Alkit Reflex Manual

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Table of Contents

Chapter

1

Requirements

This chapter lists hardware and software requirements for running Alkit Reflex

The following hardware specifactions should be seen as a recommendation. Alkit Reflex may work well also with other hardware. If you are in doubt whether a particular hardware configuration is suitable for running Alkit Reflex, please contact Alkit Communications.

Hardware Requirements

We recommend the following hardware as a minimum requirement:

- Processor: Intel Pentium, AMD Athlon, HP-PA, MIPS or SPARC

- Memory: 128 MB of RAM

Software Requirements

- Operating system: Windows 2000, Windows XP, Windows 2003, Linux , IRIX, Solaris, HP-UX

- Alkit Reflex for the operating system you use

If You Have any Trouble

Please contact Alkit Communications at `support@alkit.se`.

Chapter

2

Getting started

This section guides you through the installation of Alkit Reflex, and gets you started using it.

Installing and setting up Alkit Reflex is very straightforward. However, depending on how you intend to use Alkit Reflex, some configuration of the software might be necessary. Since Alkit Reflex is a very genaral – and therefore powerful – software, fully mastering all configuration options requres a little training.

Installing Reflex

To install Alkit Reflex, first insert the installation CD into your DVD or CD-ROM drive, or dowload the software off the Alkit Reflex website: www.alkit.se/reflex. Then proceed with installation as follows, depending on which operating system platform you use.

Windows installation
Just execute the installation program and follow the on-screen instructions.

Unix installation
Move to the directory where you wish to install Reflex. The unzip and untar the tarball by typing:

```
gzip –d reflex.tar.gz
tar xf reflex.tar
```

Obtaining and installing a license

You will need a license to be able to use the software. Contact Alkit Communications to obtain a licese.

Once you have the license file, put it in the same directory as the executable file – that is in the installation path of Alkit Reflex. Optionally, if you prefer to have the file somewhere else (or if you want to move the executable file) you can configure Alkit Reflex to look for the license file at a particular path. See the section Configuring Alkit Reflex for information about how to do this.

Starting Reflex

If you use a Windows operating system and chose to add a shortcut to the desktop when installing Reflex, double click that shortcut. You can always use the *Start* menu. In that case, select *Start -> Programs -> Alkit Reflex -> Reflex.*

Alkit Reflex should now be running, ready to be used.

Chapter

3

Setting up a conference session

This section describes how to set up a conference session on Alkit Reflex using 'refsipclient' or some other SIP signaling tool.

A client application is needed to set up conference sessions on the reflector. Each participating host must signal its preferred RTP media types for a particular session. Sessions are identified by a textual name, a port number and a protocol number. (Currently only the UDP protocol is supported, i.e. only RTP sessions over UDP can be handled by the reflector). The session setup signaling is performed using the Session Initiation Protocol (SIP). When a SIP based voice/video application, such as Alkit Confero, is used as the RTP media transmitter/receiver, the SIP signaling is built into the teleconferencing application. If some other, non-SIP RTP client is used, a standalone session initiation application called 'refsipclient' can be used (see below), to do the session setup signaling.

Reflector sessions

As mentioned above, a session is identified by a UDP port number and a textual name (such as "session1" or "project meeting"). By using a textual name in addition to the port number to identify sessions, multiple conference sessions using the same UDP port number can be active on the reflector simultaneously. To set up a conference session, the participants signal their intention to participate to the reflector, indicating the UDP port number to be used, and identifying the particular conference session to join by a textual name. The RTP media types to be used are also specified. Note that different UDP ports are to be used for audio and video RTP sessions. The port numbers that can be used for audio and video respectively, are configured in the configuration file (reflex.conf). See the section Configuring Alkit Confreo for information about how to do this.

RTP data MUST use even port numbers (as specified in RFC3550). Odd port numbers will be used for RTCP data, providing session management and control, and quality feedback.

Using refsipclient to set up sessions

The refsipclient program is a very simple SIP client that can be used to set up a conference session on the reflector. It is a command line program with the following command line parameters:

Refsipclient usage

```
refsipclient [-r] [-d] [-h] -host <hostname> -port <port
number> [-prot <protocol number>] -server <server name>
[-sip_port <port number>] -name <session name> [-bw
<bandwidth>] [-attr <attribute>] -rtptypes <type1> [type2] ...
[type10]
```

Parameters in square brackets are optional. The command line parameters are described in the table below.

Parameter	Argument	Description
-attr	attribute	Specifies an attribute to include in the SDP payload ("a=..."). Can be "recvonly", "sendonly", specifying that the member to be added is only going to send (receive) RTP data, or "notimeout", specifying that the membership of the session shoud never time out.
-bw	bandwidth	Specifies a bandwidth limit for the RTP data. Reflex will transcode the media to meet the desired bandwidth limit.
-d		Disconnect a client from a session (stop reflecting RTP packets to the client).
-h		Prints a help text.
-host	hostname	Specifies the the IP address or hostname of the client to join/leave the session. Note that this can also be a multicast address, to set up the reflector as a multicast gateway. It can also be the hostname/address of another reflector, in case multiple reflectors are being used.
-name	session name	The textual name of the session group to join.
-port	port number	The port number of the session to be used for RTP data.
-prot	protocol_number	The transport protocol to be reflected. Only 17 (UDP) is a valid protocol number (and is the default value).
-r		Add a member to a conference session identified by the '-port', '-prot' and 'name' parameters.
-rtptypes	type1 [type2] ... [type10]	List of RTP payload types that are to be sent/received by this client.
-server	server hostname	The hostname or IP address of the machine running 'reflex'.
-sip_port	port	The SIP port number used by reflex (defaults to 5060)

To set up a conference session, the reflector must be provided with some information needed to start relaying RTP data inbetween a number of clients that are part of the same session. At a minimum, the reflector needs to know the

hostnames or IP addresses of the clients, the UDP port number to use for the session, the RTP payload types that are eligible, and the name identifying the session on the reflector.

The signaling of this information is performed once for each client. It is not necessary, however, that the SIP signaling is performed by each of the clients (although this is probably the most common case). As an example, to set up a conference session called "test" between the hosts called host1, host2 and host3, on a reflector called myreflector, using UDP port number 8000 and the RTP payload types 3 (GSM) and 11 (Linear PCM), refsipclient should be run three times with command line arguments as follows:

Refsipclient example

```
refsipclient -r -server myreflector -host host1 -port 8000
-name test

refsipclient -r -server myreflector -host host2 -port 8000
-name test

refsipclient -r -server myreflector -host host3 -port 8000
-name test
```

After the conference session is finished, the session is removed from the reflector by the following command sequence:

```
refsipclient -d -server myreflector -host host1 -port 8000
-name test

refsipclient -d -server myreflector -host host2 -port 8000
-name test

refsipclient -d -server myreflector -host host3 -port 8000
-name test
```

Specifying a bandwidth limit

By giving the -b parameter to refsipclient when adding a client to a session, the reflector can be instructed to keep the data rate sent to the client to be below the bandwidth limit specified. This is particularly useful for video sessions in heterogenous networks, where some clients have less bandwidth available than others. By setting the bandwidth levels individually for the clients, the whole session is not limited to the capacity of the worst receiver. The video streams are adapted to the bandwidth limit by adjusting the frame rate of the video.

Setting up a send-only or receive-only client

A client can be set up to only send RTP data to a session. In this case the reflector will accept RTP data from the client and reflect it to the other members of the session, but no data will be sent to the client. This can be useful for instance if a video streaming server is set up to stream a video clip to a group of videoconferencing clients. In this case it is not desirable to consume bandwidth by sending all video streams of the session to the video streamer, and the streaming client should hence be set up as send-only. A client is set up as send-only by giving the -attr sendonly command line argument to refsipclient.

In the same way, a client can be set up as receive only by giving the `-attr recvonly` command line argument to refsipclient. This can be useful if one of the clients of a videoconferencing session has no camera, and consequently will only be able to receive video streams (in addition to transmitting and receiving audio streams).

Using a SIP client other than refsipclient to set up a conference session

If a SIP-capable client (other than refsipclient) is to be used to set up a session on a reflector, one must make sure that the correct SIP header fields are set in order for the session to be set up correctly. The SIP address must be the SIP address of the reflector which is `reflex@hostname`, where `hostname` is the hostname or IP address of the host running the reflector. The port number selected for the session by the SIP application must match one of the port numbers the reflector is configured to used (see the section Configuring Alkit Reflex for information about how to configure port numbers.) Moreover, the session name field of the SIP message must be set to the desired session name on the reflector.

Chapter

4

Configuring Alkit Reflex

This chapter explains how to configure Alkit Reflex.

A multitude of configuration options are available for Alkit Reflex. Most configuration options are available through the configuration file, called `reflex.conf`.

Some configuration options are available as command line parameters. We will start by examining which command line configuration options are available, and then go through the configuration file.

Command line configuration options

The followin command line arguments are available when starting Alkit Reflex from a command prompt:

Reflex command line options

```
reflex [-h] [-v] [-d debug_level] [-p port] [-c config_file]
[-l logfile] [-notimeouts] [-rtcp_timeout seconds]
[-no_nat_override]
```

The command line options are described in the table below.

Parameter	Argument	Description
-c	config file	Use 'config file' as configuration file (default reflex.conf).
-d	debug level	Set verbosity level of debugging output 0 (no output) to 3 (verbose).
-h		Print help text.
-l	logfile	Direct all output messages to the specified logfile.
-notimeouts		Disable inactivity timeouts
-no_nat_override		Disable NAT override feature (used when clients connect through NAT firewalls).
-p	port	Set administration port number to 'port' (default 5160).
-rtcp_timeout	seconds	Set inactivity timeout to the number of seconds specified.
-v		Print version number.

Configuration file options

Most of the configuration options of Alkit Reflex is avalable through a configuration file called `reflex.conf`. Usually, the configuration file is in the same path as the reflex executable (i.e. the installation path), but this can be changed by using the `-c` command line option (see above).

In the configuration file, a hash symbol (#) at the beginning of a line is treated as a comment. The following configuration options are avalable:

`LICENSE_FILE <license>`
This indicated to Reflex where the license file is located. `<license>` should be the path to the license file.

`PLUGIN_DIR <dir>`
Reflex has a plugin mechanism that allows to add plugins for getting new functionality. Simply put the plugins you would like to use into this directory and Reflex will automatically add these at startup.

`MEDIA_DIR <dir>`
If you have the plugin *savePicture* you can control where saved sessions will be saved. Enter the directory you would ölike to use.

`TRAFFIC_DESCR <name> <RTP payload type> [<RTP payload type> ...]`
This line tells Reflex which RTP payload types are legitimate, and gives a collection of RTP payload types a logical name (the `<name>` parameter), such as "audio" or "video".

`UDP_PORT <port> <mode> <max_clients> <max_lurkers> <traffic descr>`
Tells Reflex to start reflecting RTP packets on the specified UDP port. The `<port>` parameter must be an even number in the range 1024-65535. (Odd port numbers are used for the corresponding RTCP data.) `<mode>` should be either `DUMB`, to reflect packets, or `MIX` to mix together the ingress RTP streams to one egress stream (for audio only). `<traffic descr>` must match one of the traffic descriptors specified with the `TRAFFIC_DESCR` lines.

`UDP_RANGE <low port #> <hi port #> <mode> <max_clients> <max_lurkers> <traffic descr>`
Same as `UDP_PORT` but for a range of UDP port numbers.

`UDP_PORT_NO_RESTRICTIONS`
The reflector restricts the ports to use for communication to those indicated by `UDP_PORT` or `UDP_RANGE`. Many SIP clients can not cope with this and therefore you can tell the reflector to use the port indicated by the SDP message from the client. Usually, you need to turn off the firewall for the computer that is supposed to run the reflector in this mode as you can not tell before hand which port the client will negotiate.

`FW_TRAV_PORT <port> <data port>`

Enable firewall traversal support for these UDP ports. This can be used to enable a transparent firewall passthrough mechanism that is implemented in Alkit Confero.

FW_TRAV_MODE <symmetric|redirect>
The firewall traversal mechanism to use. When used with confero, use "redirect" mode (default. When used with client applications that require RTP media to be returned on the same socket as media is sent on, use "symmetric".

ADMIN_PORT <port number>
TCP port number used for sending administrative commands to the reflector. You can telnet to this port and type in HELP to see a list of available administration commands.

HOSTS_ALLOW <all | network/mask [network/mask ...]>
Clients belonging to the specified networks are allowed to connect.

HOSTS_DENY <all | network/mask [network/mask ...]>
Clients belonging to the specified networks are NOT allowed to connect.

IP_ADDRESS <IP address> (or IP_ADDRESS_EXTERNAL <IP address>)
Sets the reflector's IP address. Useful in case the reflector has several network interfaces, or alias IP addresses, or if the reflector for some reason is unable to figure out the proper IP address to use. If not specified, reflex finds the IP address by doing gethostname/gethostbyname (i.e. DNS lookup of the host name).

IP_ADDRESS_LOCAL <local IP address>
Specifies the reflector's local IP address. Useful in cases when the reflector is behind a NAT firewall (or on a NAT firewall machine) with several network interfaces, one of which is the externally visible address (specified by IP_ADDRESS or IP_ADDRESS_EXTERNAL, see above) and one is the local area network interface, serving local clients. Using a configuration with two configured IP addresses like this, the reflector can be successfully used as a firewall traversal bridge, interconncting local conference participants with externally connected participants.

Note that IP_ADDRESS_LOCAL requires that IP_ADDRESS (IP_ADDRESS_EXTERNAL) is also specified.

MULTICAST
Enables multicast clients. This makes it possible to add a group of clients to a reflector by specifying a multicast group address, when adding a client to the reflector. This option and IP_ADDRESS_LOCAL are mutually exclusive, i.e. you can only enable multicast support for reflectors with only one network interface.

MEDIA_DIR <path>
Specifies the path to where media should be store, when saving sessions.

PRECONFIG_SESSION_GROUPS
Enables pre-configured session group names. In this mode, sessions groups are not created on demand when the first participants enters a meeting, but rather must be specified beforehand.

Pre-configured sessions can be set-up using the ADDG admin command, or through a configuration file (see below).

PRECONFIG_SESSION_GROUPS_FILE <filename>
Specifies the file name of the configuration file for pre-configured session group names. The specified file is read on start-up to configure a number of pre-configured session groups. The syntax of the file is that each line should contain a port number followed by a sesion group name. Spaces are not allowed in the group names. Lines beginning with a hash symbol (#) or a semicolon (;) are treated as comments.

PLUGIN_DIR <path>
Specifies the path where Reflex looks for plugins.

Index