



Get Your Organization Ready To Capitalize On Cloud HPC Benefits

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FORRESTER OPPORTUNITY SNAPSHOT: A CUSTOM STUDY COMMISSIONED BY RESCALE | JUNE 2021

Accessible High-Performance Computing Powers Differentiation Across Industries

Companies across every industry increasingly rely on compute-intensive scenarios like complex simulations, data analytics, and AI to drive competitive advantage. High-performance computing (HPC) is generally the best solution for these calculations. However, attaining the capital to purchase the supporting infrastructure make this avenue unattainable to most companies. More recently, private and public cloud vendors have added HPC-specific instances and services. In doing so, these same companies are making this critical technology more accessible and affordable.¹

Still even with access to HPC, organizations must also consider other challenges this solution brings forth. This includes security concerns, varying workload and app requirements, and different performance levels, which often determine the success of HPC implementations.

Key Findings



Organizations across verticals turn to HPC to address multiple scenarios, including predictive analytics, supply chain and logistics, complex simulations, and R&D.



Decision-makers must carefully plan for challenges around data security, compliance, workload requirements, provider choice, and performance to maximize implementation benefits.



Leveraging best practices as well as external partner guidance, expertise, and quality control will differentiate more successful cloud HPC deployments.

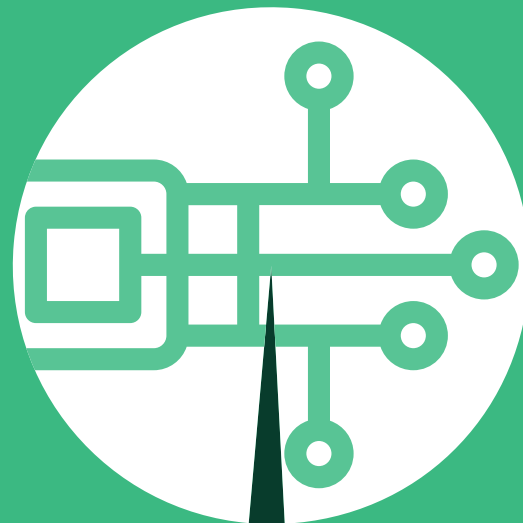
HPC Addresses Multiple Business Challenges

HPC's maturity and accessibility has spurred growth in new use cases beyond the traditional segments of genetics, government, military, and academia. Its massive computational resources fuel new applications and use cases across verticals.² This study demonstrates that multiple HPC use cases are emerging beyond its traditional segments.

Most respondents in this study (98%) were overwhelmingly likely to use HPC as a solution to address multiple business challenges. Common use cases include predictive analytics, supply chain and logistics, complex simulations, and R&D.

“Which of the following statements describes your organization’s use of HPC today?”

98% HPC is deployed more broadly to solve multiple business challenges, rather than for one specific use case.



2% HPC is deployed for one specific use case/ none of the above.

Substantial Demand Exists For Cloud HPC

In recent years, the onslaught of HPC-specific services and capabilities from hyperscalers has allowed organizations to run HPC workloads in a public cloud environment without the need for massive infrastructure spending. The availability of these services has also spurred an expansion of HPC adoption. Respondents who have experienced the benefits of HPC indicate demand for cloud HPC remains robust.

Overall, 99% of respondents indicated their organizations are open to shifting more HPC workloads to the cloud. The respondents highlighted several factors that will enable this shift, including an expansion of HPC services in cloud environments, the ability to access workload automation management solutions across their organizations' tool set, the availability of turnkey hybrid and multicloud platforms, and greater flexibility to choose hardware and tools that fit their organizations' specific use.

“Which of the following would make your organization more likely to shift HPC workloads/ environments to the cloud?”

The availability of more HPC services in cloud environments

54%

The ability to access workload automation management solutions across our toolset

46%

Turnkey hybrid and multicloud platforms

46%

The ability to access specialized architectures in the cloud

46%

The flexibility to choose specialized hardware and tools specifically suited to our use case(s)

45%

The availability to leverage burst capacity

35%

Being able to shift capital expenditures (capex) to operational expenditures (opex)

25%

Nothing would make us more likely to shift HPC workloads/ environments to the cloud.

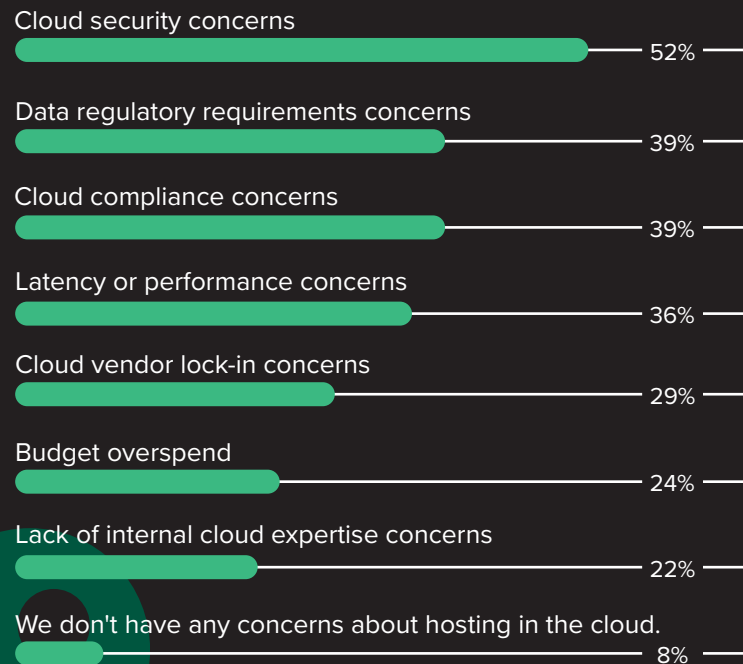
1% Δ 99%

Remember To Address Security, Compliance, And Performance Concerns

Demand is accelerating for cloud HPC today, but decision-makers must contend with some concerns. Respondents indicated their organizations are focused on three primary perceived risks of cloud HPC: 1) security concerns, 2) regulatory and compliance requirements, and 3) latency performance. Only 8% of respondents indicated their organizations had no concerns hosting HPC workloads in the cloud.



“Which of the following concerns about hosting HPC workloads/environments in the cloud do you agree with?”

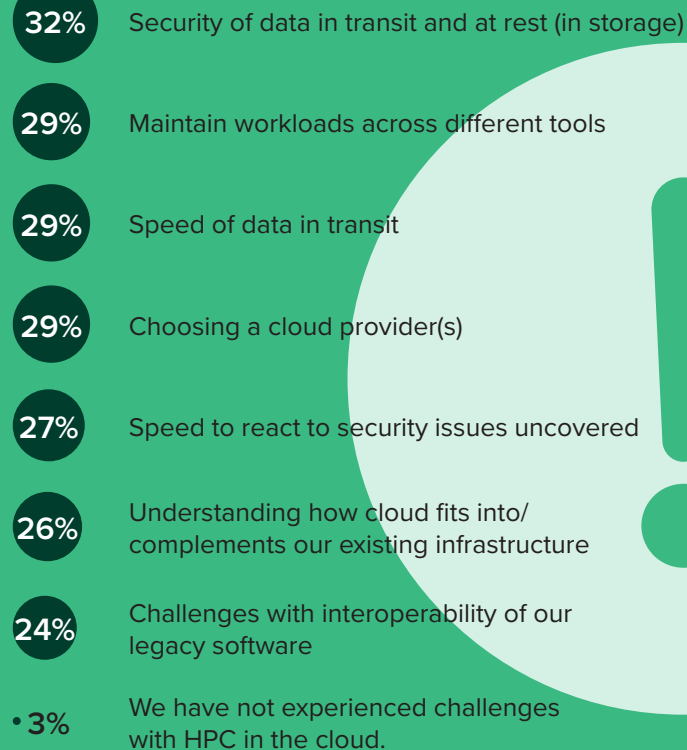


Collaborate With Security Teams To Mitigate Vulnerabilities

About a third of respondents reported experiencing an issue with the security of their organizations' data in rest and in transit. This number was slightly more than the rate at which their organizations ran into issues around maintaining workloads across diverse tools, speed of data in transit, and the general complication of choosing the most appropriate cloud provider for HPC workloads.

Forrester recommends that organizations work with security and compliance peers to ensure governance plans are properly implemented. Before migration, organizations also need to fully understand app requirements. Applications that are sensitive to performance, latency, or require frequent and large data transfer requirements are often poor candidates for migration.³

“Which of the following challenges has your organization experienced with HPC in the cloud?”



Get Ahead Of HPC Concerns Before They Become Business Problems

HPC unlocks tremendous opportunity for organizations, but also requires careful consideration of security, workload requirements, and speed. Failing to consider and address these areas can result in unsuccessful — or even disastrous — results.

When asked which challenges would occur if HPC was not used, respondents said that lower operational efficiency (32%), greater risk of security breaches (31%), and longer product innovation cycles (31%) were potential outcomes. Other challenges included lower revenue performance (27%), the inability to use specialized architectures (27%), and more. Overall, 90% of respondents agreed that failing to address cloud HPC challenges would result in at least one of these issues.

“Which of the following would occur if your organization couldn’t solve for challenges with HPC in the cloud?”



32% Lower operational efficiency

Security breaches/lapses 31%



31% Slower product innovation

Lost revenue opportunities 27%



27% Inability to effectively leverage specialized architectures

Less flexible infrastructure 24%



23% Inhibiting digital transformation initiatives

Cost overruns 23%

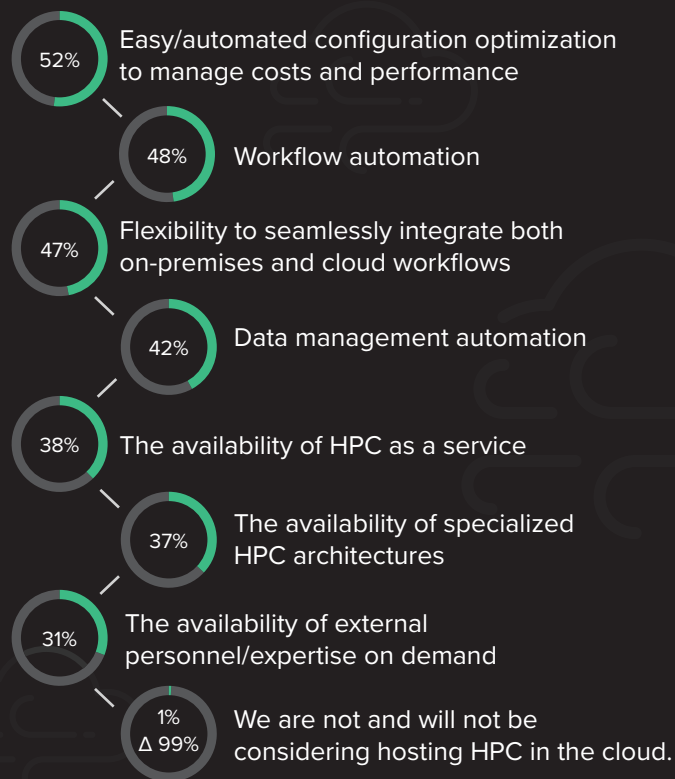


Easy Management, Integration, And Availability Drive Cloud HPC Adoption

While HPC in the cloud is an attractive alternative to on-premises, many organizations are hesitant to adopt. Survey respondents considering cloud HPC highlighted several factors that would lower the barrier.

Decision-makers want automation and easy configuration management for costs and performance. They also seek workflow automation and flexibility for seamless integration between on-premises and cloud workflows. Nearly one-third of respondents specified that the availability of external expertise would help their organizations deliver more effective cloud HPC implementations as well.

“Which of the following would be most helpful to your organization as it considers hosting HPC in the cloud?”



Effective Cloud HPC Implementation Delivers Business And Technical Benefits

HPC's ability to quickly identify answers to data-heavy, highly complex problems drives differentiation and success. This computational power, combined with the scalability of cloud, is spurring growth in adoption of cloud HPC across industries.⁴ Still, these benefits are only fully realized with an effective HPC cloud implementation.

Benefits that survey respondents anticipated from an effective implementation include better overall performance, improved operational efficiency, and faster product innovation, along with more effective digital transformations, better cost control, and improved security.

“Which of the following would result from an effective HPC cloud implementation?”



Conclusion

As cloud HPC grows in traction, decision-makers will find it harder to stay on-premises. Most organizations realize its benefits, but are unsure of how to achieve effective implementation. Rigorous course planning is required for cloud HPC success. Companies must evaluate and establish an effective governance and security plan, remain cognizant of application requirements for workload placement, and ensure seamless integration between on-premises and cloud environments for effective operation.

Executing these tasks is incredibly difficult. Fortunately, tech leaders can receive assistance. They can use services providers for support teams and guidance to make the right selection. These external services can guide previously on-premises teams on HPC best practices and quality control with each workflow and consideration.

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Methodology

This Opportunity Snapshot was commissioned by Rescale. To create this profile, Forrester Consulting supplemented this research with custom survey questions asked of IT, engineering, and R&D decision-makers at global enterprises. The custom survey began and was completed in April 2021.

ENDNOTES

¹Source: "Fire Up Cloud-Based High-Performance Computing To Stoke Innovation," Forrester Research, Inc., November 23, 2020.

²Ibid.

³Ibid.

⁴Ibid.

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Demographics

GEOGRAPHY

North America (44%)

Europe (56%)

REVENUE

\$500M to \$999M (25%)

\$1B to \$5B (65%)

More than \$5B (10%)

DEPARTMENT

R&D (48%)

IT (41%)

Engineering (11%)

TITLE

C-level executive (21%)

Vice president (24%)

Director (55%)



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