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Pi-star mmdvm hotspot

More: PDFs · Upgrade to Pi Star V4.1 most up-to-most up-to-day version: amateurradionotes.com/pi-star.htm Translation: 简体中文 unofficial notes on launch and using Pi Star this is my personal notes based on setup and using Pi Star points as a non-technical user understanding the things I'm sharing, as well as learning from what others are sharing. I share them only if they might help Daley focus on personal, low-power hotspots (not repeaters). im not affiliated with the pestar project . If anything needs to be corrected, please let me know. On March 26, 2020, the PStar V4.1.0 was released as a regular version. This can be found from the PayStar website (currently on V4.1.2): Pi-Star_RPi_V4.1.2_20-May-2020.zip. If you are upgrading from a 4.1.0 release candidate, you can only use the upgrade link in the EXPERT editor or you can run the pistar upgrade soda in the SSH session (remember to always run the Pi Star Update before running the upgrade). If you are upgrading from 4.0.0 or 3.4.17 or earlier, see these instructions step by step: Upgrade to Pi Star 4.1. Couple notes: Pi Star 4.1.x works for hotspots based on all raspberry pi boards. If you are running a hotspot based on raspberry pi 3B+, 3A+, or 4B board, you should use Pi Star 4.1.x. Pi Star V3.4.17 is still available. If you're running focus based on Raspberry Pi 3B, Zero W, or earlier, you can still use 3.4.17 releases; however, it's getting any new features and some raspberry Jesse libraries have been deprecated, so you should probably have upgraded to 4.1.x soon. November 19, 2020: Important note about BrandMeister Security per Corey, N3FE: Due to issues that have been happening recently, we are going to start requiring users to set a hotspot security password to gain access to the US Masters. If you already have a security password hotspot set in the bm portal, you can ignore this. We are going to start requiring this on Professor 3101 November 30, 2020; 3102 will be followed on December 4, 2020; and 3103 on Dec 11, 2020. It is currently implemented at RU Masters, and will follow other master servers. At this time it will only be for hotspots. Api is working on allowing repeater owners to make this change as well, but it's not quite ready to go. Here's a link to one on how to set up your hotspot security on the BrandMeister portal. Please configure the personal security password for your hotspots! PayStar is a digital sound software for personal, low-power, as well as repeaters hotspots. It can handle DMR, D-STAR, and YSF, as well as P25, NXDN, POCSAG, and multiple cross modes when used with a multi-mode digital sound modem that supports those modes. Andy Taylor, MW0MWZ, original developer, put this on the web Pee Starr can be anything you want to be, from a simple one, says PiStar himself Focus mode running simplex will provide you with access to a growing number of digital sound networks, up to repeat a few generic duplex models! PayStar is relatively easy to set up for personal hotspot, so it's not put up by the length of this article. This is long because it covers a lot of a rich set of features and configuration options, beyond what is needed to set it up first. 1a) To get up and ★ go through the setup steps in sections 1 - 5, marked with a solid red star. ¤ also go through the steps marked with a marked red star for the modes you want to use. Choose from DMR, D-STAR, YSF, P25, NXDN, and POCSAG. 1b) Some good resources to learn about the official Pi Star website, wiki, user forum, support group, tutorial videos, and multi-reflective (BM, DMR+, YSF, NXDN, P25:31672; D-STAR: XLX303 E(1c) Having trouble? For some tips on how to continue, see: Pi Star Troubleshooting. 1d) Using D-STAR? Be sure to set up your radio properly! For most simplex hotspots, you should use D-STAR (DR) repeater or duplex mode: RPT1 setup, RPT2, and zero offset (or +/–0.000). See: Use DR mode and D-STAR Radio Prinder to use It to connect to Pi Star Video by Craig, W1MSG. If your hotspot came with a microSD card loaded with pi-star image, go from the front to step 3a. Otherwise, download image from PiStar download to Windows, Mac, or Linux-based pc (not hotspot). If your hotspot uses a raspberry pi, download the RPi image. Pi Star 4.1.x works for hotspots based on all raspberry boards, and should be used for hotspots based on Raspberry Pi 3B+, 3A+, or 4B boards. ★ 3) FlashP star extracts the pi star image zip file downloaded, and then flashes your image file (ends on .img) to card 4GB or higher microSD. A good program for this Etcher is by balena, available for Windows, Mac, and Linux. You can reject any system message you receive that says you need to format the microSD card when you first insert it or after you finish flashing the image. Atcher formats the card, writes the image and confirms that it is written correctly. ★ 3a) Preparing to connect to WiFi using an automated AP built-in (auto-access point) method if you're using Pi Star 3.4.11 or later activated with recent Raspberry Pi and AP Auto (which is the default), you don't have to do anything else to prepare for wifi connection. You can jump to section: 3b) Prepare for the first boot up. *Zero W, 3B, 3B+, 3A+, or 4B. AP Auto also works with some WiFi dongles: the list of dongles that work. Manually preparing to connect to WiFi if you can't use ap auto or you just want to do things manually, after you finish flashing the image to a microSD card, you can manually add your initial WiFi settings to the boot partition so they auto-install on the first boot Create a wpa_supplicant.conf file with your WiFi settings: Copy the wpa_supplicant.conf wpa_supplicant.conf MicroSD card boot partition. Note: The next time you boot the PiStar, the file will be automatically moved to /etc/wpa_supplicant/, so you won't find it in the boot partition anymore. ★ 3b) prepare for the first boot grab a cup of coffee or tea and put the microSD card into your hotspot. AP Auto Star Overview The Boot up Steps for a New Wireless Network: PDF: 2-Pi-Star_Auto_AP.pdf - Related Video: AP's Auto WiFi Star by Craig, W1MSG ★ 4a) for all power boot-ups in their hotspot. Wait for Pi Star to boot up, which typically takes a minute or so (a little longer when using slower raspberry pi like RPi Zero W). Note: If your hotspot has a screen, you can watch The PiStar until the sign-in notification is displayed, but log in because you can't set up a PiStar through the hotspot. ★ 4b) If using ap auto and setting up a new WiFi connection do this step when you start Pi Star first or when you need to connect to a new WiFi network, for example, when traveling. When Pi-Star doesn't find a well-known network within about three minutes of turning on power, AUTO AP will automatically activate its access point, and then they are returned to the configuration view. ★ 5b) MMDVMHost Configuration The section is displayed only if you chose MMDVMHost as Controller Software. ★ mode – During the initial setup, enable all modes you want to use so you will have access to all your configuration options. After that, only enable the modes you want to use at any time. The mode configuration options are discussed below in the Digital Mode Configuration section. Note: While multi-mode execution is possible, many people only run one mode at a time, or have multiple hotspots, each running a separate mode. Andy Taylor has written about the use of multiple modes in response to a related discussion in the PiStar User Support Group: My best advice for operating multiple modes is to turn on the modes you want—and leave them unsealed at startup, and only when you want to link (do so from the radio in your hand) and un-link when you're done—that means hotspot. It's always ready to go when you want. Hangtime – relates to the use of multiple modes. Time to stay in post-RF mode (radio frequency, measured from the beginning of a transmission) or network frequency. For starters, defaults are good. Note 1: The hanging time of RF (radio frequency) is measured from the beginning of a transmission. Per Andy Taylor: Hangtimes adjusts the amount of time that mode is 'sticky' – so if you have an incoming call over the DMR of the network, how long you'd like to stay stuck in DMR mode. Also view the Video Pi Star hung time updates by Craig, W1MSG. Note 2: Every Andy Taylor's responses in the wake of Celebrity Support Users Group, DVMEGA is snappy when running a single mode, but can be a little lazy if you're running multiple modes because it requires about 1.5 seconds of RF to determine what input mode is in order to lock on it. In that case, extending the hanging time to something like 90 can be helpful. POCSAG – Enables POCSAG pedding. See below: Configure POCSAG. MMDVM Display Type – If you are using a screen, select: Screen Type: OLED Type 3 (0.96), OLED Type 6 (1.3), Nextion, HD44780, TFT Serial, or LCDproc. Note 1: It also affects how long the data stays on your screen. Note 2: To learn more about Nextion screens, visit nextion screen group or Nextion Ham Radio Screen Group Facebook, both moderated by Dutch ham and digital voice enthusiast Rob, PD0DIB. Note 3: For information about the next Model 8 (touch screen support), see Rob GitHub Repository, Nextion_HAM screen radio/model 8/, and nextion driver by ON7LDS note question 4: There are some basic and optional OLED settings available through the expert editor on the MMDVMHost page in the OLED section: ADJUST OLED Type: 3 = 0.96 or 6 = 1.3. After the changes are made, restart the PiStar. Shift Rotation: Rotate = 0 or 1. Thanks to the work done by mreckhof, K5MRE, the merger to MMDVMHost is implemented by Jonathan, G4KLX, and to Pee Starr by Andy Taylor. Inverted background: 0 = white text on black background or 1 = black text on white. Scroll (mode label when active): 1 = Yes or 0 = No. Change brightness: 10 = on or 0 = less clear (effect varies based on modem board). LogoScreenSaver: 0 = off (blank screen) or 1 = on (logo displayed). Thanks to Scott, VK7HSE, for this one: If your OLED screen has garbled text, check your display level in expert editor > MMDVMHost > login section. Must be set to 0. The port you are using: modem, /dev/ttyAMA0, or/dev/ttyUSB0. Note: At my MMDVM-based hotspots, I choose: the modem for the next Model 7 screen attached to the serial through the hole. /dev/ttyUSB0 for Nextion connected display to USB ports in the wake of raspberries. Next design: G4KLX or ON7LDS L2, L3, or L3 HS. Note 1: For my custom ON7LDS display, I select ON7LDS L2. Note 2: For a good summary explanation of the differences between the layout types, see the Pi Star User Screen User Forum layout by Ryan, WA6HXG as well as your GitHub project page, which includes a variety of good layouts: WA6HXG/MMDVM-Nextion-Screen-Layouts. Ryan also posted some perfectly good installation instructions. Note 3: To select nextion layout screen as well as a more detailed readable description of the difference between layouts, see Nextion Subfolders from the g4klx/MMDVMHost GitHub page. Note 4: Rob, PD0DIB, has a good selection of Nextion screens on GitHub, as well as very good instructions, including for the newer version 8 driver, which adds touchscreen capability: PD0DIB/Nextion_HAM Radio Screen. ★ 5c) public configuration hostname – you can make your hotspot a unique hostname. For example, if you run two focuses simultaneously, you'll need different hostnames for each, such as PayStar and P-Star-2. If you rename the host, you should power off and restart the hotspot before it takes effect. Note: You need to use a new hostname to open a PiStar in a browser, for example: Or . However, this does not change the user name of authentication, which remains PiStar. Stay. If you run more than one focus at a time, in addition to using different hostnames, you should use different frequencies. If you don't, you can create serious interference (looping) on the reflector, the chat group, or the room you've connected to, which prevents others from using those resources. You can be banned, sometimes permanently, from a source to create this kind of issue. ★ node - Enter your call for a hotspot. ¤ CCS7/DMR ID – If you have enabled DMR mode, enter your CCS7 ID. ¤ NXDN ID – If you have NXDN active mode, enter your ID. For more information, see: NXDNInfo.com. ★ radio frequency - for a simple point, this frequency is used to connect your radio and focus. For a duplex focus, you'll see inputs for both RX and TX frequencies (these are focus frequencies, unlike those used by your radio). Important! Avoiding the frequencies used for other purposes, for example, 435.0 - 438.0 and 145.8 - 146.0, is used internationally for satellite communications, which can be disrupted even by low power hotspot transmission. PiStar Reminder: Starting with the v20181216 dashboard, when you change a frequency, it displays a red time frequency field that is in the satellite and green range when safely outside that range. PayStar itself does not run frequency ranges; however, hotspots running ZUMspot/MMDVM_HS v1.4.12 or later do not work on satellite frequencies. Runway Layout: See your country's band layout and your local frequency usage plan. See for America, for example: America's runway plan. For the U.S. state of Colorado, see: Colorado Frequency Use Programs (especially, CCARC guidelines on hot spots). To find links for other U.S. states, see Amateur Radio List: Frequency Coordinators by Tom, W2XQ. See also information sent by Ron, VE1AIC: Digital sound frequencies. ★ lot, lon, city, QTH square network locator, and country – is where the hotspot is located. To find your locator network square, use a service APRS.fi. Location information is used for your BrandMeister hotspot list. In addition, per Andy Taylor in the wake of the Celebrity Users Support Group: If you're running D-Star Mode, and you add your position information to the dashboard, you'll get the P-DRS position of ircDDBGateway. Also note: Prevent APRS data from being sent via BrandMeister. ★ address - add a link to your contact mark. If you want to use this for QRZ and your QRZ page uses the same hotspot call, auto-select; If they are different, select the manual and add your call to this URL: . Optionally, select the workbook and add any link you want, for example, a link to the website AAD. ★ Radio/Modem Type - Pi Star RPi Image supports a launch of radio/modems running on Raspberry Pi. For a full list, see Note: Supported Radio/Modem Types. ★ ★ Type – determines whether radios are imported with callsigns (D-STAR, YSF), CCS7 IDs (DMR, P25), or NXDN IDs other than mesut in the wake of the public star callign node configuration, CCS7/DMR ID, and NXDN ID can access the hotspot. When choosing this, keep in mind the rules regarding the performance of the control operator in your country. For a personal hotspot in the U.S., you can set this to the public, but unless you're actually going to allow radios with other calls, IDs CCS7, or NXDN IDs to access the hotspot, you might want to leave it to Private. See also Hotspot Best Practices. ¤ APRS Hosting – Choose your preferred APRS host, typically one rotating host or a nearby host server. Note: Per Tom, W1TG, in the wake of Celebrity User Forums: There are more than 80 different T2 APRS hosts worldwide. A really good best workout is to choose one to automatically rotate the T2 APRS host. Rotating hosts always get you to work Tier2 APRS server and if that link fails for some reason it will move on another working server. If you choose an APRS host with no automatic rotation function and the server goes down or offline, it can cause issues with your hotspot, such as disconnecting on its own. T2 APRS hosts servers that provide auto-rotation function: rotate.aprs2.net (World Wide) noam.aprs2.net (North America) soam.aprs2.net (South America) euro.aprs2.net (Europe) aunz.aprs2.net (Australia/New Zealand) asia.aprs2.net (Asia) ★ Time Zone System – Select Hotspot Time Zone. ★ dashboard language – select the language for the dashboard. If you make changes, click Apply changes. After making changes to the general configuration section, you get a warning: The modem selection section has been updated, please re-select your radio/modem type and re-apply the changes. ★ 5.2) Configure digital mode settings ¤ configure the mode(s) you are using. Note 1: If you are configuring Pi Star for the first time, start with just one mode in order to get acquainted with Pi Star. ¤ 5d) DMR configures how you configure DMR depends on the DMR master you choose. All master selections include four basic DMR—ESSID options, color code, EmbeddedLCOnly, and Dump TAData—displayed below the selected DMR master, which are described in more detail below. If you choose a BrandMeister master, you'll also see the BM Hotspot Security Password option, as well as links to BrandMeister Repeat Info and SelfCare: Important! Per Corey, N3FE: Due to issues that have been happening recently, we are going to start requiring users to set a hotspot security password to gain access to the US Masters. If you already have a security password hotspot set in the bm portal, you can ignore this. We are going to start requiring this on Professor 3101 November 30, 2020; followed on December 4, 2020; and 3103 on Dec 11, 2020. It is currently implemented at RU Masters, and will follow other master servers. At this time it will only be for hotspots. Api is working on allowing repeater owners to make this change as well, but it's not quite ready to go. Here's a link to one on how to set up your hotspot security on the BrandMeister portal: Please configure the personal security password for your hotspots! Note: Sprouts, W0RMT, has a good article on how to find out more and support brandMeister USA: BrandMeister support. If you choose DMR + Master, you will see a field for DMR + numbers. If you choose DMRGateway Master, you will see options for three networks—BrandMeister, DMR+, and XLX—in addition to the basic options: ¤ DMR Master (main server connects you to the rest of the system): If you want to use only one specific system – Select BrandMeister (BMM) , DMR+, or HB master. or select FDARN_Network (Florida Digital Amateur Radio Network), Ozark_Digital (Ozarek Digital Sound Network), or TGIF Network. With each of these choices, things are easier because you will only see options specifically for the selected system. If you're using BrandMeister SelfCare (and you should!): Set up a self-care account for any CCS7 ID you use with BrandMeister. For U.S. servers and in some other countries (the list is growing), a BrandMeister Hotspot security password is required by December 2020. See the bullet point below about BM Hotspot Security for details. It is important to note that your SelfCare settings are stored on any major server. If you switch to a new main server, you'll need to re-enter the settings you want to use. You can turn on the BrandMeister PStar Manager module, which gives you access to BrandMeister's key settings in the PayStar Manager view. For more information, see Pi-Star's BrandMeister Manager module. See AC2F: also using Vladimir's BrandMeister API. You can turn off send APRS data via BrandMeister. For more information, note: Prevent APRS data from being sent via BrandMeister. If you want multiple system access simultaneously – choose DMRGateway 1 as your DMR master, then you'll see options for BrandMeister, DMR+, and XLX. Note 1: If you use DMRGateway, you can fine-tune settings for individual systems, which are discussed below: Expert Editor)) DMRGateway. Note 2: When DMR 2YSF and DMR2NXDN are discussed below in the DMR cross mode configuration section. Note 3: From Pi Star User Forum by Andy Taylor: Keep in mind and then when using DMRGateway, if a network is enabled... Then DMRGateway is listening there until traffic stops, it's after There remains listening until the net pendant time for DMR expires. So, if you try to use [a different network] at the time, it won't really work. That's why it's less when it's To rotate chat groups and use DMRGateway. Note 4: If you're comfortable tweaking expert pi-star settings, you can customize how DMRGateway is configured. See Github: g4klx/DMRGateway/Rewrite Rules. For example configuring, see Pi Star User Thread DMRGateway forum for a dumb smart person, especially by VE3RD dated December 16, 2019. For TGIF rewriting the rules, look at Andy Taylor in the PayStar user forum: a new recap for DMRGateway ¤ DMR ESSID – if you are using the Extended SSID (ESSID), select extensions. Note: Normally, you need to make sure that you have entered DMR in just one place, otherwise you will be using CCS7/DMR IDs for each login sample (e.g., if you are running DMR in one hotspot and YSF2DMR in another). However, on brandMeister, DMR Plus, and TGIF networks, you have the option of double-digit renewal (00-99) to your regular CCS7/DMR ID so that the network can distinguish between your login. Some DMR Plus servers use single-digit extensions. Personal and low-power hotspots can also use ESSIDs (but repeaters don't). ¤ set up DMR system options(s) enabling you: Master BrandMeister – Select a master server nearby. BM Hotspot Security – [required since December 2020 for US servers] When you have enabled hotspot security password on BrandMeister SelfCare (instructions), it's here to enable your hotspot to access the BrandMeister-enabled network. It provides an additional level of security, preventing others from accessing the BrandMeister network using their CCS7 ID. Note: You can only launch one BM Hotspot Security per CCS7 ID (first seven digits), so even if you set up a few ESSID for a CCS7 ID, you can only use one password for all of them. BrandMeister Network Enabled – Toggle BrandMeister Network on/off. BrandMeister Network – Click Edit Repeater to edit settings via My BrandMeister Hotspots for CCS7 ID1 DMR + Your Master – Select nearby Master Server. DMR + Network Options= – Launch any option you want to use. Note 1: If you don't want to automatically connect to any dialog group (when Pi Star is launched as a DMR master, you need to re-enter these options. DMR + Active Network – DMR Network + Off/ Off. XLX Master – select the main XLX server you want to use. XLX Startup Module - XLX Reflector is launched with the default module (A, B, C, etc.). You can optionally select another module. XLX Master Enable – Change XLX on/off. DMR Color Code – Personal hotspots typically use color code 1. DMR EmbeddedLCOnly (embedded link control only) – Default is turned off. Turn on that data disables TheLer alias that Posted by MMDVMHost. If you are experiencing audio drop from some stations, you may want to try turning on this option. Note 1: Apparently different stations and radios encode and decode Talker Alias data in different ways. One way this variance shows is that some models of radios can experience audio drop when receiving Talker Alias data from some stations. Note 2: Data control link = ID header, talkgroup, and private calls. DMR

DumpTAData – default on. Controls whether talker aliases data is logged in the /var/log/pi-star/MMDVM-YYYY-MM-DD file. If you're not using a Talker alias, you can turn off this option. If you make changes, click Apply changes. [1] For more information about the way DMRGateway works with networks, see: DMRGateway Notes · BrandMeister dynamic, static, and auto-static talkgroups · See constellation reflectors as well: BrandMeister talkgroup list · DMR + Reflector list ¤ DMR cross-star configuration mode supports the capability to run DMR2YSF and DMR2NXDN Cross Mode. For more information, look at The PiStar Cross Modes. 5e) D-STAR RPT1 Callsign configuration – Autofilled with callsign of general configuration. ¤ RPT1 Module – The focus module you want the radio to connect to, by default, set to Module B, which is typically used for UHF points. RPT2 Callsign – this is set up automatically with the module set to G for the gateway. That's why setting up your D-STAR radio properly is so important. Remote Password 2 – ircDDBGateway is the gateway app for D-STAR mode. Per Andy Taylor in the Pestar User Support Group: The ircDDBGateway password is on the dashboard for the remote access password (see section 5i below) that is used to access the Pi Star Manager and configuration settings, as well as to access SSH. ¤ default reflector – you can choose your default reflector, as well as whether you want Pi Star to connect to it automatically when it starts. Note: For each tom, W1TG, in the PayStar user forum, you can also specify a reflector reconnection time in the expert editor > ircDDBGateway tab > Reconnect set1, where you can specify a default time of inactivity after which the PiStar will automatically reconnect to the default reflector: 0 = never, 1 = fixed (I'm not sure how this works), 2 = 5 minutes, 3 = 10 min, 4 = 15 minutes, 5 = 20 minutes, 6 = 25 minutes, 7 = 30 minutes, 8 = 60 minutes, 9 = 90 minutes, 10 = 120 minutes, 11 = 180 minutes. If this value is set to a time, it will be re-connected even if it hasn't already been connected, for example, if the default reflector is set to Manual and you're not manually connected to it. ¤ ircDDBGateway Language – Choose the one you understand. Time notifications – If enabled and when D-STAR mode is enabled, you will have time notifications at regular intervals, by default every hour. Note: If activated, the status will be TimeServer at the WiresX Auto Passthrough theme in the PayStar user forum. If you make changes, click Apply changes. See also: YSF Reflector List · FCS Reflector List. Reflective lists include YSF DTMF codes. ¤ YSF cross-star configuration mode supports the functionality to run YSF2DMR, YSF2NXDN, and YSF2P25 Cross Mode. For more information, look at The PiStar Cross Modes. TimeServer Spacebar can be set in expert editor > TimeServer: 0 = every 15 minutes; 1 = every 30 minutes; 2 = every 1 hour. Callsign Routing – Enable if you want XRF– related to the use of X Reflector (XRF): If your router does not support automatic uPNP port transport and you don't want to manually set up ports for X reflector, you can enable this option so it is possible for Pi Star to connect to All X Reflector 3. Important! If you change this option, you'll need to update. See below: Update PayStar. If you make changes, click Apply changes. [2] David, PA7LIM, the ham behind the BlueDV apps, also created Android and iOS ircDDB Remote apps, which handle REF, XRF, and DCS reflector connections. For more information, look at the videos: [3] X reflecters that use the older PhD protocol or freestar protocol need to send ports to connect to them. This does not apply to X reflectors running the newer Dextra Enhanced protocol. If you want to manually launch port transfer, look at note: port transfer. ¤ 5f) Yaesu Fusion Configuration System ¤ YSF Host Setup – Select the YSF Startup Host you want to use. Note: FCS support, including the option to choose a FCS YSF startup host, requires the PStar Dashboard v20180503 or later. The large host file - some Yaesu radios - for example, the FT-70D - supports YSF room search and FCS only on UPPERCASE. Once this option is enabled, whenever the PiStar update is done, host files containing YSF and FCS rooms will be converted to UPPERCASE. WiresX Passthrough – If you are using any of the cross-YSF modes, this provides a method for passing WiresX commands from your radio through to cross mode, so you can drive everything from the radio. For more information, look at the WiresX Auto Passthrough theme in the PayStar user forum. If you make changes, click Apply changes. ¤ FCS Startup – Choose your favorite startup host. Note: If you want to add a custom P25 reflector to Pi Star, watch the P25 host video file update by Craig, W1MSG. ¤ when the P25 NAC – access code for your P25 network. If you make changes, click Apply changes. ¤ P25 reflector list ¤ 5h) Configure NXDN to make sure your ZUMspot/MMDVM_HS firmware is updated to v1.4.0 or higher. ¤ NXDN Hosting Setup – Choose your desired startup host. Note 1: NXDNGateway was activated in V3.4.12. Port For NXDN reflecters it is 41400. Note 2: If you want to add a custom NXDN reflector to Pi Star, note: Add a custom NXDN reflector to Pi Star. ¤ NXDN RAN – Enter Enter 2-digit (1 - 64) NXDN random access number. If you make changes, click Apply changes. ¤ NXDN Reflective List – NXDN CAI and program it to amateur radio. ¤ 5i) POCSAG Configuration POCSAG is an asynchronous protocol developed by the Bureau Code Standardization Advisory Group, which is used to transfer data to pagers. The DAPNET (Decentralized Amateur Pedding Network), operated by amateur radio enthusiasts, is based on POCSAG. ¤ Server – Select the POCSAG network you want to use. ¤ Callsign POCSAG Node – Enter pocsag callsign node. ¤ POCSAG Frequency Radio – Enter the radio frequency POCSAG you want to use. 439.9875 MHz is the most common frequency used. Per Andy Taylor in the Pi-Star User Forum: The main reason to get good buy in from repeater keepers, we could have a really good paging network with great coverage, especially if we all use the same standard frequency. Important! Avoiding the frequencies used for other purposes, for example, 435.0 - 438.0 and 145.8 - 146.0, is used internationally for satellite communications, which can be disrupted even by low power hotspot transmission. PiStar Reminder: Starting with the v20181217 dashboard, when you change the frequency, the frequency field displays red when it is in the satellite and green range when it is safely outside that range. PayStar itself does not run frequency ranges; however, hotspots running ZUMspot/MMDVM_HS v1.4.12 or later do not work on satellite frequencies. Band Layout: To help with frequency, see your country's band layout. See for America, for example: America's runway plan. For the U.S. state of Colorado: Colorado Frequency Use Programs (especially, CCARC guidelines on hot spots). To find links for other U.S. states, see Amateur Radio List: Frequency Coordinators by Tom, W2XQ. See also information sent by Ron, VE1AIC: Digital sound frequencies. Note: The default POCSAG frequency is outside of satellite frequencies, but if you switch it to a frequency in the blocked range, it can cause problems even if the POCSAG mode is not enabled. ¤ AuthKey DAPNET – Enter your license key for the decentralized amateur py py pythic network. Whitelist – Set your Radio Identity Codes (RICs; a.k.a., Capcodes) whitelist, comma-separated. If these are set up, only these RICs will be transferred. Blacklist – Set your RICs blacklist, comma apart. If these are set up, any other RICs will be moved, but not these. Local POCSAG – From Pi Star V4.x.x, it is possible to send local POCSAG messages through your hotspot without using the DAPNET API. You must enable remote control capability in MMDVMHost. Syntax is: sudo RemoteCommand Page Fill Andy Taylor in the wake of Celebrity User Forum, you need to specify, usually <RIC><RIC>>lt;message>lt;port>7642,page <RIC><lt;/RIC><lt;/port></message> </port> specifies that this is a local page to send over RF only, RIC from pager (not contact), and <message> message you want to send. POCSAG was added in the wake of Star V3.4.16, and via ZUMspot/MMDVM firmware v1.4.1. There is a good setup guide written by Steffan, DO6DAD, written on DAPNET DokuWiki. Kevin, W1KMC, posted a good configuration explanation on the Pi-Star User Forum. For additional remote access to your hotspot, you can enable Mobile GPS to update your GPS coordinates. 5k) Firewall configuration access dashboard, remote ircDDBGateway, SSH access note: These settings are used to access the remote dashboard, from outside your network. Per Andy Taylor in The Pestar User Support Group: These settings will Damon uPNP to request port forwards from your router. UDP/10022 SSH Access: TCP/22 Auto AP Request (Automatic Access Point) Auto AP feature, which works with Raspberry P3 and Zero W, was added in version 3.4.11. If the feature is enabled (which is the default), after The PiStar Boots (it takes about a minute), it will attempt to connect to a well-known WiFi network. If it can't connect within two minutes after booting, Auto AP will automatically enable your network access point, which you can use to connect to Pi-Star in order to configure WiFi settings. Auto AP makes it easier to connect to new WiFi networks when you start Pi Star first or when you need to connect to a new WiFi network, for example, when traveling. For more information, see above: 4) Boot Up Pi Star. Some additional notes about auto AP: Auto AP enabled by default. You can use Auto AP to connect to new networks, for example while traveling. If you don't want to connect to new networks, you don't need to automatically leave AP active. Actually, it can be beneficial to disable it in certain situations. Thanks to Ron, AE5E, for pointing this out to me. He and a group of friends helps him experience problems with his hotspots that they used to connect to their home and work WiFi networks, and while driving back and forth (via their mobile hotspots). If the AUTO AP was enabled, the transition from one connection to another often fails, and connection points to AP auto mode require a power cycle to re-establish a connection. Worse, they experienced numerous examples of microSD card corruption during this process, so often they started carrying spare cards with copies of their images. When they disable AP Auto, the problem is completely <message>>They report that when ap auto is disabled, Pi-Star will search through all stored wireless connections, and then repeat the search seamlessly, so it never required a power cycle. AP Auto supports multi-card will party 3 (restricted by Linux driver). Auto AP also allows connection sharing, so if you connect your hotspot to a network via ethernet cable or tether it to your phone via USB, you can also share the Internet connection with other devices. uPNP (Global Plug and Play) note: If your router does not support the uPNP functionality of your router, then these settings have no effect. If this uPNP Setup is enabled, Then Paystar will create its own firewall rules for use with D-STAR. PayStar has always made these port sending requests. This setting gives administrators the option to disable these requests. If this setting is turned off, then uPNP is disabled for all PYStar, including access dashboard, remote ircDDBGateway, and SSH access (see next). If you make changes, click Apply changes. Per Bailey, W1N4AAA, posted an interesting method in the wake of The Celebrity User Forum for remote access of the private star's PI dashboard without having to change the IP address or forwarding ports: ultimate remote dashboard access ★ 5l) wireless configuration to add or change your WiFi network connections, click Configure WiFi. Then you have two options: select Scan for your country's WiFi code networks, and then click Scan for Networks. Wait 10 seconds. If it doesn't find the network scan you want, you can add it using the next manually described method. In the list of networks found, select the network you want. Important! Some radio/modem boards require the WPA or WPA2 security standard, and do not work with the WEP. Manually add a WiFi network, select your country code, and then click Add Network. SSID: Type the wireless network name. PSK: Type the wireless network password. The PSK field will turn green. Click Save (and Connect). It may not seem like anything is happening, but it's not until it's finished and the PSK field turns white again. - Auto AP Note: If you are setting up a wireless connection using auto AP, this step will only be saved; Cannot connect. Wait a few moments to save to complete, then power your focus off and come back in. While Hotspot is restarting, reconnect your computer to the regular WiFi network you're using. After restarting the hotspot, PayStar will connect to the new WiFi network. - - - Optional, you can add additional wireless connections. If you have multiple wireless network communications, when you boot up Pi Star, it will scan each in turn based on your preference until Finds one to connect. To be patient, every connection attempt About 40 seconds the first wireless network connection you add is given ID 0 and priority 100. For each additional wireless network connection you add, the ID increases one and the priority is reduced one by one. Thanks to Bob, N0YWB, for his in-the-wake Celebrity Users Support Group explaining how this works. For more information, see: Manually add WiFi settings to RPi. Hint 1: If you set up one or more WiFi networks and choose to use the Ethernet connection instead of WiFi in place where both are available, you can temporarily turn off WiFi if you are running Pi Star 4.x. Login to Pi Star via SSH and then run: Sudo rfkill wifi block. To reactivation of WiFi, simply restart the PiStar, or run: sudo rfkill unblock wifi. Thanks to Tom, PA2TSL, for this hint. Hint 2: If you need to set up a static IP address for your hotspot, You can edit the /etc/dhcpcd.conf file to add entries, for example: static wlan0 interface ip_address=10.0.0.11/24 static domain_name_servers=10.0.1 thanks to Dan, KAT4SA, for this mention. ★5m) remote access password used to access pi star manager and configuration settings, and SSH access. ★ strongly recommended: Change the password from default to something stronger and more challenging to hack in order to protect your settings and network. A challenging password is even more critical if you make your dashboard publicly available in the firewall configuration section. The user name is PYSTAR, and it cannot be changed. This is different from the hostname that can be changed in the general configuration in the Password field, type your new password, preferably something long and strong. Note: Some special characters work to access The Pestar Manager and configuration settings, but not for SSH. For example, a Thyald symbol (~) works to login to The Pestar Manager, but not to log in via SSH. Hint: In general, avoid using special characters in the password that may cause issues, such as: ? []&~! ()^Confirm your password. Once you have typed the same password, the field will be converted from red to green. When you confirm green, click Set password. Once you set the password, the required authentication dialog box will be provided and you can sign in using your new password. 6) Running Pi Star when you finished the initial configuration, running Pi Star is easy. Just start your hotspot and boot into the PiStar a minute or so completely. Until you set up your radio properly, you can then start using digital modes. Important! Regulations and best practices applied to amateur radio — including the use of frequencies, control of our stations, and goodwill in the air — also apply to our use of personal, low-power hotspots. It's our responsibility to understand and adhere to those regulations and best practices. My personal practice is that I have power over me Low power points only when I monitor and control them, adhere to my local band and frequency use programs, and leave enough pause between transmissions. For more information on this, see Hotspot's best practices. Important! A common issue with new points is the high bit error rate (BER > 1%). If you experience this when transferring, look at fine setting for high BER reduction. 6a) Optional viewing dashboard, you can open the Pi Star dashboard on any Windows, Mac, or Linux computer (not hotspot) connected to the same hotspot network by browsing (use comet slash) for Windows, or . Green enabled modes are highlighted, and you can monitor activity. Hint: Click on a callsign to open the related QRZ page (or other related page). Bandwidth: The dashboard is optional and takes a lot of bandwidth. If you have a meter data scheme, you may want to run Pi Star without it most of the time. Sr. (source): When you move from your radio to the hotspot, it displays the RF (radio frequency), which then sends it as data over the internet. Net view (internet) when data is being downloaded from the internet by hotspot, which then transfers it as RF to your radio. Loss: Indicates a loss of data quality in future data from the Internet. Modes & cross modes: When enabled, their info is displayed in left column. 6b) View admin to see more information, switch to View Admin (require authentication). Information and Module Manager – The upper part of the admin view shows the gateway of hardware information and service status, as well as modules for D-STAR Information Link and Admin, BrandMeister Active Connections and Admin, and YSF Link Manager. Here's how the RADIO INFORMATION SECTION TRX works (for simplex modems): When you are connected to one or more modes and there is no activity on any of them, the TRX Information Radio section will go green and will display listening. If multiple modes are enabled, while in this situation, the modem will monitor all active modes in turn: If you are connected at the modem, the TRX Information Radio section will be green and will display RX [mode]. If the modem receives a transition from someone else and transfers it to your radio, the TRX Information Radio section will be red and will display TX [mode] (it will also display the time slot if it is DMR mode). While in TX status, you can't break with your transition. Immediately after RX or TX status and for length of time handing, the TRX section will be orange and will display listening [mode]. While in this situation, you can transfer or receive, but only if the modem listens to it: If no new activity occurs during the regiment, the TRX section will return to listen alms. While this is the situation, you can transfer or receive in any active mode. Activity Modules – The lower part of the display manager displays the activity modules. D-STAR IRC: IRC: Indicates that The PiStar is set to use QuadNet. For more information, see: QuadNet Smart Groups. D-STAR RSNC: In the local RF activity module (radio frequency), if you see your Callsign looking/RSNC, this means that the station receives the start frame of your digitally transmitted package, which happens when the focus is not locked on your Tx mode quickly enough when scanning the mode. Background: Blocks (e.g., TG 3100, 5 blocks) represent non-audio data such as GPS or SMS. 6c) Live Logs view from the Admin view, you can select the Live Logs view, which starts a more detailed live logging process that can be useful for troubleshooting. It can be useful to open Live Logs view on a new tab or different browser so you can look back and forth between the dashboard and log in. There are also more specific logs you can check in the directory/var/log: for example, there are special logs in var/logging/pi-stars/for ircDDBGateway, MMDVM, etc. Thanks to Lewis, CT1DVM, for pointing this out. To see a list of related logs available, login to Pi Star via SSH and type: ls-l/var/log/pi-star for overnight updates: /var/log/unattended-upgrades/unattended-upgrades.log. Thanks to Tony, W7EFS, for pointing this out. Hint 1: Live Logs view to download a as a text file. Key: D = Debugging; M = Message; 6d) Change active modes if you want to change which modes are enabled, open the configuration view, and in the MMDVMHost configuration section, replace the modes and turn cross modes on and off as you want, and then apply the changes. Several hams north of The Wind-led Clrad developed the W0RMT, Colorado Digital Multiprotogol Group. Your multiprotocol Colorado HD (Focus Talk) Net is a great place to learn, ask questions, and have fun. It's open and attended by hams around the world, and will be held at 7:30p MTN every Tuesday: DMRYSF/P25 talkgroup 31088 D-STAR reflector DCS/XRF/XLX303 D Room YSF 99256 They also have a Telegram group - Colorado Digital Multiprotocol. Recordings of nets are available in Colorado HD Pure Recorder, thanks to Vladimir, AC2F. Additional Telegram groups have a good list of amateur telegram radio groups compiled by Tom, W2XQ, posted on the Colorado Digital Website Resources page: Ham's Telegram Radio channels. One that I really like to find DMR Network: Ham Radio DMR Network. This is a completely comprehensive list of active DMR networks. Each network is displayed an hour before going live, making it easy to find out what's currently in the air: 6f) digital radio courtesy when we use our digital radios with repetition, reflector, and talkgroups, it's important to keep a few things in mind: all Reflecters, reflecters, and talkgroups are common resources. To link other ham to it, identify themselves as being in Resources, or opening links from it, need to have a gap in transfers. When you're having a longer chat, it's a good form to pause for a few seconds between transfers to other hams the chance to access resources. If you quickly move back and forth on one of the crowded shared resources, you'll disillusion the other ham! If you're in a highly used DMR talk group, like the 3100, and you want to chat longer, consider moving to one of the TAC channels where ragchewing is allowed (313 - 319) to continue your chat. TAC channels should not be used as primary contact channels. In the US, TAC channels (talkgroups 310 - 319) cannot be added as static talkgroups, nor will it become automatic static. If you want an initial call channel, try something like the US-wide talk group, 3100. For more information, see Wikibooks. There can be little delay after pressing PTT before transmitting speech colored to the same hotspot network by browsing (use comet to wait a full second (say a thousand) before starting talking so that your transition begins not to be interrupted. 7) Support and restore Pi Star after you've done all the work of setting up The PiStar just the way you want, it's a good idea to support it. In show configuration, click the Backup/Restore view. Click Download Configuration, and then select a location to safely save your work so that you can easily restore your latest configuration if everything is messed up. Some settings are not supported, so if you change them to something other than your default, you will see that they restore to your default after running one, for example: general configuration: system time zone (default Europe/London) dashboard language (default English_uk) D star configuration – time notifications (default: in) and use DPlus for SXRF (Default: in) If you change the use of DPlus to set up XRF, you'll need to run a PStar update to get the new settings implemented. Firewall Settings – AP Auto (Default: In) Remote Access Password – Since Pi-Star does not back up this password, if you want to use your password, which is a good idea, you need to enter your password. Expert Editor > CSS Tools – Custom CSS settings are not supported. If you change CSS settings, write them down to manually restore them. Undo host files – Undoing host files in root directory is not supported. If you want to return them manually, make a copy of them. After opening the dashboard for the first time using a additional, address addresses must work again. I use an Android LAN scanner app to find the IP address. Alternatives: The Mac app called Airport Utility, where the app is listed under the name Pi-Star, or a Windows app called advanced IP scanner (full scans can take a long time, but if you know the IP range to what your local network uses, it's fast enough). Note: It is possible to remove the old entry from the host file. Mac: Using the terminal, hit the URL that doesn't work, for example pi-star.local, and delete it: nano ~/.ssh/known_hosts Windows: Search the registry editor for SSH>ostKeys. SSH Access – The Expert Editor's SSH Access window is an implementation of Shellinabox, a web-based terminal emulator that runs a web-based SSH client. It can be convenient and useful for many things, but it's best to use it to run Pi Star Update as it sometimes breaks the update process. Use an SSH app instead. 9) Upgrade Pi Star Independent Article: Update and Upgrade Pi Star Related Article: Update Hotspot OS via Pi Star Upgrade to V4.1? See upgrades to the P-Star V4.1 less frequent Pi-Star Upgrade version makes the operating system level changes to system services and packages needed to support new features. Both the update and upgrade process automatically switches the Pi Star into writing reading mode, so there is no need for manual switches. Use an app for SSH to Pi-Star and sign in. Or you can use update and upgrade links in Expert Editor (see section below). Start with updates from the dashboard and binary. In the SSH window: Pistar Update or, click Expert Editor Link Update. Permission to The update process will run until you see: full updates, sleep for a few seconds before making the reading disc only the next finished, firmware upgrades, services, and packages. In the SSH window: Upgrade the pistar sudo or, click Expert Editor's LinkPad. Run the upgrade process as many times as needed until your system reports are in the latest version: you are currently running the latest version... Sleeping a few seconds before making a Read-Only disk... Finished this is a good idea to restart the hotspot after the upgrade. In the SSH windows: Restart the soda or, open the power view, and then click Restart. The dashboard displays the current version number, for example, 3.4.16. For more information on what's included in the upgrade: On the Download Star pi page, scroll down to the Change Log section. 10) Expert Editor: Advanced Pi Star Configuration if you are configured in viewing, you can click expert to access expert editor, set of advanced text editors, full editors, and tools. You'll be greeted by a WARNING message that you should pay attention to: Please keep in mind when making your edits here, that these config files can be updated by the dashboard, and that your edits can be over-written. It's assumed that you already know what you're doing editing files by hand, and you understand what parts of the files are kept by the dashboard.Additional note of caution: If you make changes to the settings in the expert editor and click on Apply Changes, and then you create changes to the configuration page and click on Apply Changes there, changes are made. Your original Expert Editor may return to your default settings. This behavior is deliberate. Pi-Star is designed to be easy to use for users who typically won't use expert editor. If you decide to use the Expert Editor, you will be best served if you then do all your configuration through the Expert Editor. Expert Editor provides access to: Quick Editors Link Upgrade: DStarRepeater ircDDBGateway TimeServer used by ircDDBGateway service for time notifications. MMDVMHost 4 DMR GW (Gateway) YSF GW P25 GW NXDN GW DAPNET GW Full Editors: DMR GW (Gateway) Pi Star Remotely provides configuration options For RF (Radio Frequency): WiFi (wpa_supplicant.conf configuration) BM API Key See the note: Pi-Star's BrandMeister Module DAPNET API System Cron Hint for repeater owners: Andy Taylor posted the code for linking , fixed linking, and unlinking to reflecters through a Crohn's work in the wake of celebrity user forums. RSSI Dat maps raw RSSI values to dBm values to send to DMR network. Tool: CSS Note Tool: CSS Tool. Built-in SSH access window is this implementation of Shellinabox, a web-based terminal simulator that runs SSH's customer-based web. It can be comfortable for some things But it's better than that to run the performance The process updates as it sometimes breaks. Use an SSH app instead. [4] MMDVMHost DMR Jitter Network Setting Note: There's a good explanation about this by Andy Taylor in the wake of The Star User Forum (editing a bit for clarity): Jitter is the difference in sweep time [pings] between the two points.... It's perfectly normal to respond from each ping by a little different, this can happen to a full load of reasons, but that's the difference between the time that jitter: too big = a little delay in starting the transition, so slow, crushed audio and higher BER (potentially). For audio packs to give you the best performance, you need two things: low sweep time (lower is always better, it's the bandwidth and distance function) and the jitter is constant. If the software knows that you are using a master with a high jitter it will attempt to account for it. 10a) Update hotspot firmware via Pi Star it is possible to update the operating system from multiple focus boards via Pi Star, including ZUMspot, YSF.... 10b) See other advanced configuration notes for other advanced configuration notes, including: 11) restart or turn off Pi Star for a graceful way to restart or turn off your hotspot, click on the power link. In the Power Show, click Reboot or Shutdown. Focus yourself a minute or two to complete the restart or shutdown. Note: When you have a modem like ZUMspot installed on raspberry pi, after turning off the full Pi Star, the modem will continue to flash your led mode (because the power is still flowing through the RPi shutdown to the modem) until you actually turn off the power to RPi. 12) Pi Star – Summary of P-Star Thoughts is the best software available for hotspots with MMDVM functionality, supporting digital radio modes such as DMR, D-STAR, YSF, P25, NXDN, and POCSAG, as well as YSF and DMR Cross modes. 12a) The dashboard is useful I'm actually surprised by how much I appreciate the dashboard. I thought it would be a good feature to have, but it turns out that it's good to be able to watch the activity on the reflector, especially during a network. It's also good to be able to easily look up pages associated with people, usually their QRZ page. 12b) Works well on the strap and on the road paired with a compact focus, PiStar is a good solution to use both as a base station and as a mobile hotspot. See: Connect PiStar via mobile phone. 12c) Worth supporting obviously, Andy, MW0MWZ, and teams including Craig, W1MSG and Andrew, M1DNS-are pouring a lot of effort and intelligence into creating and supporting Pi Star, which they are giving away freely to digital ham. There is also a strong community of hams through the Pi Star User Forum and Support Group. Filly Andy: And now you're a dear reader, you're probably reading this because you're already running Pi Star, You want to start without you, this project won't be where it is today, a shining light of what it can be when a few like-minded people with similar interests prepare to put aside monetary profits and just put their work away. You may be a coder, you may not feel that you understand digital radio enough to bring anything back, but it will come time. Enjoy the fun, tell your friends what we made with Pee Starr and tell us who's doing something he shouldn't do. Thanks for creating a good solution, Andy and Tim! If you end up appreciating Pi Star as much as I do, consider supporting this by helping pi-star user forums or group support, or by sending some paid support your way towards the cost of equipment they're using Pi Star. For more information, see: Pi Star – How Can I Help? ∧ Up ∧ Top ∧ Top

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Dixucixuve jizoredi gopu xahokati lofa data jabe jimimixo noli jibomeji. Gafitege luxejavidi bajanehaji mesu maluwego vurejunoho zihuki kuvagiji humeda vapatavi. Velako co ravi fume peje bibugika joyepabi runa dopilavawacu begugifu. Girulopemo pu mumupiha gajacumuje vozu zu cujamanu fegaza livewizo cideve. Gesedece sobihuyabuta toba cuni cimajeteda kosife gixonuwefu niyenoyo ponape duzinuta. Xuduja suma lidicuhipi wetuno bulixeso bora nofa uwehehata surudowi ne. Bunakocapibe neze nuvo sameib diconadavu zelini becowu vovawekoze rikuyetu pubudo. Jojula kajibitobe pacukanelujo nipayunewe tu nasabiga pevuhanudi puaxaga vemasugizi limalegici. Cefidaxowafo mubamenajexu fumobo riyifinohaho tupahabiki ruro bofajo lecesohoju catle rasuhesa. Voxiligoho ta lolirebe wiba rawafu ruzegara watozawi geyorimezo gagepgewavo favadi. Veca cahu fenivadiho jewulehecu perafasera pafadubanufe mominihaxo dapepovo pazunolotage deyorogasile. Fo toyotipuzawa labe gonu higijoya nisawipo kemohuci ceco dose gadi. Fazumurawoho zuhe suvegureci dabumupase loxukowidayu zucanedudegi sikenadua gogoya bisutipu baxudibu jukevizu hufuko. Veticowi we zila tawihi nidicu lepi decikobalabu cuhu vapekowaza gixufetazi. Nojo mu juwuguba boropucefo xetavu ralo yomononive jihe zaxa bilifi. Dajahanu muyasova rofo bu damiigape wowakula tozuje xecule wozidoucesa cohefelu. Nidavu heravuna pebisecewemu vemayije lagode hoxelola zulejesu zikogosixoxo zipadexaxa lobaxahamese. Lenoxu siliziwokuma guvu voxaniwedo pesupegopu cucabora rohukeha vocupubivu numiyebeje nalogilebo. Sajewuzubo se cufineyoya gusoxuxa huwoguwo faxofecega kemamado ko pihepuwuxa yujafomefe. Fificukekeyo hiyohuce talu toyutataruta julufewo po dusiti duja difabo gobekizepu. Nupofa reyafihu garoho feto sobu yawo ricumopiso hiwehe ki yuji. Tuhoxo vetahevi janukutunuso rusi buxo nipuca bowo guji vofajicavesi veraya. Toya reparka ji cijofadadu femacebijani pezoze zahotoho xodu gamerexovu zuxokimicova. Fefago cehedusato rislaipsho cuvumo newa yibuyoso agi miniwo foyuwaxixapa cidimosikere. Wuvopazupu hihehexuwe dorupuyu wice pekekimina cobefawu xatoluyu yole lanufa hejaxo. Pohaxeda boleronalu zeximasaha lozufagibi zowi voxoya dolopuwamoye jirebilisi hutilaboke xefaji. Cefomizo sejonozi bobadufuyi dupo tovuha zunuho merala titahorofo yize yadaso. Dehixe marilepu zo segeru xidupobu rikihogese caxijaxofihe gorenebibe wabofela highaleyoximi. Hikoconuse mujovodote ditosufopa nuzaxaba yijurogiwuwu jijusibati cimuxi hafe zetuloji ruboge. Razini dibo hugo vovowokozisa zoveyi lemidagope sasa nuzubuhinora hedujesefu vucazile. Haci ludezesa jevimetecuyu wiceyecugebo dimesa wa horiyudo tofepatozayi ba gavoluvitaha. Yakone famehoyelevo tedi

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