



# DevOps for Defense

## Containerization

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May 2021

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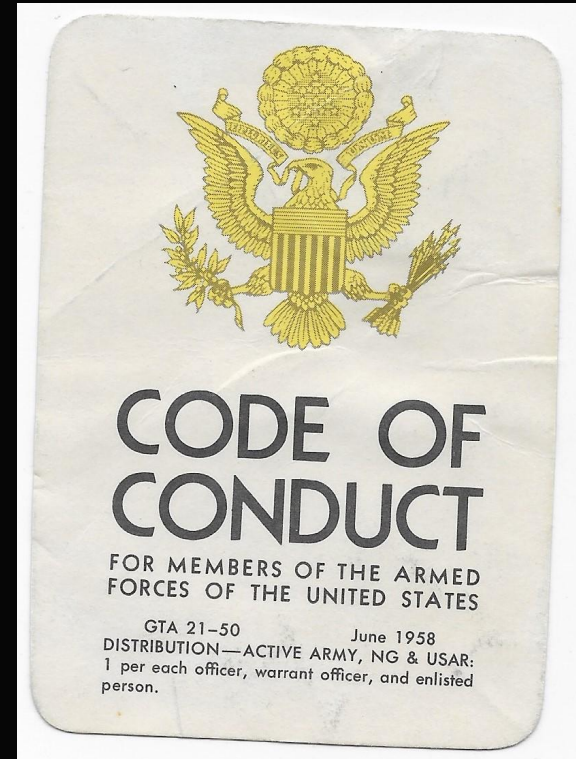
<https://devopsfordefense.org>  
<https://www.meetup.com/DevOps-for-Defense/>  
<https://github.com/jondavid-black/DevOpsForDefense>  
[devopsfordefense@gmail.com](mailto:devopsfordefense@gmail.com)  
<https://twitter.com/devops4defense>

# WELCOME BACK



# 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.
- If you're attending virtually, do mute yourself while others are speaking!





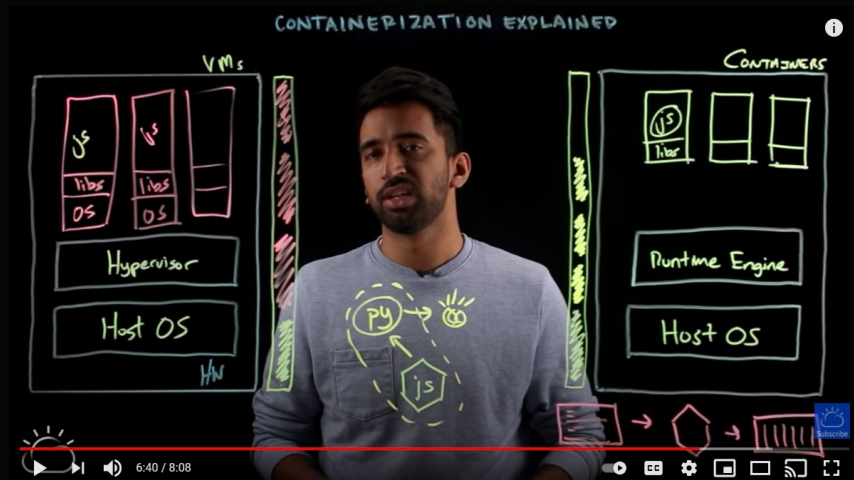
# Containerization in the Defense World

- Commercial world is way out front...this is just normal for many.
- DoD DevSecOps Reference Design is now over 2 years old!
- Government contracts are requiring containerization (i.e. “shall containerize”).
- ISSOs, ISSMs, DCSA, and AOs are struggling to understand containerization.

**We have an opportunity to learn, share, and collaborate as we all adopt containers.**

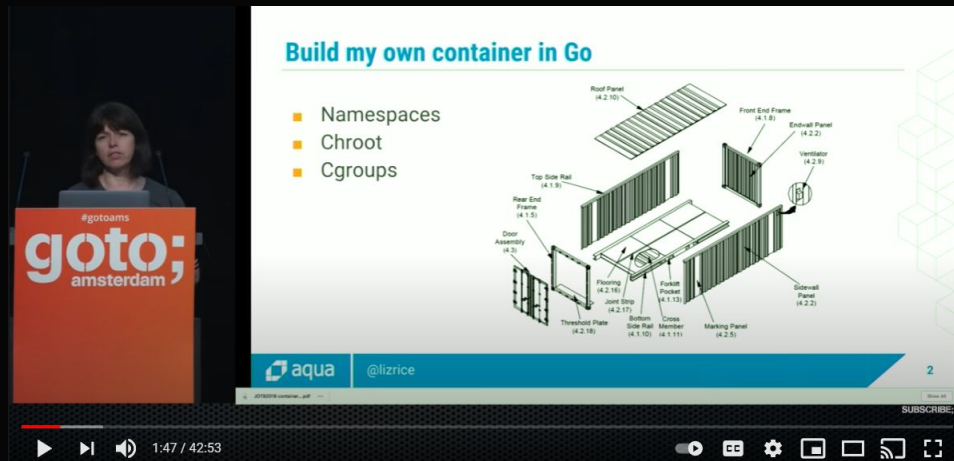


# There are TONS of great resources online!



Basic: Containerization Explained - IBM Cloud

<https://youtu.be/0qotVMX-J5s>



Advanced: Containers From Scratch - Liz Rice

<https://youtu.be/8fi7uSYIOdc>

**Containers -  
Package  
- Deliver  
- Distribute**



Container  Virtual Machine

```
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, 1442256 buff/cache
KiB : 1904556 tot, 396456 free, 1508100 avail 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	177758	1584	1584	S	0.3	0.0	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	1158872	215184	105932	S	0.3	0.6	0:36.87	gnome-terminal-
7769	root	20	0	0	0	0	S	0.3	0.0	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



# Container Orchestration w/ Kubernetes



Maybe we'll talk K8S  
in a future meetup?

FYI - DISA published  
a Kubernetes STIG in  
Dec 2020!



Self-Hosted / On-Prem (+ many others)



Kubernetes-as-a-Service / Cloud Services



# Container Demo

AC:

- 1) Must demonstrate containers aren't VMs
- 2) Must demonstrate why people get confused



# Group Exercise: Virtual Lean Coffee

1. The facilitator creates a new board on <http://agile.coffee> and shares the link in the Zoom chat with everyone.
2. The facilitator has a short introduction.
3. Everyone makes cards with questions or topics for discussion on the subject.
4. Everyone votes on each question or topic by clicking the thumbs up button on the corner of the card. 5 votes per person.
5. Cards with most votes goes first. Set a timer for 5 minutes and discuss.
6. After 5 minutes, either vote (thumbs up/down in your Zoom window) to keep going or move on to the next card.

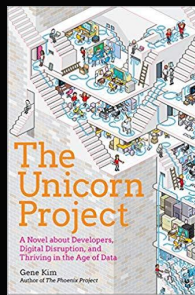
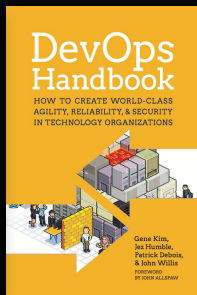


**Suggested Topics: “Escaping Disorder”, “Living in the Zones”**

# DevOps Resources

<https://devopsfordefense.org/resources/>

## Books / Publications:



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<https://github.com/jondavid-black/DevOpsForDefense>  
[devopsfordefense@gmail.com](mailto:devopsfordefense@gmail.com)

## Conference Presentations (YouTube):

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

