Intermediate: Single and Multi Site Cluster Deployments for HA & DR
Topics

In this short course we will:
• Review the Cluster Architecture
• Review prerequisites required
• Walkthrough an Installation (Full end to end demo)
• Recap Key Resources and Tools

Course Prerequisite Learning
– Basics: Introduction to Clustering
– Basics: The Power of the Connector
– Basics: Simple Cluster Installation
– Visit the Continuent website or Tungsten University on YouTube to watch these recordings
  • Continuent website https://www.continuent.com/videos/
  • Tungsten University on YouTube https://www.youtube.com/channel/UCZ9iU-7nT1RLNnJvITFCsWA or http://tinyurl.com/TungstenUni
Tungsten Cluster Architecture
Tungsten Composite Cluster Architecture

[Diagram showing the architecture of Tungsten Connector and Composite Cluster with replication and failover mechanisms]
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-5.2/prerequisite.html

• Host Prerequisites
  – OS user
  – /etc/hosts
  – sudoers and ssh
  – Ruby and required gems
  – 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?
• Which connector mode?
  – Bridge is default
  – Proxy mode
  – SmartScale
• SSL Enabled?
- Tungsten Clustering 5.2
- Tar File
- Staging Install (db1 as staging host)
- Connectors in Port Based Routing mode
- Amazon AWS EC2
- MySQL Community 5.7
- Java 1.8
- Ruby 2.0
Command Line Tools
&
Resources
Tools: cctrl

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

```
tungsten@dbl:~ $ cctrl -multi
Continuent Tungsten 5.2.0 build 235
nyc: session established, encryption=false, authentication=false
[LOGICAL] / > ls
+----------------------------------------------------------------------------+
<table>
<thead>
<tr>
<th>DATA SERVICES:</th>
</tr>
</thead>
</table>
global
london
nyc
```
Tools: ctrl

COORDINATOR[db1:AUTOMATIC:ONLINE]

DATASOURCES:
+----------------------------------------------------------------------------+
| london (composite slave:ONLINE)                                         |
| STATUS [OK] [2017/08/17 11:00:58 AM UTC]                                 |
+----------------------------------------------------------------------------+

[LOGICAL] / > use global
[LOGICAL] /global > ls

COORDINATOR[db1:AUTOMATIC:ONLINE]

DATASOURCES:
+----------------------------------------------------------------------------+
| db1 (master:ONLINE, progress=0, THL latency=0.776)                        |
| STATUS [OK] [2017/08/17 11:00:53 AM UTC]                                  |
+----------------------------------------------------------------------------+

| MANAGER (state=ONLINE) |
| REPLICATOR (role=master, state=ONLINE) |
| DATASERVER (state=ONLINE) |
| CONNECTIONS (created=0, active=0) |

[LOGICAL] /global > use /nyc
[LOGICAL] /nyc > ls

COORDINATOR[db1:AUTOMATIC:ONLINE]

ROUTERS:
+----------------------------------------------------------------------------+
| connector@db1.tt-2208[25431] (ONLINE, created=0, active=0)              |
| connector@db2.tt-2208[24548] (ONLINE, created=0, active=0)              |
| connector@db3.tt-2208[24803] (ONLINE, created=0, active=0)              |
| connector@db4.tt-2208[24875] (ONLINE, created=0, active=0)              |
| connector@db5.tt-2208[24774] (ONLINE, created=0, active=0)              |
| connector@db6.tt-2208[25049] (ONLINE, created=0, active=0)              |
+----------------------------------------------------------------------------+

DATASOURCES:
+----------------------------------------------------------------------------+
| nyc (composite master:ONLINE)                                            |
| STATUS [OK] [2017/08/17 11:00:59 AM UTC]                                  |
+----------------------------------------------------------------------------+

[LOGICAL] /global > use /nyc
[LOGICAL] /nyc > ls

COORDINATOR[db1:AUTOMATIC:ONLINE]

ROUTERS:
+----------------------------------------------------------------------------+
| connector@db1.tt-2208[25431] (ONLINE, created=0, active=0)              |
+----------------------------------------------------------------------------+

DATASOURCES:
+----------------------------------------------------------------------------+
| db1 (master:ONLINE, progress=0, THL latency=0.776)                        |
| STATUS [OK] [2017/08/17 11:00:53 AM UTC]                                  |
+----------------------------------------------------------------------------+

| MANAGER (state=ONLINE) |
| REPLICATOR (role=master, state=ONLINE) |
| DATASERVER (state=ONLINE) |
| CONNECTIONS (created=0, active=0) |
+----------------------------------------------------------------------------+

...
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;
<table>
<thead>
<tr>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>tungsten connection status:</td>
</tr>
<tr>
<td>tungsten connection count:</td>
</tr>
<tr>
<td>tungsten cluster status:</td>
</tr>
<tr>
<td>tungsten show [full] processlist:</td>
</tr>
<tr>
<td>tungsten show variables [like '&lt;string&gt;']:</td>
</tr>
<tr>
<td>tungsten flush privileges:</td>
</tr>
<tr>
<td>tungsten mem info:</td>
</tr>
<tr>
<td>tungsten gc:</td>
</tr>
<tr>
<td>tungsten help:</td>
</tr>
</tbody>
</table>

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@db1:/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
```
Tools : tpm diag

- Provides support engineers with an entire overview of the cluster state, by:
  - Gathering point-in-time status of all components in a cluster
  - Gathering log files of all components in a cluster, including database logs to provide historical information
  - Bundles everything into one easy zip file that can be attached to a support case
- ALWAYS create a tpm diag package when you contact support for assistance
- tungsten_send_diag
  - Executes tpm diag to generate the diagnostic package
  - Automatically uploads the package to support
  - [https://docs.continuent.com/tungsten-clustering-5.2/cmdline-tools-tungsten_send_diag.html](https://docs.continuent.com/tungsten-clustering-5.2/cmdline-tools-tungsten_send_diag.html)

```
tungsten@db1:/opt/continuent/service_logs  $ tungsten_send_diag -d -c 1234
```
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-5.2/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

• Tues 5th September : Advanced : Multi-Site Multi-Master Deployments
  – https://attendee.gotowebinar.com/register/5817605467764639235
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