

# 认识数据库

# 数据库

## 关系型数据库



## 非关系型数据库



# 认识数据库：关系型数据库



- MySQL：由瑞典MySQL AB公司开发，目前属于属于 Oracle 旗下。
- Oracle：Oracle公司的产品，甲骨文公司。
- SQL Server：微软公司开发的数据库。
- MariaDB：MySQL的一个分支，主要由开源社区在维护，由MySQL之父Widenius创立。
- SQLite：一款轻型的数据库，多用于嵌入式产品中。

# 关系型数据库的数据结构

- 例如，数据库中一个学员的信息记录表，格式如下。

ID	NAME	SEX	BIRTHDATE	AGE	CITY
20161001	Sunbin	男	1990/1/1	28	Beijing
20161002	Wangwu	女	1991/1/3	19	Beijing
20161003	Lisi	男	1990/11/4	21	Shanghai
20161004	Ximen	男	1989/8/7	32	
20161005	zhangsan	女	1989/1/2	35	Tianjin
20161010	Leilei	男	1990/12/5	30	
20161015	Niuer	女	1990/7/6	20	Guangzhou

# 认识数据库：非关系型数据库（NoSQL）



- mongoDB：一个基于分布式文件存储的数据库，以键值来存储数据，结构不固定。
- redis：Remote Dictionary Server，即远程字典服务，一个高性能的key-value数据库。
- HBase：Hadoop的数据库，是一个基于列的适合于非结构化数据存储的数据库。
- Hive：一个基于Hadoop的数据仓库工具，用类SQL语句访问存储在Hadoop系统中的数据。
- Cassandra：一套开源分布式NoSQL数据库系统，最初由Facebook开发，用于储存收件箱等简单格式数据。

# 认识数据库

作为初学者，推荐大家学习MySQL数据库，原因有以下三点。

1. 使用广泛，很多公司都使用MySQL数据库，包括国内很多大型互联网公司。
  2. 入门简单，从简单的开始学习，有助于增加我们学习的信心。
  3. 学好了MySQL，再去学其他数据库都是类似的、相通的。
- MySQL数据库只是一个软件，用于存储数据，那么，我们如何与MySQL数据库“沟通”呢？
  - 答案是SQL，SQL是Structured Query Language的缩写，意为结构化查询语言。
  - 我们使用SQL可以查询MySQL数据库中的数据，也可以添加、更新和删除数据库中的数据，俗称增删改查。

# 安装MySQL

MySQL的安装主要有两种以下方式：

- 一种是通过图形化的界面安装，就是下载MySQL的安装包，双击运行后，直接下一步、下一步即可；
- 另外一种是通过命令行安装，就是下载MySQL的压缩文件，解压后，再通过命令行对MySQL进行配置。

这里，推荐大家用第一种安装方式，简单易学。

在Windows下，我们可以通过MySQL Installer来安装MySQL。

# MySQL安装

通过MySQL Installer安装三个东西：

- **MySQL Server**：MySQL服务器
- **MySQL Workbench**：写SQL代码的工具。
- **MySQL Notifier**：监视器，用于启动、重启MySQL Server。

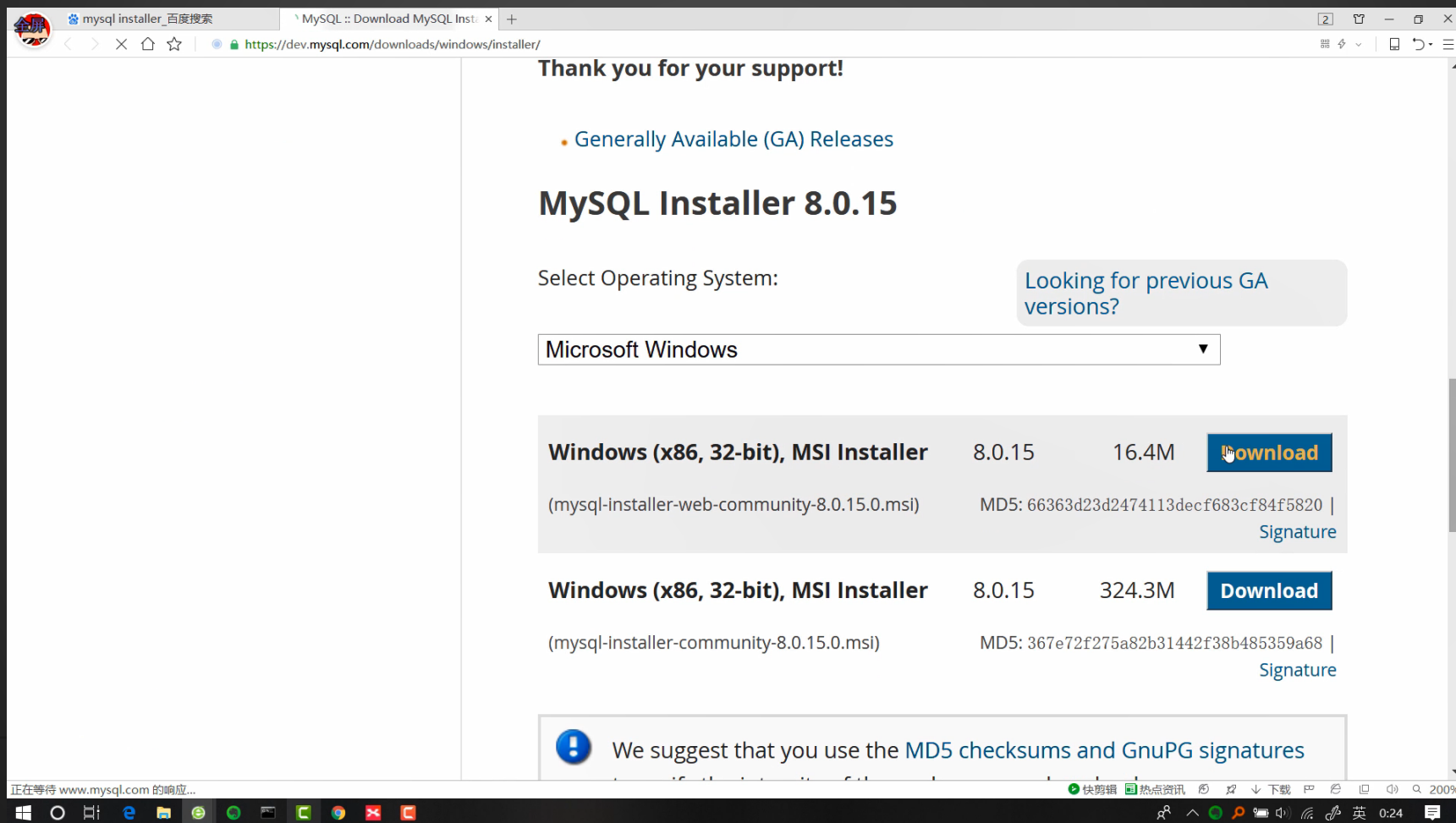


# MySQL安装

1. 下载MySQL Installer
2. 安装MySQL Installer。
3. 选择安装的两个组件。
4. 配置MySQL Server。

# 下载MySQL Installer

- MySQL Installer下载地址: <https://dev.mysql.com/downloads/windows/installer/>,



- MySQL Shell
- MySQL Workbench
- › MySQL Connectors
- Other Downloads

**Login »**

using my Oracle Web account

**Sign Up »**

for an Oracle Web account

MySQL.com is using Oracle SSO for authentication. If you already have an Oracle Web account, click the Login link. Otherwise, you can signup for a free account by clicking the Sign Up link and following the instructions.

[No thanks, just start my download.](#)



**Contact MySQL Sales**

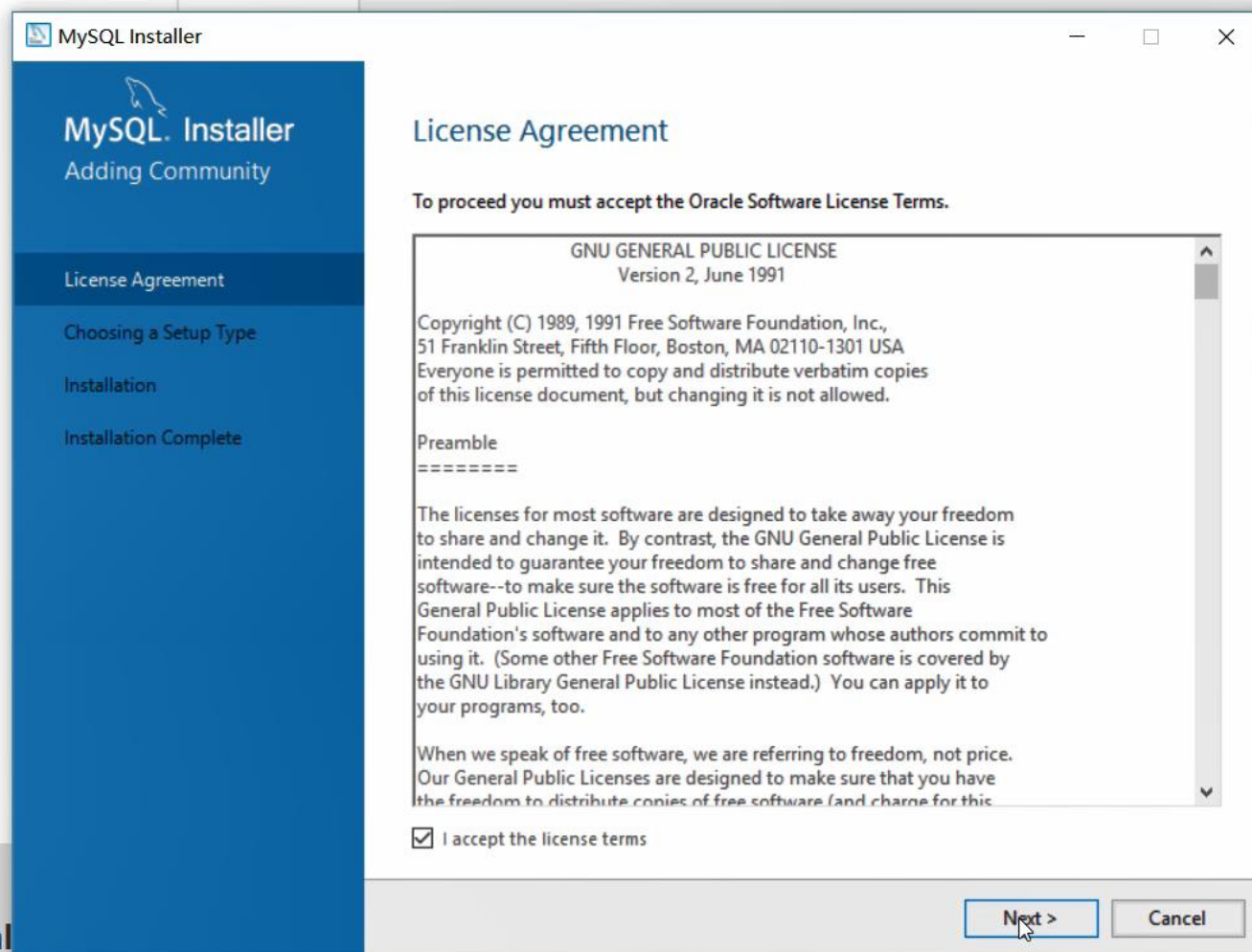
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# 安装MySQL Installer



- MySQL Shell
- MySQL Workbench
- MySQL Connectors
- Other Downloads



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- MySQL Shell
- MySQL Workbench
- MySQL Connectors
- Other Downloads

MySQL Installer

Adding Community

License Agreement

Choosing a Setup Type

Select Products and Features

Installation

Installation Complete

Choosing a Setup Type

Please select the Setup Type that suits your use case.

☐ Developer Default

Installs all products needed for MySQL development purposes.

☐ Server only

Installs only the MySQL Server product.

☐ Client only

Installs only the MySQL Client products, without a server.

☐ Full

Installs all included MySQL products and features.

☒ Custom

Manually select the products that should be installed on the system.

Setup Type Description

Allows you to select exactly which products you would like to install. This also allows to pick other server versions and architectures (depending on your OS).

< Back

Next >

Cancel



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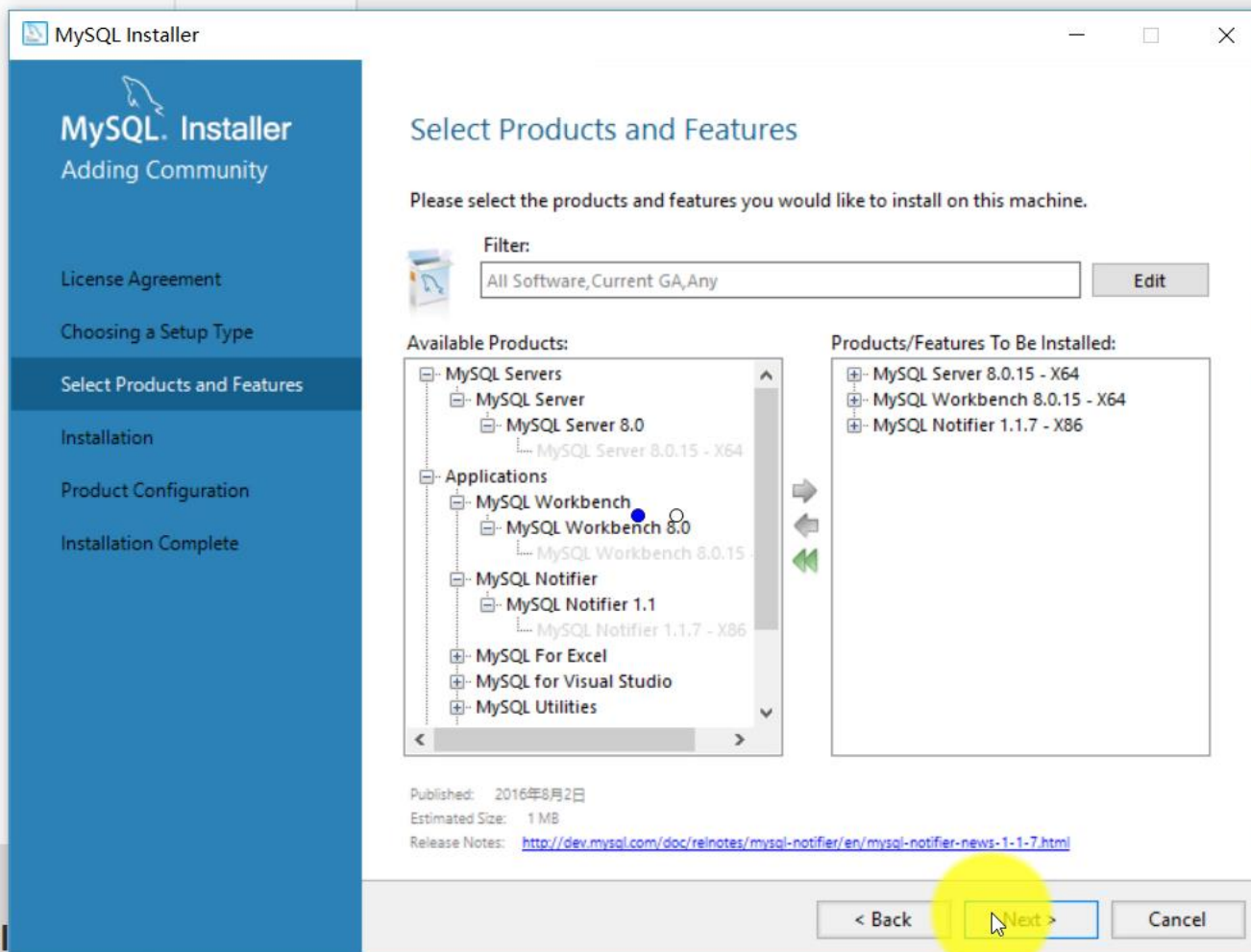




选择安装的三个组件



- MySQL Shell
- MySQL Workbench
- MySQL Connectors
- Other Downloads



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- MySQL Shell
- MySQL Workbench
- MySQL Connectors
- Other Downloads

MySQL Installer

Adding Community

License Agreement

Choosing a Setup Type

Select Products and Features

Installation

Product Configuration

Installation Complete

Installation

The following products will be installed.

Product	Status	Progress	Notes
MySQL Server 8.0.15	Downloading...	1%	
MySQL Workbench 8.0.15	Downloading...	0%	
MySQL Notifier 1.1.7	Downloading...	10%	

Show Details >

< Back

Next >

Cancel



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- MySQL Shell
- MySQL Workbench
- MySQL Connectors
- Other Downloads

MySQL Installer

Adding Community

License Agreement

Choosing a Setup Type

Select Products and Features

Installation

Product Configuration

Installation Complete

Installation

The following products will be installed.

Product	Status	Progress	Notes
MySQL Server 8.0.15	Complete		
MySQL Workbench 8.0.15	Complete		
MySQL Notifier 1.1.7	Complete		

Show Details >

< Back

Next >

Cancel



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# 配置MySQL Server



- MySQL Shell
- MySQL Workbench
- MySQL Connectors
- Other Downloads

MySQL Installer

Adding Community

License Agreement

Choosing a Setup Type

Select Products and Features

Installation

Product Configuration

Installation Complete

Product Configuration

We'll now walk through a configuration wizard for each of the following products.

You can cancel at any point if you wish to leave this wizard without configuring all the products.

Product	Status
MySQL Server 8.0.15	Ready to configure

Next > Cancel



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- MySQL Shell
- MySQL Workbench
- MySQL Connectors
- Other Downloads

MySQL Installer

MySQL Server 8.0.15

High Availability

Type and Networking

Authentication Method

Accounts and Roles

Windows Service

Logging Options

Advanced Options

Apply Configuration

### High Availability

☒ **Standalone MySQL Server / Classic MySQL Replication**  
Choose this option to run the MySQL instance as a standalone database server with the opportunity to configure classic replication later. With this option, you can provide your own high-availability solution, if required.

☐ **InnoDB Cluster** [Why is this option disabled?](#)  
The InnoDB cluster technology provides an out-of-the-box high availability (HA) solution for MySQL using Group Replication.

Note: [InnoDB cluster](#) requires a minimum of three MySQL server instances to provide a fully automated HA solution. Members of a cluster should be located such that network communication latency between servers is low.

Next >

Cancel



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- MySQL Shell
- MySQL Workbench
- MySQL Connectors
- Other Downloads

MySQL Installer

MySQL Server 8.0.15

High Availability

Type and Networking

Authentication Method

Accounts and Roles

Windows Service

Apply Configuration

Type and Networking

Server Configuration Type

Choose the correct server configuration type for this MySQL Server installation. This setting will define how much system resources are assigned to the MySQL Server instance.

Config Type: Development Computer

Connectivity

Use the following controls to select how you would like to connect to this server.

☒ TCP/IP

Port: 3306

X Protocol Port: 33060

☒ Open Windows Firewall ports for network access

☐ Named Pipe

Pipe Name: MYSQL

☐ Shared Memory

Memory Name: MYSQL

Advanced Configuration

Select the check box below to get additional configuration pages where you can set advanced and logging options for this server instance.

☐ Show Advanced and Logging Options

< Back

Next >

Cancel



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- MySQL Shell
- MySQL Workbench
- MySQL Connectors
- Other Downloads

MySQL Installer

MySQL Server 8.0.15

High Availability

Type and Networking

Authentication Method

Accounts and Roles

Windows Service

Apply Configuration

### Authentication Method

☒ **Use Strong Password Encryption for Authentication (RECOMMENDED)**

MySQL 8 supports a new authentication based on improved stronger SHA256-based password methods. It is recommended that all new MySQL Server installations use this method going forward.

**Attention:** This new authentication plugin on the server side requires new versions of connectors and clients which add support for this new 8.0 default authentication (caching\_sha2\_password authentication).

Currently MySQL 8.0 Connectors and community drivers which use libmysqlclient 8.0 support this new method. If clients and applications cannot be updated to support this new authentication method, the MySQL 8.0 Server can be configured to use the legacy MySQL Authentication Method below.

☐ **Use Legacy Authentication Method (Retain MySQL 5.x Compatibility)**

Using the old MySQL 5.x legacy authentication method should only be considered in the following cases:

- If applications cannot be updated to use MySQL 8 enabled Connectors and drivers.
- For cases where re-compilation of an existing application is not feasible.
- An updated, language specific connector or driver is not yet available.

Security Guidance: When possible, we highly recommend taking needed steps towards upgrading your applications, libraries, and database servers to the new stronger authentication. This new method will significantly improve your security.

< Back

Next >

Cancel



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- MySQL Shell
- MySQL Workbench
- MySQL Connectors
- Other Downloads

MySQL Installer

MySQL Server 8.0.15

High Availability

Type and Networking

Authentication Method

Accounts and Roles

Windows Service

Apply 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:

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 User Name	Host	User Role
-----------------	------	-----------

Add User

Edit User

Delete

< Back

Next >

Cancel



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- MySQL Shell
- MySQL Workbench
- MySQL Connectors
- Other Downloads

MySQL Installer

MySQL Server 8.0.15

High Availability

Type and Networking

Authentication Method

Accounts and Roles

Windows Service

Apply Configuration

Windows Service

☒ Configure MySQL Server as a Windows Service

Windows Service Details

Please specify a Windows Service name to be used for this MySQL Server instance. A unique name is required for each instance.

Windows Service Name:

☒ Start the MySQL Server at System Startup

Run Windows Service as ...

The MySQL Server needs to run under a given user account. Based on the security requirements of your system you need to pick one of the options below.

☒ Standard System Account

Recommended for most scenarios.

☐ Custom User

An existing user account can be selected for advanced scenarios.

< Back

Next >

Cancel



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- MySQL Shell
- MySQL Workbench
- MySQL Connectors
- Other Downloads

MySQL Installer

MySQL Server 8.0.15

High Availability

Type and Networking

Authentication Method

Accounts and Roles

Windows Service

Apply Configuration

Apply Configuration

The following configuration steps are being executed.

Configuration Steps

Log

☒ Writing configuration file

☒ Updating Windows Firewall rules

☒ Adjusting Windows service

☐ Initializing database (may take a long time)

☐ Starting the server

☐ Applying security settings

☐ Creating user accounts

☐ Updating the Start menu link

Execute

Cancel



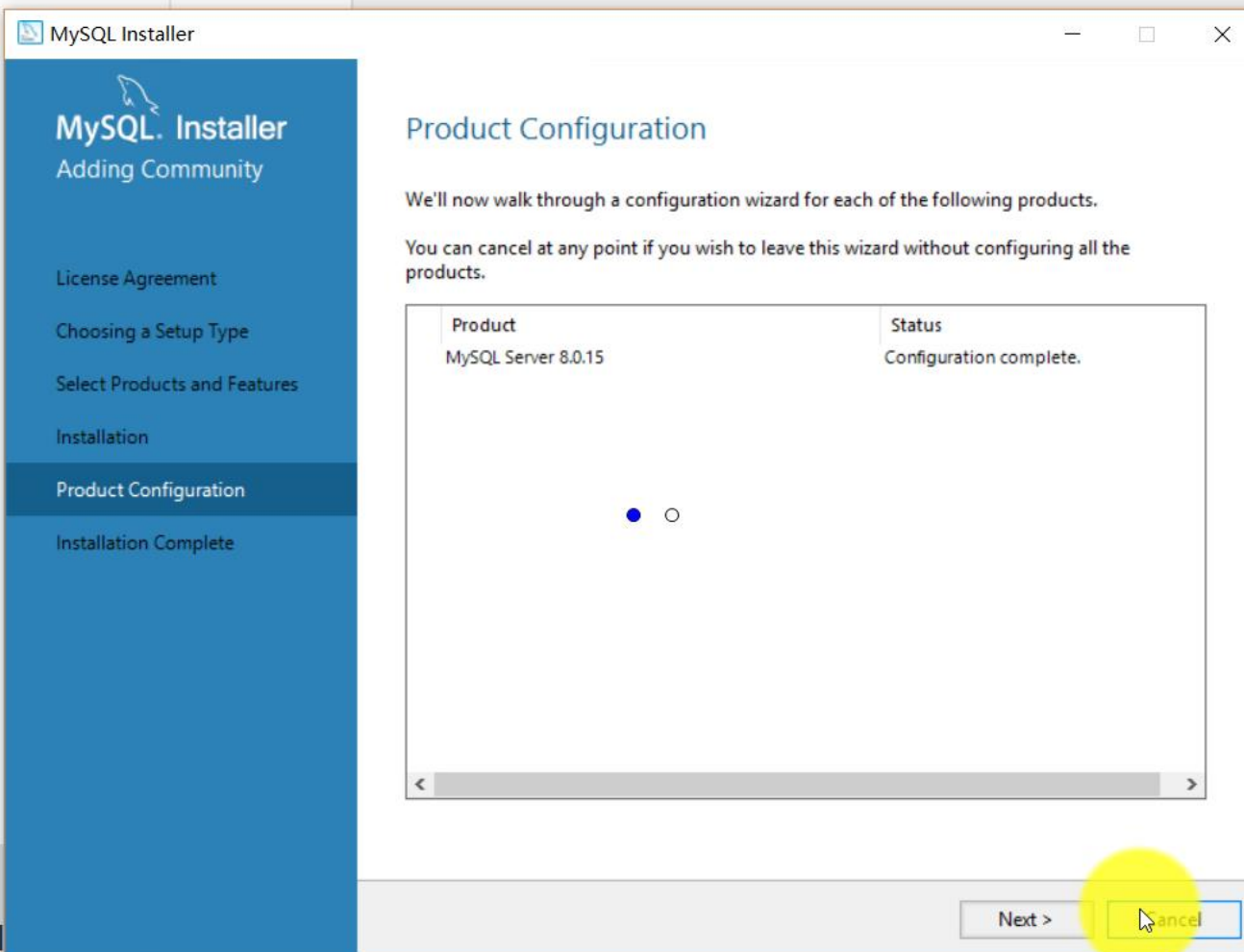
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- MySQL Workbench
- MySQL Connectors
- Other Downloads

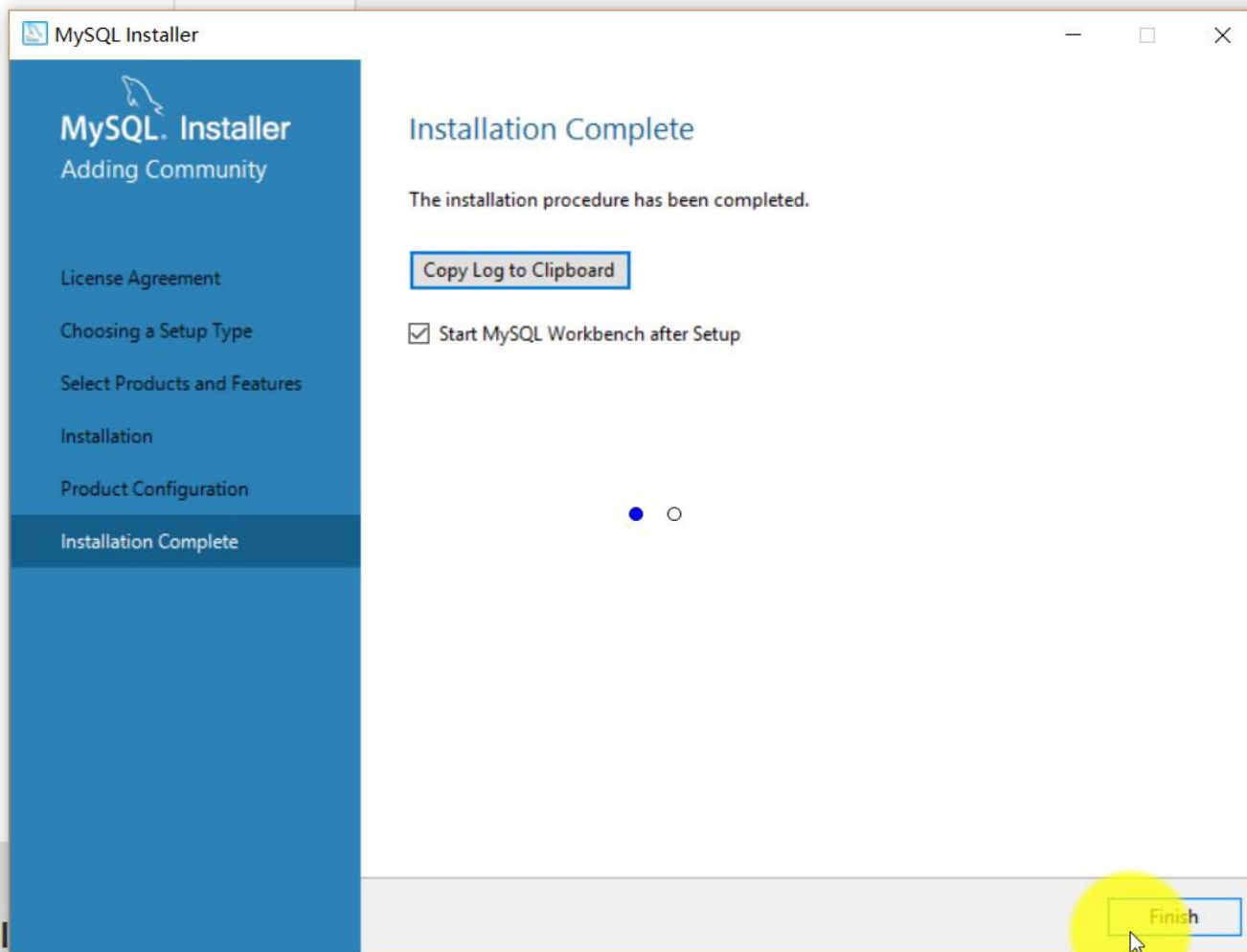
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Service MySQL80 changed status from Stopped to Running...

MySQL Notifier



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MySQL数据库安装完毕!