
Quickly create clusters using
OMNIA
Arizona State University
DELL Technologies
OMNIA

Today's Agenda

- Omnia overview (20 minutes)
- Omnia walkthrough (50 minutes)
  - Bootstrapping the Omnia appliance
  - Creating a Slurm cluster
  - Creating a Kubernetes cluster with Kubeflow
- Joining the Omnia community (10 minutes)
- Q&A (10 minutes)

Omnia overview

What does the future hold?

Next-generation research compute platforms expand the definition of HPC

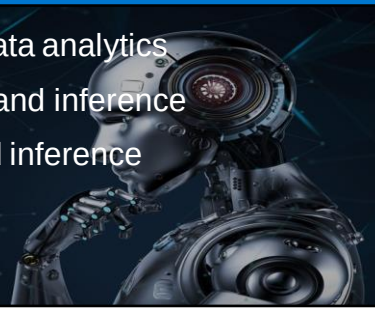
BUILDING BLOCK-BASED DESIGN

- Heterogeneous architecture
  - Dense compute
  - GPU acceleration from multiple vendors
  - FPGA acceleration from multiple vendors
  - Special-purpose deep learning accelerators from multiple vendors

HIGH-PERFORMANCE & CONTAINER-NATIVE

- Bare-metal, maximum performance
- Rapid deployment of latest open-source applications
- Ability to take advantage of various accelerators and network interfaces

EMBRACE EMERGING WORKLOADS



- Distributed, accelerated data analytics
- Machine learning training and inference
- Deep learning training and inference

SOFTWARE-DEFINED

- Rapid deployment of solutions
- Rapid expansion of solutions with additional infrastructure
- Easy tear-down of short-term solutions
- Infrastructure as code practices

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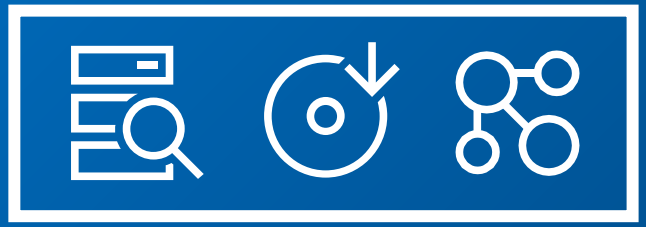
The Omnia approach

BARE-METAL PROVISIONING

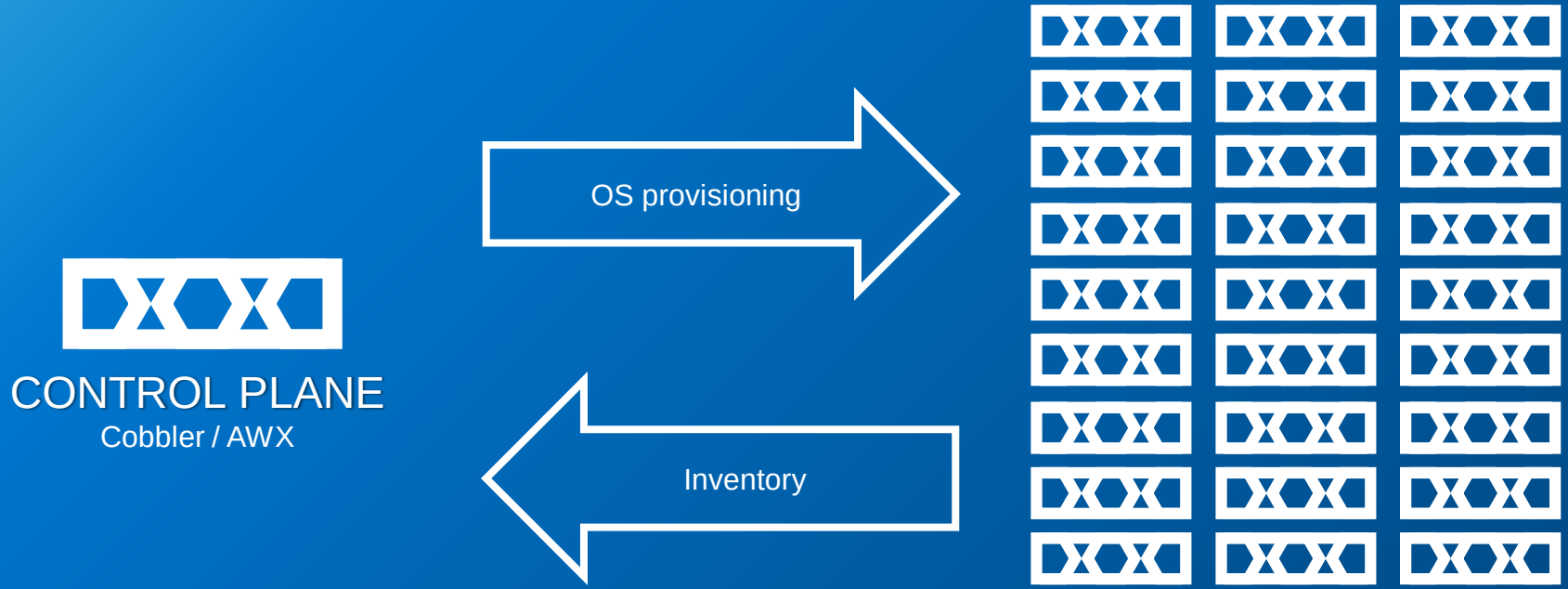
Detect new infrastructure and apply a minimal operating system in preparation for cluster deployment



INTELLIGENT DEPLOYMENT

Create new logical clusters using pool of provisioned infrastructure, network switches, and storage resources

Bare-metal provisioning



Intelligent cluster deployment with Omnia

INSPECT

Analyze the existing configuration of each server and determine the most appropriate course of action

INSTALL

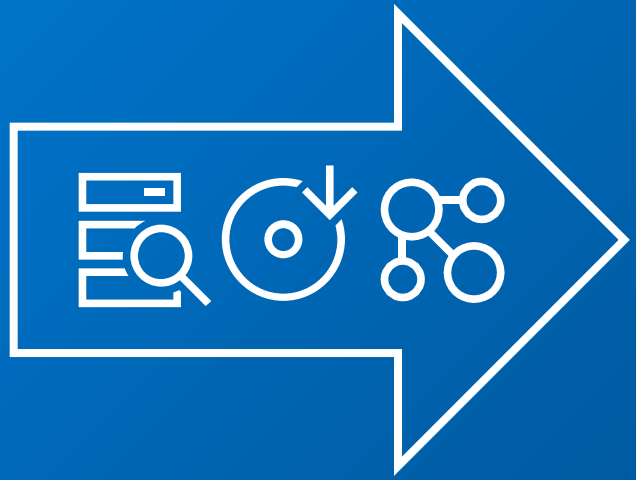
Deploy the right software packages for the server to create the desired clustered solution

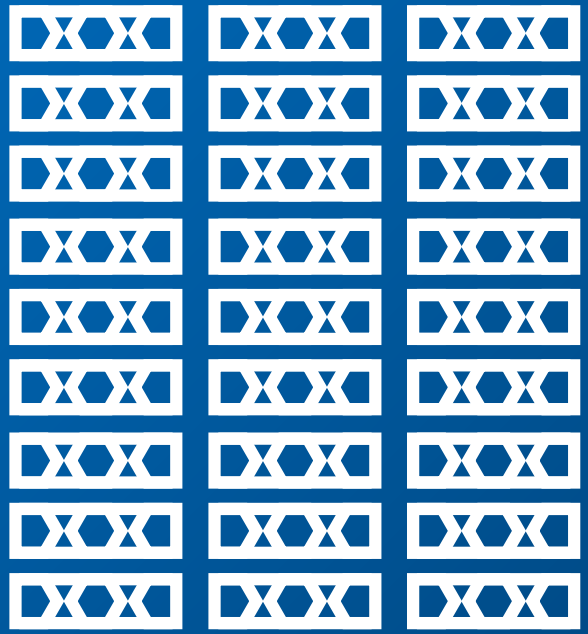
INTEGRATE

Configure installed software packages and join individual servers together into a fully-integrated cluster

Deploying clusters with Omnia

GRAPHICAL
deployment with AWX

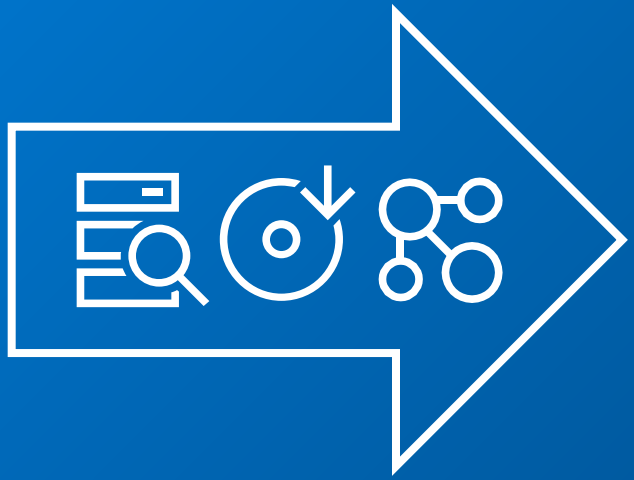


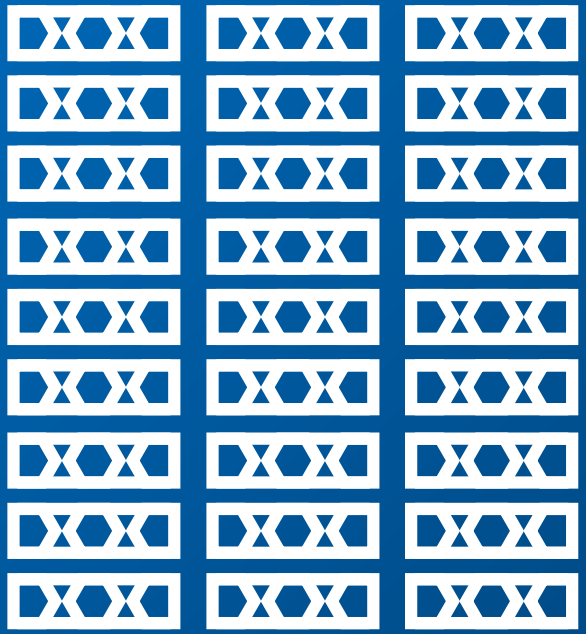


Deploying clusters with Omnia

COMMAND-LINE

deployment with Ansible





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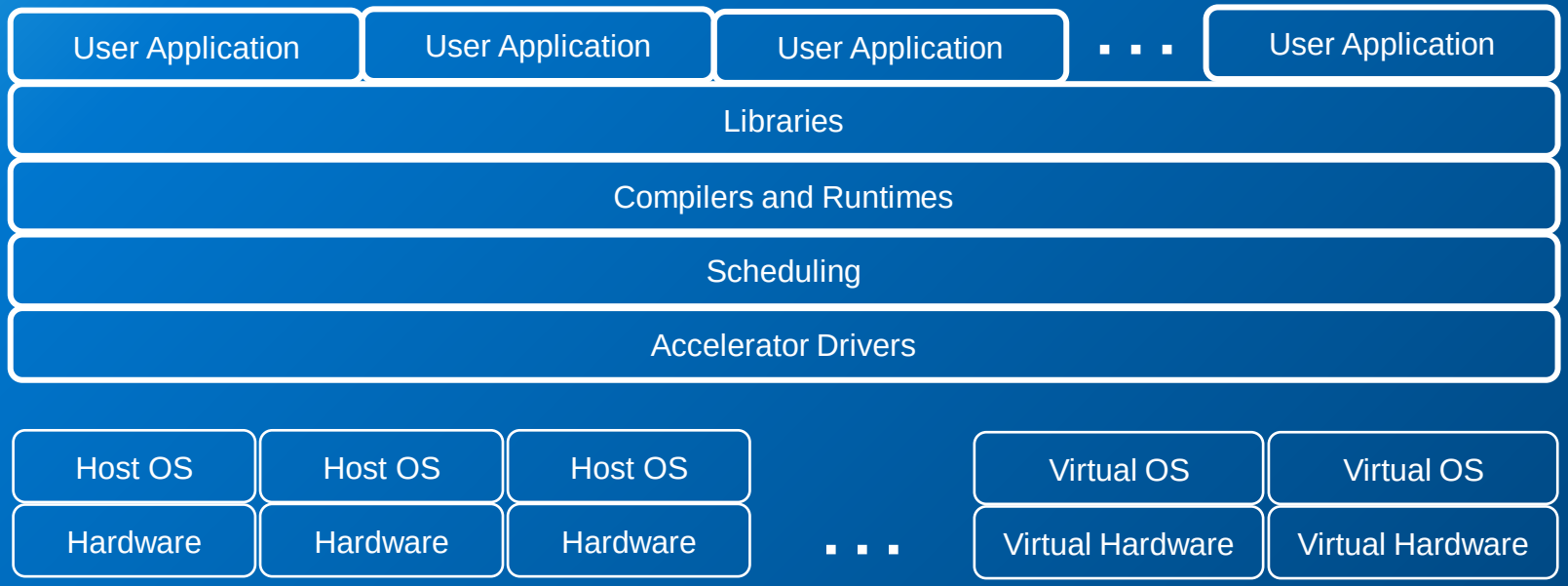
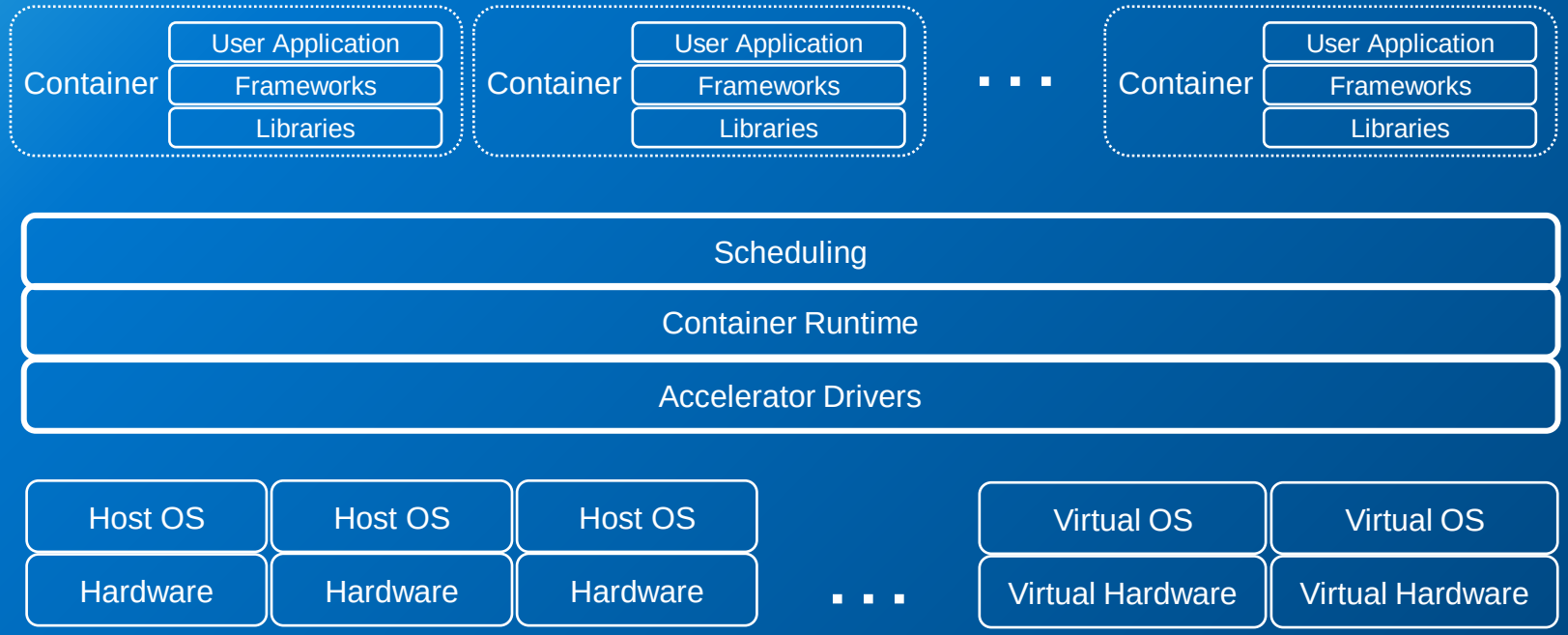
Current stacks

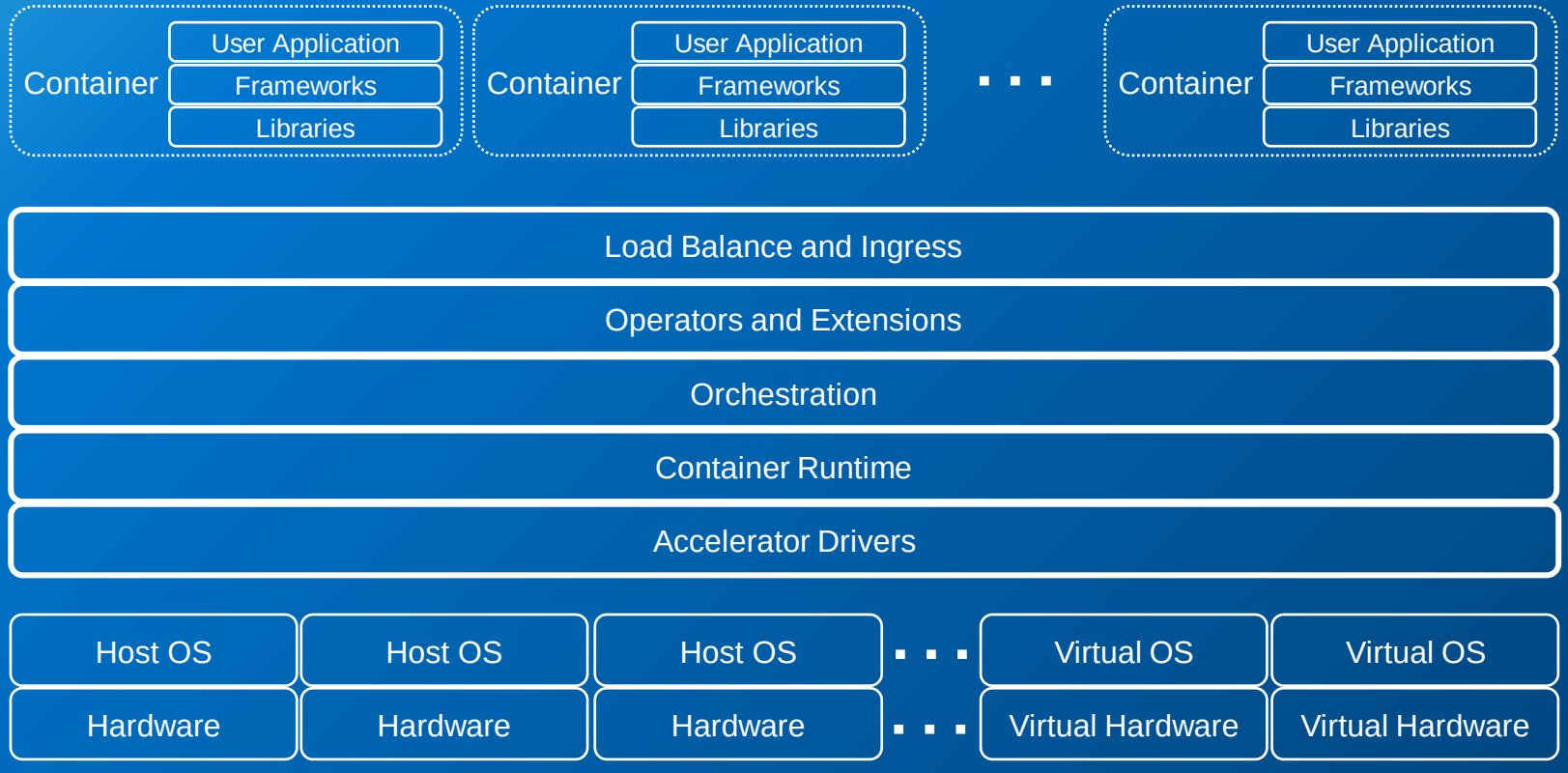
Omnia Slurm stack (traditional)



Omnia Slurm stack



Omnia Kubernetes stack



Omnia walkthrough

Join the Omnia community

Pick your Omnia path

Released Version

- Validated installation
- Deployment support contracts available
- Release cycle is currently every 4-6 months
- Bugfix releases (second dot) offered as available

Development Branch

- Latest features and capabilities
- Daily-weekly updates
- Community support (GitHub issues)

Join the Omnia community

Find Omnia on GitHub

- https://github.com/dellhpc/omnia
- Star/Watch the project
- Clone the repo
- Download the release tarball
- Create an issue

Join the Omnia Slack channel

- dellhpc.slack.com
- #omnia

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