

**Sheraton Milwaukee Brookfield Hotel
Milwaukee, WI
August 24-26, 2011**



Midwest Lotus User Group Conference 2011
Expanding Your Community Through Social Collaboration

Domino Performance Best Practices

Session: IA102

Kim Greene

kim@kimgreene.com

507-367-2888

Skype/Twitter: iSeriesDomino



Midwest Lotus User Group Conference 2011
Expanding Your Community Through Social Collaboration

About Kim Greene

- Owner of Kim Greene Consulting, Inc.
- Extensive iSeries background
- Services offered include:
 - System and application performance optimization
 - Administration
 - Upgrades
 - Troubleshooting
 - Health, performance, security, etc. checks
 - Migrations
 - Enterprise integration
- Technical writer & editor for Systems Magazine, System i Edition
- Blog
 - www.bleedyellow.com/blogs/dominodiva
- Twitter
 - [iSeriesDomino](#)



Midwest Lotus User Group Conference 2011
Expanding Your Community Through Social Collaboration

Agenda

- DO's and DON'Ts of performance tuning including..
 - Statistics monitoring & DDM
 - Full text indexing
 - HTTP
 - Mail Routing
 - file sizes
 - mail.box
 - DAOS
 - ODS level
 - Mail, Applications & Data types
 - Notes.ini parameters



DO ...

Monitor statistics



Midwest Lotus User Group Conference 2011
Expanding Your Community Through Social Collaboration

Group Cache

- Used to lookup members of groups

Default Size	Maximum Size	To View Statistics
4 MB	15 MB	Sh stat net

- Key statistics
 - NET.GroupCache.AddsFailed = 0
 - NET.GroupCache.Hits=155
 - NET.GroupCache.Misses = 10
 - NET.GroupCache.NumEntries = 9
 - NET.GroupCache.Size = 15,360
 - NET.GroupCache.Used = 2,716
- Group_Cache_Size=<size in bytes>



NLCache

- Used for name lookups

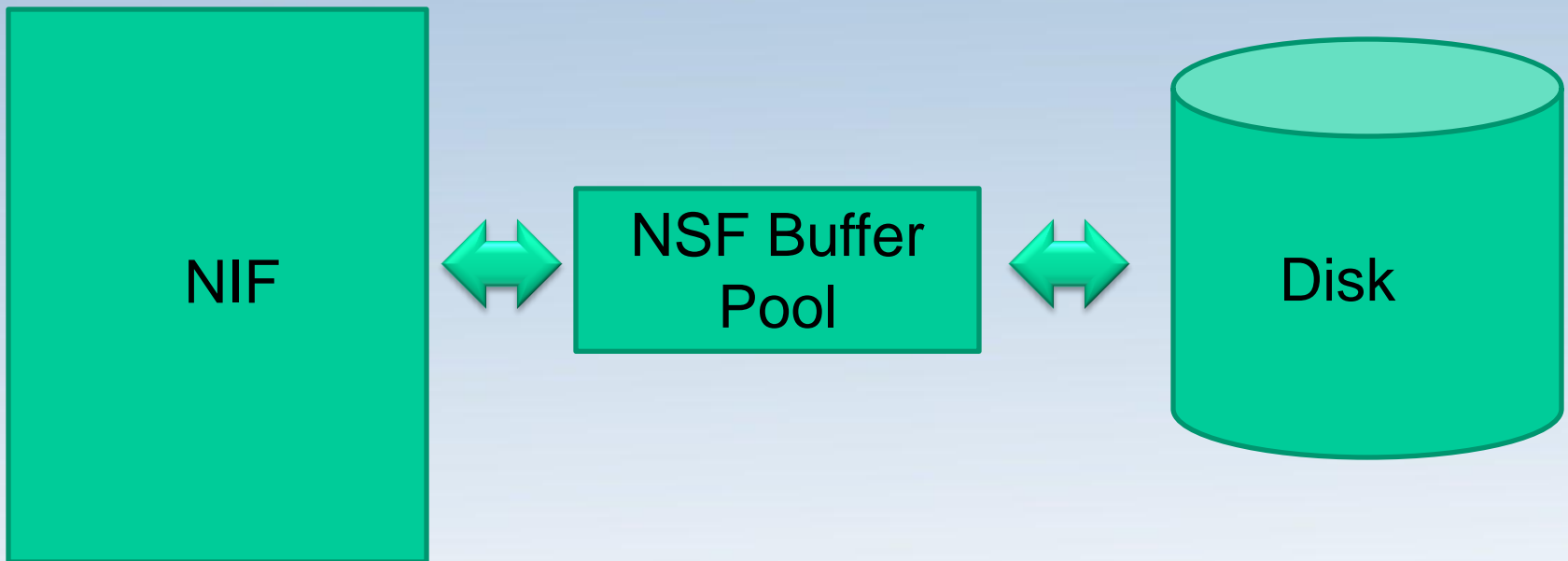
Default Size	Maximum Size	To View Statistics
16 MB prior to 8.5.2 64 MB in 8.5.2	4 GB	Sh stat nlcache

- Key statistics
 - Database.NAMELookupCacheCacheSize = 16,447,205
 - Database.NAMELookupCacheLookups = 1,879,903
 - Database.NAMELookupCacheMaxSize = 16,777,216
 - Database.NAMELookupCacheMisses = 1,362,746
- NL_Cache_Size=<size in bytes>



Unified Buffer Manager

- Also referred to as the NSF buffer pool
- Buffers data between the NIF and disk



Unified Buffer Manager

Default Size	Maximum Size	To View Statistics
300 MB	1.5 GB prior to release 8 1.0 GB for 8.x 300 MB 8.5.x	Sh stat database

- Key statistics
 - Database.Database.BufferPool.Maximum.Megabytes = 170
 - Database.Database.BufferPool.Peak.Megabytes = 168
 - Database.Database.BufferPool.PercentReadsInBuffer = 95.44
- NSB_BUFFER_POOL_SIZE_MB=<size in mb>



Database Cache

- Determines the number of databases a server can hold in its cache

Default Size	Maximum Size	To View Statistics
3x NSF buffer pool	10,000	Sh stat database

- Key statistics
 - Database.DbCache.CurrentEntries = 510
 - Database.DbCache.HighWaterMark = 714
 - Database.DbCache.MaxEntries = 510
 - Database.DbCache.OvercrowdingRejections = 8385
- NSF_DbCache_Maxentries=<number of entries>



NSF Monitor Pool

- Caches event monitors such as server and user mail rules

Default Size	Maximum Size	To View Statistics
40 MB	256 MB	Sh stat database

- Key statistics
 - Database.MonitorPool.Event.Used = 52309
 - Database.MonitorPool.Monitors.Used = 1184
 - Database.MonitorPool.Size = 41943040
- NSF_MONITOR_POOL_SIZE_MB=<size in MB>



DO ...

Tune for full text indexing



Midwest Lotus User Group Conference 2011
Expanding Your Community Through Social Collaboration

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



Full Text Indexing

- Take full text indexing out of Domino memory pool
 - Uses memory from OS pool
 - Frees up Domino memory
 - Notes.ini setting
 - `ftg_use_sys_memory=1`



DO ...

Properly tune HTTP



Midwest Lotus User Group Conference 2011
Expanding Your Community Through Social Collaboration

HTTP Tuning

- Threading model is important!!
 - High contention applications benefit from R5 threading model
 - HTTPQueueMethod=2
 - Most optimal for:
 - » URLs that run application code
 - » Large uploads/downloads
 - Threads work off a queue

**NOTE: Default setting in 8.5.2



HTTP Tuning

- Customer example

	Default HTTP threading model	R5 threading model
# users	400	400
# errors	37 (4.6%)	0 (0%)
Max response time	103 seconds	77 seconds

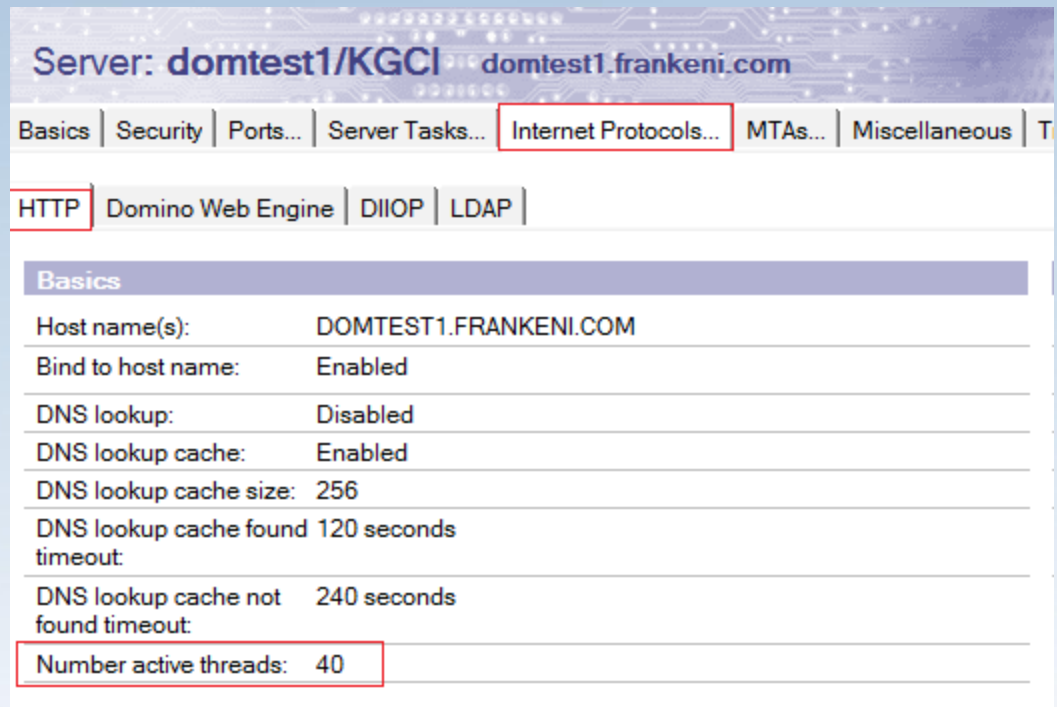


HTTP Server Threads

- Number of threads to handle web server requests

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

- Key statistics
 - Http.Workers
 - Domino.Threads.Active.Peak



The screenshot shows the Domino server configuration interface for 'Server: domtest1/KGCI' at 'domtest1.frankeni.com'. 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 settings include Host name(s): DOMTEST1.FRANKENI.COM, Bind to host name: Enabled, DNS lookup: Disabled, DNS lookup cache: Enabled, and various timeout values.



DO ...

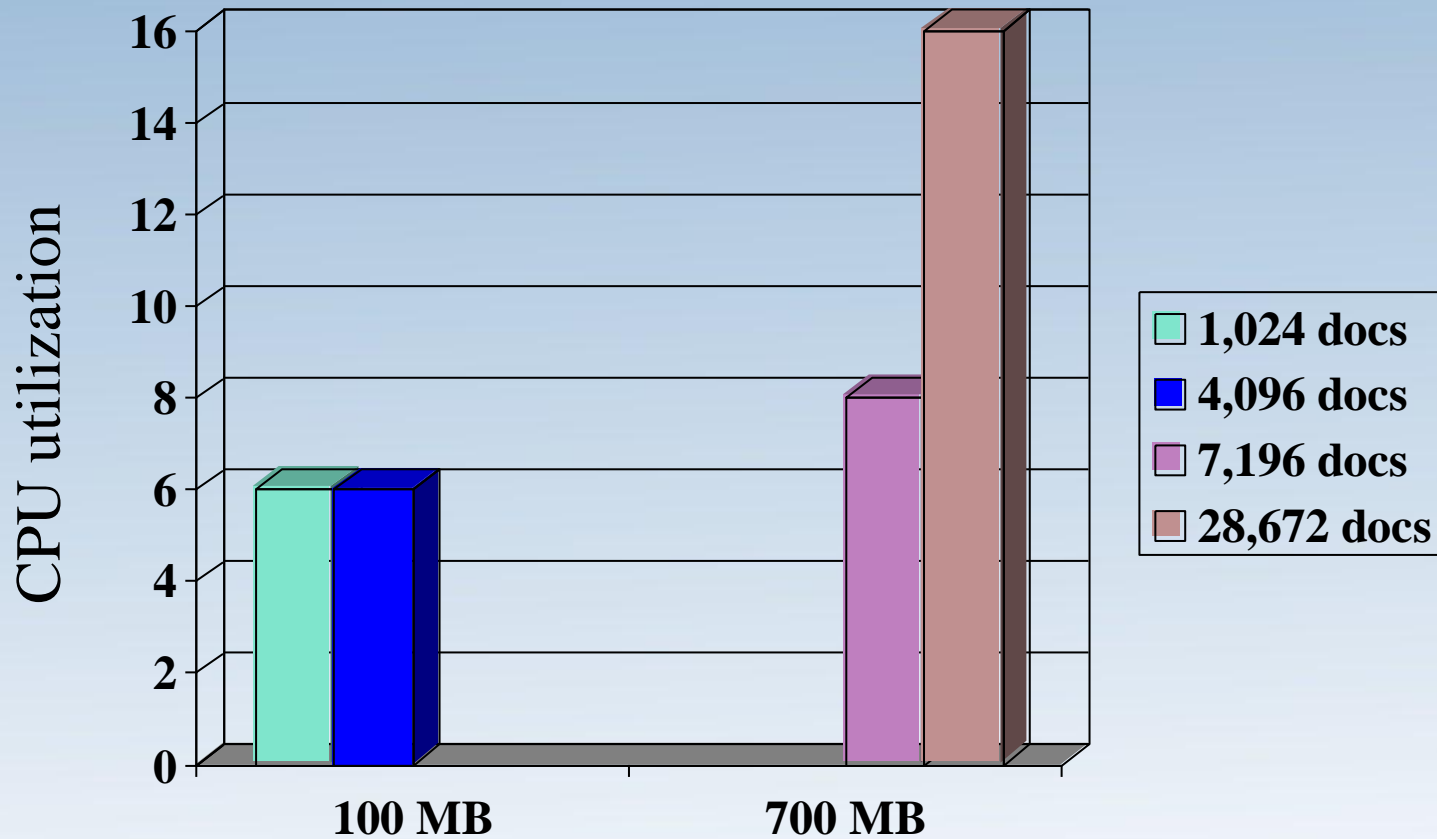
Keep mail file sizes in check



Midwest Lotus User Group Conference 2011
Expanding Your Community Through Social Collaboration

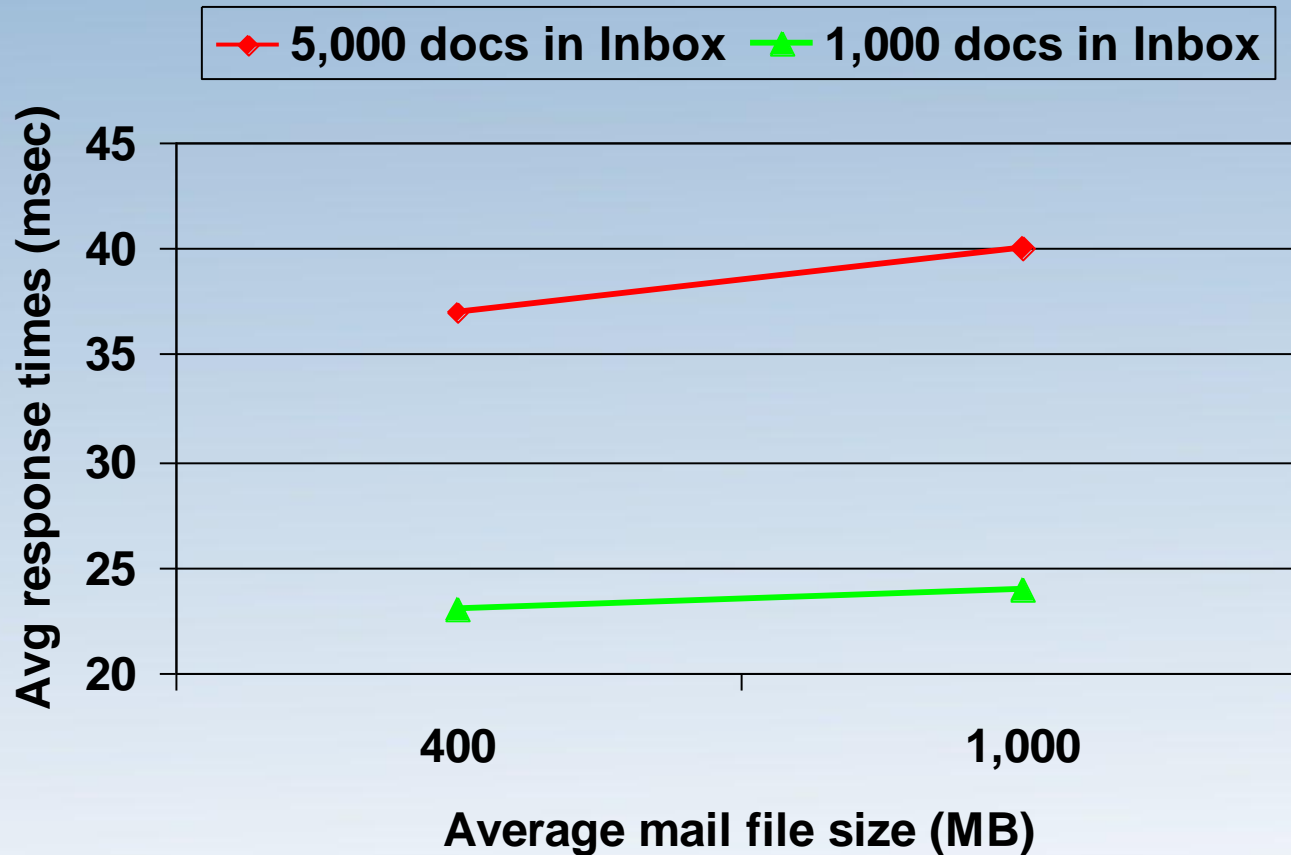
Mail Performance Tuning

- Keep mail files below 500 MB



Mail Performance Tuning

- Size of inbox impacts end user response time



Mail Performance Tuning

- Use Inbox maintenance agent

Basics	Security	Ports...	Server Tasks...	Internet Protocols...	MTAs...	Miscellaneous	Transactional Logging	Shared Mail	Lotus Traveler	Administration
Administration Process	Agent Manager	Domain Catalog	Directory Cataloger	Internet Cluster Manager	Web Retriever	Remote Debug Manager				
Basics	Maximum number of threads: 3			Mailfile Deletion Interval						
				Interval between purging mail file and deleting when using object store: day(s)						
Normal Request Settings	Interval: minutes			Delayed Request Settings						
	Execute once a day requests at:			Start executing on: Sun day(s)						
				Start executing at:						
Miscellaneous	Mail file moves expire after: 21 days			Mail Inbox Maintenance						
	Store Admin Process log entries when status of no change is recorded: No			Start executing Inbox Maintenance agent on: Sat day(s)						
	Suspend Admin Process at:			Start executing Inbox Maintenance agent at: 01:00 AM						
	Restart Admin Process at:			<input checked="" type="radio"/> Maintain inboxes for only these selected users on this home server						
				<input type="radio"/> Maintain inboxes based on policies						
				Selected users:						
				Remove documents older than [X] days from Inbox: 90						
				Maximum number of documents to remove per cleanup: 500						
				Do not remove unread documents from Inbox: <input type="checkbox"/> Yes						



DON'T ...

Accept mail.box default settings



Number of 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



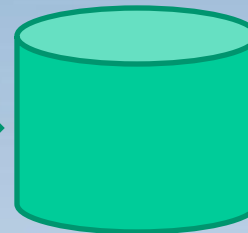
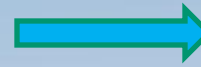
DON'T ...

Forget to DAOS enable mail.box

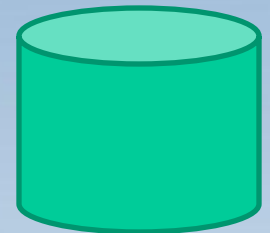


DAOS on Mail.Box

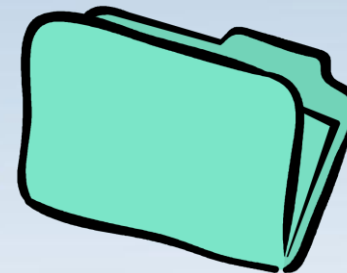
- Mail.box not DAOS enabled
 - On mail submission
 1. Deposited in mail.box



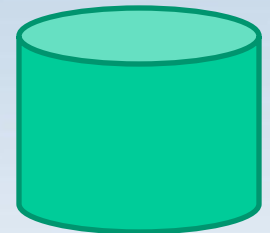
mail.box



joe.nsf



DAOS



mary.n
sf

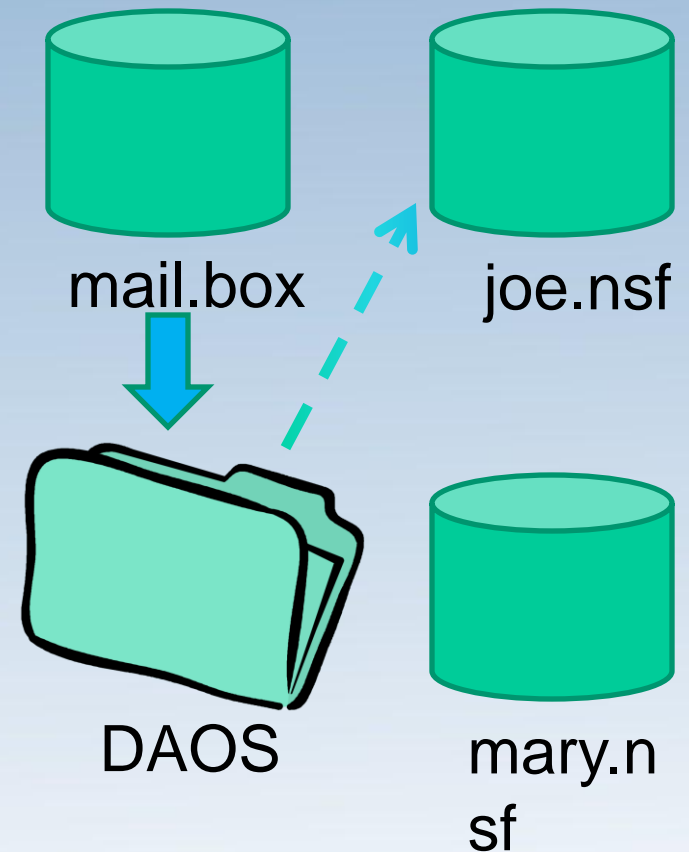


Midwest Lotus User Group Conference 2011

Expanding Your Community Through Social Collaboration

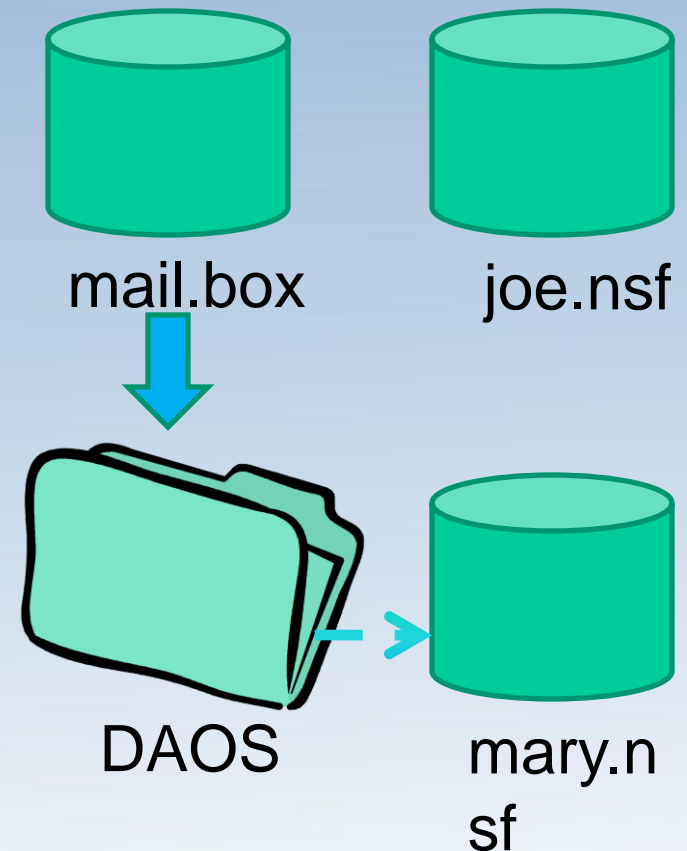
DAOS on Mail.Box

- Mail.box not DAOS enabled
 - On mail submission
 1. Deposited in mail.box
 - On delivery to Joe
 2. Read from mail.box
 3. Written to DAOS & saved
 4. Ticket written to joe.nsf



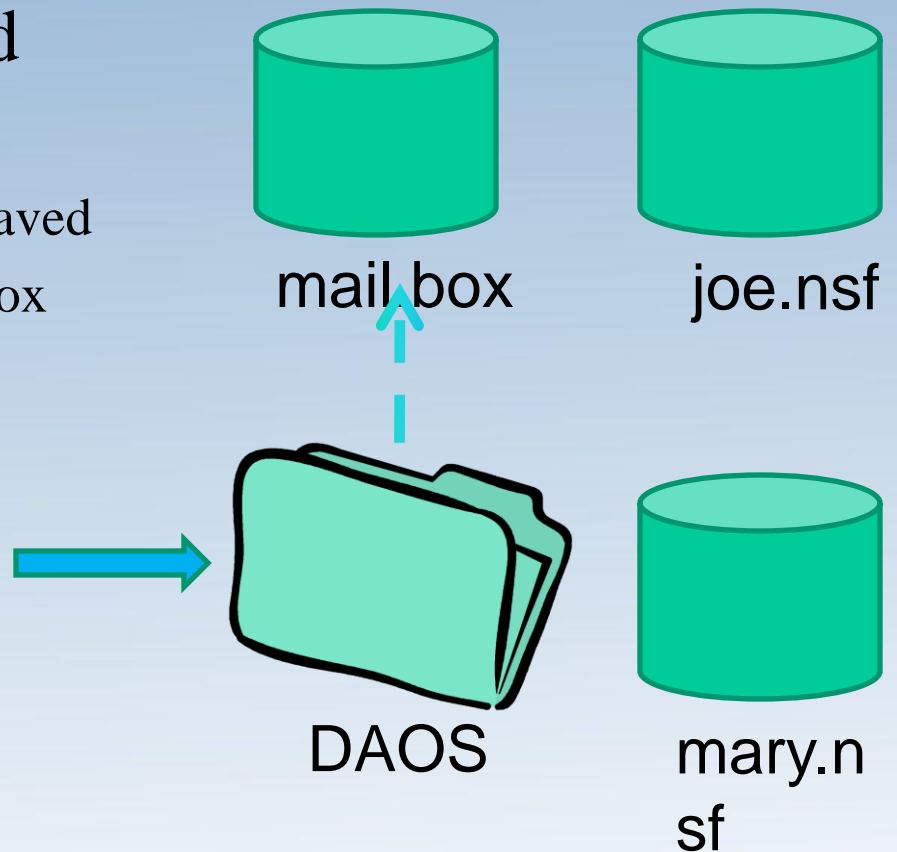
DAOS on Mail.Box

- Mail.box not DAOS enabled
 - On mail submission
 1. Deposited in mail.box
 - On delivery to Joe
 2. Read from mail.box
 3. Written to DAOS & saved
 4. Ticket written to joe.nsf
 - On delivery to Mary
 5. Read from mail.box
 6. Written to DAOS & discarded
 7. Ticket written to mary.nsf



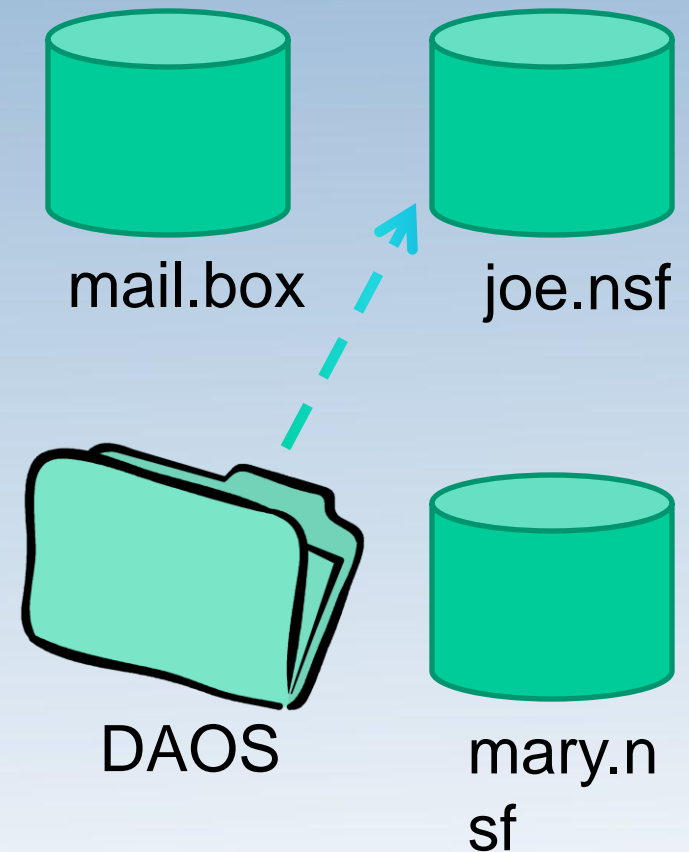
DAOS on Mail.Box

- Mail.box DAOS enabled
 - On mail submission
 1. Written to DAOS and saved
 2. Ticket written to mail.box



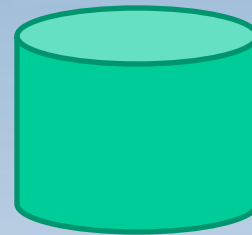
DAOS on Mail.Box

- Mail.box DAOS enabled
 - On mail submission
 1. Written to DAOS and saved
 2. Ticket written to mail.box
 - On delivery to Joe
 2. Ticket written to joe.nsf

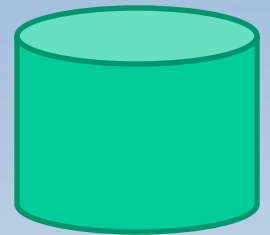


DAOS on Mail.Box

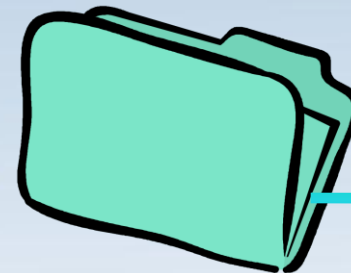
- Mail.box DAOS enabled
 - On mail submission
 1. Written to DAOS and saved
 2. Ticket written to mail.box
 - On delivery to Joe
 3. Ticket written to joe.nsf
 - On delivery to Mary
 4. Ticket written to mary.nsf



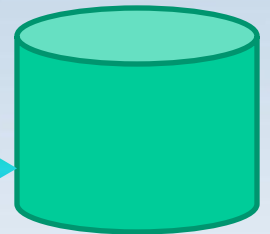
mail.box



joe.nsf



DAOS



mary.n
sf



DO ...

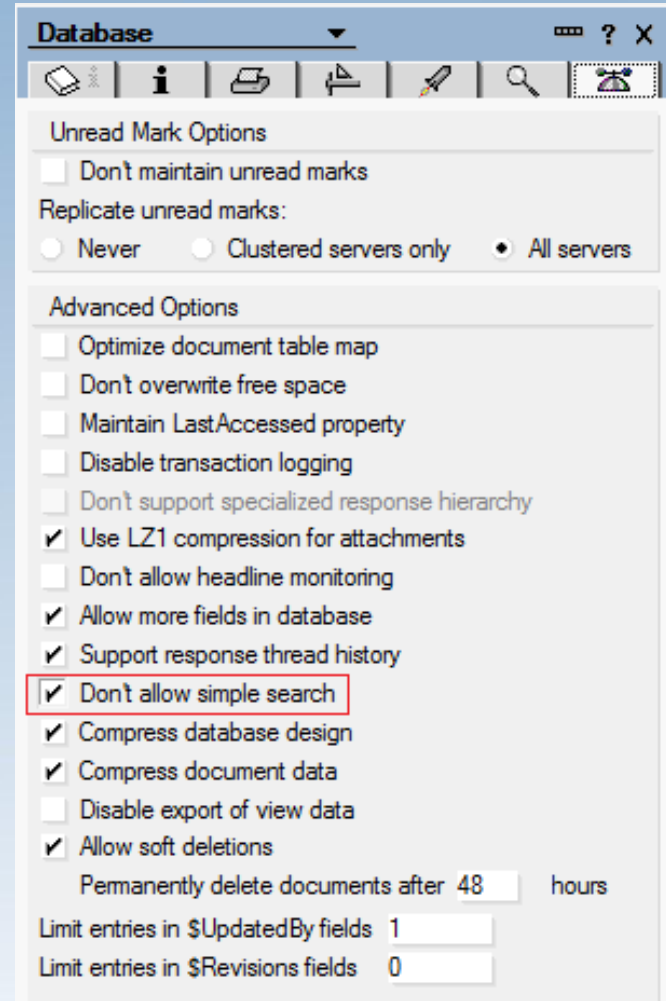
Get to the latest ODS level



Midwest Lotus User Group Conference 2011
Expanding Your Community Through Social Collaboration

Better Control of Search

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



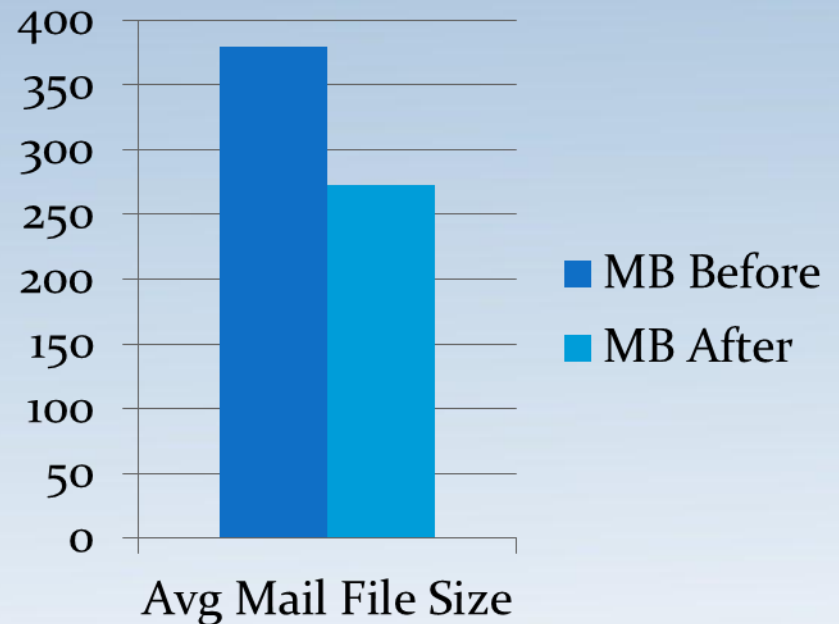
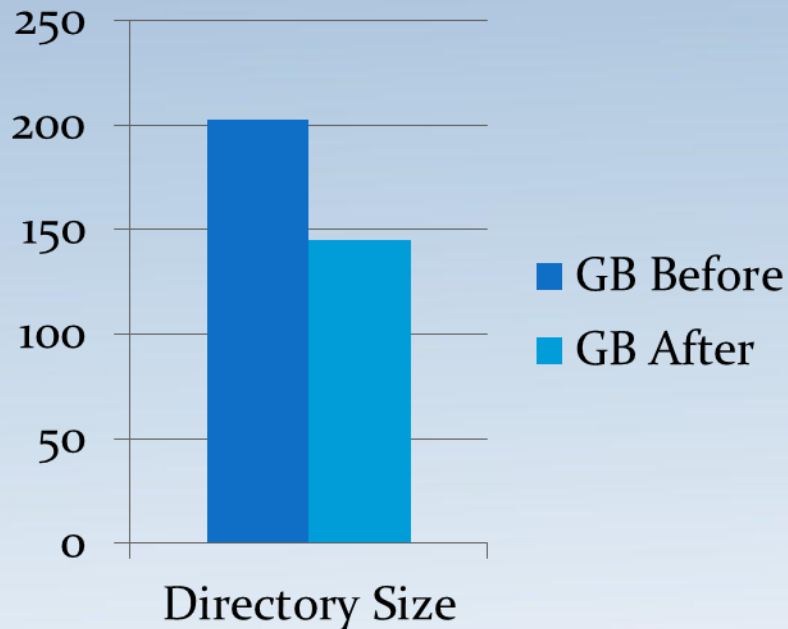
Database Performance Improvements

- Compress database design
 - Compresses design objects in a database
 - Mail files now start at 8 MB, not 18 MB
- Compress document data
 - Reduces size of all documents in a database
 - Real-life example:
 - www.bleedyellow.com/blogs/jonesy/entry/domino_8_0_1_compression
 - 533 mail files



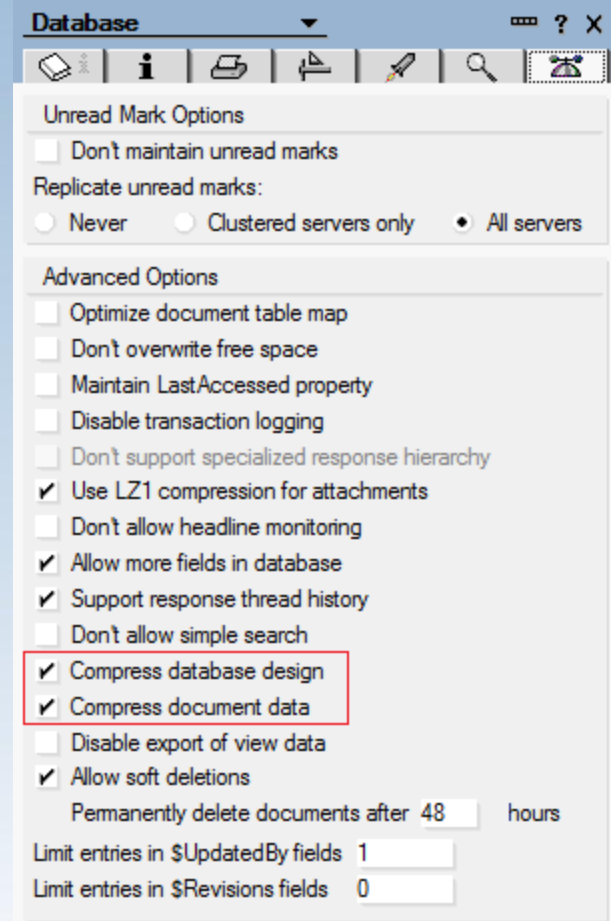
Database Performance Improvements

- Compress document data



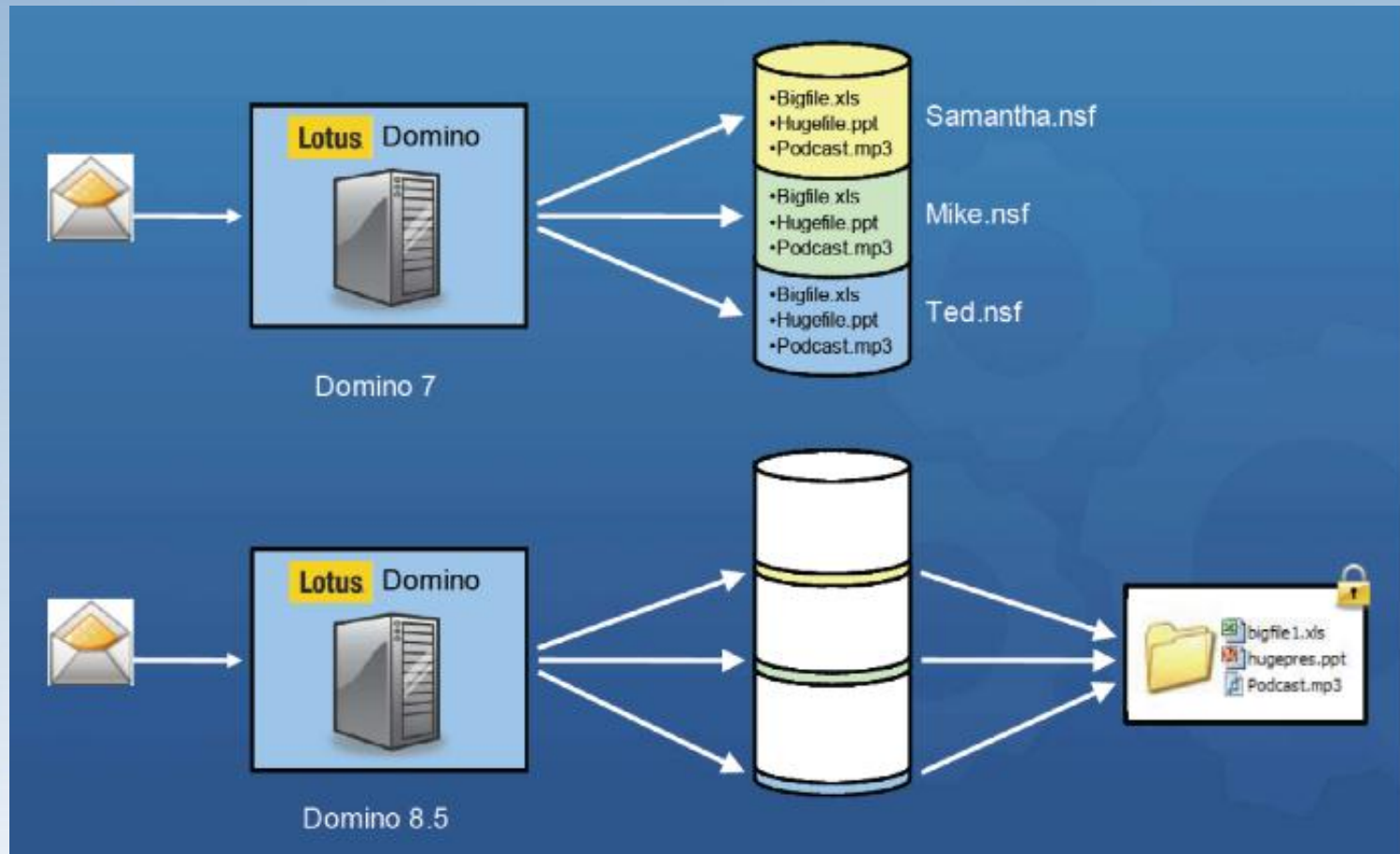
Database Performance Improvements

- Enabling ‘*compress database design*’ and ‘*compress document data*’
 - 1) Create_R85_Databases=1
 - 2) Enable database property
 - 3) Copy style compact (-C)



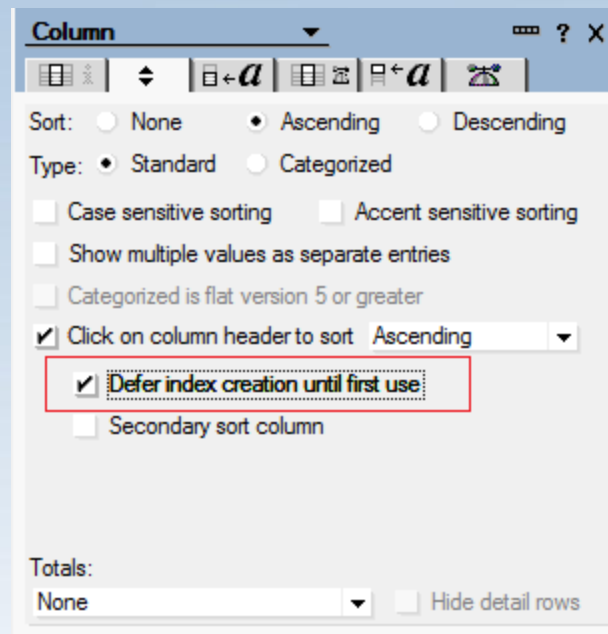
Database Performance Improvements

- DAOS saves on disk space and I/O



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



DON'T ...

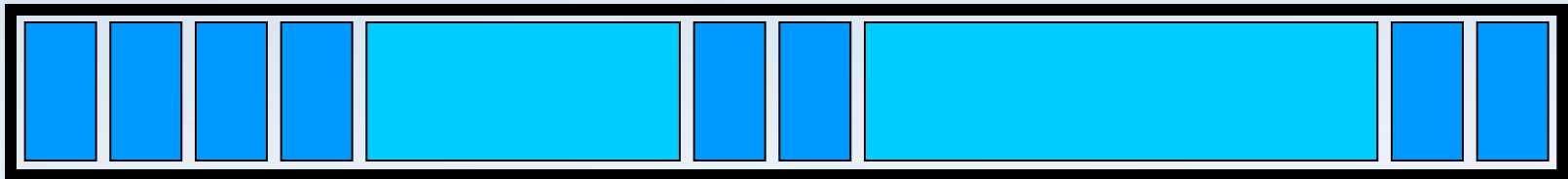
Mix mail and applications



Midwest Lotus User Group Conference 2011
Expanding Your Community Through Social Collaboration

Mixing Applications and Mail

- Where do you deploy applications?
 - Mail server
 - Application server
- Understand impact of updates
 - Update task works off queue
 - FIFO
 - Can get erratic performance



DO ...

Pay attention to data types



Lotus Enterprise Integrator (LEI)

- Think data types aren't important?
 - Think again!!
- Customer example
 - *Replication Conflict* Action: Update at Connector B; Mismatch in field 'QTYSHP'; Record Key values:
WHRLW3="G956105388117"



Lotus Enterprise Integrator (LEI)

- What happens during replication?

DB2	Notes
70.000	70
3.600	3.6
1.000	1
1142.756	1142.756
94.050	78.8

 Replication conflict

 Replication conflict

 Replication conflict

 OK, skipped

 Replication conflict



Lotus Enterprise Integrator (LEI)

- How do we fix this?
 - Change the field types to match

Original field types

- DB2
 - Packed
 - Field length 11,3
- Notes
 - Type = Number
 - Number format = Decimal
 - Decimal places = **varying**

New field types

- DB2
 - Packed
 - Field length 11,3
- Notes
 - Type = Number
 - Number format = Decimal
 - Decimal places = **3 fixed**



Lotus Enterprise Integrator (LEI)

- Now what do the data types look like?

DB2	Notes	
70.000	70.000	➡ OK, skipped
3.600	3.600	➡ OK, skipped
1.000	1.000	➡ OK, skipped
1142.756	1142.756	➡ OK, skipped
94.050	78.800	➡ Replication conflict



Lotus Enterprise Integrator (LEI)

- End result?
 - Original replication time
 - 1.5 hours
 - New replication time
 - 12 minutes

* Number of records replicated = ~200,000



DON'T ...

**Run with obsolete tuning
parameters**



Midwest Lotus User Group Conference 2011
Expanding Your Community Through Social Collaboration

Obsolete Tuning Parameters

- Important to remove obsolete tuning parameters
 - ConstrainedSHMSizeMB
 - ConstrainedSHM
 - PercentAvailSysResources



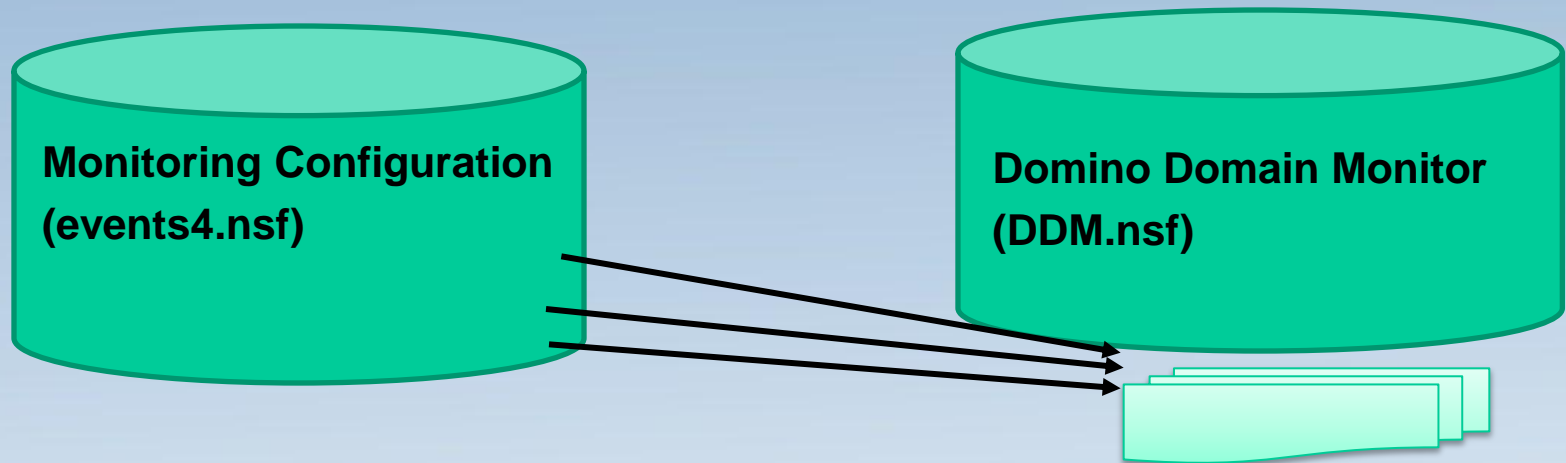
DO ...

**Use DDM probes to monitor
performance**



Midwest Lotus User Group Conference 2011
Expanding Your Community Through Social Collaboration

Domino Domain Monitoring (DDM)



Used for all Domino domain monitoring configuration

Domino domain monitoring probes generate Event report documents that get consolidated and reported into the new DDM database



Domino Domain Monitoring (DDM)

- Use probes to monitor performance
 - Probe type = Application Code
 - Probe subtypes
 - Agents behind schedule
 - Agents evaluated by CPU usage
 - Agents evaluated by memory usage
 - Long running agents

Processes to probe = **AMGR** or **HTTP**



Questions



Midwest Lotus User Group Conference 2011
Expanding Your Community Through Social Collaboration