GridGain Nebula Managed Service: How We Deploy Gridgain and Apache Ignite in Clouds

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About Me

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Agenda

- What are the benefits of public cloud deployment?
- What issues can arise during public-cloud deployments?
- How does GridGain Nebula managed services resolve these issues?
Three Reasons Why People Prefer Public Clouds

• Simple host management
• Possibilities of flexible host customization
• Support and deployment on remote hardware
How to manage a server:

• Create an account.
• Configure your host (web interface, CLI, programmatic API).
• Start your host.
Possibilities of Flexible Host Customization

To get a solution that meets your goals, you can do any or all of the following:

- Use the host configurations that you require (memory, storage, CPU)
- Use the features that you require (public IP, DNS, Load Balancer, and so on)
- Use managed services for your own solutions (Kafka, Spark, Hadoop, and so on)

What comes with HDInsight?

- Apache Hadoop
- Apache Spark
- Apache Kafka
- Apache HBase
- Apache Hive LLAP
- Apache Storm
- Machine Learning
### Support and Deployment: Bare Metal Deployment vs Public Cloud Deployment

<table>
<thead>
<tr>
<th>Bare metal deployment</th>
<th>Public cloud deployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Buy your own server.</td>
<td>● Buy a subscription for the cloud hosts and get the support.</td>
</tr>
<tr>
<td>● Hire server admins for hardware support.</td>
<td>● Buy managed services for the required software.</td>
</tr>
<tr>
<td>● Hire a DevOps team for deploying and supporting the required software.</td>
<td>● Hire a development team for implementing business logic.</td>
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<td>● Hire a development team for implementing business logic.</td>
<td>● Make tier hosts available for development and testing.</td>
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Support and Deployment: Benefits of Using Public Cloud

But, how can we save money and time with a public cloud?

- Cloud hardware issues will be resolved faster with cloud support.
- A managed services team can set up software faster than a DevOps team and can provide support.
- Host upgrades do not require modification or replacement of old servers (for example, after five years when new models appear).
Four Main Issues of Public Cloud Deployment

- Security
- Provisioning
- Management
- Monitoring
Bastion Host Configuration

- SSH and VPN configuration
- Firewall configuration between Bastion host and other networks
- Compliance with security standards used in your company
GridGain Nebula Bastion Host Solution

- Three networks (Bastion host, cluster hosts, monitoring hosts)
- SSH access to Bastion host under VPN (see the second diagram)
- Automatization of provisioning (creation and initial configuration of the instances)
- Automatization of the management processes (starting and stopping the GridGain nodes, updating the certificates, getting the logs, and so on)
Provisioning GridGain on a Public Cloud Host

- Configure host details
- Prepare directories and copy GridGain binaries
- Install software
- Configure logging and monitoring
- Create users and prepare SSH access
- Configure subnets and network security
- Prepare disks
- Manage GridGain
GridGain Management on Public Cloud Host

- GridGain stop and start
- Rolling upgrade
- Updates of the SSL certificates
- Log retrieval
- Change configuring
- Data snapshots
- And a lot of other tasks...
How Can You Implement Provisioning and Management?

With five nodes, you can do something like the following:

1. Using a Cloud web console or CLI, configure the hosts and network security.
2. Using SSH, install the packages, create users and directories, and so on.
3. Using SCP, copy the GridGain binaries.
...  
N. Repeat steps from 2 to (N-1) five times.

But, what if you have 100 steps and 100 hosts?
How Did We Implement It in GridGain Nebula?

We automate the provisioning and management processes:

- Each action can be implemented as a separate task (ansible roles).
- Tasks can be grouped into a chain (ansible playbooks).
- The chain of tasks can be executed on a subset of hosts in parallel or sequentially.

You can read more about Ansible at:

https://docs.ansible.com/ansible/latest/index.html
The SSL renewal task for a GridGain node includes the following steps:

1. Stop the GridGain node.
2. Copy the new certificate to the cluster host.
3. Replace the old certificate.
4. Start the GridGain node.
SSL Certificate Renewal Automation

Case 1

Task on node1

Task on node2

Task on node3

Task on nodeN

Case 2

Task will be broadcast.

node1

node2

node3

IGNITE_WAIT_FOR_BACKUPS_ON_SHUTDOWN = true
More Examples

To learn more about how we manage GridGain in the cloud with a live demo, please visit the following webinar in January:

We require cluster and system monitoring.

We use GridGain Control Center to monitor the cluster.

https://www.gridgain.com/docs/control-center/latest/overview

To monitor the system, by default, we use a Zabbix server:

https://www.zabbix.com/
## Examples of Monitored Items

<table>
<thead>
<tr>
<th>System</th>
<th>Cluster</th>
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<tbody>
<tr>
<td>● Free memory</td>
<td>● Memory and CPU usage</td>
</tr>
<tr>
<td>● Free disk space</td>
<td>● Long running queries</td>
</tr>
<tr>
<td>● OS audit</td>
<td>● Transaction tracing</td>
</tr>
<tr>
<td>● Expiration of the certificates</td>
<td>● Rebalance tracking</td>
</tr>
<tr>
<td>● Network issues</td>
<td>● Retrieval of information about the data</td>
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Summary

GridGain Nebula Managed Service offers all of the following:

- GridGain and Apache Ignite best practices, collected over the years
- Automation of deployment and management processes
- A dedicated support team that can provide fast resolution of any issue
- Extensive monitoring and alarm notification

All that you need do is to implement the business logic.

https://www.gridgain.com/products/managed-services