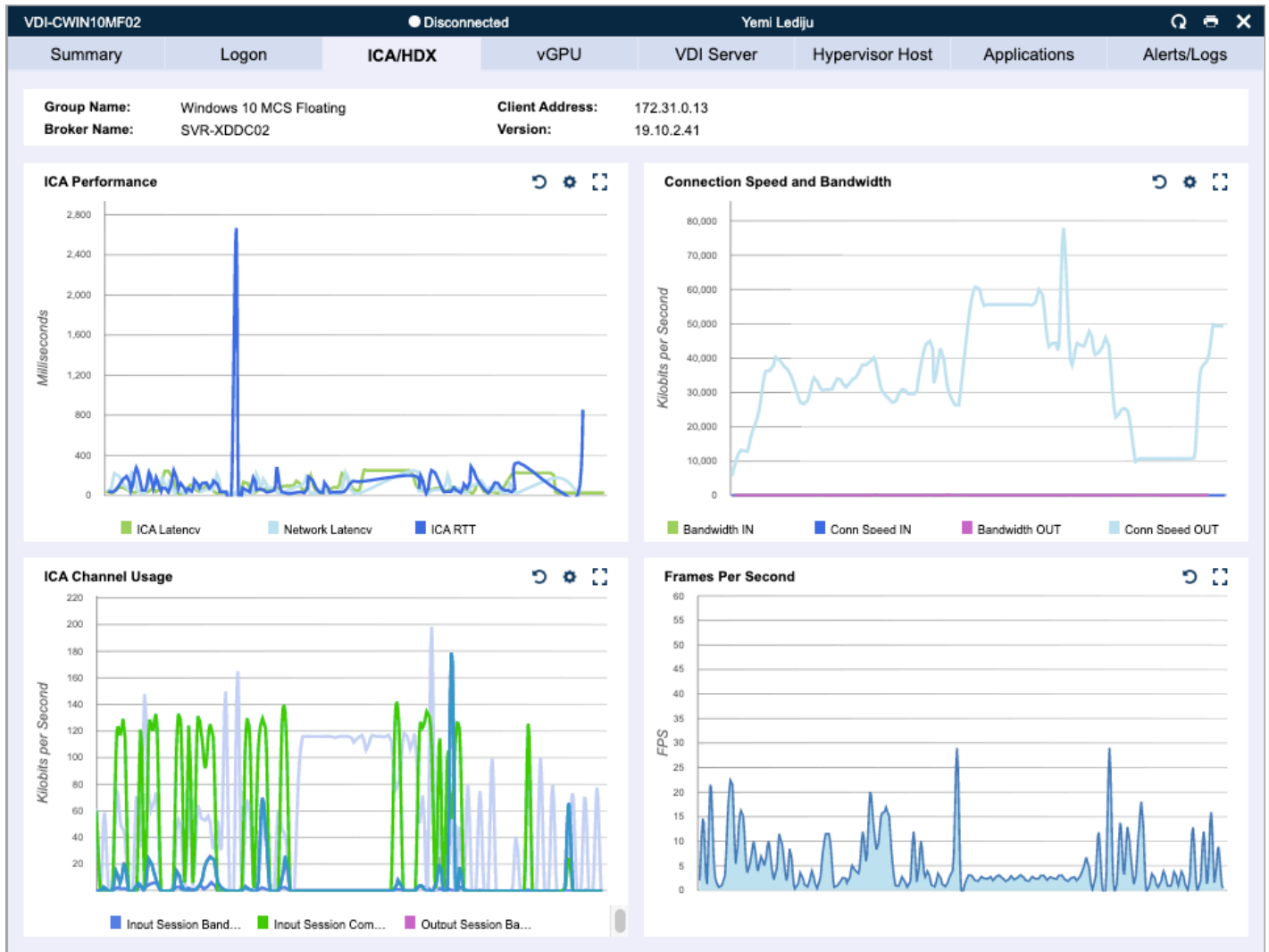# How to Use the ICA/HDX Tab to Troubleshoot Slow Session Performance Correlated Data around ICA Performance, Connection Speed, and End-User Behavior


The ICA/HDX details the ICA channel usage to and from the user's endpoint to the user's virtual machine or session host server. This is often a key metric in a user's experience as most help desk calls are related to some form of latency. This tab can often be the determining factor in distinguishing if the problem exists on the network or the Desktop/Server.

When it comes to ICA latency and how it affects the user's experience, these are Citrix's guidelines for End-User Experience:

- 0ms to 150ms: Optimal User Experience
- 150ms to 300ms: Acceptable User Experience
- 300ms+: Degrade User's Experience
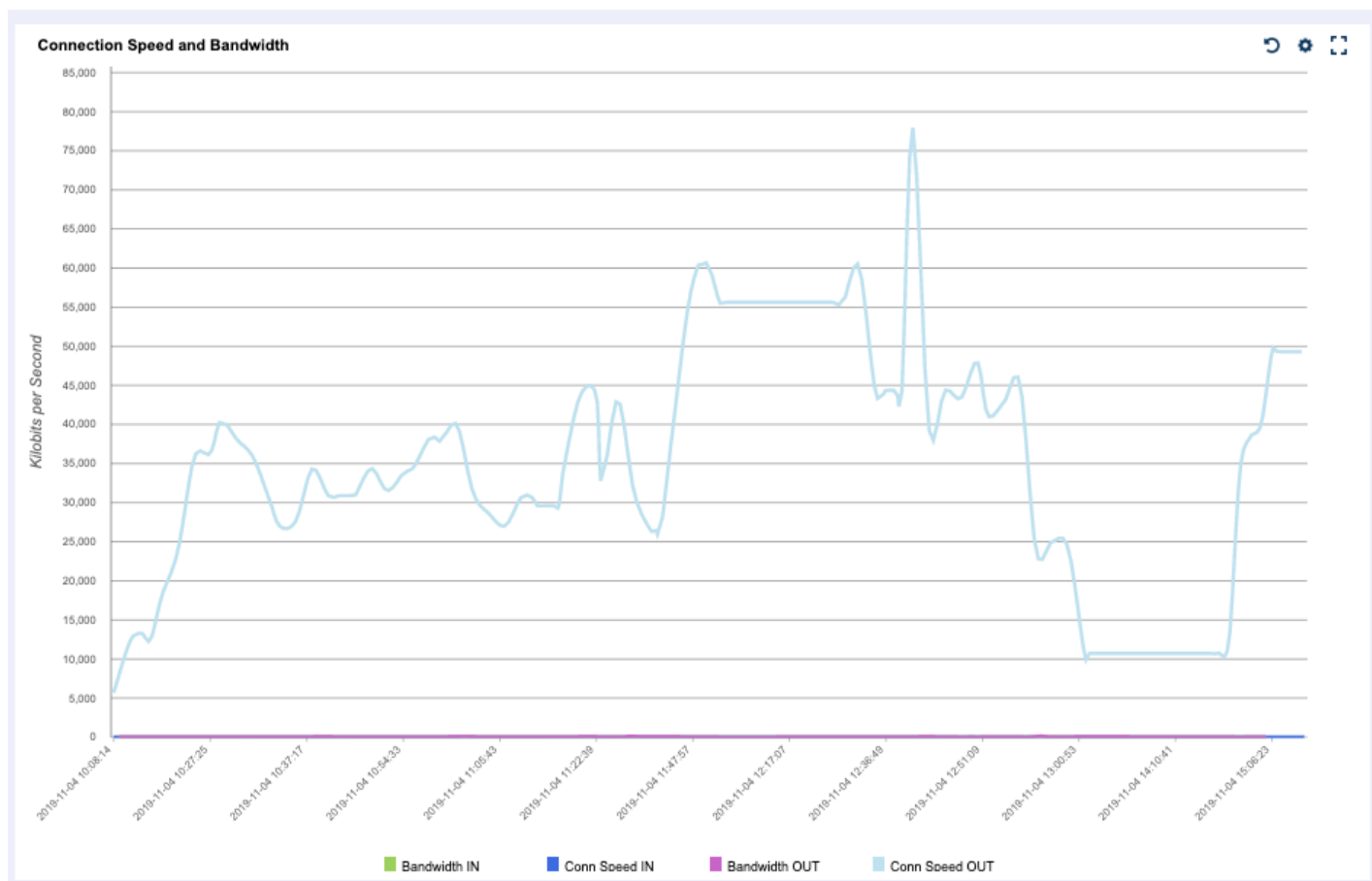
ICA Performance
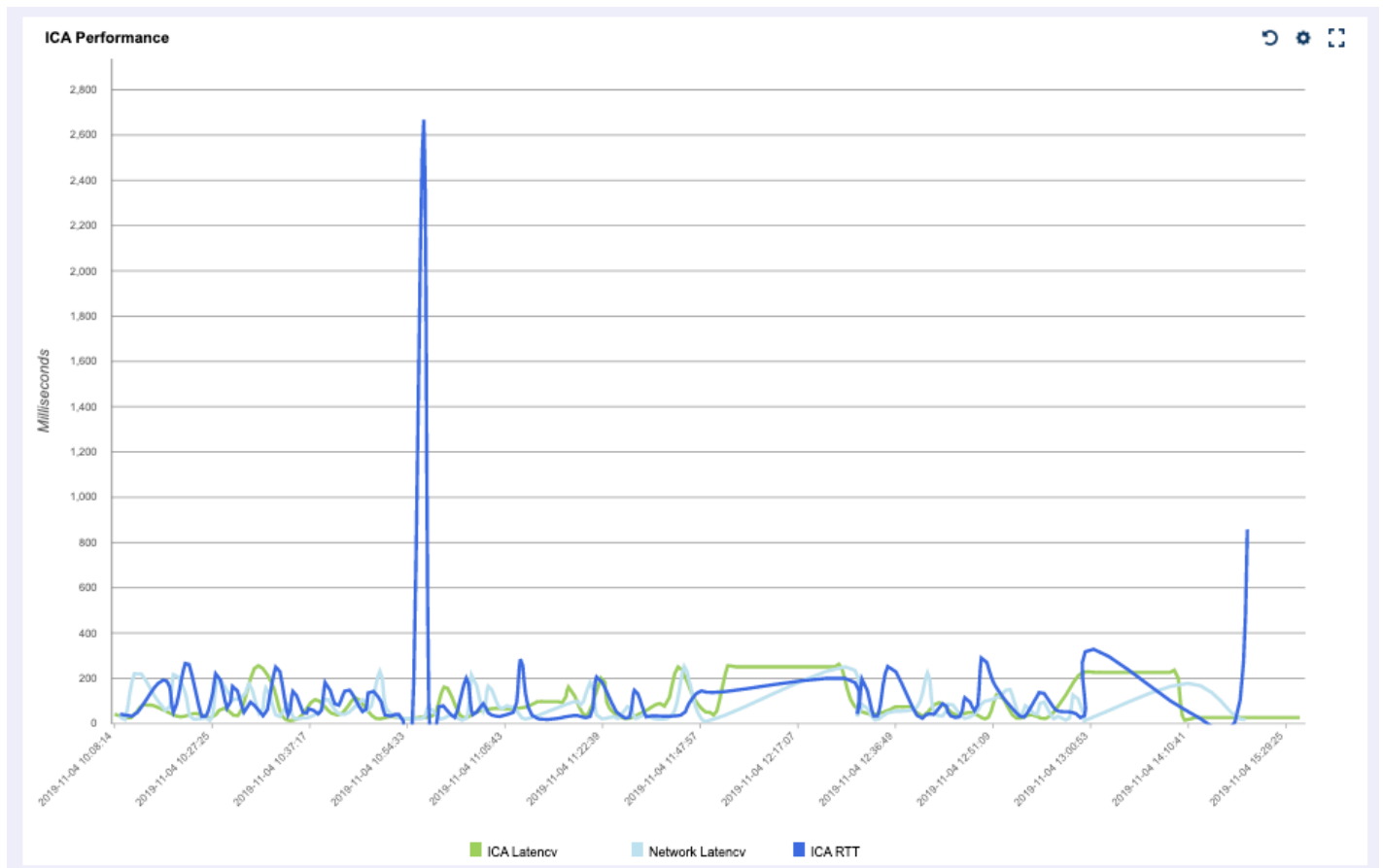
Often the ICA performance graph is a quick way to determine if a user's performance issues lie in the user's endpoint environment. A historical view of latency can help you determine how long a user has been experiencing a latency issue.

- **ICA Latency** is the time from when a user executes a keystroke or mouse click to when it is processed on the session host. It includes both network latency and any delay on the session host to process this request.

- **Network Latency** is the amount of time it takes data to traverse the network and reach the server.

- **ICA Round Trip Time (RTT)** is the elapsed time from when the user hits a key until the response is displayed back at the end point, as calculated by the session experience monitoring service. The difference between the ICA Latency and RTT is the application processing time on the session host.

How To Troubleshoot Slow Session Performance Due to Long ICA Round Trip Times:

ICA RTT (Round Trip Time) helps you confirm that a user is experiencing slowness or issues inside of their session, but **ICA Latency** and **Network Latency** help narrow down the root cause. If **Network Latency** is high and mirrors **ICA RTT**, then **Network Latency** is actually the driving factor of the poor session performance. From this point you can take a look at **Connection Speed** to investigate if the latency is from the user's end or inside of the datacenter. If **Network Latency** is low but **ICA Latency** is high, then we can point to the VDA machine's response time as the root cause of slowness in the session. To investigate issues with resource response times, you can take a look at the App Server/VDI tab or the Processes/Applications tab for further details.

Connection Speed and Bandwidth

The **Connection Speed and Bandwidth** section provides a detailed look into the user's connection over a period of time.

How To Troubleshoot Slow Session Performance Due to Poor Connection Bandwidth:

The graph above illustrates the user session started with an acceptable amount of bandwidth, but then dropped down to a troublesome rate. If a user has an acceptable connection speed at 9AM and then by 12PM it dropped below an acceptable number, you can ask, "What changed on your end around noon?" A lot of times something else in the environment has an effect on this number. You may find that the user was working from their office close to a Wi-Fi connection and then moved down to their kitchen at lunch where their Wi-Fi signal isn't strong enough to maintain acceptable bandwidth. Sometimes outside factors can come into play like someone else on the network streaming or downloading taking up all available bandwidth.

ICA Channel Usage

ICA
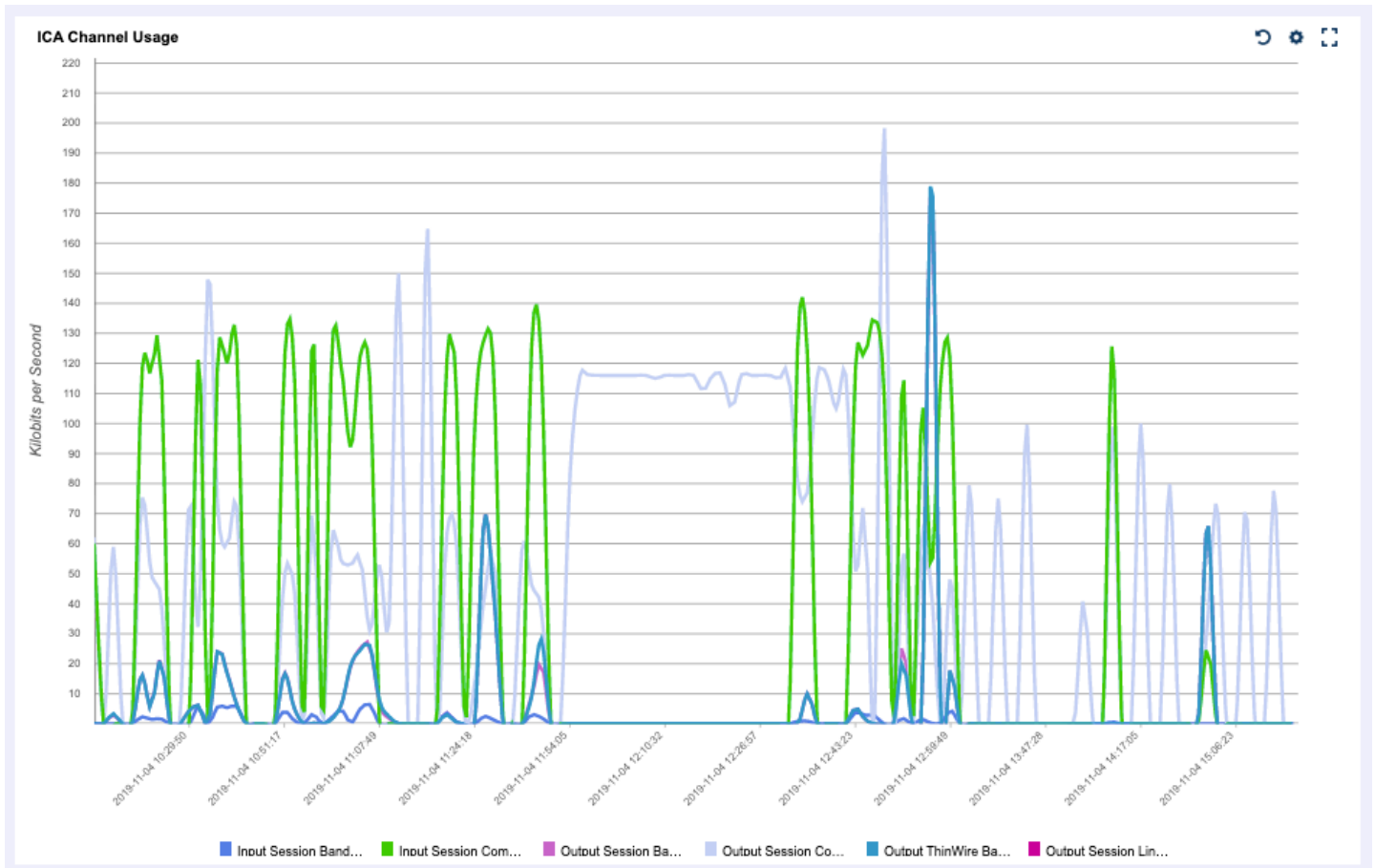
ICA Channel Usage is an overview of metrics collected from the ICA Channel.

- **Input Audio Bandwidth:** The bandwidth, measured in bps, used when playing sound in an ICA session.

- **Input Clipboard Bandwidth:** The bandwidth, measured in bps, used when performing clipboard operations such as cut-and-paste between the ICA session and the local window.

- **Input COM 1 Bandwidth:** The bandwidth, measured in bps, used when routing a print job through an ICA session that does not support a spooler to a client printer attached to the client COM 1 port.

- **Input COM 2 Bandwidth:** The bandwidth, measured in bps, used when routing a print job through an ICA session that does not support a spooler to a client printer attached to the client COM 2 port.

- **Input COM Bandwidth:** The bandwidth, measured in bps, used when sending data to the client COM port.

- **Input Control Channel Bandwidth:** The bandwidth, measured in bps, used when executing LongCommandLine parameters of a published application.

- **Input Drive Bandwidth**: The bandwidth, measured in bps, used when performing file operations between the client and server drives during an ICA session.
- **Input Font Data Bandwidth:** The bandwidth, measured in bps, used when initiating font changes within a SpeedScreen-enabled ICA session.
- **Input HDX Mediastream for Flash Data Bandwidth:** The bandwidth, measured in bps, used when streaming Flash data in an HDX-enabled session.
- **Input Licensing Bandwidth:** The bandwidth, measured in bps, used to negotiate licensing during the session establishment phase. Often, no data for this counter is available, as this negotiation takes place before logon.
- **Input LPT 1 Bandwidth**: The bandwidth on the virtual channel that prints to a client printer attached to the client LPT 1 port through an ICA session that does not support a spooler. This is measured in bps.
- **Input LPT 2 Bandwidth:** The bandwidth on the virtual channel that prints to a client printer attached to the client LPT 2 port through an ICA session that does not support a spooler. This is measured in bps.
- **Input Printer Bandwidth:** The bandwidth, measured in bps, used when printing to a client printer through a client that has print spooler support enabled.
- **Input Seamless Bandwidth:** The bandwidth, measured in bps, used for published applications that are not embedded in a session window.
- **Input Session Bandwidth:** The bandwidth, measured in bps, used from client to server for a session.
- **Input Session Compression:** The compression ratio used from client to server for a session.
- **Input Session Line Speed:** The line speed, measured in bps, used from client to server for a session.
- **Input SpeedScreen Data Channel Bandwidth:** The bandwidth, measured in bps, used from client to server for data channel traffic.
- **Input Text Echo Bandwidth:** The bandwidth, measured in bps, used for text echoing.
- **Input ThinWire Bandwidth:** The bandwidth, measured in bps, used from client to server for ThinWire traffic.
- **Latency - Last Recorded:** The last recorded latency measurement for the session.
- **Latency - Session Average:** The average client latency over the lifetime of a session.
- **Latency - Session Deviation:** The difference between the minimum and maximum measured latency values for a session.
- **Output Audio Bandwidth:** The bandwidth, measured in bps, used for playing sound in an ICA session.
- **Output Clipboard Bandwidth:** The bandwidth, measured in bps, used for clipboard operations such as cut-and-paste between the ICA session and the local window.
- **Output COM 1 Bandwidth:** The bandwidth, measured in bps, used when routing a print job through an ICA session that does not support a spooler to a client printer attached to the client COM 1 port.
- **Output COM 2 Bandwidth:** The bandwidth, measured in bps, used when routing a print job through an ICA session that does not support a spooler to a client printer attached to the client COM 2 port.
- **Output COM Bandwidth:** The bandwidth, measured in bps, used when receiving data from the client COM port.
- **Output Control Channel Bandwidth:** The bandwidth, measured in bps, used when executing LongCommandLine parameters of a published application.
- **Output Drive Bandwidth:** The bandwidth, measured in bps, used when performing file operations between the client and server drives during an ICA session.

- **Output Font Data Bandwidth:** The bandwidth, measured in bps, used when initiating font changes within a SpeedScreen-enabled ICA session.
- **Output Licensing Bandwidth:** The bandwidth, measured in bps, used to negotiate licensing during the session establishment phase. Often, no data for this counter is available, as this negotiation takes place before logon.
- **Output HDX Mediastream for Flash Data Bandwidth:** The bandwidth, measured in bps, used when streaming Flash data in an HDX-enabled session.
- **Output LPT 1 Bandwidth:** The bandwidth, measured in bps, used when routing a print job through an ICA session that does not support a spooler to a client printer attached to the client LPT 1 port.
- **Output LPT 2 Bandwidth:** The bandwidth, measured in bps, used when routing a print job through an ICA session that does not support a spooler to a client printer attached to the client LPT 2 port.
- **Output Management Bandwidth:** The bandwidth, measured in bps, used when performing management functions.
- **Output Printer Bandwidth:** The bandwidth, measured in bps, used when printing to a client printer through a client that has print spooler support enabled.
- **Output Seamless Bandwidth:** The bandwidth, measured in bps, used for published applications that are not embedded in a session window.
- **Output Session Bandwidth:** The bandwidth, measured in bps, used from server to client for a session.
- **Output Session Compression:** The compression ratio used from server to client for a session.
- **Output Session Line Speed:** The line speed, measured in bps, used from server to client for a session.
- **Output SpeedScreen Data Channel Bandwidth:** The bandwidth, measured in bps, used from server to client for data channel traffic.
- **Output Text Echo Bandwidth:** The bandwidth, measured in bps, used for text echoing.
- **Output ThinWire Bandwidth:** The bandwidth, measured in bps, used from server to client for ThinWire traffic.

How To Troubleshoot Slow Session Performance Due to User Behavior:

This section gives IT insight into the user's behavior and helps determine if the behavior is a cause of issues in the session. For instance, if a user is streaming audio inside of a session, the Output Audio Bandwidth would be high, and this can actually use enough bandwidth in a session that it may cause issues for the user. The **ICA Channel** chart can also show issues that may not even be caused by malicious user behavior. For instance, if a large print job is sent by a user, the Output Printer Bandwidth would spike, and this can be correlated with **Network Latency** and **ICA Latency** to determine if Printer bandwidth was the cause of slowness at a particular time.

Frames Per Second
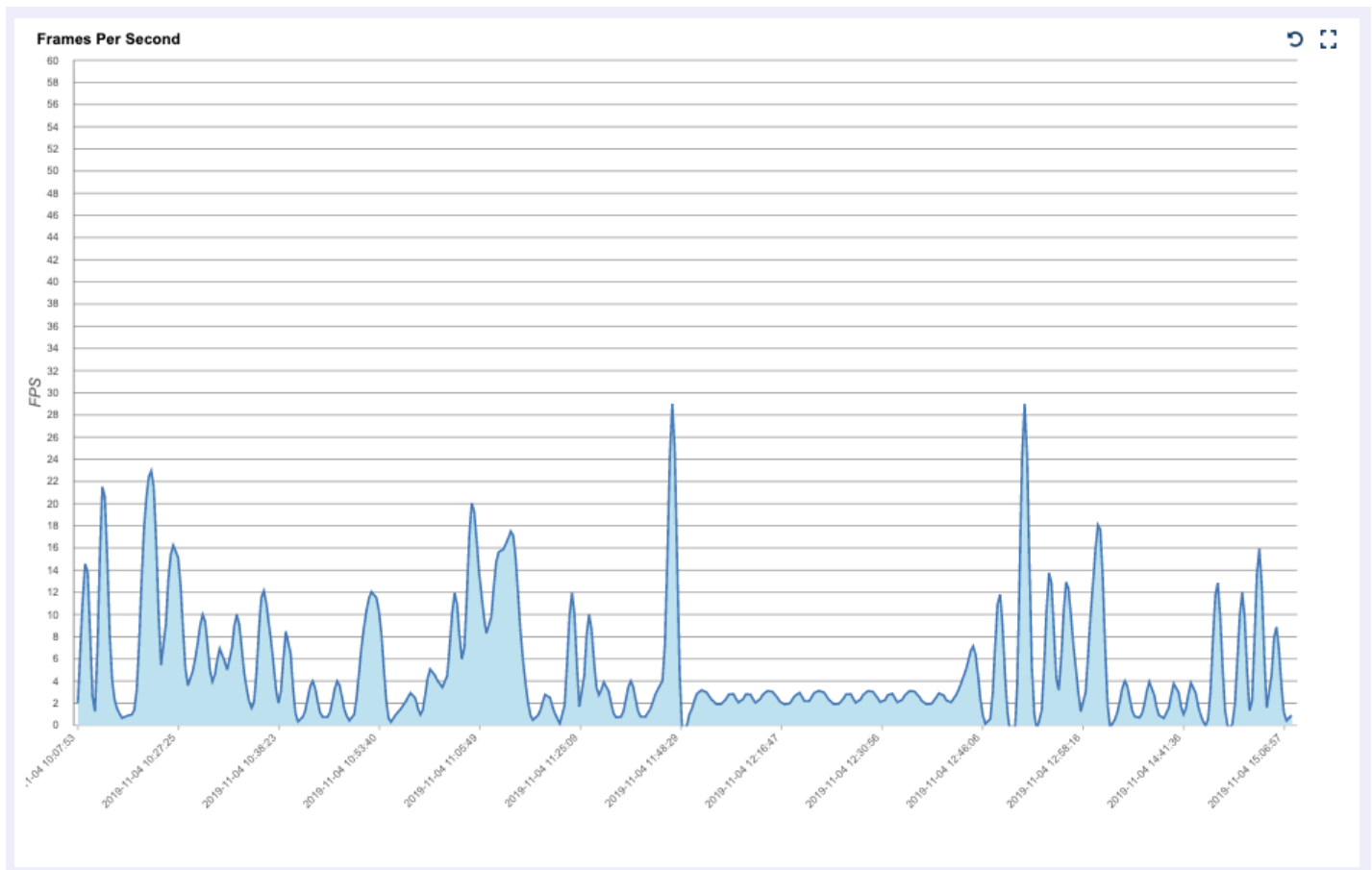
Frames Per Second is a good resource to get a feel for the user's visual experience. A higher FPS number gives a better visual experience but requires more bandwidth and processing on the host machine.

How To Use Frames per Second Metrics to Troubleshoot Slow Session Performance:

The amount of FPS is determined by ICA and can be controlled by policy. Users with low FPS often have lower bandwidth connections. Constant FPS above 20 can be indicative of a user watching a video inside of their Citrix session.