



# Ad.10 - Domino Containers The Next Step

Update from the community project



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@martdj



# 2 years ago...

## Agenda

- ▶ History of Containers
- ▶ Container Basics
- ▶ Why Domino containers in production
- ▶ Build-up of the Domino Container
- ▶ Building the image
- ▶ Install and run a new Domino server
- ▶ Convert an existing Domino server
- ▶ Customising / upgrading an image
- ▶ Conclusion



**Any Questions...  
Just Ask!**



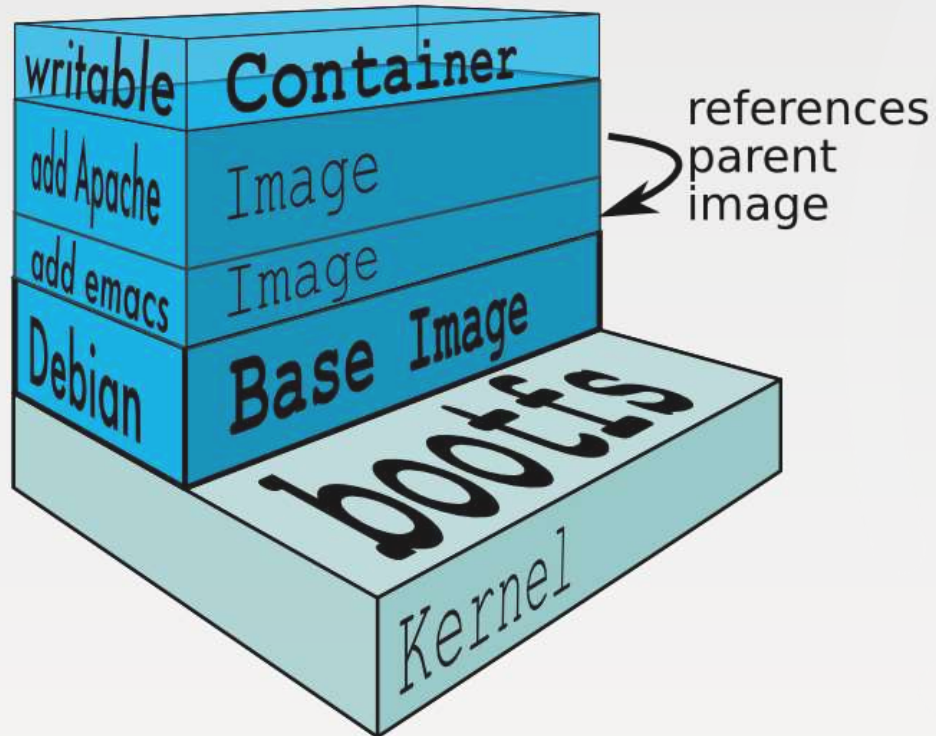
<https://youtu.be/wx5jv0rwn00>

## 2 years ago... (2)

- ▶ History of Containers
- ▶ Container Basics
- ▶ Why Domino containers in production
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# Buildup of a container



REMINDER

# Why run Domino as a Container?

- ▶ Standardisation
  - ▶ Start / stop command, locations of folders are the same on all servers
- ▶ Upgradability
  - ▶ Upgrading a server takes less than a minute
- ▶ Portability
  - ▶ Moving a server becomes a lot easier
- ▶ Testing
  - ▶ Containers make it much easier to test how your applications behaves with a new version



REMINDER

## 2 years ago... (3)

Demo	Result	Duration
<code>build.sh domino -capi -verse -nomad</code>	Container image with latest Domino version, Verse, Nomad and the C API	6:35 minutes
<code>build.sh traveler</code>	Adds Traveler to Domino image	1:17 minutes
<code>build.sh volt --from=localhost/hclcom/traveler</code>	Adds Volt (Leap) to Traveler image	33 seconds
<code>dominoctl build</code>	Create your own customized image based on the previous image	35 seconds

# Frequently Asked Questions

- ▶ I'm a Linux newbie. How do I start with this?
- ▶ How do I create an image from scratch?
- ▶ How do I start a Domino server from that image?
- ▶ How do I update the Linux packages inside the container?
- ▶ Can I automate that?
- ▶ How do I add custom packages to the Domino program directory?
- ▶ Can I have a Domino container partitioned server?



# Demo machine

SOFTWARE SELECTION

Done

ROCKY LINUX 9.3 INSTALLATION

us (intl)

Help!

Base Environment

☐ **Server with GUI**  
An integrated, easy-to-manage server with a graphical interface.

☐ **Server**  
An integrated, easy-to-manage server.

☒ **Minimal Install**  
Basic functionality.

☐ **Workstation**  
Workstation is a user-friendly desktop system for laptops and PCs.

☐ **Custom Operating System**  
Basic building block for a custom Rocky Linux system.

☐ **Virtualization Host**  
Minimal virtualization host.

Additional software for Selected Environment

☐ **Standard**  
The standard installation of Rocky Linux.

☐ **Legacy UNIX Compatibility**  
Compatibility programs for migration from or working with legacy UNIX environments.

☐ **Console Internet Tools**  
Console internet access tools, often used by administrators.

☐ **Container Management**  
Tools for managing Linux containers.

☐ **Development Tools**  
A basic development environment.

☐ **.NET Development**  
Tools to develop and/or run .NET applications.

☐ **Graphical Administration Tools**  
Graphical system administration tools for managing many aspects of a system.

☐ **Headless Management**  
Tools for managing the system without an attached graphical console.

☐ **Network Servers**  
These packages include network-based servers such as DHCP, Kerberos and NIS.

☐ **RPM Development Tools**  
Tools used for building RPMs, such as rpmbuild.

☐ **Scientific Support**  
Tools for mathematical and scientific computations, and parallel computing.

☐ **Security Tools**  
Security tools for integrity and trust verification.

☐ **Smart Card Support**  
Support for using smart card authentication.

☐ **System Tools**  
This group is a collection of various tools for the system, such as the client for connecting to SMB shares and tools to monitor network traffic.

# Demo machine

SOFTWARE SELECTION Done ROCKY LINUX 9.3 INSTALLATION us (intl) Help!

Base Environment

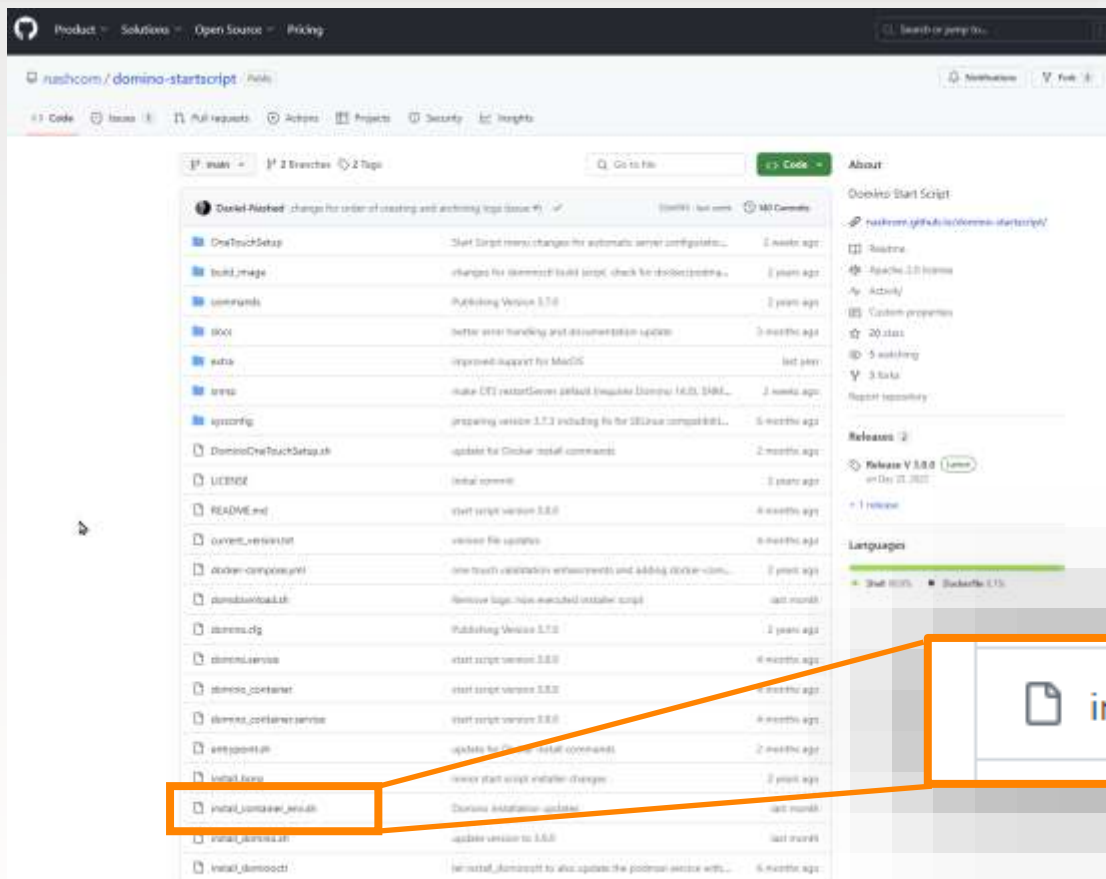
- ☐ Server with GUI
- ☒ **Minimal Install**  
Basic functionality.
- ☐ Workstation
- ☐ Virtualization Host  
Minimal virtualization host.


Additional software for Selected Environment:

- ☐ **Standard**  
The standard installation of Rocky Linux.
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# Install container environment

<https://github.com/nashcom/domino-startscript>



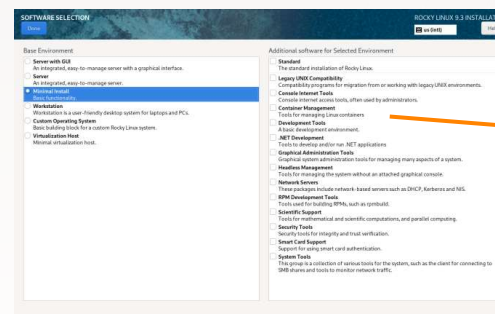
 `install_container_env.sh`

# Starting a Domino container

▶ `install_container_env.sh` prepares your server for running a Domino container:

- ▶ Installs required software (docker or podman, net-utils, jq, bind-utils, sysstat, tar)
- ▶ Adds notes:notes user and group
- ▶ Creates directory structure in `/local/` for the Domino server data (`/local/notesdata`, `/local/translog`, ...)
- ▶ Clones HCL Domino container project and Domino start script project
- ▶ Installs NashCom Domino container script (`dominoctl`)
- ▶ Sets security limits

The script will install Docker unless Podman is already installed



**Container Management**  
Tools for managing Linux containers

# Building a Domino image

```
▶ curl -fsSL https://github.com/nashcom/domino-startscript/raw/main/install_container_env.sh | sh
```

```
-----  
Configure Domino Download Token  
-----
```

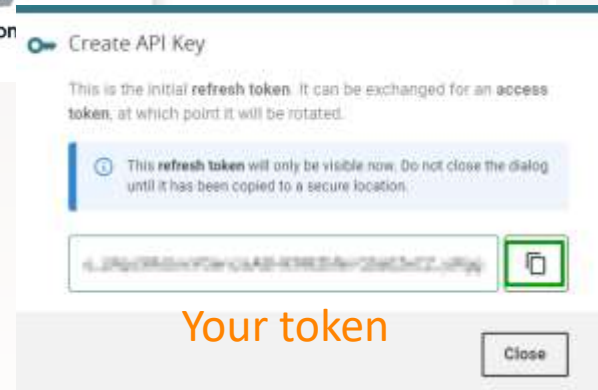
```
My HCL Software portal requires a download token.
```

```
Please visit -> https://my.hcltechsw.com
```

- Log in with your HCL software account.
- Navigate to the upper right corner and select 'API keys' to generate a key.
- Specify the generated key as a download token below.

```
Enter Download Token:
```





## Your token

# Building a Domino image

- ▶ `curl -fsSL https://github.com/nashcom/domino-startscript/raw/main/install_container_env.sh | sh`
- ▶ `cd /local/github/domino-container`
- ▶ `./build.sh`

# Let's see that live

- ▷ Build a Domino 14 image with:
  - ▷ Traveler
  - ▷ Nomad server
  - ▷ Domino Leap
  - ▷ OnTime
  - ▷ Verse



# Other options during build

- ▶ **-scan**  
Scan a Domino container image with trivy (trivy needs to be installed)
- ▶ **-from=ubi-minimal**  
Domino can be build on other Linux base images, like RedHat ubi, VMWare Photon, Ubuntu etc
- ▶ **-conf=appserver.conf**  
Build from the command line based on a configuration file that you created with the menu  
Different type of configuration files for different types of servers

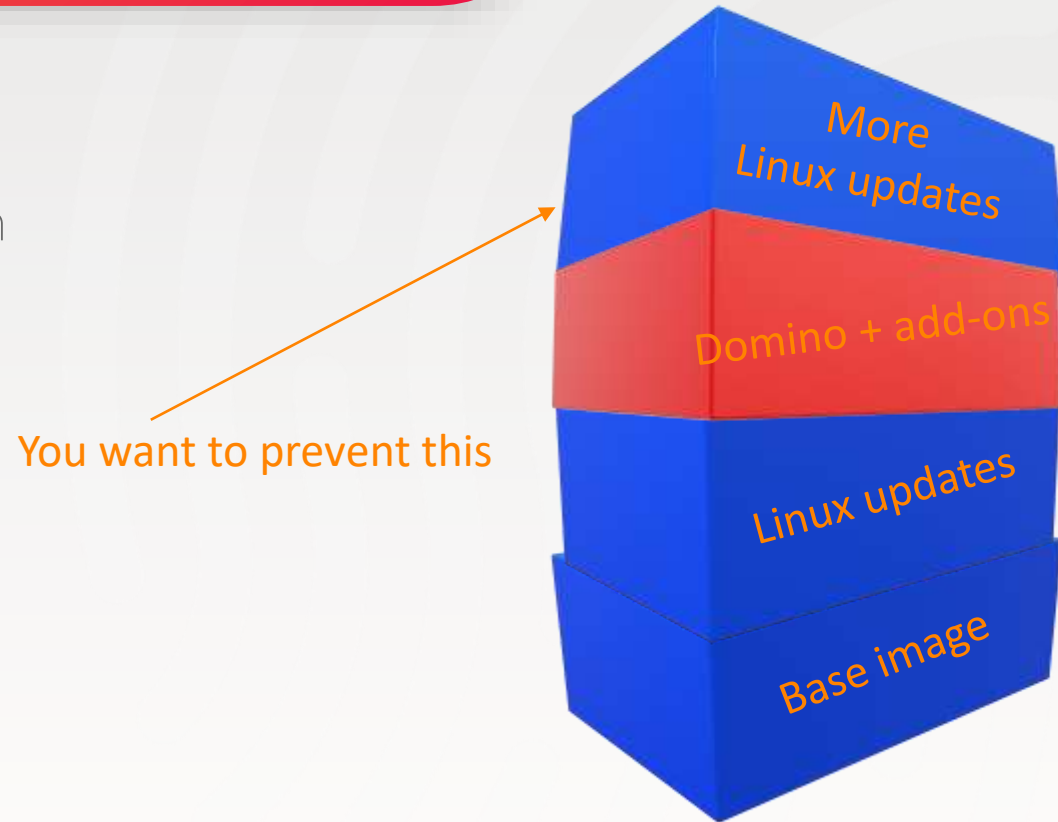
# Automation Testing

```
[root@demo2024 domino_automation_test_local]# cat result_autotest.csv
addon.installed.ontime| installed|SUCCESS|
addon.installed.verse| installed|SUCCESS|
addon.installed.nomad| installed|SUCCESS|
addon.installed.traveler| installed|SUCCESS|
addon.installed.domrestapi| installed|SUCCESS|
addon.installed.leap| installed|SUCCESS|
domino.jvm.available|Domino JVM available|SUCCESS|
domino.server.running|Domino Server startup|SUCCESS|
domino.http.running|Domino HTTP Server running|SUCCESS|
domino.certificate.available|Certificate chain downloaded|SUCCESS|
domino.server.onetouch.microca-cert|Domino One Touch create MicroCA|SUCCESS|
traveler.server.available|Traveler server available|SUCCESS|
nomad.server.available|Nomad server available|SUCCESS|
verse.server.available|Verse available|SUCCESS|
restapi.server.available|Domino REST-API available|SUCCESS|
domino-leap.server.available|Domino Leap available|SUCCESS|
domino-leap.server.version|Domino Leap version found|SUCCESS|
domino.server.onetouch.createdb|Domino One Touch create database|SUCCESS|
domino.idvault.create|Domino ID Vault create|SUCCESS|
domino.backup.create|Backup create|SUCCESS|
startscript.archive|Start Script archive|SUCCESS|
nsd.gdb|NSD GDB callstacks|SUCCESS|
container.health|Container health|SUCCESS|
startscript.server.restart|Start Script restart server|SUCCESS|
domino.translog.create|Translog create|SUCCESS|
tikaserver.available|Check if Tika Server can be started|SUCCESS|
```



# How do I update Linux packages in the image?

- ▶ There is more than one way
- ▶ Most sensible way:  
Rebuilding the image from scratch



# Can I automate that?

- ▶ Absolutely! HCL does this internally
- ▶ Do you remember that I saved the configuration?
- ▶ And that the build script has automated testing?
- ▶ `./build.sh -conf=<your saved config file>`
- ▶ If all tests were successful it will return 0

# Running a Domino server

- ▷ dominocfg
  - ▷ dominocfg setup
  - ▷ dominocfg start
  - ▷ dominocfg console
- ▷ Remember: If you use the host network, you need to create firewall rules to open the Domino ports



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- ▶ How do I add custom packages to the Domino program directory?
- ▶ Can I have a Domino container partitioned server?

# Creating a custom image

- ▶ Many companies have customisations in the Domino program directory
- ▶ Think of custom jvm.properties, company certificates in cacerts
- ▶ But also extra server tasks for custom add-ons, extra libraries, linux binaries etc
- ▶ It's not easy to add these to a Domino image...
- ▶ ... till now



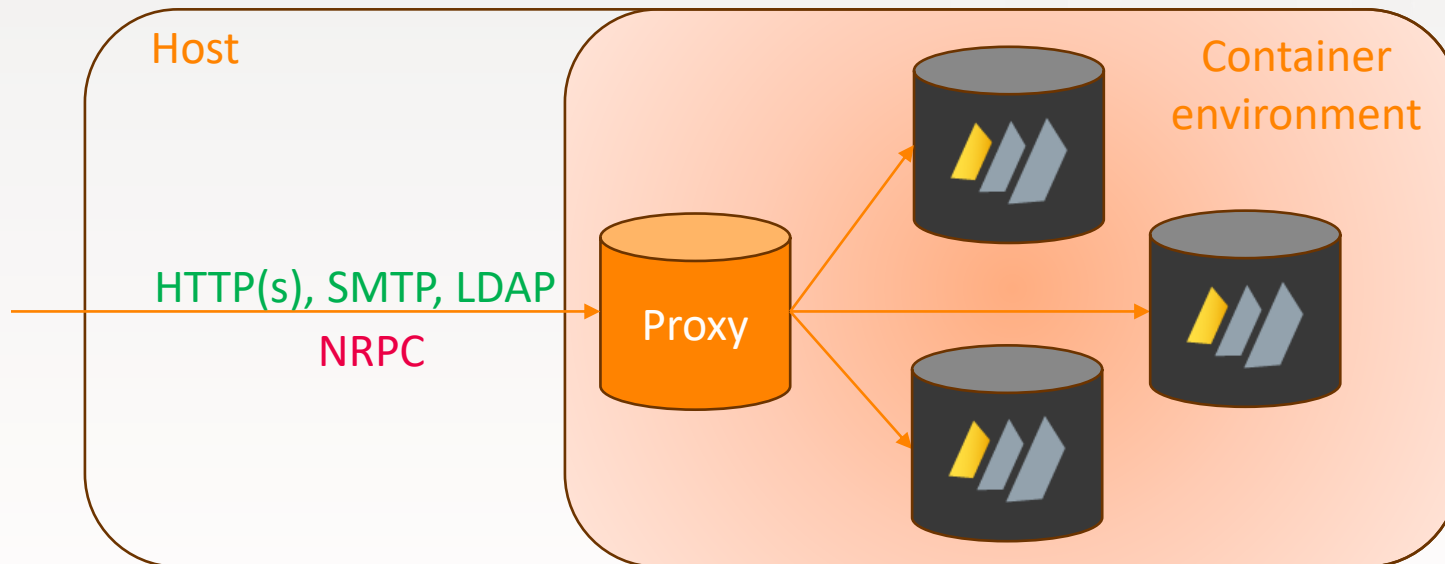
# Creating a custom image

- ▶ `build.sh -custom-addon=(https://)<path-to-compressed-tarball>#<sha256 of tarball>`
- ▶ Structure of the tarball:
  - ▶ `domino-bin`  
Files will be added to Domino program directory (`/opt/HCL/notes/latest/linux`)
  - ▶ `domino-data`  
Files will be added to notesdata folder
  - ▶ `linux-bin`  
Files will be added to Linux binary directory (`/usr/bin`)
  - ▶ `Install.sh`  
Install anything wherever you want. Install extra packages etc



# Can I have a Domino container partitioned server?

- ▶ Currently every Domino server needs it's own unique IP address
- ▶ You could achieve this by adding multiple IP addresses to the host and forwarding the ports to containers on a specific IP address
- ▶ A better solution is this:



# Can I have a Domino partitioned server?

- ▶ This works fine for HTTP(s), SMTP and LDAP
- ▶ However, a NRPC proxy does not **yet** exist
- ▶ The NRPC protocol is proprietary
- ▶ Best is if HCL would create this proxy
- ▶ If you agree that they should, please vote for this idea



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# Progress looks like...

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Demo now	Result	Duration
<code>build.sh --conf default.conf --custom-addon=https://domino-apps.martdj.nl/spamgeek.taz#35a3931e9b6708100f08c1c7d3c022f133c6cd9cf5212a9b2dd08bb93ddfd692</code>	A container image with the same add-ons as 2 years ago	5:36 minutes



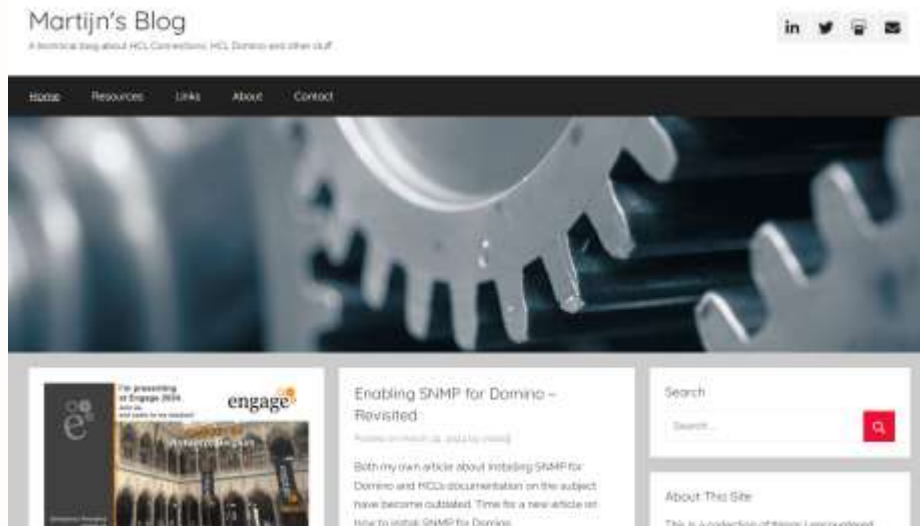
# Questions?



# More information



▶ <https://blog.martdj.nl>



Select tag domino-docker

▶ <https://blog.nashcom.de>

