# SIMATIC Virtualization as a Service

Future-proof modernization
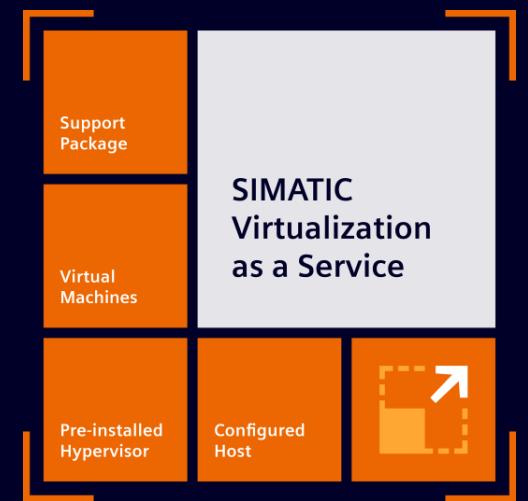
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Innovative concepts for the optimized maintenance and modernization of PC-based control systems are key

Operative challenges

- Apart from the preventive maintenance of the host platform, it is particularly the maintenance and care of the installed software components which is decisive for the lifecycle costs of a PC-based control system.

- The integration of IT-technologies into the industrial environment enables innovative concepts here as well, such as system virtualization.

- System complexity is increasing - at the same time specific know-how is getting scarce, and resources are limited

- Requirements and international targets regarding sustainability and energy savings are the focus and are increasingly becoming mandatory. They also have an impact on the company's image.

Innovative concepts like virtualization can reduce lifecycle costs and simplify modernization of PC-based control systems.

Required solution/Possible consequences

Cut lifecycle costs
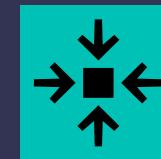
Simplify complex system updates and system expansions
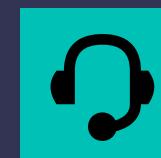
Fast, reliable service and support

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Future-proof modernization
with SIMATIC Virtualization as a Service

Solution and Service

SIMATIC Virtualization as a Service is a future-oriented virtualization technology including suitable software and host components as well as services throughout the entire lifecycle. Everything from a **single source** – with all components working together in harmony.

- **Module − Configured Host:**
  Host and management console

- **Module − Pre-installed Hypervisor:**
  Installation and configuration of the virtualization layer

- **Module − Virtual Machines:**
  Delivery of a virtual machine ready for operation

- **Modul − Support Package:**
  Includes pre-installation and configuration of the total system, Technical Support, system documentation and After-Sales-Service

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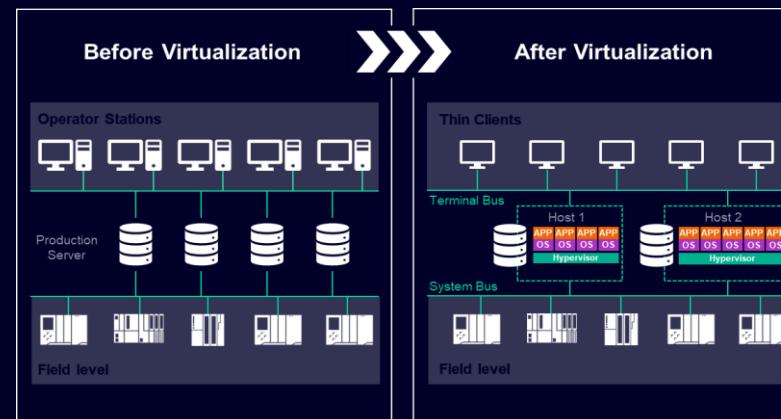
SIMATIC Virtualization as a Service
## What does virtualization mean?

Through virtualization, the operating system and the user software of a computer are decoupled from its host.
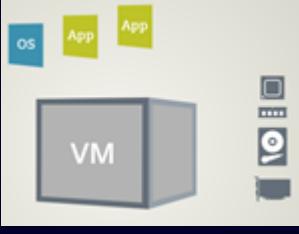
The operating system and the user software are made available in form of a virtual machine (VM).
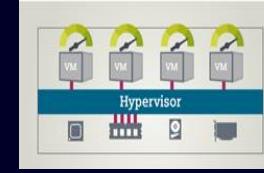
A hypervisor is installed as an additional software layer on a high performance server; it allows for the integration of several virtual machines on only one host.
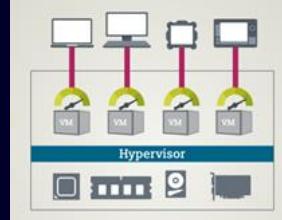
The hypervisor handles the dynamic distribution of the host resources to the virtual machines.
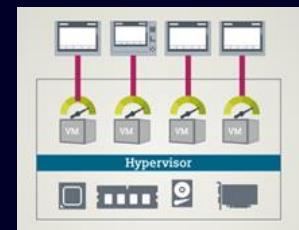
The virtual machines are accessed through energy- and cost-efficient Thin Clients.
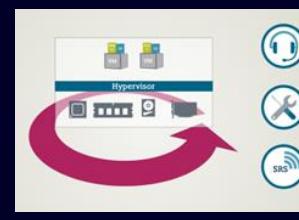
SIMATIC Virtualization as a Service offers this technology as a ready-to-run complete system including configuration and system support.

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SIMATIC Virtualization as a Service
An automation system before and after virtualization

Before Virtualization

Operator Stations

Production Server 1 Production Server 2

Field level

After Virtualization

Thin Clients

Terminal Bus

Host 1
APP APP APP
OS OS OS
Hypervisor

Host 2
APP APP APP APP
OS OS OS OS
Hypervisor

System Bus

Field level

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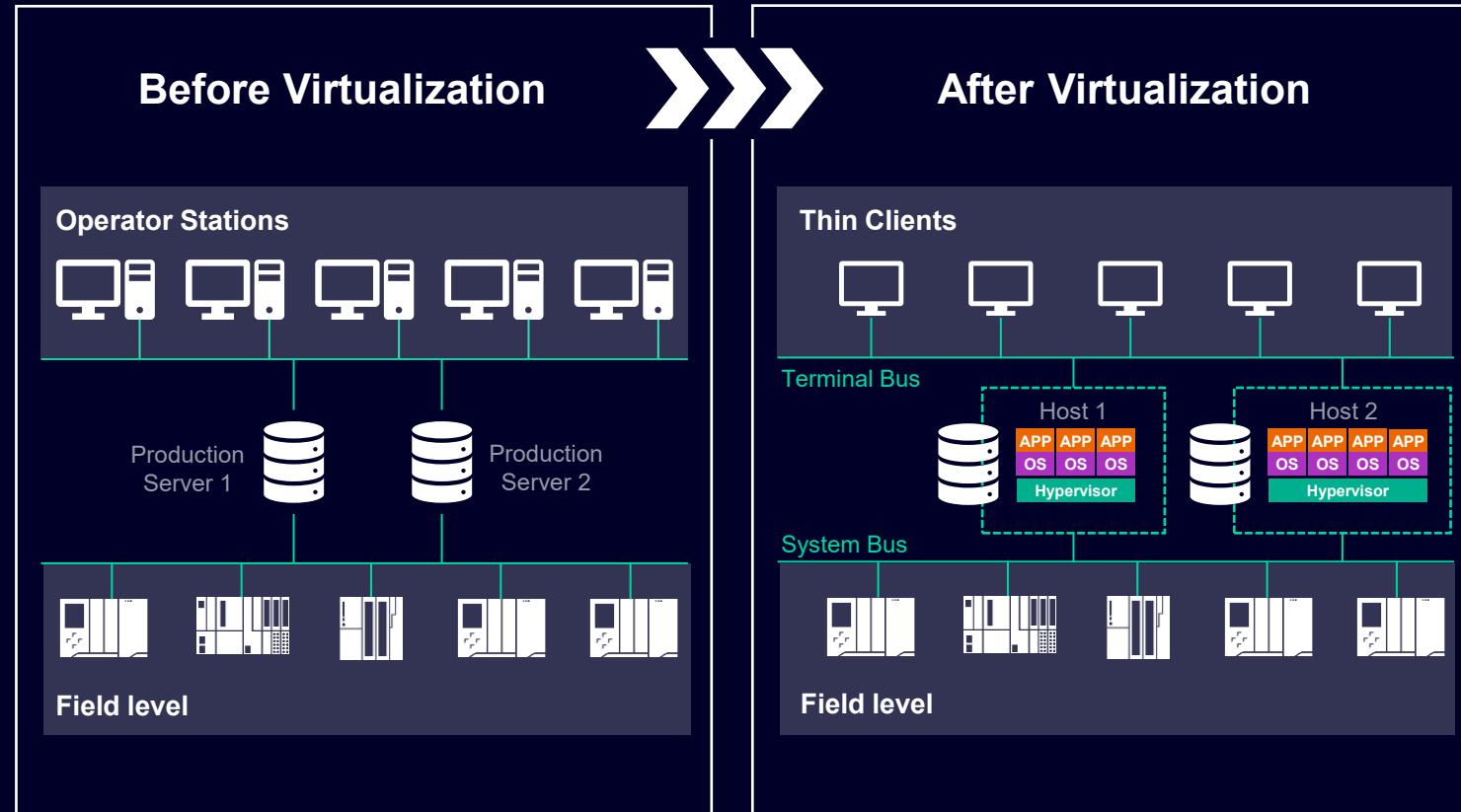
SIMATIC Virtualization as a Service
Module "Configured Host"

The system platform consists of the host (HPE ProLiant or DELL PowerEdge) and a management console (HP Thin Client or DELL).

Several hosts are available – they are equally performant and have linear scaling:
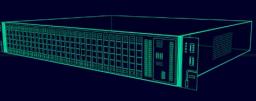
	S[2] 16x1	M 24x1	L[3] 16x2	XL 24x2
Cores	16	24	32	48
RAM [GB]	128	192	256	384
SSD[1] [GB]	3.200	4.800	6.400	9.600

Expandable via MLFB: RAM, SSD, NIC
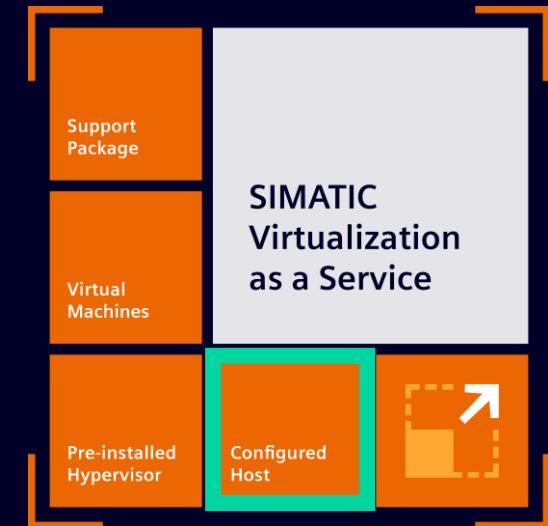
[1] net - after RAID 5 redundancy
[2] also as Max Performance available: faster CPU; 256GB RAM
[3] also as Max Performance available: faster CPU; 512GB RAM

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SIMATIC Virtualization as a Service
Module "Configured Host" – S2D Cluster

Digital systems must be highly available in order to reduce system downtime in case of a host failure.

We offer a preconfigured hyper-converged storage approach, completely integrated in the SIMATIC Virtualization as a Service. The complete **HCI cluster** consists of minimum 2 standardized hosts and can be flexibly enlarged[1] with further hosts.

Currently, only the Direct Attached (DAC) cluster is available, meaning only one fire zone. The implementation of the switched variant is planned for the near future.

S2D Host

S2D Host

HCI

S2D Host

Support Package

Virtual Machines

Pre-installed Hypervisor

SIMATIC Virtualization as a Service

Configured Host

Pre-installation and configuration

- Configuration of the hosts

- Installation and configuration of the Hyper-V Software

- Installation and configuration of the FailoverCluster

- All necessary administrative tools are also available

[1] Currently a maximum of 3 hosts in one fire zone, Further options will follow

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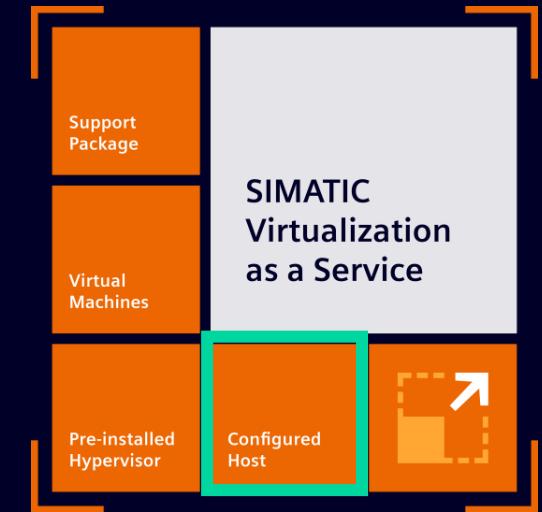
SIMATIC Virtualization as a Service
Module "Configured Host" – S2D Cluster

Digital systems must be highly available in order to reduce system downtime in case of a host failure.

We offer a preconfigured hyper-converged system approach, completely integrated in the SIMATIC Virtualization as a Service portfolio.

The HCI cluster[1] consists of either of two or three S2D (HCI) hosts plus a Quorum server.

The Quorum server includes additionally a pre-installed SIDSI Back & Restore instance.

This architecture requires no separate switch-based storage network.
(highspeed **D**irect **A**ttached **C**opper cables are in use)
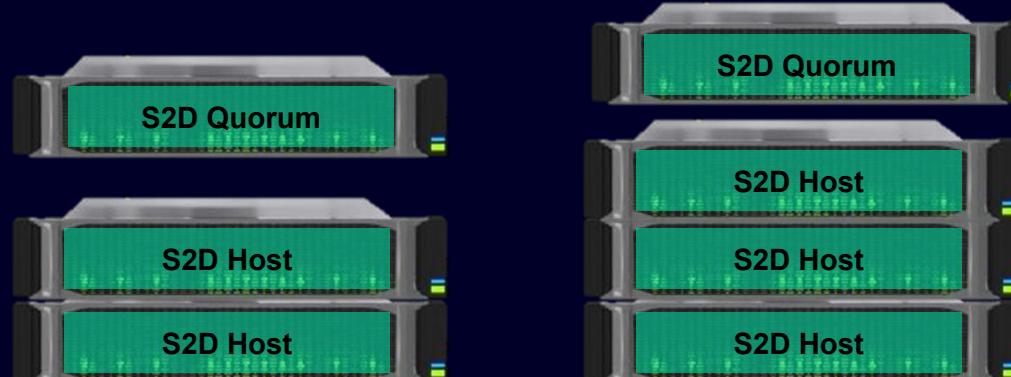
S2D Quorum

S2D Quorum

S2D Host

S2D Host

S2D Host

S2D Host

S2D Host

Pre-installation and configuration

- Configuration of the hosts

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- Installation and configuration of the Failover-Cluster

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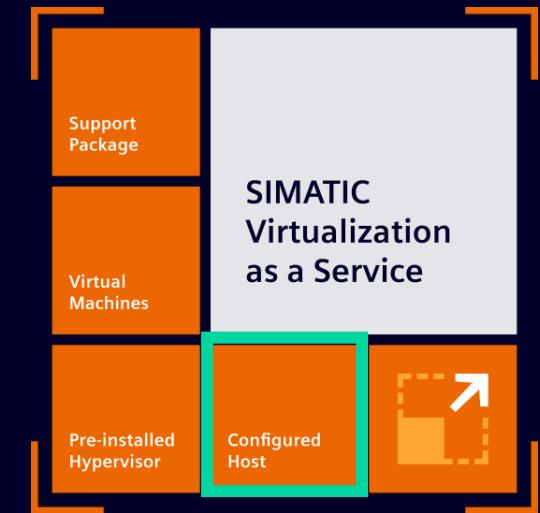
SIMATIC Virtualization as a Service
Module "Configured Host" – Overview High Available Systems

The following combinations of hosts and HA-options are possible:

	Standard				Max Performance	
	S	**M**	**L**	**XL**	**S**	**L**
CPU	16x1	24x1	16x2	24x2	16x1 MP	16x2 MP
RAM [GB]	128	192	256	384	256	512
Storage [TB]	3.2	4.8	6.4	9.6	3.2	6.4

	HCI	
	S	**L**
CPU	16x1	16x2
RAM [GB]	128	256
SSD Storage [TB]	4.0	7.5

SIMATIC Virtualization as a Service

Support Package

Virtual Machines

Pre-installed Hypervisor

Configured Host

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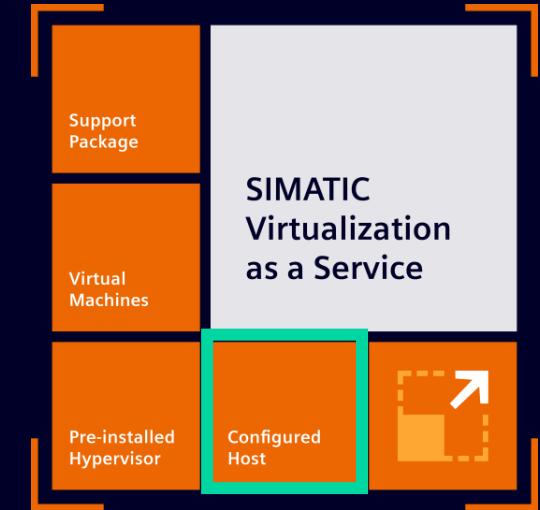
SIMATIC Virtualization as a Service
Module "Pre-installed Hypervisor - based on Microsoft Hyper-V"

Maximize your efficiency with Microsoft **Hyper-V**. The cost-effective and powerful virtualization solution.

The benefits at a glance:

- **Cost efficiency**: Integrated into Windows Server licenses.
- **Seamless Integration**: Perfect alignment with Microsoft products.
- **Powerful Performance**: Optimal performance for Windows-based VMs.
- **Security**: Protection through TPM and Secure Boot.

The new Hypervisor "Hyper-V" is already released for common SIEMENS DCS like PCS 7, TIA Portal or WinCC

- It´s system-tested, pre-installed and pre-configured
- Extended consolidated 3, 5 or exclusively also 7 years support

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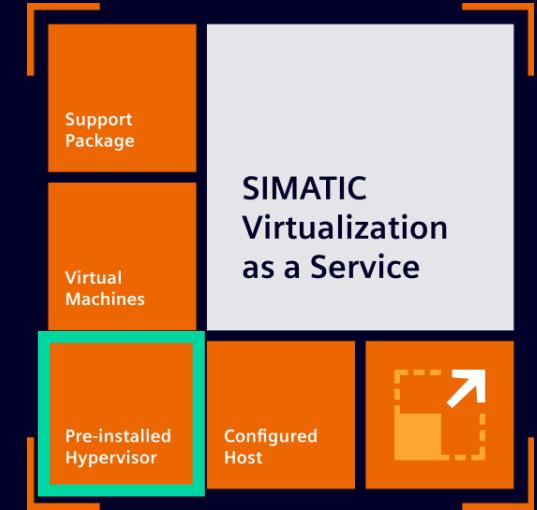
SIMATIC Virtualization as a Service
Module "Pre-installed Hypervisor - based on Hyper-V"

On the basis of the system platform, a virtualization layer is installed that handles the resource distribution of the physical host to the virtual machines. Hyper-V is used as the virtualization software.

- Preinstalled and preconfigured hypervisor software based on Microsoft Hyper-V

- Hyper-V Manager and Windows Admin Center as centralized management of your virtual infrastructure. Available for all systems on the mandatory Management Console
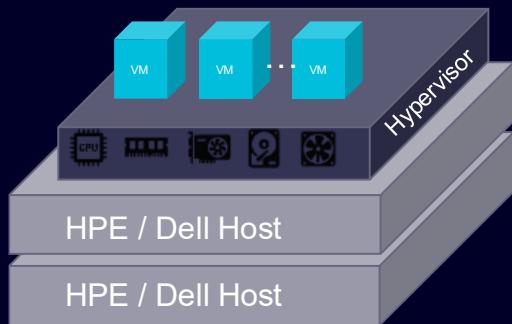
Pre-installation and configuration
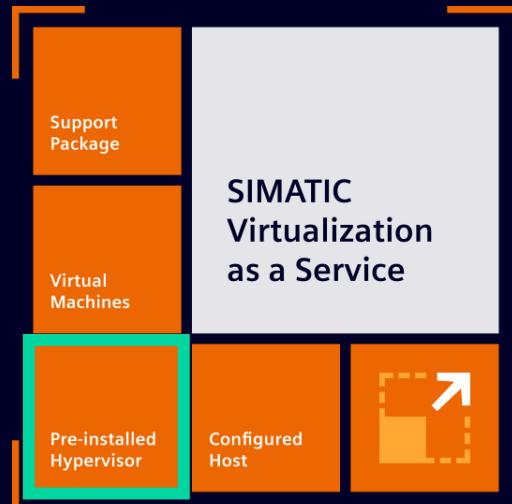
- Installation and configuration of the hypervisor Software based on Microsoft Hyper V

- Activated TPM Module and Secure Boot in all hosts

- Complete virtual network configuration

- Fully licensed software

- Pre-installed administration and maintenance software on the Management Console

VM   VM   ...   VM
Hypervisor
CPU
HPE / Dell Host
HPE / Dell Host

Support Package
Virtual Machines
Pre-installed Hypervisor
Configured Host
SIMATIC Virtualization as a Service

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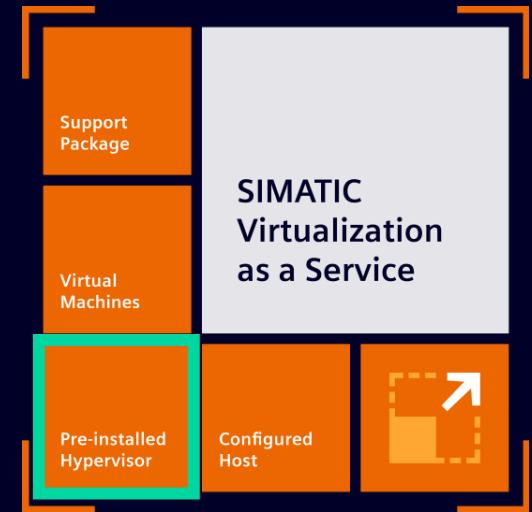
SIMATIC Virtualization as a Service
Module "Pre-installed Hypervisor - Comparison ESXi and Hyper-V"

The new pre-installed hypervisor Microsoft „Hyper-V" compared to VMware by Broadcom:

	VMware ESXi	Microsoft Hyper-V
Costs	Separate licensing - can be more expensive initially but may offer more advanced features	Integrated in Windows Server
Integration	Provides extensive support for a variety of operating systems – incl. macOS, making it more flexible	Seamless integration with other Microsoft products like Windows Server, System Center, and Azure
Management Tools	Comprehensive management tools like vSphere web client and vCenter Server	Powerful management tools like Hyper-V Manager and Windows Admin Center
Performance	Known for its performance optimization and resource management capabilities	Offers excellent performance, especially when paired with Windows-based VMs
Security	Good security and monitoring features	Built-in security features like Shielded VMs that provide additional protection
Support Agreement	Fixed 5 years duration, VMware maintenance support limited to 05/2029	Selectable: 3, 5 or 7 years
Dependance	Virtual machines and SIEMENS application are bound to the virtual hardware version of VMware	No dedicated dependency between virtual machine and SIEMENS application

Support Package

Virtual Machines

Pre-installed Hypervisor

Configured Host

SIMATIC Virtualization as a Service

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SIMATIC Virtualization as a Service
Module "Virtual Machines"

On the system platform, a virtual machine is delivered ready for operation. On every virtual machine, a Microsoft Windows Server 2019 or 2022 64-bit (with activated license) is preinstalled.

We have broad expertise in hosting the following applications:

- SIMATIC PCS neo
- SIMATIC PCS 7
- SIMATIC Step 7
- SIMATIC WinCC
- TIA Portal
- BRAUMAT & SISTAR
- SIMIT
- COMOS
- DESIGO CC

We are happy to advise you on the integration of your application.

SIMATIC PCS 7

TIA Portal

Support Package

Virtual Machines

Pre-installed Hypervisor

Configured Host

SIMATIC Virtualization as a Service

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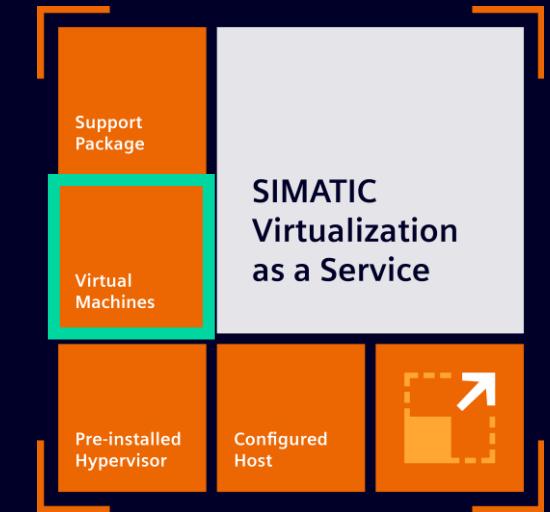
SIMATIC Virtualization as a Service
# Module "Support Package"

Installation & Configuration
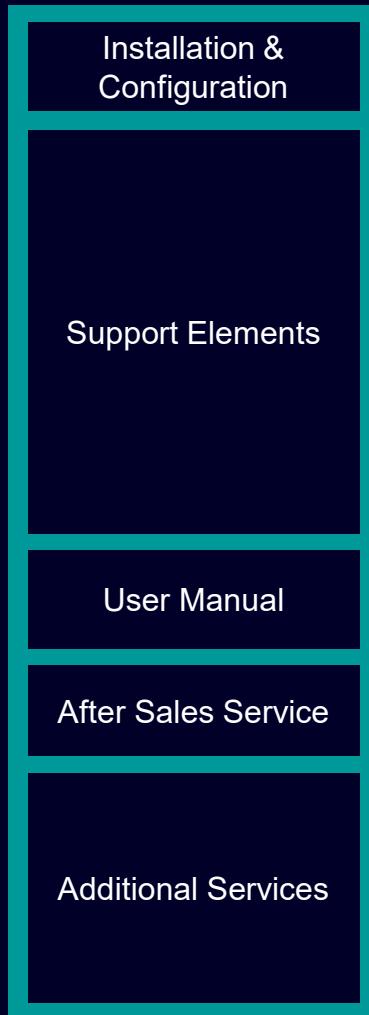
Pre-installation and configuration of the servers is part of the delivery scope

Support Elements

- 3-, 5- and 7-years for Hyper-V
- Technical Support for all used components included: Host, operating systems, Hypervisor, SIMATIC products
- One contact for all inquiries
- Individual support by experts (phone/eMail), processing duration of each case up to 2h. No limitation of cases
- Processing of inquiries regarding functions and system handling
- Coordination of the support activities regarding components from third parties
- DMR (Defective Media Retention) for broken storages – Customer IP will remain on site

User Manual

In addition to the documentation of the HW/SW components, the system documentation includes a detailed technical manual, instructions, FAQ's, upgrade procedures and application examples

After Sales Service

Warranty (up to 84 months after purchase) and spare parts availability until EOL + remaining service contract period

Additional Services

- Clients with linux based IGEL Operating System for Vmware hypervisor
- cRSP Ready Management Console
- Supplementary Lifecycle Services: Remote Services
- Supplementary Lifecycle Services: Industrial Cybersecurity Services

Support Package

Virtual Machines

Pre-installed Hypervisor

Configured Host

SIMATIC Virtualization as a Service
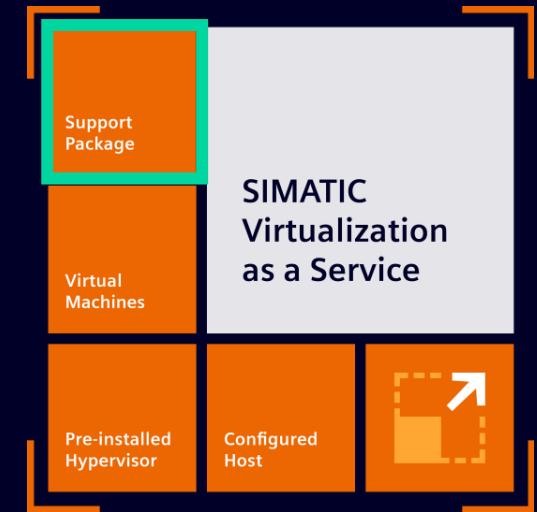
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SIMATIC Virtualization as a Service
as part of the
Managed IT/OT Infrastructure

SIMATIC Virtualization as a Service

- Support Package
- Virtual Machines
- Pre-installed Hypervisor
- Configured Host
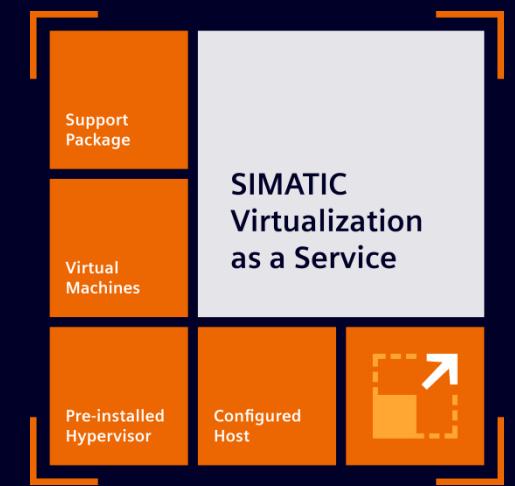
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Why not profiting from the industrial digitalization age and get Siemens on board for your IT/OT infrastructure?

Managed IT/OT Infrastructure

The perfect symbiosis of hardware, software and services

- includes a ready-to-run high-available IT infrastructure for OT environments.
- meets sustainability goals and the latest cybersecurity requirements.
- ensures operational continuity through remote management and monitoring by IT/OT experts.

➢ **bridges the gap between IT and OT.**

Secure data exchange between IT and OT based on IEC 62443 with industrial DMZ infrastructure

Future-proof modernization of control systems with a pre-configured virtualization platform

Pre-configured IT infrastructure for optimized data handling:
- Archiving
- Backup and Restore

Industrial DMZ

Virtualization

Archiving

Backup and Restore

Industrial Automation DataCenter
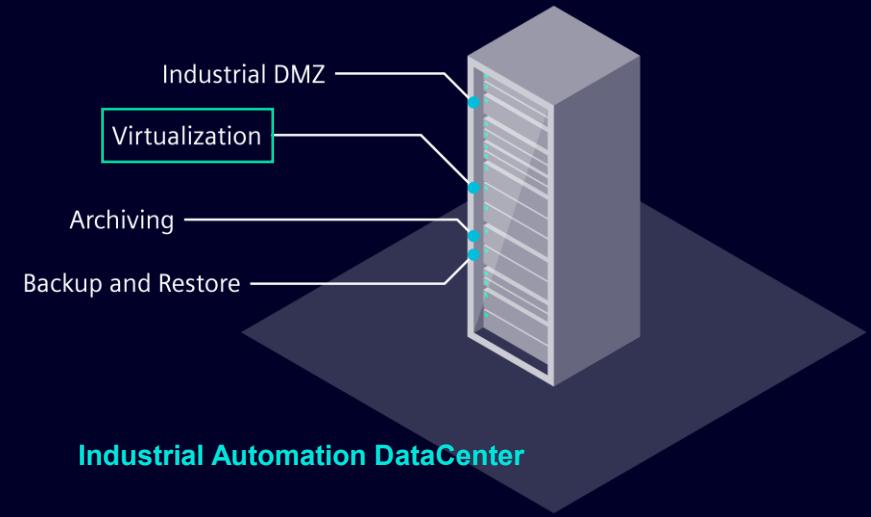
➕ Remote monitoring and management of your IT/OT infrastructure by IT/OT experts through the entire life cycle

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# SIMATIC Virtualization as a Service
& Energy efficient operations

See what you can achieve
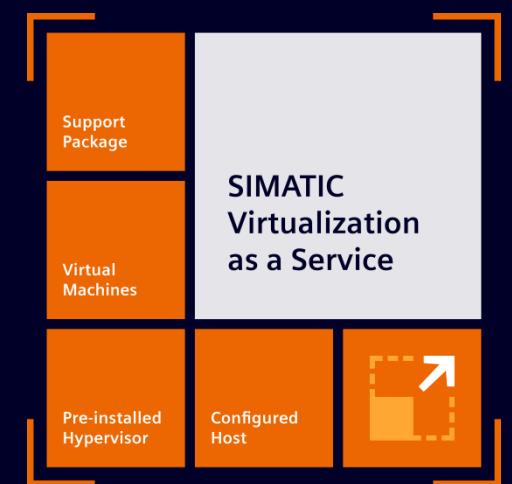
Support
Package

Virtual
Machines

Pre-installed
Hypervisor

Configured
Host

SIMATIC
Virtualization
as a Service

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Contribution to a sustainable future
with SIMATIC Virtualization as a Service

Up to

90%

IT/OT

CO$_2$

SAVINGS

SAVED
EMISSIONS EQUIVALENT TO

7x

DRIVEN
AROUND THE
WORLD

SIEMENS
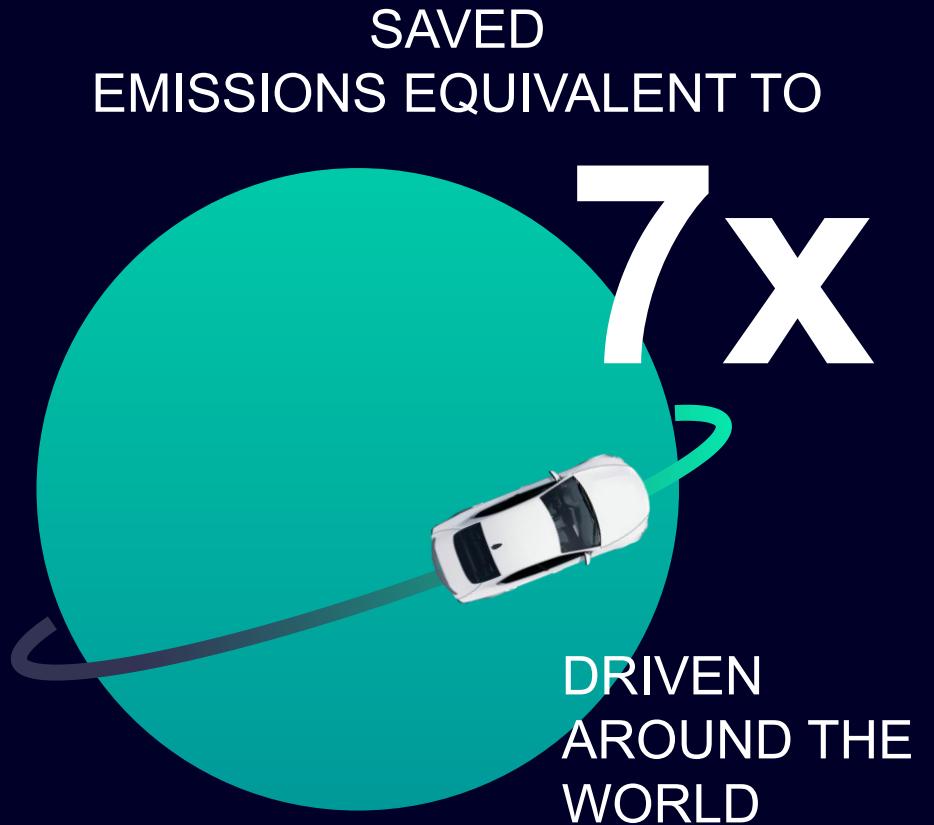
Contribution to a sustainable future with SIMATIC Virtualization as a Service

Up to

80%

space savings

through less hardware

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Why should you choose SIMATIC Virtualization as a Service?

System-tested

and pre-configured virtualization platform for industrial systems

Ready-to-use

virtualization platform for industrial systems

Full-Service partner

100% lifecycle services from a single source

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Siemens as reliable partner for IT infrastructure in OT environments

We are the automation experts

We drive digitalization

We understand industrial security

We have specific industry know-how
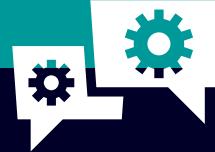
We offer state-of-the-art technology and end-to-end services from a single source

"We make sure that you can focus on your core business."

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MP Hygiène, Davézieux, France
Full IT/OT Infrastructure with Industrial Automation DataCenter

MP Hygiène

MP Hygiène is France's leading manufacturer of pure cotton wiping paper with the Origine France Garantie® label, and also manufactures non-woven wipes, soaps and hand hygiene solutions. 56,700 m² of buildings on 4 sites and 12 production lines.

Customer objectives

As part of their industrial process, the customer wanted a virtualized infrastructure and strong cybersecurity packaged by Siemens

Solution and Service

Siemens service experts provide Industrial Automation DataCenter solution with PCS 7 migration:
- Redundant SIMATIC Virtualization as a Service (SIVaaS) and SIMATIC DCS / SCADA Infrastructure (SIDSI), (back up and restore) solutions in the same infrastructure.
- Scalance based virtual network architecture including Demilitarized Zone (DMZ).
- Turnkey SIMATIC PCS 7 migration.
- Technical support from a Siemens paper industry expert throughout the project.

Customer benefits

- A pre-configured redundant Siemens virtualized infrastructure ready to host the migration of its PCS 7 project
- A powerful backup and recovery solution and a security-oriented network to prevent cyber attacks
- A service contract included with the infrastructure
- Virtualized Resources, Less Hardware, Energy Savings, Obsolescence and Cybersecurity Management

Siemens References ID: 37510

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Jack Daniels, USA
Save time and money with SIMATIC Virtualization as a Service

Jack Daniels

The oldest registered distiller in the U.S., Jack Daniel's Distillery, was running at capacity and landlocked at one distillery in Lynchburg/Tenn.

Customer objectives
- Expansion to meet current and future demand
- To keep Jack Daniel's existing operating philosophies in place at the new plant
- To implement new operator interface technologies, as well as new instrumentation, wireless networking and have the ability to connect the two plants

Solution and Service

SIMATIC Virtualization as a Service (SIVaaS)
- Virtualization System with two identical host machines. Each machine has an operator station (OS) server, Batch server, Route Control server and an engineering station providing redundant pairs for all critical functions
- SIMATIC PCS 7, BATCH and Route Control: 10 panels , more than 2,000 I/O points, four S7-410 controllers, 22 remote I/O racks and more than 200 I/O cards
- The operator interface uses a strategic placement of touch-panels and iPad tablets

Customer benefits
- Reduction of operational and development expenditures
- Control design advantages, operator and maintenance improvements and system flexibility
- Inexpensive HW replacement compared to standard machines
- Using of SIVaaS means that virtual machines can be accessed through VMware vSphere hypervisor software on the iPads for maintenance, updating and troubleshooting

Siemens References ID: Refp6242

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You want to find out **more**?

SIMATIC Virtualization as a Service	**Siemens Contact Database**	**Sales Slides**

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Security Information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit https://www.siemens.com/industrialsecurity

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under https://www.siemens.com/industrialsecurity

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