Revit Configuration Guide
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Overview

Autodesk® Revit® is a software application that utilizes Building Information Modeling (BIM) data to facilitate construction design and documentation. The Nasuni Filer supports Revit collaboration with a number of features, including the Global Locking feature.

The purpose of the Global Locking feature is to prevent conflicts when two or more users attempt to access the same file on different Nasuni Filers. If the Global Locking feature is enabled for a directory and its descendants, any file in that directory or its descendants can only be changed by one user at a time. Other users cannot change the same file at the same time.

This document describes several ways to configure Revit files to take advantage of the Nasuni Filer's features, including Global Locking.

Read This First

Here are some general recommendations for optimal performance:
- Network latency to the lock server should be less than 60 ms. You can test this by running a simple ping test against globallock-primary.api.nasuni.com from the same location where the Nasuni Filer will be deployed and observing the latency reported.
- Collaboration works best with models less than 250 MB in size. Use cases involving model sizes greater than 250 MB should be discussed with Nasuni.
- To obtain optimal performance with multiple Nasuni Filers, set the QoS policy to at least 50 megabits per second up and down.
  Important: Revit collaboration requires 50 Mbps of AVAILABLE upload and download Internet bandwidth for all Nasuni Filers involved in the collaboration process. A 50 Mbps connection is NOT sufficient, if that connection is also being used for other Internet traffic.
- No more than 4 concurrent users.
- If users are not going to collaborate on a Revit project between locations, it is not necessary to enable Advanced global locking for that Revit project.
- If users are going to collaborate on a Revit project between locations, their Revit projects should be in a folder where Advanced global locking is enabled.

The rest of this document includes more detailed recommendations.

Revit Use Cases

Revit is employed in a variety of different use cases. This section describes these use cases, how the Nasuni Filer supports collaboration in these use cases, and any special configuration that Nasuni suggests. Note that Global Locking is a feature of the version 6.0 Nasuni software; all Nasuni Filers must be at version 6.0 or above in order to use Global Locking.

`.rvt` file with a single user on a single Nasuni Filer

In this use case, one user is running Revit with a single `.rvt` file on a single Nasuni Filer.

No special configuration is required. Global Locking is not required.

`.rvt` file with a single user, but possible access by multiple sites (not simultaneous)

In this use case, the user is also running Revit with a single `.rvt` file on a Nasuni Filer. Other users on other Nasuni Filers might also attempt to access the same file.

In this situation, when a user has an `.rvt` file open, the entire file is locked. This prevents any conflicts by preventing other users from editing the `.rvt` file.
No special configuration, but assumes Global Locking is enabled.

Revit Worksharing

From Autodesk's *Multi-user Collaboration with Autodesk Revit Worksharing*:
"Revit Worksharing distributes the power of the Revit parametric building modeling environment across the project team. Worksharing provides a complete range of collaboration modes from entirely on-the-fly, simultaneous access to the shared model, through the formal division of the project into discrete shared units, to complete separation of project elements or systems into individually managed linked models. Worksharing allows the team to choose the best way to collaborate and interact based on their workflow and the project requirements."

The original project creator enables worksets to create the workshared file. A workset is a collection of building elements. Users have the option of checking out entire worksets or borrowing individual elements from a workset. All other team members may view these elements or worksets, but are unable to change them, preventing possible conflicts in the project. When working with a central file, the Revit user works in a local file of the central `.rvt` saved onto their computer. Multiple Revit users in different locations can simultaneously work on their own local copies.

Revit File-Based Worksharing on a single Nasuni Filer (simultaneous)

In this use case, multiple users work from a workshared central `.rvt` file from a single location. The Nasuni Filer's Global Locking feature is unnecessary, because Revit Worksharing manages any conflicts.

No special configuration is required. Global Locking is not required; this use case works with version 5.0 or above of Nasuni software.

Revit File-Based Worksharing from Multiple Locations
In this use case, multiple users work from a workshared central `.rvt` file from multiple locations. The central `.rvt` file is replicated to each Nasuni Filer. Users create a local file of the central `.rvt` file from their local Nasuni filer. Users in all locations can work simultaneously. Revit worksharing, together with Nasuni Filer's Global Locking, manages any conflicts.

Nasuni recommendations:
- To obtain optimal performance with multiple Nasuni Filers, use worksets, as described above. There is a slight performance advantage for worksets that have owners. However, if a workset has an owner, no other users can change the contents of the workset. Nasuni can operate on worksets with or without owners.
- To obtain optimal performance with multiple Nasuni Filers, set the QoS policy to at least 50 megabits per second up and down.
  Important: Revit collaboration requires 50 Mbps of AVAILABLE upload and download Internet bandwidth for all Nasuni Filers involved in the collaboration process. A 50 Mbps connection is NOT sufficient, if that connection is also being used for other Internet traffic.
- Network latency to the lock server should be less than 60 ms. You can test this by running a simple ping test against globallock-primary.api.nasuni.com from the same location where the Nasuni Filer will be deployed and observing the latency reported.
- Collaboration works best with models less than 250 MB in size. Use cases involving model sizes greater than 250 MB should be discussed with Nasuni.
- A Revit Central Model must be saved in such a way that the UNC (Uniform Naming Convention) path used to save the model is the same UNC path that is used to access the model.
  In order to keep a Revit Central Model validated after replication, each Revit client must access a unified namespace across all sites. In most environments, this can be done most cleanly using DFS-N. See Nasuni's *DFS Configuration and Best Practices* document for details.
- The shares from which users access the Revit Central Model can be added to the target list of a new Folder in the Namespace. The Namespace folders can then be mapped as a drive across all sites. Then each client will have the same UNC path to the Revit Central Model.
  Note: Without this arrangement, Revit will not view models replicated across Filers as Central files, instead seeing them as local files. Users will be unable to create new local files from these replicated files.
- To finalize editing requests across Nasuni Filers, it is necessary to acknowledge any Editing Request dialog boxes. This allows the request to propagate properly.

- There are two modes available for configuring Global Locking. Note that the modes are set "per folder", and do not require the entire volume to use the same mode.
  Optimized: Not recommended.
  Advanced: Recommended for applications that rely on shared access modes. Advanced locking provides the highest global locking compatibility, but might impact performance.
  When using Revit, select Advanced mode. The folder that the Revit project resides in must have Advanced locking enabled.
- When a user adds a Central Model to a Nasuni Filer, the user must also synchronize with the Central Model, then close the file, and exit Revit. After all the Nasuni Filers synchronize their data with the original Nasuni Filer, users can then proceed to use Revit.
- Under **Revit Options** move the **Worksharing Update Frequency** slider all the way to the left to "**Manual updates only**".
  Note: With this setting, a user does not automatically receive periodic updates when other users want to borrow elements.

Note: The first time that users on each Nasuni Filer synchronize with the Central Model, they might experience some slowness. However, subsequent attempts to synchronize are faster.

Specific Suggestions

Ideal Usage Suggestions for Optimal Performance

Maximum number of Nasuni Edge Appliances sharing Revit Models	3
Maximum number of simultaneous users in a Revit Model	4
Maximum Size of Revit Model	Under 250MB

For usage beyond these suggestions, contact Nasuni Technical Support.

While it is not possible to determine the optimum configuration for every Revit implementation, Nasuni recommends trying the following settings and procedures to enhance performance:

- Network settings:
  - For smaller offices, with fewer than 20 total users (1-4 concurrent Revit users), with Global File Locking, using a Central Model, with Workset, ensure that the Internet connection is at least 50 Mbps.
    Important: Revit collaboration requires 50 Mbps of AVAILABLE upload and download Internet bandwidth for all Nasuni Filers involved in the collaboration process. A 50 Mbps connection is NOT sufficient, if that connection is being used for any other Internet traffic.
  - For offices with 50-60 total users (1-4 concurrent Revit users), with Global File Locking, using a Central Model, with Workset, ensure that the Internet connection is at least 60-100 Mbps.

- o Network latency to the lock server should be less than 60 ms. You can test this by running a simple ping test against globallock-primary.api.nasuni.com from the same location where the Nasuni Filer will be deployed and observing the latency reported.
- Firewall settings:
  - o Ensure that port 443 is open outbound to `*nasuni.com`, `*amazonaws.com`, and `*windows.net`. See *Firewall Best Practices* for details.
  - o Set the firewall policy to NOT scan, process, or log port 443 traffic from the Nasuni Filer.
- Nasuni Filer settings:
  - o Set the volume sync schedule to 5 minutes (on **Volume Properties** page).
  - o Set the volume snapshot schedule to 15 minutes (on **Volume Properties** page).
  - o Disable the Antivirus Service (on **Volume Properties** page).
  - o Set the CIFS protocol level to **CIFS & SMB3** (**Configuration → General CIFS Settings**).
  - o Quality of Service (**Configuration → Quality of Service**): Set QoS to not force the bandwidth lower than recommended above (such as, 50-100 Mbps). Note that Revit models can be quite large, requiring large bandwidth.
- Revit settings:
  - o Ensure that all users are on the same update or service pack for that Revit release.
  - o Use Revit 2015 version U13 and higher.
  - o Make all Revit models a Central Model.
  - o Set the maximum number of backups to 3.
  - o Collaboration works best with models less than 250 MB in size. Use cases involving model sizes greater than 250 MB should be discussed with Nasuni.
  - o Under **Revit Options** move the **Worksharing Update Frequency** slider all the way to the left to "**Manual updates only**".
    Note: With this setting, a user does not automatically receive periodic updates when other users want to borrow elements.
- User computer settings and procedures:
  - o Suggested configuration: 16 GB of RAM, Solid State Drives (SSDs).
  - o Suggest using Windows 7 64-bit or Windows 10 64-bit.
  - o Empty the user's profile `%temp%` folder at least once a month.
  - o Ensure that antivirus software is not scanning mapped drives.
  - o Use an exclusion list with antivirus software, so that it does not scan Revit files, including those with these extensions: `*.rvt`, `*.rte`, `*.rfa`, `*.rft`, `*.dat`, `*.slog`. (See Autodesk list.)
- User settings and procedures:
  - o Verify that the existing file that the user is working on is set to a maximum of 3 backups. To verify this, perform **File → Save As**,

5

then, under **Options**, verify that "**Maximum backups**" is 3. If not, change "**Maximum backups**" to 3, then **Save**.
- Under **Revit Options** move the **Worksharing Update Frequency** slider all the way to the left to "**Manual updates only**".
  Note: With this setting, a user does not automatically receive periodic updates when other users want to borrow elements.
- NEVER open the Central Model file directly.
- NEVER open the Central Model file by double-clicking the Central Model file in Windows Explorer.
- To use the Central Model file, always open Revit first, then use the Open dialog box to select the Central Model and make sure that Create Local File is selected. (If even one user doesn't follow this method, it locks up all other users that are working on the Central Model file. They aren't able to sync back to the Central Model. They probably get a warning that the model is busy.)
- Even to quickly view the file, always open Revit first, and then open a local copy of the Central Model file.
- Users should take turns both syncing to the Central Model and creating local copies. When only one user at a time performs these tasks, the time to complete each action is much faster. Users can use instant messaging to coordinate taking turns. Conversely, if multiple users attempt these tasks at the same time, the total time to completion is longer, and "Model In Use" messages are more frequent.

Revit Worksharing Monitor

In general, do not use Revit Worksharing Monitor.

The Revit Worksharing Monitor facilitates the use of Revit software in a file-based environment, in which multiple people collaborate on one project. The Nasuni Filer supports the use of Worksharing Monitor when these conditions are satisfied:

- All of the users are connected to the same Nasuni Filer.
- Global Locking is not in use.

You can remove Worksharing Monitor, as described in this article:
https://knowledge.autodesk.com/support/revit-products/troubleshooting/caas/discussion/t5/Revit-Architecture-Forum/Remove-Add-In/td-p/5098646.html

Synchronizing with Central Model

When a user selects the "Synchronize with Central" option, Revit compares the current Central Model (located on the Nasuni Filer) with any local changes. After this comparison, Revit re-writes a portion of the project files. These new files are needed by all other Revit clients who are currently working on the project, if they want to "Synchronize with Central". Any clients who do not have the project open can open/load the Revit project without needing these new files. Other users should not "Synchronize with Central" until the previous "Synchronize with Central" has completed.

In directories with Global Locking enabled, if certain files are changed, those files are prioritized for moving to cloud storage. Because such prioritization is unique to each Filer, users in different locations on the same Revit project must perform an initial "Synchronize with Central" to enable it.

For Further Suggestions

For further suggestions on best practices for working collaboratively with Revit and worksharing, see: [Best Practices: Working on a Team Project](#).