Best Practices for IBM Spectrum Scale: Announcing a new partnership

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Ennovar Overview

Ennovar at Wichita State University emphasizes education, emerging technology, experiential learning, evolutionary research, exploration and engagement.

Ennovar employs more than 50 engineering, communication, graphic design, MBA, students and full-time professionals to lead collaborative projects with industry.

ennovar

WSU
WICHITA STATE UNIVERSITY

Ennovar Labs

- Solution Reference Architecture Testing
- Technical Marketing
- Software Development
- Research and Development
- Training

Provides a pipeline of highly qualified and prepared future employees.

Ennovar Accelerates Spectrum Scale Opportunities

Spectrum Scale Solutions Lab

- Live remote demo system
- Hands-on student training lab
- Custom building block configuration
- Testing of specific customer requirements

Critical Systems Validation

- Validation of firmware upgrades and performance degradation
- Validation of interoperability, hardware integration and implementation

Spectrum Scale Sales Enablement

- Best Practice Guides
- Configuration and setups (compatibility matrix)
- Customer “Use Case” validation
- Custom Spectrum Scale Marketing Material

Spectrum Scale Curriculum

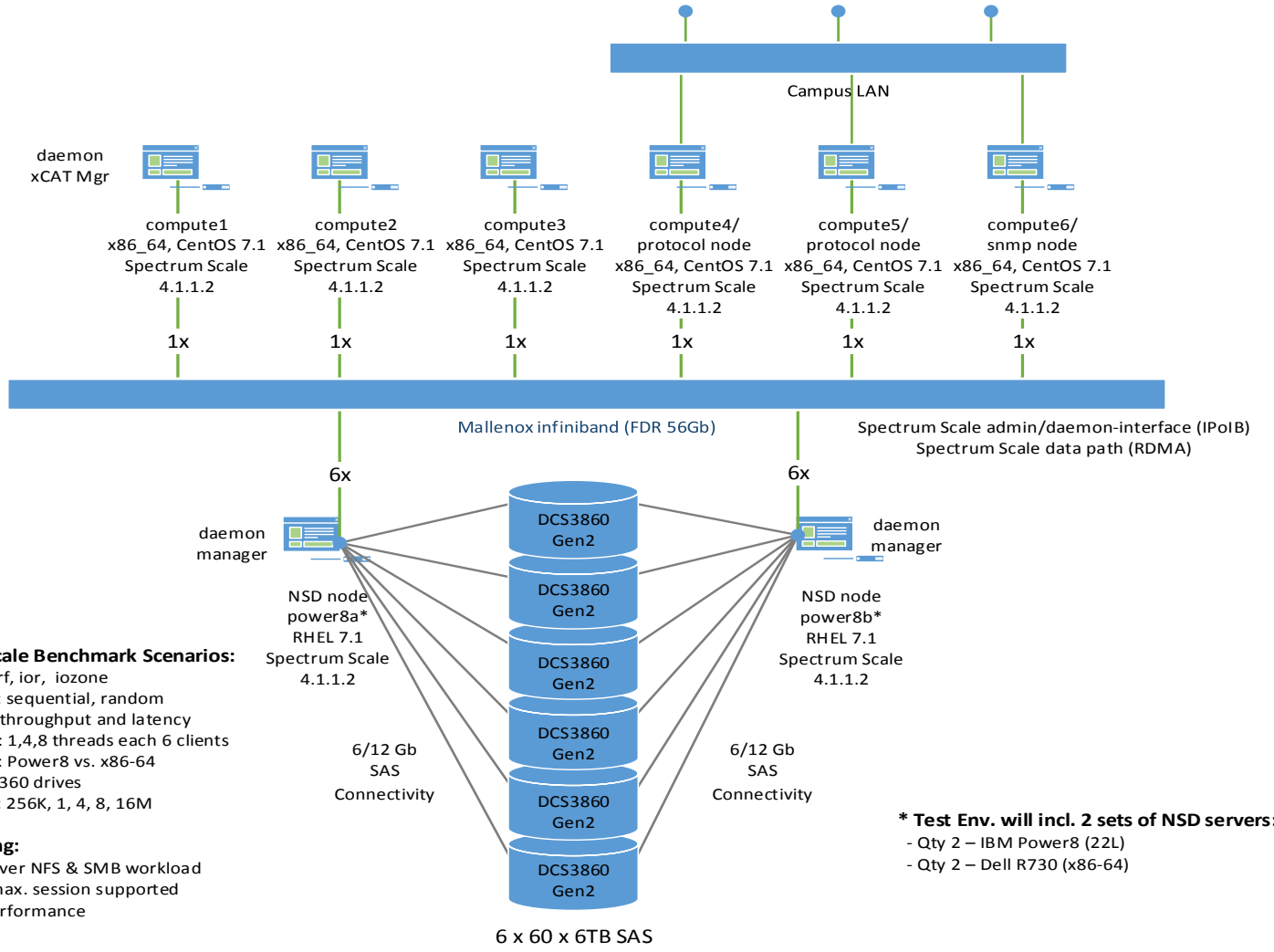
- Applied Learning
- Connected with industry
- SME mentoring an coaching
- Pipeline of new college graduates

Agile • Reliable • Flexible

Our First Project – DCS3860 Gen2 and Spectrum Scale 4.1.1.0 Integration

- **Develop Spectrum Scale deployment how-to guide**
  - Validated hardware stack - disks, controllers, servers, network
  - Validated software stack – Linux, Spectrum Scale, drivers
  - System configuration and settings – Spectrum Scale cluster, file system, Linux OS and drivers, storage provisioning, networking
  - Reference benchmarks – published tools, commands and results
  - Initial deliverable will be in the form of an IBM Redbook. Ongoing updates expected with new software and hardware releases and functions. Examples -
    - I/O performance during disk rebuild – physical array vs. Dynamic Disk Pool
    - I/O performance with T10-PI enabled
- **Project Status**
  - Two weeks into integration test - Spectrum Scale cluster up and running, initial benchmarks with large block sequential I/O
  - Discovered problem with 4-port SAS HBA – each on board IOC chip has a 2.5 GB/s throughput limit, investigating best solution now. Found this problem during benchmark tests – we were expecting between 40-50GB/s throughput when we were seeing 16GB/s
  - More information to come, please stay tuned

Build Your Own Spectrum Scale with DCS3860 Gen2



Spectrum Scale Benchmark Scenarios:
- tool: gpfsperf, ior, iozone
- test pattern: sequential, random
- test results: throughput and latency
- test threads: 1,4,8 threads each 6 clients
- NSD servers: Power8 vs. x86-64
- fs size: 180, 360 drives
- fs block size: 256K, 1, 4, 8, 16M

Other Testing:
- Protocol Server NFS & SMB workload
  - calibrate max. session supported
  - NFS I/O performance

*** Test Env. will incl. 2 sets of NSD servers:**
- Qty 2 – IBM Power8 (22L)
- Qty 2 – Dell R730 (x86-64)

Spectrum Scale Cluster Configuration

- Software
  - RHEL 7.1
  - Spectrum Scale 4.1.1.2
- Storage Building Block
  - IBM DCS Gen2 storage servers (6 systems)
    - Gen2 of the IBM DCS3700/3860
    - 60 8TB SAS disks per system (1.57PB for 6 systems)
    - Significantly improved IO performance over Gen1
  - IBM Power8 8247-22L NSD servers (2 systems)
    - Dual 10-core PPC CPU, 128GB RAM, 6x56Gb IB, 48x6Gb SAS HBA
- Networking
  - Mellanox FDR 56Gb Infiniband
    - Supports Spectrum Scale IPoIB and RDMA
- Compute
  - IBM x-Series Gen4 (6 systems)
    - Dual 12-core x86_64 CPU, 128GB RAM, 1x56Gb IB

Applying Open Source Concepts to Software Defined Storage

- Provide supercomputing community with continuous Spectrum Scale reference architectures, validated parts list, build instructions and repeatable performance tests.
  - Work with Spectrum Scale Users' Group and equipment vendors to coordinate resources and priorities.
- Ennovar Supported Services
  - Spectrum Scale system integration and testing of new hardware
  - On-going validation of new components – hardware, firmware and software
  - Customer system deployment, tuning, and on-going support
  - End-to-end system validation of customer-specific components
  - Custom application testing and tuning service
  - Spectrum Scale proof of concept engagements

How can we Accelerate your Spectrum Scale Business?

Spectrum Scale Solutions Lab

Critical Systems Validation

Spectrum Scale Sales Enablement

Spectrum Scale Curriculum

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