Welcome To The 49th HPC User Forum Meeting April 2013
Important Dates For Your Calendar

FUTURE HPC USER FORUM MEETINGS:

2013 Meetings:
- April 29 – May 1, Tucson, Arizona
- September 9 to 11, Boston, Massachusetts
- October 1, 2013 in South Korea

2014 Meetings:
- April 7 to 9, Santa Fe, New Mexico
- September 15 to 17, Seattle, Washington
- October 2014 in Europe
Thank You To Our Sponsors!

Gold
- Intel
- HP

Silver
- Altair Engineering
- SUSE

Bronze
- Bright Computing
- Brocade
- Mellanox
- Parallel Scientific

Tuesday breakfast - Parallel Scientific
Tuesday lunch - Altair Engineering
PM Break - Bright Computing
Tuesday dinner - Intel and HP
Wednesday breakfast – Brocade
Wednesday lunch – SUSE
PM Break - Mellanox
Monday Dinner Vendor Updates: 10 Minutes

- SUSE
- Brocade
- Mellanox
- Bright Computing
- Altair
- Parallel Scientific
- SGI
- IBM
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Wednesday lunch – SUSE
PM Break - Mellanox
Introduction: Logistics

Ask Mary if you need a receipt

We have a very tight agenda (as usual)
- Please help us keep on time!
- Note that the buses leave at 5:45pm for the special dinner event

Review handouts
- Note: We will post most of the presentations on the web site
- Please complete the evaluation form
With sadness and fond memories, we note the passing of our friend and fellow HPC User Forum Steering Committee member Allan Snavely. Allan was one of the leading lights of the worldwide HPC community and a person who contributed substantially to advancement of HPC technology and practices during his all-too-brief career. We will miss him.

### 2012 HPC INTERNATIONAL MEETINGS
- **July 5-6, 2012**
  - London, England
  - Imperial College
- **July 9-10, 2012**
  - Stuttgart, Germany
  - HLRS, University of Stuttgart

### 2012 HPC US MEETINGS
- **Sept 17-19, 2012**
  - Dearborn, Michigan
  - Dearborn Inn

### STEERING COMMITTEE

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steve Finn</td>
<td>Cherokee Information Services Chairman</td>
</tr>
<tr>
<td>Rupak Biswas</td>
<td>NASA Ames and Associate Chairman</td>
</tr>
<tr>
<td>Earl Joseph</td>
<td>IDC Executive Director</td>
</tr>
<tr>
<td>Vijay Agarwala</td>
<td>Penn State University</td>
</tr>
<tr>
<td>Alex Akkerman</td>
<td>Ford Motor Company</td>
</tr>
<tr>
<td>Doug Ball</td>
<td>The Boeing Company</td>
</tr>
<tr>
<td>Merle Giles</td>
<td>NCSA/University of Illinois</td>
</tr>
<tr>
<td>Chris Catherasoo</td>
<td>California Institute of Technology</td>
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<tr>
<td>James Kasdorf</td>
<td>Pittsburgh Supercomputing Center</td>
</tr>
<tr>
<td>Doug Kothe</td>
<td>Oak Ridge National Laboratory</td>
</tr>
<tr>
<td>Paul Muzio</td>
<td>City University of New York</td>
</tr>
<tr>
<td>Michael Resch</td>
<td>HLRS, University of Stuttgart</td>
</tr>
</tbody>
</table>

To access the study, click on image to reach DICE website and select Reports & Publications.
Welcome

Jim Kasdorf
HPC User Forum
Chairman

And

Rupak Biswas
HPC User Forum
Vice Chairman
HPC User Forum Mission

To Improve The Health Of The High Performance Computing Industry Through Open Discussions, Information-sharing And Initiatives Involving HPC Users In Industry, Government And Academia Along With HPC Vendors And Other Interested Parties
Steering Committee Members

- James Kasdorf, Pittsburgh Supercomputing Center, Chairman
- Rupak Biswas, NASA Ames, Vice Chairman
- Earl Joseph, IDC, Executive Director
- Swamy Akasapu, General Motors
- Vijay Agarwala, Penn State University
- Alex Akkerman, Ford Motor Company
- Doug Ball, The Boeing Company
- Jeff Broughton, NERSC/Lawrence Berkeley National Lab
- Paul Buerger, Avetec
- Chris Catherasoo, Caltech
- Jack Collins, National Cancer Institute
- Steve Conway, IDC Research Vice President
- Steve Finn, Cherokee Information Services
- Merle Giles, NSCA/University of Illinois
- Keith Gray, British Petroleum
- Doug Kothe, Oak Ridge National Laboratory
- Paul Muzio, City University of New York
- Michael Resch, HLRS, University of Stuttgart
- Vince Scarafino, Industry Expert
- Suzy Tichnor, Oak Ridge National Laboratory
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IDC HPC

Market Update
2013 IDC HPC Research Areas

Redefine key market tracking approaches
End-user based MCS reports:
1. HPC industries/applications/workloads report
2. HPC system software and middleware report
3. HPC storage and interconnect report
4. HPC processors/co-processors/accelerators
5. The emerging synergy of HPC and Big Data report

A new mid and lower end tracking of the HPC market

New And Potentially Disruptive Technologies:
- Big data -- HPDA
- Co-processors
- All types of flash/SSDs
- New software solutions
- Government programs to help bring to market new capabilities

The ROI With HPC
Special HPC Research Areas & Reports:

- A new CIS – HPDA
- A deeper investigation into the lower half of the HPC market, including SMBs and SMSs
- The evolution of government HPC budgets
- Emerging markets including China, Russia, etc.
- The evolution of clouds in HPC and 5 year cloud forecasts
- Scaling of software – issues and solutions
- Worldwide Petascale and Exascale Initiatives

Redefining and expanding our market definitions/tracking methods:

- Supercomputers, big data, clouds, tracking accelerators, and the missing middle, etc.
Top Trends in HPC

The global economy in HPC is growing again:

- 2010 grew by 10%, to reach $9.5 billion
- 2011 grew by 8.4% to reach $10.3 billion
- HPC revenue for 2012 exceeded $11B
  - Q3 2012 was the largest quarter ever in HPC
- We are forecasting ~7% growth over the next 5 years

Software hurdles continue to grow

Storage and data management continue to grow in importance

The worldwide Petascale Race is in full speed

Big Data and accelerators are hot new technologies
HPC WW Market REVENUES: By Competitive Segment

<table>
<thead>
<tr>
<th>Segment</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>cs1-Supercomputer</td>
<td>2,685,098</td>
<td>3,342,073</td>
<td>3,475,577</td>
<td>4,370,194</td>
<td>5,649,823</td>
</tr>
<tr>
<td>cs2-Divisional</td>
<td>1,390,617</td>
<td>1,078,575</td>
<td>1,268,735</td>
<td>1,236,684</td>
<td>1,209,698</td>
</tr>
<tr>
<td>cs3-Departmental</td>
<td>3,166,496</td>
<td>2,882,727</td>
<td>3,342,747</td>
<td>3,467,271</td>
<td>2,997,068</td>
</tr>
<tr>
<td>cs4-Workgroup</td>
<td>2,529,639</td>
<td>1,310,770</td>
<td>1,411,264</td>
<td>1,225,910</td>
<td>1,241,132</td>
</tr>
<tr>
<td>Total Sum of WW Rev</td>
<td>9,771,849</td>
<td>8,614,145</td>
<td>9,498,323</td>
<td>10,300,058</td>
<td>11,097,721</td>
</tr>
</tbody>
</table>
HPC WW Market SYSTEM UNITS: By Competitive Segment

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>cs1-Supercomputer</td>
<td>1,862</td>
<td>2,067</td>
<td>2,560</td>
<td>2,908</td>
<td>2,397</td>
</tr>
<tr>
<td>cs2-Divisional</td>
<td>4,029</td>
<td>3,596</td>
<td>3,914</td>
<td>3,724</td>
<td>3,650</td>
</tr>
<tr>
<td>cs3-Departmental</td>
<td>20,066</td>
<td>17,963</td>
<td>20,382</td>
<td>20,625</td>
<td>17,108</td>
</tr>
<tr>
<td>cs4-Workgroup</td>
<td>148,134</td>
<td>81,428</td>
<td>92,988</td>
<td>84,294</td>
<td>80,692</td>
</tr>
<tr>
<td>Total Sum of WW Units</td>
<td>174,091</td>
<td>105,054</td>
<td>119,844</td>
<td>111,551</td>
<td>103,847</td>
</tr>
</tbody>
</table>
## HPC WW Market Trends: By Region

<table>
<thead>
<tr>
<th>Data</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPC server N.A. Rev.</td>
<td>4,936,229</td>
<td>4,269,442</td>
<td>4,582,620</td>
<td>4,644,549</td>
<td>4,821,984</td>
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<tr>
<td>HPC server EMEA Rev.</td>
<td>3,084,233</td>
<td>2,520,192</td>
<td>3,027,000</td>
<td>3,209,455</td>
<td>3,331,153</td>
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<tr>
<td>HPC server Asia/Pac Rev.</td>
<td>1,145,659</td>
<td>920,016</td>
<td>1,213,827</td>
<td>1,525,193</td>
<td>1,593,634</td>
</tr>
<tr>
<td>HPC server Japan Rev.</td>
<td>501,554</td>
<td>825,379</td>
<td>573,362</td>
<td>783,154</td>
<td>1,246,958</td>
</tr>
<tr>
<td>HPC server ROW Rev.</td>
<td>104,174</td>
<td>79,115</td>
<td>101,514</td>
<td>137,708</td>
<td>103,993</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>9,771,849</td>
<td>8,614,145</td>
<td>9,498,324</td>
<td>10,300,058</td>
<td>11,097,721</td>
</tr>
</tbody>
</table>
# HPC WW Market Trends: By Vendor

<table>
<thead>
<tr>
<th>Mfrtr</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM</td>
<td>2,590,380</td>
<td>2,531,567</td>
<td>2,819,087</td>
<td>3,362,098</td>
<td>3,551,723</td>
</tr>
<tr>
<td>HP</td>
<td>3,562,967</td>
<td>2,473,360</td>
<td>3,017,555</td>
<td>3,307,427</td>
<td>3,419,554</td>
</tr>
<tr>
<td>Dell</td>
<td>1,553,521</td>
<td>1,100,176</td>
<td>1,462,995</td>
<td>1,493,289</td>
<td>1,493,172</td>
</tr>
<tr>
<td>Cray</td>
<td>218,320</td>
<td>342,177</td>
<td>273,225</td>
<td>155,620</td>
<td>353,800</td>
</tr>
<tr>
<td>SGI</td>
<td>156,145</td>
<td>154,757</td>
<td>258,959</td>
<td>225,741</td>
<td>256,400</td>
</tr>
<tr>
<td>Sun</td>
<td>467,483</td>
<td>350,156</td>
<td>178,227</td>
<td>75,630</td>
<td></td>
</tr>
<tr>
<td>Fujitsu</td>
<td>44,166</td>
<td>193,693</td>
<td>134,596</td>
<td>120,351</td>
<td>686,657</td>
</tr>
<tr>
<td>NEC</td>
<td>80,353</td>
<td>278,800</td>
<td>102,429</td>
<td>84,141</td>
<td>64,112</td>
</tr>
<tr>
<td>Appro</td>
<td>74,560</td>
<td>69,776</td>
<td>109,665</td>
<td>135,360</td>
<td>111,648</td>
</tr>
<tr>
<td>Hitachi</td>
<td>12,170</td>
<td>112,637</td>
<td>59,257</td>
<td>62,802</td>
<td></td>
</tr>
<tr>
<td>Dawning</td>
<td>76,385</td>
<td>44,667</td>
<td>63,469</td>
<td>102,923</td>
<td>115,359</td>
</tr>
<tr>
<td>Bull</td>
<td>42,664</td>
<td>45,709</td>
<td>106,112</td>
<td>327,536</td>
<td>60,494</td>
</tr>
<tr>
<td>Other</td>
<td>892,735</td>
<td>916,670</td>
<td>912,747</td>
<td>847,140</td>
<td>984,803</td>
</tr>
<tr>
<td>Grand Total</td>
<td>9,771,849</td>
<td>8,614,145</td>
<td>9,498,323</td>
<td>10,300,058</td>
<td>11,097,721</td>
</tr>
</tbody>
</table>
HPC WW Market Trends: A 17 Year Perspective
HPC WW Market Trends: A 21 Year Perspective
The HPC Market Beyond The Servers: The Broader HPC Market

<table>
<thead>
<tr>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>HPC Compute, Storage, Middleware, Application and Service Revenues, 2011 -- 2016 ($M)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Server</td>
<td>10,300</td>
<td>11,031</td>
<td>11,910</td>
<td>12,778</td>
<td>13,839</td>
<td>14,621</td>
<td>7.3%</td>
</tr>
<tr>
<td>Storage</td>
<td>3,664</td>
<td>3,992</td>
<td>4,350</td>
<td>4,739</td>
<td>5,163</td>
<td>5,625</td>
<td>8.9%</td>
</tr>
<tr>
<td>Middleware</td>
<td>1,147</td>
<td>1,233</td>
<td>1,326</td>
<td>1,426</td>
<td>1,534</td>
<td>1,650</td>
<td>7.5%</td>
</tr>
<tr>
<td>Applications</td>
<td>3,370</td>
<td>3,618</td>
<td>3,884</td>
<td>4,169</td>
<td>4,475</td>
<td>4,804</td>
<td>7.3%</td>
</tr>
<tr>
<td>Service</td>
<td>1,801</td>
<td>1,924</td>
<td>2,056</td>
<td>2,197</td>
<td>2,348</td>
<td>2,509</td>
<td>6.9%</td>
</tr>
<tr>
<td>Total</td>
<td>20,282</td>
<td>21,799</td>
<td>23,526</td>
<td>25,310</td>
<td>27,359</td>
<td>29,209</td>
<td>7.6%</td>
</tr>
</tbody>
</table>

Source: IDC 2012
Questions?

Please email: hpc@idc.com

Or check out: www.hpcuserforum.com
Agenda: Day One Morning

8:00am  Meeting Welcome and Announcements, Jim Kasdorf, Rupak Biswas, Earl Joseph and Steve Conway
        Morning Session Chair: Jim Kasdorf

8:15am  Brief introductions by the end-user sites -- Each user site is asked to:
        1. Explain the top 2 issues facing your HPC operations today
        2. What new solutions do you need the most and are willing to pay extra to obtain?
        3. What new technologies are you aware of that could revolutionize the HPC industry?

HPC Focus Area: The Skies Above: Aerospace, Astrophysics and Astronomy

9:00am  Keynote: Engineering for the Mars Science Laboratory, James Donaldson, NASA Jet Propulsion Laboratory

9:30am  HPC for Space and Astrophysical Sciences, Jill Dahlberg, U.S. Naval Research Laboratory

10:00am Recent Advances in Overcoming the Red Shift for CFD Simulation Analytics, Scott Imlay, Tecplot

10:30am Break

11:00am 3D Electronic Model-Based Type Design, Jeff Kreide, Gulfstream

11:30am Applying New Computing Techniques to Numerical Astrophysics, Brant Robertson, University of Arizona

12:00pm Networking Lunch
Brief Introductions By End-user Sites

Each user site is asked:

1. To explain the top 2 issues facing your HPC operations today
2. What new solutions do you need the most and are willing to pay extra to obtain?
3. What new technologies are you aware of that could revolutionize the HPC industry?
Lunch Thanks to:
Altair Engineering

Please Return Promptly at 1:00pm
Thank You To:
Altair Engineering
For Lunch
Agenda: Day One Afternoon

Afternoon Session Chair: Vijay Agarwala
HPC Focus Area: The Skies Above: Aerospace, Astrophysics and Astronomy

1:00pm  HPC in Astrophysics, Donald Lamb, University of Chicago
1:30pm  Petascale Supernova Simulation, Bronson Messer, Oak Ridge National Laboratory

2:00pm  Panel: What are the HPC Trends in Aerospace, Astrophysics and Astronomy?
Moderator: Don Lamb, University of Chicago
- NASA JPL
- NRL
- Tecplot
- Gulfstream
- ORNL
- Intelligent Light

2:30pm  Break

3:00pm  Paving the Way for HPC in the Cloud, Burak Yenier, UberCloud Experiment

3:15pm  High Performance Data Analysis (aka "Big Data Meets HPC") Moderator: Steve Conway
- Big Data Use Cases, Radhika Subramanian, Emcien
- Big Data Use Cases, Darren Schulte, Apixio
- Big Data and HPC I/O Limitations In Today’s World, Henry Newman, Instrumental
- Big Data Use Cases, John Hengeveld, Intel
- New Directions in the Lustre Community, Peter Bojanic

5:15pm  Networking Break and Time for 1-on-1 Meetings
5:45pm  Bus Leaves for Special Dinner Event at Pima Air & Space Museum
Thank You To:
Bright Computing
For The Break
Dinner Logistics

- Special Dinner Event -- Buses leave starting at 5:45pm
- Sponsored by Intel and HP
Welcome
To Day 2 Of The
HPC User Forum
Meeting
Dinner
Thanks to:
Intel and HP

Breakfast
Thanks to:
Brocade
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Agenda: Day Two Morning

8:10am  Welcome and Introductions: Jim Kasdorf, Rupak Biswas, Earl Joseph and Steve Conway
  Morning Session Chair: Vince Scarafino
8:15am  Technology Topic #1: Processors, Coprocessors and Accelerators (15 minute updates) Moderator: Vince Scarafino
  - Microserver Research, Ronald Luijten, IBM Zurich Research Laboratory
  - The Future of x86 Processors, Stephen Wheat, Intel
  - 1HPC Directions at Nvidia, Cyril Zeller, Nvidia
  - Hybrid Processors with Personalities, Steve Wallach, Convey Computer
  - Processor Discussion: The Future of Processors, Coprocessors and Accelerators
9:45am  HP Vendor Technology Update
10:00am BP HPC Plans, Keith Gray, BP
10:30am Break
11:00am HPC Activities and Directions in Russia, Alexey Shmelev, RSC Group
11:30am Intel Vendor Technology Update
11:45am IDC Big Data Update, Steve Conway and Chirag Dekate, IDC
12:00pm Networking Lunch
Lunch Thanks to: SUSE

Please Return Promptly at 1:00pm
Thank You To:
SUSE
For Lunch
Agenda: Day Two Afternoon

Afternoon Session Chair: Steve Finn

1:00pm Disruptive Technologies Panel -- Panelists will briefly (in 2-3 minutes) present potentially disruptive technologies, Moderator: Earl Joseph
  • System vendors: IBM, HP, Dell, Cray, SGI
  • Processor vendors: Intel, Micron, Nvidia, IBM,
  • Software providers: Intelligent Light, Parallel Scientific, SUSE
  • Storage vendors: Panasas, NetApp

2:00pm Break

2:30pm Technology Topic #2: Advanced Visualization
  • A Visualization Tool for Astrophysics, Hari Krishnan, NERSC
  • New Visualization Center, David Pugmire, ORNL
  • Visualization Infrastructure at the NASA Advanced Supercomputing Division, Chris Henze
    • A 3D Fly Through of the Known Universe, Yushu Yao, NERSC
    • Visualization at Oak Ridge National Laboratory, April Lewis

4:45pm New Methods for Measuring and Calculating ROI in HPC, Earl Joseph, Steve Conway and Chirag Dekate, IDC

5:00pm Meeting Wrap-Up, Jim Kasdorf, Rupak Biswas, Earl Joseph and Steve Conway
Disruptive Technologies Panel
Panelists will briefly (in 2-3 minutes) present potentially disruptive technologies:

- System vendors: IBM, HP, Dell, Cray, SGI
- Processor vendors: Intel, Micron, Nvidia, IBM,
- Software providers: Intelligent Light, Parallel Scientific, SUSE
- Storage vendors: Panasas, NetApp
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HPC ROI Study: Developing A Measurement Of How Investments In HPC Can Create ROI And Higher Levels Of Innovation

Research Update, May 1, 2013

Earl Joseph – ejoseph@idc.com
Steve Conway – sconway@idc.com
Chirag Dekate – cdekate@idc.com
Background: Project Overview

A study that describes how increases in HPC investments can significantly improve economic success and increase scientific innovation

The study includes creating two unique models:

1. A macroeconomic model which depicts the way HPC investments result in economic advancements in the form of ROI, growth and jobs

2. An "Innovation Index" that provides a means of measuring and comparing innovation levels, based on the level of applying HPC computing resources towards scientific and technical advancement
Research Overview – Key Data and Metrics

1) Determine the time delay by the different sectors/categories (delay of investments → to returns)
2) Determine the type of return and size of return by year
   ▪ Sales, profits, cost savings, employee growth, new companies/start-ups, innovation, etc.
3) Determine the % of each sector that can actually use HPC
4) Estimate the typical R&D and other costs per HPC $ invested
5) Then calculate the results:
   ▪ ROI per HPC/R&D dollar (overall and by sector)
   ▪ Additional R&D investments required per HPC dollar
   ▪ Total return for a country per HPC dollar, over time
For each sector we need 4 basic ratios

Note: IDC has conducted over 5,000 light surveys for this data as of March 2013, it will likely require 5x to 10x more surveys
The Initial Models That Are Being Tested

The ROI models will be tested for two main types:
- ROI based on revenues generated (similar to GDP) divided by HPC investment
- ROI based on jobs created divided by HPC investment

The ROI models will be tested for variances by:
1. Industry sector
2. Country
3. Organization size

The Innovation models will be of four types:
- Basic Research/Major Innovations in government & academia
- Basic Research/Major Innovations in industry
- Applied Research/Incremental Innovations in government & academia
- Applied Research/Incremental Innovations in industry

The Innovation models will be tested for variances by:
1. Industry sector
2. Country
3. Organization size
4. Government, Industry and Academia
The UPDATED Innovation Index Scale

How would you rate this innovation compared to all other innovations in this field over the last ten years, using a scale of 1 to 10?

10 = One of the top 2 to 3 innovations in the last decade
9 = One of the top 5 innovations in the last decade
8 = One of the top 10 innovations in the last decade
7 = One of the top 25 innovations in the last decade
6 = One of the top 50 innovations in the last decade
5 = It had a major impact and is useful to many organizations
4 = A minor innovation that is useful to many organizations
3 = A minor innovation or only useful to 2-3 organizations
2 = A minor innovation or only useful to 1 organization
1 = An innovation that is recognized ONLY by experts in the field
Early Results
Early Results

Note: These are VERY early results, and the final results could be very different

Sample characteristics:

• 49 sites in the database (as of 4/3/2013)

• The sample mix is:
  • 33 in Industry, 7 in Government, and 9 in Academia

• We have 40 innovations in the sample

• We have 22 financial ROI examples
Early Results

Note: These are VERY early results, and the final results could be very different

Note: This is from the first 49 data points

• The ROI in revenues for each HPC dollar invested is:
  ➢ 29.2 times

• The ROI in profits for each HPC dollar invested is:
  ➢ 6.46 times

• For sites that reported job creation, the HPC investment required per job created =
  ➢ $20K

• For each innovation in the sample:
  ➢ $1.15 million in HPC was invested
Early Results

Note: These are VERY early results, and the final results could be very different

Note: This is from the first 49 data points

The average innovation rating = 6.24

10 = One of the top 2 to 3 innovations in the last decade
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Research Schedule: 9/1/12 to June/July 2013

1. October 2012 – finalize the plan, surveys and overall research approach
2. November 2012 – conduct a limited number of surveys to both see what can be collected and start testing the two models
3. December 2012 – refine the survey guide and models as needed
   - Refine as needed
4. January – March 2013 – start the broad data collection/surveys – and review the initial results
   - We noticed that we need a larger data set
5. April/May 2013 – populate the two models with MORE DATA from both surveys and existing economic data elements
   - Refine as needed
6. May/June 2013 – present and refine the models as required, and create the 3 funding scenarios
7. June/July 2013 – disseminate the results
Questions?

Please email: hpc@idc.com

Or check out: www.hpcuserforum.com
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Tuesday breakfast - Parallel Scientific
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Wednesday lunch – SUSE
PM Break - Mellanox
Important Dates For Your Calendar

FUTURE HPC USER FORUM MEETINGS:

2013 Meetings:
- April 29 – May 1, Tucson, Arizona
- September 9 to 11, Boston, Massachusetts
- October 1, 2013 in South Korea

2014 Meetings:
- April 7 to 9, Santa Fe, New Mexico
- September 15 to 17, Seattle, Washington
- October 2014 in Europe
Thank You
For Attending The 49th
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