# NI DataFinder Server Edition

## Search Engine for Technical Data

July 2015
374430K

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# About This Manual

You can use this manual to familiarize yourself with the DataFinder Server Edition features and how to use them.

The first chapter shows you how to create a DataFinder server in a few easy steps and how to connect clients to this DataFinder server. The second chapter describes the DataFinder Manager and shows you how to configure DataFinder servers. The third chapter describes how you can use a DataFinder server as an ASAM ODS server. The fourth chapter describes how you can combine several DataFinder servers to form a federation, and the fifth chapter describes how to configure firewalls and NAT routers, and how to connect archiving systems.

## Related Documentation

For more detailed information on the DataFinder Server Edition, refer to the following documentation:

- *NI DataFinder Server Edition Help* which you can open in every dialog box with the **Help** button, on the toolbar with **Help»Contents**, or with <F1>.
- *NI DIAdem: Data Mining, Analysis, and Report Generation*

  This DIAdem manual describes the structure of DIAdem and how you use DIAdem to find data, to execute analyses, to create reports, and to combine all the functions in scripts. DIAdem can access DataFinder servers as a client.
- *NI LabVIEW DataFinder Toolkit*

  Use the LabVIEW DataFinder Toolkit to work with the DataFinder in LabVIEW. You can use the DataFinder to search for simple text in indexed data, or to execute advanced searches for data properties.

  LabVIEW can access the DataFinder server with the DataFinder toolkit as client.

# 1

# Creating and Connecting DataFinder Servers

A DataFinder server is a search engine you install on a server. The DataFinder server searches for files that contain technical data in specified folders on computers in a network. The DataFinder server indexes the data files to provide the clients with the data properties. The DataPlugins registered in the server manager determine which file types the DataFinder server indexes.

You can define several DataFinder servers in the server manager to provide different data for different work groups. Clients, such as DIAdem or LabVIEW, communicate with the DataFinder servers to search the indexed data and to load the search results.

You can use a DataFinder server as an ASAM ODS server to display, browse, and filter data with an ASAM conform data model. All applications which support the ASAM ODS Corba interface can access the ASAM ODS server in order to find and load this data.

You can combine several DataFinder servers to form a DataFinder federation. A client addresses a DataFinder federation in the same way as it addresses a single DataFinder server.

**Note** The license specifies how many DataFinder servers you can create and how many users can access the DataFinder server simultaneously. For more information about licensing, refer to the section on *NI License Manager* in Chapter 5, *Integrating the DataFinder Server in the Work Environment*.

## Creating DataFinder Servers

When you start DataFinder Server Edition, the server manager opens. In the server manager you create and configure DataFinder servers and test the functionality of the DataFinder servers. To create a DataFinder server, complete the following steps:

1. Start the DataFinder manager, for example, under Windows 7 through **Start»All Programs»National Instruments»DataFinder Server Edition»DataFinder Manager**.

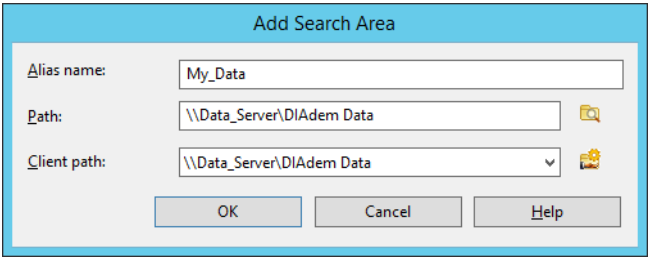
   If the server manager does not have a DataFinder server, the **New DataFinder Server** dialog box opens automatically the first time you launch the server manager.
2. Enter, for example, `TestRig` as the name of the DataFinder server to be created.
3. Click **Add Search Area** to specify a search area.

   Search areas are the file system folders where clients can search for data files.
4. Enter `My_Data` as the alias name for the search area.

5. Click **Choose a Folder**.
   a. Select the folder that you want the DataFinder server to index.
   b. Click **OK** to close the dialog box.
6. Click **Share Folder**.

   The server manager opens the Windows share dialog box, where you share folders with other users on the network. You must share the folders in the search area so the clients can read the descriptive information and also load the files found in the search.
7. Click **OK** to close the Windows share dialog box.
8. Open the list in the **Client path** textbox and select the shared network path. The **Add Search Area** dialog box displays the path of the shared folder, as shown in the following figure:

**Figure 1-1.** Defining a Search Area

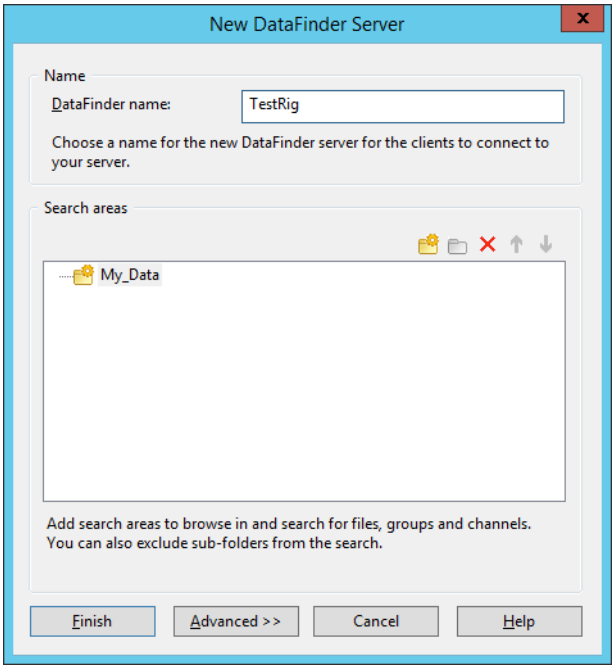



**Note** Use shared folders (`\\Data_Server\..`) and not the network drives to which you assigned a drive letter (`M:\..`). You cannot use these mapped network drives with a letter together with the start option **Run as service**.

9. Click **OK** to close the **Add Search Area** dialog box.

   The **New DataFinder Server** dialog box displays the newly created search area `My_Data`, as shown in the following figure:

**Figure 1-2.** Creating a New DataFinder Server

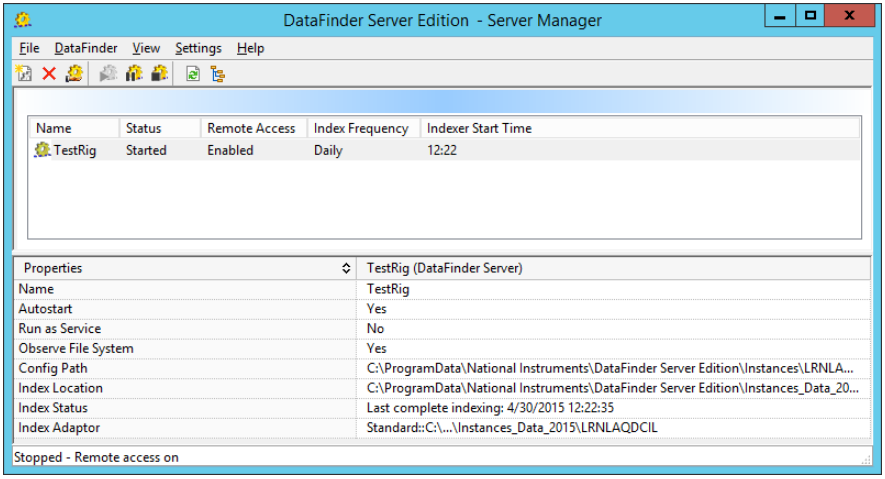



You can now define more search areas where clients can search for data. Select **Exclude Subfolder** from the context menu of a search area to exclude folders from the search. Click **Advanced** to already set the service registration, security settings, and desktop shortcuts for the DataFinder server.

10. Click **Finish** to close the dialog box.

The server manager displays the new DataFinder server, as shown in the following figure.

**Figure 1-3.** Server Manager with Configured DataFinder Server



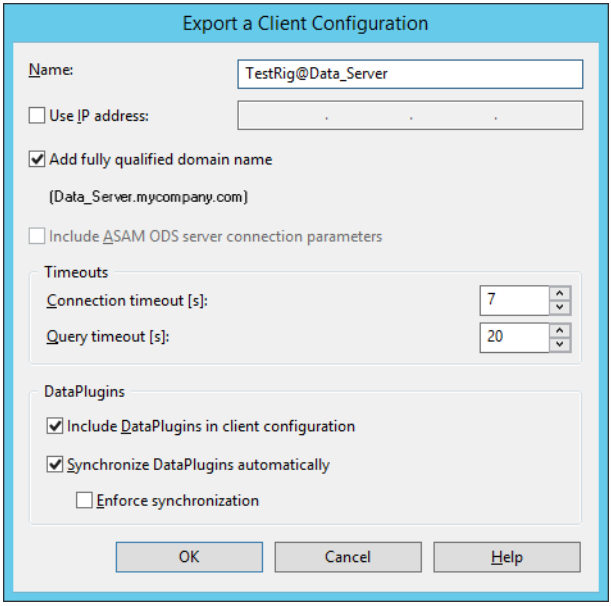

# Exporting Client Configurations

You must connect the clients to a DataFinder server so that they can execute queries on a server and load data. You can export the required connection settings, save the settings in a file, and then enable the settings on the client. To export a client configuration, complete the following steps.

1. Select the **TestRig** DataFinder server in the server manager.
2. Click **Export a Client Configuration** on the toolbar.
3. Accept the suggested name for the export file `TestRig@<Computername>`. The name consists of the name of the DataFinder server and the name of the server that DataFinder Server Edition is installed on.
4. Enable the **Include DataPlugins in client configuration** checkbox to save all the DataPlugins in the export file, as shown in the following figure.

   When you export the DataPlugins, you provide the client with all the DataPlugins for loading the files that the DataFinder server `TestRig` finds.
5. Select **Synchronize DataPlugins automatically** to synchronize DataPlugins with the DataPlugins installed on the server and to refresh them, if necessary, every time the client connects to the server.

**Figure 1-4.** Exporting a Client Configuration




**Note** You can integrate only VBScript DataPlugins or VBCrypt DataPlugins into a URF file or synchronize them with the client.

6. Click **OK** to open the **Save As** dialog box.
7. Select the storage location and click **Save** to save the client configuration. The server manager saves the connection parameters in a file that has the extension `.urf`.

# Connecting Clients to DataFinder Servers

For a client to connect to the DataFinder server `TestRig`, you must register the connection configuration on the client computer.

1. Copy the `TestRig@Computer.urf` file to the client computer.
2. Double-click the `TestRig@Computer.urf` file to register the connection parameters and the DataPlugins on the client computer.

   If you import DataPlugins that are already registered on this computer when you register the connection parameters, you can specify for each DataPlugin whether the originally installed DataPlugin is overwritten or not.

   A message indicates that the connection configuration and the new DataPlugins are registered.

DIAdem and LabVIEW can use any DataFinder server that is connected to the DIAdem or to the LabVIEW computer on a network. You can use security settings to limit the clients' access rights for DataFinder servers.

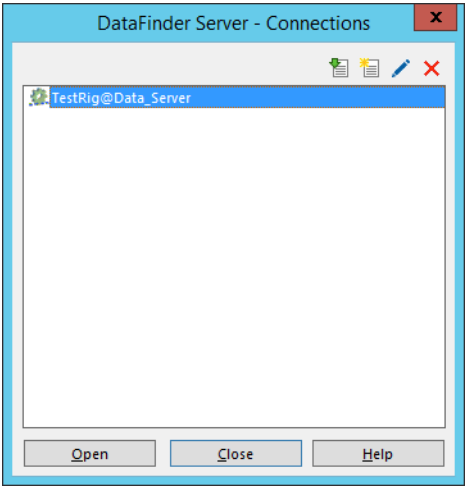
# DIAdem as a Client of a DataFinder Server

After registering the connection settings on the client computer, you can use DIAdem to navigate in the folders, which the **TestRig** server shares, and search for data.

1. Open **DIAdem**.
2. Select **DIAdem NAVIGATOR**.
3. Select **Settings»DataFinder Server**.

   The following figure shows the **DataFinder Server - Connections** dialog box with all the DataFinder servers registered in DIAdem.

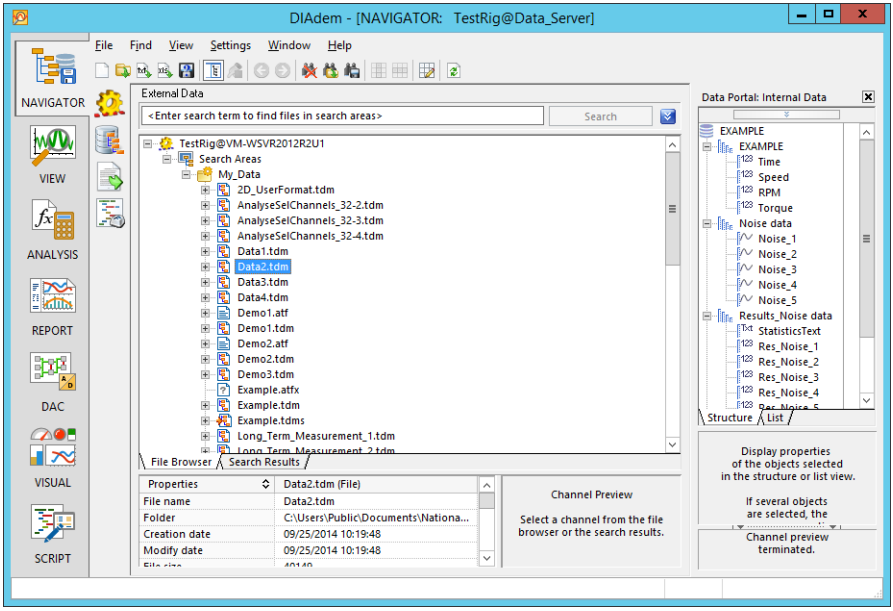
**Figure 1-5.** DataFinder Server Registered in DIAdem



4. Click **Open** to open the DataFinder server in DIAdem NAVIGATOR.

   The file browser in the following figure shows a tree view of the search areas of the DataFinder server. If the associated DataPlugin allows, you can navigate to channel level in the files.

**Figure 1-6.** Navigating in Search Areas of a DataFinder Server



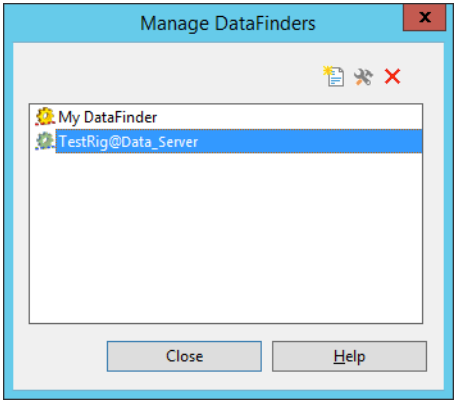
# LabVIEW as a Client of a DataFinder Server

After registering the connection settings on the client computer, you can use LabVIEW to connect the `TestRig` DataFinder server.

1. Open **LabVIEW** with an empty VI.
2. Right-click the block diagram and select **Connectivity»DataFinder Toolkit** to open the palette.
3. Click **Search Text** in the **DataFinder Toolkit** palette and drag and drop the VI into the block diagram.
4. Right-click the **DataFinder reference** terminal and select **Create»Constant** from the context menu.
5. Open the context menu of the previously created constant and select **Manage DataFinders**.

   LabVIEW opens the **Manage DataFinders** dialog box that you can use to create, delete, or configure DataFinders.
6. Select the `TestRig` DataFinder server from the list of registered DataFinders.

**Figure 1-7.** DataFinder Server Registered in LabVIEW




**Note** The LabVIEW DataFinder Toolkit is not included in the standard LabVIEW package. You can use the functions of the LabVIEW DataFinder Toolkit only when you have installed and activated the toolkit.

# 2

# Configuring DataFinder Servers

Use the server manager to create, configure, duplicate, or delete DataFinder servers. In the server manager you can also make general settings, export the settings for connecting clients to a DataFinder server, optimize custom properties, and open the search areas of a DataFinder server in a browser view.

## Configuring DataFinder Servers

To configure a DataFinder server, double-click the DataFinder server in the server manager. In the configuration you define search areas and view which file types the DataFinder server includes in the search. You can define global indexing schedulers for all data files of a DataFinder server, but you can also create individual indexing schedulers for search areas.

In **Settings»Global Options»General** you set the index path for all DataFinder servers and the memory reserved for the DataFinder, and specify the editor with which you edit DataPlugin scripts.

### Defining Search Areas

You select the folders, which the DataFinder server indexes for the search, on the **Search Areas** tab of the configuration dialog box. You can add, edit, and delete search areas and specify the order in which the DataFinder server indexes the search areas and displays the search areas in the browser. You must define the search areas of the DataFinder server with path names that are unique within the network. If you select **Edit Client Path** from the context menu of the DataFinder server, you can see in the **Client path** entry line which path the client uses to access files in the network, for example, `\\Testrig4a\NewCar\DATA`.

Use the Windows share settings to share the folders in the search areas. Clients can load files from the search areas. You define the share mode when you create a search area or edit an existing search area. Click **Share Folder** to open the Windows system dialog box for sharing files. In the Windows share settings you specify, for example, which users have read and write rights. You can enter individual users and user groups that are defined in a network, for example, to provide access rights for an entire department. Refer to the Microsoft Windows Help for more information about sharing folders.

If you use the DataFinder server as an ASAM ODS server or in a DataFinder federation, you need no further access rights on file level. Only the security settings defined in the DataFinder server apply here.

For each search area, you can define specific security settings which replace the global security settings for this search area. Refer to the section on *Specifying the Security Settings* in this chapter for more information.

To block remote access to all the search areas of a DataFinder server, deselect the **Allow remote access to this computer** checkbox on the **General** tab in the configuration dialog box.

# Reading File Types with DataPlugins

DataFinder servers decide on the basis of the filename extension whether to index a file. The **File Extensions** tab has two lists that contain all the filename extensions that the DataFinder server recognizes.

The Indexable extensions list displays all the file types that correspond to the TDM data model. In indexable files, the DataFinder server can search for properties of files, groups, and channels. Clients can navigate to channel level in indexed files. Click a filename extension to see which DataPlugins the DataFinder server uses to index these files.

The Non-indexable extensions list displays all the file types that the DataFinder server does not index.

The registered DataPlugins determine which file types the DataFinder server can index. A DataPlugin analyzes files of a specific file type and makes the results available to the DataFinder server. The **DataPlugins** tab shows you which DataPlugins the DataFinder uses for indexing. By default, only TDM DataPlugins, the TDMS DataPlugin, and the ATFX DataPlugin for the ASAM ODS server are enabled. Select **Reindex DataPlugin** to reindex all files of a specified DataPlugin.

To add DataPlugins, select **Settings»Global Options»DataPlugins**. In this dialog box you can define, import, export, update, and delete DataPlugins. If you change the properties of a DataPlugin, these changes apply to all the DataFinder servers. Click **Update** to open the DataPlugin Update Manager. The DataPlugin Update Manager lists all DataPlugins available on the `ni.com/dataplugins` website. You can refresh DataPlugins available on your computer and install further DataPlugins. This website contains DataPlugins, which have been written and tested by developers and users, for various data formats. The site also provides programming help for the creation of DataPlugins, including a description of the objects, properties, and methods, as well as many examples.

# Planning Indexing

When indexing, the DataFinder server reads properties from data files and saves this information. When clients search for data files, the DataFinder server browses the index for the properties. DataFinder Server Edition can run several parallel indexing processes and therefore profits from the multi-core systems.

Click the **Indexer** tab in the configuration dialog box to specify when and how often the DataFinder server indexes all search areas. Click the **Start Now** button to start indexing the

DataFinder server immediately. Depending on the amount of data, it can take quite a while to index a search area for the first time. Use the **Scheduler** to start the indexing regularly, for example, daily at 00:00 o'clock, when no changes in the search areas and no search queries from clients are expected.

You can enable regular indexing and also automatic indexing. Click the button with the three dots next to **Automatic indexing triggered by** to open the settings. The setting **Data file changes** ensures that a changed or new file is indexed immediately within a search area. The setting **Continuous scan for new files** indexes in regular intervals. Use the **Job file** setting for automation systems. In this case the automation system copies a job file, which contains a list of files and folders to be indexed, to a specific folder. The DataFinder server edits these job files at regular intervals and executes the indexing tasks defined in the job file. After completing the tasks, the DataFinder server deletes the job file.

You can specify a schedule for individual search areas in order to index these folders separately from the global schedule. This way, the DataFinder server indexes the folders, in which new files are constantly being created, more often than folders whose contents change only rarely. Switch to the **Search Areas** tab, select the search area to be changed, and click **Search Area Settings**. Enable the setting **Specific schedule**, and specify the time point for indexing the search area. Then start the first indexing.

Select **Settings»Index Optimization** to configure and enable a schedule for the regular optimization of the index. Because the client cannot use the index during optimization, plan the optimization for every Sunday night at 01:00 o'clock, when no search queries are expected.

If a DataFinder server no longer indexes files in a search area and thereby no longer displays groups and channels in the browser, or if valid search requests no longer return results, you can delete these files manually by clicking **Settings»Reset**. You can reset the complete index or only the index of files with indexing errors, or files that exceeded the time limit.

## Specifying the Security Settings

You can use security settings to limit the clients' access rights to DataFinder servers. If you do not enable the security settings, every client can connect to this DataFinder server and browse and search in all existing search areas. Assign global security settings to restrict access to the entire DataFinder. Assign security settings on search area level to restrict access to specific search areas. A client must have access rights to at least one search area in order to connect to a DataFinder server. If the security settings in the DataFinder servers do not match the security settings of the file system, the client receives an error message when he tries to load data from a search area for which he has no access rights.

If the DataFinder is operated as an ASAM ODS server, an ASAM ODS client can access all visible data depending on the security settings made in the DataFinder server. The access rights of the ASAM ODS client on the file system do not apply.

You enable the security settings for a DataFinder server either in the **New DataFinder Server»Advanced** dialog box when you create a new DataFinder server, or later on the **General**

tab in the configuration dialog box. To use the security settings, you require a network with a domain. After you have enabled the security settings, you can create and edit the global security settings in this dialog box. To simplify the process, you can import the security settings of shared folders. Use the global security settings to restrict access to the entire DataFinder server.

You can also specify security settings for individual search areas in order to manage access to a search area, regardless of the security settings for the entire DataFinder server. Switch to the **Search Areas** tab, select the search area to be changed, and click **Search Area Settings**. In the search areas you can, for example, restrict access to a search area for specified users. If specific security settings are assigned to a search area, the global security settings are not applied to this search area.

If possible, use the global security settings in order to ensure the best possible search performance. Note that the DataFinder server needs read permissions for all search areas, in order to be able to index the data files in the search areas.

Note also that the data between client and server is transferred unencrypted, even if the security settings are enabled.

## Optimizing Custom Properties

You can optimize the custom properties for a DataFinder server so that the client finds these custom properties faster. Custom properties are user-defined properties that you can create for files, groups, and channels of the data that is saved in the TDM data model. Custom properties give data additional characteristics that are not included in the standard data model.

To speed up the search for custom properties, select a DataFinder server in the server manager and select **Settings»Custom Properties**. On the tabs **File**, **Group**, and **Channel**, you select custom properties that you want to optimize. If you click **Optimized**, the Server Manager optimizes the selected custom properties. The DataFinder server always optimizes custom properties for the data type that the DataFinder server used most frequently for indexing the custom property. This way you can view how often the custom properties occur in the search areas of the DataFinder server.

For example, if you use DIAdem as the client, DIAdem suggests a value for the search when you select an optimized custom property in the **Advanced Search** properties. Which operators you can use for a query depends on the data type of the property searched for. You only can search for date/time custom properties if the DataFinder server has optimized these custom properties.

## Specifying the Start Options of DataFinder Servers

You do not need to open the server manager to start a DataFinder server. Select a DataFinder server in the overview, select **Settings»Start Options**, and select the **Enable autostart** checkbox. The DataFinder server now launches automatically when the user logs in.

The setting **Run as service** specifies whether the operating system executes a DataFinder server as a Windows service the next time the operating system starts. This setting also guarantees that

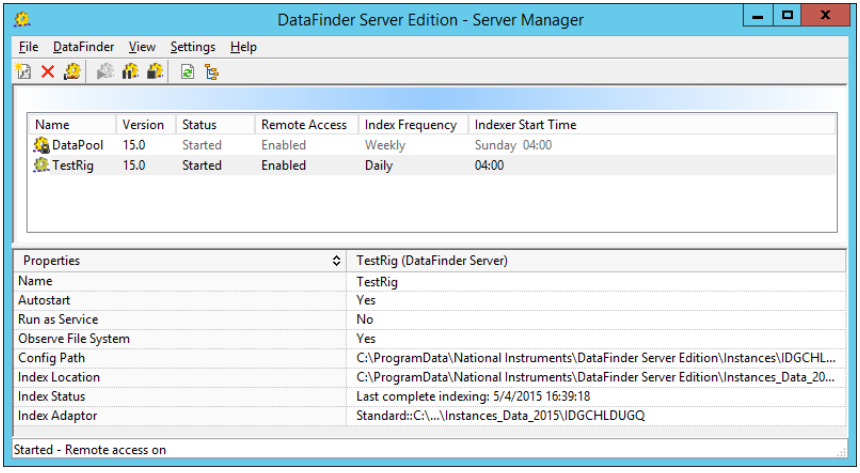
the DataFinder server is automatically available when you restart the computer after the server computer was down.

A service is a Windows application that starts automatically when Windows starts, and runs in the background until you shut down Windows. You can only run a DataFinder server as a Windows service if you are logged on as a Windows administrator. If a DataFinder server is running as a service on a network drive to which you have assigned a drive letter, it cannot index search areas. Use an UNC path instead.

# Server Manager

The server manager contains an overview of all DataFinder servers and provides access to the most important settings of every DataFinder server. If you enable the security settings, a little lock is added to the DataFinder symbol. The **Version** lists the version numbers of the DataFinder servers. The **Status** indicates whether the DataFinder server has started, paused, or stopped. The **Remote Access** shows whether clients can access the DataFinder server. The **Index Frequency** and the **Indexer Start Time** show when the regular indexing of the DataFinder server starts. If you disable regular indexing, the entry **`Never`** appears here.

**Figure 2-1.** The Server Manager Displays All DataFinder Servers




The Properties display at the bottom of the server manager shows other properties of the DataFinder server selected in the overview. The **`Autostart`** property provides information on whether the DataFinder starts automatically when the computer launches, and the **`Observe File System`** property provides information on whether the DataFinder server automatically indexes new and changed files.

If you want to interrupt data file indexing, select a DataFinder server in the server manager and click **Pause Indexing** on the Windows toolbar. If you want to close the selected DataFinder server, click **Stop**. If you close a DataFinder server, the indexing process stops, all clients are

disconnected from the server, and the server shuts down. Click **Start** to reactivate a DataFinder server. Clients can now browse in the indexed files again.

You can open the context menu of each activated DataFinder server, independently of the server manager, in the information area on the Windows task bar. Select **About** to see when a DataFinder server was last completely indexed and how many files, groups, and channels are indexed. You can also use the context menu to stop or continue indexing, and to configure or to exit the DataFinder server. The menu **DataFinder»Statistics** in the server manager also contains information on the indexing status.

If you want to monitor a DataFinder server because of occurring error messages, enable **Help» Diagnosis»Logging** to record messages. Now the DataFinder manager writes every client access and every DataFinder server reaction in different logfiles. The menu item **Create Diagnosis File** packs all log files, together with the system information, into a ZIP file which the system administrator and NI support can use for error analysis. When the diagnosis has completed, you can delete these files again in the Help menu. To do so, you must stop the DataFinder server.

# Backup for DataFinder Servers

You can make a backup for each DataFinder server in order to secure the configuration and the index. This way you can restore a previous state of a DataFinder if, for example, the index cannot be read after a computer crash. You can also use a backup to copy a DataFinder server or to transfer it to a different computer.

Stop a selected DataFinder server in the server manager and select **DataFinder»Create Backup** in order to create a backup. Then specify the folder for the backup file. Backup files have the filename extension `.dfbak` and contain the backup date in their names, for example, `DataFinder_TestRig_20150511_110804`. In the backup process the server manager does not copy the start options and the settings for operating a DataFinder server as a service. You can enable a regular backup and a manual backup, and you can configure a scheduler and specify the storage folder under **Settings»Backup**.

Select **DataFinder»Restore** and select a previous state in order to restore a DataFinder server from a backup. If you enabled the regular backup for this DataFinder server, the menu offers the last backup of this DataFinder server. When restoring a DataFinder manager, the DataFinder manager overwrites its configuration and index.

Alternatively, you can also create a copy of a DataFinder server from a backup. To do so, select **File»New from Backup** and specify the name of the new DataFinder server and if you are using an SQL server, configure the index adaptor. You must enable the setting **Run as Service** and add the start options. Observe the license conditions for operating several DataFinder servers. In order to create a copy of the DataFinder server, including its index, on a different computer, copy the DFBAK file onto this computer and create a new DataFinder server from this file.

## Upgrading DataFinder Servers

If you want to use an existing DataFinder server with the current DataFinder Server Edition, you must upgrade these DataFinder servers individually. To do so, install the current DataFinder Server Edition and stop the DataFinder server of the current installation. Then open the server manager of the new DataFinder Server Edition. The server manager marks the existing DataFinder servers with a red exclamation mark. Right-click the DataFinder servers and select **Upgrade** from the context menu. The DataFinder manager refreshes the DataFinder servers, thus making them unavailable in the earlier version. Start the DataFinder servers so that the clients can access the DataFinder servers with the same name again.

## Importing the Local DataFinder

If you are already using a local My DataFinder on a computer, create a DataFinder server from My DataFinder in order to use this DataFinder together with other clients. First export the My DataFinder configuration to the client. For example, open the configuration in DIAdem in **Settings»My DataFinder»Configure**, click **Export**, and create a configuration file with the filename extension `.dfc`. Then copy this configuration file to the DataFinder server computer. Open the server manager and create a new DataFinder server. Select **Settings»Configure** to open the DataFinder server configuration dialog box. Click **Import** and open the DFC file of My DataFinder. The new DataFinder server indexes the same search areas as the local My DataFinder, where clients can now also search for and access data.

## Exporting Connection Settings

To connect clients with the configured DataFinder server, export the associated connection settings. Select a DataFinder server in the server manager and select **Settings»Export Client Configuration**. The server manager creates a URF file with the connection settings, such as the name of the DataFinder server, the IP address of the computer, and the registered DataPlugins. You can also specify whether clients automatically synchronize their DataPlugins with the DataPlugins of the server when setting up the connection. Copy this URF file to the client and double-click the file to transfer the settings. Now a client, such as DIAdem or LabVIEW, can connect to this DataFinder server and search for and load data in the search areas of the DataFinder server if you have specified the necessary share parameters.

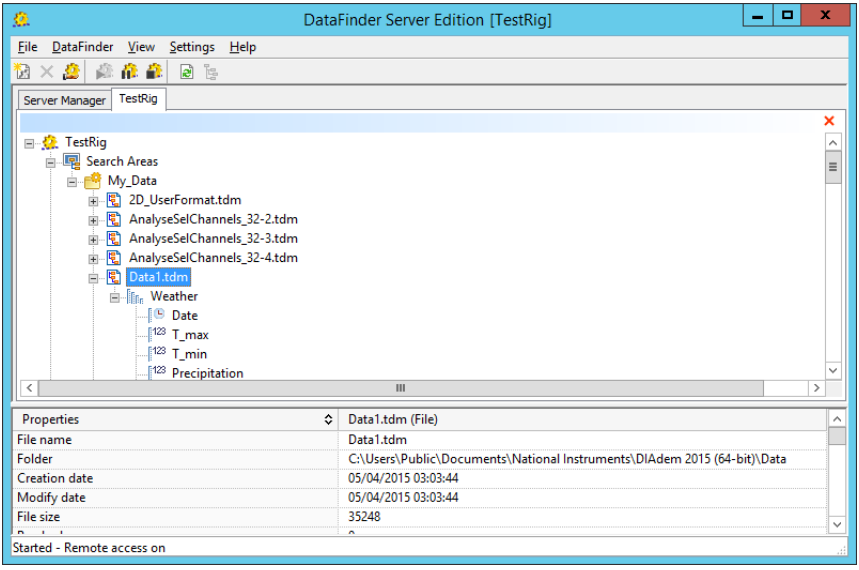
# Browsing Data

The server manager provides a browser view of the search areas of the DataFinder servers or the hierarchy of the ASAM ODS server on separate tabs.

To open a tree view of the search areas of a DataFinder server, select a DataFinder server in the server manager and click **Open in Browser** on the toolbar. If the DataPlugin that is associated with the selected file type allows, you can navigate to channel level in the folders of the search areas and in the indexed files. In order to close a browser, click the red cross in the right corner of the view.

The properties display below the tree view shows the properties of the selected file, the selected channel group, or the selected channel. Click one of the indexed files to view the file properties, as shown in the following figure. In the properties display, the server manager displays file properties, such as the filename, path, creation date, name, and author. Drag up the top edge of the properties display to view the entire properties list.

**Figure 2-2.** Browsing in the Search Areas of a DataFinder Server

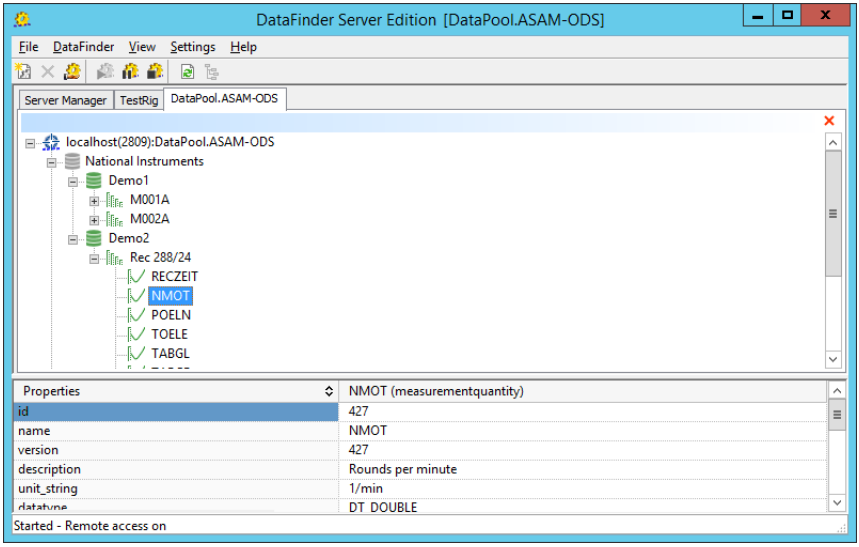



In the browser view, you can open the context menu to define other folders as search areas, to edit and delete existing search areas, and also to exclude subfolders. You can also reindex individual files and folders. You can choose whether the DataFinder reindexes all files in the specified folder or whether only the files that were changed or added since the last indexing process are reindexed. You can also specify whether the DataFinder also includes the subfolders of the specified folder in the indexing process.

If you select **View»Client View**, the server manager displays the selected DataFinder server in the view in which the client sees it. In the client view, the server manager displays only the search areas and hides the **`My Computer`** path. Depending on the security settings, the view of a specific client can differ from the client view of the server manager.

To display the hierarchy of an ASAM ODS server, select **View»Open in ASAM ODS Browser** for the DataFinder server selected in the server manager. In the data store, you can drill down from the ASAM ODS test hierarchy to the measurement values (channels). The property display below the tree view displays the properties of the selected element.

**Figure 2-3.** Browsing in the Hierarchy of an ASAM ODS Server



# 3

# DataFinder as ASAM ODS Server

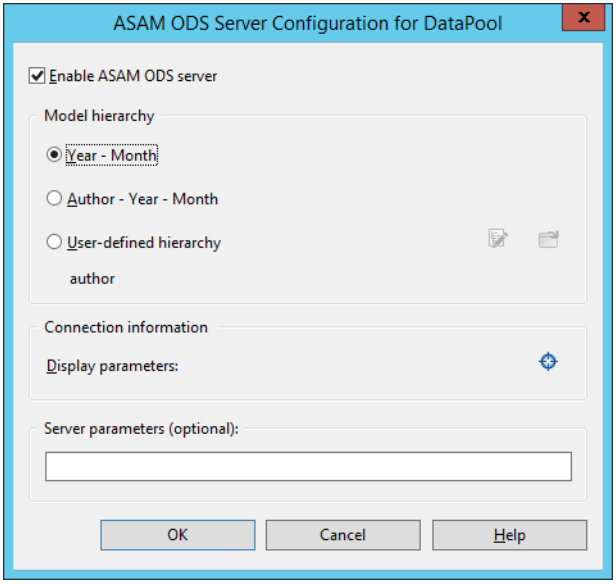
Use a DataFinder server as an ASAM ODS server to read the data from a DataFinder server through the ASAM ODS Corba interface. You can connect programs as ASAM-conform clients with this server through the ASAM ODS interface.

You need a suitable license in order to use a DataFinder server as an ASAM ODS server.

## Configuring a DataFinder Server as ASAM ODS Server

Open the ASAM configuration dialog box in **Settings»ASAM ODS** to specify an existing DataFinder server as ASAM ODS server. Enable the ASAM ODS server and select a model hierarchy for the server, as shown in the following figure. The DataFinder server provides two default model hierarchies to display the data: **Year - Month** and **Author - Year - Month**. You can also create a model hierarchy or open an existing hierarchy.

**Figure 3-1.** ASAM ODS Server Configuration



# Export a Client Configuration

You must connect the ASAM clients with this DataFinder server so that the clients can execute search queries, filter data, and load data on the ASAM ODS server. To do so, you must save the required connection settings in a file and then enable these on the client.

Click **Export a Client Configuration** on the toolbar. Select the setting **Include ASAM ODS server connection parameters**, and use the name suggestion from the export dialog box. This name comprises the name of the DataFinder server and the computer name. The server manager saves the connection parameters in a file with the extension `.urf`, for example, `engine@asam_server.urf`.

# Connecting Clients with ASAM ODS DataFinder Servers

You must register the connection settings on the client computer so that the client can connect with the DataFinder server as an ASAM ODS server. To do so, copy the `engine@asam_server.urf` file to the client computer. Double-click the URF file to transfer the connection parameters to the client computer. DIAdem can now use the DataFinder server as an ASAM ODS server over the network.

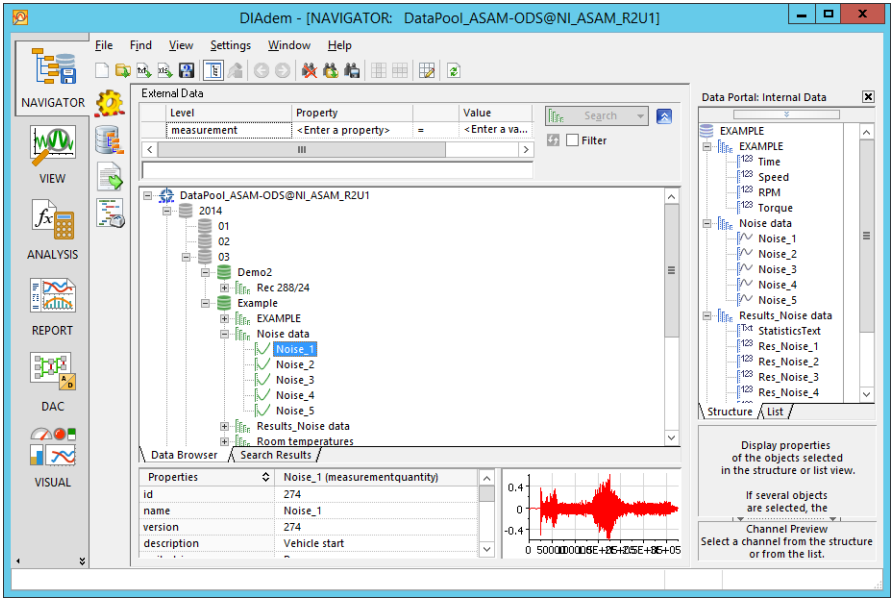
Use the security settings of the DataFinder server to restrict the access rights of the client. Refer to *Specifying the Security Settings* in Chapter 2, *Configuring DataFinder Servers* for further information.

## DIAdem as the Client of an ASAM ODS Server

If you have registered the connection settings on a DIAdem computer, DIAdem can either access the indexed data files of the DataFinder server directly or can open the indexed data as ASAM ODS data in the DIAdem NAVIGATOR data browser. Open **Settings»DataFinder Server** in DIAdem NAVIGATOR in order to use the DataFinder server as ASAM ODS server in DIAdem. Select **`DataPool_ASAM-ODS@NI_ASAM_R2U1`** from the list of registered DataFinder servers. Double-click the data store to view and edit the settings of the ASAM ODS server. If you click **Open**, DIAdem opens the ASAM ODS data store in the data browser.

The data browser in DIAdem NAVIGATOR uses a model hierarchy configured on the DataFinder server to display the data. The following figure shows the model hierarchy **Year - Month** with the hierarchy levels `Year - Month - File - Group - Channel`. You can browse in the files down to channel level and search for data. You can define search conditions for individual levels of the model hierarchy. DIAdem lists the tests, measurements, or measurement quantities it finds in the search results. You can also use search conditions to filter data. The data browser only displays the branches whose data meets the search conditions.

**Figure 3-2.** Navigating in the ASAM ODS Data Display of a DataFinder Server




## Corba-Supporting Software as Client

Every software that supports the Corba interface of ASAM ODS can connect to the DataFinder server. To access the DataFinder server as an ASAM ODS server, click **Show ASAM ODS Connection Information** in the configuration dialog box of the ASAM ODS server. The display shows the necessary connection parameters, such as server name, port address, and URL.

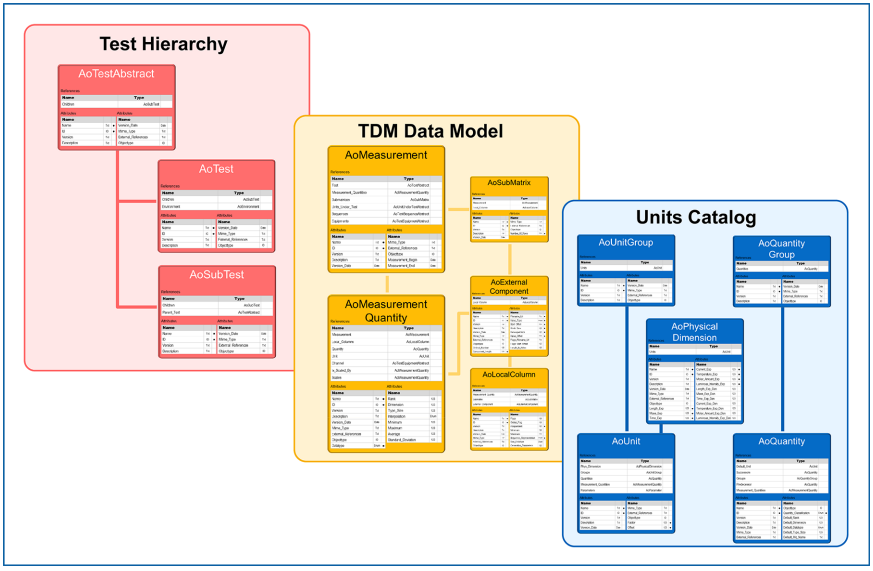
# Properties of the ASAM ODS Server

A DataFinder server as ASAM ODS server has the following functions.

## Structure of the Data Model

The DataFinder server as ASAM ODS server combines the TDM data model with a user-defined test hierarchy and a predefined extendable unit model.

**Figure 3-3.** TDM Data Model with Unit Model




The test hierarchy is defined either by the properties and optimized custom properties of the root level, or by the properties and optimized custom properties of the group level of the TDM data model. The DataFinder server has two predefined test hierarchies for displaying data: `Year Month` and `Author/Year/Month`. You can define further hierarchies.

**Note** Elements of the test hierarchy cannot be used in search requests. Instead, use the properties of the test level in order to get the same search results.

The elements of the TDM data models are below the test hierarchy and are named in the ASAM ODS server according to the ASAM ODS data model. The root level corresponds to the test of the ASAM model, the channel group corresponds to the measurement, and the channel corresponds to the measurement quantity.

1. root → test (AoSubtest)
2. channelgroup → measurement (AoMeasurement)
3. channel → measurementquantity (AoMeasurementQuantity)

If you enable the DataFinder server as ASAM ODS server, you must optimize custom properties for searching and filtering to make these properties available over the ASAM ODS Corba interface.

The measurement quantities are assigned to `units`, which are defined in ASAM ODS. The basis is a DIAdem units catalog with the filename extension `.tuc`, which you load, edit, and save in DIAdem. The name of the units catalog and its path are in the properties of the DataFinder server in the server manager.

## Further Capabilities of the ASAM ODS Server

In addition to the ASAM ODS standard, the DataFinder server also offers a full text search through the ASAM ODS Corba interface.

The DataFinder server as ASAM ODS server provides text files in Unicode. Unicode characters include special characters and also Chinese, Japanese, and Arabic characters.

The ASAM ODS server can immediately read data from different ATF-XML files with the ATFX TDM DataPlugin installed with the DataFinder server. The ASAM ODS server can also read all the data files provided by a DataPlugin.

The ASAM ODS server uses the security settings defined in the DataFinder server. Therefore user accounts in the Windows Active Directory can also be used. As is ASAM ODS standard, the user name and password are transferred unencrypted over the ASAM ODS Corba interface.

# 4

# DataFinder Federation

A DataFinder federation is a combination of several DataFinder servers. The DataFinder servers can be distributed across the entire network at different sites and do not need to be on the same computer or on the computer on which the DataFinder federation is defined.

A client addresses a DataFinder federation in the same way as it addresses a single DataFinder server. The client sends a query to the DataFinder federation, which transfers this query to the DataFinder servers registered with this federation. Then the DataFinder federation compiles the returned search results and sends the results back to the client.

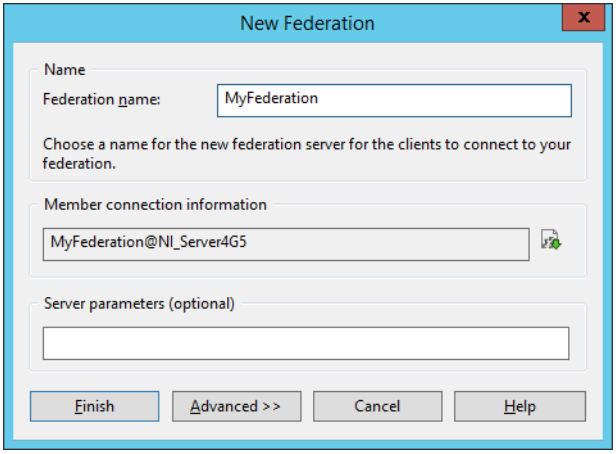
You need a license in order to create a DataFinder federation.

## Creating a DataFinder Federation

You create a DataFinder federation in two steps. In the first step, you define the DataFinder federation in the server manager and in the second step, you register the participating DataFinder servers with this DataFinder federation.

To create a DataFinder federation, select **File»New Federation** in the server manager. Enter a name for the federation.

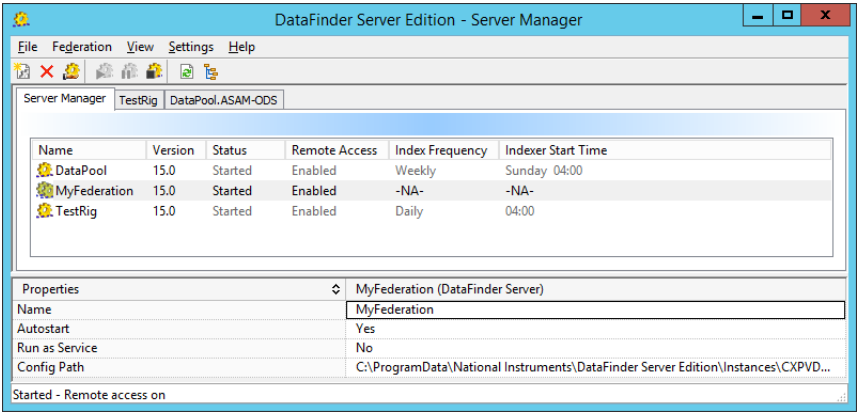
**Figure 4-1.** New DataFinder Federation



The member connection displayed in the dialog box consists of the federation name and the name of the computer on which you set up the DataFinder federation. If you click the **Member Connection Information** area, the server manager displays further information. Moreover, the optional server parameters offer the possibility of entering additional information for a server connection.

Click **Finish**. The server manager now displays a message that asks you to create a connection file that has the extension `.fed`. This federation connection file contains all information a participating DataFinder server needs to join a federation. When you close the Save dialog box, the server manager displays the new DataFinder federation.

**Figure 4-2.** DataFinder Federation in the Server Manager

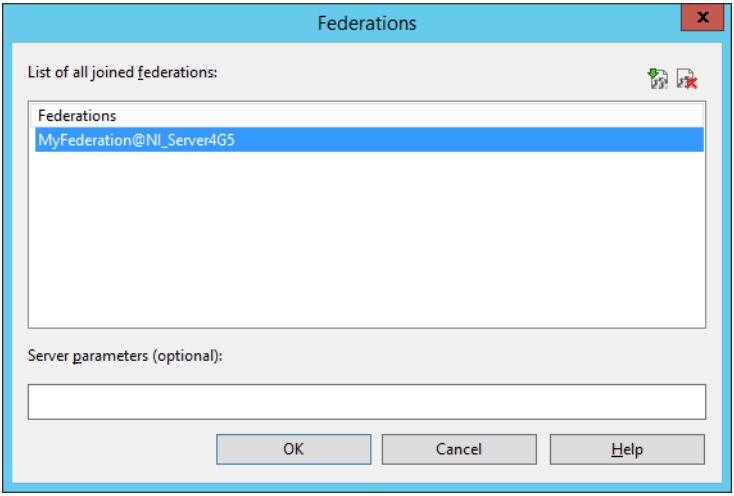



# Adding a DataFinder Server to a Federation

Once the DataFinder federation has been created, DataFinder servers must register with the federation. A DataFinder federation can accept up to 100 members.

For the DataFinder server to become a member of a DataFinder federation, the DataFinder server must read the connection settings. To do so, copy the federation connection file to the server computer, where the DataFinder server is located. Open the server manager and double-click the DataFinder server you want to add to the federation. Open the **General** tab in the configuration. Enable the setting **Join a federation** and load the connection file, for example, `MyFederation.fed`. To conclude, stop and restart the DataFinder server to allow this DataFinder server to join the DataFinder federation as a member.

**Figure 4-3.** Federations which DataFinder Server Joined




A DataFinder server can join several DataFinder federations.

# Connecting Clients to a DataFinder Federation

You can register clients with the DataFinder federation in the same way as with a DataFinder server. To do so, you must save the required connection settings of the DataFinder federation in a file and then enable these on the client computer.

Select the **MyFederation** DataFinder federation in the server manager and click **Settings» Export Client Configuration** in the context menu. Apply the proposed name, which comprises the name of the DataFinder federation and the name of the server computer. Click **OK** to save the client configuration in a file with the `.urf` extension.

Copy the client configuration `MyFederation@Computer.urf` to the client computer and double-click this file to register the connection parameters. Open **Settings»DataFinder Server** in DIAdem NAVIGATOR in order to use the indexed data files from members of the DataFinder federation, for example, in DIAdem. Select `MyFederation_ASAM-ODS@computer` from the list of registered DataFinder servers. Double-click the data store to view and edit the settings of the DataFinder federation. If you click **Open**, DIAdem connects to the federation and displays the data in the data browser. The data browser in DIAdem NAVIGATOR uses the model hierarchy configured on the DataFinder federation to display all data through which you can navigate in the same way as you do through a coherent data store.

Refer to Chapter 1, *Creating and Connecting DataFinder Servers*, for more information on registering clients.

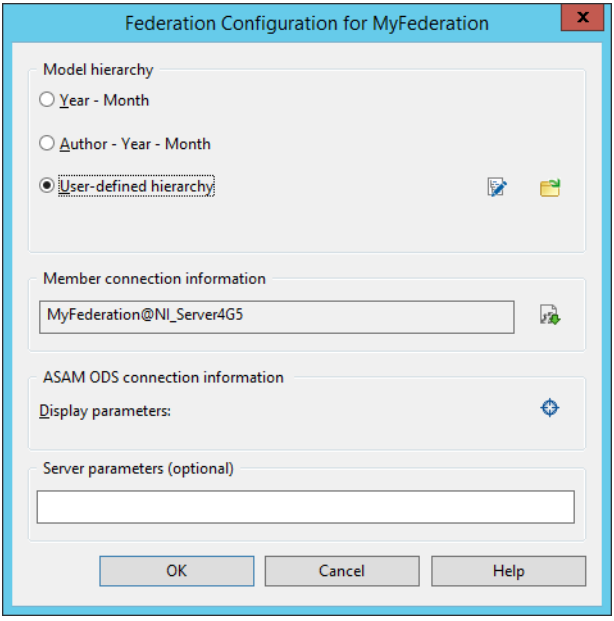
# Configuring a DataFinder Federation

After you have created a DataFinder federation and joined DataFinder servers, you can edit the configuration and the start options and view the list of members.

## Configuration

To open the configuration of a DataFinder federation, double-click the federation in the server manager. To display the member information, you can specify a model hierarchy. You can select one of the two model hierarchies **Year - Month** or **Author - Year - Month**, create a specific view on your data, or load an existing model hierarchy. If you select **Open in Browser** from the context menu of the DataFinder federation, the browser uses the model hierarchy you specified to display the data from all registered DataFinder servers, through which you can navigate in the same way as you do through a coherent data store. Click **Federation»Member Information** to see which DataFinder servers belong to a DataFinder federation and whether the connection to a DataFinder server was interrupted.

**Figure 4-4.** DataFinder Federation Configuration




In the configuration dialog box you can export the connection settings and receive more information on the connection information and on the ASAM ODS connection.

# Start Options

You do not need to open the server manager to start a DataFinder federation. Select a DataFinder federation in the overview, select **Settings»Start Options**, and enable the **Enable autostart** checkbox. The DataFinder federation now launches automatically when the user logs in.

The setting **Run as service** specifies whether the operating system executes a DataFinder federation as a Windows service the next time the operating system starts. This setting also guarantees that the DataFinder server is automatically available when you restart the computer when the server computer was down. You only can run a DataFinder server as a Windows service if you are logged on as an administrator.

# 5

# Integrating the DataFinder Server in the Work Environment

This chapter describes the necessary licenses, hardware and system requirements, and the firewall configuration, in order to connect DataFinder clients outside the firewall with a DataFinder server within the firewall. The chapter also outlines how to integrate the DataFinder server into archiving systems to index and to find archived data.

## NI License Manager

The NI License Manager helps you manage your NI software product licenses. To work with DataFinder Server Edition after your evaluation version has expired, activate your license here **Start»All Programs»National Instruments»NI License Manager** and enter your serial number.

The NI License Manager limits the number of active clients that can access the DataFinder server simultaneously. To increase the number of clients, you must purchase a license that allows more connections. Then select **Help»Activate License** in the server manager, click **Next**, and enter the new serial number.

The NI License Manager also limits the number of DataFinder servers that you can create in the server manager. If you need more than one DataFinder server, you must purchase a license that allows multiple DataFinder servers.

**Note** DataFinder Server Edition does not support the National Instruments Volume License Manager.

## Hardware and System Requirements

Using the DataFinder Server Edition may place special demands on your system. Refer to the following notes for information about optimizing your work with DataFinder Server Edition:

- Save the index to a hard disk with short access times in order to accelerate access to the index. Furthermore, National Instruments recommends storing the index and the operating system on separate hard disks.
- When accessing the index, DataFinder Server Edition stores parts of the index in the cache. Provide sufficient memory to speed up access.
- The DataFinder Server Edition uses parallel threads to index data. In addition, the indexing service runs on several independent processes. Because of this considerable parallelization,

National Instruments recommends the use of a system with several processors. Such a system improves data throughput because DataFinder Server Edition can process several search and browse requests simultaneously.

- DataFinder Server Edition consists of 64-bit components so that you can only use the program on 64-bit operating systems and you therefore have more main memory (RAM).
- The index may be lost as a result of system errors, for example, if you use RAID level 0 instead of RAID level 5. However, the DataFinder can always create a new index. National Instruments recommends the creation of regular backups.
- Minimum system requirements:
  - Processor: 2 processor cores, clock frequency 1.4 GHz
  - RAM: 2 GB
  - Operating system: Windows Server 2008 R2 SP1, Windows Server 2012 including R2
- Recommended system requirements:
  - Processor: 4 to 8 processor kernels or more, clock frequency 2.5 GHz or more
  - RAM: 16 GB or more
  - Hard disks for operating system and index: 15,000 rpm SAS drives or SSD drives

    National Instruments recommends you store the DataFinder index on a separate drive.
  - Operating system: Windows Server 2008 R2 SP1, Windows Server 2012 including R2

# Uninstalling DataFinder Server Edition

When you uninstall DataFinder Server Edition, you can specify whether to also delete an existing configuration and its indexes or whether to keep them for a later reinstallation.

The uninstallation process also removes services and autostart entries. In some cases it might happen that the uninstallation process cannot remove all autostart entries when installing or uninstalling, or when DataFinder Server Edition runs with different user accounts. In this case, delete the `ni_..._<DataFinder name>` entries for the respective user account in the Windows registry under `HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Run` in order to avoid an error message from the operating system when it restarts.

National Instruments recommends you uninstall DataFinder Server Edition versions you no longer need because the index service of the DataFinder reserves main memory space even if no DataFinder is started or configured.

# Connecting Databases with Adaptors

Use adaptors to connect the DataFinder Sever Edition with a database and to store the index in this database. The connected databases can differ in their performance and available functions.

The DataFinder Server Edition provides a standard adaptor, and also an adaptor for the connection with the Microsoft SQL Server. You can use this adaptor to integrate the DataFinder Server Edition into the existing Microsoft SQL database systems. You can only use the Microsoft SQL Server adaptor if you have an Advanced license or a Professional license.

# Configuring Firewalls and Network Address Translating Routers

DataFinder servers use the TCP port 2343 and the UDP port 2343 and a range of UDP ports beginning at port 6000. The number of UDP ports above 6000, which the DataFinder servers use, depends on the number of servers running on the computer. DataFinder clients, such as DIAdem, use a range of UDP ports beginning with port 5000. The number of UDP ports above 5000, which the DataFinder clients use, depends on the number of clients running on the computer.

## Firewalls

Installing DataFinder Server Edition adds the permission to the firewall rules to connect DIAdem or other DataFinder clients to a DataFinder server. If you suppressed these firewall rules during the installation, execute the `AddDataFinderFirewalls.vbs` script to implement these firewall rules now. The script is at `..\<Program Data>\National Instruments\DataFinder Server Edition\Config\<Version>\FirewallRules`.

**Note** You need administrator rights to execute the script.

If you do not want to execute the script, complete the following steps. The exact steps for configuring the firewall depend on which specific firewall you use. Refer to the documentation on the firewall for specific instructions about opening ports.

Open the TCP port 2343 and the UDP port 2343 for incoming packets.

- For LabVIEW DataFinder Toolkit and for DIAdem up to and including DIAdem 2012 SP1:

  Open the UDP port range from 6000 to 6010 for incoming packets.
- From DIAdem 2012 SP2 onwards:

  Open one TCP port for each used DataFinder server starting with TCP-Port 59110.

You can also allow clients inside a firewall to connect to a DataFinder server outside the firewall. Some firewalls automatically transmit incoming packets without any configuration. If the firewall does not open the ports automatically, open the UDP port range from 5000 to 5010 for incoming packets.

**Note** If you use a DataFinder server as an ASAM server, you must add the programs `..\National Instruments\DataFinder Server Edition <Version>\DataFinderNMS.exe` and `....\National Instruments\Shared\CorbaNamingService\OmniNames.exe` to the list of firewall exceptions on the server computer.

## Network Address Translating Routers

Complete the following steps to allow clients outside a NAT router to connect to a DataFinder server inside the router. The exact steps for configuring the router depend on the specific NAT router you use. Refer to the documentation on the router for further information about forwarding ports. Inside the router, only one computer can function as a server.

Forward the TCP port 2343 and the UDP port 2343 to the computer with the DataFinder server.

- For LabVIEW DataFinder Toolkit and for DIAdem up to and including DIAdem 2012 SP1:

  Forward the UDP port range from 6000 to 6010 to the computer with the DataFinder server.
- From DIAdem 2012 SP2 onwards:

  Transfer one TCP port for each used DataFinder server starting with TCP-Port 59110.

You can also allow clients inside an NAT router to connect to a server outside the router. Some routers automatically forward UDP ports without any configuration. If the router does not forward the UDP ports automatically, forward the UDP port range from 5000 to 5010 to the computer with the client (DIAdem).

**Note** If DataFinder Server Edition is installed on a Windows computer on which a Windows firewall is enabled, you must add the programs `..\National Instruments\DataFinder Server Edition <Version>\DataFinderSE.exe` and `..\Windows\System32\lkads.exe` to the firewall exclusion list on the server computer.

**Note** If a client (DIAdem) installed on a Windows computer with an enabled Windows firewall wants to access a DataFinder server, you must add the `..\Windows\System32\lkads.exe` program to the Windows firewall exception list on the client computer.

# Supporting Archiving Systems

Many factors, such as powerful multicore processors, increased memory, fast hard drives, and increasing sampling rates, are leading to increasing amounts of data. For easy and economic management of these amounts of data, you can use a backup system or an archiving system.

In a backup system the data that is not needed directly is stored on an inexpensive storage medium with a high storage capacity, usually magnetic tapes. In general, the data must be stored and recovered manually.

Archiving systems provide a more efficient way of managing large amounts of data. In archiving systems, automated and rule-based background processes move the files into the archive. A file with the same name and the same file attributes, but without any contents, remains at the original position in the file system.

The DataFinder Server Edition integrates smoothly into archiving systems. The DataFinder server recognizes archived files and saves the archiving flag together with the descriptive TDM and TDMS file data, in the DataFinder index. If you navigate in data or search for data, the DataFinder server handles archived data in the same way as all other data. You can also browse and search in files that are stored in an archive and not in the search areas. The related file symbol denotes whether the file is in the archive. When you access the file, it is automatically restored from the archive.

DataFinder Server Edition supports archiving systems from SER. Archiving systems from other providers were not tested, but can function.

# A

# NI Services

National Instruments provides global services and support as part of our commitment to your success. Take advantage of product services in addition to training and certification programs that meet your needs during each phase of the application life cycle; from planning and development through deployment and ongoing maintenance.

To get started, register your product at ni.com/myproducts.

As a registered NI product user, you are entitled to the following benefits:

- Access to applicable product services.
- Easier product management with an online account.
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Log in to your National Instruments ni.com User Profile to get personalized access to your services.

## Services and Resources

- **Maintenance and Hardware Services**—NI helps you identify your systems' accuracy and reliability requirements and provides warranty, sparing, and calibration services to help you maintain accuracy and minimize downtime over the life of your system. Visit ni.com/services for more information.
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- **Declaration of Conformity (DoC)**—A DoC is our claim of compliance with the Council of the European Communities using the manufacturer's declaration of conformity. This system affords the user protection for electromagnetic compatibility (EMC) and product safety. You can obtain the DoC for your product by visiting ni.com/certification.

For information about other technical support options in your area, visit ni.com/services, or contact your local office at ni.com/contact.

You also can visit the Worldwide Offices section of ni.com/niglobal to access the branch office websites, which provide up-to-date contact information, support phone numbers, email addresses, and current events.

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