

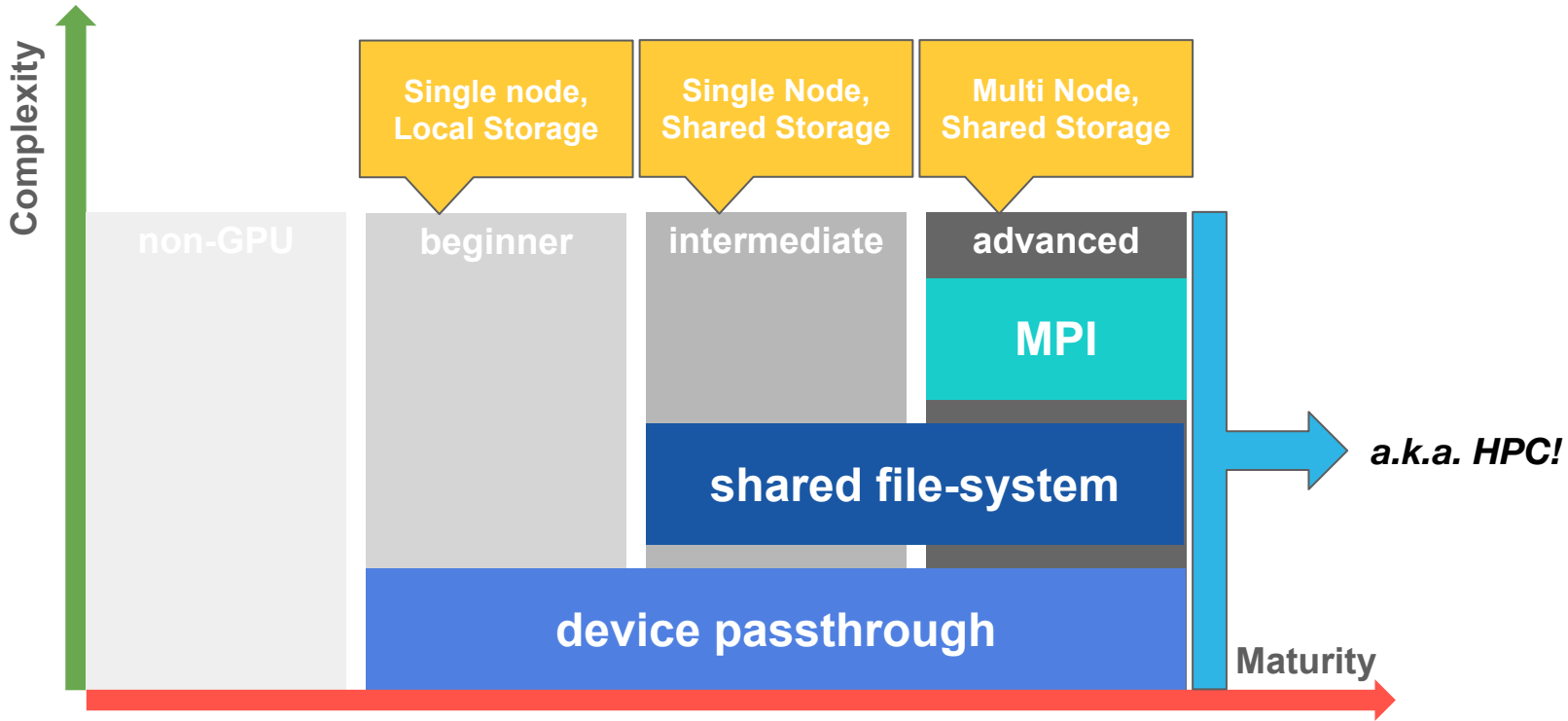
# High Performance Container Workshop

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Current Prototype and Looking Ahead



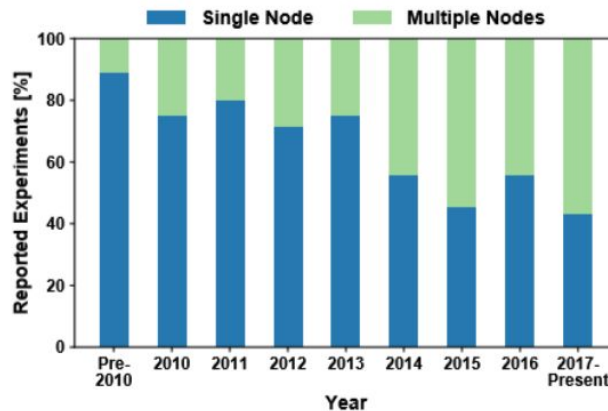
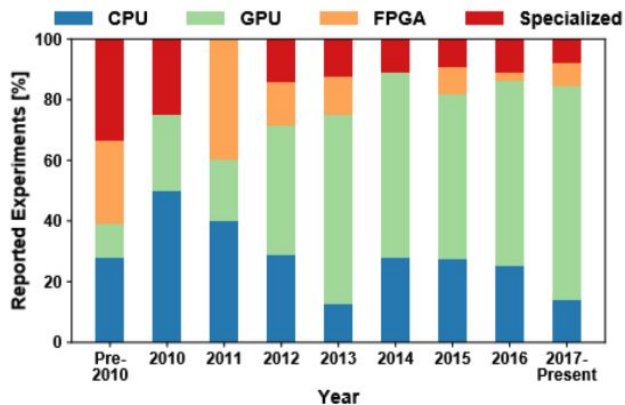
# Convergence of AI and HPC



# Evidence for AI/DL trends

## Trends in deep learning: hardware and multi-node

The field is moving fast – trying everything imaginable – survey results from 227 papers in the area of parallel deep learning



Deep Learning is largely on distributed memory today!



# The Stack

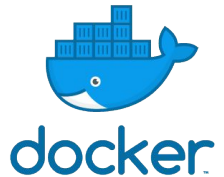


```
--device=/dev/nvidia0
```

```
"Devices": [{  
  "PathOnHost": "/dev/nvidia0",  
  "PathInContainer": "/dev/nvidia0",  
  "CgroupPermissions": "rwm"  
}],
```

```
"devices": [{  
  "path": "/dev/nvidia0", "type": "c",  
  "major": 195, "minor": 0, "fileMode": 8630,  
  "uid": 0, "gid": 0  
},
```

```
"hooks": { "prestart": [ {"path": "/usr/local/bin/nvidia.sh"} ] }
```



# Houdini Plugin

qnib / moby  
forked from moby/moby

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Branch: houdini moby / HOUDINI.md Find file Copy path

ChristianKniep update the HOUDINI.md e30d081 2 days ago

1 contributor

100 lines (77 sloc) 3.28 KB Raw Blame History

## Houdini

### Config

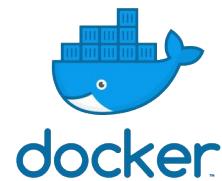
```
$ cat /etc/docker/houdini.ini
[default]
mounts=/home:/home,/usr/lib/nvidia-384:/usr/lib/nvidia
environment=LD_LIBRARY_PATH=/usr/lib/nvidia,NVIDIA_VISIBLE_DEVICES=all
#devices=/dev/nvidiactl,/dev/nvidia-umv

[user]
```



# Houdini Plugin [cont]

DEMO!



# Rootless docker-engine

```
suda@suda-ws01:~/gopath/src/github.com/docker/docker$ ps auxw | grep docker
suda 84093 1.4 0.7 460020 57840 pts/2 Sl+ 18:57 0:01 dockerd -H unix:///run/user/1001/docker.sock
suda 84101 1.1 0.3 421524 26256 ? Ssl 18:57 0:01 docker-containerd --config /run/user/1001/doc
suda 85925 0.0 0.0 14428 1084 pts/3 S+ 18:59 0:00 grep --color=auto docker
suda@suda-ws01:~/gopath/src/github.com/docker/docker$ docker -H unix:///run/user/1001/docker.sock run -d --sec
Unable to find image 'nginx:latest' locally
latest: Pulling from library/nginx
Digest: sha256:d667b17220eb9d09b34fd250f47c4fd4ac0325787fb58592bee97f86576523ae
Status: Downloaded newer image for nginx:latest
cfeef20c5de973a20e0d39d95d412391c30c218005bb4f88e021c066de0c2f18
suda@suda-ws01:~/gopath/src/github.com/docker/docker$ ps auxw | grep nginx
suda 86220 1.0 0.0 32616 5136 ? Ss 18:59 0:00 nginx: master process nginx -g daemon off;
231172 86261 0.0 0.0 33100 2388 ? S 18:59 0:00 nginx: worker process
suda 86302 0.0 0.0 14428 1008 pts/3 S+ 18:59 0:00 grep --color=auto nginx
suda@suda-ws01:~/gopath/src/github.com/docker/docker$
```



Akihiro Suda

@\_AkihiroSuda\_

Follow

Replying to @KuniSuzaki

Unlike (PRoot mode of) udocker, rootless Docker is faster and much secure, as it uses users instead of ptrace. Plus almost completely compatible to "rootful" Docker.

4:30 AM - 27 Jun 2018



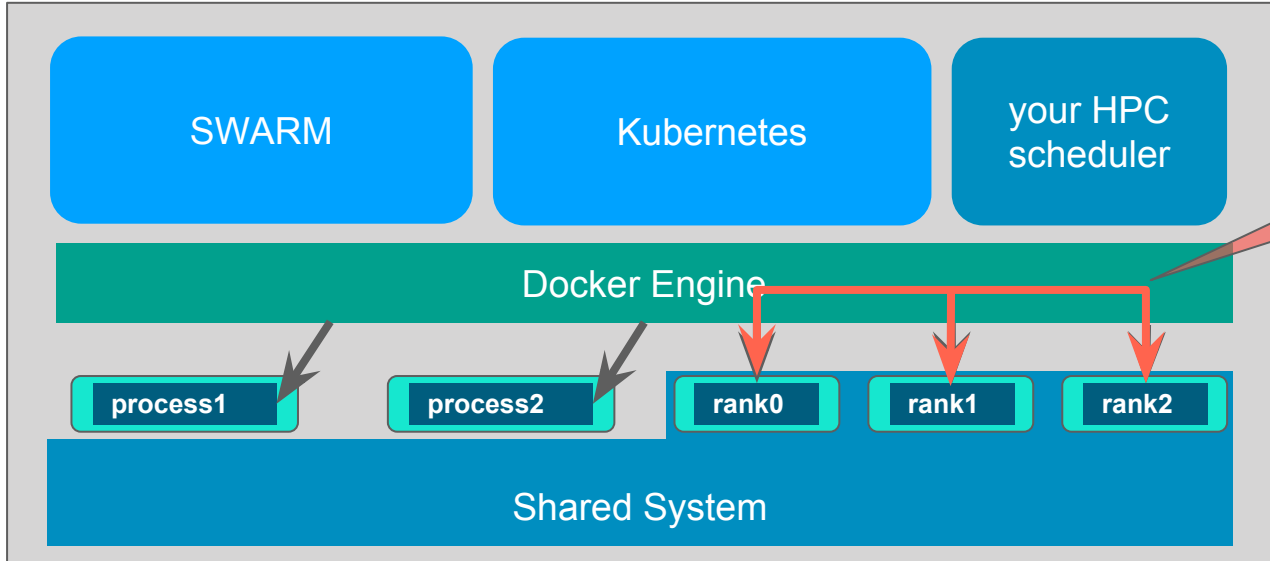
docker

<https://github.com/AkihiroSuda/docker/releases/tag/rootless.20180627>

# Service + Batch Scheduling

Not a committed idea, personal goal

Having an SWARM extension to schedule batch jobs and the engine support PMI.

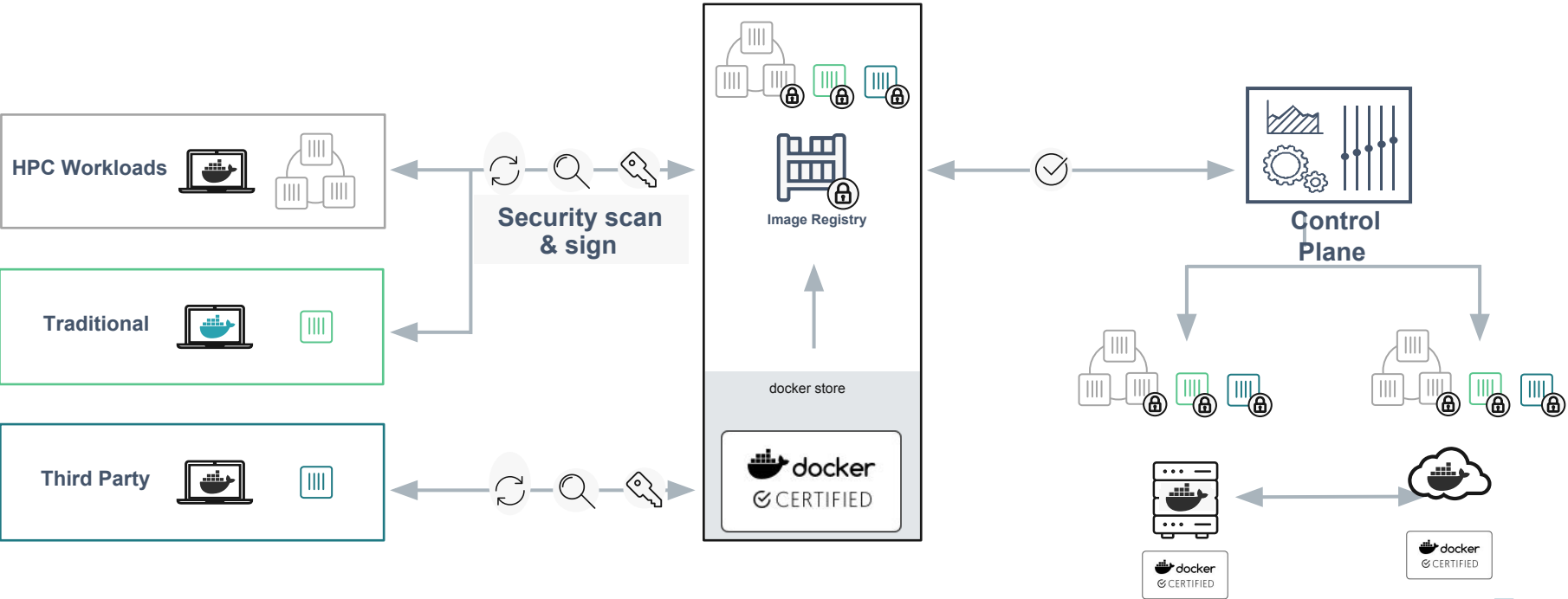


```
version: '4'  
services:  
  solver:  
    image: qnib/openfoam  
    deploy:  
      mode: batch  
      replicas: 16  
    pmi:  
      enable: true  
      version: '2'
```





# Leveraging HPC in the Enterprise / Enterprise in HPC





**THANK YOU :)**

@twitter\_handle