

# Zenith ARCA

Advanced Recovery and Continuity Appliance

Zenith Infotech, Ltd  
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ARCA to ARCA Replication

# Zenith ARCA Replication Guide

*Install & Configure Zenith ARCA Replication*

Date: 5/11/2009

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# 1 About this guide

This document is divided into the following chapters:

- About
- Introducing Zenith ARCA Replication
- Describing the System
- General Operation & Software Specifications
- Configuring Replication

## 1.1 Who Should Use It

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This guide is intended for administrative users of different degrees of knowledge and experience with backup systems:

- Administrators: The administrator will learn how to install and configure the ARCA Replication.

This guide assumes that you have some knowledge of Windows, backup, and replication concepts.

## 1.2 Typographical Conventions

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This document uses the following typographical conventions:

- Command and option names appear in bold type in definitions and examples. The names of directories, files, machines, partitions, and volumes also appear in bold.
- Variable information appears in italic type. This includes user-supplied information on command lines.
- Screen output and code samples appear in monospace type.

In addition, the following symbols appear in command syntax definitions.

- Square brackets [ ] surround optional items.
- Angle brackets < > surround user-supplied values.
- Percentage sign % represents the regular command shell prompt.
- Pipe symbol | separates mutually exclusive values for an argument.

## 2 Introducing Zenith ARCA Replication

### 2.1 Purpose

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This chapter includes the following topics:

- Breakthrough Replication Software
- Configure Vault
- Configure Scheduler
- Connect to Remote Vault
- ARCA Replication Specifics
- Appendix

### 2.2 Scope

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We will learn how to setup and configure Zenith ARCA Replication. Please see the ARCA Implementation Guide to configure the ARCA for business continuity.

## 2.3 System Organization

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This guide is organized in the following manner:

- Key Features and System Inventory
- Navigating the interface
- Configuration
- Common Tasks

### 3 Change Log

Date	Changes
04.04.2009	Version 1.0.1038 - Document created
04.10.2009	Version 1.0.1039 – added metadata share
04.11.2009	Version 1.0.1040 - Replication updates to collapse files. Added metadata replication options.
04.14.2009	Added section 5.1 - transfer protocol replication with additional explanation and added updated dashboard screens
04.15.2009	Updated Configuration screens
04.23.2009	Added firewall rules and preconfigured user and share information
05.11.2009	Clarified current option – do not select intra-daily files for replication in this model

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## 4 Describing the System

The Zenith ARCA is an all-in-one business continuity appliance which includes all the software and hardware necessary to protect your Windows Server infrastructure. This includes Breakthrough Replication Software to enable replication to other ARCA units in your infrastructure. Replication is one-to-one and can be uni or bidirectional. The number of concurrent connections will vary upon model.

### 4.1 Overview

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The replication features include software from Breakthrough, pre-installed on the ARCA: in the "**C:\Program Files (x86)\Breakthrough**" directory.

Breakthrough's Replication Suite consists of a number of integrated applications which facilitate the automated delivery of backup image files to a remote server.

**BTCopy** - primary application which pushes backup files to a remote server called a vault.

**BTConfig** - configuration utility which defines vaults, server folders, prioritization, notifications, and operational schedules within

**BTLink** – used to connect to and administer the vault. The vault service is in "vault admin mode".

#### Terminology

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**ARCA Souce Server** - system configured with RAID storage, responsible for locally archiving backup images from any number of machines.

**ARCA Destination Server** - system running the primary backup agent which copies files to the target ARCA device.

**Folder** - individual folder on the NAS device where backup files exists for specific Server.

**Root** - root directory where all server folders reside (typically D:\Backups).

**Vault** - remote off-site ARCA, where configured Server Folders are replicated.

**Copy** - off-site replication agent which resides on the local NAS device and communicates with a destination ARCA.

**Schedule** - periodic schedule which defines when the off-site replication process will execute.

**Notification** - executed event which causes an email to be generated.

**Instance** - unique number assigned to BTCopy and BTMail runs for logging and monitoring.

**Key** - activation key used to generate operational license files for BTCopy and BTVault.

**License** - unique license granting authorized use of the application on a specific machine.

## Files

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### Application

BTCopy.exe

BTConfig.exe

BTMail.exe

BTService.exe

BTVault.exe

BTLink.exe

### Support

QtCore4.dll

QtGui4.dll

QtNetwork4.dll

QtSql4.dll

### Configuration

Configuration files and databases are stored under the /config subdirectory.

bt.ini

btcopy.db

btvault.db

### Licensing

Licensing files are created upon activation and stored under the /config subdirectory.

btcopy.lic

btvault.lic

Information files are created upon application execution, and used to generate offline licenses where necessary.

btcopy.inf

btvault.inf

---

## 5 General Operation & Software Specifications

The Breakthrough Replication Suite is specifically designed to do one thing:

To provide for the configuration, prioritization, and replication of selected base image and incremental archive files to an off-site location.

The primary application that performs most of the work is BTCopy. BTCopy performs its tasks based on a configuration stored in the btcopy.db database.

BTConfig is the database management and monitoring application for BTCopy. It's responsible for defining the root backup directory, the vault connection profiles, the specific server folders to be replicated, the replication schedule, and notifications to occur based on success or failure.

### **BTCopy Process**

When BTCopy executes, it reads the currently saved configuration and begins its replication process which includes the following steps:

- Prioritize the server folders
- Query the vaults
- Determine which files need to be replicated
- Sort the files to insure the backup remains sequential
- Transfer each file
- Track any connection or file transfer errors
- Recover from disconnects or early terminations
- Resume files that may be partially transmitted
- Evaluate entire batch for completion
- Run through multiple passes to insure completion
- Terminate

BTCopy returns from execution with one of the following result codes:

- 0 = Success, the process completed without error
- 1 = Failed, some or all of the files were not transferred
- 2 = Aborted, the operation was manually aborted
- 3 = Duplicate, another copy of the process is already running
- 4 = Not Licensed, the license is missing, invalid, or the product is disabled
- 5 = Error, an internal error prevented the application from running when launched from the scheduler

6 = Terminated, the application terminated unexpectedly

Other = any other error is likely due to the application being terminated from the Task Manager, or an internal system failure of some kind.

These result codes can be evaluated by another process that launches BTCopy, including a simple batch file.

BTCopy is not normally launched from the command line, but instead spawned as a child process by the BTService scheduling service.

### **BTService Scheduler**

BTService runs as a background daemon (Windows service) and constantly monitors the current configuration and replication schedule defined in the btcopy.db database. As changes are made and saved to the database by the BTConfig application, BTService automatically refreshes its snapshot of the database and updates all internal settings to run to the new configuration.

Internally, BTService contains a scheduler which runs if the BTCopy license is valid. If the BTCopy license is missing or invalid, BTService will run, but its internal scheduler will stop and wait for the license to validate.

The internal scheduler is responsible for monitoring three schedules and acting on them...

Replication schedule in which BTCopy is executed

Notification schedule in which triggered notifications cause BTMail to be executed

Cleanup schedule in which an internal routine removes aged log and snapshot records in the btcopy.db database and on disk

### **BTConfig - Run and Abort**

Additionally, BTService monitors commands sent from the BTConfig application - specifically the Run and Abort actions under the Activity tab. The Run button will highlight when the scheduler is running but BTCopy is not already running, and the Abort button will highlight when the scheduler is running and BTCopy is already running. Clicking Run will notify the scheduler to launch BTCopy. Clicking Abort will tell the scheduler to send an abort to the BTCopy process. BTConfig and BTService do not monitor BTCopy unless it is executed by the scheduler, which means if BTCopy is executed manually, the BTConfig application will not be aware of its run, and the Run and Abort buttons will be accurate only from the perspective of the BTService scheduler.

### **BT.INI Settings File**

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The BT.INI file is stored under the /config subdirectory and contains system-level settings that affect the functionality of the BT Replication Suite.

Sections in the BT.INI file are defined by application as follows:

[btconfig]

[btcopy]

[btclean]

[btservice]

[btmail]

Each section has settings pertinent to the specific application. The following describes each setting and its available options.

Values are either "true / false" or a number. Each entry below is identified with its default value.

### **[btconfig]**

history-filter = true

Specifies whether the Filter "block" on the History tab of BTConfig is enabled or disabled. When the filter is enabled, sub options determine which log records are displayed in the window.

history-show-copy = true

Specifies whether the filter by "Copy" checkbox is checked.

history-show-mail = false

Specifies whether the filter by "Mail" checkbox is checked.

history-show-clean = false

Specifies whether the filter by "Clean" checkbox is checked.

### **[btcopy]**

copy-attempts = 10

Specifies the number of attempts to execute on a batched transfer of multiple folders and files before terminating.

copy-retries = 3

Specifies the number of connection retries to attempt on a disconnect or failed connection.

copy-delay = 10

Specifies the number of seconds to wait between connection attempts.

timeout-login = 5

Specifies the number of seconds to wait before timeout during a login command to the vault.

timeout-directory = 45

Specifies the number of seconds to wait before timeout during a directory command to the vault.

timeout-stream = 5

Specifies the number of seconds to wait before timeout during a stream command to the vault.

output-snp = true

Instructs the application to generate snapshot files in the /copy/snaps directory.

output-xml = false

Instructs the application to generate a run-time xml snapshot in the /copy/xml directory.

output-log = false

Instructs the application to append transfer transactional information to date-stamped logs files in the /copy/logs directory.

output-err = false

Instructs the application to append error information to date-stamped error files in the copy/errors directory.

#### **[btclean]**

days = 30

Number of days to keep when the cleaner runs. The cleaner will remove all historical files on disk as well as log entries from the btcopy.db.

enabled = true

Enables or disables the internal cleaner.

#### **[btservice]**

btcopy-output = false

Determines if btcopy output capture is enabled, and written to btcopy\_(instance).out files in the /service/output directory.

btmail-output = false

Determines if btmail output capture is enabled, and written to btmail\_(instance).out files in the /service/output directory.

running-wait = 10

Delay in seconds between execution attempts if targeted process is already running.

duplicate-wait = 3600

Delay in seconds between execution attempts if target process returns with a Duplicate result code, indicating a manual process is running.

terminated-retries = 3

Number of attempts to retry process execution in the event of a code-level exception.

event-base-id = 1000

Base value for Event Id numbers recorded to the Windows Event Log when event notification are enabled.

btclean-force = true

Manual override to force cleaner to execute immediately. Upon execution, this entry will be automatically removed from the BT.INI file.

#### **[btmail] – NOT USED**

archive-sent = false

Enables archiving of sent email notifications to the /mail/sent directory as standard .eml files.

archive-failed = true

Enables archiving of failed email notifications to the /mail/failed directory as standard .eml files.

archive-session = false

Enables archiving of the full SMTP session to the /mail/session directory as an output (.out) file.

## 5.1 Protocol Settings

---

There are three supported protocols in the system: BTP, TCP, & UDP. For most networks, two protocols are recommended, BTP (default) and TCP.

BTP is the default and usually performs the best. It's a high-performance protocol that constantly monitors the best route to move data over the wire in real-time, and it can outperform TCP by a factor of 10 to 1 if bandwidth is available. If operated un-throttled, it will usually reach the maximum throughput of the connection (minus any other streams on the wire). It is moderately aggressive and fair to other streams.

TCP is the simplest but also the slowest. It works best over low-bandwidth connections where you want minimal operational overhead at both ends. If you're uploading over slow connections (< 1 Mbps) and you require very high concurrency at the Vault side (50, 100, 200+ connections in parallel), TCP works best because it requires the least amount of CPU horsepower. It's not aggressive and very fair to other streams.

UDP is a third option, but requires inbound ports at both ends. This setting requires a higher level of configuration and requires more CPU overhead to transfer data at high speed. It's designed for connections with very high latency (> 200ms) and lots of bandwidth to exploit over that connection. UDP is almost always used between two data centers when replicating data over a high-latency intercontinental connection. It's very aggressive and not fair to other streams.

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**Note:** To estimate the maximum BTP transfer speed: Base it on the theoretical max throughput of TCP, which can vary from machine to machine and operating system to operating system.

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On "most systems", BTP will operate at a max throughput based on this formula:  $2621440 / \text{ping (in seconds)} = \text{bps}$ .

So if you're transferring over the wire with a 20 ms ping, BTP can transfer up to  $2621440 / 0.020 = 131072000 \text{ bps} = 131 \text{ Mbps}$ .

Similarly, if you're transferring over the wire with a 100ms ping time, BTP can transfer up to 26 Mbps.

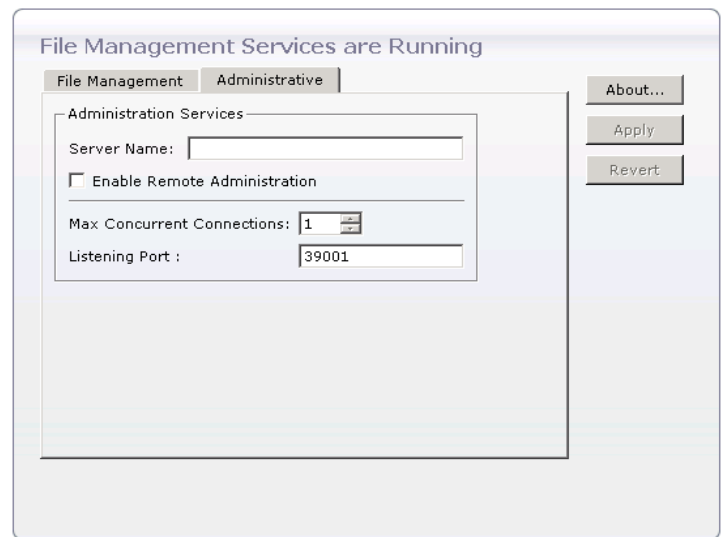
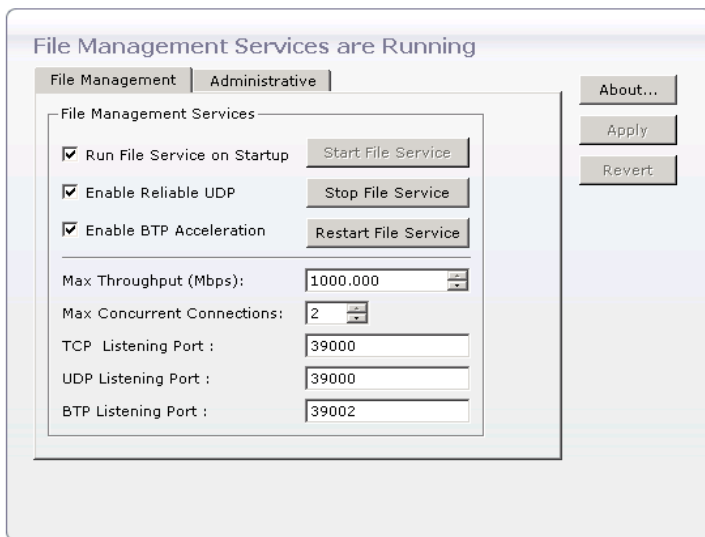
Again, this is based on "most systems", if you're replicating server to server with the same OS versions, which you are in this case, you may be able to go up to 2 times faster than those numbers. Those are the minimums.

In the end, BTP will almost always fill up the wire, but it will do it smartly, and fairly, and allow other streams to operate concurrently. TCP is for slow DSL upload connections where you don't want the overhead and you don't need the speed. UDP is for special circumstances where latency is high and line quality is poor.

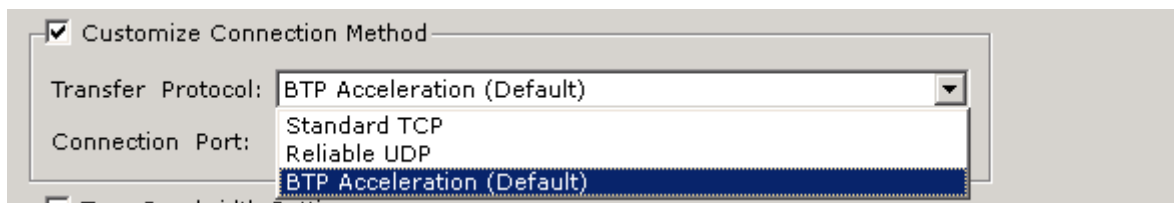
## 5.2 Firewall Rules

To enable ARCA Replication through a firewall, allow the following ports. Port settings depend on the transfer protocol selected.

- **BTP Protocol - default**
  - 39002 (TCP)
  - 39100-39120 (TCP)
- **TCP Protocol**
  - 39000 (TCP)
  - UDP Protocol
- **UDP Protocol**
  - 39000 (UDP)
  - 39100-39120 (UDP)



Vault Side Settings



Configuration Side Settings

## 6 Configuring Replication

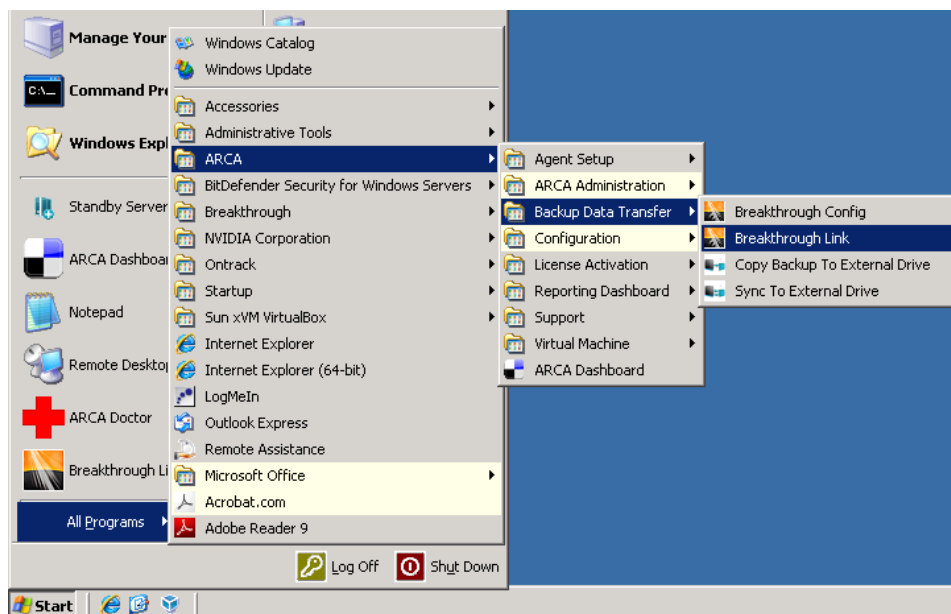
In this section we will configure the ARCA Replication Software, Breakthrough. We will configure the vault and schedule replication through the Breakthrough Config utility. We will also go over manually connecting to the vault and moving files manually.

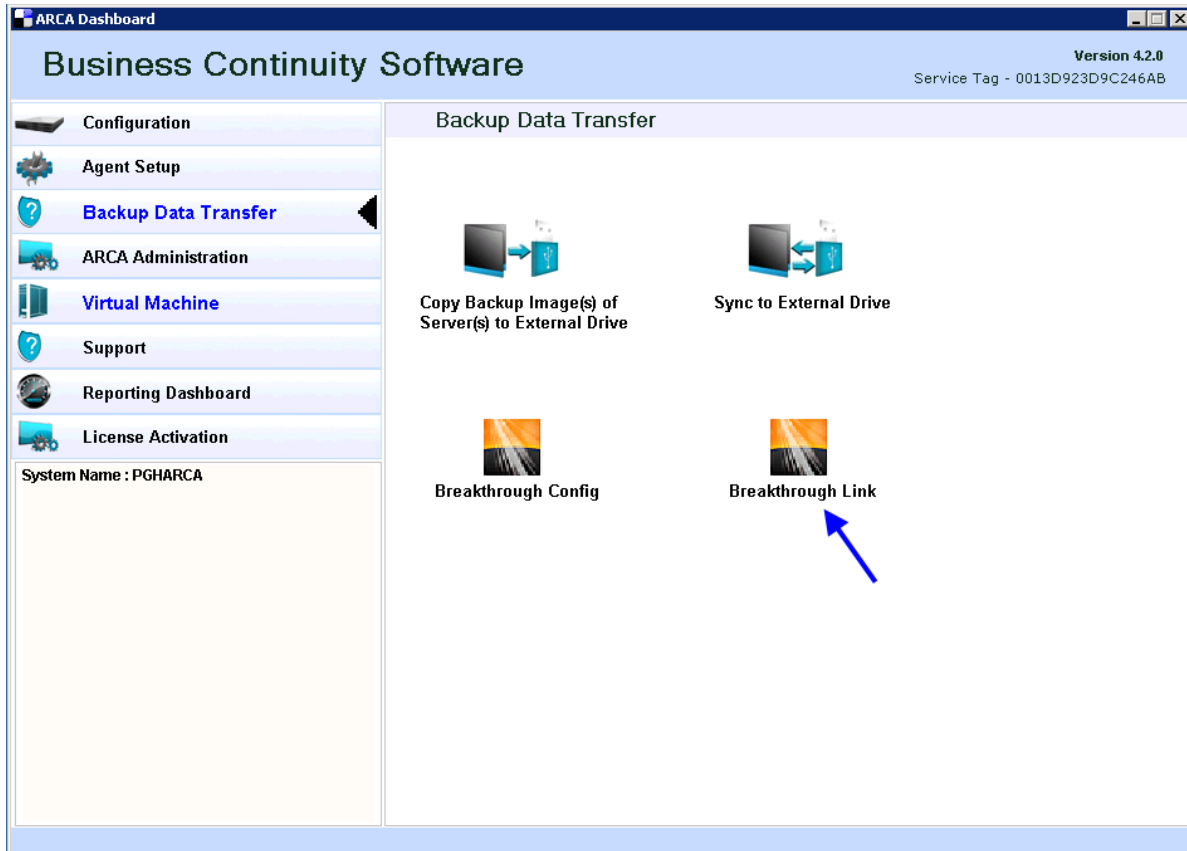
### 6.1 Vault

To start ARCA replication, the vaulting software component must be configured first. The software used to administer the vault is Breakthrough Link. From here you will configure user accounts and shares.

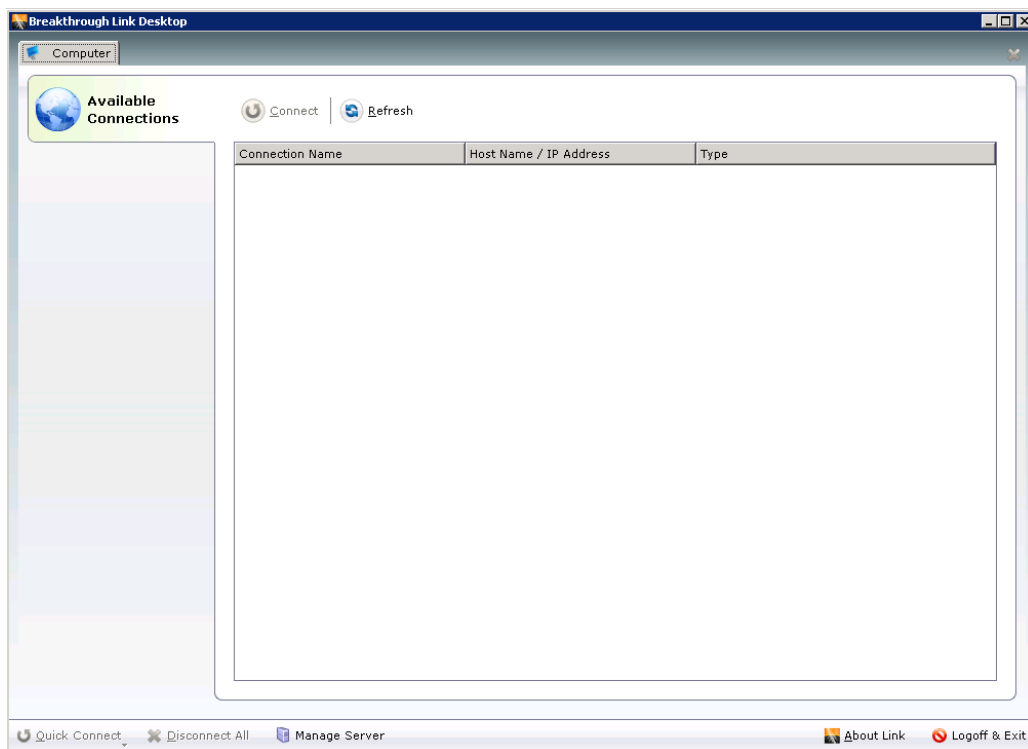
To administer the Vault you must login to the ARCA via an administrative account. The “Breakthrough Vault” service will be installed and should be in a “Started” state on any ARCA that is licensed and configured for vaulting. The service runs under the “Local System” account. If this service is stopped, server shares will be disabled and replication will fail.

- Ensure the “Breakthrough Vault” service is started.
- Launch “Breakthrough Link” from Start > All Programs > ARCA > Backup Data Transfer > Breakthrough Link. You can also access this through the ARCA Dashboard under the Backup Data Transfer section.

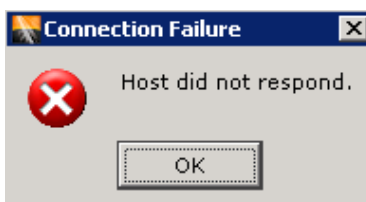


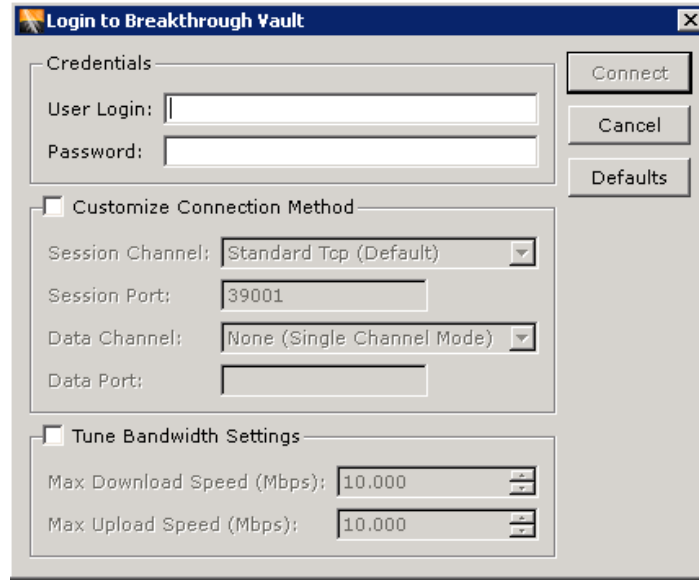


- The launches “Breakthrough Link”.

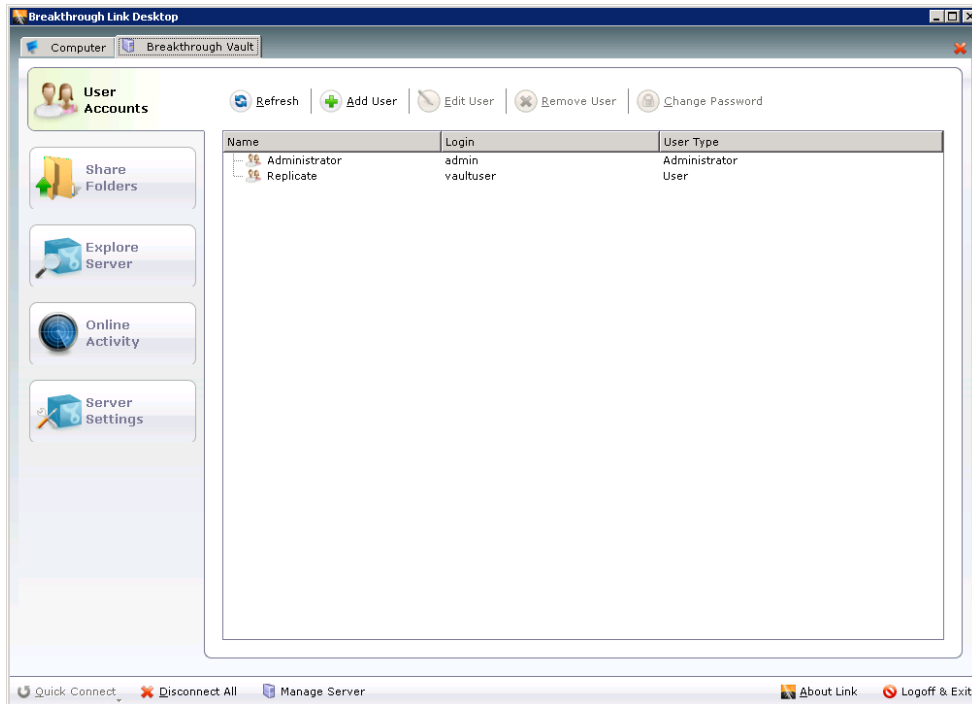


- Click “Quick Connect” button to connect to existing vaults.
  - Click “Disconnect All” to disconnect from all vault connections.
  - Click “Manage Server” to manage the local vault. If the vault component is not licensed this option is not available.
- 
- In this section we are managing the local vault. Click “Manage Server”.
  - If the “Breakthrough Vault” service is not running, you will receive a “Host did not respond” error and you will be prompted to login to an existing vault. The vault service runs under “Local System”.





- If connection is successful Breakthrough Link connects to the local vault service in admin mode.



### 6.1.1 User Accounts

- “User Accounts” will be the first screen displayed.

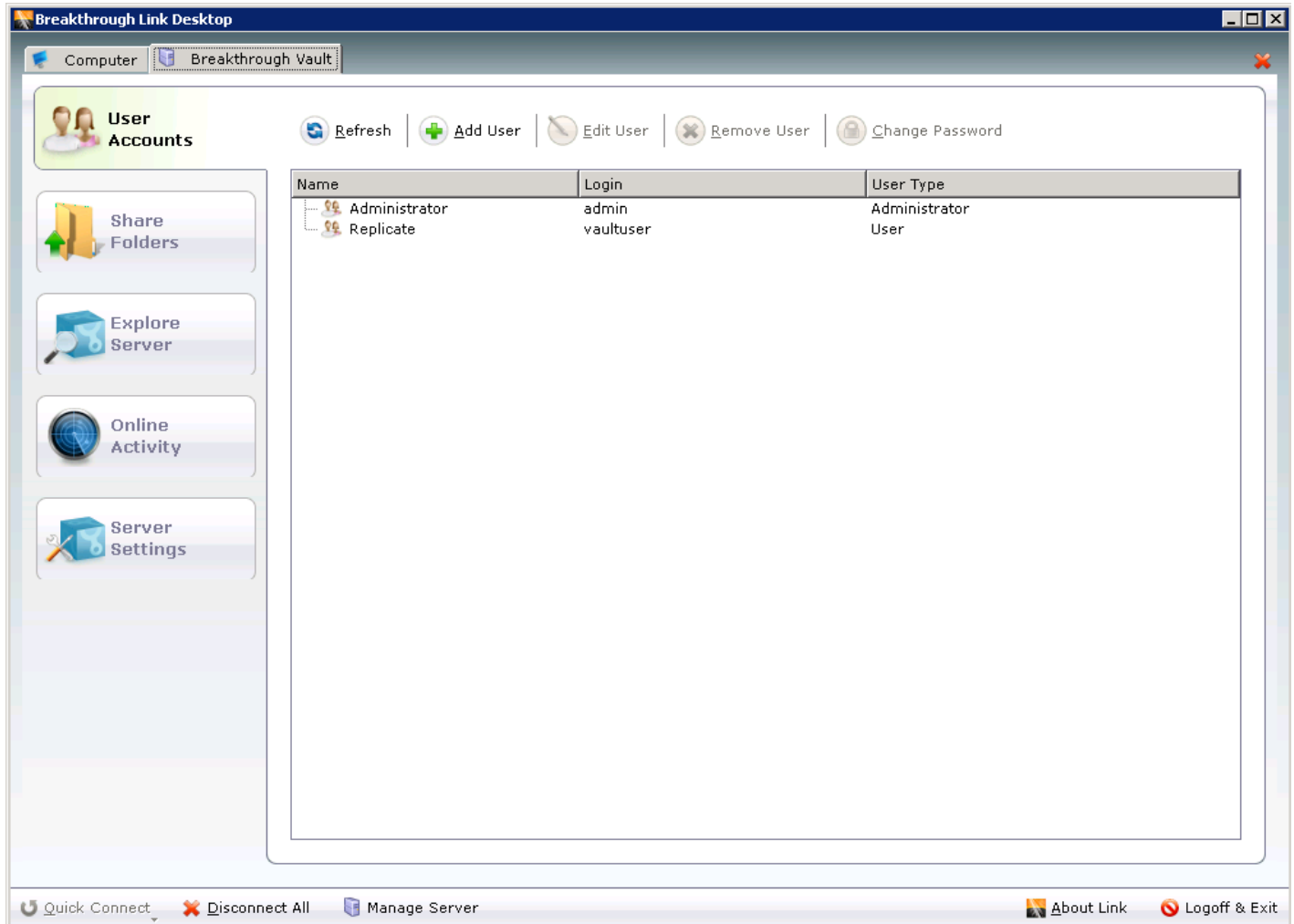
- a. The default vault user accounts are “Administrator” and “Replicate”. Use the “Replicate” account for replication.
- Administrator is a local vault account only. By default this account is restricted to the local system and has no password.
- Replicate is a predefined account used for replication. Default credentials:
  - Username: vaultuser
  - Password: vaultuser

The screenshot shows the 'Edit User' dialog box with the following details:

- User Name:** Replicate
- Rights:**
  - Account Enabled
  - Administrator
- Credentials:**
  - Login:** vaultuser
  - Password:** [Empty field]
  - Confirm Password:** [Empty field]
- Require Secret Code:** 
  - Secret Code:** [Empty field]
  - Generate** button
- Restrict Throughput:** 
  - Max Inbound Speed (Mbps):** 10,000
  - Max Outbound Speed (Mbps):** 10,000
- Restrict Access:** 
  - IP Addresses
  - MAC Addresses
  - License Numbers
  - Add IP** button
  - Add MAC** button
  - Add License** button
  - Remove** button
  - Remove All** button

### 6.1.1.1 Recommended user settings

- i. Use the “Replicate” account.
  - ii. This account is preconfigured on each ARCA specifically for replication tasks.
- To navigate the different options click each individual button.



### 6.1.1.2 Add Users

Adding Users is not a requirement. We recommend use the “Replicate” account.

- Click “Add User” button and fill out the required information. You can enable and disable the account, enable administrator access, provide credentials, restrict throughput, and restrict access by IP and MAC Address.
  - Click “OK” to create the user account.

- If you do want to create an account at this time click “Cancel”.

**Add User**

User Name: test

OK

Cancel

Rights

Account Enabled  Administrator

Credentials

Login: test

Password: ●●●●

Confirm Password: ●●●●

Restrict Throughput

Max Inbound Speed (Mbps): 10.000

Max Outbound Speed (Mbps): 10.000

Restrict Access

IP Addresses

MAC Addresses

License Numbers

Add IP

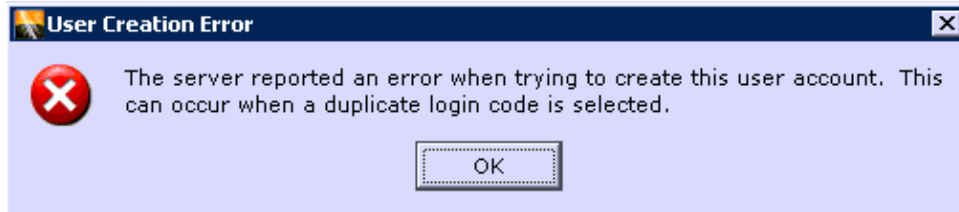
Add MAC

Add License

Remove

Remove All

- Types of user accounts:
  - User
  - Administrator (user is logged in with admin mode to vault – no difference)
- If you attempt to create an account with the same “Login” name of a user that already exists, you will receive a “User Creation Error” prompt. A duplicate user will not be created.



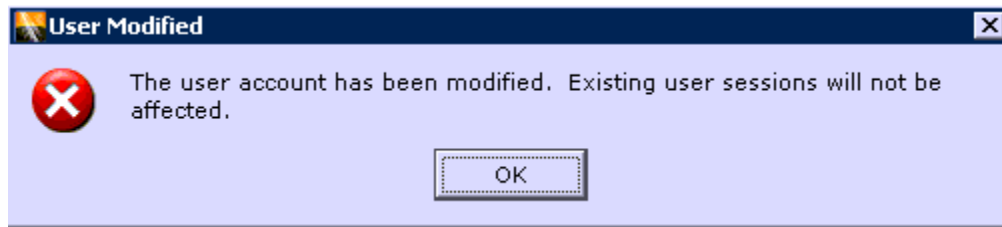
### 6.1.1.3 Edit Users

- After a user is created, double click or click "Edit User" to edit details.
  - Make any changes and click "OK" to confirm. You will receive a "User Modified" prompt after the change is applied.
  - Click "Cancel" to disregard changes.

A dialog box titled "Edit User" with a close button (X) in the top right corner. It contains several sections:

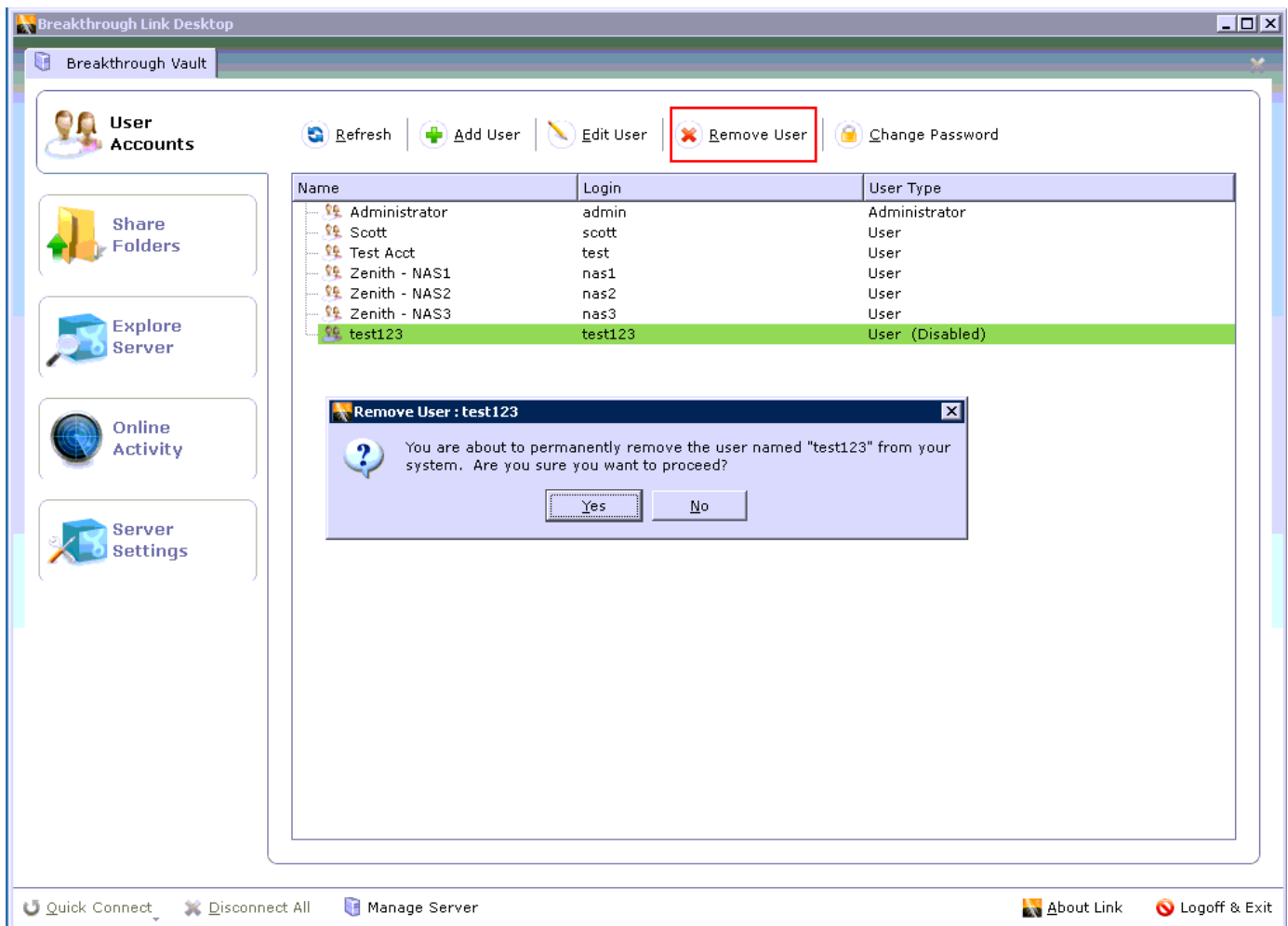
- User Name:** A text field containing "Test Acct".
- Rights:** A section with two checkboxes: "Account Enabled" (checked) and "Administrator" (unchecked).
- Credentials:** A section with three text fields: "Login" (containing "test"), "Password", and "Confirm Password".
- Restrict Throughput:** A section with a checked checkbox and two spinners: "Max Inbound Speed (Mbps)" and "Max Outbound Speed (Mbps)", both set to "10.000".
- Restrict Access:** A section with a checked checkbox and a list box containing "IP Addresses", "MAC Addresses", and "License Numbers". To the right of the list box are five buttons: "Add IP", "Add MAC", "Add License", "Remove", and "Remove All".

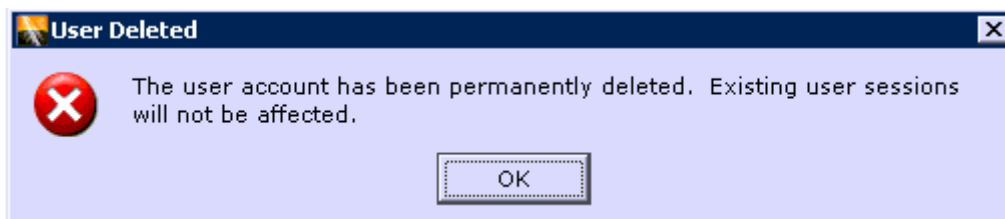
On the right side of the dialog, there are "OK" and "Cancel" buttons.



#### 6.1.1.4 Remove Users

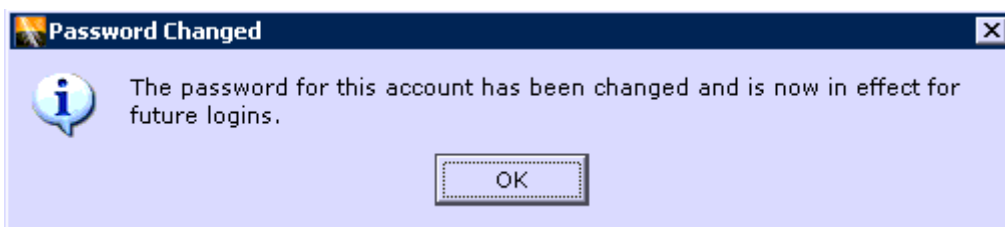
- Highlight the user for removal and click "Remove User".
  - Click "Yes" to confirm, you will receive a "User Deleted" prompt after the account is deleted.
  - Click "No" to cancel





### 6.1.1.5 Change Password



- Highlight the user account and click "Change Password"
  - Type and confirm the new password, click "OK". You will receive a "Password Changed" prompt after the change completes.



- If you do not want to change the password click "Cancel".

## 6.1.2 Share Folders

### 6.1.2.1 Required share folders settings – these shared folders are preconfigured

Share Description	Folder Location	Custom Name
 Replica	D:/Replica/	
 ReplicaMetadata	D:/ReplicaMetadata/	meta

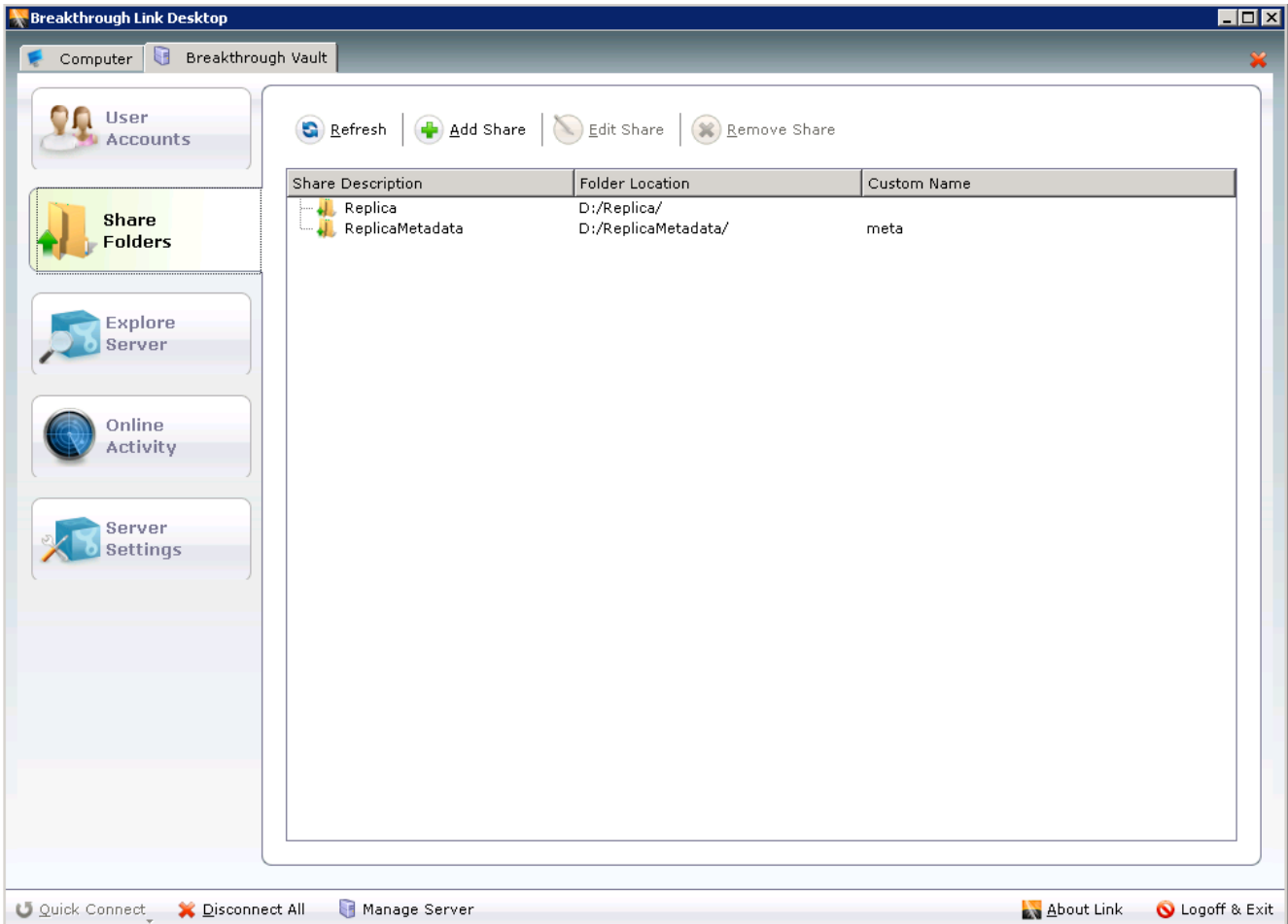
- On each ARCA there are 2 replicated folders and corresponding shares.
  - Replica – replica of D:\Backup (backup files)
  - ReplicaMetadata – replica of D:\Metadata (MD5 checksum for backup files)

---

**Warning:** Two shares must be created to match the replicated folder destinations.

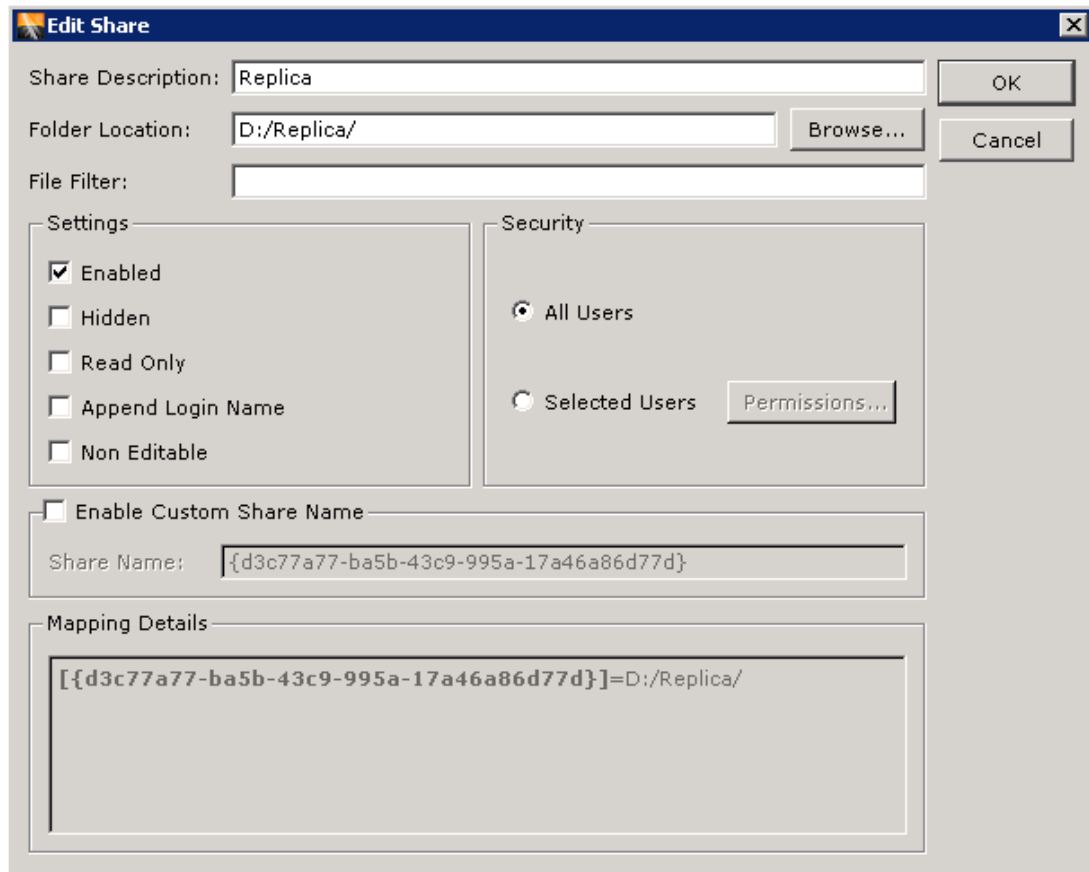
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- ARCA replication – shares - names match replica folders.
  - “Replica”
  - “ReplicaMetadata”



### 6.1.2.2 Share Folders – Add, edit, and remove vault shares (we do not recommend changing share settings)

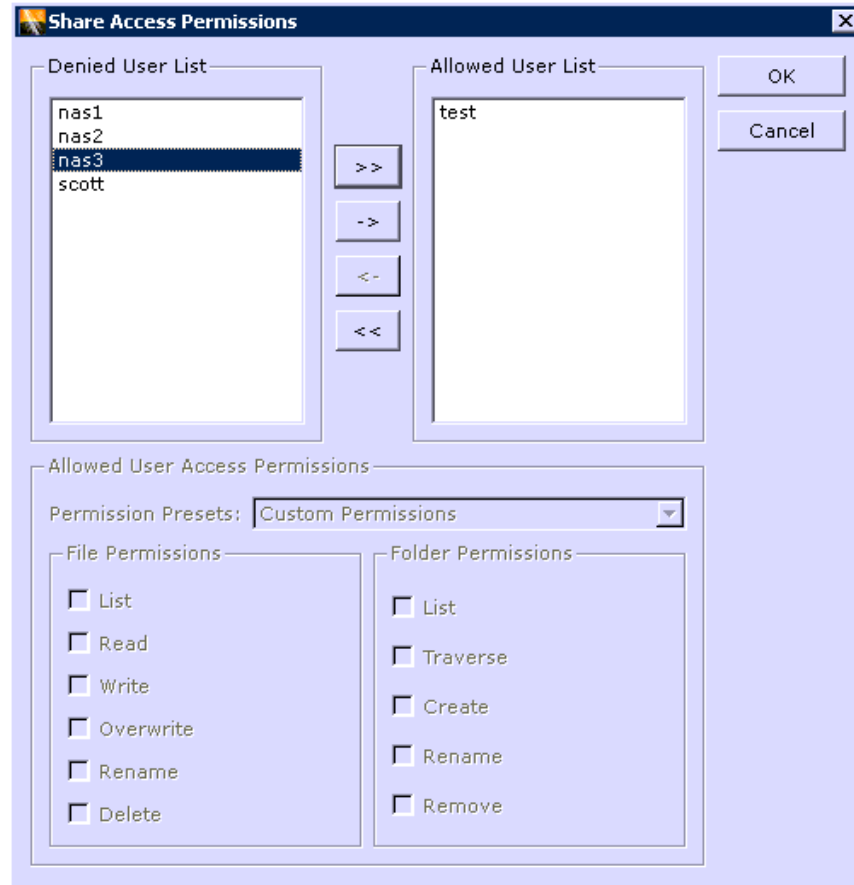
- Add Share – click “Add Share” button. This brings up the “Add Share” window.
  - Click “OK” after all attributes are defined to create share.
  - Click “Cancel” if you do not want to create a share at this time.



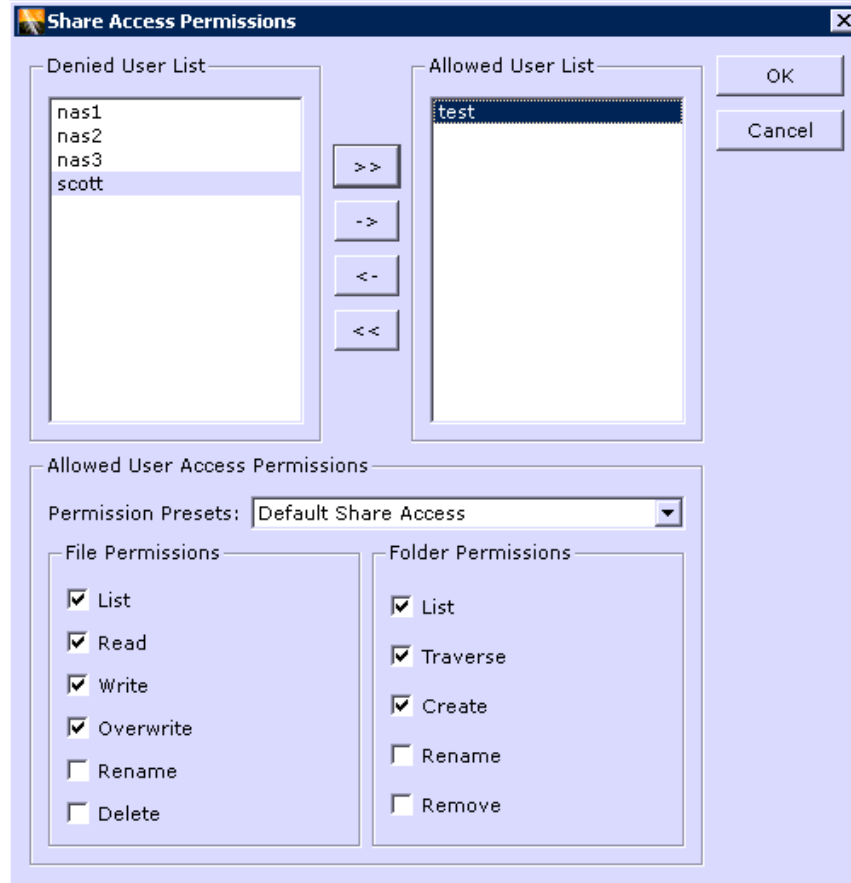
#### 6.1.2.2.1 Share Settings

- Share Description
  - **Replica**
  - **ReplicaMetadata**
- Folder Location – this will be the vault destination directory
  - **D:\Replica**
  - **D:\ReplicaMetadata**
- File Filter – filter for file conditions to replicate to the share, please leave this setting blank for proper backup chain replication – **Do not use this setting**
- Settings
  - Enabled – enable/disable vault share
  - Hidden – enable hidden share attribute (**enable for ReplicaMetadata share**)
  - Read Only – enabled read-only attribute
  - Append Login Name – appends login name to vault share path – **Do not use this setting**

- Security – the account used to authenticate to the share must have “**Default Share Access**”
  - All Users – all vault users have access to the share
  - Selected Users – only selected user have share access
    - To modify, choose this option and click the “Permissions” button.
    - By default all users are denied access to the share.
    - You can change the user permissions in one of two ways. The arrow buttons will be grayed out in one direction if no users are in the list:
      - Double-click the user name (moves denied to allowed and vice-versa)
      - Highlight the user and click “->” to moves user to allow
      - Highlight the user and click “<-“ to moves user to denied
      - Click “>>” to move all users from denied to allowed
      - Click “<<” to move all users from allowed to denied



- After a user is moved to “Allowed” highlight the user to define custom permissions. The “Allowed User Access Permissions” options are activated.

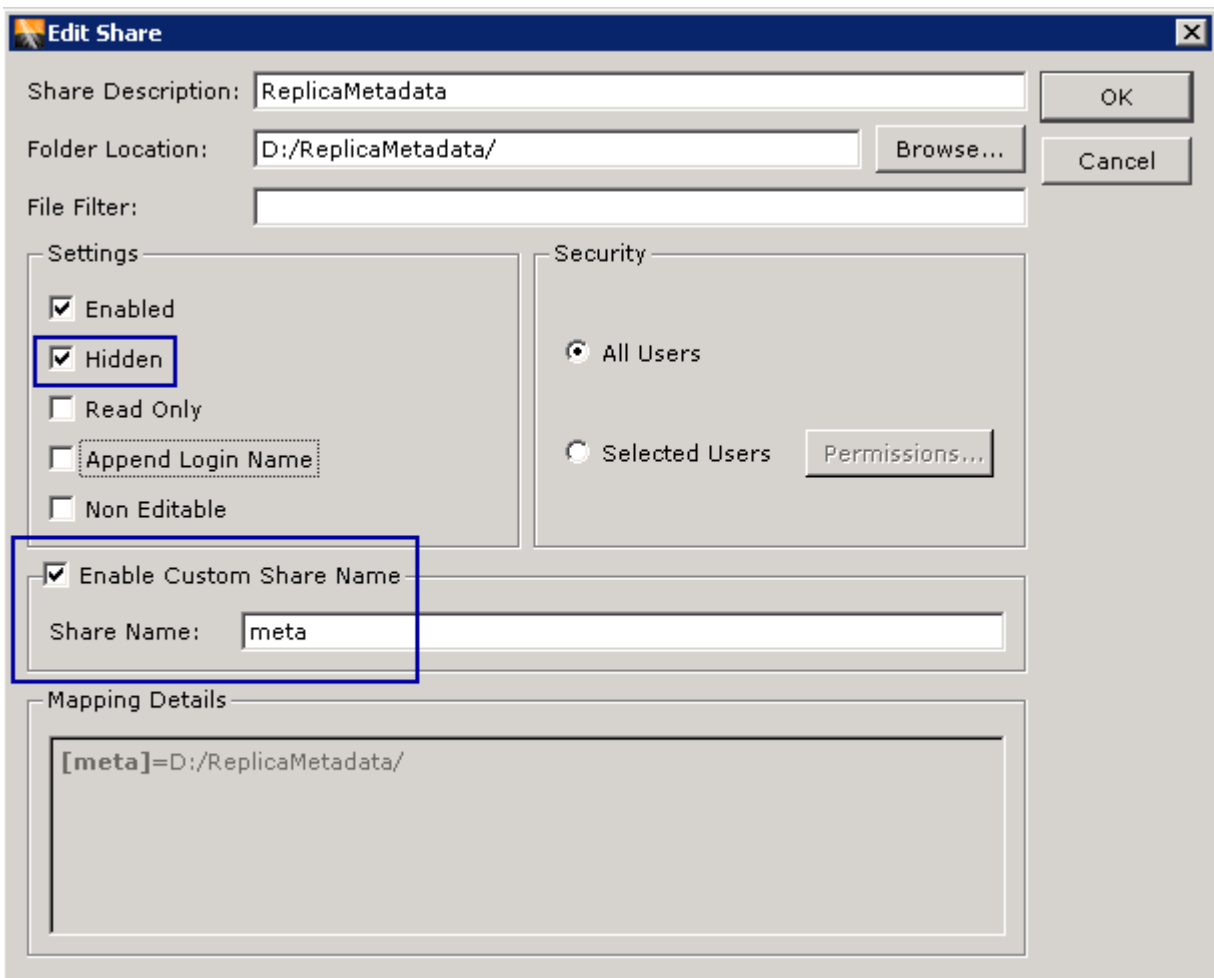


- Permissions can be defined via Permission Presets or Custom (Checking and un-checking individual attributes will change preset to custom). The default setting is “Default Share Access”.
  - **Browse** (List files, List & Traverse folders)
  - **Contribute** (List, Read, Write files, List & Traverse folders)
  - **Custom Permissions** (none - check and uncheck individual attributes)
  - **Default File Access** (List, Read, Write, Overwrite files, no folder access)
  - **Default Folder Access** (no file access, List, Traverse, Create folders)
  - **Default Share Access** (List, Read, Write, Overwrite files, List, Traverse, Create folders)
  - **Download Only** (List & Read files, List & Traverse folders)
  - **Full File Access** (all file permissions, no folder permissions)
  - **Full Folder Access** (no folder permissions, all file permissions)
  - **Full Share Access** (full file & folder permissions)
  - **Publish** (List, Read, Write Overwrite files, List & Traverse folders)
  - **Upload Only** (List & Write files, List, Travers, Create folders)

### Settings

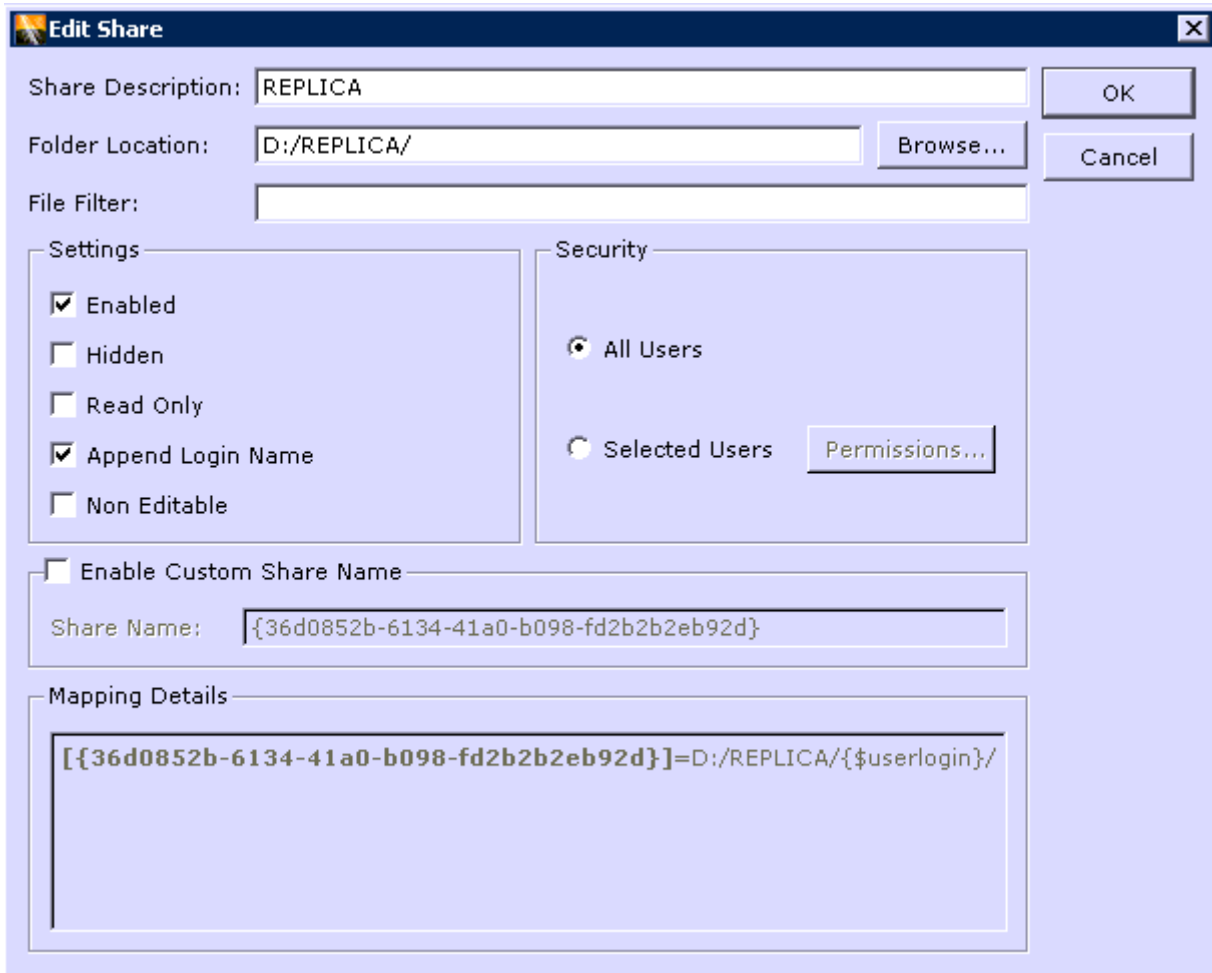
- Enable Custom Share Name – define a custom share name

**Warning:** This setting is REQUIRED for ReplicaMetadata share, custom name “**meta**”. The client side configuration relies on this custom share name to replicate the MD5 files. The “Hidden” setting is also required.

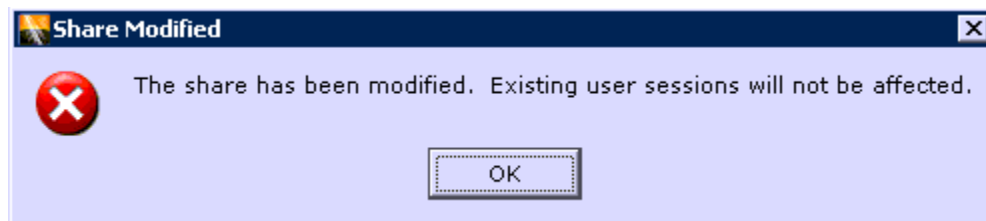


### 6.1.2.3 Edit Share

- Edit Share attributes, double-click the shared name or click the “Edit Share” button to edit share.



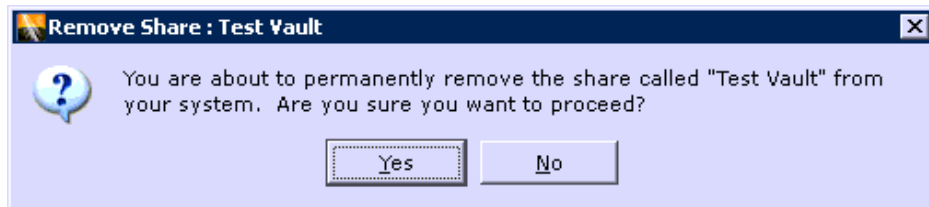
- Click “OK” to apply changes. You will receive a “Share Modified” when modification is complete.



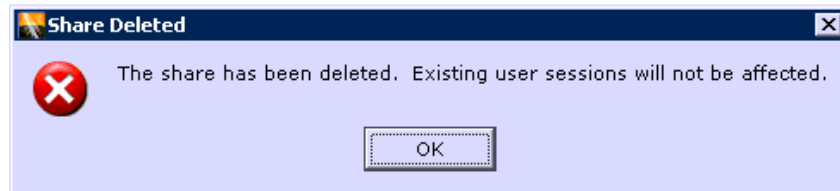
- Click “Cancel” to disregard changes

#### 6.1.2.4 Remove Share

- Removes selected share, highlight share and click “Remove Share”. If shares are removed replication will stop.
- Click “Remove Share”, you will receive the confirmation prompt below to confirm.

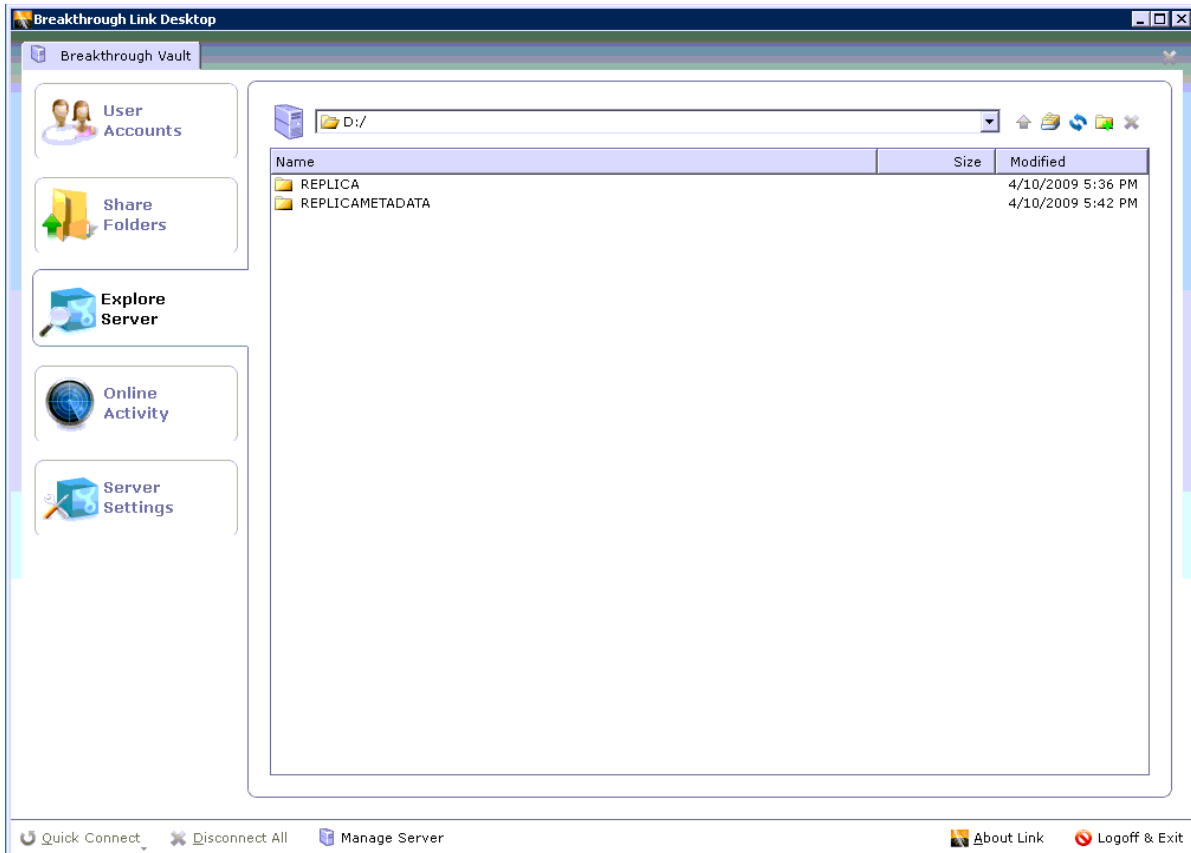


- After the share is deleted, you will receive a “Share Deleted” prompt.
- Deleting the share does not remove the underlying file structure.



## 6.1.3 Explore Server

- Browse the shares and view the file and folder vault structure



- Navigate using the buttons or via the drop-down arrow
- Buttons (left to right)



- Move Up to Parent Directory
- Show/Hide Folders (shows file
- Refresh Directory
- Create Folder
- Delete File (activated when a directory or file is selected)
  - Be careful with this option, do not delete dependent chain files or you will break the replicated backup chain. Missing files will be replicated from the source if available.
- Double-click a folder name to drill down

## 6.1.4 Online Activity

- View live local and remote connections to the vault.

The screenshot shows the 'Breakthrough Link Desktop' interface. On the left, there are navigation buttons: 'User Accounts', 'Share Folders', 'Explore Server', 'Online Activity', and 'Server Settings'. The main area displays a table of online activity with a 'Refresh' button above it. The table has columns for 'Service/Login', 'From Remote', 'To Server', 'Inbound Speed (Bytes)', 'Outbound Speed (Bytes)', and 'Online Since'. The data is as follows:

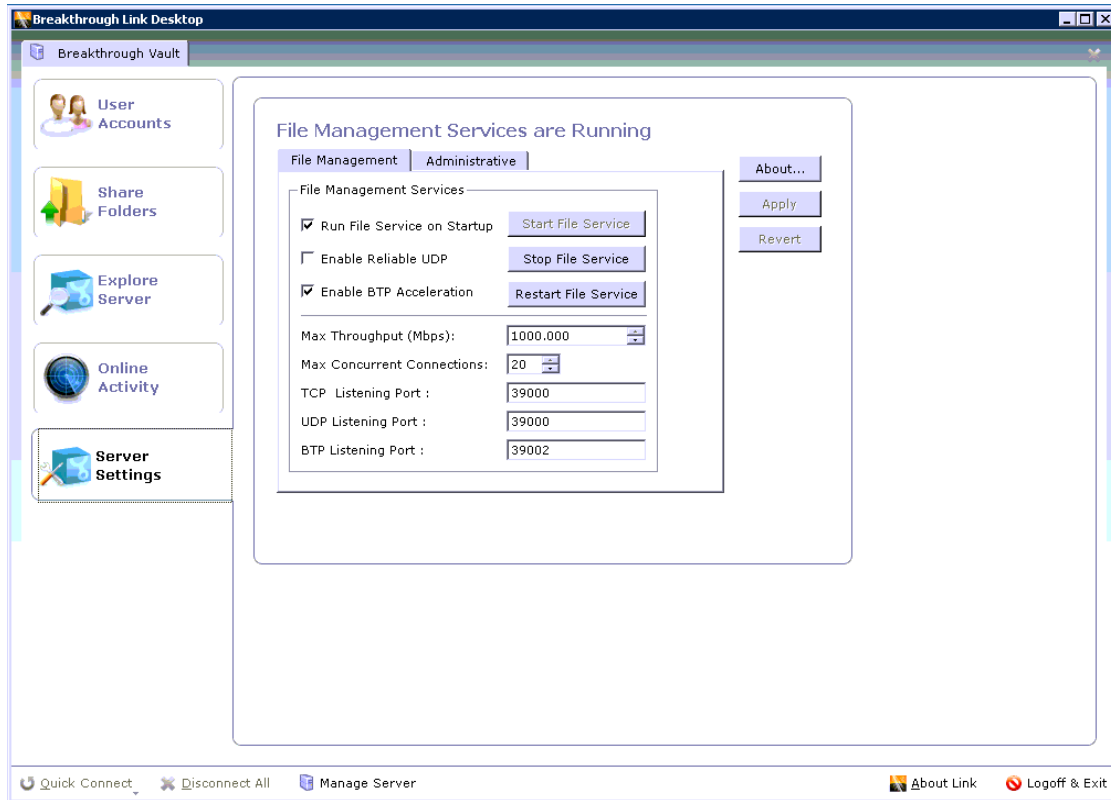
Service/Login	From Remote	To Server	Inbound Speed (Bytes)	Outbound Speed (Bytes)	Online Since
Administrative Services					
admin	127.0.0.1	127.0.0.1	0.000 Mbps (9,919 KB)	0.000 Mbps (121,273 KB)	Wed Mar 25 0
File Management Services					
nas1	98.210.96.155	192.168.194.217	1.219 Mbps (1,561,563 KB)	0.000 Mbps (574 KB)	Wed Apr 1 14
nas2	123.108.33.51	192.168.194.217	0.542 Mbps (399,713 KB)	0.001 Mbps (367 KB)	Wed Apr 1 14

At the bottom of the window, there are buttons for 'Quick Connect', 'Disconnect All', 'Manage Server', 'About Link', and 'Logoff & Exit'.

- Service/Login** – admin (local) and file management services (remote ARCA connection)
- From Remote** - source IP addresses
- To Server** - destination IP addresses
- Inbound Speed (Bytes)** – speed of inbound connections in bytes
- Outbound Speed (Bytes)** - speed of outbound connections in bytes
- Online Since** – timestamp of last successful connection to vault

## 6.1.5 Server Settings

- Configure global system settings



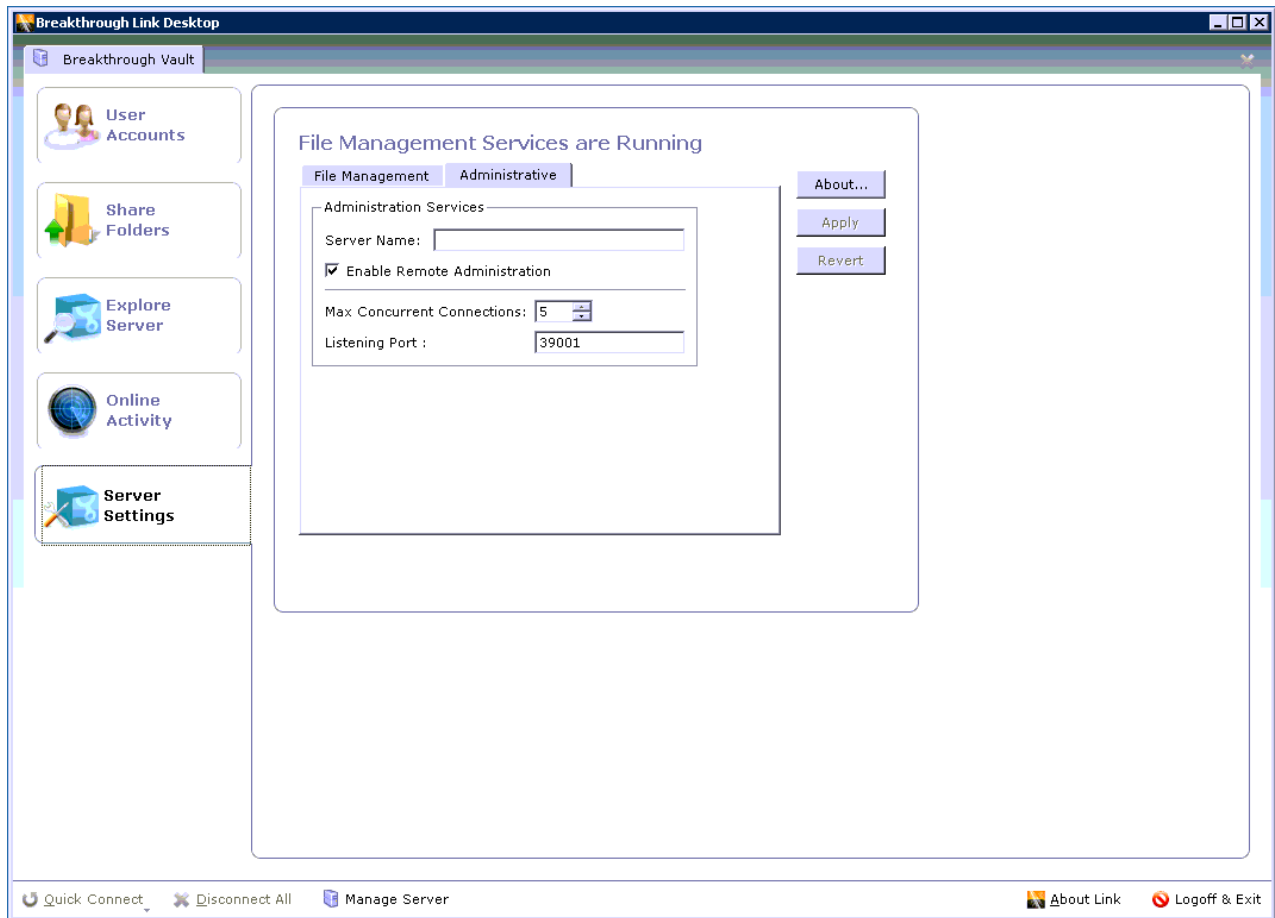
- File Management and Administrative tabs. These settings can be customized to your environment.

### 6.1.5.1 File Management

- Start/Stop/Restart File Services, change bandwidth and port settings.
  - Ensure the following options are selected. If the port settings are changed, you must update them on the client side.
    - Run File Service on Startup
    - Enable BTP Acceleration
    - Max Throughput (Mbps) – set this depending on your bandwidth
    - Max Concurrent Connections: 2, 5 or 25 depending on model
    - Default ports
      - UDP: 39000 (management port)
      - BTP Listening Port: 39002

### 6.1.5.2 Administrative

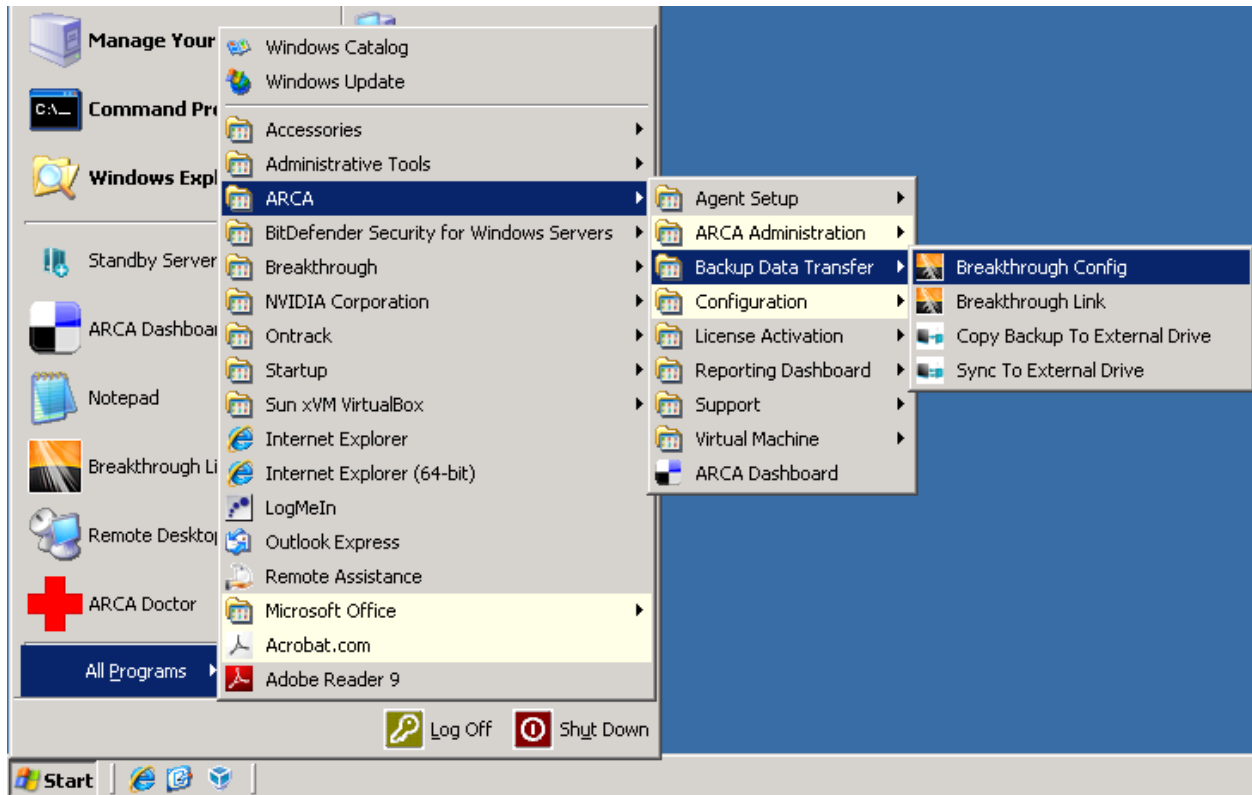
- Server Name and connection settings.

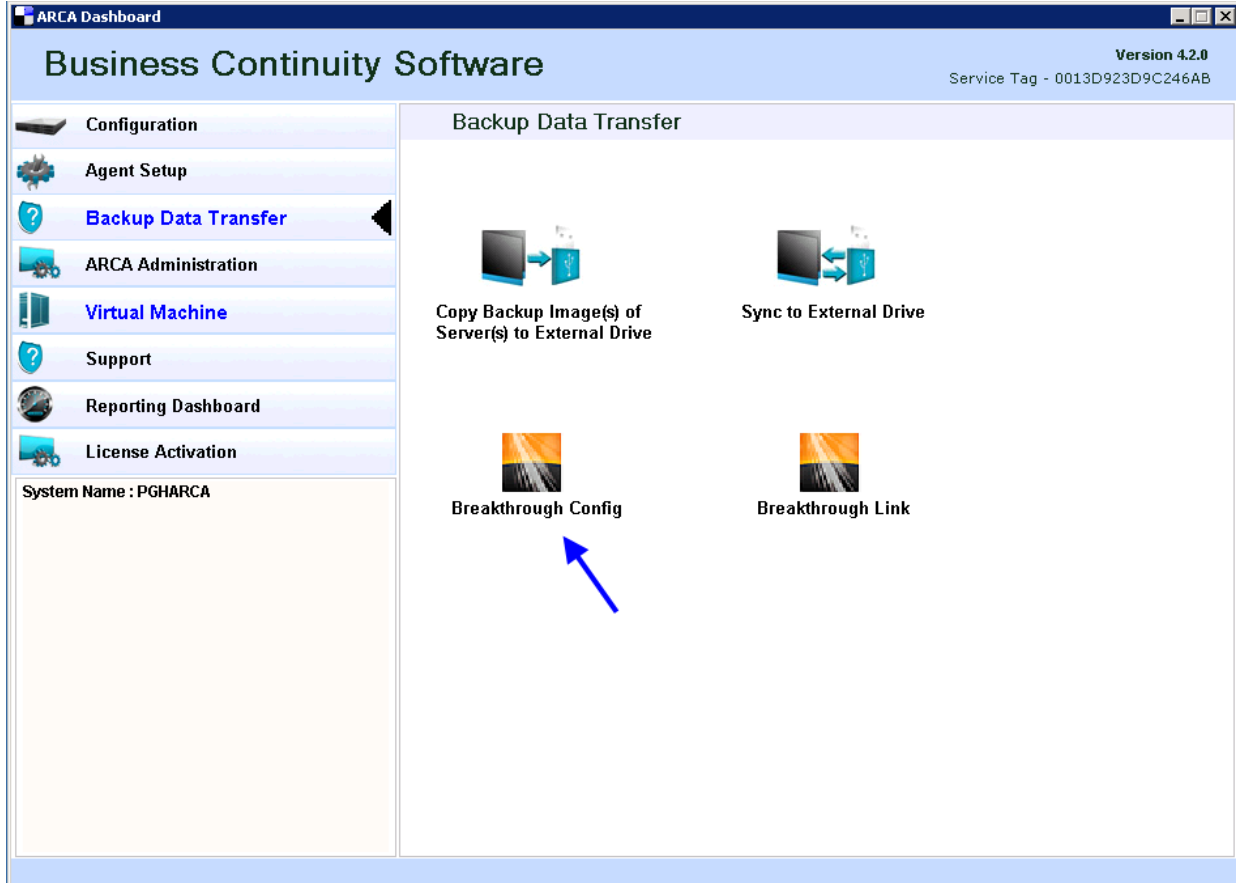


## 6.2 Scheduler

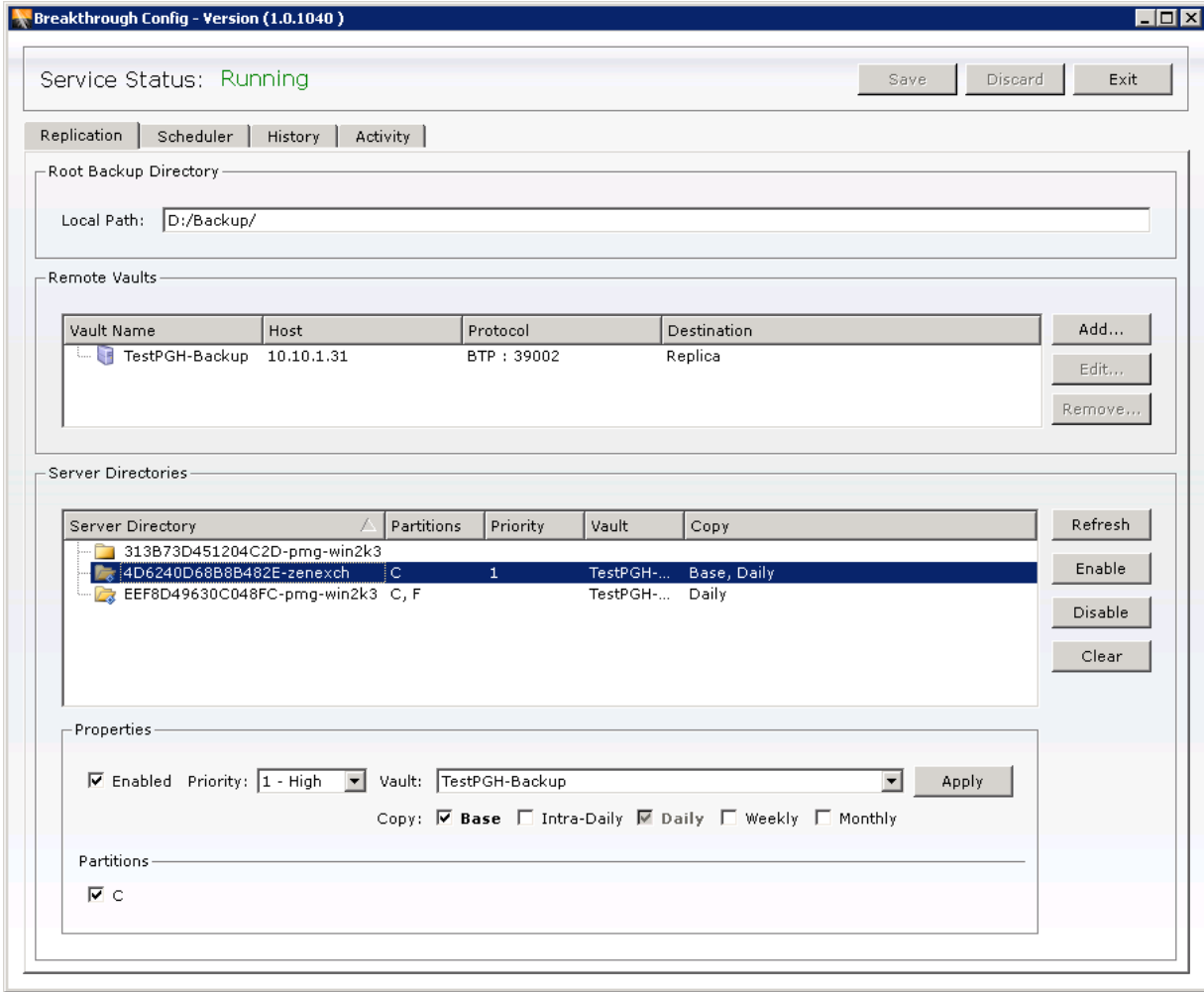
After the vault is configured, you must configure the replication source. This is accomplished through Breakthrough Config. To configure replication you must login to the ARCA via an administrative account. The "Breakthrough Scheduler" service will be installed and should be in a "Started" state. The service runs under the "Local System" account. If this service is stopped, scheduled replication will not occur. Data is replicated by server (backup chain).

- Ensure the "Breakthrough Scheduler" service is started.
- Launch "Breakthrough Config" from Start > All Programs > ARCA > Backup Data Transfer > BreakthroughConfig. You can also access this through the ARCA Dashboard under the Backup Data Transfer section.





- The launches “Breakthrough Config”. Replication options are defined here. The first tab “Replication” is displayed. To navigate the interface, select the individual tabs.



## 6.2.1 Replication

- Define Replication Settings

### 6.2.1.1 Root Backup Directory

- The Root Backup Directory is static.
  - **D:\Backup** (backup files)



**Note:** **D:\Metadata** (MD5 checksum for backup files) replication occurs automatically to the vault ReplicaMetadata share without additional configuration. This is dependent upon the custom share name being set correctly to “meta”.

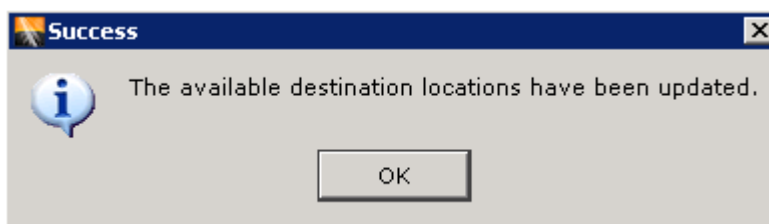
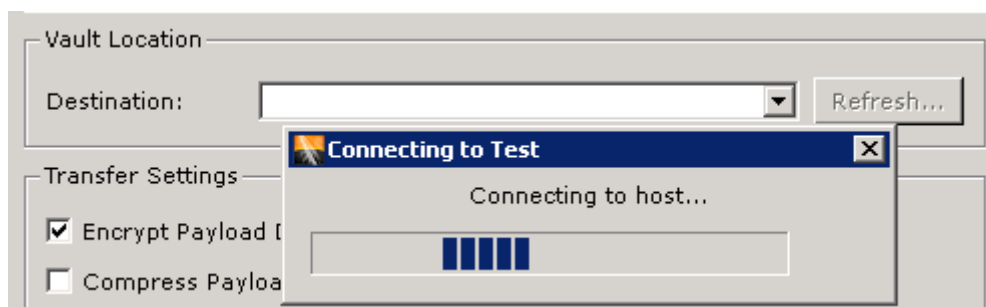
### 6.2.1.2 Remote Vaults

- Add individual vaults as defined in section [5.1 Vault](#). Multiple vaults can be added.
  - After your backup directory is defined, you must add your remote vault. You can also Edit and Remove Vaults.
  - To add a vaults click “Add”. The “Add Vault” window opens.

- Define the following
  - Name of Vault – This can be any name you specify
  - Host Address – IP or Fully Qualified Domain Name (FQDN) of the vault
  - User Login – vault user name

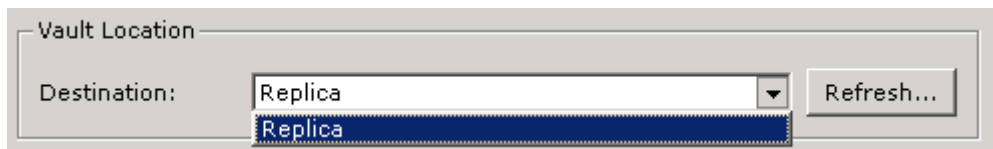
- Password – vault password
- After the above values are specified the “Refresh” button activates.
- Vault Location: Destination – to connect to the vault click “Refresh”. This will pull the connection data to your vault and defined vault shares will be listed.

**Note:** Select the defined vault share that was configured with “Replica” as the destination.

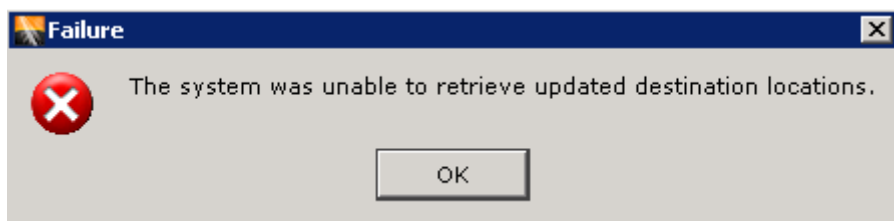


**Note:** On the destination vault 2 shares were created, “Replica” and “ReplicaMetadata”. Choose “Replica”. The “ReplicaMetadata” share should be set to “hidden” and will not be available in the drop-down. The “Metadata” source files will be replicated to the “ReplicaMetadata” share along with the backup files without additional configuration.

- Click the down arrow to select a vault share.



- If the connection fails, you will receive a “Failure” prompt.
- Verify vault settings and retry.



---

**Note:** Multiple vault shares will appear in this list if they have been defined and the user has share access.

---

- Transfer Settings
  - Encrypt Payload During Transfer – replication over encrypted tunnel
  - Compress Payload During Transfer – replicated data compressed
  - Overwrite Vault File When Different – option to overwrite changed files – carefully consider using this option
    - When the option is UNCHECKED (the default), then if the target file already exists on the VAULT, and is changed on the ARCA, the file will NOT be retransferred. The VAULT version will remain intact.
    - When the option is CHECKED, then if the file on the ARCA is different, it will be retransferred to the VAULT and overwrite the previous image.
- Customize Connection Method
  - Transfer Protocol
    - Standard TCP – use for low bandwidth sites
    - Reliable UDP – use for high latency connections
    - BTP Acceleration (default - recommended)
  - Connection Port – default 39002
    - If you need to change the port due to firewall restrictions, ensure the corresponding vault ports are updated
  - Tune Bandwidth Settings – enter the max amount of bandwidth for replication
    - Max Download Speed (Mbps) – default 10,000
    - Max Upload Speed (Mbps) – default 10,000
- Click “Defaults” button to reset all values to default.

**Edit Vault**

Name of Vault: TestPGH-Backup

Credentials

Host Address: 10.10.1.31

User Login: testpgh

Password: ●●●●●●

OK

Cancel

Defaults

- After all vault properties are defined click “OK”.
  - After a vault is defined, it can be edited by clicking “Edit” on the “Replication” tab.

Edit an existing vault:

- Select a defined vault and click “Edit”. The “Edit Vault” window opens.

**Edit Vault**

Name of Vault: TestPGH-Backup

Credentials

Host Address: 10.10.1.31

User Login: testpgh

Password: ●●●●●●

Vault Location

Destination: Replica Refresh...

Transfer Settings

Encrypt Payload During Transfer

Compress Payload During Transfer

Overwrite Vault File When Different

Customize Connection Method

Transfer Protocol: BTP Acceleration (Default)

Connection Port: 39002

Tune Bandwidth Settings

Max Download Speed (Mbps): 10.000

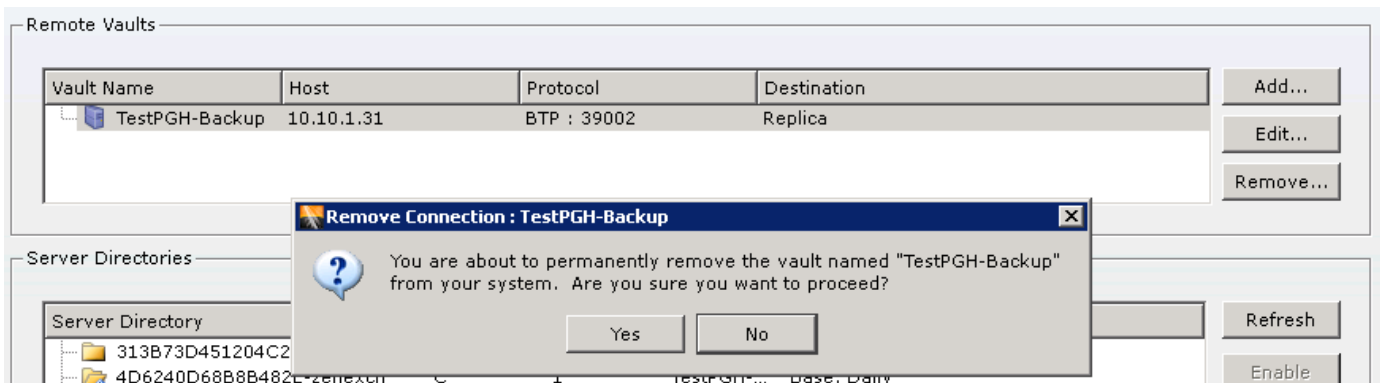
Max Upload Speed (Mbps): 10.000

OK

Cancel

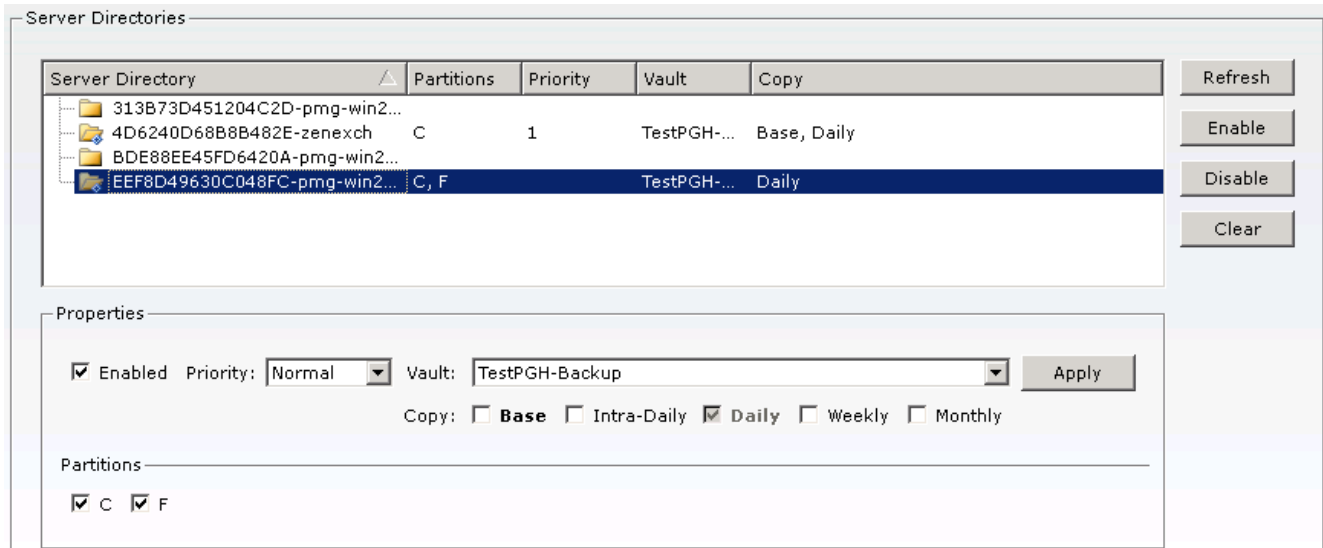
Defaults

- Edit any vault settings in the above screen.
  - Click “OK” to apply changes.
  - Click “Cancel” to disregard changes.
  - Click “Defaults” to reset all settings to default.
  
- To remove a vault, select and highlight the vault entry and click “Remove”. A “Remove Connection” prompt appears. Deleting the connection to the vault does not edit the vault itself.
  - Click “Yes” to permanently delete vault entry
  - Click “No” to cancel.



### 6.2.1.3 Server Directories

- View server directories under the “Root Backup Directory” and define replication properties.
- Any backup directories under the “Root Backup Directory” appear in the “Server Directory” list.
  - Root Directory = “D:\Backup”



- The following options are available
  - **Refresh** – refresh directory listing
  - **Enable** – enable replication for selected folder (activated when a directory is selected), folders are disabled for replication by default.
  - **Disable (default)** – disable replication for selected (activated when a directory is selected)
  - **Clear** – clear previous replication options on selected folder (activated when a directory is selected)

#### 6.2.1.4 Properties

- **Enabled** – enable folder for replication, uncheck to disable
- **Priority** – set priority 1-8 or leave “**Normal**” (default)
  - **1 - High Priority**
  - **5 - Medium Priority**
- **Vault** – select vault share to replicate (corresponds to defined Remote Vaults – empty by default)
- **Copy** – select backup file types to replicate
  - **Base** - Base Image file (\*.spf)
    - This is the full backup file and it starts the backup chain.
    - Ensure bandwidth is sufficient if transferring the base image
  - **Intra-Daily (not recommended)** – intra-daily files (\*.spi), do not select for “Current Image”
  - **Daily (required)** – daily collapsed files (\*.cd.spi)
  - **Weekly (not recommended)** – weekly collapse files (\*.cw.spi)
  - **Monthly (not recommended)** – monthly collapse files (\*.cm.spi)

---

**Note:** The source and destination ARCA and Vault perform their collapse routines independently. Replicating existing collapsed files is redundant and will increase used storage space.

---

Collapse replicated backups – 2 Models:

Current Image or Archive (the ability to replicate collapsed files but this is not recommended)

1. Current Image (Base-into 1 incremental) – every 15 days, collapsed into –cd.spi, next collapse files will be wiped and collapsed into cd.spi (saves storage) - do not select intra-daily files in this scenario

2. Archive (retention) – cd.cw, cd.cm, etc – 30 days worth of dailies

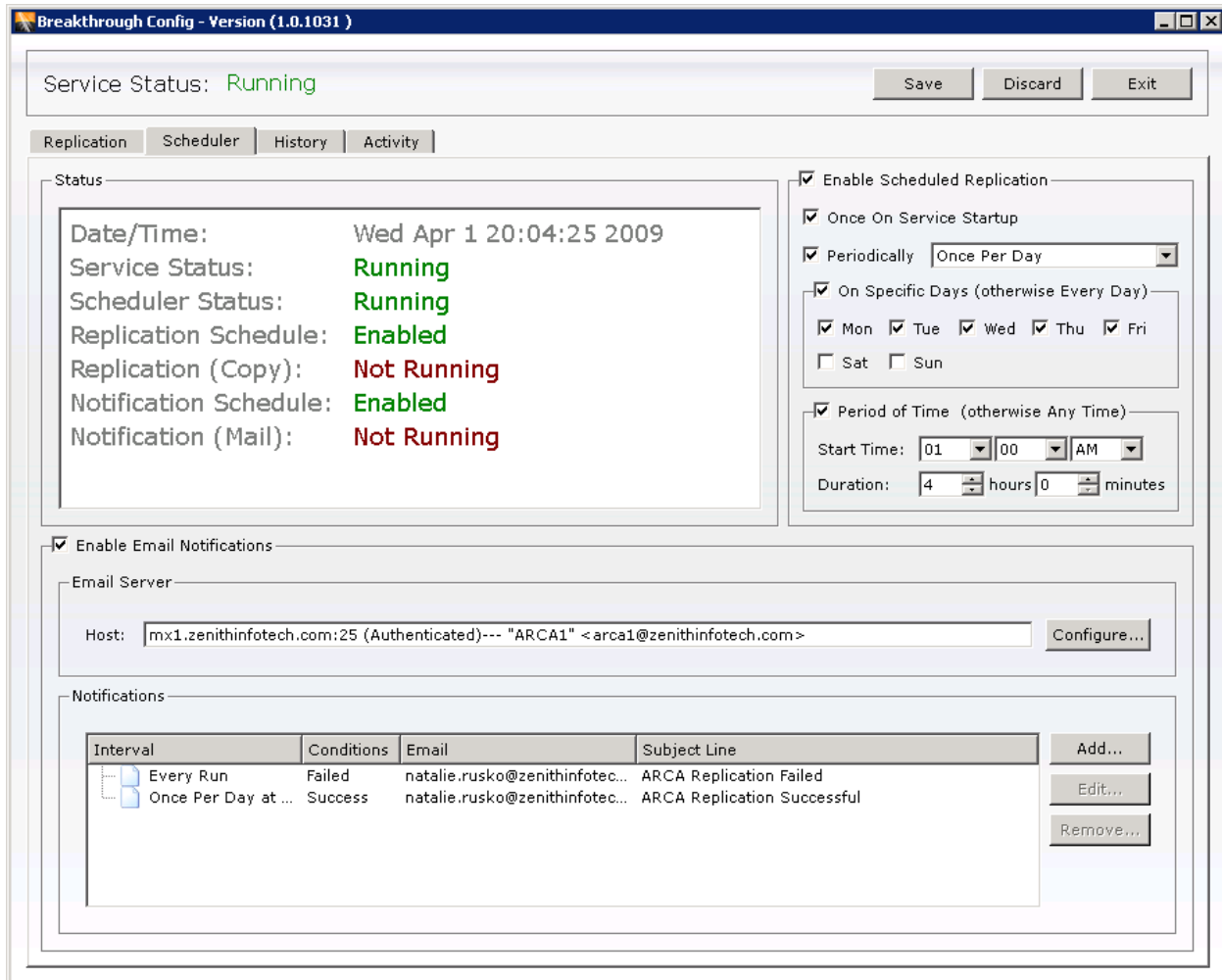
---

**Warning:** Click “Apply” after changes are made or they will not be saved.

---

## 6.2.2 Scheduler

- Define replication schedule (for details on these settings please see section [4 General Operation & Software Specifications](#))



- View Service Status and details
- Enable Scheduled Replication and define replication options
- Run:
  - Once On Service Startup
  - Periodically
  - On Specific Days (otherwise Every Day)
    - Mon, Tue, Wed, Thu, Fri, Sat, Sun
  - Period of Time (otherwise Any Time)



Verify test email was received. If the email was not received check your spam folders.

Body Text: This is a test message sent from BTConfig.

- SMTP Port – default 25
- Requires Authentication – if SMTP server requires authentication
- Method
  - Automatic (default) - “Enable TLS on Authentication” option
  - Login
  - Plain
  - Cram-MD5
  - NTLM
  - None
- Domain – SMTP domain
- User – SMTP user account name
- Password - SMTP account password
- Send From
  - Display Name – define sender name for email alerts
  - Email Address – define email address alerts for email alerts

- Notifications (enabled after “Enable Email Notifications” is selected). Multiple notifications can be specified on different criteria.

- Add – add notification
  - Click “Add” and define alert criteria

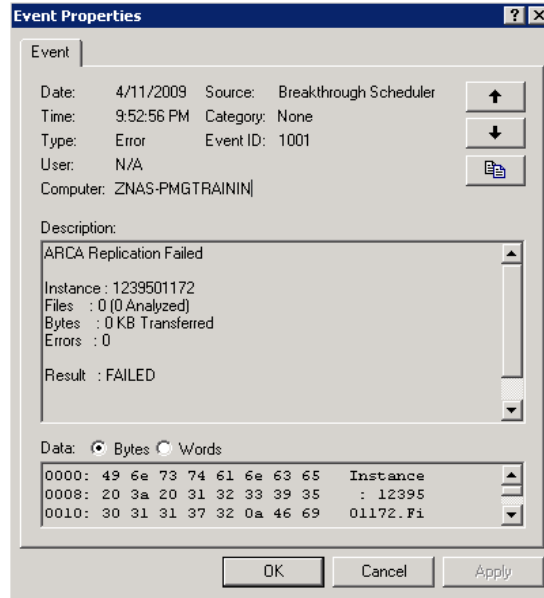
The screenshot shows the 'Add Notification' dialog box. It has a title bar with 'Add Notification' and a close button. The dialog is divided into several sections:

- Send Email:** A checked checkbox, a text box for 'Subject Line', and a text box for 'Email Address'.
- Write to Event Log:** An unchecked checkbox and a text box for 'Message'.
- Interval:** Two radio buttons: 'After Every Run' (unchecked) and 'Once Per Day at' (checked). The 'Once Per Day at' option has two dropdown menus showing '06' and 'AM'.
- Conditions:** A list of checkboxes: 'Success' (unchecked), 'Failed' (checked), 'Aborted' (unchecked), 'Duplicate' (unchecked), 'Not Licensed' (unchecked), 'Launch Error' (unchecked), and 'Terminated' (unchecked).

Buttons for 'OK' and 'Cancel' are located on the right side of the dialog.

**Options:**

- Send Email – send an email upon alert (checkbox)
- Subject Line – type email subject (customizable)
- Email Address – type recipient email address to receive alerts
- Write to Event Log – check this option to write alert events to Application Event Log
  - Message is customizable



- Interval
  - **After Every Run** – alert sent after every replication attempt
  - **Once Per Day at** – alert sent once a day depending on time specified
- Conditions
  - **Success** – replication successful (files transferred)
  - **Failed** – replication failed (reason for failure)
  - **Aborted** – replication aborted
  - **Duplicate** – duplicate file exists
  - **Not Licensed** – replication component not licensed
  - **Launch Error** – replication failed on launch
  - **Terminated** – replication improperly terminated
- Edit – edit existing notification
  - Highlight existing alert and click “Edit”

- Remove – remove notification
- Highlight existing alert and click “Remove”. You will receive a “Remove Notification” prompt. Click “Yes” to remove, “No” to cancel and retain notification alerts.

### 6.2.3 History

- View replication history (for details please see section [4 General Operation & Software Specifications](#))
  - Filter by
    - Copy – copy jobs
    - Mail – mail jobs
    - Clean – clean database jobs

Breakthrough Config - Version (1.0.1031)

Service Status: Running Save Discard Exit

Replication | Scheduler | History | Activity

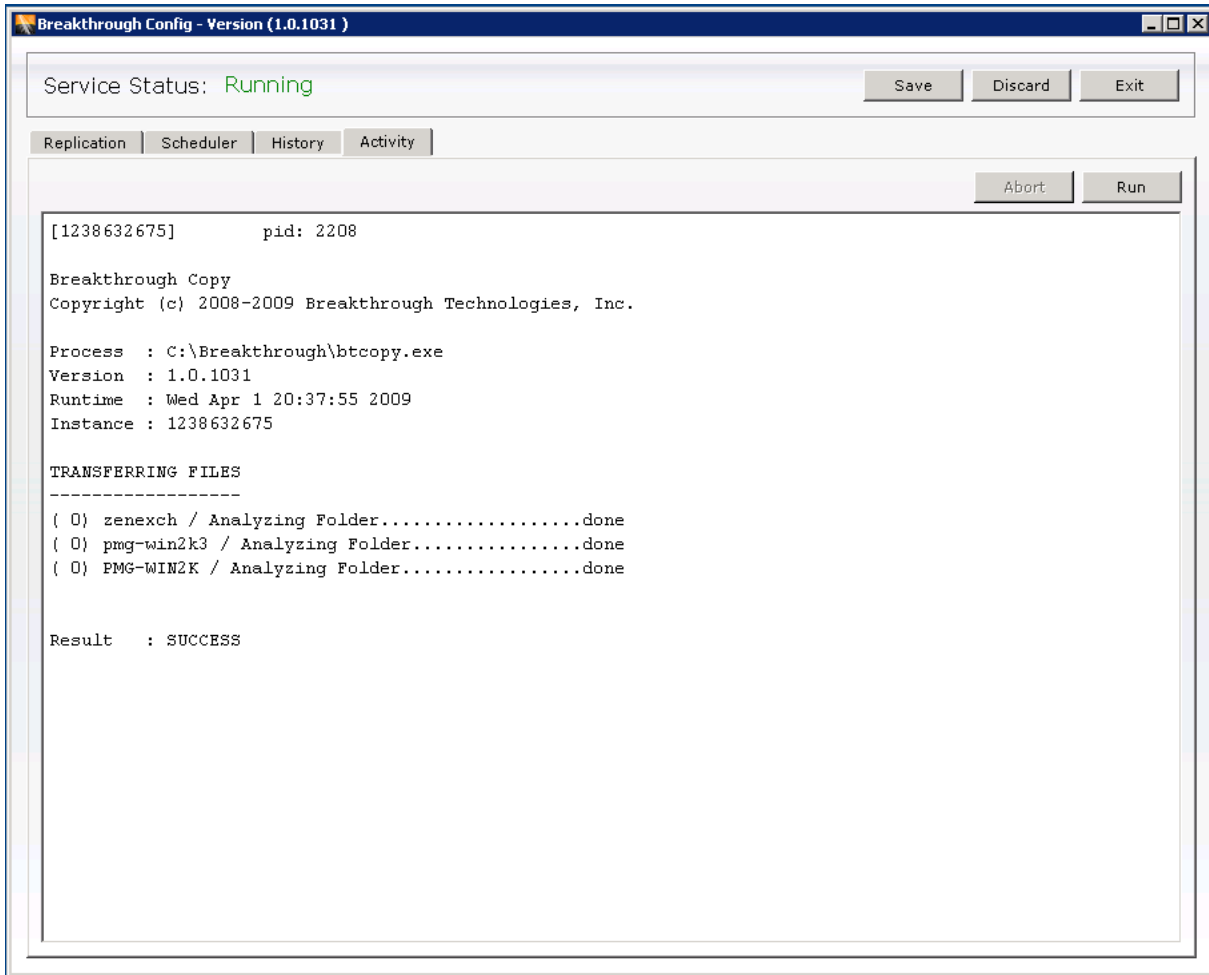
Filter Display

Copy  Mail  Clean

Completed	Process	Result	Instance	Elapsed	Started
04/01/2009 08:00 am	Mail	Success	1238587203	00:00:23	04/01/2009 08:00 am
04/01/2009 01:04 am	Copy	Success	1238562003	00:04:22	04/01/2009 01:00 am
04/01/2009 12:00 am	Clean	Success	(none)	00:00:00	04/01/2009 12:00 am
03/31/2009 08:00 am	Mail	Success	1238500803	00:00:43	03/31/2009 08:00 am
03/31/2009 01:00 am	Copy	Success	1238475603	00:00:04	03/31/2009 01:00 am
03/31/2009 12:00 am	Clean	Success	(none)	00:00:00	03/31/2009 12:00 am
03/30/2009 08:00 am	Mail	Success	1238414403	00:00:21	03/30/2009 08:00 am
03/30/2009 01:47 am	Copy	Success	1238389204	00:47:17	03/30/2009 01:00 am
03/30/2009 12:00 am	Clean	Success	(none)	00:00:00	03/30/2009 12:00 am
03/29/2009 12:00 am	Clean	Success	(none)	00:00:00	03/29/2009 12:00 am
03/28/2009 12:00 am	Clean	Success	(none)	00:00:00	03/28/2009 12:00 am
03/27/2009 08:00 am	Mail	Success	1238155203	00:00:14	03/27/2009 08:00 am
03/27/2009 01:05 am	Copy	Success	1238130003	00:05:27	03/27/2009 01:00 am
03/27/2009 12:00 am	Clean	Success	(none)	00:00:00	03/27/2009 12:00 am
03/26/2009 08:00 am	Mail	Success	1238068803	00:00:39	03/26/2009 08:00 am
03/26/2009 04:11 am	Copy	Success	1238043603	03:11:54	03/26/2009 01:00 am

### 6.2.4 Activity

- View activity of last replication job – pulled from log file (for details please see section [4 General Operation & Software Specifications](#)). You can also run and abort replication “On Demand”.

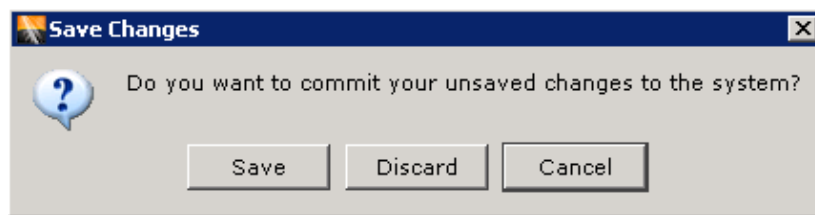


- After replication is configured for the first time, we recommend a manual “first-run” replication to verify connectivity and that replication is successful.
  - **Abort** – aborts replication
  - **Run** – starts on-demand replication

---

**Note:** Before running replication or exiting Breakthrough Config click “Save” to commit unsaved changes. Replication may be successful without saving but no data will be replicated.

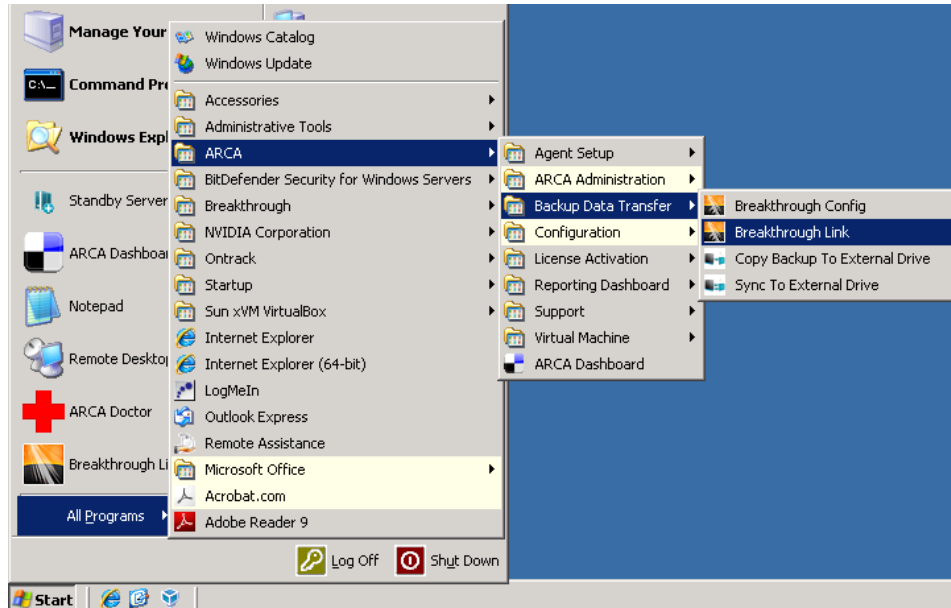
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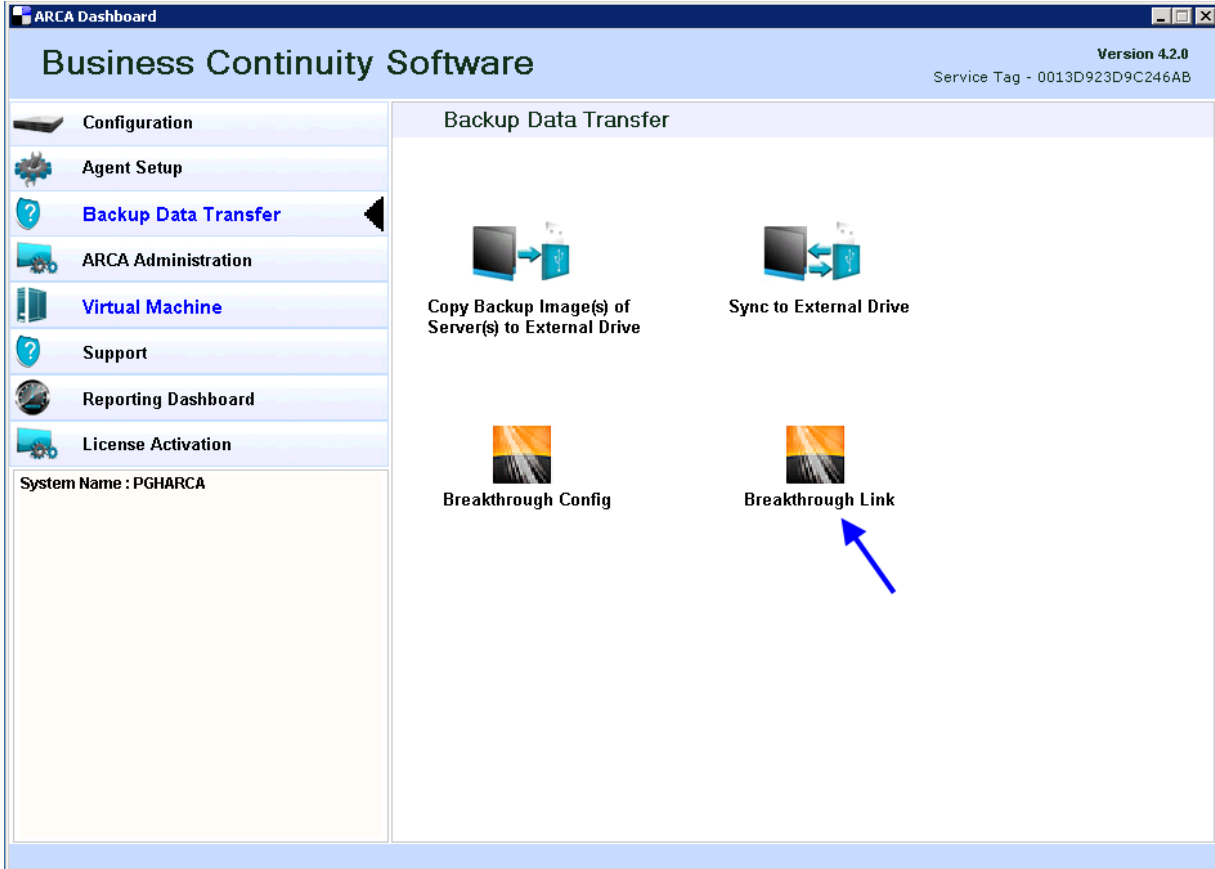


## 6.3 Connecting to Remote Vaults

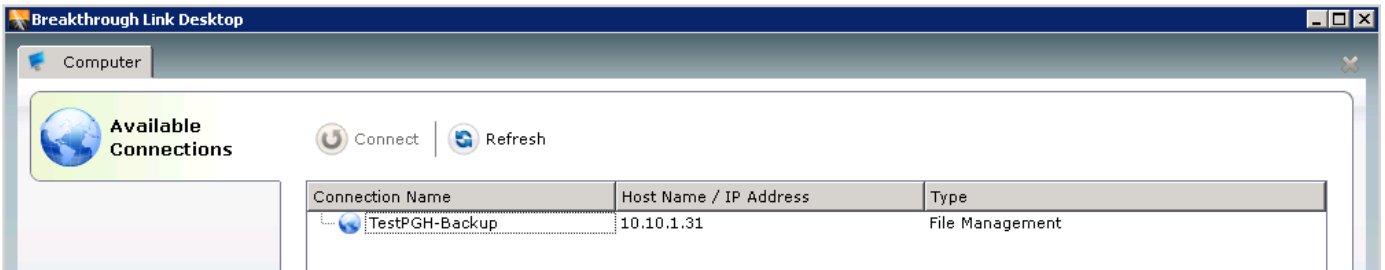
On the remote ARCA, you can manually connect to a vault or replicated ARCA. You will be able to connect to any vaults you have made a connection to in Breakthrough Config ([see section 5.2 Scheduler](#)). To connect, launch “Breakthrough Link”.

- Launch “Breakthrough Link” from Start > All Programs > ARCA > Backup Data Transfer > Breakthrough Link. You can also access this through the ARCA Dashboard under the Backup Data Transfer section.

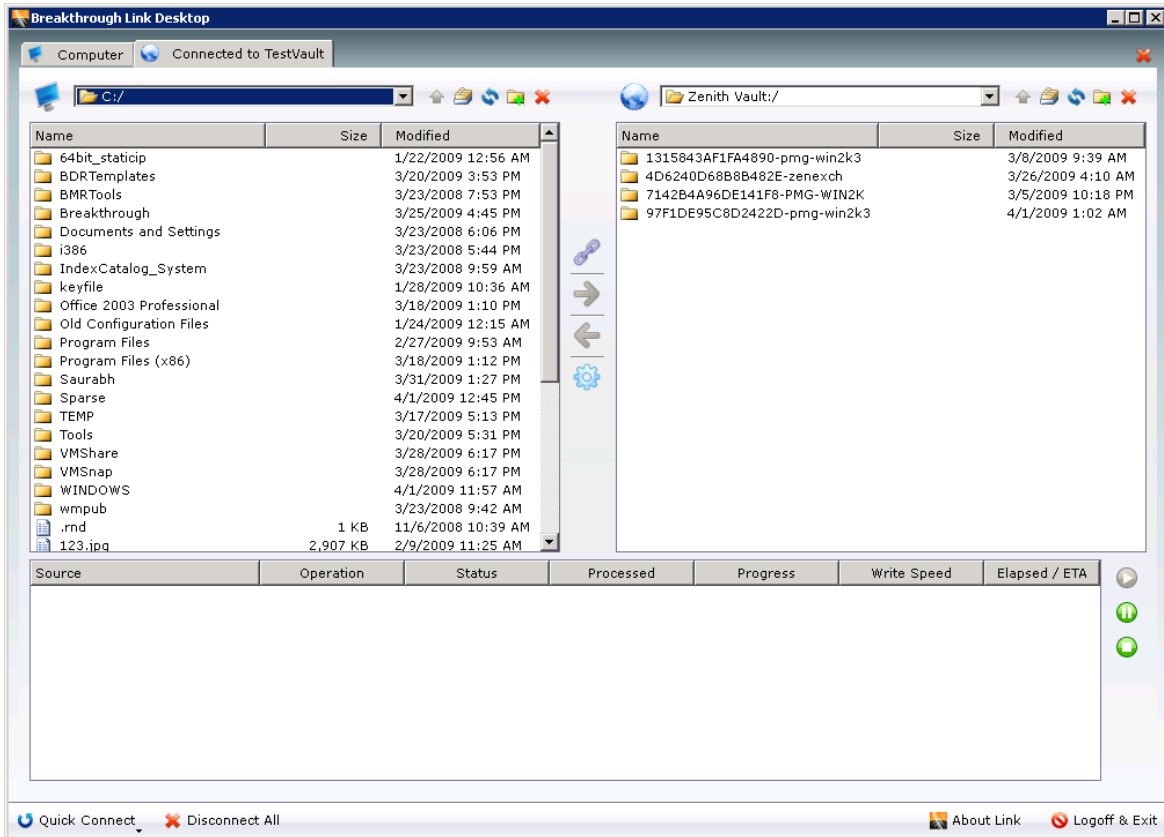
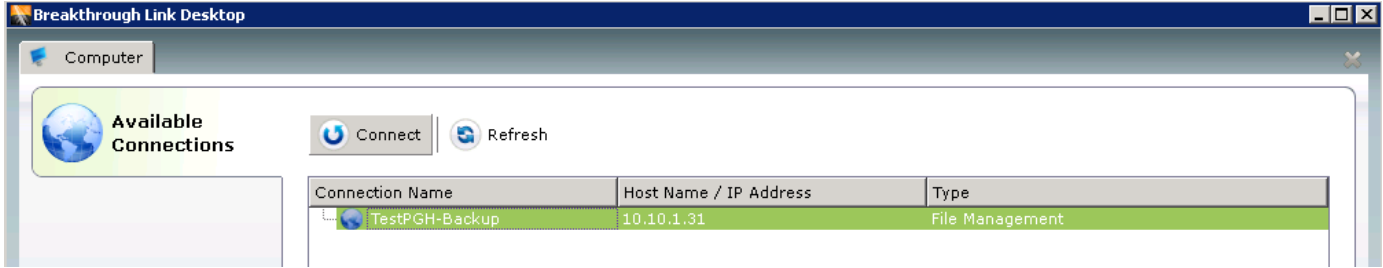




- The launches “Breakthrough Link”.



- Defined vault connections will show under “Available Connections”. To connect to the vault, select the connection and click “Connect”. You will connect to the vault with the login settings specified through Breakthrough Config. An additional tab appears with these settings called
  - **Connected to %vaultname%**

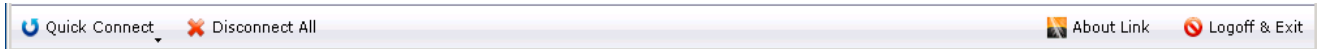


- If you experienced an error during replication, connect to the vault and copy files manually. If connectivity issues arise, resolve those issues and attempt to reconnect to the vault before resuming replication.
- The local ARCA is on the left pane, vault is on the right.



- You can navigate directories and move files from this screen.
  - Move Up to Parent Directory,

- Show/Hide Folder
- Refresh Directory
- Create Folder
- Delete Folder



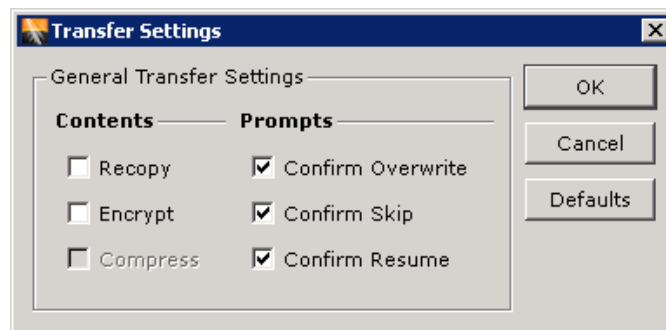
- Click the "red x" icon on top right of this window to disconnect or click "Disconnect All" at the bottom if multiple vaults are open.
- Click "Quick Connect" to connect to another vault.



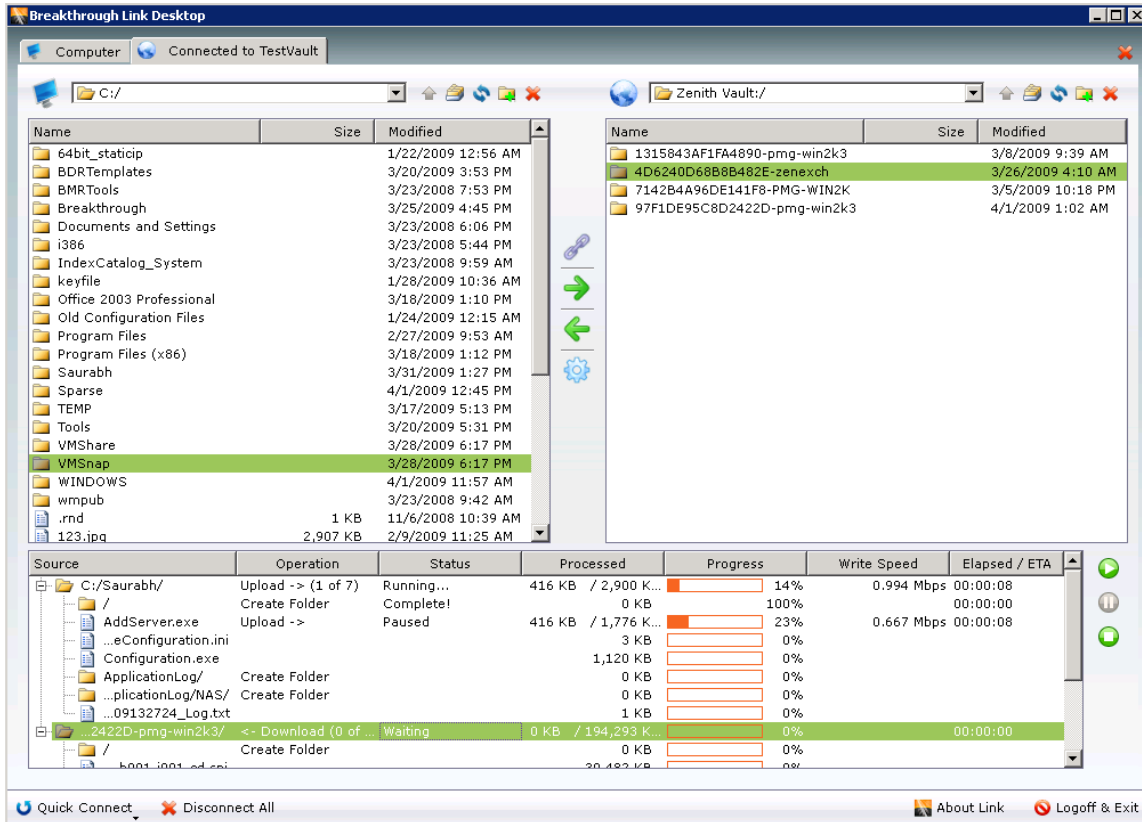
- Cross navigation between ARCA and Vault
  - Icons (top to bottom)



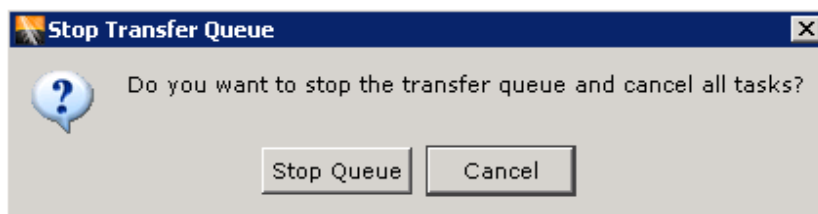
- Link Folder Navigation – link navigation between ARCA and Vault
- Upload to Server – upload file/folder to vault (active when file/folder is selected)
- Download from Server – download file/folder to ARCA (active when file/folder is selected)
- Transfer Settings – General Transfer Settings for Breakthrough Link Desktop (see below screenshot)



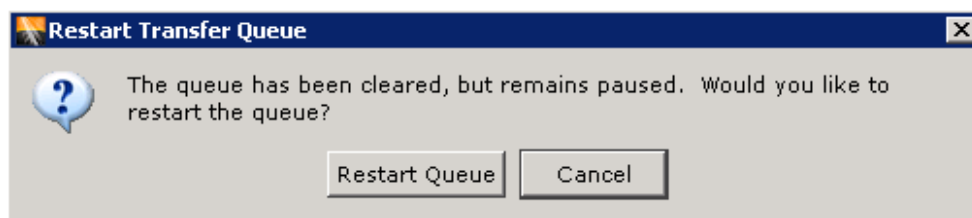
- During upload/download tasks, the status can be viewed in the status window. Jobs will queue. If a download or upload operation is in process, the next job will be in a “Waiting” status.



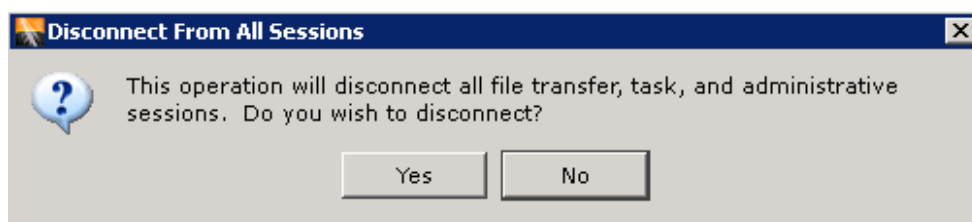
- Source – source data
- Operation – Upload/Download
- Status – Running/Paused/Complete/Stopped/Waiting
- Processed – transfer status (%)
- Write Speed – speed of transfer in Mbps
- Elapsed/ETA – estimated time of transfer completion
- Start – restarts transfer
- Pause – pauses transfer
- Stop – stops transfer and cancels all tasks.
  - You will receive a “Stop Transfer Queue” prompt to verify you want to stop the transfer.
  - Click “Stop Queue” to stop transfer queue and cancel all tasks
  - Click “Cancel” to close the prompt and resume transfers



- If the queue was paused after jobs were cleared, you will receive a "Restart Transfer Queue" prompt.
  - Click "Restart Queue" to restart the queue
  - Click "Cancel" to leave the queue paused



- When closing the window you will be prompted to "Disconnect From All Sessions".
  - Click "Yes" to disconnect
  - Click "No" to stay connected and leave any sessions open



## 6.4 ARCA Replication Specifics

This section gives general information regarding ARCA Replication.

- Copy-attempts = 10
  - Number of attempts to execute on a batched transfer of multiple folders and files before terminating.
- Copy-retries = 3
  - Number of connection retries to attempt on a disconnect or failed connection.
- copy-delay = 10
  - Number of seconds to wait between connection attempts.
- Timeout-login = 5
  
- Files that are replicated:
  - When replication occurs the collapsed daily incremental files (\*.cd.spi) are replicated per server directory. This is mandatory when a server is enabled for replication.
  - Base (full backup), Intra-Daily, Weekly, and Monthly collapse files are not replicated unless they are specifically checked (\*.spf, \*.spi, \*.cw, \*.cm). Collapsing occurs at the source and destination independently.
  - If the vault settings above were defined correctly, all backup files (“D:\Backup”) are replicated to the vault under “D:\Replica” by server directory.
    - All MD5 checksum files (D:\MetaData) are replicated to the vault under “D:\ReplicaMetadata” by server directory.
  - Every time BTCopy executes, it evaluates the entire file set for changes.

Example on destination vault:



- Retransfer of Files

- a. If a file has to be retransferred, and you DO NOT want to change the overwrite setting globally, then you must delete the target file on the Vault using BTLINK, which will cause the ARCA version to be retransmitted.
- b. This is the default. It will not be transmitted again.

## 7 Appendix A – Reference Documents

- 1, ARCA Implementation Guide

## 8 Appendix B – Glossary of Terms

<b>Term</b>	<b>Meaning</b>
<b>ARCA</b>	<b>Advanced Recovery and Continuity Appliance</b>
<b>BTCopy</b>	<b>Breakthrough Copy – copies files via scheduler</b>
<b>BTService</b>	<b>Breakthrough Scheduler – scheduler service</b>
<b>BTVault</b>	<b>Breakthrough Vault – vault service</b>
<b>BTLink</b>	<b>Breakthrough Link – interface used to connect to BTVault service</b>
<b>BTConfig</b>	<b>Breakthrough Configuration – interface used to connect to the Breakthrough Scheduler service to setup replication</b>
<b>SPF</b>	<b>ShadowProtect Full (Base) Backup File</b>
<b>SPI</b>	<b>ShadowProtect Incremental Backup File</b>
<b>CD.SPI</b>	<b>ShadowProtect Compressed Daily Backup File</b>
<b>CW.SPI</b>	<b>ShadowProtect Compressed Weekly Backup File</b>
<b>CM.SPI</b>	<b>ShadowProtect Compressed Monthly Backup File</b>