What Can We Monitor?

- J2EE Server
  - Web Container
    - JSP
    - EJB Container
    - EJB
    - EJB
    - Services
    - System log, Error log, traces
    - JMX: Request count, response time, load, current configuration...
  - JMX: # instances (active/inactive), # creates/deletes, request count, method response time, concurrent calls...
  - Resource Usage: CPU, I/O, memory & paging...
  - System logs

- Browser
  - HTTP access and error logs

- HTTP Server
  - Mod_status: # threads, active connections, CPU usage...

- Database
  - Database activity log
  - JMX, JVMTI: Heap usage, garbage collection, classes loaded, object instances, threads...
How much does monitoring cost?

- Human: at ~$100k per admin: ~$100 billion p.a.
- Automated monitoring costs:

<table>
<thead>
<tr>
<th>Monitoring Level</th>
<th>Mean Service Time (ms)</th>
<th>Std. Error</th>
<th>Overhead</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>7.468</td>
<td>0.001</td>
<td>0.0%</td>
</tr>
<tr>
<td>Minimal</td>
<td>7.604</td>
<td>0.001</td>
<td>1.8%</td>
</tr>
<tr>
<td>Detailed</td>
<td>10.152</td>
<td>0.009</td>
<td>36.0%</td>
</tr>
<tr>
<td>Logged Trace</td>
<td>12.414</td>
<td>0.089</td>
<td>66.0%</td>
</tr>
</tbody>
</table>

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Grand Challenge: Adaptive Monitoring for Problem Determination

– Automatically learn models of normal activity/behaviour from the monitoring data
  • deviations from prediction of these models indicate potential failures
  • Automatically diagnose faulty component based on where anomaly is most significant

– Do so at production-system-acceptable cost
  ➢ Adaptive monitoring
References


