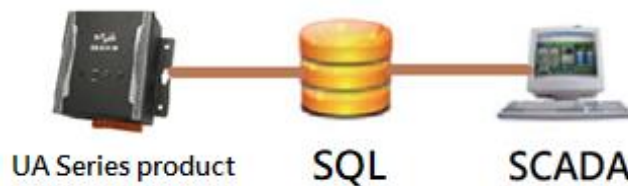


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How to save the UA collected data into SQL and then show trend chart in InduSoft? (Take MS SQL 2017 Express as an example)

UA series products of ICP DAS provide a useful service to transfer TCP/RTU data to SQL. SQL is to store device data, and then by using InduSoft can retrieve the data to manage the database easily. Due to the time format written by UA is different from the reading format of InduSoft, here is how InduSoft read data.

(In this example, we use UA-5231M-4GE + Windows 10 OS + MS SQL 2017 Express Database + DL-302 with Modbus RTU protocol)



● How to create MS SQL environment?

Go to Microsoft Official Website: <https://www.microsoft.com/en-US/download/details.aspx?id=55994> to download SQL Server 2017 Express.

Microsoft® SQL Server® 2017 Express

Important! Selecting a language below will dynamically change the complete page content to that language.

Select Language: Download

↑

Microsoft® SQL Server® 2017 Express is a powerful and reliable free data management system that delivers a rich and reliable data store for lightweight Web Sites and desktop applications.

- + Details

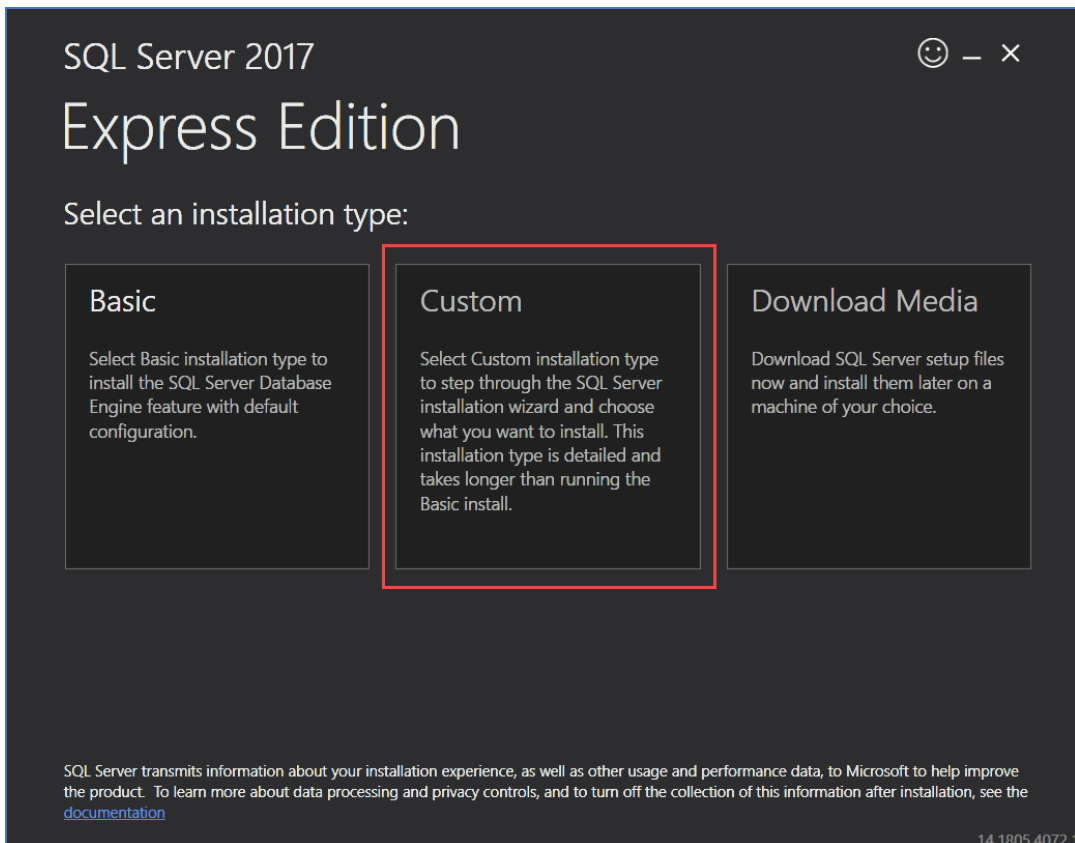
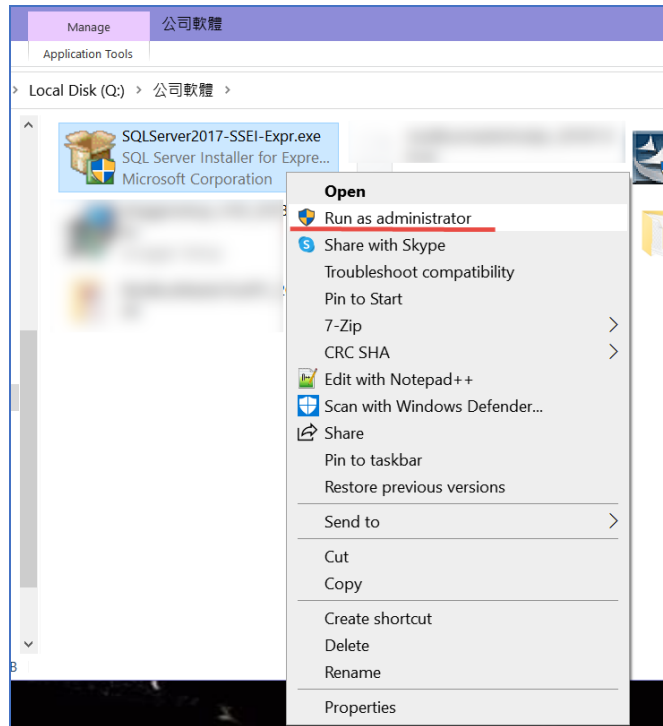
- + System Requirements

- + Install Instructions

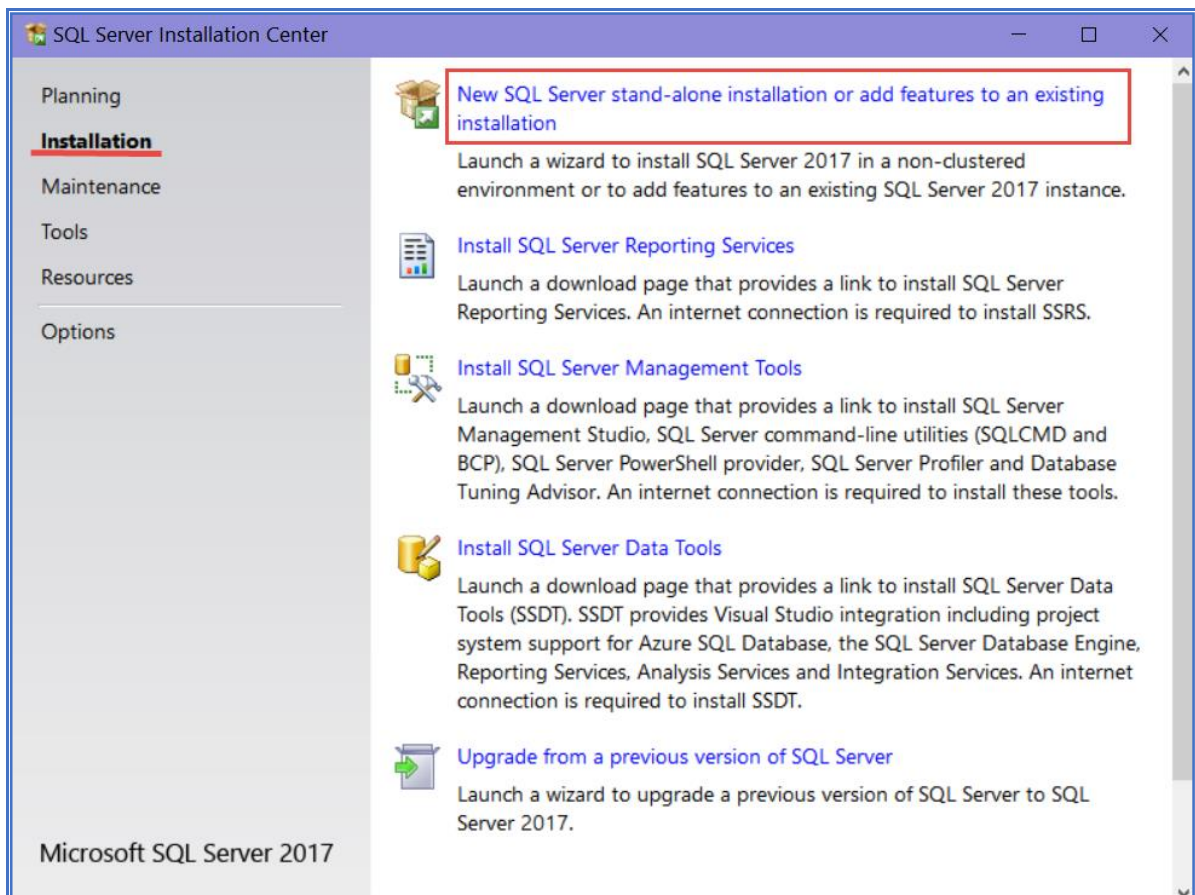
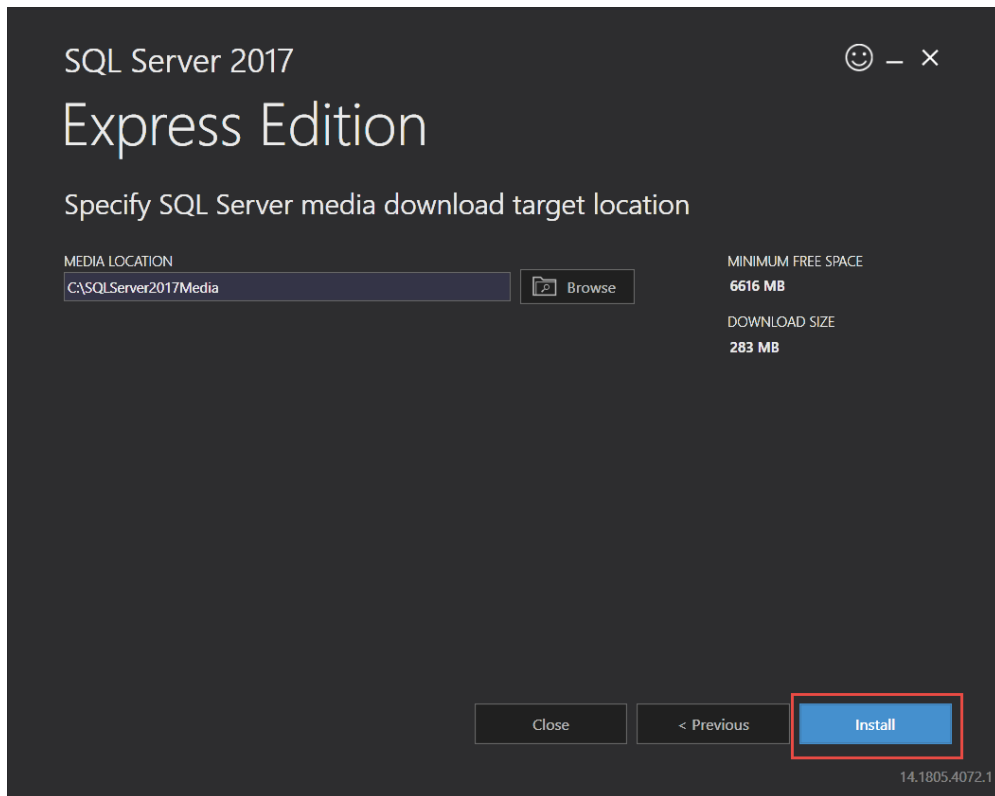
- + Additional Information

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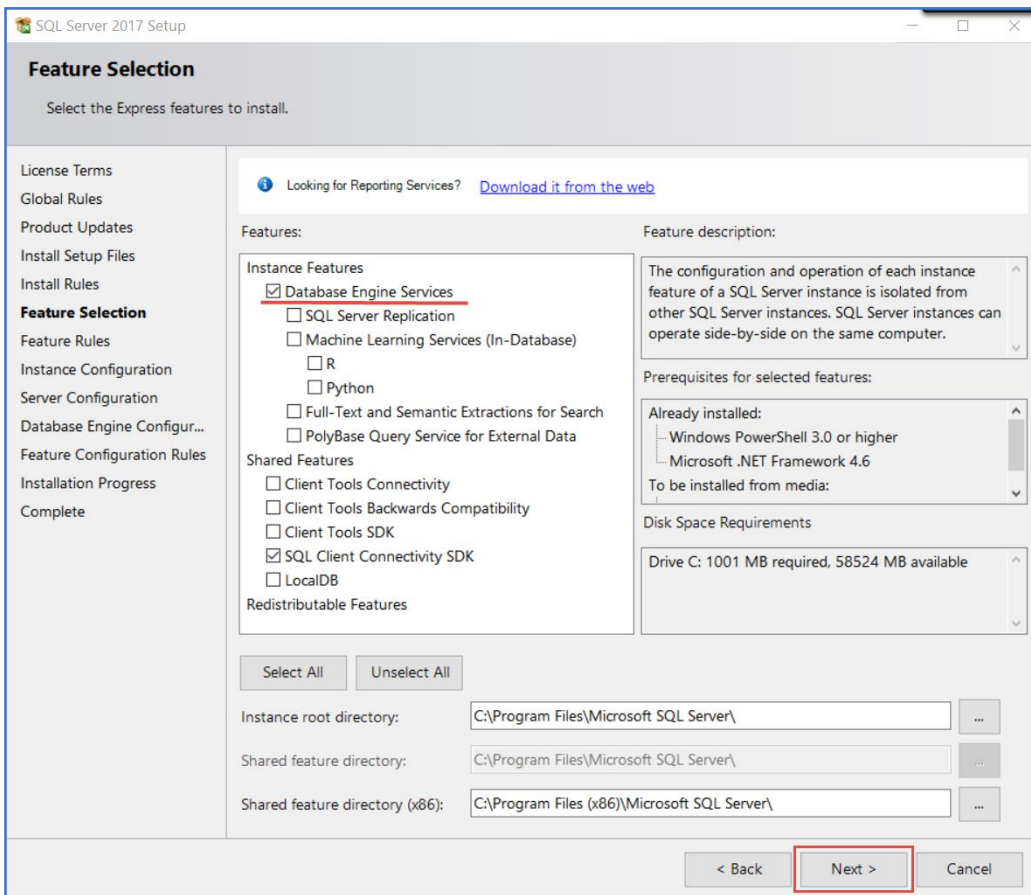
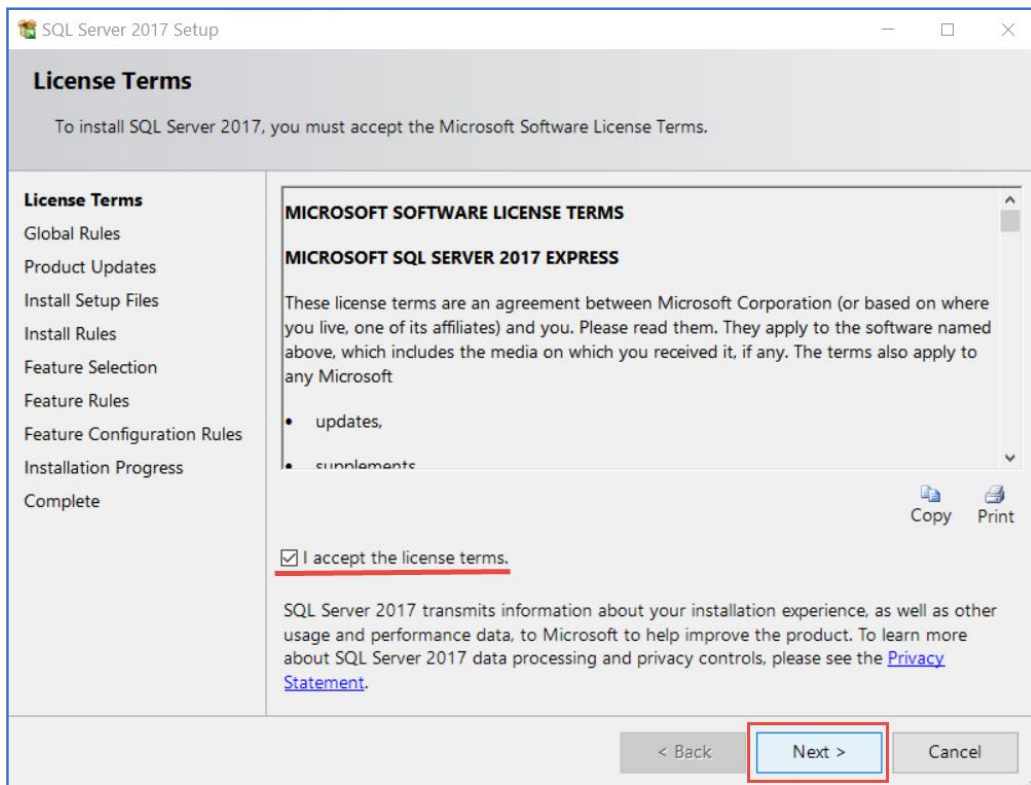
● Install “SQLServer2017-SSEI-Expr”



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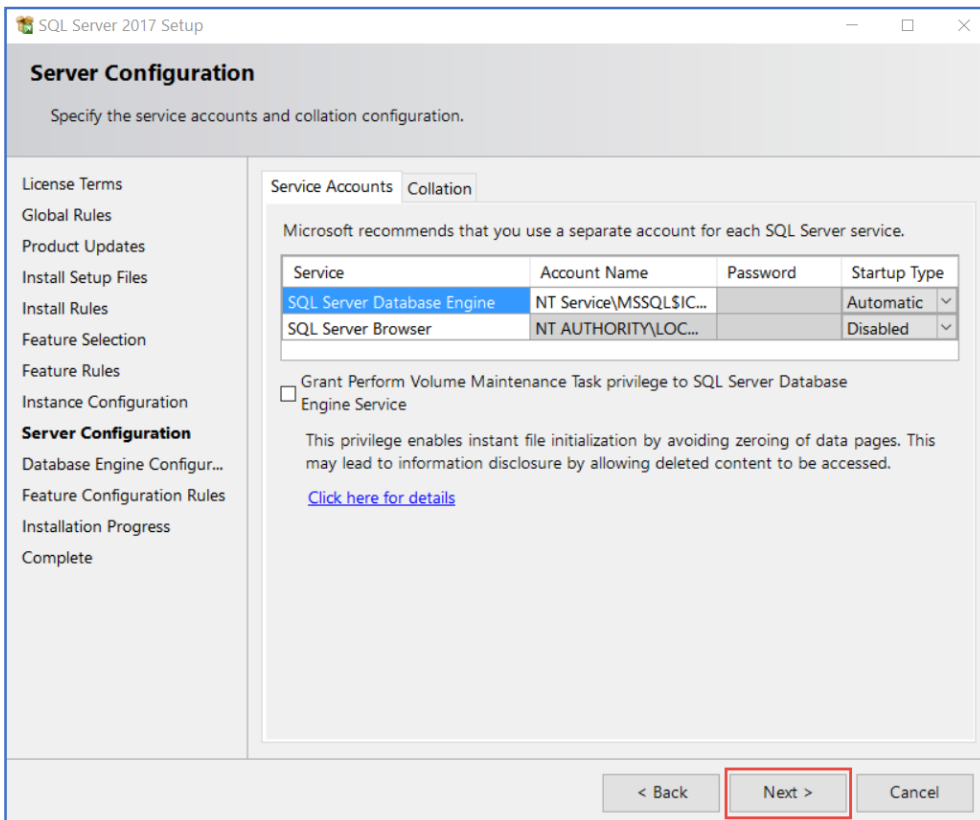
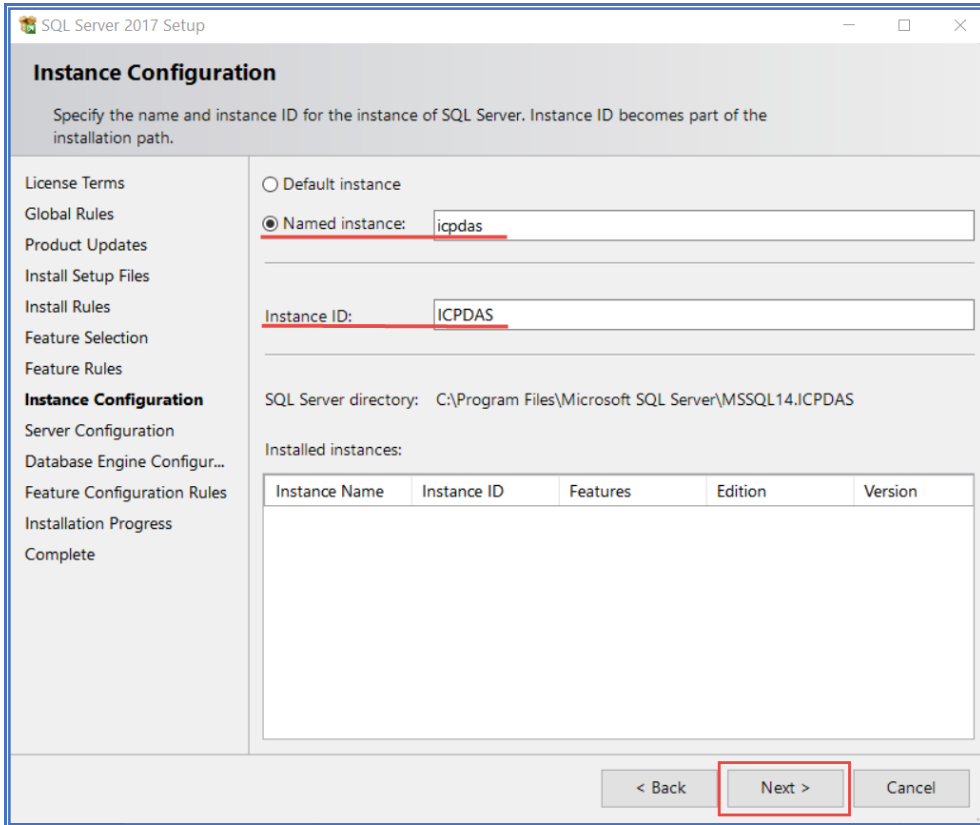


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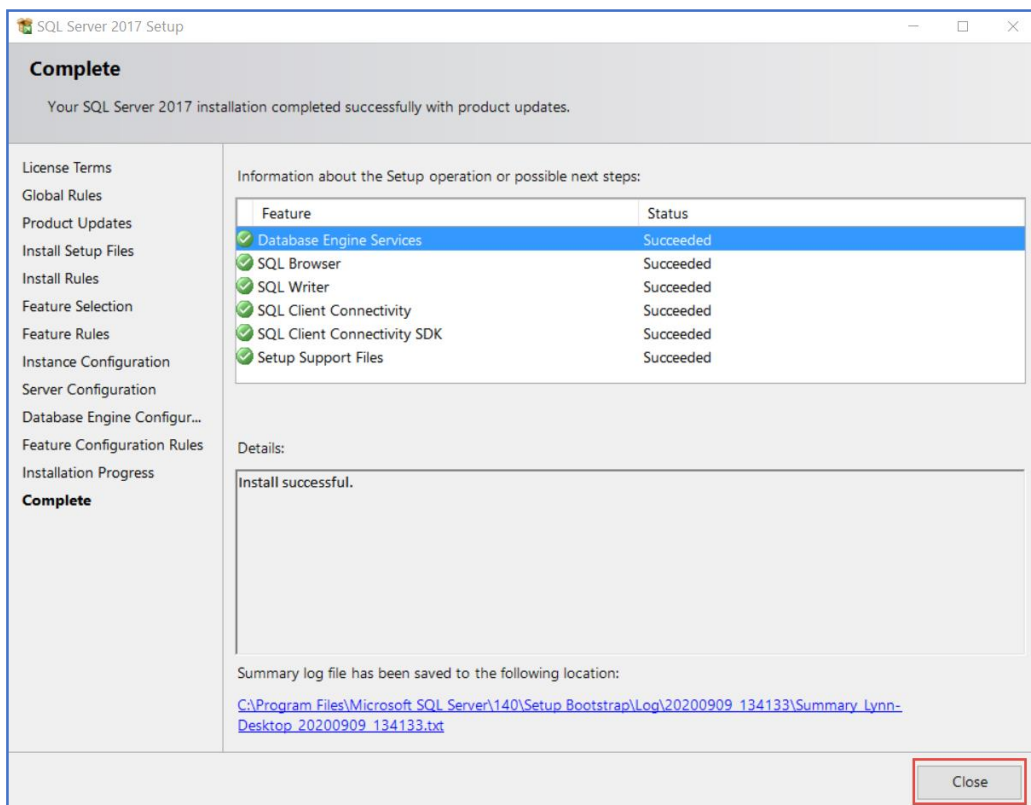
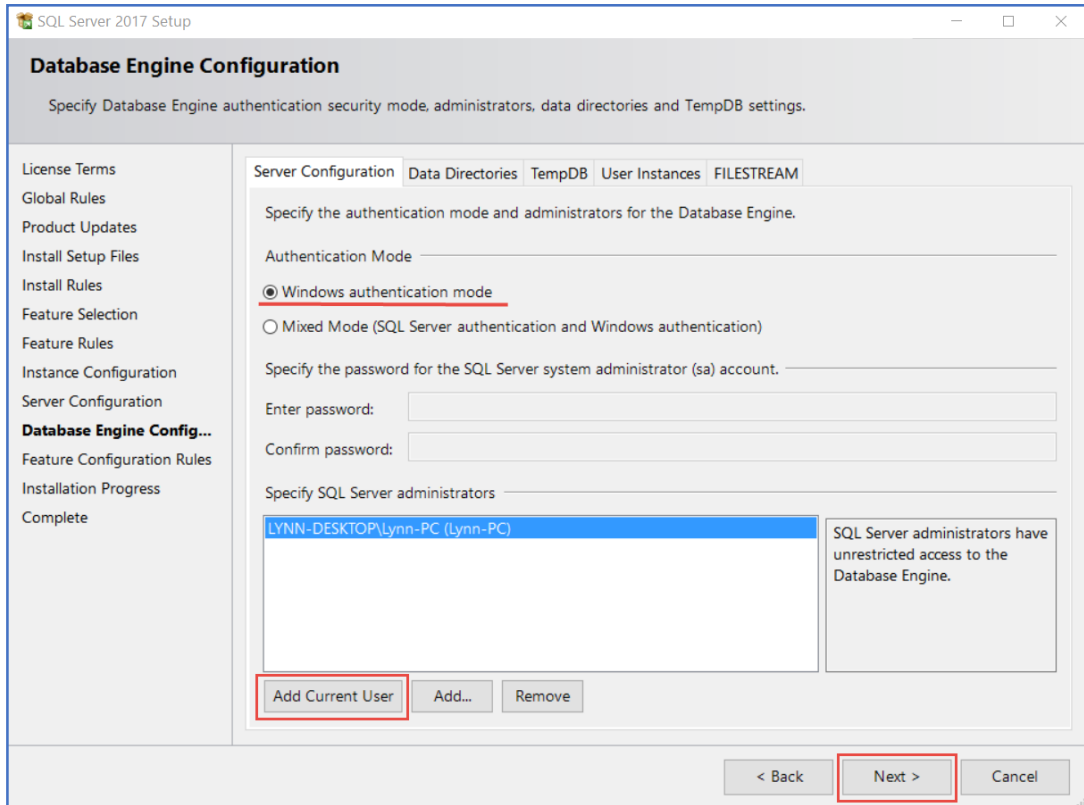


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✘Red Line must be filled!

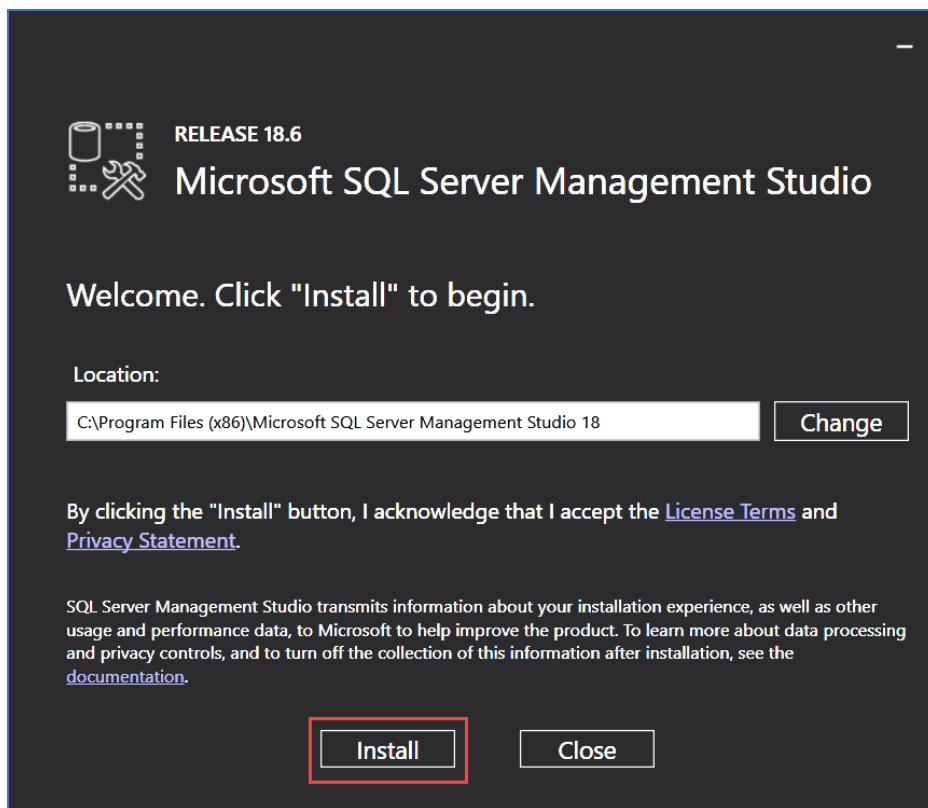
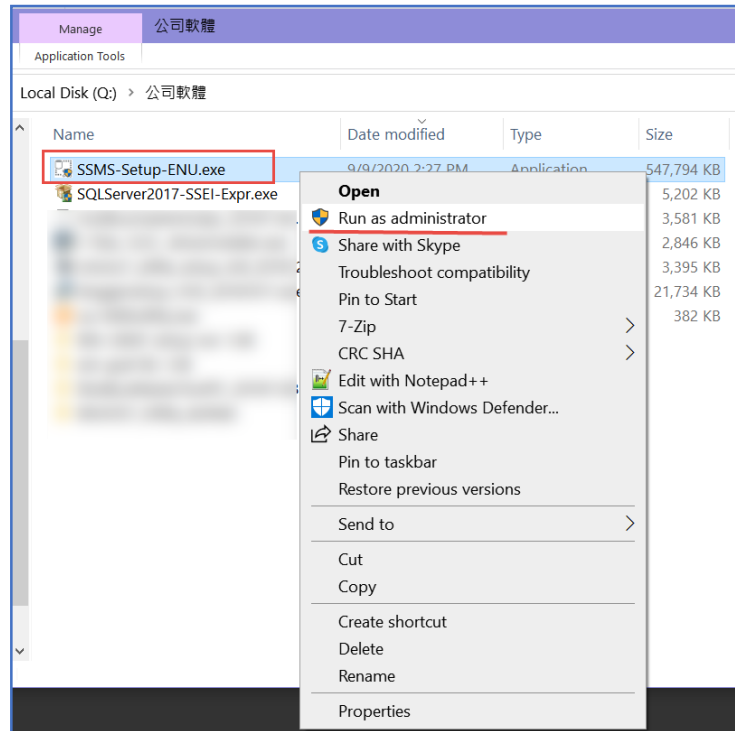


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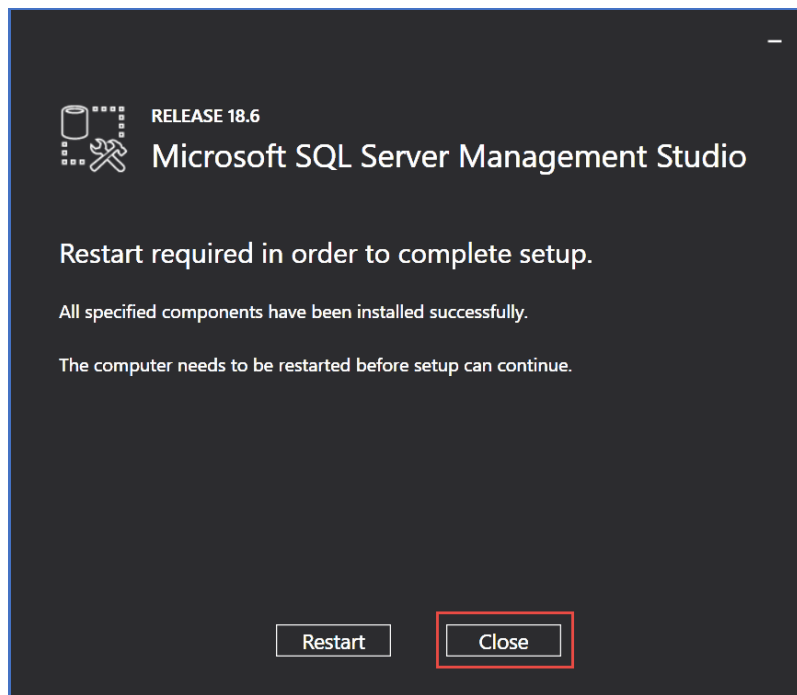


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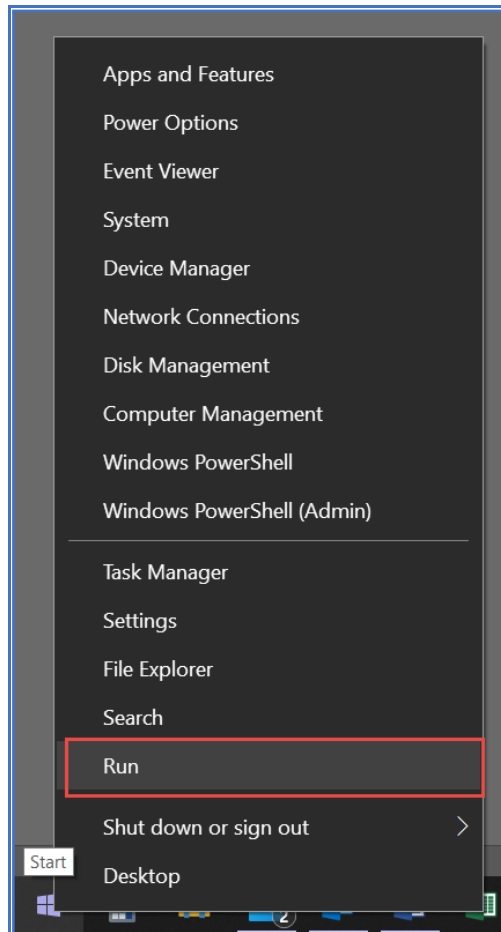
- **Download from Microsoft Website:** <https://docs.microsoft.com/en-us/sql/ssms/download-sql-server-management-studio-ssms?redirectedfrom=MSDN&view=sql-server-ver15>
- **Install “SSMS-Setup-ENU”**



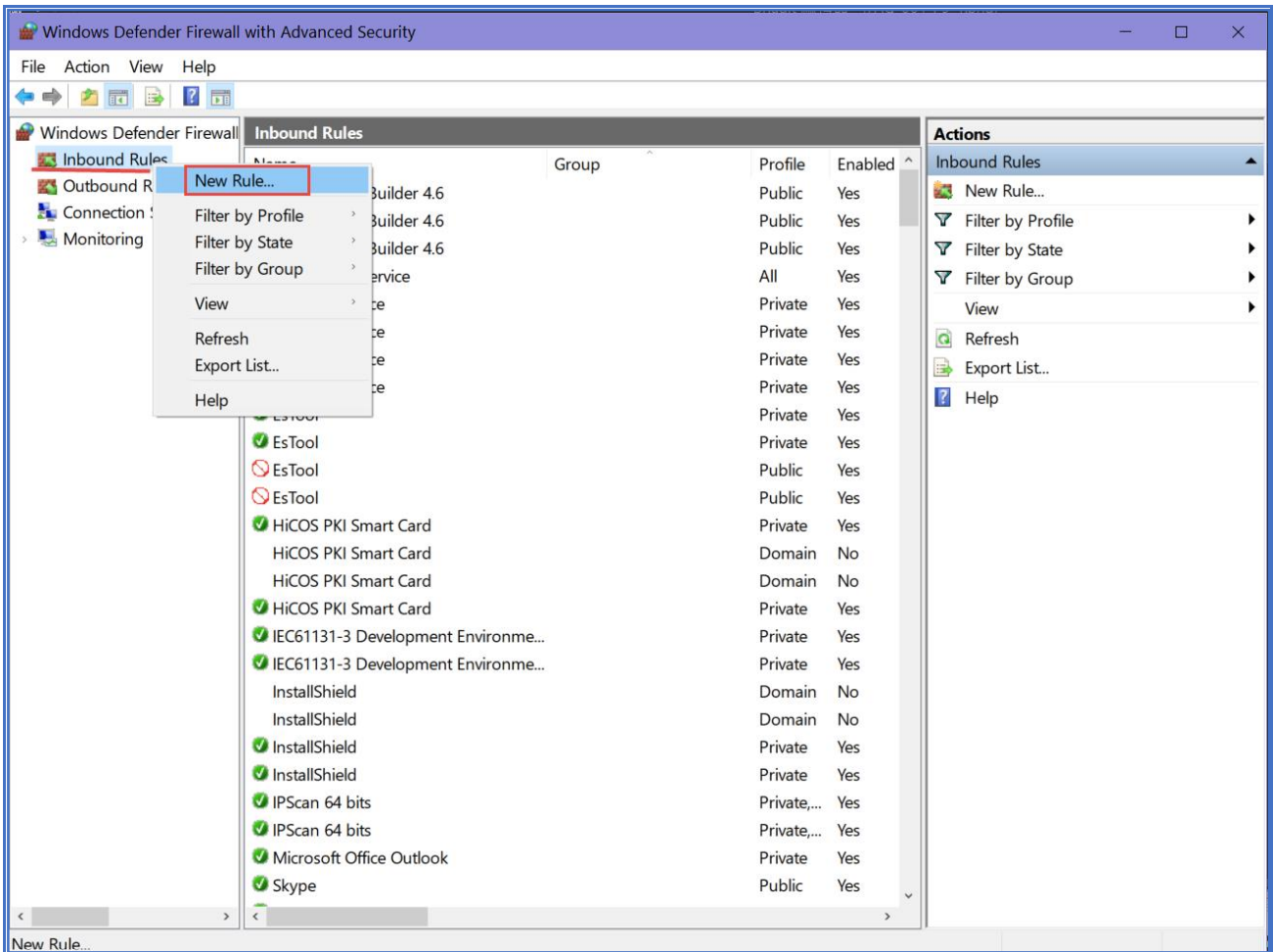
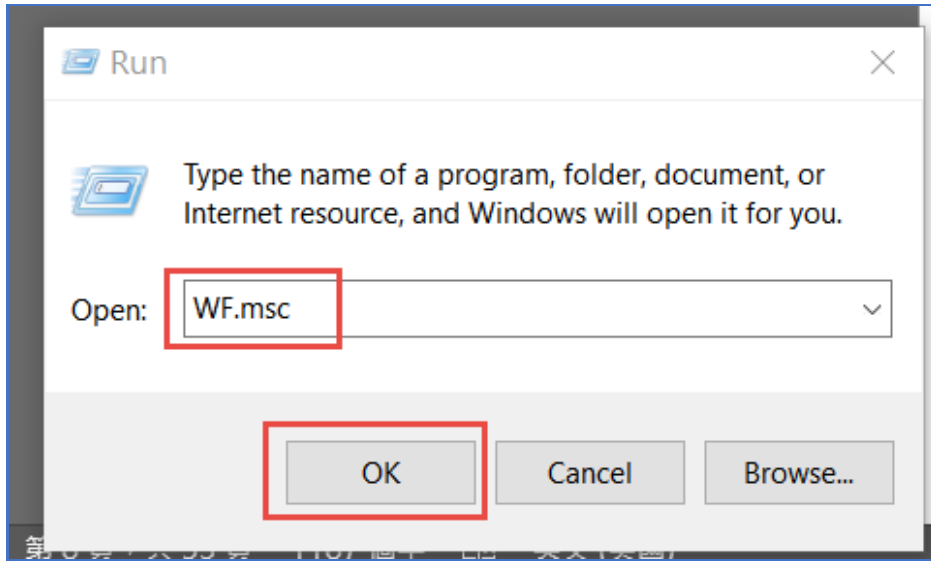
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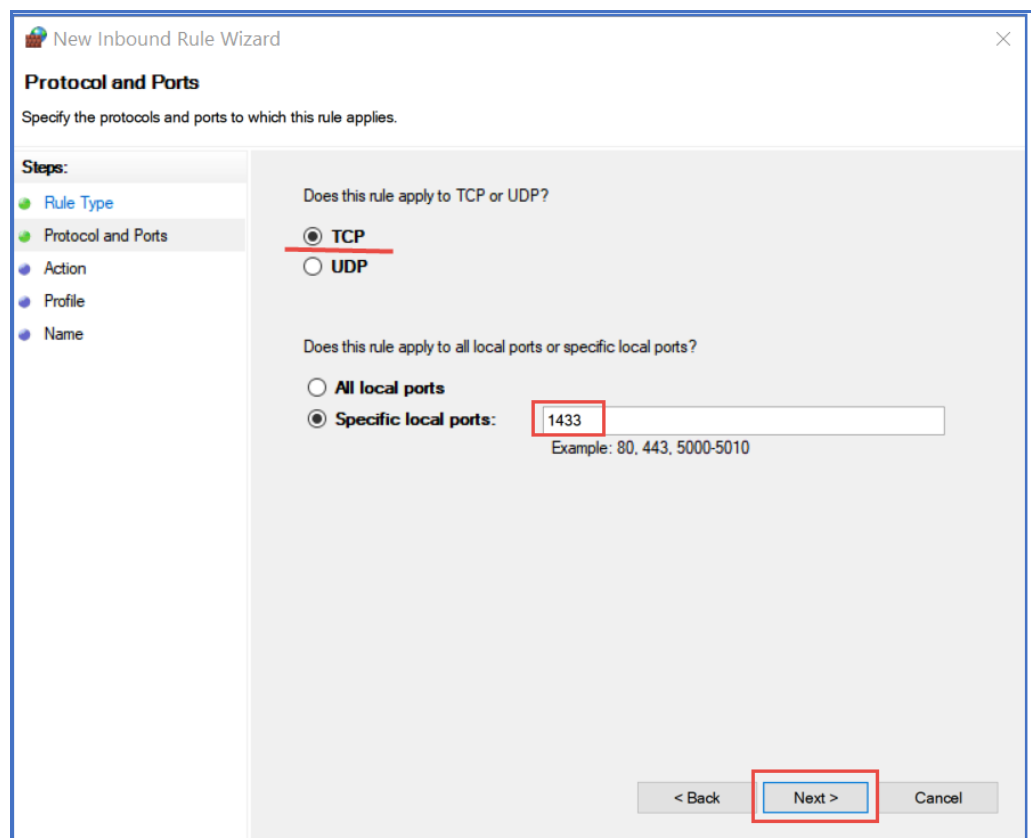
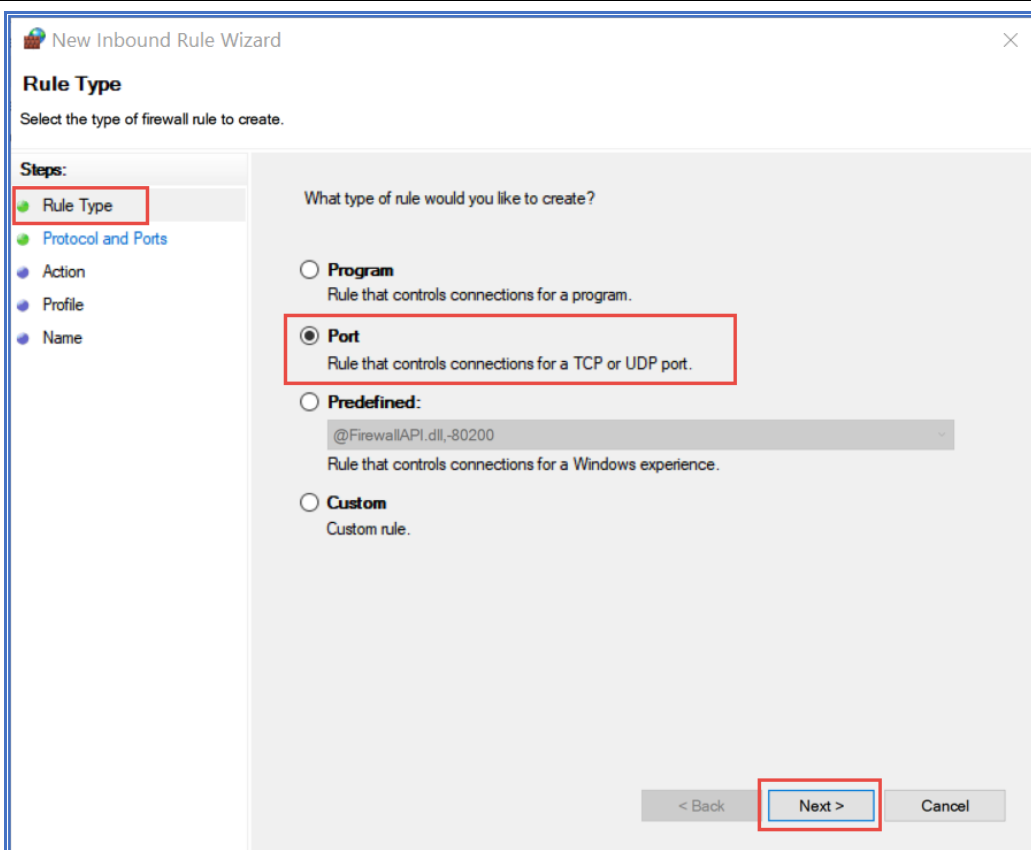
- After restarting the PC, we can go following steps to Environment Settings 1



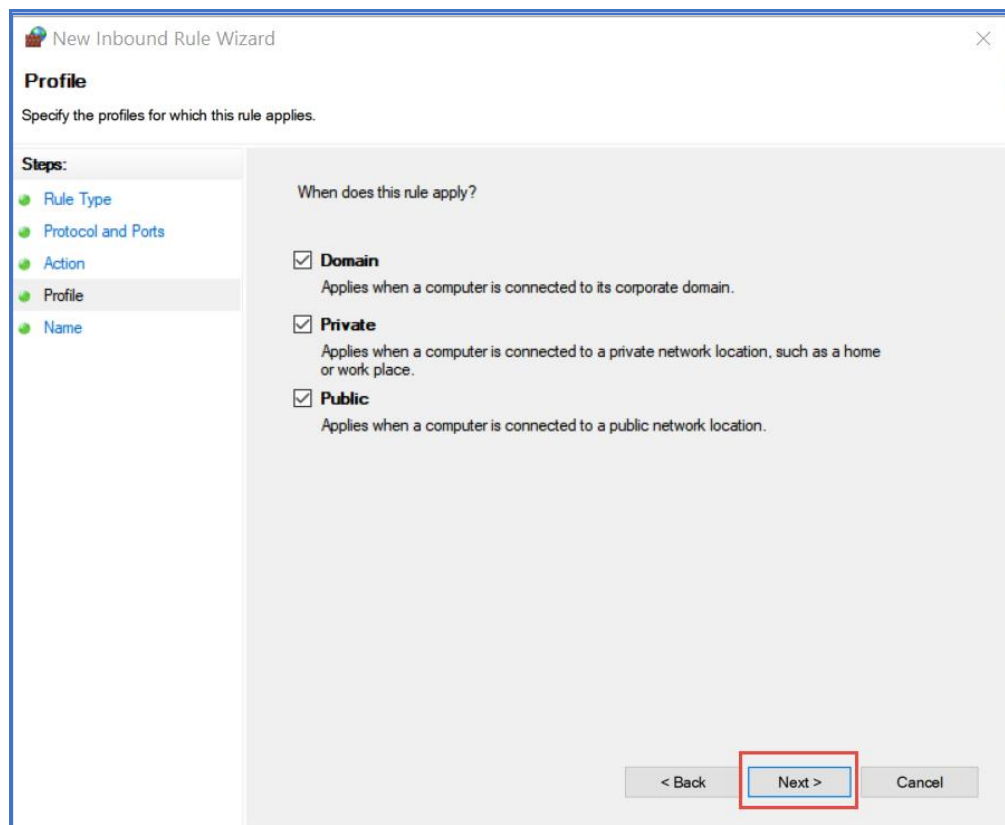
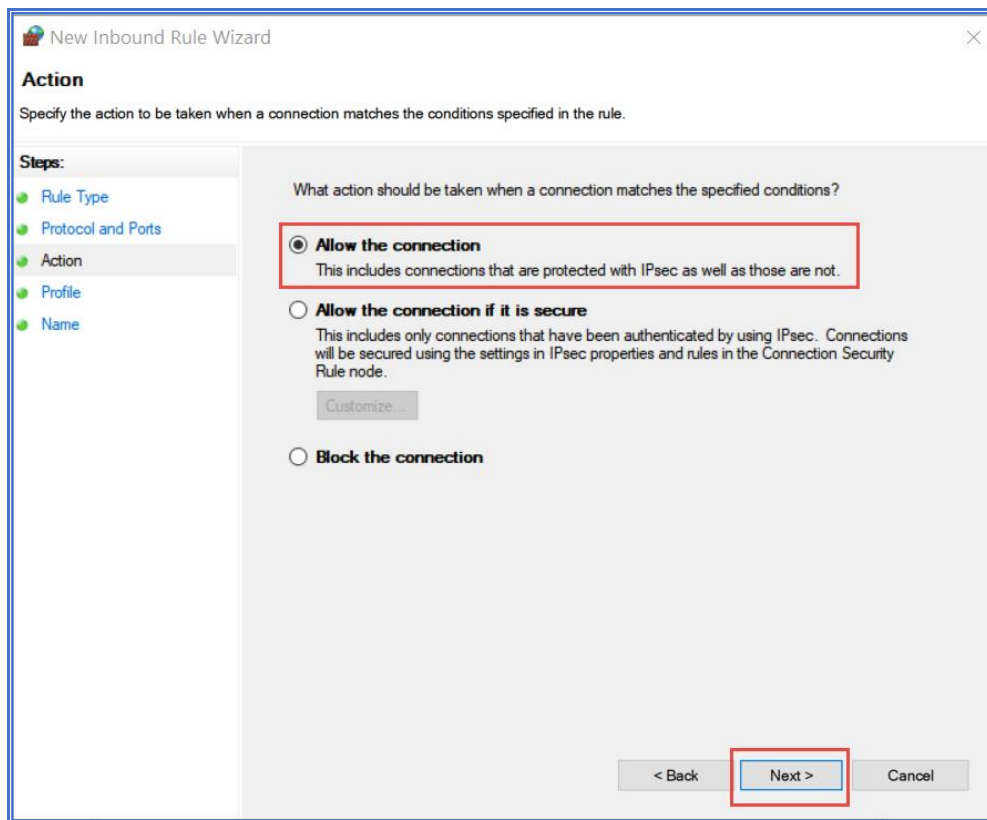
Classification	UA-Series English FAQ-Dev-001						
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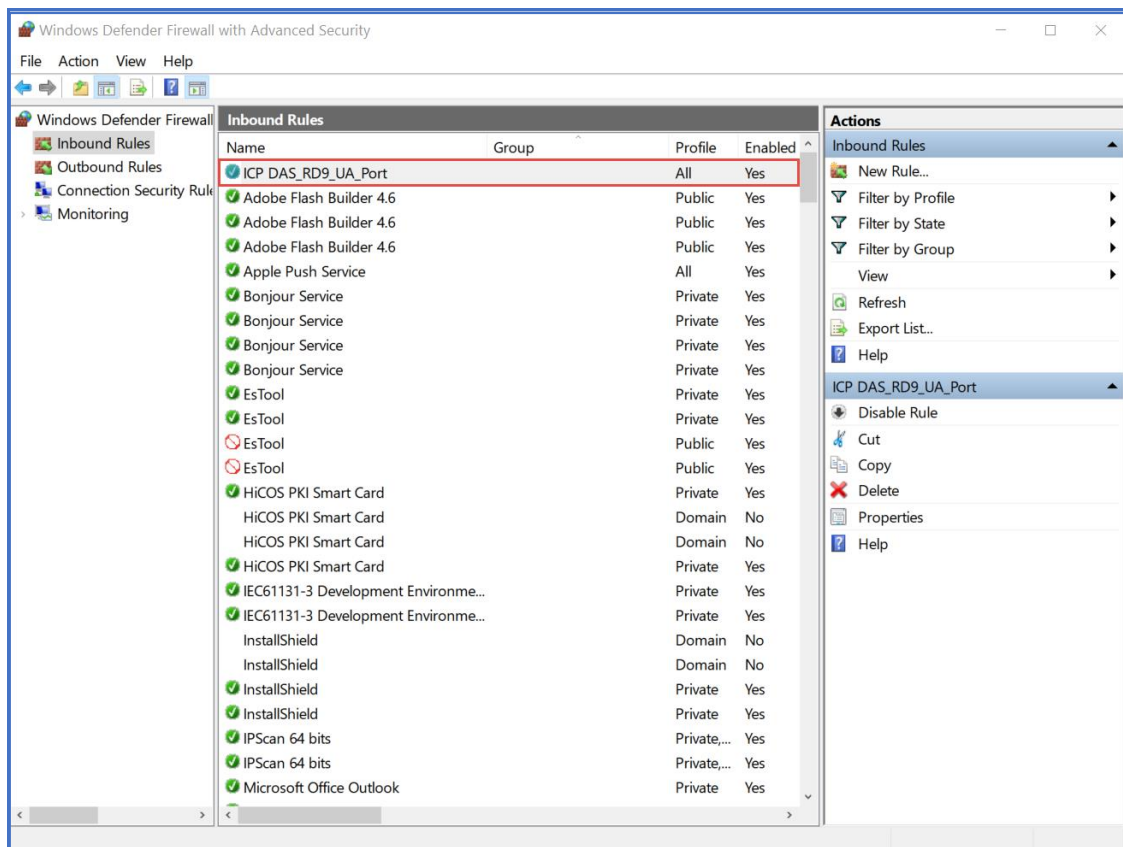
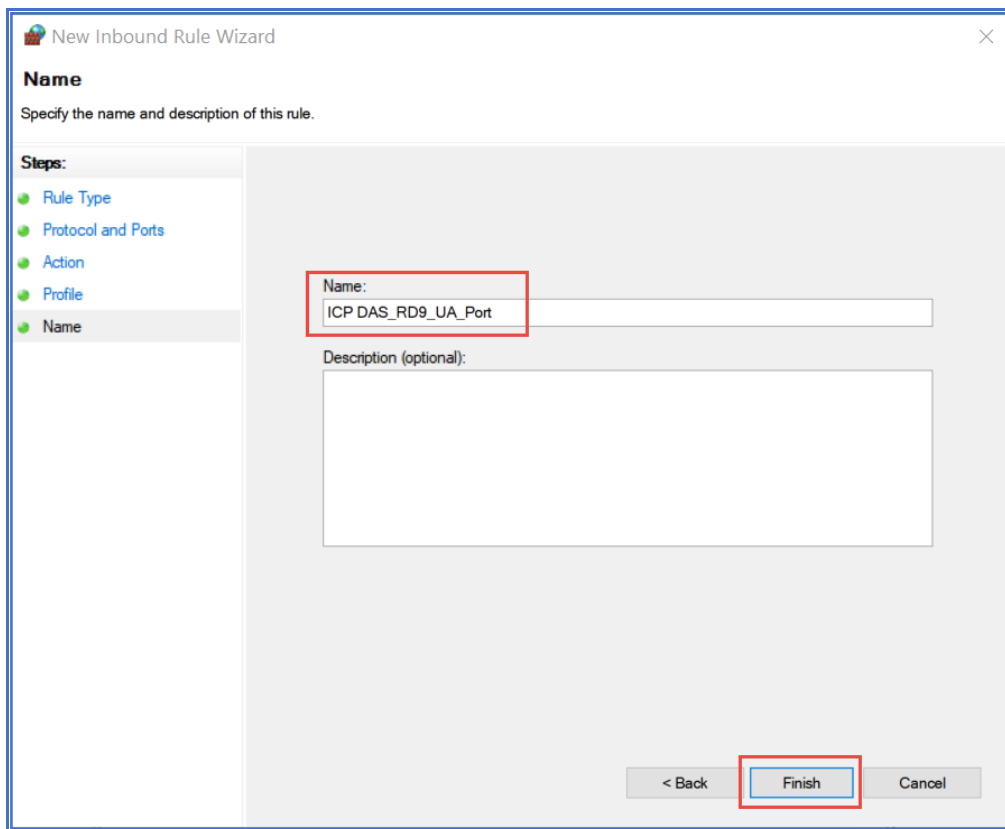
Classification	UA-Series English FAQ-Dev-001						
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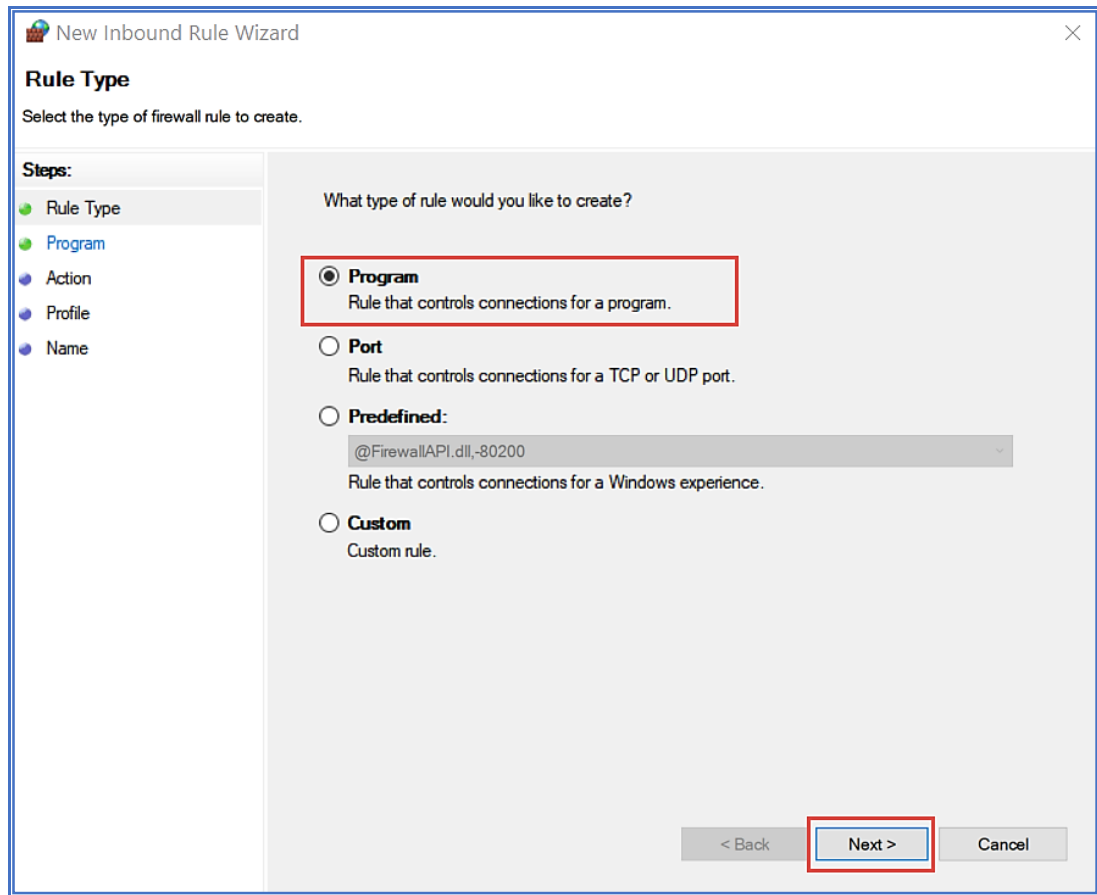
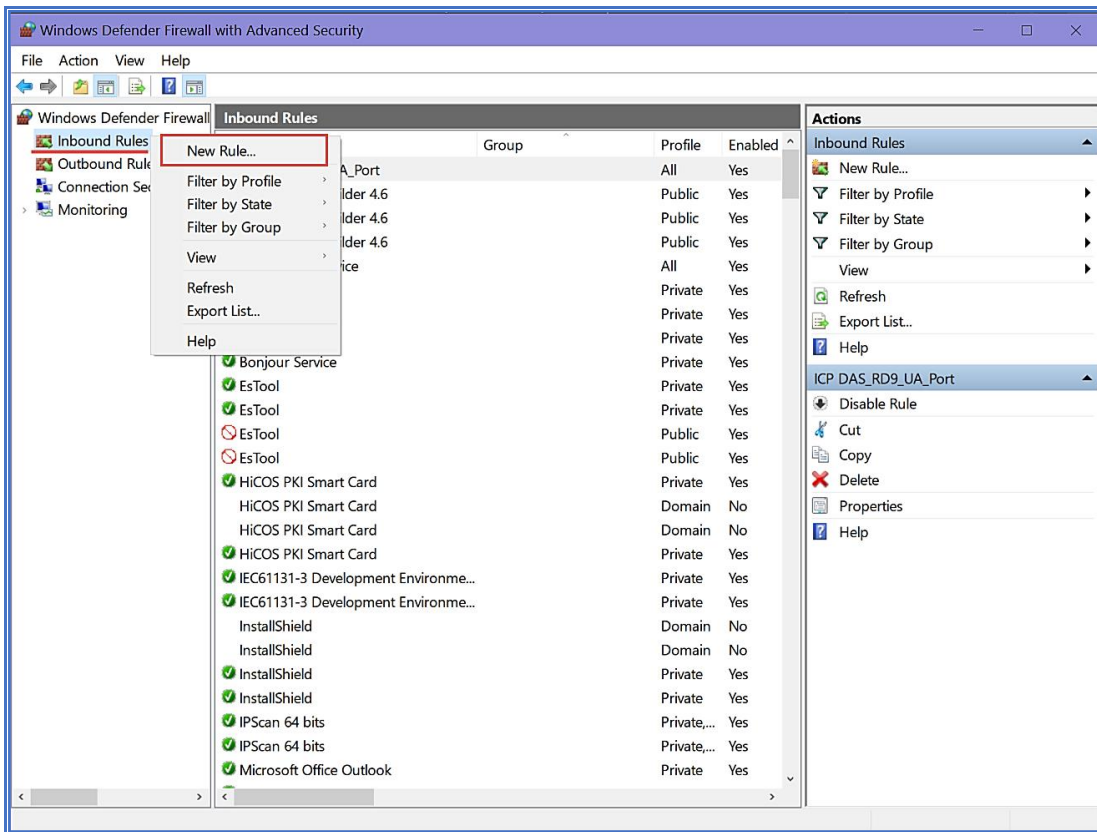
Classification	UA-Series English FAQ-Dev-001						
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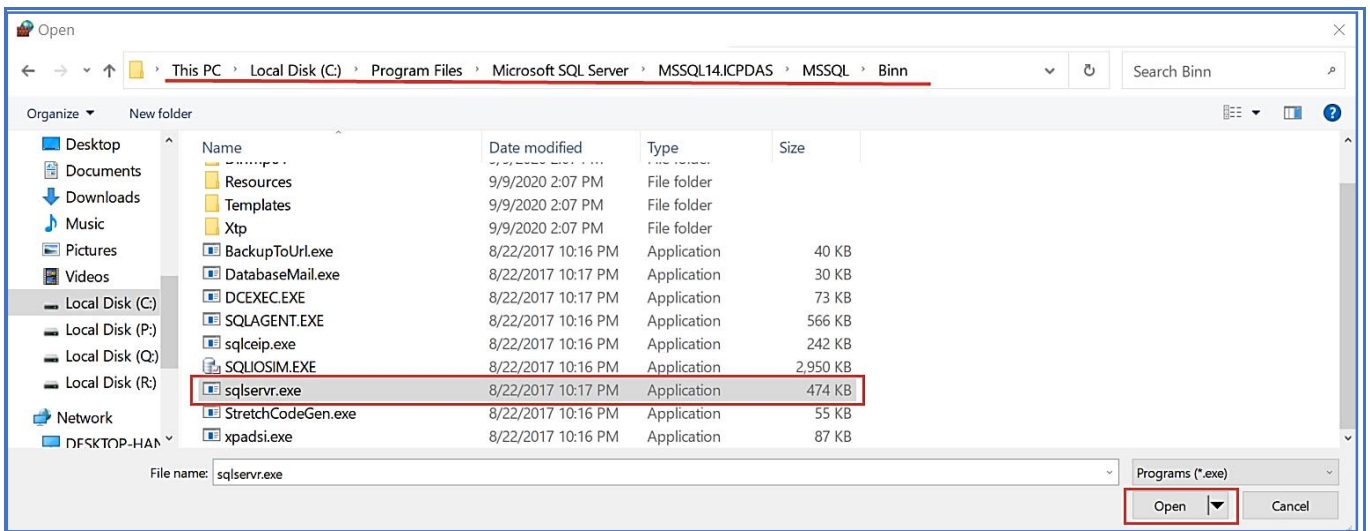
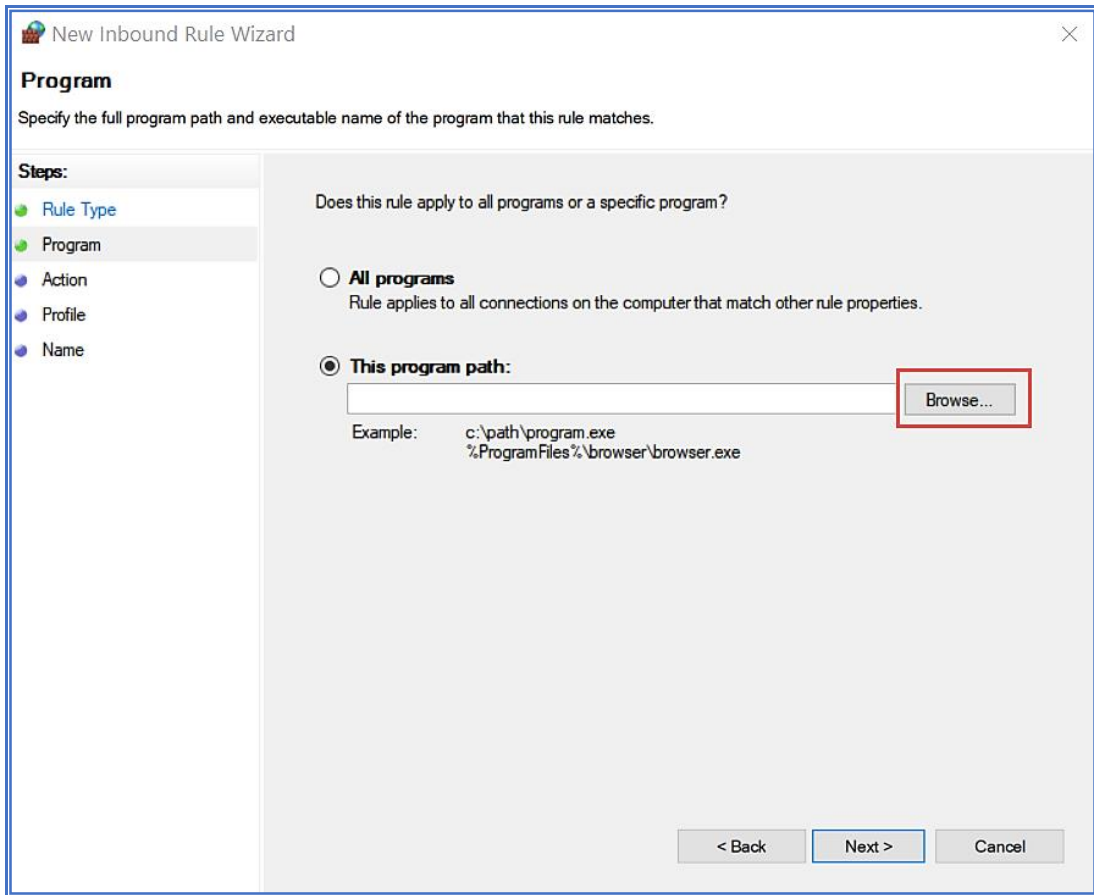
Classification	UA-Series English FAQ-Dev-001						
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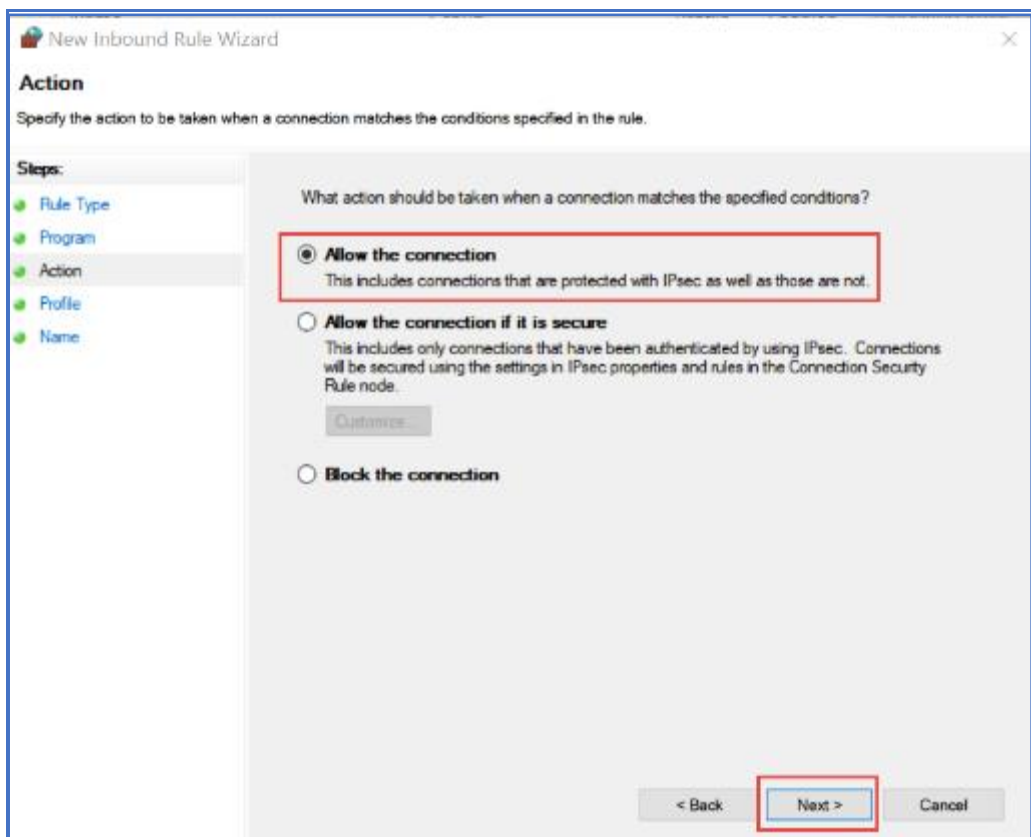
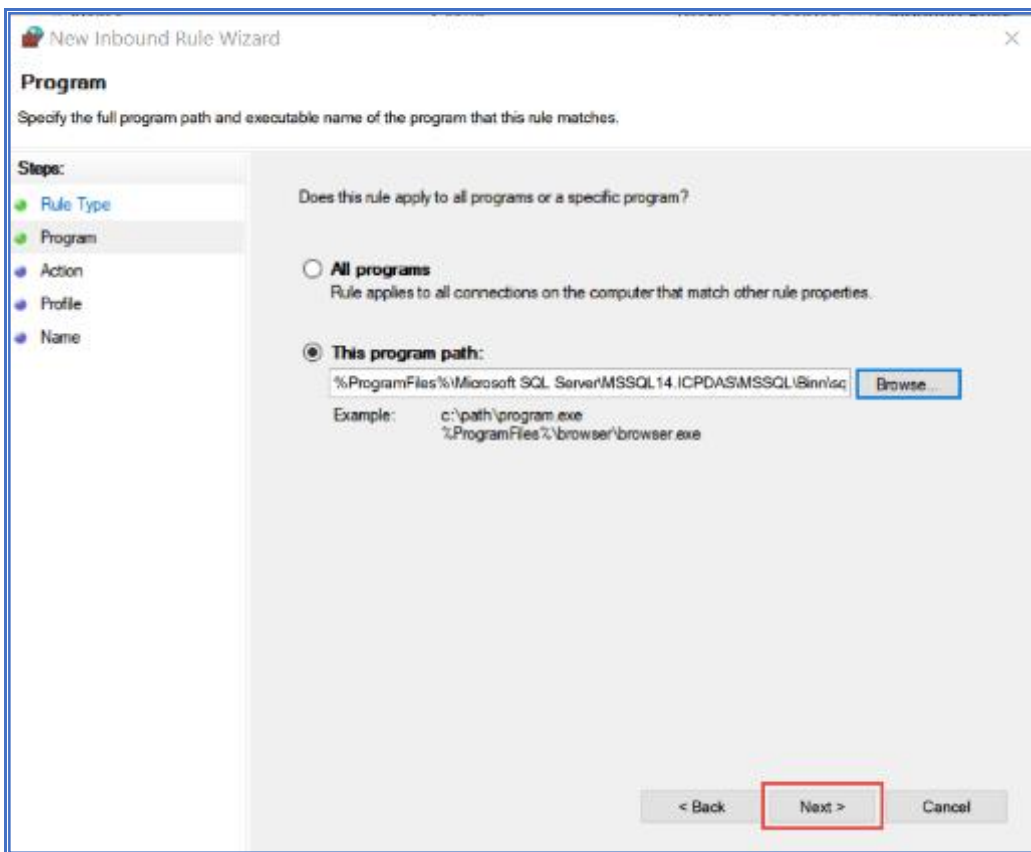
Classification	UA-Series English FAQ-Dev-001						
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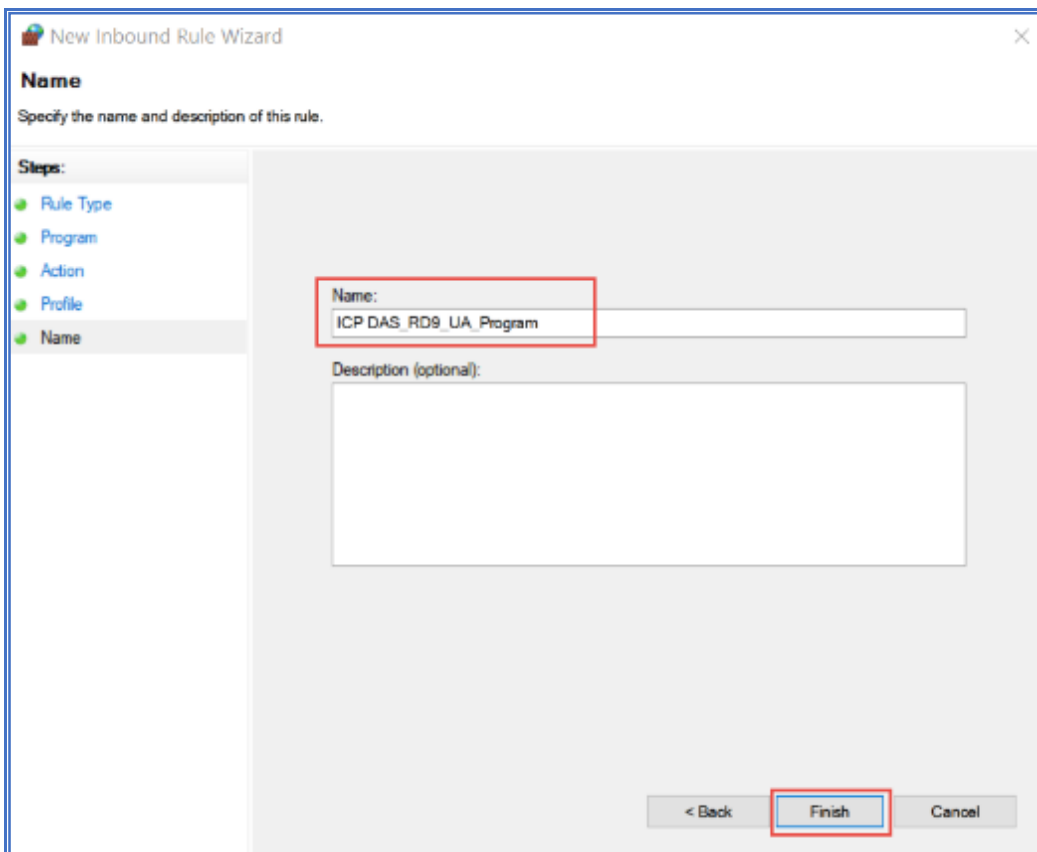
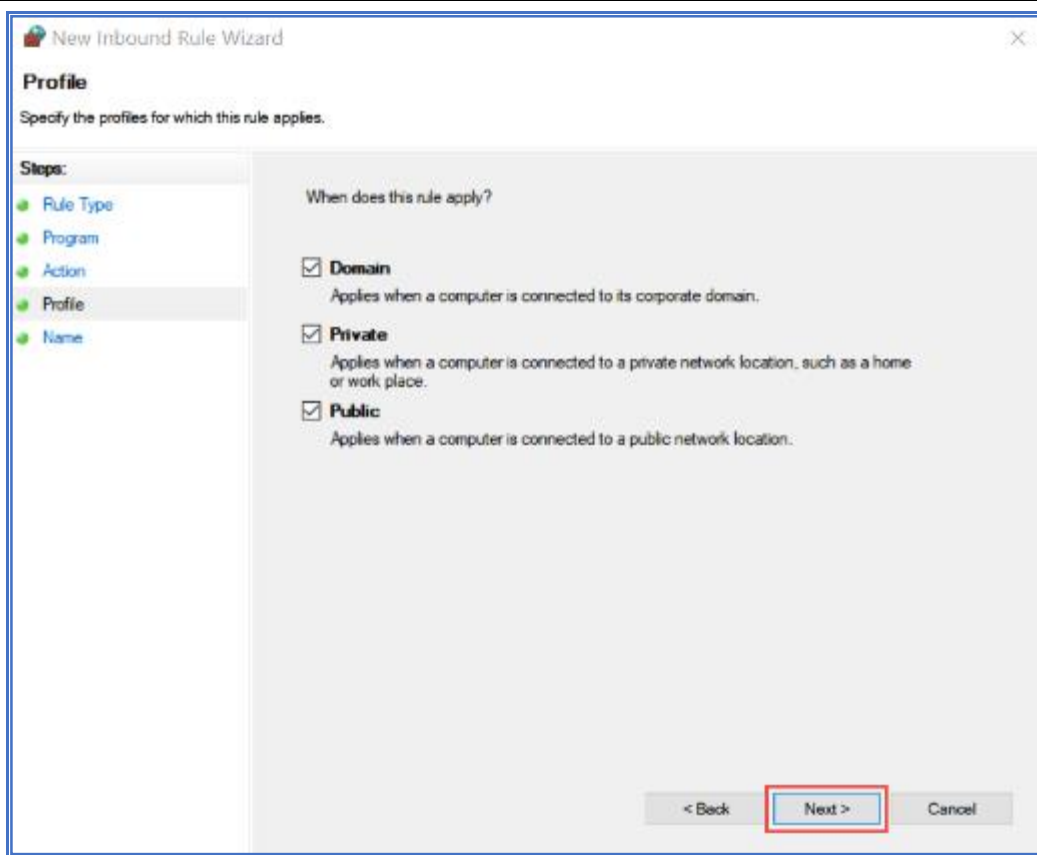
Classification	UA-Series English FAQ-Dev-001						
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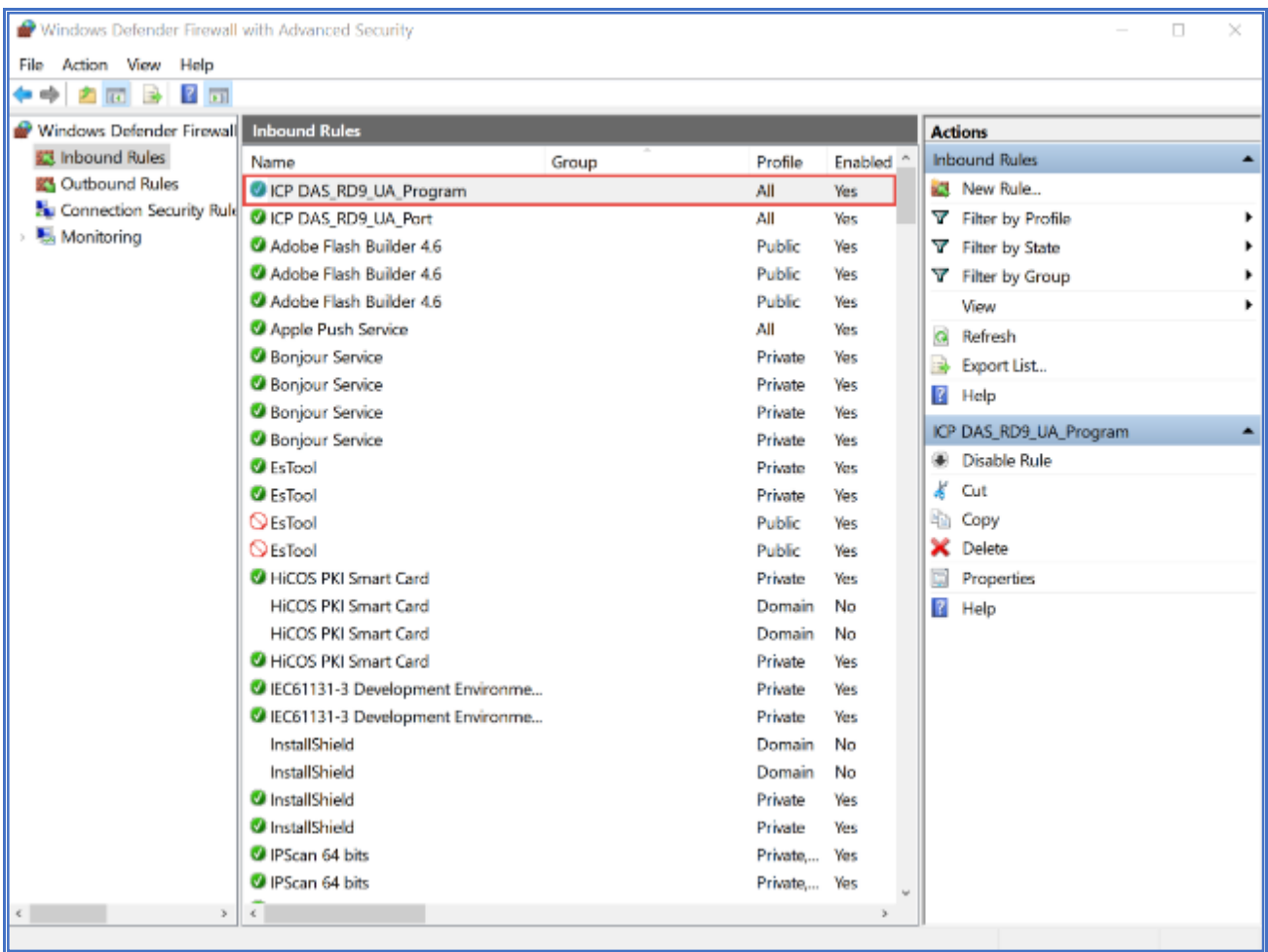
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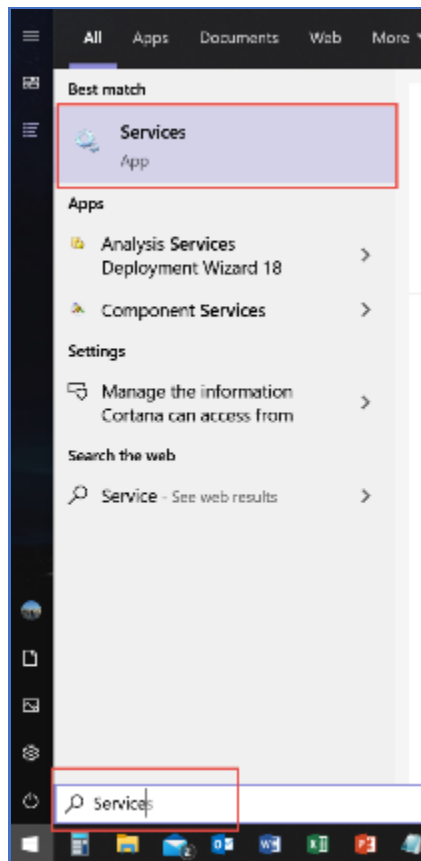
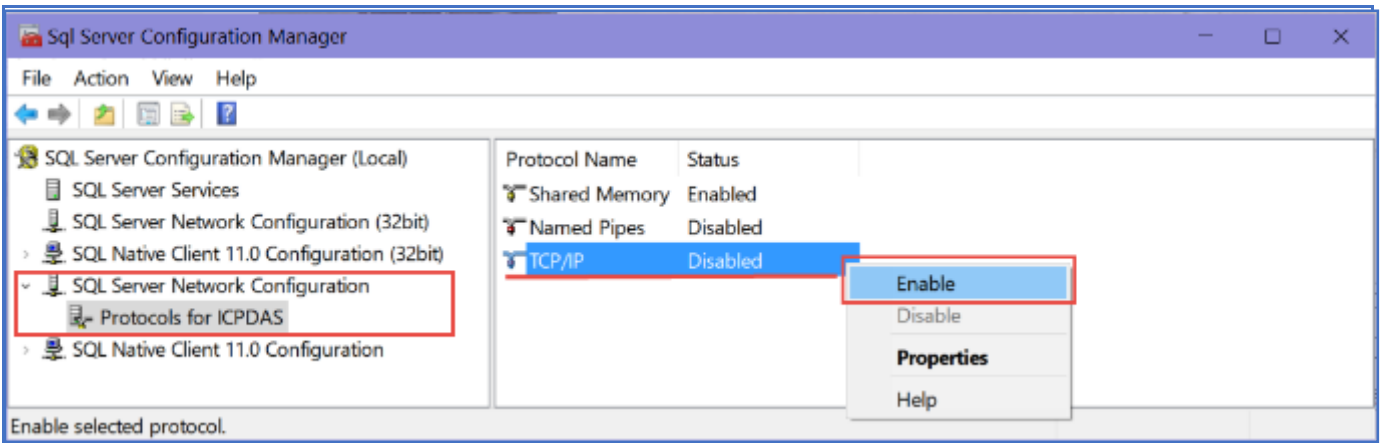
Classification	UA-Series English FAQ-Dev-001						
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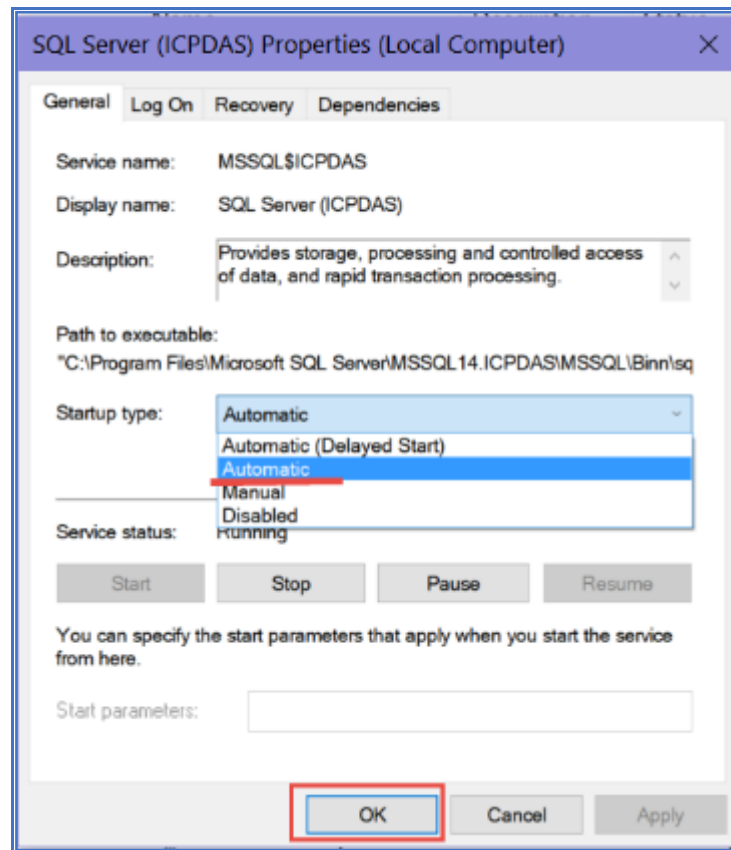
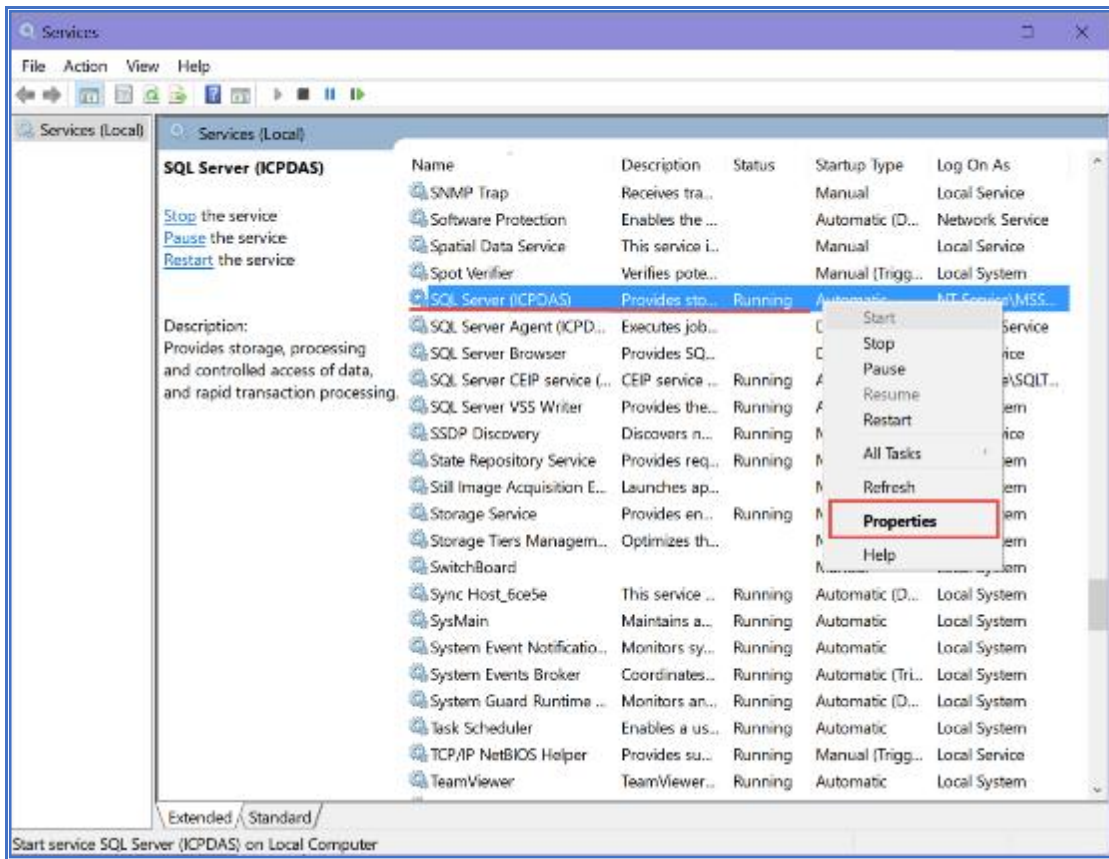
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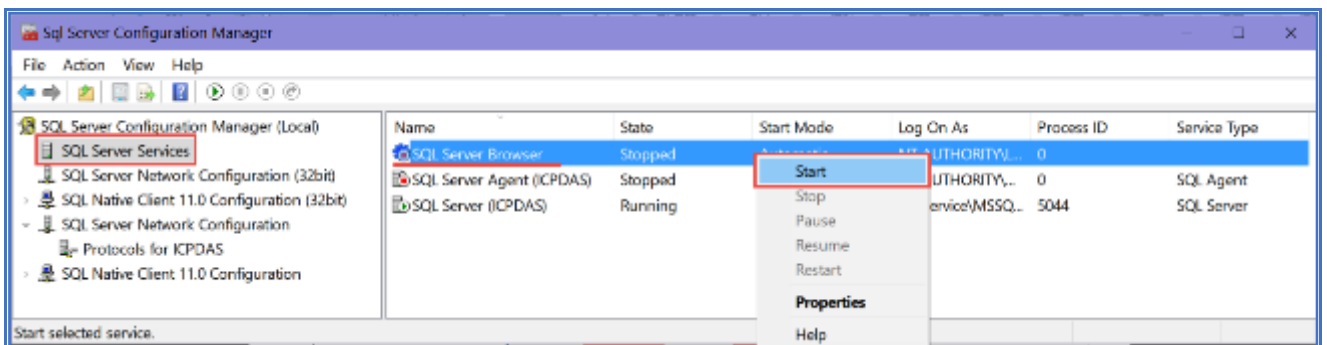
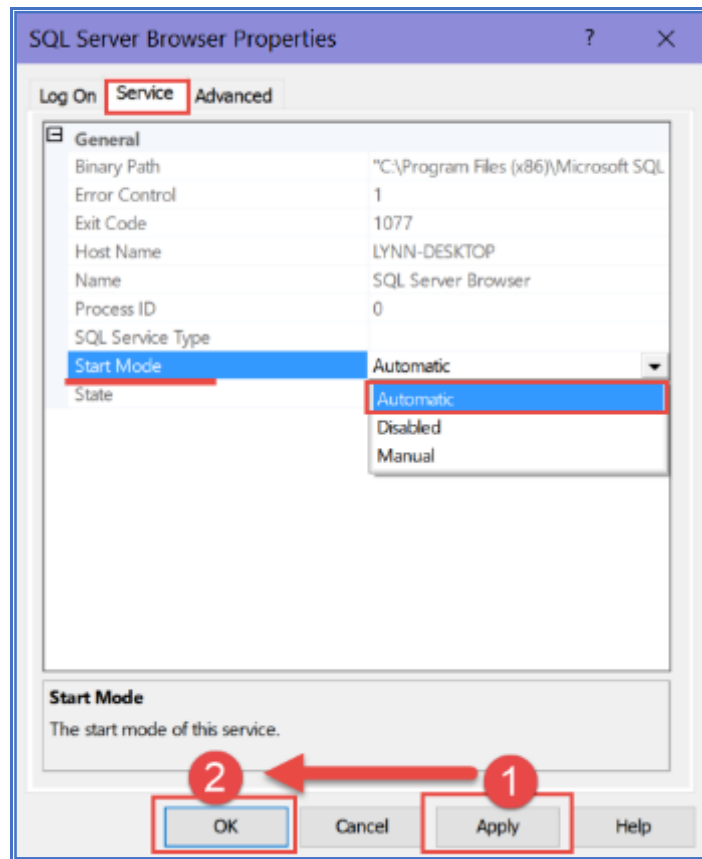
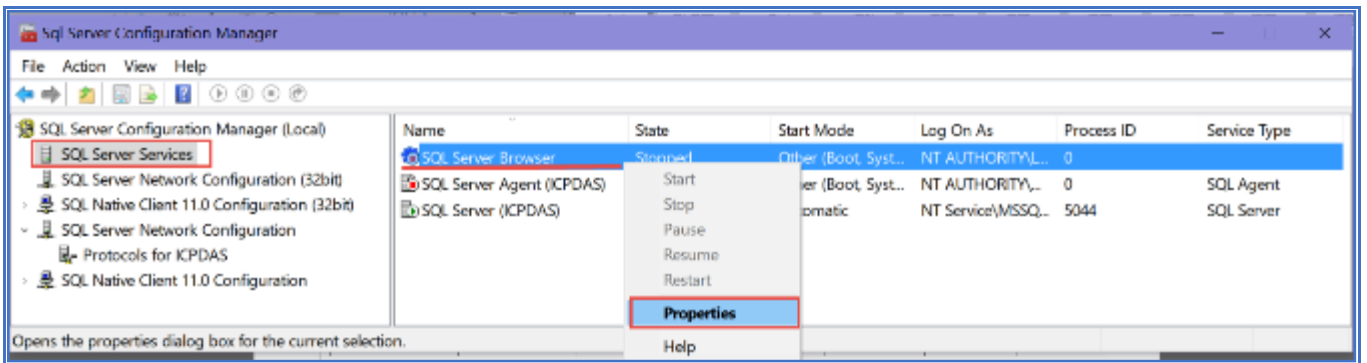
● Go following steps to **Environment Settings 2**



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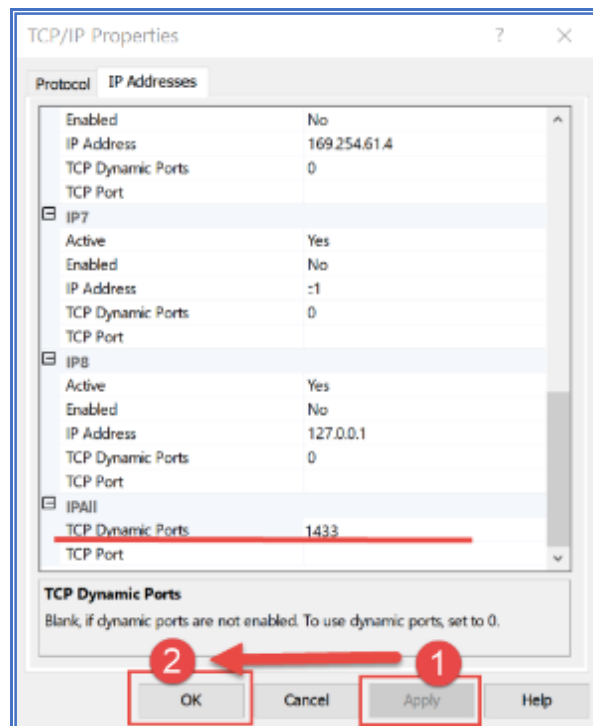
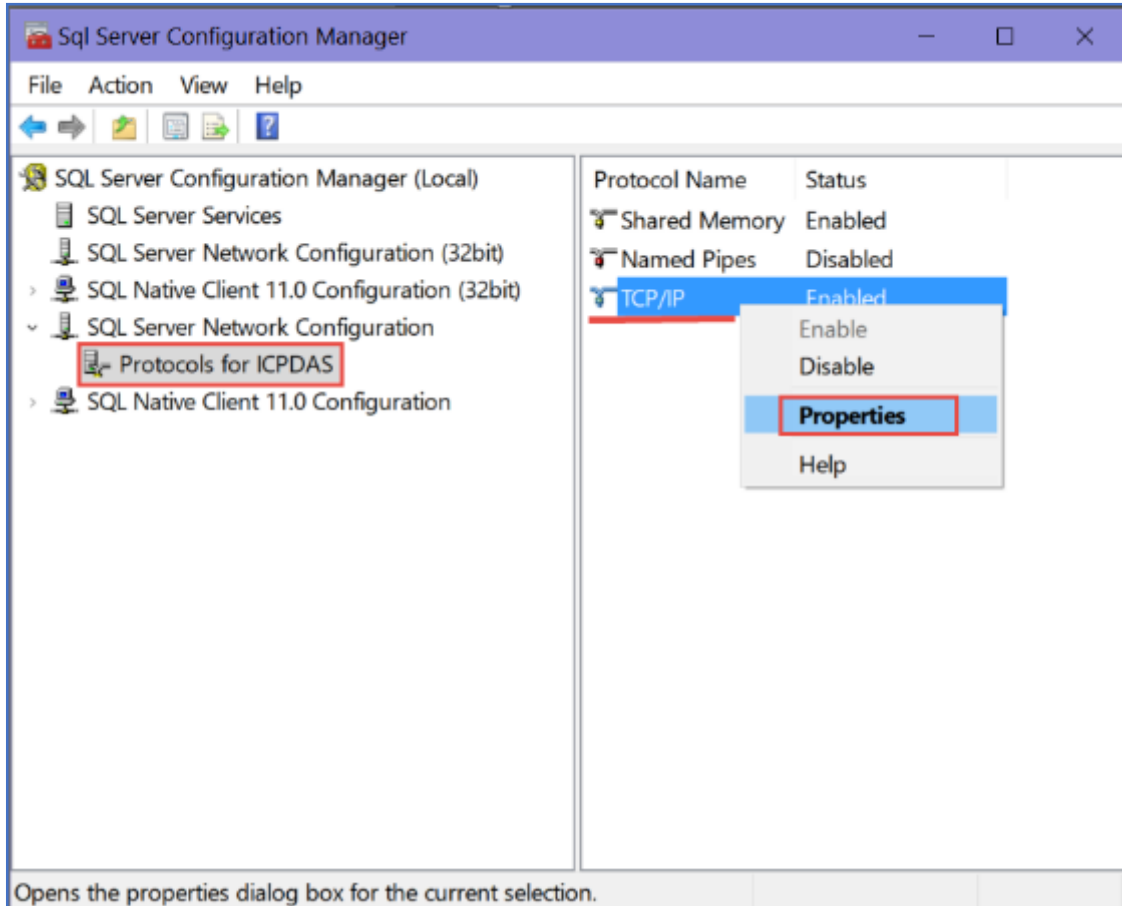
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<End of this section>

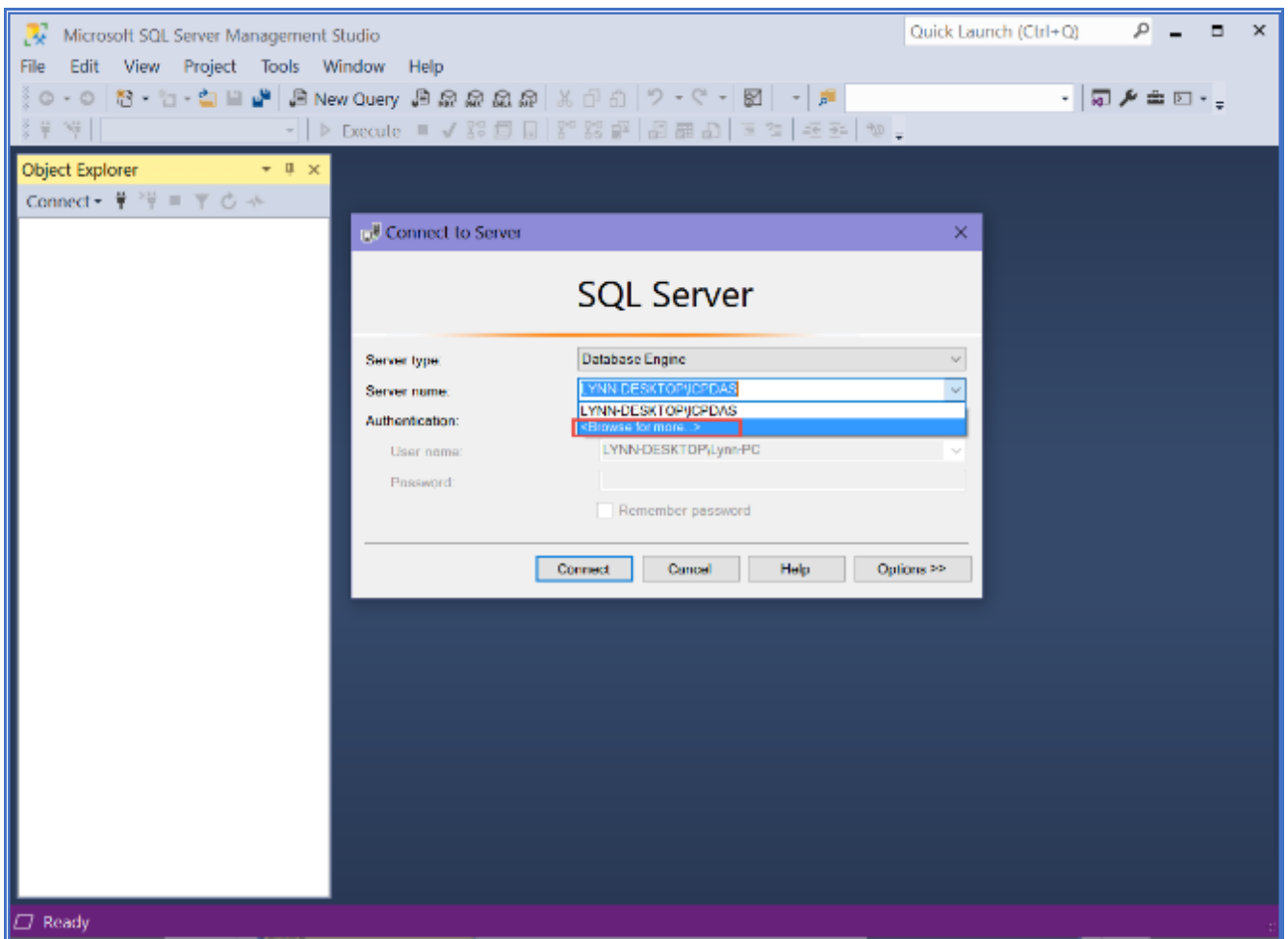
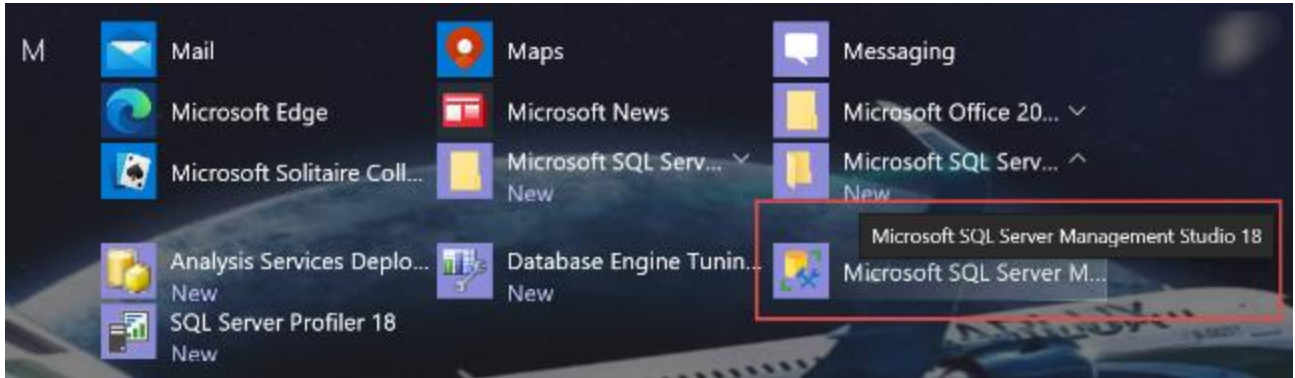
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● Communication Port Settings

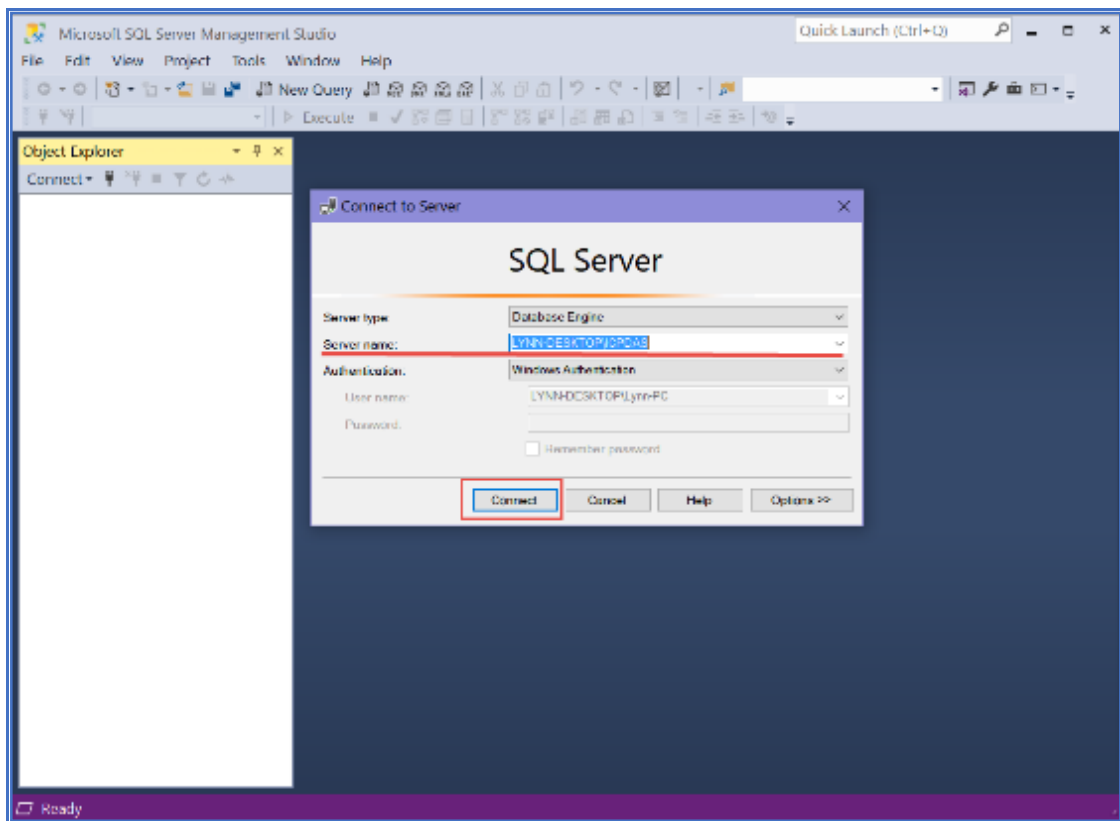
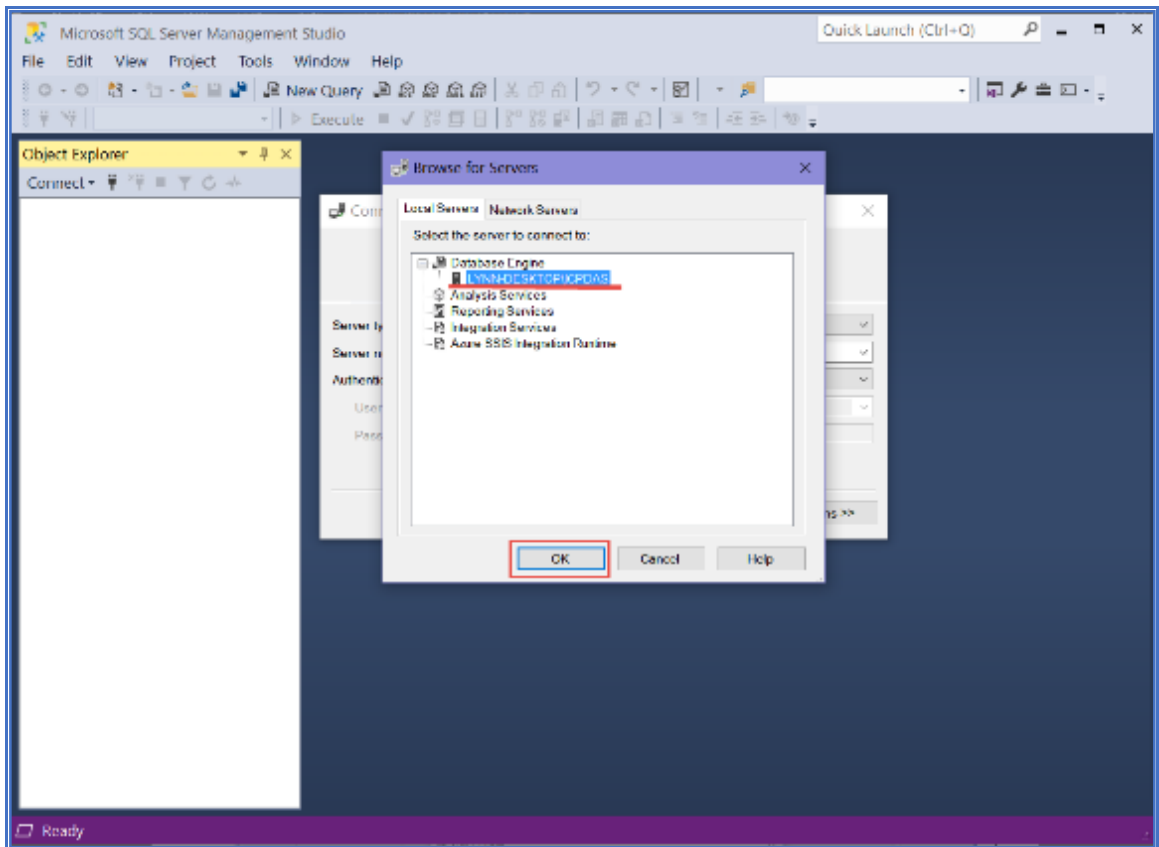


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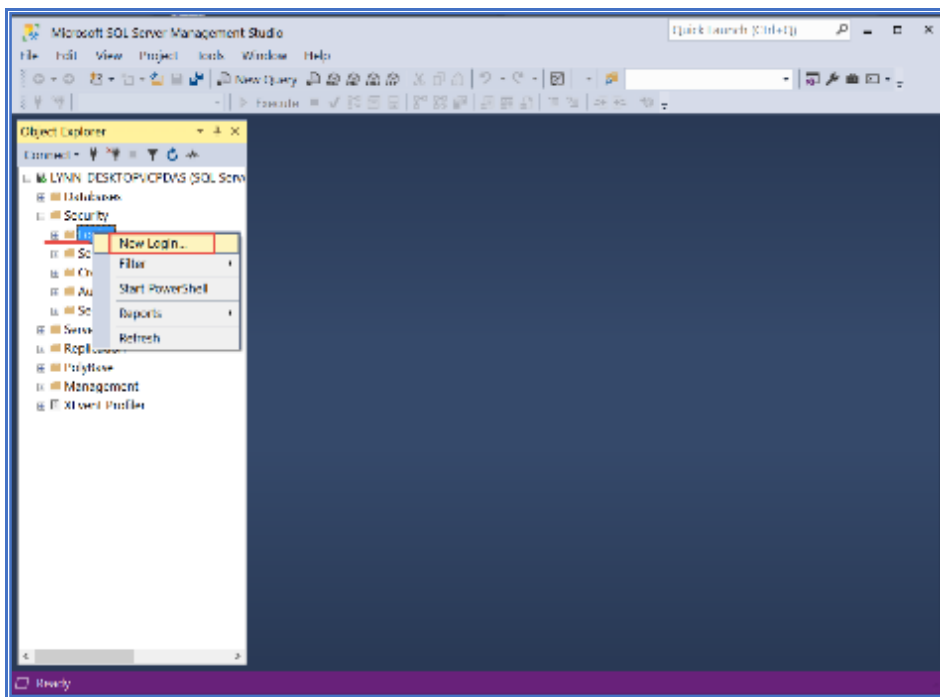
● Connection Testing



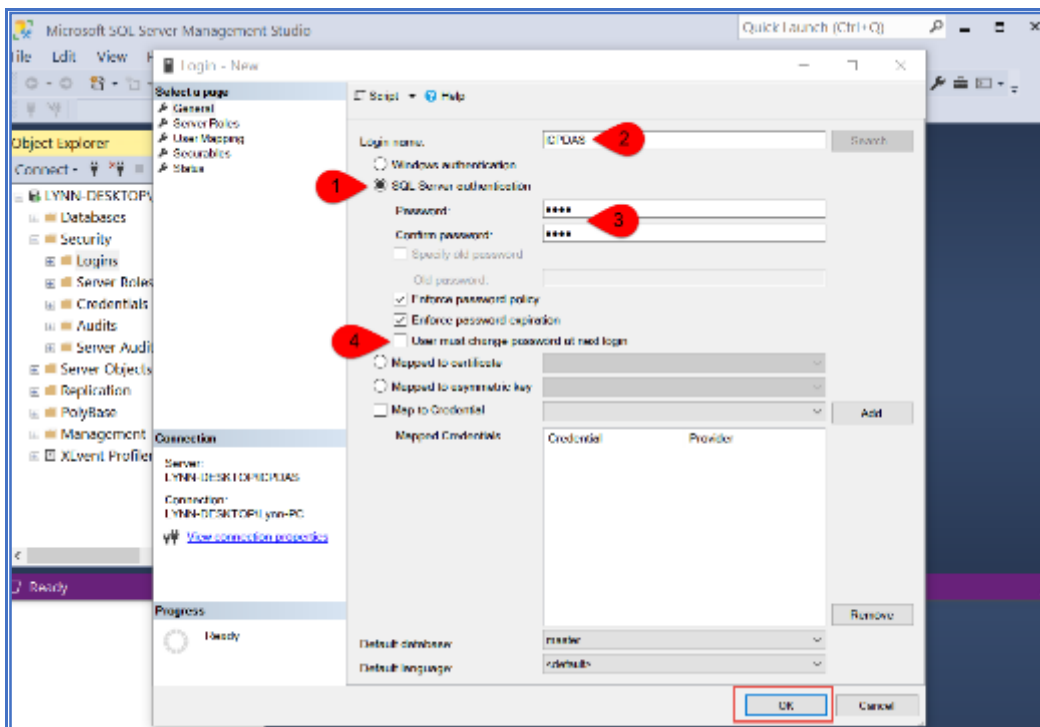
Classification	UA-Series English FAQ-Dev-001						
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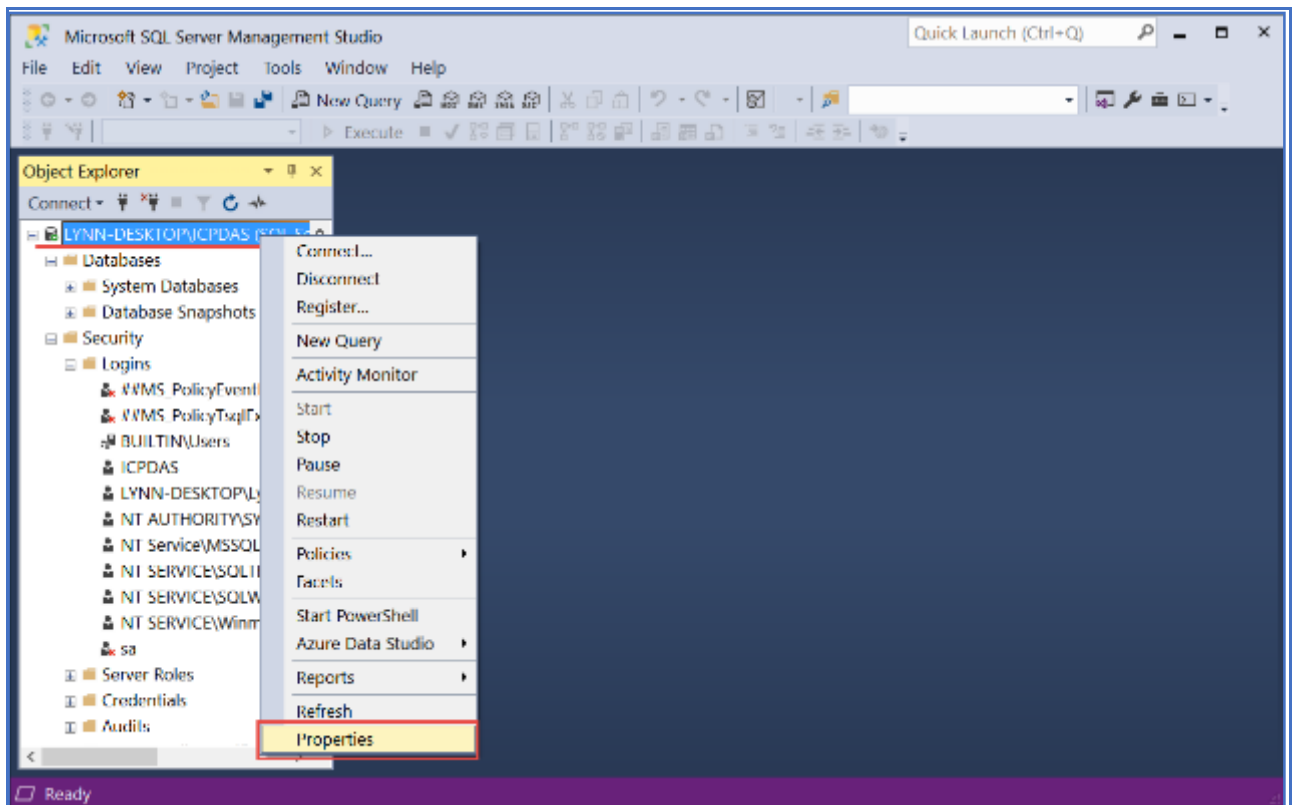
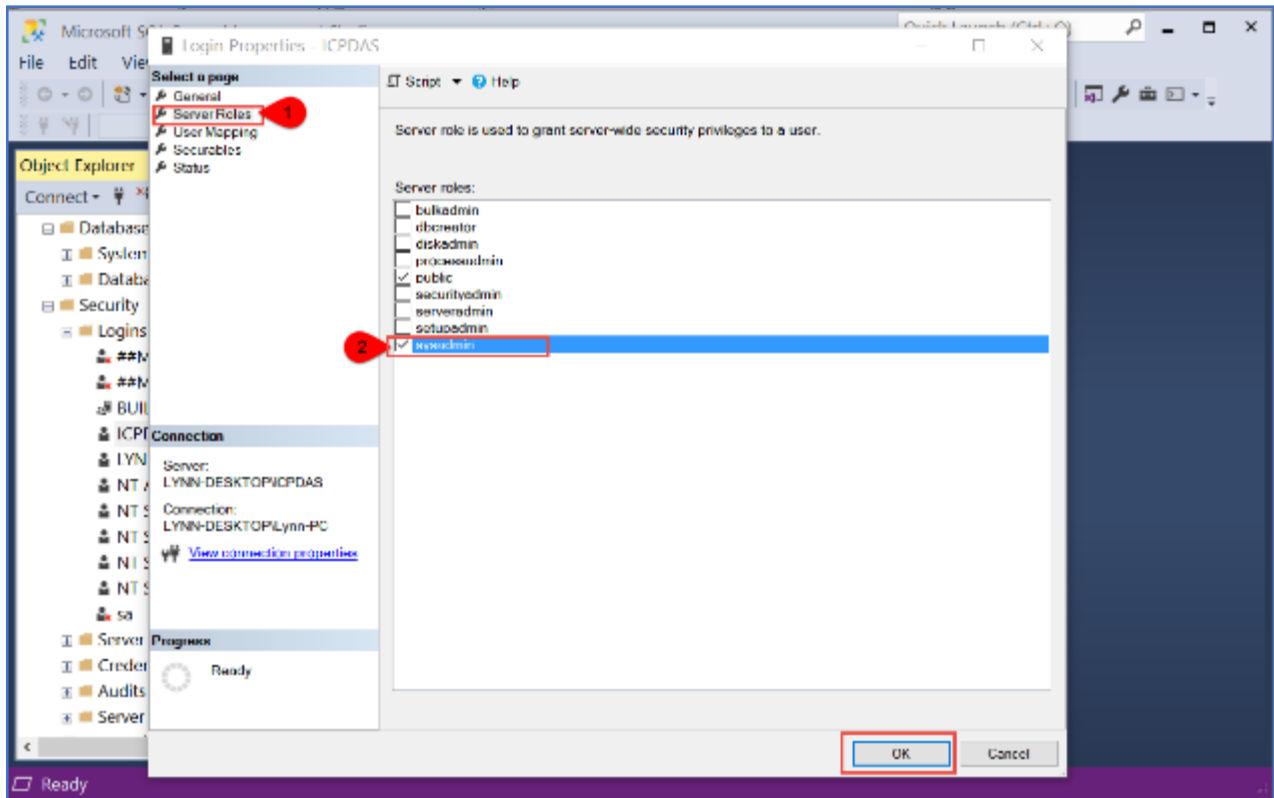
Classification	UA-Series English FAQ-Dev-001						
Author	Lynn Tang	Version	1.0.1	Date	2020,4	Page	24 / 51



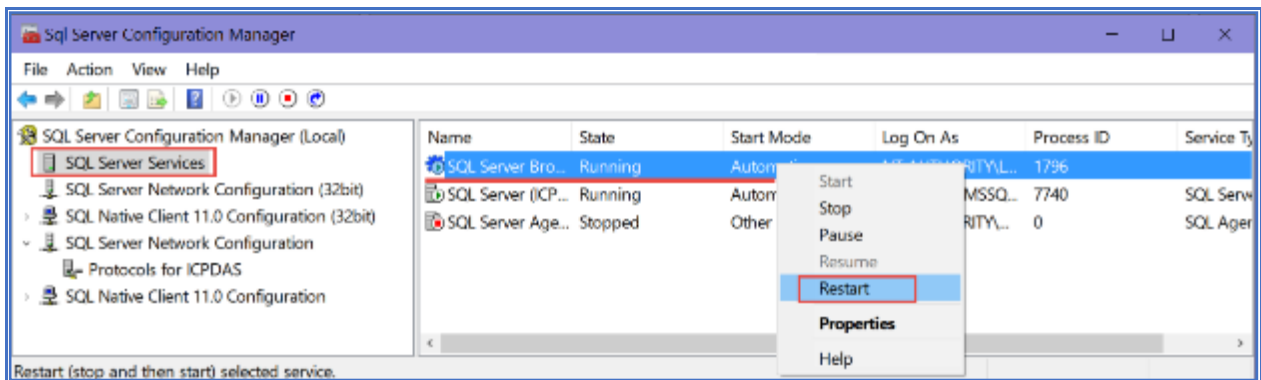
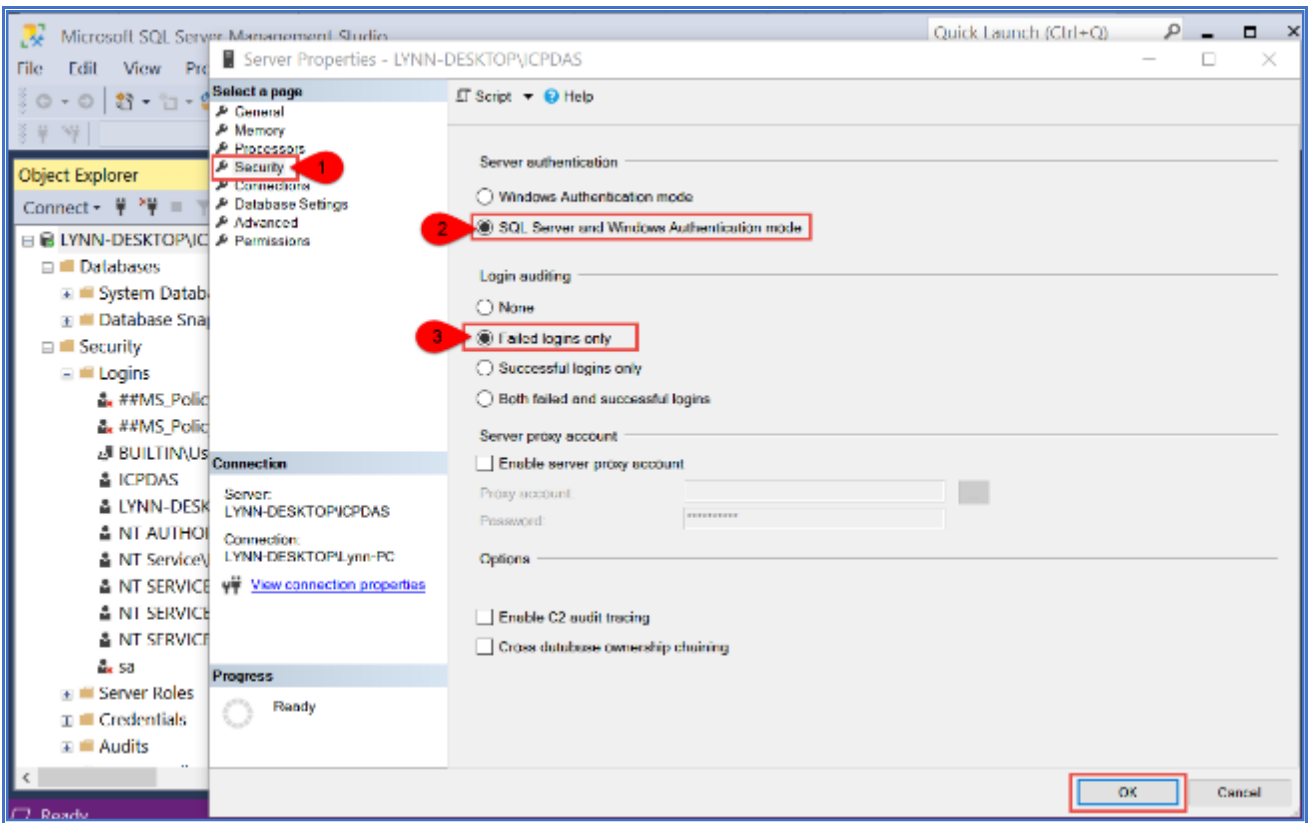
1. Choose SQL Server authentication.
2. Key in Login Name
3. Key in Password and Confirm Password
4. Cancel this checkbox.



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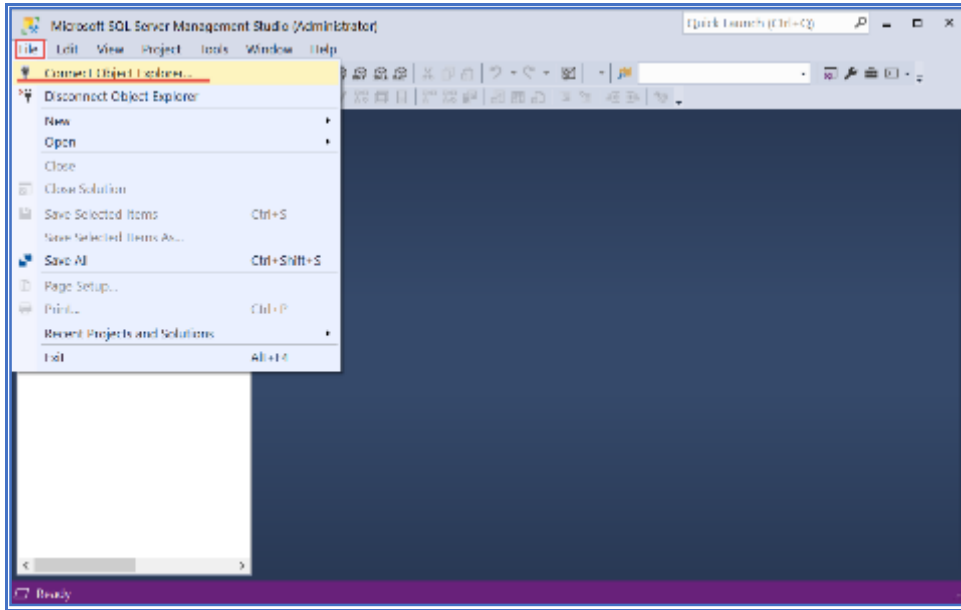
Classification	UA-Series English FAQ-Dev-001						
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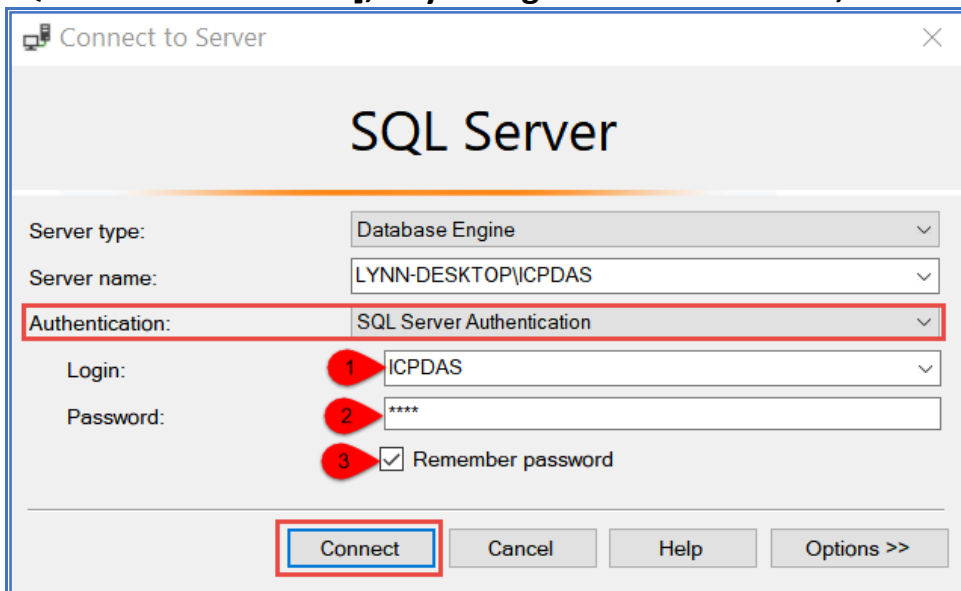
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● **Check if Database Setting is Success**

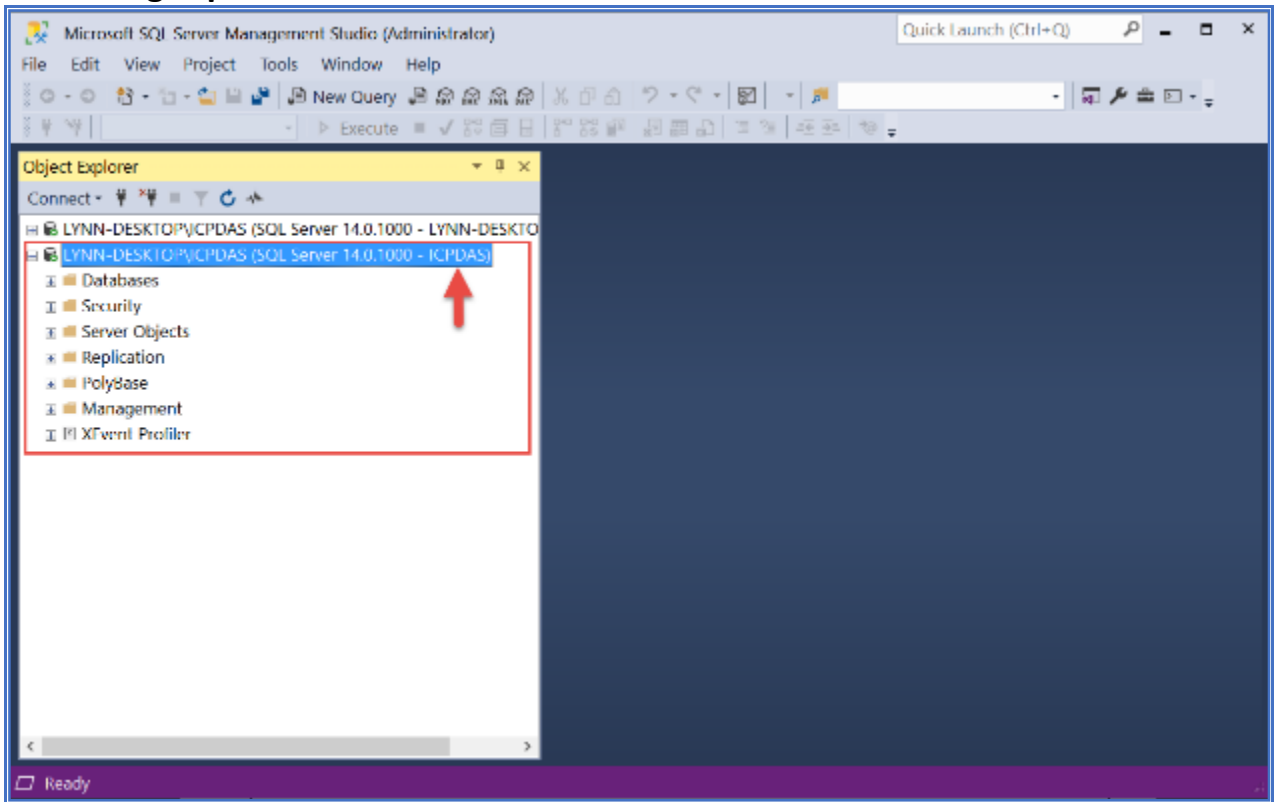


○ **Choose [SQL Server Verification], Key in Login ID and Password, then Click Connect**



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- **Confirm the status of connection.**
- **Following capture shows successful connection:**



<End of this section>

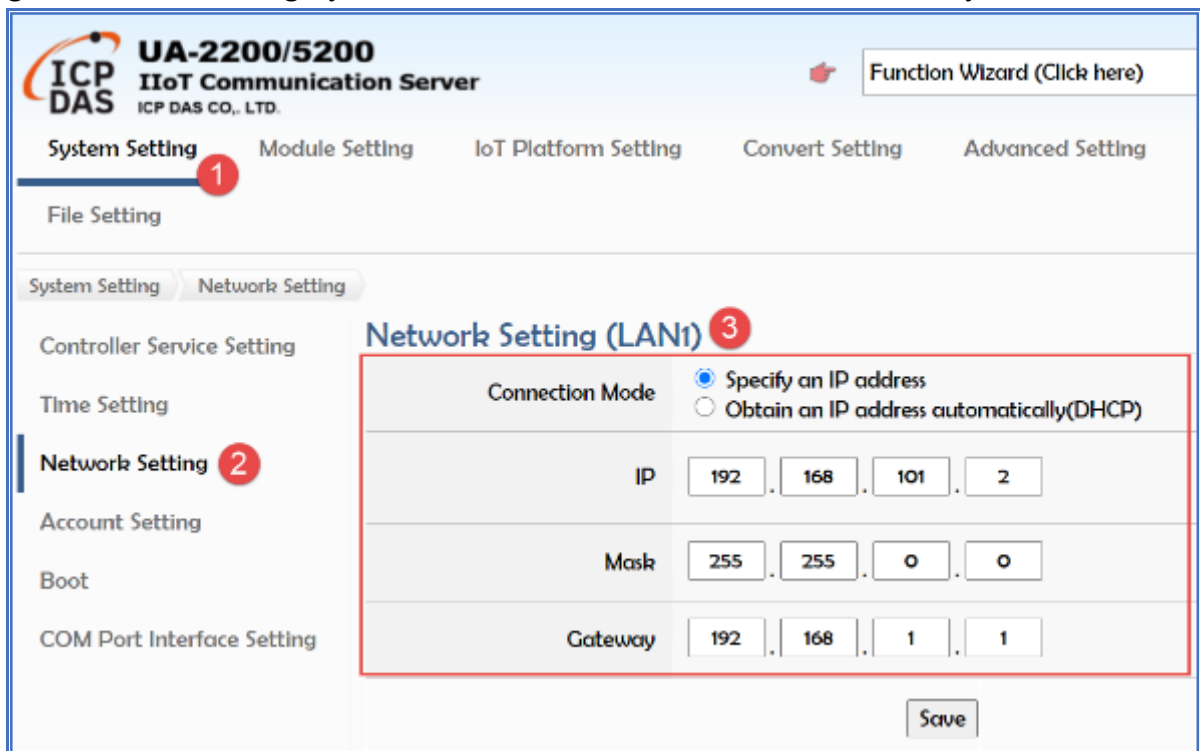
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● **How to set up UA products to save Modbus RTU data into SQL?**

1. Key in following address in the URL bar: <http://192.168.255.1>
2. When the Web UI show up, key in default Username: root
3. Key in default Password: root



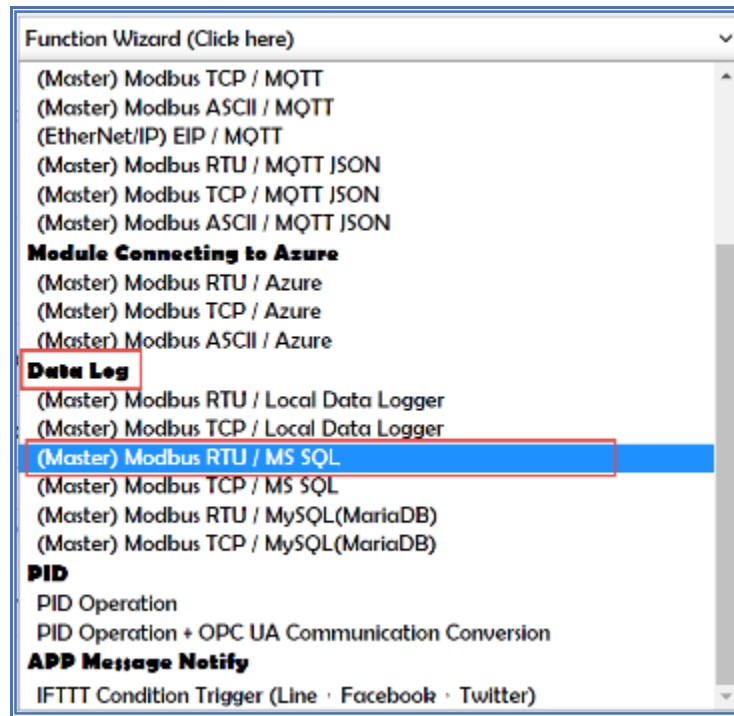
After successful Login, go to **【System Setting】 => 【Network Setting】 => 【Network Setting (LAN1)】** to change your IP Address, the mask, and the Gateway



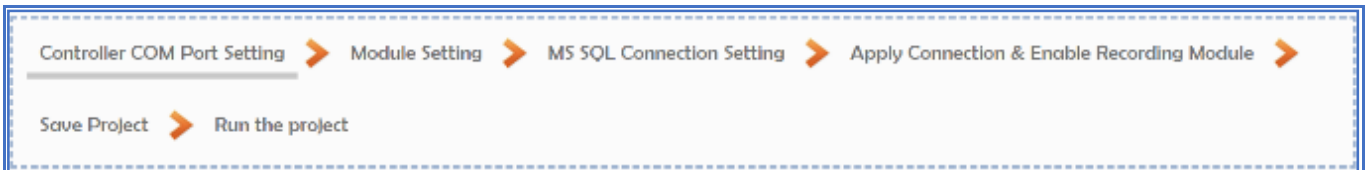
Then click "Save" .

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After reload the Web UI page, find “Data Log” and choose “(Master) Modbus RTU/MS SQL” from the drop-down menu on the upper-right corner.



Follow the steps from the Wizard to finish this Project.



We will take DL-302 as an example to run all steps in following sections.

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● COM Port Interface Setting (DL-302)

COM Port Interface Setting Page

Serial Port: ttyO2

Baud Rate: 9600

Data Bits: 8 bits

Parity: None

Stop Bits: 1 bit

Polling Rate(ms): 500

To get following information, please refer to DL-302 User Manual.

Save

Capture from DL-302 User Manual

Address: Sets the address for a module.
Default: 1 Range: 0 ~ 255
Protocol: Sets the communication protocol.
- ModbusRTU (default) - DCON - DCONChkSum: uses DCON protocol and enables checksum validation feature
Baud Rate
Default: 9600 Support Baud Rate: 1200/ 2400/ 4800/ 9600/ 19200/ 38400/ 57600/ 115200 (unit: bps)
Parity
Default: N,8,1 Support format: N81, N82, E81, O81
Response Delay (ms): Sets the delay time between receiving the command and sending the data.
Default: 0 ms Range: 0 ~ 30 (unit: ms)
Save: Saves the modification and returns to the Settings menu. All the changes take effect immediately after saving changes.
Skip: Returns to the Settings menu without saving any changes.

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Controller COM Port Setting > Module Setting > MS SQL Connection Setting > Apply Connection & Enable Recording Module >

Save Project > Run the project

System Setting **Module Setting** IoT Platform Setting Convert Setting Advanced Setting Logger Setting I/O Status

File Setting

Module Setting RTU Module (Master)

Modbus

RTU Module (Master)

TCP Module (Master)

ASCII Module (Master)

MQTT

MQTT Module

EtherNet/IP

ICPDAS Module

Modbus RTU Module List

1 Choose Serial Port

Serial Port ttyO2

Load ICPDAS Module Select The Module Update ICPDAS Module List

Select All	No.	*Module Name / Nickname	Edit
<input type="checkbox"/>	1	Name	Key in Module Name

3 Click to Add

Copy Remove

4 Save

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Controller COM Port Setting > Module Setting > MS SQL Connection Setting > Apply Connection & Enable Recording Module >

Save Project > Run the project

System Setting **Module Setting** IoT Platform Setting Convert Setting Advanced Setting Logger Setting I/O Status

File Setting

Module Setting RTU Module (Master)

Modbus

RTU Module (Master)

TCP Module (Master)

ASCII Module (Master)

MQTT

MQTT Module

EtherNet/IP

ICPDAS Module

Modbus RTU Module List

Serial Port ttyO2

Load ICPDAS Module Select The Module Update ICPDAS Module List

Select All	No.	*Module Name / Nickname	Edit
<input type="checkbox"/>	2	Name	
<input type="checkbox"/>	1	Name	Edit

Copy Remove

Remove all Save Success.

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The screenshot shows a web-based configuration interface. On the left, there are navigation tabs for 'Modbus', 'MQTT', and 'EtherNet/IP'. Under 'Modbus', there are sub-tabs for 'RTU Module (Master)', 'TCP Module (Master)', and 'ASCII Module (Master)'. The 'RTU Module (Master)' sub-tab is active, showing the 'Module Content Setting' form. This form has fields for 'No.' (value: 1), 'Module Name' (value: Name), 'Slave ID' (value: 1), and 'Timeout(ms)' (value: 500). Below this is the 'Modbus Mapping Table Setting' section, which has fields for 'Data Model' (value: 01 Coil Status(0x)), 'Start Address' (value: 0), and 'Data Number' (value: 1). There is an 'Add' button under 'Create Tables'. A red callout box points to the 'Modbus Mapping Table Setting' section with the text: 'Modbus Mapping information, please refer to the User Manual from the module you choose.'

Module Content Setting	
No.	The module number in the module list (Not editable here)
Module Name	Give a name, e.g. model number or name. Default: Name.
Slave ID	Set the module Slave ID of the UA. (Range: 1 ~ 247)
Timeout	Set the timeout value for the module. Default: 500 ms
Modbus Mapping Table Setting	
Data Model	System provides 4 Modbus data models "01" ~ "04" for mapping to address of DO, DI, AO and AI. (ex. 01: DO channels, 02: DI, 03: AO, 04: AI)
Start Address	The start address of the Modbus command. Note: the Start Address of UA is bass on 0, even if some modules are bass on 1, here it needs to follow UA to set bass on 0.
Data Number	The number of the Modbus address. Need to give enough number for the DO, DI, AO, AI channels of the module. Default: 1.
Type	This item only when the data model is 03 or 04. Choose the suitable data type: 16-bit Short, 16-bit Unsigned Short, 32-bit Long, 32-bit Unsigned Long, 32-bit Float, 64-bit Double.
Create Tables	Click [Add] button, it will add a table in the Modbus mapping table.

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DL-302 Modbus Address Mappings (Base 1)

Address	Description	Attribute
30001 ~ 30006	Analog input value of channel 0 to 5. channel 0: CO ₂ in 1ppm,	R
40001 ~ 40006	channel 1: relative humidity in 0.01%, channel 2: temperature in 0.01°C, channel 3: temperature in 0.01°F, channel 4: dew point temperature in 0.01°C, channel 5: dew point temperature in 0.01°F	

Modbus Mapping Table Setting:

Modbus Mapping Table Display and Edit.

Modbus Mapping Table

	Address	Nickname	Scaling	Bitwise								
Coil Status(0x)	Input Status(1x)	Holding Registers(4x)	Input Registers(3x)									
				<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Address</td> <td style="width: 50%;">0</td> </tr> <tr> <td>Number</td> <td>6</td> </tr> <tr> <td>Type</td> <td>Unsigned Short</td> </tr> <tr> <td colspan="2" style="text-align: right;"><input type="button" value="Edit"/></td> </tr> </table>	Address	0	Number	6	Type	Unsigned Short	<input type="button" value="Edit"/>	
Address	0											
Number	6											
Type	Unsigned Short											
<input type="button" value="Edit"/>												
<div style="border: 1px solid red; border-radius: 15px; padding: 5px; display: inline-block;"> <p style="color: red; margin: 0;">Take "DL-302 User Manual" Address 40001~40006 (Base 1) as an example.</p> </div>												
<input type="button" value="OK"/> <input type="button" value="Cancel"/>												

Nickname:

To set the variable name and the description, please click the “Nickname” to add the information.

Modbus Mapping Table
Address
Nickname
Scaling
Bitwise

01 Coil Status(0x)

1

Table Display

Address	Variable name	Data Type	Description
---------	---------------	-----------	-------------

02 Input Status(1x)

Table Display

Address	Variable name	Data Type	Description
---------	---------------	-----------	-------------

03 Holding Registers(4x)

Table Display

Address	Variable name	Data Type	Swap	Description
---------	---------------	-----------	------	-------------

04 Input Registers(3x)

Table Display

Address	Variable name	Data Type	Swap	Description
0	<input style="width: 90%;" type="text" value="CO2"/>	Unsigned Short	<input type="checkbox"/>	<input style="width: 90%;" type="text"/>
1	<input style="width: 90%;" type="text" value="RH"/>	Unsigned Short	<input type="checkbox"/>	<input style="width: 90%;" type="text"/>
2	<input style="width: 90%;" type="text" value="TempC"/>	Unsigned Short	<input type="checkbox"/>	<input style="width: 90%;" type="text"/>
3	<input style="width: 90%;" type="text" value="TempF"/>	Unsigned Short	<input type="checkbox"/>	<input style="width: 90%;" type="text"/>
4	<input style="width: 90%;" type="text" value="Tag4"/>	Unsigned Short	<input type="checkbox"/>	<input style="width: 90%;" type="text"/>
5	<input style="width: 90%;" type="text" value="Tag5"/>	Unsigned Short	<input type="checkbox"/>	<input style="width: 90%;" type="text"/>

2

3

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Controller COM Port Setting > Module Setting > **MS SQL Connection Setting** > Apply Connection & Enable Recording Module >

Save Project > Run the project

System Setting Module Setting IoT Platform Setting Convert Setting **Advanced Setting** Logger Setting I/O Status

File Setting

Advanced Setting MS SQL

PID Operation

IFTTT Condition Trigger

Data Logger

Local Data Logger

MS SQL

MySQL / MariaDB

MS SQL List

Remove	Identification Name	Status	Edit
<input type="checkbox"/>	Name		

Remove < 0 / 0 >

Save

Key in port name of the module.

Controller COM Port Setting > Module Setting > **MS SQL Connection Setting** > Apply Connection & Enable Recording Module >

Save Project > Run the project

System Setting Module Setting IoT Platform Setting Convert Setting **Advanced Setting** Logger Setting I/O Status

File Setting

Advanced Setting MS SQL

PID Operation

IFTTT Condition Trigger

Data Logger

Local Data Logger

MS SQL

MySQL / MariaDB

MS SQL List

Remove	Identification Name	Status	Edit
<input type="checkbox"/>	Name	Enable	Edit
<input type="checkbox"/>	CO2	Enable	Edit
<input type="checkbox"/>	RH	Enable	Edit
<input type="checkbox"/>	TempC	Enable	Edit
<input type="checkbox"/>	TempF	Enable	Edit

Remove < 1 / 1 >

Save

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Key in all information that needs to write into DB and set the SQL content.

Advanced Setting > Data Logger > MS SQL – Content Setting

Identification Name	User defined name to identify the database.
Database Type	Select the MSSQL type for the Microsoft SQL database.
Database Name	The name of the remote database.
Table Name	The table name of the remote database.
Server Name	The Server IP and name of the remote database.
Port	The port to link with database. Default: 1433 (for MS SQL)
Account	The login name of the remote database.
Password	The login password of the remote database.
Interval Seconds	Set up the interval time to save the I/O data to the remote database. Unit: Second.
Enable	Check to enable the data logger to the remote database. Default: check.
Test Connection	Click to test the connection to the remote database. Result: Success or Failure.
OK / Cancel	Click "OK" to save the settings of this page. Click "Cancel" to exit the setting page without saving.

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Controller COM Port Setting > Module Setting > MS SQL Connection Setting > **Apply Connection & Enable Recording Module** >
 Save Project > Run the project

System Setting Module Setting IoT Platform Setting Convert Setting Advanced Setting **Logger Setting** I/O Status
 File Setting

Logger Setting > RTU Module (Master)

Local Data Logger

RTU Module (Master)

TCP Module (Master)

MS SQL

RTU Module (Master)

TCP Module (Master)

MySQL / MariaDB

RTU Module (Master)

TCP Module (Master)

Modbus RTU Module List

No.	*Module Name / Nickname	Edit	Database Name	All Enabled
1	Name	Edit	<input type="text"/>	<input checked="" type="checkbox"/>

Apply

< 1 / 1 >

Save

Variable Table

Details Show Hide

Variable Name	Attribute	Data Type	Database Name	Enabled
<input type="text" value="CO2"/>	Read	Unsigned Short	<input type="text" value="CO2 (Remote)"/>	<input checked="" type="checkbox"/>
<input type="text" value="RH"/>	Read	Unsigned Short	<input type="text" value="RH (Remote)"/>	<input checked="" type="checkbox"/>
<input type="text" value="TempC"/>	Read	Unsigned Short	<input type="text" value="TempC (Remote)"/>	<input checked="" type="checkbox"/>
<input type="text" value="TempF"/>	Read	Unsigned Short	<input type="text" value="TempF (Remote)"/>	<input checked="" type="checkbox"/>
<input type="text" value="Tag4"/>	Read	Unsigned Short	<input type="text" value="Tag4 (Remote)"/>	<input checked="" type="checkbox"/>
<input type="text" value="Tag5"/>	Read	Unsigned Short	<input type="text" value="Tag5 (Remote)"/>	<input checked="" type="checkbox"/>

Choose corresponding Database name

Items to Enable

OK Cancel

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Modbus RTU Module List

No.	*Module Name / Nickname	Edit	Database Name	All Enabled
1	Name	<input type="button" value="Edit"/>	<div style="border: 1px solid red; border-radius: 10px; padding: 2px; display: inline-block;">1 Confirm chosen Database</div> <div style="border: 1px solid red; border-radius: 10px; padding: 2px; display: inline-block;">(Groups) <input type="button" value="Apply"/></div>	<input type="checkbox"/> <div style="border: 1px solid red; border-radius: 50%; padding: 2px; display: inline-block;">3 <input checked="" type="checkbox"/></div>
			<input type="button" value="Save"/>	

< 1 / 1 >

Click [Save Project], and then the step column will show up with a blue animation of savings as following capture. While the animation disappear means the project is finish saving.

Controller COM Port Setting > Module Setting > MS SQL Connection Setting > Apply Connection & Enable Recording Module >

Save Project

 > Run the project

To run the new project, click the next step [Run the project] and wait until the step column disappear.

To set the project manually, go back to [System Setting] → [Controller Service Setting] → Click [Run / Stop Project].

System Setting Module Setting IoT Platform Setting Convert Setting Advanced Setting

File Setting

System Setting **Controller Service Setting**

Controller Service Setting

Time Setting

Network Setting

Account Setting

Boot

COM Port Interface Setting

Function Status

Run Project	<input checked="" type="radio"/> Run	<input type="radio"/> Stop	Please wait.
MQTT Broker	<input checked="" type="radio"/> Run	<input type="radio"/> Stop	
DDNS	<input type="radio"/> Run	<input checked="" type="radio"/> Stop	

Click to run the project

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To check the I/O Status, click the “I/O status” and choose from the left-hand list. Confirm the connection value and status.

The screenshot displays the 'I/O Status' configuration page. At the top, there are navigation tabs: System Setting, Module Setting, IoT Platform Setting, Convert Setting, Advanced Setting, Logger Setting, and I/O Status (highlighted with a red circle). Below the tabs is a 'File Setting' section. The left-hand menu includes 'I/O Status' (highlighted with a red circle), 'Modbus RTU Module (Master)', 'Modbus TCP Module (Master)', and 'Modbus ASCII Module (Master)'. The 'Modbus RTU Module (Master)' configuration is shown with a table:

No.	Name	Serial Port
1	Name	ttyO2

Below this table are navigation controls: '< 1 / 0 >'. The main content area has 'Related Settings' with two rows:

- Number of variables: 10 (Updated 10 points per second)
- Display Update Time (ms): 1000

The 'I/O Status' section features a table with columns: Variable Name, Data Type, Value, Description, and Status. The 'Status' column is highlighted with a red circle. The table contains the following data:

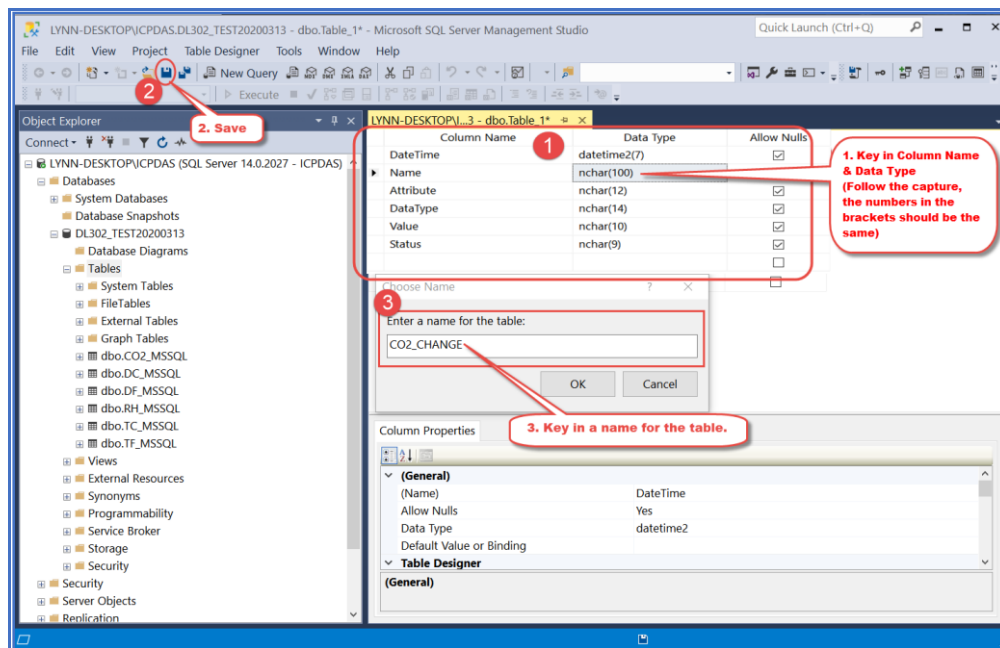
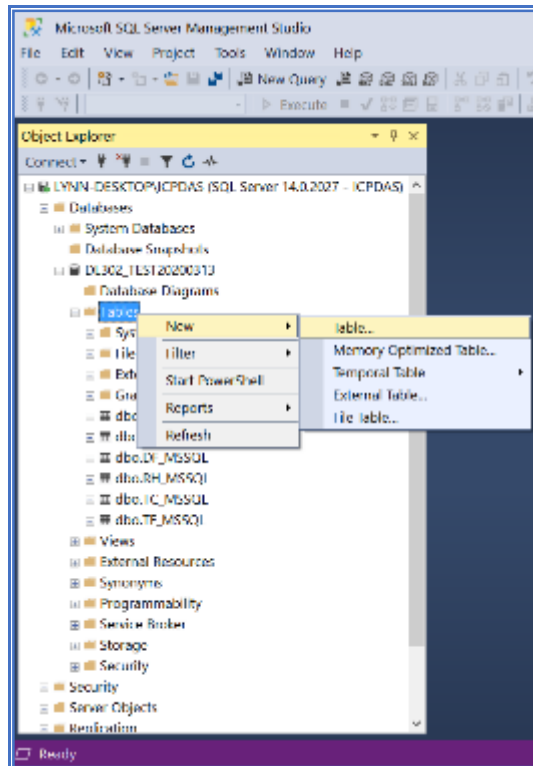
Variable Name	Data Type	Value	Description	Status
CO2	Unsigned Short	741		Good
RH	Unsigned Short	6479		Good
TempC	Unsigned Short	2426		Good
TempF	Unsigned Short	7566		Good
DewC	Unsigned Short	1720		Good
DewF	Unsigned Short	6296		Good

<End of this section>

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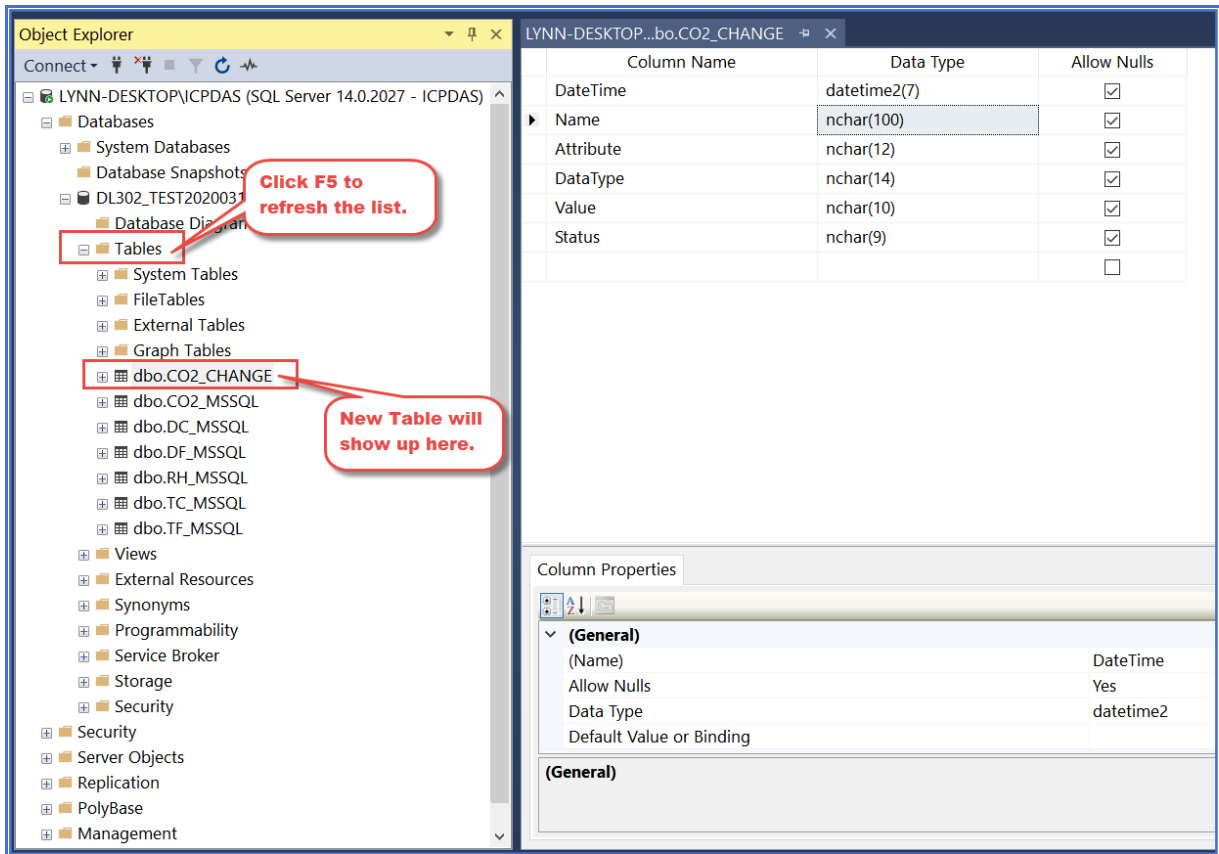
● **After transferring UA data into SQL Server, how to combine Date and Time column in the SQL Server?**

1. Right Click on the "Database" where UA data has transferred.
2. Choose "Tables" and choose "New" to create a new table and we will combine columns using this table.



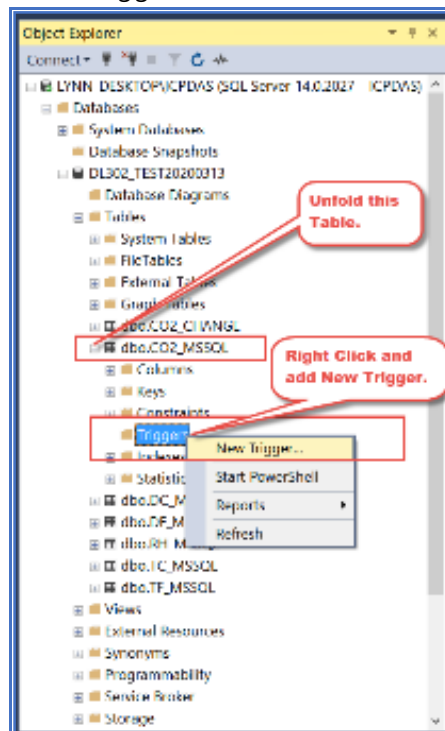
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After create the new Table, press "F5" to check if this table is successful created.



Unfold the table where UA transfer data in.

Right click on "Triggers" to add a "New Trigger" .



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Delete all data in the circled red column.

```

-----
-- template generated from template Explorer using:
-- Create Trigger (New Menu).SQL
-----
-- Use the Specify Values for Template Parameters
-- command (Ctrl-Shift-H) to fill in the parameter
-- values below.
--
-- See additional Create Trigger templates for more
-- examples of different Trigger statements.
--
-- This block of comments will not be included in
-- the definition of the function.
-----
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
-----
-- Author:      <Author,,Name>
-- Create date: <Create Date,,>
-- Description: <Description,,>
-----
CREATE TRIGGER <Schema_Name, sysname, Schema_Name>.<Trigger_Name, sysname, Trigger_Name>
ON <Schema_Name, sysname, Schema_Name>.<Table_Name, sysname, Table_Name>
AFTER <Data_Modification_Statements, , INSERT,DELETE,UPDATE>
AS
BEGIN
    SET NOCOUNT ON added to prevent extra result sets from
    -- interfering with SELECT statements.
    SET NOCOUNT ON;

    -- Insert statements for trigger here

END
GO

```

Then replace the deleted one with following code:

```

CREATE TRIGGER [TRG_CO2_INSERT] ON [DL302_TEST20200313].[dbo].[CO2_MSSQL]
AFTER INSERT
AS
    SET NOCOUNT ON;
    -- save into LOG file
    INSERT INTO [CO2_CHANGE] ( DateTime,Name,Attribute,DataType,Value,Status )
        SELECT Date+' '+Time,Name,Attribute,DataType,Value,Status FROM inserted ;

    -- show in the screen to check TRIGGER is running
    PRINT GETDATE();
GO

```

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After Copy and Paste the code, the screen should be as following:

```

SQLQuery1.sql | ...313 (ICPDAS (62))* | LYNN-DESKTOP...bo.CO2_CHANGE
-----
-- Template generated from Template Explorer using:
-- Create Trigger (New Menu).SQL
--
-- Use the Specify Values for Template Parameters
-- command (Ctrl-Shift-M) to fill in the parameter
-- values below.
--
-- See additional Create Trigger templates for more
-- examples of different Trigger statements.
--
-- This block of comments will not be included in
-- the definition of the function.
-----
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
-----
-- Author:      <Author,,Name>
-- Create date: <Create Date,,>
-- Description: <Description,,>
-----
CREATE TRIGGER [TRG_CO2_INSERT] ON [DL302_TEST20200313].[dbo].[CO2_MSSQL]
AFTER INSERT
AS
    SET NOCOUNT ON;
    -- save into LOG file
    INSERT INTO [CO2_CHANGE] ( DateTime,Name,Attribute,DataType,Value,Status )
        SELECT Date+' '+Time,Name,Attribute,DataType,Value,Status FROM inserted ;

    -- show in the screen to check TRIGGER is running
    PRINT GETDATE();
GO

```

Description:

```
CREATE TRIGGER [TRG_CO2_INSERT] ON [DL302_TEST20200313].[dbo].[CO2_MSSQL]
```

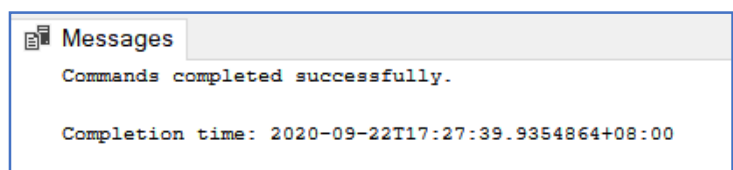
[TRG_CO2_INSERT] the name of TRIGGER
 [DL302_TEST20200313].[dbo].[CO2_MSSQL] the location of TRIGGER

```
INSERT INTO [CO2_CHANGE] ( DateTime,Name,Attribute,DataType,Value,Status )
```

[CO2_CHANGE] (DateTime,Name,Attribute,DataType,Value,Status) Table and column the data write into
 SELECT Date+' '+Time,Name,Attribute,DataType,Value,Status FROM inserted ;

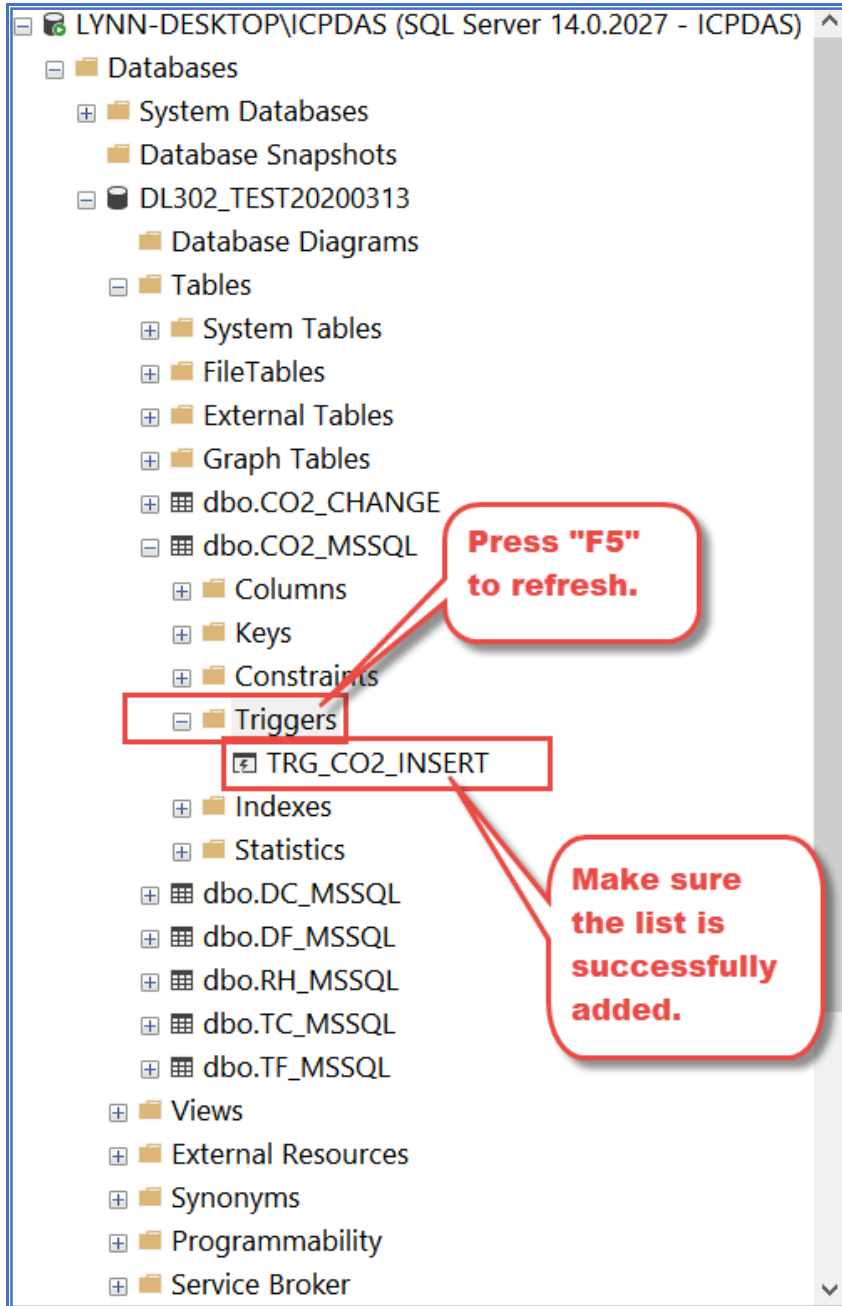
This paragraph is to find the field of UA incoming data in the temporary storage data table.

After finishing settings, press "F5" to confirm if this command is success.



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Click "Triggers" and press "F5" to refresh. Make sure the new trigger is added.



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Go back the new Table just created, right click and choose "Select Top 1000 Rows"
 To confirm if the Columns Date and Time are combined into new Table.

The screenshot shows the SQL Server Enterprise Manager interface. In the Object Explorer, the table 'dbo.CO2_CHANGE' is selected, and the context menu is open. The 'Select Top 1000 Rows' option is highlighted. A callout bubble points to this option with the text 'Choose this function.' Another callout bubble points to the table name with the text 'Right click'. In the SQL query editor, the following query is shown:

```

/***** Script for SelectTopNRows command from SSMS *****/
SELECT TOP (1000) [DateTime]
, [Name]
, [Attribute]
, [DataType]
, [Value]
, [Status]
FROM [DL302_TEST20200313].[dbo].[CO2_CHANGE]

```

A callout bubble points to the number '1000' in the query with the text 'Can adjust by key in different numbers.' Below the query, the 'Results' pane shows a table with the following data:

	DateTime	Name	Attribute	DataType	Value	Status
1	2020-09-22 17:27:39.0000000	MRTU_No 1	Read	Unsigned S	716	GOOD
2	2020-09-22 17:27:44.0000000	MRTU_No 1	Read	Unsigned S	717	GOOD
3	2020-09-22 17:27:49.0000000	MRTU_No 1	Read	Unsigned S	717	GOOD
4	2020-09-22 17:27:54.0000000	MRTU_No 1	Read	Unsigned S	717	GOOD
5	2020-09-22 17:27:59.0000000	MRTU_No 1	Read	Unsigned S	717	GOOD
6	2020-09-22 17:28:04.0000000	MRTU_No 1	Read	Unsigned S	717	GOOD
7	2020-09-22 17:28:09.0000000	MRTU_No 1	Read	Unsigned S	718	GOOD
8	2020-09-22 17:28:14.0000000	MRTU_No 1	Read	Unsigned S	718	GOOD
9	2020-09-22 17:28:19.0000000	MRTU_No 1	Read	Unsigned S	715	GOOD
10	2020-09-22 17:28:24.0000000	MRTU_No 1	Read	Unsigned S	714	GOOD
11	2020-09-22 17:28:29.0000000	MRTU_No 1	Read	Unsigned S	714	GOOD
12	2020-09-22 17:28:34.0000000	MRTU_No 1	Read	Unsigned S	714	GOOD
13	2020-09-22 17:28:39.0000000	MRTU_No 1	Read	Unsigned S	713	GOOD
14	2020-09-22 17:28:44.0000000	MRTU_No 1	Read	Unsigned S	711	GOOD
15	2020-09-22 17:28:49.0000000	MRTU_No 1	Read	Unsigned S	710	GOOD
16	2020-09-22 17:28:54.0000000	MRTU_No 1	Read	Unsigned S	709	GOOD

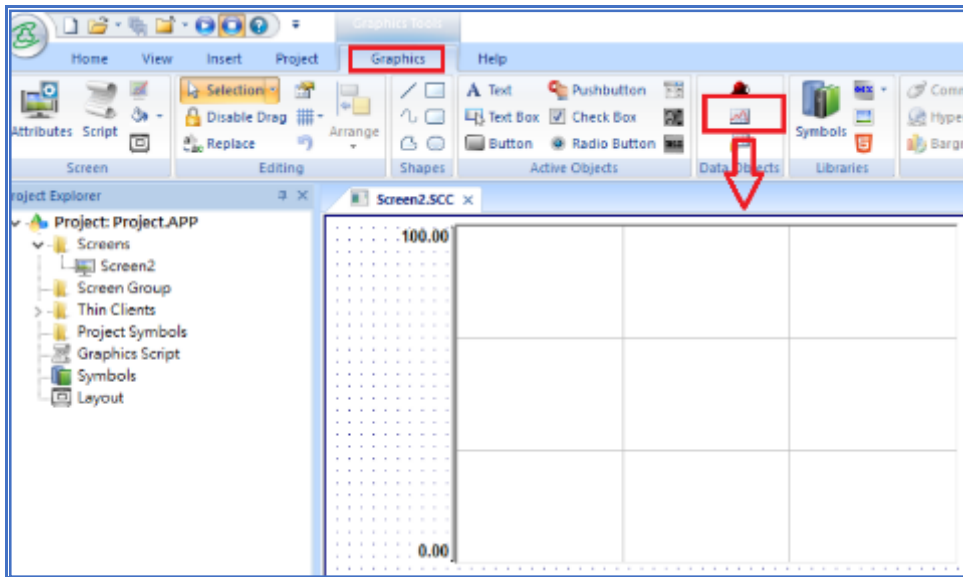
A callout bubble points to the 'DateTime' column header in the results grid with the text 'Confirm if the Date and Time is successfully combined.' The status bar at the bottom indicates 'Query executed successfully.'

<End of this section>

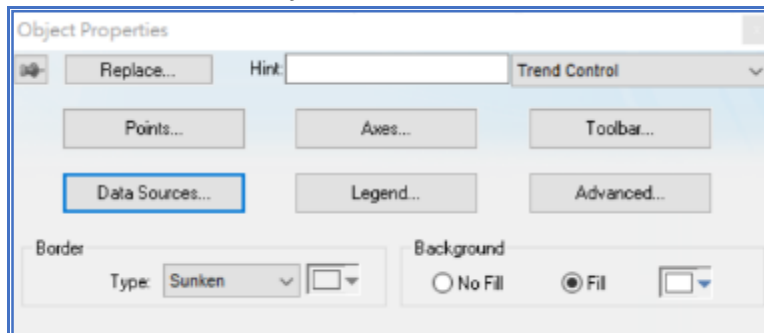
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● How InduSoft read SQL?

Log in InduSoft, choose "Graphics" and in the Data Objects, select "Trend" icon.

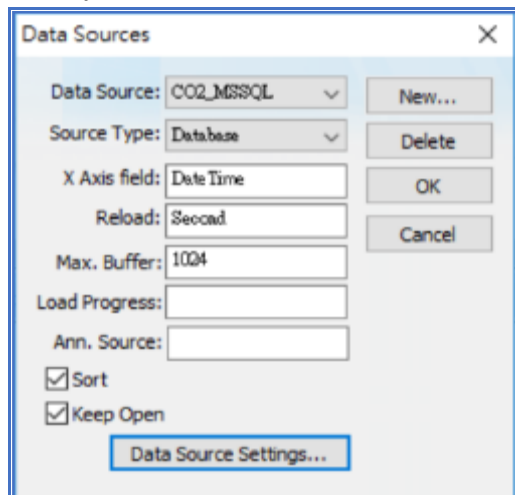


Double-click "Trend" to open the Object Properties.




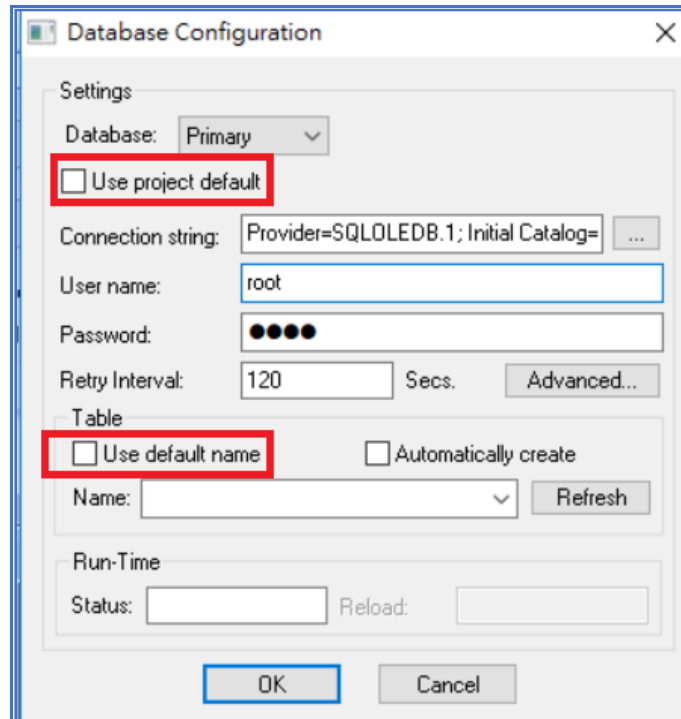
Press [Data Sources] and [New], key in the name and then press [Create] button.

In the blank of "X Axis field", key in the column name in SQL Server which records time.

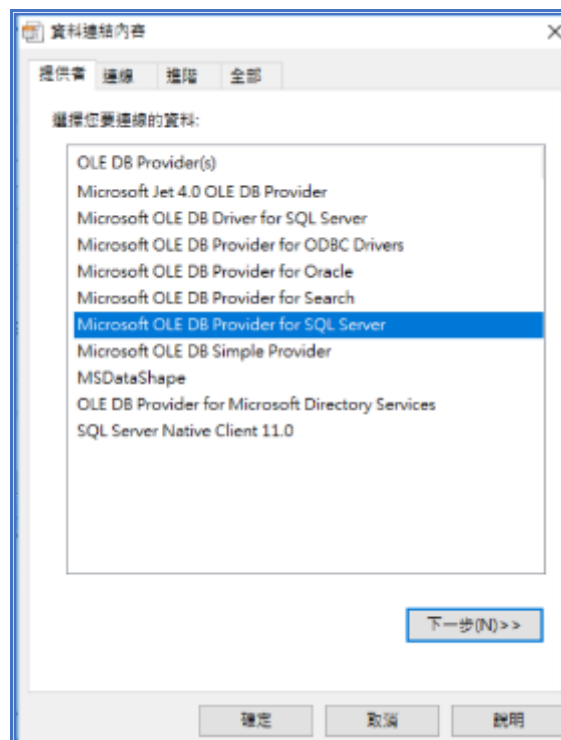


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Press [Data Source Settings], cancel the checkbox of [Use project default] and [Use default name], then click  button.

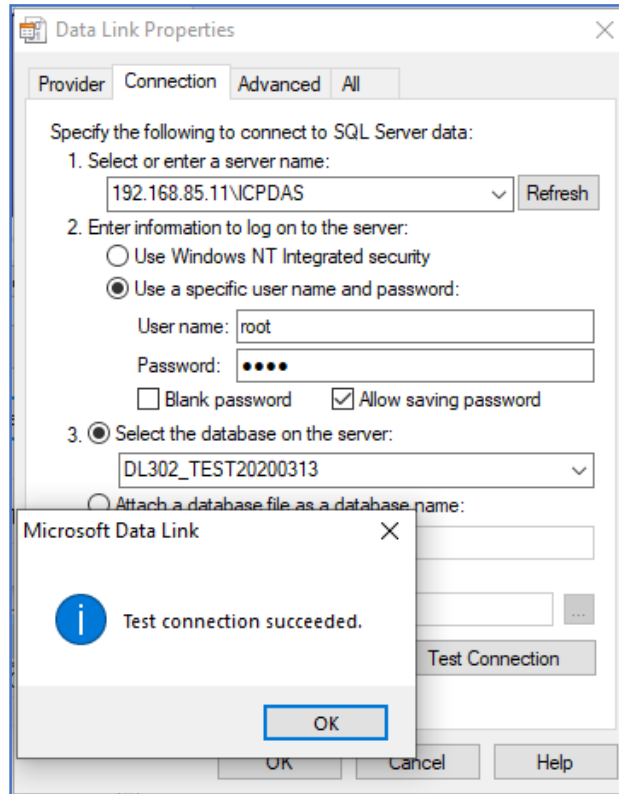


Select [Microsoft OLE DB Provider for SQL server] and click [Next].

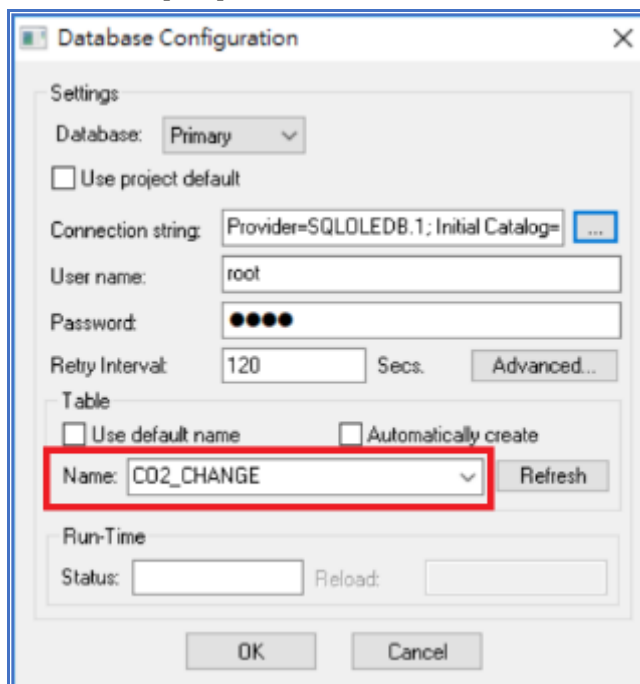


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Fill in the [Connection] content, test the connection, show up a dialog box with “success” message and click OK.

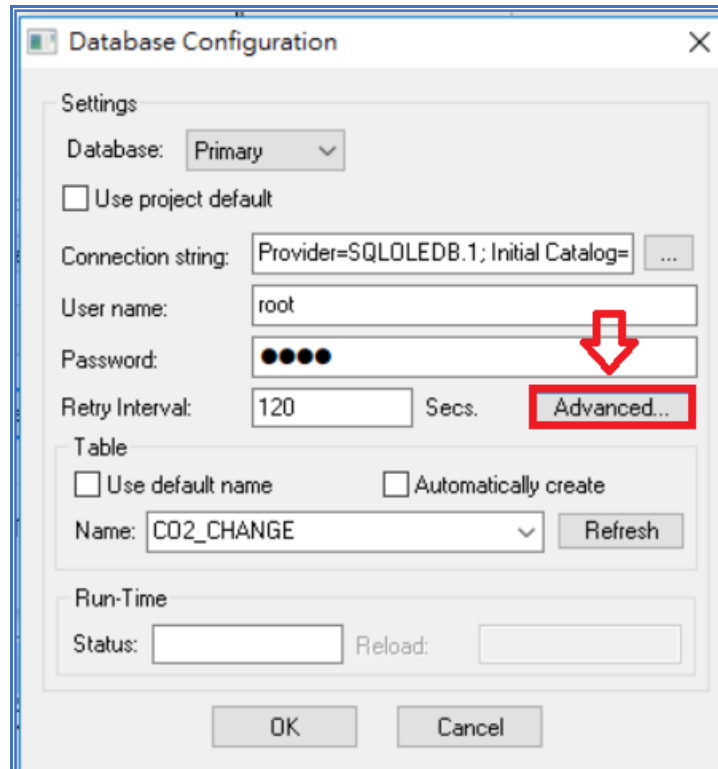


Choose the data to read, and click [OK].

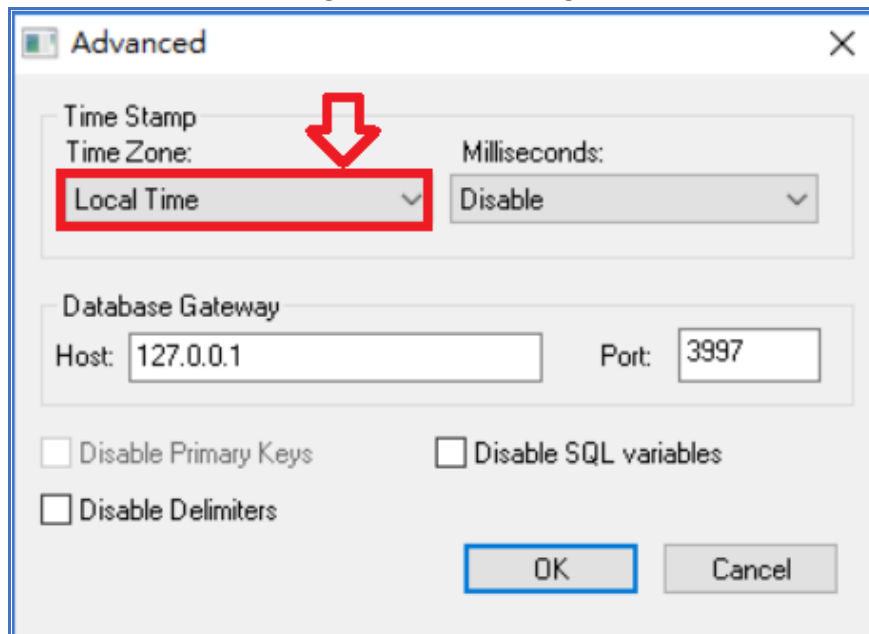


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Click [Advanced]

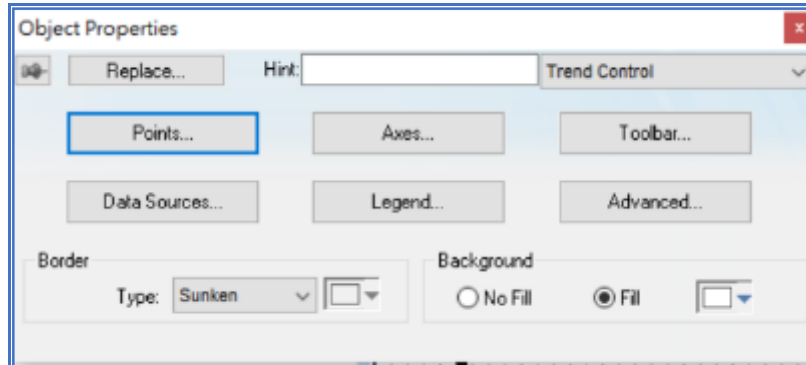


Set [Time Zone] to [Local Time] (Changeable according to different cases), and click [OK]

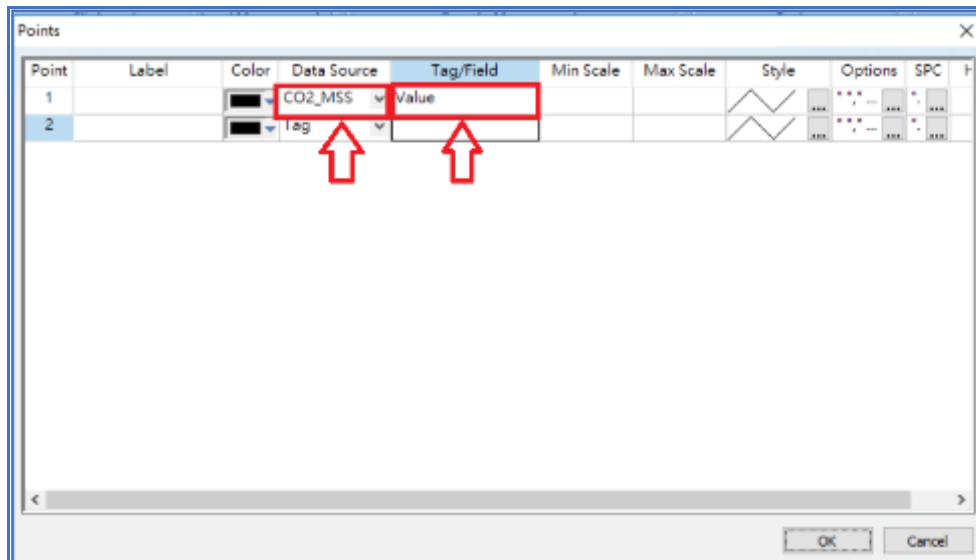


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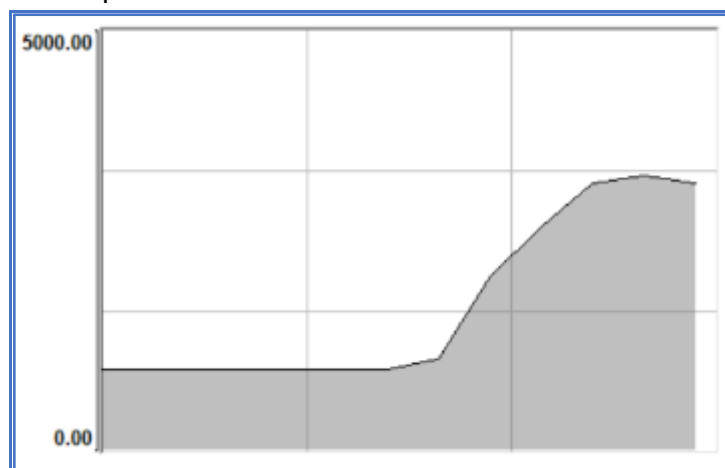
Double-click "Trend" to open the Object Properties, press [Points].



Select and fill in [Data Source] and [Tag/Field] used, click [OK].



Finish and the trend show up as below:



[End of this Section]