



K2 connect for SAP - NLB Configuration Workaround

BASED ON K2 BLACKPEARL RTM



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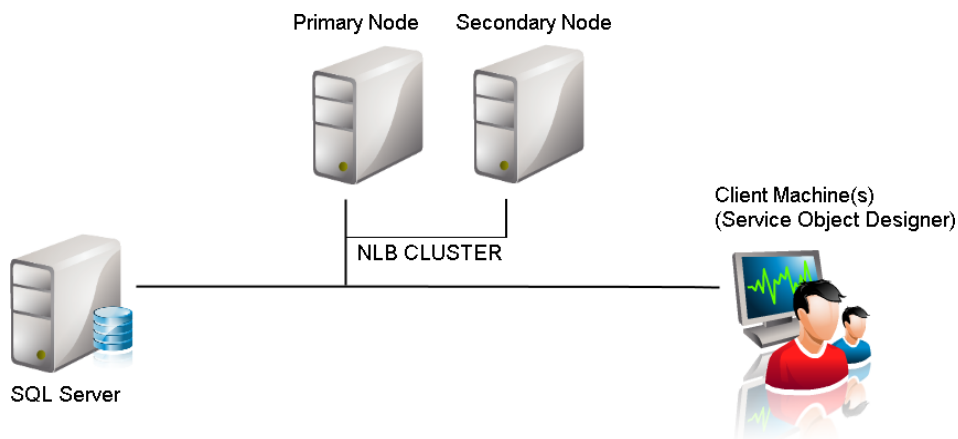
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CONNECT FOR SAP: NLB

NLB or Network Load Balance is implemented to extend the capabilities of a distributed installation to handle the increased load on a distributed network. Load balancing involves grouping 2 or more physical machines together in a cluster with similar software components installed on the two machines. Logically, all machines on the network will view the clusters or nodes as the same physical machine.

Distributed installations, are installations where each components is installed on a dedicated physical machine, and communicates with the rest of the network via the LAN. To implement the scenario described in this article, the following configuration is required.

An example distributed network is shown below, which includes a cluster node



Note: A number of manual steps are required. Owing to this, this document is not intended to serve as a replacement for original works discussing NLB. This document serves only to bridge the gap between the required know how and technical skill regarding NLB and the specific requirements for K2 connect for SAP.

Full support for NLB is not currently available in the current version of K2 connect for SAP, full support will be available in a later release of K2 connect for SAP. This article however, will describe how to implement a workaround that will enable a System’s Administrator to implement two K2 Server Machines that are in a NLB cluster.

To implement the scenario discussed in this article, the following minimum network resources are required.

Notes on installing and configuring this network:

- The prerequisites to install this network are identical to K2 blackpearl, refer to the K2 blackpearl documentation for the installation prerequisites and requirements
- The K2 connect for SAP prerequisites can be found in the K2 connect for SAP user documentation

INSTALLATION OVERVIEW

This document will discuss installing K2 connect for SAP for the first time in a "clean" environment, with the purpose of setting up a clustered NLB K2 connect for SAP Server Environment. This approach is adopted for simplicity, however some experience with installing K2 connect for SAP is assumed. During the course of the installation instructions, some steps may be excluded where no configuration is required. If a user interface is encountered where there is no discussion, maintain the default settings and click next.

INSTALLATION PREREQUISITES

To complete this installation, the K2 connect components will be installed on four machines. Excluding the SQL Server, the K2 Server Machines and the Client Machines require the following items to be installed and configured in the order described below.

LIBRFC32 DLL

- Must be installed
- The DLL is an unmanaged assembly and must be registered

ERP Connect

- Must be installed, no configuration is required

LICENSING REQUIREMENTS

When installing K2 blackpearl and K2 connect for SAP, each server instance requires a separate license. Each machine or node resident within the Cluster will require a K2 Server License and a K2 connect for SAP License.

The machine keys required to apply for licenses will be available once the installation of the server components is complete.

NLB CONFIGURATION

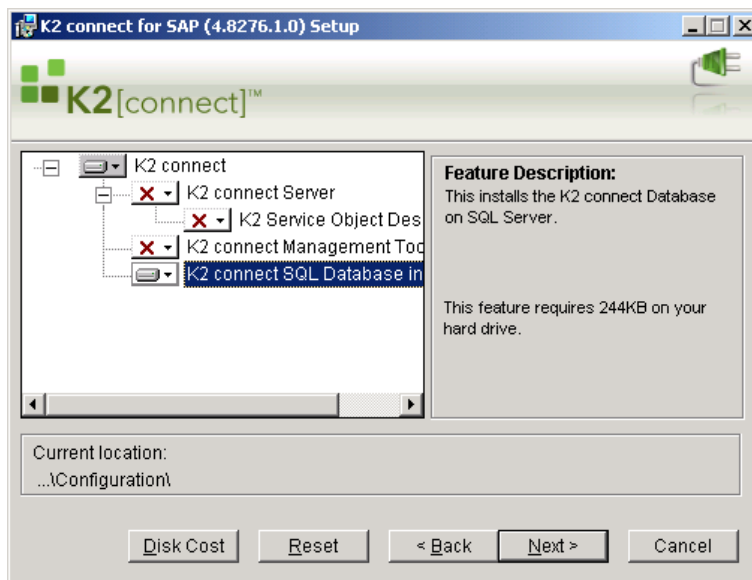
The K2 Server Machines that are the cluster must be configured as such before attempting to install the K2 connect for SAP. It is expected that the K2 blackpearl environment has been setup, configured and is currently operational before attempting to install K2 connect for SAP alongside the K2 blackpearl servers.

INSTALLING THE SQL COMPONENTS

Note: The order of installation is relevant; ensure that it is followed for best results. Not all steps contain screen captures and some steps may be omitted. This is intended as a differential set of instructions and only the relevant steps will be discussed.

The K2 connect for SAP Database components must be installed first. Follow the steps below.

1. **Welcome Screen:** Click **Next**
2. **K2 connect for SAP EULA:** Accept the terms and conditions, click **Next**
3. **Installer Details:** Click **Next** to continue
4. **Installation Folder:** The default destination can be persisted, unless a change is required. Click **Next**
5. **K2 connect Deployment Options:** Select Custom Installation, Click **Next**
6. **Feature Description:** Disable all components, except the K2 connect SQL Database components. Click **Next**



7. **Database connections:** Enter the name of the SQL Server, database name and click **Next**
8. **Ready to install:** Click **Next**
9. **Installation Complete:** Click **Finished**

K2 SERVER CLUSTERS

To complete this portion of the installation, any number of K2 Server Machines can be part of the cluster. Each physical machine where the K2 Server is installed, the K2 connect for SAP service requires a License as well.

Note: The following must be installed before the installation proceeds:

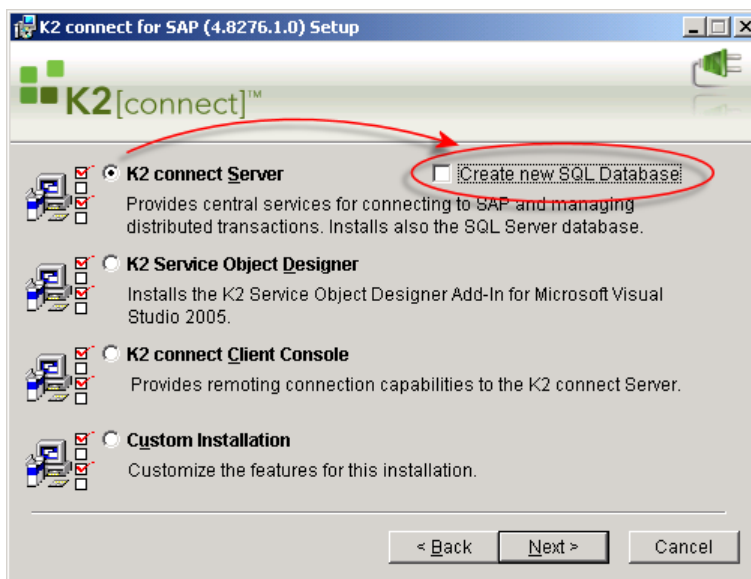
1. The LIBRFC32.DLL must be installed and added to the GAC for each machine
2. The ERPConnect components must be installed

The installation starts with the primary node in the cluster. And the cluster must be configured before the installation begins.

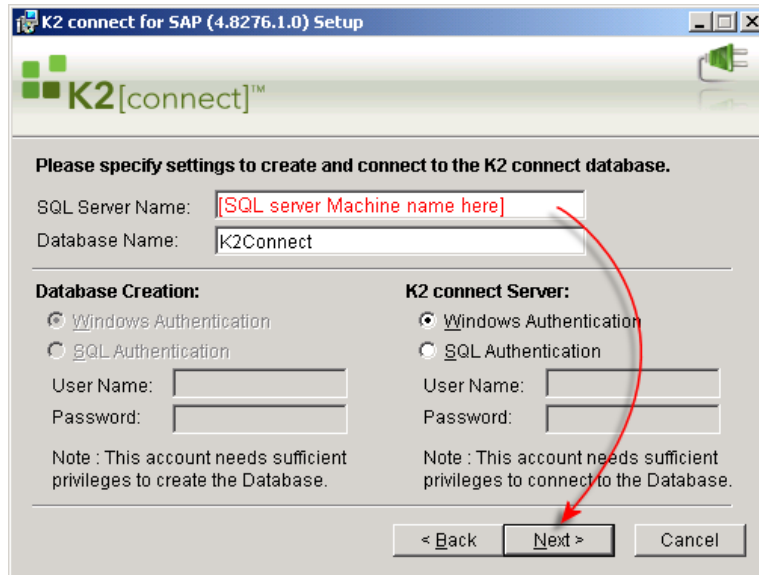
PRIMARY NODE INSTALLATION: K2 CONNECT FOR SAP SERVER

Note: The K2 connect databases must have been installed first on the SQL server before performing this step.

1. Start the installer
2. **Welcome Screen:** Click **Next**
3. **K2 connect for SAP EULA:** Accept the terms and conditions, click **Next**
4. **Installer Details:** Click **Next** to continue
5. **Installation Folder:** The default destination can be persisted, unless a change is required. Click **Next**
6. Select the option K2 connect Server, and disable the option **Create new SQL Database**. Click **Next**



7. **Database connections:** Enter the machine name of the SQL Server where the K2 connect for SAP database components were installed. Click **Next**



8. **System Account:** The SQL Server Service Account's credentials are required
 - a. Disable the option, "Use system Account"
 - b. In the field Username, add the entire domain name path i.e. MyConnectDomain\MyUser
 - c. Enter the password
 - d. Click Next to continue
9. **ERP Connection:** Click next to continue

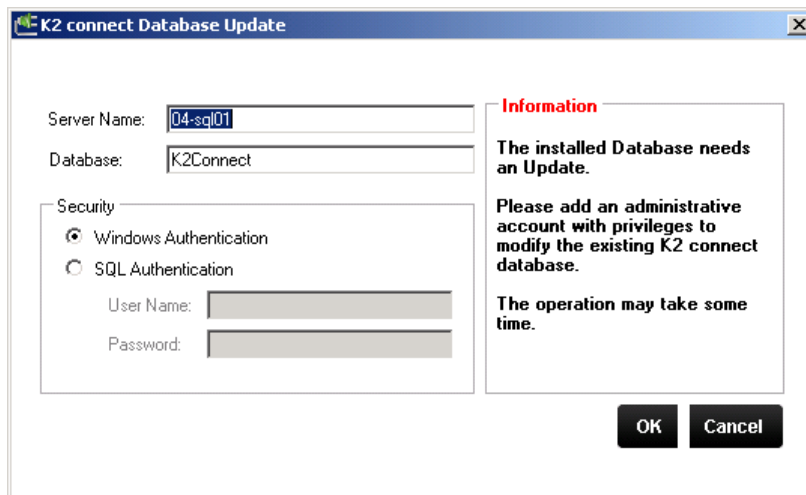
Note: If the ERP connection page does not display, the ERP software components have not been installed or have not been installed correctly and are not functioning correctly. These components are operationally critical for K2 connect for SAP and they **MUST** be installed.

10. Ready to install: Click Next
11. Installation Complete: Click **Finished**

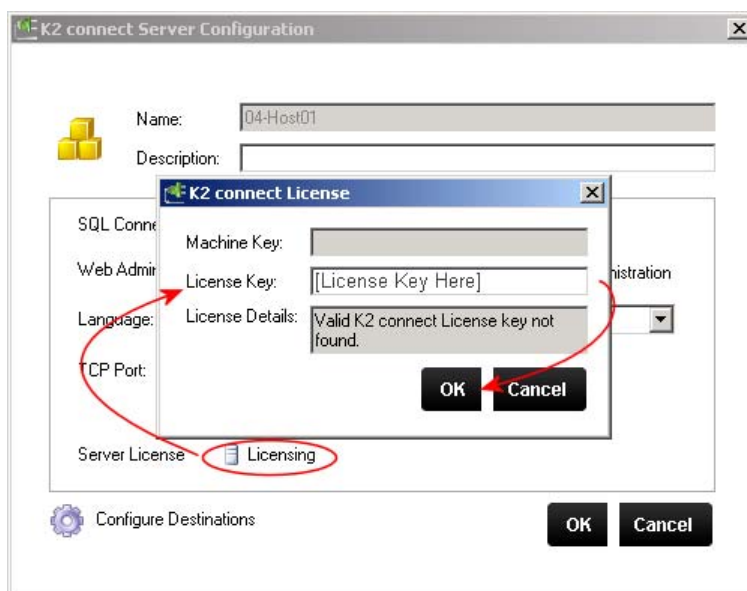
DATABASE UPGRADE AND LICENSING

Once the K2 connect Server has been installed, the node must be licensed.

1. Click on the **Start Menu > K2 connect for SAP > K2 connect Administration Tool**
2. The K2 connect Database Update tool displays, click **Ok** to proceed



3. Click on Licensing
 - a. Use the machine key to obtain a license key
 - b. Enter the license key
 - c. Click **Ok** to activate the license



ADDITIONAL NODES: SERVER INSTALLATION

The cluster can consist of as many K2 Servers that are required. The installation procedure is the same for each server node in the cluster. Repeat the steps above to install the second, third, fourth, etc servers that are in the cluster.

CONFIGURATION OVERVIEW

Before attempting to configure the nodes in the K2 Server cluster, ensure that your infrastructure has been setup **FIRST**.

In the configuration steps, the following takes place

1. From the primary node in the cluster, a SAP Destination will be configured
2. The additional nodes in the cluster will then share this SAP destination with the primary node

PRIMARY NODE: CONFIGURE SAP DESTINATION

The SAP Destination from which all the additional server nodes will import Service objects is configured initially on the primary node

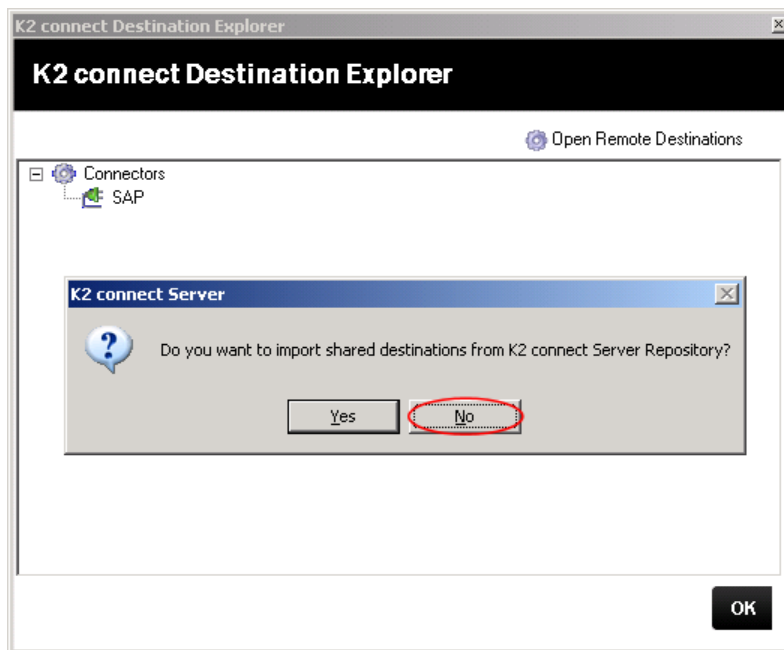
Note: All configuration and system changes must be configured first on the primary node

1. Open the K2 connect Destination Explorer
2. Right click on **Connectors > Connectors > Add**
3. Enter a name for the Destination
4. For the connector path:
 - a. Click on the folder Icon
 - b. And select the connector

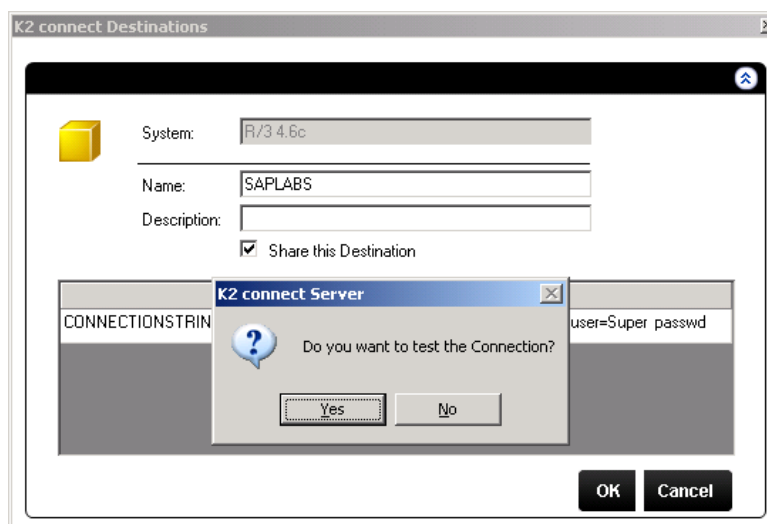
Note: If the user is unable to reach this step, the ERP connector is not installed, or not functioning correctly.



- c. Click **Open**
- 5. Since this is the primary node, click **NO**, i.e. no imports must take place



- 6. Right click on the SAP instance, and add a system
- 7. Right click on the system and select to add a destination
 - a. Enter a name for the Destination (use an intuitive name that can be easily remembered for when the additional nodes are added)
 - b. *Enable* the option to **Share this Destination**
 - c. Enter the connection string
 - d. Click **Ok**
 - e. The system will prompt the user to test the connection. Click **Yes** to verify that the connection is working



ADDITIONAL NODE: CONFIGURE SAP DESTINATION

The additional nodes are setup the same way as the primary node as far as the installation is concerned. As per the instructions above:

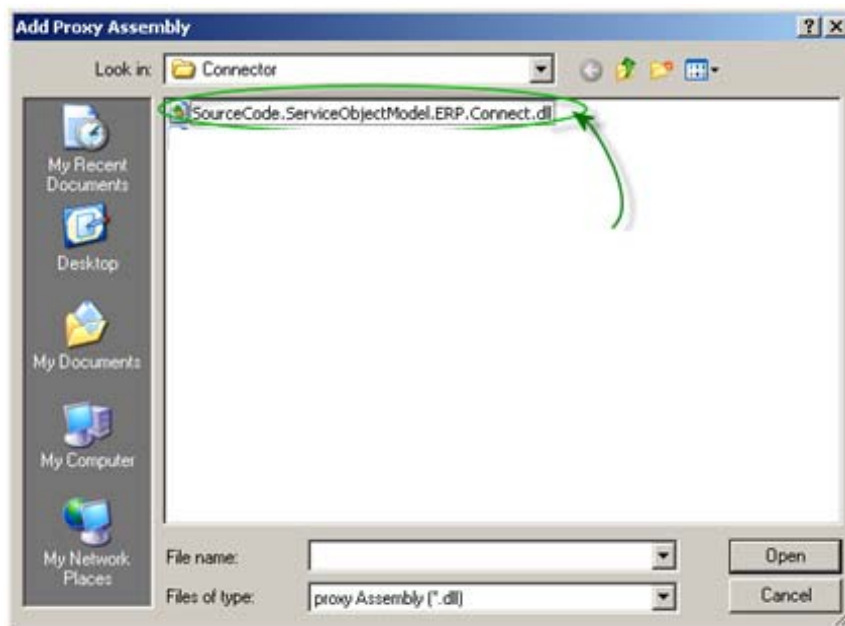
1. Install K2 connect for SAP
2. License the product, then proceed with the steps below

CONFIGURE DESTINATION FOR AN ADDITIONAL NODE

Once the additional node has been installed and licensed, then the destination can be configured.

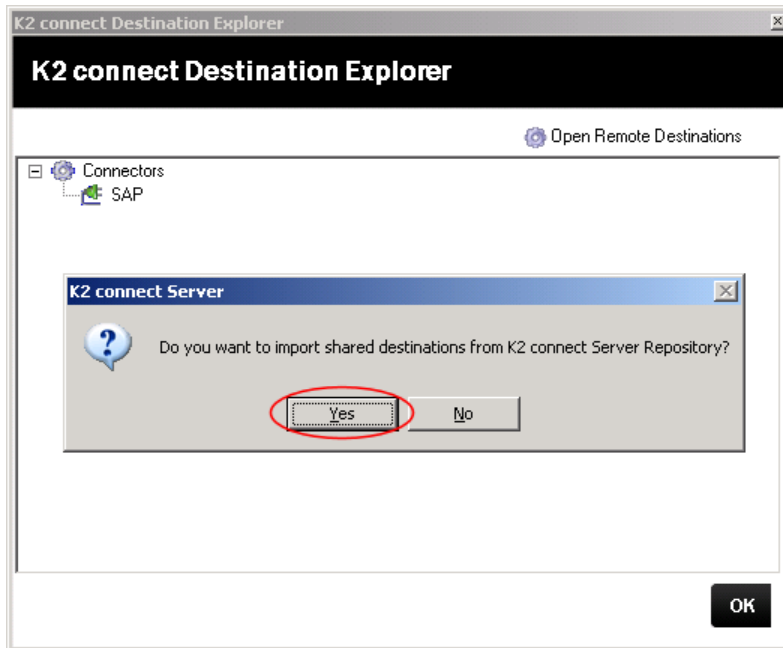
1. Open the K2 connect destination explorer
2. Right click on **Connectors > Connectors > Add**
3. Enter a name for the Destination
4. For the connector path:
 - a. Click on the folder Icon
 - b. And select the connector

Note: If the user is unable to reach this step, the ERP connector is not installed, or not functioning correctly.

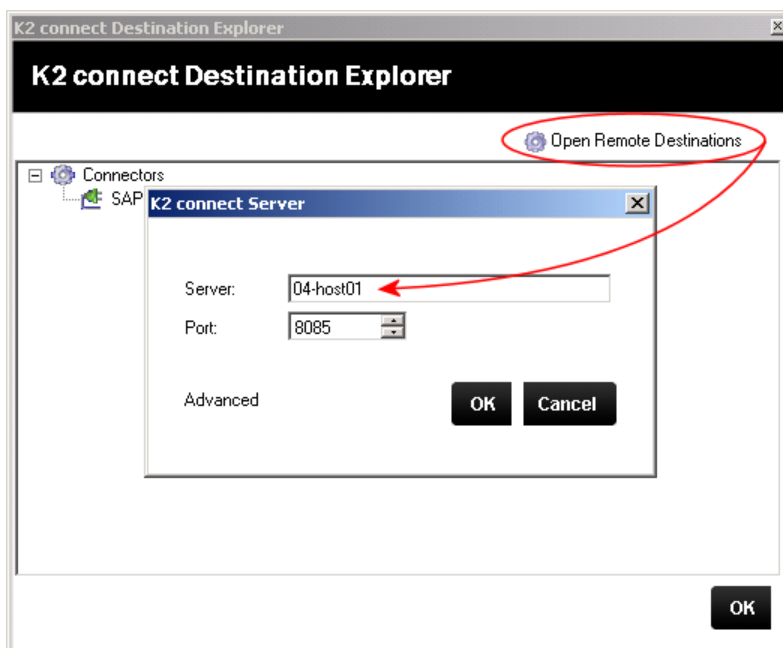


- c. Click **Open**

5. Since this is a secondary or an additional node imports will take place. Click **Yes**

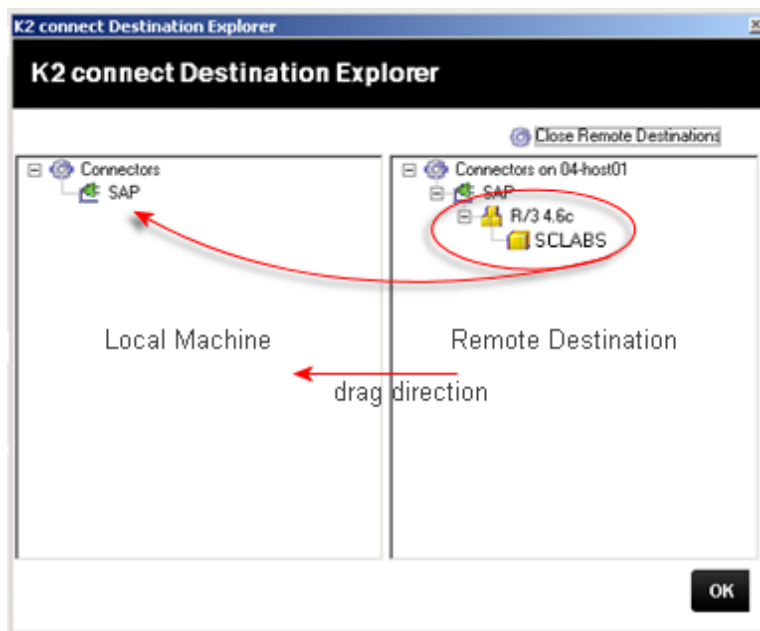


6. Click on the button **Open Remote destination** (from here the user is opening the Primary node as the remote destination)
7. Enter the machine name of the Primary node
8. Click **Ok**

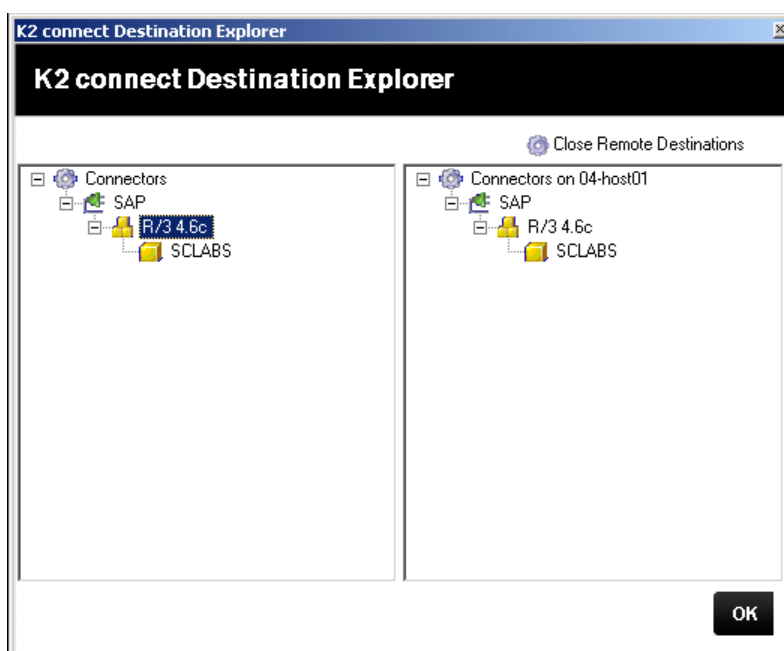


If the Primary node is configured correctly, the remote system will appear in the right hand pane. To configure the Remote Destination, do the following

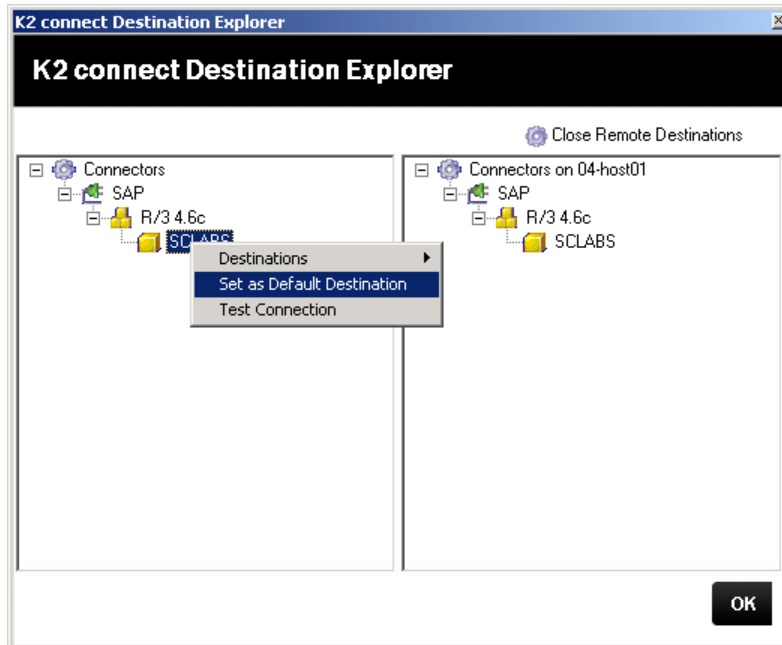
1. Expand the System Node named SAP
2. Select and hold on the destination as shown circled in red
3. Drag the System to the left in the direction of the local machine by selecting the **ICON**, and carefully drop it onto the local instance of the SAP Connector



4. Shown below, the local machine now has a replicated instance of the default destination configured on the primary node.



5. To configure the destination as the default, for the local machine
 - a. Right click on the instance of the destination
 - b. Select the option **Set as Default Destination**
 - c. The replicated instance of the default destination has now been configured as the default destination for the local cluster node



6. Click **Close Remote Destination**
7. Click **Ok** to close the Destination Explorer

Once the above is done, the Administrator can now configure the client machine. The client machine is the location from where the service objects will originate.

CLIENT MACHINE

INSTALLATION PREREQUISITES

Note: The items discussed below must be considered before attempting the client installation

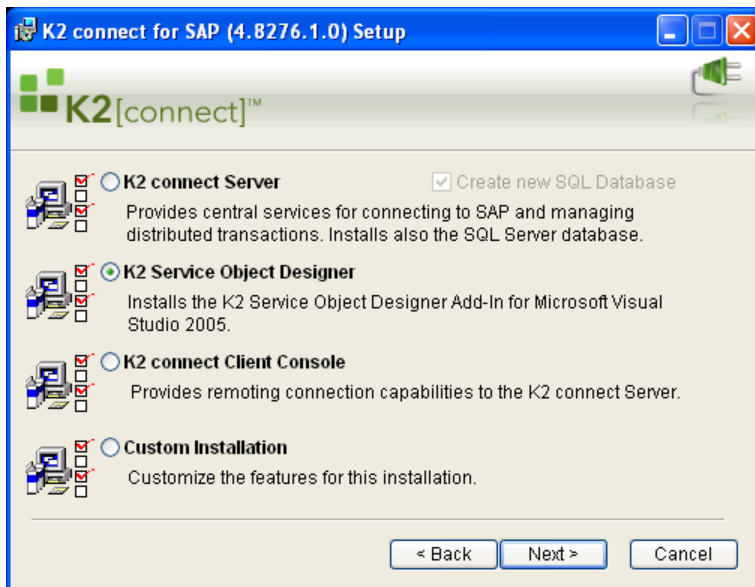
The same K2 connect for SAP installer is used to install a client machine, and the following items are required

1. **LIBRFC32.DLL:** The DLL must be copied to the machine and registered
2. **ERP connect:** ERP Connect must be installed before K2 connect for SAP is installed
3. **K2 connect for SAP:** The client machines do not require a license, however both Server and Client components are installed to facilitate system operation

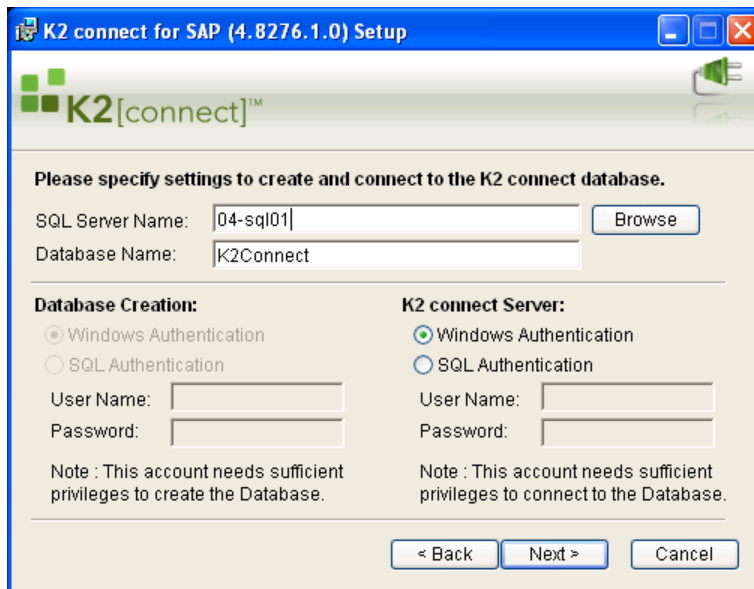
CLIENT MACHINE INSTALLATION

The K2 connect for SAP components are installed by following the steps outlined below:

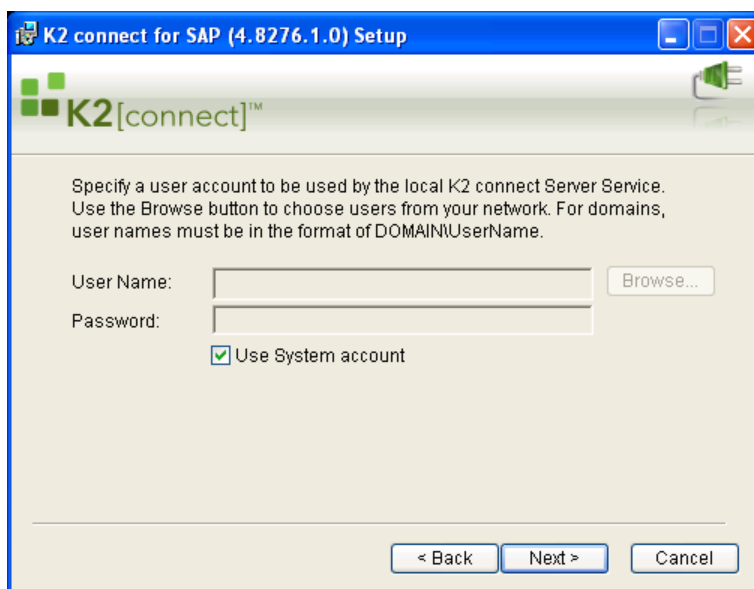
1. Run the installer
2. **Welcome Screen:** Click **Next**
3. **K2 connect for SAP EULA:** Accept the terms and conditions, click **Next**
4. **Installer Details:** Click **Next** to continue
5. **Installation Folder:** The default destination can be persisted, unless a change is required. Click **Next**
6. **K2 Connect Deployment Options:** Select K2 Service Object Designer (Client Machine), Click **Next**



7. **SQL Server:** The client machine must be directed to the SQL server instance
 - a. Enter the machine name of the SQL Server
 - b. Click **Next**

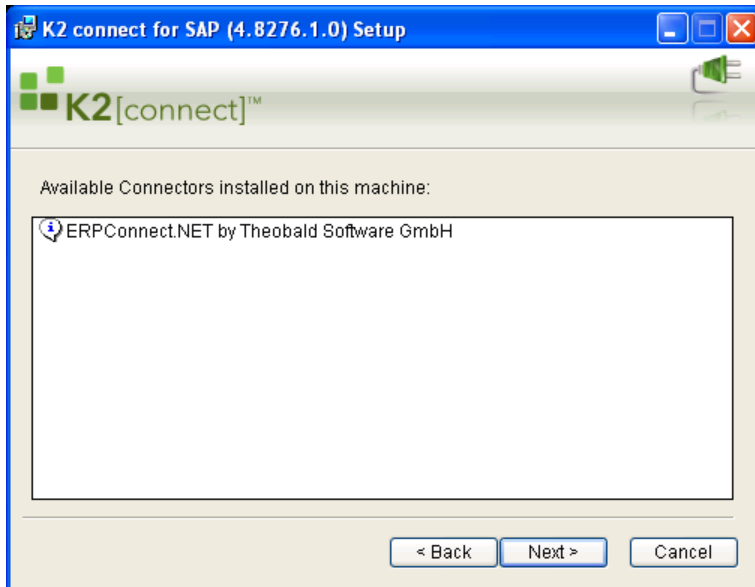


8. **Service Account:** The system account can be used for this step. Leave the default settings in place and click **Next**



9. **ERP Connection:** Click **Next** to continue

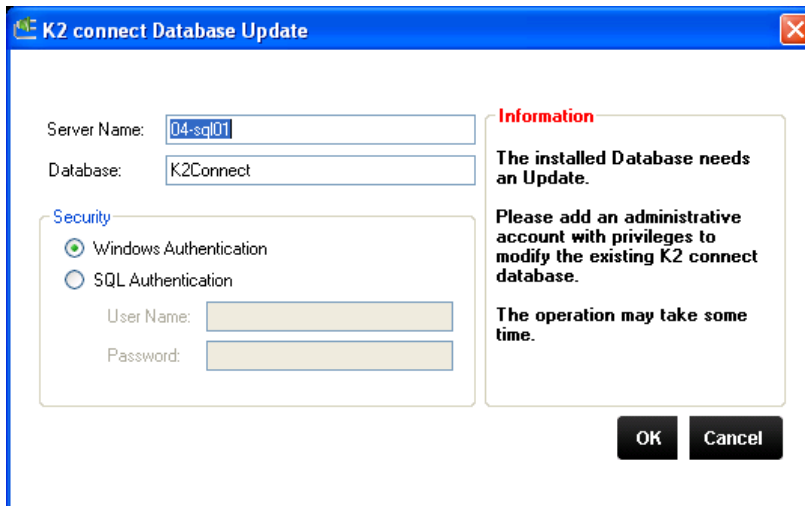
Note: If the ERP connection page does not display, the ERP software components have not been installed or have not been installed correctly and not functioning correctly. These components are operationally critical for K2 connect for SAP and they **MUST** be installed.



10. When the installation is complete, click **Finish**



11. Database Update: The database update screen displays. Enter the machine name of the SQL Server and then click **Ok**



K2 connect Database Update

Server Name:

Database:

Security

Windows Authentication

SQL Authentication

User Name:

Password:

Information

The installed Database needs an Update.

Please add an administrative account with privileges to modify the existing K2 connect database.

The operation may take some time.

OK **Cancel**

12. The K2 Administration Tools will launch after the screen above. Simply close the tool as there is nothing required by the user on this form

DEPLOYING SERVICE OBJECTS

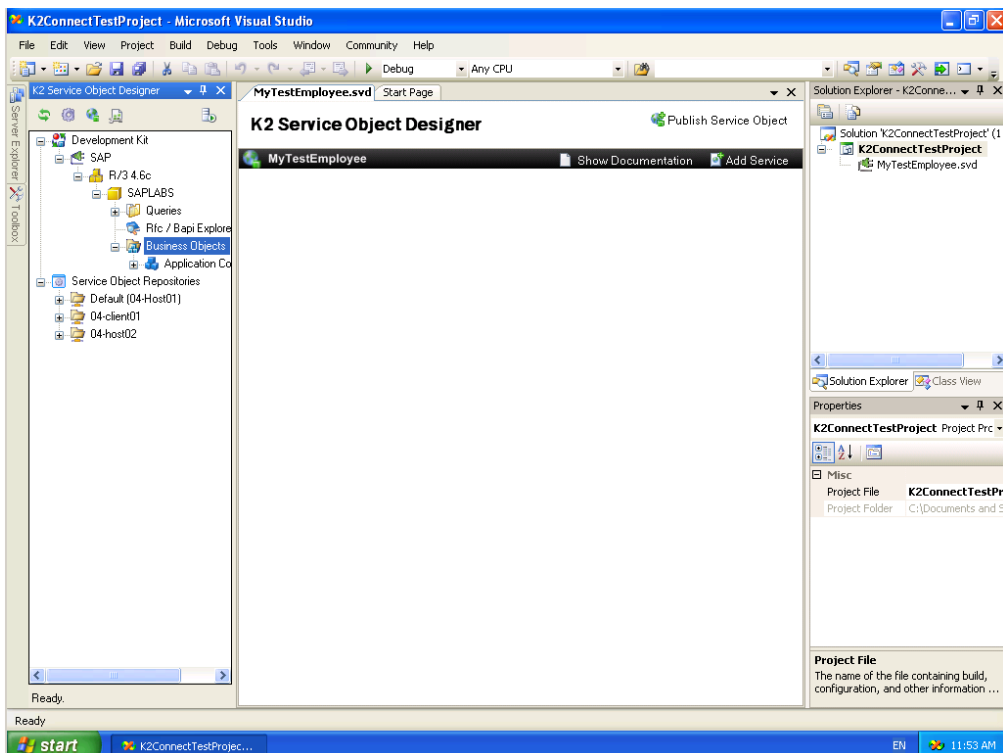
In a standalone or a distributed environment, the service object is published directly to the K2 connect destination from the K2 Designer for Visual Studio. However, when the K2 connect Server is configured in a cluster the Service Object Designer is added manually to the Service Object repository.

SET THE DEFAULT SERVER

From the K2 Service Object Designer > Service Object Repository, the user must locate the primary node and set the primary node as the default server.

CREATE AND COPY

The first step is to create a service object and a discussion of how to do this is available in the K2 connect for SAP user documentation.



Once the service object is ready to be published, the designer does the following.

1. Save the Service Object to the local machine Drive

Note: The Usual option to Publish Service Object is available but will not be able to publish

2. Select to open the containing folder, and you will locate the *.SVD file. This is the data source for the Service Object
3. Copy the *.SVD to the cluster primary node. The SVD file can be saved to any location on the primary node, so long as the location does not impose any user rights restrictions on the files once they are stored there.

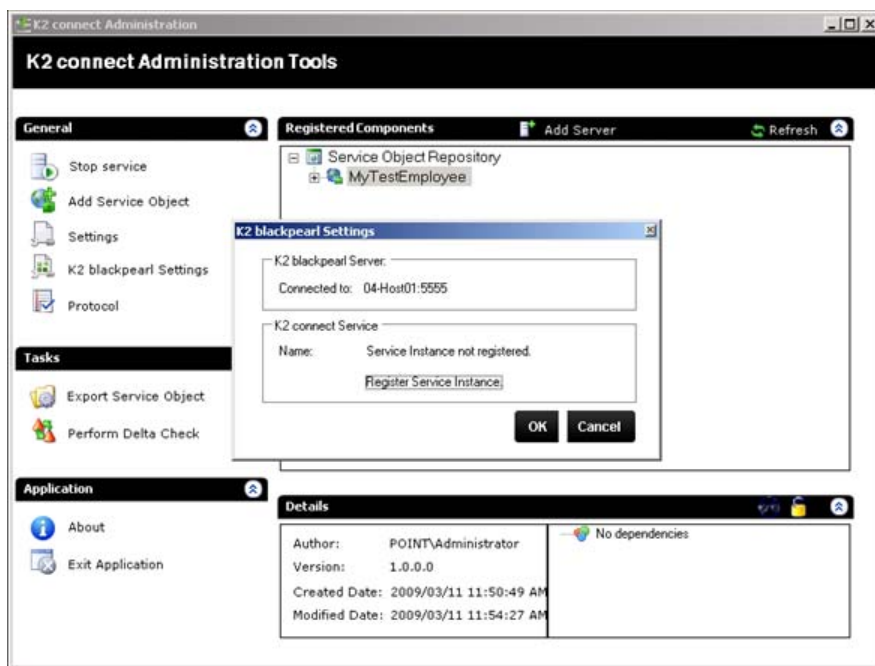
SERVICE REGISTRATION AND SERVICE METHODS

Normally, the option from the K2 Designer for Visual Studio would perform the functions of publishing the service object and creating the service methods for the service object. Both these steps must now be done manually.

HOW TO REGISTER THE SERVICE

The *.SVD file must be copied and saved locally on the primary node of the cluster. It can be saved in any location, just as long as there are no user rights restrictions on that folder. From the K2 connect Administration Tools, do the following:

1. Click on Add Service Object
2. Browse and locate the Service object's file *.SVD
3. Click Open. The *.SVD file is now located in the Service Object Repository
4. Click on K2 blackpearl Settings
 - a. From the K2 blackpearl Settings dialog, Click **Register Service Instance**
 - b. The Administration tools will register the service object and refresh the service instance

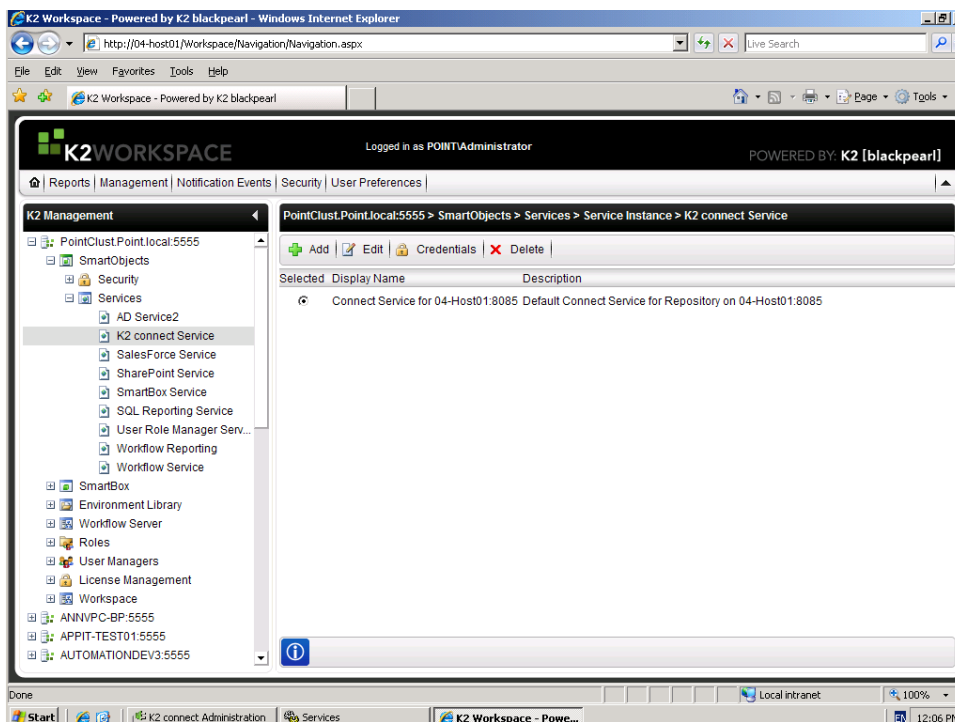


5. Click Ok to close the **K2 blackpearl Settings** user dialog

K2 WORKSPACE

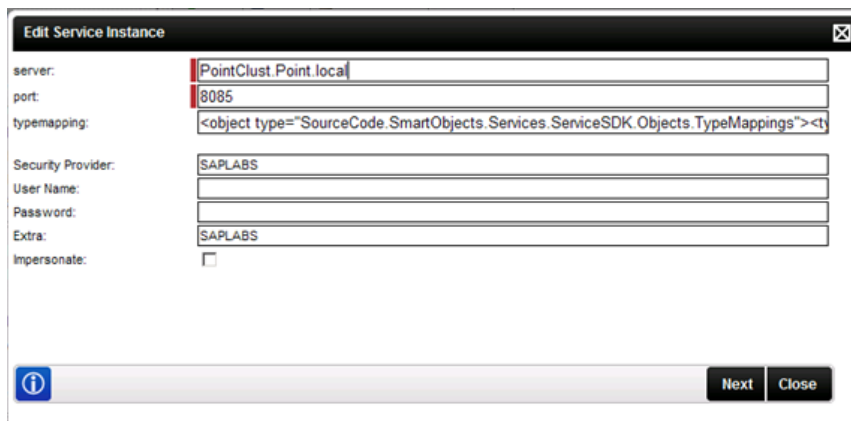
The K2 connect Service Object has been registered with K2 Workspace. However, the system is referencing the primary node in the cluster and not the cluster itself. This must be reconfigured to finally enable the NLB configuration.

1. Open K2 Workspace and login as the system Administrator
2. Browse to the folder location **K2 Management > SmartObjects > Services > K2 connect Service**
3. Select the K2 connect Service Instance and click on **Edit**



4. Enter the name of the Server Cluster and then click **Next**

Note: Currently K2 Workspace does not support the use of special characters. If the Cluster name contains special characters, you must remove them when entering the server name. This will not affect the system identifying the Server Cluster



INSTALLING AND CONFIGURING THE SMARTOBJECT TESTER

The SmartObject Service Tester must be installed manually and a number of proxy DLLs must be added to the GAC before the application can be used. The files are located on the client machine in the N:\prtogram files\K2 blackpearl \ BIN folder. They need to be copied manually to the corresponding folder onto the additional nodes within the cluster. And thereafter, the files need to be added to the GAC.

Note: This step must be done before installing K2 connect

Below is a list of dlls, the user must add these to the GAC on the Service Object Designer (Client) machine.

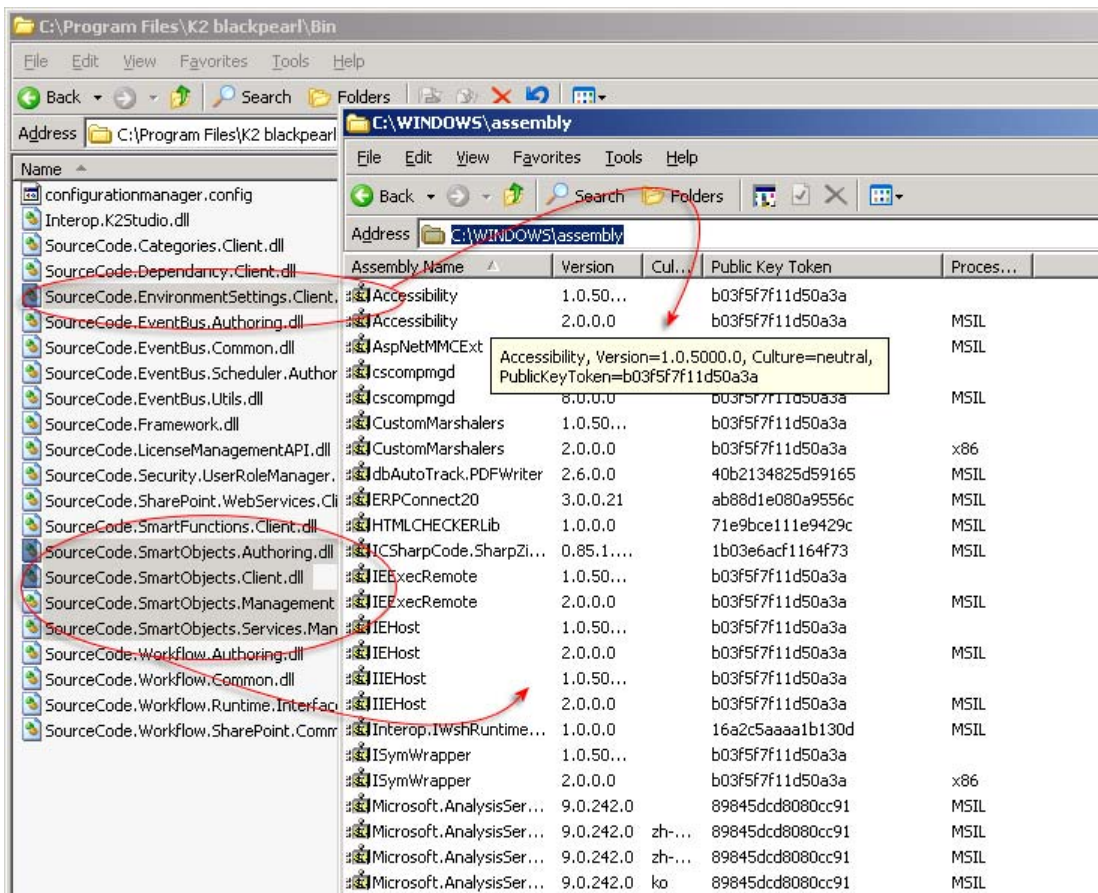
SourceCode.EnvironmentSettings.Client.dll

SourceCode.SmartObjects.Authoring.dll

SourceCode.SmartObjects.Client.dll

SourceCode.SmartObjects.Management.dll

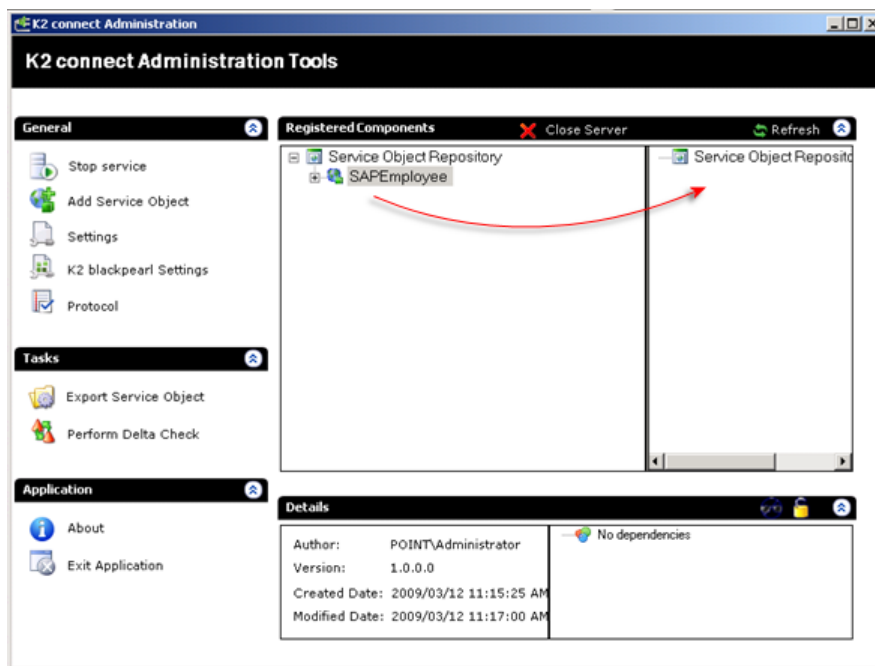
SourceCode.SmartObjects.Services.Management.dll



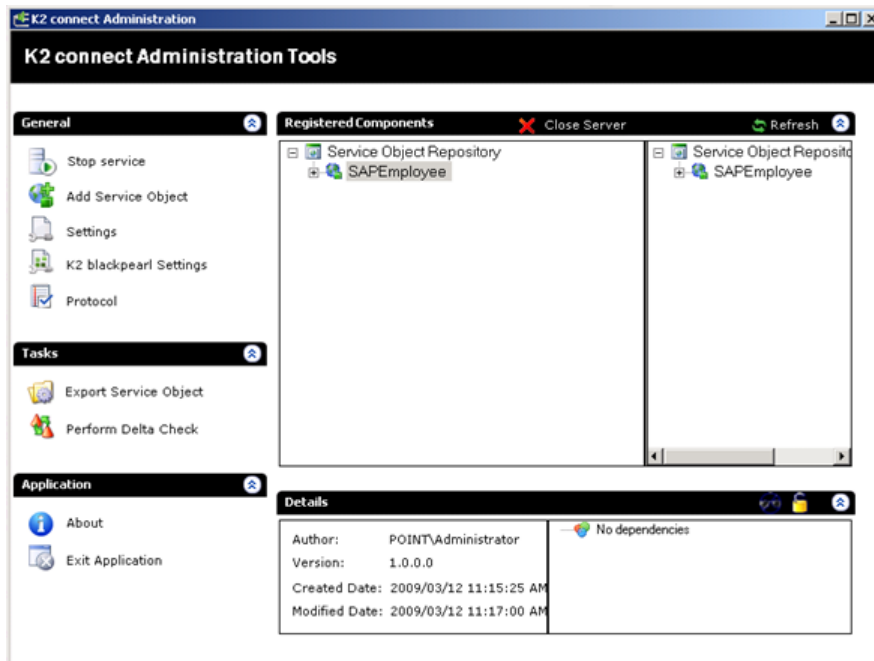
PUBLISHING SERVICE OBJECTS ON THE ADDITIONAL NODES

When publishing the service objects on the additional nodes the identical *.SVD file must be copied to the additional node. The procedure also uses the K2 connect Administration tool, but utilize the K2 Administration tools to simply drag the service object across. The K2 connect Service instance however cannot be refreshed remotely, and must be refreshed locally from the secondary node.

1. Click on **Add Server**
2. Enter the machine name of the remote node
3. Click ok and the remote K2 connect Server will load on the right hand pane
4. Select the Service object that you need to publish on the remote machine and drag it across

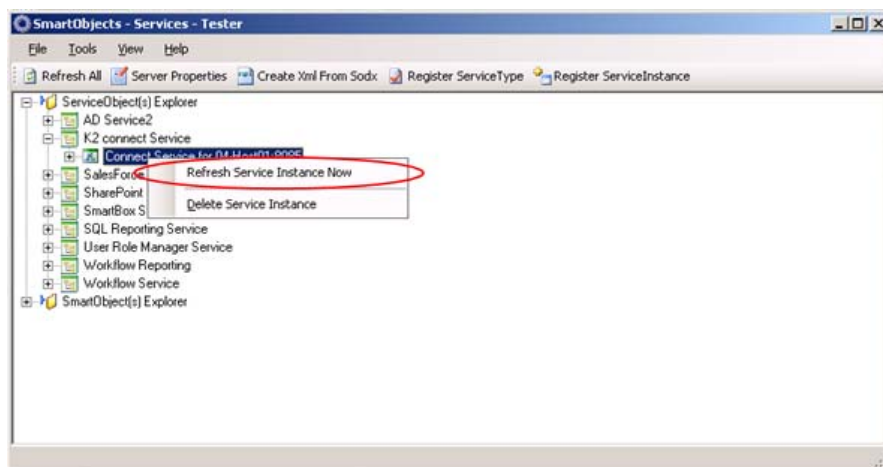


- The Service Object is now available from the secondary node in the cluster. This step is repeated for each node in the cluster



- Once the node has been copied remotely, the service on the remote node must be refreshed. This step cannot be performed remotely, and must be refreshed locally at the secondary node using the SmartObject Tester.

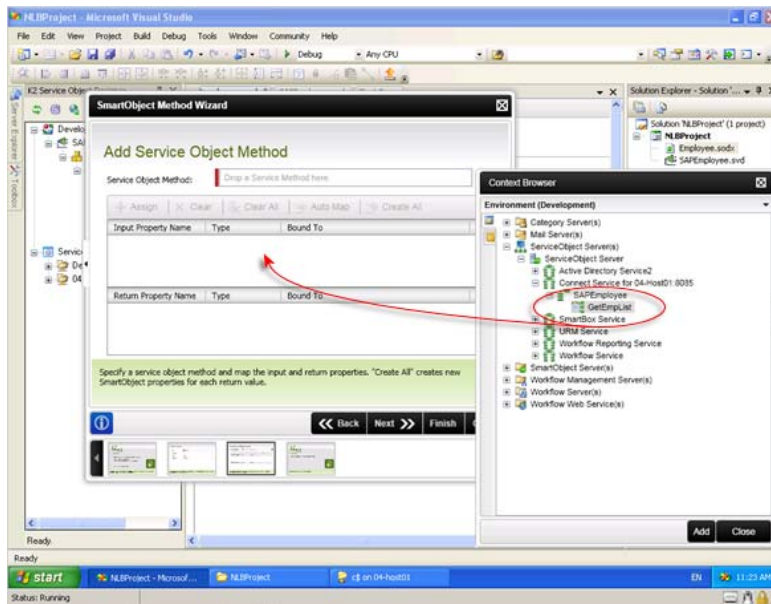
As shown below, the SmartObject tester is being used to refresh the local service instance



SERVICE METHODS

To create a SmartObject with corresponding service methods, this must be done manually. The simplified steps are below

1. Start a new K2 SmartObject Project
2. Run the K2 SmartObject Wizard in Advanced Mode
3. Clear all the default service methods for the SmartObject
4. Click on the Context Browser
 - a. Open Service Object Server > Connect Service... > Service Object Name > Service Method
 - b. Click **Add**
 - c. Click **Close**



5. **Auto Map** the Service Methods
6. Click **Finish** to complete the process