

# WebSAM

## Configuration management database (CMDB)

### Release Memo

June 2016  
NEC Corporation

Thank you for choosing our products. This document describes features and usage of the configuration management database (CMDB) you are going to use.

## Revision History

Edition	Chapter/Section	Details
First Edition		
-	-	New creation
May 2016		
	2.1	add PostgreSQL 8.4.22
	3.3.1.1	Add SQLServer warning message

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# 1. Overview

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## 1.1. What is a Configuration Management Database?

A Configuration Management Database (hereafter called "CMDB") is a database that manages the various data used in the MasterScope product. This release memo describes the procedures for setting and deletion required for using a CMDB in your product.

## 2. System Environment

---

This package operates on the following hardware and software.

### 2.1. List of Supported Software

■ List of supported cluster software/database software

Platform	Supported cluster software	Supported database software
Windows (*6)	EXPRESSCLUSTER X	Microsoft SQL Server 2014 (*1) (*2) or Microsoft SQL Server 2012 (*1) (*2) or Microsoft SQL Server 2008 (R2) (*1) (*2) or Microsoft SQL Server 2005 (*1) (*2) or Oracle 9.2.0, 10.1.0, 10.2.0, 11.1.0, 11.2.0, or 12.1.0 (*4)
	Microsoft Cluster Service, Microsoft Failover Cluster, Windows Server Failover Clustering	Microsoft SQL Server 2014 (*1) (*2) (*7) or Microsoft SQL Server 2012 (*1) (*2) (*7) or Microsoft SQL Server 2008 (R2) (*1) (*2) (*7) or Microsoft SQL Server 2005 (*1) (*2) (*7) or Oracle 9.2.0, 10.1.0, 10.2.0, 11.1.0, 11.2.0, or 12.1.0 (*4) (*7)
HP-UX	MC/ServiceGuard	PostgreSQL 8.0.3 to 8.4.22 (*3) or Oracle 9.2.0, 10.1.0, 10.2.0, or 11.1.0 (*5)
Linux	EXPRESSCLUSTER X	PostgreSQL 8.0.3 to 8.4.22 , 9.2.3 to 9.4.4(*3) or Oracle 9.2.0, 10.1.0, 10.2.0, or 11.1.0 (*5)

For 64-bit Linux, the 32-bit version of the necessary software is required.

(\*1)

To use the Microsoft SQL Server Express Edition, obtain it from Microsoft's download website separately. The Express Edition does not support a cluster system. To use a cluster system, use a high-end product such as the Enterprise Edition.

The SPs (Service Packs) of the versions of the SQL Server are supported in principle as well as the versions without SPs because they are basically bug fixes or security updates and do not affect the

functionality. This does not apply to special SPs that are no longer compatible.

(\*2)

The size of data files is limited to 4 GB in the Microsoft SQL Server 2005 Express Edition. To store data exceeding 4 GB, use a high-end product such as the Microsoft SQL Server 2005 Enterprise Edition.

(Reference) Amount of data that can be stored in a data file of 4 GB

If there is only data automatically collected by the UMF configuration information management function, about 40000 nodes can be stored under the following conditions. (The value changes depending on the system environment, etc.)

For 1 node (average)

- ◇ Number of CPUs: 1
- ◇ Number of IDE disk drives: 1 (Number of logical partitions: 5)
- ◇ Number of network ports: 1
- ◇ Number of installed operating systems: 1
- ◇ Number of installed software programs: 170

\* The size of data files is also limited in the Microsoft SQL Server 2008 Express Edition, Microsoft SQL Server 2012 Express Edition, and Microsoft SQL Server 2014 Express Edition. For details, see Microsoft's website, etc. To store data exceeding the limit, use a high-end product such as the Microsoft SQL Server 2008 Enterprise Edition.

(\*3)

For PostgreSQL, only the sources are released for the customer to compile (see "6.1 Configuration Information Management Function"). The following compilation environment is recommended. The PostgreSQL libraries for 64-bit systems are not supported. Use the PostgreSQL libraries for 32-bit systems.

	HP-UX	Linux
PostgreSQL version	PostgreSQL 8.1.8	PostgreSQL 8.1.8
Compiler version	gcc (GCC) 3.4.4	gcc (GCC) 3.2.3

(\*4)

The 64-bit version of Oracle (Intel64, IA64) for Windows is not supported. To use Oracle in 64-bit Windows, install 32-bit Oracle Client (IA32). However, Oracle cannot be used in Windows (IA64) because 32-bit Oracle Client does not support IA64.

Use the following version or later of the Oracle ODBC Driver.

- ◇ Oracle 9.2.0 : 9.2.0.6
- ◇ Oracle 10.1.0 : 10.1.0.3
- ◇ Oracle 10.2.0 : 10.2.0.3
- ◇ Oracle 11.1.0 : 11.1.0.6
- ◇ Oracle 11.2.0 : 11.2.0.1
- ◇ Oracle 12.1.0 : 12.1.0.1

(\*5)

If Oracle 9.2.0.2 (HP-UX version or Linux version) is used, SELECT may fail because of a problem in Oracle. Apply PSR of Oracle 9.2.0.3 or later. It is recommended to apply the latest PSR.

To use Oracle 10.1.0 in HP-UX 11iv3, PSR of Oracle 10.1.0.5 or later is required. It is recommended to apply the latest PSR.

To use Oracle 11.1.0 (HP-UX version), PSR of Oracle 11.1.0.7 or later is required. It is

recommended to apply the latest PSR.

(\*6)

If the “MasterScope MCOperations Base Manager Provisioning Option for Windows” is used, only Microsoft SQL Server 2005 + ServicePack2 can be used from among the required software.

(\*7)

If the Microsoft Cluster Service, Microsoft Failover Cluster, or Windows Server Failover Clustering is used, the cluster software needs to support DBMS. For the construction procedure, see the cluster software manual.

## 3. Setting Up CMDB

---

MasterScope products use database software to store configuration information. The database software that can be used varies depending on the platform of the manager function. The installation procedures for different database software are shown below. For details of the supported versions of database software for the platforms, see "2.1List of Supported Software".

If a CMDB is set up according to this chapter, the database software to be used cannot be changed after starting operation.

Perform the setup procedure in the following sections appropriate for your database software.

### 3.1. Windows Environment

The installation and setup methods for the database software that can be used in the Windows environment are as follows.

- ✓ Using the Microsoft SQL Server (hereafter called "SQL Server")  
→3.1.1
- ✓ Using Oracle  
→3.1.2

### 3.1.1. Setting Up SQL Server

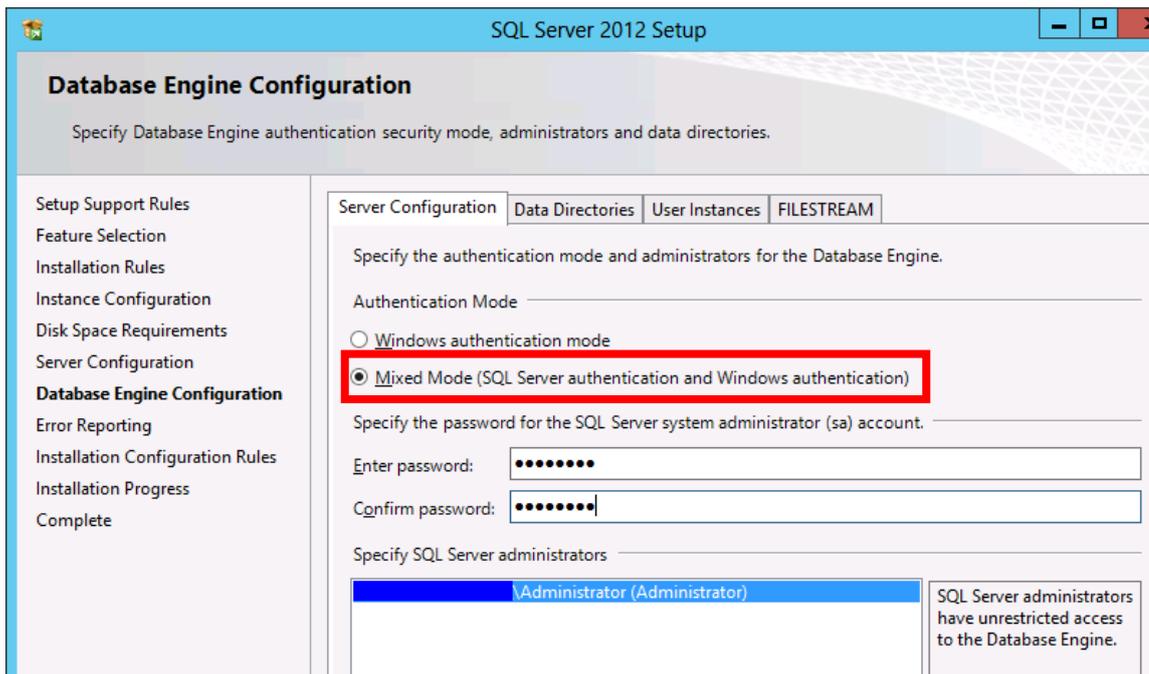
The procedure for setting up the SQL Server is described below.

When installing the SQL Server, follow the instructions in the document included with the database software.

This section describes the settings required for using the SQL Server in the MasterScope product.

- **Authentication mode**

Select [Mixed Mode (SQL Server authentication and Windows authentication)].



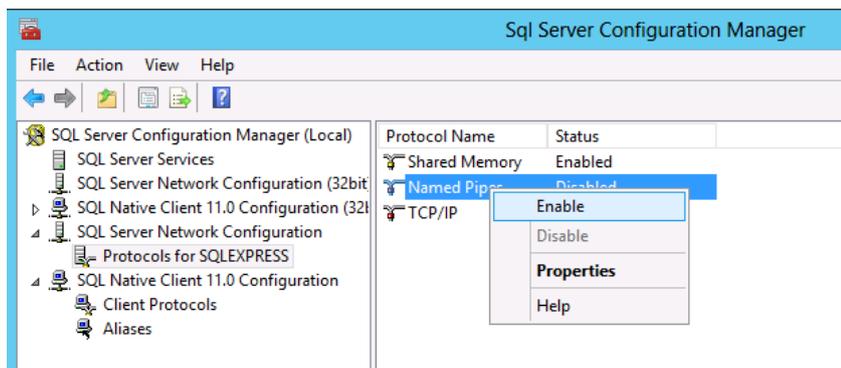
(Note) The figure shows the installation screen for the SQL Server 2012.

Perform similar settings for SQL Server 2005, SQL Server 2008, and SQL Server 2014.

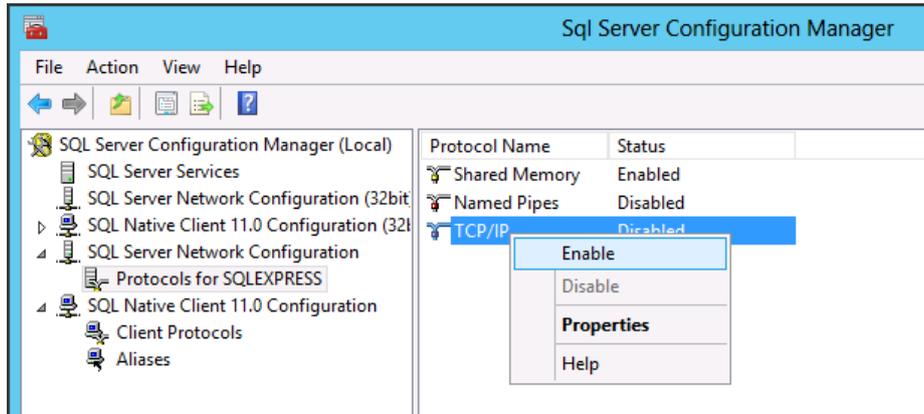
- **Changing the protocol setting**

After installation is complete, start [SQL Server Configuration Manager] from the [Start] menu. In the protocol setting for the CMDB instance, set the following items to [Enable].

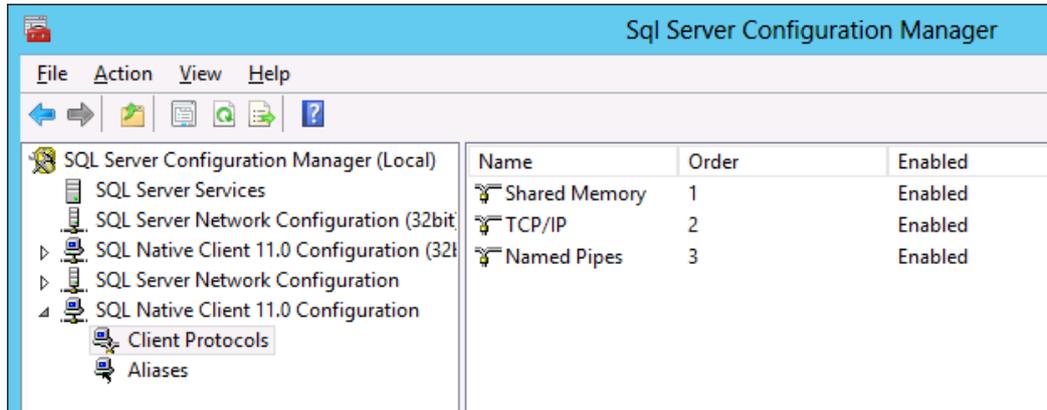
- **Named pipe**



**- TCP/IP**



(Note) Express Edition. For SQL Server 2008, SQL Server 2012, and SQL Server 2014, the configuration is as shown in the figure below. Select the protocol for the CMDB instance in [SQL Server Network Configuration], and [Client Protocols] under [SQL Native Client 11.0 Configuration], and set [Named pipe] and [TCP/IP] to [Enabled].



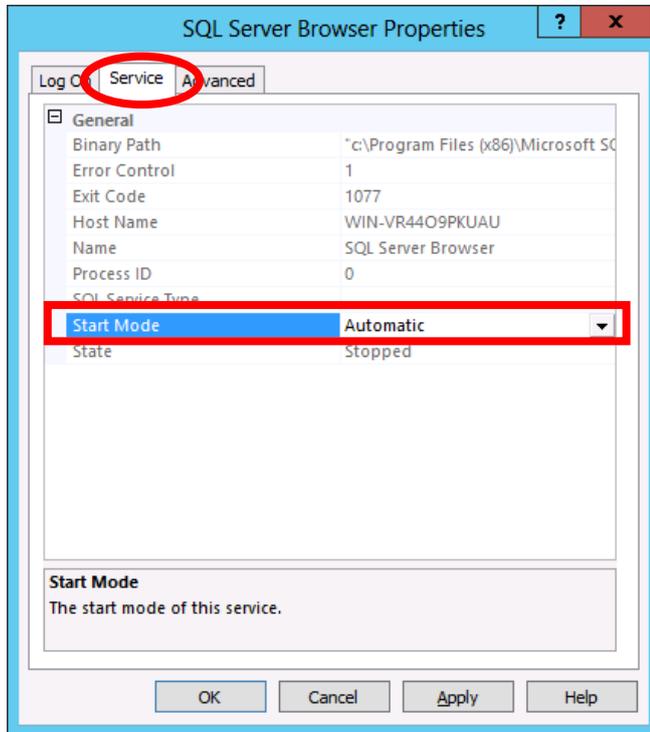
(Note) In SQL Server 2005, select [SQL Server 2005 Services] and restart the service of the CMDB instance to enable the settings. In SQL Server 2008, SQL Server 2012, and SQL Server 2014, select [SQL Server Services] and restart the service of the CMDB instance.

- **Setting the SQL Server Browser service to automatically start up**

After installation is complete, start [SQL Server Configuration Manager] from the [Start] menu. In SQL Server 2012, change [Start Mode] and [Status] of [SQL Server Browser] from [SQL Server Services] as shown below.

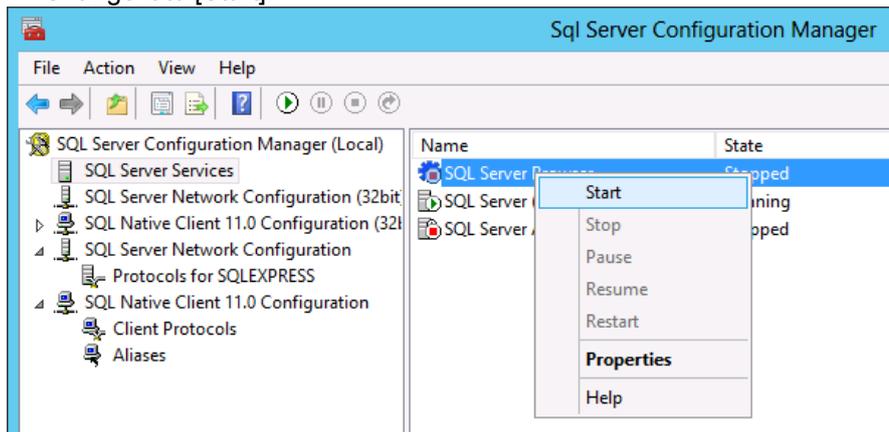
- **[Start Mode]**

Change it to [Automatic].



- **[State]**

Change it to [Start].



(Note) The figure shows the SQL Server Configuration Manager screen for the SQL Server 2012

### 3.1.1.1. Setting Up CMDB

The database setting procedure for using the SQL Server is as follows. Hereafter, the installation directory of MasterScope products is described as "%INSDIR%".

Use this procedure to update the CMDB to a new version.

To support clusters in the database software, install the database software in the active and standby

systems in advance by referring to the cluster management software manual and the database software manual.

- 1) Check the directory in which the SQL Server is installed. The directory is normally as follows.

```
C:\Program Files\Microsoft SQL Server
```

- 2) Move to %INSDIR%\Manager\sql\sqlserver and execute the CMDB configuration script (WfdbCmdSetup.bat). The created database name, destination server name, instance name, and database driver name can be specified in the command line parameters.

```
$> WfdbCmdSetup.bat <Database Name> <Server Name> <Instance Name> <Database Driver Name>
```

(Do not insert a line feed in the command.)

The default values of the parameters are described below. To change a value, specify the value to the parameter and execute the command.

- Database Name : wfdb
- Server Name : localhost
- Instance Name : SQLEXPRESS (\*Note)

If no instance name was specified during installation of the SQL Server (if the default instance was used), specify "\ " for the instance name. (\* Note)

- Database Driver Name : "SQL Server" (\*\*Note)

It is recommended to describe the latest driver in Database Driver Name.

Example: For SQL Server 2008 R2: "SQL Server Native Client 10.0" (\*\*Note)

**Example:**

```
$> WfdbCmdSetup.bat wfdb host1 \ "SQL Native Client"
```

Specify the above when the database name is "wfdb", the server name is "host1", the instance is the default instance, and the database driver is "SQL Native Client".

**Example:**

```
$> WfdbCmdSetup.bat wfdb host1 \
```

Specify the above when the database name is "wfdb", the server name is "host1", the instance is the default instance, and the database driver is "the default value ("SQL Server)".

When specifying one or more command line parameters, specify all the parameters before the parameter you want to specify. (When specifying parameters, the values do not necessarily have to be different from the default values.)

When the execution log is output to the execution folder after the command is executed, make sure that there is no error. (If there is any error, remove the cause of the error by referring to "8.1 Setting Up a Database" in Troubleshooting, and execute it again.)

(\*Note) Checking the instance

Select [Start], [Administrative Tools], and then [Services] to display a list of services.

Check it in "SQL Server (*Instance Name*)".

**In a cluster environment**

**Execute the command only in the active system.**

- 3) The specified database configuration file has been created. The file is normally as follows.

```
%INSDIR%\Manager\sg\wfdbmgr\WFDB.INI
```

Normally, this file does not have to be changed. To edit the database configuration file directly when any setting is changed, use the following as reference.

```
[SystemSvr]
USE_DATABASE=SQL_SERVER
CMDB_USER=wfdb                    The user name used for database access
CMDB_PASSWD=wfdb@Password        The password for the above user
SERVER_NAME=localhost            Server name
DATABASE_DRIVER=SQL Server       Database driver name
SQL_INSTANCE_NAME=Instance Name  SQL Server instance name
DATABASE_NAME=wfdb               Database name
SQL_CERTIFY=SQL                  SQL Server authentication method (SQL or
                                WINDOWS)
```

**In a cluster environment**

**Copy the database configuration file created in the active system to the same directory of the standby system.**

Steps 4 and 5 are required only in a cluster environment with EXPRESSCLUSTER. In other cases, proceed to Step 6.

**In a EXPRESSCLUSTER cluster environment**

- 4) Creating an SQL script

Check the drive and directory of the shared disk. As an example, assume that the X drive is the shared disk and that the database files are stored in the following directory.

```
X:\MSSQL\Data
```

The osql command shown below (including the part between the starting and ending scripts of EXPRESSCLUSTER) assumes access with Windows authentication for execution by a Windows user for which the administrator authority is set for the SQL Server. To execute it with SQL Server authentication, describe "/Usa\_user /Psa\_pwd" instead of "/E" in the osql parameter.

*sa\_user*: Specify the "sa" user.

*sa\_pwd*: Specify the password of the "sa" user.

To execute it with SQL Server authentication, set the startup account of the SQL Server service to [Local System].

Create SQL scripts for attaching database files, re-creating user accounts, detaching, obtaining SIDs, and re-creating users.

Assume that the SQL scripts are to be created at the following locations (they must exist on the path of the same local disk in the active and standby systems).

```
C:\MSSQL\ACT.sql
C:\MSSQL\ACT2.sql
C:\MSSQL\DEACT.sql
C:\MSSQL\SELECT.sql
C:\MSSQL\RECRTUSR.sql
```

The contents of each of them are as follows.

Change them according to the environment by referring to Chapter 1 of the document (PP Guide (Database)) provided by EXPRESSCLUSTER for details. (Change the italic characters according to the environment.)

#### ACT.sql

```
exec sp_attach_db 'wfdb', Specify the database name created in 3).  
    @filename1='X:\MSSQL\Data\wfdb.mdf',  
    @filename2='X:\MSSQL\Data\wfdb_log.ldf'
```

#### ACT2.sql

```
use wfdb Specify the database name created in 3).  
exec sp_change_users_login 'Auto_Fix', 'wfdb', NULL, 'wfdb@Password'  
exec sp_password NULL, 'wfdb@Password', 'wfdb'
```

#### DEACT.sql

```
Alter the database wfdb set offline with ROLLBACK IMMEDIATE  
exec sp_detach_db 'wfdb', TRUE Specify the database name created in 3).
```

#### SELECT.sql

```
SELECT SUSER_SID('wfdb') Specify the user name created in 3).
```

#### RECRTUSR.sql

```
Alter the database wfdb set offline with ROLLBACK IMMEDIATE  
exec sp_detach_db 'wfdb', TRUE Specify the database name created in 3).  
  
exec sp_droplogin @loginame = N'wfdb' Specify the user name created in 3).  
  
exec sp_attach_db 'wfdb', Specify the database name created in 3).  
    @filename1='X:\MSSQL\Data\wfdb.mdf',  
    @filename2='X:\MSSQL\Data\wfdb_log.ldf'  
  
CREATE LOGIN wfdb WITH PASSWORD='wfdb@Password', DEFAULT_DATABASE  
=wfdb, SID =0x????????????????, CHECK_POLICY=OFF  
    The bold strings above are the parameters of [CREATE LOGIN]. The values  
    specified for each of the parameters are as follows.  
    Specify the user name created in Step 3, the password for the user, the  
    database name, and the SID output in the SQL script log (SELECT.log)  
    executed in Step 5, from left to right.  
    Specify SID that is output to the SQL script log (SELECT.log) executed in  
    Step 5.
```

- 5) Moving a database file  
Perform database detach processing.

Select [Start], [All Programs], [Accessories], and then [Command Prompt], and enter the following command. (Change <Server Name> and <Instance Name> according to the environment.)

```
$> osql /E /S <Server Name>\<Instance Name> /i C:\MSSQL\DEACT.sql /o C:\MSSQL\DEACT.I  
og
```

<Server Name>: Specify the server name.

<Instance Name>: Specify the instance name.

After the detach processing, move the files *wfdb.mdf* and *wfdb\_log.ldf* to the shared disk (X:\MSSQL\Data).

Next, perform database attach processing.

Enter the following command from the command prompt. (Change <Server Name> and <Instance Name> according to the environment.)

```
$> osql /E /S <Server Name>\<Instance Name> /i C:\MSSQL\ACT.sql /o C:\MSSQL\ACT.log
```

<Server Name>: Specify the server name.

<Instance Name>: Specify the instance name.

Next, perform database user re-creation processing.

Enter the following command from the command prompt. (Change <Server Name> and <Instance Name> according to the environment.)

```
$> osql /E /S <Server Name>\<Instance Name> /i C:\MSSQL\ACT2.sql /o C:\MSSQL\ACT2.log
```

<Server Name>: Specify the server name.

<Instance Name>: Specify the instance name.

Next, obtain the SID of the *wfdb* user.

Enter the following command from the command prompt. (Change <Server Name> and <Instance Name> according to the environment.)

```
$> osql /E /S <Server Name>\<Instance Name> /i C:\MSSQL\SELECT.sql /o C:\MSSQL\SELEC  
T.log
```

<Server Name>: Specify the server name.

<Instance Name>: Specify the instance name.

Specify the SID output in the log (SELECT.log) as an argument of *sp\_addlogin* in *RECRTUSR.sql* created in Step 4.

Add the following descriptions (bold parts) to the starting and ending scripts of EXPRESSCLUSTER. For the starting script, add them before the service start command of the MasterScope product in the starting script. For the ending script, add them after the service stop command of the MasterScope product in the ending script. After that, change the scripts.

After the setting, select [Export] from the [File] menu of CLUSTER Builder to save the specified cluster information.

After that, select [Apply the Configuration File] from the [File] menu to reflect the cluster information.

**Example of a starting script (normal startup support processing)**

```

rem *****
rem Normal startup support processing
rem *****
:NORMAL

rem Disk check
IF "%CLP_DISK%" == "FAILURE" GOTO ERROR_DISK

net start <SQLServer Service Name>
ARMSLEEP 10
osql /E /S <Server Name>\<Instance Name> /Q "EXIT(SELECT COUNT(*) FROM
sysdatabases WHERE name='<Database Name>')"
IF errorlevel 1 (GOTO DEACT) ELSE (GOTO ACT)

:DEACT
osql /E /S <Server Name>\<Instance Name> /i C:\MSSQL\DEACT.sql /o
C:\MSSQL\DEACT.log

:ACT
osql /E /S <Server Name>\<Instance Name> /i C:\MSSQL\ACT.sql /o
C:\MSSQL\ACT.log
osql /E /S <Server Name>\<Instance Name> /i C:\MSSQL\ACT2.sql /o
C:\MSSQL\ACT2.log

rem -----
rem Starting MasterScope Framework Manager
ARMLOG "net start MasterScope UMF Base Manager_1" /arm
net start "MasterScope UMF Base Manager_1"
ARMLOG "net start MasterScope UMF Base Manager_1 Finish" /arm
rem -----

```

### Example of a starting script (failover support processing)

```
rem *****
rem Failover support processing
rem *****
:FAILOVER

rem Disk check
IF "%CLP_DISK%" == "FAILURE" GOTO ERROR_DISK

net start <SQLServer Service Name>
ARMSLEEP 10
osql /E /S <Server Name>\<Instance Name> /Q "EXIT(SELECT COUNT(*) FROM sysdatabases WHERE name='<Database Name>')"
IF errorlevel 1 (GOTO DEACT) ELSE (GOTO ACT)

:DEACT
osql /E /S <Server Name>\<Instance Name> /i C:\MSSQL\DEACT.sql /o C:\MSSQL\DEACT.log

:ACT
osql /E /S <Server Name>\<Instance Name> /i C:\MSSQL\ACT.sql /o C:\MSSQL\ACT.log
osql /E /S <Server Name>\<Instance Name> /i C:\MSSQL\ACT2.sql /o C:\MSSQL\ACT2.log

rem -----
rem Starting MasterScope Framework Manager
ARMLLOG "net start MasterScope UMF Base Manager_1" /arm
net start "MasterScope UMF Base Manager_1"
ARMLLOG "net start MasterScope UMF Base Manager_1 Finish" /arm
rem -----
```

### Example of an ending script (normal end support processing)

```
rem *****
rem Normal end support processing
rem *****
:NORMAL

rem Disk check
IF "%CLP_DISK%" == "FAILURE" GOTO ERROR_DISK

rem -----
rem Stopping MasterScope Framework Manager
ARMLOG "net stop MasterScope UMF Base Manager_1" /arm
net stop "MasterScope UMF Base Manager_1"
ARMLOG "net stop MasterScope UMF Base Manager_1 Finish" /arm
rem -----

osql /E /S <Server Name>\<Instance Name> /i C:\MSSQL\DEACT.sql /o C:
\MSSQL\DEACT.log
net stop <SQLServer Service Name>
ARMSLEEP 30
```

### Example of an ending script (failover support processing)

```
rem *****
rem Failover support processing
rem *****
:FAILOVER

rem Disk check
IF "%CLP_DISK%" == "FAILURE" GOTO ERROR_DISK

rem -----
rem Stopping MasterScope Framework Manager
ARMLOG "net stop MasterScope UMF Base Manager_1" /arm
net stop "MasterScope UMF Base Manager_1"
ARMLOG "net stop MasterScope UMF Base Manager_1 Finish" /arm
rem -----

osql /E /S <Server Name>\<Instance Name> /i C:\MSSQL\DEACT.sql /o C:
\MSSQL\DEACT.log
net stop <SQLServer Service Name>
ARMSLEEP 30
```

<Database Name>: Specify the database name (e.g., wfdb) attached in ACT.sql.

<SQLServer Service Name>: Specify the service name of the SQL Server. In SQL Server 2005, the service name is "MSSQL\$<Instance Name>".

<Server Name>: Specify the server name.

<Instance Name>: Specify the instance name.

Perform the following in the active and standby systems.

Select [Control Panel], [Administrative Tools], and then [Services]. If the [Startup type] for the SQL Server service used in the cluster environment ("SQL Server (MSSQLSERVER)" or "SQL Server (*Instance Name*)") is not [Manual], switch it to [Manual].

- 6) Select [Control Panel], [Administrative Tools], and then [Services] and check whether the "SQL Server Browser" service is running. If not, start them.  
If the [Startup type] value for the "SQL Server Browser" service is not [Automatic], switch it to [Automatic].

**In a EXPRESSCLUSTER cluster environment (standby system only)**

7)

If it is operating in the active system, change to the standby system before performing the operation.

Perform user re-creation.

Enter the following command from the command prompt. (Change <Server Name> and <Instance Name> according to the environment.)

```
$> osql /E /S <Server Name>\<Instance Name> /i C:\MSSQL\RECRTUSR.sql /o C:\MSSQL\REC  
RTUSR.log
```

<Server Name>: Specify the server name.

<Instance Name>: Specify the instance name.

When it is complete, change it to operate in the active system.

This concludes the setup of the SQL Server.

To enable the CMDB setting, restart the manager service by referring to the manuals for the MasterScope products.

## 3.1.2. Setting Up Oracle

The procedure for setting up Oracle is described below. Install Oracle on the server used as the database server in advance. For details of how to install Oracle, see the documents provided by Oracle. For cautions about the installation and database of Oracle, see "6.1 Configuration Information Management Function".

Perform installation of the MasterScope product, installation of Oracle, and CMDB settings as the same operating system user with all the Administrator rights.

### 3.1.2.1. Setting up CMDB

The installation directory of MasterScope products is described as "%INSDIR%". Also, the Oracle home directory is described as "%ORACLE\_HOME%".

#### 1) Creating a database

To create a database, use the database configuration assistant, etc.

"WFDB" is recommended as the database name (instance name) and Oracle net service name you create. However, you can use any name. Use a dedicated database for CMDB whenever possible. If a database name other than "WFDB" is created, change the database name specified for execution of the script as described in Steps 9 and 10 later to the database name you created.

**In a EXPRESSCLUSTER cluster environment**

The initialization parameter file, control file, data file, REDO log file, and archive file must be created on the shared disk.

Here, the environment is configured by using the X drive as the shared disk. Change them according to the environment by referring to Chapter 3 of the document (PP Guide (Database)) provided by EXPRESSCLUSTER for details.

Step 2 is required only in a 64-bit operating system environment. In other cases, proceed to Step 3.

#### 2) Installing Oracle Client

To use a 64-bit operating system, install 32-bit Oracle Client.

Because 32-bit Oracle Client does not support IA64, Oracle on IA64 cannot be used with the manager. Oracle can be used only on Intel64.

For details of how to install Oracle Client, see the documents provided by Oracle.

Install Oracle Client with the install type Administrator.

After installing Oracle Client, use the Oracle home directory of Oracle Client as the Oracle home directory in the subsequent steps.

#### 3) Creating a net service

Create a net service by using the Oracle Net Manager, etc.

To use the multi-tenant container database of Oracle12c, the service name specified during configuration of the net service name must be the same as the pluggable database name.

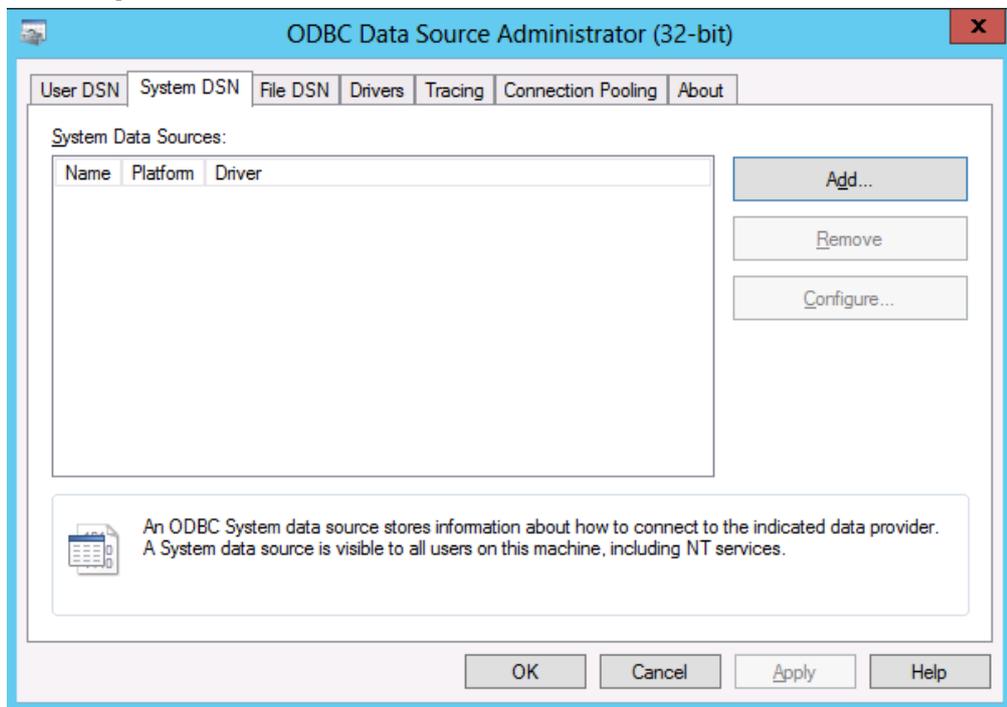
**In a cluster environment**

**Perform this on both the active node and the standby node.**

#### 4) Creating ODBC data sources

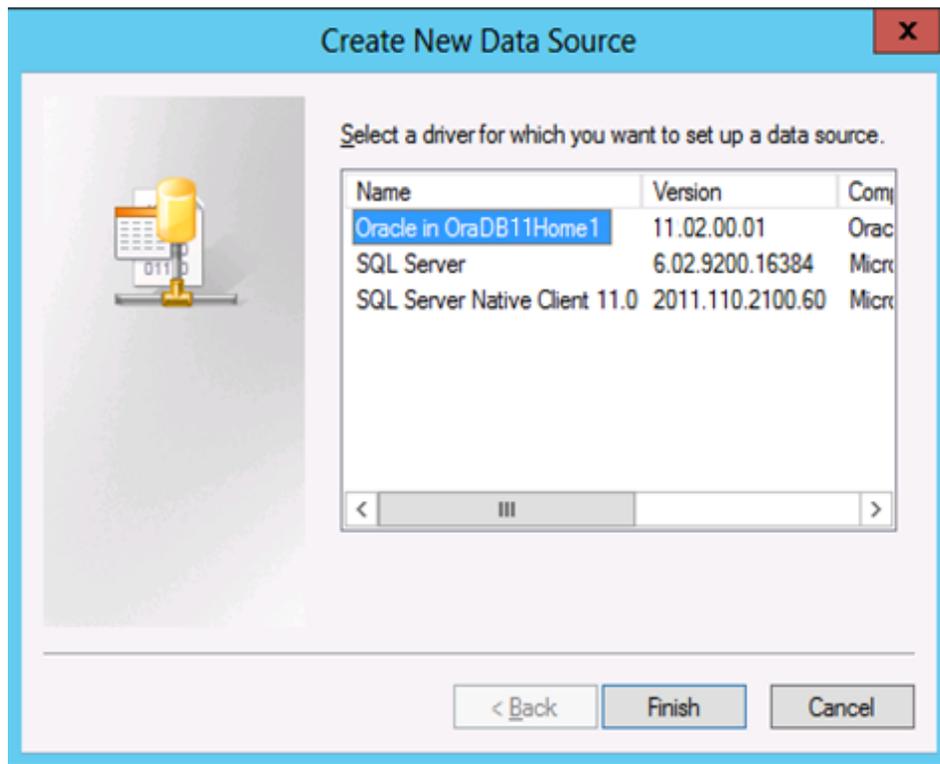
- a) For a 32-bit OS: Select [Control Panel], [Administrative Tools], and then [ODBC Data Sources], and select the [System DSN] tab.

For a 64-bit OS: Select [Start] followed by [Run], execute "<System Drive>:\WINDOWS\SysWOW64\odbcad32.exe" to start the 32-bit version of [ODBC Data Sources], and select the [System DSN] tab.



**Figure 3-1 [System DNS]**

- b) Click the [Add] button, and select the Oracle driver to be used. (The Oracle driver name varies depending on the version and installation environment of Oracle. Select the driver corresponding to the environment.) After selecting the driver, click the [Finish] button.

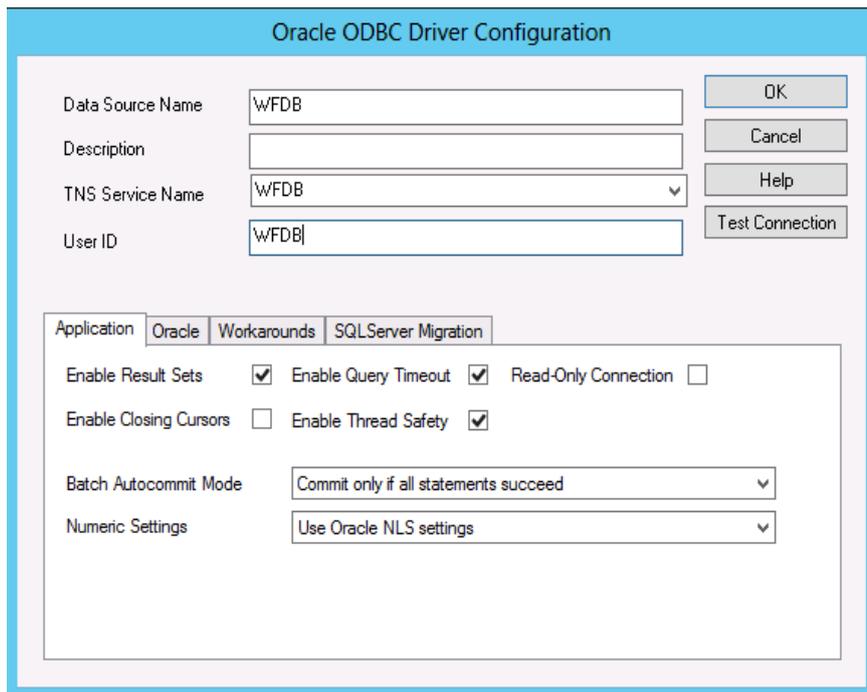


**Figure 3-2 [Create New Data Source]**

- c) Basically, specify the following 3 items and click the [OK] button. The screen configuration may vary slightly depending on the selected driver.

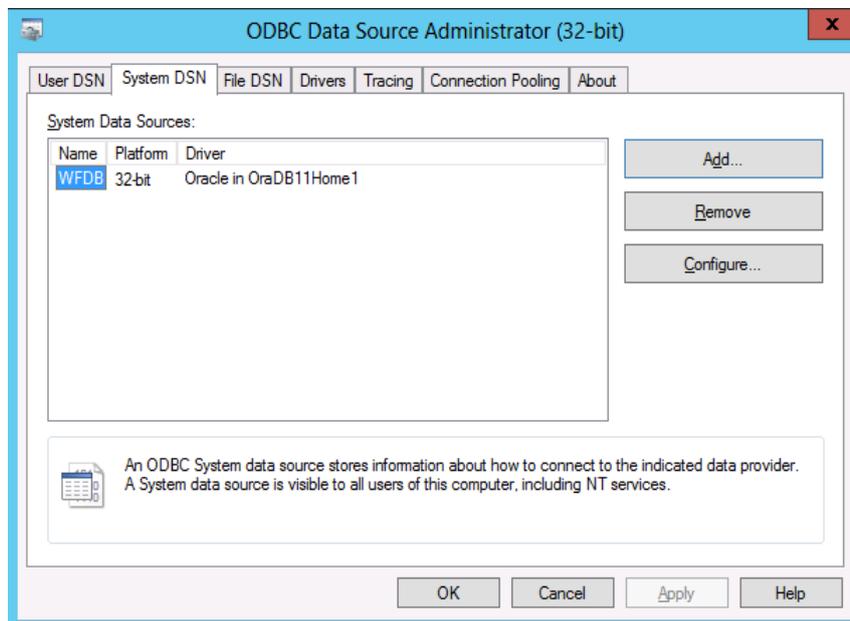
The data source name should be the same as the Oracle net service name.

- Data source name
- Oracle net service name (=TNS service name)
- User name (=User ID)



**Figure 3-3 [Oracle ODBC Driver Configuration]**

d) Check that the data source created has been added to [System DSN].



**Figure 3-4 [After adding Data Source]**

5) Checking the Oracle startup

Check that Oracle is running. Select [Control Panel], [Administrative Tools], and then [Services] and check whether the Oracle services (e.g., OracleServiceWFDB) and Oracle Listener services (e.g., OraclexxxxTNSListener) are running. If not, start them.

To use the multi-tenant container database of Oracle12c, check that the pluggable database is running. Execute the following command.

- If the TNS service for multi-tenant container database connection exists

```
$> sqlplus.exe system/<SYSTEM User Password>@<TNS Service Name for Multi-tenant Container Database Connection>
SQL> show pdbs
```

- If the TNS service for multi-tenant container database connection does not exist

```
$> cd <Oracle Home Directory for Server>\BIN
$> sqlplus.exe system/<SYSTEM User Password>
SQL> show pdbs
```

It is running if OPEN MODE of the pluggable database is not MOUNTED.

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO
3	<Pluggable Database Name>	READ WRITE	NO

It is not running if OPEN MODE of the pluggable database is MOUNTED.

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO
3	<Pluggable Database Name>	MOUNTED	NO

If it is not running, execute the following command.

```
SQL> connect sys/<SYS User Password> as sysdba
SQL> alter pluggable database <Pluggable Database Name> open ;
```

When the Oracle service is restarted, the pluggable database has not been started. Therefore, the pluggable database must be started again when the Oracle service is restarted.

Steps 6 and 7 are required only in a cluster environment with EXPRESSCLUSTER. In other cases, proceed to Step 7.

**In a EXPRESSCLUSTER cluster environment**

6) Creating a startup script and stop script

This script starts the database upon START and FAILOVER of EXPRESSCLUSTER. Describe the full paths of the SQL files of the database startup SQL script and stop SQL script. (Store the database startup SQL script and stop SQL script in the shared disk.)

For the startup and stop scripts, add the following descriptions to the EXPRESSCLUSTER templates.

Example of a startup script (start.bat)

```
set ORACLE_SID=WFDB
sqlplus /nolog @X:\oradata\WFDB\DBstartup.sql
```

Example of a stop script (stop.bat)

```
set ORACLE_SID=WFDB
sqlplus /nolog @X:\oradata\WFDB\DBshutdown.sql
```

Also, prepare the database startup script and stop script executed in the startup script and stop script.

Example of a database startup SQL script (DBstartup.sql)

```
connect sys/oracle as sysdba
startup pfile="X:\oradata\wfdb\SPFILEWFDB.ORA"
exit;
```

Example of a database stop SQL script (DBshutdown.sql)

```
connect sys/oracle as sysdba
shutdown
exit;
```

To use the multi-tenant container database of Oracle12c, the startup script must have processing to start the pluggable database.

Example of a database startup SQL script when a multi-tenant container database is used (DBstartup.sql)

```
connect sys/oracle as sysdba
startup pfile="X:\oradata\wfdb\SPFILEWFDB.ORA"
alter pluggable database <Pluggable Database Name> open ;
exit;
```

#### 7) Registering resources

In the active system, register the resources of the script files created in Step 6 "Creating a startup script and stop script" above by using EXPRESSCLUSTER.

For the procedure for registering resources, see Chapter 3 of the document (PP Guide (Database)) provided by EXPRESSCLUSTER.

#### 8) Preparing for execution of the database table creation script

Start the command prompt, and change the current directory to the directory where the script for creating database tables is saved.

```
$> cd %INSDIR%\Manager\sql\oracle
```

#### 9) Executing the database table creation script

Execute the database table creation script. Specify the user name, Oracle net service name, Oracle home directory, and Oracle system user password in the parameters. If not specified, the following values are used as the default values.

- User Name : WFDB
- Oracle Net Service Name : WFDB
- Oracle Home Directory : %ORACLE\_HOME%

- Oracle System User Password : **MANAGER**

```
$> CR_TBL.bat <User Name> <Oracle Net Service Name> <Oracle Home Directory> <Oracle System User Password>
```

(Do not insert a line feed in the command.)

**Example:**

```
$> CR_TBL.bat wfdb wfdb C:\oracle\product\10.2.0\db_1 manager
```

Specify the above when the user name is "wfdb", the Oracle net service name is "wfdb", the Oracle home directory is "C:\oracle\product\10.2.0\db\_1", and the Oracle system user password is "manager".

**Example:**

```
$> CR_TBL.bat wfdb wfdb C:\oracle\product\10.2.0\db_1
```

Specify the above when the user name is "wfdb", the Oracle net service name is "wfdb", the Oracle home directory is "C:\oracle\product\10.2.0\db\_1", and the Oracle system user password is the default value (MANAGER).

When specifying one or more command line parameters, specify all the parameters before the parameter you want to specify. (When specifying parameters, the values do not necessarily have to be different from the default values.)

When the execution log (log file) is output to the current directory, make sure that there is no error. (If there is any error, remove the cause of the error by referring to "8.1 Setting Up a Database" in Troubleshooting, and execute it again.)

**In a cluster environment**

**Execute the command only in the active system.**

10) Executing the database configuration file creation script

Execute the database configuration file creation script.

```
$> WfdbMakelni.bat <User Name> <ODBC Data Source Name>
```

The following database configuration file is created.

```
%INSDIR%\Manager\sg\wfdmgrp\WFDB.INI
```

The database configuration file is created with the following data.

```
[SystemSvr]
USE_DATABASE=ORACLE_WIN
CMDB_USER=wfdb           The user name used for database access
CMDB_PASSWD=wfdb        The password for the above user
ODBC_DATASOURCE=wfdb    ODBC data source name
```

**In a cluster environment**

**Copy the database configuration file created in the active system to the same directory of the standby system.**

This concludes the setup of the Oracle on Windows.

To enable the CMDB setting, restart the manager service by referring to the manuals for the MasterScope products.

## 3.2. UNIX Environment

The installation and setup methods for database software that can be used in the UNIX environment are as follows.

- ✓ Using PostgreSQL  
→3.2.1
- ✓ Using Oracle  
→3.2.2

### 3.2.1. Setting up PostgreSQL

The procedure for setting up PostgreSQL is described below. Install PostgreSQL in advance on the node where the manager function of the MasterScope product uses the CMDB. For details of how to install PostgreSQL, see the documents provided by PostgreSQL. For cautions about the installation and database of PostgreSQL, see "6.1 Configuration Information Management Function".

To start and stop PostgreSQL automatically when the server starts and stops, create the starting and stopping scripts of PostgreSQL and specify the auto start/stop settings in advance according to the documents provided by PostgreSQL.

The environment variables that need to be specified to use PostgreSQL are as follows.

- PATH
- LD\_LIBRARY\_PATH

#### In a cluster environment

**Install PostgreSQL on both the active node and the standby node.  
The directory to store the database must be created on the shared disk of the cluster.  
For details, see the cluster software manual and the PostgreSQL manual.**

#### 3.2.1.1. Setting up CMDB

The installation directory of MasterScope products is described as "\$INSDIR". The installation directory of PostgreSQL is described as "\$PGSQL\_HOME".

#### In a cluster environment

**Perform Steps 1 through 3 below only on the active node.**

- 1) Check that PostgreSQL is running.

```
root> ps -ef | grep postmaster
```

If the postmaster process is not running, start the postmaster process by using the method appropriate for the environment to make PostgreSQL ready for use.

If any PostgreSQL database is running other than the CMDB, determine whether PostgreSQL for the CMDB is running based on the OS user name, PostgreSQL installation directory, etc.

**Example:**

```
root> ps -ef | grep postmaster
  sfmdb 2078  1 0 13:12:38 ?          0:00 /opt/sfmdb/pgsql/bin/postmaster -i -D /var/opt/sfmdb/pgsql
 postgres 18228  1 0 18:50:10 pts/td  0:00 /usr/local/pgsql/bin/postmaster -D /usr/local/pgsql/data
```

If the PostgreSQL for the CMDB is installed to "Installation directory:/usr/local/pgsql" with the user name "postgres", the process with PID of 18228 is the PostgreSQL for the included database in the example above.

- 2) Change the current directory to the directory where the database table creation script is saved.

```
root> cd $INSDIR/Manager/sql/postgres
```

- 3) Execute the database table creation script. Specify the user name and PostgreSQL installation directory in the parameters. If not specified, the following values are used as the default values.

- User Name : wfdb
- PostgreSQL Installation Directory : /usr/local/pgsql
- PostgreSQL Port Number : 5432
- PostgreSQL Administrator User : postgres

```
root> ./CR_DB.sh <User Name> <PostgreSQL Installation Directory> <PostgreSQL Port Number> <PostgreSQL Administrator User>
```

(Do not insert a line feed in the command.)

**Example:**

```
root> ./CR_DB.sh wfdb /opt/local/pgsql 5433 post
```

Specify the above when the user name is "wfdb", the PostgreSQL installation directory is "/opt/local/pgsql", the PostgreSQL port number is "5433", and the PostgreSQL administrator user is "post".

**Example:**

```
root> ./CR_DB.sh wfdb /opt/local/pgsql 5433
```

Specify the above when the user name is "wfdb", the PostgreSQL installation directory is "/opt/local/pgsql", the PostgreSQL port number is "5433", and the PostgreSQL administrator user is the default value (postgres).

When specifying one or more command line parameters, specify all the parameters before the parameter you want to specify. (When specifying parameters, the values do not necessarily have to be different from the default values.)

When the execution log is output to the current directory and on the screen, make sure that there is no error. (If there is any error, remove the cause of the error by referring to "8.1 Setting Up a Database" in Troubleshooting, and execute it again.)

- 4) When the script is executed in Step 3, the following database configuration file is created.

```
$INSDIR/Manager/sg/wfdbmgr/WFDB.INI
```

[SystemSvr]	
USE_DATABASE=POSTGRESQL	
CMDB_USER=wfdb	The user name used for database access
CMDB_PASSWD=wfdb	The password for the above user
DATABASE_NAME=wfdb	Database name
DATABASE_PORT=5432	PostgreSQL port number (can be omitted)
SERVER_NAME=localhost	The name of the server on which PostgreSQL is running (can be omitted)
DATABASE_VERSION=8.0	The PostgreSQL version (can be omitted)

If PostgreSQL operates on the same server as the manager, the server name can be omitted. (Default: Omitted)

If the default port number of PostgreSQL is used, the port number can be omitted. (Default: 5432)  
The version of PostgreSQL is automatically determined and set by the database table creation script. If any change is required such as using multiple versions of PostgreSQL, change the value of DATABASE\_VERSION in the database configuration file. (Default: 8.0)

(Note) Specifying the PostgreSQL version

- PostgreSQL 8.0 or 8.1 : 8.0 (Default value)
- PostgreSQL 8.2 : 8.2
- PostgreSQL 8.3 or 8.4 : 8.3

#### In a cluster environment

**Copy the database configuration file created in the active system to the same directory of the standby node.**

- 5) To change the version of PostgreSQL manually, execute the library change shell (ChangeDB.sh) and specify the version.

```
Example: Using PostgreSQL 8.2
root> cd $INSDIR/Manager/bin
root> ./ChangeDB.sh
Select Number

1 : Oracle11g
2 : Oracle10g
3 : Oracle9i
4 : PostgreSQL8.3 or 8.4
5 : PostgreSQL8.2
6 : PostgreSQL8.0 or 8.1
7 : Not Connect to DB

Please Input Number : 5      ... Enter a value and press Enter.

Database Change to PostgreSQL8.2 [OK]
```

**In a cluster environment**

**In the active system, perform it as required. In the standby system, perform it by using the same settings as the active system.**

- 6) Specify the environment variables to use PostgreSQL in the manager startup script of the MasterScope product using the CMDB.

**Example for HP-UX (Itanium2)**

```
/sbin/init.d/UMFBaseManager_n *1
```

**Example for Linux**

```
/etc/init.d/UMFBaseManager_n *1
```

\*1: *n* indicates a service number of 1 or higher.

(The value is set during installation of MasterScope products.)

Add the following description in the line before "export PATH" in the startup script.

```
PATH=$PGSQL_HOME/bin:$PATH
LD_LIBRARY_PATH=$PGSQL_HOME/lib:${LD_LIBRARY_PATH}
SHLIB_PATH=$PGSQL_HOME/bin:${SHLIB_PATH}
```

**In a cluster environment**

**Perform this on both the active node and the standby node.**

- 7) Adjust the orders of starting and stopping.

To start and stop PostgreSQL automatically when the server is started or stopped, adjust the settings as shown below.

The server is started and stopped in the following order.

Starting : PostgreSQL, and then MasterScope product

Stopping : MasterScope product, and then PostgreSQL

This product uses S90, K10 (Linux), S900, and K10 (HP-UX). Create the file names of the PostgreSQL starting/stopping scripts as shown in the example below. If there are any products using PostgreSQL other than this product, adjust the starting and stopping orders of PostgreSQL while taking into account the starting and stopping orders of the products.

**For HP-UX (Itanium2)**

```
/sbin/rc2.d/S890postgresql
/sbin/rc0.d/K11postgresql
```

**For Linux**

```
/etc/rc2.d/S89postgresql
/etc/rc3.d/S89postgresql
/etc/rc4.d/S89postgresql
/etc/rc5.d/S89postgresql
/etc/rc0.d/K11postgresql
/etc/rc1.d/K11postgresql
/etc/rc6.d/K11postgresql
```

**In a cluster environment  
(PostgreSQL)**

**Do not perform auto starting or stopping of PostgreSQL when the server is started or stopped.**

**In the starting and stopping scripts of the cluster software, take the following measures.**

- PostgreSQL starts before the MasterScope product starts.**
- PostgreSQL stops after the MasterScope product stops.**

This concludes the setup of PostgreSQL.

To enable the CMDB setting, restart the manager service by referring to the manuals for the MasterScope products.

## 3.2.2. Setting up Oracle

The procedure for setting up Oracle is described below. Install Oracle and create a database in advance on the node where the manager function of the MasterScope product uses the CMDB. For details of how to install Oracle and how to create a database, see the documents provided by Oracle. For cautions about the installation and database of Oracle, see "6.1 Configuration Information Management Function". "WFDB" is recommended as the database name you create. However, you can use any name. Use a dedicated database for CMDB whenever possible. If a database name other than "WFDB" is created, change the database name in the scripts provided later to the database name you created. To support clusters, create the database file used by the CMDB on the shared disk.

The environment variables that need to be specified to use Oracle are as follows.

- PATH
- ORACLE\_BASE
- ORACLE\_HOME
- ORACLE\_SID
- NLS\_LANG
- LD\_LIBRARY\_PATH

### 3.2.2.1. Setting up CMDB

The installation directory of MasterScope products is described as "\$INSDIR". Also, the Oracle home directory is described as "\$ORACLE\_HOME".

**In a cluster environment**

**Perform the subsequent settings on the active node unless otherwise specified.**

- 1) Check that Oracle is running. Check that the background processes of Oracle (ora\_smon\_WFDB, ora\_pmon\_WFDB, etc.) are running. If not, start them.

```
root> ps -ef | grep ora_
```

- 2) Check that Oracle Listener is running. If not, start it.

```
root> ps -ef | grep tnslsnr
```

- 3) Change the current directory to the directory where the database table creation script is saved.

```
root> cd $INSDIR/Manager/sql/oracle
```

- 4) Execute the database table creation script. Specify the user name, Oracle net service name, Oracle home directory, and Oracle system user password in the parameters. If not specified, the following values are used as the default values.

- User Name : WFDB
- Oracle Net Service Name : WFDB
- Oracle Home Directory : \$ORACLE\_HOME
- Oracle System User Password : MANAGER

- Oracle Version : 10.1

```
root> ./CR_TBL.sh <User Name> <Oracle Net Service Name> <Oracle Home Directory> <Oracle System User Password> <Oracle Version>
```

(Do not insert a line feed in the command.)

(Note) Specifying the Oracle version

- Oracle10g(R1,R2) : 10.1 (Default value)
- Oracle9iR2 : 9.2
- Oracle11gR1 : 11.1

**Example:**

```
root> ./CR_TBL.sh wfdb wfdb /opt/app/oracle11/product/1110/db_1 manager 11.1
```

Specify the above when the user name is "wfdb", the Oracle net service name is "wfdb", the Oracle home directory is "/opt/app/oracle11/product/1110/db\_1", the Oracle system user password is "manager", and the Oracle version is "Oracle11gR1".

**Example:**

```
root> ./CR_TBL.sh wfdb wfdb /opt/app/oracle10/product/1010/db_1 manager
```

Specify the above when the user name is "wfdb", the Oracle net service name is "wfdb", the Oracle home directory is "/opt/app/oracle10/product/1010/db\_1", the Oracle system user password is "manager", and the Oracle version is the default value (Oracle10g(R1,R2)).

When specifying one or more command line parameters, specify all the parameters before the parameter you want to specify. (When specifying parameters, the values do not necessarily have to be different from the default values.)

When the execution log is output to the current directory, make sure that there is no error. (If there is any error, remove the cause of the error by referring to "8.1 Setting Up a Database" in Troubleshooting, and execute it again.)

- 5) When the script is executed in Step 4, the following database configuration file is created.

```
$INSDIR/Manager/sg/wfdbmgr/WFDB.INI
```

```
[SystemSvr]
USE_DATABASE=ORACLE
CMDB_USER=wfdb           The user name used for database access
CMDB_PASSWD=wfdb        The password for the above user
DATABASE_NAME=wfdb      Oracle net service name
DATABASE_VERSION=10.1   Oracle version
```

**In a cluster environment**

**Copy the database configuration file created in the active system to the same directory of the standby node.**

- 6) When the script is executed in Step 4, the database that the manager function connects to changes to Oracle10g. To change it to Oracle9i, etc., execute the library change shell (ChangedB.sh) as shown below. Note that the library varies depending on the version of Oracle.

```
Example: Using Oracle 9.2.0
```

```

root> cd $INSDIR/Manager/bin
root> ./ChangeDB.sh
Select Number

1 : Oracle11g
2 : Oracle10g
3 : Oracle9i
4 : PostgreSQL8.3 or 8.4
5 : PostgreSQL8.2
6 : PostgreSQL8.0 or 8.1
7 : Not Connect to DB

Please Input Number : 3      ... Enter a value and press Enter.

Database Change to Oracle9i [ OK ]

```

**In a cluster environment**

**Perform this on both the active node and the standby node.**

- 7) Add the environment variables to use Oracle in the manager startup script of the MasterScope product using the CMDB. Specify values to the bold characters according to the Oracle environment.

**Example for HP-UX (Itanium2)**

```
/sbin/init.d/UMFBaseManager_n *1
```

**Example for Linux**

```
/etc/init.d/UMFBaseManager_n *1
```

\*1: *n* indicates a service number of 1 or higher.

(The value is set during installation of MasterScope products.)

Add the following description in the line before "export PATH" in the startup script.

**For HP-UX (Itanium2)**

```

ORACLE_BASE=<Oracle Base Directory>    ... Specify it according to the Oracle install
                                           ation environment.
ORACLE_HOME=<Oracle Home Directory>    ... Specify it according to the Oracle instal
                                           lation environment.
ORACLE_SID=<Oracle SID Name>           ... Specify it according to the Oracle install
                                           ation environment.
LD_LIBRARY_PATH=$ORACLE_HOME/lib32:${LD_LIBRARY_PATH}
PATH=$ORACLE_HOME/bin:${PATH}
NLS_LANG=Japanese_Japan.UTF8
export ORACLE_BASE
export ORACLE_HOME
export ORACLE_SID
export NLS_LANG

```

## For Linux

```
ORACLE_BASE=<Oracle Base Directory>    ...Specify it according to the Oracle install
                                         ation environment.
ORACLE_HOME=<Oracle Home Directory>    ...Specify it according to the Oracle instal
                                         lation environment.
ORACLE_SID=<Oracle SID Name>           ...Specify it according to the Oracle install
                                         ation environment.

if [ -d $ORACLE_HOME/lib32 ] ; then
    LD_LIBRARY_PATH=${LD_LIBRARY_PATH}:$ORACLE_HOME/lib32
else
    LD_LIBRARY_PATH=${LD_LIBRARY_PATH}:$ORACLE_HOME/lib
fi
PATH=$ORACLE_HOME/bin:${PATH}
NLS_LANG=Japanese_Japan.UTF8
export ORACLE_BASE
export ORACLE_HOME
export ORACLE_SID
export NLS_LANG
```

### In a cluster environment

**Perform this on both the active node and the standby node.**

## 8) Adjust the orders of starting and stopping.

The server is started and stopped in the following order.

Starting : Oracle, and then MasterScope product

Stopping : MasterScope product, and then Oracle

This product uses S90, K10(Linux), S900, and K10(HP-UX). Create the file names of the Oracle starting/stopping scripts as shown in the example below. If there are any products using Oracle other than this product, adjust the starting and stopping orders of Oracle while taking into account the starting and stopping orders of the products.

### Example for HP-UX (Itanium2)

```
/sbin/rc2.d/S890dbora
/sbin/rc0.d/K11dbora
```

### Example for Linux

```
/etc/rc2.d/S89dbora
/etc/rc3.d/S89dbora
/etc/rc4.d/S89dbora
/etc/rc5.d/S89dbora
/etc/rc0.d/K11dbora
/etc/rc1.d/K11dbora
/etc/rc6.d/K11dbora
```

### In a cluster environment (Oracle)

**In the starting and stopping scripts of the cluster software, take the following measures.**

- Oracle starts before the MasterScope product starts.
- Oracle stops after the MasterScope product stops.

This concludes the setup of the Oracle on UNIX.

To enable the CMDB setting, restart the manager service by referring to the manuals for the MasterScope products.

## 3.3. Updating the Database before Rolling Update

Rolling update is the function to complete an upgrade without stopping the cluster package. It's necessary to update the database before Rolling update.

A database update is performed in the following procedure. Perform this procedure only in the active system just before the cluster package stop.

[Note]

There are in the update and a possibility that database access is failed temporarily.

### 3.3.1. Windows environment

Hereafter, the DVD-ROM drive is described as "E:" drive, and the installation directory of MasterScope products is described as "%INSDIR%". Replace them accordingly based on the environment.

Copy the folder as shown below.

Copy source: E:\Windows\Tools\sql\_rupdate

Copy destination: %INSDIR%\Manager\sql\_rupdate

#### 3.3.1.1. Using SQL Server

Move to %INSDIR%\Manager\sql\_rupdate\sqlserver and execute the CMDDB configuration script (WfdbCmdbSetup.bat). Specify the database name, server name, instance name, and database driver name in the command line parameters.

```
$> WfdbCmdbSetup.bat <Database Name> <Server Name> <Instance Name> <Database Driver Name>
```

(Do not insert a line feed in the command. If a space is included in the value, enclose it in double quotation marks ("").)

The values to be specified can be checked in the database configuration file (%INSDIR%\Manager\sg\wfdbmgr\WFDB.INI).

- Database Name : The value of DATABASE\_NAME
- Server Name : The value of SERVER\_NAME
- Instance Name : The value of SQL\_INSTANCE\_NAME
- Database Driver Name : The value of DATABASE\_DRIVER

When the execution log is output to the execution folder after the command is executed, make sure that there is no error. (Any error indicating that the user, role, database, or schema already exists is not a problem. If there is any error, remove the cause of the error by referring to "8.1 Setting Up a Database" in Troubleshooting, and execute it again.)

The following message is sometimes output in the <DatabaseName>AlertDB.log, but it's no problem.

```
Msg 5070, Level 16, State 2, Server <ServerName>¥<InstanceName>, Line 1
Database state cannot be changed while other users are using the database <DatabaseName>
Msg 5069, Level 16, State 1, Server <ServerName>¥<InstanceName>, Line 1
ALTER DATABASE statement failed.
```

### 3.3.1.2. Using Oracle

Move to %INSDIR%\Manager\sql\_rupdate\oracle, and execute the database table creation script (CR\_TBL.bat). Specify the user name, Oracle net service name, Oracle home directory, and Oracle system user password in the command line parameters.

```
$> CR_TBL.bat <User Name> <Oracle Net Service Name> <Oracle Home Directory> <Oracle System User Password>
```

(Do not insert a line feed in the command. If a space is included in the value, enclose it in double quotation marks (").)

The values to be specified can be checked in the database configuration file (%INSDIR%\Manager\sglwfdbmgr\WFDB.INI). (The Oracle system user password is not listed in the database configuration file.)

- User Name : The value of CMDB\_USER
- Oracle Net Service Name : The value of ODBC\_DATASOURCE
- Oracle Home Directory : The value of DBMS\_HOME (does not exist before FW3.19.0)

When the execution log is output to the execution folder after the command is executed, make sure that there is no error. (Any error indicating that the user, role, database, or schema already exists is not a problem. If there is any error, remove the cause of the error by referring to "8.1 Setting Up a Database" in Troubleshooting, and execute it again.)

### 3.3.1.3. Using the included database

Move to %INSDIR%\Manager\sql\_rupdate\postgres and execute the CMDB configuration script (WfdbCmdSetup.bat). Specify the user name, port number, user password, server name, database name, and data storage destination directory in the command line parameters.

```
$> WfdbCmdSetup.bat <User Name> %INSDIR%\Manager\bin\dbms1 <Port Number> SYSTEM <User Password> <Server Name> <Database Name> <Data Storage Destination Directory> YES
```

(Do not insert a line feed in the command. If a space is included in the value, enclose it in double quotation marks (").)

The values to be specified can be checked in the database configuration file (%INSDIR%\Manager\sglwfdbmgr\WFDB.INI).

- User Name : The value of CMDB\_USER
- Port Number : The value of DATABASE\_PORT
- User Password : The value of CMDB\_PASSWD
- Server Name : The value of SERVER\_NAME
- Database Name : The value of DATABASE\_NAME
- Data Storage Destination Directory : The value of DATABASE\_PATH

When the execution log is output to the execution folder after the command is executed, make sure that there is no error. (Any error indicating that the user, role, database, or schema already exists is not a problem. If there is any error, remove the cause of the error by referring to "8.1 Setting Up a Database" in Troubleshooting, and execute it again.)

## 3.3.2. UNIX environment

Hereafter, the DVD-ROM drive is mounted to "/SD\_CDROM", and the installation directory of MasterScope products is described as "%INSDIR%". Replace them accordingly based on the environment.

Copy the folder as shown below.

Copy source: /SD\_CDROM/Linux/Tools/sql\_rupdate , /SD\_CDROM/HP-UX\_IPF/Tools/sql\_rupdate  
Copy destination: \$INSDIR/Manager/sql\_rupdate

### 3.3.2.1. Using PostgreSQL

Move to \$INSDIR/Manager/sql\_rupdate/postgres, and execute the database table creation script (CR\_DB.sh). Specify the user name, PostgreSQL home directory, port number, and PostgreSQL administrator user name in the command line parameters.

```
root> ./CR_DB.sh <User Name> <PostgreSQL Home Directory> <Port Number> <PostgreSQL Administrator User Name>
```

(Do not insert a line feed in the command.)

The values to be specified can be checked in the database configuration file (\$INSDIR/Manager/sg/wfd bmgr/WFDB.INI).

- User Name : The value of CMDB\_USER
- PostgreSQL Home Directory : The value of DBMS\_HOME
- Port Number : The value of DATABASE\_PORT
- PostgreSQL Administrator User Name : The value of DATABASE\_ADMIN

When the execution log is output to the execution folder after the command is executed, make sure that there is no error. (Any error indicating that the user, role, database, or schema already exists is not a problem. If there is any error, remove the cause of the error by referring to "8.1 Setting Up a Database" in Troubleshooting, and execute it again.)

### 3.3.2.2. Using Oracle

Move to \$INSDIR/Manager/sql\_rupdate/oracle, and execute the database table creation script (CR\_TBL.sh). Specify the user name, Oracle net service name, Oracle home directory, Oracle system user password, and Oracle version in the command line parameters.

```
root> ./CR_TBL.sh <User Name> <Oracle Net Service Name> <Oracle Home Directory> <Oracle System User Password> <Oracle Version>
```

(Do not insert a line feed in the command.)

The values to be specified can be checked in the database configuration file (\$INSDIR/Manager/sg/wfd bmgr/WFDB.INI). (The Oracle system user password is not listed in the database configuration file.)

- User Name : The value of CMDB\_USER
- Oracle Net Service Name : The value of DATABASE\_NAME
- Oracle Home Directory : The value of DBMS\_HOME (does not exist before FW3.19.0)
- Oracle Version : The value of DATABASE\_VERSION

When the execution log is output to the execution folder after the command is executed, make sure that there is no error. (Any error indicating that the user, role, database, or schema already exists is not a problem. If there is any error, remove the cause of the error by referring to "8.1 Setting Up a Database" in Troubleshooting, and execute it again.)

### 3.3.2.3. Using the included database

Move to `$INSDIR/Manager/sql_rupdate/postgres`, and execute the database table creation script (`CR_DB.sh`). Specify the user name, PostgreSQL home directory, port number, PostgreSQL administrator user name, user password, server name, database name, and data storage destination directory in the command line parameters.

```
root> ./CR_DB.sh <User Name> <PostgreSQL Home Directory> <Port Number> <PostgreSQL
Administrator User Name> <User Password> <Server Name> <Database Name> <Data Storage
Destination Directory> YES
```

(Do not insert a line feed in the command.)

The values to be specified can be checked in the database configuration file (`$INSDIR/Manager/sg/wfd bmgr/WFDB.INI`).

- User Name : The value of `CMDB_USER`
- PostgreSQL Home Directory : The value of `DBMS_HOME`
- Port Number : The value of `DATABASE_PORT`
- PostgreSQL Administrator User Name : The value of `DATABASE_ADMIN`
- User Password : The value of `CMDB_PASSWD`
- Server Name : The value of `SERVER_NAME`
- Database Name : The value of `DATABASE_NAME`
- Data Storage Destination Directory : The value of `DATABASE_PATH`

When the execution log is output to the execution folder after the command is executed, make sure that there is no error. (Any error indicating that the user, role, database, or schema already exists is not a problem. If there is any error, remove the cause of the error by referring to "8.1 Setting Up a Database" in Troubleshooting, and execute it again.)

## 4. Deleting CMDB

---

This chapter describes how to delete the CMDB (database schema).

For details of how to uninstall database software, refer to the uninstallation procedure of the software.

### 4.1. Windows Environment

#### 4.1.1. Deleting a database (SQL Server)

The procedure for deleting an SQL Server database is described below.

- 1) Stop the manager service of the MasterScope product using the CMDB.
- 2) Check the database deletion script. If the SQL Server is installed on a node different from the node on which the manager function of the MasterScope product is installed, copy the following file to the node on which the SQL Server is installed.

```
Under %INSDIR%\Manager\sql\sqlserver
```

```
WFDBDropDB.bat
```

- 3) Execute the database deletion script.  
The deleted database name, server name, and instance name can be specified in the command line parameters. Specify the database name, server name, and instance name specified when creating the database. When the execution log is output to the execution folder, make sure that there is no error.

```
$> WFDBDropDB.bat <Database Name> <Server Name> <Instance Name>
```

The default values of the parameters are described below. To change a value, specify the value to the parameter and execute the command.

- Database Name : wfdb
- Server Name : localhost
- Instance Name : SQLEXPRESS (\*Note)

(\*Note) If no instance name was specified during installation of the database (if the default instance was used), specify "" for the instance name.

- 4) If the database is executed in a cluster, delete the descriptions of the starting script and ending script changed in 3.1.1.1.

This concludes the deletion of the CMDB (SQL Server).

## 4.1.2. Deleting a database schema (Oracle)

The procedure for deleting an Oracle database schema is described below.

- 1) Stop the manager service of the MasterScope product using the CMDDB.
- 2) Check the database schema deletion script.

```
Under %INSDIR%\Manager\sql\oracle
```

```
DR_TBL.bat
```

- 3) Execute the database schema deletion script. Specify the parameters specified when creating the database schema.

```
$> DR_TBL.bat <User Name> <Oracle Net Service Name> <Oracle Home Directory> <Oracle System User Password>
```

(Do not insert a line feed in the command.)

This concludes the deletion of the database schema.

## 4.2. UNIX Environment

### 4.2.1. Deleting a database (PostgreSQL)

The procedure for deleting a PostgreSQL database is described below.

- 1) Check that PostgreSQL is running.

```
root> ps -ef | grep postmaster
```

If the postmaster process is not running, start the postmaster process by using the method appropriate for the environment to make PostgreSQL ready for use.

- 2) If the manager daemon of the MasterScope product using the CMDDB is running, stop the manager daemon of the corresponding product. (For details of how to stop it, see the release memo for the product.)
- 3) Change the current directory to the directory where the database deletion script is saved.

```
root> cd $INSDIR/Manager/sql/postgres
```

- 4) Execute the database deletion script. Specify the user name and PostgreSQL installation directory specified during installation in the parameters. When the execution log is output to the screen, make sure that there is no error.

```
root> ./DR_DB.sh <User Name> <PostgreSQL Installation Directory> <PostgreSQL Port Number>  
> <PostgreSQL Administrator User>
```

(Do not insert a line feed in the command.)

To use a value other than the default value (5432) in PostgreSQL Port Number, execute the database deletion script (DR\_DB.sh) as shown below.

**Example (specifying 5433 for Port Number):**

```
root> ./DR_DB.sh wfdb /opt/local/pgsql 5433 postgres
```

This concludes the deletion of the CMDDB (PostgreSQL).

## 4.2.2. Deleting a database schema (Oracle)

The procedure for deleting an Oracle database schema is described below.

- 1) Check that Oracle is running. Check that the background processes of Oracle (ora\_smon\_WFDB, ora\_pmon\_WFDB, etc.) are running.

```
root> ps -ef | grep ora_
```

- 2) Check that Oracle Listener is running. If not, start it.

```
root> ps -ef | grep tnslsnr
```

- 3) If the manager daemon of the MasterScope product using the CMDDB is running, stop the manager daemon of the corresponding product. (For details of how to stop it, see the release memo for the product.)
- 4) Change the current directory to the directory where the database schema deletion script is saved.

```
root> cd $INSDIR/Manager/sql/oracle
```

- 5) Execute the database schema deletion script. Specify the parameters specified when creating the database.

```
root> ./DR_TBL.sh <User Name> <Oracle Net Service Name> <Oracle Home Directory> <Oracle System User Password>
```

(Do not insert a line feed in the command.)

This concludes the deletion of the database schema.

## 5. Backing Up and Restoring CMDB

---

Data used in the MasterScope product can be roughly classified into the following 2 types.

- Data of the MasterScope product
- CMDBs stored on RDBMS

This chapter describes the procedures for backing up and restoring the CMDB stored on RDBMS.

For details of the backup and restore procedures for data of the MasterScope product, see the product manual.

For the backup and restore procedures for data of the MasterScope product and CMDBs, there are 2 methods: the offline method performed while the manager service is stopped and the online method performed while the manager service is running.

Notes about online backup of the CMDB are as follows.

[Note]

- CMDB online backup is automatically executed during backup of data of the MasterScope product if the setting to use the CMDB is selected. The execution result of CMDB online backup is not reflected in the execution result of the command. To determine whether CMDB online backup has been executed, check whether the following CMDB backup file exists.

SQL Server: CMDB backup file "`<Installation Path>\backup\<nnn>\sg\wfdbmgr`"

Oracle (Windows): CMDB backup file "`<CMDB User Name>_<ODBC Data Source Name>.bak`" under "`<Installation Path>\backup\<nnn>\sg\wfdbmgr`"

Oracle (UNIX): CMDB backup file "`<CMDB User Name>_<Database Name>.bak`" under "`<Installation Path>/backup/<nnn>/sg/wfdbmgr`"

PostgreSQL: CMDB backup file "`<Database Server Name>_<Database Name>_<Database Port Number>.bak`" under "`<Installation Path>/backup/<nnn>/sg/wfdbmgr`"

### 5.1. Procedure for Backing Up and Restoring a Database

This section describes the procedures for backing up and restoring the CMDB for different types of database software. Perform the procedure with the user account with the database administrator authority. For details of the backup and restore of the RDBMS itself, see the RDBMS manual.

The backup source and restore destination of the database must have the same environment (database version, installation path, etc.).

### 5.1.1. SQL Server

Backup and restore of the SQL Server are performed for each database. (If the CMDB is generated in the default state, the database name of the CMDB is "wfdb".)

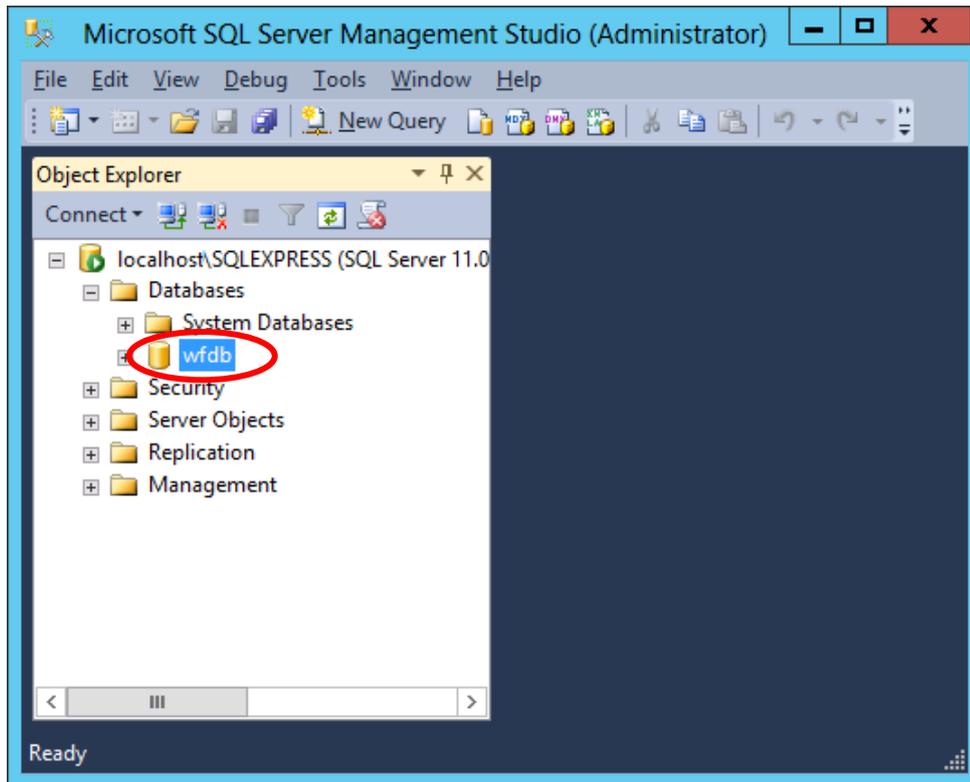


Figure 5-1 SQL Server

#### 5.1.1.1. Backup procedure

The offline backup procedure is as follows. (Backup is performed while the SQL Server is running.) CMDB online backup is automatically executed during backup of data of the MasterScope product if the setting to use the CMDB is selected. For details of the backup procedure for data of the MasterScope product, see the product manual.

- 1) Executing the backup command of the SQL Server  
Execute the backup command on the node on which the SQL Server is installed. An example of the backup command when the CMDB database name is "wfdb" is shown below. For details of the BACKUP command, see the Microsoft SQL Server manual.

```
> osql -S localhost\SQLEXPRESS -E -Q "BACKUP DATABASE [wfdb] TO DISK = N'CMDB.bak'  
WITH NOFORMAT, NOINIT, NAME = N'wfdb-Full Database Backup', SKIP, NOREWIND, NOUN  
LOAD, STATS = 10" -o wfdb_Backup.log
```

(Do not insert a line feed in the command.)

[Note]

When the backup command above is executed with the backup set file "CMDB.bak" on the disk, a backup is added in the backup set. Execute the backup command after deleting the "CMDB.bak" file at the backup destination. For details, see the Microsoft SQL Server manual.

### 5.1.1.2. Restore procedure

An overview of the restore procedure is as follows. (Restore is performed while the SQL Server is running.)

- 1) Stopping the manager service  
For details of the services to stop and how to stop them, see the MasterScope product manual.

- 2) Deleting CMDB  
Start the command prompt, and change the current directory to the directory where the database schema deletion script is saved. "%INSDIR%" is the installation directory of MasterScope products.

```
> cd %INSDIR%\Manager\sql\sqlserver
```

Execute this script on the node on which the SQL Server is installed. The deleted database name, server name, and instance name can be specified for this script. Specify the database name, server name, and instance name specified when creating the database. When omitted, the database name is "wfdb", the server name is "localhost", and the instance name is "SQLEXPRESS". To specify the default instance, specify "" for the instance name. When the execution log is output to the execution folder, make sure that there is no error.

```
> WFDBDropDB.bat <Database Name> <Server Name> <Instance Name>
```

- 3) Preparing CMDB  
Copy the backed up file in the following directory with the following file name: (The following file will be deleted when the CMDB restore command is executed.)

```
%INSDIR%\Manager\sg\wfdmgr\CMDB.bak
```

To restore the CMDB backed up with the online backup function, execute the restore command of the MasterScope product.

```
> %INSDIR%\Manager\bin\SysMonMgr.exe -restore -latest
```

- 4) Executing the CMDB restore command  
Execute the CMDB restore command.

```
> WfdbRestore_sql.bat <Database Name> <Server Name> <Instance Name>
```

To specify the default instance, specify "" for the instance name.

[Note]

The restore command above assumes that the 1st backup is specified if multiple backups exist in the backup set.

**In a cluster environment**

**Perform steps 3) through 7) in 3.1.1.1.**

**The file described in steps 3) and 4) may already exist depending on the backup state. In this case, check the descriptions in the file. It does not have to be created again if it reflects the current state.**

## 5.1.2. Oracle

Backup and restore of Oracle include physical backup (saving the entire OS files corresponding to the data file to tape, etc.) and logical backup (saving in logical units with the export command). When backing up only the CMDB, logical backup is suitable. This section describes logical backup only. When only the CMDB is backed up and restored, it is performed for each schema. (In Oracle, export is performed by specifying a user name because a schema is equivalent to an Oracle user. If the CMDB is generated in the default state, the user name of the CMDB is "wfdb".)

### 5.1.2.1. Backup procedure

An overview of the offline backup procedure is as follows. (Backup is performed while Oracle is running.) CMDB online backup is automatically executed during backup of data of the MasterScope product if the setting to use a CMDB is selected. For details of the backup procedure for data of the MasterScope product, see the product manual.

- 1) Stopping the manager service

For details of the services to stop and how to stop them, see the MasterScope product manual.

- 2) Backing up the rc script file

For HP-UX or Linux, back up the following file.

Example for HP-UX

```
/sbin/init.d/UMFBasesManager_n *1
```

Example for Linux

```
/etc/init.d/UMFBasesManager_n *1
```

\*1: *n* indicates a service number of 1 or higher. (The value is set during installation of MasterScope products.)

- 3) Executing the backup command of Oracle (exp command)

An example of the backup command is shown below. In this example, the schema name, password, and Oracle net service name are all "wfdb". For details of the exp command, see the Oracle manual.

```
> $ORACLE_HOME/bin/exp wfdb/wfdb@wfdb OWNER=wfdb file=CMDB.bak log=wfdb_ora_exp.log
```

### 5.1.2.2. Restore procedure

An overview of the restore procedure is as follows. (Restore is performed while Oracle is running.)

- 1) Stopping the manager service

For details of the services to stop and how to stop them, see the MasterScope product manual.

- 2) Deleting the Oracle schema of the CMDB

- Windows

Start the command prompt, and change the current directory to the directory where the database schema deletion script is saved. "%INSDIR%" is the installation directory of MasterScope products.

```
> cd %INSDIR%\Manager\sql\oracle
```

Execute the database schema deletion script. Specify the parameters specified when creating the database schema.

```
> DR_TBL.bat <User Name> <Oracle Net Service Name> <Oracle Home Directory> <Oracle System User Password>
```

(Do not insert a line feed in the command.)

#### ■ UNIX

Change the current directory to the directory where the database schema deletion script is saved. "\$INSDIR" is the installation directory of MasterScope products.

```
root> cd $INSDIR/Manager/sql/oracle
```

Execute the database schema deletion script. Specify the parameters specified when creating the database.

```
root> ./DR_TBL.sh <User Name> <Oracle Net Service Name> <Oracle Home Directory> <Oracle System User Password>
```

(Do not insert a line feed in the command.)

### 3) Preparing CMDB

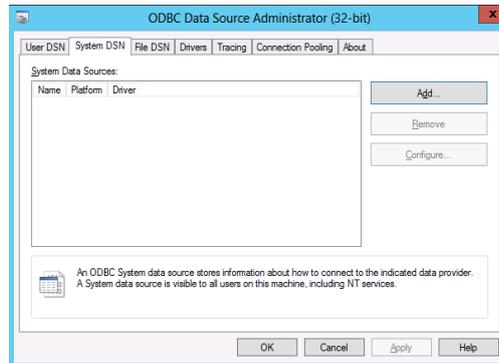
#### ■ Windows

The installation directory of MasterScope products is described as "%INSDIR%". Also, the Oracle home directory is described as "%ORACLE\_HOME%".

##### a) Create the ODBC data source.

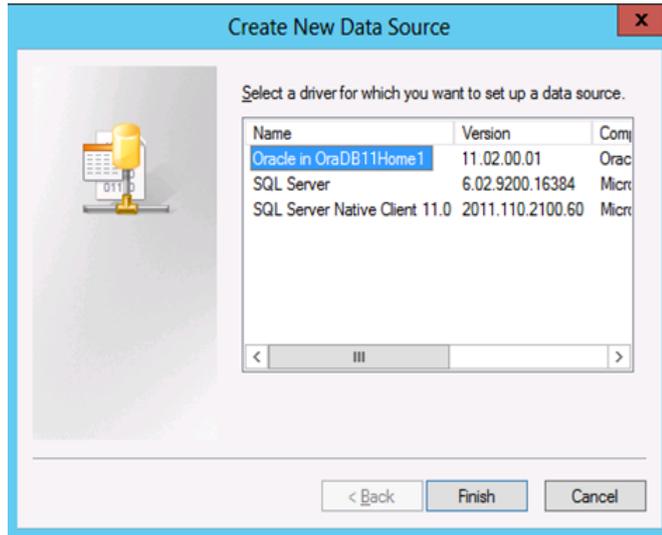
For a 32-bit OS: Select [Control Panel], [Administrative Tools], and then [ODBC Data Source Administrator], and select the [System DSN] tab.

For a 64-bit OS: Select [Start] followed by [Run], execute "<System Drive>:\WINDOWS\SysWOW64\odbcad32.exe" to start the 32-bit version of [ODBC Data Sources], and select the [System DSN] tab.



**Figure 5-2 [System DNS]**

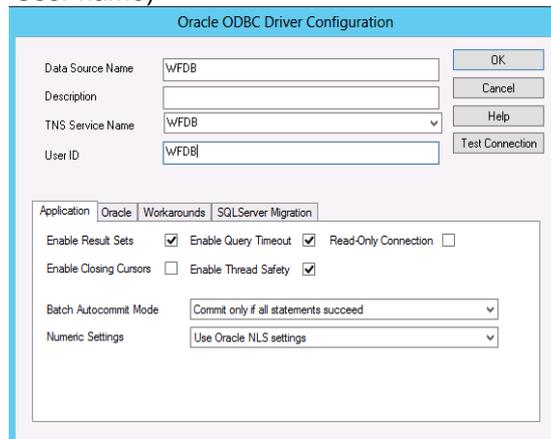
Click the [Add] button, and select the Oracle driver to be used. (The Oracle driver name varies depending on the version and installation environment of Oracle. Select the driver corresponding to the environment.) After selecting the driver, click the [Finish] button.



**Figure 5-3 [Create New Data Source]**

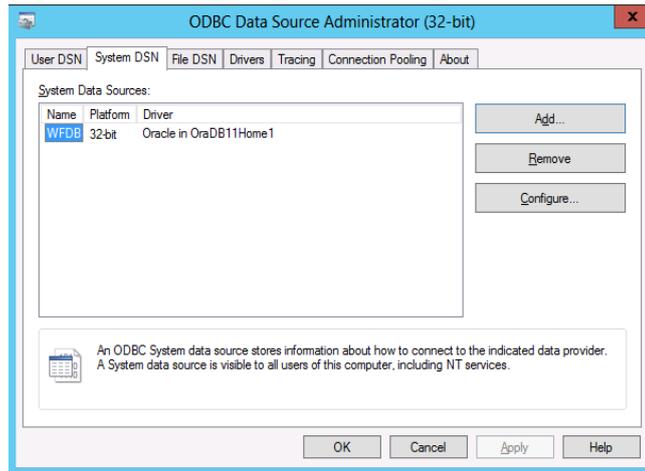
Basically, specify the following 3 items and click the [OK] button. The screen configuration may vary slightly depending on the selected driver.

- Data source name
- Oracle net service name (= TNS service name)
- User ID (= User name)



**Figure 5-4 [Oracle ODBC Driver Configuration]**

Check that the data source created has been added to [System DSN].



**Figure 5-5 [After adding Data Source]**

- b) Check that Oracle is running. Check that the Oracle services (OracleServiceWFDB, etc.) are running.
- c) Start the command prompt, and change the current directory to the directory where the script for creating database tables is saved.

```
> cd %INSDIR%\Manager\sql\oracle
```

- d) Preparing backup files  
Copy the backed up file in the following directory with the following file name: (The following file will be deleted when the CMDB restore command is executed.)  
%INSDIR%\Manager\sg\wfdmgr\CMDB.bak

To restore the CMDB backed up with the online backup function, execute the restore command of the MasterScope product.

```
> %INSDIR%\Manager\bin\SysMonMgr.exe -restore -latest
```

■ UNIX only

After executing the restore command of the MasterScope product, change the following file name.

Before change: \$INSDIR/Manager/sg/wfdmgr/<User Name>\_<Database Name>.bak  
After change: \$INSDIR/Manager/sg/wfdmgr/CMDB.bak

The values to be specified can be checked in the database configuration file (\$INSDIR/Manager/sg/wfdmgr/WFDB.INI).

- User Name : The value of CMDB\_NAME
- Database Name : The value of DATABASE\_NAME

**In a cluster environment**

Perform steps 6) through 7) in 3.1.2.1.

**The file described in step 6) may already exist depending on the backup state. In this case, check the descriptions in the file. It does not have to be created again if it reflects the current state.**

■ UNIX

The installation directory of MasterScope products is described as "\$INSDIR". Also, the Oracle home directory is described as "\$ORACLE\_HOME".

- a) Check that Oracle is running. Check that the background processes of Oracle (ora\_smon\_WFDB, ora\_pmon\_WFDB, etc.) are running.

```
root> ps -ef | grep ora_
```

- b) Change the library of the configuration information management function to change the database to which the manager function connects. Note that the library varies depending on the version of Oracle. To change the library, execute the library change shell (ChangeDB.sh) as shown below.

```
Example: Using Oracle 10.1.0
root> cd $INSDIR/Manager/bin
root> ./ChangeDB.sh
Select Number

1 : Oracle11g
2 : Oracle10g
3 : Oracle9i
4 : PostgreSQL8.3 or 8.4
5 : PostgreSQL8.2
6 : PostgreSQL8.0 or 8.1
7 : Not Connect to DB

Please Input Number : 2      ... Enter a value and press Enter.

Database Change to Oracle10g [ OK ]
```

- c) Change the current directory to the directory where the database table creation script is saved.

```
root> cd $INSDIR/Manager/sql/oracle
```

- d) Preparing backup files

Copy the backed up file in the following directory with the following file name: (The following file will be deleted when the CMDB restore command is executed.)

\$INSDIR/Manager/sg/wfdbmgr/CMDB.bak

To restore the CMDB backed up with the online backup function, execute the restore command of the MasterScope product.

```
root> $INSDIR/Manager/bin/SysMonMgr -restore -latest
```

- 4) Executing the CMDB restore command  
Execute the CMDB restore command.

■ Windows

```
> WfdbRestore_ora.bat <User Name> <Oracle Net Service Name> <Oracle Home Directory>  
<Oracle System User Password>
```

(Do not insert a line feed in the command.)

■ UNIX

```
root> ./WfdbRestore_ora.sh <User Name> <Oracle Net Service Name> <Oracle Home  
Directory> <Oracle System User Password>
```

(Do not insert a line feed in the command.)

5) Overwriting the backed up rc script

Overwrite the rc script file backed up in step 2) in 5.1.2.1 in the original location.

\* This is not required for Windows.

### 5.1.3. PostgreSQL

To back up and restore the data on PostgreSQL, perform the following procedure. In this procedure, the installation directory of MasterScope products is described as "\$INSDIR". The installation directory of PostgreSQL is described as "\$PGSQL\_HOME".

#### 5.1.3.1. Backup procedure

An overview of the backup procedure is as follows. (Backup is performed while PostgreSQL is running.) CMDB online backup is automatically executed during backup of data of the MasterScope product if the setting to use the CMDB is selected. For details of the backup procedure for data of the MasterScope product, see the product manual.

1) Stopping the manager

For details of the services to stop and how to stop them, see the MasterScope product manual.

2) Executing the backup command of PostgreSQL (pg\_dump command)

An example of the backup command is shown below. In this example, the database name and user name are both "wfdb". For details of the pg\_dump command, see the PostgreSQL manual.

```
root> ${PGSQL_HOME}/bin/pg_dump -f CMDB.bak -Fp -c -o -U wfdb wfdb
```

3) Backing up the rc script file

For HP-UX or Linux, back up the following file.

Example for HP-UX

```
/sbin/init.d/UMFBaseManager_n *1
```

Example for Linux

```
/etc/init.d/UMFBaseManager_n *1
```

\*1: *n* indicates a service number of 1 or higher. (The value is set during installation of MasterScope products.)

#### 5.1.3.2. Restore procedure

An overview of the restore procedure is as follows. (Restore is performed while PostgreSQL is running.)

1) Stopping the manager

For details of the services to stop and how to stop them, see the MasterScope product manual.

2) Deleting CMDB

Check that PostgreSQL is running.

```
root> ps -ef | grep postmaster
```

If the postmaster process is not running, start the postmaster process by using the method appropriate for the environment to make PostgreSQL ready for use.

Change the current directory to the directory where the database deletion script is saved.

```
root> cd $INSDIR/Manager/sql/postgres
```

Execute the database deletion script. Specify the user name and PostgreSQL installation directory specified during installation in the parameters. When the execution log is output to the screen, make sure that there is no error.

```
root> ./DR_DB.sh <User Name> <PostgreSQL Installation Directory> <PostgreSQL Port Number> <PostgreSQL Administrator User>
```

(Do not insert a line feed in the command.)

### 3) Preparing CMDB

- a) Change the library of the configuration information management function to change the database to which the manager function connects. To change the library, execute the library change shell (ChangeDB.sh) as shown below.

```
root> cd $INSDIR/Manager/bin
root> ./ChangeDB.sh
Select Number

1 : Oracle11g
2 : Oracle10g
3 : Oracle9i
4 : PostgreSQL8.3 or 8.4
5 : PostgreSQL8.2
6 : PostgreSQL8.0 or 8.1
7 : Not Connect to DB

Please Input Number : 4      ... Enter a value and press Enter.

Database Change to PostgreSQL8.3 or 8.4 [ OK ]
```

- b) Change the current directory to the directory where the database table creation script is saved.

```
root> cd $INSDIR/Manager/sql/postgres
```

- c) Preparing backup files

Copy the backed up file in the following directory with the following file name: (The following file will be deleted when the CMDB restore command is executed.)

\$INSDIR/Manager/sg/wfdbmgr/CMDB.bak

To restore the CMDB backed up with the online backup function, execute the restore command of the MasterScope product.

```
root> $INSDIR/Manager/bin/SysMonMgr -restore -latest
```

#### ■ UNIX only

After executing the restore command of the MasterScope product, change the following file name.

Before change: \$INSDIR/Manager/sg/wfdbmgr/<Server Name>\_<Database Name>\_<PostgreSQL Port Number>.bak

After change: \$INSDIR/Manager/sg/wfdbmgr/CMDB.bak

The values to be specified can be checked in the database configuration file (\$INSDIR/Manager/sg/wfdbmgr/WFDB.INI).

- Server Name : The value of SERVER\_NAME
- Database Name : The value of DATABASE\_NAME
- PostgreSQL Port Number : The value of DATABASE\_PORT

4) Executing the CMDB restore command

Execute the CMDB restore command.

```
root> ./WfdbRestore_pos.sh <User Name> <PostgreSQL Installation Directory> <PostgreSQL  
Port Number> <PostgreSQL Administrator User>
```

(Do not insert a line feed in the command.)

\* The following messages may be displayed as a result of restore, but this is not a problem.

```
ERROR: must be owner of schema public  
ERROR: schema "public" already exists  
  
WARNING: no privileges could be revoked  
WARNING: no privileges were granted
```

5) Overwriting the backed up rc script

Overwrite the rc script file backed up in step 3) in 5.1.3.1 in the original location.

## 5.1.4. Included Database

To back up and restore the data of the included database, perform the following procedure. In this procedure, the installation directory of MasterScope products is described as "%INSDIR%(\$INSDIR)".

### 5.1.4.1. Backup procedure

The data of the included database is also backed up in the backup procedure for data of the MasterScope product in both offline backup and online backup if the setting to use the included database is selected. For details of the backup procedure for data of the MasterScope product, see the product manual.

### 5.1.4.2. Restore procedure

If the backup was performed in the offline backup procedure for data of the MasterScope product, the data of the included database is also restored in the restore procedure for the data of the MasterScope product. For details of the restore procedure for files backed up in the offline backup procedure, see the product manual.

An overview of the restore procedure when the backup was performed in the online backup procedure for data of the MasterScope product is as follows. (Restore is performed while the included database is running.)

- 1) Stopping the manager  
For details of the services to stop and how to stop them, see the MasterScope product manual.

- 2) Checking the included database startup

#### ■ Windows

Check that the included database is running.

Select [Control Panel], [Administrative Tools], and then [Services] and check whether the "Wfdb\_wfdbn" (\*) service is running. If not, start it.

\* *n* indicates a service number of 1 or higher. (The value is set during installation of MasterScope products.)

#### ■ UNIX

Check that the included database is running.

```
root> ps -ef | grep postgres | grep dbms1 | grep <PostgreSQL Administrator User>
```

The values to be specified can be checked in the database configuration file (\$INSDIR/Manager/sg/wfdbmgr/WFDB.INI).

- PostgreSQL Administrator User : The value of DATABASE\_ADMIN

#### Example when the PostgreSQL administrator user is "wfdb1\_1":

```
root> ps -ef | grep postgres | grep dbms1 | grep wfdb1_1
wfdb1_1 14164      1  0 14:14 pts/0    00:00:00 /opt/UMF/Operations/Manager/bin/dbms1/bin
/postgres -D /opt/UMF/Operations/Manager/sg/database/wfdb/dbms1/data
```

If it is installed to "Installation directory of the MasterScope product: /opt/UMF/Operations", the process with PID of 14164 is the PostgreSQL for the included database in the example above.

If the postgres process is not running, start the postgres process by using the following command to make the included database ready for use.

```
root> su -c "$INSDIR/Manager/sg/wfdbmgr/StartDBMS1_wfdb" <PostgreSQL Administrator User>
```

The values to be specified can be checked in the database configuration file (\$INSDIR/Manager/sg/wfdbmgr/WFDB.INI).

- PostgreSQL Administrator User : The value of DATABASE\_ADMIN

### 3) Deleting CMDB

#### ■ Windows

Move to %INSDIR%\Manager\sql\postgres and execute the CMDB deletion script (DR\_TBL.bat). Specify the user name and PostgreSQL port number in the command line parameters.

```
$> DR_TBL.bat <User Name> %INSDIR%\Manager\bin\dbms1 <PostgreSQL Port Number>
```

(Do not insert a line feed in the command.)

The values to be specified can be checked in the database configuration file (%INSDIR%\Manager\sg\wfdmgr\WFDB.INI).

- User Name : The value of CMDB\_USER
- PostgreSQL Port Number : The value of DATABASE\_PORT

#### ■ UNIX

Move to \$INSDIR/Manager/sql/postgres and execute the CMDB deletion script (DR\_DB.sh). Specify the user name, PostgreSQL port number, and PostgreSQL administrator user in the command line parameters.

```
root> ./DR_DB.sh <User Name> $INSDIR/Manager/bin/dbms1 <PostgreSQL Port Number>  
<PostgreSQL Administrator User>
```

(Do not insert a line feed in the command.)

The values to be specified can be checked in the database configuration file (\$INSDIR/Manager/sg/wfdbmgr/WFDB.INI).

- User Name : The value of CMDB\_USER
- PostgreSQL Port Number : The value of DATABASE\_PORT
- PostgreSQL Administrator User : The value of DATABASE\_ADMIN

### 4) Preparing CMDB

#### a) Preparing backup files

To restore the CMDB backed up with the online backup function, execute the restore command of the MasterScope product.

```
root> $INSDIR/Manager/bin/SysMonMgr -restore -latest
```

#### ■ UNIX only

After executing the restore command of the MasterScope product, change the following file name.

Before change: \$INSDIR/Manager/sg/wfdbmgr/<Server Name>\_<Database Name>\_<Port Number>.bak

After change: \$INSDIR/Manager/sg/wfdbmgr/CMDB.bak

The values to be specified can be checked in the database configuration file (\$INSDIR/Manager/sg/wfdbmgr/WFDB.INI).

- Server Name : The value of SERVER\_NAME
- Database Name : The value of DATABASE\_NAME
- PostgreSQL Port Number : The value of DATABASE\_PORT

5) Executing the CMDB restore command  
Execute the CMDB restore command.

■ Windows

```
$> WfdbRestore_pos.bat <User Name> %INSDIR%\Manager\bin\dbms1 <PostgreSQL Port Number>
```

(Do not insert a line feed in the command.)

The values to be specified can be checked in the database configuration file (%INSDIR%\Manager\sg\wfdbmgr\WFDB.INI).

- User Name : The value of CMDB\_USER
- PostgreSQL Port Number : The value of DATABASE\_PORT

■ UNIX

```
root> ./WfdbRestore_pos.sh <User Name> $INSDIR/Manager/bin/dbms1 <PostgreSQL Port Number> <PostgreSQL Administrator User>
```

(Do not insert a line feed in the command.)

The values to be specified can be checked in the database configuration file (\$INSDIR/Manager/sg/wfdbmgr/WFDB.INI).

- User Name : The value of CMDB\_USER
- PostgreSQL Port Number : The value of DATABASE\_PORT
- PostgreSQL Administrator User : The value of DATABASE\_ADMIN

\* The following messages may be displayed as a result of restore, but this is not a problem.

```
ERROR: must be owner of schema public
ERROR: schema "public" already exists
ERROR: schema "wfdb" already exists

WARNING: no privileges could be revoked
WARNING: no privileges were granted
```

## 6. Cautions

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### 6.1. Configuration Information Management Function

#### n

#### 6.1.1. PostgreSQL

1) Installing PostgreSQL

It is recommended to download the source of the version supported by the MasterScope product from the following website and perform installation and compilation. (As of September 2008)

```
For HP-UX and Linux: PostgreSQL website (http://www.postgresql.org/download/)  
Japan PostgreSQL Users Group (http://www.postgresql.jp/)
```

2) Compiling PostgreSQL

When compiling PostgreSQL, make sure to specify the multi-thread option. If it is not specified, the framework process may abort.

Specify other options according to the environment. For details, see the PostgreSQL manual.

```
./configure --without-readline --without-zlib --enable-thread-safety
```

- \* Make sure to check that installed PostgreSQL has been compiled with the multi-thread option specified. Execute the following command and check that the multi-thread option is in the displayed line.

Example: Installing PostgreSQL in /usr/local/pgsq

```
# /usr/local/pgsql/bin/pg_config --configure  
'--without-readline' '--without-zlib' '--enable-thread-safety'
```

3) Compiling PostgreSQL (Linux 64-bit version)

When using PostgreSQL in 64-bit Linux, make sure to specify the compile option of the 32-bit version. If it is not specified, the binary of PostgreSQL becomes the 64-bit version, and CMDB cannot be used. (An environment where 32-bit compilation can be performed in 64-bit Linux is required.)

Specify other options according to the environment. For details, see the PostgreSQL manual.

```
CC='gcc -m32' LD='ld -m elf_i386' ./configure --without-readline --without-zlib  
--enable-thread-safety
```

- \* To check that the binary of PostgreSQL is the 32-bit version, execute the following command.

```
# file /usr/local/pgsql/lib/libpq.so.4.1
```

The following command execution result is output.

```
/usr/local/pgsql/lib/libpq.so.4.1: ELF 32-bit LSB shared object, Intel 80386, version 1
```

If "ELF 32-bit" is output as shown above, the binary of PostgreSQL is the 32-bit version. For the 64-bit version, "ELF 64-bit" is output.

- 4) Creating a database cluster (initdb) in PostgreSQL 8.3 or later

To creating a database cluster (initdb) in PostgreSQL 8.3 or later, make sure to specify the "--locale=C" option. Specify other options according to the environment.

```
initdb --locale=C
```

- 5) Setting auto vacuum (autovacuum) in PostgreSQL 8.1 to 8.2

In PostgreSQL 8.1 to 8.2, the auto vacuum function is disabled by default. To prevent low performance of access to PostgreSQL, it is recommended to enable the auto vacuum function. (In PostgreSQL 8.3 or later, the auto vacuum function is enabled by default. In PostgreSQL 8.0 or earlier, the auto vacuum function does not exist.)

To enable the auto vacuum function, specify the parameters in the server configuration file (postgresql.conf) of PostgreSQL. The parameters that require setting and the values to be set are as follows.

```
autovacuum = on
stats_start_collector = on
stats_row_level = on
```

Enable the above parameters (by removing the # at the start), and set "on" to each of them. After that, restart PostgreSQL. (Also restart the manager service, etc. that use PostgreSQL.)

As a result, the auto vacuum function is enabled. For details, see the PostgreSQL manual.

- 6) Setting IPv6 when PostgreSQL is used

If IPv6 is enabled after installation of PostgreSQL, PostgreSQL may not start unless the IPv6 setting of PostgreSQL is changed. The authentication configuration file (pg\_hba.conf) needs to be changed. Uncomment the part starting with "host" as shown below. (Remove the # at the start.)

```
# IPv6 local connections:
# host      all          all          ::1/128      md5
```

## 6.1.2. Oracle

- 1) Character set of Oracle

When creating an Oracle database (instance), select AL32UTF8 as the database character set, and select UTF8 as the national character set.

- 2) Database table creation script

The following error messages may be output in the log file after the database table creation script is executed in database setup if Oracle is used. This is not a problem.

```
ORA-02065: illegal option for ALTER SYSTEM
ORA-01442: column to be modified to NOT NULL is already NOT NULL
```

\* The expressions may vary slightly depending on the version of Oracle. The messages may be output in a language other than Japanese depending on the language environment of Oracle.

The following error messages may be output in the log file after the database table creation script is executed in database setup during CMDB update if Oracle is used. This is not a problem.

```
ORA-02065: illegal option for ALTER SYSTEM
ORA-01920: user name 'WFDB' conflicts with another user or role name.
ORA-02379: profile already exists.
```

- \* The expressions may vary slightly depending on the version of Oracle. The messages may be output in a language other than Japanese depending on the language environment of Oracle.
- \* They are output to both the screen and the log file in the Windows environment, but only to the screen in the Unix environment.

### 3) Setting Oracle11g

#### Bloated audit trails

There are 3 types of auditing in Oracle: standard auditing, DBA auditing, and fine-grained auditing. In Oracle11g, the default operations and behaviors for standard auditing are changed. To use standard auditing, the output destination for the audit trail must be specified in the `audit_trail` initialization parameter. Up to Oracle10g, the default value of the parameter has been "none" (Do not perform auditing). From Oracle11g, it is "db" (Output audit trail to SYS.AUD\$ table). As a result, if there is any application not using connection pooling, an audit trail is always generated for each processing.

If the database is used with the default audit setting, audit trails keep accumulating in the SYS.AUD\$ table in the SYSTEM table area unknowingly. When constructing a system, unnecessary audit settings must be canceled, only audits required for the system's security requirements must be left, and operations to save and delete audit trails periodically must be incorporated. If there is no audit requirement in the system, the audit function itself must be disabled.

#### Bloated TNS listener log

From Oracle11g, the default setting is changed to obtain the TNS listener log. When processing that repeatedly performs database connection and disconnection is performed, a large amount of the TNS listener log is output. When the log file size exceeds 4 GB, a delay occurs upon new database connection.

Because the ADR setting, a new function from Oracle11g, has priority, traces of the "support" level are output. To control output of the trace alert log of the listener in an environment where ADR is running, the following must be specified.

<1> Setting in the listener.ora file

Add "DAIG\_ADR\_ENABLED\_LISTENER = OFF" to the listener.ora file.

<2> Setting in the sqlnet.ora file

Add "DIAG\_ADR\_ENABLED = OFF" to the sqlnet.ora file.

## 6.1.3. SQL Server

### 1) Database table creation script

The following warning or caution messages may be output in the log file after the database table creation script is executed in database setup if the SQL Server is used. This is not a problem.

```
Warning! The maximum key length is 900 bytes.
The index 'pk_***' has maximum length of xxx bytes.
Warning: The maximum length of the row exceeds the permissible limit of 8060
bytes. For some combination of large values, the insert/update operation
```

will fail.

Caution: Changing any part of an object name could break scripts and stored procedures.

\* The expressions may vary slightly depending on the version of the SQL Server.

The following error messages may be output in the log file after the database table creation script is executed in database setup during CMDB update if the SQL Server is used. This is not a problem.

```
Message 1801, Level 16, Status 3, Server *****, Line 1
Database 'wfdb' already exists. Choose a different database name.
Message 15025, Level 16, Status 1, Server *****, Line 1
The server principal "wfdb" already exists.
Message 15023, Level 16, Status 1, Server *****, Line 1
User, group, or role 'wfdb' already exists in the current database.
```

\* The expressions may vary slightly depending on the version of the SQL Server.

## 2) Database recovery model

In the SQL Server, the method of data output to the transaction log changes depending on the recovery model setting. As a result, the transaction log file may become bloated and clutter the disk area depending on the recovery model setting.

There are the following recovery model settings in the SQL Server.

- Simple recovery model  
The transaction log area is automatically reused. Therefore, the required disk area is small. In case of a problem, the data in the database can only be restored to the time of the backup.
- Full recovery model  
The transaction log keeps increasing unless it is periodically backed up and compressed. As a result, it may clutter the disk area depending on the recovery model setting. In case of a problem, the data in the database can be restored to the state immediately before the problem. (The bulk-logged recovery model is the same as the full recovery model in terms of how the transaction log is handled.)

Both recovery models can be used for the CMDB. For the full recovery model, periodic backups (backup of the SQL Server database and backup of the transaction log) are required so as to avoid a bloated transaction log file. (For the detailed operation method, see the SQL Server manual.) For the CMDB, recovery to the time of the backup does not cause a serious problem in terms of the nature of the stored data. Therefore, it is recommended to use the simple recovery model, which has a lower chance of cluttering the disk area.

To change from the full recovery model to the simple recovery model, do the following. (For details of each command, see the SQL Server manual.)

Example: When the instance name is "SQLEXPRESS" and database name is "wfdb"

```
> sqlcmd -E -S localhost\SQLEXPRESS
1> alter database wfdb set recovery simple
2> go
```

## 6.1.4. CMDB online backup

### 1) Database backup/restore commands

The commands of different DBMSs used for online backup and restore of CMDB are as follows.

DataBase	Backup command	Restore command
SQLServer	osql	osql
Oracle	exp	imp
PostgreSQL	pg_dump	psql

CMDB online backup/restore are executed on the node where the manager is running. Therefore, the database must be installed and the environment variables set so that the database commands above can function on the manager node.

- 2) Stopping the manager during CMDB online backup  
If the manager is stopped during CMDB online backup, backup may not function normally and the database data may have problems. Do not stop the manager during CMDB online backup.
- 3) Stopping the database during CMDB online backup  
The database must be running during CMDB online backup. Do not stop the database during CMDB online backup.
- 4) Restoring CMDB  
In the restore destination of the CMDB, DBMS must be installed in the same path as in backup.
- 5) CMDB online backup in PostgreSQL  
To use CMDB online backup when PostgreSQL is used, trust authentication in TCP/IP connection from the host executing CMDB online backup (normally localhost) must be specified for the database and users to be backed up in the PostgreSQL client authentication (pg\_hba.conf file) setting.

## 7. Restrictions

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### 7.1. Configuration Information Management Function

For details of how to use the configuration information management function and terms used, see the configuration information management function manual.

#### 7.1.1. Oracle

1) 64-bit Oracle

The 64-bit version of Oracle (Intel64, IA64) for Windows is not currently supported. No connection can be established from the MasterScope product.

## 8. Troubleshooting

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### 8.1. Setting Up a Database

- 1) Actions to take if error messages are output in the log file (the file with an extension of ".log" output under %INSDIR%\Manager\sql\sqlserver) after the database is set up if the SQL Server (including 2014 Express Edition, 2012 Express Edition, 2008 Express Edition, and 2005 Express Edition) is used

- Error messages

```
[SQL Native Client] Named Pipes Provider: Could not open a connection to SQL Server [2].  
[SQL Native Client] Login timeout expired  
[SQL Native Client] An error has occurred while establishing a connection to the server. When connecting to SQL Server 2005, this failure may be caused by the fact that under the default settings SQL Server does not allow remote connections.
```

- Cause

Unable to connect to the SQL Server. Potential causes include the following.

- a) SQL Server service not running
- b) Wrong setting of the SQL Server
- c) Wrong argument in the CMDB configuration script

- Remedy

Resolve the cause and execute the CMDB configuration script (WfdbCmdSetup.bat) again.

- a) Start the SQL Server service.
- b) Check and change the SQL Server settings and restart the SQL Server service.  
Check especially the following settings.  
Is [Using both TCP/IP and Named Pipes protocols] selected in the remote connection setting?  
Is [SQL Server and Windows Authentication mode] selected in the server authentication setting?
- c) Check the arguments of the CMDB configuration script and execute it again.

- 2) Actions to take if error messages are output in the database creation log file ("*Database Name*>CreateDB.log" output under %INSDIR%\Manager\sql\sqlserver) after the database is set up if the SQL Server (including 2014 Express Edition, 2012 Express Edition, 2008 Express Edition, and 2005 Express Edition) is used

- Error messages (example for the SQL Server 2005 Express Edition)

```
Server localhost\SQLEXPRESS.
Msg 1802, Level 16, State 4, Line 1
CREATE DATABASE failed. Some file names listed could not be created.
Check related errors.
Server localhost\SQLEXPRESS.
Msg 5170, Level 16, State 1, Line 1
Cannot create file 'c:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\DATA\wfdb.mdf' because it already exists. Change the file path or the file name, and retry the operation
Change the file path or file name, and retry the operation.
```

- Cause
 

The database does not exist on the SQL Server, or only the remnants of the physical files of the database remain. This occurs when the SQL Server is uninstalled without deleting the CMDB (see "4.1.1 Deleting a database (SQL Server)") and installed again.
- Remedy
 

Delete the database file (e.g., c:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\DATA\wfdb.mdf) and the log file (e.g., c:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\DATA\wfdb\_log.LDF) shown in the error message by using Explorer, etc. After that, set up the CMDB (see "3.1.1.1 Setting Up CMDB").

3) Actions to take if an error message is displayed when the database table creation script is executed in database setup if Oracle (Windows version or Unix version) is used

- Error messages

```
ORA-12505: TNS:listener does not currently know of SID given in connect descriptor.
```

- Cause
 

The Oracle database used may not be running.
- Remedy
 

Forcibly terminate the database table creation script, start the Oracle database, and execute the database table creation script again.

- Error messages

```
ORA-12541: TNS: no listener.
```

- Cause
 

The Oracle Listener used may not be running.
- Remedy
 

Forcibly terminate the database table creation script, start the Oracle Listener, and execute the database table creation script again.

4) Actions to take if an error message is displayed in the log file (the file with an extension of ".log" output under %INSDIR%\Manager\sql\oracle or \$INSDIR/Manager/sql/oracle) after the database table creation script is executed in database setup if Oracle (Windows version or Unix version) is used

- Error messages

```
ORA-00910: specified length too long for its datatype
```

- Cause  
"UTF8" may not be specified for the language character set when the Oracle database was created.
- Remedy  
The Oracle database needs to be created again.  
Delete the current Oracle database, and create it again. When creating the Oracle database, specify "UTF8" for the language character set.

5) Actions to take if the following error messages are displayed when the database table creation script is executed in database setup if Oracle (Windows version or Unix version) is used

- Error messages

```
SP2-0623 Error accessing PRODUCT_USER_PROFILE.
Warning: Product user profile information not loaded!
You may need to run PUPBLD.SQL as SYSTEM
```

- Cause  
When the Oracle database was created, the Oracle script called PUPBLD.SQL may not be executed as the SYSTEM user of Oracle. As a result, the PRODUCT\_USER\_PROFILE table was not created in the SYSTEM account.
- Remedy  
Execute PUPBLD.SQL as the SYSTEM user of Oracle, and create the PRODUCT\_USER\_PROFILE table. The CMDB itself was created successfully, so it is not necessary to execute the database table creation script again.

6) Actions to take if an error message is displayed when the database table creation script is executed in database setup if PostgreSQL is used

- Error messages

```
psql: could not connect to server: No such file or directory
Is the server running locally and accepting
```

- Cause  
PostgreSQL used may not be running.
- Remedy  
Start PostgreSQL used, and execute the database table creation script again.

7) Actions to take if an error message is displayed when the database table creation script is executed in database setup if PostgreSQL is used

- Error messages

```
????? psql: could not connect to server: No such file or directory
Is the server running locally and accepting
```

- Cause  
Client authentication of the user using the database may not be completed.
- Remedy  
Describe the user name and database name specified in the database configuration file in the pg\_hba.conf file to make the database ready for use. For the information specified in the pg\_hba.conf file, see the PostgreSQL manual.