

Advanced : Upgrading from Native MySQL Replication to a Tungsten Cluster



Topics

In this course we will:

- Review the Cluster Architecture
- Discuss upgrade Methods
 - In Place Conversion
 - New Cluster with Direct Feed
- Review prerequisites required
- Walkthrough an Upgrade (Full end to end demo)
- Recap Key Resources and Tools

Course Prerequisite Learning

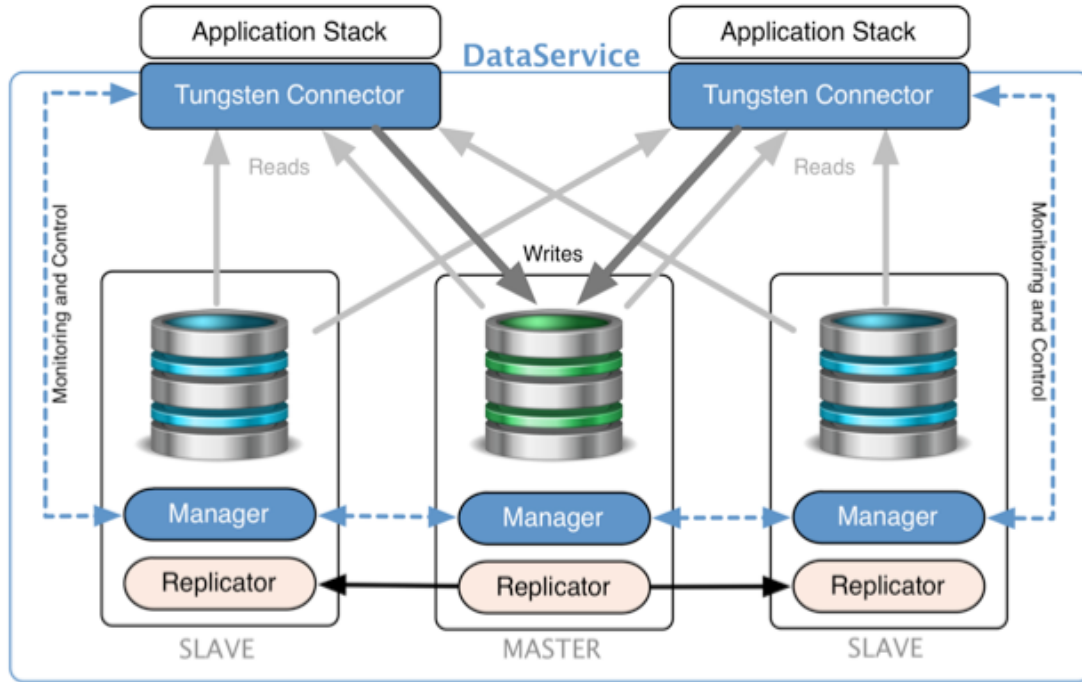
- Basics: Introduction to Clustering
- Basics: The Power of the Connector
- Visit Continuent website or Tungsten University on YouTube to watch these recordings



Tungsten Cluster Architecture



Tungsten Cluster Architecture



Upgrade Methods



Upgrade Methods

- Is downtime acceptable?
 - Peak/Off Peak Periods?
- How do your applications currently connect?
- How do we move from Native to Tungsten?
 - In Place Upgrade
 - New Cluster with Direct Feed



Upgrade Methods: In Place

- Will require downtime
 - Port change on DB Nodes
 - Re-Point applications to Connectors
- Pros
 - Do not need to build out new cluster
 - No need to export/import data
 - Replication will carry on where Native left off
- Cons
 - DB's need to be restarted for changes to be implemented
 - All Applications will need to temporarily use Master only
 - If it goes “wrong” may require more effort to rollback

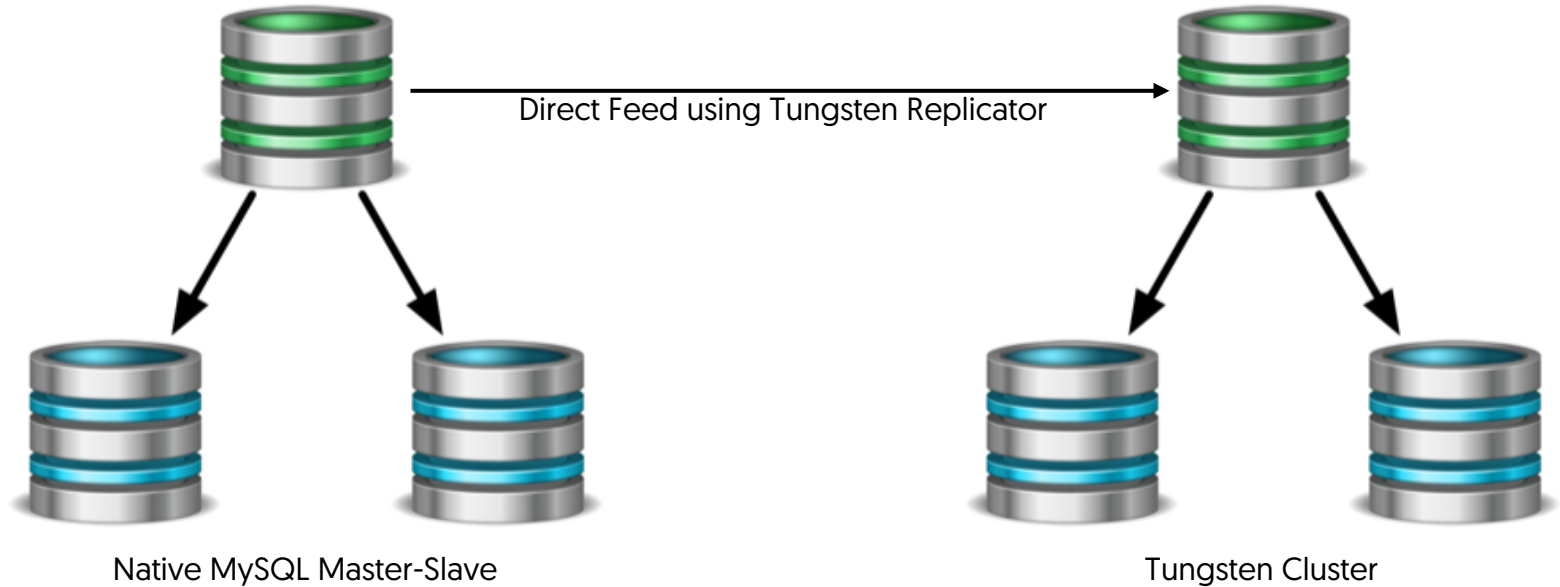


Upgrade Methods: New Cluster with Direct Feed

- Will require limited service interruption
 - Re-Point applications to New Cluster
- Pros
 - Second cluster configured in isolation
 - No risk to existing nodes
 - Easy Rollback should anything go wrong
 - Use opportunity to upgrade to newer release of MySQL
- Cons
 - Need additional hardware to build out new cluster
 - Requires All new nodes to be restored from backup of existing nodes



Upgrade Methods: New Cluster with Direct Feed



Cluster Decisions and Prerequisites



Pre Installation Environment Decisions

- Where will the connectors be installed?
 - Dev/Test/Staging – On DB Host is OK
 - Production – Dedicated hosts or hosted with App Servers
- Which release of MySQL?
 - MySQL Community
 - Percona
 - MariaDB
 - Oracle MySQL Enterprise
- Which version?
 - 5.0 to 5.7
- What monitoring tools do you have?
- What backup tools do you have?



Prerequisites

- Review docs
 - <http://docs.continuent.com/tungsten-clustering-5.3/prerequisite.html>
- Host Prerequisites
 - OS user
 - /etc/hosts
 - sudoers and ssh
 - Ruby
 - Java
- Network Prerequisites
 - Review port requirements
- MySQL Prerequisites
 - my.cnf settings
 - tungsten user accounts



Pre Installation Tungsten Decisions

- TAR file or RPM?
- INI-based install or staging install?
 - ini for In-Place conversion
- Which connector mode?
 - Bridge is default
 - Proxy mode
 - SmartScale



Installation Methods: ini vs staging

- INI-based Install
 - Install managed via /etc/tungsten/tungsten.ini on EACH host
 - PROS
 - Control over each node individually
 - Easy integration to automation software such as puppet and chef
 - Remove dependency on single host for install
 - Recommended for In-Place conversion due to greater control node by node
 - CONS
 - Configuration changes must be performed individually
 - Risk of misconfiguration between nodes

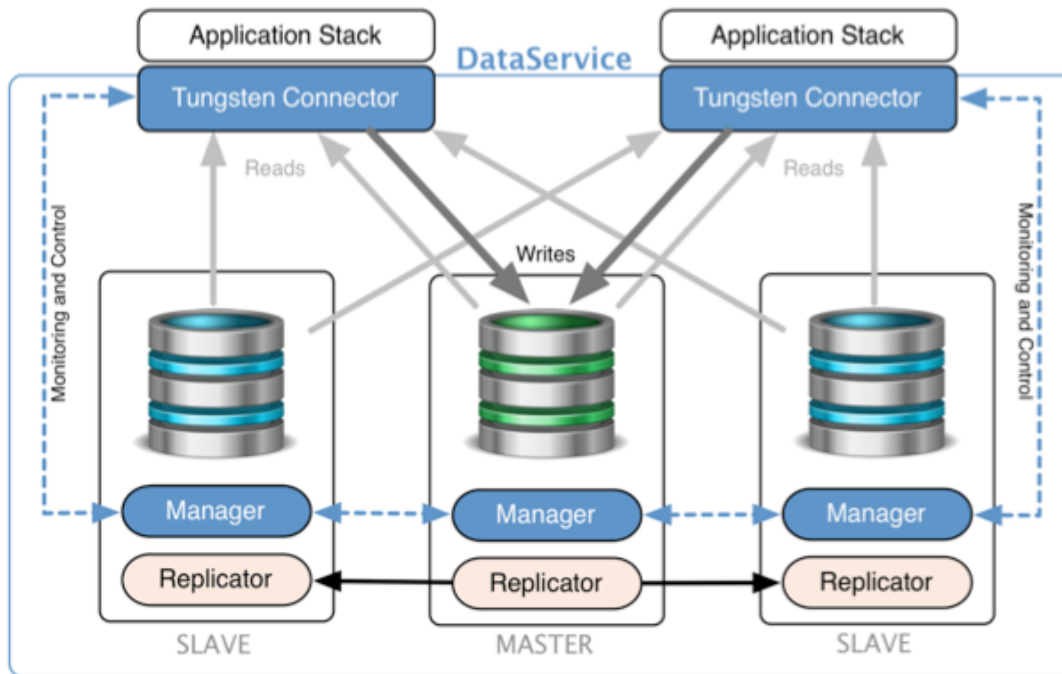


Installation Methods: ini vs staging

- Staging Install
 - Install managed from one host
 - Could be a cluster node or a separate host outside of cluster
 - PROS
 - One single place for configuration
 - Easy to install/update entire cluster in one go
 - Cluster configuration applied to all nodes, less risk of misconfiguration
 - CONS
 - No easy integration to automation software
 - Staging host become single point of failure for configuration management
 - Especially important if Staging host is a DB Node



Upgrade Demo



Command Line Tools & Resources



Tools : cctrl

- “cctrl” can be run from any node within a cluster to control the cluster and gather information
- Type “help” to get a full list of all commands available
- “ls” provides a summary overview of the entire cluster

```
[LOGICAL] /east > ls

COORDINATOR[db1:AUTOMATIC:ONLINE]

ROUTERS:
+-----+
|connector@db1.chris-vagrant[10518](ONLINE, created=0, active=0)|
|connector@db2.chris-vagrant[10596](ONLINE, created=0, active=0)|
|connector@db3.chris-vagrant[10541](ONLINE, created=0, active=0)|
+-----+

DATASOURCES:
+-----+
|db1(master:ONLINE, progress=0, THL latency=0.680)|
|STATUS [OK] [2017/06/22 03:04:15 PM UTC]|
+-----+
|  MANAGER(state=ONLINE)|
|  REPLICATOR(role=master, state=ONLINE)|
|  DATASERVER(state=ONLINE)|
|  CONNECTIONS(created=0, active=0)|
+-----+

+-----+
|db2(slave:ONLINE, progress=0, latency=3.913)|
|STATUS [OK] [2017/06/22 03:04:18 PM UTC]|
+-----+
|  MANAGER(state=ONLINE)|
. . .
```



Tools : trepctl

- “trepctl status” can be run from any node within a cluster to view the status of the local replicator
- “trepctl status -r 3” will show status output refreshed every 3 second until CTRL+C
- “trepctl qs” provides a quick summary overview of the local replicator
- “trepctl perf” provides deeper diagnostics of the different stages in the replicators

```
$ trepctl qs
State: east Online for 21.069s, running for 45.654s
Latency: 0.837s from DB commit time on db1 into THL
        21.839s since last database commit
Sequence: 1 last applied, 0 transactions behind (0-1 stored) estimate 0.00s before synchronization
```

Tools : tpm connector

- Simple and quick way to connect to MySQL CLI
- Tungsten Commands to query database and cluster stats
 - Connector-based Tungsten commands are NOT available in Bridge Mode
 - This is a good way to tell if you are in Bridge mode – if no commands are available, then you are in Bridge mode
 - `tungsten help` will show all commands available

```
mysql> tungsten help;
+-----+
| Message                                                                                                     |
+-----+
| tungsten connection status:                                     display information about the connection used for the last request ran |
| tungsten connection count:                                   gives the count of current connections to each one of the cluster datasources |
| tungsten cluster status:                                     prints detailed information about the cluster view this connector has |
| tungsten show [full] processlist:                             list all running queries handled by this connector instance |
| tungsten show variables [like '<string>']:                   list connector configuration options in use. The <string> may contain '%' wildcards |
| tungsten flush privileges:                                   reload user.map and refresh user credentials |
| tungsten mem info:                                          display memory information about current JVM |
| tungsten gc:                                                calls garbage collector |
| tungsten help:                                              display this help message |
+-----+
9 rows in set (0.00 sec)
```

Log Files

- The `/opt/continuent/service_logs/` directory contains both text files and symbolic links.
- Links in the `service_logs` directory go to one of three [3] subdirectories:
 - `/opt/continuent/tungsten/tungsten-connector/log/`
 - `/opt/continuent/tungsten/tungsten-manager/log/`
 - `/opt/continuent/tungsten/tungsten-replicator/log/`

```
tungsten@dbl:/opt/continuent/service_logs $ ll
total 116
lrwxrwxrwx 1 tungsten tungsten    61 Jun 22 09:52 connector.log -> /opt/continuent/tungsten/tungsten-connector/log/connector.log
lrwxrwxrwx 1 tungsten tungsten    62 Jun 22 09:52 mysqldump.log -> /opt/continuent/tungsten/tungsten-replicator/log/mysqldump.log
lrwxrwxrwx 1 tungsten tungsten    55 Jun 22 09:52 tmsvc.log -> /opt/continuent/tungsten/tungsten-manager/log/tmsvc.log
lrwxrwxrwx 1 tungsten tungsten    60 Jun 22 09:52 trepsvc.log -> /opt/continuent/tungsten/tungsten-replicator/log/trepsvc.log
lrwxrwxrwx 1 tungsten tungsten    63 Jun 22 09:52 xtrabackup.log -> /opt/continuent/tungsten/tungsten-replicator/log/xtrabackup.log
```

Next Steps

- If you are interested in knowing more about the clustering software and would like to try it out for yourself, please contact our sales team who will be able to take you through the details and setup a POC – sales@continuent.com
- Read the documentation at <http://docs.continuent.com/tungsten-clustering-5.3/index.html>
- Subscribe to our Tungsten University YouTube channel! <http://tinyurl.com/TungstenUni>
- Visit the events calendar on our website for upcoming Webinars and Training Sessions
- Look out for the supplementary video demonstrating the alternative method for upgrading!



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