SDRconnect Networking







Agenda

. Starting the Server

- . Server Options
 - Choosing a port
 - Other options
- . Setting up a client
 - Local network
 - From the internet
 - Port Forwarding



Server setup

- Basic Command:
 - SDRconnect --server [--options]
 - Command should be issued from the directory containing the SDRconnect executable
 - Use additional command line options to specify initial configurations, e.g. antenna port, sample rate etc
- By default Port 50000 is used
 - Alternative port numbers can be used
 - Use different port numbers if requiring multiple servers at the same IP address



Starting the server examples:

• Mac:

cd /Applications/SDRconnect.app/Contents/MacOS/
./SDRconnect --server

• Windows:

cd "C:\Program Files\SDRplay\SDRconnect"
.\SDRconnect --server

• Linux / Pi:

cd /opt/sdrconnect
./SDRconnect --server



Server Settings

Usage: SDRconnect --server [--help] [--version] [--listdevices] [--hwser=<serialNumber>] [--port=<portNumber>] [--ip=<ipAddress>] [--samplerate=<sampleRate>] [--centerfrequency=<centerFrequency>] [--biast=<biasTenable>] [--antenna=<antennaNumber>] [--rfnotch=<rfNotchEnable>] [--dabnotch=<dabNotchEnable>] [--lnastate=<lnaState>] [--ifgr=<ifGr>] [--ifagc=<ifagcEnable>] [--setpoint=<setPoint>] [--agc-adtack=<agcAttack>] [--agc-decay=<agcDecay>] [--exclusive] [--max-clients=<maxClients>]

server	(Required) Starts the server engine
help	Print this help information
version	Print the application version number
listdevices	Print a list of connected devices
exclusive	Prevent ANY client from accessing the hardware controls
<serialnumber></serialnumber>	RSP serial number
<portnumber></portnumber>	Listen on TCP port number (default is 50000)
<ipaddress></ipaddress>	Listen on TCP IP Address (default is 0.0.0.0 which is any)
<maxclients></maxclients>	maximum number of allowed clients (default = 8)
<samplerate></samplerate>	Hardware sample rate in Hz (default is 2000000)
<centerfrequency></centerfrequency>	Hardware center frequency in Hz (default is 100000000)
<biastenable></biastenable>	disable = 0, enable = 1 (default is 0)
<antennanumber></antennanumber>	Ant A/Tuner 1 500hm = 0, Ant B/Tuner 2 = 1, Ant C/HiZ = 2
<rfnotchenable></rfnotchenable>	disable = 0, enable = 1 (default is 0)
<dabnotchenable></dabnotchenable>	disable = 0, enable = 1 (default is 0)
	Range is dependant on RSP and center frequency 0=max gain Range is 20 to 59 (default is 40) disable = 0, enable = 1 (default is 1) default = -30 dbFS, range is normally -20 to -72 default = 500 ms, range is 0 to 1000 default = 500 ms, range is 0 to 1000
<agcdecaydelay></agcdecaydelay>	default = 200 ms, range is 0 to 1000

default = 5 dB, range is 0 to 20

<DecayThreshold>

To list the options: SDRconnect --server --help

Server Setup

Server Tools

Device Settings

- > Can be overridden by first Client,
- Unless --exclusive option is specified

Server Running Example

. . . MacOS - SDRconnect -- SDRconnect -- server -- port=50000 -- 104×30 steve@StevesMini MacOS % /Applications/SDRconnect.app/Contents/MacOS/SDRconnect --server --port=50000 SDRconnect Network Server (c655ed1cf) Listening on IP address: 0.0.0.0 (Any) Listening on Port: 50000 Found 1 device Opened device S/N: 1700001190 Sample Rate: 2 MSPS Center Frequency: 100 MHz IF Gain Reduction: 40 dB LNA State: 0 IFAGC Mode: Enabled IFAGC SetPoint: -30 dBFS IFAGC Attack: 500 ms IFAGC Decay: 500 ms IFAGC Decay Delay: 200 ms IFAGC Decay Threshold: 5 dB Bias-T Disabled Antenna: 0 RF Notch Disabled DAB Notch Disabled Hardware Control: 1st Client can control the hardware Maximum number of clients: 8 Server started

Press CTRL-C to stop the server Client connected (10.0.0.180:59629) Total number of clients connected = 1



Client setup

- Start SDRconnect
- The device dropdown will show any locally connected RSPs
 - Dropdown the list to show any servers you have setup
- Add a new server from the "Remote Devices Editor" Menu (or "..."dropdown)

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••	About SDRc	onnect				
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FIIIIa	Preferences		_			
	Quit	жQ	୍ର C' +	*• 🖵		
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-40				RMS	SNR:	
-45	S 1 2 3 4 5	6 7 8 9 +10 +	20 +30 +40 +50 ·	+60 -84.4 dBm	dB	
-55						
-60						
-65						





Client setup

 The procedure is slightly different depending on whether you are accessing the server on your local LAN or whether you wish to connect to a remote server over the internet

LAN

Specify the local IP address and desired port number

Internet

- Specify your WAN address and port number
- Set up port forwarding to direct the connection to your local server



Server parameters – LOCAL LAN



- 1. Click "+" to add a new server
- 2. Type in a name for your server
- 3. Put in the IP address of the server on your LAN, e.g. 192.168.1.xxx
- 4. Specify the same Port number you used in the server (50000 by default)
- 5. Test Connection
- 6. Click "Save"
- 7. Close the window

Router LAN IP reservations (optional)

6:22	all 🗢 🚺	
< LA	N Settings	
StevesMini	Edit	
Reserved IP Addr	ress: 10.0.0.180	
	Show Port Forwards	
Steves-M1	Edit	
Reserved IP Addr	ress: 10.0.0.179	
	Show Port Forwards	
Raspberry Pi	Edit	
Reserved IP Addr	ress: 10.0.0.55	
	Show Port Forwards	
Ad	ld Port Forward	
	2 0 5	
Overview Services	WiFi Security Account	

- Different router brands may organize the settings differently
 - Please refer to your router documentation
- We want to create fixed IP assignments for server computers on our LAN
- In this example we have 3 computers:
 - The MacMini has a reserved IP address of 10.0.0.180
 - The M1 has a reserved IP of 10.0.0.179
 - The Raspberry Pi has a reserved IP of 10.0.0.55

Note: although it is not always necessary to set these assignments it is recommended to prevent the router assigning different addresses at some point in the future.



Server parameters – Internet (WAN)



- 1. Click "+" to add a new server
- 2. Type in a name for your server
- 3. Put in the WAN IP address of your LAN, or Hostname if you have one
- 4. Specify the same Port number you used in the server (50000 by default)
- 5. Test Connection
- 6. Click "Save"
- 7. Close the window

Note: unless you have it set otherwise (fixed IP) your ISP may change the IP of your network as seen from the internet from time to time. In this case you will have to edit the address shown here. Or, you can sign up for a Dynamic DNS service which will automatically direct traffic to your current IP address when using your hostname.

Router Internet Settings - example

6:21 . ? 4 LAN & WAN < WAN Your WAN IP address is what your Gateway uses to connect to the Internet and is automatically configured. 24 9 255 111 WAN IPv4 address 2001:558:6040: WAN IPv6 address 25:1cd:681f:dcf6 b4c0WAN mode Unknown WAN IP translation NONE LAN Edit LAN settings allow you to customize your local area network. Local IP (IPv4) 0 Overview Accoun

- Different router brands may organize the settings differently
 - Please refer to your router documentation for details
- On this system computers on the LAN have IP assignments of the form 10.0.0.xxx
- The WAN address is the IP address used for your network from the internet
- The WAN address is assigned by your ISP and can change periodically unless you have a fixed IP arrangement.

Port Forwarding

- We have set up our server with a specified port number
- If we want to connect via the internet we need a way for a computer outside to find it's way to our server computer on the local LAN
- This is done by setting up port forwarding on your router
 - Please refer to your router documentation for details
- When there is an incoming connection from the internet it is forwarded to a specific port number on a specific computer on your network
 - In our case the specific port number we want to forward is port 50000
 - The specific computer is the one on which we are running the server
- It is entirely possible to use multiple port numbers forwarded to multiple computer servers on your network



Router Port Forwarding Settings - example

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Overview Services WiFi Security Account	10.0.0.55	rved IP Address:	Reserv
	Security Account	w Services WiFi	Overview

- Different router brands may organize the settings differently, please refer to the router documentation for details
- We want to create Port Forwarding from the internet to the appropriate server on our LAN
- In this example the MacMini will receive incoming traffic on port 50000

(SDRconnect --server --port=50000)

 The M1 will receive incoming traffic on port 3000 (SDRconnect --server --port=3000)

A note on security - disclaimer

- Any time you connect a computer or network to the internet there is the potential for malicious attacks from the internet
- Typically your router will allow *outgoing* connections but block *incoming* connections
- When you set up port forwarding you are opening up incoming connections from the internet on specific port(s), which involves an element of risk
- For this reason we recommend you only set up port forwarding when you are expecting incoming connections
- If this risk concerns you in any way you should set up a VPN or take other steps to remain secure (consult an IT professional)
- SDRplay cannot accept any responsibility for the consequences



Dynamic DNS (optional)

- We can set up our servers to point to our WAN IP address, however this is not always constant
- A Dynamic DNS server can monitor your WAN IP and direct traffic from your own hostname to that current IP address
- Example:
 - I set up a Dynamic DNS for myhostname.dyndns.org
 - In the server settings I put in my hostname and leave the IP address blank
 - When I connect to my server the Dynamic DNS server translates my hostname to the current WAN address of my network
- There are a number of free and paid for Dynamic DNS services available



Notes on Routers

- Each manufacturer uses different methods for setup including:
 - A dedicated app for your phone and/or,
 - Web-based via your browser
- SDRplay cannot provide support for configuring your router. Please consult your router manual for details of how to configure port forwarding, IP reservations or setting up a dynamic DNS service



Selecting the Server

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Primar	y SP																					
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Note: If you experience stuttering of the stream on your LAN try using "Audio" instead of "IQ"

- Stop the stream (if running)
 - Click the refresh button

•

- Your server will now appear in the dropdown
- You will see 2 options, "IQ" and "Audio"
 - IQ is suggested for local gigabit LANs
 - Audio is recommended for internet connections

- Click the desired option
- Start the stream

Connection Modes

IQ

- Receives the raw IQ data stream from the RSP
- Equivalent to having a local USB connection to the RSP
- Displays both the AUX and Audio spectrum
- Requires high bandwidth gigabit LAN recommended

Audio

- Receives the demodulated audio data stream from the server
- Receives the spectrum and waterfall display information
- Aux spectrum is not displayed
- Best performance for internet connection







Summary

- First set up a server
- . Configure the client
 - Input IP address and Port number
 - Choose a suitable Mode (Audio or IQ)
 - Set up port forwarding for internet access
- Visit <u>https://www.sdrplay.com/sdrconnect/</u> for further information



Thank you for watching

For further information please visit our website: www.sdrplay.com

