

MultiCastor 2.0 Manual



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1. Introduction

1.1 Operating Instructions

MultiCastor 2.0 is a tool for verifying the implementation of multicast-functionalities on network devices.

It provides functions to create and analyze multicaststreams of different protocols. Version 2.0 is compatible for IGMP on IPv4, MLD on IPv6 and MMRP on Layer-2 connections.

1.2 System Requirements

Software:

Supported Operating Systems:

- Windows XP
- Windows 7
- Linux (with kernel 2.6.x or greater)

You need to have a Java runtime environment and pcap (WinPCAP / libpcap) installed.

Hardware:

If you want to use Layer-2 functions you network interface needs to support promiscuous mode.

2. Commissioning

2.1 Installation

To install MultiCastor 2.0 under windows use the provided installer. Only doubleclick the provided file and follow the on screen instructions.

2.2 Starting the application

2.2.1 Start with graphical user interface

To run multicastor with the default graphical user interface you can use the provided shortcuts. These are located at your desktop as well as in your startmenu under MultiCastor 2.0.

2.2.2 Run from the command line

It is possible to run the MultiCastor with and without a graphical interface from the command line.

The usage of the MultiCastor from the command line is described in Section 3.2.



2.2.2.1 Requirements to run from the command line

To run the MultiCastor from the command line successfully, the system library file of JNetPcap (jnetpcap.[dll|so]) have to exist in the system library directory. Alternatively, you can set an other directory with the parameter `-Djava.library.path=[path-to-dir]`.

2.2.2.2 Run from the command line with a graphical interface

If you call the MultiCastor without a parameter, the program will start with a graphical interface.

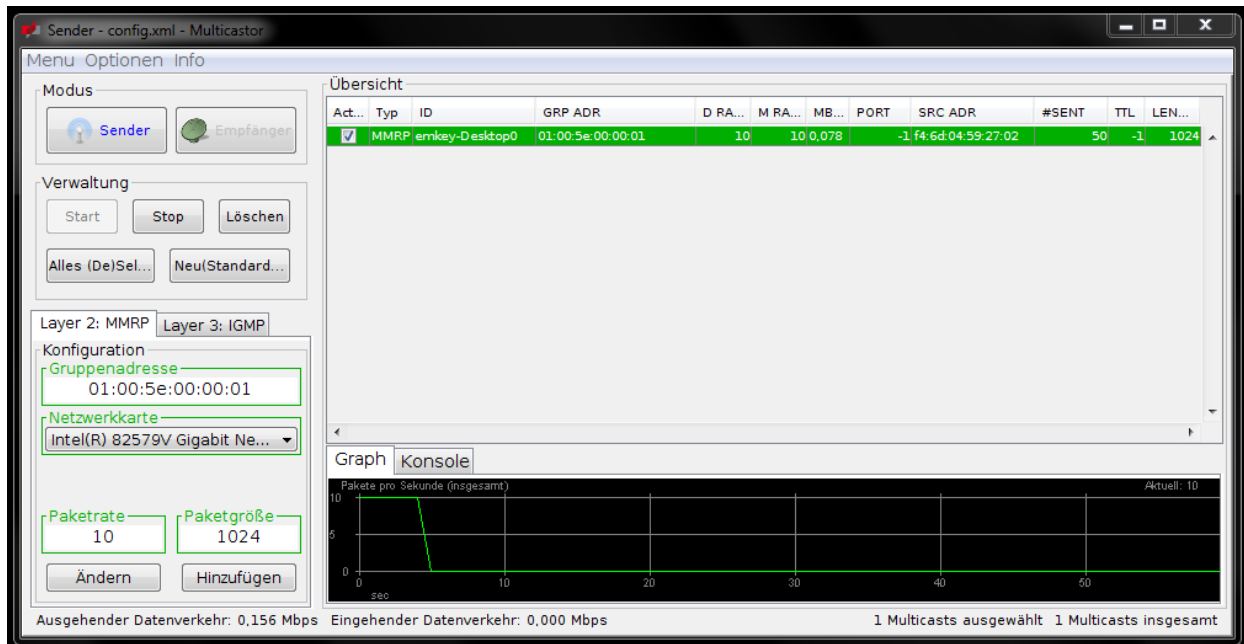
Further there is a possibility to preconfigure the program, in which mode the graphical interface should be started. This is realised with the parameter `--gui`. If you want to start in the mode "sender", you have to call the program additional with the parameter `--sender`.



3. Handling

3.1 Handling of the graphic user interface

3.1.1 Composition of the graphical user interface



3.1.1.1 Mode

In the panel "Mode" you can switch between the sender and receiver user interface. The activated mode is displayed in the title of the Multicastor window and also the activated mode has a more colorful button.

3.1.1.2 Overview

The area "Overview" shows you all created or imported multicast streams. They can be activated and marked with green color or grey and inactive. IGMP and MMRP datastreams are displayed in one table.

With a click on the tableheader the table can be sorted by the chosen property. Another click sorts in the other direction. With a right click on the tableheader you can open a popup menu which allows you to hide columns.

3.1.1.3 Control



Außerdem können die Felder der “MultiCast Configuration” geleert werden, mit der Schaltfläche “New”.

The “MulticastControl” Section allows Datastreams to activate or deactivate, to delete or to select. The “New

3.1.1.4 Configuration

Im Panel “MultiCast Configuration” können neue Multicast-Datenströme erstellt werden. Näheres dazu finden sie unter.

3.1.1.5 Graph

Der Graph zeigt im Sender und Empfänger Modus die pro Sekunde empfangenen/gesendeten Pakete an. Im Empfängermodus kann außerdem noch Jitter und der Paketverlust grafisch dargestellt werden. Die Skala des Graphen passt sich automatisch an.

3.1.1.6 Console

[PLEASE HELP HERE]

3.1.1.7 Fußleiste

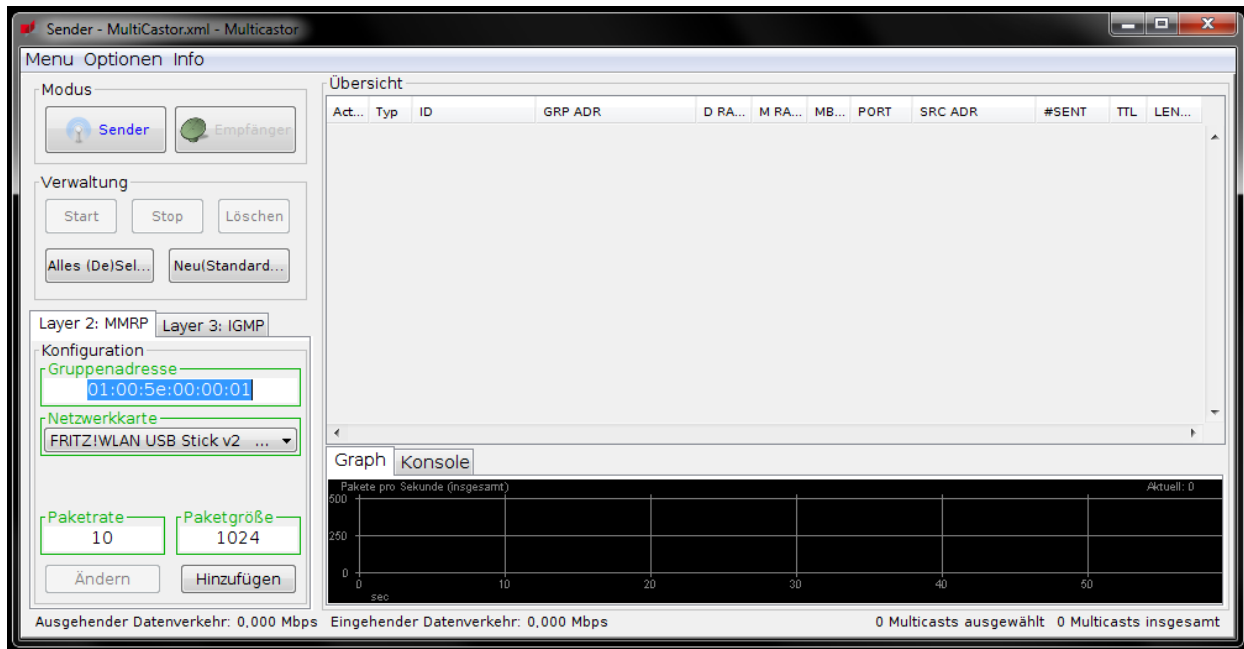
In der Fußleiste werden sowohl der eingehende als auch der ausgehende Datenverkehr angezeigt, sowie die Anzahl der vorhanden und selektierten Multicastdatenströme .

3.1.2 Funktionen des Titelmanüs

3.1.3 Functions in mode “Sender”

With the “Sender” button you can switch to sender mode.





3.1.3.1 Add multicaststream

If you want to add a multicaststream you have to choose which protocol you want to use. Current version of MultiCastor supports the following protocols:

- IGMP (Layer 3)
- MMRP (Layer 2)

Next you have to provide all requested information to the shown fields. These informations depend on the chosen protocol.

- MMRP
 - MMRP group address
 - Target MAC-address
 - must be a valid Multicast-MAC-address
 - MMRP network interface
 - the network interface to be used
 - must support promiscuous mode
 - packet rate
 - number of packets to be sent per second
 - range: 1 to 65535
 - packet length
 - packet length in byte
 - range: 60 to MTU (MTU is a value dependent on the network configuration. It usually is 1500)
- IGMP
 - IGMP group address
 - target IP-address
 - must be a valid Multicast-address
 - network interface

- the network interface to be used
- UDP Port
 - the port to be used
- TTL
 - sets Time-To-Live in IP-Header
 - range: 1 to 127
- packet rate
 - number of packets to be sent per second
 - range: 1 to 65535
- packet length
 - packet length in byte
 - range: 52 bis 65507

If all fields are filled with valid information you can create the multicaststream by clicking the “Add” button.

3.1.3.2 Start / stop multicaststream

There are two ways of starting a multicaststream.

The first one is to simply click the check box in the first row of the multicaststream in the overview area.

The second one is for starting / stopping multiple streams at once. Begin by selecting streams in the overview windows or clicking “Select All”. With the buttons “Start” and “Stop” you can now modify the state of all selected streams.

3.1.3.3 Modify multicaststream

For modifying an already existend stream simply select it in the overview area. Now you will be shown the current settings for this stream in the configuration area. Modify this values and click apply to execute the changes.

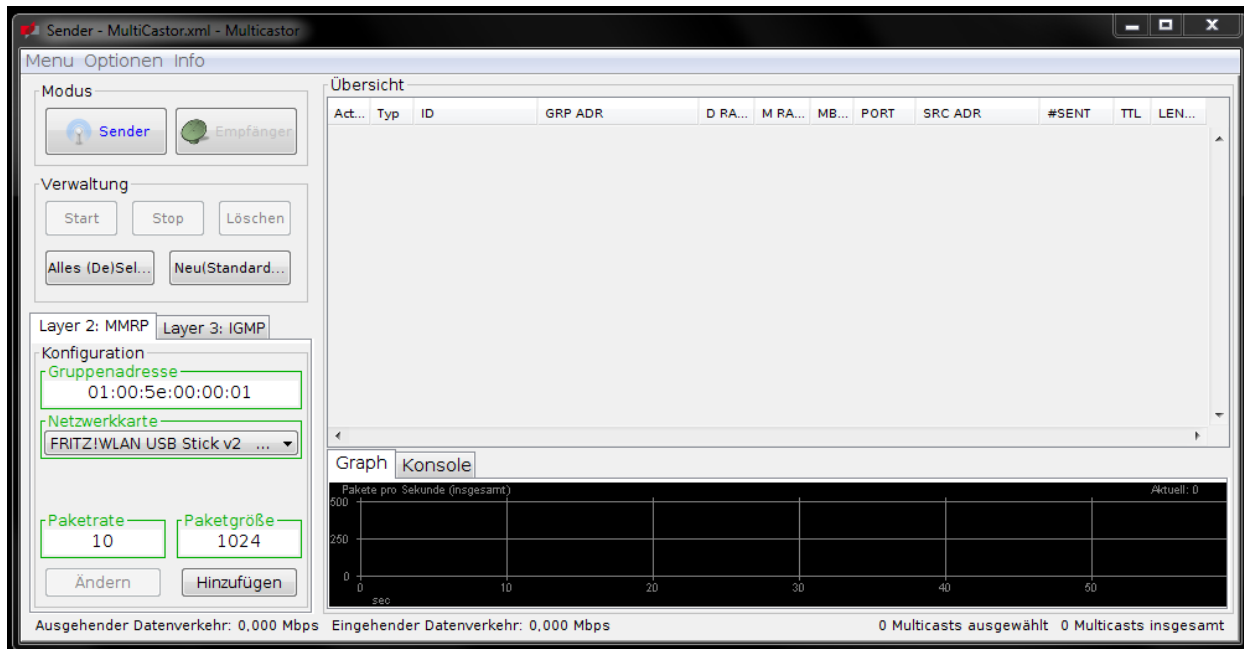
3.1.3.4 Delete multicaststream

If you want to delete a multicaststream just select all streams to remove and hit the delete button.

3.1.4 Functions in mode “Receiver”

With the “Receiver” button you can switch to receiver mode.





3.1.4.1 Add multicast receiver

If you want to add a multicast receiver you have to choose which protocol you want to use. Current version of MultiCastor supports the following protocols:

- IGMP (Layer 3)
- MMRP (Layer 2)

Next you have to provide all requested information to the shown fields. These informations depend on the chosen protocol.

- MMRP
 - MMRP group address
 - Target MAC-address
 - must be a valid Multicast-MAC-address
 - MMRP network interface
 - the network interface to be used
 - must support promiscuous mode
- IGMP
 - IGMP group address
 - target IP-address
 - must be a valid Multicast-address
 - network interface
 - the network interface to be used
 - UDP Port
 - the port to be used

If all fields are filled with valid information you can create the multicast receiver by clicking the “Add” button.



3.1.4.2 Start / stop multicast receiver

There are two ways of starting a multicast receiver.

The first one is to simply click the check box in the first row of the multicast receiver in the overview area.

The second one is for starting / stopping multiple receivers at once. Begin by selecting receivers in the overview windows or clicking "Select All". With the buttons "Start" and "Stop" you can now modify the state of all selected receivers.

3.1.4.3 Modify multicast receiver

For modifying an already existent receiver simply select it in the overview area. Now you will be shown the current settings for this receiver in the configuration area. Modify this values and click apply to execute the changes.

Important: You can not change the layer a receiver is working on.

3.1.4.4 Delete multicast receiver

If you want to delete a multicast receiver just select all receivers to remove and hit the delete button.

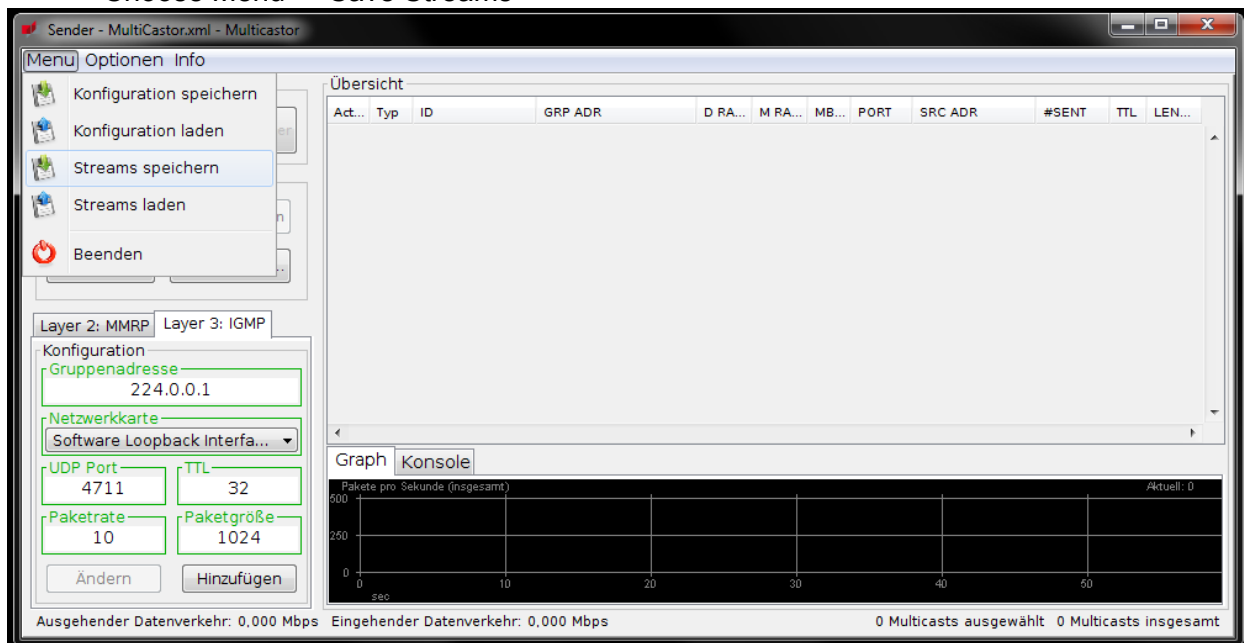


3.1.5 Export of multicast streams

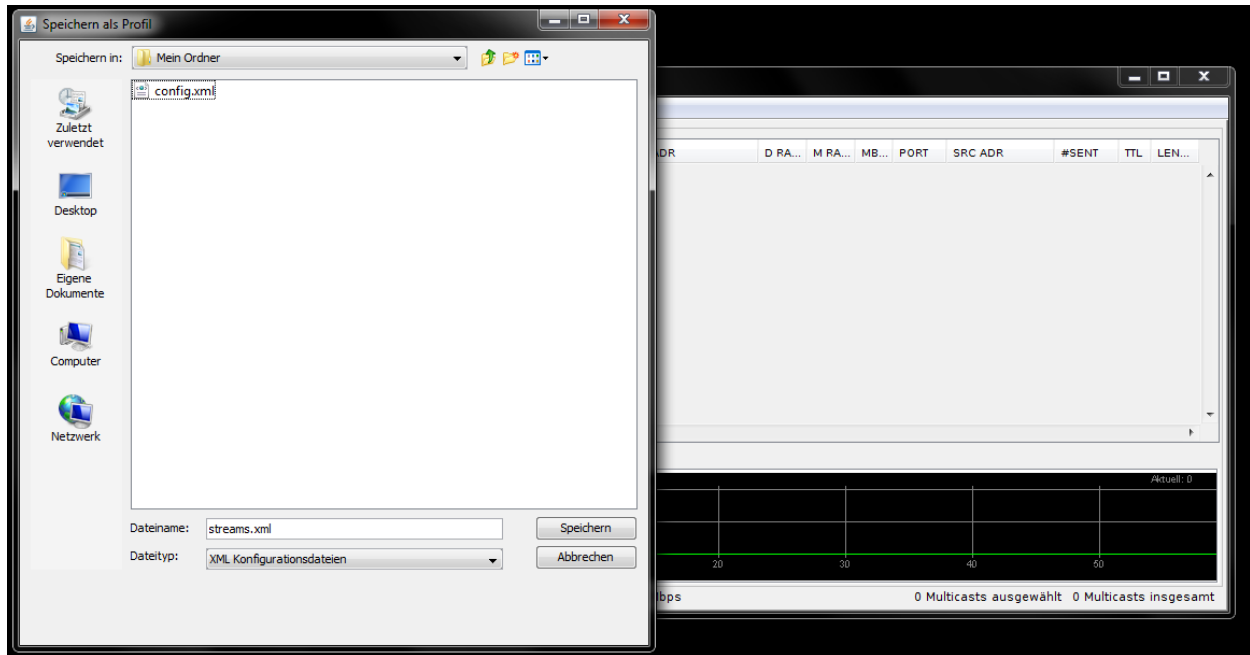
In Multicastor create Stream can be exported to a XML file at any time. In this file, all settings of these multicaststreams is stored and can be restored later. This function is especially important, when working in larger teams of testers. Predefined test sets can be used on different computers and multicastor instances to test a large set of different multicast streams without entering them manually. Furthermore a hirarchic management of testdata is posible by simply using the capabilities of the operating systems filesystem.

To save all currently entered multicast stream, do the following:

- Choose Menu -> Save Streams



- Choose the folder and filename to store the XML file

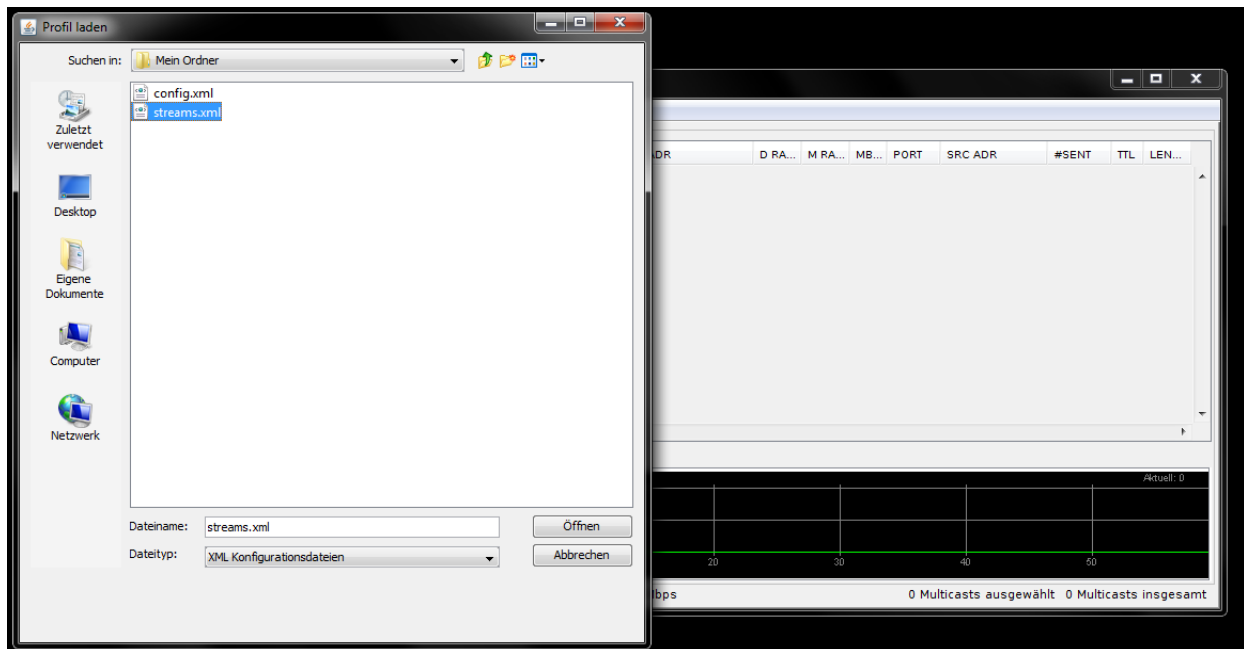


- Click “Save” to finish the process

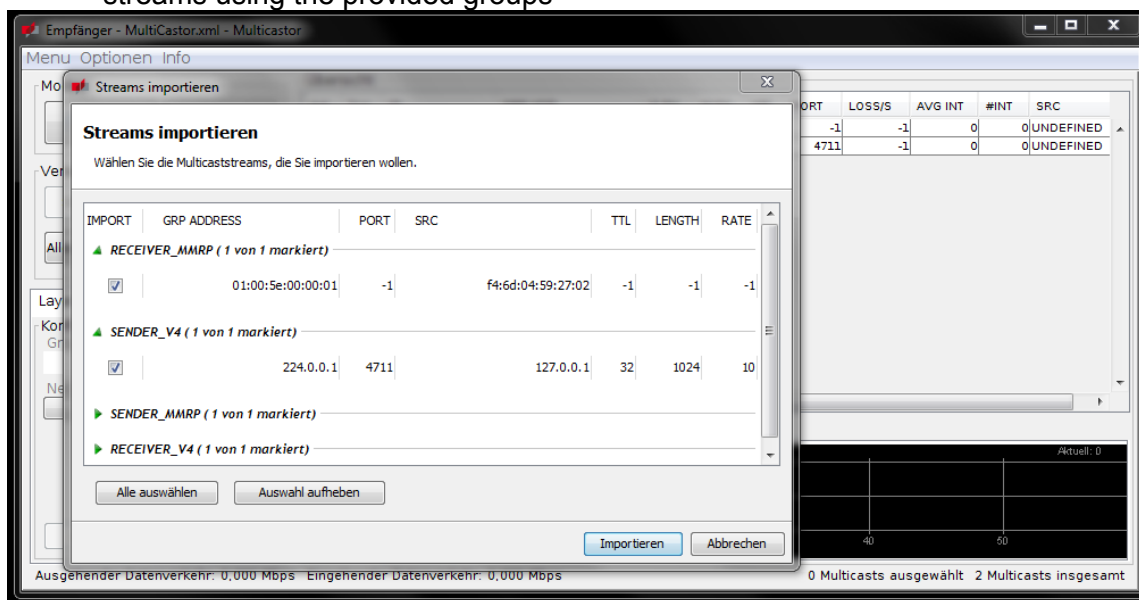
3.1.6 Import of multicast streams

To restore multicast streams from a XML file do the following

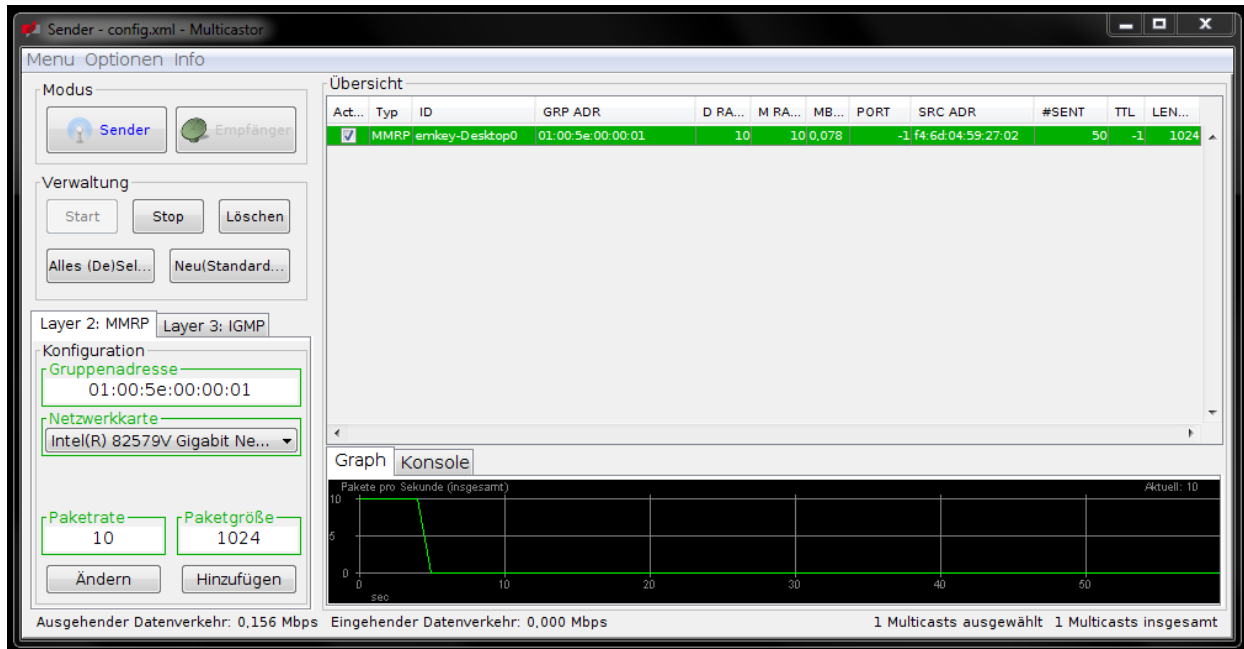
- Select Menu -> Load Streams



- Choose the file u want to import by using the select file dialog
- Choose the multicast streams you want to import from the file. You can therefore select streams using the provided groups



- Start the import by clicking “Import”
- You will see the selected multicast streams in the main window



Please remember: Multicast Stream are separated as sender and receiver streams. Therefore it can happen, that there are no streams shown after import. In this case change the view mode to match the stream type.

3.2 Configuration of the MultiCastor

In the MultiCastor Configuration, default values for IGMP and MMRP streams can be deposited. These will be read and put into the appropriate inputbox by starting MultiCastor or creating a new stream.

The *Configuration Menu* can be found under the menu **Options->Settings**.

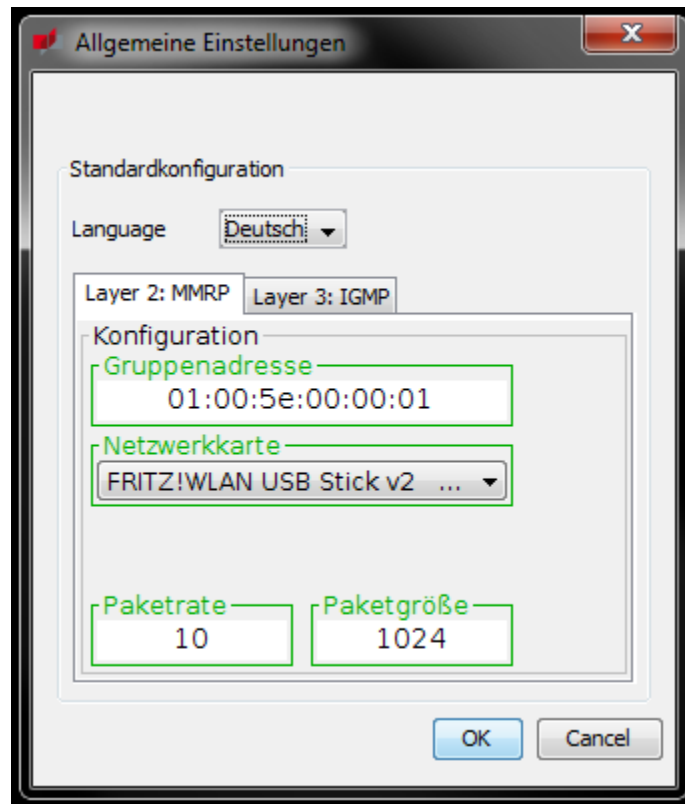


Abb.: Konfigurationsmenü

In addition to the default settings, the language of MultiCastor can be chosen in the *Configuration Menu*.

For the Selection of the language, one can choose out of two supported languages:

- English
- Deutsch (German)

To configure the default values, the Config Menu supports the same input form as on the Main Page of the MultiCastor (see picture above).

By confirming the entries, the values will be saved in the configuration. Except of the language for which the tool must be rebooted. Thus, the MultiCastor starts in the chosen language.

The new default values will be available by creating a new stream.

3.3 Usage with the commandline

It's also possible to use the MultiCastor from the command-line. This offers the benefit to handle the program without a graphical interface. As a result, it's easy to automate the usage of the MultiCastor. These are the requirements, for the use with a test environment such as STAF/STAX.

3.3.1 Possibilities to run the MultiCastor from the command line

There are various possibilities to run the MultiCastor from the command line:

1. without parameters the program will start with a graphical interface
2. with the parameter for the stream-configuration-file, all other parameters will be ignored and the MultiCastor will start with the multicast streams, which are defined in the given stream-configuration-file
3. with the given parameters, it is possible to define a multicast-stream from the command-line
4. with a unknown, wrong or the help parameter, the help-message will be printed out

3.3.2 Default Values

To use the MultiCastor with the command line, one doesn't have to give all parameters. There are default values for these parameters.

Parameter	Wert	Netzwerkschicht
Port	4711	Layer 3
Packet Lebensdauer	32	Layer 3
Packet Rate	10	Layer 2 & Layer 3
Packet Länge	1024	Layer 2 & Layer 3

3.3.3 List of the available parameters

This is a List of the available parameters:

Parameter (kurz)	Parameter (lang)	Beschreibung	Notwendig ¹⁾
-h	--help	Gibt den Hilfetext aus	n.A
-c [.../.../...]	--config=[path/to/config]	Starten des Multicastors mit Stream-Konfigurationsdatei	n.A
-S	--sender	Sender	Ja
-R	--receiver	Receiver	Ja
-4	--ipv4	IPv4 Modus	Ja
-6	--ipv6	IPv6 Modus	Ja
-m	--mmrp	MMRP Modus	Ja
-s [...]	--source=[source-address]	Source IP / Mac	Ja
-g [...]	--group=[group-assdress]	Group IP / Mac	Ja
-p [...]	--port=[port]	UDP Port	Nein
-l [...]	--length=[packet-length]	Länge von Paketen	Nein
-t [...]	--ttl=[time-to-live]	Lebensdauer von Paketen	Nein
-n [...]	--rate=[packet-rate]	Anzahl der Pakete pro Zeit	Nein
	--gui	Startet den MultiCastor mit graphischer Oberfläche (zur Vorauswahl des Modes)	Nein

¹⁾ only to generate a multicast-stream from the command-line

3.3.4 Examples for starting the MultiCastor from the command line

These examples will show, how it's possible to run the MultiCastor from the command line.

3.3.4.1 Run the MultiCastor with a graphical interface

```
java -jar MultiCastor.jar
```

This input will run the MultiCastor with the graphical interface

3.3.4.2 Run the MultiCastor with a stream-configuration-file

```
java -jar MultiCastor.jar --config=./stream-config-file.xml  
java -jar MultiCastor.jar -c /home/user/mc/stream-config-file.xml
```

With a given stream-configuration-file, all in the file defined multicast-streams will be created. It's possible to give the absolute and the relative path to the stream-configuration-file. It is also possible to use the long or the short parameter.

3.3.4.3 Run the MultiCastor and create a multicast stream with the command line

```
java -jar MultiCastor.jar --sender --ipv4 \  
--source=192.168.0.1 \  
--group=224.0.0.1 \  
--port=4711 \  
--length=1024 \  
--ttl=32 \  
--rate=10 \  

```

This example shows how one can create a multicast stream with the command line. With long parameters the default parameters will be committed. If inconsistent parameters are given, for example --sender and --receiver, the last parameter will be chosen. The same happens, when the same parameter with two different options is given.

4. Glossary

