

Application Guide:

**Configure KEPServer Enterprise as an OPC UA Server**

*This guide provides the steps to configure KEPServer Enterprise as an OPC UA Server.*

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# Prerequisites

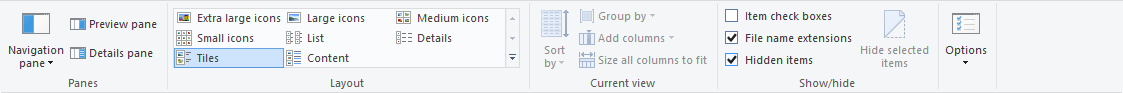
## Software Required

* FactoryTalk Services Platform (FTSP) V6.10 and greater
* OPC UA Local Discovery Server (LDS) 1.03.400
* KEPServer Enterprise V11.00 (6.6) or greater

Note: FactoryTalk Linx Gateway v6.10 and greater will install FTSP and includes OPC UA LDS

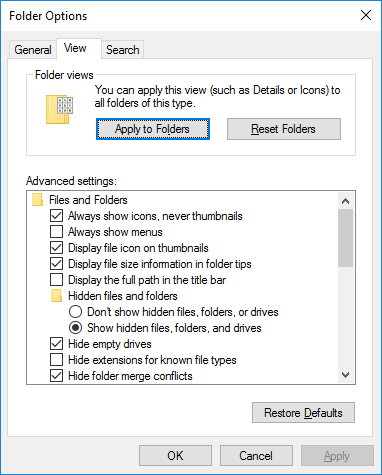
## Ensure ‘File Name Extensions’ and ‘Hidden Items’ are checked.

* Open File Explorer, select View, and ensure ‘File Name Extensions’ and ‘Hidden items’ are checked.



or

* Show hidden files, folders, and drives.



## Host files in workgroup

* Configure HOSTS files for PC if in a workgroup.

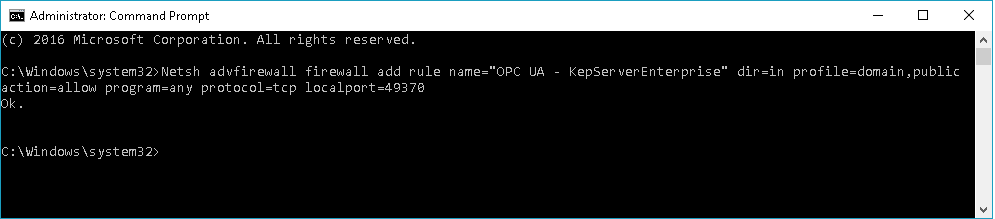
# Create Windows Firewall incoming rule.

## Create the Windows Firewall Incoming rule for KEPServer Enterprise:

* Open a CMD with admin rights and enter the following:

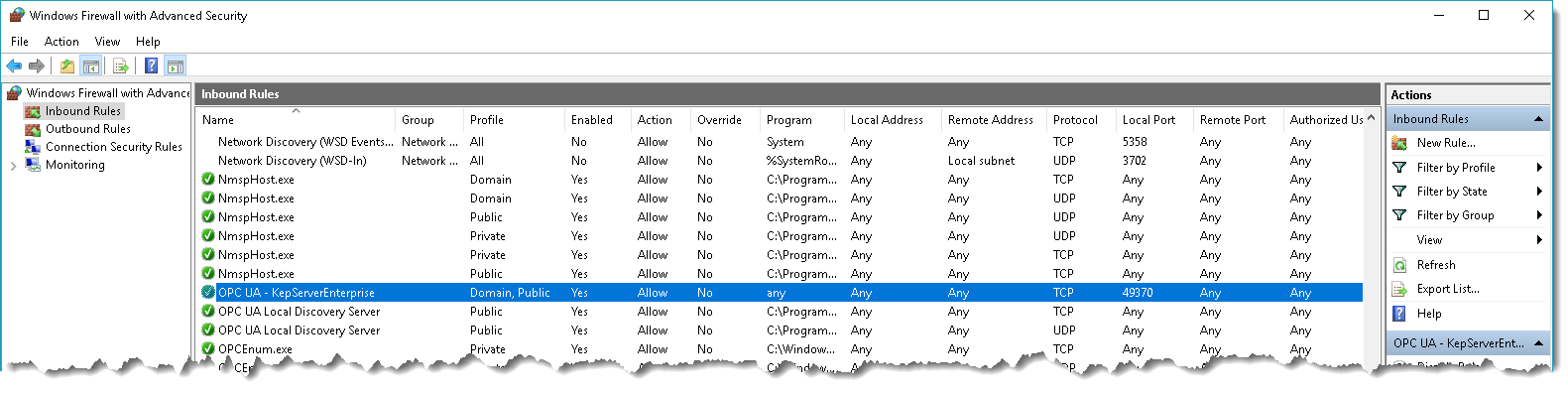
Netsh advfirewall firewall add rule name="OPC UA - KEPServerEnterprise" dir=in profile=domain,public action=allow program=any protocol=tcp localport=49370

* Select Enter to run the command.



## Open ‘Windows Firewall with Advanced Security’ to verify the entry(s) was created successfully.

* Select Windows Start, type ‘Windows Firewall with Advanced Security’, and click to open the utility.
* Scroll down and verify 'OPC UA - KEPServerEnterprise' is listed
* Scroll to the right to see the port number 49370 is listed.

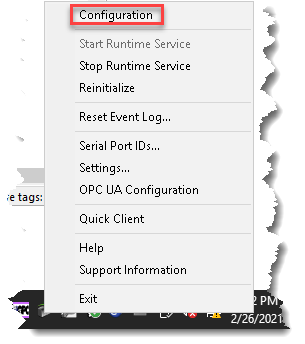


**Note:** The ‘Windows Firewall with Advanced Security’ utility can be used to create the incoming firewall rule by right-clicking ‘incoming rule’ and using the wizard with the parameters listed in the Command line above.

# Configure OPC UA settings for Project.

## Open KEPServer Enterprise Configuration utility

* Right-click on the KEPServer Enterprise icon in the system tray and select ‘Configuration’.



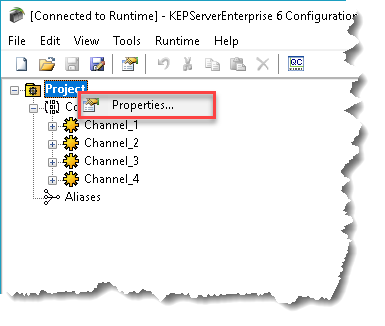
## Open the KEPServer Enterprise project.

* Select File -> Open, browse to the KEPServer Enterprise project.

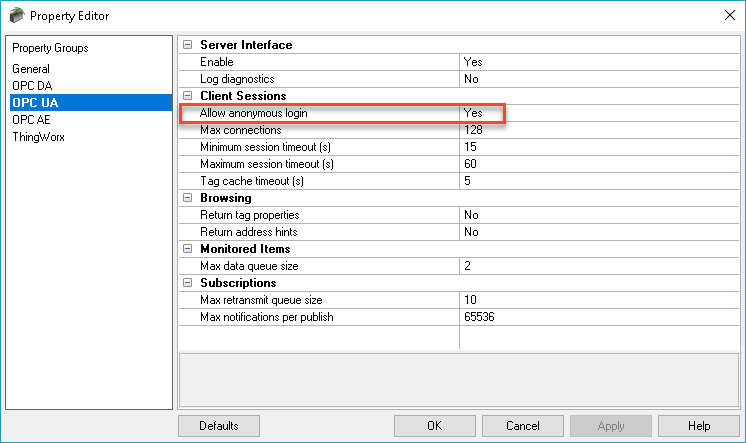
(e.g., C:\Program Files (x86)\Kepware\KEPServerEnterprise 6\Projects\simdemo.opf)

## Configure OPC UA settings for projects.

* Right-click on ‘Project…’ and select Properties.



* On the left, under Property groups, Select 'OPC UA'



* Verify if 'Allow Anonymous Login' is set to Yes.
  + Set to ‘Yes’, when initially configuring to verify OPC UA Client-Server connection.
  + Set to ‘No’ for additional layer of security.
* Leave 'Allow Anonymous Login' set to Yes.

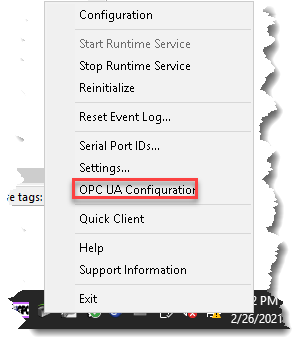
**Note:**

* When set to Yes, a username and password are not required to establish a connection.
* If set to No, users cannot login as the default user in the User Manager. Users can login as the Administrator (provided that a password was set during installation.)
* Use 'User Manager' to set a password for ‘Administrator’ or create a new user and set all user permissions.
* See the help for additional details.

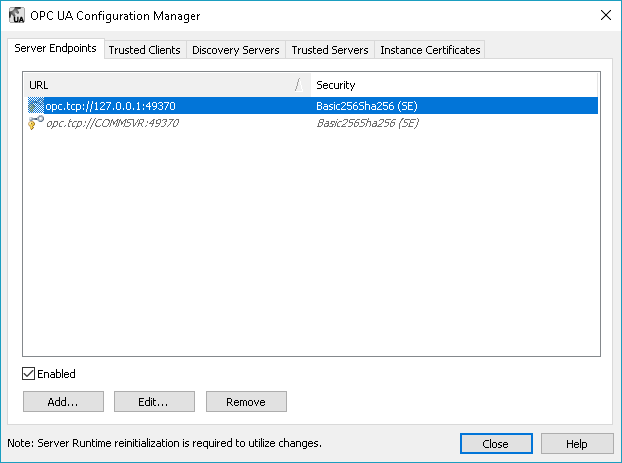
# Configure OPC UA Server endpoints

## Launch KEPServer Enterprise OPC UA Configuration utility

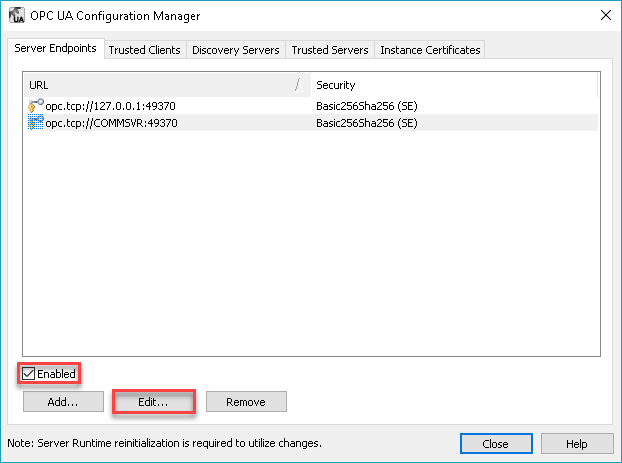
* Right-click the Kepware icon in the System Tray and select "OPC UA Configuration" from the pop-up menu.



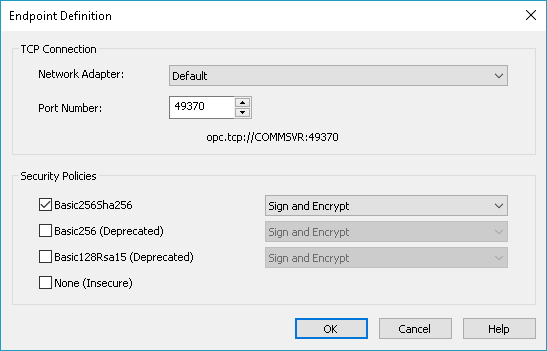
* Select the "Server Endpoints" tab
* Highlight the URL ‘opc.tcp://127.0.0.1:49370’ entry and uncheck the “Enabled” box.



* Highlight the URL ‘opc.tcp://{MachineName}:49370’ selection and check the "Enabled" box.
* With the URL ‘opc.tcp://{MachineName}:49370’ selection highlighted, Select the 'Edit…' button.



* Check the policies supported by the OPC UA Client.

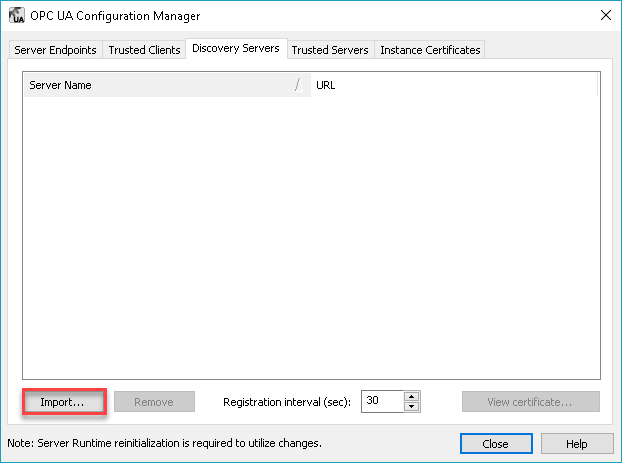


* Select 'OK'"
* Leave the OPC UA Configuration Window Open.

# Register OPC UA server with OPC UA Local Discovery Server (LDS)

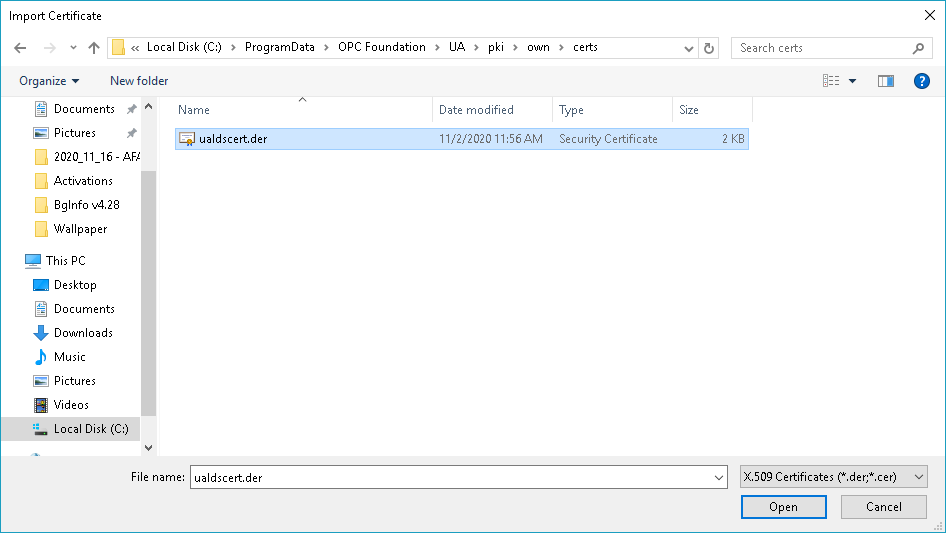
## Configure KEPServer Enterprise to trust OPC UA LDS

* On the OPC UA Configuration Manager, Select the "Discovery Servers" tab.
* Click the "Import..." button.

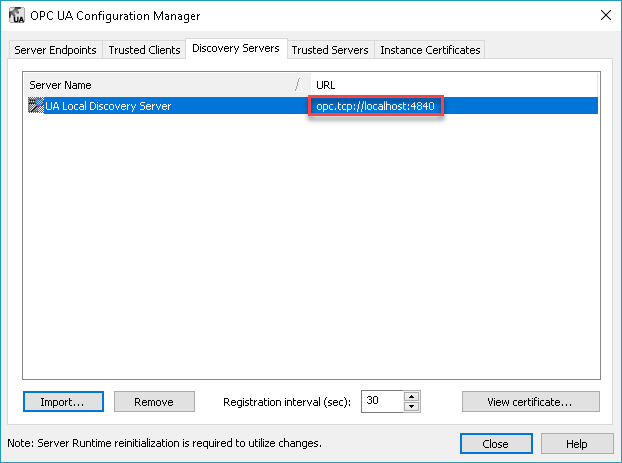


* Navigate to the following location and select the file:

C:\ProgramData\OPC Foundation\UA\pki\own\certs\ualdscert.der"



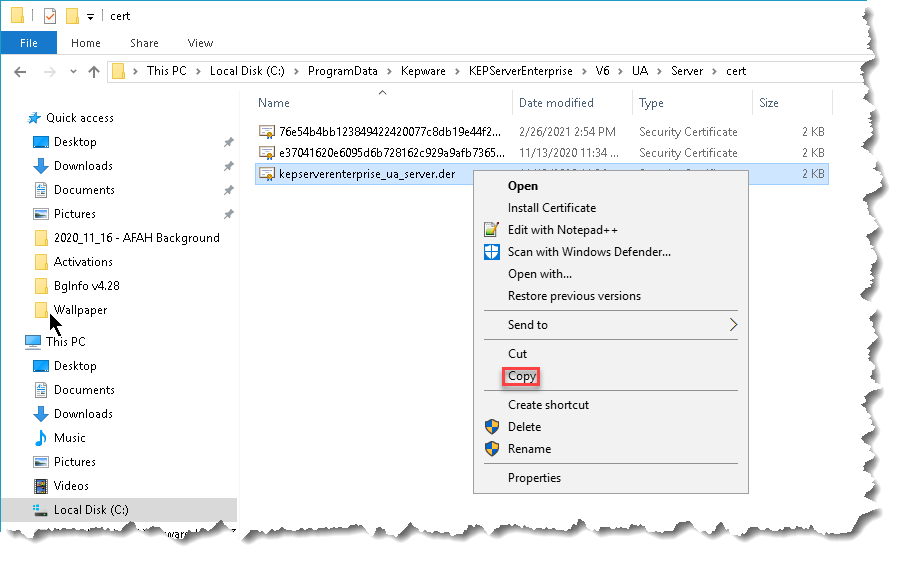
* Click ‘Open’.
* Double-click the URL and change 'localhost' to the PC name where KEPServer Enterprise is installed.



* Close the OPC UA Configuration Manager Window.

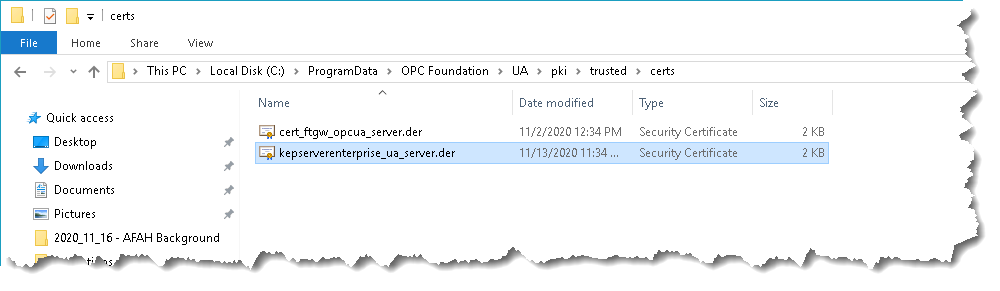
## Configure OPC UA LDS to trust KEPServer Enterprise.

* Open File Explorer
* Copy the KEPServer Enterprise Certificate to the OPC UA LDS trusted folder location:
* Copy the file “kepserverenterprise\_ua\_server.der” from the folder "C:\ProgramData\Kepware\KEPServerEnterprise\V6\UA\Server\cert



* Paste the file into the folder:

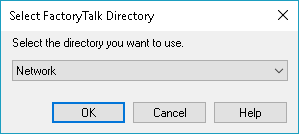
"C:\ProgramData\OPC Foundation\UA\pki\trusted\certs"



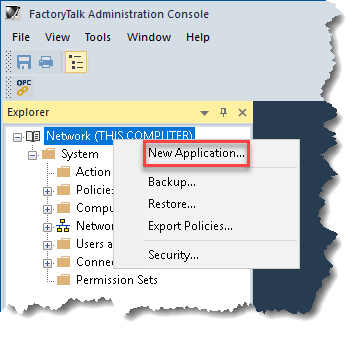
# Configure OPC UA Client (FactoryTalk Linx OPC UA Connector) to communicate with OPC UA Server endpoints

## Create FactoryTalk application

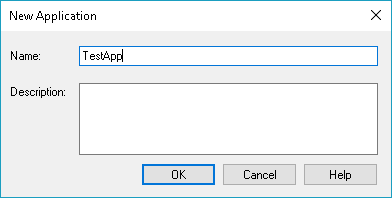
* Open FactoryTalk Administration console
* Select Network



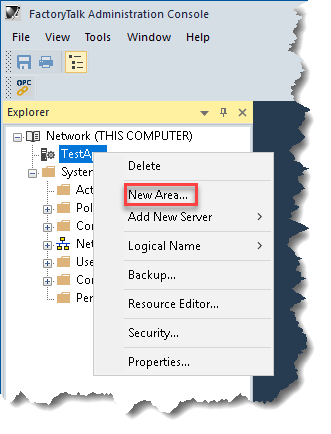
* Create a new application.
  + Right-click on Network
  + Select new application.



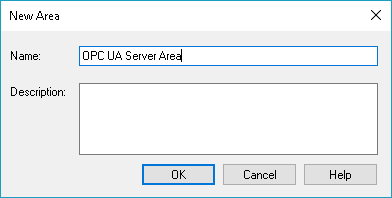
* + Type in a name (e.g., TestApp)
  + Click OK.



* Create a new area.
  + Right-click Application name (e.g., TestApp)
  + Select 'New Area…'

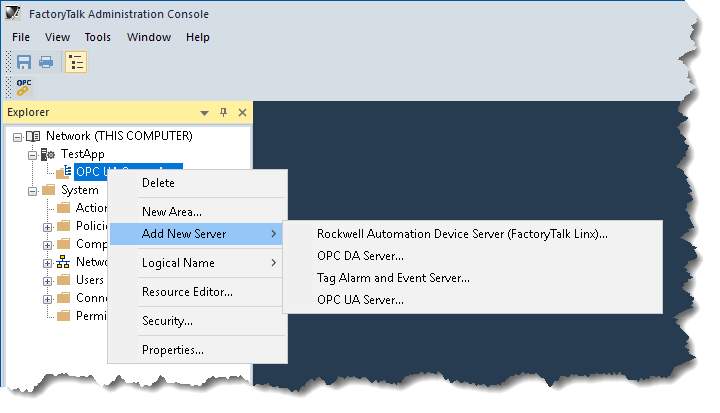


* + Type in a name for the area (e.g., OPC UA Server Area)
  + Click OK

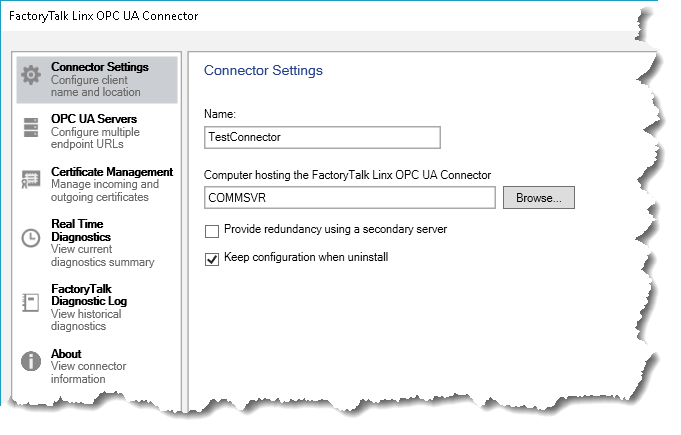


## Create OPC UA Connector

* Right-click on the area (e.g., OPC UA Server Area) and select 'OPC UA Server….'

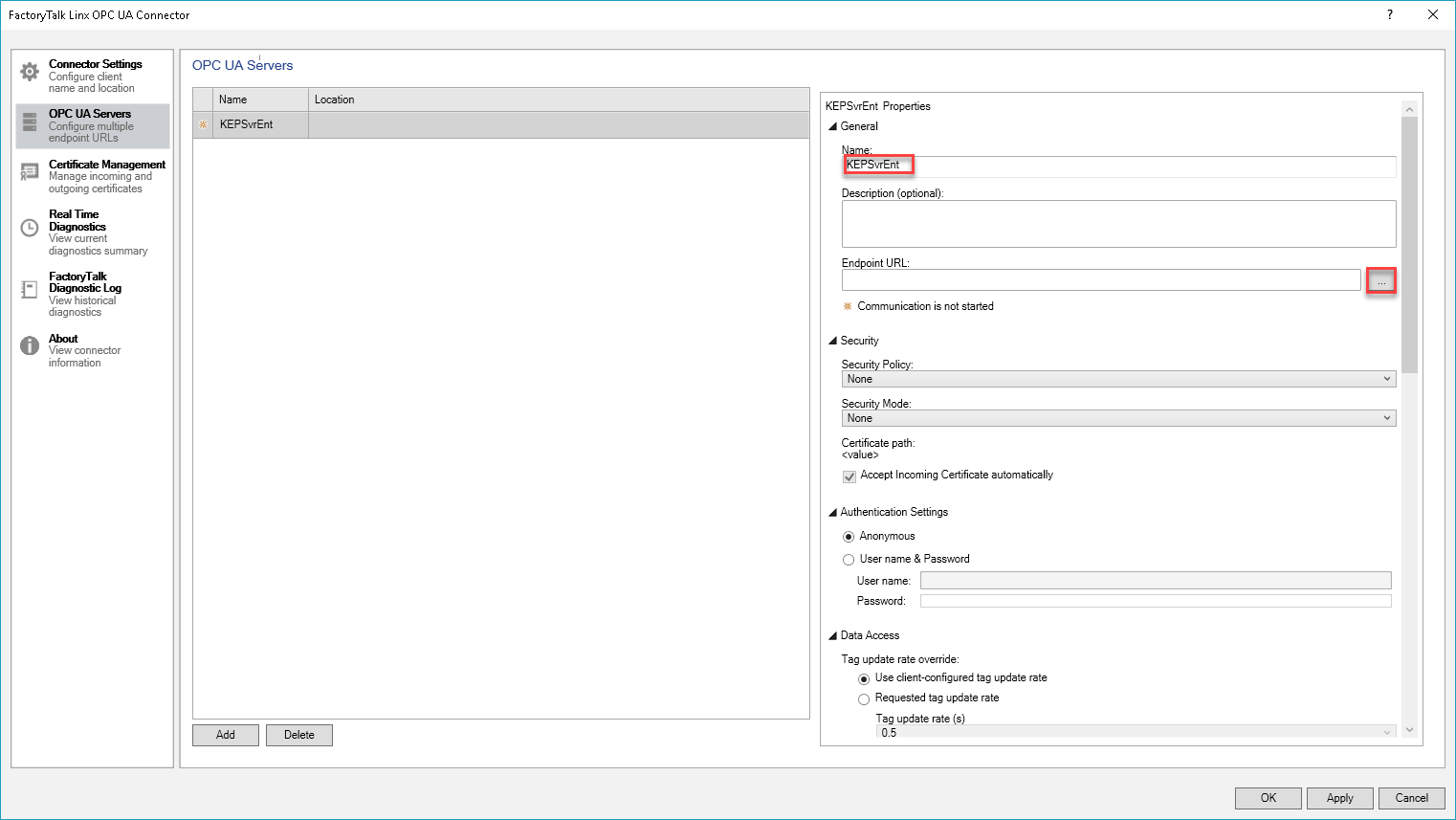


* Name the connector (e.g., 'TestConnector')
* Select the PC which will host the service.
  + Use the default PC.



## If OPC UA Server is registered with OPC UA LDS, browse for OPC UA Endpoints.

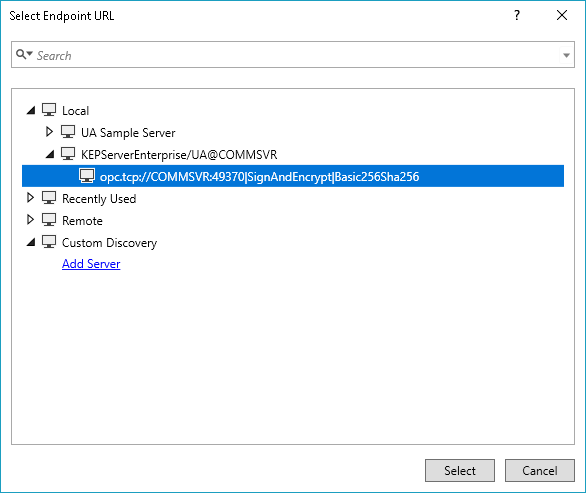
* Click 'OPC UA Servers' tab
* Under Name, type in a name for the Server endpoint (e.g., KEPSvrEnt)
* Under the heading 'Endpoint URL’, Click the button '…' to browse OPC UA LDS for UA Servers



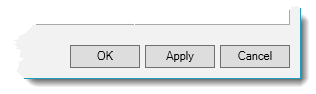
* On the 'Server Endpoint URL' window, Click Local -> KEPServerEnterprise/UA@{PC Name}
* Click the endpoint:

'opc.tcp://{PC Name}:49370|SignAndEncryptBasic256Sha256'

* Click 'Select' to add the endpoint.



* Click 'Apply' to start the OPC UA Connector service.



**Note1:** The FactoryTalk OPC UA Connector (OPC UA Client) does not generate its certificate until its service is started.

**Note2:** The FactoryTalk OPC UA Connector (OPC UA Client) contains an option to ‘Accept Incoming Certificate Automatically’ (i.e., Trust OPC UA Servers automatically)



## (Optional) If UA Server is NOT registered with OPC UA LDS, manually add UA Server endpoints.

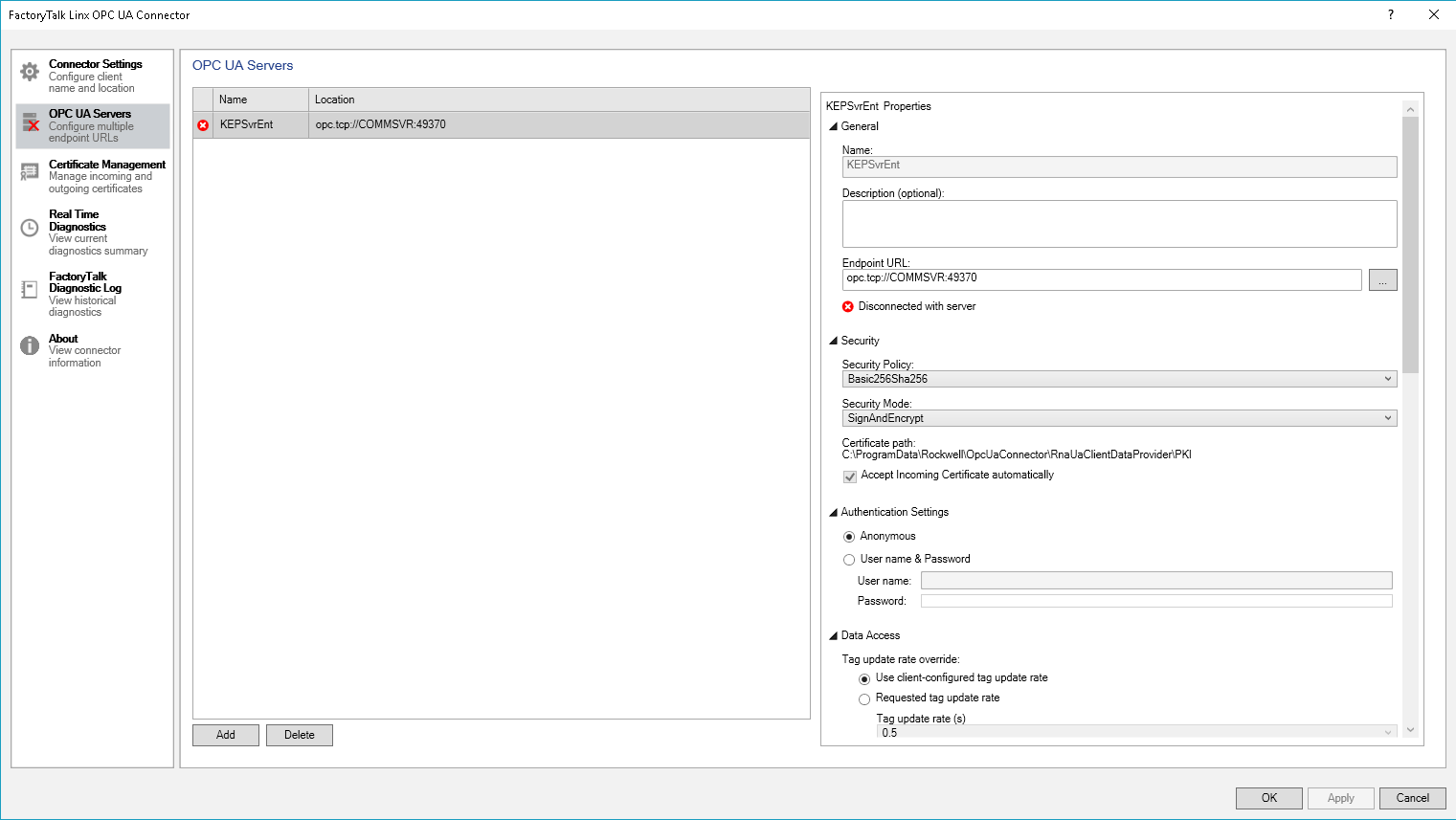
* Under 'Endpoint URL:'
* Type in the address for the OPC UA server endpoint
  + opc.tcp://{PC Name}:49370
* Configure security settings for endpoints.
  + Select security policy.
  + Select security mode.
* Configure Authentication Settings
  + ‘Anonymous’ (if the UA Server supports this settings)

Or

* + Enter Username and Password required for the endpoint.
* Click apply to start the OPC UA Connector service

## Check OPC UA connection status.

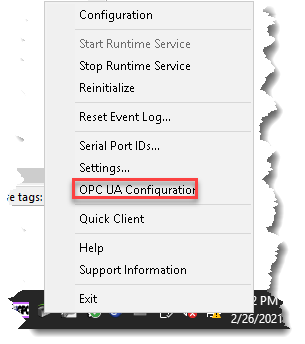
* Underneath the Endpoint URL, the following connection status will be displayed.
  + ‘Communication is not started.’
  + ‘Connecting with server.’
  + ‘Disconnected with server'.
* Leave the ‘FactoryTalk Linx OPC UA Connector’ window open.



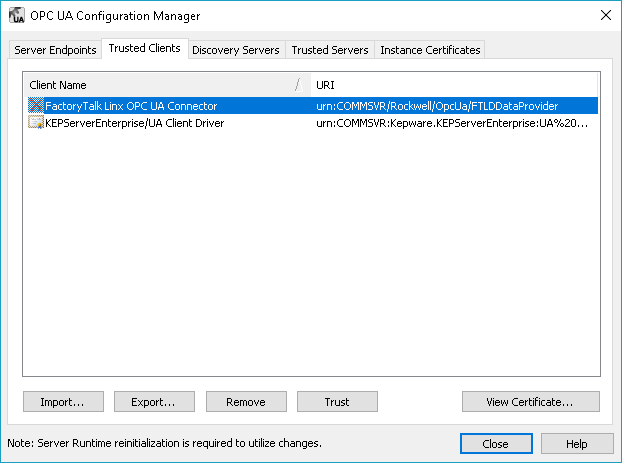
**Note:** If the status displays ‘Disconnected with server.’ The most likely cause is that KEPServer Enterprise has not been configured to trust the OPC UA Client (FactoryTalk OPC UA Connector)

## If the status displays ‘Disconnected with server.’

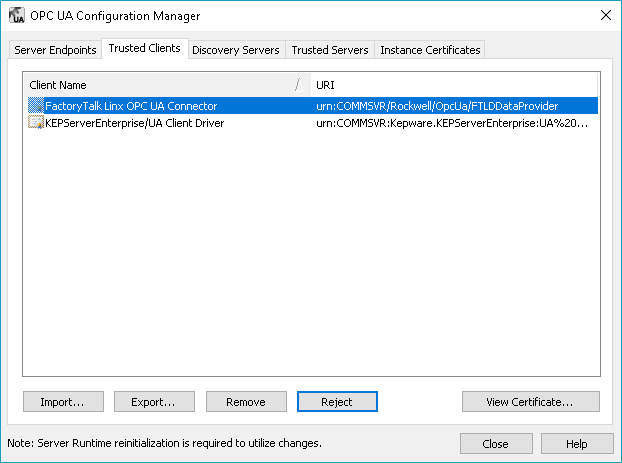
* Right-click the KEPServer Enterprise icon in the System Tray and select "OPC UA Configuration" from the pop-up menu.



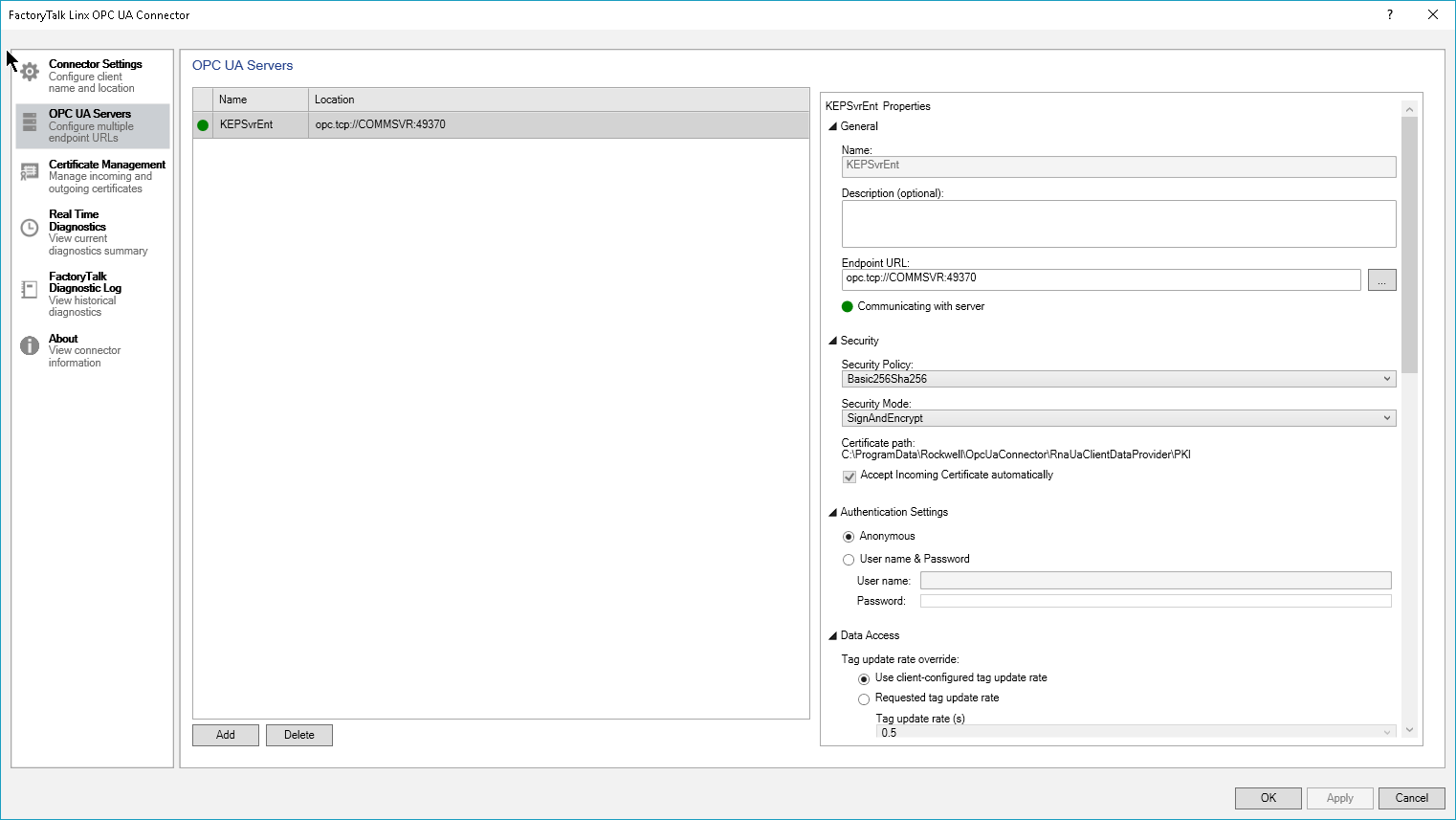
* Select the "Trusted Clients" tab
* Select 'FactoryTalk Linx OPC UA Connector' in the list
  + - * Check if there is a red 'X' to the left of the name.



* Click the 'Trust' button
  + - * The red 'X' will be removed.



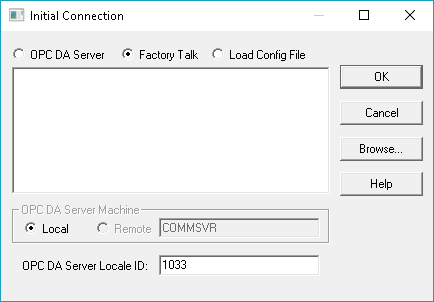
* Click 'Close'
* On the 'FactoryTalk Linx OPC UA Connector’ window
* Underneath the Endpoint URL, check the connection status.
* After approx. 10 seconds, the connection status will display 'Communicating with Server.'



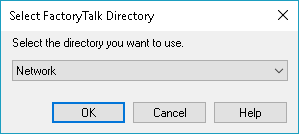
# Verify data from OPC UA Server with FactoryTalk Live Data (FTLD) Test Client

## Open FactoryTalk Live Data Test Client

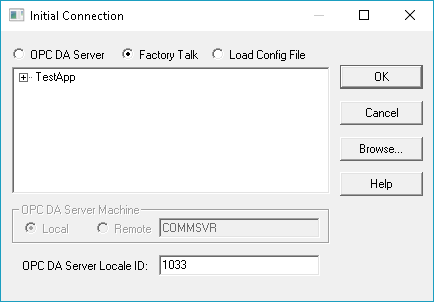
* On the Initial Connection Window
* Select the 'FactoryTalk' radial button.



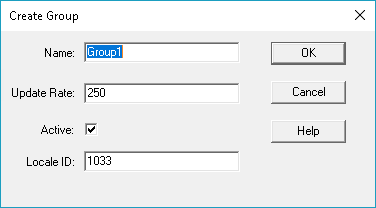
* Select 'Network’
* Click OK



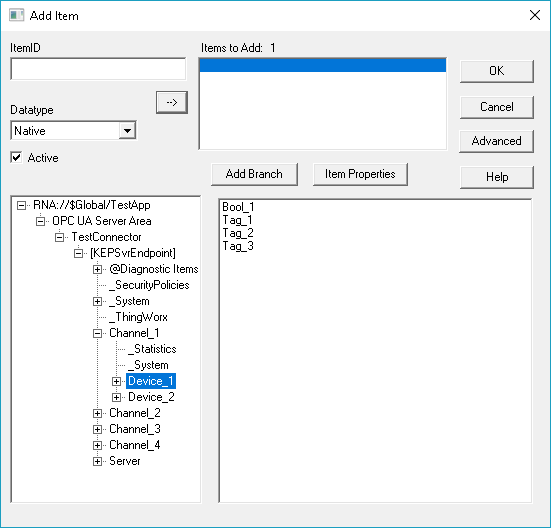
* Highlight the Application (e.g., TestApp)
* Click OK



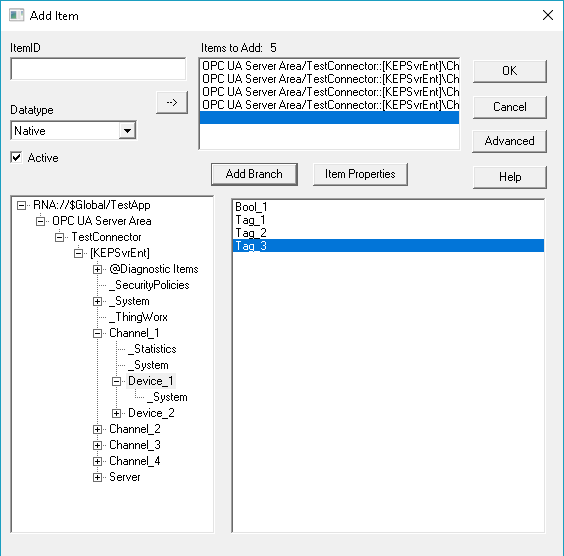
* On the 'Create Group' window, click OK.



* On the 'Add Item' Window, browse for tags.
  + - Navigate to Area name -> Connector name -> OPC UA Server Name
      * (e.g., OPC UA Server Area->TestConnector->KEPSvrEnt)
    - Continue to 'Channel' -> 'Device1', the tags will be listed.



* + - Double-click tags individually to be added. Or
    - Click 'Add Branch' to add all tags listed right hand window.



* + - Click OK to monitor the tags.
  + Verify for all tags 'Current Quality' displays 'Good’.

