

Docker Overview

Black Hole PIRE Team

April 11th, 2018, Docker and Jupyter for Reproducible Astronomy

Problem 1: Portability

DiFX	✓	?	✗	✓	✓	?
HOPS	✓	✓	✗	✓	✓	?
AIPS	?	✗	✗	?	?	?
CASA	✓	✓	✗	?	?	?
ehtim	✓	✓	✗	?	✗	?
...	?	?	✗	?	?	?
	Linux (Which?)	OS X	Windows (Really?)	Google Cloud	El Gato	...

Problem 2: Reproducible

- ❖ Which version of software, with what versions of libraries?
- ❖ Low- and high-band data processed with different versions of software?
- ❖ Very confusing to fix:
 - ❖ Rev1-Cal → ER1, ER1v2
 - ❖ Rev2-Cal → ER2, ER2v2
 - ❖ Rev3-Cal → ER3

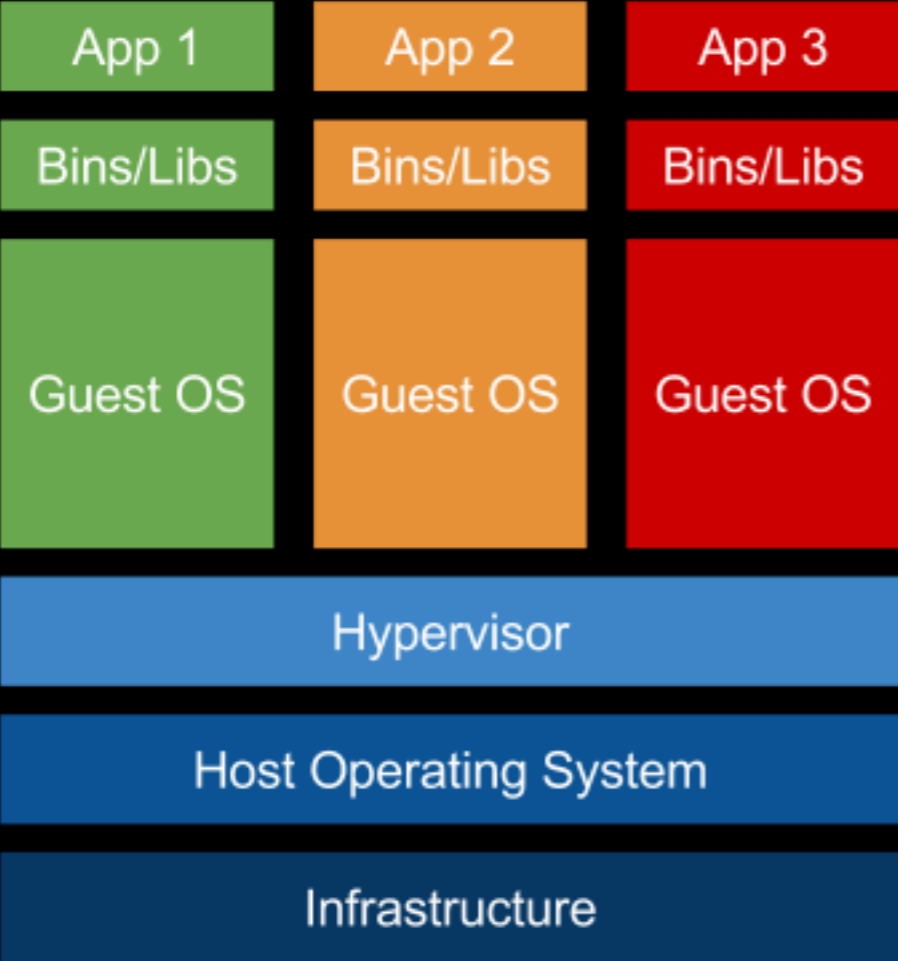
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 - ❖ Rev3-Cal → ER3
 - ❖ Rev3v2-Cal, Rev3v2patched-Cal, Rev3v2patched2-Cal → ER3v2

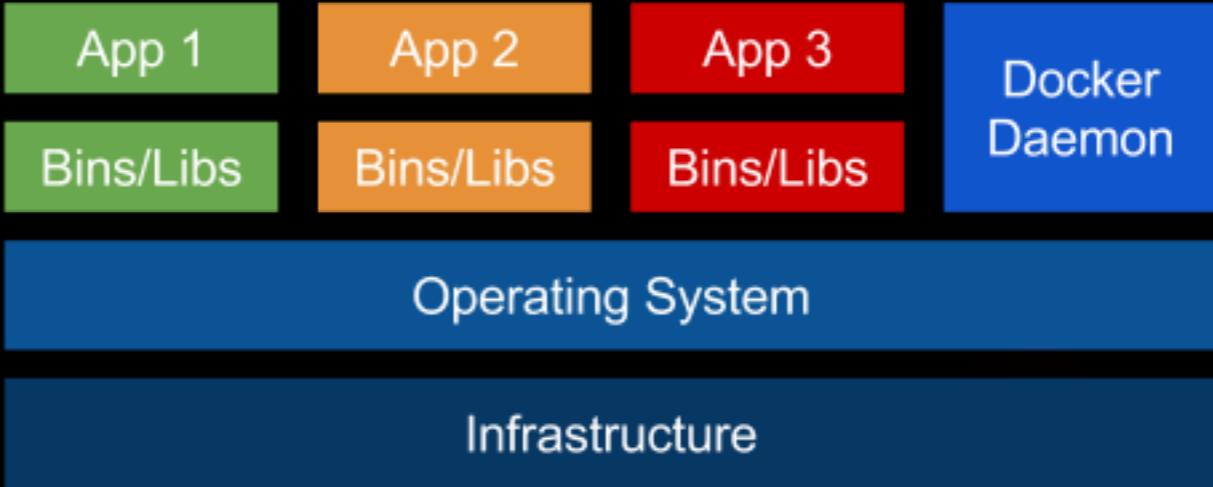
What is Docker?

- ❖ A technology to pack a software (and all its dependencies) into a self contained "image", i.e., containerize a software
- ❖ A technology to run the image across many platforms, as long as they have Docker installed
- ❖ A technology to run the image in isolated environments, but share OS kernel (and possibly bin/lib); much more lightweight than VMs
- ❖ A technology to keep track and manage images

What is Docker?





Virtual Machines



Containers

How It Solves the Problems?

DiFX						
HOPS						
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ehtim						
...						
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