BIMcloud 20 Backup Guide
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Choose backup levels

1st level – Project and Library backups

**Backing up:**
- Server data of Projects (BIMProject)
- PLN backups on the Server
- Each user’s Local Cache (PLA)

**Useful:**
- when project is damaged (most of the cases)
- optimized for minimal data loss

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistent (hourly backup)</td>
<td>Recovery time</td>
</tr>
<tr>
<td>Automated</td>
<td>Restore one by one</td>
</tr>
<tr>
<td>Accessible</td>
<td>Version dependent</td>
</tr>
</tbody>
</table>

2nd level – Full BIMcloud Server and Manager Data backup

**Backing up:**
- BIMcloud Manager data
- BIMcloud Server data/BIMProjects and BIMLibraries

**Useful:**
- when BIMcloud Server/Manager gets damaged (rarely)
- restore BIMcloud on the same/on a different machine
- Frequency: daily (overnight – outside of work hours)

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full BIMcloud recovery</td>
<td>Synced databases required</td>
</tr>
<tr>
<td>Scripted</td>
<td>Services have to be stopped</td>
</tr>
<tr>
<td></td>
<td>‘Same’ BIMcloud required</td>
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</tbody>
</table>

3rd level - Operating System snapshot

**Backing up:**
- Snapshot of the Virtual Machine

**Useful:**
- when OS or computer hardware is damaged (little chance)
- quick recovery

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full recovery (OS + BC)</td>
<td>Synced databases required</td>
</tr>
<tr>
<td>Automated</td>
<td>Services have to be stopped</td>
</tr>
<tr>
<td>Replica server</td>
<td>Management of VMs</td>
</tr>
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</table>
1st level – Project and Library backups

With BIMcloud Manager’s built in Backup solution all Teamwork projects can be automatically backed up hourly, which minimizes data loss in case a project file gets damaged. The team can easily revert back to an earlier version of the project at any time.

Backup on the BIMcloud Server

- **Backup options**
  - Two options are available out of the box to save project backups onto BIMcloud:
    - Server data of project in .BIMProject format
    - PLN backups uploaded to BIMcloud

- **Scheduling backups**
  Backup schedule can be set up for all Projects globally in the BIMcloud Manager. If a server contains multiple large projects it is advised to define a local schedule for each in order to avoid performance peaks in the BIMcloud hardware usage.

- **Managing backups**
  Manage existing backups from the BIMcloud Manager. Based on these any project can be reverted to an earlier stage or imported on another server. Since the backups are stored within the BIMcloud Server it's worth to keep a copy offsite as well. Location of backups on the server:

  - **Windows**: C:\Program Files\GRAPHISOFT\BIMcloud\BIMcloud Server 20\Projects\Project GUID\Backups
  - **OS X**: System drive/Applications/GRAPHISOFT/BIMcloud/BIMcloud Server 20/Projects/Project GUID/Backups

Backup on the client machines

Each user who is joined into the Teamwork project has a local copy of it on their client machine. This local cache is being synchronized with the server data at every Send & Receive. Saving the project off in a PLA format functions as a backup of the project that includes server libraries as well.
Restore Projects on the Server

Backups can be restored on BIMcloud by importing the BIMProject files in the Manager interface. PLN and PLA backups can be restored with re-sharing these files from ARCHICAD to the BIMcloud.

2nd level – Full BIMcloud Server and Manager Data backup

Backing up not only projects and libraries, but also all the Manager Data (users, roles, server settings, etc.) is the way to minimize any kind of data loss of BIMcloud. Having such backup can also lower the disaster recovery time. Make sure to have an offsite backup as well.

By exporting both Server and Manager Data from your BIMcloud you will be able to fully restore it on the same computer.

Outline of the full BIMcloud Backup and Restore

1. **Export Manager Data** - copy configuration and user databases
2. **Export Server Data** - there are two options to back up Server Data:
   - (A) Backup all Server db files
     - **pros** robust solution, works very stable
     - **cons** saves more data than necessary, service has to be stopped
   - (B) Backup BIMProjects and BIMLibraries
     - **pros** saves only the necessary data, flexibility in restoring some/all projects
     - **cons** delicate solution, needs more attention
3. **Import** - move the exported backups into a BIMcloud installation

Performing any of the above backup options is recommended outside of office hours only. Option (A) requires the services to be stopped while option (B) can cause a significant amount of load on the BIMcloud Server in case of many and/or large projects.

Backup BIMcloud Manager Data

- **Folders to be backed up**
  
  There are two folders that need to be copied to the backup AS IS:
  - Config
  - Data

Default location of these folders:

**OS X:** System drive/Applications/GRAPHISOFT/BIMcloud/BIMcloud Manager

**Windows:** C:\Program Files\GRAPHISOFT\BIMcloud\BIMcloud Manager
Note: It is possible to define an alternate location for the Data folder in BIMcloud Manager. Make sure to include it in the backup.

- **Before performing the backup**
  It is NOT necessary to stop the BIMcloud Manager Service when the files are copied. Though they should not be zippered before copying, since the process of zipping could prevent the manager from writing/reading from the files.

- **Run the backup with scripts**
  Instead of copying the folders manually, you can use a script to make this automated. Scripts can also be scheduled to run regularly, read more about this in the section: *Scheduling Backups*.

  Example scripts are available here both for **Mac** and **PC**.

  These scripts back up Manager data without stopping the service. Please note that the scripts keep the last backup only. Make sure to keep more backups by continuously saving these to an external site as well. To set up the scripts for your environment follow the points below:

- **PC Script**
  1) Adjust path for `ManagerDir`, `ManagerDataDir` and `localBkUp`
  2) Run the script from an Administrator Command Prompt

- **Mac script**
  1. Make the script executable on your machine. To do this open Terminal and type `chmod +x ”/Path/For/The/Backup/Script.sh”`
  2. Adjust path for `ManagerDir`, `ManagerDataDir` and `localBkUp`
  3. Run the script from Terminal with sudo prefix

(A) **Backup BIMcloud Server Data**

- **Folders to be backed up**
  Consider which BIMcloud Servers have to be backed up. Each version of BIMcloud Server on each machine has to be backed up separately. There are five folders that need to be copied to the backup AS IS:
    - Attachments
    - Config
    - Mailboxes
    - Projects
    - Sessions

  Default location of these folders:
  **OS X**: System drive/Applications/GRAPHISOFT/BIMcloud/BIMcloud Server
  **Windows**: C:\Program Files\GRAPHISOFT\BIMcloud\BIMcloud Server
• **Before performing the backup**
  The BIMcloud Server service must be stopped before the files are copied. Read more on how to Start/Stop services [here](#). Copying the above folders may take a significant amount of time therefore it is strongly recommended to perform this backup outside of office hours only.

• **Run the backup with scripts**
  Instead of copying the folders manually, you can use a script to make this automated. Scripts can also be scheduled to run regularly, read more about this in the section: *Scheduling Backups*.

  Example scripts are available here both for [Mac](#) and [PC](#). For the machine that has both BIMcloud Server and Manager installed use these Mac or PC scripts.

  The scripts contain stopping BIMcloud services, backing up files and restarting the services. Please note that the scripts keep the last backup only. Make sure to keep more backups by continuously saving these to an external site as well. To set up the scripts for your environment follow the points below:

• **PC Script**
  1. Create a separate script for each BIMcloud Server
  2. Adjust path for `ManagerDir`, `ManagerDataDir`, `ServerDir`, `ProjectDir`, `LibraryDir` and `localBkUp`
  3. Run the script from an Administrator Command Prompt

• **Mac script**
  1. Make the script executable on your machine. To do this open Terminal and type `chmod +x “/Path/For/The/Backup/Script.sh”`
  2. Create a separate script for each BIMcloud Server
  3. Adjust path for `ManagerDir`, `ManagerDataDir`, `ServerDir` and `localBkUp`
  4. Run the script from Terminal with sudo prefix

(B) **Backup BIMProject and BIMLibrary files**

• **Use Backup Tools**
  Rather than exporting BIMProjects one by one from the BIMcloud Manager interface, you can use GRAPHISOFT Backup Tools to export all projects and libraries at once from the command line. These tools will only back up projects and libraries from that BIMcloud Server folder where the tool is run, therefore it needs to be run on each BIMcloud Server module separately. Use the below Backup tools from the installed BIMcloud Server folder (…/GRAPHISOFT/BIMcloud/BIMcloud Server)
  - **TeamworkServerBackupTool** (exports Projects and Libraries)
  - **TeamworkServerProjectStoreBackupTool** (exports Projects)
- **TeamworkServerAttachmentStoreBackupTool** (exports Libraries)

For these export tools there is only one required parameter – the folder where the exported items will be put. Elevated permission is required to run these commands. On a PC make sure you are in a Command Prompt window owned by the Administrator (right click on Command Prompt “Run as Administrator”). On a Mac you need to prefix the command with “sudo”.

To use these Tools change the active directory to the BIMcloud Server folder in Terminal/Command Prompt with the `cd` command, enter the name of the Tool you would like to use and the path where you would like to export the Project and/or Library data. Example:

```
kezer-cs-mbp:BIMcloud Server 18 cskezer$ sudo ./TeamworkServerBackupTool "/BC 18 BkUp"
Password:
Server archive created successfully.
Attachment containers archived: 3.
Projects archived: 8.
See ServerBackupTool.log file for further details.
```

To see other options for each command run the command without any parameters and the help will be printed out to the Command Prompt or Terminal window.

- **Run the backup with Scripts**

Instead of running the Backup Tools manually, you can use a script to make this automated. Scripts can also be scheduled to run regularly, read more about this in the section: *Scheduling Backups*.

Download example BIMProject and BIMLibrary backup scripts for **Mac** and **PC**. If both the Server and Manager are installed on the same machine use these **Mac** and **PC** scripts to backup Manager Data as well.
The above scripts back up data without stopping BIMcloud services. Please note that the scripts keep the last backup only. Make sure to keep more backups by continuously saving these to an external site as well. To set up the scripts for your environment follow the points below:

- **PC Script**
  1. Create a separate script for each BIMcloud Server
  2. Adjust path for ManagerDir, ManagerDataDir, ServerDir and localBkUp (ManagerDir and ManagerDataDir are only present in the second script)
  3. Run the script from an Administrator Command Prompt

- **Mac script**
  1. Make the script executable on your machine. To do this open Terminal and type `chmod +x "/Path/For/The/Backup/Script.sh"
  2. Create a separate script for each BIMcloud Server
  3. Adjust path for ManagerDir, ManagerDataDir, ServerDir and localBkUp
  4. Run the script from Terminal with sudo prefix

**Scheduling Backups**
The BIMcloud setup could have the BIMcloud Manager on a different machine than the BIMcloud Server or Servers. This means in general it will be necessary to schedule backup processes for each machine that participates in the BIMcloud environment.

**Schedule PC Backup Scripts to Run Unattended**

**Use Windows Task Scheduler**

- Open the Task Scheduler and create a new folder for the tasks, like **BIMcloud**
- Within the folder right click and Create Task....
- **General Tab:**
  - Name it for example **Backup BIMcloud Server Data**
  - Choose an Administrator user account that has a password which won’t expire
  - Choose to **Run whether user is logged on or not**
  - Tick the **Run with highest privileges** checkbox
- **Triggers Tab:**
  - New...
  - Begin the task: **On a schedule**
  - Specify the frequency and time to run (for example run daily at 10:00 pm)
  - Make sure the **Enabled** checkbox is turned on, then OK the dialog
- **Actions Tab:**
New...

Action: Start a program
Program/Script: Browse for the .bat file you would like to run.
Start in: If your .bat file calls other files make sure to add the path here for the folder where the scripts are located. If the folder is not specified here only one bat file will run that is defined in the Program/Script field.

- After clicking OK on the Create Task dialog add your password as required for the account that will run the task

A more detailed description on how to schedule scripts is available [here](#).

**Schedule Mac Backup Scripts to Run Unattended**

Outline of scheduling a script to run on OS X:

1. Creating a plist file that configures the time and environment in which the backup script will run.
2. Locating that plist file appropriately on the computer.
3. Starting/Stopping the daemon (background process) that runs the script on its schedule.

1. Creating the plist file

The plist file is a daemon configuration file, here is a short description of the tags that can be found in the plist:

- **Label** should be the name of the plist file minus the “plist” extension. It is used for listing.
- **ProgramArguments** determines the location and name of the backup script that will be run at the scheduled time.
- **Nice** determines the priority of scheduling the process. The lower the number the more CPU percentage will be delegated to the process. Values can be set up between -20 and 20. Value 1 used in the example scripts proved to perform the process quickly and reliably.
- **StartCalendarInterval** determines when the backup script will be run:
  - The **com.example.BkUpDaily.plist** file is set to run the backup script at 2:01AM daily. The clock is a 24 hour clock. If The Hour key had been left out it would run on the first minute of every hour.
  - The **com.example.BkUpWeekly.plist** file is set to run the backup script at 6:30PM on every Sunday. It uses the Weekday key. The days are numbered starting with 0=Sunday, 1=Monday,... 6 =Saturday.
- **WorkingDirectory**, **StandardErrorPath**, and **StandardOutPath** are directories where the script will work in, output its errors, and output its standard output respectively.

The example plist files can be found [here].

2. **Change ownership for the plist file**

Once downloaded the ownership of the plist file will be set for the user account you are currently signed in with. However, the plist file will work correctly only if the owner is set to the root. The owner can be changed by opening Terminal and typing the following:

```bash
sudo chown root:wheel "/Path/To/The/example.plist"
```

Hit Return to execute the command and enter the admin password when requested to make the change.

3. **Locating the plist file on the computer**

It also matters where the plist file is located on the computer. The launchd daemon looks for plist files in several places. There are two useful places to put plists for backup scheduling:

   ~/Library/LaunchAgents
   /Library/LaunchDaemons

The user specific LaunchAgents directory is a good place for initial testing. When a user logs into the computer the LaunchAgents directory is automatically searched and the plist files that are there are used to configure the environment. The background processes controlled in this case will only run as long as the user is logged into the machine.

On the other hand the LaunchDaemons directory will be searched when the computer is first started and these plist configurations will remain intact for as long as the computer is running. So, the LaunchDaemons directory should be used in general when you are confident of your backup scripts.

4. **Starting/Stopping the daemon controlled processes**

The plist file will start working only after its daemon controlled background process is loaded into the OS. To load a plist file use one of the following Terminal commands (depending on where you placed your plist file):

```bash
sudo launchctl load /Library/LaunchDaemons/Example.plist
launchctl load ~/Library/LaunchAgents/Example.plist
```

If there is a need to stop the script that is configured by the plist, it must be unloaded. The control is done with the following Terminal commands:

```bash
sudo launchctl unload /Library/LaunchDaemons/Example.plist
```
launchctl unload ~/Library/LaunchAgents/Example.plist

If you would like to modify the plist file after it’s loaded you will have to unload it first, make the change and then load it again. The **sudo** command is necessary only if the service is run as a system wide process. Also note the directory where the plist has been placed.

(A) Restore BIMcloud Manager and Server Data

- **Before performing the restore**
  BIMcloud Data files can only be restored into the same installation where the backup was made from.

- **Restore process**
  Both the BIMcloud Server and Manager **services need to be stopped** for the time of the restore.

  Overwrite the following BIMcloud Manager folders from Backup:
  
  - .../BIMcloud Manager/Config
  - .../BIMcloud Manager/Data

  Overwrite the following BIMcloud Server folders for each BIMcloud Server:
  
  - .../BIMcloud Server/Attachments
  - .../BIMcloud Server/Config
  - .../BIMcloud Server/Mailboxes
  - .../BIMcloud Server/Projects
  - .../BIMcloud Server/Sessions

  Restart the BIMcloud Server and Manager services.

(B) Restore BIMcloud Manager, BIMProject and BIMLibrary files

- **Restore a few Projects**
  In case only some project files got damaged you can restore these by manually importing them in the BIMcloud Manager interface.

- **Restore many/all Projects & Libraries**
  To avoid importing projects one by one you can use GRAPHISOFT Restore Tools as a batch import. In the installed BIMcloud Server Folder there are three tools we can use for the import process:
  
  - **TeamworkServerRestoreTool** (imports both Projects and Libraries)
  - **TeamworkServerProjectStoreRestoreTool** (imports Projects only)
  - **TeamworkServerAttachmentStoreRestoreTool** (imports Libraries only)
With both of the above import tools there is only one required parameter – the folder where the data for the import is located. Run the above restore tools the same way you ran the backup tools in section: *(B)* Backup BIMProject and BIMLibrary files.

Once the project and library data is imported to the BIMcloud Module we have to synchronize these changes with the BIMcloud Manager as well. To do so:

- open the Manager Web interface
- go to the Servers panel and select the BIMcloud Server module you restored
- in the Projects and Libraries tabs the newly imported Projects and Libraries appear with an **Unused** status
- select the projects you would like to synchronize, choose the Load as New option to restore them to a chosen folder
- after this the projects will appear in the Projects’ list

**Restore full BIMcloud Data**

Restoring the BIMcloud Manager Data plus all BIMProject and BIMLibrary files is only necessary when a BIMcloud database got corrupt and the software is unusable.

1. Re-install BIMcloud on the machine

Before proceeding with the restore uninstall the corrupt BIMcloud application and install a new empty BIMcloud with exactly the same parameters:
- Operating System
- Folder structure for the BIMcloud (Manager Data folder can have a special location!)
- Computer name
- Fully Qualified Domain Name/fixed IP address

2. Restore Manager Data and Configuration files:

- stop the BIMcloud Manager service
- overwrite the following folders from your Backup:
  - .../BIMcloud Manager/Config
  - .../BIMcloud Manager/Data
  - .../BIMcloud Server 20/Config
- restart the BIMcloud Manager Service

3. Restore Projects and Libraries

Import BIMproject and BIMLibrary files with the GRAPHISOFT Restore Tools. There are three tools we can use for the import process individually for each Server module:

- **TeamworkServerRestoreTool** (imports both Projects and Libraries)
- **TeamworkServerProjectStoreRestoreTool** (imports Projects only)
- **TeamworkServerAttachmentStoreRestoreTool** (imports Libraries only)

  With both of the above import tools there is only one required parameter – the folder where the data for the import is located. Run the above restore tools the same way you ran the backup tools in section: *(B)* *Backup BIMProject and BIMLibrary files.*

  Once both the Manager information and the Projects & Libraries are restored the BIMcloud is fully restored.

### 3rd level – Operating System snapshot

Backing up the whole server application – the program itself with all hosted content (users, projects, libraries) is highly recommended when it comes to data safety. Having such backup can significantly lower the disaster recovery time. Make sure to have an offsite backup as well.

With backing up the entire computer - be it a Virtual Machine image file or mirroring it directly onto a replica server - this is the solution that provides the lowest downtime in case of a BIMcloud or Operating System malfunction. That being said this backup solution does require the BIMcloud services to be stopped and its databases to be synced when the backup is performed, therefore it cannot be run during office hours.

As a result a **full backup sequence** looks like:
- **stop BIMcloud Server’s service/daemon**
- perform the backup
- **start BIMcloud Server’s service/daemon**

Upon restoring the Virtual Machine image or replicating the server onto another machine the original Fully Qualified Domain Name has to be assigned to the new server.