TCLTK_ON_LINUX File

Installing Tcl/Tk on Linux to Support the RAQUEL GUI/Teaching Tool

Introduction

The program code of the Raquel GUI, also known as the Raquel Teaching Tool, is written mainly in Tcl/Tk, although a few modules of it are written in C/C++. Tcl/Tk is used to manage all the screen objects of the user interface.

Thus Tcl/Tk must be installed on the user's computer, as well as a C/C++ compiler, *before* the RAQUEL GUI/Teaching Tool is installed.

This document provides background information on the installation of Tcl/Tk on Linux systems.

The Tcl/Tk software can be obtained from the Tcl/Tk website at https://tcl.tk/software/tcltk/ .

Version of Tcl/Tk

The version of the Tcl/Tk libraries installed on the host machine should be **8.4.19 or later**. The current development version of the Raquel Teaching Tool uses the Tcl 8.5.19 and Tk 8.5.19 releases, which appear to be reliable and not "bleeding edge". (Later versions are available, e.g. Tcl 8.6.6 and Tk 8.6.6).

The Location of Tcl/Tk Files

Tcl/Tk runtime files : these are the dynamic shared library files, the Tcl/Tk interpreter executables (in principle called **libtcl.so** and **libtk.so**) needed to run Tcl/Tk applications.

The directory in which they are installed depends on the version of Tcl/Tk installed. The Tcl/Tk 8.5 releases (e.g. Tcl 8.5.19 and Tk 8.5.19) are installed in the **/usr/local/lib/** directory. Other directories are used by other releases.

Tcl/Tk development files : these are the header files that define access to Tcl/Tk functions compiled in the runtime files. They are needed to compile a Tcl/Tk application (such as the Raquel GUI/Teaching Tool) and create an executable file.

The Tcl/Tk development files are included within the Raquel GUI/Teaching Tool distribution. There is a **./lib** subdirectory in the **TeachingTool** subdirectory which holds the Tcl.h, Tk.h and other required header files in it.

Compiling the Raquel GUI/Teaching Tool

The following problem arises when compiling the GUI/Teaching Tool. Not only can the Tcl/Tk runtime library files can vary in their installation locations, but also the actual runtime file names typically include the Tcl/Tk version numbers - e.g. **libtcl8.5.so** or **libtcl8.5.so.0**, and **libtk8.5.so** or **libtk8.5.so.0** - so the runtime file names vary as well. Hence a means must be found to give the compiler the correct pathnames to the runtime files.

To solve the problem, softlinks with standard names are used :

- The compiler is given the '-ltcl' and '-ltk' parameters. This means that the compiler will attempt to reference the runtime library files with the standard names **libtcl.so** and **libtk.so**.

- These standard names are given to softlinks. The softlink called **libtcl.so** maps to the corresponding runtime Tcl library file that actually exists, and the softlink called **libtk.so** maps to the corresponding runtime Tk library file that actually exists. The compiler then references the actual files via the softlinks.

The correct softlinks could be created manually using the 'ln' command, after ascertaining precisely the locations and names of the Tcl and Tk runtime files.

However a bash script called 'SoftlinkToTclTk.sh' is provided to do this automatically. It first finds the locations of the Tcl/Tk runtime library files. It informs the installer if it finds no locations, i.e. Tcl/Tk is not installed. If there are multiple Tcl/Tk installations, it allows the installer to select their preferred one. Given an installation, the script then creates the required softlinks.

'SoftlinkToTclTk.sh' should be executed before starting the installation of the Raquel GUI/Teaching Tool.

Note that the Tcl/Tk installation may include static library files, identifiable by the filename extension '.a'. These are not used by the Raquel Teaching Tool and can be ignored.

The X11 Dependency
The Tk package depends on the X11 library (the root graphics library for Linux), and therefore comes complete with header files that reference X11. When Tk is installed, check its header files correctly reference X11 in X11's actual stored location.

For all normal versions of Linux with a GUI, usually Gnome or KDU, the Linux GUI depends on X11 and so the X11 runtime files have already been installed with the operating system. If this is not the case, then X11 will have to be installed.

Other Software Dependencies
See the SOFTWARE_DEPENDENCIES file for other software on which the Raquel DBMS and the C/C++ components of the RAQUEL GUI/Teaching Tool depend.