



MONITORING DOCKER CONTAINERS WITH ELASTICSEARCH

ELASTIC MEETUP – JULY 26, 2016 - RAY ELENTENY

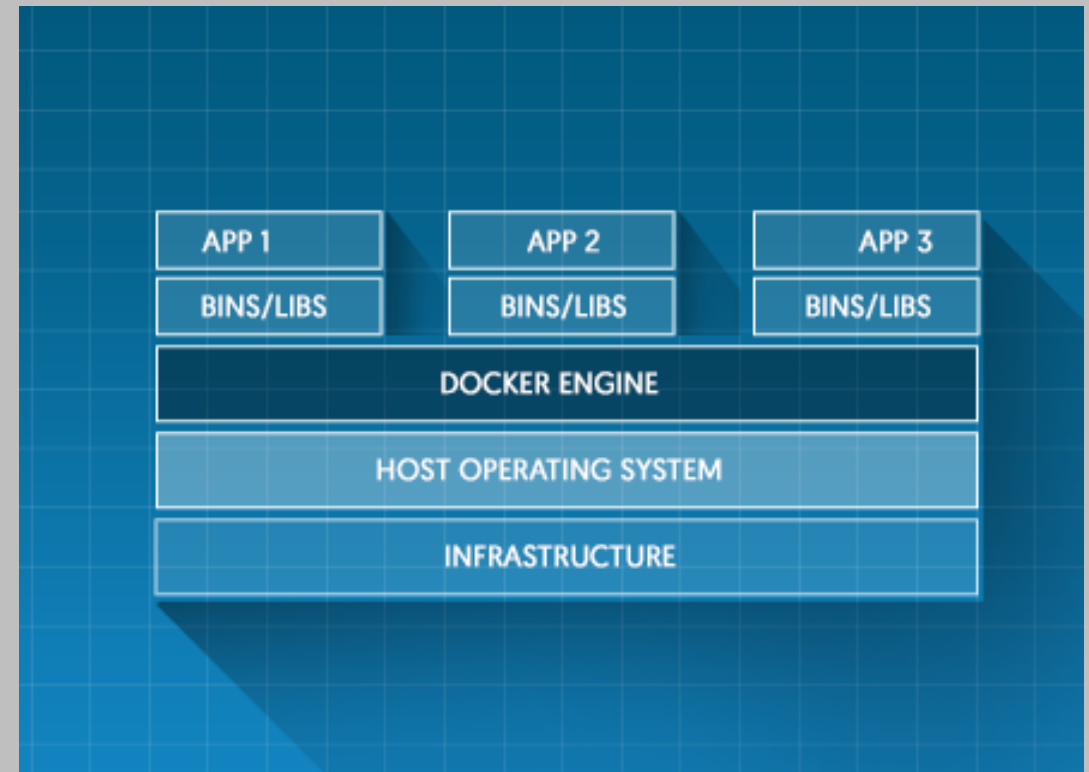
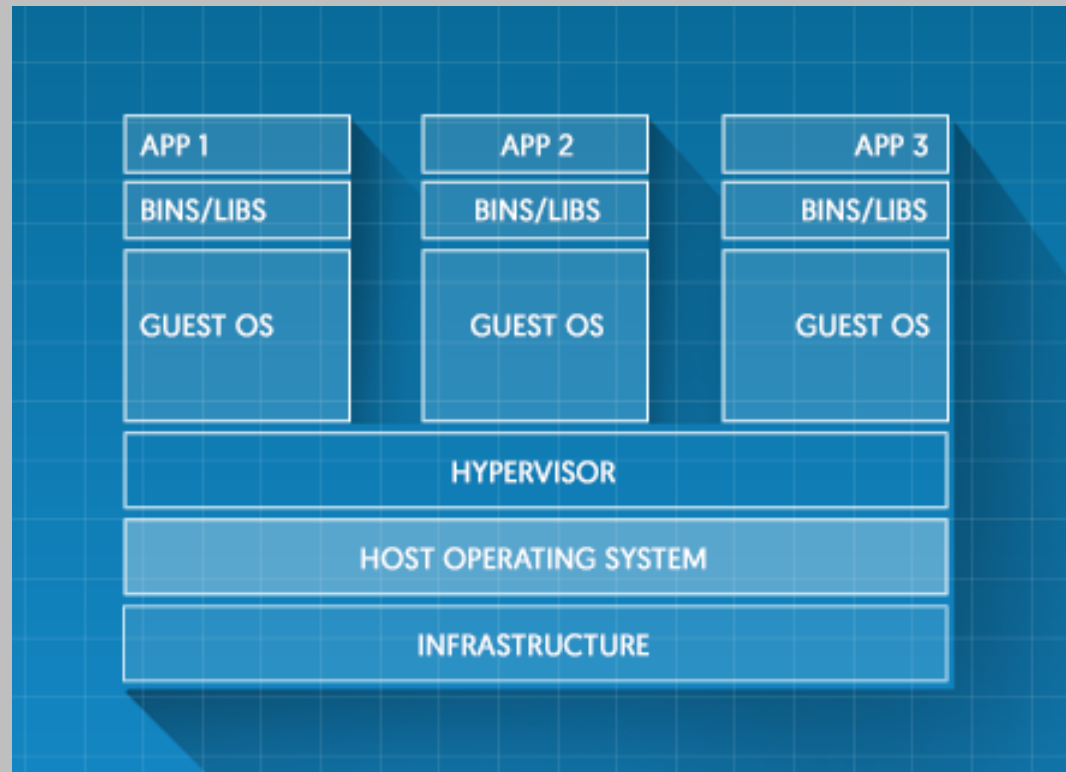
WELCOME

- In this session we'll be covering a lot of ground
 - We're going mile wide and an inch deep
 - There's just so much great stuff to discuss
- Please interrupt with questions/comments
 - I'm sure there are some in attendance with more experience than I have on these topics
- Let's have fun!
 - This is really cool stuff
 - Is my inner (or not so inner) geek showing too much? 😊

DOCKER, DOCKER AND MORE DOCKER

- It seems like it's everywhere
 - Webinars, articles, blogs, vendors, cloud providers, enterprise
- <https://www.docker.com> is the central source for all things Docker
 - Open source and commercial
- It will remain an open source technology following what has become a typical open source pattern
 - The technology is free to use
 - Vendors building ecosystems around the technology with additional products and support

A QUICK LOOK AT THE MOST COMMON QUESTION



HOW TO GET DOCKER?

- Let me count the ways
- It's available in all (most?) Linux systems package management tools
- <http://get.docker.com>
 - Directly from docker.com
 - Adds system-specific repository information to be used in standard management
 - My favorite 😊
- Docker Toolbox
 - Soon to be replaced with Docker for Mac and Docker for Windows (in beta)

DOCKER BASICS



Docker Image

The basis of a Docker container



Docker Container

The standard unit in which the application service resides



Docker Engine

Creates, ships and runs Docker containers deployable on physical or virtual host locally, in a datacenter or cloud service provider



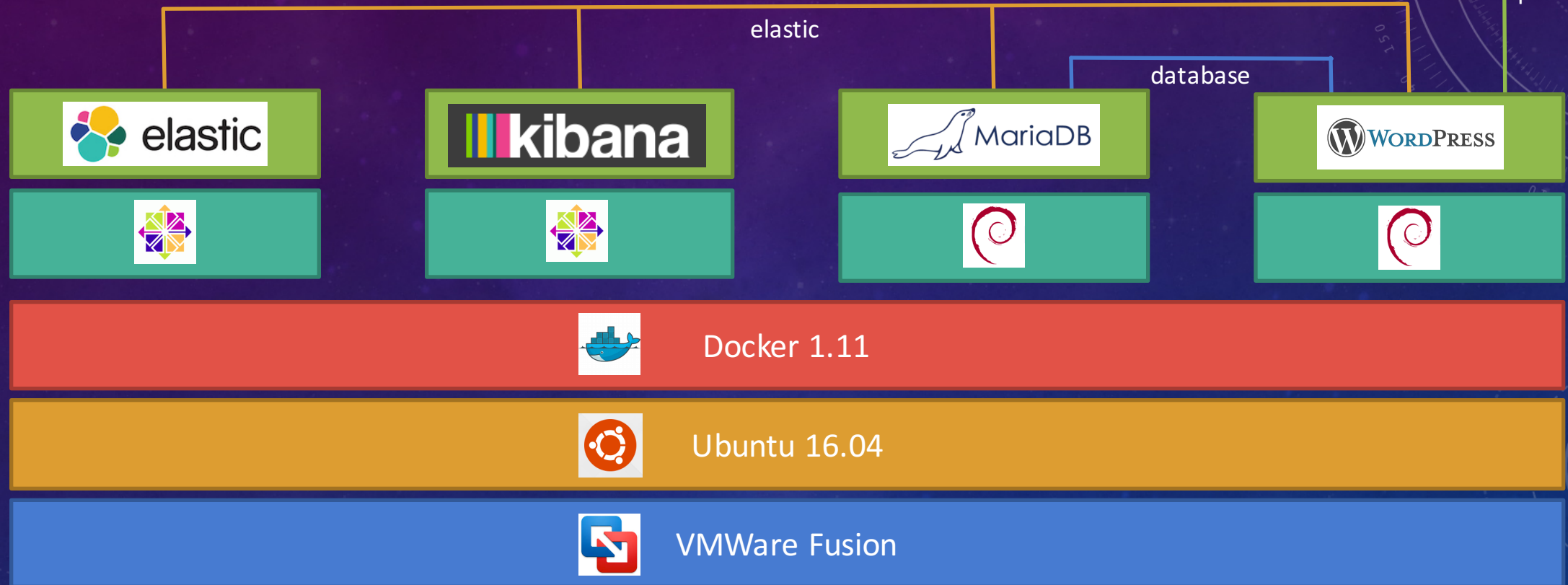
Docker Registry

On-premises registry for image storing and collaboration

EVERYTHING IS A CONTAINER

- This demonstration will walk through building and deploying four containers
 - From custom built Docker images
 - With the goal of monitoring Docker containers with Topbeat
- The pattern should quickly become familiar
 - It's very straightforward
 - Many existing build/assembly processes fit right in
- The mindset and patterns become addicting
 - Once you start deploying containers, the possibilities explode

WHAT ARE WE BUILDING TONIGHT?



A CUSTOMIZED ROOT FILE SYSTEM

The background is a gradient of dark blue and purple, speckled with small white dots resembling stars. On the right side, there are several faint, white circular patterns. One large circle has a scale from 0 to 210 degrees. Another circle below it has a dashed line and an arrow. A third circle at the bottom left also has a dashed line and an arrow.

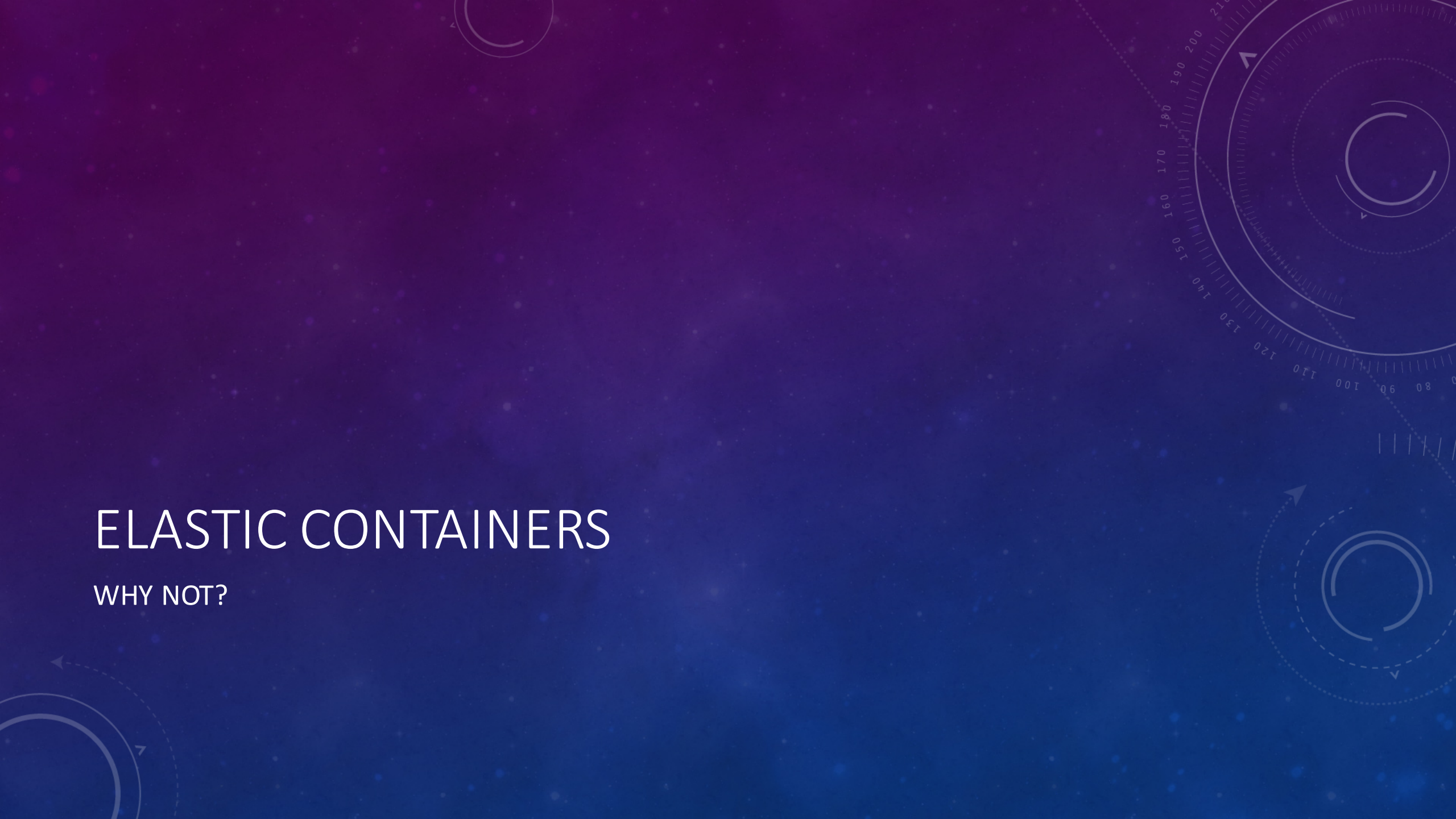
A CUSTOMIZED ROOT FILE SYSTEM...HUH?

- Technically a container is just a collection of files and binaries from which executables run
 - A container being a deployed (or instance of) an image
 - The kernel, memory, disk, drivers, etc. are shared
- Many, many base images exist
 - CentOS, Ubuntu, Alpine, BusyBox, Red Hat, and so on...and yes, even Windows Server 2016
- Images are “pulled” from a registry – public or private
- It’s the starting point from which other images are built
 - The implication being that images can be inherited
 - This is awesome!
- Tagging the image as esmeetup/centos:7

LET'S LOOK

ELASTIC CONTAINERS

WHY NOT?



ELASTIC CONTAINERS

- Building off the customized root file system image
- Separate containers for Elasticsearch and Kibana
 - Because we can 😊
- A bit of a chicken and egg challenge with this demonstration
 - Running Topbeat on the system running the Docker Engine for which statistics are to be gathered
 - The system must wait for the Elastic stack to be available in order to start feeding data
 - Typically the Elastic stack install would be on another Docker system/cluster

ELASTICSEARCH

- Building off the customized root file system image
- Install Java
- Install Elasticsearch
- Install Mapper Attachments
- Install Marvel
- Tagging the image as esmeetup/elasticsearch:1.7.1

LET'S LOOK

KIBANA

- Building off the customized root file system image
- Install Kibana
- Update configuration
- Install the Beats Dashboards
- Initialize Elasticsearch mapping
 - Technically at runtime
- Tagging the image as esmeetup/kibana:4.1.6

LET'S LOOK

COMPOSING THE ELASTIC STACK

- Docker Compose provides a mechanism to define and deploy multiple, usually related containers
- Containers are deployed, started, stopped, removed as a unit
- This example demonstrates coordinating the Elastic stack in a single deployment

LET'S LOOK

THE ELASTIC STACK IS READY



ON TO THE DEMO APPLICATION

- Wordpress and MySQL as separate images
 - And thus deployed as separate containers
- Both are publically available on the Docker Hub (<https://hub.docker.com/>)
 - A registry of tens of thousands of prebuilt images
 - Just like all open source though – some good, some not
 - The images used in this demo are labeled as “official” images from the respective software houses
- The addition of Topbeat requires customization to the base image
 - The starting point is the image “pulled” from the Docker Hub public registry
 - Additions are layered on to the base image

EXTENDING THE WORDPRESS AND MYSQL IMAGES

- Extending images is an awesome Docker capability
 - Build on someone else's work
 - Provides consistency across like deployments
 - A natural thought process for development teams
- Extending existing images often requires a bit of investigation
 - “In house” images should be documented detailing features and options
 - External images may need a bit of research
 - Fortunately images on Docker Hub also include their respective Dockerfiles, so you can see how they're constructed
- Install and configure Topbeat and update process startup

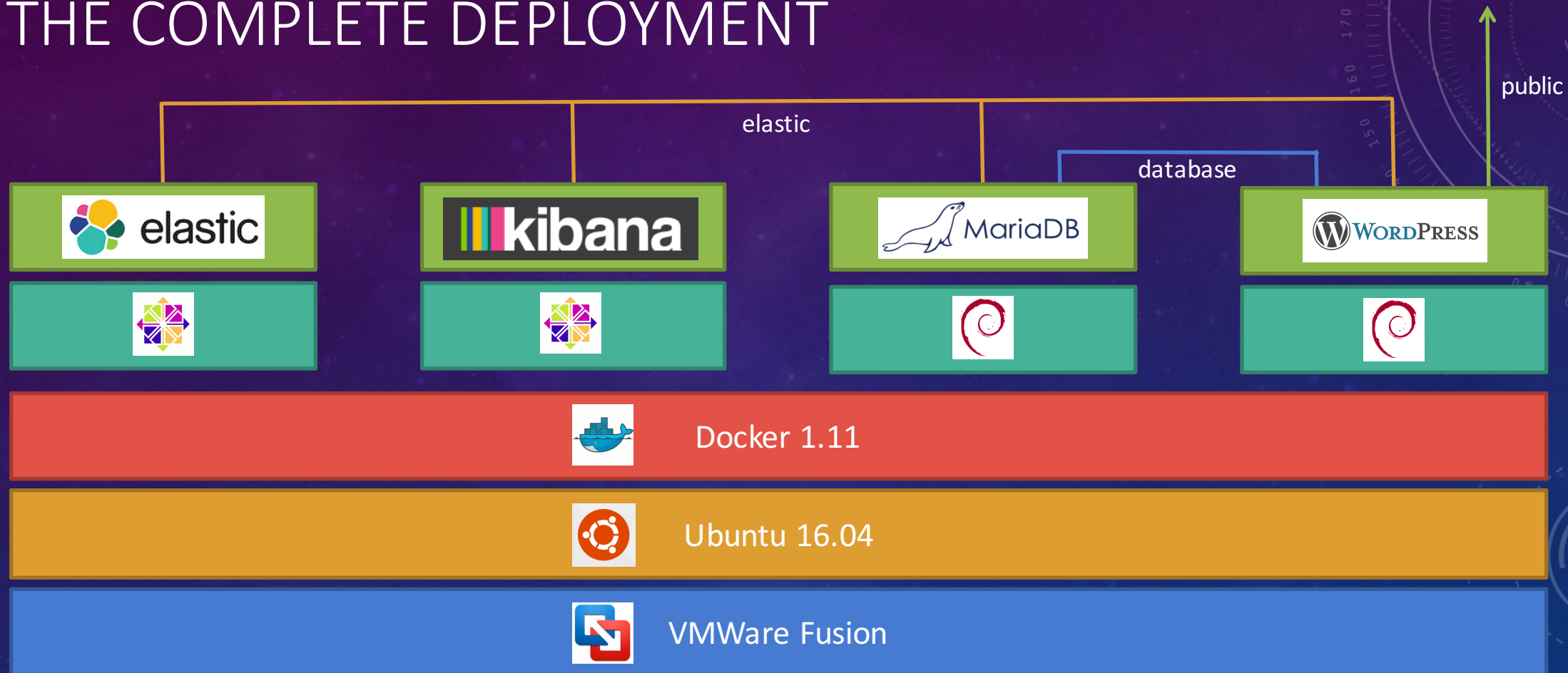
LET'S LOOK


COMPOSING THE APPLICATION

- Using the extended, custom built images
 - MySQL tagged as esmeetup/mysql:latest
 - Wordpress tagged as esmeetup/wordpress:latest
- The same process as composing the Elastic stack
 - Independent deployment though
- Demonstrating some network configurability

LET'S LOOK

THE COMPLETE DEPLOYMENT





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