# DCOM Configuration for KEPServerEX



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# **Overview**

This document is intended to provide the user with information and instruction on how to configure the Distributed Component Object Model (DCOM) for use with KEPServerEX. Since Windows NT/ 2000 security is more advanced and the options differ from Windows 95/98, we have broken this document down into three components. The first component of the document covers configuring DCOM for Windows NT/2000, the second component covers configuring DCOM for 95/98, and the third component covers Windows XP/2003.

Note: In Windows NT DCOM may function differently from one Service Pack to another. Service Pack 6 was used in creating this document and therefore it is suggested that Service Pack 6 be installed before attempting the following procedures.

Note: In our DCOM testing we have experienced instances where DCOM configuration changes do not take effect until the PC has been rebooted. If you have DCOM settings configured correctly but cannot establish a remote connection, you may want to consider rebooting both the server and client PCs.

Warning: The following instructions for DCOM configuration allow for **all access by all users** for all DCOM components. If security is a factor with your applications, you must set DCOM security settings appropriately. We recommend proving connectivity with open access before reducing access privileges to specific users at the application level.

# **Configuring DCOM for Win NT / 2000 Domains**

There may be variations in DCOM configuration between local and remote connections to KEPServerEX. Some client applications may not support browsing remote PC's for installed servers. For these clients you may need to add server registry entries to the client PC in order to obtain the proper CLSID for the server. The preferred method is running the server installation program and selecting only the OPC Quick Client for installation. If this cannot be done, then you can use the OPC\_Remote.Reg file that is provided with the server install (see <u>Appendix A</u> for details on how to do this). If you are using another Operating System, see that section for instructions.

The first part of this document will explain the steps required to prepare for DCOM configuration on the remote PC.

## Using the Install Program to Register the Server

You may also use the server installation program to make the appropriate registry entries, and to ensure that all of the files needed to make a remote connection are present.

Kepware Setup Utility	×
Select Components Choose the components Setup will install.	
Select the components you want to install, and clear the co install. KEPServerEx Drivers Example Source Code OPC Quick Client Specifications OPC Data Access Automation Specification Select All (Full Installation)	Description It is recommended that you expand the component tree and only select components you wish to install. If you select a main component, all of the sub-components beneath it will be selected automatically. Each component has a brief description, which will be displayed here.
Space Required on C: 0 K Space Available on C: 13972320 K InstallShield	
< Back	Next > Cancel

1. On the remote PC run the KEPServerEX Install program.

2. At the component selection page, deselect all the components except OPC Quick Client and click **Next** to continue with the install. We recommend installing the OPC Quick client to verify server connections.

Kepware Setup Utility	×
Select Components Choose the components Setup will install.	A CAR
Select the components you want to install, and clear the crinistall.	omponents you do not want to Description OPC Quick Client This OPC Quick Client has been developed to assist in the test and development of our OPC Data Access 1.0 and 2.0 Servers. We recommend that you install it as it may aid with technical support if the need arises.
Space Required on C: 0 K Space Available on C: 13950624 K InstallShield	
< Back	< Next > Cancel

## Editing the DCOM Configuration

The following steps describe how to configure DCOM for remote, or local, connections to the KEPServerEX.

1. Select the Start button from the Desktop task bar and click **Run** and enter DCOMCNFG.EXE in the pop-up menu and run DCOMCNFG.EXE.



2. A general DCOM configuration window will appear with four tabs. The foremost tab is Applications. All applications that can enable DCOM are listed here. The remaining three tabs are default configuration settings used by the listed applications. Changes made to the settings on these pages affect DCOM applications globally. The goal of these instructions is to allow all network users to access all DCOM applications. After a connection has been proven, the user may then choose individual applications from the list and customize their DCOM security properties for more control.

DCOM Config (known

as

### **DCOMCNFG.EXE**) is a utility that can be used to secure Distributed COM

Distributed COM (DCOM) objects that have been created.



Note: It is very important to make sure that the **Apply** button is selected after changes are made in a DCOM settings page.

3. Under the Default Properties tab, "Enable Distributed COM on this computer" should be checked. Also, ensure that the "Default Authentication level:" is set to "Connect," and the "Default Impersonation Level:" is set to "Identify". Click the Apply button to administer the changes

Distributed COM Configuration Properties	?	×
Applications Default Properties Default Security Default Protocols		
Enable Distributed COM on this computer		
Enable COM Internet Services on this computer		
Default Distributed COM communication properties		
The Authentication Level specifies security at the packet level.		
Default Authentication Level:		
Connect		
The Impersonation Level specifies whether applications can determine who is calling them, and whether the application can do operations using the client's identity. Default Impersonation Level: Identify		
OK Cancel App	y	

4. Select the Default Security tab and click the **Edit Default** button under "Default Access Permissions."



5. Add domain group "Everyone" with "Allow Access" to the permission list, then select **OK**. If you are planning to run the server as a service you will also need to add "System" with "Allow Access".

Registry Valu	e Permissions		×
Registry Value: <u>O</u> wner: ethan ( <u>N</u> ame:	DefaultAccessPermis Ethan Olsen)	sion	
🚱 Everyone		Allow Access	
		.ccess	•
ок 🔥	Cancel Add	<u>R</u> emove	<u>H</u> elp

6. Now click the **Edit Default** button under "Default <u>Launch Permissions.</u>"

Distributed COM Configu	ration Proper	ties	? ×
Applications Default Properties	Default Security	Default Protocols	
Default Acc <u>e</u> ss Permissions—			
You may edit who is allowed t provide their own settings	o access applicatio	ns that do not	
		Edit Default	
Default Launch Permissions			
You may edit who is allowed to launch applications that do not provide their own settings.			
		Edit Default	

7. Add domain group "Everyone" with "Allow Launch" to the permission list, then select **OK**.

Registry Value Permissions	×
Registry Value: DefaultLaunchPermission <u>O</u> wner: Account Unknown <u>N</u> ame:	
ETHAN_NT2\Administrators	Allow Launch Allow Launch
INTERACTIVE	Allow Launch Allow Launch
Iype of Access: Allow Launch	<b>v</b>
OK Cancel Add	<u>R</u> emove <u>H</u> elp

8. Choose the Applications tab and double-click on "KEPware Enhanced OPC/DDE Server". This will call up the KEPServerEX-specific DCOM properties.



9. In the KEPServerEX-specific DCOM window, choose the Location tab.

KEPware Enhanced OPC	/DDE Server Properties 👘 🙎 🗙
General Location Security Id	lentity Endpoints
General properties of this DCO	M application
Application name: KEPw	are Enhanced OPC/DDE Server
Application type: remote	or local server
Authentication Level: Defa	alt 🔽
Local path: c:\pro	gram files\kepserverex_r\servermain.exe
Remote computer: REMO	ITE_NT

10. Most clients allow connections directly to the remote PC by entering the Name of the PC in the server connection dialog box. For applications that do not allow these types of connections, select "Run application on the <u>following computer</u>". Next browse for the remote machine that contains the KEPServerEX application and select **Apply**. In this example the machine name is REMOTE\_NT. For local connections you will leave "Run application on the computer where the data is located" checked.

Note: See Kepware's Client Connectivity guide for information on how specific clients connect remotely to KEPServerEX.

Warning: This dialog box will allow you to select more then one check box. If this happens it produces an error state. You must make sure that only one box is checked.

KEPware Enhanced OPC/DDE Server Properties 👘 🛽 🛛 🔀		
General Location Security Identity Endpoints		
The following settings allow DCOM to locate the correct computer for this application. If you make more than one selection, then DCOM uses the first applicable one. Client applications may override your selections.		
Run application on the computer where the data is located		
Run application on this <u>c</u> omputer		
Run application on the <u>following</u> computer:		
REMOTE_NT		
OK Cancel Apply		

11. Choose the Security tab and ensure that the radio buttons for the Access permissions are set to default. Apply these changes.

KEPware Enhanced OPC/DDE Server Properties 👘 🛽 🏼
General Location Security Identity Endpoints
Use default access permissions     Use custom access permissions
You may edit who can access this application.
Edit
Use default jaunch permissions
C Use custom launch permissions
You may edit who can launch this application.
Edit
Use default configuration permissions
<ul> <li>Use custom configuration permissions</li> <li>You may edit who can change the configuration information for this application.</li> </ul>
Edit
OK Cancel Apply

12. The final step is to select the Identity tab from the application specific DCOM pages, and ensure that the "Interactive user" radio button is selected. Then select the Apply button. Select OK to exit the application specific DCOM window, and then choose OK again to exit the general DCOM window

KEPware Enhanced OPC/DDE Server Properties 💦 📍	×
General Location Security Identity Endpoints	
Which user a count do you want to use to run this application?	
The interactive user	
C The Jaunching user	
C This <u>u</u> ser:	
User: Browse	
Password:	
Confirm Password:	
C The <u>Sy</u> stem Account (services only)	
OK Cancel Apply	

At this point you should be able to connect to the server from the remote PC. If you installed the OPC Quick Client use it as a test and then try the client you are planning to use.

# Configuring DCOM for Win XP / Windows 2003 Server Domains

There may be variations in DCOM configuration between local and remote connections to KEPServerEX. Some client applications may not support browsing remote PC's for installed servers. For these clients you may need to add server registry entries to the client PC in order to obtain the proper CLSID for the server. The preferred method for adding the registry entries is running the server installation program and selecting only the OPC Quick Client for installation. If this cannot be done, then you can use the OPC\_Remote.Reg file that is provided the with the server install. (See <u>Appendix A</u> for details on how to do this.) If you are using another Operating System see that section for instructions.

The first part of this document will explain the steps required to prepare for DCOM configuration on the remote PC.

## Using the Install Program to Register the Server

You may also use the server installation program to make the appropriate registry entries and to ensure that all of the files needed to make a remote connection are present.

1. On the remote PC, run the Install program.



 At the component selection page, deselect all the components except for OPC Quick Client, and click Next to continue with the install. We recommend installing the OPC Quick client to verify server connections.

Kepware Setup Utility	×
Select Components Choose the components Setup will install.	
Select the components you want to install, and clear the co install.	Description Description OPC Quick Client This OPC Quick Client has been developed to assist in the test and development of our OPC Data Access 1.0 and 2.0 Servers. We recommend that you install it as it may aid with technical support if the need arises.
Space Required on C: 0 K Space Available on C: 13950624 K InstallShield <back< td=""><td>Next &gt; Cancel</td></back<>	Next > Cancel

# Running the DCOM Configuration Utility

Starting Windows Components like DCOM Configuration on Windows XP/2003 is slightly different in comparison to Windows NT, or Windows 2000.

- 1. Type DCOMCNFG in the Start Menu / Run dialog to launch DCOM Properties
  - (XP/2003 launches Component Services, DCOM Properties are located here).

Run	?×
	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
Open:	dcomcnfg
	OK Cancel Browse

2. Component Services is the home page of the DCOMCNFG run command.



 Click the Plus sign next to Component Services, Computers, and My Computer to expand the branches of the directory tree. This page shows My Computer (Used for accessing Default DCOM Properties), and the folder which contains all the DCOM objects.

Component Services			
File Action View Window Help			
← → 🗈 🖬 💣 🕅 🔮 🏠	₽ <u>₽</u> := ::: ::: ::: ::: ::::::::::::::::::		
Console Root Component Services Computers Computer COM+ Applications Computer Transaction C	Component Services 1 object(s)		
۲ <u> </u>			

4. Right-click My Computer on the Component Services page and select Properties. It will bring you to the General tab of the DCOM properties for this PC.

My Computer Properties			? ×
Default Protocols General	MSDTC Options	Default CO	M Security
GOOCH_XP			
Description:			
,			
	ОК	Cancel	Apply

5. Select the Default Properties tab. Verify that "Enable Distributed COM on this computer" is checked. The "Default Authentication Level" should be set to Connect, and the "Default Impersonation Level" should be set to Identify.

My Computer Properties				
Default Protocols         MSDTC         Default COM Security           General         Options         Default Properties				
Enable Distributed COM on this computer				
Enable COM Internet Services on this computer				
Default Distributed COM Communication Properties				
The Authentication Level specifies security at the packet level.				
Default Authentication Level:				
Connect				
The impersonation level specifies whether applications can determine who is calling them, and whether the application can do operations using the client's identity.				
Default Impersonation Level:				
Identify 🔽				
Security for reference tracking can be provided if authentication is used and that the default impersonation level is not anonymous.				
OK Cancel Apply				

6. Next, select the Default Protocols tab. On this tab you should see the data transfer protocols that are currently selected for this PC. You can add additional protocols from here if needed.

My Computer Properties	<u>? ×</u>		
General Options Default Properties Default Protocols MSDTC Default COM Securit	y		
DCOM Protocols  Connection-oriented TCP/IP  Connection-oriented SPX	_		
Add Remove Move Up Move Down Properties	<u></u>		
The set of network protocols available to DCOM on this machine. The ordering of the protocols reflects the priority in which they will be used, with the top protocol having first priority.			
OK Cancel App	yly		

7. Select the Default COM Security tab and click the **Edit Default** button under "Acc<u>ess</u> Permissions."

My Computer Properties	<u>? ×</u>
General Options Default Protocols MSDTC	Default Properties
Access Permissions You may edit who is allowed to access a provide their own settings.	pplications that do not
Launch Permissions You may edit who is allowed to launch a provide their own settings.	pplications that do not Edit Default
OK	Cancel Apply

8. You may see Groups and Users listed for the Default Access Permissions. You will need to add them by clicking on the **Add** button.

ess Permission		
efault Security		
Group or user names:		
🚮 Everyone		
SYSTEM		
	Add	Remove
Permissions for Everyone	Allow	Deny
Access Permission		

9. Once the Users, or Groups, window is open, click the Advanced button.

Select Users or Groups	<u>? ×</u>
Select this object type:	
Users, Groups, or Built-in security principals	Object Types
From this location:	
KEPDOMAIN	Locations
Enter the object names to select ( <u>examples</u> ):	
1	Check Names
Advanced	Canad

10. Enter your search criteria and click Find Now to list all of the Users and Groups that meet your selection criteria.

elect this object type:	
Jsers, Groups, or Built-in security principals	Object Types
rom this location:	
(EPDOMAIN	Locations
Common Queries	
Name: Starts with 💌	Columns
Description: Starts with 🔽	Find Now
Disabled accounts	Stop
Non expiring password	
Daus since last logon:	
	× 1
	0K Cancel
ame (RDN) In Folder	

11. From the list, select the users or groups that you wish to add and click **OK**.

Select Users or Gr	oups		<u>? ×</u>
Select this object ty	ipe:		
Users, Groups, or E	Built-in security pri	ncipals	Object Types
From this location:			
KEPDOMAIN			Locations
Common Queries	]		
Name: S	tarts with 💌		Columns
Description: S	tarts with 💌		Find Now
Disabled acc	counts		Stop
🗖 Non expiring	password		
Daus since last (	ogon:	-	<b>2</b>
D aj e since las. I	egon 1 1		
			OK Cancel
Name (RDN)	In Folder		
🖉 Administrator	KEPDOMAIN		
MANONYMOU	KERROLLIN		
😰 anthony	KEPDUMAIN		
G Chris	KEPDOMAIN		
Corku	KEPDOMAIN		
🚮 Domain Admins	KEPDOMAIN		
🕵 Domain Guests	KEPDOMAIN		
🕵 Domain Users	KEPDOMAIN		
<b>.</b> .	VERROLLIN		

12. You will have to add Everyone and System, like you did with the other Operating Systems. In addition, you have to add Network in Windows XP/2003 Operating Systems.



- 13. Click **OK** when you are done with Access Permissions and repeat the same process with Launch Permissions.
- 14. Next, select and expand the DCOM Config folder in the directory tree.



15. Scroll down the list of applications that support DCOM until you see the "Kepware Enhanced OPC/DDE Server". 16. Right click on the server object and select Properties.

Component Services		- 🗆 🗵
🐌 File Action View Window Help		_ <del>8</del> ×
⇔ →   € 📧   × 🖀 🕅   😫   🎦   💁 🦕 🕮 🏢	i 9	
ControlView Classic Import	KEPware Enhanced OPC/DDE Server	0 object(s)
Iogagent     Logical Disk Manager Administrative Service     Logical Disk Manager Remote Client     LuComServer     Media Player     MediaCatalogDB OLE DB Provider     Messenger Private Object     Microsoft Agent Server 2.0		

17. Right clicking on a DCOM object opens the General tab of the Property window for that object.

KEPware Enhanced OPC/	DDE Server Properties		
General Location Security Endpoints Identity			
General properties of this DCOM application			
Application Name:	KEPware Enhanced OPC/DDE Server		
Application ID:	{6E6170F0-FF2D-11D2-8087-00105AA8F840}		
Application Type:	Local Server		
Authentication Level:	Default		
Local Path:	C:\Program Files\KEPServerEx\ServerMain.exe		
	OK Cancel Apply		

18. Select the Identity tab. The Identity should be set to "The interactive user."

KEPware Enhanced OPC/DD	E Server Pro	operties	? ×
General Location Security	y Endpoints	Identity	
Which user account do you	i want to use ti	o run this applica	ation?
• The interactive user			
C The launching user.			
C This user.			
User:			Browse
Password:			
Confirm password:			
C The system account (se	rvices only).		
	ОК	Cancel	Apply

19. Select the Location tab. For local software client connections you will select "Run application on this computer." You will make the same selection if you are connecting the client software to a mix of multiple remote, or multiple remote and local, servers. If you want to limit the software client connections to only one remote server location, select "Run this application on the following computer," and enter, or browse for the PC the remote server is running on.

Warning: This dialog box will allow you to select more then one check box. If this happens it produces an error state. You must make sure that only one box is checked.

KEPware Enhanced OPC/DDE Server Properties
General Location Security Endpoints Identity
The following settings allow DCOM to locate the correct computer for this application. If you make more than one selection, then DCOM uses the first applicable one. Client applications may overide your selections.
Run application on the computer where the data is located.
Run application on this computer.
Run application on the following computer:
Browse
OK Cancel Apply

20. Select the Security tab. Launch and Access Permissions should be set to "Use Default" and Configuration Permissions should be set to "Customize."

KEPware Enhanced OPC/DDE Server Properties		? ×
General Location Security Endpoints Identity		
Launch Permissions		٦
Use Default		
C Customize	Edit	
Access Permissions		
Use Default		
C Customize	Edit	
Configuration Permissions		- ا
C Use Default		
<ul> <li>Customize</li> </ul>	Edit	
OK Ca	ncel App	yly

21. Select the Endpoints tab. This should be set to use the "default system protocols."

KEPware Enhanced OPC/DDE Server Properties	x
General Location Security Endpoints Identity	
DCOM Protocols and endpoints:	
T default system protocols	
Add Remove Properties Clear	
Description	
The set of protocols and endpoints available for use by clients of this DCOM server. The system defaults entry indicates that the default set of DCOM protocols and endpoints for the machine will be used.	
OK Cancel Apply	

22. Click **OK** to save the DCOM settings.

At this point you should be able to connect to the server from the remote PC. If you installed the OPC Quick Client test the DCOM settings with it, then try the client you are planning to use.

# Configuring DCOM for Windows XP SP2 / Windows 2003 Server SP1

## Introduction

The major goal of Windows XP Service Pack 2 (SP2) and Windows 2003 Server Service Pack 1 (SP1) is to reduce common available scenarios for malicious attack on Windows XP. This is done by improvement in shielding Windows XP and 2003 Server from the network, enhanced memory protection, safer handling of e-mail, and Internet Explorer security enhancements.

Most OPC clients and servers use DCOM to communicate over the network. When XP SP2 and 2003 Server SP1 are installed in their default configuration, OPC communication via DCOM will cease to work. This paper describes the settings necessary to restore OPC communications when using XP SP2, and 2003 Server SP1.

Two of the SP2/SP1 security enhancements directly impact OPC over DCOM. First, DCOM limit settings have been added. Secondly, the Windows firewall has been enhanced, and is turned on by default.

Since the callback method used by OPC essentially turns the OPC client into a DCOM server and the OPC server into a DCOM client, the instructions provided here must be followed on all nodes that contain OPC servers or clients.

**Note:** OPC communication that is confined to a single machine, using COM but not DCOM, will continue to function normally after the installation of XP SP2 / 2003 Server SP1 without following the instructions contained in this document.

# Windows Firewall

The Windows Firewall allows traffic across the network interface when initiated locally, but by default stops any incoming "unsolicited" traffic. However, this firewall is "exception" based, meaning that the administrator can specify applications and ports that are exceptions to the rule and can respond to unsolicited requests.

The firewall exceptions can be specified at two main levels, the application level and the port and protocol level. The application level is where you specify which applications are able to respond to unsolicited requests and the port and protocol level is where you can specify the firewall to allow or disallow traffic on a specific port for either TCP or UDP traffic. To make KEPServerEX work via DCOM, changes need to be made on both levels.

# Configuring the Firewall

1. By default, the Windows firewall is set to "On". This setting is recommended by Microsoft and by OPC to give your machine the highest possible protection. For troubleshooting, you may wish to temporarily turn off the firewall to prove or disprove that the firewall configuration is the source of any communication failure.

Window	ws Firewall		88	
ieneral	Exceptions	Advanced		
Windov program to work Program	vs Firewall is b ns and service better but mig ns and Service	locking incoming nel is selected below. Ac iht increase your sec es:	work connections, ex Iding exceptions allow urity risk	cept for the is some programs
Name				
I File I MS I Re □ Re	e and Printer S SN Messenge emote Assistar emote Desktoj	Sharing r 6.2 nce		
	rvermain.exe Do D. Exameniuer	4		
	hool Messeni	ner		
Add1	Program	Add Port	Edit	Delete
I▼ Disp <u>What a</u>	blay a notifical re the risks of	ion when Windows F allowing exceptions?	irewall blocks a progr	am
			[ OK	Cancal

2. The Windows Firewall can be opened by clicking on the Firewall icon in the Windows Control Panel. Once opened, select the "Exceptions" tab and add all OPC Clients and Servers to the exception list. Also add Microsoft Management Console (mmc.exe found in the Windows\System32 directory) and the OPC utility OPCEnum (opcenum.exe found in the Windows\System32 directory). These last two files may not appear in the Add a Program list and will have to be found by using the Browse button. Lastly you need to ensure that File and Printer Sharing is checked. This is not typically enabled on new installations of the Operating System.

	-
Wetwork Spy	
📷 OFC Client	
CPC Quick Client	
CPC Quick Client	
🖕 OPC Test Client	
opcenum.exe	
🗿 Open BSI Config	
POrder Wizard	
Dutlook Express	

 Add TCP port 135 as it is needed to initiate DCOM communications, and allow for incoming echo requests. In the Exceptions tab of the Windows Firewall, click on Add Port.

In the Add a Port dialog, fill out the fields as follows: Name: DCOM Port number: 135 Choose the TCP Radio Button

Add a Port	
Use these settings number and protoc want to use.	to open a port through Windows Firewall. To find the port ol, consult the documentation for the program or service you
<u>N</u> ame:	DCOM
<u>P</u> ort number:	135
What are the risks	of opening a port?
Change scope	OK Cancel

# **DCOM Enhancements**

Service Pack 2 for Windows XP/ Windows 2003 Server Service Pack 1 has also made some security enhancements to DCOM; two in particular need to be taken into consideration when using OPC on a network: First, the default Launch and Access permissions dialogs have been modified to allow the user to configure "limits" on the permissions given to applications using DCOM. Secondly, for each user now defined in the Launch and Access permissions, both local and remote access can be explicitly defined.

A brief background on default Launch and Access permissions in DCOM: Launch permissions define who can launch a COM based application (such as an OPC server) both over the network or locally. Access permissions define who can access that application once it has been launched. Applications can get their Launch and Access permissions from one of three places: they can use explicitly defined setting for their application, they can use the default permissions or they can set their own permissions programmatically. Because an application could set its own permissions programmatically, the explicitly defined or default settings, although set properly, may not be used and therefore the user is not able to explicitly have control over these settings. To overcome this security flaw, Microsoft has added "limits" to the DCOM security settings from Launch and Access to limit the permissions that an application can use. This limit prevents the application from using permissions beyond what is specified in the DCOM configuration settings. By default the limits set by Service Pack 2 / Service Pack 1 will not allow for OPC communications over the network. In addition to the new permissions limits, one must now specify if the user or group specified has permissions locally or remotely (or both). In order for OPC applications to work over the network with DCOM, the permissions must be set such that remote users can launch and/or access the OPC servers and clients on the machine.

# **Configuring DCOM**

Follow these steps to configure DCOM for KEPServerEX Communications using Windows XP Service Pack 2 / Windows 2003 Server Service Pack 1:

	Type the n Internet re	name of a pro esource, and	gram, folder, d Windows will op	ocument, or oen it for you.
Open:	DCOMCnl	fg		~
	C		Great	
	_	UK		

1. Go to Start -> Run and type DCOMCnfg and click on OK.

- 2. Click on Component Services under the Console Root to expand it.
- 3. Click on Computers under Component Services to expand it.
- 4. Right-click on My Computer in the pane on the right, and select Properties

le Component Services	
🐌 Eile Action Yiew Window Help	
⇔ → 🗈 🗷 🖄 😭	
Console Root Component Services Computers My Computer Event Viewer (Local) Services (Local)	Computers 1 object(s)  Stop MS DTC  Refresh all components View Properties

5. Go to the Security tab (in some dialogs, the tab is called "COM Security"). Note these are the four permission configurations that we will have to edit:

6. Edit the Limits for Access and Launch

### Access Permissions – Edit Limits...

You need to check the Remote Access box for the user labeled ANONYMOUS LOGIN in this dialog. This is necessary for OPC Enum to function.

Access Permission		? 🛛
Default Security		
<u>G</u> roup or user names:		
Administrator (ROBERT_XPV	Administrator)	
METWORK		
SYSTEM		
	A <u>d</u> d	<u>R</u> emove
Permissions for Administrator	Allow	Deny
Local Access		
Hemote Access		
,		
	OK	Cancel

### Launch and Activation Permissions - Edit Limits...

You need to check the remote boxes for the users labeled Everyone in this dialog.

Note: Since Everyone includes all authenticated users, it is often desirable to add these permissions to a smaller subset of users. One suggested way to accomplish this is to create a group named "KEPServerEX Users" and add all user accounts to this group which will execute KEPServerEX or your OPC Client, then substitute "KEPServerEX Users" everywhere that Everyone appears in these configuration dialogs.

Launch Permission		? 🗙
Security Limits		
Group or user names:		
🙎 Administrator (ROBERT_XP)	Administrator)	
Administrators (ROBERT_XF	VAdministrators)	
Everyone     NETWORK		
SYSTEM		
	Add	Bemove
	Aga	
Permissions for Administrator	Allow	Deny
Local Launch	<b>~</b>	
Remote Launch		
Local Activation		
Remote Activation	<b>~</b>	
	OK	Cancel

7. Edit Default Permissions for Access and Launch

For each user (or group) that participates in OPC communication (e.g. "KEPServerEX Users"), make sure that both the Local Allow and Remote Allow checkboxes are both checked. If the User accounts or Group accounts do not appear then you will need to add them and then check permissions as we did with Everyone in the following figures.

### Access Permissions per user

ermissions for Everyone	Allow	Deny
Local Access	<b>V</b>	
Remote Access	<b>~</b>	

Launch and Activation permissions per user

ermissions for Everyone	Allow	Deny
Local Launch	<b>V</b>	
Remote Launch		
Local Activation	<ul> <li>Image: A start of the start of</li></ul>	
Remote Activation	<b>~</b>	

8. Reboot the PC when you have completed making the changes to DCOM.

## References

Information used in preparing this document was provided by the OPC Foundation White Paper entitled "Using OPC via DCOM with Microsoft Windows XP Service Pack 2."

## Summary

Although this document is written for KEPServerEX, the DCOM settings specified apply to all Kepware OPC server products including LinkMaster, U-CON Protocol Server, and iSNMP OPC Server. If you have any additional questions please contact Kepware Technical Support.

# Configuring DCOM on Workgroups Vs. Domains

Although most projects will be done on Network Domains, there are still many places that continue to use Workgroups for their networks, or may even have mixed configurations. Unfortunately DCOM is really designed for Domains. Remote connectivity using Workgroups will require some extra configuration of the security settings. DCOM security will let a client or server application know whether the User who is running the server (or client application) is a secure DCOM user. If one, or the other, is not a user, you will not establish a connection to the server. This generally manifests itself with failed connection errors.

The primary difference between a Network Domain and a Network Workgroup is the way that security is handled. Domains have a central Access Control List (ACL). The act of logging on to the Domain provides centralized user permissions which are applied to all PCs on the domain. In Workgroups the ACL is maintained by each PC. That means that you have to add every user to every PC.

The following are known configurations for Workgroups, and the steps you will need to do to get remote connectivity working on them.

## **Connecting Workgroup to Workgroup**

When connecting a server from one workgroup PC to another you will need the same user names, and security settings on both PCs.

Note: To launch the server you have to be an administrator. Many people using NT or higher operating systems choose to run the server as a service to avoid creating administrator accounts for all users.

# **Connecting Workgroup to Domain**

When connecting from a workgroup to a domain, you need to verify that the client application located on the Workgroup PC is set to accept responses sent from the server located on the Domain PC. This means you must add any user that could be running the server on the Domain PC to the local security settings. It is ideal to run the server as a service on the Domain to reduce the number of entries you may need. You will also need to make sure the local administrator/login is added to the default security.

Note: To launch the server you have to be an administrator. Many people using NT or higher operating systems choose to run the server as a service to avoid creating administrator accounts for all users.

# **Connecting Domain to Workgroup**

When connecting from a Domain PC to a Workgroup PC, you need to add the name of the Domain user to the Workgroup PCs user list. You will also need to add the Workgroup user who is running the PC to the Domain PCs local user list. On the Workgroup PC, you will set it up like you were connecting from it to the domain.

Note: To launch the server you have to be an administrator. Many people using NT or higher operating systems choose to run the server as a service to avoid creating administrator accounts for all users.

In order to set DCOM Security in a Workgroup, you have to have the PC set for UserLevel Security *not* Share Level Security. If you are on Win 95 or Win 98 you will have to set the security before you install the DCOM patch. If you do not, then you will not be able to run the DCOMConfig.exe program or will get errors when trying to add the security settings.

# Appendix A: Using the OPC\_Remote.Reg File

## Preparing the Remote PC

If the intended *client* machine does not have a registered version of the KEPServerEX on it, you must take the initial step of registering the server on that machine. The following steps explain this procedure.

- 1. On the KEPServerEX pc, open the server's root directory \KEPServerEX, and find the file called opc\_remote.reg. Make a copy of this file and take it to the remote PC.
- 2. On the intended remote client machine, paste this file on to your C: drive (or any available hard drive on that machine).
- 3. Right click on this file and choose Edit on the drop down menu.

🖉 OPC_Remote.reg - Notepad				
Eile Edit Format Help				
REGEDIT4				
[HKEY_CLASSES_ROOT\AppID\{6e6170f0-ff2d-11d2-8087-00105aa8f840}] @="KEPware Enhanced OPC/DDE Server"				
[HKEY_CLASSES_ROOT\AppID\{6e6170f0-ff2d-11d2-8087-00105aa8f840}] "RemoteServerName"="KEPWARE"				
[HKEY_CLASSES_ROOT\CLSID\{6e6170f0-ff2d-11d2-8087-00105aa8f840}] @="KEPware Enhanced OPC/DDE Server"				
[HKEY_CLASSES_ROOT\CLSID\{6e6170f0-ff2d-11d2-8087-00105aa8f840}] "AppID"="{6e6170f0-ff2d-11d2-8087-00105aa8f840}"				
[HKEY_CLASSES_ROOT\CLSID\{6e6170f0-ff2d-11d2-8087-00105aa8f840}\ProgID] @="KEPware.KEPServerEx.V4"				
[HKEY_CLASSES_ROOT\CLSID\{6e6170f0-ff2d-11d2-8087-00105aa8f840}\RemoteServer]				
[HKEY_CLASSES_ROOT\KEPware.KEPServerEx.V4] @="KEPware Enhanced OPC/DDE Server"				
[HKEY_CLASSES_ROOT\KEPware.KEPServerEx.V4\CLSID] @="{6e6170f0-ff2d-11d2-8087-00105aa8f840}"				
[HKEY_CLASSES_ROOT\KEPware.KEPServerEx.V4\OPC]				
[HKEY_CLASSES_ROOT\KEPware.KEPServerEx.V4\OPC\Vendor] @= "KEPware"				
1 In the first few lines of this file you should see "RemoteServerName"-"KERMARE"				

- In the first few lines of this file you should see "RemoteServerName"="KEPWARE". Replace "KEPWARE"' with the name of the PC/Machine that is running KEPServerEX.
- 5. Save the changes to the file and exit.
- 6. Double click on the file name to register KEPServerEX server. A message box will be displayed on the screen to verify that the information was installed correctly in the registry. The client machine may now be configured to connect via DCOM to the remote server machine.

**Note:** You may need to place two up-to-date OPC files (from our disc or the OPC foundation) into the C:\Windows\System32 folder. These files are **opccomn\_ps.dll** and **opcproxy.dll**. You may have to register them at the DOS command prompt, for example, C:\WINNT\SYSTEM32\regsvr32 opccomn\_ps.dll Another way to get these files is to install the server on the remote machine.

# Appendix B: Configuring DCOM for Win 95/98 Domains

**Note:** Effective with release version 4.200.353, KEPServerEx no longer supports operation on workstations running Microsoft Windows 95, Windows 98 and Windows ME operating systems.

There may be variations in DCOM configuration between local and remote connections to KEPServerEX. Some client applications may not support browsing remote PCs for installed servers. For these clients, you may need to add server registry entries to the client PC in order to obtain the proper CLSID for the server. The preferred method for adding the registry entries is running the server installation program and selecting only the OPC Quick Client for installation. If this cannot be done, then you can use the OPC\_Remote.Reg file that is provided the with the server install (see <u>Appendix A</u> for details on how to do this). If you are using another Operating System see that section for instructions.

# Preparing Win95/98 for DCOM

Windows 95/98 is, by default, set for share-level access control. It must be set for user level.

- 1. Choose Start/Settings/Control Panel.
- 2. Open the Network applet in the Control Panel, and select the Access Control tab.
- 3. Select User- Level Access Control and click **OK**.

Before you can use Windows 95/98 DCOM, the machine must be configured to run DCOM applications. This requires a few more steps than you would normally take with the Windows NT or Windows 2000 DCOM setup. Also, unlike Windows NT and Windows 2000, which allow a client to launch a server remotely, it is absolutely necessary for the server component (KEPServerEX) to be running *before* a client can connect to it in Windows 95/98.

## Using the Install Program to Register the Server

You may also use the server installation program to make the appropriate registry entries and to ensure that all of the files needed to make a remote connection are present.

1. On the remote PC run the Install program.

Kepware Setup Utility	×
Select Components Choose the components Setup will install.	
Select the components you want to install, and clear the clinital.	The selected automatic base of the sub-component select component select a main component select a main component, all of the sub-components beneath it will be selected automatically. Each component has a brief description, which will be displayed here.
Space Required on C: 0 K Space Available on C: 13972320 K	
< Bac	k Next > Cancel

2. At the component selection page, deselect all the components except for OPC Quick Client, and click **Next** to continue with the install. We recommend installing the OPC Quick client to verify server connections.

Kepware Setup Utility	×
Select Components Choose the components Setup will install.	
Select the components you want to install, and clear the c install. KEPServerEx - Drivers - Example Source Code - Specifications - OPC Quick Client - Specifications - OPC Data Access Automation Specification - Select All (Full Installation)	omponents you do not want to Description OPC Quick Client This OPC Quick Client has been developed to assist in the test and development of our OPC Data Access 1.0 and 2.0 Servers. We recommend that you install it as it may aid with technical support if the need arises.
Space Required on C: 0 K Space Available on C: 13950624 K InstallShield	< Next > Cancel

### Adding DCOM Support to Win 95

 For Windows 95 users, you must obtain both DCOM95.EXE, and DCM95CFG.EXE (if you don't have them already) in order to configure DCOM, since it is not native to Windows 95. You can acquire these files from the Microsoft web site: www.microsoft.com/com/dcom/dcom95/download.asp

DCOM95.EXE is also available on the Microsoft Visual Basic CD-ROM 5.0 (Enterprise, Professional or Standard editions) in the \Pro\Tools\DCOM95 directory

- To install DCOM95, double-click DCOM95.EXE. You must reboot your system after the install to secure the changes. (NOTE: If you plan to install DCM95CFG.EXE then it would be best to reboot after both installations have been completed.)
- Double-click to install DCM95CFG.EXE (this will allow you to run the DCOMCNFG.EXE, which you will use later.) You then must reboot the machine after the installation is complete.

## Editing the DCOM Configuration

1. Click Start / Run, enter DCOMCNFG.EXE, and click OK.

Run	? ×				
	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.				
<u>O</u> pen:	dcomenfg				
	OK Cancel Browse				

DCOM Config (known as DCOMCNFG.EXE) is a utility that can be used to secure Distributed COM (DCOM) objects that have been created.

2. A general DCOM configuration window will appear with three tabs. The foremost tab is Applications, which lists all applications that can enable DCOM. The next two tabs are default configurations used for all the listed applications. Changes made to these tabs affect DCOM applications globally. Pertaining to security, the approach of the following instructions is to allow all network users access to all DCOM applications. After a connection has been established; the user may choose individual applications from the list and customize their DCOM security properties for more control.

Distributed COM Configuration Properties	? ×
Applications Default Properties Default Security	
Applications:	
Bitmap Image	
EventSystemTier2	
HTML Application	
Imaging for Windows 1.0	
KEPware Enhanced OPC/DDE Server	
Microsoft Chat Room	_
Microsoft Clip Gallery	
Microsoft NetMeeting Manager Object	
Microsoft Word Basic	
Microsoft Word Document	

Note: It is very important to make sure that the **Apply** button is selected after each change made in a DCOM settings tab.

 Under the Default Properties tab, "<u>Enable Distributed COM on this computer</u>" should be checked. Also, ensure that the "Default Authentication level:" is set to "Connect" and the "Default <u>Impersonation Level</u>." is set to "Identify". Click the Apply button if possible to administer the changes.

Distributed COM Configuration Properties	?	×
Applications Default Properties Default Security		_
Enable Distributed COM on this computer		
Default Distributed CDM communication properties		
The Authentication Level specifies security at the packet level.		
Default Authentication Level:		
Connect		
The Impersonation Level specifies whether applications can determine who is calling them, and whether the application can do operations using the client's identity. Default Impersonation Level: Identify		
OK Cancel App	ly.	

4. Select the Default Security tab and click the "Enable <u>remote connection</u>" box to allow for remote connections, then click the **Edit Default** button to view "Default Access Permissions".

Distributed COM Configuration Properties	×
Applications Default Properties Default Security	
Default Access Permissions	
You may edit who is allowed to access applications that do not provide their own settings	
Edit Default	
Enable remote connection	
OK Cancel Apply	

5. Add user group "The World" with "Grant Access" to the permission list. Then select **OK**. If you are going to connect to a server running on a Win NT/2000 PC as a service you will also need to add "System" with "Grant Access" to the permissions list.

A	ccess Permissions	X
	Name	Access Permisssions
	🕙 The World	Grant Access
		Banaua
	<u>8</u> 00	
		OK Cancel

 Click the Apply button, then select the Applications tab. Double-click on "KEPware Enhanced OPC/DDE Server". This will access the applications specific DCOM properties

Applications Default Properties Default Security
Applications:
Bitmap Image
HTML Application
Imaging for Windows 1.0
Internet Explorer(Ver 1.0)
KEPware Enhanced OPC/DDE Server
Microsoft Chat Room
Microsoft Clip Gallery Microsoft NetMeeting Manager Object
Microsoft Word Basic
Microsoft Word Document

7. In KEPServerEX's application specific DCOM window, choose the Location tab.

KEI	KEPware Enhanced OPC/DDE Server Properties 🛛 🤗 🗙				
G	eneral Location Sec	surity			
	General properties of	this DCOM application			
	Application name:	KEPware Enhanced OPC/DDE Server			
	Application type:	local server			
	Local path: D:\KEPSERVEREX\SERVERMAIN.EXE -opcrun				

8. Most clients will allow you to connect directly to the remote PC by entering the name of the PC in the server connection dialog box. For applications that do not allow direct connections, select "Run application on the <u>following computer</u>". Next, browse for the remote machine that contains the KEPServerEX application, and select **Apply**. In this example the machine name is REMOTE\_NT. For local connections you will leave "Run application on the computer where the data is located" checked.

Note: See Kepware's Client Connectivity guide for information on how specific clients connect remotely to KEPServerEX.

Warning: This dialog box will allow you to select more then one check box. If this happens it produces an error state. You must make sure that only one box is checked.

KEPware Enhanced OPC/DDE Server Properties
General Location Security
The following settings allow DCOM to locate the correct computer for this application. If you make more than one selection, then DCOM uses the first applicable one. Client applications may override your selections.
Run application on the computer where the data is located
Run application on this computer
Run application on the following computer:
REMOTE_98
OK Cancel Apply

9. Choose the Security tab and verify the radio buttons for the Access permissions are set to default. Click **Apply** to accept these changes.

KEPware Enhanced OPC/DDE Server Proper	ties 🔋	×
General Location Security		1
Use default access permissions		
C Use custom access permissions		
You may edit who can access this application.		L
	Edit	

- 10. Choose **OK** from the bottom of the application specific DCOM display window.
- 11. Choose **OK** from the bottom of the general DCOM display window.
- 12. Reboot the computer to secure the new DCOM configuration.

At this point you should be able to connect to the server from the remote PC. If you installed the OPC Quick Client use it to test the connection, and then try the client you are planning to use.