LINUX CONTAINER WORKSHOP 2017
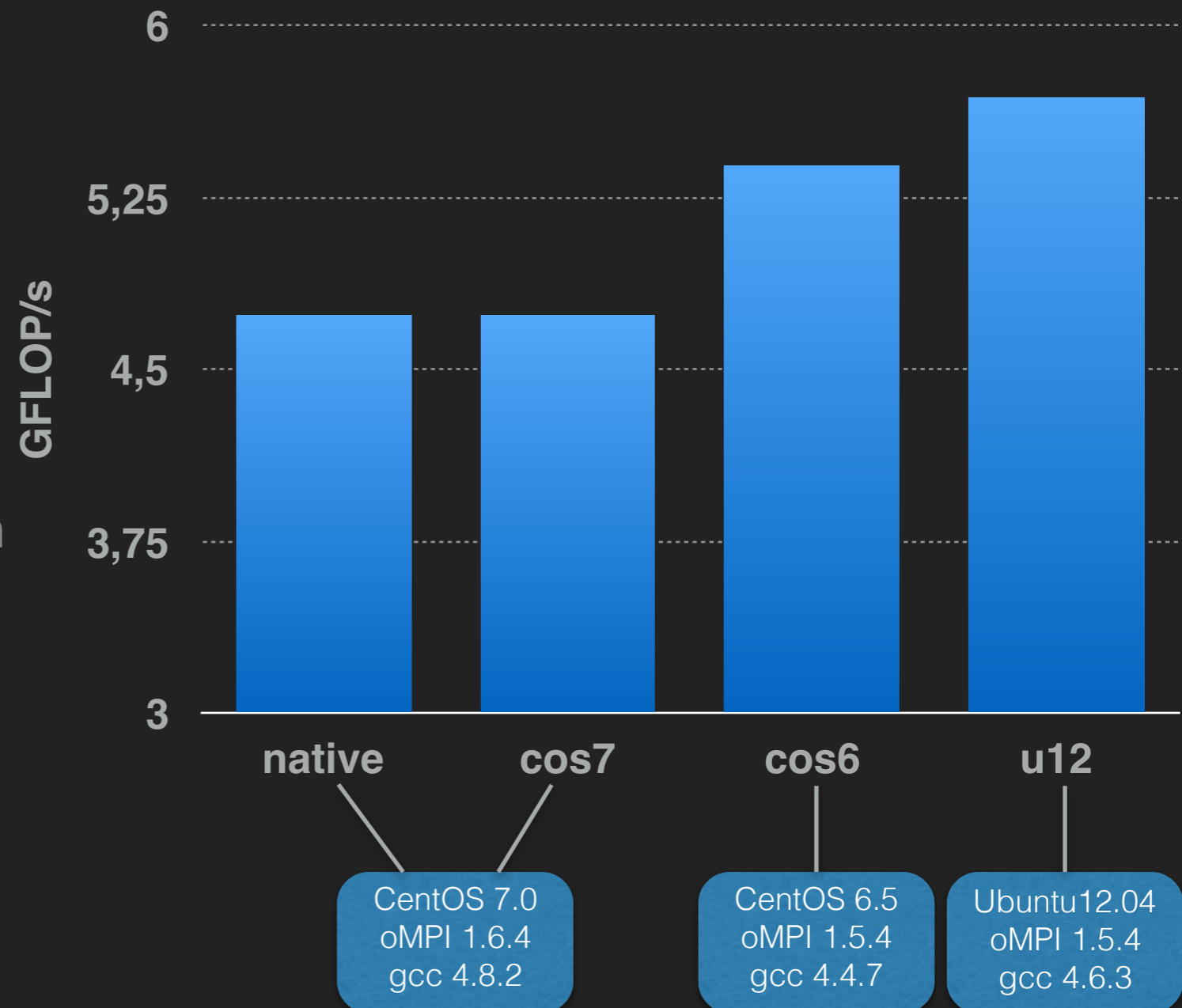
USER-LAND OPTIMISATION

FOCUS ON SUPPORTING FILESYSTEM

HPC Advisory Council
China Conference 2014
November 5, 2014
Guangzhou, P.R. China

▸ Within containers only the application code matters

▸ No need to look out for other services/applications

▸ To the extreme

➡ Start with empty filesystem

➡ Put individual files in

HPCG benchmark

GFLOP/s

6

5,25

4,5

3,75

3

native | cos7 | cos6 | u12

CentOS 7.0
oMPI 1.6.4
gcc 4.8.2

CentOS 6.5
oMPI 1.5.4
gcc 4.4.7

Ubuntu12.04
oMPI 1.5.4
gcc 4.6.3

REPRODUCIBLE ENVIRONMENTS

▸ RepoDigest represents FS layers and metadata

▸ Root of Merkle DAG

▸ As Kernel ABI is (to be investigated more) stable, image can run on newer versions

```
$ docker inspect qnib/uplain-init |jq '.[] |.RepoDigests[0]'
"qnib/uplain-init@sha256:13137d1a2532b3bcb4dc961f3be09236131a752c0038a2914957b91082cd8b34"
$ docker inspect qnib/uplain-init |jq '.[] |.RootFS '
{
  "Type": "layers",
  "Layers": [
    "sha256:6a8bf8c8edbd705f67cdc062eee3911470a38a763258c81c05da1f28d6eec896",
    "sha256:fe9a3f9c4559684b75bba751883fa084d34e418c018d687ddc25c3f23f13f657",
    "sha256:fc9e1e5e38f700997585295bd65a47e58f3da7b2f0e6a971e14a6104f199de1f",
    "sha256:f2e85bc0b7b17ab33f9060d2f24824defe600e189b05a895d60b2e8a6a7bd0d7",
    "sha256:d8b353eb3025c49e029567b2a01e517f7f7d32537ee47e64a7eac19fa68a33f3",
    "sha256:90f2fd3f1b1e5685feeac9e819cd032d9c8025712faab21c8707989a7692b8d0"
  ]
}
```

PERMUTATE CONFIGURATION / LIBRARIES

▸ Create tree of images, inheriting from each other.
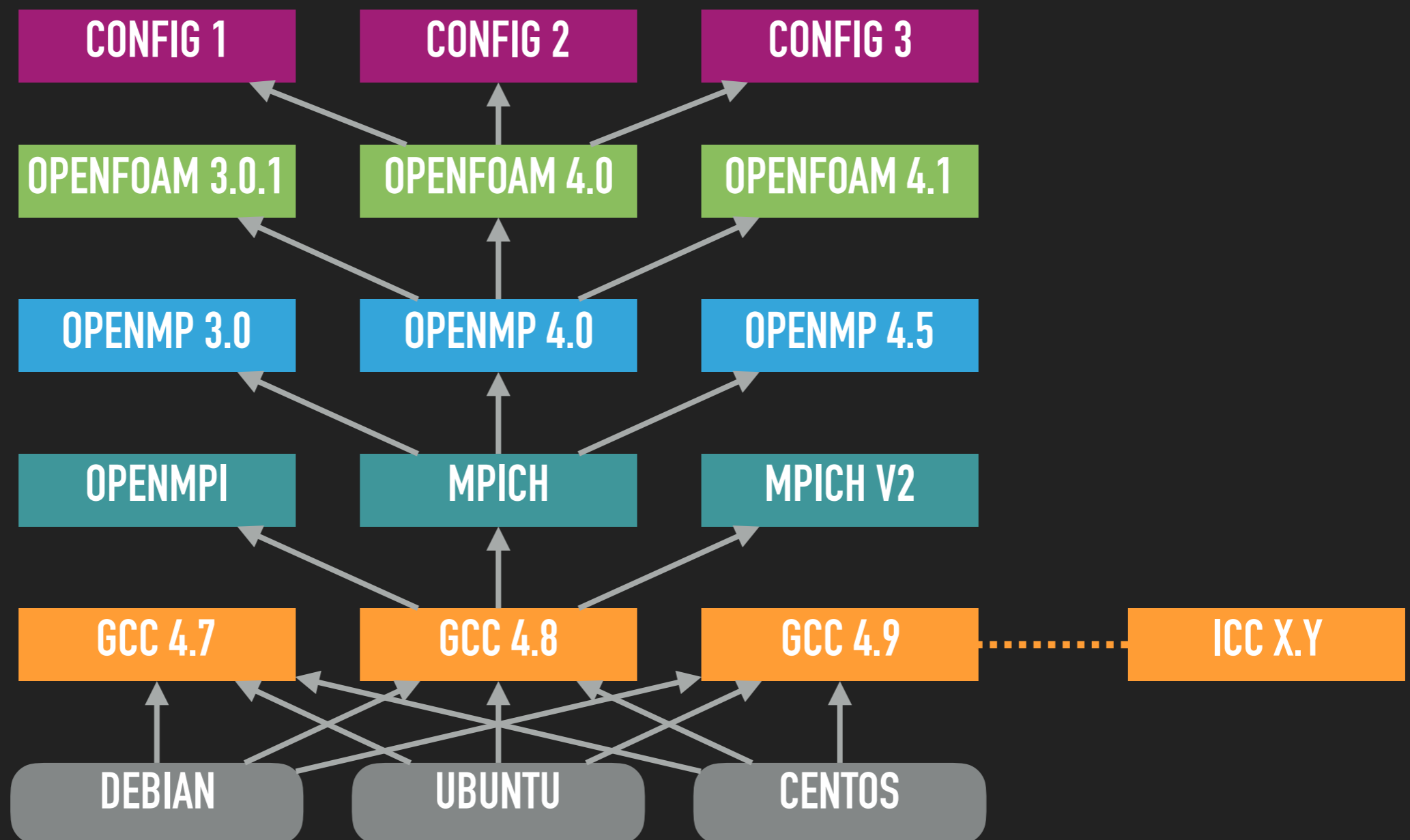
CONTINUOUS XYZ

▸ Use modern Continuous Delivery/Deployment/Testing frameworks to automate the permutation test