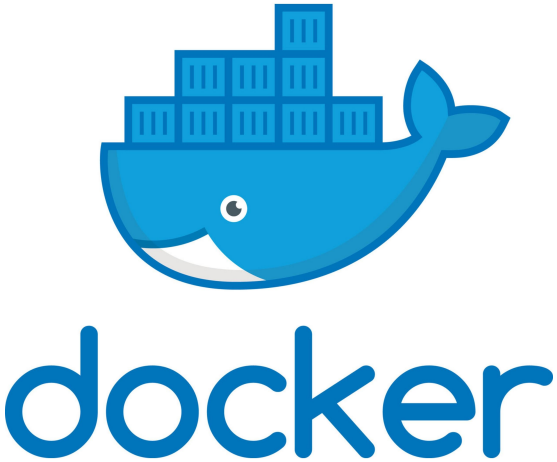
DEVSTAFF
MEET UP



Microservices and the role of Docker

What is Docker?

Many things.

What is Docker?

- A company
  - Startup based on San Francisco
  - Created the “docker” software
  - Operates a marketplace, as well as paid services about Docker
- Some software
  - Manage containers on Linux, Mac, and Windows systems
  - Package applications and things into small “images”
  - Manage fleets of servers running “docker”
- A community
  - Tens of thousands of users / people interested / contributing

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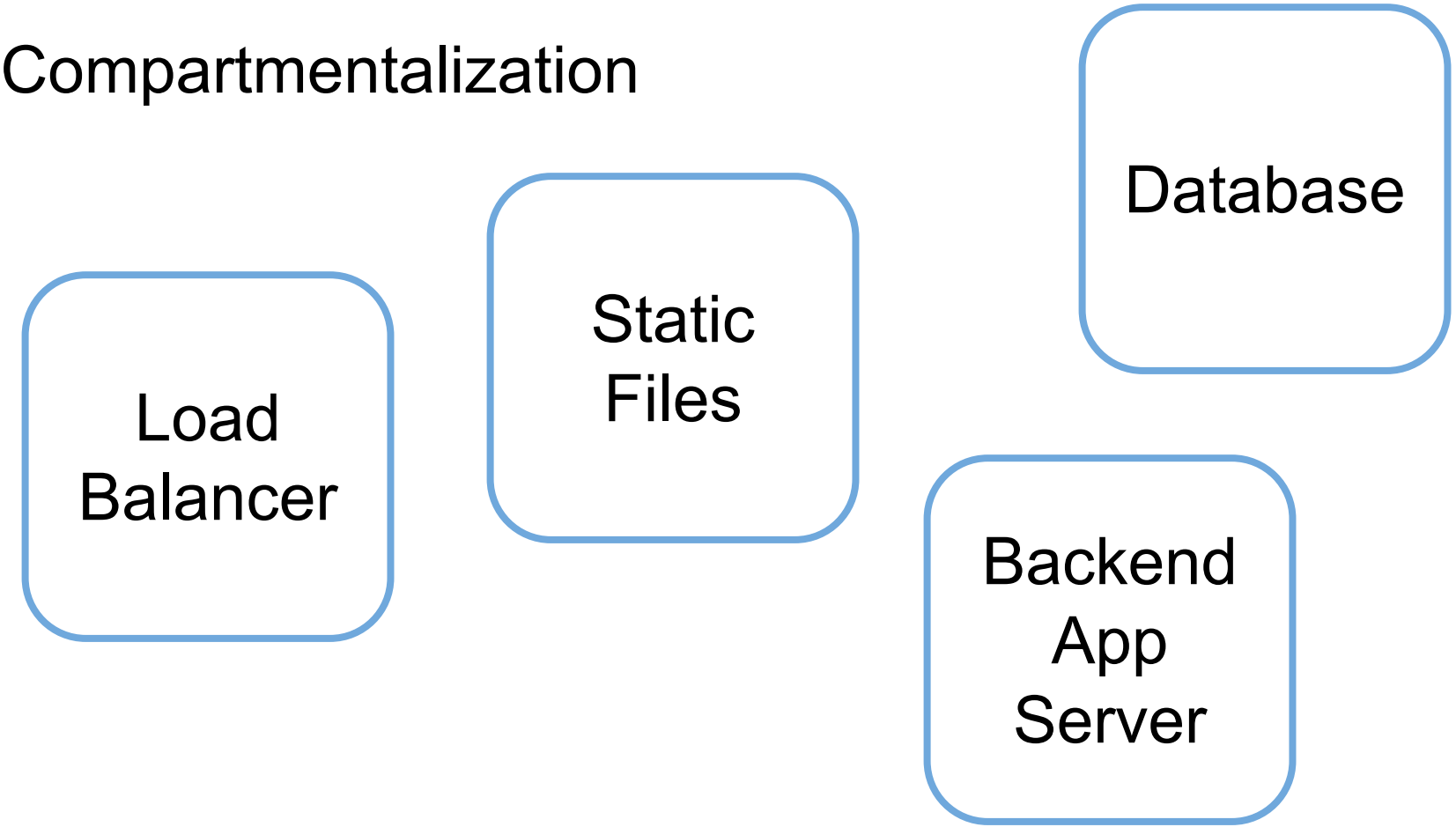
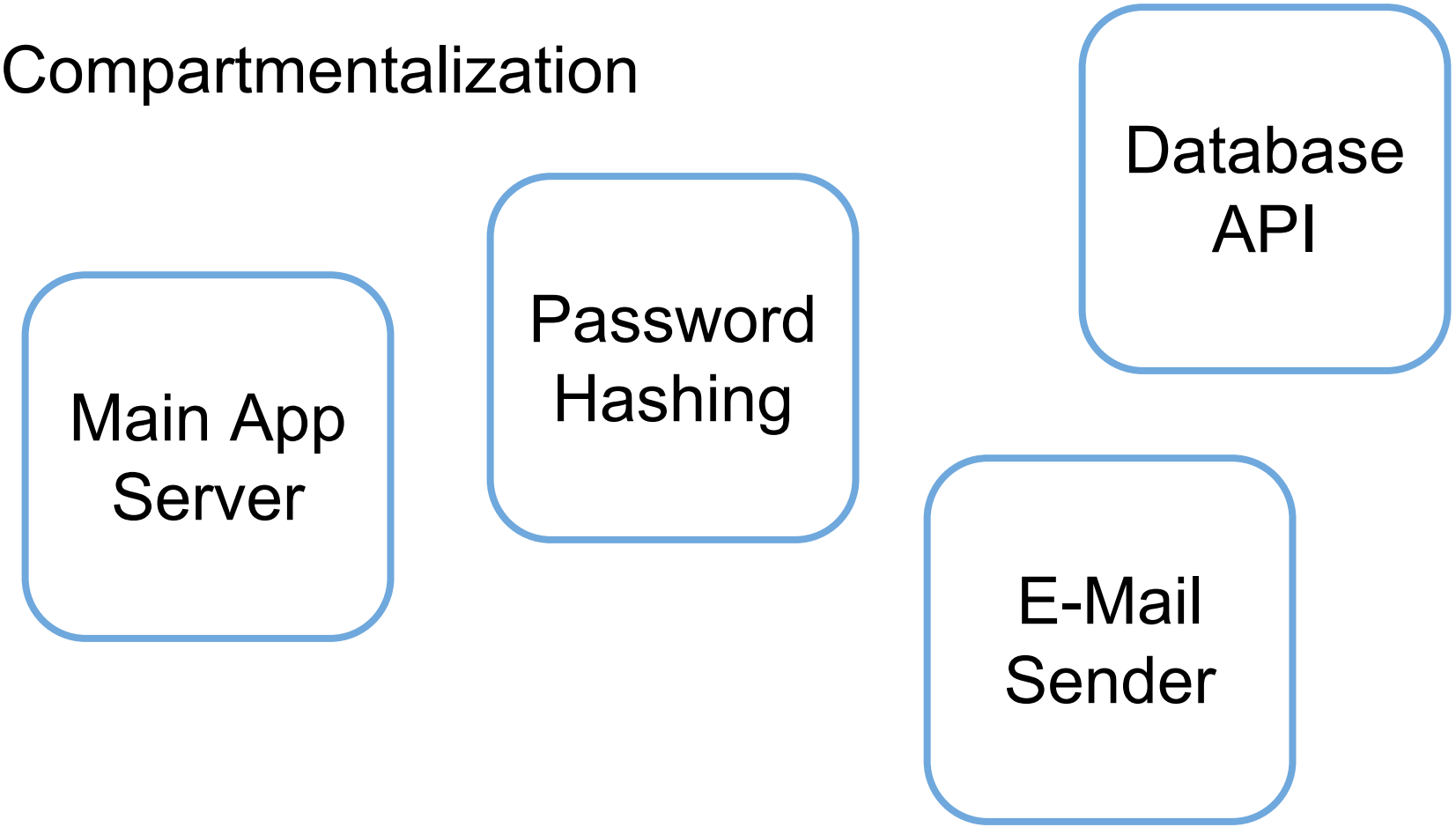
Container

- A process in a normal operating system
- Lightweight virtualization
- Same kernel as the “hypervisor”
- Isolated filesystem
- Isolated networking
- Can start stop in 2-3 seconds
- Think of it as a lightweight VM ( #pestenamefate)

Compartmentalization



Compartmentalization



Ready Images

- Ubuntu / Debian / Alpine / Windows Server
- Apache / NGiNX / Caddy
- Wordpress / Drupal / Joomla
- MySQL / PostgreSQL / Cassandra
- Redis / Memcached

You can build upon existing images

```
FROM debian:stretch

ADD myfiles /var/lib/myfiles
```

Docker Registry

Works on all our machines

File System / Volumes

- Each container has a new “volume” created upon start
- Special directories can be mapped to new volumes
  - / is a volume we don’t care about in this container
  - /var/lib/mysql/ is something we care, and want to treat differently
- Volume API
  - Ceph
  - GlusterFS
  - S3
  - Simple File
  - ...

Networking

- By default, all containers in a single network
- Virtual networks can be created easily
  - LoadBalancerToWebAppNetwork
  - WebAppToDatabaseAPINetwork
  - DatabaseAPIToMySQLNetwork
- Good isolation between individual containers or groups of containers
- Pretty much destroys iptables on the host though :-(

Server Pools / Clustering

Docker Swarm

- Easy installation
  - Install docker in a number of servers
  - Run a single command in a “master” server
  - Run a different command in all other servers
  - Congratulations! Now all these servers operate as a single docker server
- If a container listens on :80, all servers will forward their :80 on this server’s
- If a server goes down, containers will move to others to avoid downtime
- Servers can be added at anytime to increase capacity

What's Good

- Super simple to setup. Much simpler than Kubernetes.
- You start containers with a single command, and they startup in the best node
- The network is automatically set up between them and containers can talk
  - Both in the same node, as well as from node to node
- Services are restarted in a new node if existing goes down
- Scaling up or down a service is one command

What’s Bad

- It does not manage storage
  - You have to ensure sync of data on your own
- It does not work
  - Sometimes cross-node traffic is dropped
- There’s no “rebalance”
- Some hacks may be required to do certain things
  - Update a :latest image requires hacks with ENV

Shall I use it?

Not yet.

At least for important stuff.

Or without paying $2-3k/yr/server for EE

Then what?

Use Kubernetes.

Battle Tested. Works.

If you manage to make it work.

Thank you!