



HYPERION RESEARCH

HPC in the Cloud Update

ISC

June 2022

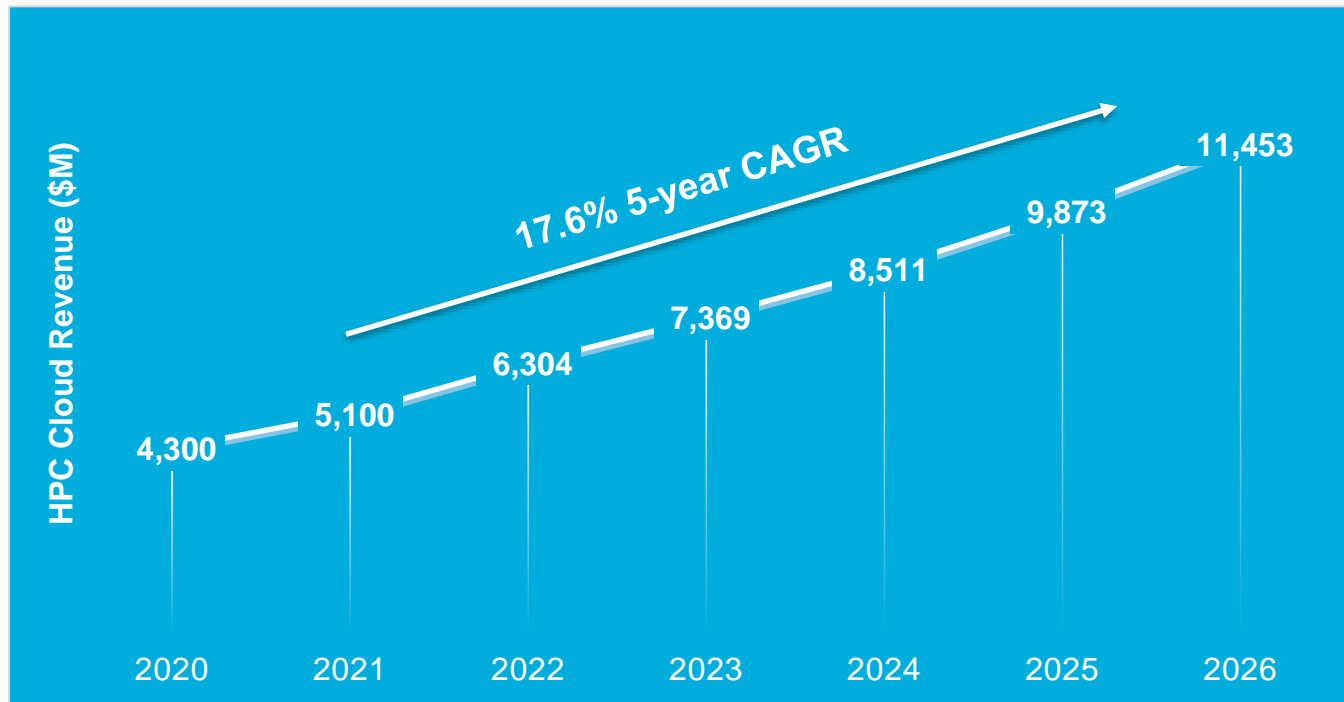
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www.HyperionResearch.com
www.hpcuserforum.com

HPC Cloud Forecast

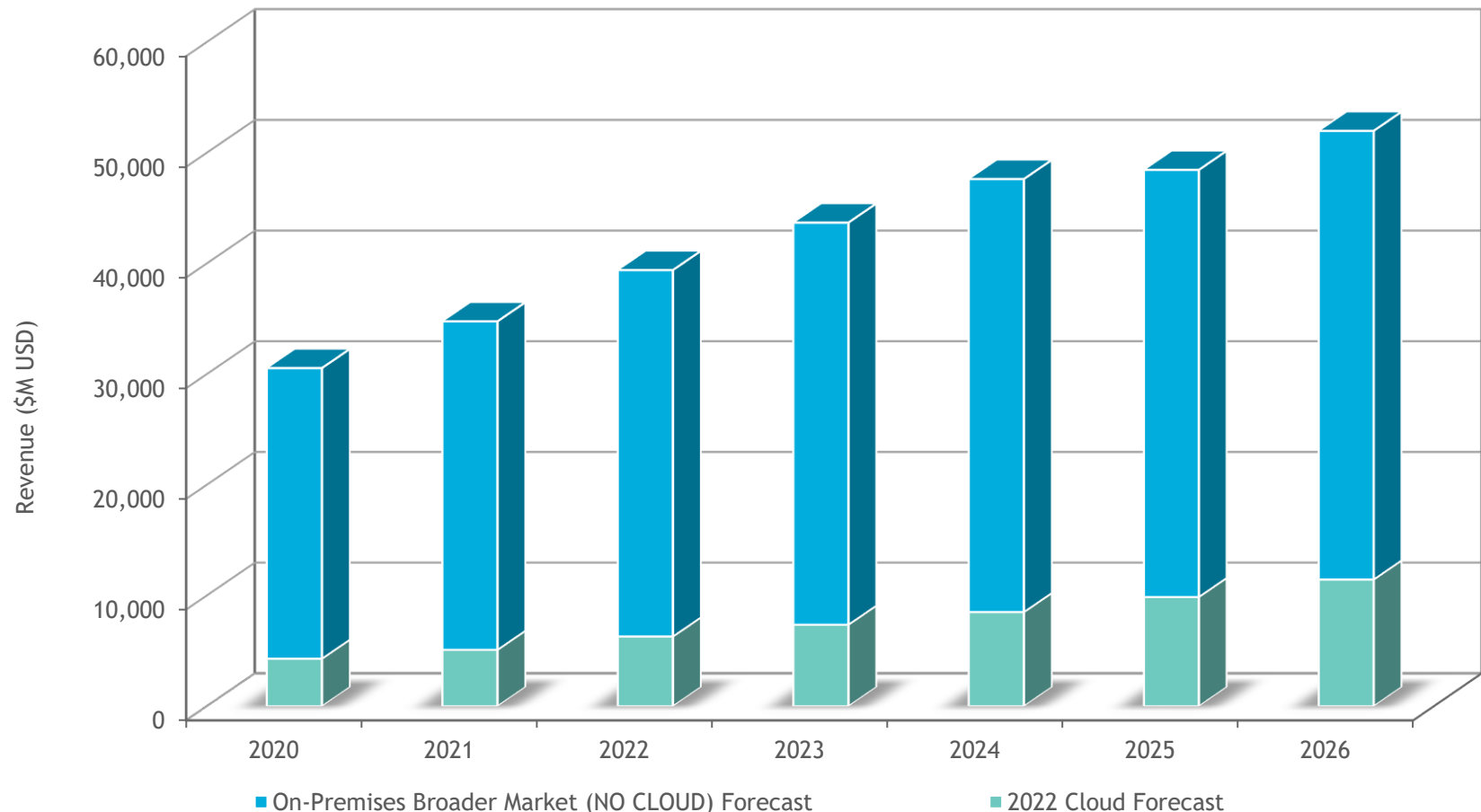
HPC cloud revenue is expected to exceed \$11 billion by 2026

- **Storage-specific components comprise roughly 1/3 of cloud revenue for HPC**
- **AI and other data-intensive applications are a high growth segment for cloud adoption in HPC**



The Total HPC Market: On-prem And Cloud Computing

The cloud market is smaller, but growing faster



Impact of HPC Cloud

Organizations are increasingly factoring cloud into future on-premises deployment plans

- **Public cloud resources have historically been seen as complementary to on-premises**
 - Many longitudinal studies show that cloud is used primarily for burst capabilities by many HPC users'
 - This perception is shifting:
 - A recent study showed that almost 50% of the users are altering on-premises deployments due to cloud
- **Migrating HPC workloads to cloud platforms requires new skills for center managers & researchers**
 - Much of the education and training on using the cloud focuses on which workloads can and should be run in the cloud versus remain on-premises
 - IT departments are factoring in data movement and security as they expand their resource pools to consist of cloud resources

No One-Size-Fits-All

Cloud and on-prem decisions depend on variety of factors

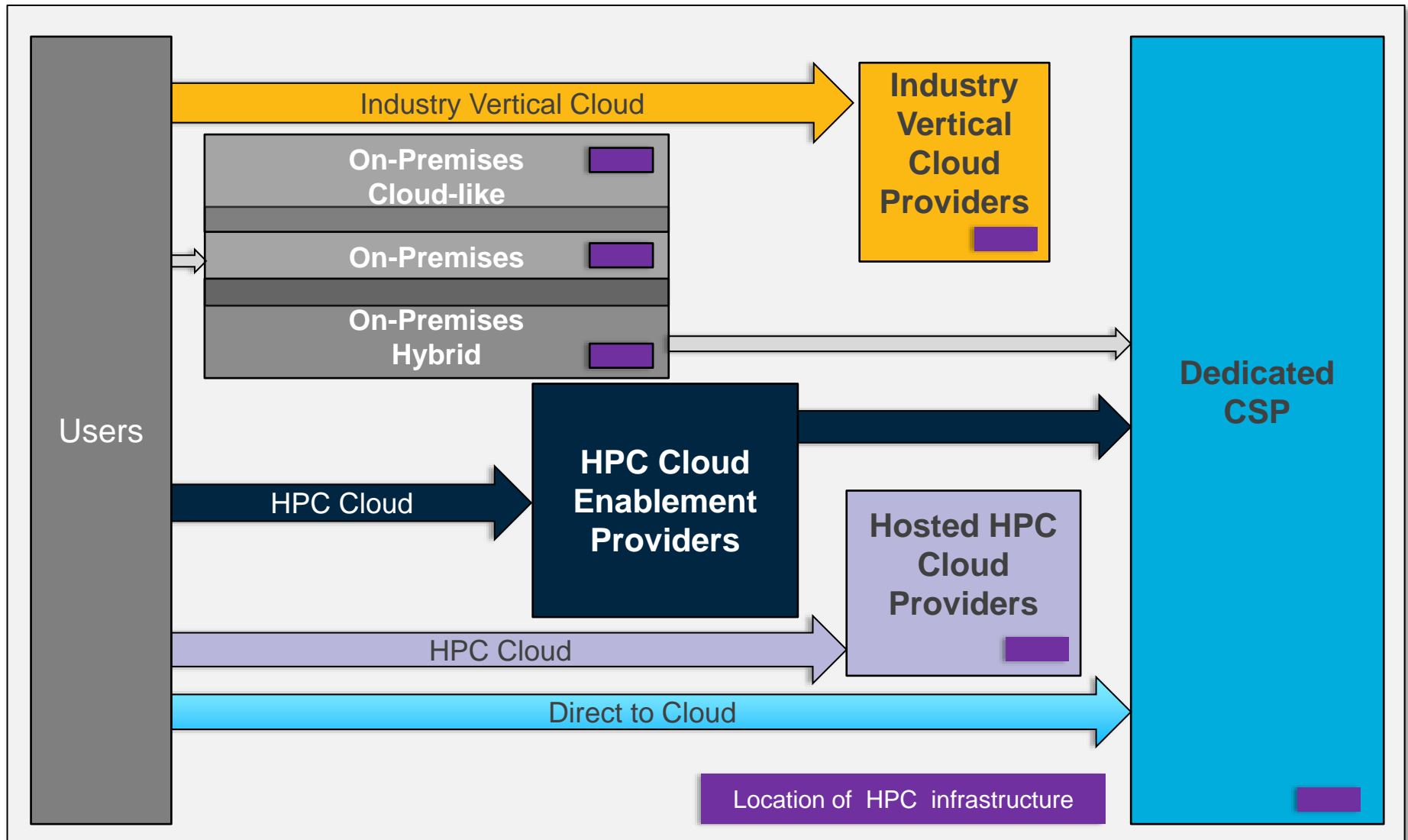
- **Choosing where to run HPC applications depends on a wide set of factors:**
 - Internal skillsets and knowledge
 - Budget and cost
 - Performance characteristics
 - Hardware availability
 - Time constraints
 - Other
- **Understanding which applications can be run cost effectively and performant in the cloud can aid in on-premises system design and optimization**
 - What technologies to invest in?
 - What scale to deploy on-premises?
 - Which middleware and software tools are necessary to optimally run HPC applications across platforms?
- **There is no single solution for all HPC user sites**

HPC Cloud Consumption Approaches

HPCaaS permeates all avenues to access HPC resources

- **On-prem and hybrid clouds**
 - Cloud-like OPEX model for on-prem utilization
 - Incorporates utilization of third party CSPs
- **Industry vertical clouds**
 - Resources housed at third party site
 - Focused on specific vertical use cases
- **Cloud Enablement Providers**
 - Leverages best-of-breed CSPs
 - Black-box provisioning of applications and instances
- **Hosted HPC Clouds**
 - Manages HPC infrastructure
 - Focus exclusively on diverse set of HPC use cases
- **Direct to Cloud**
 - Primary business is to provide cloud resources
 - HPC use case is only one of many supported workloads

Multiple Models for Accessing HPC Cloud Services



Open Research Questions

Facets that we are paying attention to over the next year

- **What is the right balance of on-prem and cloud?**
 - Is it workflow driven?
 - Is it skillset driven?
 - What factors should be considered in finding the balance?
- **How can TCO analyses be improved to create more apples-to-apples comparison of cloud and on-prem?**
- **Where are the concentrations of cloud-born users?**
- **Can the impact of cloud on the on-prem market be quantified in terms of revenue?**

Continue the conversation



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Our ISC22 Briefing Agenda

All registered attendees will receive the slide deck

- **Market Update and Forecasts**
- **Some Perspectives on European HPC**
- **Sustainability: No Longer a "Nice to Have"**
- **HPC and AI Talent Challenges**
- **Exascale Update**
- **Cloud Update**
- **Quantum Update**
- **AI Update**
- **Update on Storage & Interconnects**
- **Conclusions and Wrap-up**