

Active/Active Cloud Infrastructure

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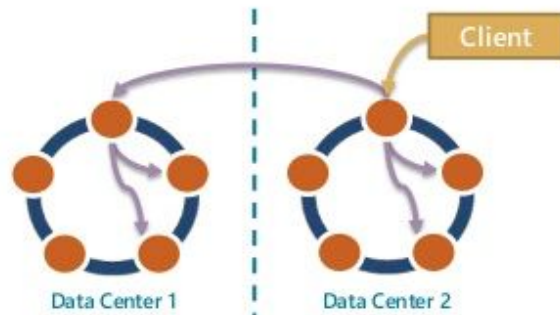
Determining a stable implementation of an Active/Active system has been a topic of great interest to those maintaining multi-datacenter cloud-based services. This type of infrastructure is highly valued because it allows for services and applications to remain continuously available, even during planned and unplanned downtimes. Before implementing an Active/Active system, one must first determine the most effective ways to satisfy its two key constraints: maintaining fast and reliable cross-datacenter replication, as well as determining efficient disaster recovery options. Based upon these two constraints, we had determined that the problem could be addressed at the database level using the NoSQL database Cassandra. In contrast to traditional SQL databases, Cassandra served as a much more intuitive cloud-based data store due to its cluster based architecture. Among its many benefits, Cassandra provides out-of-the-box functionality which directly addresses the two main problems in implementing an Active/Active system. Through a combination of its gossip protocol and snitch communications, it is able to achieve both resilient cross-region replication as well as seamless failover in disaster situations, with automatic load balancing. Below is an outline describing the key benefits provided by Cassandra for large cloud-based systems:

What is Cassandra?

• Cassandra Architecture Applicability

- Multiple Data Center "Active-Active replication"
- One Data Center goes offline, the others can seamlessly take over
- Offline DC back online becomes immediately available for workload, Cassandra automatically rationalizes data across DC's

- Fully Replicated
- Clients write local DC
- Data syncs to other DC
- Replication Factor per DC
- "Success" controlled by client app (i.e. local only, local and remote individually, local and remote combined...)



Keywords: Distributed System, High Availability Clusters, Cross-region Replication, Automatic Failover