

A Forrester Consulting  
Thought Leadership Paper  
Commissioned By Dell Technologies  
and Intel

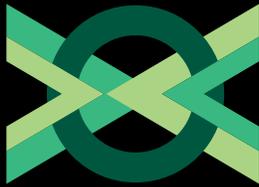
August 2020

# AI, HPC, And Cloud: A Spotlight On SMB

Small And Medium-Sized Business Results  
From The August 2020 Thought Leadership  
Paper, “Hybrid Cloud: A Smart Choice For HPC  
And AI”



SMBs are working to harness the power of cloud for HPC and AI workloads.



Running HPC and AI in a hybrid environment drives significant business benefits.

## Introduction

Historically, small and medium-sized businesses have not had the budgets to take advantage of high-performance computing (HPC). The law of HPC maintains that the more compute power you can afford, the faster you can generate results. As a result, the traditional HPC investment model can be a long-term commitment with considerable upfront and ongoing costs.<sup>1</sup> SMBs often don't have the resources to support this large commitment, but that doesn't mean they don't have the data and analytical needs that HPC — which is often used to train AI models — can help solve. Happily, cloud computing with its ability to allow companies to pay for capacity when it's needed without huge startup costs is starting to change this. Small and medium businesses can now increase their computing power and level up their analytical decision making.

Dell Technologies and Intel commissioned Forrester Consulting to understand how cloud is being used to run HPC and AI workloads at small and medium-sized organizations. To do so, Forrester conducted an online survey with 221 IT decision makers at companies of between 100 and 500 employees across the globe.

### KEY FINDINGS

- › **SMBs take advantage of cloud to improve business.** SMBs understand the power of cloud computing to transform their businesses as nearly half of respondents said their organization currently uses cloud to modernize apps, infrastructure, and processes as a means to fundamentally change their business model and operations. Though there are certainly SMBs using cloud to simply extend capabilities or make incremental tactical improvements, very few lack a formal cloud strategy altogether. Overall, these smaller businesses recognize the power of cloud and are taking advantage of the potential benefits.
- › **Efficient infrastructure utilization drives the move to cloud for data-intensive workloads.** Though HPC and AI services are mostly run on-premises today, there will be a move towards both public and private cloud within the year. Driven by a desire to make the most efficient use of currently available infrastructure options, most organizations will work with a hybrid and/or multicloud environment moving forward.
- › **Cost is a big factor for SMBs when it comes to HPC.** Though respondents reported struggling with several issues — mainly with security, data latency, performance, and application architecture — SMB teams are particularly attuned to the costs involved in this work. Often dealing with less generous budgets than their enterprise colleagues, SMB respondents said they focus on balancing the costs and benefits of moving workloads to the cloud.
- › **Hybrid is a smart way forward.** IT teams are making infrastructure decisions based on various business and application requirements to optimize performance. The good news? HPC and AI workloads running in hybrid environments lead to a slew of business benefits that both help teams overcome the challenges they face and drive bottom-line growth.

# Cloud Makes HPC And AI Possible For SMBs

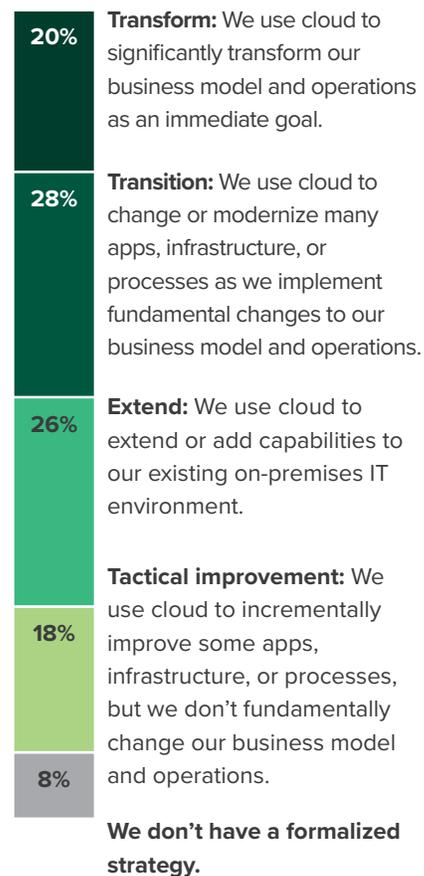
Smaller budgets don't equal smaller business problems. Small and medium businesses are still tasked with making the best use of massive amounts of data and expanding data-driven decision making throughout the organization. To do this, many are turning toward AI. In fact, the use of AI and machine learning (ML) are on the rise: 90% of SMB respondents said their company will access AI capabilities in some way this year, and 75% said their organization either plans to or is already training employees on these technologies.<sup>2</sup>

All of this advanced analysis requires a modern IT infrastructure. Eighty-seven percent of SMB respondents said their organization's AI initiatives increase the need to modernize servers and HPC while 71% said the same for hybrid cloud infrastructure. This begs the question of how and why cloud computing is being leveraged to run these workloads. Our study shows:

- › **SMBs make extensive use of cloud to elevate the business.** SMB IT teams use cloud in a variety of ways (see Figure 1). Though some of these firms use cloud to tactically improve certain aspects or simply lack a formal strategy entirely, most organizations are more advanced. More than half of the respondents said their organization leverages cloud to add capabilities to their on-premises environment or to modernize existing infrastructure in support of more fundamental changes to operations in the future. One-fifth said their organization has managed to significantly transform via the use of cloud, a state which Forrester would consider the most mature.
- › **Efficiency drives the move to cloud.** SMB respondents said their organizations largely run HPC or AI workloads on-premises. However, there will be a clear shift to cloud within 12 months: 39% of respondents said their firm plans to run HPC services in public cloud (a 16% increase) in the coming year while 38% said their organization plans to run AI/ML on private cloud (9% increase). This move is overwhelmingly driven by the desire to efficiently utilize infrastructure.
- › **Hybrid is the new reality.** The move to cloud is not a move entirely away from other deployments. The truth is that most firms today pursue a mix of public and private cloud environments based on application and business requirements. Hybrid extension — a cloud strategy wherein an application and all its data are left in place while new modules and/or data are added in the cloud — is most commonly used for both AI and HPC applications. Our study also found that respondents' teams most often deploy their AI technologies in a hybrid environment during exploratory and development (28%), testing (31%), and production (31%). Furthermore, just under one-fifth of respondents said their firm deploys these workloads in multiple clouds across all stages of the AI lifecycle.

Figure 1

“Which of the following statements most closely describes your organization's use of cloud platforms today?”



Base: 221 global decision makers on IT infrastructure cloud strategies, high-performance computing strategies, or AI strategies at organizations of less than 500 employees  
Source: A commissioned study conducted by Forrester Consulting on behalf of Dell and Intel, June 2020

# Hybrid Cloud Helps Ease HPC And AI Challenges For SMBs

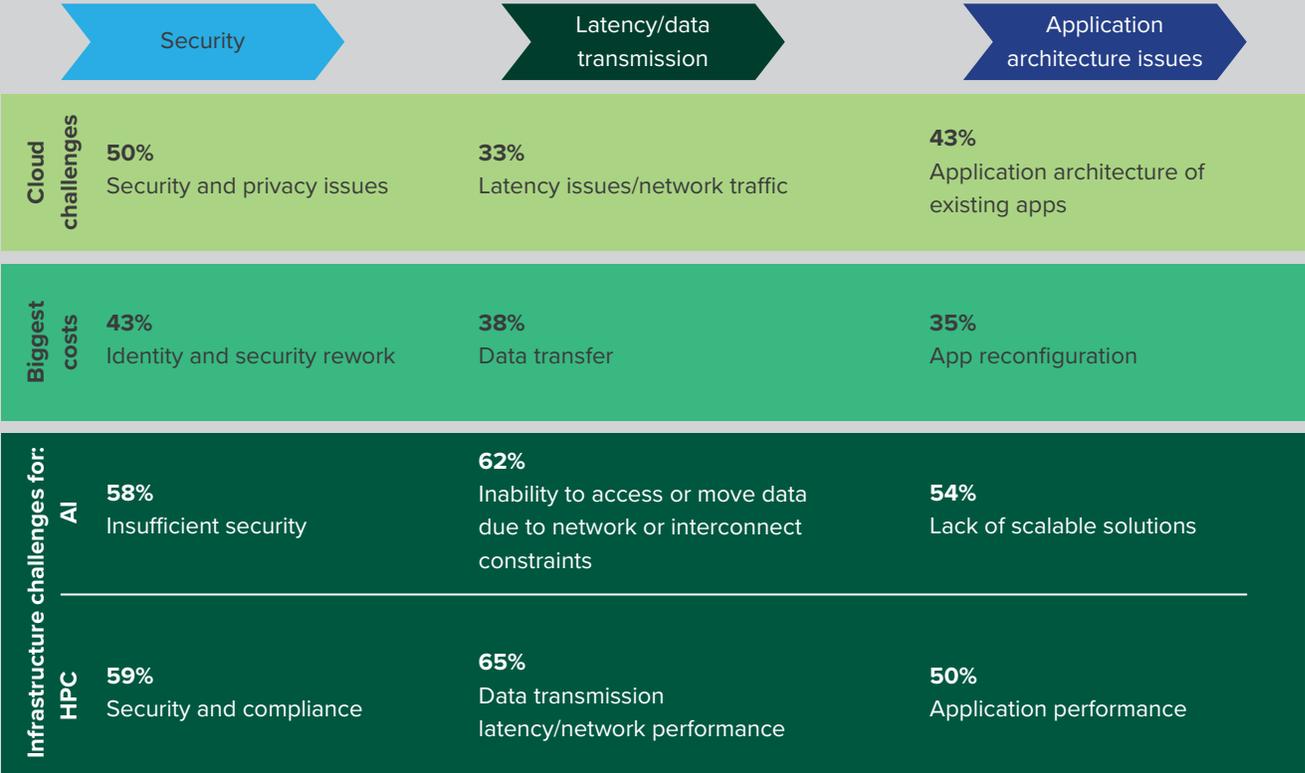
The move to cloud comes with its fair share of challenges. Cloud migration forces firms to reassess and update existing processes and applications, and it requires ample foresight to plan ahead for application growth and scale.<sup>3</sup> SMB decision makers struggle while trying to maintain strict security and privacy protocols, contending with latency and performance issues while moving data, and reworking applications to maintain peak performance and achieve desired scale (see Figure 2).

Decision makers at small businesses are also very concerned with costs. In addition to the costs that result from the above challenges, 61% of respondents said their teams struggle with infrastructure cost and cost transparency when implementing HPC workloads on cloud, and 58% find system costs when implementing AI workloads to be challenging. Data uplink and downlink costs are also an issue for 40% of respondents. Those from smaller organizations are particularly concerned with optimizing costs. When determining cloud strategies for AI, 64% of respondents noted the importance of cost optimization, making it the top criteria they use.



Within three years, 45% of small and medium-sized businesses expect a positive boost of more than 5% to their bottom lines from cloud migration.

**Figure 2**  
Key Challenges To Executing AI And HPC In The Cloud



Base: 221 global decision makers on IT infrastructure cloud strategies, high-performance computing strategies, or AI strategies at organizations of less than 500 employees  
Source: A commissioned study conducted by Forrester Consulting on behalf of Dell and Intel, June 2020

But despite the costs, organizations are starting to see returns from their time and effort. Sixty-four percent of SMB respondents reported a positive financial impact on their organization's bottom line from migrating some workloads to the cloud. This is only going to get more profitable: Eighty-two percent expect a positive return within three years.

### DRIVE BUSINESS BENEFITS WITH HYBRID CLOUD

These positive returns are a result of the benefits cloud can provide. After moving workloads to public cloud, SMB respondents said their organization experienced benefits like higher developer satisfaction (36%) and greater agility to respond to workload demands quickly and easily. Most often, IT departments found themselves freed from the demands of data center management, allowing them to focus their time and energy on strategic projects (38%).

Running AI and/or HPC workloads specifically in a hybrid cloud environment provides its own unique set of benefits (see Figure 3). Some of these benefits — like lower compute and storage costs (28%), improved security and compliance (31%), and improved app and infrastructure performance (40%) — can help alleviate some top challenges. Hybrid cloud is specifically helpful for easing SMBs' cost concerns: 33% of respondents said their organization experienced better IT cost management overall. Importantly, a hybrid strategy delivers on a SMB's initial reason for moving to cloud in the first place: 38% of respondents said their organization saw improved IT infrastructure management and flexibility. In general, if small and medium-sized businesses want to take advantage of the benefits that HPC and AI have to offer without investing too much up front, running these workloads in a hybrid environment is a smart choice.

Figure 3

#### Top benefits from running AI and/or HPC workloads in a hybrid cloud environment



Base: 221 global decision makers on IT infrastructure cloud strategies, high-performance computing strategies, or AI strategies at organizations of less than 500 employees

Source: A commissioned study conducted by Forrester Consulting on behalf of Dell and Intel, June 2020

# Key Recommendations

Traditionally, setting up high-performance computing infrastructure has been capital-intensive. In recent years, with the cost benefits brought on by Moore's Law, as well as the advanced services that public cloud vendors now offer, HPC in the cloud is not only a viable option for organizations of any size, but it can also offer significant advantages that include freeing up IT support resources to focus on innovation.<sup>4</sup> However, the right approach will require a systematic approach from planning to operations. With the advent of robust cloud options and services, fewer reasons remain for keeping all AI and HPC applications on-premises.

Forrester's in-depth survey yielded the following important recommendations:



## **Consider cost, latency, and data gravity as the core deciding factors.**<sup>5</sup>

HPC and AI workloads are resource intensive. They require specialized infrastructure including support from graphic processing units and high-speed storage as well as innovative software approaches. Whether you are experimenting with AI workloads or you already have an HPC environment and are expanding further, establish a clear framework centered around data gravity and internal cloud readiness for assessing the right approach for cloud usage. Unlike regular workloads, HPC and AI workloads attract associated applications and large amounts of analytical data quickly towards itself, eventually making any further migration efforts cost prohibitive.



**Adapt your architecture to the hybrid cloud.** Data from this survey emphasized that a hybrid cloud approach not only addresses the top concerns of organizations with regards to HPC on the cloud, but it also forces digital transformation through a cloud-first approach in application development. An all-cloud strategy for AI and HPC workloads can significantly skew the economic benefits in the long term unless justified by a lack of scalability requirements or network access. With the advent of mature HPC virtual machine orchestration engines and reliable data center interconnection networks, a hybrid approach offers the best of both worlds.

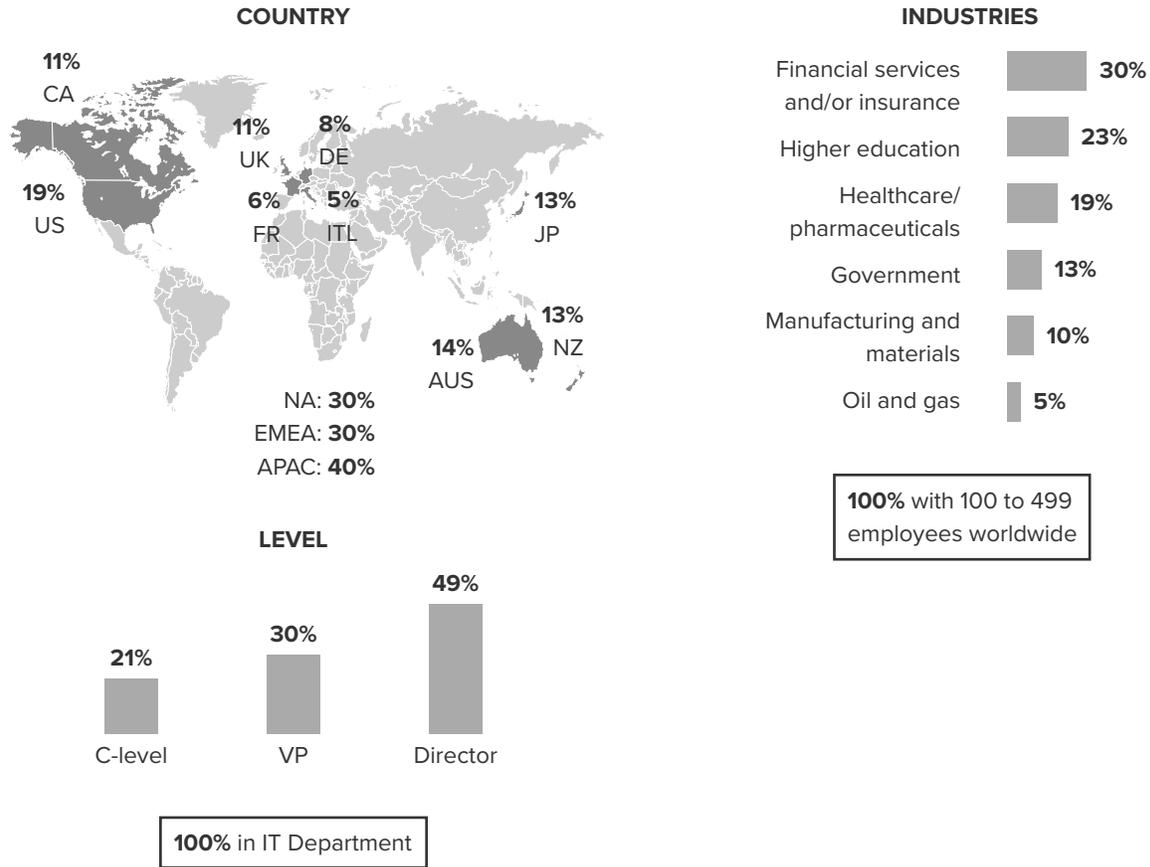


**Empower teams with the right tools and guidelines.** Infrastructure and operations leaders must empower AI/HPC teams with guidance on how to use cloud platforms safely, sustainably, and cost-effectively. To do this, develop governance guidelines and training that prepare IT staff to leverage the cloud responsibly and productively. Pay special attention to security needs of sensitive analytical workloads. Be prepared to supplement the cloud services that public cloud providers offer with cloud monitoring tools, orchestration tools, an efficient cloud release management process, and cloud access guidelines for your teams.

# Appendix A: Methodology

In this study, Forrester conducted an online survey of 221 IT decision makers in the US, Canada, the UK, Germany, France, Italy, Australia, New Zealand, and Japan with responsibility for IT infrastructure, high-performance computing, or AI strategies. Respondents were from organizations of less than 500 employees. Respondents were offered an incentive as a thank you for time spent on the survey. The study began in May 2020 and was completed in June 2020.

# Appendix B: Demographics/Data



Base: 221 global decision makers on IT infrastructure cloud strategies, high-performance computing strategies, or AI strategies at organizations of less than 500 employees

Source: A commissioned study conducted by Forrester Consulting on behalf of Dell and Intel, June 2020

# Appendix C: Supplemental Material

## RELATED FORRESTER RESEARCH

“Predictions 2020: Cloud Computing,” Forrester Research, Inc., November 4, 2019

“The Forrester Tech Tide™: Compute Platforms, Q4 2019,” Forrester Research, Inc., October 19, 2019

“Top 10 Ways To Master Performance For Your Cloud Migration,” Forrester Research, Inc., April 13, 2020

## Appendix D: Endnotes

<sup>1</sup> Source: “Justify Your Cloud Computing Investment: High-Performance Computing,” Forrester Research, Inc., December 22, 2010.

<sup>2</sup> Source: Forrester Business Technographics® Data And Analytics Survey, 2020.

<sup>3</sup> Source: “Top 10 Facts Tech Leaders Should Know About Cloud Migration,” Forrester Research, Inc., March 14, 2019.

<sup>4</sup> First observed by Intel co-founder Gordon E. Moore, Moore’s Law essentially states that the number of transistors in a given unit of space will roughly double every two years, thereby doubling computing power but halving cost.

<sup>5</sup> Data gravity is defined as the ability of bodies of data to attract applications, services, and other data. The larger the amount of data, the more applications, services, and other data will be attracted to it.

To read the full results of this study, please refer to the Thought Leadership Paper commissioned by Adobe titled “Hybrid Cloud: A Smart Choice For AI And HPC.”

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