

DevOps for Defense

February 2019

Containers

JD Black



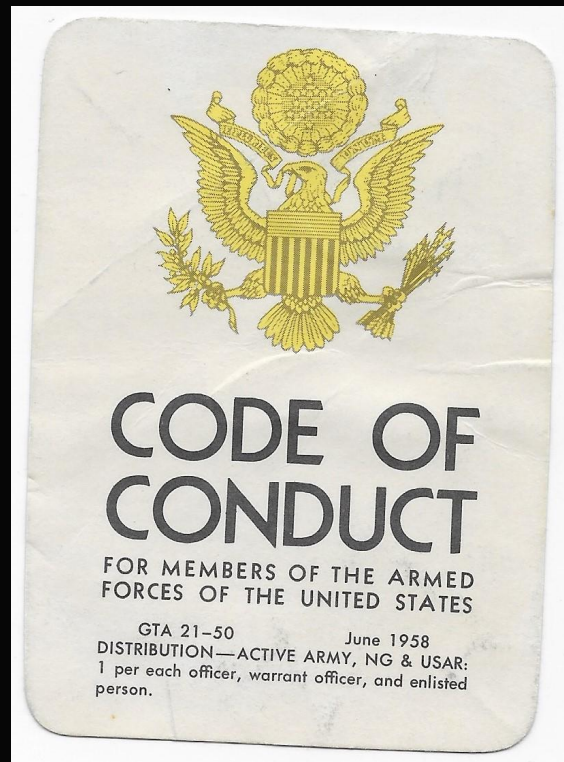
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<https://www.meetup.com/DevOps-for-Defense/>
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<https://twitter.com/devops4defense>

DevOps for Defense Meetup: Code of Conduct

- UNCLASSIFIED ONLY!!!!
- Treat each other with respect and professionalism.
- Do not talk about private, sensitive, or proprietary work.
- Do talk about your experiences, needs, desires to improve work in our domain.
- Do share your thoughts.
- Do learn from others.
- Do respect & tip your bartenders!



Be Heard!

What would you like to do in future months?

Presentations:

- Write a topic on a card & add it to the table in the Presentation area.
- If you'd like to volunteer to present the topic, add "Volunteer: [**YOUR NAME**]".

Books:

- Write the title & author on a card & add it to the table in the Book Club area.

Activities:

- Write a short name & description of the activity on a card & add it to the table in the Activity area.



Add a Dot on a Card You'd Like to Vote for!

**Containers -
Package
- Deliver
- Distribute**



Container Virtual Machine

GOTO 2018 • Containers From Scratch • Liz Rice
<https://youtu.be/8fi7uSYIOdc>


```
top - 13:25:10 up 3:09, 1 user, load average: 0.49, 0.50, 0.64
Tasks: 217 total, 1 running, 216 sleeping, 0 stopped, 0 zombie
%Cpu: 0.1 us, 0.1 sy, 0.0 ni, 99.9 id, 0.5 wa, 0.0 hi, 0.0 si, 0.0 st
KiB : 1093336 tot, 2659888 free, 142256 buff/cache
KiB : 19045 tot, 396456 free, 0 inuse, 34 Mail Mem
```

What is a Container?

1. Just a Process

(with a PID like the others)

a. Isolation (Namespace)

b. Resource Sharing (Cgroup)

c. Encapsulation (Pivot_Root)

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
2523	tecmint	20	0	2671944	1.329g	177208	S	10.3	17.3	65:28.10	firefox
4273	tecmint	20	0	1704436	240248	66812	S	9.6	3.0	1:19.85	chrome
2295	tecmint	20	0	1845984	254472	63248	S	6.6	3.2	5:05.86	cinnamon
1584	root	20	0	1777778	151100	151100	S	3.2	3.2	5:27.42	Xorg
7367	tecmint	20	0	117000	65100	65100	S	0.7	2.7	2:35.14	chrome
2688	tecmint	20	0	1158872	215184	105932	S	0.7	2.7	2:35.14	chrome
7	root	20	0	0	0	0	S	0.3	0.0	0:10.04	rcu_sched
1590	root	20	0	13444	3472	8064	S	0.3	0.2	0:46.16	teamviewerd
2503	tecmint	20	0	117000	65100	65100	S	0.3	0.6	0:36.87	gnome-terminal-
7769	root	20	0	0	0	0	S	0.3	0.6	0:00.02	kworker/3:0
7777	tecmint	20	0	41948	3780	3108	R	0.3	0.0	0:00.16	top
1	root	20	0	185728	6268	3920	S	0.0	0.1	0:01.84	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kthreadd
3	root	20	0	0	0	0	S	0.0	0.0	0:00.00	ksm/0
5	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	kworker/0:0H
8	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_bh
9	root	20	0	0	0	0	S	0.0	0.0	0:00.00	migration/0
10	root	20	0	0	0	0	S	0.0	0.0	0:00.04	watchdog/0
11	root	20	0	0	0	0	S	0.0	0.0	0:00.03	watchdog/1
12	root	rt	0	0	0	0	S	0.0	0.0	0:00.00	migration/1
13	root	20	0	0	0	0	S	0.0	0.0	0:00.08	ksoftirqd/1
15	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	kworker/1:0H
16	root	rt	0	0	0	0	S	0.0	0.0	0:00.04	watchdog/2



docker

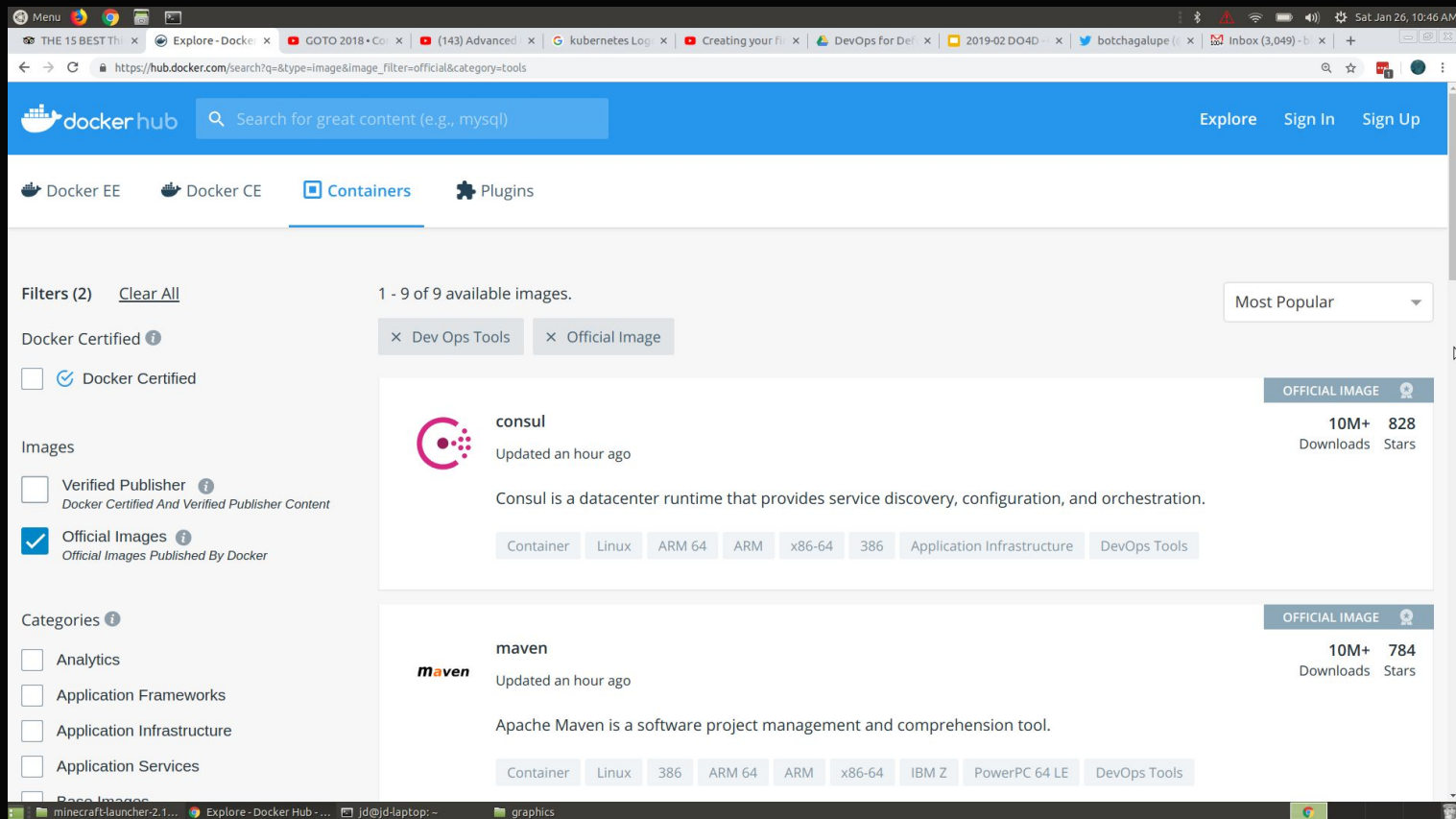
Others exist as well -





kubernetes

Large Open Source Community - Docker Hub Image Repo



The screenshot shows the Docker Hub website interface. The top navigation bar includes the Docker Hub logo, a search bar, and links for 'Explore', 'Sign In', and 'Sign Up'. Below the navigation bar, there are tabs for 'Docker EE', 'Docker CE', 'Containers' (selected), and 'Plugins'. The main content area displays search results for the 'tools' category, filtered by 'Dev Ops Tools' and 'Official Image'. The results show two images: 'consul' and 'maven', both updated an hour ago. The 'consul' image has over 10M downloads and 828 stars, while the 'maven' image has over 10M downloads and 784 stars. Both images are marked as 'OFFICIAL IMAGE'.

Menu

THE 15 BEST TH... Explore - Docker... GOTO 2018 • Co... (143) Advanced... Kubernetes Log... Creating your fi... DevOps for Def... 2019-02 DO4D... botchagalupe... Inbox (3,049) - b... +

https://hub.docker.com/search?q=&type=image&image_filter=official&category=tools

docker hub Search for great content (e.g., mysql)

Explore Sign In Sign Up

Docker EE Docker CE Containers Plugins

Filters (2) [Clear All](#)

1 - 9 of 9 available images.

Most Popular

Docker Certified ⓘ

☐ ☒ Docker Certified

Images

☐ Verified Publisher ⓘ
Docker Certified And Verified Publisher Content

☒ Official Images ⓘ
Official Images Published By Docker

Categories ⓘ

☐ Analytics

☐ Application Frameworks

☐ Application Infrastructure

☐ Application Services

☐ Data Images

☐ DevOps Tools

☐ Official Images

☐ Programming Languages

☐ System Images

☐ Tools

☐ Web Frameworks

☐ Web Servers

☐ Other

consul

Updated an hour ago

Consul is a datacenter runtime that provides service discovery, configuration, and orchestration.

Container Linux ARM 64 ARM x86-64 386 Application Infrastructure DevOps Tools

maven

Updated an hour ago

Apache Maven is a software project management and comprehension tool.

Container Linux 386 ARM 64 ARM x86-64 IBM Z PowerPC 64 LE DevOps Tools

Demo Script- Containers

1. Setup (Already done at home)
 - a. Env: Ubuntu Mate Linux w/ Latest Install of Docker
 - b. Shell: `sudo docker pull centos`
2. Start and play in a container
 - a. Shell: `sudo docker run -it centos /bin/bash`
 - b. Shell: `cat /etc/os-release` (in and out of the container)
 - c. Shell: `sudo docker ps` (outside the container)
 - d. Shell: `ps -au` (in and out of the container)
 - e. Shell: `exit` (in the container)
 - f. Shell: `sudo docker ps`
3. Create a simple containerized application
 - a. Shell: `cat run.sh` (this is our app)
 - b. Shell: `cat Dockerfile` (this specifies our container)
 - c. Shell: `sudo docker build .` (builds the specified container)
 - d. Shell: `sudo docker run --name demo ##IMAGE_ID##`

Mmmm, Tastes
like a combination
of Who Cares?
&
So What?

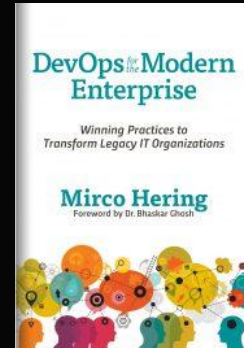
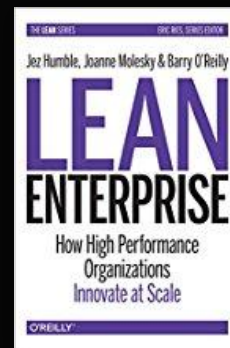
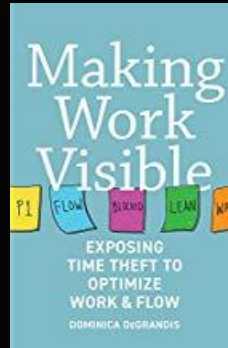
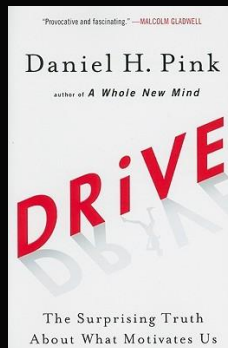
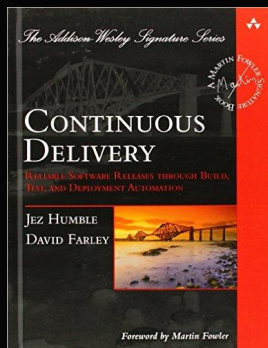
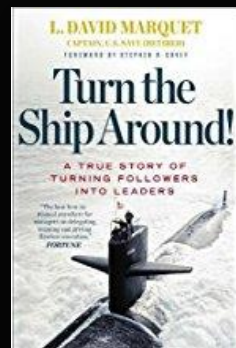
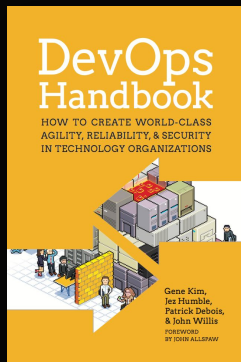
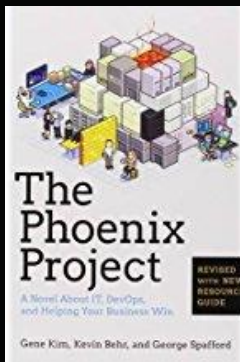


som_{ee}cards
user card

- **Better CM** of process, env, dependencies, & deployment
- **Improved system availability & scalability** if applications are designed well (12factor.net)
- **Create & destroy as needed** for provisioning, deployment, and acceptance testing in your DevOps Pipeline **without violating cyber security** accreditation
- Immutable, so **re-create with confidence** in operations
- **Better operations** visibility, management, and response with tools like Kubernetes

DevOps Resources

Books / Publications:



<https://www.meetup.com/DevOps-for-Defense/>
<https://github.com/jondavid-black/DevOpsForDefense>
devopsfordefense@gmail.com

Conference Presentations (YouTube):

- DevOps Enterprise Summit (DOES)
- IT Revolution
- Velocity
- GoTo



Group Exercises: Lean Coffee & Book Club

Book Club: Review & Discuss “Drive” Section 2

1. Each table has a facilitator.
2. The facilitator has a short introduction.
3. Everyone write down questions or topics for discussion on the subject. Place them in the middle of the table.
4. The group votes on each question or topic by placing a dot on the card. 3 votes per person.
5. Cards with most dots goes first. Set a timer for 5 minutes and discuss.
6. After 5 minutes, either vote (thumbs up/down) to keep going or move on to the next card.



Topics: “Advantages to Using Containers”, and “Obstacles to Using Containers”