# brainwaregroup

# Columbus Replication
## User Manual

Module version 7.6

# columbus

Issue: 12.18

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## MinHook

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## HDE 32C / 64C

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# Content

# General

Thank you very much for choosing Brainware and Columbus. This manual shall give you detailed information about Columbus Replication. The manual confines itself to the features of Replication and assumes basic knowledge of Columbus.

Before you deal with Replication we would like to recommend reading the manuals Columbus **Installation** as well as **Basics** which will give you information about the first installation or migration, the basic functions, the configuration of Columbus and the structure and operation of the Management Console.

## 0.1      Typographical conventions

This manual uses various formats to highlight certain terms and actions. Specific notes and tips are shown with a different background color, according to their importance.

| Format | Description |
|---|---|
| **Bold font** | Elements in the software or in the operating system, such as menu items, buttons or elements of a selection list |
| *Italic font* | Emphases (important details) and links to other chapters or documents |
| Triangle symbol "➤" | Instruction step |
| Angle bracket ">" | Command menu sequences, e.g. **File** > **Open** |
| System font | Directories, code and script samples |
| CAPITAL LETTERS | Key names, e.g. SHIFT, CTRL, or ALT |
| KEY+KEY | Key combinations, i.e. the user has to hold one key and press another simultaneously, e.g. CTRL+P or ALT+F4. |

| | |
|---|---|
| **Note** | Used for notes or tips which facilitate the work or for additional information which enhances understanding for the product. |

| | |
|---|---|
| **Important** | Information which should be observed by the user, because otherwise problems or additional work may be caused in operation. |

| | |
|---|---|
| **Attention** | Information which should be observed by the user in order to prevent malfunctions of the system (crashes, data loss, system failure). |

# 0.2     Help

Please visit our **Website http://www.brainwaregroup.com** for additional information and support. Here you can find all documents, a **KnowledgeBase https://kb.brainwaregroup.com/** as well as a support form if you have questions for our specialists.

## Support

The support page features a link to the **KnowledgeBase https://kb.brainwaregroup.com/**, the support form and information about our customer service.

➢ Open **www.brainwaregroup.com http://www.brainwaregroup.com** in your browser and click on **Support and KnowledgeBase** on the right side.

➢ Start your search in the **KnowledgeBase** where you can find a list of the most common support cases

If nothing matches your search criteria, you may use the support form for advanced information. Please provide a detailed description of your problem so that our specialists can help you as quick as possible.

➢ Click on Support Form.

➢ Please fill in at least the fields marked with an asterisk (*) and click on **Send Question**

❙ You will receive a confirmation that your question has been received in the system.

The support page contains the telephone numbers necessary for telephone contacts.

## Documentation

A separate download area is available on our web site for the currently available documentation. This area contains all manuals in PDF and CHM format in German and English language. At present, some of the technical manuals are only available in English.

➢ Navigate to **www.brainwaregroup.com http://www.brainwaregroup.com** in your browser and click on **Downloads + Licenses** on the right side.

➢ Click on **Login**, enter your **User name** and **Password** and then click on **Register**.

➢ Please select **Documentation** as download type, then select the desired product and click on **Search**

❙ An overview of all available documents will be displayed.

➢ Click on the desired format and language to download the PDF/CHM file in the desired form.

You will find the Acrobat Reader on our support page or directly under www.adobe.com.

| Note | During the installation the documents are copied by default to the directory named `[C:\Program Files]\Columbus`. In order to display the Console help in German you will have to rename the file `CMC_de.chm` in the `\Console` directory to `CMC.chm`. |
| --- | --- |

## Training information

brainwaregroup is taking all efforts to ensure that our products and solutions will be used and operated in an appropriate, qualified and proper way. Therefore, we are offering various training courses. You can find all information about training types and dates under the **Training http://www.brainwaregroup.com/de-ch/kalender/training.html?utm_source=bwg.KC&utm_medium=referral** menu point

# 0.3      Licensing

Relevant for licensing is the number of managed assets based on the valid price list at the time of purchasing the license.

Managed assets are computer systems, e.g. laptops, desktops, servers, virtual servers, thin clients, mobile devices, tablets, every kind of asset for which software can be managed or for which another active management is technically available.

Such an active management can be e.g. the installation of the operating system, the inventorization or the distribution of software (no definitive list). The service desired by the customer determines the suites or modules to be licensed.

A license is basically bound to one computer, regardless whether the license is used only once or continuously.

Apart from computers, Columbus is also able to collect data from additional network devices (routers, switches, printers, etc.) which are administered as so-called *Not Managed Devices*. These devices require no Columbus license as long as they have the status *Not Managed*.

Columbus has an active license check for all Columbus modules. License limit violations are signaled both on the Console as well as in the log file.

## Summary

The brainwaregroup licensing rules comprise the following:

- Each <ASS> operated by Columbus requires a license.
- The transfer of a license to another computer is limited to replacement purchases.


In case of a license violation

- you will be notified at the start or during your work with the Console,
- entries are generated in the log files.

| | |
|---|---|
| **Important** | If the number of managed assets increases, the customer shall bind himself/herself to obtain a new license for the additional ones within 30 days. The Software can restrict or stop the operation after an under-licensing period of 30 days. |

A license comprises the temporally unlimited, non-exclusive usage right for the current version of the Software including all hot fixes within one year from the invoice date.

# Product Description

## In this chapter

This section gives a short introduction to the material and describes the basic functions of Columbus Replication.

## 1.1 Intro

Columbus Replication is used for synchronizing the data contents of several servers. Synchronization takes place in form of a *simple replication* or a *Master-Slave* replication.

Simple replication            Transfers the data from a source directory to a target directory. If there are additional files and directories in the target, they will not be changed.

Master-Slave replication      Transfers the data from a source directory to a target directory. If there are additional files and directories in the target, they will be deleted.

All data contents are suitable for transmission which are not *locked* and can be accessed on a disk, SAN or NAS.

## 1.2 Used techniques

### OTB as transfer medium

Replications are executed via Columbus' own OTB channel, a TCP/IP based protocol. All transfers support therefore the OTB basic functions

- No share access required - data are transferred block by block
- Bandwidth limitation can be adjusted
- Transparent encryption & compression for maximum security
- Ports are settable - transfer can also be configured to take place on port 80h

### Service-based

All processes are running in Windows services - therefore no user login is required, actions can take place anytime.

### Time control

All actions can be scheduled exactly with date, time and repetitions.

### Differential transfer

The MSI package for a Microsoft Office can easily have a size of 2 GB, or a Windows service pack can have 500 MB. The transfer of such data amounts to smaller or remote subsidiaries can become a question of patience. Transfer cancelations or new synchronization after a small modification will increase the efforts.

Columbus Replication compares already existing data blocks regarding source and target and transfers only missing or changed data. This reduces the load and makes the restart after transfer cancelations easier.

### Alternative connections

While it usually makes sense that a replication server receives its data from a defined source, we would like to recommend, especially for the distribution of Columbus depots, that alternative connections are configured for situations in which the main server is unavailable.

# 1.3 Application examples

### Distribution of Columbus depots in subsidiaries

The production of OS releases, Packages, etc. is usually done in one or various center(s). The manual synchronization of such depots in the subsidiaries is prone to errors and cannot be realized with normal copy tools due to the big data volumes.

Columbus Replication automatically transfers changes to the centralized managed releases and in the background to the subsidiaries.

### Distribution of (master) data in subsidiaries

Central master data, Word templates, etc. can be distributed automatically in the subsidiaries.

### Central data backup of user shares

Consolidation of the data shares on a central server, which is then used to do the backups.

CHAPTER 2

# Installation

## In this chapter

For a description of the requirements and steps for a successful installation of the Columbus basic system please refer to the **Installation** manual. This chapter describes on the peculiarities of the Replication installation.

## 2.1    Module installation

For the installation of the *Replication* module, you have to select the **Data Replication** component during the installation of the Master Server. If this option is not displayed, it is not contained in your used license key.

➢  Select the **Data Replication** component and click on **Next**.
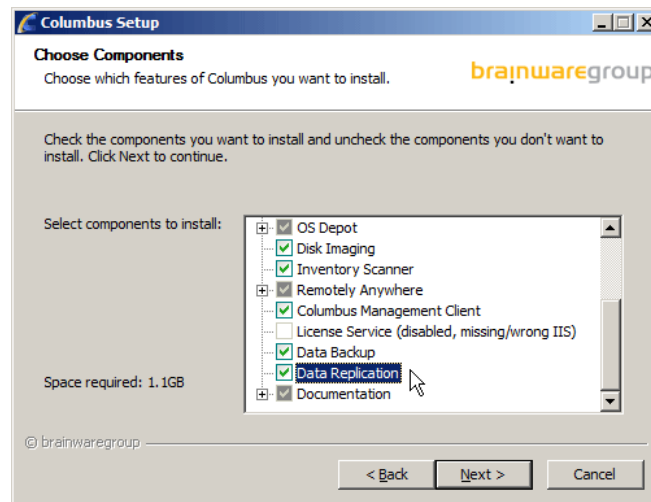


The Replication module requires the following modules as basis:

- Database Server
- Master Server
- Management Console

During the module installation, the setup will configure the Infrastructure Service with the default settings for the Indexing Agent so that a working infrastructure will be available. Possible adaptations will be described in the section Configuration.

CHAPTER 3

# Configuration

## In this chapter

This section describes the configuration steps required for the activation of Replication. The configuration consists of the following steps:

- **Understand the functional principle** (see "**Function**" on page 12)

- **Activate and assign** Replication Server Agent (see page 12)

- **Configure** Replication Server Agent

- Making images available

## 3.1 Function

The function of the Data Replication module is based on the following principle:

- In Columbus infrastructures, there are often multiple locations with identical OS, patch and SW releases, as well as disk images, inventory data or drivers. The automatic and network load saving replication of the data is the purpose of the Columbus data replication.

- The administrator configures a data source on the server which contains the master data (e.g. SW release). Then he defines DataTargets on other servers. After that, he is able to define at the Management Console which sources are transferred to which targets.

- All replications are running in the background without the need for an administrator to log in. The service runs time-controlled and can be limited in its usage of the bandwidth. The replication compares source and target and transfers only effectively changed data blocks - this enables you to efficiently retrieve even interrupted replications.

## 3.2 Activate and assign Replication Server Agent

The agent can only be used if it has been assigned to a company and has been activated. At the time of activation, an agent is loaded from the corresponding Infrastructure Service and its function is turned on. After that, the agent loads the standard configuration and starts working.

**How to activate the agent**

➢ Navigate to the **Infrastructure** screen in the <CMC_C> and highlight the Infrastructure Service.

  ❙ The list below shows all agents which are available on this server.

➢ Highlight Replication Server Agent.

  ❙ The menu ribbon shows all available functions.

> ➢ Select the function **Assign** in the **General** menu field.
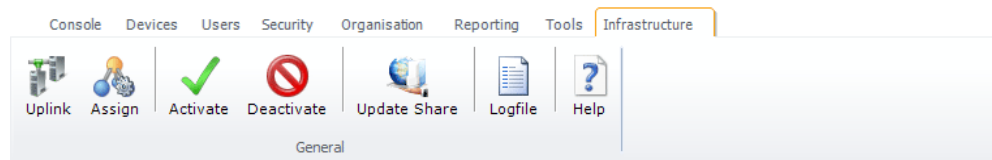


> ➢ Select the company from the list box and click on **Apply**.
>> ❙ The related company will appear in the list under the **Company** column before the Replication Server Agent.
> ➢ Select the **Activate** function in the menu ribbon.
>> ❙ The ✓ symbol in the first column of the table summary changes and indicates that the agent has been activated.
>> ❙ Date and of time of the last connection are logged in the **Last Contact** column.

In order to determine for which part of the organization shall the agent offer its services, a functional assignment to the structure tree via drag & drop is required.

**How to assign the agent to a company or site**

> ➢ Highlight Replication Server Agent.
> ➢ Drag the agent per drag & drop on a **company** or **site** in the structure tree.

After this action, the agent will offer its function to the corresponding site and all the sites under it (inheritance) Such an inheritance can be interrupted by assigning a different agent on a lower level. The currently responsible agent for a site is shown in the Console on the **Site Management** tab.

# 3.3 Configure Replication Server Agent

The Replication Server Agent manages the stored data blocks, communicates with the other servers and saves the corresponding information in the database.

| Note | If you adapt directory structures, you should always check the configuration of the related agents. |
|---|---|

After the agent has been activated, it can be configured.

## 3.3.1 Replication sources

Each replication server in the network has the possibility to offer files to other replication servers. This is done by defining a "source" on the server specifying which files shall be accessible from which path.

Other replication servers are "offered" this source and can replicate the source if required.
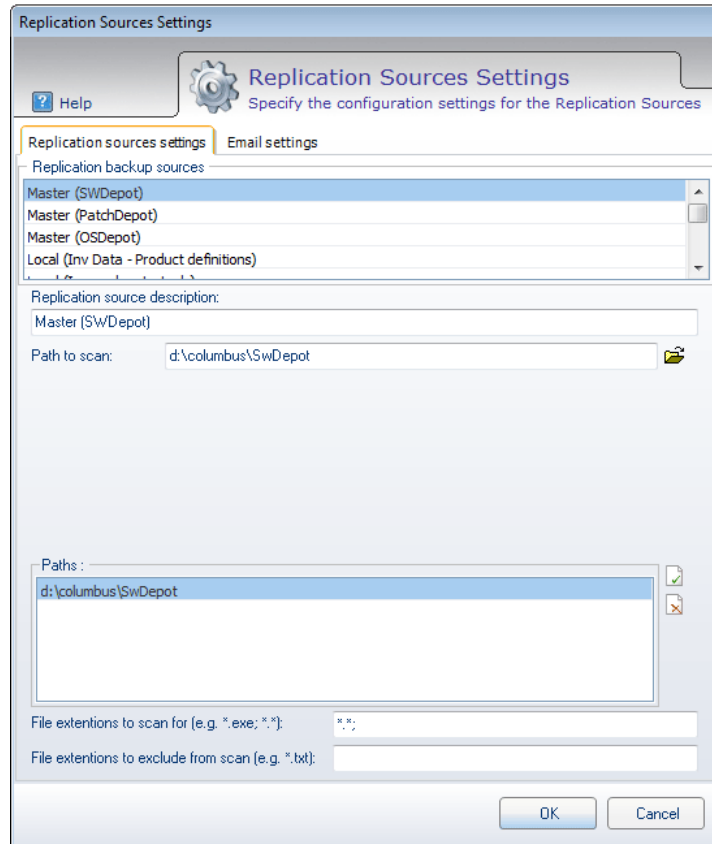
**How to configure the agent**

> ➢ Highlight the agent on the Infrastructure screen.
> ➢ Select the **Configure Sources** function in the RibbonBar.

➢ Activate the **Replication Sources Settings** tab.
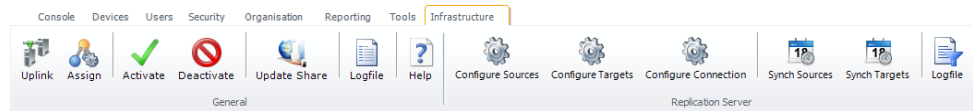


Use this dialog window to configure the available sources of a server.



Possible sources are:

- Columbus Software Depots
- Columbus Patch Depots
- Columbus OS Depots
- Columbus Inventory Depots (for product definitions)
- Columbus Image Depots (tools or complete images)
- Columbus Windows PE drivers
- Any other data directory

You can specify 10 sources max.

| Field | Description |
|---|---|
| • Replication backup sources<br>• Replication source description | Here, you can choose between the different replication sources and define then the related title and the other parameters. |
| • Path to scan<br>• Paths | Management of a path belonging to a source defined above (you can define several paths … e.g. in case of an OS replication you can only replicate certain OS within a definition. |

| Field | Description |
|---|---|
| Network access parameters | If the sources are located on another system or NAS/SAN and addressed using a UNC path, you may be obliged to enter a UserID/password to access this share. Please note that the replication will not take place under the currently logged in user, but as service in the background - the System user usually has no access on other servers without specifying a user here. |
| | If the sources are located locally on the same server, they can be addressed with normal drive specifications without UserID. |
| Impersonation parameters | According to the set Windows Server and domain policies, the system user could not be able to open the network connections. If this is the case, you will have to additionally specify an impersonation account - this account must have the right "Logon as Service" on the server. According to the configuration, this can be the same user as the one which you have specified for UNC access. |
| File extensions to scan | Files which should be considered for replication. For Columbus purposes, usually "*.*", in case of data replications, however, it could make sense to only consider certain file types. |
| File extensions to exclude | File types which should be excluded from replication. |

➢ Activate the **Email settings** tab.

If required, you can specify an E-Mail address, which can receive notifications regarding successful or faulty replications.

## 3.3.2 Replication targets

*Replication Targets* define the paths to use for the storage of replicated objects. If you want, for example, to replicate the SW depot from another server, you have to define a replication target which points to the local SW depot path and set up a replication which connects the corresponding source with this target.

### How to configure the agent

➢ Highlight the Replication Server Agent on the **Infrastructure** screen.

➢ Select the **Configure Targets** function in the RibbonBar.

➢ Activate the **Replication restore target settings** tab.
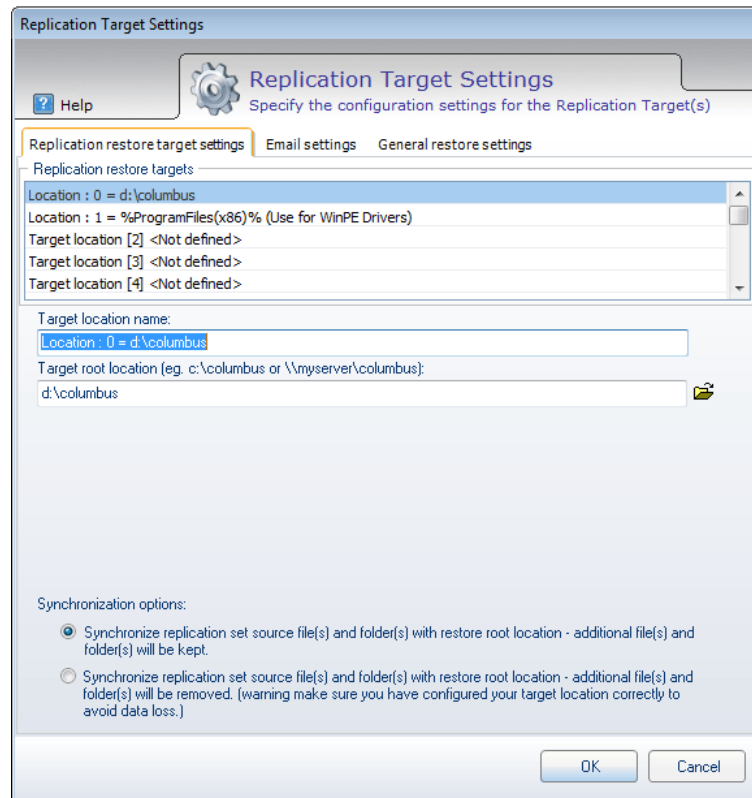


Possible targets are:

• Local paths on the server (can be specified with normal drive letter and path)

• External locations on other servers, NAS/SAN, etc. (connection information must be also specified)

You can specify 10 targets max.

| Field | Description |
|---|---|
| Replication restore targets | Here, you enter the restore targets and select them for viewing the details - the denomination is done via Target Location name |

| Field | Description |
|---|---|
| Target root location | Here, the main directory of a network share or of a directory into which the replication asset shall be stored is specified. It is important that this is done as follows: `D:\Columbus` or `\\MyServer\Columbus`. If you do not wish to specify the main directory of the target network share or of the directory, you can tick the check box on the "General Restore Settings" tab. Then, all target directories up to the main directory of a network share or a directory must be updated, so you can indicate the directory in which the replications must be restored, e.g. if you restore a software depot, set the target directory `D:\Columbus\SwDepot` or `\\MyServer\Columbus\SwDepot` (see also the general restore settings below for further information and examples). |
| Source root location | Path used to store the replicated data. For example, D:\columbus\swdepot for the replication of a complete SW depot or also \\myserver\columbus\swdepot if the data shall be stored in an external location. |
| Network access parameters | If the target is located on another system or NAS/SAN and addressed using a UNC path, you may be obliged to enter a UserID/password to access this share.<br><br>Please note that the replication will not take place under the currently logged in user, but as service in the background - the System user usually has no access on other servers without specifying a user here.<br><br>If the sources are located locally on the same server, they can be addressed with normal drive specifications without UserID. |
| Impersonation parameters | According to the set Windows Server and domain policies, the system user could not be able to open the network connections. If this is the case, you will have to additionally specify an impersonation account - this account must have the right "Logon as Service" on the server. According to the configuration, this can be the same user as the one which you have specified for UNC access. |
| Synchronization options | There are 2 options available.<br><br>Method 1: existing data are overwritten, additional files on the target remain unchanged.<br><br>Method 2: existing data are overwritten, additional files on the target are deleted.<br><br>Method 2 is usually used for the replication of SW packages which have to be identical, whereas method 1 is used more for replicating general data. |
| | **Attention** Selecting a wrong path for method 2 can have serious consequences due to data loss. |

➢ Activate the **Email settings** tab.

If required, you can specify an E-Mail address, which can receive notifications regarding successful or faulty replications.
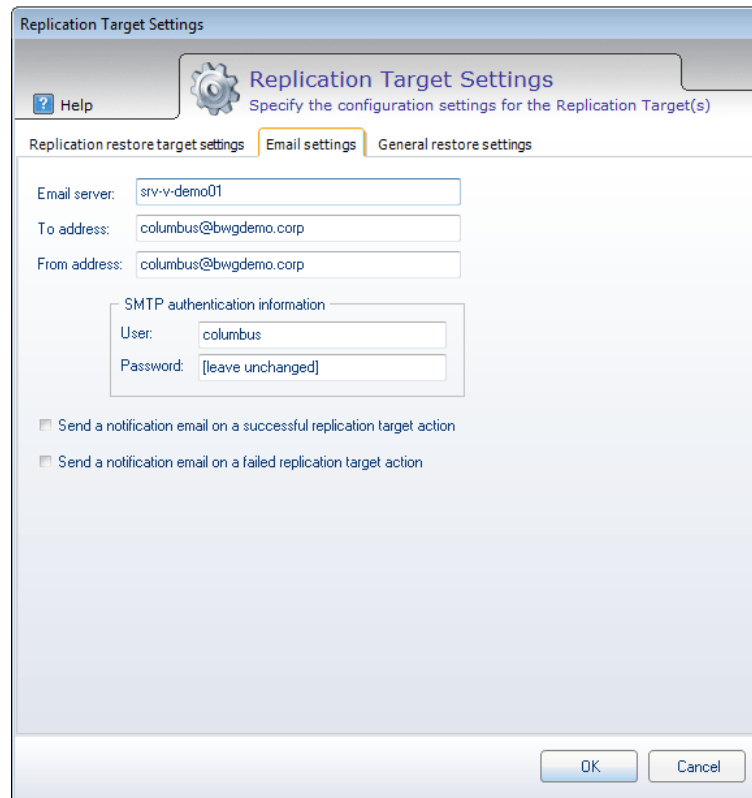


➢ Activate the **General restore settings** tab.

If the check box above was ticked, you must be sure that all target directories for the replication that indicate the main directory of a target directory or of a network share are updated in the directory in which the desired replication set is to be restored.
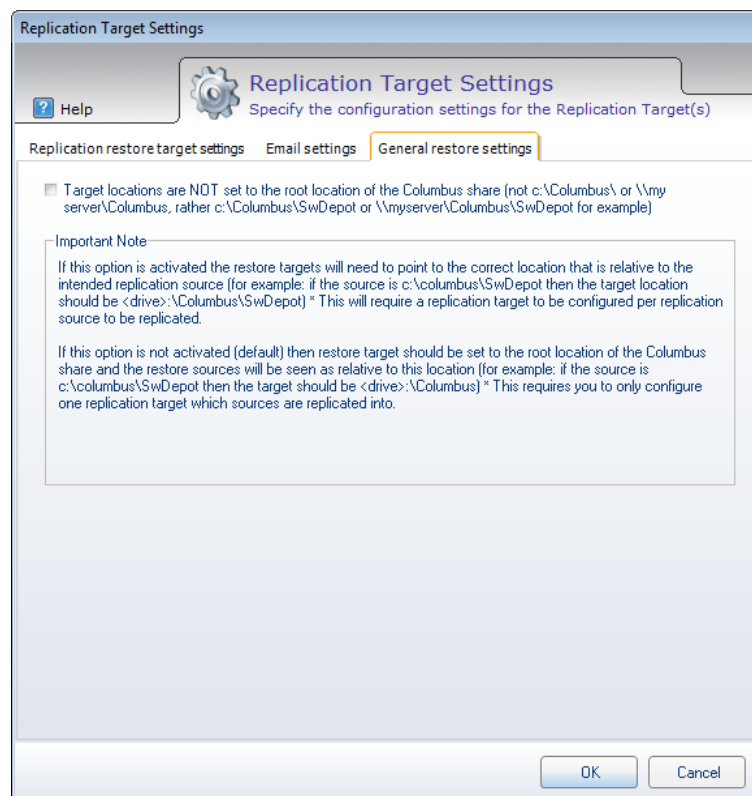
### Example 1

If you set up the following replication sources:

- Source 0: \\MyServer\Columbus\SwDepot
- Source 1: d:\Columbus\PatchDepot
- Source 2: %ProgramFiles%\Columbus\Infrastructure\PETemplates\Drivers\

If the check box is ticked, enter the target directories for every source to be restored as follows:

- Target 0: \\MyTarget\Columbus\SwDepot
- Target 1: e:\Columbus\PatchDepot
- Target 2: e:\Program Files\Columbus\Infrastructure\PETemplates\Drivers\

If the check box is not ticked (default), only the main directory of the network share must be specified as target as follows:

- Target 0: \\MyTarget\Columbus\
- Target 1: e:\Columbus\
- Target 2: e:\Program Files\

When following this procedure, only one target must be specified, e.g. \\MyTarget\Columbus. All replications in that target can be restored without having to specify a target directory for each replication source to be restored.

### Example 2

If the source directories are specified as follows:

- Source 0: \\MyServer\Columbus\SwDepot
- Source 1: \\MyServer\Columbus\PatchDepot
- Source 1: \\MyServer\Columbus\OSDepot

The target for all these replication sources can be specified as follows:

- Target 0: \\MyTarget\Columbus\

Regarding the Windows PE driver directory:

- If the check box is not ticked, the target must be as follows:
  - Target 1: %ProgramFiles%
- If the check box is ticked, the target must be as follows:
  - Target 1: %ProgramFiles%\Columbus\Infrastructure\PETemplates\Drivers

## 3.3.3    Connection settings

A basic target of the replication is to ensure that information is transferred via defined network connection - this is not always the assumed shortest way.

Let us take as example a company with head office in Zurich and subsidiaries in London, New York, Houston and San Francisco. The software release produced in Switzerland shall be replicated to all locations in an efficient manner but also with reduced load on the connection. There is a good WAN connection from London to Switzerland and from London to New York - all other connections are relatively weak and expensive.

To ensure best possible service levels in such a scenario, the following configuration is recommendable:

| Source | Target |
|---|---|
| Zurich | London |
| London | New York |
| New York | San Francisco |
| New York | Houston |

This means, we build an optimized distribution tree which shall be used by the replication for all connections. Once the setup is completed, you do not have to consider the environment for the further operation, but need only to select "what" you want and the replication is carried out in the correct way.

But what happens if a distribution server is not available?

For this case you can define alternative distribution servers, which are then used. New York could then use the slower direct connection to Zurich as alternative and San Francisco could use the connection to Houston.

### How to configure the connections of the agent

➢ Highlight the Replication Server Agent on the Infrastructure screen.

➢ Select the Configure Connections function in the RibbonBar.



Use this dialog window to define for a Replication Server Agent with which superior servers it should communicate.

| Field | Description |
|---|---|
| Default Server | Preferred server with which to communicate. You can specify either the name or also the IP address. |
| Alternate server (1) | First backup server which is addressed if the default server is not available anymore. |
| Alternate server (2) | Second backup server which is addressed if the default server and the alternate server (1) are not available anymore. |
| Broadcast addresses | Broadcast address(es) for an automated discovery of other replication servers. Since the replication is usually used in widely ramified networks, it could happen that, due to the network configuration, such broadcast signals do not reach other servers. In this case, you should enter the servers manually. |
| Server discovery port | Port which used by other replication servers to respond to discovery requests. These are the same ports which are used by the Columbus data backup. If you change these ports in Columbus Backup, this applies also for Columbus Replication and vice versa. |
| Client discovery port | Port which used by the replication server to respond to external discovery requests. These are the same ports which are used by the Columbus data backup. If you change these ports in Columbus Backup, this applies also for Columbus Replication and vice versa. |
| OTB server port | Port which is used to transfer the replication data. This port is used together with Columbus data backup. A modification would have impact on both products. |

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CHAPTER 4

# Using

## In this chapter

This section describes the basic functions which are required to operate a Replication system.

## 4.1 Function and usage

The function principle of Columbus Replication is based on the fact that all files in a source to be replicated are compared on block basis to the target system. This means that the system never transfers complete files, but only differing data blocks.

As a result, in case of e.g. a big modified file such as an MSI, only the parts are transferred which actually have been modified.

Regarding network load and time behavior, this method is considerably more efficient than the file based replication and can deal much better with unstable network connections.

## 4.2 Administration at the Console

### 4.2.1 Preparation of the replication sources

The method of block-based replication described above requires that, before starting the actual replication, the server analyzes all data blocks of its source - that means building check values which describe this block and which are later compared with the target system to decide which data have to be transferred.

This is achieved by setting up a schedule to determine when the block data have to be calculated.

➢ Highlight the data replication server of the system which contains the sources in the **Infrastructure** screen.

➢ Select Sync Sources in the RibbonBar
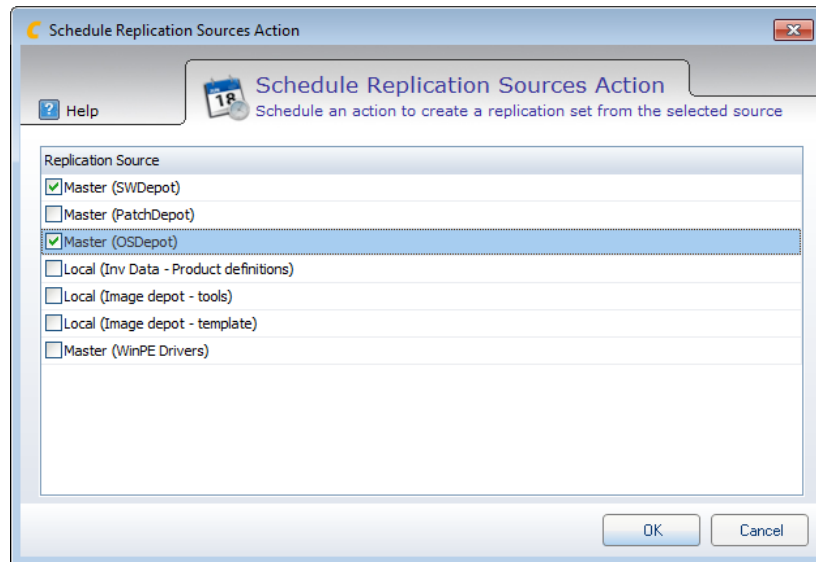


Select the sources which shall be prepared.

After selecting OK, you have the possibility to define the time, repetitions, etc.
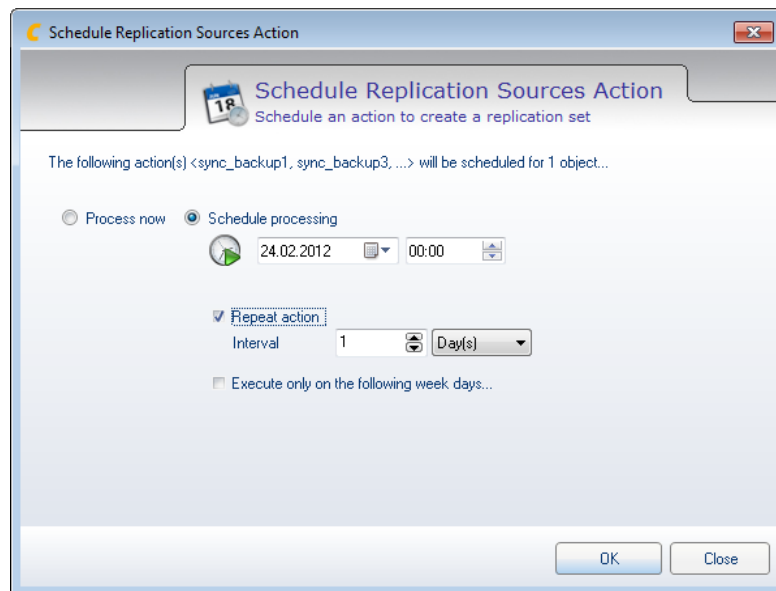


| Important | This action reads all contents of these files for calculating the check sums - in case of a software depot, this can mean several GB of data. In the ideal case, the execution should be chosen to be outside the normal business hours. |
|---|---|

Please note also that the related action requires a varying amount of time according to the size of the depots to be read - from several minutes up to one hour. The replication to be started subsequently should be set up correspondingly later.

## 4.2.2    Triggering the replication

In order to efficiently replicate data from one computer to another, please proceed as follows.

➢ Highlight the data replication server of the system which serves as target in the Infrastructure window.

➢ Select Sync Targets in the RibbonBar
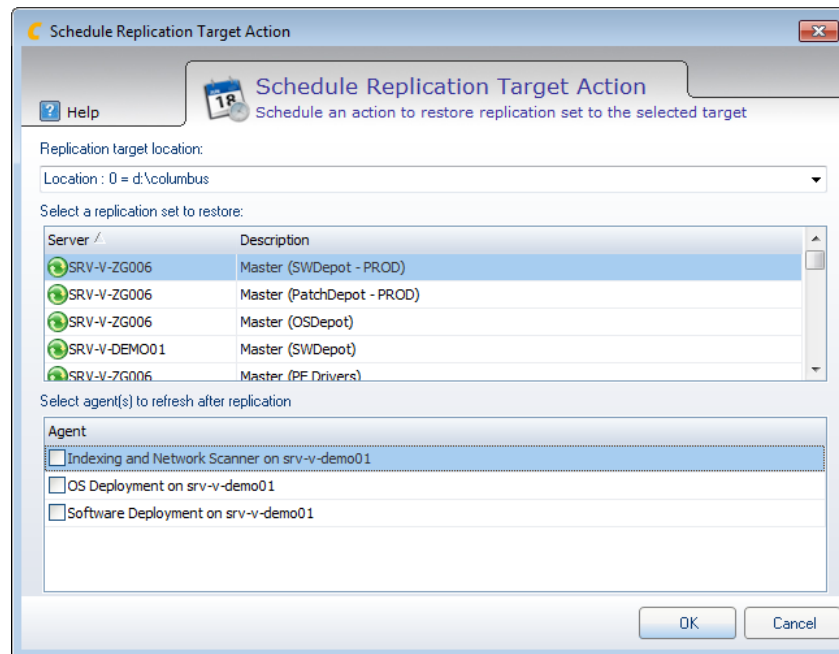


➢ Choose the desired target for the data under Replication target location.

➢ Then choose the offered replication set from another server.

In case of SWDeploy, OSDeploy and PatchDeploy you can define whether these shall execute a refresh after completing the replication so that new packages or OSReleases can be used immediately.

After selecting OK, you have the possibility to define the time, repetitions, etc.

| | |
|---|---|
| **Note** | Replications of files in the client management environment can sometimes replicate several GB of data and therefore have quite an impact on the network. Therefore, you should be very careful when choosing the time and the bandwidth of such actions in order to prevent business interruptions. |