



IBM/HCL
Notes/Domino 10

**Administration
Update Workshop**

Author
Dipl.-Ing. Manfred Dillmann

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Part I.

New in Notes/Domino Version 10

1. Introduction

Welcome to the “IBM Notes Domino 10 Update Workshop” for administrators!

1.1. Objective

In this workshop the new features and enhancements of Notes/Domino Version 10 will be presented. In addition to providing background information, the new functionalities will also be implemented during the workshop and tested by the participants - as befits a workshop.

Not all new aspects of the new version 10 can be implemented in a course room environment without providing additional services.

Therefore, few new features or enhancements will be addressed in this workshop, but not implemented and tested.

1.2. Setting up the course room environment

At the beginning of the workshop a Notes/Domino environment will be installed and configured with one domain and organization.

Each participant can decide for himself, whether he wants to use his PC for

- a Domino server + Notes client (highly recommended to test all new features and enhancements of version 10 on your own server)
- or only the Notes client

installed.

This first part of the workshop (setting up the Notes Domino environment) is certainly interesting for all those participants who have never or rarely implemented a completely new Notes/Domino infrastructure.

1.3. Legal information

Author

Engineering Office Manfred Dillmann
Dipl.-Ing. Manfred Dillmann
<https://www.madicon.de>

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2. IBM Domino 10 Server

2.1. New features in NSF databases

The internal structure of the Notes database files (ODS - On Disk Structure) has been improved over the years and also for version 10 there is a new ODS.

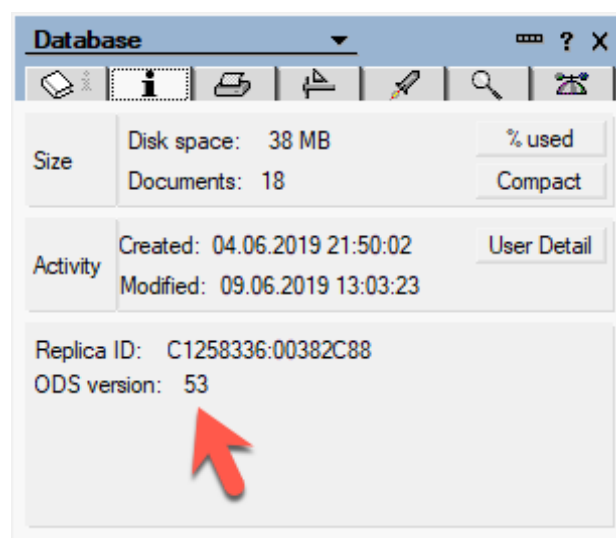


Figure 2.1.: Database Properties - ODS Version 53

The new features are described below.

2.1.1. ODS 53 with maximum database size of 256 GB

With the new ODS 53, the previously valid maximum size of 64 GB of a Notes database is lifted. A **ODS 53** Database may now be **256 GB** large.

To activate the new ODS for a Domino Server (or Notes Client), the following entry must be set in the file NOTES.INI.

Create_R10_Databases=1

Newly created databases will then immediately have the new ODS 53. Existing databases (including templates if necessary) can be converted. The Domino Server can use the console command

load compact -c -*

can be used.

The parameter “-c” provides a Copy-Style-Compact - a new database is created (the new ODS structure can be used), the contents are copied and the source database is deleted.

The parameter “-*” (minus sign + star) ensures that also the templates (.NTF files) and the server mailboxes (mail.box, mail1.box, mail2.box etc.) are converted to the new ODS structure.

For the Notes Client the NOTES.INI entry

NSF_UpdateODS=1

must be used for the conversion of existing databases.

Hint

Since a Domino Server itself has several databases permanently open in read or write mode during operation, some system databases will certainly not be converted to the new ODS structure.

Really all databases (as well as all templates and mailboxes) can be converted if the Domino Server is not running. Perform the following steps.

1. Shut down the domino server.
2. Open a command line window of the operating system.
3. Navigate to the Domino program directory.
4. Start the Compact Task of the Domino Server (on Windows OS: *ncompact.exe -c -**).
5. Depending on the size and number of databases to be converted, the conversion to the new ODS may take some time. Restart the Domino Server after the conversion has been completed.

With this procedure it should be possible to convert all databases, templates and mailboxes to the new ODS version.

2.1.2. ODS 53 - increased maximum size for folders

The maximum database size for ODS 53 is now 256 GB. In addition, the maximum size for a folder has been significantly increased. Although the exact maximum size is difficult to quantify, the user can expect at least a 10 times increase in the capacity of a folder.

To take advantage of the increased database and folder size capacity, upgrade databases to Domino 10 - ODS 53. After upgrading a database on a Domino Server version 10 to ODS 53:

- A Notes 10 Client can open the database on the Domino 10 Server and access all content, regardless of database or folder size. A Notes 9 Client can only open the database without problems if the database and folder sizes are within the size limits of version 9.
- Up to 64 GB of database data can be replicated to a target database on any version of a Domino Server or Notes Client. To replicate more than 64 GB of data, the target database must be located on a Domino 10 Server or Notes 10 Client and updated to ODS 53.

- Folders in the database that are within the size limit of the previous release can be replicated to a target database on any version of a Domino server or Notes client. If a folder in the database exceeds the size limit for the previous version, its entire contents can only replicate with a database that has been updated to ODS 53 and stored on a Domino 10 Server or Notes 10 Client.

2.1.3. ODS 52 as standard for new databases

If you create a new database on a Domino Server or Notes Client version 10.x, it will automatically have the ODS 52. The additional entry in the NOTES.INI file required for version 9.x is no longer necessary.

This means that new features introduced in version 9.x such as

- DAOS
- compression of user data
- compression of the database design

can be used directly with any newly created database.

If the ODS 43 (Notes Domino version 6, default for version 9) is desired, this can be done with the **new** entry available in Domino Version 10

Create_R6_Databases=1

in the NOTES.INI file.

2.1.4. Dynamic indexing of heavily used Views

Domino now dynamically assigns views with frequently updated content to dedicated indexing threads.

This feature keeps views up to date and enables faster opening. There is no need to manually index and manage views for active, heavily used views.

When this feature is enabled, the Domino Server regularly monitors the level of update activity for all views in all open databases and assigns an update activity rating to them.

The ten highest scoring views are referred to as “high usage views” and are kept up to date by a series of dedicated view threads. The definition of “high usage views” may change as the update patterns of the views change.

The advantages of this feature are most noticeable in views with frequent document updates, but relatively rare view updates. Performance tests have shown a two- to three-fold improvement in response time.

End users notice this improvement when opening a view in the Notes Client by a noticeably shorter time to display the first documents.

Hint

This function is **deactivated** by default. To enable it, change the following parameter in the NOTES.INI file on the Domino Server.

NIF_VIEW_USAGE_ENABLED=1

Restart the Domino Server (command *restart server* in the Domino Console).

As soon as the option is active and the server has updated some views, you can use the console command *show task* to get information about the entry **View Indexer**.

```
[2060:0008-2748] Database Server Process Monitor
[2060:0008-2748] View Indexer madicon-easyMail-de.nsf "LOGsCategory" 10 sec. high usage read
[2060:0008-2748] View Indexer madicon-easyMail-de.nsf "LOGsCompany" 10 sec. high usage read
[2060:0008-2748] Cluster Replicator Idle
```

Figure 2.2.: Dynamic indexing - *show task*

The corresponding characteristic values can also be called up from the statistical values. Detailed information is provided by the console command ***show stat database.viewusage.****.

```
sh stat database.viewusage.*
[2060:0008-2748] Database.ViewUsage.Calls = 68
[2060:0008-2748] Database.ViewUsage.HighUsageCurrent = 2
[2060:0008-2748] Database.ViewUsage.HighUsageDisables = 0
[2060:0008-2748] Database.ViewUsage.HighUsageEnables = 2
[2060:0008-2748] Database.ViewUsage.HighUsageUpdateChecks = 62
[2060:0008-2748] Database.ViewUsage.HighUsageUpdates = 2
[2060:0008-2748] Database.ViewUsage.Skipped = 0
[2060:0008-2748] 7 statistics found
```

Figure 2.3.: Dynamic indexing - result of the command: *show stat database.viewusage.**

Statistical value	Meaning
<i>Database.ViewUsage.Calls</i>	Number of calls to update code that added to the cumulative update activity score for views.
<i>Database.ViewUsage.HighUsageDisables</i>	Number of times that high usage views were disabled (no longer high usage).
<i>Database.ViewUsage.HighUsageEnables</i>	Number of times that high usage views were enabled (made high usage).
<i>Database.ViewUsage.HighUsageUpdateChecks</i>	Number of times dedicated high usage view threads checked whether views were stale.
<i>Database.ViewUsage.HighUsageUpdates</i>	Number of times dedicated high usage view threads updated views.
<i>Database.ViewUsage.Skipped</i>	Number of times that updating the update activity scores for views was skipped to avoid semaphore contention.
<i>Database.ViewUsage.HighUsageCurrent</i>	Current number of high usage views.
<i>Update.View.<db-file-name>.<view-name>.Score</i>	Current score for a view.
<i>Update.View.<db-file-name>.<view-name>.<statistic></i> where <statistic> is one of the following: TotalInserts, TotalRemoves, TotalNew, TotalReplace, TotalNonReplace, TotalNodataReplace	Count of specified NIF primitive update operations done by dedicating indexing for a specific high usage view. Use to verify specific actions resulting from dedicating view indexing of a view.

Table 2.1.: Meaning of the output values of the console command: *show stat database.viewusage.**

2.1.5. More reliable full text index

Full text indexing is described in this release as “more reliable”. The following techniques are used for this purpose:

- To ensure that full-text searches on both the client and the server find current document changes, documents with outstanding indexed changes are indexed before searching.
Up to **200 documents** can be indexed before search; more documents are queued for immediate indexing.
- If a damaged index is found during indexing or searching (applies to both the server and the client), the index is queued to be rebuilt.

Hint

If this functionality is not desired for the full text index, it can be disabled by the NOTES.INI entry **FT_SUPPRESS_AUTO_UPDATING** (applies to the Domino Server as well as to the Notes Client).

2.1.6. Logging of document deletions

Deletions of documents in Notes databases can be logged with version 10 for selectable databases. This makes it possible to determine afterwards who deleted which documents and when.

Requirement

Transaction Logging must be **enabled** for the desired databases. You can enable transaction logging for the Domino Server in the server document and for individual databases in the database properties.

Activation

With a new parameter of the console command *compact* the logging of deletions for one or more databases can be enabled.

load compact "database path" -dl on "comma separated list of items"

- "database path" is a single database or folder containing multiple databases. All information must be given relative to the Domino Data directory.
- "comma separated list of items" is a list of field names separated by a comma. The contents of these fields are contained in the logs and help to assign or identify deleted documents.

Allowed field types are: **Text**, **Text_List**, **RFC822_Text**, or **Time**.

```
load compact mail/mdillman.nsf -dl on "Subject, DeliveredDate"
[0460:0004-19C8] 26.05.2019 14:17:35 Informational, Deletion Logging has been enabled for database mail\mdillman.nsf.
[0460:0002-1F40] 26.05.2019 14:17:37 Database compactor process shutdown
```

Figure 2.4.: Document Deletions - Activation

```
load compact mail/mdillman.nsf -dl off
[17B4:0004-1DAC] 26.05.2019 14:19:43 Informational, Deletion Logging has been disabled for database mail\mdillman.nsf.
[17B4:0002-1F4C] 26.05.2019 14:19:45 Database compactor process shutdown
```

Figure 2.5.: Document Deletions - Deactivation

Results

When document deletions (or document restores in case of a “softdeletion”) occur, the delete information is stored in the file

delete.log in the folder ***IBM_TECHNICAL_SUPPORT***

stored below the data directory.

When a Domino Server is restarted, a new log file is created. Old log files are renamed according to the scheme *delete_<servername>_yyyy_mm_dd@hh_mm_ss.log*.

Example: ***delete_S01_2019_05_26@08_23_34.log***

Deleting a document adds the following information to the current LOG file - the data is written in the form of a CSV file.

Hint

If a document deletion is performed by replication with another Domino Server, this is also logged. In this case the “cause” of the deletion is the Domino Server in whose replica the document was previously deleted by e.g. a user.

The following data is stored:

Data of the log entry	Clues
Date and time of document deletion.	
Database in which the document was deleted.	Specification relative to the data directory.
Replica ID of the database	Useful if replicas on different servers do not have the same file name.
Process that executed the deletion.	e.g. server, replica, dbmt
Name of the Domino Server or the person who deleted the document.	
Document deletion type	<p>The following types are distinguished:</p> <ul style="list-style-type: none"> ▪ SOFT (Document has been placed in recycle bin) ▪ HARD (Document was e.g. removed from recycle bin) ▪ RESTORE (Document was restored after a soft deletion)
Class of the deleted document	<p>One of the following HEX values:</p> <ul style="list-style-type: none"> ▪ 0001 (Document - NOTE_CLASS_DATA) ▪ 0002 ("About the Database" document - NOTES_CLASS_INFO) ▪ 0004 (Form - NOTES_CLASS_FORM)
DocumentUniqueID	Unique document ID, even across replicas.
Fields	<p>Up to 4 fields from the deleted document for easy identification. These fields are defined when the deletion log is activated.</p> <p>Each entry for a field has 3 components:</p> <ul style="list-style-type: none"> ▪ the field name ▪ The length of the field contents ▪ the first 400 characters of the field contents

Table 2.2.: Document deletions - contents of the LOG file

2.2. New in Domino Cluster

The cluster functions of the Domino Server have been extended with some useful features and existing functions have been improved with version 10.

The new and improved features are described below.

2.2.1. Symmetric Cluster

“Symmetric Cluster” is a function that ensures that Notes databases are available on all servers in a cluster. Missing or corrupted databases are repaired or replaced with functionally flawless replicas of the databases from another Domino Server in the cluster.

Requirements for a symmetrical cluster

- Each Domino Server in the cluster must be version 10 and use a Domino directory based on version 10 (or higher) of the *pubnames.ntf*. Servers in the cluster that do not meet these requirements will be ignored.
- Cluster servers must all have sufficient capacity. The Database Repair Service forces folder symmetry across all servers in the cluster.

All Domino servers in the cluster should have approximately the same capacity in terms of disk space and DAOS storage - at least for the pairs of folders to be kept symmetrical.

- If you use Domino Attachment and Object Services (DAOS), DAOS must be enabled on all cluster members with the same minimum object size configuration.

In addition, the DAOS catalog (*daoscat.nsf*) must be synchronized across all cluster servers.

- Each monitored database replica must be in the same folder path on all servers and have the same file name. If case sensitive file names are used on UNIX systems, the file name of each monitored database must be case-sensitive.

For example, “test.nsf” on Server A and “Test.nsf” on Server B is an unsupported configuration. Use the console command *repair list missing* to determine if monitored files have an unsupported configuration.

- The following types of databases are **not** supported:
 - Databases with a smaller version than ODS 52. Update all databases monitored in a symmetric cluster to at least ODS 52.
 - Databases that are locally encrypted with the server ID. Note that encrypted DAOS objects (.nlo files) referenced by databases are supported without restrictions.
 - Only temporarily available or individual databases (no replicas). Exclude these databases from the monitored folders - only “real” replicas should be considered. Use the Cluster Database Directory (*clbdbdir.nsf*) to help solve this problem.
 - Databases in which cluster replication is not activated. All monitored databases must be activated for cluster replication.

- Databases that are accessed via directory or database links.

Hint

If the NOTES.INI entry ***NIFNSFEnable=1*** is used, databases with an external view index can also be repaired.

The repair takes longer for NIFNSF-enabled databases because the .ndx files are regenerated during the repair.

Functionality of a Symmetrical Sluster

▪ Detection and repair of missing databases

The server task - ***AutoRepair*** - must run on every server in a symmetric cluster. This task checks certain folders on the server for missing databases. ***AutoRepair*** asks the cluster database directory (clbdir.nsf) to determine which databases the monitored folders should contain.

If ***AutoRepair*** detects and repairs missing databases, all DAOS .nlo files referenced by these databases will also be repaired.

AutoRepair is controlled by the new “Cluster configuration documents” available in version 10, possible settings:

- Determines whether ***AutoRepair*** merely enters missing databases in the Domino Log (log.nsf) or whether missing databases are replaced.
- Specify the folders to be monitored. These must be located below the data directory of the server.
- Create a schedule to search ***AutoRepair*** for missing databases.

▪ Detection and repair of corrupted databases

To detect and repair corrupted databases, select “Fix damaged files” in a cluster configuration document.

If this option is selected and a Domino Server detects a corrupted database in a monitored folder, the Fixup-task is run first to repair the database.

If Fixup is unsuccessful, the server isolates the corrupted database by setting its file extension to:

.pd_bad_<timedate>

The repair service immediately restores a “good version” of the database from a cluster member. The server task ***RepairCleanup*** deletes the isolated versions of databases after the number of days specified in the cluster configuration document.

▪ Tasks of the repair service

To replace a missing or defective database, the repair service performs the following steps:

- Copies a “snapshot” from another cluster member who has an error-free replica of the database.
- Updates the folder references.
- Adjusts the replication history for other cluster members to minimize the load of the first replication.
- Creates a full text index if a full text index was activated in the copied database.
- Analyzes the database to ensure that all DAOS objects (.nlo files) are available on this server. Missing .nlo files will be recreated.

Set-up of a symmetrical cluster

To set up a symmetrical cluster, perform the following steps on all Domino servers involved.

1. Add the entry ***D10_ENABLE_REPAIR=1*** to the file NOTES.INI.
2. Make sure that both tasks ***AutoRepair*** and ***RepairCleanup*** are loaded when the server is started (Entry in NOTES.INI or via a program document).

Hint

As soon as the task ***AutoRepair*** is active, it can be controlled by the console command ***Repair***. More details about the syntax can be found in the command ***help*** at the Domino Console.

3. Create a cluster configuration document in the Domino Directory.

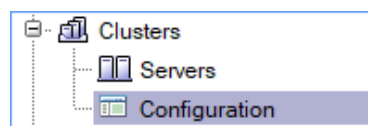


Figure 2.6.: Symmetric Cluster - Domino Directory - Cluster Configuration

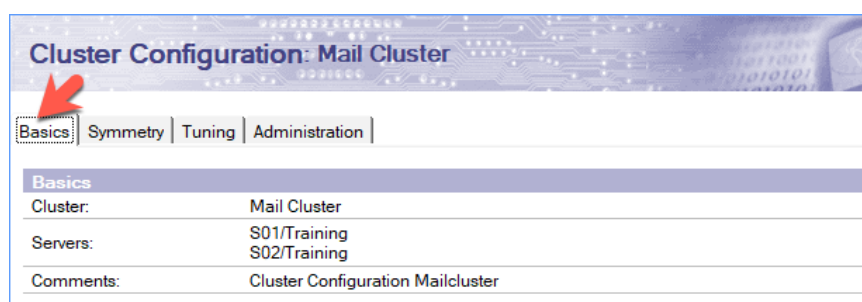


Figure 2.7.: Symmetric Cluster - Cluster Configuration - Register “Basics”

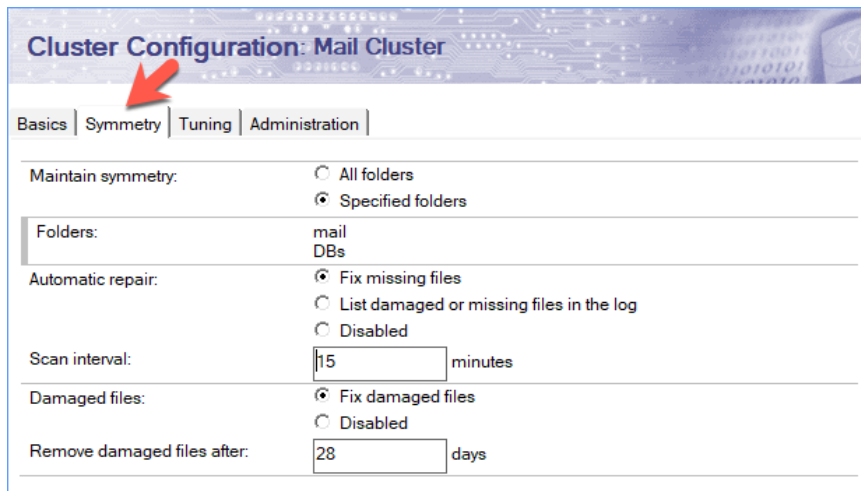


Figure 2.8.: Symmetric Cluster - Cluster Configuration - Register "Symmetry"

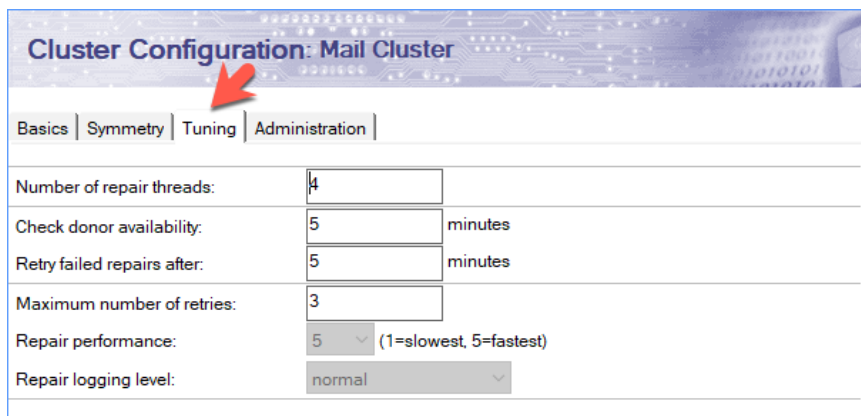


Figure 2.9.: Symmetric Cluster - Cluster Configuration - Register "Tuning"

Depending on the selected configuration, the Domino Servers will now be kept synchronized with respect to all or selected folders (below the Domino Data directory) and/or databases detected as defective will be repaired.

Result after a manual deletion of a database at the Domino Console:

```
[11FC:0002-0DA8] Reparaturanforderung für DBs\D1.nsf in der Warteschlange
[11FC:0002-0DA8] REPARATUR: 1 Datei(en) zur Reparatur in der Warteschlange
REPAIR: 04.06.2019 22:14:48 Job-00001.1 *Kopieren* - DBs\D1.nsf von CN=S01/O=Training
[0348:0020-1338] REPAIR: 04.06.2019 22:14:48 Job-00001.2 *Kopieren abgeschlossen* - DBs\D1.nsf von CN=S01/O=Training
[0348:0020-1338] REPAIR: 04.06.2019 22:14:48 Job-00001.3 *Post Process* - Repaired - File DBs\D1.nsf CN=S01/O=Training!DBs\D1.nsf
[C:\IBM\Domino\data\DBs\R0741350.TMP]
[0348:0020-1338] Clearing DBIID 908ED566 for DB C:\IBM\Domino\data\DBs\R0741350.TMP
[0348:0020-1338] REPAIR: 04.06.2019 22:14:49 Job-00001.4 *Repariert* - DBs\D1.nsf Erfolgreich repariert
```

Figure 2.10.: Symmetric Cluster - Recovery of a deleted Database

2.2.2. Keep database replicas synchronous

Occasionally, database replicas are no longer synchronous. The contents of the documents are no longer fully synchronized or documents are missing.

In the past, deleting the replication history could force a full comparison at the next replication. With large databases, however, complete replication can take some time and delay the replication of new updates (new documents, document changes or deletions).

By a new parameter of the console command **replicate** a full comparison between replicas can now be carried out alternatively - new updates on document level are displayed without delay.

New parameter **-F** of the console command **replicate**:

```
replicate <server> <database> -F
```

Example:

```
replicate S02/Training DBs/d1.nsf -F
[1D80:0002-1F74] 05.06.2019 09:05:20 Database Replicator started
[1D80:0002-1F74] 05.06.2019 09:05:20 Replicator is set to Ignore Database Quotas
[1D80:0002-1F74] 05.06.2019 09:05:20 Starting replication with server S02/Training
[1D80:0002-1F74] 05.06.2019 09:05:20 Pulling DBs\d1.nsf from S02/Training DBs\D1.nsf
[1D80:0002-1F74] 05.06.2019 09:05:21 Pushing DBs\d1.nsf to S02/Training DBs\D1.nsf
[1D80:0002-1F74] 05.06.2019 09:05:21 Finished replication with server S02/Training
[1D80:0002-1F74] 05.06.2019 09:05:21 Database Replicator shutdown
```

Figure 2.11.: Keep databases synchronous - Parameter: **-F**

Additionally the parameter **-L** can be used:

```
replicate <server> <database> -L
```

Example:

```
replicate S02/Training DBs/d1.nsf -L
[1740:0002-09F8] NoteRepl: CN=S02/O=Training!!DBs\D1.nsf to DBs/d1.nsf Since 05.06.2019 09:05:20
[1740:0002-09F8] NoteRepl: DBs/d1.nsf to CN=S02/O=Training!!DBs\D1.nsf Since 05.06.2019 09:05:20
[1740:0002-09F8] 05.06.2019 09:09:21 Database Replicator started
[1740:0002-09F8] 05.06.2019 09:09:21 Replicator is set to Ignore Database Quotas
[1740:0002-09F8] 05.06.2019 09:09:21 Starting replication with server S02/Training
[1740:0002-09F8] 05.06.2019 09:09:21 Pulling DBs\d1.nsf from S02/Training DBs\D1.nsf
[1740:0002-09F8] 05.06.2019 09:09:21 Pushing DBs\d1.nsf to S02/Training DBs\D1.nsf
[1740:0002-09F8] 05.06.2019 09:09:21 Finished replication with server S02/Training
[1740:0002-09F8] 05.06.2019 09:09:21 Database Replicator shutdown
```

Figure 2.12.: Keep databases synchronous - Parameter: **-L**

The parameter **-L** lists details to the documents at the Domino console, which would be replicated if the parameter **-F** were used - a “real” replication does not take place if the parameter **-L** is used.

2.2.3. Detecting Delayed Replication in a Cluster

If replication is overdue for a database on a server in a cluster, corresponding entries are created in the server log (log.nsf).

Hint

Entries in the server log (log.nsf) are created from a delay duration of **at least 4 hours**.

Example entry in log.nsf:

```
ReplCurrency Source="discussion.nsf",
Dest=CN=Server2/O=Renovations (Q:3) discussion.nsf,
UpdateToRepl2="07/25/2018 03:12:04 AM",
LastRepl="07/24/2018 08:03:28 PM",
TimeDiff= 300 min,
TimeDiff2=728 min
```

Output	Explanation
<i>ReplCurrency</i>	Indicates a replication delay of at least four hours.
<i>Source</i>	The database on the current server that is overdue for replication.
<i>Dest</i>	The target server.
<i>Q:n</i>	SCR queue (out of 4) used to the destination replica for this database. If there are many databases for the same destination queue to the same destination server, a problematic database may be slowing replication for that queue.
<i>UpdateToRep</i>	The time that the database was last changed on the destination server.
<i>LastRepl</i>	The time that the database was last replicated on the destination server.
<i>TimeDiff</i>	The time that the database was last replicated on the destination server.
<i>TimeDiff2</i>	The number of minutes since the database on the current server last replicated to the target server. If greater than 5000, the text Warning="5000+ mins on replication is shown.

Table 2.3.: Delayed replication in a cluster - output values of a *ReplCurrency* log entry

A repeated ***ReplCurrency*** entry for a particular database may indicate database corruption or a replication problem. In this case, perform the following steps:

- Check the replication history to make sure the warning is valid.
- Force manual replication to determine if there are problems with replication or database corruption.

Hint

It is possible that a **ReplCurrency** log entry is created for a database when a new replica is being created during a scan. Once the first full replication is complete, no more log entries are generated.

In addition, various statistical values also provide information about possible delays in replication in the cluster.

The console command

```
show stat replica.cluster.currency.*
```

shows corresponding values at the console.

```
show stat replica.cluster.currency.*
[0A34:0008-1C90] Replica.Cluster.Currency.S02/Training.Outside8Hours = 0
[0A34:0008-1C90] Replica.Cluster.Currency.S02/Training.Uninitialized = 3
[0A34:0008-1C90] Replica.Cluster.Currency.S02/Training.Within15Min = 0
[0A34:0008-1C90] Replica.Cluster.Currency.S02/Training.Within1Hour = 0
[0A34:0008-1C90] Replica.Cluster.Currency.S02/Training.Within1Min = 18
[0A34:0008-1C90] Replica.Cluster.Currency.S02/Training.Within4Hours = 0
[0A34:0008-1C90] Replica.Cluster.Currency.S02/Training.Within5Min = 0
[0A34:0008-1C90] Replica.Cluster.Currency.S02/Training.Within8Hours = 0
[0A34:0008-1C90] 8 statistics found
```

Figure 2.13.: Detect delayed replication in cluster - output of console command `show stat replica.cluster.currency.*`

2.2.4. Improved “Streaming Cluster” Replication during server restart

SCR (streaming cluster replication) is a fast and efficient replication method that allows Domino servers to replicate within clusters.

SCR is a push replication method that captures changes in databases on the local server and pushes them to other replicas within the cluster. The following improvements are new in version 10.

Restarting a Cluster Server

Every minute SCR stores its current state in the file **scrstate.dat** in the data directory.

After a shutdown and subsequent restart, the Domino Server can read its latest state from the file **scrstate.dat** and use the last known SCR state after the restart.

Before version 10 a Domino Server had to completely reinitialize the SCR function after a restart, which could lead to a noticeable delay of the SCR.

```
[1328:0002-00C0] 05.06.2019 12:01:15 RestoreSCRState: Starting SCR restore at 05.06.2019 12:01:14
[1328:0002-00C0] 05.06.2019 12:01:15 RestoreSCRState: Finished SCR restore at 05.06.2019 12:01:14
[1328:0002-00C0] 05.06.2019 12:01:15 RestoreSCRState: Input Lines = 20, Destinations Restored = 19
```

Figure 2.14.: SCR - Messages when restarting a cluster server

The number of **Inputlines** corresponds to the number of entries in the file **scrstate.dat** and the number at **Destination Restored** corresponds to the entries transferred back to the SCR queue.

Server restarts of Cluster Members

When a Domino Server detects that a cluster member has been shut down, the SCR-specific information remains in the SCR queue for 20 minutes. If the restart occurs within this time, replication can restart with the last known SCR state.

Before version 10, the SCR had to be completely reinitialized during a restart.

```
[1840:0012-1820] 05.06.2019 12:01:05 ClientSCRDestHandler: Starting wait for server CN=S01/O=Training to restart at 05.06.2019 12:01:05  
[1840:0012-1820] 05.06.2019 12:01:05 ClientSCRDestHandler: Connection re-established to server CN=S01/O=Training at 05.06.2019 12:01:05
```

Figure 2.15.: SCR - Messages when another server restarts in the cluster

After the remote cluster server is restarted and the SCR connection is restored, this is logged by the above messages on the Domino Console.

2.3. Mailrouting

2.3.1. Automatic processing of Deadmails

Deadmails occur when the router service cannot deliver messages to the intended recipient or NDRs (Non Delivery Reports) cannot be delivered to the sender.

Prior to Domino version 10, administrators had to re-send or delete the deadmails themselves.

With Domino version 10 it can be configured that the Domino server automatically makes further delivery attempts and if this is not successful, deadmails can be deleted from one of the mailboxes (mail.box, mail1.box etc.) after a desired number of delivery attempts.

To enable automatic processing of Deadmails, perform the following steps.

1. Open an existing configuration document or create a new one.
2. Change to the register "Router/SMTP" ⇒ "Advanced" ⇒ "Controls".
3. Activate the option "Automatically process dead mail" in the "Undeliverable Mail" area.

Figure 2.16.: Automatic processing of Deadmails - Options

You can set the following parameters:

- **Dead mail delivery attempts allowed**

How often should a delivery attempt of Deadmail be made? The default is 12, the maximum allowed is 1,000. If a 0 is entered, no further delivery attempt is made and the Deadmail is deleted. The entered value "survives" Router or Server restart.

- **Time between dead mail delivery attempts**

The time in minutes between each delivery attempt. The default is 360 minutes (6 hours), the minimum is 15 minutes and the maximum is 1,440 minutes (24 hours).

- **Internal Internet domains**

If the Domino Server is only responsible for mails from a single Internet domain, this field remains empty. If the routing is for several domains, enter them here, separated by a comma. The Domino Server will try again to send an original message if the error report (NDR) comes from one of these internal domains.