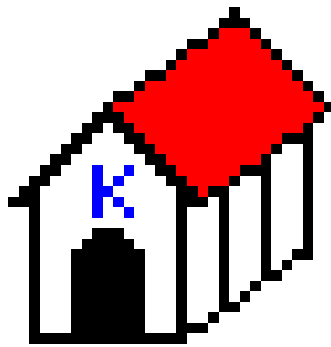


# **KTELNET**



**Version 1.00**

**1999-06-19**

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# Introduction to KTelnet

---

KTelnet is an implementation of Kerberos versions of Telnet and FTP running on Windows 95, Windows 98 and Windows NT. Kerberos is a security system featuring encrypted authentication and transmission of data. With Kerberos no password is ever sent clearly over a network connection session. Telnet is the basic remote terminal protocol used on Internet (based on TCP/IP). FTP is used for transferring file between computer system on Internet.

KTelnet also features a local daemon that will permit a standard mail reader (for example Netscape Communicator or Microsoft Outlook) to take advantage of Kerberos authentication for mail receiving via POP.

When KTelnet is installed on a computer system it consists of two application programs and several Dynamic Link Libraries (DLL). Some of the DLL's can be used without KTelnet if the functionality of Kerberos is needed in some other application. The API and usage of these DLL's is not described in this document.

## Some words about Kerberos and Tickets

For authentication Kerberos is using a data block called 'Ticket'. When an authentication is to take place the client part of Kerberos asks the server for a granting ticket. The granting ticket is encrypted with a key based on the users password, this key is stored in a databases maintained by the Kerberos server. The client receives the encrypted ticket and tries to decrypt it with a key created from a password supplied by the user. After the decryption of the ticket the client verifies the contents of the ticket and if the ticket seems to be reasonable it accepts the ticket. If the ticket can't be decrypted the password is assumed to be wrong and the Kerberos client can give a diagnose message about this. The client can only validate parts of the ticket, one part of the ticket is still encrypted and can only be decrypted by the server. This first retrieved ticket is called a 'Ticket Granting Ticket'. This ticket is only valid for a limited time and only from a specific IP-address.

This 'Ticket Granting Ticket' is hereafter used when a specific ticket for a specific service is needed.

All computers that share the same Kerberos database is said to belong to the same REALM. The Kerberos client will automatically decide which realm a specific computer belongs to based on its full name, for example the machine 'sundance.stacken.kth.se' belongs to the realm 'STACKEN.KTH.SE'. A realm name is usually written with capital letters. A computer may

belong to a realm with a name that differs from the name of the computer, for example 'foxglove.pdc.kth.se' belongs to the realm 'NADA.KTH.SE'. The Kerberos client maintains a list of computers or domains and which realm it should be associated with.

## **Year 2000**

KTelnet have been tested to work into the 21'st century.



# Installation

---

KTelnet is installed on Windows 95, 98 or NT based systems by running its installation program. The installation program will copy several files to a directory (selectable by the user), no files are copied into the windows directories. The installation program will also install some defaults for the program in the registry (all can later be changed by the user in KTelnet).

## Instructions

Start the installation program (usually named 'KTW32.EXE').

Follow the instructions on the screen and KTelnet will be installed on you computer.

If you want to uninstall KTelnet it can be done by opening the control panel and starting the add/remove program utility. Select KTelnet from the list that is displayed and all files belonging to KTelnet and its registry entries will be removed.

# Quick guide to KTelnet

---

## Starting KTelnet

After KTelnet is installed on your computer you can start it in the Start menu-> Program-> Kerberos Telnet->Kerberos Telnet. This will bring you into an empty screen. If this is the first time you are running KTelnet it will be pretty small and centered on the display. If you enlarge the window or move it on the screen KTelnet will remember the size and placement of the window and the next time you are starting KTelnet it will open up its window with this size and placement. KTelnet will emulate a subset of a xterm window.

## Opening a session

To begin a session with KTelnet you will need to have an active connection to the network, either through remote connection by modem or by direct connection to a network (for example by Ethernet or Token Ring). Select 'Connection'-'>'Open' in the upper left menu. This will bring up a dialog box where you can select the type and destination of your session (see figure 1). The displayed dialog box have three pages: 'Telnet', 'Serial port' and 'FTP', the type of session is selected with these three pages.

In the first page (figure 1) a Telnet session is selected. You must supply the name of the host you want to connect to. Type in the name of the system or select one of the earlier systems you have

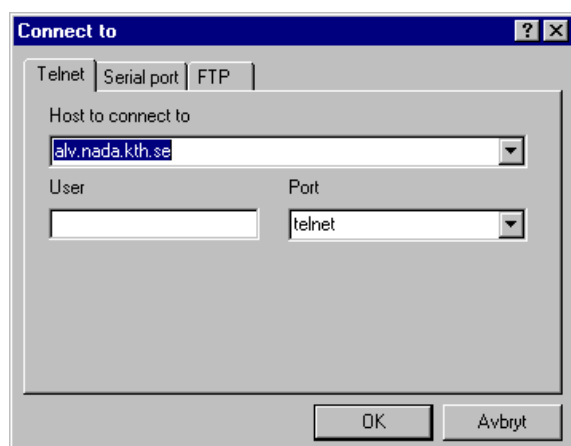


Figure 1: Connect to Telnet session

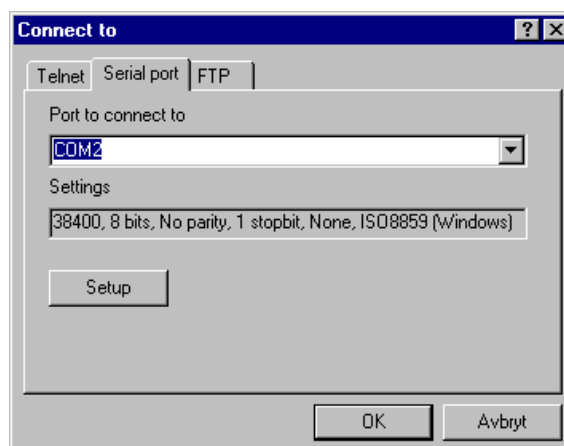


Figure 2: Connect to serial port.

connected (KTelnet remembers the last 10 system you have been connected to). Usually the fields 'User' and 'Port' can be left unaltered, they are used if you want to login as a different user from who you are authenticating as or if you want to connect to a specific port on the host.

The second page (figure 2) is used if you want to use KTelnet as a terminal talking with some system or unit that is directly connected to a serial port on your local computer. In this page you select the serial port and communication parameters for that port.

If you want to run FTP you bring up the third page (figure 3). You select the host to connect to and the user in same way as for Telnet (this page uses a different history for hosts). User can normally be left unaltered.

After you have selected the type of session, host and other parameters you click on OK and the session will start.

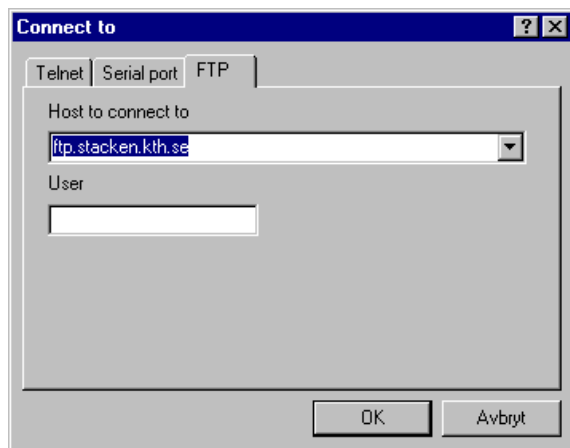


Figure 3: Connect to FTP session.

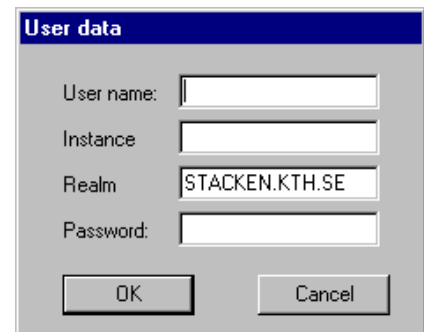


Figure 4: User data

## Telnet session

KTelnet will now try to verify the name of the host and translate it into its generic name. The generic name of the host is needed by Kerberos. If the name could be verified a connection is opened to the host. If the host runs the Kerberos system it will automatically request Kerberos authentication to take place. If you don't have any tickets KTelnet will request your username, password and some other data (see figure 4). Fill in your user name and password. The fields 'Instance' and 'Realm' are normally not changed. When you type your password it will be shown as '\*' in the dialog box. After you have supplied the necessary information you click OK. The Kerberos client will now request the necessary tickets and send the needed tickets to the host. If the host accepts the ticket it will log you in to the host and you can use that computer. During this login sequence encryption will be turned on (you can see this in the status line in bottom of the KTelnet window).

## **Authentication**

If you already have tickets for the realm KTelnet will try to use these tickets during the authentication. If these tickets are not accepted KTelnet will give an error message. If the 'No warning box' flag (see page 16) is not set KTelnet will ask if it should delete the tickets for the required realm and request new tickets. If the flag is set KTelnet will destroy the tickets and ask for new user data (figure 4). The same procedure will be taken if wrong password is given. Because the Kerberos authentication only can be tried one time the connection will be closed and then reopened if new tickets are required.

If you for some reason wants to disable the Kerberos authentication sequence you can put a single '\' in front of the host name, this will disable Kerberos for this session. If you write the hostname as an IP-number (for example 130.237.234.41), this IP-number will be translated to the generic name of the host and Kerberos authentication will take place. If you precede an IP-number with a single '\' both the verification of the hostname and the Kerberos authentication is disabled.

## **Serial port**

This will connect you to the selected serial with the selected communication parameters.

## **FTP session**

This implementation of the FTP client uses a command line interface, this command line interface is running in a KTelnet window. After you have started the FTP session KTelnet will contact the selected server and tries to authenticate you by the Kerberos system. If the host doesn't support Kerberos KTelnet will prompt you for an ordinary user and password (both which will be sent clearly over the connection). If you don't have any tickets the Kerberos client will show the same dialog box as for Telnet (figure 4), supply you user name and password and click OK. The Kerberos client will request the necessary tickets for you and log you into the remote system. You have been logged into the system when you see the command prompt 'FTP>'. When Kerberos authentication has been done only the control channel is encrypted, not the data channel.

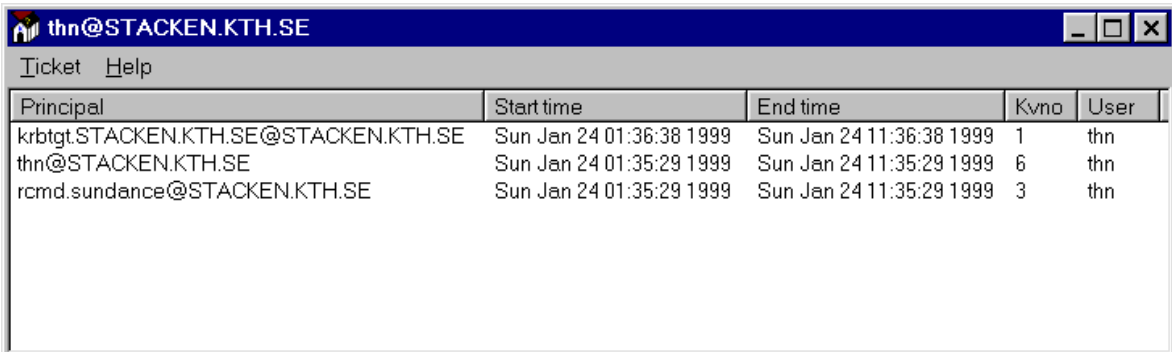
You can now start giving FTP commands to transfer files etc between you computer and the host. The supported FTP commands are described on page 24. Depending on your host you might have to give the command 'KAUTH' to get tickets locally on the FTP host, especially if you will access files on an AFS file system.

## **Closing session**

When you have finished the session you can close KTelnet in a normal Windows way, if the session is still active you will get a question if you really wants to close the session. An alternative to closing KTelnet is to select the menu choice 'Connection'->'Close'. This will close the connection but leave KTelnet running on you local computer.

## Showing tickets

You look into your tickets with the menu choice 'Connection'-> 'Show ticket'. This will start a new copy of KTelnet running the ticket manager. In the ticket manager you see each ticket as a single line showing the name of ticket and the time interval when the ticket is valid (see figure 5). If you are running multiple sessions you will see several tickets in the window.



The screenshot shows a window titled 'thn@STACKEN.KTH.SE' with a menu bar containing 'Ticket' and 'Help'. Below the menu bar is a table with the following data:

Principal	Start time	End time	Kvno	User
krbtgt.STACKEN.KTH.SE@STACKEN.KTH.SE	Sun Jan 24 01:36:38 1999	Sun Jan 24 11:36:38 1999	1	thn
thn@STACKEN.KTH.SE	Sun Jan 24 01:35:29 1999	Sun Jan 24 11:35:29 1999	6	thn
rcmd.sundance@STACKEN.KTH.SE	Sun Jan 24 01:35:29 1999	Sun Jan 24 11:35:29 1999	3	thn

Figure 5: Ticket manager

## Mail support

The program KPopProxy is used when a standard mail reader (for example Netscape Communicator or Microsoft Outlook) is to be used for reading mail and receive mail through the POP3 protocol. It is possible to use a variant of POP3 which will take advantage of Kerberos authentication, this protocol is called KPOP. The program KPopProxy is started on you local computer and will listen for POP3 connections from the local computer. When such a connection is established KPopProxy will bridge the normal POP3 protocol into KPOP and connect to the desired KPOP host.

KPopProxy is meant to be started automatically and will reside on the system tray. During installation you were asked if you wanted to use KPopProxy and if it should be automatically started, if you answered yes to this question a shortcut were created in you autostart folder on your start menu.

After KPopProxy have been started you will need to make some changes in your mail reading program (the exact procedure for this change is not the topic of this manual). You will have to change the following settings:

### POP3 server

#### localhost

Here you shall give the name of the POP3 server, in this case it should be the word *localhost*, this will direct your mailreader to connect to your local machine.

### POP3 user name

#### user/host

Here you shall give your user name and the host where the KPOP server exists separated by a slash, for example *thn/pop.stacken.kth.se*

### POP3 password

#### kerberos

The single word *kerberos* (all lower or uppercase).

When you are trying to fetch mail and you don't have any tickets for the realm where your mail account resides KPopProxy will bring up the dialog box (see figure 4) asking for user data for the realm. Fill in the required information and click OK, tickets will be created and the communication will proceed.

# Reference guide

---

## Command line, KTelnet

KTelnet may be started with arguments on the command line. This is used to start the Ticket manager of KTelnet or directly create a session to another host. KTelnet accepts the following variants on the command line:

### Ticket Manager

```
KTELNET -m
```

This will start KTelnet in Ticket Manager mode (see page 7).

### Bring up Connect to dialog box

```
KTELNET -o
```

This will bring up the 'Connect to' dialog box (see page 4) to open a new session.

### Start Telnet session

```
KTELNET [-l user -p user[.instance][@realm]] host [port]
```

This form is used to open a new telnet connection.

**-l user** Optional argument giving the user name to be logged in as.

**-p user.instance@realm**

Optional argument giving the user name, instance and realm to be used for authentication. If realm is left out it is taken from realm for connected host.

**host** Name of host to connect to. This parameter must be given.

**port** Optional argument giving the port name (or number) of the port to connect to.

## Start serial connection

```
KTELNET -s [port]
```

- s** Start a serial connection
- port** Argument specifying witch port to connect to. If this parameter is not given the 'Connect to' dialog box for serial port (see figure 2) will be shown.

## Start FTP session

```
KTELNET -f [-l user -p user[.instance][@realm]] [host]
```

- f** Start a FTP-session.
- l user** Optional argument giving the user name to be logged in as.
- p user.instance@realm**  
Optional argument giving the user name, instance and realm to be used for authentication. If realm is left out it is taken from realm for connected host.
- host** Name of host to connect to. If this parameter is not given the 'Connect to' dialog box for FTP (see figure 3) will be shown.

## Command line, KPopProxy

KPopProxy doesn't accept any arguments on the command line.

```
KPOPPROXY
```

This will start KPopProxy. If the normal window of KPopProxy is shown it will display a log of different activities during the operation of KPopProxy. This window is normally not used.



# Menus

## KTelnet menus

The menus in KTelnet is used to activate different types of functions. There are four main menus, each having different sub menus (see figure 6).

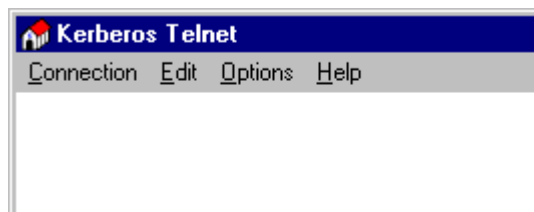


Figure 6: Menus in KTelnet.

### Connection

- Show tickets** Start (or activate) the ticket manager.
- New** Start a new copy of KTelnet and bring up the 'Connect to' dialog.
- Open** Open a new connection in the current window. Only available if no connection is available in the current window.
- Close** Close the connection in the current window.
- Properties** Set properties for KTelnet and Kerberos.
- Exit** Exit KTelnet (and close session in current window).

### Edit

- Copy** Copy current text selection to the clipboard. Only available if some text is selected in current window.
- Paste** Paste text from clipboard into current window as if it had been typed on the keyboard.
- Select all** Select all text in current window for copy.

### Options

- Terminal** Change parameters for terminal.
  - Edit Keymap** Edit keymap (see page 30).
  - Set default keymap** Clear keymap and load default keymap.
  - Import keymap** Read in keymap from file. Asks if current keymap shall be cleared before loading.
  - Export keymap** Exports keymap to file. Exporting and importing keymaps is not guaranteed to work between different versions of KTelnet.
  - Reset terminal** Reset terminal emulator (no text is cleared).

### **Serial port settings**

Change settings for serial port. Only available when serial connection is active.

**Send** Sends several telnet specification codes. Only available when a telnet session is active.

**Are you there**

**Interrupt Process**

**Abort Output**

**Erase Character**

**Erase Line**

**Break**

**Text** Commands for sending and capturing text

**Capture text**

Capture all received characters to a local diskfile

**End capture**

Ends above capture function

**Send text**

Sends text from a local file as it was typed on the keyboard. Brings up a file browser to select the name of the file to be sent. In the same dialog the mode of character conversion can be selected.

**Printer** Functions to control printer.

**Eject page**

Eject page (or sends a Form Feed) to selected local printer.

### **Help**

**About** Shows the about box with copyright and version information

## Ticket manager menus

The menus in Ticket Manager is used to manage the tickets. There are two main menus (see figure 7) and a popup menu when the ticket manager is active on the system tray.

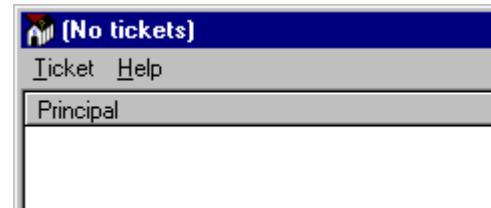


Figure 7: Menu in Ticket Manager

### Ticket

#### New connection

Starts a KTelnet and opens a new connection.

**Refresh** Redraw the contents of the ticket window.

**Properties** Set properties for KTelnet and Kerberos

**Login** Login into a new realm.

#### Change password

Change password for a user in a realm.

#### Destroy tickets

Destroys all tickets (after confirmation).

#### Close window

Close down window (doesn't exit program if Ticket Manager exists on System Tray).

#### Exit ticket manager

Exit Ticket Manager.

### Help

**About** Shows the about box with copyright and version information

### System Tray

**Left click** Bring up the ticket window.

**Right click** Bring up a menu.

## KPopProxy menus

The menu in KPopProxy is used to activate different types of functions. There are three main menus, each having different sub menus (see figure 8) and a popup menu when KPopProxy is active on the system tray.

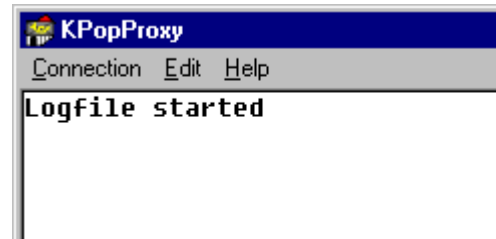


Figure 8: Menu in KPopProxy

### Connection

**Show tickets** Start (or activate) the ticket manager.

**Properties** Set properties for KPopProxy and Kerberos.

### Close window

Close down window (doesn't exit program if KPopProxy exists on System Tray).

**Exit** Exit KPopProxy.

### Edit

**Select all** Select all text in current window for copy.

**Delete all** Delete all text in logwindow.

**Save as** Save text in logwindow into a file.

**Copy** Copy current text selection to the clipboard. Only available if some text is selected in current window.

### Help

**About** Shows the about box with copyright and version information

### System Tray

**Left click** Bring up the main (log) window.

**Right click** Bring up a menu.

## Program Properties

With the 'Properties' choice in 'Connection' menu or 'Ticket' menu different types of properties are set for KTelnet, Ticket Manager and Kerberos Client.

### Main properties

The main properties page (figure 9) contains several flags for KTelnet and FTP, font size for window, cursor style and size of scroll back buffer.

#### Flags

**Auto wrap** Enables automatic wrap of long lines in terminal window.

#### Paint if scroll needed

If checked the whole window is redrawn if a scroll is needed. When running a serial session with high speed (> 9600 bps) characters may be lost due to some behavior of video drivers. Checking this flag bypasses the problem but slows down screen updating.

#### Enable notes

Show notes during establishing of connections.

#### Use FTP passive

Default flag is passive mode shall be used for FTP transfers or not.

#### Show # during FTP

Shows a number sign for every 1024 bytes that is transferred of a file.

#### FTP Prompt mode

A confirmation is needed for every file to transfer in MPUT and MGET commands during FTP.

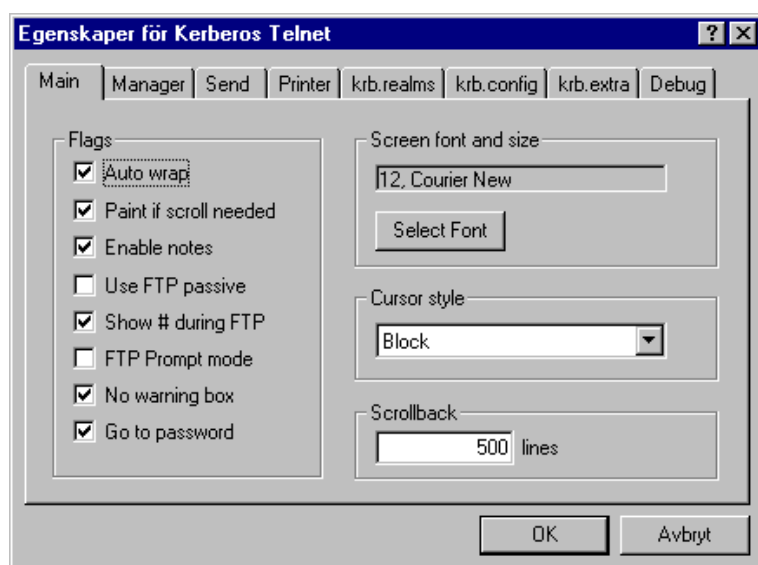


Figure 9: Main properties page.

**No warning box**

Disables the warning box when closing KTelnet and a session is open. Also disables the dialog shown when bad tickets are encountered assuming that the tickets shall be destroyed and that new tickets shall be created (see page 6).

**Goto password**

Defines behavior of dialog box when asking for user name and password. If username and realm is given (or known) the password field is activated when dialog is shown.

**Screen font and size**

Shows the currently selected screen font and size. The 'Select Font' button brings up a Windows Font Selection Dialog. Only fixed pitch fonts are shown in dialog.

**Cursor style**

Allows change of cursor style between 'Vertical bar' (Windows normal), 'Block' and 'Underline'.

**Scroll back**

Sets the size of scroll back buffer. Maximum size is 500 lines. KTelnet must be restarted for this option to take effect if it is changed.

## Pop Proxy properties

The Pop Proxy properties page (figure 10) contains several flags for KPOPPROXY.

### Flags

**Echo**            Echo commands back to POP3 channel. Only used during debug. If this flag is enabled during normal operation the communication with the local mail reader will fail.

### On startup

#### Normal Window

Start a normal window when KPOPPROXY is started.

#### Icon on system tray

Start KPOPPROXY as an icon on the system tray.

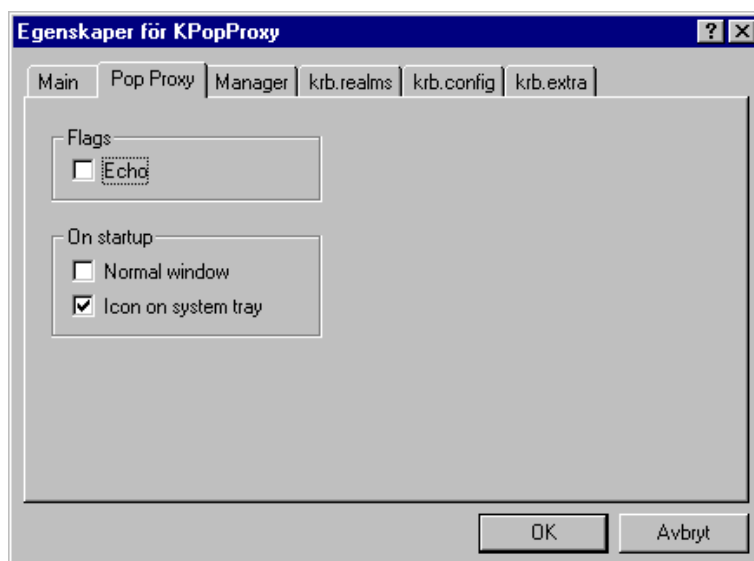


Figure 10: Pop proxy properties page.

## Manager properties

The manager properties page defines the name and behavior of the Ticket manger.

### Ticket manager command line

This specifies the name of the Ticket Manager EXE-file and command line arguments. If KTelnet is used as ticket manager this fields shall contain the absolute path of the KTelnet EXE-file and the argument '-m' to start KTelnet as Ticket Manager (see page 10 for explanation of command line parameters).

### On startup

#### Normal window

Start Ticket manger with a normal window.

#### Icon on system tray

Start Ticket manager as an icon on the system tray.

#### Auto start ticket manager

Let Kerberos libraries start the ticket manager if someone is requesting use of the Kerberos Client.

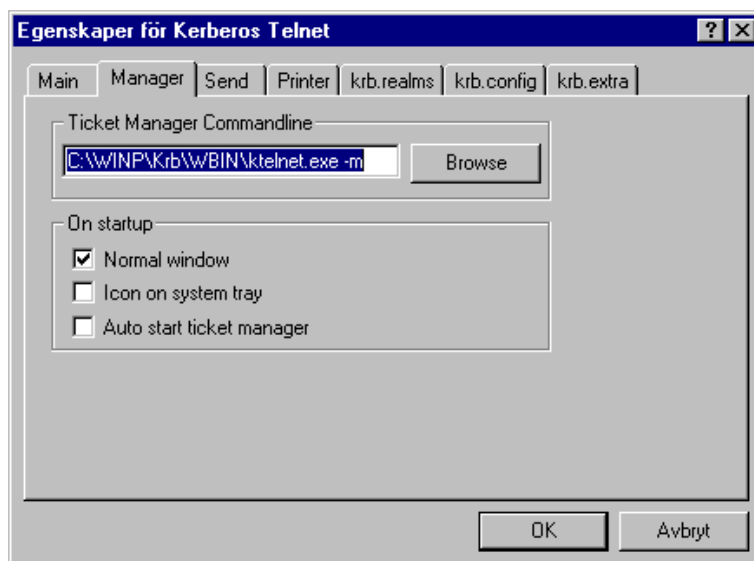


Figure 11: Manager properties page



## Send properties

The send properties defines properties for sending a file with the menu choice 'Option' -> 'Text' -> 'Send text' (see page 12).

### Default character conversion

Defines the default character conversion for sending a text file.

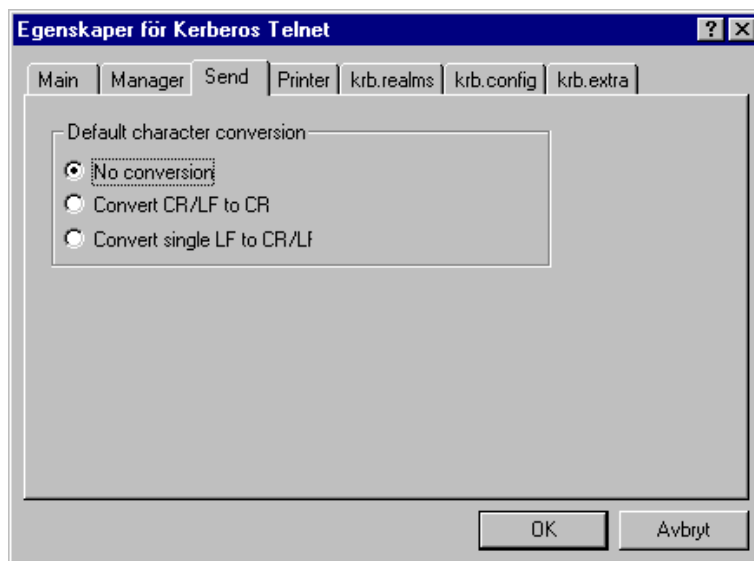


Figure 12: Send properties page

## Printer properties

Defines the properties for local printer. The local printer (if defined) can be activated by host during a telnet session with special character sequences.

### Output

Selects the printer type, setup for printer and font.

**Disk file** Received print data is written to a file. The 'Setup' button brings up a file browser for selection of file.

### Windows printer

Received data is sent to a windows printer. KTelnet simulates a dumb printer acting only on Carriage Return, Line Feed, Horizontal TAB and Formfeed. The 'Setup' button is used to select which Windows printer to use. 'Select Font' is used to select which font (and size) to be used during printing.

### Direct to COM1, COM2, COM3, COM4

Send data to serial printer attached to selected serial port. The 'Setup' button lets you select speed and other characteristics of the serial port.

### Direct to LPT1, LPT2, LPT3

Send data to printer attached to selected printer port.

### Options

#### Show text during print

If checked all characters sent to printer is shown on screen.

#### Append formfeed on print end

If checked the current printed page is printed out when a print sequence is ended.

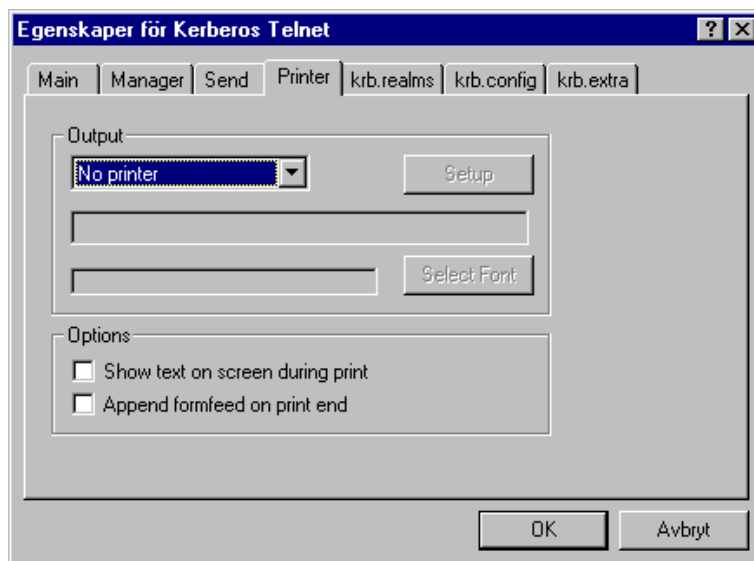


Figure 13: Printer properties page.

## Krb.realms properties page

This page defines realm names for hosts and domains. The data shown on this page is used by the Kerberos Client. This is a list of host or domain names, for each entry a realm is assigned. Data is changed by bringing up a pop up menu in the list window, the pop up menu has the following choices:

**Delete entry** Delete currently selected entry.

**Change domain/node**

Change name of selected domain or node.

**Change realm**

Change name of realm for selected entry.

**Add entry** Add a new entry.

**Import** Import data from a file. The file format is the same as in the original Kerberos file 'krb.realms'. When file is to be loaded KTelnet asks if current list shall be cleared.

**Export** Export current list to a file. The file format is the same as in the original Kerberos file 'krb.realms'.

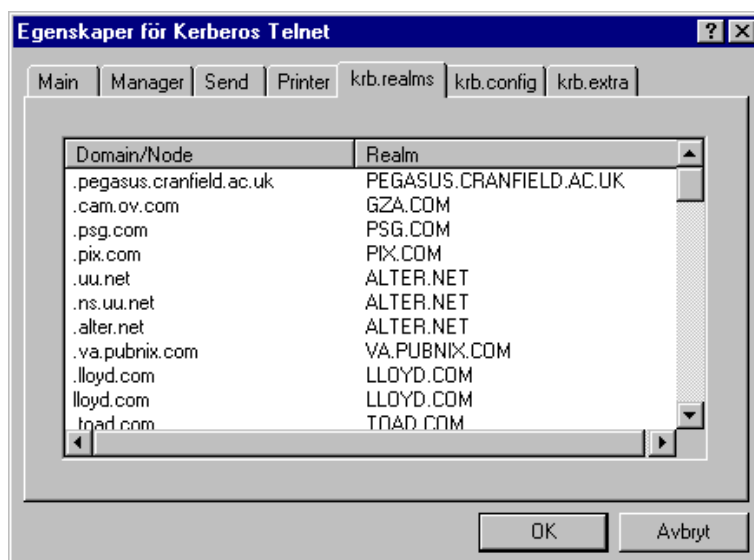


Figure 14: Kerberos realms properties page.

## Krb.config properties page

This page defines the default realm and servers for realms. This list is used by the Kerberos Client. Every entry consists of one realm, a server name and service properties for that server. An entry need only be put into this list if the Kerberos server has a nonstandard name. Data is changed by bringing up a pop up menu in the list window, the pop up menu has the following choices:

**Delete entry** Delete currently selected entry.

**Change default realm.**

Change the name of the default realm.

**Change server/service**

Change name of server or services for selected realm.

**Add realm**

Add a new realm.

**Add server** Add a new server for selected realm.

**Import** Import data from a file. The file format is the same as in the original Kerberos file 'krb.config'. When file is to be loaded KTelnet asks if current list shall be cleared.

**Export** Export current list to a file. The file format is the same as in the original Kerberos file 'krb.config'.

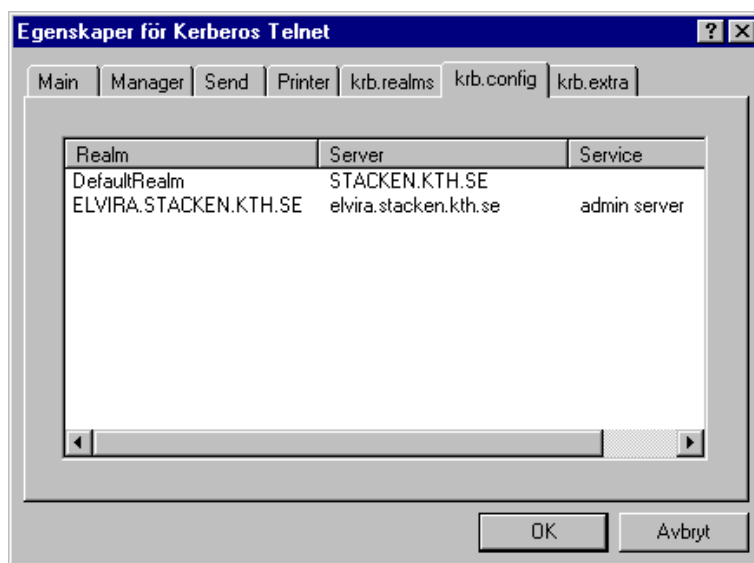


Figure 15: Kerberos configuration properties page

## Krb.extra properties page

This page defines extra properties for the Kerberos client. The data shown on this page is used by the Kerberos Client and KTelnet. This is a list of properties names and values. Data is changed by bringing up a pop up menu in the list window, the pop up menu has the following choices:

**Delete entry** Delete currently selected entry.

**Change variable**

Change name of selected variable.

**Change value**

Change value of selected variable.

**Add entry** Add a new entry.

**Import** Import data from a file. The file format is the same as in the original Kerberos file 'krb.extra'. When file is to be loaded KTelnet asks if current list shall be cleared.

**Export** Export current list to a file. The file format is the same as in the original Kerberos file 'krb.extra'.

This is a few variables used by the Kerberos Client and KTelnet:

**nat\_in\_use** Defines if NAT is used between our local machine and some Kerberos server (see page 29). Value 'Yes' or 'No'.

**kdc\_timesync**

Defines if automatic compensation of time difference between local machine and Kerberos server shall be performed. Value 'Yes' or 'No'.

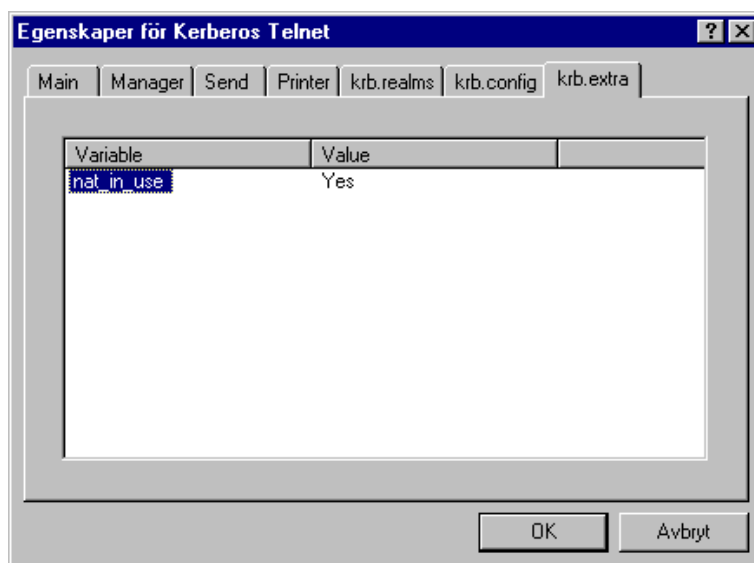


Figure 16: Kerberos extra properties page

## FTP commands

When a FTP session is active the FTP client in KTelnet accepts the following commands:

**ASCII**        Select ASCII mode transfer of files.

**BINARY**      Select BINARY mode for transfer of files.

**BYE**          Close down FTP session

**CD [directory]**  
                Change directory on FTP server.

**CWD [directory]**  
                Change director on FTP server.

**DELETE filename**  
                Delete file on FTP server.

**DIRECTORY [path [localfile]]**  
                List directory on FTP server. If 'localfile' is given output from directory listing is written to this file.

**EXIT**          Close down FTP session.

**GET remotefile [localfile]**  
                Get file from FTP server. If 'localfile' is given file is written to that name, otherwise 'remotefile' is used as local filename.

**HASH**          Toggle printing of a number sign (#) for every 1024 transferred byte.

**HELP**          Show a list of available commands.

**KAUTH [principal]**  
                Start authentication sequence on FTP server to create tickets on FTP server.

**KDESTROY**     Destroy tickets on FTP server.

**KLIST**        List tickets on FTP server.

**LDIRECTORY [path]**  
                List directory on local machine.

**LCD [directory]**  
                Change current directory on local machine.

**LCWD [directory]**  
                Change current directory on local machine.

**LOCALDIRECTORY [path]**  
List directory on local machine.

**LOCALCD [directory]**  
Change current directory on local machine.

**LOCALCWD [directory]**  
Change current directory on local machine.

**LS [path [localfile]]**  
List directory on FTP server. If 'localfile' is given output from directory listing is written to this file.

**MGET wildcard**  
Get multiple files from FTP server in one operation. If prompting is on a confirmation is needed for every file.

**MKDIR path**  
Create directory on FTP server.

**MPUT wildcard**  
Send multiple files to FTP server in one operation. If prompting is on a confirmation is needed for every file.

**PASSIVE** Toggle passive mode. Note that if Kerberos authentication (and encryption) and NAT is used passive mode must be enabled to allow file transfer. KTelnet automatically detects this situation and enables passive mode.

**PROMPT** Toggle prompt mode during transfer of multiple files (MGET and MPUT).

**PUT localfile [remotefile]**  
Send local file to FTP server. If 'remotefile' is given file is written with this name on FTP server.

**PWD** Print name of current directory on FTP server.

**QUIT** Close down FTP session.

**RM remotefile**  
Delete file on FTP server.

**RMDIR path**  
Delete a directory on FTP server.

**TENEX** Enable BINARY and TENEX mode on FTP server.

## Supported XTERM commands

The ANSI emulator in KTELNET supports a subset of XTERM and ANSI control sequences. The following list is only shown as a reference of which control character and sequences KTELNET accepts.

### Definitions

c	The literal character c.
C	A single (required) character.
Ps	A single (usually optional) numeric parameter, composed of one or more digits.
Pm	A multiple numeric parameter composed of any number of single numeric parameters, separated by ; character(s).
Pt	A text parameter composed of printable characters.

### Supported sequences

BEL	Bell (Ctrl-G), makes a standard Windows beep.
BS	Backspace (Ctrl-H).
TAB	Horizontal Tab (HT, Ctrl-I).
LF	Line Feed or New Line (NL, Ctrl-J).
CR	Carriage Return (Ctrl-M).
ESC # 8	Fill screen with the character 'E'.
ESC 7	Save Cursor.
ESC 8	Restore Cursor.
ESC =	Application Keypad.
ESC >	Normal Keypad.
ESC <	ANSI mode.
ESC D	Index (Cursor down).
ESC E	Next Line.
ESC H	Tab Set at current column.



ESC M        Reverse Index (Cursor up).

ESC Z        Return Terminal ID: ESC [ ? 1 ; 2 c

ESC [ Ps @    Insert Ps Character(s) (default = 1).

ESC [ Ps A    Cursor Up Ps Times (default = 1).

ESC [ Ps B    Cursor Down Ps Times (default = 1).

ESC [ Ps C    Cursor Forward Ps Times (default = 1).

ESC [ Ps D    Cursor Backward Ps Times (default = 1).

ESC [ Ps ; Ps H  
              Cursor Position [row;column] (default = [1,1]).

ESC [ Ps J    Erase in Display (ED)  
              Ps = 0 -> Clear Below (default).  
              Ps = 1 -> Clear Above.  
              Ps = 2 -> Clear All.

ESC [ Ps K    Erase in Line (EL)  
              Ps = 0 -> Clear to Right (default).  
              Ps = 1 -> Clear to Left.  
              Ps = 2 -> Clear All.

ESC [ Ps L    Insert Ps Line(s) (default = 1).

ESC [ Ps M    Delete Ps Line(s) (default = 1).

ESC [ Ps P    Delete Ps Character(s) (default = 1).

ESC [ Ps c    Send Device Attributes  
              Ps is ignored, always answer ESC [ ? 1 ; 2 c

ESC [ Ps ; Ps f  
              Horizontal and Vertical Position [row;column] (default = [1,1]).

ESC [ Ps g    Tab Clear.  
              Ps = 0 -> Clear Current Column (default).  
              Ps = 3 -> Clear All.

ESC [ Ps h    Set Mode  
              Ps = 4 -> Insert Mode

ESC [ Ps i    Start/Stop Printer  
              Ps = 5 -> Print start.  
              Ps = 4 -> Print end.

ESC [ Pm l    Reset Mode  
              Ps = 4 -> Replace Mode.

ESC [ Pm m    Character Attributes  
              Ps = 0 -> Normal (default).  
              Ps = 1 -> Bold.  
              Ps = 4 -> Underscore.  
              Ps = 5 -> Blink (appears as Reverse).  
              Ps = 7 -> Inverse.

ESC [ Ps n    Ps ignored, always return cursor position as ESC [ r ; c R

ESC [ Ps ; Ps r  
              Set Scrolling Region [top;bottom] (default = full size of window).

ESC [ ? Pm h    DEC Private Mode Set  
              Ps = 1 -> Application Cursor Keys.  
              Ps = 6 -> Origin Mode.  
              Ps = 7 -> Wraparound Mode.

ESC [ ? Pm l    DEC Private Mode Reset  
              Ps = 1 -> Normal Cursor Keys.  
              Ps = 6 -> Normal Cursor Mode.  
              Ps = 7 -> No Wraparound Mode.

ESC ] Ps ; Pt BEL  
              Set Text Parameters  
              Ps = 0 -> Change Icon Name and Window Title to Pt.  
              Ps = 2 -> Change Window Title to Pt.

ESC c        Full Reset.

## Running through NAT

NAT (Network Address Translation) is a technique to allow several local system share the same IP-address at the same time when they connect to Internet or an Intranet, for example when an ISDN connection is used to Internet from a small LAN. The ISP supplies only one IP-address for the connection and the local ISDN router rewrites all packets that is routed between the local network and Internet. The computers on local network usually uses addresses from the 10.0.0.0 net. This may also be called PAT (Port Address Translation) or 'Single User Account'.

During a telnet session this is not a problem but for FTP and for password change KTelnet and the Kerberos Client must be aware of this, in some cases the Kerberos Client must supply its own IP-address to the server in a Kerberos packet, the address supplied must be the same address that the Kerberos Server sees the client as. The Kerberos Client supplied with KTelnet can handle this. For efficiency this must be enabled in the Kerberos Client, this is done with the 'nat\_in\_use' property. This property is set in the 'krb.extra' properties page (see page 23).

## Editing keymap

During a session all keys (except for the Shift, Control and Alt) can be bound to send a arbitrary sequence of characters or to perform a command inside KTelnet. The exact action of every key is defined through the 'Options'-> 'Terminal'-> 'Edit Keymap' menu choice. This will bring up a dialog box (see figure 17) in which the keymap can be edited.

The simplest way to edit the definition of a key is to click in the 'Press to Select Key' button and then press the desired key combination on the keyboard. This will update the 'Key' and 'Shift status' fields with the press key combination and show the current definition.

'Windows' means that the key combination is handled by windows and may generate a character to be sent to the remote system (this is the normal case for all 'normal' keys). 'Command' means that the key combination shall activate a given KTelnet command. 'Send string' means that the given characters shall be send to the remote system. In the example shown the characters ESCAPE, 'O' and 'P' is sent to the remote system when function key F1 is pressed on the keyboard. If a non printable character shall be sent it could be written as an octal constant (three digits) be preceding them with an backslash ('\'). Some commonly used non printable characters has a shortcut:

- \a      Send a BEL, ASCII 7.
- \b      Send a Backspace, ASCII 8
- \t      Send Horizontal TAB, ASCII 9
- \n      Send a Line Feed, ASCII 10
- \r      Send a Carriage Return, ASCII 13
- \e      Send an ESCAPE, ASCII 27

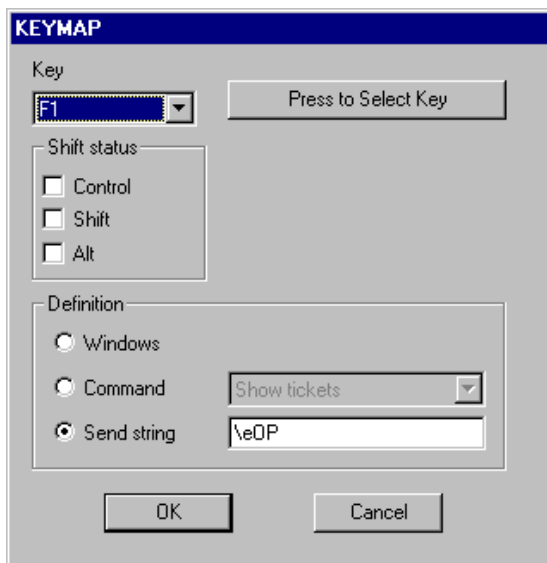
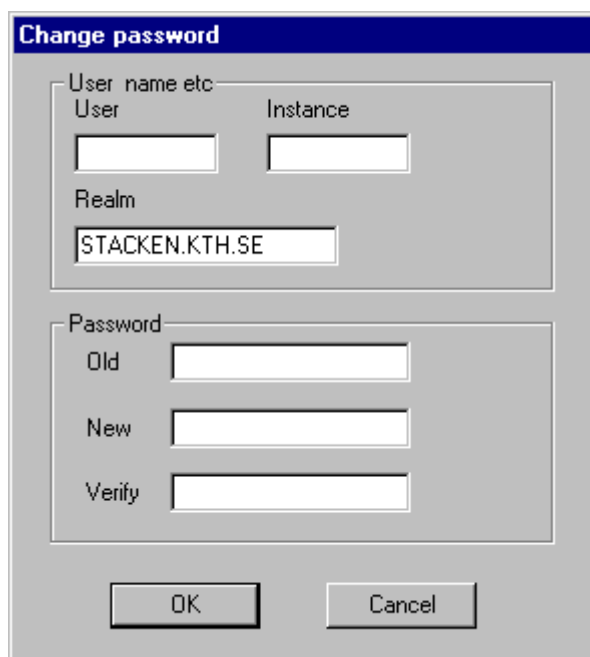


Figure 17: Editing of keymap

## Changing password

It is possible to change the password in a realm from the Ticket Manager. The menu choice 'Ticket'-> 'Change password' will bring up a dialog box (see figure 18), fill in all data in this dialog box and press 'OK'. During the sequence of changing password the normal tickets will be replaced by some special tickets for password change. After the password change is completed or aborted the normal tickets is restored. It is only possible to change the password for yourself.



The dialog box titled "Change password" contains the following fields and controls:

- User name etc**
  - User:
  - Instance:
  - Realm:
- Password**
  - Old:
  - New:
  - Verify:
- Buttons:  and

Figure 18: Change of password