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# DTS 4: MySQL 5.6 Installation Guide

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### A. Introduction

This document will provide guidelines for installing and configuring MySQL for use with the Apelon DTS server. This document covers a Windows installation in the most detail, but the configuration settings specified here are applicable to both Windows and Linux.

This guide will require that DTS be installed on a system per the DTS Quick Start guide, or the DTS Installation Guide – up through the “**Preparing Your Knowledgebase**” step. At that point, this guide covers the MySQL specific steps for preparing the knowledgebase. After completing this guide, you will return to the primary DTS documentation to continue the configuration.

### B. Requirements

To utilize MySQL as your database for a DTS server, you must have MySQL Community Server 5.6. Currently, this is the only version that is officially supported. DTS also requires a 64-bit installation of MySQL.

## C. Configuration Quick Start

The following is a 1 page summary of all configuration settings that need to be made to a MySQL server to configure is appropriately for DTS. If you already have MySQL installed and are familiar MySQL, set the following options and execute the queries below. For detailed instructions on configuring MySQL, skip this page and read the rest of this installation guide.

### C.1 my.ini / my.cnf file

```
[mysqld]
#Customize for your installation
datadir="C:/ProgramData/MySQL/MySQL Server 5.6/data/"

character-set-server=utf8
collation-server = utf8_general_ci
default-storage-engine=InnoDB
lower_case_table_names = 1
max_allowed_packet=100M
#Customize for your hardware
innodb_buffer_pool_size=2000M
innodb_flush_log_at_trx_commit=2
innodb_log_file_size=512M
```

DTS uses the default username and password of “dts4”. However, you can specify your own database credentials that are most suitable for your environment. You can use the following example, replacing the brackets [] and their values with ones you prefer for your setup.

```
create database dts4;
create user '[dts4user]'@'%' identified by '[dts4password]';
grant all privileges on dts4.* to [dts4user];
create user '[dts4user]'@'localhost' identified by
'[dts4password]';
grant all privileges on dts4.* to [dts4user]@localhost;
flush privileges;
commit;
```

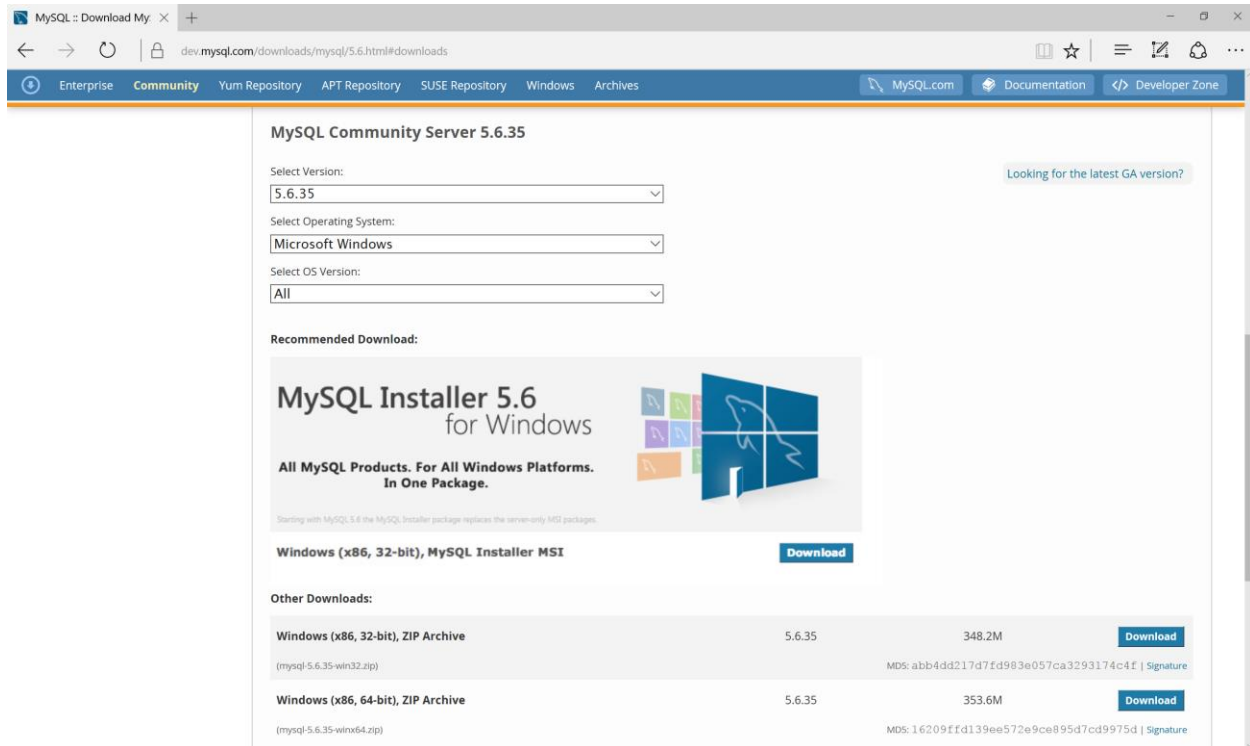
### C.3 Tablespace Creation

Follow the steps listed below in Creating and Populating the DTS Schema and Tablespace

## D. Getting MySQL

### D.1 Windows Installation

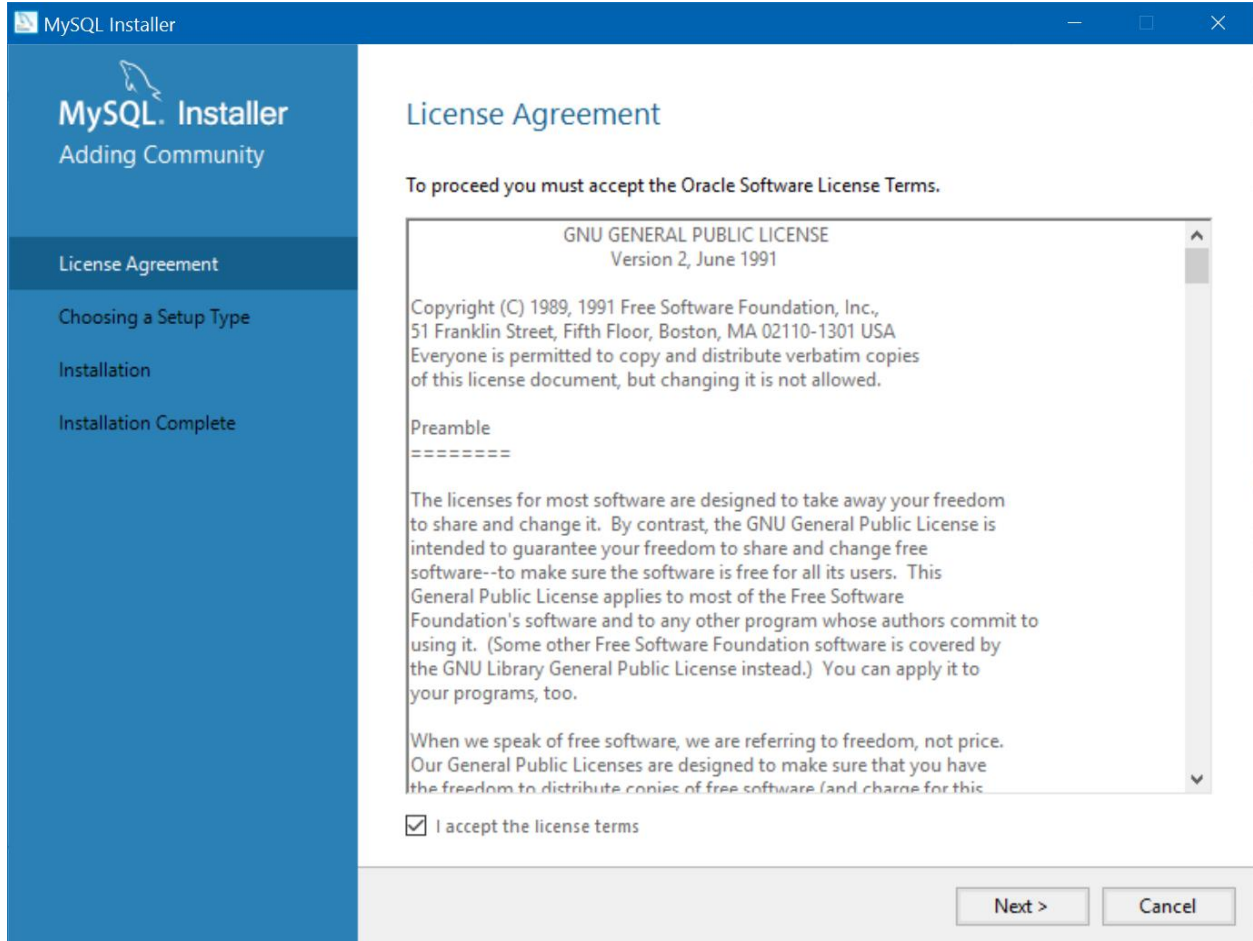
On Windows, the preferred method of installation is to use the single package MySQL installer from: <https://dev.mysql.com/downloads/mysql/5.6.html>



Note that on Windows, the installer has a prerequisite of version 4.0 of the .NET Framework. The installer will prompt you with the download location for the .NET framework, if necessary. The installer also requires the Microsoft Visual C++ 32-bit runtime – the installer will also prompt you to install this if necessary.

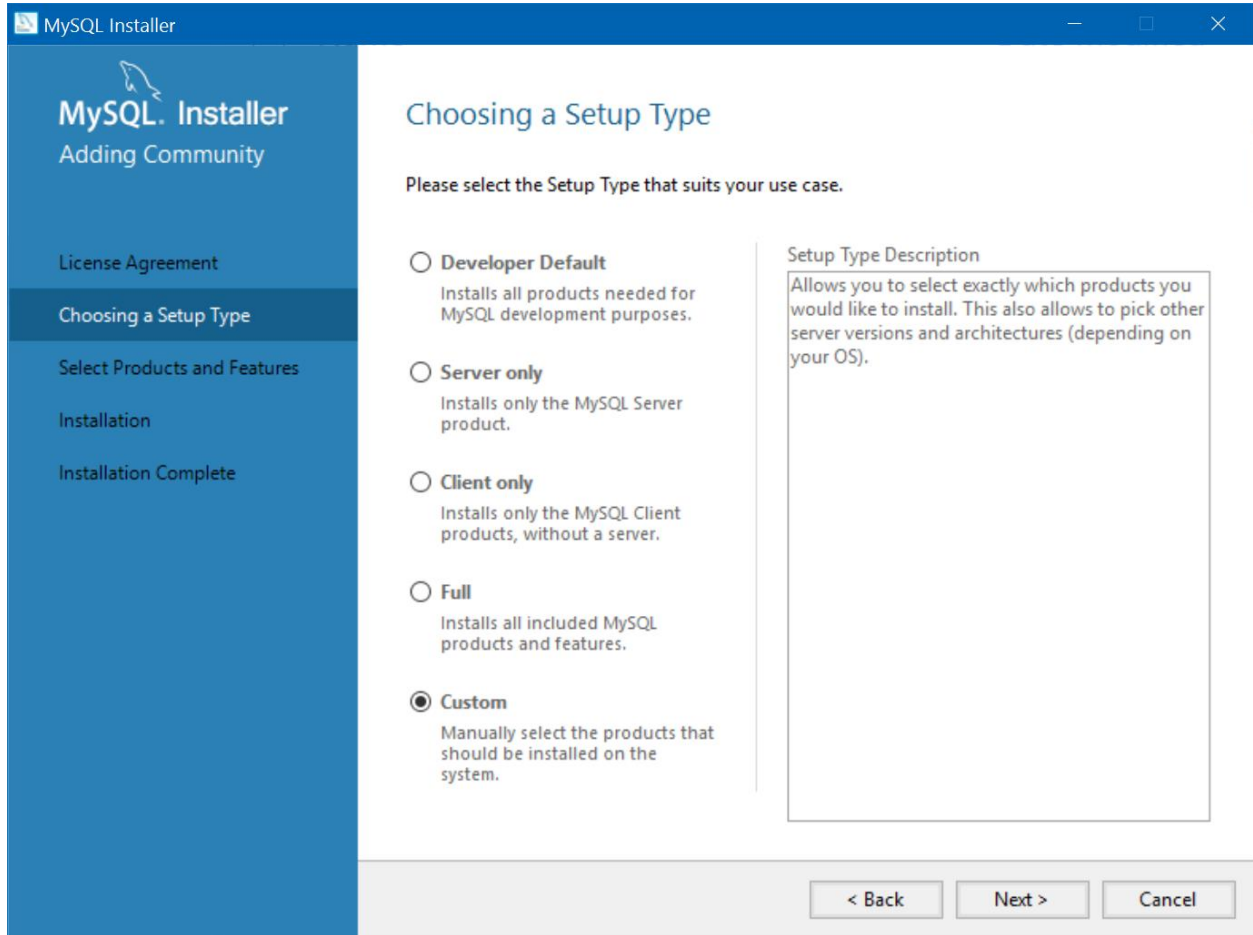
## DTS 4: MySQL 5.6 Installation Guide

Accept the license terms and select Next



## DTS 4: MySQL 5.6 Installation Guide

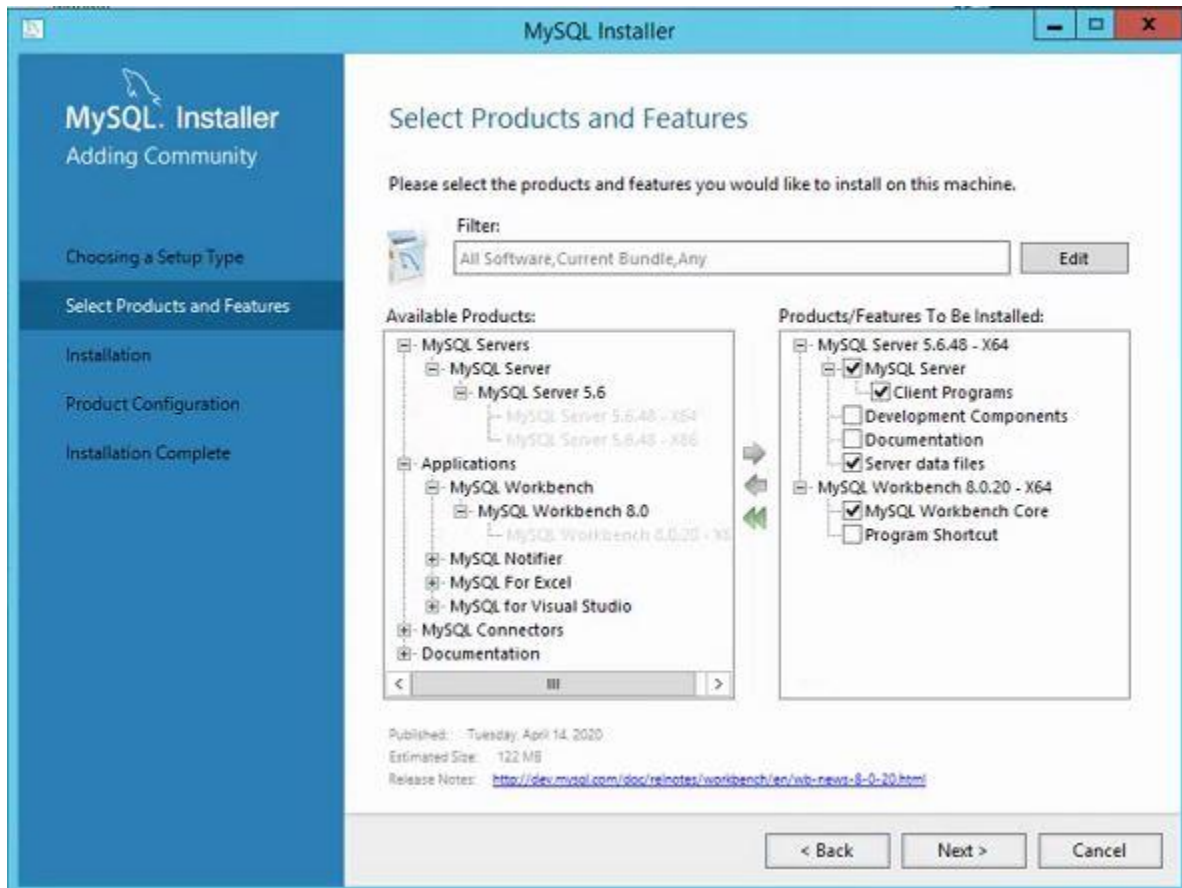
The installer will prompt you to select an installation type. We recommend either a Full or a Custom install.



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If you choose a Custom install, please install (at a minimum) the components:

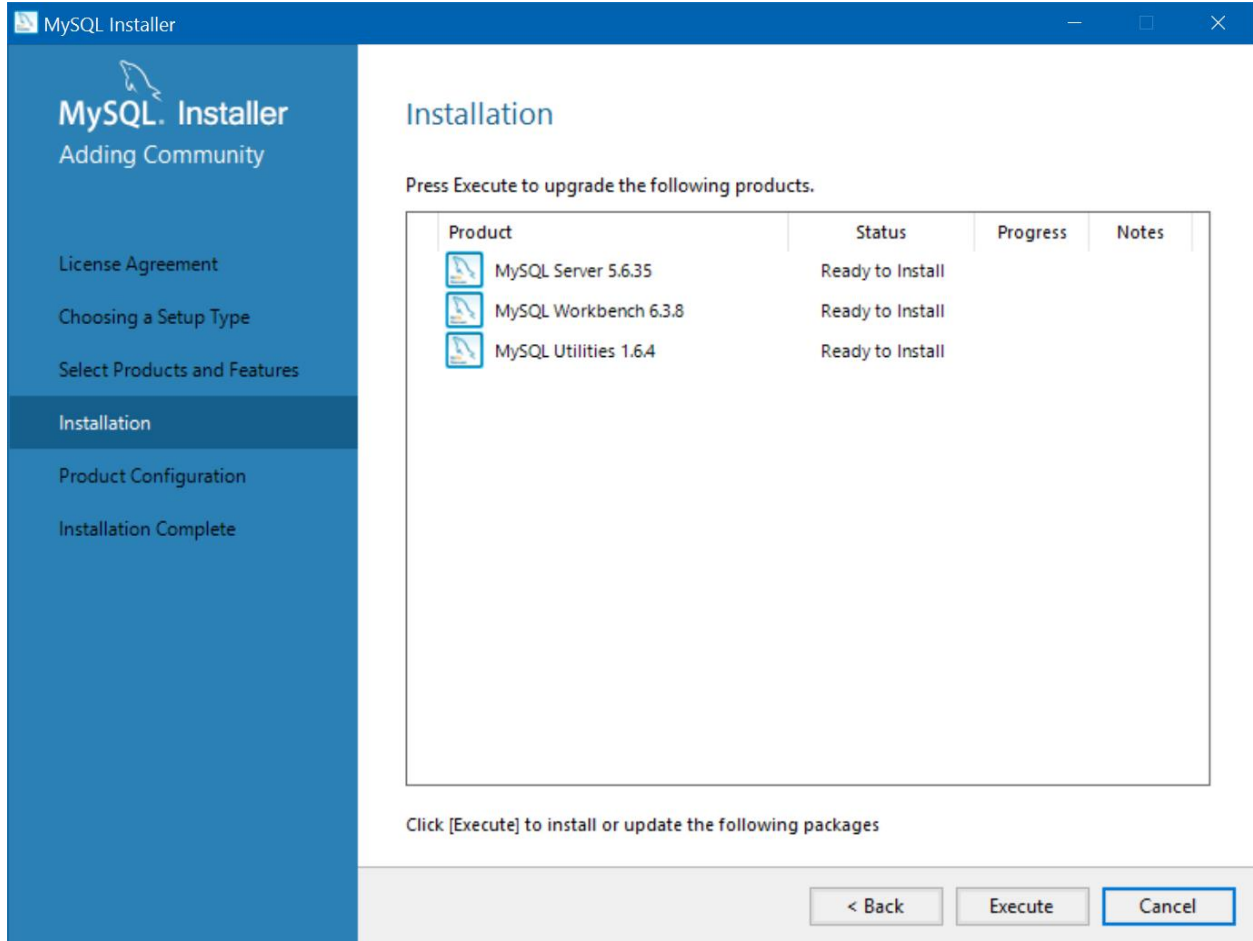
- Under MySQL Server
  - MySQL Server
  - Client Programs
  - Server data files (required for configuring the Windows service)
- Under Applications
  - MySQL Workbench





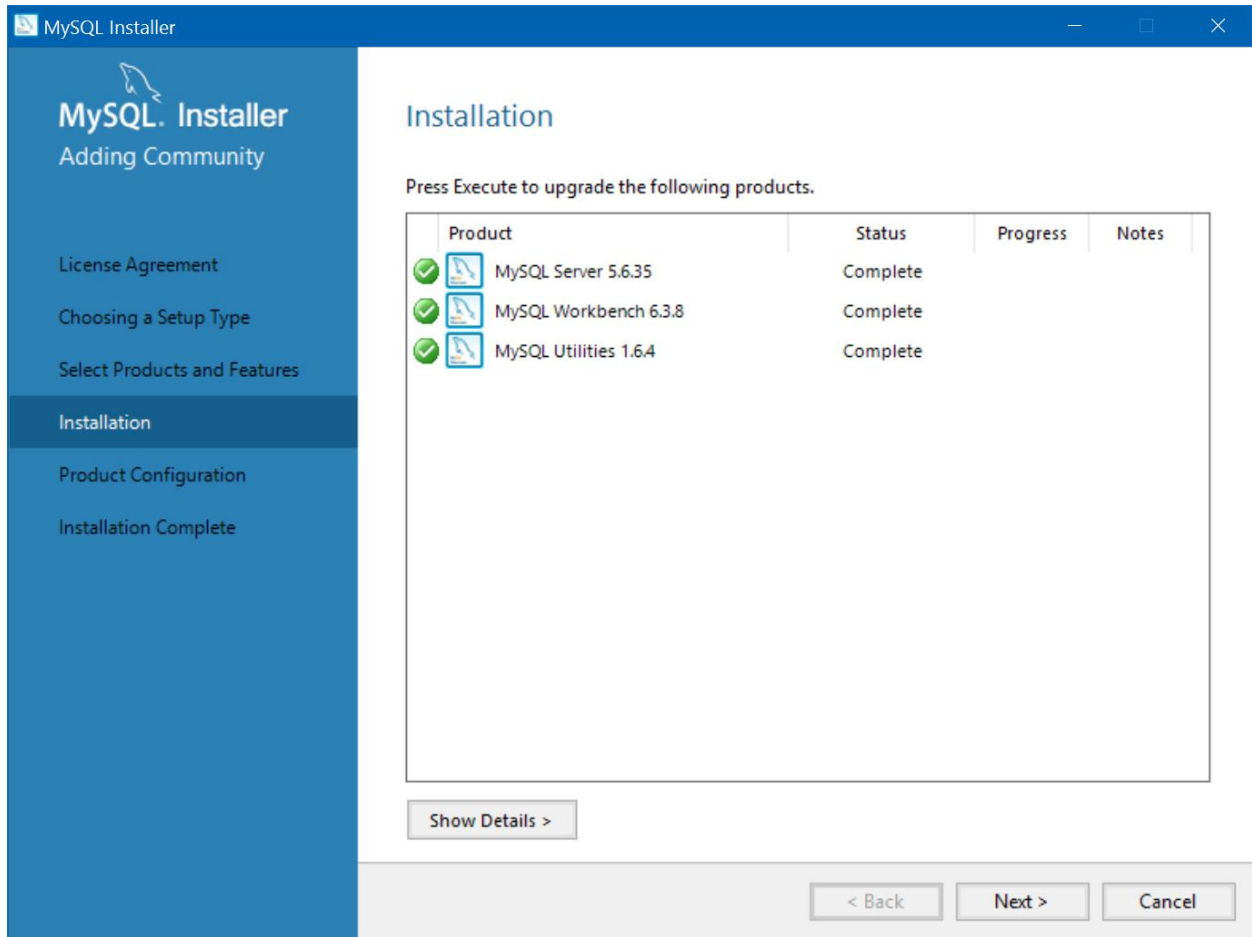
## DTS 4: MySQL 5.6 Installation Guide

Select Execute on the Installation page

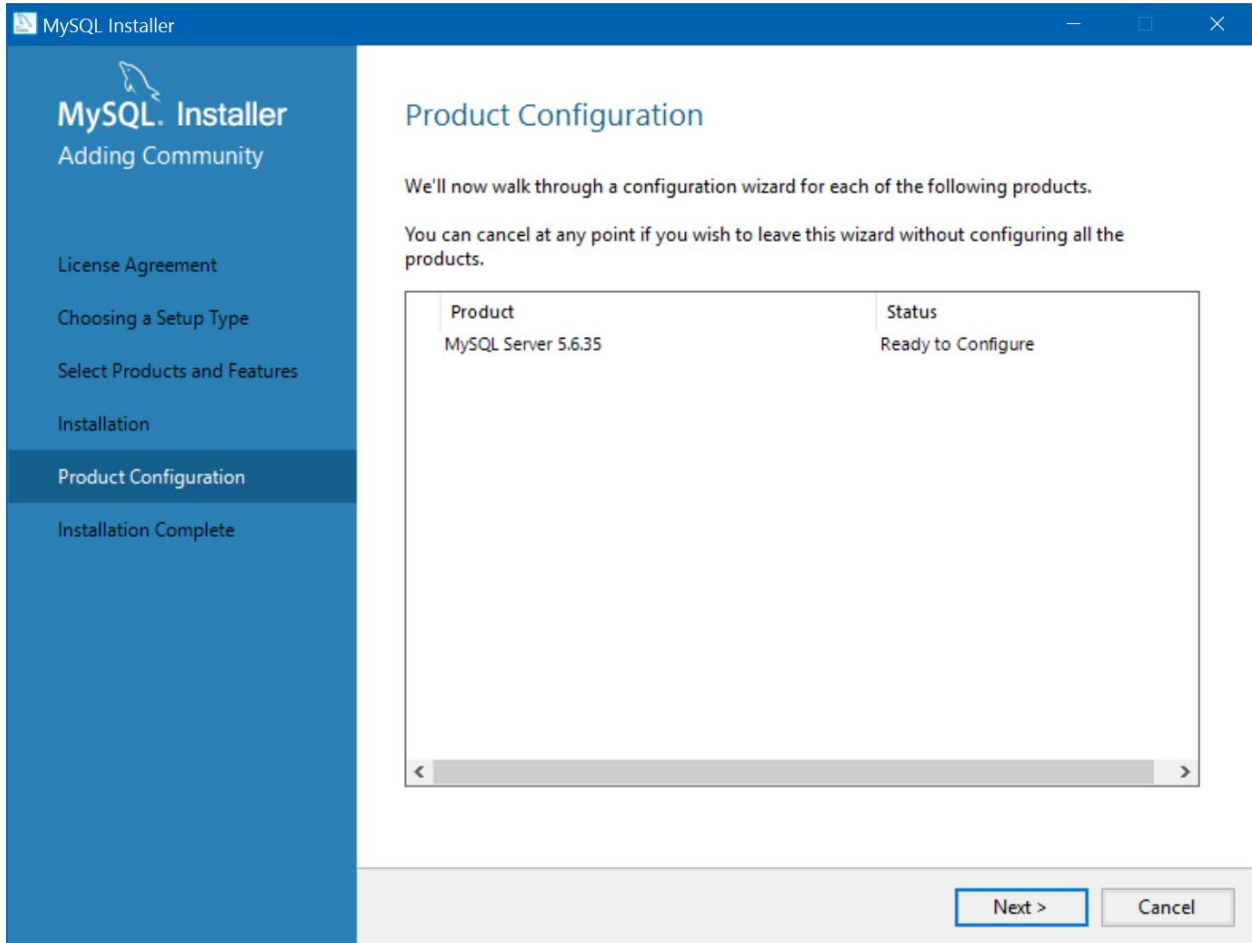


## DTS 4: MySQL 5.6 Installation Guide

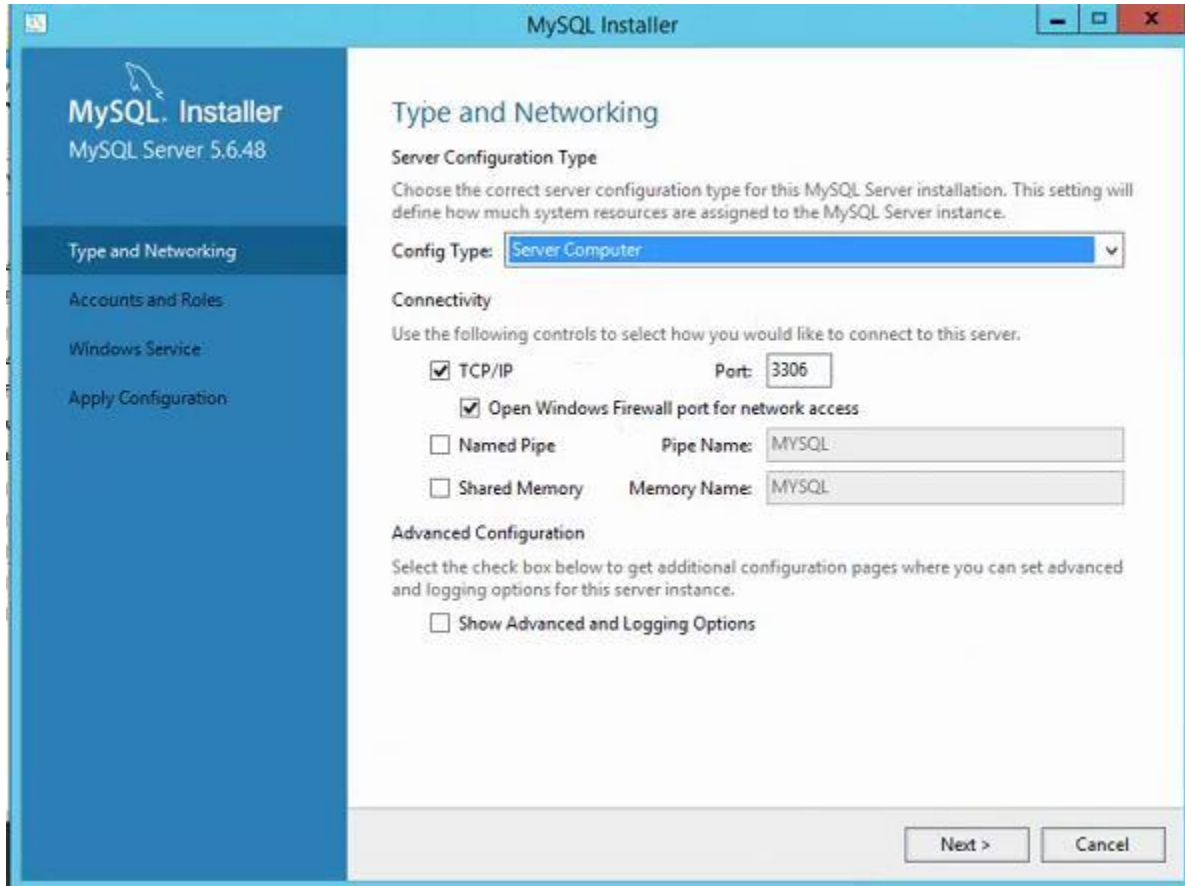
Select Next when the installation is complete



Select Next on the Product Configuration page



On the Type and Networking pages, the suggested **Config Type** is Server Machine. This sets the defaults that MySQL uses for memory usage – though these can be customized later. Ensure that TCP/IP Networking is enabled. If necessary, also select the option to open the firewall port. This will be necessary if the DTS installation is on a different physical system than the MySQL server.



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On the Accounts and Roles page, configure the root password for the server and select Next

MySQL Installer

MySQL Server 5.6.35

Type and Networking

**Accounts and Roles**

Windows Service

Apply Server Configuration

### Accounts and Roles

**Root Account Password**  
Enter the password for the root account. Please remember to store this password in a secure place.

MySQL Root Password:

Repeat Password:

Password Strength: **Weak**

**MySQL User Accounts**  
Create MySQL user accounts for your users and applications. Assign a role to the user that consists of a set of privileges.

MySQL Username	Host	User Role
----------------	------	-----------

Add User

Edit User

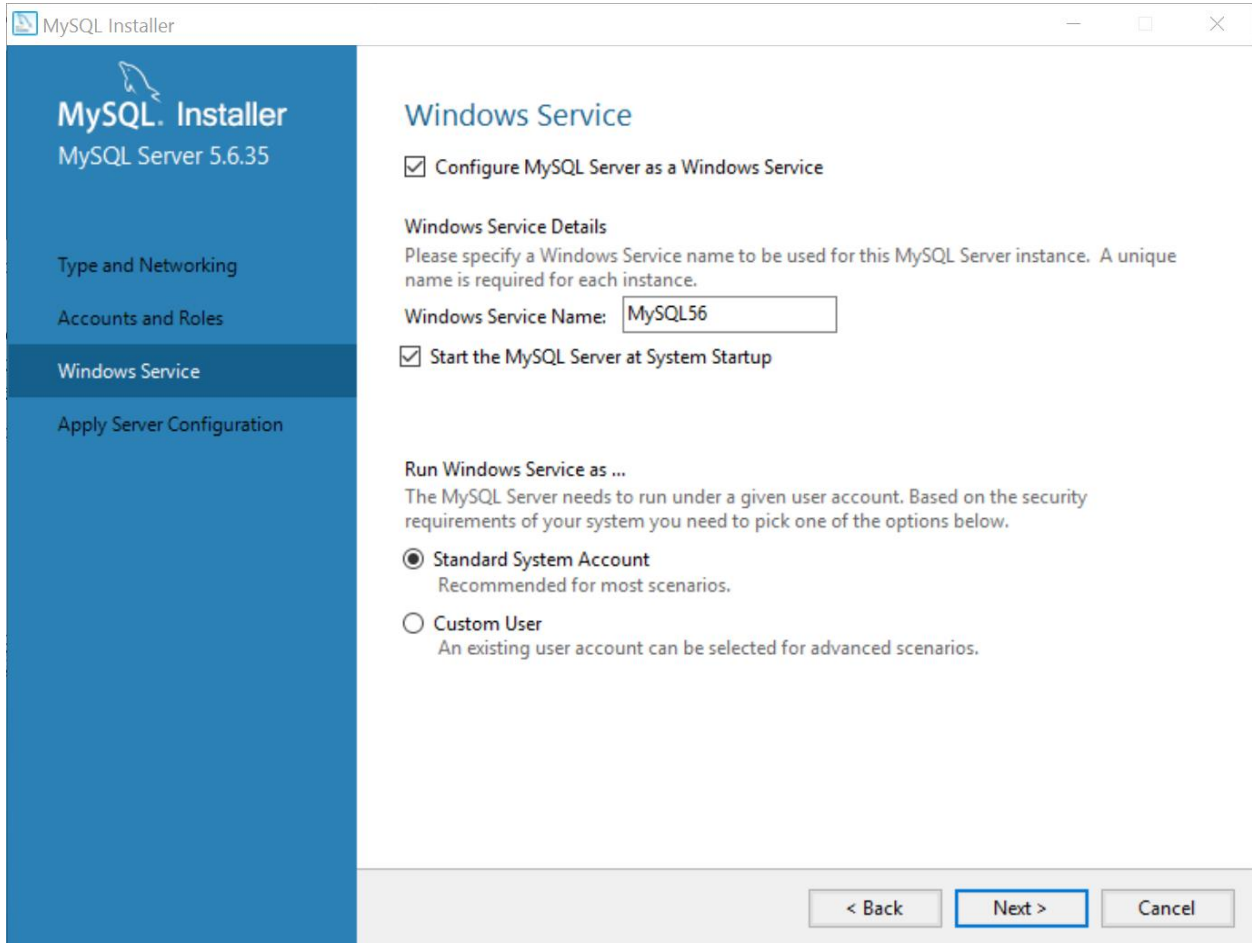
Delete

< Back    Next >    Cancel

## DTS 4: MySQL 5.6 Installation Guide

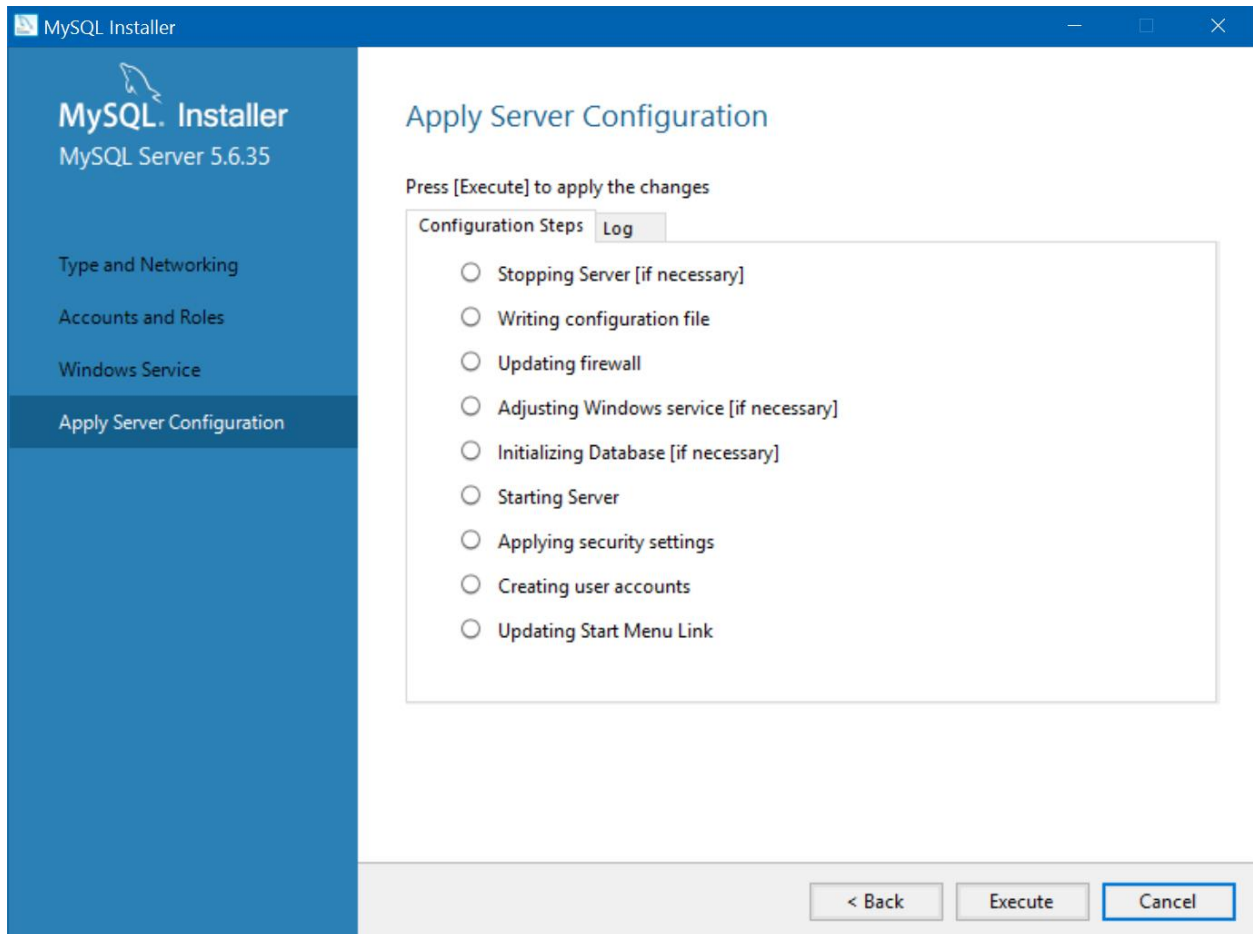
On the Windows Service page, enable the option to Configure MySQL Server as a Windows Service and select the option to run the Windows Service as a Standard System Account.

Take note of the Windows Service Name – you may need to know this name depending on how you choose to customize the configuration of the server.

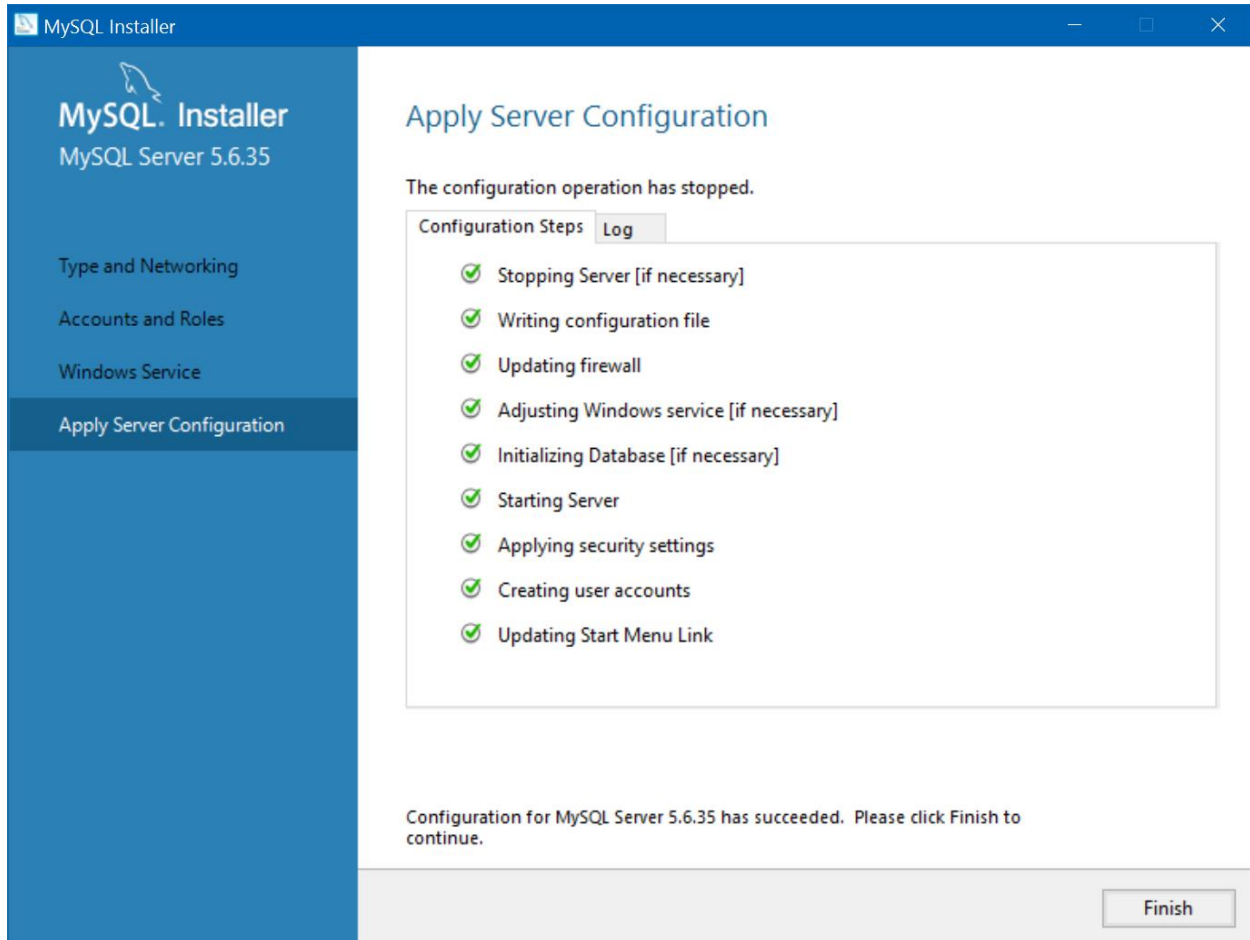


## DTS 4: MySQL 5.6 Installation Guide

Select Execute at the Apply Server Configuration screen of the installer.



Select Finish once all configuration steps are completed



### D.2 Linux Installations

Most Linux distributions already include MySQL in their package management tools. As long as the included version is at least version 5.6, let your package manager handle the initial installation.

If your Linux package does not include a new enough version of MySQL, refer to <https://dev.mysql.com/downloads/mysql/5.6.html> for instructions on configuring your package manager to get the latest version from MySQL.

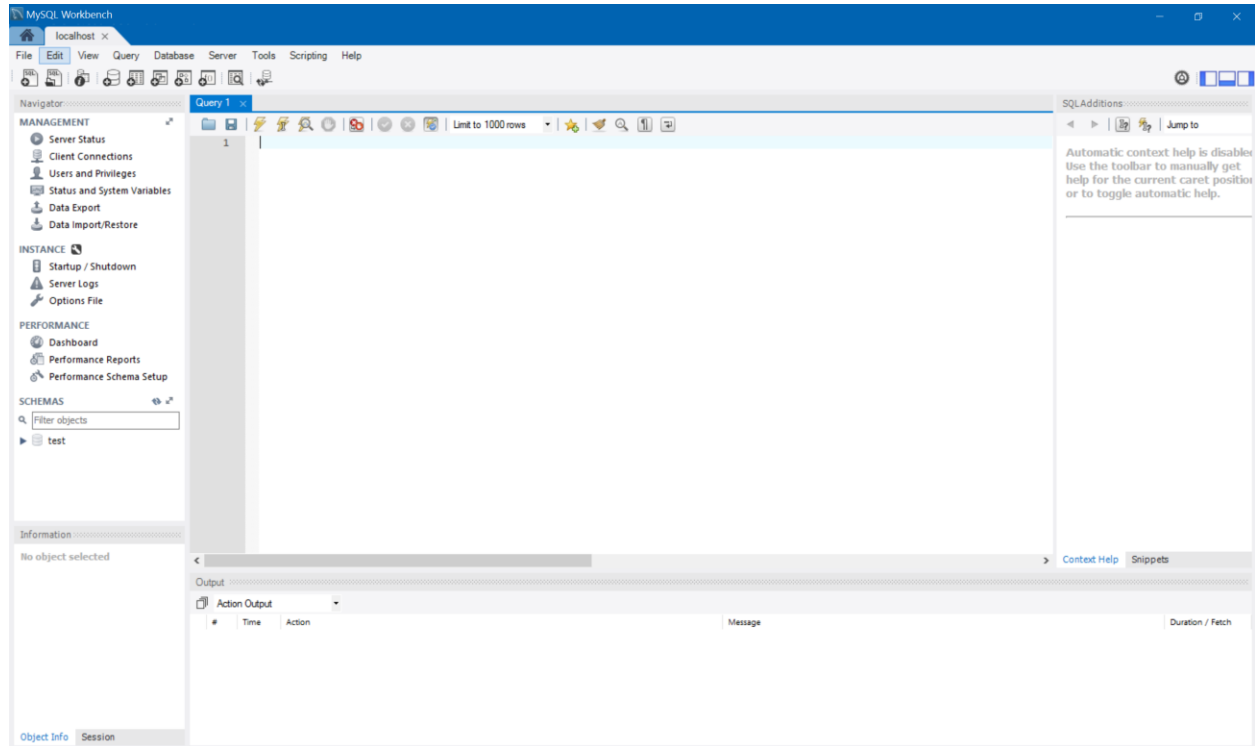
It is also recommended that you install the MySQL Workbench.



## E. MySQL Configuration

### E.1 Verify the Installation

After installation, you should be able to launch the MySQL workbench and connect it to your MySQL Server.



### E.2 Locate the Configuration File

There are a few parameters which must be set on your MySQL server to ensure compatibility with DTS.

These parameters are typically placed in a file named my.cnf (or my.ini)

The location of the configuration file on Windows is typically within the folder where the database data is stored (which was selected during installation). On Linux, the typical location is in the /etc/ path.

However, there are many other locations which are read for configuration data, with most (but not all) options being merged. See <http://dev.mysql.com/doc/refman/5.6/en/option-files.html> for the official documentation.

**CAUTION:** On Windows when MySQL is installed as a system service, it uses the parameter `--defaults-file` to specify the path to the MySQL configuration file. When the `defaults-file` parameter is given, no other paths except for the specified path are referenced for configuration information, and none of the merging behavior from the hierarchy of configuration files takes place.

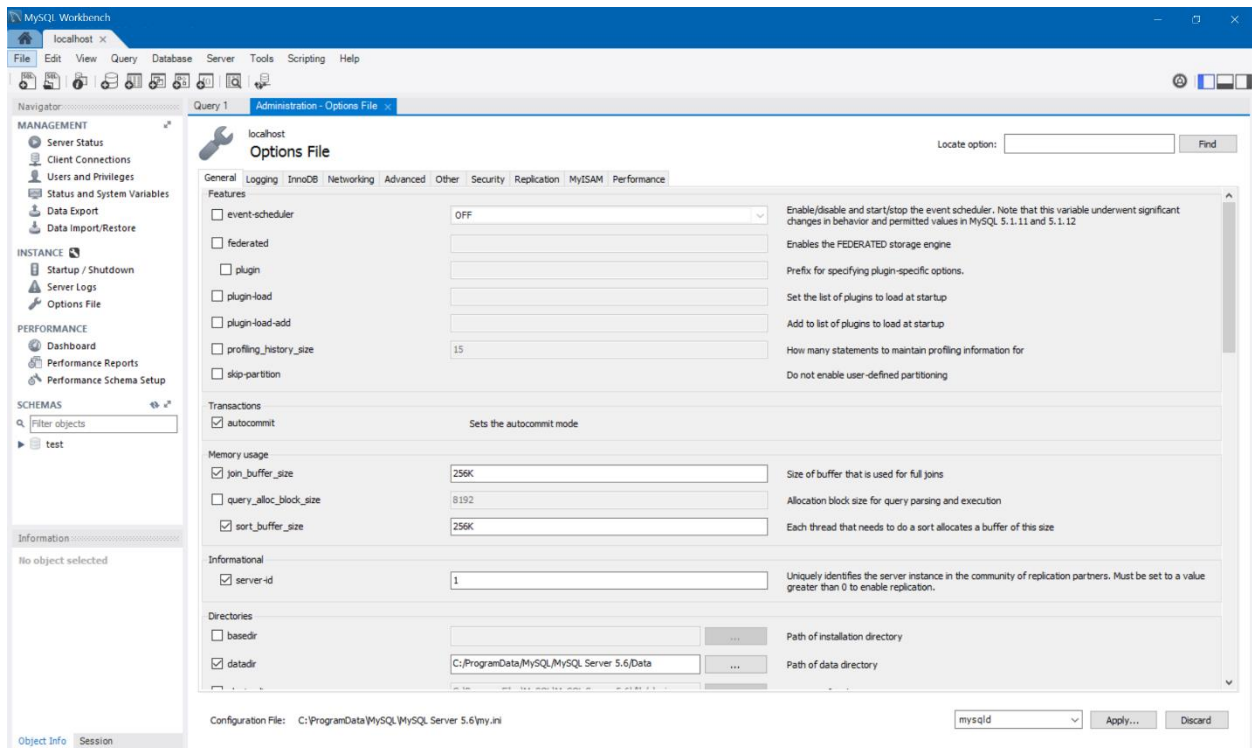
## DTS 4: MySQL 5.6 Installation Guide

If you wish to use a configuration file from a different folder for your MySQL instance on Windows, you must uninstall the service and re-install it with the path to the new configuration file. See <http://dev.mysql.com/doc/refman/5.6/en/windows-start-service.html> for details. This step is optional – the easiest method of customizing the installation is to simply edit the file that is currently in use.

We suggest you manually edit the configuration file.

The MySQL Workbench can be used to locate the current my.ini file of the running instance by clicking on the ‘Options file’ page. To locate the current my.ini file for the running instance from the MySQL Workbench, click the “Options File” item under the “Server” menu.

**Note:** On Windows, this path may be marked as a ‘System’ or ‘Hidden’ folder, and you may have to enable viewing ‘System’ and/or ‘Hidden’ files before you can navigate to this path.



### E.3 Customize the Installation

The following options are the configuration settings that should be set for a successful DTS installation. These parameters are all part of the ‘**mysqld**’ section.

```
[mysqld]
character-set-server=utf8
collation-server=utf8_general_ci
default-storage-engine=InnoDB
lower_case_table_names=1
max_allowed_packet=100M
innodb_buffer_pool_size=2000M
innodb_flush_log_at_trx_commit=2
innodb_log_file_size=512M
```

- `lower_case_table_names` – optional for windows, required for Linux
- `default-storage-engine` – DTS requires the transactional storage engine InnoDB
- `max_allowed_packet` – required to allow large terminologies to be loaded in bulk
- `character-set-server` – required to ensure correct handling of data
- `collation-server` – required to ensure correct handling of data
- `innodb_buffer_pool_size` – this parameter controls the cache size of the main cache within MySQL. Setting a large value here generates large performance improvements for DTS. The recommendation above is for 2 GB. You may need to customize this value for your installation, depending on the hardware you have available. A value greater than 2 GB may help if you have a number of large terminologies loaded. A smaller value may be required if your server is memory constrained, and is also hosting the EE server hosting DTS, for example. At least 500 MB is recommended, at a minimum.
- `innodb_flush_log_at_trx_commit` - an (optional) performance improvement that helps during data loads and large commits, at the cost of a slight risk of data loss (up to the last second worth of commits) in the event of a server failure. For more details see: [http://dev.mysql.com/doc/refman/5.6/en/innodb-parameters.html#sysvar\\_innodb\\_flush\\_log\\_at\\_trx\\_commit](http://dev.mysql.com/doc/refman/5.6/en/innodb-parameters.html#sysvar_innodb_flush_log_at_trx_commit).
- `innodb_log_file_size` - The size in bytes of each log file in a log group. The combined size of log files (`innodb_log_file_size * innodb_log_files_in_group`) cannot exceed a maximum value that is slightly less than 512GB. A pair of 255 GB log files, for example, would allow you to approach the limit but not exceed it. The default value is 48MB. Sensible values range from 1MB to 1/N-th of the size of the buffer pool, where N is the number of log files in the group. For more details see: [http://dev.mysql.com/doc/refman/5.6/en/innodb-parameters.html#sysvar\\_innodb\\_log\\_file\\_size](http://dev.mysql.com/doc/refman/5.6/en/innodb-parameters.html#sysvar_innodb_log_file_size).

These options should be set manually within the configuration file (edit or replace the existing values).

**Note:** On Both Windows and in many Linux distributions, the installation process for MySQL sets a large number of variables in the configuration file by default – based off of the ‘Server Configuration Type’ that was selected during installation.

In general, most of these parameters are unnecessary, as current releases of MySQL choose reasonable defaults on its own. The MySQL installer has not yet been updated to follow the new best practices documentation for configuring MySQL of only setting the values that are necessary.

The only other recommended parameter that should be set in addition to the required parameters above is the ‘datadir’ parameter.

The following is a full, complete my.cnf file suitable for Windows or Linux, if the appropriate path for the ‘datadir’ variable is substituted. This can be used to replace the existing file (though it is recommended that you keep a backup of the existing file)

```
[mysqld]
datadir="C:/ProgramData/MySQL/MySQL Server 5.6/data/"

character-set-server=utf8
collation-server = utf8_general_ci
default-storage-engine=InnoDB
lower_case_table_names = 1
max_allowed_packet=100M
innodb_buffer_pool_size=2000M
innodb_flush_log_at_trx_commit=2
innodb_log_file_size=512M
```

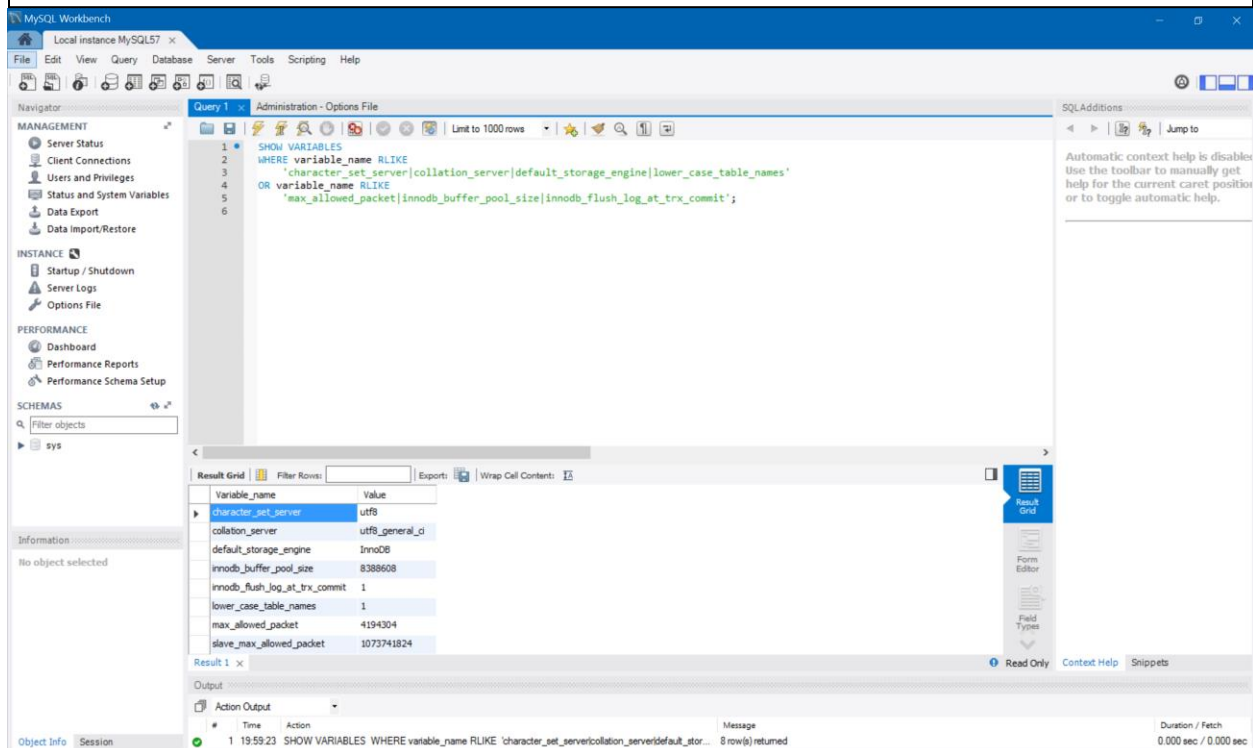
**Note:** If you choose to keep the large default configuration file, ensure that you do not have multiple copies of the same variable set.

After editing the configuration restart the MySQL server. If the MySQL server fails to start, there is likely an error in the syntax within your configuration file. Compare your file with the default file that you started editing.

### E.4 Validate the Configuration Settings

After customizing the installation, please run the following query within the MySQL Workbench to validate that the required configuration options are set.

```
SHOW VARIABLES
WHERE variable_name RLIKE
    'character_set_server|collation_server|default_storage_engine|lower_case_table_names'
OR variable_name RLIKE
    'max_allowed_packet|innodb_buffer_pool_size|innodb_flush_log_at_trx_commit';
```



The screenshot shows the MySQL Workbench interface. The query editor contains the following SQL query:

```
SHOW VARIABLES
WHERE variable_name RLIKE
    'character_set_server|collation_server|default_storage_engine|lower_case_table_names'
OR variable_name RLIKE
    'max_allowed_packet|innodb_buffer_pool_size|innodb_flush_log_at_trx_commit';
```

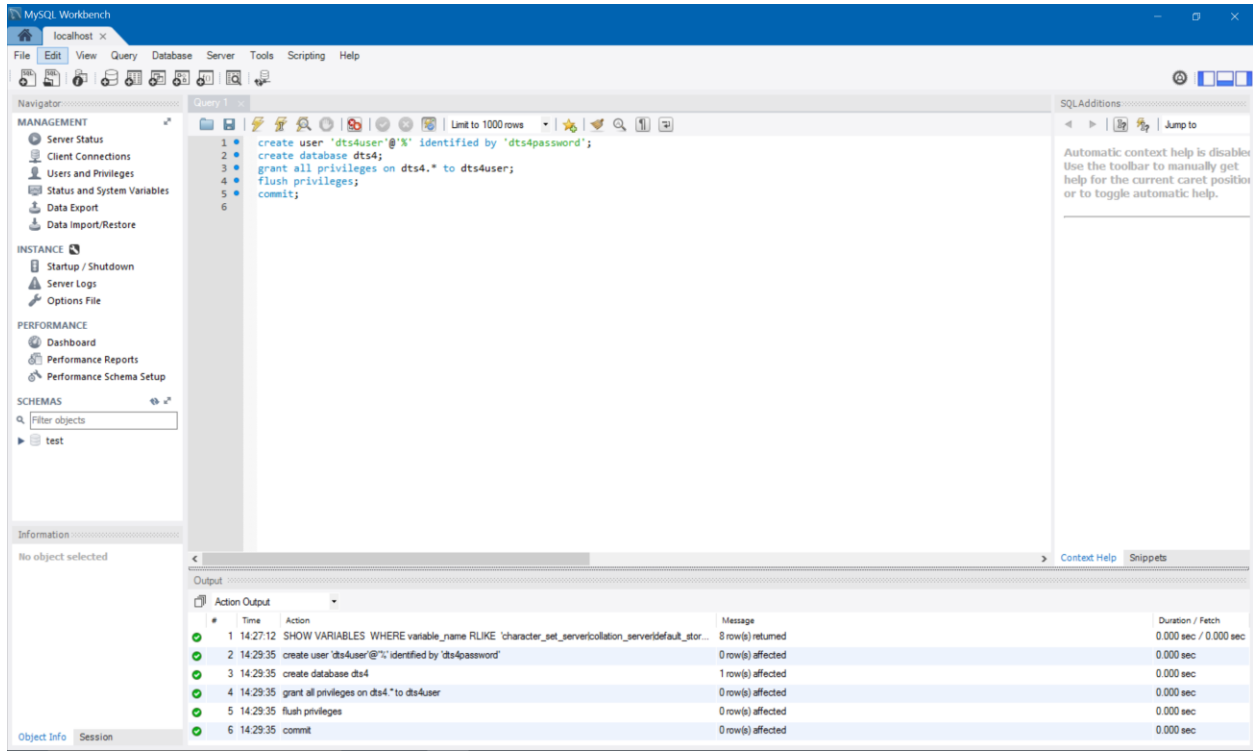
The results are displayed in a table with the following data:

Variable_name	Value
character_set_server	utf8
collation_server	utf8_general_ci
default_storage_engine	InnoDB
innodb_buffer_pool_size	8388608
innodb_flush_log_at_trx_commit	1
lower_case_table_names	1
max_allowed_packet	4194304
slave_max_allowed_packet	1073741824

The output pane at the bottom shows the execution details: 1 19:59:23 SHOW VARIABLES WHERE variable\_name RLIKE 'character\_set\_server|collation\_server|default\_stor... 8 row(s) returned 0.000 sec / 0.000 sec

## F. Create the DTS User and Database

Run the following SQL commands to create a DTS user and an empty DTS database.



*\*NOTE: DTS uses the default username and password of “dts4”. However, you can specify your own database credentials that are most suitable for your environment. . You can use the following example, replacing the brackets [] and their values with ones you prefer for your setup.*

```
create database dts4;
create user '[dts4user]'@'%' identified by '[dts4password]';
grant all privileges on dts4.* to [dts4user];
create user '[dts4user]'@'localhost' identified by
'[dts4password]';
grant all privileges on dts4.* to [dts4user]@localhost;
flush privileges;
commit;
```

- create database dts4;
  - Create a new, empty database for DTS
- create user 'dts4user'@'%' identified by 'dts4password';
  - The first parameter is the user name – this is the value you will use when configuring your DTS installation to connect to MySQL. The second parameter are the hosts allowed to connect using this username. The third parameter is the password that will be used when configuring your DTS installation to connect to MySQL.
- grant all privileges on dts4.\* to dts4user;

- Grant the dts user created above full permissions to the DTS database
- `create user 'dts4user'@'localhost' identified by 'dts4password';`
  - The first parameter is the user name – this is the value you will use when configuring your DTS installation to connect to MySQL. The second parameter indicates ‘localhost’ rather than ‘%’ as the host allowed to connect using this username. The third parameter is the password that will be used when configuring your DTS installation to connect to MySQL.
- `flush privileges;`
  - Activate the permissions change
- `commit;`
  - In case this is inside a transaction, ensure it is committed.

## G. Creating and Populating the DTS Schema and Tablespace

The next steps assume that you have DTS installed on your system – as they rely on scripts provided by the DTS installation. Please refer to the **DTS Installation Guide** or the **DTS Quick Start Guide** for instruction on installing DTS. Return to this document when you get to the step “**Preparing Your Knowledgebase**”.

### G.1 Create DTS Knowledgebase Schema

After you create the MySQL username and Database, you must create the DTS tables, or schema. Before you can run the Knowledgebase Create utility to create the schema, you must follow this procedure to configure the parameters by which the schema will be created, and by which a connection will be made to the DTS database.

1. Go to `DTS_HOME\bin\kb`. If `target-connection.xml` is not there, copy `target-connection-<database>.xml` (where `<database>` is `mysql`) as `target-connection.xml`.
2. Open the `target-connection.xml` file (`DTS_HOME\bin\kb`) where you set the values for the database connection. For the **user** and **pass** property values (highlighted) enter the username and password for the user you created earlier.

*\*NOTE: DTS uses the default username and password of “dts4”. However, you can specify your own database credentials that are most suitable for your environment.*

```
<!--
  MySQL connection.
-->
<connection>
  <property name="direction" value="target" />
  <property name="type" value="mysql"/>
  <property name="user" value="dts4user"/>
  <property name="pass" value="dts4password"/>
  <property name="host" value="localhost"/>
  <property name="databaseName" value="dts4"/>
  <property name="databasePort" value="3306"/>
  <property name="jdbcDriver" value="com.mysql.jdbc.Driver"/>
  <property name="url_template" value="jdbc:mysql://[HOST]:[PORT]/[DATABASE]"/>
</connection>
```

different host than the system where MySQL was installed. When you run the Knowledgebase Create utility, a database connection will be established based on the values in this file.

3. Save the `target-connection.xml` file.
4. Run the file `kbcreate.bat` (`DTS_HOME\bin\kb\create`) (or `kbcreate.sh` for Linux) to start the Knowledgebase Create utility. If this is the first time `kbcreate.bat` is being run, the utility creates all the tables required to load data into the knowledgebase. If `kbcreate.bat` was run previously, the Knowledgebase Create utility checks for existing tables.

**Important Note:** If one or more tables are missing from an existing set, the utility automatically drops all existing tables, then recreates them all (without displaying any user prompts).

If all the tables exist, the utility prompts you to drop, or not drop, existing tables.

**All the tables exist. Do you want to drop all tables (y/n)?**

If you type **y**, the utility drops all existing tables, then recreates them all. Type **n** to bypass the drop of existing tables and creation of new ones, and to exit the utility.

The results of running the Knowledgebase Create utility are written to the log file (the default log file is `kbcreate.log` in `DTS_HOME\bin\logs`. If a different log file name and location are



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specified in the log configuration file `kbcreatelog.xml` (`DTS_HOME\bin\kb\create`) the results are written to that file.

If an error occurs in the knowledgebase creation process, the utility stops and updates the log file to reflect the error.

### **G.2 Populate the DTS Knowledgebase**

Please return to the **DTS Quick Start** or **DTS Installation Guide** and continue with the step “**Populating the DTS Knowledgebase**” - using MySQL as your database when you configure the Subscription Import Wizard.