telconi

Terminal

for Cisco IOS®

User's Manual

TECHNOLOGY PREVIEW VERSION



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Credits

Telconi Terminal *for Microsoft Windows* and *Unix* is based in part on the work of the FLTK project (http://www.fltk.org). *Microsoft Windows* and *Unix* versions also use "FLU – FLTK Utility Widgets" by Jason Bryan.

About this Manual

This Document describes the preview version of *Telconi Terminal* and should be considered as work in progress, so it might be outdated. For an up-to-date version of this document, please refer to our website http://www.telconi.com.

Update: By the time of writing, Windows and Unix/Linux versions weren't available. This manual has been updated to cover the new versions, but some parts may only apply to MacOS X.

Recent Changes

The following recent changes and additions are not covered yet:

Version 04a

- Support for Microsoft Windows (98, NT, 2000 and XP)
- Support for Linux
- Bug fixes

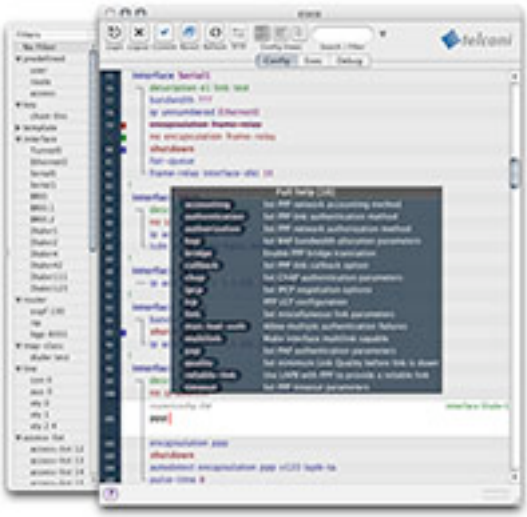
Version 03a

- debug and exec sessions connected only as needed
- help facility runtime cache improvements
- improved exec mode formatting
- improved event handling for inline views
- ability to clear interfaces from config mode
- more output options in configuration view
- more meaningful error messages
- some bug fixes and other minor improvements

Version 02a

- improves exception handling
- adds views for all defined access lists
- adds interface accounting display in config mode
- adds confirmation dialogs to commit and revert
- reduces the size of PDF printing output
- corrects some minor memory leaks
- fixes an issue with input focus
- fixes an issue with fonts
- improves event handling

1 Preface



Cisco® routers and switches are usually configured using a poor command line interface (CLI) and require general knowledge of networking technologies, protocols and Cisco IOS®. Some existing network management applications may cover fault-, software- and other management tasks pretty well. For most other tasks, however, you'll have to step down to the command line interface.

Telconi Terminal, a network management productivity application for Cisco IOS® based routers and devices, helps network administrators to accomplish their daily work more efficiently and comfortably by complementing the IOS® command line interface with a more convenient, interactive visual user interface.

In a network management model, it most closely resembles a local craft terminal or element manager. The application requires knowledge of the underlying networking technologies, network protocols and IOS® and does not try to remove the complexities of router configuration and network administration.

2 Introduction

Note: You should read this section with some sense of humor.

2.1 The Joy and Pain of Using Cisco IOS®

Cisco® IOS® command line interface (CLI) is quite flexible and allows you to enter complex configurations elegantly with only a few configuration lines. For historical and other reasons, however, it has some flaws for the more experienced user. Its original intention appears to try to keep users from entering configuration lines before they think, which makes sense. Assume we want to **remove a secondary ip address definition** on an Ethernet interface. Now we type:

```
$ telnet <router>

Username: <your-user-name>
Password: <your password>

Router>
```

Now we arrived at the first prompt. We can't do much. Now we have to proceed to the privileged level by:

```
Router> enable
Password:  <your password>
```

All right, now we see another prompt:

```
Router#
```

Having arrived at this point, we usually do a "`show running-config`". Thanks to the command line abbreviation and completion functionality, typing isn't so hard. So we keep on typing the **TAB** key until it beeps or remember working abbreviations, such as "`sh run`". At some point, we enter the configuration mode to get to another prompt by:

```
Router# configure terminal
Router(config)#
```

As we did a "`show running`" before, we figured out what the interface number of our target interface is, maybe we have to scroll a bit back with our terminal emulation. Okay, the interface of choice was "`Ethernet 1`" because we've seen this configuration fragment in our (possibly quite longish) output:

```
interface Ethernet 0
  ip address 10.1.2.1 255.255.255.0
  ip address 10.1.2.3 255.255.255.0 secondary
```

Now, we enter the context of that interface:

```
Router(config)# interface Ethernet 1
Router(config-if)#
```

So, after having arrived at the 4th prompt now, we can now the secondary ip-address (as long as we remember what it was we wanted to do in the first place):

```
Router(config-if)# no ip address 10.1.2.3 255.255.255.0 secondary
```

It is important to note that completion does not work for parameters such as ip-addresses or netmasks. We have to type in the entire line (or, of course, use our terminal emulation, scroll back, copy the entire line in our paste buffer, just type in "`no`" and then paste the line with the terminal emulation. Usually we would type **TAB** and? several times during the whole process, causing help facility output to scroll the context way up, making it hard to scroll back to our configuration output. Finally, we want to check if everything is all right. We now have the convenience to press "**CTRL-Z**" and break back to levels, right back to our EXEC mode prompt:

```
Router#
```

Now, we enter something like "`show interface Ethernet 1`", or "`show running-config`" again. Assume we like what we see, the router does not yet have the configuration saved in its non-volatile memory. To do so, we type the command:

```
Router# write
```

We're done.

2.2 An Alternative Way...

With *Telconi Terminal*, the whole task would look like:

- log in (in the final version by selecting your pre-configured router and pushing a button)
- click on the interface of choice in the dynamic filter list
- position the mouse over the configuration line and select the **negate** operation
- hit **RETURN**
- to save it to non-volatile memory, push the **commit** button

Point is, things will be easier to enter. However, you've to know *exactly* what you are doing. You need to understand the concepts of IOS®, the router's entities and the meaning of the configuration lines. You can't just click and play.

3 Prerequisites and Requirements

3.1 Operating System Requirements

Currently we support Mac OS X 10.3 (Panther release). Earlier versions of Mac OS X are not supported. The PC version will run on Microsoft Windows XP and Microsoft Windows 2000. Later, we also plan to create a Unix versions for Sun Solaris and Linux, depending on demand.

Update: Windows and Unix/Linux preview versions are available now due to user demand. The current version runs on Windows XP, Windows 2000, Windows NT and Windows 98. Windows 95 is not supported. The Unix/Linux version works with newer distributions, such as Redhat 9. Soon, we will release for more Unix platforms, such as Sun Solaris.

3.2 Supported Platforms and IOS® Versions

Telconi Terminal has been designed to support all IOS® based devices. The preview version has been tested with many devices such as Cisco® Series 2500, 3600 7200 routers and Catalyst 3500XL/2900XL switches running IOS® version 12.x. It is not possible to test all combinations of routers, IOS® versions and line cards, so Telconi Terminal might not work correctly with your configuration. If you encounter problems with your configuration, please feel free to report them as explained in the feedback section of this manual.

3.3 Router Configuration Requirements

The router must be accessible through an IP network. We currently do neither support serial lines nor SSH access in the preview version. Later versions will include SSH access, but support for serial lines is not yet planned. The router must be configured for multiple TELNET connections and must have an IP address assigned. This initial configuration must be preconfigured using a traditional terminal application. A sample minimal configuration using a single TELNET session password is:

```
enable password <your password>

interface Ethernet0
    ip address 10.1.1.1 255.255.255.0

line vty 0 4
  password <your password>
```

Using this model, there are no usernames required when logging in. IOS® also supports a commonly used alternative model, allowing to authenticate with different user names, which can be configured like:

```
aaa new-model
username admin password <your password>
enable password <your password>
```

There is much more to configure (with privileges, RADIUS authentication, things like TACACS+ command authorization etc.). What you will need for *Router Terminal* to function correctly is a user configured with full access to the router after entering enable mode.

Update: Also, users configured for privilege level 15 (no need to enable) will not be able to log in as the enable password is an required text field in the login panel. This will be corrected in future versions.

Also note the router should allow four concurrent sessions, as three are required for each *Telconi Terminal* session.

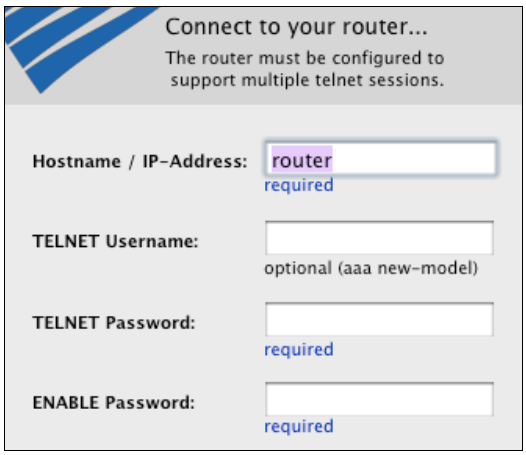
4 How to Use Telconi Terminal

4.1 Getting Started

Download the latest version from our website http://www.telconi.com. After downloading the distribution file, copy the application to your hard disk and double-click it. In the preview version, the application window and a login dialog should appear.

4.1.1 Connecting to the Router, Switch or other Device

Before you can connect to a router, you must enter your connection information in the following dialog:



Hostname / IP-Address

IP-Address or hostname of your router.

TELNET Username

If your router is configured for `aaa-new` model, you must enter your user name here. If you're using simple telnet passwords, this field must be left blank.

TELNET Password

Either your virtual terminal password or the password configured for the username entered above (depending whether you use `aaa new-model`).

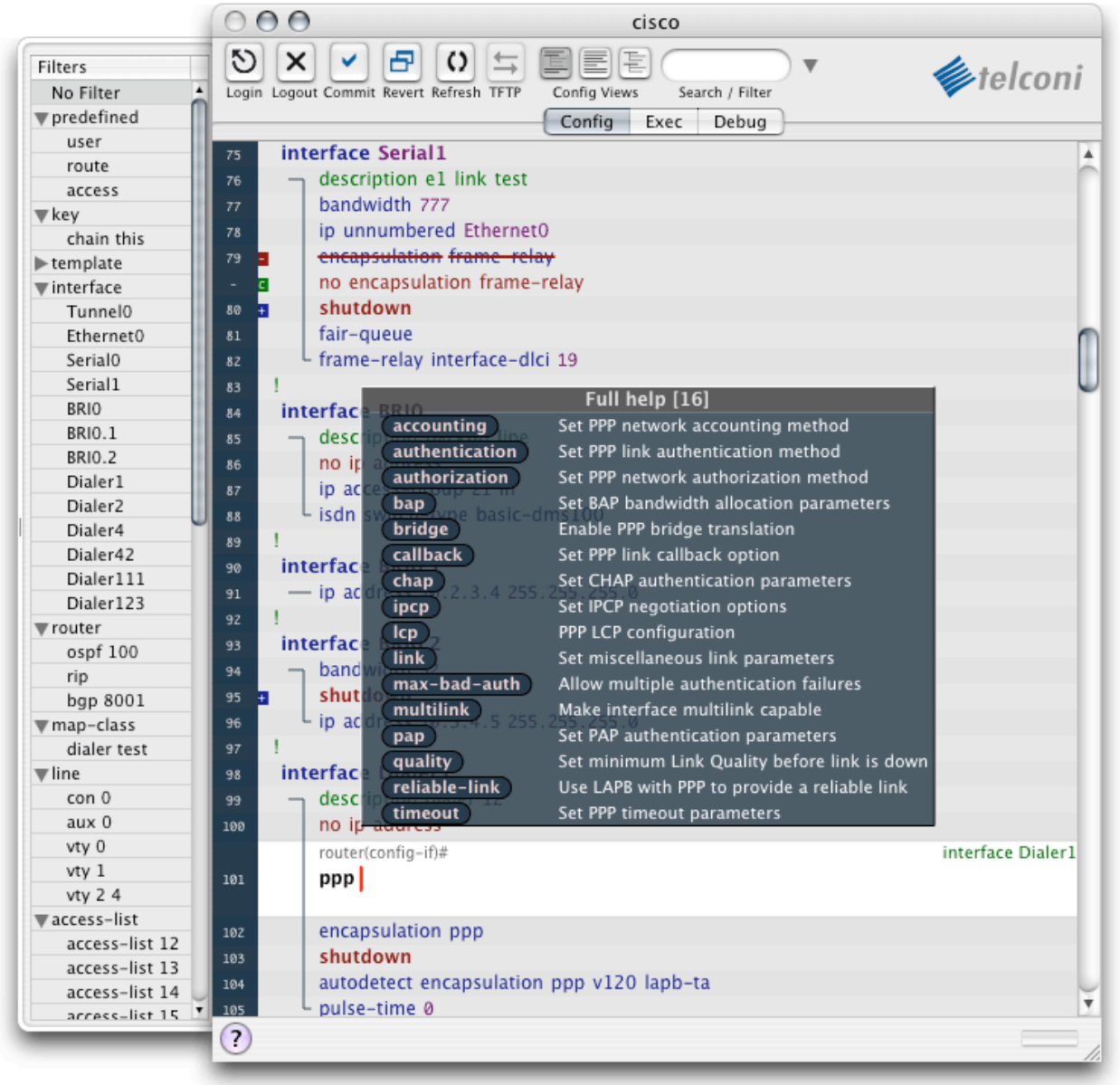
ENABLE Password

The password you configured for privileged command and configuration mode.

Preview version note: The preview version requires you to enter all login information each time you connect. Later versions will allow to create and save profiles for a number of routers.

4.1.2 Basic User Interface

Once you successfully connect to your router, the application window will appear like this:



The main window has three tabs, letting you select **Configure**, **Exec** and **Debug** sessions. These tabs represent three independent sessions. The drawer on the left shows a list of dynamically discovered configuration filters for interfaces, lines and other entities for fast configuration navigation. The controls on the top let you **re-login**, **reconnect** one of the three sessions and allow further configuration file filter settings.

Preview version note: The preview version allows you to connect to one router at a time. Later versions will allow to connect to multiple routers simultaneously.

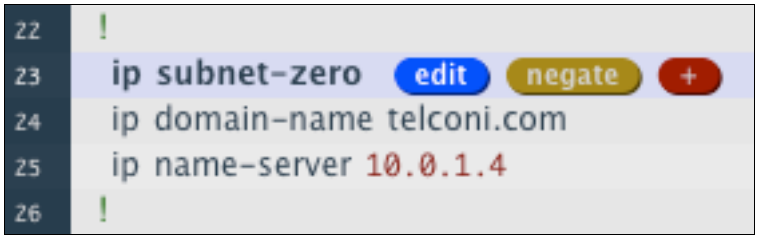
4.2 Configuration Session

To enable the config sessin, select the **Config** tab of the main view. It represents a session in configuration mode and allows you to edit or add individual configuration lines in a full-screen fashion. It also gives you access the routers built-in help facility as you type. The configuration displayed is always the *"running-config"* of your router.

The Config session operates in two modes. Each mode has it's own keyboard and mouse bindings.

4.2.1 Line Selection Mode

This mode is used to select configuration lines and operations on configuration lines. As you move your mouse over the configuration view, lines on which you can apply operations (like edit, add, negate), appear in a highlighted fashion as follows:



In selection modes, the following keys bindings apply:

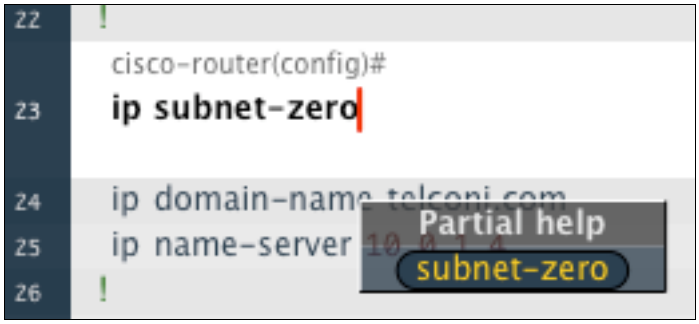
H (also HOME)	first line, beginning of configuration
G (also END)	last line, end of configuration
CURSOR-left	select previous word
CURSOR-right	select next word
CURSOR-up, K, P or CTRL-P	previous line
CURSOR-down, J or N or CTRL-N	next line
TAB	next configuration section
SHIFT-TAB	previous configuration section
A, I, + (also INSERT)	add a new line after selected line
BACKSPACE or -	enter editor with line negated (i.e. with "no" prepended)
RETURN, E or C	start editing this line
SPACE (also PAGE DOWN)	scroll down a page
B (also PAGE UP)	scroll back (up) a page

You can also just click on a line using the mouse. If you select a word of a line, only words before the selection will be copied.

Note: We've defined some keyboard alternatives to Cursor keys – especially for those who are used to the Unix *vi* editor. The line selection mode (i.e., selecting a line before entering line edit mode) in *Telconi Terminal* is quite similar to *vi*. Some default *Emacs* key-bindings will also work.

4.2.2 Line Editing Mode

After you've selected a line (by left-clicking the mouse or typing **+**, **RETURN** or **BACKSPACE, A, C or E**), a little terminal input window opens within the line selection area:



Note: if you intend to insert a new global configuration line, just enter **+** or **a** after any other global configuration line or the last line of an indented section such as an interface definition. To add a new line within an interface, use **+** or **a** while selecting the first or any other but the last one of a given configuration section. To leave this mode, press **ESC** left-click outside the highlighted area. The line selection mode will also be entered once the mouse leaves the viewing area. No changes are sent to the router unless you press the **RETURN** key in this mode. In line editing mode, you may simply use the same command line editing keys as you normally would. With exception of **ESC**, the command line editing keystrokes are transparently passed to the CLI interface, such as:

CTRL-A	move to the beginning of line
CTRL-E	move to the end of line
CTRL-W	delete word
CTRL-K	delete to end of line
CTRL-B	one character backward
CTRL-F	one character forward
CTRL-L	redisplay current line
CURSOR-left	one character backward
CURSOR-right	one character forward
TAB	complete command
?	get help
ESC	return to line selection mode

As shown above, it is also possible to access the built-in router help facility. The help overlays appear after a left mouse click, the?-key or **CURSOR-Up**. Once an overlay is visible, items on the help overlay can be selected and copied to the command line as follows:

CURSOR-up	previous item of help overlay
CURSOR-down	next item of help overlay
CURSOR-right	copy item to command line
RETURN	copy item to command line
Left-Mouse	copy item to command line
SPACE	scroll in multi-page overlays

4.3 Using Filters to Navigate in Configurations

Router configurations can be lengthy and confusing. To quickly jump to a configuration section of interest or to search for something specific, Telconi Terminal features a built-in configuration filter.

4.3.1 Static Filters (Config views)



Update: Currently unavailable on Microsoft Windows and Unix/Linux

These static, built-in filters allow you to toggle the configuration view as follows:

- everything, including global and indented configuration lines
- global configuration lines only
- indented configuration lines only, such as interfaces

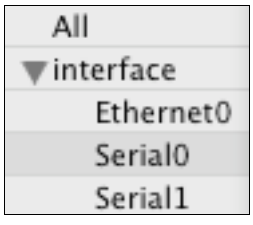
Static filters will be available only if the Search / Filter field is blank.

4.3.2 Incremental Search Filter



You also can define a filter by entering some text in the Search / Filter field. The configuration view changes incrementally as you type. This allows you to quickly find specific definitions for users, passwords, IP-addresses and so on. If you search for patterns in indented sections of the configuration file, the entire section – and not just the single line – will be included in the search result.

4.3.3 Dynamic Filters



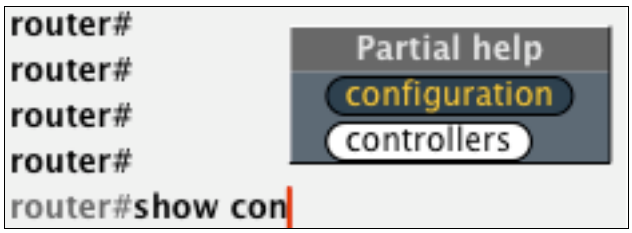
As you log in, Router Terminal automatically builds up a list of dynamic filters according to the configuration file loaded. In this list, you will see such entities as interfaces, controllers, routers, addresses etc. Selecting an item will set the incremental search filter.

4.4 Using the Router's Help Facility

As mentioned earlier, Telconi Terminal lets you access the router's built-in help system in a comfortable manner. Using a traditional terminal software, help system output is written below your current line, causing the display to scroll and disturbing your vision and context. In *Telconi Terminal*, help system output is being captured and displayed in dynamic overlay windows. In addition to a more convenient display, you also can select items in those overlays to copy them to your command line. Alternatively, of course, you might want to use the command completion feature of IOS®.

4.4.1 Partial Help

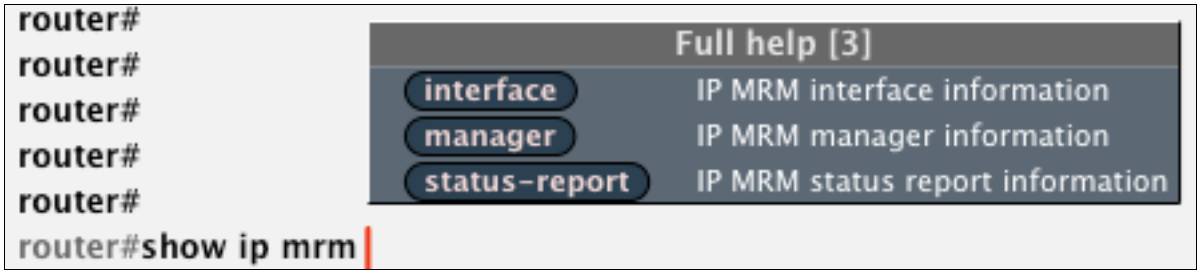
If the cursor is in a word (i.e. not after a SPACE character), the router outputs partial help. Partial help shows you possible completions for the word you've started to type, such as:



Help is invoked by pressing the?-key. In the configuration view, you can alternatively use the **CURSUR-Up** key. Here, the character before the cursor is not a SPACE character. Command line completion does not work, as two choices are possible: controllers and configuration. In Telconi Terminal, you can highlight items by using either the mouse or cursor keys. To copy an item to the command line, use either the **RETURN-key**, **CURSOR-Right-key** or left-click with the mouse. To hide the help overlay again, use the **ESC-key**. Use the **SPACE** key to scroll to the next page a multi-page overlay**.**

4.4.2 Full Help

Full help, a somewhat more descriptive help system output, is being shown if the cursor is not in a word, i.e. after a space character or at the beginning of a line. Full help includes a descriptive line for each item. Keyboard use is identical as with partial help. Here's a sample output:



4.5 IOS® Responses and Messages

The router gives you feedback as you enter wrong commands, some required entity hasn't been configured yet and so on. Usually, this is output to the terminal in separate lines, causing the screen to scroll as with the help system. For example:

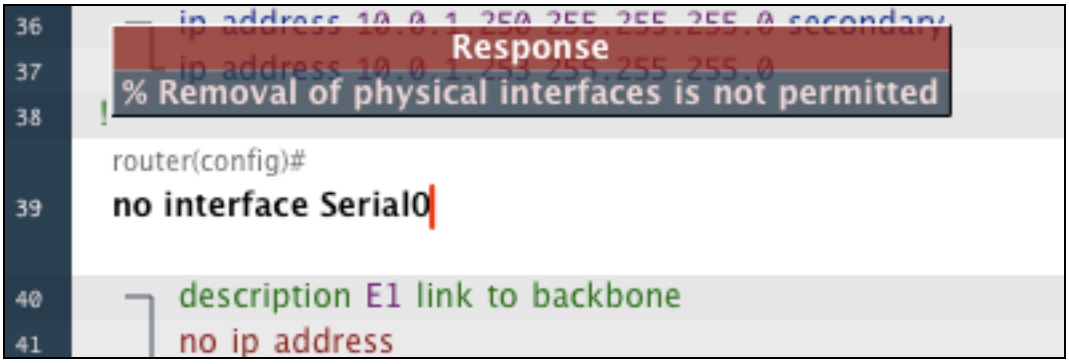
```
router(config)#no interface serial 0
% Removal of physical interfaces is not permitted
router(config)#
```

or

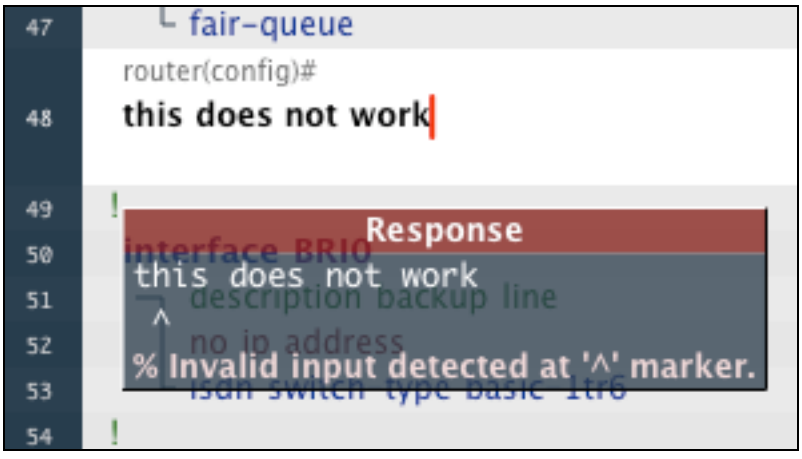
```
router(config)#this does not work
                ^
% Invalid input detected at '^' marker.

router(config)#
```

The ladder example shows a caret indicating the position the parser would not understand. Using *Telconi Terminal,* the same messages are displayed as overlays – just like the help facility:

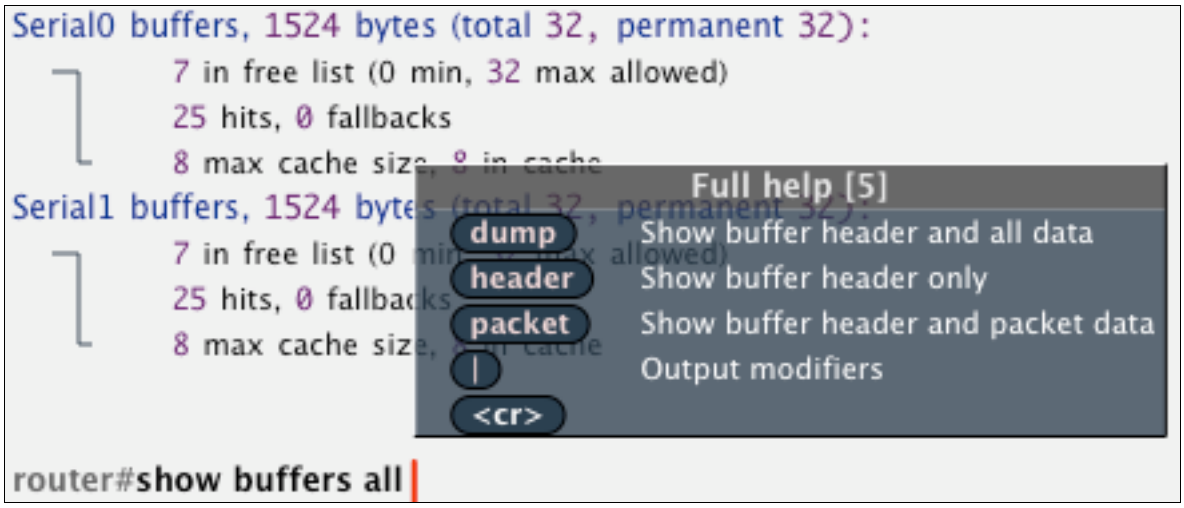


and



4.6 Exec Session

To enable the Exec session, select the **Exec** tab of the main view. It represents an individual session and is used to enter non-configuration commands, such as displaying interfaces and so on.



Using the Exec session is similar as using the line editing mode in configuration mode., including the use of the help facility However, the following key bindings apply (if the help overlay is not displayed):

CTRL-P or CURSOR-up	one command up in command history
CTRL-N or CURSOR-down	one command down in command history

Note: In the line selection mode, these keys will not show the command history, but position the line selection cursor accordingly.

Despite of an often more readable output and are more convenient way to use the help system, using the Exec mode is quite similar as using traditional terminal emulation. You may also enter the configuration mode in Exec mode, but make sure to reload the configuration view after you have made any changes to obtain a configuration view consistent with the routers memory.

4.7 Debug Session

If you enable debugging in Exec mode, debugging output is being sent to a terminal with monitoring enabled. Debugging output is written directly to your terminal and is disturbing if you use the same session to enter commands. So using a traditional terminal, you usually would connect a second session for debugging output.

The debug session represents a separate session with debugging output enabled (as if you `type terminal monitor`) in the Exec session. This session is automatically initiated and configured as you log in. Usually, you would not type in this session and look at it's output only. The last line of this window is also displayed in the status line.

4.8 Using the built-in TFTP Server

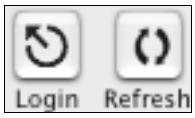


The *Telconi Terminal* application features a built-in TFTP server to transfer configuration files and software images to and from your router.

Preview version notice: As this feature requires root permissions to work, it has been disabled in the preview version. Later versions will enable this feature. You will be able to transfer configuration files and software images from and to the connected router in an integrated GUI.

4.9 Logging in and Refreshing a Session

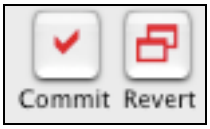
There are two buttons above the main viewing window:



The **Login**-button brings up the login dialog again. All three sessions will be terminated and you have to enter your connection information again.

The **Refresh**-button is used to reload the current session only (i.e. the session selected by the tab above the main viewing window). It remembers the passwords you initially typed, terminates the current session and reloads it. This is being used mainly to refresh the configuration view in the main window after having applied some modifications.

4.10 Commit and Revert



These two buttons should be used with caution. They are used to control the routers non-volatile memory (NVRAM). What you see in the configuration view is the "running-configuration" of the router, the configuration in the routers volatile memory (RAM). Any configuration changes you make will be lost after a reboot (or reload) of the router, unless you copy the current configuration to the non-volatile memory (NVRAM). Note that if you either **commit** or **revert** the current configuration, the displayed configuration is consistent with what the router will use at the next reboot phase. Otherwise, the router will fallback to the last committed variant of your configuration.

Commit

This button will commit any changes in the running configuration and make them permanent (by writing it to NVRAM). After a reboot of the router, uncommitted changed will be lost. The commit button is equivalent to typing

```
Router# write
Router# show config
```

in an exec session. This button also will automatically reload the configuration written. It will reload from the non-volatile memory in this case, as they're identical at this point, but will reload more quickly than loading the running configuration.

Revert

The **revert** button will revert to the last committed version of the routers configuration. Any changes since the last committed version will be undone. The commit button is equivalent to typing

```
Router# configure memory
Router# show config
```

in an exec session. Like the **commit** button also will automatically reload the configuration written. It will reload from the non-volatile memory in this case, as they're identical at this point, but will reload more quickly than loading the running configuration.

Preview version notice: Please be careful when using these buttons. These two functions are not protected by "are you sure" dialogs yet. In future versions, you will be allowed to optionally configure this behavior in your preferences.

5 Development Roadmap

This section describes features already available in this technology preview release and what will be in the first beta release. Planned features for future releases are also listed. This roadmap is currently planned, but might be changed as we receive user feedback accordingly.

Update: Due to user demand, we slightly modified our roadmap and developed preview versions for Microsoft Windows and Unix/Linux.

5.1 Technology Preview Version

This preview version can be characterized as follows:

- Mac OS X Platform support
- Basic communications (TELNET) and session management
- Basic functionality (Configuration, Exec and Debug sessions, interface Monitoring)
- Saving and reverting configurations
- Configuration file navigation with dynamic views
- Pretty-printing and syntax highlighting in all modes, Printing support
- Router help system support
- Built-in TFTP functionality (currently disabled)
- Decrypt passwords configuration files

5.2 First Beta Release (additional Platforms and Features)

- additional support for Microsoft Windows 2000 and XP platforms
- Software and configuration management features, configuration backup
- router profile and password management
- simultaneous connections to multiple routers
- extensive interface monitoring
- editor for access-lists and other lists
- SSH-support (possibly SNMP for monitoring)
- Cut & Paste support and some user preferences

5.3 Future Releases (additional Platforms and Features)

The following features are planned, yet not scheduled, for future releases:

- additional support for Unix platforms, such as Linux®, Solaris® or others on demand
- support for additional networking equipment, such as non-IOS switches or non-Cisco® high-end routers on demand.
- templates and user defined macros
- integration as a node manager within systems such as HP OpenView
- configuration file version management and documentation features
- central server configuration and documentation file storage and retrieval

6 F.A.Q. (Frequently Asked Questions)

This section covers a growing number of frequently asked questions about Telconi Terminal.

What is Telconi Terminal and who should use it?

Telconi Terminal is a productivity application and user interface for Cisco IOS® based routers and devices. It was designed for users with knowledge of Cisco IOS® who now would mainly use a telnet client for router administration and configuration.

What are the main benefits? What makes it unique?

It's benefits include full-screen, interactive editing of router configurations and full support of the routers built-in online help facility. It is unique because of it's interactive nature – it is not an offline editor for configuration files – but more like an user interface.

Is this commercial software, freeware or open source?

It is commercial software, but there will be always a free version available. Currently, we do not sell the software. Pricing and availability of the commercial version has not yet been determined. Which features will be in the free and commercial version has not been determined yet either. Source code is not available to the public, but can be requested for integration purposes.

Where can I buy your software?

We currently do *not sell the software*. For the time being, there's only a preview version available, which can be downloaded freely for evaluation purposes. After that, there will be beta versions available. A commercial version will be released after the beta process along with a free variant.

Do you offer integration services or can you add some features for me?

Yes, we will offer to integrate our software with your existing OSS or NMS solutions on a per-project basis.

Does the technology preview version expire after some time?

Yes. The technology preview version will stop working after a certain time. This is because we do not want versions with potential problems around, and not to make you pay. See above.

Is my router configuration automatically modified?

No, it does not touch your router's configuration automatically. It makes some settings for the terminal sessions, but it does not automatically reconfigure your router or make any permanent changes unless you do so.

Why it is released on Mac OS X first?

Mac OS X is a solid development platform and its user base is known to give good feedback. We want a small user base in this phase of the project before we release for Windows and other platforms. We're aware that Mac OS X does not have a large user base and most user's desire Windows or Linux platform releases.

When will a PC version for Windows be available?

Update: available now.
We're actively working on it and it won't be too long – a matter of weeks or months. We won't make any promises at this point, as we want to ensure the software's quality and interoperability before we release for Windows.

When will Linux version be available?

Update: available now.
As pointed out, we plan to support Linux and other Unices in the future depending on user demand. We have no release date for a Linux version scheduled at the moment.

How does it work?

It simply connects multiple telnet sessions to your router and parses the routers' responses to commands and keystrokes. It does not (yet) support other protocols such as SNMP. Later versions will also use SSH and possibly SNMP for monitoring. TFTP is being used for file transfers (configuration files and software images).

Will you support other routers and switches?

As many routers, switches and other devices such as firewalls use a command line interface similar to that of IOS®, we plan to support other devices in the future as well, depending on demand. Generally, IOS®-based devices should already work .

How are you related with Cisco® Systems?

We're completely independent and have no relationship at all with Cisco® whatsoever. They just happen to produce routers with a large user base. Our product will not be limited to Cisco IOS® in the future and support other equipment vendor's products with similar command line interfaces.

7 Troubleshooting and Known Issues

This section covers some known issues and bugs with the preview version.

User Interface

The User Interface currently is not as clean as we would like it to be. As it is intended to run on many platforms, we did not make use of too many platform specific user interface elements. Also, we're thinking of integrating the debugging view with the main window (so it is always visible).

IOS® Inconsistencies and Caveats

IOS®, especially, it's configuration interface, isn't entirely consistent. Consider the following example:

```
line con 0
  transport preferred none
```

Here, to cancel options, it's not "`no transport preferred`" as one could expect. Using *Telconi Terminal*, automatically negating the line will cause an error. Instead, you'll have to manually type the line. The next example shows that configurations may be displayed with invalid syntax:

```
interface Serial0
  clockrate 2000
```

Here, "`clockrate`" is displayed, but the command you have to enter is "`clock rate`", written as two separate words. Trying to edit a line like this will cause an error, as the router won't accept "`clockrate`" as a valid keyword. You'll have to type the entire line instead. Another example deals with non-intuitive default settings:

```
interface Ethernet0
  logging event link-status
```

if you configure lines like this, the router will never show as configuration lines, but accepts them if entered as valid configuration commands. The reason is that most default settings are not displayed in order to keep the configuration files small. As a result, as you redisplay he configuration after you added a default line like this, the configuration line will not be shown in the output. Currently, we do not use rules to cope with these inconsistencies. You will simply run into an error or see the same inconsistencies as with the command line.

Session Login Banners

Session login banners might confuse *Telconi Terminal* during session initiation. If you cannot connect, please check your configuration for login banners.

Multi-line Input

Configuration sections spanning multiple lines such as the `banner` global configuration commands are not supported yet. You will see them in your configuration, but you won't be able to edit.

Configuration Prompt

As *Telconi Terminal* parses the responses of your router, there are some settings which will confuse it, including `service config prompt`.

Session Limits

Update: this has been improved. New sessoins are only initiated on demand

Many routers support only four concurrent sessions. As *Telconi Terminal* opens three sessions initially (for Config, Exec and Debug), only one more session is available as you're logged in. Future versions of the software might multiplex single session for multiple modes, reducing the number of required simultaneous sessions – or we bring up sessions on demand (starting with only the configuration session).

Error Messages

Update: error messages during login sequence have improved,

Error messages are not very intuitive at the moment. For example, if your password is incorrect, you'll most likely get a timeout message instead.

Marking of Changed Lines

As you change lines, *Telconi Terminal* tries to mark the changes, displaying the old and new configuration lines. These markings aren't always correct and consistent with the configuration in memory and you need to reload the configuration in order to obtain a consistent and correct display of the router's current configuration.

Preview note: future versions will include more sophisticated rules for marking changed lines more correctly.

Exception handling

Update: this has been mostly fixed already.

Some exceptions (error responses) are not caught in configuration mode, and others will be wrongly interpreted. For example, if you remove an `BRI0.1` sub interface, the router will output a message indicating not all lines will be removed before you reload – but accepts the command. *Telconi Terminal* interprets such behavior as if the router did not accept it and as a consequence does not mark the configuration lines as changed. Also, sometimes the router would output single line responses (i.e. with no % character). An example is entering a bad netmask. *Telconi Terminal* ignores such messages, representing the display as if the router accepted the configuration line. In either case, refreshing the display will show the correct representation of the router's configuration memory.

Preview note: future versions will improve exception handling.

8 Feedback and Reporting Bugs

We'd like to improve *Telconi Terminal* by enhancing its features and by correcting possible problems and inconsistencies. To do so, we rely on the feedback of our users, so please feel free to write to feedback@telconi.com. We're highly interested in your comments and suggestions and will consider and answer all requests.

General support requests for *Telconi Terminal* should be directed to support@telconi.com. Please understand we will only be able to provide support for our software, and not for general Cisco IOS® configuration problems.

As mentioned earlier, it is not possible to test all combinations of routers, IOS® versions and line cards, so *Telconi Terminal* might not work correctly with your configuration. If you encounter problems with your configuration, please report to bugs@telconi.com and include the following information:

- your router hardware
- your IOS® software version
- your router configuration (or just the relevant fragments of your configuration)
- a short description of the problem (misbehavior, crash etc.)

This information can be easily obtained using the following privileged EXEC commands of your router:

```
Router# show hardware
Router# show version
Router# show running-config
```

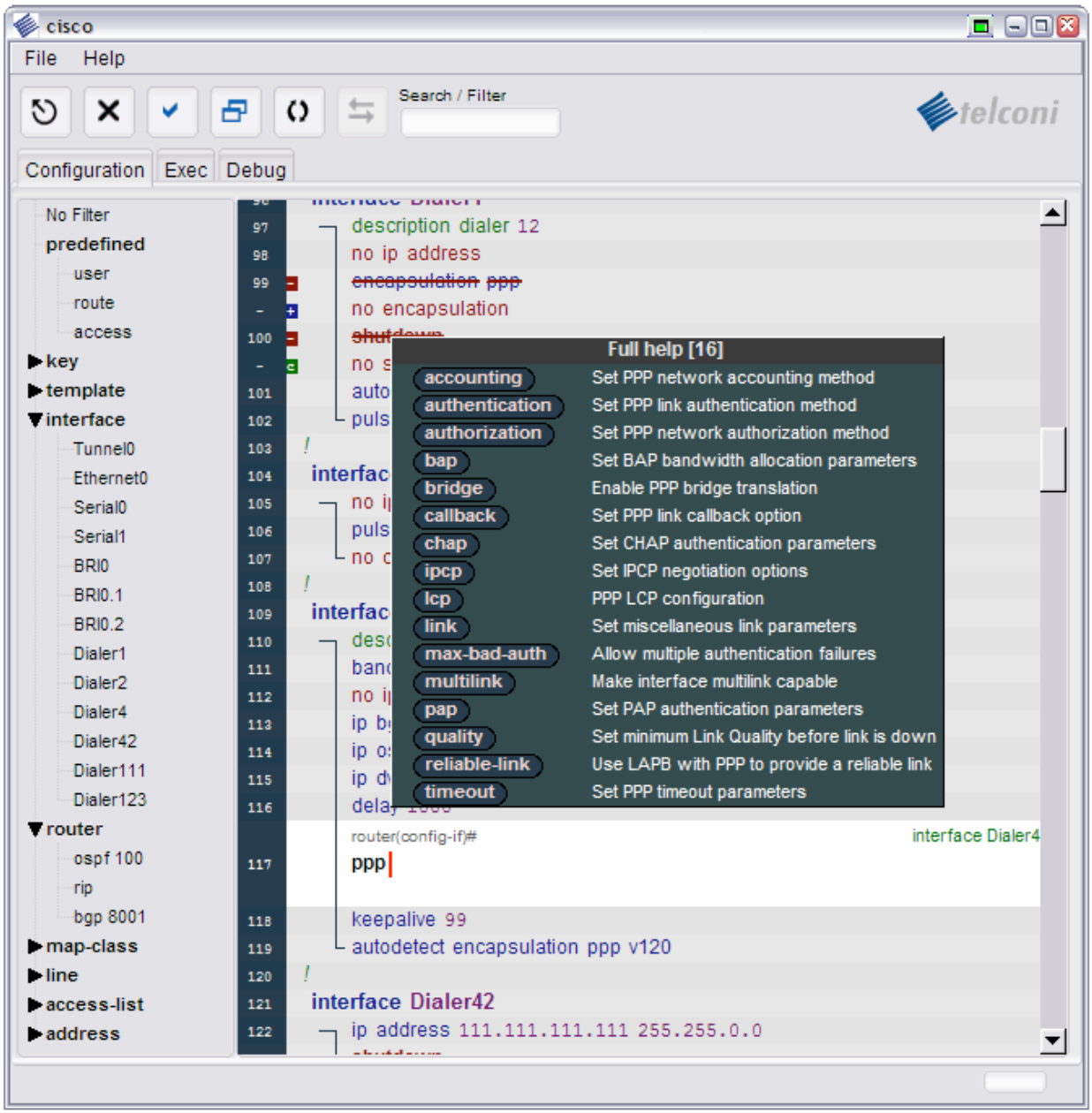
Security note: any passwords should be removed from configuration files before you send them by email for security reasons. These passwords often can be easily decrypted – even by our applications - and generally should not be transmitted to anyone.

Privacy Policy

Whether you send us feedback, support-requests or bug reports, we of course won't use your email address for unsolicited email messages or submit your address to any third party.

Appendix A: Microsoft Windows Version

The Windows version runs on Microsoft Windows XP, 2000, NT and 98. The screenshot shows *Telconi Terminal* running on Windows XP:

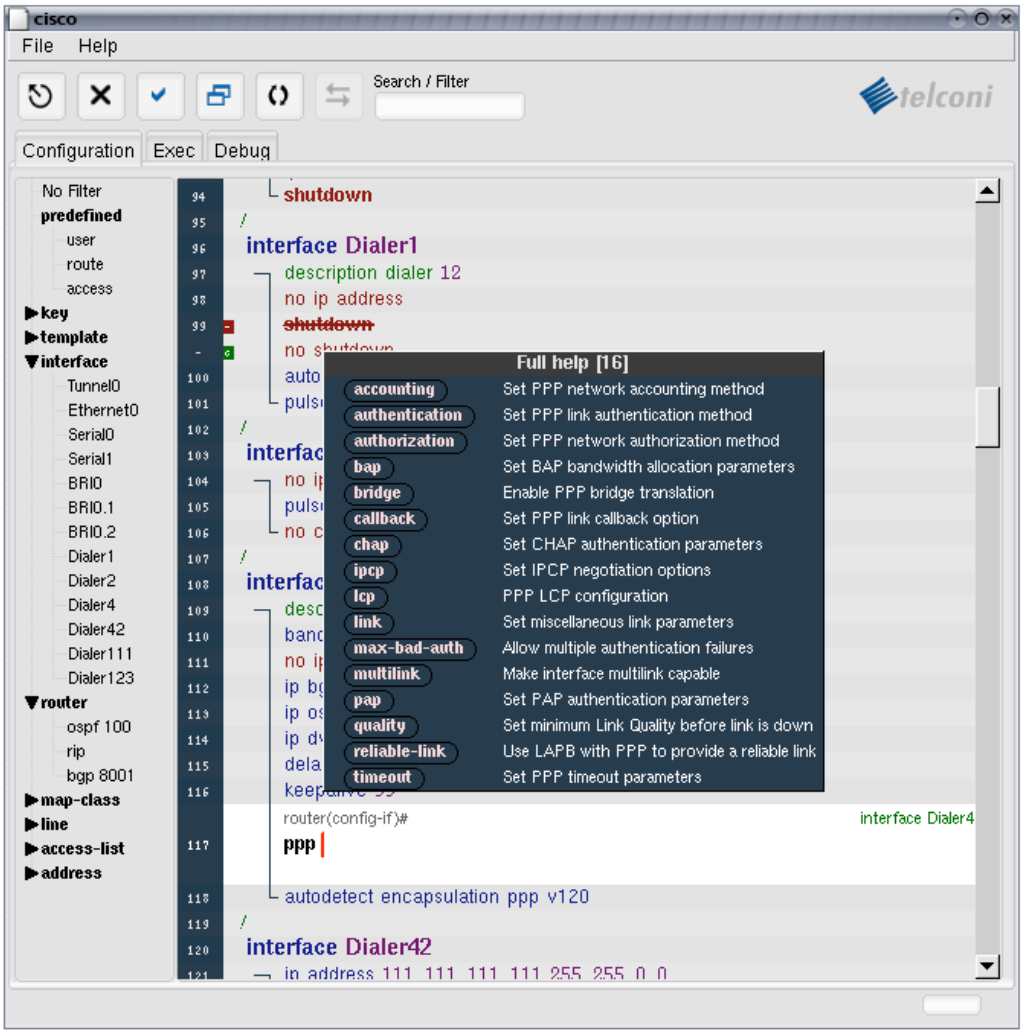


Knows Issues

The implementation cannot make use of some MacOS X specific features, such as PDF-printing and transparent overlays. The functionality should be identical otherwise.

Appendix B: Unix/Linux Version

The Unix/Linux version is identical to the Microsoft Windows version. It has been tested with RedHat 9, Suse Linux 9, Mandrake 9 and other distributions. This is what it looks like on RedHat Linux:



Known Issues

The implementation cannot make use of some MacOS X specific features, such as PDF-printing and transparent overlays. The functionality should be identical otherwise.

Due to compatibility issues, the preview version does not yet make use of anti-aliased fonts (Xft) and the fonts do not appear smooth. This issue will be dealt with in future releases.

There might be problems with older Linux variants due to missing shared libraries. We will produce variants for older Linux versions in the future.

Other Unix binaries, such as Solaris, HP/UX, AIX etc. are not available yet.