# CliQr ®

High Performance Compute (HPC)

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High Performance Compute (HPC) job-based applications, including Big Data analytics workflows are a perfect match for the elasticity of the public cloud. However, HPC workloads can vary dramatically, as can what you need from them in different circumstances. For example, optimized cost might sometimes be paramount for an HPC workload and speed might not be an issue. At other times, speed might be the most important aspect and cost might not be a factor. In most situations, some combination of these considerations is important.

HPC, in search of Best Execution Venue

*Any* **PHYSICAL, PRIVATE,** *or* **PUBLIC** *Cloud*
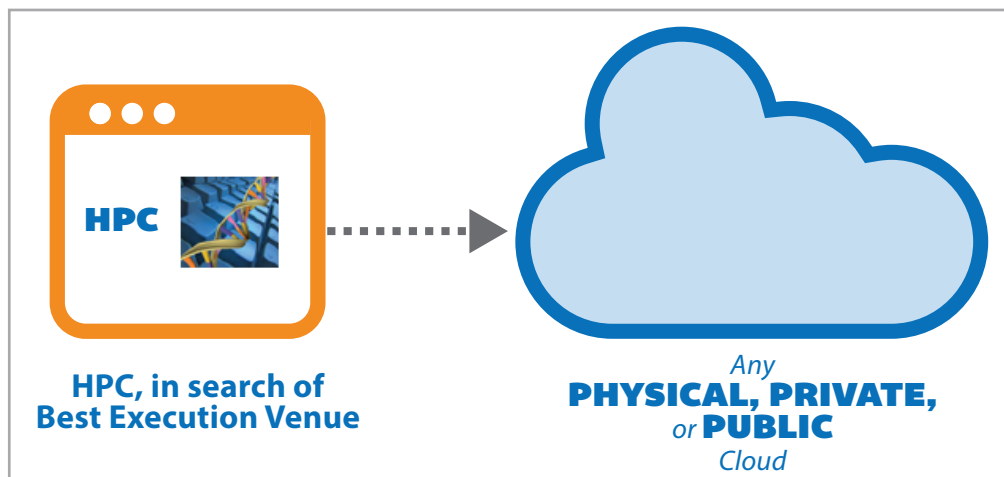
For overall performance, it's important to know which cloud is the best choice for each workload given different optimizations and different scenarios for the same application. And when the situation changes – say, one cloud's pricing goes up – being able to move both binaries and data quickly to a better choice is essential.

CliQr's CloudCenter solves the problem of figuring out which cloud offers the best price-performance optimization for each situation by placing crucial information in your hands and by easing the migration of HPC applications and their data from one cloud to another when circumstances warrant a change.

# Onboarding and Running an HPC Application

With CloudCenter, a DevOps engineer can onboard and run an HPC application like Hadoop or Blender easily. To onboard an HPC application to the CloudCenter platform, the engineer provides the essential application binaries that Hadoop requires, as well as the job's input data files to CloudCenter's multi-cloud storage repository. An easy to use drag-and-drop browser interface and an SFTP file transfer utility for larger files is available to onboard applications.
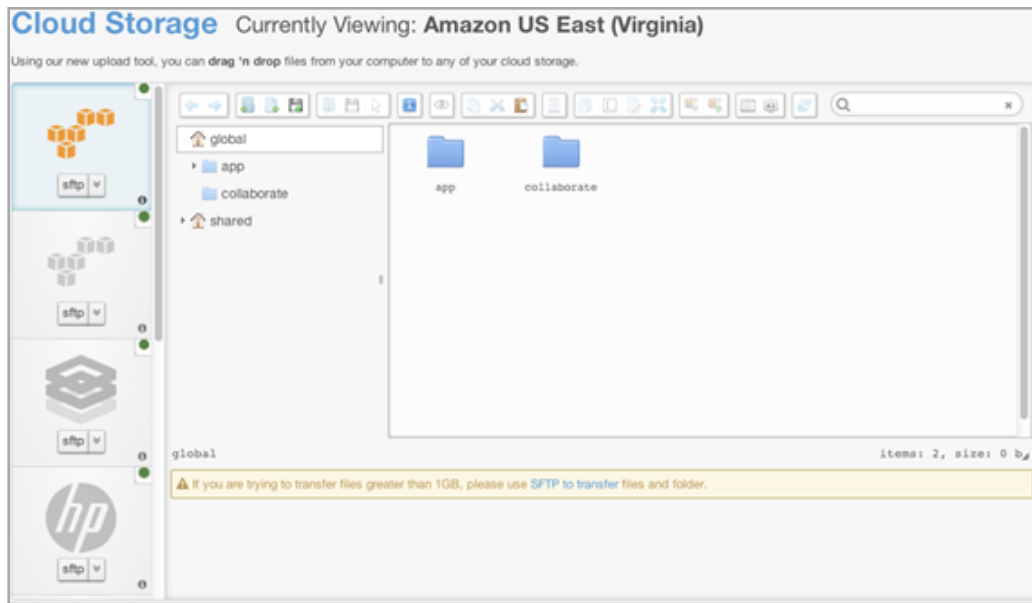
Each file is AES-256 encrypted at rest to ensure security. All files stored in the multi-cloud storage repository are easily synchronized among any public, private, and physical clouds that CloudCenter supports.

CliQr Application Profiles

Based on the binaries and data in the multi-cloud storage repository, the next step is to build an Application Profile, which is a cloud-agnostic description of the applications infrastructure needs. The easiest way to create an Application Profile is with the Graphical Topology Builder in CloudCenter Manager (CCM).
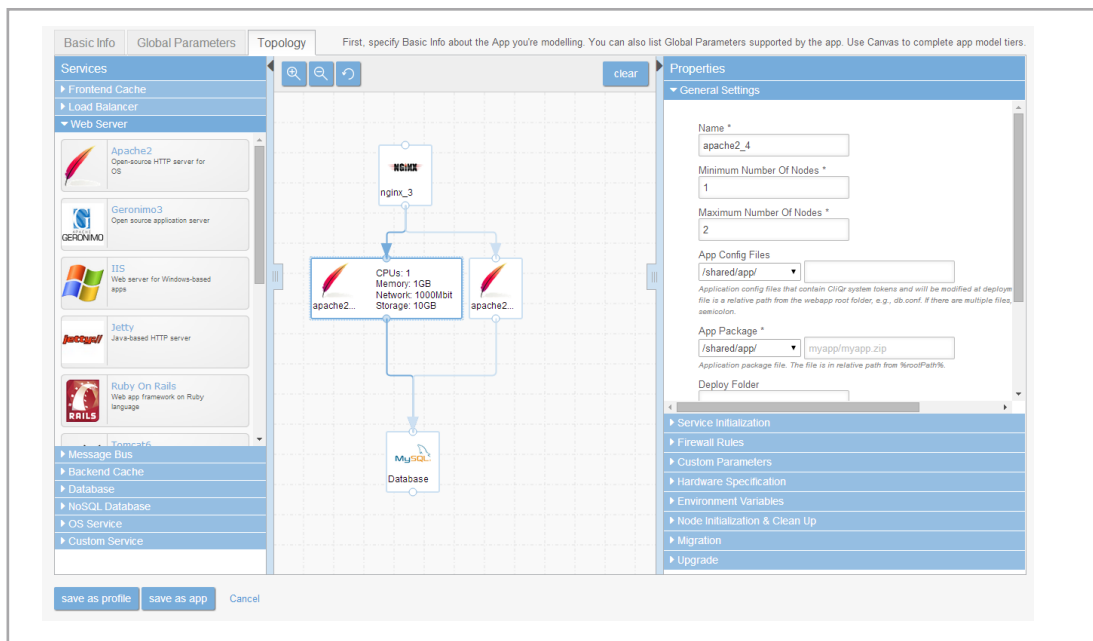
CliQr Graphical Topology Builder

Here, the various layers needed by the application are defined by dragging from a palette of services on the left pane to a canvas in the middle pane. On the right pane, specific needs are described in a set of properties, including references to the binaries and data on the multi-cloud storage repository.

At deployment time, the Application Profile is passed to CliQr's patented CloudSmart Orchestrator (CSO) that runs on the target cloud of choice. There, the cloud-agnostic Application Profile is provisioned using knowledge of best practices built into the CSO for the specific target cloud. Having that knowledge inside the CSO instead of the Application Profile provides unmatched portability to applications being governed and managed by CloudCenter.

Benchmarking

How do you know which cloud your HPC application runs best on? And what does "best" mean? Where should you run your application when you need a fast solution? Where should you run your application when you need an inexpensive solution?

CloudCenter's benchmarking feature can place the answers to these questions in your hands so you can make an informed choice. Because of the portability that CloudCenter offers, you can easily generate a graph that shows performance on the Y-axis and price on the X-axis for any existing Application Profile.

Benchmark Result

Cost and Performance analysis of benchmark run. Points closer to the origin provide better price-performance.

Job Name:	may15_all5_16blender_bench01
App Name:	16 Task Blender
Job Status:	Complete
Job Start Time:	2014-05-15 11:06:52
Job End Time:	2014-05-15 19:45:27

Job Performance

Compare clouds and cloud configurations based on CliQr Price-Performance Index. A higher Price-Performance index indicates a more optimal configuration for your application.

Best Price Performance:	Amazon US East (Virginia),c3.4xlarge
Best Performance:	HP Cloud US-East,standard.8xlarge
Best Price:	Google us-central1-a zone,n1-standard-4

Price Performance Spectrum

Price Performance Index Comparison

Google us-central1-a zone:n1-standard-4
1-node: **202.21**

CliQr Benchmarking

With CliQr benchmarking, now you have the price-performance data you need to make an informed decision on what applications should run where under different circumstances. It's even possible to schedule benchmarks on a regular basis to ensure the latest price-performance data for each application as cloud providers change pricing or add new instance types, so you can always have the most up-to-date information on the best execution venue for your HPC application.

Making HPC Work for Any Organization

Combined with CloudCenter's unmatched application portability, CliQr's benchmarking feature is a must have for any HPC workload. With price-performance data at your disposal, you can make informed decisions on which cloud you should run your HPC job on depending upon what it is you are trying to optimize, even if what you are trying to optimize differs for each run. Without CliQr's benchmarking capabilities, you can only guesstimate the right cloud for your HPC application and end up wasting a large amount of money when you are proved wrong

Find out how CliQr can cost-effectively support your HPC tasks at www.cliqr.com.

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