

Domino Administration for Newbies - Part 2

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Kim Greene - Introduction

- Owner of Kim Greene Consulting, Inc.
 - www.kimgreene.com
- HCL Collaboration Solutions
- Services offered include:
 - System and application performance optimization
 - Administration
 - Upgrades
 - Troubleshooting
 - Health, performance, security, etc. reviews
 - Custom development
 - Enterprise integration
 - Migrations
- Blog: www.dominodiva.com



IBM CHAMPION 

 HCL Ambassador

Michelle Smith - Introduction

- Owner of an IT consulting company
 - M.E. Smith Consulting
- Started fixing IT issues during University work terms and learned I loved solving the 'puzzles'
- First exposure to Lotus Notes and Domino was migrating a non-Y2K compliant email environment to Domino
- Focus areas:
 - HCL Collaboration Solutions
- Work with Kim to support a group of amazing clients!



Previous Webinars You May Find Helpful

- Domino for Newbies – Administration, Part 1
 - <https://youtu.be/Ob2cy3pURlg>
- Domino without Downtime: The Clustering & DBMT Blueprint for Continuous Availability
 - <https://youtu.be/GOzVXfZq2Wo>
- Domino Administration: Things Lurking You May Not Be Aware of and How to Fix Them
 - <https://youtu.be/QHciciqsWdA>
- Deep Dive into Debugging Domino with the Divas and “the Dude”
 - https://youtu.be/yf2_NzSQIzk
- All slide decks can be found here:
 - <https://openntf.org/webinars>

Agenda

- Server tasks
- Console commands
- Policies
- Infrastructure
- Notes.ini maintenance
- Upgrade planning

Agenda

- Templates
- Language packs
- Semaphore timeouts
- Performance
- SSL certificate renewal
- What you should be doing and when

Server Tasks

- Perform critical administrative, routing and maintenance operations
- Most are set to start automatically via these notes.ini variables
 - ServerTasks=
 - SERVETASKS=Replica,Router,Update,AMgr,Adminp,Sched,CalConn,RnRMgr,POP3,HTTP,collect,LDAP,LEI
 - ServerTasksAtX=
 - SERVETASKSAT2=Updall
 - SERVETASKSAT19=Catalog
- **Tip:** To see which tasks start automatically, issue `SHOW CONF SERVETASKS*` at the console

```
SERVETASKS=Replica,Router,Update,AMgr,Adminp,Sched,CalConn,RnRMgr,CertMgr,LDAP,imap,TRAVELER
SERVETASKSAT1=Catalog,Design
SERVETASKSAT2=UpdAll
SERVETASKSAT5=Statlog
```

Server Tasks

- Can be run manually
 - Some examples
 - load updall
 - load design
- Can be scheduled via Program documents

Program: UPDALL

Basics Administration

Basics	Schedule
Program name: UPDALL	Enabled/disabled: Enabled
Command line: OpenLog.nsf -T CleanupAgentView	Run at times: 10:30 PM each day
Server to run on: Dorr	Repeat interval of: 0 minutes
Comments: 2020-11-11 (MS): Created to force the cleanup agent view to be refreshed before the agent starts in order to prevent the agent from pausing while it is rebuilt	Days of week: Sun, Mon, Tue, Wed, Thu, Fri, Sat

Server Tasks

- Messaging / Mail

- Router

- Routes and delivers mail between servers and mail files

- SMTP

- Handles outbound/inbound Internet mail

- MTC (Message Tracking Collector)

- Records routing data for message tracking

- IMAP / POP3

- Provide client access protocols to mailboxes

- Database Maintenance

- Updall

- Updates view indexes and full-text indexes

- Compact

- Reduces database size and reorganizes storage

- Fixup

- Detects and repairs database corruption

- Design

- Applies template updates to databases

Server Tasks

- Scheduling / Calendar
 - Calconn
 - Handles free/time scheduling requests between servers
 - Sched
 - Calendar scheduling services (availability lookups)
- Administration / Automation
 - AdminP
 - Automates administrative changes (rename, ACL updates, etc.)
 - AMgr (Agent Manager)
 - Executes scheduled and triggered agents
- Web / Client Access
 - HTTP
 - Enables web access (Verse, iNotes, apps)
 - LDAP
 - Provides directory services to LDAP clients
 - DIIOP
 - Enables Java/CORBA access to Domino data
- Directory / Infrastructure
 - Catalog
 - Maintains database catalog
 - Dircat
 - Builds and updates directory catalogs
 - Domidx
 - Provides domain-wide search indexing

Server Tasks

- Add-on Tasks
 - Run as a “service” within a given Domino server
- Examples:
 - Traveler
 - Mobile sync (mail, calendar, contacts)
 - Nomad
 - Delivered via HTTP + Domino services (no unique core task; uses HTTP stack)
 - HEI / LEI
 - Data integration (runs as add-in tasks / connectors)
 - HTMO
 - Outlook sync components (uses HTTP + mail services)
- Best to have these isolated (ex: don’t mix HTMO, Nomad, Traveler, ... with an Application or Mail server)

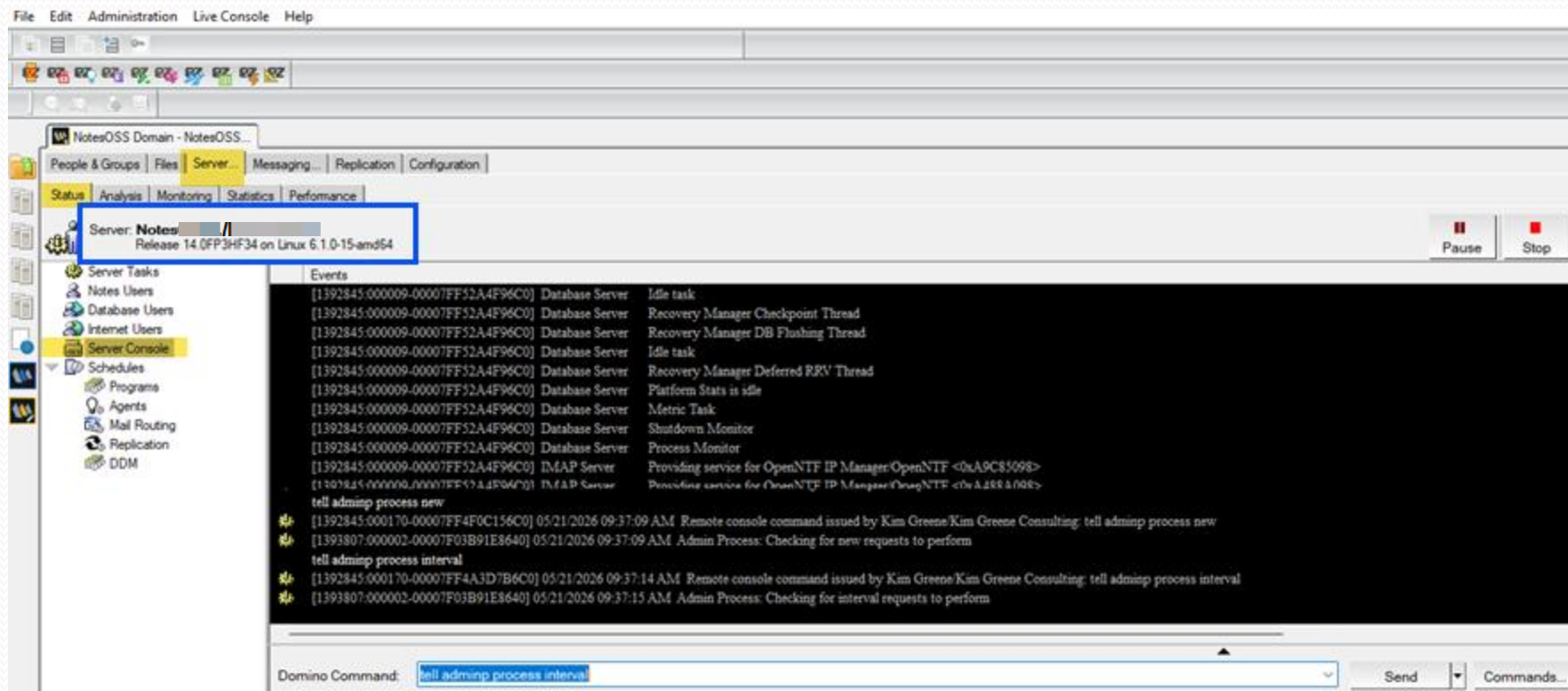
Console Commands

Console Commands

- Used to monitor and troubleshoot Domino server
- Provides real-time interaction with the server
- Command syntax
 - `command [task] [parameters]`
- Examples
 - `show server`
 - `tell router quit`
 - `load router`
 - `restart task http`

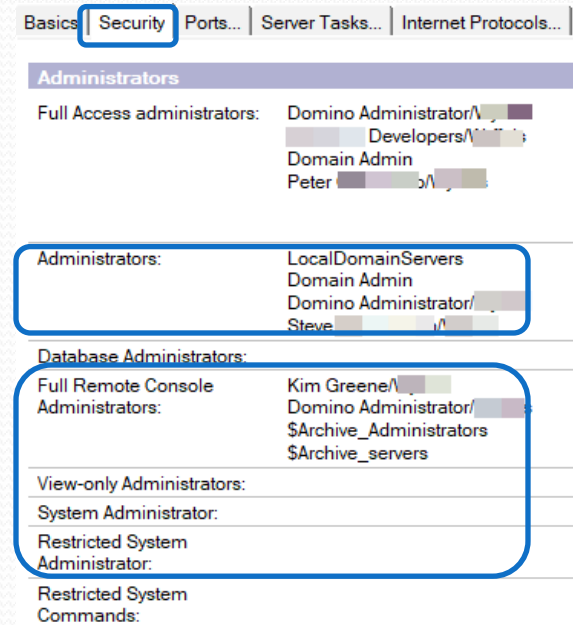
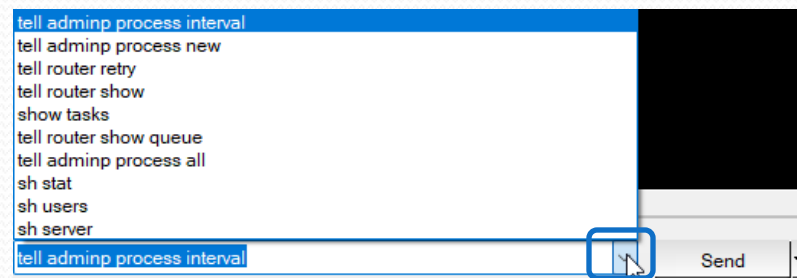
Console Commands

- Getting to the console - Domino Administrator client
 - [File -> Open Server ->] Server -> Status -> Server Console



Console Commands

- Issuing commands
 - Enter in “Domino Command:” prompt
 - Click the caret to display list of recent commands
 - Simply select a recent command to resubmit
- Tip:
 - Settings in Security section of Server document control who can work with the console



Common Console Commands

- Server status & monitoring

- show server
 - Displays server status (uptime, memory, load)
- show tasks
 - Lists all running server tasks
- show users
 - Displays active user sessions
- show stat
 - Displays server statistics
 - show stat <statistic>
 - Ex: show stat mail (mail-related stats)

- Task control

- load <task>
 - Starts a server task
 - Ex: load http
- tell <task> quit
 - Stops a running task
 - Ex: tell router quit
 - **Caution: quit ends the server!**
- restart task <task>
 - Restarts a service
 - Ex: restart task http



Common Console Commands

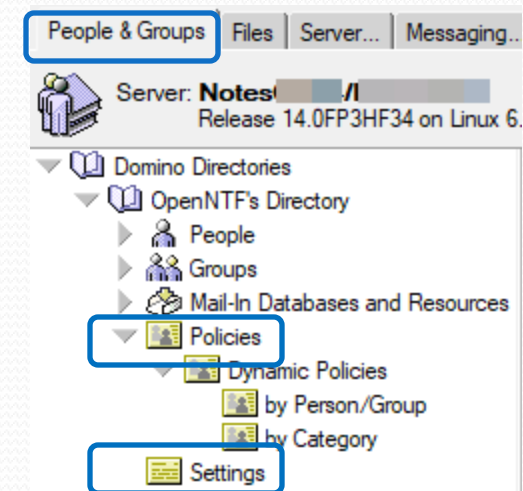
- Mail troubleshooting
 - tell router show
 - Displays mail routing status
 - tell router update config
 - Reloads routing configuration
 - tell router retry
 - Retries mail delivery queue
- Replication
 - replicate <server> <database>
 - Forces replication
 - Replicate
 - Runs all scheduled replications immediately
- Administration process
 - tell adminp process all
 - Processes all new & modified immediate, interval, daily and delayed requests
 - tell adminp process new
 - Processes newly created requests
 - Tell adminp process interval
 - Processes all immediate requests & those normally processed according to the Interval setting in the Server document
- Setting debug
 - set config <variable>
 - Ex: set config debugrouter=3
 - Remember to disable once done!
 - set config debugrouter=0

Policies

- Centralized way to manage user and client configurations
 - Define defaults, persistent values, and rules applied to:
 - Notes clients
 - Mail configurations
 - Security
 - Etc,
- Great way to enforce consistent configuration settings for users
- Flexible in how can be applied
 - Entire organization
 - Groups of users
 - Individuals

Policies

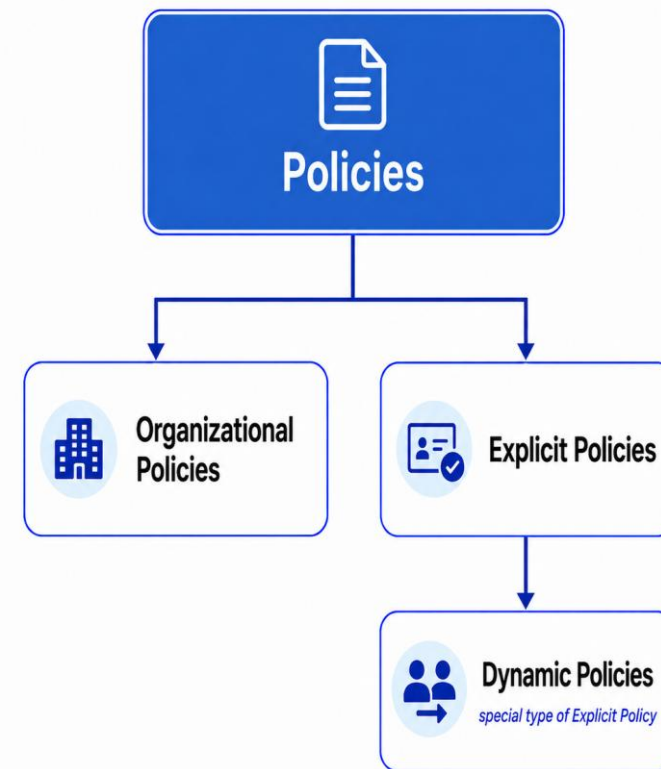
- Two types of documents associated with Domino policies
 - Policy document
 - Contains one or more policy Settings documents
 - Settings documents
 - Define values for specific client configurations (mail, security, registration, traveler, ...)
 - Linked to policy document(s)
- Managed in the Domino Directory via the Domino Administrator client
 - Most commonly via **People & Group -> Policies**



Types of Domino Policies

- Organizational
 - Applied to users based on hierarchy (O / OU)
 - Ex: */Sales/Acme, */Acme, ...
 - Use for enterprise-wide standards
- Explicit
 - Assigned to Users or Groups
 - On the Policy Assignment tab of the explicit policy document
 - Note: assigned this way makes it a 'Dynamic' policy
 - During user registration
 - By editing the user's Person document
 - By using the Assign Policy tool in the Domino Administrator client
 - Best reserved for:
 - Groups requiring specific settings (contractors, executives, IT department, ...)

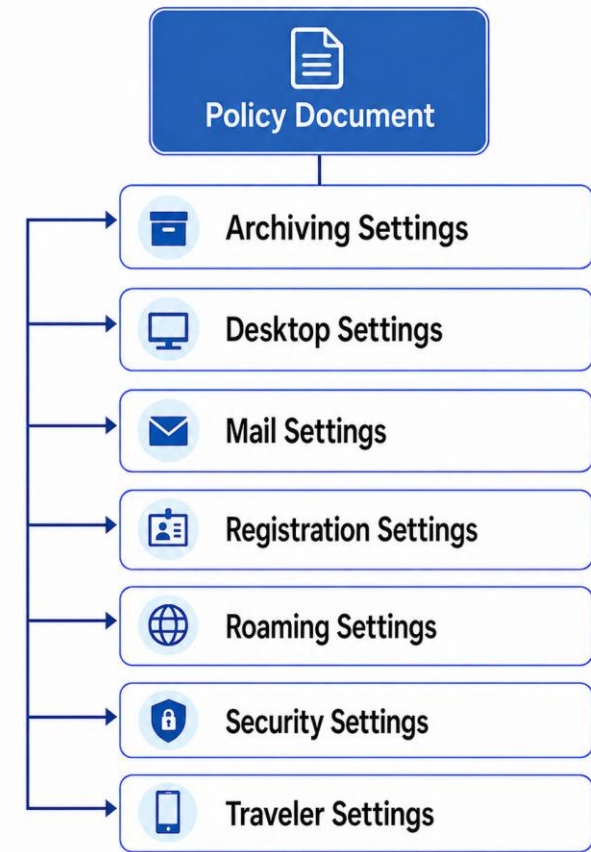
HCL Domino Types of Policies



Policies

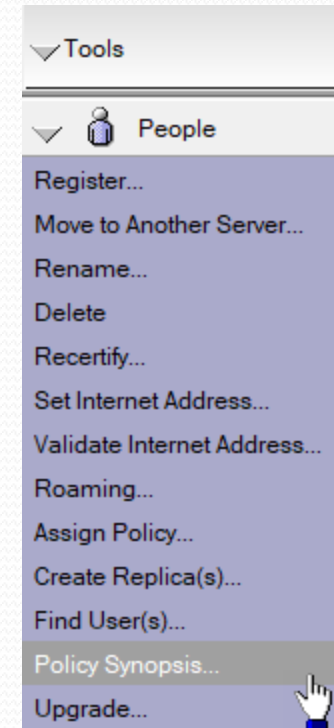
- Settings documents
 - Archiving Settings
 - Controls archive location (local or server)
 - Controls archive criteria
 - Desktop Settings
 - Controls Notes client UI (workspace, bookmarks), preferences and client behavior
 - Applied at setup and updated later
 - Mail Settings
 - Mail preferences, calendar behavior, delegation, ...
 - Registration Settings
 - Defaults for new user creation when registering users
 - Roaming Settings
 - Controls Notes roaming configuration settings
 - Security Settings
 - Controls password, execution control list (ECL), ID Vault and security options
 - Traveler Settings
 - Mobile sync settings and mobile device access

HCL Domino Policy Settings Hierarchy



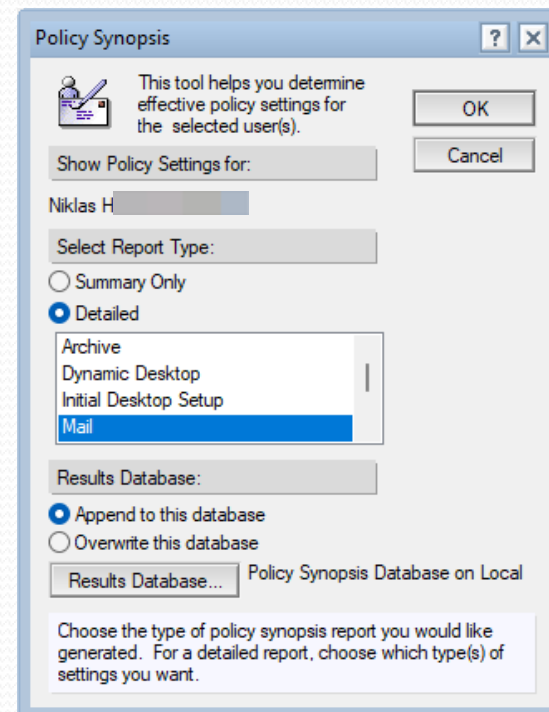
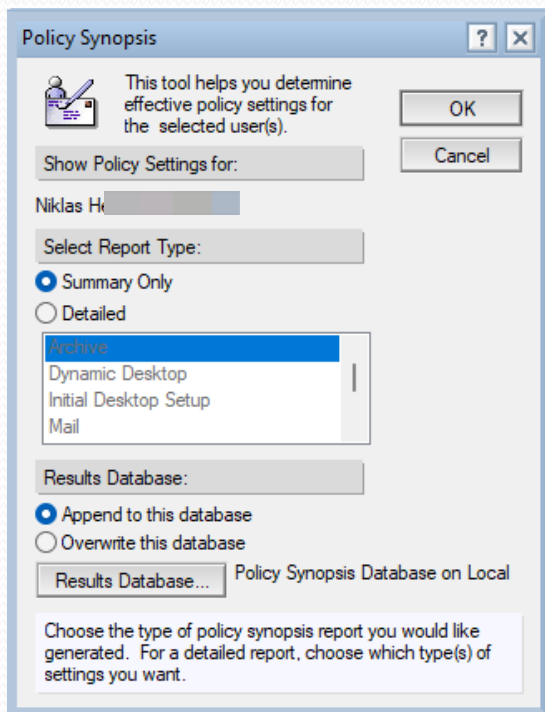
Policies

- Policy synopsis
 - Tool in the Domino Administration client
 - Use to determine effective policy settings for selected user(s)
 - Output is directed to Policy Synopsis Results database (POLCYSYN.NSF)
 - **Tip:** Store on Local rather than a server
 - Invoked via **People & Groups -> People -> Tools -> People -> Policy Synopsis**



Policies – Policy Synopsis - Report Types

- Summary only
 - Default
 - Provides an overall of all settings documents applied
- Detailed
 - Use for analyzing specific type(s) of settings
 - Select one of more settings types



Policies – Best Practices

- Use ...
 - Organizational policies for broad defaults
 - Dynamic policies for fine tuning
 - Explicit policies for exceptions
- Detail what each Policy and Settings document is intended to control in the 'Description' field
 - Ex:
 - “Default Settings for all Laptop Users”
 - “Default Registration Settings”

The image shows two overlapping screenshots of the Group Policy Editor. The left screenshot shows the 'Policy : /Mobile Laptop Users' configuration page with the 'Basics' tab selected. The right screenshot shows the 'Policy : /Mobile Laptop Users' configuration page with the 'Policy Assignment' tab selected.

Policy : /Mobile Laptop Users	
Policy name:	/Mobile Laptop Users
Policy type:	Explicit
Description:	Default Settings for all Laptop Users
Category:	

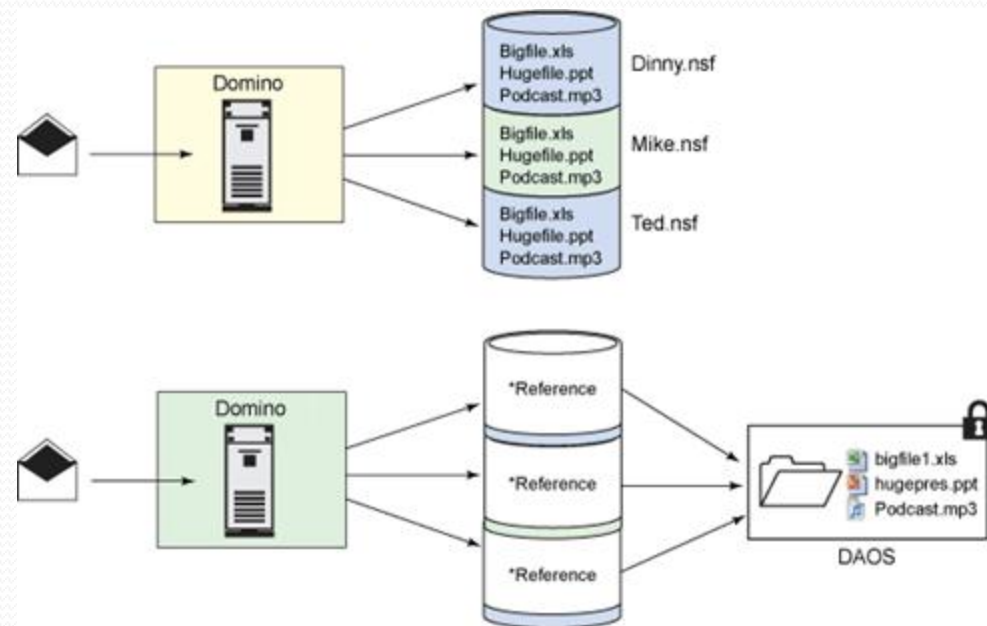
Policy : /Mobile Laptop Users	
Users and Groups	Policy - Mobile Laptop Users

Policies – Best Practices

- Test policy changes with small group of users
 - Remember to utilize the Policy Synopsis tool
- Review old policies regularly, especially when
 - Upgrading or retiring servers
 - Adding new sites or divisions

DAOS

- **Domino Attachment and Object Service (DAOS)**
- Separates attachments from NSF databases
- Stores attachments once in a shared repository
- Replaces attachments in documents with references (pointers)
- Attachments are stored as **Notes Large Object files**
- Can save a substantial amount of disk space



DAOS

- DAOS folder should be located outside Domino data directory
- Notes of caution
 - Do NOT manipulate the NLO files or the DAOS folders (unless instructed by HCL)
 - Set AV to not scan/act on DAOS folders and NLO files
- For online backups, ensure NSFs are backed up PRIOR to the NLOs
 - Ensures all objects referenced by the NSF (NLOs) are backed up

DAOS

- Tips for setting up
 - Choose whether or not to have NLOs encrypted with Server's ID
 - Use the DAOS Estimator to determine best attachment size
- DAOS catalog
 - Tracks object references and usage
 - Ensure have a Program Document to keep the DAOS catalog synchronized

Transactional Logging

- Logs changes before committing them to a database
 - Records all changes made to Domino databases in a separate log file
 - Captures each database “transaction” (e.g., create/edit/save document)
 - Writes changes to a sequential transaction log first, then to the database later
 - Uses a set of log files (TXN extents) and a control file to track activity
- Enable for data protection and faster recovery from crashes
- Reduces downtime by enabling faster server restarts

Transactional Logging

- Enables incremental backups, provided the backup solution has the capability
- Tip:
 - Make sure use a separate disk or equivalent if using a SAN

Basics | Security | Ports... | Server Tasks... | Internet Protocols... | MTAs... | Miscellaneous | **Transactional Logging** | Sh

Basics	
Transactional logging:	Enabled
Log path:	D:\DominoTransLogs
Logging style:	Circular
Use all available space on log device:	<input type="radio"/> Yes <input checked="" type="radio"/> No
Maximum log space:	4096 MB
Automatic fixup of corrupt databases:	Enabled
Runtime/Restart performance:	Standard

Quotas	
Quota enforcement:	Check file size when extending the file

Notes.ini Maintenance

- Don't leave debug enabled
 - Disable once issue debugging has been resolved
 - Otherwise consumes valuable resources
- Add comments when making changes
 - You will forget when and why debug was added
- Don't forget about the Configuration document!

Basics | Security | Client Upgrade | Router/SMT/ | MIME | **NOTES.INI Settings** | HCL iNotes |

NOTES.INI Settings

Current parameters:CLUSTER_ADMIN_ON =1
CLUSTER_REPLICATORS=2
CONSOLE_LOG_ENABLED=1
CONSOLE_LOG_MAX_KBYTES=102400
Create_R9_DATABASES=1
DEFAULT_INDEX_LIFETIME_DAYS=14
DISABLE_BCC_GROUP_EXPANSION=1
DONT_CACHE_MONITOR_FORMULAS=1
FTG_USE_SYS_MEMORY=1
HTTPJVMMMaxHeapSizeSet=1
HTTPJVMMMaxHeapSize=512M
PORTS=TCPIP
SERVER_SESSION_TIMEOUT=30
SERVER_TRANSINFO_RANGE=12
UPDATE_FULLText_Thread=1
=1

Upgrade Planning Steps

1. Inventory current environment

- Servers/VMs running Domino on
- Domino release levels, fix packs, interim fixes, hotfixes
- Determine order in which want to upgrade

- Example

Domino Server	Upgrade Order
DomMail01	2
DomMail02	3
DomMail01HA	1
DomTrav	4
DomNomad	5

- Where are servers located?
- Who will upgrade?

Upgrade Planning Steps

2. Reference “System Requirements” document to determine if
 - Hosting system will support version upgrading to
 - Compatible OS level is being used
 - Found here: https://support.hcl-software.com/csm?id=kb_article&sysparm_article=KB0073794
 - Click link for desired release

Content

See the following articles for detailed system requirements for recent HCL Domino releases. These requirements list supported operating systems, system requirements, prerequisites, and optional supported software.

Domino 14.5.1

[System Requirements for HCL Domino 14.5.1](#)

Domino 14.5

[System Requirements for HCL Domino 14.5 Fix Pack 1](#)

[System Requirements for HCL Domino 14.5](#)

Domino 14

[System Requirements for HCL Domino 14.0 Fix Pack 5](#)

[System Requirements for HCL Domino 14.0, and 14.0 FP1, FP 2, FP3, and FP4](#)

Domino 12

[System Requirements for HCL Domino 12.0.2 and 12.0.2 FP1, FP2, FP3, FP4, FP5, FP6, FP7, and FP8](#)

Upgrade Planning Steps

- Locate operating system details

Operating Systems

OS	Hardware	Bitness
Windows Server 2019, 2022, 2025* (All editions)**	x86-64	64-exploit
IBM AIX*** 7.2 TL5+**** SP5+	Power9	64-exploit
IBM AIX*** 7.3 TL1+	Power9, Power10	64-exploit
IBM i 7.4, 7.5, 7.6	Power9, Power10	64-exploit, 128-bit pointers
Red Hat Enterprise Linux (RHEL) Server 9.0+, 10.0+ *****	x86-64	64-exploit

- Locate hardware details (disk space, memory)
 - Keep in mind, these are “bare” minimums

Upgrade Planning Steps

3. Reference “What’s New” documentation for the release upgrading to
 - Example below for 14.5.1
 - <https://help.hcl-software.com/domino/14.5.1/admin/>

What's new in 14.5.1?

HCL Domino 14.5.1 introduces these new features and enhancements.

General updates

Domino v14.5.1 includes component upgrades and other enhancements.

Configuration features

Domino 14.5.1 provides the following features and enhancements related to configuring users and servers.

Security updates

Security features and enhancements in Domino 14.5.1.

Administration features

Domino 14.5.1 provides the following new features and enhancements related to administering.

XPages: Support for multiple file uploads

The XPages file upload UI now supports multiple selections by default.

Upgrade Planning Steps

4. Determine if using Auto Update or doing upgrade Manually

- Auto Update (Windows, Linux and AIX)
 - Introduced in Domino 14
 - Notifies, downloads, distributes updates
 - Updates the software catalog database (autoupdate.nsf)
 - Installation of updates starts in version 14.5
 - Windows and Linux only
- AutoUpdate resources
 - HCL Domino v14 Deep Dive – Auto Update
 - <https://www.youtube.com/watch?v=AT1tDzMDoPA>
 - OpenNTF Webinar – Domino 14.5 AutoInstall Deep Dive
 - https://www.youtube.com/watch?v=pE_5FzgMKds

Upgrade Planning Steps

5. Obtain necessary hotfix(es)

- What is a hotfix?
 - Custom patch issued by HCL to fix a specific problem
- Only one hotfix can be installed per server
- Contact HCL Support to:
 - Determine if hotfix is included in a Fix Pack (FP)
 - If not, obtain new hotfix to work with Domino release and FP upgrading to

Upgrade Planning Steps

6. Verify compatibility with extended products
 - Check prerequisites for extended products
 - Traveler
 - Enterprise Integrator (LEI / HEI)
 - HTMO
 - Nomad

7. Verify compatibility with 3rd party add-on products
 - Check with vendor to ensure planned release is supported
 - Spam, anti-virus, mail signature, etc.

Upgrade Planning Steps

8. Plan when to upgrade the Domino Directory design
 - Upgrade when server is upgraded?
 - What impact does this have on other servers?
 - Upgrade at a later time?

9. Plan when to upgrade the mail template(s)
 - Any customizations will need to be carried forward

Upgrade Planning Steps

10. Review template customizations

- Have any customizations been made to HCL-supplied templates?
- Will custom templates inherit new design or must new templates be created and deployed?
- Have default ACL entries been modified?

Upgrade Planning Steps

11. Plan for the new On-Disk Structure (ODS) level, if applicable

- On-Disk Structure defines how data is stored inside an NSF and feature/functions available
 - Most major releases have a new ODS level
 - New features provided with each ODS level
- A few examples:

Release Level	ODS Level	Examples of functionality enhancements
5.0	ODS41	Participate in transactional logging
8.0	ODS48	Design & document compression
8.5	ODS51	Participate in DAOS
9.0.1	ODS52	Numerous performance improvements
10.0.x	ODS53	Maximum database size increased from 64 GB to 256 GB
12.0.x 14.0.x 14.5.x	ODS55	Increase in allowed ACL entries & size allowed for individual summary fields

Upgrade Planning Steps

12. Review notes.ini file(s)

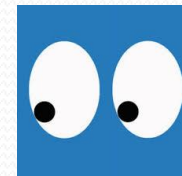
- Any debug needing to be disabled?
- Any settings no longer needed?

13. Plan for upgrading the Notes clients

- Two versions: Standard and Basic

14. Plan to test custom applications at new release

- Most over looked step!!
- Remember to plan for testing upgrade to BOTH Client and Server levels



Upgrade Planning Steps

15. Obtain Domino installation media (if doing manual upgrade)

- Download from My HCLSoftware Portal
- <https://my.hcltechsw.com/downloads>
- Click 'HCL Domino' -> 'Domino'
- Choose the appropriate release

Releases

14.5.1	14.5	14.0	12.0.2	12.0.1	11.0.1
--------	------	------	--------	--------	--------

Name	Released
14.5.1 Interim Fix 1	20 May 2026
14.5.1	19 Mar 2026

- Click on the appropriate links to download the required software

Releases

14.5.1	14.5	14.0	12.0.2	12.0.1	11.0.1
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Name	Released
14.5 Fix Pack 1	29 Sep 2025
14.5	17 Jun 2025

Templates

- What is a template?
 - A “blueprint” used to create or update the design of one or more databases
- Why use templates?
 - **Consistency:** Databases created from the same template have the same forms, views, agents, actions, and design structure
 - **Efficiency:** Design updates can be applied broadly without manually editing every database
 - **Standardization:** Mail files, system databases, and custom applications can follow a known approved design
 - **Controlled Change Management:** Template updates can be developed, tested, approved, and then deployed

Templates

- NSF = **Notes Storage Facility**

 - Domino application/database (mail file, custom application, ...)
 - Contains both design and data

- NTF = **Notes Template Facility**

 - Contains design only

- Many templates ship with a Domino server (HCL Standard Templates)
 - Domino directory, mail templates, discussion database, document library, ...

Templates

Template .vs. Database

- A database should have:
 - File extension of **.nsf**
 - Property set:
 - Database Properties -> Inheritance -> Inherit Design from Master Template -> Template Name
- A template should have:
 - File extension of **.ntf**
 - Property set:
 - Database Properties -> Database file is a master template -> Template Name

Templates

Database

Database

Title: My Old Mail File

Server: Local

Filename: MyOldMailFile.nsf

Type: Standard

Settings: Archive Settings, Encryption Settings, Replication Settings, Replication History

Web Access:

- Use JavaScript when generating pages
- Require SSL connection
- Don't allow URL open
- Enable enhanced HTML generation
- Don't allow open in HCL Client Application Access

Disable background agents for this database
 Allow use of stored forms in this database
 Display images after loading
 Allow document locking
 Allow connections to external databases using DCRs
 Inherit operating system theme from Notes preferences

Database

Design is not hidden

Options:

- Allow design locking
- List in Database Catalog
- Categories: _____
- Show in 'Open Application' dialog
- Include in multi-database indexing
- Do not mark modified documents as unread
- Mark parent note on reply or forward

Inheritance:

- Inherit design from master template
- Template name: StdR11Mail
- Template version is 11.0.1 (2020-02-07)

Refresh design on admin server only
 Database file is a master template
 Template name: _____
 List as advanced template in 'New Application' dialog
 Copy profile documents with design
 Single copy template

Multilingual Options

Template

Database

Title: Mail (R11.0.1)

Server: Local

Filename: mail11.ntf

Type: Standard

Settings: Archive Settings, Encryption Settings, Replication Settings, Replication History

Web Access:

- Use JavaScript when generating pages
- Require SSL connection
- Don't allow URL open
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- Don't allow open in HCL Client Application Access

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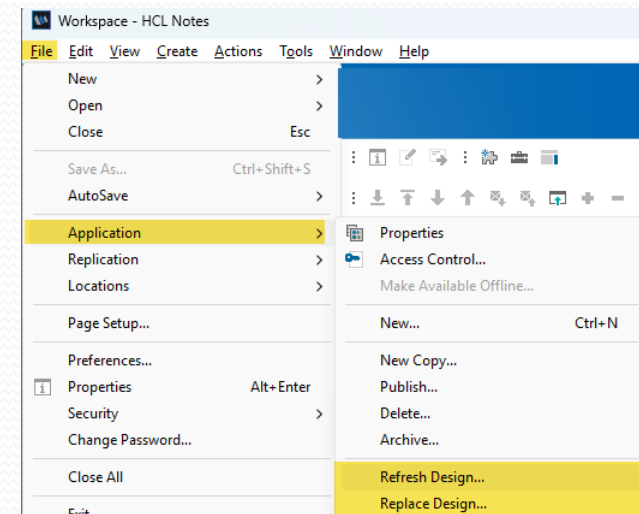
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Multilingual Options

Templates

Design Inheritance

- When a database is set to Inherit from a template, changes will take effect:
 - Automatically when the Design task runs on the server
 - Manually from the console with a **Load Convert** command
 - Manually in the Notes Client or the Domino Administrator Client
 - Select the database
 - Click **File -> Application**
 - **Refresh Design...** or
 - **Replace Design...**

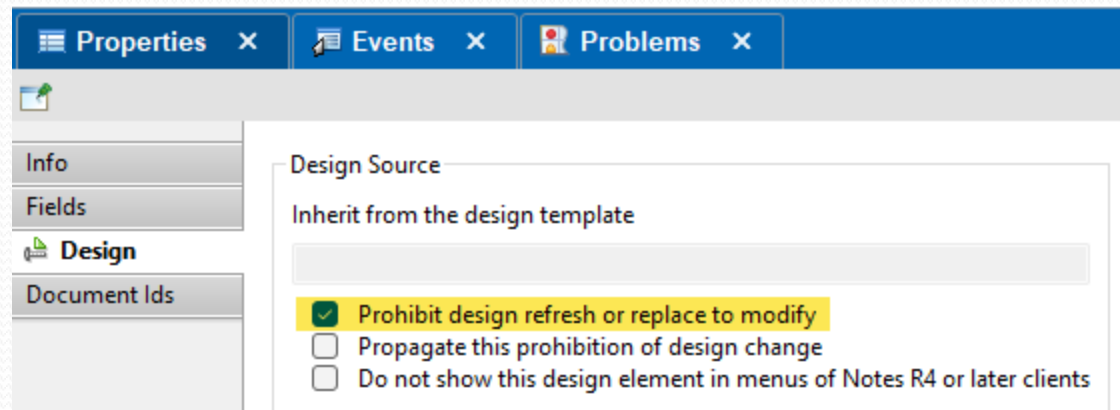


Templates

- Refresh Design
 - Updates design elements for a database whose design is linked to a template
 - Can preserve customized design elements
- Replace Design
 - Replaces the database design with the selected template
 - Same template or a different template
 - Can overwrite customizations

Templates

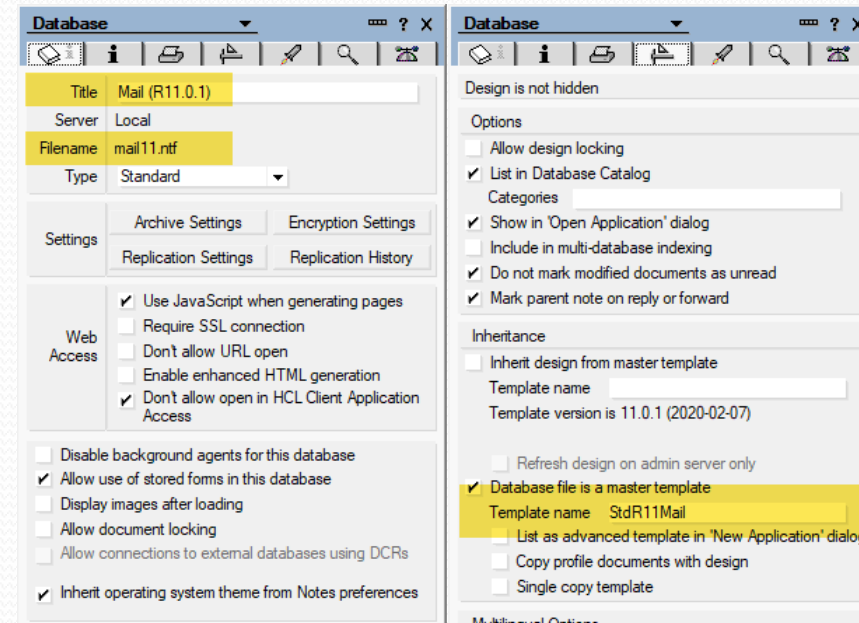
- "Prohibit design refresh or replace to modify"
 - Design elements can have this property checked
 - Can lead to unexpected results when a Design Refresh or Replace is performed
- **Tip:** Open in Designer client to confirm



Templates

Template Title .vs. Template Name .vs. Filename

- This can confuse new Administrators
- In the example, we have:
 - Template Title: **Mail (R11.0.1)**
 - Template Name: **StdR11Mail**
 - Filename: **mail11.ntf**



Templates

- Performing a Load Convert
 - Syntax: `load convert <database-path> <current-template-name> <new-template-file>`
- For mail template upgrades on a single mail file:
 - `load convert mail\MyOldMailFile.nsf * mail14.ntf`
- For mail template upgrades on multiple mail files:
 - Only update the mail files that have a specific template:
 - `load convert mail*.nsf StdR11Mail mail14.ntf`
 - Update all mail files in the mail directory, regardless of the current template used:
 - `load convert mail*.nsf * mail14.ntf`

Templates

- Best Practices
 - Never edit standard HCL templates directly
 - Make a copy of the template if customization is required
 - Give the new template a new Template Name
 - Test template changes before applying broadly
 - Back up databases before major design changes
 - Document any customized templates

Language Packs

- Default language is English
- Can replace English or install additional languages
 - Most common is to Add additional languages
- Allows administrators to add translated
 - Templates (mail, discussion, document library...)
 - Can customize which templates are updated
 - Help files
 - Core binary files

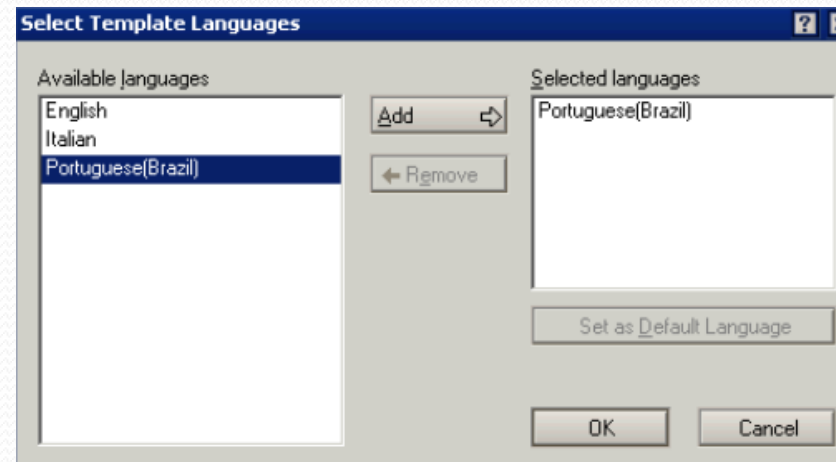
Language Packs

- Server
 - Modifies HCL supplied templates and web rendering
 - Can customize which templates to update
- Client
 - Multilingual User Interface (MUI)
 - Changes language of menus, buttons & sidebars with Notes client
 - OS provides local language functions for keyboard
 - Translates templates to local language

Language Packs

- Convert tool
 - Used to replace database's design to a specific language
 - load convert -g"language"
 - load convert -g"German" mail/kgreene.nsf * mail14.ntf
 - load convert -g"ChineseSimplified" mail/msmith.nsf * mail12.ntf

- Replace design option
 - **File -> Application -> Replace Design**
 - Select language in dialog box



Language Packs

- Select “Preferred Language” when registering a user

The screenshot shows a software dialog box titled "Register Person -- New Entry". On the left is a navigation pane with tabs: Basics, Mail, Address, ID Info, Groups, Roaming, and Other (which is selected). The main area contains several input fields and dropdown menus. A blue box highlights the "Preferred language:" dropdown menu, which is open to show a list of languages including Afrikaans, Albanian, Arabic, Arabic (Algeria), Arabic (Bahrain), Arabic (Egypt), Arabic (Jordan), Arabic (Kuwait), Arabic (Lebanon), Arabic (Morocco), Arabic (Oman), Arabic (Qatar), Arabic (Saudi Arabia), Arabic (Syria), Arabic (Tunisia), Arabic (United Arab Emirates), Arabic (Yemen), Bulgarian, Byelorussian, Catalan, Chinese (China), and Chinese (Hong Kong SAR). Other visible fields include "Setup profile" (set to "(None Available)"), "Unique org unit:", "Location:", "Local administrator:", "Comment:", "Alternate name language:" (set to "(None)"), "Alternate name:", "Alternate org unit:", and "Advanced" (checked). At the bottom, there are buttons for "Register All", "Options...", "Views...", and "Done".

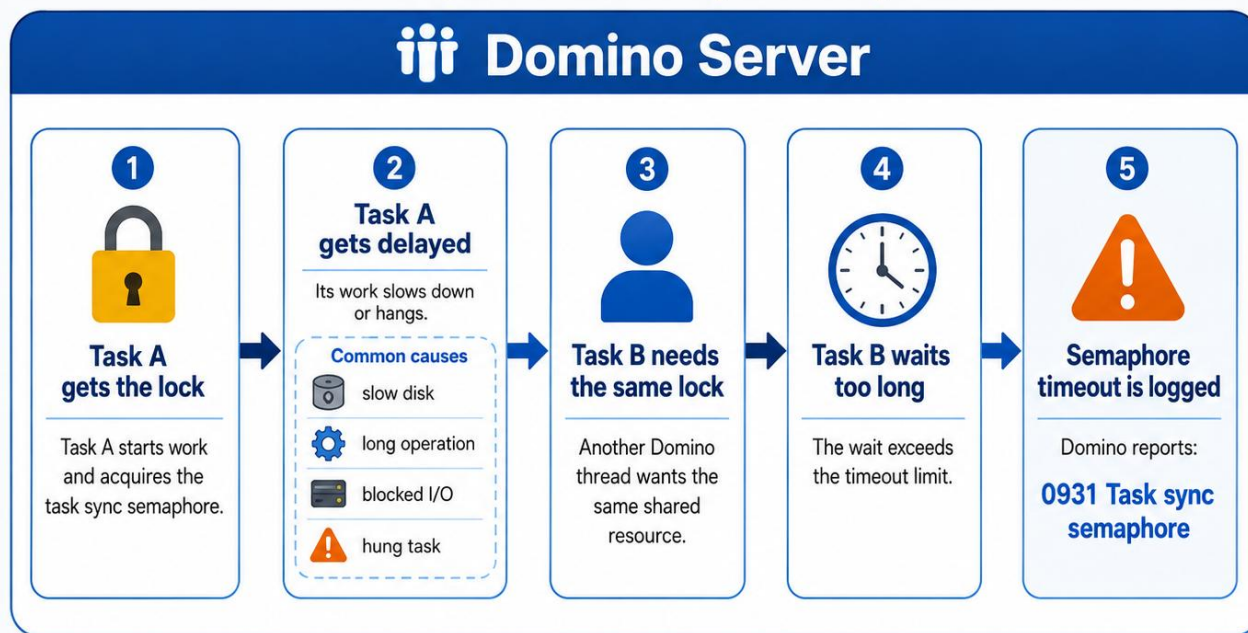
Semaphore Timeouts

- What is a semaphore?
 - Mechanism used to control access to shared resources
 - Ensures
 - Data consistency
 - Controlled access to databases, memory and processes
 - Like a traffic light
 - Only one thread uses a resource at a time
 - Others must wait in a queue

Semaphore Timeouts

How a Semaphore Timeout Happens

Example: 0931 Task sync semaphore



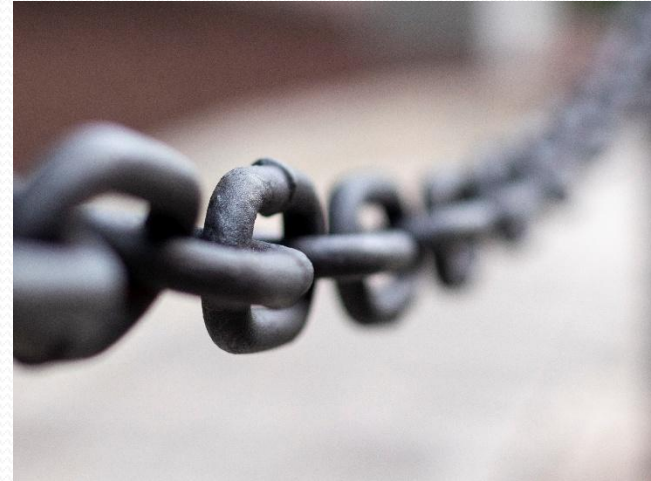
What this means

Usually the timeout is a symptom.

The real issue is that **Task A held the lock too long.**

Semaphore Timeouts

- What is a semaphore timeout?
 - A thread wait too long for a resource
 - 30 seconds or longer
- When does it matter?
 - Impacts performance
 - Slow or unresponsive behavior
 - Resource contention
 - Many tasks competing for same resource
 - Dead locks
 - Extreme impact to server performance



Semaphore Timeouts

- Deadlocks
 - Two or more threads waiting on each other or the same resource
 - End result = system appears “hung”
- Determining if semaphore timeouts are happening
 - `sh stat sem`
 - If none exist:
 - SEM not found in server statistics table
 - If timeouts exist, Sem.Timeouts= contains list of semaphore timeouts
 - Sem.Timeouts = 4A12:265 1120:126 2B06:86 1136:85 117C:44 1135:25 BAE4:8 0931:1



Semaphore Timeouts

- Understanding 'sh stat sem' output
 - Sem.Timeouts= xxxx:yyy
 - xxxx = semaphore timeout number
 - :yyy = number of times semaphore has happened since last server restart
- Normal to see zero to a handful of semaphore timeouts on a healthy server
- When to be concerned
 - :yyy is a high number
 - OR
 - :yyy is quickly climbing in value

Semaphore Timeouts

- When to be concerned
 - Customer example
 - Reports server is hung
 - Server tasks are still active
 - Number of semaphore timeouts climbing quickly, 'sh stat sem' shows
 - Initially shows: Sem.Timeouts = 042D:15518
 - 20 seconds later: Sem.Timeouts = 042D:15596
 - **78 new semaphore timeouts in a 20 second time range!**
 - 042D identifies **LSIWRAP SHARED SEMAPHORE**
 - Relates to the LotusScript Wrapper—meaning a script, agent, or Domino-integrated Java function is deadlocked or taking too long to execute

Performance – Where to Start?

- Know what's “normal”
- Start with system level performance
- Focus on key Domino statistics
- Understand impact of semaphore timeouts

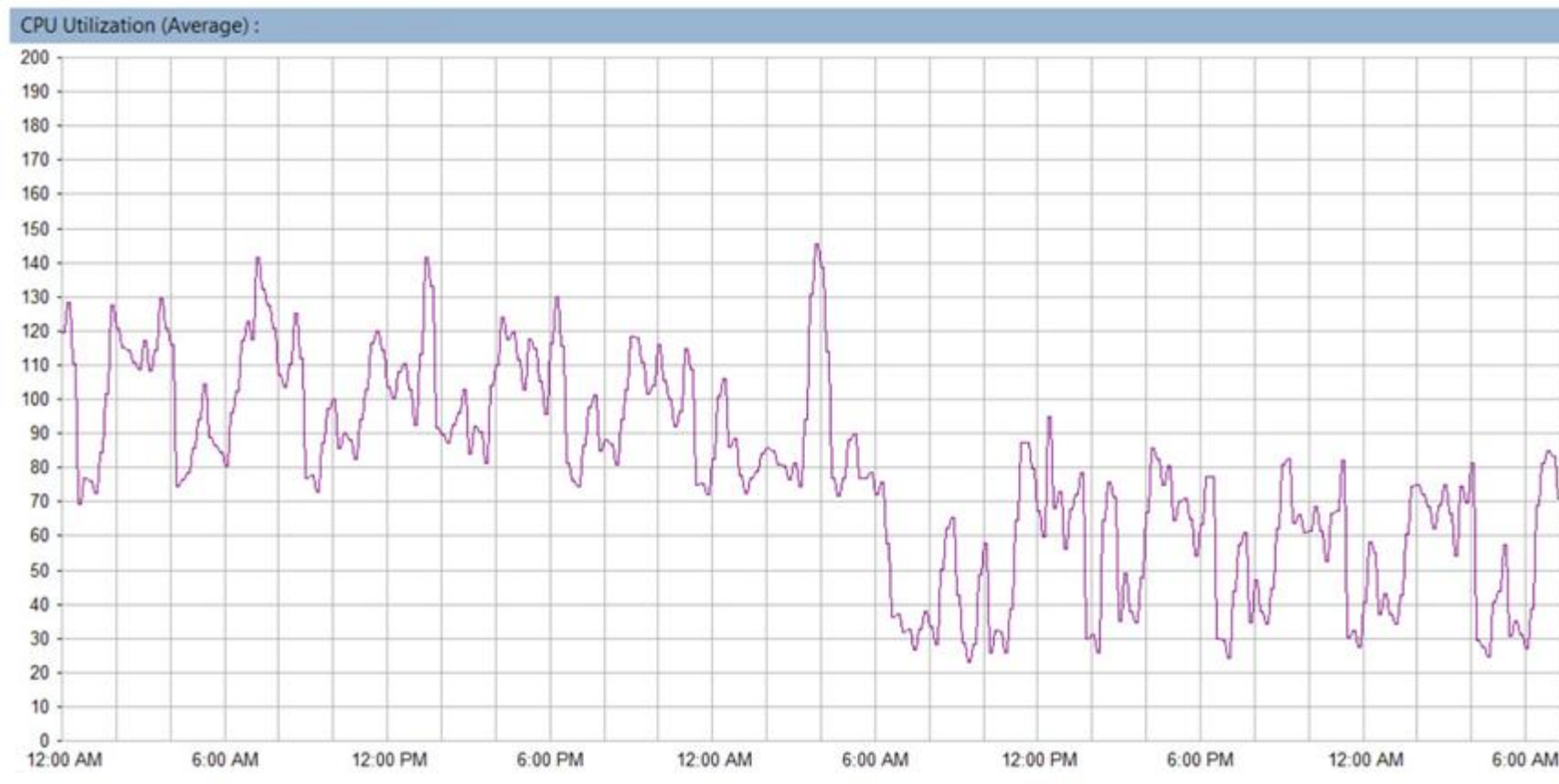
Performance – System Statistics

- Need tool to gather statistics for system as a whole
- Capture statistics on:
 - CPU
 - Memory
 - Disk I/O
 - Network I/O
- Some examples
 - Perfmon
 - Perfpmr
 - nmon
 - Vstat
 - Collection Services
 - iostat
 - netstat



Performance – System Memory Example

- Impact on CPU by properly optimizing system memory allocation



Performance – Impact of Disk Configuration

- Windows server example
 - Pages/Sec: rate memory pages are read from or written to disk

	Pages/Sec		
	Average	Minimum	Maximum
Non-SSD	509.532	0.000	57655.272
SSD	15142.617	9.426	358717.153

- ~2872% increase in average pages/second with SSD
- Page Faults/Sec: rate at which processes request memory pages not immediately available in their working set

	Page Faults/Sec		
	Average	Minimum	Maximum
Non-SSD	22586.549	14.238	400898.185
SSD	515.820	0.000	25800.639

- ~98% reduction in average page faults/second

Performance – Domino Statistics

- Collect statistics regularly
 - sh stat
 - To limit to specific area (examples):
 - sh stat database (309 stats)
 - sh stat http (50 stats)
 - sh stat mail (179 stats)
 - sh stat platform (224 stats)
- Critical areas of focus:
 - Domino memory management
 - Mail statistics
 - Cache sizes
 - Transaction rates

```

Database.DAFailoverCount = 0
Database.DARefreshServerInfoCount = 24
Database.DAReloadCount = 64
Database.Database.BufferPool.Maximum.Megabytes = 1024
Database.Database.BufferPool.MMM.Reads = 84
Database.Database.BufferPool.MMM.Writes = 789
Database.Database.BufferPool.Peak.Megabytes = 1023
Database.Database.BufferPool.PerCentReadsInBuffer = 99.5
Database.DbCache.CurrentEntries = 175
Database.DbCache.DatabaseLinkEntries = 0
Database.DbCache.HighWaterMark = 181
Database.DbCache.Hits = 782414
Database.DbCache.InitialDbOpens = 815596
Database.DbCache.Lookups = 30832218
Database.DbCache.MaxBucketLength = 2
Database.DbCache.MaxEntries = 3072
Database.DbCache.NumBuckets = 3079
Database.DbCache.NumBucketsUsed = 164
Database.DbCache.OvercrowdingRejections = 0
Database.DbCache.Size = 10003
  
```

```

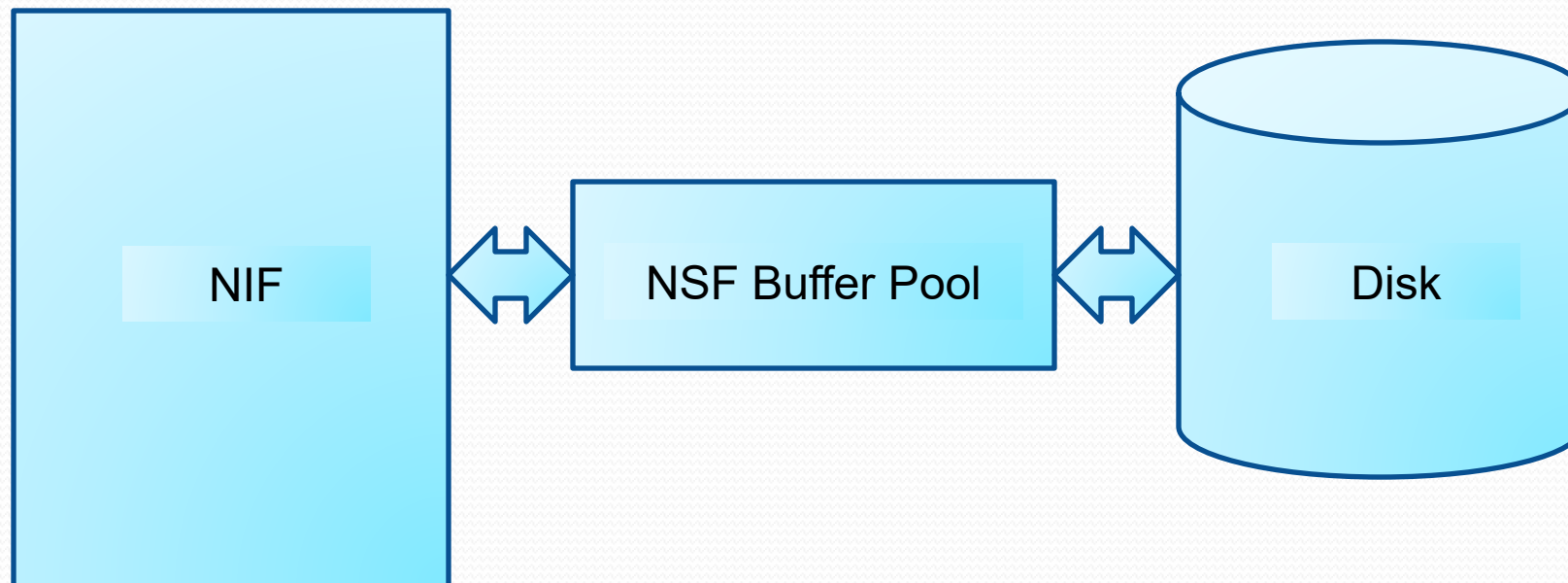
Http.MaxConnections = 2000
Http.PeakConnections = 2000
Http.Workers = 400
Http.Worker.Total.BytesRead = 283,696,263
Http.Worker.Total.BytesWritten = 10,043,830,215
Http.Worker.Total.CertManager.Requests = 20
Http.Worker.Total.CertManager.RequestTime = 7,239
  
```

```

Platform.Memory.PagesPerSec = 0
Platform.Memory.RAM.AvailMBytes = 1,786.17
Platform.Memory.RAM.AvailMBytes.Avg = 844.98
Platform.Memory.RAM.AvailMBytes.Min = 145.22
Platform.Memory.RAM.AvailMBytes.Peak = 3,934.63
Platform.Memory.RAM.PctUtil = 88.83
Platform.Memory.RAM.TotalMBytes = 15,992.2
Platform.Network.1.AdapterName = eth0
Platform.Network.1.BytesRecvdPerSec = 38,539.38
Platform.Network.1.BytesSentPerSec = 44,070.2
Platform.Network.1.NetworkBytesPerSec = 82,609.58
Platform.Network.1.PctCollisionRate = 0
Platform.Network.TotalNumofAdapters = 1
Platform.Network.Total.BytesRecvdPerSec = 38,539.38
Platform.Network.Total.BytesSentPerSec = 44,070.2
Platform.Network.Total.NetworkBytesPerSec = 82,609.58
Platform.Network.Total.PctCollisionRate = 0
Platform.PagingFile.Free.SizeMBytes = 0
Platform.PagingFile.Total.PctUtil = 100
  
```

Unified Buffer Manager

- Also referred to as the NSF buffer pool
- Buffers data between the Notes Indexing Facility (NIF) and disk
- Reduces disk reads/writes by keeping database pages in memory
 - Domino's own memory manager



Unified Buffer Manager

- sh stat database
- Key statistics with example
 - Database.Database.BufferPool.Maximum.Megabytes = 1024
 - Maximum size NSF buffer pool can be
 - Database.Database.BufferPool.Peak.Megabytes = 1023
 - Largest size NSF buffer pool has been since server restart
 - Database.Database.BufferPool.PercentReadsInBuffer = 99.44
 - Want \geq 95% reads in buffer
- Adjust with this notes.ini variable
 - NSF_BUFFER_POOL_SIZE_MB=

Database Cache

- Determines the number of databases a server can hold in its cache
- Defaults to 3x size of NSF buffer pool
- Key statistics with example
 - Database.DbCache.CurrentEntries = 1213
 - Database.DbCache.HighWaterMark = 1350
 - Database.DbCache.MaxEntries = 900
 - Database.DbCache.OvercrowdingRejections = 157,580
 - Should be zero on a healthy system!
- Adjust with this notes.ini variable
 - `NSF_DbCache_Maxentries=`

Number of Mail.Box Files

- `sh stat mail`
- Key statistics
 - Mail.Mailbox.Accesses
 - Mail.Mailbox.AccessConflicts
 - Want < 2% conflicts
 - $\text{Mail.Mailbox.AccessConflicts} / \text{Mail.Mailbox.Accesses} = < 0.02$

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

NSF Monitor Pool

- Caches event monitors such as server and user mail rules
- `sh stat database`
- Key statistics with example
 - `Database.MonitorPool.Event.Used = 52309`
 - `Database.MonitorPool.Monitors.Used = 1184`
 - `Database.MonitorPool.Size = 41943040`
- Check the log for the error “Insufficient memory – NSF monitor pool is full”
- Adjust with this notes.ini variable
 - `NSF_MONITOR_POOL_SIZE_MB=`

Full Text Index Tuning

- Spawn full-text indexing off to own thread
 - Prevents long full text indexing operations from delaying view updates
 - By default, view updates and full text indexing are driven by the same thread
- Key statistics with example
 - FT.Index.Count = 56,150
 - FT.Index.Search = 27,652
 - FT.Search.Total.Results = 1,002,317
- Enable with this notes.ini variable
 - `Update_Fulltext_Thread=1`

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

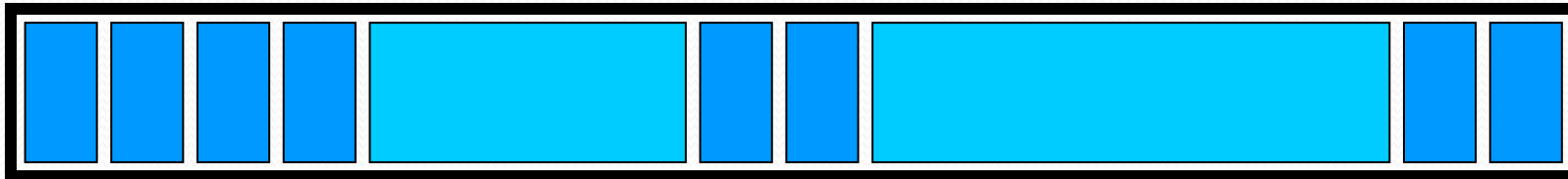
- Enabling Update_Fulltext_Thread=1 eliminated semaphore timeouts

Monitor Size of Logging Databases

- Common for agents to write to logging databases as they process data
 - Keep these logging databases small
 - Examples: log.nsf, domlog.nsf, custom logging database
- 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

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 when mixing mail and application



SSL Certificates

- What the heck are they?
 - A digital data file hosted on a website's server
 - Acts as an electronic passport
 - Verifies the sites' identify
 - Enables encrypted connections between users and the server
- Provides encrypted connections to Domino services
 - HTTPS / HCL Verse / iNotes
 - Traveler / HTMO
 - Nomad
 - SMTP
 - IMAP / POP3
 - LDAP
 - ...

SSL Certificate Renewals

- Two ways to process Domino certificate renewals
 - Manually
 - Utilizes keyring (.kyr) and stash (.sth) files
 - Tools required:
 - OpenSSL
 - KYRTool
 - Certificate Manager / CertStore
 - Introduced in Domino 12
 - Uses certstore.nsf to manage certificates across domains
 - New [CertMgr](#) task
 - * Supported on Windows, Linux, AIX, Docker/Containers

Certificate Renewal Workflow

- These steps are the same regardless of the renewal process chosen
 1. Identify expiring certificate
 2. Confirm affected Domino services/servers
 3. Confirm renewal method
 - Manual or Certificate Manager
 4. Generate or obtain renewed certificate
 5. Import or update certificate and intermediate chains
 6. Update certificate on required Domino server(s)
 7. Restart tasks/server and confirm new certificate is in use
 8. Test, test, test

Certificate Renewal Process

- Manually
 - https://support.hcl-software.com/csm?id=kb_article&sysparm_article=KB0033348
- Certificate Manager process
 - https://help.hcl-software.com/domino/14.5.1/admin/secure_using_certificate_manager.html

What You Should Be Doing and When

- Daily
 - Check the Administration Requests application - Admin4.nsf
 - Approvals, ...
 - Console
 - Know what is “normal”
 - Errors in logs
 - Log.nsf
 - Domlog.nsf
 - Custom logging database
 - Monitor servers
 - Recent reboots
 - Dead mail, pending mail queues, DNS availability
 - Backups

What You Should Be Doing and When

- Weekly
 - Domino Domain Monitoring (DDM) reports
 - Server disk space

- Monthly
 - Cluster analysis
 - Missing and duplicate replicas
 - Note counter discrepancies across replicas
 - Performance
 - System level
 - Domino level

What You Should Be Doing and When

- Quarterly
 - Cluster failover testing
 - Restore from backup
 - Fix pack availability
- Yearly
 - Upgrades
 - User audit
 - Verify person documents are valid
 - Datacenter failover
 - Full review of configuration
 - Server, Configuration, Connection, Program, Internet Site, documents

Questions?



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