

GStreamer Setup: Raspberry Pi to Host PC Streaming

Step 1: Install GStreamer on Both Devices

Run this on both the Raspberry Pi and host PC:

```
sudo apt update
```

```
sudo apt install gstreamer1.0-tools gstreamer1.0-plugins-base \
    gstreamer1.0-plugins-good gstreamer1.0-plugins-bad \
    gstreamer1.0-plugins-ugly gstreamer1.0-libav
```

If you're on Windows, download from:

<https://gstreamer.freedesktop.org/download/>

Step 2: Configure Python to Send Video from Raspberry Pi

GStreamer pipeline in your Python code:

```
gst_str = (
    f'appsrc ! videoconvert ! x264enc tune=zerolatency bitrate=500
    speed-preset=ultrafast ! '
    f'rtph264pay config-interval=1 pt=96 ! udpsink host={{HOST_IP}} port=5000'
)
```

This sends a real-time compressed H.264 video stream to HOST_IP:5000.

Step 3: Receive the Stream on the Host PC

On your host PC (use same IP as HOST_IP), run:

```
gst-launch-1.0 -v udpsrc port=5000 caps="application/x-rtp, media=video,
encoding-name=H264, payload=96" \
! rtph264depay ! avdec_h264 ! videoconvert ! autovideosink
```

This listens on port 5000, decodes the H.264 stream, and displays it.

Recap of Ports and IPs

Role	Device	Configuration
Sender	Raspberry Pi	Streams to HOST_IP:5000
Receiver	Host PC	Listens on port 5000
Local IP	Printed in script	get_local_ip() result
Remote Host	HOST_IP variable	Replace in Python script

Debug Tips

Symptom	Fix
No video on host	Check HOST_IP, network reachability
High CPU usage on Pi	Lower resolution/FPS
GStreamer error on Pi	Ensure VideoWriter opened correctly
Firewall issues	Ensure UDP port 5000 is open