HPC: The Once and Future IT King

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50th HPC User Forum
September 9-11, 2013
Boston, Massachusetts
April 2000:
HPC User Forum
Planning Meeting
April 2000: HPC User Forum Planning Meeting

Summary

- Held at IDC HQ (Framingham, MA)
- Wide participation (well…28) by major Users in government, industry, academia, along with major vendors
- Serious rift between COTS and non-COTS system advocates split the meeting into two separate breakout sessions:
  - “Large Systems” breakout (MPP, vector and non-COTS systems)
  - “Clustering Large and Small Systems” breakout (COTS systems)
April 2000: HPC User Forum Planning Meeting: Issues for All Participants

- How to make the market for HPC systems sustainable.
  - Will this market disappear?
  - Developing an economically viable supercomputing ecosystem
- Mapping applications to architectures
- Measuring sustained vs. peak performance (beyond Linpack/Top500)
- Creating better channels for collaborating, exchanging information
- Providing input for government policy creation
- Pull together common requirements, so that vendors will address them

- Relative price/performance, COTS vs. non-COTS systems
- Ability of clusters to handle “capability” problems
  - Need for memory bandwidth, but costs escalating
- Strategies for migrating codes to clusters
- The Top500 hurts decisions
- Linux capabilities
April 2000: HPC User Forum Planning Meeting: Issues for the Cluster (COTS) Group

- Relative price/performance of scalable systems
  - Attack of the “Killer Micros”
  - “Good enough” computing
- Small SMP clustering
- Linux capabilities / trends in operating systems
- Measuring performance on applications (beyond Linpack/Top500)
  - The Top500 hurts decisions
- Advancing the standards for clusters
- Feedback on real-world experiences with clusters
Top500 Supercomputers List:  
First HPC User Forum Meeting vs. Today

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<th></th>
<th>April 2000</th>
<th>September 2013</th>
<th>Gain Factor</th>
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<tbody>
<tr>
<td><strong>#1 System</strong></td>
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<tr>
<td>ASCI Red (Intel)</td>
<td>3.2 TF</td>
<td>77,300 TF</td>
<td>24,156</td>
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<tr>
<td>Tianhe-2A (NUDT/Intel)</td>
<td>2.4 TF</td>
<td>54,900 TF</td>
<td>22,875</td>
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<tr>
<td>Cores</td>
<td>9,632</td>
<td>3,120,000 Cores</td>
<td>324</td>
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<td><strong>Entire List (500 Systems)</strong></td>
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<tr>
<td>Peak performance</td>
<td>77.3 TF</td>
<td>326,000 TF</td>
<td>4,217</td>
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<tr>
<td>Linpack performance</td>
<td>51.0 TF</td>
<td>223,000 TF</td>
<td>4,373</td>
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HPC Technologies: Trickling Down Into Broader IT Markets

- Parallelism (hardware, software and systems)
- Clusters
- Grids
- Clouds
- Linux
- Big Data
Broader Market Technologies: “Bubbling Up” into HPC

- X86 dominates
- Standard COTS memory parts
- Low cost power, cabinets, cooling
- GPUs came from the desktop world
- What might be next?
  - ARM based supercomputers?
  - How will commercial big data solutions impact HPC?
  - Will power demands cap the size of the largest supercomputers – or will buyers build 100 Megawatt centers?
Major IT Trends that Will Impact HPC: The Third Platform
IDC’s View Of The Future Of IT: The Third Platform

The Growing Significance of “The 3rd Platform”

- Citizen/consumer transformation pushes enterprise transformation
- New platforms
- New engagement models
- New decision makers
- Continuing focus on operational efficiency
- New focus on
  - Outcomes versus outputs
  - Innovation

Source: IDC 2012
The Four Pillars

IDC Four Pillar research provides insight into the intersection and impact of emerging intelligent solutions

• As Big Data/Analytics, Cloud, Mobility and Social come together in an unprecedented way to create entirely new business value solutions and change the ICT playing field, they are enabling intelligent industries and solutions, and most of all - innovation.

• While productivity issues remain important, there is a noticeable shift across all industries in the decision making and purchasing when it comes to these new technologies.

• Unlike traditional IT decisions, the keys users of the technology are playing a more significant role than the technical group within the organization.

• As the 3rd Platform continues to evolve, and the intersection of these trends increases, so will the impact on buyers and their buying behavior.
Questions?

Please email: hpc@idc.com

Or check out: www.hpcuserforum.com