SIMATIC Virtualization as a Service

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- What is virtualization?
- Virtualization in PCS 7
- SIVaas product portfolio

Introduction

General trends in manufacturing and process automation

Due to focusing on sole production process, our customers increasingly demand for services and long-term service contracts directly from the system suppliers.
The demographic change of the service personnel at the customer's end requires an increasing strategy to outsource these services. In addition, the increasing complexity of the systems requires comprehensive special knowledge ("Anyone who is not familiar with this technology should get outside assistance" – specialist article in "Chemie Technik"). Due to increasing cost pressure, customers are less and less willing to build up or maintain this special knowledge in-house.

More and more customers therefore demand as much cost transparency as possible with regard to the investment and operation of a system (incl. the associated provided services). The reactive attitude of customers in the past with regard to service and maintenance is increasingly changing to a proactive attitude, which includes a corresponding demand for these services.

Market requirements

- Optimizing the utilization of hardware resources
- Buying preconfigured systems with corresponding services
- Minimizing lifecycle cost
- Simplifying expensive system updates and plant expansions
- Managing and maintaining the plant centrally
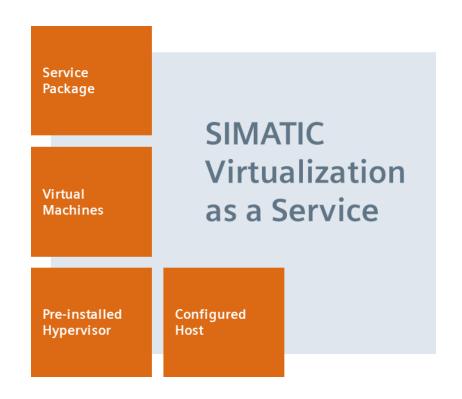- Increasing IT and data security standards
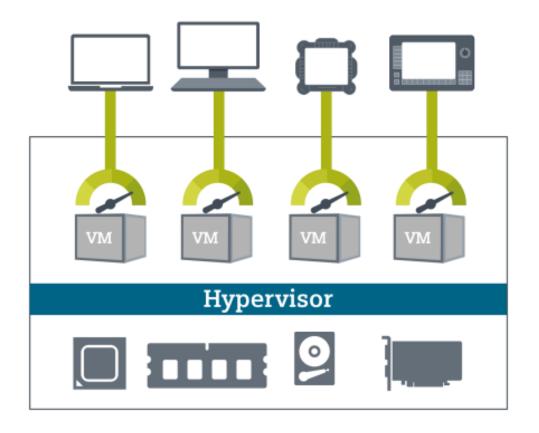
Introduction

Customer benefits

- Simple implementation of a virtualization solution through pre-configured and ready systems with optimal use of existing hardware resources
- Specifically designed for use as infrastructure for SIMATIC PCS 7 environments (→ no special product releases are required)
- Based on the specific system architecture, all the necessary VMware and Microsoft software licenses are included, activated and audit-ready (operating system for hosts and thin clients, RDS CALs and CALs also included)
- Lifecycle services and technical pre-sales and after-sales support are provided by Siemens for all supplied components (including third-party units) → Reduction in lifecycle costs
- Free spare parts supply is included
- Entire architecture was tested separately for the PCS 7 SW system test
- Preconfigured virtual machines for SIMATIC PCS 7 and Windows Server require only simple installation routines to run → cost-effective and rapid expansion of ES/OS system components thanks to ready-to-run templates
- Includes host diagnostics brokers for easy integration into PCS 7 maintenance stations
- Backup and recovery tool for storing and restoring virtual machines and Hypervisor configurations are included
- The initial system configuration is backed up from the outset, allowing simple restoration as required
- Several security measures pre-implemented
- Extensive documentation for handling and configuration is included
- Greater system flexibility and availability with reduced overhead in the case of system upgrades/updates
- Simple system management and comprehensive support in connection with SIMATIC remote services

Motivation for Siemens

- Providing a standardized and innovative service offering

- Is an attractive and valid basis for the subsequent service contract opportunities (short and long term) and system upgrades

What is virtualization?

SIMATIC
Virtualization
as a Service

Service Package

Virtual Machines

Pre-installed Hypervisor

Configured Host

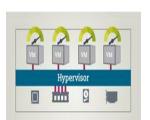18.07.2019   Pham Ngoc Minh / RC-VN DI PR&TS

What does virtualization mean?
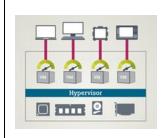
Through virtualization, the operating system and the user software of a computer are decoupled from its hardware.
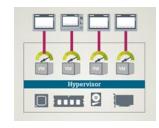
The operating system and the user software are made available inform of a virtual machine (VM).

To this end, a hypervisor is installed as additional software layer on a high performance server; it allows for the integration of several virtual machines on one hardware.

The hypervisor handles the dynamic distribution of the hardware resources to the virtual machines

The virtual machines are accessed by means of energy and cost efficient Thin Clients.
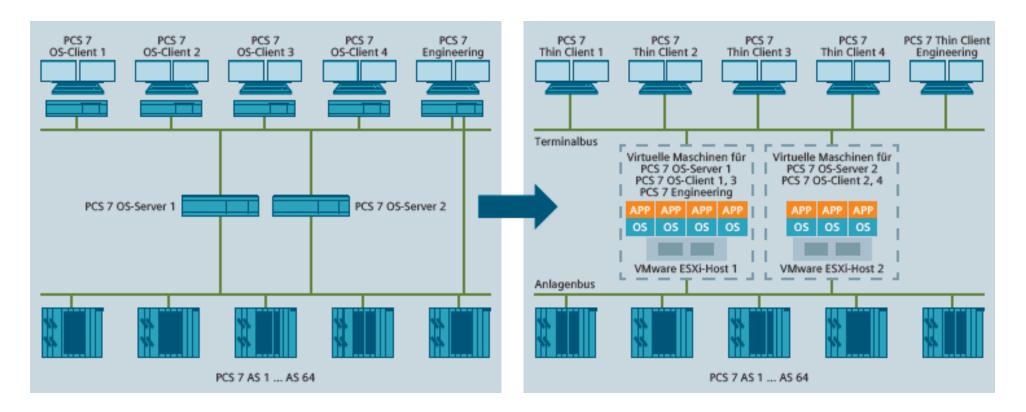
SIMATIC Virtualization as a Service offers this technology as a ready-to-run complete system including configuration and system support.
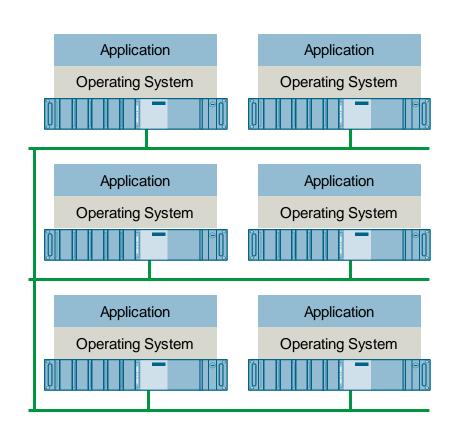
An automation system before and after virtualization
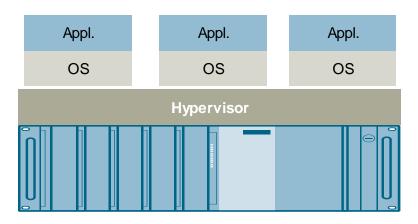
Before Virtualization

After Virtualization

Pham Ngoc Minh / RC-VN DI PR&TS

An automation system before and after virtualization

Application	**Application**
Operating System	Operating System

Application	**Application**
Operating System	Operating System

Application	**Application**
Operating System	Operating System

Appl.	Appl.	Appl.
OS	OS	OS

Hypervisor
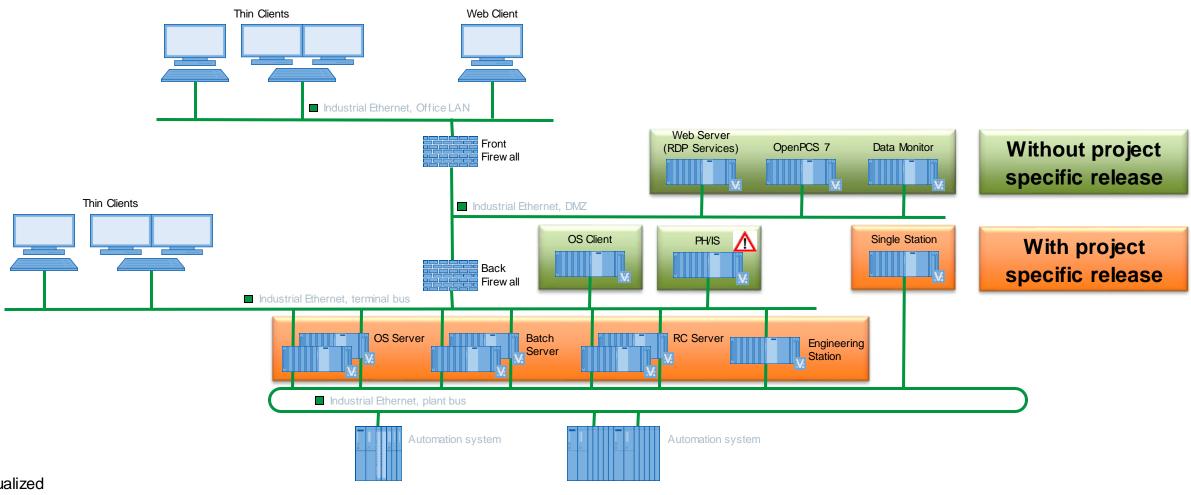
Traditional architecture

Virtual architecture

System architecture PCS 7 V9.0 in virtual environment

Thin Clients

Web Client

Industrial Ethernet, Office LAN

Front Firewall

Industrial Ethernet, DMZ

Web Server (RDP Services)   OpenPCS 7   Data Monitor

Without project specific release

Thin Clients

Back Firewall

OS Client   PH/IS ⚠

Single Station

With project specific release

Industrial Ethernet, terminal bus

OS Server   Batch Server   RC Server   Engineering Station

Industrial Ethernet, plant bus

Automation system   Automation system

V̲ virtualized

⚠ The Process Historian need a special consulting for the configuration.

virtual redundant OS server pair

PCS 7 Process Historian

PCS 7 OS Client

OS Server   **OS Clients**

ES   **OS-Server (red.)**   **OS Clients**

No mixed configuration (real/virtual) for OS master server and OS standby server

ESXi Server

ESXi Server

Redundancy Bus

Terminal Bus

Plant Bus

AS 1

AS 8

...

V: virtualized

Portfolio
Introduction – Positioning within the DF CS PA portfolios

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Modernization

| DCS Modernization Services | DCS Application Services | SIMATIC Virtualization as a Service | SIMATIC DCS / SCADA Infrastructure | Power Control Integrations Services | SIMATIC Software Platform as a Service |

Maintenance

| Lifecycle Management Suite | Remote Services | Calibration Services |

Spare Parts & Repairs

| Asset Optimization Services | Extended Exchange Option | Legacy System Services |

Support & Consulting

| Inventory Baseline Services | Lifecycle Information Services | SIMATIC System Audit | Preventive System Analytics | Managed System Services | Multi-Vendor Device Integration |

Digital Services

| Industrial Security Services |

Lifecycle Service Contracts

- Modernization Services
- Maintenance Services
- Spare Part Services
- Repair Services
- Support Services
- Consulting Services

- Managed Service Contract
- SLA / KPI Fulfilment:
  Fix Lifecycle Service Costs
  Defined Migrations Steps
  Service Performance
  Logistics & Delivery

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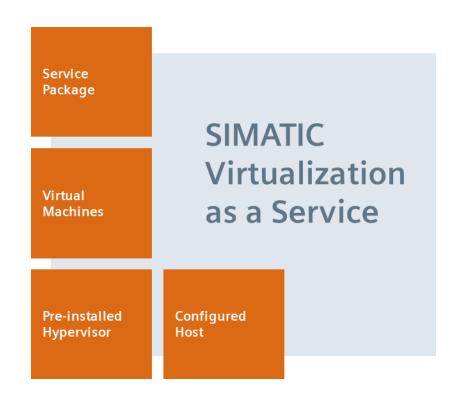
Portfolio
Product description – overview

Service Package

Virtual Machines

Pre-installed Hypervisor

Configured Host

SIMATIC Virtualization as a Service

- The core piece of the portfolio is the extensive service package for the simple implementation of a virtualization solution with pre-assembled configured systems tested for usability.

- Four different hardware platforms allow to scale the virtualization solution to the actual requirements.

- Technical Support includes all SIMATIC products, VMware and the components of the HP system platform.

Portfolio
Product description – module "Configured Host"

- The system platform consists of the server hardware (HP Proliant or SIMATIC IPC) and a management console (HP Thin Client)

- The VMware vSphere hypervisor software is alerady preinstalled and preconfigured

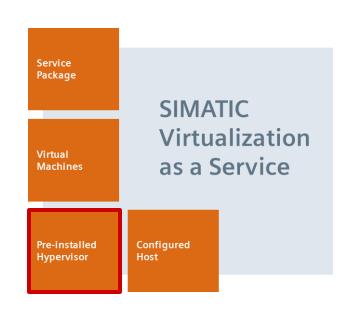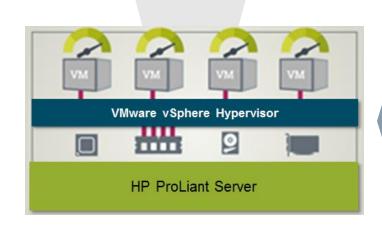| SIMATIC IPC647D **4Cx1P**	HP ProLiant DL380 GEN10 **12Cx1P HP**	HP ProLiant DL380 GEN10 **16Cx1P HP**	HP ProLiant DL380 GEN10 **12Cx2P HP**	HP ProLiant DL380 GEN10 **16Cx2P HP**
Intel Xeon Processor	**Intel Xeon Gold Processor**	**Intel Xeon Gold Processor**	**Intel Xeon Gold Processor**	**Intel Xeon Gold Processor**
32 GB RAM	**48 GB RAM**	**64 GB RAM**	**128 GB RAM**	**196 GB RAM**
2x 1TB HDD / RAID 1	**2.4TB HDD / RAID 5**	**3.6TB HDD / RAID 5**	**4.8TB HDD / RAID 5**	**6.0TB HDD / RAID 5**
2x Ethernet 1GB 2-port	**2x Ethernet 1GB 4-port**	**2x Ethernet 1GB 4-port**	**2x Ethernet 1GB 4-port**	**2x Ethernet 1GB 4-port**
2x Power Supply Kit	**2x Power Supply Kit**	**2x Power Supply Kit**	**2x Power Supply Kit**	**2x Power Supply Kit**
	3Y iLo Advanced license	**3Y iLo Advanced license**	**3Y iLo Advanced license**	**3Y iLo Advanced license**

SIMATIC Virtualization as a Service

Service Package

Virtual Machines

Pre-Installed Hypervisor

Configured Host

Portfolio
Product description – module "Pre-installed Hypervisor"

Service Package

Virtual Machines

SIMATIC Virtualization as a Service

Pre-installed Hypervisor

Configured Host

- On the basis of the system platform, a virtualization layer is installed that handles the recource distribution of the physical hardware to the virtual machines

- VMware is used as the virualization software

- Preinstalled and preconfigured VMware software vSphere 6.7 Standard
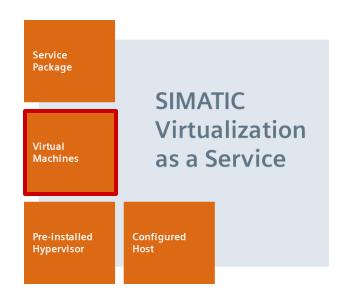- Optional: VMware vCenter Server
- Optional: vSAN Cluster, see next page

VMware vSphere Hypervisor

HP ProLiant Server
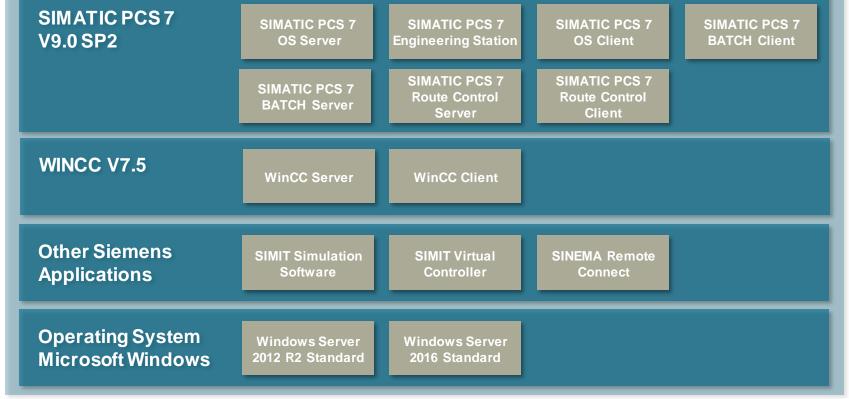
Pre-installation and configuration

- Configuration of the server hardware
- Installation and configuration of the VMware Software vSphere 6.5 Standard
- Complete net configuration
- Licensed VMware Software (VMware licences)
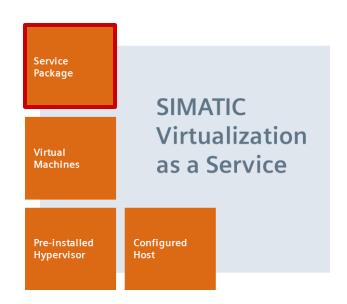- Pre installed VMware vSphere Webclient on the management console

Portfolio
Product description – module "Virtual Machines"

- On the system platform, a virtual machine is delivered ready for operation.
- On every virtual machine, a **Microsoft Windows Server 2012 / 2016 64-bit** (with activated license) is preinstalled. The virtual machines are <u>not</u> SIMATIC licensed.

- The following virtual machines are available for selection:

| Service Package |
| Virtual Machines |
| Pre-installed Hypervisor | Configured Host |

SIMATIC Virtualization as a Service

SIMATIC PCS 7 V9.0 SP2	SIMATIC PCS 7 OS Server	SIMATIC PCS 7 Engineering Station	SIMATIC PCS 7 OS Client	SIMATIC PCS 7 BATCH Client
	SIMATIC PCS 7 BATCH Server	SIMATIC PCS 7 Route Control Server	SIMATIC PCS 7 Route Control Client	

WINCC V7.5	WinCC Server	WinCC Client

Other Siemens Applications	SIMIT Simulation Software	SIMIT Virtual Controller	SINEMA Remote Connect

Operating System Microsoft Windows	Windows Server 2012 R2 Standard	Windows Server 2016 Standard

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Portfolio
Product description – module "Service Package"

Service Package

Virtual Machines

SIMATIC Virtualization as a Service

Pre-installed Hypervisor

Configured Host

DI CS PA ist …

vmware® PARTNER

TECHNOLOGY ALLIANCE

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

In addition to the documentation of the HW/SW components, the system documentation includes a detailed technical manual, instructions and application examples.

Installation & Configuration

Service Contract (2 or 5 years)

User Manual

After Sales Service

- Technical Support for all used componentds included: server hardware, operating systems, VMware, SIMATIC products

- One contact person 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

Warranty:
24 months after purchase

Spare parts availability:
Until EOL + remaining service contract period

Delivery time spare parts:
1 to 2 working days

The times specified apply within the EU up to delivery at the shipping address. In the case of deliveries from the central warehouse to countries outside the EU, the specified time applies up to the customs border of the receiving country. The time for import handling and transport within the country is not included.

Contact Information

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