Postgres Plus Cloud Database

Presented by Dave Page
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Introduction

Community

- pgAdmin lead developer
- PostgreSQL core team member
- Installer maintainer
- Postgres Europe and Postgres Canada board member

EnterpriseDB

- Chief Architect, Tools & Installers
- Infrastructure lead
What is a Cloud Database?

Database taking advantage of a cloud environment

- Point and click deployment
- Point and click management
- Auto and manual scaling
- Auto healing

Not merely "installed" in the cloud

- Which would require similar administration to a physical machine.
What is PPCD?

Cloud database:

- Multi-platform:
  - Amazon AWS
  - HP Cloud (OpenStack)
  - Citrix (CloudStack)
  - More coming soon…

- Multi-server:
  - PostgreSQL 9.1/9.2
  - Postgres Plus Advanced Server 9.1/9.2
Features

- Web based management
- Data security
- Horizontal and vertical scaling
- Storage scaling
- Self-healing
- Extensible
Architecture

Amazon AWS, HP Cloud (OpenStack), Citrix (CloudStack)

New Instance

PPCD Server

PPCD Console

Cloud Controller

JClouds API

Cloud Cluster Manager

Configuration Manager

PPCD Database

Applications

REST/WS

Browser

PPCD Cluster

SQL Router (pgpool II v3.2)

PG 9.2

Node Manager

Master

PG 9.2

Node Manager

Replica 1

PG 9.2

Node Manager

Replica 2
Web based management

- Deploy new database clusters with a simple wizard

- Perform manual maintenance with a few clicks:
  - Add replicas and clones
  - Perform backups
  - Upgrade clusters
  - Performance monitoring
Live Demo – Create a new cluster

Cluster: cluster1
Creation Date: Tue Mar 05 08:12:15 EST 2013
Username: postgres
Size: 2gb
Region: us-east-1
Hardware: m1.small
Engine Version: PostgreSQL 9.2.2 64bit
Configuration: default
Cluster healing mode:
- Replace failed master with a new master
- Replace failed master with existing replicate

Provide the details for your cluster
- Cluster Name: cluster2
- Engine Version: PostgreSQL 9.2.2 64bit
- Server Class: m1.small
- Number of nodes: 2
- Storage GB: 20
- Master User: postgres
- Master Password: Password

Backup Settings
- Backup Window: 12:00am - 2:00am
- Backup Retention: 1
Data security - replicas

- Clusters contain one or more replicas of your data
- Uses streaming replication
- Replicas are used for read load balancing
- Replicas can be promoted to the master role at any time
Clone a cluster at any time

Useful for:

- "online" backups
- Reporting clusters
- Development clusters
Data security - backups

- Automated backups to storage such as S3
- Manual on-demand backups
- Restore to a new cluster on demand
Live Demo – Run a backup
Horizontal scaling

- Scales out by adding more nodes to the load balanced cluster
- Manual scaling on demand
- Auto-scaling based on "read" connection numbers
- Can be performed live

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- Configuration: default
- Cluster healing mode:
  - Replace failed master with a new master
  - Replace failed master with existing replica

Auto-Scaling Thresholds:
- % of Storage Size used: 65
- # of Server Connections: 95
Horizontal scaling – how?

- Snapshot the data directory
- Initialise a new server instance
- Create a data directory from the snapshot
- Add the new instance to the cluster and "catch up"
- Add the new instance to the load balancer
Live Demo – Add a replica
Vertical scaling

- Scales up (or down) by changing the machine type
- Manually initiated only
- Currently requires a maintenance window
Vertical scaling – how?

- Snapshot the current cluster
- Duplicates cluster servers onto new machine types
- Restores backup taken in step 1 to all nodes
- Starts the databases and replication
- Optionally switches the elastic IP over to the new cluster
Storage scaling

- Manual scaling of storage
- Automatic scaling when at N% used
- Can be performed live
Storage scaling – how?

- New EBS volumes are created for each node
- New volumes are mounted and added to the data volume group
- Logical volume expanded to utilise additional space
Live Demo – Auto scaling
Self healing

- Automatic replacement of failed replicas

- Automatic replacement of failed masters:
  - Promotes then replaces an existing replica OR
  - Creates a new master and brings it online
Extensible

- Shell access to cluster nodes
- Allows installation of extensions like PostGIS
- Push configuration changes to the pooler and database servers from the console
Questions?

www.enterprisedb.com/cloud-database