



Configuring Pi-Star based hotspots to allow simultaneous access to BrandMeister and TGIF DMR networks

References:

1) Jonathan Naylor, <https://github.com/g4klx/DMRGateway>

2) John Cole,
<https://brara.org/BLOG/2020/05/26/dmr-configure-a-pi-star-based-multi-network-dmr-hotspot/>

3) F5VMR, <https://f5vmr.wordpress.com/2020/05/04/today-on-dmr-expert-settings-for-dmr-gateway/>

version	date	author	comment
0.1	Nov 21, 2020	KO4GOB	initial

- In a world of DMR, there are multiple networks, each network hosts its own set of talk groups.
- When accessing these network via Pi-Star based hotspot, the hotspot has to be 'told' what DMR network to use. This is not very convenient, if a typical radio operator regularly participates in talk groups on both networks. Remembering to go to hotspot configuration every time network needs to be switched, is inconvenient and easy to forget.
- DMRGateway is a feature of Pi-Star based hotspots, that allows the radio to 'Hint' to the the hostpot what DMR network is intended when you emit Tx traffic from your radio.
- To do that your Radio would emit Hint+TalkGroupID (rather than just talk group id) with your TX traffic. Same feature also instructs your hotspot to 're-write traffic' it receives from a particular network, into HINT+talkgroup ID, such that your radio will know what channel to assign the Rx traffic to
- This presentation is intended to help Pi-Star based hotspot owners to configure their hotspots such that BrandMeister and TGIF networks can be used simultaneously, without configuration switching.
- The particular hotspot that was used to take configuration pictures from is a Duplex hotspot. However, same configuration will work with Simplex Pi-star based hotspots.
- **The DMRgateway will work with more than 2 networks at the same time:**

"... This is the DMR Gateway which allows for the connection of up to six different DMR networks to one MMDVM system. One of the networks is defined as being an XLX reflector, while the other five may be any combination of DMR+, BrandMeister, TGIF, or local HBLink systems.

This software works by use of powerful rewriting rules which allow for changes in the slot, talk group, the type, and even the destination, of the messages. Without a rewrite rule, even if it does no actual rewriting, traffic will not be passed through from that defined network to the MMDVM and back again..."

Jonathan Naylor, <https://github.com/g4klx/DMRGateway>

- **This presentation consists of series of pictures with labels to draw attention to a particular section of the configuration**
- **Do not forget to take backup of your existing configuration before making any changes**
- **A working configuration would show TGIF and BrandMeister networks, as depicted by AA1 and AA2, slide 7.**

- Login into pi-star and go to Configuration menu (slide 8). In DMRMaster section select DMRGateway, as shown by BA1. BrandMeister network ESSID should your radio Id, or your radio ID + 01 (this is essentially a hotspot Id). If you have more than one hotspot you would usually set their ESSID as YourRadioID+01 on the first hotspot and YourRadioID+02 on the second hotspot and so on. If your radio has already been working on BrandMeister, no reason to change your ESSID – so this can be left alone.
- Go to Expert | DMR GW configuration. In this section we will instruct DMRGateway to work with BrandMeister network (will use DMR Network 1 section) and TGIF network (will use DMR Network 4 section)

- In the Expert DMR GW configuration for DMR Network 1.

You can leave all the defaults as they are set. Just confirm that your hotspot ESSID (labeled as CA2, slide 9) is set to RadioID, or as in my case as RadioID+01. If your Brandmeister self care is configured with an API password (you have to set it in BM Selfcare and it will be same password, for all the hotspot), set it shown by CA1, slide 9 label. Because we did not modify any routing rules, it means that BM talk groups in your radio will not require any modifications. They will work with DMR gateway using their talk group numbers as is.

- In the Expert DMR GW configuration for DMR Network 4. We will now configure TGIF. For this network, will tell the DMRGateway software to 're-route' packets of DMR data.

When you do Tx from your radio, DMGW will look at the talk group your radio is emitting, if it starts with '4', it will strip that digit out, and pass the rest to TGIF network.

When DMRGW receives (Rx) data from TGIF, it will add 4 to talk group numbers (and any padding zeros that are necessary to make the whole talk group number to be 7 digits) and make it available for your radio to pickup.

This configuration in full is depicted on slide 10. You can copy it verbatim, only change to reflect your Radio ID (DA1), the password (*passwd*) must stay the same as shown, this seems to be a default password that works.

[DMR Network 4]

Enabled=1

Name=TGIF_Network

PCRewrite1=1,4009990,1,9990,1

PCRewrite2=2,4009990,2,9990,1

TypeRewrite1=1,4009990,1,9990

TypeRewrite2=2,4009990,2,9990

TGRewrite1=1,4000001,1,1,999999

TGRewrite2=2,4000001,2,1,999999

SrcRewrite1=1,9990,1,4009990,1

SrcRewrite2=2,9990,2,4009990,1

SrcRewrite3=1,1,1,4000001,999999

SrcRewrite4=2,1,2,4000001,999999

Address=tgif.network

Port=62031

Location=0

Password=passwd0rd

Debug=0

Id=YOURRADIOID

- **Once you hot spot is configured, save configuration and reboot the hotspot**
- **Then go to you radio and add/replace your TGIF talk groups with 4[0]<TGIF group IDs> as shown on Slide 11.**
- **The first digit (4) will tell the DMRGW that this a TGIF talk group.**
- **To test working configuration, I recommend using Parrot talk group on BM and TGIF, they both should work (only, remember, that TGIF Parrot group is now 4009990). Also, as a side note, parrot talk groups must be set to 'Private call' in your radio configuration (as shown on the right picture on slide 11).**

Pi-Star Digital Voice Dashboard for [Redacted]

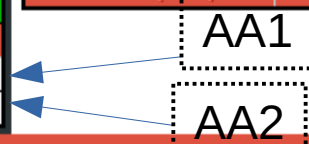
Dashboard | Admin | Configuration

Gateway Activity

Time (UTC)	Mode	Callsign	Target	Src	Dur (s)	Loss	BER
21:36:24 Nov 21st	DMR Slot 1	KE6HNF	TG 93	Net	TX 35+ sec		
21:36:21 Nov 21st	DMR Slot 1	NJ6F	TG 93	Net	2.6	0%	0.0%
21:36:16 Nov 21st	DMR Slot 1	KY4DD	TG 93	Net	29.3	0%	0.0%
21:31:23 Nov 21st	DMR Slot 1	KI5LNU	TG 93	Net	3.0	0%	0.0%
21:28:16 Nov 21st	DMR Slot 1	N1XDN	TG 93	Net	0.5	0%	2.4%
21:28:12 Nov 21st	DMR Slot 1	WB2SNN	TG 93	Net	0.8	0%	0.2%
21:23:32 Nov 21st	DMR Slot 1	WJ7RMC	TG 93	Net	1.2	60%	0.0%
21:16:46 Nov 21st	DMR Slot 1	KCORDJ	TG 93	Net	0.5	0%	0.0%
21:15:58 Nov 21st	DMR Slot 1	3172485	TG 93	Net	4.1	0%	0.0%
21:13:29 Nov 21st	DMR Slot 1	KD9QQV	TG 93	Net	0.5	0%	0.0%
21:09:16 Nov 21st	DMR Slot 1	WD5DAW	TG 93	Net	0.8	0%	0.0%
21:04:56 Nov 21st	DMR Slot 1	3172819	TG 93	Net	0.8	0%	0.0%
21:01:10 Nov 21st	DMR Slot 1	KM5TD	TG 93	Net	3.4	42%	0.0%
21:00:05 Nov 21st	DMR Slot 1	WB0NPN	TG 93	Net	1.2	0%	0.0%
20:56:07 Nov 21st	DMR Slot 1	3172200	TG 93	Net	4.4	0%	0.0%
20:53:20 Nov 21st	DMR Slot 1	F8FFO	TG 93	Net	1.6	0%	0.0%
20:40:03 Nov 21st	DMR Slot 1	KI5KYR	TG 93	Net	0.5	0%	0.0%
20:39:49 Nov 21st	DMR Slot 1	KC0QVT	TG 93	Net	6.6	0%	0.0%
20:35:37 Nov 21st	DMR Slot 1	WN3V	TG 93	Net	0.5	0%	0.0%
20:31:05 Nov 21st	DMR Slot 1	3172607	TG 93	Net	74.6	0%	0.0%

Local RF Activity

Time (UTC)	Mode	Callsign	Target	Src	Dur (s)	BER	RSSI
		AA1					
		AA2					



Modes Enabled

D-Star	DMR
YSF	P25
YSF XMode	NXDN
DMR XMode	POCSAG

Network Status

D-Star Net	DMR Net
YSF Net	P25 Net
YSF2DMR	NXDN Net
YSF2NXDN	YSF2P25
DMR2NXDN	DMR2YSF

Radio Info

Trx	TX DMR Slot 1
Tx	442.200000 MHz
Rx	447.200000 MHz
FW	HS_Hat:v1.4.17
TCXO	14.7456 MHz

DMR Repeater

DMR ID	your radio id
DMR CC	1
TS1	enabled
TS2	enabled
DMR Master	
BM United States ..	
TGIF Network	

General Configuration

Setting	Value
Hostname:	pi-star Do not add suffixes such as .local
Node Callsign:	
CCS7/DMR ID:	
Radio Frequency RX:	447,200,000 MHz
Radio Frequency TX:	442,200,000 MHz
Latitude:	degrees (positive value for North, negative for South)
Longitude:	degrees (positive value for East, negative for West)
Town:	
Country:	USA
URL:	http://www.qrz.com/db/ Auto Manual
Radio/Modem Type:	MMDVM_HS_Dual_Hat (DB9MAT, DF2ET & DO7EN) for Pi (GPIO)
Node Type:	Private Public
APRS Host:	euro.aprs2.net
System Time Zone:	UTC
Dashboard Language:	english_uk

Apply Changes

DMR Configuration

Setting	Value
DMR Master:	DMRGateway
BrandMeister Master:	BM_United_States_3102
EM Hotspot Security:	
BrandMeister Network ESSID:	01
BrandMeister Network Enable:	<input checked="" type="checkbox"/>
BrandMeister Network:	Repeater Information Edit Repeater (BrandMeister Selfcare)
DMR+ Master:	DMR+_IPSC2-Australia
DMR+ Network:	Options=
DMR+ Network ESSID:	None
DMR+ Network Enable:	<input type="checkbox"/>
XLX Master:	XLX_950
XLX Startup Module:	Default
XLX Master Enable:	<input type="checkbox"/>
DMR Colour Code:	1
DMR EmbeddedLOOnly:	<input type="checkbox"/>
DMR DumpTAData:	<input type="checkbox"/>

Apply Changes

Mobile GPS Configuration

Setting	Value
MobileGPS Enable:	<input type="checkbox"/>
GPS Port:	/dev/ttyACM0
GPS Port Speed:	38400

Apply Changes

Firewall Configuration

Setting	Value
Dashboard Access:	Private Public
ircDDBGateway Remote:	Private Public

BA1

BA2

Pi-Star - Digital Voice Dashboard - [X] +

10.0.1.4/admin/expert/edit_dmrgateway.php

Port	62030
Password	passw0rd
ReloadTime	60
Slot	2
TG	6
Base	64000
Relink	60
Debug	0
Id	7
UserControl	1

Apply Changes

DMR Network 1	
Enabled	1
Address	74.91.114.19
Port	62031
TGRewrite0	2,9,2,9,1
PCRewrite0	2,94000,2,4000,1001
TypeRewrite0	2,9990,2,9990
SrcRewrite0	2,4000,2,9,1001
PassAllPC1	1
PassAllPC2	2
PassAllTG1	1
PassAllTG2	2
Password	5
Debug	0
Id	01
Name	BM_United_States_3102

Apply Changes

DMR Network 2	
Enabled	0
Address	103.93.139.189
Port	55555
TGRewrite0	2,8,2,9,1
PCRewrite0	2,84000,2,4000,1001
Password	PASSWORD
Debug	0
Id	
Name	DMR+_IPSC2-Australia

Apply Changes

DMR Gateway
Advanced Config.
BrandMeister

CA1

BM self care password (set in BM Self care. I think this is optional)

CA2

BM hotspot ID
YourRadioid+01 (if you have it setup that way, or just your radio ID)



10.0.1.4/admin/expert/edit_dmrgateway.php



Address	103.93.139.189
Port	55555
TGRewrite0	2,8,2,9,1
PCRewrite0	2,84000,2,4000,1001
Password	PASSWORD
Debug	0
Id	
Name	DMR+_IPSC2-Australia

Apply Changes

DMR Network 3

Enabled	0
Name	HBLink
Address	1.2.3.4
Port	5555
TGRewrite	2,11,2,11,1
Password	PASSWORD
Location	0
Debug	0
TGRewrite0	2,11,2,11,1

Apply Changes

DMR Network 4

Enabled	1
Name	TGIF_Network
PCRewrite1	1,4009990,1,9990,1
PCRewrite2	2,4009990,2,9990,1
TypeRewrite1	1,4009990,1,9990
TypeRewrite2	2,4009990,2,9990
TGRewrite1	1,4000001,1,1,999999
TGRewrite2	2,4000001,2,1,999999
SrcRewrite1	1,9990,1,4009990,1
SrcRewrite2	2,9990,2,4009990,1
SrcRewrite3	1,1,1,4000001,999999
SrcRewrite4	2,1,2,4000001,999999
Address	tgif.network
Port	62031
Location	0
Password	passw0rd
Debug	0
Id	

DMR Gateway
Advanced Config.
TGIF

DA2

These are re-writing rules
'4' is important

DA1

Your radio ID

- When configuring talk groups on radio, do not forget to Prefix TGIF talk groups with, what I call '**section number**' (which is **4** in our case), and then with the padding 0s – to bring the total length of digits representing a given talk group to 6. Therefore, total number of digits for TGIF talk group should always be 1+6=7
- The section number is that digit that is used in TGIF rewriting rules (see fig. **DA2**)

Talk Group Edit---69

Name: 4-TGIF-1870

Call Type: Group Call

TG/DMR ID: 4001870

Call Alert: None

Buttons: OK, Cancel, Previous, Next

City:

Repeater Number:

State/Prov:

Country:

Remarks: Legion

Section Padding 0s TalkGroupNumber

Talk Group Edit---66

Name: 4-TGIF-9990

Call Type: Private Call

TG/DMR ID: 4009990

Call Alert: None

Buttons: OK, Cancel, Previous, Next

City: parrot

Repeater Number:

State/Prov:

Country:

Remarks: private parrot

Section Padding 0s TalkGroupNumber