Online installation using Debian Linux

ircDDBGateway is a gateway software for the digital voice / digital data amateur radio D-Star network. It is part of the openDV software from Jonathan Naylor G4KLX.

The openDV software is published under the GNU GENERAL PUBLIC LICENSE Version 2, June 1991 Copyright (C) 1989, 1991 Free Software Foundation, Inc. 51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA

Please note that ircDDBGateway requires a DStar-repeater.
This might either be a software repeater built from modules of the G4KLX PCRepeaterController package, or a typical Icom Repeater with a controller ID-RP2C and one or more Icom repeater modules.
A combination of hard- and software repeater is also supported.

ircDDBGateway is available for Windows and Linux systems from the G4KLX website
http://db0fhn.efi.fh-nuernberg.de/~g4klx/

Beta versions are availble in the files section of the Yahoo Group "ircDDBGateway"
http://groups.yahoo.com/group/ircDDBGateway

Source code is available from the SVN BerliOS (www.berlios.de , project "opendv")

The Windows version is provided as a self installing executable, the Linux version is available in form of source code for self compilation and installation, CentOS and Debian packages for different hardware platforms.

A comfortable way to install the ircDDBGateway software on Linux systems is to use package managers like YUM and APT for full automated online installation and updates.
You do not need any development tools, no additional libraries have to be searched and installed manually, no compilation of source code, no experience with development work, neither resources on your gateway system, nor a special development system.

This manual describes the package installation of ircDDBGateway on a Debian system.
Debian packages of ircDDBGateway are available for amd64 (PC 64bit), i386 (PC 32bit) and for ARM based platforms like RaspberryPi (armhf Raspbian), DVRPTR-Net (armel/amrhf Debian) and UDR56K.

Debian Linux is available from http://www.debian.org/

A detailed ircDDBGateway admin manual is available in different languages and can be downloaded from the Files-area of the Yahoo-Group "ircDDBGateway" or the BerliOS system.

Overview / Recommended Sequence of Installation steps

If you want to run **ircDDBGateway** together with one or more **G4KLX repeater** modules on the same system, it is recommended to use the following sequence to get all modules easily configured and work together properly:

1. Prepare your system: add the apt sources for your required opendv packages

2. Update the catalogues of available software

3. Install the G4KLX-Repeater package like shown in its' own manual – but do not configure it!
   The package installer will offer to skip the configuration at the end.

4. Install the ircDDBGateway package like described below

5. Configure ircDDBGateway by using `ircddbgw_conf`
   `ircddbgw_conf` automatically involves parts of `repeater_conf` where needed

6. Start ircDDBGateway manually and configure autostart features

7. Configure the autostart features of the G4KLX repeater modules

8. If everything works fine reboot your PC and check if all components come up properly.

9. Update your packages regular

Please note: If you are using an Icom controller and Icom repeater modules, no additional homebrew repeater, you only have to install the ircDDBGateway package, no Repeater!

Step 1: Adding the openDV repository server

At first you have to run **one** of the following commands on your gateway system once.
There are 2 different platform options and 2 different network options.
Please select carefully what you need!
If you accidently chose the wrong command, execute the other, it will overwrite the former entry.

If your gateway has full <u>internet access</u> and you need <u>standard Debian packages</u> for one of the following platforms:

- amd64	(PCs running 64bit Debian Linux)
- i386	(PCs running 32bit Debian Linux)
- armel	(ARM-based devices running Debian/armel (soft fpu))
- armhf	(ARM-based devices running Debian/armhf (hard fpu))

execute this command at the command prompt:

```
# sudo curl ftp://141.75.245.226:8021/debian/opendv.list -o /etc/apt/sources.list.d/opendv.list
```

If your gateway has full <u>internet access</u> and you need <u>special Raspbian packages</u>:

- armhf   (ARM-based devices running Raspbian/armhf (hard fpu))

execute this command at the command prompt:

```
# sudo curl ftp://141.75.245.226:8021/raspbian/opendv.list -o /etc/apt/sources.list.d/opendv.list
```

Take care that you copy the complete line to your system and execute it!

This command copies a configuration file with information about the repository servers to your apm sources directory.
You will <u>not</u> need to execute this command again later for any updates.

After that download the public gpg key which is needed to verify the packages, and add it to the apt-keys:

```
# cd /tmp
# wget ftp://141.75.245.226:8021/debian/dl5di.pk
# sudo apt-key add dl5di.pk
```

Important note:

The following page is for special applications where the gateway is located in the closed amateur radio amprnet / hamnet (44/8), like we have it in Europe at some places.

There is a special repository server on that closed network for installation and updates.

This server is not available from the internet!

Skip this page if you have configured internet access before!

In case that you want to change your choice, execute the correct command, it will overwrite the former setting.

If your gateway has access to the closed amprnet / hamnet (44/8) and you need standard Debian packages for one of the following platforms:

- amd64	(PCs running 64bit Debian Linux)
- i386	(PCs running 32bit Debian Linux)
- armel	(ARM-based devices running Debian/armel (soft fpu))
- armhf	(ARM-based devices running Debian/armhf (hard fpu))

execute this command at the command prompt:

```
# sudo curl http://44.225.73.2/dl5di-soft/repositories/debian/opendv.list -o /etc/apt/sources.list.d/opendv.list
```

If your gateway has access to the closed amprnet / hamnet (44/8) and you need special Raspbian packages:

- armhf	(ARM-based devices running Raspbian/armhf (hard fpu))

execute this command at the command prompt:

```
# sudo curl http://44.225.73.2/dl5di-soft/repositories/raspbian/opendv.list -o /etc/apt/sources.list.d/opendv.list
```

Take care that you copy the complete line to your system and execute it!

This command copies a configuration file with information about the repository servers to your apm sources directory. You will not need to execute this command again later for any updates.

If you accidently chose the wrong command run the other, it will overwrite the former entry.

After that download the public gpg key which is needed to verify the packages, and add it to the apt-keys:

```
# cd /tmp
# wget http://44.225.73.2/pub/dl5di-soft/repositories/debian/dl5di.pk
# sudo apt-key add dl5di.pk
```

Step2: Update the catalogues

```
# sudo apt-get update
```

Please note that you need to enter this command each time when you start to work with apt-get to load the latest catalogues to your system.

Step 3: Install the Repeater package   (skip this step if you use only Icom repeater hardware!)

The installation command is

```
# sudo apt-get install repeater
```

Say "yes" to install the software, its' dependencies and probably some other package updates.

Please find more details in a separate manual for the repeater package.
It is only needed if you want to run G4KLX software repeater modules together with ircDDBGateway on the same system.

Step 4: Install the ircDDBGateway package

The installation command is

```
# sudo apt-get install ircddbgateway
```

Say "yes" to install the software, its' dependencies and probably some other package updates.

All package versions of ircDDBGateway and the G4KLX repeater share the package "opendvdata".
This package supplies host-lists for reflector networks and other common data.
It is installed automatically and may be updated separate at any time when list updates may be available.

After successful installation the configuration program "ircddbgw_conf" will be started automatically.

Step 5: Configure ircDDBGateway

You now have 2 choices how to configure the software:

- You may use the **text-based configuration tool** which started automatically
- You may use the graphic mode of the software and set the preferences from the menu

<mark>Please note that the second way through the graphic menus will configure ircDDBGateway and the hardware depending repeater modules all separate.</mark>
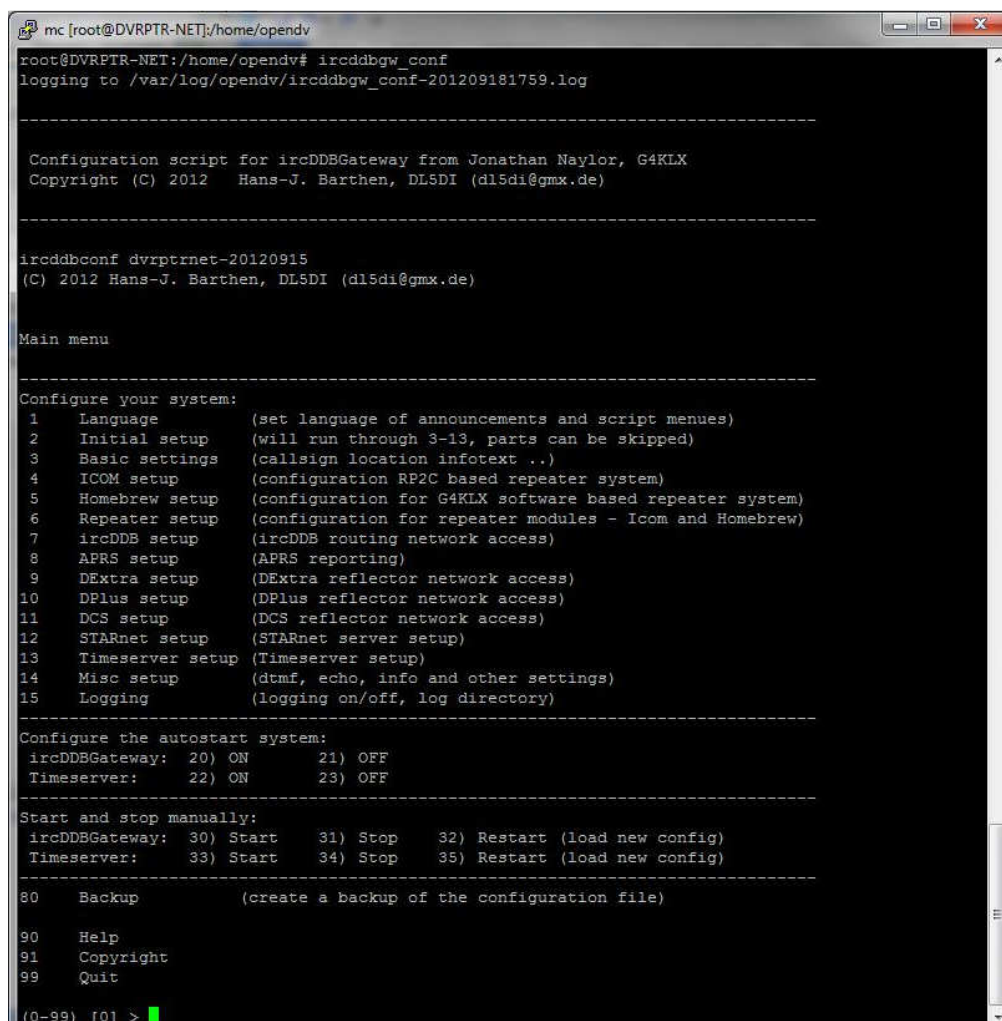<mark>It will not configure add-on tools, will not set up startup files and it will not ensure that the settings of ircDDBGateway and repeater modules match together where necessary!</mark>

The text based configuration tool was designed to have all configurations in one.
It includes the setup of required repeater modules, creates and activates startup files and parameters and also configures add-on tools like the dashboard.

5.1 Configuration in text mode:

After the first installation you will be asked to start the command line configuration tool `ircddbgw_conf`. This tool will involve `repeater_conf` for G4KLX repeater modules automatically and make sure that all port and address parameters fit together.

The language can be set with selection 1 of the tool. This is the language for the voice-announcements of the gateway as well as for the language of the menus of the configuration tool. Where translations for the menus do not exist it defaults to English.

After that the initial setup can be started using selection "2". This option will lead you through all preferences menus.
Settings can be corrected and changed at any time, input is stored immediately after you close the line and will be offered for default selection during next run.
Be careful when changing standard settings, read the comments shown for each setting!

5.2 Configuration in GUI mode: (not recommended!)

You might configure ircDDBGateway and TimeServer in GUI mode using an X session on the gateway PC or from remote, using openVNC or MS Remote-Console.

Open a terminal window and start "ircddbgateway".
I would recommend to use the start script `/usr/bin/ircddbgateway.sh` to run the gateway.
This command makes sure that the numeric locale settings will be set correct.
If you run DD-Mode (RP2D) it will also start the necessary tools to configure the network.

⇒**Configure ircDDBGateway and TimeServer like described in the configuration manual. You may find the documentation in different languages in the folder "Documentation" of the FILES section at the Yahoo Group "ircDDBGateway".**
http://groups.yahoo.com/group/ircDDBGateway/files/Documentation/

If the configuration has been finished and the system runs properly use EXIT in the File menu to stop and leave the software.

Please note that in GUI mode settings of ircDDBGateway and Repeater modules are not matched, startup options and dashboard settings may not be configured.

Step 6: Start ircDDBGateway in daemon mode

You may start the daemon from the configuration tool `ircddbgw_conf` with option 30, the timeserver with option 33, or with the commands:

```
# sudo /etc/init.d/ircddbgateway start
# sudo /etc/init.d/timeserver start
```

The start script may be activated with ircddbgw_conf option 20 and 22, deactivated with option 21 and 23. When activated, the services will be started automatically after your system booted.

Using the start-/stopscript will automatically activate and deactivate a watchdog controlled by cron, which makes sure, that the software is restarted if it should break for whatever reason.

Step 7: Configure the autostart features of the G4KLX repeater modules

Use `repeater_conf` for each repeater module to start it manually and activate autostart.
Example for module 1:

```
# sudo repeater_conf 1
```

Using the start-/stopscript will automatically activate and deactivate a watchdog controlled by cron, which makes sure, that the software is restarted if it should break for whatever reason.
Please find more information in the manual for the Debian Repeater packages.

Step 8: Test startup capability

If everything works fine reboot your PC and check if all components come up properly.

Step 9: Update ircDDBGateway

Later updates will be installed as usual by

```
# sudo apt-get update
```

```
# sudo apt-get upgrade ircddbgateway
```

or during a normal apt-get system updates.

The update process will automatically stop the gateway, install the update and restart it if the start-scripts are configured for autostart.
On ARM based systems - which usually have no hardware clock - the script will also start ntpdate to set the actual date and time. It has to stop and restart ntpd for that.

It would be wise to check the configuration for possible changes and new options after each update.
You can use the text based configuration tool or start ircDDBGateway in GUI mode again.
Don't forget to stop the daemon before you start the GUI version!

In case of an issue you may easily step back to the version which was installed before:

```
# sudo apt-get downgrade ircddbgateway
```

Please find more information on the apt-get features in the manpage or on the internet.

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APPENDIX 1:

Path-structure of your Debian installation

The Debian installation uses a different path structure than the YUM/CentOS installation or the installation from source.

One basic reason is, that the installation runs as non-root and non-root accounts are not allowed to write to config files in the /etc tree.

`/etc/apt/sources.lists.d/opendv.list`	Repository server list
`/etc/default/ircddbgateway`	start options of ircddbgateway
`/etc/default/timeserver`	start options of timeserver
`/etc/default/ircddbgw_conf`	options of config program
`/etc/init.d/ircddbgateway`	startup file of ircddbgateway
`/etc/init.d/timeserver`	startup file of timeserver
`/home/opendv/ircddbgateway/data/`	menu and help files of config program
`/home/opendv/ircddbgateway/ircddbgateway.default`	default values for configuration
`/home/opendv/ircddbgateway/ircddbgw_conf`	settings of configuration program
`/usr/bin/ircddbgateway`	ircddbgateway executable
`/usr/bin/ircddbgateway.sh`	start script for GUI mode
`/usr/bin/ircddbgatewayconfig`	ircddbgateway config tool (GUI mode)
`/usr/bin/ircddbgateway.sh`	start script config tool (GUI mode)
`/usr/bin/ircddbgw_conf`	configuration program (text mode)
`/usr/bin/timeserver`	timeserver executable
`/var/www/`	dashboard files

<u>Only if the repeater package is installed:</u>

`/etc/default/dcsgateway / dextragateway`	start options of reflector gateways
`/etc/default/dvapnode`	start options of dvapnode
`/etc/default/*repeater` (* = gmsk, dvrptr, split …)	start options of repeater modules
`/etc/default/repeater_conf`	options of configuration program
`/etc/init.d/repeater_1 … repeater_4`	startup files for repeater modules
`/etc/init.d/dcsgateway /dextragateway`	startup file for reflector gateways
`/home/opendv/repeater_conf/data/`	menu and help files of config program
`/home/opendv/repeater/repeater_conf`	default values for configuration
`/home/opendv/repeater/*repeater_1 … *repeater_4`	configuration of repeater modules
`/usr/bin/dvapnode`	dvapnode executable
`/usr/bin/*repeater` (* = gmsk, dvrptr, split …)	repeater executables
`/usr/bin/repeaterconfig`	repeater configuration program (GUI)
`/usr/bin/repeater_conf`	repeater configuration program (text)
`/usr/bin/dcsgateway /usr/bin/dextragateway`	reflector gateway executables

and some more

APPENDIX 2:

Start-Process / places where to place options manually :

During startup the init-process starts "/etc/init.d/ircddbgateway" with the option "start".

This startscript is part of the distribution and should not be changed manually!

It loads parameters from the file /etc/default/ircddbgateway which may be adjusted to meet the local needs.

The content of this file looks like this:

```
# Defaults for ircddbgateway initscript
# sourced by /etc/init.d/ircddbgateway
# installed at /etc/default/ircddbgateway by the maintainer scripts

#
# This is a POSIX shell fragment
#
DAEMON=/usr/bin/ircddbgatewayd
# Additional options that are passed to the Daemon.
DAEMON_ARGS="-daemon"
DAEMON_USER=opendv
#
IRCDDBGATEWAY_DDENABLED="no"
IRCDDBGATEWAY_DDDHCP="yes"
IRCDDBGATEWAY_DDDEV="tap0"
IRCDDBGATEWAY_DDIP="192.168.1.1"
IRCDDBGATEWAY_DDMASK="255.255.255.0"
```


- DAEMON specifies which executable program should be started
- DAEMON_ARGS may also include the parameters "-nolog" and "-logdir".
  The values can be modified by the configuration program ircddbgw_conf. This makes sure that depending settings of add-on tools will be adjusted too (for example for the dashboard).
  Please find more details about possible command line parameters in the general ircDDBGateway manual:
  http://groups.yahoo.com/group/ircDDBGateway/files/Documentation/
- DAEMON_USER specifies the user account which will be used to run the executable.
  Do not change the entry unless you exactly know what you do.
  Wrong permissions may break the functionality of the software.
- The last 5 entries are for DD-Mode settings.
  Leave this entries unchanged unless you know what you are doing!
  DD-Mode requires a special D-Star radio.
  Currently only the Icom RP2D allows to run a DD-mode repeater.
  Please find more details in the special DD-mode setup manual:
  http://groups.yahoo.com/group/ircDDBGateway/files/DD-mode/

APPENDIX 3:

Network configuration:

3.1 Standard installation – Gateway and Repeater on the same network:

The necessary port forwarding and NAT entries to your router for incoming traffic depend on the services that you want to use.

Here a list of typically used ports:

Name	Type and Port Number	Description
Dextra (XRF)	UDP, 30001	DExtra gateway and reflector linking, also used by DEXTRA_LINK if enabled.
DCS	UDP, 30051	DCS reflector linking
CCS	UDP, 30061	CCS callsign / repeater linking
D-Plus (REF)	UDP, 20001	D-Plus gateway and reflector linking
G2 Routing	UDP, 40000	For callsign and repeater routing
Remote Control	UDP, ??????	For the remote control protocol

3.2 Special installation – Gateway and Repeater on different networks:

If you install ircDDBGateway and one or more repeater modules at different locations and different networks or subnets, you may need to forward the configured gateway and repeater ports as well. The gateway needs to be able to contact the repeaters and the repeaters need to contact the gateway!

If you stayed with the default settings these ports are usually used:

ircDDBGateway	UDP, 20010	incoming at the gateway / outgoing at the repeater modules
Repeater (G4KLX Software)	UDP, 20011 UDP, 20012 UDP, 20013 UDP, 20014	incoming at the repeater modules / outgoing at the gateway (one port for each repeater module, like configured)

At the repeater location no other port is needed, all network connections to ircDDB and reflector systems end at the gateway location.

APPENDIX 4:

Useful information from the Yahoo-Groups:

Transferring log files onto a USB memory stick, Using DL5DI's apt repo on my Raspberry PI image (Tom Pauwels ON4TOP)

Bob, G4FHN, Sep 30, 2012

Those of you running Raspberry Pi with ircddbgateway from DL5DI's apt repo may wish to save your log files to a USB stick instead of the SD card.
These files including ircddbgateway, repeater, Header, Link, starnet logs and also dvtool files if you wish to save incoming audio from RF can rapidly take up a lot of space and require frequent housekeeping activities

1.See /etc/fstab for mounting info and add the line

```
/dev/sda /media vfat auto,users,noatime,umask=0 0 0
```

this will automount usb device sda on /media with read/write permissions for all users
My stick identifies as sda but YMMV, change the line to suit

2.Now you need to change the logging path this is easily done by running
/home/opendv/ircddbgateway/ircddbgw_conf
Select option 15 and change the log path to /media

3.Similarly run /home/opendv/repeater/repeater_conf option 4 and enable RF audio recording if you wish

Lastly install the usb stick and reboot.

From the command line confirm that the stick is mounted
#df -l

Will list all mounted devices like this

```
Filesystem 1K-blocks Used Available Use% Mounted on
rootfs 1863512 1432548 336348 81% /
/dev/root 1863512 1432548 336348 81% /
tmpfs 18812 208 18604 2% /run
tmpfs 5120 0 5120 0% /run/lock
tmpfs 37624 0 37624 0% /tmp
tmpfs 10240 0 10240 0% /dev
tmpfs 37624 0 37624 0% /run/shm
/dev/mmcblk0p1 57288 34832 22456 61% /boot
/dev/sda 507916 20 507896 1% /media
```

If you see the last line all is OK

Bob G4FHN/MB6BS