



Docker & POWER

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A colorful banner for the OpenPOWER Summit 2015. It features a stylized city skyline in blue and white outlines against a background of overlapping, semi-transparent triangles in various colors (orange, yellow, green, blue, purple, pink). The sun is visible on the left, casting rays. A dark blue banner at the top right contains the hashtag #OpenPOWERSummit. At the bottom, the text "OpenPOWER™ Summit 2015" is displayed in white, with "San Jose, CA | March 17-19" below it. On the right side, there is a call to action: "Join the conversation at #OpenPOWERSummit".

#OpenPOWERSummit

OpenPOWER™ Summit 2015
San Jose, CA | March 17-19

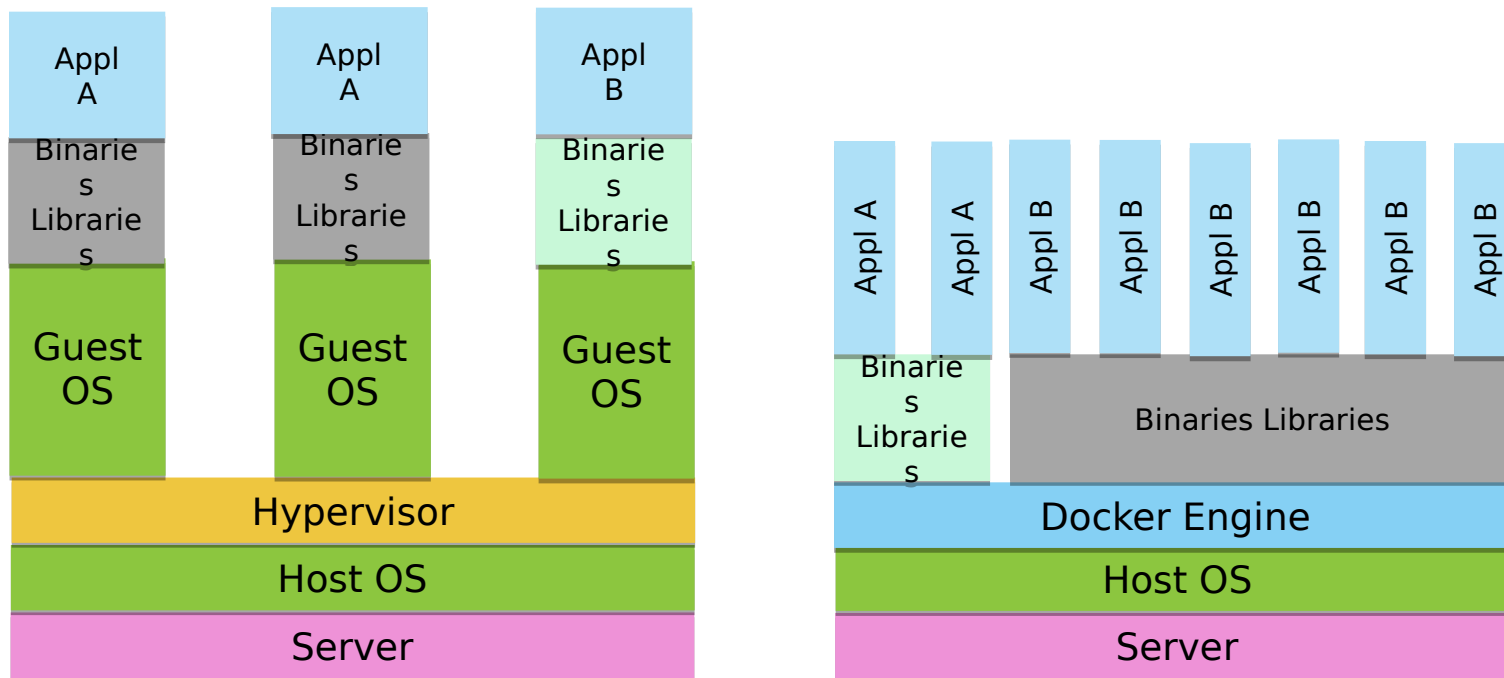
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Brief Outline

- What is Docker and why is it so hot
- Docker on POWER platforms
- Summary

What is Docker Container?

VM vs Docker Container



Docker Container = Linux namespaces + cgroups + overlay file system + image format

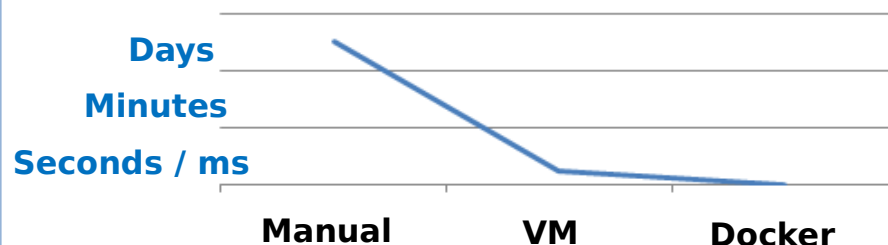
Why Docker Container?

- **High Density:** Because containers share the same OS image and middleware (when applicable) we can run more applications on a server.
- **Fast Start up:** Because containers may have several layers in common only the new layers need to be copied, reducing build/transfer/boot/load times dramatically.

Portability across environments

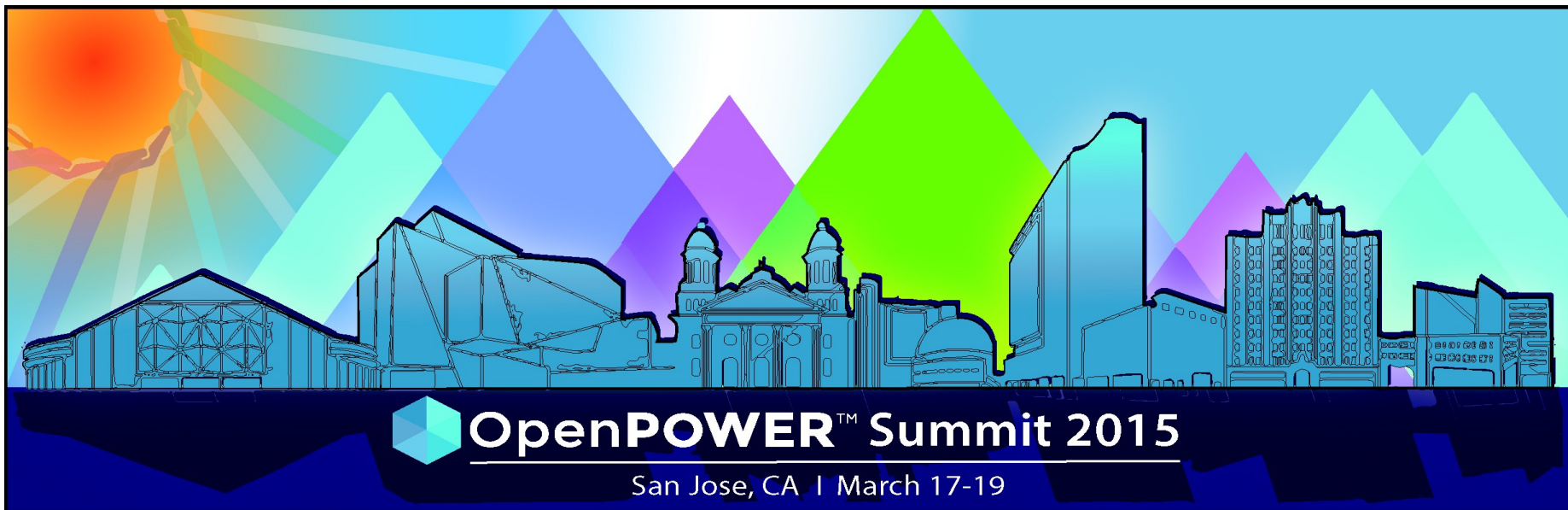
- Cloudy operations with Docker LXC outperform VM
 - 48x server reboot, 1.5x server boot, 1.62x server snapshot, etc.
- Docker LXC density potential compared to VMs
 - 3x memory savings
 - 26x CPU savings
 - 3.22x smaller images in this test (note - image sizes can vary based on required packages)

Significant threat to virtualization market
Provision Time





Docker on POWER

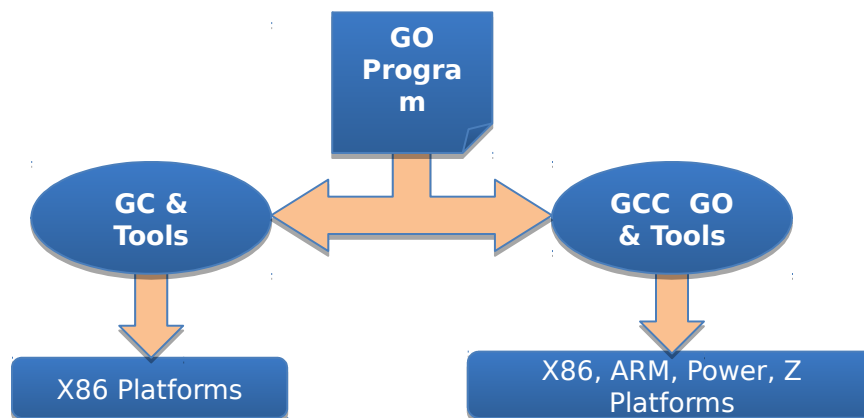


Enablement for Developers

- Docker on POWER is no different than Docker on x86 platforms from a usability perspective; get it and use from:
 - http://ftp.unicamp.br/pub/ppc64el/ubuntu/14_10/docker-ppc64el/
- Docker is available to use on POWER platforms today
- There is a growing ecosystem of dockerized applications for POWER and work with community
- Try it today and give us your requirements and feedback
- You can see a demo of 1000 Docker containers on a single POWER system at expo booth

Building Docker from source on POWER

- Docker is developed using GO programming language

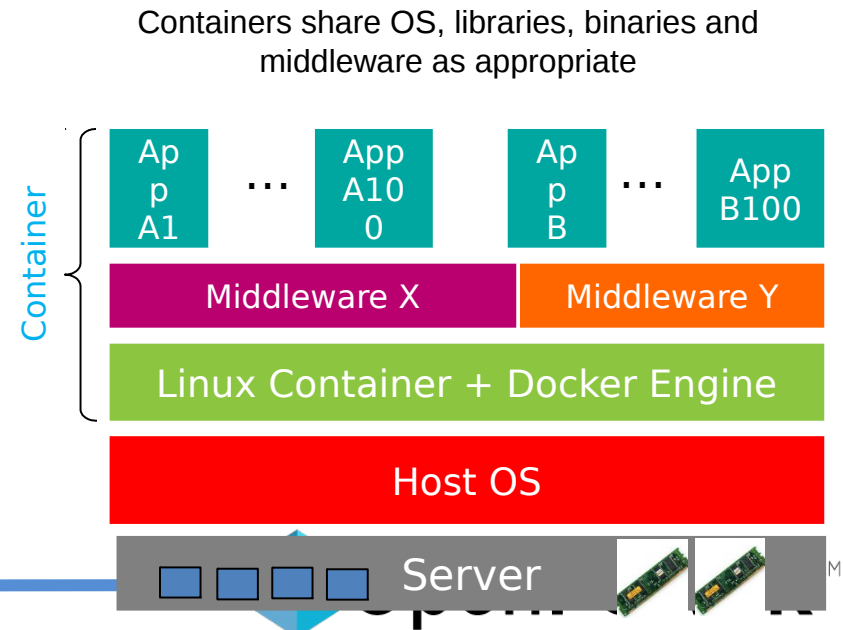
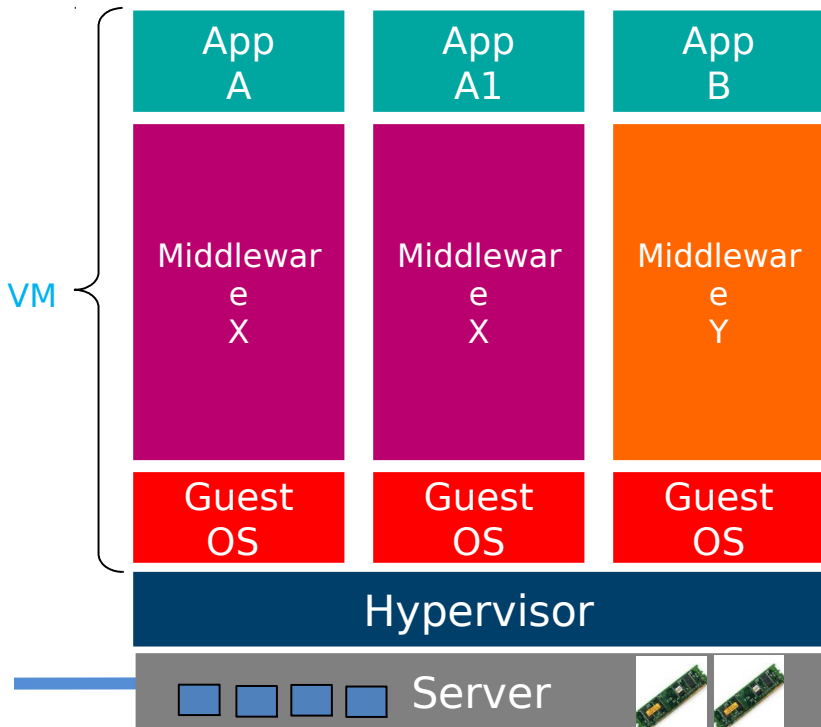
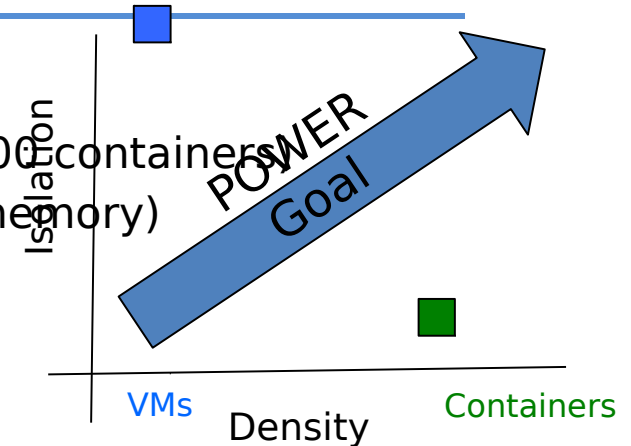


- GCC GO is a community effort with contributions from IBM
- Docker now builds with GCCGO on POWER Platform
- Additional details are available below:
 - Build gcc-go on POWER
 - Build docker code using gcc-go on POWER
 - IBM developerWorks article [1] will provide the step by step process

Optimizations for Service Providers

High level structure in cloud

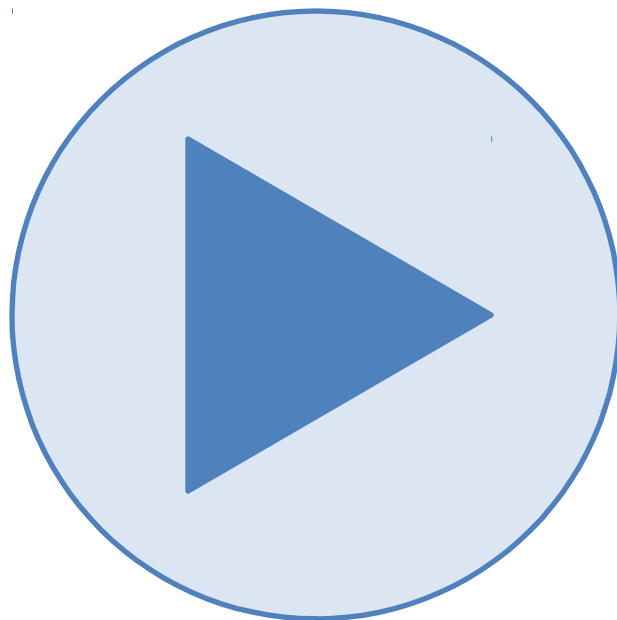
- Large number of containers per system (~100-10000 containers)
- Significant overcommit (e.g., 1-32x CPU and 1-4x memory)



Docker and POWER Demo

- Introduction to Docker
- How to install and configure Docker
- How to run “Hello World”
- Real applications (build and run steps):
 - SSH Container
 - Acme Air Node.js version
 - Acme Air WAS/Liberty version
- Wow
 - 1000 containers of Acme Air Node.js on a single POWER virtual machine

Demo



Summary

- Docker on POWER is no different than Docker on x86 platforms from a usability perspective
- Docker is available to use on POWER platforms today
 - http://ftp.unicamp.br/pub/ppc64el/ubuntu/14_10/docker-ppc64el/
- Try it today and give us your requirements and feedback
- You can see a demo of Docker on POWER at the expo booth
- There is a growing ecosystem of dockerized applications for POWER
 - Let us grow this ecosystem together
 - Tell us what packages/software you need for your applications
- POWER has many unique capabilities that can all be exploited via applications in docker containers; we can help

References

- Seetharami Seelam, Ogata Kazunuri, et. al. : Docker on POWER Platforms:
<https://www.ibm.com/developerworks/library/d-docker-on-power-linux-platform/>
- Breno Leitao: Ubuntu Core on Docker for POWER
https://www.ibm.com/developerworks/community/blogs/fe313521-2e95-46f2-817d-44a4f27eba32/entry/ubuntu_core_on_docker_for_power?lang=en
- Jean-Tiare LE BIGOT: Getting Docker to run on Power8
<https://blog.jtlebi.fr/2014/10/28/getting-docker-to-run-on-power8/>
- Pradipta Banerjee: How to create a Dockerized Application for Ubuntu on Power (ppc64) Servers.
<http://cloudgeekz.com/114/how-to-create-a-dockerized-application-for-ubuntu-on-power-ppc64-servers.html>



Question? Reach out to us...

- SeetharamiSeelam: sseelam@us.ibm.com
- Mel Bakhshi: melb@ca.ibm.com

Docker and POWER: Demo flow

- Usability of Docker on POWER
- POWER Docker images
- Docker registry on POWER
- Building Docker from source on POWER
- Demo of Docker containers on POWER
- Conclusion
- References

Usability of Docker on POWER

Docker on POWER builds are publically

```
$echo deb  
http://ftp.unicamp.br/pub/ppc64el/ubuntu/14\_10/docker-ppc64el/ utopic main >> /etc/apt/s  
ources.list
```

```
$sudo apt-get update
```

```
$apt-get install docker.io
```

```
$apt-get install debootstrap
```

```
$curl -o debootstrap.sh
```

```
https://raw.githubusercontent.com/docker/docker/master/contrib/mkimage/debootstrap
```

```
$chmod 755 debootstrap.sh
```

```
./debootstrap.sh ubuntu --components=main,universe trusty
```

```
$tar -C ubuntu -c . | docker import - ubuntu:14.04
```

```
$docker tag ubuntu:14.04 ubuntu:trusty
```

```
$docker tag ubuntu:14.04 seelam/ubuntule
```

Docker image with ssh

ssh Dockerfile

```
FROM seelam/powerle
MAINTAINER Seetharami Seelam seelam@gmail.com
RUN apt-get update && apt-get install -y openssh-server
RUN mkdir /var/run/sshd
RUN echo 'root:passw0rd' | chpasswd
RUN sed -i 's/PermitRootLogin without-password/PermitRootLogin yes/'
/etc/ssh/sshd_config
# SSH login fix. Otherwise user is kicked off after login
RUN sed 's@session\s*required\s*pam_loginuid.so@session optional pam_loginuid.so@g'
-i /etc/pam.d/sshd
ENV NOTVISIBLE "in users profile"
RUN echo "export VISIBLE=now" >> /etc/profile
EXPOSE 22
CMD ["/usr/sbin/sshd", "-D"]
```

Build and Run

```
$ docker build -t seelam/ubuntulessh .
$ docker run -d -P seelam/ubuntulessh
$ ssh localhost -p 49153
```

```
root@94c19e5aefa6:~#
```

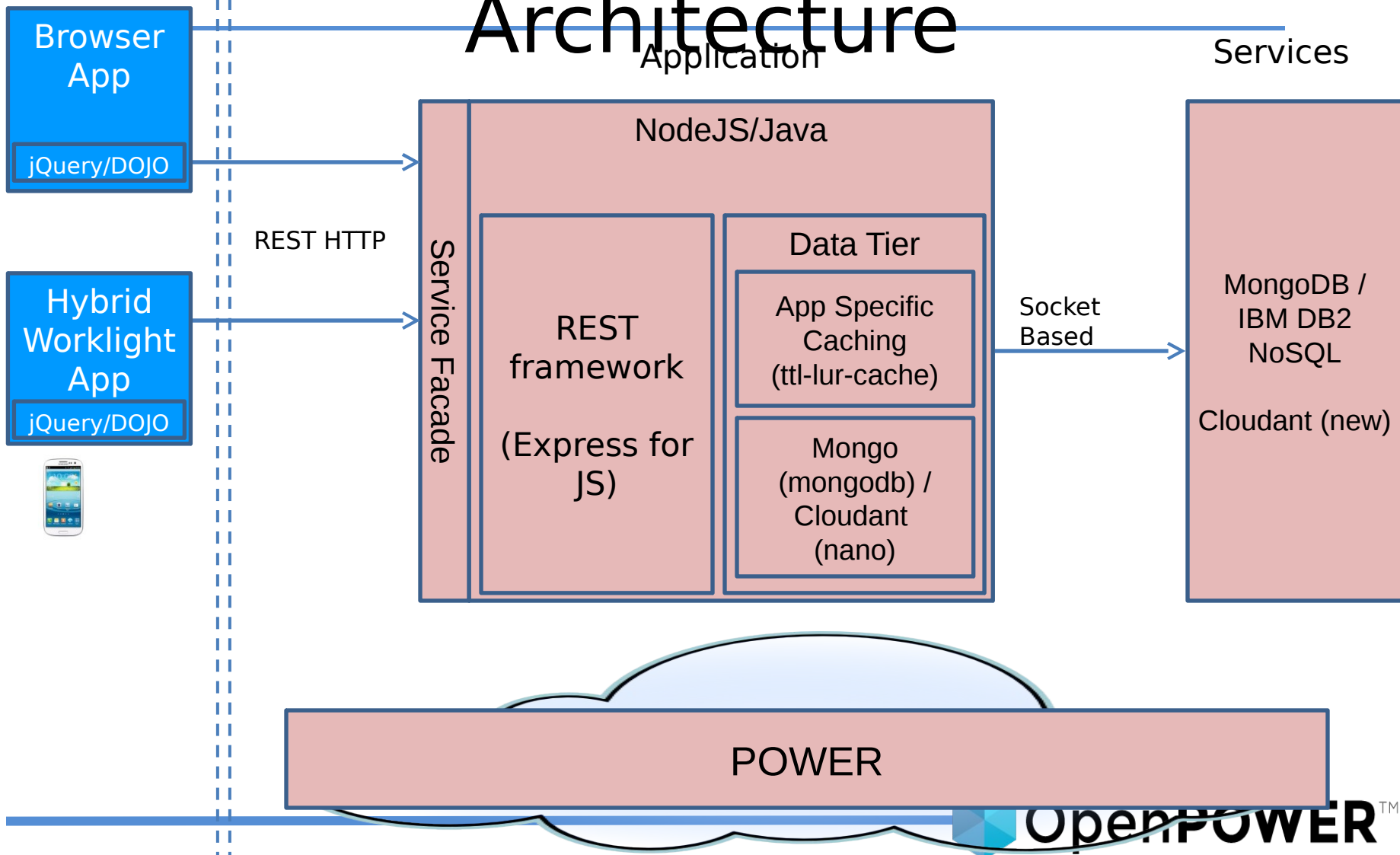

Docker Registry on POWER

- Docker registry enables easy sharing of docker images
- Docker registry is python code

```
$ cd ~  
$ git clone https://github.com/docker/docker-registry  
$ cd ~/docker-registry  
$ git checkout -q 0.9.1
```

```
$ cd ~/docker-registry  
$ patch -p1 < docker-registry.patch  
$ docker build -t registry .  
$ docker run -p 5000:5000 registry
```

Acme Air (JavaScript/Java) Architecture



Explore the Application - Web UI

nile

Flights, Baggage, and Loyalty all with a Smile

Outbound flights from Paris to Moscow

Flight	Departure Time	Arrival	Economy Cost	Select Flight
AA280	May 30, 2013 - 12:00 AM	May 30	\$200.00	selected

Return flights from Moscow to Paris

Flight	Departure Time	Arrival Time	First Class Cost	Economy Cost	Select Flight
AA241	June 1, 2013 - 12:00 AM	June 1, 2013 - 02:33 AM	\$500.00	\$200.00	selected

Example Text

- Standard bullets to be used
 - Indent sub-bullet
- Text
- Text



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