
Flight Simulator Interface for MSFS

Getting Started - Networked PCs



Live View Multi-Screen Display

Photo courtesy of the Human-Centered Design Institute, Florida Institute of Technology

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Software Installation

The first stage is to install and set up the OpusMSFS software on your server PC in accordance with the OpusMSFS_Getting_Started_Single_PC guide. When you have tested out the single PC standalone operation then you are ready to set up the OpusMSFS network with your client PCs.

Installing OpusMSFS

The OpusMSFS software must be installed on your MSFS server and each of your client MSFS systems.

Simply copy the OpusMSFS.msi installation file onto your client systems and double-click on the file. Alternatively you can create an OpusMSFS folder on each of your client PCs and simply copy the files and sub-folders across from the server's OpusMSFS folder. You only need to copy the DLL and EXE files across from the main folder, along with all sub-folders.

You may install the software onto any drive and subfolder provided its folder name is OpusMSFS with the exception that you must not install OpusMSFS in the **Opus Software** or **Program Files** folders, and don't install in more than one folder on your PC.

Updating OpusMSFS

Download the latest Release or Beta version from the downloads page on our website.

Uninstall the old software on your server before installing the upgrade via Control Panel, Uninstall a Program, do not delete your **OpusMSFS** folder. Double click on the Opus msi file and follow the instructions to install the software upgrade.

All your original configuration (DAT and CMD files will remain intact in the **OpusMSFS** folder but it is a good idea to take a backup of your files.

If you wish you can copy new **OpusMSFS msi** installation file onto your client systems and double-click on the file to install the software, but you must uninstall the old software first via Control Panel, Uninstall a program , do not delete your OpusMSFS folder containing your system configuration files.

Alternatively you can simply create a c:\OpusMSFS folder on each of your client PCs and copy the files and sub-folders across from the server's c:\OpusMSFS folder. You only need to copy the DLL and EXE files across from the main folder, along with all sub-folders. *Take care not to corrupt your DAT files on the client PCs which contain your client's current configuration and operational data.*

Create Desktop Shortcuts

After installing the software we recommend you create shortcuts on your client desktops for the client programs. These shortcuts will allow you to manually start your networked MSFS system without too much fuss.

On each of your client systems ...

In Windows Explorer, navigate to your installation folder (c:\OpusMSFS) and right-click on the FSIClient program. Select the **Send to - Desktop (create shortcut)** option. Right-click on the new desktop icon, select **Properties**, check the program is configured to **Start In:** your installation folder (c:\OpusMSFS). Select the compatibility tab (if available) and tick the checkbox to **Run this program as an Administrator**. Click **OK**.

Left click on the icon once to select it and then left click again to select the icon name, type in **OpusMSFS CLIENT** to rename the icon.

Setting up the Network

If you are using Live View you will need to install the simulator and scenery onto your client systems, although some users share their scenery over the network successfully.

The OpusMSFS network is created by running the SERVER program on the main (host) Flight Simulator PC, and running the CLIENT program on each of the client PCs. There is no need to run the sim to carry out the initial set up and configuration of your SERVER and CLIENT programs. You may need to set up your network first, see below.

Network Set Up ...

These set up requirements and guidelines apply to your main 'flying' server and each client computer you intend to connect. Make sure you set the advanced sharing settings on the server and all client machines!

The **OpusMSFS** software uses IPC (**Inter Process Communications**). Multiple IPC connections provide the fastest possible links because they allow process-to-process communications without all the usual networking and routing overheads. In order to allow IPC between your mcomputer systems your Advanced Sharing and Windows Firewall settings must be set in accordance with the following.

Control Panel - Network and Internet - Network Sharing Center - Advanced sharing settings,

- Turn on network discovery
- Turn on file and printer sharing
- Turn on sharing so anyone with network access can read and write ...
- Use 128-bit encryption ...
- Turn off password protected sharing
- Allow Windows to manage Homegroup connections

Do this for both **Public** and **Home and Work** profiles. If you are using a LAN via a **Public** network to communicate then you can just change the settings for your **Public** network.

At the very least you should have '**FILE AND PRINTER SHARING**' turned **ON** and '**PASSWORD PROTECTED SHARING**' turned **OFF** for your network.

Remember to click '**Save Changes**' after modifying each profile, you will also have to restart the SERVER and CLIENT program afterwards. It might also take a minute for the changes to come into effect and the client and server programs to connect.

After changing the Network Advanced Sharing above you must also enable certain features through your Windows Firewall, assuming that **Windows Firewall** is enabled that is, but it is best to enable the features just in case you enable the Firewall later.

Control Panel - System and Security - Windows Firewall - Allow a program or feature through Windows Firewall

Enable both **Home/Work(Private)** and **Public** options for the following features,

- Core Networking
- File and Printer Sharing
- Network Discovery

Once again, at the very least you should have '**FILE AND PRINTER SHARING**' enabled through the Firewall on your server and all client systems.

Also make sure all the computer systems have the same **Workgroup** set,

Control Panel - System and Security - System - Change Settings - Change...

and configure the main server's computer name or IP Address into the CLIENT programs. You will probably have to use the computer name over a Wi-Fi link.

If you are using LAN cable then make sure you configure compatible Internet Protocol Version 4 (TCP/IPv4) IP Addresses into all of your LAN adapters. You will also need to use a crossover cable for PC to PC connections.

Control Panel - Network and Internet - Network Sharing Center - Change Adapter Settings

Right-click on your local area network device, select Properties, highlight 'Internet Protocol Version 4 (TCP/IPv4)', click Properties and edit the assigned IP Address and Subnet masks within either your General or Alternate Configuration tabs,

For example,

Workgroup:	MSFSGROUP	on all computers.
IP v4 Addresses:	192.168.1.11	on the server.
	192.168.1.21	on the 1st client,

192.168.1.22 on the 2nd client etc.

All Subnet masks must be set to 255.255.255.0

On some networks you may have to configure the IP v4 Address as an 'Alternate Configuration'. Generally though, if you can 'see' the computers within Windows Explorer 'Network' then you should be able to connect and communicate using **OpusMSFS**.

On some systems you may actually have to go as far as setting up the drive's Sharing and Security Permissions, or enter a password, so that you can access the other computer's folders and files. To check if you need to enter a password run Windows Explorer and try to view folders on the networked PC. You will be prompted for a password if necessary.

Firewall

You may need to allow OpusMSFS through your firewall. In **Control Panel** select **System and Security, Windows Firewall, Allow a Program or feature through Windows Firewall**. Click on **Allow another program** and browse to FSISERVER (or FSISCLIENT on a client PC) in the OpusMSFS installation folder.

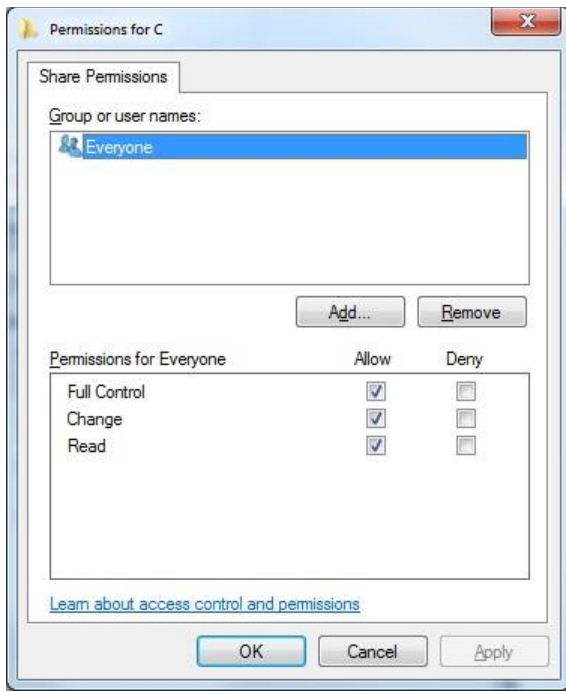
Sharing and Security Permissions

Set up your sharing and security permissions for Everyone on your server and client systems. Both the drive and the sim install folder must be shared and accessible. You may need to set sharing **and** security permissions on both your OpusMSFS and your MSFS folder in order for OpusMSFS to write the necessary files.

Sharing

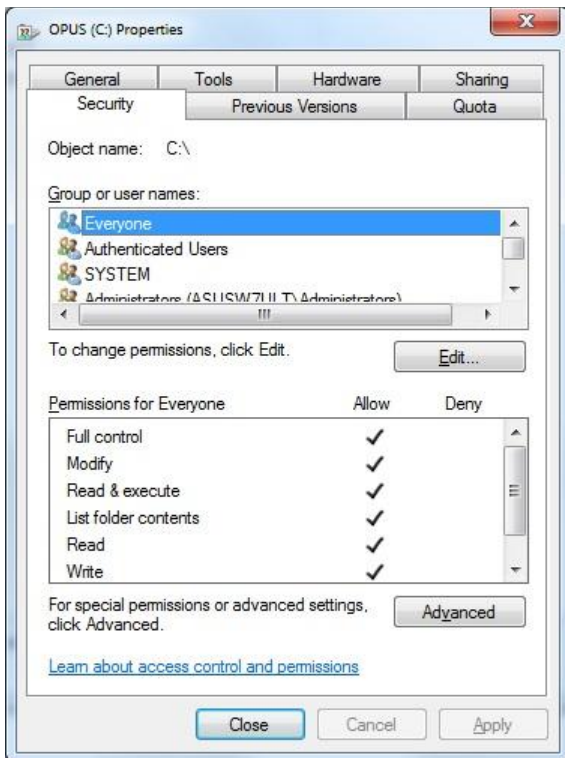
To set up *Sharing* on a drive run Windows Explorer, right click on the drive you wish to share, select **Properties**, select the **Sharing** tab, select **Advanced Sharing**, tick the checkbox to share the drive and enter a share name. Make sure the share name is a single letter code, e.g. C, not 'Drive C' for instance, otherwise OpusMSFS will not be able to find the drive.

Click on **Permissions**, enter **Everyone** in the **Group or user names** box and tick the checkboxes to allow **Full Control** for **Everyone**. Some users find it is not enough to share folders, the whole drive must be shared.



Security Permissions

To set up *Security Permissions* run Windows Explorer, right click on the drive you wish to set Security settings for, select **Properties**, select the **Security** tab, select **Everyone** in the **Group or user names** box and ensure the Permissions are **Full Control**, if not click on the **Edit** button and tick the Permissions checkboxes to allow **Full Control** for **Everyone**. If **Everyone** does not exist click **Advanced**, click **Change Permissions**, click **Add**, type in the name **Everyone** and click **OK**. Also select **Authenticated Users** in the **Group or user names** box and tick the checkboxes to allow **Full Control**.



If you are connecting more than two machines together over the network then we recommend the following options,

- Bridge LAN connections through machines equipped with two LAN adapters.
- Install a Gigabit LAN hub (better).
- Install a Gigabit LAN switch (best).

If your network relies on other devices (routers, bridges, servers etc.) then I'm afraid we can offer very little advice or assistance, the set up to allow IPC connections will be your responsibility.

OpusMSFS utilizes multiple IPC connections to achieve optimum performance, it does not use socket based TCP/IP or similar links which are considered far too slow. You will therefore have to configure your network accordingly with adequate sharing, permissions and security settings assigned to all of the networked computer systems.

Win7 and XP Networked Systems

You may (or may not) experience problems if you have both Win7 and XP systems on your network. Removing the homegroup and reverting to standard networking may help. See these websites,

<http://windows.microsoft.com/en-US/windows7/Networking-home-computers-running-different-versions-of-Windows>

and http://www.youtube.com/watch?v=VRY4_POp9zA

General Operation

The recommended start up procedures for the SERVER and CLIENT programs are detailed below. You can monitor the connection status on the main form displays of the SERVER program and each of the CLIENT programs. In each case, the Application Links will turn green when a connection is made. Note, the server will allocate two or three links for each 'Live View' client, one link for each of the possible 'Live View' Position & Attitude, and Traffic connections.

Recommended Start Up Procedure For Live View Operation

- Run MSFS on all systems and wait for them initialize. Wait for your flight to fully load and initialize on all systems.
- Run the FSISERVER program on your main SERVER system.
- Run the FSIClient programs on each of the client systems and watch them connect to the server.
- When all the MSFS systems have settled and fully initialized, decide on your chosen Weather option for the flight and load it.
- One final check that all your cloud formations are in synch and all desired zoom settings are set then you are ready to fly.

Checklist:

1. Run MSFS on all systems and load flight.
2. Run the SERVER program.
3. Run all CLIENT programs.
4. Check/reload weather or Choose Weather Theme.
5. Start Flying.

Set Up and Configuration

This section assumes you have already installed the **OpusMSFS** software, created your desktop shortcuts, and set up your network. This section uses a pictorial guide to configuring your networked system.

The SERVER and CLIENT programs **MUST** be started in their local installation folders, in other words they **MUST** be started in **OpusMSFS**.

Run the SERVER program on your main MSFS system. You do not need to run the flight simulator (if installed) at this time since we are just going to configure the system.

Live View Operation (Views on client PCs)



Figure 1 - MSFS Server's Main Form

Click on the **Configure** button to display the 'Opus FSI Server - Configuration' dialog.

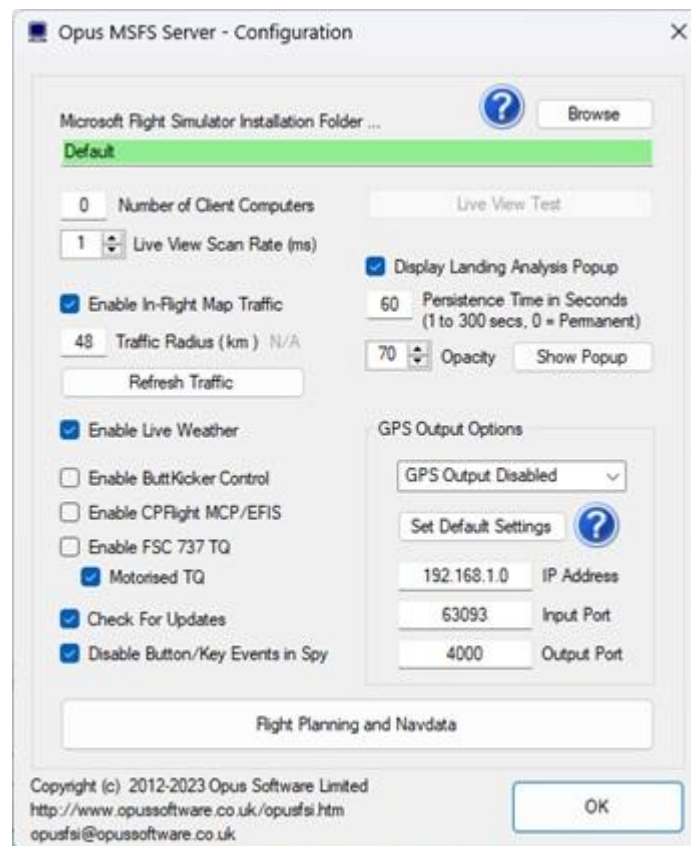


Figure 2 - MSFS Server's Configuration Dialog

Specify the number of **Client Computers** you intend connecting to the server.

The **Live View Scan Rate** (0 to 60ms) adjustment controls the position update rate communicated to the server enabling you to match the preferred rate found using the **Live View Test**. This should be tuned on fast systems to limit the position update rate of transmission to an acceptable level.

Click OK.

Select **View Client App Links** from the server's main form and you will notice that the appropriate number of client links have been created. These will be indicated in yellow until a connection is made.

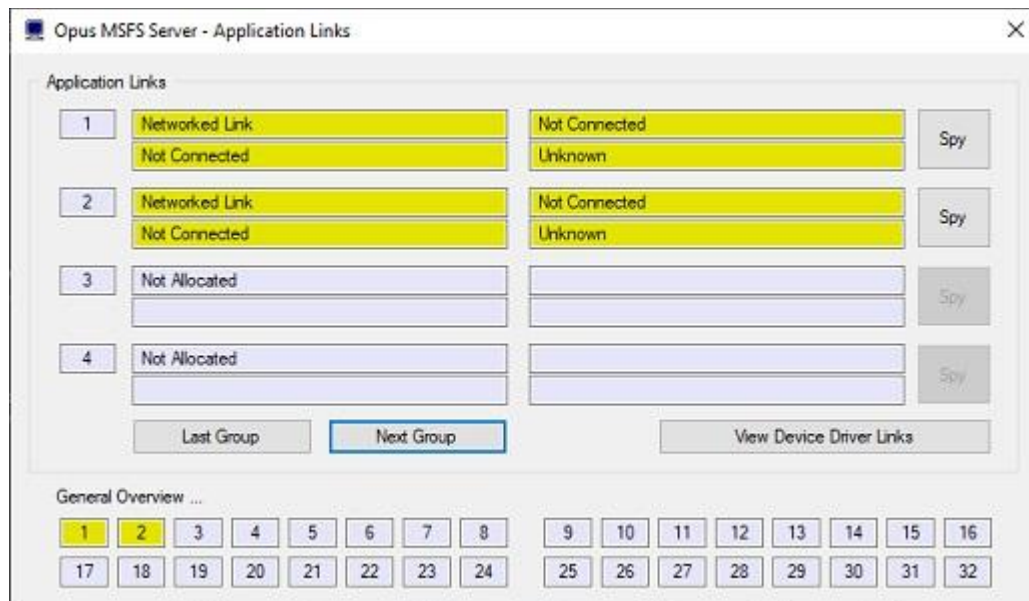


Figure 3 - Server Waiting For Client Connections

On Each Client SIM System ...

Run the CLIENT program on the client MSFS system. Once again you do not need to run MSFS at the moment.



Figure 4 - Client's Main Form

Click on the **Configure** button to display the 'Opus FSI Client - Configuration' dialog.

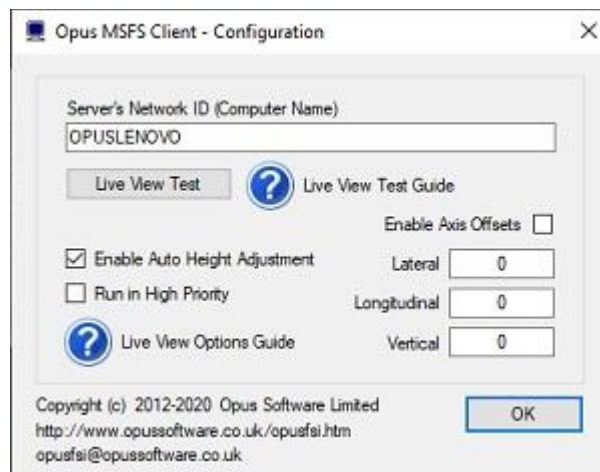


Figure 5 - Client's Configuration Dialog

Specify the network identity (name or IP address) of your main SIM server machine. *If you have problems on the network and are using Computer Names in the configuration then try using IP addresses and vice versa. Do not use non alphanumeric characters in the computer name (e.g. -).*

Enable the required options for the client system.

Enable **Run in High Priority** if required on your system, this helps some Live View networked systems operate more smoothly.

Click OK.

Select **View Client App Links** from the client's main form and you will notice that the appropriate number of application links have been created. These will be indicated in yellow until a network connection is made. With the SERVER program running on the main SIM server you should notice the links turning green on both the client and server systems as the network connections are made.

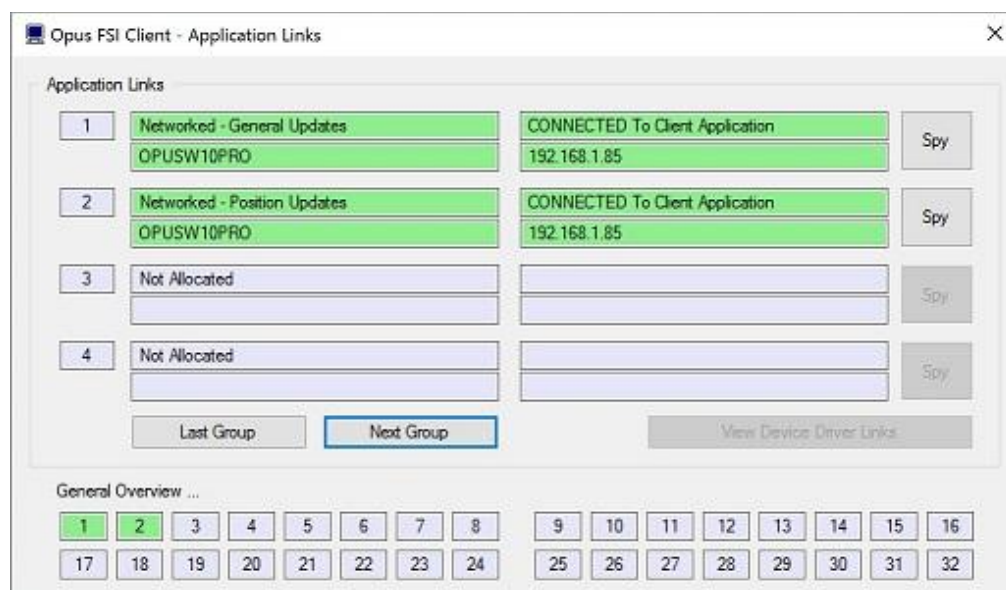


Figure 6 - Client Connected To Server

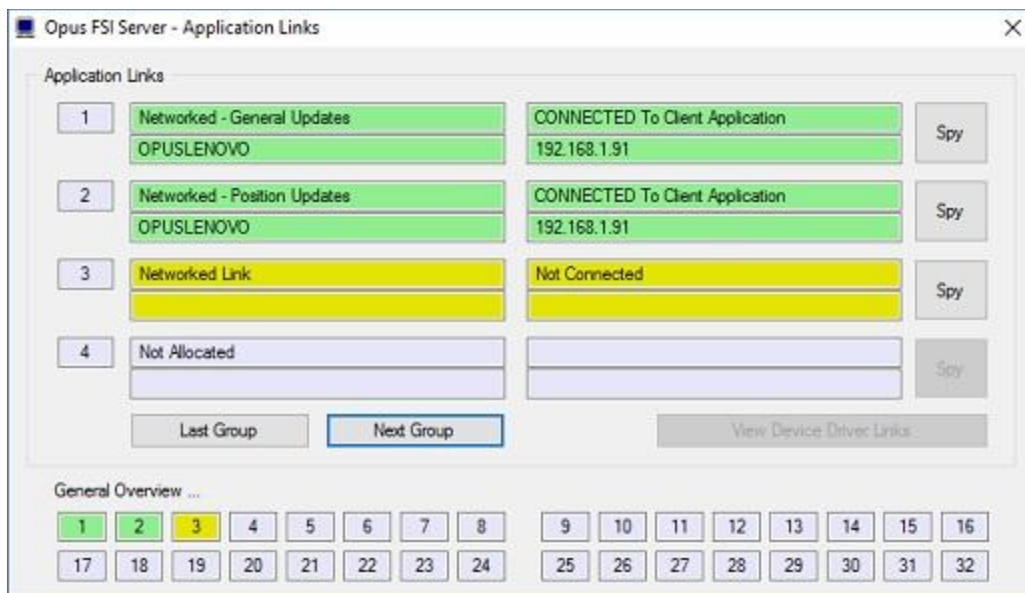


Figure 7 - Server with single client connected

After you have successfully established a connection with each of your client systems, shut down the server and clients and use the Recommended Start Up Procedure described above to enjoy your networked flight simulator system.

Auto Height Adjustment

The **Enable Auto Height Adjustment** option in combination with the Live View **Vertical** Axis Offset can accommodate any scenery differences between the installed sim types.

Live View Offsets

The CLIENT Config dialog includes an option to edit Live View Offsets. The offsets (in meters) adjust the reference point for the aircraft axis on the client system(s). The aircraft's current heading and global position is factored in to determine the current axis offset in latitude and longitude.

The required Lateral, Longitudinal and Vertical aircraft axis offset values are entered as double precision floating point numbers in meters. A decimal place must be used to enter a fraction of a meter e.g. 0.3.

Recommended Procedure

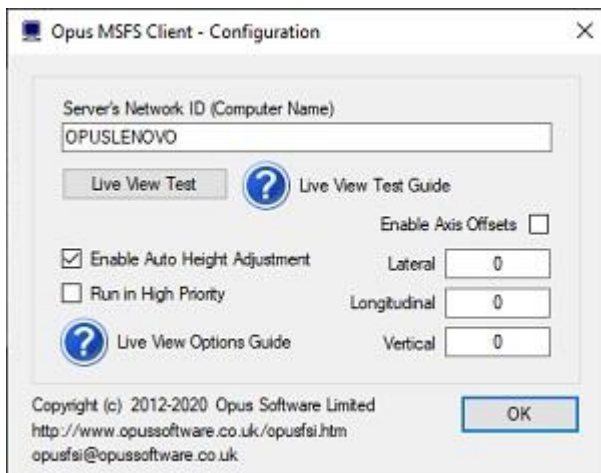
The recommended procedure for setting offsets is,

On a Client System ...

Run the CLIENT program on a client MSFS system. You will also need to run MSFS.



Click on the **Configure** button to display the '**Opus MSFS Client - Configuration**' dialog.



Manually enter and fine tune your offsets. The altitude is in meters.

Recommended Settings for CLIENT Systems using Live View

The Flight Simulator program on all client 'Live View' PCs is going to be used to provide nothing more than a scenic display. It is therefore highly recommended that you to turn off all SIM settings that are likely to have an adverse effect on the client system's display performance (e.g. flight realism).

Virus Checkers

We recommend turning off all virus checkers whilst running MSFS since they can have a serious effect on performance and can even stop or delete our software.

Performance using Live View

Please remember you cannot just rely on the frame rate measurements because MSFS will always give a fairly high priority to updating the screen. On networked systems you must always give your

server's MSFS adequate CPU capacity to perform other essential tasks, such as issuing the very important position updates. If your system has the stutters, then it is these infrequent position updates from the server's MSFS that is producing them!

OpusMSFS has very little impact on the SIM performance and can generally communicate the position updates as fast as MSFS can issue them. So if you are having stutter problems then you should investigate other possible causes. For instance, make sure you are not running any software (AV or Firewall) that could be interfering with the SERVER program's piped IPC link communications. Are you draining the SIM performance by displaying too many views on the server, in-house we never drive more than the single view on the server. Remember if you must have a wide panoramic view then you can always install a wide view screen or use three identical display screens with a TrippleHead2Go type product, in which case, as far as the sim is concerned, you are still driving a single main view, just one with a large pixel width. Other possible causes could be your server's PC spec (is it up to the job), insufficient memory (Windows 10 64-bit + loads of memory is highly recommended), do you have a poor or slow network connection (this is the age of Gigabit LANs - there's no excuse), is your actual aircraft sim well behaved (or does it hog the processor?), is your scenery too complex for your system, or have you been over enthusiastic with the MSFS settings.

The client position update rates (most important) are displayed in the client's **Spy** window for the 'Networked Live View - Position and Attitude' application link when the aircraft is in motion. Remember OpusMSFS generally updates the client systems as fast as the server MSFS program can issue position updates.

My client systems are set up in accordance with our Getting Started guide. Note also, I use Kingston Solid State Drives (SSDs) to give the fastest possible read performance for MSFS. Do not load the operating system on these drives though since the write performance is quite poor.

Live View Test

These tests are designed to help you set up your **Live View** system and isolate problems within your server, network, or client systems. Make sure you have set up all systems in accordance with the **Getting Started Guide for Networked Systems**.

Pay careful attention to all the recommended sharing, permissions and security settings, remembering the share both the install drive and folders of OpusMSFS and your simulator. Also pay attention to the recommended settings and optimisation of your client systems.

Starting Up

Run the simulator and load the flights on the server and all client systems (or just the client system you wish to test and set up). Your aircraft can be sat at an airport before starting the test, alternatively you may conduct the test with the aircraft positioned anywhere you want.

Your simulator should be run in Windowed Mode on all systems.

Run the SERVER program on your server and let it initialise, then run the CLIENT program on each client system you are going to test.

Allow all the systems to settle down with all client system simulators fully initialised and positioned. You are now ready to conduct the Live View link tests.

Testing Your System

Testing Your Client System ...

Run the client side Live View Test first to make sure your client system can cope with the changing position and attitude updates reported via its SimConnect interface.

1. Close all Spy windows.
2. Pause your server system's simulator.
3. Open the Configure dialog on your client system.
4. Click on the Live View Test button.
5. Your aircraft should jump to 2000 feet above the runway.
6. With all Test tick boxes ticked, click the Start button.
7. Your client display should now show relatively smooth changes in attitude without any major stutters.
8. You should be able to alter the Update Rate slider and see a fairly smooth motion for all rates.

Testing Your Server Link ...

Determine Your Optimum Update Rate ...

Close any Spy windows you have opened and ensure you have minimised your server's simulator to the taskbar.

To start the test, open the server **Configure** dialog and click on the **Live View Test** button. The Live View Test dialog will be displayed and your simulator will be un-paused.



Start off with the **Update Rate** slider in the centre position and tick each of the **Pitch**, **Bank**, and **Yaw** test options, then click the **Start** button. You should now see your client display jump to 3000 feet above the surface and start moving in all three attitude axis. Let it run for a few seconds then click the **Stop** button.

The client display should stop and reset straight and level without any significant delay. Adjust the **Update Rate** until you can run this test and Stop without any appreciable lag in the client response.

Once you have determined your optimum **Update Rate** open the **Position & Attitude** Spy window on your client system, start the test and make a note of the rough average number of Position Updates per second. Divide 1000 by this figure and set the ms rate in the **Live View Scan Rate** box provided in the Configure dialog e.g. 100 updates per second is 10 ms. For MSFS you may need to set the server **Live View Scan Rate** to **zero**.

Both server and client systems display the following reports,

FSISERVER,

APP Position Updates: SIM xxx LAN xxx /sec

FSCLIENT,

APP Position Updates: LAN xxx SIM xxx /sec

On the server, the SIM and LAN counts indicate the approximate rate at which SimConnect updates are received and IPC updates are transmitted. On the client, the LAN and SIM counts indicate the approximate rate at which IPC updates are received and SimConnect updates are sent to the MSFS sim.

N.B. These rates are not synchronised so will not be identical.

Stuttering Client Display

Your client display should move fairly smoothly with no major stutters or abrupt changes in attitude.

If your client display stutters badly running the Live View Test on your Server then you most likely have a problem with either your network connection or your actual client simulator system, try conducting the Live View Test on your client system.

If your client display stutters badly whilst running the Live View Test on your Client then this will indicate your client simulator system cannot cope with the position and attitude updates. Please make sure you have optimised your client simulator system and stopped all unnecessary software including any virus scanners. You could also try adjusting the simulator settings, changing the simulator's target frame rate etc. For MSFS you may need to set the server **Live View Scan Rate** to **zero**.

Options

Update Rate

This slider will typically alter the update rate from between 50 updates per second (Slow) up to about 120+ updates per second. This slider should be adjusted so that there is no appreciable lag when Stopping the test.

If there is a lag then reduce the rate of updates sent from the server by adjusting the configurable scan rate (i.e. increase the value) in the server Configure dialog's **Live View Scan Rate (ms)**.

Test Tick Boxes

The Test Speed, Pitch, Bank and Yaw tick boxes allow you to select speed and each of the attitude modes individually.

Start Button

Click the Start button to start the test and vary the selected pitch, bank and yaw attitudes for the aircraft. At the start of a test the aircraft is automatically positioned 500 feet AGL.

Stop Button

Click the Stop button to terminate the test and re-centre the aircraft.

Quit

Either click on the Quit button or the dialog's X to abort the test and close the Live View Test dialog.

FAQ and Troubleshooting

TypeInitialisation errors when running the client program

Select the .NETv4 variants of SimConnect and SlimDX. Run the SlimDX dotNet 4 runtime using our supplied msi file in the OpusMSFS folder.

SlimDX error

You must ensure the FSICLIENT program ...

- Is starting in the correct c:\OpusMSFS folder.

- Has permissions to copy and rename the relevant SlimDX DLL file.

- Is able to copy the current SlimDX DLL, it's not locked or write protected.

- Is not blocked by AV or Win Defender software.

Otherwise its attempt to copy and rename the SlimDX file will fail. You may also need to install the SlimDX dotNet 4 runtime using our supplied msi file in the OpusMSFS folder.

Can't connect to client

Have you configured the correct number of clients in the server?

Can you still see the server's OpusMSFS drive and folder in Windows Explorer on your client?

Check a windows update hasn't re-enabled 'password protected sharing' on the PCs.

Is an Anti Virus program active or Win Defender active on the client? Stop Anti Virus software and disable Win Defender since these will cause problems and even possibly stop or delete the software.

Are you identifying the server using its IP Address or Computer Name? Try both methods.
Does the client IP Address have the same group numbers as the server, as per the Getting Started Guide?

Can I use a Wi-Fi network ?

Yes you can, however you should note that a direct Wi-Fi link is only going to give you 54Mbps and a redirected link will operate at about 16 to 24Mbps. This may be faster than an ancient 1990s 10base-T network running at 10Mbps but nowadays everyone uses either 100Base-TX (100 Mbps) or a 1000Base-T gigabit LAN running at 1000Mbps (1Gbps). The modern cabled LANs are going to operate up to 64 times faster than the Wi-Fi link!

However, if you must use a Wi-Fi link (no LAN ports or Cat5 cable) then just make sure all the computer systems have the same workgroup set (Control Panel - System and Security - System - Change Settings - Change...) and configure the main server's computer name into the CLIENT programs. You will find the link works perfectly well with perhaps a few tiny jitters when taking off of flying fast and low (depends how good or busy your Wi-Fi link is).

My client system lags behind the server

The lag indicates the clients cannot keep up with the updates. The programs have 32K buffers for both receive and transmit over each IPC link, hence the possible back log.

There are two solutions. The best is to reduce the rate of updates sent from the server by adjusting the configurable scan rate (i.e. increase the value) in the server Configure dialog's **Live View Scan Rate (ms)**. The second solution is to occasionally pause using the 'P' key on the server, let everything catch up and then unpaue, let things settle and the lag will then be gone. You can also use the pause key to measure the lag or amount of buffering at the client end. If the system is configured and tuned correctly there should never be any lag and both server and client should pause together almost instantly. If your system is set up correctly it should be able to cope with the throughput.

We have a Live View test facility to help you tune your system.

Start up all the client SIM systems and the server SIM so that they are all up and running. Then start the SERVER program, let it settle, then each of the CLIENT programs. Once they connect their SIMs will normally reload to the new location.

It is very important to set up your client systems as per the Getting Started guides to optimise your client systems, this can have a dramatic impact on the performance. It's all about giving SIM more time to process the stream of position updates.

The tell tale sign that one system has been paused too long is that you will get different cloud formations on the server and client system. If you don't pause this should never happen.

We also recommend not running anti-virus software since this can have a serious performance effect on the clients or even stop or delete the software.

Win7 and XP networked systems

You may (or may not) experience problems if you have both Win7 and XP systems on your network. Removing the homegroup and reverting to standard networking may help.

<http://windows.microsoft.com/en-US/windows7/Networking-home-computers-running-different-versions-of-Windows>

and http://www.youtube.com/watch?v=VRY4_POp9zA

Please also refer to the FAQ in the OpusMSFS_Getting_Started_Single_PC pdf guide which can be found in the OpusMSFS installation folder, also available from our [downloads page](#).