



The Iam Lotus User Group

Be a Domino Detective: Hunting the Gremlins

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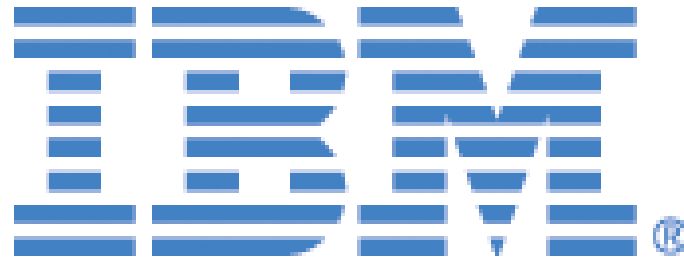
Divergent Solutions LLC

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Kim Greene - Introduction

- Owner of Kim Greene Consulting, Inc.
- Over 15 years experience with Domino and 24 years experience with IBM i
- **Services offered include:**
 - ♦ System and application performance optimization
 - ♦ Administration
 - ♦ Upgrades
 - ♦ Troubleshooting
 - ♦ Health, performance, security, etc. checks
 - ♦ Migrations
 - ♦ Custom development
 - ♦ Enterprise integration
- Blog: www.bleedyellow.com/blogs/dominodiva
- Twitter: [iSeriesDomino](#)

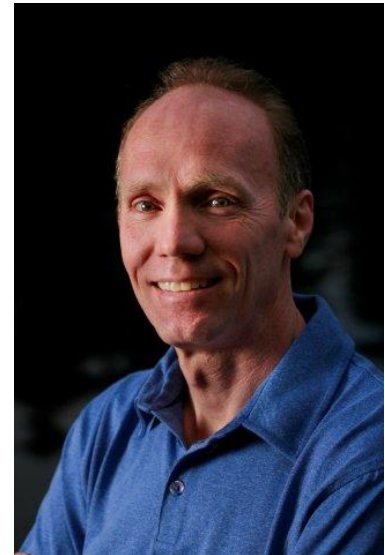


David Hablewitz - Introduction

- **Principal of Divergent Solutions LLC**
- **PMI certified Project Management Professional**
- **19 years of experience in Notes/Domino**
- **Degree in Computer Science**

- **Provide services in the areas of:**
 - ◆ **Project Management**
 - ◆ **System Administration**
 - ◆ **Assessments for performance & security**
 - ◆ **Architecture improvements**
 - ▶ **Upgrades, migrations, mergers, consolidations**
 - ◆ **Migrations to SmartCloud for Social Business**
 - ◆ **Software licensing**

- **Blog: <http://thenotesguyinseattle.com>**
- **Twitter: [@davehabz](#)**



What We'll Cover ...

- Hunting configuration gremlins
- Hunting security gremlins
- Hunting architecture gremlins
- Hunting performance gremlins
- When gremlins strike
- Checklists to avoid gremlins

HUNTING CONFIGURATION GREMLINS

Domino Directory – hidden documents

- Create a view that selects all documents
- Add first column to display the Form field
- Sort and Categorize this column
- Look for forms that don't belong

The screenshot shows the Domino Directory interface. On the left is a tree view with categories like People, Groups, Configuration, Messaging, Replication, Directory, Web, Clusters, Security, Miscellaneous, and Admin. The 'All Documents' entry under Admin is selected. On the right is a list of forms with columns for 'Form' and 'Type'. The 'Memo' and '(Not Categorized)' entries are highlighted with red boxes.

Form	Type
▶ Certifier	
▶ container	
▶ country	
▶ CrossCertificate	
▶ Database	
▶ Domain	
▶ FileIdentification	
▶ Group	
▶ Holiday	
▶ local	
▶ locality	
▶ LTPAConfig	
▶ Mailrule	
▶ Memo	
▶ organization	
▶ organizationalUnit	
▶ Person	
▶ PolicyDesktop	
▶ PolicyExt	
▶ PolicyMail	
▶ PolicyMaster	
▶ PolicySecurity	
▶ Program	
▶ remote	
▶ Server	
▶ ServerConfig	
▶ ServerParameter	
▼ (Not Categorized)	

Server Docs

- **Basics tab**

- ♦ SMTP listener task only for servers that need to receive SMTP mail or risk viruses, spam & relaying

- **Ports – Internet Ports**

- ♦ HTTP, IMAP, POP, SMTP in, SMTP out, DIIOP, (SSL too)
Turn off what you don't need. Enabled by default.

- **Server Tasks**

- ♦ Domain Catalog – usually just one per domain
 - ▶ **Don't put on Admin server**
 - ▶ **Must be reachable by users**
- ♦ Directory Catalog – default 360 mins may not be often enough
- ♦ Agent Manager
 - ▶ **Field 'Max LotusScript/Java execution time'**
 - *Have seen set to 1440*
 - That's 24 hours!!

Configuration docs

- Basics

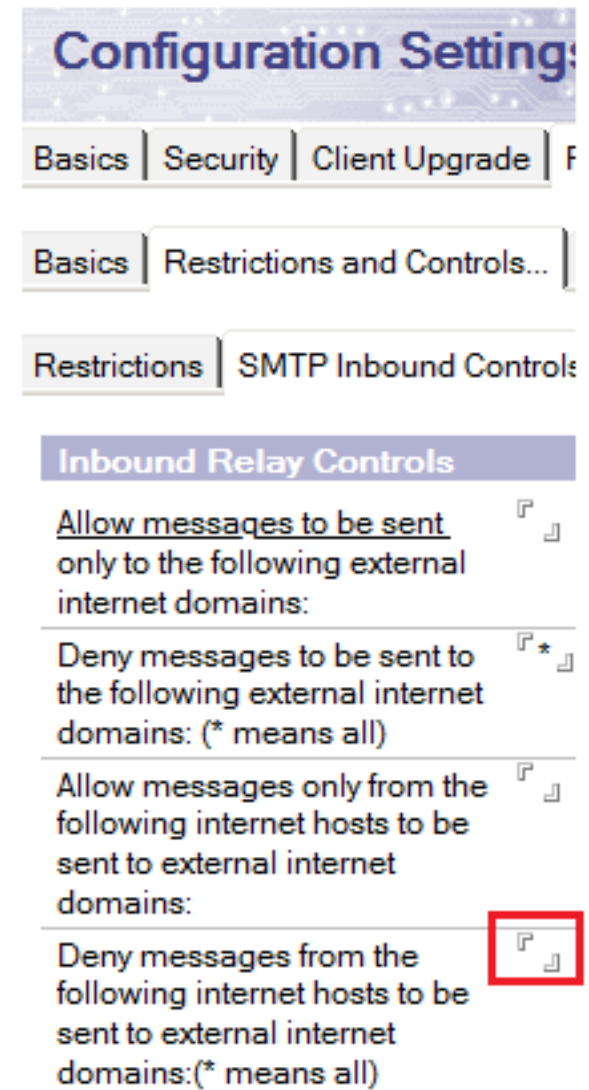
- ♦ Config doc specified for each server or set of clustered servers?
- ♦ Do you have a default doc?
 - ▶ Is it correct?

- Security

- ♦ Lockout settings consistent on all docs?

- Router/SMTP

- ♦ Restrictions and Controls – SMTP Inbound Controls
 - ▶ Don't allow relaying (put * in 2 & 4)
 - ▶ Default values = NOT good!



The screenshot shows a web interface for configuring SMTP settings. At the top, there's a header 'Configuration Settings' with a blue background. Below it are several tabs: 'Basics', 'Security', 'Client Upgrade', 'F...', 'Basics', 'Restrictions and Controls...', 'Restrictions', and 'SMTP Inbound Controls'. The 'SMTP Inbound Controls' tab is selected, showing a section titled 'Inbound Relay Controls'. This section contains four settings, each with a 'Yes' (Y) and 'No' (N) radio button:

- Allow messages to be sent only to the following external internet domains: (Y) (N)
- Deny messages to be sent to the following external internet domains: (* means all) (Y) (N*)
- Allow messages only from the following internet hosts to be sent to external internet domains: (Y) (N)
- Deny messages from the following internet hosts to be sent to external internet domains:(* means all) (Y) (N)

The 'Deny messages from the following internet hosts...' setting is highlighted with a red box.

Connection docs

- Do not keep unused Connection docs!
- Use DNS names, NOT IP addresses
- Do NOT set to replicate from 12:01 AM – 11:59 PM on heavily loaded servers

Server Connection: **Hub**

Basics | Replication/Routing | Schedule | Comments | Administration

Scheduled Connection

Schedule:	<input type="checkbox"/> Enabled ▾
Connect at times:	<input type="checkbox"/> 12:00 AM - 11:59 PM ▾ each day
Repeat interval of:	<input type="checkbox"/> 5 ▾ minutes
Days of week:	<input type="checkbox"/> Sun, Mon, Tue, Wed, Thu, Fri, Sat ▾

Connection docs

- Are names.nsf, admin4.nsf, and events4.nsf replicating?
- **Want to avoid this!**
 - ♦ admin4.nsf has not replicated (PULL) with ANY server since MM/DD/YYYY HH:MM:SS (1681 hours ago)
 - ♦ admin4.nsf has not replicated (PUSH) with ANY server since MM/DD/YYYY HH:MM:SS (1681 hours ago)
 - ♦ This is 70 days 1 hour !!!

Schedules

- When are tasks running?
 - ♦ ServerTasksAt1=Catalog,Design
 - ♦ ServerTasksAt2=Updall
 - ♦ ServerTasksAt3=Object Info –Full
 - ▶ No longer needed, for shared mail only
 - ♦ Server TasksAt5=Statlog
- Are critical tasks running?
- Are heavy agents running while maintenance tasks are running?
- What is your Backup schedule?
- Use 'show sched' to show schedule of all program documents

Person docs

- Policy assigned properly to all?
- Perform periodic audit to remove obsolete entries
 - ◆ Test accounts are security risks

Desktop Policy Settings docs

- Medium encryption when creating new local replicas?
- Auto-save enabled and set to short time (<5 minutes)?
- Check for mail every N minutes, where $N \geq 10$?
- Fault Reports enabled?
- Contacts Synchronized?

Disable Debug When Not Needed

- Collecting debug data consumes resources
- Customer example:
 - ♦ Debug_Enable_Update_Fix=8191
 - ♦ Debug_Disable_DDM=1
 - ♦ NSD_RUN_MEMCHECK=1
 - ♦ debug_sem_timeout=1000
 - ♦ DEBUG_PRIVATE_POOLS=1
 - ♦ DEBUG_SHARED_POOLS=1
 - ♦ NSF_DocCache_Thread=1
 - ♦ debug_nif=0
 - ♦ debug_nif_update=1

HUNTING SECURITY GREMLINS

Domino Directory

- Users have Author access?
- Users do NOT have local replicas of the directory?
 - ♦ Directory contains entire info of your domain
 - ♦ Replication with old replicas can Raise the Dead (documents)!

Domain Catalog – Access Control Lists - by Name

The screenshot shows a web application interface for managing access control lists. The main content area is titled "Search in View 'Access Control Lists'". Below the search bar, there is a table with columns "Name" and "Title". The table lists several ACLs, with the "By Name" view selected in the left navigation pane. Two red boxes highlight the expanded view of the "-Default-" and "Anonymous" ACLs.

Name	Title
-Default-	1. Manager 2. Designer 3. Editor 4. Author 5. Reader 6. Depositor 7. No Access
Anonymous	1. Manager 3. Editor 4. Author 5. Reader 7. No Access

User ID Management

- ◆ Any IDs in the directory?
- ◆ Stored on a network drive?
- ◆ Emailed to helpdesk or admins?
- ◆ In your Sent mail?
- ◆ On your PC?
- ◆ ID Vault enabled?

Pa\$\$w0rd Checking requires 2 settings – not on by default

Server

Basics | Security | Ports... | Server Tasks... | Internet Protoc

Administrators

Full Access administrators: [No groups here] ▾

Administrators: ▾

Database Administrators: ▾

Full Remote Console Administrators: ▾

View-only Administrators: ▾

System Administrator: ▾

Restricted System Administrator: ▾

Restricted System Commands: ▾

Obsolete as of Domino 6: Administer server from a browser: ▾

Security Settings

Compare public keys: ▾

Log public key mismatches: ▾

Allow anonymous Notes connections: Yes No

Check passwords on Notes IDs: Enabled Disabled



Person

Basics | Work/Home | Other | Miscellaneous | Certificate

Administration

Owners: Bubba Jones/Zcorp ▾

Administrators: Bubba Jones/ZCorp ▾

Allow foreign directory synchronization: Yes ▾

Last updated: 04/20/2013 06:13:49 PM

Password Management

Check password: Check password ▾

Required change interval: 0 ▾

Grace period: 0 ▾

Last change date:

Password digest: ▾

Last change date: (Internet Password)

Force user to change Internet Password on next login: Yes

Security Policy Settings docs

- Password checking enabled?
 - ♦ Remember to enable in server document!
- Internet password synchronized?

Security Settings : basic security

Basics | Password Management | Execution Control List | Keys and Ce

Password Management Basics | Notes Shared Login |

Password Management Options

Use Custom Password Policy for Notes Clients	<input type="radio"/> No ▾
Check password on Notes id file	<input checked="" type="radio"/> Yes ▾
Allow Users to Change Internet Password over HTTP	<input checked="" type="radio"/> Yes ▾
Update Internet Password When Notes Client Password Changes	<input checked="" type="radio"/> Yes ▾
Don't prompt for a password from other Notes-based programs (reduces security):	<input type="radio"/> No ▾
Enable Windows single sign-on for Standard Notes Client:	<input type="radio"/> No ▾

Group docs

- LocalDomainServers has only active servers
 - ♦ No test servers, no people, no other groups
- Group type and access set correctly on key groups?
 - ♦ Author Names fields (Owner, Admin fields on Admin tab)
 - ♦ Reader Names fields (document properties dialog)

The screenshot shows a configuration window for a mailing list group named "All Employees". The window has three tabs: "Basics", "Comments", and "Administration". The "Basics" tab is active, showing the following fields:

Group name:	All Employees
Group type:	Mail only
Category:	
Description:	
Mail Domain:	
Internet Address:	
Auto Populate Method:	None
Members:	All Employees Seattle All Employees Greenville All Employees Tampa All Employees Queensland

Overlaid on the bottom right is a "Document" properties dialog box. It has a toolbar with icons for document, print, and key. The "Who can read this document" section has a checkbox for "All readers and above" which is unchecked. Below it, a list of users is shown with checkboxes: NotesAdmin (checked), LocalDomainServers (checked), and Broadcasters (checked). The "Encryption Keys" section has two fields: "Secret Encryption keys" with a dropdown set to "None" and a checked checkbox, and "Public Encryption keys" with a dropdown set to a user icon and a checked checkbox.

HUNTING ARCHITECTURE GREMLINS

Common General Architecture Gremlins

- Backups verified by performing Restores?
- OS patches applied promptly?
 - ♦ 2nd Tue every month is “patch Tuesday” for MS Windows
- Cluster Failover tested?
 - ♦ Mail routing during cluster failover tested?
- Systems relaying via Domino use DNS alias, not a specific server name?
 - ♦ smtp.mydomain.com vs. servername.mydomain.com
- Using spam/virus filter for both inbound and outbound?
- Users cannot access administration server?







Tools – Server Monitor

- Leave Server Monitor running at all times
- Check often

The screenshot shows the Server Monitor interface with a table of server status. The table has columns for Adm, Age, Dat, Eve, Ind, Rep, Rou, Sta, Users, Dead, Hold, Waiting, AvailabilityIndex, and ElapsedTime. A red box highlights a row with 154 in the Dead column and a time of 08:25:30 in the ElapsedTime column.

Adm	Age	Dat	Eve	Ind	Rep	Rou	Sta	Users	Dead	Hold	Waiting	AvailabilityIndex	ElapsedTime
...	-	15	0	0	0	100	14 days 03:40:22
...	-	22	0	0	0	3	14 days 03:31:05
...	-	128	13	0	0	100	6 days 12:05:01
...	-	3	154	0	0	100	6 days 12:55:44
...	-	6	0	0	0	100	6 days 12:45:21
...	-	2	0	0	0	100	6 days 12:40:04
...	-	9	0	0	0	100	114 days 03:40:02
...	-	3	0	0	0	100	40 days 04:52:46
...	-	1	0	0	0	100	08:25:30
...	-	162	0	0	0	25	36 days 16:56:52
...	-	1	0	0	0	0	2 days 16:50:08
...	-	17	0	0	0	100	6 days 12:44:34

Tools – Server Monitor

Users	Dead	Hold	Waiting	AvailabilityIndex	ElapsedTime
15	0	0	0	100	14 days 03:40:22
-	-	-	-	-	-
22	0	0	0	3	14 days 03:31:05
128	13	0	0	100	6 days 12:05:01
3	154	0	0	100	6 days 12:55:44
					
6	0	0	0	100	6 days 12:45:21
2	0	0	0	100	6 days 12:40:04
9	0	0	0	100	114 days 03:40:02
3	0	0	0	100	40 days 04:52:46
1	0	0	0	100	08:25:30
162	0	0	0	25	36 days 16:56:52
1	0	0	0	0	2 days 16:50:08
17	0	0	0	100	6 days 12:44:34
-	-	-	-	-	-

Tools – Domino Configuration Tuner

Lotus. Domino Configuration Tuner

DCT.NSF is on Local (Rule Definitions: 02/15/2011)

Run New Scan **View Results** **Check for Updates** **Preferences** **Help**

Current Report Change | Delete | Run again
Second scan 04/18/2013 01:18:38 PM PDT

Filtered by Server Show reports for all servers

Isdom01/Ismo

- Critical**
 - notes.ini CONSOLE_LOG_ENABLED causes the Domino Server to write console data to console.log in the IBM_TECHNICAL_SUPPORT directory.
 - notes.ini CONSOLE_LOG_MAX_KBYTES sets the maximum size of the console.log file in Kbytes.
 - notes.ini DAOSMinObjSize indicates the size (in bytes) of the smallest attachment that will use DAOS. (iSeries specific)**
 - notes.ini DEBUG_CAPTURE_TIMEOUT captures semaphore time stamps and logs them to semdebug.txt
 - notes.ini DEBUG_SHOW_TIMEOUT instructs the Domino server to log semaphore information to semdebug.txt
 - notes.ini DEBUG_THREADID instructs the Domino server to output verbose logging with thread specific information.
- Warning (High)**
 - database ODS version should be as high as possible
 - notes.ini FTG_USE_SYS_MEMORY reduces memory fragmentation related to full text index searching (post 6.5.4 inclusive)
 - notes.ini FT_FLY_INDEX_OFF=1 will prevent on-the-fly full text index creation thereby reducing disk I/O and CPU consumption
 - notes.ini GROUP_CACHE_SIZE specifies the size of the GroupCache (in KBytes.)
 - notes.ini LOG_MAILROUTING specifies how much logging detail the mail router sends to the server console and log file
 - notes.ini NLCACHE_SIZE specifies the size (in bytes) of the NameLookup cache.
 - notes.ini NSF_BACKUP_MEMORY_CONstrained limits the amount of memory used by backup applications and may prevent a server crash
 - notes.ini SERVER_NAME_LOOKUP_NO_UPDATE can prevent unnecessary Domino Directory views updates (post 8.0.1 inclusive)
 - notes.ini UPDATE_FULLTEXT_THREAD enables using a separate thread to do full text indexing which can improve server performance.
 - ServerDoc 'Transactional Logging' Enabled/Disabled
- Warning (Low)**
 - database property 'Compress database design' can reduce I/O demands
 - database property 'Compress document data' can reduce I/O demands
 - database property 'Don't overwrite free space' can reduce I/O demands
 - database property 'Use LZ1 compression for attachments' can reduce I/O demands

Apply Recommended Change

Status: DAOSMinObjSize has a current value of '4096', which is not a recommended configuration.

Server: Isdom01/Ismo running Domino 8.5.2 on OS400 V6R1M0

Severity: Critical

Explanation

notes.ini DAOSMinObjSize specifies the minimum size of attachments (in bytes) that will make use of DAOS. The minimum for iSeries servers is 1048576.

Recommendations


DAOSMinObjSize should never be set to a value less than the iSeries minimum of 1048576. A value of less than 1048576 would make DAOS less efficient than storing the attachment in an NSF file.

Links & References


[Best Practice: Domino community opinion regarding 'DAOSMinObjSize'](#) (Source: Domino Wiki)

Tools – Domino Configuration Tuner

 Apply Recommended Change

Status:  DAOSMinObjSize has a current value of '4096', which is not a recommended configuration.

Server:  lsd0m01/lsmo running Domino 8.5.2 on OS400 V6R1M0

Severity:  Critical

▼ Explanation

notes.ini DAOSMinObjSize specifies the minimum size of attachments (in bytes) that will make use of DAOS. The minimum for iSeries servers is 1048576.

▼ Recommendations

DAOSMinObjSize should never be set to a value less than the iSeries minimum of 1048576. A value of less than 1048576 would make DAOS less efficient than storing the attachment in an NSF file.

▼ Links & References

[Best Practice: Domino community opinion regarding 'DAOSMinObjSize'](#) (Source: Domino Wiki)

HUNTING PERFORMANCE GREMLINS

Number of Mail.Box Files

- **Ensure you have enough mail.box files**
 - ♦ **Mail.Mailbox.Accesses**
 - ♦ **Mail.Mailbox.AccessConflicts**
 - ▶ **Want a lower percentage of conflicts (2% or less)**
 - **$\text{Mail.Mailbox.AccessConflicts} / \text{Mail.Mailbox.Accesses} = < 0.02$**

Mail Delivery Statistic	Original	After Tuning
Mail.Mailbox.AccessConflicts	1151	8
Mail.Mailbox.Accesses	3877	3023
Server.MailBoxes	2	4

Full Text Index Tuning

- **Spawn full-text indexing off to own thread**
 - ▶ **Update_Fulltext_Thread=1**
 - ♦ Prevents long full text indexing operations from delaying view updates
 - ♦ By default, view updates and full text indexing are driven by the same thread

FT.Index.Count	FT.Index.Search	FT.Search.Total.Results
56,150	27,652	1,002,317

Customer Tuning Example

- **Semaphore timeouts**

Semaphore Timeout	# of times occurring	Description
3A05	793	SEM_HTTP_AGENT
0266	20	NSF per-database full-text semaphore
0244	15	NSF per-database semaphore
0931	8	Task sync semaphore
03A8	2	DBCNT page zero semaphore

- ♦ **Enabling Update_Fulltext_Thread=1 eliminated semaphore timeouts**

HTTP Server Threads

- **Number of threads to handle web server requests**

Default Size	Maximum Size	To View Statistics
40	512	Sh stat database Sh stat http

- **Key statistic**
 - ◆ **Http.Workers**
 - ◆ **Domino.Threads.Active.Peak**

***Critical for Traveler Performance!!**

The screenshot shows the Domino server configuration interface for 'Server: domtest1/KGCI'. The 'Internet Protocols...' tab is selected, and the 'HTTP' sub-tab is active. Under the 'Basics' section, the 'Number active threads' is set to 40, which is highlighted with a red box. Other visible settings include Host name(s): DOMTEST1.FRANKENI.COM, Bind to host name: Enabled, DNS lookup: Disabled, DNS lookup cache: Enabled, DNS lookup cache size: 256, DNS lookup cache found timeout: 120 seconds, and DNS lookup cache not found timeout: 240 seconds.

Monitor Traveler Performance

- **tell traveler status**

- ♦ **Example Yellow status**

```
tell traveler status
* [0458:004B-05BC] 08/06/2012 11:03:10 AM Remote console command issued by Kim Greene/ : tell traveler status
[0458:0006-029C] tell traveler status
[08C8:390E-070C] The Lotus Notes Traveler task has been running since Sun Aug 05 23:55:42 CDT 2012.
[08C8:390E-070C] The last successful device sync was on Mon Aug 06 11:03:06 CDT 2012.
[08C8:390E-070C] Yellow Status Messages
[08C8:390E-070C] The response times for opening databases on mail server CN=Traveler/O=Wofff-1c are above the acceptable threshold.
[08C8:390E-070C] There have been 259 device sync failures for reasons other than the server is busy.
[08C8:390E-070C] The current native memory usage is 94 percent of the total available memory.
[08C8:390E-070C] The overall status of Lotus Notes Traveler is Yellow.
```

- ♦ **Example Green status**

```
tell traveler status
[0484:0006-08D4] tell traveler status
* [0484:0049-09D0] 08/07/2012 10:42:57 AM Remote console command issued by Kim Greene/ : tell traveler status
[0A68:2A8C-0C74] The Lotus Notes Traveler task has been running since Mon Aug 06 22:54:47 CDT 2012.
[0A68:2A8C-0C74] The last successful device sync was on Tue Aug 07 10:42:18 CDT 2012.
[0A68:2A8C-0C74] The overall status of Lotus Notes Traveler is Green.
```

Monitor Traveler Performance

- **tell traveler mem**

- ◆ **Java memory usage**

- ▶ **Max total = 1024 MB**
 - ▶ **Current total = 96 MB**
 - ▶ **Free = 976 MB (95%)**
 - ▶ **Allocated = 48 MB (5%)**

- ◆ **C memory usage**

- ▶ **Total = 2047 MB**
 - ▶ **Free = 395 MB**
 - ▶ **Allocated = 1652 MB**

Monitor Traveler Performance

- **Threads**

- ♦ **HTTP threads = # of devices X 1.2**

- **Traveler thread pools**

- ♦ **Check GetThreadDelayTime**
 - ▶ **Want majority in 0-2 second range**
- ♦ **Monitor device synchronization return codes**
 - ▶ **503 – Server busy, indicates insufficient synchronization threads**

Defrag the Derby Database

- **Over time Traveler performance can deteriorate**
 - ♦ Defrag the Derby database to restore performance
- **Steps to start a Defrag:**
 - ♦ Tell traveler shutdown
 - ♦ Tell http quit
 - ♦ Load traveler -defrag



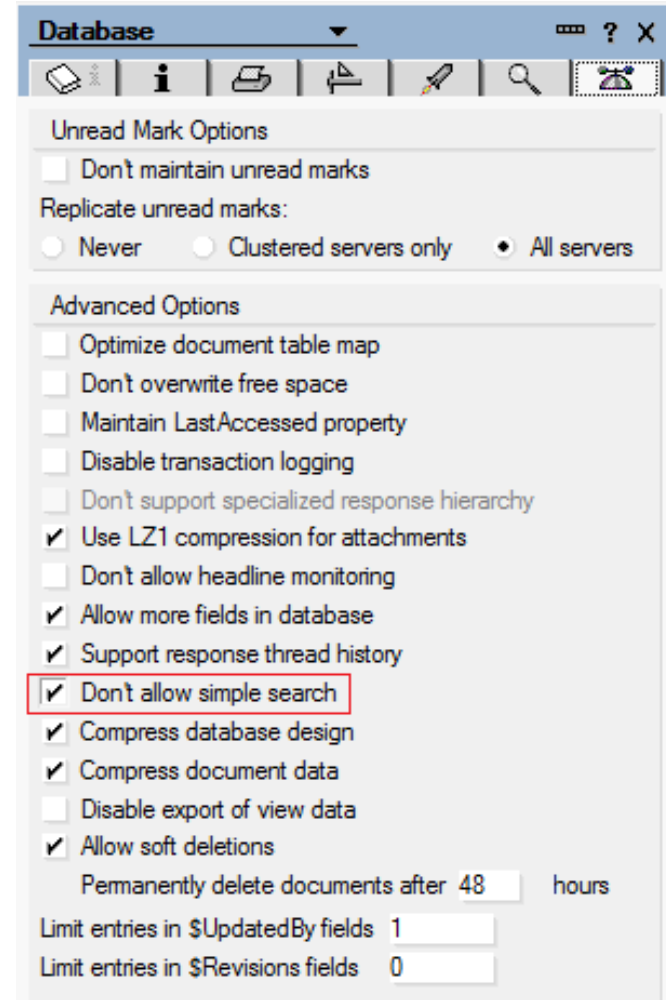
```
[17D0:0002-0EE0] 02/12/2013 05:32:03 PM Lotus Traveler: Defragging and Compressing is complete.  
[17D0:0002-0EE0] 02/12/2013 05:32:03 PM Lotus Traveler: Defragmentation reclaimed 60.73%  
[17D0:0002-0EE0] 02/12/2013 05:32:03 PM Lotus Traveler: Defragmentation reclaimed 60.73%
```

Defrag the Derby Database

- **Requires Traveler 8.5.2.4 or 8.5.3.1 or later**
- **New Notes.ini parameters**
 - ◊ **NTS_DEFRAG_INTERVAL_DAYS=<# of days>**
 - ◊ **NTS_LAST_DEFRAG=<timestamp of last defrag>**
- **Defrag will automatically run if NTS_LAST_DEFRAG doesn't exist or if the # days past the last run is greater than the defined interval**
- **Defrag a minimum of every 30 days for optimal traveler server performance**
 - ◊ **Recommend every 7 days on busy servers**

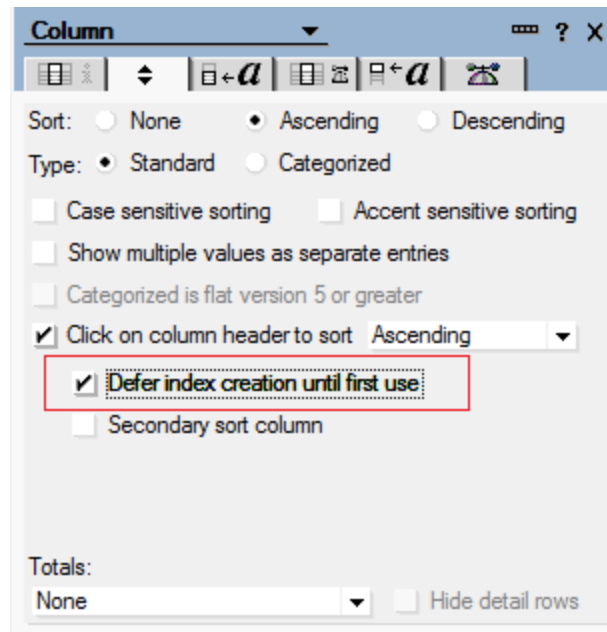
Get to the Latest ODS!

- **Don't allow simple search**
 - ◆ Prevents users from searching a database that is not full-text enabled
 - ◆ Doesn't prevent searches on whole server!!



View Performance Option

- **On-demand column collations**
 - ♦ Reduces overhead associated with indexes
 - ♦ Indexes built on-demand
 - ▶ **Built over column first time user sorts on column**



Deletion Stubs

- Domino's way of tracking the life cycle of a document
- Eventually deleted when "purge interval" is reached
- Many deletion stubs can impact performance to end user
 - ♦ Searches read deletion stubs and include them in response returned
 - ▶ Search count only shows count of full documents, which is what user sees
- Use 'show database dbname.nsf' to get live and deleted document count
- Important to purge deletion stubs on regular basis

Document Type	Live	Deleted
Documents	21,292	1,174

Check Configuration for Bottlenecks

- **Number of worker threads and concurrent threads processing**
 - ◊ **Server threads**
 - ▶ **Number of server threads available for processing**
 - *Servers.Users.Peak*
 - *Server.WorkerThreads.TCPIP*
 - Need sufficient threads for number of users
 - **Default size: $Server_Pool_Tasks * \# \text{ of NRPC ports}$**
 - ◊ **Server_Max_Concurrent_Trans**
 - ▶ **Controls number of threads allowed to execute at same time**
 - ▶ **Default size: 20**
 - ◊ **Server_Pool_Tasks**
 - ▶ **Controls number of threads in IOCP thread pool**
 - ▶ **Check these statistics:**
 - *Server.ConcurrentTasks*
 - *Server.ConcurrentTasks.Waiting*
 - Should be no waiting
 - ▶ **Default size: $Server_Max_Concurrent_Trans * 2$**



Obsolete tuning parameters

- **Important to remove obsolete tuning parameters**
 - ♦ **ConstrainedSHMSizeMB**
 - ♦ **ConstrainedSHM**
 - ♦ **PercentAvailSysResources**
- **Can adversely affect performance**

Monitor Size of Logging Databases

- **Common for agents to write to logging databases as they process data**
- **Keep these logging databases small**
 - ◆ **Have seen a number of semaphore timeout issues and HTTP thread locking issues with large logging databases**
 - ◆ **Recommend archiving / purging documents out of logging databases on regular basis**

Example 1

- **Scenario**

- ◊ New IBM i LPAR
- ◊ Three new Domino servers running in the LPAR
- ◊ Very slow performance on all 3 Domino servers
 - ▶ All types of operations slow (opening databases, sending emails, ...)

- **Detective steps**

- ◊ Checked CPU utilization
 - ▶ Less than 10%
- ◊ Checked memory utilization
 - ▶ Very low faulting rates
- ◊ Checked network
 - ▶ Response times as expected
- ◊ Checked Domino statistics
 - ▶ Nothing stood out

Example 1 (cont'd)

- **What we know**

- ◊ There are ample hardware resources available
 - ▶ **But they're not being used!!**
- ◊ Domino throughput is bottlenecked

- **Next steps**

- ◊ Checked number of threads available for processing in memory pool Domino was running in
 - ▶ **BINGO!!!**
 - ▶ **Not enough threads with default settings**

- **Resolution**

- ◊ Increased number of threads
- ◊ Domino performance increased dramatically
- ◊ CPU utilization increased
- ◊ Throughput no longer an issue

Example 2

- **Initial scenario**

- ◊ Recent upgrade of operating system (V5R4 -> V6R1)
- ◊ Recent upgrade of Domino (7.0.3 -> 8.5.2)
- ◊ Core application slow
- ◊ End users complaining about response times

- **Detective steps**

- ◊ Analyzed server performance (CPU, memory, disk)
 - ▶ **No bottlenecks found**
- ◊ Analyzed notes.ini file
 - ▶ **Found 'PercentAvailSysResources' set on server**
 - *Obsolete in Domino 8.x*

- **Next steps**

- ◊ Removed 'PercentAvailSysResources'
- ◊ Restarted Domino sever
 - ▶ **Performance improves, Domino is utilizing memory much better**

Example 2 (cont'd)

- **Scenario after initial tuning**
 - ♦ Performance great majority of time
 - ♦ Intermittent poor response times
- **Detective steps**
 - ♦ Ensured system performance monitor still active
 - ♦ Enabled semaphore debug
 - ♦ Enabled Domino statistic collection
 - ♦ Analyzed semaphore debug
 - ♦ Analyzed Domino statistics
 - ♦ Analyzed call stacks while performance issue occurred again

Example 2 (cont'd)

- **What we know**

- ◊ Large number of semaphore timeouts reported on Domino server console
- ◊ Number of active threads for HTTP task spikes from average of 25 threads to maximum of 512 threads
- ◊ Faulting in Domino memory pool spikes when problem occurs
- ◊ Server appears to be choking itself spending more time trying to check to see if it can now take its turn to process a request than performing actual work
- ◊ Accesses to the Agent log database causing semaphore timeouts

- **Resolution**

- ◊ Reduced number of HTTP threads to 100
- ◊ Reduced size of Agent log database
- ◊ Moved ODBC connection processing jobs (QSQSRVR) to separate memory pool
- ◊ Overall throughput improved dramatically
- ◊ No server performance complaints
- ◊ HTTP requests average 55 ms (previously over 150 ms)

Example 3

- **Scenario**

- ♦ Taking 3-4 seconds to tab from field to field in application

- **Detective steps**

- ♦ Enable `client_clock=1`
- ♦ Analyze output

```
584-150 [584]) OPEN_NOTE(REP86257959:00A51F20-NT00000796,00400000): 828 ms. [48+64376=64424]
(585-150 [585]) READ_ENTRIES(REP86257959:00A51F20-NT00000796): 1062 ms. [76+55104=55180]
(586-152 [586]) DB_MODIFIED_TIME: 78 ms. [14+68=82]
(587-152 [587]) OPEN_NOTE(REP86257959:00A51F20-NT00000796,00400000): 813 ms. [48+64376=64424]
(588-152 [588]) READ_ENTRIES(REP86257959:00A51F20-NT00000796): 844 ms. [76+55104=55180]
(589-153 [589]) DB_MODIFIED_TIME: 78 ms. [14+68=82]
(590-153 [590]) OPEN_NOTE(REP86257959:00A51F20-NT00000796,00400000): 828 ms. [48+64376=64424]
(591-154 [591]) READ_ENTRIES(REP86257959:00A51F20-NT00000796): 812 ms. [76+55104=55180]
(592-155 [592]) DB_MODIFIED_TIME: 109 ms. [14+68=82]
```

- ♦ See a pattern here??

Example 3 (cont'd)

- **What we know**

- ◊ Same database is being opened and read over and over

584-150 [584]) OPEN_NOTE(REP86257959:00A51F20-NT00000796,00400000): 828 ms. [48+64376=64424]
(585-150 [585]) READ_ENTRIES(REP86257959:00A51F20-NT00000796): 1062 ms. [76+55104=55180]

- **Next steps**

- ◊ Analyze form design

- **What we know**

- ◊ Found computed field doing lookup
- ◊ Found form property “Automatically refresh fields” set on form

- **Resolution**

- ◊ Changed form property
- ◊ Changed view involved in lookup to not rebuild more than once an hour
- ◊ Dramatically improved performance

WHEN GREMLINS STRIKE

Being Prepared When Things Go Wrong: Crashes

- Crash notifications – Server doc
- Fault reports for servers – Config doc
- Server Add-on tool from LNN Sandbox: MTBF

- Client fault reports – Desktop Policy Settings
- Custom view in Fault Reports to fix client crashes

Crash Notifications – Server doc

- Server doc - Basics tab – Auto recovery

- ♦ Want to be notified when a server crashes?
 - ▶ **Must enable Auto Restart first**

Automatic Server Recovery	
Run This Script After Server Fault/Crash:	<input type="text"/>
Run NSD To Collect Diagnostic Information:	<input checked="" type="checkbox"/> Enabled
Automatically Restart Server After Fault/Crash:	<input checked="" type="checkbox"/> Enabled
Cleanup Script / NSD Maximum Execution Time:	<input type="text" value="600"/> seconds
Server Shutdown Timeout:	<input type="text" value="300"/> seconds
Maximum Fault Limits:	<input type="text" value="3"/> faults within <input type="text" value="5"/>
Mail Fault Notification to:	<input type="text" value="NotesAdmin"/> <input type="button" value="v"/>

Fault Reports for Servers – Configuration doc

- Diagnostics tab - Enable collecting Server fault reports
- Analyzing manually can provide more flexibility

The screenshot shows a configuration interface with a header 'Configuration Settings' and a navigation bar with tabs: Basics, Security, Client Upgrade, Router/SMTP, MIME, and NOTE. Below this is a section titled 'Diagnostic Collection Options' containing several settings:

Mail-in Database for diagnostic reports:	<input type="text" value="Fault Reports/XYZCorp"/>
Maximum size of diagnostic message including attachments (in MB):	<input type="text" value="20"/>
Maximum size of NSD output to attach (in MB):	<input type="text" value="10"/>
Maximum amount of console output file to attach (in KB):	<input type="text" value="10240"/>
Diagnostic file patterns:	<input type="text" value=""/>
Remove diagnostic files after a specified number of days:	<input type="text" value="No"/>

Below this is a section titled 'Fault Analyzer' with one setting:

Run FaultAnalyzer on Fault DBs on this server:	<input type="text" value="No"/>
--	---------------------------------

Red boxes highlight the 'Fault Reports/XYZCorp' text field and the 'No' dropdown menu in the 'Run FaultAnalyzer' setting.

Free Server Add-on Tool from LNN Sandbox: MTBF

- Mean Time Between Failures
- Measures the time the server is up
- Records every shutdown and crash
- Shows length of the outage
- Provides a place to document the cause
- Gives % up time
- Windows 32 bit & 64 bit only

- Management likes it and it illustrates the reliability of your servers

MTBF (cont.)

- For more info and to download visit <http://thenotesguyinseattle.com/2011/04/03/mtbf85/> and <http://thenotesguyinseattle.com/2011/04/27/mtbf-for-windows-64-bit-os/>

Mean Time Between Failure:	Time	Server	Build	Resolved	Outage Length ^	Description
1) Server Information	04/01/2013					
2) Server Crashes	10:31:24 AM	AIserver7/AICorp	8.5.3	No	3 minutes	Still needs to be addressed!!!
By Date	03/22/2013					
By Server	03:24:43 AM	AIserver7/AICorp	8.5.3	No	3 minutes	Still needs to be addressed!!!
3) Server Shutdowns	03/20/2013					
4) Server Entries	06:46:03 AM	AIserver7/AICorp	8.5.3	No	395 minutes	Still needs to be addressed!!!
5) Server Log Entries	03/13/2013					
6) Server Statistics	03:50:34 AM	AIserver7/AICorp	8.5.3	No	3 minutes	Still needs to be addressed!!!
By Date	02/13/2013					
By Server	02:47:11 PM	AIserver7/AICorp	8.5.3	No	31 minutes	Still needs to be addressed!!!
7) User Information	04:05:59 AM	AIserver7/AICorp	8.5.3	No	5 minutes	Still needs to be addressed!!!
	01/16/2013					

Client Crashes: Desktop Policy - Diagnostics

- Set the desktop policy to collect fault reports
- Set the prompts to NO
 - ◆ Otherwise security-minded people will cancel

Desktop Settings : Primary Desktops

Basics | Smart Upgrade | Applications | Widgets | Dial-up Connec

Diagnostic Collection Options

Mail-in Database for diagnostic reports:

Fault Reports/XYZCorp@XYZ

Prompt user to send diagnostic report:

No

Prompt user for comments:

No

Fault Reports – Only good if you use them

- Create a view in Fault reports Db

- ♦ Selection criteria:

```
SELECT Form = "Memo": "Partial Match" : "Exact Match"&  
(@Adjust(CrashTime; 0;2;0;0;0;0) > @Today)
```

- ♦ Sort / Categorize by username
- ♦ Add a column for CrashTime
- ♦ Add a column with a formula value of 1 and include totals

	Time
3	AI Server 7/AI Corp
1	01/16/2013
1	02/13/2013
1	03/07/2013
3	

CHECKLISTS TO AVOID GREMLINS

Daily and Weekly Checklists

- Daily

- ◆ Server monitor:

- ▶ Recent reboots
 - ▶ Dead mail, pending mail queues, DNS availability
 - ▶ Monitor logs for errors
 - *log.nsf*
 - *domlog.nsf*
 - ▶ DDM reports
 - ▶ Admin4.nsf

- Weekly

- ◆ Server disk space

Monthly and Quarterly Checklist

- **Monthly**

- ♦ Cluster analysis
- ♦ Log and Domlog analysis
- ♦ Admin group membership
- ♦ Server reboot
 - ▶ Review logs after startup

- **Quarterly**

- ♦ Cluster failover test
- ♦ Restore from backup test
- ♦ Domino Configuration Tuner

Annual Checklist

- **User audit**
 - ♦ Verify all person docs are still valid
- **Datacenter failover**
- **Full review of configuration**
 - ♦ Server docs
 - ♦ Configuration docs
 - ♦ Connection docs
 - ♦ Web site docs
 - ♦ Etc.

Follow Up



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