

Directory Services Repair Utility

Overview	3
Concepts to Know	3
Unattended Full Repair	3
Time Synchronization	4
Replica Synchronization	5
View/Edit Repair Log File	5
Advanced Repair Options	6
Log File and Login Configuration	6
Repair Local DS Database	7
Repairing Synchronized Up To Attributes	9
Servers Known to This Database	11
Time Synchronization and Server Status	11
Repair all Network Addresses	11
Repair Selected Server's Network Address	12
Update Schema on All Servers	12
Update Schema on the Selected Server	12
View Entire Server's Name	12
View Remote Server ID List	13
Verify All Remote Server IDs	13
Verify Selected Remote Server ID	13
Delete the Selected Remote Server ID	13
Replica and Partition Operations	13
View Replica Ring	14
Synchronize the Replicas on All Servers	14
Synchronize the Replica on the Selected Server	14
Send all Objects to Every Replica in the Ring	14
Receive All Objects from the Master to This Replica	14
Remove this Server from the Replica Ring	15
View Entire Server Name	15
Synchronize All Servers in All Replicas	15
Repair All Replicas	15
Repair Selected Replica	15
Schedule Immediate Synchronization	16
Send All Objects to Every Replica in the Ring	16

Receive All Objects From the Master to This Replica	16
Repair Time Stamps and Declare a New Epoch	16
Cancel Partition Operation	17
Designate This Server as the New Master Replica	17
Display Replica Information	17
View Entire Replica Name	17
Security Equivalence Synchronization	18
Prompt Before Adding Equivalent To Me? Yes	18
Prompt Before Adding Security Equals? No	18
Global Schema Update	19
Update All Server's Schema	19
Update the Root Server Only	19
View/Edit DSRepair Log File	19
Create a Database Dump File	20
DSRepair Switches	20

Overview

This appendix describes the DSRepair utility, which is provided to check for and correct problems in the Directory database on an individual server basis. DSRepair is implemented as a NetWare Loadable Module, and is written with the C-Worthy user interface using the NWSNUT.NLM library module. This library module is automatically loaded when DSRepair is loaded on the server.

You can load the DSRepair utility on any server in the Directory tree. It provides the following primary operations:

- Unattended full repair
- Time synchronization
- Replica synchronization
- View/Edit repair log file
- Advanced options menu

The Advanced Options Menu provides the following additional operations:

- Log file and Login configuration
- Repair local DS database
- Servers known to this database
- View remote server ID list
- Replica and partition operations
- Security equivalence synchronization
- Global Schema update
- View/Edit repair log file
- Create a database dump file

Note These Novell Directory Services operations are discussed in the order listed above, which is the order they appear in the DSRepair menus. You should read this appendix if you intend to fix any problems in your NDS database. s

Concepts to Know

To understand this appendix you should be familiar with the following NDS concepts:

- Directory tree structure
- Partition management
- Replica management
- General NDS synchronization

Unattended Full Repair

The “Unattended Full Repair” option automatically performs all possible repair operations that do not require operator assistance. You control

parameters or items to be checked or repaired through first accessing and changing the parameters in the “Repair Local DS Database” option in the “Advanced Repair Options” menu. The log file records all actions during this operation so that you can determine what was done. During the local database repair, the NDS database is locked, making it inaccessible to the client or any other use until the repair is completed. After completing the “Local NDS Database Repair” operation and saving the repaired database, this operation unlocks the local database files and opens them for access. DSRepair does not lock the database during the other three operations listed below.

The unattended full repair goes through four major repair procedures:

- Local NDS database repair (*database is locked*)
- Repair of all network addresses (*database is unlocked*)
- Remote server ID checks (*database is unlocked*)
- Replica ring repairs (*database is unlocked*)

These four automated, unattended procedures perform the same repair operations as the following operations in the “Advanced Repair Options” menu:

- Repair Local DS Database
- Repair All Network Addresses
- Verify All Remote Server IDs
- Repair All Replicas

For detailed descriptions of these repair operations, see “Advanced Repair Options” later in this appendix.

After completing the repair operations, DSRepair opens the log file for viewing so that you can see what repairs were done and what the state of the database.

Time Synchronization

This operation contacts every server known to this server’s local database and requests information about NDS, time synchronization, and server status. If this server contains a replica of the [Root] partition, the operation lists every server in the Directory tree. Each server’s information is displayed on the screen and written to the log file as a table. The content of the information fields are explained in Table B.1 below:

Table B.1
Server Information from the Time Synchronization Process

Field Name	Description
Server Name	The Distinguished Name of the server responding to the Directory Services request is displayed.

Table B.1
Server Information from the Time Synchronization Process

Field Name	Description
DS.NLM Version	The NDS version running on the reporting server is returned and displayed.
Replica Depth	The replica depth is reported as -1 if no replicas are stored on the server, 0 if the server contains a replica of the [Root] partition, or a positive integer that indicates how many objects away from the root the first replica is on the reporting server.
Time Source	DSRepair cannot report the time source for each server, but does reveal the time source server type, which can be used to determine if time synchronization has been configured properly. All servers in the tree must be synchronized to the same time source, or NDS cannot resolve synchronization collisions properly.
Time is in Sync	This field reports the local time synchronization status on the reporting server, which should be <i>Yes</i> . <i>No</i> means that the server cannot contact its time source. However, this should not cause problems over short periods of time, because the server's internal clock will not drift significantly.
Time Delta	This field reports time differences relative to this server. All servers should be within 1 second of each other, or they have not been configured properly. This field reports up to 999 minutes and 59 seconds (approximately 16.5 hours) in the form MINUTES:SECONDS. If the time difference is greater than that, the maximum value is displayed as 999:59.

Replica Synchronization

This operation synchronizes all partitions that have a replica stored on the local server. This operation contacts each server in the replica ring and requests that it synchronize to every other server in the replica ring. Thus, the synchronization process is performed on other servers as well as the local one. A server does not synchronize to itself, so the status for a server's own replica is displayed as "host." DSRepair displays any errors that occur and writes them to the log file for later viewing. If all the replicas of each partition are synchronizing properly, the tree is functioning correctly.

View/Edit Repair Log File

This option allows you to view the DSRepair log file, which contains the results of operations performed by the utility. The log files's default location is SYS:SYSTEM\DSREPAIR.LOG. When DSRepair is loaded, the

log file becomes active, and it appends the results of the operations to it. Thus, the file size grows with each repair operation performed. The log file size is displayed in parenthesis at the end of the log file title line. You can use the “Log File and Login Configuration” option in the “Advanced Repair Options” menu to:

- Turn the log file off.
- Turn it on again.
- Change the name to write to any local DOS or NetWare Volume.
- Delete the file.

Advanced Repair Options

This option allows you to manually control the individual repair operations and global repair functions on the Directory tree. You can also access diagnostic information about the Directory database to analyze the status of the tree. It provides advanced repair operations, several of which are the same as the main menu options discussed above.

Log File and Login Configuration

This option provides two functions:

- Configuration of the DSRepair log file
- Login to the Directory tree

Configuring the DSRepair log file allows you to manage that file. You can turn it off, delete it, or change the file name to any local DOS drive or NetWare volume.

When a function requires you to log in, a Login screen appears for you to enter your user name and password. Once you have logged in, the prompt no longer appears. The system then uses the last user’s Login name. The “Login” option in this function is useful for all other global functions of DSRepair, such as the “Security Equivalence Synchronization” operation. This function allows you to change the logged-in user and set rights to a different part of the Directory tree.

Table G.15 below explains each of the parameters for the “Log File Configuration” option. The bold text indicates the default values for the field.

Table G.15
Log File Configuration Parameters

Field Name	Description
Current file size	<Bytes> . This parameter is provided for information only.

Table G.15
Log File Configuration Parameters

Field Name	Description
Reset the log file	Press <ENTER> to delete the log file. This parameter resets the file size to zero. When the file is deleted, you will lose all log information that has been previously sent to the file.
Log output to a file	Yes. Selecting <i>Yes</i> saves the output of DSRepair operations and error messages to a log file. Selecting <i>No</i> writes the output to a temporary buffer that is displayed in place of the log file. The information is then erased at the end of each operation.
Log file filename	SYS:SYSTEM\DSREPAIR.LOG. You can replace the default path and filename with a different path and filename, including any local DOS drive or NetWare volume.
If file already exists	Append to existing file. This option adds to the end of the existing log file, if it exists for the path indicated. To write over the existing file, you can select the “Overwrite Existing File” option.
Administrator Name	Enter the full NDS path (complete name context) for the Administrator. This user needs the Supervisor object right to the root object of this tree.
Password	Enter the Administrator’s password for this tree.

Repair Local DS Database

This function repairs the NDS database files stored on the server, allowing you to manually control all repair operations. All of the database checks and repairs described here are included in the “Unattended Full Repair” option in the main DSRepair menu, using the default parameter settings. The options in the “Repair Local Database” menu are described in Table H.16 below. The bold text indicates the default values for the field.

Table H.16
Repair Local Database Options

Options	Description
Pause on errors?	No. Choose <i>Yes</i> to pause after each error message. Select the default option, <i>No</i> , if you don’t want DSRepair to stop on errors. After the repair has completed, you can view all actions it performed in the log file.

Table H.16
Repair Local Database Options (Continued)

Options	Description
Validate trustee IDs?	Yes. Choose the default option, <i>Yes</i> , to check the file system for valid trustees after the repairs have been made. This operation searches all mounted volumes for trustee IDs. It creates a report of the trustee IDs that didn't have entries in the Directory database and then deletes them from the volume. This can be time consuming on large volumes. This action is similar to the BINDFIX utility in NetWare 3.
Validate mail directories?	Yes. Choose the default option, <i>Yes</i> , to check the mail directories on volume SYS for users who no longer exist after repairs have been made. NDS does not require mail directories.
Validate stream syntax files?	Yes. Choose the default option, <i>Yes</i> , to check for valid stream syntax files after the repairs have been made. Stream syntax files contain data for a property with the syntax of <i>stream</i> . This operation creates a list of stream syntax files that don't have entries in the database, and then deletes them.
Rebuild operational schema?	No. Choose <i>Yes</i> to rebuild the pre-defined base schema on the server. The operational schema is the schema required for NDS base operations. If the operational schema becomes damaged, you must rebuild it (this should rarely be the case). The default for this option is <i>No</i> .
Conserve disk space?	No. Choose <i>Yes</i> to remove noncritical files before and after repair. These files can help recover a damaged database, but they use disk space. The default for this option is <i>No</i> .
Exit automatically upon completion?	No. Choose <i>Yes</i> to immediately exit the DSRepair utility upon completion. This will also unlock and open the local NDS database files after completing the repairs. Choosing the default option, <i>No</i> , allows you to look at the repair operations before saving the repaired database.

The Directory database is temporarily locked during these repair operations to prevent users from logging in. This option also requires you to confirm the local database repairs. All repairs are performed on a tempo-

rary copy of the files. These files are renamed at the end when committing to save the database on which repairs have been made.

During the local NDS database repair operations checks, DSRepair finds any errors and repairs them. DSRepair checks the following items. If it finds an error during the check, it repairs it.

1. *Entry value, block, and partition records.* DSRepair checks for invalid partitions and partition roots. If the utility finds any errors, it fixes those errors. It also checks for invalid checksum and links in records. DSRepair fixes any errors, then checks again for invalid partitions and partition roots. During these operations, it creates a temporary database file set with the extension .TMP. At the end of the repair operations this temporary database file set becomes the permanent database file set, unless you choose not to accept the repairs made.
2. *The Directory tree structure.* DSRepair checks the Directory tree structure to ensure that all records are linked to the root object and that all properties are linked to the respective entry records.
3. *The schema.* DSRepair checks the schema for valid object class and attribute definitions. DSRepair rebuilds any invalid classes and/or attributes found in the operational schema, if the “Rebuild Operational Schema” option is set to *On*.
4. *Object level repairs.* For each replica root, DSRepair checks all objects in the partition (replica ring) for valid containment and for consistency with the schema. It deletes any illegal optional attributes. It changes any object class missing a mandatory attribute to an *Unknown* class. If it finds any illegal containment, it changes the parent class to *Unknown*. It checks all attribute syntaxes for consistency.
5. *All mounted volumes.* DSRepair checks all mounted volumes for valid volume objects and valid trustee IDs. It only checks for this if the default option, *Yes*, is set for this repair operation.
6. *All mail directories.* DSRepair checks all mail directories for valid IDs. It deletes any invalid IDs. DSRepair only checks for them if the default option *Yes* is set for this repair operation.
7. *Any illegal stream syntax files.* DSRepair deletes any invalid stream syntax files. It makes this check only if the default option, *Yes*, is set for this repair operation.

After DSRepair completes the repairs and saves the repaired local database, it unlocks and opens the local database files.

Repairing Synchronized Up To Attributes

As DSRepair repairs each replica in the local database, it repairs the Synchronized Up To attribute on each partition root. The process also repairs the schema's Synchronized Up To attribute, which is an attribute of the Pseudo-Server object.

To repair Synchronized Up To attributes, DSRepair does the following:

1. Checks creation and modification time stamps on all objects and properties to find all replica numbers (regardless of replica type).
2. Saves the latest time in seconds found for each replica number.
3. For replica root objects, creates an additional list of all replica numbers found in the replica ring. This list does not include schema replicas. Since these replica numbers correspond to actual replicas in use, they are considered "active" replica numbers.
4. Deletes Synchronized Up To attributes that contain a replica number not found on any time stamps in the replica.
5. Checks the local server object's time stamp against the latest time stamp issued on the replica.
 - If the server's time stamp is later than the replica's, DSRepair sets the server's time stamp to equal the replica's latest time stamp. The DSRepair message used is "Deleting unused property: <record offset> 'Synchronized Up To' for replica: <replica number>."
 - If the replica is master replica whose replica number is not in the replica ring and its latest time stamp is ahead of the server's Synchronized Up To attribute, the replica's time stamp is set to equal the server's stamp. The DSRepair message used is "Updating property 'Synchronized Up To' for replica number: <replica number>."
6. Adds the Synchronized Up To attribute to any replica whose replica numbers were found but that do not have the attribute.
 - If the replica is the schema replica or an "inactive" master replica, DSRepair adds the Synchronized Up To attribute with a creation time stamp equal to the latest time stamp. The DSRepair message used is "Adding property: 'Synchronized Up To' for replica number: <replica number>, latest time."
 - If the replica is not the schema replica, a master replica, or inactive, DSRepair adds the Synchronized Up To attribute with a creation time of zero. The DSRepair message is "Adding property: 'Synchronized Up To' for replica number: <replica number>, time = 0."

Servers Known to This Database

This feature lists all servers known to the local Directory database. If this server contains a replica of the [Root] partition, then this list most likely contains all the servers in the tree. However, if the server does not contain a replica of the [Root] partition the list will be a subset of the servers in the Directory tree. This feature lists the *Local Status* and the *Local ID* for each server in the list. The *Local Status* field reports the state of a server as seen from this server. If the server is *UP*, then it is active. If it is *DOWN*, a communication problem has occurred recently. If the server has recently become active, polling it for status will change its state to *UP*. After a period of time, the server on which you are running DSRepair will try to contact the *DOWN* server. The contacted server's state will then change to *UP*. If servers appear that no longer belong to this tree, you must delete their server object using the client utilities PARTMGR or NWADMIN. Eventually the server object will be purged from all the servers remaining in the tree.

Upon selecting a server displayed in the list, the following server options become available.

Time Synchronization and Server Status

This operation contacts every server known to this server's local database and requests information about Novell Directory Services, time synchronization, and server status. If this server contains a replica of the [Root] partition, it polls every server in the Directory tree to collect this information. The information on each server is displayed on the screen and written to the log file in the form of a table. The information fields and explanations of the field contents are exactly the same as those in the Time Synchronization operation of the DSRepair main options menu.

Repair all Network Addresses

This operation searches three places to find all possible server objects known to the local database:

- Server object IDs from the remote server ID table
- Server object IDs from the replica table
- NCP server class objects in the database

This option searches for the server's name in the local SAP table for every server object known to the local database. If it finds an address in the SAP table, it compares this address to the server object's Network Address attribute and the address in each Replica attribute of every partition root object. If the address it finds in the SAP table differs from these, it updates the other table addresses to match the address found in the SAP table. That is, it assumes that the address from the SAP table is the most correct one. If it cannot find a SAP name-to-network-address mapping, it

does not do any other repairs. This operation, thus, repairs the server's network address in replica rings and server objects in the local database. This operation is also included in the “Unattended Full Repair” option in the DSRepair main menu. When this option completes the repairs, it takes you automatically to the log file, if the log file creation option is turned on, or to the operation results screen.

Repair Selected Server's Network Address

This operation is identical to the “Repair all Network Addresses” function, except that it checks and repairs only the selected server. This operation repairs the selected server's network address in replica rings and server objects in the local database. It checks the network address of the selected server in the local database by searching for the server's name in the local SAP table. If it finds an address in the SAP table, it compares this address to the server object's network address attribute and the address in each replica attribute of every partition root object. If the address it finds in the SAP table differs from these, then it uses the network address in the SAP table to update the network address in the other tables. If it cannot find a SAP name-to-network-address mapping, then it does not do any other repairs. After completing the repairs, it takes you automatically to the log file, if the log file creation option is turned on, or to the operation results screen.

Update Schema on All Servers

This operation verifies the operational schema on all servers known to the local database, and it updates the base schema if needed. This is the same operation as in the “Advanced Menu Option” for “Global Schema Update”, except that it checks only servers known to the local server. This includes all servers that hold replicas of partitions that are also held by the local server. This operation is faster than the “Global Schema Update” option because it does not have to walk the tree.

Update Schema on the Selected Server

This operation verifies the operational schema and updates the base schema, if needed, on the selected server. This is the same as the “Advanced Menu Option” for “Global Schema Update”, except it checks only the selected server. This operation is also faster than the “Global Schema Update” because it does not have to walk the tree, and faster than the “Update Schema on All Servers” option because it operates only on the selected server.

View Entire Server's Name

This feature allows you to verify the entire Directory Services Distinguished Name, which can be as long as 256 characters. Use this when the

full Distinguished Name is longer than that allowed by the DSRepair menu options field.

View Remote Server ID List

This option displays the remote server ID list, allowing the remote IDs to be verified and edited. This option provides a “Local ID to Remote ID List” in table form. This list contains the remote server’s name, the local ID for remote servers, and the local server’s ID on the remote servers. In a Directory tree, an object’s ID is unique on each server. The remote server ID list contains a list of the server’s object IDs as they are found on the remote server’s database. If the remote ID is incorrect, this server returns a -699 error, indicating that it cannot authenticate to the remote server. The option list gives you tools to repair the remote ID and to authenticate to the remote server so you can verify that the ID is correct.

Upon selecting a server from the list, the following remote ID repair options are given.

Verify All Remote Server IDs

This operation uses the remote server ID cache table on the selected server to locate servers known to it. It then contacts each server in the list to verify that its ID on that server is correct in the table. This operation checks all remote server IDs in the list and repairs or deletes any that are incorrect. This action could be slow on networks that must contact many remote servers. This operation is included in the Unattended Full Repair option in the main DSRepair menu.

Verify Selected Remote Server ID

This operation is identical to the above “Verify All Remote Server IDs” option, except the action involves only the selected server in the remote server ID table.

Delete the Selected Remote Server ID

This operation removes the selected server’s ID pair from the remote server ID list. Perform this operation only if you are certain that the entry is incorrect and DSRepair does not fix it.

Replica and Partition Operations

This option displays a list of all partitions that have a replica stored on the local server’s Directory Services database. Each partition is shown in table form with the replica type (master, secondary or read-only) and replica state (*On* or *Off*) as it is stored on this server. After you select a partition to access, this option displays a list of partition and replica operations you can choose from. These replica and partition operations allow you to

repair replicas and perform diagnostic synchronization to reveal any problems with servers involved in partition operations.

View Replica Ring

This option displays in a table all the servers that contain replicas of the selected partition. This set of servers is called the replica ring. The replica ring list shows the replica type and replica state information for each server in the ring. When you select a server in the replica ring, this option displays a list of six replica ring operations.

Synchronize the Replicas on All Servers. This operation checks the synchronization status of every server that has a replica of the selected partition. If all the servers with a replica of the partition are synchronizing properly, the partition is functioning correctly. As this operation proceeds, each server in the replica ring is contacted and requested to immediately synchronize to every other server in the replica ring. Servers do not synchronize to themselves, so the status for a server's own replica is shown as "host". After the operation is completed, this option displays the results and stores them in the log file, if the file is turned on.

Synchronize the Replica on the Selected Server. This operation determines the synchronization status of the selected partition on the selected server. If the selected server can synchronize properly to every other server that contains a replica of the selected partition, the replica on that server is functioning correctly. This operation contacts the selected server and has it immediately synchronize to every other server in the replica ring. After completing the operation, this option displays the results and stores them in the log file, if the file is turned on.

Send all Objects to Every Replica in the Ring. This operation sends all objects from the selected server in the replica ring to all other servers that contain a replica of its partition. This ensures that a replica synchronizes to all other replicas of the partition. It marks every other replica in the replica ring as a new replica. It also destroys all objects in that replica and sends a new copy of the replica to the server that is to receive the new replica. Any modifications made in other replicas that have not been synchronized with the selected server will be lost. You cannot perform this operation on subordinate references. Also, you should be aware that execution of this function can create high network traffic.

Receive All Objects from the Master to This Replica. This operation copies all objects from the master replica to the replica on the selected server, which can be a secondary (read/write) or read-only replica. This ensures that the selected partition synchronizes with the master replica. The replica on the selected server is marked as a new replica. This operation also destroys all objects in this server's replica and sends a new copy of the master replica to this server. Any modifications that have been

made to this server's replica that have not been synchronized to the master replica will be lost.

Remove this Server from the Replica Ring. This operation removes the selected server from the replica ring stored on this server. If a server that is either no longer in the tree or no longer contains a replica appears in the replica ring, use the client utilities (PARTMGR or NWADMIN) to delete that server's object. Over a period of time the server object will be deleted and the replica ring will be updated accordingly. This period of time ranges from minutes to several hours. If the Directory Services tree is sufficiently damaged to prevent this operation from completing normally, you may have to manually remove the server.



Caution

Be aware that misusing this operation can cause irrevocable damage to the Directory Services tree.

View Entire Server Name. This feature allows you to view the server's entire Distinguished Name, which can be as long as 256 characters. Use this when the NDS name is longer than that allowed by the DSRepair options menu field.

Synchronize All Servers in All Replicas

This operation determines the synchronization status for every replica stored on the local server. If all the replicas on each server synchronize properly, the tree is functioning correctly. This operation contacts each server in the replica ring and has that server immediately synchronize to every other server in the replica ring. Servers do not synchronize to themselves, so the status for a server's own replica is shown as "host". This option performs the same operations as the "Replica Synchronization" option in the "Main" menu.

Repair All Replicas

This operation repairs all replicas displayed in the replica table for the selected partition. Repairing a replica consists of checking the replica ring information on each server that contains a replica, and validating the remote partition root ID, that is, the ID of the partition root on the target server. This option is identical to the "Unattended Full Repair" operation. Perform the "Repair Local Database" operation before initiating this option, if that operation has not been done within the previous 30 minutes.

Repair Selected Replica

This operation checks and repairs only the selected replica. Repairing a replica consists of checking the replica ring information on each server that contains a replica and validating the remote partition root ID. This option is identical to the previous "Repair All Replicas" option, except that the "Repair Selected Replica" operation acts on only the one selected replica rather than on all of this server's replicas. Perform the "Repair

Local Database” operation before initiating this option, if that operation has not been done within the previous 30 minutes.

Schedule Immediate Synchronization

This operation immediately synchronizes all replicas. This is useful when you are viewing the DS.NLM trace screen and would like to see the synchronization trace information without waiting for the normally scheduled synchronization process.

Send All Objects to Every Replica in the Ring

This option performs the same functions as the “Send all Objects to Every Replica in the Ring” operation in the “View Replica Ring” options menu, except that the selected server is the local server.

Receive All Objects From the Master to This Replica

This option performs the same functions as the “Receive All Objects From the Master to This Replica” operation in the “View Replica Ring” options menu, except that the selected server is the local server.

Repair Time Stamps and Declare a New Epoch

This operation provides a new point of reference to the master replica, so that all replicas of the selected partition are updated. This operation is always performed on the master replica, which does not need to be the local replica on the current server. In this operation all time stamps in the master replica are examined. If any time stamps are ahead of the current time, they are replaced with the current one that is unique and will not be reissued. After the time stamps have been made consistent in time, a new epoch is declared.

An epoch is an instant in time that is arbitrarily selected as a point of reference. It is used here to mean a new version. An epoch controls replica synchronization. When a new epoch is declared, it begins on the master replica. Other replicas cannot send updates to a replica with a new epoch, but they will receive updates from the master replica until they become fully synchronized with it. When this process completes, all replicas have the same epoch, and can synchronize with others again.

Before using this option, make sure that all servers in the replica ring are communicating properly. To do this, choose the “Synchronize the Replica on all Servers” option from the “Replica Ring Options” menu. Use this option if you notice a discrepancy between objects in a replica or in an object’s property.

Keep in mind the following things as you begin this operation:

- The master replica does not have to be on the local server, but you must have rights to the master replica to make the repairs.

-
- All time stamps are examined and repaired as required.
 - A new epoch is declared on the master replica, affecting all objects in the replica.
 - A replica receives a copy of all the objects from the master replica or from another replica that has received the new epoch.
 - As the replicas synchronize, they do not accept updates from replicas with a prior epoch.
 - The replica becomes the same epoch as the master.
 - Any modifications from a previous epoch will be lost.

Cancel Partition Operation

Use this option to cancel a partition operation in progress on the selected partition. This operation always resolves to the master replica of the partition. You might have to cancel an operation if it does not complete by itself, or because of damage to the tree, such as a missing server. However, you might not be able to cancel an operation if it has progressed too far.

Designate This Server as the New Master Replica

This operation designates the replica (secondary or read-only) of the selected partition on the local server as the master replica. This operation sets a replica on the local server as a master, and cannot operate remotely to designate another server's replica as a master. Each partition can have only one master replica, so if another master replica exists, this operation changes it to a secondary. Use this operation to designate a new master replica if the original one is lost. This could occur if the server that contained the master replica has a hardware failure and must be replaced.

Display Replica Information

This operation generates a detailed report on all the replicas found on the local server. The report lists replica ring information, remote ID's, network addresses, synchronization properties, and other detailed information not found elsewhere. This information is useful for diagnostic purposes when detailed information about the partition and replication state of a server is needed. This diagnostic information is written to the log file, if the file is active.

View Entire Replica Name

This feature allows you to view the replica's entire Distinguished Name, which can be as long as 256 characters. Use this option when the replica name is longer than what the display field allows.

Security Equivalence Synchronization

This operation allows synchronization of security equivalence attributes throughout the global tree. The operation walks the Directory tree and checks each object for an *Equivalent To Me* attribute and for the corresponding object referenced by this attribute for a *Security Equals* attribute. You must log in with rights to walk the Directory tree and read/validate *Security Equals* and *Equivalent to Me* attributes on all objects in the tree. You are given the option of logging in upon initiating this operation, unless you have already logged in using the “Log File and Login Configuration” option discussed above.

The *Equivalent To Me* attribute, used in optimizing security equivalence operations, was introduced in NetWare 4.1. This attribute is properly managed and synchronized with the *Security Equals* attribute on NW 4.1 servers, but NW 4.01 and 4.02 servers do not manage this attribute, and thus they must be synchronized manually.

Note If the logged in user does not have rights to read both attributes, this option will first report that the attributes are out of sync and then will fail if an update is requested.

Upon logging in to the server as the *Admin* user, two “Scan Equivalence” Options are given. These options control how DSRepair security equivalence synchronization will be done. These options and their defaults are as follows.

Prompt Before Adding Equivalent To Me? Yes

When set to *Yes*, DSRepair forces a prompt before adding the *Equivalent To Me* attribute. It also requires a prompt when an object’s *Security Equals* attribute contains equivalence to another object, and that other object does not have this object in its *Equivalent To Me* attribute. You must then decide to update the *Equivalent To Me* attribute on the other object, delete the *Security Equals* attribute on this object, or do nothing. When set to *No*, DSRepair assumes the *Security Equals* attribute to be correct and updates the *Equivalent To Me* attribute on the other object to contain this object.

Prompt Before Adding Security Equals? No

When set to *Yes*, DSRepair forces a prompt before adding the *Security Equals* attribute. It also requires a prompt when an object’s *Equivalent To Me* attribute contains equivalence to another object, and that other object does not have this object in its *Security Equals* attribute. You must then decide to update the *Security Equals* attribute on the other object, delete the *Equivalent To Me* attribute on this object, or do nothing. When set to *No*, DSRepair assumes the *Equivalent To Me* attribute to be correct and

updates the *Security Equals* attribute on the other object to contain this object.

This operation displays the results of the equivalence scan process and writes them to the log file, if that file is active.

Global Schema Update

This option verifies that all servers in the Directory tree contain the correct schema. If not, it updates the schema in those servers that do not contain the correct schema.

The NDS operational (base) schema for NetWare 4.1 has been extended to allow for new services. When you create a NW 4.1 tree it loads the new operational schema. Also, installing the first NW 4.1 server into an existing NDS tree loads the new operational schema into the tree, and updating NW 4.01 and 4.02 servers to NW 4.1 updates the schema automatically. Loading the new operational schema does not affect any user-defined schema. However, if a server does not have the new schema, it may not synchronize properly. This option provides functions to update the schema in the tree.

The “Global Schema Update” provides an option to update the schema on all servers in the tree or on only the root server.

Update All Server’s Schema

This operation updates the schema on all servers in the Directory tree. Use this option to update the schema on 4.0x servers in a 4.1 tree. If a 4.0x server is updated to 4.1, it automatically receives the 4.1 schema. Other 4.0x servers in the tree may not receive the updated schema information. This may result in *No Such Attribute* (-603) and *No Such Class* (-604) errors during synchronization.

Update the Root Server Only

This operation updates only the schema on the server that contains the master replica of the [Root] partition.

DSRepair displays the results of these operations and stores them in the log file, if the file is active.

View/Edit DSRepair Log File

This option allows you to view the DSRepair log file. The default location of the file is: SYS:SYSTEM\DSREPAIR.LOG. When DSRepair is loaded, the log file becomes active and the results of the operations performed by DSRepair are appended to it. Thus, the file size grows with each repair operation. The log file size is displayed in parenthesis at the end of the log file title line. You can turn the log file off, turn it on again,

change the name to write to any local DOS or NetWare Volume, or delete the file by using the “Log File Configuration” option in the “Advanced Options Menu”.

This is the same option as in the DSRepair “Main” options menu.

Create a Database Dump File

This feature allows you to copy the Novell Directory Services database files to disk in compressed format to be used for off-line diagnostics and repairs. Creating a dump file will record the state of the database, which can be useful in troubleshooting. Upon selecting this option, you are asked to enter the path name for the dump file, with the default as: SYS:SYSTEM\DSREPAIR.DIB. The dump file can only be written to a NetWare volume, not to a DOS drive. If the file already exists you are then given the options to overwrite the existing file or to enter a different file name.



Important Do not use this option as a backup method.

DSRepair Switches

The following table shows the switches used in DSRepair and their functions. You can escape the switches by using one of the following identifiers: “/”, “\”, or “-”.

Table I.17
DSRepair Switches

Switch	Description
A	Enable advanced mode. Allows you to set a subordinate reference to a master replica.
D<DIB extension>	Repair DIB with extension <DIB extension>. Defaults to NDS if the database is not specified. The NDS DIB is always closed and locked regardless of the DIB being repaired.
K1	Killer 1 switch. Unlinks from the local database all non-present objects that do not have subordinate present objects, all obituary properties, and all leaf objects with a zero creation time or with an unknown class.
K2	Killer 2 switch. Marks invalid all user-defined partition roots in the local database. Converts to external references all objects with creation and modification time stamps set to zero. Clears all flags except EF_PRESENT. Sets all object classes to -1 (not back linked).
K3	Killer 3 switch. Clears the back link status of all external references (by clearing the EF_BACKLINKED flag, setting the creation time stamp to zero, and setting the object class to -1). Sets to zero the time stamps of all attributes of an external reference.

Table I.17
DSRepair Switches (Continued)

Switch	Description
L<log file name>	Log file name. Specifies an alternate location/name for the log file. The default is SYS:SYSTEM\DSREPAIR.LOG. The path can specify any NetWare volume of DOS drive (for example, A:TEMP.LG).
M	Report OBT_INHIBIT_MOVE obituaries. This switch is used to discover if a move has completed or if a partition is busy (because OBT_INHIBIT_MOVE obituaries on a replica have not finished processing or are broken).
MR	Report and delete the OBT_INHIBIT_MOVE obituaries. This switch works like M but also deletes the OBT_INHIBIT_MOVE obituaries by marking them as not present with a time stamp that will synchronize with other replicas. Deleting valid obituaries can cause serious problems.
O	Report all obituaries. This switch is used to discover if any obituaries have not finished processing or are broken.
OR	Report and delete all obituaries. This is the same as O, but it deletes all obituaries by marking them as not present with a time stamp that will synchronize to other replicas. Deleting valid obituaries can cause serious problems.
U	Unattended mode. Runs the Main menu unattended mode operations without user intervention and unloads them when complete.
V	Ignore API version. This allows DSRepair to run with an unsupported version of NDS. Using this switch will likely result in abends.
?	Command line usage message for L and U, which do not cause potential database problems.

The following DSRepair switches are available only in DSRepair version 4.26c or later. Each of these switches creates a status file called "<log file name>.DSM" by default. This .DSM file contains status information for the DSManager tool. All of the following switches are shortcuts to DSRepair menu operations.

Switch	Description
RD	Repair local database.
RI	Repair remote server IDs.
RL	Specify an alternate log file. Unlike the L option, this switch deletes the existing file first instead of appending the new file.
RM<partition root ID>	Set this server as the master in the specified replica's replica ring.
RN	Repair network address.
RR<partition root ID>	Repair the specified partition root and check the remote IDs in the ring.

Switch	Description
RS<server I>	Remove the specified server from the specified replica's replica ring.

The following switch is available only in DSRepair version 4.26h or later:

Switch	Description
/P	Marks all Unknown objects as referenced. This allows incoming synchronization to write over the Unknown objects.