



SingleServerSafe Product Introduction

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NEC Corporation,
Cloud Platform Division,
(EXPRESSCLUSTER)



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NEC creates the social values of
safety, security, fairness and efficiency
to promote a more sustainable world
where everyone has the chance to reach
their full potential.

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1. Requirements for High Availability

Several thin, flowing orange lines that start from the top right and curve downwards and to the left, crossing the title area and extending towards the bottom right corner of the slide.

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.**

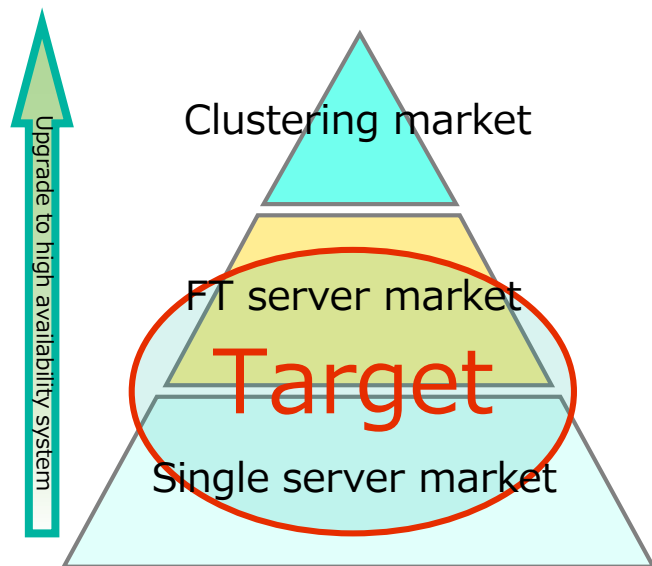
Maximum usage of EXPRESSCLUSTER X technology for enabling to improve availability and to avoid failure on single server.



EXPRESSCLUSTER X SingleServerSafe

Target of EXPRESSCLUSTER X SingleServerSafe

How you avoid the server disruption of mission critical systems?



Advantage of EXPRESSCLUSTER X SingleServerSafe;

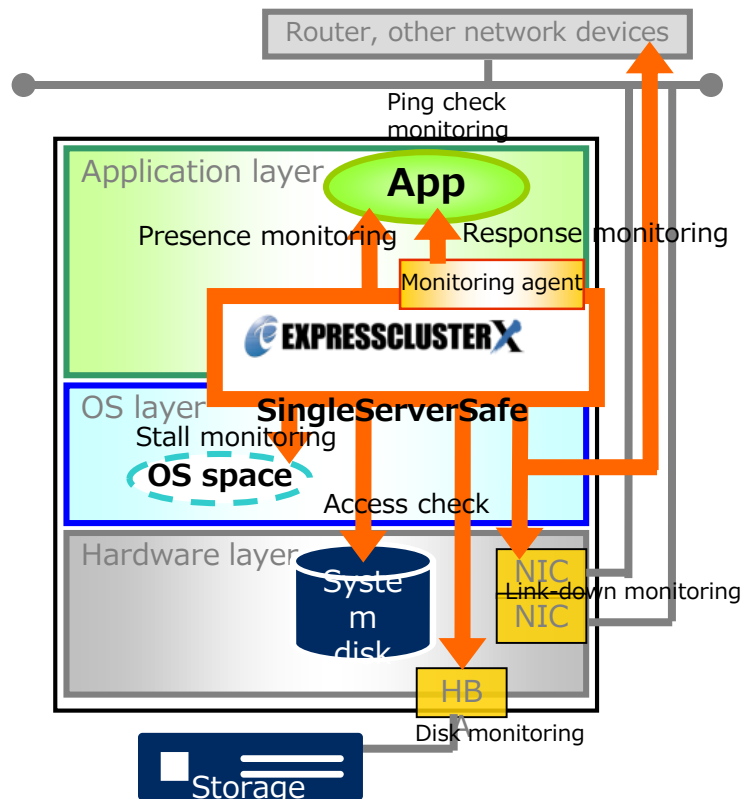
- Duplication in required systems enables to improve availability in single server.
- Monitors abnormality of HW & SW, recovers them from failure, and improves availability!
- FT server (HW duplicated server) also acquires SW availability to become server with higher reliability!
- For further availability,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

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

2. Product Overview

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.

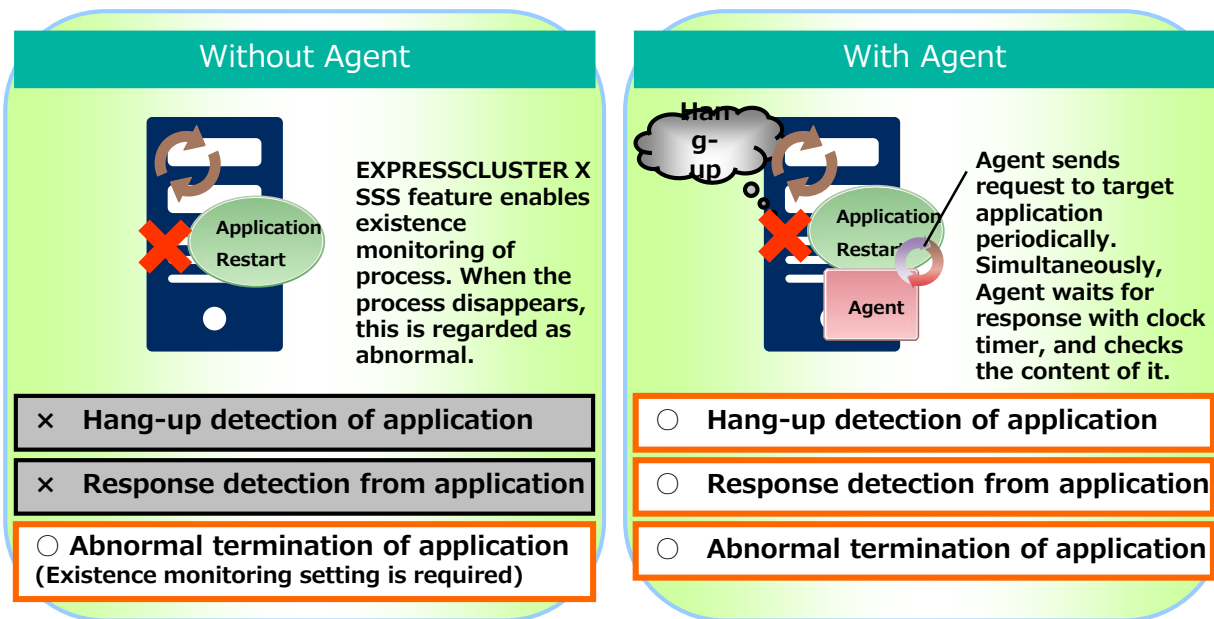
Hardware layer

- 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

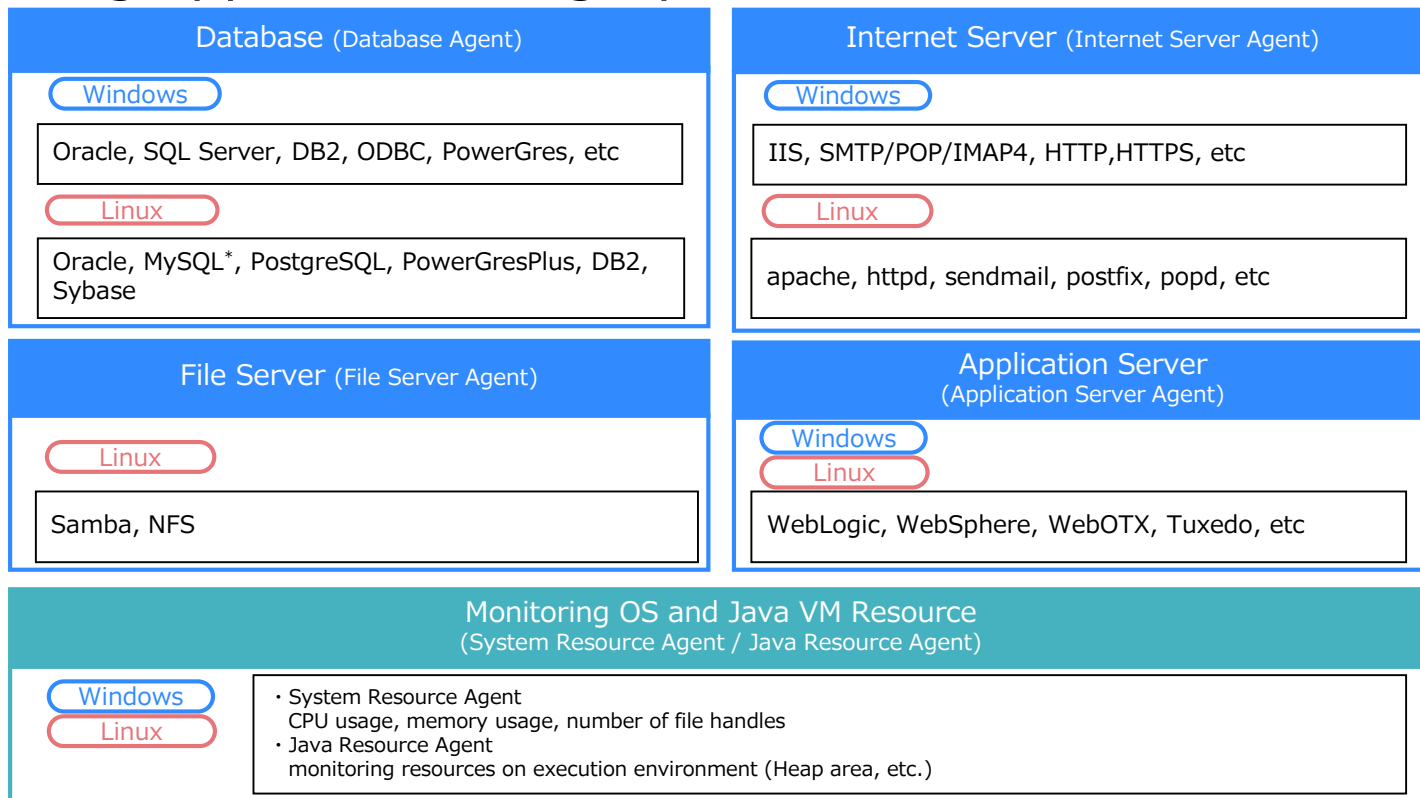
- Same monitoring Agent as Agent of EXPRESSCLUSTER X can be used.



***Monitoring Agent is strongly recommended**

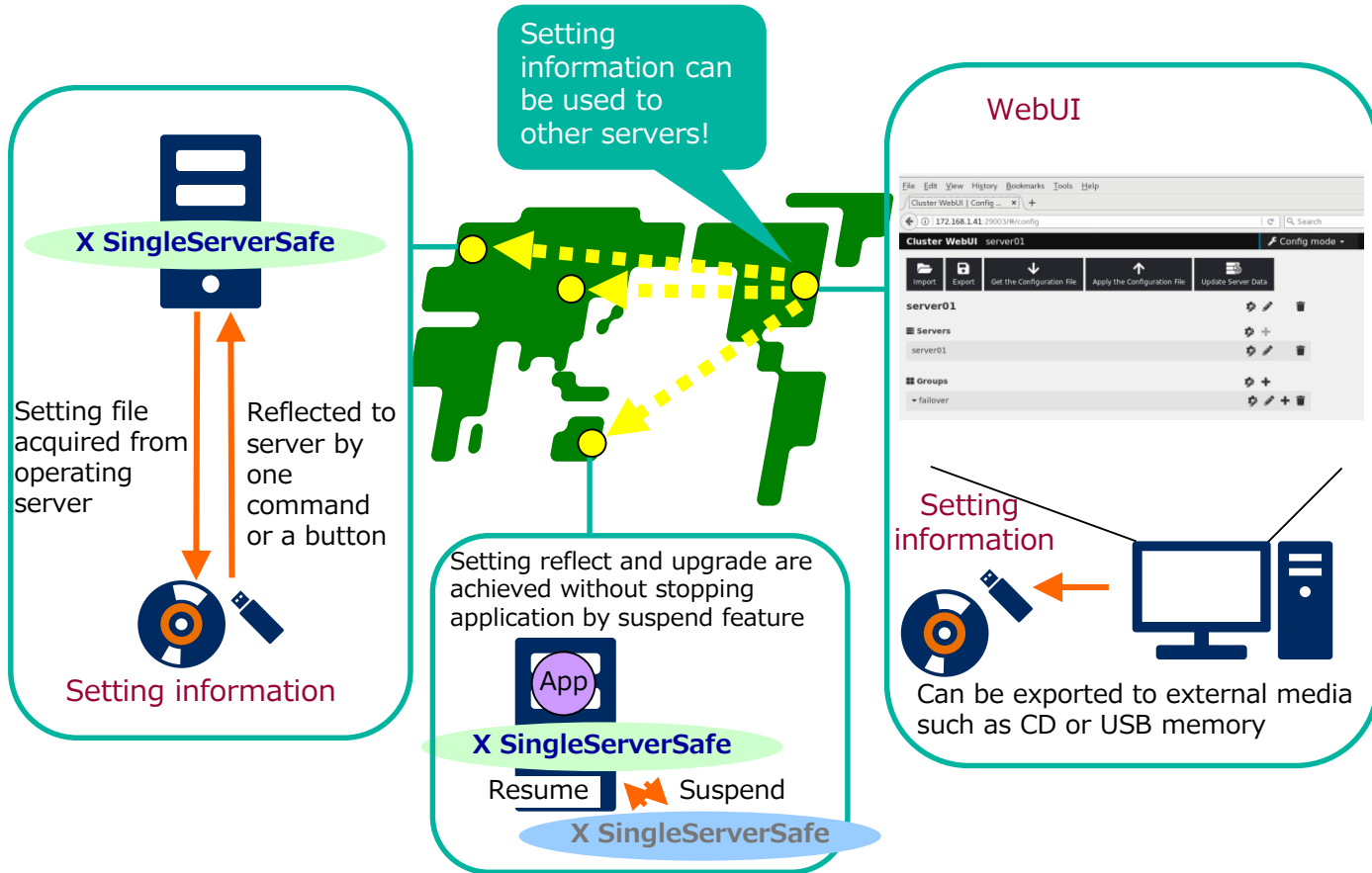
Monitoring target of Agent

Monitoring application hang-ups and abnormal events in detail!

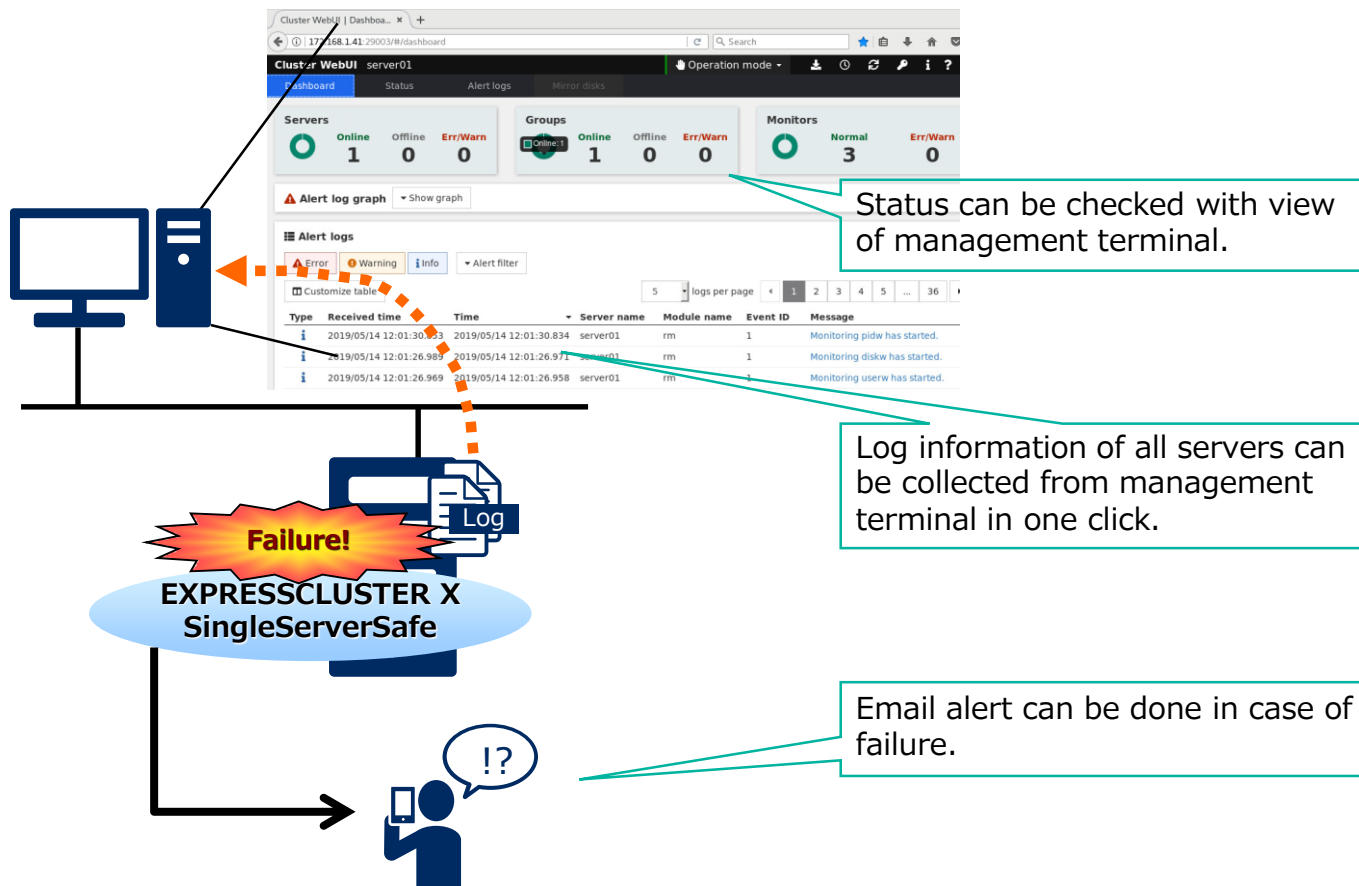


*In order to use the MySQL Monitor resource, please get a paid MySQL product (MySQL subscription or MySQL OEM license that matches your MySQL usage).

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



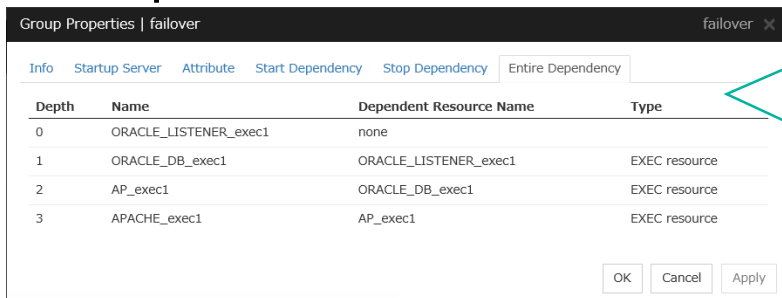
Alert and support in case of failure



3. Features in Operation (Screen, Usability)

Features in operation

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



Group Properties | failover

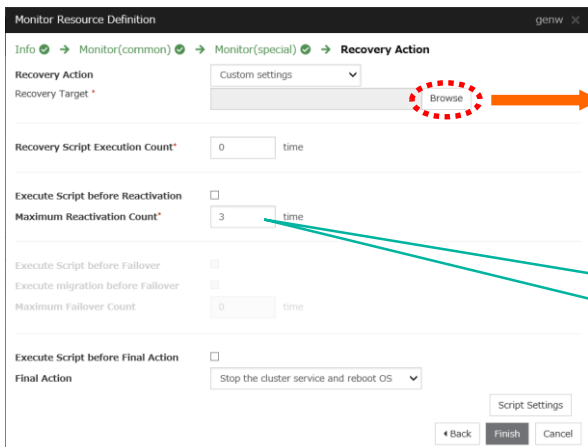
Info Startup Server Attribute Start Dependency Stop Dependency Entire Dependency

Depth	Name	Dependent Resource Name	Type
0	ORACLE_LISTENER_exec1	none	
1	ORACLE_DB_exec1	ORACLE_LISTENER_exec1	EXEC resource
2	AP_exec1	ORACLE_DB_exec1	EXEC resource
3	APACHE_exec1	AP_exec1	EXEC resource

OK Cancel Apply

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).



Monitor Resource Definition

Info Monitor(common) Monitor(special) Recovery Action

Recovery Action Custom settings

Recovery Target * Browse

Recovery Script Execution Count* 0 time

Execute Script before Reactivation ☐

Maximum Reactivation Count* 3 time

Execute Script before Failover ☐

Execute migration before Failover ☐

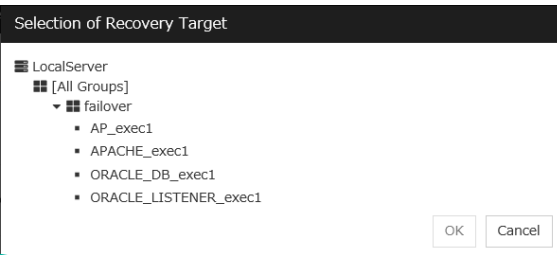
Maximum Failover Count 0 time

Execute Script before Final Action ☐

Final Action Stop the cluster service and reboot OS

Script Settings

Back Finish Cancel



Selection of Recovery Target

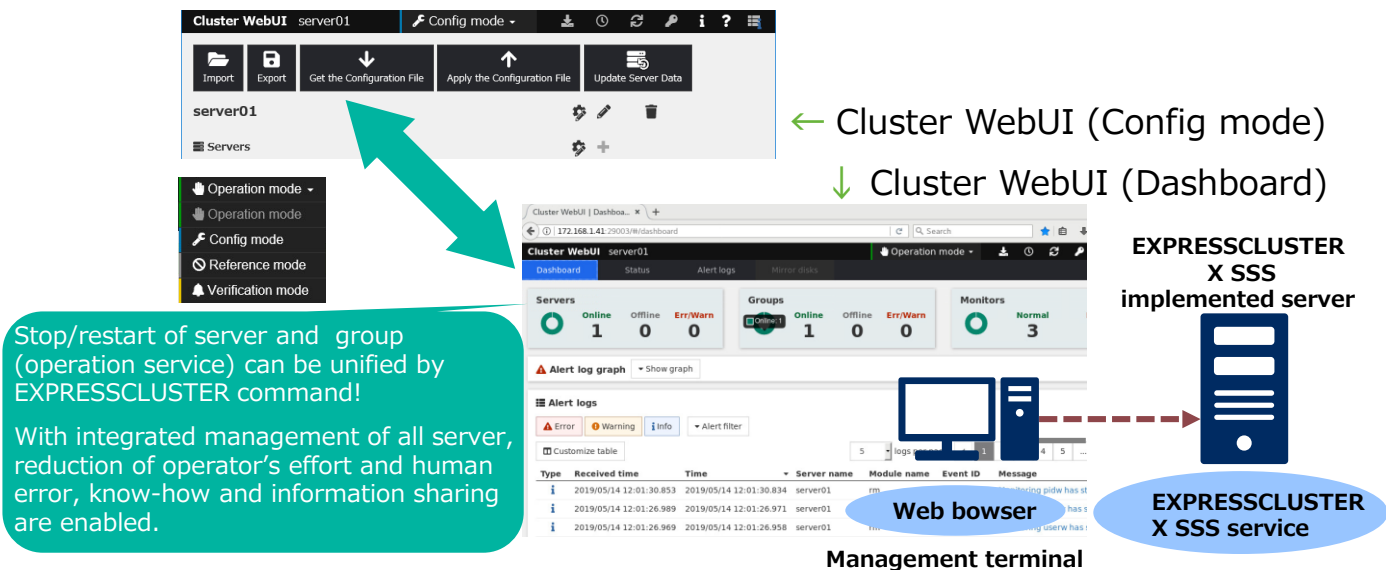
- LocalServer
 - [All Groups]
 - failover
 - AP_exec1
 - APACHE_exec1
 - ORACLE_DB_exec1
 - ORACLE_LISTENER_exec1

OK Cancel

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

Operating procedure

- Same GUI 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 Cluster WebUI, as well as CLI.

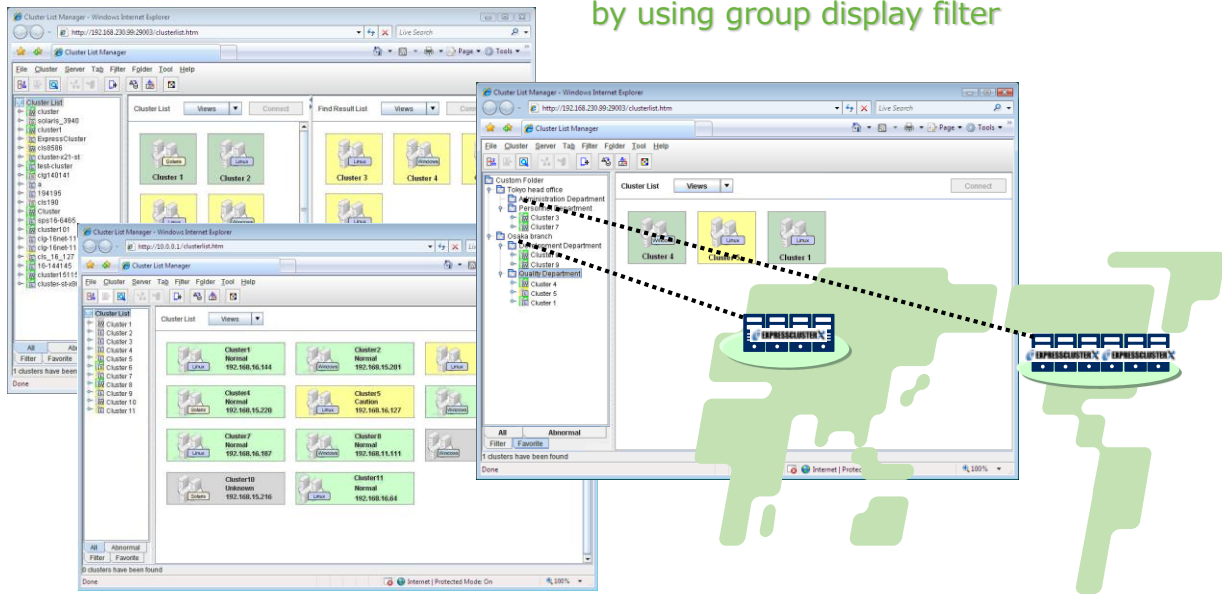


Simple view of server status with integrated Manager

- 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

The image displays three overlapping screenshots of a GUI wizard titled "Resource Definition of Group | virtualmachine". The wizard consists of four steps: Info, Dependency, Recovery Operation, and Details. The first screenshot shows the "Info" step with fields for Type, Name, and Comment, and a "Get license Info" button. The second screenshot shows the "Dependency" step with a "Follow the default dependency" section and a table for "Dependent Resources". The third screenshot shows the "Recovery Operation" step with settings for "Recovery Operation at Activation Failure Detection" and "Recovery Operation at Deactivation Failure Detection". The fourth screenshot shows the "Details" step with fields for VM Type, VM Name, and VM Path, and a "Tuning" button. Green arrows indicate the flow from one step to the next.

Resource Definition of Group | virtualmachine

Info → Dependency → Recovery Operation → Details

Type*

Name*

Comment

Get license Info

Select the type of

Resource Definition of Group | virtualmachine

Info ✓ → Dependency

Follow the default dependency

Dependent Resources

Name	Resource type
No Dependent Resources	

Resource Definition of Group | virtualmachine

Info ✓ → Dependency ✓ → Recovery Operation → Details

Execute Script before or after Activation or Deactivation

Settings

Recovery Operation at Activation Failure Detection

Retry Count* 5 time

Failover Target Server

☐ Stable server

☒ Maximum priority server

Failover Threshold 0 time

Final Action*

☐ Stop the cluster service and re

☐ Execute Script before Final A

Recovery Operation at Deactivation Failure Detection

Retry Count at Deactivation Failure* 0 time

Final Action*

☐ Stop the cluster service and s

☐ Execute Script before Final A

Resource Definition of Group | virtualmachine

Info ✓ → Dependency ✓ → Recovery Operation ✓ → Details

VM Type* Hyper-V

VM Name* sample

VM Path* c:sample

Tuning

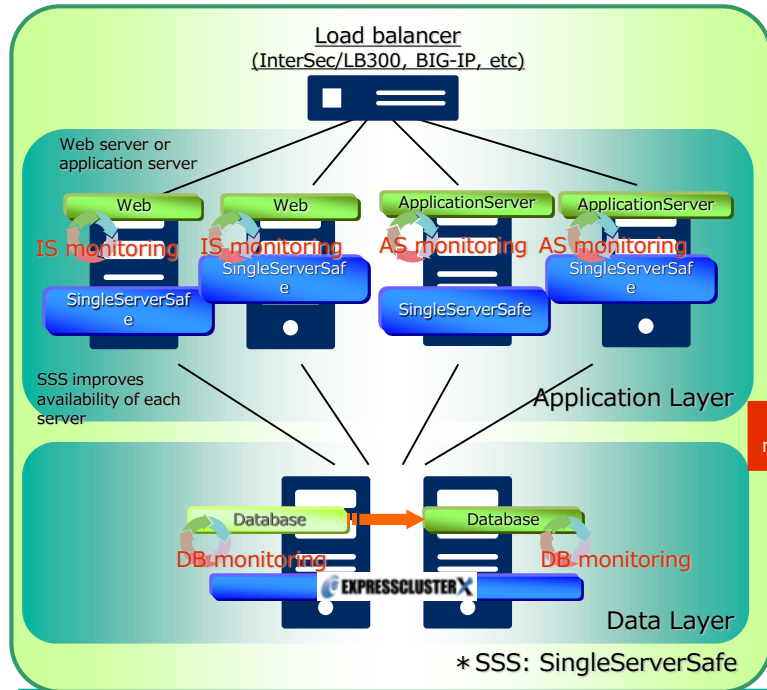
Back Finish Cancel

Enables integration of virtual machine to one platform with HA feature

4. Usage Scene

Solution to improve reliability for Web 3 layer system

Enables integrated management of system under load balancer using SingleServerSafe

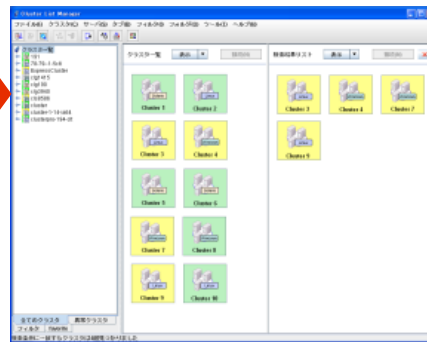


Improves availability of whole system by deploying EXPRESSCLUSTER X SSS in web server / app server under load balancer and deploying EXPRESSCLUSTER X to DB server.

Integrated management of whole system

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

Integrated management



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

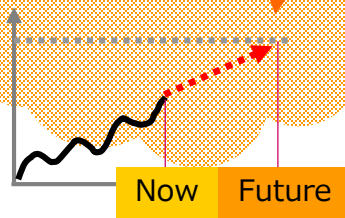
Monitors resource of each process
Alerts abnormal resource usage

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

Process



Process



Process



Resource usage

System Resource Agent

SingleServerSafe

Resource usage

System Resource Agent

SingleServerSafe

Thank You



An Integrated High Availability and Disaster Recovery Solution

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

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



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