PROCESS AUTOMATION

Freelance 2019

Engineering Manual
OPC Tunnel - Configuration

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About this book

Use of warning, caution, information, and tip icons

This publication includes **Warning**, **Caution**, and **Information** where appropriate to point out safety related or other important information. It also includes **Tip** to point out useful hints to the reader. The corresponding symbols should be interpreted as follows:

Electrical warning icon indicates the presence of a hazard which could result in *electrical shock.*

Warning icon indicates the presence of a hazard which could result in *personal injury.*

Caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in *corruption of software or damage to equipment/property.*

Information icon alerts the reader to pertinent facts and conditions.

Tip icon indicates advice on, for example, how to design your project or how to use a certain function

Although **Warning** hazards are related to personal injury, and **Caution** hazards are associated with equipment or property damage, it should be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to personal injury or death. Therefore, comply fully with all **Warning** and **Caution** notices.

Terminology

The Glossary contains terms and abbreviations that are unique to ABB or have a usage or definition that is different from standard industry usage. Please make yourself familiar to that.

You will find the glossary at the end of this manual.

Document conventions

The following conventions are used for the presentation of material:

- The words in names of screen elements (for example, the title in the title bar of a window, the label for a field of a dialog box) are initially capitalized.
- Capital letters are used for the name of a keyboard key if it is labeled on the keyboard. For example, press the ENTER key.
- Lowercase letters are used for the name of a keyboard key that is not labeled on the keyboard. For example, the **space bar**, **comma key**, and so on.
- Press CTRL+C indicates that you must hold down the CTRL key while pressing the C key (to copy a selected object in this case).
- Press **ESC, E, C** indicates that you press and release each key in sequence (to copy a selected object in this case).
- The names of push and toggle buttons are boldfaced. For example, click **OK**.
- The names of menus and menu items are boldfaced. For example, the **File** menu.
  - The following convention is used for menu operations: MenuName > MenuItem > CascadedMenuItem. For example: select **File** > **New** > **Type**.
  - The **Start** menu name always refers to the **Start** menu on the Windows Task Bar.

- System prompts/messages are shown in the Courier font, and user responses/input are in the boldfaced Courier font. For example, if you enter a value out of range, the following message is displayed:

  ```
  Entered value is not valid. The value must be 0 to 30.
  ```

  You may be told to enter the string TIC132 in a field. The string is shown as follows in the procedure:

  TIC132

  Variables are shown using lowercase letters.

  sequence name

1 Introduction

The setup program for Freelance contains the component “ABB OPC Tunnel”. This component must be installed on all PCs with an OPC Server or Trend Server to be connected to the Freelance system. The OPC Tunnel replaces the Windows DCOM configuration and makes its complicated settings unnecessary.

If only one OPC server is used on a PC, the names of the OPC server DataAccess interface and Alarm/Event interface and a port number must be configured in the OPC Tunnel tool “Configurator”. For using more than one OPC server on one PC, the configuration is done with the help of the “Advanced Configurator Tool”.

These configuration tools can be reached via the start menu:

Windows 7:
Start > Programs > ABB > Freelance > OPC Tunnel > Configurator (or **Advanced Configurator)**

Windows 10:
Start > ABB > Configurator (or. **Advanced Configurator**)

After a change of the OPC Tunnel configuration, the tunnel must be restarted:

Windows 7:
Start > Programs > ABB > Freelance > OPC Tray

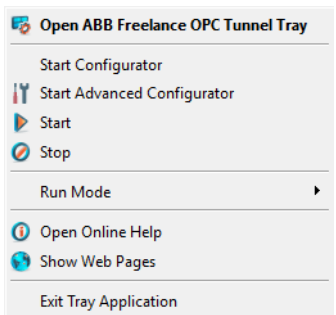
Windows 10:
Start > ABB > OPC Tray

Select tunnel icon from the task bar notification area, call context menu with a right mouse click and select **Start**

Icon of the OPC Tunnel in the task bar (red: stopped, green running):

Tunnel icon.bmp

Context menu of the OPC Tunnel:



Tunnel context menu.png

2 Configuration

2.1 OPC Tunnel Configuration

The OPC Tunnel can be configured using the Simple Configurator or Advanced Configurator.

If the OPC Tunnel is configured for the Trend Server, the Simple Configurator must be used.

The Simple Configurator can be used to configure at most one DA server and one AE server with empty item prefix.

DA Server: “Freelance2000OPCServer.ID”

AE Server: “Freelance2000OPCAEServer.ID” (for third-party system only)

ID = OPC server ID from Freelance Settings

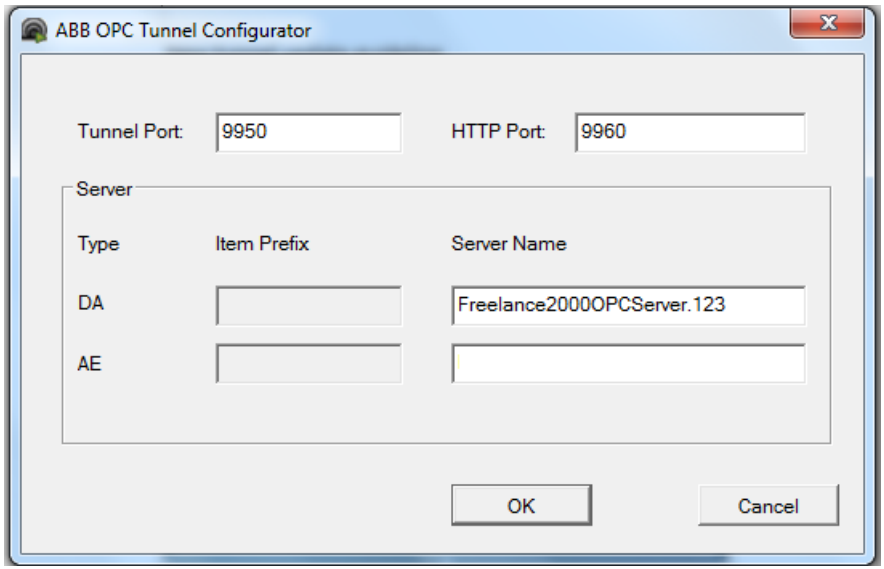
The Advanced Configurator supports configuring multiple DA servers and multiple AE servers with empty or non-empty item prefix. Item prefixes are needed, if more than one OPC server contains OPC items of the same name.

If non-empty item prefix is configured, a unique and user-defined part name with a maximum length of 14 shall be used. If configured for the Trend Server and OPC Server on the same PC, the configure sequence should be as follows: first configure for the Trend Server by using the Simple Configurator and then configure for the OPC Server by means of the Advanced Configurator.

Tunnel configuration Alarms and Events 'AE' is not required for the Freelance System. The following examples with configured AE are only valid for clients of Non-Freelance systems.

2.1.1 Configured by Simple Configurator

- Add the Resource ID (i.e. 123).
- Configure the Tunnel Port, HTTP Port, DA Server Name, and AE Server Name.

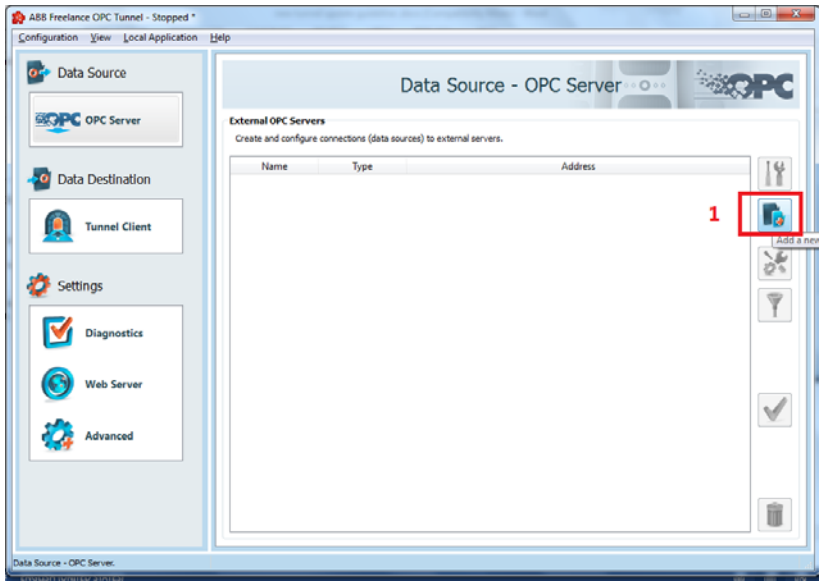


OPC_1 us.png

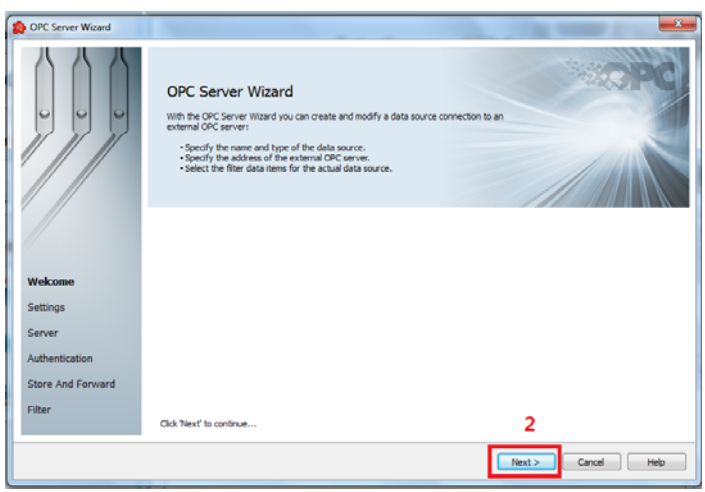
- Press **<OK>** to save the configuration.

2.1.2 Configured by Advanced Configurator

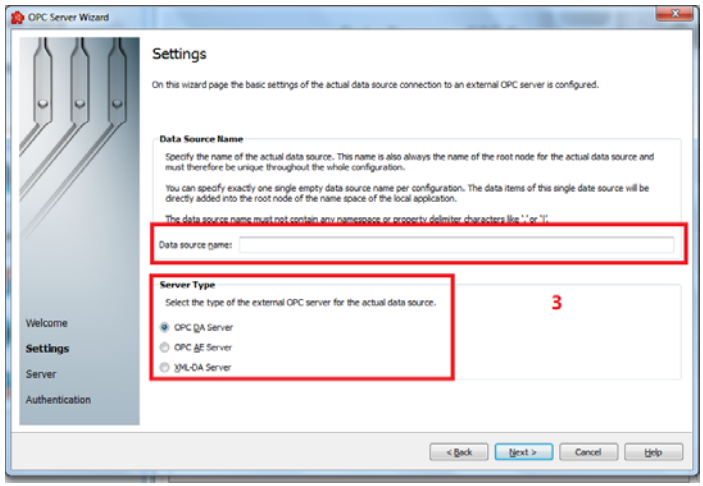
- Add the Resource ID (i.e. 123).
- Add connections to external servers.



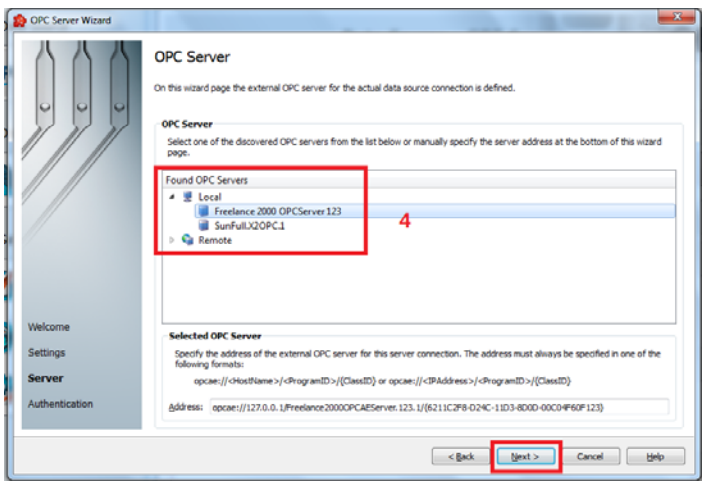
OPC_2 us.png



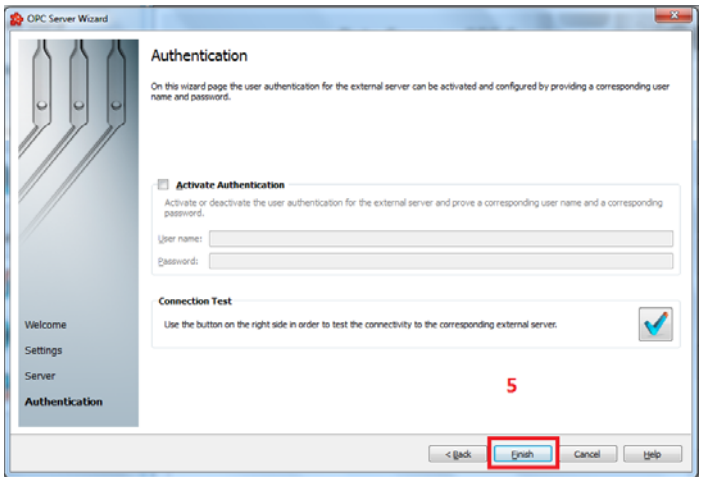
OPC_3 us.png



OPC_4 us.png



OPC_5 us.png



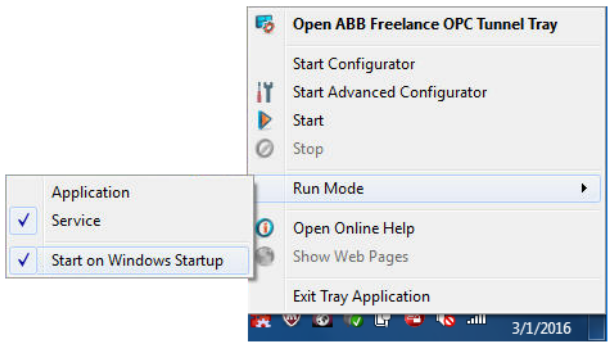
OPC_6 us.png

- Press the key combination **<Ctrl+S>** or select"**Configuration -> Save**" to save the configuration.

2.2 Automatically start the OPC Server or Trend Server

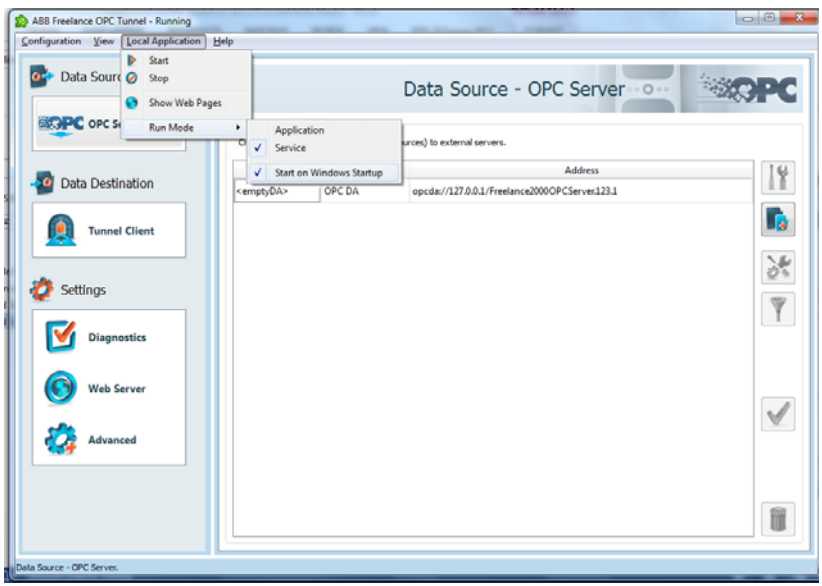
The new OPC Tunnel supports two options for automatically starting the OPC Server or Trend Server.

Option 1: OPC Tunnel Tray -> **Run Mode** -> **Start on Windows Startup**



OPC_19 us.png

Option 2: Advanced Configurator, select "**Local Application** -> **Run Mode** -> **Start on Windows Startup**"

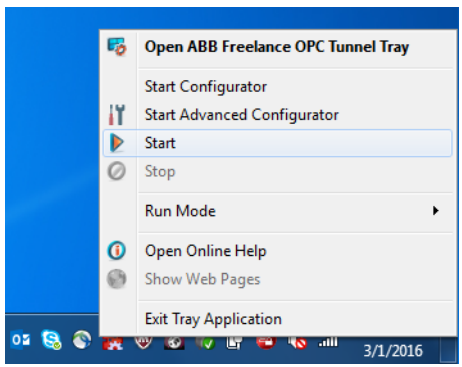


OPC_20 us.png

2.3 Manually start the OPC Server or Trend Server

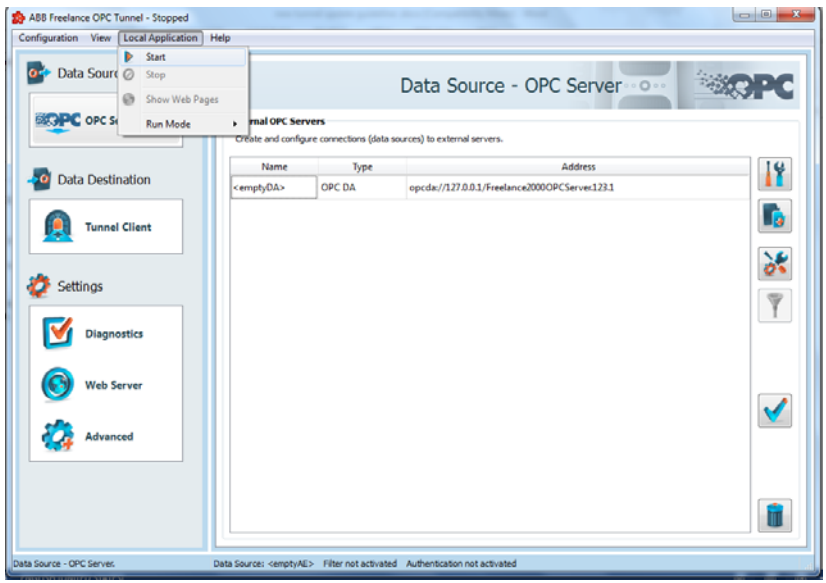
The new OPC Tunnel supports two options for manually starting the OPC Server or Trend Server.

Option 1: OPC Tunnel Tray -> **Start**



OPC_7 us.png

Option 2: Advanced Configurator, select "**Local Application -> Start**"

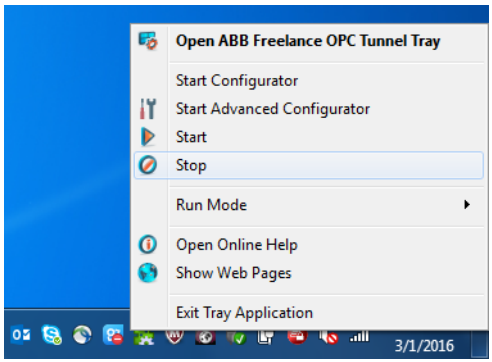


OPC_8 us.png

2.4 Manually stop the OPC Server / Trend Server

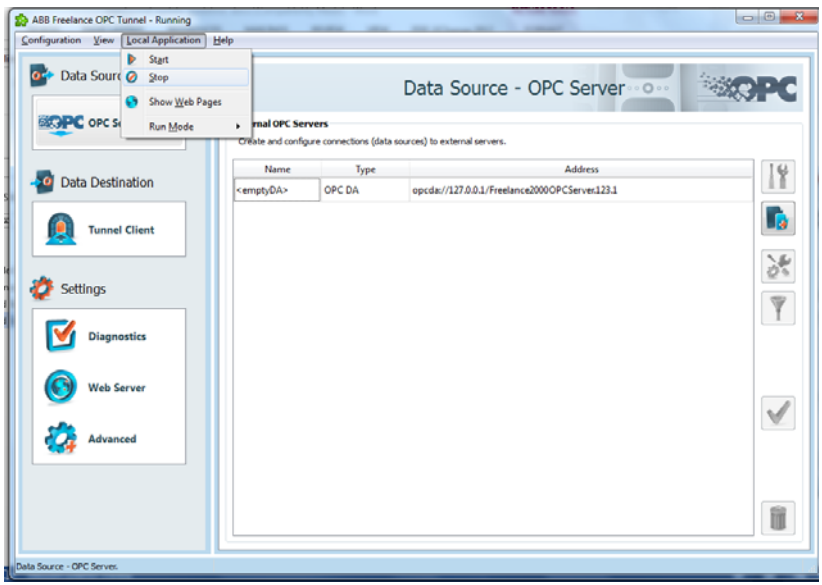
The new OPC Tunnel supports two options for manually stopping the OPC Server or Trend Server.

- Option 1: OPC Tunnel Tray -> **Stop**



OPC_9 us.png

- Option 2: Advanced Configurator, select "**Local Application -> Stop**"



OPC_10 us.png

2.5 Update item prefix

2.5.1 General description

The Freelance OPC Tunnel can be configured with empty or non-empty item prefix.

After changes of item prefix the Freelance Engineering project must be updated. Proceed as follows:

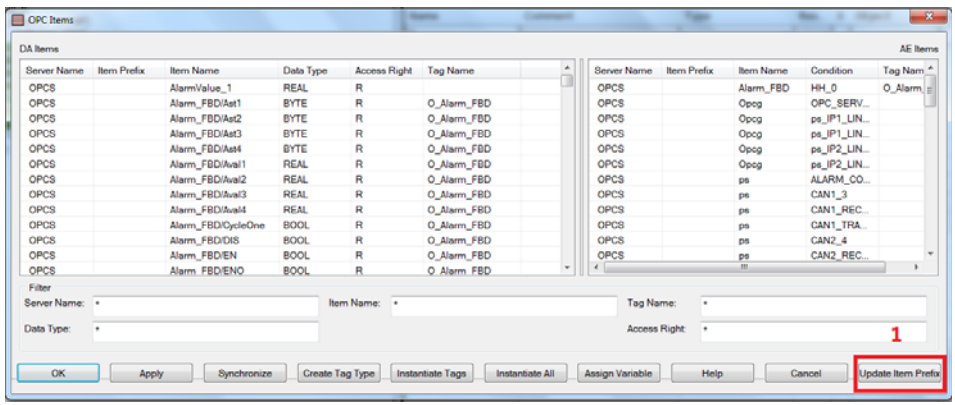
- Change to configuration mode.
- Select **System -> OPC item list** to open the "OPC Items" dialog.
- Update the item prefix.
- Press **<OK>** or **<Apply>** to save the changes.

Here, OPC items in "OPC items" are called as DB items and OPC items in Freelance OPC Server are called as OPC Server items. Both DB items and OPC Server items can be divided into unique items and reduplicate items. That is:

- Unique DB item: Item which does not have same item (regardless of the item prefix) in the OPC item list (database).
- Unique OPC Server item: Item which does not have same item (regardless of the item prefix) in the OPC Server.
- Reduplicate DB item: Item which has the same item (regardless of item prefix) in the OPC item list (database).
- Reduplicate OPC Server item: Item which has the same item (regardless of item prefix) in the OPC Server.

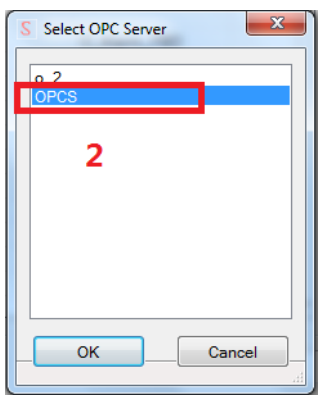
2.5.2 Update unique item

- Press <**Update Item Prefix**>.



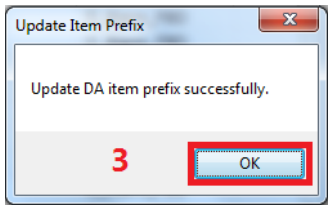
OPC_11 us.png

- Select the target OPC Server.



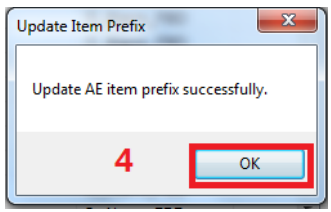
OPC_12 us.png

- Press <**OK**>.



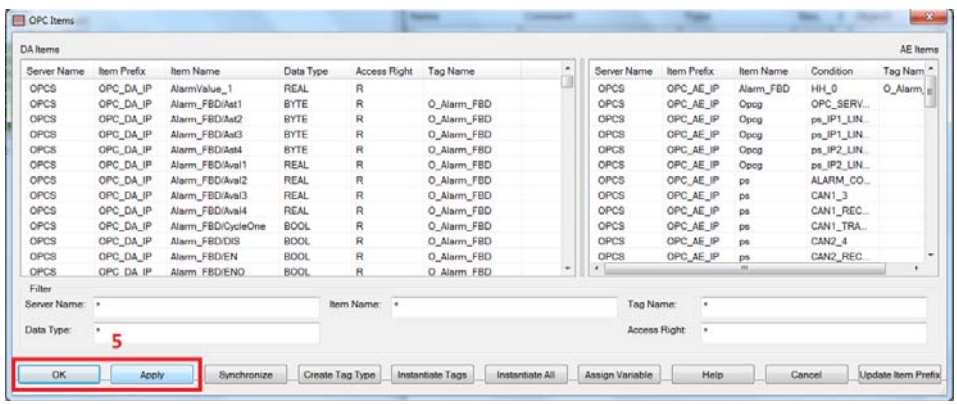
OPC_13 us.png

- Press <**OK**>.



OPC_14 us.png

Press <**OK**> or <**Apply**> to save the update.



OPC_15 us.png

Check and download the changes to Freelance Operations

2.5.3 Update reduplicate items

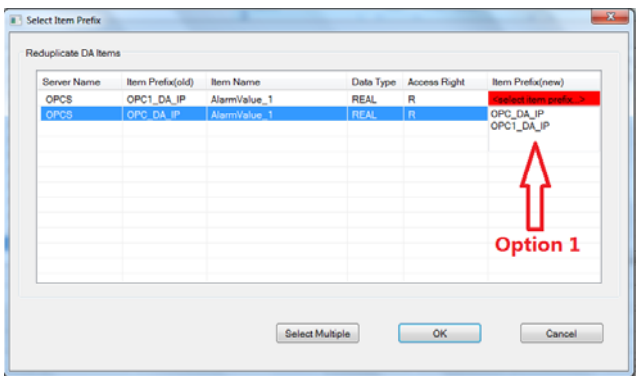
The procedure for updating reduplicate items is similar to that for updating a unique item. The major difference is that updating reduplicate items requires the user to select the target item prefix in the “Select Items Prefix” dialog, which happens between step 2 and step 3 (for reduplicate DA item) and/or between step 3 and step 4 (for reduplicate AE items). The other steps are the same.

There are two options to select the item prefix in the “Select Items Prefix” dialog.

- Option 1: Click the **<select item prefix…>** cell to select the target item prefixes one by one
- Option 2: Select multiple lines and press <Select Multiple> to select the target item prefix.

Option 1: Click the <select item prefix…> cell to select the target item prefixes one by one

- Click the **<select item prefix…>** cell to select the target item prefix

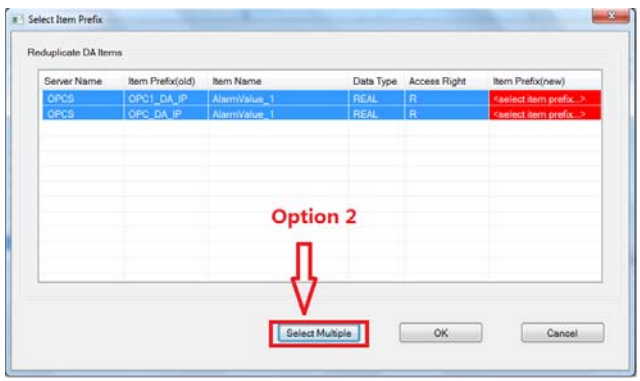


OPC_16 us.png

- Select the rest.
- Press **<OK>** to save the selections.

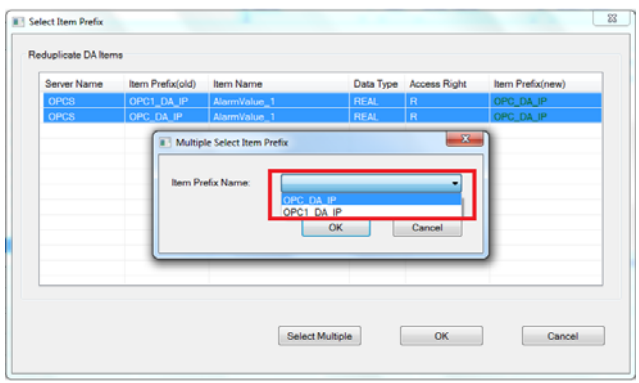
Option 2: Select multiple lines and press <Select Multiple> to select the target item prefix

- Press and hold the <**Shift**> key and then click with the mouse to select multiple lines.
- Press <**Select Multiple**>.



OPC_17 us.png

- Select the target item prefix for the selected items.



OPC_18 us.png

- Press <**OK**> to save the selections.

3 Installation Examples

3.1 Using a Freelance Trend Server in a Freelance system

3.1.1 Overview

The Freelance Trend Server allows you to configure trend displays that are based on variables of the Freelance system without using a trend acquisition function block. The configuration of these trend displays can be done generally in the Freelance Engineering, or user-specific on a Freelance Operations station.

Additionally, via the Trend Server the optional Control Aspect can be used to display online values and locks.

3.1.2 Installing the Trend Server

Start the Freelance setup program on the Trend Server PC and select the installation mode “Custom” and then in the install tree

Server & Gateways / Trend server

Additionally, the component “OPC Tunnel” is selected automatically.

Complete the installation and create an instance of the Trend Server by entering a resource ID, e.g. number 99.

Finish the Freelance setup.

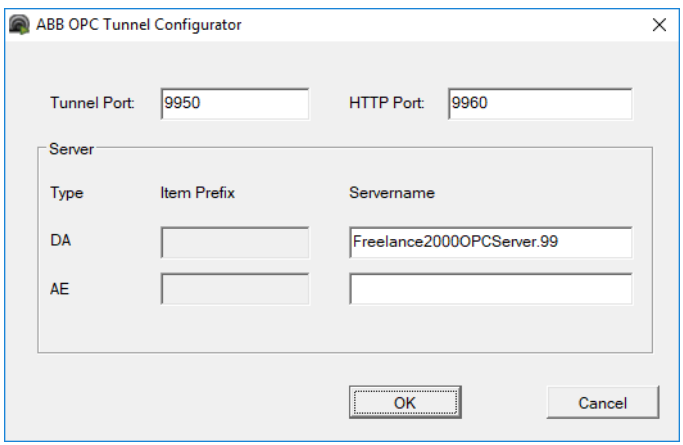
3.1.3 Configuring the OPC Tunnel

Call the ”Configurator” of the OPC Tunnel from the start menu:

Windows 7:
Start > Programs > ABB > Freelance > OPC Tunnel > Configurator

Windows 10:
Start > ABB > Configurator

Enter the name of the Trend Server in the DA Server field (Data Access). For Freelance Trend Server this is the name of the Freelance OPC Server follow by dot and the resource ID. In this example “Freelance2000OPCServer.99”. Delete the entry in the AE Server field (Alarms&Events). Close the dialog with the **OK** button.



OPCTunnelConf1_us.png

3.1.4 Restarting the OPC Tunnel

As the configuration of the OPC Tunnel has changed, the tunnel must be restarted:

Windows 7:
Start > Programs > ABB > Freelance > OPC Tray

Windows 10:
Start > ABB > OPC Tray

Select tunnel icon from the task bar notification area, call context menu with a right mouse click and select **Start**

3.2 Connecting a 3rd-party OPC Server to a Freelance system

3.2.1 Overview

If values from any 3rp-party system are to be used in a Freelance system, the 3rd-party OPC server must be known and connected within the Freelance system.

The connection of an AC500 OPC server is described here as an example. For your specific usage perform the described steps according to your application.

3.2.2 Installing the OPC Server and the OPC Tunnel

First install the 3rd-party OPC Server, e.g. AC500 OPC server, on a PC following the vendor description.

Then start the Freelance setup program on this PC to install the OPC Tunnel software. For this, select installation mode “Custom” and then in the install tree

Server & Gateways / ABB OPC Tunnel

Finish the Freelance setup.

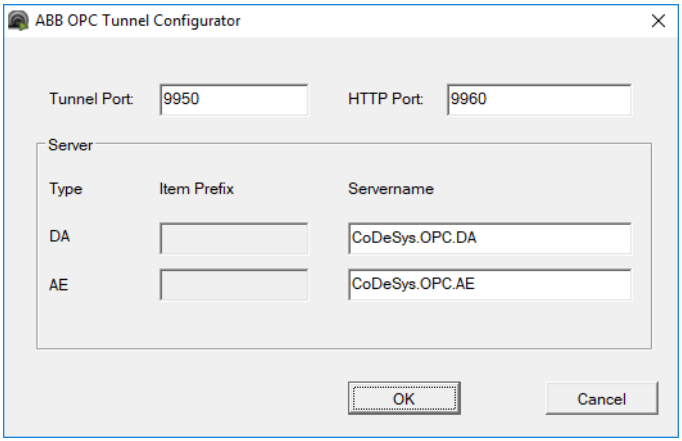
3.2.3 Configuring the OPC Tunnel

Call the ”Configurator” of the OPC Tunnel from the start menu:

Windows 7:
Start > Programs > ABB > Freelance > OPC Tunnel > Configurator

Windows 10:
Start > ABB > Configurator

Enter the names of the Data Access and Alarms&Events servers of the installed OPC server in the dialog, e.g. for an AC500 OPC server enter “CoDeSys.OPC.DA” for the DataAccess server (DA server) and “CoDeSys.OPC.AE” for the Alarms&Events server (AE server). If you do not know the program names of the OPC server, contact the vendor of the OPC software.



OPCTunnelConf2_us.png

3.2.4 Restarting the OPC Tunnel

As the configuration of the OPC Tunnel has changed, the tunnel must be restarted:

Windows 7:
Start > Programs > ABB > Freelance > OPC Tray

Windows 10:
Start > ABB > OPC Tray

Select tunnel icon from the task bar notification area, call context menu with a right mouse click and select **Start**

3.3 Special use case: One Freelance OPC Server and one Trend Server on same PC

3.3.1 Installing the OPC Server and the Trend Server

Start the Freelance setup program to install the OPC Server and the Trend Server software on the PC. Together with the Trend Server the OPC Tunnel software package will also be installed.

Use the Freelance “Settings” tool to create one instance of the OPC Server and the Trend Server, each. In this example, the Freelance OPC Server is created with resource ID 123 and the Trend Server with resource ID 99.

Finish the Freelance setup.

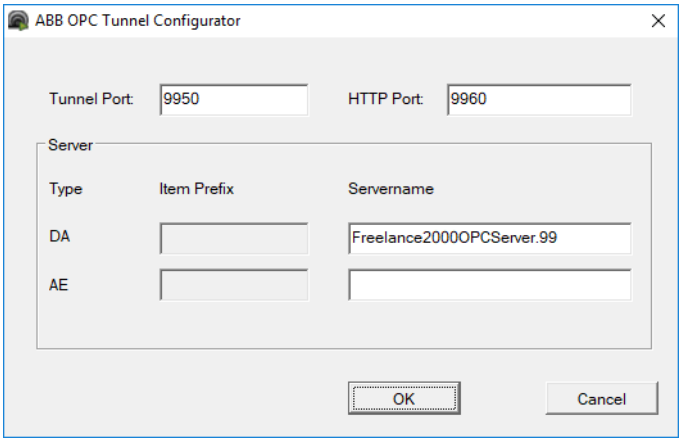
3.3.2 Configuring the OPC Tunnel

Call the ”Configurator” of the OPC Tunnel from the start menu:

Windows 7:
Start > Programs > ABB > Freelance > OPC Tunnel > Configurator

Windows 10:
Start > ABB > Configurator

Enter the name of the Trend Server in the DA Server field (Data Access), in this example “Freelance2000OPCServer.99”. Delete the entry in the AE Server field (Alarms&Events). Close the dialog with the **OK** button.



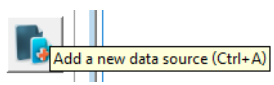
OPCTunnelConf1_us.png

Start the “Advanced Configurator” of the OPC Tunnel from the start menu.:

Windows 7:
Start > Programs > ABB > Freelance > OPC Tunnel > Advanced Configurator

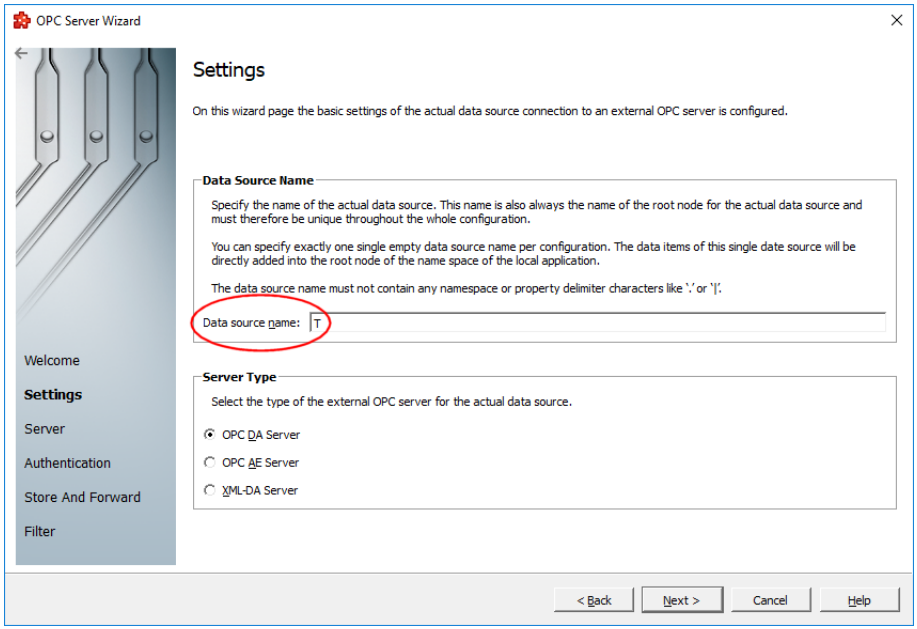
Windows 10:
Start > ABB > Advanced Configurator

In the right part of the window select **Add a new data source**.



OPCTunnelConfAdvanced1_us.png

The OPC Server Assistant opens, click on **Next** to make the further settings.



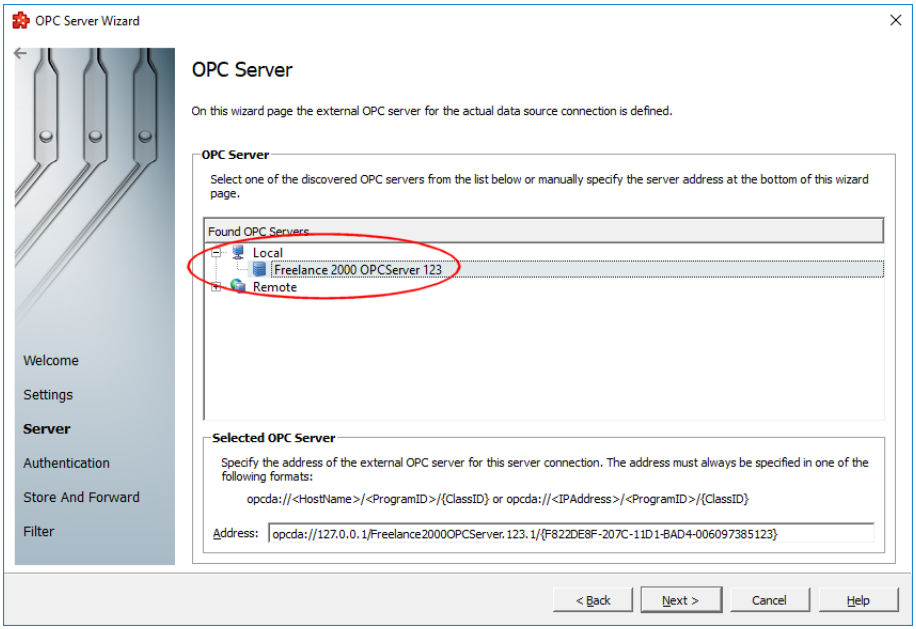
OPCTunnelConfAdvanced2_us.png

Insert a value for the **Data source name** attribute, e.g. "T"

In previous Freelance releases, the data source name was named as ItemPrefix. For updates, any existing ItemPrefix tag should not be changed.
The ItemPrefix configuration (Data source name) is needed, if more than one OPC server is used on the same PC. All OPC servers on a PC use the same tunnel. The ItemPrefix allows for unique assignment of the data and alarms to a single OPC server in order to avoid any confusion when using identical names.

Do not change the server type.

Click **Next** to enter the OPC server.

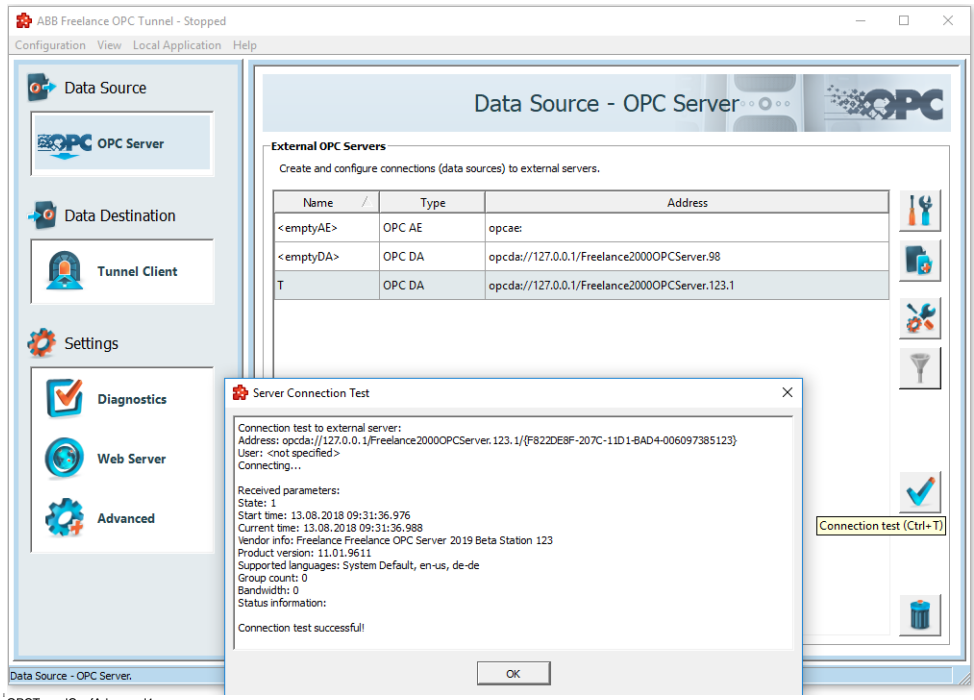


OPCTunnelConfAdvanced3_us.png

After double-clicking on **Local**, the available local OPC servers are searched. Now select the previously configured Freelance OPC Server and click **Next**.

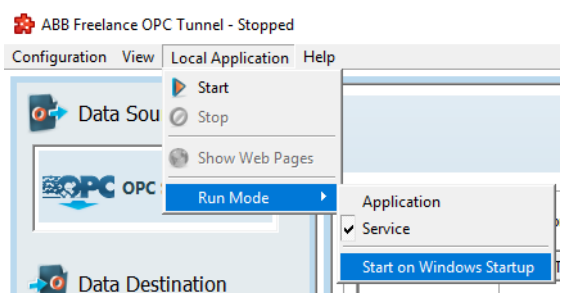
Click **Next** in the following dialogs “Authentication" and "Store And Forward", complete the configuration with clicking the button **Finish** in the "Filter" dialog. No entries are necessary in these dialogs.

Click on the **Connection test** icon in the right window area to perform a connection test.



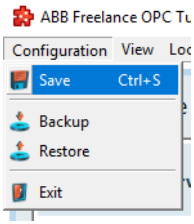
OPCTunnelConfAdvanced4_us.png

The option **Start at Windows start** at the menu **Local application > Execution mode** should be selected to start the OPC tunnel automatically after every restart of the computer.



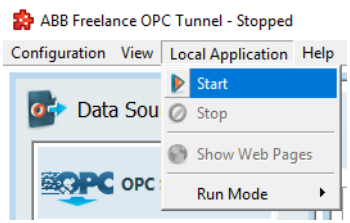
OPCTunnelConfAdvanced5_us.png

Finally, save the configuration via the menu item **Configuration > Save**

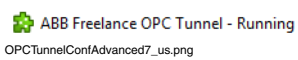


OPCTunnelConfAdvanced6_us.png

and start the OPC tunnel via **Local application > Start**.



OPCTunnelConfAdvanced7_us.png

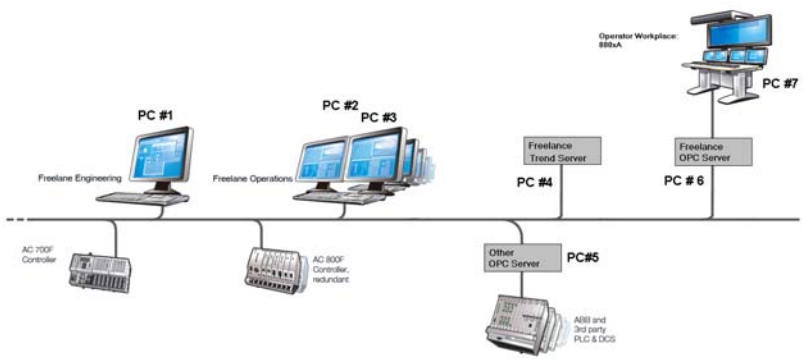


OPCTunnelConfAdvanced7_us.png

3.4 Freelance System

3.4.1 System structure

The following Freelance system is to be installed and configured:



Tunnel - Freelance System Structure.bmp

The system consists of the following components:

- One Freelance Engineering station (for configuration of one AC 700F and one AC 800F controller) - **PC #1**
- Two Freelance Operations stations - **PC #2, PC #3**
- One Freelance Trend Server (for user-defined trends in Freelance Operations) - **PC #4**
- One 3rd-party controller with 3rd-party OPC Server (to be connected to Freelance Operations for DataAccess and Alarm/Event) - **PC #5**
- One Freelance OPC Server (for connection of an 800xA system) - **PC #6**
- One 800xA System (as OPC client via Freelance Connect) - **PC #7**

3.4.2 Installing the components

PC #1: Freelance Engineering Station

Start the Freelance setup program and install the ***Freelance Engineering*** software.

PC #2: Freelance Operations Station 1

Start the Freelance setup program and install the ***Freelance Operations*** software.

PC #3: Freelance Operations Station 2

Start the Freelance setup program and install the ***Freelance Operations*** software.

PC #4: Freelance Trend Server

Start the Freelance setup program and install the ***Freelance Trend Server*** software. Together with the Trend Server the ***ABB OPC Tunnel software*** will be installed.

Create an instance of the Trend Server by entering a resource ID via the Settings tool.

Configure the OPC Tunnel as described in the example “Freelance Trend Server” (see above): Start the Configurator, enter for the DA Server (DataAccess) *FreelanceOPCServer.<ResID>* and delete the entry in the field for the AE Server (Alarms&Events). Restart the OPC Tunnel software.

PC #5: 3rd-party OPC Server station

Start the setup program of the 3rd-party OPC Server. Install the software and create an instance by following the instructions of the vendor.

Start the Freelance setup program and install the ***ABB OPC Tunnel*** software.

For configuring the tunnel, start the “Configurator” from the start menu:

Windows 7:
Start > Programs > ABB > Freelance > OPC Tunnel > Configurator (or **Advanced Configurator)**

Windows 10:
Start > ABB > Configurator (or. **Advanced Configurator**)

For the DataAccess Server (DA Server) and the Alarms&Events Server (AE Server), enter the names of the OPC servers (see example “3rd-party OPC Server station”). If you do not know the program names of the OPC server, contact the vendor of the OPC software.

PC #6: Freelance OPC Server

Start the Freelance setup program and install the ***Freelance OPC Server*** software.

Create an instance of the OPC server by entering a resource ID via the Settings tool.

This OPC Server is used to provide values from the Freelance system to the 800xA System. The Freelance Operations stations do not need values from this OPC Server. Thus, the OPC Tunnel software is **not** needed on this PC.

PC #7: 800xA System

Start the setup program of the 800xA System and install the required software packages. Follow the instructions in the 800xA installation manual and configure the connection with the Freelance OPC Server which is installed on PC #6.

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www.abb.com/freelance
www.abb.com/controlsystems

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