FUJITSU Software
Systemwalker Operation Manager

Cluster Setup Guide for Windows

Windows(R)

Preface

Purpose of This Document

This document presents an overview of installing Systemwalker Operation Manager on cluster systems. It also describes how to perform settings for these systems and how to operate them.

Use this guide for the Windows version of this product.

Intended Readers

This document is intended for users who are installing Systemwalker Operation Manager on any of the following cluster systems, as well as for users administering Systemwalker Operation Manager with cluster systems.

- Microsoft(R) Fail Over Clustering

Readers are assumed to have an overall understanding of cluster system in general and Systemwalker Operation Manager in particular.

Abbreviations and Generic Terms Used

- The term "Windows Server 2012 R2" is used to refer to all of the following products:

    - Microsoft(R) Windows Server(R) 2012 R2 Foundation (x64)

    - Microsoft(R) Windows Server(R) 2012 R2 Standard (x64)

    - Microsoft(R) Windows Server(R) 2012 R2 Datacenter (x64)

- The term "Windows Server 2012" is used to refer to all of the following products:

    - Microsoft(R) Windows Server(R) 2012 Foundation (x64)

    - Microsoft(R) Windows Server(R) 2012 Standard (x64)

    - Microsoft(R) Windows Server(R) 2012 Datacenter (x64)

    - Microsoft(R) Windows Server(R) 2012 R2 Foundation (x64)

    - Microsoft(R) Windows Server(R) 2012 R2 Standard (x64)

    - Microsoft(R) Windows Server(R) 2012 R2 Datacenter (x64)

- The term "Windows Server 2008 R2" is used to refer to all of the following products:

    - Microsoft(R) Windows Server(R) 2008 R2 Foundation

    - Microsoft(R) Windows Server(R) 2008 R2 Standard

    - Microsoft(R) Windows Server(R) 2008 R2 Enterprise

    - Microsoft(R) Windows Server(R) 2008 R2 Datacenter

- The term "Windows Server 2008 Foundation" is used to refer to all of the following products:

    - Microsoft(R) Windows Server(R) 2008 R2 Foundation

    - Microsoft(R) Windows Server(R) 2008 Foundation

- The term "Server Core" is used to refer to all of the following products:

    - Microsoft(R) Windows Server(R) 2012 Standard Server Core

    - Microsoft(R) Windows Server(R) 2012 Datacenter Server Core

    - Microsoft(R) Windows Server(R) 2008 Standard Server Core

    - Microsoft(R) Windows Server(R) 2008 Standard without Hyper-V(TM) Server Core

    - Microsoft(R) Windows Server(R) 2008 Enterprise Server Core

- Microsoft(R) Windows Server(R) 2008 Enterprise without Hyper-V(TM) Server Core

- Microsoft(R) Windows Server(R) 2008 Datacenter Server Core

- Microsoft(R) Windows Server(R) 2008 Datacenter without Hyper-V(TM) Server Core

- The term "Windows Server 2008 STD" is used to refer to all of the following products:

  - Microsoft(R) Windows Server(R) 2008 Standard(x86)/(x64)

  - Microsoft(R) Windows Server(R) 2008 Standard without Hyper-V(TM)

- The term "Windows Server 2008 DTC" is used to refer to all of the following products:

  - Microsoft(R) Windows Server(R) 2008 Datacenter(x86)/(x64)

  - Microsoft(R) Windows Server(R) 2008 Datacenter without Hyper-V(TM)

- The term "Windows Server 2008 EE" is used to refer to all of the following products:

  - Microsoft(R) Windows Server(R) 2008 Enterprise(x86)/(x64)

  - Microsoft(R) Windows Server(R) 2008 Enterprise without Hyper-V(TM)

- The term "Windows Server 2008" is used to refer to all of the following products:

  - Microsoft(R) Windows Server(R) 2008 Standard (x86)/(x64)

  - Microsoft(R) Windows Server(R) 2008 Enterprise (x86)/(x64)

  - Microsoft(R) Windows Server(R) 2008 Datacenter (x86)/(x64)

  - Microsoft(R) Windows Server(R) 2008 Foundation (x64)

  - Microsoft(R) Windows Server(R) 2008 Standard without Hyper-V(TM) (x86)/(x64)

  - Microsoft(R) Windows Server(R) 2008 Enterprise without Hyper-V(TM) (x86)/(x64)

  - Microsoft(R) Windows Server(R) 2008 Datacenter without Hyper-V(TM) (x86)/(x64)

  - Microsoft(R) Windows Server(R) 2008 R2 Foundation (x64)

  - Microsoft(R) Windows Server(R) 2008 R2 Standard (x64)

  - Microsoft(R) Windows Server(R) 2008 R2 Enterprise (x64)

  - Microsoft(R) Windows Server(R) 2008 R2 Datacenter (x64)

- The term "Windows Server 2003 STD" is used to refer to all of the following products:

  - Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition

  - Microsoft(R) Windows Server(R) 2003 R2, Standard Edition

  - Microsoft(R) Windows Server(R) 2003, Standard x64 Edition

  - Microsoft(R) Windows Server(R) 2003, Standard Edition

- The term "Windows Server 2003 DTC" is used to refer to all of the following products:

  - Microsoft(R) Windows Server(R) 2003 R2, Datacenter x64 Edition

  - Microsoft(R) Windows Server(R) 2003 R2, Datacenter Edition

  - Microsoft(R) Windows Server(R) 2003, Datacenter x64 Edition

  - Microsoft(R) Windows Server(R) 2003, Datacenter Edition for Itanium-based Systems

  - Microsoft(R) Windows Server(R) 2003, Datacenter Edition

- The term "Windows Server 2003 EE" is used to refer to all of the following products:

  - Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition

  - Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition

- Microsoft(R) Windows Server(R) 2003, Enterprise x64 Edition

- Microsoft(R) Windows Server(R) 2003, Enterprise Edition for Itanium-based Systems

- Microsoft(R) Windows Server(R) 2003, Enterprise Edition

- The term "Windows(R) 2000" is used to refer to all of the following products:

  - Microsoft(R) Windows(R) 2000 Professional

  - Microsoft(R) Windows(R) 2000 Server

  - Microsoft(R) Windows(R) 2000 Advanced Server

  - Microsoft(R) Windows(R) 2000 Datacenter Server

- The term "Windows NT(R)" is used to refer to all of the following products:

  - Microsoft(R) Windows NT(R) Server network operating system Version 4.0

  - Microsoft(R) Windows NT(R) Workstation operating system Version 4.0

- The term "Windows(R) 8.1" is used to refer to all of the following products:

  - Windows(R) 8.1 (x86)

  - Windows(R) 8.1 Pro (x86)

  - Windows(R) 8.1 Enterprise (x86)

  - Windows(R) 8.1 (x64)

  - Windows(R) 8.1 Pro (x64)

  - Windows(R) 8.1 Enterprise (x64)

- The term "Windows(R) 8" is used to refer to all of the following products:

  - Windows(R) 8 (x86)

  - Windows(R) 8 Pro (x86)

  - Windows(R) 8 Enterprise (x86)

  - Windows(R) 8 (x64)

  - Windows(R) 8 Pro(x64)

  - Windows(R) 8 Enterprise(x64)

  - Windows(R) 8.1 (x86)

  - Windows(R) 8.1 Pro (x86)

  - Windows(R) 8.1 Enterprise (x86)

  - Windows(R) 8.1 (x64)

  - Windows(R) 8.1 Pro (x64)

  - Windows(R) 8.1 Enterprise (x64)

- The term "Windows(R) 7" is used to refer to all of the following products:

  - Windows(R) 7 Home Premium (x86)

  - Windows(R) 7 Professional (x86)

  - Windows(R) 7 Enterprise (x86)

  - Windows(R) 7 Ultimate (x86)

  - Windows(R) 7 Home Premium (x64)

  - Windows(R) 7 Professional (x64)

- Windows(R) 7 Enterprise (x64)

- Windows(R) 7 Ultimate (x64)

- The term "Windows Vista(R)" is used to refer to all of the following products:

    - Windows Vista(R) Home Basic (x86)

    - Windows Vista(R) Home Premium (x86)

    - Windows Vista(R) Business (x86)

    - Windows Vista(R) Enterprise (x86)

    - Windows Vista(R) Ultimate (x86)

    - Windows Vista(R) Home Basic (x64)

    - Windows Vista(R) Home Premium (x64)

    - Windows Vista(R) Business (x64)

    - Windows Vista(R) Enterprise (x64)

    - Windows Vista(R) Ultimate (x64)

- The term "Windows(R) XP" is used to refer to all of the following products:

    - Microsoft(R) Windows(R) XP Professional x64 Edition

    - Microsoft(R) Windows(R) XP Professional

    - Microsoft(R) Windows(R) XP Home Edition

- Microsoft(R) Windows(R) Millennium Edition is abbreviated as "Windows(R) Me".

- Microsoft(R) Windows(R) 98 operating system is abbreviated as "Windows(R) 98".

- Microsoft(R) Windows(R) 2000 Server is abbreviated as "Windows(R) 2000 Server".

- Windows Internet Explorer(R) is abbreviated as "Internet Explorer".

- Versions of Systemwalker Operation Manager that run on all of the following operating systems are referred to as "Windows versions of Systemwalker Operation Manager" or simply "Windows versions":

    - Windows

    - 64-bit versions of Windows, except Itanium

- Articles specific to the version of Systemwalker Operation Manager that runs on 32-bit versions of Windows are referred to as "Windows x86 version".

- Articles specific to the version of Systemwalker Operation Manager that runs on Itanium-compatible versions of Windows are referred to as "Windows for Itanium version".

- Articles specific to the version of Systemwalker Operation Manager that runs on 64-bit versions of Windows, except Itanium, are referred to as "Windows x64 version".

- Windows(R) 2000, Windows Server 2003 STD, Windows Server 2003 DTC, Windows Server 2003 EE, Windows Server 2008, Windows Server 2008 EE, Windows Server 2008 DTC, Windows Server 2008 STD, Windows Server 2008 Foundation, Windows Server 2008 R2, Server Core, Windows Server 2012, and Windows Server 2012 R2 may be abbreviated as "Windows servers".

- Oracle Solaris may be referred to as Solaris, Solaris Operating System or Solaris OS.

- Versions of Systemwalker Operation Manager that run on Solaris are referred to as "Solaris versions of Systemwalker Operation Manager" or simply "Solaris versions".

- Articles specific to the version of Systemwalker Operation Manager that runs on 32-bit versions of Solaris are referred to as "Solaris 32-bit version".

- Articles specific to the version of Systemwalker Operation Manager that runs on 64-bit versions of Solaris are referred to as "Solaris 64-bit version".

- Versions of Systemwalker Operation Manager that run on HP-UX are referred to as "HP-UX versions of Systemwalker Operation Manager" or simply "HP-UX versions".

- Versions of Systemwalker Operation Manager that run on AIX are referred to as "AIX versions of Systemwalker Operation Manager" or simply "AIX versions".

- Versions of Systemwalker Operation Manager that run on the following operating system are referred to as "Linux versions of Systemwalker Operation Manager" or simply "Linux versions":

  - Linux

  - 64-bit versions of Linux, except Itanium

- Articles specific to the version of Systemwalker Operation Manager that runs on 32-bit versions of Linux are referred to as "Linux x86 version".

- Articles specific to the version of Systemwalker Operation Manager that runs on Itanium-compatible version of Linux are referred to as "Linux for Itanium version".

- Articles specific to the version of Systemwalker Operation Manager that runs on 64-bit versions of Linux, except Itanium, are referred to as "Linux x64 version".

- Solaris, HP-UX, AIX, Linux and Linux for Itanium versions of Systemwalker Operation Manager are referred to collectively as "UNIX versions of Systemwalker Operation Manager" or simply "UNIX versions".

- Solaris, HP-UX, AIX and Linux may be referred to as "UNIX servers".

- Systemwalker Operation Manager Standard Edition may be abbreviated as "SE".

- Systemwalker Operation Manager Enterprise Edition may be abbreviated as "EE".

- Standard Edition may be abbreviated as "SE" and Enterprise Edition may be abbreviated as "EE".

- BrightStor(R) ARCserve(R) Backup for Windows is abbreviated as "ARCserve".

- Microsoft(R)-Mail that is provided as a standard feature with Windows NT(R) is abbreviated as "MS-Mail".

Export Restriction

Exportation/release of this document may require necessary procedures in accordance with the regulations of your resident country and/or US export control laws.

Trademarks

APC and PowerChute are trademarks or registered trademarks of American Power Conversion Corporation.

ARCserve is a registered trademark of CA, Inc. or one of its subsidiaries.

HP-UX is a registered trademark of Hewlett-Packard Development Company.

IBM, the IBM logo, AIX, HACMP, and ViaVoice are trademarks or registered trademarks of International Business Machines Corporation in the United States and/or other countries.

Intel and Itanium are trademarks of Intel Corporation in the U.S. and/or other countries.

MC/ServiceGuard is a registered trademark of Hewlett-Packard Company.

Microsoft, Windows, and Windows Server are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

Red Hat, Red Hat Enterprise Linux, the Shadowman logo and JBoss are registered trademarks of Red Hat, Inc. in the U.S. and other countries.

Linux is a registered trademark of Linus Torvalds.

Oracle and Java are registered trademarks of Oracle and/or its affiliates.

R/3 and SAP are registered trademarks of SAP AG in Germany and in several other countries.

Tcl/Tk is free software developed by the University of California, Sun Microsystems, Inc., Scriptics Corporation, and other parties.

UNIX is a registered trademark of The Open Group.

VMware, the VMware logo, and VMotion are registered trademarks or trademarks of VMware, Inc. in the United States and/or other jurisdictions.

Short Mail is a registered trademark of NTT DoCoMo, Inc.

Other names may be trademarks or registered trademarks of their respective owners.

The use of screenshots follows the guidelines of Microsoft Corporation.

May 2015

Contents

Chapter 1 Overview

This chapter describes how Systemwalker Operation Manager servers operate in a cluster system.

1.1 Supported Cluster Systems

Systemwalker Operation Manager can support the following cluster systems:

   - Microsoft(R) Fail Over Clustering

Refer to the *Systemwalker Operation Manager Technical Guide* for details on the version level.

The following figure shows a schematic representation of Systemwalker Operation Manager operations with cluster system.
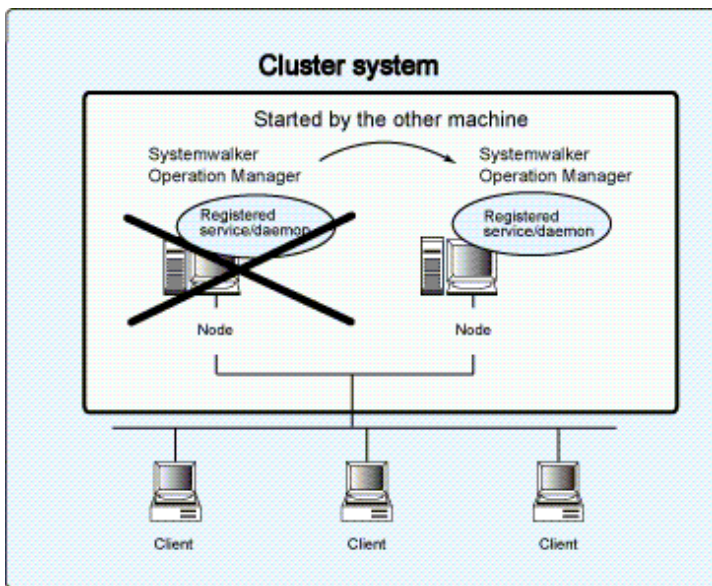
The terminology used to describe nodes and processes in cluster system varies from cluster system to cluster system. The descriptions in this manual use the following terms:

Active node

   This is the node where jobs normally run.

Standby node

   This node is on standby to take over jobs when the active node fails.

Failover

   This refers to the transfer of jobs from the active node to the standby node when errors occur.

Shared disk

   This is the disk that is shared between the active node and the standby node.

Logical IP address

   This is the virtual IP address used by the cluster system and is common to both the active node and the standby node.

Physical IP address

   This is the IP address specific to each node.

However, the terminology of relevant cluster system is also used to describe windows, and in other cases where the use of such terminology makes explanations easier to understand.

Services that can be registered with cluster systems

The following Systemwalker Operation Manager services can be registered as resources with cluster systems:

- Jobscheduler (including the Master Schedule Management function)

- Job Execution Control

Information that can be automatically reflected in the cluster system

The following information can be automatically reflected in both the active node and the standby node of the cluster system:

- Security information

- Calendar information

    - Day change time

    - Calendar holiday information

    - Schedule information, power schedule information and completion monitoring information for the SYSTEM_CALENDAR

- Service/application startup information

    - Application startup information

It is also possible to make settings so that "Schedule information, power schedule information and completion monitoring information for the SYSTEM_CALENDAR" under "Calendar information" and "Application startup information" under "Service/application startup information" are not reflected automatically.

Failover triggers

Failover takes place when an error occurs in the resources registered with the cluster systems.

1.2 Supported Cluster System Configurations

Systemwalker Operation Manager supports the following cluster system configurations:

- 1:1 active/standby configuration

- N:1 active/standby configuration

- Dual node mutual standby configuration

This section describes each configuration as well as notes on operating Systemwalker Operation Manager.

1.2.1 1:1 active/standby configuration

In this configuration, there is one standby node for each active node.

The following figure shows the nodes for 1:1 active/standby configuration.
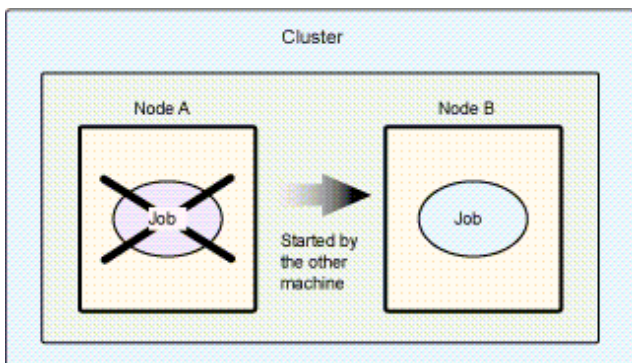
Node A is the active node and Node B is the standby node. Node B is on standby in case an error occurs with Node A.

The 1:1 active/standby configuration has the following features:

- Features

  - Processing performance is guaranteed even after processing is taken over by the standby node when the active node fails.

  - Subsystems can be created on a single node and then the newly created subsystems can be operated together in a cluster system. Subsystems numbered between 0 and 9 (making a total of 10 subsystems) can be operated together as a cluster system.

  - It is also possible to create subsystems on a single node and operate only some of these newly created subsystems as a cluster system. When only some subsystems are operated as a cluster system, those subsystems that are not organized into a cluster system can be used to operate jobs independently. When some subsystems are organized into a cluster system, subsystems numbered from 1 to 9 (making a total of nine subsystems) can be used in cluster operation. Subsystem 0 cannot be used in cluster operation.

🅿 Point

A subsystem and multi-subsystem operations

Multiple instances of the Systemwalker Operation Manager Jobscheduler and Job Execution Control can run simultaneously. The Jobscheduler and Job Execution Control are collectively referred to as "subsystem", and operation that runs multiple subsystems is referred to as "multi-subsystem operation".

1.2.2 N:1 active/standby configuration

In this configuration, there is one node on standby for multiple active nodes.

The following figure shows an example of the nodes for N:1 active/standby configuration.
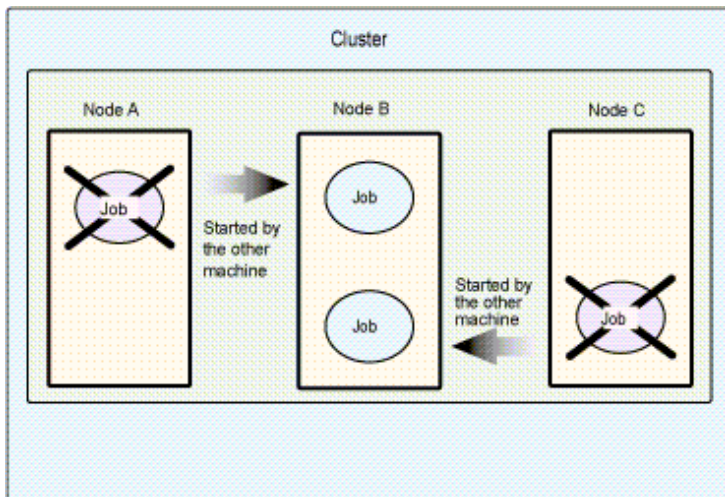
Node A and Node C are active nodes, and Node B is the standby node. Node B is on standby in case error occurs with either Node A or Node C.

The N:1 active/standby configuration has the following features and precautions:

- Features

  - Standby costs are low because there is only one standby node. Processing performance is guaranteed even if one of the active nodes fails.

- Precautions

  - If error occurs with more than one active node, the standby node can only take over jobs from the first active node that failed.

1.2.3 Dual node mutual standby configuration

In this configuration, two nodes are on standby for each other.

The following figure shows the nodes for dual node mutual standby configuration.
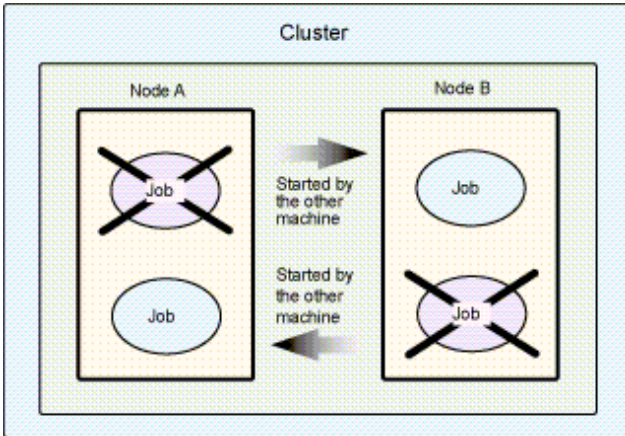
Node A is an active node and Node B is a standby node. Node B is on standby in case error occurs with Node A.

On the other hand, Node B is an active node and Node A is a standby node. Node A is on standby in case error occurs with Node B.

The dual node mutual standby configuration has the following features and precautions:

- Features

    - Both nodes are operating as active nodes during normal operations.

    - Multiple subsystems can run on both nodes. The two nodes can run a total of up to 10 subsystems.

- Precautions

    - If jobs are processed independently on each of the two active nodes, then all the jobs will have to be processed in one single node when a failover occurs. This will reduce the performance level available after the failover.

Information

To register different resources for each subsystem in a 1:1 active/standby configuration environment, follow the dual node mutual standby configuration procedure.

1.3 Systemwalker Operation Manager Configurations on Cluster Systems

Systemwalker Operation Manager can be run on cluster systems using the following configurations:

- Using a cluster configuration for the entire Systemwalker Operation Manager server system

    - 1:1 active/standby cluster configuration

    - N:1 active/standby cluster configuration

    - Dual node mutual standby cluster configuration

- Using a cluster configuration for the schedule server only

    - Using the schedule server with a 1:1 active/standby cluster configuration

    - Using the schedule server with a N:1 active/standby cluster configuration

    - Using the schedule server with a dual node mutual standby cluster configuration

- Organizing some Systemwalker Operation Manager server subsystems into a cluster configuration

    - Operating with a 1:1 active/standby cluster configuration

A cluster configuration can be used for either the execution server only, or for both the schedule server and the execution server.

This section describes cluster configurations for the following cases:

- Using a cluster configuration for the entire Systemwalker Operation Manager server system

- Using a cluster configuration for the schedule server only.

1.3.1 Using a cluster configuration for the entire Systemwalker Operation Manager server system

This section outlines the possible cluster system configurations when a cluster configuration is used for the entire Systemwalker Operation Manager server system.

1:1 active/standby configuration

In this configuration, the way that jobs are taken over by the standby node differs in the non multi-subsystem operation and the multi-subsystem operation.

Non multi-subsystem operation

In the following figure, Node 1 is operating as the active node, and Node 2 is operating as the standby node.

If error occurs with Node 1, jobs on Node 1 are taken over by Node 2.

Multi-subsystem operation

In the following figure, Node 1 is operating as the active node, and Node 2 is operating as the standby node. This figure shows an example where the multi-subsystem operation is implemented in Subsystem 0 and Subsystem 1, and error occurs with Node 1. If error occurs with Node 1, all the jobs in Subsystem 0 and Subsystem 1 are taken over by the standby node.

: Job taken over from Node 1

If error occurs with Subsystem 1 on Node 1, the jobs in Subsystem 0 are also taken over by Node 2.

The configurations -- the non multi-subsystem operation in 1:1 active/standby configuration and the multi-subsystem operation in 1:1 active/standby configuration--are each referred to as the follow:

In case not implementing the multi-subsystem operation in 1:1 active/standby configuration:

1:1 active/standby configuration (without subsystems)

In case implementing the multi-subsystem operation in 1:1 active/standby configuration:

1:1 active/standby configuration (with subsystems)

The term "1:1 active/standby configuration" includes 1:1 active/standby (without subsystems) configurations, 1:1 active/standby (with subsystems) configurations, and the 1:1 active/standby (with subsystems and partial cluster operation) configuration described below.

N:1 active/standby configuration

In the following figure, Node 1 and Node 3 are operating as the active nodes, and Node 2 is operating as the standby node. In this example, if error occurs with Node 1, jobs on Node 1 are taken over by Node 2. Similarly, jobs on Node 3 will be taken over by Node 2 if Node 3 fails.

: Job taken over from Node 1
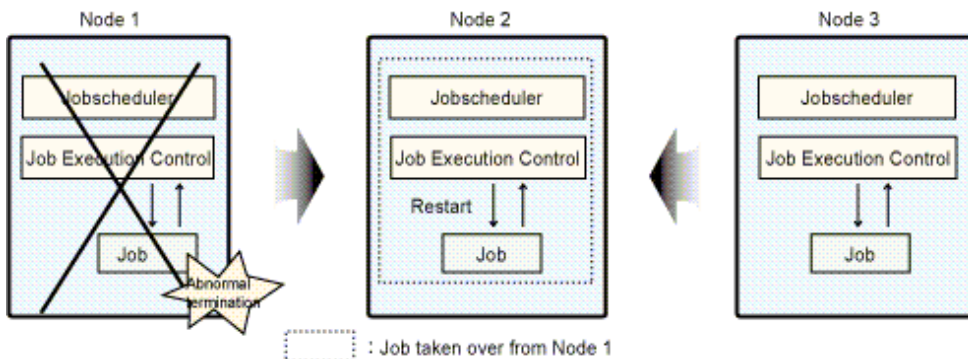
If error occurs with either Node 1 or Node 3, jobs are taken over by Node 2. If errors occur with both nodes, then only jobs from the node where error occurred first will be taken over by the standby node; jobs on the second failed node will not be taken over.

Dual node mutual standby configuration

In this figure, Node 1 and Node 2 are on standby for one another with each node executing its own jobs. In this example, if error occurs with Node 1, jobs on Node 1 are taken over by Node 2. Similarly, jobs on Node 2 will be taken over by Node 1 if Node 2 fails.
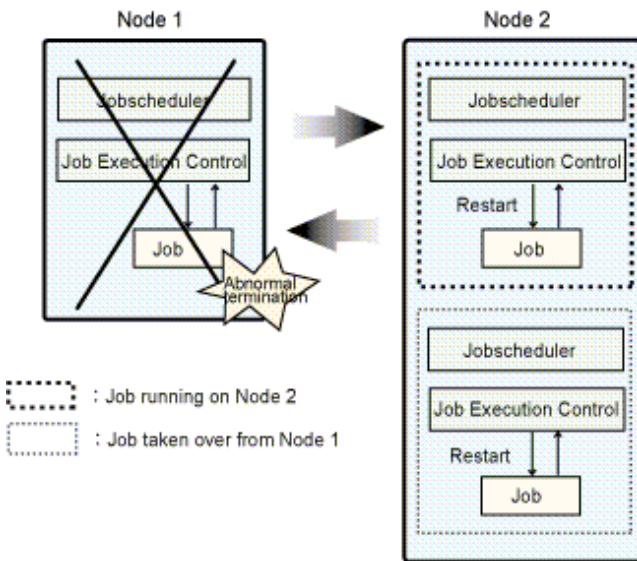
1.3.2 Using a cluster configuration for the schedule server only

This section outlines the possible cluster system configurations when a cluster configuration is used for the schedule server only (with the execution server set up on a separate node).

1:1 active/standby configuration

In this configuration, the way that jobs are taken over by the standby node differs in the non multi-subsystem operation and the multi-subsystem operation.

Non multi-subsystem operation

In the following figure, Node 1 is operating as the active node, and Node 2 is operating as the standby node.

If error occurs with Node 1, jobs on Node 1 are taken over by Node 2. Network jobs running on the execution server are automatically taken over by Node 2.

Multi-subsystem operation

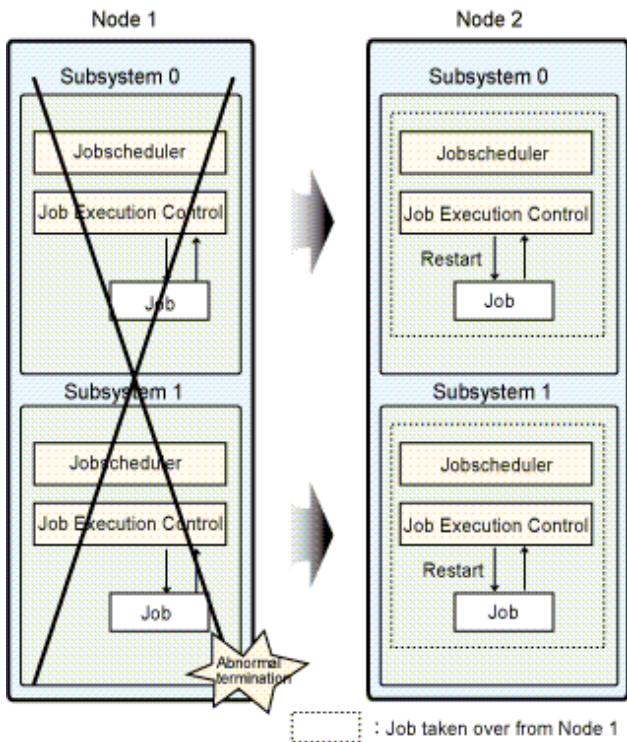In the following figure, Node 1 is operating as the active node, and Node 2 is operating as the standby node. This figure shows an example where the multi-subsystem operation is implemented in Subsystem 0 and Subsystem 1, and error occurs with Node 1. If error occurs with Node 1, all the jobs in Subsystem 0 and Subsystem 1 are taken over by the standby node.

If error occurs with Subsystem 1 on Node 1, the jobs in Subsystem 0 are also taken over by Node 2. Network jobs running on the execution server are automatically taken over by Node 2.

The configurations -- the non multi-subsystem operation in 1:1 active/standby configuration and the multi-subsystem operation in 1:1 active/standby configuration--are each referred to as the follow:

In case not implementing the multi-subsystem operation in 1:1 active/standby configuration:

   1:1 active/standby configuration (without subsystems)

In case implementing the multi-subsystem operation in 1:1 active/standby configuration:

   1:1 active/standby configuration (with subsystems)

The term "1:1 active/standby configuration" includes 1:1 active/standby (without subsystems) configurations, 1:1 active/standby (with subsystems) configurations, and the 1:1 active/standby (with subsystems and partial cluster operation) configuration described below.

N:1 active/standby configuration

In the following figure, Node 1 and Node 3 are operating as active nodes, and Node 2 is operating as the standby node, and error occurs with Node 1.

Schedule server (with cluster system configuration)
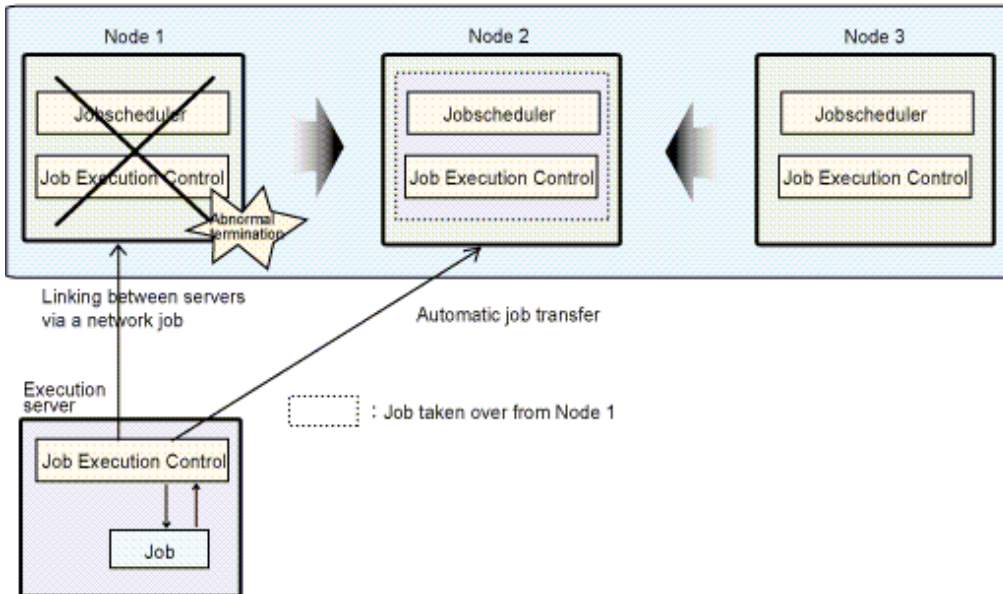
If error occurs with Node 1 or Node 3, jobs are taken over by Node 2. Network jobs running on the execution server for the failed node (Node 1 or Node 3) are also automatically taken over by Node 2.

If errors occur with both nodes, then only jobs from the node where error occurred first will be taken over by the standby node; jobs from the second failed node will not be taken over.

Dual node mutual standby configuration

In the following figure, Node 1 and Node 2 are on standby for one another with each node executing its own jobs, and the execution server is placed on a separate node.

In this example, if error occurs with Node 1, jobs on Node 1 are taken over by Node 2. Network jobs running on the execution server for Node 1 are also automatically taken over by Node 2. Similarly, if error occurs with Node 2, jobs on Node 2 are taken over by Node 1. Network jobs running on the execution server for Node 2 are also automatically taken over by Node 1.

Schedule server (with cluster system configuration)
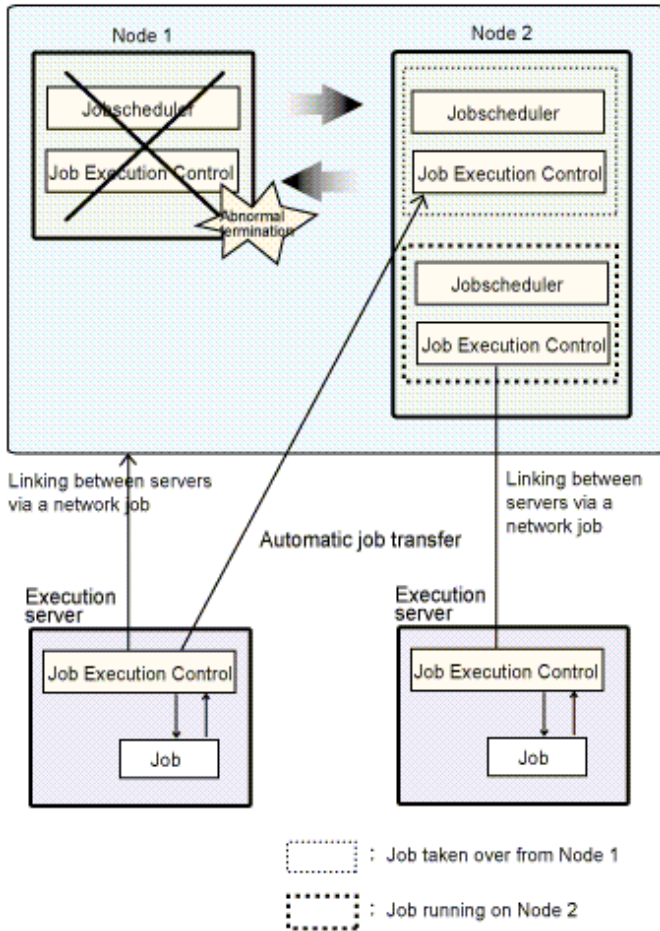
Node 1
Jobscheduler
Job Execution Control
Abnormal termination

Node 2
Jobscheduler
Job Execution Control

Jobscheduler
Job Execution Control

Linking between servers via a network job

Automatic job transfer

Linking between servers via a network job

Execution server
Job Execution Control
Job

Execution server
Job Execution Control
Job

: Job taken over from Node 1

: Job running on Node 2

1.3.3 Organizing some Systemwalker Operation Manager server subsystems into a cluster configuration

This section outlines how to organize some of the Systemwalker Operation Manager server subsystems into a cluster configuration.

1:1 active/standby

The following diagram shows an example of a system in which only Subsystem 1 is used in a cluster configuration, with Node 1 used as the active node and Node 2 used as the standby node. Subsystem 0 is not placed in a cluster configuration and operates on both Node 1 and Node 2. The example in the following diagram illustrates what happens when an error occurs on Node 1. When the error occurs on Node 1, jobs on Subsystem 1 are transferred to the standby node. Because the jobs on Subsystem 0 are not in a cluster configuration, they are not affected by the job transfer within Subsystem 1. As long as Subsystem 0 is able to operate on Node 1, it will continue to do so.
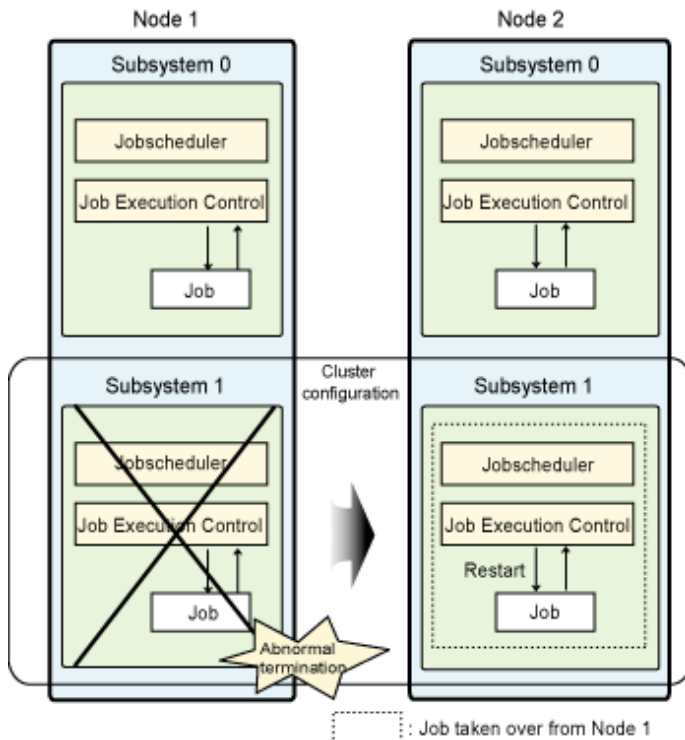
When multiple subsystems are operating and only some are organized into a 1:1 active/standby cluster configuration, the configuration is referred to as follows:

1:1 active/standby (with subsystems and partial cluster operation)

The term "1:1 active/standby configuration" includes 1:1 active/standby (with subsystems and partial cluster operation) as well as the 1:1 active/standby (without subsystems) configurations and 1:1 active/standby (with subsystems) configurations described above.

1.4 Jobs Taken Over in the Cluster System

The following Systemwalker Operation Manager jobs are taken over when failover occurs in a cluster system:

- Schedule information
  When failover occurs, schedule information for the Jobscheduler is automatically taken over by the standby node.

- Running jobs and job nets

  - If both the schedule server and the execution server are running on the same cluster system, jobs and job nets that terminated abnormally can be restarted after failover is complete.
    Settings are required in order to automatically restart jobs and job nets after failover. Refer to "2.10 Settings for Restarting Jobs" for details on these settings.

  - If the schedule server is running as a cluster configuration and a network job is running on a separate execution server, jobs and job nets can still continue to execute even after failover occurs.
    Settings are required in order to have jobs and job nets to automatically continue to execute after failover occurs. Refer to "2.3 Settings for Submitting Network Jobs from Cluster System" for details.

1.5 Notes on Cluster System Operations

This section provides some notes on operating Systemwalker Operation Manager on cluster systems.

Jobs that cannot be submitted

The following jobs and job nets cannot be run on cluster systems:

- Network jobs submitted from an active node to a standby node in a cluster configuration
  It is not possible to submit network jobs from an active node to a standby node when an entire Systemwalker Operation Manager system is in a cluster configuration, as described in "1.3.1 Using a cluster configuration for the entire Systemwalker Operation Manager server system" and "1.3.2 Using a cluster configuration for the schedule server only."

  When only some Systemwalker Operation Manager server subsystems are organized into a cluster configuration as described in "1.3.3 Organizing some Systemwalker Operation Manager server subsystems into a cluster configuration," network jobs can be submitted to those subsystems not in a cluster configuration, even if those subsystems exist on the standby node.

- Network jobs submitted to a lower version when multiple subsystems are operating
  If a 1:1 active/standby (with subsystems), a 1:1 active/standby (with subsystems and partial cluster operation) or a dual node mutual standby configuration is used, network jobs cannot be submitted to the following versions:

  - SystemWalker/OperationMGR V5.0L30 or earlier for Windows

  - SystemWalker/OperationMGR 5.0 or earlier for Solaris/HP-UX /AIX

  - SystemWalker/OperationMGR 5.2 for Linux

  Refer to the *Systemwalker Operation Manager Technical Guide* for details on the range of jobs that can be submitted.

- Load distribution jobs

  When using the load distribution function that is compatible with V10.0L21 and earlier, a cluster server cannot be specified as the distribution destination server.

Notes on when servers running Systemwalker Operation Manager coexist with Operation Management Servers running Systemwalker Centric Manager and those servers are running as cluster systems

The Event Monitoring function and the Action Management function are failed over as a group or cluster service of Systemwalker Centric Manager. To use the following functions, Systemwalker Centric Manager and Systemwalker Operation Manager need to work on the same node. Therefore, register them with the same group or cluster service.

- Using the Event Monitoring function and Action Management function from Systemwalker Operation Manager clients

- By linking with Systemwalker Centric Manager, monitoring job nets abended, and restarting/confirming the job net abended so that the job net's status is automatically changed to "resolved"

- By linking with Systemwalker Centric Manager, displaying the [Monitor Job Net] window of the abended job net directly from the event list of Systemwalker Centric Manager's monitoring screen

Notes on defining cluster systems as trust hosts

When defining cluster systems as trust hosts, define the logical IP address specified in the [Cluster Settings] tab of the [Define Operating Information] window.

Notes on using Jobscheduler's normal termination shutdown exit

jobschendexit.bat, which is provided at installation time, includes processes to stop the Jobscheduler and Job Execution Control services and invoke the queuing completion notification command (*f3crheet*). Therefore, once the exit program has run, it will be assumed that the services have terminated and failover may occur under some cluster system settings.

To prevent failover from occurring in the cluster system, comment out the Jobscheduler and Job Execution Control termination processes and the queuing completion notification command (*f3crheet*) in the exit program.

Submitting network jobs from the cluster system configuration's schedule server

When submitting a network job from the cluster system configuration's schedule server, define the logical IP address of the schedule server, according to the communications environment of the execution server, as follows:

- When the execution server is in an IPv6 single stack environment:

  IPv6 address

- When the execution server is in an IPv4 single stack environment or an IPv4/IPv6 dual stack environment:

  IPv4 address

Note that you cannot operate an execution server in an IPv6 single stack environment together with an execution server in an IPv4 single stack environment or an IPv4/IPv6 dual stack environment. Refer to the following for whether or not to allow operation in cases where the execution server's communications environment is mixed, and for the logical IP address of the schedule server that will be defined during operations.

Combinations of execution server communications environments			Operation allowed	Schedule server logical IP address
IPv6 single	IPv4 single	-	N	-
IPv6 single	-	IPv4/IPv6 dual	N	-
IPv6 single	IPv4 single	IPv4/IPv6 dual	N	-
-	IPv4 single	IPv4/IPv6 dual	Y	IPv4 address

   Y: Operation allowed/ N: Operation not allowed

Chapter 2 Installation

This chapter describes the installation and environment setup procedures required when installing Systemwalker Operation Manager on cluster systems.

The commands described in this chapter must be executed by a user with system administrator (a user belonging to the "Administrators" group) privileges.

Do not move the current directory to the shared disk when executing the *soperationmgr* or *poperationmgr* command. Otherwise, the installation process may not work correctly.

2.1 Installation Procedure

This section describes the procedures for installing Systemwalker Operation Manager on a cluster system.

New installations

The procedure for installing Systemwalker Operation Manager on a cluster system for the first time is as follows:

1. Determine the structure for the cluster system, and install the cluster system and Systemwalker Operation Manager on each node of the cluster system.

   Refer to "2.2 Installation."

2. For structures where a cluster configuration will only be used for the schedule server (with network jobs executed in an execution server), or structures where some Systemwalker Operation Manager server subsystems will be clustered (with network jobs submitted to non-clustered subsystems), use the *jmmode* command to set up "continuous execution mode" on all the nodes making up the cluster system and also on the nodes that will execute network jobs. Further, set a logical IP address for Job Execution Control.

   Refer to "2.3 Settings for Submitting Network Jobs from Cluster System."

   These definitions are not required if both the schedule server and the execution server are part of the same cluster system configuration.

3. Set the Master Schedule Management function if it is to be used.

   Refer to "2.4 Settings for Using the Master Schedule Management Function."

   If the Master Schedule Management function is not used, this definition is unnecessary.

   These definitions are not required on the execution server that configures the cluster system.

4. Set the IP addresses required to operate Systemwalker Operation Manager with a cluster system.

   Refer to "2.5 IP Address Settings."

   These settings are not required on the execution server that configures the cluster system.

5. Register Systemwalker Operation Manager with a cluster system.

   Refer to "2.6 Registering Systemwalker Operation Manager with a Cluster System."

6. Move the resources used by Systemwalker Operation Manager to the shared disk of the cluster system.

   Refer to "2.7 Moving Resources to the Shared Disk."

   These operations are not required on the execution server that configures the cluster system.

7. Make settings to automatically reflect information on both the active node and the standby node.

   Refer to "2.8 Settings for Automatic Reflection."

   Some of these settings are not required on the execution server that configures the cluster system.

8. Standardize information managed by each node between active and standby nodes in the cluster system.

   Refer to "2.9 Standardizing the Information Managed by Each Node."

9. Set up job restart to have jobs restart automatically when failover occurs (assuming that a cluster configuration is used for the entire Systemwalker Operation Manager server system).

   Refer to "2.10 Settings for Restarting Jobs."

   This setting is not required if only the schedule server is on a cluster configuration with the execution server running on a separate node.

Migrating to a cluster system

Refer to "New installations" to migrate Systemwalker Operation Manager from a standard system to a cluster system.

However, it is necessary to back up resources on the standard system using the **Operation Environment Maintenance Wizard** window prior to migrating to the cluster system.

Refer to the *Systemwalker Operation Manager Installation Guide* for details on the **Operation Environment Maintenance Wizard** window.

Upgrading Systemwalker Operation Manager on a cluster system

Use the following procedure to upgrade Systemwalker Operation Manager that is operating on a cluster system:

1. Remove Systemwalker Operation Manager from the cluster system.

   Refer to "2.11 Uninstalling Systemwalker Operation Manager from a Cluster System."

2. Upgrade Systemwalker Operation Manager on all the nodes (active and standby) on the cluster system.

   Refer to the *Systemwalker Operation Manager Upgrade Guide*.

3. Apply Systemwalker Operation Manager to the cluster system again.

   Perform the procedure described in "2.6 Registering Systemwalker Operation Manager with a Cluster System" and the subsequent procedures.

Information
....

When upgrade installation is performed, the following settings are transferred from the previous installation, so there is no need to set them up again.

- Subsystem environments

- Continuous execution mode

- IP address settings

The process monitoring targets are not transferred. Either transfer the settings according to the *Systemwalker Operation Manager Upgrade Guide* or reset using the procedure described in "2.2.4 Changing the monitored process."

For V10.0L21 or earlier, any node name definitions that have been specified will be transferred. To operate using a logical IP address, set up as explained in "2.3.2 Setting logical IP address for Job Execution Control."
....

2.2 Installation

This section describes the procedure for creating a cluster system and installing Systemwalker Operation Manager on the cluster system.

2.2.1 Creating a cluster system

Create a cluster system using the following procedure:

1) Determine the system configuration

Determine which operation mode to use (1:1 active/standby, N:1 active/standby, or dual node mutual standby), considering the strengths and weaknesses of each mode. Also, determine how the Systemwalker Operation Manager server system is to be configured as a cluster system.

2) Prepare resources

Prepare and set up the following resources required to install Systemwalker Operation Manager on cluster system:

- Shared disk

- Logical IP address

Estimate the space required for the shared disk

Estimate the amount of space required on the shared disk for the nodes in the cluster system. The following Systemwalker Operation Manager directories are placed on the shared disk, so estimate the amount of space required by these directories.

- Directory for calendar control information

- Database directory for Jobscheduler

- Spool directory for Job Execution Control

- Database directory for Master Schedule Management

    The directory capacity for Jobscheduler, Job Execution Control, and Master Schedule Management is the same as the directory capacity required in a normal system. Refer to the *Systemwalker Operation Manager Technical Guide* for details on how to estimate the amount of space required.

    The amount of space required for the calendar control information directory can be calculated using the following formula:

> *Amount of space (bytes) on the shared disk required for calendar control information* = 50 (bytes) x *the number of registered calendars* x *the number of subsystems being used*

Prepare logical IP address

Prepare the logical IP address for the cluster system. The logical IP address is the virtual IP address used in common between the active node and the standby node.

Prepare logical IP address, separate from the node-specific physical IP addresses. (Prepare one logical IP address for 1:1 active/standby configuration, "*N*" logical IP addresses for N:1 active/standby configuration and two logical IP addresses for dual node mutual standby configuration.) Make sure that these IP addresses are not used by any other network nodes.

3) Installing the cluster system

Install and create the cluster system. Refer to the cluster system manual for details on how to create cluster system.

2.2.2 Installing Systemwalker Operation Manager

Install Systemwalker Operation Manager on the active and standby nodes. Refer to the *Systemwalker Operation Manager Installation Guide* for details on how to install Systemwalker Operation Manager on each type of node.

📝 Note
. . . .
Do not install Systemwalker Operation Manager on the shared disk.
. . . .

If the Systemwalker Operation Manager users are controlled by selecting the "Restrict so that only users included in the swadmin group can start demand jobs, start jobnet Job execution control attributes or use Jobscheduler command functions." option in the **Define Operation Manager Shared Parameter** window, define user restrictions on the active and standby nodes after installing Systemwalker Operation Manager. Refer to the *Systemwalker Operation Manager Installation Guide* for details.

📝 Note
. . . .
The user restriction definitions cannot be changed after registering Systemwalker Operation Manager with a cluster system.

Be sure to set the definition before registering Systemwalker Operation Manager with the cluster system.
. . . .

2.2.3 Creating subsystem environments

A prerequisite for 1:1 active/standby configurations (with subsystems), 1:1 active/standby configurations (with subsystems and partial cluster operation), N:1 active/standby configurations (with subsystems), and dual node mutual standby configurations is that the subsystem environment must be created in advance so that multiple subsystems can run on the cluster system. Additionally, create the same subsystem environment on both the active node and the standby node for the 1:1 active/standby configuration (with subsystems), or the N:1 active/standby configuration (with subsystems).

To create the environment, log in as a user who is a member of the Administrator group and who has the user right to "part of the operating system functions", and then perform the following procedure. Refer to the *Systemwalker Operation Manager Installation Guide* for details on how to create the subsystem environment.

1. Create the subsystem environment

   Execute the *createsubsystem.exe* command on each node.

2. Set port numbers for subsystems

   Set port numbers for the subsystems used by the Jobscheduler on each node.

3. Set port numbers for network jobs

   These settings are required if the execution server for network jobs uses a multiple subsystem configuration, or if the own server (schedule server) uses a multiple subsystem configuration and a job that spans multiple subsystems is submitted.

   Set port numbers for network jobs on all the nodes in the cluster system and also on the execution server for network jobs.

4. Restart Systemwalker Operation Manager.

2.2.4 Changing the monitored process

On each node (active and standby), remove the Jobscheduler and Job Execution Control from the list of processes monitored by the process monitoring function.

1. Open the following definition file for monitored processes with a text editor such as Notepad:

   ```
   Systemwalker Operation Manager installation directory
   \mpwalker.jm\mpcmtool\pmon\etc\mppmon.usr
   ```

2. Edit the lines shown in the following examples:

   ```
   [Before]

   Fujitsu MpWalker MpJobsch=1
           :
   Fujitsu MpWalker MpMjes=1

   [After]

   Fujitsu MpWalker MpJobsch=0
           :
   Fujitsu MpWalker MpMjes=0
   ```

Refer to "Changing the Processes to be Monitored" in the *Systemwalker Operation Manager Installation Guide* for details on the procedure for changing the monitored processes.

📋 Note

As a result of this procedure, Jobscheduler and Job Execution Control processes for subsystems not registered with a cluster system will also be removed from the list of processes monitored by the process monitoring function. This procedure will also prevent messages from being sent to the event log or syslog when a process error occurs.

2.3 Settings for Submitting Network Jobs from Cluster System

For operations where the schedule server is running on a cluster system and network jobs are submitted to an execution server, jobs and job nets can still continue to execute even after the schedule server has failed over. The following definitions are required:

- Specifying continuous execution mode with the *jmmode* command

- Setting up a logical IP address for Job Execution Control

2.3.1 Specifying continuous execution mode with the jmmode command

Specify continuous execution mode by executing the *jmmode* command on all schedule servers and execution servers.

The following figure shows an overview of this definition.
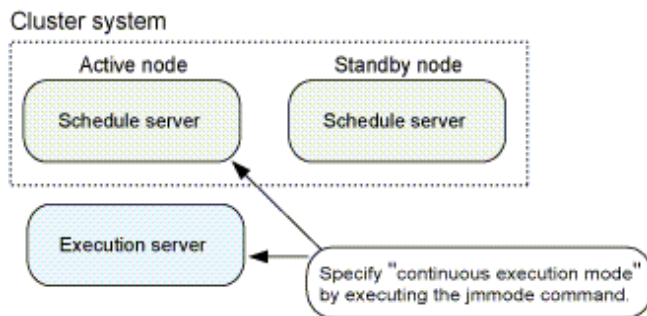
Execute this command with all the Systemwalker Operation Manager services stopped. After the command is executed, these services will need to be restarted in order for continuous execution mode to take effect.

Refer to the *Systemwalker Operation Manager Reference Guide* for details on the jmmode command.

Example of command execution for a 1:1 active/standby configuration (without subsystems) or N:1 active/standby configuration (without subsystems)

Perform the following procedure on all nodes:

1. Stop the Systemwalker Operation Manager services.

```
poperationmgr
```

2. Execute the *jmmode* command with the "continue -func JOB" option specified.

```
jmmode continue -func JOB
```

3. Execute the *jmmode* command with the "check" option specified, and check that "JOB" has been set to "on".

```
jmmode check
```

   [Display example]

```
SYS 0
JOB on
WRT off
```

Example of command execution for a 1:1 active/standby configuration (with subsystems)

Perform the following procedure on all nodes. In this example, Subsystem 0 and Subsystem 1 are operating.

1. Stop the Systemwalker Operation Manager services.

```
poperationmgr
```

2. Execute the *jmmode* command with the "continue -func JOB" option specified.

```
jmmode continue -func JOB -sys 0
jmmode continue -func JOB -sys 1
```

3. Execute the *jmmode* command with the "check" option specified to confirm that "JOB" has been set to "on".

```
jmmode check
```

[Display example]

```
SYS 0
JOB on
WRT off

SYS 1
JOB on
WRT off
```

Example of command execution for a 1:1 active/standby configuration (with subsystems and partial cluster operation)

Perform the following procedure on all nodes. The following example shows a configuration in which both Subsystem 0 and Subsystem 1 are operating but only Subsystem 1 is registered with a cluster system and Subsystem 0 is using a network job. In the case of a 1:1 active/standby configuration (with subsystems and partial cluster operation) in which Subsystem 0 cannot be used in cluster operation but a network job is used, use the *jmmode* command with Subsystem 0, just as in the example of a 1:1 active/standby configuration (with subsystems).

1. Stop the Systemwalker Operation Manager daemons.

```
poperationmgr
```

2. Execute the *jmmode* command with the "continue -func JOB" option specified

```
jmmode continue -func JOB -sys 0
jmmode continue -func JOB -sys 1
```

3. Execute the *jmmode* command with the "check" option specified, and check that "JOB" has been set to "on".

```
jmmode check
```

[Display example]

```
SYS 0
JOB on
WRT off

SYS 1
JOB on
WRT off
```

Example of command execution for a dual node mutual standby configuration

Perform the following procedure on all nodes:

1. Stop the Systemwalker Operation Manager services.

```
poperationmgr
```

2. Execute the *jmmode* command with the "continue -func JOB" option specified.

```
jmmode continue -func JOB -sys 1
jmmode continue -func JOB -sys 2
```

3. Execute the *jmmode* command with the "check" option specified to confirm that "JOB" has been set to "on".

```
jmmode check
```

[Display example]

```
SYS 0
JOB off
WRT off

SYS 1
JOB on
WRT off

SYS 2
JOB on
WRT off
```

Remarks:

Continuous execution mode has not been specified for Subsystem 0, and so "JOB off" is set for this subsystem.

Example of N:1 active/standby configuration (with subsystems)

Execute the following procedure on all nodes. Below is an example of a 2:1 active/standby configuration. Note that the active nodes are formatted as Active 1 and Active 2.

1. Stop Systemwalker Operation Manager services.

```
poperationmgr
```

2. Specify the continue -func JOB option, and execute the jmmode command.

Example of Active 1 command

```
jmmode continue -func JOB -sys 0
```

Example of Active 2 command

```
jmmode continue -func JOB -sys 1
```

Example of standby node command

```
jmmode continue -func JOB -sys 0
jmmode continue -func JOB -sys 1
```

3. Specify the check option, and execute the jmmode command, and then check whether "JOB" is set to "on".

```
jmmode check
```

Display example of Active 1

```
SYS 0
JOB on
WRT off
```

Display example of Active 2

```
SYS 0
JOB off
WRT off

SYS 1
JOB on
WRT off
```

Display example of standby node

```
SYS 0
JOB on
WRT off

SYS 1
JOB on
WRT off
```

![Note](Note icon)**Note**

When executing the *jmmode* command after transferring resources to the shared disk in "2.7 Moving Resources to the Shared Disk," be sure to run this command on an active node on which the shared disk is mounted.

2.3.2 Setting logical IP address for Job Execution Control

To submit network jobs from a schedule server with a cluster configuration, set a logical IP address for Job Execution Control.

The following figure shows an overview of this definition.
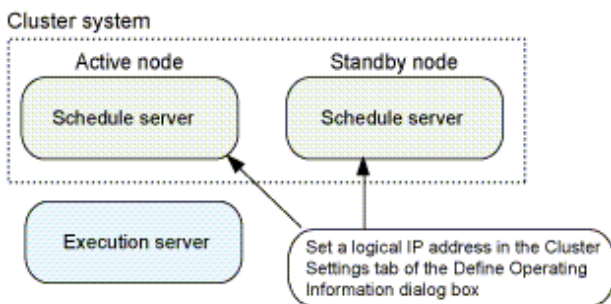
For 1:1 active/standby configuration and dual node mutual standby configuration, define a logical IP address on each node (active and standby) in the cluster system. For N:1 active/standby configuration (without subsystems), make this definition on the active nodes only.

In the case of N:1 active/standby configuration (with subsystems), define a logical IP address on each node (active and standby) only in subsystems that comprise the cluster system.

1. Start the Systemwalker Operation Manager on each node.

```
soperationmgr
```

2. Connect to the active node from the environment setup client by specifying its physical IP address, and then set a logical IP address by selecting the **Register the logical IP address** checkbox in the **Schedule server settings** section under the **Cluster Settings** tab of the **Define Operating Information** window. The **Server settings** section need not be set.
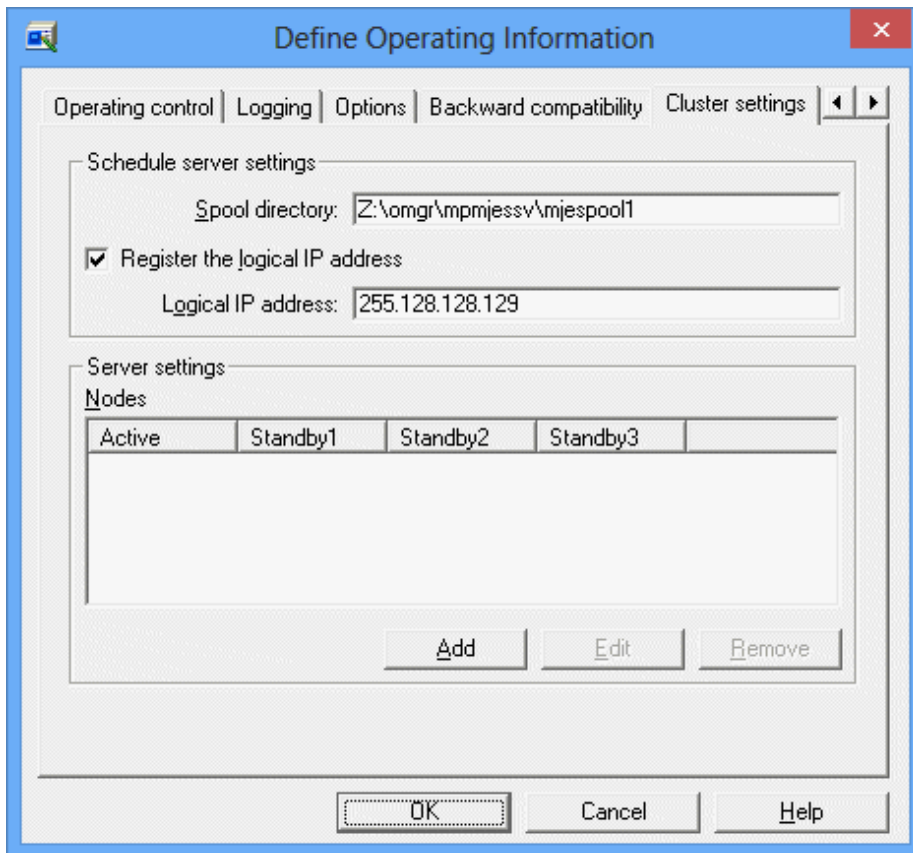
3. For 1:1 active/standby configuration and dual node mutual standby configuration, connect to the standby node from the environment setup client by specifying its physical IP address, and then perform the same settings as in step 2.

For 1:1 active/standby configurations (with subsystems), perform the procedure shown in steps 2 and 3 for all subsystems. For 1:1 active/standby configurations (with subsystems and partial cluster operation), perform steps 2 and 3 for all subsystems to be registered with a cluster system.

In the case of N:1 active/standby configuration (with subsystems), perform the procedures in steps 2 and 3 for the subsystems to be registered with a cluster system on each active node and standby node.

To set the trust host name for the trust host definition on the execution server, set the logical IP address that was specified in step 2.

Instead of defining a logical IP address, it is also possible to define the names of the active and standby nodes in the **Server settings** section. However, since node name definitions exist in order to provide backwards compatibility with Systemwalker OperationMGR V10.0L21 or earlier, define a logical IP address for V11.0L10 or later. Node name definitions are not supported for a N:1 active/standby configuration.

Information
. . . .

Node name definitions

If node names are used, define them on the execution server that will receive network jobs from the schedule server with a cluster configuration. Define the names of the active and standby nodes in the **Server settings** section under the **Cluster Settings** tab of the **Define Operating Information** window. In this case, the **Schedule server settings** section need not be set.
. . . .

Configuring logical IP addresses that take execution server communications environments into account

When submitting a network job from the cluster system configuration's schedule server, define the logical IP address of the schedule server, according to the communications environment of the execution server, as follows:

- When the execution server is in an IPv6 single stack environment:

   IPv6 address

- When the execution server is in an IPv4 single stack environment or an IPv4/IPv6 dual stack environment:

   IPv4 address

Note that you cannot operate an execution server in an IPv6 single stack environment together with an execution server in either an IPv4 single stack environment or an IPv4/IPv6 dual stack environment.

Refer to the *Systemwalker Operation Manager Installation Guide* for details on how to perform definitions using the **Define Operating Information**, and to the *Systemwalker Operation Manager Online Help* for details on the **Define Operating Information** window.

2.4 Settings for Using the Master Schedule Management Function

Set up the Master Schedule Management function if it is to be used. The Master Schedule Management function does not need to be set up if it is not to be used or if a 1:1 active/standby configuration (with subsystems and partial cluster operation) is to be used and subsystems are not to be registered with a cluster system.

1. Create an environment for the Master Schedule Management function.

   To create the environment of the Master Schedule Management function, execute the *stemenvset* command (environment setup command) on all the nodes in both the active and standby systems.

   ```
   stemenvset.exe -set
   ```

   Refer to the *Systemwalker Operation Manager Reference Guide* for details on the stemenvset command.

2. Set up the Schedule by dates mode (for active node).

   Prior to setting this, start Systemwalker Operation Manager by using the *soperationmgr* command.

   Connect to the active node, and set up the Schedule by dates mode (**Daily schedule management** or **Daily schedule management (Test mode)**) in the **Master Schedule Management Environment Setup** dialog box.

A confirmation dialog box will appear, asking you to confirm that you wish to restart the Jobscheduler service. Click **No** not to restart the Jobscheduler service.

   Refer to the *Systemwalker Operation Manager User's Guide - Master Schedule Management* for details on how to set up the Master Schedule Management environment.

3. Register the service for cluster (for active node).

   Execute the following command on the active node to register the service of the Master Schedule Management function for cluster system.

   The command must be run by a user who is a member of the Administrator group and who has the user right to "part of the operating system functions."

   ```
   stemregservice.exe -reg -sys subsystem number
   ```

   Refer to the *Systemwalker Operation Manager Reference Guide* for details on the stemregservice command.

4. Set up the Schedule by dates mode (for standby node).

Connect the standby node, and set up the Schedule by dates mode (**Daily schedule management** or **Daily schedule management (Test mode)**) in the same manner as step 2.

5. Register the service for cluster (for standby node).

Register the service of the Master Schedule Management function for cluster on the standby node in the same manner as step 3.

2.5 IP Address Settings

If Systemwalker Operation Manager is operating as a cluster system, perform settings related to IP addresses according to the type of operation being used:

Refer to the *Systemwalker Operation Manager Installation Guide* for details on how to perform these settings.

IP address settings for the client computer

If a logical IP address is registered in the "hosts" file on the client machine, then Systemwalker Operation Manager client can be connected to the server by specifying the host name corresponding to this logical IP address.

IP address settings for the monitored host

If a monitored host managed by Systemwalker Operation Manager is in a cluster configuration, then a logical IP address can be set as the IP address of the monitored host.

Monitored host definitions are stored on each node, not on the shared disk. If the definition on one node is modified, modify the others so that the settings are the same on all nodes. Refer to "2.9.3 Standardizing Systemwalker Operation Manager environment definitions" for details.

Monitoring-permission host definitions

If the multi-server monitoring function is used to monitor other servers from a cluster system, define all nodes on the cluster system as monitoring-permission hosts for the monitored servers.

2.6 Registering Systemwalker Operation Manager with a Cluster System

The procedure to register Systemwalker Operation Manager with a cluster system is described as the information specific to MSCS systems or Microsoft(R) Fail Over Clustering systems.

- To register Systemwalker Operation Manager with the Microsoft(R) Fail Over Clustering system
  Refer to "4.1 Registering Systemwalker Operation Manager with the Microsoft(R) Fail Over Clustering System."

2.7 Moving Resources to the Shared Disk

The method to move resources to the shared disk in a cluster system is described as the information specific to MSCS systems or Microsoft(R) Fail Over Clustering systems.

- To move the resources to the shared disk on the Microsoft(R) Fail Over Clustering system
  Refer to "4.2 Moving Resources to the Shared Disk."

2.8 Settings for Automatic Reflection

The settings so that the security information, calendar information, and service/application startup information can be automatically reflected in the active and standby nodes are described as the information specific to MSCS systems or Microsoft(R) Fail Over Clustering systems.

- To make settings for the automatic reflection on the Microsoft(R) Fail Over Clustering system
  Refer to "4.3 Settings for Automatic Reflection."

2.9 Standardizing the Information Managed by Each Node

In order for Systemwalker Operation Manager to run correctly on a cluster system, the various information managed by each node must be consistent between the active and standby nodes. This section describes how to standardize the information on each node.

2.9.1 Standardizing operating system information

The information below must be the same for the active and standby nodes. If this information is changed on one node, make the same changes on the other node.

- User name, password, user group

- "hosts" file

- "services" file

- User resources and file systems required for batch jobs executed from Systemwalker Operation Manager, such as exit files, batch files, executable files, and data.

2.9.2 Standardizing the User Management Method

The user management method must be the same on each node in the cluster. In each user management method, the users that have been registered on each node must also be standardized.

User names, passwords, and user group names registered in the operating system must be the same on each node. If the Systemwalker authentication repository is used, the connection destination Systemwalker authentication repository must be the same on each node.

2.9.3 Standardizing Systemwalker Operation Manager environment definitions

Of all the information managed by Systemwalker Operation Manager, the following information is standardized at each node.

The following information is standardized by extracting and distributing policy information:

- Common "monitored host" definitions

- Common **Shared parameter** definitions

- "Startup parameters" and "monitoring-permission host" definitions of Jobscheduler

- "Operation information", "trust host" and "job owner" definitions of Job Execution Control

- "Job folder" definition of Job Execution Control

- Web Console definition information

The following information is standardized by performing specific operations:

- "Password management book" and "host information file" of Task Link

If the following information is changed, "startup parameters" definitions of Jobscheduler must be targeted for extraction/distribution.

- "Setting virtual time" in the Master Schedule Management function

When the above information is added or changed, ensure that the information in the active node and the standby node remains the same. To standardize the definition, use the policy information extraction function or the policy information distribution function to copy information from the active node to the standby node. It is also possible to extract the definition created in another non-cluster node with the policy information extraction function, and then distribute this information to the active and standby nodes.

Note, however, that the "password management book" and "host information file" of Task Link cannot be copied individually using the policy extraction and distribution functions. Accordingly, they must be copied using the specific procedures explained below.

Extracting and distributing policy information

Extract the following policy information at the active node and distribute it to the standby node. Refer to "3.3 Distributing and Applying Policies in Cluster System Operations" for details.

- The following items on the **Environment definition** tab of the **Extract Policy** window:

    - Monitored host

    - Startup parameter

    - Monitoring permission host

    - Operation information

    - Trust host

    - Job owner

  - The following item on the **Registration information** tab of the **Extract Policy** window:

    - Job folder

Standardizing the "password management book" and "host information file" of Task Link

To copy the "password management book" and "host information file" of Task Link, use the Windows copy function to copy the following directory from the active to the standby node.

```
Systemwalker Operation Manager installation directory\MpWalker.JM\mpnjsosv\manage information in directory
```

Note
. . . .

For N:1 active/standby and dual node mutual standby configurations, the cluster system includes multiple active nodes. In such cases, note the following points:

- Make the "monitored host" definition, "job folder" definition, "password management book" and "host information file" the same for all the active nodes. Information definitions cannot differ in active nodes.

. . . .

Refer to the *Systemwalker Operation Manager Installation Guide* for the "password management book" and "host information file" definitions of Task Link.

2.10 Settings for Restarting Jobs

If the schedule server and the execution server are both running on the same cluster system, any jobs or job nets that are executing when a failover occurs will be displayed as having terminated abnormally (execution suspended status: completion code =239) when the failover completes.

Recovery processing (such as restarting) for these jobs and job nets is not performed automatically. Check the abnormal termination, and take the appropriate action (restarting, etc.).

In order to continue operation after the failover, create a job to perform the following processing, and then register this job as the job net that is executed when the server starts up.

Be sure to set startup days for the job net to be registered. If not set the startup days, the job net will not start after the failover.

1. Output a job net status list with the *jobschprint -n* command. Redirect the output results to a file and save the file.

2. Read the file saved in step 1, and check whether the job net is in suspended status by checking whether the completion code is "239".

3. If the job net was interrupted, restart it with the *jobschcontrol rerun* command.

4. Repeat steps 2 and 3 for each job net in the list output in step 1.

Sample source code that performs this processing can be found at the following location:

```
Systemwalker Operation Manager installation directory\MpWalker.jm\mpjobsch\sample\abendrerun.c
```

Refer to the *Systemwalker Operation Manager Reference Guide* for details on the jobschprint command and the jobschcontrol command.

2.11 Uninstalling Systemwalker Operation Manager from a Cluster System

The procedure to uninstall Systemwalker Operation Manager from a cluster system is described as the information specific to MSCS systems or Microsoft(R) Fail Over Clustering systems.

- To uninstall Systemwalker Operation Manager from the Microsoft(R) Fail Over Clustering system,

  Refer to "4.4 Uninstalling Systemwalker Operation Manager from the Microsoft(R) Fail Over Clustering System."

Chapter 3 Operation

This chapter describes procedures and cautions required when operating Systemwalker Operation Manager on cluster systems.

The commands described in this chapter must be executed by a user with system administrator (a user belonging to the "Administrators" group) privileges.

3.1 Systemwalker Operation Manager Operations in Cluster Systems

This section describes procedures and cautions required when operating Systemwalker Operation Manager on cluster systems.

- Connecting to cluster system from clients

- Settings for changing operation definitions

3.1.1 Connecting to cluster system from clients

To use the following functions displayed in the **Job Selection** window in the left pane of the **Systemwalker Operation Manager** window from a Systemwalker Operation Manager client connected to a clustered Systemwalker Operation Manager server, specify either the physical IP address or the logical IP address created for Systemwalker Operation Manager:

- Jobscheduler

- Job

- Queue

If automatic reflection is to be applied to the cluster system with the *calsetcluster* command and any of the following functions are to be used, specify either the logical IP address of the cluster system or the host name corresponding to that logical IP address. If the cluster system is not subject to automatic reflection, specify the physical IP address of the respective machine.

- Registering, modifying or deleting calendars

- Automatically controlling the power supply to the server

- Defining service/application startup information

When setting up the environment for Systemwalker Operation Manager, specify the physical IP address for the "server IP address" when starting the **Systemwalker Operation Manager Environment Setup** window.

When using a multi-server monitoring client, specify the physical IP address for the server IP address at startup.

When using the Jobscheduler information print client, specify either the physical IP address or the logical IP address for the server IP address at startup.

When using the Master Schedule Management function, specify either the logical IP address of the cluster system or the host name corresponding to that logical IP address in both the cases of accessing from the **Master Schedule Management** window and the **Master Schedule Management Environment Setup** dialog box.

If failover occurs while the client is connecting to the server, the connection to the server will be broken. Reconnect after the failover is completed.

3.1.2 Settings for operation definitions that have been changed

The following information for Systemwalker Operation Manager is managed independently on each node. As a result, changes made on one node will not be reflected in the other nodes in the cluster system. So if information is modified on one node, copy the changed definition information to all other nodes.

Refer to "2.9.3 Standardizing Systemwalker Operation Manager environment definitions" for details on how and when to copy this information.

- Common "monitored host" definitions.

- "Startup parameters" and "monitoring-permission host" definitions of Jobscheduler

- "Operation information", "trust host", "job owner", and "job folder" definitions of Job Execution Control

- "Password management book" and "host information file" of Task Link

- "Setting virtual time" in the Master Schedule Management function

- Web Console definition information

3.2 Starting and Stopping Services on Cluster Systems

The method to start/stop Systemwalker Operation Manager on a cluster system is described as the information specific to MSCS systems or Microsoft(R) Fail Over Clustering systems.

- To start or stop Systemwalker Operation Manager on the Microsoft(R) Fail Over Clustering system

  Refer to "4.5 Starting and Stopping Services on the Microsoft(R) Fail Over Clustering System."

3.3 Distributing and Applying Policies in Cluster System Operations

The procedure to distribute and apply policies in the cluster system operations is described as the information specific to MSCS systems or Microsoft(R) Fail Over Clustering systems.

- To distribute and apply policies in Microsoft(R) Fail Over Clustering system operations

  Refer to "4.6 Distributing and Applying Policies in Microsoft(R) Fail Over Clustering System Operations."

3.4 Backing up and Restoring Resources in Cluster System Operations

The method to back up and restore the Systemwalker Operation Manager resources in the cluster system operations is described as the information specific to MSCS systems or Microsoft(R) Fail Over Clustering systems.

- To back up and restore the resources in Microsoft(R) Fail Over Clustering operations

  Refer to "4.7 Backing up and Restoring Resources in Microsoft(R) Fail Over Clustering System Operations."

3.5 Changing the Scheduling Mode for the Master Schedule Management Function

This section describes the procedures to change the mode of the scheduling method in Systemwalker Operation Manager running on cluster systems.

When changing the mode between Daily schedule management and Daily schedule management (Test mode)

To do it, follow the procedure below:

1. Change the mode of the scheduling method, referring to the *Systemwalker Operation Manager User's Guide - Master Schedule Management*.

   ## Note

   - To set up the Master Schedule Management environment in Systemwalker Operation Manager during cluster operations, specify either the logical IP address of the cluster system or the host name corresponding to that logical IP address in the **Master Schedule Management Environment Setup [Login]** window.

   - Make sure that the Jobscheduler service is not restarted from the **Master Schedule Management Environment Setup** dialog box when applying the Master Schedule Management environment settings.

2. Restart the Systemwalker Operation Manager service for the changed mode to take effect. To do it, refer to "3.2 Starting and Stopping Services on Cluster Systems."

3. The information managed by Systemwalker Operation Manager is updated because the mode has been changed. To apply the changes to the standby node, extract the following policy information on the active node and distribute it to the standby node. For details on the procedure, refer to "3.3 Distributing and Applying Policies in Cluster System Operations."

   - In the **Environment definition** tab of the **Extract Policy** window, select "Startup parameter."

When changing the mode from Normal schedule to Daily schedule management, or Daily schedule management (Test mode)

To do it, follow the procedure below:

1. Uninstall Systemwalker Operation Manager from a cluster system to revert it to the normal system operation, referring to "2.11 Uninstalling Systemwalker Operation Manager from a Cluster System."

2. Again, apply Systemwalker Operation Manager to the cluster system. (To do it, perform the rest of the installation steps after the step of "2.2.4 Changing the monitored process.")

Chapter 4 Cluster Setup Procedure Specific to Systems Using Microsoft (R) Fail Over Clustering

This chapter describes the specific operations for the Microsoft(R) Fail Over Clustering systems.

4.1 Registering Systemwalker Operation Manager with the Microsoft(R) Fail Over Clustering System

Register the Systemwalker Operation Manager cluster service with the Microsoft(R) Fail Over Clustering system so that the Microsoft(R) Fail Over Clustering system can control the startup and shutdown of Systemwalker Operation Manager services. Perform one of the following registration operations at either the active or standby node:

- Registration used in 1:1 or N:1 active/standby configuration

- Registration used in dual node mutual standby configuration

4.1.1 Registration used in 1:1 or N:1 active/standby configuration

The following section explains the registration method used in a 1:1 or N:1 active/standby configuration.

1) Suppressing automatic start of Systemwalker Operation Manager

In active/standby configurations, change the start trigger of the Systemwalker Operation Manager services shown below that will be registered in the cluster system to manual start.

[1:1 active/standby configuration (without subsystems) or N:1 active/standby configuration (without subsystems)]

The following services must be changed:

- Jobscheduler: Systemwalker MpJobsch

- Job Execution Control: Systemwalker MpMjes

- Master Schedule Management function: Systemwalker MpStem (only when the Master Schedule Management function is enabled)

[1:1 active/standby configuration (with subsystems)]

Subsystems that have been operated must be changed. For example, if subsystems 0 and 1 have been operated, the following services must be changed:

- Jobscheduler: Systemwalker MpJobsch

- Job Execution Control: Systemwalker MpMjes

- Master Schedule Management function: Systemwalker MpStem (only when the Master Schedule Management function is enabled)

- Jobscheduler: Systemwalker MpJobsch1

- Job Execution Control: Systemwalker MpMjes1

- Master Schedule Management function: Systemwalker MpStem1 (only when the Master Schedule Management function is enabled)

[1:1 active/standby configuration (with subsystems and partial cluster operation)]

Subsystems that will be operated in a cluster must be changed. For example, if subsystems 0 and 1 have been operated, and only subsystem 1 will be operated in a cluster, the following services must be changed:

- Jobscheduler: Systemwalker MpJobsch1

- Job Execution Control: Systemwalker MpMjes1

- Master Schedule Management function: Systemwalker MpStem1 (only when the Master Schedule Management function is enabled)

[N:1 active/standby configuration (with subsystems)]

Stop the following Systemwalker Operation Manager services that are registered with the cluster system on the active node and the standby node from starting automatically.

This shows examples where 2:1 active/standby configuration and active node are "Active 1" and "Active 2", using Subsystem 0 with Active 1, and Subsystem 1 with Active 2.

[Services to be changed on "Active 1"]

- Jobscheduler: Systemwalker MpJobsch

- Job Execution Control: Systemwalker MpMjes

[Services to be changed on "Active 2"]

- Jobscheduler: Systemwalker MpJobsch1

- Job Execution Control: Systemwalker MpMjes1

[Services to be changed on the standby node]

- Jobscheduler: Systemwalker MpJobsch

- Job Execution Control: Systemwalker MpMjes

- Jobscheduler: Systemwalker MpJobsch1

- Job Execution Control: Systemwalker MpMjes1

The procedure to change the service start trigger in environments except the Server Core environment is shown below:

1. Stop the Systemwalker Operation Manager service using the **Control Panel** >> **Administrative Tools** >> **Services** dialog box.

2. Change the startup type of the above stopped services from "Automatic" to "Manual", In the case of active/standby configurations (with subsystems and partial cluster operation), do not change the startup type to "Manual" for subsystems that are not registered with a cluster system.

The procedure to change the service start trigger in the Server Core environment is shown below:

1. Stop the service using the operating system SC command. Execute one of the commands shown below, depending on the service that will be stopped. To start the service, replace "stop" with "start" and execute the command.

[Systemwalker MpJobsch]

```
sc stop "Fujitsu MpWalker MpJobsch"
```

[Systemwalker MpMjes]

```
sc stop "Fujitsu MpWalker MpMjes"
```

[Systemwalker MpStem] (only when the Master Schedule Management function is enabled)

```
sc stop "Fujitsu MpWalker MpStem"
```

[Systemwalker MpJobsch1]

```
sc stop "Fujitsu MpWalker MpJobsch1"
```

[Systemwalker MpMjes1]

```
sc stop "Fujitsu MpWalker MpMjes1"
```

[Systemwalker MpStem1] (only when the Master Schedule Management function is enabled)

```
sc stop "Fujitsu MpWalker MpStem1"
```

[Systemwalker MpJobsch2]

```
sc stop "Fujitsu MpWalker MpJobsch2"
```

[Systemwalker MpMjes2]

```
sc stop "Fujitsu MpWalker MpMjes2"
```

[Systemwalker MpStem2] (only when the Master Schedule Management function is enabled)

```
sc stop "Fujitsu MpWalker MpStem2"
```

2. Change the service start trigger to a manual start using the operating system's SC command. Execute one of the commands shown below, depending on the service that will be changed. To restore the service start trigger to automatic start, replace "start= demand" with "start= auto" and execute the command.

[Systemwalker MpJobsch]

```
sc config "Fujitsu MpWalker MpJobsch" start= demand
```

[Systemwalker MpMjes]

```
sc config "Fujitsu MpWalker MpMjes" start= demand
```

[Systemwalker MpStem] (only when the Master Schedule Management function is enabled)

```
sc config "Fujitsu MpWalker MpStem" start= demand
```

[Systemwalker MpJobsch1]

```
sc config "Fujitsu MpWalker MpJobsch1" start= demand
```

[Systemwalker MpMjes1]

```
sc config "Fujitsu MpWalker MpMjes1" start= demand
```

[Systemwalker MpStem1] (only when the Master Schedule Management function is enabled)

```
sc config "Fujitsu MpWalker MpStem1" start= demand
```

[Systemwalker MpJobsch2]

```
sc config "Fujitsu MpWalker MpJobsch2" start= demand
```

[Systemwalker MpMjes2]

```
sc config "Fujitsu MpWalker MpMjes2" start= demand
```

[Systemwalker MpStem2] (only when the Master Schedule Management function is enabled)

```
sc config "Fujitsu MpWalker MpStem2" start= demand
```

3. Check that the service start trigger has changed. Execute one of the commands shown below, depending on the service that has been changed:

[Systemwalker MpJobsch]

```
sc qc "Fujitsu MpWalker MpJobsch"
```

[Systemwalker MpMjes]

```
sc qc "Fujitsu MpWalker MpMjes"
```

[Systemwalker MpStem] (only when the Master Schedule Management function is enabled)

```
sc qc "Fujitsu MpWalker MpStem"
```

[Systemwalker MpJobsch1]

```
sc qc "Fujitsu MpWalker MpJobsch1"
```

[Systemwalker MpMjes1]

```
sc qc "Fujitsu MpWalker MpMjes1"
```

[Systemwalker MpStem1] (only when the Master Schedule Management function is enabled)

```
sc qc "Fujitsu MpWalker MpStem1"
```

[Systemwalker MpJobsch2]

```
sc qc "Fujitsu MpWalker MpJobsch2"
```

[Systemwalker MpMjes2]

```
sc qc "Fujitsu MpWalker MpMjes2"
```

[Systemwalker MpStem2] (only when the Master Schedule Management function is enabled)

```
sc qc "Fujitsu MpWalker MpStem2"
```

In the command output result, when START_TYPE is "3 DEMAND_START" it means manual start, and when it is "2 AUTO_START" it means automatic start. In the example below, the MpJobsch start trigger has been changed to manual start.

```
C:\>sc qc "Fujitsu MpWalker MpJobsch"
[SC] GetServiceConfig SUCCESS

SERVICE_NAME: Fujitsu MpWalker MpJobsch
        TYPE               : 10   WIN32_OWN_PROCESS
        START_TYPE         : 3    DEMAND_START
        ERROR_CONTROL      : 1    NORMAL
        BINARY_PATH_NAME   : C:\systemwalker\MPWALKER.JM\bin\tskmnsrv.exe
        LOAD_ORDER_GROUP   :
        TAG                : 0
        DISPLAY_NAME       : Systemwalker MpJobsch
        DEPENDENCIES       : Eventlog
                           : Fujitsu MpWalker MpMjes
                           : Fujitsu MpWalker MpJmCal
                           : Fujitsu MpWalker ACL Manager
        SERVICE_START_NAME : .\systemwalker
```

2) Register cluster service

Use the **Failover Cluster Management** dialog box to register the cluster service that will be used for Systemwalker Operation Manager:

1. Select **Services and Applications** in the tree on the left side of the **Failover Cluster Management** window. From the **Action** menu select **More Action** and then select **Create Empty Service Or Application** to create a **New Service Or Application**.

2. Right click on the newly created **New Service Or Application** and select **Properties** from the shortcut menu that appears.

3. When the **New Service or Application Properties** window appears, enter any valid name in the **Name** field and use **Preferred owners** to arrange nodes in order of preference.

In the case of N:1 active/standby configuration (with subsystems), execute N times (the number of active nodes). In cases of 2:1 active/standby configuration, execute the registration of cluster services between each active node and standby node twice.

3) Register resources

Register resources with the cluster service created in 2) above.

a) Register IP address resource

Register the logical IP address to be used between the active node and the standby node to the cluster service.

Select the Systemwalker Operation Manager cluster service created in 2) above, and select **Add a resource** and then **Client Access Point** from the **Action** menu. Alternatively, right-click on the Systemwalker Operation Manager cluster service, and select **Add a resource** and then **Client Access Point** from the shortcut menu that appears.

Only execute the procedure in 7 in the case of N:1 active/standby configuration (with subsystems).

1. Specify the following items in the **New Resource Wizard** window to create an IP address resource:

   - Name: Host name.

   - Address: Logical IP address

2. With the newly created IP address resource selected, right click and select **Properties** from the shortcut menu that appears.

3. Select the **Policies** tab and set the value of **Maximum restarts in the specified period** to 0.

4. With the host name (specified in step 1 above) selected, right click and select **Properties** from the shortcut menu that appears.

5. Select the **Dependencies** tab and specify the IP address resource created in step 1 above.

6. Select the **Policies** tab and set the value of **Maximum restarts in the specified period** to 0.

7. Select the **Advanced Policies** tab, and select the node you will not transfer from **Possible owners**.

   For example, enter settings as described below when 2:1 active/standby configuration and active node are used for "Active 1" and "Active 2":

   - For cluster services that will be used between Active 1 and standby, only select the nodes for Active 1 and standby.

   - For cluster services that will be used between Active 2 and standby, only select the nodes for Active 2 and standby.

b) Register physical disk resources

Register the shared disk that will be used to save Systemwalker Operation Manager management data.

Only execute the procedure in 6 in the case of N:1 active/standby configuration (with subsystems).

1. Select **Storage** in the tree on the left side of the **Failover Cluster Management** dialog box.

2. Right click on the disk resource to be used in **Available Storage** and select **More Action** and then the option for moving this resource to another service or application from the shortcut menu that appears.

3. When the **Select Service or Application** window appears, select the Systemwalker Operation Manager cluster service and click **OK**.

4. Right click on the newly added disk drive and select **Properties** from the shortcut menu that appears.

5. Select the **Policies** tab and set the value of **Maximum restarts in the specified period** to 0.

6. Select the **Advanced Policies** tab and select the node you will not transfer from **Possible owners**.

   For example, enter settings as described below when 2:1 active/standby configuration and active node are using "Active 1" and "Active 2":

   - For cluster services that will be used between Active 1 and standby, only select the nodes for Active 1 and standby.

- For cluster services that will be used between Active 2 and standby, only select the nodes for Active 2 and standby.

Assign a shared disk that is not being used by another cluster service (i.e., another business).

Information

. . . .

Both nodes can connect to the shared disk and the shared disk can be accessed from each node, but the same shared disk cannot be used by both nodes at the same time. For this reason, it is necessary to assign a drive that is not used by another cluster service (i.e., another business) as a shared disk.

. . . .

c) Register general-purpose service resources

Register the following services as general -purpose services:

- Job Execution Control service

- Jobscheduler service

- Master Schedule Management service (only when the Master Schedule Management function is enabled)

For 1:1 active/standby configurations (with subsystems), register the services with all the operating subsystems. For example, if subsystem 0 and subsystem 1 are operating, the following services must be registered as general-purpose services:

- Job Execution Control service of Subsystem 0

- Jobscheduler service of Subsystem 0

- Master Schedule Management service (only if this service is enabled) of Subsystem 0

- Job Execution Control service of Subsystem 1

- Jobscheduler service of Subsystem 1

- Master Schedule Management service (only if this service is enabled) of Subsystem 1

For 1:1 active/standby configurations (with subsystems and partial cluster operation), register the services for all the subsystems that will be registered with a cluster system. Do not register the services for subsystems that will not be placed in a cluster configuration. For example, if both Subsystem 0 and Subsystem 1 are operating but only Subsystem 1 will be registered with a cluster system, the following services must be registered as general-purpose services:

- Job Execution Control service of Subsystem 1

- Jobscheduler service of Subsystem 1

- Master Schedule Management service of Subsystem 1 (only when the Master Schedule Management function is enabled)

For N:1 active/standby configurations (with subsystems), register the services for all the subsystems that will run on each node. For example, if 2:1 active/standby configuration and active node are "Active 1" and "Active 2", using Subsystem 0 with Active 1, and Subsystem 1 with Active 2, then register the following services as general purpose services:

[Cluster services for Active 1 and standby node]

- Job Execution Control services for Subsystem 0

- Jobscheduler services for Subsystem 0

- Master Schedule Management function services for Subsystem 0 (only when the Master Schedule Management function is enabled)

[Cluster services for Active 2 and the standby node]

- Job Execution Control services for Subsystem 1

- Jobscheduler services for Subsystem 1

- Master Schedule Management function services for Subsystem 1 (only when the Master Schedule Management function is enabled)

The following procedure is used to register these services:

Select the Systemwalker Operation Manager cluster service, and select **Add a resource** and then **Generic Service** from the **Action** menu. Alternatively, right click on the Systemwalker Operation Manager cluster service, and select **Add a resource** and then **Generic Service** from the shortcut menu that appears.

Only execute the procedure in 5 in the case of N:1 active/standby configuration (with subsystems).

1. Select the service from the list in the **New Resource Wizard** window.

   The following table lists the service names to be selected:

   [1:1 active/standby configuration (without subsystems) or N:1 active/standby configuration (without subsystems)**]**

Service	Service name	Service display name
Job Execution Control	Fujitsu MpWalker MpMjes	Systemwalker MpMjes
Jobscheduler	Fujitsu MpWalker MpJobsch	Systemwalker MpJobsch
Master Schedule Management (*1)	Fujitsu MpWalker MpStem	Systemwalker MpStem

   *1: Only when the Master Schedule Management function is enabled.

   [1:1 active/standby configuration (with subsystems)]

   The table below lists an example when Subsystem 0 and Subsystem 1 are operating:

Service	Service name	Service display name
Job Execution Control of Subsystem 0	Fujitsu MpWalker MpMjes	Systemwalker MpMjes
Jobscheduler of Subsystem 0	Fujitsu MpWalker MpJobsch	Systemwalker MpJobsch
Master Schedule Management (*1) of Subsystem 0	Fujitsu MpWalker MpStem	Systemwalker MpStem
Job Execution Control of Subsystem 1	Fujitsu MpWalker MpMjes1	Systemwalker MpMjes1
Jobscheduler of Subsystem 1	Fujitsu MpWalker MpJobsch1	Systemwalker MpJobsch1
Master Schedule Management (*1) of Subsystem 1	Fujitsu MpWalker MpStem1	Systemwalker MpStem1

   *1: Only when the Master Schedule Management function is enabled.

   [1:1 active/standby configuration (with subsystems and partial cluster operation)]

   In this example both Subsystem 0 and Subsystem 1 are operating but only Subsystem 1 is registered with a cluster:

Service	Service name	Service display name
Job Execution Control of Subsystem 1	Fujitsu MpWalker MpMjes1	Systemwalker MpMjes1
Jobscheduler of Subsystem 1	Fujitsu MpWalker MpJobsch1	Systemwalker MpJobsch1
Master Schedule Management (*1) of Subsystem 1	Fujitsu MpWalker MpStem1	Systemwalker MpStem1

   *1: Only when the Master Schedule Management function is enabled

[N:1 active/standby configuration (with subsystems)]

Below are examples where active/standby configuration and active node are "Active 1" and "Active 2", using Subsystem 0 with Active 1, and Subsystem 1 with Active 2.

[Cluster services for Active 1 standby node]

Service	Service name	Service display name
Job Execution Control of Subsystem 0	Fujitsu MpWalker MpMjes	Systemwalker MpMjes
Jobscheduler of Subsystem 0	Fujitsu MpWalker MpJobsch	Systemwalker MpJobsch
Master Schedule Management function of Subsystem 0 (*)	Fujitsu MpWalker MpStem	Systemwalker MpStem

[Cluster services for Active 2 standby node]

Service	Service name	Service display name
Job Execution Control of Subsystem 1	Fujitsu MpWalker MpMjes1	Systemwalker MpMjes1
Jobscheduler of Subsystem 1	Fujitsu MpWalker MpJobsch1	Systemwalker MpJobsch1
Master Schedule Management function of Subsystem 1 (*)	Fujitsu MpWalker MpStem1	Systemwalker MpStem1

```
*: Only when the Master Schedule Management function is enabled
```

2. Right click on the newly created resource and select **Properties** from the shortcut menu that appears.

3. Select the **Dependencies** tab and specify the IP address resource registered in a) above and the physical disk resource registered in b) above using **AND**.

4. Select the **Policies** tab and set the value of **Maximum restarts in the specified period** to 0.

5. Select the **Advanced Policies** tab and select the node you will not transfer from **Possible owners**.

   For example, enter settings as described below when 2:1 active/standby configuration and active node are "Active 1" and "Active 2":

   1. For cluster services that will be used between Active 1 and standby, only select the nodes for Active 1 and standby.

   2. For cluster services that will be used between Active 2 and standby, only select the nodes for Active 2 and standby.

To register the Jobscheduler service, in addition to the above operations it will also be necessary to register a general-purpose service resource for Job Execution Control as a dependency.

🛐 Note

. . . .

Registering other services as general-purpose services

To schedule jobs that operate on services other than Systemwalker Operation Manager such as Interstage by using Systemwalker Operation Manager, register the relevant services with the Systemwalker Operation Manager cluster service. For this, it is necessary to register general-purpose service resources of Jobscheduler as dependencies.

. . . .

e) Register general-purpose application resources

Use the following procedure to register an application that automatically updates security information as a general-purpose application resource:

Select the Systemwalker Operation Manager cluster service, and select **Add a resource** and then **Generic Application** from the **Action** menu. Alternatively, right click on the Systemwalker Operation Manager cluster service, and select **Add a resource** and then **Generic Application** from the shortcut menu that appears.

1. Specify the following command line in the **New Resource Wizard** window:

   - Command line: <*Systemwalker Operation Manager installation director*>\MPWALKER\mpaclmgr\bin\jmaclapp.exe (*1)

   *1:

   For N:1 active/standby configuration, enter the directory on the shared disk for the parameter in the **Command line** box. The following shows an example where the shared disk directory is "z:\omgr".

   Command line: <*Systemwalker Operation Manager installation directory*>\MPWALKER\mpaclmgr\bin\jmaclapp.exe z:\omgr

2. Right click on the newly created resource and select **Properties** from the shortcut menu that appears.

3. Select the **Dependencies** tab and specify the IP address resource registered in a) above and the physical disk resource registered in b) above using **AND**.

4. Select the **Policies** tab and set the value of **Maximum restarts in the specified period** to 0.

4) Register cluster information

Execute the following command at all the active and standby nodes that make up the cluster system to register the configuration information of the cluster environment.

For N:1 active/standby configuration (with subsystems), in cases where there are multiple shared disks on the standby node, use this command only after re-specifying the shared disk you wish to acquire when the backup/restore commands are executed.

```
<Systemwalker Operation Manager installation directory>\MpWalker.jm\mpcmtool\bin\mpsetcluster.exe
```

Refer to the *Systemwalker Operation Manager Reference Guide* for details on the mpsetcluster command.

4.1.2 Registration used in dual node mutual standby configuration

The following section explains the registration method used in a dual node mutual standby configuration.

The registration procedure is basically the same as that described in the previous section "Registration used in 1:1 or N:1 active/standby configuration." However, the series of operations is performed at each subsystem and a separate Systemwalker Operation Manager cluster service name, resource name, IP address and shared disk are prepared for each subsystem.

The example provided below shows the registration procedure used when two subsystems, Subsystem 1 and Subsystem 2, are created. Refer to "4.1.1 Registration used in 1:1 or N:1 active/standby configuration" above for details.

1) Inhibiting automatic start of Systemwalker Operation Manager

At the active node and the standby node, prevent the following Systemwalker Operation Manager services registered with the cluster system from starting automatically.

- Systemwalker MpJobsch1

- Systemwalker MpMjes1

- Systemwalker MpStem1 (only when the Master Schedule Management function is enabled)

- Systemwalker MpJobsch2

- Systemwalker MpMjes2

- Systemwalker MpStem2 (only when the Master Schedule Management function is enabled)

2) Register Subsystem 1 cluster service

Use the **Failover Cluster Management** dialog box to register the Systemwalker Operation Manager cluster service for Subsystem 1.

When registering the cluster service for Subsystem 2, set the order of precedence in **Preferred owners** to the reverse of that specified for Subsystem 1.

3) Register Subsystem 1 resources

Register resources with the Subsystem 1 cluster service registered in 2) above.

a) Register IP address resource

Register the IP address that will be used when connecting to the cluster system from a client. Specify any suitable resource name and IP address for Subsystem 1.

b) Register physical disk resources

Register the shared disk that will be used to save Systemwalker Operation Manager management data. Specify any suitable resource name and a shared disk for Subsystem 1.

c) Register general-purpose service resources

Register the following services as general-purpose services:

- Job Execution Control service of Subsystem 1

- Jobscheduler service of Subsystem 1

- Master Schedule Management service of Subsystem 1 (only when the Master Schedule Management function is enabled)

The following table lists the service names to be selected:

Service	Service name	Service display name
Job Execution Control of Subsystem 1	Fujitsu MpWalker MpMjes1	Systemwalker MpMjes1
Jobscheduler of Subsystem 1	Fujitsu MpWalker MpJobsch1	Systemwalker MpJobsch1
Master Schedule Management (*1) of Subsystem 1	Fujitsu MpWalker MpStem1	Systemwalker MpStem1

*1: Only when the Master Schedule Management function is enabled.

Each service name for Subsystem 2 is as shown in the following table:

Service	Service name	Service display name
Job Execution Control of Subsystem 2	Fujitsu MpWalker MpMjes2	Systemwalker MpMjes2
Jobscheduler of Subsystem 2	Fujitsu MpWalker MpJobsch2	Systemwalker MpJobsch2
Master Schedule Management (*1) of Subsystem 2	Fujitsu MpWalker MpStem2	Systemwalker MpStem2

*1: Only when the Master Schedule Management function is enabled

d) Register general-purpose application resources

Register an application that will update security information automatically. Specify a suitable resource name for Subsystem 1 and the cluster service name for Subsystem 1. Specify the command line on Subsystem 1 and Subsystem 2 as follows:

```
<Systemwalker Operation Manager installation directory>\MPWALKER\mpaclmgr\bin\jmaclapp.exe
```

4) Register Subsystem 2 cluster service/resources

Perform steps 2) and 3) on Subsystem 2. When doing so, read all instances of "Subsystem 1" as "Subsystem 2". When registering cluster services, set the order of precedence in **Preferred owners** to be the reverse of that specified for Subsystem 1. Also register a general-purpose service resources service name for Subsystem 2.

5) Register cluster information

Execute the following command at all the active and standby nodes that make up the cluster system to register the configuration information of the cluster environment:

```
<Systemwalker Operation Manager installation directory>\MpWalker.jm\mpcmtool\bin\mpsetcluster.exe
```

Refer to the *Systemwalker Operation Manager Reference Guide* for details on the mpsetcluster command.

4.2 Moving Resources to the Shared Disk

This section describes the procedure for moving resources to the shared disk of a Microsoft(R) Fail Over Clustering system.

These operations are not required on the execution server that configures the cluster system.

Note

Perform the operations to transfer resources to the shared disk at both the active and standby nodes separately. If the shared disk is varied online and resources are transferred from both nodes simultaneously, data on the shared disk may become corrupted.

4.2.1 For 1:1 or N:1 active/standby configuration

The procedure explained below is used to transfer resources in 1:1 or N:1 active/standby configuration.

Resources to be moved

Transfer the following resources of the active and standby nodes to the shared disk:

- Calendar control information

- Database directory for Jobscheduler

- Spool directory for Job Execution Control

- Database directory for the Master Schedule Management function (only when the Master Schedule Management function is enabled)

In the case of a 1:1 active/standby configuration (with subsystems), move the resources of all the subsystems that are operating. For example, if Subsystem 0 and Subsystem 1 are operating, move the following directories to the shared disk:

- Calendar control information of Subsystem 0

- Spool directory for Job Execution Control of Subsystem 0

- Database directory for Jobscheduler of Subsystem 0

- Database directory for the Master Schedule Management function (only when the Master Schedule Management function is enabled) of Subsystem 0

- Calendar control information of Subsystem 1

- Spool directory for Job Execution Control of Subsystem 1

- Database directory for Jobscheduler of Subsystem 1

- Database directory for the Master Schedule Management function (only when the Master Schedule Management function is enabled) of Subsystem 1

In the case of a 1:1 active/standby configuration (with subsystems and partial cluster operation), move the resources of all the subsystems that are operating within a cluster configuration. Do not move the resources of subsystems not operating in a cluster configuration. For example, if both Subsystem 0 and Subsystem 1 are operating but only Subsystem 1 is involved in cluster operation, move the following directories to the shared disk:

- Calendar control information of Subsystem 1

- Spool directory for Job Execution Control of Subsystem 1

- Database directory for Jobscheduler of Subsystem 1

- Database directory for the Master Schedule Management function of Subsystem 1 (only when the Master Schedule Management function is enabled)

Relocation procedure

The relocation procedures explained in this article are organized as follows:

- For 1:1 active/standby configuration (without subsystems) or N:1 active/standby configuration

- For 1:1 active/standby configuration (with subsystems)

- For 1:1 active/standby configuration (with subsystems and partial cluster operation)

1:1 active/standby configuration (without subsystems) or N:1 active/standby configuration (without subsystems)

The procedure used to transfer resources to the shared disk in a 1:1 active/standby configuration (without subsystems) or N:1 active/ standby configuration is explained below. In the following explanation, the shared disk is indicated by the drive letter "z:".

1. Use the **Failover Cluster Management** dialog box to vary the Systemwalker Operation Manager cluster service offline.

   Cluster services are in an offline state immediately after they have been registered, so it is advisable to wait a few moments after registration, and vary the cluster service online, and then vary the cluster service offline again.

2. Transfer the ownership rights of "Systemwalker Operation Manager" to the active node.

   To transfer ownership to the active node, right-click on the Systemwalker Operation Manager cluster service and specify the active node via **Move this service or application to another node**.

   This operation is not necessary if the active node is already designated as the owner.

3. Stop the calendar service on the active node.

   Open the **Services** dialog box from the **Administrative Tools** applet in the **Control Panel** and stop the following service:

   - Systemwalker MpJmCal

4. Verify that the active node is designated as the owner and then vary the shared disk online.

   Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk online.

5. Create a directory for calendar control information on the active node and transfer the calendar control information to the shared disk.

   1. Create a directory for calendar control information on the shared disk.

      This operation is not required on the standby node.

      In the following example, calendar control information directory "\mpjmcal" will be created in the "\omgr" directory on shared disk "z:".

      ```
      z:\omgr\mpjmcal
      ```

   2. Use the *calregpath* command to register the calendar control information directory created in step 1 of step 5 above. Also specify the *-pm* operand to transfer the calendar control information to the shared disk.

      Example:

      ```
      calregpath.exe -add -all -pm -p z:\omgr\mpjmcal
      ```

When performing this operation on the standby node (explained below), enter the command as shown in the following example.

Example:

```
calregpath.exe -add -all -p z:\omgr\mpjmcal
```

6. Move the Jobscheduler's database directory at the active node.

   To move the database directory, use the **Systemwalker Operation Manager Environment Setup** window.

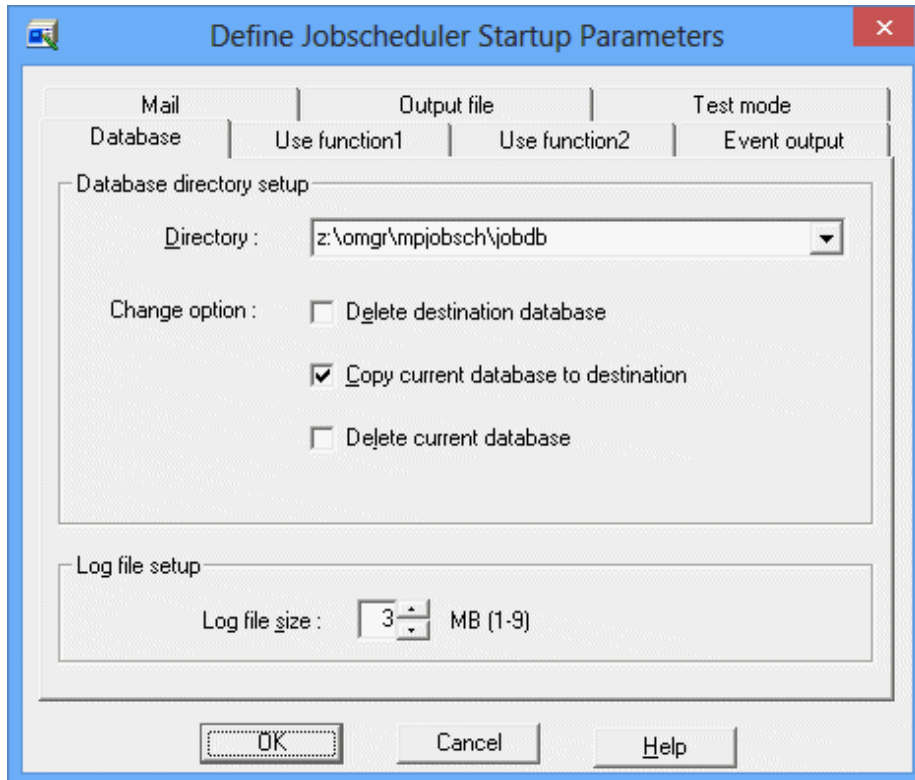   1. Display the **Systemwalker Operation Manager Environment Setup** window connected to the active node.

      To do so, select **Systemwalker Operation Manager**, click **Environment Setup** - **Environment Setup**, and use the **Environment Setup [Login]** window that appears to connect to the active node.

      Specify the physical IP address of the active node in the **Host name** field of the **Environment Setup [Login]** window.

   2. Click the **Startup parameter** button in the **Jobscheduler** field of the **Systemwalker Operation Manager Environment Setup** window.

      The **Define Jobscheduler Startup Parameters** window will be displayed.

   3. Select the **Database** tab and change the default drive name as the installation directory shown in the **Directory** box in the **Database directory setup** field to the drive name of the shared disk.

   Select the **Copy current database to destination** check box. In the procedure used with the standby node (explained below), this check box does not need to be selected.

   4. Click the **OK** button. The database directory will be created on the shared disk.

7. Move the spool directory for Job Execution Control at the active node.
   To move the spool directory, use the **Systemwalker Operation Manager Environment Setup** window as follows:

   1. Click the **Operation information** button in the **job control** field in the **Systemwalker Operation Manager Environment Setup** window.

      The **Define Operating Information** window will be displayed.

2. Select the **Cluster settings** tab and change the location shown in the **Spool directory** box to the directory on the shared disk.
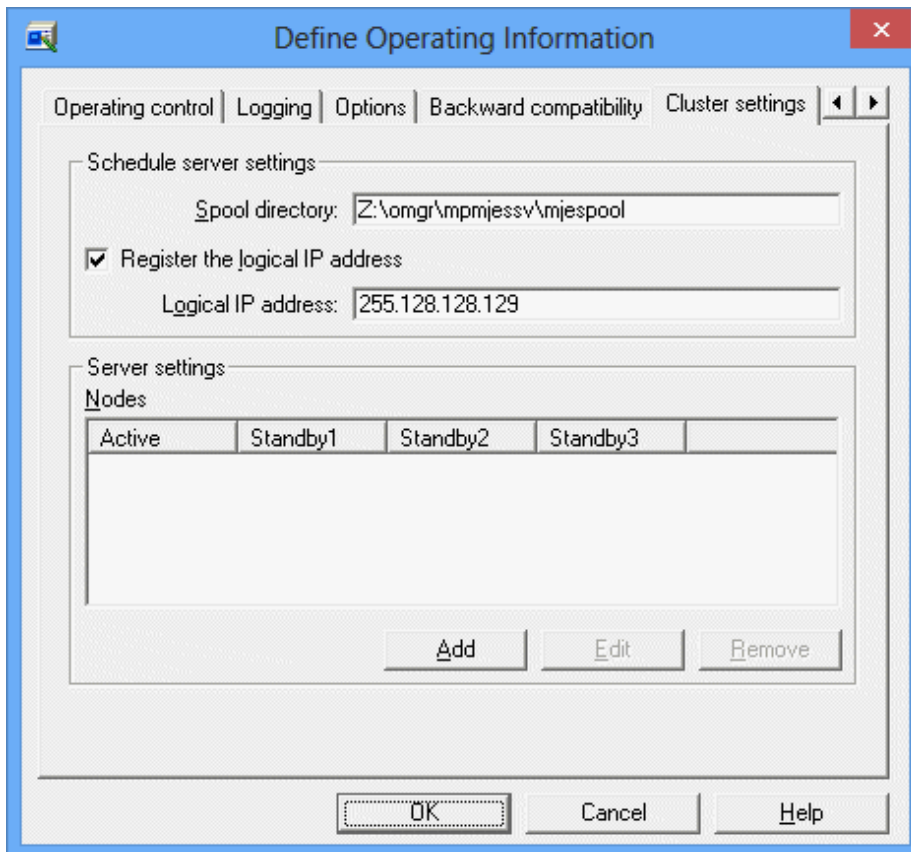
3. Click the **OK** button and use the **Save of the defining operation information** window that appears to save the operating information definition. Once saved, the operating information definition will become effective when the next operation takes place.

8. Move the database directory for the Master Schedule Management function at the active node (only when the Master Schedule Management function is enabled).

   To move the database directory, use the *stemsetdbpath* command (DB directory change command for cluster).

   Example:

   ```
   stemsetdbpath.exe z:\omgr\mpstemsv -r
   ```

   In the procedure used with the standby node (explained below), enter the command as follows.
   Example:

   ```
   stemsetdbpath.exe z:\omgr\mpstemsv -r -n
   ```

   Refer to the *Systemwalker Operation Manager Reference Guide* for details on the *stemsetdbpath* command.

9. Confirm that the active node is designated as the owner and vary the shared disk offline.

   Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk offline.

10. Perform steps 2 through 9 at the standby node. When doing so, read all instances of "active node" in the explanation as "standby node". Also note the following with respect to the standby node:

    - At the standby node, there is no need to create the directory on the shared disk in 1 of step 5.

    - At the standby node, there is no need to specify the *-pm* operand when executing the *calregpath* command in 2 of step 5.

    - At the standby node, there is no need to select the **Copy current database to destination** check box in 3 of step 6.

    - At the standby node, specify the *-n* operand when executing the *stemsetdbpath* command in step 8.

1:1 active/standby configuration (with subsystems)

The procedure used to transfer resources to the shared disk in a 1:1 active/standby configuration (with subsystems) is explained below. In the following explanation, it assumes that Subsystem 0 and Subsystem 1 are operating, and the shared disk is indicated by the drive letter "z:".

1. Use the **Failover Cluster Management** dialog box to vary the Systemwalker Operation Manager cluster service offline.

   Cluster services are in an offline state immediately after they have been registered, so it is advisable to wait a few moments after registration, and vary the cluster service online, and then vary the cluster service offline again.

2. Transfer the ownership rights of "Systemwalker Operation Manager" to the active node.

   To transfer ownership to the active node, right-click on the Systemwalker Operation Manager cluster service and specify the active node via **Move this service or application to another node**.

   This operation is not necessary if the active node is already designated as the owner.

3. Stop the calendar service at the active node.

   Open the **Services** dialog box from the **Administrative Tools** applet in the **Control Panel** and stop the following service:

   - Systemwalker MpJmCal

4. Verify that the active node is designated as the owner and then vary the shared disk online.

   Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk online.

5. Create a directory for calendar control information at the active node and transfer the calendar control information to the shared disk.

   1. Create a directory for calendar control information on the shared disk.

      This operation is not required at the standby node.

      In the following example, directory "\mpjmcal\sys0" for the calendar control information of Subsystem 0 will be created in the "\omgr" directory on shared disk "z:".

      ```
      z:\omgr\mpjmcal\sys0
      ```

   2. Use the *calregpath* command to register the calendar control information directory for each subsystem, which was created in 1 of step 5 above. Also specify the *-pm* operand to transfer the calendar control information to the shared disk.

      Example:

      ```
      calregpath.exe -add -sys 0 -pm -p z:\omgr\mpjmcal\sys0
      ```

      When performing this operation at the standby node (explained below), enter the command as shown in the following example.

      Example:

      ```
      calregpath.exe -add -sys 0 -p z:\omgr\mpjmcal\sys0
      ```

   3. Repeat steps 1 and 2 for each subsystem.

      For example of Subsystem 1, enter the directory name as "sys1" and enter the option of *calregpath.exe* as "-sys 1".

6. Move the Jobscheduler's database directory at the active node.

   1. Display the **Systemwalker Operation Manager Environment Setup** window connected to the Subsystem 0.

      To do so, select **Systemwalker Operation Manager**, click **Environment Setup** - **Environment Setup**, and use the **Environment Setup [Login]** window that appears to connect to the server. Specify the subsystem number "0" in the **Specify Subsystem Connection** window displayed as a result.
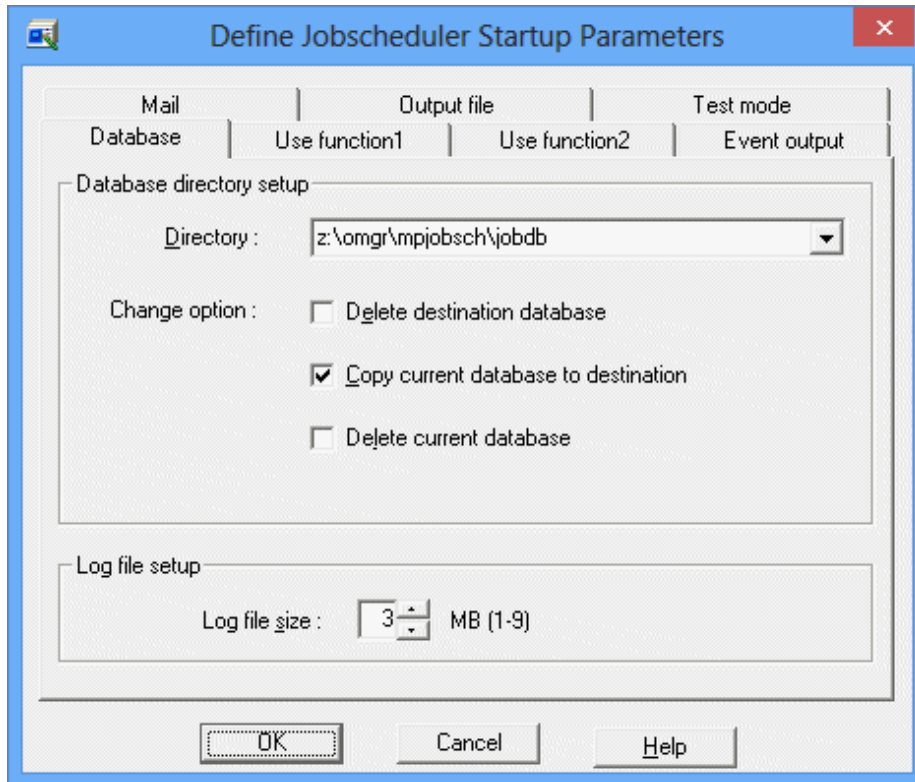
      And then the **Systemwalker Operation Manager Environment Setup** window will be displayed.

      Specify the physical IP address of the active node in the **Host name** field of the **Environment Setup [Login]** window.

2. Click the **Startup parameter** button in the **Jobscheduler** field of the **Systemwalker Operation Manager Environment Setup** window.

   The **Define Jobscheduler Startup Parameters** window will be displayed.

3. Select the **Database** tab and change the default drive name as the installation directory shown in the **Directory** field in the **Database directory setup** field to the drive name on the shared disk to specify the database directory of Subsystem 0.

   Select the **Copy current database to destination** check box. In the procedure used with the standby node (explained below), this check box does not need to be selected.

4. Click the **OK** button. The database directory will be created on the shared disk.

7. Move the spool directory for Job Execution Control at the active node.

   1. Click the **Operation information** button in the **job control** field in the **Systemwalker Operation Manager Environment Setup** window.

      The **Define Operating Information** window will be displayed.

2. Select the **Cluster settings** tab in the **Define Operating Information** window and change the **Spool directory** field to the drive name on the shared disk to specify the spool directory of Subsystem 0.

3. Click the **OK** button and use the **Save of the defining operation information** window that appears to save the operating information definition. Once saved, the operating information definition will become effective when the next operation takes place.

8. Move the database directory for Jobscheduler and the spool directory for Job Execution Control at Subsystem 1.

When doing so, read all instances of "Subsystem 0" in step 6 and 7 as "Subsystem 1". Also note the following:

   - In 3 of step 6, specify the database directory on the shared disk for Subsystem 1 in the **Directory** field in the **Database** tab.

   Example:

```
z:\omgr1\mpjobsch\jobdb1
```

   - In 2 of step 7, specify the spool directory on the shared disk for Subsystem1in the **Spool directory**.

   Example:

```
z:\omgr1\mpmjessv\mjespool1
```

9. Move the database directory for the Master Schedule Management function at the active node (only when this function is enabled).

To move the database directory, use the *stemsetdbpath* command (DB directory change command for cluster).

Example:

```
stemsetdbpath.exe z:\omgr\mpstemsv -r -sys 0
```

In the procedure used with the standby node (explained below), enter the command as below.

Example:

```
stemsetdbpath.exe z:\omgr\mpstemsv -r -n -sys 0
```

Perform the above operations for each subsystem. For Subsystem 1, specify the "-sys 1" option when executing the *stemsetdbpath* command.

For details on the *stemsetdbpath* command, refer to the *Systemwalker Operation Manager Reference Guide*.

10. Confirm that the active node is designated as the owner and vary the shared disk offline.

    Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk offline.

11. Perform steps 2 through 10 at the standby node as well. When doing so, read all instances of "active node" in the explanation as "standby node". Also note the following with respect to the standby node:

    - At the standby node, there is no need to create the directory on the shared disk in 1 of step 5.

    - At the standby node, there is no need to specify the *-pm* operand when executing the *calregpath* command in 2 of step 5.

    - At the standby node, there is no need to select the **Copy current database to destination** check box in 3 of step 6.

    - At the standby node, specify the *-n* operand when executing the *stemsetdbpath* command in step 9.

1:1 active/standby configuration (with subsystems and partial cluster operation)

The procedure used to transfer resources to the shared disk in a 1:1 active/standby configuration (with subsystems and partial cluster operation) is explained below. In the following explanation, it is assumed that both Subsystem 0 and Subsystem 1 are operating, that Subsystem 0 is not involved in cluster operation and is operating on each node, and that only Subsystem 1 is operating in a cluster. The shared disk is indicated by the drive letter "z:".

1. Use the **Failover Cluster Management** dialog box to vary the Systemwalker Operation Manager cluster service offline.

   Cluster services are in an offline state immediately after they have been registered, so it is advisable to wait a few moments after registration, then vary the cluster service online, and then vary the cluster service offline again.

2. Transfer the ownership rights of "Systemwalker Operation Manager" to the active node. To transfer ownership to the active node, right-click on the Systemwalker Operation Manager cluster service and specify the active node via **Move this service or application to another node**.

   This operation is not necessary if the active node is already designated as the owner.

3. Stop the calendar service at the active node.

   Open the **Services** dialog box from the **Administrative Tools** applet in the **Control Panel** and stop the following service:

   - Systemwalker MpJmCal

4. Check that the active node is designated as the owner and then vary the shared disk online.

   Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk online.

5. Create a directory for calendar control information at the active node and transfer the calendar control information to the shared disk. Transfer the calendar control information for Subsystem 1 only, which is used in cluster operation.

   1. Create a directory for calendar control information on the shared disk.

      This operation is not required at the standby node.

      In the following example, the directory "\mpjmcal\sys1" for the calendar control information of Subsystem 1 will be created in the "\omgr" directory on shared disk "z:":

      ```
      z:\omgr\mpjmcal\sys1
      ```

   2. Use the *calregpath* command to register the calendar control information directory created in 1 of step 5 above for each subsystem. Also specify the *-pm* operand to transfer the calendar control information to the shared disk.

      Example:

      ```
      calregpath.exe -add -sys 1 -pm -p z:\omgr\mpjmcal\sys1
      ```

      When performing this operation at the standby node (explained below), enter the command as shown in the following example.

      Example:

```
calregpath.exe -add -sys 1 -p z:\omgr\mpjmcal\sys1
```

3. If more than one subsystem is used in cluster operation, perform 1 and 2 of step 5 above for each such subsystem. In this example, only Subsystem 1 is used in cluster operation so these steps are performed for Subsystem 1 only.

6. Move the Jobscheduler database directory at the active node. Only move the database directory of Subsystem 1 only, which is the subsystem used in cluster operation.

   1. Display the **Systemwalker Operation Manager Environment Setup** window connected to Subsystem 1.

      Select **Systemwalker Operation Manager**, **Environment Setup** and then **Environment Setup**. Use the **Environment Setup [Login]** window that appears to connect to the server. When the **Specify Subsystem Connection** window appears, specify the subsystem number "1".
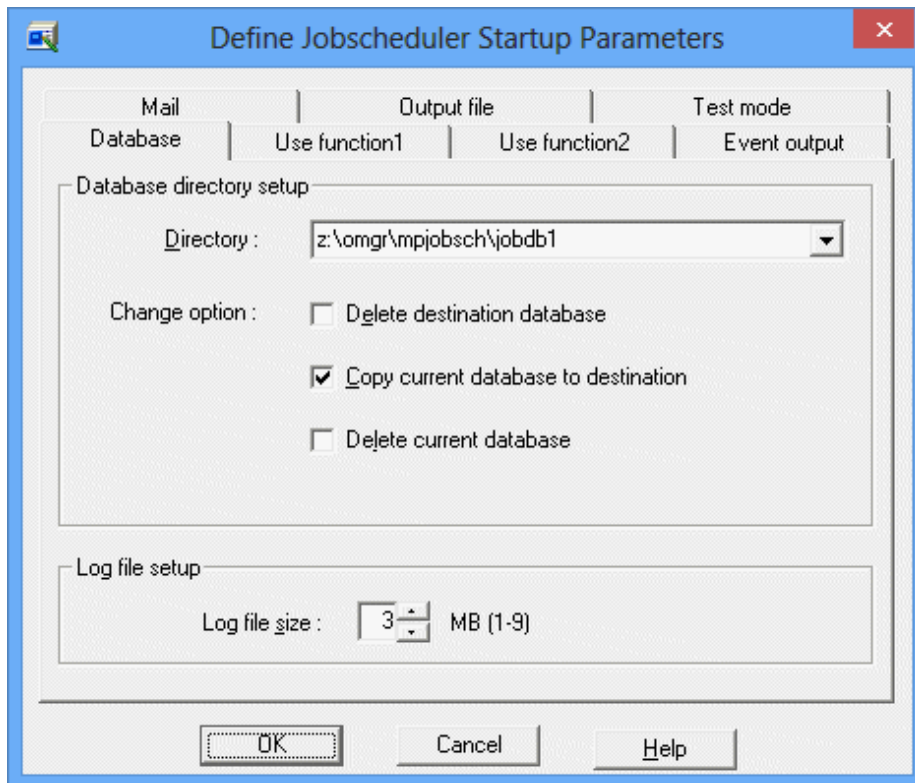
      The **Systemwalker Operation Manager Environment Setup** window will be displayed.

      Specify the physical IP address of the active node in the **Host name** field of the **Environment Setup [Login]** window.

   2. Click the **Startup parameter** button in the **Jobscheduler** field of the **Systemwalker Operation Manager Environment Setup** window.

      The **Define Jobscheduler Startup Parameters** window will be displayed.

   3. Select the **Database** tab and change the default drive name that appears as the installation directory in the **Directory** field in the **Database directory setup** frame to the drive name of the shared disk to specify the database directory of Subsystem 1.

      Select the **Copy current database to destination** check box. In the procedure used with the standby node (explained below), this check box does not need to be selected.

   4. Click the **OK** button. The database directory will be created on the shared disk.

7. Move the spool directory for Job Execution Control at the active node. Move the spool directory of Subsystem 1 only, which is the subsystem used in cluster operation.

   1. Click the **Operation information** button in the **job control** field in the **Systemwalker Operation Manager Environment Setup** window.

      The **Define Operating Information** window will be displayed.

2. Select the **Cluster settings** tab in the **Define Operating Information** window and change the **Spool directory** field to the drive name of the shared disk to specify the spool directory of Subsystem 1.

3. Click the **OK** button and use the **Save of the defining operation information** window that appears to save the operating information definition. Once saved, the operating information definition will become effective when the next operation takes place.

8. If more than one subsystem is used in cluster operation, perform the same procedure as that described in steps 6 and 7 above for each such subsystem. In this example, only Subsystem 1 is used in cluster operation so these steps are performed for Subsystem 1 only.

9. Move the database directory for the Master Schedule Management function at the active node (only when the Master Schedule Management function is enabled).

Use *stemsetdbpath* (DB Directory Change Command for Cluster) to move the database directory.

Example:

```
stemsetdbpath.exe z:\omgr\mpstemsv -r -sys 1
```

When performing this operation at the standby node (explained below), enter the command as shown in the following example.

Example:

```
stemsetdbpath.exe z:\omgr\mpstemsv -r -n -sys 1
```

Perform the above operations for each such subsystem used in cluster operation. In this example, only Subsystem 1 is used in cluster operation so these operations are performed for Subsystem 1 only.

Refer to the *Systemwalker Operation Manager Reference Guide* for details on the *stemsetdbpath* command.

10. Verify that the active node is designated as the owner and then vary the shared disk offline. Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk offline.

11. Perform steps 2 through 10 at the standby node. When doing so, read all instances of "active node" in the explanation as "standby node". Also note the following with respect to the standby node:

   - At the standby node, there is no need to create the directory on the shared disk in 1 of step 5.

   - At the standby node, there is no need to specify the *-pm* operand when executing the *calregpath* command in 2 of step 5.

   - At the standby node, there is no need to select the **Copy current database to destination** check box in 3 of step 6.

   - At the standby node, specify the *-n* operand when executing the *stemsetdbpath* command in step 9.

N:1 active/standby configuration (with subsystems)

The procedure used to transfer resources to the shared disk in an N:1 active/standby configuration (with subsystems) is explained below. This explanation assumes that 2:1 active/standby configuration and active node are "Active 1" and "Active 2", using Subsystem 0 with Active 1, and Subsystem 1 with Active 2, the shared disk for Active 1 is indicated by the drive letter "z:", and the shared disk for Active 2 is indicated by the drive letter "y:".

1. Put the Systemwalker Operation Manager cluster service offline using **Failover Cluster Management**.

   As the cluster service is offline immediately after registration, wait a little while after registering, and then switch cluster service to online, and then offline after that.

2. Transfer the ownership rights of Systemwalker Operation Manager to the active node. To transfer ownership, place the cursor over the Systemwalker Operation Manager cluster service and right click, then specify the active node in **Move this service or application to another node**.

   This operation is not required if the active node is already designated as **Owner**.

3. Stop the calendar service on the active node.

   Use **Services** in the **Administrative Tools** dialog box of the **Control Panel** to stop the following service.

   - Systemwalker MpJmCal

4. Confirm that the active node is designated as the **Owner**, and put the shared disk online.

   Select the registered physical disk resource with **Failover Cluster Management**, and put the shared disk online.

5. On the active node, create a directory for calendar control information, and transfer the calendar control information. Only Subsystem 1, which is used in cluster operation, can be transferred.

   1. Create a directory for calendar control information on the shared disk.

      This operation is not required on the standby node.

      Example of creating the calendar control information directory\mpjmcal under the \omgr directory of Active 1's shared disk "z:" and Active 2's shared disk "y:":

      [Create directory for Active 1]

      ```
      z:\omgr\mpjmcal
      ```

      [Create directory for Active 2]

      ```
      y:\omgr\mpjmcal\sys1
      ```

   2. Register the directory for calendar control information created in step 1 of step 5 in each subsystem with the calregpath command. Also, specify the operand "-pm" and transfer the calendar control information to the shared disk.

      Example of registering the calendar control information directory\mpjmcal under the \omgr directory of Active 1's shared disk "z:" and Active 2's shared disk "y:" using the calregpath command, and then transferring it to a shared disk:

      Example of Active 1 command:

      ```
      calregpath.exe -add -sys 0 -pm -p z:\omgr\mpjmcal
      ```

Example of Active 2 command:

```
calregpath.exe -add -sys 1 -pm -p y:\omgr\mpjmcal\sys1
```

Example of standby node command:

```
calregpath.exe -add -sys 0 -p z:\omgr\mpjmcal
calregpath.exe -add -sys 1 -p y:\omgr\mpjmcal\sys1
```

   3. If there are multiple cluster operation subsystems, execute the procedure undertaken in steps 1 and 2 of step 5 above for each subsystem that is used in cluster operation. In this example, as only Subsystem 1 is used in cluster operation, only execute it for Subsystem 1.

6. Transfer the Jobscheduler's database directory on the active node. Move Subsystem 1 only, which is the subsystem used in cluster operation.

   1. Display the **Systemwalker Operation Manager Environment Setup** window connected to Subsystem 1.

      Select **Start** >> **Programs** >> **Systemwalker Operation Manager** >> **Environment Setup** >> **Environment Setup**, connect to the server in the **Systemwalker Operation Manager Environment Setup [Login]** window that is displayed, and select subsystem number 1 in the **Specify Subsystem Connection** window that is displayed.
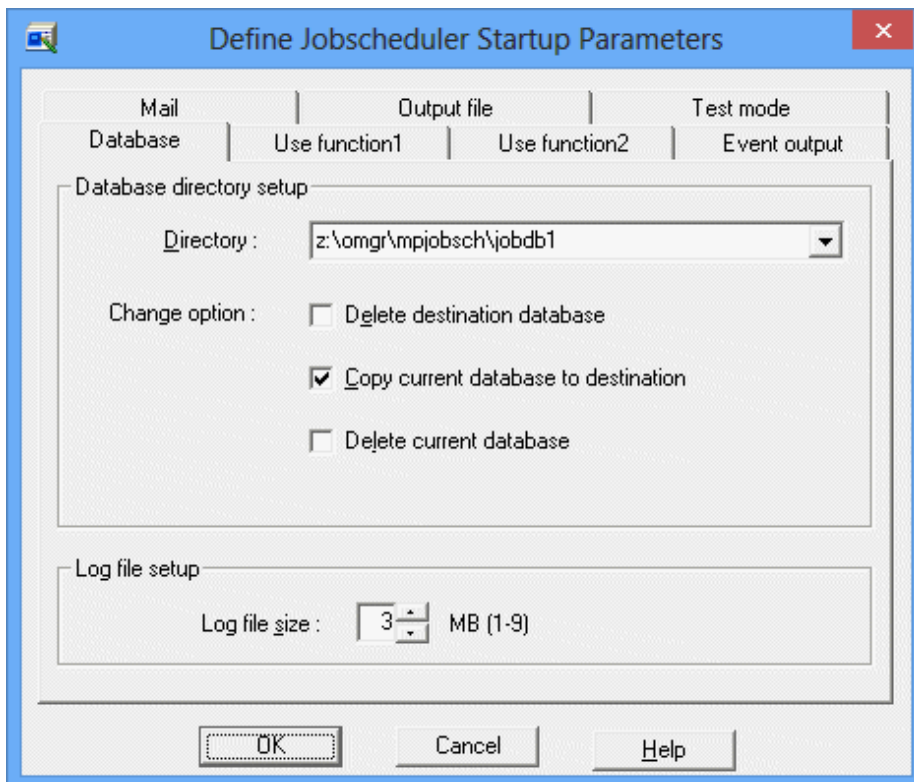
      The **Systemwalker Operation Manager Environment Setup** window will be displayed.

      Specify the physical IP address of the active node in the **Host** field of the **Systemwalker Operation Manager Environment Setup [Login]** window.

   2. Click the **Startup parameter** button in **Jobscheduler** of the **Systemwalker Operation Manager Environment Setup** window.

      The **Define Jobscheduler Startup Parameters** window will be displayed.

   3. Select the **Database** tab and change the default drive name that appears as the installation directory in the **Directory** field in **Database directory setup** to the drive name of the shared disk to specify the database directory of Subsystem 1.


      Select the **Copy current database to destination** checkbox. In the procedure used with the standby node (explained in Step 11 below), this checkbox does not need to be selected.

4. Click the **OK** button. The database directory will be created on the shared disk.

7. Move the spool directory for Job Execution Control on the active node. Move the spool directory of Subsystem 1 only, which is the subsystem used in cluster operation.

   1. Click the **Operation information** button in **Job control** in the **Systemwalker Operation Manager Environment Setup** window.

      The **Define Operating Information** window will be displayed.

   2. Select the **Cluster settings** tab in the **Define Operating Information** window and change the **Spool directory** to the drive name of the shared disk to specify the spool directory of Subsystem 1.
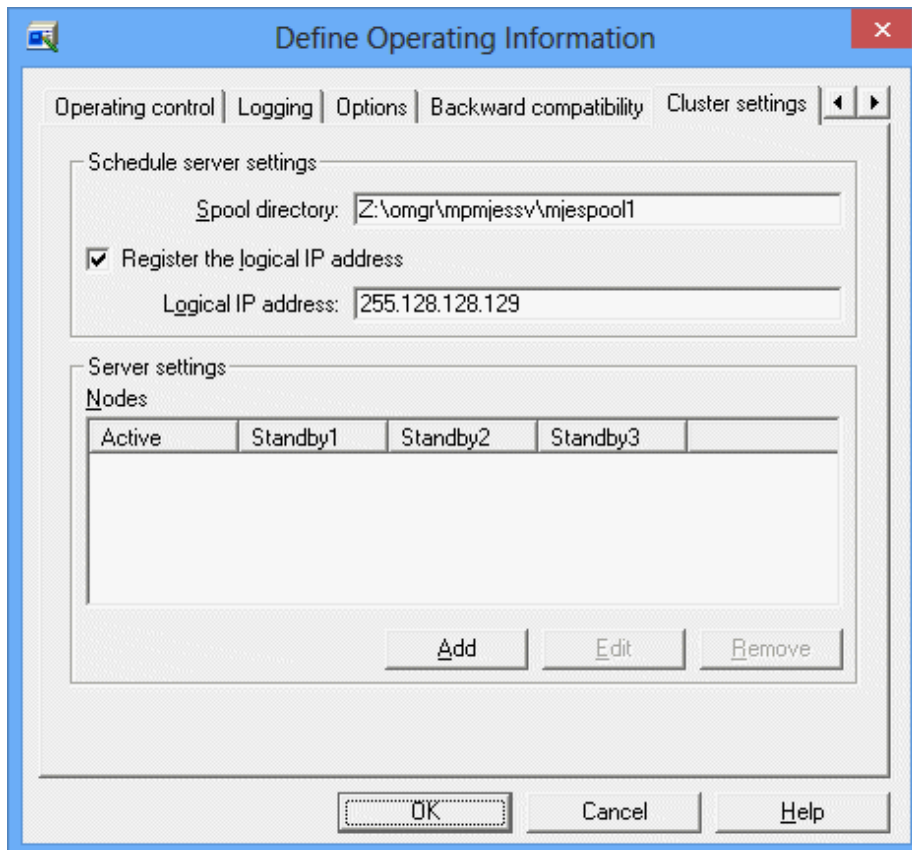
   3. Click the **OK** button and use the **Save of the defining operation information** window that appears to save the operating information definition. Once saved, the operating information definition will become effective when the next operation takes place.

8. If there are multiple cluster operation subsystems, execute the same procedure undertaken in steps 6 and 7 for each subsystem that is used in cluster operation. In this example, as only Subsystem 1 is used in cluster operation, these steps are only performed for Subsystem 1.

9. Move the database directory for the Master Schedule Management function on the active node (only when Master Schedule Management function is enabled).

   Use the stemsetdbpath command (DB directory change command for cluster) to move the database directory.

   Example:

   ```
   stemsetdbpath.exe z:\omgr\mpstemsv -r -sys 1
   ```

   When performing this operation at the standby node (explained in Step 11 below), enter the command as shown in the following example.

   Example:

   ```
   stemsetdbpath.exe z:\omgr\mpstemsv -r -n -sys 1
   ```

Perform the above operations for each subsystem used in cluster operation. In this example, as only Subsystem 1 is used in cluster operation, only perform these steps for Subsystem 1.

Refer to the *Systemwalker Operation Manager Reference Guide* for details on the stemsetdbpath command.

10. Confirm that the active node is designated as the **Owner**, and put the shared disk offline. Select the registered physical disk resource with **Failover Cluster Management**, and put the shared disk offline.

11. Perform steps 2 through 10 on the standby node in the same way. When doing so, read all instances of "active node" in the explanation as "standby node". Also note the following with respect to the standby node when performing operations:

    - On the standby node, there is no need to create the directory on the shared disk in 1 of step 5.

    - On the standby node, there is no need to specify the -pm operand when executing the calregpath command in 2 of step 5.

    - On the standby node, there is no need to select the **Copy current database to destination** checkbox in 3 of step 6.

    - On the standby node, specify the "-n" operand when executing the stemsetdbpath command in step 9.

4.2.2 For dual node mutual standby configuration

The procedure explained below is used to transfer resources in dual node mutual standby configuration.

The example below assumes that resources will be transferred using the following configuration.
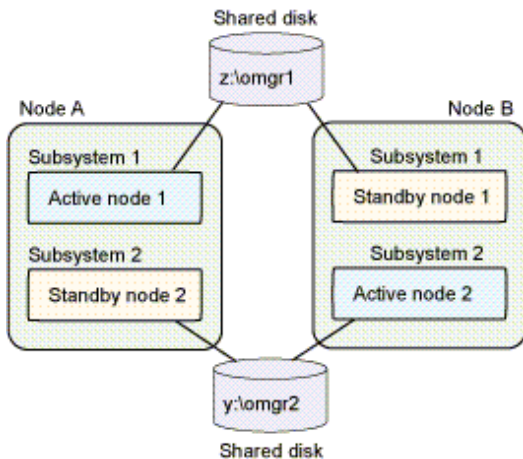
Resources to be moved

Resources are transferred to respective shared disk for each subsystem. For example, if Subsystem 1 and Subsystem 2 have been created, the following resources will be transferred:

- Calendar control information of Subsystem 1

- Database directory for Jobscheduler of Subsystem 1

- Spool directory for Job Execution Control of Subsystem 1

- Database directory for the Master Schedule Management function of Subsystem 1 (only when the Master Schedule Management function is enabled)

- Calendar control information of Subsystem 2

- Database directory for Jobscheduler of Subsystem 2

- Spool directory for Job Execution Control of Subsystem 2

- Database directory for the Master Schedule Management function of Subsystem 2 (only when the Master Schedule Management function is enabled)

Relocation procedure

At both Node A and Node B, transfer resources to the shared disk of Subsystem 1 and the shared disk of Subsystem 2.

This example explains how to transfer resources. The explanation assumes that the cluster service "OperationMGR1" is registered for Subsystem 1, and the cluster service "OperationMGR2" is registered for Subsystem 2. The shared disk of Subsystem 1 is "z:" and the shared disk of Subsystem 2 is "y:". It also assumes that Subsystem 1 resources will be transferred to "z:\omgr1" and Subsystem 2 resources will be transferred to "y:\omgr2".

Perform the following operations at Node A.

1. Open the **Failover Cluster Management** dialog box and vary the Systemwalker Operation Manager cluster services "OperationMGR1" and "OperationMGR2" (for Subsystem 1 and Subsystem 2) offline.

   Cluster services are in an offline state immediately after they have been registered, so it is advisable to wait a few moments after registration, and vary the cluster services online, and then vary the cluster services offline again.

2. Transfer the ownership rights of "Systemwalker Operation Manager" to Node A.

   To transfer ownership to the active node, right-click on the Systemwalker Operation Manager cluster service and specify the active node via **Move this service or application to another node**.

   This operation is not necessary if Node A is already designated as the owner.

3. Stop the calendar service.

   Open the **Services** dialog box from the **Administrative Tools** applet in the **Control Panel** and stop the following service:

   - Systemwalker MpJmCal

   A dialog box will appear asking the user to confirm shutdown of the "Systemwalker MpJobsch" service. Click the **OK** button.

4. Vary the shared disks of Subsystem 1 and Subsystem 2 online.

   Use the **Failover Cluster Management** dialog box to select the physical disk resource registered for Subsystem 1 and vary the shared disk online. Perform the same procedure for the shared disk of Subsystem 2.

5. Create directories for calendar control information on the shared disks of Subsystem 1 and Subsystem 2 and transfer the information.

   1. Create directories for calendar control information on the shared disks connected to Subsystem 1 on the active node and Subsystem 2 on the standby node.

      This operation is not required on Node B.

      In the following example, calendar control information directory "\mpjmcal\sys1" will be created in the "\omgr1" directory on shared disk "z:".

      ```
      z:\omgr1\mpjmcal\sys1
      ```

      In the following example, calendar control information directory "\mpjmcal\sys2" will be created in the "\omgr2" directory on shared disk "y:".

      ```
      y:\omgr2\mpjmcal\sys2
      ```

   2. Use the *calregpath* command to register the shared disk directory of Subsystem 1 with the calendar control information directory created in 1 above. Also specify the *-pm* operand to transfer the calendar control information to the shared disk.

      Example:

      ```
      calregpath.exe -add -sys 1 -pm -p z:\omgr1\mpjmcal\sys1
      ```

      Use the *calregpath* command to register the shared disk directory of Subsystem 2. As Subsystem 2 is the standby node, there is no need for Node A to transfer the calendar control information to the shared disk with the *-pm* operand.

      Example:

      ```
      calregpath.exe -add -sys 2 -p y:\omgr2\mpjmcal\sys2
      ```

      In the procedure used with Node B (explained below), the command operand is changed.

6. Move the Jobscheduler's database directory at Subsystem 1.

   To move the database directory, use the **Systemwalker Operation Manager Environment Setup** window.

1. Display the **Systemwalker Operation Manager Environment Setup** window connected to Subsystem 1.

   To do so, select **Systemwalker Operation Manager**, click **Environment Setup** - **Environment Setup**, and use the **Environment Setup [Login]** window that appears to connect to the server.

   Specify the subsystem number "1" in the **Specify Subsystem Connection** window displayed as a result.

   And then the **Systemwalker Operation Manager Environment Setup** window will be displayed.

   Specify the physical IP address of Node A in the **Host name** field of the **Environment Setup [Login]** window.

2. Click the **Startup parameter** button in the **Jobscheduler** field of the **Systemwalker Operation Manager Environment Setup** window.

   The **Define Jobscheduler Startup Parameters** window will be displayed.

3. To specify the database directory of Subsystem 1, select the **Database** tab and change the default drive name of the installation directory shown in the **Directory** box in the **Database directory setup** field to the drive name of the shared disk.
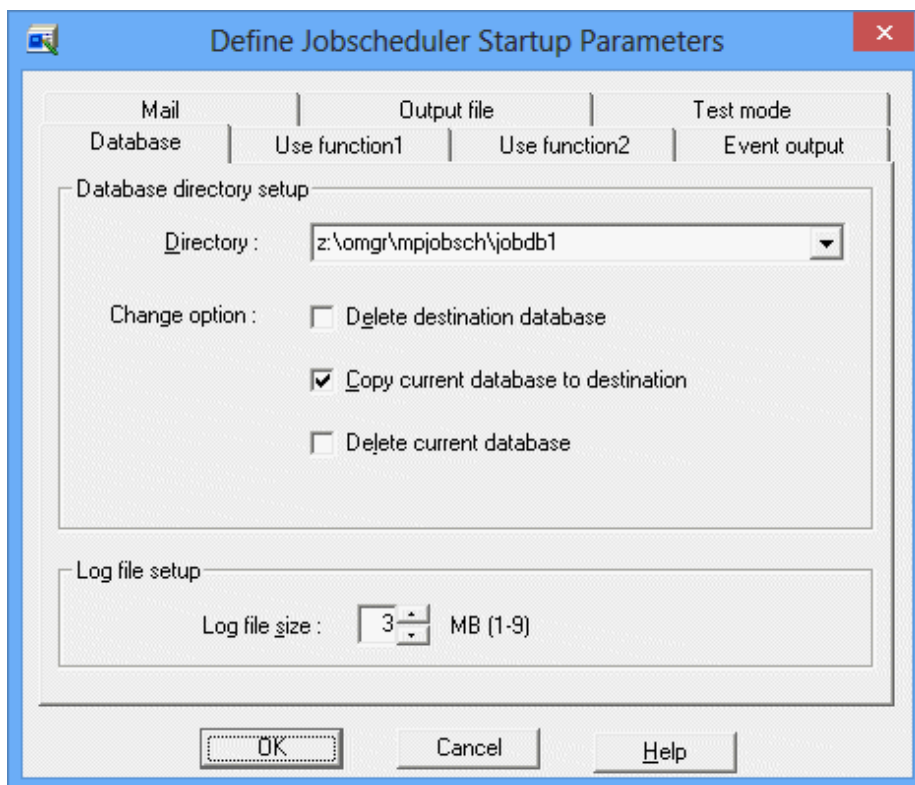
   Select the **Copy current database to destination** check box. In the procedure used with Node B (explained below), this check box does not need to be selected.

4. Click the **OK** button. The database directory will be created on the shared disk.

7. Move the spool directory for Job Execution Control at Subsystem 1.

   To move the spool directory, use the **Systemwalker Operation Manager Environment Setup** window.

   1. Click the **Operation information** button in the **job control** field in the **Systemwalker Operation Manager Environment Setup** window.

   The **Define Operating Information** window will be displayed.

2. Select the **Cluster settings** tab of the **Define Operating Information** window. To set the **Spool directory** of Subsystem 1, change the value shown in the **Spool directory** box in the **Schedule server settings** field to the drive name on the shared disk for Subsystem 1.
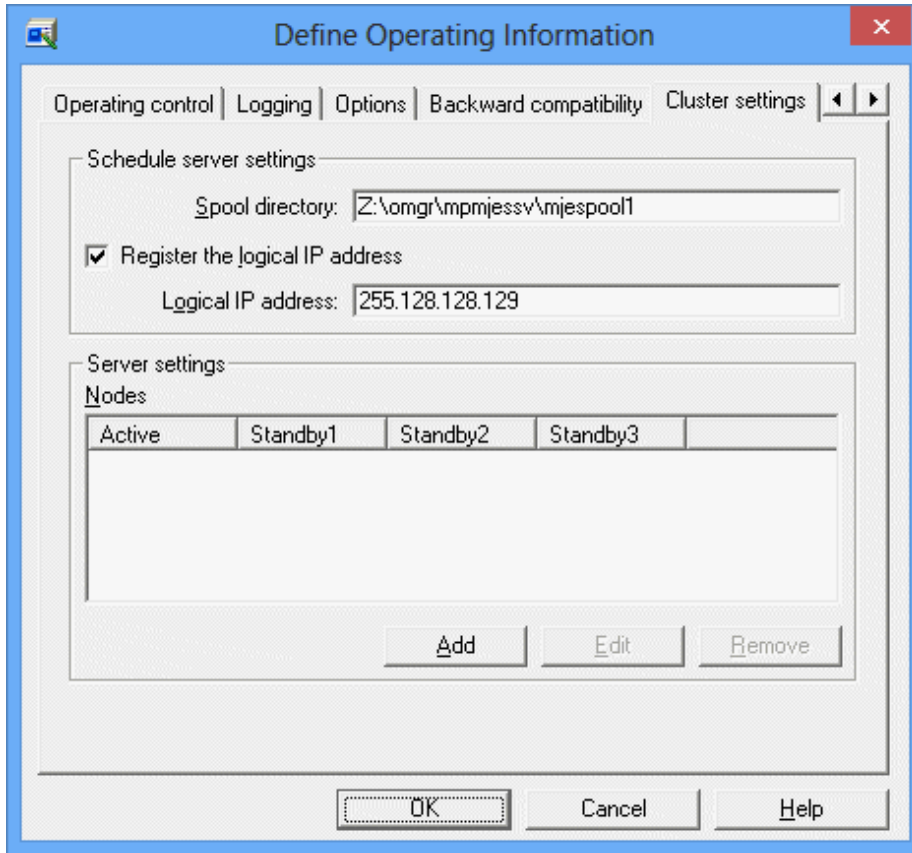
3. Click the **OK** button and use the **Save of the defining operation information** window that appears to save the operation information definition. Once saved, the operating information definition will become effective when the next operation takes place.

8. At Subsystem 2, move the Jobscheduler database directory and the Job Execution Control spool directory.

   When doing so, read all instances of "Subsystem 1" in steps 6 and 7 as "Subsystem 2". Also note the following:

   - When performing the operations described in 3 of step 6, specify the database directory on the Subsystem 2 shared disk in the **Directory** field of the **Database** tab.

     Example:

     ```
     y:\omgr2\mpjobsch\jobdb2
     ```

   - When performing the operations described in 2 of step 7, specify the spool directory on the Subsystem 2 shared disk in the **Spool directory**.

     Example:

     ```
     y:\omgr2\mpmjessv\mjespool2
     ```

9. Move the database directory for the Master Schedule Management function (only when this function is enabled).

   To move the database directory, use the *stemsetdbpath* command (DB directory change command for cluster).

   Move the database directory at Subsystem 1 to the shared disk:

   Example:

   ```
   stemsetdbpath.exe z:\omgr1\mpstemsv -r -sys 1
   ```

Change the registration information in the database directory at Subsystem 2.

Example:

```
stemsetdbpath.exe y:\omgr2\mpstemsv -r -n -sys 2
```

In the procedure used with Node B (explained below), enter the command as follow.

Example:

```
stemsetdbpath.exe z:\omgr1\mpstemsv -r -n -sys 1
stemsetdbpath.exe y:\omgr2\mpstemsv -r -sys 2
```

Refer to the *Systemwalker Operation Manager Reference Guide* for details on the *stemsetdbpath* command.

10. Vary the shared disks of Subsystem 1 and Subsystem 2 offline.

    Use the **Failover Cluster Management** dialog box to select the physical disk resource registered for Subsystem 1 and vary the shared disk offline. Perform the same procedure for the shared disk of Subsystem 2.

Transfer the resources at Node B.

Perform the operations described in steps 2 through 9 above at Node B. However, when doing so, note the following:

- There is no need to perform the operations described in 1 of step 5 because the relevant directory has already been created on Node A.

- When performing the operations described in 2 of step 5 on Node B, change the command options as shown in the following example:

  Register the directory on the shared disk of Subsystem 2

  ```
  calregpath.exe -add -sys 2 -pm -p y:\omgr2\mpjmcal\sys2
  ```

  Register the directory on the shared disk of Subsystem 1

  Because Subsystem 1 is the standby node, there is no need for Node B to transfer the calendar control information to the shared disk with the *-pm* operand.

  ```
  calregpath.exe -add -sys 1 -p z:\omgr1\mpjmcal\sys1
  ```

- When performing the operations described in 3 of step 6, clear the **Copy current database to destination** check box.

- In step 9, change the designation of the *-n* operand between the active node and standby node when executing the *stemsetdbpath* command.

4.3 Settings for Automatic Reflection

Perform settings so that the following information can be automatically reflected in the active and standby nodes:

- Security information

- Calendar information

  - Day change time

  - Calendar holiday information

  - Schedule information, power schedule information and completion monitoring information for the SYSTEM_CALENDAR

- Service/application startup information

  - Application startup information

Settings for automatically reflecting security information

This section describes the procedure for automatically reflecting security information.

Settings for 1:1 active/standby (without subsystems) and 1:1 active/standby (with subsystems) configurations

1. Transfer the ownership rights of "Systemwalker Operation Manager" to the active node.

   To transfer ownership to the active node, right-click on the Systemwalker Operation Manager cluster service and specify the active node via **Move this service or application to another node**.

   This operation is not necessary if the active node is already designated as the owner.

2. Vary the shared disk online at the active node.

   Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk online.

3. Execute the following command at the active node to set the cluster information.

   When the shared disk directory created in "4.2 Moving Resources to the Shared Disk" is "z:\omgr":

   ```
   mpaclcls z:\omgr
   ```

   Refer to the *Systemwalker Operation Manager Reference Guide* for details on the mpaclcls command.

4. Reflect security information in files on the shared disk by executing the following command on the active node. This operation is not required on the standby node.

   ```
   mpcssave
   ```

   Refer to the *Systemwalker Operation Manager Reference Guide* for details on the mpcssave command.

5. Vary the shared disk offline at the active node.

   Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk offline.

6. Perform steps 1, 2, 3 and 5 at the standby node. There is no need to perform step 4.

Settings for 1:1 active/standby configurations (with subsystems and partial cluster operation)

 Note
・・・
Perform these settings for only subsystems that will be registered with a cluster system.
・・・

In the following explanation of the transfer procedure, it is assumed that Subsystem 1 will be used in cluster operation.

1. Transfer the ownership rights of "Systemwalker Operation Manager" to the active node.

   To transfer ownership to the active node, right-click on the Systemwalker Operation Manager cluster service and specify the active node via **Move this service or application to another node**. This operation is not necessary if the active node is already designated as the owner.

2. Vary the shared disk online at the active node.

   Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk online.

3. Execute the following command at the active node to set the cluster information.

   When the shared disk directory created in "4.2 Moving Resources to the Shared Disk" is "z:\omgr":

   ```
   mpaclcls -s 1 z:\omgr
   ```

   Refer to the *Systemwalker Operation Manager Reference Guide* for details on the mpaclcls command.

4. Execute the following command on the active node to apply security information to files on the shared disk. This operation is not required on the standby node.

   ```
   mpcssave -s 1
   ```

   Refer to the *Systemwalker Operation Manager Reference Guide* for details on the mpcssave command.

5. Vary the shared disk offline at the active node.

   Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk offline.

6. Perform steps 1, 2, 3 and 5 at the standby node. There is no need to perform step 4.

Settings for N:1 active/standby configuration (without subsystems)

1. Transfer the ownership rights of "Systemwalker Operation Manager" to the active node.

   To transfer ownership to the active node, right-click on the Systemwalker Operation Manager cluster service and specify the active node via **Move this service or application to another node**.

   This operation is not necessary if the active node is already designated as the owner.

2. Vary the shared disk online at the active node.

   Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk online.

3. Execute the *mpaclcls* command at the active node as shown in the following example to set the cluster information.

   When the shared disk directory created in "4.2 Moving Resources to the Shared Disk" is "z:\omgr":

   ```
   mpaclcls z:\omgr
   ```

   Specify the shared disk connected to each active node as a shared disk.

   Refer to the *Systemwalker Operation Manager Reference Guide* for details on the *mpaclcls* command.

4. Reflect security information to files on the shared disk by executing the following command on the active node. This operation is not required on the standby node.

   ```
   mpcssave
   ```

   Refer to the *Systemwalker Operation Manager Reference Guide* for details on the mpcssave command.

5. Vary the shared disk offline at the active node.

   Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk offline.

6. Perform steps 1 through 5 at on all the active nodes.

   When performing these operations, change the shared disk in steps 1 and 5 and "z:\omgr" in step 3 to an actual directory on the shared disk (e.g., "x:\omgr").

N:1 active/standby configuration (with subsystems)

1. 1. Transfer the ownership rights of Systemwalker Operation Manager to the active node.

   To transfer ownership, place the cursor over the Systemwalker Operation Manager cluster service and right click, then specify the active node in **Move this service or application to another node**.

   This operation is not required if the active node is already designated as **Owner**.

2. 2. On the active node, change the shared disk to online.

   Select the registered physical disk resource using **Failover Cluster Management**, and put the shared disk online.

3. 3. Execute the following command on the active node to set the cluster information.

   In the examples below, when moving resources to the shared disk (explained in "4.2 Moving Resources to the Shared Disk"), 2:1 active/standby configuration and active node are "Active 1" and "Active 2", using Subsystem 0 with Active 1, and Subsystem 1 with Active 2, and the shared disk for Active 1 is indicated by the drive letter "z:", and the shared disk for Active 2 is indicated by the drive letter "y:":

   [Example of Active 1 command]

   ```
   mpaclcls z:\omgr
   ```

   [Example of Active 2 command]

   ```
   mpaclcls -s 1 y:\omgr
   ```

   [Example of standby node command]

```
mpaclcls z:\omgr
mpaclcls -s 1 y:\omgr
```

Refer to the *Systemwalker Operation Manager Reference Guide* for details on the mpaclcls command.

4. Execute the following command on the active node to reflect the security information in the files on the shared disk. This operation is not required for the standby node.

   The following examples show where 2:1 active/standby configuration and active node are "Active 1" and "Active 2", and using Subsystem 0 with Active 1, and Subsystem 1 with Active 2.

   [Example of Active 1 command]

```
mpcssave
```

   [Example of Active 2 command]

```
Mpcssave -s 1
```

   Refer to the *Systemwalker Operation Manager Reference Guide* for details on the mpcssave command.

5. 5. On the active node, change the shared disk to offline.

   Select the registered physical disk resource using **Failover Cluster Management**, and put the shared disk offline.

6. 6. Perform steps 1 to 5 on the standby node. However, step 4 is not required.

Settings for dual node mutual standby configuration

The following example uses the configuration shown in "4.2.2 For dual node mutual standby configuration" in "Moving Resources to the Shared Disk."

Perform the following operations at Node A.

1. Transfer the ownership rights of "Systemwalker Operation Manager" to Node A.

   To transfer ownership to the active node, right-click on the Systemwalker Operation Manager cluster service and specify the active node via **Move this service or application to another node**.

   This operation is not necessary if Node A is already designated as the owner.

2. Vary the shared disks of Subsystem 1 and Subsystem 2 online.

   Use the **Failover Cluster Management** dialog box to select the physical disk resource registered for Subsystem 1 and vary the shared disk online. Perform the same procedure for the shared disk of Subsystem 2.

3. Execute the following command to create a directory on the shared disk for security information. When the procedure is performed at Node B (explained below), the command operand is changed.

   When the shared disk directory created in "4.2 Moving Resources to the Shared Disk" is "z:\omgr1":

```
mpaclcls -s 1 z:\omgr1
```

4. Execute the following command to apply the security information of Node A to files on the shared disk. When the procedure is performed at Node B (explained below), the command operand is changed.

```
mpcssave -s 1
```

5. Execute the following command to register the Subsystem 2 shared disk of Node A with the registry. When the procedure is performed at Node B (explained below), the command operand is changed.

   When the shared disk directory created in "4.2 Moving Resources to the Shared Disk" is "y:\omgr2":

```
mpaclcls -s 2 -w y:\omgr2
```

6. Vary the shared disks of Subsystems 1 and 2 offline.

   Use the **Failover Cluster Management** dialog box to select the physical disk resource registered for Subsystem 1 and vary the shared disk offline. Perform the same procedure for the shared disk of Subsystem 2.

Perform steps 1 to 6 on Node B. When doing so, note the following:

- Read all instances of "Node A" as "Node B".

- In step 3, execute the *mpaclcls* command as shown in the following example:

```
mpaclcls -s 2 y:\omgr2
```

- In step 4, execute the *mpcssave* command as shown in the following example:

```
mpcssave -s 2
```

- In step 5, execute the *mpaclcls* command as shown in the following example:

```
mpaclcls -s 1 -w z:\omgr1
```

Refer to the *Systemwalker Operation Manager Reference Guide* for details on the *mpaclcls* command and *mpcssave* command.

Settings for automatically reflecting calendar information and service/application startup information

The procedure for automatically reflecting calendar information is described below.

These operations are not required on the execution server that configures the cluster system.

1) Enable the automatic reflection function

Information

. . . .

In the operation of registering Systemwalker Operation Manager with a cluster system, the automatic reflection function allows you to automatically synchronize the setting information of the calendar and the service application startup function between active node and standby node by using Systemwalker Operation Manager services.

. . . .

Enable the automatic reflection function for calendar information and service/application startup information.

Enable the automatic reflection function for calendar information and service/application startup information by executing the *calsetcluster* command on all the nodes (active and standby) in the cluster system. When executing the *calsetcluster* command, the Systemwalker Operation Manager calendar services must be stopped.

The following examples show how this command is executed.

[Example where all information is automatically reflected with 1:1 active/standby configuration]

```
calsetcluster.exe -type s
```

[Example where all information is automatically reflected with N:1 active/standby configuration]

```
calsetcluster.exe -type n
```

[Example where all information is automatically reflected with dual node mutual standby configuration]

```
calsetcluster.exe -type e
```

Refer to the Systemwalker Operation Manager Reference Guide for details on the calsetcluster command.

2) Set up the automatic reflection hosts

Define the hosts where calendar information and service/application startup information will be reflected in the *calcphost.def* definition file on the active and standby nodes.

For nodes using multiple physical IP addresses, when setting "specific IP addresses", other than those physical "main IP addresses" acquired by executing the OS "hostname" command, as the automatic reflection destination, perform steps 3 to 4 on those nodes that use a "specific IP address".

When using a "main IP address", steps 3 to 4 are not required.

1. Open the *calcphost.def* definition file with a text editor such as Notepad.

```
Systemwalker Operation Manager installation directory\MPWALKER.JM\mpjmcal\etc\calcphost.def
```

2. Enter the physical IP addresses or host names corresponding to the physical IP addresses for all the nodes in the cluster system. Make sure that the definition files include the host name or physical IP address of the local node

   Also, specify the same content for the *calcphost.def* definition file in all nodes that configure cluster systems.

   Instead of specifying a host name, when setting a "specific IP address" to the automatic reflection destination without using a "main IP address", specify the physical IP address to be used as the "specific IP address".

3. Open the *myhostip.def* definition file with a text editor such as Notepad in nodes that will use a "specific IP address".

```
<Systemwalker Operation Manager installation destination directory>\MPWALKER.JM\mpjmcal\etc
\myhostip.def
```

4. Specify the physical IP address that will be used as the "specific IP address".

```
XXX.XXX.XXX.XXX
```

```
Note: Only use numerals and "." as separators.
Do not include characters other than those listed above such as leading or trailing blank spaces
or newline codes.
```

To enable the definition file content, start the calendar service.

Use the **Administrative Tools** >> **Services** dialog box of the **Control Panel** to start the following service:

- Systemwalker MpJmCal

Refer to the *Systemwalker Operation Manager Reference Guide* for details on the *calcphost.def* definition file.

🛈 Note
. . . .

To apply automatic reflection to nodes that are already operating, first distribute policy to standardize the calendar information and service/application startup information on all the nodes. The information extracted by the policy is the information that will be subject to automatic reflection (either calendar information or service/application startup information or both).
. . . .

🛈 Note
. . . .

myhostip.def **definition file**

- The physical IP address specified in the *myhostip.def* definition file must exist in the calendar reflection destination host *calcphost.def* definition file. Also if the IP address does not exist or the specification format is invalid, automatic reflection of calendar information will be invalid.

- The *myhostip.def* definition file is not subject to backup and restore by Systemwalker Operation Manager. If necessary, manually perform backup or restore.
. . . .

4.4 Uninstalling Systemwalker Operation Manager from the Microsoft(R) Fail Over Clustering System

The following procedure is used to uninstall Systemwalker Operation Manager from the Microsoft(R) Fail Over Clustering system.

1. Stop the services managed by the cluster system.

   Stop the services managed by the cluster system by varying the Systemwalker Operation Manager cluster service offline in the **Failover Cluster Management** dialog box.

2. Back up resources.

   If it is necessary to back up resources, refer to "4.7 Backing up and Restoring Resources in Microsoft(R) Fail Over Clustering System Operations" and back up the active node.

3. Transfer resources to each node.

   To save existing information before an upgrade installation, transfer the information stored on the shared disks to each node.

   Refer to "4.2 Moving Resources to the Shared Disk" and transfer resources to the following directory on each node.

   - The database directory for the Jobscheduler

     When no subsystems have been created:

     ```
     Systemwalker Operation Manager installation directory\mpwalker.jm\mpjobsch\jobdb
     ```

     When subsystems have been created:

     ```
     Systemwalker Operation Manager installation directory\mpwalker.jm\mpjobsch\jobdbn
     ```

     n: Subsystem number

   - The spool directory for Job Execution Control

     When no subsystems have been created:

     ```
     Systemwalker Operation Manager installation directory\mpwalker.jm\mpmjessv\mjespool
     ```

     When subsystems have been created:

     ```
     Systemwalker Operation Manager installation directory\mpwalker.jm\mpmjessv\mjesn\mjespool
     ```

     n: Subsystem number

   - The database directory for the Master Schedule Management function (only when the Master Schedule Management function is enabled)

     ```
     Systemwalker Operation Manager installation directory\mpwalker.jm\mpstemsv
     ```

4. Delete the resources from the cluster system.

   1. Use the **Failover Cluster Management** dialog box to delete the following Systemwalker Operation Manager resources set in the cluster system:

      1. General-purpose application resources
      2. General-purpose service resources
      3. Physical disk resources
      4. Network name resources
      5. IP address resources

   2. Use the **Failover Cluster Management** dialog box to delete the Systemwalker Operation Manager cluster service.

5. Remove the Master Schedule Management function for the cluster service.

   If the Master Schedule Management function is used, execute the following command at the active and standby nodes to remove the Master Schedule Management function for the cluster service.

   ```
   stemregservice.exe -del -sys subsystem number
   ```

6. Stop services not managed by the cluster system.

   Execute the following command at the active and standby nodes to stop the Systemwalker Operation Manager services not managed by the cluster system.

   If Systemwalker Centric Manager is installed, specify the "/a" option to stop the Systemwalker Centric Manager services as well.

   ```
   poperationmgr /a
   ```

7. Cancel the automatic reflection settings.

   Cancel the automatic reflection settings at the active and standby nodes.

   1. Use the following command to cancel the security information settings:

      ```
      mpaclcls -u
      ```

   2. Use the following command to cancel the settings for automatically reflecting calendar and service/application startup information:

      ```
      calsetcluster.exe -d
      ```

   3. Use the following command to restore the registered directory information for the calendar control information to its original state at installation:

      ```
      calregpath.exe -del -all
      ```

8. Delete cluster information.

   Execute the following command at the active and standby nodes to cancel the cluster environment settings:

   ```
   Systemwalker Operation Manager installation directory\MpWalker.jm\mpcmtool\bin\mpsetcluster.exe
   ```

9. Delete unnecessary directories.

   Delete any unnecessary directories from the shared disks.

   Steps 1 through to 9 release Systemwalker Operation Manager from its application to the cluster system.

   To completely remove Systemwalker Operation Manager, also perform the following operations:

10. Uninstall Systemwalker Operation Manager.

    Uninstall Systemwalker Operation Manager from the active and standby nodes. Refer to "Uninstallation" in the *Systemwalker Operation Manager Installation Guide* for details.

11. Start services.

    If Systemwalker Centric Manager is installed, start the Systemwalker Centric Manager services at the active and standby nodes as required.

    The method used to start Systemwalker Centric Manager differs depending on the version of Systemwalker Centric Manager installed.

    V5.0 or later:

       Execute the *scentricmgr* command.

    V4.0 or earlier:

       Use the **Control Panel**.

To reinstall Systemwalker Operation Manager, first use the procedure above to uninstall Systemwalker Operation Manager, and then reinstall it on the cluster system.

To perform an upgrade installation, release Systemwalker Operation Manager from its application to the cluster system by following steps 1 through to 8 above, perform the upgrade installation, and then reapply Systemwalker Operation Manager to the cluster system.

4.5 Starting and Stopping Services on the Microsoft(R) Fail Over Clustering System

This section describes how to start and stop Systemwalker Operation Manager on the Microsoft(R) Fail Over Clustering system. For 1:1 active/standby configurations (with subsystems and partial cluster operation), it is assumed in the examples that Subsystem 1 is used in cluster operation while Subsystem 0 is not.

Starting services

This section describes the procedure for starting the Systemwalker Operation Manager services.

1. Transfer the ownership rights of Systemwalker Operation Manager to the active node.

   To transfer ownership to the active node, right-click on the Systemwalker Operation Manager cluster service, and specify the active node via **Move this service or application to another node**.

2. Execute the *soperationmgr* command to start any Systemwalker Operation Manager services. In the case of a 1:1 active/standby configuration (with subsystems and partial cluster operation), the Jobscheduler and Job Execution Control services of subsystems not registered with a cluster system will also start.

3. Check the Systemwalker Operation Manager cluster service to verify all the registered resources are online by using the **Failover Cluster Management** dialog box. If all the registered resources are not online, vary the Systemwalker Operation Manager cluster service online by using the **Failover Cluster Management** dialog box.

Stopping services

This section describes the procedure for stopping the Systemwalker Operation Manager services.

1. To stop the Systemwalker Operation Manager services registered with the cluster system, vary the Systemwalker Operation Manager cluster service offline by using the **Failover Cluster Management** dialog box.

   In a 1:1 active/standby (without subsystems) or N:1 active/standby configuration, the following services will be stopped:

   - Systemwalker MpJobsch

   - Systemwalker MpMjes

   - Systemwalker MpStem (only when the Master Schedule Management function is enabled)

   In a 1:1 active/standby (with subsystems) configuration, the Jobscheduler service and Job Execution Control service of subsystem registered with the cluster system will be stopped. If Subsystem 0 and Subsystem 1 are registered with the cluster system, the following services will be stopped:

   - Systemwalker MpJobsch

   - Systemwalker MpMjes

   - Systemwalker MpStem (if the Master Schedule Management function is enabled)

   - Systemwalker MpJobsch1

   - Systemwalker MpMjes1

   - Systemwalker MpStem1 (if the Master Schedule Management function is enabled)

   In the case of a 1:1 active/standby configuration (with subsystems and partial cluster operation), the Jobscheduler and Job Execution Control services of subsystems registered with a cluster system will stop. If only Subsystem 1 is used in cluster operation, the following services will stop:

   - Systemwalker MpJobsch1

   - Systemwalker MpMjes1

   - Systemwalker MpStem1 (when the Master Schedule Management function is enabled)

   In a dual node mutual standby configuration where Subsystem 1 and Subsystem 2 have been created and registered with the cluster system, the following services will be stopped:

- Systemwalker MpJobsch1

- Systemwalker MpMjes1

- Systemwalker MpStem1 (if the Master Schedule Management function is enabled)

- Systemwalker MpJobsch2

- Systemwalker MpMjes2

- Systemwalker MpStem2 (if the Master Schedule Management function is enabled)

2. Stop any Systemwalker Operation Manager services that are not registered with the Microsoft(R) Fail Over Clustering system by using the *poperationmgr* command. In the case of a 1:1 active/standby configuration (with subsystems and partial cluster operation), the Jobscheduler and Job Execution Control services of subsystems not registered with a cluster system will also stop.

The MpJmCal and MpJobsch services are interlocked, so they must be started and stopped in the correct order. MpJmCal must be started first, and MpJobsch can only be started after MpJmCal is running. Conversely, when stopping these services, MpJobsch must have completely stopped before MpJmCal can be stopped. If MpJmCal is stopped while MpJobsch is still running, MpJobsch will be forcibly terminated and a failover will occur.

Note

- Do not start or stop any services using the **Service control** section in the **Systemwalker Operation Manager Environment Setup** window.

- When configuring the Master Schedule Management environment, do not restart the Jobscheduler service from the **Master Schedule Management Environment Setup** dialog box.

Note

Do not use the **Services** dialog box, which is accessed using the **Administrative Tools** applet in the **Control Panel**, to start or stop the following services, otherwise the **Failover Cluster Management** may determine that the relevant service has malfunctioned.

- **In a 1:1 active/standby (without subsystems) or N:1 active/standby configuration:**

    - Systemwalker MpJobsch

    - Systemwalker MpMjes

    - Systemwalker MpStem (if the Master Schedule Management function is enabled)

- **In a 1:1 active/standby (with subsystems) configuration:**

    This issue applies to the Jobscheduler, Job Execution Control, and Master Schedule Management function (if enabled) services of subsystem registered with the cluster system. For example, if Subsystem 0 and Subsystem 1 are registered with the cluster system, the relevant services are as follows:

    - Systemwalker MpJobsch

    - Systemwalker MpMjes

    - Systemwalker MpStem (if the Master Schedule Management function is enabled)

    - Systemwalker MpJobsch1

    - Systemwalker MpMjes1

    - Systemwalker MpStem1 (if the Master Schedule Management function is enabled)

- **In a 1:1 active/standby (with subsystems and partial cluster operation) configuration:**

    This issue applies to the Jobscheduler, Job Execution Control, and Master Schedule Management function (if enabled) services of subsystem registered with the cluster system. For example, if Subsystem 1 only is registered with the cluster system, the relevant services are as follows:

    - Systemwalker MpJobsch1

- Systemwalker MpMjes1

- Systemwalker MpStem1(if the Master Schedule Management function is enabled)

- **In a dual node mutual standby configuration:**

    - Systemwalker MpJobsch1

    - Systemwalker MpMjes1

    - Systemwalker MpStem1 (if the Master Schedule Management function is enabled)

    - Systemwalker MpJobsch2

    - Systemwalker MpMjes2

    - Systemwalker MpStem2 (if the Master Schedule Management function is enabled)

Note

It will be necessary to start the calendar service "Systemwalker MpJmCal" before starting the Jobscheduler service so that the Jobscheduler service "Systemwalker MpJobsch" can run.

4.6 Distributing and Applying Policies in Microsoft(R) Fail Over Clustering System Operations

This section describes how to distribute and apply policies in Microsoft(R) Fail Over Clustering system operations.

First, the procedure for distributing and applying Systemwalker Operation Manager policy information extracted from other servers to the active node is shown below.

1. Distribute policies to the active node

   In the **Systemwalker Operation Manager Distribution [Login]** window, specify the active node host name, and distribute policies to the active node. Select **Apply at the next service startup**.

2. Stop active node services

   Stop each Systemwalker Operation Manager service that is operating on the active node. Refer to "4.5 Starting and Stopping Services on the Microsoft(R) Fail Over Clustering System" for details on how to stop services.

3. Start active node services

   Start each Systemwalker Operation Manager service on the active node. Refer to "4.5 Starting and Stopping Services on the Microsoft(R) Fail Over Clustering System" for details on how to start services.

   When the service starts, the distributed policy information is applied.

Use the following procedure to extract policy information on the active node and distribute it to the standby node:

1. Connect to the active node.

   Select **Start** or **Apps** >> **Systemwalker Operation Manager** >> **Environment Setup**. The **Environment Setup [Login]** window will be displayed. Specify the active node from which policy is to be extracted and then click the **Login** button.

2. Extract policy.

   Click the **Extract policy** button in the **Systemwalker Operation Manager Environment Setup** window to display the **Extract Policy** window.

   Use the **Environment definition** and **Registration information** tabs in the **Extract Policy** window to select the policy to be extracted and then click the **OK** button.

3. Change the connection destination of the shared disk.

    1. Stop the Systemwalker Operation Manager services registered with the cluster system by varying the Systemwalker Operation Manager cluster service offline using the **Failover Cluster Management** dialog box.

    2. Transfer the ownership rights of Systemwalker Operation Manager to the standby node.

       To transfer ownership to the active node, right-click on the Systemwalker Operation Manager cluster service and specify the standby node via **Move this service or application to another node**.

    3. Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk online.

4. Display the **Specify Distribution Subsystem** window.

   Click the **Distribute policy** button in the **Systemwalker Operation Manager Environment Setup** window to display the **Specify Distribution Subsystem** window.

5. Specify distribution destination.

   Specify the destination node (standby node) as the distribution destination in the **Specify Distribution Subsystem** window, and then click the **OK** button.

6. Select when policy is to be applied.

   The **Apply Policy** window will be displayed allowing the user to select when the policy is to be applied. Select **Apply at the next service startup**.

7. Apply security information to the shared disk.

   Execute the following command at the active node machine to apply the security information to the shared disk.

   For 1:1 active/standby or N:1 active/standby configuration:

```
mpcssave
```

   For 1:1 active/standby configuration (with subsystems and partial cluster operation), and for dual node mutual standby configuration:

```
mpcssave -s subsystem number
```

8. Change the connection destination of the shared disk.

    1. Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk offline.

    2. Transfer the ownership rights of Systemwalker Operation Manager to the active node. To transfer ownership, place the cursor over the Systemwalker Operation Manager cluster service and right click, then specify the active node in **Move this service or application to another node**.

    3. By changing the Systemwalker Operation Manager cluster service to online in the **Failover Cluster Management**, Systemwalker Operation Manager services registered to the cluster system will be started.

The Event Monitoring function and the Action Management function consider the active and standby nodes as independent Systemwalker Operation Manager servers.

For this reason, the information on the active and standby nodes does not always need to be standardized. If different environments have been constructed on the active and standby nodes, extract the policies for these functions at both nodes separately and distribute/apply suitable policies to each environment.

📝 Note
. . . .

Policy information does not include the following cluster operation information for calendar information, so this information must be set on each node.

- Information registered with the *calsetcluster* command

- Information registered with the *calregpath* command

- Information in the calendar reflection host definition file

. . . .

Note

. . . .

If cluster operations are being used, select **Apply at the next service startup**. Do not select **Apply at once** (**Restart the service**).

To immediately apply the policies to the active node, restart the services. Refer to "4.5 Starting and Stopping Services on the Microsoft(R) Fail Over Clustering System" for details on how to restart services.

The policies distributed to the standby node can be applied when a failover occurs next time.

. . . .

Note

. . . .

Refer to the **Logging** tab in the **Define Operating Information** window and check the saved location of the job execution history information and the operation record information of the extraction source server. Check if this saved location is a server where the system performs cluster operations. If it is not, create a directory in a system that performs cluster operations so that the saved location of the directory is the same as the extraction source server. Perform this step before distributing the operation information.

. . . .

4.7 Backing up and Restoring Resources in Microsoft(R) Fail Over Clustering System Operations

This section describes how to back up and restore Systemwalker Operation Manager resources in Microsoft(R) Fail Over Clustering system operations.

4.7.1 Procedure for backing up resources in Microsoft(R) Fail Over Clustering system operations

To back up Systemwalker Operation Manager resources on the Microsoft(R) Fail Over Clustering system, follow the procedure below.

Procedure for backing up resources with services running

Use the following procedure to back up Systemwalker Operation Manager resources on a cluster system with services still running.

1) Transfer ownership to the active node

Transfer the ownership rights to the active node. To transfer ownership to the active node, right-click on the Systemwalker Operation Manager cluster service and specify the active node via **Move this service or application to another node**.

2) Vary the shared disk online

Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk online.
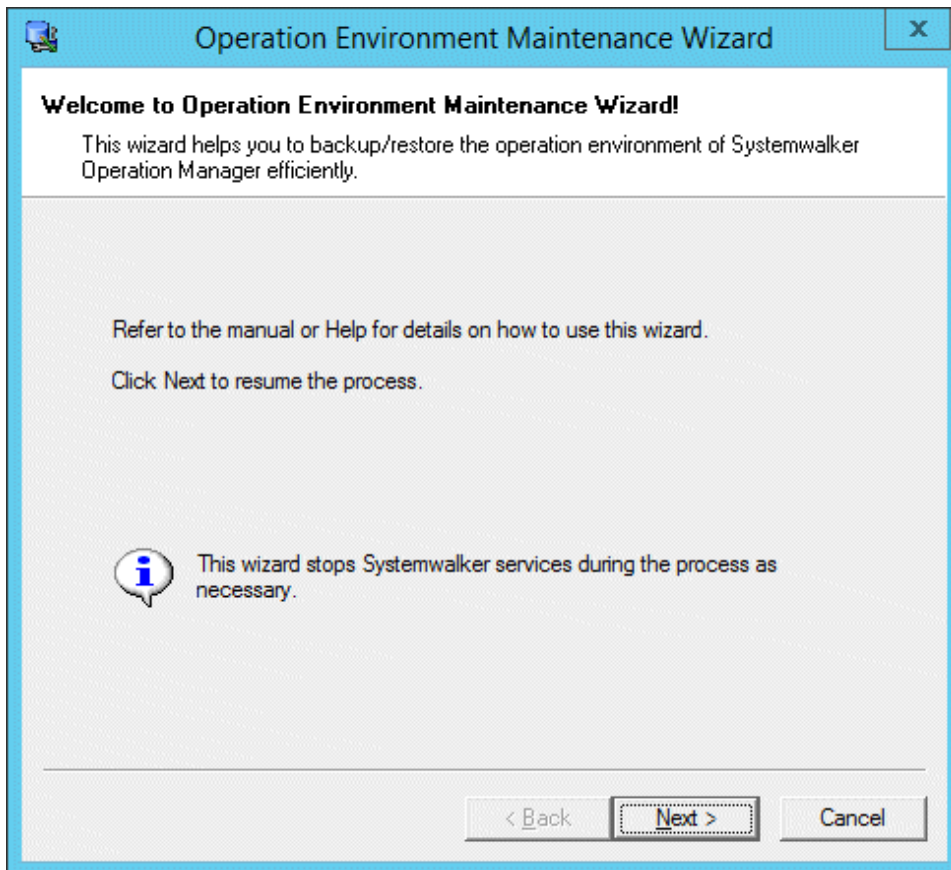
3) Back up resources on the active node

Use the wizard at the active node to perform the backup.

1. Start the **Operating Environment Maintenance Wizard**.

   Select **Start** or **Apps** >> **Systemwalker Operation Manager** >> **Maintain Operation Environment**.

The following window will be displayed. Check the displayed content and then click the **Next** button.

2. Specify the operation type and the location where the backup data will be stored.

   When the following window appears, select **Backup operation environment**, specify the location where the backup data will be stored, and then click the **Next** button.
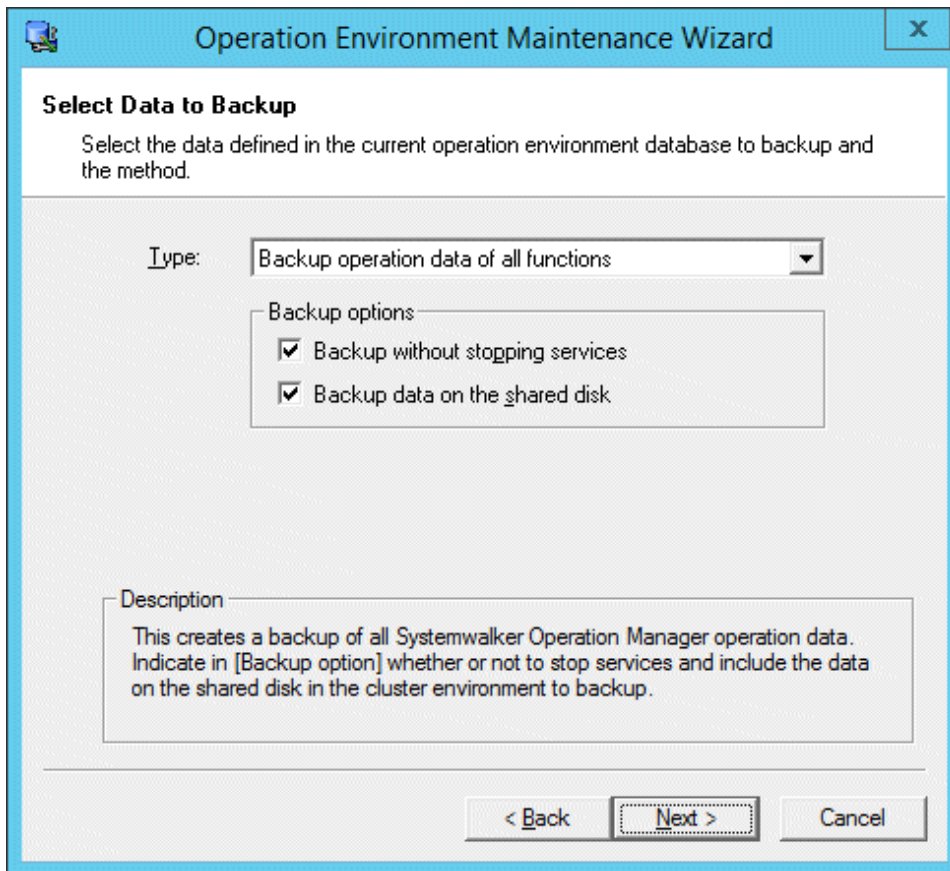

Backup Data Location:

   Specify the location where the backup data will be stored.

   Specify the destination path using up to 32 characters. Spaces cannot be included in the pathname.

3. Specify the type of backup to be performed.

   When the following window appears, select the backup options required and then click the **Next** button.

Backup option:

   The backup options are as follows:

Backup without stopping services:

   Select this option if the backup is to be performed without stopping services.

Backup data on the shared disk:

   This option can be selected when performing a backup on the active node of a cluster system. If this option is selected, information on the active node and information on the shared disk will be backed up.

4. Confirm settings.

   When the following window appears, check the settings and then click the **Next** button if all are correct.
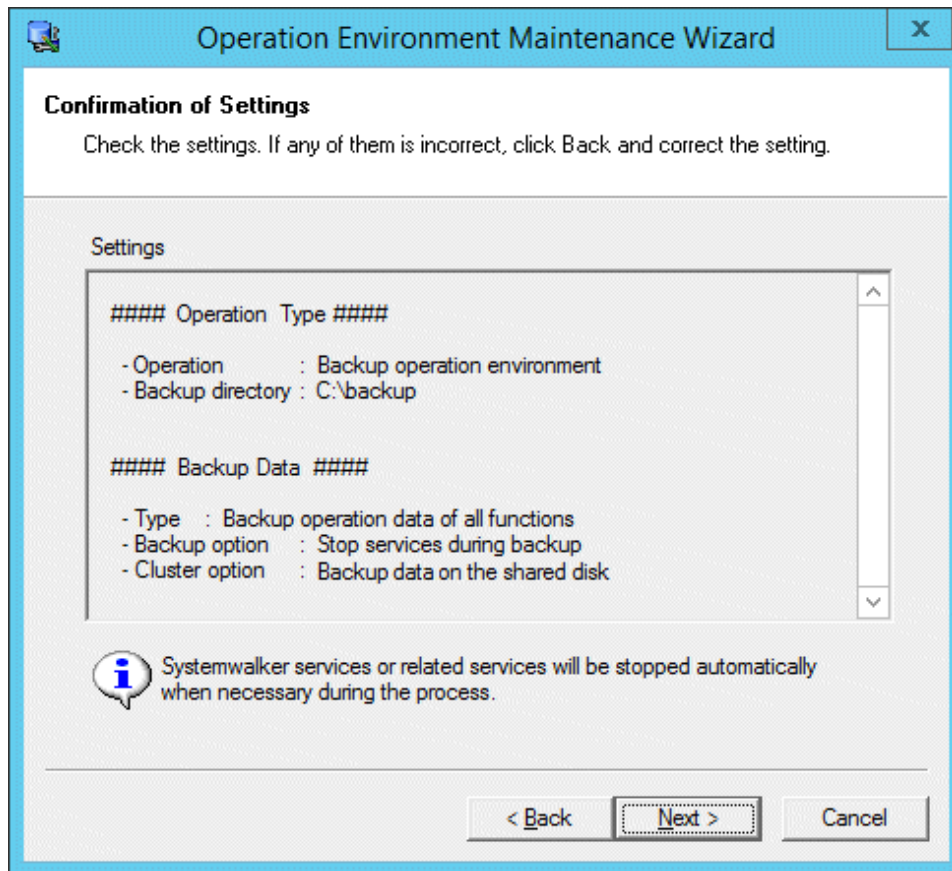
   Note that no warning information will be displayed at the bottom of the window if the **Backup without stopping services** option is selected in the **Select Data to Backup** dialog box.

The backup process will start and the following window will be displayed.
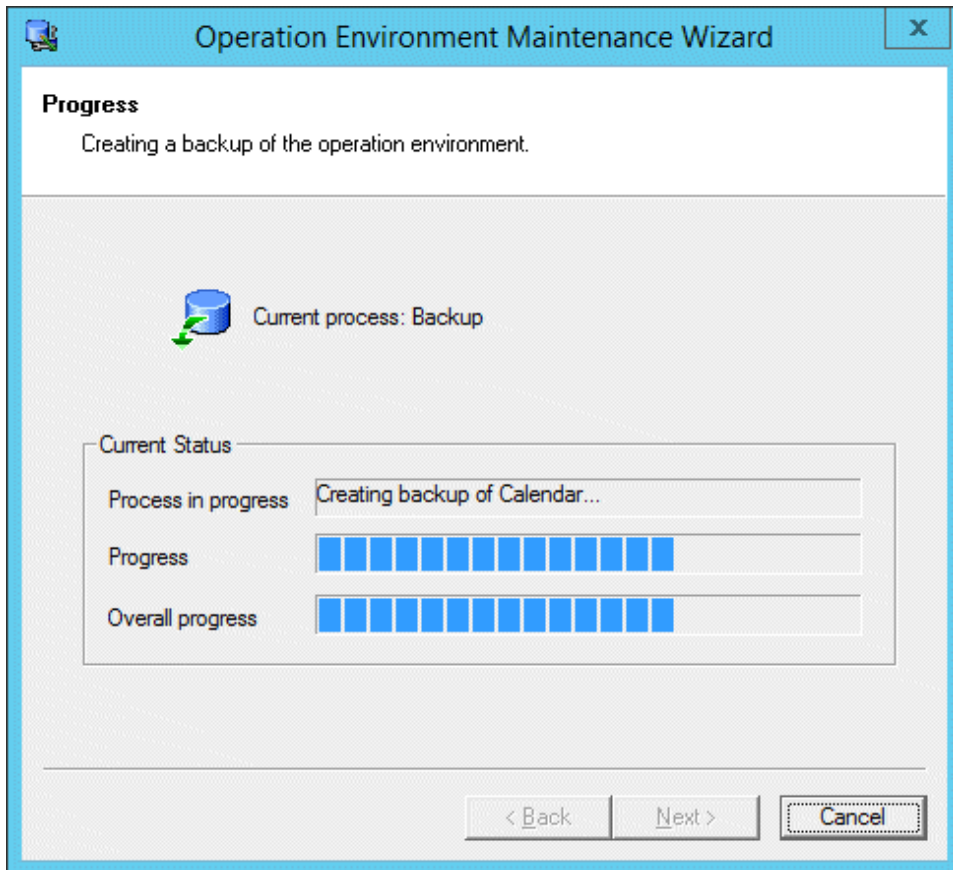
The following window will appear when the backup process completes.
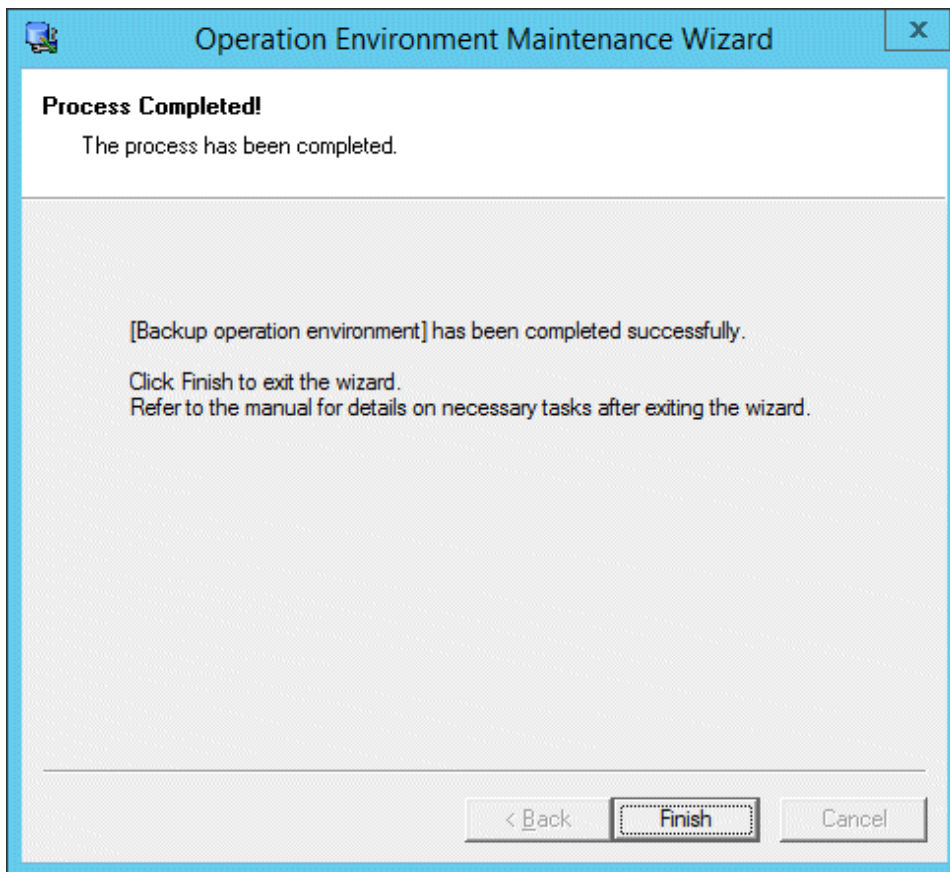
4) Vary the shared disk offline

Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk offline.

If the content of the local disks is the same on both the active and standby nodes, there is no need to back up the standby node. In cases when the content of the local disk of the active node differs from that of the standby node (such as when functions that do not support cluster systems contained different information in the active and standby nodes), perform the backup procedure shown above on the standby node as well (reading all instances of "active node" as "standby node").

Procedure for backing up resources with services stopped

Use the following procedure to back up Systemwalker Operation Manager resources on a cluster system with services stopped.

1) Vary the Systemwalker Centric Manager cluster service offline

Note that if cluster operations are performed with Systemwalker Centric Manager, back up the resources after varying the Systemwalker Centric Manager cluster service offline by using the **Failover Cluster Management** dialog box.

2) Vary the Systemwalker Centric Manager cluster service offline

Stop the Systemwalker Operation Manager services registered with the cluster system by varying the Systemwalker Operation Manager cluster service offline in the **Failover Cluster Management** dialog box.

Systemwalker Operation Manager services that are not registered with the cluster system do not have to be stopped because they will stop automatically when the backup starts.

3) Transfer ownership to the active node

To transfer ownership to the active node, right-click on the Systemwalker Operation Manager cluster service and select **Move this service or application to another node** from the shortcut menu that appears.

4) Vary the shared disk online

Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk online.
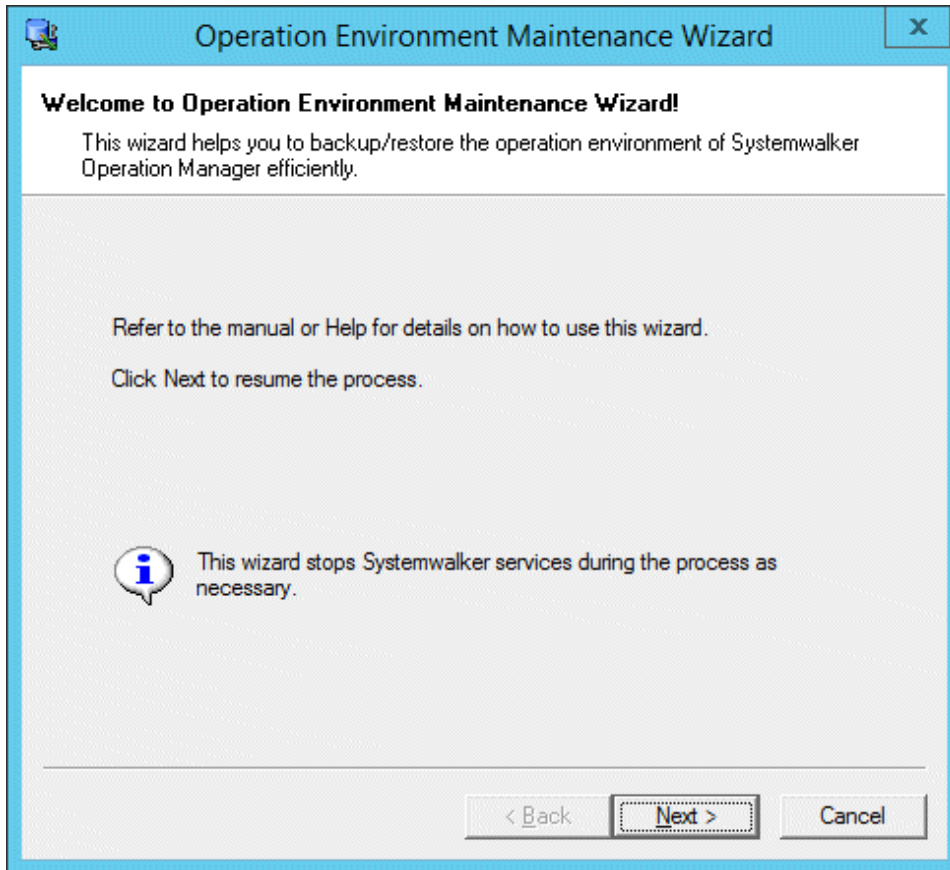
5) Back up resources on the active node

Use the wizard at the active node to perform the backup.

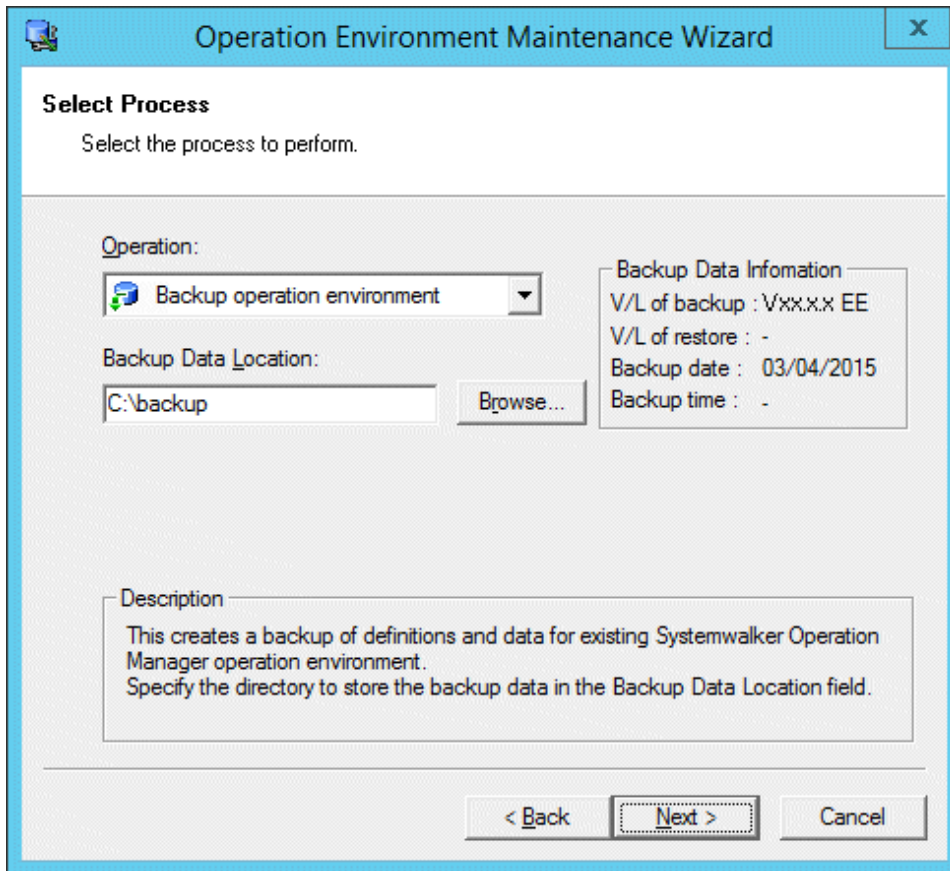1. Start the **Operating Environment Maintenance Wizard**.

   Select **Start** or **Apps** >> **Systemwalker Operation Manager** >> **Maintain Operation Environment**.

   The following window will be displayed. Check the displayed content and then click the **Next** button.

2. Specify the operation type and the location where the backup data will be stored.

When the following window appears, select **Backup operation environment**, specify the location where the backup data will be stored, and then click the **Next** button.

Backup Data Location:

Specify the location where the backup data will be stored.

Specify the destination path using up to 32 alphanumeric characters. Spaces cannot be included in the pathname.

3. Specify the type of backup to be performed.

When the following window appears, select the backup options required and then click the **Next** button.
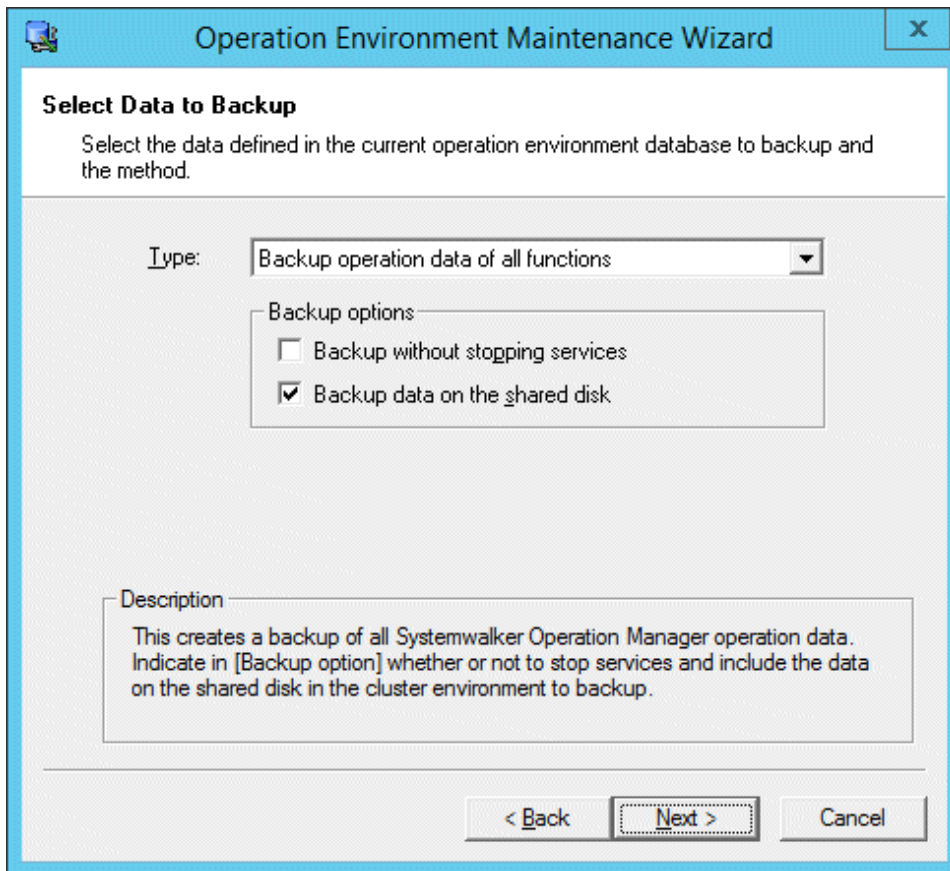
Backup option:

The backup options are as follows:

Backup without stopping services:

Clear the check box.

Backup data on the shared disk:

This option can be selected when performing a backup on the active node of a cluster system. If this option is selected, information on the active node and information on the shared disk will be backed up.
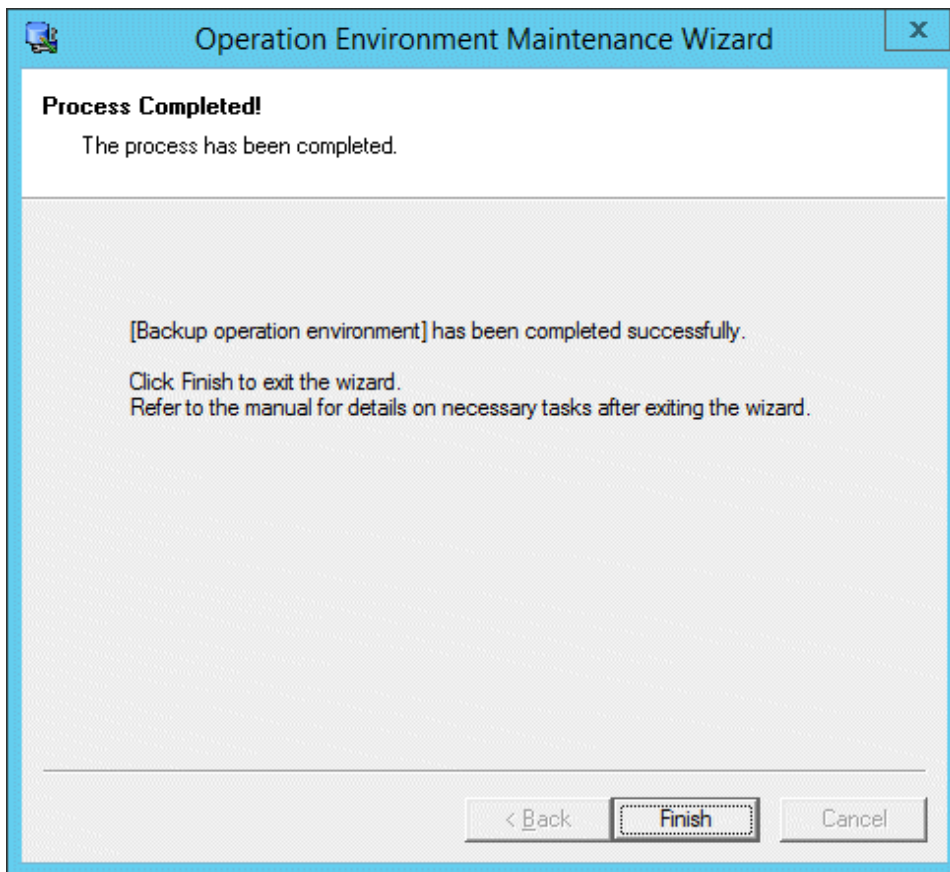
4. Confirm settings.

   When the following window appears, check the settings and then click the **Next** button if all are correct.
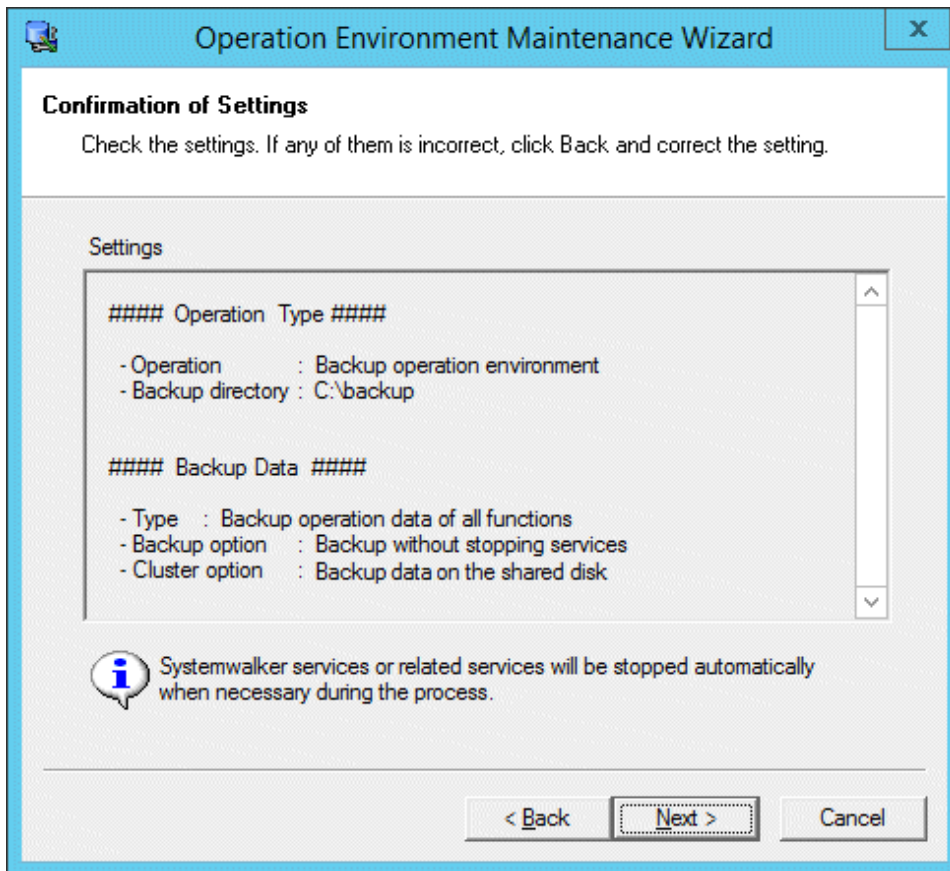
The backup process will start and the following window will be displayed.
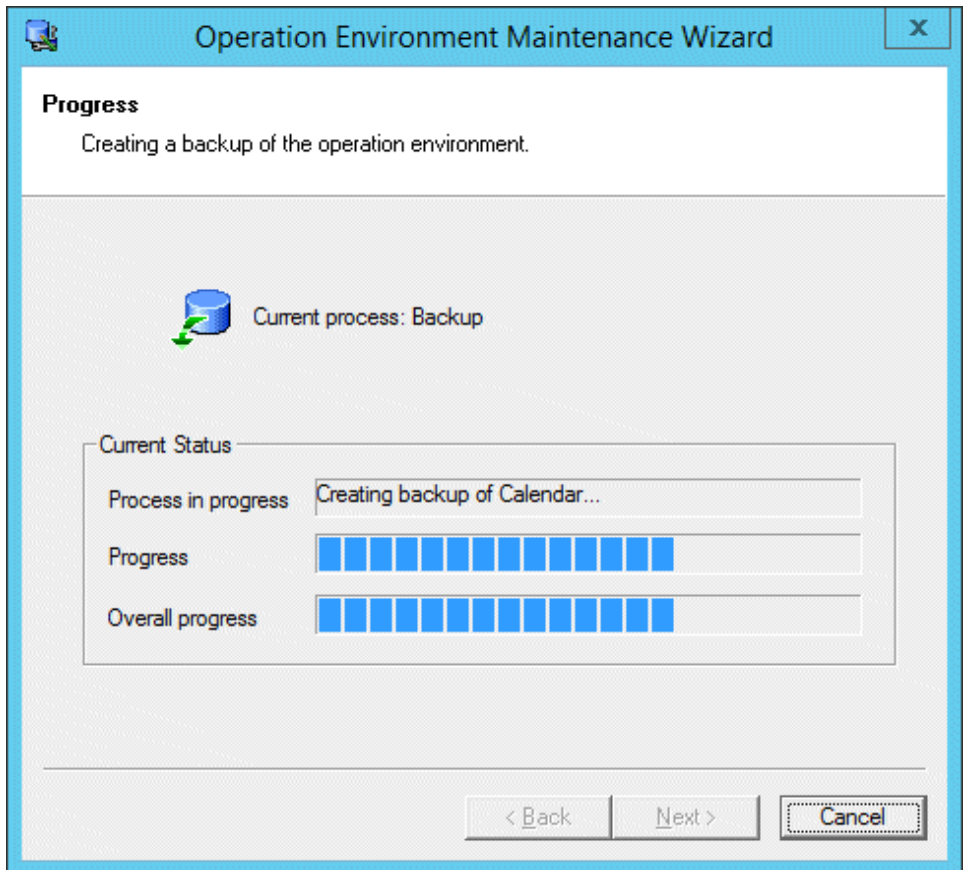
The following window will appear when the backup process completes.

6) Vary the shared disk offline

Select a registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk offline.

7) Start services on the active node

Use the *soperationmgr* command to start Systemwalker Operation Manager services that are not registered with the cluster system. Also start Systemwalker Operation Manager services registered with the cluster system by varying the Systemwalker Operation Manager cluster service online in the **Failover Cluster Management** dialog box.

If the content of the local disks is the same on both the active and standby nodes, there is no need to back up the content of the local disk of the standby node. In cases when the content of the local disk of the active node differs from that of the standby node (such as when functions that do not support cluster systems contained different information in the active and standby nodes), perform the backup procedure shown above on the standby node as well (reading all instances of "active node" as "standby node").

4.7.2 Procedure for restoring resources in Microsoft(R) Fail Over Clustering system operations

To restore Systemwalker Operation Manager resources on the Microsoft(R) Fail Over Clustering system, follow the procedure below.

Also note that if cluster operations are performed with Systemwalker Centric Manager, restore resources after varying the Systemwalker Centric Manager cluster service offline by using the **Failover Cluster Management** dialog box.

1) Vary the Systemwalker Operation Manager cluster service offline

Stop the Systemwalker Operation Manager services registered with the cluster system by varying the Systemwalker Operation Manager cluster service offline using the **Failover Cluster Management** dialog box.

Systemwalker Operation Manager services that are not registered with the cluster system do not have to be stopped because they will stop automatically when restoration starts.

2) Transfer ownership to the active node

To transfer ownership to the active node, right-click on the Systemwalker Operation Manager cluster service and specify the active node via **Move this service or application to another node**.

3) Vary the shared disk online

Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk online.
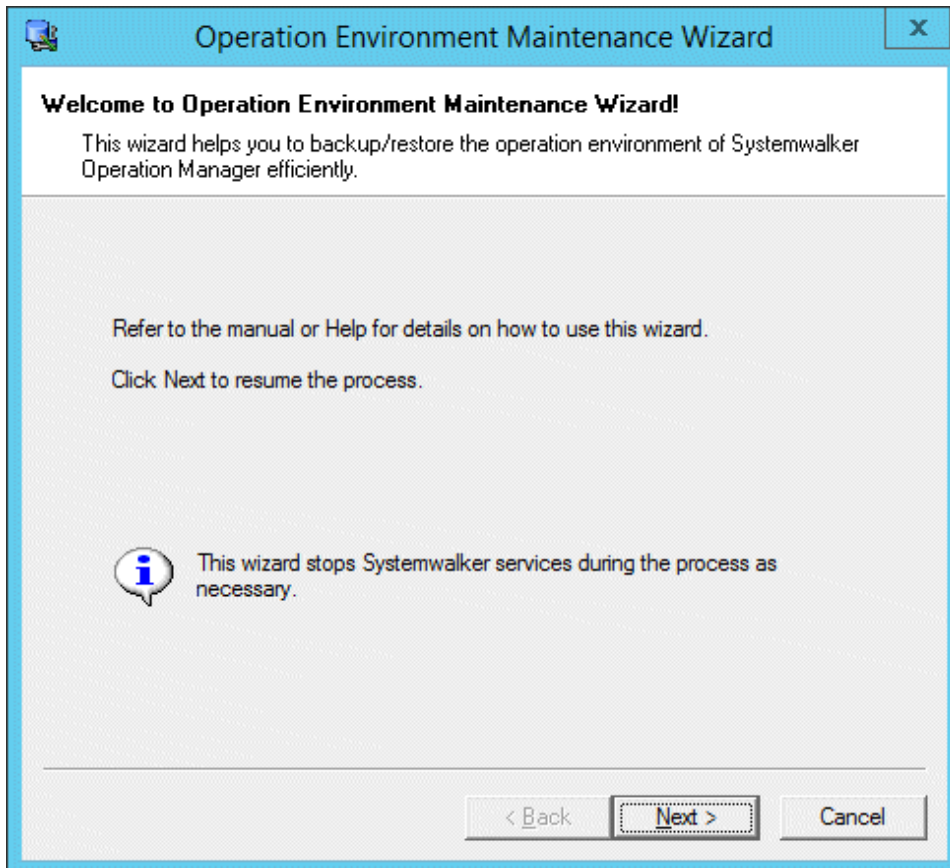
4) Restore resources on the active node.

Use the wizard at the active node to perform restoration.

1. Start the **Operating Environment Maintenance Wizard**.

   Select **Start** or **Apps** >> **Systemwalker Operation Manager** >> **Maintain Operation Environment**.

   The following window will be displayed. Check the displayed content and then click the **Next** button.

2. Specify the operation type and the location where the backup data is stored.

When the following window appears, select **Restore operation environment**, specify the location where the backup data is stored, and then click the **Next** button.
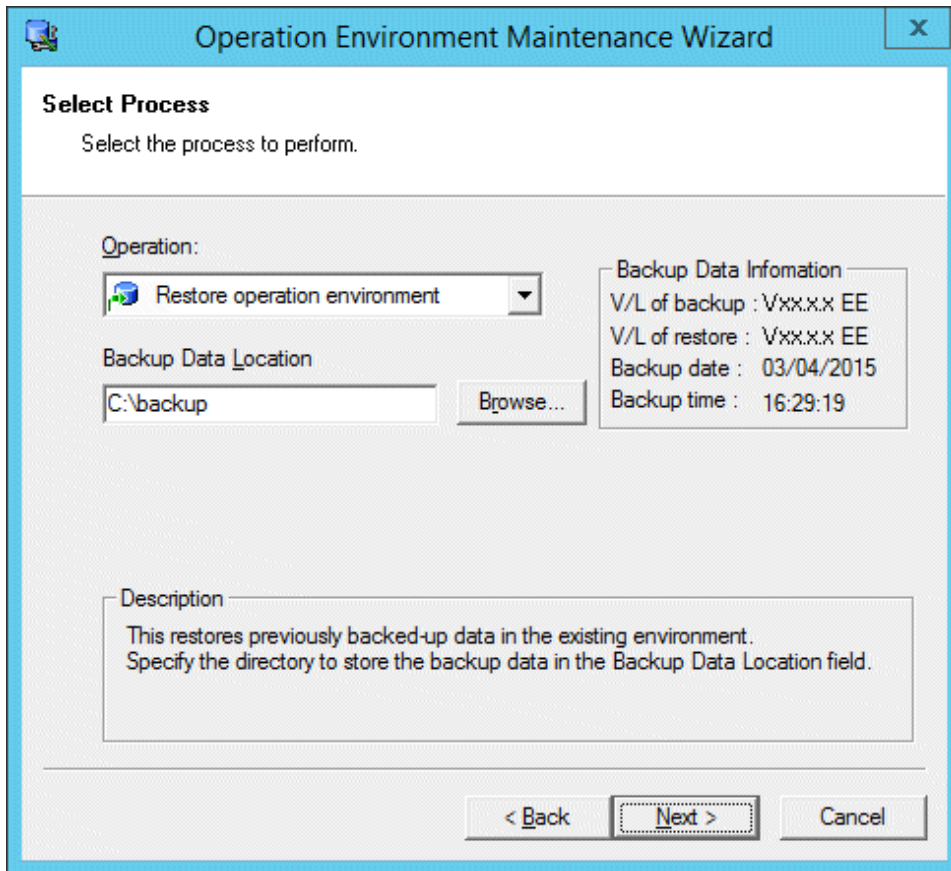
Backup Data Location:

Specify the location where the backup data is stored.

Specify the location using up to 32 characters. Spaces cannot be included in the pathname.

3. Specify the type of restoration to be performed on the data.

The following window will be displayed. Specify the restoration type and the restoration options that will determine what information is restored.

Click the **Next** button when finished.

Restore option:

The restoration options are as follows.

Information to restore:

Use the restoration options "Log and definition information", "Definition information only" and "Log information only" to select the information that will be restored.

Restore data on the shared disk:

When this option is selected, information will be restored to the active node and the shared disk.

This option can be selected when both of the following two conditions are met: The restoration process will be performed at the active node, and the storage location of the backup data collected when the **Backup data on the shared disk** option was selected at backup time is specified as the location where backup data is stored at restoration time.

4. Confirm settings.

When the following window appears, check the settings and then click the **Next** button if all are correct.
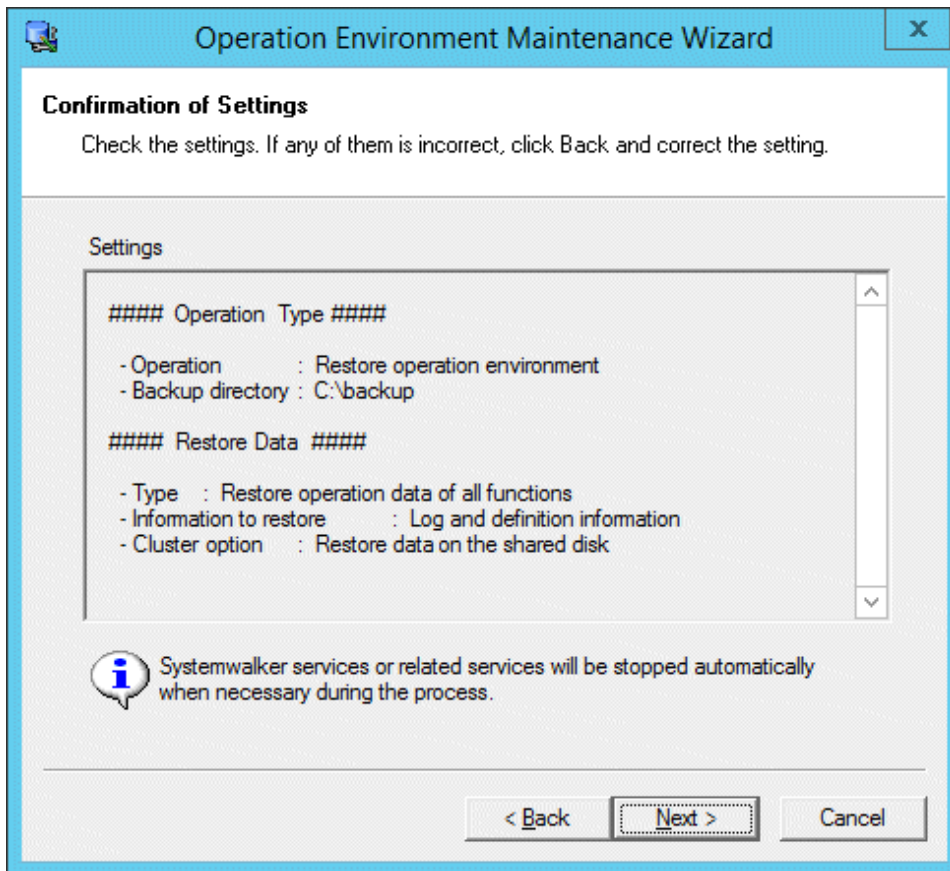
The restoration process will start and the following window will be displayed.
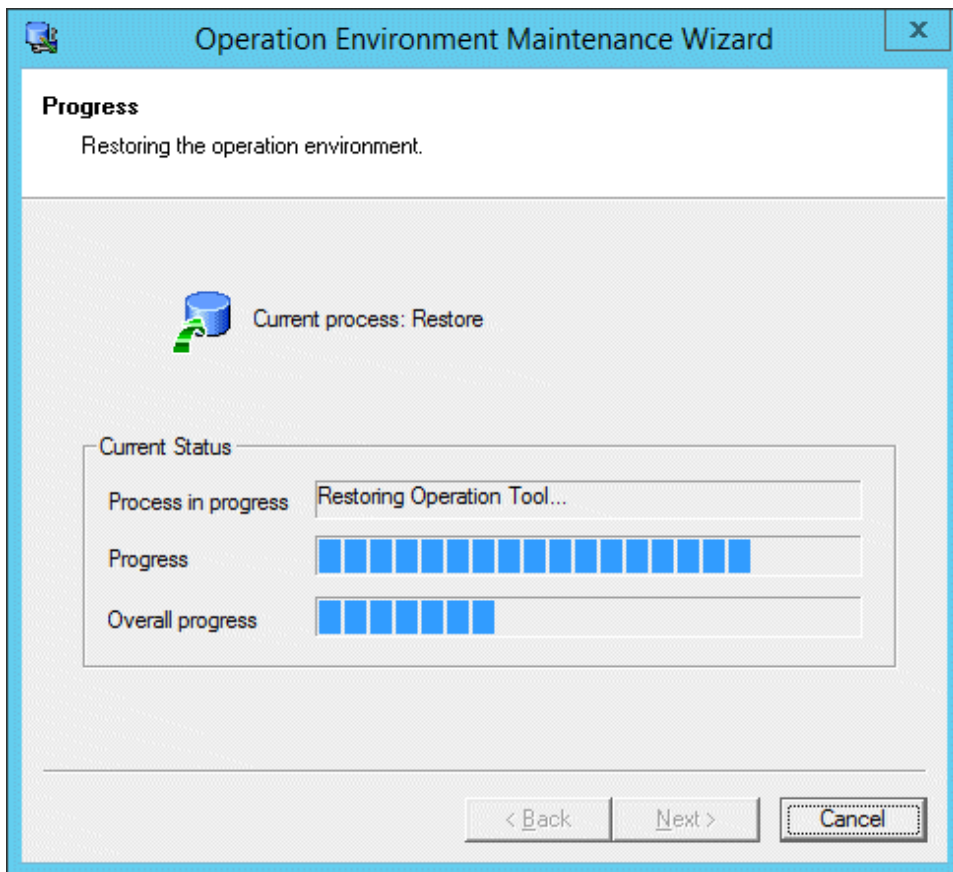
The following window will appear when the restoration process completes.

```
┌─────────────────────────────────────────────────────────────┐
│ 🖥  Operation Environment Maintenance Wizard          [ x ]  │
├─────────────────────────────────────────────────────────────┤
│ Process Completed!                                           │
│    The process has been completed.                           │
├─────────────────────────────────────────────────────────────┤
│                                                              │
│                                                              │
│                                                              │
│        [Restore operation environment] has been completed    │
│        successfully.                                         │
│                                                              │
│        Click Finish to exit the wizard.                      │
│        Refer to the manual for details on necessary tasks    │
│        after exiting the wizard.                             │
│                                                              │
│                                                              │
│                                                              │
│                                                              │
│                    < Back  │  Finish  │  Cancel              │
└─────────────────────────────────────────────────────────────┘
```
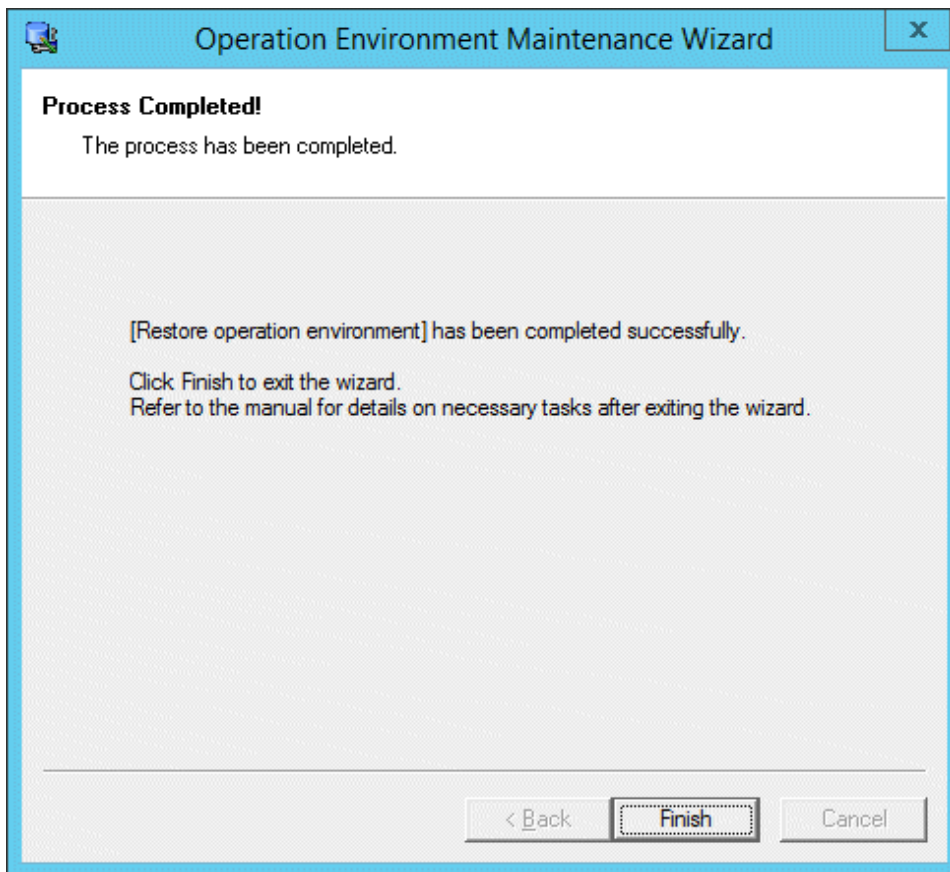
5. Apply the security information to the shared disk.

   Execute the following command to apply the security information of the active node to the shared disk.

   For 1:1 active/standby or N:1 active/standby configuration:

   ```
   Mpcssave
   ```

   For dual node mutual standby configuration:

   ```
   mpcssave -s subsystem number of active node
   ```

5) Vary the shared disk offline

Select the registered physical disk resource in the **Failover Cluster Management** dialog box and vary the shared disk offline.

6) Start services on the active node

Start Systemwalker Operation Manager services that are not registered with the cluster system by using the *soperationmgr* command. And also start Systemwalker Operation Manager services that are registered with the cluster system by varying the Systemwalker Operation Manager cluster service online using the **Failover Cluster Management** dialog box.

If the content of the local disks is the same on both the active and standby nodes, there is no need to restore the standby node. In cases when the content of the local disk of the active node differs from that of the standby node (such as when functions that do not support cluster systems contained different information in the active and standby nodes), perform the restoration procedure shown above on the standby node as well (reading all instances of "active node" as "standby node").

Restoring calendar information and service/application startup information

After resources have been completely restored on the active node, any data for the following information created on the standby node since the backup was taken will be automatically reflected in the active nodes.

- Calendar information

- Service/application startup information

Use the procedures below according to the situation:

To use existing data when the backup was taken (and not using data created after the backup was taken)

After stopping the Systemwalker Operation Manager services on all nodes, delete the following files from each node. Then, by restoring resources, all nodes will be standardized using the definitions existed when the backup was taken.

```
Systemwalker Operation Manager installation directory\MPWALKER.JM\mpjmcal\caldb\*.*
```

```
Systemwalker Operation Manager installation directory\MPWALKER\mpaosfsv\ini\f3crhsvb.ini
```

Refer to "4.5 Starting and Stopping Services on the Microsoft(R) Fail Over Clustering System" for details on how to stop the Systemwalker Operation Manager services.

If either the SYSTEM_CALENDAR or service/application startup information is not subject to automatic reflection

If the following information has been defined independently for each node, then this information will have to be backed up and restored on each node.

- SYSTEM_CALENDAR schedule information, power schedule information, termination monitoring information

- Service/application startup information

The procedures for backing up and restoring this information are as follows:

[Backup procedure]

1. Back up information on the active node.

   Refer to "4.7.1 Procedure for backing up resources in Microsoft(R) Fail Over Clustering system operations" for details on the back up procedure.

2. Back up the following files on the standby node using the copy command.

```
Systemwalker Operation Manager installation directory\MPWALKER.JM\mpjmcal\caldb\*.*
```

```
Systemwalker Operation Manager installation directory\MPWALKER\mpaosfsv\ini\f3crhsvb.ini
```

   Do not save calendars or service/application startup information until the backup is completed on both the active and standby nodes.

[Restoration procedure]

1. Stop the Systemwalker Operation Manager services operating on the standby node.

   Refer to "4.5 Starting and Stopping Services on the Microsoft(R) Fail Over Clustering System" for details on how to stop the Systemwalker Operation Manager services.

2. On the active node, restore the data that was backed up on the active node.

   Refer to "4.7.2 Procedure for restoring resources in Microsoft(R) Fail Over Clustering system operations" for details on the restoration procedure.

3. Restore data on the standby node.

   Copy the files saved in step 2 of the backup procedure to the standby node. Place these files on the standby node using the same directory structure as the active node.

4. Start the Systemwalker Operation Manager services operating on the standby node.

Information

Use the *calsetcluster* command to check the automatic reflection settings for each node.

```
calsetcluster.exe -v
```

When this command is executed, any item with "Disable" displayed in the standard output is not subject to automatic reflection.