Store Process Analyze Collaborate Archive Cloud

### **#BurstForward**

Invent Discover Compete

# DataDirect

## **Burst Buffers**

Mike Vildibill VP, Product Management, and Emerging Technologies Development



DataDirect

ORKS

ddn.com

© 2013 DataDirect Networks. Inc

#### 2

#### Many Potential IME Use Cases

Burst Buffers is Just One of Many Use Cases

#### **HPC Requirements**

#### Burst Buffer I/O Acceleration

- Checkpoint-Restart
- Write-back and Write-through Cache for File Alignment (direct effect) and Block Alignment (indirect effect)
- Stage-in, Stage-out, Demand Loading
- Isolation of ill-behaving applications
- Out-of-Core I/O
- Data Analysis Support
  - Post-processing
  - Visualization

DataDirect

- Temporary Data Storage
  - Sequential-job Data Sharing (many-task computing)

ddn.com

© 2013 DataDirect Networks. Inc.

- Concurrent-job Data Sharing (applicationcoordinated sharing of data)
- Intermediate Results

WORKS

#### **Exploring Other Use Cases**

- NAS Acceleration
- Key-Value + NoSQL Databases
- Emerging In Memory Data Grid Models



#### **IME Customer Testbeds**

Platforms for Collaboration, Experimentation and Development

#### Example: 17U IME Scalable Unit:

- 8 IME Servers using a 36-port IB FDR switch
  - 。 2x IB to each IME Server (16 total)
  - 16 IB to Compute Cluster
  - 4 IB to PFS

ataDirect

- Performance and Capacity:
  - $_{\circ}~$  192 SSDs; Raw Capacity 37 to 150 TB
  - Internal SSD bandwidth:
    - ~100 GB/s (Read)
    - 68 to 100 GB/s (Write)
- Bandwidth to compute cluster: 80 GB/s
- Bandwidth to PFS: 16 GB/s
- I/O Transactions Rate: 20 Million IOPs (4K)

© 2013 Data Direct Networks. Inc



Store Process Analyze Collaborate Archive Cloud

### **#BurstForward**

Invent Discover Compete

# DataDirect

## **Burst Buffers**

Mike Vildibill VP, Product Management, and Emerging Technologies Development