# Counter-Strike 2 Low Latency DOCSIS Trial Instructions

Purpose

Counter-Strike 2, a free to play game, provides network statics and the ability to enable/disable Low Latency DOCSIS (LLD) from within the game client. For this trial, we would like to collect network statistics for different scenarios while LLD is enabled and disabled.

Setup

1. Install the Steam application: https://store.steampowered.com/
2. Install CS2 from within the Steam application.
3. Once installed in your Steam library list, right click CS2 and select "Properties…"
4. Under General>Launch Options, type: `-console -sw`
   a. `-console` allows opening of the console window to enter game commands
   b. `-sw` allows the game to run in a window instead of full screen. It also allows moving the mouse cursor outside of the game window to use the iPerf traffic tool.
5. Close the Properties window.
6. Download the Traffic Generator tool. Please download this version even if you have done so previously:
   - https://github.com/jlivingood/IETF-L4S-Deployment/blob/main/iperf3-gui.zip
   - Click the "Download Raw file" button to properly download the .zip file.
   - Open the .zip file and place the iperf3-gui.exe somewhere you can find it again later.
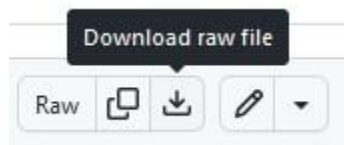
7. In the Steam app, select CS2 in the game list and click Play.
8. We recommend changing your video settings to make getting to the iPerf tool and Notepad easier:
   a. Click the cog to access the game options.
   b. Under Video, change your Display Mode to "Windowed"
9. Hit Esc to exit the options window.

Note: Currently only the Windows version of CS2 supports LLD.

Playing CS2 and Collecting Data

In order to run the following tests and collect data for our trial and you have never played CS2 before, you will need to complete an in-game tutorial, The tutorial is played locally with no network activity and must be completed before you can join online, public matches. . The tutorial takes some time to complete and **does not** need to be completed in a single sitting.

These instructions will place you in "Casual" mode which places you in an unranked match. It is not recommended to do the tests in a ranked mode as you will be doing activities outside of the game window and lose control of your character. If you die before 5 minutes of gameplay, it is OK to spectate for the remaining amount of time to gather valid data.

Running the Tests

There are three scenarios we would like you to gather stats for.

Test 1: Baseline– No Low Latency with No Background Traffic
1. Press ` to open the console window.
2. Enter this command to disable Low Latency: `net_option ecn -1`
3. Click Play at the top, center of the window.
4. Select Matchmaking on the line below.
5. Select Casual on the line below that.
6. Pick any group out of the four choices and click Go.
    a. If you die, you can spectate another player for the rest of time needed for the test.
    b. Sometimes you will be placed as a spectator for an in progress match. This is fine and you can continue spectating. This will still provide valid data for the test.
7. 5 minutes after gameplay begins, type these commands in the console window. Press ` if you closed it:
    a. `clear` : clear the console window first.
    b. `net_option ecn` : record low latency setting for the record
    c. `net_connections_stats` : outputs the game session's network stats
8. Right click in the console window and select "Save to Log"
9. Save the file with the name: `cs2-1.txt`
10. Finish playing the match or quit right away by pressing Esc and selecting "Exit to main menu"

Test 2: Upstream - No Low Latency with background Traffic
1. Open the iPerf traffic generator tool and click the **Upload** button. Do **not** press the play button yet.
2. On the CS2 screen, press ` to open the console window if it is not already.
3. Enter this command to disable Low Latency: `net_option ecn -1`
4. Click Play at the top, center of the window.
5. Select Matchmaking on the line below.
6. Select Casual on the line below that.
7. Pick any group out of the four choices and click Go.
8. When "Your match is ready" appears, switch to the iPerf tool and press the play button.

a. If you die, you can spectate another player for the rest of time needed for the test.
   b. Sometimes you will be placed as a spectator for an in progress match. This is fine and you can continue spectating. This will still provide valid data for the test.
9. Switch back to the CS2 window.
10. Before the 5 minute timer on the iPerf tool expires, type these commands in the console window. Press ` if you closed it:
   a. `clear` : clear the console window first.
   b. `net_option ecn` : record low latency setting for the record
   c. `net_connections_stats` : outputs the game session's network stats
11. Right click in the console window and select "Save to Log"
12. Save the file with the name: `cs2-2.txt`
13. Finish playing the match or quit right away by pressing Esc and selecting "Exit to main menu"

Test 3: Upstream - Low Latency with background traffic

1. Open the iPerf traffic generator tool and click the **Upload** button. Do **not** press the play button yet.
2. On the CS2 screen, press ` to open the console window if it is not already.
3. Enter this command to enable Low Latency: `net_option ecn 1`
4. Click Play at the top, center of the window.
5. Select Matchmaking on the line below.
6. Select Casual on the line below that.
7. Pick any group out of the four choices and click Go.
8. When "Your match is ready" appears, switch to the iPerf tool and press the play button.
   a. If you die, you can spectate another player for the rest of time needed for the test.
   b. Sometimes you will be placed as a spectator for an in progress match. This is fine and you can continue spectating. This will still provide valid data for the test.
9. Switch back to the CS2 window.
10. Before the 5 minute timer on the iPerf tool expires, type these commands in the console window. Press ` if you closed it:
   a. `clear` : clear the console window first.
   b. `net_option ecn` : record low latency setting for the record
   c. `net_connections_stats` : outputs the game session's network stats
11. Right click in the console window and select "Save to Log"
12. Save the file with the name: `cs2-3.txt`
13. Quit the match by pressing Esc and selecting "Exit to main menu"

Tests 4 and 5: Downstream – Background traffic without and with low latency

1. Please rerun Upstream tests 2 and 3 but click the **Download** button during step 1 of each test.
2. Please save the data files with the names: `cs2-4.txt` and `cs2-5.txt`

Subjective Testing

The above testing will provide quantifiable data demonstrating the benefits of low latency while gaming, but it does not provide a good situation for the player to "feel" a benefit. CS2 is in a genre of games that should noticeably benefit in a real match against other players when high amounts of action are on screen.

If willing, we would like our trial users to also play more populated deathmatches with LLD enabled and disabled. And if feeling brave, with the iPerf traffic generator running in the background. We would welcome feedback on how the gameplay feels not just during this LLD trial, but also compared to past matches where you noticed moments where gameplay slowed down or the frame rate dip during high intensity moments.

Send In Your Results

If you want to run the tests more than once each, we welcome the extra data!

Please use this form to upload the notepad files with data you collected using the console commands: https://app.smartsheet.com/b/form/b57ea3a3364f4b69a97c4ed1fbc37a74

Please use this form to provide your subjective feedback on playing regular deathmatches outside of collecting the network statistics based on past patches and matches with LLD enabled and disabled: https://app.smartsheet.com/b/form/1f8a26bed7ab40a5916fb1ad7f5ebf23

Thank you!