

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.

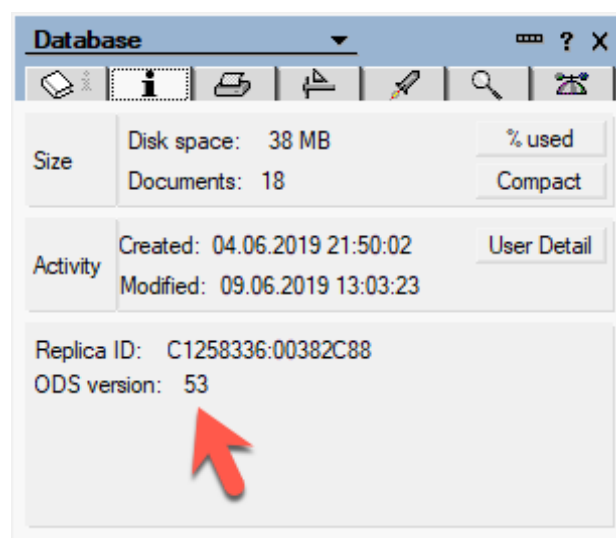


Figure 2.1.: Database Properties - ODS Version 53

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.

- 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.

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).

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.

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.

▪ 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.

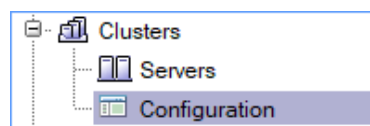


Figure 2.6.: Symmetric Cluster - Domino Directory - Cluster Configuration

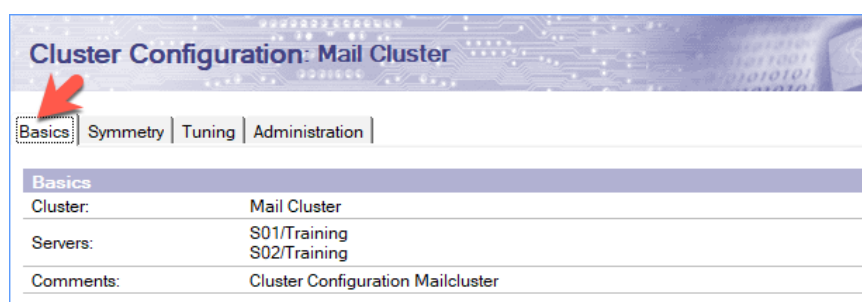


Figure 2.7.: Symmetric Cluster - Cluster Configuration - Register “Basics”

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.

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.

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.

2.4. Security

2.4.1. New “SSL Cipher” configuration (v10.0.1)

For a long time IBM had not updated the SSL cipher settings in the server document and so administrators had to manually control the desired ciphers in Domino version 9 via the entry **SSL-CipherSpec** in NOTES.INI.

Since Domino version 10.0.1 the settings in the server document (“Ports” ⇒ “Internet-Ports...”) have been updated.

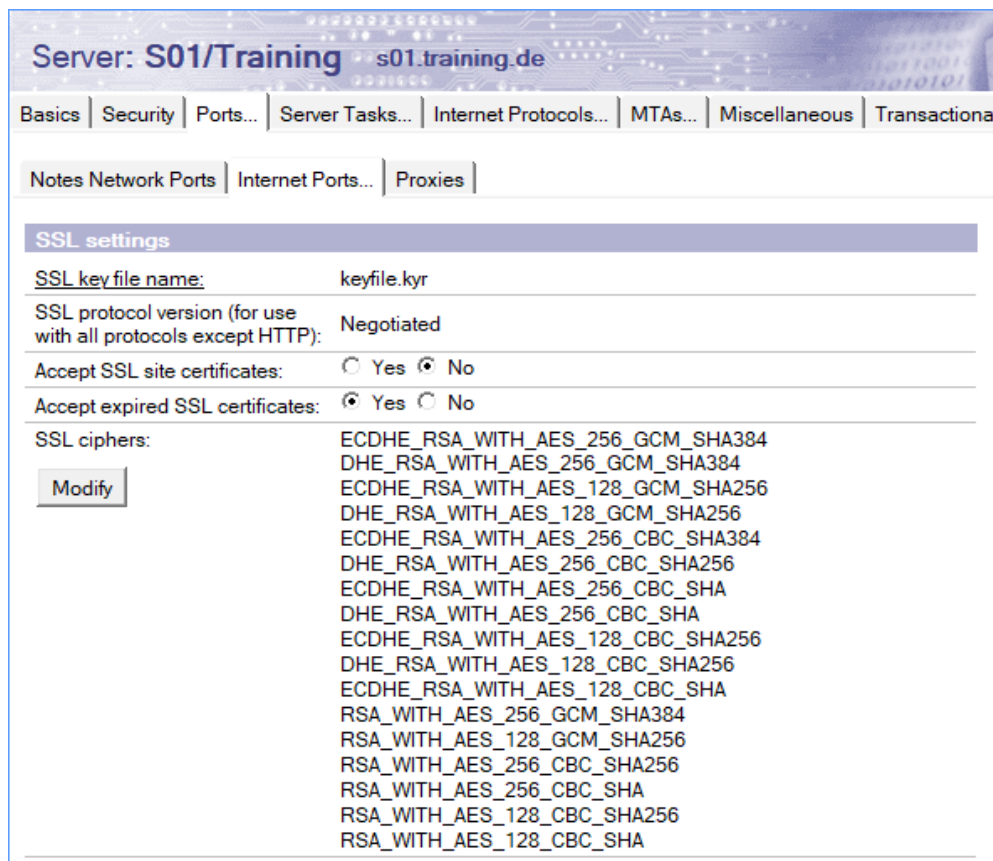


Figure 2.17.: Security - cipher setting in server document

Hint

The following points should be considered when upgrading to Domino version 10.0.1:

- The Cipher settings should be checked in the server document as well as in the Internet Site Documents (if used).
- If you have used the NOTES.INI parameter **SSLCipherSpec** on a Domino 9.0.1 server, these settings will be applied when you upgrade to Domino 10.0.1. After that, the parameter **SSLCipherSpec** is ignored.
- The Cipher **RSA_WITH_3DES_EDE_CBC_SHA** is classified as weak with Domino 10. This was not yet the case with Domino 9.0.1.

With Domino version 10 you can enable the automatic restart of the synchronization if the passwords are no longer synchronized. You can also use console commands or the Domino Administrator to monitor and manage ID synchronization.

Restart Synchronization - Activation

The following entry in the NOTES.INI file can be used to replace the Notes ID file stored in the ID Vault with the current Notes ID file of the user in case of different passwords.

Enable_Autorecovery_FromBadPassword=1

The exchange of the Notes ID only takes place if the synchronization has not worked for more than **7 days**.

Restarting the Synchronization - How it works

1. As soon as the synchronization fails due to a different password, this is recorded in the ID Vault in the corresponding user document (e.g. in the field ***FirstBadPassword***).
2. After more than 7 days have passed without successful synchronization, the corresponding user document is renamed in the ID Vault so that the title begins with a tilde (~). Such documents are called "Archive Documents".
3. The next time a synchronization attempt is made, the user document is no longer found in the ID vault due to the renaming and the Notes ID is uploaded again. After that the synchronization should work fine again.

Restarting the Synchronization - Administration

The console command ***load qvault*** and a new option in the Domino Administrator allow different options to be used to manage the ID Vault.

First the following entry must be added to the file NOTES.INI:

IDV_Enable_Vault_Scan=1

Now the Console command ***load qvault*** can be used (a server restart may be required).

```
load qvault /?
[1CEC:0002-1BDC] Query Vault Tool.
[1CEC:0002-1BDC] Usage: load qvault [-x <vaultname> [-u <username> [-r | -a | -d]] | [-d]]
[1CEC:0002-1BDC] Usage: Usage: Add quotes around <vaultname> or <username> if the name contains a space
[1CEC:0002-1BDC] -x <vaultname> Scan O=VaultName
[1CEC:0002-1BDC] -x <vaultname> -u <username> Scan O=VaultName for UserName
[1CEC:0002-1BDC] -x <vaultname> -u <username> -r Revert Archived UserName in O=VaultName
[1CEC:0002-1BDC] -x <vaultname> -u <username> -a Archive UserName in O=VaultName
[1CEC:0002-1BDC] -x <vaultname> -u <username> -d Delete Archived UserName in O=VaultName
[1CEC:0002-1BDC] -x <vaultname> -d Delete All Archived Users in O=VaultName
[1CEC:0002-1BDC] e.g. load qvault -x O=Vaultname
```

Figure 2.19.: ID Vault - options of the Console command ***load qvault***

2.4.4. Whitelist content filter for HTML content in mails

The following information is only valid for handling HTML mails in iNotes and Verse - not for Notes mails.

You can activate a whitelist filter as Active Content Filter (ACF) in Domino. ACF is used to remove potentially harmful active content, such as JavaScript, Java, and ActiveX from HTML messages.

A whitelist filter removes all objects except those in the whitelist. A blacklist filter (used by default) keeps all entities except those in the blacklist.

To enable the whitelist filter, the following entry must be added to the NOTES.INI file:

DOMINO_ENABLE_WHITELIST_ACF=1

For detailed information on use and specification, see the iNotes Administrator Help.

2.5.3. Transferring Statistical Values to External Services

As of version 10, a Domino Server can be configured so that Domino statistics values can be transferred to an external monitoring service.

The service must be able to accept the statistics values via HTTP POST requests.

By default, a Domino server is configured to pass statistics to the New Relic service via the New Relic Plugin API. In this case, only a New Relic account is required and an entry must be added to the NOTES.INI file.

Alternatively, you can configure the Domino Server yourself to pass the Domino statistics values to another service (e.g. Hosted Graphite).

Publishing statistics at the New Relic Service

To use the New Relic Service, follow these steps:

1. Create an account at www.newrelic.com.
2. Log in to your account.
3. Click on the "Account Settings" option in the upper right area.
4. Copy the license key from the "License key" field to the clipboard.
5. Add the following entry to the NOTES.INI file on each Domino server that should report statistics to New Relic:

Newrelic_License_Key=<key>

<key> is the New Relic license key..

6. Wait a few minutes until an initial publication of the statistics values has taken place. In your New Relic account, click on the "PLUGINS" option.
7. To open the DominoStats plugin, click "DominoStats"..

Publishing of statistical values - individual configuration

The Domino 10 servers are basically configured for the publication of statistical values at the New Relic Service. However, statistic values can be published to all services that accept HTTP POST requests by making corresponding entries in the NOTES.INI file.

- Support for a large number of file formats, including container formats such as **.zip** or **.tar** files.
- Search ASCII files using UTF-8 encoding .
- Own selection of which file attachments are included in the full text index and definition of the maximum file size.

The Tika filters are active when the following options are selected when creating a full text index:

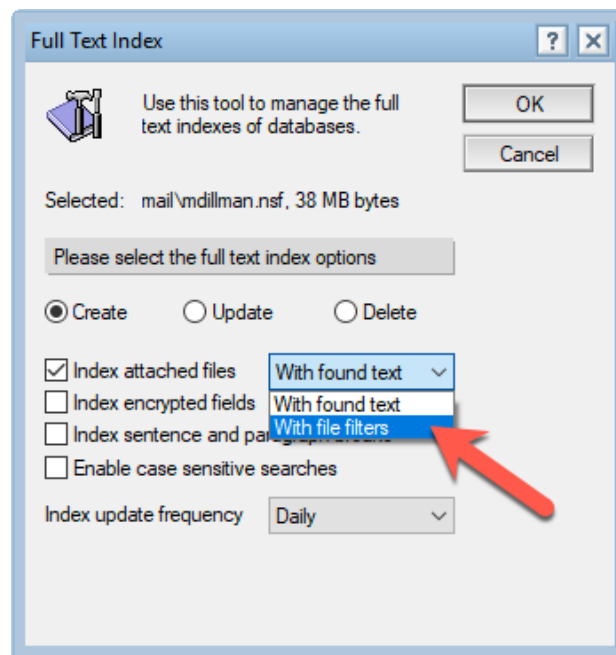


Figure 2.21.: Full text index with Tika filter - Domino Administrator dialog

Definition of own file types as well as definition of the maximum file size

Basically, all file types supported by Tika 1.18 (tika.apache.org/1.18/formats.html) are used for a full text index with the following **exceptions**:

.au, .bqy, .cca, .dbd, .dll, .exe, .gif, .gz, .img, .jar, .jpg, .mov, .mp3, .mpg, .msi, .nsf, .ntf, .p7m, .p7s, .pag, .pdb, .png, .rar, .sys, .tar, .tar, .tif, .wav, .wpl, .z, .zip

To define your own file types or the maximum size for file attachments, follow the steps below.

1. Activating the whitelist

Add the following parameter to the NOTES.INI file on the Domino Server or Notes Client:

FT_USE_MY_ATTACHMENT_WHITE_LIST=1

This setting overwrites the default full-text setting and no more file attachments are indexed until the following steps have been performed.

2.5.6. “MarvelClient Essentials” Notes Client Management Solution (v10.0.1)

The Notes Client Management solution “MarvelClient Essentials” from Panagenda is available from Notes/Domino version 10.0.1 directly with the Notes Client or Domino Server installation. Nothing has to be installed additionally.

With “MarvelClient Essentials” you get the following advantages:

- Continuously analyze and visualize the Notes workspace, client configuration, and operating system details.
- Inventory the complexity and inconsistencies of your client installations.
- Distribute files such as your Notes 10 upgrade image, run programs and manage the Windows registry.
- Provide IT, helpdesk and management staff with concrete details, facts and figures on client installations in the enterprise.
- Detect problems with upgrades - caused by e.g. insufficient resources or non-standardized installations.
- Bereiten Sie einen effizienten und später funktionierenden Upgrade-Pfad vor.
- Reduce risks and the number of Helpdesk tickets.

“MarvelClient Essentials” consists of the following components:

- The **MarvelClient Configuration Database** (panagenda\pmc_config.nsf), stored on a Domino Server. In this database, the interactions with the Notes client are defined.
- The **MarvelClient Analysis Database** (panagenda\pmc_analyze.nsf), stored on a Domino Server. This database stores the Notes client data obtained by the analysis.
- The **MarvelClient Software Component** (pmc.dll on Windows, libpmc.dylib on macOS), stored on the Notes Client. This file is automatically available at the Notes Client from version 10.0.1 and is activated by the NOTES.INI entry **EXTMGR_ADDINS**.

2.6. New Server features for controlling the Notes Client

Domino Servers from version 10 offer new functions, which can be activated by administrative defaults or settings on the Notes client.

These functions are described below.

2.6.1. Time-controlled Mail dispatch

Domino 10 Mail Servers support time-controlled delivery of mails. For example, a user can compose a mail at the beginning of the week and set it to be sent at a later time.

Planned mails are stored in one of the mailboxes (e.g. mail.box) on the home server of the sender. The router sends scheduled mails at the specified time.

The **time controlled sending** of mails is **enabled as standard** on a version 10 Domino Server. This function can be disabled by a Configuration Document in the Domino Directory.

Hint

In addition, a corresponding policy is required for the Notes Clients. Details can be found on the following pages.

To use this functionality, the mail database of the users must be updated to the version 10 Template (mail10.ntf). The time-controlled sending only applies to Notes Clients - it is not supported by **iNotes, Verses or Traveler Clients**.

Hinweis

- Domino Servers running an older version than 10 do not know any time-controlled sending and therefore route mails immediately.
- If you use the time-controlled sending of mails, make sure that your mail servers use Domino Version 10.

Activate/deactivate scheduled mail sending on the Domino Server

Perform the following steps:

1. Open or create a Configuration Document in the Domino Directory.
2. Select the register "Router/SMTP" ⇒ "Restrictions and Controls" ⇒ "Transfer Controls".