Open MPI

Combine the expertise from across the HPC community to create the highest-quality, open-source MPI implementation capable of efficiently supporting desktop to petaflop systems.

How well are we meeting our goals?

How can we assess the health of the project?
Lots & Lots of Testing

- Configure (~100)
- Unit Tests (1000s)
- Runtime (~500)
- System Arch., Compiler, interconnect, Resource Mgr.

Coverage: The Old Method
The MPI Testing Tool (MTT)

Infrastructure for automated, distributed testing

- Institutions volunteer testing resources
- Combine all testing results into a database
- Provide tools for testing analysis

Local Testing  Data Storage  Analysis

Configure (~100)  Unit Tests (1000s)  Runtime (~500)

System Arch., Compiler, interconnect, Resource Mgr.
How do you make sense of .5 Million test results every day?
### Analysis: The Old Way

![Diagram of network traffic](image)

### MTT Reporter

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>John</td>
</tr>
<tr>
<td>Test</td>
<td>TCP</td>
</tr>
<tr>
<td>Time</td>
<td>Now</td>
</tr>
</tbody>
</table>

![MTT Reporter Interface](image)

**Summary:**
- **Status:** Ok
- **Errors:** 0
- **Tasks:** 10

**Performance:**
- **CPU:** 90%
- **Memory:** 50%
- **Disk I/O:** 80%

**Details:**
- **Network Traffic:**
  - **TCP:** 1000 packets
  - **UDP:** 500 packets
  - **ICMP:** 200 packets

**Statistics:**
- **Total packets:** 1700
- **Total bytes:** 2.5MB

**Graph:**
- Network traffic over time
- Bandwidth usage

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**Note:**
- **Run Time:** 11/21/08
MTT Visualization

Difficult to assess project health in the Reporter

Focus Groups:

<table>
<thead>
<tr>
<th>Organization x Platform</th>
<th>Binco x Compiler Name</th>
</tr>
</thead>
</table>

MTT Visualization (Static)

ompi-nightly-trunk / 1.4a1r19857

* Legend *

100% Passed

Some failures (All indicates percent)

100% Failure

Trivial all pass

Trivial at least one fail

No tests applicable

Last Updated on: Fri Oct 31 16:07:36 EDT 2008
MTT Visualization

- Worse
- No Change
- Some Fail
- Better
- Better, All Pass
- All Pass
Future Directions

- Extended reporting (topology, hidden info)
- Parallel testing

- Improve Performance Reporting
- Information Tagging

- Interactive Visualization Environment
- Time based visualization

Questions & Comments

Local Testing  Data Storage  Analysis