FUJITSU
shaping tomorrow with you

FUJITSU Software ServerView Resource Orchestrator Functional Overview

Fujitsu Limited

Contents

- Benefit of private cloud
- Functional Overview
  - Features for Private Cloud
  - Features for Resource management
- System configuration & supported environment

Benefit of private cloud

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Speed up system setup time and reduce operational complexity and management

1. Service Portal

User interface for system operation and management

Provide a unified interface for a multi-Platform environment and reduce the operational costs

2. Auto deployment

Automated L-Platform setup

Dramatically reduce setup time by batch setup of a multi-tier system with a standardized template

3. Resource Pool

Integrate resources into a resource pool

Use resources more effectively by optimizing multiple systems' resources

Features for Private Cloud

FUJITSU Software ServerView

Platform provision as a service

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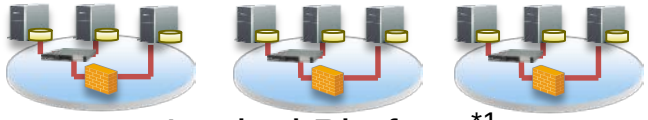
Automatically provide a ready-to-use platform

Use the service

Service Portal



Logical Platform*1

Auto deployment

Virtualization

Server | Network | Storage

Provide a service

Operation

- Subscribe a L-Platform
- Start/stop servers
- Status monitor, etc.

Management

- Create, publish service template
- Manage resources
- Monitor capacity, etc.

*1 A production system mixed with a combination of physical and virtual resources.

Technical terms : Management and roles

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Administrative operations are limited by the user roles

Tenant User

- L-Platform subscription
- Resource status monitor

Service Portal

Tenant Admin

- Manage tenant private pools
- Manage tenant specific templates
- Manage tenant user accounts
- Approve L-Platform subscriptions

L-Platform

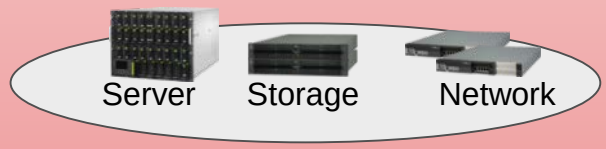
Deployment

Infra Admin

- Register resources, manage hardware
- Manage public pools
- Create and publish the basic templates
- Review and approve L-Platform subscriptions

Server/Storage/Network/image

Resource Pools

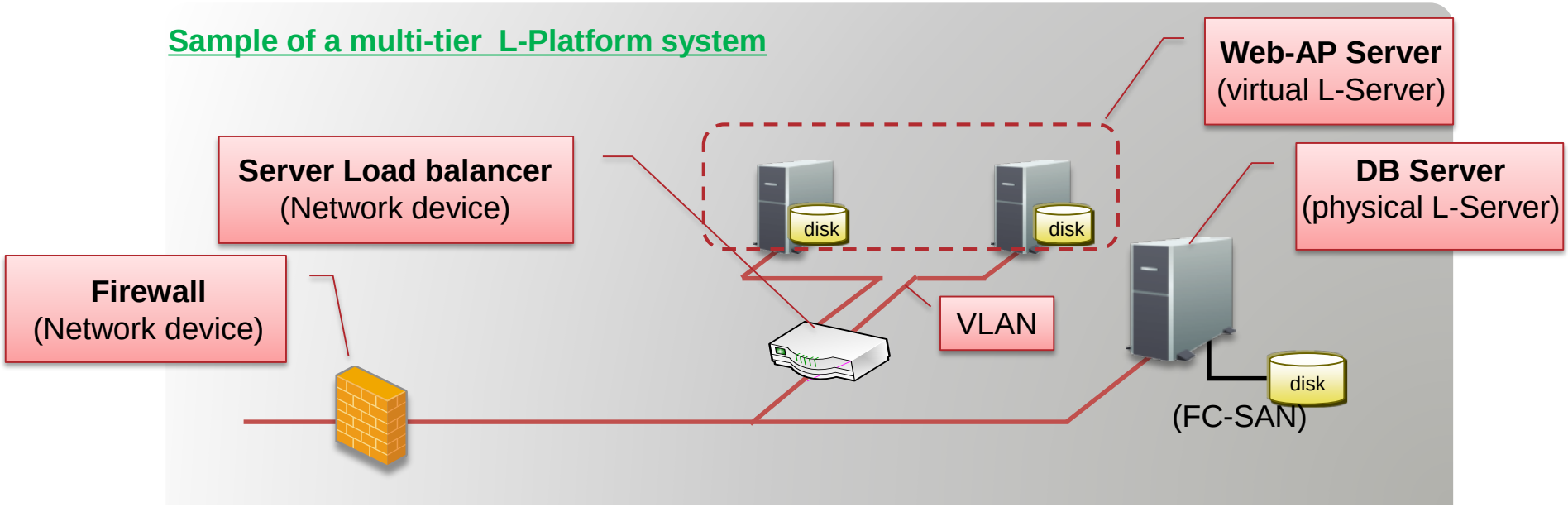


Visualize the operation status

Technical Terms : Logical-Server / Logical-Platform

- L-Server can be a **physical L-Server** (native OS and hypervisors) or a **virtual L-Server** (VM Guest) which is: [Defined by FUJITSU Software ServerView Resource Orchestrator using resources in the resource pools]

- L-Platform is an infrastructure logical platform that may include one or more L-Servers, storages, networks and system images; up to a maximum of 30 components including firewall and server load balancer.



Note 1: L-Server defines the logical specification for virtual server/physical server and storage/ network connected to them (number of CPU, memory size, number of NIC, disk etc).

Note 2: L-Platform is by FUJITSU Software ServerView Resource Orchestrator unit of subscription by users

Manage resources in a multi-tenant environment

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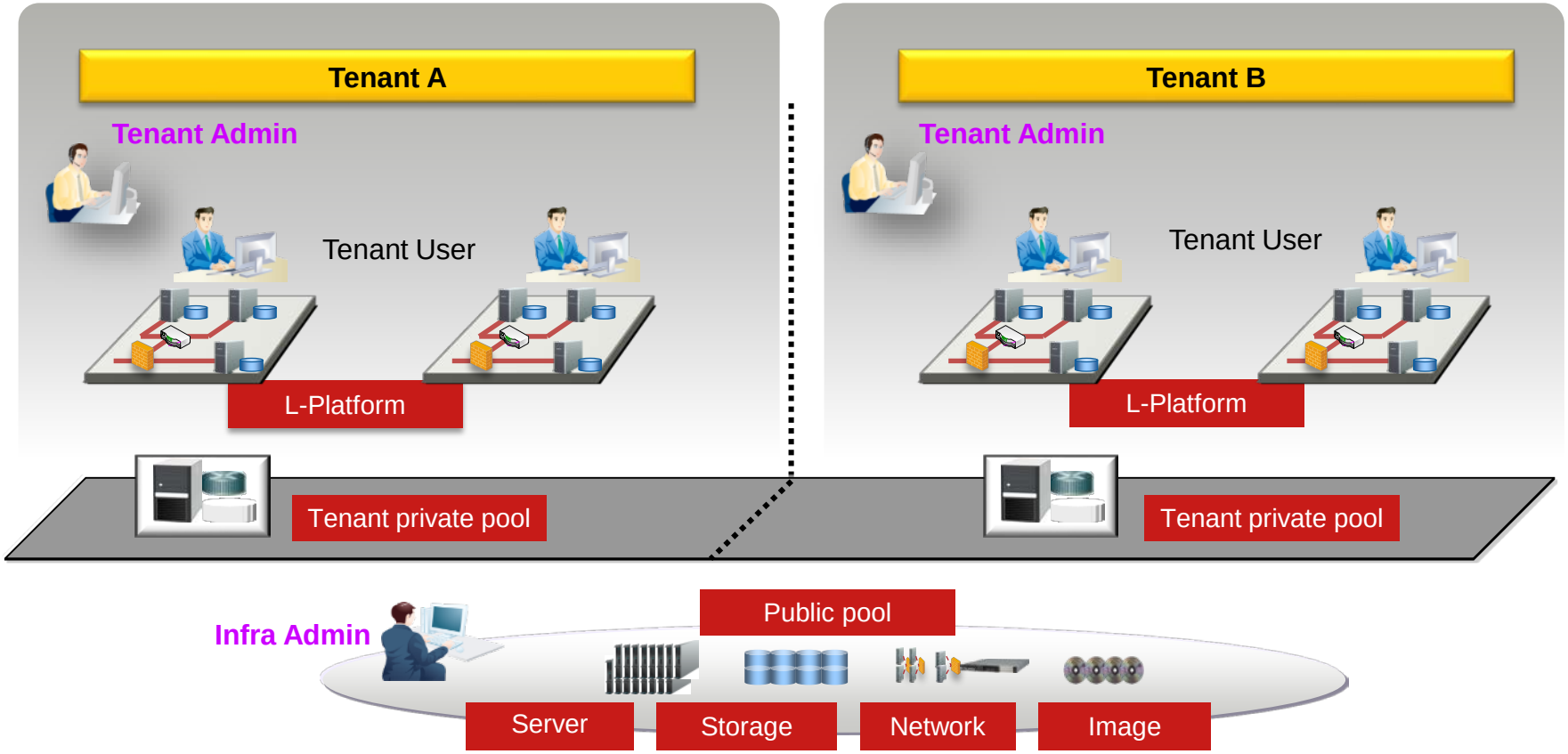
Share public infrastructure resources across multiple separated tenants

- Each tenant uses resources exclusively from the private resource pools
- L-Platform template creation and publication is tenant-specific as well



Advanced Cloud Access Portal

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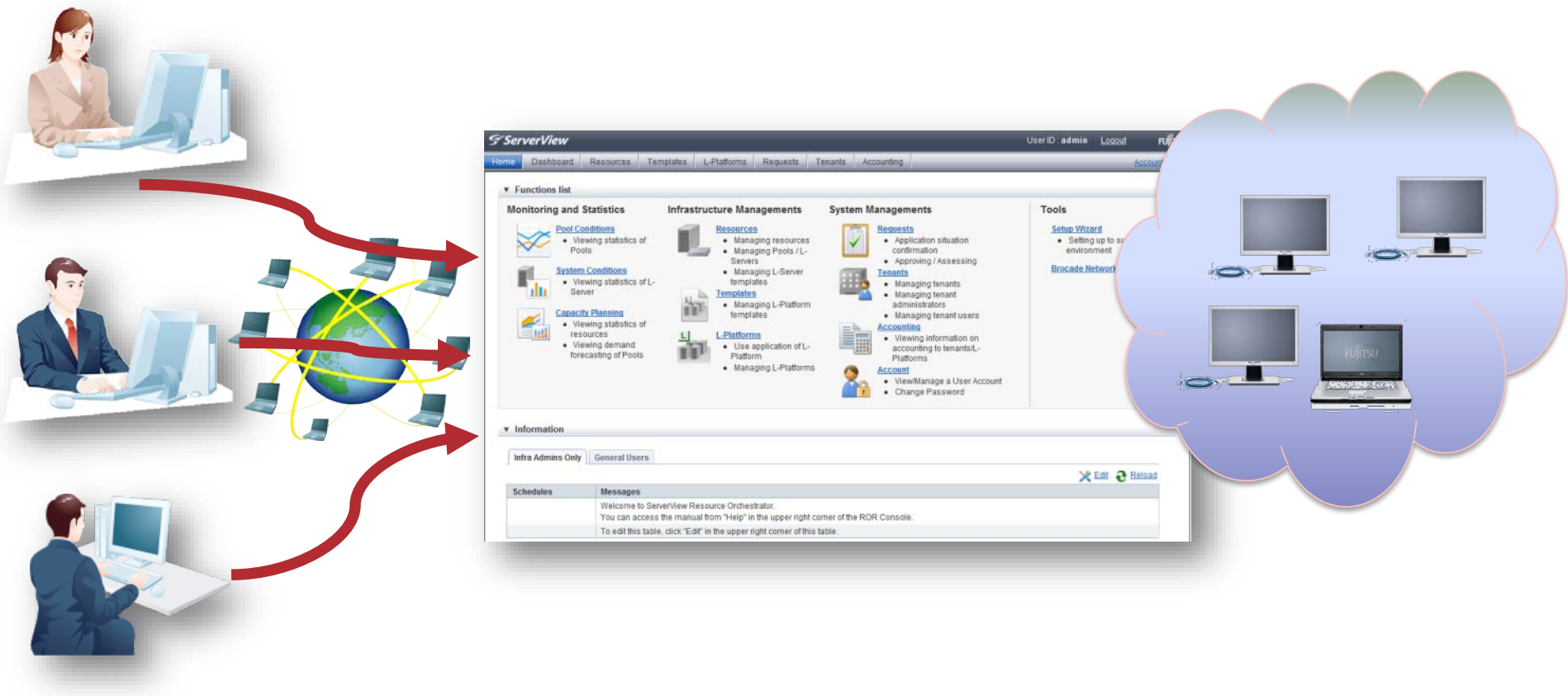
Users access cloud resources via the advanced self-service portal

Tenant Users | **Self Service Portal** | ***Cloud resources***



Platform lending process flow

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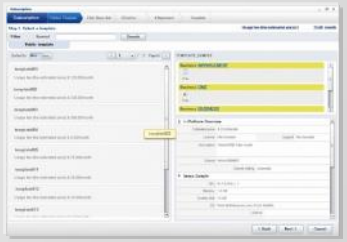
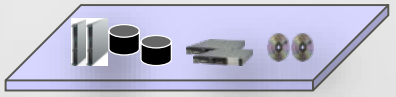
Automatic building of the infrastructure layer which can also be used for visualization of ICT resource usage

Tenant User	Tenant admin	Infrastructure administrator	FUJITSU Software ServerView Resource Orchestrator



Preparing

Pool Management of ICT resources.
(consolidate resources and create pools)



ICT resource pools

Define L-Platform specification.

Release the service on Self-service portal

Apply for service

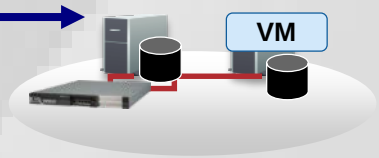
Select L-Platform and apply for service

Approval of L-Platform

Approval of L-Platform

Provisioning management
(Building of L-Platform)

Use service



Displays status of utilization

Pool management of ICT resources.
(Figure out allocation remaining of Pools)

L-Platform deployment

Automatic

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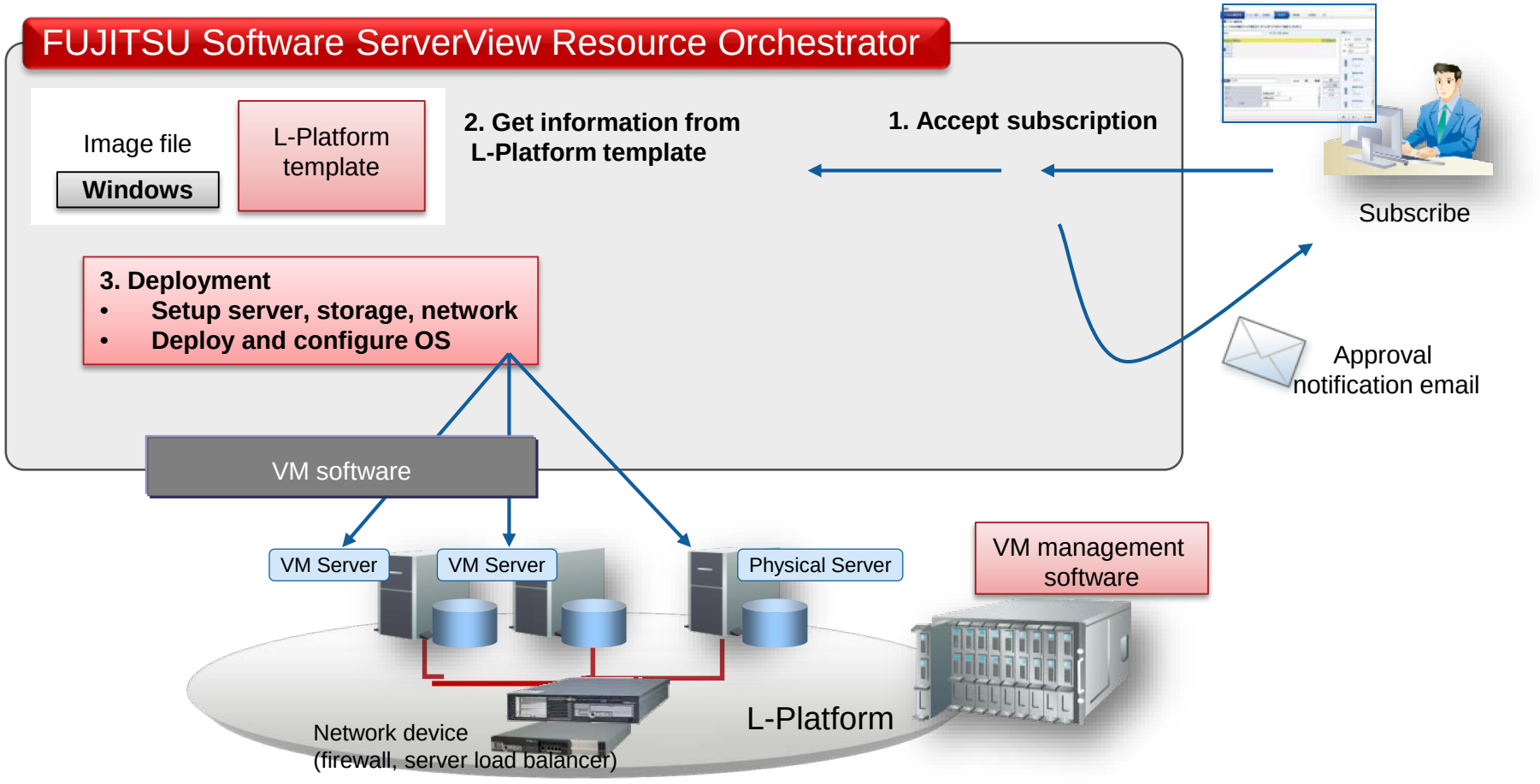
Quickly provide logical platforms to tenant user

- Based on the user specified template, L-Platform is automatically deployed and configured. Physical/VM mixed L-Platforms are also supported



Template creation and publish

Infra Admin
Tenant Admin

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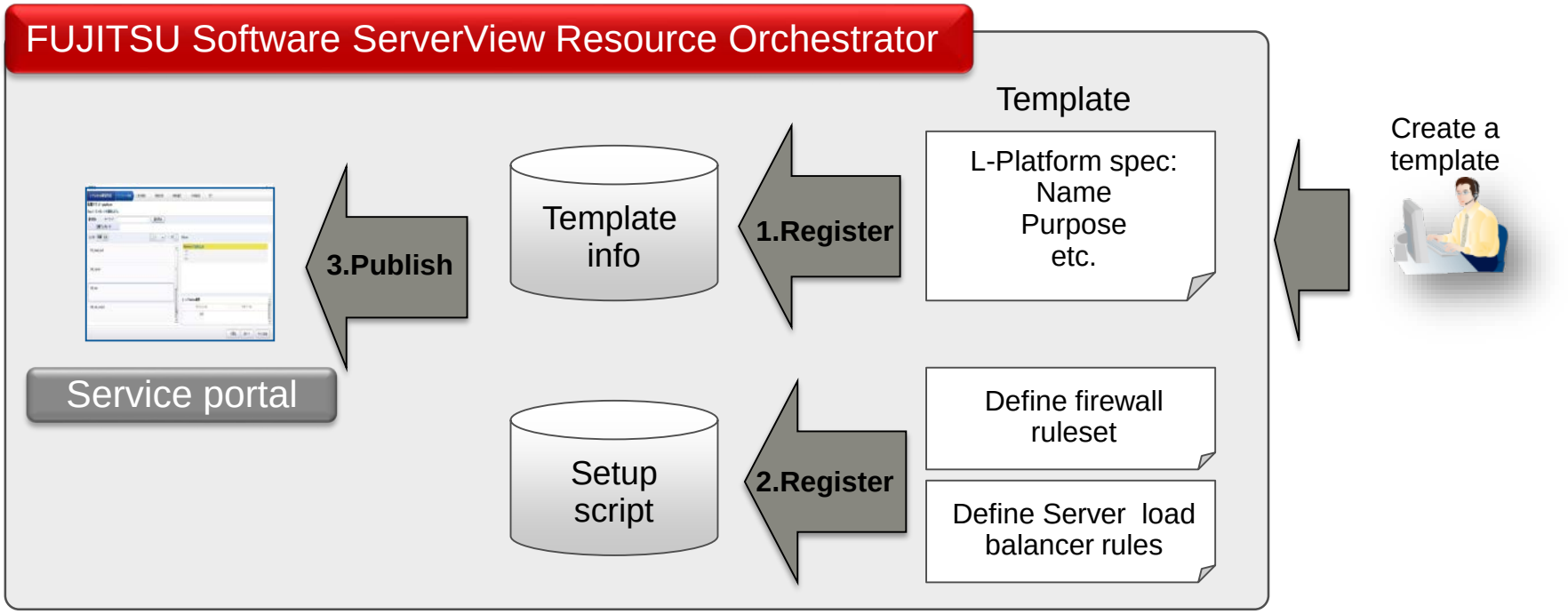
Provide different configuration patterns to group companies or for internal use

- GUI operation to create, register and publish a template
- Server and allocated resources can be defined for each template
- Template can be shared by multiple tenants or used by one tenant



L-Platform subscription

Tenant User

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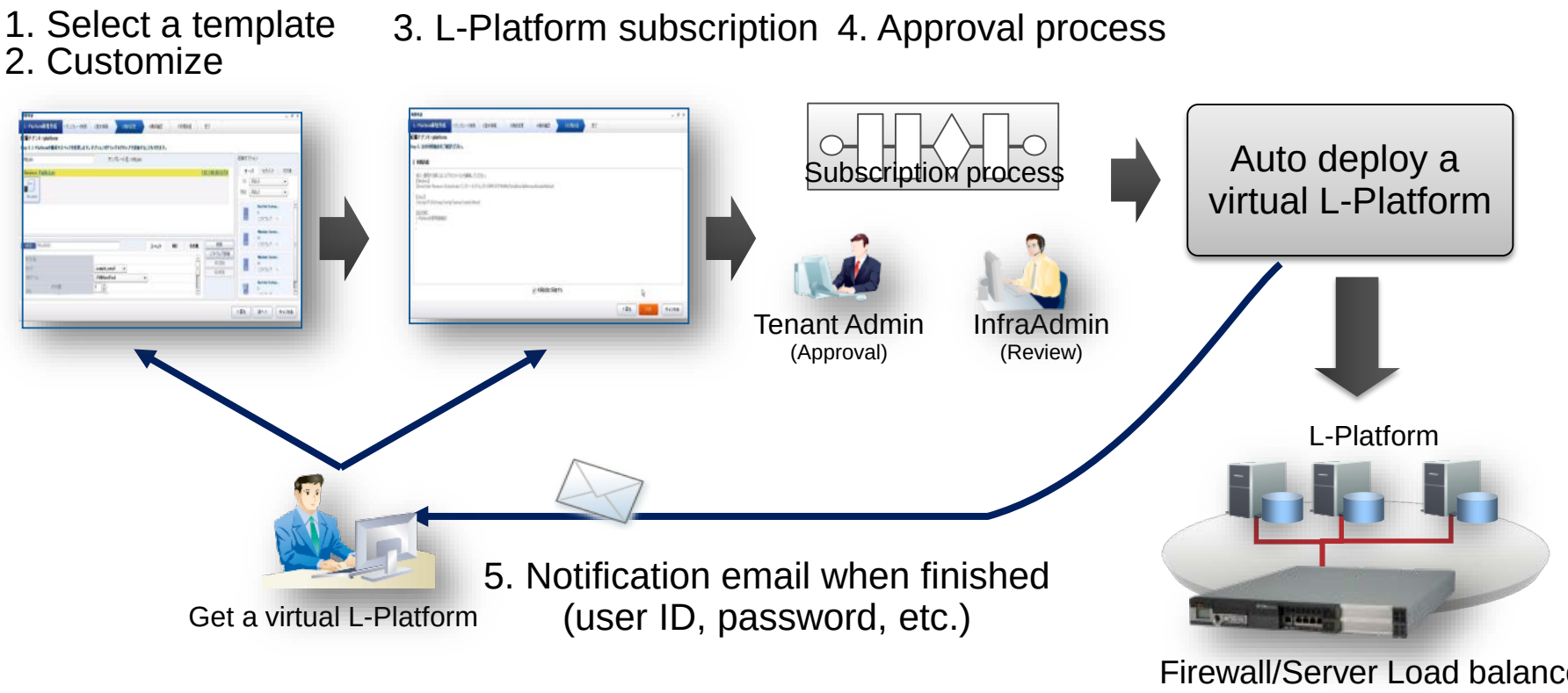
Service-enabled L-Platform creation with full automation process

- A multi-tier system, including firewall and server load balancer, can be deployed automatically by simply selecting a template
- CPU and Memory spec can be changed after L-Platform creation



Subscription process

Infra Admin
Tenant Admin

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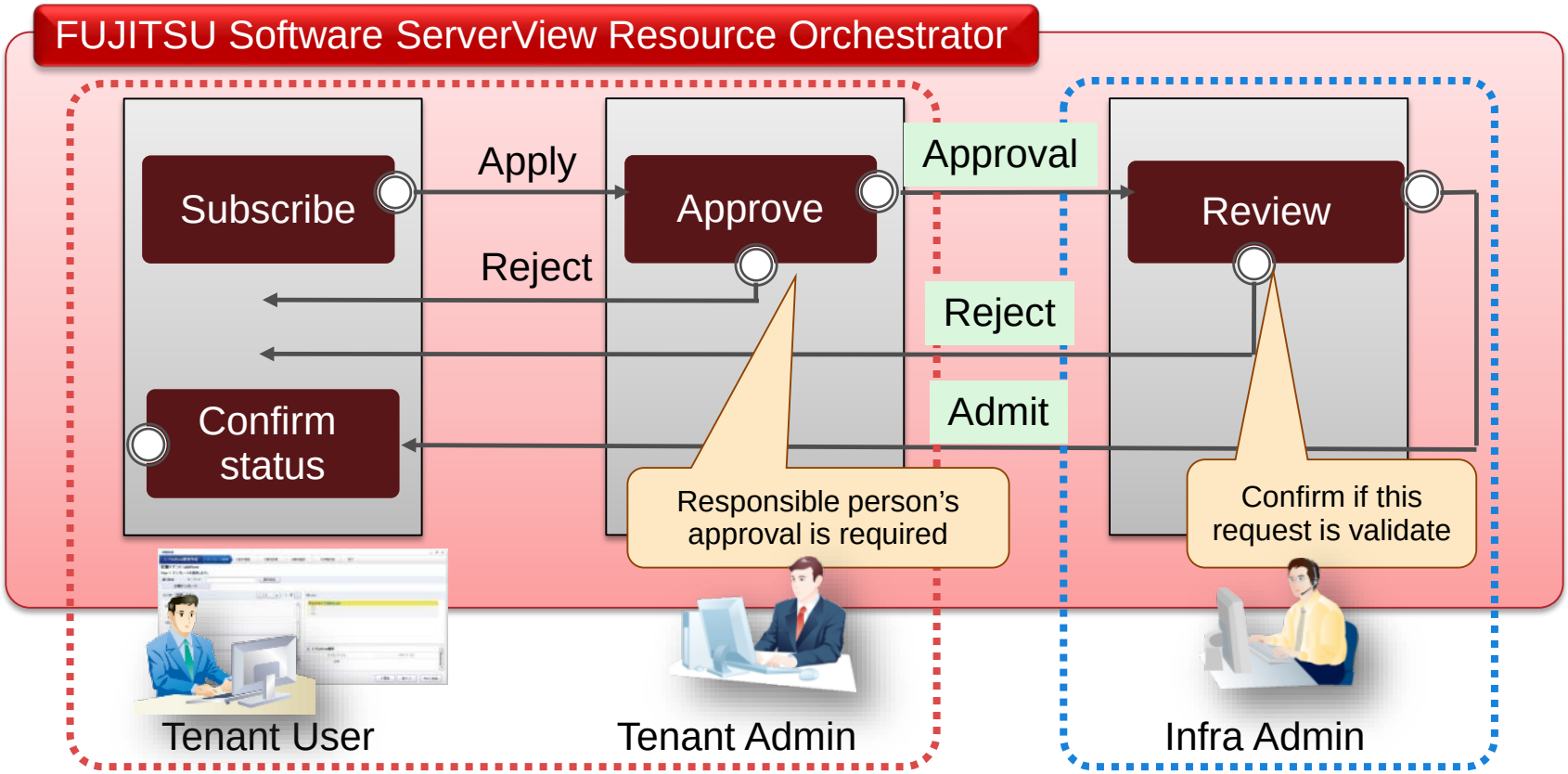
Ensure the subscription of a tenant user is valid or not before the actual deployment

- Two stages (review and approval) to check the tenant user's subscription
- Reject or approve the subscription is judged by the responsible person



Using of cloud services (1)

Tenant User

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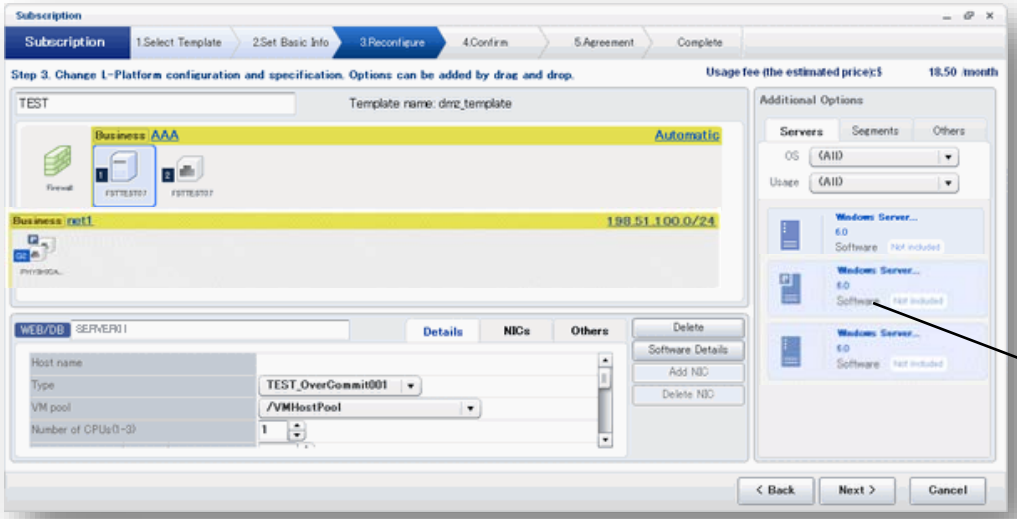
After L-Platform deployment, L-Platform spec and configuration can be changed by tenant user (subscription is required)

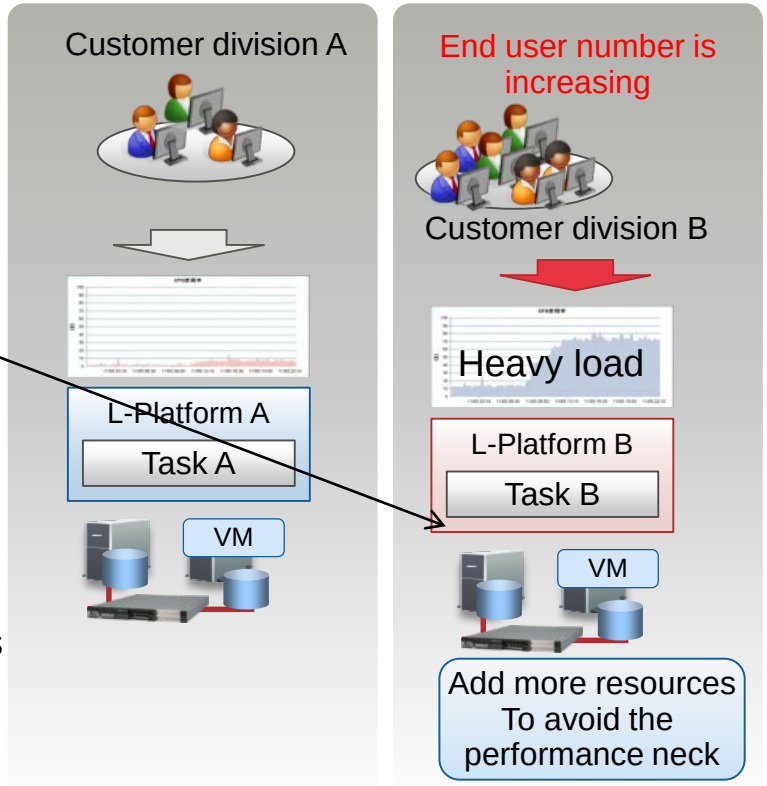
- System configuration, spec and L-Server number can be changed



Tenant User

Tenant user can change the following parameters without stopping L-Platform

- CPU number, performance
- Memory size
- Disk number
- Server Number



Using of cloud services (2)

Tenant User

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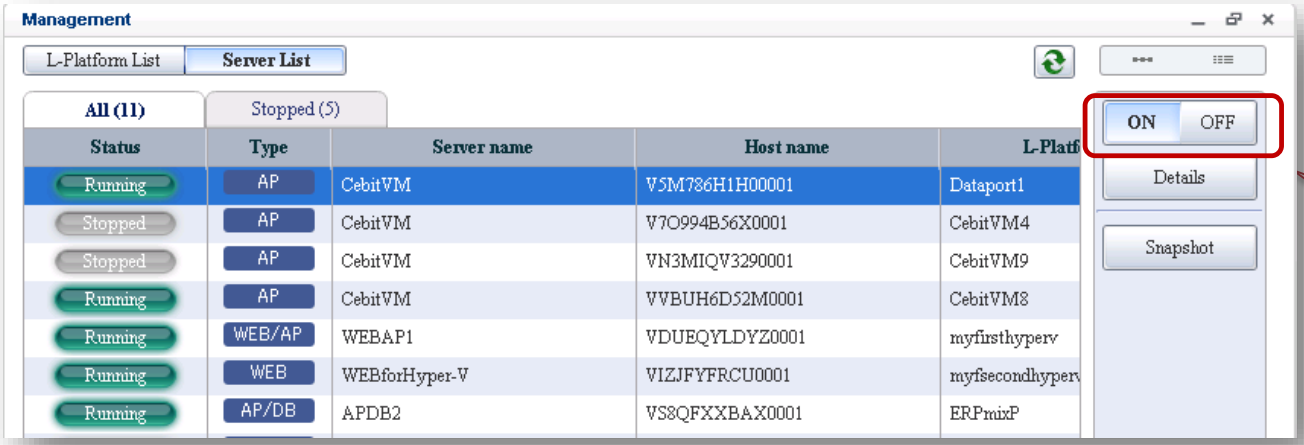
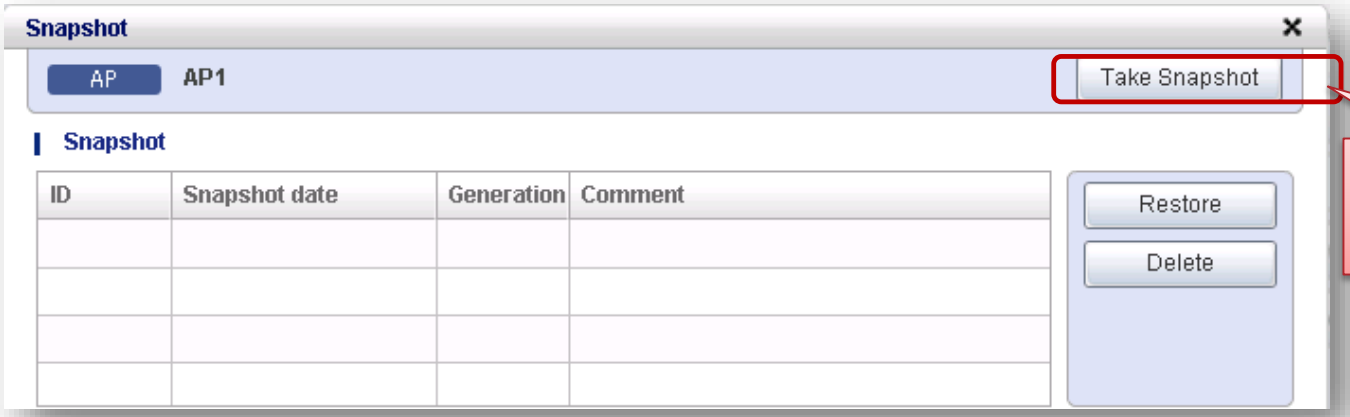
Easy operation and easy maintenance

- Power on/off L-Platform, including all L-Servers through one operation



Power control button

- Support 3 generations snapshot image management, and be able to restore to any specified generation



Snapshot collect

Resource pool management

Infra Admin
Tenant Admin

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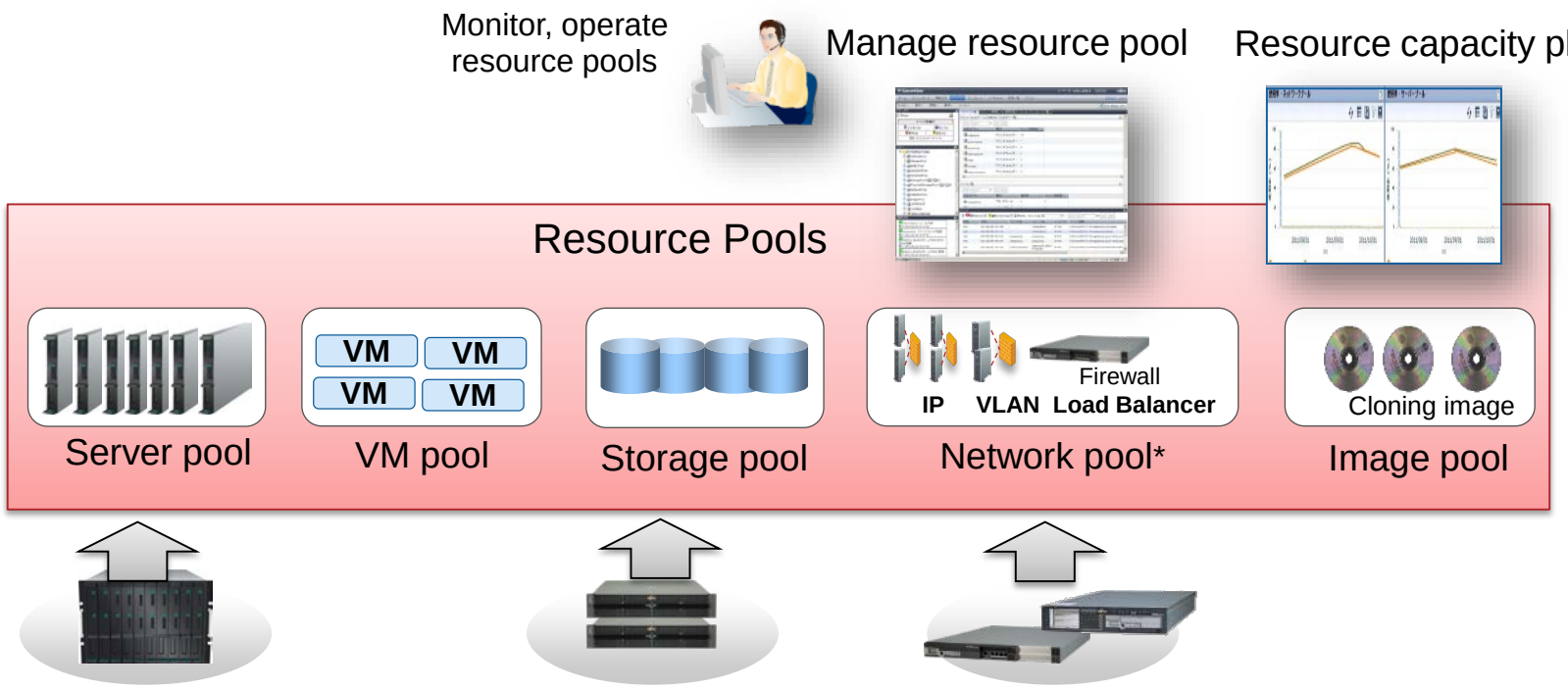
Improve the hardware utilization ratio by allocating/releasing resources on demand

- Integrate resources into resource pools for central management
- Easy to know the current resource usage and plan for future



Integrate the scattered resources into resource pools

*: Pools to manage the network configuration info (IP, VLAN-ID, physical connection) and network devices (Firewall/Server load balancer)

Network configuration automation (1)

Automatic

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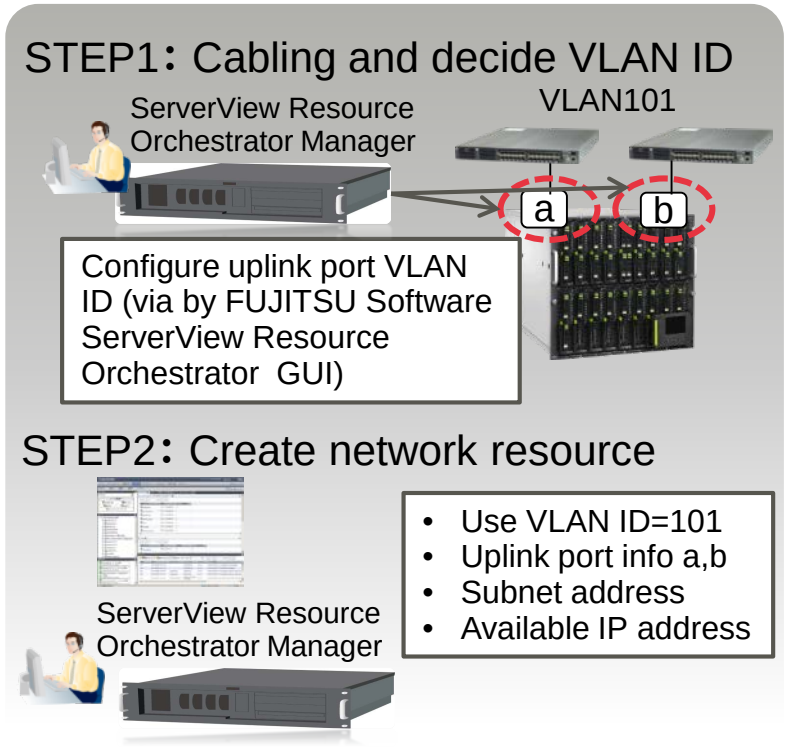
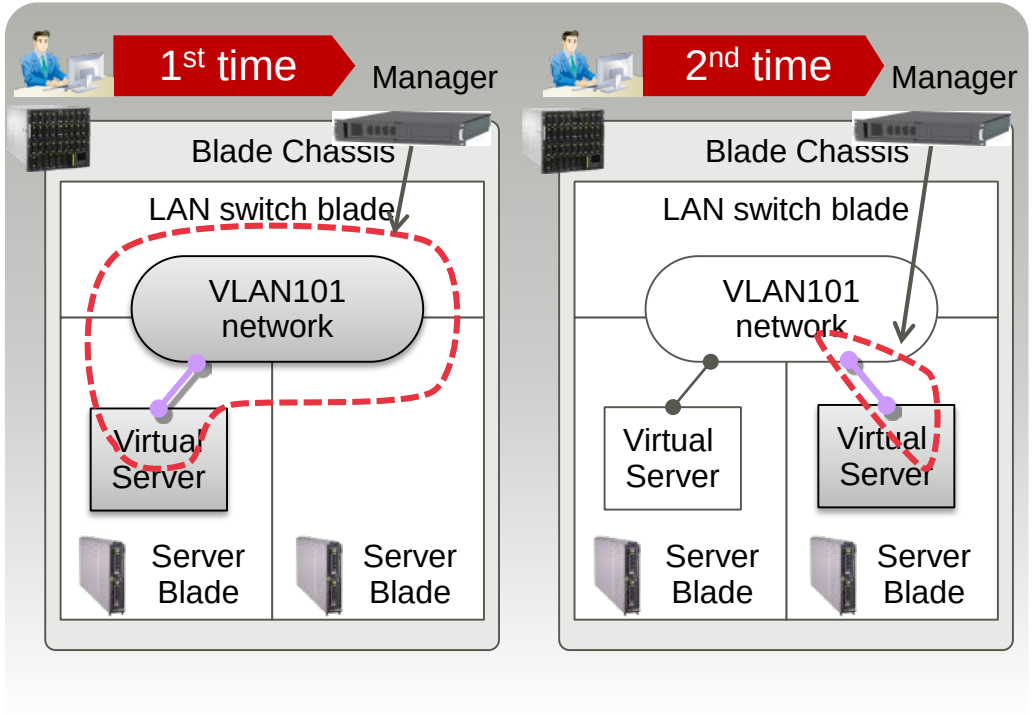
Reduce operation costs by automating and simplifying VLAN networks

- Automatically create VLAN and virtual networks on the VM host.
- Automatically connect newly created virtual servers into the virtual network

Site Preparation



L-Platform subscription



* Sample of VMware ESX/ESXi(vNetwork), Hyper-V on blade server. Automation scope differs from OS/hardware environment

Network configuration automation (2)

Automatic

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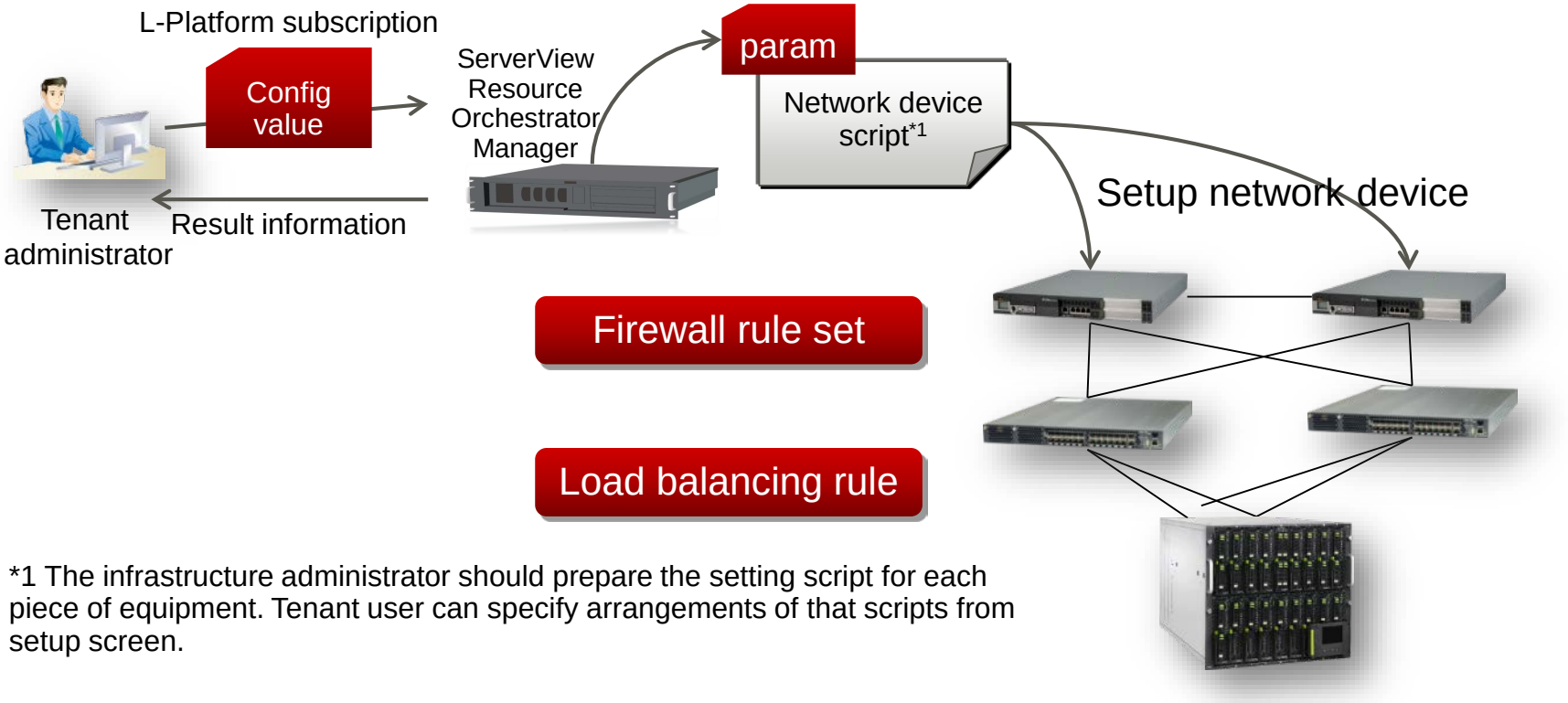
Simplify firewall and server load balancer configuration

- Automatically configure firewall and load balancer when creating/modifying/changing the L-Platform
- Prepare recovery scripts in advance, if the script execution fails, it is skipped and the unfinished configuration is removed automatically



*1 The infrastructure administrator should prepare the setting script for each piece of equipment. Tenant user can specify arrangements of that scripts from setup screen.

Resource status monitoring

Infra Admin
Tenant Admin

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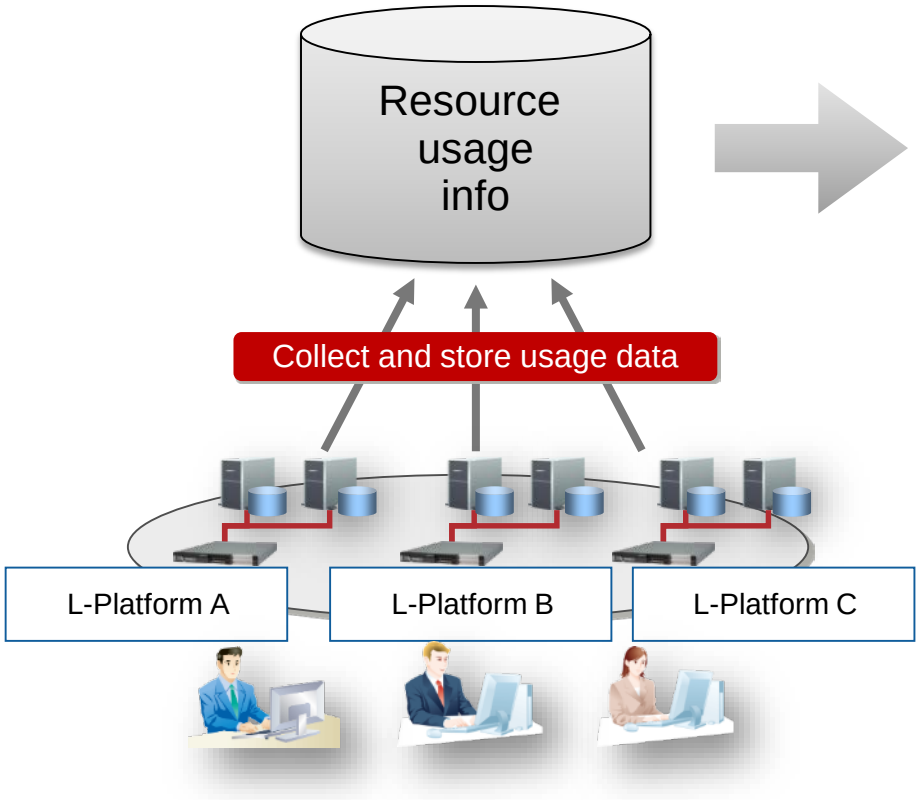
Easy to check the server resource usage and conditions

- Centralized view to show all the L-Platform resources usage
- Reference range can be restricted in accordance with the tenant user and tenant admin's role authority



Display resource usage in graph

- CPU usage rate(%)
- Memory amount (MB)
- Disk read/write amount (MB/S)
- Disk read/write number (IOPS)
- Network throughput (Mbps)

Monitoring of resource usage (1)

Infra Admin

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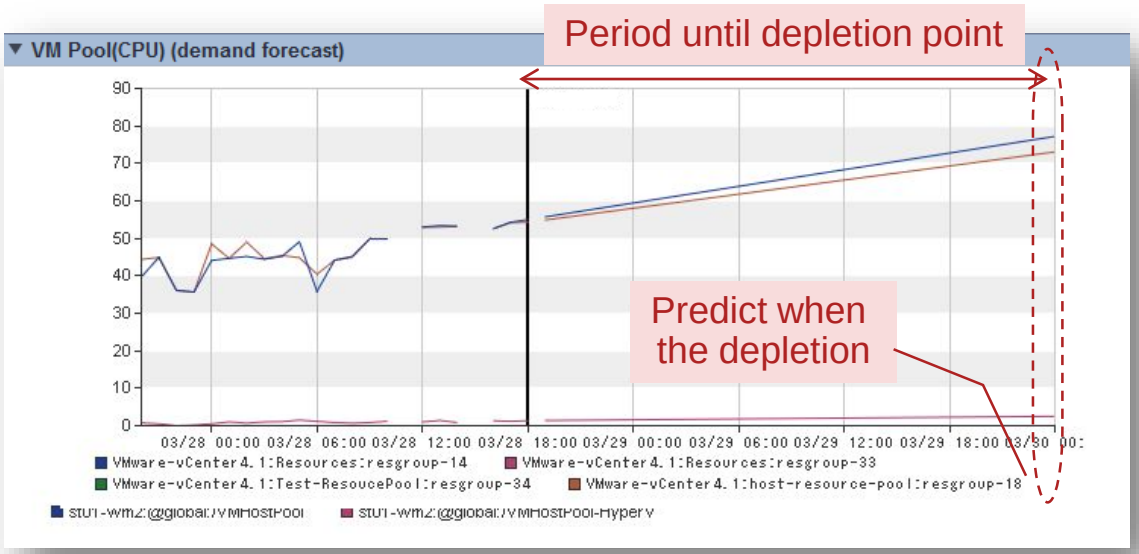
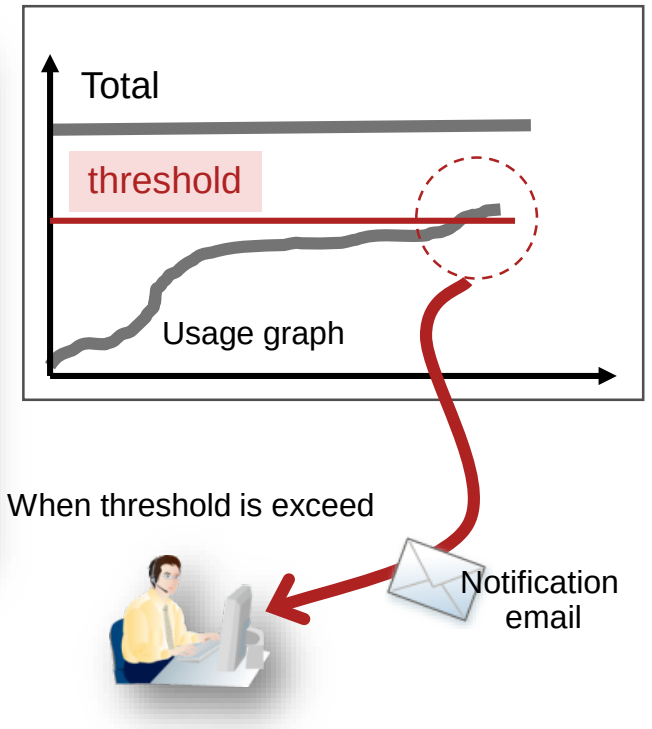
Real time analysis for the best performance

- Predict the future usage based on existing actual data
- Early detection of insufficient resources through threshold monitoring

Regression analysis the usage of the resource pool



Threshold monitoring and email notification



Monitoring of resource usage (2)

Infra Admin

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Resolve the VM host insufficient resource problem by optimizing the VM guest relocation

- Resource load is displayed in graph per host, which can be used to check whether the host is over-loaded or under-loaded
- Simulate the VM guest reallocation, to find the best solution and avoid peak time heavy load in advance

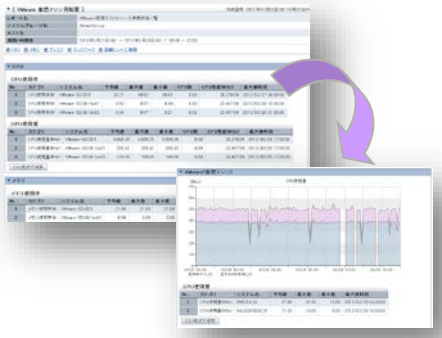
Monitor over-load VM host based on the physical resource amount and usage

Keep running

Based on the result of simulation reallocate the guest OS to avoid the over-load

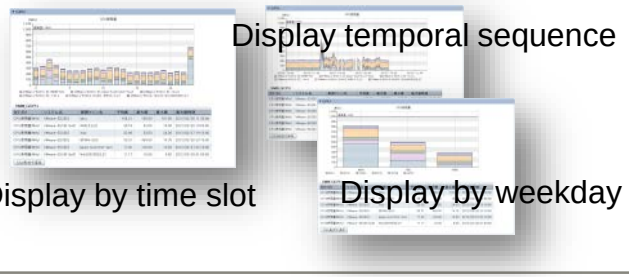
Pre-validate the resource usage by simulating the status after guest OS reallocation

1. Check usage per host

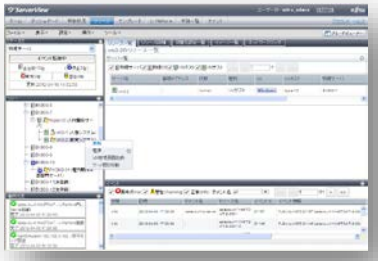


2. Check usage per guest

3. Decide the reallocate guest OS and its destination



4. Refer to the simulation result and migrate the target guest OS



5. Avoid system over load

Improved Network security

Infra Admin

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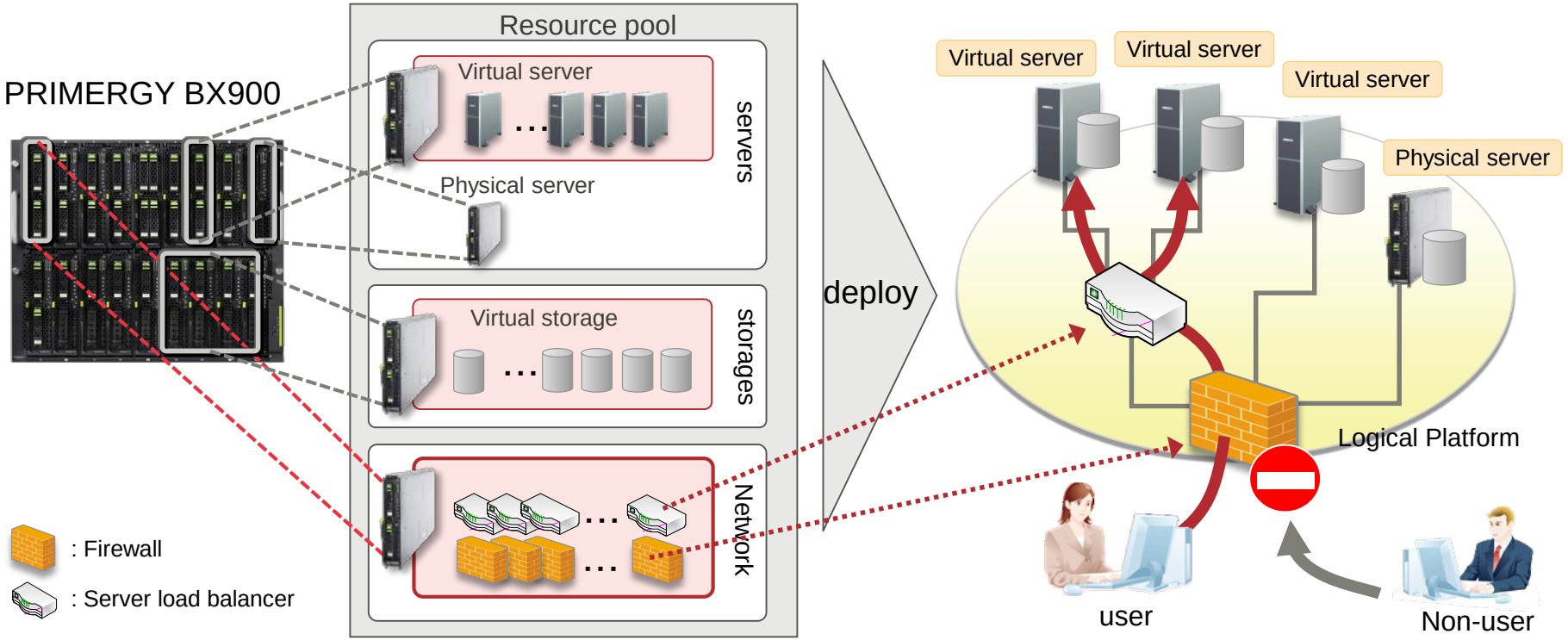
Improved network security for customers, projects & divisions

- The Access Control Feature controls the access between tenants and platforms
- Address Translation Function can hide secure server information
- The Anomaly IPS feature protects each platform from flooding-attacks



Billing function

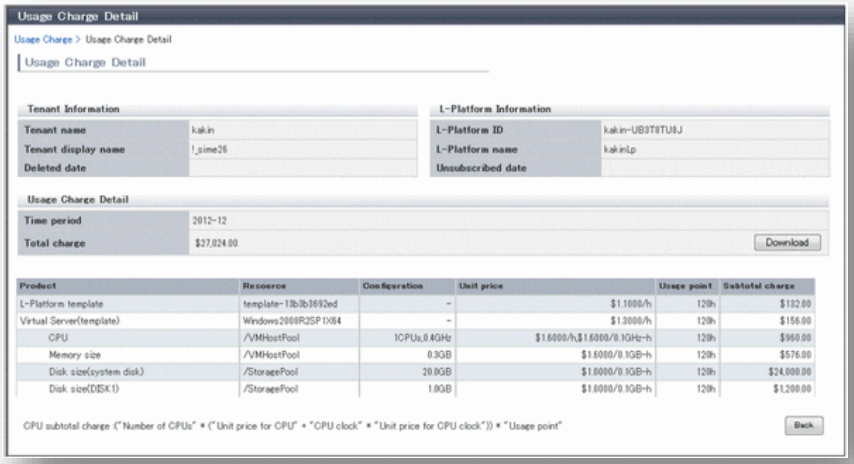
Infra Admin

FUJITSU

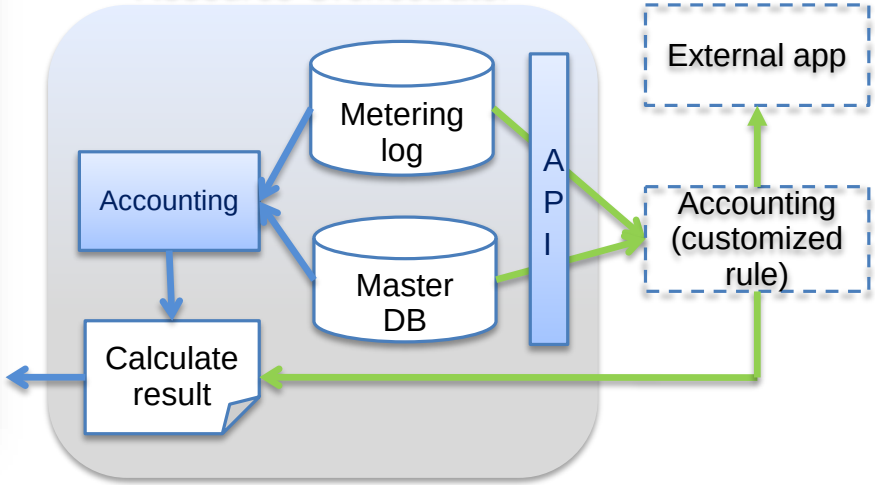
Flexible billing function based on the customer requirements

- Easy to use monthly billing based on the unit price of L-Platform
- Unit price (master DB) and usage (metering log) can be collected from FUJITSU Software ServerView Resource Orchestrator API, to customize the billing rule

Monthly billing info



FUJITSU Software ServerView Resource Orchestrator



Disaster recovery

Infra Admin

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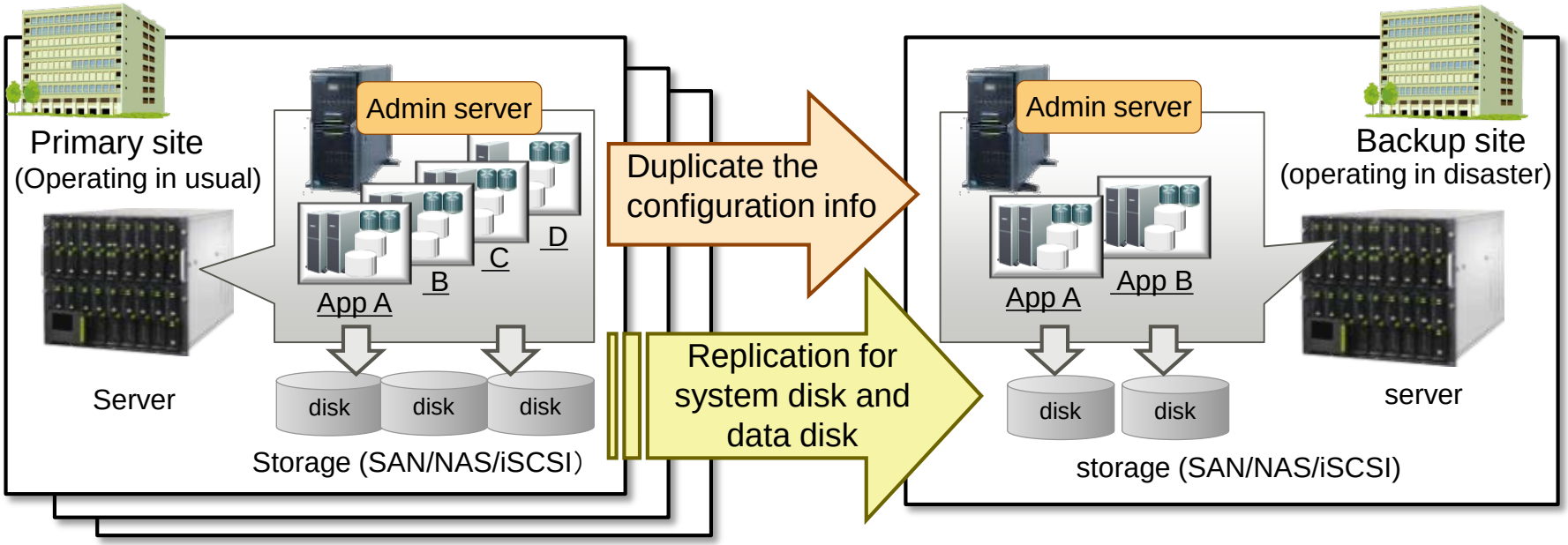
Quickly recover the private cloud infrastructure on the backup site by replicating the disk contents and FUJITSU Software ServerView Resource Orchestrator configurations

- Both of primary site and backup site can be used as active state (backup site can be used for another purpose)
- In case of disaster, the whole primary site or a part of resources (L-Platform, tenant, etc.) can be recovered. More than one primary sites can share one backup site to reduce spare resources

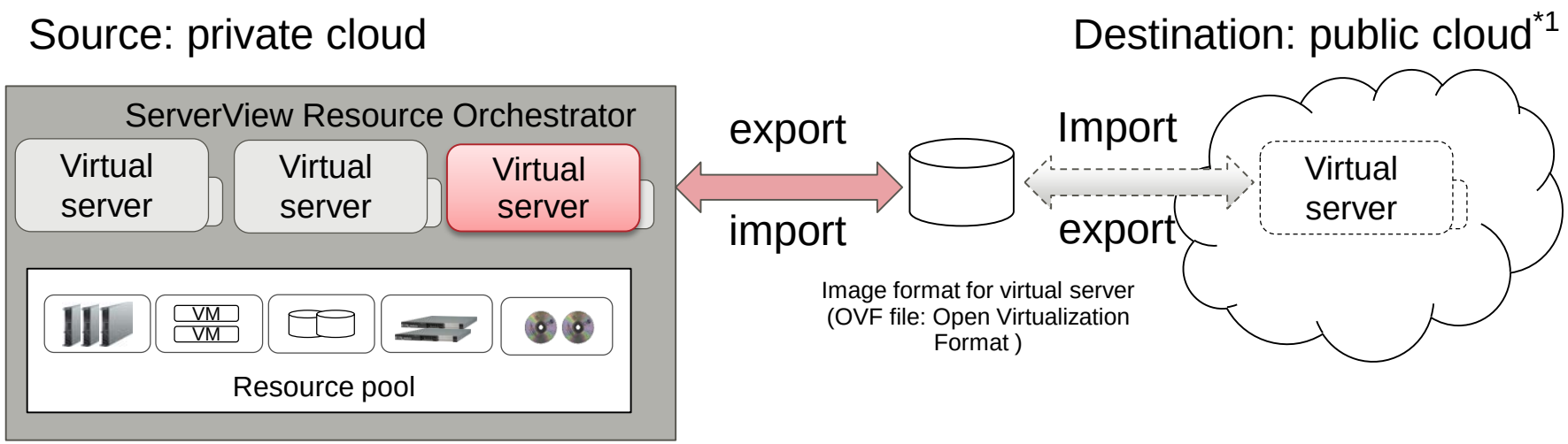


* This function is activated by “ServerView Resource Orchestrator DR Option”.

Hybrid cloud support (migration between private and public)

Realize a flexible migration of virtual server to the public cloud

- Export/Import the virtual server image format (OVF file) on the private cloud with a definition information.



*1: Please contact the engineer about the destination cloud.

Apply for VDI (Virtual Desktop Infrastructure)

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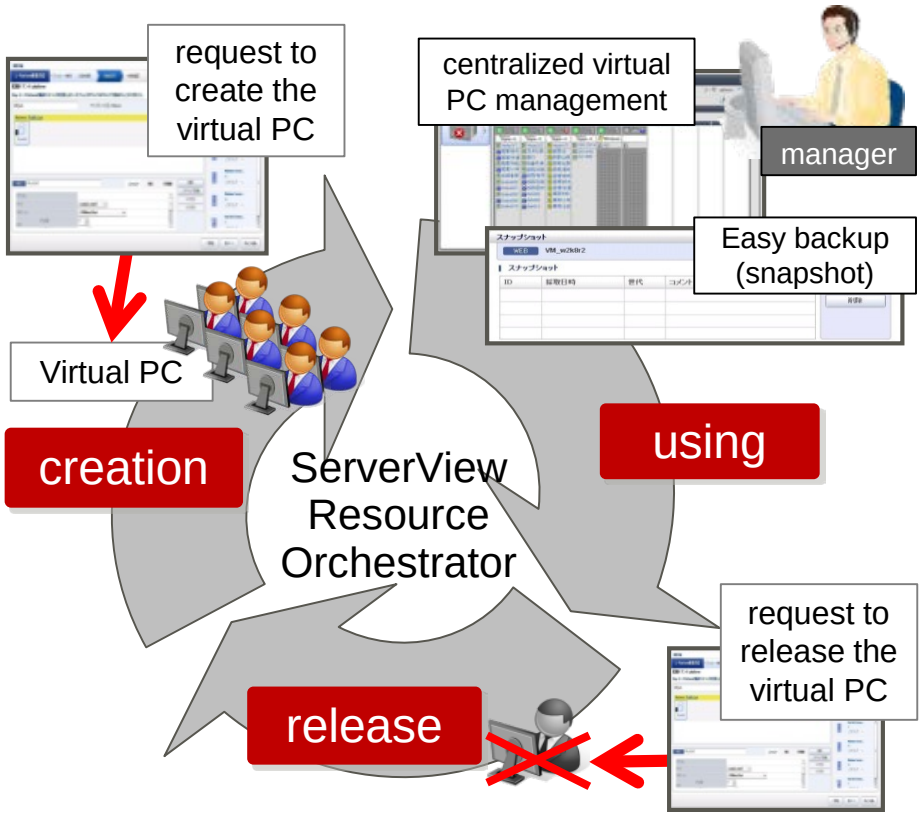
Decrease the operation costs of the VDI environment

In VDI, timely providing of virtual PC to the user is important like Private Cloud operation. This product can efficiently operate the life cycle of the virtual PC by automatic deployment and visualization of the operation status.



[point 1] timely providing of a lot of virtual PCs

- Shortening at VDI environment creation period (1.5 month[*1]) by automatic deployment of virtual PC (including register ActiveDirectory and VDI software).

[point 2] easy management of virtual PCs

- The user operation status can be monitored via viewer function.
- Take a snapshot before OS patch is applied.
- Reuse the released resources from user.

*1: an actual sample of a customer

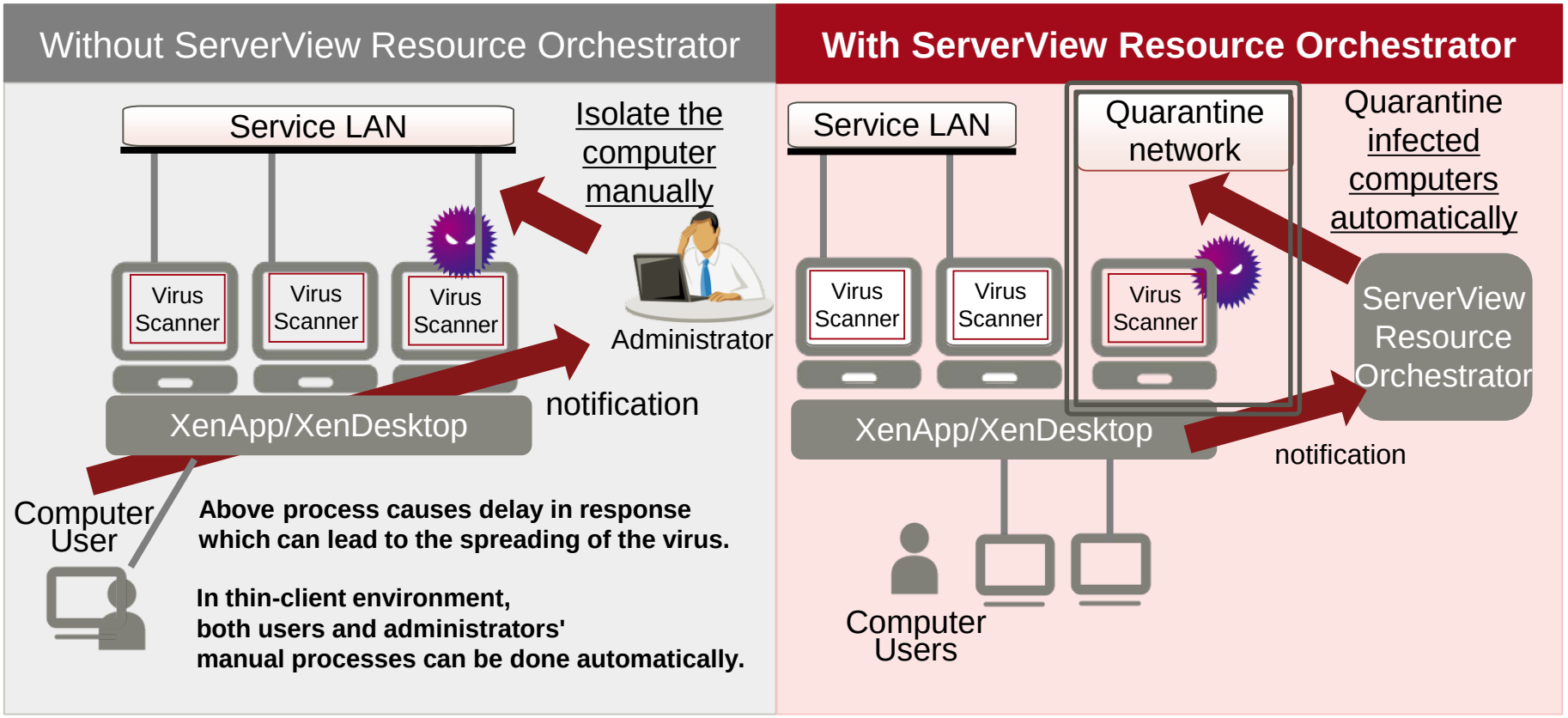
Automatically Quarantine

enhancement

FUJITSU

Automatically switch infected computer to the quarantine network

The infected computer is automatically switched to the quarantine network by ServerView Resource Orchestrator, and vice versa.



Dynamic resource management function list

Function		Summary	Virtual Edition	Cloud Edition
Security	Account management	Register/delete users for each tenant		✓
	Access management	Limit operational resource scope based on the user's role		✓
	Automatically Quarantine	Automatically Quarantine virus-infected computers		✓
Service Portal	Resource subscription	Apply for a logical platform (L-Platform)		✓
	Configuration change	Delete/modify the L-Platform configurations after it is created. Define firewall and server load balancer's setting		✓
	Power control	Power on/off L-Platform and L-Servers		✓
	Snapshot	Collect and restore virtual server's snapshot as backup		✓
	Display resource usage	Display CPU/memory usage, power status, Network status, etc. of each L-Platform.		✓
Auto deploy	Service template	Define/modify/customize/publish a service template. Cloning master can be change/delete as well. Define the scripts for the external network device		✓
	Subscription workflow	Manage L-Platform application, approval operation and history		✓
Resource pool	Resource pool	Create/change/move/delete resource and resource pool		✓
	Provisioning	Automate server provisioning within the accessible resources		✓
	Monitor resource usage	Monitor resource pool's usage and forecast. Display and simulate virtual server, virtual host resource usage.		✓
	Disaster-recovery	Move the customer production from primary site to remote backup site		✓ *1
Billing	Billing and accounting	Collect and output the resource usage data which relates with billing (XML/CSV). Calculate and display the billing report on GUI		✓

*1 FUJITSU Software ServerView Resource Orchestrator DR option license is required

Features for Resource management

FUJITSU Software ServerView

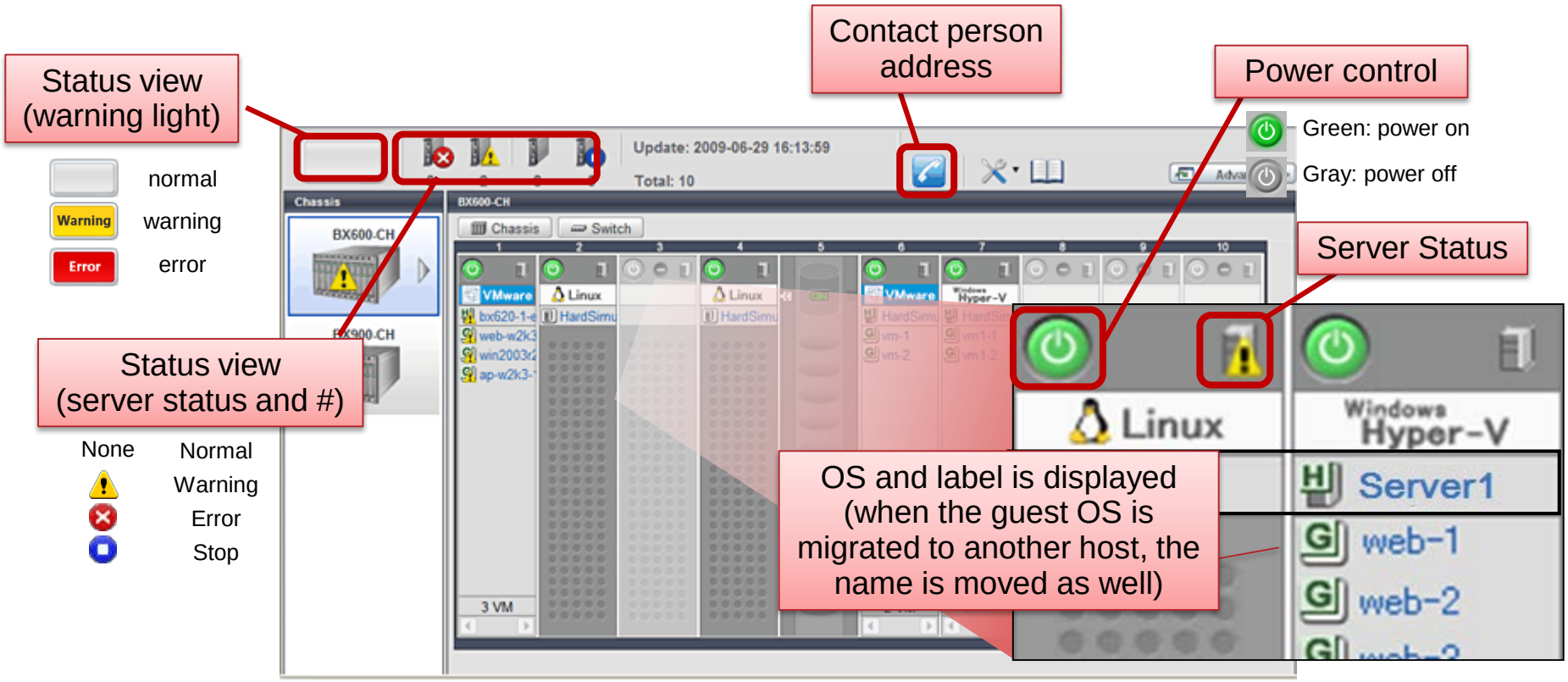
BladeViewer

Infra Admin

FUJITSU

Simplify blade server management

- Display blade chassis, server blades, virtual/physical servers, OS names
- Easy to confirm status of all servers (powered on/off, error)



Network Viewer (1)

Infra Admin

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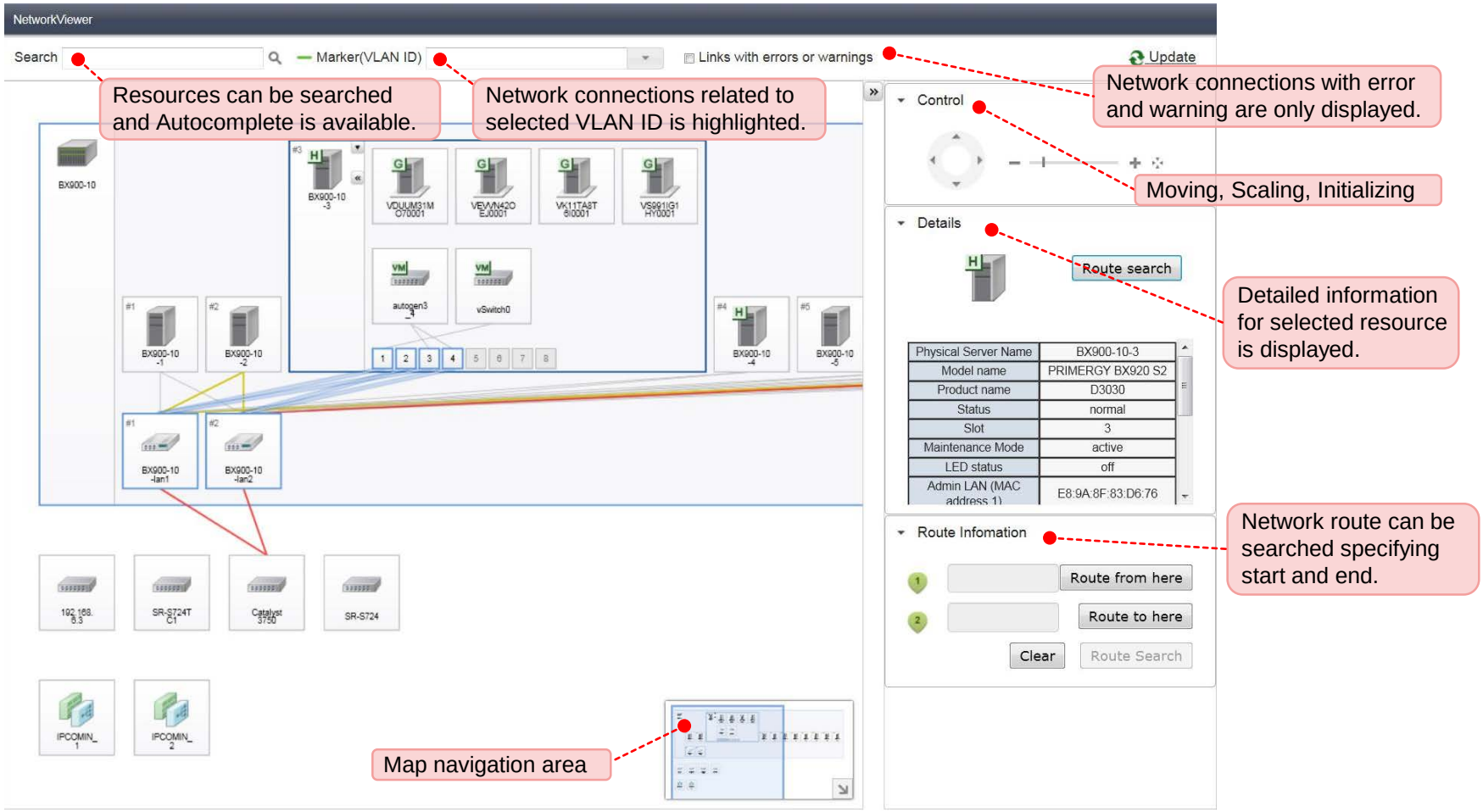
Easy to identify the network error location and impacted servers

- Display the connection between physical/virtual servers, physical/virtual switches
- Display connections (VLAN/VM, redundant network) and switch port status



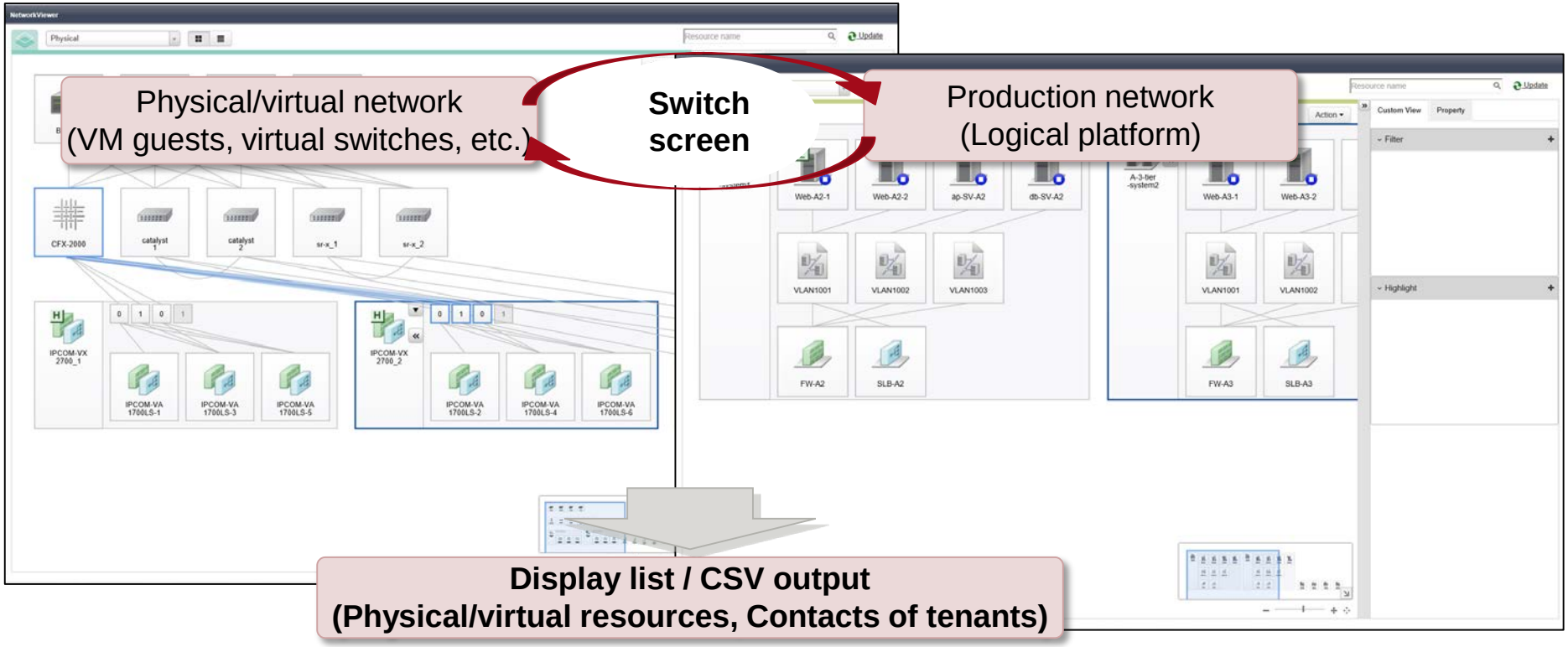
Network Viewer (2)

enhancement | Infra Admin | FUJITSU

Strongly support operations management of cloud management

[Function]
- Display physical/virtual network and corresponding production network (logical platform configuration)
- Display/output lists of resources and contacts of tenants

[Benefit]
- Enable administrators to monitor network status from service perspective



VM home position

Infra Admin

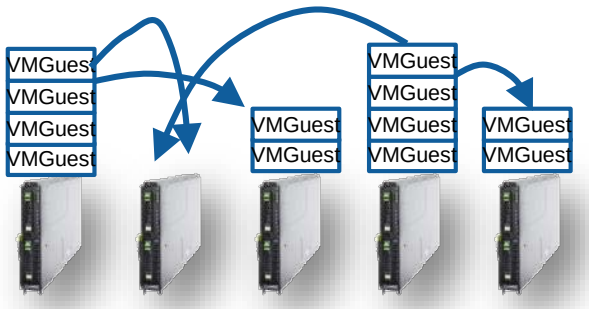
FUJITSU

One click to migrate all guest OSs to the original location

- Register the belonging VM host (home position), and move all the guest OSs back to original location automatically
- Home position registration and home position operation can be done for a single physical server or the whole system

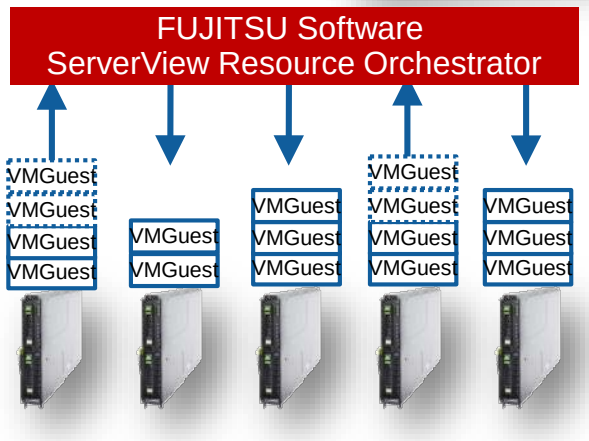
Without VM home position

Sometimes the administrator needs to migrate the guest OSs to other hosts temporarily (during maintenance, etc.). But after that, it takes time to migrate those guest OSs back to the original designated position



With VM home position

One click will move all the guest OSs to the original designated position



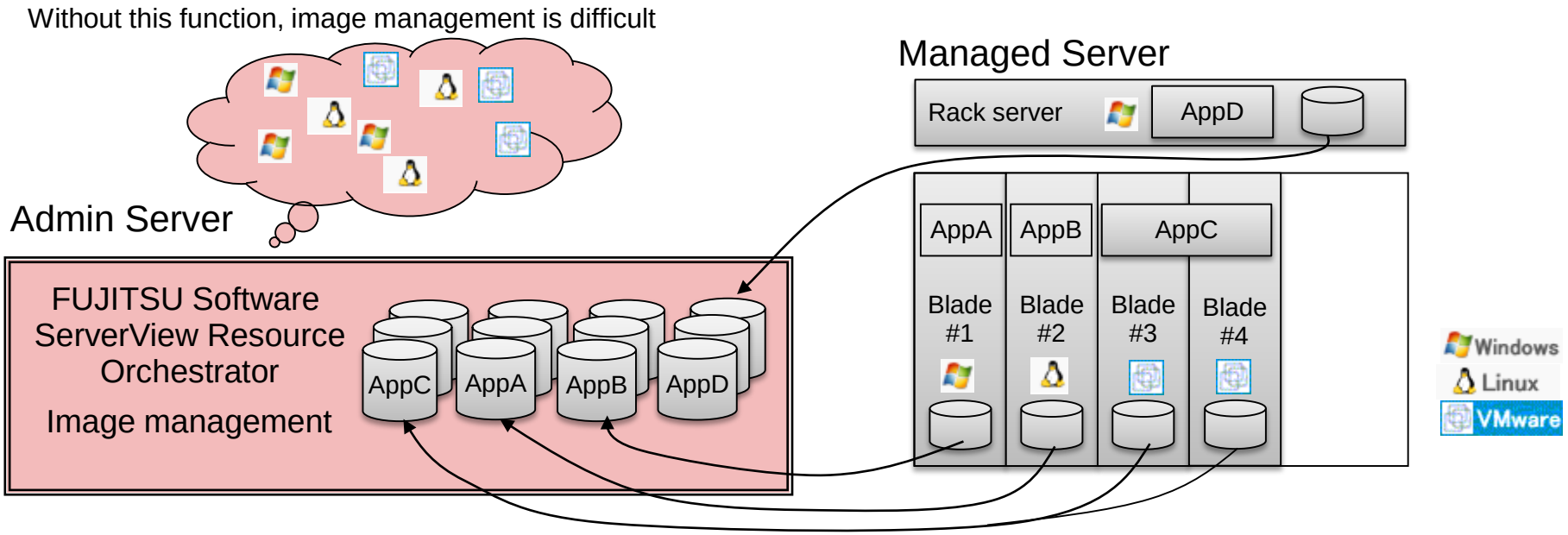
Unified system image management

Infra Admin

FUJITSU

Simplify system image management

- Backup system images, and centrally manage images in FUJITSU Software ServerView Resource Orchestrator manager (keep multiple generations)
- Simple operation from GUI to backup system image. CLI is also provided for automation



- This function supports iSCSI boot and EFI environment as well (in addition to SAN boot and local boot).
- Backup/restore can be performed for each physical server or VM host.
- Note that VMware vSphere 4/5 host backup/restore is not supported.

Auto recovery (PC Server)

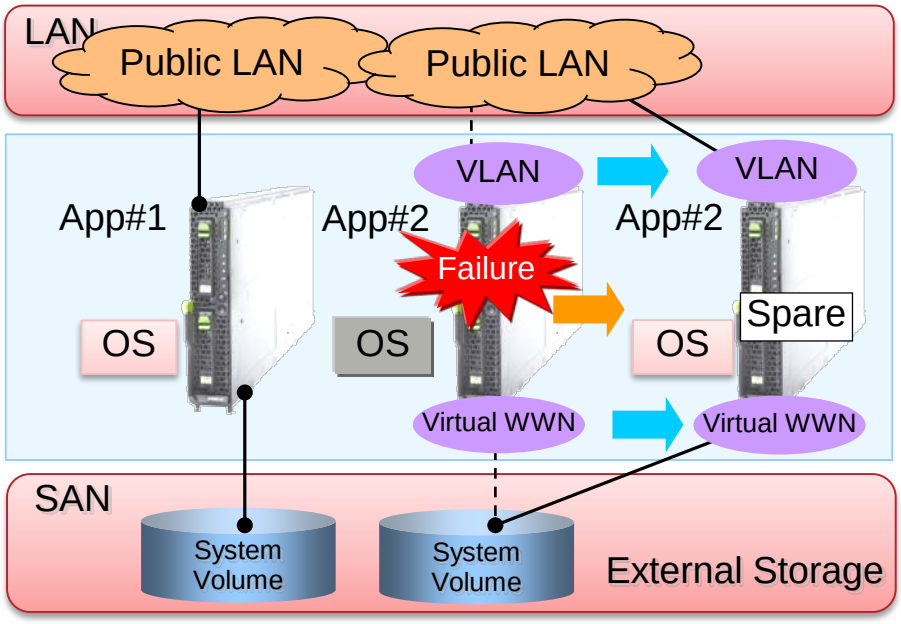
Infra Admin

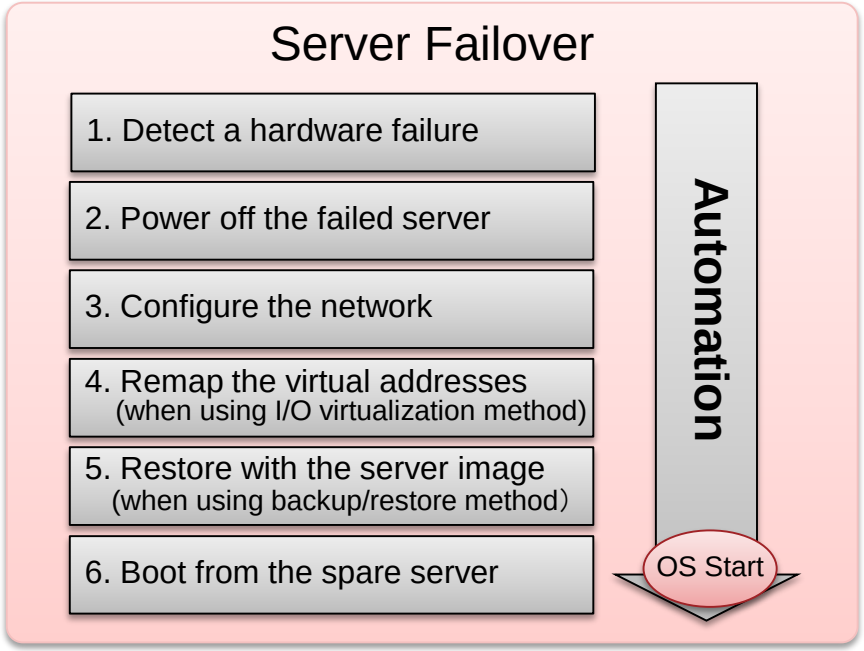
FUJITSU

N+1 “cold-standby” enables high availability and cost reduction

- Share one spare server across multiple production servers (N+1 cold-standby)
- Auto recovery of failed server on spare server to keep server functional

Ex: FUJITSU Serer PRIMERGY BX900+SAN Boot





*: Windows server can not share the same spare server with VMware vSphere 4/5 ESX/ESXi servers.

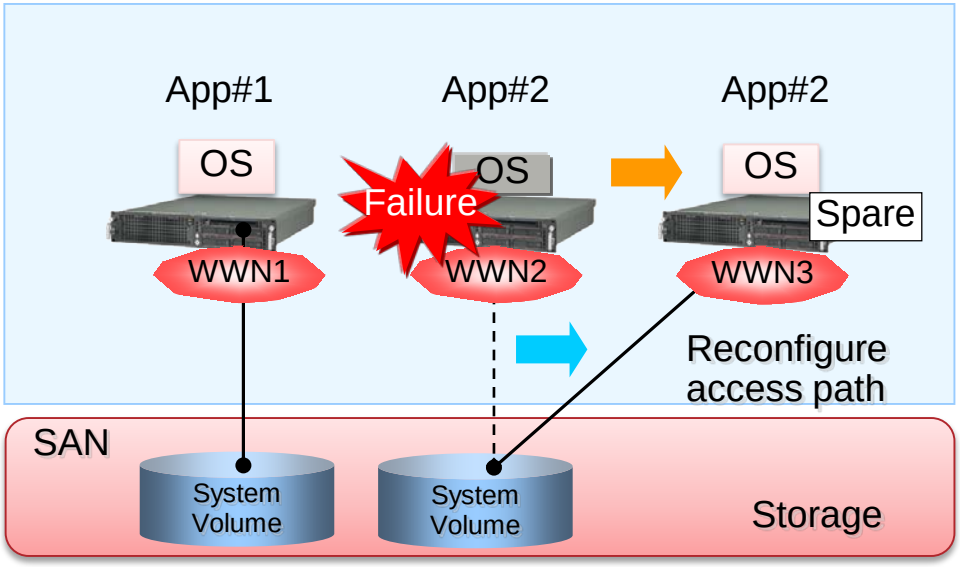
Auto recovery (UNIX Server)

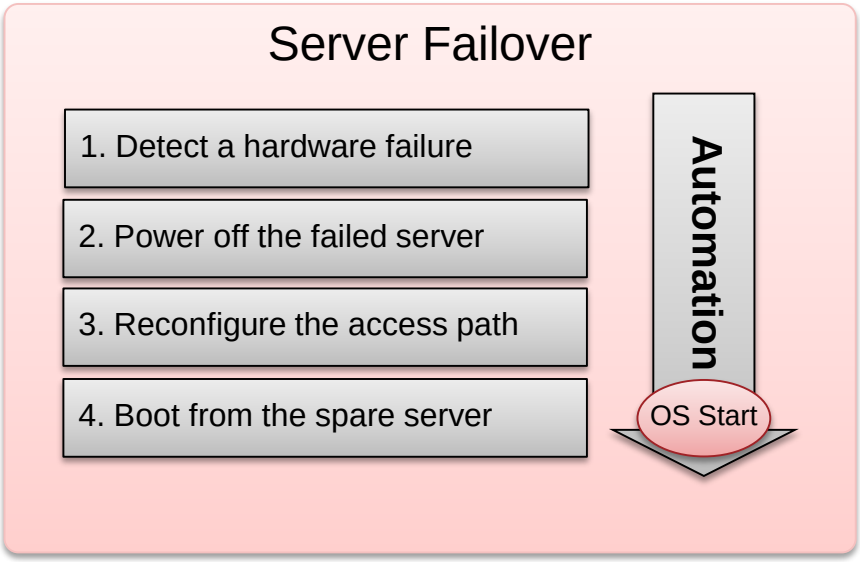
Infra Admin

FUJITSU

N+1 cold-standby solution on SPARC Servers

- Auto recovery FUJITSU SPARC Servers from a hardware failure
- Integrate with FUJITSU Software ETERNUS SF Storage Cruiser(*1), FC switch zoning and host affinity settings of SAN storage settings can be automatically switched





*1. ETERNUS SF Storage Cruiser is required for this function

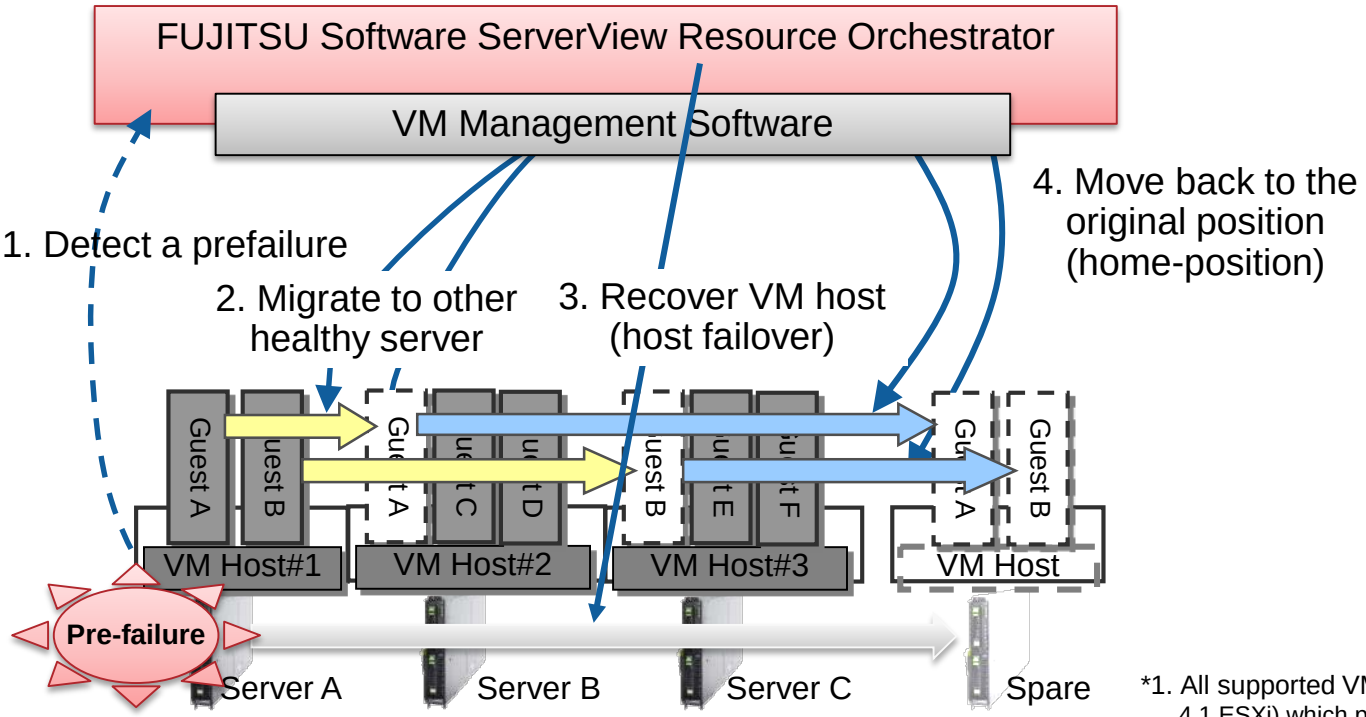
Auto migration from pre-failure error

Infra Admin

FUJITSU

Reduce the risk of server stoppages due to physical server failure

- Pre-failure detection, migration, failover, and move back to the original host (home position), the whole process is automated



Process of prefailure detection until system recovery

*1. All supported VM software (except for VMware vSphere 4.1 ESXi) which provides migration function can be supported.

*2. This function requires external script (will be published on web site)

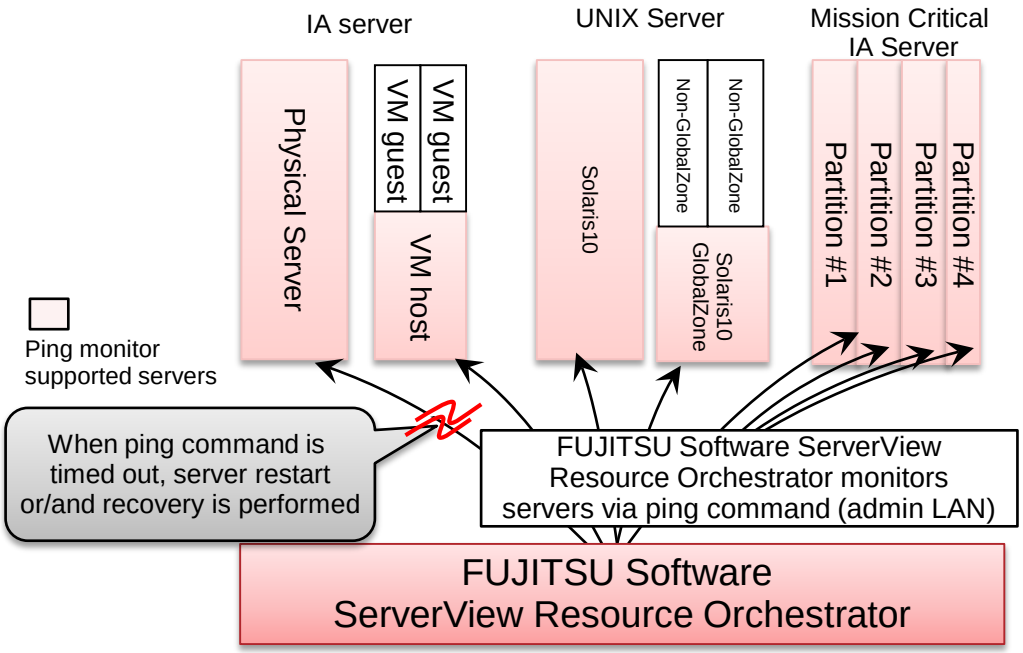
OS hang-up monitor

Infra Admin

FUJITSU

Besides server hardware error/pre-failure, OS hang-up is also monitored and can also be auto-recovered

- FUJITSU Software ServerView Resource Orchestrator monitors the managed servers by ping command(*1). When the server has no response, FUJITSU Software ServerView Resource Orchestrator automatically re-starts the server(*2)
- When the server has no response after restart, FUJITSU Software ServerView Resource Orchestrator automatically failovers the server to spare server(*3)



*1. FUJITSU Software ServerView Resource Orchestrator uses admin LAN to monitor the managed server. When this “OS hang-up monitor” option is enabled, the server may be forcibly rebooted when running. Admin LAN redundant setting is recommended.

*2. VMware ESXi is not supported

*3. For servers which doesn’t support server failover (FUJITSU Server PRIMEQUEST 2000/1000 Series), the action will be OS restart only

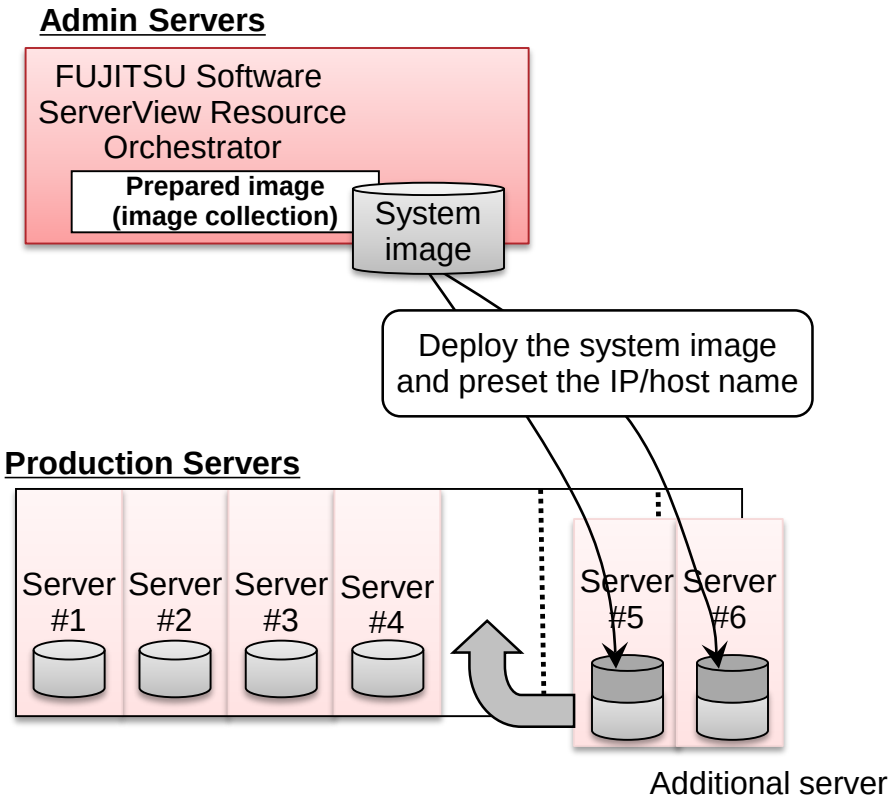
Physical Server Auto deployment (Cloning)

Infra Admin

FUJITSU

Quick server addition using cloning image deployment

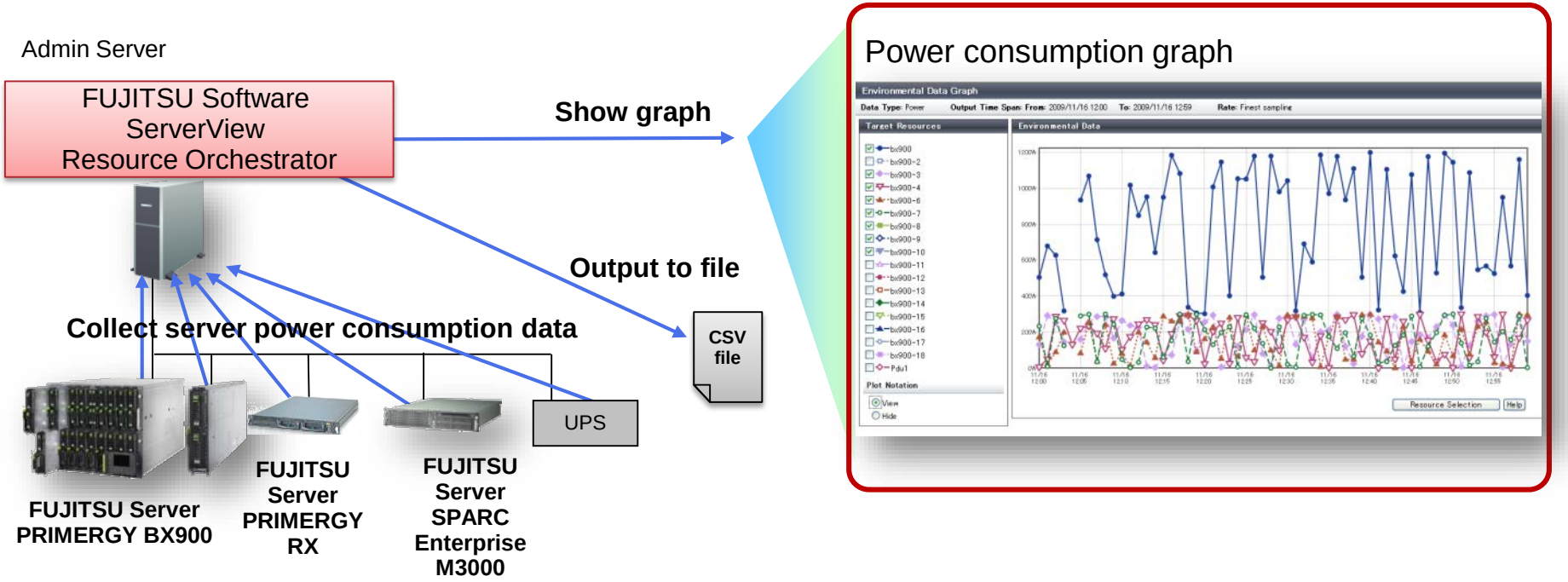
- Using image deployment to setup a new server quickly
- After image deployment, management LAN information is automatically configured



Visualize power consumption

Visualize power consumption and support green IT

- Monitor each IT resources (chassis, server, UPS) power consumption status in real time



Server management function list

Function	Summary	Virtual Edition	Cloud Edition
Configuration display	Display physical/virtual server list, and the relationship of VM host and guest	✓	✓
Server monitor	Monitor physical/virtual server status (normal/stop/warning/error)	✓	✓
Failure monitor *1	Monitor server hardware failure, hardware prefailure and vCenter alert. Invoke server failover, force reboot or other external customer scripts	✓	✓
Power control	Physical/virtual server power control ON/OFF (provides GUI/CLI)	✓	✓
Power consumption display *1	Graphically display power consumption amount of server, blade chassis, UPS	✓	✓
Server cloning *1	Quickly deploy native OS to physical server for quick setup (Windows/Linux)	✓	✓
Disk backup *1	Backup/restore system disk of physical server (Windows/Linux)	✓	✓
VM server migration *1,*2	Migrate VM guest to other VM host. One-click to re-migrate back all VM guests to the original VM host position	✓	✓
PRIMERGY blade server management	Monitor blade server in intuitive GUI which shows similar picture as a real blade chassis. Simplify LAN switch blade VLAN setting and display the topology including virtual network and physical LAN switch blade VLAN setting	✓	✓
PQ partition management	Display server partition information (SB,IOB,GSPB). Display virtual network and server NIC vlan setting	✓	✓
Server I/O virtualization *1	Replace physical server without re-configure SAN storage	✓	✓
VM server HA *1,*2	Automatic migrate guest OS to other server when hardware prefailure happens on hypervisor	✓	✓
Physical Server HA *1	Switchover and reboot the spare server, when the server OS is hung-up or hardware failure occurs	✓	✓

*1 Function differs from different server type and OS *2 VM management software (VMware vCenter, Microsoft SCVMM) is required

FUJITSU

Product information

FUJITSU Software ServerView

Products

- **FUJITSU Software ServerView Resource Orchestrator Virtual Edition**
  - Simplify server management lifecycle by automating server installation, visualizing multi platform systems, and server failover
- **FUJITSU Software ServerView Resource Orchestrator Cloud Edition**
  - Manage resource pools and quickly automate the L-Platform deployment based on the users request to improve the system operation efficiency.

<optional products>

- **FUJITSU Software ServerView Resource Orchestrator I/O virtualization option (FJ-WWN16)**
  - **for FUJITSU Software ServerView Resource Orchestrator Virtual Edition / Cloud Edition**
  - Required for server I/O virtualization function. Provides globally unique virtual WWN number for 16 managed servers.
- **FUJITSU Software ServerView Resource Orchestrator I/O virtualization (FJ-MAC16)**
  - **for FUJITSU Software ServerView Resource Orchestrator Virtual Edition / Cloud Edition**
  - Required for server I/O virtualization function. Provides globally unique virtual MAC number for 16 managed servers.
- **FUJITSU Software ServerView Virtual-IO Manager**
  - Simplified Operation and management of the LAN-SAN environment of a server blade. And link virtual network to physical

Functional Differences Between Virtual Edition & Cloud Edition

x: Supported, -: Not supported

Requirement	Functionality	Virtual Edition	Cloud Edition
Centralized virtual/physical server management	Visualize and monitor virtual and physical servers	x	x
	Consistent interface of server management	x	x
Improve server availability	I/O virtualization for flexible connectivity between server/storage	x	x
	Auto recovery from server hardware failure	x	x
	Detect hardware prefailure to avoid virtual server stop	x	x
Provide platform service	Visualization of resource and resource pool usage	-	x
	Auto deploy L-Platform with template	-	x
	Manage L-Platform with service portal	-	x
	Visualize resource capacity and billing	-	x
	Disaster recovery for L-Platform (ServerView Resource Orchestrator DR option is required)	-	x

Support environment (1)

Windows / Linux / Solaris

x: Supported, -: Not supported

OS	Function	FUJITSU Software ServerView Resource Orchestrator	
		Virtual Edition	Cloud Edition
Windows Server 2016	Admin server (Manager)	x	x
Windows Server 2012,2012R2		x	x
Windows Server 2008,2008 R2		x	x
Red Hat Enterprise Linux 6		x	x
Windows Server 2016	Managed Server (Agent)	x	x
Windows Server 2012,2012R2		x	x
Windows Server 2008,2008 R2		x	x
Red Hat Enterprise Linux 7		x	x
Red Hat Enterprise Linux 6		x	x
Oracle Solaris 11		x	x
Oracle Solaris 10		x	x

Browser (web client)

Microsoft Internet Explorer 8/9/10/11(Desktop) and FireFox ESR24/ESR31/ESR38/ESR45 is supported

Support environment (2)

Server

x: Supported, -: Not supported

Server	Function	FUJITSU Software ServerView Resource Orchestrator	
		Virtual Edition	Cloud Edition
FUJITSU Server PRIMERGY BX/RX/TX	Manager	x	x
FUJITSU Server PRIMEQUEST 2000/1000 series		x	x
FUJITSU Server PRIMERGY BX/RX/TX/CX	Agent	X	x
FUJITSU Server PRIMEQUEST 2000/1000 series		X	x
FUJITSU SPARC Servers		X	x
IPMI 2.0 compatible 3rd party vendor Server*1		X	x

*1: Please contact Fujitsu for details about the supported server vendor/models

Virtual management software

x: Supported, -: Not supported

Software	Function	FUJITSU Software ServerView Resource Orchestrator	
		Virtual Edition	Cloud Edition
VMware vSphere	Agent	x	x
Microsoft Hyper-V		x	x
Linux Kernel-based Virtual Machine (KVM)		x	x
Solaris Zone[*2], Oracle VM Server for SPARC		x	x

*2: Solaris Kernel Zone is not supported.

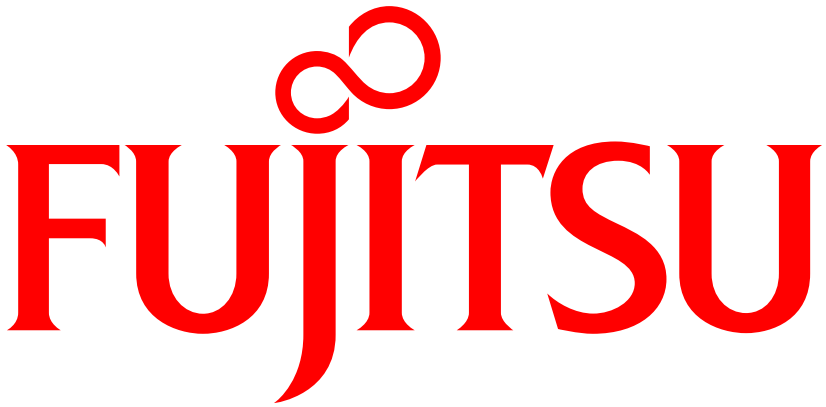
Support environment (3)

Network devices

x: Supported, -: Not supported

Network device	Function	FUJITSU Software ServerView Resource Orchestrator	
		Virtual Edition	Cloud Edition
FUJITSU Network System SR-X300	Agent	-	X
FUJITSU Network System SR-X500		-	X
Cisco Catalyst		X*1	X*2
FUJITSU Network System IPCOM EX IN series		-	X
FUJITSU Network System IPCOM EX SC series		-	X
Cisco ASA 5500		-	X*3
Cisco Nexus 5000		-	X*4 *6
Brocade VDX		-	X*5 *6
F5 Networks BIG-IP		-	X

*1: The following series are supported: 2950, 2960, 3560, 3750
*2: The following series are supported: 2900, 2918, 2928, 2940, 2950, 2955, 2960, 2970, 2975, 3500, 3550, 3560, 3750
*3: ASA 5505 is not supported
*4: The following series are supported: 2000, 5000
*5: The following series are supported: 6710, 6720, 6730, 6740, 6740T
*6: Support for network device monitor function. For network device auto configuration, the sample script is not provided



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