Connect to OPC UA Server / Kepware

System Requirements

To make use of this feature, the following system requirements need to be matched.

- KepServerEx V5 (or higher).
- OPC UA Protocol

How to Use

The procedure for a successful OPC UA connection is divided into three main steps.

- KepServerEx OPC UA Server Configuration
- Creating certificates for Engineering and Runtime
 Importing client certificates on OPC UA

KepServerEx Configuration

At KepServerEx project properties, enable support for OPC UA. Use the command "Reinitialize" after changing the settings so they can be applied.

🔯 [Connected to	o Runtime] - KEPServerEX	6 Configuration				— C	
File Edit View	Tools Runtime Hel	2					
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	tivity annel 1	Property Editor	h			;	×
🖃 🔶 Cha	annel2	Property Groups	Server Int	erface			_
	Click to add a device.	General	Enable		Yes		_
	annel3	OPC DA	Log diagnos	tics	INO		- 11
Allases	d Tess	OPC UA		sions	N		_
Advance Advance	ed Tags & Evente	DDE	Max copped	tione	120		_
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Data Lo	oner	OPC HDA	Maximum ses	ssion timeout (s)	10		- 11 - 1
Add	Log Group	ThingWorx	Tag gage t	import (a)	5		_
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- 🔁 Add	Poll Group		Beturn tagin	monties	No		_
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- 🏷 Add	Splunk Connection			items	110		_
🖻 💏 loT Gat	eway		Max data qu		2		
Add	Agent		Subscripti	ons	-		
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In the Server EndPoints tab, configure the endpoint parameters (network adapter, port number, and security policies) and copy the URL because it will be used later.

For the security policies configuration, you need to enable one (or both) of the following:

- Basic256.
- Basic128Rsa15.

🕼 OPC UA Configuration Manager

JRL			/ Security			
opc.tcp://	/127.0.0.1:49320		Basic 128R	sa15 (SE), Basic256 (SE	E)	
[©] opc.tcp://	/DESKTOP-4GFPG	NF:49320	Basic128R	sa15 (S,SE), Basic256 (S,SE)	
Endpoint	Definition				×	
TCP Cor	nnection					
Net	work Adapter:	Localhost only			\sim	
Port			_			
	:Number:	49320				
	Number:	49320 • •	//127.0.0.1:49320	0		
Security	Policies	49320 • opc.tcp:	//127.0.0.1:49320)		
Security	v Policies Basic256Sha256	49320 -	//127.0.0.1:49320	ypt	~	
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On the Instance Certificates page, click on the Export Button and select a folder to save the certificate for the OPC UA Server.

iver Endpoints	Trusted Clients	Discovery Servers	Trusted Servers	Instance Certificates		
Server						
	View server	certificate	Generate 2021-01-	d by Luiz Otavio@OE3 27120.08.20.434 using	SKTOP-4GFPGN/ OpenSSL 1.1.16	en -1 10
	Export server	certificate	Sep 2011	9		
	Reissue o	ertificate				
	Import co	ertificate				
Client Driver						
	View client driv	er certificate	Generate 2020, /0	d by Luiz Otavio@DES	KTOP-4GFPGN	on
	Export client driv	ver certificate	Sep 201))	Common 111	
	Reissue o	ertificate				
	Import ce	ertificate				

Engineering and Runtime Configuration

In your Project, navigate to **Devices > Channels** and create a new OPC UA channel.

ſ	Channels Nodes Points AccessTypes	
	Installed Protocols: OPCUA - OPC UA Client Channel: Create new	
	Drag a column header here to group	
	Name Protocol ProtocolOptions Interface Se	ett

In **Devices > Nodes**, paste the OPC URL (copied from the previous section) in the *PrimaryStation* configuration popup. Fill in the remaining parameters accordingly.

A For the Server Endpoint URL, you should **NOT** change from 127.0.0.1 to localhost. The Endpoint needs to be the same one used in the Server Instances Tab.

Then, click on the Certificates button to launch the UaClientConfigHelperNet4.exe tool. Make sure the file is launched with Administrator privileges.

	Channels Nodes	Points Access	Types			
	Protocol: OPCUA Node: OPCUA1	Help	New	2		
	Drag a column header he					Filter by Name:
	Name	Cha	nnel	PrimaryStation	BackupStation	Description
*	OPCUA1	OPCUA		opc.tcp://127.0.0.1:49320;500;True;Fals	e;Fals 🔻	
				Test		
				Certificates		
				Service URL	opc.tcp://127.0/0.1:49320	
				KefreshKate	500	
				AllitemsSameGroup	<u>×</u>	
				EnableReadPolling	-	
				WindowsAuthentication	-	
				DisableSecurity	-	
				UserName		
				Password		
				Domain		
				ReadFromDevice	2	
				UseTimestampFromComputer	a	
			L			

1 The certification tool can also be launched (with admin rights) from the Product's installation folder.

..\fs-9.1\UaClientConfigHelperNet4.exe.

The steps to create a certificate are described below:

- With the exe opened, browse for the application (\fs-9.1\TManagerExe.exe).
- Press Create UA Configuration, Edit UA Configuration, and press Certificates.
 Press the Create Button.
- Press "Server Certificates", the "Import" button, and select the server certificate created by the Kepware application.
- Press "Export".

⚠

• Press "OK", and "Save and Close".

The steps above are illustrated in the image below.

🐝 UA Client C	onfiguration Helper	(c) Advosol Inc.		- 0		
Application	C/Users/Luiz Otavio/Deskto	p/trabalho/fs-3.1.7_Bin_Preview1/FactoryStu	die ¥s-9.1∖TManagerExe.exe	— ſ	Browse	
UA Config File	C:\Users\Luiz Otavio\Deskto	n/trabalho/fs-9.1.7_Bin_Preview1\FactoryStu	dio Vs-9.1\TManagerExe.Ua.Config.Xml	-		
2	Create UA Configuation	Create an UA Configuration File with defaul	t settings for the application.		1	
	Check UA Configuration	Check if the UA configuration file exists for	the application with the proper name/links.			
3	Edit UA Configuration	Edit the Setting in the UA Configuration XM	L File.		🕷 UA Configuration TManagerExe.Ua.Config.Xml —	×
					Application Name OPCDA.NET.UA	-
	Firewall Exceptions	Manage the Firewall Settings for this Applic	ation	Done	Application URI um/localhost:Advosol Inc.:OPCDA.NET.UA	٣
					Product URI 4 http://advosol.com/OPCDA.NET/UA	
🐝 Certifica	te Helper Co	opyright 2011-2014 Advosol Inc.	- 🗆 X		Cettificates Manage the Application Certificate. Certificates can be imported or created. Import Server Certificates.	
Selected	Client Certificate		Server Certificates		Trace Configuration	
TManage	r	5	Browse		Output File	
Show	Import The certificate	ficate with the private key is added to the e store configured for application certs.	Import Certificate is added on the certificate store configured for		Trace Mask 513 Change 🗹 Delete On Load	
Browse	Export The certification of the file:	ficate is exported with only the public to name [thumbprint].der ser Access Rights	Move The certificate is moved from the configured Rejected Certificate Store to the Trusted Certificates store.		Save Save and Gose Cancel	
Create a	new self signed certificate	6	-			
Certificate Machine	Name TManager Name DESKTOP-4GFPGN	Create	The created certricate is stored in the certificate store and a certificate with only the public key is exported to the file name [thumbprint].der			

The same procedure must be repeated for the \fs-9.1\TRunModule.exe application. ≙

	Channels	Nodes	Points AccessT	ypes				
	Protocol: Node:	OPCUA OPCUA1	Help	New	luc -			
	Drag a colu							Filter by Name:
		Name	Char	nnel	PrimaryStation	Bac	ckupStation	Description
*	ODCUAL					- Cala		
					Test Certificates Service URL RefreshRate AllItemsSameGroup EnableReadPolling WindowsAuthentication DisableSecurity UserName Password Domain ReadFromDevice UseTimestampFromComputer	opc.tcp://127. 500	.0 0.1:49320	

	Channels Nodes Point	AccessTypes				
	Protocol: OPCUA Node: OPCUA1	Help Import N	ew			
	Drag a column header here to group					Filter by Name:
~	Name	Channel	PrimaryStation		BackupStation	Descriptio
	OPCUA1	OPCUA	:49320;500;True;False;False;False;;;False;;;False;;;False;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;False;;;False;;;False;;;False;;;False;;;False;;;False;;;False;;;False;;;False;;;False;;;False;;;False;;;False;;;False;;;False;;;;False;;;False;;;;False;;;;False;;;;False;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;;False;;;;;False;;;;;False;;;;False;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	se;False 🔻		
			Test	ок		
			Certificates		// 27 0 0 4 / 2220	
			Service UKL RefrechRate	opc.tcp:/	//127.0.0.1:49320	
			AllItemsSameGroup	V		
			EnableReadPolling			
			WindowsAuthentication	-		
			DisableSecurity	-		
			UserName			
			Password			
			Domain			
			ReadFromDevice	-		
			UseTimestampFromComputer			

Importing Client certificates and Testing Connection

Back at KepServerEx, import the two certificates created in the previous section. Go to the OPC UA Configuration Manager - Trusted Clients Tab.

OPC UA Conf	iguration Mana	ger				\times
Server Endpoints	Trusted Clients	Discovery Servers	Trusted Servers	Instance Certificates	•	
Client Name KEPServer	EX/UA Client Driv	er	/ URI um:DESK	FOP-4GFPGNF:Kepwa st:Advosol Inc. :OPCD	are.KEPServer	EX.V6:U
TRunModule um:localhost:Advosol Inc.:OPCDA.NET.UA						
		*				
	/					
Import	Export	Remove	Reject		View Certifi	icate
ote: Server Runtime reinitialization is required to utilize changes. Close Ajuda						

Once the certifications have been trusted, we can test our connection. On the Project's **Devices > Nodes** page, open the PrimaryStation configuration popup and click on Test button. If this was done correctly, you should see an OK status.

	Channels Nodes Poir	nts AccessTypes				
	Protocol: OPCUA Node: OPCUA1	Help Import	ew			
	Drag a column header here to group					Filter by Name:
*	Name	Channel	PrimaryStation		BackupStation	Descriptio
ø	OPCUA1	OPCUA	1:49320;500;True;False;False;False;;;False;;;False;;;False;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;;;False;;False;;False;;;;False;;;False;;;False;;;False;;;;False;;;;False;;;;False;;;;False;;;False;;;;False;;;False;;;False;;;False;;;False;;;False;;;False;;;False;;;False;;False;;False;;False;;;False;False;Fa	se;False 💌		
			Test	ок		
			Certificates		/// 27 0 0 / /02220	
			Service URL RefreshRate	opc.tcp: 500	;//127.0.0.1:49320	
			AllItemsSameGroup	<u>×</u>		
			EnableReadPolling	-		
			WindowsAuthentication	-		
			DisableSecurity	<u>-</u>		
			UserName			
			Password			
			Domain			
			ReadFromDevice	-		
			UseTimestampFromComputer	-		

Lastly, on **Devices - Points**, create a row for our OPC Node and assign a Tag to it. In the *Address* column, you will be able to browse for every available Tag found on the Server in a TreeView style popup.

	Channels Nodes Points	AccessTypes		
	Drag a column header here to group		Filter by Address:	
*	TagName	Node	Address	
1	Integer1	OPCUA1	CustomAlarms	

OPCServer Available Data

If the available data in the OPCServer is from internal data (server information and diagnostics) or if the available data is from a simulation channel, the data can be exchanged by exception and the FS Node "Enable Read Polling" checkbox can be disabled.

If you are using the "Kepware OPC UA Client" or another device, you will need to enable the FS Node "Enable Read Polling" checkbox.

WE SUGGEST TESTING TO MAKING SURE THE CONNECTION AND DATA EXCHANGE IS WORKING PROPERLY and READING THE INTERNAL DATA FROM THE OPCSERVER KEPWARE. _System._Time_Second OR ANY SIMULATION VALUE.