

GALAXY REDUNDANT SERVER SOLUTION

SQL SERVER BACKUP & RECOVERY PROCEDURE

Using Carbonite Availability 8.1 powered by Double-Take



WHAT'S IN THIS GUIDE

This manual is a procedural guide that provides...

- » concept overview of the data replication and failover process*
 - » server, network and system operation requirements*
 - » procedural steps to manage data replication jobs, failovers, and related tasks*
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Carbonite Availability powered by Double-Take Software version 8.1.0.677

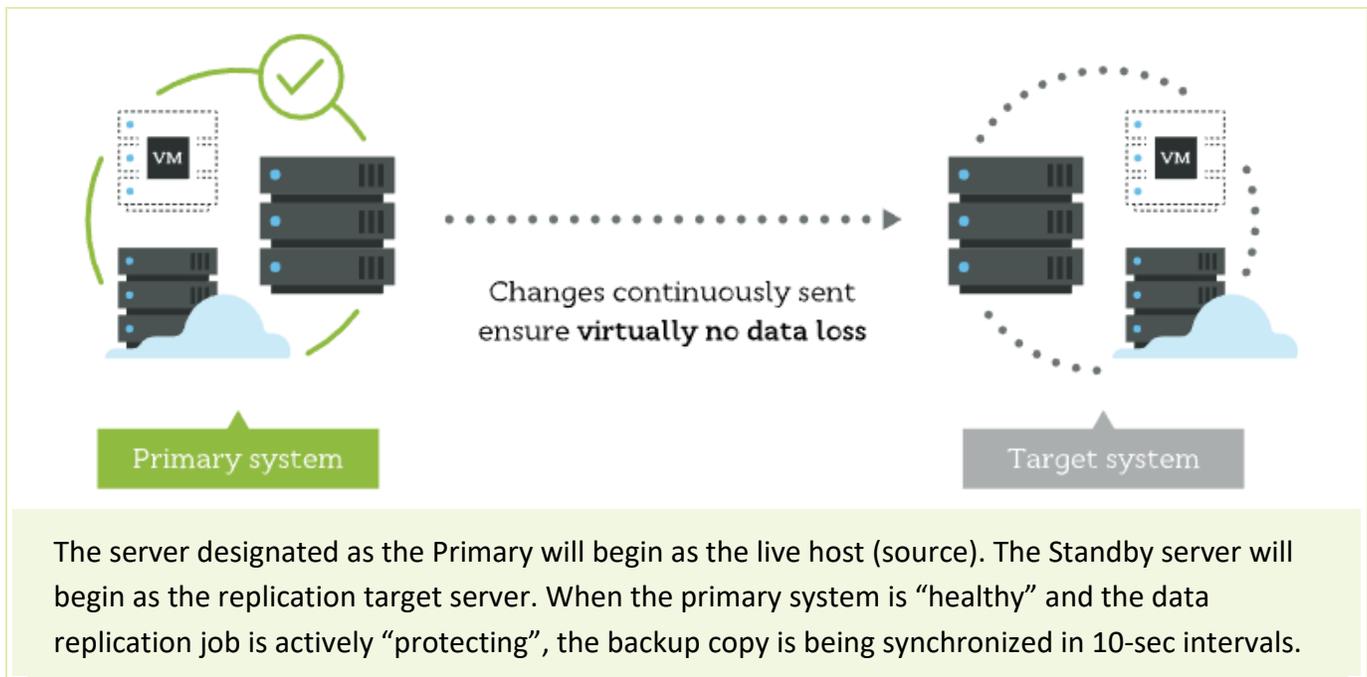
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INTRODUCTION OF REDUNDANT SERVER SOLUTION

Galaxy Control Systems offers an engineered *redundant server solution* using the Carbonite Availability Solution for data replication with Microsoft® Hyper-V® virtual environment.

The Primary and Standby Servers are prebuilt at Galaxy Control Systems. Both servers are preloaded with Carbonite Replication Solution, Hyper-V®, Windows Server® OS, and appropriate services. System Galaxy Access Control software is also included.



IMPORTANT SECTIONS IN THIS GUIDE

INTRODUCTION:

- » Overview of Healthy Redundant Server
- » Stages of Disaster Recovery
- » Terminology Used
- » Recent Change History

REQUIREMENTS & SPECIFICATIONS

- » System & Operational Requirements
- » Network Requirements
- » Specifications for Redundant Servers

PROCEDURES:

- » Services
- » Set Up Email Notification (failure alerts)
- » Type of Failover
- » New Replication Job
- » View the Health of Replication Job
- » Identify a Replication Failure (Jobs View)
- » Perform a Manual Failover
- » Resume Replication (after Failover Complete)

TERMS USED IN THIS GUIDE

SOFTWARE

Carbonite Availability	the data replication & site recovery solution; manages replication between servers.
Replication Console	the software UI used to configure, manage, monitor the <i>replication jobs</i> , perform the failover and related tasks.
Hyper-V	(VM) the Microsoft® software used to create & maintain a virtual environment; System Galaxy software & database will install and operate on the VM.
System Galaxy	(SG) the integrated access control software from Galaxy Control Systems.

SERVER

Primary Server <i>live host</i>	the physical server currently operating as the “live host” – i.e. the server that is actively hosting the running copy of System Galaxy on a virtual environment (i.e. Hyper-V) .
Target Server <i>standby server</i>	the physical server operating as the “standby server” or backup server during replication, which is storing an up-to-date image of the live host while standing by for failover.

PROCESS

“failed”	the <i>activity state</i> that indicates the Double-Take replication job has detected a failure and is no longer updating or backing-up to the standby server (replication job is not protected).
Failover	the act of performing a failover or transferring live operations to the target/standby server.
“failed-over”	the <i>activity state</i> that indicates that the standby server has resumed live operation; however, data is not yet being replicated/protected.
healthy job status	when the data/software is being replicated and job activity state is “Protecting”.
notification	an email that is distributed to designated addresses to notify of replication errors or warnings (optional / recommended).
“protecting”	replication job <i>activity state</i> that indicates data is being backed-up or copied to a standby server.
replication	the operation of storing the current, up-to-date copy of the data and software from a <i>live/source server</i> onto a <i>standby/target server</i> .
replication failure	a condition that interrupts the active data replication due to a fault or failure of the server hardware, system or connectivity between the live/source server and the standby/target server.
resume replication	manually recreating the replication job to re-establish duplication after a failover has completed. [“Resume replication” replaces the operation of ‘reverse roles’. Once the failover is completed and the standby Target server assumes live-operation in the “production” environment, it may remain in place as the Primary (host) server. A replaced or repaired server becomes the new Standby/Target. The replication job must be recreated to re-establish data duplication.]
“stopped”	the <i>activity state</i> showing that data replication has stopped.
“synchronizing”	the <i>activity state</i> showing that the Double-Take software is synchronizing the mirror image on the standby server to match the source server image.

IMPORTANT CHANGES SINCE v7 (IN THIS GUIDE)

1. The “Replication Console” replaces “Double-Take Console” (UI & terminology). The new *Carbonite Replication Console* is considered to be “powered by Double-Take”. The basic features are still available for a virtual environment with the exceptions below.
 - a) Removed “**Undo-Failover**” **button/option** (the automated feature is currently unavailable when using a virtual machine in the replication process).
 - b) Replaced “**Reverse Roles**” with “**Resume Replication**”. The Reverse Roles automated feature/button is unavailable to the virtual environment. The steps to reverse roles has been replaced with manual steps to recreate a new replication job after a failover completes – see “RESUME DATA REPLICATION (after Failover Completed)”.

2. Updated instructions throughout this guide to reflect the currently supported process & terminology.
 - a) Updated Requirements and Diagrams with applicable removals and substitutions.
 - b) All screens have been updated. Updated Terms & Definitions table.

OVERVIEW OF HEALTHY REDUNDANT SERVER

The *redundant server solution* provides a means for quick disaster recovery in case of a catastrophic failure on the live/source server. The down-time is minimized, by the ability to switch to a stand-by server that has been mirroring the live server. This cutover to the stand-by server is called a FAIL-OVER.

IMPORTANT: There is a difference between a “failed” condition and a “failed-over” condition in the job status.

During a failure you should be aware of these things!

- ❶ During a **server failure condition**, the System Galaxy **database is offline** (i.e. not running on either server) and the **data replication is stopped/failed** (see Figure 2).

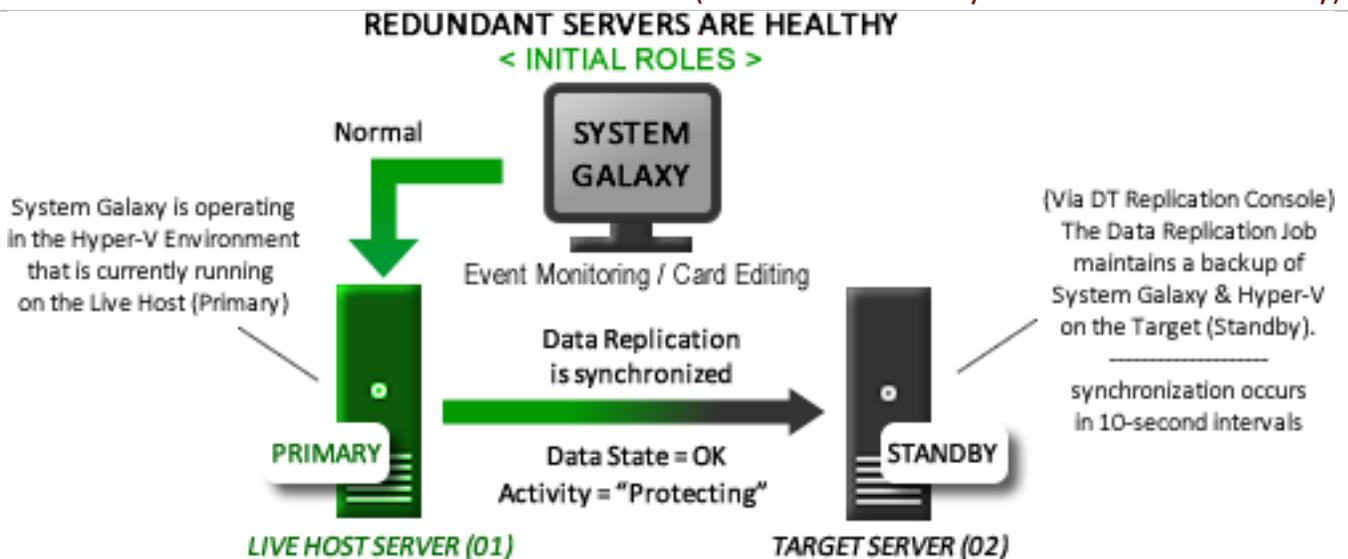
However, **all Galaxy control panels remain fully functional and do not degrade in performance** because all necessary programming is stored in the panel. This means all door & lock schedules, access, credentials/cards, input & output activation, arming/disarming, relays, etc. and all hardware remains fully operational. Events will be transmitted to the database when the server is online again.

- ❷ Once a **Failover is complete**, the System Galaxy comes back online on the standby server.

Data synchronization (mirroring) is still stopped/failed until you recreate the job that resumes replication. Since SG is online, the panels will reconnect and transmit their events to the SG database. System Galaxy extended functions can resume (e.g. badging, enrolling, monitoring, etc.). See Figure 3. *At this point replication has not resumed.*

- ❸ After the failure is repaired and the downed server comes back online, the administrator can **resume replication by recreating the job**. the server images will re-synchronize/replication job will resume a protected state (fig. 4).

FIGURE 1: Redundant Servers in their Initial Roles (live host & stand-by servers are both healthy)



When the replication job's Activity is in the "protecting" state and the condition is healthy, then a replica of the SG database is being updated and stored on the target/standby server. See the section on **Stages of a Disaster Recovery Process** for details about interim states such as failed, failed-over, ...

FIGURE 3: Target Server is Failed-Over (SG resumes running on stand-by server/Hyper-V)

Once the FAILOVER process is performed at the target server, System Galaxy will start up (running on Hyper-V) on the standby/target server(02). Although System Galaxy is running again, redundancy or data replication has not been restored.

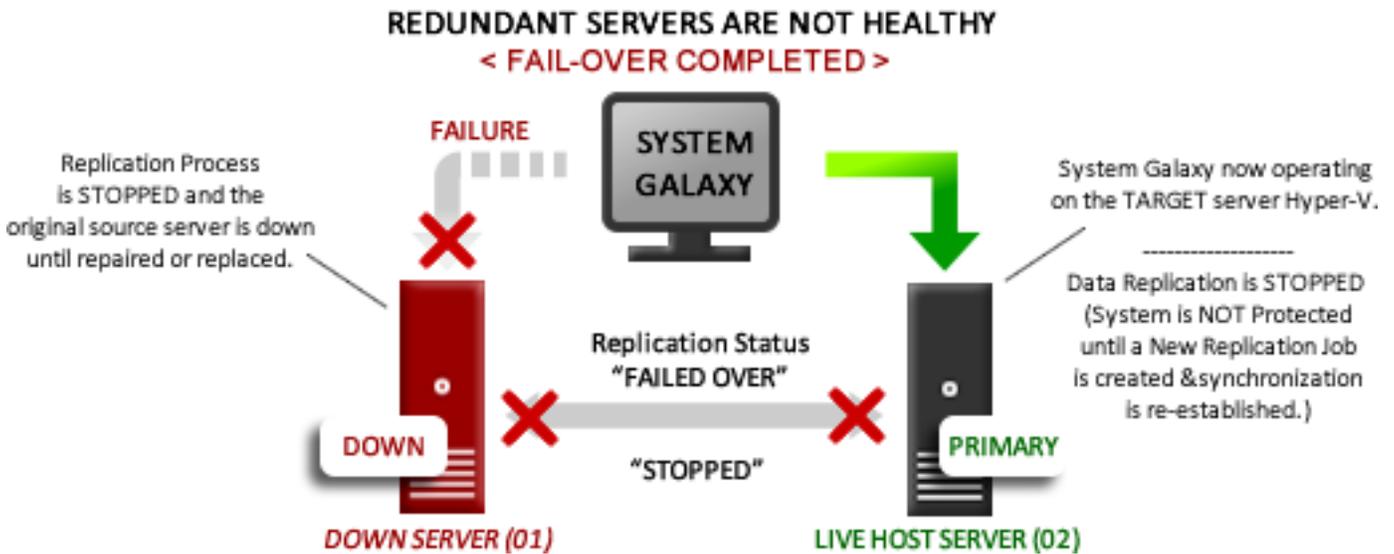
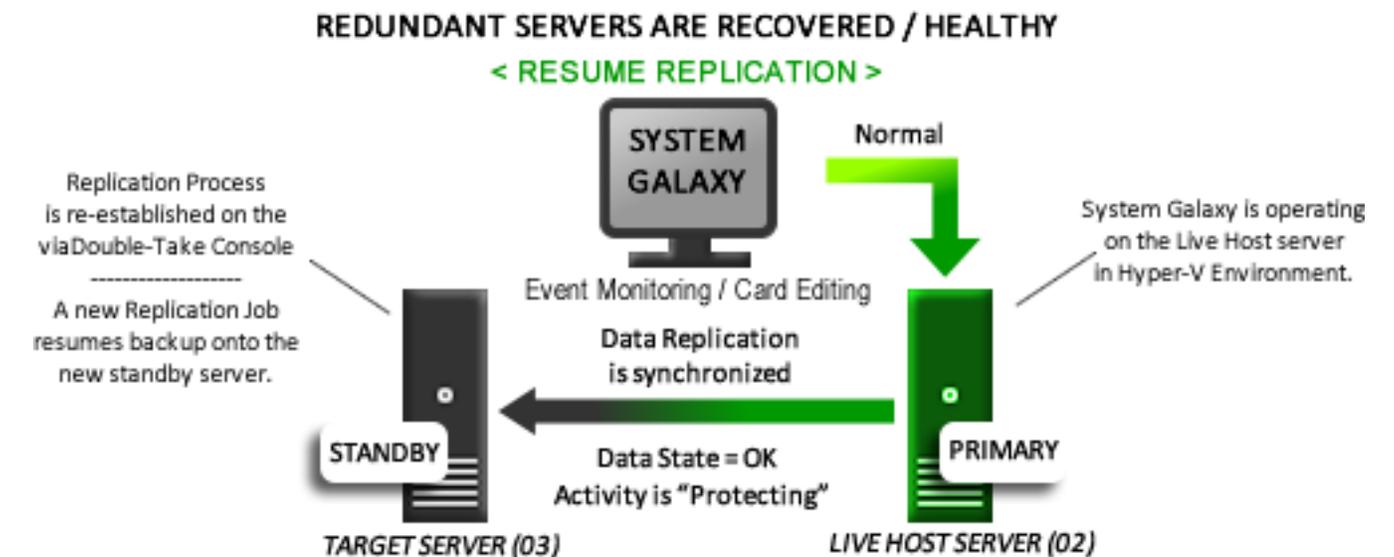


FIGURE 4: Replication has Resumed (live & stand-by servers are both healthy)

Once the failure condition is corrected/repared, the administrator can current Primary (virtual machine) may remain in it's current location after the failover is completed, thereby preventing additional downtime. The new replication job would then provision a brand new virtual machine as a backup, on the opposing physical host.

The system is considered healthy again when the replication job is recreated and resumes replication (i.e. both servers are re-synchronized and data replication state indicates "protecting").



REQUIREMENTS & SPECIFICATIONS

SYSTEM & OPERATIONAL REQUIREMENTS

1. Galaxy Control Systems supports server replication using Hyper-V and Double-Take software when the redundant server solution is purchased through Galaxy.
2. **Microsoft® Windows Server® 2012 | 2016** will be running on the host operating system of the primary and standby/target servers, as well as on the virtual machines.
3. **Hyper-V and Double-Take software** must be installed and running on the operating system of both the source/host server and the standby/target servers.
4. The **Double-Take services** must be set to run automatically. These services must be running on the Primary/Host OS & virtual machine, as well as on the Target server. The target virtual machine image is “off” during protected status.
 - » Double Take (Automatic Start)
 - » DT Management Service (Automatic Delayed Start)
5. The **Double-Take firewall ports/exceptions** must be open on both host servers and on network devices across the LAN as required (6320 TCP & UDP, 6330 TCP & UDP, 6332 TCP & UDP, and 6325 TCP & UDP).
6. The **active replication job** will copy a backup image of the *Hosted System Galaxy/Hyper-V session* from the **Live Primary server** onto the **Standby Target server**. The replication job updates the Target server every few seconds to maintain synchronization with the Live Primary.
7. Double-Take should be configured to **send email notifications** for warnings and errors when a replication failure occurs. This is especially recommended for servers using manual failover procedures.
8. **The failover process** may be initiated when a **replication failure occurs**.

CAUTION: The cause of a **replication failure** should be carefully evaluated in order to determine whether performing a cutover/failover is the best course of action. **IF a failover is necessary, the failover process must be “completed” before the new live-host server is operational⁽¹⁾. The data replication job must be recreated before protected replication can resume.**

IMPORTANT: to resume replication after a cutover, a new replication job must be manually recreated. The servers must be **resynchronized and in the “protecting” state** before redundancy is truly re-established.

(1) NOTICE: System Galaxy access control panels continue to be fully operational (i.e. no degraded operation) because all access control information is stored in the panel. Events are stored at the panel and transmitted to the SG database after the cutover is completed and System Galaxy is back online.

9. **The automated option to “reverse roles” is no longer supported within the virtual environment.** The only recovery method available to a virtual environment is to resume replication by recreating a new job. -see “Resuming Replication after Failover is Completed”, when the Target server becomes the Live-Primary and a new Target is setup as the standby server.
10. **Resuming replication** is now a manual process after failover is completed. You must rename your instance when you recreate the new replication job.
11. In Carbonite 8.1 you cannot **undo a failover** when hosting SG in a virtual environment.

NETWORK SETUP REQUIREMENTS

1. You need three (3) static IP Addresses. One for each server and one for the Virtual Machine. Assign IP addresses to 2nd NIC card on each host server.
2. IP Addresses must be valid within the Network IP Range for each server.
3. It is recommended the System Administrator tags or labels the source server at all times.

SYSTEM SPECIFICATIONS FOR REDUNDANT SERVERS

In the Galaxy redundant server implementation, the following infrastructure will be observed:

HOST OS: SERVER-A and SERVER-B

- » Both servers (A/B) will run Microsoft Server 2012 | 2016 as the host operating system.
- » Both servers (A/B) will run the Double-Take services set to start automatically: Double Take, DT Hyper V, DT Management.
- » Both servers (A/B) will open both TCP & UDP ports 6320, 6330, 6332, and 6325 (necessary for Double-Take).
- » Both servers (A/B) will have the Double-Take Console software installed and able to run when in the role of the standby/target.

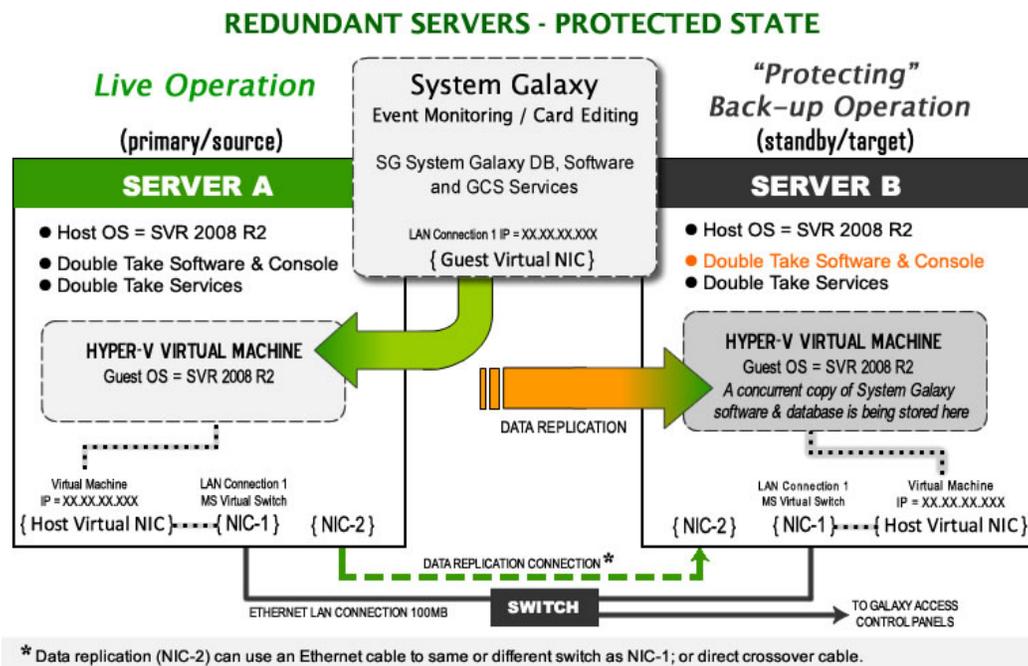
GUEST OS:

- » The Hyper-V guest virtual environment will run Microsoft Server 2012 | 2016 (or appropriate version) as the operating system.

SERVER ROLES and RESPONSIBILITIES

- » The server operating in the **live role** (*source*) hosts the virtual machine where System Galaxy, database & services are running.
- » The server operating in the **standby role** (*target*) is where the data replication is updating the synchronized backup copy.
- » The *live/source* server will support card editing and event monitoring of the System Galaxy software.
- » The *standby/target* server will perform failover in the event of a catastrophic failure of the live server.
- » Once a failover is completed, the standby server will go-live and begin hosting System Galaxy. Replication must be resumed by recreating the replication job (manually).

FIGURE 5: HEALTHY REDUNDANT SERVER SOLUTION (PROTECTED)



REPLICATION CONSOLE PROCEDURES

This section contains the step-by-step instructions for the main tasks involved with configuring and operating the Carbonite®/Double-Take server.

SETUP & CONFIGURATION STEPS:

- » About Services (services should auto-start when platform is powered on)
- » Set Up Email Notification (for failure alerts)
- » Configure Type of Failover

MANAGE REPLICATION

- » Create a New Replication Job
- » View the Health of a Replication Job
- » Identify a Replication Failure (Jobs View)
- » Perform a Manual Failover from the Target Server
- » Resume Replication after Failover is Completed

SYSTEM ERRORS

- » See the appropriate documentation from the solution manufacturer's for identifying errors or contact technical support as needed.

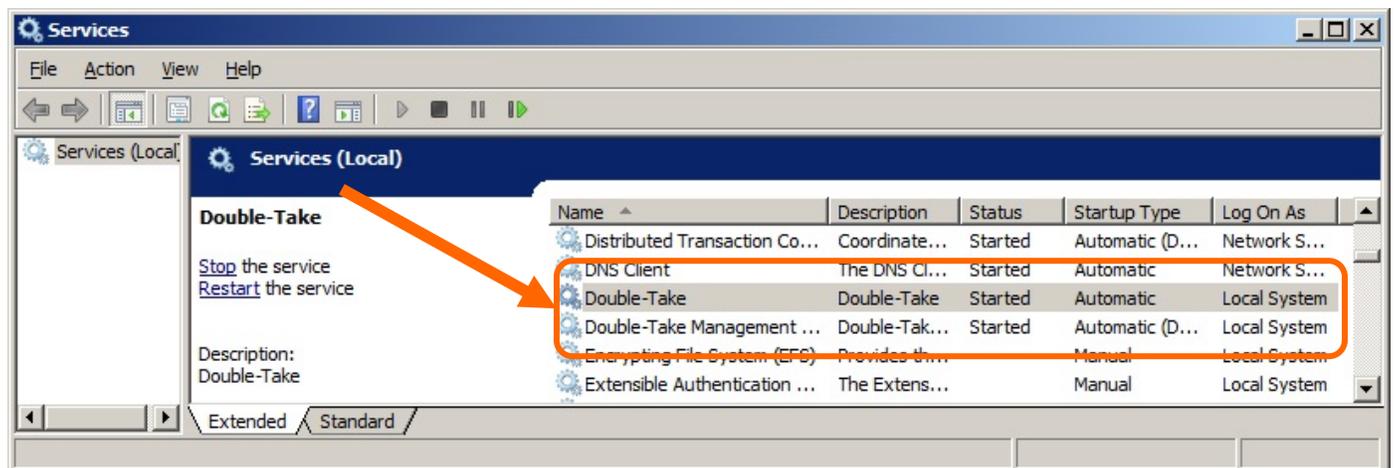
ABOUT SERVICES

IMPORTANT

- » Services must be running before any configuration or operation can occur.
- » Carbonite/Double-Take Services must be running all servers (Primary, Target, & in the live Hyper-V session).

QUICK STEPS

1. Open the **Services window** at each server:
 - » **START > Control Panel > Administrative Tools > Services.**
2. Locate the two Double-Take services. Ensure Status is “**started**” and Startup Type is “**automatic**”.
 - » Double-Take (or name of Replication Console)
 - » Double-Take Management (or name of Replication Console)
3. Services should be set services to start automatically.



SET UP E-MAIL NOTIFICATION (FAILURE ALERTS)

IMPORTANT

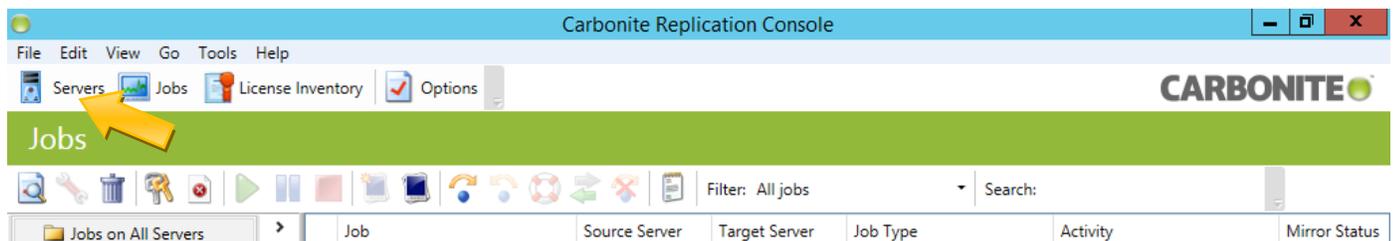
- Double-Take services must be running at both servers (Primary, Target, and Hyper-V session).
- You must configure E-mail Notification at **both servers** (Primary and Target).

QUICK STEPS

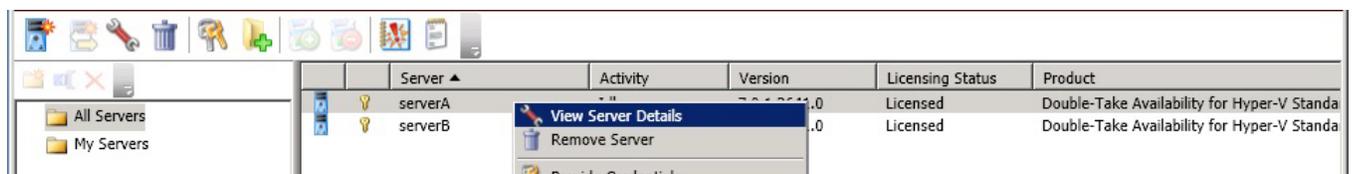
1. Go to the **Target Server's** host OS and double-click the [Double-Take Console] desktop icon to open the Double-Take Console software.



2. From the console toolbar, click on the  [SERVERS] button.



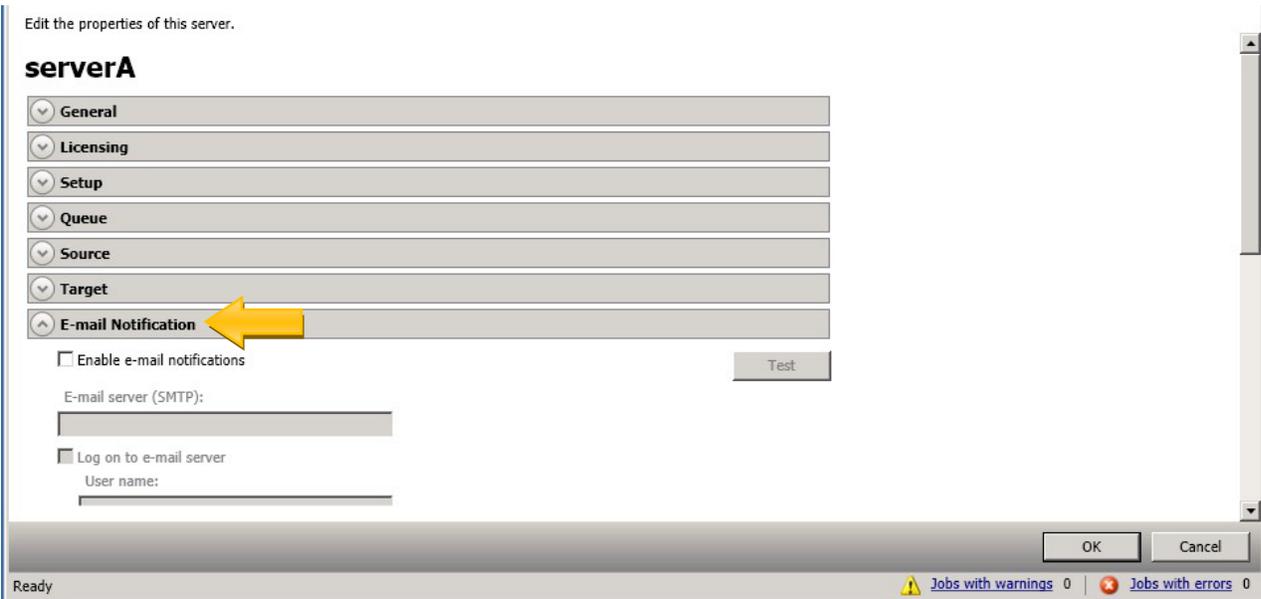
3. Right-click the desired **server name** and select 'View Server Details' in the shortcut menu.



4. Click the 'Edit Server Properties' in the TASKS list on the right side the screen.



5. Expand the E-mail Notification option in the Server Properties screen.



6. Check the [Enable Notification] option and enter the *Mail Server Address* (mailserver.domain.com).
7. Check the [Log onto email server] option and enter the *Login Credentials* for the e-mail server.
8. Enter the *From Address*, and *Send To* address (yourname@domain.com).
9. Enter the desired text in the *Subject Prefix* field.
10. (optional) You do not need to enable the *add event description* option – this will make your subject line longer and you will see this in the message content anyway.
11. Check the [Warning] and [Error] options.
12. Click [TEST] to verify your e-mail will work with these settings.
13. Save your settings and repeat these steps for the other Server.

The screenshot shows the 'E-mail Notification' configuration window. It contains the following fields and options:

- Enable e-mail notifications
- E-mail server (SMTP):
- Log on to e-mail server
- User name:
- Password:
- From address:
- Send to:
- Subject prefix:
- Add event description to subject
- Include these events:
 - Information
 - Warning
 - Error
- Exclude these event IDs:
- Enter event IDs and event ID ranges separated by commas. For example: 4000,4002,4010-4020.

A 'Test' button is located in the top right corner of the window.

CONFIGURE TYPE OF FAILOVER

You must determine whether you want to depend on a manual failover process or an automatic failover process. A manual failover/cutover must be performed by the system administrator after Double-Take software has reported that a 'condition for failure' has been met. An automatic failover is initiated by the software whenever the system has met a 'condition for failure'.

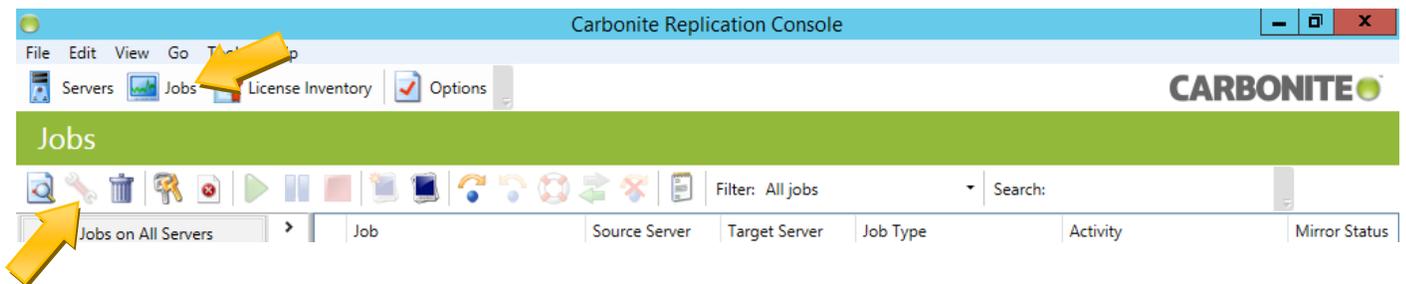
IMPORTANT

- If using a manual failover, the user must perform the failover from the TARGET SERVER.
- An automatic failover will cut-over replication to the target sever without user intervention.

QUICK STEPS

The type of failover is configured in the Job Properties screen. This can be done from either the target or the source server once the job has been created.

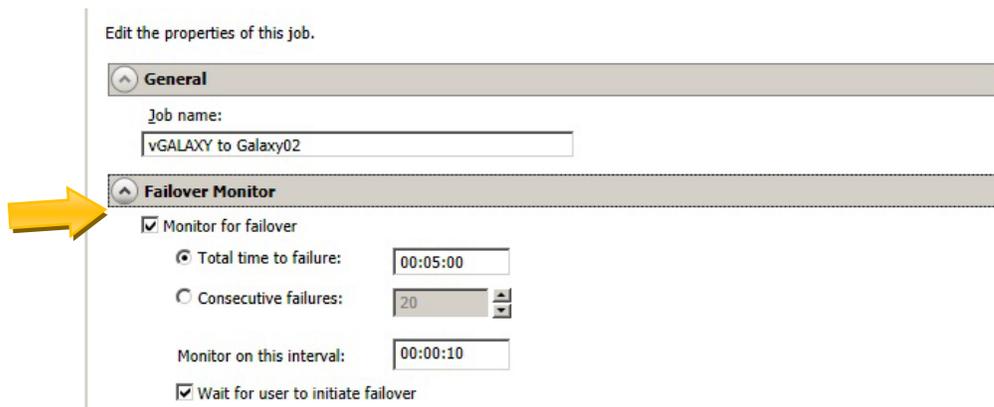
1. Click the  [JOBS] button on the main toolbar, then click the  [VIEW JOB DETAIL] button on the lower toolbar.



2. Click the EDIT JOB PROPERTIES link under the TASKS list, on the right side of the screen.



3. In the *Edit Job Properties* page, expand the **Failover Monitor** section and set the following:
- Enable (“check”) the [Monitor for Failover] option.
 - (Recommended) choose [Total Time to Failure] option and set Time to the desired value.
 - Set the [monitor on this interval] value to an appropriate value.
 - Enable (“check”) the [Wait for User to Initiate Failover] option if you want the system to wait for the administrator to **manually** initiate a failover/cutover. *Unchecking this option will allow the system to automatically failover when a condition for failure is met.*



Edit the properties of this job.

General

Job name:
vGALAXY to Galaxy02

Failover Monitor

Monitor for failover

Total time to failure: 00:05:00

Consecutive failures: 20

Monitor on this interval: 00:00:10

Wait for user to initiate failover



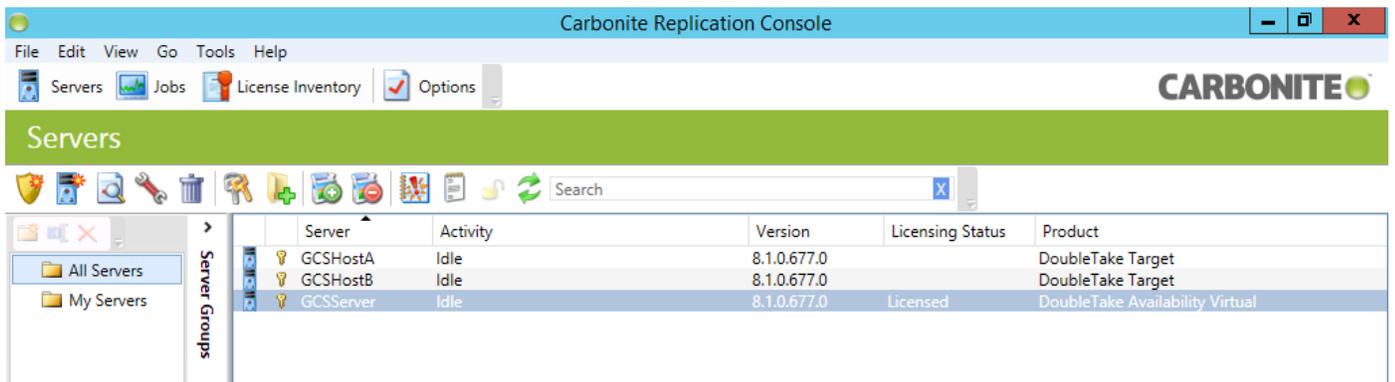
The “Wait for User to Initiate” option: Enabling (checking) this option means the system administrator must manually initiate a failover when the software reports that a ‘condition for failure’ has been met (e.g. Target server loses communication to the Source server).

Disabling (unchecking) this option means the Double-Take system automatically initiates a fail-over when any ‘condition for failure’ has been detected by the software. *An automatic failover may be undesirable in controlled tests/planned outages (e.g. server/router reboot).*

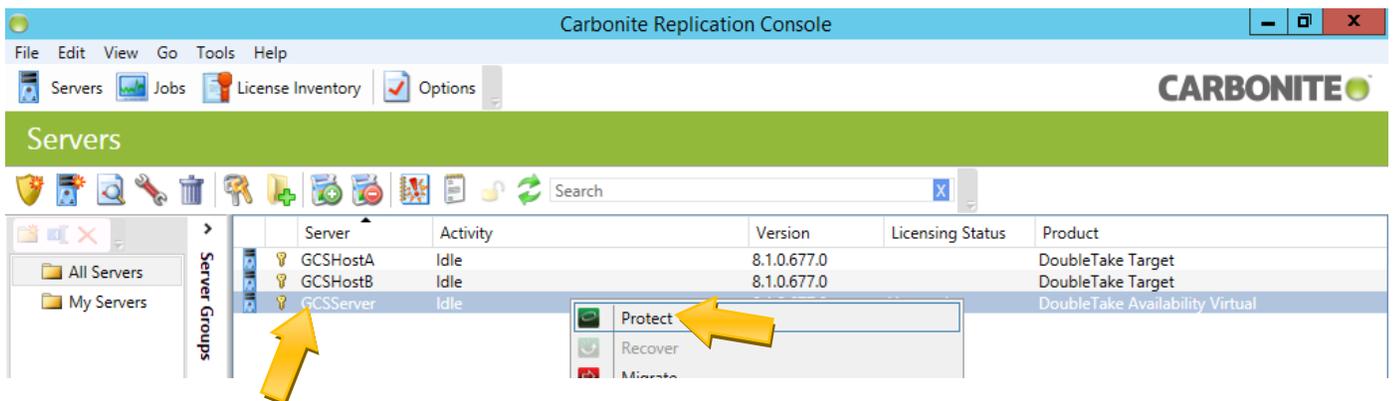
CREATE A NEW REPLICATION JOB

The steps below show how to create a new replication job in the case that the target server goes down and the replication job is dropped.

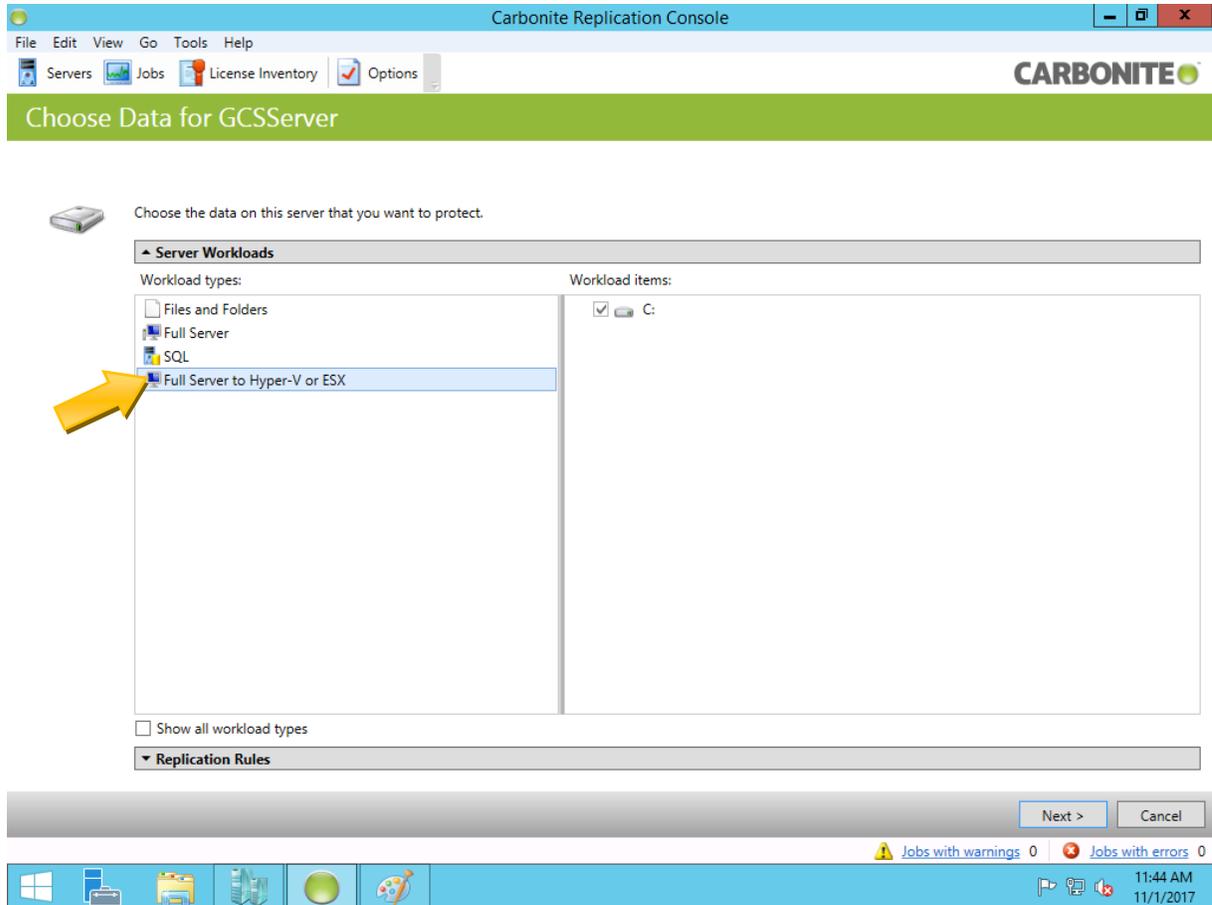
1. Go to the server host operating system and double-click the **Replication Console** startup icon on the desktop to open Replication Console (Main Screen – All Servers).



2. Right-click on the bottom (licensed) instance of the *Double-Take Availability Virtual* server (in the list of servers) and choose "Protect" from the shortcut menu..



3. Choose the **'Full Server to Hyper-V...'** option and **accept all defaults**.
4. Choose the **'Protect files and folders, application or entire server'** task.



- Under the CURRENT SERVERS list, select (highlight) the *name* of the physical server that you want to operate as the Target/standby server.

The target is the machine that is NOT currently hosting the live session running System Galaxy.

IMPORTANT! if you are recreating a job after failover completed, you must verify which machine is now the Primary and is currently hosting the “running” virtual session. Use the Hyper-V Console to view determine which server is currently “running” the live instance of Hyper-V/SG. Do not select the currently running server as the Target.

WARNING! Failure to choose the correct server could result in total loss of data in the event of a failure. Never Back-up your *synchronized copy* onto the currently running (live) server. If you set the *running host* as the target you are not truly protected, even if though the replication job indicates the “protecting” state. A catastrophic failure will prevent a successfully failover and your backup data can be permanently lost. Proceed with caution!

- Click the NEXT button to continue.

Carbonite Replication Console

File Edit View Go Tools Help

Servers Jobs License Inventory Options

CARBONITE

Choose Target Server

Choose the server that will store the protected data.

Current Servers

Servers:

Server	Version	Product
GCSHostA	8.1.0.677.0	DoubleTake Target
GCSHostB	8.1.0.677.0	DoubleTake Target

Show all servers

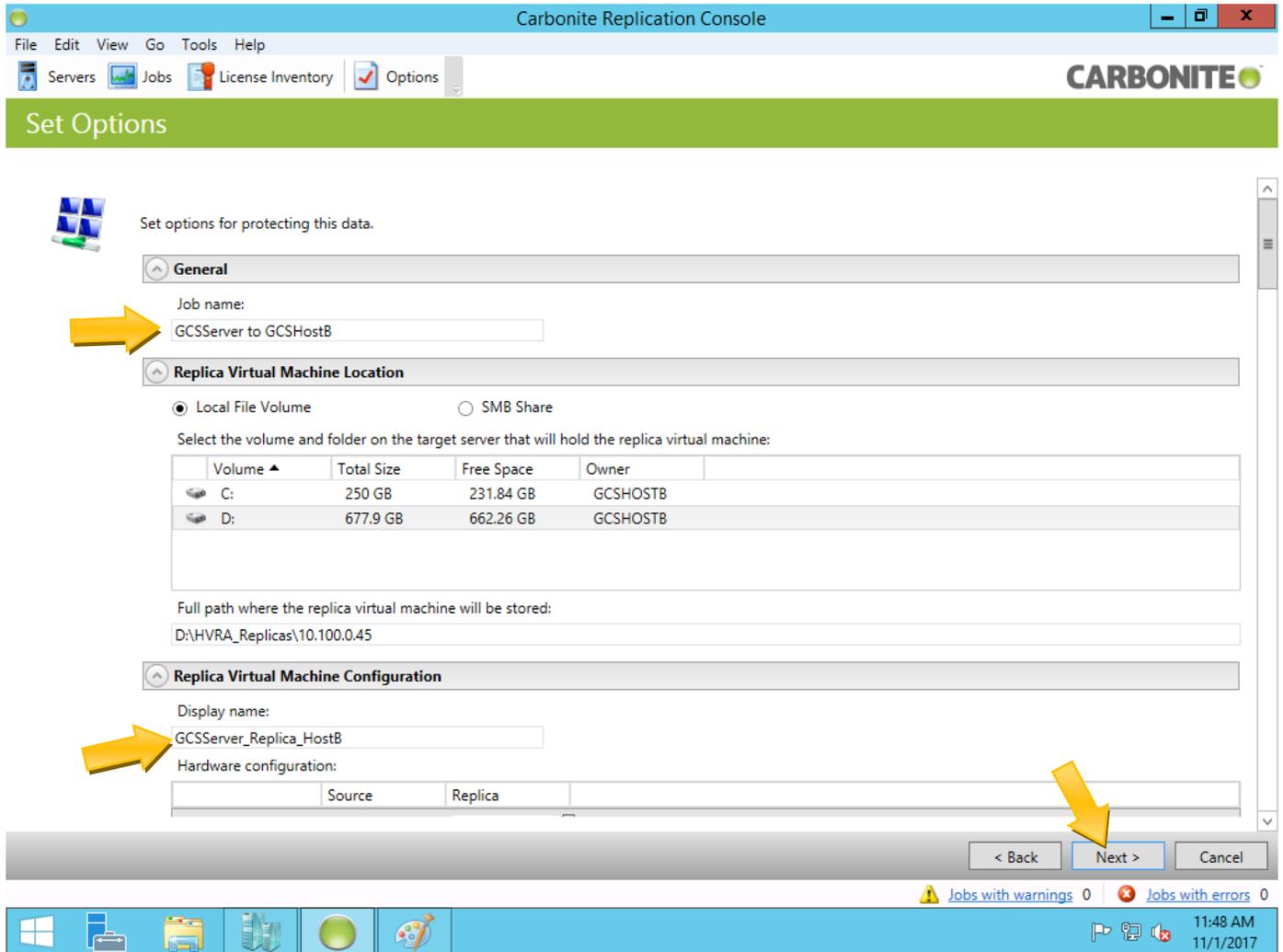
Find a New Server

Diagnostics job

< Back Next > Cancel

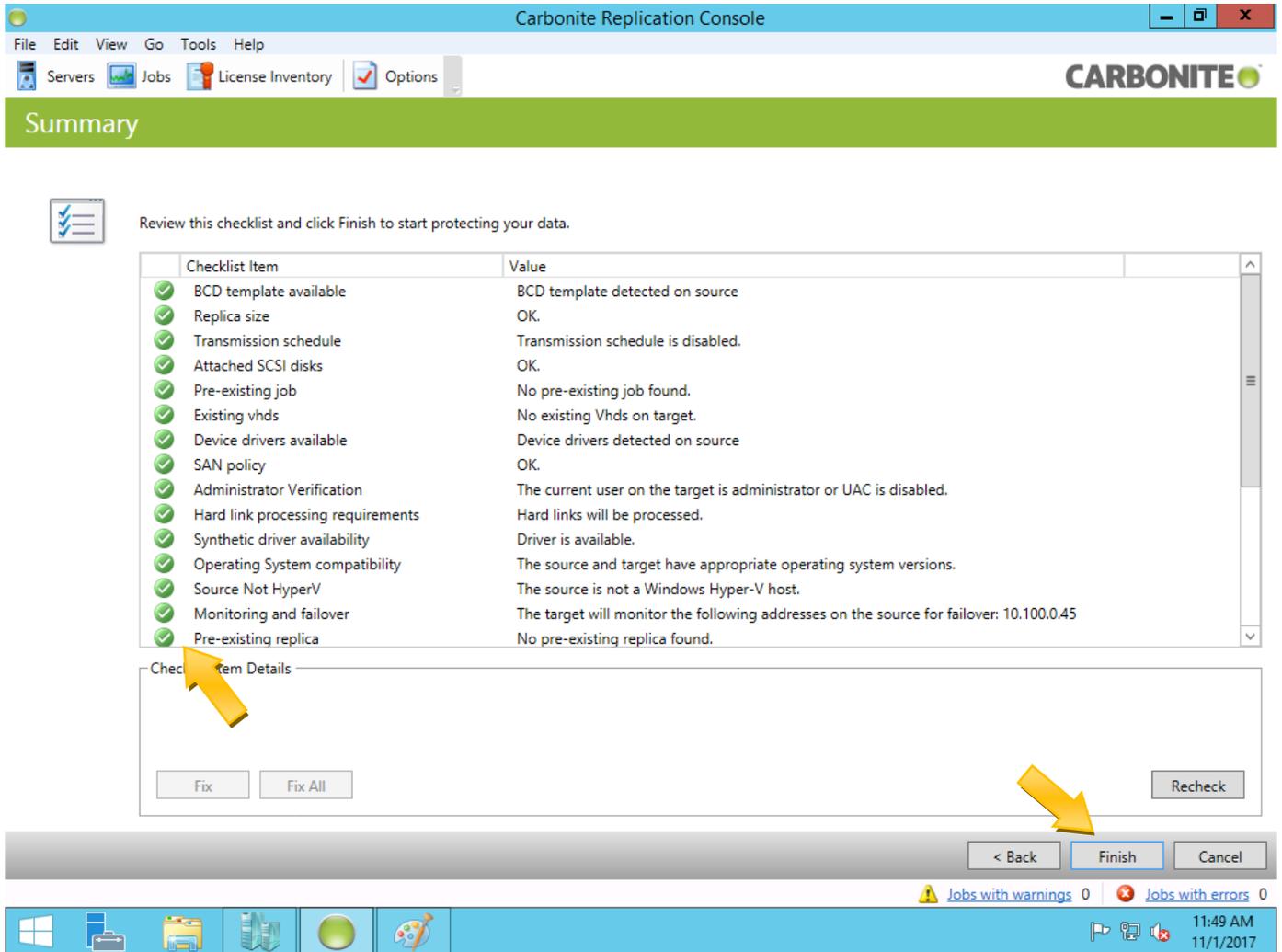
Jobs with warnings 0 Jobs with errors 0

7. Under GENERAL, enter the Job Name (be unique/descriptive).
8. Under REPLICA VM CONFIGURATION, enter the Display Name (be unique/descriptive).
9. Accept all the defaults.
10. Click NEXT to continue.



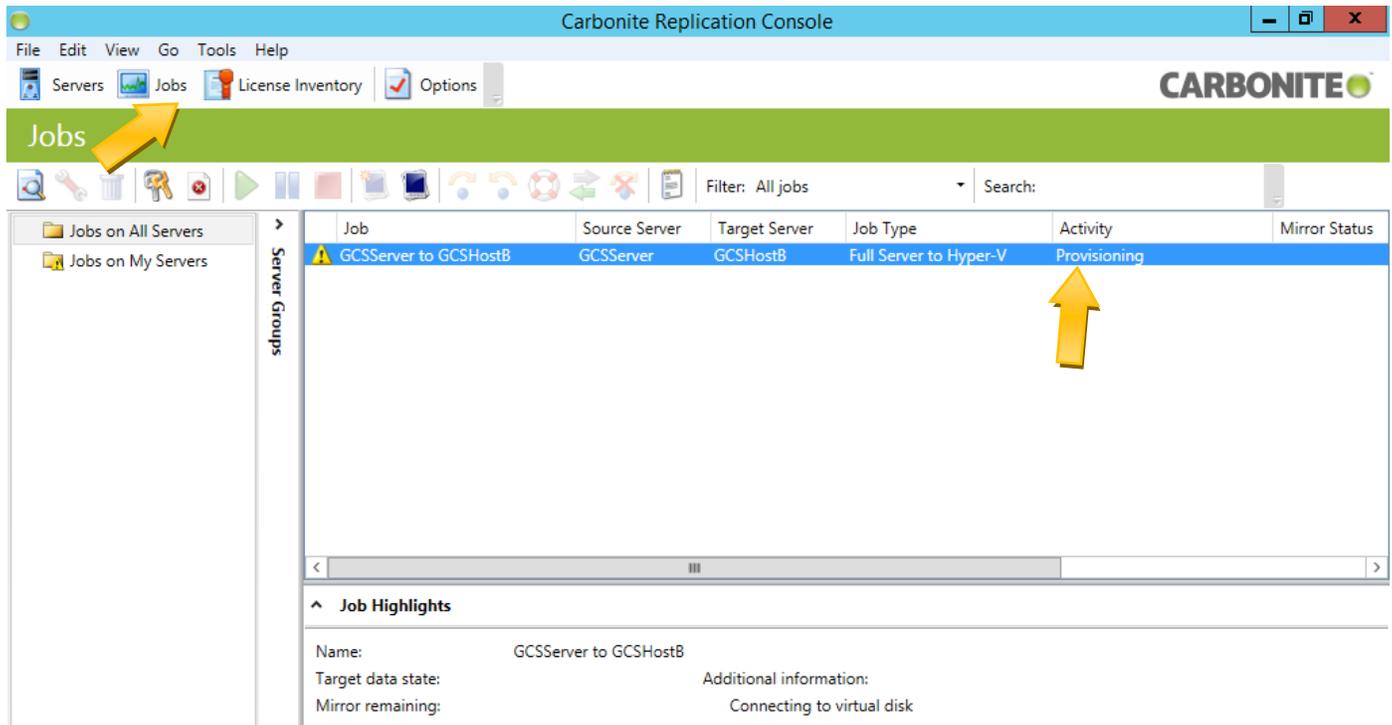
11. Double-take will perform the obligatory checks.

12. Click FINISH to save and continue. *Your standby Target server will begin creating the backup image.*

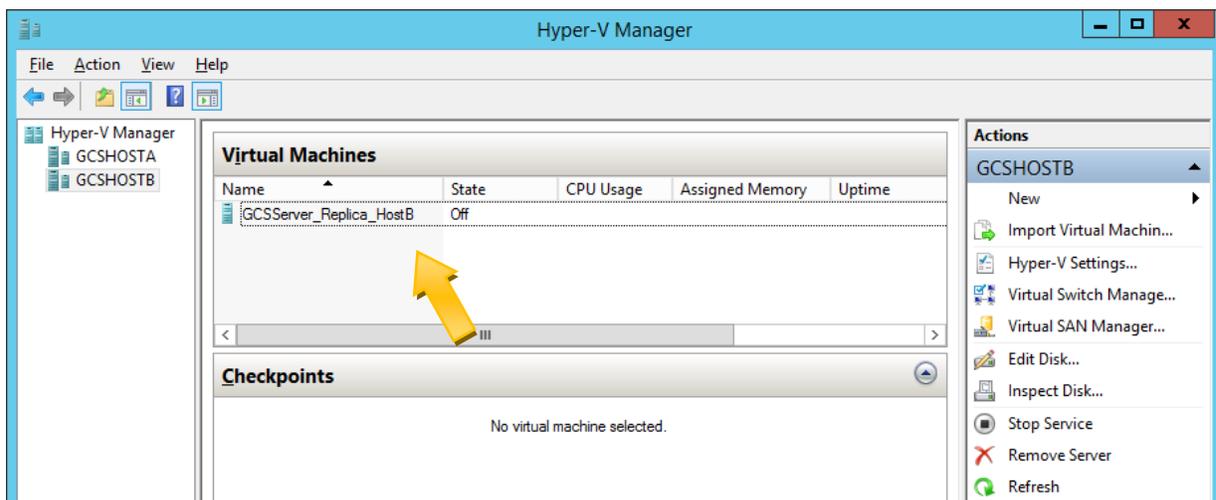


13. The user is returned to the  JOBS screen and the replication will connect and begin synchronizing with the Primary (source) virtual machine.

The process will cycle through several states of activity – i.e. Provisioning, Synchronizing Calc, Synchronizing %, – before reaching the “Protecting” status. This process will take a while.

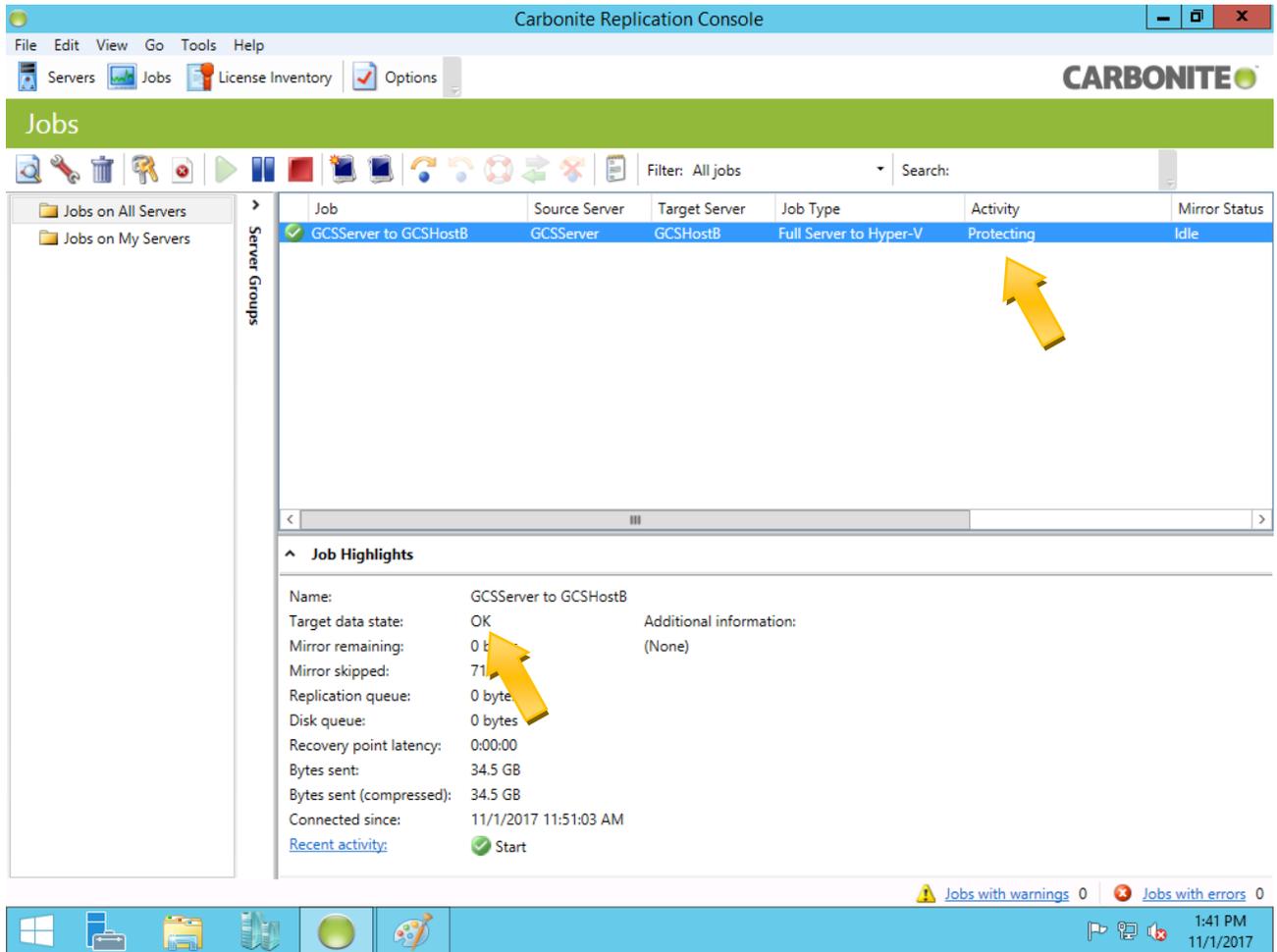


14. Swap over to Hyper V Console and verify the Target server instance was created as intended. Target state should be “off”.



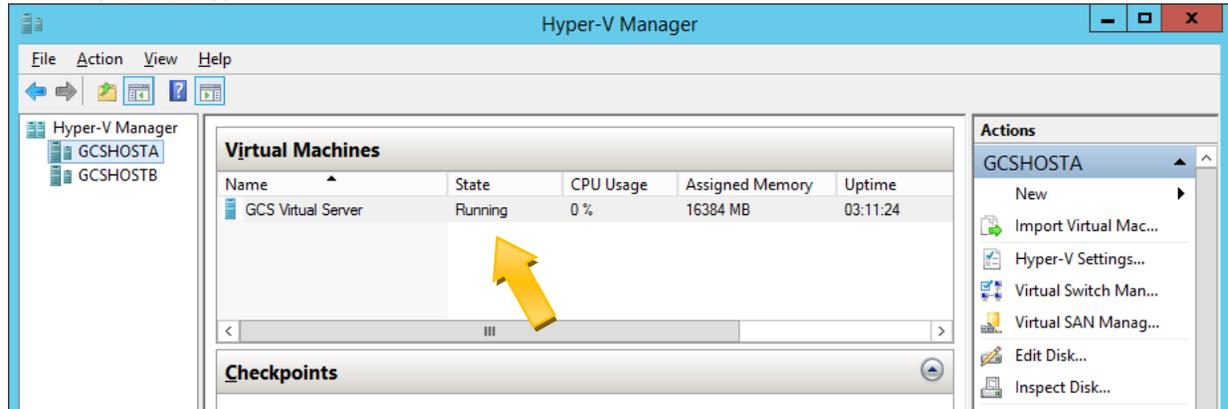
15. Return to the Replication Console to monitor the activity status of the new replication job.

The synchronization is complete when the job indicates “Protecting”, and Data State is “OK”.

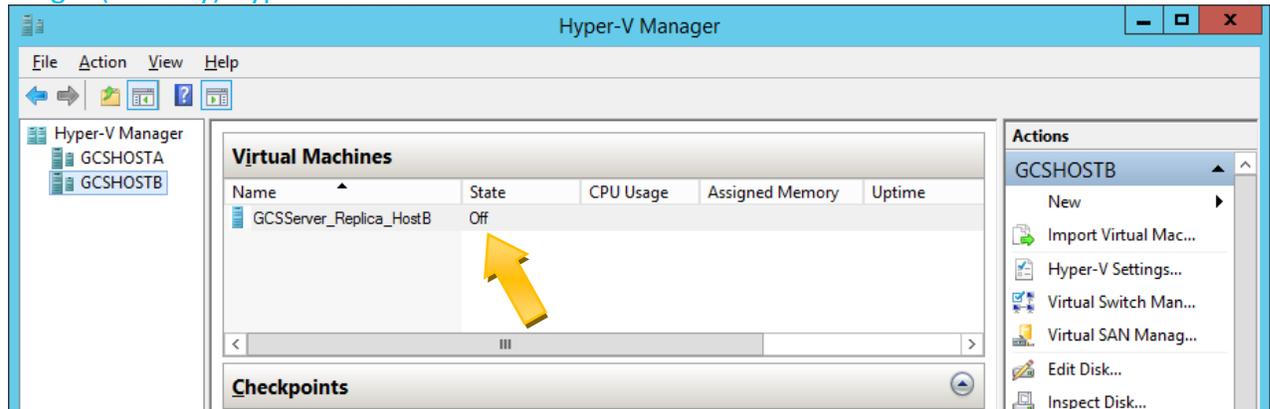


16. In Hyper-V Console, verify the states of both Hyper-V sessions
- the Primary (live/host) HYPER-V session should be “running”.
 - the Standby/Target HYPER-V session should be “off”

Primary (live) Hyper-V Session



Target (standby) Hyper-V Session

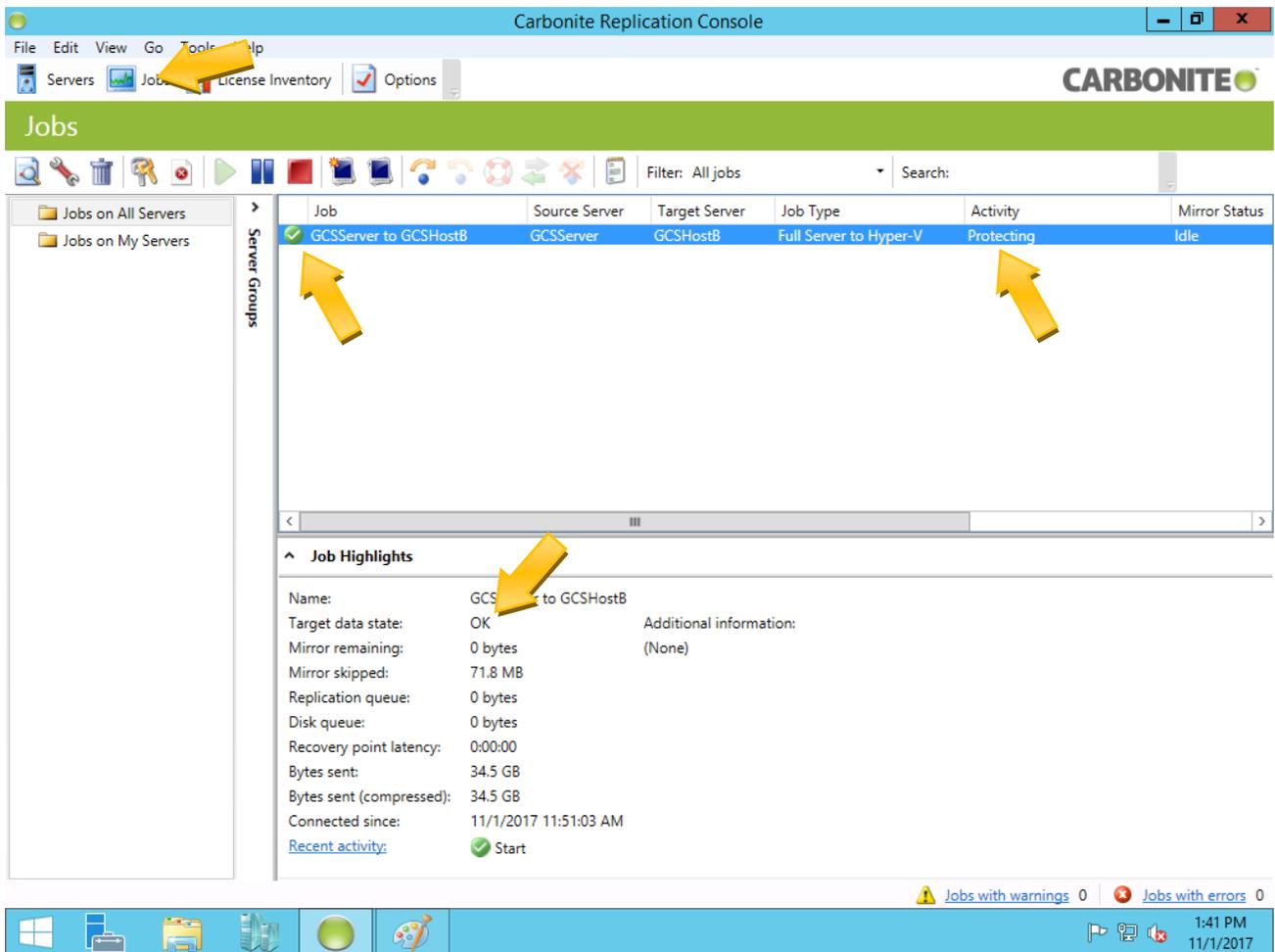


VIEW THE 'HEALTH' OF A REPLICATION JOB

1. Go to the **Target Server's** host OS: Double-click the **Replication Console** desktop icon to open Double-Take Console.



2. Click the  JOBS button on the main toolbar.
3. List of Jobs Panel: When data is actively replicating, the Job status indicates a **green arrow** and the Activity column displays **"Protecting"**.
4. Job Highlights Panel: The **Target Data State** should indicate **"OK"**



The screenshot displays the Carbonite Replication Console interface. The main window shows a list of jobs with the following columns: Job, Source Server, Target Server, Job Type, Activity, and Mirror Status. A job named "GCSServer to GCSHostB" is highlighted, showing a green checkmark in the Job column, "GCSServer" as the Source Server, "GCSHostB" as the Target Server, "Full Server to Hyper-V" as the Job Type, "Protecting" as the Activity, and "Idle" as the Mirror Status. Below the job list, the Job Highlights panel is expanded, showing details for the selected job: Name: GCSServer to GCSHostB, Target data state: OK, Mirror remaining: 0 bytes, Mirror skipped: 71.8 MB, Replication queue: 0 bytes, Disk queue: 0 bytes, Recovery point latency: 0:00:00, Bytes sent: 34.5 GB, Bytes sent (compressed): 34.5 GB, Connected since: 11/1/2017 11:51:03 AM, and Recent activity: Start. The status bar at the bottom indicates 0 jobs with warnings and 0 jobs with errors. The system tray shows the time as 1:41 PM on 11/1/2017.

Job	Source Server	Target Server	Job Type	Activity	Mirror Status
GCSServer to GCSHostB	GCSServer	GCSHostB	Full Server to Hyper-V	Protecting	Idle

Job Highlights

Name: GCSServer to GCSHostB
Target data state: OK Additional information: (None)
Mirror remaining: 0 bytes
Mirror skipped: 71.8 MB
Replication queue: 0 bytes
Disk queue: 0 bytes
Recovery point latency: 0:00:00
Bytes sent: 34.5 GB
Bytes sent (compressed): 34.5 GB
Connected since: 11/1/2017 11:51:03 AM
Recent activity: Start

Jobs with warnings: 0 Jobs with errors: 0

1:41 PM 11/1/2017

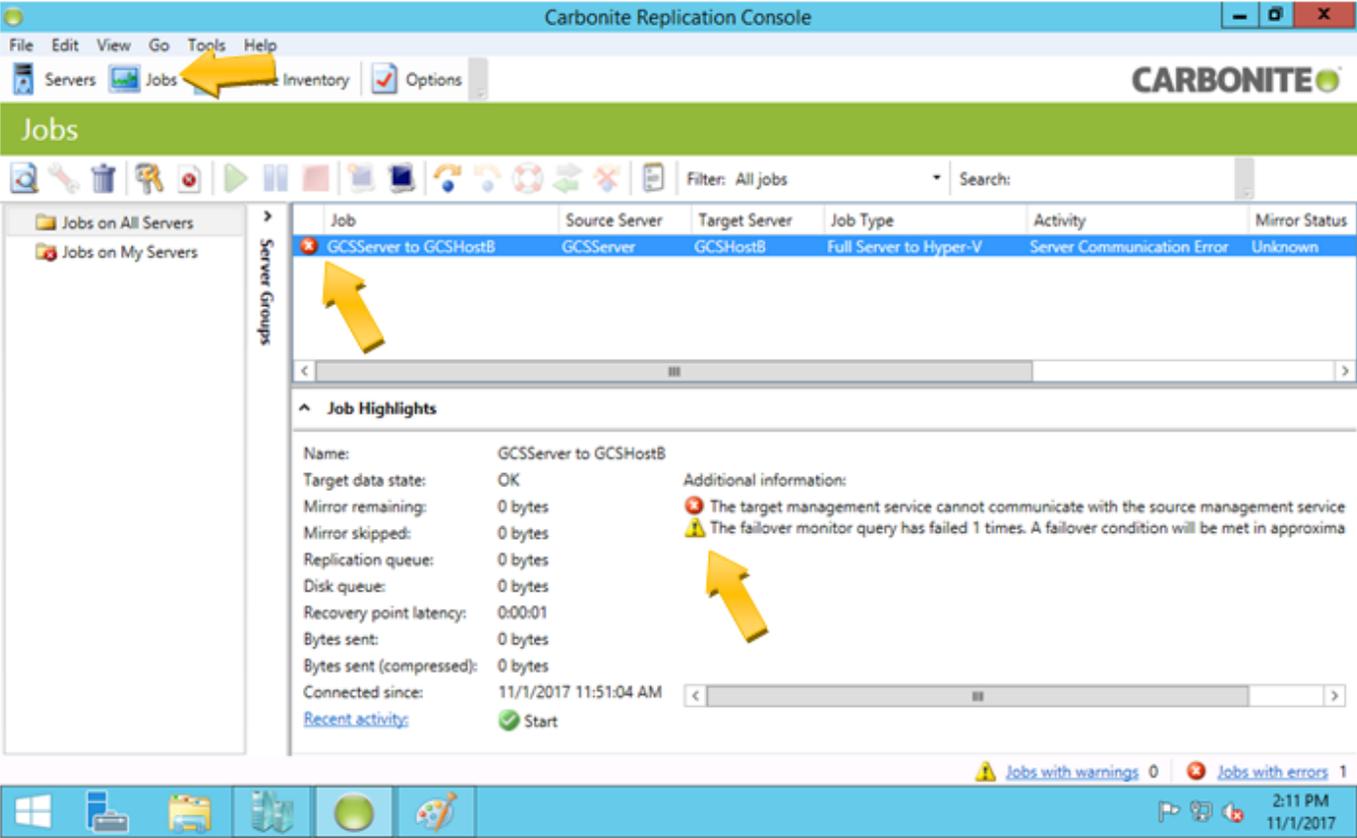
IDENTIFY A REPLICATION FAILURE (IN JOBS VIEW)

A replication failure at the source server will interrupt the source server's ability to continue protecting the system. The failure will be reported through emails and status changes. You will go to the Target Server to confirm the failure.

1. Go to the **Target Server's** host operating system and double-click the **Carbonite Replication Console** startup icon on the desktop to open Replication Console.



2. Click the  JOBS button.
 - a. The replication job may display a Red-X (it depends on the reason for failure)
 - b. You should get email(s) for a failure if you are properly set up to receive notifications.
 - c. Job Highlights panel may also show a red-X or caution symbol indicating the failure.
 - d. The *FAILOVER* button will be enabled/ON at the target server.
 - e. When a failure condition occurs, you may or may not be able to View Server Events for the source server. However, you may still be able to see Job Logs both the target and source server during a failure condition.



The screenshot shows the Carbonite Replication Console interface. The 'Jobs' tab is active, and a table lists the replication jobs. The job 'GCSServer to GCSHostB' is highlighted, showing a 'Server Communication Error' in the 'Activity' column. The 'Job Highlights' panel for this job shows a red 'X' and a warning icon, indicating a failure. The error message states: 'The target management service cannot communicate with the source management service' and 'The failover monitor query has failed 1 times. A failover condition will be met in approxima...'. The 'Recent activity' shows a green checkmark for 'Start'.

Job	Source Server	Target Server	Job Type	Activity	Mirror Status
GCSServer to GCSHostB	GCSServer	GCSHostB	Full Server to Hyper-V	Server Communication Error	Unknown

Job Highlights

Name: GCSServer to GCSHostB

Target data state: OK

Mirror remaining: 0 bytes

Mirror skipped: 0 bytes

Replication queue: 0 bytes

Disk queue: 0 bytes

Recovery point latency: 0:00:01

Bytes sent: 0 bytes

Bytes sent (compressed): 0 bytes

Connected since: 11/1/2017 11:51:04 AM

Recent activity: Start

Additional information:

- The target management service cannot communicate with the source management service
- The failover monitor query has failed 1 times. A failover condition will be met in approxima...

Jobs with warnings: 0 | Jobs with errors: 1

2:11 PM
11/1/2017

ABOUT PERFORMING A 'TEST FAILOVER'

Performing a “test failover” validates the ability of your system to failover (or cutover) when a ‘condition for failure’ is met. You do not have to induce an actual failure in order to perform a test failover.

The process for performing a test failover is similar to performing a manual failover, except without a network connection present.

Refer to the Carbonite documentation for the appropriate steps.

The initial test failovers will be done when the system is initialized, and the appropriate team support is present. After that, test failovers are not necessarily recommended. You should schedule test failovers with the proper planning and field support teams' approvals and available or onsite.

PERFORM A MANUAL FAILOVER

NOTICE: In case of a complete hardware failure on the source server, contact Galaxy technical support. Return the failed server to Galaxy to be repaired / rebuilt.

NOTICE: In the case of other failures, you will restore your network connection as soon as possible

NOTICE: Once the failover is complete on the TARGET machine, all System Galaxy updates/changes will start being committed to the Target server which becomes the Primary Live Host – System Galaxy will resume normal operation. Panels will transmit their event buffers.

WARNING: you must resume data replication manually to restore protected state!

1. Go to the **Target Server's** host operating system and double-click the **Double-Take Console** startup icon on the desktop to open DT Console.



2. Click the  JOBS button.

3. On the Jobs toolbar, either click the  FAILOVER button – OR – select the 'failover' option from the shortcut menu.

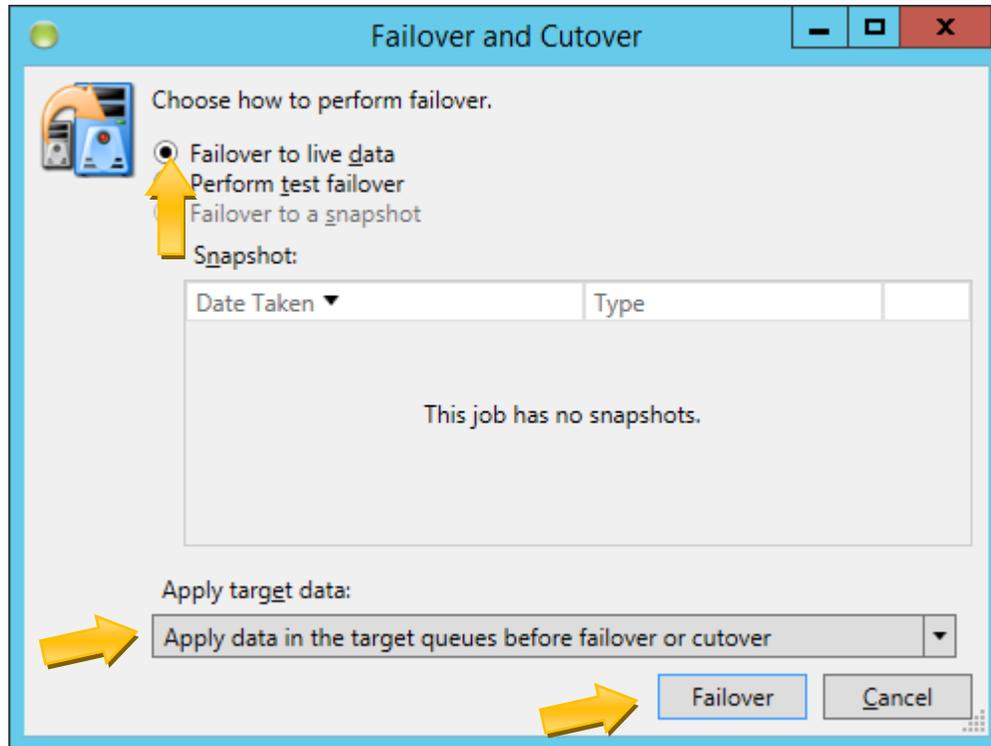
The screenshot shows the Carbonite Replication Console interface. The 'Jobs' toolbar is visible, and a context menu is open over a job entry. A yellow arrow points to the 'Failover, Cutover, or Recover...' option in the menu. Another yellow arrow points to the 'Job Highlights' section below the table.

Job	Source Server	Target Server	Job Type	Activity	Mirror Status
GCSServer to GCSSHostB	GCSServer	GCSSHostB	Full Server to Hyper-V	Protecting	Idle

Job Highlights

- Name: GCSServer to GCSSHostB
- Target data state: OK
- Mirror remaining: 0 bytes
- Mirror skipped: 0 bytes
- Replication queue: 0 bytes
- Disk queue: 0 bytes
- Recovery point latency: 0:00:00
- Bytes sent: 432.9 MB
- Bytes sent (compressed): 432.9 MB
- Connected since: 11/1/2017 2:12:34 PM
- Recent activity:  Start

4. When the Failover dialog opens ...
 - a. choose Failover to Live Data option
 - b. select the 'Apply data in the target queues before failover /cutover
 - c. click FAILOVER button.



5. The Double-Take Job ACTIVITY status will change to 'Failing Over'

The screenshot shows the Carbonite Replication Console interface. At the top, the title bar reads 'Carbonite Replication Console'. Below it is a menu bar with 'File', 'Edit', 'View', 'Go', 'Tools', and 'Help'. A toolbar contains icons for 'Servers', 'Jobs', 'License Inventory', and 'Options'. The main area is titled 'Jobs' and features a table with columns: Job, Source Server, Target Server, Job Type, Activity, and Mirror Status. A single job is listed: 'GCSServer to GCSHostB' with source 'GCSServer', target 'GCSHostB', and job type 'Full Server to Hyper-V'. The 'Activity' column for this job is 'Failing over', which is highlighted by a yellow arrow. Below the table is a 'Job Highlights' section for the selected job, showing details like 'Name: GCSServer to GCSHostB' and 'Additional information: Failing Over: Disconnecting from Double-Take', with another yellow arrow pointing to the latter. At the bottom right, a status bar shows 'Jobs with warnings 1' and 'Jobs with errors 0'. The Windows taskbar at the very bottom shows the time as 2:22 PM on 11/1/2017.

Job	Source Server	Target Server	Job Type	Activity	Mirror Status
GCSServer to GCSHostB	GCSServer	GCSHostB	Full Server to Hyper-V	Failing over	

Job Highlights

Name: GCSServer to GCSHostB

Target data state:

Mirror remaining:

Mirror skipped:

Replication queue:

Disk queue:

Recovery point latency:

Bytes sent:

Bytes sent (compressed):

Connected since:

Recent activity: Failover

Additional information: Failing Over: Disconnecting from Double-Take

Jobs with warnings 1 | Jobs with errors 0

6. The Double-Take Job ACTIVITY status will change to 'Failed Over' when the failover process completes.

The screenshot displays the Carbonite Replication Console interface. The main window shows a table of jobs with the following columns: Job, Source Server, Target Server, Job Type, Activity, and Mirror Status. A job named 'GCSServer to GCSHostB' is highlighted in blue, with its Activity status set to 'Failed over'. A yellow arrow points to this status. Below the table, the 'Job Highlights' section provides details for the selected job, including its name, target data state, and a status of 'Failed Over', also indicated by a yellow arrow. The console includes a menu bar (File, Edit, View, Go, Tools, Help), a toolbar with various icons, and a sidebar with 'Jobs on All Servers' and 'Jobs on My Servers' options. The Windows taskbar at the bottom shows the system clock as 2:24 PM on 11/1/2017.

Job	Source Server	Target Server	Job Type	Activity	Mirror Status
GCSServer to GCSHostB	GCSServer	GCSHostB	Full Server to Hyper-V	Failed over	

Job Highlights

Name: GCSServer to GCSHostB

Target data state: Additional information:
Failed Over

Mirror remaining:

Mirror skipped:

Replication queue:

Disk queue:

Recovery point latency:

Bytes sent:

Bytes sent (compressed):

Connected since:

[Recent activity](#) ✔ Failover

Jobs with warnings: 1 | Jobs with errors: 0

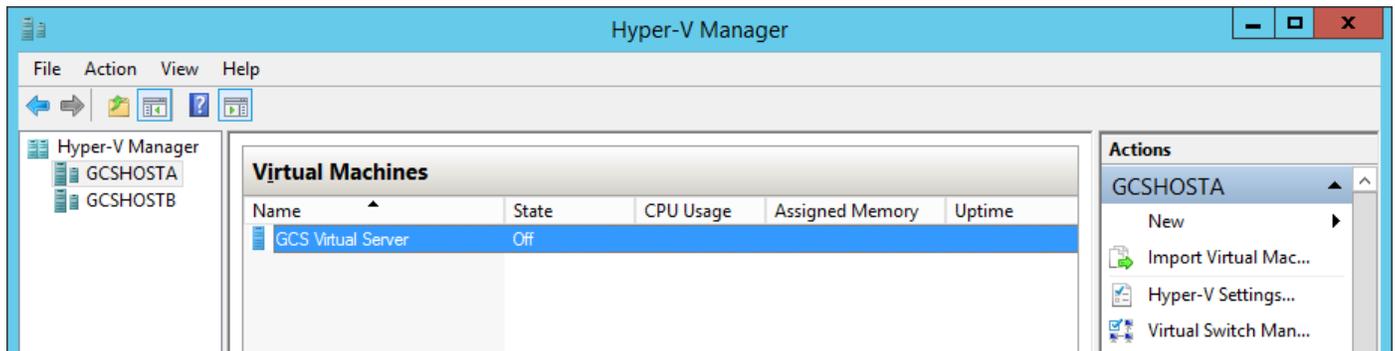
IMPORTANT: System Galaxy hardware will continue to be fully operational during the failover. The System Galaxy software is fully operational on the Target server's Hyper-V session – see steps on the next page.

During a failover, the data replication is interrupted and redundancy is not ensured. After you have repaired or corrected the failure condition, you must recreate the replication job to re-establish redundancy and data duplication.

7. Verify the system is running by opening the Hyper-V Manager at the Target Server. Go to the target server's host operating system and double-click the Hyper-V Manager startup icon on the desktop to open Hyper-V.



8. The Hyper-V Manager on the Primary machine will show the VM status of OFF and the Target server will be 'Running' once the cutover is completed.



NOTE: System Galaxy hardware will continue to be fully operational during the failover. System Galaxy panels are designed to continue providing access control and remain fully functional (according to their programming) even if the System Galaxy database is offline. Events are buffered in the panel's memory until connectivity is restored. Events will begin transmitting when System Galaxy is back online on the new Primary server.

WARNING: you must resume data replication manually to restore protected state!
SEE NEXT SECTION...

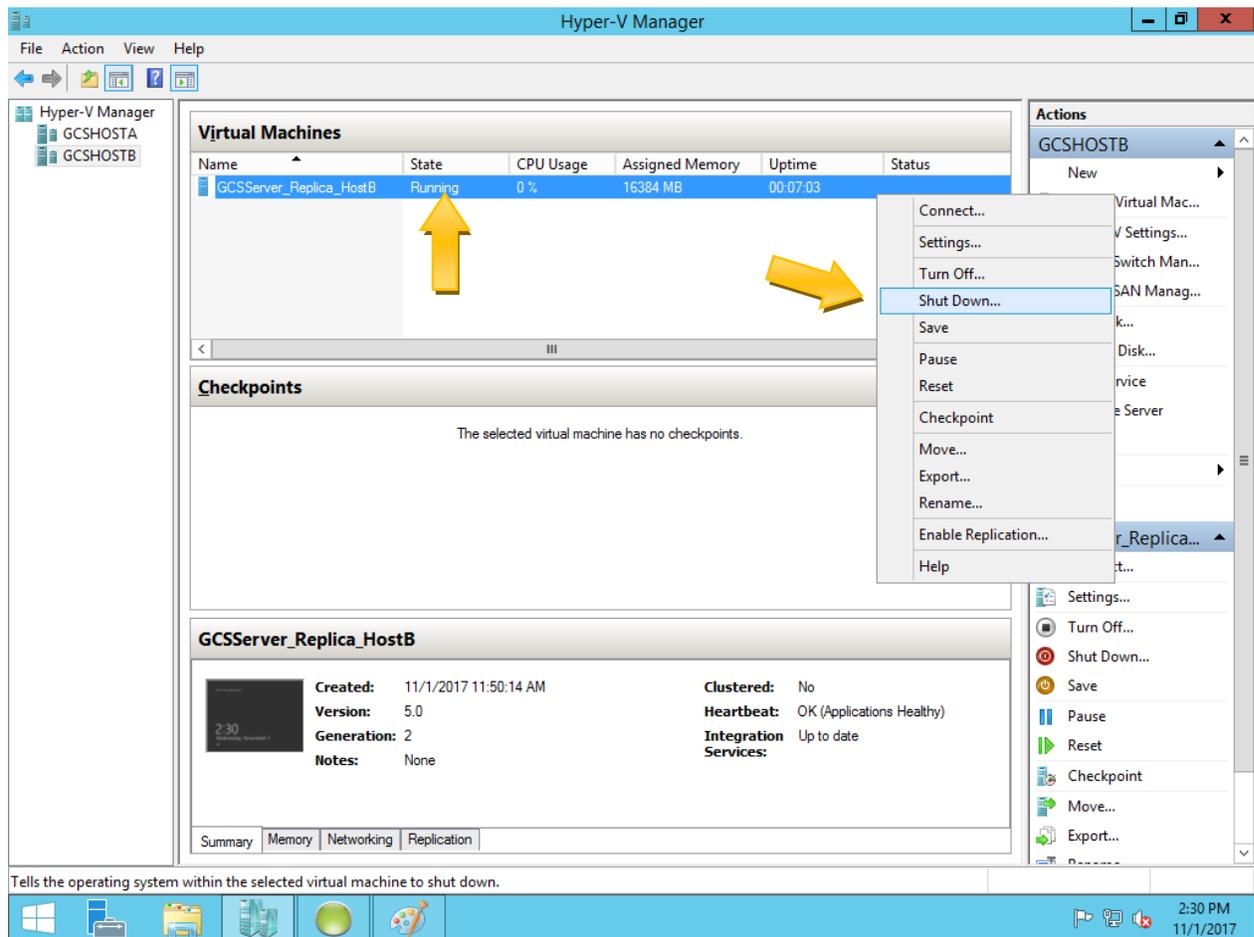
RESUME DATA REPLICATION (after Failover Completed)

Once the source server connection is restored, you must **recreate the replication job** for the new target.

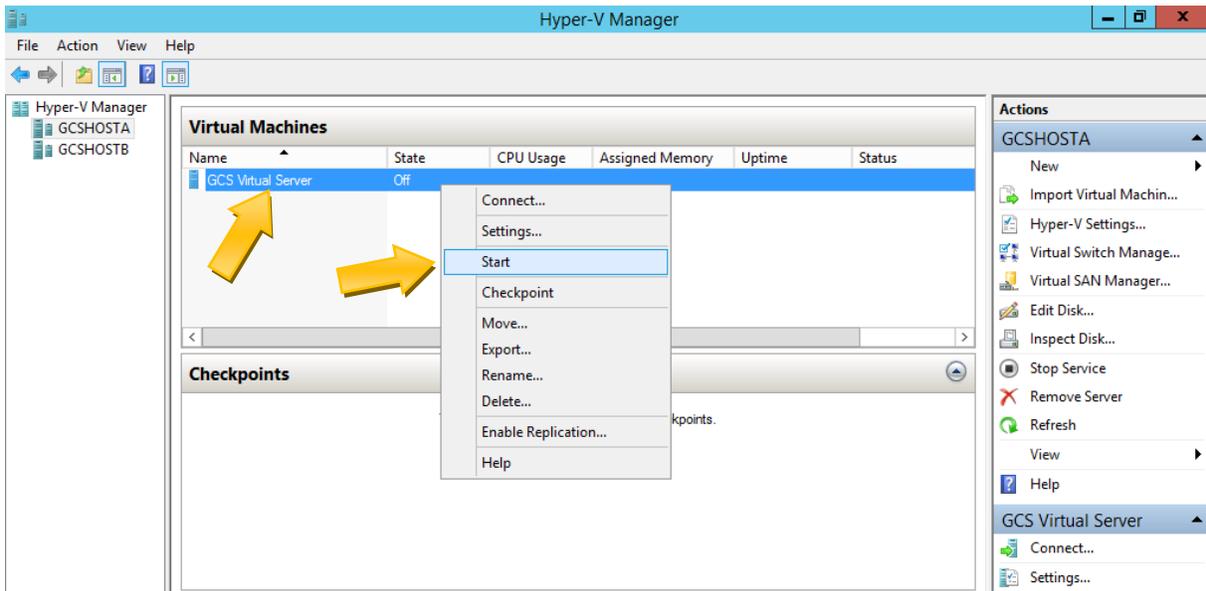
CAUTION for Data Loss: If you choose to *Undo Failover*, you will loose any/all updates and changes that have occurred on the **TARGET server's Virtual Machine** since the initiation of the failover. When a real-time failover occurs, the target server takes over the live support of the System Galaxy operational updates - all changes will be lost if you undo failover.

IMPORTANT: Make sure to put the duplicate *protected copy* on the Machine where it is **NOT** running.

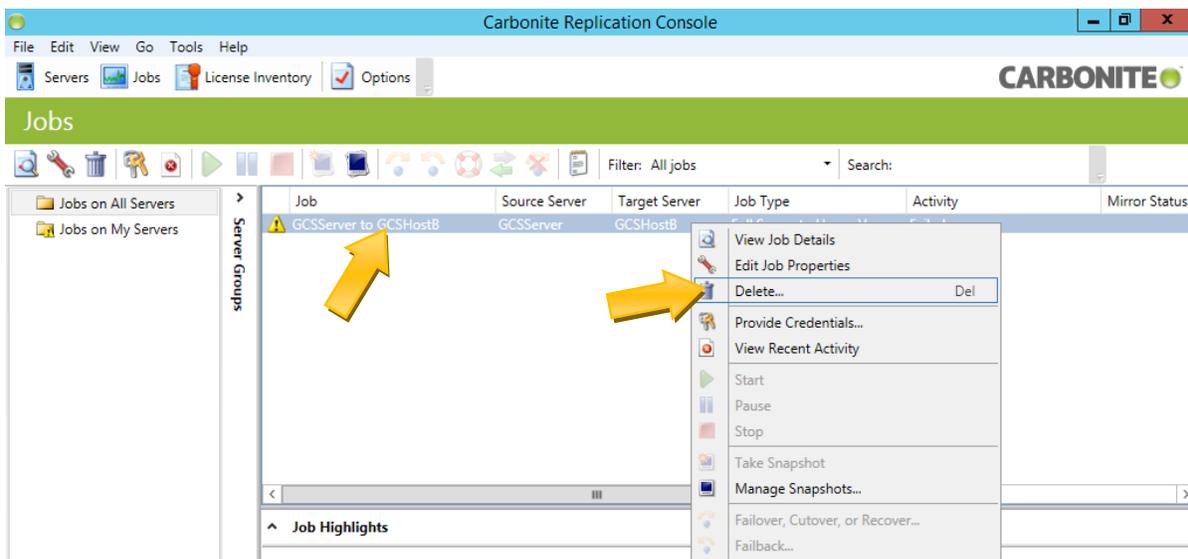
1. Click  JOBS from the Target Server toolbar.
2. Right-clicking the Backup server (Hyper-V) and choose "Shut Down" on the menu.



3. Select the Primary Server and right-click the server and choose “Start” from the menu.



4. Delete the **GCS Host B** replication job from the job queue by right-clicking the job and selecting “Delete” from the shortcut menu.



5. Now delete Replica Host (the one that is not running).

