## Revision History

<table>
<thead>
<tr>
<th>Edition</th>
<th>Revised Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>10/04/2013</td>
<td>New manual</td>
</tr>
</tbody>
</table>
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Preface
This Guide: Building the cluster system when FileMaker Server 12 is used under EXPRESSCLUSTER.

Who Should Use This Guide
This Guide is intended for administrators who want to build a cluster system, system engineers who want to provide user support, and maintenance personnel.
This Guide introduces software whose operation in an EXPRESSCLUSTER environment has been checked. The software and setup examples introduced here are for reference only. They are not meant to guarantee the operation of each software product.

Scope of Application
This guide covers the following EXPRESSCLUSTER versions.
- EXPRESSCLUSTER X 3.1 for Windows

Chapter 1  Functional overview: Provides a functional overview.
Chapter 2  Operating environment: Describes the verified operating environment for this function.
Chapter 3  Cautions: Provides cautions on configuration.
Chapter 4  Configuration: Describes the procedure for configuring a cluster.
Chapter 5  Command reference: Describes the commands used in scripts for linkage.
Chapter 6  Scripts for linkage: Describes the scripts used for linkage.
Appendix  Sample scripts: Provides script description examples.
EXPRESSCLUSTER Documentation Set

The EXPRESSCLUSTER X manuals consist of the following five guides. The title and purpose of each guide is described below:

**Getting Started Guide**
This guide is intended for all users. The guide covers topics such as product overview, system requirements, and known problems.

**Installation and Configuration Guide**
This guide is intended for system engineers and administrators who want to build, operate, and maintain a cluster system. Instructions for designing, installing, and configuring a cluster system with EXPRESSCLUSTER are covered in this guide. This guide follows the actual sequence of actions performed when introducing a cluster system using EXPRESSCLUSTER to describe how to design the system, install and set up EXPRESSCLUSTER X, check the operation after the setup, and perform evaluation before starting operation.

**Reference Guide**
This guide is intended for system administrators. The guide covers topics such as how to operate EXPRESSCLUSTER, function of each module, maintenance-related information, and troubleshooting.

The guide is supplement to the *Installation and Configuration Guide*

**Integrated WebManager Administrator's Guide**
This guide is intended for system administrators who manage cluster system using EXPRESSCLUSTER with EXPRESSCLUSTER Integrated WebManager and for system engineers who introduce the Integrated WebManager. In this guide, details on required items for introducing the cluster system using the Integrated WebManager are explained in accordance with the actual procedures.

**WebManager Mobile Administrator's Guide**
This guide is intended for system administrators who manage cluster system using EXPRESSCLUSTER with EXPRESSCLUSTER WebManager Mobile and for system engineers who introduce the WebManager Mobile. In this guide, details on those items required for introducing the cluster system using the WebManager Mobile are explained in accordance with the actual procedures.

EXPRESSCLUSTER Documentation Set

For details about FileMaker Server, refer to the following FileMaker Server guides.

Contacting NEC

For the latest product information, visit our website below:
http://www.nec.com/global/prod/expresscluster/
Conventions

In this guide, **Note**, **Important**, **Related Information** are used as follows:

**Note:**
Used when the information given is important, but not related to the data loss and damage to the system and machine.

**Important:**
Used when the information given is necessary to avoid the data loss and damage to the system and machine.

**Related Information:**
Used to describe the location of the information given at the reference destination.

The following conventions are used in this guide.

<table>
<thead>
<tr>
<th>Convention</th>
<th>Usage</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bold</strong></td>
<td>Indicates graphical objects, such as fields, list boxes, menu selections, buttons, labels, icons, etc.</td>
<td>In <strong>User Name</strong>, type your name. On the <strong>File</strong> menu, click <strong>Open Database</strong>.</td>
</tr>
<tr>
<td>Angled bracket within the command line</td>
<td>Indicates that the value specified inside of the angled bracket can be omitted.</td>
<td>clpstat -s[-h host_name]</td>
</tr>
<tr>
<td>Monospace (courier)</td>
<td>Indicates path names, commands, system output (message, prompt, etc), directory, file names, functions and parameters.</td>
<td>/Linux/3.0/eng/server/</td>
</tr>
<tr>
<td><strong>Monospace bold</strong> (courier)</td>
<td>Indicates the value that a user actually enters from a command line.</td>
<td>Enter the following: # clpcl -s -a</td>
</tr>
<tr>
<td><strong>Monospace italic</strong> (courier)</td>
<td>Indicates that users should replace italicized part with values that they are actually working with.</td>
<td>rpm -i expressclsbuilder -&lt;version_number&gt;- &lt;release_number&gt;.i686.rpm</td>
</tr>
</tbody>
</table>
Chapter 1  Functional overview

This chapter provides a functional overview when FileMaker Server 12 is used under EXPRESSCLUSTER.

The following figures show FileMaker Server operation in an EXPRESSCLUSTER environment. A client connects to server A by using a floating IP address that is assigned by EXPRESSCLUSTER.

If a failure has occurred on server A such that a failover has been performed, the FileMaker Server service starts up on server B and the database data is also switched to server B. A client who had been accessing server A will instead be connected to server B. The floating IP address moves to server B when a failover is performed, so a client can connect to the same IP address without having to be aware of the server switchover.

Figure 1-1. Overview of a shared disk type cluster
This configuration guide assumes that, for a shared disk configuration, the database files are placed in the switchable partition on the shared disk. For a mirror disk configuration, the database files are assumed to be placed in the data partition on the mirrored disks. Note that a partition used for data switchover between the servers in a shared disk configuration is referred to as the switchable partition, and the partition in which the mirrored data is stored in a mirror disk configuration is referred to as the data partition.

For details on the cluster configuration procedures, refer to "Chapter 4 Setup Procedures".
## Chapter 2 Operating Environment

The description in this configuration guide has been verified in the following environments.

<table>
<thead>
<tr>
<th>OS</th>
<th>Microsoft Windows Server 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Microsoft Windows Server 2008 R2</td>
</tr>
<tr>
<td>EXPRESSCLUSTER</td>
<td>EXPRESSCLUSTER X 3.1 for Windows</td>
</tr>
<tr>
<td>FileMaker</td>
<td>FileMaker Server 12</td>
</tr>
<tr>
<td></td>
<td>FileMaker Server 12 Advanced</td>
</tr>
</tbody>
</table>
Chapter 3 Notes

This chapter describes the cautions to be observed when clustering is applied to FileMaker Server using EXPRESSCLUSTER.

• When setting a firewall on a server, Configure to be able to access the port number by using EXPRESSCLUSTER:
  
  For details about the port numbers by using EXPRESSCLUSTER, refer to below.
  – EXPRESSCLUSTER X 3.1 for Windows Getting Started Guide
    Chapter 5 Notes and Restrictions
    >> Before installing EXPRESSCLUSTER
    >> Communication port number

• Direct-attached storage must be used to handle FileMaker database files and backups.

• Specify only one additional database folder for database files. Additional database folder to be placed in switchable partitions or data partitions. Default folder is not placed in switchable partitions or data partitions.

• To use the progressive backup linkage function, you must not use the character string which contains “ing”, “error”, “closed” regardless of a capital letter and a small letter for a database file name.
  ex. Error_LIST.fms12,ERROR_LIST.fms12,error_LIST.fms12
Chapter 4 Setup Procedures

This chapter describes the procedures for setting up clusters having the given configurations.

Figure 4-1 Shared disk type cluster configuration

Figure 4-2 Mirror disk type cluster configuration
Chapter 4 Setup Procedures

The following describes Example of cluster configuration

**Example of cluster configuration**

<table>
<thead>
<tr>
<th>Target</th>
<th>Parameter</th>
<th>Value (For shared disk)</th>
<th>Value (For mirror disk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster configuration</td>
<td>Cluster name</td>
<td>cluster</td>
<td>cluster</td>
</tr>
<tr>
<td></td>
<td>Number of servers</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Number of failover groups</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Number of failover resources</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Number of kernel mode LAN hertbeats</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Heartbeat resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First server Information</td>
<td>Server name</td>
<td>server01</td>
<td>server01</td>
</tr>
<tr>
<td></td>
<td>Interconnect IP address</td>
<td>10.0.0.1</td>
<td>10.0.0.1</td>
</tr>
<tr>
<td></td>
<td>Public IP address</td>
<td>192.168.0.1</td>
<td>192.168.0.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second server Information</td>
<td>Server name</td>
<td>server02</td>
<td>server02</td>
</tr>
<tr>
<td></td>
<td>Interconnect IP address</td>
<td>10.0.0.2</td>
<td>10.0.0.2</td>
</tr>
<tr>
<td></td>
<td>Public IP address</td>
<td>192.168.0.2</td>
<td>192.168.0.2</td>
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<tr>
<td>First NP resolution resource</td>
<td>Type</td>
<td>Ping</td>
<td>Ping</td>
</tr>
<tr>
<td></td>
<td>Ping target</td>
<td>192.168.0.100</td>
<td>192.168.0.100</td>
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<tr>
<td></td>
<td>server01</td>
<td>Use</td>
<td>Use</td>
</tr>
<tr>
<td></td>
<td>server02</td>
<td>Use</td>
<td>Use</td>
</tr>
<tr>
<td>Second NP resolution resource</td>
<td>Type</td>
<td>DISK</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ping target</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>server01</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>server02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failover group</td>
<td>Type</td>
<td>failover</td>
<td>failover</td>
</tr>
<tr>
<td></td>
<td>Group name</td>
<td>failover01</td>
<td>failover01</td>
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<tr>
<td></td>
<td>Startup server</td>
<td>All Servers</td>
<td>All Servers</td>
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<tr>
<td></td>
<td>Number of group resources</td>
<td>6</td>
<td>6</td>
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<tr>
<td>First group resources</td>
<td>Type</td>
<td>floating IP</td>
<td>floating IP</td>
</tr>
<tr>
<td></td>
<td>Group resource name</td>
<td>fip</td>
<td>Fip</td>
</tr>
<tr>
<td></td>
<td>IP address</td>
<td>192.168.0.10</td>
<td>192.168.0.10</td>
</tr>
<tr>
<td>Second group resources</td>
<td>Type</td>
<td>disk resource sd</td>
<td>Mirror disk resource Md</td>
</tr>
<tr>
<td></td>
<td>Group resource name</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disk resource drive letter</td>
<td>F:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mirror disk resource cluster partition drive letter</td>
<td>-</td>
<td>E:</td>
</tr>
<tr>
<td>Group Resources</td>
<td>Type</td>
<td>Service Resource</td>
<td>Service name</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------</td>
<td>------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Third group</td>
<td>Service Resource</td>
<td>service_fmserver</td>
<td>FileMaker Server</td>
</tr>
<tr>
<td>Forth group</td>
<td>Script Resource</td>
<td>script_dbclose</td>
<td>script_dbclose</td>
</tr>
<tr>
<td>Fifth group</td>
<td>Script Resource</td>
<td>script_dbbackup1</td>
<td>script_dbbackup1</td>
</tr>
<tr>
<td>Sixth group</td>
<td>Script Resource</td>
<td>script_dbbackup2</td>
<td>script_dbbackup2</td>
</tr>
<tr>
<td>First Monitor</td>
<td>NIC Link Up/Down</td>
<td>miiw1</td>
<td>miiw1</td>
</tr>
<tr>
<td>Second Monitor</td>
<td>NIC Link Up/Down</td>
<td>miiw2</td>
<td>miiw2</td>
</tr>
<tr>
<td></td>
<td>process name monitor</td>
<td>psw_fmserver</td>
<td>fmsib.exe</td>
</tr>
<tr>
<td>Third Monitor</td>
<td>process name monitor</td>
<td>psw_fmserver</td>
<td>fmsib.exe</td>
</tr>
<tr>
<td>Forth Monitor</td>
<td>process name monitor</td>
<td>psw_fmsib</td>
<td>fmsib.exe</td>
</tr>
<tr>
<td>Fifth Monitor</td>
<td>Service monitor</td>
<td>servicew1</td>
<td>service_fmserver</td>
</tr>
<tr>
<td>(Automatically</td>
<td>Service monitor</td>
<td>service_fmserver</td>
<td>service_fmserver</td>
</tr>
<tr>
<td>created after</td>
<td>Floating IP monitor</td>
<td>fipw1</td>
<td>fipw1</td>
</tr>
<tr>
<td>creation of</td>
<td>Floating IP monitor</td>
<td>fipw1</td>
<td>fipw1</td>
</tr>
<tr>
<td>Service resource</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Chapter 4 Setup Procedures

#### FileMaker Server 12 Clustering System Configuration Guide

<table>
<thead>
<tr>
<th>(Automatically created after creation of floating IP resource)</th>
<th>name</th>
<th>Target resource</th>
<th>Recovery target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seventh monitor resources (Automatically created after creation of disk resource)</td>
<td>Type</td>
<td>Disk TUR monitor</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Monitor resource name</td>
<td>sdw1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Disk resource</td>
<td>sd</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Recovery target</td>
<td>sd</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Final Action</td>
<td>None</td>
<td>-</td>
</tr>
</tbody>
</table>

| Eighth monitor resources (Automatically created after creation of mirror disk resource) | Type | - | mirror connect monitoring |
| | Monitor resource name | - | mdnw1 |
| | Mirror disk resource | - | md |
| | Recovery target | - | md |
| | Final Action | - | None |

| Ninth monitor resources (Automatically created after creation of mirror disk resource) | Type | - | Mirror disk monitor |
| | Monitor resource name | - | mdw1 |
| | Mirror disk resource | - | Md |
| | Recovery target | - | Md |
| | Final Action | - | None |

The following describes Example of FileMaker Server configuration
Specify only one additional database folder for database files. Additional database folder to be placed in switchable partitions or data partitions. Default folder is not placed in switchable partitions or data partitions.

#### Example of FileMaker Server configuration

| Installation path | C:¥Program Files¥FileMaker¥FileMaker Server |
| additional database folders | F:¥FileMakerDB |
| progressive backup folder, | F:¥FileMakerPB |

Configure a cluster like that shown above by following the procedure below.

4-1. Configuring the system
4-2. Configuring EXPRESSCLUSTER

## 4-1. Configuring the system

Before installing EXPRESSCLUSTER, perform the following procedure.

Select either a shared disk system or mirror disk system. Also, determine the hardware configuration, and set up the hardware as well as the network.

For details about how to determine a system configuration, refer to “Chapter 1  Determining a system configuration” of the EXPRESSCLUSTER “Installation and Configuration Guide”.
4-2. Configuring EXPRESSCLUSTER

Install EXPRESSCLUSTER, and set up a cluster having a shared disk configuration or mirror disk configuration.

For this configuration, create the resources required to build the cluster, such as setting up a cluster and creating a failover group. Next, install FileMaker Server. Finally, set up individual group resources and monitor the resources. This procedure allows you to organize all the resources required to sustain the application into a failover group and perform failover on an application basis.

This description assumes that EXPRESSCLUSTER has already been installed. For how to install EXPRESSCLUSTER, refer to “Chapter 3 Installing EXPRESSCLUSTER” of the “Installation and Configuration Guide”.

Configure EXPRESSCLUSTER by following the procedure below.

4-2-1. Create a cluster
Configure the servers and networks according to the cluster configuration.

4-2-2. Create a failover group
Create a failover group.

4-2-3. Add group resources (1)
Configure the following group resources:
- Disk resources (shared disk resources and mirror disk resources)
- Floating IP resources

4-2-4. Add monitor resources (1)
Configure the following monitor resources:
- NIC Link Up/Down monitor resource (for public LAN)
- NIC Link Up/Down monitor resource (for interconnect LAN)

4-2-5. Install FileMaker Server
Install FileMaker Server on each server.

4-2-6. Add group resources (2)
Configure the following group resources:
- Service resources
- Script resources

4-2-7. Add monitor resources (2)
Configure the following monitor resources:
- Process name monitor resources

4-2-1. Create a cluster

This section describes how to create a cluster using EXPRESSCLUSTER Builder (hereinafter referred to as Builder).
* Builder represents Config Mode of EXPRESSCLUSTER WebManager (hereinafter referred to as WebManager).
1. Start WebManager by entering the following address from the browser.
http://<Host name or IP address of the host>:29003/

2. Switch to **Config Mode** (Builder), select **New** from **File**, and then click **Cluster Generation Wizard**.

3. Enter the cluster name in the **Cluster Name** box.

4. The Server Definition window is displayed. The server *(server01)* for which the IP address was specified as the URL when starting up the WebManager is registered in the list. To add a server to the cluster, click **Add**.
5. The **Add Server** dialog box is displayed. Enter the server name, FQDN name, or IP address of the second server, and then click **OK**.

```
Add Server

Server Name or IP Address:

Description
Enter an IP address or a server name.
When entering a server name, name resolution is necessary.
Both IPv4 and IPv6 for IP address can be used.
When entering an IP address, the server name is automatically acquired.
```

6. The second server (server02) is added to the **Server Definition List**.

**Configuring interconnects**

Configure the network between the servers constituting the cluster. The setting value of an interconnect differs according to the cluster configuration. Example settings are shown below for both **Shared disk type cluster** and **Mirror disk type cluster**.
Shared disk type cluster

7. Configure the interconnects for a shared disk type cluster.

7.1. Click Add, and then set up an interconnect LAN.

7.2. Click Add, and then set up a public LAN. Click Next.

* In the above configuration, two interconnects are prepared by registering the public IP addresses to priority 2.
Mirror disk type cluster

7. Configure the interconnects for a mirror disk type cluster.
   7.1. Click **Add**, and then set up an interconnect LAN.
           Select "mdc1" from the pull-down list of MDC.

           ![Interconnect Configuration](image1)

           7.2. Click **Add**, and then set up a public LAN. Click **Next**.

           ![Public LAN Configuration](image2)

           * In the above configuration, two interconnects are prepared by registering the public IP addresses to priority 2.

Configuring the NP resolution

8.1. Click **Add** in the NP resolution configuration.

           ![NP Resolution Configuration](image3)
8.2 For a mirror disk type cluster, select the Ping method, and then specify “192.168.0.100” in the Ping target field.

8.3 For a shared disk type cluster, select DISK method, and then set the E: drive as the heartbeat partition. Click Next.

Without NP resolution, if a failure occurs on all the network communication channels between the clustered servers, all of the servers will fail over. Also, if no NP resolution is configured for the shared disk configuration, this can lead to data corruption. For details, refer to the "EXPRESSCLUSTER Installation Guide".

To configure an NP resolution resource to be used with the Ping method, a device that is always able to receive and respond to the ping command (a ping device) is required.

If a ping device is available, click Add and set it on the above screen.

4-2-2.Create a failover group

Create and add, to the cluster, a failover group that executes FileMaker Server. If a failure occurs on server01, failover is performed by switching those resources that are required for the execution of application and registered in this failover group, to server02.
1. Click **Add** in the **Group List**.

![Group List](image1)

2. In **Group Definition**, enter the group name (failover01). Click **Next**.

![Group Definition](image2)

3. In **Servers that can run the Group**, set the servers on which the failover group can be started.

   - Make sure that **Failover is possible for all servers** is selected.
   - Click **Next**.

![Servers that can run the Group](image3)
4. Specify each attribute value of the failover group. Because all the default values are used for the setup example in this chapter, click Next. The Group Resource List is displayed.

4-2-3. Adding group resources (1)
Configure the following group resources:
- disk resource / mirror disk resource
- floating IP resource

Adding a disk resource or mirror disk resource
Add a disk resource or mirror disk resource as a group resource.
By storing the data required by the application in either a switchable or data partition, this data can be automatically inherited upon failover, failover group migration, or the like.
A partition that is used for data switchover between the servers in a shared disk configuration is referred to as a switchable partition while a partition in which the mirrored data is stored in a mirror disk configuration is referred to as the data partition.

The group resource to be created differs depending on the cluster configuration. Example settings are shown below for both Shared disk type cluster and Mirror disk type cluster.
- Add a disk resource for a shared disk type cluster.
- Add a mirror disk resource for a mirror disk type cluster.

Shared disk type cluster
Add a shared disk as a group resource.
For details, refer to “Understanding disk resources” of the “Reference Guide”. 
1. Click **Add** in **Group Resource List**.

2. The Resource Definition of Group(failover01) dialog box is displayed. In the Resource Definition of Group(failover01) dialog box, select the group resource type disk resource in the Type box, and enter the group resource name sd in the Name box. Click Next.

3. The **Dependent Resources** page is displayed. Specify nothing. Click Next.
4. The **Recovery Operation at Activation Failure Detection** and **Recovery Operation at Deactivation Failure Detection** pages are displayed. Click **Next**.

5. Select **server01** in the **Servers that can run the Group**. Click **Add**.

6. The **Selection of partition** dialog box is displayed. Select the partition **F**: Click **OK**.
7. Similarly, add server2 to Servers that can run the Group, and click Finish.
8. The disk resource is added to **Group Resource List**.

Mirror disk type cluster
Add a mirror disk as a group resource.
For details, refer to “Understanding mirror disk resources” of the “Reference Guide”.

1. Click Add in **Group Resource List**.
2. The **Resource Definition of Group(failover01)** dialog box is displayed. In the **Resource Definition of Group(failover01)** dialog box, select the group resource type **mirror disk resource** in the **Type** box, and enter the group resource name md1 in the **Name** box. Click **Next**.

3. The **Dependent Resources** page is displayed. Specify nothing. Click **Next**.

4. The **Recovery Operation at Activation Failure Detection** and **Recovery Operation at Deactivation Failure Detection** pages are displayed. Click **Next**.
5. Select server01 in the Servers that can run the Group. Click Add.

6. The Selection of partition dialog box is displayed. In the Selection of Partition dialog box, click Connect, and then, select a data partition F: and cluster partition E:. Click OK.
7. Similarly, add server2 to Servers that can run the Group, and click Finish.
8. The mirror disk resource is added to **Group Resource List**.

Add a group resource (floating IP resource)
Add a floating IP resource to be used for connecting the clients to a cluster server.
By using the floating IP resource, clients need not be aware of the switching of the access destination server even when EXPRESSCLUSTER executes a failover or group migration.
For details, refer to “Understanding floating IP resources” of the “Reference Guide”.

1. Click **Add** in the **Group Resource List**.
2. The **Resource Definition of Group(failover01)** dialog box is displayed. In the **Resource Definition of Group(failover01)** dialog box, select the group resource type *floating ip resource* in the **Type** box, and enter the group resource name fip1 in the **Name** box. Click **Next**.

3. The **Dependent Resources** page is displayed. Specify nothing. Click **Next**.

4. The **Recovery Operation at Activation Failure Detection** and **Recovery Operation at Deactivation Failure Detection** pages are displayed. Click **Next**.
5. Enter IP address (192.168.0.10) to **IP Address** box. Click **Finish**.

6. The floating IP resource is added to **Group Resource List**. Click **Finish**.

Click **Next** to proceed to the monitor resource setting screen.
4-2-4. Adding a monitor resource (NIC Link Up/Down monitor)

Add a monitor resource that monitors a specified target to the cluster.

Configure the following monitor resources:
- NIC Link Up/Down monitor resource (for public LAN)
- NIC Link Up/Down monitor resource (for interconnect LAN)

Add monitor resources that obtain information defining how the specified NIC is linked and monitor whether the linkage is up or down. By monitoring the NIC link status, failover or other recovery action is performed automatically if the link goes down. By means of this configuration procedure, create an NIC Link Up/Down monitor resource for both the public LAN and interconnect LAN.

Adding an NIC Link Up/Down monitor resource (public LAN)

Add an NIC Link Up/Down monitor resource for the public LAN. For details, refer to “Understanding NIC Link Up/Down monitor resources” of the “Reference Guide”.

1. Click Add in the Monitor Resource List dialog box.

2. Select the monitor resource type NIC Link Up/Down monitor in the Type box, and enter the monitor resource name miiw1 in the Name box. Click Next.
3. Enter the monitor settings. Select **Always** in the **Monitor Timing box**. Click **Next**.

4. For **Individually Set Up Servers**, select "server01" and then click **Add**.

5. For **IP Address Settings**, enter "192.168.0.1".
6. "server01" has been set. Next, select "server02" and then click Add.

7. For IP Address Settings, enter "192.168.0.2".

8. "server02" has been set. Click Next.
9. On the recovery action screen, select **Executing failover to the recovery target** for Recovery Action. Click **Browse** for Recovery Target.

10. On the Select Recovery Target screen, select “failover01” and then click **OK**.

11. Click **Finish** to end the setting operation.
12. "miiw1" has been added to the Monitor Resources.

**Adding an NIC Link Up/Down monitor resource (interconnect LAN)**

Add an NIC Link Up/Down monitor resource for the interconnect LAN. For details, refer to “Understanding NIC Link Up/Down monitor resources” of the “Reference Guide”.

1. In the **Monitor Resource List**, click **Add**.

2. Select the monitor resource type **NIC Link Up/Down monitor** in the **Type** box, and enter the monitor resource name **miiw2** in the **Name** box. Click **Next**.
3. **Set Always for Monitor Timing**, and then click **Next**.

4. **For Individually Set Up Servers**, select "server01" and then click **Add**.

5. **For IP Address Settings**, enter "10.0.0.1".
6. "server01" has been set. Next, select "server02" and then click **Add**.

7. For **IP Address Settings**, enter "10.0.0.2".

8. "server02" has been set. Click **Next**.
9. On the recovery action screen, select **Execute only the final action** for **Recovery Action**. Click **Browse** for **Recovery Target**.

10. On the **Select Recovery Target** screen, select **All Groups** and then click **OK**.

11. Click **Finish** to end the setting operation.
12. "miw2" has been added to Monitor Resources. Click Finish.

13. Click Yes to complete the cluster configuration.

Apply the settings, and then start the cluster.
For details, refer to “1 Create a cluster” in “Chapter 5 Creating the cluster configuration data” of the EXPRESSCLUSTER “Installation and Configuration Guide”

Select Apply the Configuration File from File to apply the configuration information.
Select **Operation Mode** from **View** to switch to **Operation Mode**.

Select **Start Cluster** from **Service** to start the cluster.

### 4-2-5. Install FileMaker Server

Install FileMaker Server on each server. For details about how to install FileMaker Server, refer to the “FileMaker Server 12 Getting Started Guide”.

After installing FileMaker Server, perform the following configuration operations. In **Operation Mode** of ClusterManager, right-click the failover group (failover01). Click **Move**, and then select the server01 to which to fail over the group.
**4-2. Configuring EXPRESSCLUSTER**

**Creating an additional database folder**
From Admin Console of FileMaker Server, create an additional database folder (database storage folder) in the switchable partition or data partition area.
ex. F:¥FileMakerDB

**Using the progressive backup feature**
FileMaker Server 12 offers a progressive backup feature that periodically backs up the database data.
For details about progressive backup, refer to the “FileMaker Server 12 Getting Started Guide”.

EXPRESSCLUSTER checks the status of the database data when FileMaker Server is started. If the status of the data is abnormal, the backup can be applied by using the progressive backup feature. (This is called the progressive backup linkage function, below.)

To use the progressive backup linkage function, create a progressive backup folder in the switchable partition or data partition area, from Admin Console of FileMaker Server, ex. F:¥FileMakerPB

※ If the progressive backup linkage function is used, you must not use the character string which contains `ing`, `error`, `closed` regardless of a capital letter and a small letter for a database name.

**Setting the startup type of the service**
Starting/stopping of the FileMaker Server service is controlled by EXPRESSCLUSTER.
To prevent the FileMaker Server service from starting automatically at OS startup, set the startup type of the service to **Manual** on each server constituting the cluster.

After move failover group(failover01) to the server02, setting server02 in the same way as above.

**4-2-6. Adding group resources (2)**
Configure the following group resources:
Service resources
Script resources

Using Builder, add the FileMaker Server service as a service resource.
In addition, create scripts for executing the progressive backup linkage function, as well as a script which closes the FileMaker Server databases, and then add these scripts as script resources.

The group resources to be created are as follows:
The group resource names in parentheses ( ) are set in EXPRESSCLUSTER.
1. Service resource (service_fmserver)
   Starts/stops the FileMaker Server service.
2. Script resource (script_backup1)
   Backs up the progressive backup data when the failover group is started.
3. Script resource (script_backup2)
   Checks the database status when the failover group is started and, upon the detection of an error, applies the backup using the progressive backup feature.
4. Script resource (script_dbclose)
   Closes the FileMaker Server databases when the failover group is stopped.

If the progressive backup linkage function is not used, there is no need to add the related script resources (script_backup1/ script_backup2).
The steps performed when the failover group is started/stopped are shown below.

**Steps performed when the failover group is started**
1. Script resource (script_backup1)
   Backs up the progressive backup data.
2. Service resource (service_fmserver)
   Starts the FileMaker Server service.
3. Script resource (script_backup2)
   Checks the database status and, upon the detection of an error, applies progressive backup.

**Steps performed when the failover group is stopped**
1. Script resource (script_dbclose)
   Closes the FileMaker Server databases.
2. Service resource (service_fmserver)
   Stops the FileMaker Server service.

The dependencies between the group resources must be set in the following order:
1. Script resource (backs up the progressive backup data)
2. Service resource (starts/stops FileMaker Server)
3. Script resource (applies the progressive backup)
4. Script resource (closes the databases)
By following the procedure below, first add the individual group resources, and then set the dependencies.

**Adding a service resource**
Add the FileMaker Server service as a service resource.
For details, refer to "Understanding service resources" of the "Reference Guide".

1. In Config Mode of WebManager, right-click the failover group (failover01) in the list, and then click Add Resource.
2. The **Resource Definition of Group(failover01)** dialog box is displayed. Select the group resource type **service resource** in the **Type** box, and enter the group resource name `service_fmserver1` in the **Name** box. Click **Next**.

3. The **Dependent Resources** page is displayed. Specify nothing. Click **Next**.

4. The **Recovery Operation at Activation Failure Detection** and **Recovery Operation at Deactivation Failure Detection** pages are displayed. Click **Next**.
5. In Service Name, click Connect.


7. Click OK.
8. The service resource is added to **Group Resource List**.

Adding a script resource (script for closing the databases)
Create a script to close the FileMaker Server databases when the failover group is stopped, and then add this script as a script resource.
For details about script resources, refer to “Understanding script resources” of the “Reference Guide”.

1. In **Config Mode** of WebManager, right-click the failover group (failover01) in the list, and then click **Add Resource**.

2. The **Resource Definition of Group(failover01)** dialog box is displayed. In the **Resource Definition of Group(failover01)** dialog box, select the group resource type **script resource** in the **Type** box, and enter the group resource name **script_dbclose** in the **Name** box. Click **Next**.
3. The **Dependent Resources** page is displayed. Specify nothing. Click **Next**.

4. The **Recovery Operation at Activation Failure Detection** and **Recovery Operation at Deactivation Failure Detection** pages are displayed. Click **Next**.

5. In the **Scripts** list, select stop.bat and then click **Edit**. Edit stop.bat. Refer to "Appendix Sample scripts" to determine how to edit the sample script. Note that there is no need to edit start.bat.
6. Click **Finish**.
The script resource is added to **Group Resource List**.

![Image of Group Resource List](image)

**Adding script resources (scripts for progressive backup linkage)**
Create a script that checks the status of the database data at the startup of FileMaker Server and applies the backup in collaboration with the progressive backup feature in the event of an error, and then add this script as a script resource.
For details, refer to "Understanding script resources" in the "Reference Guide". If the progressive backup linkage function is not used, this script is not required.

Create the following two script resources:
- **script_dbbackup1**
  Backs up the progressive backup data.
- **script_dbbackup2**
  Checks the status of the database data, and then applies the backup if an error is found.
  This script calls the PowerShell script, which performs the database status check and applies the backup if an error is found.
  For details about the PowerShell script, refer to "Chapter 6 Scripts for linkage".

1. In **Config Mode of WebManager**, right-click the failover group (failover01) in the list, and then click **Add Resource**.

![Image of Add Resource](image)
2. The Resource Definition of Group(failover01) dialog box is displayed. Select the group resource type script resource in the Type box, and enter the group resource name script_backup1 in the Name box. Click Next.

3. The Dependent Resources page is displayed. Specify nothing. Click Next.

4. The Recovery Operation at Activation Failure Detection and Recovery Operation at Deactivation Failure Detection pages are displayed. Click Next.
5. In the Scripts list, select start.bat and then click Edit.
   Edit start.bat. Refer to "Appendix Sample scripts" to determine how to edit the
   sample script. Note that there is no need to edit stop.bat.

6. Click Finish.
   The script resource is added to Group Resource List.

   In the same way as above, add the script_backup2 script resource.
   After edit start.bat, add PowerShell script "FMbackupcheck.ps1" "FMconffile.ps1".
   Refer to "Appendix Sample scripts" to determine how to edit the sample script.

**Setting the dependencies**
Set the dependencies between the group resources in the following order.
1. script rezource (script_backup1)
2. sercive resource (service_fmserver)
3. script resource (script_backup2)
4. script resource (script_dbclose)

The dependencies are as follows.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Name</th>
<th>Dependent resource name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>fip</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>sd</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>script_backup1</td>
<td>---</td>
<td>*</td>
</tr>
<tr>
<td>2</td>
<td>service_fmserver</td>
<td>script_backup1</td>
<td>Script resource</td>
</tr>
<tr>
<td>3</td>
<td>script_backup2</td>
<td>service_fmserver</td>
<td>Service resource</td>
</tr>
<tr>
<td>4</td>
<td>script_dbclose</td>
<td>script_backup2</td>
<td>Script resource</td>
</tr>
</tbody>
</table>

* For script_backup1, the information set according to **Follow the default dependency** is displayed.

If the progressive backup linkage function is not used, set the dependency only for the script_dbclose script resource.

Specify the dependency for the service resource.
Right-click the service resource (service_fmserver), and then select **Property**.

In the **Resource Properties** dialog box, select the **Dependency** tab. Clear **Follow the default dependency**, and then add the script resource that will back up the progressive backup data (script_backup1) as a dependent resource.

Specify the dependency for the script_backup2 script resource.
Right-click the script resource (script_backup2), and then select **Property**.
In the Resource Properties dialog box, select the Dependency tab. Clear Follow the default dependency, and then add the FileMaker Server service resource (service_fmserver) as a dependent resource.

Specify the dependency for the script_dbclose script resource. Right-click the script resource (script_backup2), and then select Property.
In the **Resource Properties** dialog box, select the **Dependency** tab. Clear **Follow the default dependency**, and then add the script resource that applies the backup (script_dbbbackup2) as a dependent resource. If the progressive backup linkage function is not used, add the FileMaker Server service resource (service_fmserver) as an additional dependent resource.

In the **Entire Dependency** tab, check the dependencies between the registered resources.

### 4-2-7. Adding monitor resources (2)

Configure the following type of monitor resource.

- **Process name monitor resource**

**Adding a process name monitor resource**

In EXPRESSCLUSTER, configure monitoring for the following processes that are used for the FileMaker Server service. By monitoring these processes, a failover or some other recovery action can be performed automatically if a process stops.

For details about process name monitor, refer to “Understanding process name monitor resources” of the “Reference Guide”.

- `fmserver.exe`: Process for database management
- `fmsib.exe`: Process for backup
1. Select **Config Mode** in WebMnager. Right-click **Monitor** in the list and then click **Add Monitor Resource**.

2. The **Monitor Resource Definition** screen opens. Select the monitor resource type (process name monitor) in the **Type** box, and then enter the monitor resource name (psw_fmserver) in the **Name** box. Click **Next**.

3. The **Monitor Settings** page is displayed. Select **Active** for **Monitor Timing**, and then click **Browse** for **Target Resource**.
4. On the **Target Resource** screen, select "script_backup2" and then click **OK**.
If the progressive backup linkage function is not being used, select "service_fmserver".

```
4. On the Target Resource screen, select "script_backup2" and then click OK.
If the progressive backup linkage function is not being used, select "service_fmserver".
```

5. Specify "fmserver.exe" for **Process Name**.
   For **Process Name**, specify the process name of the process that is actually running.
   For details about how to confirm the process name, refer to “Understanding process name monitor resources” of the “Reference Guide”.

```
5. Specify "fmserver.exe" for Process Name.
   For Process Name, specify the process name of the process that is actually running.
   For details about how to confirm the process name, refer to “Understanding process name monitor resources” of the “Reference Guide”.
```
6. On the Recovery Action screen, click **Browse** for **Recovery Target**.

7. On the **Select Recovery Target** screen, select "failover01" and then click **OK**.
8. "Process name monitor" has been added to Monitor Resources. In the same way as above, add a process name monitor resource for fmsib.exe.

Apply the configuration information, and then start the cluster. The cluster with the following configuration will be created.
Chapter 5 Command reference

This chapter describes the command that FileMaker Server uses. For details, refer to “Command line reference” of the “FileMaker Server 12 FileMaker Server Help”.

Command line: fmsadmin command [options]
Description: This command manages FileMaker Server by specifying an option.

Execution example:
For a user name and password, admin and pword are specified, respectively.

Close all hosted databases.
fsadmin close -f -y -u admin -p pword

Stop a database.
fsadmin stop server -y -u admin -p pword

Displays a list of hosted files.
fsadmin list files -s -y -u admin -p pword

Opens all databases in the host area.
fsadmin open -y -u admin -p pword
Chapter 6 Scripts for linkage

This chapter describes the scripts used for linkage between the FileMaker Server progressive backup feature and EXPRESSCLUSTER. PowerShell scripts are used as scripts for linkage. To execute these scripts for linkage, first change the Windows PowerShell script execution policy to RemoteSigned by using the Set-ExecutionPolicy cmdlet. After making the change, check that RemoteSigned has been set by using the Get-ExecutionPolicy cmdlet.

The following sample scripts for linkage are provided:

- FM_conf.ps1 Configuration file containing parameters, including the progressive backup storage folder
- FMbackupcheck.ps1 Script that checks the status of the database data and which applies the backup

Store these scripts on each server according to the script set by the script_dbbackup2 script resource used to apply the backup.

For the script sample to be edited, refer to “Appendix Sample Scripts”.

The FMbackupcheck.ps1 processing flow is as follows:

1. The number of progressive backups is checked. (Progressive backups are stored in Incrementalbackup_yyyymm-dd-hhmm format.)
2. If no progressive backup has been created, the script ends without a backup having been applied. Also, if only one progressive backup has been created, the acquisition of that backup may not yet have been completed, so the script ends without the backup having been applied.
3. If two or more progressive backups have been created, the file name of the second newest file is obtained. (The newest file may currently be being used for backup creation. If backup application is required, the second newest file is used to apply that backup.)
4. Database status check is performed by using the fmsadmin -LIST FILES command of FileMaker Server. Loops are used to enable waiting until all the databases have been opened.
5. Database verification is performed by using the fmsadmin VERIFY command of FileMaker Server. If a file in the closed state is found while checking the database status, the database is judged as being abnormal and is subject to backup application.
6. Before the backup is applied, all the databases are closed by using the fmsadmin CLOSE command of FileMaker Server.
7. The backup is applied. (The current database is backed up, and is replaced with the progressive backup file.)
8. The fmsadmin OPEN command of FileMaker Server is used to open all databases.
Appendix. Sample scripts

This appendix describes the files that are set for the following scripts.

The following sample scripts are used for establishing linkage between FileMaker Server and EXPRESSCLUSTER:

- FMconffile.ps1  Configuration file containing parameters, including the progressive backup storage folder
- FMbackupcheck.ps1  Script that checks the status of the database data and which applies the backup

The following sample scripts are specified as script resources for EXPRESSCLUSTER:

- start_backup1_sample.bat  Sample script that backs up progressive backup data. Set as a script resource (script_backup1).
- start_backup2_sample.bat  Sample script that checks the status of the database data and which applies the backup. Set as a script resource (script_backup2).
  (Sample script that calls FMbackupcheck.ps1.)
- stop_dbclose_sample.bat  Sample script that closes the databases. Set as a script resource (script_dbclose).
**FMconffile.ps1**

Configuration file containing parameters, including the progressive backup storage folder. Modify the shaded portions according to your environment. Create files and folders as well.

```powershell
#********************************************************
#* FMconffile.ps1                                     *
#*                                                      *
#* title : FMconffile                                   *
#* date : 2013/09/02                                    *
#* version : 11.1.3-1                                   *
#********************************************************

#Configuration file
#set drive and folder name

$DBDrive = "F:"
$DBFOLDER = "FileMakerDB"
$DBBAKFOLDER = "FileMakerDBTMP"

$DBBAKPATH = "$DBDrive\$DBBAKFOLDER"
$DBPATH = "$DBDrive\$DBFOLDER"

#progressive backup temp folder
#PBBAKPATH1 :progressive backup temp folder
#PBBAKPATH2 :'progressive backup temp folder' temp folder
$PBBAKPATH1 = "F:\FileMakerPBTMP"
$PBBAKPATH2 = "F:\FileMakerPBTMP2"

#file to check database state
$checklogfile = "C:\Program Files\EXPRESSCLUSTER\log\FMCheckLog.txt"

#FileMaker Server Installation path
$FMS_Path = "C:\Program Files\FileMaker\FileMaker Server\Database Server"

#logfile
$FMbackupcheck_log = "C:\Program Files\EXPRESSCLUSTER\log\FMbackupcheck.log"

#wait and loop time to be until all the databases have been opened.
$waitsec = 5
$waitcount = 10

#FileMaker Server ID/PASS
$ID_FM = "XXXXXX"
$PASS_FM = "XXXXXX"
```
FMbackupcheck.ps1
Script that checks the status of the database data and which applies the backup.
Modify the shaded portions according to your environment.

```powershell
#********************************************************
#* FMbackupcheck.ps1                                    *
#*                                                      *
#* title : FMbackupcheck.ps1                            *
#* date : 2013/09/02                                    *
#* version : 11.1.3-1                                   *
#********************************************************
#applies the backup script
#call configuration file
.
FMconffile.ps1

echo "-----------------------------------" >> $FMbackupcheck_log
(Get-Date).ToString("yyyyMMddhhmmss") >> $FMbackupcheck_log
get-process -name fmserver >> $FMbackupcheck_log
echo "backupcheck start" >> $FMbackupcheck_log

#check the number of progressive backup
$BackupFoldername=Get-ChildItem $PBBAKPATH1 | Where-Object {$_._Attributes -eq "Directory"} | Sort-Object name | select-string Incrementalbackup_[0-9]

#no progressive backup :no action
if( $BackupFoldername -eq $null ){
    echo "$((Get-Date).ToString("yyyyMMddhhmmss")) no backup" >> $FMbackupcheck_log
    Remove-Item $PBBAKPATH1* -Force -Recurse
    exit 0
}

$FolderCount=(GetBackupFoldername | Measure-Object).count
echo "FolderCount=$FolderCount" >> $FMbackupcheck_log
echo "$((Get-Date).ToString("yyyyMMddhhmmss")) check PB count" >> $FMbackupcheck_log

#one progressive backup :no action
#two or more progressive backup :check database state
if( $FolderCount -eq 1 ){
    echo "$((Get-Date).ToString("yyyyMMddhhmmss")) one backup" >> $FMbackupcheck_log
    Remove-Item $PBBAKPATH1** -Force -Recurse
    exit 0
}
elseif( $FolderCount -ge 2 ){
    echo "$((Get-Date).ToString("yyyyMMddhhmmss")) backup start" >> $FMbackupcheck_log

#check closed database
$FMwait=0
while (1)
{
    $FMwait++
    echo "$((Get-Date).ToString("yyyyMMddhhmmss")) check DB ing" >> $FMbackupcheck_log
```
. $FMS_Path\fmsadmin.exe LIST FILES -s -yu $ID_FM -p $PASS_FM > $checklogfile
echo "$. $FMS_Path\fmsadmin.exe LIST FILES -s -yu $ID_FM -p $PASS_FM" >> $FMbackupcheck_log

Get-Content $checklogfile >> $FMbackupcheck_log

$testlog = Select-String $checklogfile
$testlog2 = Select-String Error $checklogfile
if($testlog -eq $null -and $testlog2 -eq $null)
    echo "FMwait = $FMwait" >> $FMbackupcheck_log
    echo "$(Get-Date).ToString("yyyyMMddhhmmss")" no ings or Errors" >> $FMbackupcheck_log
break

} echo "sleep FMwait = $FMwait" >> $FMbackupcheck_log
sleep $waitsec

if($FMwait -eq $waitcount)
    echo "DB_OPEN_FAIL" >> $FMbackupcheck_log
    Move-Item $PBBAKPATH1\* $PBBAKPATH2 >> $FMbackupcheck_log
    exit 1
}

} echo "before check closed FMwait = $FMwait" >> $FMbackupcheck_log

#verify database
$. $FMS_Path\fmsadmin.exe VERIFY -s -yu $ID_FM -p $PASS_FM
echo "$. $FMS_Path\fmsadmin.exe VERIFY -s -yu $ID_FM -p $PASS_FM" >> $FMbackupcheck_log

$. $FMS_Path\fmsadmin.exe LIST FILES -s -yu $ID_FM -p $PASS_FM > $checklogfile
echo "$. $FMS_Path\fmsadmin.exe LIST FILES -s -yu $ID_FM -p $PASS_FM" >> $FMbackupcheck_log
Get-Content $checklogfile >> $FMbackupcheck_log

#no database closed state :No action
$testlog = Select-String closed $checklogfile
echo "$testlog = $testlog" >> $FMbackupcheck_log
if($testlog -eq $null)
    echo "$(Get-Date).ToString("yyyyMMddhhmmss")" NO closed DB" >> $FMbackupcheck_log
    Remove-Item $PBBAKPATH1\* -Force -Recurse
    exit 0
} else
{
    echo "$(Get-Date).ToString("yyyyMMddhhmmss")" there are closed file(s). start to apply PB backup." >> $FMbackupcheck_log

#close database
$. $FMS_Path\fmsadmin CLOSE -f -yu $ID_FM -p $PASS_FM >> $FMbackupcheck_log

#file name of the second newest file is obtained
$PBFile=$BackupFoldername[-2]
echo $PBBAKPATH1\$PBFile >> $FMbackupcheck_log
Appendix. Sample scripts

```powershell
#apply backup
    echo "$(Get-Date).ToString("yyyyMMddhhmmss")" Change FOLDER >> $FMbackupcheck_log
    $DBHIST=$(Get-Date).ToString("yyyyMMddhhmmss")
    New-Item $DBBAKPATH$DBHIST -ItemType dir -Force >> $FMbackupcheck_log
    Move-Item $DBPATH $DBBAKPATH$DBHIST >> $FMbackupcheck_log

#copy database
    echo "$(Get-Date).ToString("yyyyMMddhhmmss")" Copy FOLDER >> $FMbackupcheck_log
    Copy-Item $PBBAKPATH1$PBFile$DBFOLDER $DBDrive -Recurse >> $FMbackupcheck_log
    Move-Item $PBBAKPATH1$ PBBAKPATH2 >> $FMbackupcheck_log

#open database
    .$FMS_Path\fmsadmin OPEN -yu $ID_FM -p $PASS_FM >> $FMbackupcheck_log
    (Get-Date).ToString("yyyyMMddhhmmss") >> $FMbackupcheck_log
}
echo "END1" >> $FMbackupcheck_log
}
echo "END2" >> $FMbackupcheck_log
exit
```
Sample script that backs up progressive backup data.
Modify the shaded portions according to your environment.

```
rem **************************************************************
rem * start_backup1_sample.bat *
rem * title: start backup1 sample *
rem * date: 2013/09/02 *
rem * version: 11.1.3-1 *
rem **************************************************************

rem **************************************************************
rem Check startup attributes
rem **************************************************************
IF "%CLP_EVENT%" == "START" GOTO NORMAL
IF "%CLP_EVENT%" == "FAILOVER" GOTO FAILOVER
IF "%CLP_EVENT%" == "RECOVER" GOTO RECOVER

rem Cluster Server is not started
GOTO no_arm

rem **************************************************************
rem Startup process
rem **************************************************************
: NORMAL
: FAILOVER

rem set drive and folder name
rem DBDrive : switchable partition/data partition drive
rem PBFOLDER : 'progressive backup' folder
rem PBBAKFOLDER : 'progressive backup' backup folder

set DBDrive=F:
set PBFOLDER=FileMakerPB
set PBBAKFOLDER=FileMakerPBTMP

echo script_backup1_start >> "C:\Program Files\EXPRESSCLUSTER\log\FMcheckbat.log"
dir "%DBDrive%\PBFOLDER\Incremental*" /b /a >> "C:\Program Files\EXPRESSCLUSTER\log\FMcheckbat.log"

rem delete unnecessary files
rmdir "%DBDrive%\PBFOLDER\Changes_FMS" /S /Q
rmdir "%DBDrive%\PBFOLDER\Copies_FMS" /S /Q
rmdir "%DBDrive%\PBFOLDER\InProgress_FMS" /S /Q
rmdir "%DBDrive%\PBFOLDER\Removed_by_FMS" /S /Q

rem backup incremental backup folder
for /F %a in ('dir "%DBDrive%\PBFOLDER\Incremental*" /b /a') do move "%DBDrive%\PBFOLDER\%a" "%DBDrive%\PBBAKFOLDER%"

dir "%DBDrive%\PBBAKFOLDER%" >> "C:\Program Files\EXPRESSCLUSTER\log\FMcheckbat.log"
```
rem recreate progressive backup folder
rmdir "%DBDrive%\PBFOLDER%" /S /Q
mkdir "%DBDrive%\PBFOLDER%"

:RECOVER
rem No Action
GOTO EXIT

rem Cluster Server is not started
:no_arm
ARMBCAST /MSG "Cluster Server is offline" /A

:EXIT
Sample script that calls FMbackupcheck.ps1.
Modify the shaded portions according to your environment.

```batch
rem ***********************************************
rem * start_backup2_sample.bat                *
rem *                                        *
rem * title : start backup2 sample           *
rem * date : 2013/09/02                      *
rem * version : 11.1.3-1                     *
rem ***********************************************

rem ***********************************************
rem Check startup attributes
rem ***********************************************
IF "%CLP_EVENT%' == "START" GOTO NORMAL
IF "%CLP_EVENT%' == "FAILOVER" GOTO FAILOVER
IF "%CLP_EVENT%' == "RECOVER" GOTO RECOVER
rem Cluster Server is not started
GOTO no_arm

rem ***********************************************
rem Startup process
rem ***********************************************
:NORMAL
:FAILOVER
echo script_backup2_start >> "C:\Program Files\EXPRESSCLUSTER\log\FMcheckbat.log"
cd %CLP_SCRIPT_PATH%
rem Calls FMbackupcheck.ps1
powershell -command ".\FMbackupcheck.ps1"
:RECOVER
rem No Action
GOTO EXIT
rem Cluster Server is not started
:no_arm
ARMBCAST /MSG "Cluster Server is offline" /A
:EXIT
```
stop_dbclose_sample.bat
Sample script that closes the databases.
Modify the shaded portions according to your environment.

rem ***************************************
rem * stop_dbclose_sample.bat            *
rem *                                     *
rem * title : stop_dbclose sample         *
rem * date : 2013/09/02                   *
rem * version : 11.1.3-1                  *
rem ***************************************

rem ***************************************
rem Check startup attributes
rem ***************************************
IF "%CLP_EVENT%" == "START" GOTO NORMAL
IF "%CLP_EVENT%" == "FAILOVER" GOTO FAILOVER

rem Cluster Server is not started
GOTO no_arm

rem ***************************************
rem Process for normal quitting program
rem Process for failover
rem ***************************************
:NORMAL
:FAILOVER
echo script_dbclose_stop >> "C:\Program Files\EXPRESSCLUSTER\log\FMcheckbat.log"

rem Close Database
rem Set FileMaker Server installation path, ID/PASS
"C:\Program Files\FileMaker\FileMaker Server\Database Server\fmsadmin.exe" close -f -u ID -p Password -y
GOTO EXIT

rem Cluster Server is not started
:no_arm
ARMBCAST /MSG "Cluster Server is offline" /A

:EXIT