



Edge Capacity Expansion

Add Region

Agenda

- Overview
- Prerequisites
- Scenario
- Response files creation
- Region addition process



Overview

Overview

- The steps for adding a new region are very similar to the individual steps required to horizontally scale the planet by adding one component at the time.
- In this video we make emphasis on the “process” required to add a new region rather than the individual commands needed for each step.
- Detailed example for adding a region is available as part of the official documentation:
<http://docs.apigee.com/private-cloud/latest/adding-data-center>
- On this deck we extend that example by describing the prerequisites, process and considerations needed to successfully add new regions.



Prerequisites

Prerequisites

Many of the design principles discussed as part of topology design, apply to the addition of regions on an existing planet. Before adding a new region you must:

- Produce a topology design diagram clearly describing all regions (old and new) on the planet.
- Understand the basic principles governing Edge data replication:
 - OpenLDAP multi-master replication
 - Cassandra ring topology requirements. Each region must have equal number of Cassandra nodes.
 - Zookeeper cluster requirements. The total number of Zookeeper nodes configured as voters must be odd across the cluster. All nodes across all regions as part of the same Zookeeper cluster.
 - Postgres replication. Depending on the design of the original topology, you may be starting with a single PostgreSQL or two or more PostgreSQL servers with a master/slave configuration. As part of the region expansion, you must determine if new PostgreSQL servers will be needed on the new region.
- Consider that a region addition requires not only the installation of new components on the new DC but also reconfiguration of the existing nodes on the current region(s) to expand clusters configuration and server registration.
- Comply with cross-region component connectivity requirements as described on Edge Installation Guide:

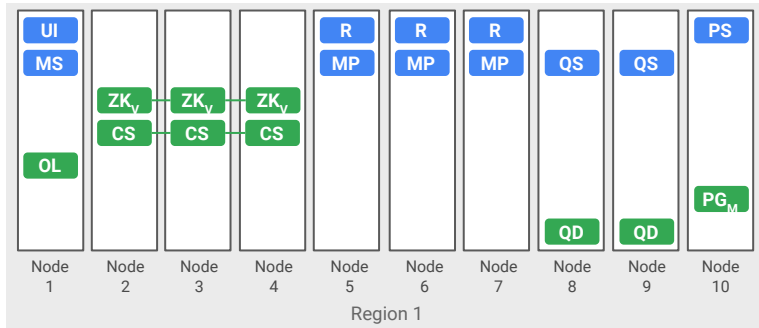
<http://docs.apigee.com/private-cloud/latest/installation-requirements>



Scenario

Scenario - Current Topology

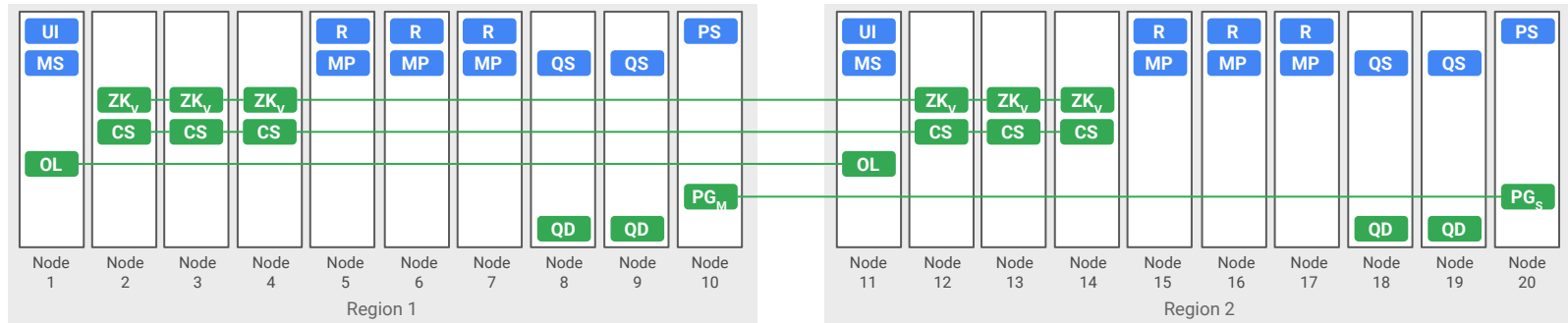
Current topology



To illustrate the process of adding a new region, we describe a scenario starting with a single region (current topology) to which we will add a second region (target topology) with similar configuration, same number of nodes.

Scenario - Desired State

Target topology





Creating response files

Response File Creation

- Create response file per region. You require response file for both old and new regions.
- If the current planet install file is available, it will need to be modified add references to:
 - OpenLDAP peer
 - Zookeeper hosts on region 2
 - Cassandra hosts on region 2
- Below we list the key variables involved on multi-region setup process. Complete sample file is presented next

/tmp/apigee/edge-response-1709-dc1.txt

```
...
MSIP="$DC1IP1"
...
LDAP_TYPE="2"
LDAP_SID="1"
LDAP_PEER="$DC2IP1"
...
REGION="dc-1"
ZK_HOSTS="$DC1IP2 $DC1IP3 $DC1IP4 $DC2IP2 $DC2IP3 $DC2IP4:observer"
ZK_CLIENT_HOSTS="$DC1IP2 $DC1IP3 $DC1IP4"
CASS_HOSTS="$DC1IP2:1,1 $DC1IP3:1,1 $DC1IP4:1,1 $DC2IP2:2,1 $DC2IP3:2,1
$DC2IP4:2,1"
...
```

/tmp/apigee/edge-response-1709-dc2.txt

```
..
MSIP="$DC2IP1"
...
LDAP_TYPE="2"
LDAP_SID="2"
LDAP_PEER="$DC1IP1"
...
REGION="dc-2"
ZK_HOSTS="$DC1IP2 $DC1IP3 $DC1IP4 $DC2IP2 $DC2IP3 $DC2IP4:observer"
ZK_CLIENT_HOSTS="$DC2IP2 $DC2IP3 $DC2IP4"
CASS_HOSTS="$DC2IP2:2,1 $DC2IP3:2,1 $DC2IP4:2,1 $DC1IP2:1,1 $DC1IP3:1,1
$DC1IP4:1,1"
...
```

Sample response files

/tmp/apigee/edge-response-1709-dc1.txt

```
HOSTIP="$(hostname -i)"
MSIP="$DC1IP1"
ADMIN_EMAIL="<email@example.com>"
APIGEE_ADMINPW="<password>"
LICENSE_FILE="/tmp/edge/license.txt"
USE_LDAP_REMOTE_HOST="n"
LDAP_TYPE="2"
LDAP_SID="1"
LDAP_PEER="$DC2IP1"
APIGEE_LDAPPW="<password>"
MP_POD="gateway"
REGION="dc-1"
ZK_HOSTS="$DC1IP2 $DC1IP3 $DC1IP4 $DC2IP2 $DC2IP3 $DC2IP4:observer"
ZK_CLIENT_HOSTS="$DC1IP2 $DC1IP3 $DC1IP4"
CASS_HOSTS="$DC1IP2:1,1 $DC1IP3:1,1 $DC1IP4:1,1 $DC2IP2:2,1 $DC2IP3:2,1 $DC2IP4:2,1"
PG_MASTER="$DC1IP5"
PG_STANDBY="$DC2IP5"
SKIP_SMTP="y"
SMTPHOST="smtp.example.com"
SMTPPORT="25"
SMTPUSER="smtp@example.com"
SMTPPASSWORD="<password>"
SMTPSSL="n"
BIND_ON_ALL_INTERFACES="y"
```

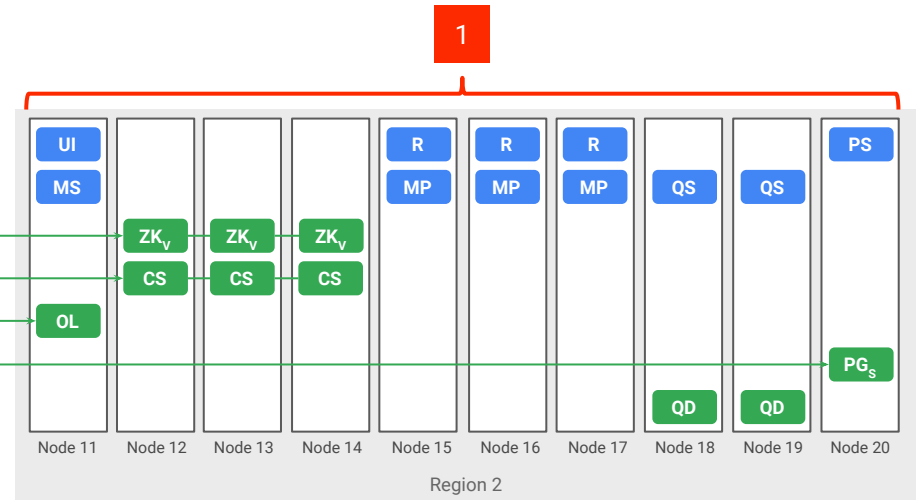
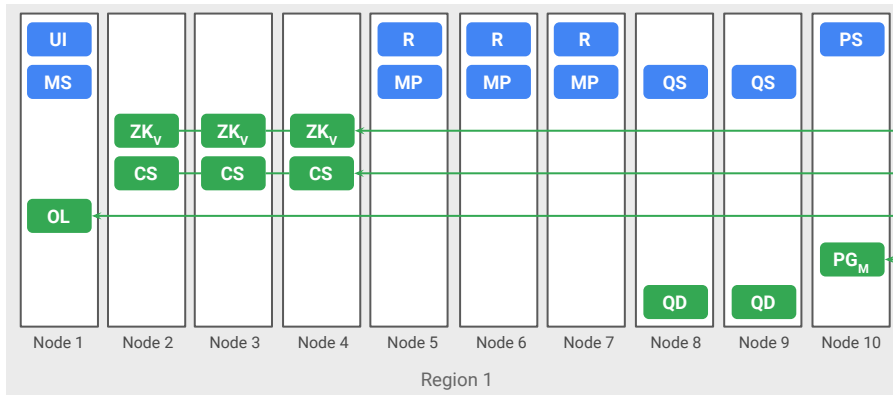
/tmp/apigee/edge-response-1709-dc2.txt

```
HOSTIP="$(hostname -i)"
MSIP="$DC2IP1"
ADMIN_EMAIL="<email@example.com>"
APIGEE_ADMINPW="<password>"
LICENSE_FILE="/tmp/edge/license.txt"
USE_LDAP_REMOTE_HOST="n"
LDAP_TYPE="2"
LDAP_SID="2"
LDAP_PEER="$DC1IP1"
APIGEE_LDAPPW="<password>"
MP_POD="gateway"
REGION="dc-2"
ZK_HOSTS="$DC1IP2 $DC1IP3 $DC1IP4 $DC2IP2 $DC2IP3 $DC2IP4:observer"
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SMTPPORT="25"
SMTPUSER="smtp@example.com"
SMTPPASSWORD="<password>"
SMTPSSL="n"
BIND_ON_ALL_INTERFACES="y"
```



Adding the Region

Region addition process



On region 1

- rerun setup.sh Datastore nodes (ZK, CS nodes)
- Rerun setup.sh on Management Server node (UI, MS, OL)

On region 2

- Perform bootstrap and install apigee-setup on all nodes
- Install Datastore nodes (ZK, CS nodes)
- In all CS nodes, perform `nodetool -h <host> rebuild dc-1`
- Install Management Server node (UI, MS, OL)
- Install Routers and Message Processors (R, MP)
- Install Qpid server (QS, QD)
- Install Postgres server (PS, PG)



Legend:



Router



Message Processor



Enterprise UI



Management Server



Postgres Server



Qpid/Ingest Server



Developer Portal



MySQL



Zookeeper



Cassandra



Openldap



PostgreSQL



Apache Qpid

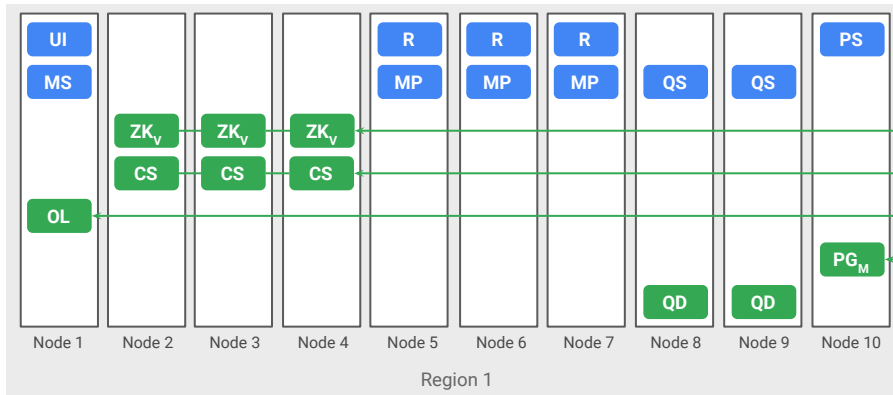


Server/Virtual Machine



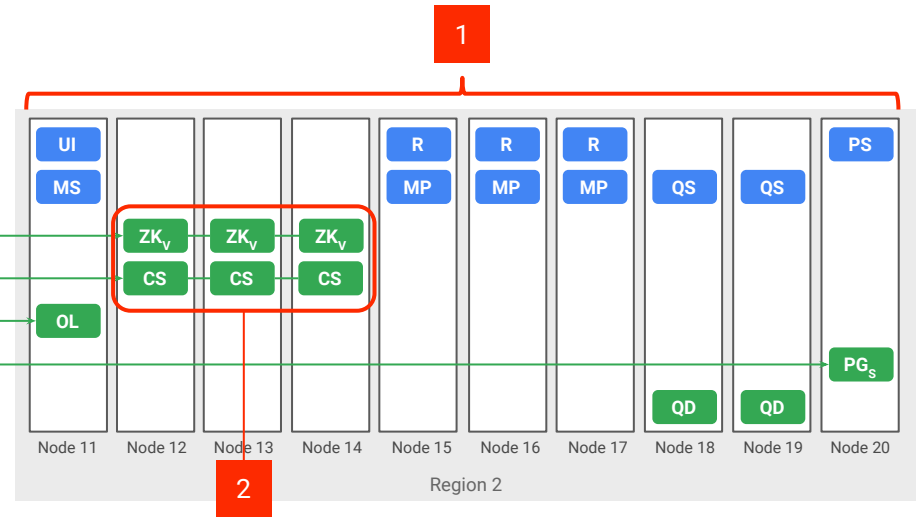
POD

Region addition process



On region 1

3. rerun setup.sh Datastore nodes (ZK, CS nodes)
4. Rerun setup.sh on Management Server node (UI, MS, OL)



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1. Perform bootstrap and install apigee-setup on all nodes
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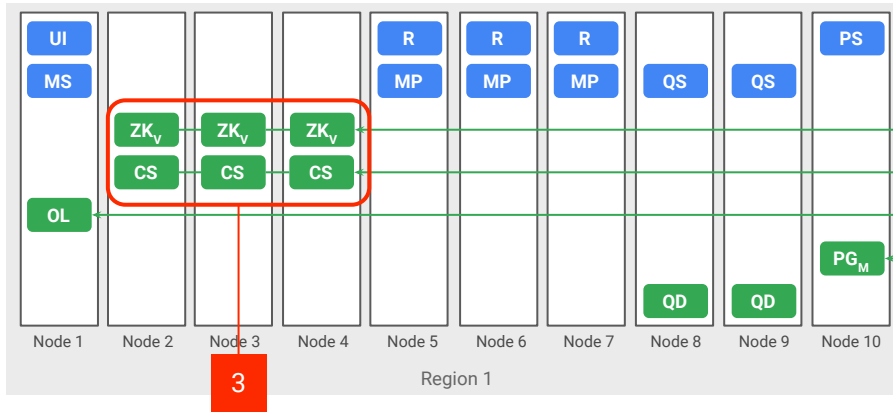


Server/Virtual Machine



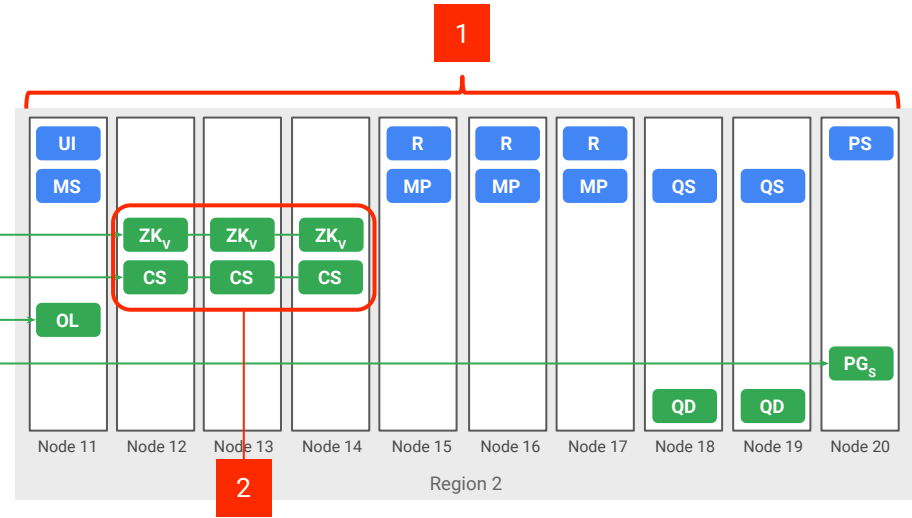
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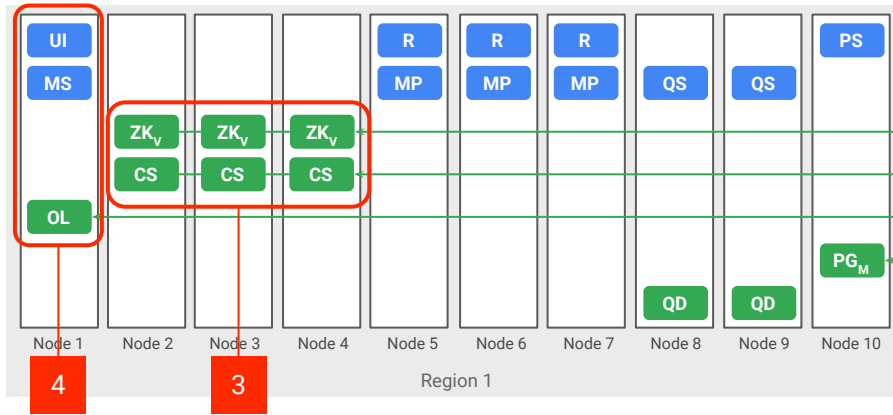


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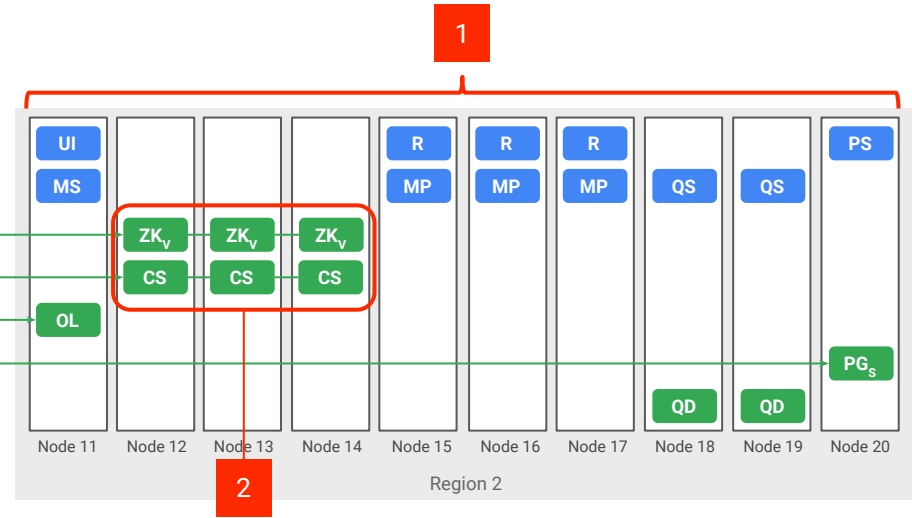
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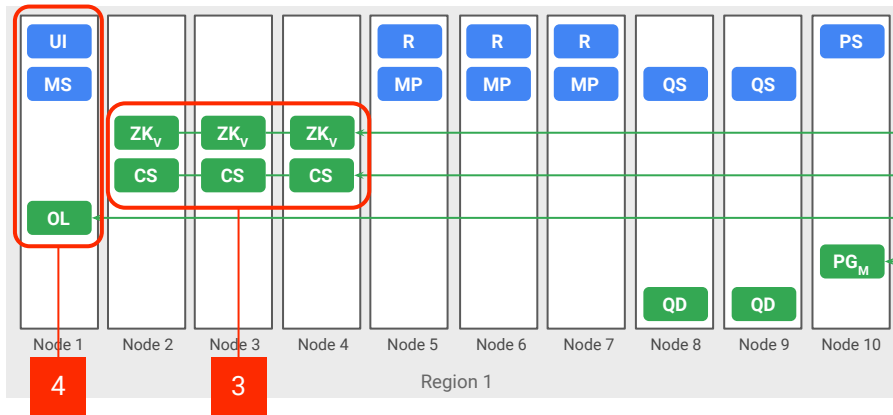


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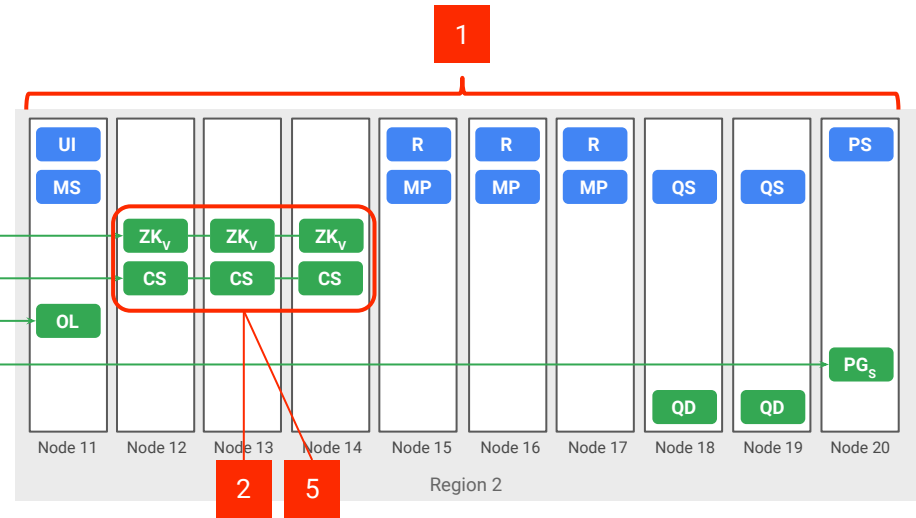
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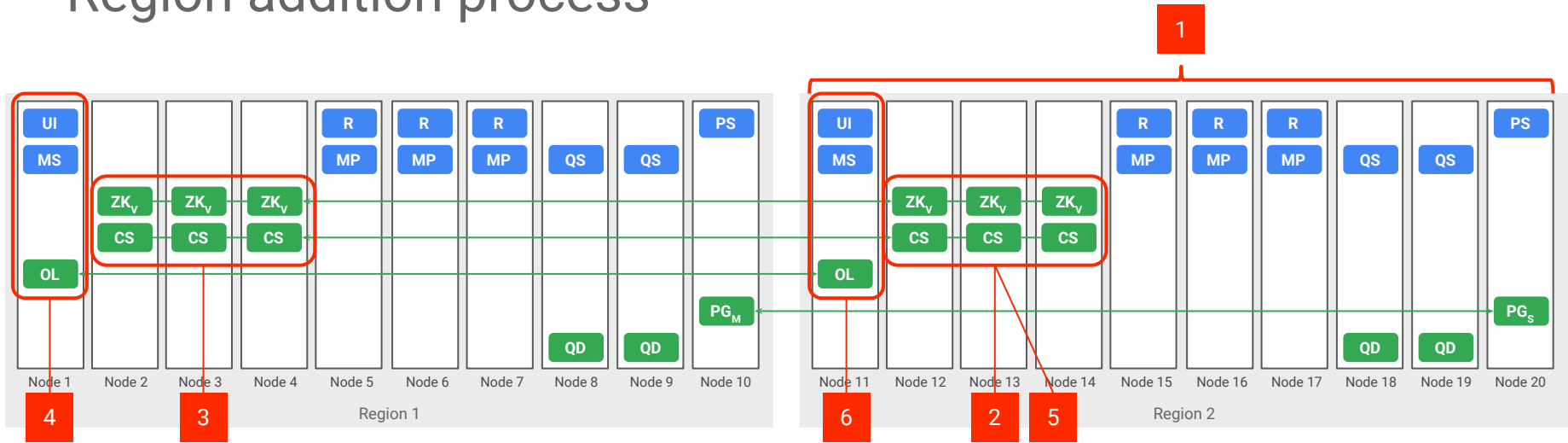


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POD

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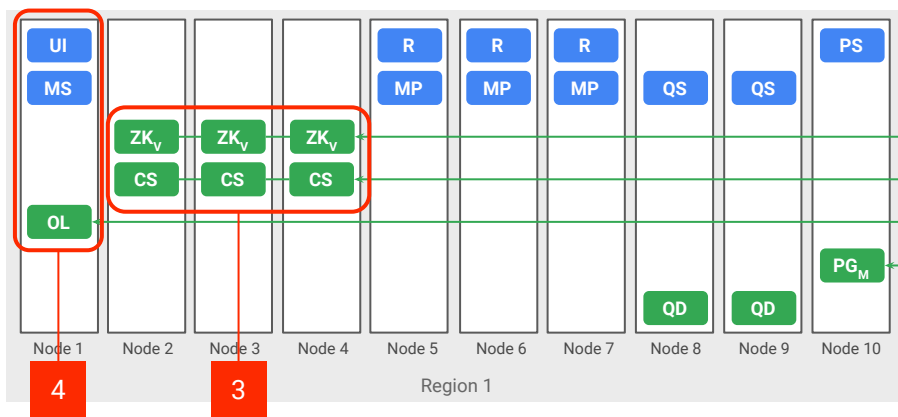
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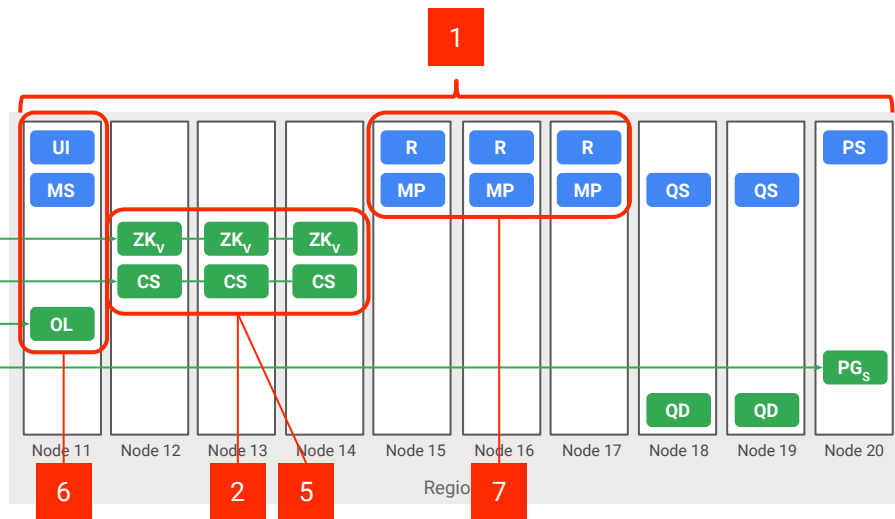
R Router	MS Management Server	DP Developer Portal	MY MySQL	OL Openldap
MP Message Processor	PS Postgres Server		ZK Zookeeper	PG PostgreSQL
UI Enterprise UI	QS Qpid/Ingest Server		CS Cassandra	QD Apache Qpid
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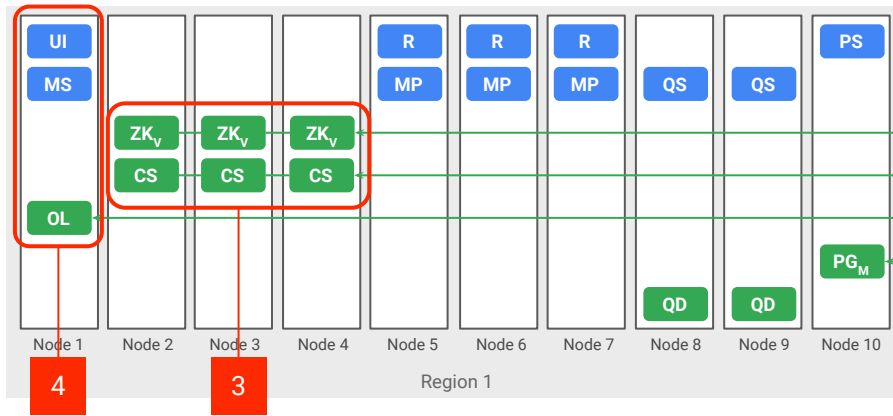


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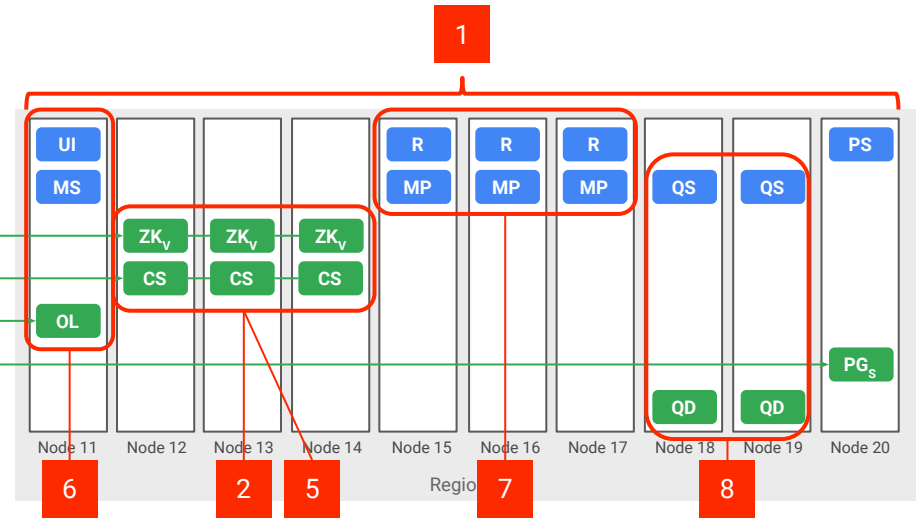
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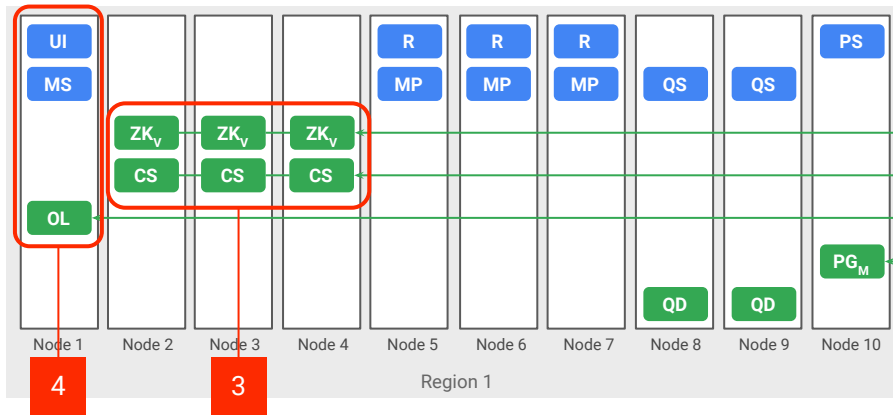


Server/Virtual Machine



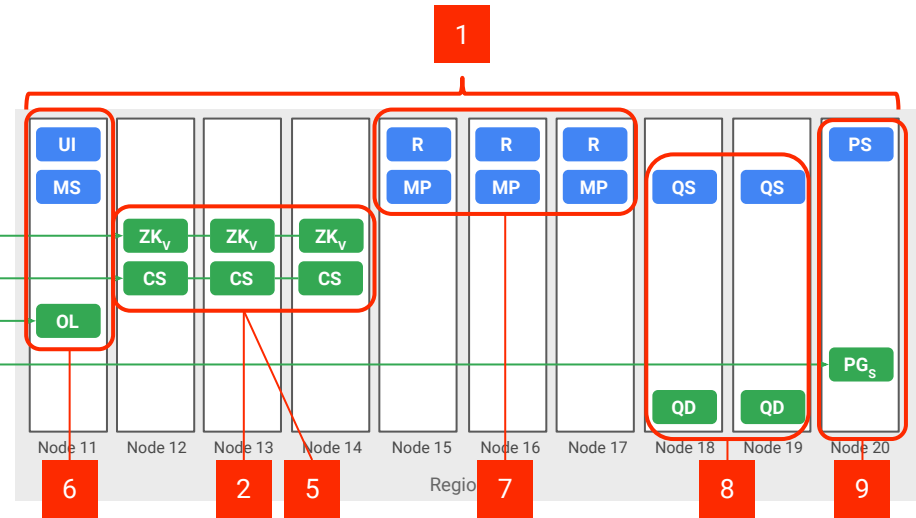
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R Router	MS Management Server	DP Developer Portal	MY MySQL	OL Openldap
MP Message Processor	PS Postgres Server		ZK Zookeeper	PG PostgreSQL
UI Enterprise UI	QS Qpid/Ingest Server		CS Cassandra	QD Apache Qpid
				Server/Virtual Machine
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Region addition process

10. Setup Postgres master/standby for the Postgres nodes

The Postgres node in dc-1 is the master, and the Postgres node in dc-2 is the standby server. On both region 1 and region 2 response files (on the previous sample file), PG_MASTER and PG_STANDBY variables are already set to point to appropriate Postgres server.

On region 1

10.1. Enable replication on the new master:

```
/opt/apigee/apigee-service/bin/apigee-service apigee-postgresql setup-replication-on-master -f  
configFile
```

On region 2

10.2. Stop the server and then delete any existing Postgres data:

```
/opt/apigee/apigee-service/bin/apigee-service apigee-postgresql stop  
rm -rf /opt/apigee/data/apigee-postgresql/
```

Configure the standby node:

```
/opt/apigee/apigee-service/bin/apigee-service apigee-postgresql setup-replication-on-standby -f  
configFile
```

Region addition process

11. Update analytics configuration

- Edge uses analytics groups as a mapping between available analytics resources (Qpid and Postgres) and Organizations and Environments.

```
curl -u <sysAdminEmail>:<passwd> "http://<ms_IP>:8080/v1/analytics/groups/ax"
[ {
  "name" : "axgroup001",
  "properties" : {
    "consumer-type" : "ax"
  },
  "scopes" : [ "traininglab~prod" ],
  "uuids" : {
    "postgres-server" : [ "baf7d9d5-618c-4ce4-8c5b-23ad2c62eb51:489aa9b0-b764-4ade-8615-27db09e9deca" ],
    "qpid-server" : [ "708cf21f-2efe-41c9-97b5-809e56676347", "4f1c20e5-0dc5-450c-8619-3cd9fe75ce4b",
      "90a34c3b-310e-408e-84b8-07c424489ab4", "157cdc66-463a-4756-bf0a-172908d0b4c0" ]
  },
  "consumer-groups" : [ {
    "name" : "consumer-group-001",
    "consumers" : [ "708cf21f-2efe-41c9-97b5-809e56676347", "4f1c20e5-0dc5-450c-8619-3cd9fe75ce4b",
      "90a34c3b-310e-408e-84b8-07c424489ab4", "157cdc66-463a-4756-bf0a-172908d0b4c0" ],
    "datastores" : [ "baf7d9d5-618c-4ce4-8c5b-23ad2c62eb51:489aa9b0-b764-4ade-8615-27db09e9deca" ],
    "properties" : {
    }
  } ],
  "data-processors" : {
  }
} ]
```


Region addition process

12. Cassandra nodes clean up

- Run the following nodetool command on all Cassandra nodes in dc-1 to recover space:

```
/opt/apigee/apigee-cassandra/bin/nodetool -h cassandraIP cleanup
```

13. Reconfigure organizations

On the Management Server node of dc-1. For each organization and for each environment that you want to support across data centers

```
apigee-adminapi.sh orgs pods add -o orgName -r dc-2 -p gateway-2 --admin adminEmail --pwd adminPword --host localhost
```

where gateway-2 is the name of the gateway pod as defined by the MP_POD property in the dc-2 config file.

14. Add the new Message Processors to the org and environment

On the Management Server node of dc-1, for each Message Processor in dc-2, add the Message Processor to an environment for the org:

```
apigee-adminapi.sh orgs envs servers add -o orgName -e envName -u UUID --admin adminEmail --pwd adminPword --host localhost
```

Global Load Balancer

- Once two or more regions are present on the planet a mechanism to route traffic to each data center must be implemented.
- Most customers use Global Load Balancer. It is up to the customer to decide how to configure the Global Load Balancer. Active/Active, Active/Passive, Geo-location and other routing rules are possible to implement.

Edge data replication across the planet is active/active.



Thank You