Welcome To The 51st HPC User Forum Meeting October 2013

Agenda: Welcome and Greetings

Welcome by KSCSE: Dong Pil Min

Welcome by Jim Kasdorf, HPC UF Chairman

Welcome by Rupak Biswas , HPC UF Vice Chairman

Welcome by Steve Conway, IDC

IDC HPC Market Overview, Earl Joseph

Welcome

Jim Kasdorf
HPC User Forum
Chairman

And

Rupak Biswas
HPC User Forum
Vice Chairman

HPC USER FORUM

Important Dates For Your Calendar

FUTURE HPC USER FORUM MEETINGS:

2014 Meetings:

- April 7 to 9, Santa Fe, New Mexico
- Riken, Japan, Data TBD
- September 15 to 17, Seattle, Washington
- October in Europe

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9:30am Coffee and refreshments

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- IDC HPC Market Overview, Earl Joseph

10:45am Education and Training in Computational Sciences (Session Chair: Jim Kasdorf)

- Computational Science Education in Korea, Chongam Kim
- Pittsburgh Supercomputing Center Educational Approach, Jim Kasdorf
- City University of NY, Paul Muzio
- Computational Science Infrastructure and Education at Penn State, Vijay K Agarwala

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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

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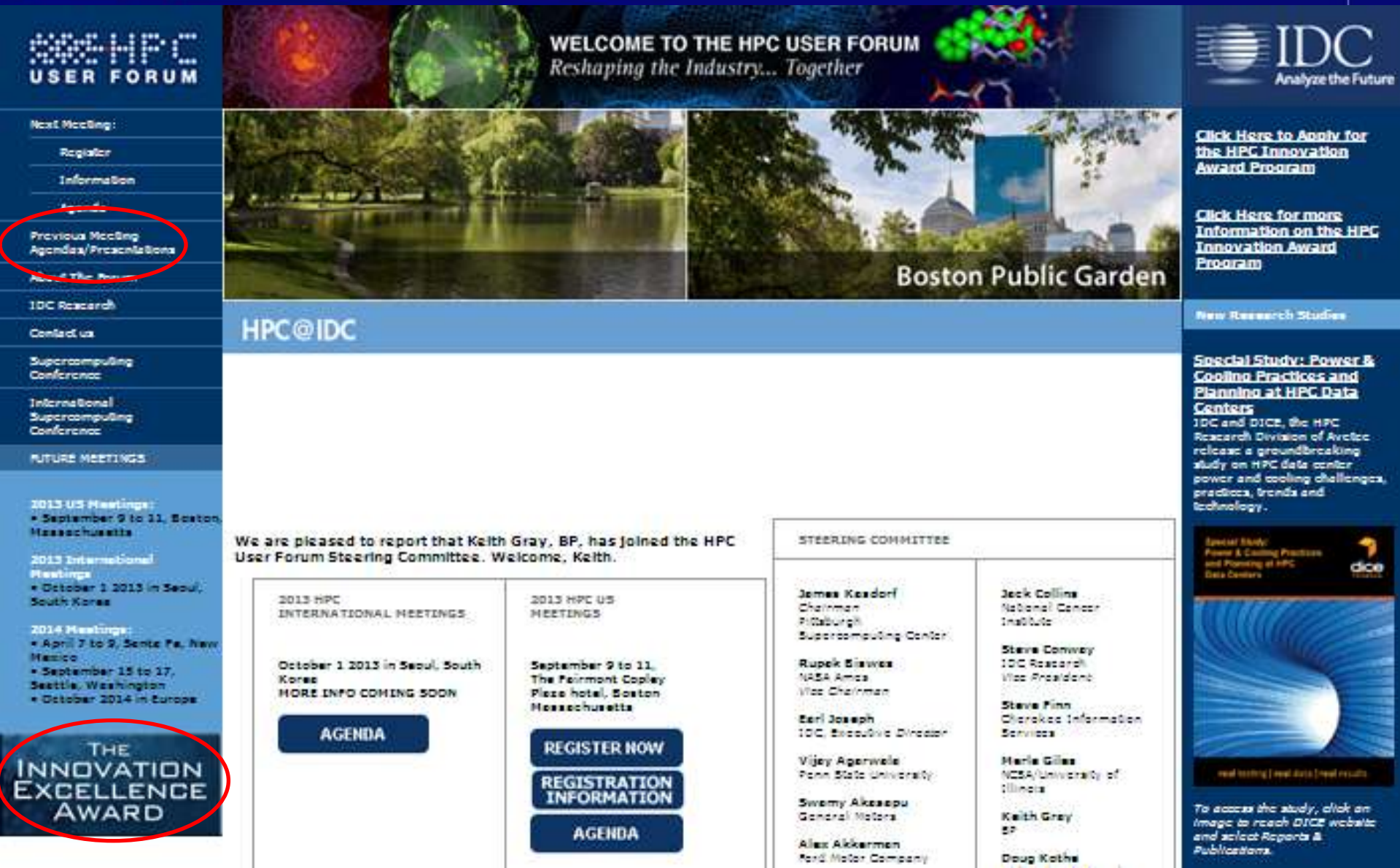
www.hpcuserforum.com



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
- Jysoo Lee, National Institute of Supercomputing and Networking
- Paul Muzio, City University of New York
- Michael Resch , HLRS, University of Stuttgart
- Vince Scarafino, Industry Expert
- Suzy Tichenor, Oak Ridge National Laboratory

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IDC HPC

Market Update

2013 New IDC HPC Research Areas

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

Redefining and expanding our market tracking methods:

- Supercomputers, big data, clouds, tracking accelerators, and the missing middle, etc.

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

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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
- 1&2 Q13 -- The lower half of the market is growing again
- We are forecasting ~7% growth over the next 5 years

Major challenges for datacenters

- Power, cooling, real estate, system management
- Storage and data management continue to grow in importance

Software hurdles continue to grow

The worldwide Petascale Race is in full speed

Big Data and accelerators are hot new technologies

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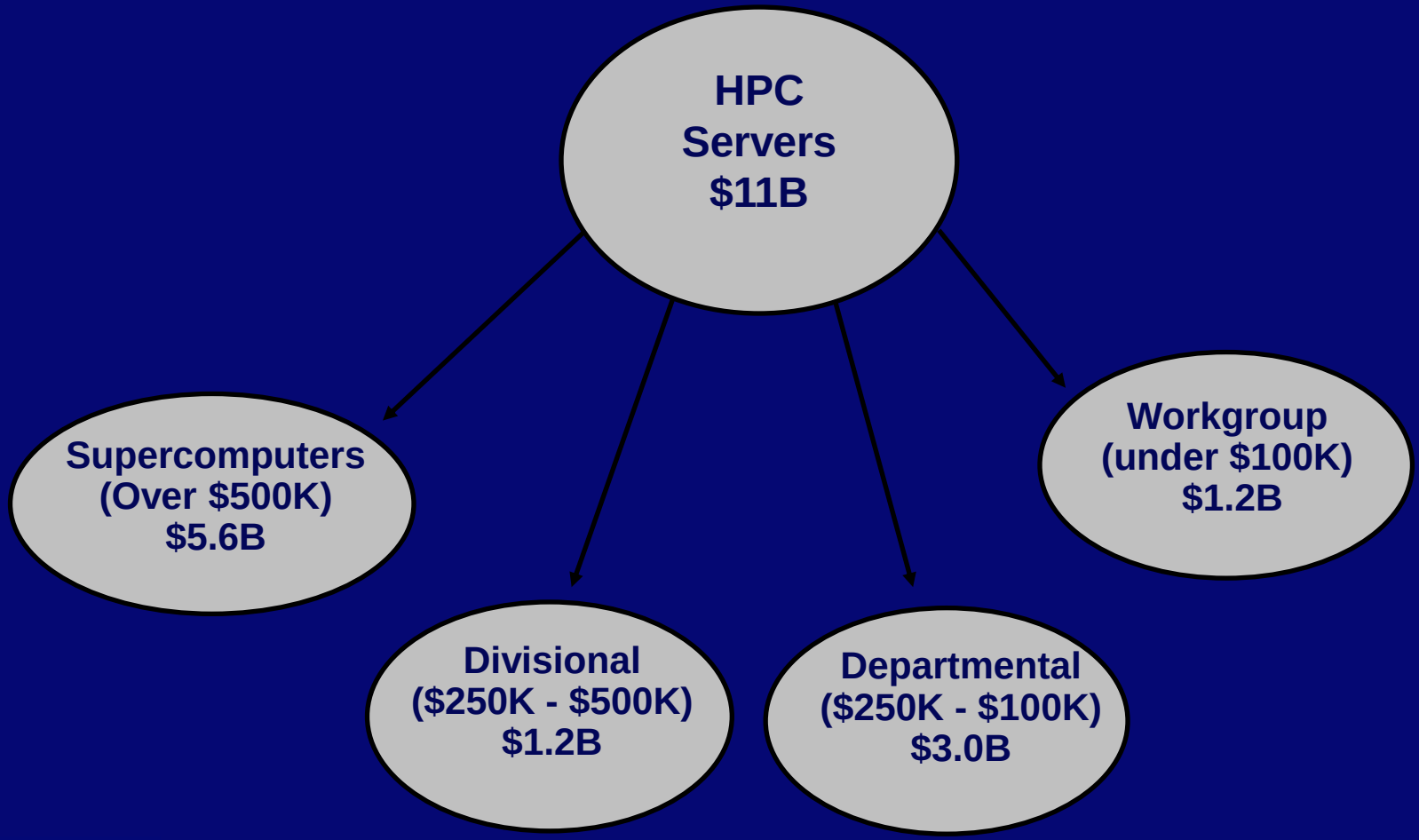
IDC HPC Competitive Segments: 2012



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HPC WW Market Trends: By Competitive Segments

Segment	2010	2011	2012	11/12 Growth
cs1-Supercomputer	3,475,577	4,370,194	5,649,823	29.3%
cs2-Divisional	1,268,735	1,236,684	1,209,698	-2.2%
cs3-Departmental	3,342,747	3,467,271	2,997,068	-13.6%
cs4-Workgroup	1,411,264	1,225,910	1,241,132	1.2%
Total Sum of WW Rev	9,498,323	10,300,058	11,097,721	7.7%

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HPC WW Market Trends: By System Units Sold

Segment	2010	2011	2012	11/12 Growth
cs1-Supercomputer	2,560	2,908	2,397	-17.6%
cs2-Divisional	3,914	3,724	3,650	-2.0%
cs3-Departmental	20,382	20,625	17,108	-17.1%
cs4-Workgroup	92,988	84,294	80,692	-4.3%
Total Sum of WW Unit	119,844	111,551	103,847	-6.9%

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HPC WW Market Trends: By Processors Sold

CPU Type	2010	2011	2012	11/12 Growth
EPIC	62,419	35,300	14,800	-58.1%
RISC	98,958	197,163	258,553	31.1%
RISC-BG	44,928	13,870	201,221	1350.8%
Vector	288			
x86-64	2,758,982	2,922,042	3,001,340	2.7%
Grand Total	2,965,575	3,168,375	3,475,914	9.7%

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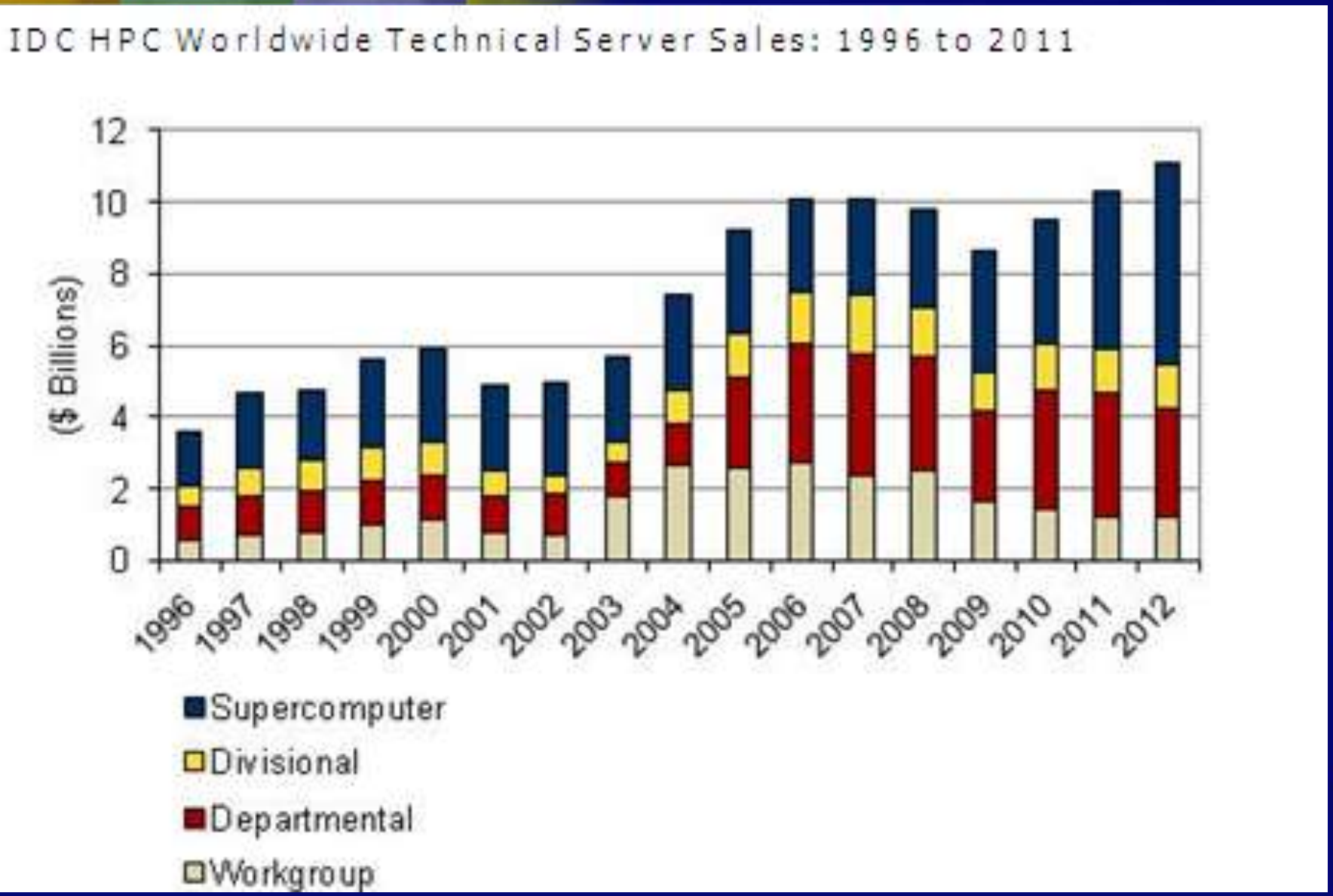
HPC WW Market Trends: By OEM

Mftr	2010	2011	2012	11/12 Growth
IBM	2,819,087	3,362,098	3,551,723	5.6%
HP	3,017,555	3,307,427	3,419,554	3.4%
Dell	1,462,995	1,493,289	1,493,172	0.0%
Cray	273,225	155,620	353,800	127.3%
SGI	258,959	225,741	256,400	13.6%
Sun	178,227	75,630		
Fujitsu	134,596	120,351	686,657	470.5%
NEC	102,429	84,141	64,112	-23.8%
Appro	109,665	135,360	111,648	-17.5%
Hitachi	59,257	62,802		
Dawning	63,469	102,923	115,359	12.1%
Bull	106,112	327,536	60,494	-81.5%
Other	912,747	847,140	984,803	16.3%
Grand Total	9,498,323	10,300,058	11,097,721	7.7%

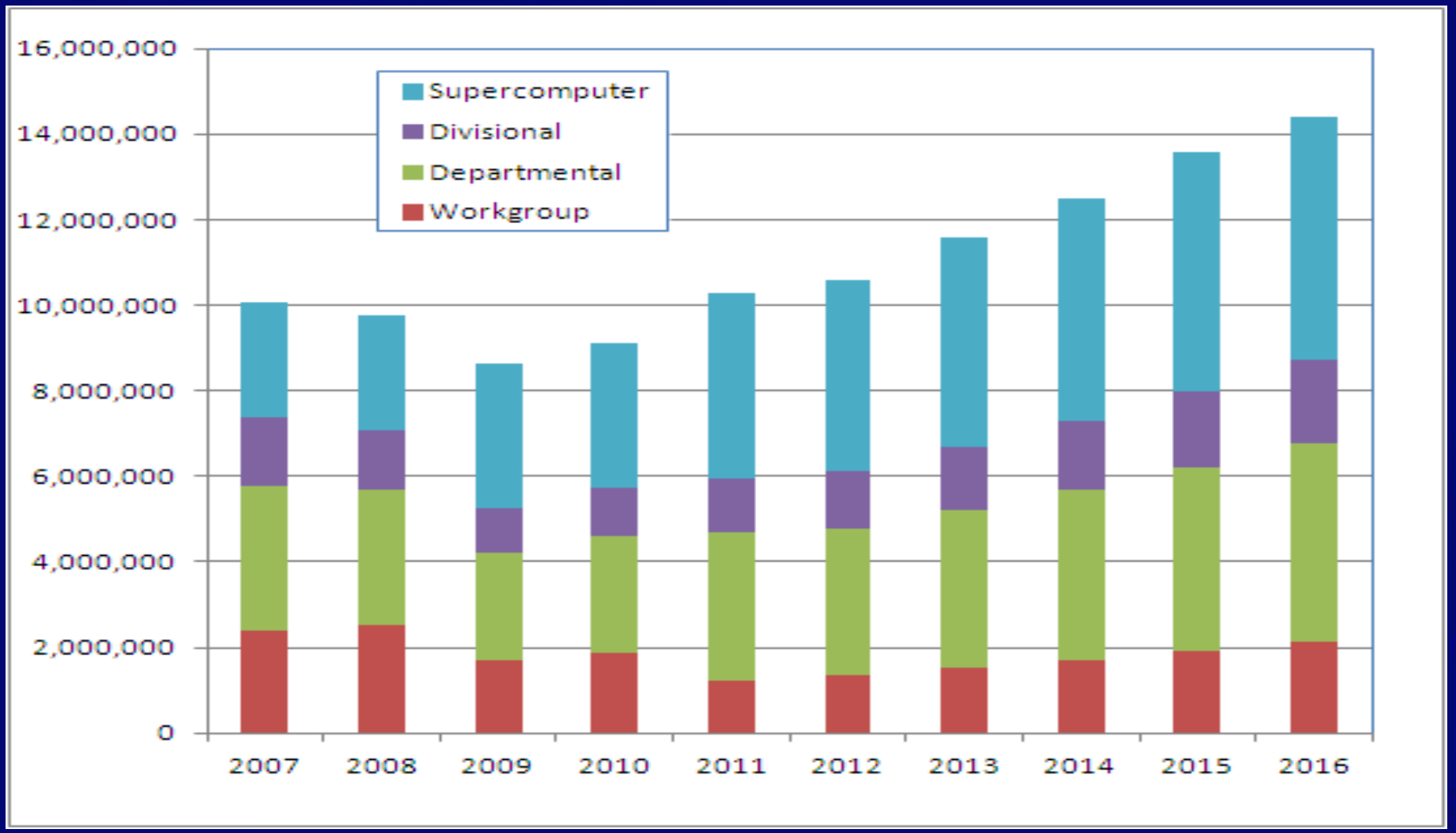
HPC WW Market Trends: A 17 Year Perspective



HPC Forecasts: By Verticals/Application Areas

	2010	2011	2016	CAGR (11-16)
Bio-Sciences	$1,240,127	$1,251,665	$1,722,588	6.6%
CAE	$1,013,233	$1,095,398	$1,714,457	9.4%
Chemical Engineering	$193,759	$192,789	$251,392	5.5%
DCC & Distribution	$519,549	$569,026	$868,925	8.8%
Economics/Financial	$253,607	$279,294	$472,015	11.1%
EDA / IT / ISV	$594,187	$662,674	$1,009,535	8.8%
Geosciences	$579,355	$653,859	$906,900	6.8%
Mech Design and Drafting	$75,316	$63,102	$79,128	4.6%
Defense	$919,558	$1,004,632	$1,380,750	6.6%
Government Lab	$1,467,110	$2,078,029	$2,714,603	5.5%
University/Academic	$1,762,777	$1,900,883	$2,526,773	5.9%
Weather	$388,735	$453,999	$601,585	5.8%
Other	$108,912	$94,708	$137,736	7.8%
Total Revenue	$9,116,225	$10,300,058	$14,386,387	6.9%

HPC Forecasts:
By Competitive Segment



The HPC Market Beyond The Servers: The Broader HPC Market

The Broader HPC Market Growth to 2016							
HPC Compute, Storage, Middleware, Application and Service Revenues, 2011 -- 2016 ($M							
	2011	2012	2013	2014	2015	2016	CAGR (11-16)
Server	10,300	11,031	11,910	12,778	13,839	14,621	7.3%
Storage	3,664	3,992	4,350	4,739	5,163	5,625	8.9%
Middleware	1,147	1,233	1,326	1,426	1,534	1,650	7.5%
Applications	3,370	3,618	3,884	4,169	4,475	4,804	7.3%
Service	1,801	1,924	2,056	2,197	2,348	2,509	6.9%
Total	20,282	21,799	23,526	25,310	27,359	29,209	7.6%
Source: IDC 2012							

IDC Analyze the Future

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Questions?

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Please Return Promptly From Lunch

Starting At 1:00pm

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We Invite
Korean HPC Users To Apply
For The IDC
HPC Innovation Award

IDC
Analyze the Future

KR-HPC
USER FORUM

HPC Award Program Goals

#1 Help to expand the use of HPC by <u>showing real ROI examples</u>:

1. Expand the "Missing Middle" – SMBs, SMEs, SMSs -- by providing examples of what can be done with HPC
2. Show mainstream and leading edge HPC success stories

#2 Create a large database of success stories across many industries/verticals/disciplines

- To help justify investments and show non-users ideas on how to adopt HPC in their environment
- Creating many examples for funding bodies and politicians to use and better understand the value of HPC → to help grow public interest in expanding HPC investments
- For OEMs to demonstrate success stories using their products

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Users Have to Submit the Value of the Accomplishment

Users are required to submit the value achieved with their HPC system, in any of 3 broad categories:

a) Dollar value of the HPC usage
- e.g. made $$$ in new revenues, saved $$$ in costs, made $$$ in profits, etc.

b) Scientific or engineering accomplishment
- e.g. discovered how xyz really works, develop a new drug that does xyz, etc.

c) Value to society as a whole
- e.g. ended nuclear testing, made something safer, provided protection against xyz, etc.

… and the investment in HPC that was required (in order to calculate the ROI)

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The Judgment Process -- Clear, Fair And Transparent

The ranking of the accomplishments are done by only HPC USERS, following very specific rules.

A three step process is proposed:

1. First the submission has to be complete with a clear "Value" shown
   - A number of the submissions were good, but needed a little more information – we have invited them to apply for the fall award
2. Secondly, an assessment is made to see that it is a realistic assessment of the value/returns
   - By the HPC User Forum Steering Committee
3. Then in cases where the value isn't clear, or a deeper technical depth is required -- the final evaluation is by experts in the specific area/discipline

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The New Winners: At ISC'13 -- PART 1

We recognize these sites for their excellence in applying HPC to solve key business and scientific problems:

Site (Alpha Ordered)	Person	Success Area	Org Size
Alenia Aermacchi	Enrica Marentino	ROI & Eng.	Medium
High Performance GeoComputing LabUCSD	YiFeng Cui	Sci/Eng & Society	Large
DOD HPC MOD	Deborah Schwartz	ROI & Eng.	Large
DOD HPC MOD	John West	ROI & Eng.	Large
ESTECO & Airworks Eng.	Paolo Vercesi	ROI & Eng.	Medium
UCL, NAG HECTOR	HECToR dCSE	ROI Sci/Eng&Society	Medium
U. Warwick NAG HECTOR dCSE	HECToR dCSE	ROI Sci/Eng&Society	Medium

HPC USER FORUM

The New Winners: At ISC'13 -- PART 2

We recognize these sites for their excellence in applying HPC to solve key business and scientific problems:

Site (Alpha Ordered)	Person	Success Area	Org Size
Bottero S.P.A	Alberto Marino	ROI & Eng.	Medium
Polestar Racing	Per Blomberg	ROI & Eng.	Medium
RENCI	Phil Owen	Sci/Eng & Society	Medium
University of North Carolina/RENCI	Rick Lutteich, Brian Blanton	Sci/Eng & Society	Medium

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The Trophy For Winners

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