Comparing and contrasting Docker images

from Ortus, Adobe, and Lucee

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Who is this talk for?

- **Speaking to those using/considering using containers, whether for ACF or Lucee**
- **Many here may know of Ortus Commandbox images for CF and Lucee**
  - **But both Adobe and Lucee offer their own container images (or "Docker images")**
- **We'll assess differences among them: what they do, how they work/are configured**
  - **Capabilities vary pretty widely**
  - **Commandbox images are more capable than the others, but those may still surprise some**
- **May help you consider alternatives, or at least help you help others do that**
- **…**

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Other housekeeping

- **Talk also presumes you already understand Docker**
  - **Including why you might want to use it, when it makes sense**
  - **You may be just exploring it, using it for CI/CD, running in prod or not**
- **Even if totally new, should still get considerable value from the talk**
  - **Indeed, may help get you started far faster than just on your own**
- **Presentation slides available at carehart.org/presentations**
- **Thank you to the ITB committee/Ortus for having me back again!**

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Me.about()

- **Independent consultant**
- **Long-time community contributor**
- **Not too active in Ortus community, as I don't do development professionally, so don't use most of the wonderful tools**
- **But I do help people on whatever platform they're on (CF, Lucee, Commandbox, etc.)**

- **…a couple more housekeeping items before we get rolling…**

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Focus is NOT on custom-building images

- **Speaking here on the pre-built images from these vendors**
- **Some may prefer to build their own images from scratch -- not covered in this talk**
  - **See recent blog posts from Mark Drew, *markdrew.io/slimmer-lucee-docker-images***
  - **Github project from Igal Sapir: *github.com/isapir/lucee-docker***
  - **Beware you may well find on Dockerhub images named "coldfusion" or "lucee" that are NOT from vendors but from people publishing their own (perhaps from scratch)**
- **Choice to use vendor image vs your own is similar to frameworks debate ☺**

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On Compose, Dockerfiles, Kubernetes

- **Finally, demos will be using images via compose**
  - **Of course can use Dockerfile's if desired/when needed**
  - **Apply what I show however you may deploy the images**
- **Indeed, this is not to deny value of awesome kubernetes**
  - **Of course can deploy these images via k8s, via any implementation**
  - **Those familiar with k8s may often convert compose specs to pod(s)**
    - **Tool to help do this at *kompose.io* (free and cross- platform)**
- **…now we can move on to the real focus of the talk …**

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Finding these Docker images

- **All are available via DockerHub**
  - ***hub.docker.com/u/adobecoldfusion***
  - ***hub.docker.com/u/lucee***
  - ***hub.docker.com/r/ortussolutions/commandbox/***
- **Adobe also makes their images available via Amazon ECR:**
  - ***gallery.ecr.aws/adobe***
  - **Offered only via jFrog bintray May 2018-Sep 2021…odd choice, past is past**
- **Let's take a quick look at those image repositories**

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About differing images and tags

Adobe ColdFusion

- Offers CF, as well as:
  - CF Addons (Solr, PDFg/cfhtmltopdf support)
  - PMT (monitor)
  - API Manager
  - API Manager addons
- Repository for each of them
- Uses tags for each update

Lucee

- Offers Lucee, one repository
  - Other repos are very old
- Uses tags for different engine versions, and
  - Snapshots, RC
  - Major JVM versions
  - Major Tomcat versions
  - Lucee Light, Lucee+nginx
  - Optional alpine

Ortus CommandBox

- Offers CF and Lucee, one repo
- Uses tags for the engines and:
  - Major CF versions
  - Lucee versions (including snapshots)
  - Major JVM versions
  - Optional alpine

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Docs for each

- **Docs include discussion of image tag formats, environment vars, more**
- **Adobe CF Docker image help**
  - ***helpx.adobe.com/coldfusion/using/docker-images-coldfusion.html***
  - **And some on the dockerhub page**
- **Lucee Docker image help**
  - **Primarily the dockerhub page**
  - **Also *github.com/lucee/lucee-dockerfiles***
- **Commandbox image help**
  - ***commandbox.ortusbooks.com/deploying-commandbox/docker***
  - **And some on the dockerhub page**

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CF licensing

- **Elephant in the room…**
- **Deploying ACF images for production will indeed require licensing**
  - **Same is true of prod deploying ACF via Commandbox images (which can't support CF Standard, due to underlying WAR implementation)**
- **Adobe CF is free for development**
  - **Many folks use containers entirely for development/exploration, rather than production deployment**
- **Adobe states container licensing as being that:**
  - **For CF Enterprise, can deploy 8 containers**
  - **For CF Standard, each container must be licensed**
  - **More: *coldfusion.adobe.com/2019/03/coldfusion-licensing-docker-containers***

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Download counts…fwiw

Adobe ColdFusion

- 500k, across Dockerhub, ECR
  - Over past year
  - 3 CF engine "repositories"
  - With a few tags each

Lucee

- 1500k + on Dockerhub
  - over 5+ years
  - And 9 "repositories"
- That main lucee/lucee image has had 7000+ tags
- As for lucee52-nginx image
  - Last updated 4 years ago
  - Has 1000k+ of those 1500k+ total
- Beware lucee/lucee5
  - also not updated in 5 yrs

Ortus CommandBox

- 1000k+ on Dockerhub
  - Over 5 years
  - Across both CFML engines
  - Just 1 "repository", over 600 tags

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Another “elephant”: CPU architecture support

Adobe ColdFusion	Lucee	Ortus CommandBox
➢ AMD (x86) 64-bit only ➢ (for now)	➢ AMD (x86) 64-bit only ➢ (for now) ➢ See discussion on building these lucee/lucee images as ARM via docker build from dockerfile: ➢ *dev.lucee.org/t/lucee-docker-on-apple-silicon/9208/7* ➢ *dev.lucee.org/t/lucee-docker-on-apple-silicon/9208/13*	➢ AMD (x86) 64-bit ➢ ARM 64-bit

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Side-note: all these images are Linux images

- **This will be obvious/old info to those using Docker already**
- **To those new to Docker:**
  - **This does NOT mean you "can't run the images in Windows"**
  - **Docker Desktop for Windows or Linux VMs could run these**
    - **WSL (Windows Subsystem for Linux) is yet another way to run Linux and Docker**
- **As for CFML running on Linux…**
  - **Beware case-sensitivity of file names**
  - **Otherwise most would never notice CF is running "on Linux"**
    - **Just as how many don't notice/realize CF is running on Java**

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Demo time!

- **Let's run the most basic example of each of the engines**
- **I'll show a compose file for each**
  - **Don't worry if you've never seen a compose file or have never used Docker**
  - **We'll come back and elaborate on some things**
- **Also, I will show them as run via VS Code and its Docker extension**
  - **But you could run them (and the images) from the command line**
  - **Or via Portainer or even Docker Desktop (as alternative mgt Uis)**
  - **Or again via Kubernetes manifests, which can also be managed from all 3**
- **…**

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Still much more to cover

- **Image sizes, time awaiting first pull**
- **Environment variables**
- **Implementing CFML code**
- **Admin setting configuration**
- **Acessing CF or Lucee admin (or disabling)**
- **Setting CF or Lucee admin password**

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Beware of first pull download time

- **If you were to run these yourself for first time, images must be downloaded**
  - **Time will depend on image size (more in a moment) and your bandwidth**
- **Docker (and Compose and Kubernetes) all automatically pull image when used for first time, caching it for later reuse**
  - **Can also use** docker pull **(or** docker compose pull**) to force a pull**
- **Compose offers commands/args/**pull_policy **regarding forced pulls**
  - ***baeldung.com/ops/docker-compose-latest-image***
- **Note: Kubernetes pulls images on <u>each</u> pod deployment if:**
  - **You don't specify an imagepullpolicy <u>and</u>**
  - **You use "latest" tag or no tag at all**
  - ***kubernetes.io/docs/concepts/containers/images/#imagepullpolicy-defaulting***

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Image sizes (as shown at Dockerhub)

Adobe ColdFusion

- For CF2018 and 2016
  - About 600mb
- For CF2021
  - About 200mb

Lucee

- About 270-600mb, depending on:
  - Light or not
  - Nginx or not
  - Alpine or not

Ortus CommandBox

- For CF2018 and 2016
  - About 800mb
- For CF2021
  - About 600mb
- For Lucee
  - About 450-750mb, depending on:
    - Light or not
    - Alpine or not

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Environment variables

- **Most Docker images offer configurability via "environment vars"**
  - **Each container is free to implement them however they want**
  - **Be aware they are case-sensitive (name and expected values)**
- **In the case of these CF engine images, there's quite a disparity…**

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Built-in environment variables in CF images

Adobe ColdFusion

- **acceptEULA=YES (required)**
- **password (Admin)**
- **serial/previousSerial (if used)**
- **installModules (list or** all**)**
- **importModules (file listing them)**
- **importCFSettings (json file of settings, from** cfsetup**)**
- **importCFSettingsPassphrase (if set in *cfsetup*)**
- **setupScript (to name script to run at startup, such as to call adminapi methods)**
- **And many more (see online help earlier)**

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Built-in environment variables in CF images

Lucee

- **LUCEE_JAVA_OPTS**

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Built-in environment variables in CF images

Ortus CommandBox

- **APP_DIR**
- **USER**
- **cfconfig_[engine setting]**
- **BOX_SERVER_APP_SERVERHOMEDIRECTORY**
- **BOX_SERVER_CFCONFIGFILE**
- **BOX_SERVER_APP_CFENGINE**
- **BOX_SERVER_PROFILE**
- **BOX_SERVER_WEB_REWRITES_ENABLE**
- **BOX_INSTALL / box_install**
- **CFPM_INSTALL and CFPM_UNINSTALL**
- **Also supports <<SECRET:*>> for secret values, or _FILE suffix**

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Implementing or pointing to CFML code

- **Each CFML engine image offers a default location (within the container as deployed)**
- **You can copy code into an image using Dockerfiles (or** docker cp**)**
- **You also can use bind mounts or volumes, whether pointed to in:**
  - **Compose file**
  - **Dockerfile**
  - **Command line (**`Docker Run`**)**
- **This talk can't elaborate on those options**
- **…**

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Default app folder

Adobe ColdFusion	Lucee	Ortus CommandBox

➢ /app
➢ Files typical of cf wwwroot also there, including folders:
  ➢ CFIDE
  ➢ cf_scripts
  ➢ restplay
	➢ /var/www
	➢ If nothing mounted there, 4 default files are there:
	  ➢ index.cfm
	  ➢ Application.cfc
	  ➢ debug.cfm
	  ➢ favicon.ico
		➢ /app
		➢ If nothing mounted there, 4 default files are there:
		  ➢ index.cfm
		  ➢ commandBoxLogo300.png
		  ➢ 403.html

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Admin setting configuration

- **Naturally, your code may not work if you haven't configured things like datasources, mappings, etc.**
- **All 3 vendor images offer different ways to facilitate that…**

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Adobe ColdFusion

- In CF2021:
  - importCFSettings env var
- In CF2021, 2018, 2016:
  - Car file mounted into /data folder in container
  - Or AdminAPI, callable in cfml named in setupScript env var

Lucee

- Can copy lucee config files into:
  - /opt/lucee/web/
  - /opt/lucee/server/lucee-server/context

Ortus CommandBox

- cfconfig import, via env vars:
  - BOX_SERVER_CFCONFIGFILE
  - cfconfig_[engine setting]

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Default port for web apps (and admin, if any)

Adobe ColdFusion	Lucee	Ortus CommandBox
➢ 8500	➢ 8888	➢ 8080 and 8443

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Acessing CF or Lucee admin (if enabled)

Adobe ColdFusion	Lucee	Ortus CommandBox
➢ /CFIDE/administrator/index.cfm	➢ /lucee/admin/server.cfm ➢ /lucee/admin/web.cfm	➢ See links on left

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Setting CF or Lucee admin password

Adobe ColdFusion	Lucee	Ortus CommandBox

➢ password env var	➢ Place a password.txt file in container at /opt/lucee/server/lucee-server/context
	➢ Can do with:
	  ➢ Dockerfile COPY
	  ➢ Compose bind mount
	  ➢ docker cp
		➢ adminPassword property in cfconfig

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Many more things we could discuss

- **Enabling/disabling admin access**
- **Limiting admin access by IP**
- **Enabling/disabling browsing of directories**
- **Modifying JVM args within the containers**
- **Enabling FR within the containers**
- **Benchmarking performance differences**
- **Showing integration with web servers in front of CFML engine**
- **Showing integration with database servers (running in other containers or not)**
- **And still more**
- **Look for a part 2 or blog posts to come**

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Bonus tip: searching/listing the many tags for Lucee and CommandBox

- **Dockerhub ui offers search (filter)**
  - **Useful if looking FOR something**
  - **But can't seem to negate, not useful for finding anything BUT something**
- **While there is a** docker search**, it does not support searching tags**
- **There is an http api, which can list all tags**
  - **Can format with jq (if installed) and limit results with grep or awk, for instance**
- **For instance, how to filter out the 6,800+ lucee/lucee image tags that say SNAPSHOT, -RC, -beta or -BETA?**
  - **wget -q https://registry.hub.docker.com/v1/repositories/lucee/lucee/tags -O - | jq -r '.[].name' | grep -Ev 'SNAPSHOT|-RC|-beta|-BETA'**

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Some closing thoughts

- **Getting my compose files**
  - ***github.com/carehart/awesome-cf-compose***
  - **See also *github.com/docker/awesome-compose*, which inspired it**
    - **Briefly: why I haven't yet put my contributions there instead**
- **Where can you get help on these things**
  - **No particular place focuses on any of the engine docker images**
  - **Normal places for support for specific engines, or wider cf community**
    - **See *cf411.com/cfcommhelp***
  - **And of course I can help directly, free to a point, or via consulting**

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Summary

- **We've seen there are indeed options for running CFML images**
  - **Those from each vendor have their pros and cons**
  - **Folks can decide if one or another suits them better**
- **The images from each will surely evolve over time**
- **Again, see links I've shared for the images, help in using them, my compose files, and getting help beyond this session**
- **With that, enjoy the rest of this wonderful conference!**

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