Bachelor thesis

Cloud infrastructure controlling for resource optimized use of distributed algorithms

Max Schrimpf
Objectives

• Evaluation of different Infrastructure as a service providers
• Evaluation of possibilities to configure and distribute different applications with all their dependencies in a cloud environment
• Definition of a concept for a computation
  – Start
  – Monitoring
  – Stop
• Implementation of a prototype for the defined concept.
• Test of the prototype with a sample computation.
• [...]
Technologies

- Core OS
- Ansible
- Switch
Concept of a computation
## Elapsed time of the CPU benchmark (in seconds)

<table>
<thead>
<tr>
<th></th>
<th>1 Thread</th>
<th>2 Threads</th>
<th>4 Threads</th>
<th>8 Threads</th>
<th>Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC2</td>
<td>42.9704</td>
<td>43.0945</td>
<td>43.1302</td>
<td>43.107</td>
<td>43.0755</td>
</tr>
<tr>
<td>SWITCH</td>
<td>44.0359</td>
<td>42.7589</td>
<td>42.2763</td>
<td>43.3047</td>
<td>43.094</td>
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<tr>
<td>GCE</td>
<td>43.2985</td>
<td>43.3765</td>
<td>43.4104</td>
<td>43.3554</td>
<td>43.3602</td>
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<tr>
<td>Azure</td>
<td>55.1634</td>
<td>55.2703</td>
<td>55.2612</td>
<td>55.1446</td>
<td>55.2099</td>
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</table>
## RAM speed (in MB/sec)

<table>
<thead>
<tr>
<th></th>
<th>1 Thread</th>
<th>2 Threads</th>
<th>4 Threads</th>
<th>Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCE</td>
<td>887.675</td>
<td>914.912</td>
<td>914.3</td>
<td>905.629</td>
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<td>SWITCH</td>
<td>819.86</td>
<td>817.545</td>
<td>830.818</td>
<td>822.741</td>
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<tr>
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<td>387.105</td>
<td>395.265</td>
<td>395.363</td>
<td>392.578</td>
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<td>Azure</td>
<td>274.842</td>
<td>268.072</td>
<td>289.077</td>
<td>277.331</td>
</tr>
</tbody>
</table>

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Spring 2015
SWITCH engines as part of the thesis

• Without SWITCH engines the continuous tests of the prototype would have been way to expensive
  – Tests over many days
  – Tests with a high number of CPUs (up to 74)

• Uncomplicated support in case of questions

⇒ The offering of SWITCH engines made this thesis possible
Questions?