

# HCL Domino 11 First Look



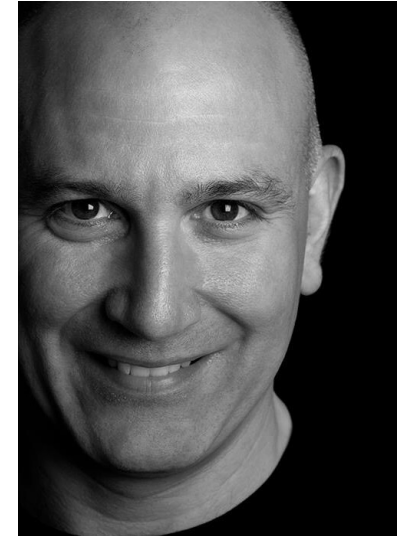
# HCL Domino

**Daniel Nashed, Nash!Com**  
**Ulrich Krause, midpoints**

**November 2019, Köln**

# Speaker Introduction Daniel Nashed

- Nash!Com – HCL Business Partner
- Member The Penumbra group - An international consortium of selected Business Partners pooling their talent and resources
- Focus: Cross-Platform C-API, IBM® Domino® Infrastructure, Administration, Integration, Performance, Security, Troubleshooting and IBM® Traveler
- “DNUG Fachgruppenleiter” Verse/Notes/Domino
- Author Domino on Linux® Start Script
- Co-Author Domino Docker Script



 **HCL** Grandmaster

# Speaker Introduction Ulrich Krause

- Lotus Notes and Domino since 1993
- Developer / Administrator
- IBM Champion 2010 – 2019
- HCL Master 2019
- OpenNTF Contributor
- Let's Encrypt 4 Domino ( LE4D )
- Working with midpoints GmbH

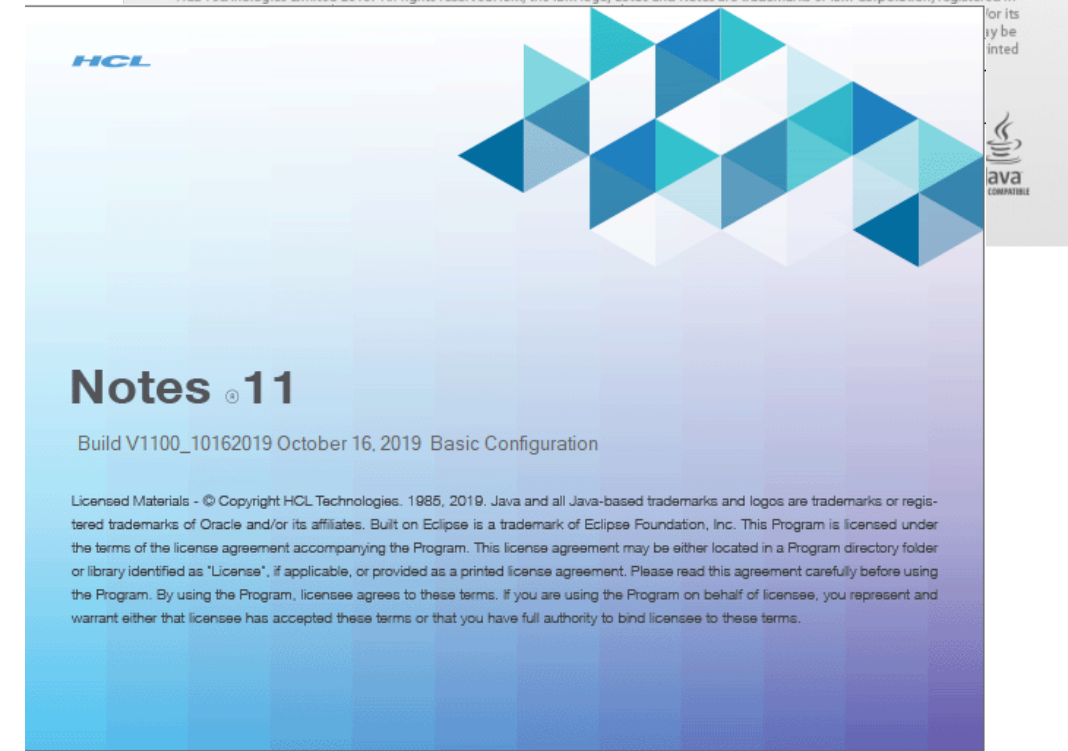
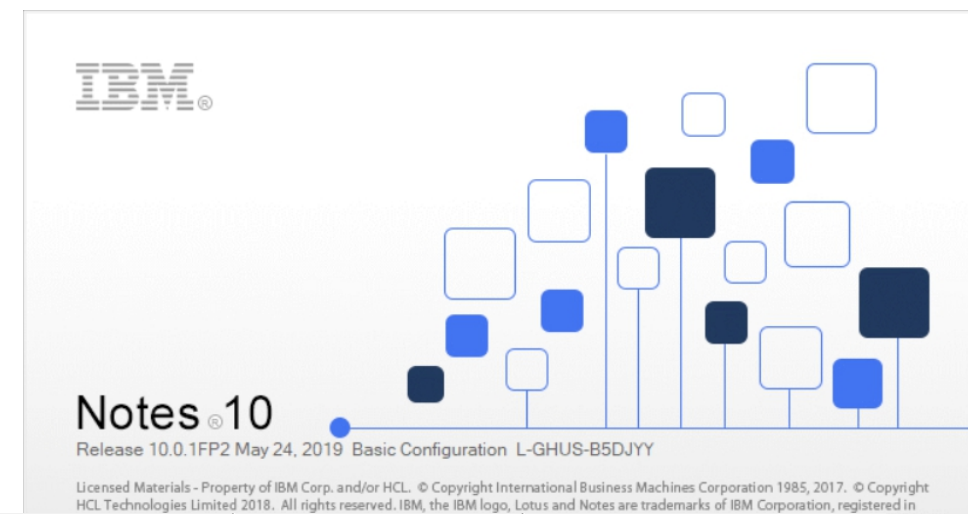


# Agenda

- Introduction
- Backend/Infrastructure Changes
- New Features
  - DirSync
- Flexnet Licensing
- Q&A

# “IBM” → “HCL” Branding

- “IBM” is replaced by “HCL” in most places
- But there are still some “IBM” strings which stay
- “Lotus” and “Domino” remains



# Guidelines followed while replacing IBM to HCL

- Any “IBM” Strings are Logos which are visible in normal use of the product are replaced
  - IBM Strings, Logos and Copyright in any UI like Splash screens
  - Error message, Dialog etc which are visible in normal use
  - Templates and Database which are shipped as part of Domino 11
  - Registry path in Windows platform

# “IBM” Strings not replaced

- Any Directories or Path which may cause the customers to have to alter their applications
  - IBM\_TECHNICAL\_SUPPORT
  - IBM\_ID\_VAULT
  - IBM\_Credstore
  - IBMDomino.sym
  - ibmditar.css
  - C:\Program Files\IBM\Domino\data\domino\js\dojo-1.5.4\ibm
- Any configuration parameters which has IBM string in notes.ini
- IBM strings coming from IBM proprietary like IBM OS , Server and Compiler
- LDAP Attributes
- Any COM objects with IBM as namespace

# New Default Installation Directory

- Linux/AIX Example:
  - **/opt/hcl/domino**
- New Nash!Com Start script version doesn't install into Domino binary directory
  - New Directory **/opt/nashcom/start-script**
  - Install script will install into new location
  - Existing configuration is still used
- Best Practice: Uninstall and cleanup binary directory and install in new path!

# InstallAnywhere instead of InstallShield Multiplatform (ISMP)

- Flexera InstallAnywhere 2018 used for Domino Server install
  - Traveler is already using InstallAnywhere
  - Notes Clients still stay with Install Shield (different product than ISMP)
- Some changes in detail
  - Graphic User Interface (GUI) mode, available only on Windows
  - Console mode, available only on AIX and Linux
  - Silent install mode, available on all platforms!
  - Makes perfectly sense because Windows customers prefer GUI  
Linux/AIX customers are usually more console oriented



# InstallAnywhere

- Works similar to ISMP but
  - Command Line has different parameters
  - New response file format
  - Response file is **UTF-8** formatted → needs a proper editor like Notepad++ or Ultraedit
  - Windows → **install.exe -r <path> <myresponse>.properties**
  - Linux/AIX → **sudo ./install -r <path> <myresponse>.properties**
- New silent install is used by Domino on Docker
  - Works well but some detailed output has changed
    - Domino 10 → "Dominoserver Installation successful"
    - Domino 11 → "install Domino Server Installation Successful"

# New Java™ Runtime Environment in Notes/Domino 11

OpenJDK

- Notes/Domino 10 used the IBM JVM
  - Previous Notes/Domino version used IBM JVM build by IBM JVM team based on Oracle sources
  - HCL needed to replace the JVM with an Open JVM
    - Oracle JVM isn't free any more for commercial use (only Open Java is free)
    - See <https://www.oracle.com/technetwork/java/javase/overview/oracle-jdk-faqs.html>
- Eclipse OpenJ9 that is provided through AdoptOpenJDK
  - <https://adoptopenjdk.net>
  - <https://openjdk.java.net>

# New Java™ Runtime Environment in Notes/Domino 11

OpenJDK

- openjdk version "1.8.0\_222"
  - OpenJDK Runtime Environment (build 1.8.0\_222-b10)
- Eclipse OpenJ9 VM
- Time Zone data base tzdata2019c
  - <https://www.iana.org/time-zones>
- Just In Time (JIT) is still enabled by default
  - Can be still disabled via notes.ini JavaEnableJIT=0

# IBM® GSKit crypto libs replaced with OpenSSL



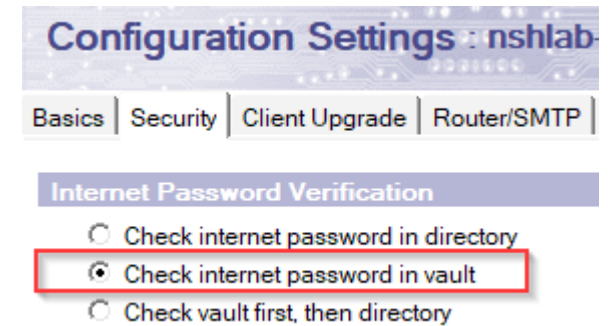
- Previous Notes/Domino version used IBM® GSKit cryptographic libraries
- Replaced with the OpenSSL equivalents → Free & open SSL Lib
- OpenSSL 1.1.1a → Up to date version shipped with Notes/Domino 11
  - See details here → <https://www.openssl.org>
- Notes® W32 and Mac
  - Not FIPS support (**F**ederal **I**nformation **P**rocessing **S**tandards – required by US government)
- Domino® W64, Linux® 64, AIX64
  - With OpenSSL 2.0 FIPS mode ([https://wiki.openssl.org/index.php/FIPS\\_module\\_2.0](https://wiki.openssl.org/index.php/FIPS_module_2.0))
    - Disable FIPS support → notes.ini **HCC\_FIPS\_NON\_CERTIFIED=1**

# Limiting ID vault download disabled for SAML federated

- Previously you had to enable **automatic ID download** if SAML is used
- The ID Vault security policy setting “Allow automatic ID downloads” is ignored for SAML
  - The setting is ignored because SAML authentication requires unrestricted download access to ID files from the vault
- User already used trusted authentication against AD
- This feature is already included in Domino 10.0.1 FP2 → SPR# DKENAJTT67

# Web authentication against Notes® ID passwords in the ID vault

- Idea: Instead of having two different passwords which need to sync and need to be stored in the person doc, just use the ID vault password
  - No sync needed between web and Notes.ID password
  - Safer place to store passwords
  - This only used for users with a Notes.ID
  - So there is no “all or nothing” setting
  - Instead you can define what should happen, when no ID in vault is found
    - Configured in configuration document
- New challenge: Sync AD Password → Notes.ID password



# TLS Deprecated (weak) Ciphers

- The following ciphers are listed as weak in Domino 11
  - TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA (0x35)
  - TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA (0x39)
  - TLS\_ECDHE\_RSA\_WITH\_AES\_128\_CBC\_SHA (xC013)
  - TLS\_ECDHE\_RSA\_WITH\_AES\_256\_CBC\_SHA (xC014)

Weak because they still use SHA1

- Also a BSI recommendation!
- Cipher names come back after doc refresh
  - You should remove the weak (deprecated) ciphers

Notes Network Ports | Internet Ports... | Proxies

## SSL settings

SSL key file name:

SSL protocol version (for use with all protocols except HTTP):

Accept SSL site certificates:  Yes  No

Accept expired SSL certificates:  Yes  No

SSL ciphers:

Modify

ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384  
DHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384  
ECDHE\_RSA\_WITH\_AES\_128\_GCM\_SHA256  
DHE\_RSA\_WITH\_AES\_128\_GCM\_SHA256  
ECDHE\_RSA\_WITH\_AES\_256\_CBC\_SHA384  
DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA256  
C014 (deprecated)  
39 (deprecated)  
ECDHE\_RSA\_WITH\_AES\_128\_CBC\_SHA256  
DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA256  
C013 (deprecated)  
RSA\_WITH\_AES\_256\_GCM\_SHA384  
RSA\_WITH\_AES\_128\_GCM\_SHA256  
RSA\_WITH\_AES\_256\_CBC\_SHA256  
35 (deprecated)  
RSA\_WITH\_AES\_128\_CBC\_SHA256  
RSA\_WITH\_AES\_128\_CBC\_SHA

# Directory Sync with Active Directory (AD)



- New implementation for a dedicated sync tool with AD
- Completely new feature in Domino 11
- Thanks to Ulrich Krause (midpoints) who is the most active & best tester for this feature!

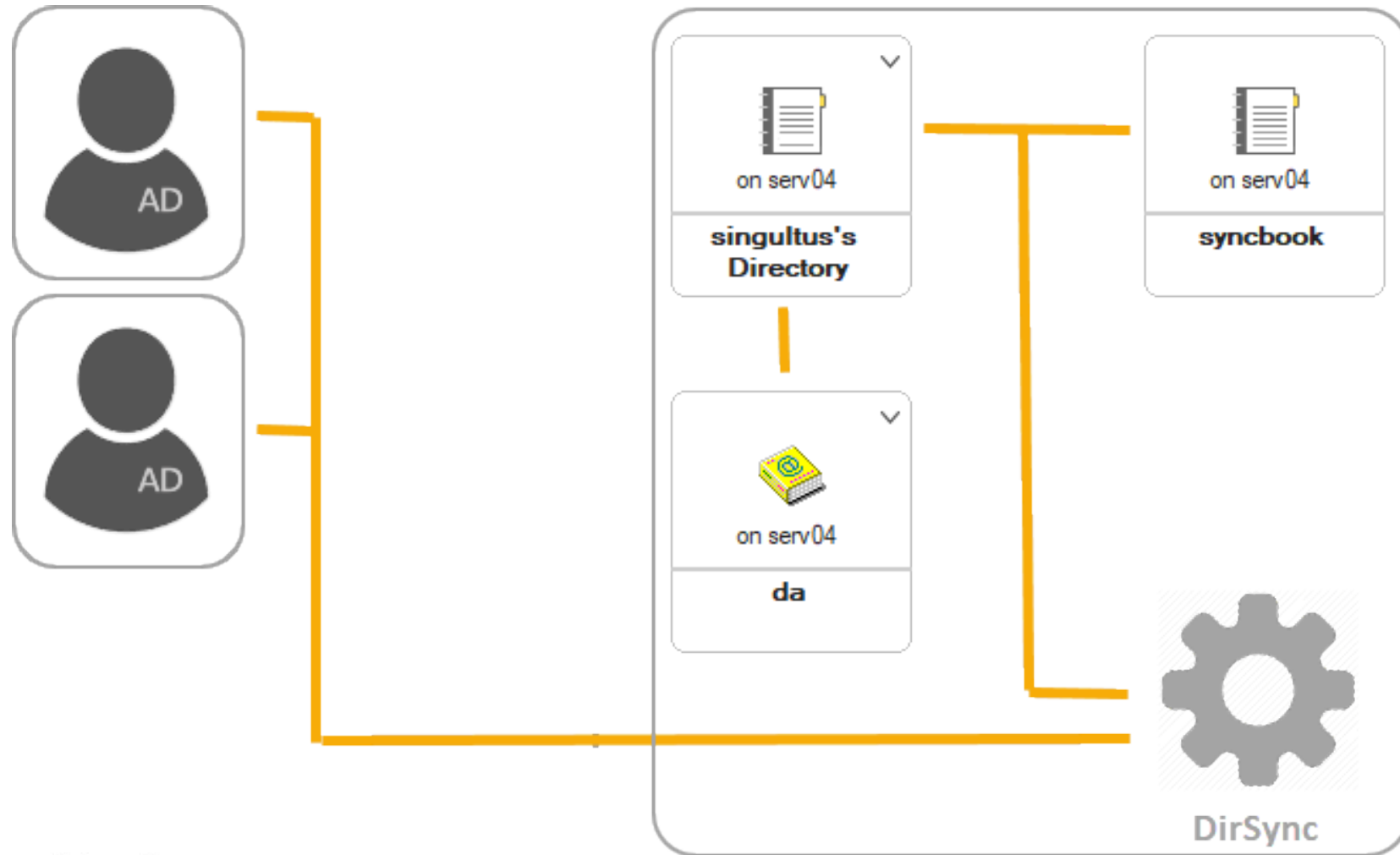
# Directory Sync (DirSync)

- Directory Sync allows you to sync **people** and **group** data from an external LDAP directory into the Domino® directory
  - Currently data from Active Directory can be synced
- Directory Sync makes it easy for your Note users to address mail to and see details about users in your organization not using Notes® such as Microsoft™ Outlook users registered in Active Directory
  - With this feature, Active Directory users automatically have Person documents in the Domino® directory so that Notes® users can find their addresses and other information
  - Without Dirsync, Notes® users must know the addresses of the Active Directory users before they can send mail to them, unless Person documents are added for them manually

# Directory Sync Components

- LDAP directory assistance document created in a directory assistance database that is enabled for Directory Sync
- Directory Sync Configuration document created in the Directory Sync view of the Domino® directory
- A server task, Dirsync, that runs only on the Domino® administration server, that connects to the Active Directory server regularly to pull person and group changes into the Domino® directory

# Directory Sync Overview



# Directory Assistance

**DIRECTORY ASSISTANCE**

Basics | Naming Contexts (Rules) | LDAP

**Basics**

|                                |   |
|--------------------------------|---|
| Domain type:                   | LDAP  |
| Domain name:                   | AD  |
| Company name:                  |   |
| Search order:                  |   |
| Make this domain available to: | <input type="checkbox"/> Notes Clients & Internet Authentication/Authorization<br><input type="checkbox"/> LDAP Clients<br><input checked="" type="checkbox"/> Directory Sync |
| Group authorization:           | No  |
| Enabled:                       | Yes   |

**SSO Configuration**

Attribute to be used as name in an SSO token (map to Notes LTPA\_UsrNm):

Windows single sign-on for Web clients  Enabled

## Inheritance

- Inherit design from master template
- Template name
- Template version is 11.0 (12.08.2019)

# Directory Assistance

## DIRECTORY ASSISTANCE

Basics | Naming Contexts (Rules) | LDAP

Configure Directory Assistance access to a remote LDAP server.

### LDAP Configuration

|  |   |        |
|--|---|--------|
| Hostname:                                      | serv04.ad.fritz.box:389                                   | Verify |
| LDAP vendor:                                   | Active Directory  |        |
| Optional authentication credential for search: | Username: CN=Administrator,CN=Users,DC=ad,DC=fritz,DC=box | Verify |
|  | Password:   |        |
| Base DN for search:                            | DC=ad,DC=fritz,DC=box                                     | Verify |

### Connection Configuration

|                     |      |
|---------------------|------|
| Channel encryption: | None |
| Port:               | 389  |

### Advanced Options

|  |                       |        |
|--|-----------------------|--------|
| Timeout:                                     | 60 seconds            |        |
| Maximum number of entries returned:          | 100                   |        |
| Dereference alias on search:                 | Never                 |        |
| Preferred mail format:                       | Internet Mail Address |        |
| <input type="checkbox"/> Enable name mapping |                       |        |
| Type of search filter to use:                | Active Directory      | Verify |

# SHOW XDIR

```
DomainName      DirectoryType   ClientProtocol  Replica/LDAP Server
-----
1 SINGULTUS     Primary-Notes  Notes & LDAP   names.nsf
2 SYNCBOOK     Secondary-Notes Notes           syncbook.nsf
3 AD            Secondary-LDAP SYNC           SERV04.AD.FRITZ.BOX:389
4 MIDPOINTS     Secondary-LDAP SYNC           DIR01.DEMOPOINTS.NET :389
```

# DirSync Configuration

The screenshot shows the Domino Directory configuration interface for 'serv04' on 'names.nsf'. The left sidebar shows a tree view with 'Directory Sync' selected. The main area displays a table of DirSync configurations:

|   | Domain    | Domino Directory Path ^ | Sync Status |
|---|-----------|-------------------------|-------------|
| ✘ | MIDPOINTS | names.nsf               | 0:No error  |
| ✔ | AD        | syncbook.nsf            | 0:No error  |

At the top of the interface, there are buttons for 'Add Directory Sync', 'Edit DirSync', 'Delete DirSync', 'Enable', 'Disable', and 'Resync'.

1. Open the Domino® directory.
2. Select **Configuration > Directory > Directory Sync**.
3. Click **Add Directory Sync**.

# DirSync Configuration

## Directory Sync Configuration AD

Basics | Synchronization | Status | Administration

### Basics

|   |   |
|---|---|
| Directory Assistance domain                                 | AD  |
| Dirsync status  | Enabled   |
| <u>Sync all Active Directory users</u>                      | <input checked="" type="radio"/> Yes <input type="radio"/> No |
| Domino Directory file name                                  | syncbook.nsf  |
| Direction   | Active Directory to Domino                                    |
| Rename registered Domino users upon Active Directory rename | <input checked="" type="radio"/> Yes <input type="radio"/> No |
| Sync frequency  | <input type="text" value="1"/> minutes                        |
| Resync frequency  | <input type="text" value="1200"/> minutes (0 for no resync)   |

# DirSync Configuration

## Directory Sync Configuration AD

Basics | Synchronization | Status | Administration

### Fields to sync to Domino

Fields

*one per line*

Restore Defaults

memberOf

jpegPhoto

Info

### LDAP Filter

Filter to sync a subset  
of users and groups

*Use standard LDAP search syntax to filter which users and groups to sync.*

### LDAP Groups

Types of groups to  
sync

Security groups

Distribution groups

# Sync Groups

- If you want to synchronize groups, select the types of groups to synchronize. If you don't want to synchronize groups, do not select either option.
- **Global Security groups**, to be able to use Active Directory security groups in Notes® access lists.
- **Global Distribution groups**, to be able to use Active Directory distribution groups in Notes® mail addressing.








## LDAP Groups

Types of groups to sync

- Security groups
- Distribution groups

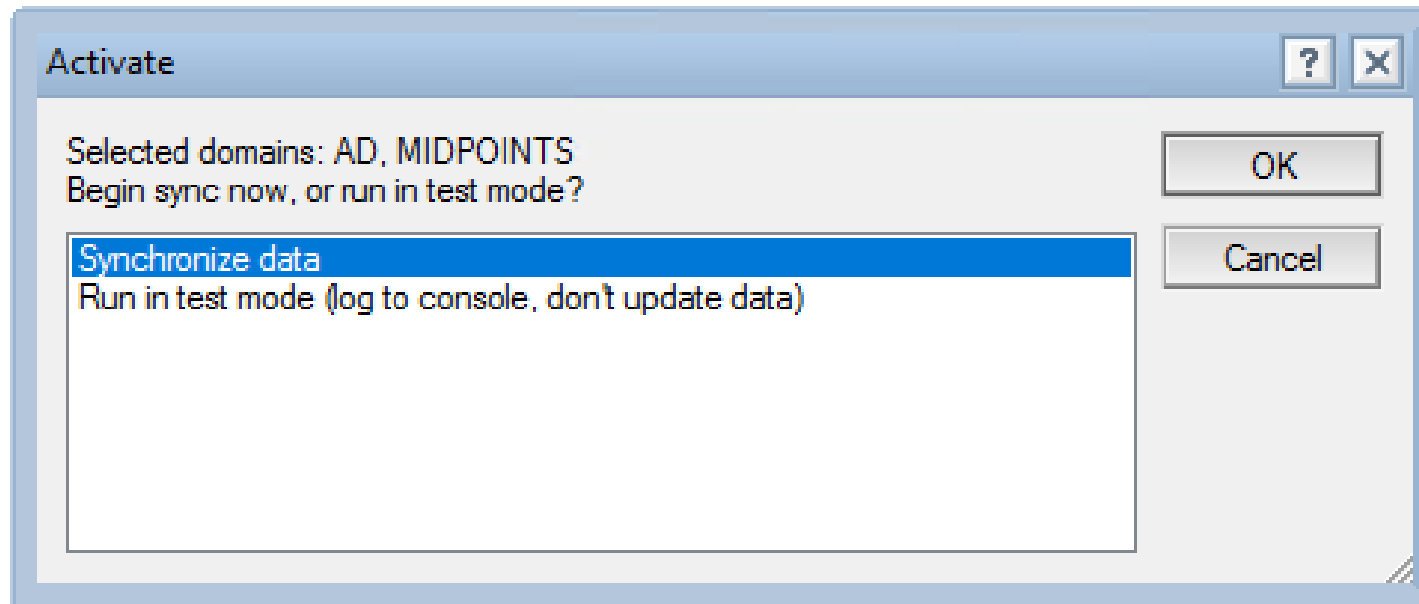
# Enable DirSync Configuration

- Select one or more DirSync configurations and click „**Enable**“.

|  Add Directory Sync |  |           |  |  Edit DirSync |  |                         |  |  Delete DirSync |  |  |  |  Enable |  |  |  |  Disable |  |  |  |
|--|--|-----------|--|--|--|-------------------------|--|--|--|--|--|--|--|--|--|---|--|--|--|
|  |  | Domain    |  |  |  | Domino Directory Path ^ |  |  |  |  |  |  |  |  |  |   |  |  |  |
|                     |  | MIDPOINTS |  |  |  | names.nsf               |  |  |  |  |  |  |  |  |  |   |  |  |  |
|                     |  | AD        |  |  |  | syncbook.nsf            |  |  |  |  |  |  |  |  |  |   |  |  |  |

# Enable DirSync Configuration

- Select "**Run in test mode**" to simulate the actions that Directory Sync would take but without changing any Domino® data.



# Enable DirSync Configuration

- Resync request is created automatically, when DirSync configuration has been changed.

|                          |   | Domain    |
|--------------------------|---|-----------|
| ✓                        | ▼ | MIDPOINTS |
| Requested action: Resync |   |           |

Scheduled a Resync due to Config Doc options changing.

# Resync

Server: **serv01/singultus**  
Release 10.0.1FP3 on Windows/2016 10.0

Server  
Messaging  
Replication  
Directory  
  Directory Assistance  
  Directory Servers  
  Directory Sync  
  LDAP  
  Directory Cataloger  
Security  
Policies  
Web  
Monitoring Configuration  
Health Monitoring  
Cluster  
DECS Administrator  
Offline Services  
Miscellaneous

Add Directory Sync Edit DirSync Delete DirSync Enable Disable Resync

Search in View 'ServerDirectory Sync' Show re

Search for

|   | Domain | Domino Directory Path ^ | Sync Status |
|---|--------|-------------------------|-------------|
| ✓ | AD     | names.nsf               | 0:No error  |
| ✗ | MI     |                         | error       |

Resynchronize Selected Directories

✗ This operation is allowed only on the administrative server of the domain (serv04).

OK

# Disable DirSync Configuration

- Before you can edit the configuration, you must disable it!
- Select one or more DirSync configurations and click „**Disable**“
- Request action document is being created and processed by DirSync task

|   | Domain      | Domino Directory Path ^ |
|---|-------------|-------------------------|
| ✓ | ▼ MIDPOINTS | names.nsf               |

Requested action: Disable

# Register Selected Person

The screenshot shows the Domino Directory Administration Console interface. The window title is "SINGULTUS Domain - serv04...". The navigation pane on the left shows the hierarchy: Domino Directories > singultus's Directory > People. The main pane displays a table with columns for Name, Address, and other attributes. A context menu is open over the table, with "Register Selected Person..." highlighted in blue. Other menu items include "Print...", "Register Person...", "Move to Another Server...", "Rename...", "Delete", "Recertify...", "Set Person's Internet Address...", "Validate Unique Internet Address...", "Roaming...", and "Assign Policy...".

Server: **serv04/singultus**  
Build V1100\_10162019 on Windows/2016 10.0

Domino Directories

- singultus's Directory
  - People
  - Groups
  - Mail-In Databases and Templates
  - Policies
    - Dynamic Policies
      - by Person/Group
      - by Category
  - Settings

Add Person

| Name | Address | Other |
|------|---------|-------|
| ap   | Ap      |       |
| Da   | do      |       |
| Ha   |         |       |

- Print...
- Register Person...
- Register Selected Person...**
- Move to Another Server...
- Rename...
- Delete
- Recertify...
- Set Person's Internet Address...
- Validate Unique Internet Address...
- Roaming...
- Assign Policy...

# Register Selected Person

Register Person -- Hans-Peter Hansen

Provide name, password and other basic information for the new person. To view/edit additional registration settings, check the 'Advanced' checkbox below.

Registration Server... serv04/singultus

First name: Middle name: Last name: Short name:  
Hans-Peter [ ] Hansen [ ]

Password: Mail system: Explicit policy:  
[ ] HCL Notes (No explicit policy assigned)

Organization policy: \*/singultus

Enable roaming for this person  
 Create a Notes ID for this person

Advanced  New Person Migrate People... Import Text File...

Registration Queue (local):

| ^ | User Name ^ | Registration Status ^ | Date ^ |
|---|-------------|-----------------------|--------|
|---|-------------|-----------------------|--------|

Register All Register Delete Options... Views... Done

Login to HCL Notes

HCL Notes

CERTIFIER NAM  
/singultus

Certifier password:  
[ ]

OK CANCEL

# Rename Registered Person

## Directory Sync Configuration AD

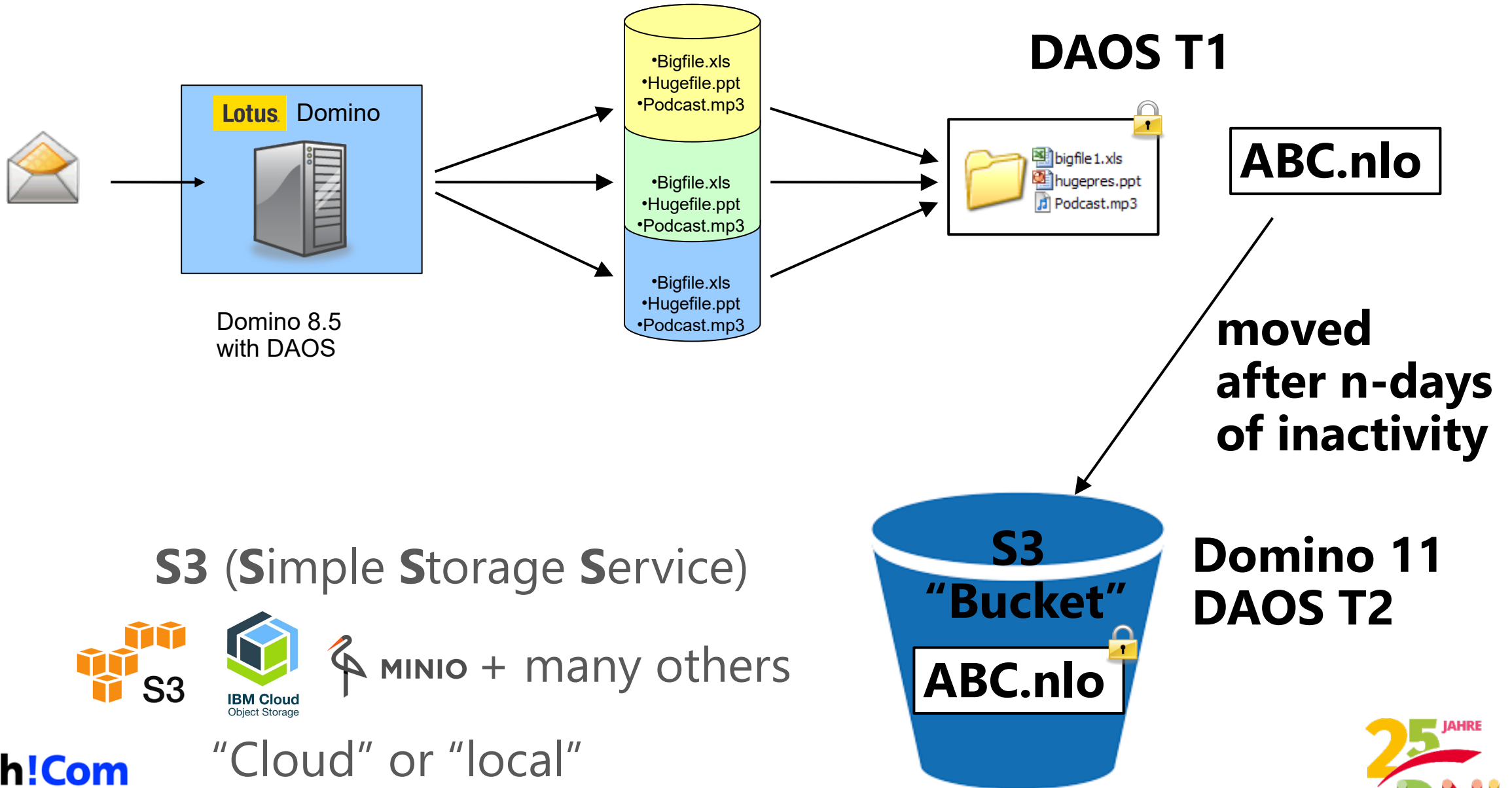
Basics | Synchronization | Status | Administration

### Basics

|   |   |
|---|---|
| Directory Assistance domain                                 | AD  |
| Dirsync status  | Disabled  |
| Sync all Active Directory users                             | <input checked="" type="radio"/> Yes <input type="radio"/> No |
| Domino Directory file name                                  | names.nsf   |
| Direction   | Active Directory to Domino                                    |
| Rename registered Domino users upon Active Directory rename | <input checked="" type="radio"/> Yes <input type="radio"/> No |
| Sync frequency  | <input type="text" value="2"/> minutes                        |
| Resync frequency  | <input type="text" value="1200"/> minutes (0 for no resync)   |

- “Rename Domino users upon Active Directory rename” option must be enabled in the Directory Sync configuration document

# Domino 11 – Two Tier DAOS



**S3 (Simple Storage Service)**



MINIO + many others

"Cloud" or "local"

# DAOS Tier 2 Storage on S3 Storage

- **“Domino Attachment Object Service (DAOS) Tier 2 storage”**
  - Allows to use S3-compatible storage service to store older attachment objects that haven't been accessed within a specified number of days
  - Reduces the amount of data stored on Domino® servers that use DAOS because of
    - **Scalability**
    - **Storage costs**
    - **Backup optimization**
- A S3-compatible storage service uses the Amazon Web Services (AWS) Simple Storage Service (S3) API

# Amazon S3 Storage

- S3 Amazon is the reference implementation
  - Amazon **S**imple **S**torage **S**ervice
  - There is an SDK from Amazon which is also used by Domino
    - [https://en.wikipedia.org/wiki/Amazon\\_S3](https://en.wikipedia.org/wiki/Amazon_S3)
- Many vendors support “cloud object storage”
  - But it's not just for cloud storage vendors!
  - It's a general interface!
- Simple design
  - Objects organized in “buckets” + Each object is identified by a unique, user-assigned key



# Other S3 Implementations

- Minio Server

- Provides a S3 server and also a nice command-line client
- Can run as a single binary or inside a Docker container
- References and good start point
  - <https://docs.min.io/docs/minio-quickstart-guide.html>
  - <https://docs.min.io/docs/minio-client-complete-guide>

- Other vendor examples

- IBM Cloud
- NetApp & others



# DAOS T2 Configuration

- Simple configuration
- Credential Name of user/password stored in credential store
- S3 Bucket / S3 Endpoint
  - Settings for S3 Server
- Push object store if not accessed for
  - Standard value 1000 days
  - Minimum internal value 7 days

Server: nshlab-dom-win1/NashComLab nshlab-dom-win1.nashcom.l

Basics | Security | Ports... | Server Tasks... | Internet Protocols... | MTAs... | Miscellaneous | Transactional Lo

### DAOS Settings

|  |                |
|--|----------------|
| Store file attachments in DAOS:                          | Enabled        |
| Minimum size of object before Domino will store in DAOS: | 131072 bytes   |
| DAOS base path:  | d:\domino\daos |
| Defer object deletion for:                               | 30 days        |

### Tier 2 Storage

|   |  |
|---|--|
| DAOS Tier 2:                              | <input checked="" type="checkbox"/> Enable |
| S3 Credential Name:                       | dominocos                                  |
| S3 Bucket:                                | nsh-domino11-daos                          |
| S3 Endpoint:                              | 192.168.100.107:9000                       |
| Assigned S3 Storage ID:                   | 045731D47D45CF4B3BAC64C260EB84A92822F76A   |
| Push object to store if not accessed for: | 1000 days                                  |

# S3 storage ID

- Unique identifier for the server that is created the first time server configures itself for tier 2. This ID becomes part of the name of each S3 object!
- **Don't change this ID once it is established!**
- You cannot access existing S3 objects if the ID changes!

# Create S3 Credentials

Create a file with the credentials "**dominocred.txt**"

**[dominocos]**

**aws\_access\_key\_id = my-access-key..**

**aws\_secret\_access\_key = my-secret-key...**

Create named encryption key and credential store

- **KEYMGMT CREATE NEK credstorenek**
- **KEYMGMT CREATE CREDSTORE credstorenek**
- Credentials are stored encrypted in credential store
- **tell daosmgr S3 storecred dominocred.txt**

# S3 MINIO special configuration



- S3 MINIO needs additional parameters
  - Some of them are not just for MINIO
- S3\_USE\_MINIO=1
  - Enable MINIO configuration
- COS\_SKIP\_SSL\_VERIFY=1
  - Disable SSL certificate checking → certificates are checked against **cacert.pem** in data directory
- COS\_USE\_HTTP=1
  - User HTTP instead of HTTPS (only recommended for local or test deployments)

# Restart server and check startup

- Restart server
  - This is needed to restart DAOS for each process
  - Make sure server configuration is replicated to the right server ;-)
- Server Commands
  - tell daosmgr status
  - tell daosmgr objectinfo summary
  - tell daosmgr objectinfo all

# New “tell daosmgr commands”

- OBJECTINFO [-O outfile] [-olderThan days] [-prefix prefix] [TIER1|TIER2|ALL|SUMMARY]
  - Show information about DAOS Objects
- OBJECTPUSH age Push objects older than age to S3
  - Manually push NLOs to T2 → Very useful for testing
- S3 related config commands
  - S3 STORECRED Stores an S3 credential in the credential store cred-file-path [OVERWRITE]
  - S3 DELETECRED Deletes an S3 credential from the credential store cred-name
  - S3 SHOW Shows S3 credentials in the credential store
-

# Tell daosmgr status

```
...  
24.11.2019 08:56:26 DAOS Encryption is currently Disabled  
24.11.2019 08:56:26  
24.11.2019 08:56:26 DAOS Tier2 is Enabled  
24.11.2019 08:56:26  
24.11.2019 08:56:26 DAOS Tier2 Server ID = 045731D47D45CF4B3BAC64C260EB84A92822F76A  
24.11.2019 08:56:26 DAOS Tier2 Credential name = dominocos  
24.11.2019 08:56:26 DAOS Tier2 Bucket = nsh-dominol1-daos  
24.11.2019 08:56:26 DAOS Tier2 Endpoint = 192.168.100.107:9000  
24.11.2019 08:56:26 DAOS Tier2 days since last access before pushing = 1  
...
```

# Tell daosmgr objectinfo summary

```
tell daosmgr objectinfo summary
```

```
DAOS TIERED STORAGE SUMMARY
```

```
TIER 1 STORAGE:
```

```
  OBJECTS      - 0
```

```
  MB           - 0 MB
```

```
TIER 2 STORAGE:
```

```
  OBJECTS      - 5
```

```
  MB           - 933 MB
```

```
TOTAL STORAGE :
```

```
  OBJECTS      - 5
```

```
  MB           - 933 MB
```

```
  AVERAGE AGE - 47 days
```

# Tell daosmgr objectinfo tier2 -o file.txt

- Default outputfile: **objectinfo.txt** in notesdata

```
tell daosmgr objectinfo tier2 -o d:\t2.txt
```

| NLO_KEY  | TIER | STATE  | ACCESSED   | AGE | LENGTH      |
|--|------|--------|------------|-----|-------------|
| 74B9AD33C9A37D5BE8406D993BACE688BA271EEC0003E9DE | T2   | Shared | 09/29/2019 | 56  | 256,478     |
| ABFD47F6F4FDE853FEA03127E578EBD074FA374939020DB8 | T2   | Shared | 10/14/2019 | 40  | 956,435,896 |
| 84C534B143FE5BC221D3B1AB12DDABBDF3E0311F00AE3B30 | T2   | Shared | 10/23/2019 | 31  | 11,418,416  |
| 5044FAB61575A0B36575E676CF7FEED189A844800004B3AE | T2   | Shared | 09/29/2019 | 56  | 308,142     |
| 237FDB9BE73376B8577F9F111E69F2F8AA40D5C4009B6A5E | T2   | Shared | 09/29/2019 | 56  | 10,185,310  |

## DAOS TIERED STORAGE SUMMARY

### TIER 2 STORAGE:

OBJECTS - 5  
MB - 933 MB  
AVERAGE AGE - 42 days

# S3 Storage Encryption and Backup



- The channel is already HTTPS encrypted
- Even if your DAOS store isn't encrypted, the S3 NLOs are encrypted on the fly!
- Paranoid admins might add another level of encryption on AWS level
- Backup could be performed locally before data is pushed to S3
  - But this would need to keep NLOs not to be deleted from backup when moved to S3
- Backup should also be performed on S3 storage!

# AWS References and Download

- Build with AWS SDK for C++ Version:1.7.85
  - <https://aws.amazon.com/sdk-for-cpp>
- AWS Command Line Tools
  - <https://aws.amazon.com/cli/>
- Short Video
  - <https://youtu.be/77IMCiiMilo>

## AWS Command Line Interface

The AWS Command Line Interface (CLI) is a unified tool to manage your AWS services. With just one tool to download and configure, you can control multiple AWS services from the command line and automate them through scripts.

The AWS CLI introduces a new set of simple [file commands](#) for efficient file transfers to and from Amazon S3.



[Getting Started »](#)



[CLI Reference »](#)



[GitHub Project »](#)



[Community Forum »](#)

# “FlexNet Licensing Server” instead of “ILMT”

- HCL is planning to use the FlexNet License services
- FlexNet License Portal
  - Provide license information and license keys
  - Software Downloads
  - License measurement with FlexNet License server instead of ILMT
- The idea is to count floating users in a 30 days usage period
  - All users with authenticated access to a none-system database count
    - Access types measured
      - NRPC access (Notes client, Traveler)
      - HTTP (e.g. iNotes, Verse)
      - POP3/IMAP



# Licensing Terminology

- Entitlementment
  - Licensing model that you've been entitled to. For Domino, your entitled to Counted user model licensing which is based on a number of users accessing Domino servers.
  - There will be a license key for Domino 11
- FlexNet Operations Site (FNO)
  - Site used to download software and map licensing entitlements. Referred to as
- License server (device on FNO site)
  - A server to which Domino connects to validate licensing entitlements
  - Either Cloud License server or Local License Server configuration

# Cloud License Server (CLS)

- A virtual/logical license server available through the HCL License Portal
- You configure a Logical Device on the FNO website
  - FlexNet Server identifier and admin password you specify
- HTTPS connection needed from Domino Servers to FNO License Servers
- Most customers will probably use the CLS
- No FlexNet server setup is needed

# Local License Server (LLS) – Planned for 11.0.1

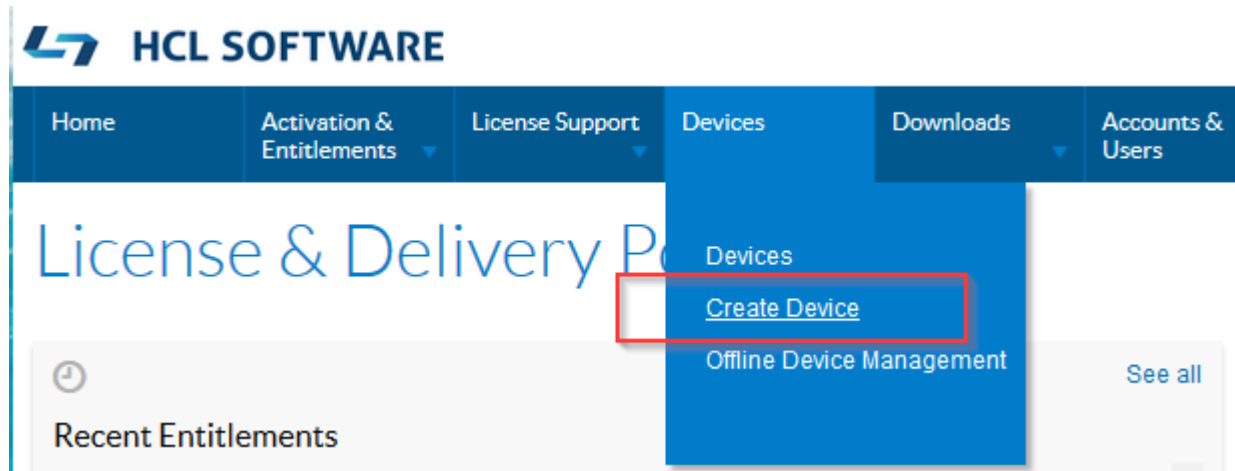
- A license server installed on-premises
- Two different modes
- Online connects to FNO website
  - Connects over HTTPS to FNO License Servers
- Completely off-line
  - Entitlements are manually downloaded and imported to LLS
  - Reports are manually downloaded from LLS and uploaded to FNO Website
  - Manual process which needs access to the LLS and FNO website!

# Configure Could License Server (CLS)

- Log into your FlexNet account
  - <https://hclsoftware.flexnetoperations.com/flexnet/operationsportal/startPage.do>
- Create a virtual "license device" (CLS)
- Set password for device
- Map Licenses

# Login & Create License Device

- Log into FlexNet
- Create Device



Login

daniel@acme.com

••••••••••

English (United States)

[Forgot password?](#)

Login

# Configure as "CLS"

- Give it a meaningful name and site name
  - Just for reference. Not used
- Select "**Runs license server?**"
- Select "Server deployment": "**Cloud**"

**HCL SOFTWARE**

Home Activation & Entitlements License Support Devices Down

## Device [New Device](#)

Name: \* fn.demo.dnug

Runs license server? ?

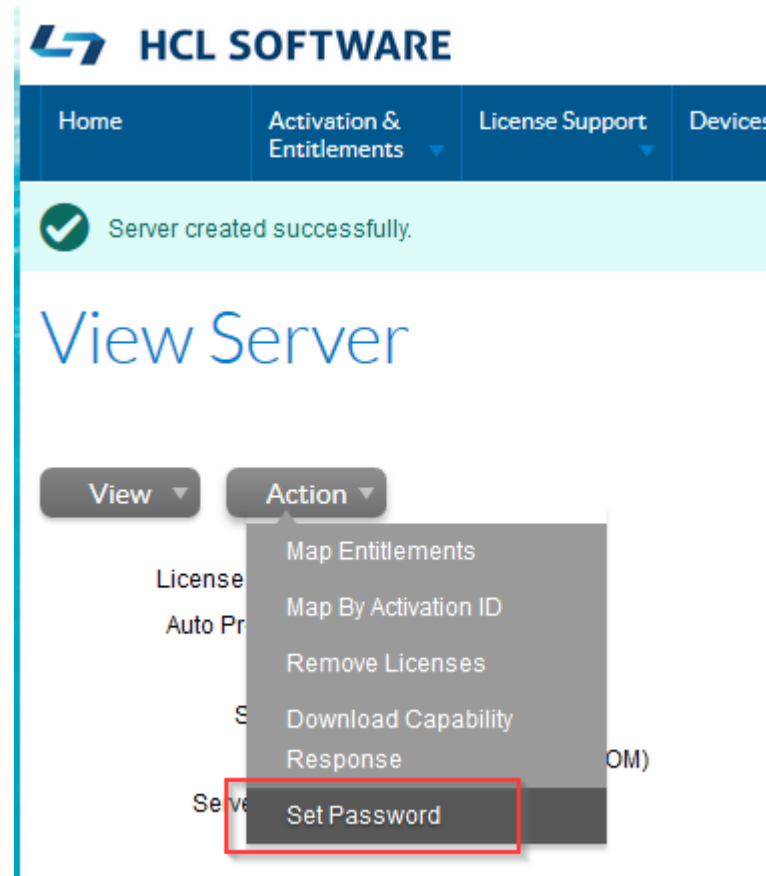
Server deployment:  Local  Cloud

Site name: DNUG

Save

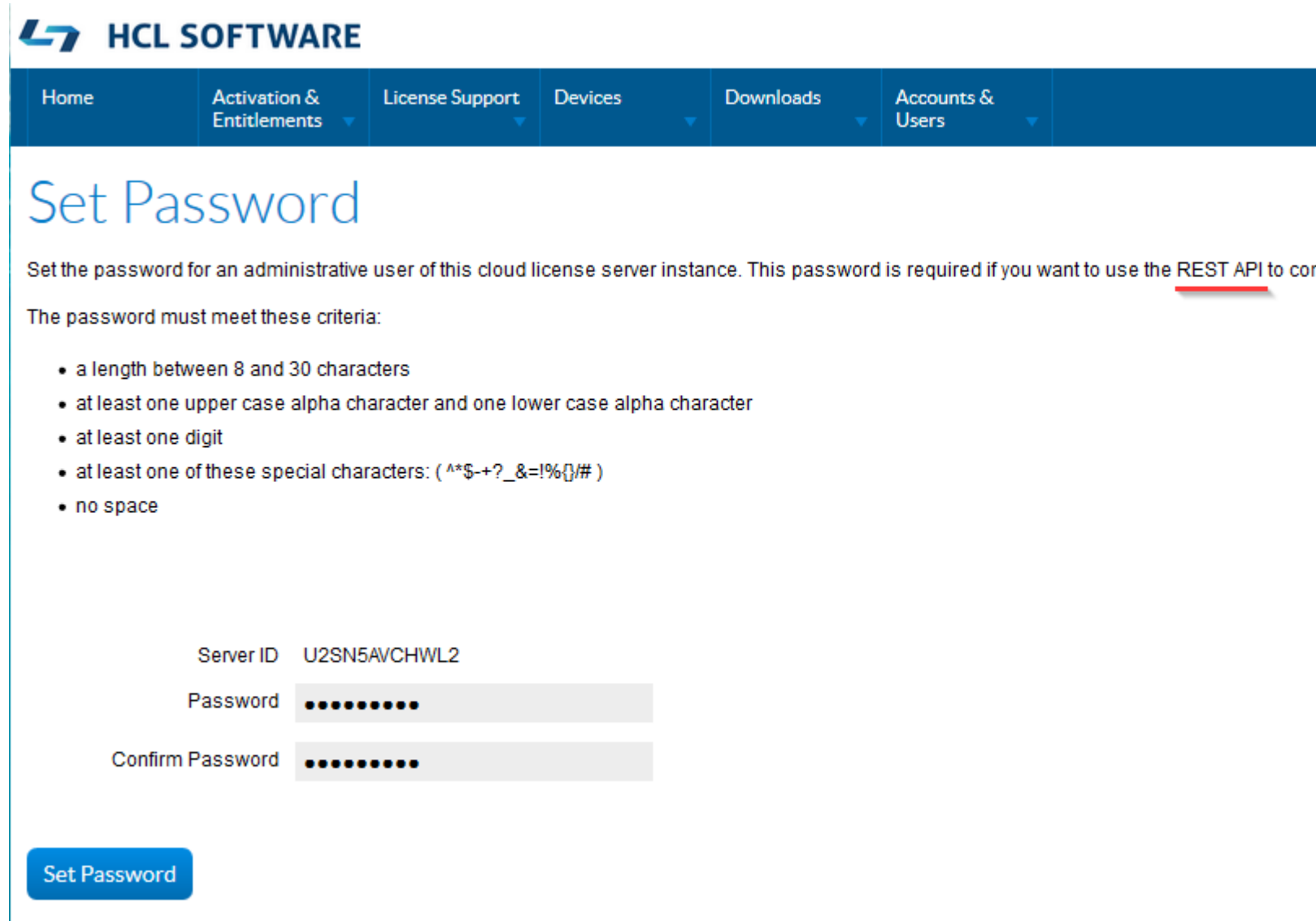
# Configure as "CLS"

- Action: "Set Password"



# Set CLS Password

- Create a password
  - Tip: Avoid Linux specific chars!
- Needed for REST calls to FNO



The screenshot shows the HCL Software 'Set Password' page. At the top is the HCL Software logo and a navigation bar with links for Home, Activation & Entitlements, License Support, Devices, Downloads, and Accounts & Users. The main heading is 'Set Password'. Below it, a paragraph explains that the password is for an administrative user and is required for REST API access. A list of criteria for the password is provided: length (8-30 characters), inclusion of upper and lower case letters, a digit, and one of several special characters, with a note that spaces are not allowed. The form includes a 'Server ID' field with the value 'U2SN5AVCHWL2', a 'Password' field, and a 'Confirm Password' field, both currently masked with dots. A blue 'Set Password' button is located at the bottom of the form.

**HCL SOFTWARE**

Home Activation & Entitlements License Support Devices Downloads Accounts & Users

## Set Password

Set the password for an administrative user of this cloud license server instance. This password is required if you want to use the REST API to connect to the server.

The password must meet these criteria:

- a length between 8 and 30 characters
- at least one upper case alpha character and one lower case alpha character
- at least one digit
- at least one of these special characters: ( ^\*\$-+?\_&=!%{}/# )
- no space

Server ID U2SN5AVCHWL2

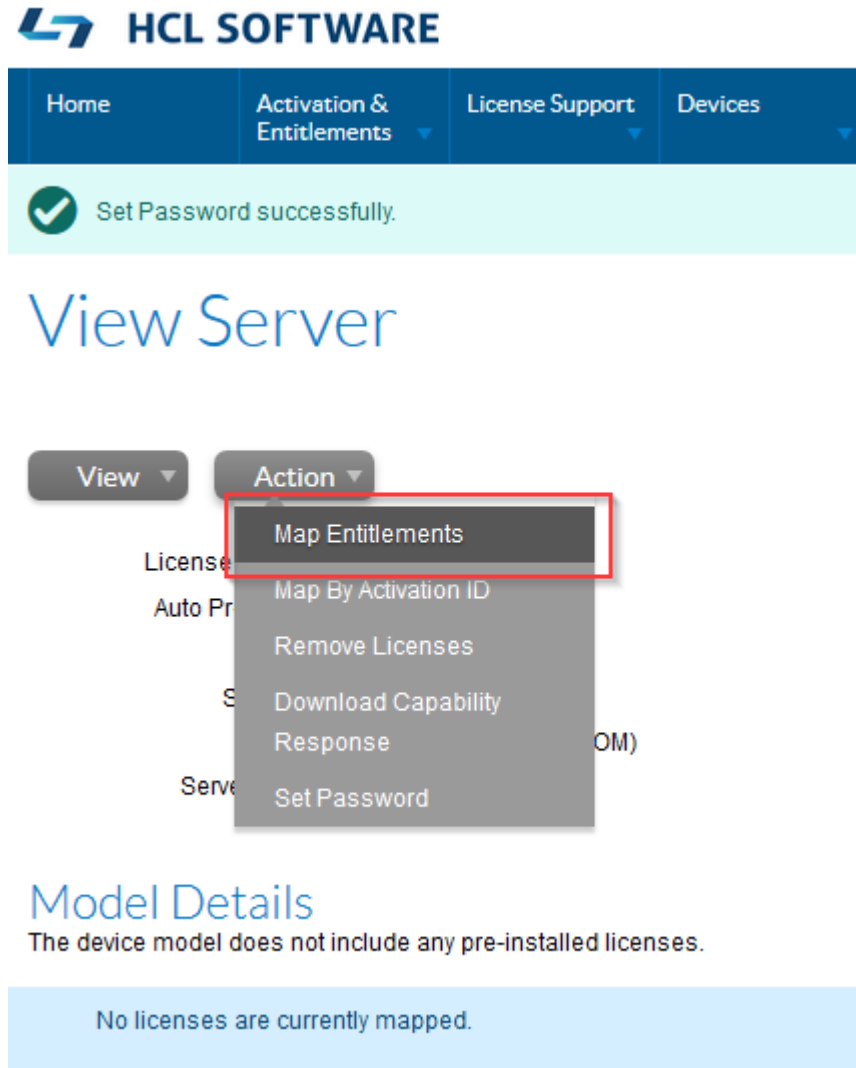
Password

Confirm Password

Set Password

# CLS Map Entitlements

- Action: **Map Entitlements**



The screenshot displays the HCL Software web interface. At the top, the HCL Software logo is visible, followed by a navigation bar with tabs for Home, Activation & Entitlements, License Support, and Devices. A green notification banner indicates 'Set Password successfully.' Below this, the page title 'View Server' is shown. A dropdown menu is open under the 'Action' tab, with 'Map Entitlements' highlighted by a red box. Other options in the menu include 'Map By Activation ID', 'Remove Licenses', 'Download Capability Response (COM)', and 'Set Password'. Below the menu, the 'Model Details' section states 'The device model does not include any pre-installed licenses.' A light blue banner at the bottom of the section reads 'No licenses are currently mapped.'

# CLS Map Entitlements

- This assigns licenses to your license server

**HCL SOFTWARE**

Home Activation & Entitlements License Support Devices Downloads Accounts & Users

## Map Entitlements

ID U2SN5AVCHWL2  
Name fn.demo.dnug  
Account: HCL25197

| Qty to add | Available qty | Total qty | Product               | Activation ID    |
|------------|---------------|-----------|-----------------------|------------------|
| 5          | 89            | 100       | HCL Notes Domino Beta | 9abd-b0a2-bf67-4 |

# CLS Server Setup complete



- Home
- Activation & Entitlements
- License Support
- Devices
- Downloads
- Accounts & Users

## View Server

- View
- Action

License Server ID U2SN5AVCHWL2  
Auto Provisioned No  
Name fn.demo.dnug  
Site Name DNUG  
Account : HCL (NASH!COM)  
Server Status : ACTIVE

## Model Details

The device model does not include any pre-installed licenses.

## Licenses

| Product               | Activation ID                      | Status            | Qty mapped | Expiration   | Owner    |
|-----------------------|------------------------------------|-------------------|------------|--------------|----------|
| HCL Notes Domino Beta | 9abd-b0a2-bf67-4f8b-<br>[redacted] | License generated | 5          | Nov 29, 2019 | NASH!COM |

# Connect Domino to CLS

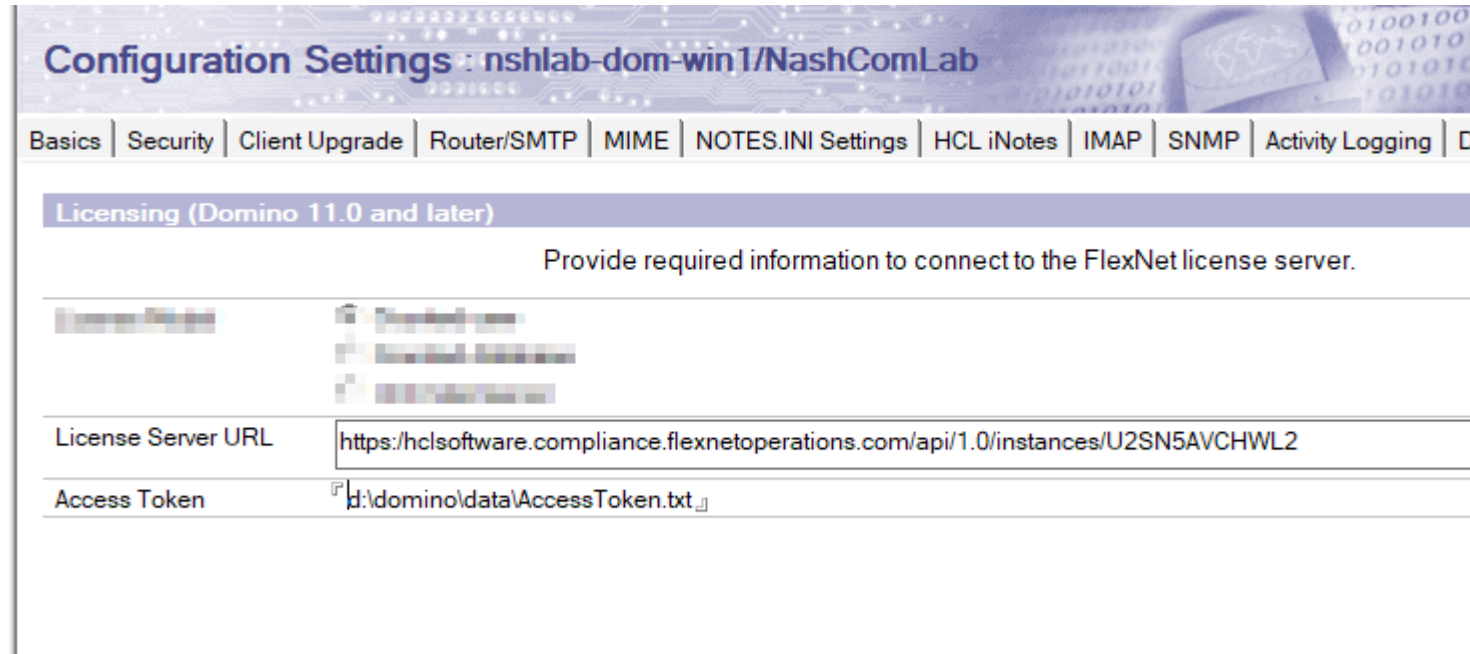
- Domino needs to connect to CLS over HTTPS
  - Either directly or via Proxy
    - In 11.0.0 without authentication only

REST Request for Flexnet authenticated via "JSON Web Token" (JWT)

- A JSON web token needs to be generated from a public/private key pair
- The public key needs to be registered with the CLS server
- Sounds complicated but is covered by a server command (not part of Beta2)

# Domino License Configuration

- The JWT needs to be stored in a local file on the server
- License configuration is in a new tab in config document
  - All servers can share the same configuration
  - But each server currently has it's own configuration and would need to connect to FlexNet on it's own



**Configuration Settings** : nshlab-dom-win1/NashComLab

Basics | Security | Client Upgrade | Router/SMTP | MIME | NOTES.INI Settings | HCL iNotes | IMAP | SNMP | Activity Logging | D

**Licensing (Domino 11.0 and later)**

Provide required information to connect to the FlexNet license server.

|                    |  |
|--------------------|--|
| License Server URL | <input type="text" value="https://hclsoftware.compliance.flexnetoperations.com/api/1.0/instances/U2SN5AVCHWL2"/> |
| Access Token       | <input type="text" value="d:\domino\data\AccessToken.txt"/>  |

# Domino FlexNet License Reporting

- “restart server” to get changes effective
- If you want to see more details enable debugging via notes.ini **ServerLicenseDebug=3**

```
23.11.2019 16:57:27,42 Licensing> Hashed 'daniel nashed/nashcomlab' into
'1A8F29B6674EF0F4A86918A046078E93EB892E7A'
23.11.2019 16:57:27   Opened session for Daniel Nashed/NashComLab (Release 11.0)
23.11.2019 16:57:27,84 Licensing> Capability Request =
00000000: 207B 6822 736F 4974 2264 203A 227B 7974   '{ "hostId": {"ty'
00000010: 6570 3A22 2220 7473 6972 676E 2C22 7622   'pe": "string","v'
00000020: 6C61 6575 3A22 2220 4131 4638 3932 3642   'alue": "1A8F29B6'
00000030: 3736 4534 3046 3446 3841 3936 3831 3041   '674EF0F4A86918A0'
00000040: 3634 3730 4538 3339 4245 3938 4532 4137   '46078E93EB892E7A'
00000050: 7D22 222C 6F62 7272 776F 692D 746E 7265   '"},"borrow-inter'
00000060: 6176 226C 203A 3322 6430 2C22 6622 6165   'val": "30d","fea'
00000070: 7574 6572 2273 203A 7B5B 6322 756F 746E   'tures": [{"count'
00000080: 3A22 3120 222C 616E 656D 3A22 2220 4448   '": 1,"name": "HD'
00000090: 4D4F 4E49 5F4F 7355 7265 2C22 7622 7265   'OMINO_User","ver'
000000A0: 6973 6E6F 3A22 2220 2E31 2230 5D7D 7D   'sion": "1.0"}]}'
23.11.2019 16:57:27,84 Licensing> Flexnet URL:
https://hclsoftware.compliance.flexnetoperations.com/api/1.0/instances/..
```

# Domino FlexNet License Reporting

- "show license" Domino Server command
  - Shows the currently cached licenses

```
show license

Begin Domino License Cache dump.
Licensed Entity:
Added to cache time      Error  Total Hits  MQ  HashID                                     Last Server Attempt  Last Server Refresh  Expires
-----
daniel nashed/nashcomlab :
23.11.2019 16:57:27      0         1    0  1A8F29B6674EF0F4A86918A046078E93EB892E7A  23.11.2019 16:57:28  23.11.2019 16:57:28  23.12.2019 16:57:28
-----

License.Cache.Entries = 1
License.Cache.Hits = 1
License.Cache.Misses = 1
License.Cache.HitRate = 50%
License.Cache.PoolSize = 1048576
License.Cache.PoolUsed = 1024
License Model = Counted User
Last cache enumeration time: 23.11.2019 17:56:35
End Domino License Cache dump.
```

# Domino FlexNet License Reporting

- Show used licenses using the FlexNet Admin
  - Command-Line needs your FlexNet Server identifier and admin password for the CLS

```
flexnetlsadmin -server https://hclsoftware.compliance.flexnetoperations.com/api/1.0/instances/DZ2EPP4XGCKT -authorize admin xyz -licenses -verbose
User authentication succeeded.
```

```
=====
Feature ID      Feature Name      Feature Version  Feature Count Used/Available
=====
682125         HDOMINO_User     1.0              4/6
=====
```

Device Information:

```
-----
Device Name      Feature Registered(Used Count)
-----
CAF36C31C586F7561610D449F265CC7396D9622A   HDOMINO_User(1)
2DCF1E219F34A8D21966D30544D71E62D94ED994   HDOMINO_User(1)
CBC2706DA6267BAE259F5F93DC76287B4FB3D80A   HDOMINO_User(1)
1A8F29B6674EF0F4A86918A046078E93EB892E7A   HDOMINO_User(1)
-----
```

```
=====
Total feature count      : 10
Total feature count used : 4
Total uncounted features : 0
=====
```

# FlexNet License Server Download Packages

- Needed for
  - Local License Server
  - FlexNet Admin Commands
- Windows or Linux, Local Online or Offline Server – Just download the online version
  - Those files are usually used for the Local License Servers
- Extracted directories contain “enterprise” directory, containing “flexnetadmin” command

|                          |   |  |         |              |   |
|--------------------------|---|--|---------|--------------|---|
| <input type="checkbox"/> | + | HCL Common Local License Server Linux            | 95.64MB | Jul 31, 2018 | <a href="#">↓ HCL_CLLS-x64-linux-2018.02.tar.gz</a>         |
| <input type="checkbox"/> | + | HCL Common Local License Server Linux, Offline   | 95.64MB | Jul 31, 2018 | <a href="#">↓ HCL_CLLS-x64-linux-2018.02-offline.tar.gz</a> |
| <input type="checkbox"/> | + | HCL Common Local License Server Windows          | 95.33MB | Jul 31, 2018 | <a href="#">↓ HCL_CLLS-x64-windows-2018.02.zip</a>          |
| <input type="checkbox"/> | + | HCL Common Local License Server Windows, Offline | 95.33MB | Jul 31, 2018 | <a href="#">↓ HCL_CLLS-x64-windows-2018.02-offline.zip</a>  |

# Traveler 11

- Works on Domino 9.0.1, 10.0.1, 11.0
  - You should install current fixpacks (9.0.1 FP10 IF5, 10.0.1 FP3)
- Traveler is continuous build with a build-date, which get a “version tag” at some point
- The same installer will install different binaries based on your Domino version!
  - For example for Domino 11 the GSKIT is removed
- HTTP/2 support for APNS (Apple Push notifications)
- Supports ActiveSync 16
  - Draft Folder sync
  - Calendar Attachments & more than 24-hour meeting support

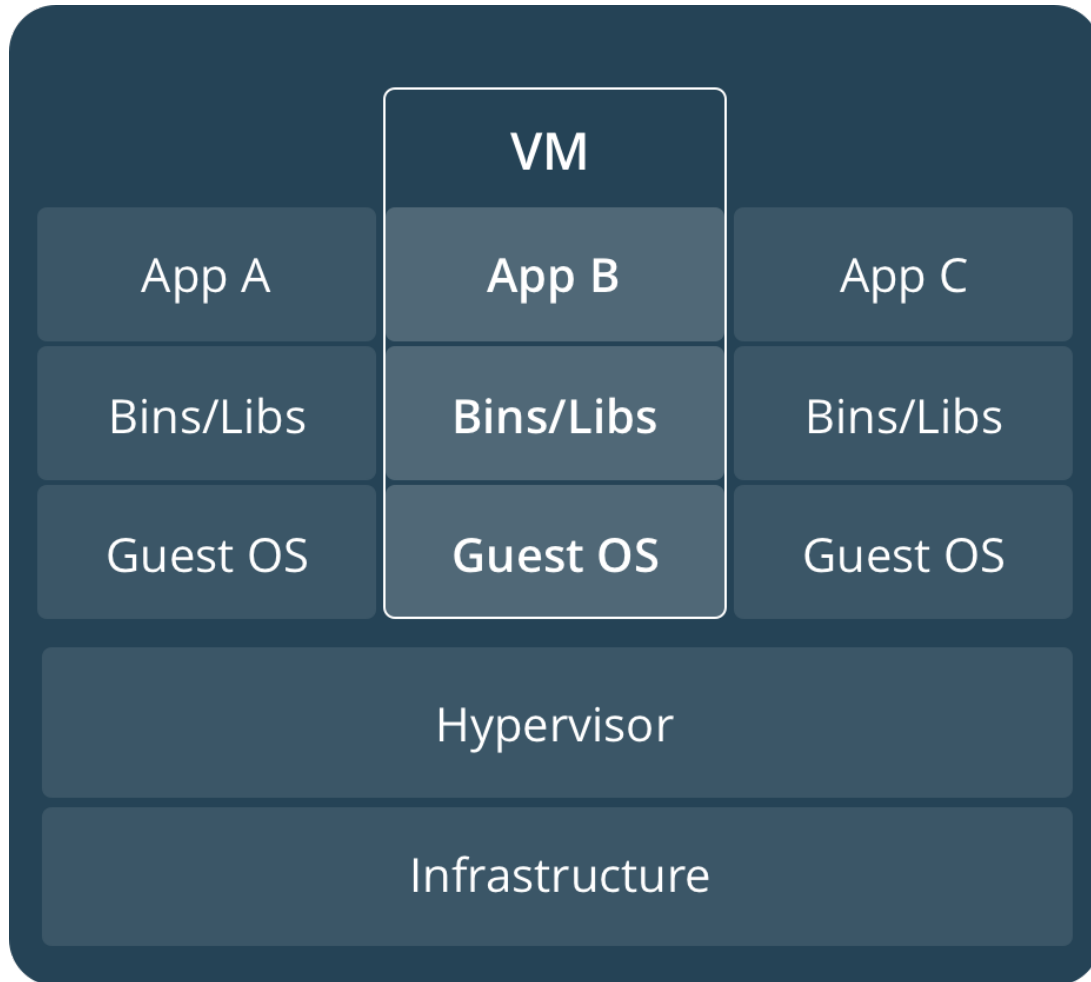
# Domino Docker



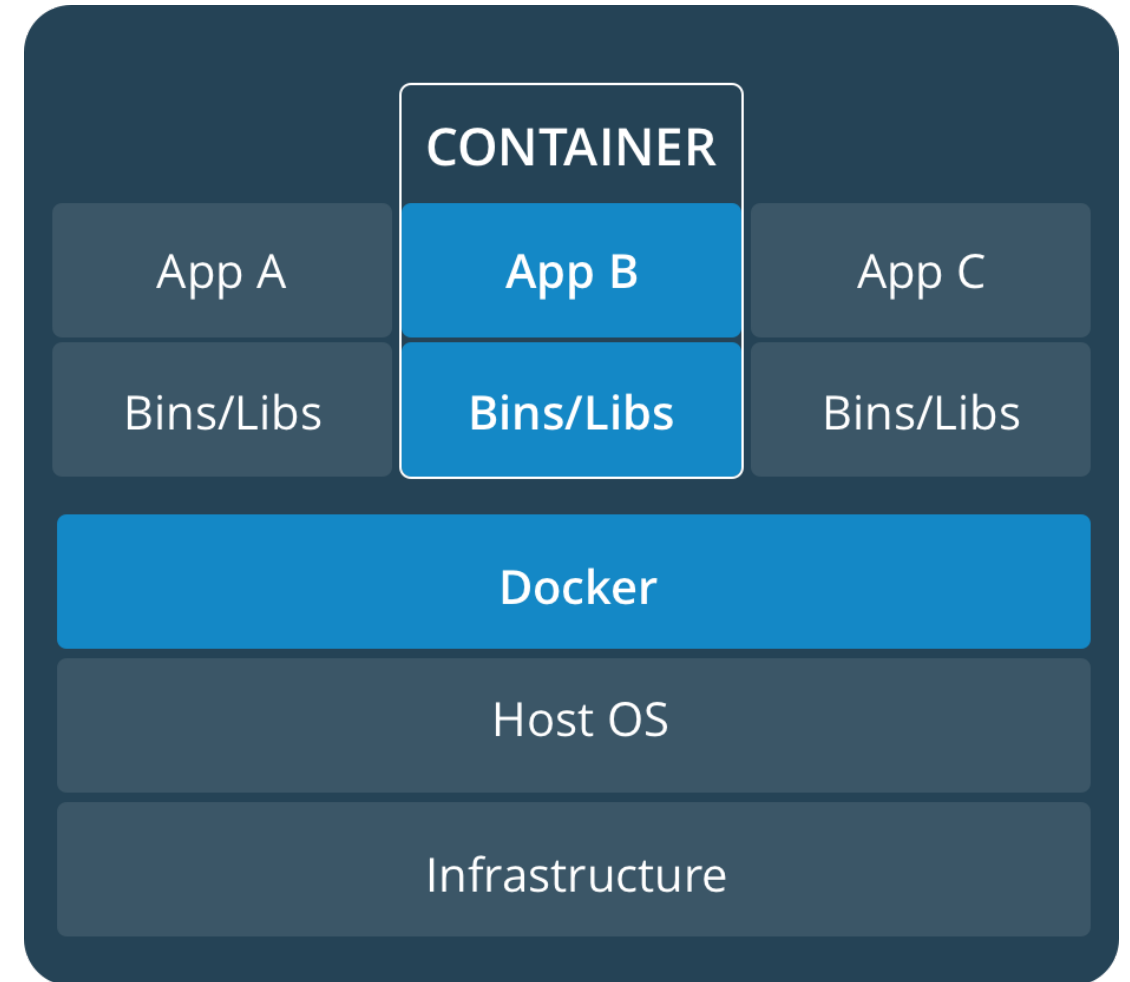
- Domino 9.0.1 FP10 is already supported on Docker
  - Documented via IBM technote (not available any more)
- IBM published a first reference implementation on GitHub
  - <https://github.com/IBM/domino-docker>
  - Dockerfiles run on Linux and MAC OSX Docker Docker hosts
  - Domino-Core Image dockerfiles will contain installation for Domino 10.0.1
  - Sample Dockerfiles how to adapt the image for your environment and applications
  - Nash!Com Domino Start Script supports Domino on Docker with automatic installation routine and Docker Entrypoint

# Virtual Machine vs. Docker Infrastructure

## Virtual Machines

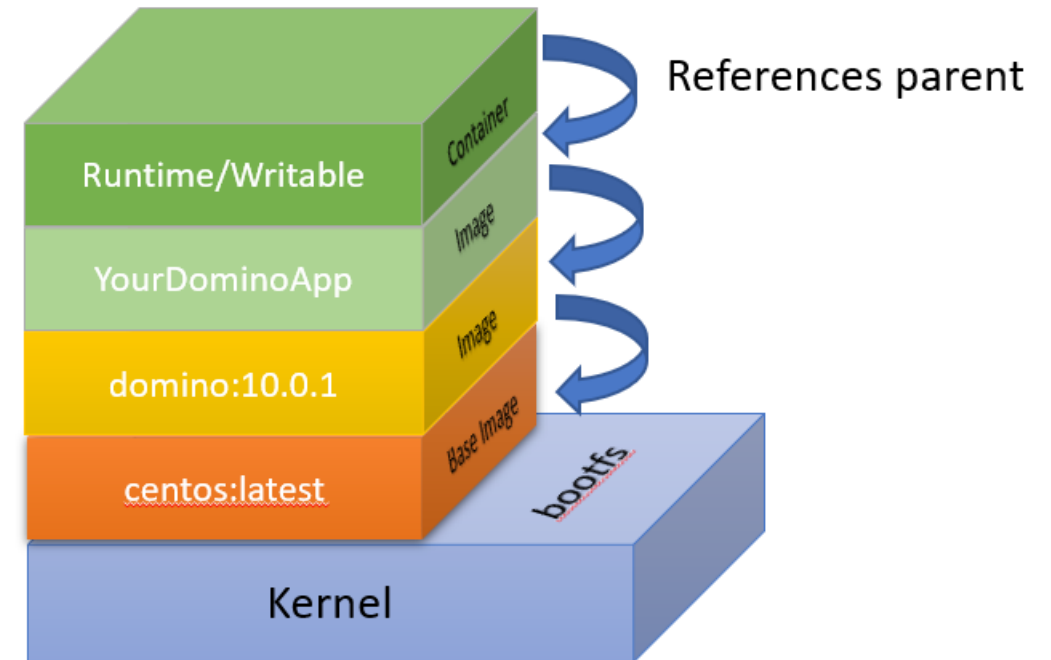


## Docker Containers



# Docker Container Concept

- Container is
  - A layered file system where each layer references the layer below
  - A run-time instance of an image.
  - Not containing your persistent (Domino) data
    - They are stored on a separate "volume"
- Images
  - Are used to create containers
  - Layers build on top of each other
  - Only the differences are stored in each layer



# Questions & Answers?

- Questions & Further information
  - <http://blog.nashcom.de> , nsh@nashcom.de
  - <https://www.eknori.de> , ulrich.krause@midpoints.de
- Resources
  - HCL site
    - <https://www.hcltechsw.com/welcome>
  - Domino Ideas #dominoforever
    - <https://domino-ideas.hcltechsw.com>
    - Submit your most wanted features

