

HULFT Integrate

Cluster Configuration Guide

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HULFT

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1. Before Use

Cluster Configuration Guide contains information regarding configuration of IntegrateServer in a cluster.

- Cluster Architecture
- Synchronization between cluster nodes
- Monitoring the vital status of IntegrateServer

1.1. Precautions

1.1.1. Copyright Notice

- The copyright of this software is owned by HULFT, Inc. or its licensors.
- Unauthorized copy, reprinting of this software and this manual is prohibited.
- While preparing this manual every effort has been taken to ensure its correctness but in case of any mistakes, mismatch, and suggestions please contact us.
- Please use this software by user's responsibility. As a result, with regard to any trouble and the lawsuit, etc. occurs by any chance, damage or loss caused directly or indirectly, our company doesn't at all assume any responsibilities. This is for your information beforehand.
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1.2. About the mark of this document

The rules of the notations in this document are as follows.




- Menu name, tab name, property item name, value, and button name displayed on screen are enclosed with [] and in bold letters. Moreover, the one without title of screens and other function names are enclosed with "" and distinguished from the former.
- "\$INTEGRATE_HOME" shows the directory where HULFT Integrate is installed. In default, it is "C:\Program Files\hulft\integrate" for Windows version and "<HOME>/hulft/integrate" for UNIX/Linux version.
- "x86 version" means 32bit OS.
"x64 version" means 64bit OS of 64bit CPU (Intel 64/AMD64).
- Name enclosed with < > is variable value.

Example: \$INTEGRATE_HOME/server/logs/<Date directory>

- URLs of the Web sites shown in this document are as of November 2018, and are subject to change without notice due to reasons of the Web site.
- "Studio" means "Integrate Studio", and "Studio for Web" means "Integrate Studio for Web".
- The descriptions of the Windows and UNIX/Linux versions of IntegrateServer have been standardized.
Please replace descriptions of operating system dependent items (such as path delimiter characters) as necessary.
- The numbers beginning with "DSS -" are unique IDs for controlling each corresponding problem.

1.3. About the Icons Used in This Guide

This Guide uses the following icons in its explanation.

Icon	Description
	Indicates that there are hints about operations or configurations.
	Indicates that there are warnings about operations or configurations.
	Indicates that there are detailed descriptions in other resources.

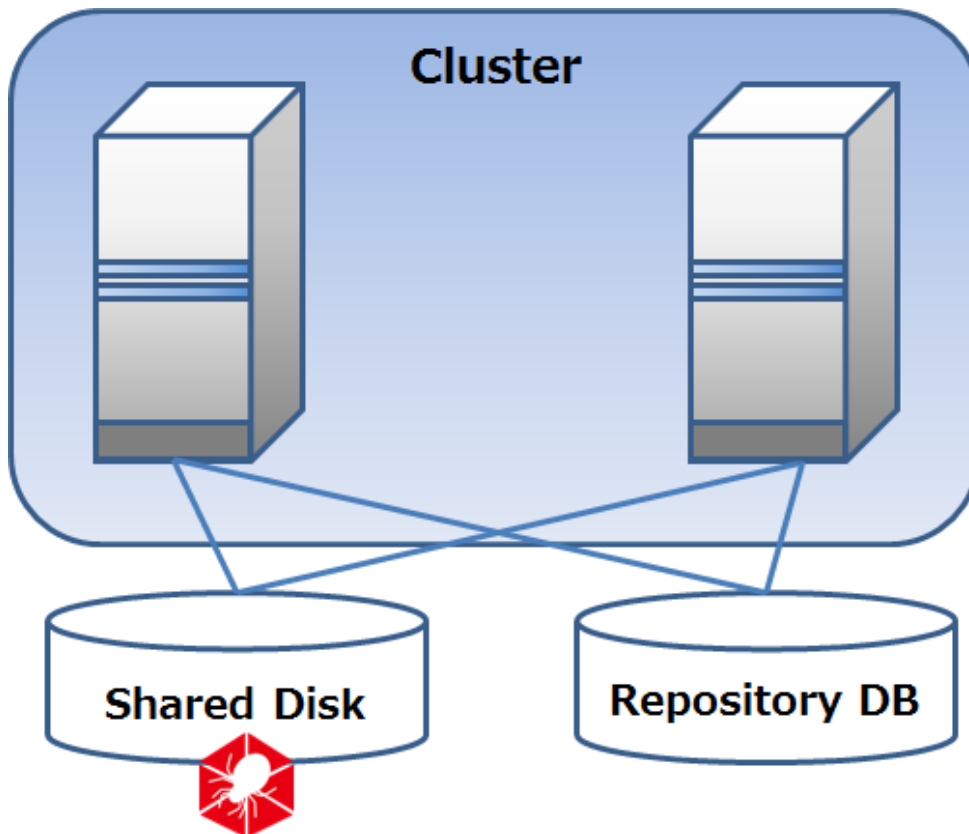
2. Cluster Architecture

IntegrateServer Cluster is comprised of the set of one active and one standby node. The combination of the nodes can be one of the following, nodes with or without repository DB and whether the IntegrateServer is installed to a shared volume or it is installed individually to each cluster node.

- With repository DB/IntegrateServer is installed to a shared volume
- Without repository DB/ IntegrateServer is installed to a shared volume
- With repository DB /IntegrateServer is installed to each cluster node individually
- Without repository DB / IntegrateServer is installed to each cluster node individually

2.1. With repository DB/IntegrateServer is installed to a shared volume

This diagram visualizes the cluster comprised of the nodes using a repository DB and a shared volume to which IntegrateServer is installed.



2.1.1. System Architecture

A repository DB is shared between the active node and the passive node. IntegrateServer is installed to a shared volume.

Guidelines on cluster architecture

- If the shared volume is network mounted, the path to the mount point specified in both cluster nodes need to be identical.
- The directory mounted needs to exist in a shared volume accessible from both cluster nodes.

2.1.2. Installing IntegrateServer

IntegrateServer is installed to each cluster node. Guidelines on installing IntegrateServer to the cluster nodes are the followings:

- Although the destination of the IntegrateServer installation is the shared volume between two cluster nodes, individual installation procedure is necessary as the IntegrateServer needs to be registered as a Windows service in each cluster node.
- If the platform used is Windows, the IntegrateServer should be registered as Windows service.
In many cluster software, an application run in a cluster is required to be registered as a Window service.
- The path to the IntegrateServer installation directories need to be the same in all nodes in a cluster.

2.1.3. Synchronizing Settings

As IntegrateServer configuration files in one shared volume are referenced by the cluster nodes, there is no data synchronization involved.


- Configuration items for which no synchronization is necessary.
 - \$INTEGRATE_HOME/bin/IntegrateServer.lax
 - \$INTEGRATE_HOME/conf/dslog.properties
 - \$INTEGRATE_HOME/conf/system.properties
 - User account settings
 - Holiday settings
 - Trigger settings
 - Global resource settings
 - Application log settings
 - Environment variable settings
 - Mount settings
 - Integrate Log settings
 - My Log search criteria settings
 - EICS Repository
 - ◇ required when SAP adapter is used

2.1.4. Synchronizing Data


There is no data synchronization necessary as each node in a cluster references the same data in a shared volume.


- Synchronization achieved manually

Perform it by copying the files and directories between the cluster nodes.

 Creating the backup data before the operation is strongly recommended.

- Data in the mounted volume

 Directory in the shared volume cannot be referenced from each node in a cluster.

 Directory contains the data which needs to be synchronized.

- Data for which synchronization is not necessary.

- services
- projects
- data stored in the shared volume

2.1.5. Synchronizing modules

Additional adapters installed or adapters patches applied are supposed be in the shared volume so there should be no synchronization necessary.

Refer to the README file for how additional adapters are installed or patches are applied to adapters.

2.1.6. Log

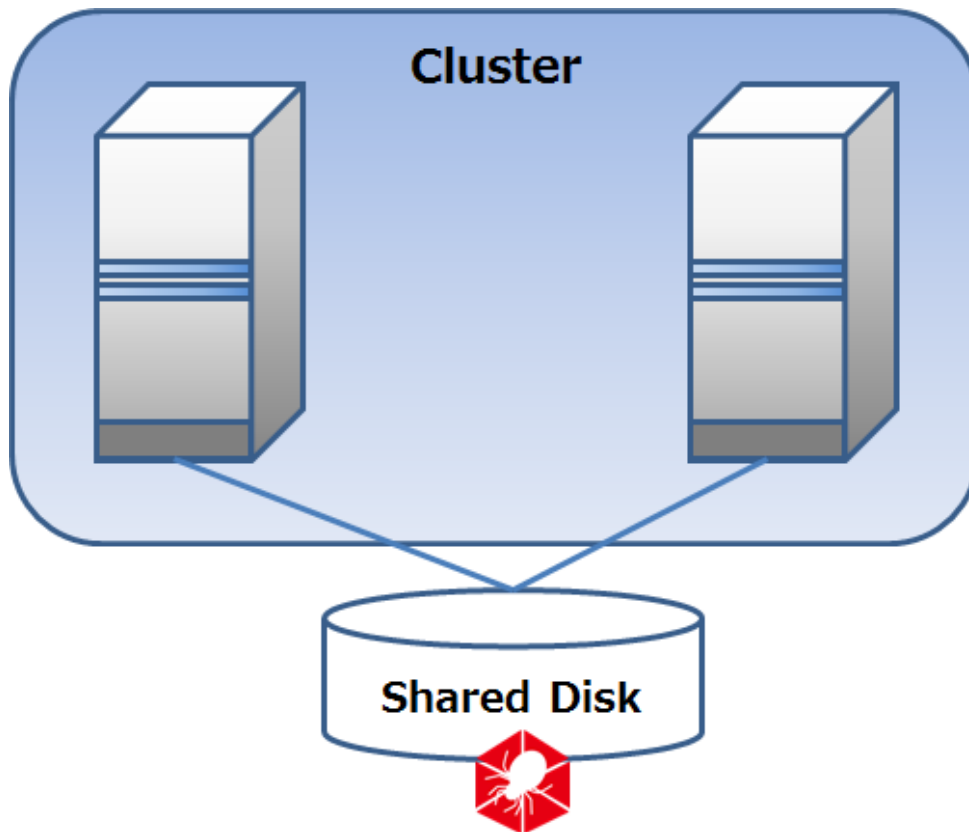
Each node in the cluster logs to the same target file. To determine which node in the cluster made the entries to the log file, investigate the log generated by the cluster software.

2.1.7. Guidelines on Failover

- When performing a failover, wait until the active IntegrateServer node stops before starting the standby node.
 - If the active node is starting or stopping, the standby node will fail to start if it cannot lock the log that is shared between the nodes in the cluster.

2.2. Without repository DB/ IntegrateServer is installed to a shared volume

This diagram visualizes the cluster comprised of the nodes that share a volume to install IntegrateServer without a repository DB.



2.2.1. System Architecture

IntegrateServer is installed to a volume shared between the active and the passive node in the cluster. No repository DB is used.

Guidelines on cluster architecture

- If the shared volume is network mounted, the path to the mount point specified in both cluster nodes need to be identical.
- The directory mounted needs to exist in a shared volume accessible from both cluster nodes.

2.2.2. Installing IntegrateServer

IntegrateServer is installed to each cluster node. Guidelines on installing IntegrateServer to the cluster nodes are the followings:

- Although the destination of the IntegrateServer installation is the shared volume between two cluster nodes, individual installation procedure is necessary as the IntegrateServer needs to be registered as a Windows service in each cluster node.
- If the platform used is Windows, the IntegrateServer should be registered as Windows service.
In many cluster software, an application run in a cluster is required to be registered as a Window service.
- The path to the IntegrateServer installation directories need to be the same in all nodes in a cluster.

2.2.3. Synchronizing Settings

There is no data synchronization necessary as each node in a cluster references the same data in a shared volume.


- Configuration items for which no synchronization is necessary.
 - \$INTEGRATE_HOME/bin/IntegrateServer.lax
 - \$INTEGRATE_HOME/conf/dslog.properties
 - \$INTEGRATE_HOME/conf/system.properties
 - Holiday settings
 - Trigger settings
 - Global resource settings
 - Application log settings
 - Environment variable settings
 - Mount settings
 - Integrate Log settings
 - My Log search criteria settings
 - EICS Repository
 - ◇ required when SAP adapter is used

2.2.4. Synchronizing Data


There is no data synchronization necessary as each node in a cluster references the same data in a shared volume.


- Synchronization achieved manually

Perform it by copying the files and directories between the cluster nodes.

 Creating the backup data before the operation is strongly recommended.

- Data in the mounted volume

 Directory in the shared volume cannot be referenced from each node in a cluster.

 Directory contains the data which needs to be synchronized.

- Data for which synchronization is not necessary.

- services
- projects
- data stored in the shared volume

2.2.5. Synchronizing modules

Additional adapters installed or adapters patches applied are supposed be in the shared volume so there should be no synchronization necessary.

Refer to the README file for how additional adapters are installed or patches are applied to adapters.

2.2.6. Log

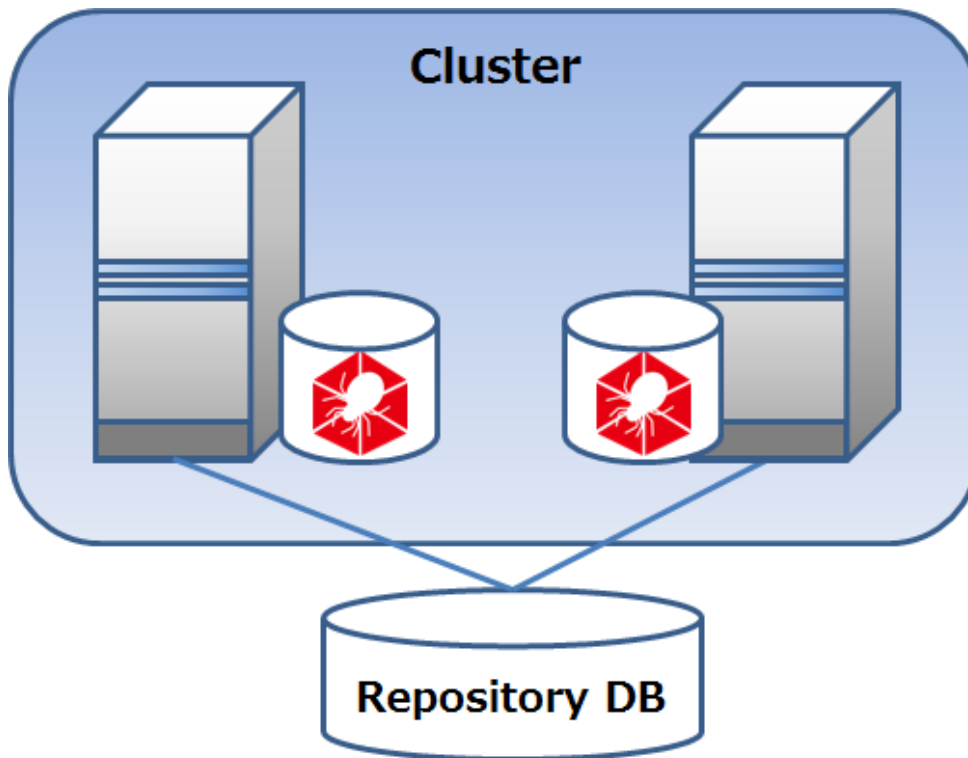
Each node in the cluster logs to the same target file. To determine which node in the cluster made the entries to the log file, investigate the log generated by the cluster software.

2.2.7. Guidelines on Failover

- When performing a failover, wait until the active IntegrateServer node stops before starting the standby node.
 - If the active node is starting or stopping, the standby node will fail to start if it cannot lock the log that is shared between the nodes in the cluster.

2.3. With repository DB/ IntegrateServer is installed individually to each cluster node.

This diagram visualizes the cluster comprised of the nodes each installed IntegrateServer in its own space and using a repository DB.



2.3.1. System Architecture

The cluster is comprised of the nodes each installed IntegrateServer in its own space and there is no repository DB.

Guidelines on cluster architecture

- If the shared volume is network mounted, the path to the mount point specified in both cluster nodes need to be identical.
- The directory mounted needs to exist in a shared volume accessible from both cluster nodes.

2.3.2. Installing IntegrateServer

IntegrateServer is installed to each cluster node. Guidelines on installing IntegrateServer to the cluster nodes are the followings:

- If the platform used is Windows, the IntegrateServer should be registered as Windows service.

In many cluster software, an application run in a cluster is required to be registered as a Window service.

- The path to the IntegrateServer installation directories need to be the same in all nodes in a cluster.

2.3.3. Synchronizing Settings

Synchronization of configuration settings between two nodes in the cluster becomes necessary.

- Synchronization achieved manually

Configuration settings necessitate synchronization are described below. Synchronizations can be achieved by manually editing the files in each node or by copying the files and directories between the cluster nodes.



Creating the backup data before the operation is strongly recommended.

- \$INTEGRATE_HOME/bin/IntegrateServer.lax

It is strongly recommended to set the heap size the same value in every cluster node.

- \$INTEGRATE_HOME/conf/dslog.properties

It is strongly recommended to set the natures relates to log management the same way in every cluster node. These include Log level, log file size and number of backlogs.

- \$INTEGRATE_HOME/conf/system.properties

It is strongly recommended to propagate the settings to other cluster node, if it is modified in one environment.

- EICS repository

required when using SAP adapter. Whenever the registration information in an EICS is modified. To perform synchronization, create the backup of whichever EICS repository that is used to propagate the changes to the EICS repositories in other nodes in the cluster by restoring. For details about the EICS repository backup, consult the "SAP EICS Install Guide".

- Synchronization need to be performed using client tools.

Settings found in the “Integrate Log settings” in “Control Panel” need to be the same in every cluster node.

- Integrate Log settings

- Configuration items for which no synchronization is necessary.

- User account settings

- Holiday settings

- Trigger settings

- Global resource settings

- Application log settings

- Environment variable settings

- Mount settings


- My Log search criteria settings

2.3.4. Synchronizing Data


Synchronization of data between two nodes in the cluster becomes necessary. Data stored in the shared repository DB may be excluded.


- Synchronization achieved manually

Perform it by copying the files and directories between the cluster nodes.

 Creating the backup data before the operation is strongly recommended.

- Data in the mounted volume

 Directory in the shared volume cannot be referenced from each node in a cluster.

 Directory contains the data which needs to be synchronized.

- Data for which synchronization is not necessary.

- services

- projects

- data stored in the repository DB

2.3.5. Synchronizing modules

Additional adapters installed or adapters patches applied need to be copied to each node in the cluster.

Refer to the README file for how additional adapters are installed or patches are applied to adapters.

2.3.6. Log

Use different location in each cluster node for the log output

Viewing the logs in IntegrateServer running in passive mode cannot be performed using My Log feature of Integrate Studio. Use text editors alternatively to view the log files.

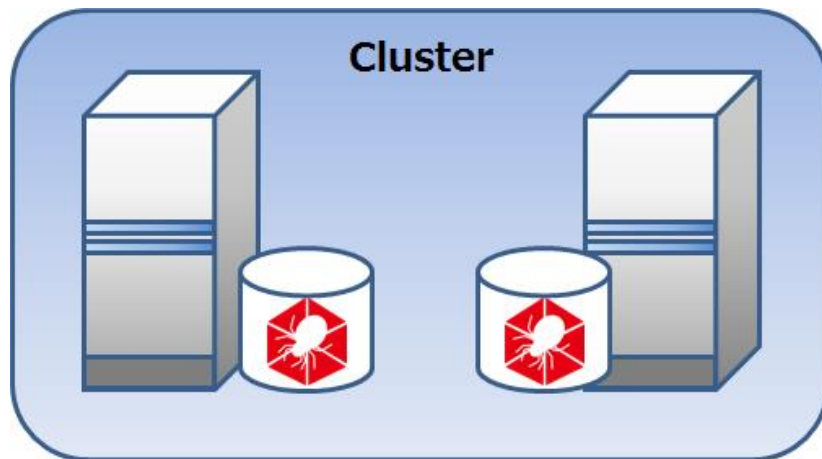
2.3.7. Guidelines on Failover

- If the cluster is comprised of the nodes, both in hot standby mode, the following trigger cannot be used as they are configured the same in each cluster node.
 - Schedule trigger
 - DB trigger
 - SAP trigger

In addition, the file checked against by a file trigger cannot reside in the volume shared.

2.4. Without repository DB/ IntegrateServer is installed individually to each cluster node

This diagram visualizes the cluster comprised of the nodes each installed IntegrateServer in its own space and there is no repository DB.



2.4.1. System Architecture

The cluster is comprised of the nodes each installed IntegrateServer in its own space and there is no repository DB.

Guidelines on cluster architecture

- If the shared volume is network mounted, the path to the mount point specified in both cluster nodes need to be identical.
- The directory mounted needs to exist in a shared volume accessible from both cluster nodes.

2.4.2. Installing IntegrateServer

IntegrateServer is installed to each cluster node. Guidelines on installing IntegrateServer to the cluster nodes are the followings:

- If the platform used is Windows, the IntegrateServer should be registered as Windows service.

In many cluster software, an application run in a cluster is required to be registered as a Window service.

- The path to the IntegrateServer installation directories need to be the same in all nodes in a cluster.

2.4.3. Synchronizing Settings

Synchronization of configuration settings between two nodes in the cluster becomes necessary.

- Synchronization achieved manually

Configuration settings necessitate synchronization are described below. Synchronizations can be achieved by manually editing the files in each node or by copying the files and directories between the cluster nodes.



Creating the backup data before the operation is strongly recommended.

- \$INTEGRATE_HOME/bin/IntegrateServer.lax

It is strongly recommended to set the heap size the same value in every cluster node.

- \$INTEGRATE_HOME/conf/dslog.properties

It is strongly recommended to set the natures relates to log management the same way in every cluster node. These include Log level, log file size and number of backlogs.

- \$INTEGRATE_HOME/conf/system.properties

It is strongly recommended to propagate the settings to other cluster node, if it is modified in one environment.

- EICS repository

required when using SAP adapter. Whenever the registration information in an EICS is modified. To perform synchronization, create the backup of whichever EICS repository that is used to propagate the changes to the EICS repositories in other nodes in the cluster by restoring. For details about the EICS repository backup, consult the "SAP EICS Install Guide".

- Synchronization need to be performed using client tools.

Following settings are synchronized using server settings export feature available in Studio. Exporting the settings of the node used as the source to propagate from and importing them to other node in the cluster is how the synchronization is done.

It can be performed using [Control Panel]-[IntegrateServer Settings]-[Server export] or executing exp/imp command in CLI Console.

- Holiday settings
- Trigger settings
- Global resource settings
- Application log settings
- Environment variable settings

Use [Control Panel]-[Mount Settings] or mount command in CLI Console to set the same values in each cluster node.

- Mount settings

Use [Control Panel]-[Integrate Log Settings] to set the same values in each cluster node.

- Integrate Log settings

Use [My Log] to set the same search criteria in each cluster node.


- My Log Search Criteria

2.4.4. Synchronizing Data


Synchronization of data between two nodes in the cluster becomes necessary.


- Synchronization achieved manually

Perform it by copying the files and directories between the cluster nodes.


 Creating the backup data before the operation is strongly recommended.

- Data in the mounted volume

 Creating the backup data before the operation is strongly recommended.

 Data in the mounted volume

- Data resides in /data, /home, and /tmp directories

 If these contains data which need to be synchronized.

- Synchronization achieved using the client tools

Following settings are synchronized using server settings export feature available in Studio. Exporting the settings of the node used as the source to propagate from and importing them to other node in the cluster is how the synchronization is done.

It can be performed using [Control Panel]-[IntegrateServer Settings]-[Server export] or executing exp/imp command in CLI Console.

- service

- project

2.4.5. Synchronizing modules

Additional adapters installed or adapters patches applied need to be copied to each node in the cluster.

Refer to the README file for how additional adapters are installed or patches are applied to adapters.

2.4.6. Log

Use different location in each cluster node for the log output.

Viewing the logs in IntegrateServer running in passive mode cannot be performed using My Log feature of Integrate Studio. Use text editors alternatively to view the log files.

2.4.7. Guidelines on Failover

- If the cluster is comprised of the nodes, both in hot standby modes, disable all triggers in the passive node to prevent the triggers from firing concurrently in each cluster node.

3. Monitoring the vital status of IntegrateServer

Monitoring the active state (server's vital status) of IntegrateServer can be achieved by the following ways.

- Monitoring the process of IntegrateServer.
- Monitoring IntegrateServer by executing a script.

3.1. Monitoring the process of IntegrateServer

The vital status check can be achieved by monitoring the IntegrateServer process named as follows:

- Windows version: IntegrateServer.exe
- UNIX version: IntegrateServer

Consult the document provided with the clustering software for how these process names are used.

3.1.1. Guidelines on IntegrateServer process monitoring

It is not possible to determine the service availability or the system in hang up state by monitoring the IntegrateServer process. In order to detect the service condition, monitoring by executing a script is necessary.

3.2. Monitoring IntegrateServer by executing a script

Monitoring the availability of the service can be achieved by executing a script that actually performs checks on every aspects of the server. This will bring more accurate results compared to the monitoring of IntegrateServer process. A script can perform periodical checks on the following perspectives:

- Whether the IntegrateServer process is active or not.
- Whether the client tools can be connected to the designated port.
- Whether IntegrateServer is in service and scripts can be executed.

The monitoring software installed can determine of the above by the status code returned by ScriptRunner which can be either 0, if it succeeded or anything else if it failed.

3.2.1. Guidelines on monitoring IntegrateServer by executing a script

A script that is deployed for the IntegrateServer monitoring purpose is not prioritized therefore is executed with the same priority as other scripts that may be running concurrently. In other words, under heavy load, if scripts are on wait, which is not an exception for the script that performs the monitoring.

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