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IBM Bluemix
Development & Certification

Summary decks for a course that covers the A to Z of IBM Bluemix.

For more information visit:
http://www.acloudfan.com

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1. Intro to Docker Containers
2. IBM Containers
3. Virtual Servers

PS: Certification practice test questions NOT included in the summary decks

Discounted access to the courses:

https://www.udemy.com/ibm-bluemix/?couponCode=BLUE100

Coupon Code = **BLUE100**

https://www.udemy.com/rest-api/?couponCode=REST100

Coupon Code = **REST100**

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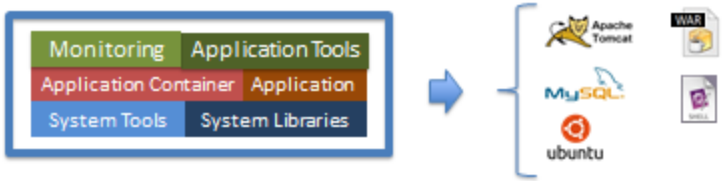
Introduction to Docker Containers

What is *Container*?

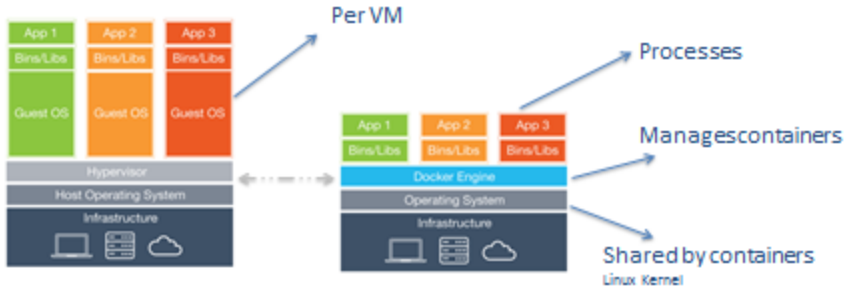
- A standard way of packaging the application & all its dependencies



- Container addresses issue of *Dependency Hell*
- Linux containers have been around for a while but *Docker* has simplified their use

VM versus Docker runtime

- *Virtual Machine* (VM) abstracts underlying servers (aka. Bare metal)
- *Docker* abstracts application from the underlying operating system



Benefits of Docker Containers

- Accelerated Delivery
- Environment Consistencies
- Scalability
- Portability
- Developer Empowerment
- Compute Efficiencies
- Sharing

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Docker image

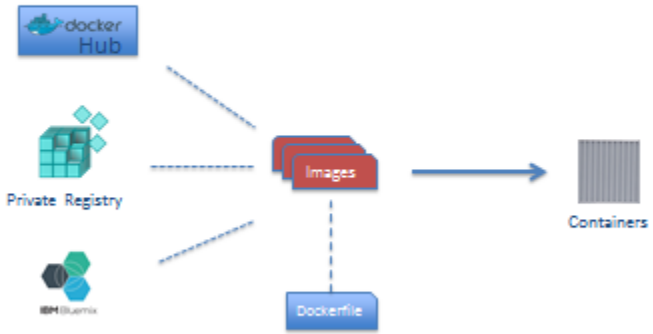
- **Image** is a read-only template that are used to create containers
- Images are the basis for containers
- Images are built via templates referred to as ***Dockerfile***
- Images are managed in registries. ***DockerHub*** is a public registry.

Docker Registries

- Registries are the distribution component of Docker
- The Docker Hub is a cloud-based registry service for building and shipping application or service containers
  - Image Discovery
  - Distribution & Change Management
  - User & Team collaboration

https://hub.docker.com

Containers, Images, Registry



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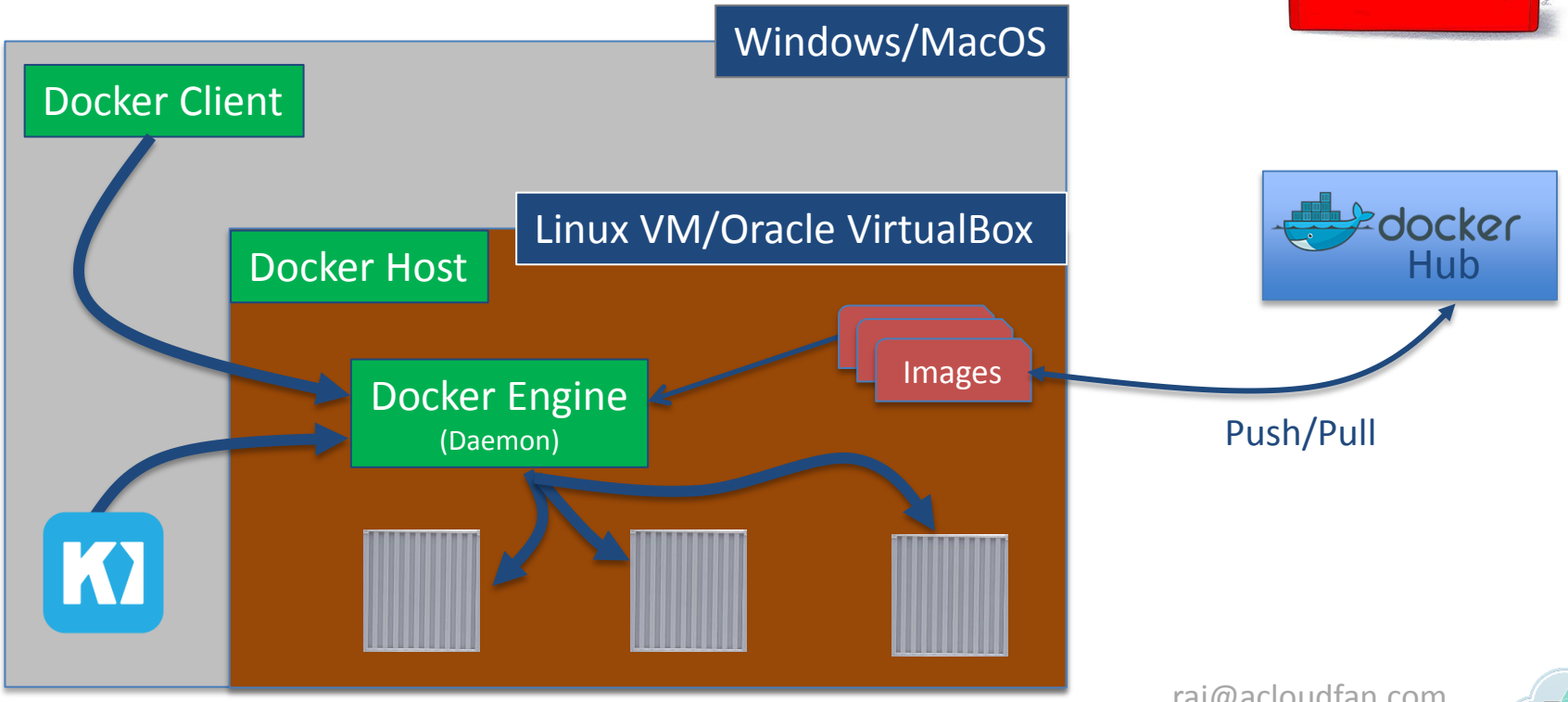
Docker Toolbox



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Dockerfile

- Use ***DockerHub://tomcat:latest*** as the base image

  FROM tomcat:latest

- ADD : tomcat-users.xml to the image

  Create *tomcat-users.xml* to enable management of Tomcat container

  ADD ./tomcat-users.xml /usr/local/tomcat/conf/tomcat-users.xml

- ADD : application war file to the image

  ADD ./target/DockerSample.war /usr/local/tomcat/webapps/DockerSample.war

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Summary

- Docker toolbox installed on local machine sets up multiple tools
- Docker-machine used for creating docker hosts
- Dockerfile has commands for creating images
- Image is created locally using the *docker build* command
- To run a container you need to set the environment variable and then issue the *docker run* command

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IBM Containers

IBM Containers

- IBM containers is Bluemix runtime that leverages Docker technology
  - Existing images may be used as-is
  - Automatic validation of images for vulnerabilities
  - Can be configured as container groups for auto-scaling & auto recovery
  - Monitoring & log consolidation
  - IBM Container Extension (ice) *OR* CF ic Plugin for management; same commands as *Docker* client

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IBM Image Registry

Each organization has a private registry

- Existing images may be pushed as-is
- Created the first time a container is created
  https://registry.ng.bluemix.net/{namespace}/
- Users within the organization can access the images
- Maximum of 25 images allowed in the registry

Storage Volume

- Storage volumes persist data for containers

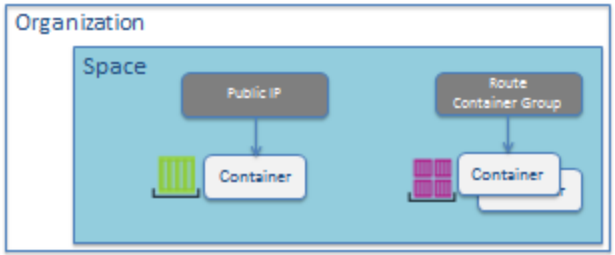
```
cf ic volume create VOLNAME
```

```
ice volume create VOLNAME
```

- Allocated per space
- Not affected by the updates made to images
- Lifecycle is independent of the lifecycle of the container
- Storage volume added to containers with ADD in *Dockerfile*

Scaling Container Group Vs Single Container

- Scaling container group option for high availability & recovery
- Single container may be setup with a public IP address



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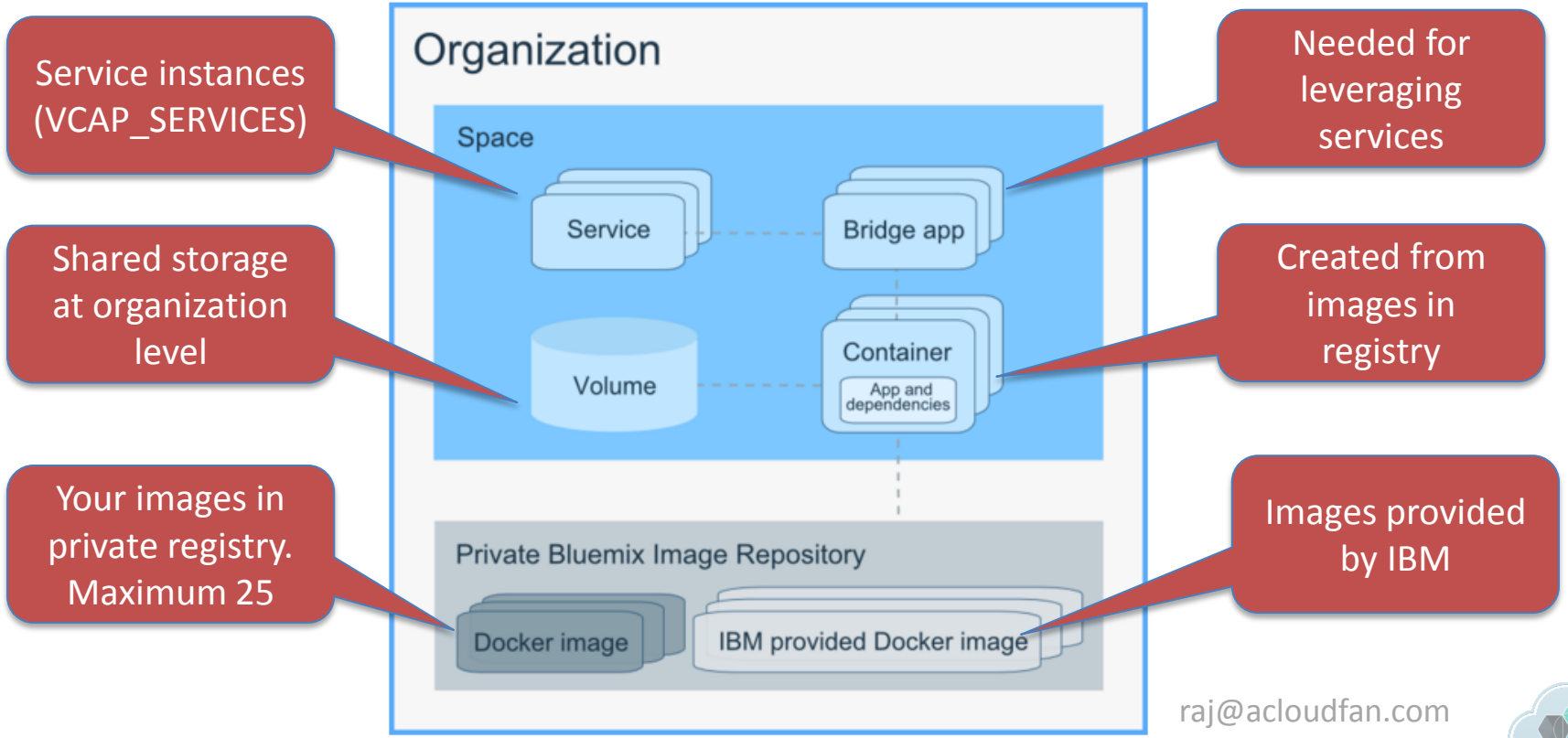
Summary



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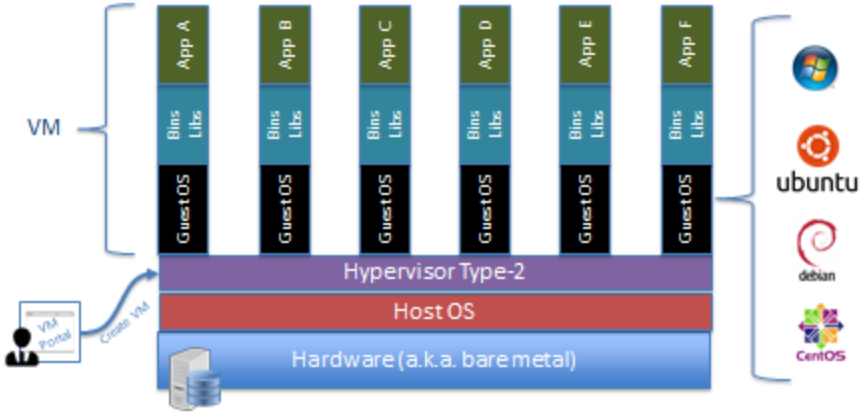
Virtual Servers

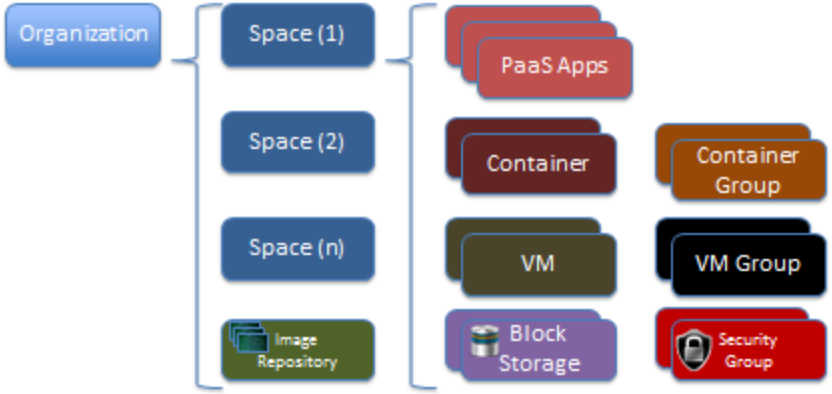
Virtual Machine (VM)

- A self-contained operating environment that behaves as if it is a separate computer
- Multiple Virtual Machine (VM) instances share the common underlying physical hardware (a.k.a. bare metal)
  - More efficient use of the hardware
  - Cost effectiveness
  - Self provisioning

Virtualization



IBM Bluemix VM – Astronaut's view



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VM setup & management tools

- VM can be setup & managed using
  - Bluemix console/UI 
  - OpenStack client 

<<< Horizon UI Supported

- SSH to VM
  - On Widows use **Putty** 

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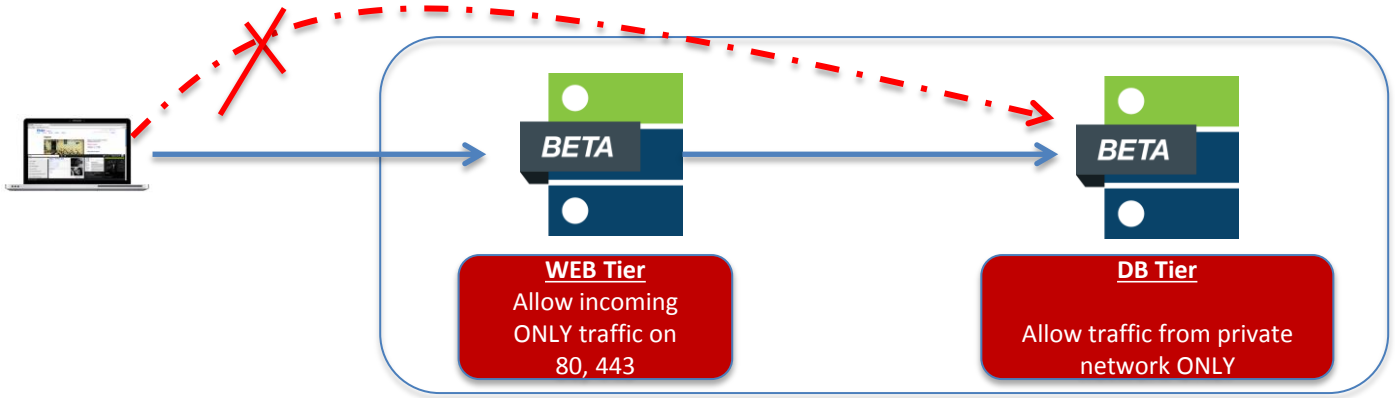
Security Group

- Sets up the allowed inbound & outbound traffic



- *default* = No inbound traffic from outside the private network
- *allow_ssh (22) , allow_https (443), allow_rdp (3389), allow_all*

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VM Logging & Monitoring

- By default Logging is NOT enabled
  - Need to install & enable Bluemix *logstash* fowarder agent
- By default Monitoring is enabled
  - CPU
  - Memory
  - Network
  - Graphite based monitoring dashboard

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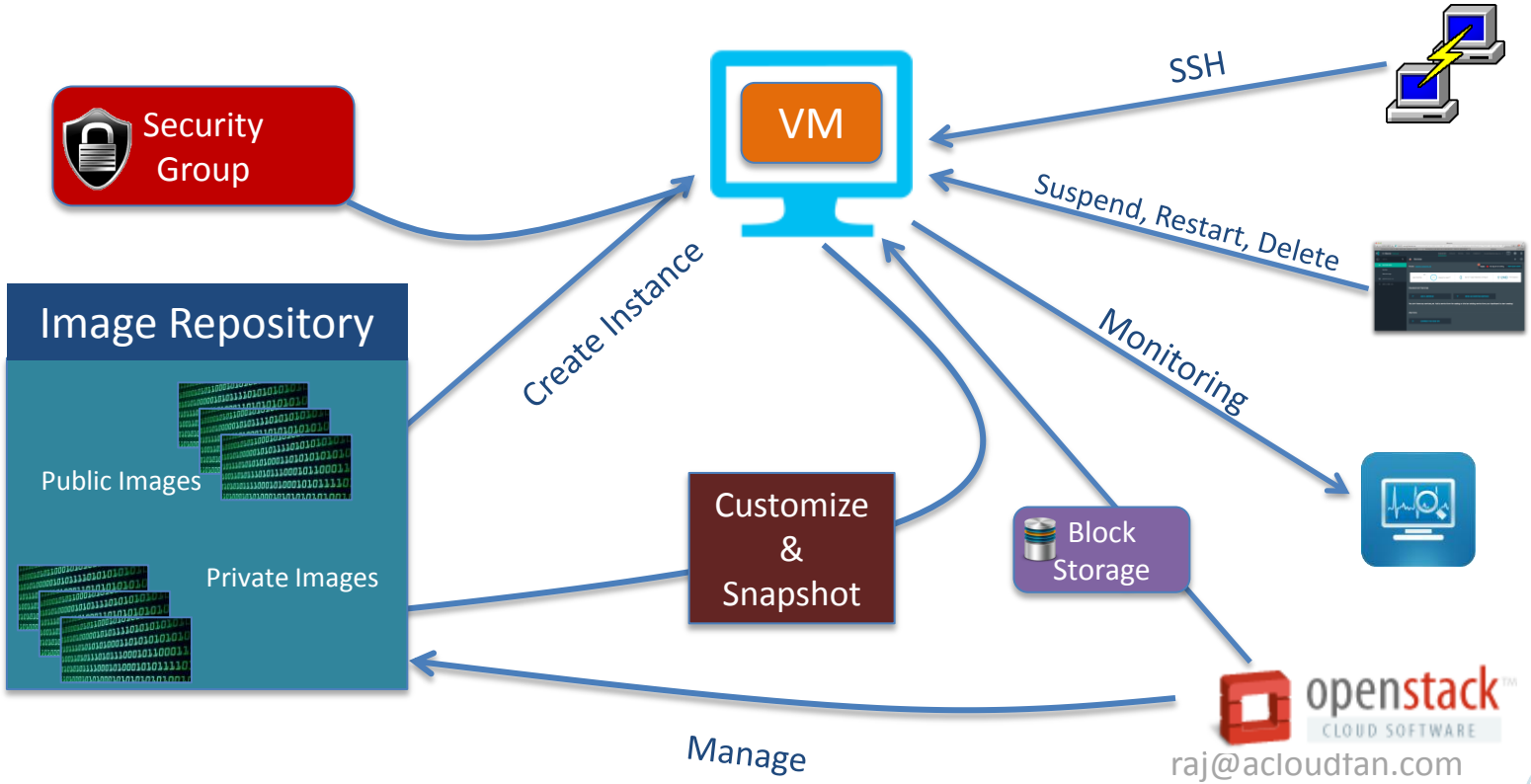
IBM VM Creation



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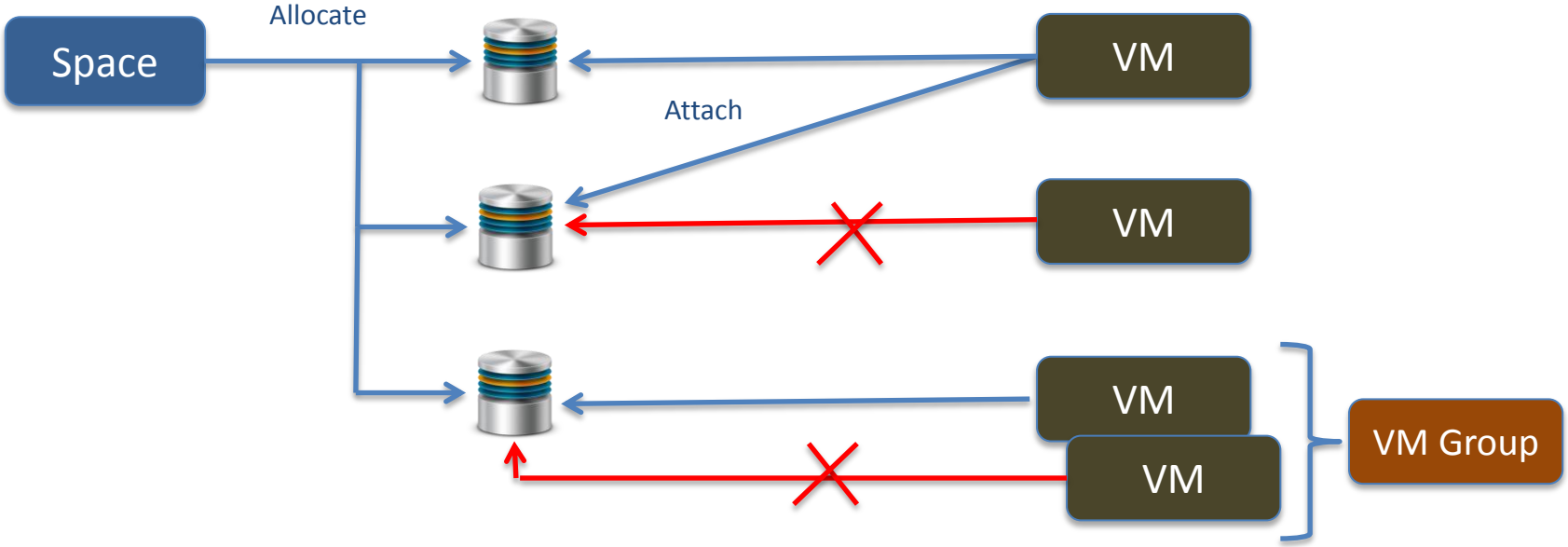
IBM VM Storage



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