Special Report

Summary of 2023 Published Research

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2023 RESEARCH YEAR IN REVIEW

2023 was an eventful year relative to activity across all dimensions of the HPC ecosystem. The research produced as part of our Continuous Information Service (CIS) subscriptions by the team of analysts at Hyperion Research covered many aspects of the activity and was driven by several elements:

- Thought-leadership documents to address key global advanced computing topics
- Enduring items such as new technologies, HPC sales, vendor market share data and 5-year HPC market forecasts
- Survey results and discussions with end-users and suppliers
- Planned research regarding technology adoption and forecast of HPC architectural elements, such as compute (e.g., CPUs, GPUs, FPGAs, bespoke silicon), external system interconnects (e.g., ethernet, InfiniBand), storage media (solid state, hard drive, tape), schedulers, and operating systems, to name a few
- Event-driven analysis to summarize key sessions at conferences and workshops (e.g., SC, ISC, HPC User Forum) or provide timely analysis of new announcements (e.g., acquisitions, exascale system acceptance, and intriguing innovation announcements)

The list of research published in 2023 is provided in Table 1.

In addition to these research reports, Hyperion Research also completed a number of custom study reports and presentations in 2023.

TABLE 1

Published CIS Research, Jan 2023-Dec 2023

Document Type	Title	Lead Analyst
Quick Take	AI-Specific Software Use is Low but Poised for Growth	Tom Sorensen
HYP_Link	€270 Million Pinned for RISC-V Based European HPC Ecosystem	Tom Sorensen
Research Agenda	Recently Published Research and Planned Research Topics for 2023	Mark Nossokoff
HYP_Link	IonQ Plans to Establish First Dedicated US-based QC Manufacturing Facility	Bob Sorensen
HYP_Link	U.S. and EU to Share AI Expertise to Solve Global Challenges	Tom Sorensen
Special Analysis	Forecast Update: GPU and Accelerator Growth in HPC	Melissa Riddle
Special Analysis	2022 HPC End Users Perspectives on AI, Big Data, and HPDA	Tom Sorensen
Special Analysis	2022 HPC End Users Perspectives on Processors, Coprocessors/Accelerators, and HPC Budgets	Bob Sorensen
Special Analysis	2022 HPC End Users Perspectives on Trends and Forecast in HPC Storage and Interconnects – Key Findings	Mark Nossokoff
Special Analysis	2022 HPC End Users Perspectives on Use of Public/External Clouds for HPC Workloads, Trends, and Drivers.	Mark Nossokoff
Quick Take	US QC Supplier Rigetti's Recent Realignment: Positing Its Larger Implications	Bob Sorensen
Special Analysis	Top 10 Predictions for the Global HPC Community in 2023	Mark Nossokoff
HYP_Link	EuroHPC JU Fortifies Goal of Post-exascale Era Leadership	Mark Nossokoff
HYP_Link	US DOE Funds Pathfinder Program for QC Assessment Research Ideas	Bob Sorensen
Special Analysis	2022 HPC End Users Perspectives on Vertical/Application Workload Areas and HPC System Software and Middleware	Melissa Riddle
Special Study	Perspectives on Sustainability in HPC: Current Views and Future Considerations	Jaclyn Ludema
Quick Take	AI Workloads Dominate Cloud Cycles Among HPC Users	Tom Sorensen
Special Analysis	Summary of QC Cloud Access Offerings: Scoping the Wide Range of QC Providers, Technology Options, and Pricing Schemes	Bob Sorensen
HPC User Forum Update	Quantum Science Center Update: Quantum Enabled Science is Rapidly Approaching	Tom Sorensen
Special Report	Recent HPC-centric AI Success Stories	Tom Sorensen

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Special Report	Perspectives on Composable Systems and HPC/AI Architectures and How They May Fit in the HPC Market	Mark Nossokoff
Special Study Results	49% of HPC Sites Indicate That AI Expertise Is the Number One Barrier to Increased AI Adoption and Usage	Tom Sorensen
Special Study Results	Cloud Resources are Employed at Nearly Half of HPC Sites and are Expected to Gain Additional Popularity	Jaclyn Ludema
Special Study Results	Programming Languages Becoming More Ubiquitous: Most HPC Sites Use C/C++ and Python	Melissa Riddle
Special Study Results	GPUs Stand Out as Planned Processor Element at a Rate of 74%	Tom Sorensen
Special Study Results	Cloud Adoption is Impacting On-Premises HPC Spending	Mark Nossokoff
Special Study Results	Expertise is a Major Concern for Both HPC and AI Users	Melissa Riddle
Special Study Results	Slurm Remains Top Resource Manager	Melissa Riddle
HPC User Forum Update	Leveraging Advanced Computing to Achieve Fusion Power at the Princeton Plasma Physics Laboratory	Tom Sorensen
Special Study Results	HPC Users Express Mixed Optimism Towards Adopting Edge Computing	Melissa Riddle
Special Study Results	Application Scaling for Typical HPC Site Covers Broad Range from Single-Core to Multi-Node	Melissa Riddle
Special Study Results	HPC Users Willing to Pay 10-15% Premium for Faster, Higher Performance Processors and Larger, Faster Memory	Melissa Riddle
Special Study Results	Tape-based Storage Remains as a Key Element for On-Premises Storage Strategies	Mark Nossokoff
Special Study Results	System Interconnect Architectures are Expected to Shift with Future HPC Procurements	Mark Nossokoff
Special Study Results	More Sites are Employing Multiple CSPs	Mark Nossokoff
HYP_Link	HPE GreenLake Partners with AWS for Seamless Hybrid Clouds	Melissa Riddle
Special Study Results	Frameworks Used for AI, ML, DL, and HPDA Workloads	Jaclyn Ludema
HPC User Forum Update	Massive Galaxy Scale Simulations Present Unique Compute Demands	Tom Sorensen
HYP_Link	HPE Enters Public AI LLM Cloud Market with HPE GreenLake	Mark Nossokoff

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HYP_Link	First European RISC-V Summit Sees IBM, BSC “Future of Computing” Agreement	Tom Sorensen
Special Study Results	HPC System Processor Preference: x86 Continues to Dominate	Melissa Riddle
Special Study	HPC Profiles in Leadership: Barcelona Supercomputing Center	Mark Nossokoff
Special Study Results	Professional Services Make Up a Sizable Portion of Overall HPC Budgets	Jaclyn Ludema
Quick Take	2022 Year-End Worldwide HPC On-premises Market Closes at $30.8B, with Servers Representing Half of the Broader Market	Mark Nossokoff
HYP_Link	RISC-V Gains Ground with New Qualcomm Joint Venture	Tom Sorensen
HYP_Link	A Standardized Ethernet for At-Scale HPC and AI Ecosystems	Mark Nossokoff
Quick Take	2022 HPC Market Results and a Historical View of the HPC Server Market by Region, 2017-2022	Melissa Riddle
Market Forecast	Worldwide HPC Server Market Forecast Update, 2022-2027	Melissa Riddle
HYP_Link	IBM and NASA Create Open-Source Climate Foundation Model	Tom Sorensen
HYP_Link	Broad Collaboration Enables Environmental Intelligence Research on Derecho at NCAR-Wyoming Supercomputer Center	Mark Nossokoff
HYP_Link	atNorth Recognized for Innovative Approach to Energy Innovation and Sustainable Building Design	Jaclyn Ludema
HYP_Link	EuroHPC JU Issues €30M Call for SME HPC Competitiveness	Tom Sorensen
HYP_Link	Open Source Community Affirms Commitment to RHEL Compatibility and Linux Source Code Access	Melissa Riddle
Quick Take	Historical View of the HPC Server Market by Vendor, 2017- 2022	Bob Sorensen
Quick Take	Historical View of the HPC On-Premises Server Market in Processors Installed, 2017-2022	Melissa Riddle
Quick Take	Historical View of the HPC Server Accelerators Market, 2017- 2022	Tom Sorensen
Quick Take	Historical View of the On-Premises HPC Server Market by Competitive Segment, 2017-2022	Melissa Riddle
Special Analysis	HPC Cloud Resources Have Become a Viable Tool for Running Many Large-scale Scientific Research Workloads	Mark Nossokoff

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Document Type	Title	Lead Analyst
Market Forecast	Worldwide HPC Server Market Forecast by Competitive Segment, 2022-2027	Melissa Riddle
Market Forecast	Worldwide HPC Server Market Forecast by Geographic Region, 2022-2027	Melissa Riddle
Quick Take	Motivators and Limitations for HPC Cloud Users	Melissa Riddle
Quick Take	HPC Workload Trends: Modeling and Simulation Still Leads On-Premises While AI Leads in the Cloud	Melissa Riddle
Quick Take	Global Cloud Market Shares for HPC/AI-HPDA Workloads Dominated by Top Three CSPs	Melissa Riddle
HYP_Link	Intel Developer Cloud Available for Public Beta Evaluation	Melissa Riddle
Special Report	HPC Profiles in Leadership: DUG Technology	Mark Nossokoff
Forecast Document	Worldwide HPC in the Cloud Forecast, 2022-2027	Mark Nossokoff
Forecast Document	Worldwide On-Premises HPC Server Market Forecast by Vertical, 2022-2027	Jaclyn Ludema
HPC User Forum Update	DiRAC UK HPC – Application Driven Distributed Facility	Tom Sorensen
HPC User Forum Update	Reflections on the Exascale Era with Doug Kothe	Tom Sorensen
Special Report	Perspectives from SC23	Mark Nossokoff

Source: Hyperion Research, 2024

FUTURE OUTLOOK

Hyperion Research expects 2024 to be just as eventful, if not more so, than 2023. Themes expected to be covered by the analyst team in 2024 include:

- Market data for advanced computing infrastructure
- Evolving nature of the cloud, including both accelerating growth of users' adoption of the cloud and an increasing number of ways users are accessing and managing their cloud resources
- Sustainability and energy efficiency
- Growing pervasive use of AI, including HPC-enabled AI and AI-enabled HPC, HPDA, big data, and data analytics
- Quantum computing and technologies

- Importance of storage and interconnects in deployment and optimization of HPC infrastructure
- Emerging technologies that could have a lasting impact on HPC architectures
- New exascale systems and their applications
- Vertical application software
- Key areas for industry sector sites to consider in planning for new procurements

Look for more details for 2024 in the soon-to-be published Hyperion Research 2024 Research Agenda.

About Hyperion Research, LLC

Hyperion Research provides data-driven research, analysis and recommendations for technologies, applications, and markets in high performance computing and emerging technology areas to help organizations worldwide make effective decisions and seize growth opportunities. Research includes market sizing and forecasting, share tracking, segmentation, technology and related trend analysis, and both user & vendor analysis for multi-user technical server technology used for HPC and HPDA (high performance data analysis). Hyperion Research provides thought leadership and practical guidance for users, vendors, and other members of the HPC community by focusing on key market and technology trends across government, industry, commerce, and academia.

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