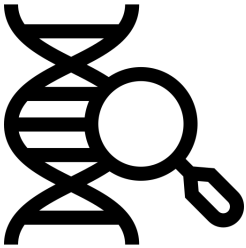


DeNovo Gene Sequence Assembly



Cloud Service Providers recommend that only stateless or fault-tolerant apps to run in spot instances, but large stateful, non-fault tolerant genomic analytic apps can't use spot instances. When the spot instances are preempted, the application can't recover efficiently and often need to re-run from the beginning in a new instance. The Memory Machine Fault Tolerance Service from MemVerge removes this restriction.

The Memory Machine fault-tolerant service makes stateful, long-running, genomic analytic pipelines suitable for spot Instances

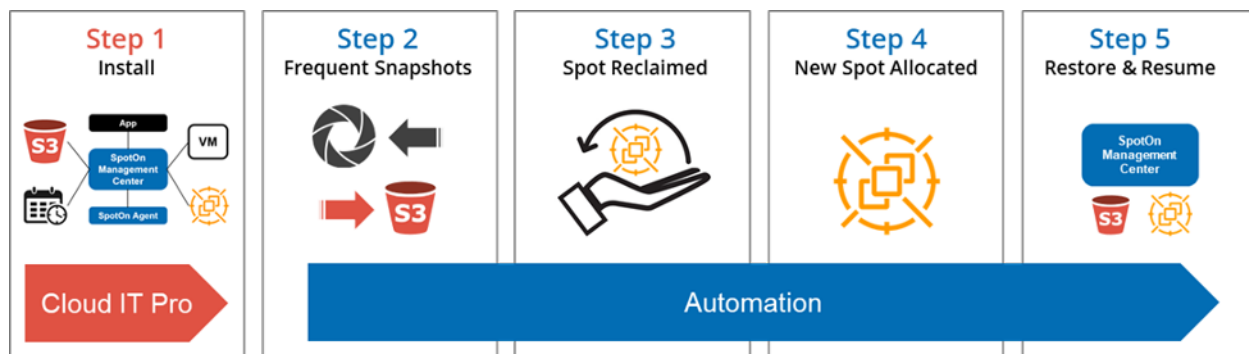
The Memory Machine Fault Tolerance Service (FTS) is Software-as-a-Service that provides end-users a seamless application experience at the lowest cloud infrastructure cost, while giving cloud IT pros full control to meet their security and computing environment requirements.

FTS consists of 2 components, the SpotOn Management Center and SpotOn agent that run inside a cloud VM along with the user apps.

FTS easily integrates with the existing job schedulers, cloud management, and cloud storage services. Once SpotOn is configured by cloud IT pros, the service runs automatically and transparently to the end user.

Snapshots of the complete app states are taken at intervals and asynchronously saved to persistent cloud storage. After a Spot Instance is reclaimed, a new instance is automatically allocated. The FTS Management Center then restores the latest snapshot from the storage service and the app resumes execution.

How It Works

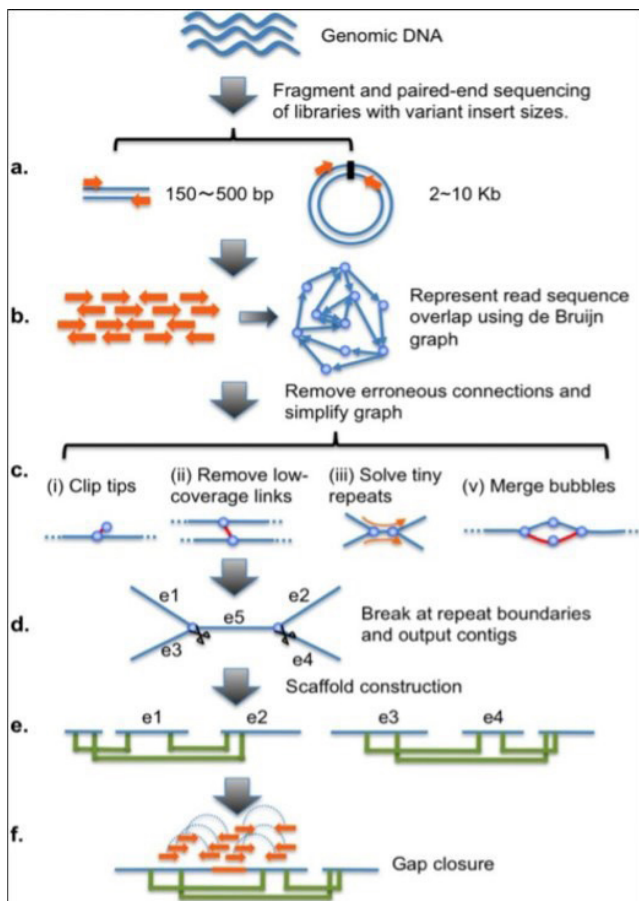


Cost Analysis for DeNovo Gene Sequence Assembly using FTS

Shown below on the left is an example of Denovo Gene Sequence Assembly pipeline. On the right you can see the execution time the workload is 9.8 hours while using 1.5TB of memory and an x1e.16xlarge compute instance at \$13.34 per hour.

The Memory Machine Fault Tolerance Service made it practical for this non-fault tolerant, long-running workload to run on spot instances because it now can quickly and gracefully recover from a spot termination. The result in moving to spot instances was a 63% cost savings.

DeNovo Assembly Pipeline



Savings with FTS

Execution Time	9.8 Hours
DRAM Usage	1,500 GB
AWS Instance	x1e.16xlarge
On-demand Pricing	\$13.34 per hour
Spot Discount	70%
Spot Interruption Rate	> 20%
On-demand Cost	\$131
Spot + Overhead Cost	\$48
Saving %	63%

Learn More

To learn more about MemVerge, Big Memory Cloud Technology, and Memory Machine Cloud Edition, visit www.memverge.com and www.bigmemorycloud.com.

Watch these videos to see how [Analytical Biosciences](#) shaved 58% off their execution time and [TGen](#) cut their time-to-discovery by 37%.