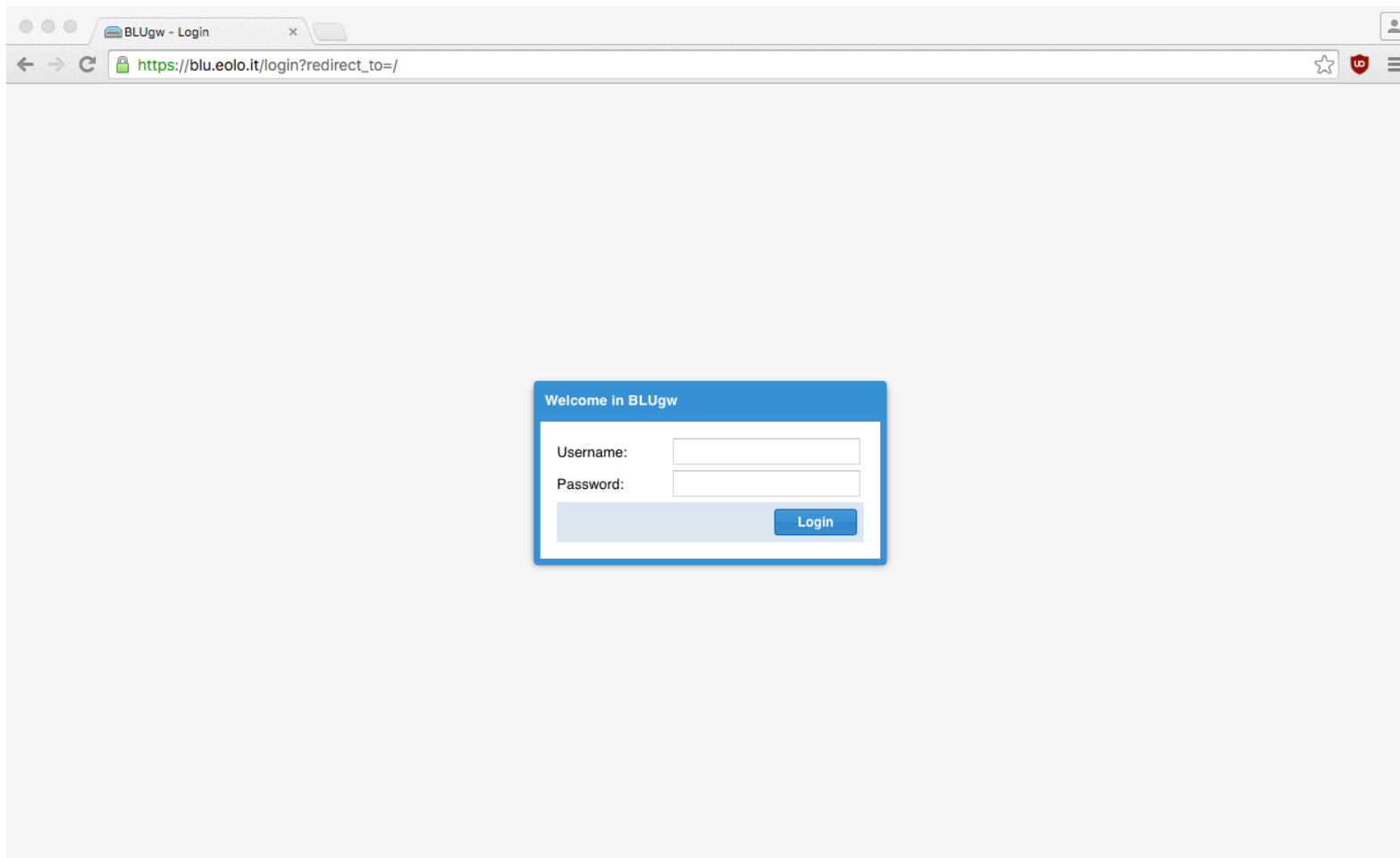


A selection of

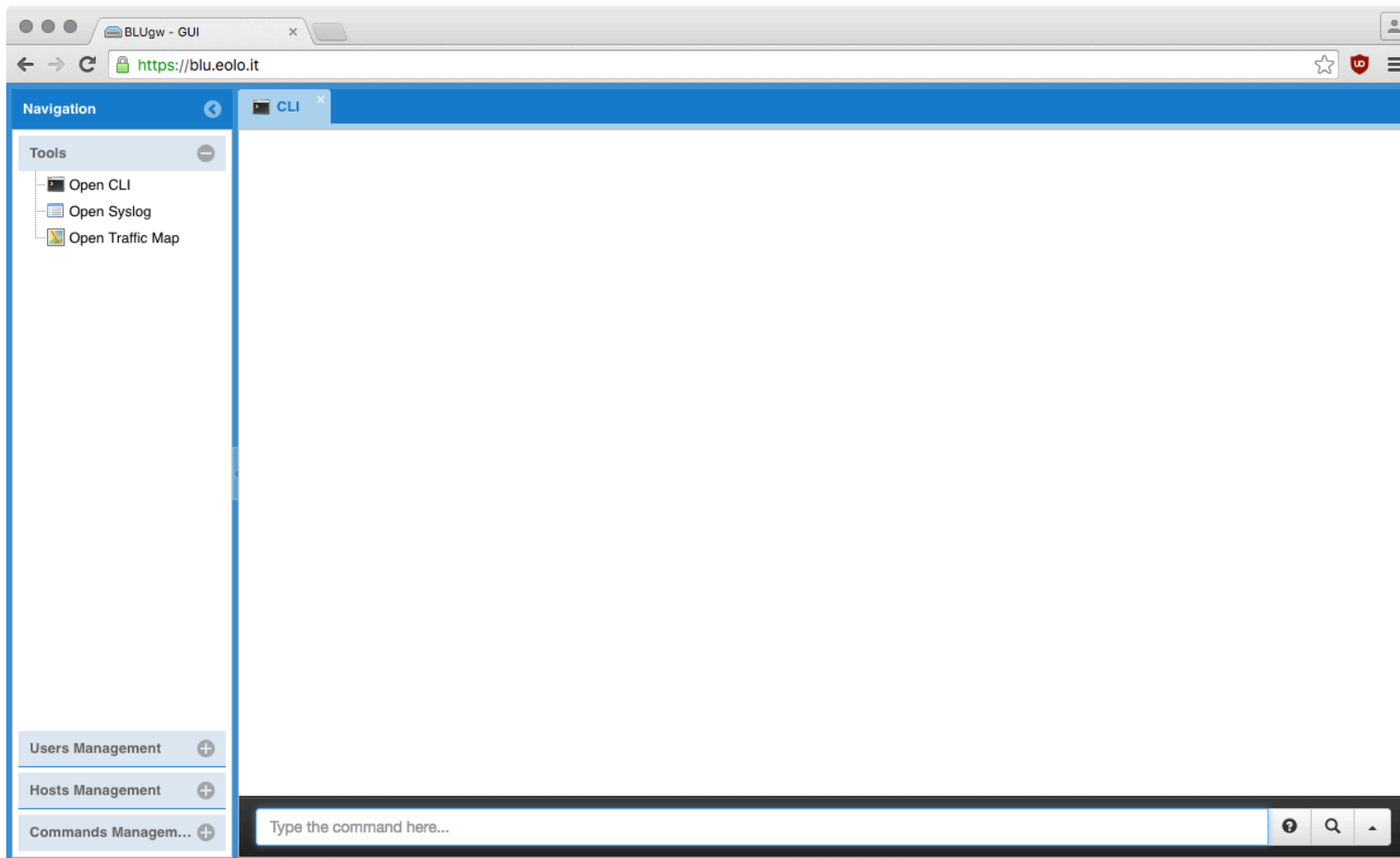
# BLU screenshots

Giacomo Bernardi

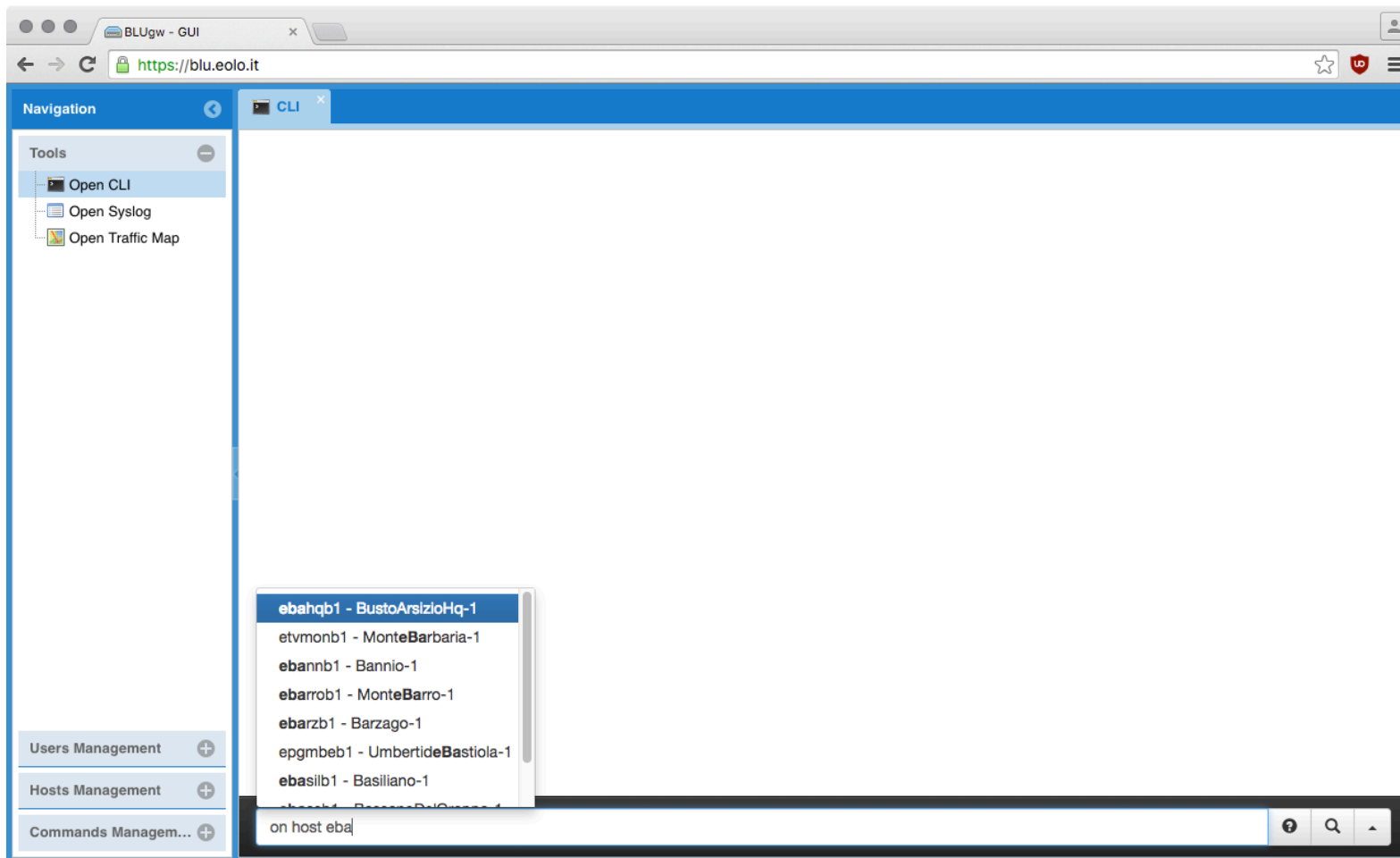
Please do not share this document.



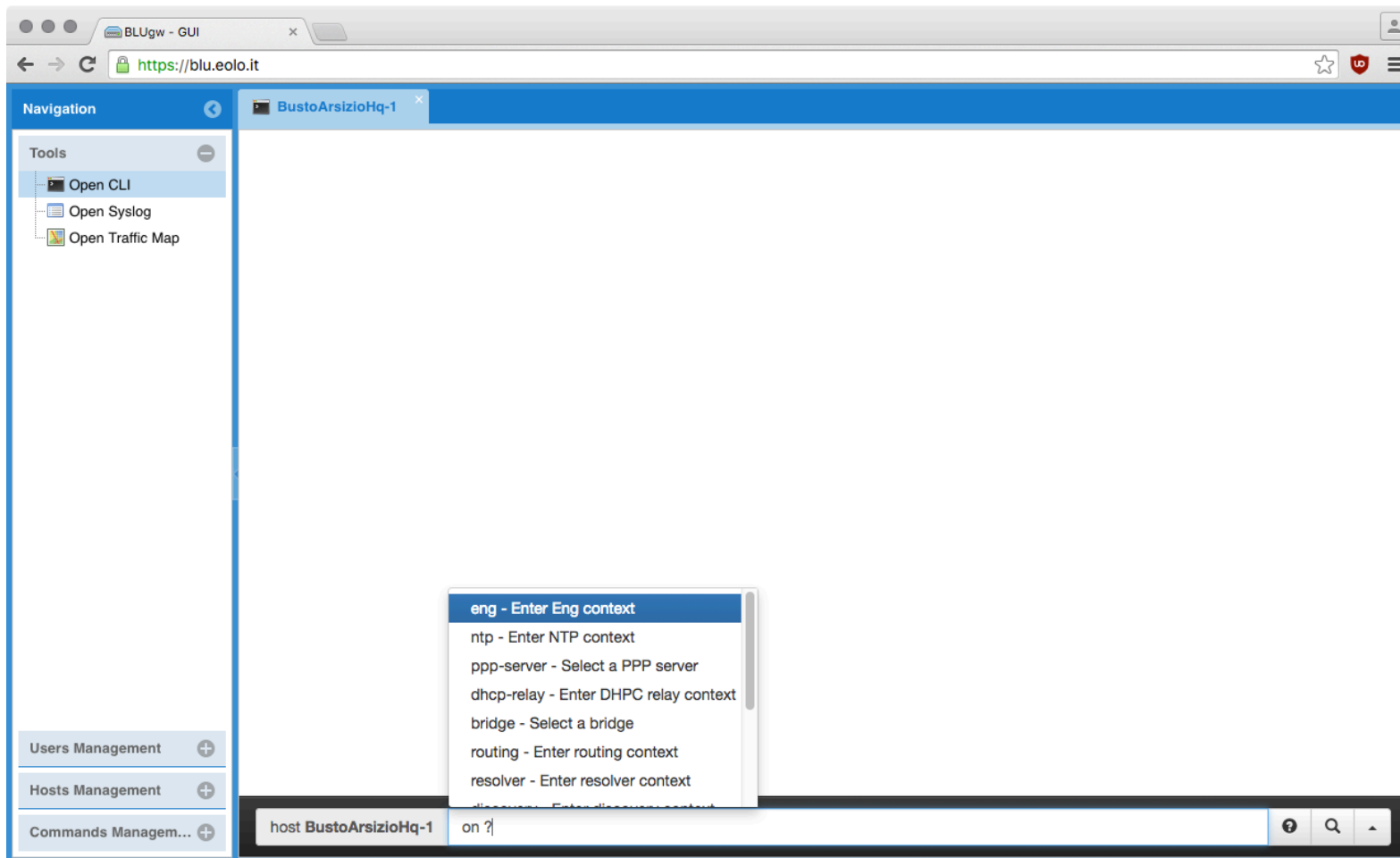
**Login screen.** Users and groups are defined locally or from a remote LDAP or Active Directory server. Direct SSH access to the routers is only granted to few escalation engineers (e.g., for emergency debug tasks), who login using a central PKI.



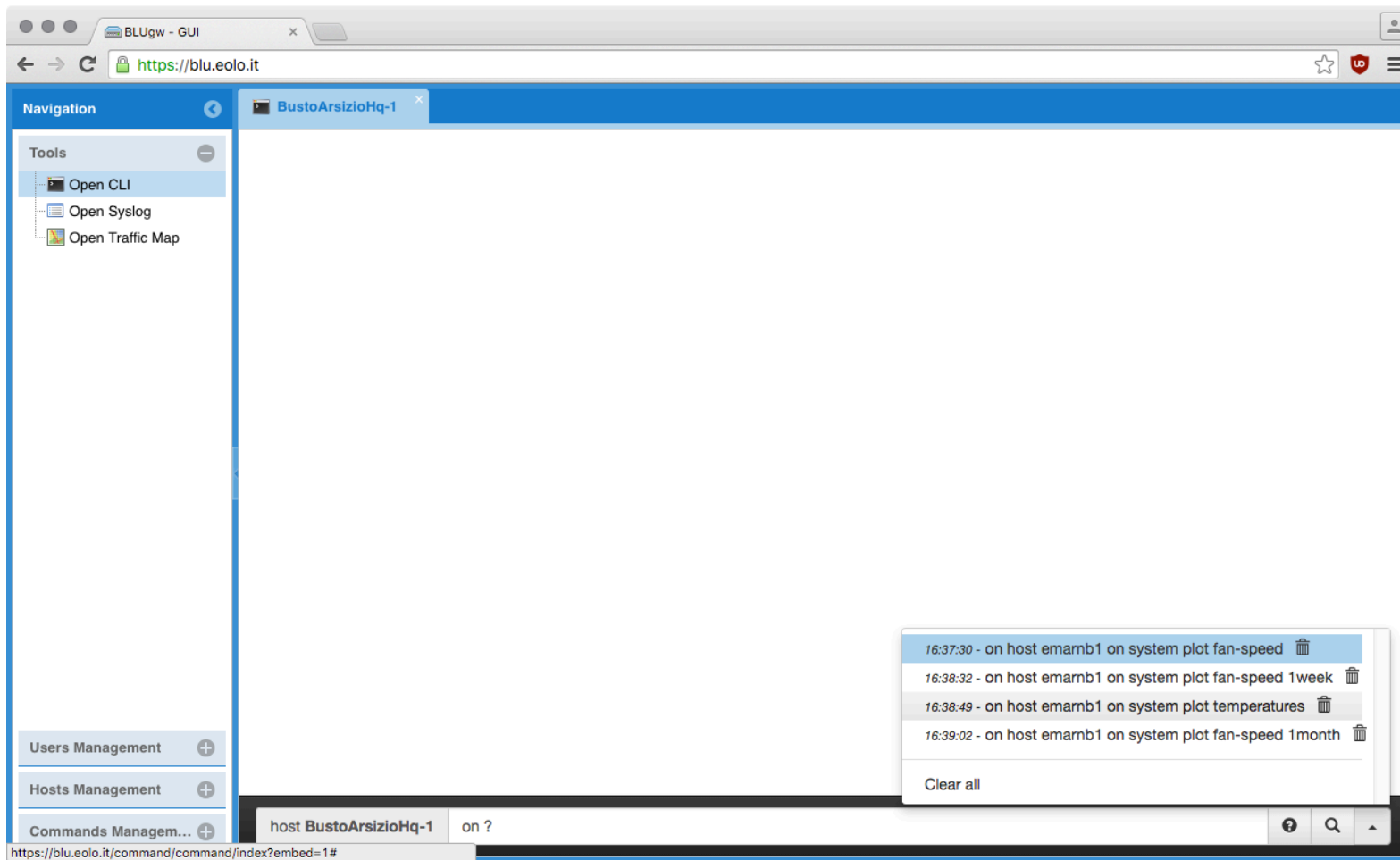
The **main interface** after completing the login.  
On the bottom, the **prompt** which allows to query and configure one or more (i.e., a group of) devices using a specific SQL-like syntax.



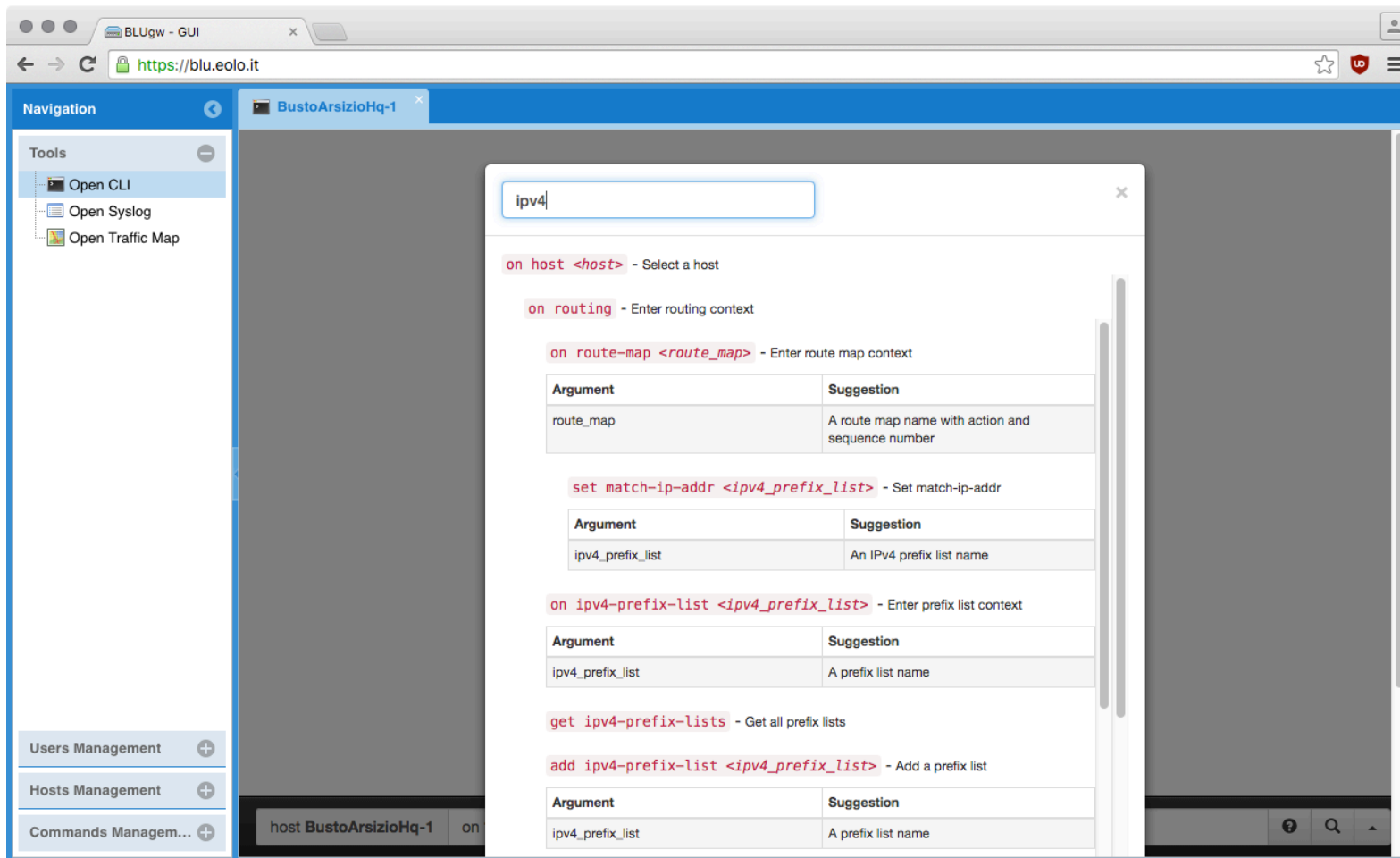
The operator types commands on this command-line textbox. There's a **context-sensitive auto-completion** mechanism that tries to guess what the operator is trying to do based on the local context, the history and his/her privileges. There's also a set of keyboard shortcuts.



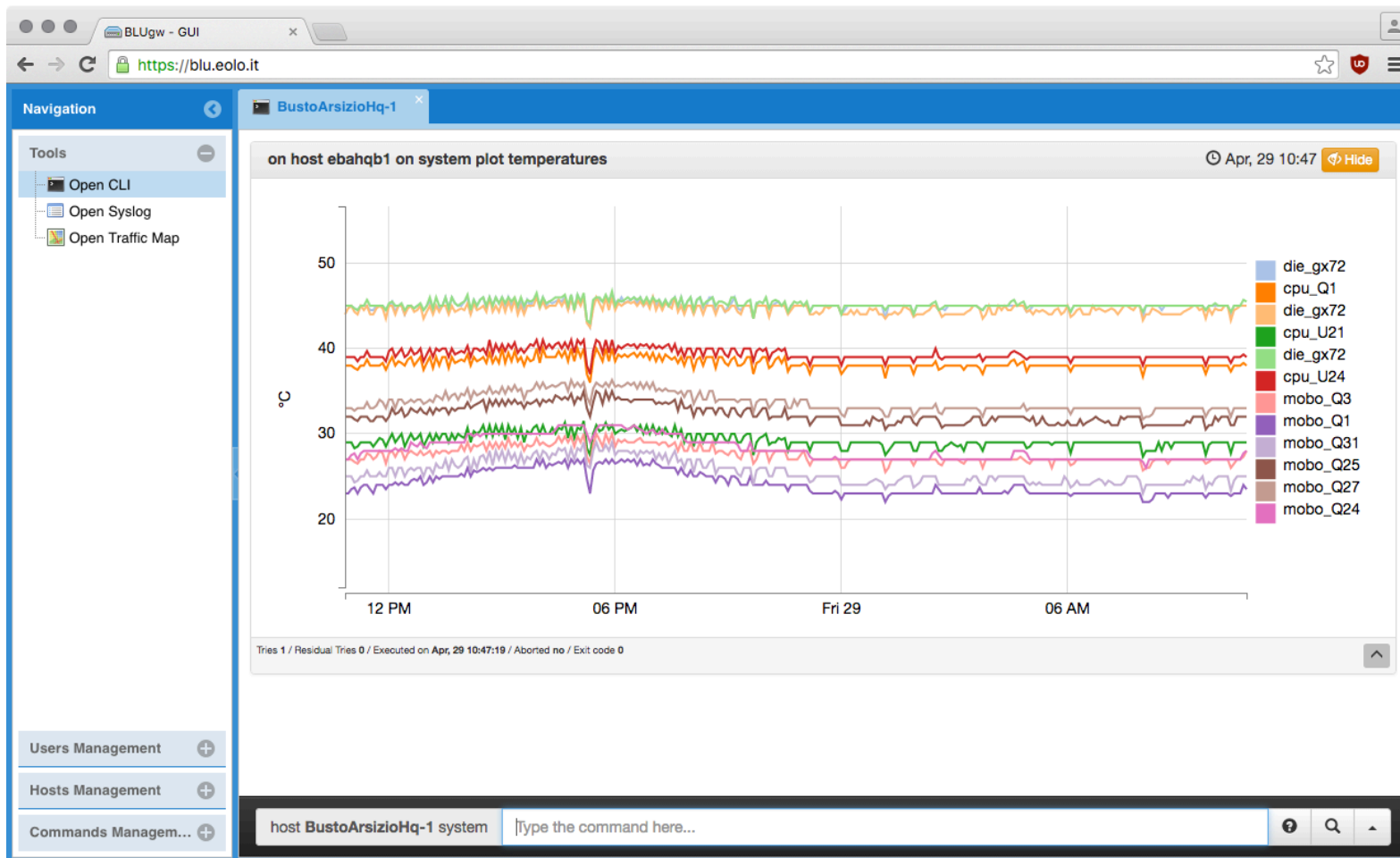
The CLI **auto-completion** providing a quick help on each command.



Quickly accessible **history** of the latest commands executed on this router.

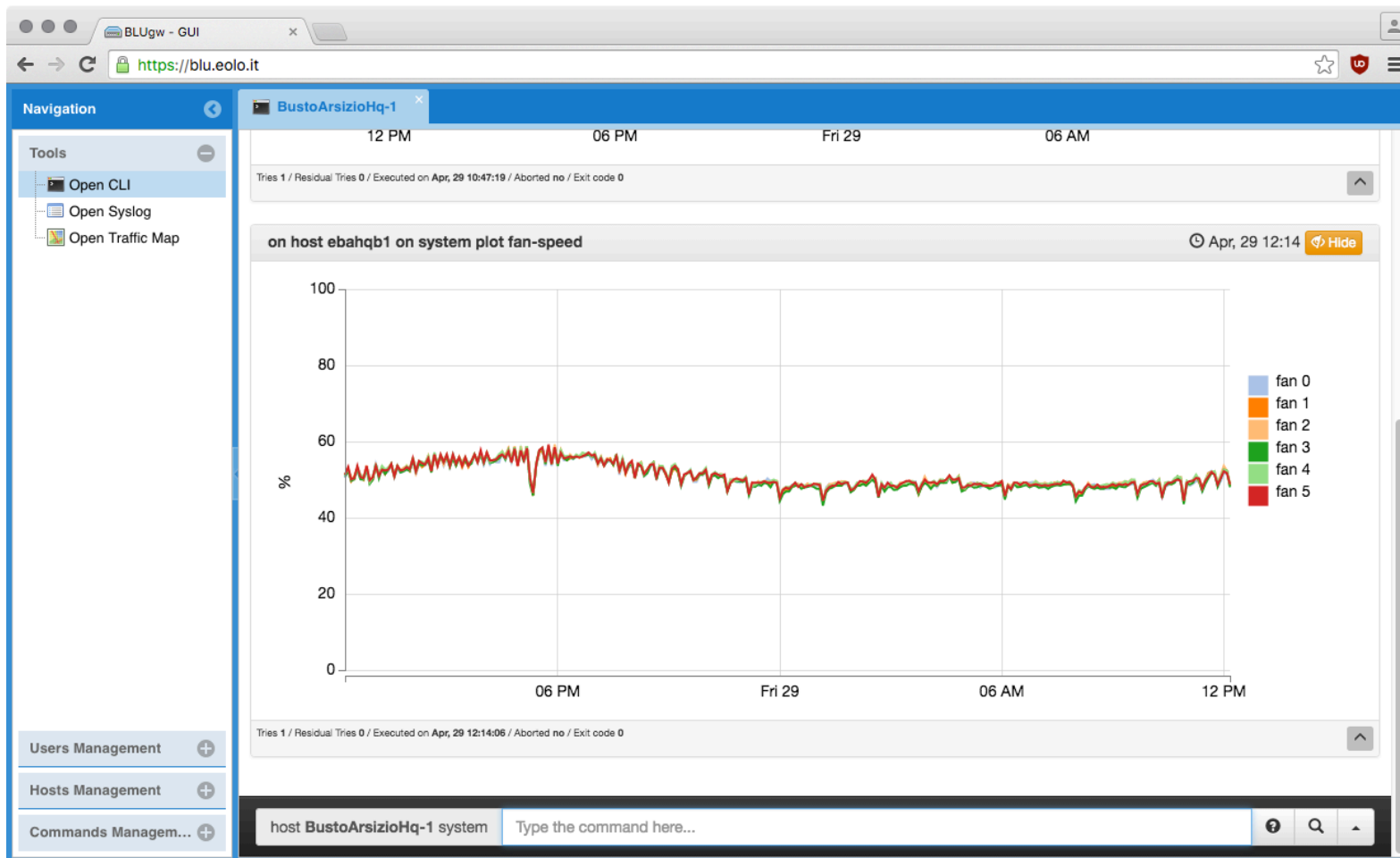


The “help” function provides a dynamically generated **reference guide** for all the commands that the specific operator is allowed to run.



The result of CLI commands are rendered either as **text**, as a **table**, or in a **graphical representation**.  
In this example, the operator is plotting the temperatures of the last day for a given router.

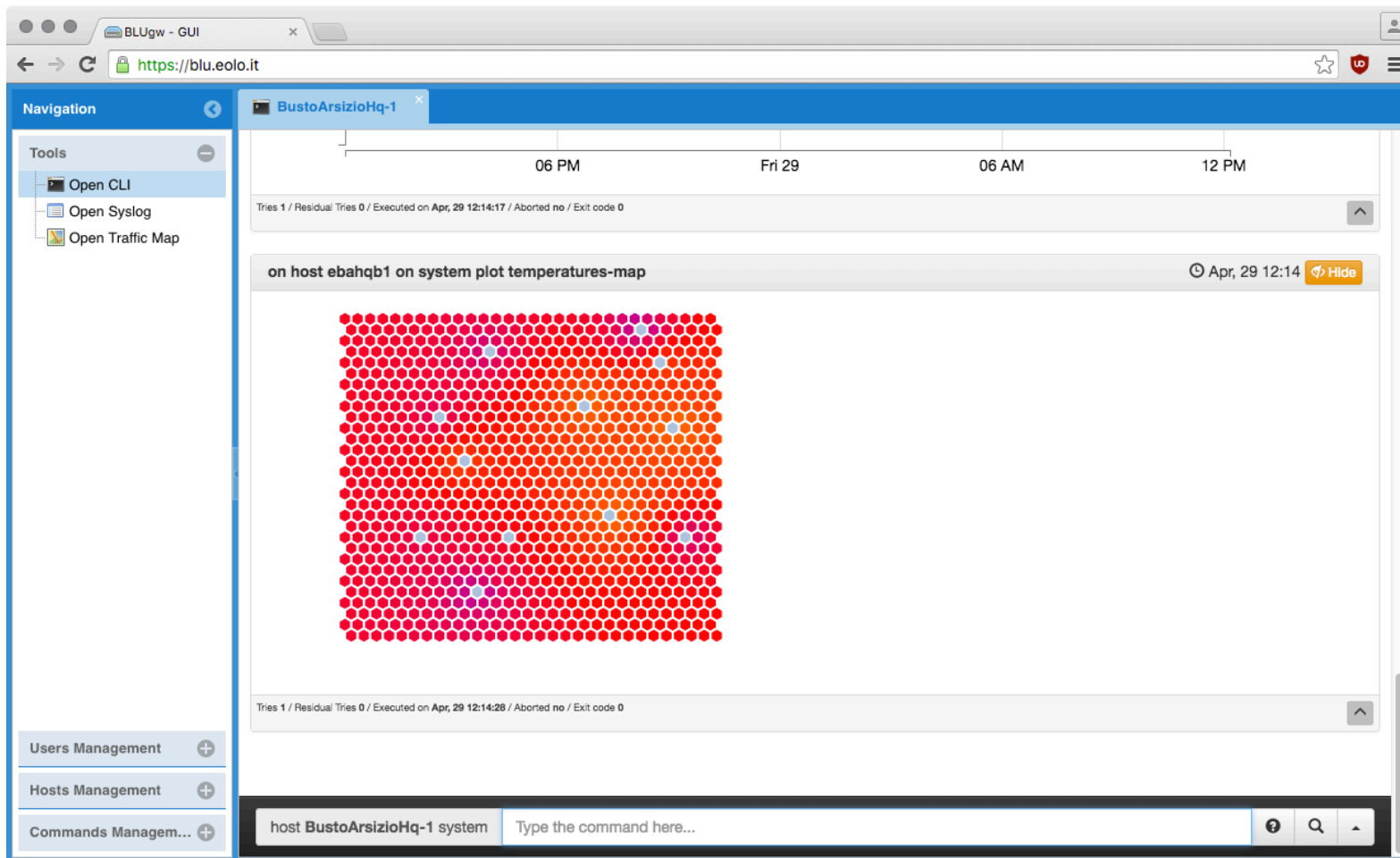




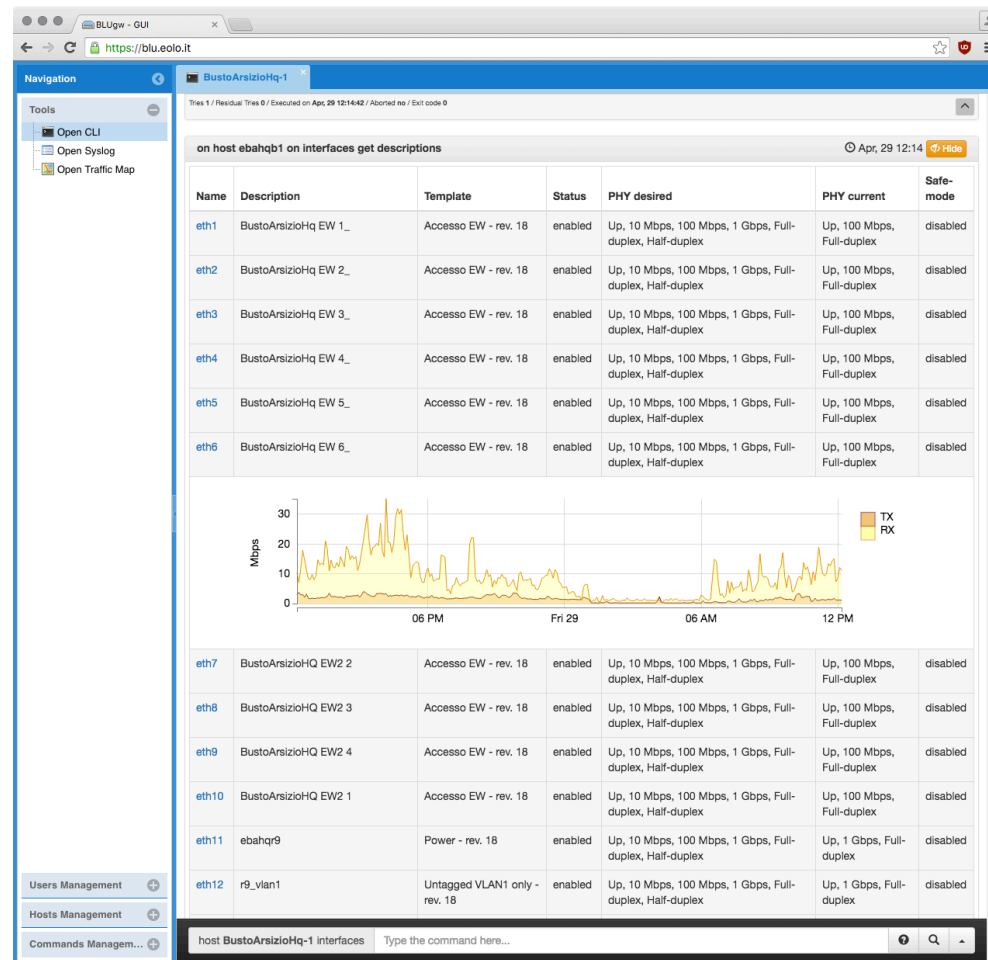
In this example, plotting the fan speeds of a given router.



In this example, plotting the power monitoring of the PSUs of a given router.



In this example, interpolating the **thermal distribution** inside the enclosure of a router, given the latest reading from its 12 temperature sensors (blue dots).



**Quick summary** of the interfaces enabled on a given router, along with traffic plots of a specific port.  
In case of failures/errors on an interface, that row would be highlighted.

Navigation

Tools

- Open CLI
- Open Syslog
- Open Traffic Map

Users Management

Hosts Management

Commands Managem...

on host ebahqb1 on interface eth1 get stats

parameter	value
collisions	0
multicast	0
rx_bytes	851365168432 (851.4GB )
rx_compressed	0
rx_crc_errors	0
rx_dropped	1125
rx_errors	0
rx_fifo_errors	0
rx_frame_errors	0
rx_length_errors	0
rx_missed_errors	0
rx_over_errors	0
rx_packets	2696384739
tx_aborted_errors	0
tx_bytes	3736244338062 (3.7TB )
tx_carrier_errors	0
tx_compressed	0
tx_dropped	0
tx_errors	0
tx_fifo_errors	0
tx_heartbeat_errors	0
tx_packets	3683838310
tx_window_errors	0

host BustoArsizioHq-1 interface eth1

Type the command here...

In this example, a **table view** of the L2 statistics of an Ethernet interface.

BLUgw - GUI

https://blu.eolo.it

Navigation

Tools

Users Management

Hosts Management

Hosts

BLUs Versions

BLUs/template matrix

Templates

Interfaces Templates

OVS Flows

Commands Managem...

CLI Hosts

Update template Update BLUs Update tonight

<input type="checkbox"/>	name ↑	human_name	unit_type	ip	sn	bluos_version	pppoe_session	template_re	template_type	last_push	creation_date
<input checked="" type="checkbox"/>	€	Ag	PRODU...	10.	ROK-01...	BLUos rev. ...	43	19	Legacy	Fri Apr 29 2...	Tue Apr 05 ...
<input type="checkbox"/>	€	Ag	PRODU...	10.	ROK-01...	BLUos rev. ...	196	21	Mainstream	Fri Apr 29 2...	Thu Feb 18...
<input type="checkbox"/>	€	Bri	PRODU...	10.	ROK-01...	BLUos rev. ...	255	21	Mainstream	Fri Apr 29 2...	Tue Jan 26 ...
<input type="checkbox"/>	€	Ca	PRODU...	10.	ROK-01...	BLUos rev. ...	27	20	Mainstream	Fri Apr 29 2...	Wed Feb 17...
<input type="checkbox"/>	€	Po	PRODU...	10.	ROK-01...	BLUos rev. ...	12	21	Mainstream	Fri Apr 29 2...	Wed Mar 02...
<input type="checkbox"/>	€	An	PRODU...	10.	ROK-01...	BLUos rev. ...	0	18	Mainstream	Fri Apr 29 2...	Wed Dec 16...
<input type="checkbox"/>	€	Ac	PRODU...	10.	ROK-01...	BLUos rev. ...	2	20	Mainstream	Fri Apr 29 2...	Wed Dec 16...
<input type="checkbox"/>	€	Ag	PRODU...	10.	ROK-01...	BLUos rev. ...	0	20	Mainstream	Fri Apr 29 2...	Thu Mar 10...
<input type="checkbox"/>	€	Arc	PRODU...	10.	ROK-01...	BLUos rev. ...	4	6	Mainstream	Fri Apr 29 2...	Wed Dec 16...
<input type="checkbox"/>	€	Ba	PRODU...	10.	ROK-01...	BLUos rev. ...	2	20	Mainstream	Fri Apr 29 2...	Wed Dec 16...
<input type="checkbox"/>	€	Arc	PRODU...	10.	ROK-01...	BLUos rev. ...	2	20	Mainstream	Fri Apr 29 2...	Wed Dec 16...
<input type="checkbox"/>	€	Cr	PRODU...	10.	ROK-01...	BLUos rev. ...	0	21	Mainstream	Fri Apr 29 2...	Fri Feb 05 2...
<input type="checkbox"/>	€	Cu	PRODU...	10.	ROK-01...	BLUos rev. ...	6	21	Mainstream	Fri Apr 29 2...	Wed Dec 16...
<input type="checkbox"/>	€	An	PRODU...	10.	ROK-01...	BLUos rev. ...	94	21	Legacy	Fri Apr 29 2...	Fri Jan 08 2...
<input type="checkbox"/>	€	For	PRODU...	10.	ROK-01...	BLUos rev. ...	1	21	Mainstream	Fri Apr 29 2...	Wed Dec 16...
<input type="checkbox"/>	€	Mo	PRODU...	10.	ROK-01...	BLUos rev. ...	1	18	Mainstream	Fri Apr 29 2...	Fri Apr 01 2...
<input type="checkbox"/>	€	Mo	PRODU...	10.	ROK-01...	BLUos rev. ...	4	20	Mainstream	Fri Apr 29 2...	Mon Apr 11...
<input type="checkbox"/>	€	Off	PRODU...	10.	ROK-01...	BLUos rev. ...	1	21	Mainstream	Fri Apr 29 2...	Wed Feb 17...
<input type="checkbox"/>	€	Mo	PRODU...	10.	ROK-01...	BLUos rev. ...	0	14	Mainstream		Thu Mar 10...
<input type="checkbox"/>	€	Mo	PRODU...	10.	ROK-01...	BLUos rev. ...	0	1	Mainstream		Wed Dec 16...
<input type="checkbox"/>	€	Pa	PRODU...	10.	ROK-01...	BLUos rev. ...	1	21	Mainstream	Fri Apr 29 2...	Wed Dec 16...
<input type="checkbox"/>	€	Pol	PRODU...	10.	ROK-01...	BLUos rev. ...	0	20	Mainstream		Mon Apr 11...

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List of the **hosts provisioned** with basic details (e.g., hostname, versions, serial numbers, etc).

The screenshot shows the BLUgw GUI interface. The main content area displays a table of BLUos Versions. The table has three columns: date, revision, and changelog. The data is sorted by date in descending order. The left sidebar contains navigation links for Tools, Users Management, Hosts Management, BLUos Versions (selected), BLUos/template matrix, Templates, Interfaces Templates, and OVS Flows. The bottom of the page shows pagination controls and the text 'Displaying 1 - 30 of 91'.

date	revision ↓	changelog
2016-04-26 16:26:52	517	* Fix for Case9199: OVS considering PVST status of original vlan * Fix for Case9201: OVS not working correctly with MPLS actions * Removing temporary debug level from the kernel * blues_factory_install: support for the TILEmpower-Gx72-FR platform
2016-04-22 17:24:43	513	* Controllino-webGUI: Added new devices
2016-04-22 15:25:01	512	* Adding blu12 to testbed
2016-04-21 17:25:34	511	* New units mapping
2016-04-18 10:27:20	510	* Adding various utilities for lab validation
2016-04-11 17:26:44	509	* OVS: fix LLDP over ethgrp interfaces
2016-04-07 14:26:12	508	* Bash: disabling automatic window resize and re-enabling the 'ft' command
2016-04-05 13:26:32	507	* Testbed: new mappings.conf file
2016-03-31 16:26:36	506	* Bash: automatically detecting terminal size (even over serial, wow...) * ovs: fix to syslog priority in messages * ethgrp: improved how ethergroups are restored at boot * spare: fixed how backup configuration files are restored * ft: deprecating this script (it is now automatic)
2016-03-30 13:26:46	501	* OVS: first restore groups, then flows (and not the opposite)
2016-03-29 14:26:44	500	* Adding bash alias of-groups
2016-03-21 16:26:20	499	* Removing obsolete patch for case8950
2016-03-21 14:26:41	498	* 3.41.NGL17 * 3.41.NGL17 (Bob the builder script)
2016-03-21 10:26:23	496	* Added prespantega keep-alive daemon (pska)
2016-03-18 16:26:28	495	* Introducing 'ft': the fix terminal utility
2016-03-18 11:26:11	494	* BLUos spare post: changing timers
2016-03-15 12:26:37	493	* LACP: fix instability case9085 * OVS: fix for BPDU on ports not configured for those vlans (case9091) * renaming patch 130 * renaming patch 131

**Changelog** of the latest BLUos (the operating system of BLU routers) builds. Logs are automatically generated from commit comments. Once a build is committed into production, it goes through a suite of regression tests.

Navigation

Tools

Users Management

Hosts Management

- Hosts
- BLUos Versions
- BLUos/template matrix
- Templates**
- Interfaces Templates
- OVS Flows

Commands Managem...

Hosts Templates

Add Delete Edit Duplicate Commit Promote to STABLE

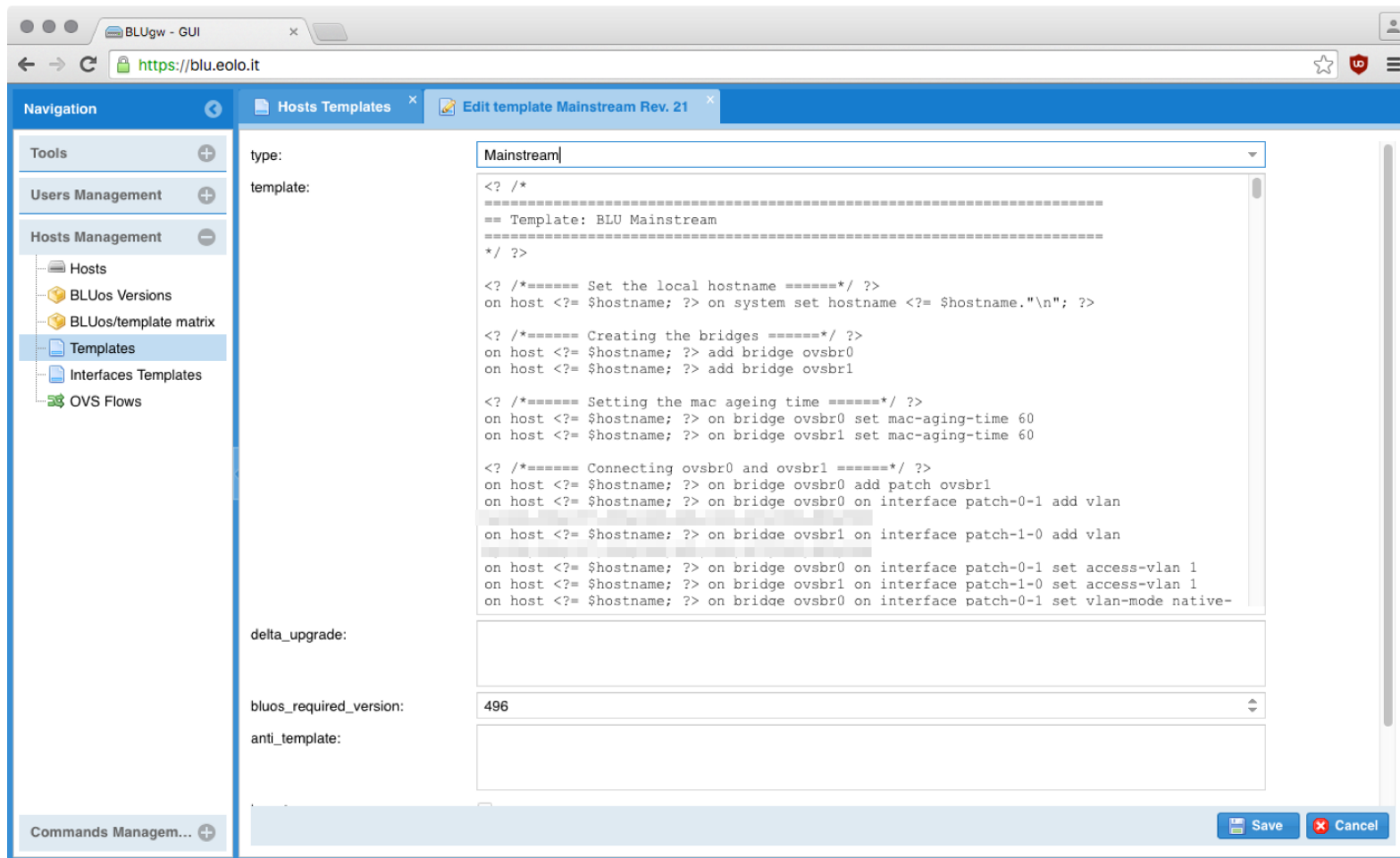
<input type="checkbox"/>	revision_number ↓	type	bluos_required_ve	visibility	anti_template	is_extra	priority	status
<input type="checkbox"/>	21	Mainstream	496	Public		0	0	STABLE
<input type="checkbox"/>	21	Legacy	496	Public		0	0	STABLE
<input type="checkbox"/>	21	Spare	496	Public		0	0	STABLE
<input type="checkbox"/>	20	Mainstream	496	Public		0	0	BETA
<input type="checkbox"/>	20	Legacy	496	Public		0	0	BETA
<input type="checkbox"/>	20	Spare	496	Public		0	0	BETA
<input type="checkbox"/>	19	Mainstream	496	Public		0	0	BETA
<input type="checkbox"/>	19	Legacy	496	Public		0	0	BETA
<input type="checkbox"/>	19	Spare	496	Public		0	0	BETA
<input type="checkbox"/>	18	Mainstream	496	Public		0	0	BETA
<input type="checkbox"/>	18	Legacy	496	Public		0	0	BETA
<input type="checkbox"/>	18	Spare	496	Public		0	0	BETA
<input type="checkbox"/>	17	Mainstream	496	Public		0	0	BETA
<input type="checkbox"/>	17	Legacy	496	Public		0	0	BETA
<input type="checkbox"/>	17	Spare	496	Public		0	0	BETA
<input type="checkbox"/>	16	Mainstream	496	Public		0	0	BETA
<input type="checkbox"/>	16	Legacy	496	Public		0	0	BETA
<input type="checkbox"/>	16	Spare	496	Public		0	0	BETA
<input type="checkbox"/>	15	Mainstream	324	Public		0	0	BETA
<input type="checkbox"/>	15	Legacy	324	Public		0	0	BETA
<input type="checkbox"/>	15	Spare	324	Public		0	0	BETA
<input type="checkbox"/>	14	Mainstream	324	Public		0	0	BETA

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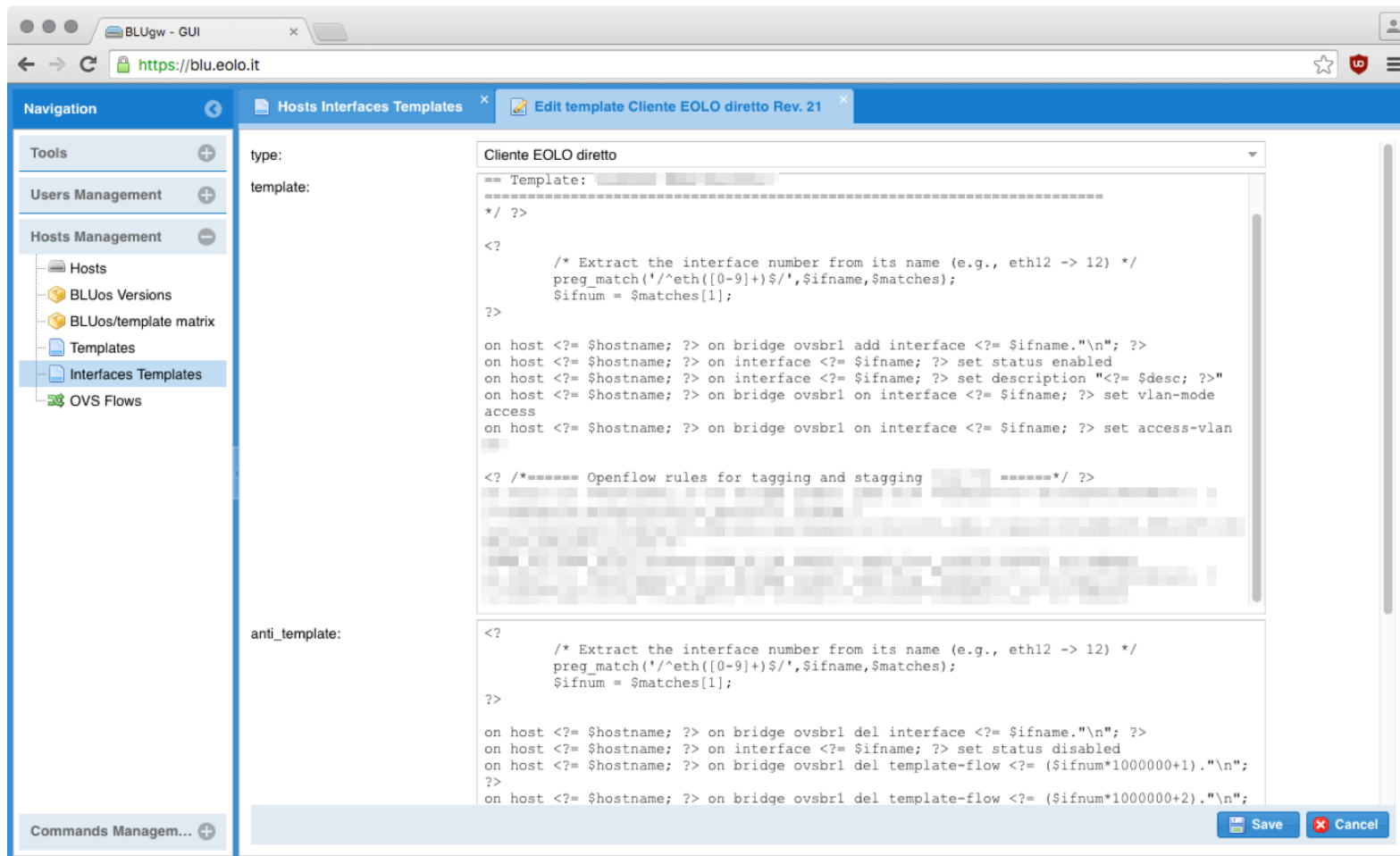
Displaying 1 - 30 of 58

List of the **host configuration templates**, which are defined using the CLI syntax shown before.  
 Once a template is declared as “stable”, it is incrementally rolled out  
 on production routers following an automated schedule.





Detail of an **host template**.  
Since this screenshot, syntax highlighting has been added.



### An example of **interface template**.

In order to ensure long-term configuration consistency, individual interfaces cannot be manually configured from the CLI. Instead, they are associated to one or more templates.

BLUgw - GUI

https://blu.eolo.it

Navigation

- Tools
- Users Management
- Hosts Management
  - Hosts
  - BLUos Versions
  - BLUos/template matrix
  - Templates
  - Interfaces Templates
  - OVS Flows**
- Commands Management

Host Flow Editor - eagnab1

flow	bridge	locked	status
<input type="checkbox"/> table=0,priority=100,dl_vlan=0xffff,in_port=101,action=drop	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=40,dl_vlan=202,action=resubmit(,1)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=40,dl_vlan=157,action=resubmit(,1)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=40,dl_vlan=100,action=resubmit(,1)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=40,dl_vlan=53,action=resubmit(,1)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=40,dl_vlan=52,action=resubmit(,1)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=40,dl_vlan=51,action=resubmit(,1)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=40,dl_vlan=50,action=resubmit(,1)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=40,dl_vlan=8,action=resubmit(,70)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=30,ip,nw_dst=,action=resubmit(,10)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=30,ip,nw_dst=,78,action=resubmit(,10)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=30,ip,nw_dst=,78,action=resubmit(,10)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=30,ip,nw_dst=,action=resubmit(,10)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=30,ip,nw_dst=,action=resubmit(,10)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=30,ip,nw_dst=,action=resubmit(,10)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=30,ip,nw_dst=,action=resubmit(,10)	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=21,in_port=101,,actions=resub...	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=21,in_port=101,,actions=resub...	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=20,dl_vlan=150,,actions=learn(table=101,de...	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=20,dl_vlan=150,,actions=learn(table=101,de...	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=0,priority=0,actions=normal	ovsbr0	1	UPDATED_...
<input type="checkbox"/> table=1,priority=1,dl_type=0x8863,action=normal	ovsbr0	1	UPDATED_...

<< < Page 1 of 5 > >> ↺

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Editor/viewer of the **OpenFlow** rules.

Typically, most of these rules are automatically generated and are never manually modified.

<input type="checkbox"/>	insert_time	execute_time	command	source	priority	username	exit	residual	not_before	not_after	abort	trace	exhumable	delay_mode
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on system ...	CLI	33	piombo	0	1			0	0	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on interfa...	CLI	100	piombo	0	0			0	1	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on eng se...	CONFI...	100	userBlugw	0	9	2016-0...		0	1	0	30_SEC
<input type="checkbox"/>	2016-0...		on host e... on eng se...	CONFI...	0	userBlugw	0	10	2016-0...		1	0	0	30_SEC
<input type="checkbox"/>	2016-0...		on host e... on eng se...	CONFI...	0	userBlugw	0	10	2016-0...		1	0	0	30_SEC
<input type="checkbox"/>	2016-0...		on host e... on eng se...	CONFI...	0	userBlugw	0	10	2016-0...		1	0	0	30_SEC
<input type="checkbox"/>	2016-0...		on host e... on eng se...	CONFI...	0	userBlugw	0	10	2016-0...		1	0	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on interfa...	CLI	100	piombo	0	0			0	1	0	30_SEC
<input type="checkbox"/>	2016-0...		on host e... on eng se...	CONFI...	0	userBlugw	0	10	2016-0...		1	0	0	30_SEC
<input type="checkbox"/>	2016-0...		on host e... on eng se...	CONFI...	0	userBlugw	0	10	2016-0...		1	0	0	30_SEC
<input type="checkbox"/>	2016-0...		on host e... on eng se...	CONFI...	0	userBlugw	0	10	2016-0...		1	0	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on interfa...	CLI	100	piombo	0	0			0	1	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on interfa...	CLI	100	piombo	0	0			0	1	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on bridge...	SAFE_...	100	userBlugw	0	9	2016-0...		0	1	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on bridge...	SAFE_...	100	userBlugw	0	9	2016-0...		0	1	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on bridge...	SAFE_...	100	userBlugw	0	9	2016-0...		0	1	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on interfa...	SAFE_...	100	userBlugw	0	9	2016-0...		0	1	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on eng se...	SAFE_...	100	userBlugw	0	9	2016-0...		0	1	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on interfa...	SAFE_...	100	userBlugw	0	9	2016-0...		0	1	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on bridge...	SAFE_...	100	userBlugw	0	9	2016-0...		0	1	1	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on bridge...	SAFE_...	100	userBlugw	0	9	2016-0...		0	1	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on interfa...	SAFE_...	100	userBlugw	0	9	2016-0...		0	1	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on bridge...	SAFE_...	100	userBlugw	0	9	2016-0...		0	1	0	30_SEC
<input type="checkbox"/>	2016-0...	2016-0...	on host e... on eng se...	CONFI...	0	userBlugw	0	10	2016-0...		1	0	0	30_SEC

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All commands are inserted in a **queue**, which is then handled in parallel by a number of “workers”. Each command shows the success/failure code, the estimated time to completion, number retries left, logs, etc...

Navigation

- Tools
- Users Management
- Hosts Management
- Commands Management
- Commands queue
- Hosts Commands

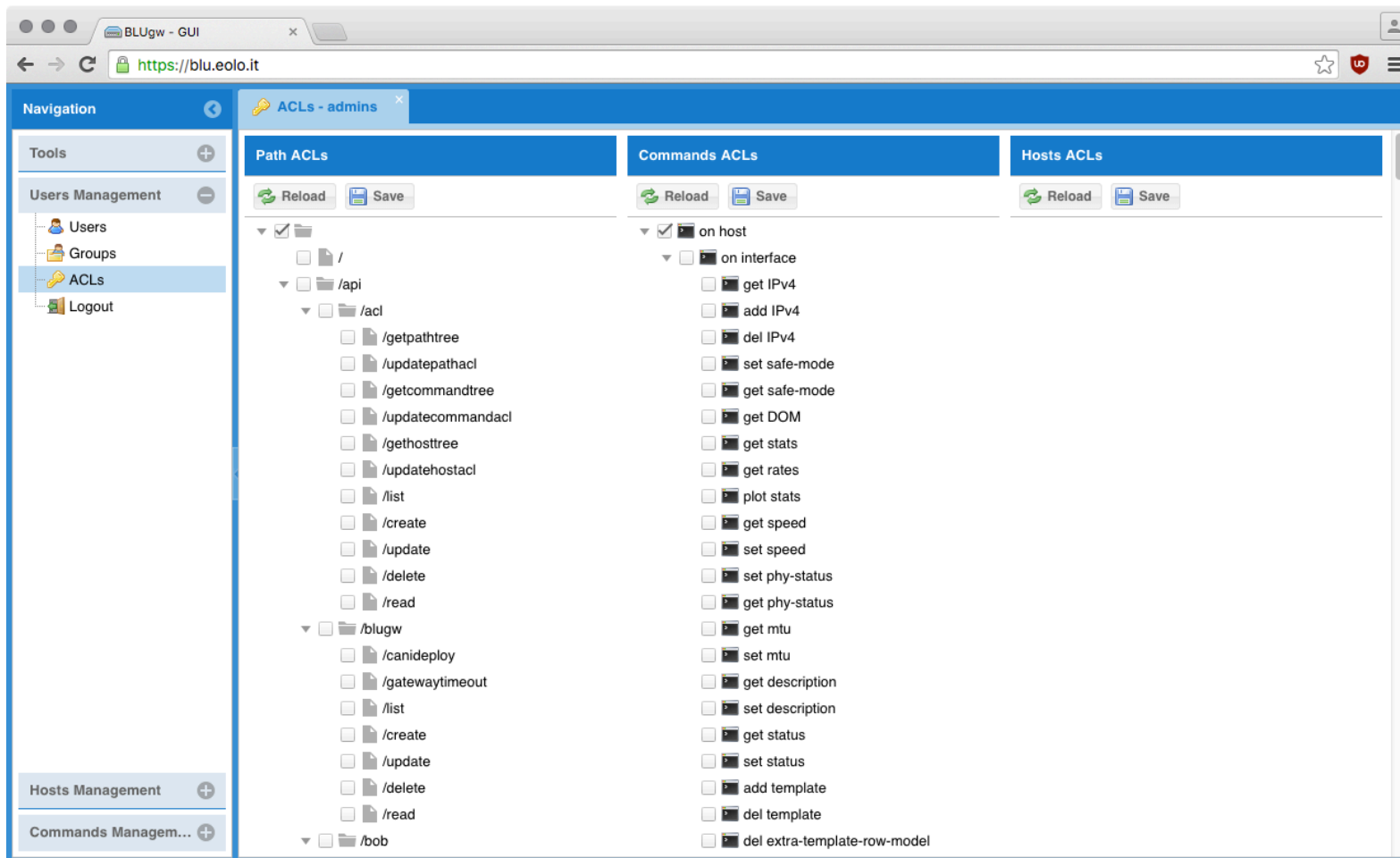
Host pending commands

<input type="checkbox"/>	name	human_name	pending_commands	pending_bluos_update	pending_template_update
<input type="checkbox"/>	es...	Sav...	0	0	0
<input type="checkbox"/>	es...	Stel...	0	0	0
<input type="checkbox"/>	eb...	Bus...	0	0	0
<input type="checkbox"/>	ev...	Son...	0	0	0
<input type="checkbox"/>	ec...	Can...	0	0	0
<input type="checkbox"/>	em...	Mor...	0	0	0
<input type="checkbox"/>	es...	Pas...	0	0	0
<input type="checkbox"/>	et...	Sca...	0	0	0
<input type="checkbox"/>	em...	Mor...	0	0	0
<input type="checkbox"/>	ep...	Coll...	0	0	0
<input type="checkbox"/>	eb...	Ben...	0	0	0
<input type="checkbox"/>	evi...	Col'	0	0	0
<input type="checkbox"/>	ea...	Pos...	0	0	0
<input type="checkbox"/>	ea...	Pat...	0	0	0
<input type="checkbox"/>	eb...	Valr...	0	0	0
<input type="checkbox"/>	ep...	Cas...	0	0	0
<input type="checkbox"/>	ep...	Fer...	0	0	0
<input type="checkbox"/>	esc...	Sas...	0	0	0
<input type="checkbox"/>	ep...	Mor...	0	0	0
<input type="checkbox"/>	ep...	Mer...	0	0	0
<input type="checkbox"/>	efn...	Mor...	0	0	0
<input type="checkbox"/>	ear...	Fort...	0	0	0
<input type="checkbox"/>	ec...	Car...	0	0	0
<input type="checkbox"/>	...	Montec...	0	0	0

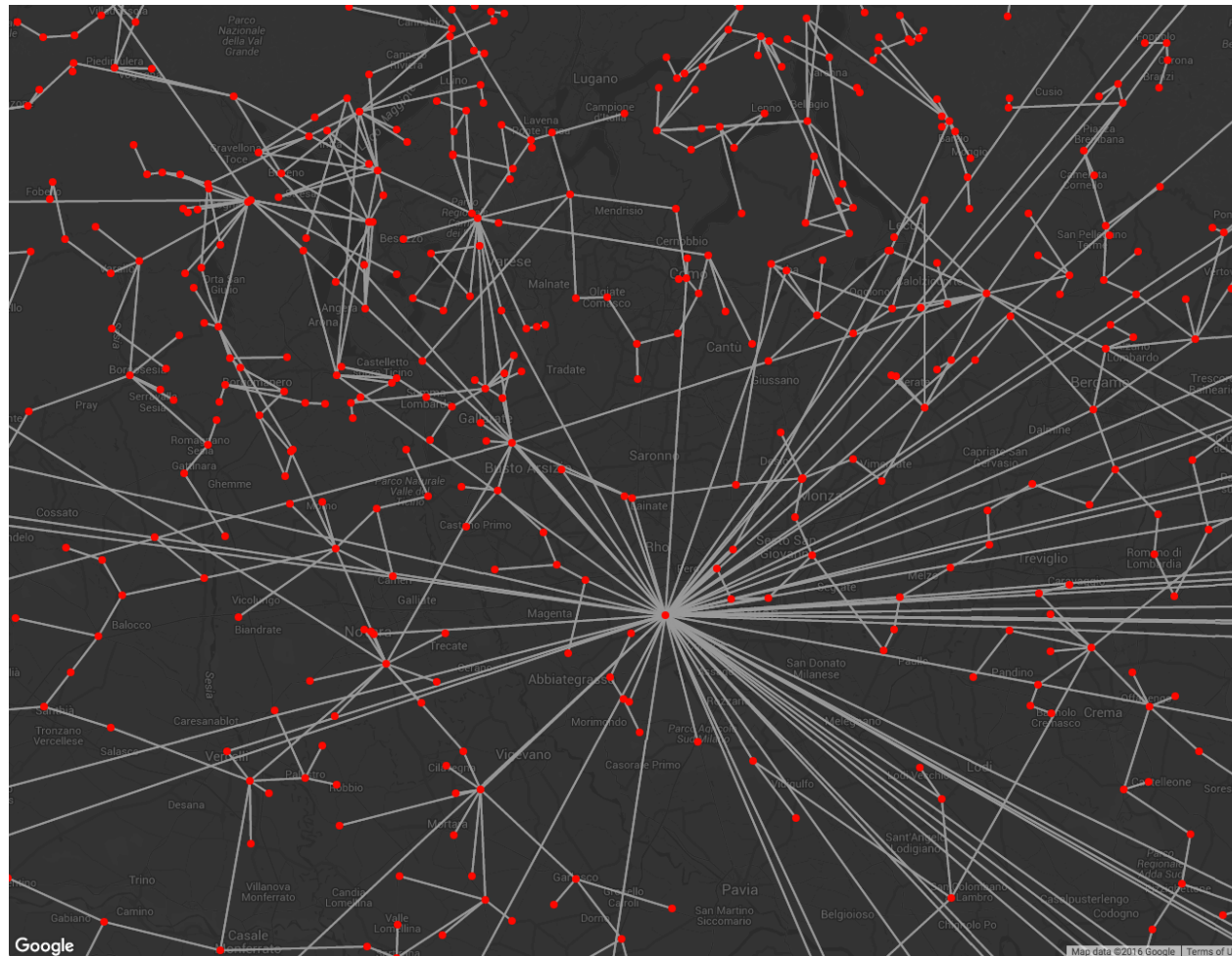
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A summary pivot table for the commands that are left to be run on each router.  
This is sometimes useful to check whether the command schedulers are working properly.

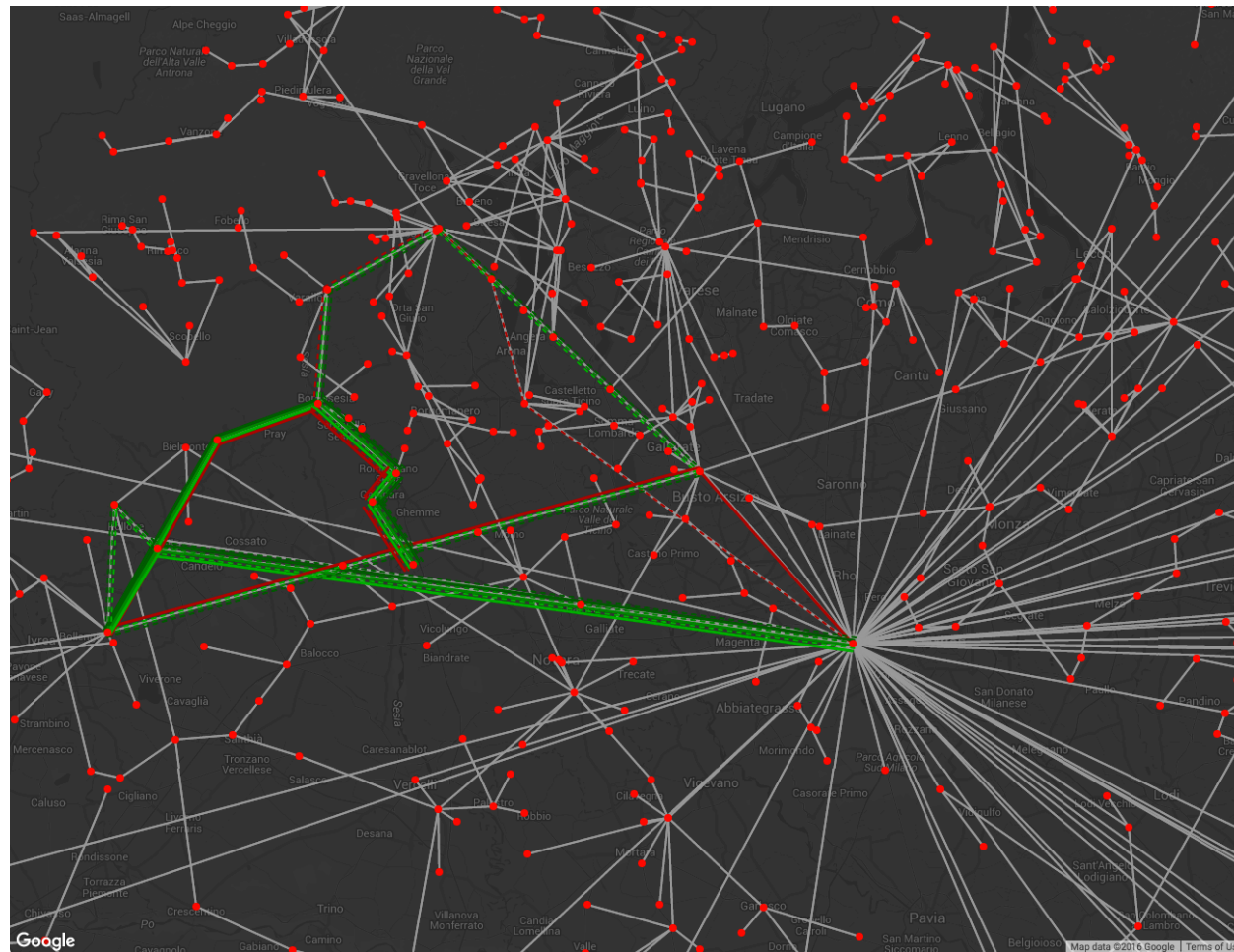


Interface to define **permission for groups and users**.  
An individual user can be given right to execute any specific command.



**Geographic view** of a network region. Red dots are the radio towers where the BLU routers are installed. This is automatically generated by merging LLDP neighboring information.





Mouse-over on a tower shows the **path currently used** by the SDN topology (green: downlink, red: uplink).  
 Continuous lines are the “main” paths, dashed lines are the pre-installed “backup” paths.  
 Similarly, mouse-over on a link shows the nodes currently reached through that given link and real-time traffic status.