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Develop scalable applications with DataStax Drivers for Apache Cassandra and DataStax Enterprise

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DataStax Drivers

Smart clients for Apache Cassandra and DataStax Enterprise

DataStax Drivers

Java

node JS

php

python

Microsoft .NET

Goals of DataStax Drivers

- Consistent set of features across languages
  - Asynchronous execution
  - Automatic cluster discovery
  - Connection pools and automatic reconnection
  - Load balancing
  - Fault tolerant
  - Address resolution
- Flexible to the core
- Consistent terminology
  - Cluster -> Session -> PreparedStatement & Statement -> Future or ResultSet

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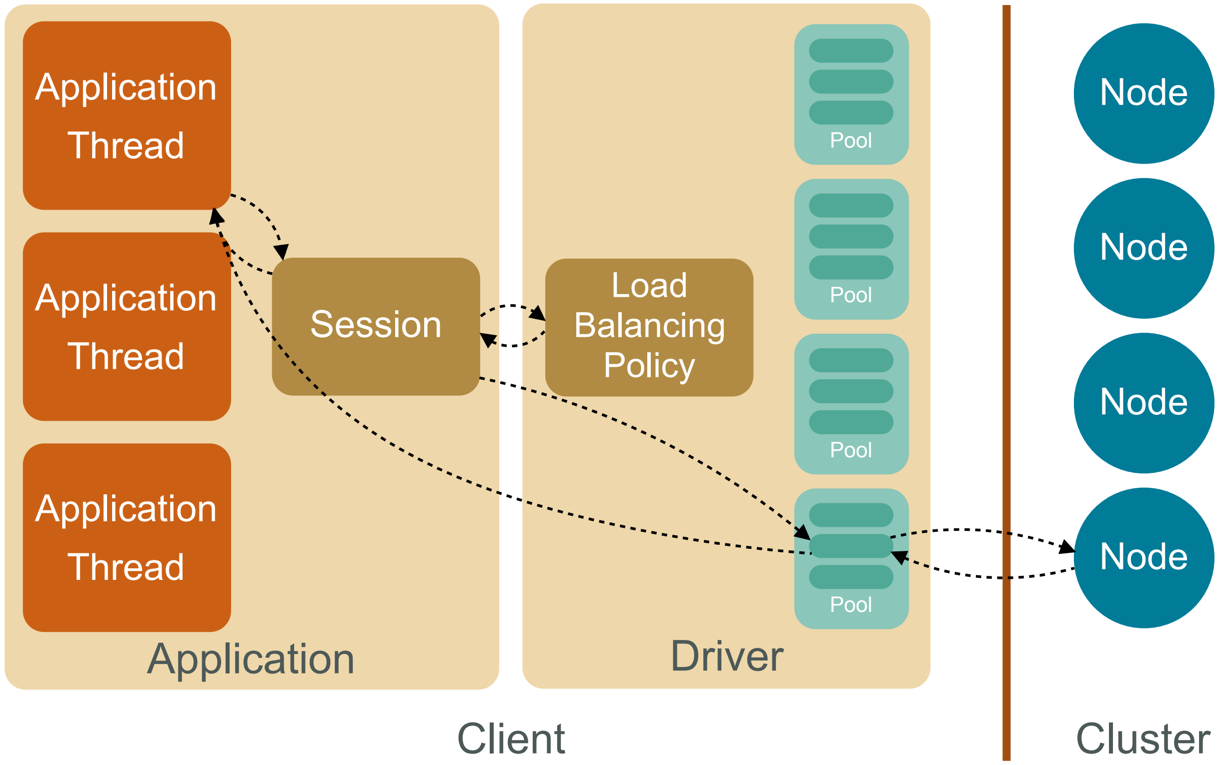
Load Balancing

Principles and Implementations

Load Balancing



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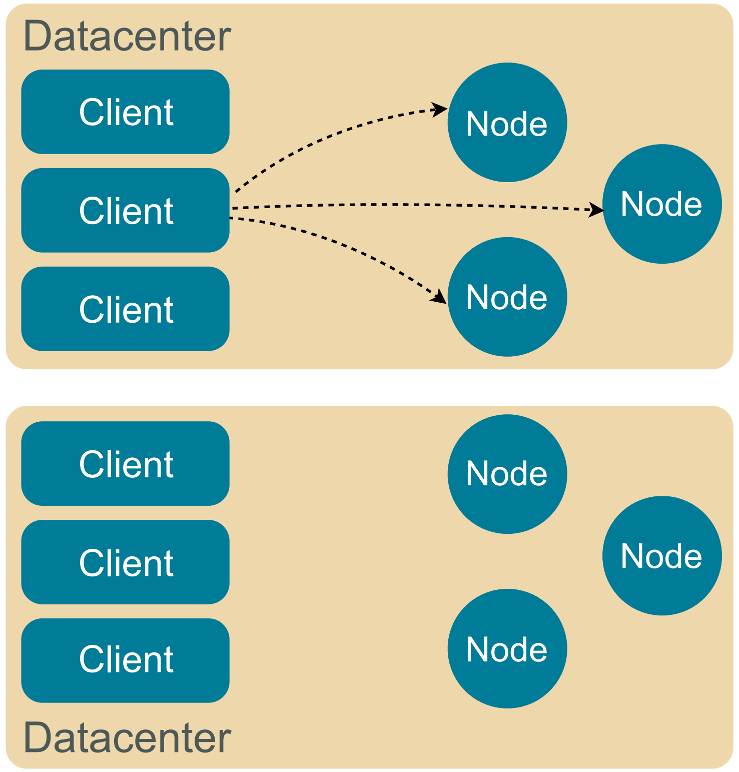
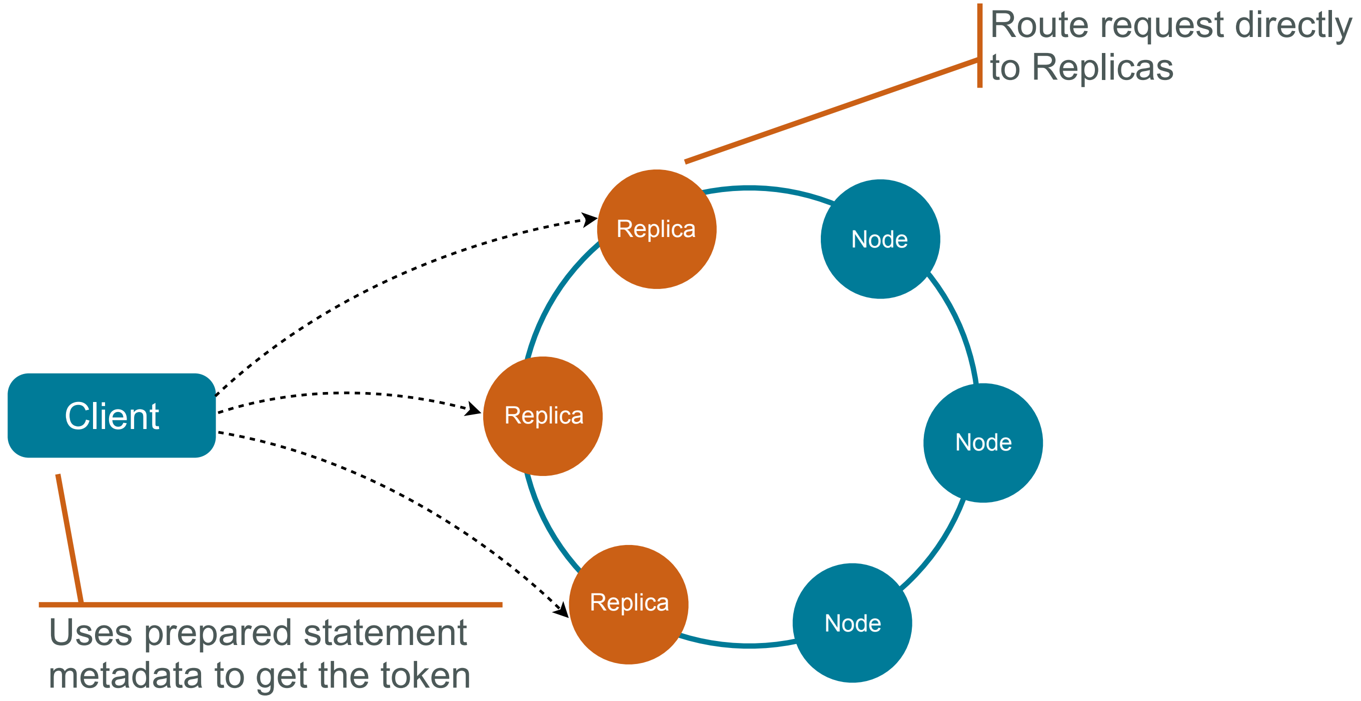
DataCenter Aware Balancing



Local nodes are queried first, if none are available, the request could be sent to a remote node.

Token Aware Balancing



Route request directly to Replicas

Uses prepared statement metadata to get the token

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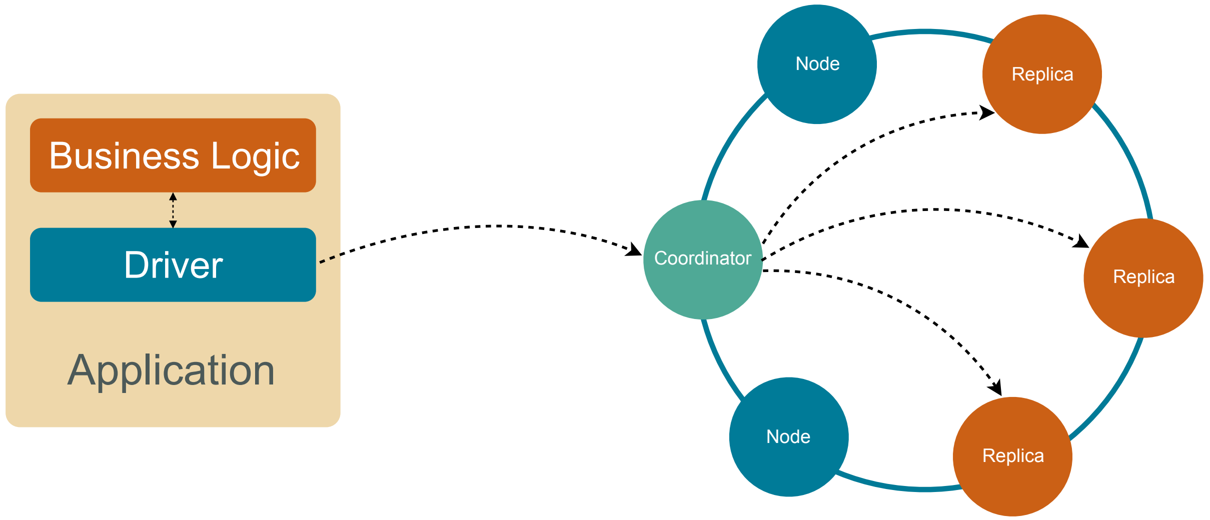
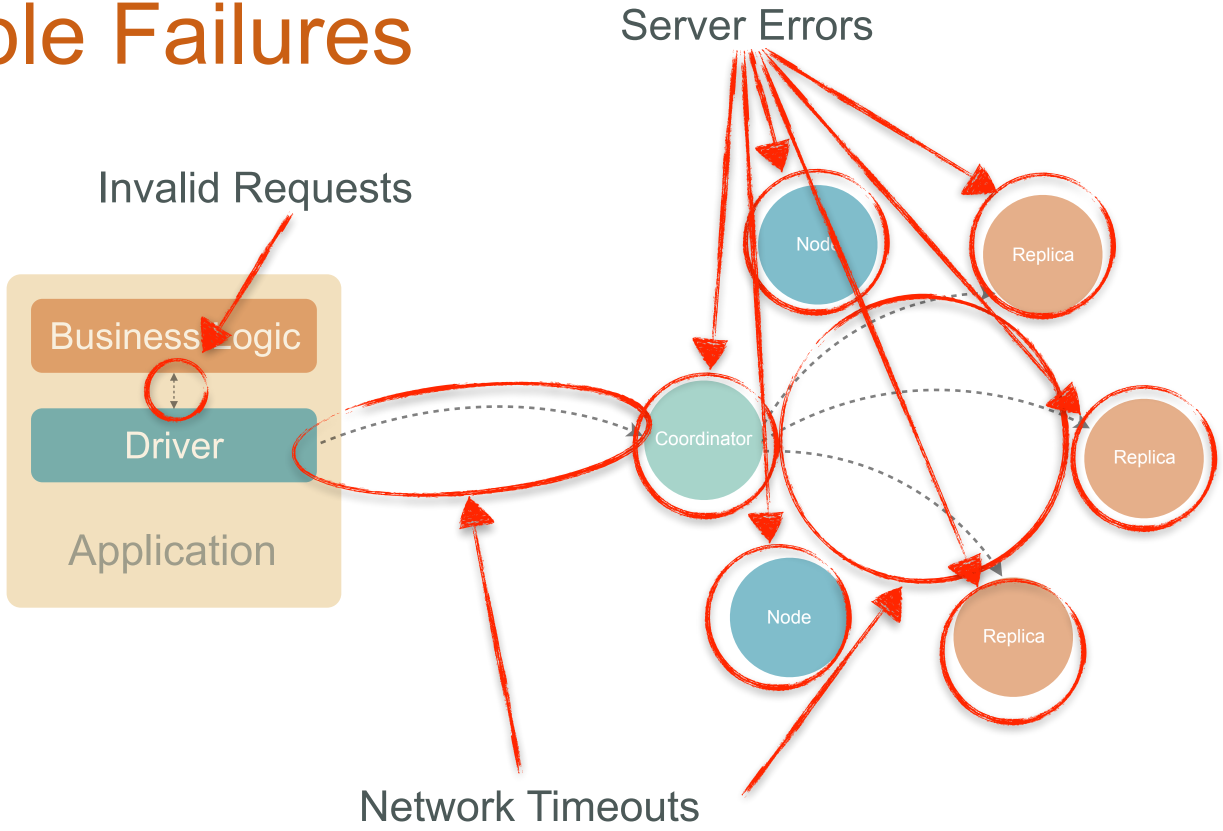
Fault Tolerance

Sources of Failure and Error Handling

Fault Tolerance



Possible Failures



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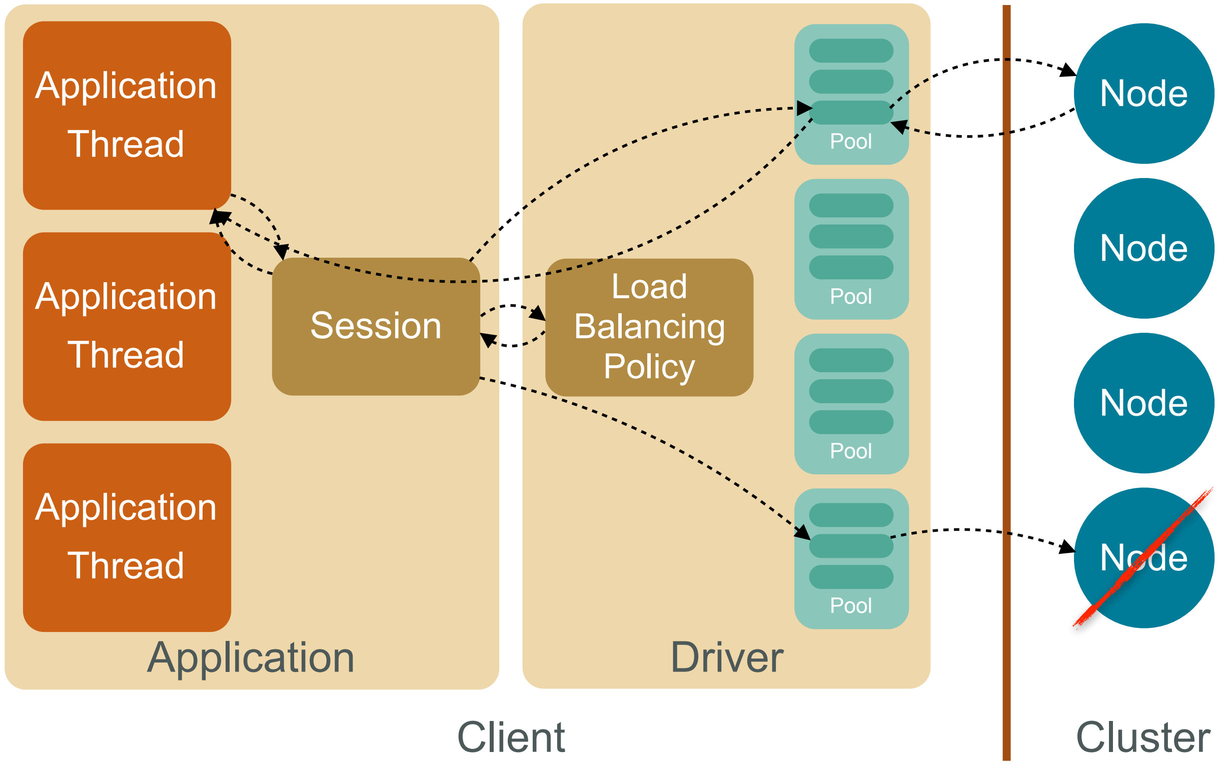
Automatic Retry of Server Errors



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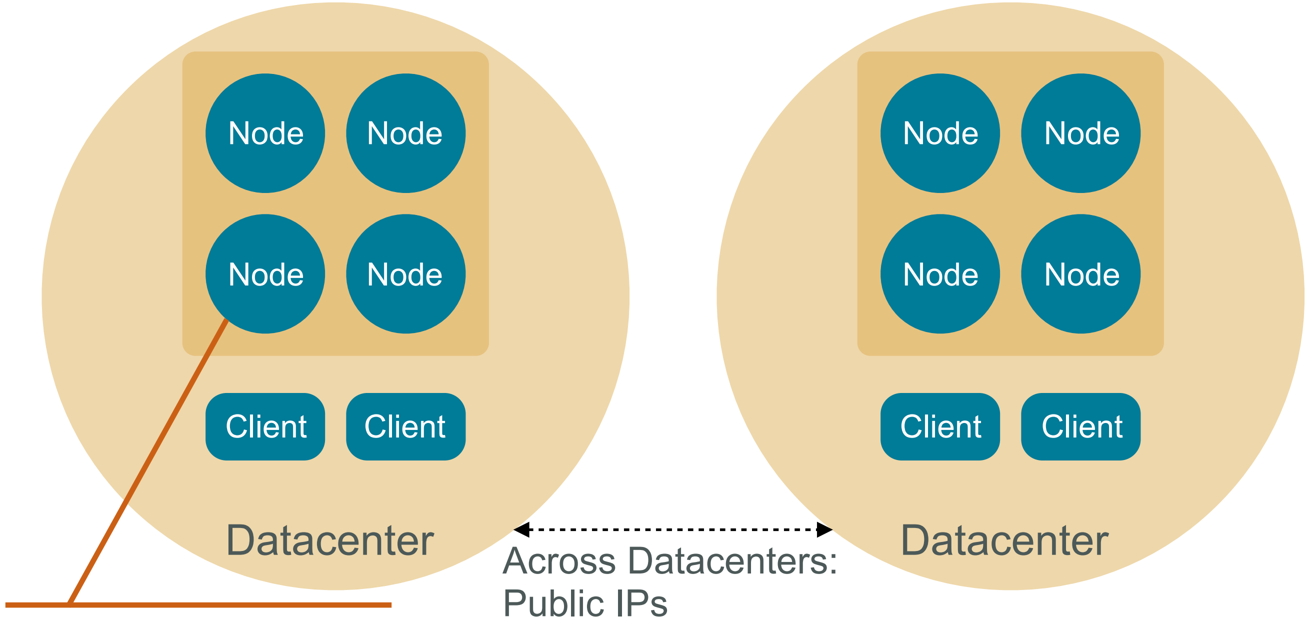
Address Resolution

Topology Aware Client

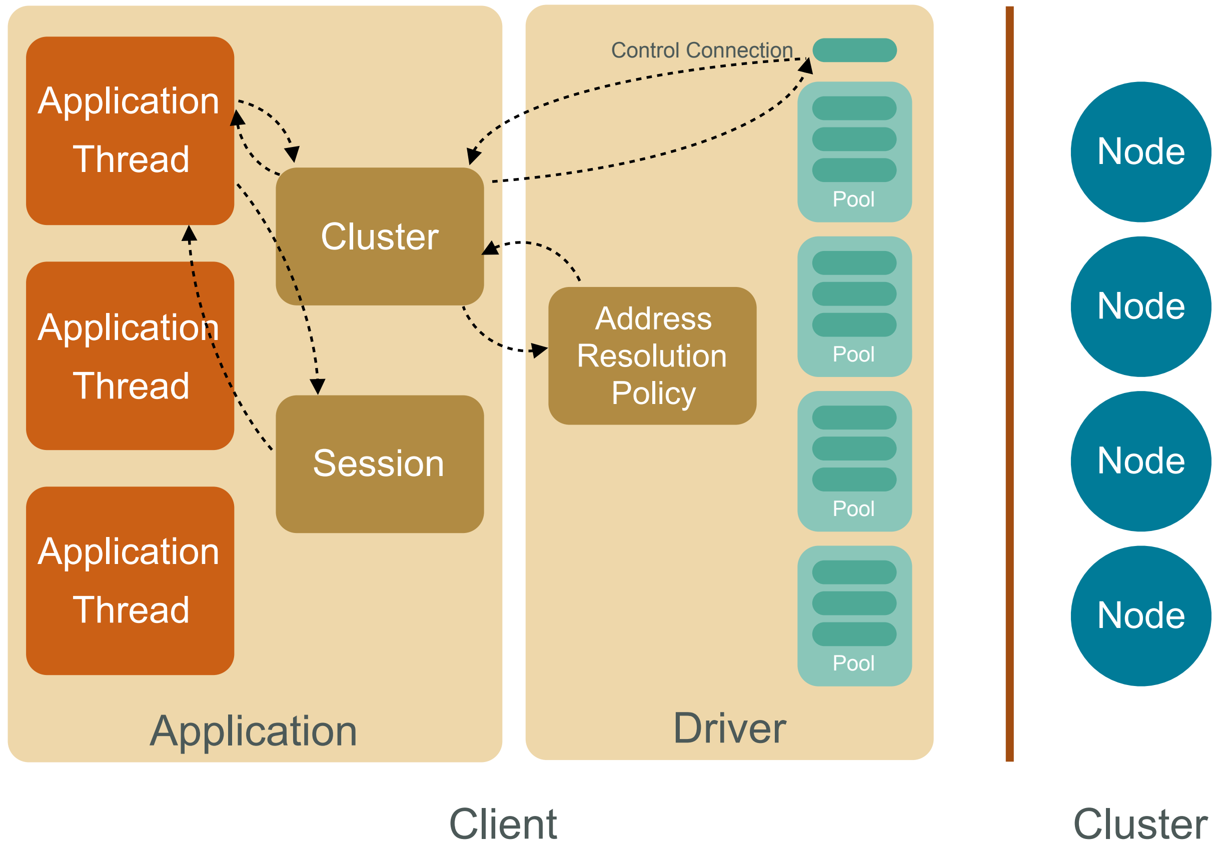
Multiple Addresses



Across Datacenters:
Public IPs

Within Datacenter:
Private IPs

Address Resolution



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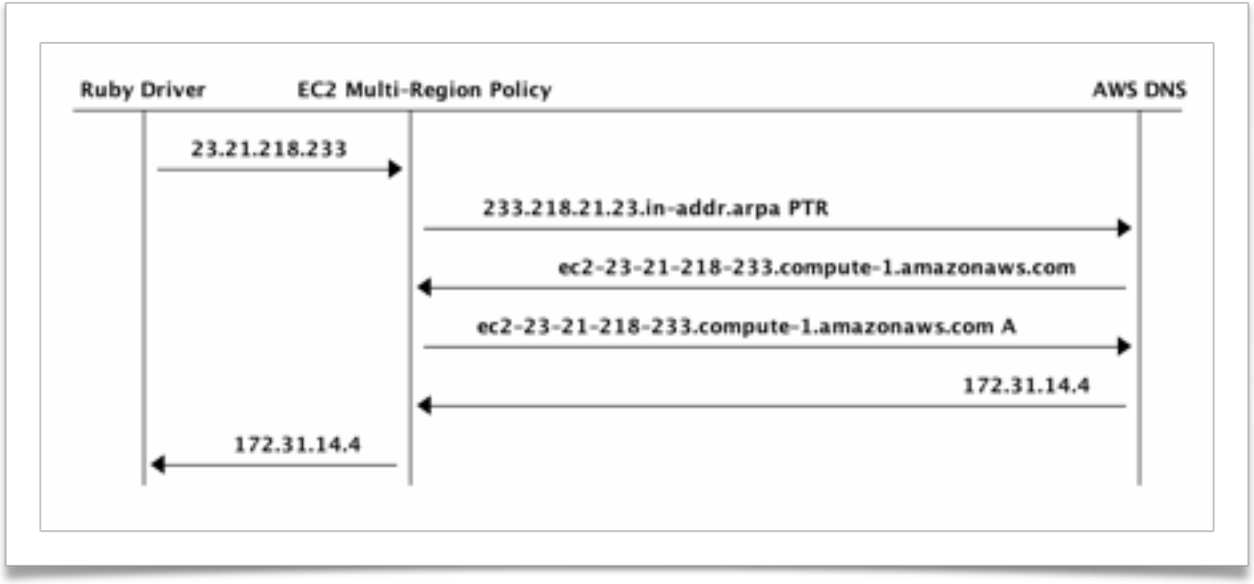
EC2 Multi-Region Address Resolution


Ruby Driver
EC2 Multi-Region Policy
AWS DNS
23.21.218.233
233.218.21.23.in-addr.arpa PTR
ec2-23-21-218-233.compute-1.amazonaws.com
ec2-23-21-218-233.compute-1.amazonaws.com A
172.31.14.4
172.31.14.4

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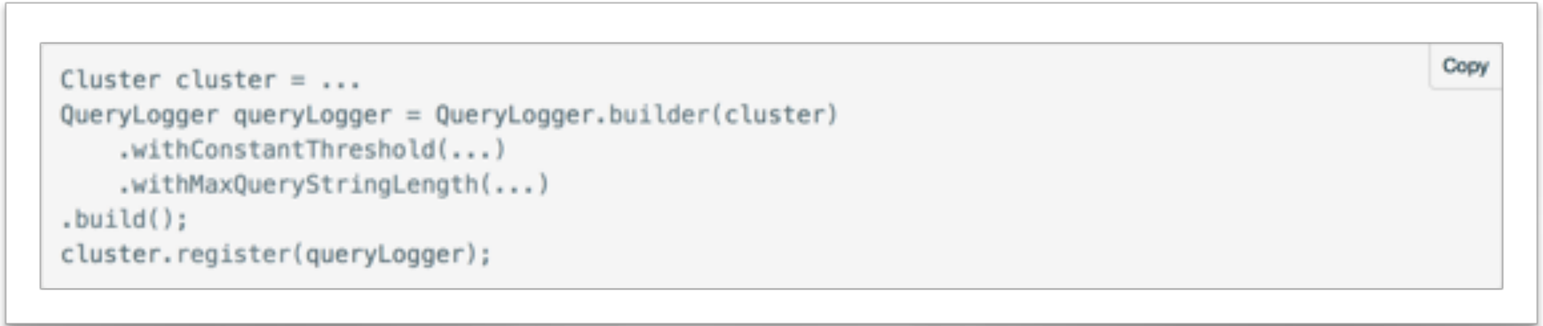
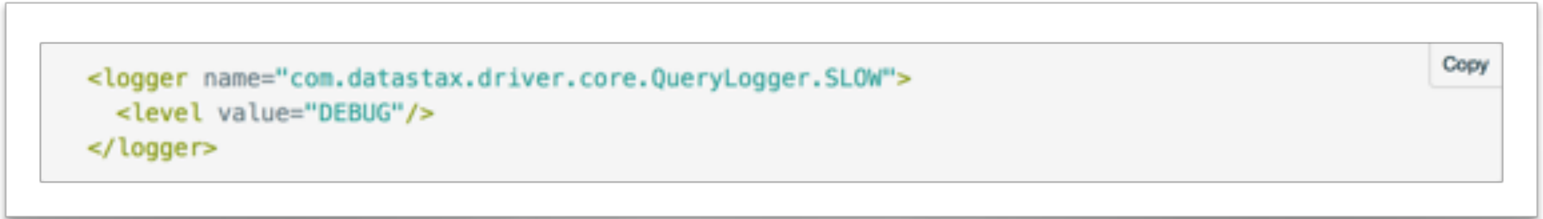
One more thing…

Sneak peek of new and upcoming driver features

Sneak peek: Slow query log



```java
Cluster cluster = ...
QueryLogger queryLogger = QueryLogger.builder(cluster)
    .withConstantThreshold(...)
    .withMaxQueryStringLength(...)
.build();
cluster.register(queryLogger);
```



```xml
  <logger name="com.datastax.driver.core.QueryLogger.SLOW">
    <level value="DEBUG"/>
  </logger>
```

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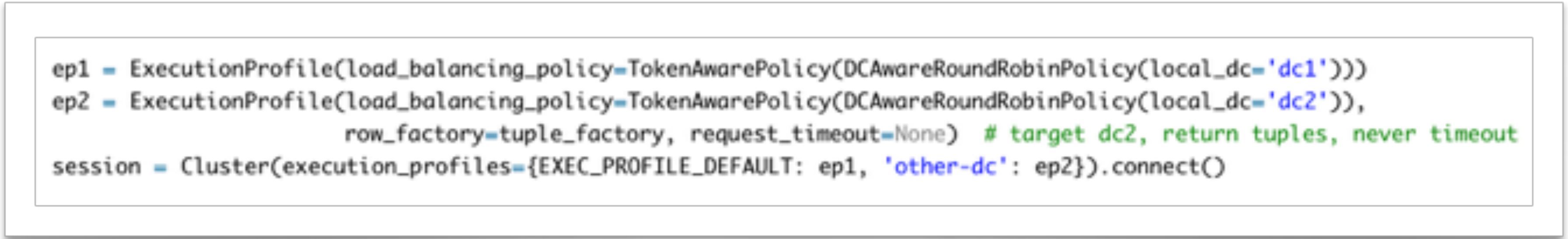
Sneak peek: Execution profiles



```
ep1 = ExecutionProfile(load_balancing_policy=TokenAwarePolicy(DCAwareRoundRobinPolicy(local_dc='dc1')))
ep2 = ExecutionProfile(load_balancing_policy=TokenAwarePolicy(DCAwareRoundRobinPolicy(local_dc='dc2')),
                       row_factory=tuple_factory, request_timeout=None)  # target dc2, return tuples, never timeout
session = Cluster(execution_profiles={EXEC_PROFILE_DEFAULT: ep1, 'other-dc': ep2}).connect()
```

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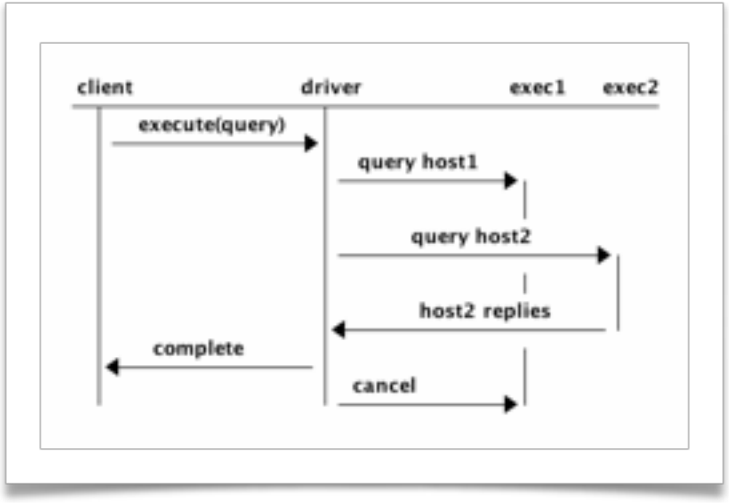
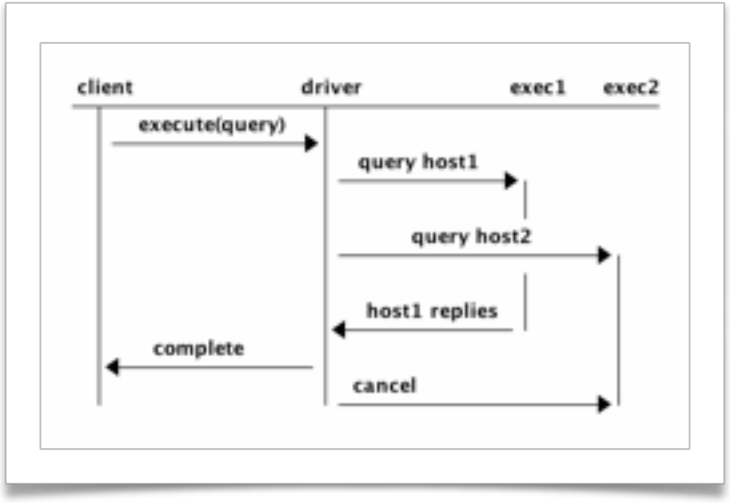
Sneak peak: Speculative retries





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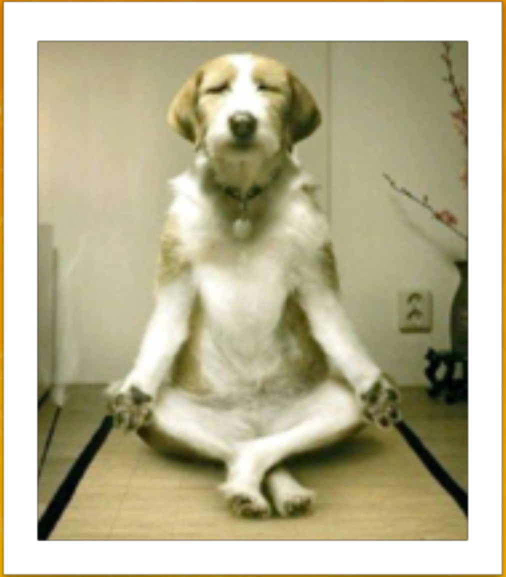
Q&A



Thank you!