ResTech Lunch & Learn: From PC to Cloud or High Performance Computing (HPC)
Topics

Agenda

Motivation

Cloud Computing

Common Concerns

High Performance Computing

Cloud v HPC

Conclusion
Problem
Virtually divided = Users have as many portions they want
Five main characteristics:

- On-demand self-service
- Resource pooling
- Rapid elasticity
- Measured service
Common Concerns

Common concerns when adopting cloud computing include:

- Privacy & Security
- Portability of tools and data to and from different (cloud) platforms
- Expertise
High Performance Computing

- Acts as a single large computer
- Main objective is to run jobs (script/program/experiment)
- It has a job queue
High Performance Computing

Key characteristics:

• Users can make use of a high number of cores
• Users do not need to maintain OS
• Batch Scheduling
# Cloud v HPC

<table>
<thead>
<tr>
<th>Use Case</th>
<th>Cloud</th>
<th>HPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convenience?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Large Data Set?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Parallel Problem Solving?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Long term storage</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Multi-Node?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Queuing Time</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
## Cloud v HPC

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<thead>
<tr>
<th>Use Case</th>
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<th>HPC</th>
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</thead>
<tbody>
<tr>
<td>GUI interaction?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Complex Licensing</td>
<td>Yes*</td>
<td>No</td>
</tr>
<tr>
<td>Cloud based Databases</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Interactive programs</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Custom Deployment</td>
<td>Yes</td>
<td>No</td>
</tr>
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</table>
Conclusion

• Combination of Cloud and HPC
• More CPUs doesn’t necessary means faster!
• Optimise the combination of I/O and compute time
• Before you start doing big runs, you need to find the optimised number of cores etc