Node-Level Systems Research Breakout

NSFCloud Workshop
Washington, DC
December 12, 2014
Participants

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Motivating Research Areas/Experiments

- OS/VM Design and Implementation
- Performance Engineering
- System-level resource allocation
- Heterogeneous systems
- Power and energy management
- Modeling and simulation of networks
What’s currently provided

■ 90% is all the way there:
  ▪ Bare metal access
  ▪ Low-level debugging support/access
  ▪ Performance counter access and control

■ Some things are 90% there
  ▪ Specialized hardware
  ▪ Accelerators
  ▪ Power/thermal Instrumentation Image deployment support
All I want for Christmas

- **Hardware** – specialized storage, accelerators, etc.
- **System configuration**
  - Online access to full system configuration (hardware and firmware versions, system settings, etc.)
  - Full specification and programmer documentation of hardware system
  - Capture/snapshot full system image including BIOS, etc.
  - Reference images
- **Resource allocation/management**
  - Rerun on exactly the same hardware
  - Dynamic topology and node allocation
- **Instrumentation/Control**
  - Full system view of resource allocation, performance
  - Potential use or development of a common API
  - Chassis-level monitoring and control?
- **Network control boxes for traffic control, etc.**
- **Global, long-term system traces and performance information**
Ecosystem Issues

- **Support**
  - Need a broad set of applications/runtimes/data/workloads
  - Licenses and support for common tools on the system
  - Compatibility or transition process to commercial clouds

- **Community Development**
  - Ticket/Trouble management system
  - Forums/discussion/community support

- **We’ve missed things:** Need a longer-term process for addressing/adding missing platform features and capabilities