XENA™

Test. Improve. Repeat.

Automation with ValkyrieCLI

A STEP-BY-STEP GUIDE

CONTENTS

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What is ValkyrieCLI?

ValkyrieCLI is installed together with all the other software applications in every Valkyrie release.

Command Line Interface (CLI) to the Xena Server (chassis)

- Covers all functionality

Supports interactive sessions

- Command and Reply
- Replay of command lists

Scripted or programmed sessions

- Pre-programmed actions and check

Reuse of existing GUI setup

- Jump start script writing
- Use as template

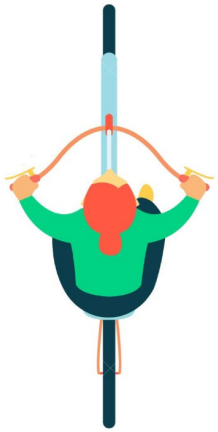
ValkyrieCLI Advantages

Versatile

Can be used with ANY scripting and program language
Can run in ANY operating system
No need to install drivers or proprietary programs
Re-use your existing automation framework

Fast

Extremely low communication overhead
Very simple and efficient protocol
No requirements to the CLI client



Simple

Purely text based
No binary modules
Easy to learn
Well documented
Easy to debug
Reuse existing configurations

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CLI API - BASICS

Xena Automation is based on:

1. A TCP connection from script/program to Valkyrie tester

+

2. Input/output via CLI-like API commands over the TCP socket

TCL Example

Creating a TCP Socket –

```
set s [socket -async $chassis_ip $chassis_port]
```

Communicating via Socket (s) –

```
puts $s "c_logon $chassis_pass"
gets $s response
```

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CLI API - BASICS

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Ruby Example:

Creating a TCP Socket –

```
require 'socket'      # Sockets are in standard library
s = TCPSocket.open($hostname, $port)
```

Communicating via Socket (s) –

```
socket.puts(tx_string)
response = socket.gets
```

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CLI API - BASICS

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Python Example:

Creating a TCP Socket –

```
from LabUtils.Drivers.SocketDrivers import SimpleSocket
sock = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
```

Communicating via Socket (s) –

```
sock.send(cmd + '\n')
response = sock.recv(1024)
```

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CLI API - BASICS

Xena Automation is based on:

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+

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Bash Example:

Creating a TCP Socket –

```
exec 3<> /dev/tcp/${MACHINE}/${PORT}
```

Communicating via Socket (s) –

```
echo -en "C_LOGON ${PASSWORD}\r\n" >&3
read  <&3
```

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CLI API - BASICS

Remember:

TCP Port used for connecting:	22611
Once TCP Socket is open, ASCII text commands are used, must be terminated by:	CR/LF

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CLI API - Commands

Command Structure

```
module/port command [index] value value …
```

Example:

```
2/5 PS_RATEPPS [3] 500000
```

Meaning:

- Module is no. 2
- Port on module is no. 5
- Command is: **PS_RATEPPS** =Set Stream Rate as Packets Per Second
- Stream on port is no. 3 *(SID)*
- Packets Per Second is set to 500000

- <u>All indices start at zero</u>

* Use "?" as value to READ current setting (explained in next slide)

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CLI API - Commands

Command Structure

Most commands can be used both to :

query the current status/data using "?" or

modify/set data via the actual value you would like to set:

You would query for the current value this way:

0/5 PS_RATEPPS [3] ?

And the chassis would respond the same way that you set the value yourself:

0/5 PS_RATEPPS [3] 500000

CLI API - Commands

Command Identifiers

C_.....CHASSIS PARAMETER
M_..... MODULE PARAMETER
P_..... PORT PARAMETER
PS_.....STREAM PARAMETER
PM_.... MATCH TERM PARAMETER
PL_..... LENGTH TERM PARAMETER
PF_.....FILTER PARMATERS
PC_.... CAPTURE PARAMETER
PT_.... TRANSMIT STATISTICS PARAMETER
PR_.... RECEIVE STATISTICS PARAMETER
PD_.... DATASET PARAMETER(HISTOGRAMS)
PP_.... 40/100G PARAMETER

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CLI API - Commands

Special scripting commands

Commands for supporting the scripting process itself:

sync	Produces a reply of <SYNC>, helpful when parsing and delimiting returned lines
sync on	Automatically set "sync" after each command.
sync off	Disables "sync on".
wait n	Waits for the specified number of seconds, (max 60), then replies <RESUME>
help ?	Gives an overview of the built-in help function
help "cmd"	Gives a brief overview of the syntax for "cmd"

CLI API – Status Messages

Status messages

The set/change commands themselves simply produce a reply from the chassis of:

<OK>

If something is unacceptable to the chassis, it may return one of the following:

<NOTLOGGEDON>	You have not issued a C_LOGON providing the chassis password.
<NOTRESERVED>	You have not issued a x_RESERVATION for the resource you want to change.
<NOTWRITABLE>	The parameter is read-only.
<NOTREADABLE>	The parameter is write-only.
<NOTVALID>	The operation is not valid in the current chassis state, e.g. because traffic is on.
<BADMODULE>	The module index value is out of bounds.
<BADPORT>	The port index value is out of bounds.
<BADINDEX>	A parameter sub-index value is wrong.
<BADSIZE>	The size of a data value is not appropriate.
<BADVALUE>	A value is not appropriate.
<FAILED>	An operation failed to produce a result.

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CLI API – Status Messages

Status messages

If there is a plain syntax error, misspelled parameter, or an inappropriate use of module/port/indices, the chassis will return a line pointing out the column where the error was detected, e.g.:

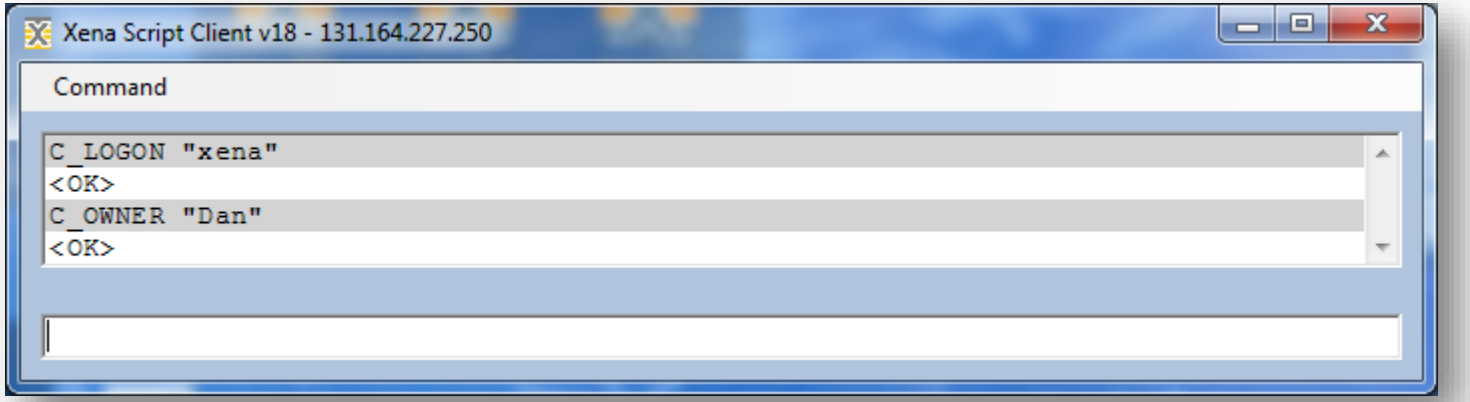
```
0/5 PS_RATEPPS [] 5q00
                  ---^
#Syntax error in column 24
```

CLI API – First Steps

First open connection via script/program or via Xena Script Client.

Then authenticate the connection to the chassis and provide a username for reservation:

```
C_LOGON "xena"
C_OWNER "example"
```



CLI API – First Steps

*Wi-Fi [Wireshark 1.10.9 (v1.10.9-0-g6b041ab from master-1.10)]

File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: tcp.port == 22611 Expression... Clear Apply Save

No.	Time	Source	Destination	Protocol	Length	Info
152	12.2173860	192.168.1.80	192.168.1.170	TCP	66	53531 > 22611 [SYN] Seq=0 Win=8192 Len=0 MSS=1260 WS=256 SACK_P
153	12.2185210	192.168.1.170	192.168.1.80	TCP	66	22611 > 53531 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SA
154	12.2185930	192.168.1.80	192.168.1.170	TCP	54	53531 > 22611 [ACK] Seq=1 Ack=1 Win=66560 Len=0
280	22.3342570	192.168.1.80	192.168.1.170	TCP	70	53531 > 22611 [PSH, ACK] Seq=1 Ack=1 Win=66560 Len=16
281	22.3355620	192.168.1.170	192.168.1.80	TCP	60	22611 > 53531 [ACK] Seq=1 Ack=17 Win=5888 Len=0
282	22.3378680	192.168.1.170	192.168.1.80	TCP	60	22611 > 53531 [PSH, ACK] Seq=1 Ack=17 Win=5888 Len=5
283	22.3846410	192.168.1.80	192.168.1.170	TCP	54	53531 > 22611 [ACK] Seq=17 Ack=6 Win=66560 Len=0
496	48.4415070	192.168.1.80	192.168.1.170	TCP	73	53531 > 22611 [PSH, ACK] Seq=17 Ack=6 Win=66560 Len=19
497	48.4450140	192.168.1.170	192.168.1.80	TCP	60	22611 > 53531 [PSH, ACK] Seq=6 Ack=36 Win=5888 Len=5

```
Frame 152: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
Ethernet II, Src: IntelCor_3b:52:22 (7c:7a:91:3b:52:22), Dst: Armorlin_16:72:d3 (00:18:7d:16:72:d3)
Internet Protocol Version 4, Src: 192.168.1.80 (192.168.1.80), Dst: 192.168.1.170 (192.168.1.170)
Transmission Control Protocol, Src Port: 53531 (53531), Dst Port: 22611 (22611), Seq: 0, Len: 0
```

Follow TCP Stream

Stream Content

```
c_logon "xena"
<OK>
c_owner "Michael"
<OK>
```

Entire conversation (48 bytes)

Find | Save As | Print | ASCII | EBCDIC | Hex Dump | C Arrays | Raw

Help | Filter Out This Stream | Close

```
0000  00 18 7d 16 72 d3 7c 7a  91 3b 52 22 08 00 45 00   ..}.r.|z .;R"..E.
0010  00 34 54 97 40 00 80 06  21 e2 c0 a8 01 50 c0 a8   .4T.@... !....P..
0020  01 aa d1 1b 58 53 e5 31  d9 dc 00 00 00 00 80 02   ....XS.1 ........
0030  20 00 e3 0f 00 00 02 04  04 ec 01 03 03 08 01 01    ....... ........
0040  04 02                                              ..
```

File: "C:\Users\MICHAE~1\AppData\Local\T... ... Profile: Default

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Scripting

An automated test script has two main components:

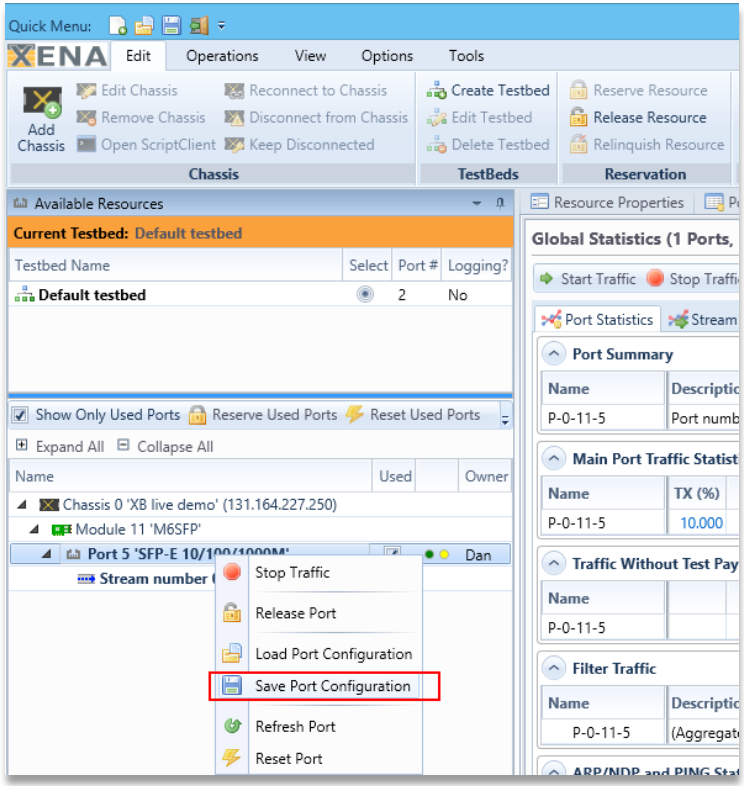
1 - Port Configuration

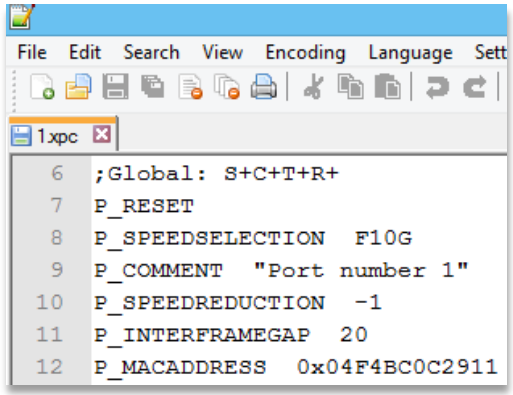
2 - Test Logic

Scripting

Port Configuration

- Includes *Port, Streams, Capture, Filters, Histograms* Configuration commands
- Can be exported via the GUI
- Can be imported to a port via a small method

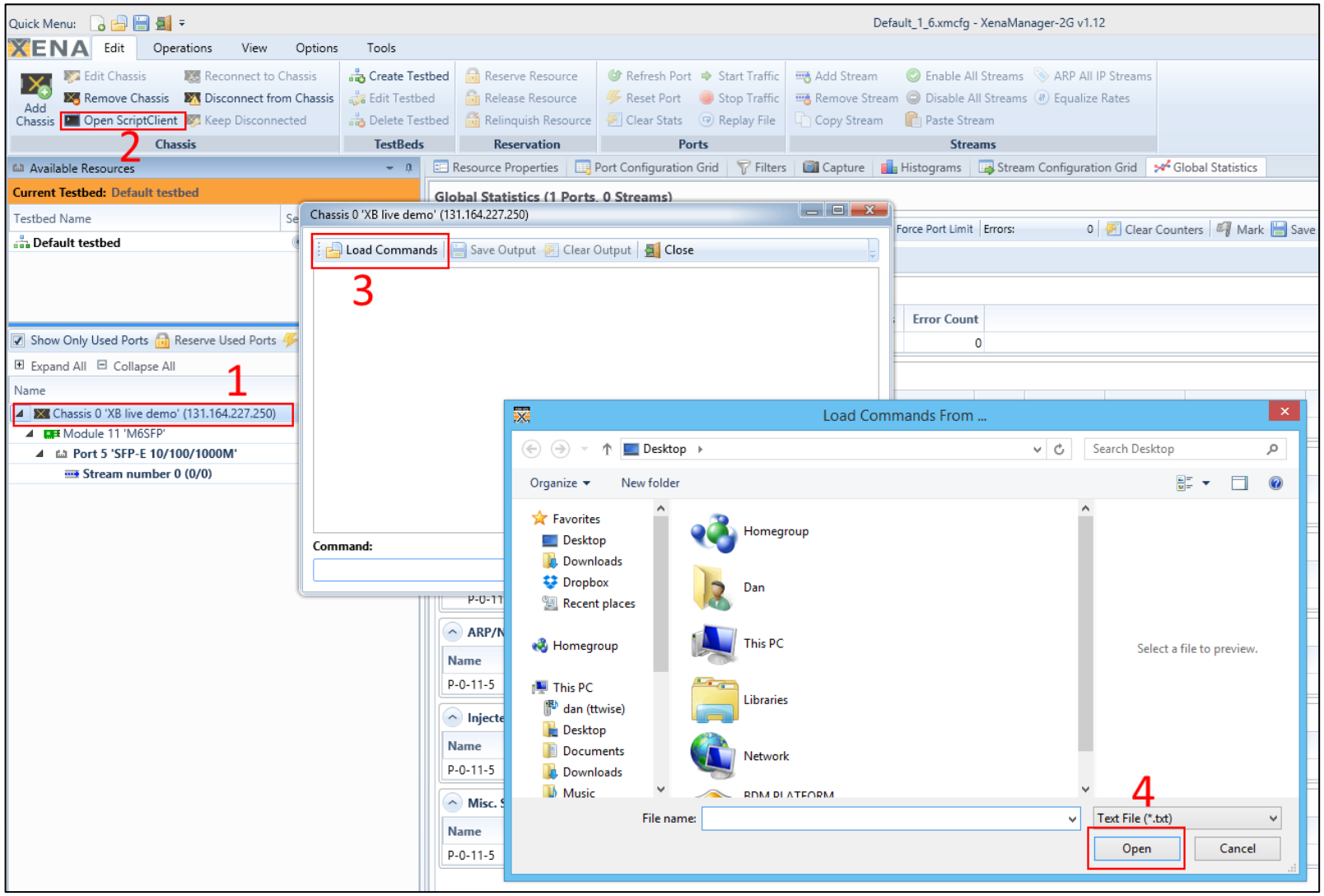





```
proc LoadPortConfig { s port file_name console} {
    set file_data [read $fp]
    set data [split $file_data "\n"]

    foreach line $data {
        if {$line==""} {break}
        if !{[string match ";*" $line]} {
            puts $s "$port $line"
            gets $s response
        }
    }
    close $fp
}
```

Scripting – Port Configuration



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Scripting

Test Logic

- If/else/while/etc… logic provided by the scripting or program language
- Real-time interaction commands with Xena referred to as the SCRIPT CORE COMMANDS
- Real-time interaction commands with the DUT

Connect

Connect / Login

Reservation

Reserve / Release / +IsReserved? / + IsReservedByMe?

Port

PortLinkUp / PortLinkDown / +HasLink?

Configuration

Clear / Load

Traffic

Start / Stop

Capture

Start / Stop / Save

Results

Clear / Get (Port / Stream / Filter) / Save (Port / Stream / *Filter*) to .CSV

Scripting – Login Example

```
# ---------------- Login ----------------
proc Login {s chassis_pass chassis_user console} {

    set pf_flag 1

   puts $s "c_logon $chassis_pass"
   gets $s response
   if {$response == ""} { gets $s response  }

   if {"$response" != "<OK>"}    {set pf_flag 0}
   if {$console == 1} { puts "Logging | $response" }


   puts $s "c_owner $chassis_user"
   gets $s response
   if {$response == ""} { gets $s response  }

   if {$console == 1} { puts "Owner   | $response" }
   if {"$response" != "<OK>"}    {set pf_flag 0}

   return $pf_flag
}
#
# ----------------------------------------
```

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Automating Test Suites

Use simple one-line shell command to automate a full RFC test based on prebuilt test configuration

TCL uses “EXEC” in order to execute a process

C:\Windows\system32\cmd.exe

```
C:\Program Files\Xena>Xena2544run_27.exe

XenaRun - Xena Test Configuration Executer
Copyright c Xena Networks 2012 - 2013


ERROR: The option --config is mandatory and must be provided.

Valid options:

  -c, --config        Required. Path to test configuration file.
  -t, --testtype      Test type to execute: { conf (*) | perf } (Y.1564 only).
  -u, --user          Set the username (default: xenacli)
  -r, --reportpath    Path where reports are saved.
  -o, --company       Company name.
  -l, --logo          Path to logo file.
  -h, --help          Display this help screen.

C:\Program Files\Xena>
```

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Valkyrie REST Server

The new Valkyrie REST server

- is a client-less, language-agnostic, out-of-the-box, chassis embedded REST server.
- lets you build automation scripts with your choice of language, tool and client environment.
- supports all Valkyrie CLI commands and adds many more abstract operations (like returning statistics as ready-to-consume JSON) that simplify and speed up automation development.

With the REST server Xena also releases a full Python object-oriented REST client

- enabling Python developers to simply pip install it and start building automation scripts without spending time on developing the traffic generator layer.

For more information see:

Valkyrie REST Server User Manual

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Want more?

CHECK TECHNICAL DOCUMENTATION

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