SQL Server

Set Up & Access

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Outline

- Step by Step Installation
- Access SQL Server with Java
- External Resources

Download SQL Server

- SQL Server 2005, 2008 & 2012

- Available free at (only for ECE students):

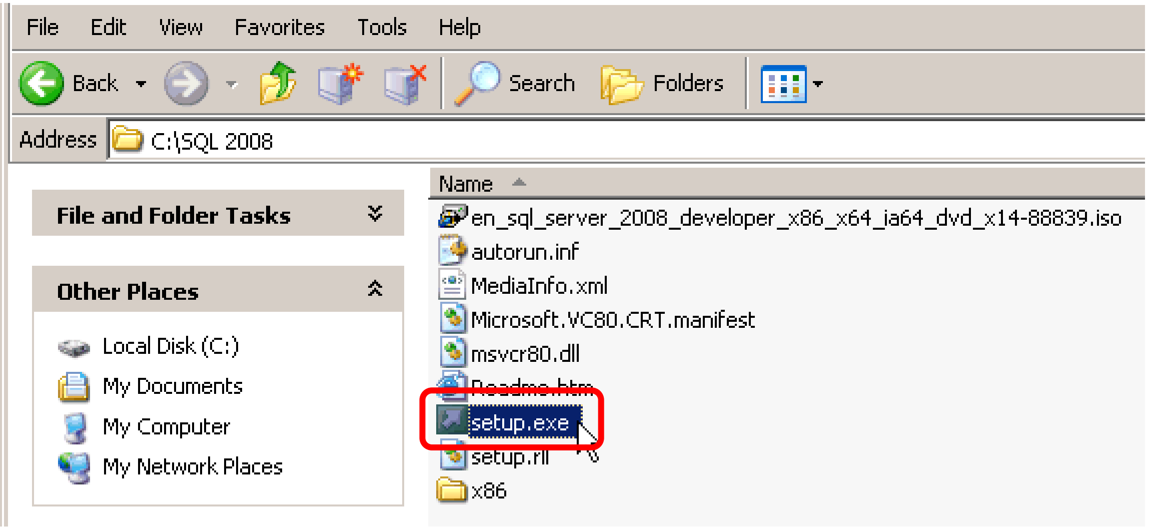
  MSDN Academic Alliance

- More info at:

  MSDN Academic Alliance Download Tutorial

Installation – Step 1/15

Select the setup.exe from the root folder.



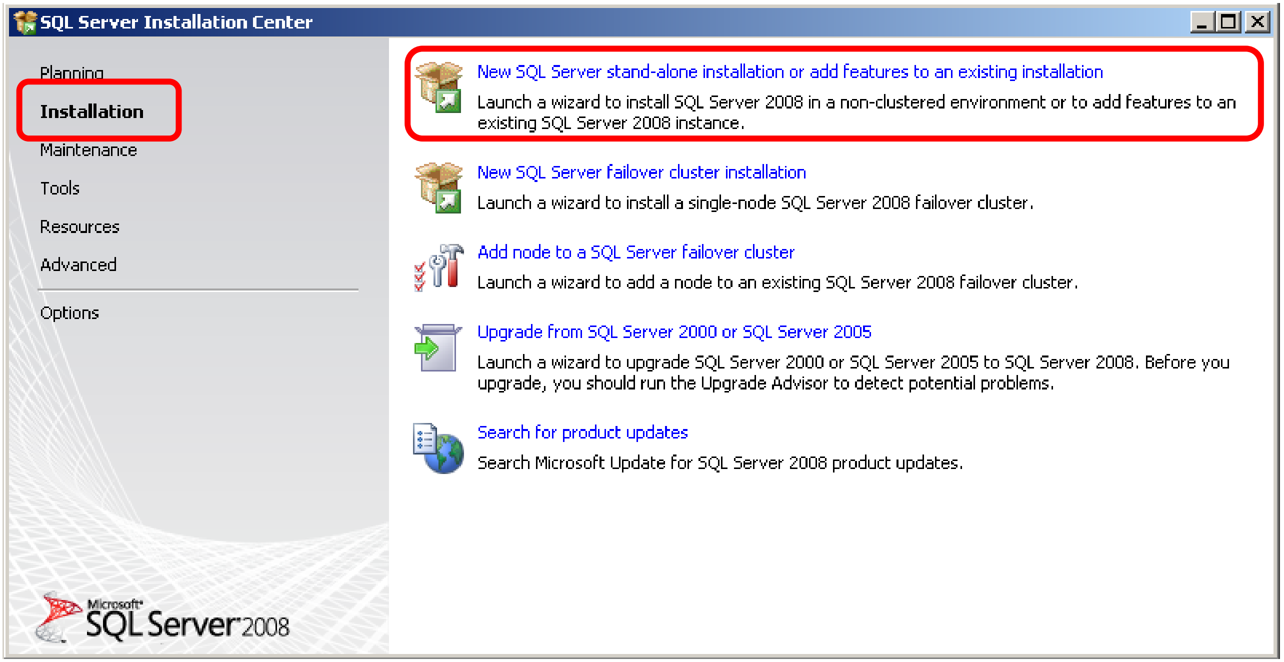
C:\SQL 2008

en_sql_server_2008_developer_x86_x64_ia64_dvd_x14-88839.iso
autorun.inf
MediaInfo.xml
Microsoft.VC80.CRT.manifest
msvcr80.dll
Readme.htm
setup.exe
setup.rll
x86

Installation – Step 2/15

Select Installation (left panel).

Then, select New SQL Server Stand-alone installation or add features to an existing installation (right panel).



New SQL Server stand-alone installation or add features to an existing installation

Launch a wizard to install SQL Server 2008 in a non-clustered environment or to add features to an existing SQL Server 2008 instance.

New SQL Server failover cluster installation

Launch a wizard to install a single-node SQL Server 2008 failover cluster.

Add node to a SQL Server failover cluster

Launch a wizard to add a node to an existing SQL Server 2008 failover cluster.

Upgrade from SQL Server 2000 or SQL Server 2005

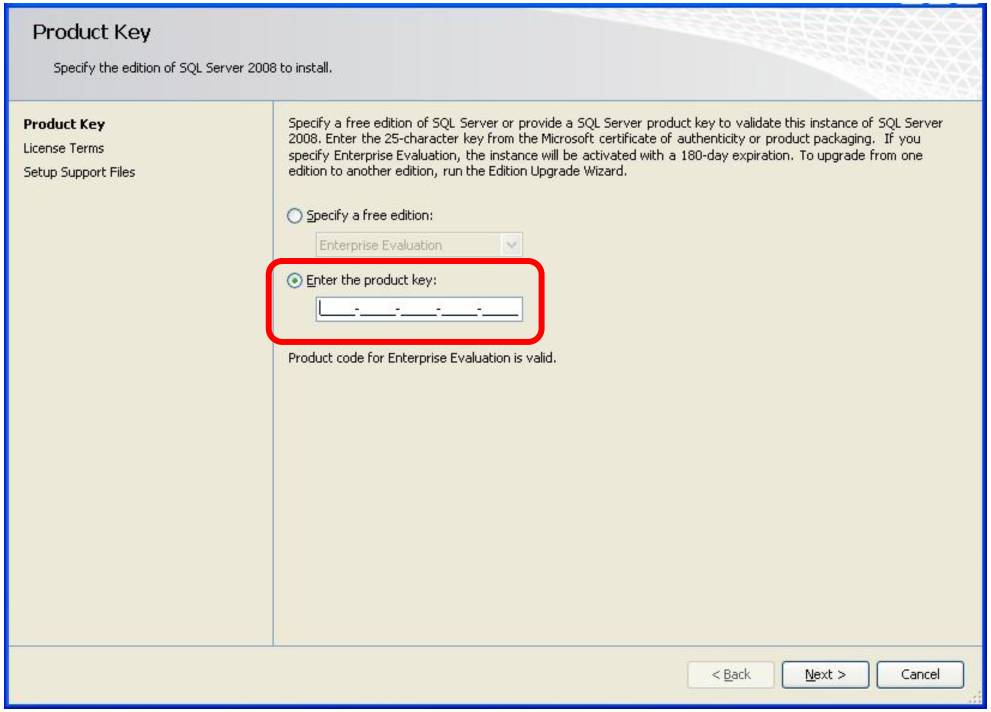
Launch a wizard to upgrade SQL Server 2000 or SQL Server 2005 to SQL Server 2008. Before you upgrade, you should run the Upgrade Advisor to detect potential problems.

Search for product updates

Search Microsoft Update for SQL Server 2008 product updates.

Installation – Step 3/15

Enter your product key.



Product Key

Specify the edition of SQL Server 2008 to install.

Specify a free edition of SQL Server or provide a SQL Server product key to validate this instance of SQL Server 2008. Enter the 25-character key from the Microsoft certificate of authenticity or product packaging. If you specify Enterprise Evaluation, the instance will be activated with a 180-day expiration. To upgrade from one edition to another edition, run the Edition Upgrade Wizard.

○ Specify a free edition:

Enterprise Evaluation

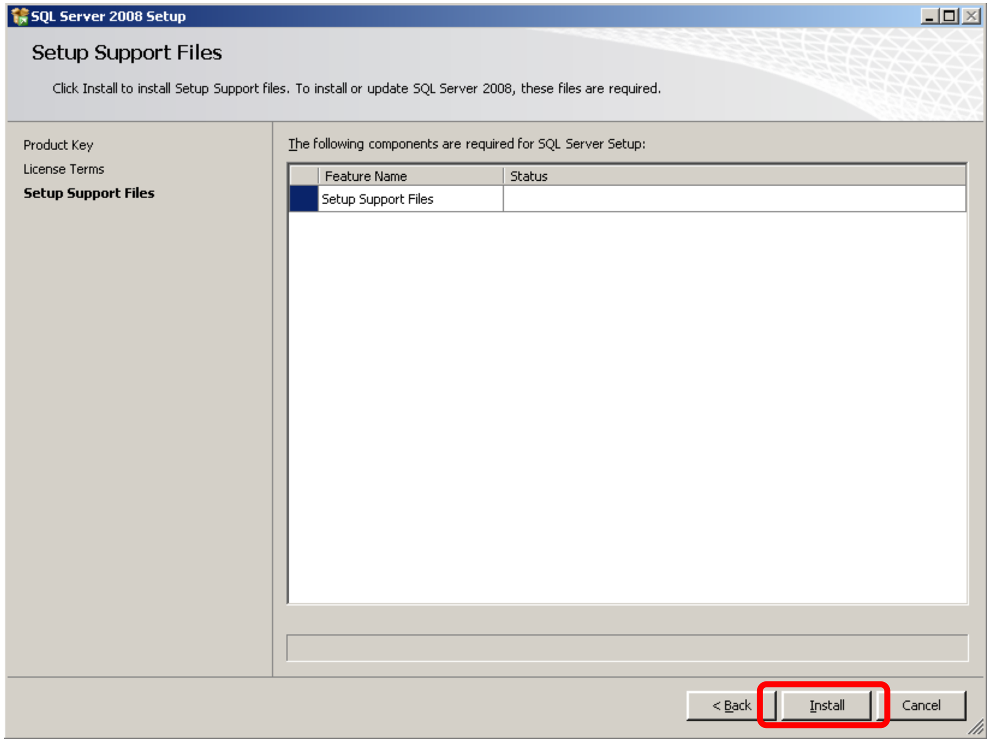
● Enter the product key:

_____-_____-_____-_____-_____

Product code for Enterprise Evaluation is valid.

Installation – Step 4/15

SQL Server will prompt you to install any files missing, just click Install button.



SQL Server 2008 Setup

Setup Support Files

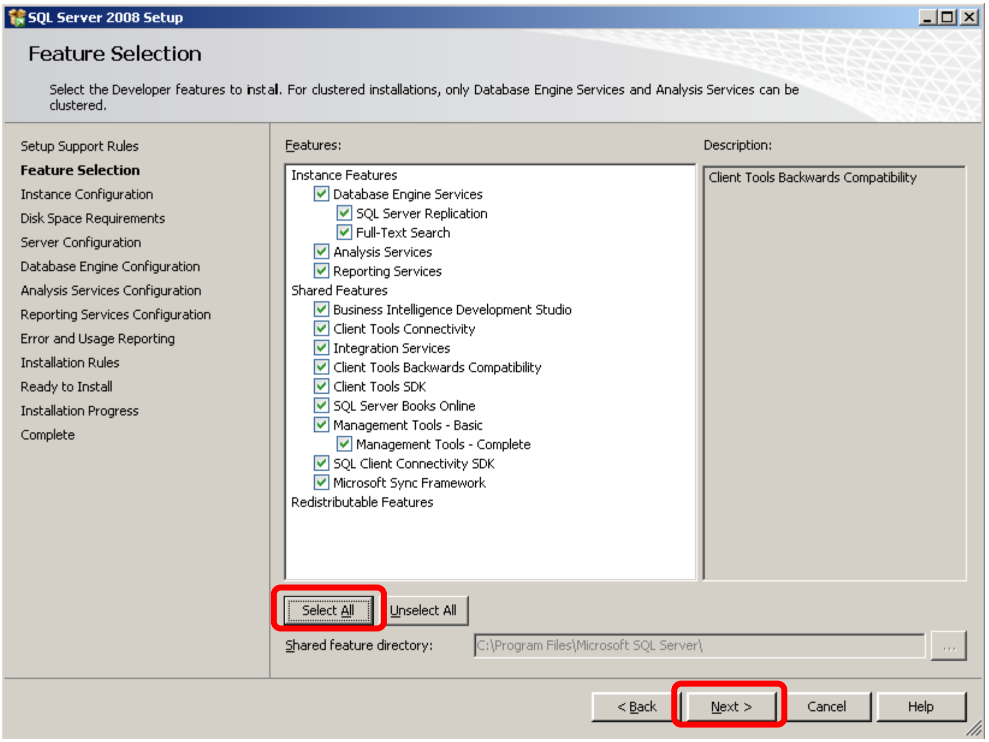
Click Install to install Setup Support files. To install or update SQL Server 2008, these files are required.

The following components are required for SQL Server Setup:

Feature Name	Status
Setup Support Files	

Installation – Step 5/15

Click Select All button.



Feature Selection

Select the Developer features to install. For clustered installations, only Database Engine Services and Analysis Services can be clustered.

Features:

Instance Features
- ☑ Database Engine Services
  - ☑ SQL Server Replication
  - ☑ Full-Text Search
- ☑ Analysis Services
- ☑ Reporting Services

Shared Features
- ☑ Business Intelligence Development Studio
- ☑ Client Tools Connectivity
- ☑ Integration Services
- ☑ Client Tools Backwards Compatibility
- ☑ Client Tools SDK
- ☑ SQL Server Books Online
- ☑ Management Tools - Basic
  - ☑ Management Tools - Complete
- ☑ SQL Client Connectivity SDK
- ☑ Microsoft Sync Framework

Redistributable Features

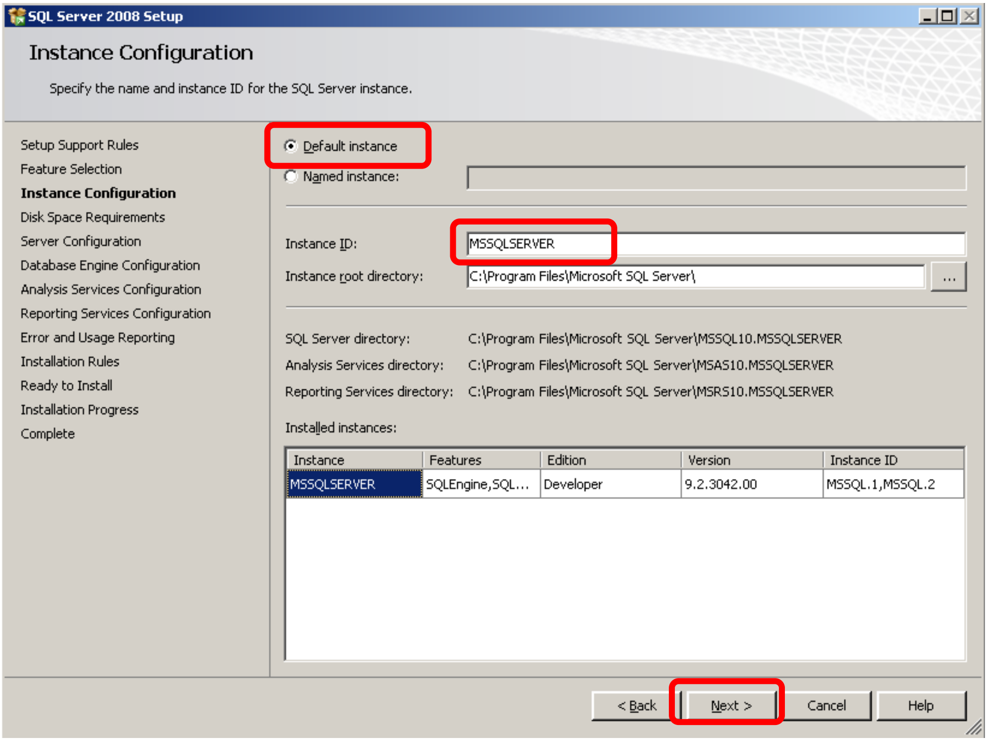
Description:

Client Tools Backwards Compatibility

Shared feature directory: C:\Program Files\Microsoft SQL Server\

Installation – Step 6/15

Select the Default Instance radio button.



Instance Configuration

Specify the name and instance ID for the SQL Server instance.

● Default instance

○ Named instance:

Instance ID: MSSQLSERVER

Instance root directory: C:\Program Files\Microsoft SQL Server\

SQL Server directory: C:\Program Files\Microsoft SQL Server\MSSQL10.MSSQLSERVER

Analysis Services directory: C:\Program Files\Microsoft SQL Server\MSAS10.MSSQLSERVER

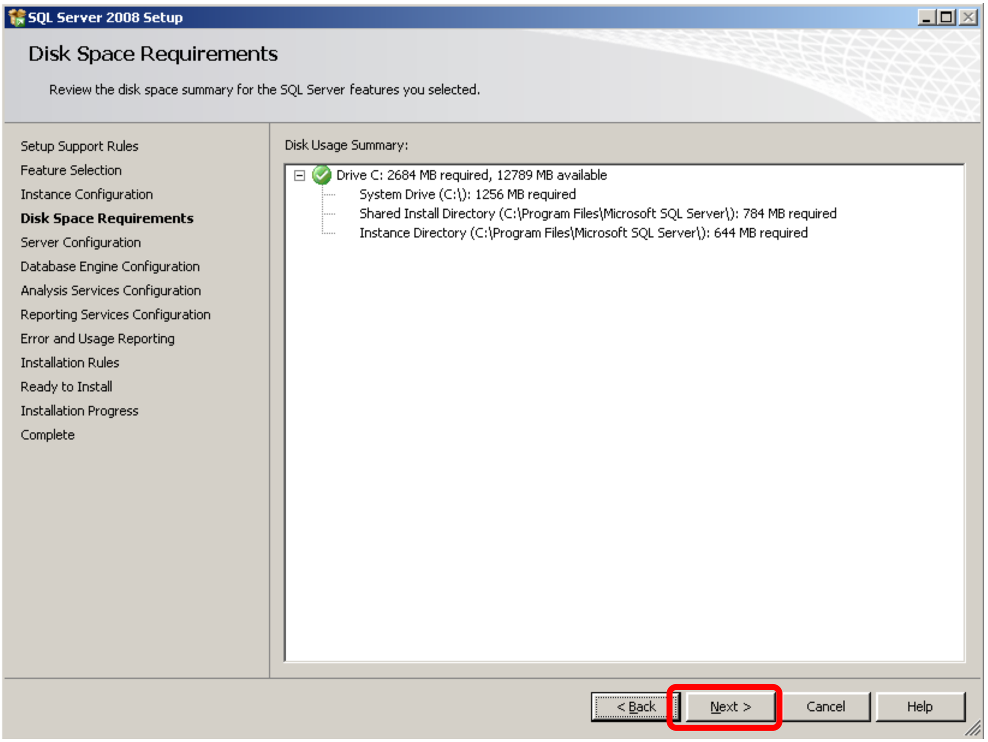
Reporting Services directory: C:\Program Files\Microsoft SQL Server\MSRS10.MSSQLSERVER

Installed instances:

Instance	Features	Edition	Version	Instance ID
MSSQLSERVER	SQLEngine,SQL...	Developer	9.2.3042.00	MSSQL.1,MSSQL.2

Installation – Step 7/15

Click Next button.



SQL Server 2008 Setup

Disk Space Requirements

Review the disk space summary for the SQL Server features you selected.

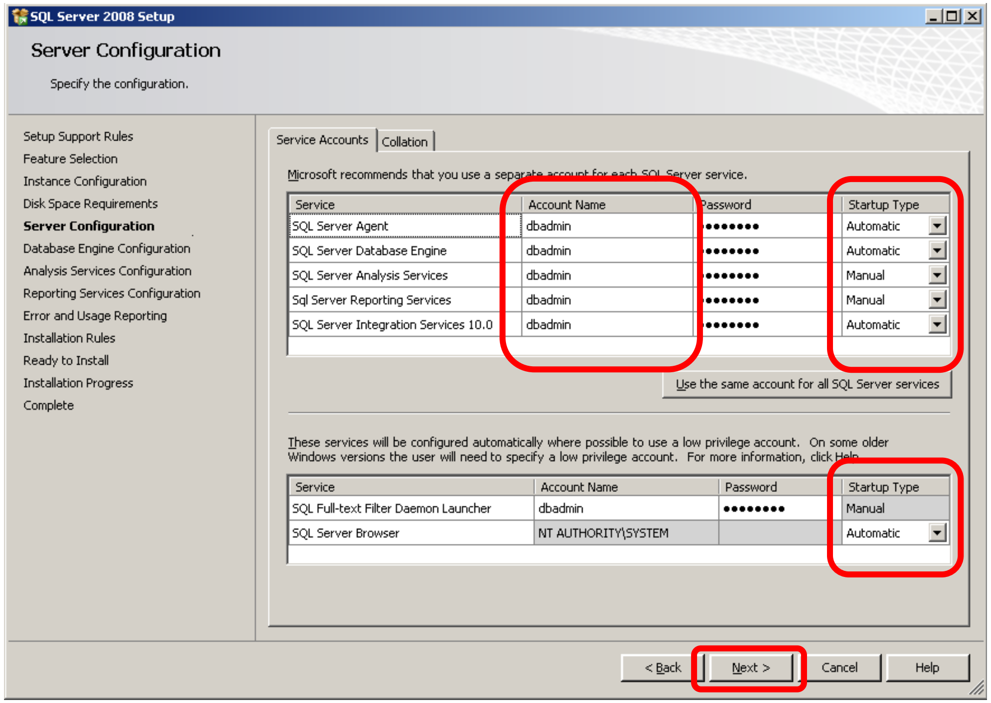
Setup Support Rules
Feature Selection
Instance Configuration
Disk Space Requirements
Server Configuration
Database Engine Configuration
Analysis Services Configuration
Reporting Services Configuration
Error and Usage Reporting
Installation Rules
Ready to Install
Installation Progress
Complete

Disk Usage Summary:

- Drive C: 2684 MB required, 12789 MB available
  - System Drive (C:\): 1256 MB required
  - Shared Install Directory (C:\Program Files\Microsoft SQL Server\): 784 MB required
  - Instance Directory (C:\Program Files\Microsoft SQL Server\): 644 MB required

Installation – Step 8/15

Set all account credentials to the dbadmin credential.
Choose the startup-type according to the print-screen.



Server Configuration

Specify the configuration.

Microsoft recommends that you use a separate account for each SQL Server service.

Service	Account Name	Password	Startup Type
SQL Server Agent	dbadmin	●●●●●●●	Automatic
SQL Server Database Engine	dbadmin	●●●●●●●	Automatic
SQL Server Analysis Services	dbadmin	●●●●●●●	Manual
Sql Server Reporting Services	dbadmin	●●●●●●●	Manual
SQL Server Integration Services 10.0	dbadmin	●●●●●●●	Automatic

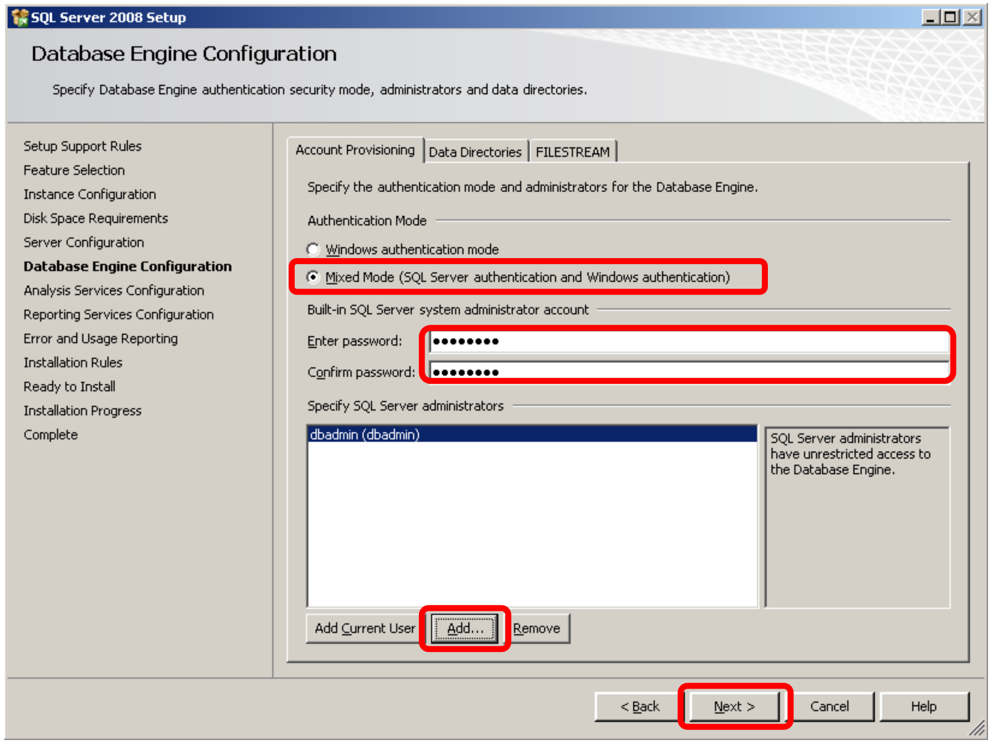
These services will be configured automatically where possible to use a low privilege account. On some older Windows versions the user will need to specify a low privilege account. For more information, click Help.

Service	Account Name	Password	Startup Type
SQL Full-text Filter Daemon Launcher	dbadmin	●●●●●●●●	Manual
SQL Server Browser	NT AUTHORITY\SYSTEM		Automatic

Installation – Step 9/15

Set the Authentication Mode to Mixed Mode.

Then, select dbadmin account as part of the SQL Server administrators.



SQL Server 2008 Setup

Database Engine Configuration

Specify Database Engine authentication security mode, administrators and data directories.

Specify the authentication mode and administrators for the Database Engine.

Authentication Mode

○ Windows authentication mode

● Mixed Mode (SQL Server authentication and Windows authentication)

Built-in SQL Server system administrator account

Enter password: ••••••••

Confirm password: ••••••••

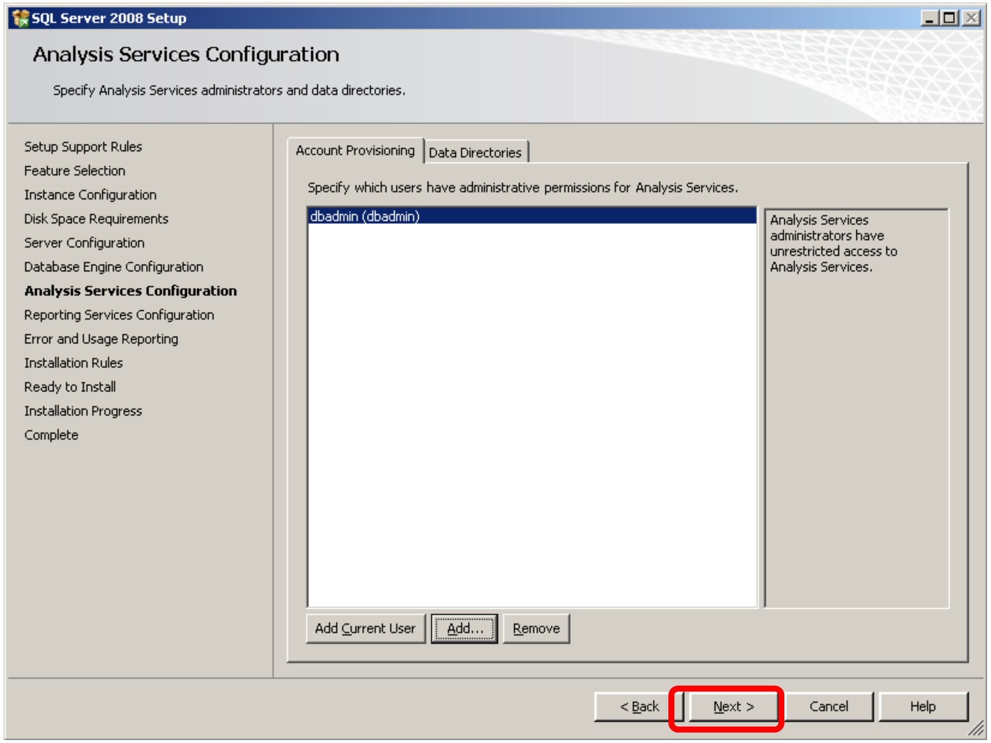
Specify SQL Server administrators

dbadmin (dbadmin)

SQL Server administrators have unrestricted access to the Database Engine.

Installation – Step 10/15

Add the dbadmin account as part of the of the users who have administrative permissions for Analysis Services.



SQL Server 2008 Setup

Analysis Services Configuration

Specify Analysis Services administrators and data directories.

- Setup Support Rules
- Feature Selection
- Instance Configuration
- Disk Space Requirements
- Server Configuration
- Database Engine Configuration
- **Analysis Services Configuration**
- Reporting Services Configuration
- Error and Usage Reporting
- Installation Rules
- Ready to Install
- Installation Progress
- Complete

Account Provisioning | Data Directories

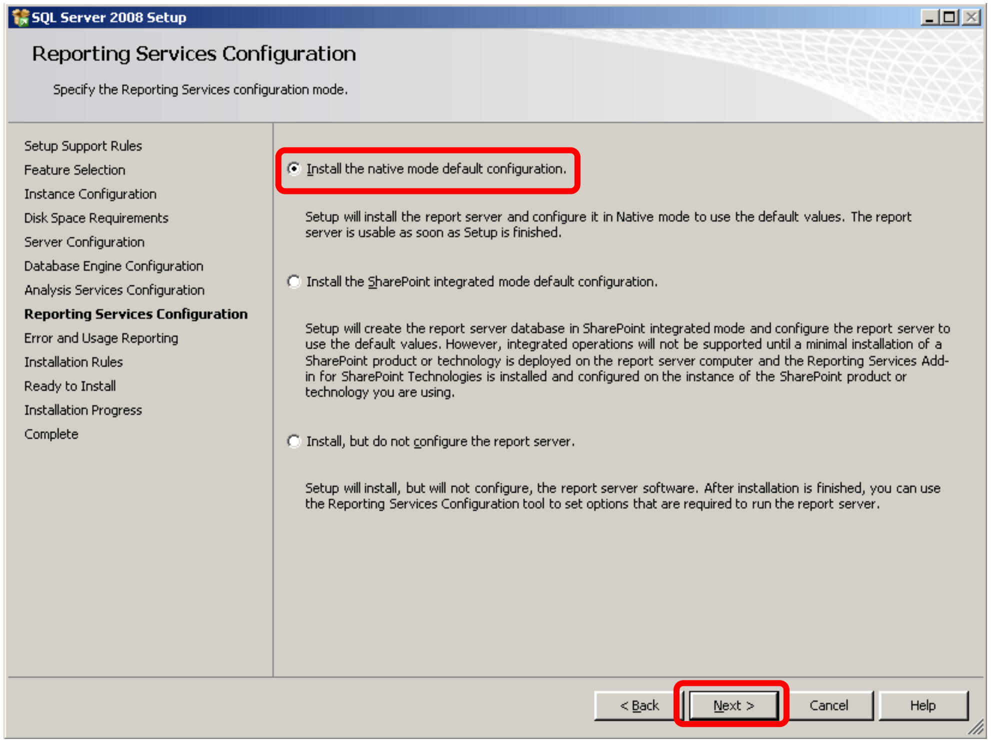
Specify which users have administrative permissions for Analysis Services.

dbadmin (dbadmin)

Analysis Services administrators have unrestricted access to Analysis Services.

Installation – Step 11/15

Select the radio button Install the native mode default configuration.



SQL Server 2008 Setup

Reporting Services Configuration

Specify the Reporting Services configuration mode.

● Install the native mode default configuration.

Setup will install the report server and configure it in Native mode to use the default values. The report server is usable as soon as Setup is finished.

○ Install the SharePoint integrated mode default configuration.

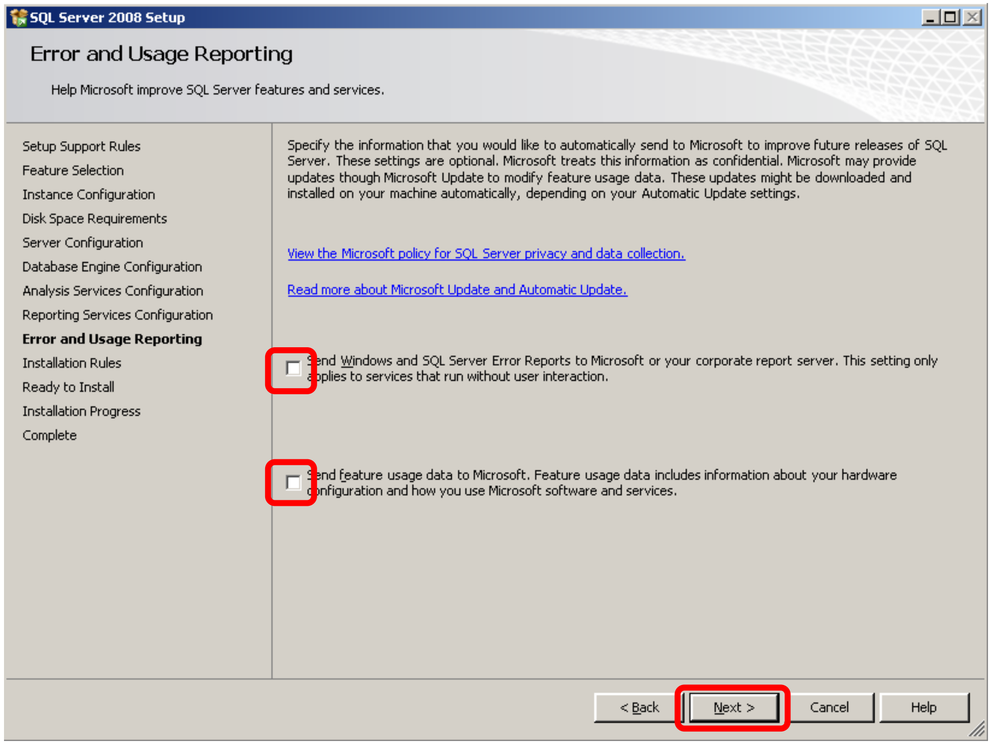
Setup will create the report server database in SharePoint integrated mode and configure the report server to use the default values. However, integrated operations will not be supported until a minimal installation of a SharePoint product or technology is deployed on the report server computer and the Reporting Services Add-in for SharePoint Technologies is installed and configured on the instance of the SharePoint product or technology you are using.

○ Install, but do not configure the report server.

Setup will install, but will not configure, the report server software. After installation is finished, you can use the Reporting Services Configuration tool to set options that are required to run the report server.

Installation – Step 12/15

Uncheck all checkboxes.



SQL Server 2008 Setup

Error and Usage Reporting

Help Microsoft improve SQL Server features and services.

Specify the information that you would like to automatically send to Microsoft to improve future releases of SQL Server. These settings are optional. Microsoft treats this information as confidential. Microsoft may provide updates though Microsoft Update to modify feature usage data. These updates might be downloaded and installed on your machine automatically, depending on your Automatic Update settings.

View the Microsoft policy for SQL Server privacy and data collection.

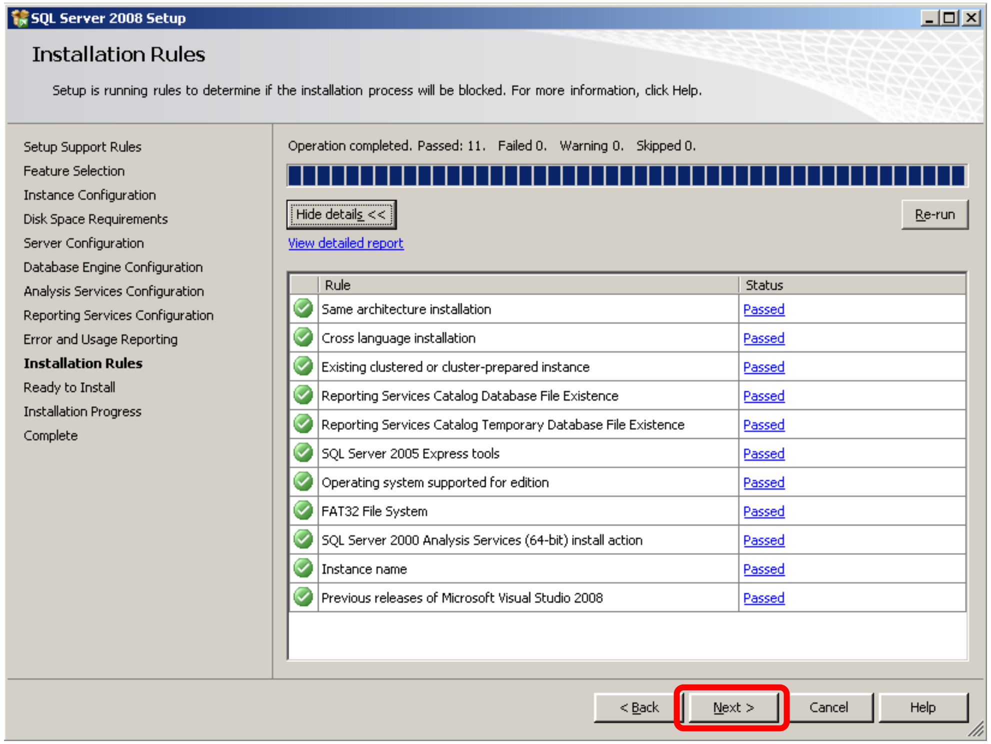
Read more about Microsoft Update and Automatic Update.

□ Send Windows and SQL Server Error Reports to Microsoft or your corporate report server. This setting only applies to services that run without user interaction.

□ Send feature usage data to Microsoft. Feature usage data includes information about your hardware configuration and how you use Microsoft software and services.

Installation – Step 13/15

Click Next Button.



Installation Rules

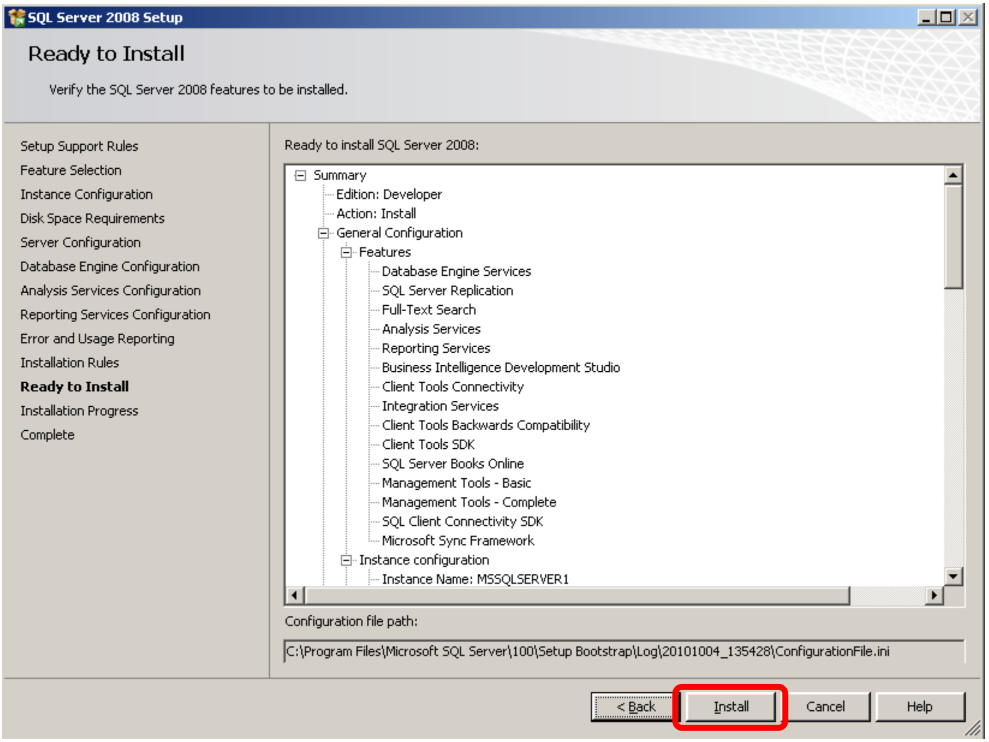
Setup is running rules to determine if the installation process will be blocked. For more information, click Help.

Operation completed. Passed: 11. Failed 0. Warning 0. Skipped 0.

	Rule	Status
✓	Same architecture installation	Passed
✓	Cross language installation	Passed
✓	Existing clustered or cluster-prepared instance	Passed
✓	Reporting Services Catalog Database File Existence	Passed
✓	Reporting Services Catalog Temporary Database File Existence	Passed
✓	SQL Server 2005 Express tools	Passed
✓	Operating system supported for edition	Passed
✓	FAT32 File System	Passed
✓	SQL Server 2000 Analysis Services (64-bit) install action	Passed
✓	Instance name	Passed
✓	Previous releases of Microsoft Visual Studio 2008	Passed

Installation – Step 14/15

Review all the configuration options that you have selected during the installation process and then click Install button.



SQL Server 2008 Setup

Ready to Install

Verify the SQL Server 2008 features to be installed.

Ready to install SQL Server 2008:

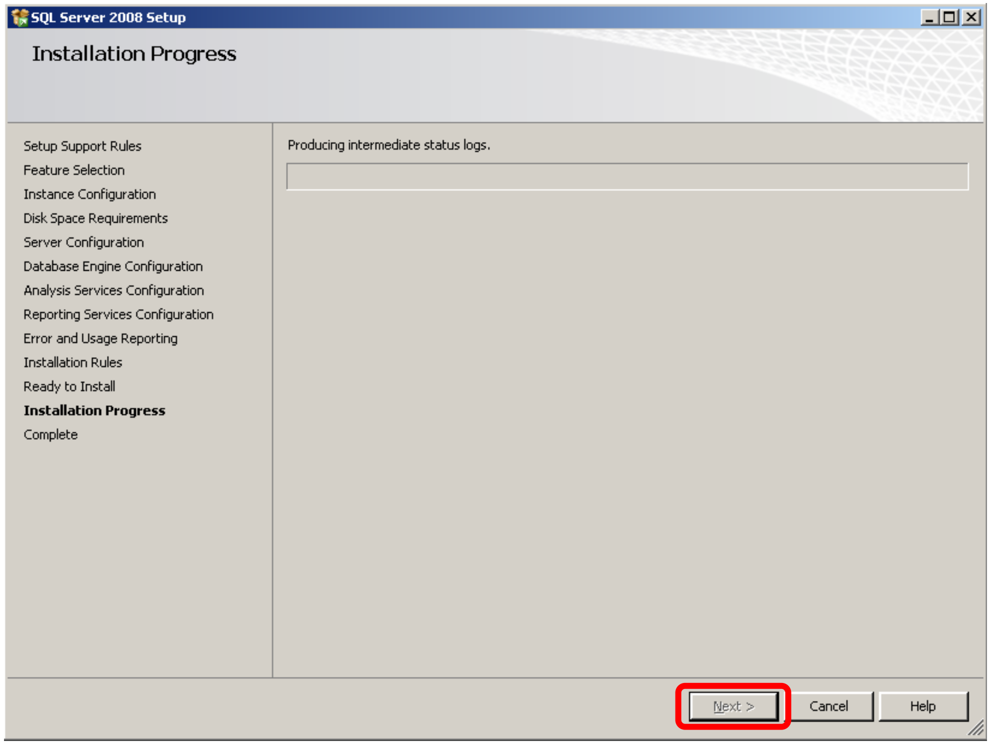
```
⊟ Summary
    Edition: Developer
    Action: Install
  ⊟ General Configuration
    ⊟ Features
        Database Engine Services
        SQL Server Replication
        Full-Text Search
        Analysis Services
        Reporting Services
        Business Intelligence Development Studio
        Client Tools Connectivity
        Integration Services
        Client Tools Backwards Compatibility
        Client Tools SDK
        SQL Server Books Online
        Management Tools - Basic
        Management Tools - Complete
        SQL Client Connectivity SDK
        Microsoft Sync Framework
    ⊟ Instance configuration
        Instance Name: MSSQLSERVER1
```

Configuration file path:

C:\Program Files\Microsoft SQL Server\100\Setup Bootstrap\Log\20101004_135428\ConfigurationFile.ini

Installation – Step 15/15

Wait…



SQL Server 2008 Setup

Installation Progress

- Setup Support Rules
- Feature Selection
- Instance Configuration
- Disk Space Requirements
- Server Configuration
- Database Engine Configuration
- Analysis Services Configuration
- Reporting Services Configuration
- Error and Usage Reporting
- Installation Rules
- Ready to Install
- **Installation Progress**
- Complete

Producing intermediate status logs.

SQL Server & Java

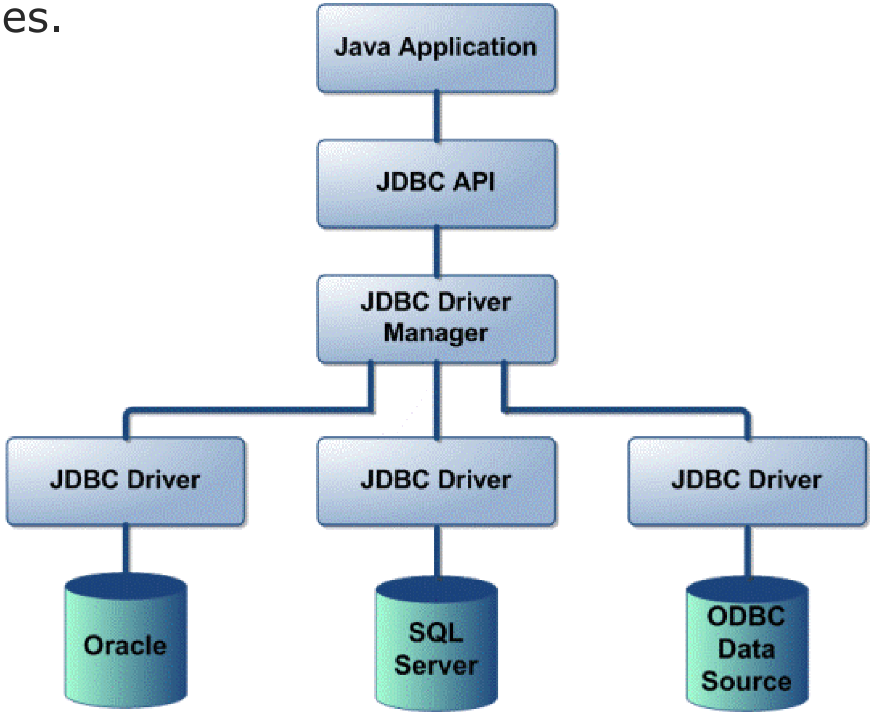
- JDBC
  - Java Database Connectivity
  - An API for the Java programming language that defines how a client interact with a database.
  - JDBC works with Java on a variety of platforms, e.g., Windows, Mac OS, and the various versions of UNIX.

- Microsoft JDBC Driver for SQL Server

  http://msdn.microsoft.com/en-us/sqlserver/aa937724.aspx

JDBC Architecture

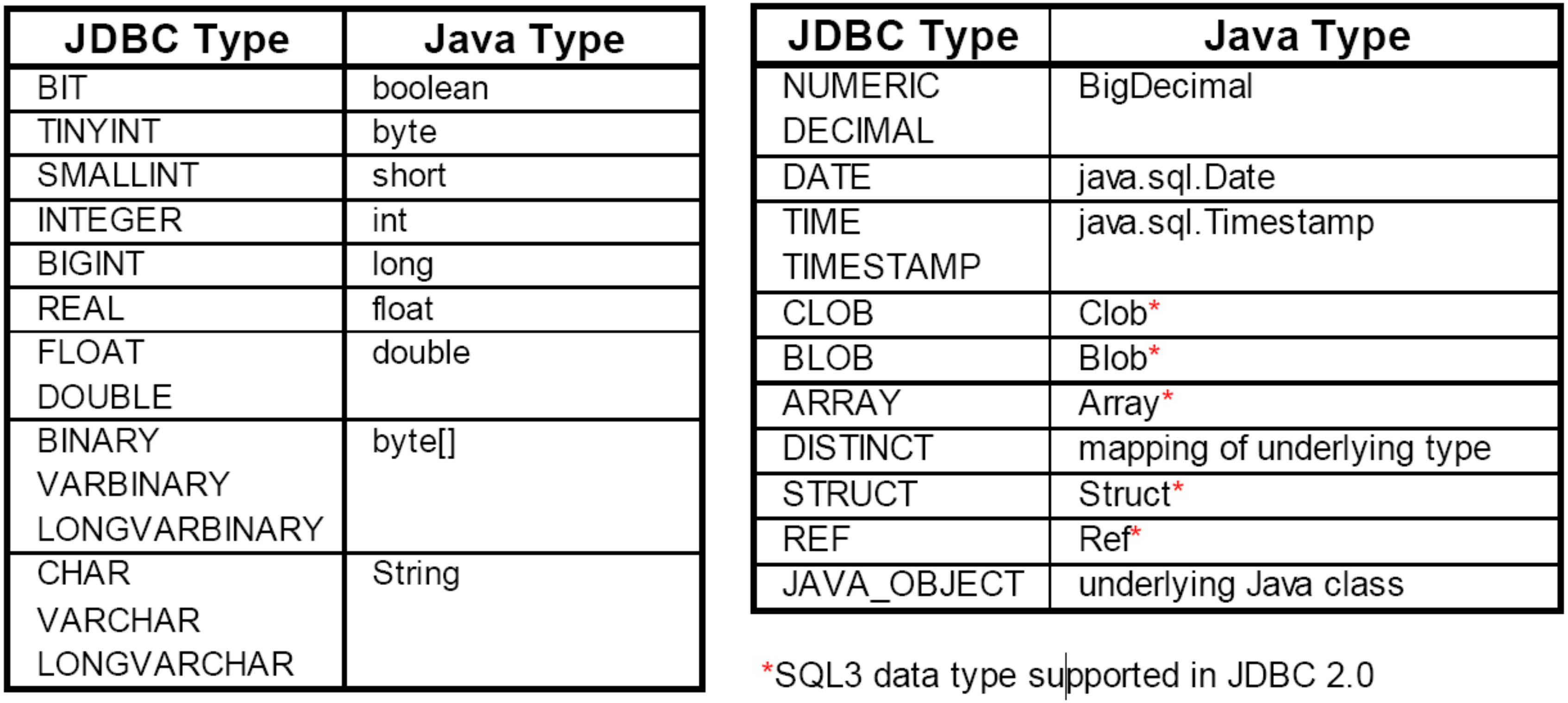
- Two layers Architecture
  - **JDBC API:** Java Application to JDBC Driver Manager
  - **JDBC Driver API:** JDBC Driver Manager to (database-specific) Driver
    - Ensures that the correct driver is used to access each data source.
    - Multiple concurrent drivers connected to multiple heterogeneous databases.



JDBC Basic Steps

- Seven steps in querying databases
  1. Load the JDBC driver
  2. Define the connection URL
  3. Establish the connection
  4. Create a statement object
  5. Execute a query or update
  6. Process the results
  7. Close the connection

JDBC vs. Java Data types



JDBC Type	Java Type
BIT	boolean
TINYINT	byte
SMALLINT	short
INTEGER	int
BIGINT	long
REAL	float
FLOAT DOUBLE	double
BINARY VARBINARY LONGVARBINARY	byte[]
CHAR VARCHAR LONGVARCHAR	String

JDBC Type	Java Type
NUMERIC DECIMAL	BigDecimal
DATE	java.sql.Date
TIME TIMESTAMP	java.sql.Timestamp
CLOB	Clob*
BLOB	Blob*
ARRAY	Array*
DISTINCT	mapping of underlying type
STRUCT	Struct*
REF	Ref*
JAVA_OBJECT	underlying Java class

*SQL3 data type supported in JDBC 2.0

Basic JDBC Components

- **Connection:** connection objects are used to communication with database.
- **Statement:** Statement objects used to submit the SQL statements to the database.
- **ResultSet:** These objects hold data retrieved from a database after you execute an SQL query using Statement objects.
- **ResultSetMetaData:** Info regarding Result set object (e.g., number of columns, columns types, etc.)

Statement Methods

- boolean **execute**(String SQL)
  - Execute SQL statements.
  - Returns true if a ResultSet object can be retrieved; otherwise, it returns false.
- ResultSet **executeQuery**(String SQL)
  - Use this method when you expect to get a result set, as you would with a SELECT statement.
  - Returns a ResultSet object.
- int **executeUpdate**(String SQL)
  - Used for executing INSERT, UPDATE, or DELETE SQL statements
  - Returns the numbers of rows affected by the execution of the SQL statement.

ResultSet Methods

- boolean **first**()
  - Moves the cursor to the first row
- void **last**()
  - Moves the cursor to the last row.
- boolean **previous**()
  - Moves the cursor to the previous row
- boolean **next**()
  - Moves the cursor to the next row
- int **getRow**()
  - Returns the row number that the cursor is pointing to.
- int **getXXX**(String columnName)
  - Returns the value in the current row in the column named columnName
  - Where **XXX** is int, float, long, String, etc.
- int **getXXX**(int columnIndex)
  - Returns the value in the current row in the specified column index.
  - The column index starts at 1
  - Where **XXX** is int, float, long, String, etc.

ResultSetMetaData Methods

- Create ResultSetMetadata object of by calling getMetaData() method from ResultSet object.

```
ResultSetMetaData rsmd=res.getMeataData();
```

- int **getColumnCount**()
  - Returns the number of columns in this ResultSet object.
- String **getColumnName**(int columnIndex)
  - Get the designated column's name.
- int **getColumnType(int** columnIndex)
  - Retrieves the designated column's SQL type.
- String **getTableName**(int columnIndex)
  - Gets the designated column's table name.

Set up JDBC Driver

- In case you receive the following error message:

  java.lang.ClassNotFoundException: com/microsoft/jdbc/sqlserver/SQLServerDriver

- Include to your system CLASSPATH variable the driver path:

  C:\Program Files\Microsoft JDBC Driver 4.0 for SQL Server\sqljdbc.jar

- Also make sure that the environment variable
  - JAVA_HOME contains C:\Program Files\Java\jdk1.6.x_xx
  - PATH contains C:\Program Files\Java\jdk1.6.x_xx\bin

Database Example

```
CREATE DATABASE dbTest

CREATE TABLE Employee (
        ID int PRIMARY KEY,
        Name varchar(40),
        Salary real
)
```

Use ConnectSQLServer.java to access dbTest Database

ConnectSQLServer.java

```java
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.ResultSet;
import java.sql.Statement;

public class ConnectSQLServer {
    public static void main(String[] args) {
        try {
                Class.forName("com.microsoft.sqlserver.jdbc.SQLServerDriver");
                 Connection connection = DriverManager.getConnection(
                            "jdbc:sqlserver://localhost:1433;databaseName=dbTest","myUserName", "myPassword");

                Statement statement = connection.createStatement();
                String queryString = “Select Name, Salary from Employee";
                ResultSet resultSet = statement.executeQuery(queryString);

                while (resultSet.next()) {
                      System.out.println("Employee Name:" + rs.getString("Name") );
                      System.out.println("Employee Salary:" + rs.getFloat("Salary") ) ;
                }
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```

External Resources

- SQL Server 2008 & 2012 (Recourses & Installation Guides)
  - Microsoft SQL Server Library
  - How to Install SQL Server 2008 - A Step by Step Guide
  - How to install SQL Server 2008
  - Video Installation Guide SQL Server 2008
  - SQL Server 2012 Installation Guide
  - How to install SQL Server 2012
  - Video Installation Guide SQL Server 2012

- SQL Server & Java
  - Connect Java with MS SQL Server Tutorial
  - Microsoft JDBC Driver Library
  - JDBC Tutorial

Thank you