

























































## TCSS 562: Software Engineering for Cloud Computing School of Engineering and Technology, UW-Tacoma



























































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- Amazon elastic container service (ECS)
- Apache aurora

## Container-as-a-Service

- Serverles containers without managing clusters
- Azure Container Instances, AWS Fargate...

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**KEY ORCHESTRATION FEATURES** 

Providing connectivity to clients outside the container cluster

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Management of container hosts

Rescheduling failed containers

Linking containers to support workflows

Scale in/out, add/remove containers
Load balancing over groups of containers

Firewall: control network/port accessibility

Dynamic scaling of containers: horizontal scaling

Rolling upgrades of containers for application

Launching set of containers

November 16, 2020

Docker	CLI $ ightarrow$ Docker Enginer (dockerd) $ ightarrow$ containerd $ ightarrow$ rund
Docker	installation
Docker	file
Docker	run
Docker	ps
Docker	exec -it
Docker	stop

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Lommanus:	the second s
attach	Attach local standard input, output, and error streams to a funnting container
Build	Build an image from a Dockerfile
commit	Create a new image from a container's changes
ср	Copy Tiles/Tolder's between a container and the local Tilesystem
create	Create a new container
deptoy	Deploy a new stack or update an existing stack
derr	Inspect changes to rules or directories on a container's rulesystem
events	Get real time events from the server
exec	Run a command in a running container
export	Export a container's filesystem as a tar archive
htstory	Show the history of an image
images	List images
import	Import the contents from a tarball to create a filesystem image
into	Display system-wide information
inspect	Return low-level information on Docker objects
kttt	Kill one or more running containers
load	Load an image from a tar archive or STDIN
login	Log in to a Docker registry
logout	Log out from a Docker registry
logs	Fetch the logs of a container
pause	Pause all processes within one or more containers
port	List port mappings or a specific mapping for the container
ps	List containers
pull	Pull an image or a repository from a registry
push	Push an image or a repository to a registry
rename	Rename a container
restart	Restart one or more containers
rm.	Remove one or more containers
rmi	Remove one or more images
run	Run a command in a new container
save	Save one or more images to a tar archive (streamed to SIDOUT by default)
search	Search the Docker Hub for images
start	Start one or more stopped containers
stats	Display a live stream of container(s) resource usage statistics
stop	Stop one or more running containers
tag	Create a tag TARGET_IMAGE that refers to SOURCE_IMAGE
top	Display the running processes of a container
unpause	Unpause all processes within one or more containers
update	Update configuration of one or more containers
version	Show the Docker version information
wait	Block until one or more containers stop, then print their exit codes











## **AREAS OF THE CLOUD**

- Area: Serverless Computing
  - Function-as-a-Service
- Container-as-a-Service Infrastructure-as-a-Service Cloud Virtual Machines
- Containers & container clusters (Kubernetes)
- Perspective: cloud provider vs. cloud consumer
- Applications: tsunami modeling, bioinformatics, environmental modeling
- **Problem:** driven by the area & perspective • Common problems: what is the right abstraction? ightarrow
- observability
- resource contention, resource heterogeneity, provisioning variation, performance variability (delta between min/max performance)

