Best Practices in HPC Cluster Management
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Maintaining System Health

Use a **methodical mechanism** to examine hardware, software, and configuration of the system to known states of functionality, consistency, and performance.

These are some of the motivations for:
- Intel® Scalable System Framework Platform Specification
- Intel® Cluster Checker
Maintaining System Health

**Functionality**
The system contains and provides an expected set of functional features.

The system has/provides what is expected. Guards against unexpected exclusions or changes.
Maintaining System Health

**Consistency**
Checks across a wide range of system aspects looking for differences between compute nodes.

Detect both obvious and subtle differences that can contribute to complex issues.
Maintaining System Health

**Performance**
Track individual element performance up through system level benchmarks.

Identify macro problems that help determine overall “appearance” of system health.
Correlating Diagnostic Information

Intel® Cluster Checker tries to correlate data to determine cause. Example: some of the diagnostics for Intel® Omni-Path Fabric

- All devices active
- Cards in the same slot in each node
- Firmware versions consistent
- OFI versions consistent
- Bandwidth and latency results consistent and meet expected value
- HPCG results meet expected results

Many issues manifest as a performance degradation. Need to quickly see the relationship of the diagnostic chain.
Some Suggestions

Run routinely – don’t wait for issues

Make (some) diagnostics available to users

Run full diagnostics – don’t guess or assume

Expand coverage with each new issue

Look at diagnostics across these areas each time – not just when it’s thought needed
Intel® Scalable System Framework Platform Specification provides base solution requirements. Defines some of the core functionality and consistency requirements.

Intel® Cluster Checker verifies requirements in the platform specification.

Additional information:
Intel® Scalable System Framework Platform Specification
Intel® Cluster Checker
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