



Virtual Laboratory for e-Science
The VL-e Toolkit

The VL-e Toolkit Installation and User's Guide

(For version 0.7.2)

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Chapter 1

Introduction

The VL-e Toolkit.

This is the Installation and User Guide to the VL-e Toolkit (VLET). This document introduces you to the vlet environment and is divided into the following parts:

- Part I: Intro & Installation: Chapter 1 and 2.
- Part II: Using the VL-e Toolkit: Chapter 3 and 4.
- Part III: Advanced features and customizing settings: Chapter 5.
- Appendices.

Please report any problems, bugs to: `vlet-users@lists.vl-e.nl` with the subject: 'bug report'.

Chapter 2

Installation

2.1 Installation requirements

The VL-e Toolkit has the minimal following installation requirements:

- Java 1.5 JRE (Java Runtime Environment)
- Either Windows 2000,XP or recent Linux (2.6 kernel) OS

Also, to be able to access grid resources, you MUST have a grid certificate. For instruction how to get one, see: <http://certificate.nikhef.nl/request>.

2.2 Unpacking

Unzip the package with winzip (windows) or gunzip (linux). The installation directory into which you installed it, will be referred to as `VLET_INSTALL`.

Default installation path on linux (system wide) installation could be:

```
/opt/vlet-0.7
```

The installation path on linux for non system administrators, could be:

```
$HOME/vlet-0.7
```

Default installation under windows (system wide) installation could be:

```
C:\vlet-0-7
```

As users do not need write access to the installation path nor administrator rights to install or run parts of the VL-e Toolkit, any user can install it at the desired place he or she wants to.

After unpacking the VL-e toolkit can be used directly by starting the desired application or tool from the `VLET_INSTALL/bin` directory. Most users don't have to configure their installation and should be able to use the tools right out of the box. For custom configurations, see the next chapters for an explanation of optional properties and installation settings.

Quick install steps for the impatient are as follows:

- Unzip the vlet distribution.
- Put grid credentials (certificates) in your HOME/.globus directory.
- Optionally create shortcut to VLET_INSTALL/bin/vbrowser.exe (for **Windows**) and copy this to your desktop.
- Start `vbrowser.sh` or `browser.exe` from VLET_INSTALL/bin (or use shortcut).
- Configure firewall settings by right-clicking (alt mouse button) on the MyVLe icon, select **properties** and set `passiveMode` to `true` for firewalled users, or specify an incoming port range if you allow incoming tcp/ip connections.

2.2.1 Directory structure

Below an overview of the directory structure of the installation. Only relevant files and directories are listed here.

```
# Directory structure overview of VLET package:

ReleaseNotes.txt      # latest release notes
README.txt            # general README
INSTALL.txt           # extra installation notes
bin/                  # scripts and (binary) executables
bin/vbrowser.sh        # UNIX (Linux) VBrowser startup script
bin/vbrowser.exe       # Windows VBrowser startup executable
etc/                  # configuration files
etc/vletrc.prop        # installation settings
etc/vletenv.sh         # extra unix/linux environment settings.
etc/srbsettings.prop   # default SRB server settings
etc/certificates/      # root certificates needed for authentication
doc/                  # documentation and Java API (javadoc) files
lib/                  # libraries and needed jar files including icons
lib/viewers           # custom viewers and plugins
lib/icons             # custom icons
```

2.3 Configuring the installation

This section explains how to configure the default settings in your installation. Most settings can be changed interactively through the **VBrowser** as well. (right-click or use alt-mouse button when clicking on the MyVLe icon).

2.3.1 Configuring default SRB settings

The installation directory VLET_INSTALL/etc contains default SRB settings. When creating a new SRB server location, the default settings from this file will be used. This file contains *installation* wide settings and may not contain user specific configuration details.

The location of this file is:

VLET_INSTALL/etc/srbsettings.prop

The default SRB configuration to access the SRB server at SARA is:

```
##
# File      : srbsettings.prop
# Location: $VLET_INSTALL/etc/srbsettings.prop
# ---
# Default SRB settings file for SRB server at SARA

hostname=srb.grid.sara.nl
# default home.
path=/VLENL/home
port=50000
mdasCollectionHome=/VLENL/home
mdasDomainHome=vlenl
mdasDomainName=vlenl
defaultResource=vleGridStore
# leave empty
srbUser=
mcatZone=VLENL
# Use GSI Authentication.
AUTH_SCHEME=GSI_AUTH
# set to true when behind a firewall
passiveMode=false

# end srbsettings.prop file
```

Note: Do NOT put a username in this file, since this file contains installation wide settings.

Before users will be able to access a SRB server, they have to create/modify a SRB server location interactively by using the VBrowser (see Chapter: [3](#)). The above mentioned file is *only* for default installation settings.

2.3.2 Advanced installation settings

See the file VLET_INSTALL/etc/vletrc.prop for advanced installation configuration. All the variables can be specified for each user also in the HOME/.vletrc/vletrc.prop. (see Section: [2.4.1](#)). As this file changes per distribution, see the comments before each property what the optimal defaults are for your distribution and your environment.

2.4 Configuring user settings

2.4.1 Configuring your grid certificate

The next paragraphs explain where you can find/store your grid certificate depending on the operating system you are using.

Grid certificate directory for Linux

The default location to store your grid certificate for **Linux** is:

HOME/.globus.

This is the location where the Globus Commodity Grid Toolkit (CoG) stores its configuration files. This location is the recommended place for linux users to store their certificates.

Grid certificate directory for Windows

The default location for **Windows** (XP) could be (depending on the default user's home):

C:\WINDOWS\profiles\Your User Name\globus

The C:\WINDOWS part is the prefix where windows is installed. The **.globus** is the directory where the Globus Commodity Grid Toolkit (CoG) stores its configuration files. Alternatively you could store your certificates into another location, or keep a copy, in for example the following location:

C:\My Documents\globus

When installing your grid certificates into another location then the default, you need to configure the CoG toolkit to search for this location. This will be explained in another section.

The Globus configuration files

The files which must be present in your globus certificate directory are:

- **userkey.pem** : Your *private* grid certificate. Never share this file with anyone. If you loose this file, you'll need to reapply for a new grid certificate.
- **usercert.pem** : Your *public* grid certificate. This file is send over the internet to identify you as the person defined in your grid certificate. Together with the **userkey.pem** it forms your *public-private* keypair.

For more about *public-private* keypair encryption, see: [?].

Optionally this directory may contain the following files:

- **cog.properties** : This file contains the Globus Commodity Grid (CoG) Toolkit properties.

Note: The **cog.properties** file is *always* stored in the default globus configuration directory (**.globus**) in your **HOME** directory.

2.4.2 Configuring host certificates

The default place to store host certificates under **Linux** is:

/etc/grid-security/certificates

If you don't have the rights to add/install certificates to this place, you can add new certificates to the following location:

VLET_INSTALL/etc/certificates

Certificates added to this location are loaded automatically when starting tools from the VL-e toolkit.

For access to dutchgrid sites, no extra configuration should be necessary.

2.4.3 Advanced user settings

See the file HOME/.vletrc/vletrc.prop for advanced user settings. Explanation of these properties can be found in Section:2.5)

2.5 Properties and configuration settings

In the next (sub)sections an overview of the most important settings which can be specified either installation wide in the VLET_INSTALL/etc/vletrc.prop file or in the user's configuration file HOME/.vletrc/vletrc.prop.

2.5.1 Firewall settings

:

- **firewall.portrange:** Allowed incoming port range for hosts which have a 'hole' in their firewall. For example:

firewall.portrange=20000,25000

Leave empty if no range is defined.

- **passiveMode:** Set to true when incoming connections are NOT allowed (firewall portrange will be ignored!). For example:

passiveMode=true

Note: if you set **passiveMode** to **true**, *all* server configurations will use **passiveMode**. Keep settings to **false** if you want to specify this setting per server. This is the case when you have file servers which are behind the same (company) firewall and are not blocked when accessing them from your desktop.

Performance note: Allowing incoming connections can considerably speed up file transfer and is recommended for large file transfers even for low bandwidth connections and especially for connections which have a high (tcp/ip) latency.

2.5.2 Grid proxy and grid certificate locations

:

You can specify alternate locations to your Grid Certificate and Proxy Location. Beware that when you specify these setting in your installation configuration (`VLET_INSTALL/etc/vletrc.prop`), you'll be specifying this for *all* users.

Use `HOME/.vletrc/vletrc.prop` for personalized settings.

- `grid.proxy.location`: absolute path to grid proxy location or relative from user's HOME. For example (absolute path):

```
grid.proxy.location=/etc/ptdeboer_proxy.x509
```

or a location relative to the user's HOME:

```
grid.proxy.location=mycerts/myproxy.x509
```

or (preferably) leave empty to use (CoG/globus) defaults.

- `grid.certificate.location`: Relative path (to user's home) or absolute path to the directory containing your grid certificates (both public and private keys). Leave empty to use (globus) defaults.

```
grid.certificate.location=.globus
```

Above setting is the default location as used by CoG/globus.

2.5.3 Command line options and environment variables

All properties can be set by specifying them as extra arguments on the command by using the `-D` command as follows: `-D<variable>=<value>`. The order in which porties are checked is as follows (higher priority first):

- Command line options `-D<variable>=<value>`
- Environment variables
- User configuration file: `HOME/.vletrc/vletrc.prop`
- Installation configuration file: `VLET_INSTALL/etc/vletrc.prop`
- Hardcoded defaults (for configurationless environments)

Chapter 3

Using the VBrowser

3.1 Starting the VBrowser

3.1.1 VBrowser panel overview

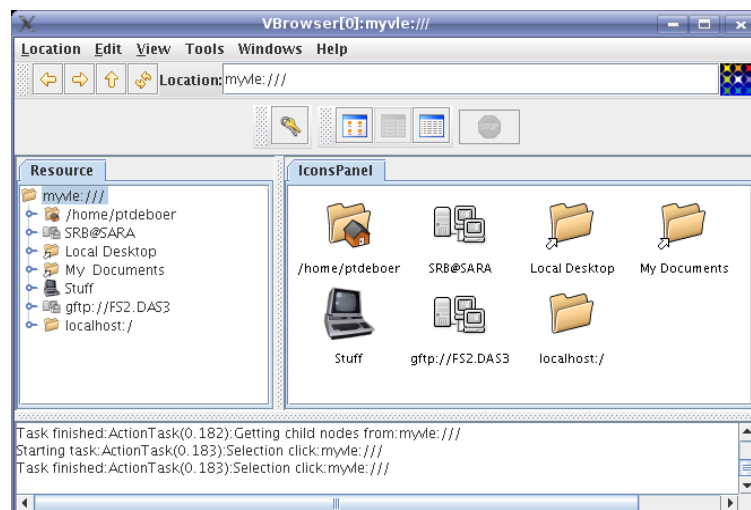


Figure 3.1: VBrowser window

3.1.2 Location bar

The location bar is the place or location which you are currently viewing.



Figure 3.2: Location bar

You can drop icons and other URLs (or URI compatible strings) into this location.






3.1.3 Toolbars

Toolbars are the bars which have a set of buttons with small icons in them. These buttons represent menu shortcuts or optional ways to view the contents of a location.



Figure 3.3: Toolbars in the VBrowser

An overview of the current toolbar buttons is as follows:

-  Grid Credentials button. Status is invalid: Grid proxy has not been created.
-  Grid Credentials button. Status is valid: Grid proxy has been created.
-  Icons panel button.
-  List panel button.
-  Table panel button.

Pressing the icon button will show the resources as icons, pressing the table icons will present the resources in table with detailed information about the resources.

3.1.4 Resource Tree panel

The resource tree is by default the panel on the left when starting the **VBrowser**. It represents your complete environment as a single tree, like 'My Computer' in **Windows**.

3.1.5 Icons panel

The icons panel is by default the panel you see on the right when starting the **VBrowser**. Click or double click onto the icon to open the location it represents, or use right-click (alt-mouse-button) to get the special options menu.

3.1.6 Table panel

When clicking on the table panel icon details from the resources will be shown in a table form as can be seen in figure [3.4](#).

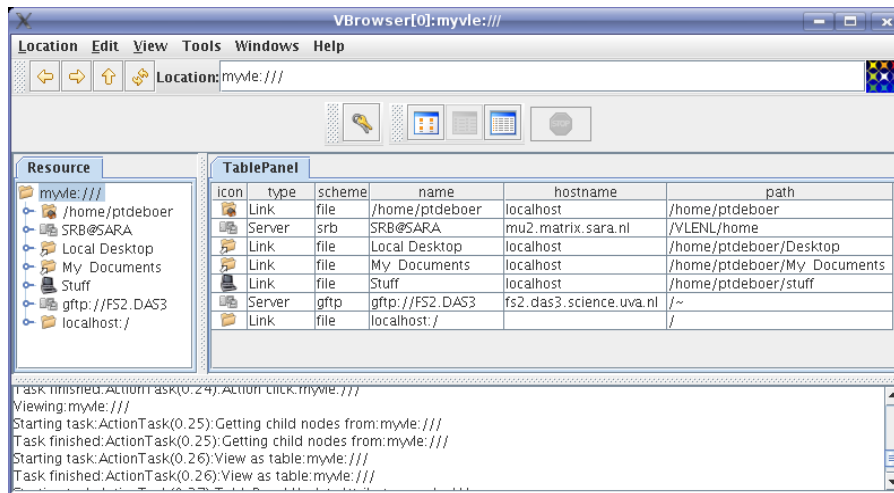


Figure 3.4: :Table Panel

For each resource the default attributes are shown. Clicking on the header of the table column will sort the table according to the logical value of the fields in that column. More attributes can be added by right-clicking (or pressing alt-mouse button) on the headerbar of the table panel as can be seen in figure 3.5.

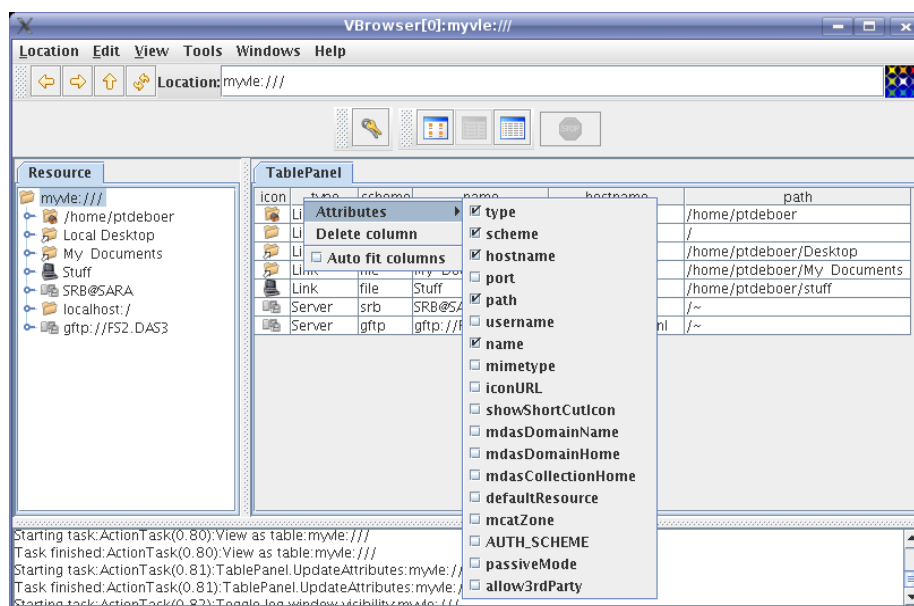


Figure 3.5: :Table Panel

You can also move around the columns by dragging the column header to the desired position. Currently the layout of the table is not saved between browsing sessions.

3.1.7 Pop-up or Action menu

When right-clicking (or use alternative mouse button) on a resource, an pop-up menu will appear. This is the Resource's Action Menu and from this menu special actions can be selected which are to

be performed on the resource. These actions include standard Copy and Paste actions as well as more complicated actions. See figure 3.6

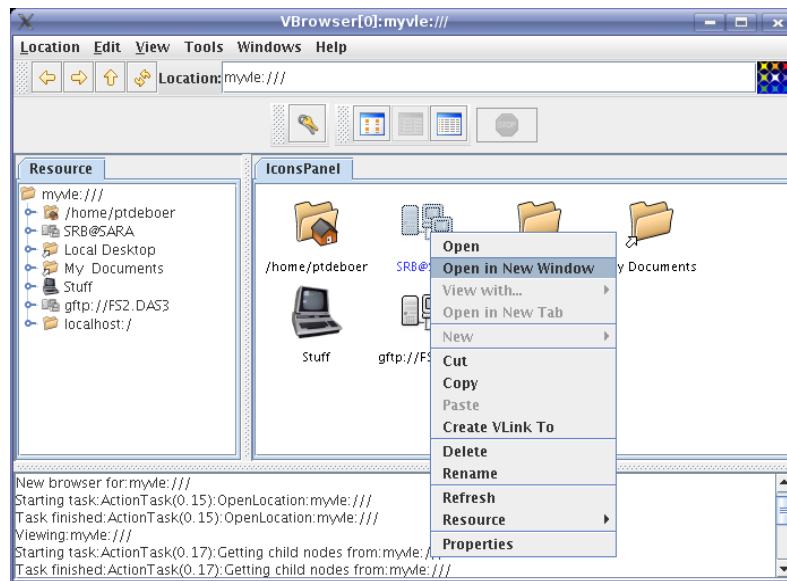


Figure 3.6: VBrowser Action Menu

3.2 Authenticating yourself with the Grid

The first thing you do is to authenticate yourself with the grid. This is done by creating a *grid proxy* which is a file containing a temporary key which you must use to access resources on the grid. For security reasons this file can only be used for a limited time.

To create a grid proxy you can use your *Grid Certificate* and your secret *Passphrase* which combined can create a Grid Proxy for you.

To create one interactively, click on the *keys* icon which can be seen in figure 3.7.



Figure 3.7: Grid Proxy Icon

A dialog will appear where you can create your grid proxy. See figure: 3.8.

To create a Grid Proxy, enter your passphrase and press **Create**. Your grid proxy will be valid for 12 hours if not specified otherwise. You can enter grid proxy creation options, like proxy location (file path) and lifetime (in hours), in the dialog if needed. Also you can **Destroy** your grid proxy if you don't need it anymore. Pressing **Create** again will refresh your proxy and update it with a new lifetime.

3.3 Configuring your personal environment

When the **VBrowser** starts, the left panel will show the Resource Tree with as toplevel or the root resource an icon (currently) named: **MyVL**. This root resource will contain your personal grid environment.

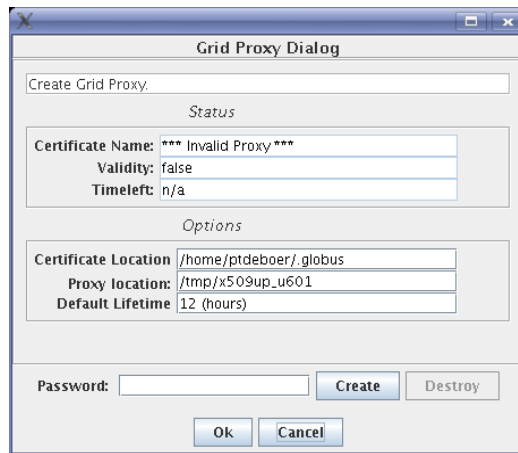


Figure 3.8: Grid Proxy Creation Dialog

3.3.1 Adding Resources

To add resource to your root resource, do the following:

- **right-click** on MyVLe and select:New
- Select the resource you want to add.

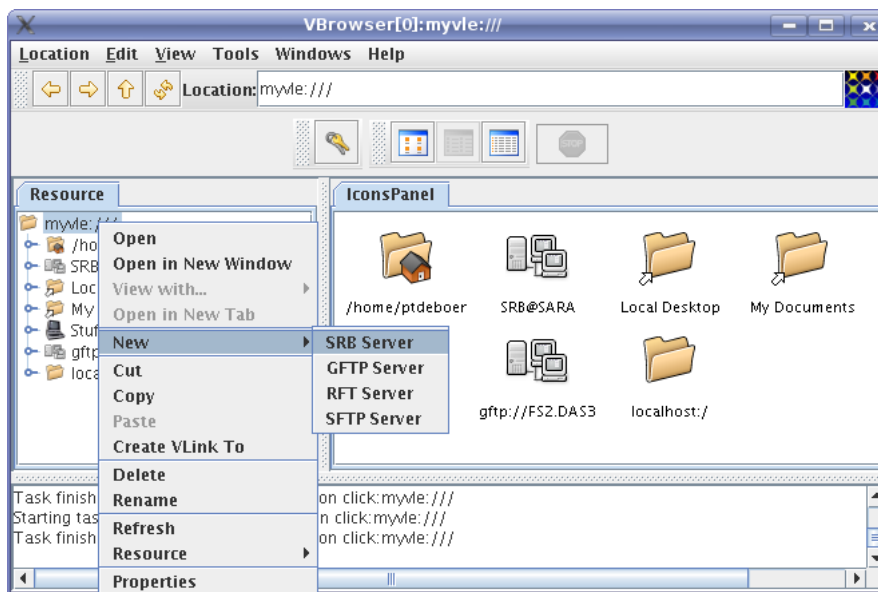


Figure 3.9: Create new server

Deleting can be done as follows:

- **right-click** on the resource icon you want to delete and select:Delete

Note: Deleting a resource from the root resource (MyVLe) will delete the entry, never the directory it points to.

To configure the settings for a resource, select the properties from the pop-up menu as follows:

- **right-click** on the resource icon and select:properties

Check and optionally change the properties of this resource.

3.3.2 Adding GridFTP server

You can add a new Grid FTP location as follows:

- **right-click** on MyVLe and select:New →GFTP Server

Now set the Grid FTP server properties by selecting the properties option from the pop-up menu as follows:

- **right-click** on the GridFTP icon and select:properties

Fill in the location properties of the new GridFTP server.

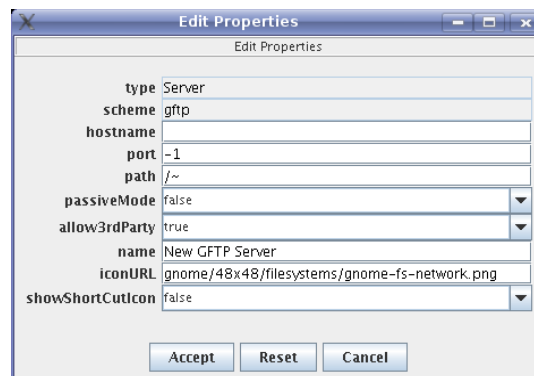


Figure 3.10: GridFTP properties

Current extra options (properties) for Grid FTP servers are:

- *passiveMode* : set to 'true' when incoming connections are not possible, for example when browsing from behind a firewall.
- *allow3rdParty* : whether 3rd party copying is possible to and from this server. This is initiated when copying resources from a remote server to another remote server.

3.3.3 Adding SRB server

If there is no SRB icon (default name is "MySRB"), create one as follows:

- **right-click** on MyVLe and select:New →SRB Server

Now set the SRB server properties by selecting the properties option from the pop-up menu as follows:

- **right-click** on the SRB icon (MySRB) and select:properties

Current extra options (properties) for SRB servers are:

- *passiveMode* : set to 'true' when incoming connections are not possible, for example when browsing from behind a firewall.

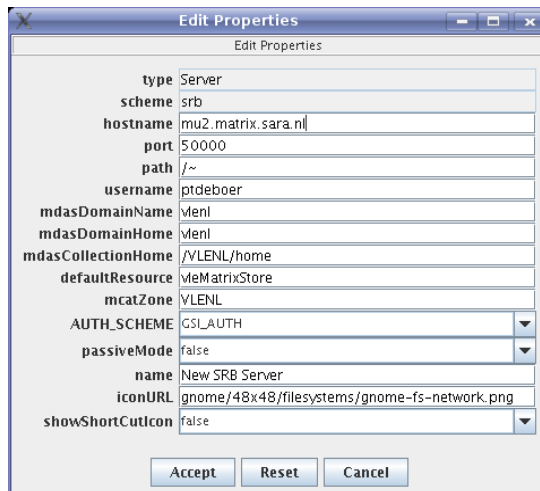


Figure 3.11: SRB server properties

- *AUTH_SCHEME* : authentication scheme. GSI authentication is the standard used on the Grid.
- *mdas/mcat settings* : Make sure you fill in the right *mdas...* settings and *mcat...* settings. Contact your SRB administrator for the right values.
- *defaultResource* : A SRB Server might allow different values for the *defaultResource*. Contact your SRB administrator for the right values. (Values given are example values).

3.4 Links or shortcuts

Another way of creating a resource entry is creating a **Link**. A **Link** behaves in a similar way as shortcuts on windows. This type of resource does *not* resemble a unix hard- or softlink in anyway. When opening a **Link**, the location pointed to by the **Link**, will be opened.

Typically a **Link** icon has a small arrow in the bottom left corner to indicate it is a link, as can be seen in figure 3.12.




Figure 3.12: Link icon




You can create a link by selection the Create VLink to option from the pop-up menu or action menu.

3.5 Basic Browsing

Most browsing actions are supported. Typing the full URI into the location bar opens that location. The navigation buttons behave in the same way that popular webbrowsers behave.

Here is an overview of the actions and associated buttons:

-  Refreshes the current viewed location.

-  Browses back one location from history.
-  Browses a location forward again, when the user has browsed back.
-  Browse to the parent location of the current viewed location.

Chapter 4

Other Tools

4.1 Application and Tools

Other applications currently available in the VL-e Toolkit are:

- **GridProxyDialog**: for creating and managing Grid Proxies.
- **VLTerm**: simple (alpha version!) vt100 emulator with some xterm extensions.
- **uricopy.sh**: URI copy script.

4.2 GUI utils

4.2.1 GridProxyDialog

Some part of the **VBrowser** can be used stand alone. The Grid Proxy Init dialog can be called by running the `GridProxyDialog.jar` as follows:

```
java -jar $VLET_INSTALL/bin/GridProxyDialog.jar
```

Or double click on the jar file in the `VLET_INSTALL/bin` directory:

```
VLET_INSTALL/bin/GridProxyDialog.jar
```

You cannot move this file out of the installation, but you can create a shortcut to the jar file instead.

4.2.2 VLTerm

The VL-e Toolkit has an alpha version of a VT100 terminal emulation program. This terminal emulator can be used as a backup if there is no standard xterm or SSH terminal program available on the user's host.

Most VT100 and some XTERM control codes are supported. For basic remote command execution this terminal application can be used.

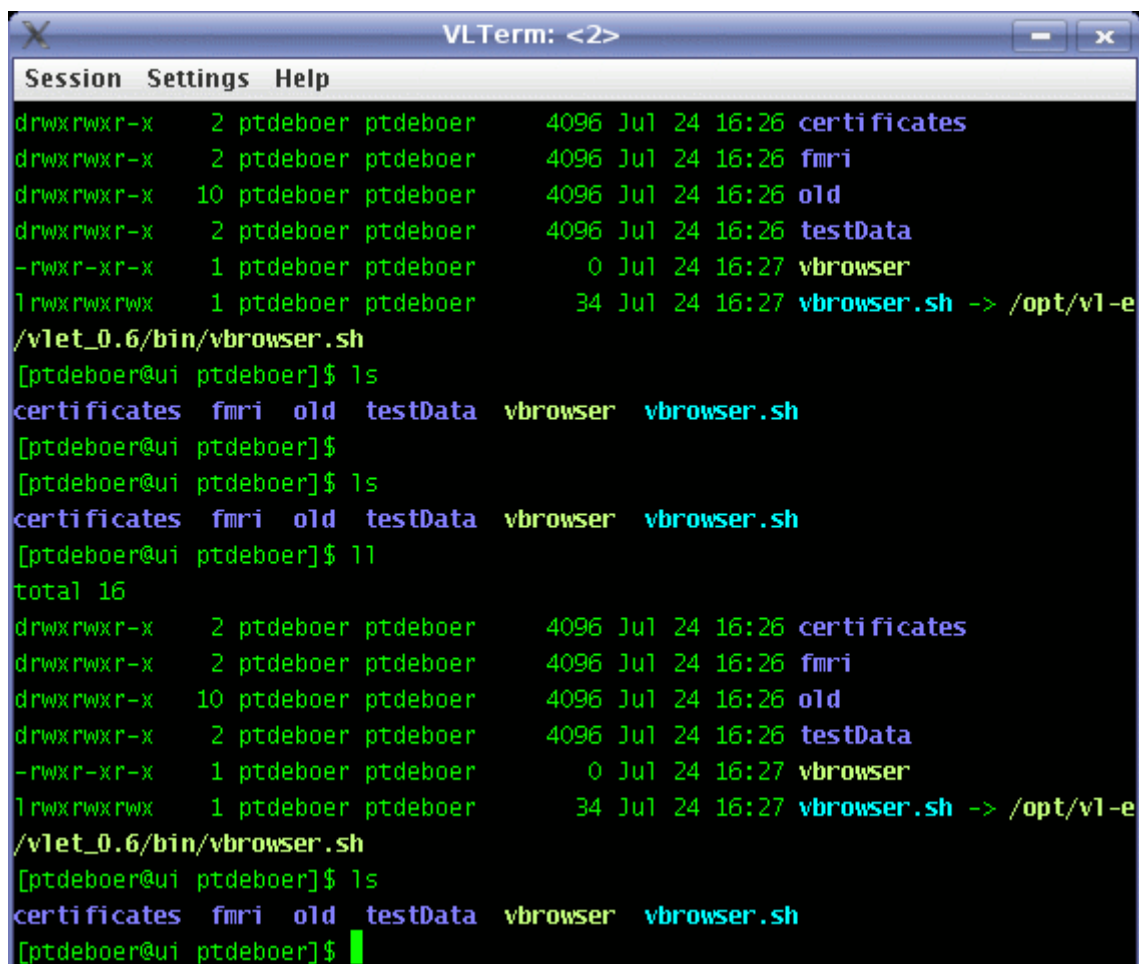
To start the VLTerm application use the command line as follows:

```
java -jar $VLET_INSTALL/bin/vlterm.jar
```

Or double click on the jar file at the following path:

```
VLET_INSTALL/bin/vlterm.jar
```

You cannot move this file out of the installation, but you can create a shortcut to the jar file instead.



The screenshot shows a window titled "VLTerm: <2>" with a menu bar containing "Session", "Settings", and "Help". The terminal content is as follows:

```
drwxrwxr-x  2 ptdeboer ptdeboer  4096 Jul 24 16:26 certificates
drwxrwxr-x  2 ptdeboer ptdeboer  4096 Jul 24 16:26 fmri
drwxrwxr-x 10 ptdeboer ptdeboer  4096 Jul 24 16:26 old
drwxrwxr-x  2 ptdeboer ptdeboer  4096 Jul 24 16:26 testData
-rwxr-xr-x  1 ptdeboer ptdeboer    0 Jul 24 16:27 vbrowser
lrwxrwxrwx  1 ptdeboer ptdeboer   34 Jul 24 16:27 vbrowser.sh -> /opt/vl-e
/vlet_0.6/bin/vbrowser.sh
[ptdeboer@ui ptdeboer]$ ls
certificates  fmri  old  testData  vbrowser  vbrowser.sh
[ptdeboer@ui ptdeboer]$
[ptdeboer@ui ptdeboer]$ ls
certificates  fmri  old  testData  vbrowser  vbrowser.sh
[ptdeboer@ui ptdeboer]$ ll
total 16
drwxrwxr-x  2 ptdeboer ptdeboer  4096 Jul 24 16:26 certificates
drwxrwxr-x  2 ptdeboer ptdeboer  4096 Jul 24 16:26 fmri
drwxrwxr-x 10 ptdeboer ptdeboer  4096 Jul 24 16:26 old
drwxrwxr-x  2 ptdeboer ptdeboer  4096 Jul 24 16:26 testData
-rwxr-xr-x  1 ptdeboer ptdeboer    0 Jul 24 16:27 vbrowser
lrwxrwxrwx  1 ptdeboer ptdeboer   34 Jul 24 16:27 vbrowser.sh -> /opt/vl-e
/vlet_0.6/bin/vbrowser.sh
[ptdeboer@ui ptdeboer]$ ls
certificates  fmri  old  testData  vbrowser  vbrowser.sh
[ptdeboer@ui ptdeboer]$
```

Figure 4.1: VLTerm at SARA

4.3 Command line tools

4.3.1 URI copy script: uricopy.sh

At this moment there is only one script interface to the Virtual Resource System (VRS). This script is the URI copy script: `uricopy.sh`

The location is: `VLETINSTALL/bin/uricopy.sh` and the syntax is as follows:

```
uricopy.sh [options] <source URI> <destination URI> [-D<PROPERTY>=<VALUE >]*
```

Where [options] can any of the following:

```
-r      ; recursively copy the source location (for copying directories).
-force  ; overwrite (optional) existing target location.
-move   ; move resource and delete source URI after copy command.
-result ; print resulting destination URI as follows: "result=...".
-debug  ; enable debug output.
```

The properties which can be specified are depending on the source and destination URIs. Most VLET settings can be specified as command line options using the `-D<NAME>=<VALUE>` syntax.

An overview of relevant properties are:

Global properties:

```
-DpassiveMode=true always use passive mode for all file transfers.
```

SRB properties:

```
-Dsrb.username=USERNAME          ; username for the SRB server.
-Dsrb.defaultResource=vleMatrixStore ; specify resource to store new file/directories.
-Dsrb.mdasCollectionHome=/VLENL/home ; specify default home.
-Dsrb.mdasDomainName=vlenl}       ; specify DomainName.
-Dsrb.hostname=mu2.matrix.sara.nl ; hostname of SRB server.
-Dsrb.port=50000                  ; port of SRB server.
```

If you specify any of the above as command line options, you can omit them in the URI.

General usage:

The source and destination URIs are mandatory. Options can be both specified before and after the URIs. The source URI must be an existing file or directory and the target URI *must* be an existing directory! This is to avoid ambiguity between destination files and directories.

Copying directories:

To copy a directory specify the `-r` option (for recursive copy).

The uricopy command will create the new destination directory which always will be a child (subdirectory) of the destination URI.

Moving files or directories:

To move a file or a directory specify the `-move` option. The source will be deleted after and *only* after a successful copy.

Important: The behaviour of `uricopy.sh` is different then the common used `'mv'` command under

unix. This is to avoid ambiguity between destination files and directories.

4.3.2 Examples

SRB upload example:

An example how to upload files to the SRB server goes as follows:

```
$VLET_INSTALL/bin/uricopy.sh file:///home/ptdeboer/hello.txt \  
srb://piter.de.boer.vlenl@srb.grid.sara.nl:50000/VLENL/home/piter.de.boer.vlenl \  
-Dsrb.defaultResource=vleGridStore
```

The option:

```
-Dsrb.defaultResource=vleGridStore
```

may be omitted if the default resource of the SRB server ((`srb.defaultResource`) equals the one specified in srb settings file: `VLETINSTALL/etc/srbsettings.prop`.

If this option is not or incorrectly set the SRB server might return an error as follows:

```
OBJ_ERR_RES_NOT_REG resource has not been registered -2400
```

This means the SRB server could not 'register' the file at the default 'storage' location.

4.3.3 Customized uricopy script

You can use the `uricopy.sh` as an example and modify it to your liking. Make sure the `VLET_INSTALL` environment variable is set so the script can find the installation as follows:

```

#!/bin/bash
##
# File   : Example modified uricopy.sh script
# Version: VLET 0.7.2
# ---

# Default installation:
export VLET_INSTALL=/opt/vlet
export VLET_SYSCONFDIR=$VLET_INSTALL/etc
# Configuration files on PoC R2:
#export VLET_SYSCONFDIR=/etc/vlet

# set base directory
BASE_DIR=$VLET_INSTALL

# my options:
OPTIONS="-DpassiveMode=true -Dsrb.username=piter.de.boer -r -force"

# source vlet settings:
source $VLET_SYSCONFDIR/vletenv.sh

##
# VLET java class to start: VFSCopy
CLASS=nl.uva.vlet.vfs.VFSCopy

# JVM options:
JVMOPTS="-Dvlet.install.sysconfdir=$VLET_SYSCONFDIR -jar $BASE_DIR/bin/bootstrapper.jar"

# Start bootstrapper which does the rest
echo "Command:" $JAVA $JVMOPTS $CLASS $OPTIONS $@
$JAVA $JVMOPTS $CLASS $OPTIONS $@
# keep return value:
RETVAL=$?

#return exit code from VFSCopy
exit $RETVAL;

```


Chapter 5

Customization

5.1 Custom viewers/plugins

You can install extra viewers or VBrowsers plugins in the following directories (create them if they don't exist):

- `VLETINSTALL/lib/viewers`: for installation configured plugins.
- `HOME/.vletrc/viewers`: for user configured plugins.

A **VBrowser** plugin can be a single jar file or a directory that contains the needed jar file and (optional) used libraries. The filename or directory must be the full classname of the plugin. This name triggers the VBrowsers upon startup to load the plugin. For example the custom VTK image viewer which can be installed at one of the following locations:

```
VLETINSTALL/lib/viewers/nl.uva.vle.app.vtk.viewer.NiiViewer/
```

for system wide installation of custom plugins, or:

```
HOME/.vletrc/viewers/nl.uva.vle.app.vtk.viewer.NiiViewer/
```

for custom plugins installed for a single user only (in his or hers HOME directory).

Some viewers might need extra configuration. For example in the case of the above VTK viewer, specifying the VTK library paths as follows:

```
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/opt/vl-e/vtk.5.0.2/lib:/opt/vl-e/mesa3d.6.4.2/lib
```

The above library paths are the installation paths as specified on the VL-e PoC environment (R2). You can add them to your `.bashrc` or add them to the installation configuration in `VLETINSTALL/etc/vletenv.sh` if library paths are not already setup as specified.

Extra plugins can be downloaded from the VL-e gforge site: gforge.vl-e.nl/frs/?group_id=19

5.2 Custom Mimetypes and icons

Mimetypes are a way of telling an application what kind of content is in the file or resource. In most cases this is a simple mapping of an extension to a standard defined mimetype. This mimetype is a simple string which describes the type of content, for example “text/plain” or “image/jpeg”. Usually it consists of a generic part (“text/” or “image/”) and a specific part (“plain” or “jpeg”) separated by a (forward) slash.

The following files defines the mimetypes used in VLET:

- `VLETINSTALL/etc/mime.types`: for installation configured mime types.
- `HOME/.vletrc/mime.types`: for user configured mime types.

The syntax of the mimetype configuration is the mimetype name followed by a list of extensions or complete filename(s) as follows:

type/subtype EXT1 EXT2 EXT3...

An example of some standard mimetypes is given as follows. First the mimetype name is given followed by their extension(s):

```
[170]
###
# File      : mime.types
# Location: $VLET_INSTALL/etc/mime.types
# ---
# Default mime types:  <MIMETYPE>  <EXTENSION1> <EXTENSION2> ...
#
image/x-xbitmap          xbm
image/x-xpixmap          xpm
image/jpeg               jpeg jpg jpe JPG
text/rtf                 rtf
text/plain               txt

#end default mime types file
```

5.2.1 User defined mimetypes

A user can override the default mimetype for a resource or specify a new one by adding a line in the `HOME/.vletrc/mime.types` file as follows:

```
##
# File      : mime.types
# Location: $HOME/.vletrc/mime.types
# ---
# User defined mime types

# customized mime type for VL-e Text:
application/vle-text      txt TXT inf info

# end user defined mime types
```

Now .txt (and .TXT, .inf, .info) files will have the “application/vle-text” mimetype as can be seen in figure:5.1

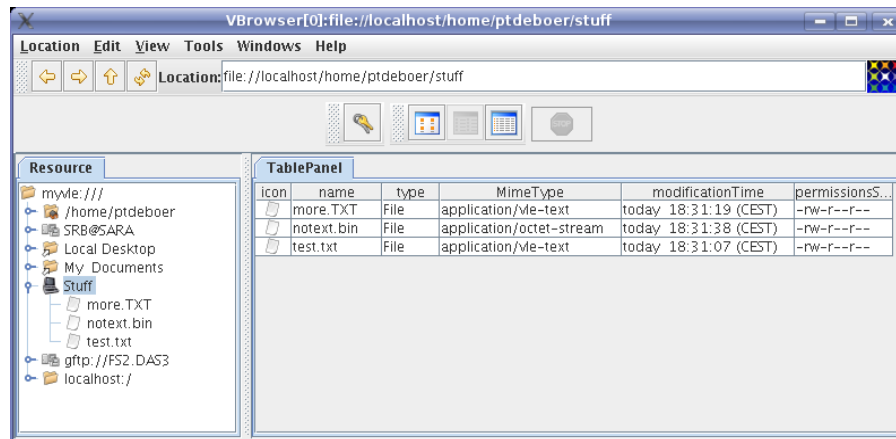


Figure 5.1: Custom Mimetypes

5.2.2 Magic types

Another way to determine the file content is by matching the first bytes of a resource with well known 'magic types' which specify the type of file. For example linux executables have the letters 'ELF' in the beginning of the file which specifies it is an Linux Executable.

Other examples are: GIF files (.gif) start with the ASCII letters 'GIF' and WAV files (.wav) start with the letters 'RIFF' and have the letter 'WAVE' in the RIFF header.

Magic types are not supported (yet) by the VBrower but are available in the VLET Java API through the MimeTypes class (`nl.uva.vlet.util.MimeTypes`) and can be used by, for example, plugins to further determine the (actual) file contents.

5.2.3 Custom icons

Each resource which has a mimetype is mapped to a (default) icon based on the mimetype. The name of the icon is the mimetype with forbidden characters (like a forward slash) substituted with a dash (“-”) and the extension “.png” is added. For example the mimetype: “application/vle-text” is tranformed to the icon name: “application-vle-text.png”

If this icon exists in either the installation directory for mimetype icons or the user directory for mime-type icons, this icon will be used. To add mimetype icons, add the icon to one of the following directories:

`HOME/.vletrc/icons/mimetypes`

Use the above location for user configured icons. To make the icons available for all users, use the installation directory below:

VLET_INSTALL/lib/icons/mimetypes

In the example of the custom mimetype “application/vle-text” you can create a customized icon named: “application-vle-text.png” which should have the following path:

HOME/.vletrc/icons/mimetypes/application-vle-text.png

All text files will now have the customized 'vle' icon as can be seen in figure 5.2

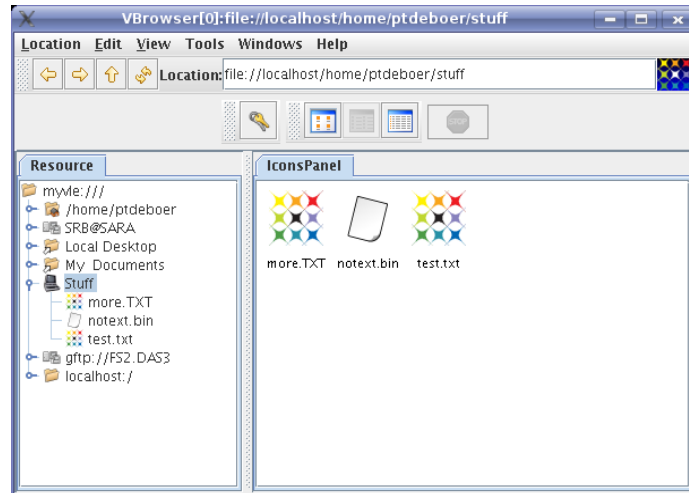


Figure 5.2: Custom Icons

You can also put the icon in your installation by creating it at the following path:

VLET_INSTALL/lib/icons/mimetypes/application-vle-text.png

5.2.4 Viewer preferences and defaults

To specify which viewer (vbrower plugin) is used the user can configure the file HOME/.vletrc/viewerconf.prop. This file specifies per line the mimetype and the viewerclass which is started as default viewer when the user opens or clicks (on) a resource. The syntax is as follows:

mimetype/mimesubtype=viewerclass

For example to specify a new viewer for the “application/vle-text” mimetype, add a line as follows:

```
##
# File      : viewerconf.prop
# Location: $HOME/.vletrc/viewerconf.prop
#---
# Mimetype/viewer class mapping file
# <MIMETYPE>=<VIEWERCLASS>

# viewerclass mapping for the application/vle-text mimetype:
application/vle-text=nl.uva.vlet.gui.viewers.HexViewer

# end viewerconf.prop file
```

Now, instead of the default textviewer, the actual bytes will be shown in the HexViewer utility.
Other default vbrowser internal viewer classes are:

```
nl.uva.vlet.gui.viewers.TextViewer
nl.uva.vlet.gui.viewers.HexViewer
nl.uva.vlet.gui.viewers.VHTMLViewer
nl.uva.vlet.gui.viewers.LightImageViewer
```

For information about how to create custom plugins, see the VLET Developers Guide (ref:[]).

Appendix A

Appendices

A.1 VRL specification

This appendix specifies the syntax used for VRLs (Virtual Resource Locators) which follows the specification of URIs (Universal Resource Locators) as specified in [RFC3986].

In short a VRL an URI, but not all URIs are VRLs.

A.1.1 Syntax

VRL ::= SCHEME + ‘:’ + ‘//’ + [USERINFO+‘@’] + [HOSTNAME] + ‘/’ + [PATH] + [‘?’+QUERY] + [‘#’+FRAGMENT]

SCHEME ::= ‘file’, ‘gftp’, ‘sftp’, ‘http’, ‘rfts’

USERINFO ::= USERNAME + [‘.’+DOMAINNAME] + [‘:’+PASSWORD]

USERNAME ::= <see rfc3986>

DOMAINNAME ::= <see rfc3986>

HOSTNAME ::= <see rfc3986>

PASSWORD ::= <see rfc3986>

QUERY ::= <see rfc3986>

FRAGMENT ::= <see rfc3986>

Notes:

- SRB URIs have a DOMAINNAME in the USERNAME part. VRLs will take the last dot separated string as domain name. For example in ‘john.doe.vle’, the ‘vle’ part is the domain name and ‘john.doe’ the username.
- It is not recommended putting plain text passwords in URIs as this is a security hazard.

Bibliography