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San Antonio Digital Radio

(<https://sadigitalradio.com/>)

Helping hams around San Antonio find digital radio resources

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How To Create An XLX/XRF D-Star Reflector

Name	Linking Protocols	Open Source/Closed Source	Notability	Notes
REF	DPLUS	Closed Source	D-Star's first reflector system that was not originally implemented into D-Star.	Created within the first few years of D-Star's release as the first "homebrewed" reflector system.
DCS	DCS	Closed Source	Built to compete/replace REF with its added functionalities.	Module A on all DCS reflectors are linked together. First to use ircDDB and built in 2012.

About This Site

This website is a resource for amateur or "Ham" radio operators along with radio enthusiasts to find resources regarding digital voice in the radio hobby around the San Antonio area.

Module A on all *sadigitalradio.com* DCS reflectors *is not affiliated with* are linked together. First *the San Antonio* to use ircDDB *Digital Radio Club.* and built in 2012.

Looking for the SADRC?

Name	Linking Protocols	Open Source/Closed Source	Notability	Notes
X-Reflectors (XRF)	D-Extra,DCS, and DPLUS	Open Source	First to give admins complete control over a reflector and allowing all linking protocols to link to it.	XRF and X X are interchangeable because most XRF reflectors are built using XLX software. Its complicated.
XLX	D-Extra,DCS, and DPLUS	Open Source	The First multi protocol reflector with transcoding ability. Out of the box DMR and D-Star are supported	XRF and X X are interchangeable because most XRF reflectors are built using XLX software. 73! Its complicated.

SADRC – San Antonio Digital Radio Club

The San Antonio Digital Radio Club is a Yaesu fusion based club with members at the ready to take their experiences and

Since the dawn of D-Star, there have been a few reflectors and networks built to support D-Star. XLX/XRF is the newest edition of reflectors that allows you to spin up your very own D-Star reflector. Reflectors like REF and DCS, already have servers in place that you request access to use as an admin. XLX/XRF is a piece of software that runs on a Linux

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server that can be linked to from other D-Star repeaters and hotspots. One of the special things about these reflectors is they do not require registration on the D-Star trust system to use them.

Users can simply link and start talking. XLX sets itself apart from the other reflectors in the D-Star world because its a ‘multi-mode reflector’ meaning, it has the ability of acting as a DMR reflector and other modes as well. By adding another piece of software, AMBED, and hardware vocoder chips, it can act as a transcoding server allowing other modes to talk together. More information on the transcoding part [HERE](#) .

(<https://sadigitalradio.com/digital-radio-how-to/build-digital-voice-transcoding-server/>)

Some features include:

- Real Time dashboard showing last heard and current ongoing QSOs through the reflector.
- Ability to link to other reflectors, and networks like Brandmeister.
- Cross digital modes using a hardware vocoder; D-Star can talk to DMR or D-Star to analog or Fusion, etc..
- Can be a DMR server too out of the box using the Pi-Star “DMR Gateway” feature.
- Supports 26 modules/rooms A-Z.
- Opensource!!

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Whats involved:

- Finding and registering an available XRF number if you would like your reflector to be in the pi-star host files automatically.
- Using the script below to install XLXD onto a fresh updated Debian 9.x computer
- Getting a static public IP address and setting up DNS if you are going to be a public reflector.
- Being or finding a Linux admin to maintain and upkeep the server.

How to install XLX/XRF on Debian Linux

Once you have a Debian 9.x Linux server at the ready and have both a FQDN and XRF # in mind, you are ready to install.

```
git clone https://github.com/n5amd/xlxd-debian-installer
cd xlxd-debian-installer
./xlxd-debian-installer
```

The script will ask you a few questions, then install xlx and configure apache for the web dashboard.

After the install

Your web dashboard should be accessible after the install. Since the reflector won't be available yet in pi-star, you can test connectivity by updating clients DExtra hosts file.

```
systemctl start xlxd #This will start xlxd.
```

```
system status xlxd #This will show the status
```

```
netstat -4plan | grep xlxd #This will show if the  
service is actively listening for traffic
```

```
# netstat -4plan | grep xlxd
```

```
udp 0 0 192.168.1.2:10001 0.0.0.0:* 32173/xlxd
```

```
udp 0 0 192.168.1.2:10002 0.0.0.0:* 32173/xlxd
```

```
udp 0 0 192.168.1.2:30001 0.0.0.0:* 32173/xlxd
```

```
udp 0 0 192.168.1.2:30051 0.0.0.0:* 32173/xlxd
```

```
udp 0 0 192.168.1.2:10100 0.0.0.0:* 32173/xlxd
```

```
udp 0 0 192.168.1.2:20001 0.0.0.0:* 32173/xlxd
```

```
udp 0 0 192.168.1.2:62030 0.0.0.0:* 32173/xlxd
```

```
udp 0 0 192.168.1.2:8880 0.0.0.0:* 32173/xlxd
```

Requesting your XRF be added to the core host files in Pi-Star:

Your dashboard MUST BE ACCESSIBLE and setup properly before they will accept and add your reflector.

1. Go to the last page of <http://xrefl.boards.net/thread/2/request-adding-changing-directory-xrefl>
(<http://xrefl.boards.net/thread/2/request-adding-changing-directory-xrefl>)
2. Make a post in the following format....
 - 1) Required: the URL to a working dashboard
 - 2) Required: the address to be added to the host file
 - 3) Required: the hosting or sponsoring station or organization
 - 4) Required: the country
 - 5) Optional: the organization website if it exists
 - 6) Optional: any title or other description for the reflector
 - 7) Optional: the city and/or region
3. Scroll through the posts on that thread, to get an example if you need to.
4. It could take a few days for the admin to approve it if everything is correct. If something is off, they will let you know. Please have patience while awaiting for approval.
5. Once approved, edit the config file to start callinghome.

Editing the main config file to activate the reflector

The config file is important and is where you will make the majority of your personal changes for the reflector. The file is:

/var/www/xlxd/pgs/config.inc.php. Most of the options in the file are self explanatory and have comments explaining the fields. You will want to update this file before going live.

Once you are approved, the field you need to update is:

```
$CallingHome['Active'] = false; // xlx phone home,  
true or false
```

When this gets switched to **'true'** your reflector will start to announce its live and show up on the reflector list.

****When this is flipped, a file called "*callinghome.php*" is created in /xlxd. Make sure to copy this file or change its location in the config.**

This hash verifies the reflector is yours. Back it up!!**

Adding transcoding capabilities to your XLX reflector

Quite possibly the best part about the XLX reflector is its capability to trans-code from one digital mode to another. Users can connect via DMR and talk to D-Star users, or connect via Yaesu Fusion and talk to D-Star users. Hardware AMBE vocoder USB chips are required for this to happen, but once you have an XLX server and vocoder chips, all you need to do is install AMBED where your vocoder chips are and edit the `/etc/init.d/xlxd` file to point to the IP of AMBED

- AMBED installer (<https://github.com/n5amd/ambed-debian-installer>)
- How to build a transcoding server (<https://sadigitalradio.com/digital-radio-how-tos/build-digital-voice-transcoding-server/>)

Updated: 12-19-2018

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