

# Integration of Docker containers in CERN Batch system



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CERN OpenLab - 2016

# 1 What is Batch ?

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**2 What is Docker ?**

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**3 Why Docker on Batch ?**

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**2 What is Docker ?**

**3 Why Docker on Batch ?**

**4 How to make it work ?**

**1 What is Batch ?**

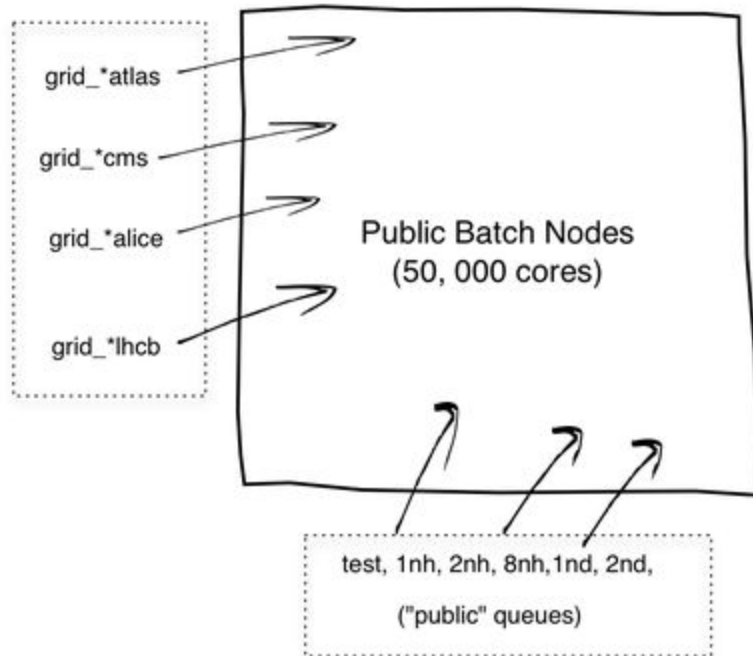
**2 What is Docker ?**

**3 Why Docker on Batch ?**

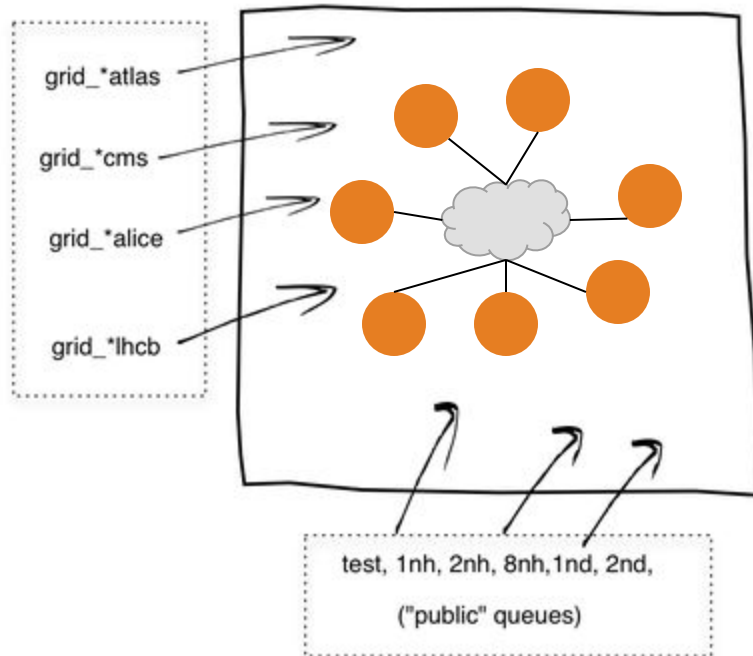
**4 How to make it work ?**

**5 Future ?**

("Grid" queues)

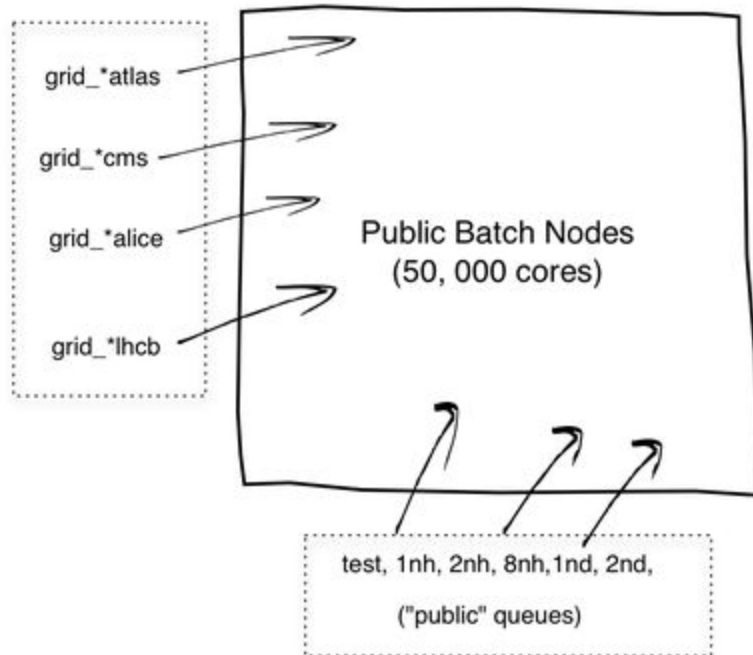


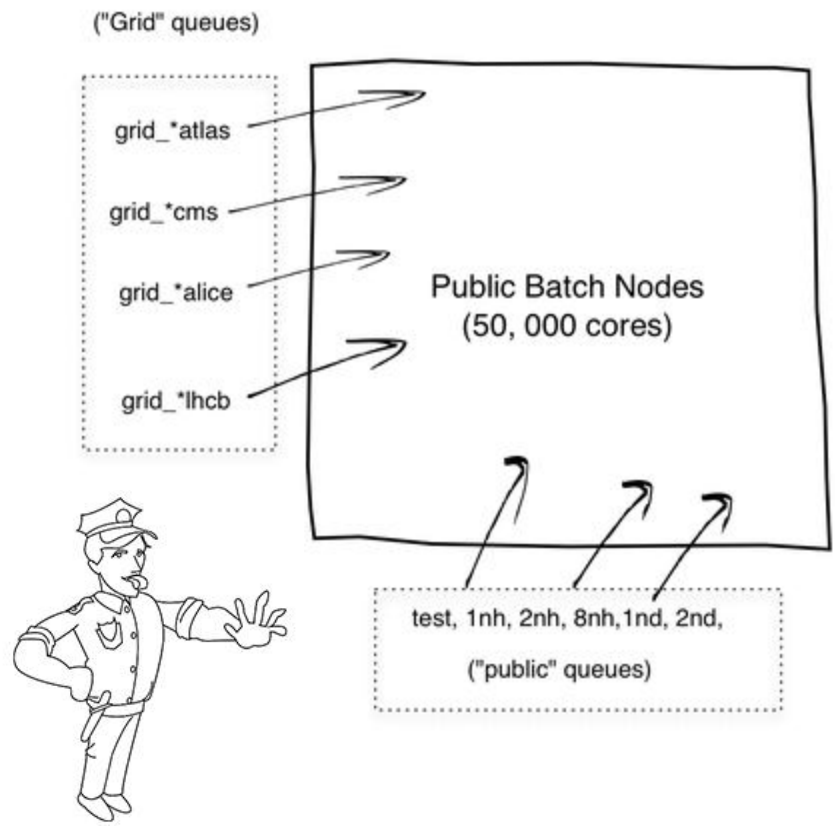
("Grid" queues)





("Grid" queues)





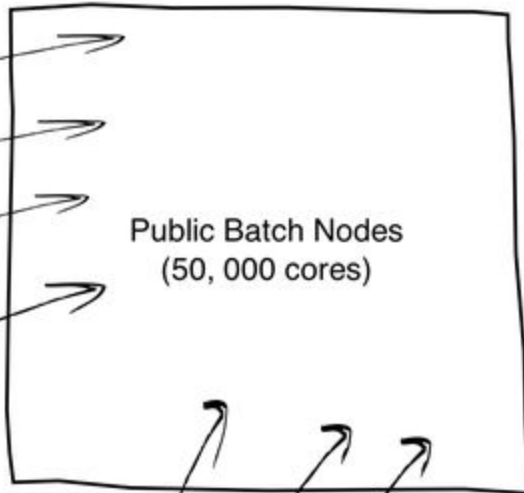


**HTC**ondor  
High Throughput Computing



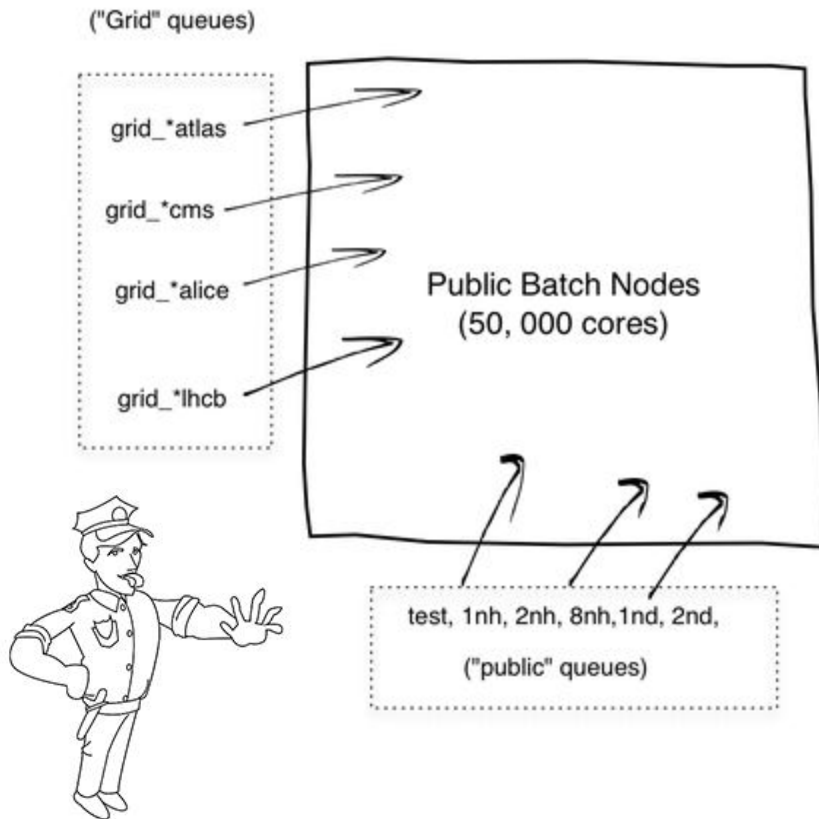
("Grid" queues)

grid\_\*atlas  
grid\_\*cms  
grid\_\*alice  
grid\_\*lhcb

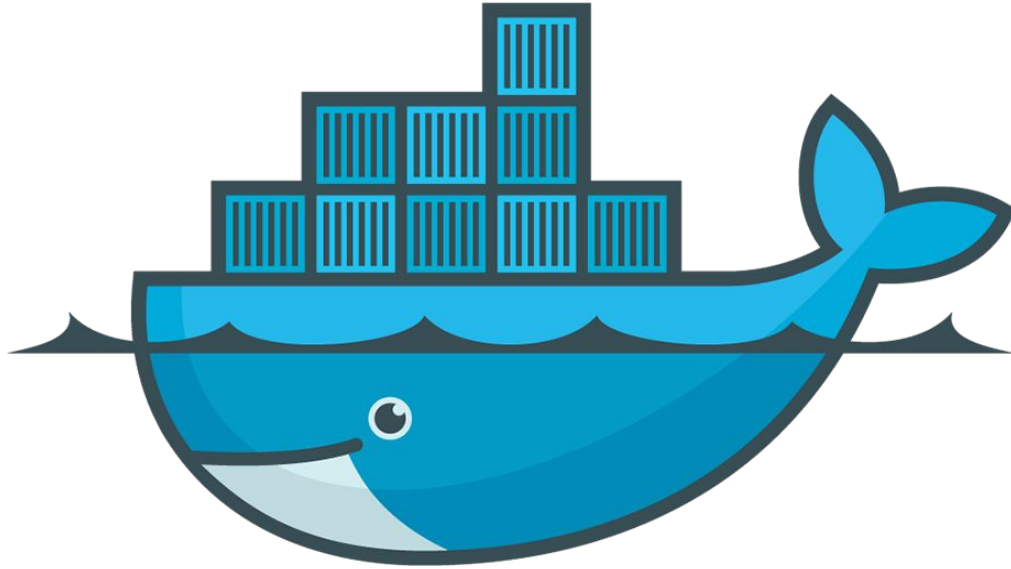


Public Batch Nodes  
(50,000 cores)

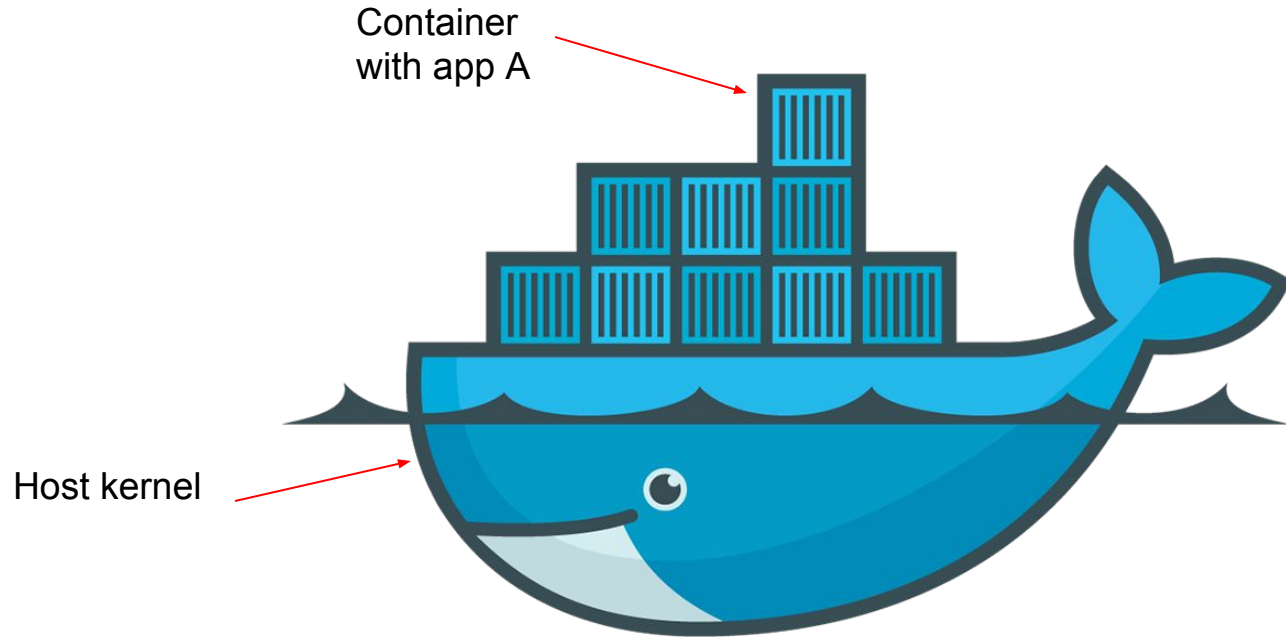
test, 1nh, 2nh, 8nh, 1nd, 2nd,  
("public" queues)



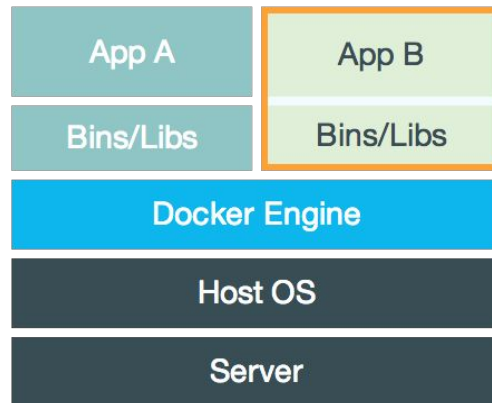
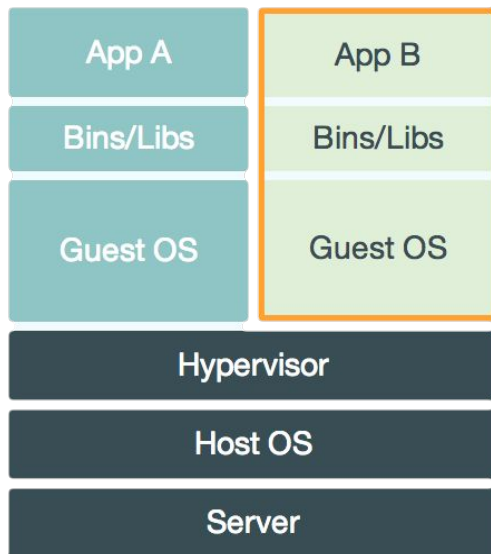
- Vanilla
- Standard
- Parallel
- Grid
- VM
- ...



LXC (Linux containers): Kernel features: namespaces , cgroups, Root file system, NATed network ....



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# WHY ?



# 1. Users asking for docker

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2. No bad guys

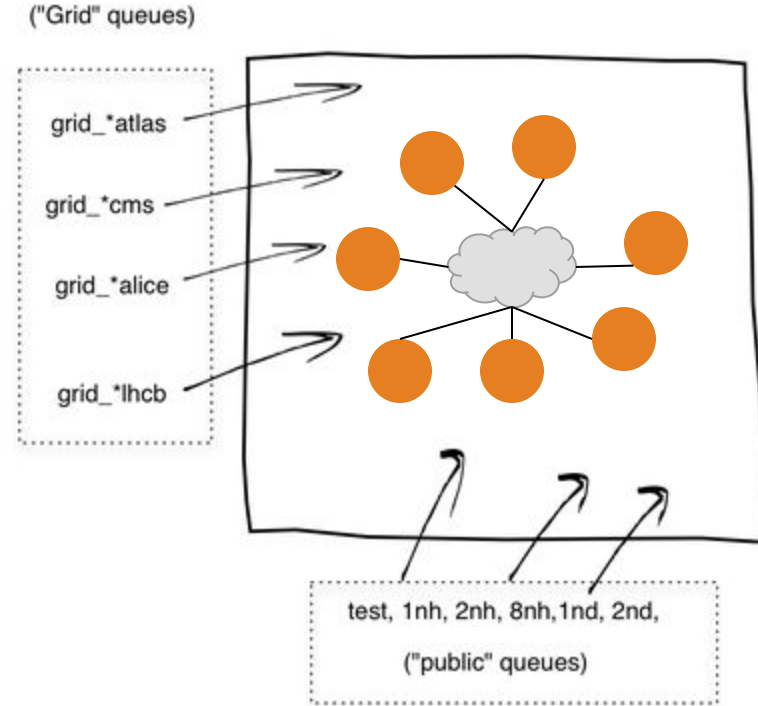
3

**1. Users asking for docker**

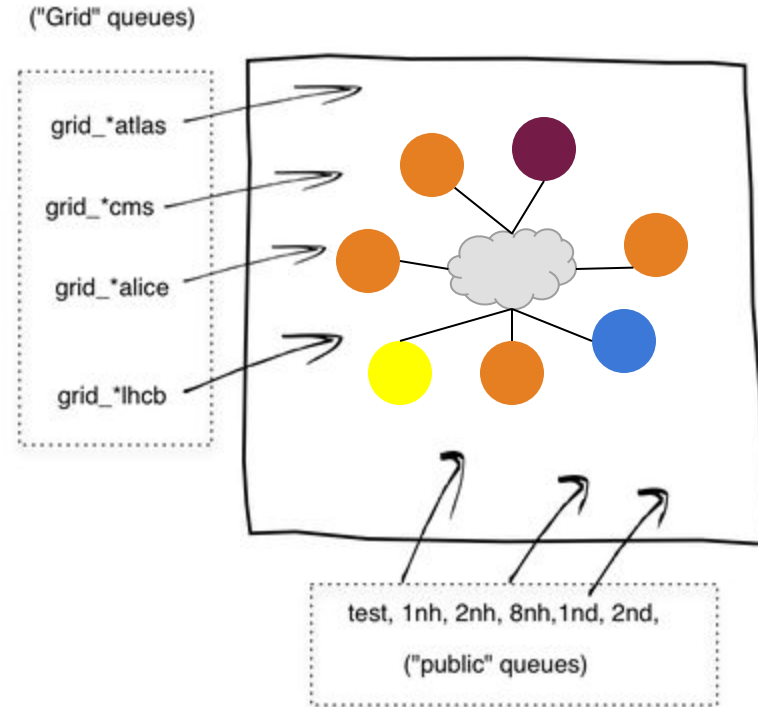
**2. No bad guys**

**3. Flexibility for users**

1. Users asking for docker
2. No bad guys
3. Flexibility for users
4. Easier life for sysadmins

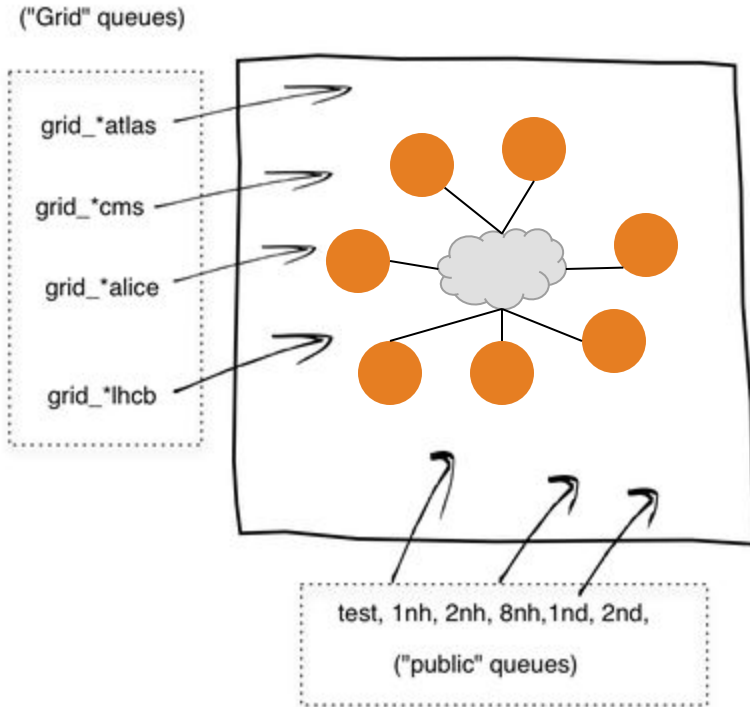


1. Users asking for docker
2. No bad guys
3. Flexibility for users
4. Easier life for sysadmins
5. Heterogenous worker nodes



# HOW?

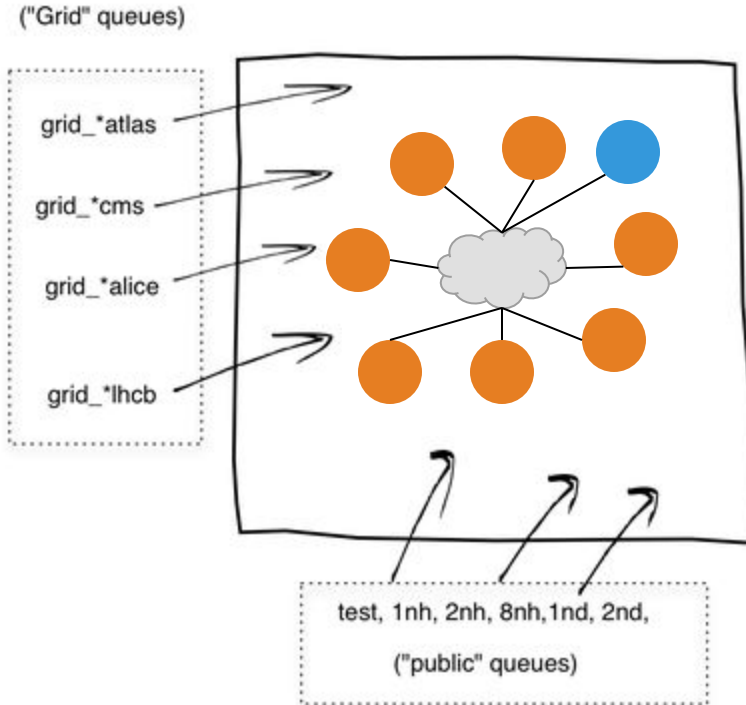
# Contribution



**Condor  
Docker Universe**

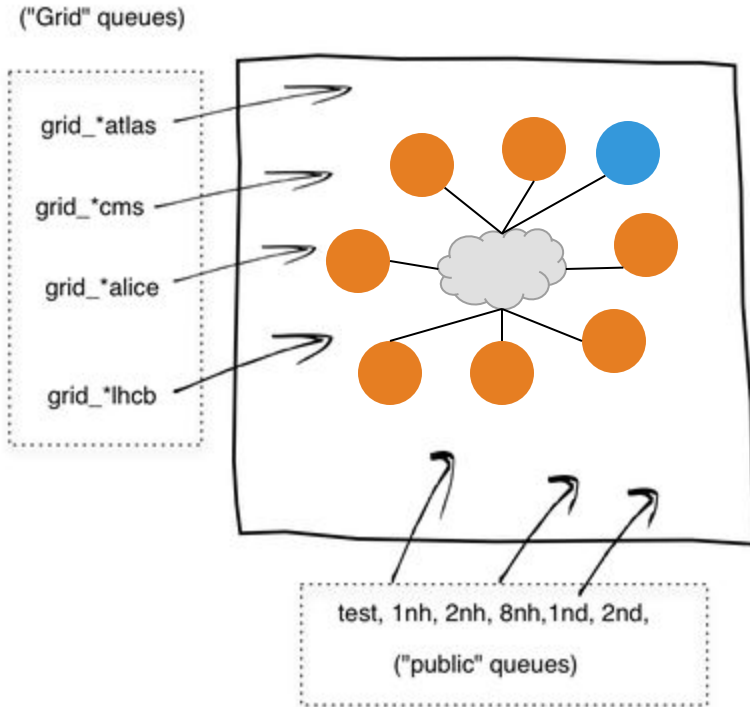
# Contribution

- Deploying CC7 nodes





# Contribution



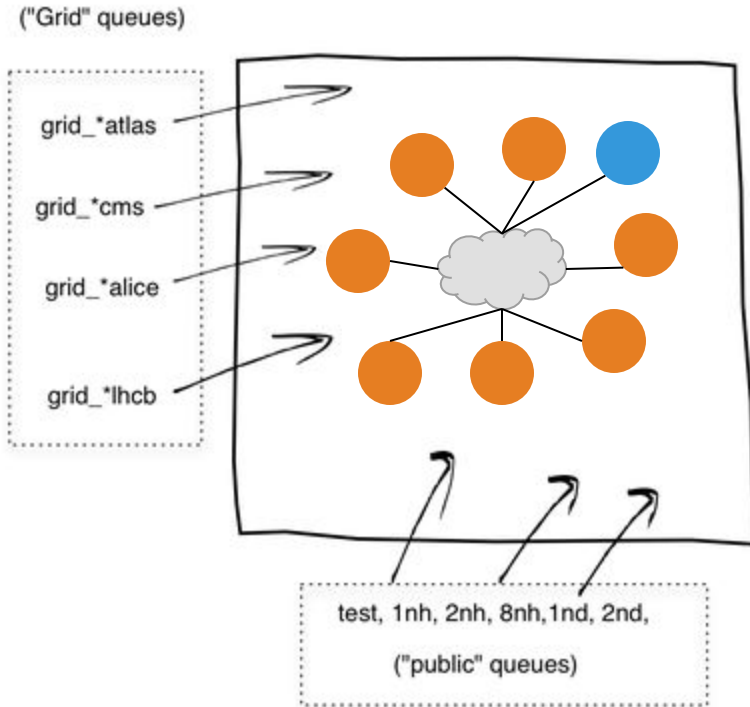
- Deploying CC7 nodes



- Installing docker on nodes
- Configuring docker for condor



# Contribution



- Deploying CC7 nodes



- Installing docker on nodes

- Configuring docker for condor

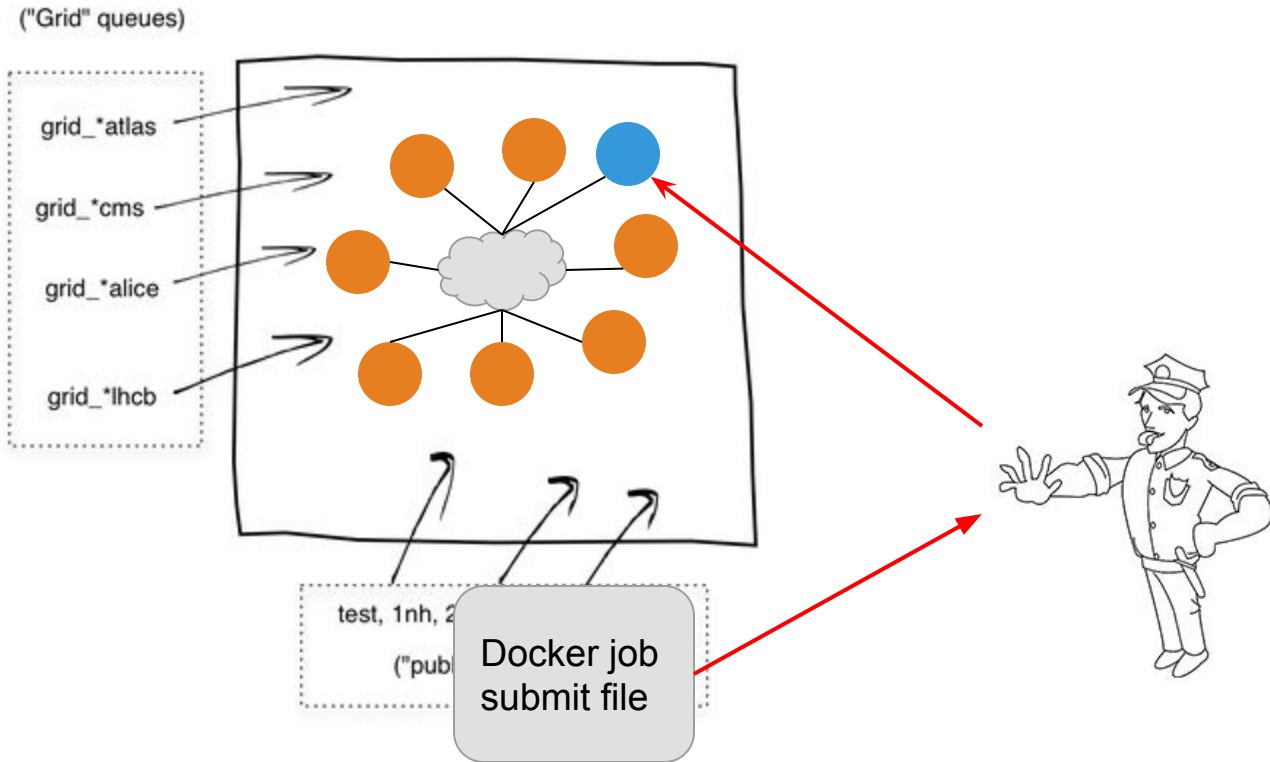


- Mount CVMFS

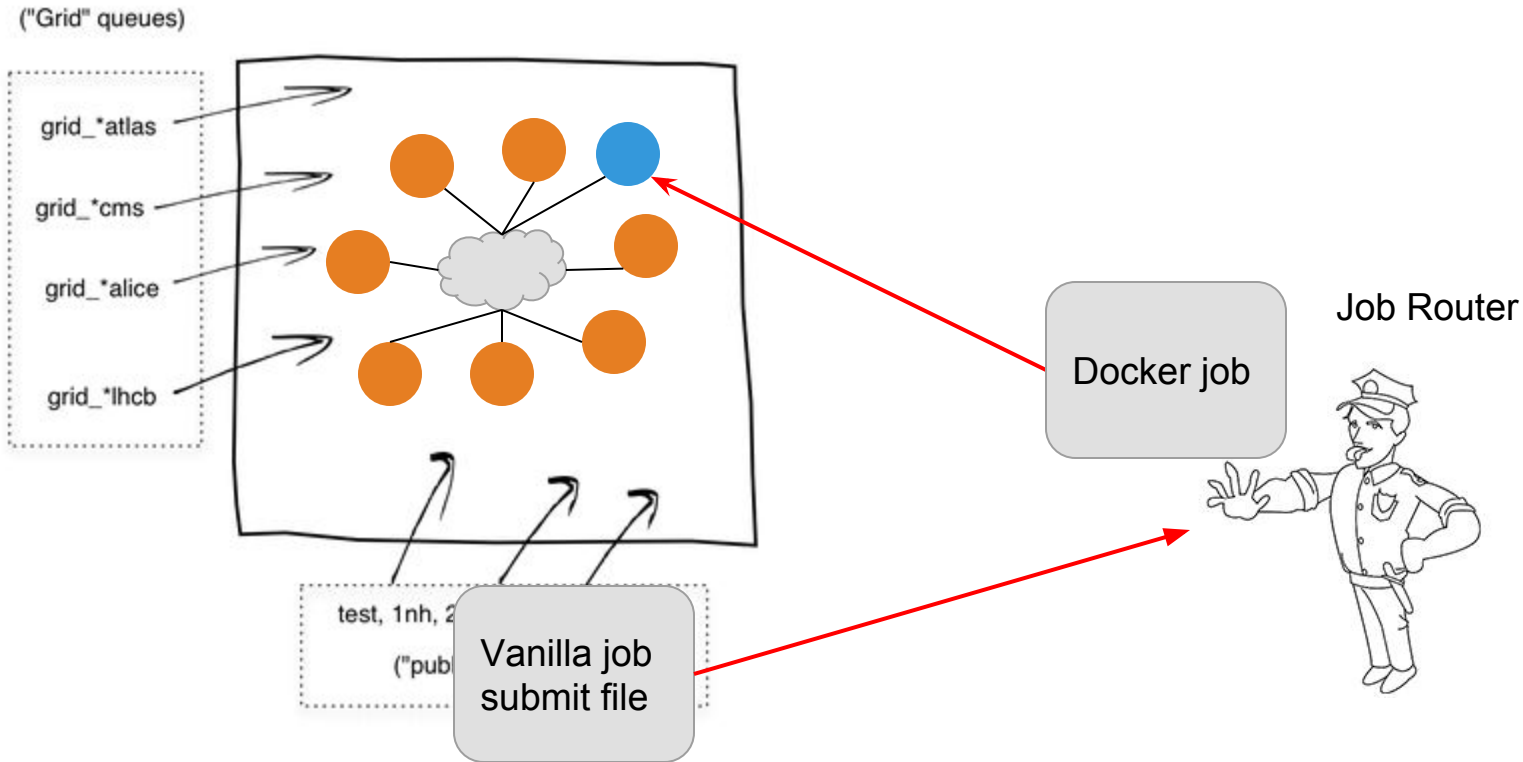
- Adding Cern docker registry



# Contribution

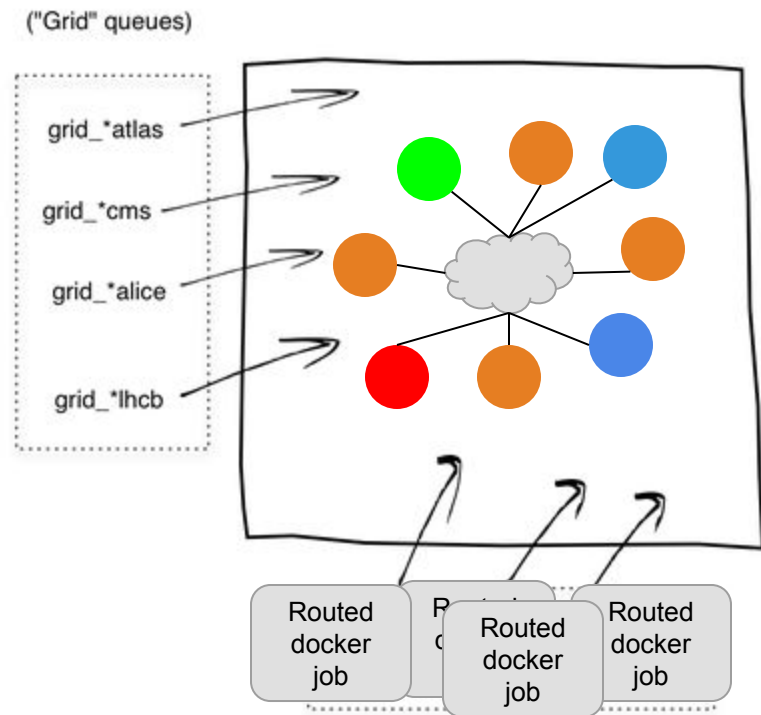


# Contribution



# Status / Future

1. QA (test infrastructure)
2. SLC6 docker image for batch
3. Cases to use docker route
4. Heterogeneous OS release in batch



# THANK YOU !

**Images:**

Batch: <http://information-technology.web.cern.ch/book/cern-batch-service-user-guide>

Policeman: [http://www.momjunction.com/articles/community-helpers-coloring-pages-your-toddler-will-love-to-learn-color\\_0094441/](http://www.momjunction.com/articles/community-helpers-coloring-pages-your-toddler-will-love-to-learn-color_0094441/)

Docker vs VM: <http://www.gordonsun.me/docker-compare-to-virtual-machine-part-2/>