Running virtualized Galera instances for fun and profit
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Outline

1. Introduction
2. Galera and Virtualization
3. Coming Together
4. Conclusion
Overview

- Synchronous replication
- Galera and PXC
- Virtualization
- High Availability
- Commonality
Galera/PXC

- What are they
- How do they work
- MySQL Compatibility
- Synchronous replication
  - Others
    - Google F1/Spanner
    - MySQL NDB
- Sharding?
Virtualization

- Popular solutions
  - Xen, KVM, OpenStack
  - Containers - LXC, Docker, ZeroVM
    - Application-isolated virt
- Application
- Constraints
- Advantages
- Data-centers
  - WSCs and clusters
Warehouse-scale

- Clusters
  - Hadoop, Manta et.al.
- Different from normal data-centers
  - Why?
  - Homogenity of hardware and stacks
  - Demands and constraints
Current scenario

- Popular Solutions
  - GlusterFS: FUSE
  - Sheepdog: QEMU

- Application level clustering
  - How is this different
    - Can work with them
  - Galera and others
    - Hadoop
    - {No,New,}SQL
    - Mapreduce/Compute
Scenarios

- Necessity
  - Hardware of today
    - Saturation
    - WSC
  - High Availability
    - Migration
    - WANs
  - Isolation
    - Hosting
Deployment I

- Initialisation
  - Bootstrapping
  - Cloning
    - QCOW zero-copy: I/O
    - Reduced memory footprint: KSM
    - Thin-provisioning: Ballooning
    - Upgrades!
    - Load-balancing galera
Operation

- Migration
  - Live Migration: Streaming
- Guest Agent
  - FTWRL: Xtrabackup
- Shared storage
  - COW or COR
  - LAN v/s WAN
Deployment III

- Storage
  - Single host
    - VirtFS: share the root!
      Works well with QCOW

- Network
  - Latency
    - Synchronous replication!
      Affects pre-commit stage
  - virtio-net/vhost-net
Deployment IV

Misc

- Backups
  - Dirty bitmaps

Roles

- Throttling
- Reader - Writer
  - Upgrades, maintenance
  - Non-homogenous hardware
  - Async replication support
Thoughts?

- Questions
- Usage and Experience
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http://wnohang.net/about

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https://launchpad.net/percona-xtradb-cluster