



SingleServerSafe

Product Introduction

<http://www.nec.com/expresscluster/>

NEC Corporation
System Software Division
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Product introduction

Requirements for high availability

- Requirement for high availability expanded from traditional mission critical system to servers in departments/shops.
- Impact of server failure in complex and highly-developed IT society is getting bigger and bigger.
- Usage of Windows / Linux servers in low-end to middle-range became general in recent years, and higher availability / usability has been required more and more.



**Technology of EXPRESSCLUSTER X^{*}
can be applied to single server.**

Maximum usage of EXPRESSCLUSTER X technology for enabling to improve availability and to avoid failure on single server.

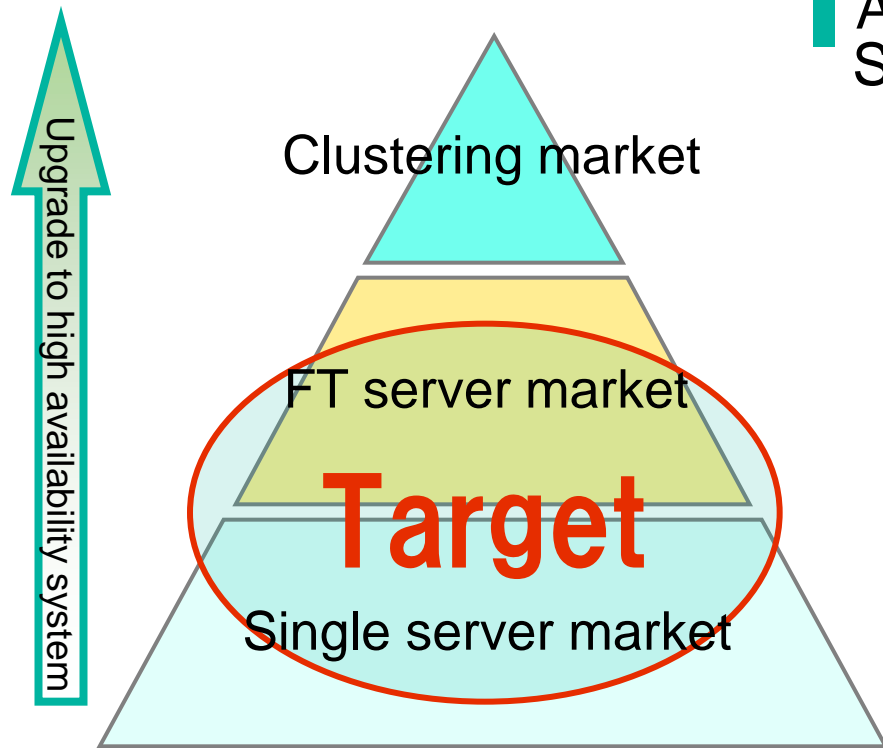


^{*} ... No.1 Market Share in Asia Pacific region.

EXPRESSCLUSTER X SingleServerSafe

Target of EXPRESSCLUSTER X SingleServerSafe

How you avoid the server disruption of mission critical systems?



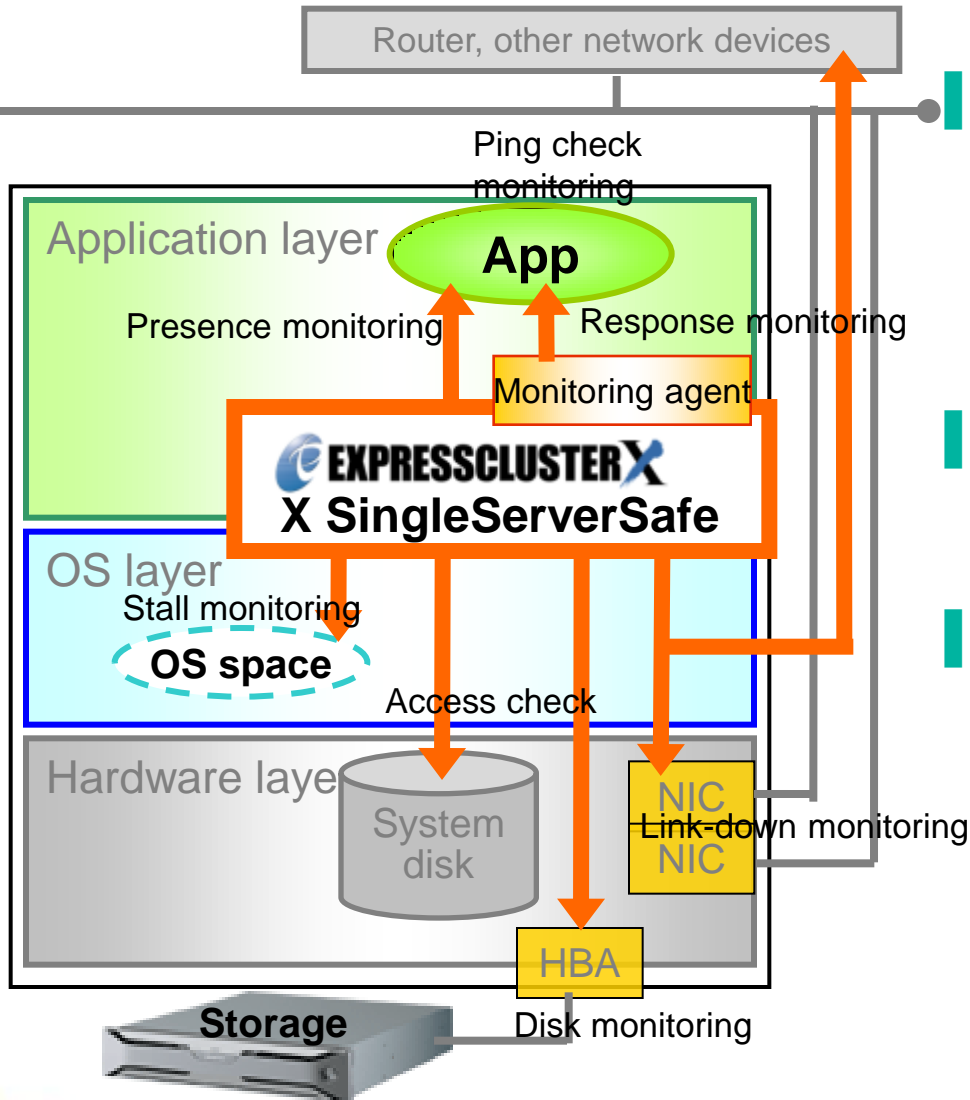
Advantage of EXPRESSCLUSTER X SingleServerSafe;

- Duplication in required systems enables to improve availability in single server.
- Monitors abnormality of HW & SW, recovers them from failure, and improves availability!
- FT server (HW duplicated server) also acquires SW availability to become server with higher reliability!
- For further availability, upgrade to clustering system is enabled.

Easy implementation compared with cluster, achieving high robustness to the failure.

Detectable failure (monitoring target)

Accurate monitoring to check the actual status



Application layer:

- Presence monitoring of process
 - Restarts when process abnormality is detected
- Monitoring agent
 - Restarts when abnormality in SQL, HTTP and so on is detected

OS layer

- User space monitoring
 - Restarts when abnormality in AP layer such as hang-up is detected.

Hardware layer

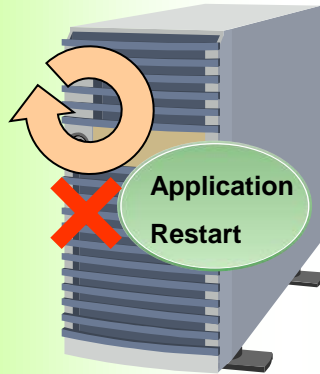
- Disk monitoring
 - Restarts when disk access abnormality is detected.
- Ping monitoring
 - Restarts when ping abnormality is detected.
- NIC Link UP/DOWN monitoring
 - Restarts when link-down is detected.
 - Availability can be improved by NIC duplication.

Benefit of monitoring Agent

Improves high availability due to appropriate monitoring of application

- Same monitoring Agent as Agent of EXPRESSCLUSTER X can be used.

Without Agent



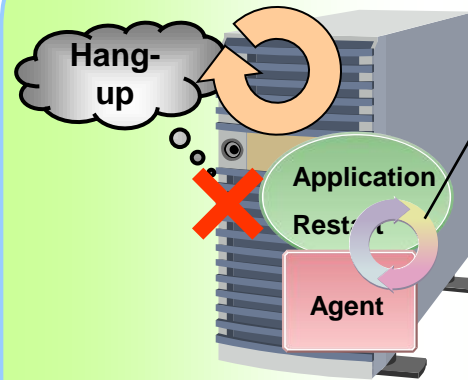
EXPRESSCLUSTER X SSS feature enables existence monitoring of process. When the process disappears, this is regarded as abnormal.

× Hang-up detection of application

× Response detection from application

○ Abnormal termination of application
(Existence monitoring setting is required)

With Agent



Agent sends request to target application periodically. Simultaneously, Agent waits for response with clock timer, and checks the content of it.

○ Hang-up detection of application

○ Response detection from application

○ Abnormal termination of application

***Monitoring Agent is strongly recommended**

Monitoring target of Agent

Frequently used key apps in five fields are supported.

Two more monitoring Agent is added to line-up (from X 3.1)

System Resource (System Resource Agent **New!**)

Windows Linux

CPU, memory, file, and so on

Java VM Resource (Java Resource Agent **New!**)

Windows

WebOTX, WebLogic

Linux

WebOTX, WebLogic, JBoss, Tomcat

Database (Database Agent)

Windows

Oracle, SQL Server, DB2, ODBC, PowerGres, etc

Linux

Oracle, DB2, PostgreSQL, PowerGresPlus, MySQL

Internet Server (Internet Server Agent)

Windows

IIS, SMTP/POP/IMAP4, HTTP/HTTPS, etc

Linux

apache, httpd, sendmail, postfix, popd, etc

File Server (File Server Agent)

Linux

Samba, NFS

Application Server (Application Server Agent)

Windows Linux

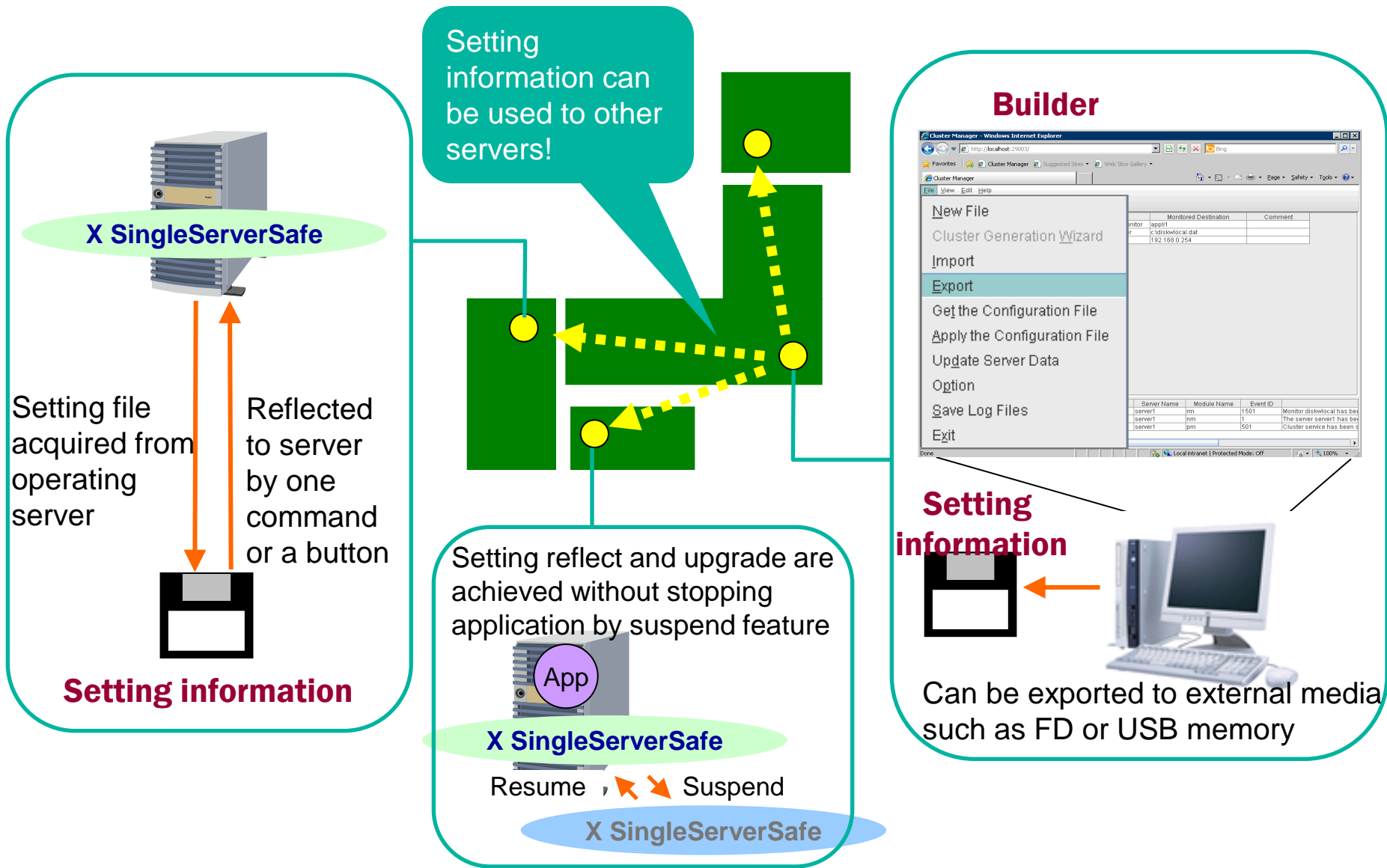
Oracle AS, Tuxedo, WebLogic, WebSphere, WebOTX

Anti-Virus Software (Anti-Virus Agent)

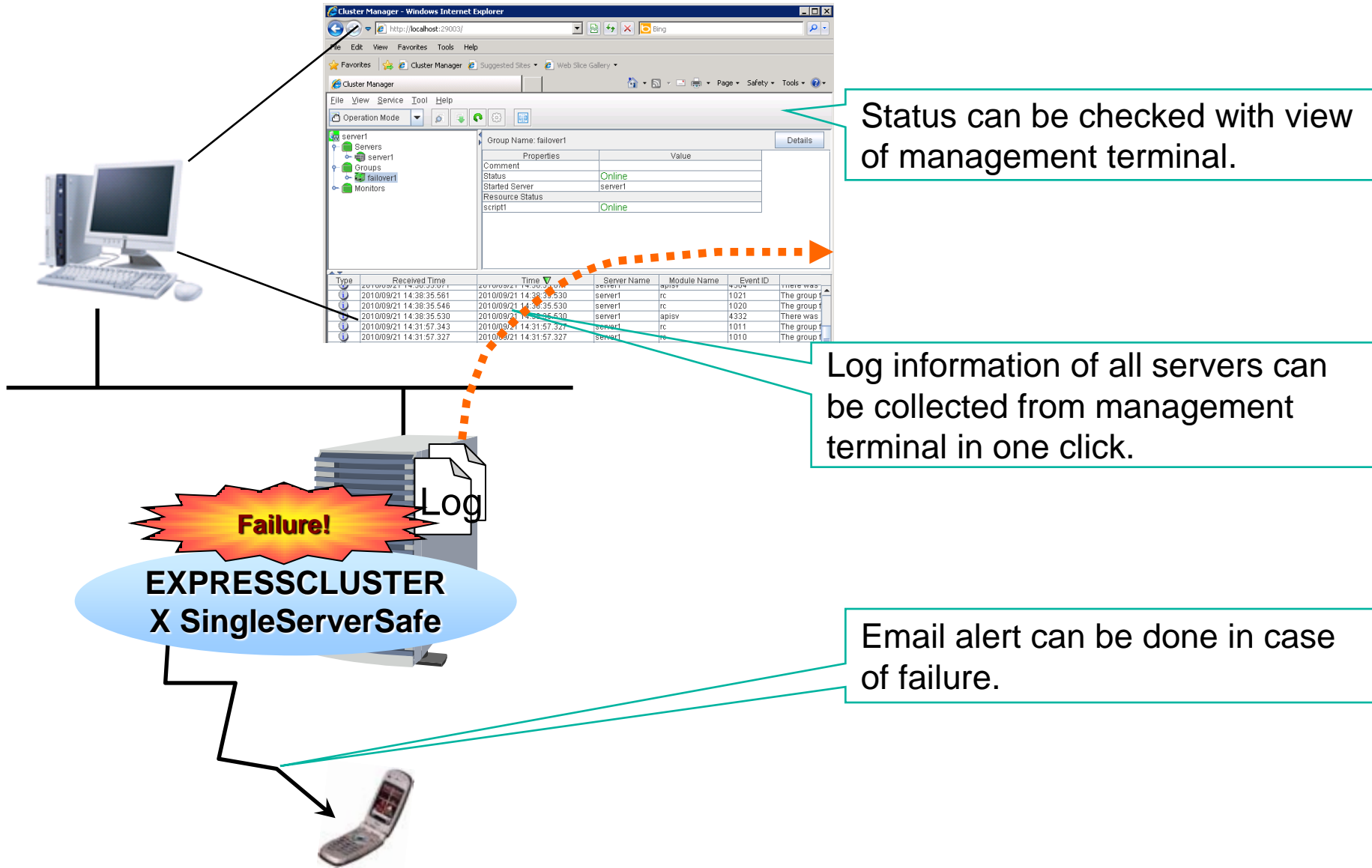
Windows

Trend Micro Enterprise Security

Off-line creation of setting information can be applied to other servers

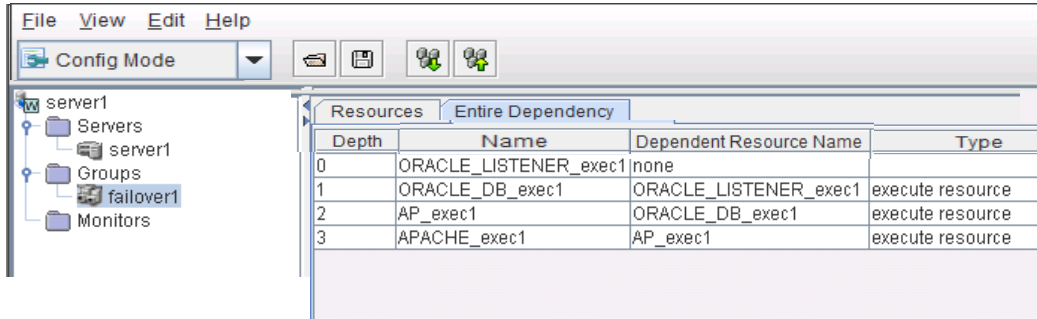


Alert and support in case of failure



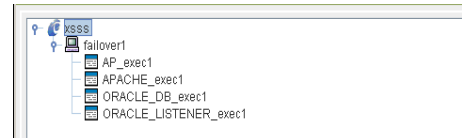
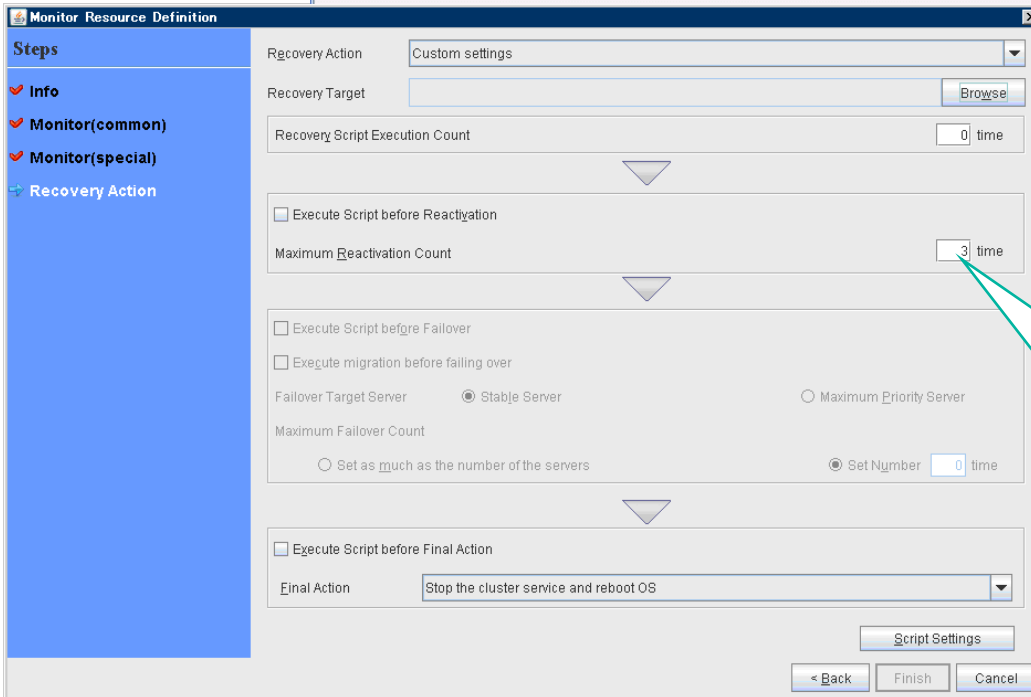
Features in operation

Start / stop order and recovery process from abnormal status can be set up.



Makes system groups in operation unit, and set up procedure of start /stop

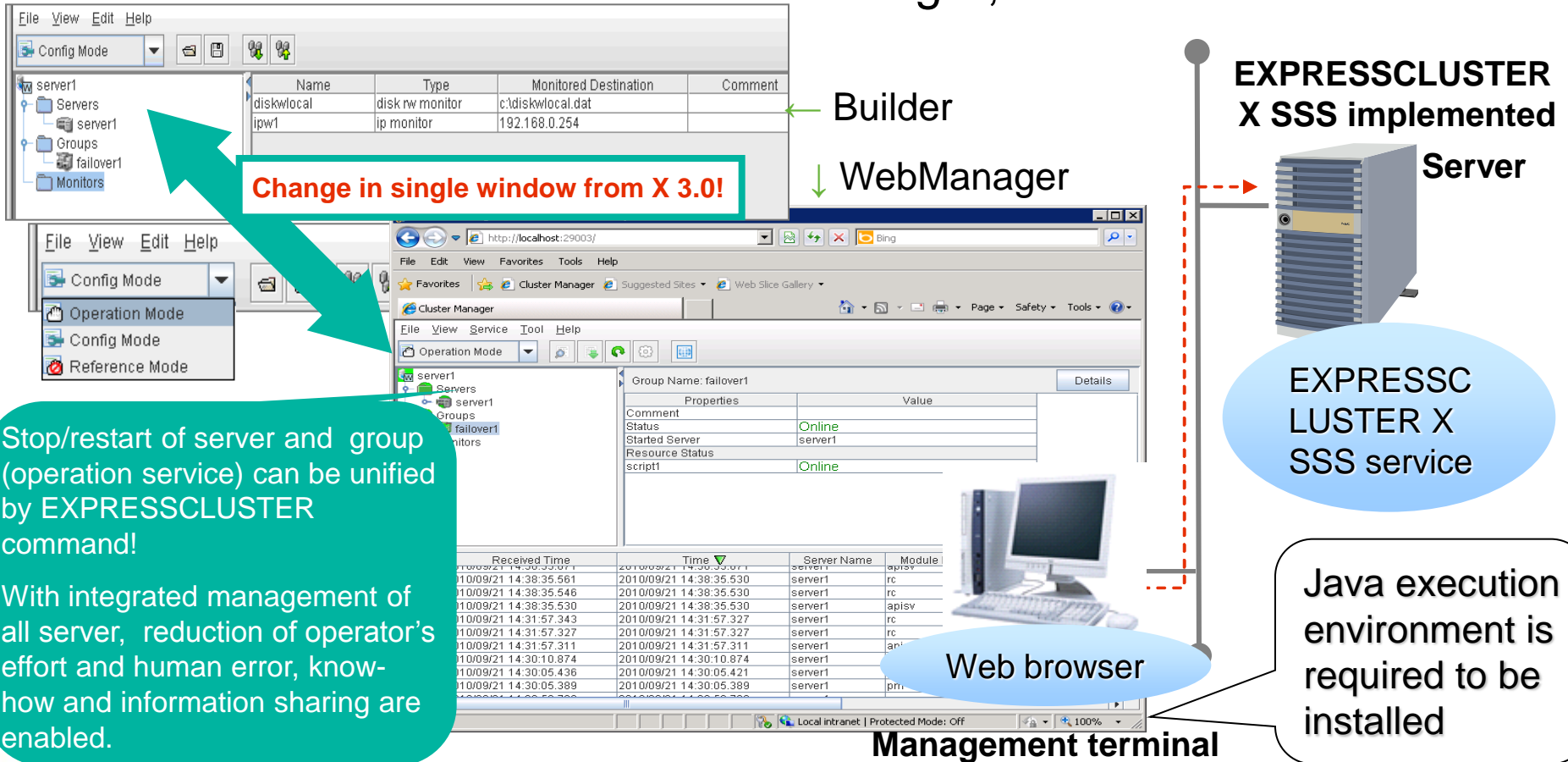
Enables setting from operation point of view unlike start procedure of OS service manager (Windows) or init script(Linux).



Sets up restart in resource unit, group unit, or server unit, as a recovery procedure from abnormal situation.

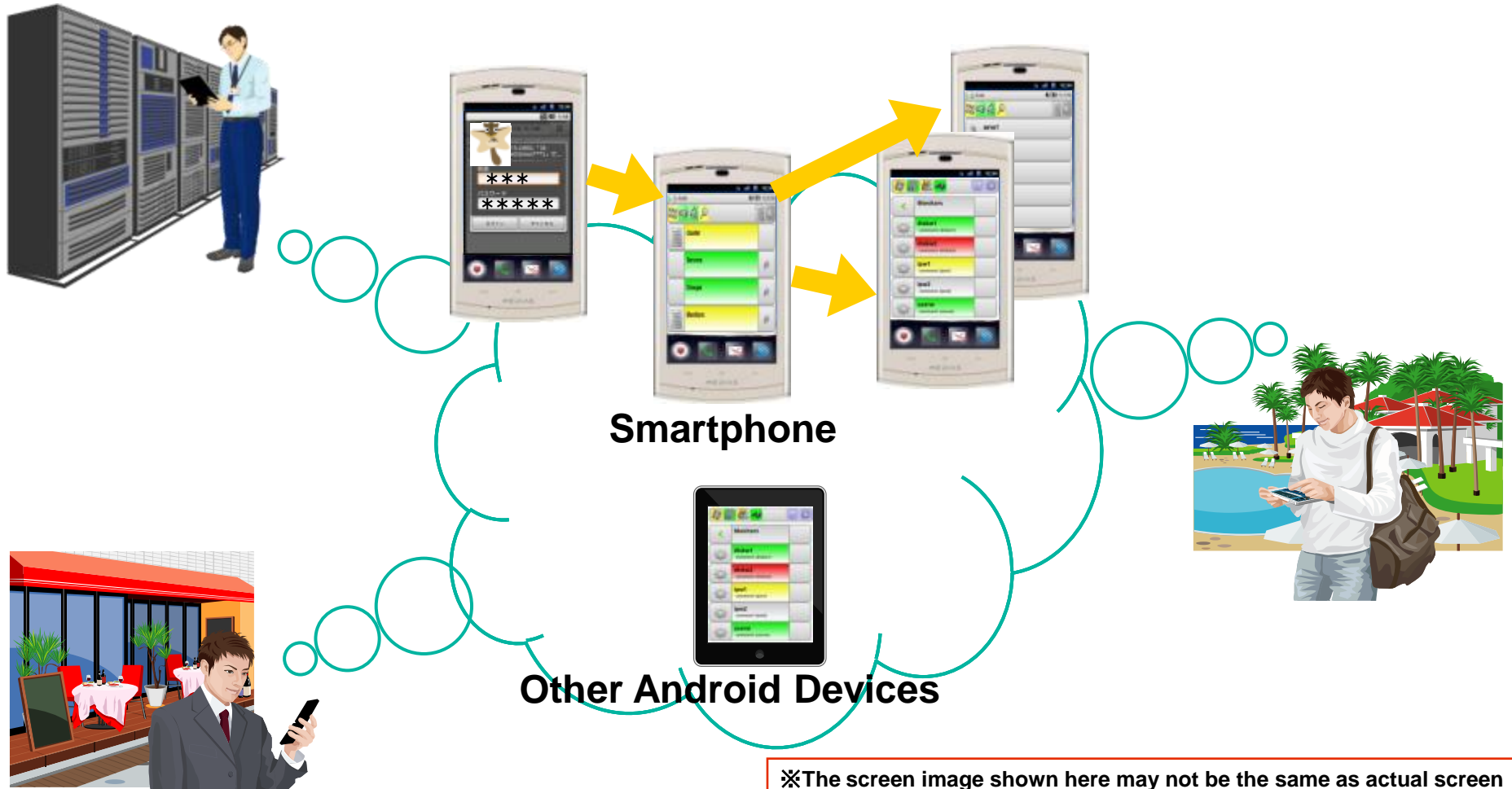
Operating procedure

- Same Builder as one for EXPRESSCLUSTER X can be used for environment configuration
- Server status monitoring, start / stop of operation group, and log collection can be done from WebManager, as well as CLI.



Smartphone & tablet support

Managing cluster systems from Android devices.



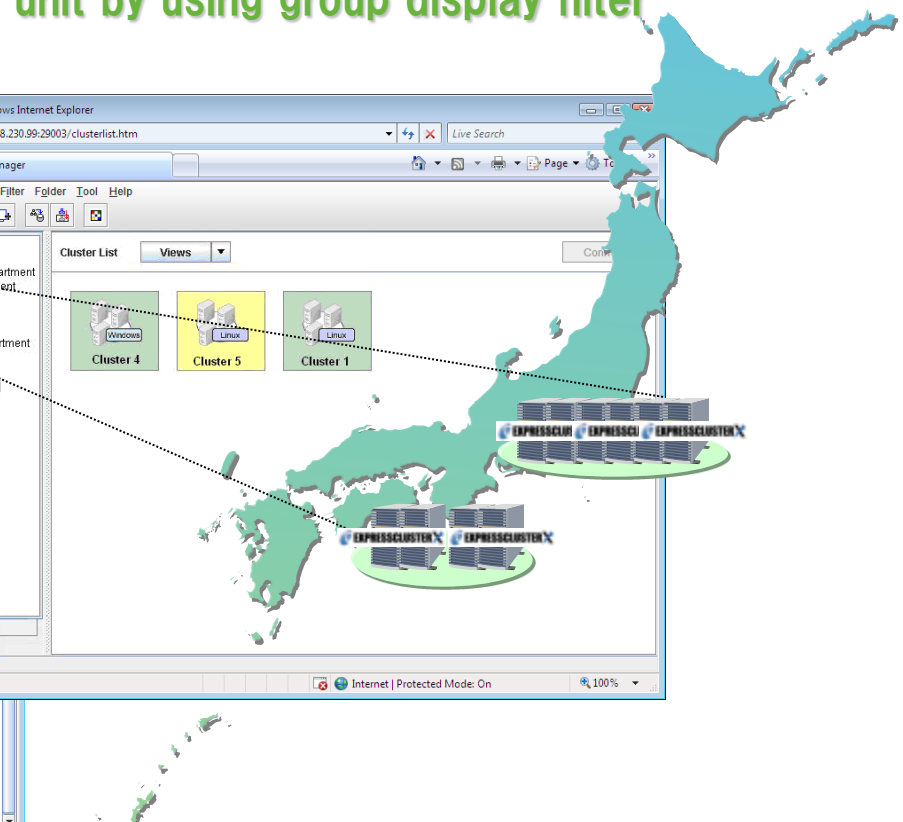
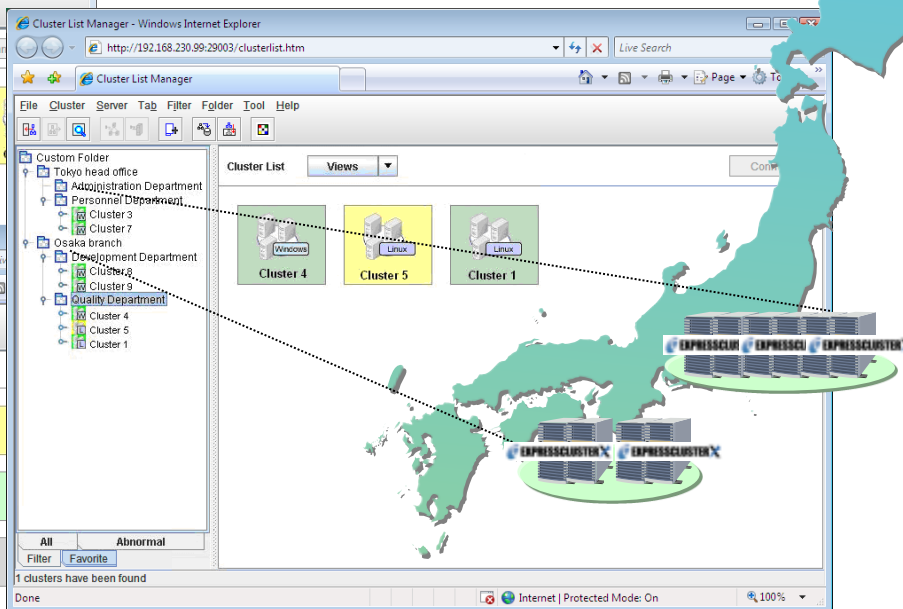
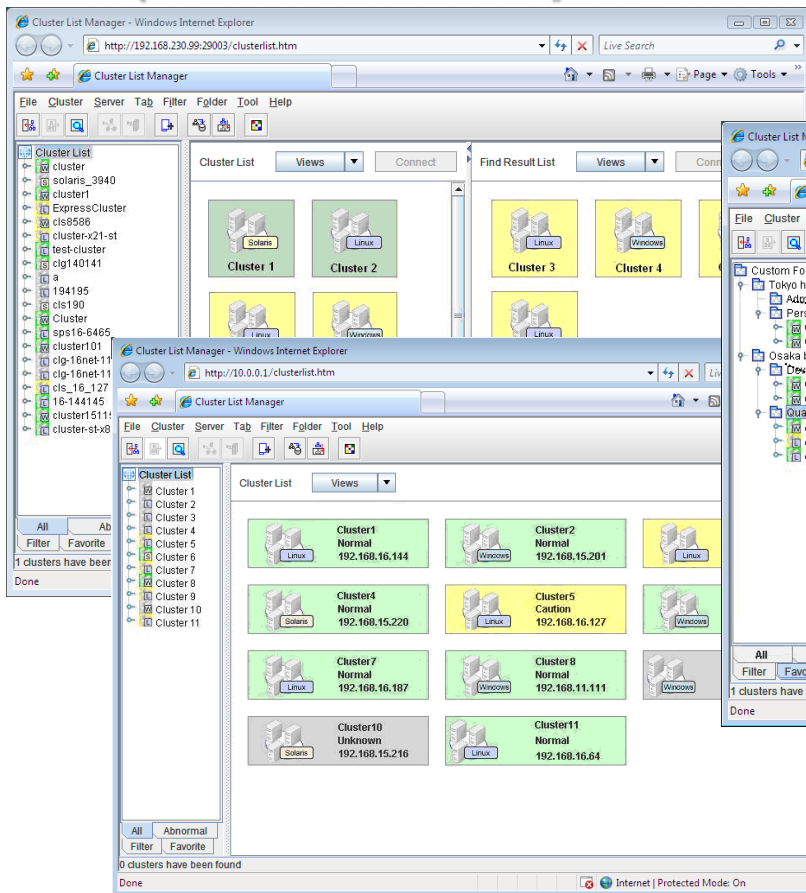
Simple view of server status with integrated Manager

Enables to refer to clustering configuration status of both EXPRESSCLUSTER X and SingleServerSafe in the same LAN.

Enables to run several WebManager separately

Rapid search of node by search filter

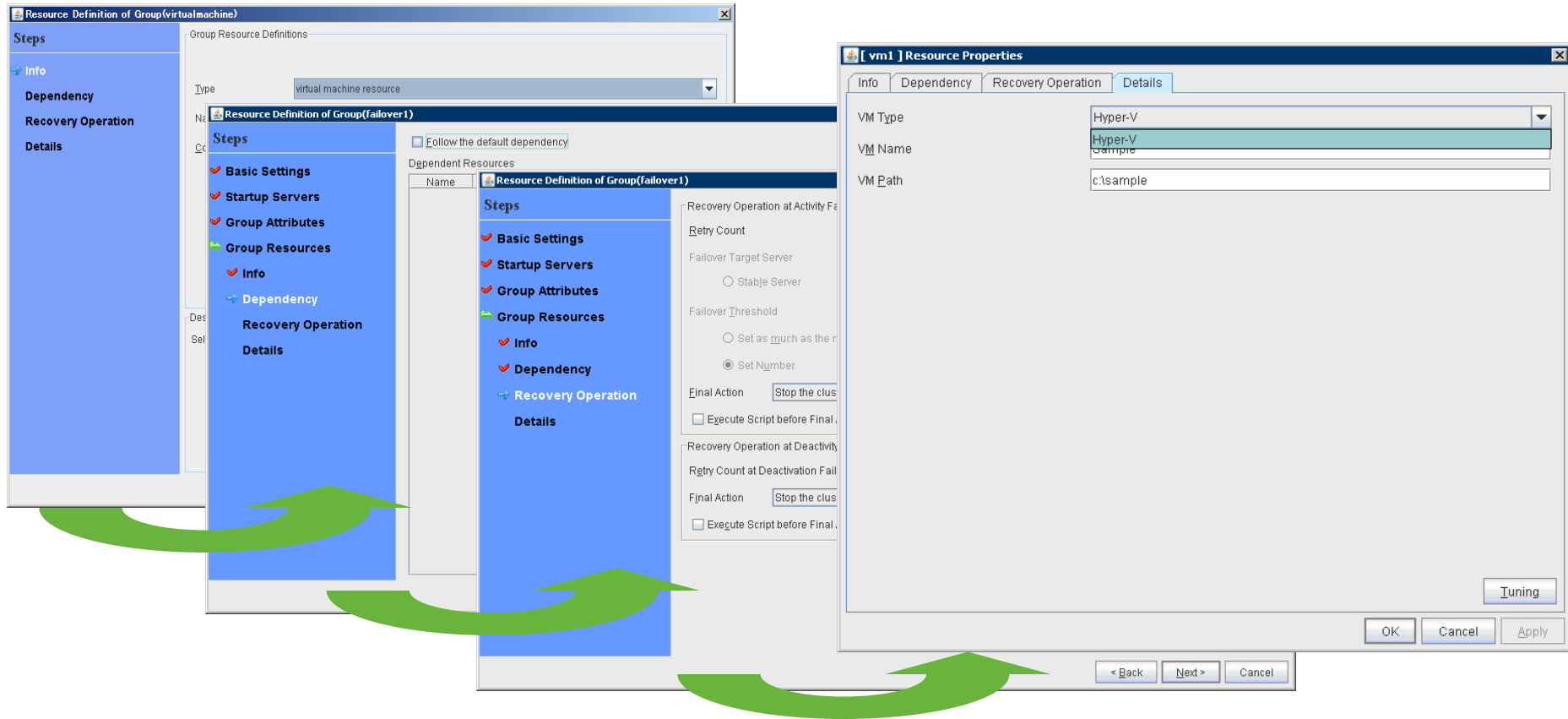
Selected cluster display in business application unit by using group display filter



Easy implementation for virtualization environment

Easy setting of start / stop / monitoring of virtual machine

- Only needs to input required items to GUI wizard format



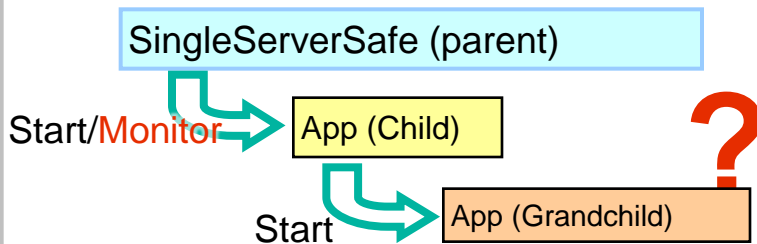
Enables integration of virtual machine to one platform with HA feature

Process name monitoring

Child/Grandchild process can now be monitored

Previous

- Process (grandchild) of parent/child relation is not monitored.



A screenshot of the 'Monitor Resource Properties' dialog box. The 'Process Name' field contains the text '/usr/sbin/trond'. Below the dialog, there are two settings:

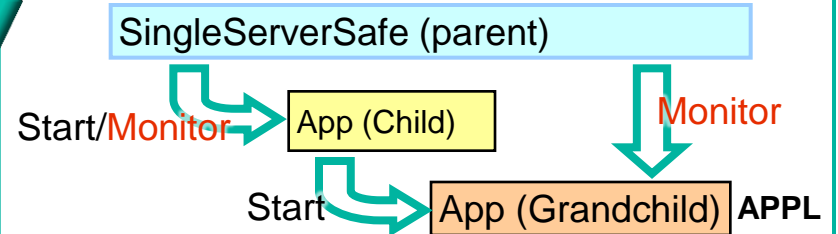
- Setting of E.g.1
 - Process name "APPL"
- Setting of E.g.2
 - Process name "APP*"

A red callout box points to the asterisk in "APP*" with the text: **Wildcard "*" is supported**

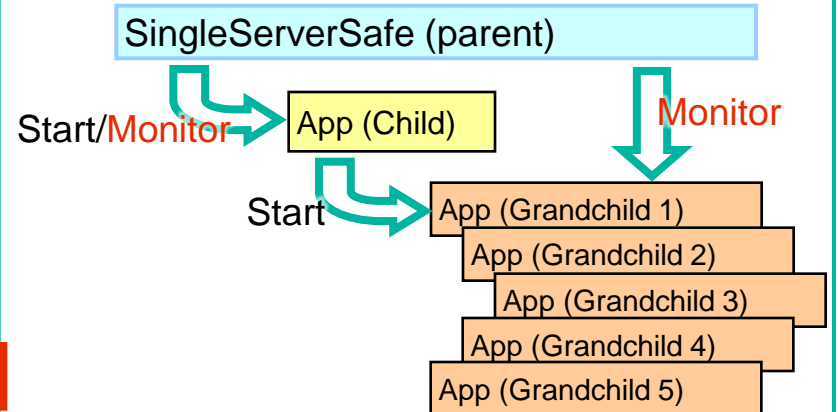
X 3.1

- With process name monitoring resource, structure of app is understood while monitoring.

- E.g.1)



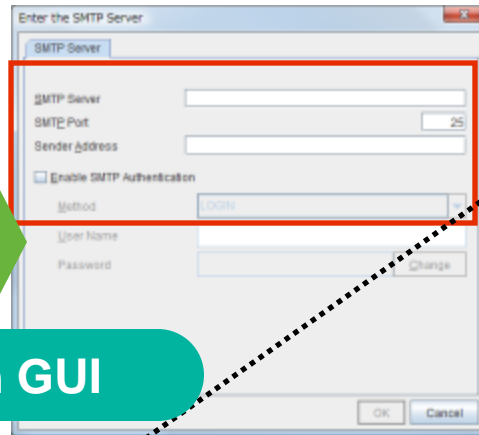
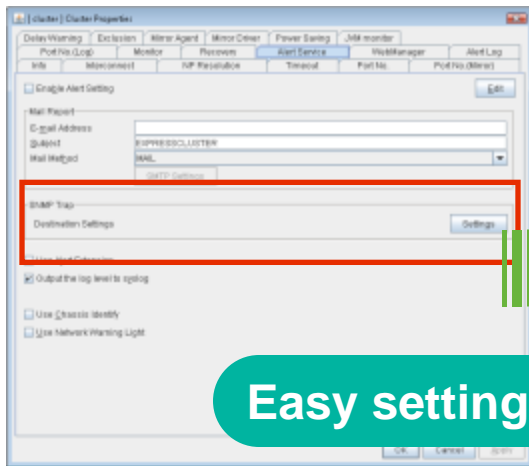
- E.g.2)



Linkage between system mgmt software (MIB support)

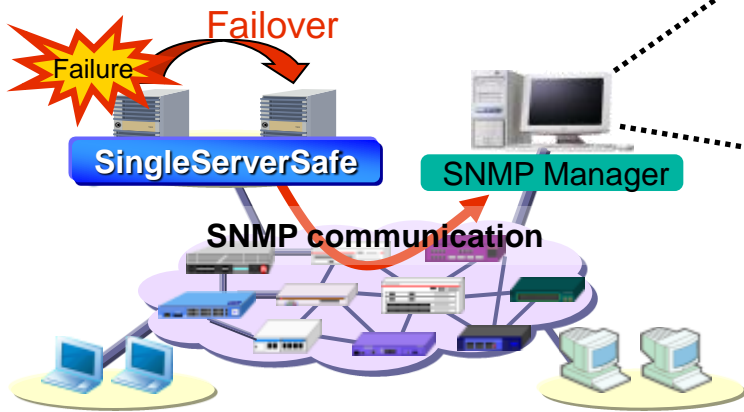
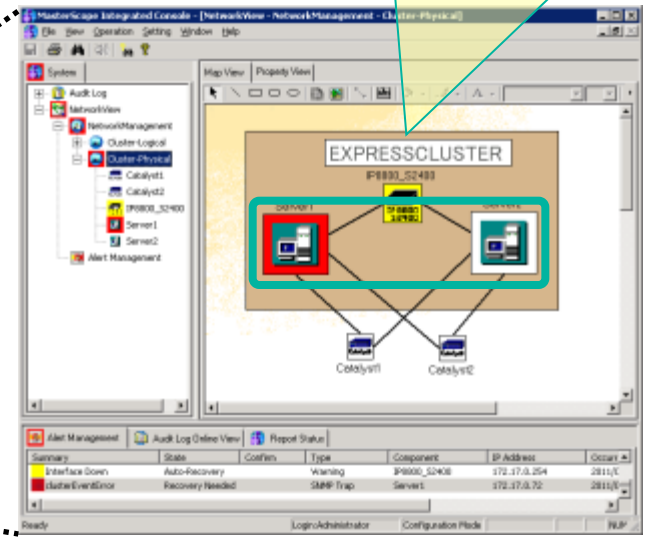
SNMP Manager enables cluster management

- Enables integrated management including network devices etc



Easy setting with GUI

Displays information/situation from SNMP communication of SingleServerSafe



* NEC MasterScope Network Manager case

Failure simulation from the management console

Enables failure simulation from management console for testing the failover scenario

- “Verification Mode” is added to the management console
- Early discovery of mistakes in configuration, and confirms recovery of monitor resource.

1. Select verification mode

2. Select dummy failure from monitor resource

3. Select server to use for dummy failure

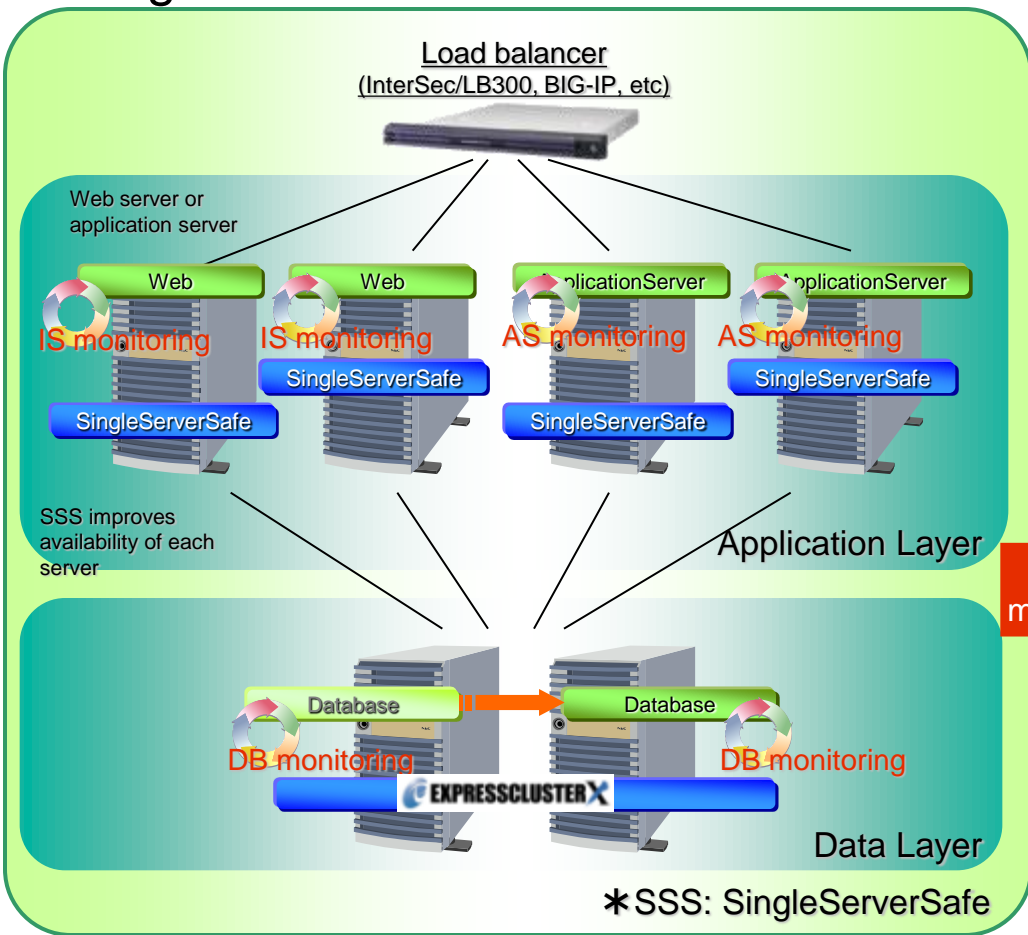
4. Easily simulate the failure

Resource Status on Each Server	Server Name	Status
	server1	Error(Dummy Failure)
	server2	Normal

Usage scene

Solution to improve reliability for Web 3 layer system

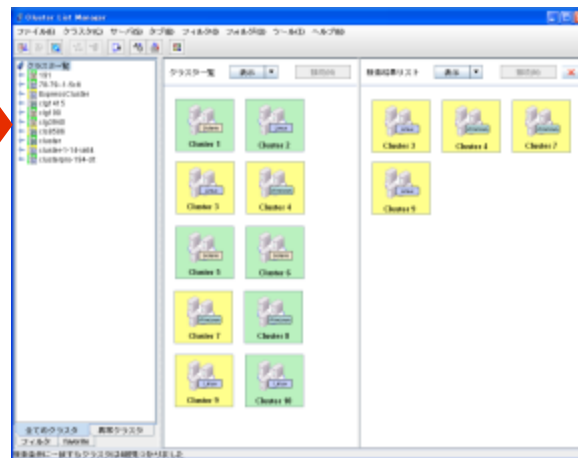
Enables integrated management of system under load balancer using SingleServerSafe



Improves availability of whole system by deploying EXPRESSCLUSTER X SSS in web server / app server under load balancer and deploying EXPRESSCLUSTER X to DB server.

Integrated management of whole system

With EXPRESSCLUSTER X integrated manager, enables to manage whole system configured for different purpose and on heterogeneous OS.



Achieves higher availability and usability of whole system

“System Resource Agent” usage situation

Realize stable operation by avoiding system resource failure

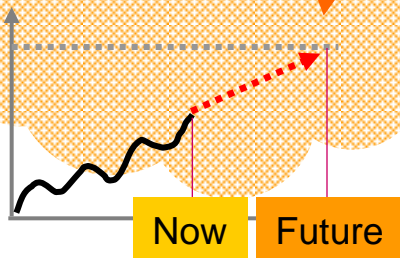
Monitors whole system resource
Prevents trouble in advance

Monitors resource of each process
Alerts abnormal resource usage

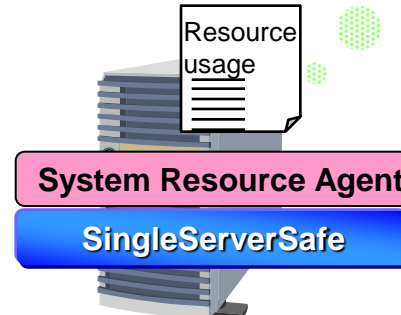
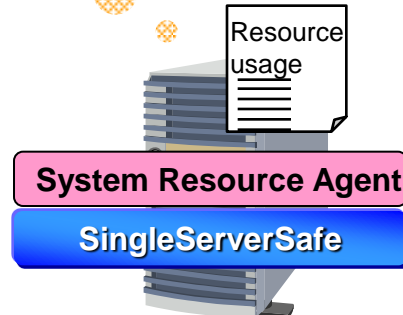
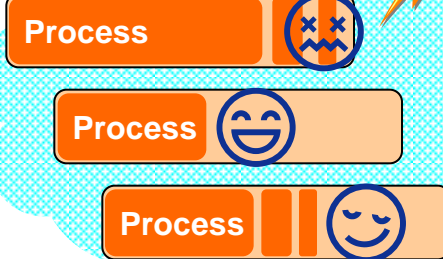
Stores system resource information
Can be used for sizing or reporting

System resource
- CPU
- Memory
etc

Predicts resource shortage near future



small Resource usage Big Alert

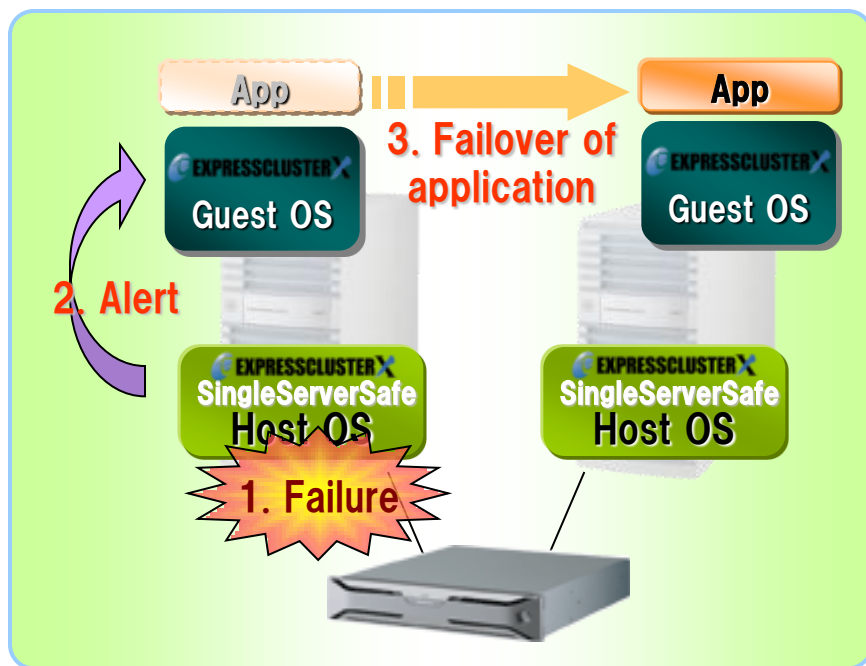


Linkage with EXPRESSCLUSTER X supporting virtual environment

Guest cluster type

Quicker failover than host cluster type

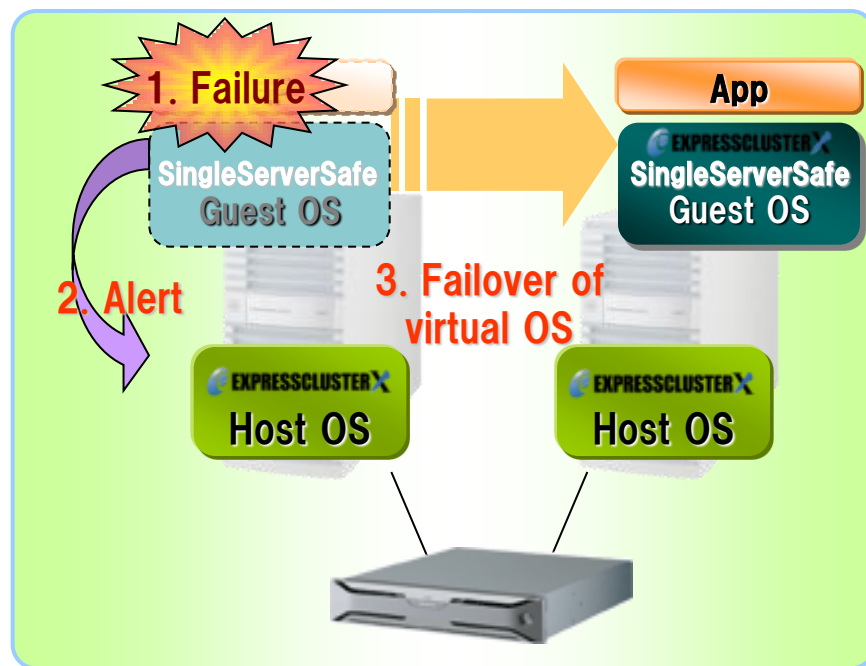
- ① Physical failure on host OS occurs
- ② Alerts failure detected on host OS to guest OS
- ③ Failover of application running on guest OS



Host cluster type

More economical than guest type cluster

- ① Application failure on guest OS occurs
- ② Alerts failure detected on guest OS to host OS
- ③ Failover of whole guest OS



Supported hypervisor

VMware vSphere 5 / 4.x

KVM

Windows 2008 R2 Hyper-V

IBM PowerVM

XenServer 5.6 / 5.5



System protection from danger of virus

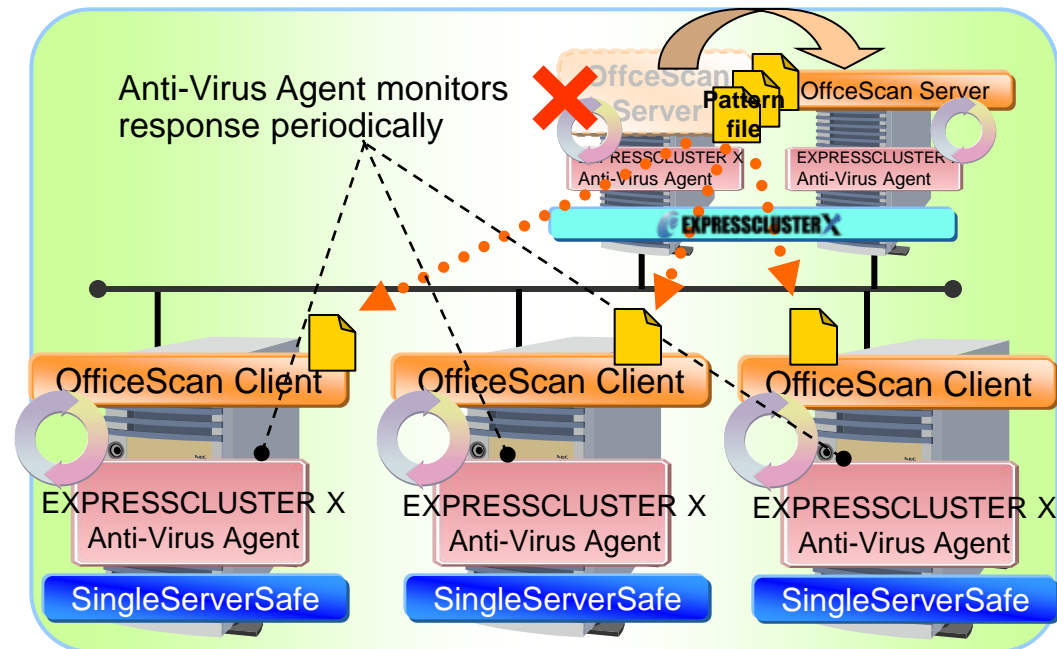
Anti-Virus Agent can protect system from virus!

Supported products : Trend Micro "OfficeScan Corporate Edition 10.5 & 8.0 SP1 Patch 1"

- Anti-Virus Agent monitors status of OfficeScan Client.
Detects hang-up as well as service status, and restarts service.
- Monitors communication with OfficeScan Server, and ensures the pattern files to be delivered.
- For higher availability of the anti-virus system, OfficeScan Server is recommended to be clustered by EXPRESSCLUSTER X.

If failure occurs in Anti-Virus software, risk of virus infection becomes higher due to failure of pattern file import.

Operation with more robust Anti-Virus system can be achieved!



Thank You



An Integrated High Availability and Disaster Recovery Solution

For more product information & request for trial license,
visit >> <http://www.nec.com/expresscluster>

For more information, feel free to contact us - info@expresscluster.jp.nec.com

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