



GW3-TRBO®
Archiver
Software Version 2.16.4
Module Book

GW3-TRBO®

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Support

Customer satisfaction is our number one priority at Genesis. We are here to provide you with the best software possible, and we want to know when you have any questions, concerns or problems with GW3-TRBO so that we can make it a better product for everyone.

Refer to the *Troubleshooting & Support* section of the GW3-TRBO Manual Shell (Book 600-2.16.4-AA.1) for complete support and contact information.

Document History

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Goals

This document describes the role and function of the Archiver module in the GW3-TRBO solution.

Who Should Read This Manual?



This manual is written for an expected audience of mid-level PC users. Reporting and archiving personnel should read this manual.

How This Manual Is Organized

This manual is organized as follows:

- **Overview:** Describes the Archiver module and options available in the Archiver Graphical User Interface (GUI).
- **Forensic Reporting:** Describes the process of backing up and restoring the GW3-TRBO database in order to satisfy forensic reporting needs.

This manual contains the following images, used to indicate that a segment of text requires special attention:

-  **Additional Information:** Additional information is used to indicate shortcuts or tips.
-  **Warning:** Warnings are used to indicate possible problem areas, such as a risk of data loss, or incorrect/unexpected functionality.

Important Note

The MOTOTRBO “backbone” that GW3-TRBO uses is a powerful stream of data that, as time goes by, will be revealing much more of its power. You may notice GW3-TRBO terms, setup options or real-time activity properties that may not make sense in the current MOTOTRBO world. If you see terms, options or properties that are not adequately explained in your GW3-TRBO documentation, please contact support, look in the Glossary section of the GW3-TRBO Manual Shell, or on our GW3-TRBO web site. If you see terms, options or properties that you understand, but do not pertain to MOTOTRBO, please disregard them for the time being. As new MOTOTRBO features are added over time, you will begin to understand that your GW3-TRBO is ready for those MOTOTRBO enhancements!

This chapter describes the Archiver module and options available in the Archiver module GUI (Figure 1.1).

This chapter contains the following sections:

- **Terms:** Describes basic terms related to Archiver.
- **What is Archiver?:** Describes the Archiver module.
- **System ID:** Describes the Archiver system ID selection feature.
- **Packet Type Settings:** Describes the Archiver packet type settings.
- **Purging Settings:** Describes the Archiver purging settings.
- **Database Down Functionality:** Describes Archiver behavior when disconnected from the database.

Terms

- **Archiving:** Writing data to a database. This data is available through reporting.
- **Packet:** Data received from a GW3-TRBO input.
- **Decode:** The act of converting 0s and 1s into readable data.
- **Purging:** Deleting data from the database. This is generally based on time, where all data older than x hours, days, months, etc. is deleted. This operation frees up room in the database and allows reporting to run more efficiently.

What is the Archiver?

The Archiver module *archives decoded* GW3-TRBO input *packets* to an SQL database. The Archiver GUI allows you to manipulate the following categories of Archiver settings on a per-system basis:

- **Packet Types:** The types of packets that are archived.
- **Purging:** Options for *purging* archived data. Purging data manages the amount of hard drive space the database consumes.

System ID

This feature allows you to choose separate Archiver options for each of your licensed systems. The **System ID** list contains a System ID and alias for each of your licensed systems. Archiver's **Packet Types** and **Purging** panels show the Archiver options for the system ID selected in the **System ID** list.

Packet Type Settings

The packet type list, under the **Packet Types** tab, contains an entry for each archived packet type. If a packet type in this list is checked, then that packet type

is archived to the SQL database by the Archiver module. If it is not checked, then it is not archived.

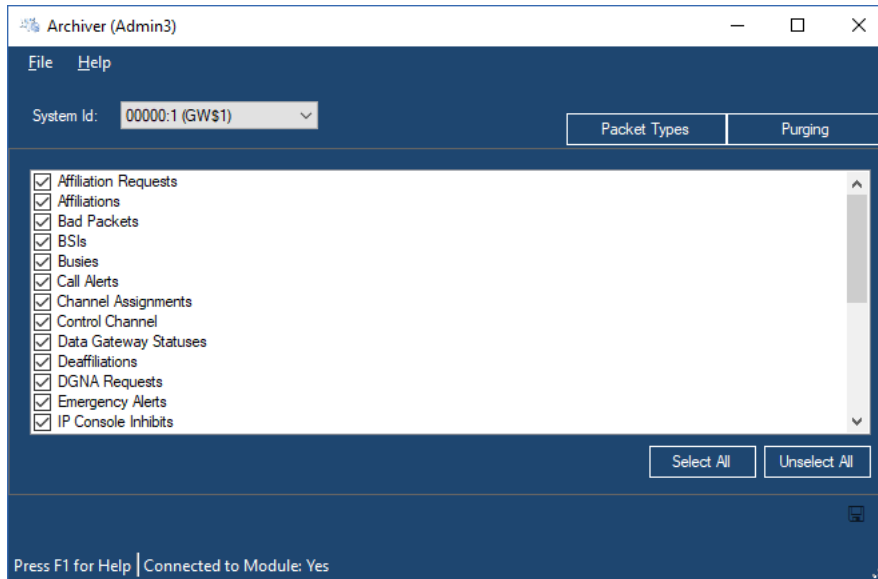


Figure 1.1 – Packet Types Options



Many of the GW3-TRBO reports rely on the data in the Channel Assignments table. If these packets are not archived, many of the reports will not show data. Genesis recommends archiving all packet types.

Generally each packet type received by GW_Archiver has a corresponding archive table in the database. For example, when GW_Archiver receives a Call Alert packet, it stores this packet in the ARC_CallAlerts table. However, there are some archive tables that include a broader range of packets.

Bad Packets

Each packet that is marked as Corrupt qualifies as a Bad Packet. These are stored in the ARC_BadPackets table. Because these packets cannot be reliably decoded, GW_Archiver simply stores their source (WACN, System, Zone/RFSS and Site) and their corruption type (see the Type column of the ARC_BadPackets table):

1. Reported Corrupt from Device
2. Previous Word was Invalid
3. Invalid structure for packet from this source
4. Orphan call activity (call continuation without a corresponding start of call)

System Events

When GW_Archiver does not know which archive table to store a packet in, it stores the packet in GW_SystemEvents. This table stores the packet's source (WACN, System, Zone/RFSS and Site), the packet's type, raw data and the values decoded from the raw data.

Packet Throttling

Some tables are protected against duplicate packet reporting by Archiver's packet throttling feature. The following table shows which archive tables are protected by packet throttling and the packet throttling limits enforced per table:

Table Name	Time Threshold (seconds)	Quantity Threshold
ARC_Affiliations	3	4
ARC_BSIs	3	4
ARC_CallAlerts	N/A	N/A
ARC_ChangeMes	3	4
ARC_ControlChannel	600	N/A
ARC_Deaffiliations	1.25	4
ARC_DynamicRegroupings	3	4
ARC_EmergencyAlerts	3	4
ARC_Failsofts	3	4
ARC_Inhibits	3	4
ARC_Messages	3	4
ARC_RejectReasons	3	4
ARC_RMRTs	3	4
ARC_Selectors	3	4
ARC_Statuses	3	4
ARC_SystemDiagnostics	3	2

When a packet targeting one of the tables above is received, if the packet time threshold between packets is reached the packet is archived. If the quantity threshold is reached within the time threshold, the packet is archived.

Purging Settings

Date-Based Purging

The purging settings inform the Archiver module when data should be deleted from the archive tables in the SQL database. Tables in the GW database that begin with the prefix ARC_ are archive tables. The purging table list, in the **Purging** tab (Figure 1.2), contains an entry for each applicable archive table in the GW database.

Each table has its own separate purge setting. The Archiver module performs purging when the module is started and every hour after it is started. If a table contains records older than its purging option, then these records are permanently deleted during the hourly purging operation.

Purge duration options include:

- *After 1 hour*
- *After 4 hours*
- *After 12 hours*
- *After 1 day*
- *After 2 days*
- *After 1 week*
- *After 2 weeks*
- *After 1 month (30 days)*
- *After 3 months (90 days)*
- *After 6 months (180 days)*
- *After 1 year*

Your purging options should reflect your reporting needs. If your biggest report is a monthly report, then set purging to occur every 3 months. If your biggest report is a bi-weekly report, then set purging to occur every month. Regular purging will allow your reports to run more quickly.



Packet types with a purging interval of After 2 Weeks or longer are kept for an additional 7 days. This allows you to set the purge interval to After 1 Month and still have 6-7 days to run your monthly reports before data is purged.

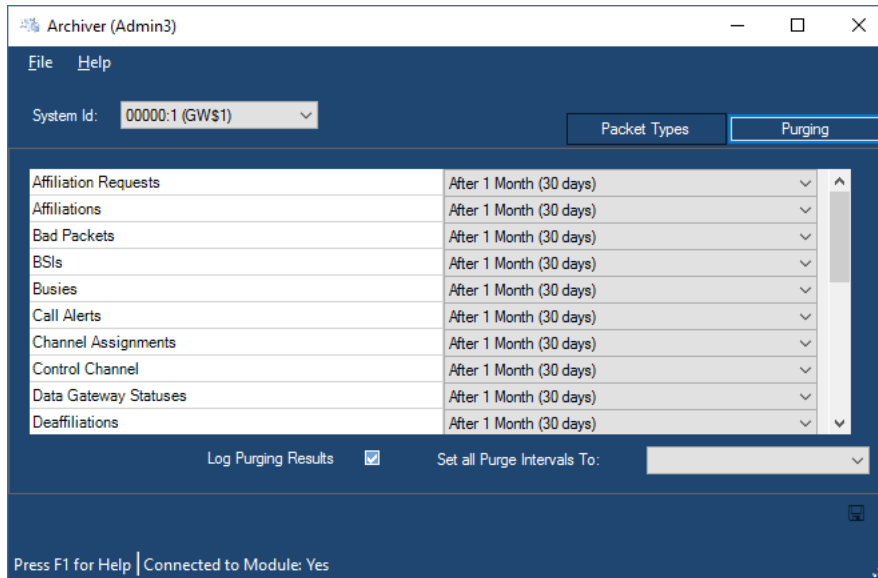


Figure 1.2 – Archiver Purging Options

Select a purge interval in the **Set All Purge Intervals To** list to set all of the above purge intervals to the selected purge interval.

Log Purging Option

Each hour Archiver performs a purge operation. This operation compares the timestamp of the archived data with the current time of the GW3-TRBO machine that is hosting the GW3-TRBO service. Archiver deletes each record with a timestamp that differs from the machine time by greater than the date-based purging option selected for the record's type.

For example, if you selected *After 6 Months (180 days)* for *Calls*, each hour Archiver will delete each call record archived more than 187 days ago (down to the second, and including the 7 days of padding applied to all intervals greater than 2 weeks).

If the *Log Purging* option is checked on this screen, Archiver module will report:

- When the purging operation begins.
- When the purging operation ends, reporting the results of the purging operation (number of records purged for each archive table purged).

These results will show in the Windows Event Viewer (in the *GenWatch* event log) and are sent via the SysLog module. See the SysLog section of the *GW3-TRBO Core Manual* for more information on SysLog.

Chapter 2 describes how to back up data so that you can do forensic reporting on data more than your allowed archiving time period.

Skyview Connect Plus Tables Purging

Archiver stores active call, busy and diagnostic activities originating from multi-site TRBO systems (such as Connect Plus, LCP and Capacity MAX) in the following tables:

- SkyViewConnectPlusBusies
- SkyViewConnectPlusBusySites
- SkyViewConnectPlusCalls
- SkyViewConnectPlusCallSites
- SkyViewConnectPlusDiagnostics

TRBO SkyView is a web-based Genesis product. The active calls, busies and diagnostics in these tables are used to serve near real-time data to TRBO SkyView.

Each hour during the purging process, Archiver purges calls and busies that have ended and diagnostics that have been cleared from these tables. Archiver also purges un-ended calls and busies older than 30 days and un-cleared diagnostics older than 90 days.

Database Down Functionality

In remote database configurations of GW3-TRBO, Archiver is designed to continue operation while the database is down or unreachable due to network issues. While the database is unavailable, Archiver queues archive records in memory and, if needed, to the disk drive. Once the database is restored, the queued records are written to the database.

GenWatch3.config Settings

The following settings are stored in the GenWatch3.Config file in the host's [Program Data]\Genesis\GenWatch3 path:

- **ArchiverBatchAmount:** Batching SQL operations is more efficient than processing each operation independently. This value indicates how many database insert and update operations Archiver gathers before executing them in a single batch. Suggested values are 1-1,024 based on system load. This number should be set to a value that results in a batch execution every few seconds.
- **SubscriberGpsEventsCorrelationInterval:** This value indicates the frequency (in minutes) that Archiver will check to perform Subscriber GPS event correlation. At each interval, Archiver will correlate new Subscriber GPS events with Calls to determine the RSSI and/or Site Id of the Subscriber GPS event. Suggested values are 1-5. This number should be set to a value that corresponds with any near-real time reporting from the *ARC_SubscriberGpsEvents* table. See *Appendix A - Subscriber GPS Event Correlation* of the Connect module documentation for details.

As described in the previous chapter, Archiver limits the amount of time archived data is stored in the GW database. This section contains detailed instructions on how to back up data and restore backed-up data, so that you may report on data that is older than your allowed archiving time period.

This chapter contains the following sections:

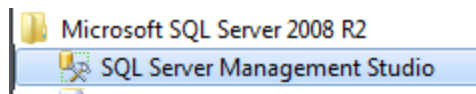
- **Loading the SQL Server Management Studio Application:** Describes the steps required to load the SQL Server Management Studio application.
- **Performing a Database Backup:** Describes the steps required to perform a GW3-TRBO database backup.
- **Performing a Database Restore:** Describes the steps required to perform a restore of a GW3-TRBO database backup.

Loading the SQL Server Management Studio Application

Backups and restores are performed in the SQL Server Management Studio application. These steps are referenced in the Performing a Database Backup section and *Performing a Database Restore* sections of this chapter. To load this application, follow the steps below. These steps may vary depending on the version of SQL Server being used.

Windows 7

1. Click the Windows **Start** button. This will show the Start menu.
2. Click the **All Programs or Programs** item. This will show the program folders and programs installed on this machine.
3. Click the **Microsoft SQL Server** item. This will show the program folders and programs under this category.
4. Click on **SQL Server Management Studio Express** or **SQL Server Management Studio**. This entry name will vary between SQL Server Express and SQL Server for Workgroups. This will load the SQL Server Management Studio application.



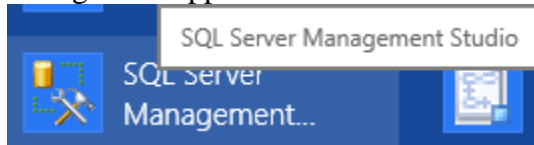
5. The SQL Server Management Studio application will show the *Connect to Server* dialog. Enter the Server Name (GW3-TRBO database machine name), select *Windows Authentication* for **Authentication** and click the **Connect** button. This will connect you to the SQL Server instance on the selected server name.



Figure 2.1 – Connect to Server dialog

Windows 8

1. Press the Windows key. This will show the Start screen.
2. Right click on the Start screen. This will display the **All apps** button in the bottom right corner.
3. Click the **All apps** button. This will show the program folders and programs installed on this machine.
4. Click on **SQL Server Management Studio Express** or **SQL Server Management Studio**. This entries name will vary between SQL Server Express and SQL Server for Workgroups. This will load the SQL Server management application.



- 5.
6. The SQL Server management application will show the *Connect to Server* dialog. Enter the Server Name (GenWatch3 database machine name), select *Windows Authentication* for *Authentication* and click the **Connect** button. This will connect you to the SQL Server instance on the selected server name.

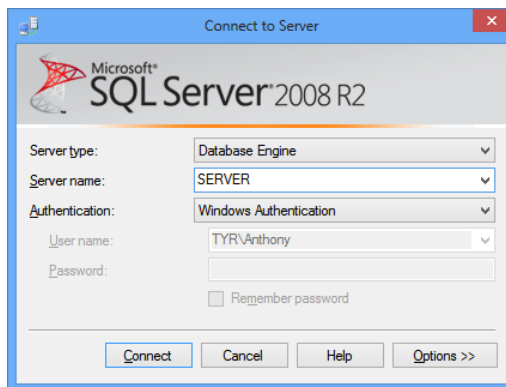


Figure 2.2 – Connect to Server dialog (Windows 8)

Performing a Database Backup

A database backup is a snapshot of your database at a given point in time. This operation creates a copy of your database while it is still archiving data. This process will result in a single file. This file can be 3.5 gigabytes or greater in size, depending on your system activity.

It is best to store these files off-site or at least off of the GW3-TRBO machine, as they can act as a complete database backup as well as a forensic reporting archive.

To backup your GW3-TRBO database, follow the steps below:

1. Load the SQL Server Management Studio application. This is described in the *Loading the SQL Server Management Studio Application* section of this chapter.
2. In the **Object Explorer** section of the SQL Server Management Studio screen, expand the *Databases* item. This will show all of the databases under this SQL Server instance, including the **GW** database.
3. Right-click on the **GW** database. This will show the database options menu.
4. Click the **Tasks** option. This will show the Tasks options menu.

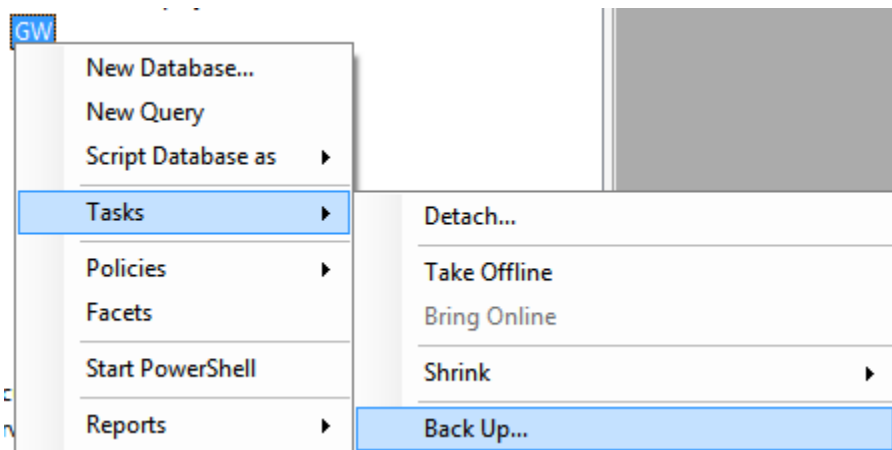


Figure 2.3 – Tasks options

5. Click the **Backup...** option. This will show the *Back Up Database* screen.
6. Under the **Backup set** section, change the **Name** to **GW-<yyyy-mm>** where yyyy = the 4-digit year and mm = the 2-digit month. For example, a backup performed on 12-31-2018 would be named GW-2018-12.

- In the **Destination** section, click the **Remove** button. This will remove the default destination entry.

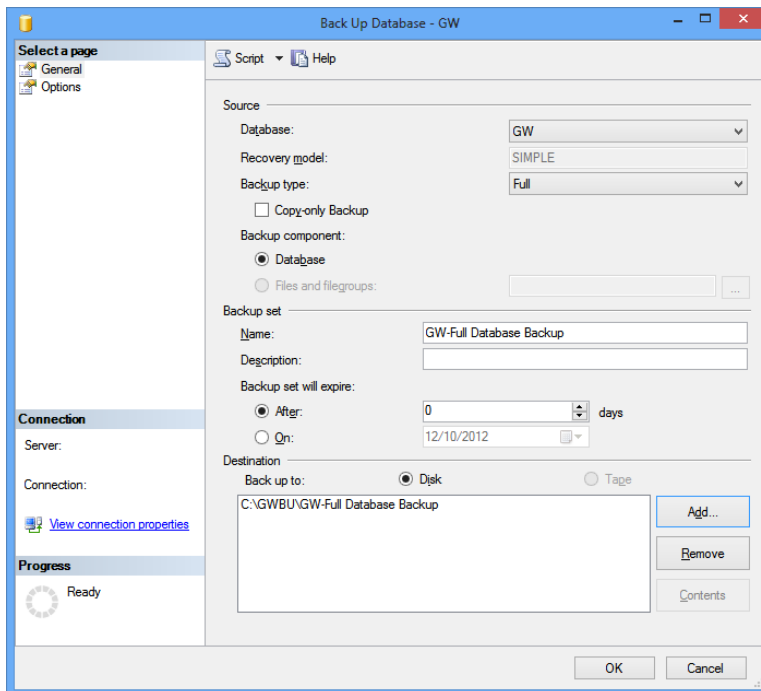
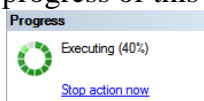


Figure 2.4 – Back Up Database dialog

- In the **Destination** section, click the **Add...** button. This will show the *Select Backup Destination* screen.
- In the **File Name** section, type the backup destination. The destination drive can be any writeable hard drive, such as local hard disk or an external hard disk. The drive must be local to this machine. Network drives are not supported. The folder that you choose must already exist on the drive that you choose. Name the backup file GW-yyyy-mm.BAK where yyyy is the 4-digit year and mm is the 2-digit month. For example, a backup performed on 12-31-2018 would have a destination named GW-2018-12.BAK.
- Click **OK** to confirm the file name. This will close the *Select Backup Destination* screen and return you to the *Back Up Database* screen.
- Click the **OK** button. This will perform the backup process (Notice the progress of this operation in the Progress section).



- Once this process is complete, you are ready to move your GW3-TRBO database backup file from the destination location to an off-site location.

Performing a Database Restore

A database restore is a process used to make forensic data temporarily available for reporting. This process restores a database backup file to the GW3-TRBO machine's SQL Server instance. After a restore, you may use Reports to select the restored database as the data source.



If you are restoring a GW database that was backed up on a different PC than you are restoring to, please see the Special Case section below.

To perform a GW3-TRBO database restore, follow the steps below:

1. Load the SQL Server Management Studio application. This is described in the *Loading the SQL Server Management Studio Application* section.
2. In the **Object Explorer** section of the SQL Server Management Studio screen, right-click in the **Databases** item. This will show the Databases options menu.
3. Click the **Restore Database...** option. This will show the *Restore Database* screen.

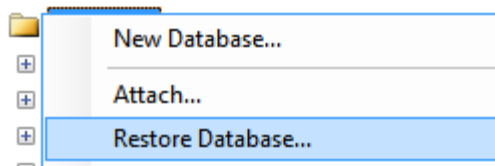



Figure 2.5 - Object Explorer

4. In the **Source** section, select the **Device** option.
5. Click the  button at the end of the **Device** option. This will load the *Select backup devices* screen.
6. In the *Select backup devices* screen, for the **Backup media type** option, choose **File**.
7. Click the **Add** button. This will show the *Locate Backup File* screen.
8. Click on your backup file (created via the Database Backup process) and click the **OK** button. This will return you to the *Select backup devices* screen.
9. Click **OK** in the *Select backup devices* screen. This will return you to the *Restore Database* screen and populate the *Backup sets to restore* list with one entry.

- Verify that the checkbox in the *Restore* column of the *Backup sets to restore* list is checked.

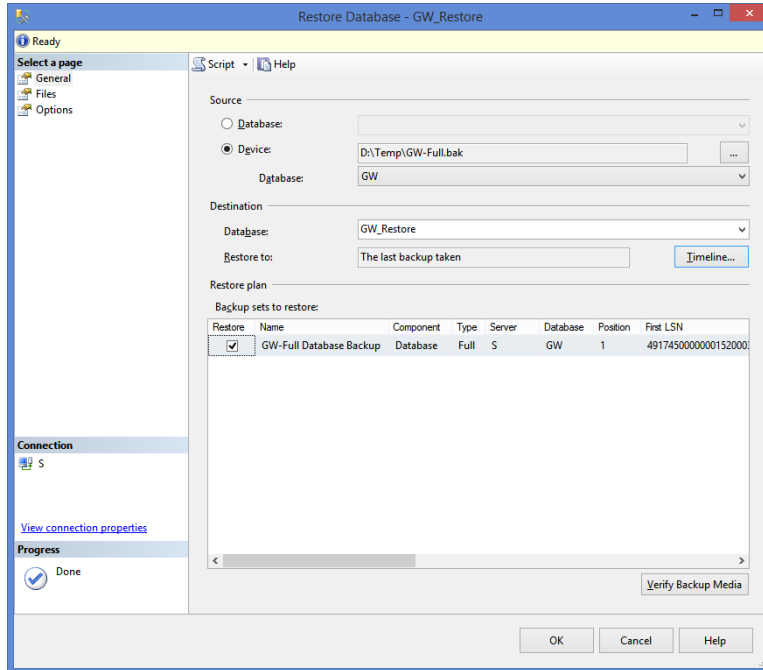



Figure 2.6 – Restore Database dialog – General page

- Under the **Destination** section, type *GW_Restore*.
 - In the *Select a page* section, click on the *Files* item. This will show the Files options panel.
 - In the *Restore the database files as* section, click on the **Restore As** column for the *GW_Data* entry. This will allow you to modify the file name.
 - Change the **Restore As** file name to *GW_Data_Restore.MDF*.
 - Click on the **Restore As** column for the *GW_Data_log* entry. This will allow you to modify the file name.
 - Change the **Restore As** file name to *GW_Log_Restore.LDF*.
-  Ensure that the files *GW_Data_Restore.MDF* and *GW_Log_Restore.LDF* files do not already exist in the Restore As folder.

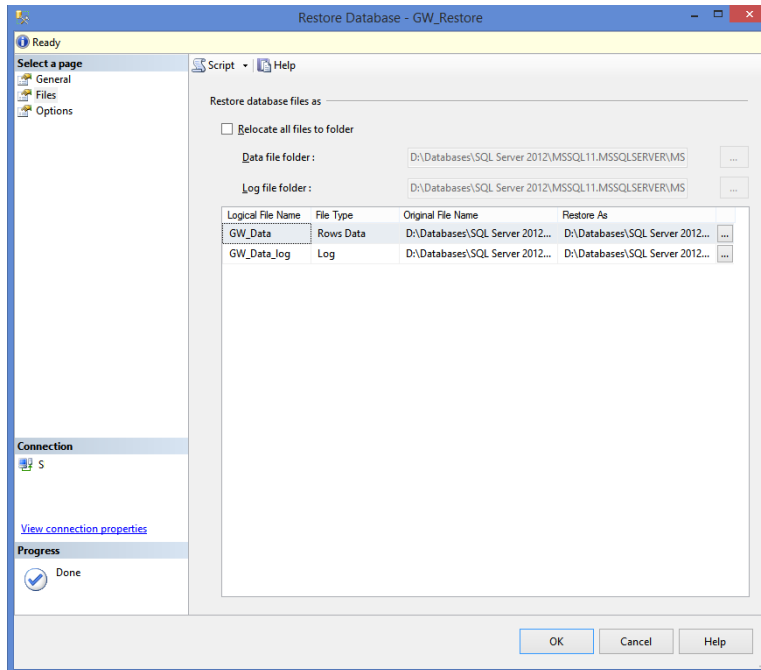


Figure 2.7 – Restore Database dialog – Files page

17. Click the **OK** button. This will perform the restore process.
18. Upon completion, SQL Server management shows a dialog stating that the restore is complete.

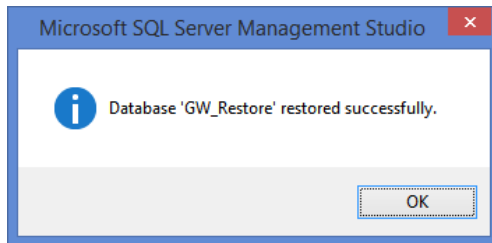


Figure 2.8 – Restore Complete dialog


19. You can now choose the *GW_Restore* database as a reporting source in Reports.


Special Case – Restore from One PC to Another

If you backup a GW database on one PC and restore it to another, you must perform additional setup to map the SQL Server Logins to the users in the restored database. Restoring the GW database to a machine that has never hosted the GW database will require even further setup. Please contact GW3-TRBO support for further instructions.

Restore Cleanup

Once you have completed your forensic reporting, cleanup is required. This process ensures that the next time you need forensic reporting, you can perform a restore without having to worry about pre-existing restored databases.

 If the Restore Cleanup process is not performed, the Restore Database process may fail.

 You must close the Reports GUI and all Microsoft Excel instances that reported on the GW_Restore database before performing these steps

To perform restore cleanup, follow the steps below:

1. Load the SQL Server Management Studio application. This is described in the *Loading the SQL Server Management Studio Application* section.
2. In the **Object Explorer** section of the SQL Server management screen, right-click on the *GW_Restore* database. This will show the Databases options menu.
3. Click on the **Delete** option. This will show the *Delete Object* screen.

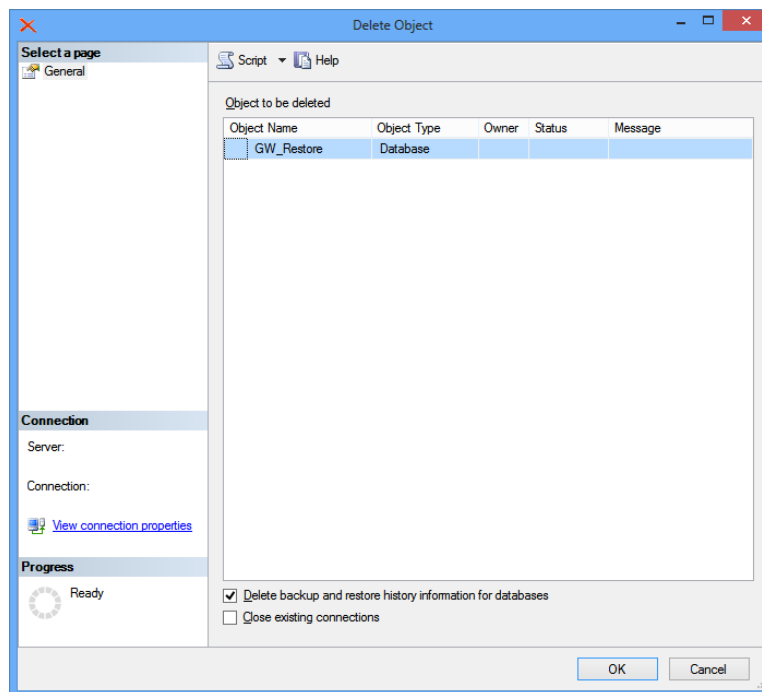


Figure 2.9 – Delete Object dialog

4. Uncheck the **Delete backup and restore history information for databases** option.
5. Click the **OK** button. This will detach the database from the SQL Server instance and delete the files created in the *Restore Database* process.