

**Welcome To The 71st
HPC User Forum Meeting
October 1-2, 2018
HLRS/University of Stuttgart**



Thank You To Our Sponsors!

- Cray
- IBM
- Intel
- Inspur
- Lenovo
- Tech Data
- Verne Global

Important Dates For Your Calendar

HPC USER FORUM MEETINGS:

- April 1 to 3, 2019, Santa Fe, New Mexico
- September 9 to 11, 2019, Chicago Illinois, Argonne National Laboratory

And Join us for the Hyperion SC18 Briefing:

- Tuesday, November 13, The Adolphus Hotel

CHAIRMAN'S WELCOME

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**



The HPC User Forum: 70 Meetings Worldwide Since 2000

Amsterdam, Netherlands (SARA)

Annecy, France

Bangalore, India (Indian Institute of Technology)

Beijing, China (Chinese Academy of Sciences)

Bologna, Italy (CINECA)

Bristol, UK

Bruyères-le-Châtel, France (Teratec)

Canberra, Australia

Geneva, Switzerland (CERN)

Kobe, Japan (RIKEN)

Lausanne, Switzerland (EPFL)

London, UK (Imperial College)

Manchester, UK (Manchester University)

Melbourne, Australia

Munich, Germany (LRZ)

New Delhi, India (Indian Institute of Science)

Paris, France (GENCI)

Seoul, Korea (National Institute of Supercomputing & Networking)

Stuttgart, Germany (HLRS)

Warsaw, Poland (University of Warsaw)

Yokohama, Japan (Earth Simulator Center)

Zurich, Switzerland (ETH Zurich)

United States (many locations)

Introduction

HPC User Forum Steering Committee

Paul Muzio
Chairman, Industry Expert

Rupak Biswas
NASA Ames
Vice Chairman

Earl Joseph
Executive Director,
Hyperion Research

Vijay Agarwala
Virginia Tech.

Swamy Akasapu
General Motors

Alex Akkerman
Ford Motor Company

C. Scot Atkins
Industry Expert - Advanced
Analytics/Dense
Supercomputing

Simon Burbidge
University of Bristol (UK)

Jack Collins
National Cancer Institute

Steve Conway
Vice President,
Hyperion Research

Steve Finn
Emagine IT

Merle Giles
Moonshot Research

Keith Gray
BP

Arno Kolster
Providentia Worldwide

Doug Kothe
Oak Ridge National Laboratory

Doug Ball
HPC Expert

Jeff Broughton
NERSC/Lawrence
Berkeley National Lab

Paul Buerger
Industry Expert

Clayton Chandler
Credit Suisse Group AG

Candace Culhane
Los Alamos National Labs

Sharan Kalwani
Industry Specialist
Consultant

Chris Gathmann

Jysoo Lee
KAUST

David Martin
Argonne National Laboratory

Michael Resch
HLRS, University of Stuttgart

Ryan Quick
Providentia Worldwide

Stephane Requena
GENCI

Vince Scarafino
Industry Expert

Suzy Tichenor
Oak Ridge National Laboratory

CHECK OUT OUR WEB SITE: www.hpcuserforum.com



FAQs on
Hyperion
Research

Latest
News

[Home](#) [About](#) [Events](#) [Research](#) [Join](#)

JOIN ONE OF THE WORLD'S
LEADING EDGE SUPERCOMPUTING
ORGANIZATIONS



[DETAILS](#) | [AGENDA](#)

[REGISTER NOW](#)

INNOVATION
& ROI AWARDS

MEETING
PRESENTATIONS

FUTURE
MEETINGS

HPC Market Update

Visit Our Website: www.HyperionResearch.com

Twitter: [@HPC_Hyperion](https://twitter.com/HPC_Hyperion)



HYPERION RESEARCH
The former IDC HPC analyst team

[Home](#)

[Services](#) ▾

[Team](#)

[Contact](#)



Hyperion Research helps organizations make effective decisions and seize growth opportunities by providing research and recommendations in both high performance computing and emerging technology areas.

Hyperion Research Holdings, LLC:

- Owns 100% of the IDC HPC assets
- Tracking the HPC market since 1986
- Headquarters:
365 Summit Ave., St. Paul, MN 55102



The Hyperion Research Team

Earl Joseph

Research studies & strategic consulting

Steve Conway

Strategic consulting, HPC UF, Big Data, AI

Bob Sorensen

Strategic research, government studies, QC

Alex Norton

Special studies, new data analysis, surveys

Mike Thorp

Global sales management

Kurt Gantrish

Global sales management

Jean Sorensen

Business manager

Kirsten Chapman

Data collection and surveys

Nishi Katsuya

Japan research and studies

Hyperion Research HPC Activities

- Track all HPC servers sold each quarter
- 4 HPC User Forum meetings each year
- Publish 85 plus research reports each year
- Visit all major supercomputer sites & write reports
- Assist in collaborations between buyers/users and vendors
- Assist governments in HPC plans, strategies and direction
- Assist buyers/users in planning and procurements
- Maintain 5 year forecasts in many areas/topics
- Developing a worldwide ROI measurement system
- **HPDA program (includes ML/DL/AI)**
- **HPC Cloud usage tracking**
- **Quarterly tracking of GPUs/accelerators**
- **Cyber Security**
- **Quantum Computing**

Top Trends in HPC



He first half of 2018 is looking strong – Exceeded \$6 billion (US\$) in revenues!

- 2017 was also a strong year

The top systems has slowed for **over 4 years**

- But the profusion of Exascale announcements is generating a lot of buzz
- Governments are investing heavily in exascale systems

Big data combined with HPC is creating new solutions

- Adding many new users/buyers to the HPC space
- AL/ML/DL & HPDA are the hot new areas

Top Trends in HPC

2Q 2018 showed major growth:

Hyperion Research Press Release:

High Performance Computing Server Market Jumps 27.6% in Second-Quarter 2018

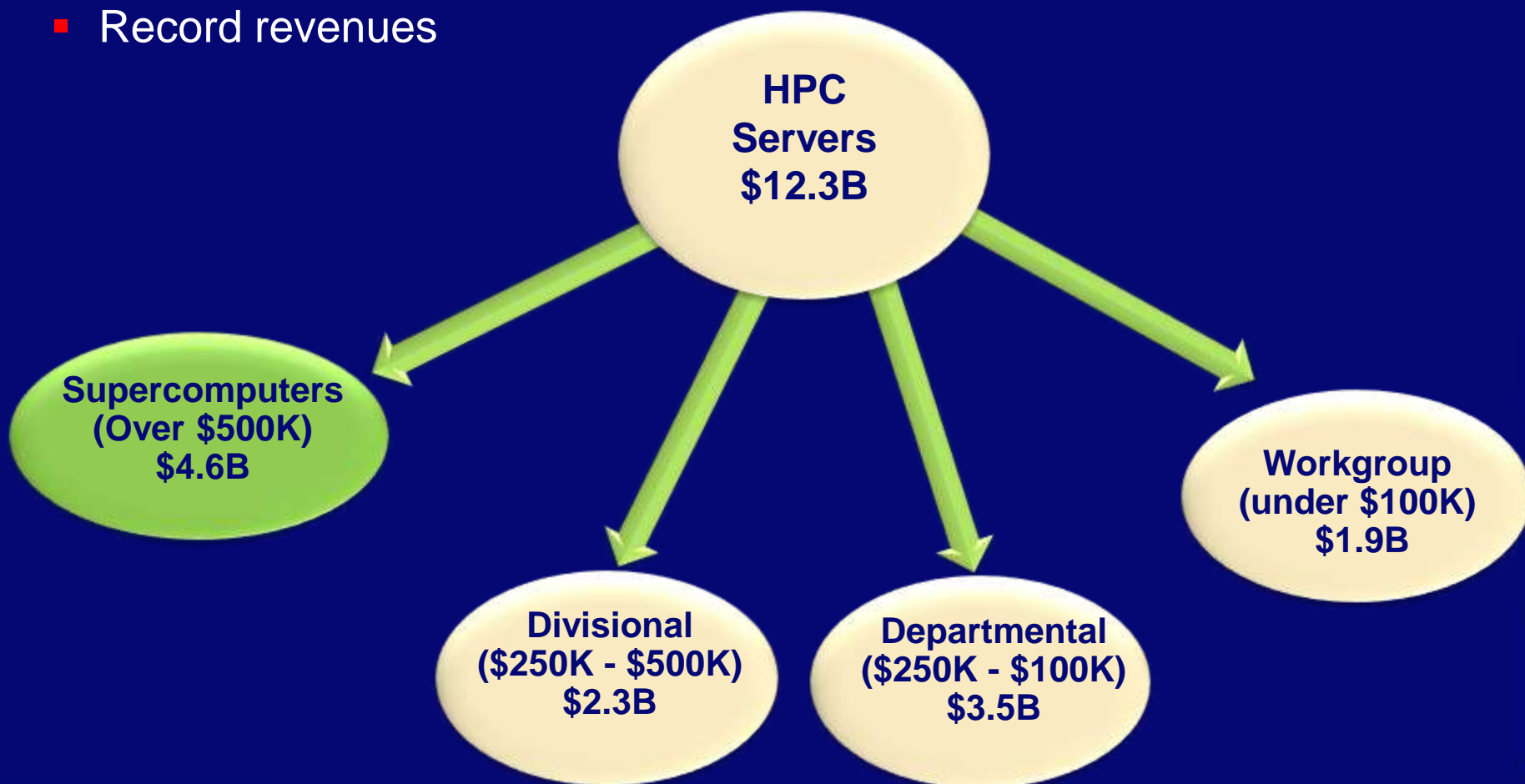
ST. PAUL, Minn., September 25, 2018 - Worldwide factory revenue for the high-performance computing (HPC) technical server market jumped 27.6% to \$3.7 billion in the second quarter of 2018 (2Q18), up from \$2.9 billion in the same period of 2017, according to the newly released Hyperion Research Worldwide High-Performance Technical Server QView. Sequentially, second-quarter 2018 HPC server revenue grew 16.7% over the \$3.2 billion figure in the first quarter of 2018.

Revenue in the first half of calendar year 2018 rose 23.8% over the 2017 first half, from \$5.6 billion to \$6.9 billion. Hyperion Research forecasts that revenue for HPC server systems will reach about \$12.9 billion in full-year 2018 and will grow to \$19.6 billion in 2022.

- Leading the charge on year-over-year second-quarter growth was the Supercomputers segment for HPC systems sold for \$500,000 and up. Revenue in this segment climbed 36.8% to \$1.6 billion, compared with \$1.2 billion in the prior-year second quarter, and accounted for 43.4% of second-quarter 2018 HPC server revenue.

The Worldwide HPC Server Market: \$12.3 Billion in 2017

- Record revenues



2017 HPC Market By Vertical (\$ Millions)

	2017
Bio-Sciences	1,114,627
CAE	1,361,539
Chemical Engineering	184,203
DCC & Distribution	698,000
Economics/Financial	667,791
EDA / IT / ISV	881,140
Geosciences	920,642
Mechanical Design	56,487
Defense	1,255,355
Government Lab	2,341,167
University/Academic	2,165,472
Weather	501,574
Other	114,300
Total Revenue	12,262,296
Source: Hyperion 2018	-

HPC Market By Vendor Shares (\$K)

Vendor	2016	2017	2017 Share %	2017/2016 Growth %
HPE/HP	3,877,593	4,194,470	33.8%	8.2%
Dell	2,013,824	2,330,134	18.8%	15.7%
Lenovo	908,532	869,895	7.0%	-4.3%
Inspur	727,243	740,207	6.0%	1.8%
IBM	491,959	575,130	4.6%	16.9%
Sugon (Dawning)	315,048	348,846	2.8%	10.7%
Cray	460,830	250,195	2.0%	-45.7%
Fujitsu	226,995	227,802	1.8%	0.4%
NEC	165,758	171,344	1.4%	3.4%
Penguin	136,250	158,750	1.3%	16.5%
Bull Atos	117,717	133,422	1.1%	13.3%
SGI	168,650	-		
Other	2,120,479	2,420,852	19.5%	14.2%
Total	11,730,878	12,421,046	100.0%	5.9%
<i>Source: Hyperion Research 2018</i>				

HPC Market By Regions (\$K)

	2016	2017	2017
Data			%
HPC server N.A. Rev.	5,155,105	5,595,811	45.6%
HPC server EMEA Rev.	3,247,174	3,621,498	29.5%
HPC server Asia/Pac Rev.	2,284,973	2,171,111	17.7%
HPC server Japan Rev.	770,011	734,599	6.0%
HPC server ROW Rev.	137,365	139,278	1.1%
Total	11,594,628	12,262,296	
<i>Source: Hyperion Research</i>			

New HPC Market Forecasts (\$ K)

	2017	2022	CAGR 17-22
Supercomputer	4,840,985	9,521,092	14.5%
Divisional	2,295,273	3,058,506	5.9%
Departmental	3,370,137	4,540,846	6.1%
Workgroup	1,755,901	2,436,173	6.8%
Total	12,262,296	19,556,617	9.8%
Source: Hyperion 2018	-	-	

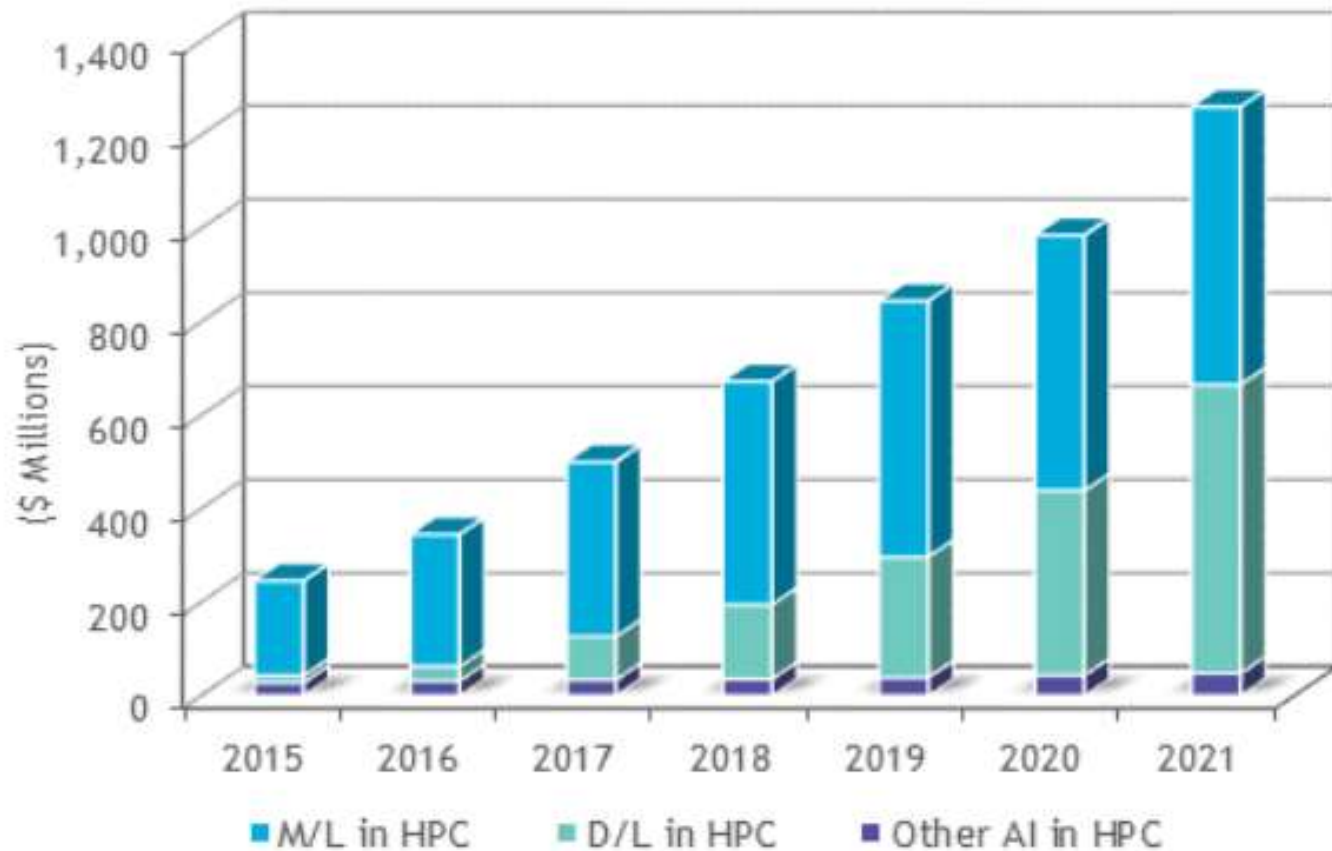
New Forecast: The Broader HPC Market (\$ K)

Revenues by the Broader HPC Market Areas			
	2017	2022	CAGR 17-22
Server	12,262,296	19,556,617	9.8%
Storage	4,661,102	7,606,884	10.3%
Middleware	1,367,147	2,170,912	9.7%
Applications	3,961,491	6,277,996	9.6%
Service	2,022,090	2,798,378	6.7%
Total Revenue	24,274,126	38,410,788	9.6%
Source: Hyperion 2018			

WW M/L, D/L, & AI Forecasts

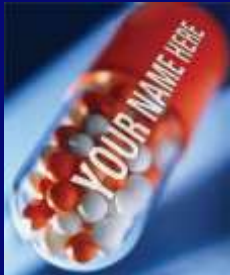
FIGURE 2

Worldwide M/L, D/L & AI HPC-Based Revenues



Source: Hyperion Research 2017

Most Important Use Cases



Precision Medicine



Automated Driving Systems



Fraud and anomaly detection



Affinity Marketing

Business Intelligence



Cyber Security



IoT



AI is Still Near the Start

Today: Bounded Problems

Many observations but few choices

“One trick dogs”: 10 AI solutions in a box to solve 10 problems

Examples:

- Image & voice recognition
- Early automated driving
- Reading an MRI



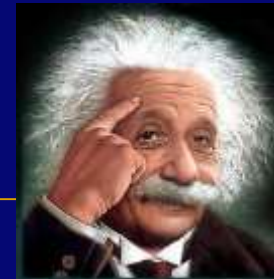
Future: Unbounded, Too

Many observations, many choices

Versatile decision-makers capable of serious experiential learning

Examples:

- Discerning human motivation
- Mature automated driving
- Diagnosing/“curing” a cancer



In Summary

HPC is still expected to be a growth market

- Growing recognition of HPC's strategic value
- HPDA, including ML/DL, cognitive and AI
- HPC in the Cloud will lift the sector writ large

Vendor share positions shifted greatly in 2015, 2016 & 2017 and may continue to shift

- E.g., HPE acquisition of SGI & Lenovo buying IBM's x86 server business

The HPDA, AI, ML & DL markets will expand opportunities for vendors

Questions?

Please email:

ejoseph@hyperionres.com

Or check out:

www.HyperionResearch.com

www.hpcuserforum.com



UPDATED: Monday Agenda

- 13:00** Welcome/Introductions: Michael Resch and Bastian Koller, HLRS; Paul Muzio, Earl Joseph and Steve Conway
- 13:15** Welcome, on behalf Peter Castellaz, Baden-Wuerttemberg Ministry of Science, Research and Art
- 13:20** Update on Gauss Centre for Supercomputing (GCS), Michael Resch
- 13:40** Update on Jülich Supercomputing Centre (FZJ), Norbert Attig
- 14:00** Update on HLRS, Bastian Koller
- 14:20** Perspective on the HPC Community, Michael Resch, HLRS/University of Stuttgart
- 14:45** Lenovo Technical/Strategy Update, Martin Hiegl
- 15:00** Break
- 15:30** Testing Approaches for Autonomous Vehicles, Marius Feilhauer, ETAS
- 16:00** The European Processor Initiative, Jean-Marc Denis, Chair, EPI
- 16:30** IBM Technical/Strategy Update
- 16:40** Cray Technical/Strategy Update, Wilfried Oed
- 16:55** Cost Models for HPC: What, How and Who Cares? Andy Jones, NAG
- 17:15** After-Meeting Socializing

UPDATED: Monday Agenda

- 15:00 Break**
- 15:30 Testing Approaches for Autonomous Vehicles, Marius Feilhauer, ETAS**
- 16:00 The European Processor Initiative, Jean-Marc Denis, Chair, EPI**
- 16:30 IBM Technical/Strategy Update**
- 16:45 Cray Technical/Strategy Update, Wilfried Oed**
- 17:00 Cost Models for HPC: What, How and Who Cares? Andy Jones, NAG**
- 17:20 After-Meeting Socializing**

Welcome To The Second Day Of The HPC User Forum Meeting



Thank You To Our Sponsors!

- Cray
- IBM
- Intel
- Inspur
- Lenovo
- Tech Data
- Verne Global

Tuesday Agenda

- 9:00** Welcome: Bastian Koller, Paul Muzio, Earl Joseph and Steve Conway
- 9:15** EuroHPC and the European HPC Strategy, Leonardo Flores, European Commission
- 9:45** Update on Leibniz Supercomputing Centre of the Bavarian Academy of Sciences and Humanities (LRZ), Dieter Kranzlmüller
- 10:00** Intel Technical/Strategy Update, Johann Lombardi
- 10:15** Update on the Fortissimo Project, Mark Parsons, EPCC
- 10:45** Break
- 11:15** Automated Driving and AI in Urban Environments – Recap of September Meeting, Paul Muzio, Steve Finn
- 11:30** Verne Global Technical/Strategy Update
- 11:45** Use of HPC at Robert Bosch GmbH, Christoph Altman
- 12:15** Successful Use of HPC by SMEs and the Role of Training for Industrial Users, Andreas Wierse, Sicos BW
- 12:45** Inspur Technical/Strategy Update, Vangel Bojaxhi
- 13:00** EXCELLERAT: HPC Engineering in the Exascale Era, Bastian Koller, HLRS
- 13:30** Meeting Wrap Up and Plans for Future HPC User Forum Meetings

Tuesday Agenda

- 10:45 Break**
- 11:15 Automated Driving and AI in Urban Environments – Recap of September Meeting, Paul Muzio, Steve Finn**
- 11:30 Verne Global Technical/Strategy Update**
- 11:45 Use of HPC at Robert Bosch GmbH, Christoph Altman**
- 12:15 Successful Use of HPC by SMEs and the Role of Training for Industrial Users, Andreas Wierse, Sicos BW**
- 12:45 Inspur Technical/Strategy Update, Vangel Bojaxhi**
- 13:00 EXCELLERAT: HPC Engineering in the Exascale Era, Bastian Koller, HLRS**
- 13:30 Meeting Wrap Up and Plans for Future HPC User Forum Meetings**

Important Dates For Your Calendar

HPC USER FORUM MEETINGS:

- April 1 to 3, 2019, Santa Fe, New Mexico
- September 9 to 11, 2019, Chicago Illinois, Argonne National Laboratory

And Join us for the Hyperion SC18 Briefing:

- Tuesday, November 13, The Adolphus Hotel

Thank You To Our Sponsors!

- Cray
- IBM
- Intel
- Inspur
- Lenovo
- Tech Data
- Verne Global

**Thank You
For Attending The
HPC User Forum
Meeting!**



Questions?

Please email:

ejoseph@hyperionres.com

Or check out:

www.HyperionResearch.com

www.hpcuserforum.com

