



Version 4.2 **New** Enhancement

December, 2020

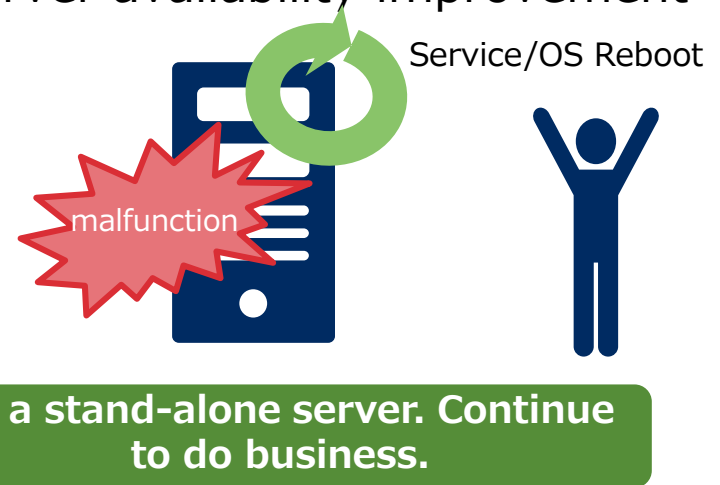
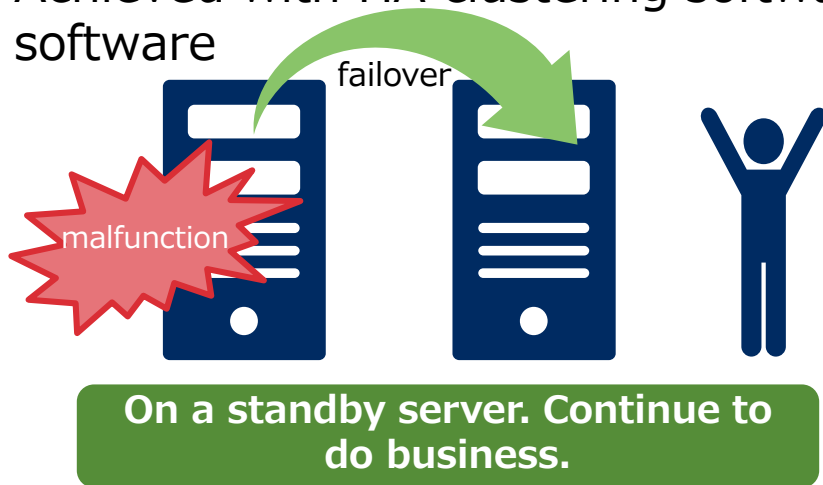
NEC Corporation,
Cloud Platform Division,
(EXPRESSCLUSTER)

What is EXPRESSCLUSTER?

What is EXPRESSCLUSTER?

It's a solution that maximizes the uptime of your business.

- No.1 market share in Japan for 19 consecutive years* high availability software
- Protect your business from any obstacles that could lead to business interruption
 - Make business systems redundant, including hardware and OS
 - Monitor hardware, OS, application and other failures
 - Business continuity on a healthy server in the event of an outage
- Achieved with HA clustering software and server availability improvement software



*Source: IDC Japan, July, 2020 'Japan Computing and Network Infrastructure Software Market Shares, 2019'(JPJ45146920)

EXPRESSCLUSTER functional enhancements

Ships April 10, 2020.

Background to the enhancements

As the use of cloud environments and migration projects are progressing, the demand for HA clusters is increasing as a countermeasure against failures and to ensure availability, and there is a demand for products that take advantage of the benefits of cloud (flexibility, operation/operation, cost reduction, etc.).

Summary of main features and enhancements

1. Enhancing Cloud Connectivity

- Oracle Cloud Infrastructure Expands Resources for Google Cloud Platform
- Cloud storage cost reduction (non-stop expansion of mirrored disk space)

2. Enhancing Application Connectivity

- Added the RESTful API.
- Increased scripting flexibility
- Added the script execution account setting feature (Windows version only).

3. usability improvement

- Added configuration verification (checking cluster configuration information, disabling cluster operation).
- OS authentication method added to access control of Cluster WebUI
- Group start and stop prediction time display, HTML version of manual added.

Key points EXPRESSCLUSTER

"Highlights."

For the Cloud Market reinforcement

AWS follows Azure with expanded resources for Oracle Cloud Infrastructure and Google Cloud Platform. In addition, cloud storage costs can be reduced, making it easier to offer.

application Strengthen cooperation with

The RESTful API allows other applications to manipulate the cluster and obtain information from it. It is also easier to work together than ever before to be able to write a script simply.

Simple and secure enhancement

Added configuration validation and enhanced security for Cluster WebUI to make HA clusters easier to use and more secure.

Suggestion to the customer (please suggest to this kind of customer)

- Customers who want to improve their business availability
- Customers looking to migrate from an on-premises environment to a cloud environment without compromising availability.
- Customers do not want to stop working when the cloud service itself is being maintained
- The customer who wants to restore the business automatically even if there is no SE at the time of the failure

Why EXPRESSCLUSTER is being used in the cloud

- In many cases, redundancy is required as an application condition of SLA(*) of IaaS.
- The SLA(*) of IaaS is only the SLA(*) of the foundation. In order to ensure the availability of systems built on the cloud, it is necessary to create a mechanism to improve the availability at the user's responsibility.
- Few HA cluster software support public clouds, and EXPRESSCLUSTER formally supports running in the cloud. By sharing data with data mirroring function, HA cluster configuration is possible even if there is no shared disk.
- With EXPRESSCLUSTER, the on-premises environment can be lifted to the cloud, reducing the cost of application modification and reevaluation. It can also be reverted from the cloud to on-premises, avoiding cloud vendor lock-in.
- All applications that support HA clusters can be made redundant. The cost of the application is also reduced because the redundant features on the application side are not used.

(*)SLA(Service Level Agreement) :

The content and scope of cloud services presented by cloud vendors and the level of achievement for quality

Improvements for the Cloud Market

Several thin, flowing orange lines that start from the top right and curve downwards and to the left, crossing the horizontal line that separates the blue header from the white body.

Expansion for the supported Cloud

Expand resources for Oracle Cloud Infrastructure(OCI) and Google Cloud Platform(GCP)
This makes setting for OCI/GCP easier

ORACLE CLOUD INFRASTRUCURE



Virtual
Machine

Resource Definition of Group | failover ocvip

Info → Dependency → Recovery Operation → Details

Type*

Name*

Comment



Google Cloud Platform



Compute
Engine

Resource Definition of Group | failover gcvip

Info → Dependency → Recovery Operation → Details

Type*

Name*

Comment

We have a guide for structuring software!

<https://www.nec.com/en/global/prod/expresscluster/en/support/Setup.html>

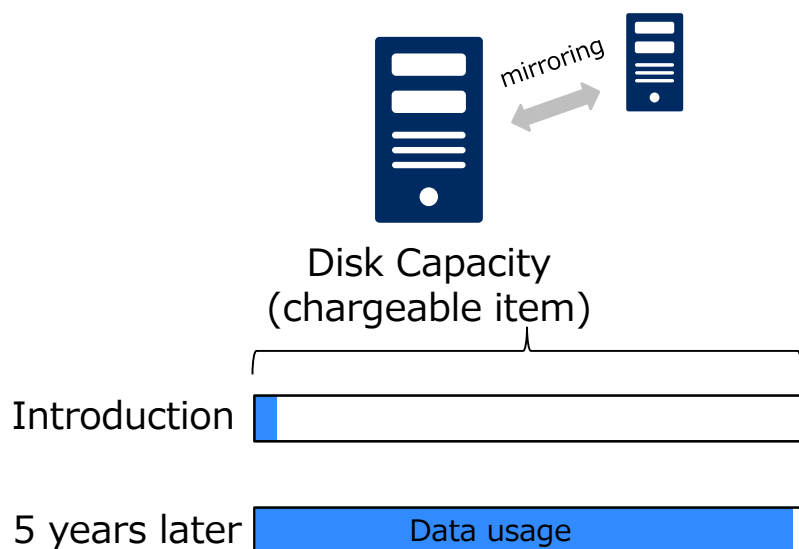
Reduce costs of Cloud storage (non-stop expansion of mirror disk capacity※1)

Compared with traditional cloud storage services, EXPRESSCLUSTER saves costs by billing only for incremental usage, rather than in bulk up-front.

Before

500GB of block storage for five years ※2

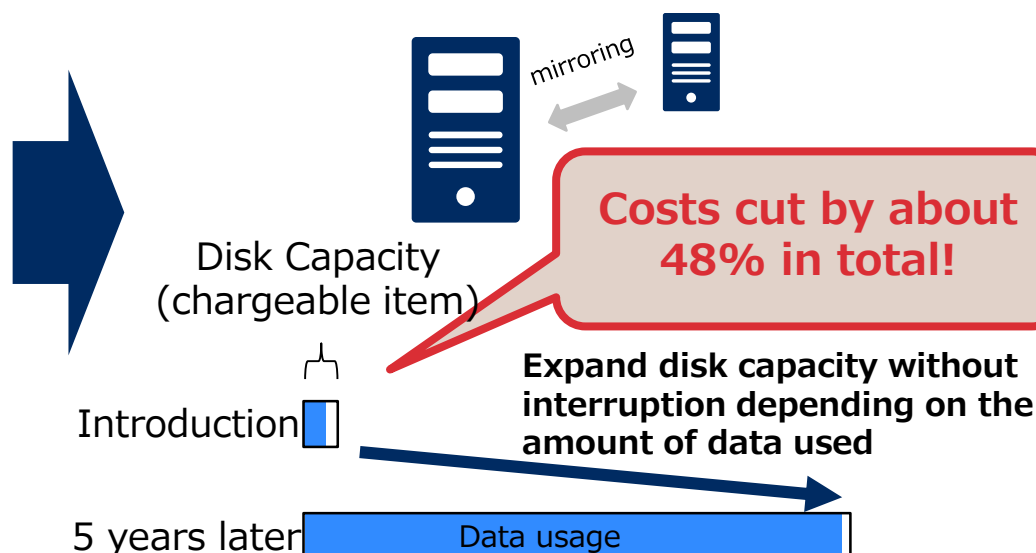
Total cost for 5 years: **\$7300**



After

Your data usage increases by 8.4GB per month and reaches 500GB after 5 years ※2

Total cost for 5 years: **\$3800**



※1 Supported only for mirrored disk resources as of 2020/04. Hybrid disk resources are not supported. The file system of the Windows version supports NTFS. The Linux version supports LVM and XFS only.

※2 As of 2020/03, using the mirroring disk configuration. Total block storage usage fees apply for Active-Standby.

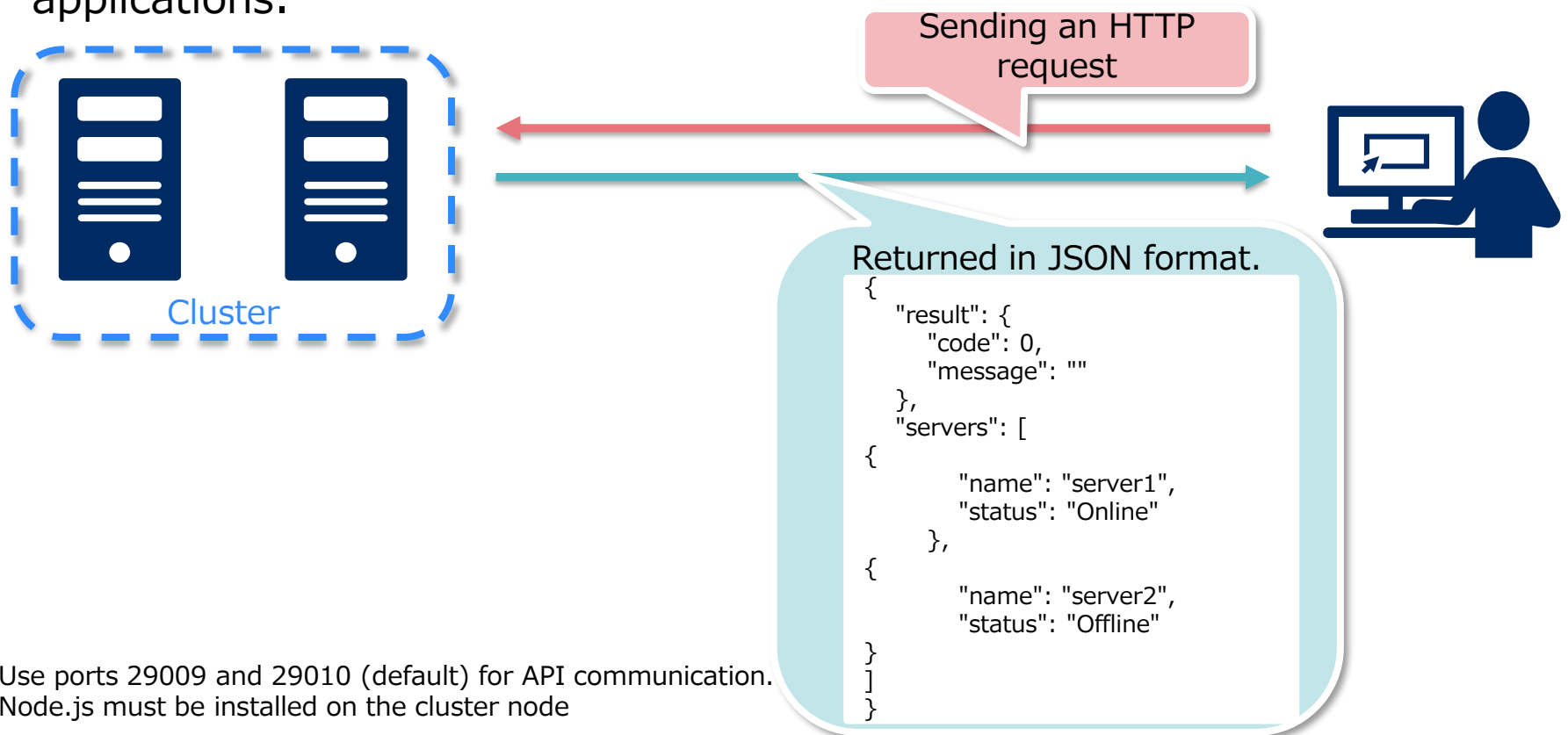
Improvements to Application Connectivity

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.

Adding RESTful API.

Operation and state acquisition of Cluster are possible with "RESTful API".

- Cluster operation and status acquisition is possible with a remote connection from a client or server, with the exception of cluster nodes.
- RESTful API enables efficient and flexible integration with other applications.

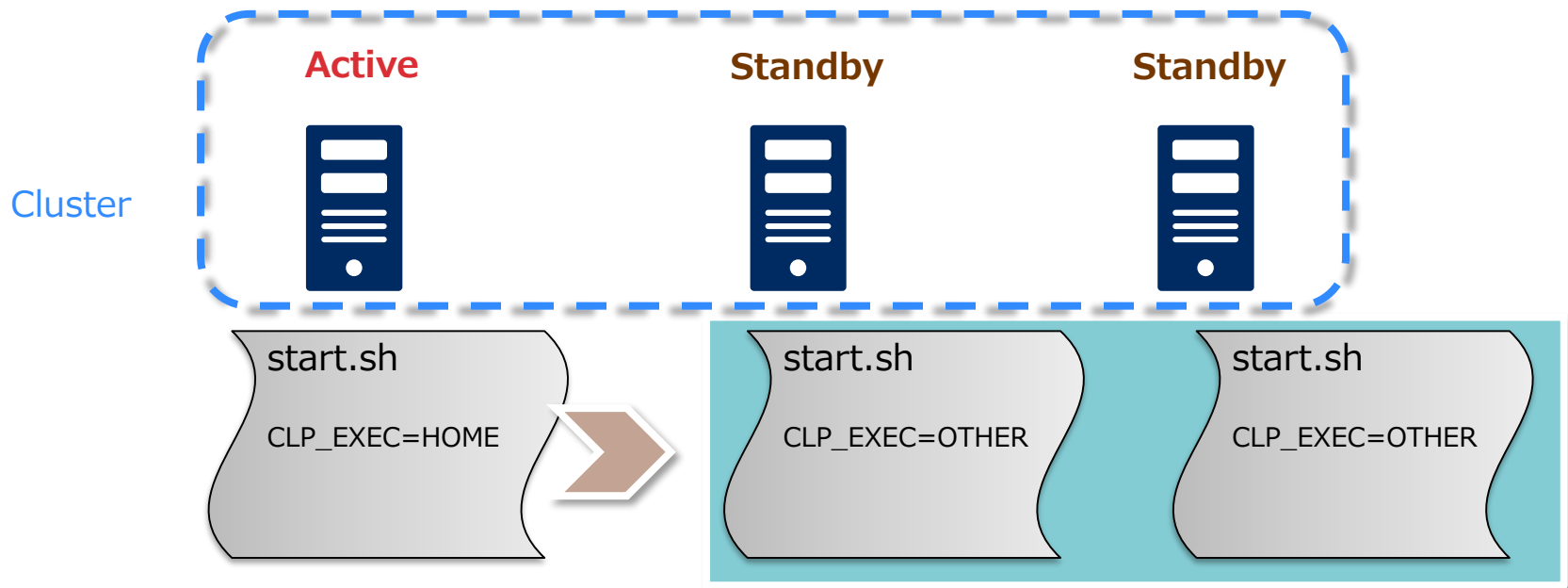


- ※ Use ports 29009 and 29010 (default) for API communication.
- ※ Node.js must be installed on the cluster node

Enhance scripting flexibility

Start/stop scripts for script resources and exec resources can now be executed not only by Active systems but also by all Standby systems.

You can write simple scripts when you want to run them in the Standby system such as when you want to run the script with the replication software (at the replication destination and the replication source).



Allow users other than local system accounts (such as DB and application administrators) to execute scripts

Script Resource Tuning Properties

Start

☒ Synchronous Timeout* 1800 sec

☐ Asynchronous

Normal Return Value

Execute on standby server ☐

Timeout 10 sec

Perform recovery processing ☐

Stop

☒ Synchronous Timeout* 1800 sec

☐ Asynchronous

Normal Return Value

Execute on standby server ☐

Timeout 10 sec

Target VCOM Resource Name

Allow to Interact with Desktop ☐

Exec User

Initialize

Administratoor
test

OK Cancel Apply

Scripts that can be configured for execution accounts

- Application resource and start/stop scripts
- Script resources and start/stop scripts
- Custom monitoring resources and monitoring scripts
- Scripts before and after resource activation/abnormalities
- Recovery action script
- Force stop script

Cluster's properties-> [Account] Tab -> Set a User

Add resource -> [Info] Tab -> Select [Type](Script resource) -> [Details] Tab -> [Tuning] Button -> Select [Exec User]

Improvement of usability

Several thin, flowing orange lines that start from the right edge of the slide and curve downwards and to the left, crossing each other in a complex, abstract pattern.

Configuration verification function (checking cluster configuration information, disabling cluster operation)

Safely check operations before and after applying setting changes

Before applying settings

Function to check cluster configuration information

Cluster WebUI cluster

Import Export Get the Configuration File Apply the Configuration File Update Server Data Check the Configuration File

Cluster WebUI Cluster Configuration Information Check - Cluster Manager

Cluster Configuration Information Check Result

cluster

Overall Result

	192-168-0-170	192-168-0-171
Result summary	FAIL	FAIL
Check started at	2020/04/22 10:52:04	2020/04/22 10:52:14
Check ended at	2020/04/22 10:52:13	2020/04/22 10:52:24

Results by Category

Cluster Property	192-168-0-170	192-168-0-171
Number check on Port No. tab	PASS	PASS
Group Resource		
Ping check on flp	192.168.0.169 is used already.	192.168.0.169 is used already.
Partition presence check for md	PASS	PASS
Heartbeat Resource		
Ping check on lankhb1	PASS	PASS
Others		
OS start time check	PASS	PASS
Unrecommended Settings Check		
Recovery action check for deactivation failure(flp)	PASS	PASS

Check for common mistakes in advance such as mismatched HW and OS settings!

After applying settings

Disabling cluster operation

Cluster Properties -> [Extension] Tab

Disable Cluster Operation (Recommended for maintenance purposes)

Group Automatic Startup	<input checked="" type="checkbox"/>
Recovery Operation when Group Resource Activation Failure Detected	<input checked="" type="checkbox"/>
Recovery Operation when Group Resource Deactivation Failure Detected	<input checked="" type="checkbox"/>
Recovery Action when Monitor Resource Failure Detected	<input checked="" type="checkbox"/>



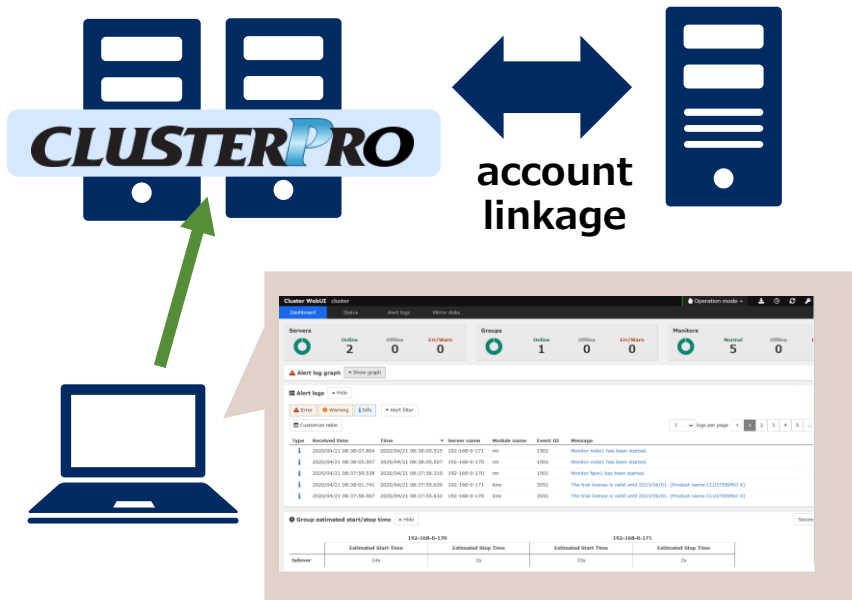
Temporarily disables unnecessary recovery operations (such as failover) due to configuration errors of scripts etc..

OS authentication is added to access control of Cluster WebUI

- ✓ IDs can be managed centrally by linking with Active Directory.
- ✓ The automatic logout setting makes operation more secure.

[Cluster Properties] -> [WebManager] -> [Control connection by using password] -> [Settings] Button

Active Directory Server



Password Settings

☐ Cluster Password Method

Password for
Operation

Change

Password for
Authentication

Change

☒ OS Authentication Method

Add

Remove

Edit

Authorized Group List

Group

Operation

No authorized groups

Please add a Authorized Group.

Login Session Lifetime Period*

1440 min

Automatic Logout Time Period*

60 min

Lockout Threshold*

0 time

Lockout Time*

10 min

Initialize

ⓘ If OS Authentication Method is configured, it is recommended to configure HTTPS for Communication Method.

OK

Cancel

Apply

Accurate group start/stop estimation

Display the estimated time it will take to start and stop the business on each server.
Predict the approximate outage time when the system is switched

Cluster WebUI cluster

Operation mode

DashboardStatusAlert logsMirror disks

Servers

Online2Offline0Err/Warn0

Groups

Online1Offline0Err/Warn0

Monitors

Normal5Offline0

Alert log graph

Show graph

Alert logs

Hide

ErrorWarningInfo

Alert filter

Customize table

5 logs per page

12345...

Type	Received time	Time	Server name	Module name	Event ID	Message
i	2020/04/21 08:38:07.804	2020/04/21 08:38:05.515	192-168-0-171	rm	1501	Monitor module has been started
i	2020/04/21 08:38:05.507	2020/04/21 08:38:05.507	192-168-0-170	rm	1501	
i	2020/04/21 08:37:59.538	2020/04/21 08:37:56.319	192-168-0-170	rm	1501	
i	2020/04/21 08:38:01.741	2020/04/21 08:37:55.639	192-168-0-171	lcns	3551	
i	2020/04/21 08:37:58.507	2020/04/21 08:37:55.632	192-168-0-170	lcns	3551	

Group estimated start/stop time

Hide

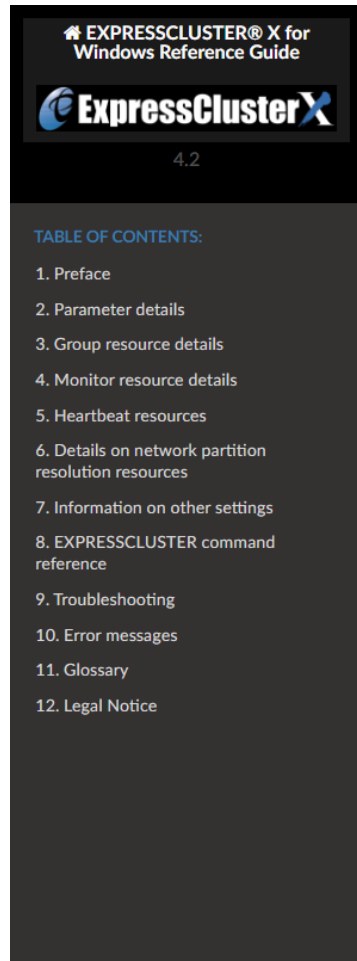
	192-168-0-170		192-168-0-171	
	Estimated Start Time	Estimated Stop Time	Estimated Start Time	Estimated Stop Time
failover	24s	2s	33s	2s

It can be switched in about 35 seconds. Business stop time (2 s (stop) + 33 s (start)).

Add HTML version of the manual in addition to the previous PDF version.

Add an HTML version of the manual with improved accessibility

It's possible to link inter-document as well as intra-document.



EXPRESSCLUSTER® X for Windows Reference Guide

ExpressCluster X

4.2

TABLE OF CONTENTS:

- 1. Preface
- 2. Parameter details
- 3. Group resource details
- 4. Monitor resource details
- 5. Heartbeat resources
- 6. Details on network partition resolution resources
- 7. Information on other settings
- 8. EXPRESSCLUSTER command reference
- 9. Troubleshooting
- 10. Error messages
- 11. Glossary
- 12. Legal Notice

[Docs](#) » [EXPRESSCLUSTER X 4.2 for Windows Reference Guide](#)

EXPRESSCLUSTER X 4.2 for Windows Reference Guide

Table of Contents:

- 1. Preface
 - 1.1. Who Should Use This Guide
 - 1.2. How This Guide is Organized
 - 1.3. EXPRESSCLUSTER X Documentation Set
 - 1.4. Conventions
 - 1.5. Contacting NEC
- 2. Parameter details
 - 2.1. Parameter settings
 - 2.2. Cluster properties
 - 2.3. Servers Properties
 - 2.4. Server Properties
 - 2.5. Group Properties
 - 2.6. Group Resource Properties
 - 2.7. Monitor Resource Properties
 - 2.8. Parameters list
 - 2.9. Upper limits of registration
- 3. Group resource details
 - 3.1. Group resources
 - 3.2. What is a group?
 - 3.3. Group common properties
 - 3.4. Group properties
 - 3.5. Resource Properties
 - 3.6. Understanding application resources
 - 3.7. Understanding floating IP resources
 - 3.8. Understanding mirror disk resources

New supported OS/Applications

New supported OS/Applications

OS

- Windows Server, version 1903 Standard
- Windows Server, version 1903 Datacenter
- Windows Server, version 1909 Standard
- Windows Server, version 1909 Datacenter
- Red Hat Enterprise Linux 8 (Update2)*
- Red Hat Enterprise Linux 8 (Update1)*
- Red Hat Enterprise Linux 7 (Update8)*
- Red Hat Enterprise Linux 7 (Update7)
- MIRACLE LINUX 8 Asianux Inside
- Novell SUSE LINUX Enterprise Server 15 (SP1)
- Novell SUSE LINUX Enterprise Server 15
- Novell SUSE LINUX Enterprise Server 12 (SP4)
- Oracle Linux 7.7 UEK4
- Ubuntu 18.04.3 LTS
- Amazon Linux 2 (4.14.138-114.102.amzn2.x86_64)

Applications

- Oracle Database 19c
- SQL Server 2019

* EXPRESSCLUSTER driver update patch must be applied. For more information [here](#).

Cautions

■ Solaris version

- The Solaris version is no longer available from X 4.2.

■ If you are updating from an older version (X 4.1/4.0), you will need to open the following new ports.

- 29008 (for CLUSTERPRO/EXPRESSCLUSTER Information Base Service)
- 29009/29010 (for CLUSTERPRO/EXPRESSCLUSTER API Service)

Please contact us for more information.

| Inquiry (Customers from outside the company can also inquiry us directly.)

- Contact before purchasing EXPRESSCLUSTER: info@expresscluster.jp.nec.com

| Information Website

- Product site: <https://www.nec.com/expresscluster/>
- EXPRESSCLUSTER free trial version download site:
<https://www.nec.com/expresscluster/en/trial/evaluation.html>