Equitrac Office and Express 5.2 Cluster Deployment Guide

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<th>Revision Date</th>
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<tr>
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Symbols Used In This Guide

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

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

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

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

This guide describes the process for installing and configuring Equitrac Office or Express 5.3 within an existing Windows Server 2008 failover cluster environment. This guide assumes that you have already created, configured and tested your Windows cluster or clusters. For information on creating clusters in Windows Server 2008 or 2008 R2, refer to your Microsoft documentation.

This guide provides information to:

- determine the prerequisites required before you install Equitrac Office or Express
- plan the installation
- perform the installation
- configure the software for initial use
- perform an upgrade

**Topics**

- Deployment Workflow
- Prepare the Cluster
- Install Equitrac Office or Express Server Components
- Configure Cluster Services for Equitrac Office or Express
- Configure the Print Spooler Service
- Configure the Database for an Installation that Includes CAS
- Activate Licenses
- Add Printers
- Upgrade Equitrac Office and Express Server Components
- Trusted Certificates
Chapter 1: Installing Equitrac Office or Express in a Server Cluster Environment

Deployment Workflow

Follow the steps listed below in the order presented to ensure successful deployment of Equitrac Office or Express within a cluster environment. For information on upgrading server components, see Upgrade Equitrac Office and Express Server Components on page 37.

1. **Prepare the cluster** – Before installing Equitrac Office or Express, work through the prerequisites checklist to ensure the cluster is prepared correctly. See Prepare the Cluster on page 7.

2. **Install server components** – Install the Equitrac Office/Express components on each cluster node. See Install Equitrac Office or Express Server Components on page 14.

3. **Configure cluster services** – Use the Failover Cluster Manager Console to create separate services for each Equitrac resource. See Configure Cluster Services for Equitrac Office or Express on page 15.

4. **Configure spool services** – Configure the spooler cluster service to integrate with DRE component. See Configure the Print Spooler Service on page 26.

5. **Configure the database** – Configure the Equitrac CAS ODBC data source to communicate with an Oracle or SQL database. See Configure the Database for an Installation that Includes CAS on page 31.

6. **Activate licenses** – Activate the Cluster Enabler license, and one DRE server license per cluster node. See Activate Licenses on page 33.

7. **Add printers** – Add Equitrac printer ports to each virtual print server. See Add Printers on page 34.
Step 1: Prepare the Cluster

Component Overview

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

Equitrac Office and Express are comprised of the following core server components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
</table>
| Core Accounting Server (CAS)     | • 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)    | • 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  
Note: SPE uses Equitrac’s proprietary Load Balancing technology, and is not designed to be part of a cluster deployment |
Chapter 1: Installing Equitrac Office or Express in a Server Cluster Environment

Planning the Equitrac Cluster Resources

The recommended practice for configuring Equitrac services for high availability is to create separate Cluster Services to be balanced across the cluster’s physical nodes and the cluster 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 services 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. EQ CAS Service).

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 to be configured.
   - Cluster Service name
   - Network name (the name that clients use to access the service)
   - IP address resource
   - Physical cluster disk to be allocated (including the amount of storage required)

   **NOTE:** The DCE Service Resource type and DRE Service Resource type have been added to version 4.1.0 (and higher) of Equitrac Office and 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 Service (Virtual Print Servers) which need to be configured for print tracking by Equitrac.

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 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.

The Service Location Protocol (SLP) is a standard application layer protocol which uses TCP and UDP protocols on the transport layer. SLP allows Equitrac services to quickly update the status and location of other services as needed. SLP is a part of the Equitrac Office and Express installation, and has to be configured as a resource for the CAS and DRE resource group.

**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.

This account must be a member of the local Administrative group on each cluster node. If the account is not assigned these privileges on every node in the cluster then problems with licensing and/or failover will occur.
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>Cluster Node1</td>
<td>Physical Server 1</td>
<td>Pub</td>
<td>10.10.10.111</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Priv</td>
<td>10.1.1.11</td>
<td></td>
</tr>
<tr>
<td>Cluster Node2</td>
<td>Physical Server 2</td>
<td>Pub</td>
<td>10.10.10.112</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Priv</td>
<td>10.1.1.12</td>
<td></td>
</tr>
<tr>
<td>SQLServer</td>
<td>Database Server</td>
<td>Pub</td>
<td>10.10.10.145</td>
<td></td>
</tr>
<tr>
<td>Cluster Service</td>
<td>User ID = EQCluster</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equitrac Service</td>
<td>Domain = EQDevCluster</td>
<td>UserID</td>
<td>EQCluster</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Password</td>
<td>Equitrac1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cluster Node 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cluster Node 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Print Spooler 1</td>
<td>IP Address</td>
<td>10.10.10.121</td>
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<tr>
<td></td>
<td></td>
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<td>EQCluster</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Cluster Disk</td>
<td>Q:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Print Spooler 2</td>
<td>IP Address</td>
<td>10.10.10.123</td>
<td>Owner: Cluster Node 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Network Name</td>
<td>EQPrintSrv2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cluster Disk</td>
<td>Y:</td>
<td></td>
</tr>
<tr>
<td>DRE Service</td>
<td>DRE IP Address</td>
<td>IP Address</td>
<td>10.10.10.124</td>
<td>Owner: Cluster Node 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Network Name</td>
<td>EQClusterDRE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cluster Disk</td>
<td>X:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DRE Service</td>
<td>Other Service</td>
<td>EQ DRE Service</td>
<td>Dep: DRE Net Name &amp; DRE Disk</td>
</tr>
<tr>
<td>DCE1 Service</td>
<td>DCE1 IP Address</td>
<td>IP Address</td>
<td>10.10.10.125</td>
<td>Owner: Cluster Node 1</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>EQClusterDCE1</td>
<td>Dep: DCE1 IP Address</td>
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<tr>
<td></td>
<td></td>
<td>Cluster Disk</td>
<td>U:</td>
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<td>DCE2 Service</td>
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<tr>
<td></td>
<td></td>
<td>Cluster Disk</td>
<td>W:</td>
<td></td>
</tr>
</tbody>
</table>
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, install the product software on every node, and then configure all of those components on each node.

Identify the Equitrac Tracked Spooler Service

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

Virtual Print Server Spooler Cluster Disk Resource Sizing

When printing on a Print Server Cluster is being tracked by Equitrac, the size of the Spooler cluster 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 cluster 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 cluster 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 service)
- $PV$ = 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: $178 \times 58 \times 1.12 \times 2 \times 1.5 = 33.9$ GB

NOTE: Equitrac recommends that a minimum of 100 MB of free space is available on the cluster disk resource for each of the other resource components, such as DCE, DME, and DRE.
Chapter 1: Installing Equitrac Office or Express in a Server Cluster Environment

**Single or Multiple Spooler Resources**

Equitrac Office and Express support 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 services. An EQSpool directory and corresponding file share resource needs to be added to the existing spooler services. See *Configure the Print Spooler Service* on page 26.
Verify High Availability Server Cluster Deployment Prerequisites

Before installing the Equitrac Office or Express software, complete the following checklists, and then proceed with the installation only when you confirm that your cluster meets all the outlined prerequisites.

In our workflow, we document the configuration of Equitrac cluster resources after installing the Equitrac components. Before configuring the Equitrac resources, first verify the cluster prerequisites, then proceed to Configure Cluster Services for Equitrac Office or Express on page 15 to configure each component.

Verify the following:

- Cluster supported editions of Microsoft Windows 2008 or 2008 R2 are installed on the physical cluster nodes.
- The Microsoft Cluster Service has been installed and configured on the multi-node cluster.
- A cluster disk resource is available where required for each of the Equitrac cluster services 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 41.

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 should be initially added as standard TCP/IP ports and tested. Later, after the Equitrac components are installed and configured, the TCP/IP printer ports can then be converted to Equitrac Ports using the Equitrac Printer Configuration Wizard.

There are two advantages to verifying 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 Printer Configuration Wizard, registry information is saved which will allow the Equitrac ports to be restored to TCP/IP ports if necessary.
Chapter 1: Installing Equitrac Office or Express in a Server Cluster Environment

Step 2: Install Equitrac Office or Express Server Components

This section describes the procedures for installing individual Equitrac Office or Express services within a cluster. For information on upgrading Equitrac Office or Express server components, see Upgrade Equitrac Office and Express Server Components on page 37.

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 or Express installation is identical for all nodes, in that you have selected the same components and service on each node. The installation path can be different on each node. The Equitrac Office or Express installation path must be on the local disk of each node, not on the shared cluster disks.

Follow the instructions in the Server Installation chapter in the Equitrac Office and Express Installation Guide to install the Equitrac Office or 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.

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.

**NOTE:** During installation, the user is 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.

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 DCE Service. 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 or Express with either a SQL or Oracle database. Microsoft does not support the SQL Server Express database format 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 database. See Configure the Database for an Installation that Includes CAS on page 31. Confirm that the ODBC connection is functional on all nodes if CAS is installed into a server cluster.

For the CAS cluster environment, the CAS database should be installed on a different host or cluster. CAS nodes should be configured with ODBC connection to the database host or cluster.
Step 3: Configure Cluster Services for Equitrac Office or Express

Creating separate cluster services for the Equitrac resources is recommended to maximize availability, and to get the greatest benefit from the customer investment in the cluster resources. For example, if you place CAS and DRE in the same service, a failover in the DRE service will also cause a CAS failover, 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.

Use the Failover Cluster Manager to create the following services:

- CAS + Scheduler Service
- DME Service
- DRE Service
- DCE Service or Services
- SLP Service

Validate the Equitrac Server Configuration

If you have not already performed this task, verify that the servers and server settings are configured correctly and are compatible with failover clustering.

1. Open the Failover Cluster Manager Console, right-click Failover Cluster Manager in the left pane, and then select Validate a Configuration from the menu.
2. When the Validate a Configuration Wizard opens, follow the instructions in the wizard to specify the servers, and run all of the cluster validation tests.
3. After the tests run, the Summary page appears. Click View Report to confirm that the cluster configuration is supported by Windows Server 2008 or 2008 R2.
4. Click Finish to close the wizard.

Refer to your Microsoft documentation for detailed information on validating servers in Windows Server 2008 or 2008 R2.
Active-Passive CAS+Scheduler Cluster Service

The CAS and Scheduler services must be in the same service.

Configure the CAS Service

To create a CAS Service, do the following:

1. Open the Failover Cluster Manager Console, and double-click Failover Cluster Manager in the left pane to display the cluster.

If the cluster does not appear in the console tree view, right-click Failover Cluster Manager in the left pane, and select Manage a Cluster from the menu, and then select the cluster you want to configure from the Select a cluster to manage dialog box.

Alternatively, you can select Failover Cluster Manager in the left pane, and then click Manage a Cluster from the Management section or from the Actions pane, and then select the cluster you want to configure.

2. Right-click Services and applications in the left pane, and select Configure a Service or Application from the menu to open the High Availability Wizard.

Alternatively, you can select Configure a Service or Application from the Actions pane.
Chapter 1: Installing Equitrac Office or Express in a Server Cluster Environment

3 If the **Before You Begin** page appears, click **Next** to continue.

**NOTE:** You can skip the **Before You Begin** page by selecting the **Do not show this page again** checkbox. This page contains general information on configuring a device or application, and is not part of the actual configuration itself.

4 On the **Select Service or Application** page, select **Generic Service**, and click **Next**.

5 On the **Select Service** page, select **EQ CAS Service**, and click **Next**.
6 On the **Client Access Point** page, enter the **Name** and **IP address** that clients will use when accessing the CAS Service, and click **Next**.

7 On the **Select Storage** page, select the cluster disk assigned to the CAS service, and click **Next**.

8 On the **Replicate Registry Settings** page, click **Next** to skip this step, as the CAS Service does not require specific registry keys to be functional.

9 On the **Confirmation** page, verify that the information is correct, and click **Next** to continue.

If you need to modify any of the information, click **Previous** to go back and edit the previous pages in the wizard.
10 Once the wizard configuration is complete, a Summary page appears. Click View Report to see a report of the tasks the wizard performed to create the Generic Service.

![Summary Page Image]

11 Click Finish to close the wizard.

12 Right-click the EQ CAS Service and select Properties from the menu.

13 On the General tab, ensure that the Use Network Name for computer name checkbox is selected, and then click OK to close the dialog box.

**Configure the Scheduler Service**

**NOTE:** The Scheduler Service follows the same High Availability Wizard configuration workflow as the CAS Service. Refer to Configure the CAS Service on page 16 to see the wizard pages and task descriptions.

1 Open the Failover Cluster Manager Console, and expand the tree view until you see the EQ CAS Service.

2 Right-click the CAS Service in the left pane, and select Add a resource > Generic Service from the menu to open the New Resource Wizard.

   Alternatively, you can click the CAS service and select Add a resource > Generic Service from the Actions pane.

3 On the Select Service page, select EQ Scheduler Service, and click Next.

4 On the Confirmation page, verify that the information is correct, and click Next to continue.

   If you need to modify any of the information, click Previous to go back and edit the previous pages in the wizard.

5 Once the wizard configuration is complete, a Summary page appears. Click View Report to see a report of the tasks the wizard performed to create the Generic Service.

6 Click Finish to close the wizard.

7 On the Failover Cluster Manager Console, right-click the EQ Scheduler Service, select Properties from the menu, and do the following:

   a On the Dependencies tab, select EQ CAS Service from the Resource section and click Apply.
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b. On the General tab, select the Use Network Name for computer name checkbox.

c. Click Apply to save the changes, and then click OK to close the dialog box.

8. Right-click the EQ Scheduler Service and bring the resource online.

Create a CAS Data Registry Value

In order for the Driver Repository to continue to operate when the CAS Service fails over to a backup cluster node, a Driver Repository Registry value must be created on each cluster node that points to the shared disk assigned to the CAS service. It is recommended that you back up the registry before making any changes.

To create the Driver Repository registry value, do the following

1. Go to HKEY_LOCAL_MACHINE\SOFTWARE\Equitrac\CAS\.
2. Create a new Key value called DataPath.
3. Set the registry value with the full path to a driver repository directory on the cluster disk which is assigned to the CAS Service.

This folder will be created when the CAS service is brought online.

Active-Passive SLP Service on the CAS Resource

SLP (Service Location Protocol) has to be configured as a resource for the CAS resource group.

To configure the SLP Service on CAS, do the following:

1. Open the Failover Cluster Manager Console, and expand the tree view until you see the EQ CAS Service.
2. Right-click the EQ CAS Service in the left pane, and select Add a resource > Generic Service from the menu to open the New Resource Wizard.

Alternatively, you can click the CAS service and select Add a resource > Generic Service from the Actions pane.

3. On the Select Service page, select EQ SLP Service, and click Next.
4 On the **Confirmation** page, verify that the information is correct, and click **Next** to continue.
   If you need to modify any of the information, click **Previous** to go back and edit the previous pages in the wizard.
5 Once the wizard configuration is complete, a **Summary** page appears. Click **View Report** to see a report of the
tasks the wizard performed to create the Generic Service.
6 Click **Finish** to close the wizard.
7 On the **EQ SLP Service properties**, do the following:
   a On the **Dependencies** tab, select the **hostname** and the **CAS shared disk resource**, click **OK** to close the panel.
   b On the **General** tab, select the **Use Network Name for computer name** checkbox. Clear the text on the
      **Startup parameters** entry box with a space. Click **Apply** to save the changes, and then click **OK** to close the
dialog box.
8 Right-click the **EQ SLP Service** and bring the resource online.

### Active-Passive DME Cluster Service

Before running the application wizard, you must create the Registry Key for the DME Service on all cluster nodes,
otherwise you will need to restart the DME Service after adding the Registry Key. It is recommended that you back up
the registry before making any changes.

1 Create the DME Registry Key, do the following
   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 DME directory on the cluster disk which is assigned to the DME
      Service. (For example, w:\DMEcache).
      This folder will be created when the DME service is brought online.

   **NOTE:** The DME Service follows the same High Availability Wizard configuration workflow as the CAS Service. Refer to
   **Configure the CAS Service** on page 16 to see the wizard pages and task descriptions.

2 Open the **Failover Cluster Manager Console**, and double-click **Failover Cluster Manager** in the left pane to
display the cluster.
3 Right-click **Services and applications** in the left pane, and select **Configure a Service or Application** from the
   menu to open the **High Availability Wizard**.
4 If the **Before You Begin** page appears, click **Next** to continue.
5 On the **Select Service or Application** page, select **Generic Service**, and click **Next**.
6 On the **Select Service** page, select **EQ DME Service**, and click **Next**.
7 On the **Client Access Point** page, enter the **Name** and **IP address** that clients will use when accessing the DME
   Service, and click **Next**.
8 On the **Select Storage** page, select the cluster disk assigned to the DME Service, and click **Next**.
9 On the **Replicate Registry Settings** page, click **Next** to skip this step, as the DME Service does not require specific
registry keys to be functional.
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10 On the Confirmation page, verify that the information is correct, and click Next to continue.
   If you need to modify any of the information, click Previous to go back and edit the previous pages in the wizard.
11 Once the wizard configuration is complete, a Summary page appears. Click View Report to see a report of the tasks the wizard performed to create the Generic Service.
12 Click Finish to close the wizard.

Active-Active or Active-Passive DCE Cluster Services

You can create active-active and/or active-passive DCE services. Active-active configurations have more than one active DCE service running at the same time on the same cluster, allowing for greater scalability and availability with both embedded devices and PageCounters.

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

1 Open the Failover Cluster Manager Console, and double-click Failover Cluster Manager in the left pane to display the cluster.
2 Right-click Services and applications in the left pane, and select Configure a Service or Application from the menu to open the High Availability Wizard.
3 If the Before You Begin page appears, click Next to continue.
4 On the Select Service or Application page, select Other Server, and click Next.
5 On the Client Access Point page, enter the Name and IP address that clients will use when accessing DCE, and click Next.
6 On the Select Storage page, select the cluster disk assigned to DCE, and click Next.
7 On the Select Resources Type page, select EQ Device Control Engine, and click Next.
8 On the Confirmation page, verify that the information is correct, and click Next to continue.
   If you need to modify any of the information, click Previous to go back and edit the previous pages in the wizard.
9 Once the wizard configuration is complete, a Summary page appears. Click View Report to see a report of the tasks the wizard performed.
10 Click Finish to close the wizard.
11 Right-click EQ Device Control Engine, select Properties from the menu, and do the following:
   a On the General tab, rename the DCE service if you plan to configure more than one active-active DCE service on the same cluster. The different services must have different names in order to run on the same cluster (e.g. EQ Device Control Engine 1, EQ Device Control Engine 2). If you do not change the name now, then you will be unable to create additional DCE services.
   b In the CacheFolder field on the Parameters tab, enter the full path name to the directory on the cluster disk which is assigned to DCE (e.g. w:\DCE1cache).
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On the Dependencies tab, select the DCE Server Name AND the Cluster Disk from the Resource section.

Click Apply to save the changes, and then click OK to close the dialog box.

Repeat this procedure to create additional active-active DCE services, if desired. Each DCE service must have a different name.

Active-Passive DRE Cluster Service

It is recommended that the Equitrac DRE cluster resources be configured as part of a separate DRE Service, and not part of an existing Windows Print Spooler Service. If a Spooler Service is not able to communicate with DRE, startup/failover recovery times are greatly increased. If CAS is on the same cluster as DRE, than DRE should be placed in the same resource group as CAS. See Installing CAS and DRE on the Same Cluster on page 25.

1. Open the Failover Cluster Manager Console, and double-click Failover Cluster Manager in the left pane to display the cluster.
2. Right-click Services and applications in the left pane, and select Configure a Service or Application from the menu to open the High Availability Wizard.
3. If the Before You Begin page appears, click Next to continue.
4. On the Select Service or Application page, select Other Server, and click Next.
5. On the Client Access Point page, enter the Name and IP address that clients will use when accessing the DRE Service, and click Next.
6. On the Select Storage page, select the cluster disk assigned to the DRE Service, and click Next.
7. On the Select Resources Type page, select EQ DRE Service, and click Next.
8. On the Confirmation page, verify that the information is correct, and click Next to continue.
   If you need to modify any of the information, click Previous to go back and edit the previous pages in the wizard.
9. Once the wizard configuration is complete, a Summary page appears. Click View Report to see a report of the tasks the wizard performed.
10. Click Finish to close the wizard.
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11 Right-click EQ DRE, select Properties from the menu, and do the following:
   a In the CacheFolder field on the Parameters tab, enter the full path name to the directory on the cluster disk which is assigned to the DRE Service (e.g. y:\DREcache).
   b On the Dependencies tab, select the DRE Server Name AND the Cluster Disk from the Resource section.
   c Click Apply to save the changes.

**Active-Passive SLP Service on the DRE Resource**

SLP (Service Location Protocol) has to be configured as a resource for the DRE resource group.

To configure the SLP Service on DRE, do the following:

1 Open the Failover Cluster Manager Console, and expand the tree view until you see the EQ DRE Service.
2 Right-click the EQ DRE Service in the left pane, and select Add a resource > Generic Service from the menu to open the New Resource Wizard.
   Alternatively, you can click the DRE service and select Add a resource > Generic Service from the Actions pane.
3 On the Select Service page, select EQ SLP Service, and click Next.
4 On the Confirmation page, verify that the information is correct, and click Next to continue.
   If you need to modify any of the information, click Previous to go back and edit the previous pages in the wizard.
5 Once the wizard configuration is complete, a Summary page appears. Click View Report to see a report of the tasks the wizard performed to create the Generic Service.
6 Click Finish to close the wizard.
7 On the EQ SLP Service properties, do the following:
   a On the Dependencies tab, select the name of the hostname, click OK to close the panel.
   b On the General tab, select the Use Network Name for computer name checkbox. Clear the text on the Startup parameters entry box with a space. Click Apply to save the changes, and then click OK to close the dialog box.
8 Right-click the EQ SLP Service and bring the resource online.
Installing CAS and DRE on the Same Cluster

If DRE is deployed on the same cluster environment with CAS, you must deploy DRE as a resource for the CAS resource group since SLP will be shared by CAS and DRE on the same node. DRE and SLP have to be configured as resources for the CAS resource group. The DRE resource can be added after configuring the SLP service for CAS (see Active-Passive SLP Service on the CAS Resource on page 20).

To add DRE resource to CAS, do the following:

1. Open the Failover Cluster Manager Console, and expand the tree view until you see the EQ CAS Service.
2. Right-click the EQ CAS Service in the left pane, and select Add a resource > Other Server from the menu to open the New Resource Wizard. Alternatively, click the CAS service and select Add a resource > Other Server from the Actions pane.
3. On the Select Resource Types page, select EQ DRE Service, and click Next.
4. On the Confirmation page, verify that the information is correct, and click Next to continue. If you need to modify any of the information, click Previous to go back and edit the previous pages in the wizard.
5. Once the wizard configuration is complete, a Summary page appears. Click View Report to see a report of the tasks the wizard performed to create the Generic Service.
6. Click Finish to close the wizard.
7. Right-click EQ DRE, select Properties from the menu, and do the following:
   a. In the CacheFolder field on the Parameters tab, enter the full path name to the directory on the cluster disk which is assigned to the DRE Service (e.g. y:\DREcache).
   b. On the Dependencies tab, select the CAS Server Name AND the Cluster Disk from the Resource section.
8. Click Apply to save the changes.
**Step 4: Configure the Print Spooler Service**

The following workflow applies to all new and existing Print Spooler Service (Virtual Print Servers) which are tracked by Equitrac.

**Configuration Workflow**

1. **Create the Print Spooler Service on the cluster.**
   
   Refer to your Microsoft cluster documentation to create the Print Spooler Service on the cluster. Verify that the size of the cluster disk assigned to the spooler services meets or exceeds the size estimated in the Equitrac cluster deployment planning. See [Virtual Print Server Spooler Cluster 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 as standard TCP/IP ports and tested. Later, after the Equitrac components are configured, the TCP/IP printer ports can then be converted to Equitrac Ports using the Equitrac Printer Configuration Wizard. This makes it easier to identify and resolve any potential configuration problems that may occur.

2. **Create a print spooling directory the spooler cluster disk.**
   
   Use Windows Explorer to create a new Equitrac spooling directory called **EQSpool** on the spooler cluster disk. An EQSpool directory is required on each cluster disk 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, and cost preview purposes.

3. **Define NTFS security permissions on the EQSpool directory and the DRE Service account.**
   
   When defining the local NTFS folder permissions, give Full Control to the Equitrac Cluster Services user account, the System account, and the user you are logged in as.

4. **Remove the Everyone group entry from the permissions list.**

5. **Add a Share Folder in each spooler cluster service.** See [Create a Share Folder](#).

**Create a Share Folder**

To add a Share Folder in each spooler cluster service, do the following:

1. **Open the Failover Cluster Manager Console,** and double-click **Failover Cluster Manager** in the left pane to display the cluster.

2. **Right-click the Print Spooler Service in the left pane,** and select **Add a shared folder** from the menu to open the **Provision a Shared Folder Wizard.**
3 On the **Shared Folder Location** page, specify the path to the **EQSpool** folder location, and click **Next**.

4 On the **NTFS Permissions** page, select one of the following options:

   - **No, do not change NTFS permissions**, and then click the **Next**. Select this option if you have already set NTFS security permissions on the EQSpool directory, as previously defined in step 3 of Configure the Print Spooler Service workflow.
   
   - **Yes, change NTFS permissions**, and then click the **Edit Permissions** button.

If you choose to change the NTFS security permissions for EQSpool, you must give Full Control to the Equitrac Cluster Services user account, the System account, and the user you are logged in as.
5 On the **Share Protocols** page, select the **SMB** checkbox, specify the **Share name**, and then click **Next**.

The Share name must be in the form of `VirtualPrintServer_EQSpool`, where “VirtualPrintServer” refers to the network name of the Print Spooler Service (e.g. PrintSrv1_EQSpool).

6 On the **SMB Settings** page, specify any desired Advanced settings such as, **User limit**, **Access-based enumeration**, or **Offline settings**, and then click **Next**.
7 On the SMB Permissions page, select the **Users and groups have custom share permissions** option, and then click the **Permissions** button.

8 On the Permissions for EQSpool window, do the following:
   a. Remove the **Everyone** group from the permission list, as this may pose a potential security risk.
   b. Click **Add** to open the **Select Users or Groups** dialog box.
   c. On the **Select Users or Groups** dialog box, enter the name of the **Equitrac Service** account and the **System** account in the object names field, and then click **OK**.
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Set the permissions for the **Equitrac Service** account and **System** account to allow **Full Control**, and click **Apply** to save the changes, and then click **OK** to close the dialog box.

9. On the **DFS Namespace Publishing** page, click **Next** as you do not need to publish the SMB share to a DFS namespace.

10. On the **Review Settings and Create Share** page, verify that the information is correct, and click **Create**.

   If you need to modify any of the information, click **Previous** to go back and edit the previous pages in the wizard.

11. After the wizard configuration is complete, the **Confirmation** page appears indicating that you successfully added the Shared Folder.

12. Click **Close** to exit the wizard.

13. On the Failover Cluster Manager, right-click the **Print Spooler Service**, and select **Properties** from the menu.

14. On the **Dependencies** tab, select the **Print Server Name**, **AND** the **File Server** **AND** the **Cluster Disk** from the **Resource** section.

15. Click **Apply** to save the changes, and then click **OK** to close the dialog box.

**NOTE:** You must use the Failover Cluster Manager tools to manage the EQSpool file shares and share 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

The following steps in this procedure differ from the Microsoft SQL Server or Oracle database setup procedure as documented in the Equitrac Office and 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. Open SQL Server Management Studio, connect to the eqcas database and execute the following SQL scripts located on CAS in C:\Program Files\Equitrac\Office or Express\Database.
   a. EOSQLServerInit.sql (Office).
   —Or—
   b. EESQLServerInit.sql (Express).
   b. SQLServerOpt.sql - streamlines functionality. This script must be run against the Master database.

CAUTION: If you are using SQL Server Authentication, an error may occur indicating that the eqcas password does not meet Windows password policy requirements as it is too short. In order to correct this, you need to change the minimum password length in your Domain Security Policy settings.

NOTE: Microsoft recommends using Windows Authentication where possible, as it provides secure validation and encryption of passwords.

3. On each cluster where CAS is installed, the Equitrac Office or 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 Failover Cluster Manager, bring the CAS service online. Do NOT start the CAS service from the service console.

Equitrac Office or Express is now configured to use the Microsoft SQL Server database.

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 and 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 EEOOracleServerInit.sql script located on CAS in C:\Program Files\Equitrac\Office or Express\Database.
3. On the accounting server, create an eqcas ODBC System DSN and verify communication with this DSN to your Oracle database system.
4. Modify the registry to use the newly created ODBC data source:
   a. Open Windows registry editor (not on the Web Client computer).
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b. Navigate to the HKEY_LOCAL_MACHINE\SOFTWARE\Equitrac\CAS\database value.

c. Set its DSN child value to eqcas with the same name as in step 3.

d. Specify the user credentials in the User and Password child values. These values specify the user account which is used for the eqcas ODBC data source. The DSN name is to be the same.

5. Verify the eqcas ODBC System DSN database connection from every node in the cluster.

6. To ensure your Oracle database properly executes the long statements in the final SQL script, open a command prompt, navigate to C:\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 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>
   ```

   Example:

   ```
   eqdbloader -f "c:\Program Files\Equitrac\Express\Database\CAS_Loader_Oracle_EE.sql" -d Oracle_DSN -u eqcas -p eqcas
   ```

7. Using Failover Cluster Manager, bring the CAS service online. Do NOT start the CAS service from the service console.

Equitrac Office or Express is now configured to use the Oracle database.
Step 6: Activate Licenses

Apart from the required Microsoft and Equitrac licenses, implementing Equitrac 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 must be run as the Local Administrator to provide correct information in a cluster environment.

On startup, both CAS and DCE 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 and Express do not assign licenses to the cluster nodes until print time, it is possible for a cluster service 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 service 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 accounting database.
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 as standard TCP/IP ports and tested. Later, after the Equitrac components are configured, the TCP/IP printer ports can then be converted to Equitrac ports using the Equitrac Printer Configuration 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 Configuration Wizard, registry information is saved which allows the Equitrac ports to be restored to TCP/IP ports if necessary, using the Equitrac Printer Configuration 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 Configuration Wizard to convert existing network printer ports to EQ ports. See **Converting Existing Printer Ports** in the Equitrac Office and Express Installation Guide for this procedure.

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

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

**NOTE:** When using the Equitrac Printer Configuration 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. EQPrintSrv1).

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.
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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 a virtual print server is different from the process of adding a printer for Equitrac Office or Express on a standard non-clustered server.

Add Printer Through Failover Cluster Manager

1. Open the Failover Cluster Manager Console, and double-click Failover Cluster Manager in the left pane to display the cluster.
2. Expand the Services and applications tree view and select the clustered print server.
3. From the Actions pane, click Manage Printers. Alternatively, you can right-click the clustered print server, and select Manage Printers from the menu.
4. An instance of the Failover Cluster Manager appears with Print Management in the tree view. Under Print Management, select Print Servers to display the clustered print server.
5. Right-click the clustered print server, and select Add Printer from the menu. The Network Printer Installation Wizard opens.
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6 On the Installation Wizard, select **Create a new port and add a new printer**, and choose **Equitrac Port** from the drop-down list, and then click **Next**.

![Network Printer Installation Wizard](image)

7 Follow the steps in the **Add Equitrac Printer Port** wizard to complete the port conversion.
8 Complete the steps in the **Add Printer** wizard to associate a driver and define a printer name.

**Add Printer Through Windows Explorer**
1 Open Windows Explorer and 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 or Express 5.3 within a Windows 2008 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 and 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 the Equitrac Office or Express server components, see Upgrade to Equitrac Office or Express 5.3.

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 Services, including the "Cluster Service" as necessary, to another active node.
   Alternatively, you can place all Equitrac related Services offline.
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 Services online.
5. Test each Equitrac application service to verify that the upgrade was successful. See Verification on page 41.
6. On a print server cluster, test each virtual print server to verify that the upgrade was successful.

Upgrade to Equitrac Office or Express 5.3

A direct upgrade in a server cluster environment from Equitrac Office or Express 4.2.3 or lower to version 5.3 is not supported. You must be running at least Equitrac Office/Express 4.2.6 in order to upgrade to version 5.3.

NOTE: In order to upgrade from Equitrac Office or Express 5.1 or lower, the 5.3 .msi installer must be run as Administrator, as the msi needs to be run with elevated permissions.

If you are upgrading from versions 4.2.1, 4.2.2 or 4.2.3 to 5.3, you first need to fully upgrade all components to 4.2.6, and then upgrade to 5.3. You do not need to uninstall the earlier version of Equitrac Office/ Express when upgrading across these two versions, and the database will upgrade accordingly.

If you are upgrading from version 4.2.0 (or lower), you must uninstall the current version of Equitrac Office/ Express and any applicable hotfixes, and then fully install all components to version 4.2.6. After installing 4.2.6, you can then perform a direct upgrade to 5.3.

NOTE: Do not perform a partial upgrade to version 4.2.6, as all Equitrac Office/Express components need to be running at least 4.2.6 in order to upgrade to version 5.3.

1. Pause the node to be upgraded (this prevents the node from accepting failovers).
2. Move all online Services, including the "Cluster Service" as necessary, to another active node.
   Alternatively, you can place all Equitrac related Services offline.
3. On the node to be upgraded, do one of the following:
   If upgrading from versions 4.2.1, 4.2.2 or 4.2.3 to 5.3, run the Equitrac Installation Wizard to upgrade to 4.2.6 and again to upgrade to version 5.3, and then proceed to Step 4 to continue the upgrade.
   —Or—
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If upgrading from version 4.2.0 (or lower) to 5.3, do the following:

a. Uninstall the current Equitrac components, leaving the EQCAS database and cluster printers in place.
b. Optionally, revert the printers back to standard TCP/IP ports to allow printing to continue while the upgrade is in progress. Print jobs will not be tracked during the upgrade. To revert the ports, run the Equitrac Printer Configuration Wizard from any node and select Remote server as the Print server location, and then enter the Windows spooler resource name. Then follow the steps in the Wizard for reverting Equitrac printer ports to standard TCP/IP ports.
c. Delete all Equitrac resource objects from their respective groups. You do not need to delete the hard drive, name, or IP address from the groups. You do not need to delete the group itself.
d. Uninstall all Equitrac hotfixes on each node.
e. Uninstall the Equitrac software on each node.
f. Install Equitrac Office/Express 4.2.6 and then upgrade to 5.3 using the Equitrac Installation Wizard on each node.
g. Reboot if requested by the install.
h. Apply any applicable updates to the system on each node, and reboot again if required.
i. Re-create the Equitrac resource objects in their respective groups.
j. Convert TCP/IP printer ports to Equitrac ports if they were reverted in step 3b using the Equitrac Printer Configuration Wizard.

4. After the upgrade install is complete, resume the nodes to bring the Services online.
5. Move any Services 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 41.
Chapter 1: Installing Equitrac Office or Express in a Server Cluster Environment

Trusted Certificates

In order to use trusted certificates in a cluster environment, the certificate file must be installed on every cluster node where the services run on. To generate certificate-authority-signed certificates for all relevant virtual servers and replicate those certificates to all nodes in the cluster, do the following:

1. Move all Equitrac resource groups onto the same cluster node, and bring them online. This causes a self-signed certificate to be created on that node for all virtual servers (failover cluster instances) that the Equitrac services use.

2. Run **EQSSLCertificateManager** on that node. The Equitrac SSL Certificate Manager opens.

3. For each certificate displayed, do the following:
   
   k. Select the self-signed certificate.
   
   l. Press **Create Certificate Request**.
   
   m. Submit the certificate request to a CA (certificate authority) to obtain a trusted certificate file.
   
   n. Press **Accept Certificate**, and open the certificate file.

4. Press **Export All Certificates**.
   
   a. Enter a self-assigned password to protect the private keys that are exported with the certificates.
   
   b. Click **OK**, and save the **equitrac-certificates.pfx** file. It is recommended that you save the .pfx file in the same location as the trusted certificate file for easy retrieval.

5. On each of the other cluster nodes, run **EQSSLCertificateManager** and press **Import Certificates**.
   
   a. Select and open the **equitrac-certificates.pfx** file.
   
   b. Enter the password, and click **OK**.


7. Take all Equitrac resource groups offline, then bring them back online through Cluster Administrator to begin using the new trusted certificates.
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 service
- Failback the cluster service
- Bring each service Online
- Place each service Offline
- Move all Spooler services to each node, and perform a test print

**NOTE:** Moving spooler services and the main cluster service 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.
Chapter 2: Verification

CAS
Bring the CAS Cluster Service online to each cluster node one at a time.
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 Service online to each cluster node one at a time.
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 Service 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 Service 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 Service 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 Service network name.
2. Scheduler should be registered under the Cluster Service.
3. DRE should be registered under the DRE Service network name.
4. DME should be registered under the DME Service network name.
5. DCE should be registered for each DCE Service, with the Service network name.
6. System Manager should be registered for each computer it has been run on.
Chapter 2: Verification

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 cluster node.
- The required number of print device licenses are available.
- The CAS Cluster Enabler license is assigned correctly.
## Troubleshooting

### Node specific issues
- A variety of problems occur only when an Equitrac Cluster Service or Windows Spooler Service is online to a particular cluster node.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Possible Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node specific issues</td>
<td>Configuration settings specific to that cluster node are incorrect.</td>
<td>Depending on the type of failure, check the failing cluster node configuration for:</td>
</tr>
<tr>
<td></td>
<td>Explanation:</td>
<td>• Print Server license assignments – is a Print Server license assigned to the failing node?</td>
</tr>
<tr>
<td></td>
<td>If Windows or Equitrac configuration settings that are unique to each cluster node (physical server) are incorrectly set on one node in a cluster environment, then some problems might be experienced only when an Equitrac Cluster Service (application component) is currently online to that particular node.</td>
<td>• Equitrac services user account, are Local Administrator rights assigned to the Equitrac account on the failing node?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Any required Local Permissions for the Equitrac service account.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• EQCAS Database access – confirm that the EQCAS OBDC DSN connection is configured correctly and can connect to the database server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Windows platform configuration – e.g. network connections, firewall, storage disks.</td>
</tr>
</tbody>
</table>

### Window Print Spooler
- Printers do not register as System Manager Devices.
- Very slow Spooler start/failover, Spooler Cluster Service “stuck” in pending online status.
- Print documents remain “stuck” on the print queue only for printers using the Equitrac port monitor.
- After a couple of minutes the print queue document status changes to “attempting to contact DRE.”

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Possible Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Window Print Spooler</td>
<td>The TCP/IP connection between the Equitrac printer port monitor (print server) and the DRE server is failing.</td>
<td>Is the failure occurring only with spoolers that are online to particular cluster nodes or on every cluster node?</td>
</tr>
<tr>
<td></td>
<td>The DRE cluster resource is unavailable to spooler services connecting via the Equitrac port monitor.</td>
<td>If printing is failing from every cluster node then check the status of the DRE cluster resource.</td>
</tr>
<tr>
<td></td>
<td>A specific node is incorrectly configured in a way that prevents the spooler Equitrac port monitor from connecting to DRE.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Is a “ping” successful from the failing node to the DRE Service network name?</td>
<td>Is a firewall active on the affected node?</td>
</tr>
</tbody>
</table>
### Symptoms

<table>
<thead>
<tr>
<th>Print devices</th>
</tr>
</thead>
<tbody>
<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.

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.

<table>
<thead>
<tr>
<th>Print devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Print queue for a device does not register in System Manager.</td>
</tr>
<tr>
<td>- Print transactions not recorded in CAS.</td>
</tr>
<tr>
<td>- These problems only occur when the spooler is running on a particular node.</td>
</tr>
</tbody>
</table>

#### 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 service (virtual print server) that is currently online to that node.

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.
# Chapter 3: Troubleshooting

## Printer Configuration Wizard

- **Symptoms:** Taking more than ten seconds to convert each printer port.

  - **Possible Cause:** SNMP communication with printer is disabled or blocked.

  - **Explanation:**
    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.

  - **Action:** If SNMP is not being used, deselect the “auto-discover model” option on the Printer Configuration Wizard.

  - **Note:** 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.

<table>
<thead>
<tr>
<th>CAS Licensing fails</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptoms:</strong> SystemID displayed in System Manager is the CAS Cluster Service network name.</td>
</tr>
<tr>
<td><strong>Possible Cause:</strong> The CAS service is unable to access the Cluster Name because it is not running with the necessary rights.</td>
</tr>
</tbody>
</table>
| **Explanation:**
| If CAS is unable to retrieve the Cluster Name information for any reason, it defaults to using the Computer Name. In a Equitrac CAS Cluster Service, cluster services will set the computer name to the Cluster Service Network Name. |
| **Action:** Verify that the Equitrac services user account has been assigned local administrator rights on every cluster node. |
### Chapter 3: Troubleshooting

#### CAS Licensing fails
- **SystemID displayed in System Manager is the physical cluster node computer name.**

  **Explanation:**
  If an Equitrac service is not run as part of a Cluster Service, then the service behaves as though the cluster does not exist. In this case, the computer name returned will be the name of the physical server the service is running on.

  Verify that CAS was started by the correct method of bringing the cluster CAS Cluster Service online. If CAS is started outside of the cluster resource then the cluster name is not available.

  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.

#### Equitrac Resource types cannot be assigned to specific nodes

- **Windows Cluster Error Code 5079.**
- **Error attempting to read properties for an Equitrac cluster resource type.**

  **Explanation:**
  Windows cluster services was unable to retrieve the properties for an Equitrac cluster resource component from a particular node. This can happen if the component is either not installed on a node or if there is are incompatible versions of the component installed on different nodes in the cluster.

  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.

---

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Possible Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<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 Service.</td>
<td>Verify that CAS was started by the correct method of bringing the cluster CAS Cluster Service online. If CAS is started outside of the cluster resource then the cluster name is not available. 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>
</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>
</tbody>
</table>
## Chapter 3: Troubleshooting

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Possible Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<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 Service. When implemented on a Windows server cluster, the following Equitrac components should have their Cluster Service Network Name registered as the System name in the System Manager “Software” dialog: • CAS • DCE • DRE • DME</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 Service offline, select the option, then bring the Service 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>
</tbody>
</table>

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 | Note: The Scheduler component will register using the Cluster Name. | |

### 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 Cluster Service 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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Symptoms: 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
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 service, such as a disk, an IP address, a network name, or an Equitrac application service.

Resource Service
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 Service 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 Service, 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 Service to Offline on one node and then placing the Service 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 Service 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.
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.

Cluster 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.