



HYPERION RESEARCH

HPC Applications and Verticals

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www.HyperionResearch.com
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Melissa Riddle

Applications and Verticals Forecasts



HPC Applications and Middleware Revenue Forecast

HPC applications and middleware revenue expected to collectively exceed \$9 billion by 2027

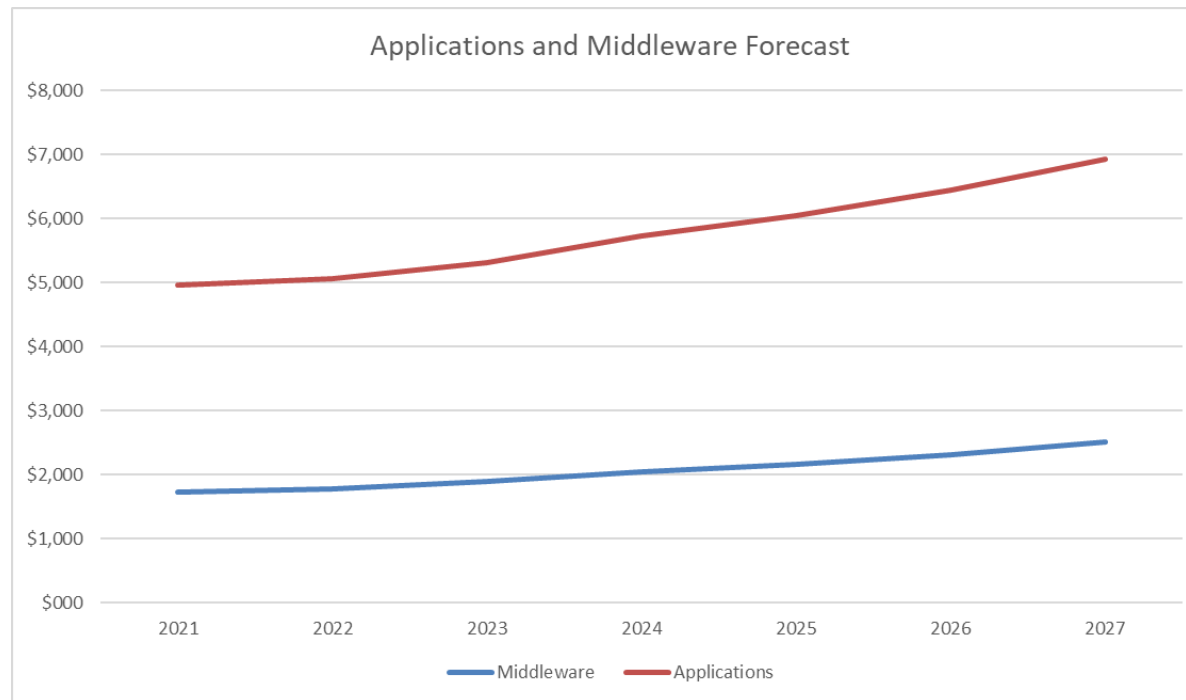
- **Today, applications (e.g., ISV software) and middleware (e.g., compilers, schedulers) make up 22% of the HPC on-premises broader market**
- **Middleware growth (7.0% CAGR) is expected to slightly outpace applications growth (6.5% CAGR)**
 - Both are expected to grow slightly slower than the market writ large (7.6% CAGR)

Revenues by the Broader HPC Market Areas								
	2021	2022	2023	2024	2025	2026	2027	CAGR 22-27
Server	\$14,781	\$15,369	\$16,486	\$18,113	\$19,369	\$20,894	\$22,586	8.0%
Storage	\$5,985	\$6,380	\$6,924	\$7,759	\$8,434	\$9,161	\$10,007	9.4%
Middleware	\$1,733	\$1,781	\$1,887	\$2,049	\$2,160	\$2,316	\$2,503	7.0%
Applications	\$4,960	\$5,069	\$5,320	\$5,729	\$6,045	\$6,446	\$6,935	6.5%
Service	\$2,272	\$2,214	\$2,220	\$2,286	\$2,323	\$2,344	\$2,508	2.5%
Total Revenue	\$29,731	\$30,813	\$32,836	\$35,936	\$38,331	\$41,161	\$44,539	7.6%
Source: Hyperion Research, November 2023								

HPC Applications and Middleware Revenue Forecast (cont'd.)

HPC applications and middleware revenue expected to collectively exceed \$9 billion by 2027

- **Applications software represents the majority of these revenues at \$6.9 billion in 2027**



HPC Server Forecast by Vertical

Most verticals expected to exceed \$1B in servers each annually by 2027

- **Fastest growing verticals include Other, Weather, CAE, Geosciences, University/Academic, and Bio-Sciences**

2022-2027 HPC Server Forecast by Vertical (\$M)			
	2022	2027	CAGR 22-27
Bio-Sciences	\$1,443	\$2,132	8.1%
CAE	\$1,760	\$2,830	10.0%
Chemical Engineering	\$172	\$247	7.5%
DCC & Distribution	\$822	\$1,187	7.6%
Economics/Financial	\$755	\$1,071	7.2%
EDA / IT / ISV	\$870	\$1,205	6.7%
Geosciences	\$992	\$1,490	8.5%
Mechanical Design	\$57	\$75	5.9%
Defense	\$1,597	\$2,259	7.2%
Government Lab	\$3,324	\$4,438	6.0%
University/Academic	\$2,648	\$3,972	8.4%
Weather	\$697	\$1,183	11.1%
Other	\$232	\$495	16.3%
Total Revenue	\$15,369	\$22,586	8.0%
Source: Hyperion Research, November 2023			

HPC Verticals Forecast

Looking at the total HPC broader market (including cloud), most verticals represent over \$1B each today

- **The largest verticals are driven by on-premises revenues: Government Lab, University/Academic, CAE, Bio-Sciences, and Defense**

2022 HPC Revenues by Vertical (\$M)				
	On-Premises Servers	On-Premises Broader Market	Cloud	Total HPC (On-Premises + Cloud)
Bio-Sciences	\$1,443	\$2,892	\$1,557	\$4,450
CAE	\$1,760	\$3,530	\$1,289	\$4,818
Chemical Engineering	\$172	\$345	\$154	\$499
DCC & Distribution	\$822	\$1,648	\$347	\$1,995
Economics/Financial	\$755	\$1,513	\$398	\$1,911
EDA / IT / ISV	\$870	\$1,744	\$443	\$2,187
Geosciences	\$992	\$1,989	\$403	\$2,392
Mechanical Design	\$57	\$113	\$27	\$141
Defense	\$1,597	\$3,201	\$471	\$3,672
Government Lab	\$3,324	\$6,665	\$443	\$7,107
University/Academic	\$2,648	\$5,308	\$276	\$5,585
Weather	\$697	\$1,398	\$184	\$1,582
Other	\$232	\$466	\$141	\$607
Total Revenue	\$15,369	\$30,813	\$6,132	\$36,945

Source: Hyperion Research, November 2023

HPC Verticals Forecast (cont'd.)

All verticals now expect higher growth in the cloud than their respective on-premises growth rates

- **Fastest growing verticals include Other, Weather, CAE, Geosciences, and Economics/Financial**

2022-2027 Forecasted Growth Rates by Vertical				
	On-Premises Servers	On-Premises Broader Market	Cloud	Total HPC (On-Premises + Cloud)
Bio-Sciences	8.1%	7.8%	12.6%	9.6%
CAE	10.0%	9.6%	18.5%	12.3%
Chemical Engineering	7.5%	7.2%	11.7%	8.7%
DCC & Distribution	7.6%	7.3%	16.1%	9.0%
Economics/Financial	7.2%	6.9%	21.2%	10.5%
EDA / IT / ISV	6.7%	6.4%	17.1%	8.9%
Geosciences	8.5%	8.1%	21.6%	10.9%
Mechanical Design	5.9%	5.6%	10.6%	6.6%
Defense	7.2%	6.8%	18.3%	8.6%
Government Lab	6.0%	5.6%	25.0%	7.3%
University/Academic	8.4%	8.1%	14.7%	8.5%
Weather	11.1%	10.8%	29.7%	13.7%
Other	16.3%	16.0%	25.3%	18.4%
Total Revenue	8.0%	7.6%	18.1%	9.7%

Source: Hyperion Research, November 2023

Applications and Verticals Trends



Applications Trends

Software opportunities and challenges

- **Increased cloud adoption increases concern about software licensing terms**
 - HPC users continue to report that application availability and/or pricing is a significant limitation on cloud growth
 - Users are likely to select schedulers with favorable licensing terms both on-premises and in the cloud (e.g., SLURM)
- **Operating system upheaval continues with rippling effects from Red Hat's CentOS evolution**
 - Some end users evaluating multiple operating systems
 - Has led to the development of open source partnerships, an outpouring of pledges, etc.

Verticals Trends: AI Adoption

Verticals with highest rates of AI adoption include DCC, Government Lab, Bio-Sciences, and Defense

- **Verticals with highest AI revenues include Government Lab, University/Academic, Defense, and Bio-Sciences**

2022 AI HPC Revenues by Vertical (\$M)					
	All HPC Servers	HPC AI Servers	Vertical as % of HPC	Vertical as % of AI	AI as % of HPC
Bio-Sciences	\$1,443	\$215	9.4%	12.5%	14.9%
CAE	\$1,760	\$110	11.5%	6.4%	6.2%
Chemical Engineering	\$172	\$17	1.1%	1.0%	10.0%
DCC & Distribution	\$822	\$178	5.3%	10.3%	21.6%
Economics/Financial	\$755	\$48	4.9%	2.8%	6.4%
EDA / IT / ISV	\$870	\$23	5.7%	1.4%	2.7%
Geosciences	\$992	\$28	6.5%	1.6%	2.8%
Mechanical Design	\$57	\$	0.4%	0.0%	0.0%
Defense	\$1,597	\$217	10.4%	12.6%	13.6%
Government Lab	\$3,324	\$580	21.6%	33.8%	17.4%
University/Academic	\$2,648	\$257	17.2%	15.0%	9.7%
Weather	\$697	\$30	4.5%	1.7%	4.3%
Other	\$232	\$15	1.5%	0.9%	6.4%
Total Revenue	\$15,369	\$1,718	100.0%	100.0%	11.2%

Source: Hyperion Research, November 2023

Questions?



mriddle@hyperionres.com