



Technical report:

Integrating FileNet Image Services with IBM System Storage N series Unified Storage for Microsoft Windows

Best practices

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Abstract

The need to deliver rapid access to hundreds of millions of fixed content objects—that may include images, documents, and rich media content—should lead a company to carefully choose an appropriate software and hardware solution. As access and storage demand grows overtime, it must also address scalability and performance issues. In addition to meeting these needs, the solution must also provide data security and be capable of permanently storing the information required in regulated business operations. FileNet provides an effective software solution to address all of these issues. And, FileNet integration with the IBM System Storage N series unified storage solution offers significant advantages in a Windows environment.

Introduction

To successfully manage content management, an enterprise must deliver access to fixed content objects that may number from the hundreds of thousands to the hundreds of millions. It must also be capable of supporting rapid content growth while providing adequate performance and high data availability. Fixed content typically includes electronic documents, faxes, images, and rich media files for large numbers of users. In addition, strong security and data protection solutions should be part of the permanent storage solution for this critical business information. These stringent requirements demand an efficient content management solution.

FileNet has a range of products that provide business solutions for document management and content management needs. The most common and best known of these is FileNet Image Services (IS). Optical Storage and Retrieval (OSAR) was once the preferred (and only) storage-media choice for Image Services technology, but technical improvements led FileNet to consider the advantages of magnetic disk media over optical storage. FileNet IS now supports magnetic disk media using its Magnetic Storage and Retrieval (MSAR) software.

IBM® System Storage™ N series storage devices are integrated hardware- and software-based network storage systems that serve data using any of the multiple storage protocols that are supported for both storage area network (SAN) and network-attached storage (NAS) environments. These storage devices are known as IBM N series systems. They act on client/application or server requests for data and process those requests by writing data to or retrieving data from the storage system. Fast and reliable operation as well as advanced data protection options are made possible by IBM System Storage N series with Data ONTAP™, the microkernel operating system (OS).



Purpose and scope

This paper describes the steps necessary to integrate FileNet Image Services software and Oracle 9.2.0.x on Microsoft® Windows® with an IBM N series unified storage solution. Unified storage includes both traditional Fibre Channel (FC) SAN, Internet Protocol (IP) SAN, and NAS modes. Note that IP-based SAN configurations use iSCSI technology. Configurations and procedures covered in this report generally apply to IS 4.0 on UNIX® platforms with IBM N series storage using SAN and NAS architecture, but the specifics of these other configurations are beyond the scope of this document. This report highlights the importance of using either a NAS or SAN (or both) appropriately to store FileNet IS data. (**Note:** This information should be taken only as a starting point. Customers should consult FileNet and IBM N series Professional Services to determine the configurations most appropriate for their environments.)

Integrating FileNet and IBM N series

Integration of FileNet Image Services 4.0 and an IBM N series storage solution provides an effective solution for content management. This section describes the integration of FileNet Image Services 4.0 and IBM N series unified storage.

FileNet Image Services 4.0

FileNet Enterprise Content Management (ECM) solutions allow customers to build and sustain competitive advantage by managing content throughout their organizations, automating and streamlining their business processes, and providing the full-spectrum of connectivity needed to simplify their critical and everyday decision making. FileNet ECM solutions deliver a comprehensive set of capabilities that integrate with existing information systems to provide cost-effective solutions that solve real-world business problems. Image Server 4.0 delivers faster access to large numbers of fixed objects (billions of them) such as documents, reports, print streams, faxes, e-mail, and rich media content. FileNet Image Server (IS) provides the ability to:

- Improve the operational effectiveness of content information
- Allow high availability yet ensure the security of information assets
- Improve the content access experience of the customers
- Maintain access while preventing data corruption and ensuring security

With FileNet IS software, customer can create a high-performance repository with failover capability and high availability of data while providing effective security.

Currently FileNet Image Services is supported on Windows 2000. Supported UNIX platforms are Sun Solaris 8 (at the time of this writing 8.2 OS), HP/UX (at the time of writing, HP/UX 11i), and AIX (at the time of writing, the IBM AIX 5.1 OS).



IBM N series storage devices

Rapid growth in the demand for data requires an efficient storage solution infrastructure. This infrastructure has to provide a tightly integrated solution that delivers the highest level of data availability and scalability. IBM N series storage solutions help achieve this goal by seamlessly centralizing and consolidating the data. In this context, IBM N series provides a unified storage solution by supporting multiple protocols on the same storage device. These include SAN configurations with FC and iSCSI protocols and NAS configurations using NFS and common internet file system (CIFS) protocols.

The unified storage solution from IBM N series enables effective use of industry-leading enterprise database and business applications, providing a number of key benefits:

- Operational efficiency
- Efficient resource utilization
- Support for technology and partnership experience

Fabric-attached storage servers are required for FC SAN configurations. SAN configurations using iSCSI software can be used on other IBM N series storage devices. On UNIX platforms, FileNet Image Services requires configuration for block access for storage of multikeyed File (MKF) datasets. FC SAN can be configured to meet this requirement for MKF data. Windows does not restrict block access for configuring MKF/cache. However, this installation described in this paper uses either FCP or iSCSI with IBM System Storage N series with SnapDrive™ for UNIX 3.0 and later to set up and install the database and IS server.

A SAN on an existing network infrastructure using iSCSI (Internet Protocol Small Computer System Interface) is known as an iSAN configuration. Both SAN and iSAN configurations provide local SCSI disks to the Windows OS. FC-host bus adapters (FC HBAs) come with a dedicated 2Gb per second FC link. Usually FC SAN configurations have a failover server, IBM N series storage server, and multipath to address any single point of failure. If the SnapLock™ connector for Image Services is planned, network connectivity must be CIFS on the Windows platform or NFS on UNIX platforms.

The following diagram shows a simple single-path point-to-point configuration. Both the Gigabit Ethernet (GigE) and FC connections are made without using a switch. However, for mission-critical projects it's best to configure the full SAN configuration to address any single point of failure.

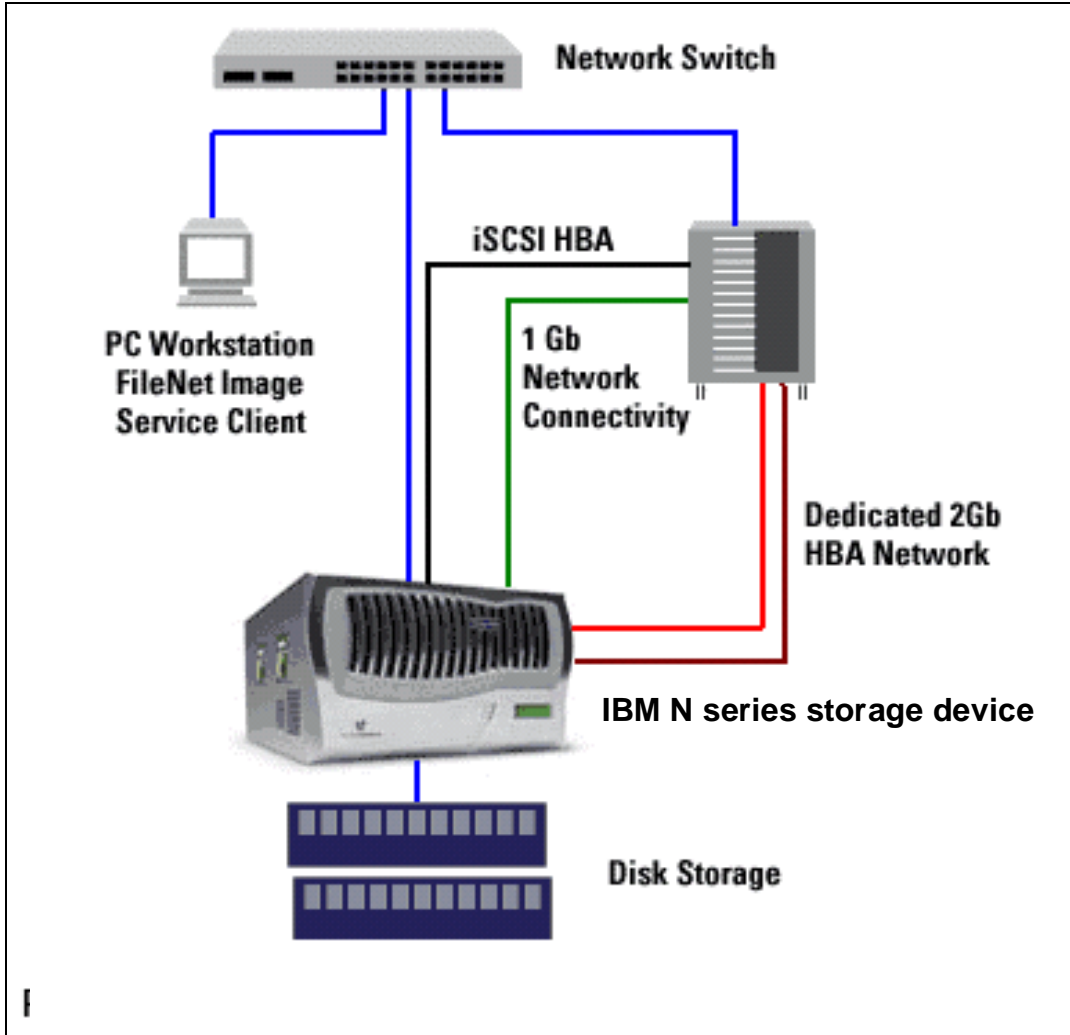


Figure 1. Simple storage-area-network configuration.



Design architecture

FileNet Image Services on Windows works with IBM N series storage devices in SAN or NAS configurations. MSAR and MKF/cache can be configured on network-shared disks. However, the database and FileNet IS software can be installed on local SCSI disks configured using IBM N series FC SAN or iSCSI software or a hardware iSCSI HBA. For easier storage management, this paper strongly suggests installation of SnapDrive 3.x software. SnapDrive allows storage to grow without affecting the application by growing online. Backup of data stored in these LUNs (logical unit numbers, or locally configured disks) can be performed using IBM System Storage N series with Snapshot™. IBM N series unified storage allows some storage to be deployed as SAN for MKF/cache, while the rest can be deployed as NAS for data sharing across multiple servers.

For NAS storage, any IBM N series storage appliances will work well with this setup. For SAN, only fabric-attached storage appliances that support FC Protocol (FCP) will work with IS 4.0. Regarding the license requirement, NAS requires the NFS license to be activated, and SAN requires a FCP license with FCP services up and running. For SAN configuration using iSCSI, an iSCSI license must be enabled and the iSCSI service must be running.

On UNIX, FileNet IS requires a raw disk (block storage) to store the MKF database and cache data. If your configuration uses only NAS for integrating IS services, MKF/cache storage can be configured by using the iSCSI protocol on available platforms to create raw devices. On Windows 2000, you can use IBM N series SnapDrive software and FCP or iSCSI hardware or software. iSCSI is supported on Windows 2000 and on Linux®, HP/UX, and AIX; there is also limited support on Sun Solaris. Both the database and FileNet Image services software must be installed on the locally configured SCSI disks or on the local disks. For this purpose, our test setup used Microsoft iSCSI and IBM N series SnapDrive software on a Windows server to configure the LUNs and local disks.

FileNet IS can also be configured using FC SAN. In addition, the cluster failover (CFO) option provides higher data availability in an enterprise-level configuration by eliminating a single point of failure for the storage system. For FileNet IS configuration, CFO configuration is optional.

In CFO mode, each unit can take over the other failed unit. This configuration adds security for data protection and availability in an enterprise environment. Figure 2 shows a CFO configuration.

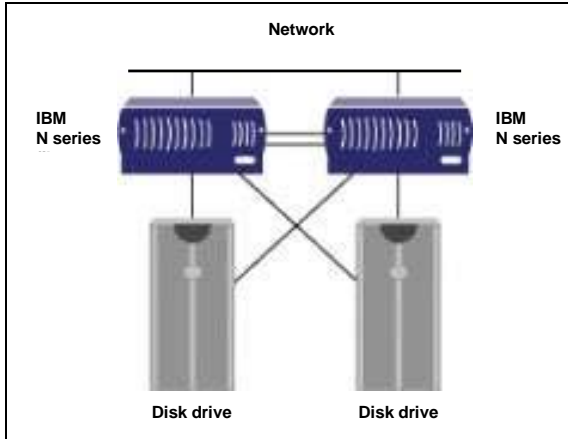


Figure 2. IBM N series cluster-failover configuration.

Application server clustering can also be configured with or without IBM N series storage device clustering. Figure 3 shows a typical diagram for application server clustering.

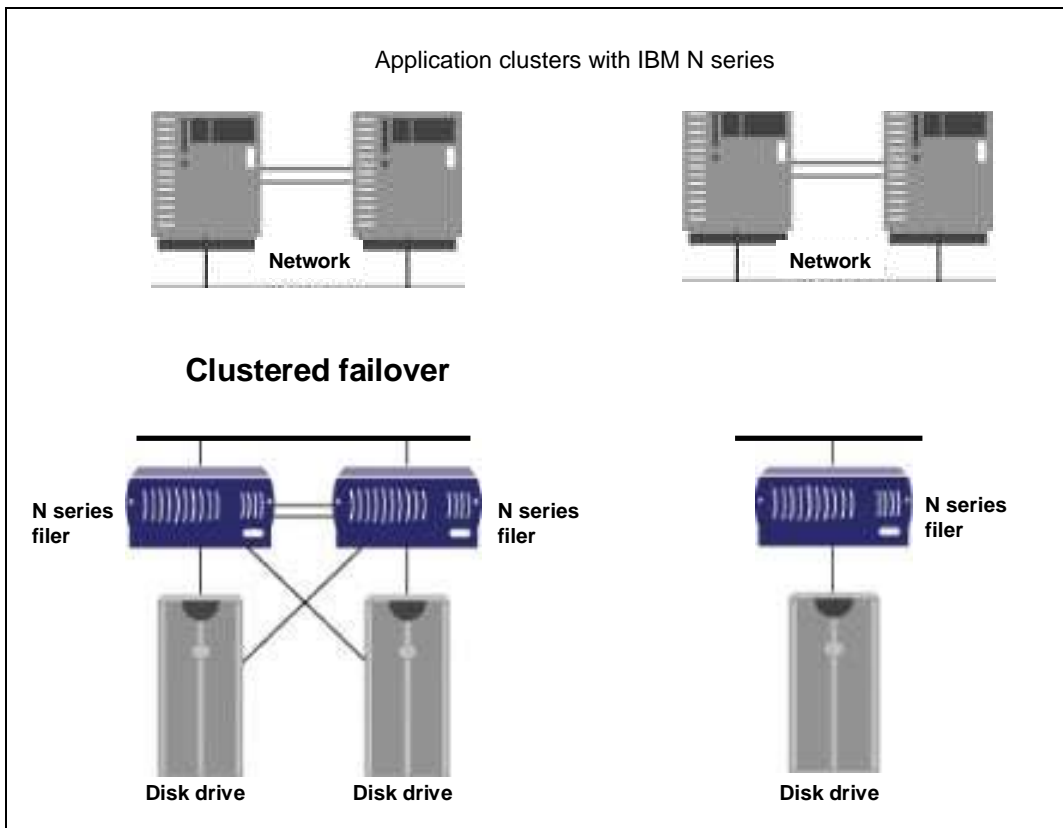


Figure 3. Application-server clustering with/without IBM N series storage-clustering configuration.

In a FileNet customer environment, the OS can host both Image Services and the database server, or the database can be run on a separate, remote server connected to the storage. Figure 3 shows how the



FileNet solution integrates with storage. In addition, for enterprise customers with more than a few terabytes (TB) of MSAR data, IS images and documents can be achieved to IBM System Storage N series with NearStore® disk-based storage, which provides higher performance and availability than optical storage and at a lower cost than optical storage. Using an IBM N series or IBM N series with NearStore, MSAR can be deployed alone or together with optical storage/OSAR in a hybrid environment. The IBM System Storage N series with SnapLock® offering also brings magnetic disk write-once, read-many (WORM) storage, including FileNet SnapLock Storage and Retrieval (SSAR) capabilities, but the integration of FileNet IS with SnapLock will be discussed separately.

Assumptions

The reader is assumed to be familiar with the operation of IBM N series storage devices and the concepts of a storage area network and network-attached storage. The reader is also assumed to have a system administrator's knowledge of the FileNet Image Services server software. The term "filer" can refer interchangeably to the IBM N series, with the caveat that not all IBM N series storage devices support the FC SAN protocol options.

Infrastructure

A sample system configuration was selected to install and test the product to validate the information in this document. The purpose was to show the procedure for integrating FileNet IS software with a IBM N series storage device. Performance specifications and tuning are not within the scope of this document. Infrastructure components may have later versions available, however the combinations listed herein were selected at the time of this report writing.

The simple configuration required to run the Oracle 9.2.0.5 database with FileNet Image Services 4.0 on a Windows 2000 host (the server selected at the time of this writing) with a storage system is listed below:

- FileNet IS 4.0 Server on a Windows 2000 server (FileNet supports later versions of Windows, including Windows 2003)
- IBM N series with CIFS, iSCSI, and FCP capability
- Network for management and dataflow
- FileNet IS-required environment settings such as user accounts, software, storage appliance mount points, and/or SAN storage.

In this document, the following infrastructure is used for completing the installation of Image Services software:

- The name of the storage unit boy
- The command prompt is shown as boy>
- The Solaris host name beavis
- OS users referenced in this document 'fnsw' 'orcl' 'root'
- Oracle database username oracle
- Command output is displayed in courier font



Network connectivity

Network connectivity is required between the Oracle/IS server and the IBM N series storage appliance. In a SAN configuration, the primary connection for the flow of SCSI block data is a dedicated 2Gb per second FC link. Out-of-band communications for management purposes and other NFS-related communications are handled via either GigE or a regular 100Base-T Ethernet network connection. If iSCSI is used, a GigE network connection is required between FileNet IS, the database servers, and the IBM N series storage device.

Configuring the network properly plays an important role in using the FileNet IS services solution with IBM N series storage. High-performance access to binary objects is one of the main business objectives, hence we recommend use of dedicated GigE network connecting the storage system, IS server, and Oracle database servers, except where FC SAN connections are used. This GigE storage network is used for IS and Oracle data transfer activities to avoid competition with regular network traffic. Setting up a separate GigE switch using an existing switch's VLAN capabilities will suffice for this purpose. Note that a dedicated network connection provides the additional benefits of less network latency and data contention in the network.

A simple single-path point-to-point configuration can be configured to use FileNet Image Services. Both the GigE and FC connections are made directly without a switch. Note that in many GigE and a FC-SAN configurations it is assumed that one or two GigE or FC switches will be used to connect the server(s) to the storage. Using two switches with multipathing is optional but can be done to eliminate any possible single point of failure in the storage network. Different configurations will be discussed later in this paper.

FileNet Image Service 4.0 and the Oracle database environment

Both the Oracle database and FileNet Image Services require some preinstallation preparations on the server host. Both Oracle and IS services software installation require X Windows support on the server machine. Currently FileNet supports database servers such as Oracle 9.2.0.2 , IBM DB2, and SQL Server 2000. Our test setup used Oracle 9.2.0.5 on Windows 2000 with iSCSI and SnapDrive 3.1.

Installation tasks

A user account and appropriate groups must be created. Table 1, further into the document, shows the required user accounts and their group and permission requirements.

After these tasks are completed, setup and configuration of local disks must be performed. This may involve configuration of a SAN using either FCP or iSCSI protocols.

- Install Oracle database
- Perform postinstallation tasks
- Install FileNet Image Services
- Perform postinstallation tasks
- Configure MSAR storage libraries
- Install Image Services Connector for IBM N series SnapLock

Setup and configuration of local disks

This section describes the procedure for installing and configuring local SCSI disks using iSCSI. (The procedure to install and configure FC-SAN storage is explained in detail [online](#).) This section provides a high-level overview to guide you through the setup of your IBM N series storage system in the SAN environment using FCP for SCSI. The following diagrams show a single-path host connection, a direct-attached host connection, and a multipath connection. This paper recommends connecting the target HBAs to the different switches. This will avoid connecting the target HBAs to the same switch, introducing a chance for a single point of failure at switch level. It is important to install the initiator HBA in the host machine. In a direct-attached configuration a second port is not used, hence a terminator must be attached to that port. Before proceeding further, check the IBM N series SAN support matrix to verify that the host and OS have all the required patches or service packs.

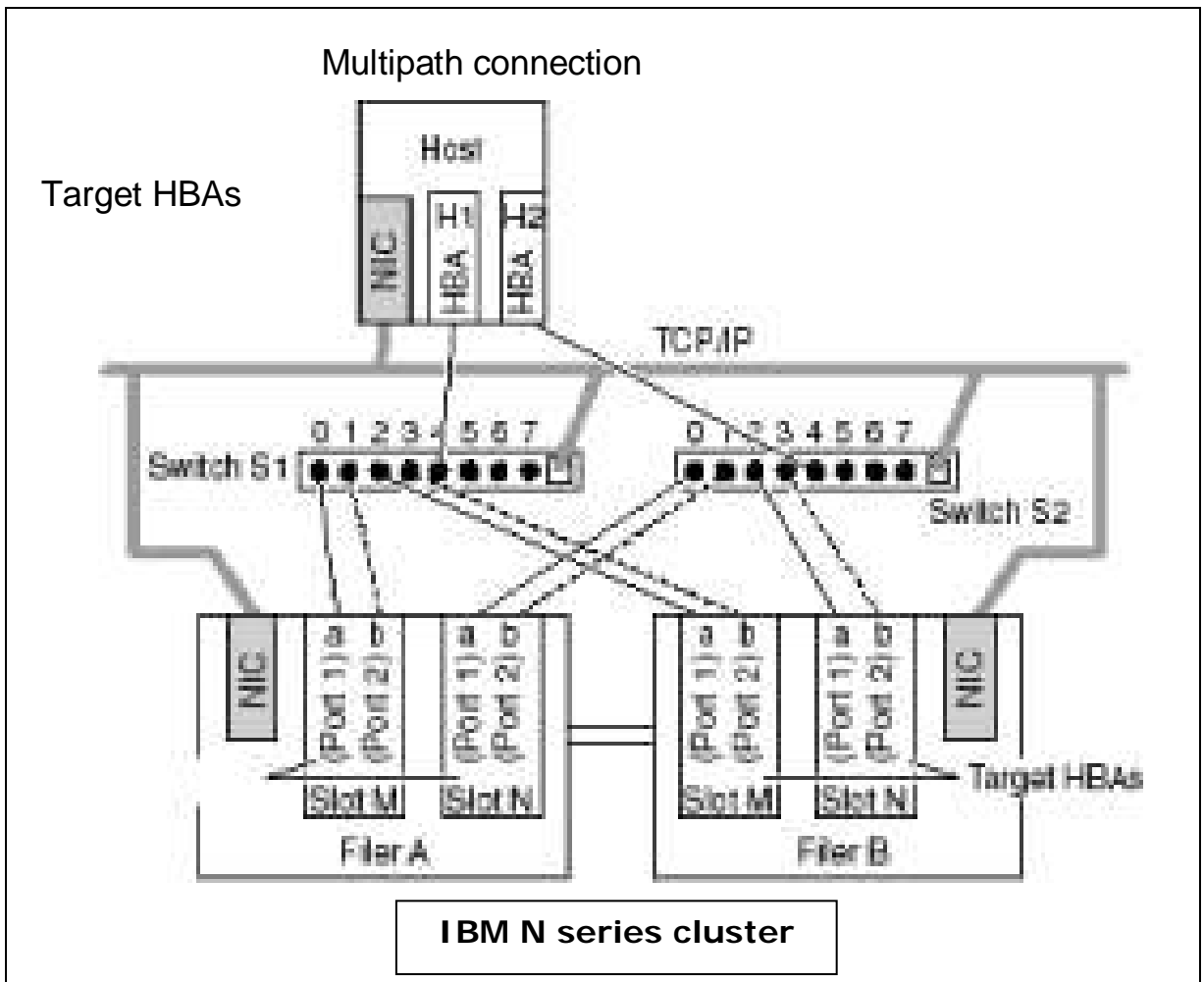


Figure 3. Multipath host connection with IBM N series storage system cluster.

Installing and configuring a SAN with the iSCSI protocol

This section describes the procedure for installing and configuring local disks using iSCSI software. The configuration may use the iSCSI Host Attach Kit (HAK) from IBM N series using hardware HBAs. Software configuration uses the software initiator software available from the [Microsoft download site](#). Search for the latest available iSCSI software initiator for your platform. This test setup used iSCSI software initiator version 1.04a, but the setup and configuration routine applies to later releases as well.

Verify that the Windows server has the required service pack and that network connectivity exists. Note that a fast Ethernet network is required for configuring and using the iSCSI software initiator. This is required even though the network will work with the software initiator configuration. Verify that the licenses for SnapDrive, iSCSI, and CIFS are enabled and that CIFS and iSCSI services are running on the IBM N series storage devices.

After the installation of the iSCSI software initiator, configure the iSCSI initiator to establish a network connection to the target device. The procedure is shown next in this section.

Click the Microsoft iSCSI initiator icon, choose Target Portals, and click the Add button to add a target portal with a socket number and the port number. A sample diagram is shown in Figure 4.

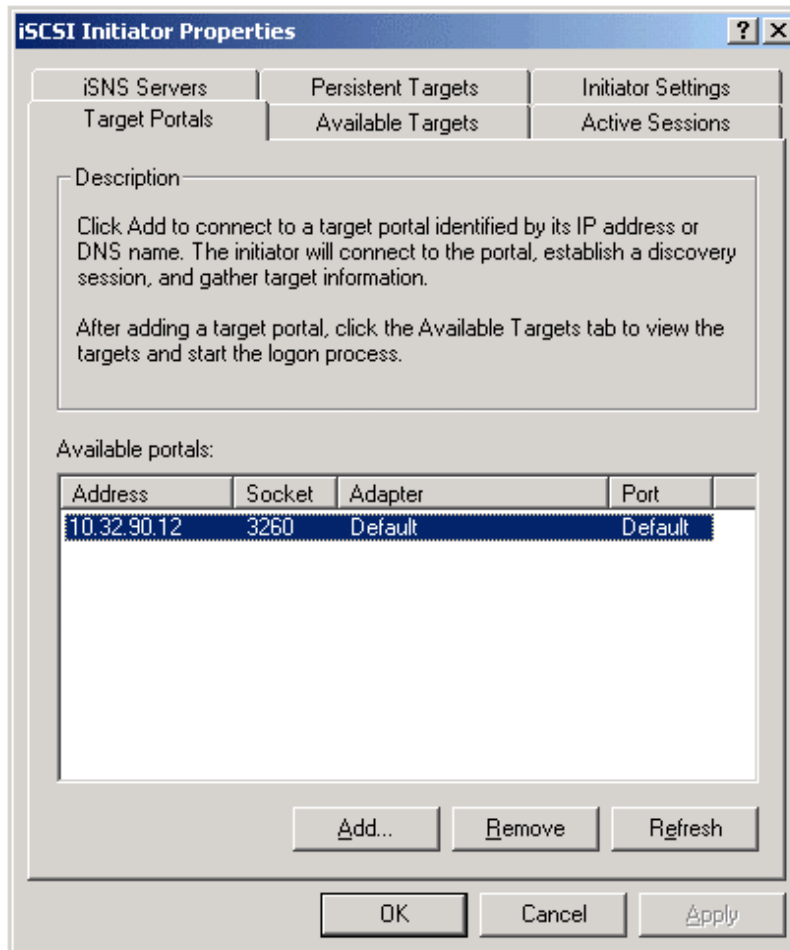


Figure 4. Available target portals.

Note that you can add multiple target portals to the iSCSI initiator. For example, multiple IBM N series storage devices can be added to the host iSCSI initiator to configure local disks. Complete the initial iSCSI initiator settings to set up an initiator group and challenge handshake authentication protocol (CHAP) service to allow the initiator to authenticate targets when performing mutual CHAP.

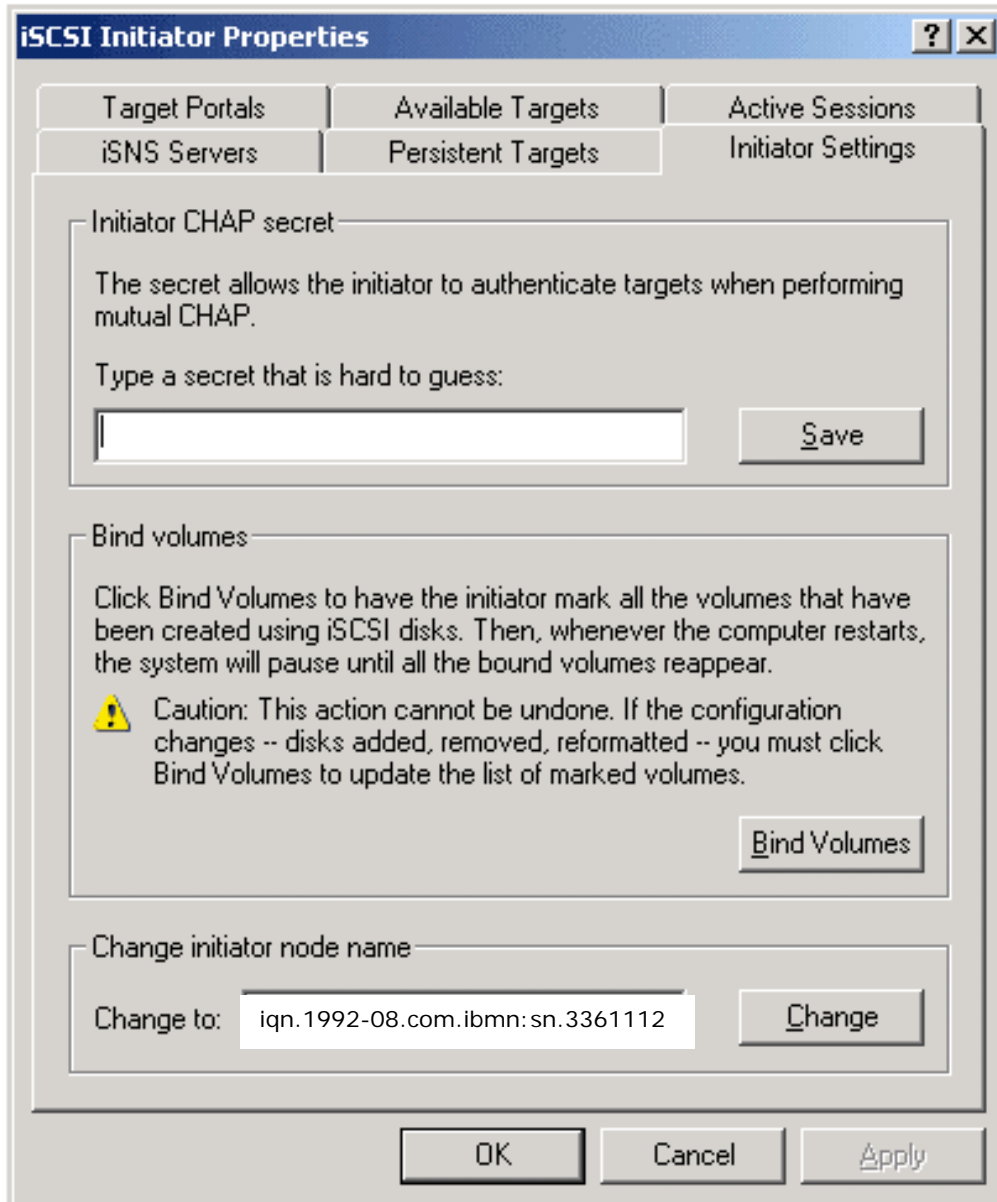


Figure 5: Initiator initial settings.

Now verify that the iSCSI initiator host has at least one available target portal that is connected. If it is not connected, click the Login button to connect to the target portal. Install IBM N series SnapDrive 3.x, verify the installation, and complete the local disk configuration using the Computer Management utility.



FCP-related tasks

This section assumes that you have reviewed the design architecture and some of the options discussed earlier in Section 3.5. Complete installation of the software provided with the FCP Host Utilities for the OS host. Before creating LUNs, analyze the storage and file system space requirements for FileNet IS software configuration, including the space requirement for the database. This paper strongly suggests having 'space reservation' enabled on any LUN to take advantages of quick backup and recovery using Snapshot and IBM System Storage N series with SnapRestore® features.

Setting up the Brocade FC switches

IBM N series supports different types of switches, including most Brocade and McData switch models. Additional brands and models are being added to the list of officially supported switches on a regular basis. Check for support of a particular type of FC switch. The switches supplied with the IBM N series storage appliance include the proper microcode, and both switches in a SAN fabric must be the same model and running the same microcode. Configuring FC switches and FC SAN fabric can be complex, especially when you are using a multipath I/O. You are strongly encouraged to involve IBM N series Professional Services, a IBM N series system integrator, or FC storage experts before configuring or changing your IBM N series FC SAN. The setup instructions below assume a Brocade FC switch, but the same storage networks can also be built using other switches supported by IBM N series.

SAN configuration procedure

Define an initiator group on the storage system with the FileNet IS host included as a member. On the operating-system host, get the World Wide Port Name (WWPN) information of the FCP adapter using the `sanlun` command. This information is required to create an igroup on the system:

```
# sanlun fcp show adapter
lpfc0      WWPN:10000000c92d60b2
#
```

Using the information obtained for the WWPN, create an igroup. An example is shown below:

```
sunday> igroup create -f -t windows beavis 10000000c92d60b2
```

If the required volumes do not exist already, create volumes on the system. In our test environment, we created one volume for the Oracle database, the FileNet IS services installation, and the MSAR surfaces. The sample command to create these volumes is shown below:

```
sunday> vol create sri 8
```

Because IBM N series supports multiple LUNs on one volume, you can use a single volume for all LUN setup in a FileNet environment. (If you use multiple IBM N series appliances for FileNet data, you need different volumes for the different units.) You can configure multiple volume setups, depending on configuration and usage requirements. In a SAN configuration, backup of LUNs requires that you configure space reservation to enable you to benefit from the almost instant backup and quick restore features of Snapshot and SnapRestore. To enable space reservation, we entered `vol` command:

```
sunday> vol options sri space_reservations on
```

On Windows, use FilerView and SnapDrive to configure and manage SAN storage and local disks.



FileNet Image Service and Oracle Database preinstallation requirements

This section provides the information required to complete the preinstallation tasks prior to software installation and configuration. The integration of Image Services with IBM N series storage system(s) requires installing and configuring SnapDrive and iSCSI initiator/ FCP setup on the Windows server.

The installation and configuration procedure requires having Administrator privileges. FileNet Image Service 4.0 requires previous installation of the supported database server and that the database server is up and running. Since FileNet Image Services 4.0 supports a specific version of each database, it's important to verify and configure the supported version. Starting with IS 4.0, FileNet supports only site-controlled database configuration. It has discontinued support for database configuration controlled by FileNet. FileNet IS 4.0 requires the system administrator to create the user names and their corresponding groups with certain privileges. If your configuration requires the VERITAS volume manager to manage file systems on the SAN setup, refer to the *FileNet Image Services Installation Procedure for Windows Guide* for details. The following table lists the requirements for user names and their corresponding user groups.

Group name	Members	Remarks
fnsr	fnsr, Administrator, oracle	These members can operate any FileNet software. Operators and administrators belong to this group.
dba	fnsr, oracle	These members must also belong to the dba group. Users in the dba group should have Administrator privileges.
fnadmin	fnsr, oracle	Members can administer FileNet software. Administrators must belong to this group. This group can do configuration changes, backup, and recovery operations.
fnop	fnsr	Members can start and stop all FileNet software. Administrators also belong to this group.

Table 1. User account information.

Operating-system information

For a successful completion of software installation, follow these steps in getting the system information. As many as 16 peer systems can be configured, so organization and domain name information are very important. FileNet Image Services supports both Windows 2000 and UNIX platforms such as Solaris 8, AIX 5.1, and HP/UX 11.00. The following table may serve as a preinstallation requirement worksheet. Again, keep in mind that FileNet supports later versions of platforms as well, including Windows 2003.

Installation information	System information	Remarks
Server IP Address		Use the GigE address. Host-name resolution may be required.
Network Address		Optional additional network path.
System Serial Number		This is a 10-digit number provided by FileNet.
Domain Name		An example would be domain.company.com
Organization Name		

Table 2. Networking information.



Determining dataset-space requirements

By knowing in advance the space requirement for the datasets, we can better configure the volume and qtree. We assume that you have taken the space requirement into consideration while creating the LUNs during the disk format phase. For more information, refer to the *Image Services Installation Procedures Guide* that comes with Image Services software. Once dataset sizes have been decided, determine the number needed for system cache information. This includes the default size, minimum size required, and the maximum size available for the configuration. For details on how to determine these numbers, see the FileNet IS product information.

Printer information will help you to configure network clearing house (NCH) server name with the printer type and printer server IP address. Configuring or tuning the OS kernel parameters: This information was discussed in earlier section. Choosing the type of Image Server: Before installing the software, choose the type of servers:

- Root/Index server during a DUAL server installation
- Root/Index/Storage library server during a combined or entry server installation

Database Server Installation

The database server must be installed and configured properly for a successful installation and configuration of Image Services. FileNet Image Services 4.0 supports Oracle, SQL Server 2000, and DB2 databases. In our test setup we installed Oracle database and upgraded to Oracle 9.2.0.5. Installing and configuring the Oracle database server is critical for successful installation of FileNet Image Services. Since FileNet IS supports site-controlled Oracle databases, it's best to install the Oracle database server as an Oracle user on a different path or on a different server in the network. This will avoid the need to remove all the binaries and data files if the FileNet software needs to be uninstalled for any reason.

Oracle Database Server installation

The Oracle database server can be installed from scratch or you can use an existing Oracle database server. It is important to apply the Oracle patch to upgrade to at least version 9.2.0.4 or later. This document recommends installing Oracle at a location outside the FileNet Image Services software installation directory. This will avoid the loss of data and binaries in case you need to uninstall FileNet IS software. The procedure for completing the database configuration is documented below.

Install the Oracle server and you can skip the database creation step. Verify that the Oracle service has been created, that related services have been started, and that necessary environment variables have been set. oraclehome and oraclesid are some of the variables required. If required, modify the Oracle services to start automatically. If the service has not been created, verify that the database server was installed successfully. If so, you can create a service using the oradim Oracle utility. Using the oradim utility may create a new Oracle service. On our test setup, we used the Oracle Database Configuration Assistant (DBCA) utility to create the service and the complete database creation and configuration requirements a sample of the output used to create an Oracle service called IDB is shown below where G:\ is a locally configured SCSI drive created using the iSCSI Protocol and managed by SnapDrive 3.0 software.

```
G:\oracle\ora92>oradim -new -sid IDB G: \oracle\ora92>
```

Figure 6 shows the status of Oracle database installation.

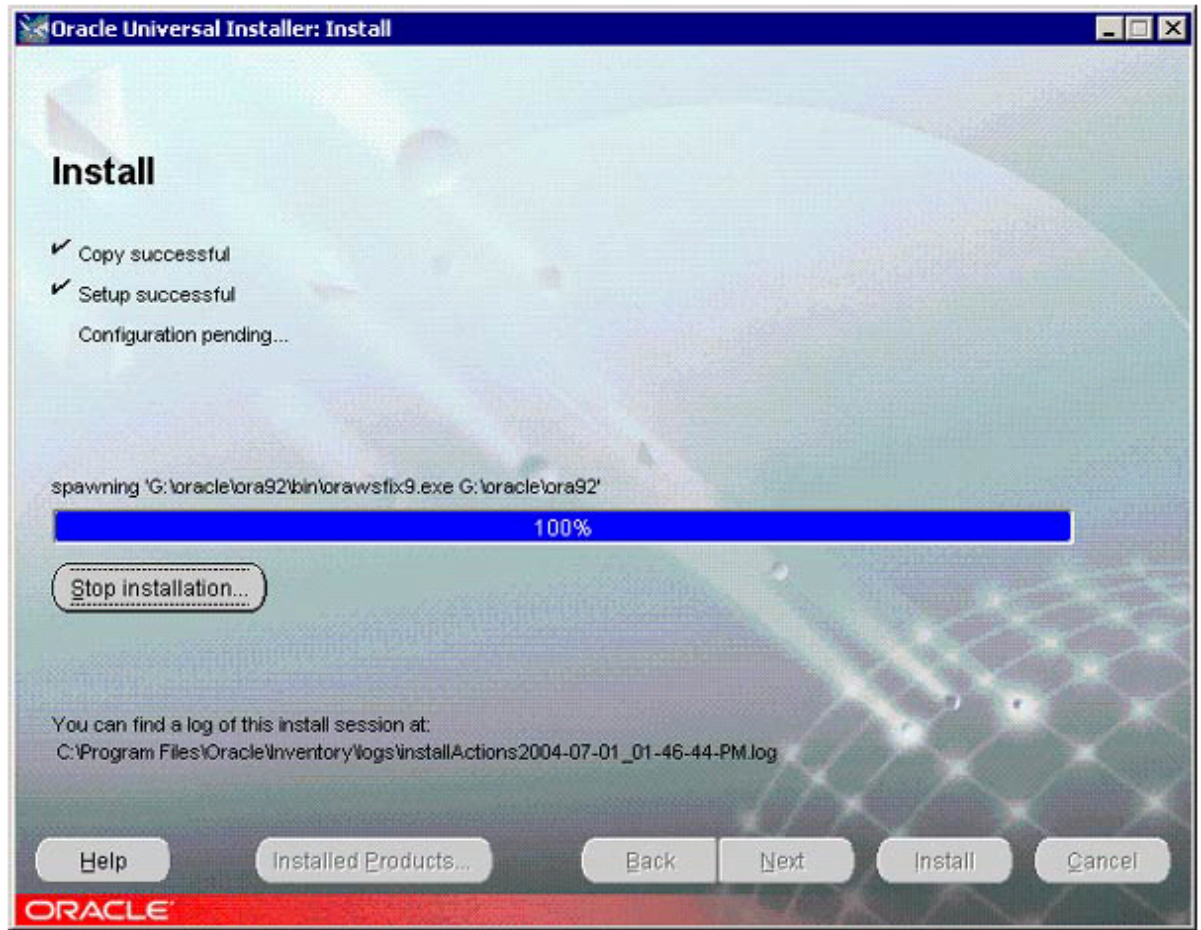


Figure 6. Oracle installation status.

Figure 7 shows Oracle user configuration details such as the SYS and SYSTEM user password, Global database name, and the System Identifier. It is important to save this information for a future use.

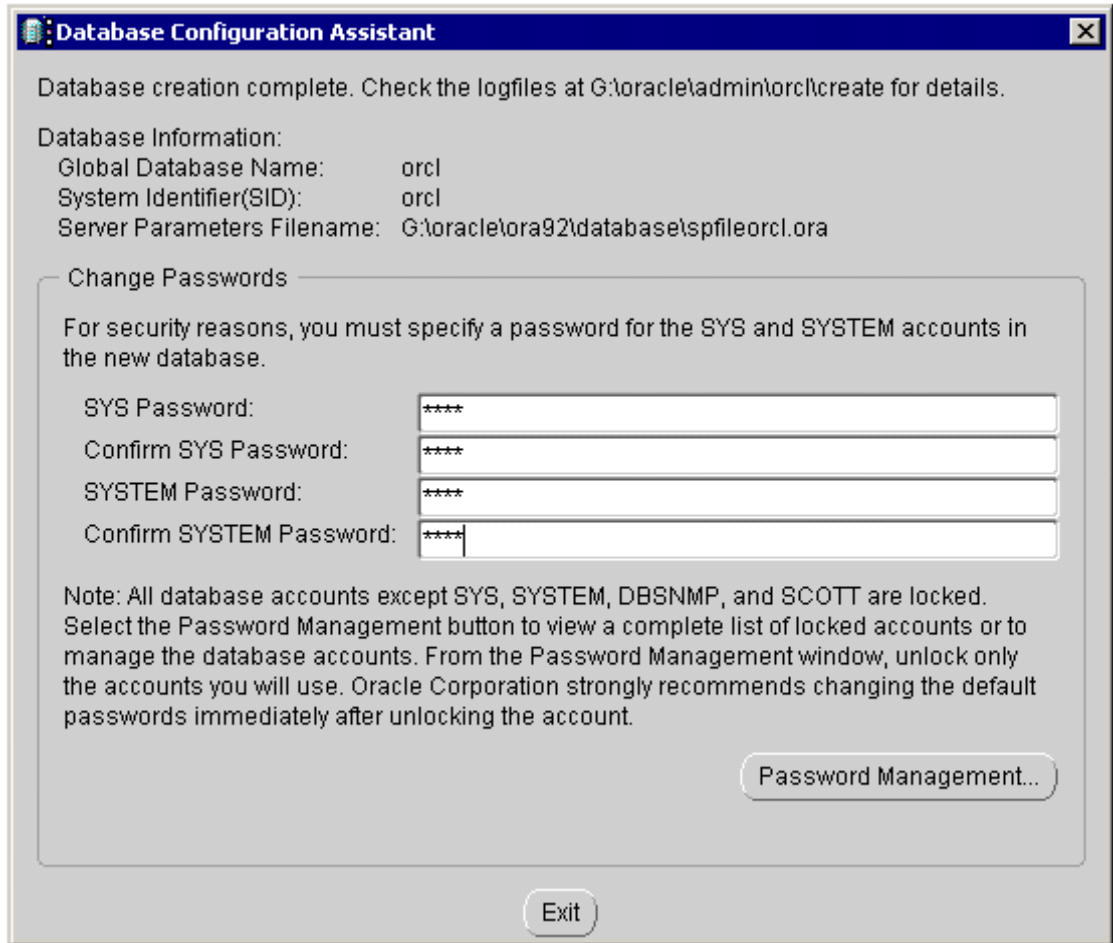


Figure 7. Oracle installation status with the system information.

Now a new service is created and started called OracleORCL. It can be verified from **control panel -> Admin Tools -> services**. On our test setup, we have configured Oracle services to be started manually every time the system is restarted. This approach gives the Administrator the ability to make sure that the system has the necessary data available. In our test setup, oraclesid is IDB. Oracle services may be configured to automatic so that the services are started automatically if the data is available.

Verify that fnsw oracle users have been created and the corresponding user groups have been created, such as dba, fndadmin, and fnop for database and FileNet configuration setup. If the Oracle database software is already installed, verify that the related services have been started. This can be checked with services tool from the Control Panel.

If the database was created using the Oracle dbca utility, skip the following information to Section 7.23. If the database was not created using Oracle's dbca utility and wants to create the database and prepare for the FileNet Image Services installation, refer to the following information. Otherwise, skip to Section fnsw_tabies.sqi.



Now bring up the Oracle Database instance without mounting the database. On our setup, we used the following two commands to login to the Oracle SQL interactive session and bring up the Oracle instance without mounting the database.

```
G: \oracle\ora92>sqlplus "/as sysdba"
SQL*Plus: Release 9.2.0.5.0 - Production on Wed Jun 30 15:09:41 2004
Copyright (c) 1982, 2002, Oracle Corporation. All rights reserved.
Connected to an idle instance.
SQL> startup nomount
ORACLE instance started.
Total System Global Area 135339940 bytes
Fixed Size 454564 bytes
Variable Size 109051904 bytes
Database Buffers 25165824 bytes
Redo Buffers 667648 bytes
SQL>
```

Create a database using a script. You can use a script called `mkdb.sql` that contains the SQL statements to create the database.

If the above script is executed, the output is displayed similar to the following:

```
SQL> @'g:\oracle\ora92\dbs\mk_db'
SQL> create database ntap
 2          controlfile reuse
 3          maxlogfiles      2
 4          maxlogmembers    2
 5          maxdatafiles     50
 6          maxinstances     1
 7 logfile
 8          group 1 ( ' G: \oracle\rollback\oracle_r11') size 40M,
 9          group 2('G:\oracle\rollback\oracle_r12') size 40M
10 datafile
11          'G:\oracle\data\oracle_sys0' size 400M autoextend on
12 character set US7ASCII
13 spool off
14
```

Use this script to create a database and create the Oracle catalog and `catproc` procedure by running the script files `catalog.sql` and `catproc.sql` files located under `rdbms` directory in the `ORACLE_HOME/rdbms/admin` directory. These scripts take several minutes to complete successfully.

After the `catalog.sql` and `catproc.sql` scripts have been completed successfully, create a file called `fnswtabies.sql`. The sample code is listed below, and you can make changes as needed to reflect your configuration environment.

If the Oracle utility was used and the Oracle services is started, log into a SQL*Plus session by issuing the following command:

```
I:\FNSW_LOC\oracle>sqlplus "/as sysdba"
SQL*Plus: Release 9.2.0.5.0 - Production on Tue Jul 6 12:10:16 2004
Copyright (c) 1982, 2002, Oracle Corporation. All rights reserved.
Connected to:
Oracle9i Enterprise Edition Release 9.2.0.5.0 - Production
With the Partitioning, OLAP and Oracle Data Mining options
JServer Release 9.2.0.5.0 - Production
SQL>
```



Tablespace creation

If the Oracle service is started and the database is mounted and opened as shown in the above command output, edit a file called `fiienettabies. sqi` with the following entries to create two tablespaces and a temporary tablespace. Note that the tablespace names and location and size need to be modified to reflect to a specific setup configuration.

```
create tablespace FNSYS_TS
datafile 'G:\oracle\data\oracle_dbo'
size 200M
autoextend on;

create temporary tablespace FNTMP_TS tempfile 'G:\oracle\data\oracle_tr0'
size 400M autoextend on;

create tablespace FNUSR_TS
datafile 'G:\oracle\data\oracle_udbo'
size 200M
autoextend on;
```

The `fiienettabies. sqi` script creates the specified tablespaces according to the specified parameters such as tablespace name, location and size, etc. In the above command, modify the names and directory locations as needed. Note that `fntmpts` must be declared as temporary tablespace in order for the installation to complete successfully.

If the database was created manually using the script `mkdb. sqi`, a system rollback segment must be created before creation of any other user rollback segments. To create a system rollback segment, use the following commands. If the database was created by `dbca` utility, separate creation of a system rollback segment is NOT required in Oracle 9.2.0.5. After creating the necessary tablespaces, login to Oracle SQL server with the following command:

```
Sqlplus system/manager
SQL> create public rollback segment R1;
SQL> alter rollback segment R1 online;
SQL> quit
```

Creating rollback segments (not required if database is created using dbca utility)

We have now created the database, necessary tablespaces, and a system rollback segment (if needed). Now we'll edit a file called `roiibacksegment.sql` with the following statements to create four rollback segments on the tablespace. In our test setup, we used the following parameters to create the rollback segments.

```
select * from sys.dba_tablespaces;
create public rollback segment RSO tablespace FNTMP_TS
      storage (initial 5 00K NEXT 500K MAXEXTENTS 121);
alter rollback segment RSO online; create public rollback segment RSI tablespace
FNTMP_TS
      storage (initial 5 00K NEXT 500K MAXEXTENTS 121);
alter rollback segment RSI online; create public rollback segment RS2 tablespace
FNTMP_TS
      storage (initial 5 00K NEXT 500K MAXEXTENTS 121);
alter rollback segment RS2 online; create public rollback segment RS3 tablespace
FNTMP_TS
      storage (initial 5 00K NEXT 500K MAXEXTENTS 121);
alter rollback segment RS3 online;

select * from sys.dba_tablespaces;
```

Now run the file `roiibacksegment.sql` to create four rollback segments. Modification to this file may be needed in your configuration. After making any required changes, run the scripts as shown below:

```
SQL> @rollback_segment
```

If this displays a File Not Found error, give the full pathname of the file. Now edit the `orainit.ora` or its equivalent startup script and uncomment the rollback segments line.

Verify that the Oracle service is started and the property is changed to automatic. After this, start the Oracle instance by issuing the following command:

```
sqlplus "/as sysdba" SQL> startup
```

Before proceeding further, ensure that the Oracle database server is configured properly and the setup is complete. If the Oracle server is not upgraded to the latest patch, the upgrade process can be completed at this time.

Verify that the Oracle database is installed and configured as described in the FileNet document Site-Controlled RDBMS for IS 4.0. If the Oracle Service was not created during the installation, it can be created using the `oradim` utility.

init.ora file sample

If you have created the database using the dbca utility, it will create an Oracle initialization file called init.ora. If the database was created using the mkdb.sql script and then configured, edit the Oracle initialization file ora. init. A sample init. ora file to start the Oracle server instance is shown below.

```
# uncommenting these parameters, this parameter file can be used
# as a complete stand-alone init.ora file.

db_name = orcl

# Define at least two control files by default
control_files = G:\oracle\control\ctl0.ora,
G:\oracle\control\ctl1.ora, G:\oracle\control\control3.ora
db_block_buffers = 1000
db_block_size = 2048
db_files = 96
db_file_multiblock_read_count = 8
dml_locks = 100
log_archive_start = FALSE
logjouffer = 327 68
max_dump_file_size = 10240
processes = 96
shared_pool_size = 3500000
compatible = 9.2.0.4
sort_area_size = 131072
rollback_segments = rs0,rs1,rs2,rs3
LOCAL_LISTENER = "(ADDRESS + (PROTOCOL = TCP) (HOST= BEAVIS) (PORT =1521))"
```

Start the Oracle instance

Before starting Image Services, start the Oracle database by locating the init. ora control files. On our system, Oracle instance was up and running after the Oracle services were started. If the SQL session is connected to an idle session, verify in the Control Panel that the Oracle services have been started and issue the following commands:

```
sqlplus "as /sysdba" sqlplus > startup
```

Configure Oracle archive logging

Even though this step is optional, we suggest that you enable Oracle archive logging. The necessary steps to configure the system are listed below:

- Create a directory for the archival logs
- Enable the archive log in the init. ora file


```
log_archive-start =TRUE
log_archive_dest = /oras1/orasite/archive
```

Backup of Oracle system-related files

To recover the Oracle instance, make a backup copy of all related datafiles, log files, control files, and archive logs, storing them at a different location. This helps restore the Oracle server if required.

Shutdown and restart the Oracle instance

After configuring the Oracle server, shut down the database instance and restart it. Then, the configured changes will be effective. This is not required if the database was configured using dbca utility and no changes were made after the database creation process.

Installing FileNet Image Services software

This section discusses the procedure for installing FileNet Image Services 4.0. As part of the preinstallation process, check to ensure that the appropriate users have been created and that their permissions have been set appropriately. To complete the use of the Image Services, make sure that Software License Access Control (SLAC) has to be applied and that FileNet has supplied the appropriate SLAC license code.

Adding users on the Image Services server machines

FileNet Image Services needs to have a user account called fns. The user group and other details are discussed in the section entitled “FileNet Image Service and Oracle Database preinstallation requirements.”

Preinstallation requirements

Before installing IS software, please check the FileNet documents for any required OS patch installations. Windows 2000 must be upgraded to at least the third service pack (SP3).

Install IS software

This section describes the procedure for completing installation of IS software.

- Log in as Administrator
- Start the Installation wizard by running the file setup. exe; double-click the file if it does not start automatically.

This utility starts a window to enable you to install the software. Continue with the software installation. On our test setup, fns product installation status was displayed as shown in Figure 7:

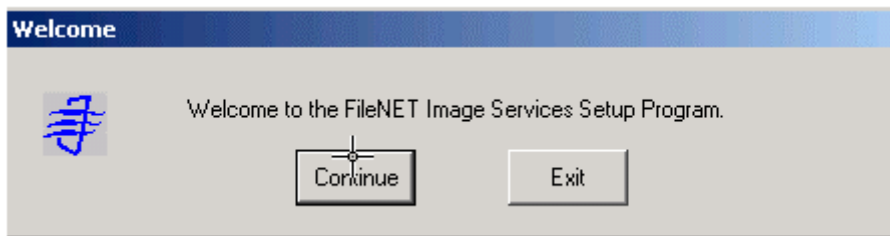


Figure 7. FileNet Image Services Setup Program.

If the FileNet Image Services software is being installed as a cluster system, select the appropriate option and continue the installation. On our test setup, we used the default option of using a single system. Next it displays the available disks for the software installation. Now select the destination for the software installation. On our system, the available local NTFS drives and the Windows drive are displayed as shown in Figure 8.

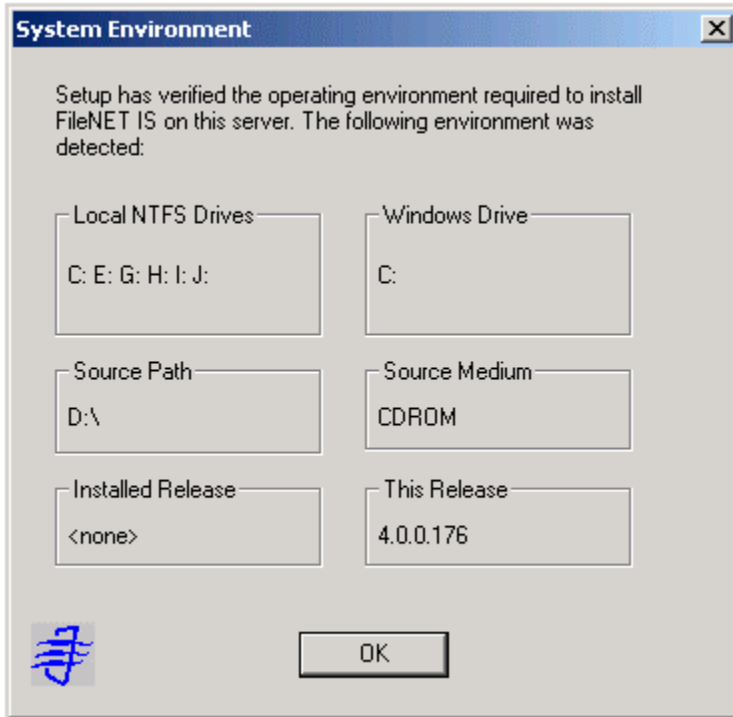


Figure 8: Available Local NTFS Drives

Next, select the directory for the software installation. On our setup, we selected a local NTFS drive called i:\, which is configured using iSCSI and SnapDrive.

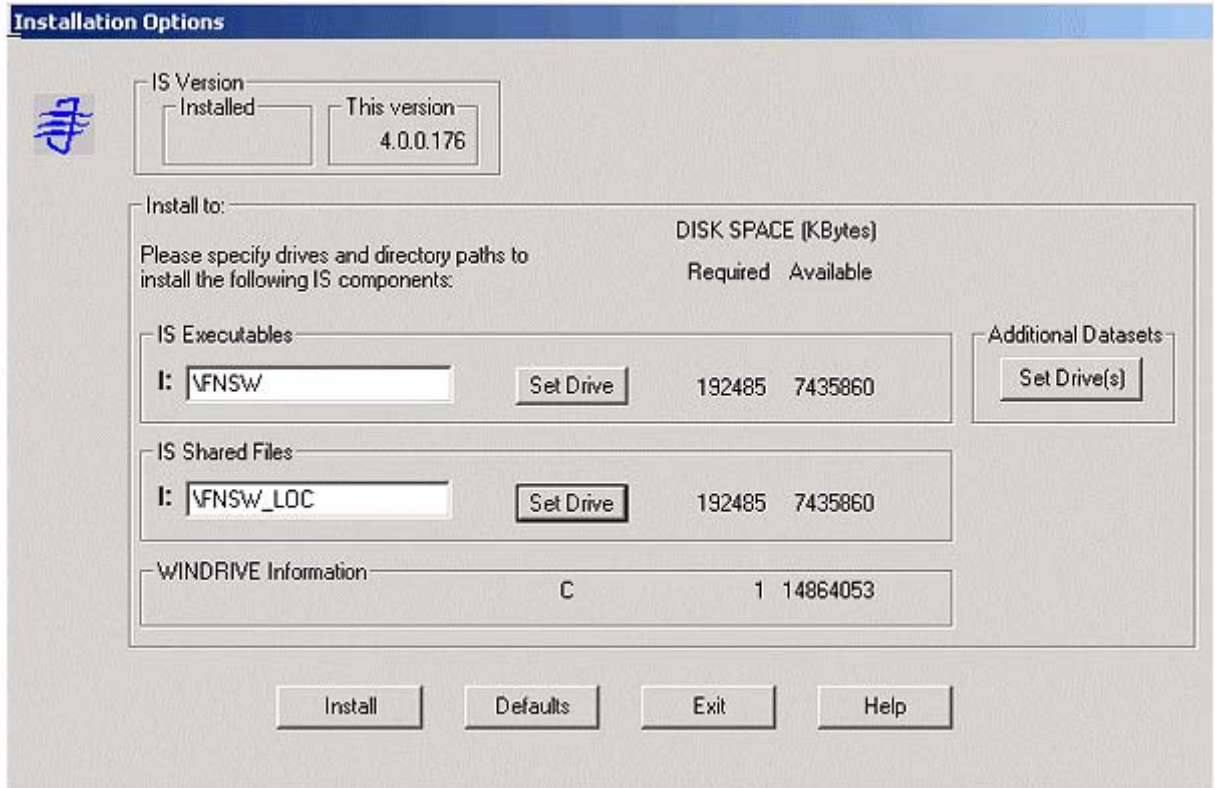


Figure 9. FileNet Image Services installation options.

Next, choose the type of Image Services mode, such as Combined Server, as shown below.

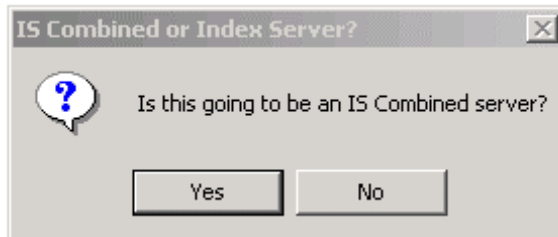


Figure 10. Image Services server type.

From the preinstallation worksheet, obtain the System Serial Number (SSN) and determine the NCH and domain name and enter that information. On our setup, these parameters are as shown below. Note that the SSN shown below does not reflect the actual number. Complete this parameter with the information obtained from FileNet.

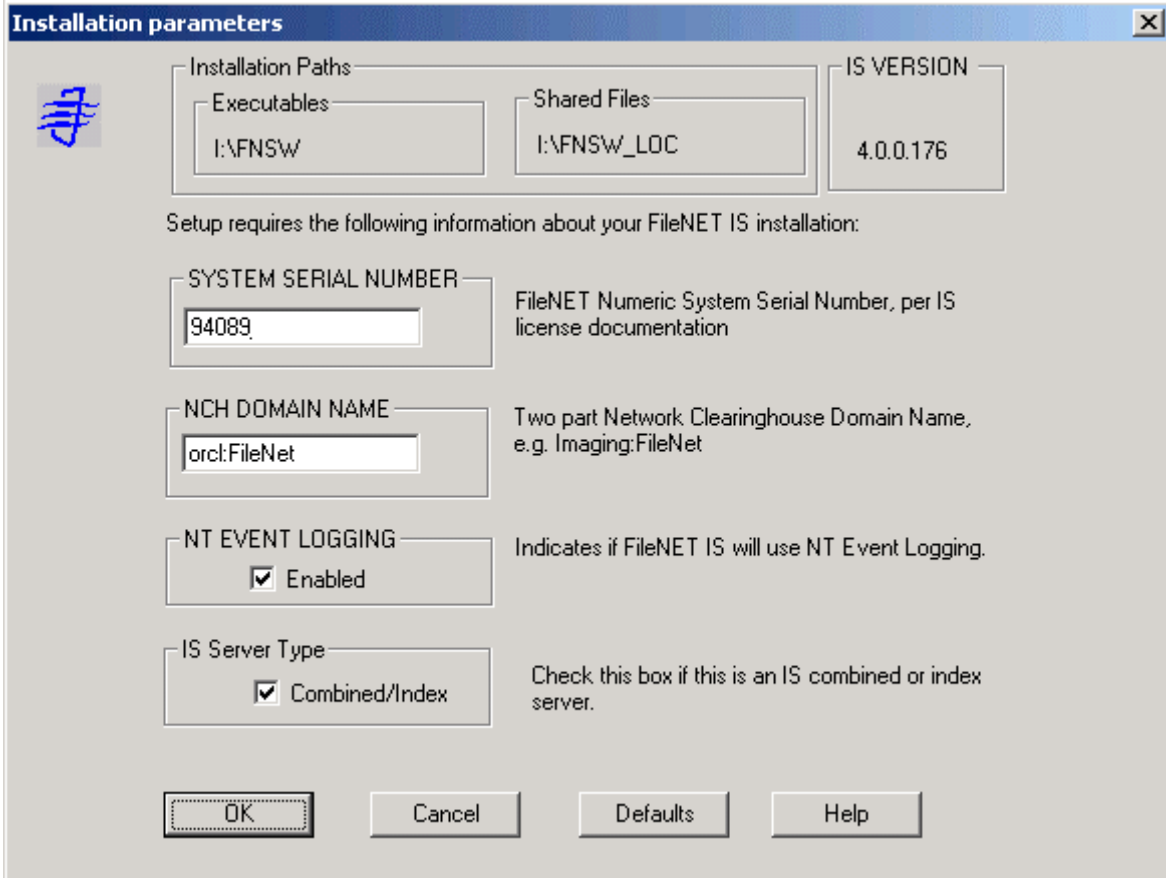


Figure 11. FileNet Image Services installation parameters.

Continuing with the above step allows you to validate the license key using SLAC. Apply the appropriate license obtained from FileNet. If you have a valid license, click Yes and continue the installation: the installation utility will validate the license key.

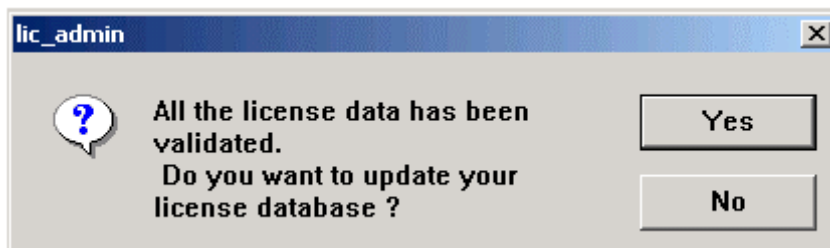


Figure 12: FileNet Image Services license administration.

With the validation of SLAC, FileNet Image Services software installation is completed. Since the release of IS 4.0 software, FileNet has addressed several issues, added additional features, such as support for Image Services Connector for SnapLock (ISCS), and released a service pack called IS 4.0 SP01. FileNet requires users to upgrade to the latest release level. Even though Image Services 4.0 works with SnapLock, it is recommended that you upgrade the server to support native retrieval from a SnapLock archived destination. The next section will describe the procedure for upgrading FileNet Image Services.

Upgrading FileNet Image Services to a new hot fix pack

To upgrade to IS 4.0 SP01, obtain the necessary software by visiting the FileNet [Customer Services Web site](#). Before upgrading Image Services, stop the image services and stop the related ISControlService.

On our system, we issued the following commands to stop Image Services.

```
Microsoft Windows 2000 [Version 5.00.2195].
C> Copyright 1985-2000 Microsoft Corp.
^:\Documents and Settings\Administrator.DBLAB>initfnsw stop re you sure you
want to stop software on server 'Beay is'? <y!n>[n] .elimination of FileNET
software completed.
?:\Documents and Settings\Administrator.DBLAB>killfnsw -SAD
re you sure you want to run killfnsw? [y] y
pc_daemon 2468
illfnsu: All FileNET processes have terminated.
i:\Documents and Settings\Administrator.DBLAB>
```

Figure 13. Stopping Image Services before upgrading the software.

Now start the upgrading of Image Services. The installation utility starts the upgrade process and processes all the required information. On our test setup, following output was shown.

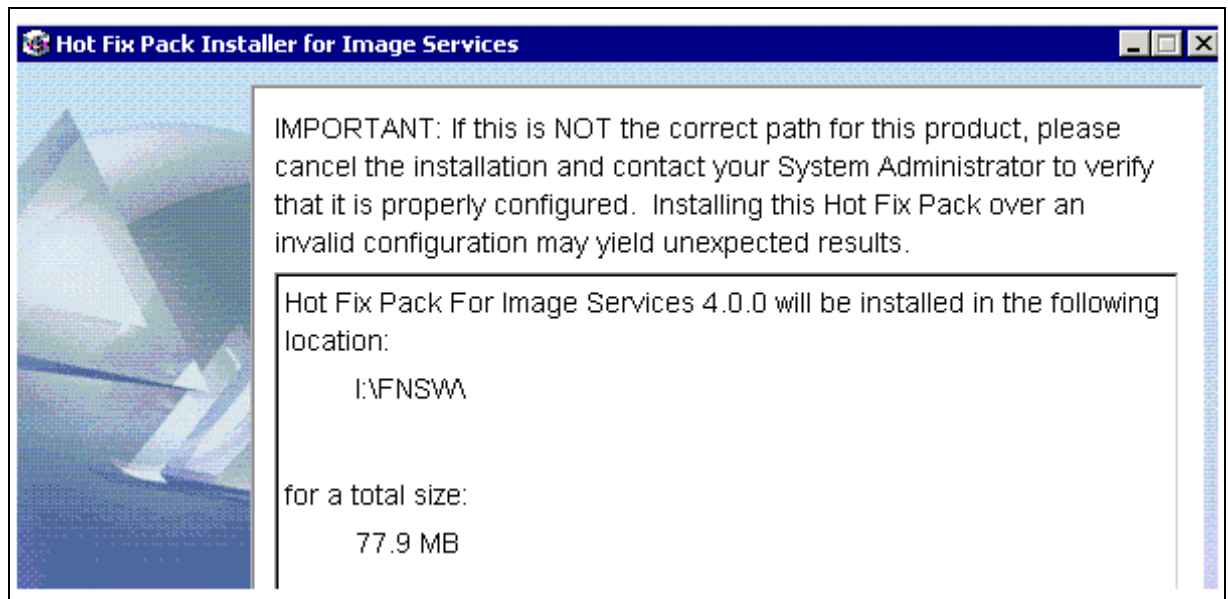


Figure 14. Location for the FileNet Image Services Hot Fix Pack.

Configuration files are overwritten on the target system, and any changes to the original configuration must be manually incorporated from the backup directory into the updated file. This procedure will complete the upgrade of FileNet Image Services to the 4.0 SP01 release.

Configuring FileNet Image Services

After installation and upgrading of FileNet Image Services, certain tasks must be performed before you can start using the IS system. To configure the IS system, use the FileNet Image Services System editor. When the system editor is started for the first time after installation, it displays the information about new database configuration, including the database, domain name, and the database template. On our system, this information is shown below.

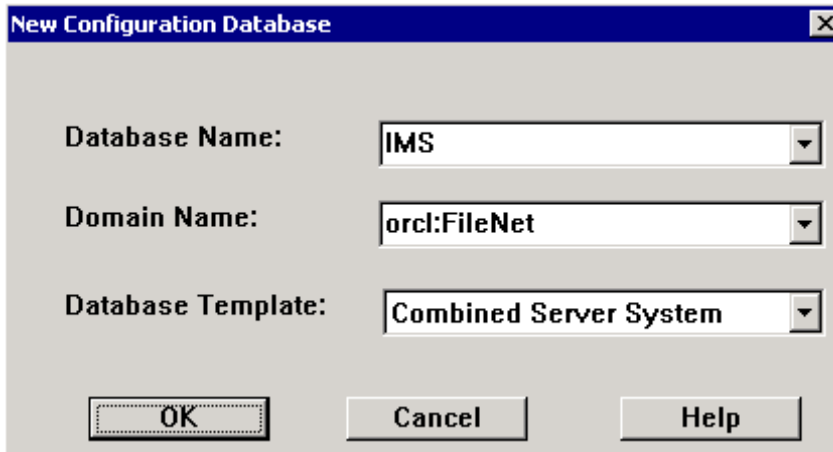


Figure 15. New database configuration details.

After verifying the above information—for example, the name of the database template (in this case, Combined Server System), continue the configuration by providing the base directory for storing the default datasets. Next, the relevant database server type must be configured. On Windows 2000, FileNet Image Services supports both Oracle and Microsoft SQL Server 2000. Select the appropriate relational database in your environment. On our system, we selected Oracle 9.2.0 to configure the relational database for the IS system, as shown in Figure 16.

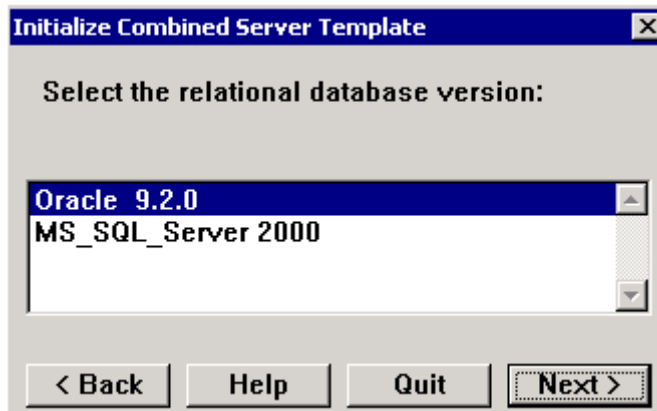


Figure 16. Relational database version.

If the tape and printer configurations must be configured, add the appropriate services. With these entries, the customized settings for Image Services are complete. Verify that the datasets are defined correctly and modify the size of the datasets as needed in your environment. Once configuration is completed, exit the configuration editor and proceed with building the database.



Completing the configuration of Image Services system

After configuring the necessary parameters using the configuration editor, it is necessary to complete certain post-installation tasks. This section will explain the procedure to be completed before using the IS system.

Using the `fn_build` utility

Now build the database using the `fnjouild` utility. We used the `-a` option to build all. The following was the output of `fnbuiid -a` command.

```
fn_build -a
I:\FNSW\dev\l>fn_buiId -a fn_build:
START, options = -a fn_build: creating temporary files:
  I:\FNSW_LOC\ssn.new
  I:\FNSW_LOC\sd\nch_dbinit.new
  I:\FNSW_LOC\sd\inx_conf.new
  I:\FNSW_LOC\sd\print_config.new
  I:\FNSW_LOC\sd\snmp.conf.new
  I:\FNSW_LOC\sd\as_conf.g.new
  I:\FNSW_LOC\sd/l/as_conf.s.new
  I:\FNSW_LOC\sd/l/tapeconfig.new
  I:\FNSW_LOC\sd/l/nch.ddl.new
  I:\FNSW_LOC\sd/l/permanent.ddl.new
2004/07/08 11:07:22.687 <Administrator> fnjouild -a (2108.2232 0x83c. fn_build:
setting max_record_types to 32.
  Warning: If restoring a database with a different value, it's necessary to
  edit the correspondling '.ddl' file.

fn_build: setting max_record_types to 32.
  Warning: If restoring a database with a different value, it's necessary to
  edit the correspondling '.ddl' file.
2004/07/08 11:07:22.703 <Administrator> fnjouild -a (2108.2232 0x83c.
INFO ONLY - fnjouild,ddl: Using Large MKF for Permanent Database.

      Updating I:\FNSW_LOC\sd/l/permanent.ddl
  I:\FNSW_LOC\sd/l/sec.ddl.new
  I:\FNSWJ10C\sd/l/transient.ddl.new
2004/07/08 11:07:22.750 <Administrator> fnjouild -a (2108.2232 0x83c. INFO ONLY -
fnjouild,ddl: Using Large MKF for Transient Database.
  I:\FNSW_LOC\sd/serverGroup.new
  I:\FNSWJ10C\sd/rdb.init.new
  I:\FNSW_LOC\sd\OracleHome.glob.new
  I:\FNSW_LOC\sd/l/FNSHMSEGSZ.new

fn build: DONE
```



Initialize the datasets using the fnutil command

Verify the success of the fnbuid process by checking its log file, which is created at \FNswjioc\Logs\fnjouiid\fnjouiid.log. If there is no error, continue to initialize the database as explained in this section.

FileNet software installation has created several commands and utilities to manage the IS system. Fnutil.exe will allow the database to be created and initialized and the following command initializes all the configured datasets. Note that the FileNet Image Services system has been stopped properly before executing the fn_util.exe command. This utility will create the necessary databases if the file is not present, and hence any related error message during initialization may be safely ignored. On our system, we executed the following command; the output is shown below:

```
I:\FNSW\dev\l>fn_util init
I:\FNSW\dev\l>fn_util init fn_util: running
'initfnsw -y stop' Termination of FileNET
software completed.
```

Warning: This tool will delete the contents of BES cache, including any Panagon Capture settings, templates and capture paths you have defined. If your system uses Panagon Capture, copy your configuration node from the BES to your local Capture repository before continuing. Refer to the Panagon Capture documentation for more information.

```
Enter Y to continue or N to abort: y
fn util del I:\FNSW\dev\l\transient db*
Could Not Find I:\FNSW\dev\l\transient db*
fn_util creating trans database with I:\FNSW_LOC\sd\l\transient.ddl.
fn util successfully created trans database.
fn util initializing cache
fn util del I:\FNSW\dev\l\cacheO
fn util del I:\FNSW\dev\l\permanent_db*
fn util creating perm database with I:\FNSW_LOC\sd\l\permanent.ddl.
fn util successfully created perm database.
fn util del I:\FNSW\dev\l\sec_db*
fn util creating sec database with I:\FNSW_LOC\sd\l\sec.ddl.
fn util successfully created sec database.
fn util starting RDBMS initialization
fn util starting Oracle initialization.
fn util successful RDBMS initialization
fn util done
```



Granting Oracle user permissions

FileNet Image Services supports only site-controlled databases and hence appropriate user privileges are necessary for access to data. During the installation process, IS creates several SQL scripts to perform the necessary tasks. Execute the script file called FiieNetsite. sqi. A sample command and output are shown below:

```
I:\FNSW\dev\1>
@filenet_site.sql
I:\FNSW\oracle>sqlplus "/as sysdba"
SQL*Plus: Release 9.2.0.5.0 - Production on Thu Jul 8 11:14:29 2004
Copyright (c) 1982, 2002, Oracle Corporation. All rights reserved.
Connected to:
Oracle9i Enterprise Edition Release 9.2.0.5.0 - Production
With the Partitioning, OLAP and Oracle Data Mining options
JServer Release 9.2.0.5.0 - Production
SQL> @filenet_site.sql
Grant succeeded.
Grant succeeded.
Grant succeeded.
Grant succeeded.
Grant succeeded.
Grant succeeded.
Grant succeeded.
Grant succeeded.
Grant succeeded.
Grant succeeded.
Grant succeeded.
Grant
succeeded.
Grant
succeeded.
SQL>
```

Running the fn_Oraupgrade_sp.sql script

Run the fn_oraupgrade_sp.sql script to grant necessary permissions. A part of the output is shown below, as displayed on our test system:

```
@fn_oraupgrade_sp
SQL> GRANT EXECUTE ON fn_error TO PUBLIC;
Grant succeeded.
SQL> GRANT EXECUTE ON fn_errortxt TO PUBLIC;
Grant succeeded.
SQL> GRANT EXECUTE ON fn_oraversion TO PUBLIC;

Grant succeeded.
SQL> GRANT EXECUTE ON fn_oraversiontxt TO PUBLIC;
Grant succeeded.
SQL> rem stamp 0G^AXNR5LcFs@l?Q4KbE\?VLP;JsU]>W>02P'CZ=W<N1HbSZ<X=MO\AX;Z5LcF]
F]=d4KbE\?V9b3JaE]EU?e2I'G1=T7T1H_WYDS<bOGaAX;RJLcF]@XLX;ObE
SQL>
SQL> EXIT
Disconnected from Oracle9i Enterprise Edition Release 9.2.0.5.0 - Production
With the Partitioning, OLAP and Oracle Data Mining options
JServer Release 9.2.0.5.0 - Production
I:\FNSW\oracle>
```




Complete the installation

Storage Library Configuration is required if the system is configured for dual-server operation. If so, refer to the FileNet documentation for instructions on configuring the system. Otherwise, skip this section.

Configure cross-committal

A cross-committal system will have a source Image Services system and a target Image Services system. In this configuration, the source Image Services system commits images to the target Image Services system without retaining the images locally. A Remote Entry Server (RES) is a specific type of cross-committal system that has no storage library and is used only for entering images for committal to a target system that does have a storage library.

Configure multicommittal systems

A FileNet Image Services Multicommittal System (MSS) commits images both to its own storage library and to the storage library of another independent FileNet Image Services system. MSS may or may not be compatible systems with nonoverlapping document IDs. If they are noncompatible, new doc IDs are assigned on the target system, which may be a minor performance consideration.

Check the System Serial Number (SSN) of Image Services, which is a 10-digit number assigned by FileNet. The SSN is written onto all storage media. It must be unique for each Image Services system.

Start the FileNet software

Before starting Image Services, check that IS ControlService has been started and that the property is set to automatic in the Services Control Panel. Also check that Oracle services have been started and that database server is up and running. Use the Task Manager on the FileNet Image Services panel to check the status of Image Services. On our test setup, Figure 17 shows the Task Manager.

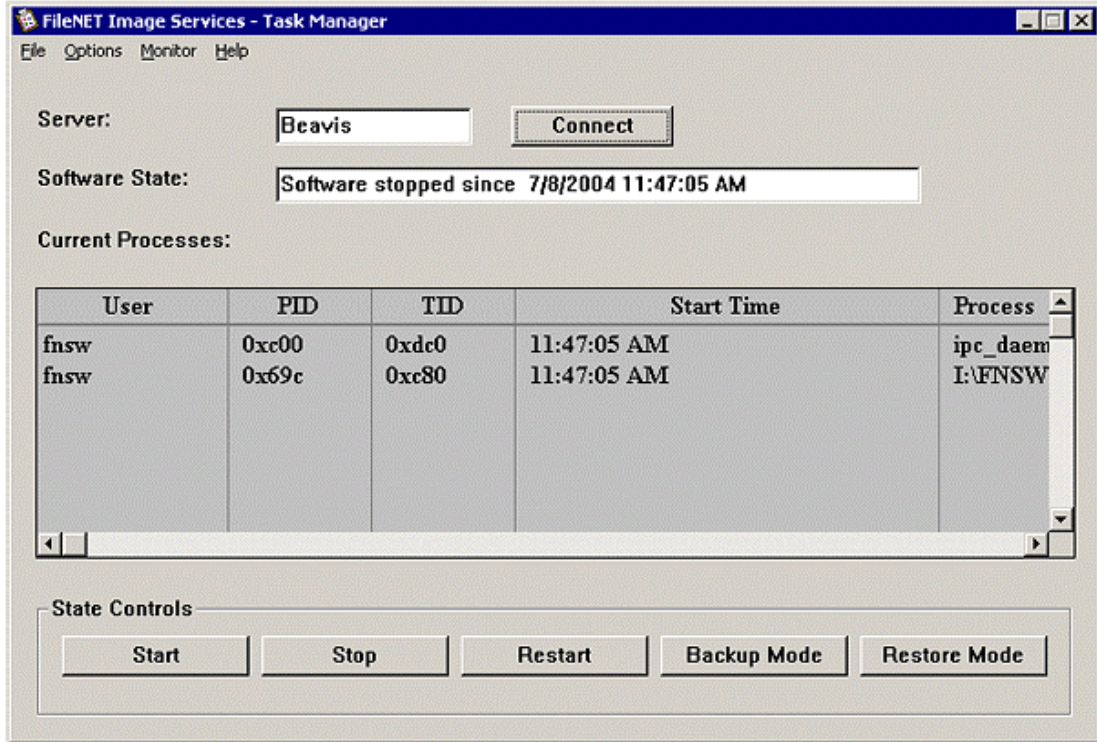


Figure 17. FileNet Image Services – Task Manager status when the services are stopped.

To start the software, click the Start button. A screen similar to the one shown below will appear.

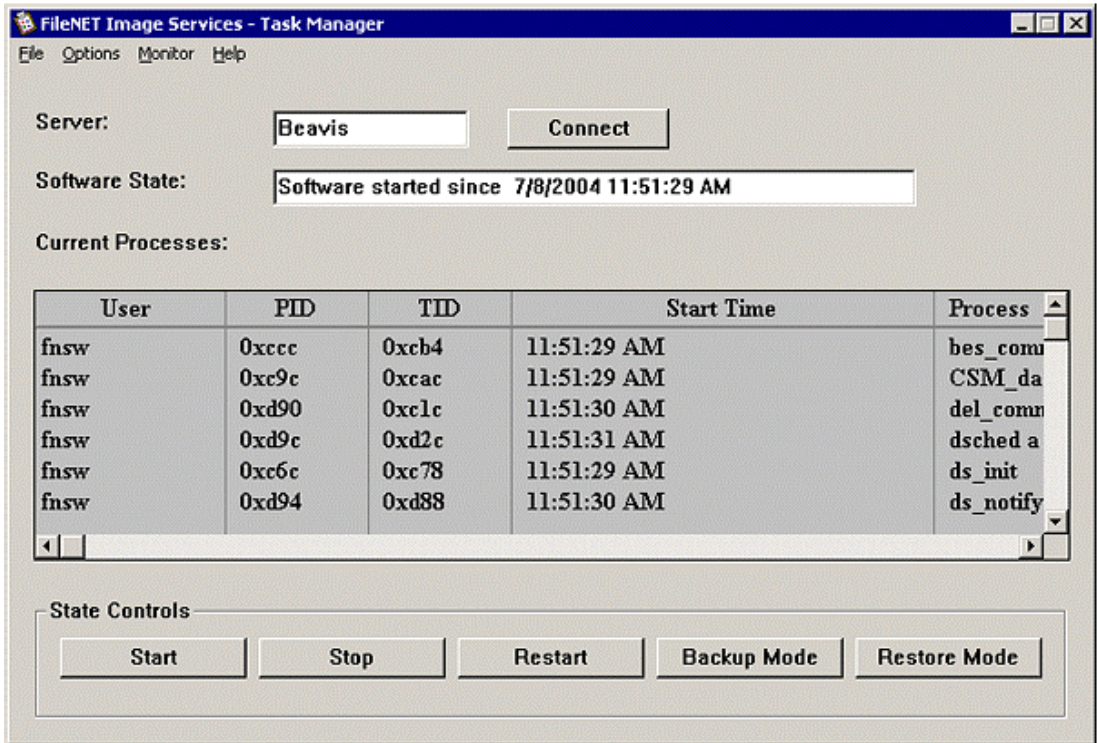


Figure 18. FileNet Image Services – Task Manager Status after the startup.



Configuring the MSAR storage library

Starting with Image Services 4.0, MSAR is supported directly without having to upgrade the FileNet IS server. In July 2002, FileNet added a new feature called MSAR (Magnetic Storage and Retrieval) to its Image Services Release 3.6 ESE (Extended Storage Edition) to support the storage of images and documents on magnetic storage, which can be used along with OSAR or can replace optical storage entirely. Because its advantages, many IS customers are replacing optical media with MSAR. Some of the benefits of using MSAR rather than optical media are listed below:

- Increased storage scalability and density
- Faster performance due to:
 - Faster drive performance on magnetic drives than on optical drives
 - Elimination of delays due to media swapping and spinup
 - Higher availability due to elimination of library robotics
 - Instant data backup and quick recovery with IBM N series Snapshot and SnapRestore features
 - Reduction in end-user delays and complaints
 - Improved system manageability

The minimum MSAR surface size is 1GB; the maximum size is 32GB. The maximum number of slots is 1024 per MSAR storage library. Types of MSAR storage library are Model 16, Model 128, Model 256, Model 512, and Model 1024. (The model number corresponds to the number of licenses purchased.) Maximum capacity of MSAR storage is 128TB. (These MSAR licensing options are subject to change by FileNet in future versions of IS.) Our test configuration used the Model 512 MSAR storage library to configure MSAR surfaces.

Upgrading to IS 3.6 ESE from IS 3.6 information

Both IS 3.6 SP2 and IS 3.6 ESE were independent releases. IS 3.6.xx was the non-MSAR IS field release. It's important not to confuse these releases. The following diagram, duplicated from FileNet documents, shows the progression of the service pack release for IS 3.6 in relation to IS 3.6 ESE.

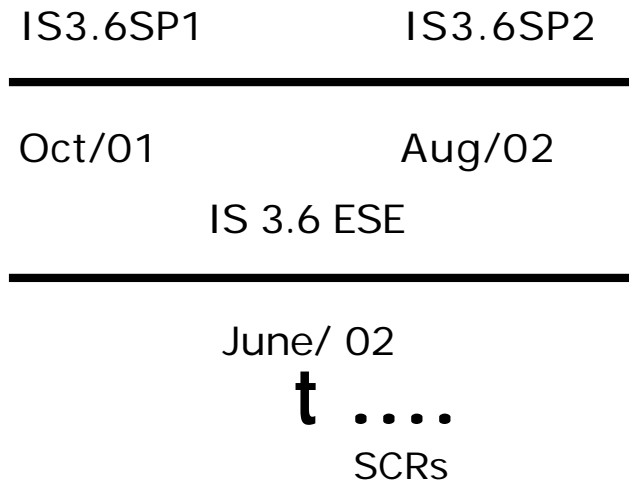


Figure 19. FileNet IS Rreleases in relation to IS 3.6 ESE.

1. If IS 3.6 ESE is installed on a system that has already been upgraded to IS 3.6 SP2, the system will essentially revert back to an older release. If that happens, all the patches will be removed and will have to be reinstalled. The required special contingency risks (SCRs) are listed at the end of this document.
2. To bring an MSAR system with IS 3.6 ESE up to the latest SCR level similar to IS 3.6 SP2, all the required SCRs must be manually installed. Again, the required SCRs are listed at the end of this document.
3. The IS 4.0 release has to be upgraded to IS 4.0 SP01 or later release to take advantage of native retrieval.

The SCRs will have new functionality as included in the IS 3.6 ESE release and the patches released with IS 3.6 ESE and IS 3.6 SP2. After installing all the required SCRs to the IS 3.6 ESE, install the additional patches released after the IS 3.6 ESE release date.

Using the MSAR storage library

MSAR surface creation using IBM N series storage is simple. It is created in the MSAR creation directory. Its path information is stored in the database with each storage, which has one creation directory for storing the MSAR surface. New MSAR surfaces can be created when the existing MSAR surface is full or approaches the configured size. All existing MSAR surfaces will remain intact, and the old MSAR files will not automatically move over to the newly created MSAR surfaces. Migrating them to the newly created surface requires intentional surface data movement. To guarantee data integrity, have done extensive

tests have been done to verify that data written to MSAR to NFS IBM N series volumes is written synchronously.

Configuring the MSAR surface

Use the FileNET configuration editor (fnedit. exe) to configure a new MSAR surface or delete an existing MSAR surface library. To add a MSAR surface, choose Configuring an MSAR Storage Library, and click Run, and follow the instructions. Note that, in the “Configure an MSAR storage library” screen, the number of disks for favoring writes can be ignored and set to zero as shown in Figure 20.



Figure 20. Configuring the MSAR surface library—drives favor writes.

Once configuration is completed, save the changes before exiting the configuration editor and rebuild the datasets by running the `fnbuild -a` command.

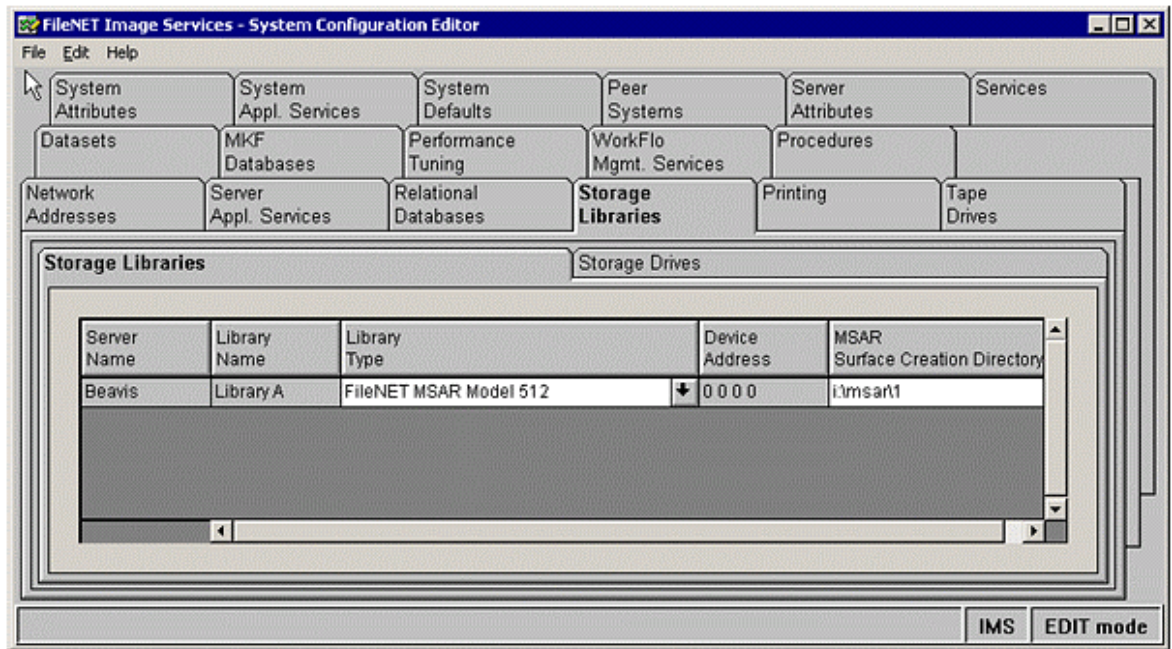


Figure 21 FileNet Image Services configuration editor.



Useful information

This section provides some information to help the reader to manage Image Services data efficiently.

Useful information regarding the Oracle Database Server

This section presents some database tips to help you to manage the Oracle database server. This paper recommends replicating some database-related files, such as init.ora and control files to a location other than their source path. In a nonclustered failover configuration, modify the init.ora file with new control file information, shut it down, and restart the Oracle server to make the changes effective.

Create mirrored sets of online redo log files. Using IBM System Storage N series with SyncMirror®, you can create a synchronous copy of the online redo log files. This can also be done using VERITAS Volume Manager.

Keep online and archive redo logs in separate volumes. Keeping them in separate volumes provides some advantages, such as added data protection and more flexible database recovery.

Placing the redo logs in a separate volume also simplifies the management of these files. This is especially useful in a backup and recovery process.

To increase the Oracle server availability and prevent problems, avoid filling the volume to capacity.

In a SAN configuration, enable persistent binding so that a device entry to a LUN connection will remain consistent across system reboots.

Integration of Image Services Connector for SnapLock

To take advantage of WORM capability on magnetic media, FileNet has announced support for IBM N series SnapLock via iSCSI. iSCSI works with both IS 3.6 ESE and IS 4.0 servers. To take advantages of native retrieval, this paper recommends to upgrading to IS 4.0 SP01 software.

IBM N series SnapLock configuration allows users to archive the data onto a permanent nonerasable, nonrewritable magnetic media while taking advantage of IBM N series technology for archival, backup, and disaster recovery.



Conclusions

FileNet support for image storage on magnetic disk using MSAR combined with IBM N series unified storage enables IBM N series storage systems to operate in a true unified storage architecture and serve as both file system and raw partition storage for FileNet Image Services, depending on the needs of the system and the preferences of the FileNet administrator. Administrators who need the features of SAN and/or NAS configurations (block or raw partition storage from SAN and remote file system storage from NAS on UNIX platforms) can now deploy FileNet storage that is fast, scalable, reliable, and flexible enough to store any kind of FileNet data, including database, MKF, cache, and images with MSAR. On Windows 2000, MKF/cache can be configured on network share devices. In addition, IBM N series storage system integration provides FileNet customers with quick backup and recovery capabilities as well as simplified data replication and disaster recovery planning. This paper demonstrates that deploying IBM N series unified storage solutions for FileNet storage is both technically simple and provides significant technical and business benefits when compared to traditional direct-attached, NAS-only, SAN-only, or optical storage.

Caveats

IBM N series has not tested all possible combinations of hardware platforms and storage architecture and software options. If you use a different server OS, different version of Image Services, or a different database, significant differences in your configurations that may alter the procedures necessary to achieve the objectives outlined in this document.



Appendix

This section lists the FileNet SCRs required to help you to upgrade to IS 3.6 ESE from IS 3.6 SP2.

Start FileNet Image Services

Start the Task Manager application and click the Start button to start the IS services if the services have been stopped. You will get the status output on a separate X window. Check the events log to verify that the Image Services system has started successfully. Now you're ready to use the FileNet Image Services.

FileNet required SCRs (relevant only to the IS 3.6 ESE release)

All Platforms	156591, 156921, 156925, 156928 156929 156939 156951 ,156952, 156961, 156963, 154817, 156582, 157574, 157577, 157580, 157582 157591, 157926, 158288, 158297, 158645 156964, 157568,
AIXOS	156576
AIXOS - Localization	157933, 158630 156930, 157556, 157589,
HP-UX	None
HP-UX-Localization	157936 158634 156931, 157557, , 157593,
SOLARIS	156576, 156958
SOLARIS - Localization	157937 158642 156932, 157559, , 157594,
WINDOWS 2000	15830 157598, 157965, 2
WINDOWS 2000 - Localization	158644, 158644 156933, 157560, 157595, 157943,

Table 3. FileNet required SCRs information for IS 3.6.



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