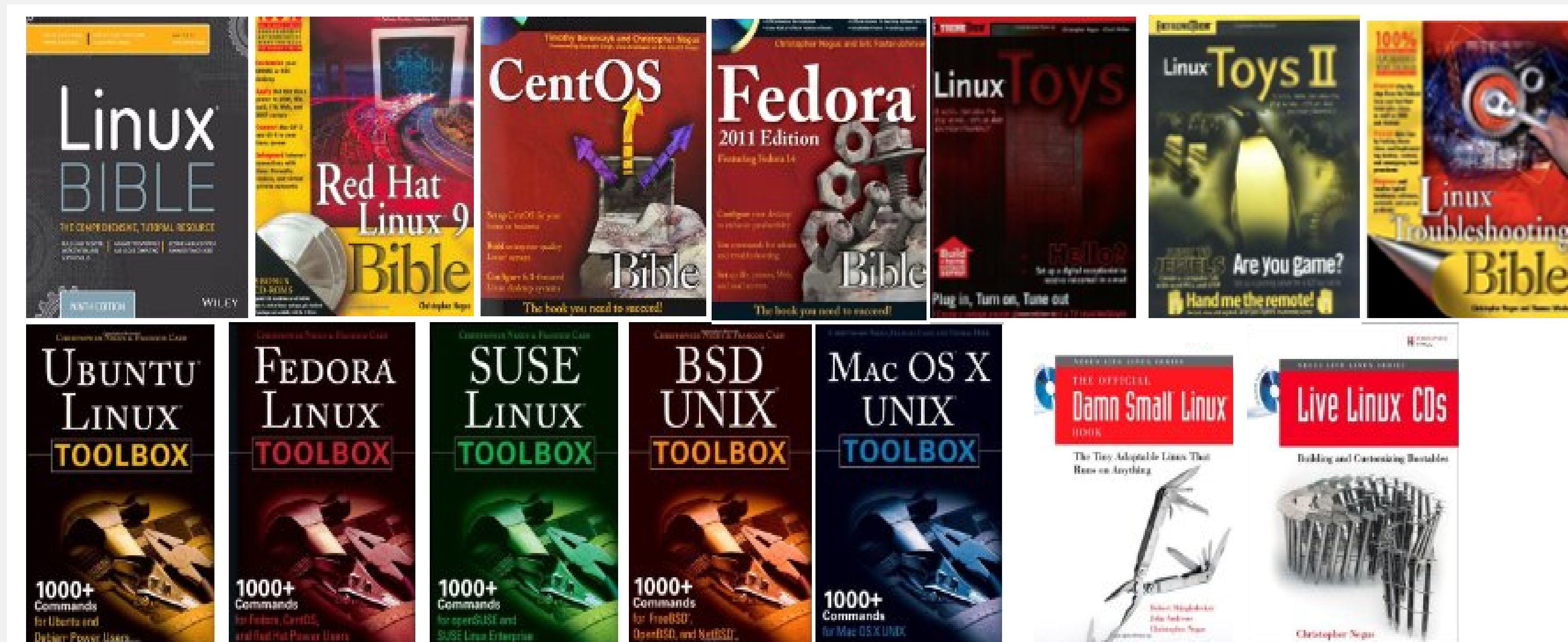RED HAT SUMMIT

BOSTON, MA
JUNE 23-26, 2015

Linux Containers Overview
(Docker, Kubernetes and Atomic)

Christopher Negus
June 24, 2015

redhat

About me (Chris Negus)

- Principal Technical Writer for CEE
- RHCA, RHCI, RHCX
- Authored or co-authored the following books

My applications are working just fine, so...

- Why Docker Containers?
- Why RHEL Atomic?
- Why Kubernetes?
- How do I begin learning about them?

What is Docker?

- Docker is an open source project
- Container format and tools
- Based on LXC
- Build and run Linux applications that are: portable, small and fast
- The **docker** command: Daemon and tool
- Concepts of:
  - Images (stored containers)
  - Containers (running/stopped containers)
- Container images stored in registries or locally (Docker Hub or Red Hat Registry)

redhat.

Why Docker Formatted Containers?

- **Container vs. running directly on a host?**
  - Pull and run vs. install and run
  - Separate vs. host namespaces: file system, network interfaces, process table, IPC
  - Easy to remove (stop and remove) vs. removing across file system
  - Easy to update vs. risk messing up the host
- **Container vs. running in a virtual machine?**
  - No separate kernel to boot vs. much slower start-up
  - Easy to pull out of datacenter (stop and commit) vs. shutting down
  - Flexibly deploy as micro-services vs. bundled or unweildy VMs

redhat.

What is Red Hat Enterprise Linux Atomic Host?

- **A lean Linux distribution for running containers:**
  - Atomic versions for trusted RPM-based distributions: RHEL, Fedora, and CentOS
  - Available in ISO (anaconda installer) and cloud images (cloud-init)
  - Specially built for containers with these included: Docker, Kubernetes, etcd...

redhat.

Why Red Hat Enterprise Linux Atomic Host?

- **RHEL Atomic vs. standard RHEL**
  - Installer ISO is 600MB vs. multiple GB
  - Made for just running containers vs. general purpose OS
  - Does atomic upgrade vs. yum upgrades
  - Can easily and quickly rollback vs. potentially messy rollbacks
  - Add software with containers vs. yum install
- **Bottom Line...**
  No bloated container OS

redhat.

Why Kubernetes?

- **Kubernetes vs. Docker alone**
  - Deploy containers to multiple hosts vs. deploy on local host
  - Associate containers together across hosts (services) vs. only link on local host
  - Maintain a set number of replicated containers (in pods) vs. manual replication
- **Other reasons for Kubernetes**
  - Cooperative development with Google and others.
  - Serves as the foundation for containerization via OpenShift 3

redhat.

Demos

Docker

- Search and pull images
- Run containers (Web server container and bash shell container)
- Check images and containers
- Run special privileged containers

RHEL Atomic

- subscription-manager
- atomic status
- atomic upgrade

Kubernetes

- **Creating a Kubernetes Cluster to Run Docker Formatted Container Images**
  - https://access.redhat.com/node/1353773

RHEL Atomic, Docker and Kubernetes Documentation

- **Try out Docker Containers:**
  - **Get Started with Docker Formatted Container Images on Red Hat Systems**
    - https://access.redhat.com/articles/881893
- **Try out RHEL Atomic Host:**
  - **Getting Started with Red Hat Enterprise Linux Atomic Host**
    - https://access.redhat.com/articles/rhel-atomic-getting-started
- **Try out Kubernetes:**

  - **Creating a Kubernetes Cluster to Run Docker Formatted Container Images**
    - https://access.redhat.com/node/1353773
- **Get more Atomic, Docker and Kubernetes Documentation:**
  - https://access.redhat.com/articles/rhel-atomic-documentation

If you liked this presentation, you might like...

- **Docker Containers LiveLessons, by Christopher Negus**
  - http://www.informit.com/store/docker-containers-livelessons-9780134096131
- **Docker Containers: From Start to Enterprise by Christopher Negus**
  - http://www.amazon.com/Docker-Containers-Start-Enterprise-Negus/dp/013413656X/
- **Linux Bible, 9th Edition by Christopher Negus**
  - http://www.amazon.com/Linux-Bible-Christopher-Negus/dp/1118999878/

redhat.