

VISUAL message center

Clustering VISUAL Message Center with Microsoft Cluster Services

VMC-GEN

Clustering VISUAL Message Center with Microsoft Cluster Services

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How to Use this Guide

This chapter explains how to use Tango/04 User Guides and understand the typographical conventions used in all Tango/04 documentation.

Typographical Conventions

The following conventional terms, text formats, and symbols are used throughout Tango/04 printed documentation:

Convention	Description
Boldface	Commands, on-screen buttons and menu options.
<i>Blue Italic</i>	References and links to other sections in the manual or further documentation containing relevant information.
<i>Italic</i>	Text displayed on screen, or variables where the user must substitute their own details.
Monospace	Input commands such as System i commands or code, or text that users must type in.
UPPERCASE	Keyboard keys, such as CTRL for the Control key and F5 for the function key that is labeled F5.
	Notes and useful additional information.
	Tips and hints that will improve the users experience of working with this product.
	Important additional information that the user is strongly advised to note.
	Warning information. Failure to take note of this information could potentially lead to serious problems.

Chapter 1

Introduction

This document is intended as a reference for VISUAL Message Center administrators and provides information about how to deploy a high availability monitoring solution using Microsoft Cluster Services (MSCS).

Although there are many possible configurations that should work successfully, this document focuses on how to create a 2-node cluster with four shared drives (usually SCSI disks):

- One for the cluster quorum
- another for the SmartConsole, and AccessServer
- a third for ThinkServer, and
- a fourth for Web applications.

The main objective is to provide a step-by-step configuration guide for implementing a VISUAL Message Center cluster. Basic information about MCSC configuration is included in this document and we refer you to the Microsoft Web site for further details.

Chapter 2

Requirements

The requirements for deploying a VISUAL Message Center cluster running on MSCS are the same as the basic requirements for configuring a 2-node cluster with shared storage.

2.1 Server Requirements

Both machines should meet the product requirements specified in the VISUAL Message Center SmartConsole and VISUAL Message Center ThinkServer user guides.

To illustrate the steps in the process we will use two example servers: SSPP-CLUS1 and SSPP-CLUS2.

Server	Requirements
SSPP-CLUS1	Server matching minimum product requirements specified. Windows Server 2003 Enterprise Edition
SSPP-CLUS2	Server matching minimum product requirements specified. Windows Server 2003 Enterprise Edition



Note

As Windows 2000 Server clustering is not supported by Tango/04 products, we will use Windows Server 2003 in our examples

2.2 Storage Requirements per Server

Each server should have Windows Server 2003 installed locally.

Drive	Minimum size	Recommended Size	Use
System (C:)	5 GB	10 GB	Operating System and limited Tango/04 data

2.3 Shared Storage Requirements

To configure a MSCS cluster you need at least one common disk drive to exchange synchronization information between the cluster nodes. This disk is called the quorum disk.

To provide both high availability and load-balancing for performance purposes, we will use additional shared disks:

- One for SmartConsole
- another for ThinkServer
- Web applications

This way the required configurations will be available for the node executing each application.

You will find the requirements for the shared disks described in the table below:

Drive letter	Minimum Size	Recommended Size	Use
Quorum (Q:)	500 MB *	500 MB *	The quorum disk is used to exchange information between the nodes of the cluster. It is used to synchronize services, configurations, etc.
SmartConsole (S:)	1 GB	4 GB	SmartConsole application and configuration files.
ThinkServer (T:)	2 GB	5 GB	ThinkServer application and configuration files.
Web Applications (W:)	2 GB	10GB **	Web applications and configuration files.

* This is the quorum size recommended by Microsoft ¹

** The recommended size depends on how many scheduled reports can be expected to be implemented.

2.4 Recommended reading

As mentioned before, this document is intended for experienced MSCS users. The following tasks are important to making the cluster work, but are not within the scope of this document. If you are not familiar with the following topics, we suggest you check the Microsoft Web site for more information.

2.4.1 Ethernet configuration for redundancy

To communicate the between different cluster nodes, create a heartbeat between the nodes and avoid a single point of failure, Microsoft recommends enabling a dedicated network interface for each cluster node. As this configuration is not mandatory for our purposes, it is not discussed in this document. However we suggest you follow Microsoft's recommendations described in *Recommended private "Heartbeat" configuration on a cluster server* available from the Microsoft Web site (July 2007) <http://support.microsoft.com/kb/258750/EN-US/>

1. Excerpt from "Quorum Drive Configuration Information" available at <http://support.microsoft.com/kb/280345> (17 July 2007):

"It is recommended that you configure the quorum disk size to be 500 MB; this size is the minimum required for an efficient NTFS partition. Larger disk sizes are allowable but are not currently needed. It is also recommended that you configure some form of fault tolerance at the hardware level to be used for the quorum drive, such as hardware mirroring or hardware RAID. If the quorum drive is lost, the cluster may not be available."

2.4.2 Configuration of a clustered database

Configuration of a clustered database is not in the scope of this document. Depending on the clusters database you choose to configure, for example a SQL Server, you can find extensive documentation on the Internet. In addition we recommend the following documentation:

- Microsoft SQL Server 2000 Failover clustering

<http://www.microsoft.com/technet/prodtechnol/sql/2000/maintain/failclus.msp#E1F>

- SQL Server 2005 Failover Clustering White Paper

<http://www.microsoft.com/downloads/details.aspx?FamilyID=818234dc-a17b-4f09-b282-c6830fead499&DisplayLang=en>

3.1 Configure Disks on the First Server (SSPP-CLUS1)

To configure clustering you must connect and configure the disks on both servers. When the disks have been connected to the servers, start the *Disk Management* feature:

- Open the **Administrative Tools** menu,
- double-click **Computer Management**, and
- open the **Disk Management** tool

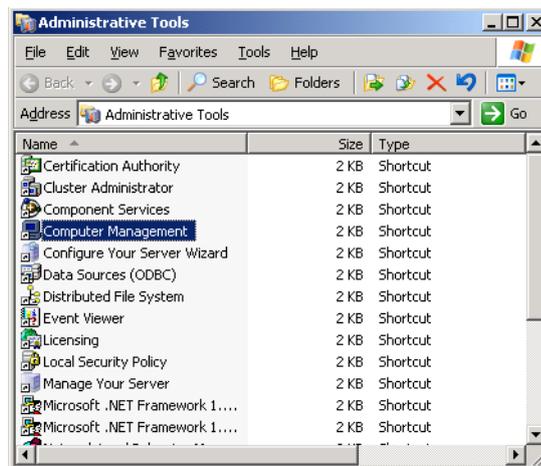


Figure 1 – Administrative Tools



Important

The following steps must be performed only on one server, for example SSPP-CLUS1. Once the partitions are created and formatted, you only have to add them to SSPP-CLUS2. They do not need to be formatted again.

If any new disks are detected when you open Computer Management, a wizard appears to help you initialize them. Click **Next** to continue.



Figure 2 – Initialize and Convert Disk Wizard

The wizard first asks you what disks to convert to dynamic disks. You do not want to convert your disk to a dynamic disk. Therefore, **do not select any disk in the list**. Any disk you select here will be converted to a dynamic disk.

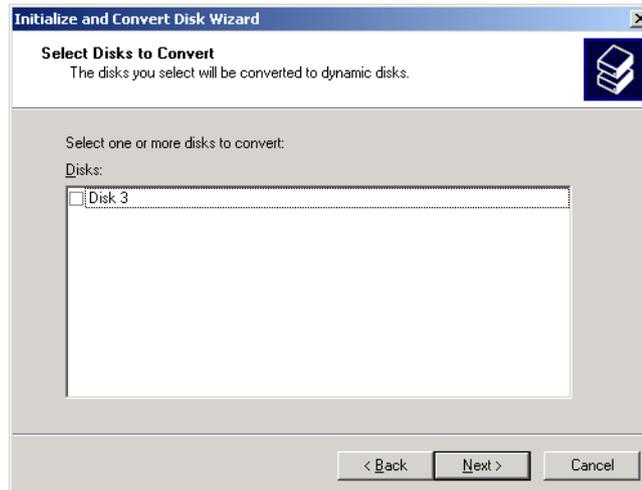


Figure 3 – Make sure none of your disks are selected or they will be converted to a “dynamic disk”

Click **Next** to continue.

The next window that appears shows all available partitions. If you are missing a partition, create and format a new partition here.

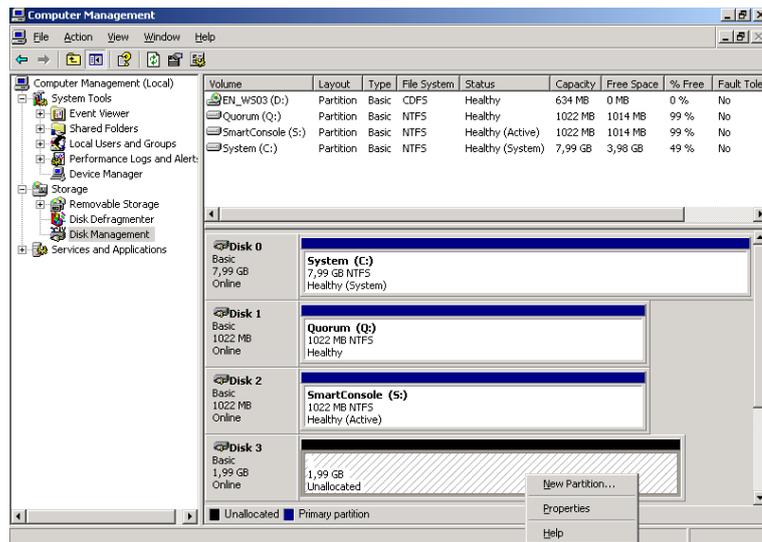


Figure 4 – Available partitions

A partition wizard appears to help you through the process. Click **Next** to continue.



Figure 5 – New Partition Wizard

Create a primary partition for each disk and use the maximum size of the partition, as shown below:

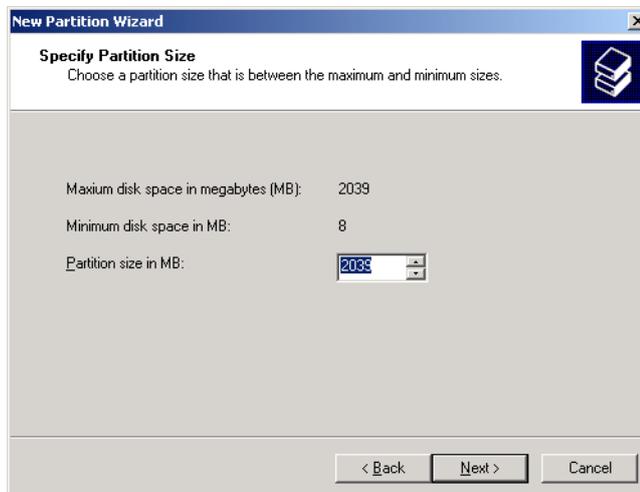


Figure 6 – Specify partition size

Click **Next** to continue.

Assign a drive letter. You can use the notation presented in [section 2.3 - Shared Storage Requirements on page 3](#), but it is not mandatory.

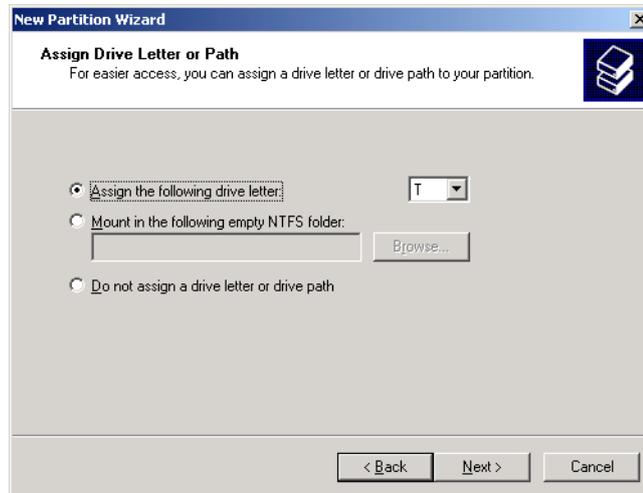


Figure 7 – Assign Drive Letter

Click **Next** to continue.

Format the partition and assign a label.

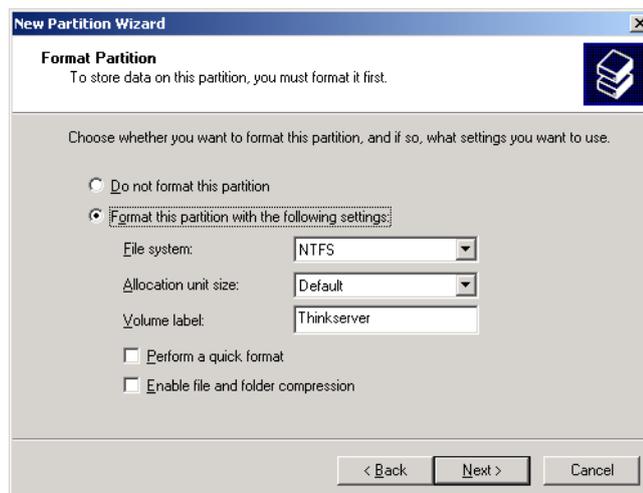


Figure 8 – Format the partition and assign a label

If necessary, repeat these steps until all four shared disks are available:

Drive letter	Minimum Size	Recommended Size	Use
Quorum (Q:)	500 MB *	500 MB *	The quorum disk is used to exchange information between the nodes of the cluster. It is used to synchronize services, configurations, etc.
SmartConsole (S:)	1 GB	4 GB	SmartConsole application and configuration files.
ThinkServer (T:)	2 GB	5 GB	ThinkServer application and configuration files.

Drive letter	Minimum Size	Recommended Size	Use
Web Applications (W:)	2 GB	10GB **	Web applications and configuration files.

* This is the quorum size recommended by Microsoft ¹

** The recommended size depends on how many scheduled reports can be expected to be implemented.

Once all four shared disks are configured on SSPP-CLUS1, your disk configuration on SSPP-CLUS1 should resemble the image below:

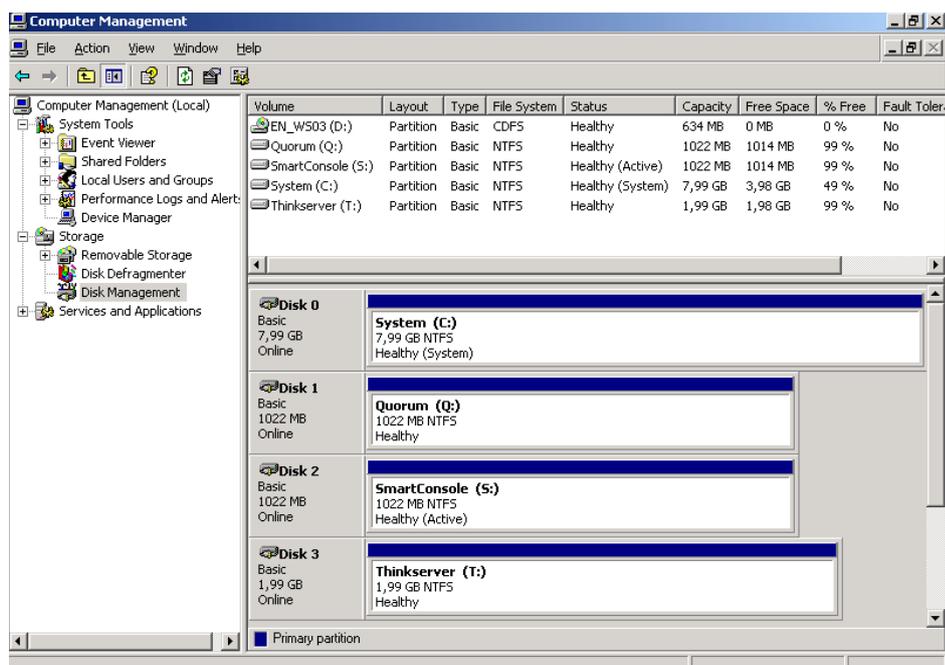


Figure 9 – Disk configuration

3.2 Configure Disks on the Second Server (SSPP-CLUS2)

To make the partitions you created on SSPP-CLUS1 available from the other cluster server (SSPP-CLUS2) start the *Disk Manager* on SSPP-CLUS2.

- Open the **Administrative Tools** menu,
- double-click **Computer Management**, and
- open the **Disk Management** tool

Right-click the *drive* and select the option **Change Drive Letter and Paths...**

1. Excerpt from "Quorum Drive Configuration Information" available at <http://support.microsoft.com/kb/280345> (17 July 2007):

"It is recommended that you configure the quorum disk size to be 500 MB; this size is the minimum required for an efficient NTFS partition. Larger disk sizes are allowable but are not currently needed. It is also recommended that you configure some form of fault tolerance at the hardware level to be used for the quorum drive, such as hardware mirroring or hardware RAID. If the quorum drive is lost, the cluster may not be available."

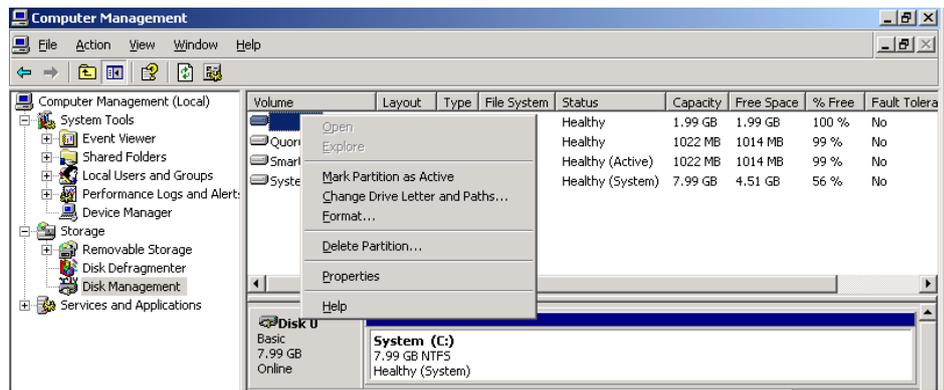


Figure 10 – Change Drive Letter

Assign the correct drive letter.

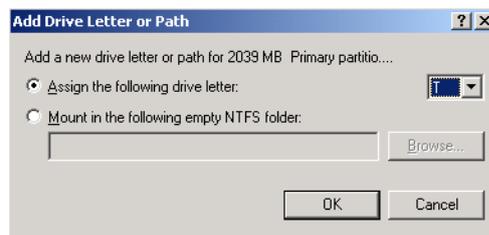


Figure 11 – Assign the correct drive letter



Important

Assign the same letters for each partition on both servers. For example, if you used the letter S to represent the SmartConsole unit on SSPP-CLUS1, also use the letter S to represent the SmartConsole unit on SSPP-CLUS2.

3.3 Ethernet Configuration for Redundancy

To communicate the between different cluster nodes, create a heartbeat between the nodes and avoid a single point of failure, Microsoft recommends enabling a dedicated network interface for each cluster node. As this configuration is not mandatory for our purposes, it is not discussed in this document. However we suggest you follow Microsoft’s recommendations described in *Recommended private “Heartbeat” configuration on a cluster server* available from the Microsoft Web site (July 2007) <http://support.microsoft.com/kb/258750/EN-US/>

Install Tango/04 Products on the First Node

Once you have configured the disks, and prior to configuring the cluster, you need to install the Tango/04 software. Place the Tango/04 products DVD in one of the servers, or a network shared folder.

For detailed information about the installation process, refer to the individual product installation guides.



Important

Shut down `SSPP-CLUS2` server to ensure that disks are not being used by `SSPP-CLUS2` while installing software on `SSPP-CLUS1`

Status:

`SSPP-CLUS1`: Started

`SSPP-CLUS2`: Stopped

4.1 Install ThinkServer

4.1.1 ThinkServer

Install ThinkServer on a shared disk, (for example `disk T:`) because ThinkServer configuration files must be accessible from both servers. The configuration files are stored in the following folders:

- **Templates:** Messages generated by the monitors.
- **Config:** Monitor configurations.
- a number of files are stored in the **ThinkServer** folder.

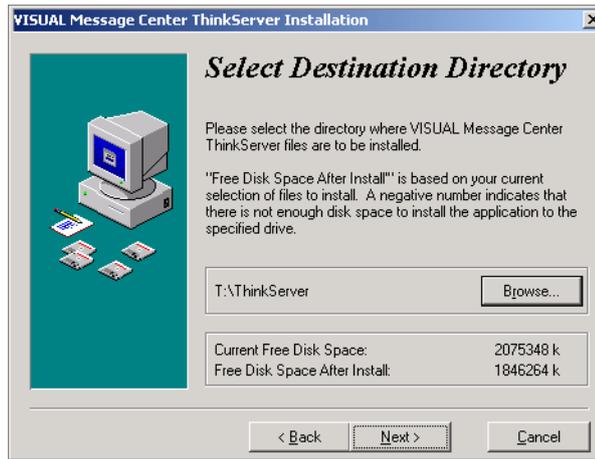


Figure 12 – Install ThinkServer on one of the shared disks you created earlier (for example: drive T:).

Once the application is installed on the shared disk, we need to install ThinkServer as a system service. You can do this from the Windows start menu as shown in the image below.

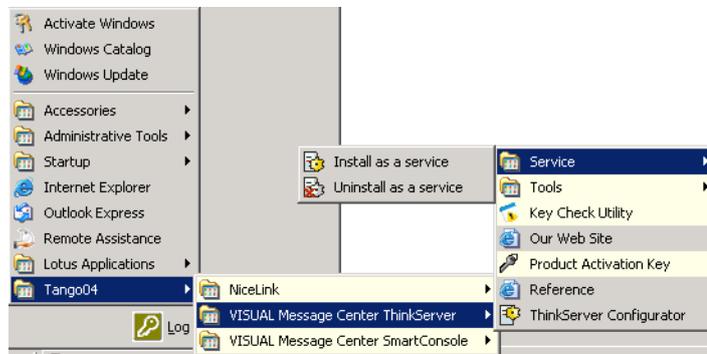


Figure 13 – Install ThinkServer as a service from the Start menu

4.1.2 NiceLink

When installing ThinkServer choose to install NiceLink environment. NiceLink should be installed in the system drive (C:) on both systems (SSPP-CLUS1 and SSPP-CLUS2)



Figure 14 – Choose to install NiceLink Environment

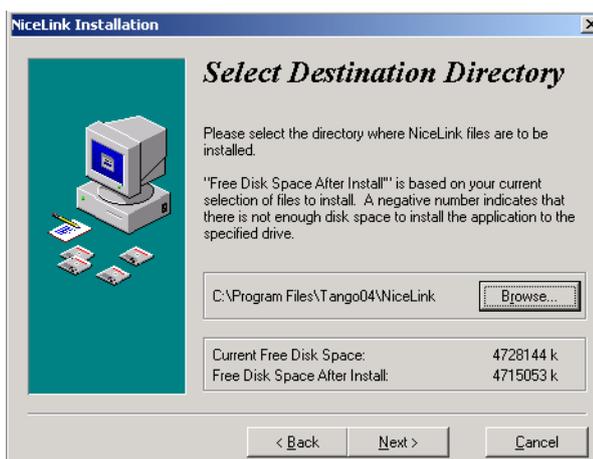


Figure 15 – Install NiceLink in the system drive

4.1.3 Configure database

ThinkServer and SmartConsole share a database: ThinkServer generates and stores events and SmartConsole reads and processes them.

As we are configuring a high availability environment, we'll probably want to make the products work with a high-availability database. Keep in mind that any failure in the database used by ThinkServer and SmartConsole will stop the monitoring process.

To configure the database, open the **Database Configurator** from the ThinkServer program menu, and choose an *ODBC connection* that points to a valid database.

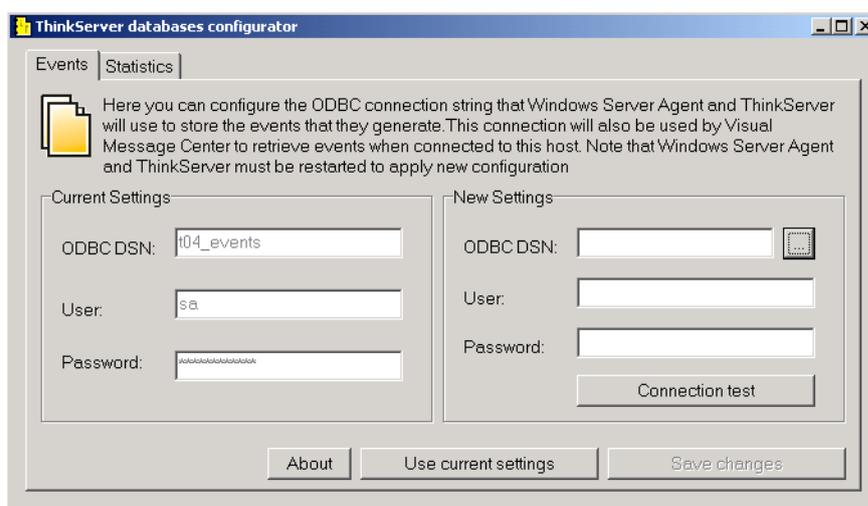


Figure 16 – Choose an ODBC connection. The selected database must be shared between all ThinkServers in the cluster

Configuration of a clustered database is not in the scope of this document. Depending on the clusters database you choose to configure, for example a SQL Server, you can find extensive documentation on the Internet. In addition we recommend the following documentation:

- Microsoft SQL Server 2000 Failover clustering

<http://www.microsoft.com/technet/prodtechnol/sql/2000/maintain/failclus.msp#E1F>

- SQL Server 2005 Failover Clustering White Paper

<http://www.microsoft.com/downloads/details.aspx?FamilyID=818234dc-a17b-4f09-b282-c6830fead499&DisplayLang=en>

4.1.4 Install Applications Agent

Install Applications Agent on the same shared disk as ThinkServer (disk T:) because Applications Agent configuration files must be accessible from both servers.

4.2 Install SmartConsole

Install SmartConsole on a shared disk, for example disk S:. The SmartConsole configuration is stored in the registry, and inside the product folder there are several items that should be accessible from both servers, including:

- **Maps:** Enterprise Views images (BMP)
- **Templates:** Text templates used for notifications.

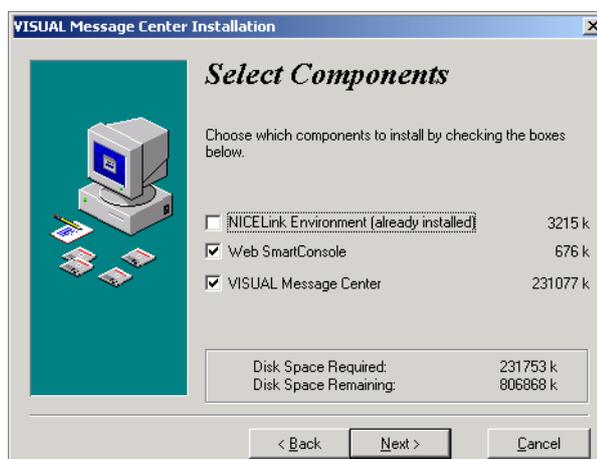


Figure 17 – Select components to install. Then select to install it as “Service Mode”



Figure 18 – Select to install SmartConsole on drive S:

4.2.1 Configure SmartConsole

To configure the SmartConsole you need to select which High Availability (HA) mode you wish to use in SmartConsole using the **SmartConsole HA Manager**.

Click the **Windows Start menu > Program Files > Tango/04 > VISUAL Message Center SmartConsole Tools > SmartConsole HA Manager**.

The following window will open:



Figure 19 – SmartConsole HA Manager

Complete the following steps as explained in the SmartConsole HA Manager, to successfully configure the High Availability mode:

- Step 1.** Export SmartConsole configuration.
- Step 2.** Close the SmartConsole (or stop the service).
- Step 3.** Select the desired HA mode. Select **Normal** or **Cluster** from the **High Availability Mode** box.
- Step 4.** Restart SmartConsole (or service).
- Step 5.** Import the previously exported configuration.

Click **Save & Exit** to apply the selected HA mode and exit the SmartConsole HA Manager.

SmartConsole should now be installed on the server as a service. If this is not the case, you can do so now from the Tango/04 product menu, as shown in [Figure 20](#) below. Start the SmartConsole service (open the Windows Start menu, select Run, and enter `net start smartconsole`). You will be asked to create a NiceLink connection.

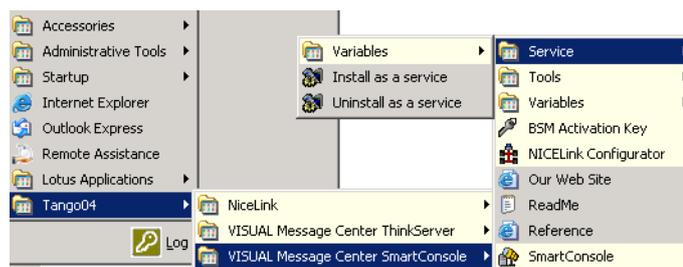


Figure 20 – Install SmartConsole as a service from the Start menu

By default the NiceLink configuration file will be stored in `C:\WINDOWS\system32\System.NLK`. Regardless of where you choose to store the NiceLink configuration file, make sure the file is stored in a **non-shared disk**, for example `C:`

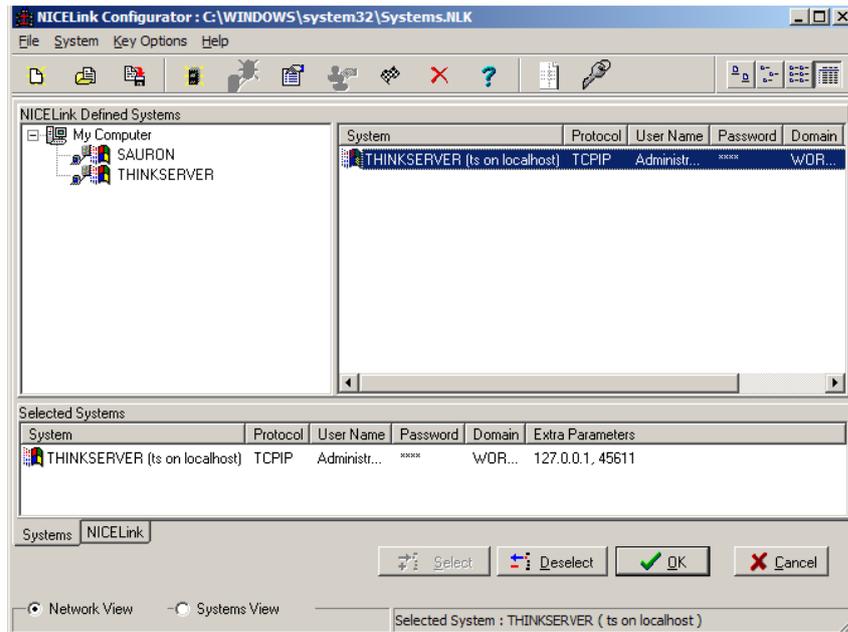


Figure 21 – NiceLink Configurator

Configure a NiceLink system to point at LOCALHOST, specify a user name and select **save password**

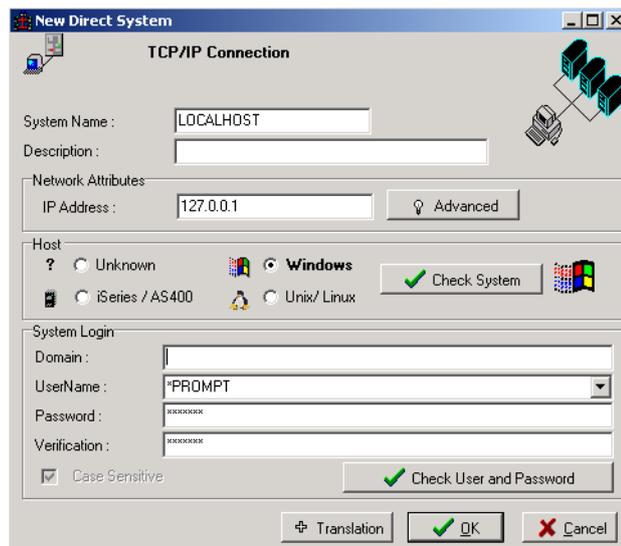


Figure 22 – Configure a new TCP/IP connection

Select the new system so the SmartConsole can connect to it.

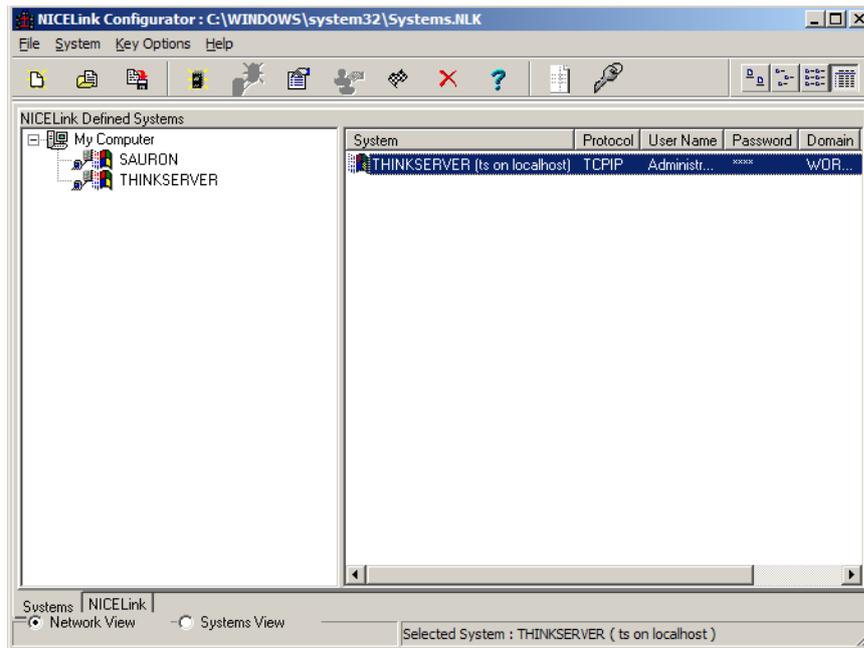


Figure 23 – A connection to localhost is selected in NiceLink

Once you open the SmartConsole check that the system has been connected successfully.

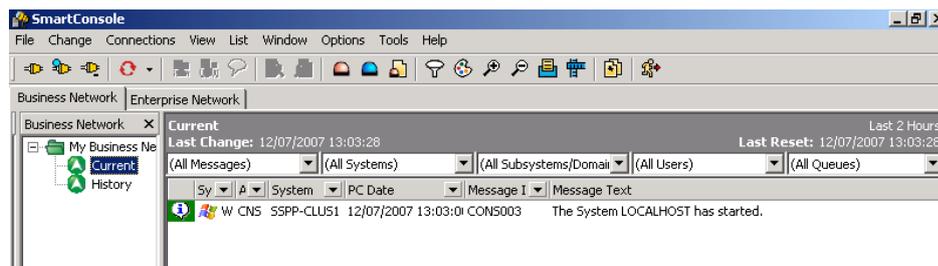


Figure 24 – Check the system has started

SmartConsole can be configured to automatically store and replicate its configuration, and if a node change occurs it can maintain the configuration and the status. To achieve this you need to set the SmartConsole to **resilient mode**.

To set the console to **resilient mode**:

- Open the **Options** menu and select **Options**.
- open the **console mode** tab and select Resilient.
- click **OK** to continue.

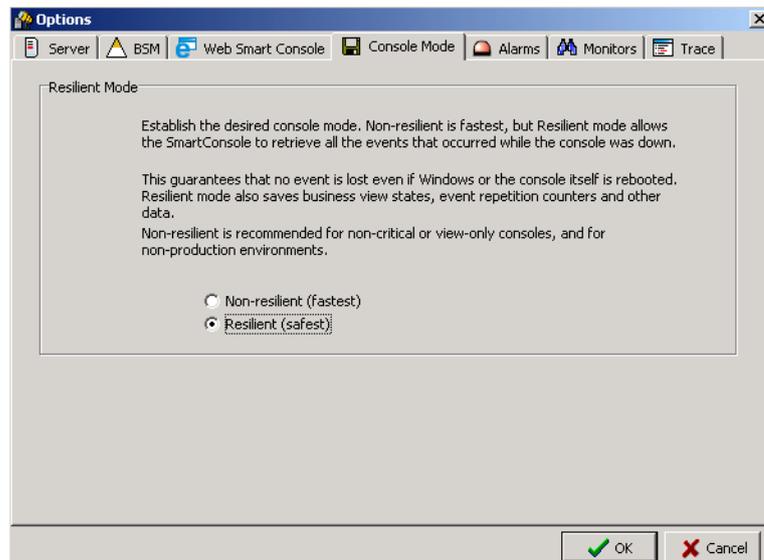


Figure 25 – Select resilient mode from the Console Mode tab

4.3 Install Web Applications

Install all Web applications on the same shared disk, for example disk W: because the configuration files must be accessible from both servers.

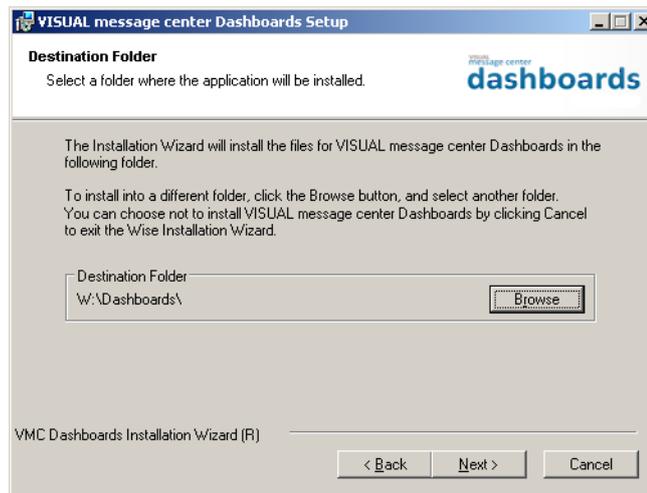


Figure 26 – Install all Web applications on the shared disk you created earlier. In this example Dashboards is installed on drive W:

4.3.1 VISUAL Message Center Reports

When installing VISUAL Message Center Reports you also need to install the *Tango/04 Scheduler* and *Shared Objects*.

For further information regarding installing Reports please refer to the [VISUAL Message Center Reports Installation Guide](#).

4.3.2 VISUAL Message Center Dashboards

For further information regarding installing Dashboards please refer to the [VISUAL Message Center Dashboards Installation Guide](#).

4.3.3 VISUAL Message Center SmartConsole Web Client

For further information regarding installing Web SmartConsole please refer to the [VISUAL Message Center SmartConsole Web Client Installation Guide](#).

Install Tango/04 Products on the Second Node



Important

First shut down the SSPP-CLUS1 server. Then start the SSPP-CLUS2 server. This ensures that any disk cache from shared disks has been cleared and disks are no longer in use by SSPP-CLUS1, while installing software on SSPP-CLUS2

Status:

SSPP-CLUS1: Stopped

SSPP-CLUS2: Started

5.1 Install ThinkServer

This second installation is necessary to create the appropriate configuration changes on the SSPP-CLUS2 server, including shortcuts, ThinkServer Configurator, Database Configurator and the Windows service.



Note

This second installation will overwrite files previously copied to T: which is not a problem.

5.1.1 ThinkServer

To install ThinkServer on SSPP-CLUS2 follow the steps described in [section 4.1 - Install ThinkServer on page 11](#).

5.1.2 NiceLink

To install NiceLink follow the steps described in [section 4.1.2 - NiceLink on page 12](#).

5.1.3 Database

Configure the database the same way you did for SSPP-CLUS1. For details [see section 4.1.3 - Configure database on page 13](#).



Important

Both servers should point to the same database.

5.1.4 Applications Agent

Install Applications Agent on SSPP-CLUS2.

5.2 SmartConsole

To install SmartConsole on SSPP-CLUS2 follow the steps described in [section 4.2 - Install SmartConsole on page 14](#).



Note

This second installation will overwrite files previously copied to S: which is not a problem.

You also need to configure the LOCALHOST connection in NiceLink as you did for SSPP-CLUS1. For details [see section 4.2.1 - Configure SmartConsole on page 14](#).

5.3 Web Applications



Note

This second installation will overwrite files previously copied to W: which is not a problem.

Please [see section 4.3 - Install Web Applications on page 18](#) for further details regarding installing Web applications on SSPP-CLUS2.

Chapter 6

Cluster Configuration

This chapter describes how to create and configure the cluster and its resources (disks, Ethernet and applications) in order to run Tango/04 products in a High Availability environment.

In this chapter we will create the following:

- a cluster (CLUSTER)
- two nodes:
 - SSPP-CLUS1
 - SSPP-CLUS2
- four groups of resources:
 - Cluster Group: contains cluster resources such as the quorum disk (Disk Q:), the Cluster Name and the Cluster IP Address
 - SmartConsole: contains a physical disk (S:)
 - ThinkServer: contains a physical disk (T:)
 - WebApplications: contains a physical disk (W:)

6.1 Create the Cluster

**Important**

Before you begin shut down server SSPP-CLUS2 and start server SSPP-CLUS1. This ensures that any disk cache from shared disks has been cleared and disks are no longer in use by SSPP-CLUS2, while configuring SSPP-CLUS1.

Status:

SSPP-CLUS1: Started

SSPP-CLUS2: Stopped

To create a new cluster:

Step 1. Open **Administrative Tools**, and then open **Cluster Administrator**.

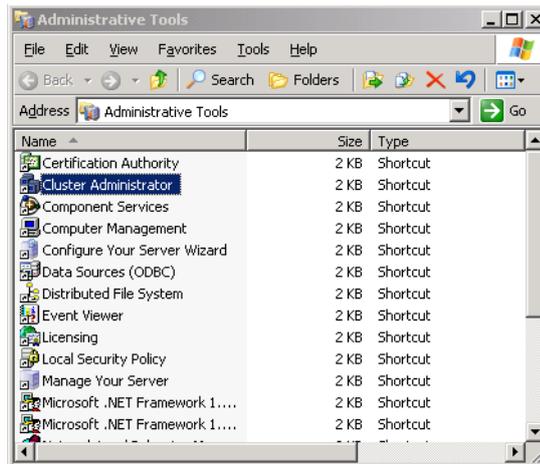


Figure 27 – Cluster Administrator is available from Administrative Tools

Step 2. Select the option **Create new cluster** from the window that appears.

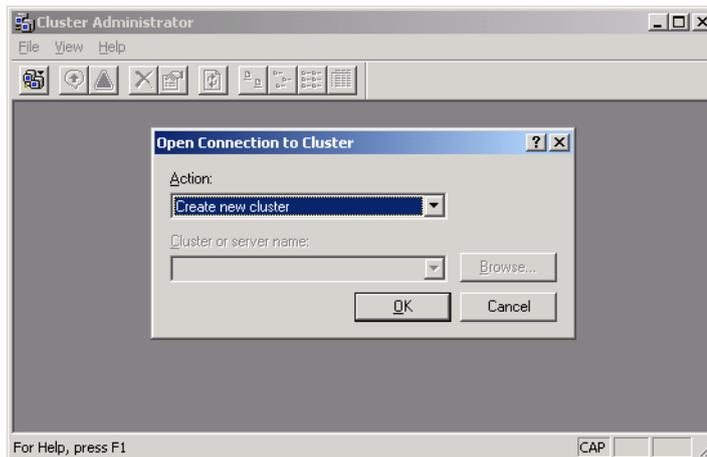


Figure 28 – Create a new cluster

Step 3. The New Server Cluster Wizard appears.



Figure 29 – New Server Cluster Wizard

Click **Next** to continue.

- Select the *domain* where you want to create the cluster from the Domain drop-down list box (In our example this is SSPP)
- Enter a *name* for the Cluster in the Cluster name field (CLUSTER)

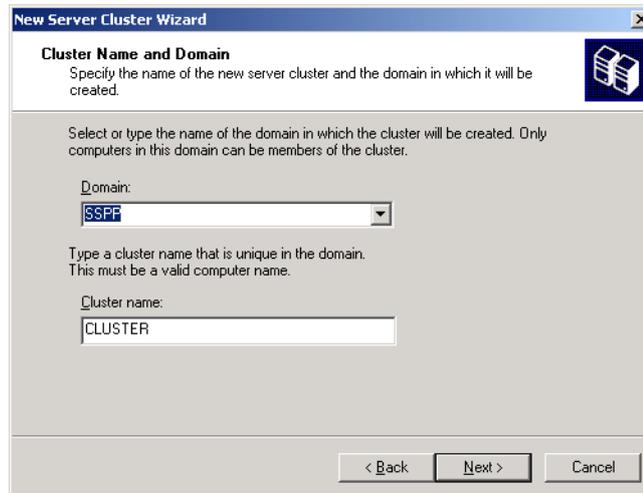


Figure 30 – Enter the domain where you want to create the cluster and the cluster name

Click **Next** to continue.

Step 4. Enter the name of the *server* that will be the *first node* in the new cluster.

Enter SSPP-CLUS1 in the Computer name field. Or click **Browse** to navigate to the correct server.

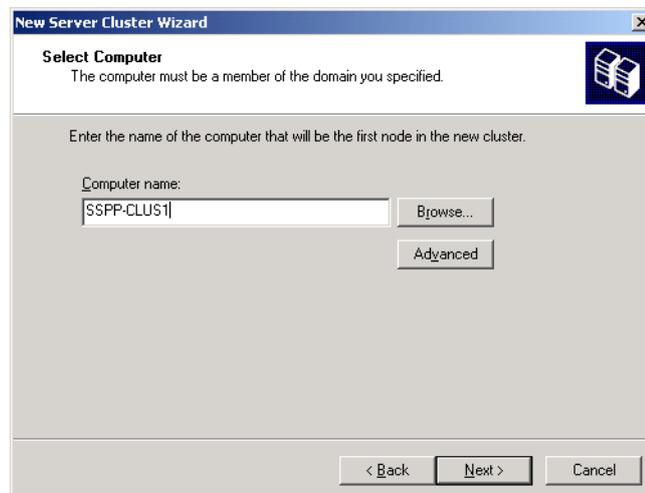


Figure 31 – Enter SSPP-CLUS1 for the first node in the cluster

Click **Next** to continue

Step 5. The cluster wizard will check whether all requirements are met, as shown in the image below:

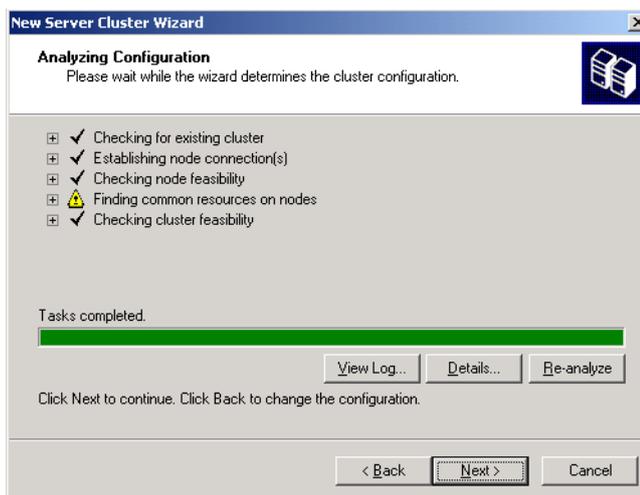


Figure 32 – The new cluster wizard checks the cluster configuration

Step 6. Once the configuration is correct and verified you need to enter the IP address of the first node (SSPP-CLUS1) so that the cluster management tool can connect to the cluster.

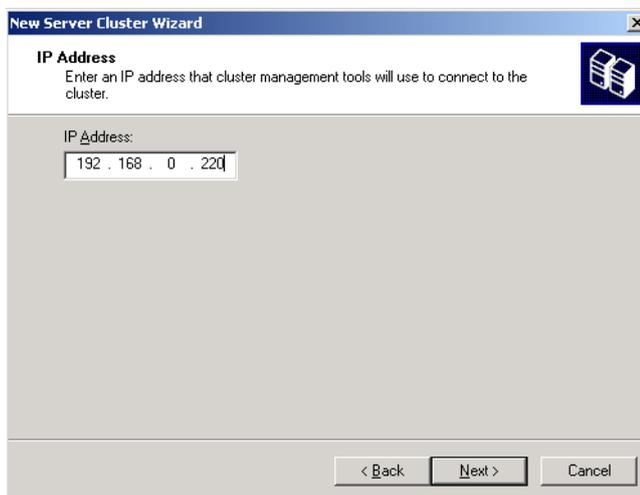


Figure 33 – Specify an IP address for the cluster

Click **Next** to continue.

Step 7. Enter the user name, password and domain details for the account that will run the cluster service.

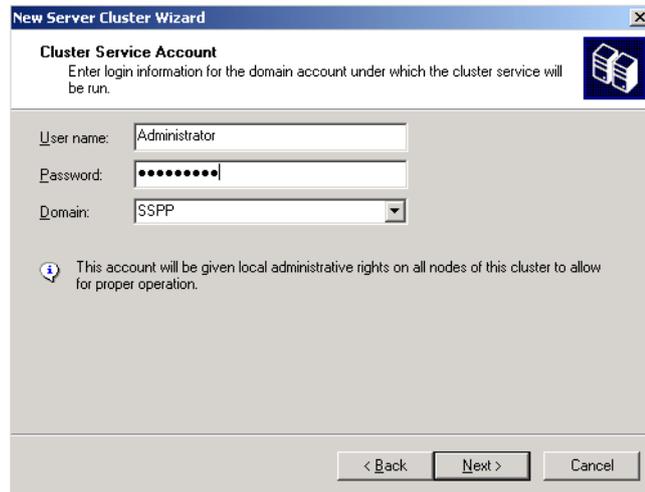


Figure 34 – Enter the account details for running the cluster service

Click **Next** to continue.

- Step 8.** In the window that appears, you can see the proposed cluster configuration. Check that all settings are as required and specify the quorum disk. In our example we select Disk Q:.

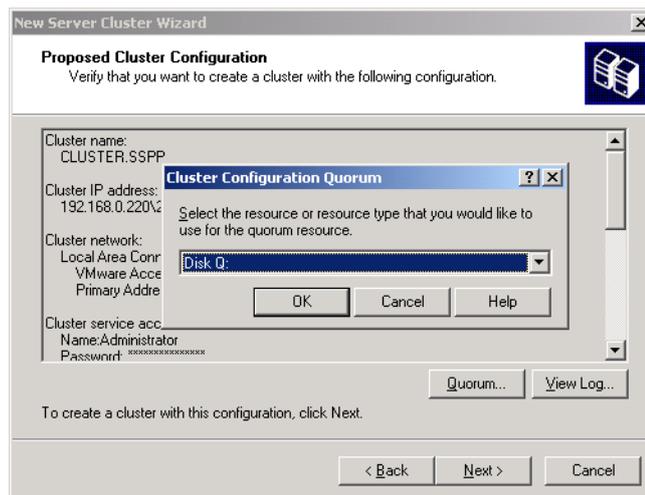


Figure 35 – The proposed configuration. Select disk Q: to be the quorum disk

Click **Next** to continue.

- Step 9.** The cluster wizard will check the cluster configuration and create the new cluster.

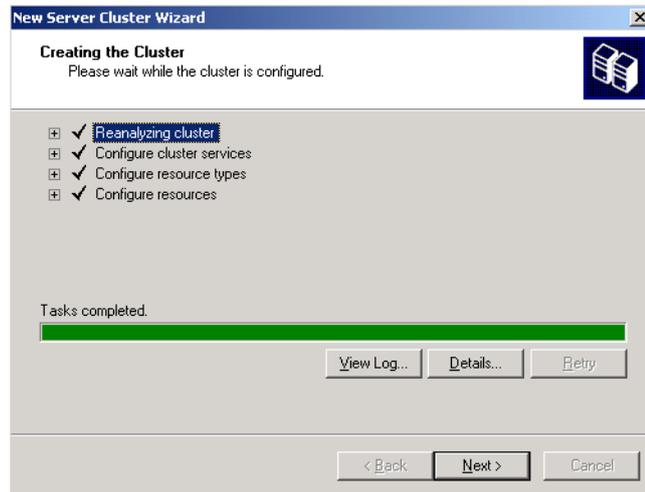


Figure 36 – The wizard checks the configuration and creates the cluster.

Click **Next** to continue.

Step 10. Add a *Network Name* resource to the main cluster node.

Right-click the main cluster node **CLUSTER**, select **New** and click **Resource**.

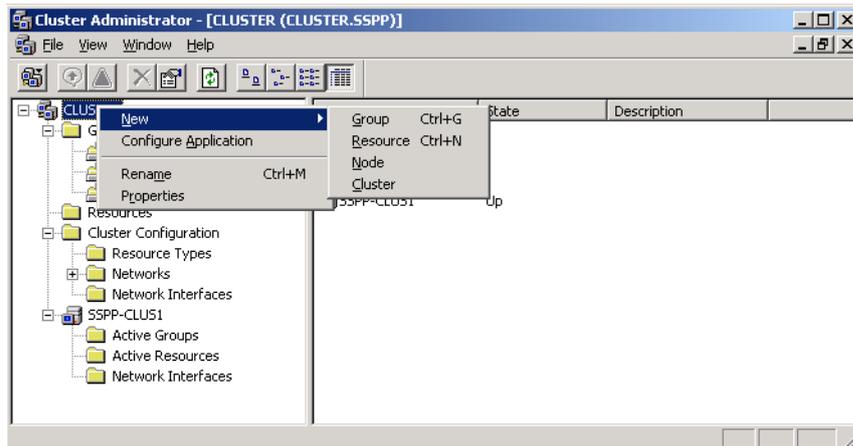


Figure 37 – Add a new resource

Enter the name of the network resource you want to add (for example **TANGOCLS**) and click **Next** to continue.

Step 11. The cluster administrator shows the details of the newly created cluster.

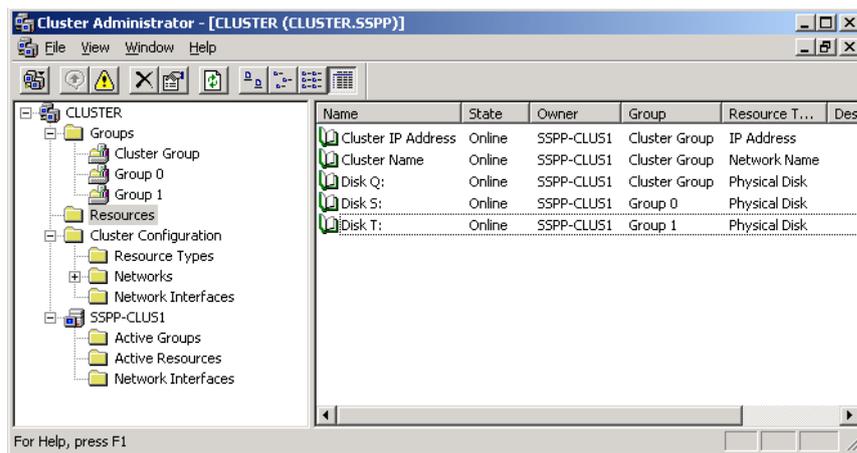


Figure 38 – Cluster Administrator showing details of the new cluster with the first node created (SSPP-CLUS1)

Step 12. The Cluster wizard has automatically created four groups of resources:

- Cluster Group: contains cluster resources such as the quorum disk (Disk Q:), the Cluster Name and the Cluster IP Address
- Group 0: contains a physical disk (S:)
- Group 1: contains a physical disk (T:)
- Group 2: contains a physical disk (W:)

Now you are ready to add a second node to the cluster.

6.2 Add a Second Node to the Cluster

To add SSPP-CLUS2 to the new cluster:

Step 1. Right-click the main cluster node CLUSTER, select **New** and click **Node**.

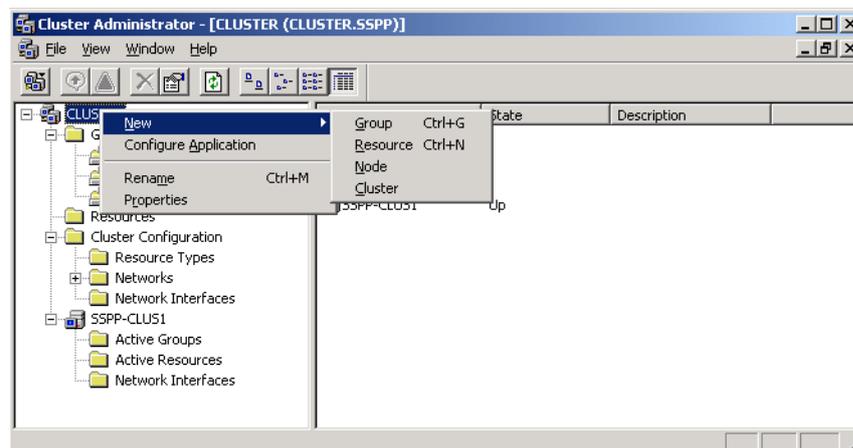


Figure 39 – Add a new node

Step 2. The Add Nodes Wizard appears.

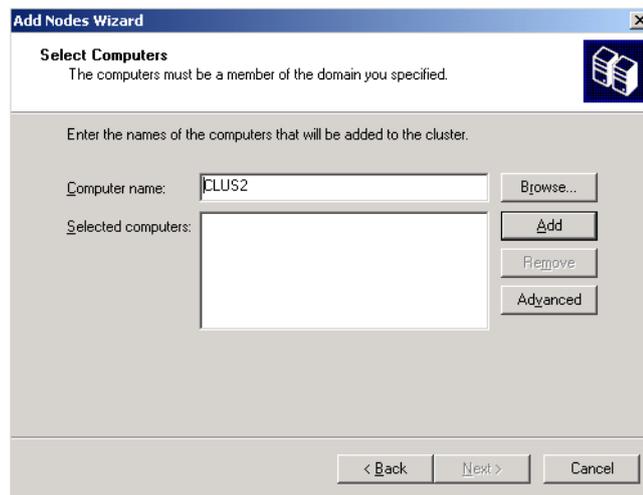


Figure 40 – Add SSPP-CLUS2 to the cluster

Enter the *server* you want to add as the *second node* (SSPP-CLUS2), and click **Next** to continue.

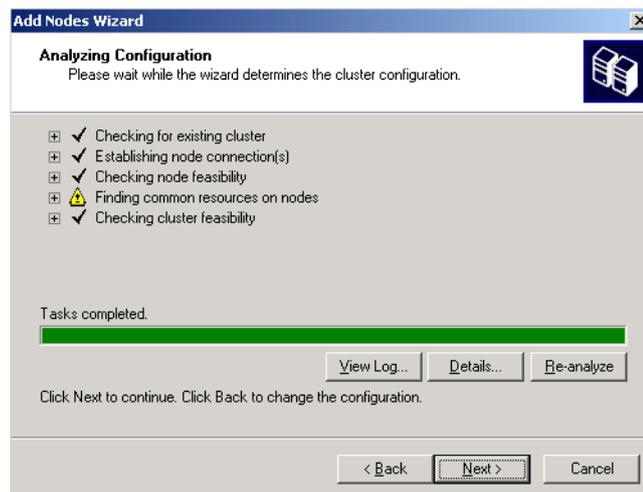


Figure 41 – The wizard checks the cluster configuration

Step 3. The wizard will indicate whether the SSPP-CLUS2 server can be added to the cluster.

Click **Next** to continue.

Step 4. You will be asked for administrator login details and to confirm the operation.

The Add Nodes Wizard checks the configuration again, before adding the new node.

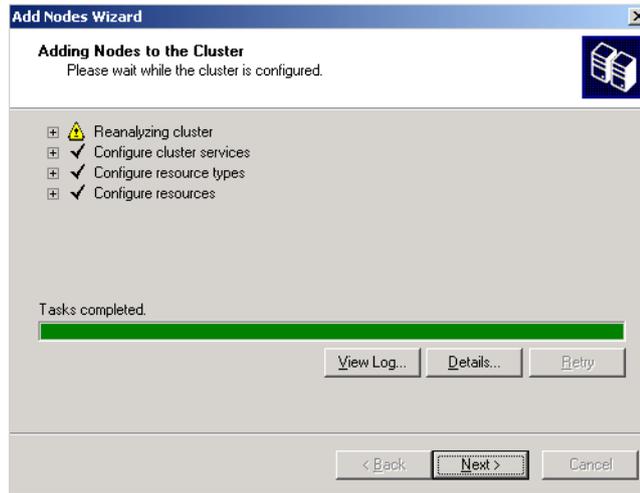


Figure 42 – Creating the second node in the cluster

6.3 Rename the groups

We recommend you rename the groups of resources that are automatically created by the Cluster Wizard as follows:

- the group containing disk S: to SmartConsole
- the group containing disk T: to ThinkServer
- the group containing disk W: to WebApplications.

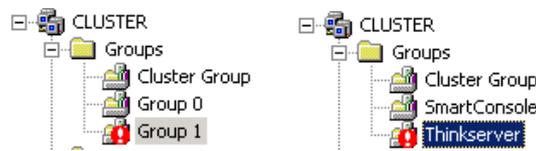


Figure 43 – Rename the Groups

Cluster Resources Configuration

To get ThinkServer, SmartConsole and the Web applications working on any of the cluster nodes, we need to make the shared disks available to the different nodes. To accomplish this we need to configure the *groups* created in the previous chapter which use the relevant resource (T:, S:, or W:), to start the related services.

Group Name	Resource (Disk)	Services
SmartConsole	S:	<ul style="list-style-type: none"> • SmartConsole • AccessServer • Maintenance
ThinkServer	T:	<ul style="list-style-type: none"> • ThinkServer • System i • JMX service • WebSphere Application Server • Applications Agent
WebApplications	W:	<ul style="list-style-type: none"> • IIS • Scheduler

By configuring the ThinkServer, SmartConsole or a Web application as a cluster application the cluster will check whether the application is being executed in one of the nodes.

Details of the configuration for each application are discussed in the following sections.

7.1 Configure ThinkServer

First we are going to make the T: disk available on this node. To do this we are going to create a Group which uses the T: resource, and then starts ThinkServer service.

In order for the cluster to check whether the application is being executed in one of the nodes, we are going to configure ThinkServer as a cluster application.

To configure ThinkServer as a cluster application we need to create the following resources:

- **Physical Disk** (Disk T:)

- **IP Address** (ThinkServer IP)
- **Network Name** (CLUS-TS)
- five **Generic Service** resources:
 - **ThinkServer service:** (ThinkServer)
 - **System i** (ThinkServer Java System i Server)
 - **JMX service:** ThinkServer JMXServer JSR
 - **WebSphere Application Server service:** ThinkServer JMXServer WAS
 - **Applications Agent service:** Applications Agent

7.1.1 Create a Physical Disk Resource

We start by creating a *Physical Disk* resource which the ThinkServer service will mount in order to run.

To create a Physical Disk resource:

Step 1. Open **Administrative Tools**, and then open **Cluster Administrator**.

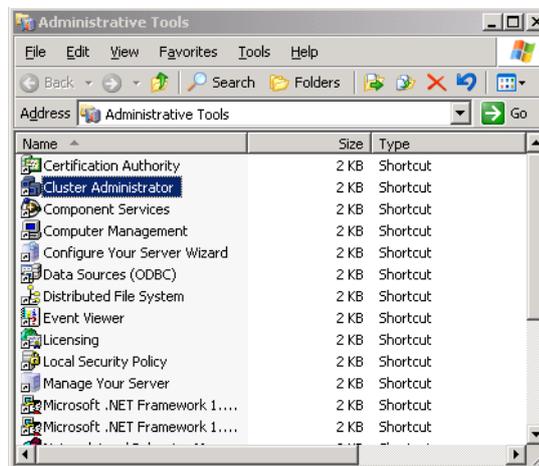


Figure 44 – Cluster Administrator is available from Administrative Tools

Step 2. Right-click the *ThinkServer* group in the cluster tree, select **New** and click **Resource**.

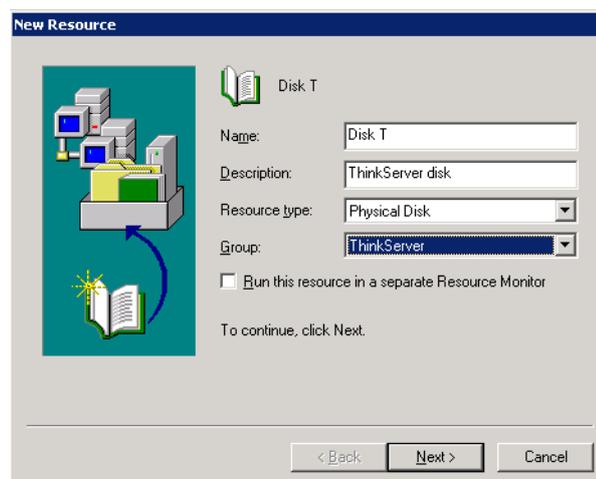


Figure 45 – Create a Physical Disk resource for the ThinkServer group

- Enter Disk T: in the Name field
- enter a *description* for the new resource in the Description field

- select **Physical Disk** from the **Resource type** drop-down list box
- make sure **ThinkServer** is selected in the **Group** drop-down list box

Click **Next** to continue.

- Step 3.** To make the application available to both servers, specify the *possible owners*. In our example we select both **SSPP-CLUS1** and **SSPP-CLUS2** from the Available nodes list and click the **Add** button.

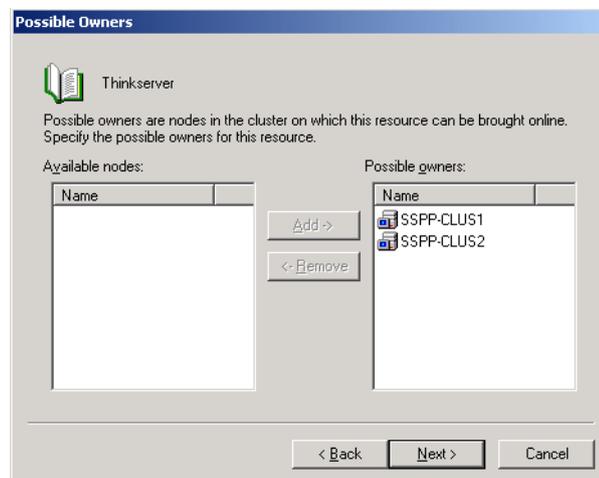


Figure 46 – Add both nodes as possible owners for the ThinkServer Service

Click **Next** to continue.

- Step 4.** Select the Dependencies.

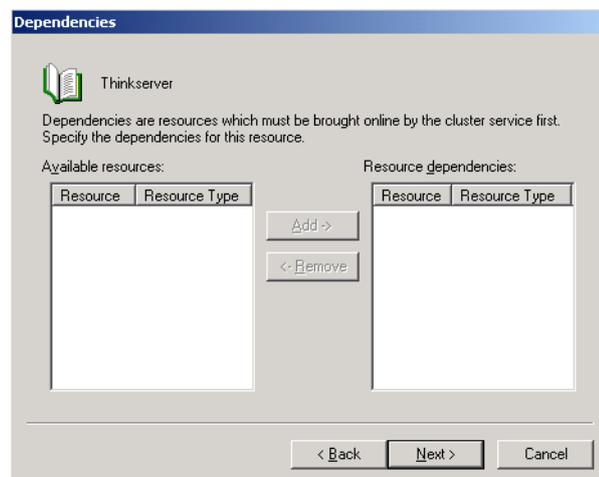


Figure 47 – No dependencies added for this resource

There are no dependencies for the Physical Disk resource, so click **Next** to continue.

- Step 5.** Select the correct disk (Disk T:) from the drop-down list box.

Click **Finish**.

7.1.2 Create an IP Address Resource

In certain circumstances you may want to work with ThinkServer from a client PC. We can achieve this by configuring *IP Address* and *Network Name* resources in the ThinkServer Group.

To create an IP Address resource:

Step 1. Create an *IP Address* resource in the ThinkServer group.

Right-click the *ThinkServer* group in the cluster tree, select **New** and click **Resource**.

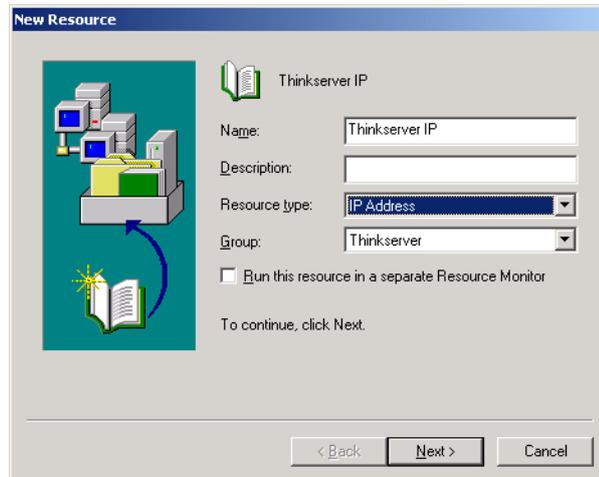


Figure 48 – Create an IP Address resource for the ThinkServer group

- Enter ThinkServer IP in the Name field
- enter a *description* for the new resource in the Description field
- select IP Address from the **Resource type** drop-down list box
- make sure ThinkServer is selected in the **Group** drop-down list box

Click **Next** to continue.

Step 2. To make the application available to both servers, specify the *possible owners*. In our example we select both SSPP-CLUS1 and SSPP-CLUS2 from the Available nodes list and click the **Add** button.

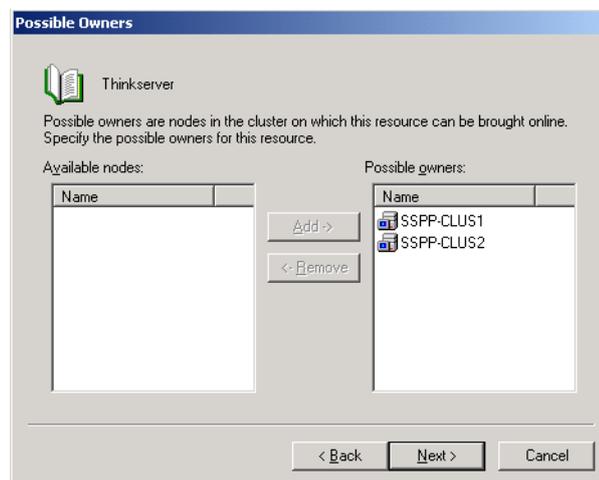


Figure 49 – Add both nodes as possible owners for the ThinkServer Service

Click **Next** to continue.

Step 3. Select the Dependencies.

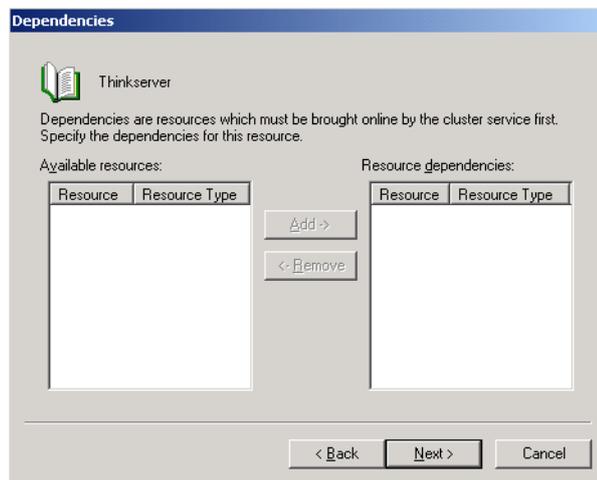


Figure 50 – No resources created to add as dependencies

There are no dependencies for the IP Address resource, so click **Next** to continue.

Step 4. Enter the IP Address Parameters:

- *IP address*
- *Subnet mask*
- *Network LAN*
- Select the **Enable NetBIOS for this address** check box.

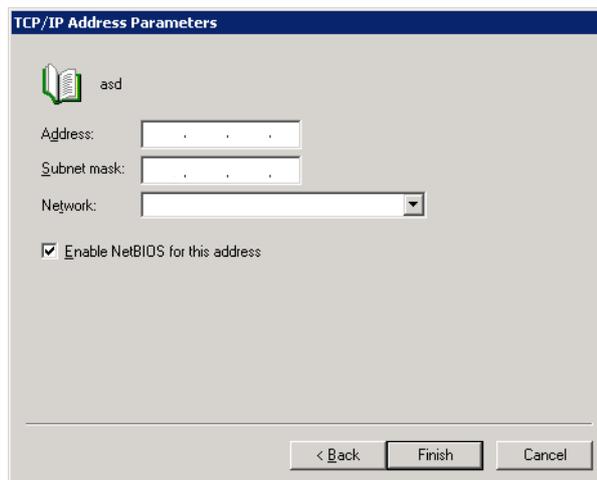


Figure 51 – Enter the IP Address parameters

Click **Finish**.

7.1.3 Create a Network Name Resource

To create an Network Name resource:

Step 1. Create an *IP Address* resource in the ThinkServer group.

Right-click the *ThinkServer* group in the cluster tree, select **New** and click **Resource**.

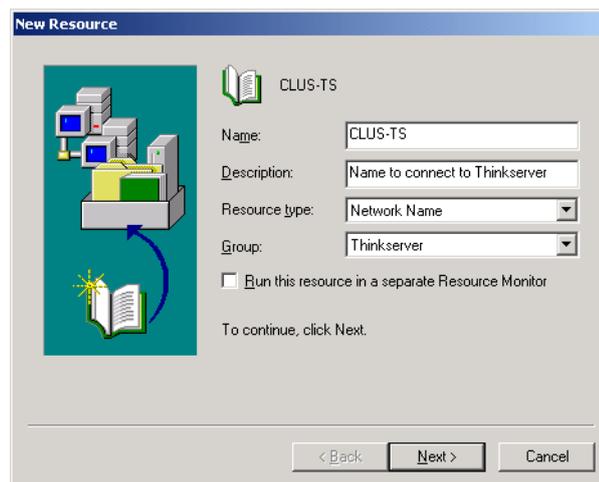


Figure 52 – Create a Network Name resource to connect to ThinkServer

- Enter CLUS-TS in the Name field
- enter a *description* for the new resource in the Description field.
- Select Network Name from the **Resource type** drop-down list box
- make sure ThinkServer is selected in the **Group** drop-down list box

Click **Next** to continue.

Step 2. In the dependencies window make the network name dependent on the IP address you have just created.

Select *IP Address* in the Available resources list and click the **Add** button to add it to the Resource dependencies list.

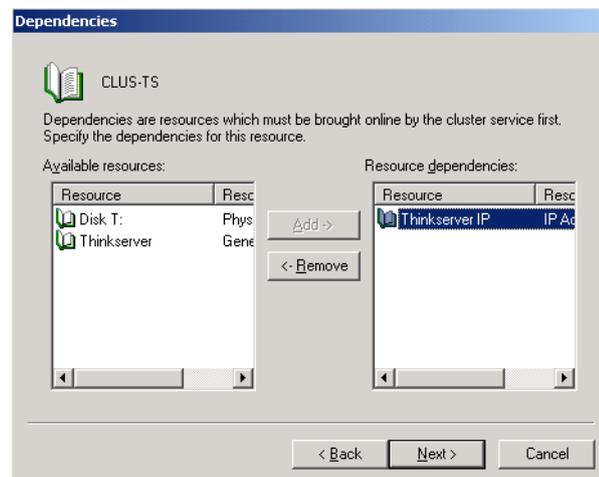


Figure 53 – Make the Network Name dependant on the IP Address you have just created

Click **Next** to continue. Click **Finish**.

7.1.4 Create Generic Service Resources

To create the Generic Service resources:

Step 1. Create a Generic Service called ThinkServer

Right-click the *ThinkServer* group in the cluster tree, select **New** and click **Resource**.

- Enter ThinkServer in the name field

- enter a *description* for the new resource in the Description field
- Select **Generic Service** from the **resource type** drop-down list box
- make sure **ThinkServer** is selected in the **Group** drop-down list box

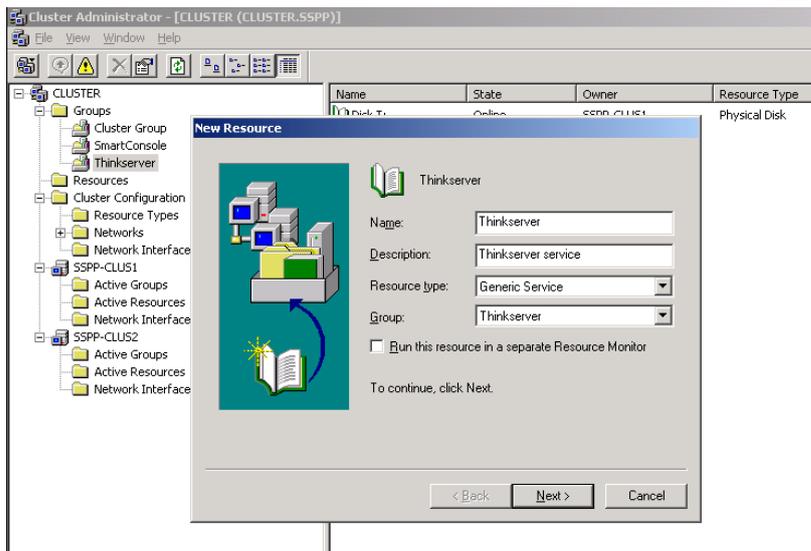


Figure 54 – Add the ThinkServer Generic Service resource to the ThinkServer Group

Click **Next** to continue.

- Step 2.** To make the application available to both servers, specify the *possible owners*. In our example we select both SSPP-CLUS1 and SSPP-CLUS2 from the Available nodes list and click the **Add** button.

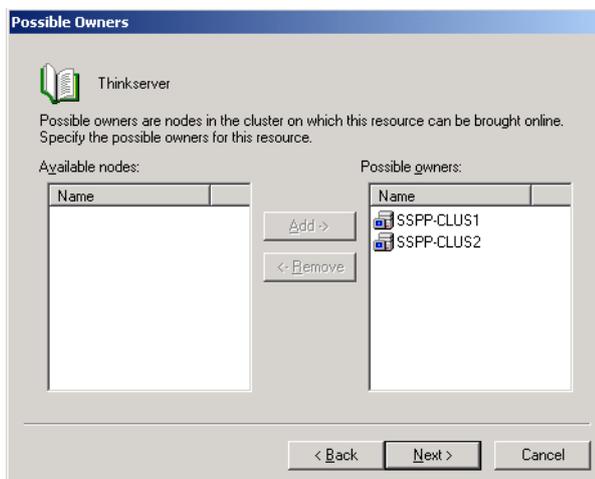


Figure 55 – Add both nodes as possible owners for the ThinkServer Service

Click **Next** to continue.

- Step 3.** Select the Dependencies for the Generic Service.

Select the following resources from the Available resources list:

- **IP Address** (ThinkServer IP)
- **Network Name** (CLUS-TS)
- **Physical Disk:** for the cluster to be able to run the ThinkServer service it must first mount disk T:. Therefore we select the Physical Disk resource we created earlier (Disk T:) as a dependency for the ThinkServer resource.

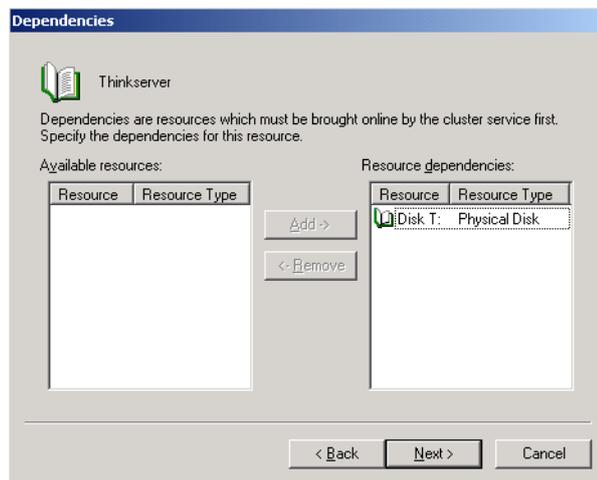


Figure 56 – Add Disk T: as a dependency so it can be mounted before starting the ThinkServer service

Click **Next** to continue.

Step 4. Now you can add any required starting parameters for the ThinkServer service. For our purposes it is only necessary to add the service name: ThinkServer.

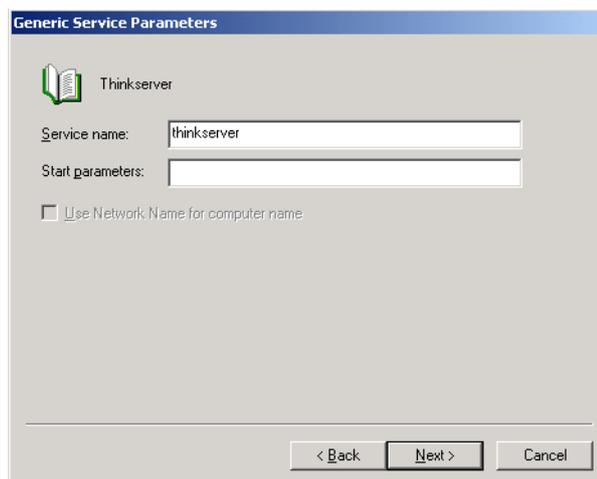


Figure 57 – Add the Service name and any required starting parameters

Click **Next** to continue.

Step 5. If your programs or services store data in the registry you need to add the registry keys that should be replicated in all nodes in the cluster. In the case of the ThinkServer all configuration files are stored in the ThinkServer folder and we do not need to replicate any registry data.

Leave this window blank and click **Finish**. The new node appears in the Cluster Administrator.

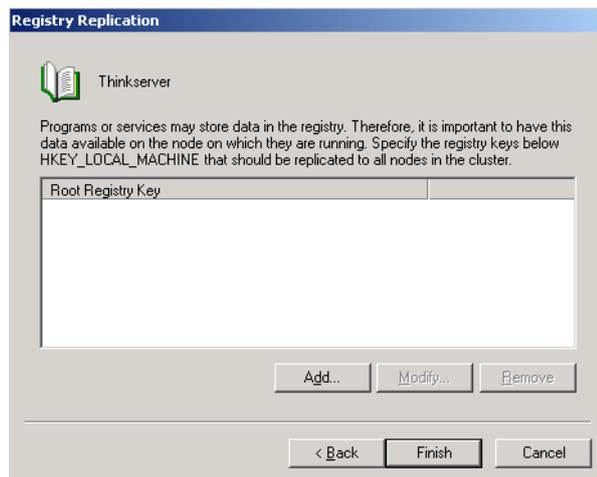


Figure 58 – Add registry keys that need to be replicated on all nodes in the cluster

Step 6. Create the following Generic Services:

- ThinkServer Java System i Server
- ThinkServer JMXServer JSR
- ThinkServer JMXServer WAS
- Applications Agent

Repeat [steps 1 to 5](#) above for each new service, but remember to change the Generic Service name in [step 1](#) in the Name field and in [step 4](#) in the Service name field.

7.1.5 Set the order of the servers

After creating the required resources for the ThinkServer group, we must set the order of the servers in which the cluster service tries to execute the ThinkServer service.

To set the server order:

Step 1. Right-click the *ThinkServer* group in the cluster tree, and select **Properties**.

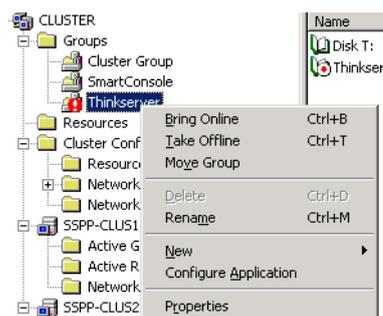


Figure 59 – Open the ThinkServer Group Properties

Step 2. In the ThinkServer Properties window, add the preferred owners SSPP-CLUS1 and SSPP-CLUS2 in the order in which the cluster should try to use them.

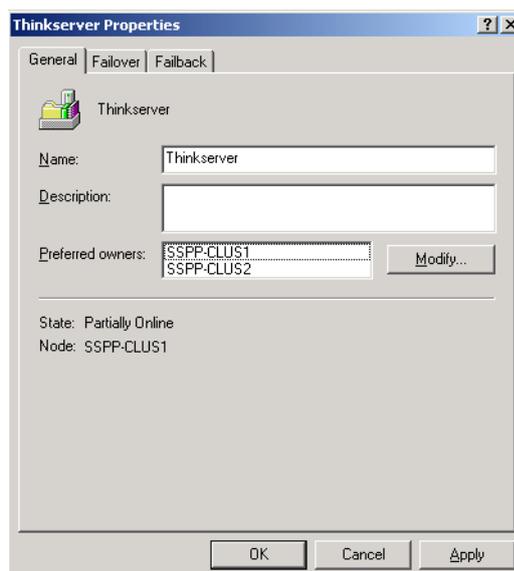


Figure 60 – Add SSPP-CLUS1 and SSPP-CLUS2 as preferred owners, in this order

The configuration shown in [Figure 60](#) above means that the cluster service will first try to execute ThinkServer in SSPP-CLUS1 and, if it fails, it will then try to execute it in SSPP-CLUS2.

Click **OK** to apply the changes and complete the configuration of ThinkServer.



Note

When you connect from the ThinkServer Configurator to the clustered ThinkServer, use the network name you have defined in these steps (CLUS-TS).

7.2 Configure SmartConsole

Next carry out the same procedures for the SmartConsole.

To configure SmartConsole as a cluster application we need to create the following resources, dependencies, and registry keys (see [section 7.1 - Configure ThinkServer on page 31](#) for details on how to set up each resource type):

- **Physical Disk** (Disk S:)
- **IP Address** (SmartConsole IP)
- **Network Name** (CLUS-SC)
 - Dependencies: IP Address
- three **Generic Service** resources:
 - **SmartConsole service** (SmartConsole)
 - Dependencies: IP Address (SmartConsole IP); Network Name (CLUS-SC); Physical Disk (Disk S:)
 - Registry keys:
 - SOFTWARE\Tango/04\AdrBook
 - SOFTWARE\Tango/04\Bdetector
 - SOFTWARE\Tango/04\LDAP
 - SOFTWARE\Tango/04\Schedules
 - SOFTWARE\Tango/04\SmartConsole
 - SOFTWARE\Tango/04\SMTPList
 - SOFTWARE\Tango/04\NICELink\Network

- **AccessServer** (T04AccessServer)
 - Dependencies: Physical Disk (Disk S:)
 - Registry keys:
 - SOFTWARE\Tango/04\AccessServer
- **Maintenance** (T04 Maintenance)
 - Dependencies: IP Address (SmartConsole IP); Network Name (CLUS-SC); Physical Disk (Disk S:)



Important

- Right-click the *SmartConsole* group in the cluster tree, select **New** and click **Resource** to add resources to the SmartConsole group
- For each resource make sure that SmartConsole is selected in the Group drop-down list box

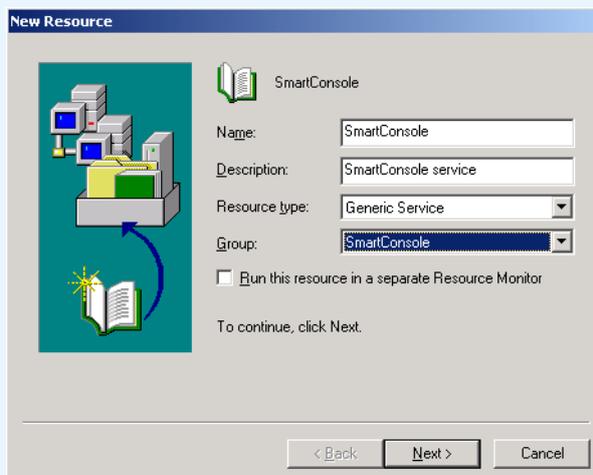


Figure 61 – Add a new resource to the SmartConsole Group

- In contrast to the ThinkServer, SmartConsole does store some information in the registry. Therefore it is important to add the following registry keys:
 - To the *SmartConsole* Generic Service:
 - SOFTWARE\Tango/04\AdrBook
 - SOFTWARE\Tango/04\Bdetector
 - SOFTWARE\Tango/04\LDAP
 - SOFTWARE\Tango/04\Schedules
 - SOFTWARE\Tango/04\SmartConsole
 - SOFTWARE\Tango/04\SMTPList
 - SOFTWARE\Tango/04\NICELink\Network
 - To the *AccessServer* Generic Service:
 - SOFTWARE\Tango/04\AccessServer
- The keys will be replicated so that the data will be available on all nodes.

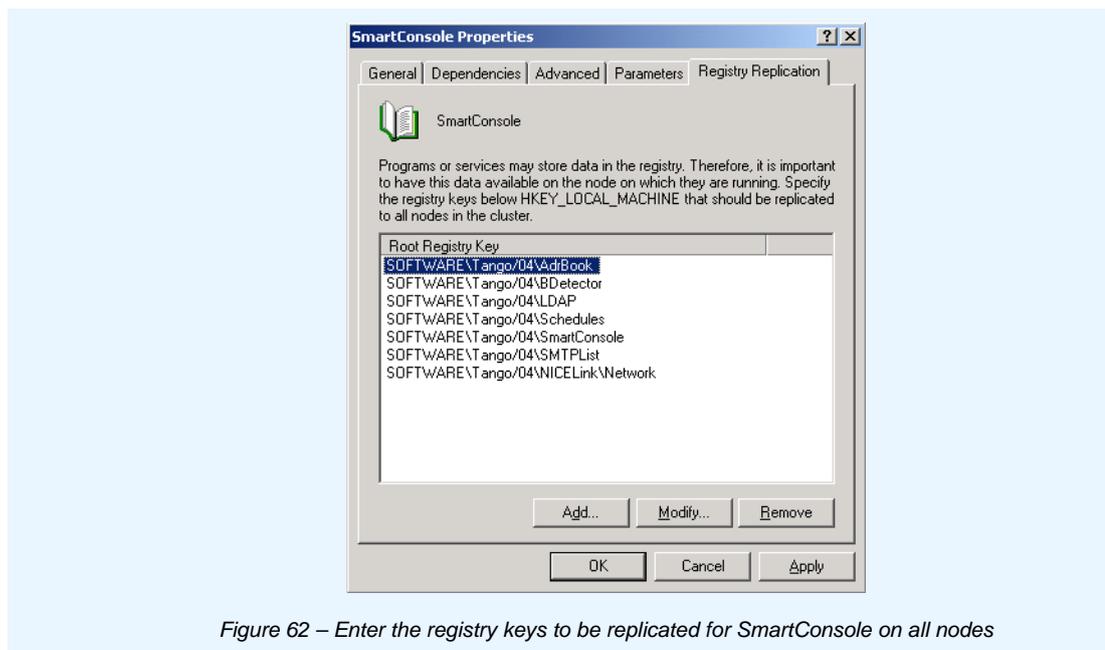


Figure 62 – Enter the registry keys to be replicated for SmartConsole on all nodes

7.2.1 Import a SmartConsole Configuration into a Cluster

It is possible to import a complete existing SmartConsole configuration into a cluster but it is important that the following procedure is carefully adhered to.

To import a SmartConsole configuration into a cluster:

- Step 1.** Stop the SmartConsole cluster group
- Step 2.** Open the SmartConsole cluster group Properties window, select the **Registry Replication** tab and click the **Remove** button to clear the *registry entries* in the SmartConsole cluster group.

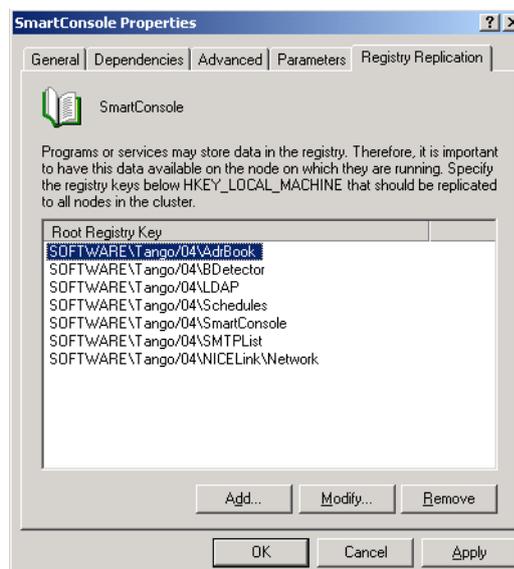


Figure 63 – Clear the registry entries in the SmartConsole cluster group.

- Step 3.** Make sure that SmartConsole is configured in *High Availability* mode by running **SmartConsoleHAManager.exe** and selecting **Cluster** mode.
- Step 4.** Import the desired configuration using the **SmartConsoleImporterExporter.exe** tool. In cluster mode it does not matter whether you select User or Service mode.

- Step 5.** Open the SmartConsole cluster group Properties window, select the **Registry Replication** tab and add the *registry entries* previously removed in step 2.
- Step 6.** Return to the previous configuration screen in the SmartConsole cluster group and launch the SmartConsole cluster group.

7.3 Configure Web Applications

Next carry out the same procedures for the Web applications.

To configure Web applications as cluster applications we need to create the following resources and dependencies (see [section 7.1 - Configure ThinkServer on page 31](#) for details on how to set up each resource type):

- **Physical Disk** (Disk W:)
- **IP Address** (Web IP)
- **Network Name** (TANGOWEB)
 - Dependencies: IP Address
- two **Generic Service** resources:
 - **IIS** (W3SVC)
 - Dependencies: IP Address (Web IP); Network Name (TANGOWEB); Physical Disk (Disk W:)
 - **Scheduler** (T04Scheduler)
 - Dependencies: IP Address (Web IP); Network Name (TANGOWEB); Physical Disk (Disk W:)



Important

- Right-click the *WebApplications* group in the cluster tree, select **New** and click **Resource** to add resources to the WebApplications group
- For each resource make sure that *WebApplications* is selected in the Group drop-down list box

7.4 Load Balancing

Creating a cluster is not only useful for high availability purposes, but also for load balancing. As the cluster is composed of 2 servers, we can configure which server executes what application.

In [section 7.1.5 - Set the order of the servers on page 39](#) we configured ThinkServer to run on *node 1* by preference, and if node 1 fails, to be run on *node 2*. Here we will configure SmartConsole to be run on *node 2* by preference, and in case of failure, to be moved to *node 1*.

To configure SmartConsole to be run on *node 2*:

- Step 1.** Right-click the *SmartConsole* Group and select **Properties** to open the Properties window.

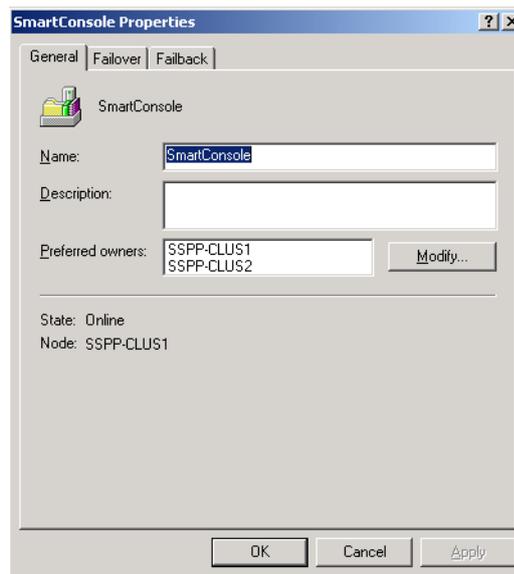


Figure 64 – SmartConsole Group properties

Step 2. Click the **Modify** button to change the order of the preferred owners.

Use the Up or Down arrow buttons to set SSPP-CLUS2 as the first node.

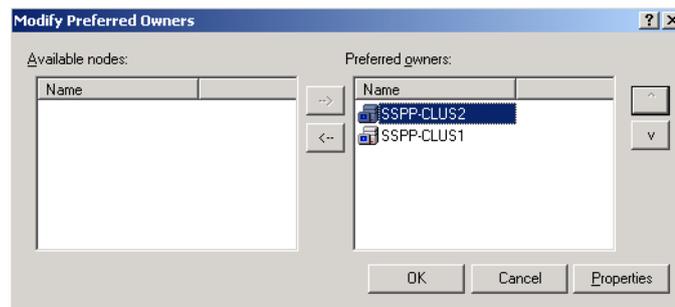


Figure 65 – Change the order of the preferred owners to show SSPP-CLUS2 first.

Click **OK**.

Appendix A

Contacting Tango/04

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About Tango/04 Computing Group

Tango/04 Computing Group is one of the leading developers of systems management and automation software. Tango/04 software helps companies maintain the operating health of all their business processes, improve service levels, increase productivity, and reduce costs through intelligent management of their IT infrastructure.

Founded in 1991 in Barcelona, Spain, Tango/04 is an IBM Business Partner and a key member of IBM's Autonomic Computing initiative. Tango/04 has more than a thousand customers who are served by over 35 authorized Business Partners around the world.

Alliances



Partnerships

- IBM Business Partner
- IBM Autonomic Computing Business Partner
- IBM PartnerWorld for Developers Advanced Membership
- IBM ISV Advantage Agreement
- IBM Early code release
- IBM Direct Technical Liaison
- Microsoft Developer Network
- Microsoft Early Code Release

Awards



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