizon by integrating XenServer and NetScaler capabilities into the offerings as combined licenses instead of separate SKU's. Which means that Citrix users now have the choice of only 3 license types: Citrix Private Cloud, Citrix Universal Hybrid Multi Cloud and the Citrix Platform license, which Fujitsu can offer through local distribution.

- **Citrix Private Cloud**: This license is designed for customers who want to deploy Citrix solutions in a private cloud environment. It includes Citrix Virtual Apps and Desktops, Remote PC, Workspace Environment Manager, HDX Bandwidth Optimizations, Citrix Provisioning Services, Autoscale (on-prem), Citrix App Layering, Session Management & Recording and XenServer Premium Edition.
- **Citrix Universal Hybrid Multi Cloud**: This is a new subscription that includes all features of Citrix Private Cloud plus Public Cloud Integrations, Gateway Service, Smart Access, Adaptive Authentication, App Protection, Citrix DaaS Premium, 1000 GB of NetScaler throughput with unlimited instances and Citrix Endpoint Management. It is only offered for 250 or more seats. Citrix Universal subscription allows you to use both IT-managed CVAD and Citrix DaaS for the subscription period.
- **Citrix Platform Licenses**: This license goes even further in value, providing enterprise-wide usage for all your users and apps, while enabling you to expand to new use cases that go beyond traditional virtualization and ADC, like zero trust private access, an enterprise browser for secure web and SaaS delivery, and advanced insights and observability across the platform. It includes all features in Citrix Universal Hybrid Multi Cloud plus Citrix Secure Private Access, Enterprise Browser, Security and Performance Analytics, UberAgent and unlimited NetScaler instances with unlimited throughput capacity.

Other Open-Source based Virtualization Vendors

In addition to the established vendors mentioned above, there are emerging players like Proxmox, Vates or Virtuozzo gaining traction in the virtualization space. For example, Proxmox is increasingly sought after in many countries as a viable virtualization platform due to its cost-efficient virtualization approach based on Open-Source software. These solutions typically operate on standard x86 servers, making Fujitsu's PRIMERGY systems an ideal hardware platform. Although these vendors are currently not listed on the PRIMERGY OS release matrix, there is no loss of hardware warranty when utilizing this kind of Open-Source based software. However, it's important to note that there is currently no validation of these software stacks in combination with different PRIMERGY hardware components (e.g., LAN controllers). As a result, support may be limited to issues directly attributable to clearly defective hardware components or the software itself.

For more information on all supported Open-Source distributions (including also a range of non-commercial, community and regional Linux Operating Systems, please see the current PRIMERGY OS release matrix.

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Fujitsu Services for Virtualized Environments

In addition to the pure virtualization software in combination with our PRIMERGY systems, Fujitsu provides a range of consulting services aimed at assessing and reshaping a customer's virtualization landscape. These consulting services are tailored to meet specific needs, including assistance in the areas of "Hybrid Cloud" and "VDI":

- Hybrid Cloud Assessment Services: For those who don't know how to start off their hybrid cloud journey, this Hybrid Cloud Assessment Service gives customers a complete overview of their IT environment in just 6 weeks and provides them with valuable recommendations on how to optimize their IT infrastructure to make it fit for a hybrid cloud future.
- VDI Assessment Service: The VDI Assessment Service assists customers in determining the suitability of a Virtual Desktop Infrastructure for their use case. In collaboration with our industry-leading solution partner Cutter Group, Fujitsu provides a fixed-price workshop, proof of concept, and reporting package. This service is designed to propose and validate a VDI solution tailored specifically to a customer's infrastructure and business needs.

Summary

If any of the current shifts in the virtualization market affect your business and you are looking into alternatives to your current virtualization platform, Fujitsu is here to help. Whether you are unhappy with your current vendor or in need of modernizing your IT infrastructure for other reasons, a closer look to the individual use case becomes imperative. It's essential to consider all implications a potential vendor change may have on the overall IT infrastructure operations. By choosing Fujitsu, you will benefit from our vast experience in deploying large data center infrastructures. We will help you understand the technology options available and develop an effective migration strategy that is aligned with your business needs.

For support in technical discussions get in touch with your local Fujitsu or partner pre-sales teams or contact: expert.primergy@fujitsu.com or expert.integratedsystems@fujitsu.com.

Glossary

ADC: Application Delivery Controller
AHV: Nutanix Acropolis Hypervisor
AKS: Microsoft Azure Kubernetes Services
Aria: VMware's cloud management suite
AOS: Nutanix Acropolis Operating System
AVD: Microsoft Azure Virtual Desktops
AWS: Amazon Web Services (Amazon Cloud Platform)
Azure: Microsoft Cloud Platform
CVAD: Citrix Virtual Apps and Desktops
DaaS: Desktop as a Service
Flow: Nutanix Network Virtualization software
Frame: Dizzion's cloud-native, hybrid and multi-cloud, Desktop as a Service (DaaS) platform (formerly from Nutanix)
GCP: Google Cloud Platform
Harvester: SUSE HCI solution
HCX: VMware Hybrid Cloud Extension software
HDX: High-definition video streaming service
Horizon: Virtual Desktop Infrastructure software from Omnissa (formerly VMware)
Hyper-V: Microsoft Hypervisor
iRMC: integrated Remote Management Controller
KubeVirt: An open-source project that enables virtual machines (VMs) and containerized workloads to coexist within Kubernetes clusters
KVM: Kernel-based Virtual Machines
ISM: Fujitsu Infrastructure Manager

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LCM: Life Cycle Manager
NSX: VMware Network Virtualization software
OpenShift: RedHat Kubernetes Management Platform
Prism: Nutanix Management software
RHEL: Red Hat Enterprise Linux
Tanzu: VMware Kubernetes Management Platform
TiB: A tebibyte is a unit of measurement in computers and similar electronic devices using the binary system
TTS: Technical Solution Support
SC OM Microsoft System Center Operation Manager
SC VMM: Microsoft System Center Virtual Machine Manager
SDN: Software Defined Networking
SLES: SUSE Linux Enterprise Server
SPOC: Single Point of Contact
Storage Spaces Direct: Virtual storage software in Windows Server (for HCI use cases)
vCenter: VMware Management software
VDI: Virtual Desktop Infrastructure
vLCM: VMware virtual Life Cycle Manager
vSAN: VMware virtual SAN software (for HCI use cases)
vSphere: VMware hypervisor
WAC: Windows Admin Center
Xen: Free and open-source type-1 hypervisor
XenCenter: Management tool for XenServer environments
XenServer: Hypervisor software (formerly Citrix Hypervisor)

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