

# Heads in the Cloud: Cloud Deployment Best Practices

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# Agenda

Define Terms

Deployment Options

Best Practices



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# Ignite & GridGain In-Memory Computing Platform

Monitoring & Management

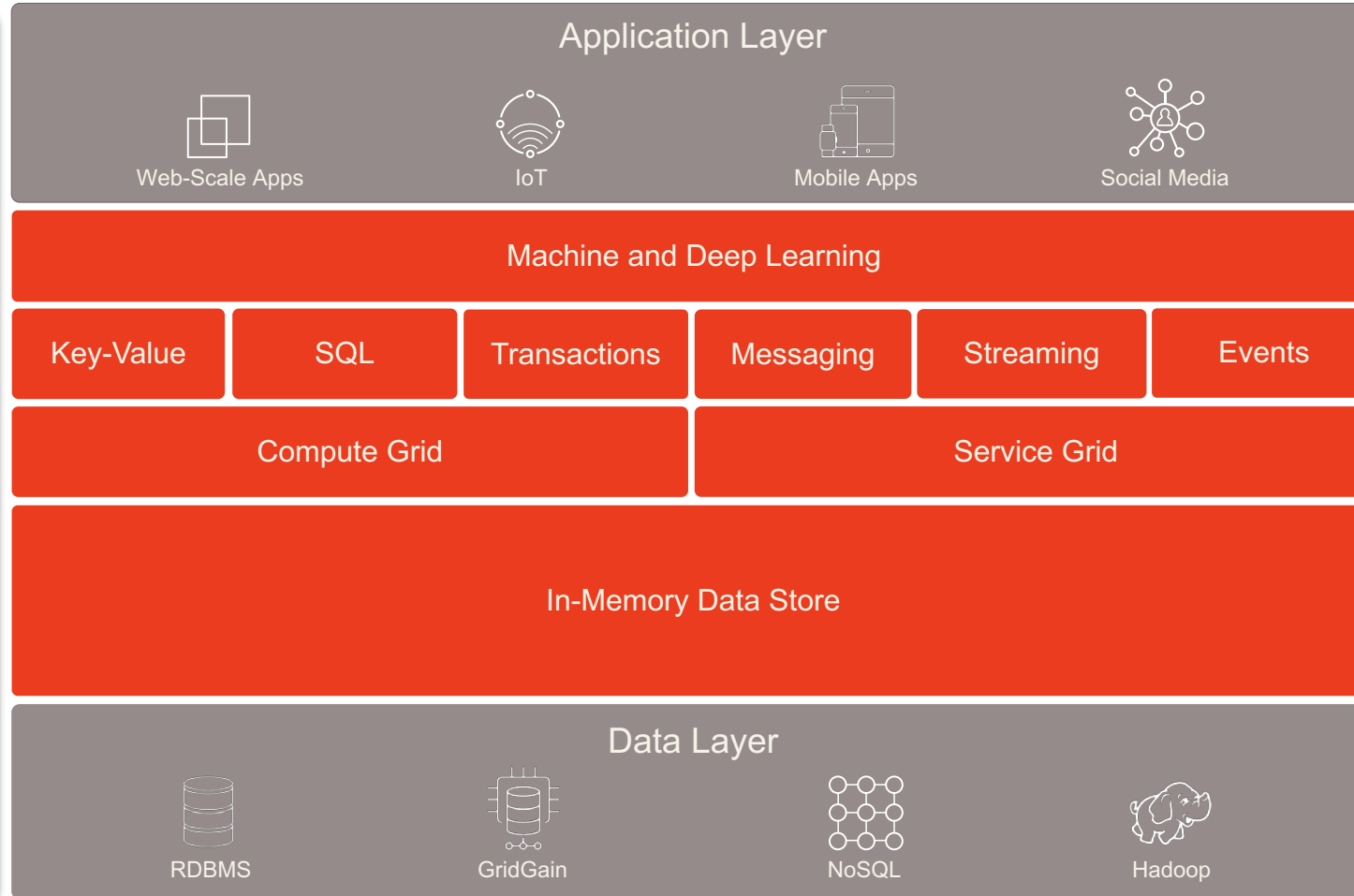
Security & Auditing

Segmentation Protection

Data Center Replication

Rolling Upgrades

Connectors (Kafka, GoldenGate, Hadoop)



Full, Incremental, Continuous Backups

Network Backups

Point-in-Time Recovery

Heterogeneous Recovery

GridGain 

+

 **CLOUD NATIVE**  
COMPUTING FOUNDATION

 **LINUX**  
FOUNDATION



# What is “The Cloud”?



# According to Salesforce

1. Flexibility
2. Disaster Recovery
3. Automated Software Updates
4. Capital-expenditure Free
5. Increase Collaboration
6. Work From Anywhere
7. Document Control
8. Security
9. Competitiveness
10. Environmentally Friendly

<https://www.salesforce.com/uk/blog/2015/11/why-move-to-the-cloud-10-benefits-of-cloud-computing.html>

# According to IBM

- Scalability
- Storage Options
- Control Choices
- Tool Selection
- Security Features
- Accessibility
- Speed to Market
- Data Security
- Savings on Equipment
- Pay Structure
- Streamlined Work
- Regular Updates
- Collaboration
- Competitive Edge

<https://www.ibm.com/cloud/learn/benefits-of-cloud-computing>

# Elastic Scalability





# Flexibility



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# It's not in your data center

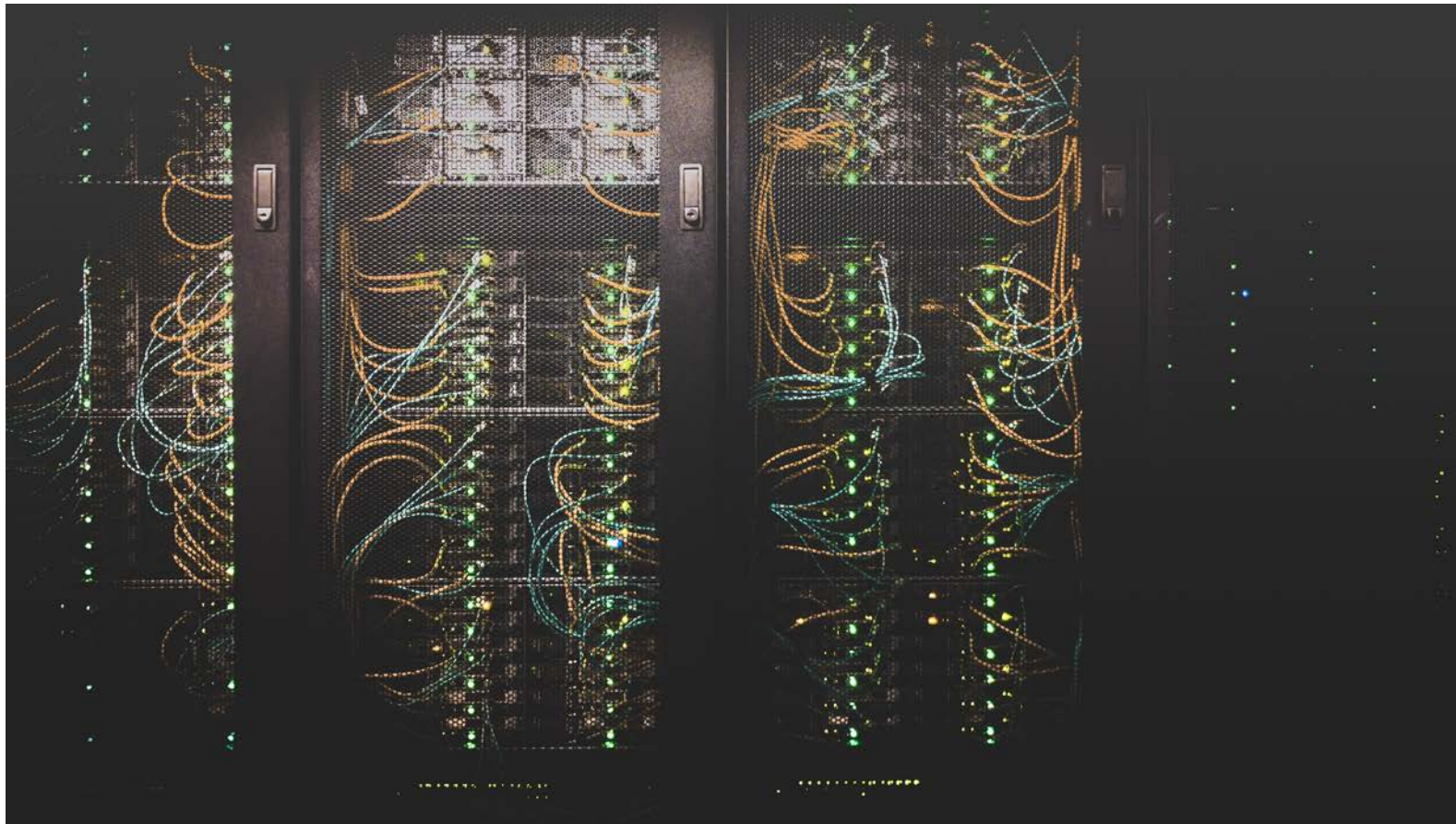


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# Best Practice 1: Tooling



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# Docker is...

“A container is a standard unit of software that packages up code and all its dependencies so the application runs quickly and reliably from one computing environment to another”



By dotCloud, Inc. - File:Docker (container engine) logo.png,  
Apache License 2.0, <https://commons.wikimedia.org/w/index.php?curid=52332268>



# Kubernetes is...

“...an open-source system for automating deployment, scaling, and management of containerized applications.”



# SaaS: GridGain Cloud

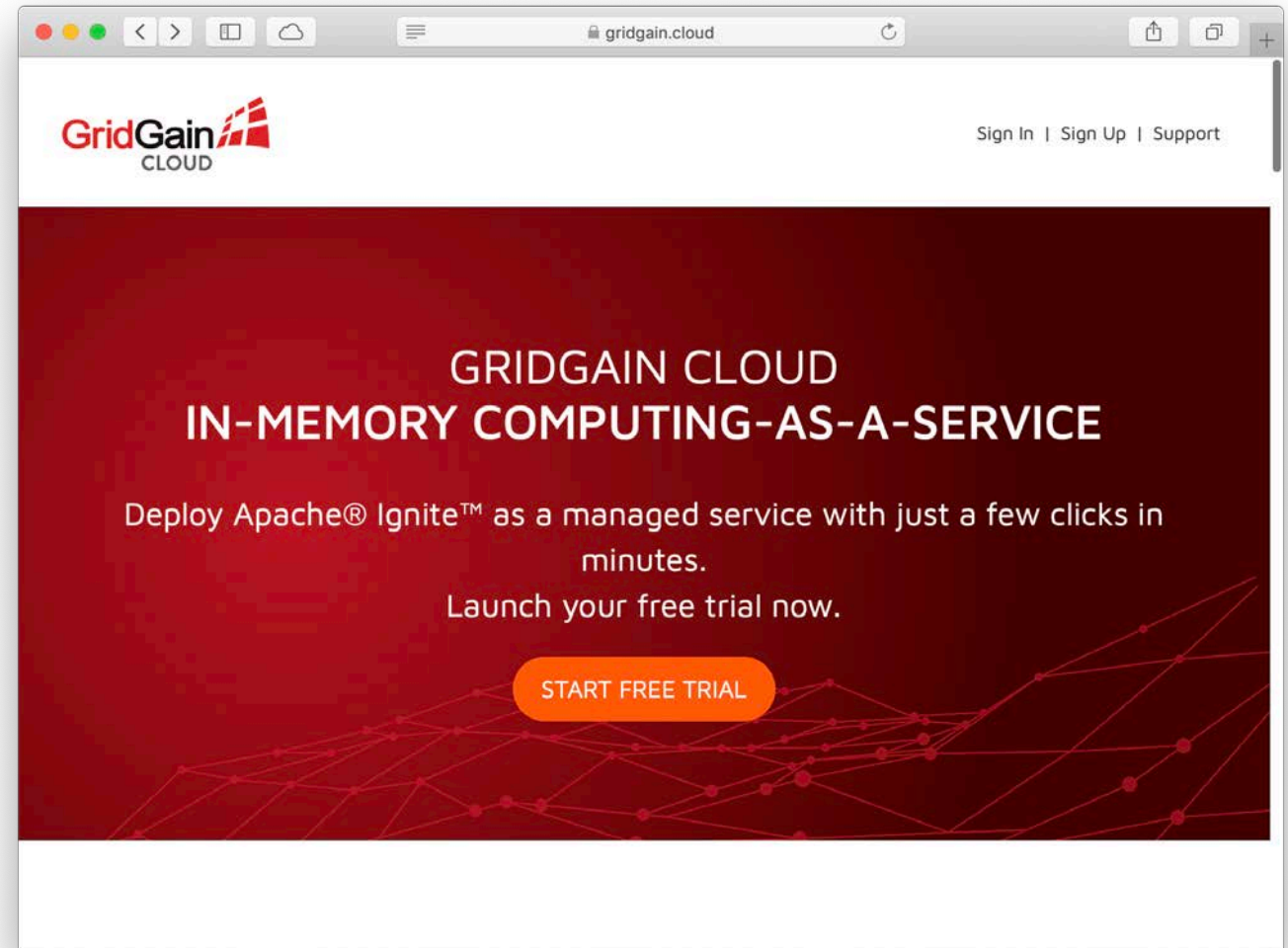
Fully Managed In-Memory  
Computing Built on Apache  
Ignite

Web Console

Data access

- REST
- JDBC/ODBC
- Ignite thin-clients

“Up and running in minutes”



# AWS

- EC2
- ECS
- EKS
- On-demand
- Spot instances
- Reserved instances
- Dedicated hosts
- Fixed performance
- Burstable
- Cluster Networking
- Intel
- ARM
- General purpose (7 options)
- Compute (3 options)
- Memory optimized (7 options)
- Accelerated (4 options)
- Storage optimized (4 options)

# Azure

- Virtual Machines
- Virtual Machine Scale Sets
- Azure Kubernetes Service
- Container Instances



# Best Practice 2: Memory Sizing

For data-grid use cases, aim for the “big memory” options

Consider Replication

- Better to have four 256Gb nodes than one 1Tb node

Use the Sizing Calculator  
(<https://apacheignite.readme.io/docs/capacity-planning>)

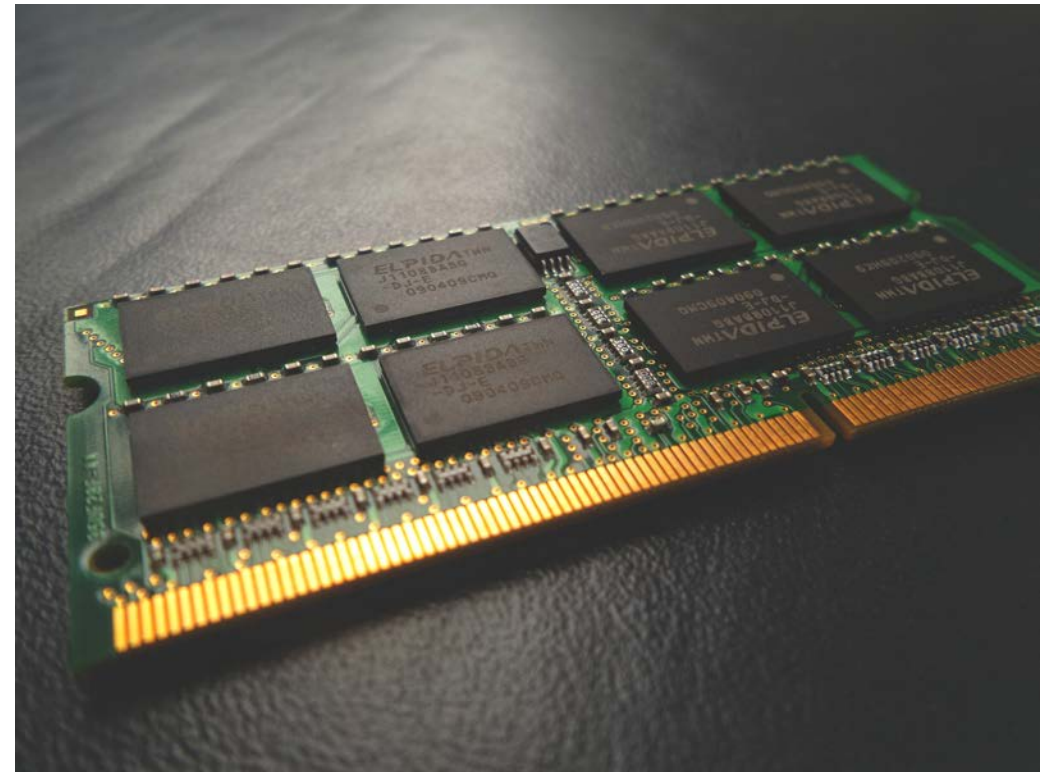


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# Best Practice 3: Disk Storage

## Trade offs

- EBS vs Instance Storage Volumes

AWS EBS – IOPS SSD (io1)  
volumes

Azure – Standard or Premium SSD

Use StatefulSets in Kubernetes



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# Best Practice 4: Images

Use custom images or  
containerization!

Make it easy to create / kill new  
GridGain nodes

Automate as much as possible



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# Best Practice 5: Performance

## Predictable versus maximum

- Reserved
- Spot

## Scale automatically

- “Horizontal Pod Autoscaler” with Kubernetes
- EC2 Auto Scaling in AWS
- Scale Sets in Azure
- But remember licensing



Photo by [Alessio Lin](#) on [Unsplash](#)



# Best Practice 6: Security

TLS/SSL between nodes

Disk encryption

Firewall ports

Use GridGain security options for authentication, authorization and auditing



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# Best Practice 7: Data Location

Where is your data?

Who has access to data?

- Synchronization Layer
- Change Data Capture

How do you get it to “the cloud”?

- Deltas versus full extracts
- Migrate everything?

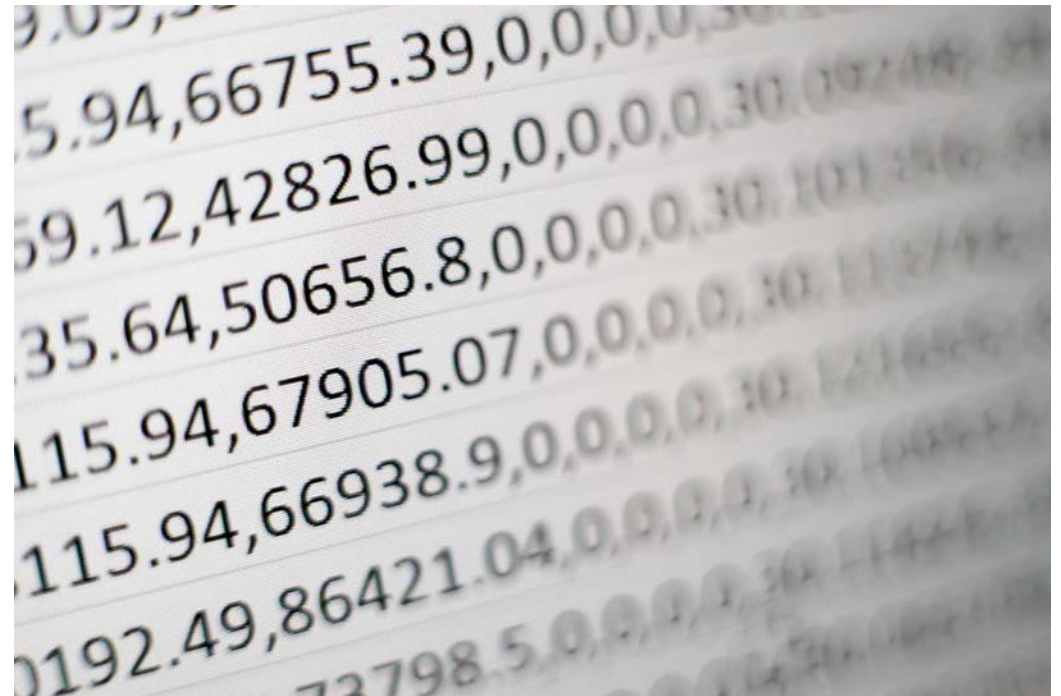


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Checkout [In-Memory Computing Best Practices: Adding Speed and Scale to Existing Applications](#)

# Best Practice 8: Migration

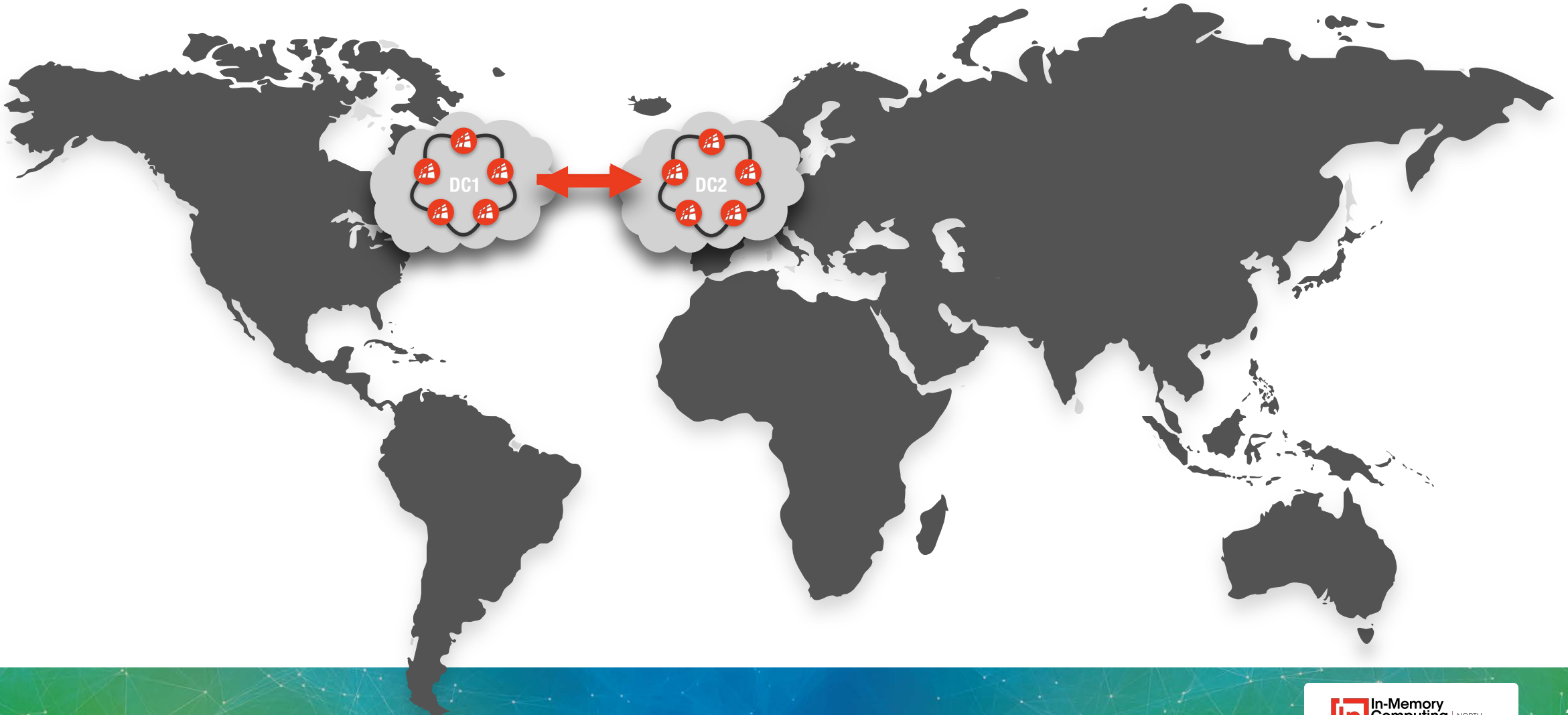
Use Data Center Replication



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# Best Practice 8: Migration



# What have we learned?

The cloud *is* different from on-prem

## Best practices

- Tooling
- Memory sizing
- Disk storage
- Use custom images
- Performance
- Security
- Data location
- Migration

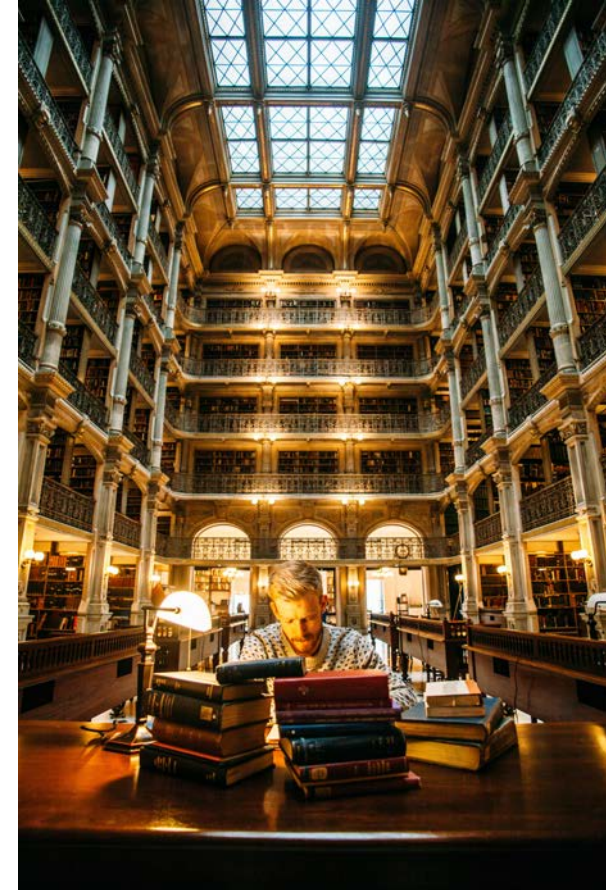


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# Additional Sessions

Time	Session	Location
Thurs 9:45-10:05AM	<u>Fitness + In-Memory Computing = Getting ahead of the game</u> <b>Craig Gresbrink</b> <i>24 Hour Fitness</i>	Keynote
Thurs 11:00-11:50AM	<u>Enabling Java applications for low-latency use cases at massive scale with Azul Zing and GridGain</u> <b>Denis Magda</b> <i>GridGain</i> , <b>Gil Tene</b> <i>Azul Systems</i>	Ballroom B
Thurs 11:55-12:45AM	<u>Moving Apache Ignite into Production: Best Practices For Disaster Recovery and High Availability</u> <b>Stanislav Lukyanov</b> <i>GridGain</i>	Ballroom C
Thurs 1:45-2:35PM	<u>How-to for real-time alerting, analytics and reporting at scale with Apache Kafka and Apache Ignite</u> <b>Denis Magda</b> <i>GridGain</i> , <b>Jeff Bean</b> <i>Confluent</i>	Ballroom B



# GridGain Resources

## Webinars

- Visit <https://www.gridgain.com/resources/webinars>
- Visit <https://www.imcsummit.org/>

## White Papers

- Visit <https://www.gridgain.com/resources/papers>

## Videos

- Visit <https://www.gridgain.com/resources/videos>

## Free 30-Day Ultimate, Enterprise or Professional Edition Trial

- Visit <https://www.gridgain.com/resources/download>

# Thank You

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