Intelligent Cost Recovery and Print Management

Equitrac Office/Express
4.2.5
Cluster Deployment Guide
for Windows Server 2003

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Symbols used in this guide:

The following symbols are used in the margins of this guide:

- **Caution**: The accompanying text provides key information about a step or action that might produce unexpected results if not followed precisely.

- **Note**: The accompanying text provides cross-reference links, tips, or general information that can add to your understanding of the topic.

- **Warning**: Read the accompanying text carefully. This text can help you avoid making errors that might adversely affect program behavior.
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Installing Equitrac Office/Express in a Server Cluster Environment

Topics

- Deployment Workflow
- Prepare the Cluster
- Install Equitrac Office/Express Server Components
- Configure Cluster Resources for Equitrac Office/Express
- Configure Print Spooler Cluster Resource Groups
- Configure the Database for an Installation that Includes CAS
- Activate Licenses
- Add Printers
- Upgrade Equitrac Office/Express Server Components

This guide describes the process for installing and configuring Equitrac Office/Express 4.2.5 within an existing Windows Server 2003 failover cluster environment. This guide assumes that you have already created, configured and tested your Windows cluster or clusters. For information on creating Windows server clusters, refer to your Microsoft documentation.

This guide provides information to:

- determine the prerequisites required before you install Equitrac Office/Express 4.2.5
- plan the installation
- perform the installation
- configure the software for initial use
- perform an upgrade
Chapter 1: Installing Equitrac Office/Express in a Server Cluster Environment

Deployment Workflow

Follow the steps listed below in the order presented to ensure successful deployment of Equitrac Office/Express within a cluster environment. For information on upgrading server components, see Upgrade Equitrac Office/Express Server Components on page 33.

1. Prepare the Cluster
   Before installing Equitrac Office/Express, work through the prerequisites checklist to ensure the cluster is prepared correctly.
   page 7

2. Install Server Components
   Install the Equitrac Office/Express components on each cluster node.
   page 14

3. Configure Cluster Resources
   Use the Cluster Administrator to create separate groups for each Equitrac Office/Express resource.
   page 15

4. Configure Spool Groups
   Configure the spooler cluster groups to integrate with DRE component.
   page 26

5. Configure the Database
   Configure the Equitrac Office/Express CAS ODBC data source to communicate with an Oracle or SQL database.
   page 28

6. Activate Licenses
   Activate the Cluster Enabler license, and one DRE server license per cluster node.
   page 30

7. Add Printers
   Add Equitrac printer ports to each virtual print server.
   page 31
Chapter 1: Installing Equitrac Office/Express in a Server Cluster Environment

Step 1: Prepare the Cluster

Component Overview

To plan an installation, you first need to understand the core components that comprise Equitrac Office/Express. You can then make decisions on the best way to deploy the components across the cluster nodes.

Equitrac Office/Express is comprised of the following core server components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
</table>
| Core Accounting Server (CAS) + the Scheduler | • verifies users, calculates printing charges, and assigns charges to an appropriate user or group account  
• calculates charges using page count and job attribute information  
• Connects to an accounting database where all printer, user, department, billing code, transaction, and balance information is stored |
| Document Routing Engine (DRE) + the Equitrac Port Monitor | • routes network print jobs to the appropriate device  
• determines size and attributes of each print job from the print stream; passes the information to the Core Accounting Server (CAS)  
• fully integrated with the Windows print spooler subsystem  
• enables the Port Monitor to receive and route print jobs to network-connected printers  
• can redirect jobs based on device status retrieved from DME  |
| Note: If you are deploying a Windows print server cluster, the DRE component must be installed on every cluster node that will be configured as an available node for DRE failover, as well as any cluster node that will be configured as an available node for a print server failover. |
| Device Control Engine (DCE)                | • provides transaction tracking at the device level  
• communicates via different interfaces to control and manage copy, fax, and hardware devices such as PageCounter |
| Device Monitoring Engine (DME)             | • tracks device status to proactively identify maintenance or replacement needs  
• provide status information to the reporting engine  
• define alert sets to notify an Administrator of impending problems or faults |
| Scan Processing Engine (SPE)               | • optional core component required to use with the Equitrac scanning features  
• SPE uses Equitrac's proprietary Load Balancing technology, and is not designed to be part of a cluster deployment |
Planning the Equitrac Cluster Resources

The recommended practice for configuring Equitrac services for high availability is to create a separate Cluster Resource Group (Virtual Server) for each service. This enables the workload to be balanced across the cluster’s physical nodes and the physical disk resources; achieving maximum benefit from the customer’s investment in the cluster server hardware during normal operations, and to help distribute workloads in the event of a failover. In the event of a failure in a single service, the impact of cluster recovery actions is isolated to only that affected service, and recovery (failover) is faster. Problem isolation is also easier when separate resource groups are used.

Planning the naming conventions for the cluster resources makes the configuration of the cluster much easier. The recommended convention is to prefix the name of each resource with the name of the Equitrac component that it is associated with, followed by the resource type (e.g. CAS IP Address). Also, it is recommended that the resource parameter be used as the resource description. Doing so makes each of the resources easier to identify when viewed in the Cluster Administration Console.

The following is an example a recommended naming convention:

- Resource Type: IP Address
- Resource Name: EQ CAS IP
- Description: 192.168.100.100

Planning Workflow

The workflow for planning the Equitrac Cluster Resources configuration is as follows:

1. Identify which Equitrac components will be installed into the server cluster.
2. Identify the user account that the Equitrac Services will run under.
3. Identify and document the following resources for each Equitrac Service Resource Group to be configured.
   - Group name
   - IP address resource
   - Network name resource
   - Physical disk resource to be allocated (including the amount of storage required)
   - Service resource(s)

**NOTE:** DCE Service Resource type and DRE Service Resource type have been added to version 4.1 (and higher) of Equitrac Office/Express. Earlier versions created a Generic Service resource type for both DCE and DRE.

4. Identify all cluster nodes that the Equitrac components will be installed onto.
5. Identify any Windows Spooler Resource Groups (Virtual Print Servers) which need to be configured for print tracking by Equitrac.
Chapter 1: Installing Equitrac Office/Express in a Server Cluster Environment

Identify the Equitrac Components to be Installed on the Server Cluster

If you are deploying a Print Server Cluster, then the Equitrac DRE print server component must be configured on the cluster. Many Administrators choose to place only the DRE print server component into a Print Server Cluster. DRE supports both Active-Passive and Active-Active Print Server Clusters, although the DRE service itself is configured as an Active-Passive cluster application. The Equitrac DRE component must be installed onto every cluster node so that the Equitrac Port Monitor is available to every virtual print server in the cluster regardless of which node the virtual print server is running on.

You can also install the Core Accounting Server (CAS) onto a Server Cluster for failover purposes. When hosting CAS on a server cluster, you must utilize either a Microsoft SQL Server or Oracle database.

NOTE: Microsoft and Oracle both offer well-documented methods to ensure high-availability of the CAS database, for example Failover Clustering or Database Mirroring. Refer to the Microsoft or Oracle documentation for specific details. Microsoft does not support SQL Server Express with Failover Clustering.

The Device Control Engine (DCE) can be deployed in an Active-Active or Active-Passive configuration. All other Equitrac services can only be deployed in an Active-Passive configuration.

Identify the Equitrac Services User Account

Equitrac requires that a domain user account is used to run the Equitrac services in a cluster. This account must have local Administrative privileges on each cluster node. This will reduce the chance of a failover and licensing problem occurring where the user account is incorrectly configured on a particular node.

For example, cluster file share permissions for the EQSpool directory will not take effect on a failover to another node if the file share permissions are based on a local account or a local group, and is not configured correctly on every node in the cluster. The use of a domain user account also enables access to the domain active directory for user account synchronization (ADSync).

Domain user accounts must include the domain name when prompted for by the install process (for example: domain\username). On the domain, this account only needs to be a member the Domain Users group,
## Chapter 1: Installing Equitrac Office/Express in a Server Cluster Environment

### Document the Equitrac Services Cluster Resource Configuration

The recommended practice is to document all of the Cluster Resources in the configuration as part of the planning process.

The following worksheet is an example of planning documentation for resources.

<table>
<thead>
<tr>
<th>Cluster Item</th>
<th>Service Resource</th>
<th>Resource Type</th>
<th>Parameter</th>
<th>Preferred Owner / Dependencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Server 1</td>
<td>Pub = 10.10.10.11, Priv = 10.1.1.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Server 2</td>
<td>Pub = 10.10.10.12, Priv = 10.1.1.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQL Server</td>
<td>Database Server, Pub = 10.10.10.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster Service</td>
<td>UserID = EQCluster, Password = Equitrac1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equitrac Service</td>
<td>Domain = EQDevCluster, UserID = EQCluster, Password = Equitrac1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster</td>
<td>EQCluster Group, Cluster IP Address = 10.10.10.27, Cluster Net Name = EQCluster, Cluster Quorum Physical Disk = Q</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Print Spooler 1 Resource Group</td>
<td>Print Server1 Group, Print Server1 IP Address = 10.10.10.25, Print Server1 Net Name = EQPrintSrv1, Print Server1 Drive Physical Disk = Z</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Print Spooler 2 Resource Group</td>
<td>Print Server2 Group, Print Server2 IP Address = 10.10.10.26, Print Server2 Net Name = EQPrintSrv2, Print Server2 Drive Physical Disk = Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRE Resource Group</td>
<td>EQDRE Group, DRE IP Address = 10.10.10.21, DRE Net Name = EQClusterDRE, DRE Drive Physical Disk = X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCE1 Resource Group</td>
<td>EQDCE1 Group, DCE1 IP Address = 10.10.10.23, DCE1 Net Name = EQClusterDCE1, DCE1 Drive Physical Disk = U</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCE2 Resource Group</td>
<td>EQDCE2 Group, DCE2 IP Address = 10.10.10.24, DCE2 Net Name = EQClusterDCE2, DCE2 Drive Physical Disk = V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS &amp; Scheduler Resource Group</td>
<td>EQCAS Sched Group, CAS IP Address = 10.10.10.20, CAS Net Name = EQClusterCAS, CAS Service Generic Service, Scheduler Service Generic Service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DME Resource Group</td>
<td>EQDME Group, DME IP Address = 10.10.10.22, DME Net Name = EQClusterDME, DME Drive Physical Disk = W</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Equitrac Office/Express Cluster Deployment Guide**

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Chapter 1: Installing Equitrac Office/Express in a Server Cluster Environment

Identify the List of Cluster Nodes for the Equitrac Installation

List all cluster nodes that the Equitrac components will need to be installed on. The recommended practice is to identify all of the Equitrac components required on the cluster, and then perform the product installation on every cluster node to configure all of those components on each node.

Identify the Equitrac Tracked Spooler Groups

**NOTE:** This is only required if installing the DRE component into a Print Server Cluster. Identify each spooler group and its associated physical disk. Add the information to the planning worksheet.

Virtual Print Server Spooler Physical Disk Resource Sizing

When printing on a Print Server Cluster is being tracked by Equitrac, the size of the Spooler Physical Disk resource needs to take into account the space required by the Equitrac Port Monitor for use by the secure document release, rule set handling or cost preview features. Because print jobs may be held on the spooler physical disk longer, you must ensure that adequate disk space has been provided.

The following formula can be used to estimate the combined space required by the spooler resource (Spool directory) and Equitrac Port Monitor (EQSpool directory) on each physical disk associated with a Virtual Print Server.

The estimated shared spooler drive size is equal to \(NP \times PV \times PS \times HR \times SN\)

- **NP** = Number of Printers on the Virtual Print Server (spooler resource group)
- **PV** = Maximum number of print jobs in any one hour time frame, on the day with the highest print volume of the year
- **PS** = Largest single print job size
- **HR** = Hold time (specified in hours) for secure document release. The hold time cannot be less than 1 hour
- **SN** = Safety net (error in estimates given) normally between 1.5 and 2

Example: 178 (printers) x 58 (print jobs/hour) x 1.12mb (average print job size) x 2 (hours of hold time) x 1.5 (safety net) = 33.9 GigaBytes

**NOTE:** Equitrac recommends that a minimum of 10 MB of space is available on the physical disk resource for each of the other resource components, such as DCE, DME, and DRE.
Chapter 1: Installing Equitrac Office/Express in a Server Cluster Environment

**Single or Multiple Spooler Resources**

Equitrac Office/Express supports one or more spooler resources (Virtual Print Servers). The DRE is an active-passive service, running on one node at a time, but provides services to multiple spooler resources even when they are running across multiple nodes. If your cluster is already set up for printing, and meets the prerequisites listed in Verify High Availability Server Cluster Deployment Prerequisites on page 13, you do not need to create new spooler resource groups. An EQSpool directory and corresponding file share resource needs to be added to the existing spooler groups. See Configure Print Spooler Cluster Resource Groups on page 26 for details.

---

### Single Spooler Resource Sample Configuration

<table>
<thead>
<tr>
<th>Node 1</th>
<th>Node 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spooler Resource Group</td>
<td>Spooler Resource Group</td>
</tr>
<tr>
<td>IP Resource</td>
<td>IP Resource</td>
</tr>
<tr>
<td>Disk 1 Resource</td>
<td>Disk 1 Resource</td>
</tr>
<tr>
<td>Network Name resource</td>
<td>Network Name resource</td>
</tr>
<tr>
<td>Spooler Resource</td>
<td>Spooler Resource</td>
</tr>
<tr>
<td>EQSpool File Share</td>
<td>EQSpool File Share</td>
</tr>
<tr>
<td></td>
<td>Disk 2 (DRE)</td>
</tr>
<tr>
<td></td>
<td>Disk 1 (Spooler)</td>
</tr>
<tr>
<td></td>
<td>Quorum (Disk)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### Multiple Spooler Resource Sample Configuration

<table>
<thead>
<tr>
<th>Node 1</th>
<th>Node 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRE Group</td>
<td>Spooler Resource Group 2</td>
</tr>
<tr>
<td>IP Resource</td>
<td>IP Resource</td>
</tr>
<tr>
<td>Disk 1 Resource</td>
<td>Disk 3 Resource</td>
</tr>
<tr>
<td>Network Name resource</td>
<td>Network Name resource</td>
</tr>
<tr>
<td>Spooler Resource Group 1</td>
<td>Spooler Resource Group 2</td>
</tr>
<tr>
<td>IP Resource</td>
<td>IP Resource</td>
</tr>
<tr>
<td>Network Name resource</td>
<td>Disk 1 Resource</td>
</tr>
<tr>
<td>Spooler Resource</td>
<td>Disk 2 Resource</td>
</tr>
<tr>
<td>Disk 2 Resource</td>
<td>EQSpool File Share</td>
</tr>
<tr>
<td></td>
<td>Quorum (Disk)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Verify High Availability Server Cluster Deployment Prerequisites

Before you install the Equitrac Office/Express software, complete the following checklists. Proceed with the installation only when you confirm that your cluster meets all items in the checklists.

In our workflow, we document the configuration of Equitrac cluster resources after installing the Equitrac components. If required, some Equitrac cluster resources can be pre-configured prior to installing the Equitrac components. The following is a list of the resources that can be pre-configured.

- Resource groups
- IP Address resources
- Network Name resources
- Physical Disk resources
- EQSpool File Share resource in each Windows print spooler group

To pre-configure the Equitrac cluster resources, first verify the cluster prerequisites as documented below, then proceed to Configure Cluster Resources for Equitrac Office/Express on page 15 to configure each component.

Verify the following:

- Cluster supported edition of Microsoft Windows 2003 is installed on the physical cluster nodes (Windows NT is not supported)
- The Microsoft Cluster Service has been installed and configured on the multi-node cluster
- A physical disk resource is available where required for each of the Equitrac Cluster Resource Groups identified in the planning stage above
- The Cluster infrastructure has been tested to verify that the cluster is configured and operating correctly before installing the Equitrac components (See Verification on page 37)

If you are running a print spooler resource, also verify the following:

- Printing through all virtual print servers is successful
- Printing after failover is successful on all virtual print servers on all nodes
- Printing after failback is successful on all virtual print servers on all nodes

**NOTE:** Equitrac recommends that the print server cluster be configured and fully tested before deploying the Equitrac components. Printers on the Virtual Print Server can be initially added with Microsoft TCP/IP ports and tested. Later, after the Equitrac components are installed and configured, the printers can then be converted to Equitrac Ports using the Equitrac printer conversion Wizard.

There are two advantages to pre-configuring and testing the print server cluster.

- The print server cluster configuration can be verified before introducing Equitrac components.
- When the printers are first added and then converted using the Equitrac conversion Wizard, registry information is saved which will allow the Equitrac port to be restored to TCP/IP ports if necessary.
Chapter 1: Installing Equitrac Office/Express in a Server Cluster Environment

Step 2: Install Equitrac Office/Express Server Components

This section describes the procedures for installing individual Equitrac Office/Express services within a cluster. For information on upgrading Equitrac Office/Express server components, see Upgrade Equitrac Office/Express Server Components on page 33.

To install the Equitrac components into a server cluster, the Equitrac installer must be run on each physical node in the cluster. Ensure that the Equitrac Office/Express installation is identical for all nodes, in that you have selected the same components and service user account on each node. The installation path can be different on each node. The Equitrac Office/Express installation path must be on the local disk of each node, not on the shared cluster disks.

Follow the instructions in Install the Server Components within the Equitrac Office or Equitrac Express Installation Guide to install the Equitrac Office/Express Server components for each node in the cluster.

Select the relevant options during the installation to install the desired components. The EQ Scheduler component installs automatically as part of CAS.

During installation on a cluster, the Equitrac installer asks for the network name or IP address of the CAS server. Enter the network name or IP address you plan to assign to the CAS Virtual Server in the EQ CAS Service cluster resource group.

During installation on a cluster, if DRE is selected, the Equitrac installer asks for the network name or IP address of the DRE server. Enter the network name or IP address you plan to assign to the DRE Virtual Server in the EQ DRE Service cluster resource group.

**NOTE:** During installation, the user will be prompted for the credentials of the user under which the EQ services will run – the user/password entered must be for a domain account that is a member of the local Administrator group on each physical node.

**NOTE:** If you plan to cluster the DCE component, you must use the DCE virtual server address assigned in the resource group on all manually-configured PageCounter control terminals and embedded devices. This will be the network name or IP address that is assigned to the EQ Device Control Engine resource group. If you have configured an Active-Active DCE cluster, then those endpoint devices can be distributed between the Virtual DCE servers to balance the load across cluster nodes.

**NOTE:** If CAS is being installed into the server cluster then install Equitrac Office/Express with either a SQL or Oracle database. Microsoft does not support the SQL Server Express database in a server cluster environment.

After the CAS component is installed, confirm the EQCAS ODBC DSN configuration on each node, and ensure that it is functional and points to a correctly configured Equitrac Office/Express database. See Configure the Database for an Installation that Includes CAS on page 28. Confirm that the ODBC connection is functional on all nodes if CAS is installed into a server cluster.
Step 3: Configure Cluster Resources for Equitrac Office/Express

Creating separate resource groups for the Equitrac Office/Express resources is strongly recommended to maximize availability and to get the greatest benefit from the customer investment in the cluster resources. For example, if you place CAS (the accounting server) and the DRE (document routing engine) in the same group, a failover in the DRE service will also cause a CAS failover, unnecessarily rendering the CAS database unreachable for a period of time. The failover of two services instead of one might also increase risks because of the sudden change in the workload across the physical nodes.

Create groups only for those components that you have installed on the cluster. For example, if you are only clustering the DRE print service, create a resource group for the DRE service.

Use the Cluster Administrator tool to create the following resource groups:

- CAS + Scheduler resource group
- DME resource group
- DRE resource group (new resource type added with software version 4.1)
- DCE resource group or groups (new resource type added with software version 4.1)

The following graphic is an example of multiple cluster resource groups.
Chapter 1: Installing Equitrac Office/Express in a Server Cluster Environment

Create Cluster Resource Groups

To create a cluster resource group in Windows 2003 Cluster Administrator, use the following procedure:

1. From the File menu, select New > Group to create a new group. Alternately, you can press CTRL + G, or right-click the screen and select New > Group to open the New Group dialog.

   ![New Group Dialog](image)

2. Provide a unique Name and Description for this group, and click Next.
   
   While your choice of naming convention is arbitrary, Equitrac recommends applying the service name in the group name and as part of the description to simplify identification.
   
   For example: The group name is CAS Group, and its description is Cluster CAS virtual server.

3. In the Preferred Owners dialog, select the cluster nodes from Available nodes list, click Add to move the nodes into the Preferred owners section, and click Finish.
   
   You can load balance the Equitrac services across nodes by arranging the order of the Preferred owners.
Chapter 1: Installing Equitrac Office/Express in a Server Cluster Environment

A dialog pops up stating **Cluster group 'CAS Group' created successfully.**

![Cluster Administrator](image)

4 Click **OK** to return to the Cluster Administrator.

Follow the same steps to create DME, DCE, and DRE Cluster resource groups. Since DCE can be deployed as an Active-Active or Active-Passive configuration, multiple DCE resource groups may be created for this service to run on multiple nodes. After creating the cluster groups, you need to add resources to populate each group.

**Active-Passive CAS+Scheduler Cluster Resource Group**

In the CAS Cluster Resource Group create the following resource types:

- IP Address
- Network Name
- Generic Service - EQCASSrv (CAS)
- Generic Service - EQSchSrv (Scheduler)

**NOTE:** The CAS and Scheduler services must be in the same resource group. The CAS and Scheduler services do not require a Physical Disk resource.

**Create an IP Address Resource**

1 Select the group (e.g. CAS Group) from the groups list in Cluster Administrator.

2 Select **File > New > Resource** to create a new resource for the selected group. Alternately, you can press **CTRL + N**, or right-click the group and select **New > Resource** to open the **New Resource** dialog.
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3. Enter a **Name** and **Description** for this resource.
   Equitrac recommends applying the group service name in the resource name (e.g. CAS IP address), and the static IP address in the description field to simplify identification.

4. Select **IP Address** from the **Resource type** drop-down list.

5. Select **CAS Group** from the **Group** drop-down list, and click **Next**.

6. On the **Possible Owners** dialog, select the nodes from the **Available nodes** list on which you want this group to run, click **Add** to move the nodes into the **Possible owners** section, and click **Next**.

7. Click **Next** to bypass the **Dependencies** dialog, as the IP address resource does not require any resource dependencies.
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8. On the **TCP/IP Address Parameters** dialog, enter the static **IP address** and **subnet mask** associated with the public network that was assigned to the CAS group.

9. Select **Public** from the **Network** drop-down list, and click **Finish**.

The new resource now appears in Cluster Administrator.
Create a Network Name Resource

1. Select File > New > Resource to create a new resource for the selected group.
2. In the New Resource dialog, complete the following:
   a. Enter a Name (e.g. CAS network name) and Description for this resource.
   b. Select Network Name from the Resource type drop-down list.
   c. Select CAS Group from the Group drop-down list, and click Next.
3. On the Possible Owners dialog, select the nodes from the Available nodes list on which you want this group to run, click Add and then click Next.
4. In the Dependencies dialog, select the CAS IP address from the Available resources list as the resource dependency, click Add and then click Next.
5. On the Network Name Parameters dialog:
   a. In the Name field, enter the Network Name identified during planning to be assigned to the CAS server.
   b. Select DNS Registration Must Succeed, and click Finish.

Create CAS Service and Scheduler Service Resources

1. Select File > New > Resource to create a new resource for the selected group.
2. In the New Resource dialog, complete the following:
   a. Enter a Name and Description for this resource.
   b. Select Generic Service from the Resource type drop-down list.
   c. Select CAS Group from the Group drop-down list, and click Next.
3. On the Possible Owners dialog, select the nodes from the Available nodes list on which you want this group to run, click Add and then click Next.
4. In the Dependencies dialog, select CAS Network Name from the Available resources list as the resource dependency, click Add and then click Next.
5 On the **Generic Services Parameters** dialog:
   
a. Enter **EQCASSrv** in the Service name field.
   
b. Select **Use Network Name for computer name**, and click **Next**.

**CAUTION:** Ensure you enable this option for all services, otherwise Equitrac Office/Express will use the computer name of the physical nodes instead of the Network Name. This option is only available if you make the resource dependent on the Network Name.

6 Click **Finish** to bypass the **Registry Replication** dialog as Equitrac services do not require registry replication.

**NOTE:** To create the Scheduler service (**EQSchSrv**) resource, repeat the procedure for creating the CAS service resource, except enter **EQSchSrv** in the Service name field on the **Generic Services Parameters** dialog.
Active-Passive DME Cluster Resource Group
Create the DME Cluster Resource Group consisting of the following resource types:
- IP Address (see Create an IP Address Resource on page 17)
- Network Name (see Create a Network Name Resource on page 20)
- Physical Disk
- DME Service - EQDMESrv

Create a Physical Disk Resource
1. Select File > New > Resource to create a new resource for the selected group.
2. In the New Resource dialog, complete the following:
   a. Enter a Name (e.g. DME Drive W) and Description for this resource.
   b. Select Physical Disk from the Resource type drop-down list.
   c. Select DME Group from the Group drop-down list, and click Next.
3. On the Possible Owners dialog, select the nodes from the Available nodes list on which you want this group to run, click Add and then click Next.
4. In the Dependencies dialog, select DME IP address from the Available resources list as the resource dependency, click Add and then click Next.
5. In the Disk Parameters dialog, select the physical disk which is assigned to the DME resource group, and click Finish.
Create a DME Service Resource

1. Select File > New > Resource to create a new resource for the selected group.
2. In the New Resource dialog, complete the following:
   a. Enter a Name (e.g. DME service) and Description for this resource.
   b. Select Generic Service from the Resource type drop-down list.
   c. Select DME Group from the Group drop-down list, and click Next.
3. On the Possible Owners dialog, select the nodes from the Available nodes list on which you want this group to run, click Add and then click Next.
4. In the Dependencies dialog, select DME Network Name and Physical Disk from the Available resources list as the resource dependencies, click Add and then click Next.
5. On the Generic Services Parameters dialog:
   a. Enter EQDMESrv in the Service name field.
   b. Select Use Network Name for computer name, and click Next.
      Ensure you enable this option for all services, otherwise Equitrac Office/Express will use the computer name of the physical nodes instead of the Network Name. This option is only available if you make the resource dependent on the Network Name.
6. Click Finish to bypass the Registry Replication dialog as Equitrac services do not require this.
7. Create or change the following registry entry for the DME service on all cluster nodes.

   **NOTE:** You must define this registry entry on all nodes in the cluster. Microsoft recommends backing up the registry before making any changes.

   a. Go to HKEY_LOCAL_MACHINE\SOFTWARE\Equitrac\.
   b. Create a new key called DME and a string value called cachefolder.
   c. Set the registry value with the full path to a directory on the physical disk which is assigned to the DME Cluster Resource Group. For example - w:\DMEcache.
      This folder will be created when the DME cluster resource is brought online.
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Active-Passive DRE Cluster Resource Group

Create the DRE Cluster Resource Group consisting of the following resource types:

- IP Address (see Create an IP Address Resource on page 17)
- Network Name (see Create a Network Name Resource on page 20)
- Physical Disk (see Create a Physical Disk Resource on page 22)
- EQ DRE Service Resource

**NOTE:** It is recommended that the Equitrac DRE cluster resources be configured as part of a separate DRE resource group, not included in an existing Windows print spooler group. If a spooler group is not able to communicate with DRE, startup/failover recovery times are greatly increased.

Create an EQ DRE Service Resource.

1. Create a new resource for the selected group.
2. In the New Resource dialog, complete the following:
   a. Enter a Name (e.g. DRE service) and Description for this resource.
   b. Select EQ DRE Service from the Resource type drop-down list.
   c. Select DRE Group from the Group drop-down list, and click Next.
3. On the Possible Owners dialog, select the nodes from the Available nodes list on which you want this group to run, click Add and then click Next.
4. In the Dependencies dialog, select DRE Network Name and Physical Disk from the Available resources list as the resource dependencies, click Add and then click Next.
5. In the CacheFolder field on the DRE Parameters dialog, enter the full path name to the directory on the physical disk which is assigned to the DRE resource group (e.g. x:\DREcache), and click Finish.

   If the folder does not exist, it will be auto-created when DRE starts.
Active-Active or Active-Passive DCE Cluster Resource Groups

You may create active-active and/or active-passive DCE cluster groups. Active-active means that you have more than one active DCE services resource group. An active-active configuration enables greater scalability and availability with both embedded devices and PageCounters.

**NOTE:** For active-active configurations you must create a resource group for each active DCE virtual server. Often one DCE group is created for each physical node. For active-passive configurations, only create one DCE group.

Create the DCE Cluster Resource Group consisting of the following resource types:

- **IP address** - Create a unique IP address resource in each DCE group, specifying the static IP address on the public network that was assigned for each group. For example, DCE1 IP address, DCE2 IP address.
- **Network name** - Create a unique Network name resource in each DCE group that will be dependent on the IP address resource for that group. For example, DCE1 Network name, DCE2 Network name.
- **Physical Disk** - Create a physical disk resource in each DCE group for the logical drive assigned to that group, and make it dependent on the IP address resource for that group.
- **EQ Device Control Engine** - Create an EQ Device Control Engine resource in each DCE group, and make it dependent on the Network name and Physical disk.

Create an EQ Device Control Engine Resource

1. Create a new resource for the selected group.
2. In the **New Resource** dialog, complete the following:
   a. Enter a **Name** (e.g. DCE1 service) and **Description** for this resource.
   b. Select **EQ Device Control Engine** from the **Resource type** drop-down list.
   c. Select **DCE1 Group** from the **Group** drop-down list, and click **Next**.
3. On the **Possible Owners** dialog, select the nodes from the Available nodes list on which you want this group to run, click **Add** and then click **Next**.
4. In the **Dependencies** dialog, select **DCE Network Name** and **Physical Disk** from the Available resources list as the resource dependencies, click **Add** and then click **Next**. For example; DCE1 Network name and DCE Drive U.
5. In the **CacheFolder** field on the **DCE Parameters** dialog, enter the full path name to the directory on the physical disk which is assigned to the DCE resource group (e.g. u:\DCE1cache, v:\DCE2cache), and click **Finish**.

If the folder does not exist, it will be auto-created when DCE starts.
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Step 4: Configure Print Spooler Cluster Resource Groups

The following procedure applies to all new and existing print spooler resource groups (Virtual Print Servers) which are tracked by Equitrac.

1 Refer to your Microsoft cluster documentation to create print spooler resource groups (Virtual Print Servers) on the cluster. Verify that the size of the physical disk resource assigned to the spooler group meets or exceeds the size estimated in the Equitrac cluster deployment planning. See Virtual Print Server Spooler Physical Disk Resource Sizing on page 11.

   NOTE: Equitrac recommends that the print server cluster be configured and fully tested before deploying the Equitrac components. Printers on the Virtual Print Server should be initially added with Microsoft TCP/IP ports and tested. Later, after the Equitrac components are configured, the printers can then be converted to the Equitrac Port Monitor using the Equitrac printer conversion Wizard. This makes it easier to identify and resolve any potential configuration problems that may occur.

2 Use Windows Explorer to create a new Equitrac spooling directory called EQSpool. An EQSpool directory is required on each physical disk resource on which a Windows spooler resource depends.

   NOTE: This is not the same directory that the Windows printing subsystem uses for print spooling. The EQSpool directory holds print jobs for the Equitrac Port Monitor for secure document release, rule set handling, or cost preview purposes.

3 Define NTFS security permissions on the EQSpool directory by granting the DRE service account and the Microsoft Cluster Service user accounts Full Control. If permissions are not granted to Cluster Services, then the Cluster Administrator Console will not have access to the EQSpool directory, and the next step in this procedure will fail.

4 Use the Windows Cluster Administrator to create a File Share resource in each spooler cluster group by using the following procedure:
   a Select File > New > Resource to create a new resource for the selected group.
   b In the New Resource dialog, enter a Name and Description for this resource, select File Share from the Resource type drop-down list, and click Next.
   c In the File Share Parameters dialog, create a Share name, select the Path, and click Finish.

   The share name must be in the form of networkname_EQSpool, where networkname refers to the network resource on which the print spooler depends (e.g. PrintSpooler1_EQSpool). The path must point to the EQSpool directory on the physical disk owned by that spooler group (e.g. y:\EQSpool). This share resides on the existing physical disk with the spoool/drivers folders.

   NOTE: When the cluster file share resource is created, the Cluster Administrator application creates the actual Windows file share for the EQSpool directory.

   NOTE: Ensure the cluster file share resource is dependent on both the physical disk resource and the network name resource for the spooler resource group. You must then make the corresponding Windows spooler resource dependent on this new file share resource.
In Windows Cluster Administrator, define the Security permissions from the Parameters dialog for the EQSpool file share. You must set the cluster file share resource permissions to provide Change access to this resource for both the System user account and also the user account under which the EQ DRE Service cluster resource runs.

**NOTE:** The DRE runs under the same user account as the EQ Cluster Service. This is the domain user account that was identified in the Equitrac deployment planning and that is provided for the Equitrac services when the DRE component is installed on each physical node.

**NOTE:** You must use the Cluster Administration tools to manage the EQSpool file shares and permissions. Changes made using Windows Explorer will be lost when these file shares fail over to other nodes in the cluster, causing the associated Virtual Print Server to fail.
**Step 5: Configure the Database for an Installation that Includes CAS**

**NOTE:** The following steps in this procedure differ from the Microsoft SQL Server or Oracle database setup procedure as documented in the Equitrac Office or Equitrac Express Installation Guide. You must confirm that the ODBC connection is functional on all nodes in the cluster.

### Microsoft SQL Server Configuration

Refer to your Microsoft SQL Server documentation for general SQL Server setup instructions.

1. On your SQL Server database system, create a database named `eqcas`.
2. Using a Microsoft SQL Server provided tool, such as Query Analyzer, connect to the `eqcas` database and execute the following SQL scripts located on CAS (the accounting server) in `<root>\Program Files\Equitrac\Office or Express\Database`.
   - `CAS_SQLServer.sql` - creates schema
   - `CAS_SysData_SQLServer.sql` - adds system data
   - `CAS_SysData_SQLServer_EO.sql` - adds system data (Office)
     —Or—
   - `CAS_SysData_SQLServer_EE.sql` - adds system data (Express)
   - `EQCASSQLServerInstall.sql` - creates an eqcas user ID
   - `EQCASSQLEXPR2005.sql` - streamlines functionality (only run on SQL Server 2005 or higher)
3. On each cluster node where CAS is installed, the Equitrac Office/Express installation process created an ODBC System DSN named `eqcas`. You must verify the ODBC System DSN database connection from every node in the cluster.
4. Using Cluster Administrator, bring the CAS resource group online. Do NOT start the CAS service from the service console.
5. To set up Equitrac reports for SQL server, on one of the cluster nodes where CAS is installed, open a command prompt and navigate to `<root>\Program Files\Equitrac\Office or Express\Accounting Service` and execute the following command:
   - **For Equitrac Office:**
     ```
     eqrptload.exe -a <accounting server> -f reports\reportlist.csv -u -v EQvariables.csv -h globalstyle.txt
     ```
   - **For Equitrac Express:**
     ```
     eqrptload.exe -a <accounting server> -f reports\EEreportlist.csv -u -v EQvariables.csv -h globalstyle.txt
     ```
     where `<accounting server>` represents the network name of your CAS virtual server.
     For example:
     ```
     eqrptload.exe -a EQCASSrv -f reports\reportlist.csv -u -v EQvariables.csv -h globalstyle.txt
     ```

Equitrac Office/Express is now configured to use the Microsoft SQL Server database.
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Oracle Database Configuration

Refer to your Oracle documentation for general Oracle database setup instructions. Use the following procedure to configure the Oracle database to function with Equitrac Office/Express.

1. On your Oracle database server, create a database named `eqcas`.

2. Using an Oracle provided tool, such as SQL *Plus, connect to the `eqcas` database and execute the following Oracle scripts located on the Equitrac Office/Express Core Accounting Server system in `<root>\Program Files\Equitrac\Office or Express\Database`:
   - `CAS_Oracle.sql` - creates schema
   - `CAS_SysData_Oracle.sql` - adds system data
   - `CAS_SysData_Oracle_EO.sql` - adds system data (Office)
     —Or—
   - `CAS_SysData_Oracle_EE.sql` - adds system data (Express)

3. On each cluster node where CAS is installed, the Equitrac Office/Express installation process created an ODBC System DSN named `eqcas`. Verify the ODBC System DSN database connection from every node in the cluster.

4. To ensure your Oracle database properly executes the long statements in the final SQL script, open a command prompt, navigate to `<root>\Program Files\Equitrac\Office or Express\Tools` and execute the following command:
   **For Equitrac Office**
   
   ```
   eqdbloader -f <full path to CAS_Loader_Oracle_EO.sql> -d <your Oracle ODBC system DSN> -u <your Oracle Admin user> -p <your Oracle Admin password>
   ```
   
   For example:
   ```
   eqdbloader -f "c:\Program Files\Equitrac\Office\Database\CAS_Loader_Oracle_EO.sql" -d Oracle_DSN -u eqcas -p eqcas
   ```

   **For Equitrac Express**
   
   ```
   eqdbloader -f <full path to CAS_Loader_Oracle_EE.sql> -d <your Oracle ODBC system DSN> -u <your Oracle Admin user> -p <your Oracle Admin password>
   ```
   
   For example:
   ```
   eqdbloader -f "c:\Program Files\Equitrac\Express\Database\CAS_Loader_Oracle_EE.sql" -d Oracle_DSN -u eqcas -p eqcas
   ```

5. Using Cluster Administrator, bring the CAS resource group online. Do NOT start the CAS service from the service console.

6. To set up Equitrac reports on the Oracle database, open a command prompt, navigate to `<root>\Program Files\Equitrac\Office or Express\Accounting Service`, and execute the following command:
   **For Equitrac Office**
   
   ```
   eqrptload.exe -a <accounting server> -f reports\reportlist.csv -u -v EQvariables.csv -h globalstyle.txt
   ```
For Equitrac Express

eqrptload.exe -a <accounting server> -f reports\EEreportlist.csv
-u -v EQvariables.csv -h globalstyle.txt

where <accounting server> represents the network name of your CAS virtual server.

For example:
eqrptload.exe -a EQCASSrv -f reports\reportlist.csv -u -v EQvariables.csv
-h globalstyle.txt

Equitrac Office/Express is now configured to use the Oracle database.

Step 6: Activate Licenses

Apart from the required Microsoft and Equitrac licenses, implementing Equitrac Office/Express cluster support requires a single Cluster Enabler license for each cluster, whether you are implementing CAS/Scheduler, DCE, DRE, DME or any combination of these components on a cluster. Without a Cluster Enabler license, these services will start, but will default to unlicensed functionality. For example, DRE will allow printing, but will not track any transaction details in the CAS database.

In addition to the cluster license, cluster printing requires a minimum of one DRE print server license for each cluster node; you may require additional print server licenses if the number of printer ports on all of the virtual print servers exceeds the DRE license limit of 100 printers multiplied by the number of print server licenses.

Before registering any licenses, run the EQSystem ID.exe tool, found in the Utilities folder on the Equitrac CD. This tool provides the system identification information you require to register the Equitrac licenses.

**NOTE:** EQSystem ID.exe requires Administrator privileges to provide correct information in a cluster environment.

On startup, both CAS and DCE will check for a valid Cluster Enabler license.

The DRE requests a print server license for each of the cluster nodes the first time it prints a document using that node. Since Equitrac Office/Express does not assign licenses to the cluster nodes until print time, it is possible for a cluster group to fail over to another node, and be unable to retrieve a DRE license.

To ensure that each cluster node is assigned a valid print server license prior to an actual failover situation, print a test page on each cluster node (moving a print spooler group to that node first, if necessary). This forces the cluster node to request and accept a print server license assignment from CAS, and record the test page in the Equitrac Office/Express accounting database.
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Step 7: Add Printers

Equitrac recommends that the Windows print server cluster be configured and fully tested before deploying the Equitrac components. Printers on the Virtual Print Server should be initially added with Microsoft TCP/IP ports and tested. Later, after the Equitrac components are configured, the printers can then be converted to the Equitrac Port Monitor using the Equitrac printer conversion Wizard.

There are two advantages to pre-configuring and testing the print server cluster:

- The print server cluster configuration can be verified before introducing Equitrac components.
- When the printers are first added and then converted with the Equitrac printer conversion Wizard, registry information is saved which allows the Equitrac ports to be restored to TCP/IP ports if necessary, using the Equitrac conversion Wizard.

**NOTE:** You can only create cluster printers on the virtual print server. Printers created on the local physical node are not part of the supported cluster configuration.

You can use the Equitrac Printer Conversion wizard to convert existing network printer ports to EQ ports. See Converting Existing Printer Ports in the Equitrac Office or Equitrac Express Installation Guide for this procedure.

The Equitrac Printer Conversion Wizard can be accessed in two different ways:

- Select Start > All Programs > Equitrac Office/Express > Printer Conversion Wizard.
- Navigate to C:\Program Files\Equitrac\Office or Express\Tools. If using the Conversion Wizard from the Tools folder, right-click the application and select Run as administrator from the menu.

**NOTE:** When using the Equitrac Printer Conversion Wizard with a Virtual Print Server, you must select Remote Server and specify the network (DNS) name or IP address of the Virtual Print Server (e.g. printserver1).

Once you have converted all the print queues on the cluster and sent a print request, each physical device should have a print queue in System Manager.
Use the Equitrac Printer Port Wizard

To add a printer, use either the console of one of the cluster nodes, or a terminal services session to one of the cluster nodes. If you are connecting to the Virtual Print Server from a remote workstation using Windows Explorer to add the printers, you must install the Equitrac DRE component, which also installs the Equitrac Port Monitor, on the remote workstation first.

The process of adding a new printer on an virtual print server is different from the process of adding a printer for Equitrac Office/Express on a standard non-clustered server:

1. Use Windows Explorer to browse to the virtual print cluster server.
2. Select Printers and Faxes.
3. Select Add Printer to add a new printer on the virtual cluster server.
4. Select Add a local printer.
5. Select Create a new port, and choose Equitrac Port from the drop-down list, and then click Next.
6. Follow the steps in the Add Equitrac Printer Port wizard to complete the port conversion.
7. Complete the steps in the Add Printer wizard to associate a driver and define a printer name.

Verify the Print Server Configuration

After installing and configuring Equitrac Office/Express 4.2.5 within a Windows 2003 cluster environment, verify the following:

- Printing through all virtual print servers is successful
- Printing after failover is successful on all virtual print servers on all nodes
- Printing after failback is successful on all virtual print servers on all nodes
Upgrade Equitrac Office/Express Server Components

The following section describes the general process for uninstalling, upgrading, or applying maintenance to Equitrac applications in a server cluster environment. For specific instructions for upgrading to Equitrac Office/Express 4.2.5, see Upgrade from 4.0.x to 4.2.5 or Upgrade from 4.1.x and 4.2.0 to 4.2.5 or Upgrade from 4.2.1 or later to 4.2.5.

**NOTE:** Check the documentation for the upgrade or hotfix being applied to see if specific instructions are provided for a cluster environment.

1. Pause the node to be upgraded (this prevents the node from accepting failovers).
2. Move all online Resource Groups, including the "Cluster Group" as necessary, to another active node.
3. Run the **Equitrac Installation Wizard** and proceed with the upgrade. This will need to be done on every node in the cluster.
4. Bring all Equitrac related Resource Groups online.
5. Test each Equitrac application service to verify that the upgrade was successful. See Verification on page 37.
6. On a print server cluster, test each virtual print server to verify that the upgrade was successful.

**Upgrade from 4.0.x to 4.2.5**

A direct upgrade in a server cluster environment from Equitrac Office/Express 4.0.x to 4.2.5 is not supported. Before upgrading to 4.2.5 you must uninstall version 4.0.x from each server cluster node.

To upgrade to 4.2.5, do the following to all nodes in the cluster:

1. Pause the node to be upgraded (this prevents the node from accepting failovers).
2. Move all online Resource Groups, including the "Cluster Group" as necessary, to another active node.
   - Alternately, you can place all Equitrac related Resource Groups offline.
3. On the node to be upgraded, do the following:
   a. Uninstall the 4.0.x Equitrac components, leaving the EQCAS database and cluster printers in place.
   b. Install Equitrac Office/Express 4.2.5 using the Equitrac Installation Wizard.
   c. Reboot if requested by the install.
4. After upgrade install is complete, resume the paused node.
5. On the active node with the online Resource Groups, do the following:
   - **NOTE:** The Equitrac applications will be temporarily offline while updating the Equitrac Cluster Resource Groups.
     a. Take the Equitrac Resource Groups offline.
     b. In any Resource Group containing the **EQDRESrv** Generic Service resource, right-click the **EQDRESrv** resource and select **Delete**.
     c. In any Resource Group containing the **EQDCESrv** Generic Service resource, right-click the **EQDCESrv** resource and select **Delete**.
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d Create a new DRE cache folder on the shared disk assigned to the DRE resource group, using the full path to the EQSpool directory required for the Equitrac 4.2.5 cluster environment (e.g. x:\DREcache\EQSpool).

e Move the contents of the existing DRE cache directory configured for Equitrac 4.0.x on the shared disk to the new DRE cluster resource cache folder "EQSpool" directory configured for Equitrac 4.2.5.

NOTE: In Equitrac 4.2.5, the DRE cluster resource will look for the DRE cache database files in the path specified in the DRE cluster resource "CacheFolder" parameter, with \EQSpool appended (e.g. x:\EQDRECache\EQSpool). In order to preserve the contents of the DRE spool when upgrading from 4.0.x to 4.2.5, the contents of the existing DRE cache folder should be moved to the new location. After 4.2.5 is installed, DRE will then be able to access the previous cache.

6 Move the Resource Groups to the upgraded node, and bring them online.

7 On the upgraded node, do the following:
   a Create a new EQ DRE Service resource to replace the deleted EQDRESrv resource. See Active-Passive DRE Cluster Resource Group on page 24 for details.
      When setting the CacheFolder parameter, enter the full path name to the new EQSpool directory on the physical disk which is assigned to the DRE resource group, excluding the "EQSpool" (e.g. x:\DREcache).
   b Create a new EQ Device Control Engine resource to replace the deleted EQDCESrv resource. See Active-Active or Active-Passive DCE Cluster Resource Groups on page 25 for details.

8 Verify that the upgrade was successful. See Verification on page 37.

9 Repeat steps 1 to 3 to upgrade the Equitrac components on each node in the cluster.

10 Move the Resource Groups to the desired cluster node.

Upgrade from 4.1.x and 4.2.0 to 4.2.5

A direct upgrade in a server cluster environment from Equitrac Office/Express 4.1.x or 4.2.0 to 4.2.5 is not supported. Before upgrading to 4.2.5, you must uninstall the previous version from each server cluster node.

1 Pause the node to be upgraded (this prevents the node from accepting failovers).

2 Move all online Resource Groups, including the "Cluster Group" as necessary, to another active node. Alternately, you can place all Equitrac related Resource Groups offline.

3 On the node to be upgraded, do the following:
   a Uninstall the 4.1.x or 4.2.0 Equitrac components, leaving the EQCAS database and cluster printers in place.
   b Install Equitrac Office/Express 4.2.5 using the Equitrac Installation Wizard.
   c Reboot if requested by the install.

4 After the upgrade install is complete, resume the nodes to bring the Resource Groups online.

5 Move any Resource Groups back to the upgraded node, as needed.

6 Repeat steps 1 to 3 to upgrade the Equitrac components on each node in the cluster.

7 Verify that the upgrade was successful. See Verification on page 37.
Upgrade from 4.2.1 or later to 4.2.5

A direct upgrade from Equitrac Office/Express 4.2.1 or later to 4.2.5 requires running the Equitrac Installation Wizard and following the prompts. You do not need to uninstall 4.2.1 or later in order to perform an upgrade.

1. Pause the node to be upgraded (this prevents the node from accepting failovers).
2. Move all online Resource Groups, including the "Cluster Group" as necessary, to another active node. Alternately, you can place all Equitrac related Resource Groups offline.
3. On the node to be upgraded, run the Equitrac Installation Wizard and proceed with the upgrade. This needs to be done on every node in the cluster.
4. Reboot if requested by the install.
5. After the upgrade install is complete, resume the nodes to bring the Resource Groups online.
6. Move any Resource Groups back to the upgraded node, as needed.
7. Repeat steps 1 to 3 to upgrade the Equitrac components on each node in the cluster.
8. Verify that the upgrade was successful. See Verification on page 37.
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Configuration errors account for the majority of cluster failures that are reported. An incorrect parameter can negate the investment that has been made in a high availability server configuration. Testing is required to verify the cluster and application configuration before a failover situation occurs.

**Verify the Cluster Infrastructure**

The configuration and operation of the target cluster environment should be verified. Listed below are common verification steps used with cluster environments.

- Failover the Cluster Group
- Failback the Cluster Group
- Bring each Resource Group Online
- Place each Resource Group Offline
- Move all Spooler Groups to each node, perform a test print

**NOTE:** Moving spooler groups and the main cluster group to each node is done to verify that cluster print resources are properly synchronized and configured across all nodes. This greatly reduces recovery time in the event of a failover.

- Fiber Channel failure
- Fiber Channel recovery
- Public NIC failure
- Public NIC recovery
- Private NIC failure
- Private NIC recovery
- Initiate Failure for each node
- Recovery of each node
Verify the Cluster Equitrac Application

After the required Equitrac components have been installed and configured in the cluster environment, the following verification steps are recommended.

**CAS**

Bring the CAS cluster resource group online to each cluster node.

Verify for each node by:

1. Starting System Manager and connecting to the CAS virtual server address.
2. Confirming in the system manager Licensing "License View" that the system ID is correct and that the licenses display without any error messages. The system ID should contain the cluster name.

**DRE**

Bring the DRE cluster resource group online to each cluster node.

Verify for each node by:

1. Printing a test document to a print device on a virtual print server.
2. Confirming that the print transaction was recorded by CAS by running a report.

**Virtual Print Servers**

Bring each Windows print spooler group online to each cluster node one at a time.

Verify for each node by:

1. Printing a test document to a device on this virtual print server, for each unique device type.
2. Confirming that all of the print transactions were recorded by CAS by running a report.

**DCE**

Bring the DCE cluster resource group online to each cluster node one at a time.

Verify by logging onto a device authentication interface assigned to that particular DCE virtual server.

**DME**

Bring the DME cluster resource group online to each cluster node one at a time.

Verify by starting the DME console and checking the device status dialog.
Verify Software Registration

After performing the above checks on each Equitrac application component, verify that every component has registered correctly by checking the system manager Software dialog to confirm that all required clustered Equitrac software components registered with the correct system names.

1. CAS should be registered under the CAS group network name.
2. Scheduler should be registered under the Cluster group.
3. DRE should be registered under the DRE group network name.
4. DME should be registered under the DME group network name.
5. DCE should be registered for each DCE cluster group, with the group network name.
6. System Manager should be registered for each computer it has been run on.
Verify Licensing

After performing the above checks on each Equitrac application component, verify that every component has been licensed correctly by checking the system manager Licensing "Assignment View" dialog to verify the following:

- A print server license is assigned as required for every physical node.
- The required number of print device licenses are available.
- The CAS Cluster Enabler license is assigned correctly.
## Troubleshooting

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<thead>
<tr>
<th>Symptoms</th>
<th>Possible Cause</th>
<th>Action</th>
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</table>
| Node specific issues  
• A variety of problems occur only when an Equitrac cluster resource group or Windows Spooler group is online to a particular cluster node. | Configuration settings specific to that cluster node are incorrect. | Depending on the type of failure, check the failing cluster node configuration for:  
• Print Server license assignments – is a Print Server license assigned to the failing node?  
• Equitrac services user account, are Local Administrator rights assigned to the Equitrac account on the failing node?  
• Any required Local Permissions for the Equitrac service account.  
• Network names specified during the install on that node for CAS and DRE – verify that registry key “HKLM\Software\Equitrac\Common” points to the correct network names or IP addresses and that the failing node is able to connect to those addresses.  
• EQCAS Database access – confirm that the EQCAS OBDC DSN connection is configured correctly and can connect to the database server.  
• Windows platform configuration – e.g. Network Connections, Firewall, Storage (Disks). |
## Chapter 3: Troubleshooting

### Symptoms

<table>
<thead>
<tr>
<th>Window Print Spooler</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptoms</strong></td>
</tr>
<tr>
<td>Printers do not register as System Manager Devices.</td>
</tr>
<tr>
<td>Very slow Spooler start/failover, Spooler cluster group “stuck” in pending online status.</td>
</tr>
<tr>
<td>Print documents remain “stuck” on the print queue only for printers using the Equitrac port monitor.</td>
</tr>
<tr>
<td>After a couple of minutes the print queue document status changes to “attempting to contact DRE”.</td>
</tr>
</tbody>
</table>

#### Possible Cause

- The TCP/IP connection between the Equitrac printer port monitor (print server) and the DRE server is failing.
- The DRE cluster resource is unavailable to spooler groups connecting via the Equitrac port monitor.
- A specific node is incorrectly configured in a way that prevents the spooler Equitrac port monitor from connecting to DRE.

#### Action

- Is the failure occurring only with spoolers that are online to particular cluster nodes or on every cluster node?
- If printing is failing from every cluster node then check the status of the DRE cluster resource.
- If the problem occurs only when the spooler is online to specific cluster nodes, check the configuration and TCP communications from the failing cluster node.
- Is a “ping” successful from the failing node to the DRE group network name?
- Is a firewall active on the affected node?

<table>
<thead>
<tr>
<th>Print devices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptoms</strong></td>
</tr>
<tr>
<td>Print transactions are not being recorded in CAS.</td>
</tr>
<tr>
<td>Print devices will not register in System Manager.</td>
</tr>
</tbody>
</table>

#### Possible Cause

- Print Devices licenses are either not available or they are all assigned.

#### Explanation:

- When a new print device is assigned an Equitrac port, the “Print Devices” license “Used” count should increase by one the first time that either the associated spooler (print server) is restarted or when the next print document is sent to that print device.

#### Action

- In the System Manager License Assignment dialog verify that there are “Print Devices” licenses still available to be assigned to the device, by checking that the license “Count” value is greater than the license “Used” value.
### Chapter 3: Troubleshooting

#### Print devices

- **Symptoms**:
  - Print queue for a device does not register in System Manager.
  - Print transactions not recorded in CAS.
  - These problems only occur when the spooler is running on a particular node.

- **Possible Cause**: Print Server DRE license is not available to the print cluster node that is in use. All of the nodes in a print cluster have not been assigned a Print Server DRE license.

- **Explanation**: In a print cluster with Equitrac managed printers, each physical node requires one “Print Server Document Routing Engine” license. A physical node is assigned a Print Server DRE license the first time that a document is printed to an Equitrac printer on any print spooler cluster group (virtual print server) that is currently online to that node.

- **Action**: In the System Manager License Assignment dialog verify that a print server license assignment has been made for that print cluster node. Do this by checking that for license option “Print Server Document Routing Engine”.
  - In the drop-down list for that license option, the name of each physical cluster node should be listed, which mean that the node is licensed for DRE.
  - If the node does not appear in the list, check that the license “Count” value is greater than the license “Used” value. If these values are equal, then a print server license is not available to be assigned to this node.

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<tr>
<td>Printer Conversion wizard</td>
<td>SNMP communication with printer is disabled or blocked.</td>
<td>If SNMP is not being used, deselect the “auto-discover model” option on the printer conversion Wizard. If SNMP is not being used, consider disabling vendor print server configuration options that trigger SNMP requests. For example: bi-directional printer communication.</td>
</tr>
<tr>
<td></td>
<td><strong>Explanation</strong>: The conversion process is attempting to discover information about the device using SNMP. If SNMP is either not supported by the device, is disabled or blocked, then each attempt will wait for a communications timeout before proceeding. Disabling the conversion tool “auto-discover model” option will bypass this processing. Note that if slow performance is encountered when backing out the Equitrac port monitor, the vendor print driver with the standard TCP/IP port may be attempting to make SNMP requests to obtain information about the device. In this case it would not be an Equitrac related issue.</td>
<td></td>
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### Chapter 3: Troubleshooting

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<tr>
<td>CAS Licensing fails</td>
<td>The CAS service is unable to access the Cluster Name because it is not running with the necessary rights.</td>
<td>Verify that the Equitrac services user account has been assigned local administrator rights on every cluster node.</td>
</tr>
<tr>
<td>SystemID displayed in System Manager is the CAS cluster group network name.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explanation: If CAS is unable to retrieve the Cluster Name information for any reason, it defaults to using the Computer Name. In an Equitrac CAS cluster resource group, cluster services will set the computer name to the cluster group Network Name.</td>
<td></td>
</tr>
<tr>
<td>CAS Licensing fails</td>
<td>The CAS service is unable to access the Cluster Name because the service was not started in a cluster resource group.</td>
<td>Verify that CAS was started by the correct method of bringing the cluster CAS resource group online. If CAS is started outside of the cluster resource then the cluster name is not available.</td>
</tr>
<tr>
<td>SystemID displayed in System Manager is the physical cluster node computer name.</td>
<td>Verify that the CAS service “startup type” is set to manual. Verify that the Equitrac services user account has been assigned local administrator rights on every cluster node.</td>
<td></td>
</tr>
<tr>
<td>Equitrac Resource types cannot be assigned to specific nodes</td>
<td>The Equitrac component for that resource type is not installed on all of the required nodes in the cluster. There is a mismatch in the installed version of the Equitrac cluster resource across nodes.</td>
<td>Ensure that the component is installed on all of the required nodes. Verify that the component is installed from the same Equitrac application version for all nodes in the cluster. Verify whether a hotfix applied to that Equitrac component on one or more nodes may have introduced an incompatibility with nodes that do not have that hotfix. The best practice is to install the same version and maintenance level of required Equitrac components across all nodes in the cluster.</td>
</tr>
<tr>
<td>Windows Cluster Error Code 5079.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error attempting to read properties for an Equitrac cluster resource type.</td>
<td></td>
<td></td>
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### Chapter 3: Troubleshooting

#### Software Component system names

System Names displayed for the components in the System Manager “Software” and “Diagnostic settings” dialogs are incorrect.

The CAS, Scheduler or DME Components registered in System Manager multiple times with different System Names

Diagnostic logging for individual components cannot be activated due to communications errors – e.g. error code 10061

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<tr>
<td>Software Component system names</td>
<td>Equitrac Components are registering using the physical cluster node name (computer name) instead of the network computer name associated with their resource group. When implemented on a Windows server cluster, the following Equitrac components should have their cluster group Network Name registered as the System name in the System Manager “Software” dialog</td>
<td>Verify that all Equitrac Generic Service resources have the option “Use Network Name as Computer Name” selected on the Parameter tab. Verify that the Equitrac Generic Service resources are dependant on their corresponding Network Name resources. If this option is not selected, take the resource group offline, select the option, then bring the resource group online. If the CAS, DME or Scheduler components are registered multiple times, then verify that those specific services are not setup with the service “Startup Type” set to “Automatic”. The CAS, DME and Scheduler services should all have been setup by the product install process as “Startup Type – Manual”.</td>
</tr>
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<td>System Names displayed for the components in the System Manager “Software” and “Diagnostic settings” dialogs are incorrect.</td>
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<td>The CAS, Scheduler or DME Components registered in System Manager multiple times with different System Names</td>
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**Explanation:**

The Equitrac software components register in System Manager using the Computer Name of the system that they are running on. In a properly configured server cluster environment, the Windows cluster services will return the Equitrac resource group Network Name as the Computer Name.

If an Equitrac software component runs in an incorrectly configured cluster environment, it may register with the physical node name instead. If the component is brought online to different cluster nodes, the component may register multiple times using a different system name obtained from each node.

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Note: The Scheduler component will register using the Cluster Name.
Chapter 3: Troubleshooting
Glossary

Microsoft Cluster Terminology

Server Clustering technology introduces a number of terms which are used in this document.

Node
A physical server that is a member of a cluster.

Resource
A hardware or software component that exists in a cluster group, such as a disk, an IP address, a network name, or an Equitrac application service.

Resource Group
A collection of resources that are managed to make an application service available as a virtual server.

Virtual server
In a cluster environment this is typically a resource group that contains all of the resources required to run an application and appears to clients as though it is a physical Windows based server. A virtual server must be associated with an IP address resource and a network name resource.

Dependency
An association between two or more resources in a cluster resource group, where the online/offline state of one resource is tied to the state of another resource. For example, a network name may be configured to enter the online state only if its associated IP address is also online.

Move
The process of changing the state of a particular Resource Group to Offline on one node and then placing the Resource Group in an Online state on another node. This in effect moves the associated Virtual Server from one node to another.

Failover/failback
The process recovering from a detected hardware or software failure by moving online resource groups from one node to another. Failover can occur when a physical node or an application experiences a failure, or when the administrator initiates a failover in order to test the cluster configuration.
Glossary

**Active/Active**
Applications that can exist as multiple virtual servers in a cluster. This means that the workload can be balanced across multiple nodes.

**Active/Passive**
Applications that can only run on one node at a time in a cluster. Active/Passive applications can run alongside Active/Active applications in the same cluster. For example, the Active/Passive Equitrac DRE service can support multiple instances of Active/Active virtual print servers in a single Print Server Cluster.

**Physical disk resource**
A *cluster capable* disk being managed as a cluster resource, in order to make it accessible to other cluster resources on a particular node as required.

**Cluster capable disk**
A storage device accessible by all nodes in a cluster, but able to be managed so that it can be owned by only one node at a time. A SAN is an architecture for providing access to a virtual collection of cluster capable disks.

**Storage Area Network (SAN)**
External Fiber Channel or ISCSI storage hardware and physical disks that can be configured and accessed by all nodes within a cluster as a collection of virtual hard drives. In a cluster only one node can access a particular virtual external storage disk at a time.