

White paper

FUJITSU Software ServerView solution with VMware

VMware vSphere (ESXi – V5.x / V6.x)

1. Overview

Virtualization solutions from Fujitsu

Fujitsu is committed to total virtualization – from servers to storage to networks – and to virtualization software and operation management tools. The partnership between VMware and Fujitsu brings you continuity of technology assets, more efficient resource use, and steps toward the elimination of IT complexity.

Fujitsu has considerable experience in developing mainframe solutions and developing proprietary virtualization technologies, and now combines that experience and solutions with best in class partners like VMware to provide bundled solutions for servers, storage and network – this allows for speedy implementation of a proven, easy-to-use system with fast return on investment.

VMware and FUJITSU Software ServerView integrated virtualization support

VMware vSphere is a suite of software products for providing virtualization solutions, which is the industry standard in terms of reliability, performance and ecosystem support. It is the industry-leading virtualization platform for building cloud infrastructures. vSphere accelerates the shift to cloud computing for existing datacenters and underpins compatible public cloud offerings. FUJITSU PRIMERGY rack, tower and blade servers and FUJITSU PRIMEQUEST servers have been optimized to support VMware's server virtualization technology since many years. All current-generation PRIMERGY and PRIMEQUEST server models from Fujitsu are tuned to deliver best results in performance, efficiency and reliability for VMware's cloud computing platform, providing a solid foundation stone for datacenter consolidation projects.

The ServerView integrated Remote Management Controller iRMC S4 enables extensive monitoring and management of FUJITSU PRIMERGY servers regardless of their system status – even in out-of-band operation.

ServerView supports the CIM management standard, making it possible to monitor and manage VMware vSphere based environments more reliably and securely. Administrators can view all physical and virtual machines through a single interface, with automatic grouping of VMware vSphere hosts making administration simpler.

2. Components of the FUJITSU Software ServerView solution with VMware

In the following, the components of the FUJITSU Software ServerView solution with VMware are shortly presented. For detailed information on functionalities refer to the following chapters.

ServerView Operations Manager and ServerView ESXi CIM provider

ServerView Operations Manager is the server monitoring software where PRIMERGY and PRIMEQUEST servers and associated storage extension units in the network can be monitored and analyzed, and it includes VMware management. It automatically detects virtual machines and can show the status of hosts and guests. This offers single point of console management and the advantage of ServerView Event Management for alerting. ServerView Operations Manager enables you to use the ServerView ESXi CIM providers to monitor VMware vSphere based servers.

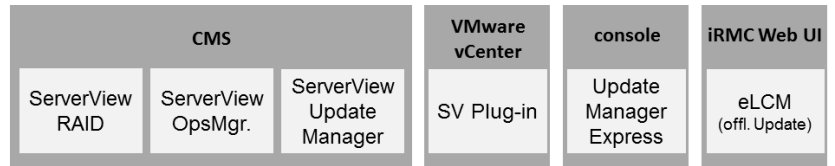
Fujitsu provides various possibilities for installing/upgrading or updating ServerView ESXi CIM providers – more information is available under "Software provision and installation notes". Additional information sources for ServerView Operations Manager for a VMware vSphere based server are the ServerView RAID Manager and the iRMC monitoring function.

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ServerView Plug-in for VMware vCenter

Fujitsu implemented the ServerView Plug-in for VMware vCenter (SV Plug-in) to the vSphere Web Client for vCenter. It shows the values of a host system provided by the ServerView ESXi CIM providers and the LSI CIM providers (Storage view) – for further information see "3. Integration solutions".



FUJITSU ServerView Plug-ins for VMware vRealize Orchestrator

The FUJITSU ServerView Plug-ins for VMware vRealize Orchestrator integrate workflows in VMware vRealize Orchestrator, which you can execute as usual VMware vRealize Orchestrator workflows.

ServerView RAID Manager

ServerView RAID Manager allows you to monitor and manage all RAID controllers installed in PRIMERGY or PRIMEQUEST servers centrally and based on CIM. ServerView RAID Manager forwards its alarms, so that you can access it using the ServerView Operations Manager interface.

ServerView Update Manager

Centralized management of server updating provides the ServerView Update Manager. In this case, the software uses a previously created repository in the data center, which is filled with Autonomous Support Packages (ASPs) for BIOS and firmware by download or via the installation DVD.

ServerView Update Manager Express

ServerView Update Manager Express installs firmware, BIOS and Windows drivers for various components in FUJITSU PRIMERGY and PRIMEQUEST servers. During the installation the ServerView Update Manager Express uses self-extracting and self-installing software packages known as Autonomous Support Packages (ASPs) for BIOS and firmware or PRIMERGY Support Packages (PSPs) for Windows drivers respectively.

iRMC, ServerView agentless Management, and eLCM

Implemented in a chip on the motherboard the ServerView integrated Remote Management Controller iRMC S4 integrates essential system management functions with extensive remote management functionality. As an autonomous system on the system board of a FUJITSU PRIMERGY server, iRMC S4 has its own operating system, its own web server, separate user management and independent alert management. iRMC S4 remains powered up even when the server is in stand-by mode. Communication is carried out via a LAN connection, which can be shared with the FUJITSU PRIMERGY server or used exclusively for system management.

Embedded Life Cycle Management (eLCM)

Beyond making it possible to manage a PRIMERGY server out-of-band, the enhanced functionality of the iRMC S4 - which comes with an integrated SD card - allows for comprehensive lifecycle management of a PRIMERGY server. As life cycle management is integrated ("embedded") in and entirely controlled by the iRMC, it is called "embedded Life Cycle Management (eLCM)".

ServerView agentless management in agentless mode (without Agentless Service)

Management via the iRMC S4 without ServerView agents and CIM providers is referred to as "ServerView agentless management". Out-of-band management without installation of ServerView Agentless Service on the managed server is known as "agentless mode". In agentless mode, the server is managed exclusively via the iRMC S4 of the managed server. On the managed server, neither ServerView agents or CIM providers nor ServerView Agentless Service are running. For this reason there is also no communication between the iRMC S4 and the operating system on the managed server. The consumers, such as ServerView Operations Manager and Nagios Plug-in, communicate with the iRMC S4 via the dedicated management LAN port only. There is no burden on the productive LAN.

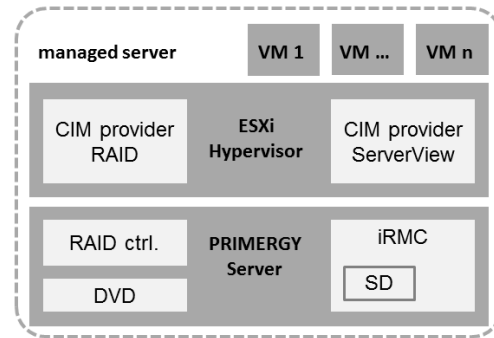


Figure 1: Components of the FUJITSU Software ServerView solution with VMware

3. Integration solutions

ServerView Plug-in for VMware vCenter

ServerView ESXi CIM providers are following the CIM standards defined by the DMTF (see section "Architecture" - "Hardware management with CIM"). Due to the importance of hardware management, PRIMERGY and PRIMEQUEST servers are equipped with a high number of sensors, which are not covered within the CIM standard definition. ServerView ESXi CIM providers are therefore using also non-standard objects, which are presented in FUJITSU Software ServerView. FUJITSU PRIMERGY and PRIMEQUEST servers are also providing sensor information to VMware vCenter. VMware vCenter presents hardware related information at the hardware tab to the administrator. That information on PRIMERGY and PRIMEQUEST servers and their components is not as comprehensive as using FUJITSU Software ServerView, since vCenter will search for objects following the common part of the CIM specifications.

Fujitsu implemented the ServerView Plug-in for VMware vCenter (SV Plug-in) to the vSphere Web Client for vCenter which shows the performance values of a connected host system provided by the ServerView ESXi CIM providers and the LSI CIM providers (Storage view).

The ServerView Plug-in for VMware vCenter (SV Plug-in) integrates FUJITSU PRIMERGY specific information in the vSphere Web Client interface. There are two approaches to do so:

- Data integration in event and alarm management of the vSphere Web Client itself
- Full sites integrated in the vSphere Web Client offer the FUJITSU PRIMERGY specific data of ESXi hosts, of hosts of vCenters or Clusters, of MMBs and of PRIMEQUEST systems.

In the web client a separate start page and a summary provide an initial overview of the information available. Details can be accessed using the Monitor tabs, where the administrator can learn everything about the overall status of the connected PRIMERGY systems and their components.

FUJITSU PRIMERGY vCenter role definitions have been added to the SV Plug-in. They are designed for using single sign-on when starting the iRMC Web Interface and Remote Console (AVR). All role definitions contain the system privileges as well as the privilege Host.CIM.Interaction because that is needed to operate the SV Plug-in itself. It is possible to add the extended iRMC privileges to a FUJITSU PRIMERGY vCenter role definition. Additional, you can use the FUJITSU PRIMERGY vCenter role definitions to limit iRMC functionality. For further information see the manual "ServerView Plug-in for VMware vCenter" (see "Further documentation").

VMware recommends to install the SV Plug-in in a separate appliance. Alternatively, you can install it together with vCenter in one appliance.

FUJITSU ServerView Plug-ins for VMware vRealize Orchestrator

The VMware vCenter Server™ offers a central platform for the management of VMware vSphere environments, enabling users to provide a reliable virtual infrastructure and automate processes. These functions extend the intelligent IT operations management VMware vRealize™ Operations™ (vROps) to include predictive analysis functions and policy-based automation of applications right through to storage for vSphere, Hyper-V, Amazon and physical hardware. Thanks to the comprehensive, central insight into applications and infrastructures users can improve performance, avoid interruptions to business operations and increase efficiency

FUJITSU Server Plug-ins for Nagios Core

Created in 2002 from the Open Source tool NetSaint, Nagios developed during the following years to become the de facto standard tool for system, network and infrastructure monitoring in Linux and UNIX environments.

FUJITSU Server Plug-ins for Nagios Core is a collection of scripts, sample configurations and more usable for a Nagios Core integration and all products based on Nagios Core. With these Plug-ins you can see an overall hardware status of your rack, tower and blade models of the FUJITSU PRIMERGY family, and the PRIMEQUEST servers as well as indepth details such as power consumption, temperatures, fan speed, and hardware issues. Supported protocols: SNMP and CIM.

4. Monitoring

ServerView Operations Manager

ServerView Operations Manager provides a browser-based console for managing the servers and representing the information determined. The managed servers are automatically displayed in a server list, which can be structured as required. Integrated grouping and filter options offer improved clarity, particularly in larger networks.

ServerView Operations Manager detects VMware vSphere based servers with their network address, model, and operating system information. The virtual servers associated with the host server can be displayed in the server list under the entry for the host server with their current VMware names. In addition, there are individual views in which you can query information about the host server and the virtual machines installed on it.

For monitoring purposes, the following information sources are evaluated:

- CIM-based using the ServerView ESXi CIM providers,
- Information/ events from iRMC, and
- Information from ServerView RAID Manager.

ServerView Plug-in for VMware vCenter

The SV Plug-in offers extensive possibilities to monitor ESXi hosts, MMB blades or PRIMEQUEST systems: Status icons provide quick and detailed views provide extensive information on a selected host and a number of FUJITSU PRIMERGY actions items support calling a monitoring tool or doing settings on the host.

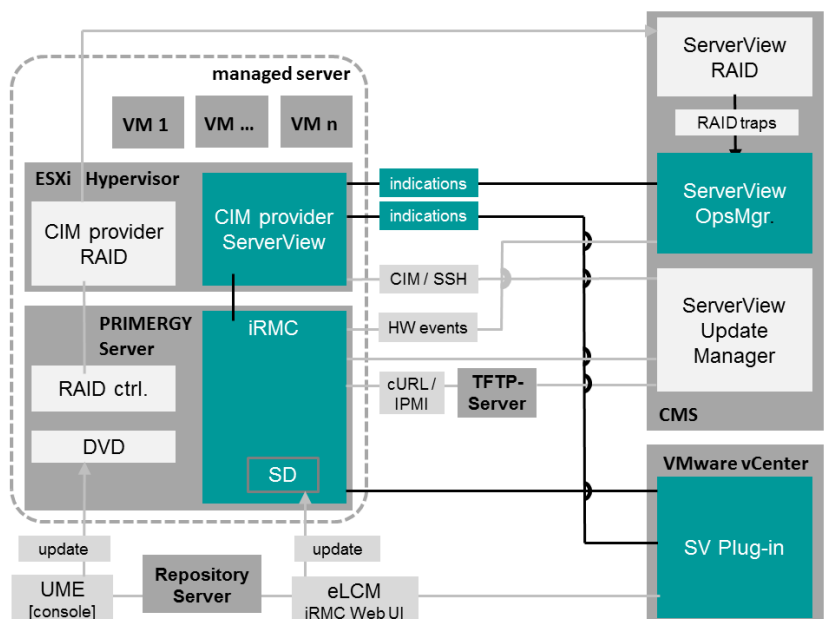


Figure 2: Monitoring of VMware vSphere based servers with ServerView

For vCenters and clusters the SV Plug-in offers lists of the hosts assigned to a vCenter or to a Cluster. Via this access point the SV Plug-in offers less information on the single host than via the inventory tree item Hosts, but all FUJITSU PRIMERGY actions are available.

To vSphere Web Client a MMB is a custom object type. To support custom object types, the object navigator vCenter level has to be extended with a new inventory list. The SV Plug-in adds the new inventory list PRIMERGY Blade Server to the object navigator vCenter level. The SVvCenter Service is used to make an discovery for all MMBs.

To vSphere Web Client a PRIMEQUEST system is a custom object type. To support custom object types, the object navigator vCenter level has to be extended with a new inventory list. The SV Plug-in adds the new inventory list PRIMEQUEST Server to the object navigator vCenter level. The SVvCenter Service is used to make an discovery for all PRIMEQUEST systems.

Additional monitoring tools:

An extended ServerView environment provides additional monitoring tools for monitoring a VMware vSphere-based server:

Nagios

The current main function of Nagios Core is the monitoring of network services, which takes place at protocol level, and of hardware resources, which are addressed via special interfaces or software agents. Nagios is modular in design and consists of a core, the so-called Nagios Core, which implements the most important monitoring functions – among other things for protocols like SMTP, POP 3 and HTTP protocols, for the utilization of processors and hard disks, for heat development, etc.

Detailed information, for example about the following components can be accessed via the central Nagios management console: System and chassis, Processors, RAM, Hard disks / SSDs (also in the RAID array), I/O interfaces (switches, FC and SAS connections, KVM switches, etc.), Power supply, and Fans. The CPU and RAM load, temperature, operating voltage and power consumption are all collected.

ServerView RAID Manager

ServerView RAID Manager allows you to monitor all RAID controllers installed in PRIMERGY or PRIMEQUEST servers centrally and based on CIM.

ServerView agentless management in agentless mode (without Agentless Service)

ServerView agentless management in agentless mode provides information about several system components, such as the motherboard, memory modules, power supplies, certain RAID controller and others. Nevertheless the monitoring capabilities are limited to components which are directly accessible by the iRMC S4 through I²C or other hardware interfaces. But there is no information available on the operating system, e.g. PrimeCollect data including OS event log.

iRMC monitoring function

iRMC S4 allows for remote monitoring of server-internal HDDs, PCIe SSDs and RAID configurations also in agentless out-of-band operation. The iRMC not only has its own operating system, but also acts as a web server, providing its own interface. The connection to the iRMC web server is established over a standard web browser. Among other things, the web interface of the iRMC provides you with access to all system information and data from the sensors such as fan speeds, voltages, etc.

Alternatively, the alphanumeric user interface of the Remote Manager (from a Telnet/SSH client or over Serial 1) provides you with access to system and sensor information, power management functions and the error event log.

5. Event Management

ServerView Operations Manager

The configurable alarm system in ServerView Event Manager ensures that reliable information about faults that occur is available rapidly. This results in a targeted response: System messages are detected, evaluated, filtered, forwarded and saved.

ServerView Event Manager integrates the following components into ServerView Operations Manager:

- o Alarm Monitor: In the ServerView Operations Manager main window, the alarms for the selected servers are displayed.
- o Alarm Configuration: You can configure settings for handling alarms: Alarm rules, filter rules, and general settings.

The messages of the ServerView ESXi CIM providers, that are CIM-based recorded, and the iRMC messages are evaluated.

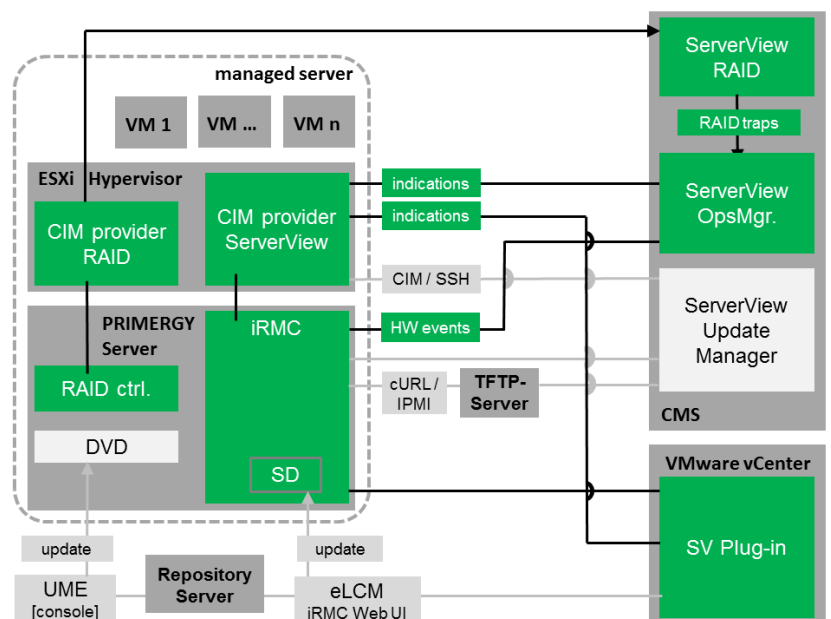


Figure 3: Event Management of VMware vSphere based servers with ServerView (up to V5.3)

Alarm management with ServerView

In order to be able to communicate with a server using VMware vSphere, ServerView logs in as a "subscriber" on the Small Footprint CIM Broker (SFCB – CIMOM), which is part of VMware vSphere (1). This login qualifies ServerView to receive messages about defined events from VMware vSphere from now on.

The CIMOM (SFCB) informs the task-specific CIM providers which events messages are required for under the new subscription (2).

The CIM providers use hardware-related protocols to monitor the server infrastructure (3). They convert the data identified into specific messages and forward these to the CIMOM (SFCB) (4).

On the ServerView side, the indication notifications reach the CIM listener (5) via the CIM/XML protocol, which then forwards the event messages to the alarm manager of the ServerView alarm management (6).

Alarm management for iRMC

As an autonomous system on the system board of a current PRIMERGY or PRIMEQUEST server, the iRMC features independent alarm management. The ServerView alarm management evaluates the iRMC alarm management. Furthermore, this alarm management enables you to configure how an alarm is forwarded to ServerView Operations Manager. If this SNMP trap forwarding is enabled, the iRMC send traps to the ServerView alarm management.

ServerView Plug-in for VMware vCenter

- *SVvCenter Service - Integration in event and alarm management of vCenter*
The SV Plug-in includes the SVvCenter Service which routes FUJITSU PRIMERGY specific events to the vCenter event management to be monitored in the vSphere Web Client. If a FUJITSU PRIMERGY host detects a problem, it will create a CIM indication and send it to subscribed destinations. Alarm is created too and can be configured for further actions. If SVvCenter Service is subscribed to the host, it will receive the CIM indication. It creates a vCenter event and forwards it to vCenter Server. So the FUJITSU PRIMERGY specific event is shown in the regular Monitor-Events-subtab of the vSphere Web Client.
- *System Event Log view and system identification led*
Events of PRIMERGY systems will be forwarded to the vSphere Event Manager. In addition, you can view the system event log including specialized cause and resolution information. To simplify service tasks the SV Plug-in provides the ability to turn the system identification led of the PRIMERGY server on/off.

Integration of system-specific events of FUJITSU PRIMERGY and PRIMEQUEST servers in VMware vRealize Operations

The ServerView Plug-in for VMware vCenter is also an important component for the integration of the system-specific events of FUJITSU PRIMERGY and PRIMEQUEST servers in VMware vRealize Operations. Once appropriately configured, VMware vRealize Operations (vROps) is in a position to receive a variety of system events from several vCenter instances and use them to create alerts and symptoms. The latter are then processed in vROps and ultimately affect the respective system's health status, which is in turn transmitted to the administrator for further processing by e-mail or other channels of communication.

System-specific events of FUJITSU PRIMERGY and PRIMEQUEST servers, such as events from the environment of internal system storage components, power management as well as temperature sensors and fans, can also be integrated in this mechanism. With the aid of this integration the health status of servers in vROps is not only influenced by normal OS-related events, but also by hardware-specific events, which would otherwise remain unnoticed. All in all, this increases server availability and in the event of an error is conducive towards eliminating the problem quickly.

6. Power Management

As well as power management for the physical host server, ServerView Operations Manager provides power control functions for the virtual machines that are installed on it.

Power management in ServerView Operations Manager is utilized by selecting the relevant server from the server list. The functions available (for example, Power ON, Power OFF, Shutdown) can be used on both physical servers and virtual servers.

7. Update Management

The ServerView Suite provides several tools, with which components of the managed servers can be updated:

ServerView Update Manager Express [iRMCS2/S3/S4]

For the local modification of individual systems the ServerView Update Manager Express is used, which is included as a complete package on the ServerView Update DVD (see "Software provision and installation notes"). ServerView Update Manager Express installs firmware, BIOS and Windows drivers for various components in FUJITSU PRIMERGY and PRIMEQUEST servers. The update is performed with the aid of self-extracting and self-installing software packages known as Autonomous Support Packages (ASPs) for BIOS and firmware or PRIMERGY Support Packages (PSPs) for Windows drivers respectively.

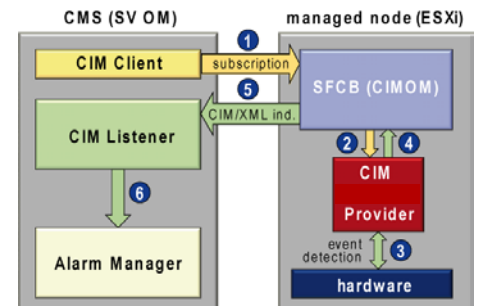


Figure 4: CIM-based information in ServerView Alarm management

You can update components of a VMware vSphere based server by booting from a ServerView Update DVD or the image of the ServerView Update DVD from a bootable USB stick.

ServerView Update Manager [iRMCS3/S4]

Centralized management of server updating provides the ServerView Update Manager. In this case, the software uses a previously created repository in the data center, which is filled with ASPs by download or via the installation DVD.

On a VMware vSphere based server ServerView Update Manager (version 6.2 and higher) enables you to update the BIOS and the firmware of the Baseboard Management Controller (iRMC) in case of a recent PRIMERGY or PRIMEQUEST server model with iRMC S3 or S4. Installed ServerView ESXi CIM providers on the VMware vSphere based server and enabled SSH access are required. For further information about steps and functioning (e.g. communication paths: CIM, SSH, IPMI and cURL) see the manual "ServerView Update Management" (see "Further documentation").

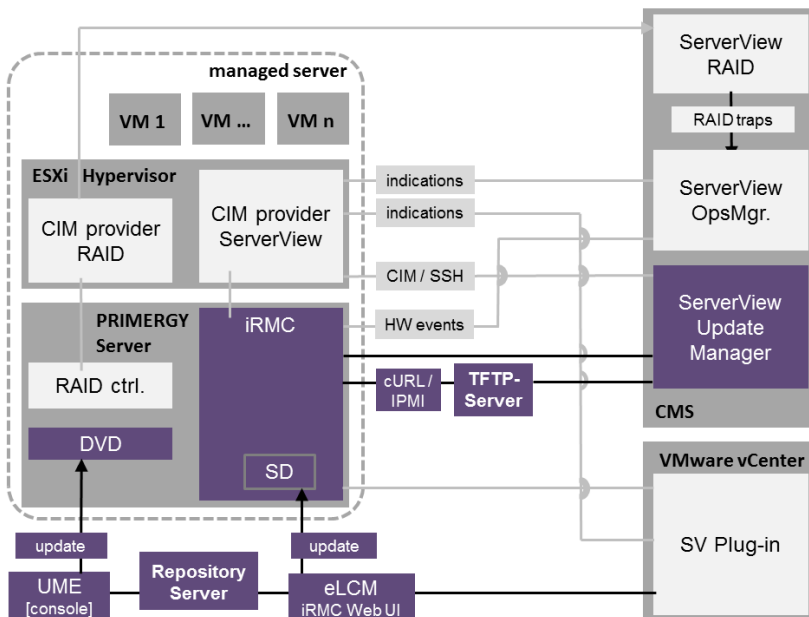


Figure 5: Update Management of VMware vSphere based servers with ServerView

eLCM [iRMC S4]

Beyond making it possible to manage a PRIMERGY server out-of-band, the enhanced functionality of the iRMC S4 - which comes with an integrated SD card - allows for comprehensive lifecycle management of a PRIMERGY server. As life cycle management is integrated ("embedded") in and entirely controlled by the iRMC, it is called "embedded Life Cycle Management (eLCM)".

eLCM update management functionality is based on the ability of the iRMC S4 to automatically download files from a repository server via the dedicated iRMC S4 management LAN port and to store them on the iRMC S4 SD card. The repository server can be the FTS Support Server or a separate server running the ServerView Repository Server.

ServerView Agentless Service does not support the VMware ESXi operating system. Therefore you have to use the offline update of eLCM update management. The offline update allows you to update system components like network or storage controller. In case of an offline update, a bootable update image previously downloaded from the repository server onto the iRMC S4 SD card is mounted by the iRMC S4 via remote image mount as a system USB DVD ROM device. Similar to the common Update DVD, the bootable update image consists of two major parts: A boot loader for booting CentOS and the eLCM offline update manager itself, which is a slim version of the ServerView Update Manager Express. Once the USB CD ROM is mounted, the iRMC S4 automatically shuts down the server and reboots it from the mounted DVD ROM device.

There are several opportunities to prepare an eLCM offline update and to start it:

- In the Offline Update page of the iRMC S4 web interface. For further information see the manuals "Remote Management. iRMC S4 - integrated Remote Management Controller" and "ServerView embedded Lifecycle Management (eLCM)" (see "Further documentation").
- Via the SV Plug-in user interface (see below).
- In the VMware vRealize Orchestrator workflow tree (see below).

ServerView Plug-in for VMware vCenter and FUJITSU ServerView Plug-ins for VMware vRealize Orchestrator: Offline update via eLCM

To perform the eLCM offline update, a new ServerView eLCM Offline Update Workflow has been developed. It is a part of the FUJITSU ServerView Plug-in for VMware vRealize Orchestrator eLCM Offline Update package. Workflows combine actions, decisions, and results that, when performed in a particular order, complete a specific task or a specific process in a virtual environment.

You can start an offline update via eLCM on a host via the SV Plug-in user interface or in the VMware vRealize Orchestrator workflow tree. For further information see the manuals "ServerView Plug-in for VMware vCenter" and "FUJITSU ServerView Plug-in for VMware vRealize Orchestrator" for details (see "Further documentation").

8. RAID Management

ServerView RAID Manager allows you to monitor and manage all RAID controllers installed in PRIMERGY or PRIMEQUEST servers centrally and based on CIM.

ServerView RAID Manager forwards its alarms, so that you can access it using the ServerView Operations Manager interface. In addition, ServerView RAID Manager has its own graphical interface and a command line interface. To manage VMware vSphere based servers, ServerView RAID Manager is installed on the central management station.

Integration in VMware vCenter

Fujitsu has implemented the ServerView Plug-in for VMware vCenter to the vSphere Web Client for vCenter (see "3. Integration solutions") which shows the values of a host system provided by the ServerView ESXi CIM providers and the LSI CIM providers. The Storage view of the ServerView Plug-in for VMware vCenter offers an overview of the RAID controllers found on the host and details on their logical drives and physical disks.

9. Architecture of VMware vSphere

VMware vSphere

VMware vSphere is a virtualization platform for providing virtualization solutions for data centers. vSphere is made up of several components – like e.g. VMware ESXi, VMware vSphere (Web)Client. For licensing these components are combined into different VMware vSphere Editions and VMware vSphere Kits (see "Software provision and installation notes").

VMware vSphere and CIM

VMware vSphere bases on the VMware ESXi hypervisor architecture. Management tasks for VMware ESXi are performed using a remote command line interface, a Web interface or the VMware vSphere Client. For interaction with ServerView VMware ESXi has been equipped with CIM providers, which comply with system management standards.

Hardware management with CIM

With the Common Information Model (CIM) the Distributed Management Task Force (DMTF) devised an object-oriented standard for management information in IT environments, which defines the description of the managed units, their construction and their relationships with one another. Object orientation makes CIM a comparatively powerful model, which can handle classes, inheritance and relationship concepts, object paradigms and methods. When implemented, CIM and WBEM use an infrastructure consisting of CIM Object Manager (CIMOM) and CIM providers:

CIMOM is the central software component that receives and processes WBEM queries. CIMOM knows which classes exist and which system components they correspond to. To keep CIMOM as flexible as possible, it does not access the managed system resources directly. Instead, WBEM makes use of a modular concept, with a CIM provider used for each instance of a class. Thus, a CIM provider is a software component that allows management access to device drivers and hardware components. Conceptually, these providers specialize in a particular management task and are designed for as small a range of programs as possible. CIMOM forwards external queries, e.g. from management software, to the CIM providers and/or collates their information and returns the result to the requesting application using standard APIs.

10. Security issues (Source: www.vmware.com)

With VMware vSphere, VMware has built one of the most secure and robust virtualization platforms available. VMware has both the technology and the processes to ensure that this high standard is maintained in all current as well as future products. Users can be assured that all the benefits of running their most critical services on vSphere – specifically on VMware ESXi – do not come at the cost of security.

VMware ESXi has been developed from the ground up to run virtual machines in a secure manner and incorporates many powerful security features that address the security concerns of the most demanding data center environments for enterprises and government organizations. The holistic security architecture of ESXi achieves this goal by providing security mechanisms at multiple layers:

- Secure isolation of virtual machines at the virtualization layer. This includes secure instruction isolation, memory isolation, device isolation, and managed resource usage and network isolation.
- Configurable secure management of the virtualized environment. This includes secure communication between virtualization components via SSL; host protection via lockdown mode; and least privilege by a fine-grained, role-based access-control mechanism.
- Secure deployment of the ESXi software on servers through use of various platform-integrity mechanisms such as digitally signed software packages and Intel Trusted Platform Module (TPM)-based trusted boot.
- Rigorous secure software development life cycle that enables developers to create software using secure design and coding principles such as minimum attack surface, least privilege, and defense in depth.

The success of this architecture in providing a secure virtualization and cloud infrastructure is evidenced by the fact that many large, security-conscious customers from areas such as banking and defense have chosen to trust their mission-critical services to VMware virtualization. In fact, the most recent four versions of VMware vSphere have been validated under the U.S. Common Criteria Evaluation and Validation Scheme (CCEVS) process, achieving EAL4+ certification.

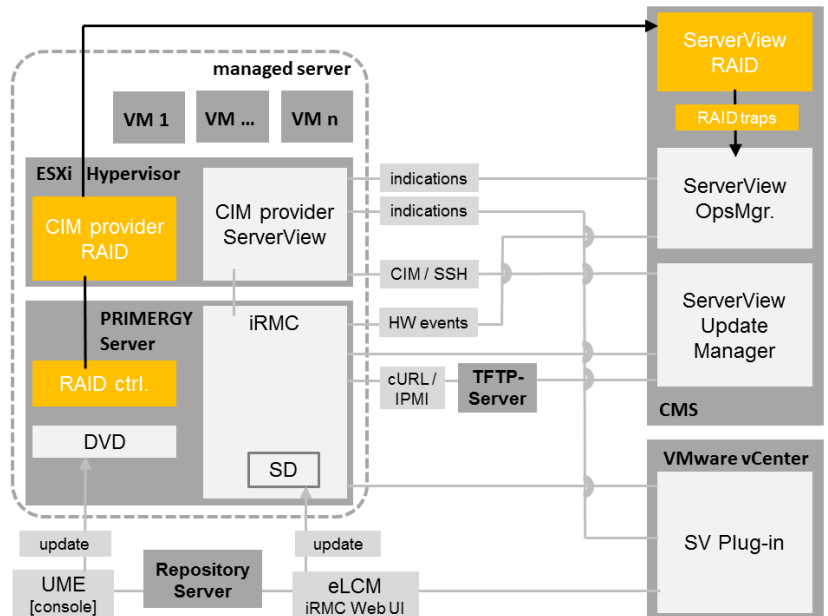


Figure 6: Update RAID Management of VMware vSphere based servers with ServerView

11. Documentation, provisioning, and licensing

Further documentation

Documentation on ServerView Suite: Further documentation on ServerView Suite products is available on the Fujitsu website at <http://manuals.ts.fujitsu.com> : x86 Servers – Software – ServerView Suite.

The image of the ServerBooks DVD is available at <ftp://ftp.ts.fujitsu.com/images/serverview>.

Documentation on VMware vSphere: Further documentation on the VMware vSphere products is available on the VMware website at <http://pubs.vmware.com/vsphere-55/index.jsp> resp. <http://pubs.vmware.com/vsphere-60/index.jsp>.

Software provision and installation notes

Fujitsu provides the following possibilities for installation/upgrading or updating ServerView ESXi CIM providers:

FUJITSU Custom Offline Bundle ESXi

Image for **updating** a VMware vSphere Hypervisor installation

– It contains the latest VMware ESXi patch, the ServerView ESXi CIM providers (incl. RAID), and the latest drivers for PRIMERGY and PRIMEQUEST hardware.

Installing *FUJITSU Custom Offline Bundle ESXi* is described in “Quick Guide. Installation of ESXi-based PRIMERGY Servers for Server Management with ServerView” (<http://manuals.ts.fujitsu.com>).

You can also use *vCenter Update Manager* for the installation of *FUJITSU Custom Offline Bundle ESXi*. More information on this is available in the VMware documentation.

FUJITSU Custom Image ESXi

Image for the **initial installation** of a VMware vSphere Hypervisor installation or for the **upgrade** of an existing installation to the following VMware vSphere major-version

– It contains the latest VMware ESXi patch, the ServerView ESXi CIM providers (incl. RAID), and the latest drivers for PRIMERGY and PRIMEQUEST hardware.

ServerView Installation Manager supports this installation procedure.

ServerView ESXi CIM-Provider

Individual components for updating

– The update of the *ServerView ESXi CIM providers* (incl. RAID) on an existing VMware vSphere system is the same as a classical VMware vSphere update.

The VMware documentation describes in more detail how to install, remove, and update VMware vSphere enhancements.

ServerView ESXi CIM providers versions:

<i>ServerView ESXi CIM providers version</i>	<i>released for ESXi version</i>
6.20.01 or former	ESXi V4.x and V5.x
6.21.01 or later	ESXi V5.x
7.01 or later	ESXi V5.x and V6.0

Please note:

In order to use the ServerView ESXi CIM providers version 6.31.x, you require ServerView Operations Manager version 6.31.x or later. ServerView Operations Manager V6.31.x for its part supports all existing versions of the ServerView ESXi CIM providers.

The ServerView ESXi CIM provider for Event Management is not available until ESXi version 5.0 or later.

You can obtain the required software components in the following ways:

FUJITSU Custom Image ESXi

- Download from the Fujitsu website: <http://support.ts.fujitsu.com> Drivers & Downloads – VMware – [vSphere Version] – ESXi Images
- Download from the VMware website: <https://my.vmware.com/en/web/vmware/downloads> VMware vSphere: Download Product – Select Version:<version> – Custom ISOs
Click the > sign in front of *OEM Customized installer CDs*.
- Order with a new PRIMERGY or PRIMEQUEST Server: “Embedded VMware vSphere Hypervisor” is available as an option for certified PRIMERGY and PRIMEQUEST servers.

FUJITSU Custom Offline Bundle ESXi

- Download from the Fujitsu website: <http://support.ts.fujitsu.com> Drivers & Downloads – VMware – [vSphere Version] – ESXi Images

ServerView ESXi CIM Provider

- Download from the FUJITSU *ServerView Management and Serviceability DVD*: ServerView – Agents and Providers – Linux and VMware
Content: <http://support.ts.fujitsu.com/prim-supportcd/>
Image: <http://support.ts.fujitsu.com> (search term: “ServerView Management and Serviceability DVD”)
- Download from the Fujitsu website: <http://support.ts.fujitsu.com> Servers – FUJITSU Server PRIMERGY – Drivers & Downloads – Software –

ServerView Suite – ServerView Update DVD

Contains the Update Manager software and the Update Repository (updates of BIOS, firmware, agents or drivers for PRIMERGY and PRIMEQUEST servers).

Download from the Fujitsu website: <http://support.ts.fujitsu.com> (search term: "ServerView Update DVD")

Licensing the software

Licenses for VMware vSphere are available from Fujitsu or from VMware.

License for ServerView Suite

The ServerView ESXi CIM providers are subject to the general terms and conditions of business from the software usage and service agreement with Fujitsu. The ServerView Suite is a licensed software component of the PRIMERGY and PRIMEQUEST server hardware. It may only be used with hardware, software, or services from Fujitsu. The terms of the end user license agreement for the ServerView Suite, regulating copying and distribution of the software to third parties, must be complied with. Further information can be found in the end user license agreement (EULA) on ServerView Management and Serviceability DVD or at

http://support.ts.fujitsu.com/prim_supportcd/.

License for VMware vSphere

VMware offers VMware vSphere Hypervisor as a free product to get started with virtualization at no cost. But from Version 3.5 Update 4 VMware has restricted write privileges to a VMware based server. This means that various functions are not available – including starting and stopping virtual machines or correctly displaying the status of the VMware based host. If you are using VMware vSphere Hypervisor with a free license, you must switch to a version with a paid license.

VMware vSphere includes a variety of functions whose availability depends on the license for the relevant VMware vSphere Edition or Kit. An upgrade of those editions or kits is possible by entering the relevant license key without the need to install or upgrade the image.

VMware currently supplies the following levels (in increasing order of the range of functions):

Edition	Target group
VMware vSphere Standard	Entry-level solution for basic server consolidation
VMware vSphere Enterprise	Robust solution that customers can use to optimize IT assets, ensure cost-effective business continuity and streamline IT operations through automation
VMware vSphere Enterprise Plus	Ideal solution for cloud computing

Further information can be found at: <http://www.vmware.com> – Products – Datacenter Products – VMware vSphere.

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