

The background is a solid blue color with a repeating pattern of white and yellow lightbulb icons. The icons are scattered across the entire frame, with some appearing as simple white outlines and others as glowing yellow shapes with radiating lines.

ZADARA
SUMMIT
2018

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NOW**



ZADARA®

Smarter Storage with Containerized Applications

Always Aligned with your Changing World



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Solutions Architect, Zadara Storage

Accumulated years of experience in advanced software design and development as well as management roles in government and civilian capacities.

Currently working on new storage-oriented projects directed toward general business automation, enterprise resource planning, and international cloud-based service oriented architectures.

Smarter Storage with Containerized Applications

- Converged Infrastructure
- Docker
- Docker + Zadara
- Use Cases and Example
- Conclusion

Converged Infrastructure

Definition:

(Hyper) Converged Infrastructure

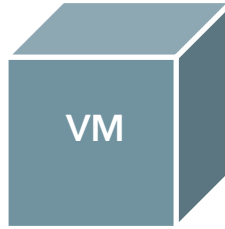
Operates by grouping multiple information technology (IT) components into a single, optimized computing package.

-Wikipedia

Convergence - Combining for ease of use



+



+



=

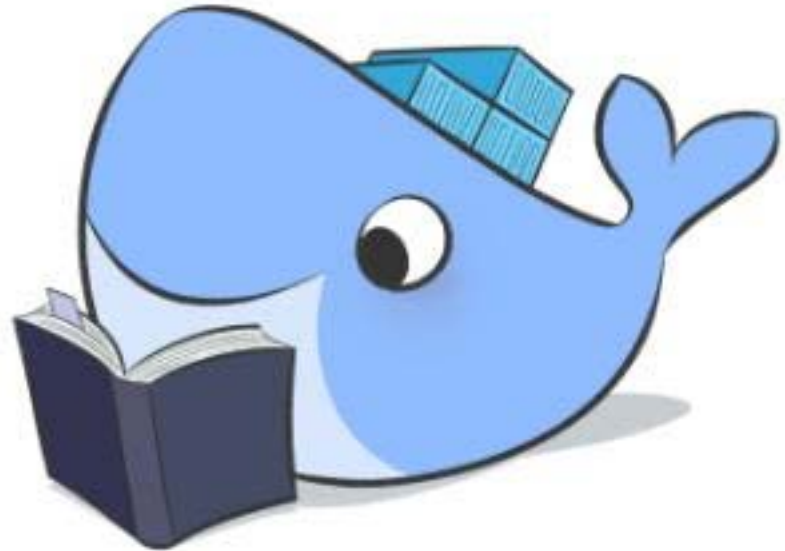
Elastic



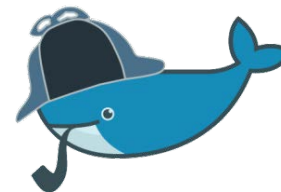
Unified

Convergence - Can we do better?

Well we can definitely do different (and probably better too)!



We need to solve the following



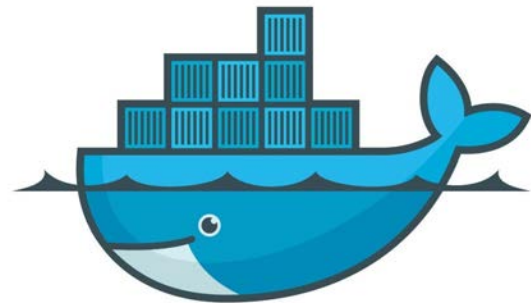
Problem Solution

- ✓ Portability!
- ✓ Scalable!
- ✓ Uniformity!
- ✓ Efficient!

Problem

- ✓ Portability?
- ✓ Scalable?
- ✓ Uniformity?
- ✓ Efficient?

Cue Docker!



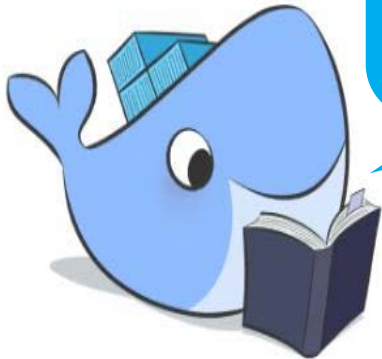
What is Docker?

Docker is a computer program that performs operating-system level virtualization also known as containerization.

-Wikipedia

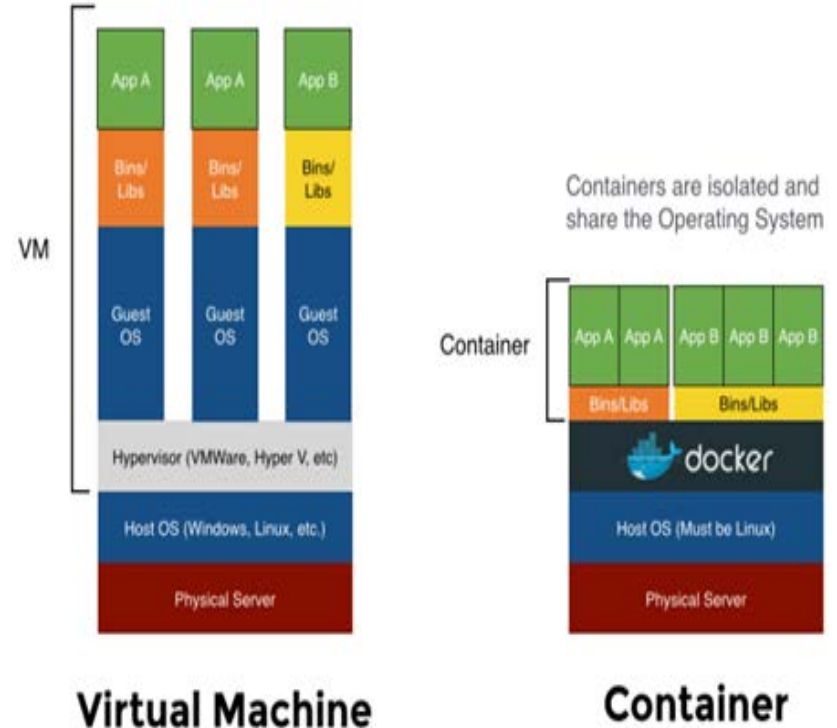
Docker 101 - Architecture

Wait what about VM's!?!?!



Docker doesn't require Guest OS'es or a Hypervisor

Container vs. VMs

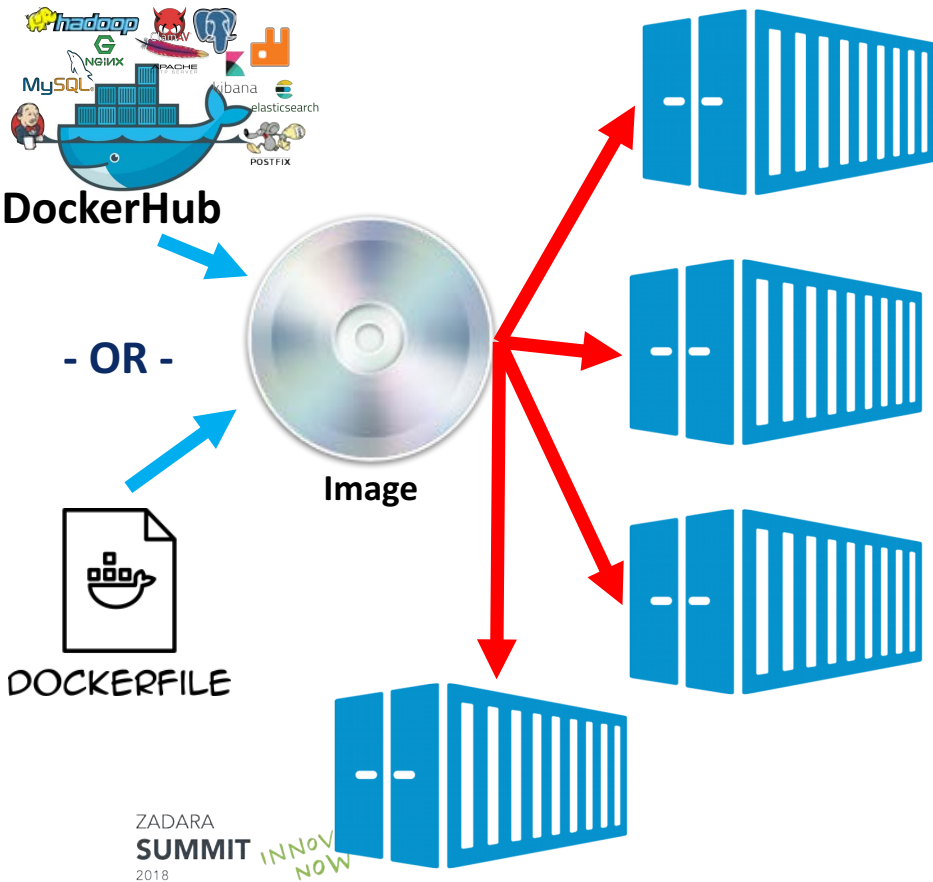




Docker containers give you of all the properties of a VM without the overhead of an actual Guest OS since the OS/Kernel is shared:

- ✓ **Networking**
- ✓ **Independent File System**
- ✓ **Installed Dependencies**
- ✓ **Storage Access**
- ✓ **Virtual Storage**
- ✓ **Cloning**

Docker 101 - How Does it Work?



- Create an Image or pull one from Docker hub
- Deploy as many containers your host or cluster of hosts can handle
- Exposed environmental variables for super quick deployment configuration

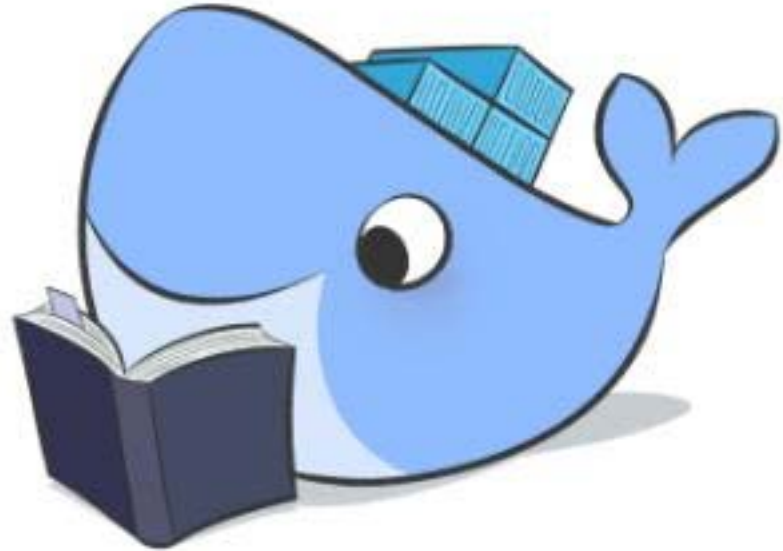
Docker 101 - Common Design/Deploy Patterns

- De-couple! One container image per service
- Ephemeral! A container should be re-spawn-able at any time
- Build image as compact as possible (alpine 30x smaller than debian) 😊
- Identical / uniform dev and production containers
- Scale up and down as needed
- Collect your Logs!



We Love Docker!

I think we'll adopt!



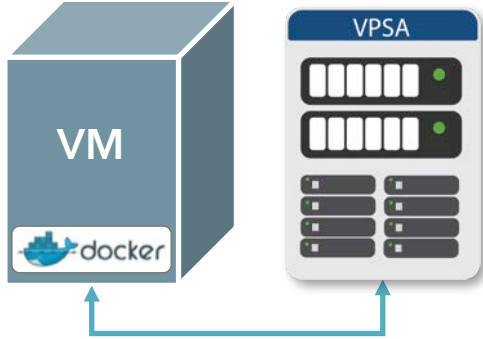
Docker + Zadara (ZCS)





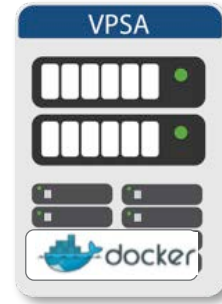
Zadara Container Services (ZCS)

Before:



- Docker Apps run on VM
- Network Latency

After:

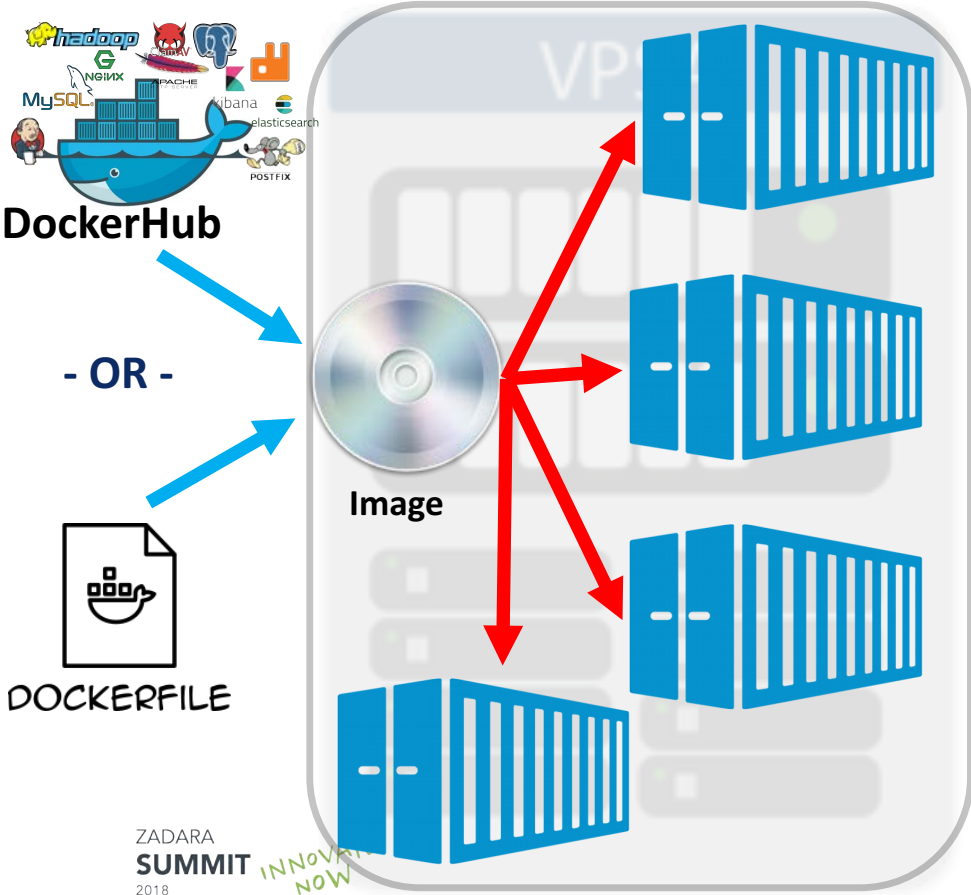


Upload your own image or pull from Docker hub Directly!!!

- Docker Apps run within VPSA
- Zero Latency, High throughput
- No transfer charges
- Automation
- Free up host CPU cycles

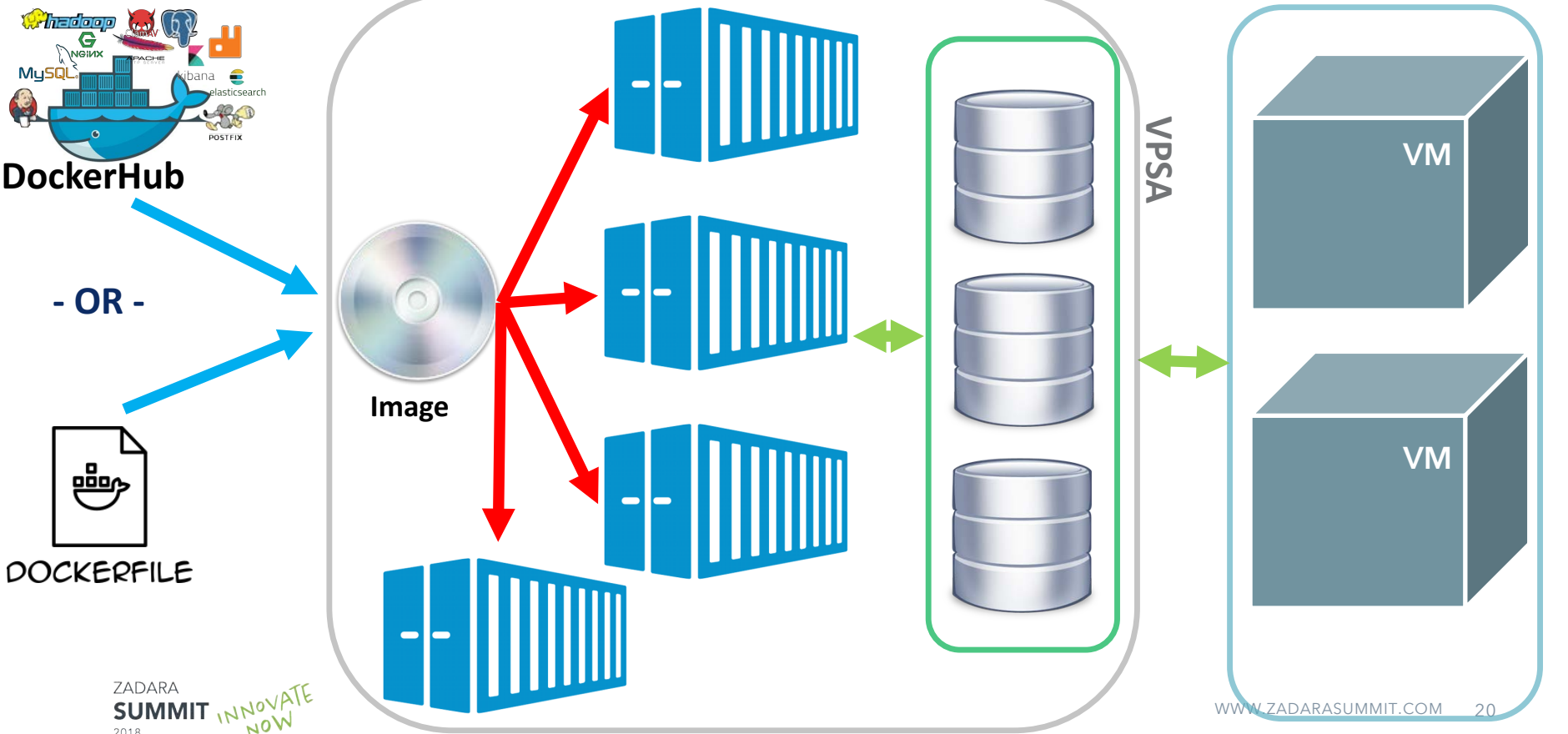
Run tasks within storage for high-performance

ZCS - Docker overlay on VPSA

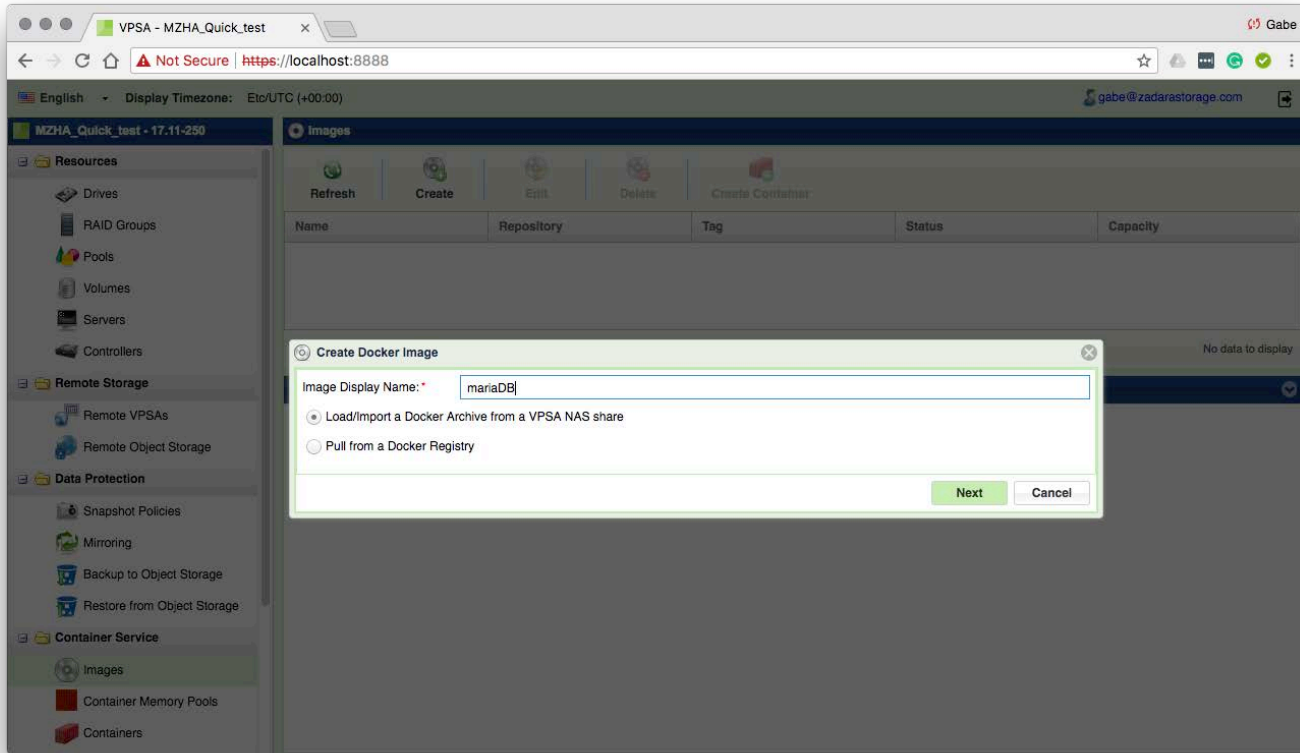


- Pull from DockerHub directly or upload your own Images!
- Deploy as many containers your ZCS Engine can handle, (increase engine as needed)
- All in GUI or orchestrate-able via the Zadara API
- Accesses same Zadara NAS shares available to traditional compute
- Offer services right out of the Array

ZCS - Docker overlay on VPSA



ZCS - In action



ZCS - In action

VPSA - MZHA_Quick_test x Gabe

Not Secure | https://localhost:8888

English - Display Timezone: Etc/UTC (+00:00) gabe@zadarastorage.com

MZHA_Quick_test - 17.11.250

Resources

- Drives
- RAID Groups
- Pools
- Volumes
- Servers
- Controllers

Remote Storage

- Remote VPSAs
- Remote Object Storage

Data Protection

- Snapshot Policies
- Mirroring
- Backup to Object Storage
- Restore from Object Storage

Container Service

- Images
- Container Memory Pools
- Containers

Images

Refresh Create Edit Delete Create Certificate

Name Repository Tag State Capacity

No data to display

Create Docker Image

Search Docker Hub Public Registry
 Pull from a custom Docker Registry

Repository: * MariaDB

Choose Image:

Name	Description	Official	Star co...
mariadb	MariaDB is a community-developed fork of MySQL intended to remain free under the...	true	1962
bitnami/mariadb	Bitnami MariaDB Docker Image	false	59
toughiq/mariadb-...	Dockerized Automated MariaDB Galera Cluster - Built for use with Docker 1.12+	false	31
linuxserver/mariadb	A Mariadb container, brought to you by LinuxServer.io.	false	29
colinmollenhour/...	MariaDb w/ Galera Cluster, DNS-based service discovery and auto-recover. Swarm, ...	false	16
panubo/mariadb-...	MariaDB Galera Cluster	false	15

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Select Tag (Optional):

Create Back

ZCS - In action

The screenshot displays the ZCS web interface. A modal dialog titled "Create Container from Image mariaDB" is open, showing configuration options for a new container. The dialog is divided into several sections:

- Name:** mariaDB
- Volumes:** A table with columns Name, Volume Type, Access, and Path. One volume is defined: Share-01, File-System, rw, /var/lib/mysql.
- Container Ports:** A table with columns Protocol, User Start, User End, Internal Start, and Internal End. One port is defined: top, 3306.
- Environment Variables:** A table with columns Variable and Value. One variable is defined: user, root.

At the bottom of the dialog are "Create" and "Cancel" buttons. The background interface shows a sidebar with navigation options like "Remote Storage", "Data Protection", and "Container Service". The main content area displays details for the "mariaDB" container, including its ID, tag, Docker ID, capacity (382 MB), and creation/modification timestamps.

ZCS - In action

The screenshot displays the ZCS web interface in a browser window. The address bar shows 'https://localhost:8888'. The interface is divided into a left sidebar and a main content area. The sidebar contains navigation menus for 'Remote Storage', 'Data Protection', 'Container Service', 'Images', 'NAS Access Control', 'System', and 'User Management'. The 'Containers' menu item is highlighted. The main content area shows a 'Containers' section with a table of running containers. Below the table, there is a 'Details for mariaDB' section with tabs for 'Properties', 'Volumes', 'Port Ranges', 'Environment Variables', 'Args', 'Links', and 'Logs'. The 'Properties' tab is active, showing details for the 'mariaDB' container.

Name	Image name	Status	Running	IP	Entry point
mariaDB	mariaDB	normal	No	172.31.240.137	

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Displaying 1 - 1 of 1

Details for mariaDB

Properties | Volumes | Port Ranges | Environment Variables | Args | Links | Logs

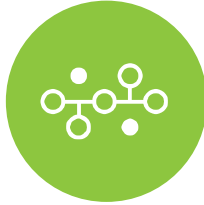
ID: container-00000001
Name: mariaDB
Comment:
Image ID: img-00000001
Image Name: mariaDB
Memory Pool ID: dgroup-00000001
Memory Pool Name: Default_Memory_Pool
Status: normal
Started: No

Zadara Container Services (ZCS) Uses



Organize and Discover

- NAS Indexing / search / notifications
- Data Classification
- Low-latency OLTP tasks
- Hadoop / Map Reduce



Manipulate

- Transcoding / data transformation
- Compress



Protect

- Data governance / auditing of NAS share
- Secure file transfer
- Anti-virus scanning



Share

- WebDAV/FTP server

ZCS Use Cases and Examples

“We’ve got a container for that!”

The nice things to notice about our ZCS

— Nice Things —



- Quick prototyping
- New/Special functionality
- Administrative tasking
- Hot fixing
- Uniform build and deployment
- Testing
- CI/CD ready

ZCS Examples



Clam AV

Functional Requirement:

Customer Need, Feature Prototype

- **Problem:** Need a way to provide customers AV.
- **Solution:** Clam AV - A mature antivirus solution that is designed to protect windows, linux and mac. Virus signatures are updated frequently by ClamAV. Can provide on-demand and manual scanning.
- **Results:** Ability to provide on-demand scanning as well as manual scanning for really large quantities of files.

ZCS Examples



Zadara Capmon

- **Problem:** Need capacity monitoring for VPSA
- **Solution:** Still a work in progress, but created a Grafana and InfluxDB instances and provides a python script to permit volume metrics to be gleaned from a target VPSA.
- **Results:** Active capacity monitoring

Functional Requirement:

Customer Need, Feature Prototype

ZCS Examples



B2O Restore

- **Problem:** Need a quick universal restore tool.
- **Solution:** Zadara proprietary restore utility Dockerized. Mounts a volume which can access to object-store-based backups
- **Results:** Customers get quick access to restores ease.

Functional Requirement:

Customer Need, Administrative

ZCS Examples

B2O Proxy

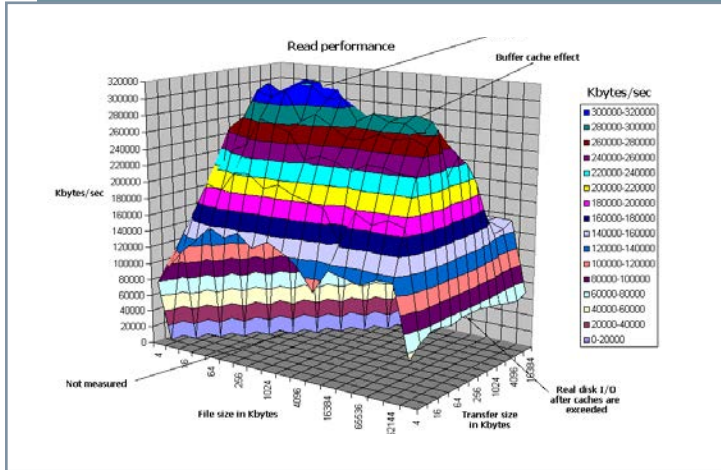


Functional Requirement:

Customer Need

- **Problem:** Need to avoid going over public WAN to backup to AWS S3 in same region.
- **Solution:** Squid Proxy is a useful general purpose proxy built as Linux service.
- **Results:** Access for Zadara object storage to backup bypassing unnecessary charged ingress/egress activity and provides a good general NAT when needed.

ZCS Examples



IO Zone

- **Problem:** Need for VPSA performance analytics.
- **Solution:** IOZone is a great utility to test IO performance and provide solid benchmarking.
- **Results:** Performance awareness tool also useful for debugging performance issues.

Functional Requirement:

Customer Need, Feature Prototype

ZCS Examples



OwnCloud

- **Problem:** Need for cloud-based RBAC file access with client syncing and remote mounting.
- **Solution:** OwnCloud is a mature open source project that provides very tailorable file shares and access to CIFS shares and mounted storage.
- **Results:** Customer's users get on-demand access anywhere with a fully sync-able and remote-mountable suite.

Functional Requirement:

Customer Need

ZCS Examples



Zadara AutoExpander

Functional Requirement:

Customer Need, Feature Prototype

- **Problem:** Need dynamic expansion for VPSA's. Very large global customer looking to simplify growth.
- **Solution:** Custom-built tool using Zadara API's to create growth elasticity at various thresholds as well as notifications.
- **Results:** Customer saves time and energy letting growth happen dynamically and being informed of the changes.

Zadara Docker Reference

<https://github.com/zadarastorage/dockerfiles>

The background of the entire image is a solid blue color. Scattered across this background are numerous white line-art icons of lightbulbs. One lightbulb icon, located in the upper right quadrant, is highlighted in yellow. In the center of the image, there is a black rectangular area that serves as a chalkboard. On this chalkboard, the words "ANY QUESTIONS?" are written in white, hand-drawn, chalk-like capital letters. The text is arranged in three lines: "ANY" on the top line, "QUESTIONS" on the middle line, and a large question mark "?" on the bottom line.

ANY
QUESTIONS
?



THANK YOU!

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