



REMOTE MULTI-USER SESSION

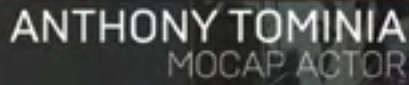


Remote Multi-User Editing

This guide will cover the necessary setup steps and best practices for using Multi-User Editing in Unreal Engine for remote collaboration. This requires Unreal Engine 4.25 or later.

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Multi-User Editing is intended to complement traditional source control in Unreal Engine. For this reason, you will need to properly sync your project to the source control system of your choosing; Unreal Engine supports Perforce, Git, Plastic SCM, and Subversion. For tips on using the various source control options, view the [Source control in Unreal Engine webinar](#).



Source control is currently disabled.

To enable, select a provider from the drop-down menu. You can re-enable source control by clicking the **Enable** button.

Source Control Login

None (source control disabled)

None (source control disabled)

Subversion

Plastic SCM

Perforce

Git (beta version)

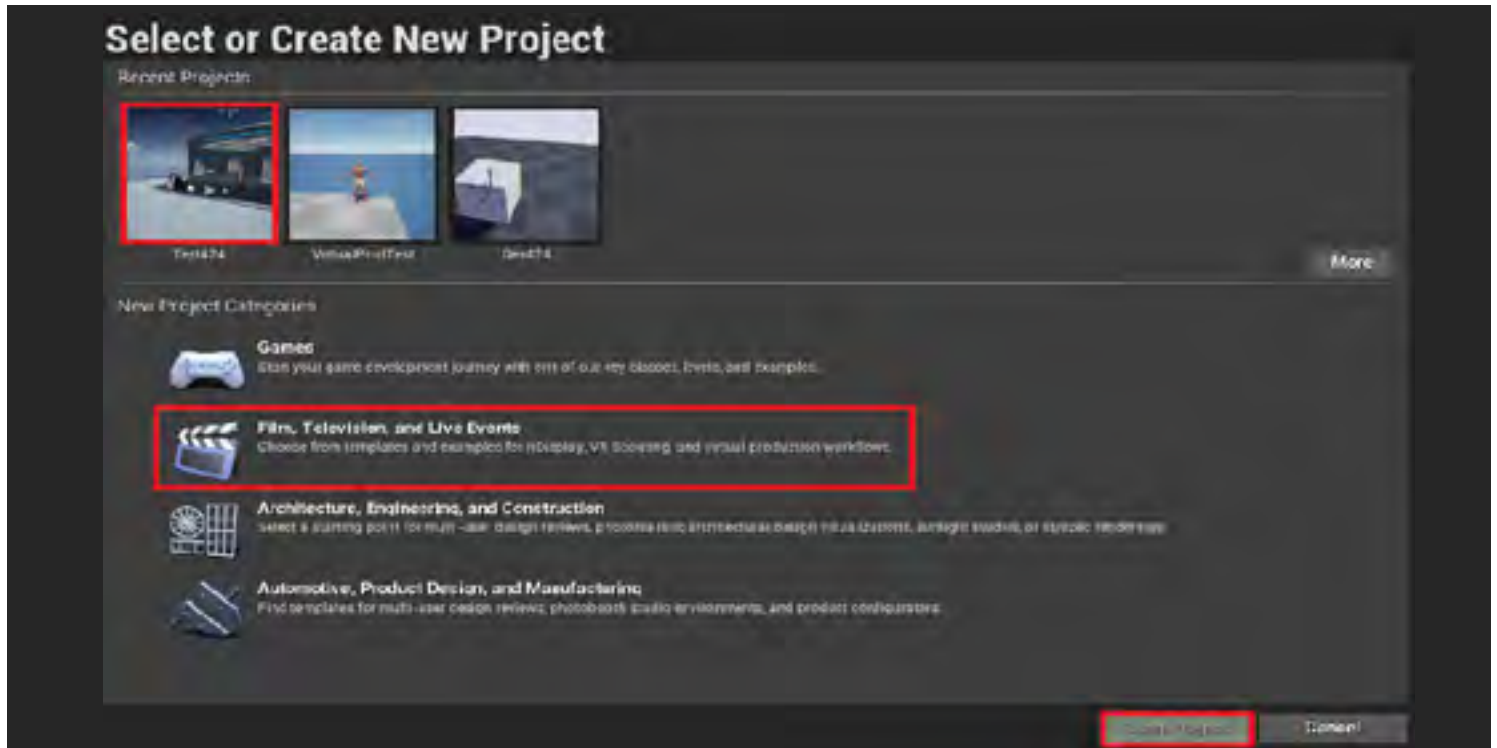
► Source Control Log

Accept Settings

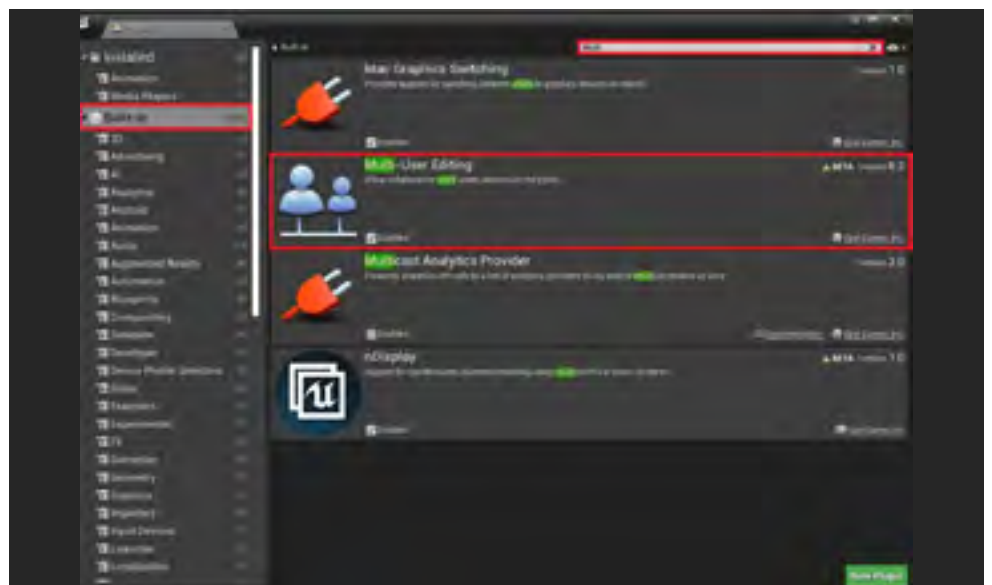
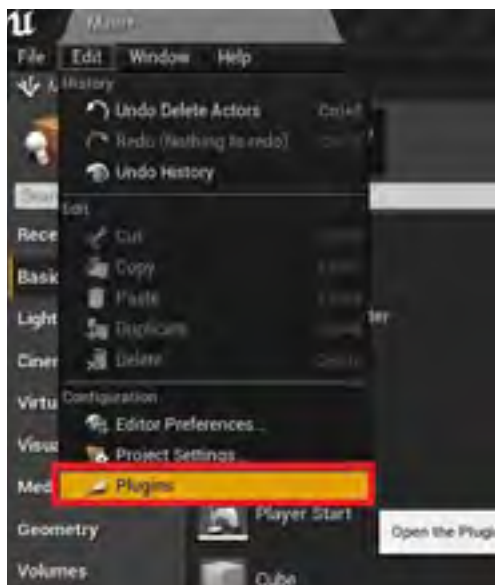
Run Without Source Control

In our example, we will be using Perforce. Links to documentation for each provider can be found in the [additional resources](#) section at the end of this guide.

- After installing and opening Unreal Engine, create a new project or select an existing project to launch. Ensure that your source control workspace points to the directory where the project is created.

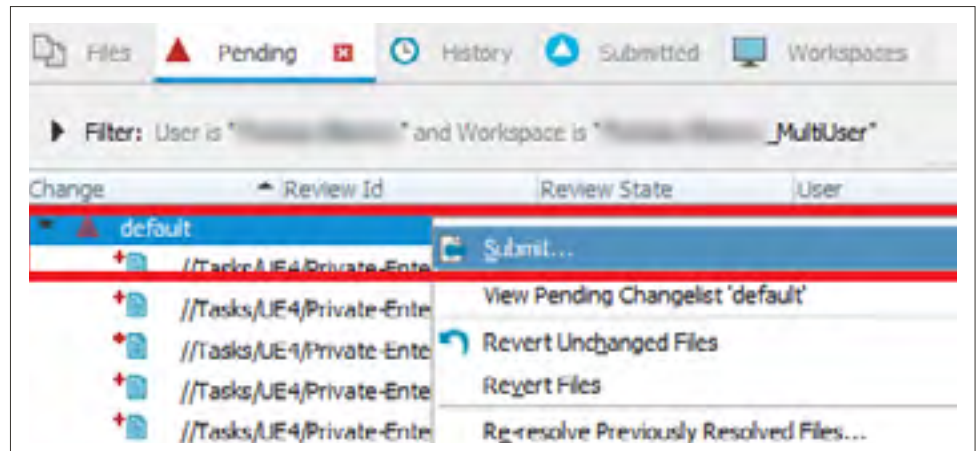
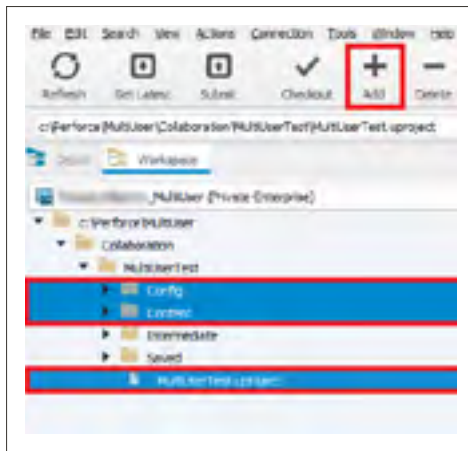


- Once the project opens, select **Plugins** under the **Edit** menu.
- Select **Built-In**, search for **Multi-User**, and ensure that **Multi-User Editing** is enabled.
- If the plugin was not already enabled, you will get a message asking you to restart Unreal Engine.

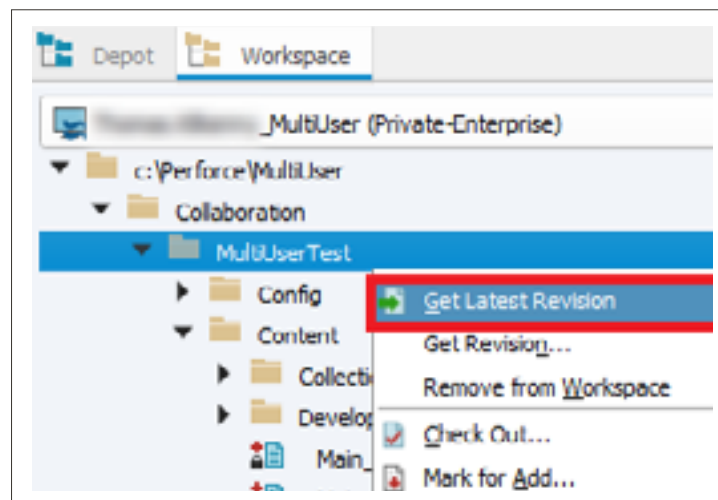




- In your source control provider, add and submit your project's **.uproject** file and **Content** and **Config** directories. Do not submit **Intermediate** and **Saved**.



- Once a project is in source control, all users who wish to join the Multi-User Session must be on the same changelist. This will generally mean being synced to the most recent version.
- Once the project is synced, no local changes should be made before joining the Multi-User Session.
- When syncing your project, close Unreal Engine to avoid issues.



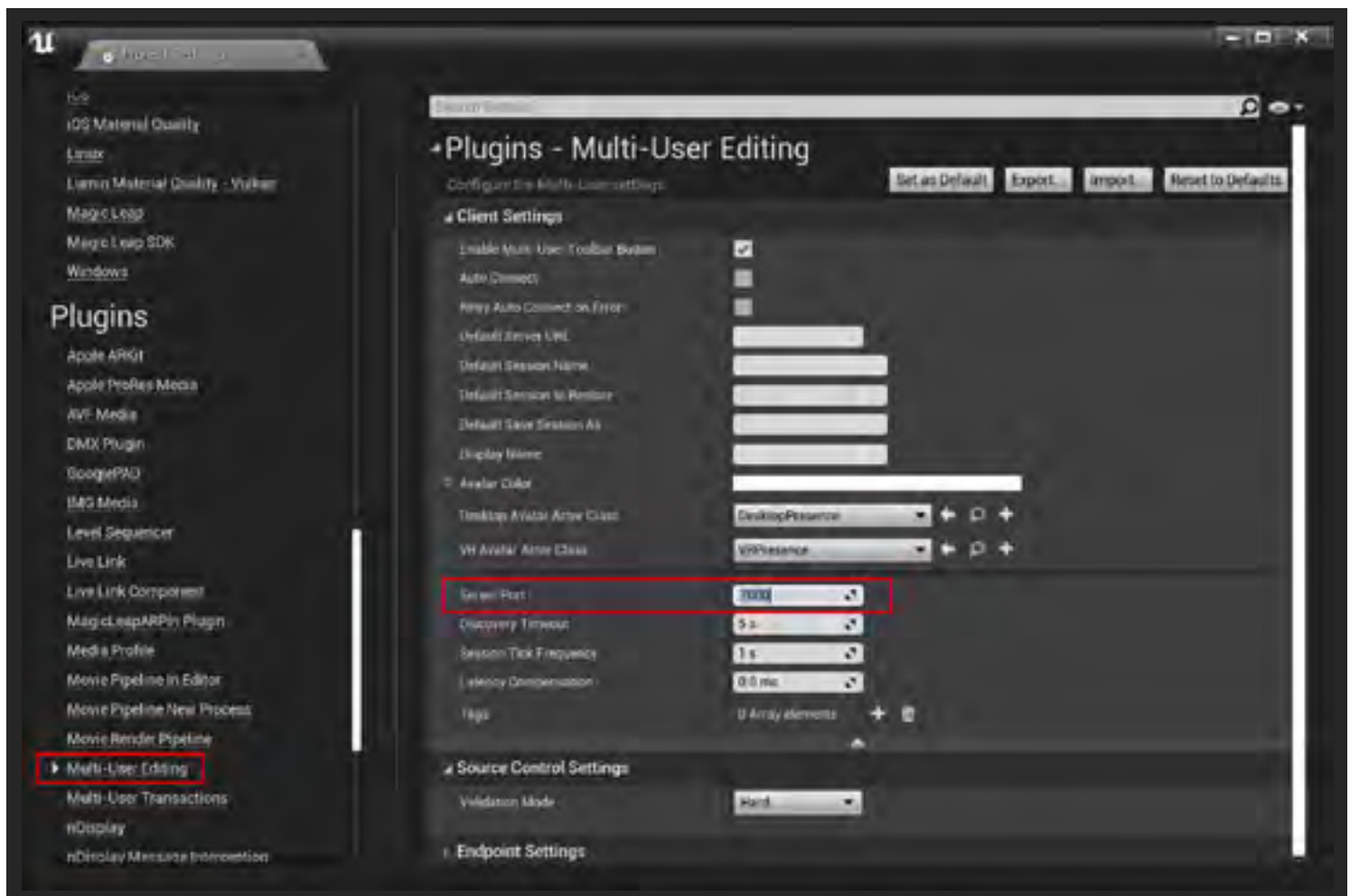
2. Configuring network and UDP messaging settings for VPN use

Before creating or joining a Multi-User Session, all users connecting over VPN will need to configure their UDP messaging settings in Unreal Engine.

- If you are using a VPN, ensure that your connection is open and you have been assigned an IP address. From Windows, open Command Prompt and type **ipconfig**. Take note of the IPV4 address associated with the network your Session will be on (this will be your VPN if you are using one).
- Re-open your project, but do not modify any content or open any maps.

Hosting a Server

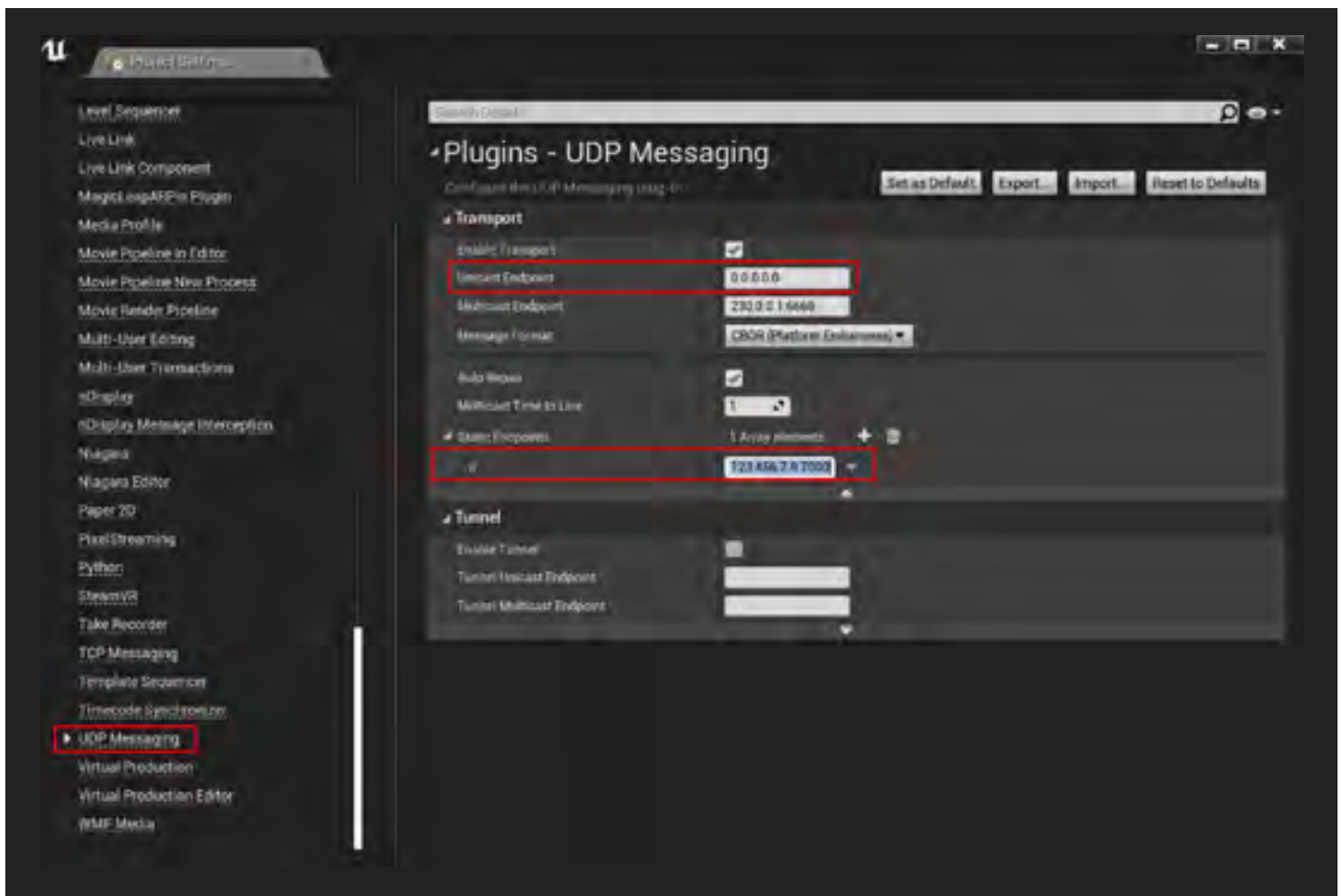
- If you will be *hosting* a Server, go to **Edit > Project Settings > Plugins > Multi-User Editing**, expand the **Client Settings** section and select a Server Port for your Multi-User Server such as **7000**. Do not use port **6666** or ports used by other services on your network.



Joining a Server

- For those *joining* a Server, scroll down to **Edit > Project Settings > Plugins > UDP Messaging**. There are two settings that need to be filled in here:
- Unicast Endpoint:** should be set to **0.0.0.0:0**
- Static Endpoint:** There should be a static endpoint set to the IP address of the machine that will be hosting the Multi-User Server, followed by the port set by the host in the previous step. For example: **123.456.7.8:7000**

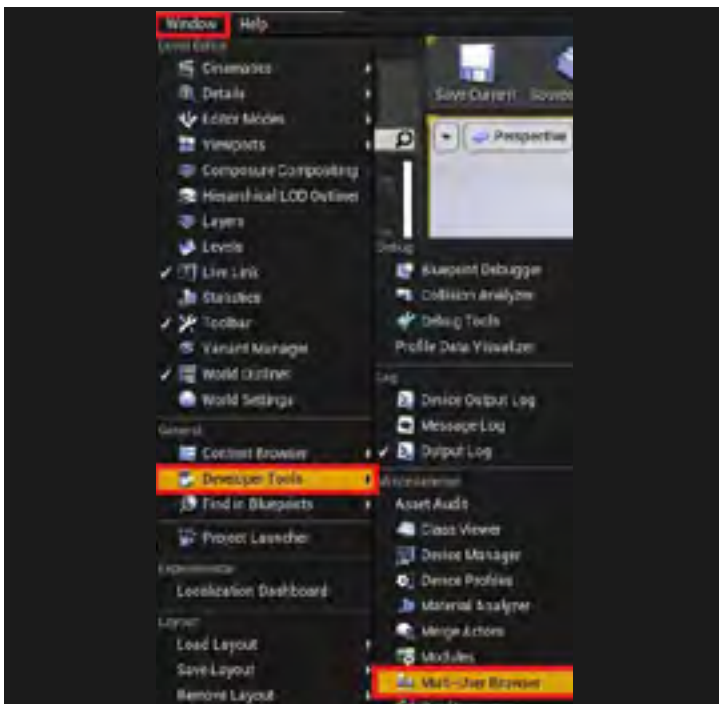
NOTE: If any of these settings change on the Multi-User host machine, the Server will need to be restarted for the changes to take effect.



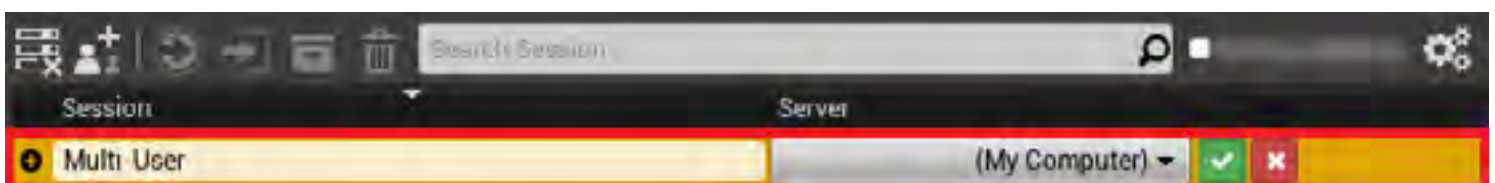
3. Hosting a Multi-User Server

Once the project is synced with source control and your UDP messaging settings have been configured, you are ready to start a Multi-User Server and Session.

- Open your project and navigate to **Window > Developer Tools > Multi-User Browser**. This will open the Multi-User Browser window.
- Once the Multi-User Browser is open, you will see an option to **Launch a Server**. Select this option only if you are the intended Server host.



- The Server will launch as a standalone application; once it is initialized, you will see the option to add a new Session. You can create additional Sessions from the **Create Session** button in the upper-left corner. Once you have created the Session, give it a name and press **Enter** to launch it. You will be entered into the Session automatically.





Launching the standalone Multi-User Server from the command line

You can also launch this Server from the command line on any computer that has Unreal Engine installed.

If you run the Server from the command line, you don't need to have your project on that computer. The Server only records transactions and modified assets; it has no dependency on having the entire project content available. Only the computers that join a Session need to have copies of the project content.

This is a good solution for having a dedicated machine with a Multi-User Server always on, so that people can create Multi-User Sessions at any time. It is also good for hosting a [Multi-User Server on the cloud](#) or to take advantage of a location [office] with very high internet bandwidth. There is no need to have Unreal Engine running when using the standalone Multi-User Server.

- You'll find the Multi-User Server executable in your Unreal Engine installation folder at **Engine\Binaries\UnrealMultiUserServer.exe**. For example: **C:\Program Files\Epic Games\UE_4.25\Engine\Binaries\Win64\UnrealMultiUserServer.exe**.
- When you launch it, you can provide optional parameters on the command line to control its behavior. To configure UDP messaging settings, you would use the following parameter.
- **-UDPMESSAGING_TRANSPORT_UNICAST=[ip]:[DesiredPort]** For example: **>MultiUserServer.exe -UDPMESSAGING_TRANSPORT_UNICAST=123.456.7.8:7000**

```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.16299.1387]
(c) 2017 Microsoft Corporation. All rights reserved.

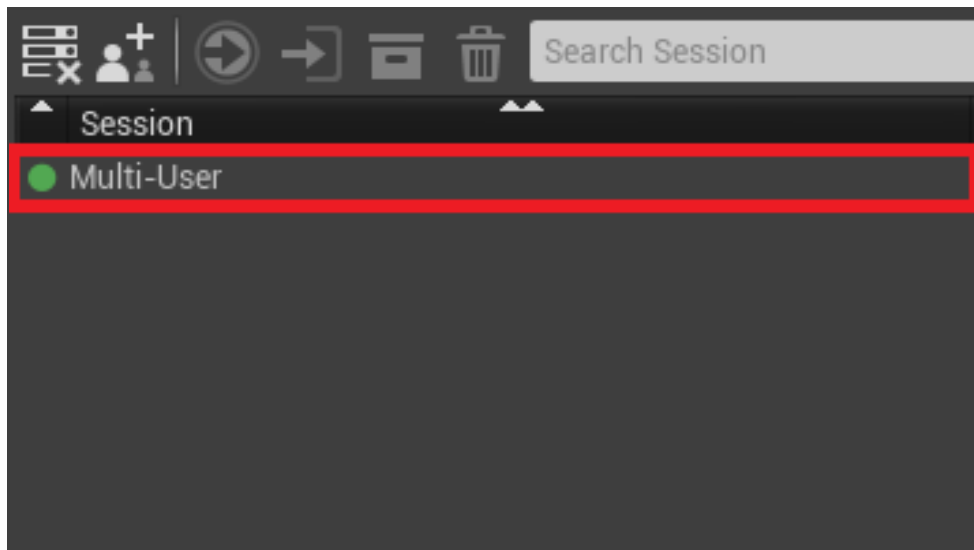
C:\Users\>cd C:\Program Files\Epic Games\UE_4.25\Engine\Binaries\Win64\
C:\Program Files\Epic Games\UE_4.25\Engine\Binaries\Win64>UnrealMultiUserServer.exe -UDPMESSAGING_TRANSPORT_UNICAST=123.456.7.8:7000
```

- For a complete list of optional parameters and other information relating to using the standalone Multi-User Server, view the [full reference documentation](#).

4. Joining a Multi-User Session

Once a Multi-User Server and Session have been launched on your network, joining is very simple.

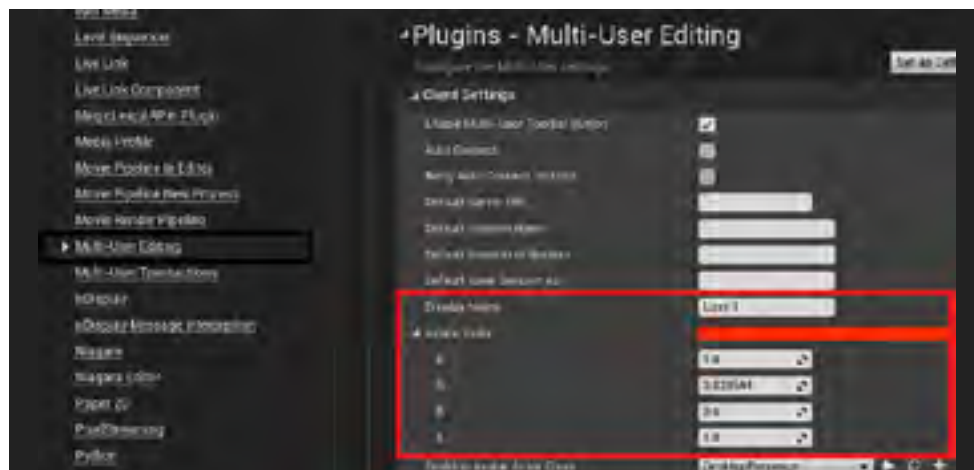
- Open your project and navigate to **Window > Developer Tools > Multi-User Browser**. This will open the Multi-User Browser window.
- If a Multi-User Server and Session have been launched, and you have correctly configured your UDP messaging settings, you will automatically see the available Sessions on your network. Double-click to join.



5. Multi-User Editing features

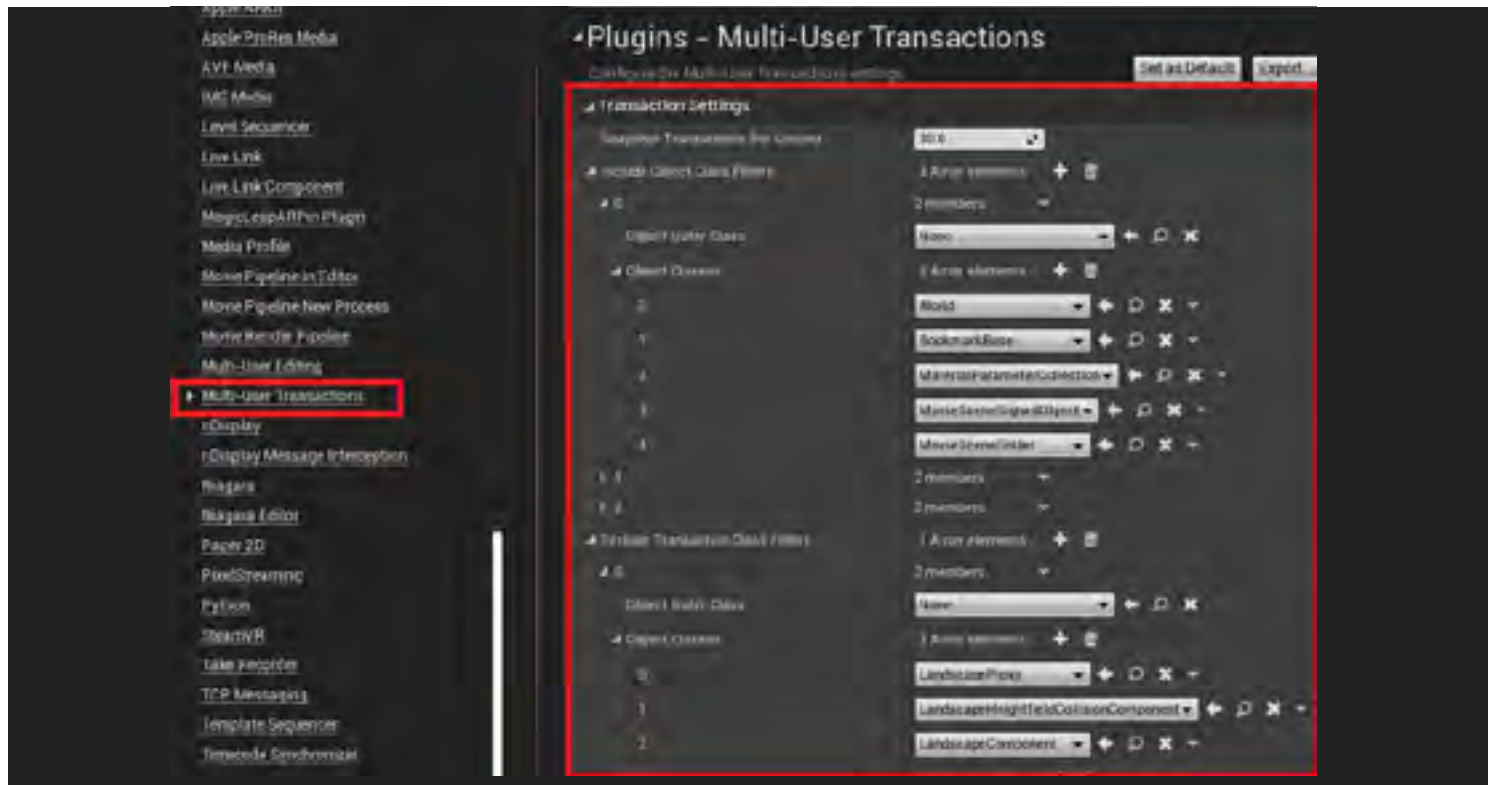
Avatars

Each user in a Multi-User Session is represented by an avatar visible to other users. The color and name of this avatar can be customized in **Project Settings > Plugins > Multi-User Editing**.



Transactions

Multi-User Editing functions by sending changes across the network to be applied on top of a common starting state. These changes are called “Transactions”, and properties which are sent are said to be “transacted”. The majority of properties on the majority of objects are transacted by default, but if you would like to add or exclude a class for transaction, you can do so under **Project Settings > Plugins > Multi-User Transactions**.



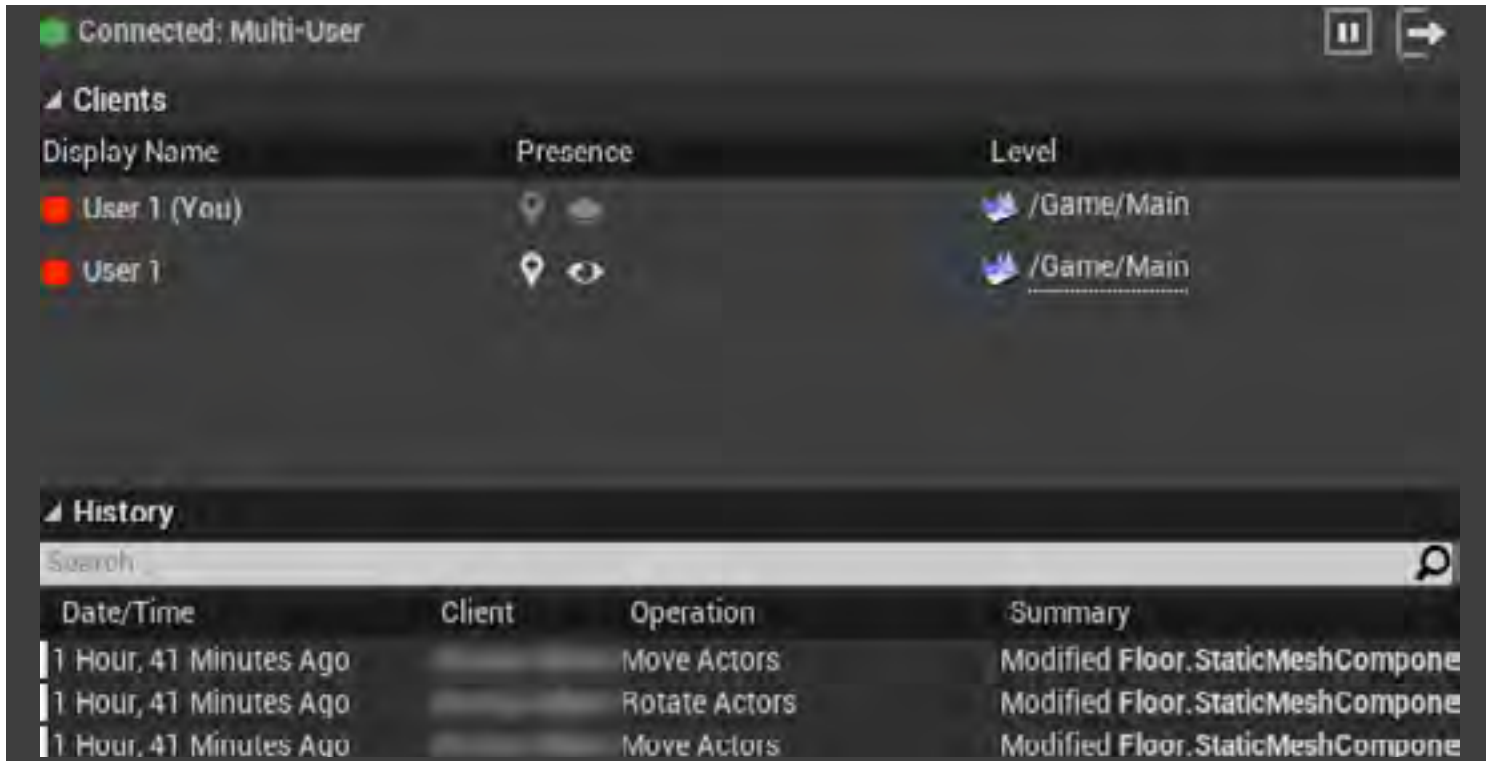
For custom logic executed in Blueprints that you would like to expose, add the following Blueprint nodes:

- **Begin Transaction, End Transaction, and Cancel Transaction**—All logic executed between these nodes will be transacted unless execution reaches a Cancel Transaction node.
- **Transact Object**—Transact a specific object’s change.



Multi-User Browser

The Multi-User Browser shows all connected users on a given Session, enabling you to jump to their position or toggle their avatar visibility. This window also provides a log of all transacted changes during the Session's life.



Simultaneous playback in Sequencer

Multi-User Editing is also capable of controlling the Sequencers of all connected clients to facilitate simultaneous playback. In order to enable this control, all users must enable several options in their Sequencer. These are, from left to right:

- **Toggle Multi-User Playback Sync**—This setting will enable all Sequencers with the same level sequence open to have their playhead position synced.
- **Toggle Multi-User Unrelated Timeline Sync**—This setting will enable all Sequencers to sync playhead position regardless of which level sequence they have open. This should be disabled if users are working on different sequences and do not want playback synced.
- **Toggle Multi-User Remote Open**—Clients with this setting toggled will have their Sequencer automatically load level sequences opened by other users.

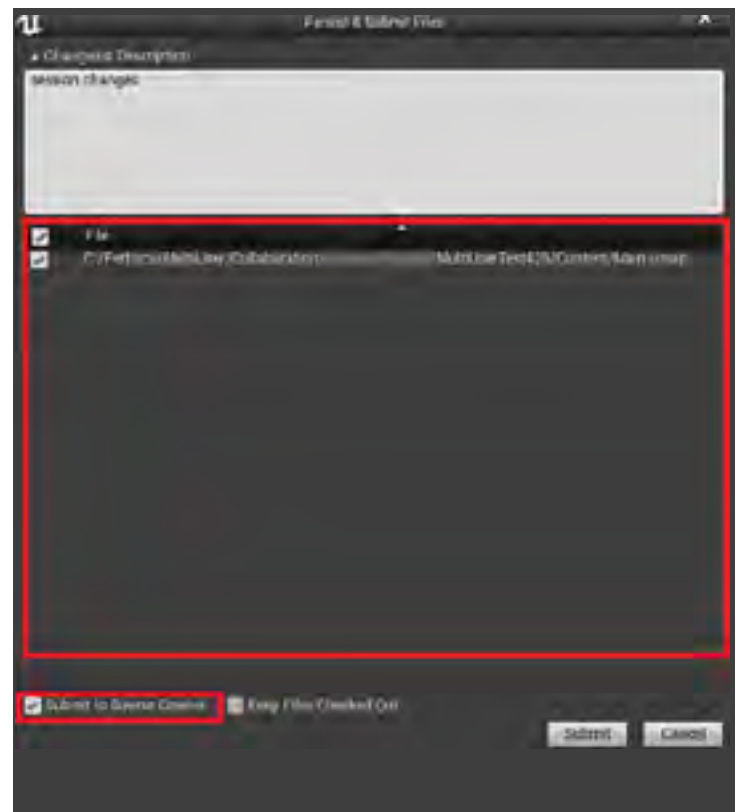
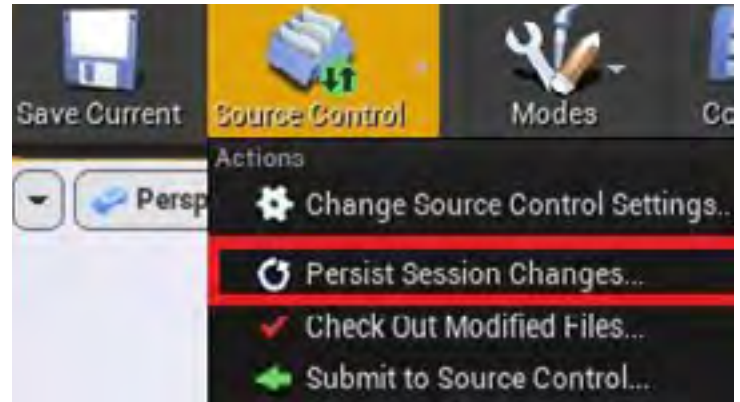


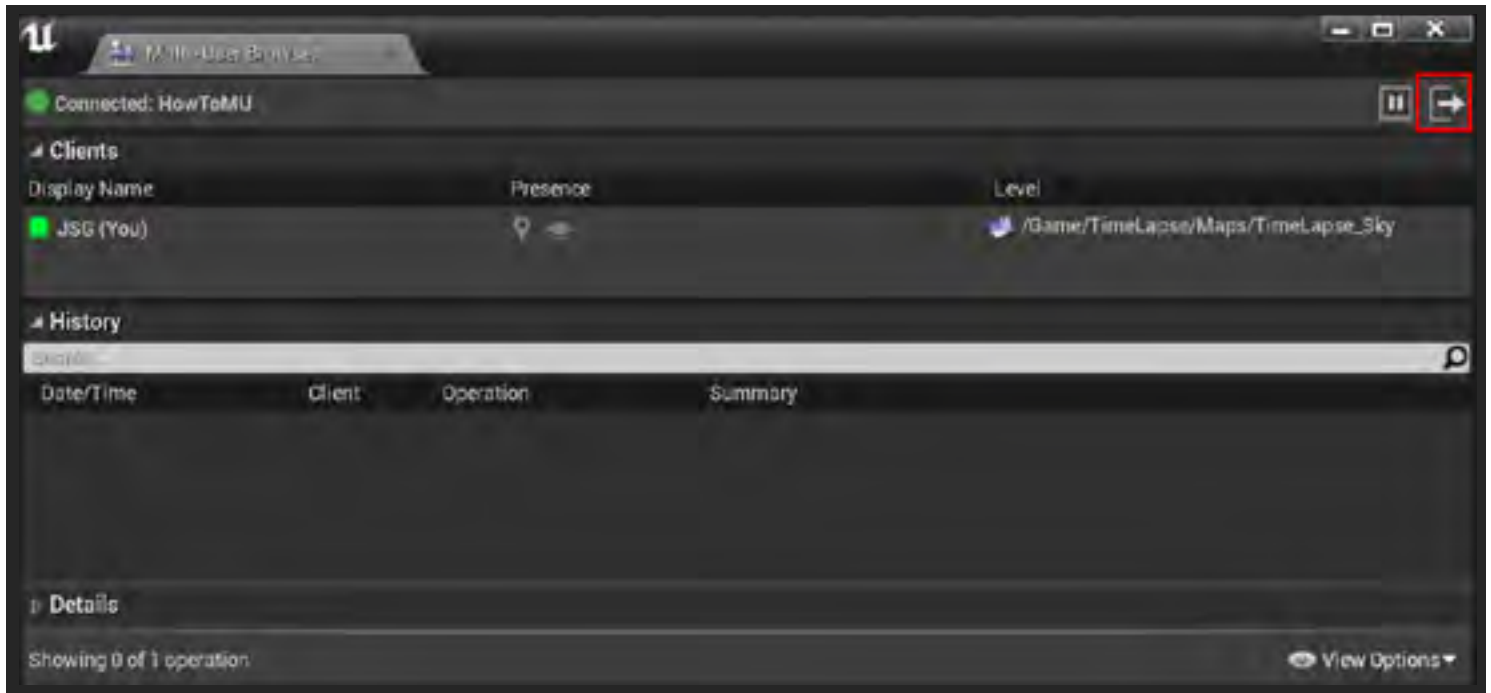
6. Ending a Session

All Multi-User changes are stored on the server and not to disk in any one user's Unreal Engine instance. As a result, leaving a Session will restore a user's project state to what it was before joining the Multi-User Session. In order for changes made in a Session to be made permanent, a user will need to save and persist those changes. While any user can perform these steps, it is highly recommended that the host be the one to save and persist the changes. Ideally, this process should be done at least twice a day, and before completing work for the day.

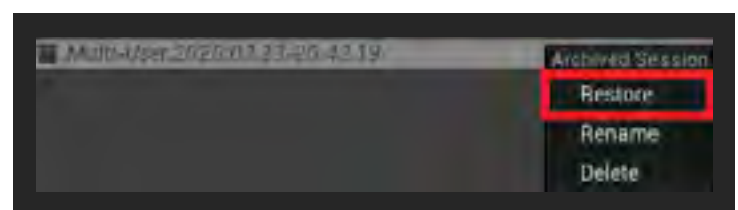
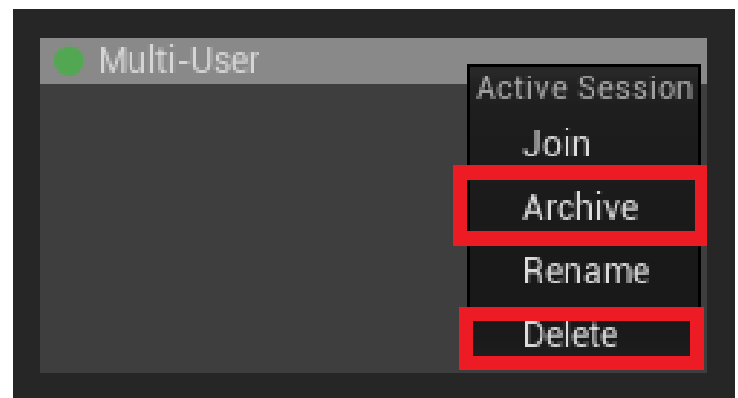
NOTE: Do not run the Session for days or weeks without persisting. If the host machine were to become permanently non-operational, all work on the server would be lost.

- When ready to save and persist, the host should navigate to the **Source Control** button in the toolbar and select **Persist Session Changes**.
- This will bring up an options window listing all modified files in the Session. Selecting **Submit to Source Control** will prompt for a changelist description and enable you to submit the changes directly to source control. Leaving this unchecked and continuing will save files to disk, but not to source control.
- Once changes have been persisted, you can exit the Multi-User Session by clicking the **Leave the Current Session** button in the upper-right corner.





- You can now close the current Session by right-clicking on the Session and selecting **Delete**. Alternatively, you can choose to **Archive**, which will store the Session as a snapshot but leave the existing Session active.
- Archived Sessions can be restored at a later date using the **Restore** button, enabling users to join the Session with the change history from that archive.
- Once you have finished, you can close the Server by hitting the **Close Server** button or closing the Multi-User Server standalone application. All open and archived Sessions will still be available when the Server is restarted on the same host machine and from the same Unreal Engine installation.





7. Note on performance capture

Recording performance capture creates files that may be too large for transaction via Multi-User through an internet connection, especially when recording raw Live-Link curves. This can be mitigated by recording actors instead of Live-Link and/or selecting reduced keys on the Take Recorder source's settings to remove keys considered duplicates within a threshold.

Even with these settings, you will need a server and clients with very high upload and download bandwidths to avoid client/server hiccups. Updates to improve recording efficiency in Multi-User Editing are currently in development.

8. Common errors

A Server is active on my network but Unreal Engine doesn't see it to join.

- Ensure that both you and the host have completed the UDP messaging setup in [section 2](#).
- Make sure you are using the correct IP and port of the Multi-User Server machine.

"Failed to join server: The workspace has in memory changes."

- In order to maintain the same state across all users, Multi-User Editing requires that all users have the same starting state. You are receiving this error message because you have modified a file that has yet to be saved before attempting to join. Exit Unreal Engine and discard changes, then relaunch to join.

"Failed to join server: The workspace has local changes."

- In order to maintain the same state across all users, Multi-User Editing requires that all users have the same starting state. You are receiving this error message because you have changes to the project in source control that have yet to be committed. In order to join, you must revert these changes or submit them and have the other users sync to the new changelist.

"LogUdpMessaging: Error: StartTransport failed to create unicast socket on [IP:Port]"

- This error message indicates the Server wasn't able to start because the IP/port defined was either already in use by another application or is invalid. Check your server IP/port and restart the Multi-User Server.

"FUdpSocketBuilder: Failed to create and initialize socket UdpMessageMulticastSocket"

- This error message indicates an incorrect UDP Messaging Multicast endpoint. This IP should not be changed from the default unless you have configured advanced settings on your network. Consult the person in charge of your network if you believe this address should be different from the default.

You are hosting the Multi-User Server on your local machine, but you don't see it in your Multi-User Browser.

- Under **Project Settings > Plugins > UDP Messaging**, make sure you have the correct **Static Endpoints** for your machine's IP address and the Multi-User Server port. See [section 2](#).

Additional resources

[Additional Multi-User Editing documentation](#)

[Multi-User cloud setup documentation](#)

[Unreal Engine source control documentation](#)

[Perforce documentation](#)

[SVN documentation](#)

[Git documentation](#)