

Five reasons to run your HPC applications in the cloud.

High Performance Computing (HPC) has always been about solving the world's most complex problems. For too long, however, HPC applications and workloads have been constrained by limited on-premises infrastructure capacity, high capital expenditures, and the constant need for technology refreshes.

Not anymore. Run your HPC workloads in the cloud. Unleash innovation with virtually unlimited HPC infrastructure and instant access to the latest technologies.

The total worldwide HPC market reached

\$39B

in 2019, **up 8.2%** from 2018.¹



In 2019, the market for cloud HPC solutions

grew by 59%

from 2018.²

Here are five good reasons why Amazon Web Services may be right for you.

1

Drive Innovation with Flexible Architectures



- Let your research dictate the architecture, not the other way around
- Access virtually unlimited cloud resources, available with the latest Intel® technologies, without the overhead of procuring, deploying, and managing infrastructure
- Unlock research teams to freely imagine and innovate

Challenge:

Encourage and facilitate experimentation and innovation

Solution:

Enable researchers and scientists to access capacity when they need it by moving to AWS

See the complete case study here

Results:



Reduce time to run informatics jobs to less than one day from weeks or months

Empower researchers

to try out fringe use cases with trivial investments



Eliminate bottlenecks that prevent running jobs in parallel

2

Accelerate Time to Results



- Create, operate, and tear down secure, well-optimized HPC clusters in minutes
- Develop HPC apps faster, and scale capacity quickly to avoid performance degradation caused by resource limitations
- Gain faster, more insightful results using analytics

Challenge:

Rapidly pinpoint the genetic causes of diseases in very ill children

Solution:

Run computational workloads in parallel using up to 200 gigabytes of RAM

Results:



Reduce time to interpret a genome from 12 weeks to 2 hours



Facilitate more accurate and timely diagnoses



Comply with strict patient health information (PHI) data-protection requirements

See the complete case study here

3

Collaborate Securely Around the World



- Share massive data volumes securely with teams of scientists and researchers anywhere
- Comply fully with HIPAA, FISMA, GDPR, FedRAMP, PCI, and other regulations
- Protect sensitive intellectual property with encryption and granular permissions

Challenge:

Allow global researchers to access biotech research tools

Solution:

Upload biophysical models and design methods to the cloud

See the complete case study here

Results:

Allow **6,000** researchers worldwide to access Penn State biotech research tools

Facilitate design of more than **50,000** synthetic DNA sequences

4

Unleash Creativity and Productivity



- Start resource-intensive jobs as soon as they are ready, avoiding the queue
- Spin up new configurations to match the specific requirements of each job
- Gain immediate access to the latest Intel technology upgrades without stalling research

Challenge:

Free artists to create stunning visual effects without worrying about rendering time

Solution:

Burst rendering applications to the cloud to circumvent internal capacity constraints

Results:

Process **20,000** rendering jobs a month during busy periods—impossible to manage with in-house resources



Avoid schedule overruns by adding capacity as deadlines approach



Take on new business with confidence in the ability to deliver

See the complete case study here

5

Minimize Spending without Compromising Research



- Choose from a range of AWS services and Intel powered Amazon EC2 instances and pay only for what you use
- Take advantage of spot pricing to further reduce cost for time-flexible workloads
- Avoid the capacity limitations of many other cloud providers

Challenge:

Cut simulation costs and accept projects that exceed on-premise capacity

Solution:

Migrate computational fluid dynamics (CFD) simulation application from existing provider to AWS

See the complete case study here

Results:

Reduce cost per simulation by **75% on average**

Check job status from anywhere to catch problems early and reduce costly rework

Remove **1,000-node limit** imposed by previous service provider

Unchain your research with HPC on Amazon Web Services

There are significant advantages to running your HPC applications in the cloud—but which cloud?

Amazon Web Services provides secure, resizable capacity in the cloud and offers a wide range of Intel® Xeon® technology-powered instance types, so you can easily and quickly spin up a configuration that fits your workload. By migrating some or all of your HPC applications to AWS, you can increase the speed of research, and reduce time to results.

AWS' large partner network provides professional services and software solutions to enhance HPC workloads running on AWS. The AWS cloud is compliant with the latest revisions of GDPR, HIPAA, FISMA, FedRAMP, PCI, and other regulations.

For a full list of AWS compliances, please visit <https://aws.amazon.com/compliance/>

Choosing the right cloud provider for HPC goes beyond feeds and speeds; it's also a business decision with significant consequences for your organization. AWS offers you advantages that others simply can't match.

Preferred by Industry Leaders

Hundreds of companies in life sciences, financial services, manufacturing, energy and geo sciences, media and entertainment are solving complex problems and speeding time to results using HPC on AWS.



Selected AWS HPC customers. See AWS customer stories here.

¹ Data cited from mti triple forecast and survey reports. Inquire with Intersect360 Research, info@intersect360.com
² Data cited from Hyperion Research | Inquire with Hyperion Research, info@hyperionres.com

For more information:
<https://aws.amazon.com/hpc>