MySQL Shell for Database Engineers

Karthik P R
CEO, Mydbops

December 12, 2020
MinervaDB Athena 2020
About Me

- Interested in Open Source Database technologies
- 11 Years of Experience with MySQL
- Ex-Yahoo!
- Tech Speaker/ Blogger
- CEO Mydbops

Karthik P R
Focuses on Top Opensource database MySQL, MariaDB, MongoDB and PostgreSQL ON Premises and Cloud
Agenda

MySQL Shell an Overview

MySQL Shell Utilities

MySQL Shell for Database Engineers
Audience

- Database Engineer
- Database Administrator
- Database Reliability Engineers
- Cloud DBA
- Devops Engineer
- SRE's
MySQL Shell an Overview

- Command Line based tool
- Advanced MySQL Client
- Python based Framework
- Act as a Code editor
- Support for API's
- Support MySQL / MariaDB / Percona Server / MySQL on RDS
- Open Source tool kit
Overview to MySQL Shell
MySQL Shell Overview

- MySQL Shell ease Database Operations
- Admin API's for Database HA and Scalability
- Custom Extensions
- Inbuilt Utilities
- X Protocol Support

Note: Support Linux / Windows / Mac OS
MySQL Shell Overview

Language Support

JS  SQL  PYTHON

Note: Even it Support OS command from 8.0.18
MySQL Shell Overview

- Supports
  - Interactive executions
  - Batch mode executions

Additional features

- Auto Completion
- Support Multiple Output Formats
MySQL Shell Utilities
MySQL Shell Utilities

- Inbuilt Utilities makes DBA's and DBE's life better
  - Upgrade Checker
  - Json Import Utility
  - Table export Utility
  - Parallel Table Import Utility
  - Instance / Schema / Table Dump Utility
  - Dump loading Utility
MySQL Shell Utilities

Upgrade Checker

- Ease the MySQL Upgrade to latest MySQL 8 from lower major/minor versions.

```sql
checkForServerUpgrade() dumpSchemas() help() loadDump()
configureOci() dumpTables() importJson()
dumpInstance() exportTable() importTable()
```
MySQL Shell Utilities

- Parallel import / Table export
  - Makes the CSV backup and loading faster.
  - `util.importTable()` & `util.exportTable()`

- Instance / Schema / table Dump
  - Makes the logical backup faster than ever.
  - `util.dumpInstance()`, `util.dumpschemas()`, `util.loadDump()`
Dump Loading Utility

- Makes the recovery of logical backup, blazing fast even for a single table.
- Supports GTID, Histogram, OCI import
- `util.loadDump()`
MySQL Shell For Database Engineers
MySQL Shell For Database Engineers
MySQL Shell For Database Engineers

- MySQL Shell can support Databases on-premises and on-cloud.
- They can support complex DB Architecture.
- Deploy HA Solutions with MySQL Router
- Deploying and Managing InnoDB Clusters
- Creating Async slaves (InnoDB Replica Set)
- Playing with MySQL Sandboxes
- The InnoDB Cluster can be deployed by a few lines (customised Script)

[root@clientServer mysqlsh]# mysqlsh -f setup_innodb_cluster.js
InnoDB cluster set up
==================================
Setting up a Percona Server for MySQL - InnoDB cluster.

Password for the MySQL root account: ************
Number of data nodes: 3
Hostname for node1: clusternode1
Hostname for node2: clusternode2
Hostname for node3: clusternode3


Source: https://www.percona.com/blog/2020/05/05/settin-up-an-innodb-cluster-with-a-few-lines-of-code/
The InnoDB Replicaset can be deployed by a few lines too (customised Script)

```
[root@clientServer mysqlsh]# mysqlsh -f setup_innodb_replicaset.js
InnoDB ReplicaSet set up
==================================
Setting up a MySQL - InnoDB Replicaset.

Password for the MySQL root account: **********
Please enter number of data nodes: 2

Code: https://github.com/riveraja/scripts/blob/master/setup_innodb_replicaset.js

They just need the MySQL to be installed, MySQL Shell will rebuild them using CLONE Plugin and configure the ASYNC GTID based replication
```
MySQL Shell For Database Engineers

Custom Shell Plugins.

- The Custom shell Plugins ease the job further
- Making the own utility for troubleshooting
- Connect across multiple DB components (Router / ProxySQL too)
- Customising PFS and SYS schema Queries via Java Script / Python
MySQL Shell For Database Engineers

Custom Shell Plugins.

- To get started Lefred has custom Plugin and they are in Git.

https://github.com/lefred/mysqleshell-plugins

- These plugin helps in DB Operations and DB troubleshooting Realtime.

- These plugin can be further extended based on needs.
MySQL Shell For Database Engineers

Custom Shell Plugins.

- Collations
- demo
- InnoDB
- InnoDB Cluster
- Maintenance
- ProxySQL
- Router
- Schema
- Security
- User
Samples

Get the tables inside InnoDB Buffer Pool

```
MySQL [localhost:33060+ ssl JS] innodb.getTablesInBP()
Processing, this can take a while (don't forget to run ANALYZE TABLE for accurate results)...
InnoDB Buffer Pool Size = 128.00 MiB (1 instance)

<table>
<thead>
<tr>
<th>Table Name</th>
<th>Pages</th>
<th>Total Data in BP</th>
<th>Total Table Size</th>
<th>in BP</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>classicmodels</code>.<code>employees</code></td>
<td>2</td>
<td>32.00 KiB</td>
<td>48.00 KiB</td>
<td>66.67%</td>
</tr>
<tr>
<td><code>classicmodels</code>.<code>Student_details</code></td>
<td>1</td>
<td>16.00 KiB</td>
<td>32.00 KiB</td>
<td>50.00%</td>
</tr>
<tr>
<td><code>classicmodels</code>.<code>payments</code></td>
<td>1</td>
<td>16.00 KiB</td>
<td>16.00 KiB</td>
<td>100.00%</td>
</tr>
</tbody>
</table>
```
Samples

Create a MySQL user with a Random password.

```
CREATE USER user
    
    Enter the new user’s account: prk
    Enter the password (leave is blank to generate one):
    Does the user need to change his password? (Y,n) n
    Do you want to lock the account after 3 failed attempts? (Y,n) n
    +--------------------------+
    | user | host | generated password |
    +--------------------------+
    | prk  | %    | 7%7&*L6Rh4Avf/:AFQfE |
    +--------------------------+
```
## Fetching the Fragmented Tables

### MySQL Shell

```sql
innodb.getFragmentedTablesDisk()
```

<table>
<thead>
<tr>
<th>NAME</th>
<th>ROWS</th>
<th>DATA_SIZE</th>
<th>INDEX_SIZE</th>
<th>TOTAL_SIZE</th>
<th>DATA_FREE</th>
<th>FILE_SIZE</th>
<th>WASTED_SIZE</th>
<th>FREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>northwind/Categories</td>
<td>8</td>
<td>272.00 KiB</td>
<td>16.00 KiB</td>
<td>288.00 KiB</td>
<td>0 bytes</td>
<td>352.00 KiB</td>
<td>64.00 KiB</td>
<td>18.18%</td>
</tr>
<tr>
<td>classicmodels/orderdetails</td>
<td>2996</td>
<td>160.00 KiB</td>
<td>80.00 KiB</td>
<td>240.00 KiB</td>
<td>0 bytes</td>
<td>320.00 KiB</td>
<td>80.00 KiB</td>
<td>25.00%</td>
</tr>
<tr>
<td>northwind/Orders</td>
<td>830</td>
<td>144.00 KiB</td>
<td>96.00 KiB</td>
<td>240.00 KiB</td>
<td>0 bytes</td>
<td>304.00 KiB</td>
<td>64.00 KiB</td>
<td>21.05%</td>
</tr>
<tr>
<td>northwind/OrderDetails</td>
<td>2155</td>
<td>128.00 KiB</td>
<td>48.00 KiB</td>
<td>176.00 KiB</td>
<td>0 bytes</td>
<td>240.00 KiB</td>
<td>64.00 KiB</td>
<td>26.67%</td>
</tr>
<tr>
<td>sbtest/sbtest1</td>
<td>500</td>
<td>144.00 KiB</td>
<td>16.00 KiB</td>
<td>160.00 KiB</td>
<td>0 bytes</td>
<td>256.00 KiB</td>
<td>96.00 KiB</td>
<td>37.50%</td>
</tr>
<tr>
<td>sbtest/sbtest2</td>
<td>500</td>
<td>144.00 KiB</td>
<td>16.00 KiB</td>
<td>160.00 KiB</td>
<td>0 bytes</td>
<td>256.00 KiB</td>
<td>96.00 KiB</td>
<td>37.50%</td>
</tr>
<tr>
<td>sbtest/sbtest3</td>
<td>500</td>
<td>144.00 KiB</td>
<td>16.00 KiB</td>
<td>160.00 KiB</td>
<td>0 bytes</td>
<td>256.00 KiB</td>
<td>96.00 KiB</td>
<td>37.50%</td>
</tr>
<tr>
<td>sbtest/sbtest6</td>
<td>500</td>
<td>144.00 KiB</td>
<td>16.00 KiB</td>
<td>160.00 KiB</td>
<td>0 bytes</td>
<td>256.00 KiB</td>
<td>96.00 KiB</td>
<td>37.50%</td>
</tr>
<tr>
<td>sbtest/sbtest5</td>
<td>500</td>
<td>144.00 KiB</td>
<td>16.00 KiB</td>
<td>160.00 KiB</td>
<td>0 bytes</td>
<td>256.00 KiB</td>
<td>96.00 KiB</td>
<td>37.50%</td>
</tr>
<tr>
<td>sbtest/sbtest7</td>
<td>500</td>
<td>144.00 KiB</td>
<td>16.00 KiB</td>
<td>160.00 KiB</td>
<td>0 bytes</td>
<td>256.00 KiB</td>
<td>96.00 KiB</td>
<td>37.50%</td>
</tr>
<tr>
<td>sbtest/sbtest4</td>
<td>500</td>
<td>144.00 KiB</td>
<td>16.00 KiB</td>
<td>160.00 KiB</td>
<td>0 bytes</td>
<td>256.00 KiB</td>
<td>96.00 KiB</td>
<td>37.50%</td>
</tr>
<tr>
<td>classicmodels/products</td>
<td>110</td>
<td>64.00 KiB</td>
<td>16.00 KiB</td>
<td>80.00 KiB</td>
<td>0 bytes</td>
<td>160.00 KiB</td>
<td>80.00 KiB</td>
<td>50.00%</td>
</tr>
<tr>
<td>classicmodels/orders</td>
<td>326</td>
<td>48.00 KiB</td>
<td>16.00 KiB</td>
<td>64.00 KiB</td>
<td>0 bytes</td>
<td>128.00 KiB</td>
<td>64.00 KiB</td>
<td>50.00%</td>
</tr>
</tbody>
</table>
Thank You

Reach Us: Info@mydbops.com