

WiFi Captive Portal Bot (portal-bot)

Goal: Execute a battery of of captive portal logins from virtual wifi stations using the newer portal-bot.pl script.

Public access open WiFi service is often gated with a web sign-on form (a captive portal). LANforge virtual stations can emulate sign-in to the captive portal using the **portal-bot.pl** script. This script is by necessity incomplete because many captive portals have different behaviors and login form requirements. With this script, you provide a *bot plugin* that bridges the gap. This cookbook will coach you through a basic portalbot integration and then you will create ten stations that authenticate through a captive WiFi portal.

In this example, we will be testing agains a simple LAMP server on the upstream side of the AP. Do no use your LANforge server as the LAMP server because the routing will be difficult. In this chapter, a LAMP server is at 10.26.1.254, and there is an /etc/hosts entry for *basic-portal* to that address.



Basic Interactions of a Captive Portal

The basic order of operations of a captive portal are summarized in these steps:

- 1. A WiFi station accesses the LAN and is assigned a DHCP address.
- 2. The AP redirects any DNS and HTTP(s) request from the station. It returns either
 a login page directly
 - a 301-Redirect to the login page
- 3. The station user submits this form. This form knows where to submit itself to, but it is possible that the form does not submit to the same address or service that it came from.
- 4. A successful authentication provides one of these responses:
 - The originally requested page, either as a 301-Redirect or as a proxied result.
 - A portal-div providing a logout or service menu and the original content inside.
 - A redirect page that uses javascript or meta-refresh mechanisms to tell the browser to reload the originally requested page.



Configuring a Demo Captive Portal

Provide Login/Logout pages

If you wish to set up a login and logout page on an Apache/PHP server to test with, you can copy the below files to the /var/www/html directory on the LAMP server.

login.php:

Provide a Redirect in lieu of Portal Capture

Getting a redirect to the login page does not have to be very complex. The portal-bot script will first start off requesting whatever URL you wish, so request http://basic-portal/start. Here is an Apache configuration line to redirect that URI to login.php:

httpd.conf

```
<Location /start>
Redirect /start /login.php
</Location>
```

After adding this redirect, restart your Apacher service using this command:

sudo apachectl configtest && sudo apachectl restart

Testing your redirect

You can use the command curl -sqv http://basic-portal/start to test out the redirect you just created.

```
> curl -sqv http://basic-portal/start
* STATE: INIT => CONNECT handle 0x25bd9e8; line 1034 (connection #-5000)
* Added connection 0. The cache now contains 1 members
* STATE: CONNECT => WAITRESOLVE handle 0x25bd9e8; line 1071 (connection #0)
   Trying 10.26.1.254...
* bind-local, addr: (nil) dev: (nil)
* STATE: WAITRESOLVE => WAITCONNECT handle 0x25bd9e8; line 1151 (connection #0)
* Connected to basic-portal (10.26.1.254) port 80 (#0)
* Marked for [keep alive]: HTTP default
* STATE: WAITCONNECT => D0 handle 0x25bd9e8; line 1229 (connection #0)
> GET /start HTTP/1.1
> User-Agent: curl/7.41.0-DEV
> Host: basic-portal
> Accept: */*
* STATE: D0 => D0_D0NE handle 0x25bd9e8; line 1314 (connection #0)
* STATE: D0_D0NE => WAITPERFORM handle 0x25bd9e8; line 1441 (connection #0)
* STATE: WAITPERFORM => PERFORM handle 0x25bd9e8; line 1454 (connection #0)
* HTTP 1.1 or later with persistent connection, pipelining supported
< HTTP/1.1 302 Found
< Date: Fri, 04 Sep 2015 22:52:53 GMT
* Server Apache/2.4.7 (Ubuntu) is not blacklisted
< Server: Apache/2.4.7 (Ubuntu)
< Location: http://basic-portal/login.php
< Content-Length: 290
< Content-Type: text/html; charset=iso-8859-1
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>302 Found</title>
</head><body>
<h1>Found</h1>
The document has moved <a href="http://basic-portal/login.php">here</a>.
<hr>
<address>Apache/2.4.7 (Ubuntu) Server at basic-portal Port 80</address>
</body></html>
```

Using the Portal Bot bash script

Before we get straight to working with portal-bot.pl, let's see how it is used. Your LANforge installation has an example script called portal-bot.bash-example for you to copy and modify. This script is intended for you to login and logout separately. The LANforge manager will call portal-bot.pl differently when building up the station or tearing down the station, these actions are similar:

```
    i ./portal-bot.bash will log your station in
    i ./portal-bot.bash --logout will log your station out
```

Inside the bash script

The portal-bot.bash script is for exercising your portal-bot.pl script options from the command line while you develop with it. This is very close to the values you will place in the *Ports* \rightarrow *Misc/Post IF-UP* field.

Switches you won't use in the GUI

You will never place the PBOT_NOFORK option in the Ports \rightarrow Misc/Post IF-UP field because that will interrupt the processing of the LANforge Manager process. You will also never place \$* in that field, either. You can place the --verbose and --debug flags in there, but it can fill your disk with log output more quickly.

	Port St	tatus Information		
	Current: LINK-U	P GRO Authorized		
	Driver Info: Port Ty	pe: WIFI-STA Par	ent: wiphy2	
	Port	Configurables		
Etopdard Configurati	an K Advanced Configure	tion Mice Confli	auration Custom MAEL	
Standard connigarati	Mon	e WiFi Settings	garation [custom min]	
Freq-2.4:	0xfffffff	Freq-5:	0xfffffff	
AMPDU-Factor:	OS Default 💌	AMPDU-Density:	OS Default	-
Max-AMSDU:	OS Default 💌	Bridge-IP:		
X-Coordinate:		Y-Coordinate:		
Z-Coordinate:	0	Venue-ID:	0	
Post IF-UP Script:				
Custom WPA Cfg	WPA Cfg:			
Scan Hidden	Passive Scan. 🔲 Allow Mig	ration IBSS Mo	de	
Destart DUCD as	Connect Chin Destal		Auto FCC Description I No Apply	DUICD
Restart DHCP on	connectstip Fortan		Auto Ess Roaming I No Apply	
rint View Details	Probe Displa	ay Scan Synd	c <u>Apply OK</u>	<u>_</u>
				_

Below is an example portal-bot.bash script with 1 line-continuation characters formatted for clarity:

```
PBOT NOFORK=1 ./portal-bot.pl \
     --dev sta100
    --dev staloo (

--bot bp.pm (

--ip4 10.26.2.30 (

--dns 192.168.100.1 (

--mgt /dev/null (

--delays 0,1,3 (

--user "bob" (

--pass "secret" (

--ap_url "http://basic-portal/" (

--start_url "http://basic-portal/start" (

--login form "login pbp" (
     --login form "login.php"
     --login action "login.php"
     --logout url "logout.php"
     --verbose --debug $*
```

Below is the same script using short switches:

```
PBOT NOFORK=1 ./portal-bot.pl \
  -i stal00
                                   \backslash
  -b bp.pm
  --ip4 10.26.2.30
  --dns 192.168.100.1
  --mgt /dev/null
  --delays 0,1,3
  -u "bob"
  -p "secret"
  -a "http://basic-portal/"
  -s "http://basic-portal/start" \
  -n "login.php"
                                   \backslash
  -o "login.php"
                                  "logout.php"
  -t
  -v -d $*
```

Using the portal-bot.bash command on the command-line:

A common misconception is thinking that \$* is a command-line argument. It is only used in bash scripts. Do not put \$* on the command-line.

```
PBOT_NOFORK=1 ./portal-bot.pl -i sta100 -b bp.pm --ip4 10.26.2.30 \
       --dns 192.168.100.1 --mgt /dev/null -u "bob" -p "secret" \
       -a "http://basic-portal/" -s "http://basic-portal/start"
       -n "login.php" -o "login.php" -t "logout.php" -v -d
```

Using the portal-bot.pl perl script

Tips:

• First thing to do: edit a copy of that script and adjust it for your station device and it's IP address.

- Add -d to add more debugging messages. That makes dbg() statements print.
- Add --print after you get the script to work. This will print out the format of the arguments useful for putting the statements into the GUI *Ports→Misc/Post IF-UP* field.

		Port St Current: LINK-UF Driver Info: Port Ty	atus Information 9 GRO Authorized pe: WIFI-STA Par	ent: wiphy2
	Standard Configurati	Port on Advanced Configural	Configurables tion Misc Confi	guration Custom WiFi
		More	e wiri seculiys	
	Freq-2.4:	0xffffffff	Freq-5:	0xfffffff
	AMPDU-Factor:	OS Default 💌	AMPDU-Density:	OS Default 👻
	Max-AMSDU:	OS Default 💌	Bridge-IP:	0.0.0.0
	X-Coordinate:		Y-Coordinate:	
	Z-Coordinate:	0	Venue-ID:	
	Post IF-UP Script:			•
	Custom WPA Cfg	WPA Cfg:		
	🔲 Scan Hidden 🔲 I	Passive Scan 🔲 Allow Migr	ation 🔲 IBSS Mo	de
	Restart DHCP on	Connect 🔲 Skip Portal o	on Roam 🔲 No .	Auto ESS Roaming 🔲 No Apply DHCP
Print	⊻iew Details	Probe Displa	y Scan Synd	C Apply OK Car

The first six arguments are provided by LANforge when you use **portal-bot.pl** with a station. You want to populate these in your bash script, but not in the *Post IF_UP* field.

PBOT_NOFORK

This environment variable tells the **portal-bot.pl** script to not fork. **Use it only when developing**. Omitting this is normal and allows for multi-processing of web requests from LANforge.

-i

station name

--bot

The bot plugin you provide

--ip4

The IP of the station. This script is useless if there has been no DHCP lease.

--ip6

Use '' for no IPv6 address.

--dns

The DNS addresses provided from the DHCP lease

--mgt

The FIFO that signals the LANforge server. You don't use it when testing.

The second set of arguments describe your own AP environment:

--user | -u

portal user name

--pass | -p

portal user password

--ap_url | -a

A string to prepend to URLs when talking to the AP. Not necessary, but if you don't use it, you have to provide fully qualified URLs to *--login_form*, *--login_action*, and *--logout_form*.

--start_url | -s

The first URL requested from the AP, this should provide either a login page or a redirect to a login page. If you get your destination page (like, if you request baidu.com and actually get it), your station has probably not been logged out from the captive portal.

--login_form | -n

This is what you request to get a login form. Often it is returned in the redirect, but sometimes you cannot get a cookie assignment if you do not request it specifically.

--login_action | -o

Submit your login credentials to this URL.

--delays

Comma separated list of seconds to delay at certain points:

- 1. \$::delays[0] Used to delay the very first 'start_url' GET request
- 2. \$::delays [1] Used to delay the first POST request in 'submit_login'
- 3. **\$:::delays[2]** Used to delay the 'submit_logout' request.
- 4. \$::delays[3+] Your bot can utilize further delays if you specify

You may specify skips by adding a zero: --delays 1,0,2

You may specify a random time by using 'random': --delays 1, random, 2

You may specify just one time for all delays: --delays 2

You may specify a random range: --delays 3-20,4-25

--logout_form | -t

Submit to this URL to log out of the captive portal

-v -d

Verbose and debug output, respectively.

--print

Skips process and prints out formatted arguments.

\$*

Expands to all remaining shell arguments

We will connect to our LANforge system^{*}. You want to copy this file to your own **./portal-bot.bash** file, edit it and then make it executable.

¹ * You can connect via VNC, PuTTY or other SSH client.

¹ Use **chmod +x portal-bot.bash** to make your script executable.

Now let's see how to use this script with station sta100. Run the commands:

```
$ cd /home/lanforge
$ chmod +x portal-bot.bash
$ ./portal-bot.bash
```

	lanforge@jed	test:~	
jreynolds@cyrano3:~ 🚿	jreynolds@cyrano3: 💥	jreynolds@cyrano3: »	🛚 lanforge@jedtest:~ 🛛 🗶
lanforge@jedtest ~ >			
lanforge@jedtest ~ > cd /home/lanforge			
lanforge@jedtest ~ > chmod +x portal-bo	t.bash	\$	
lanforge@jedtest ~ > ./portal-bot.bash			=

You will see a lot of output, it will show the contents of the web pages it finds.

```
INTERPRET given HTTP/1.1 200 Ok
Date: Fri, 04 Sep 2015 22:57:12 GMT
Server: Apache/2.4.7 (Ubuntu)
X-Powered-By: PHP/5.5.9-1ubuntu4.11
Varv: Accept-Encoding
Content-Length: 192
Content-Type: text/html
<!DOCTYPE html !>
<html>
<head>
  <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
   <title>Login</title>
</head>
<bodv>
         bob access granted.
   </bodv>
</html>found ref to data?
                                     bob access granted, result for sta100: 0Kportal-bot result for sta100: 0K(elapsed=0.0452320575714111 0.045232057
5714111)
lanforge@jedtest ~
>
```

Watching the Logs

Typically you won't need to look at this output in the terminal, and you will not add **-d -v** flags to your LANforge stations. You very likely will need to check the log output from these scripts in case you need to diagnose connection problems during your test. Each virtual station leaves a log in the /home/lanforge/wifi directory, like wifi/portal-bot.sta100.log

¹ Watch logs using *tail*: tail -F wifi/portal-bot.sta100.log

Executing the LANforge curl commands yourself

To find the actual **curl** commands being executed, you want to **grep** the logs. Below is an example of grepping the logs and running the curl command.

```
$ cd /home/lanforge/wifi
$ grep Submitting portal-bot-sta100.log
Submitting: /home/lanforge/local/bin/curl -sLki -c /tmp/sta100_cookie.txt -b /tmp/sta100_cookie.txt -4
Submitting: /home/lanforge/local/bin/curl -sLki -c /tmp/sta100_cookie.txt -b /tmp/sta100_cookie.txt -4
```

You might noticed that some of the commands in the log might appear repeated, there are areas of redundant logging. There is a case where you can legitimately see repeated commands: when you have an *Post IF_UP* value configured for the port you are testing with. (Remember that the *Post IF_UP* field should be blank when developing the script.)

Remember, this **cur1** command cannot be run without first doing a **source /home/lanforge/lanforge.profile** in your shell (our curl is a custom build). Here is an example. We take a command similar to the one above, add **-qv** and cancel it using **Ctl-C** :

```
$ cd /home/lanforge
 $ source lanforge.profile
                                                                                                 # add a -qv to see header details
 $ /home/lanforge/local/bin/curl -qv -sLki -c /tmp/sta100_cookie.txt -b /tmp/sta100_cookie.txt -4
* STATE: INIT => CONNECT handle 0xa80158; line 1397 (connection #-5000)
* Added connection 0. The cache now contains 1 members
  Trving 10.51.0.254...
* TCP NODELAY set
^{\star} SO BINDTODEVICE stal00 failed with errno 1: Operation not permitted; will do regular bind
* Name 'sta100' family 2 resolved to '10.41.4.223' family 2
* Local port: 0
* STATE: CONNECT => WAITCONNECT handle 0xa80158; line 1450 (connection #0)
^C
4
```

Explaining the curlCommand

There are many arguments to the curl command, but in general, you should be able to copy and paste the command into a terminal and it should work (see note about lanforge.profile above). Below is an example of a curl command, with [n] characters as line-continuation marks, formatted for clarity.

```
$ /home/lanforge/local/bin/curl -qv \
    -sLki
```

```
-c /tmp/sta100_cookie.txt \
-b /tmp/sta100_cookie.txt \
-4 \
--interface sta100 \
--localaddr 10.41.4.223 \
--dns-interface sta100 \
--dns-ipv4-addr 10.41.4.223 \
http://basic-portal/start
```

Switch	Example Value	Purpose
-q		Suppress page output
-V		Verbose, prints diagnostic steps
-S		Suppresses page output
-L		Follow redirects
-k		Suppress certificate validation errors
-i		Print HTTP headers
-C	sta100_cookie.txt	Send cookies from file
-b	sta100_cookie.txt	Save cookies to file
-4		Use IPv4
interface	sta100	bind to this interface
localaddr	10.41.4.223	bind to this address
dns-interface	sta100	send DNS queries from this interface
dns-ipv4-addr	10.41.4.223	bind to this address when sending DNS queries
dns-interface	sta100	send DNS queries from this interface
-X	GET	Use HTTP GET method
	POST	Use HTTP POST method
-d	'username=bob'	URL encoded form parameters used during POST method

Your **portal-bot.bash** script is intended to be a way of focusing on the development of your bot plugin and not repetitively typing a long curl command.

Writing your Bot Plugin

Your bot plugin, the Perl module you will write for your captive portal, is central to the operation of the *portal-bot.pl* script. It is also important that you do not alter the **portal-bot.pl** script unless absolutely necessary, because your changes could be overwritten by upgrades. Any alteration to the time at which the **fork()** call is made in this script can make the LANforge server grind to a halt.

¹ Only edit your bot perl module, please.

The Bot Subroutines

The example bot, *bp.pm*, provided with LANforge defines four subroutines. In order:

find_redirect_url

This subroutine receives the response of the HTTP(S) GET of your *--start_url* parameter. Look through this to see if:

- you are already getting destination content--if so, you were not logged out,
- you get a login form directly and not a redirect,
- or you get a redirect to a login page (possibly on a separate port like :8080)

If you get a redirect to another port, compare the *--login_url* value to this. If it is different, consider updating your login_url parameter.

There might be many form parameters, like ones for a session id, a PHP_SESSID, a cookie, a base64 encoded string indicating your originally requested url (or just a plain URL-encoded url), and any possible co-branding parameters that might indicate any advertising campaigns associated with this captive portal. Missing some of these might make submitting the form give you an error. Store these values as necessary in your bot:: namespace. You do not submit your login page in this method.

Define a package scope variable using our \$thing; after your package statement.

submit_login

Here is where you submit your login page forms. The **botlib::request()** function is provided to make GET and POST requets verbose logging and debugging. The page is returned as lines in the **@response** array.

```
my $post_data = "username=".uri_escape($user_name);
my @response = ();
request({'curl_args'=> $::curl_args,
  'url' => $post_url,
  'method' => 'POST',
  'delay' => '0,3',  # see --delays option
  'post_data' => $post_data,
  'print' => 1},  # turns on debugging
  \@response);
```

The submit_login function uses the **\$::delay[1]** parameter if --delays were set. See paragraph on randomDelay.

interpret_login_response

Here you determine if you are getting an access denied error or are being forwarded to your original *start_url* destination. Set your **\$result** variable to **OK** or **FAIL**. Use the *logg()* method to add information for the wifi/portal-bot log.

In order to add events, such as page load time, you want to use the **botlib::newEvent()** function:

```
my $page_time = botlib::time_milli() - $::start_at;
newEvent("portal login: $result", $page time, $::dev);
```

Your event log will gain messages like these:

<u>\$</u>			LANfor	ge Manager V	ersion(5.3	.3)					
Control Reporting Tear-Of	ff <u>I</u> nfo	<u>P</u> lugins									
				Stop /		Restart Manager	B	efresh	HE	P	
				Bropr		nestart Hanager		oncon			
Test Group Resource	Mar	Event Lo	Alerts	Port Mar v	AP Statio	ns Messages					
Status	I	ayer-3		L3 Endps		WanLinks		Test M	gr		
			1						<i>.</i>	-	
Configure Events					Se	elect All Create Mod	fy Delet	te			
Events											
Time-Stamp	ID	Priority	Name	Event		Event Description		Type	EID		
2016-01-26 14:29:29.051	3090	Info	stal00	Custom	submit lo	gout: OK -LOGOUT 0.037806		Event	0		
2016-01-26 14:29:29.053	3091	Info	default	Logout	User: defa	ault logged out.		Shelf	0		
2016-01-26 14:29:29.053	3092	Info	stal00	IFDOWN-OK	stal00: (OK portal logout: OK -LOGOUT	(39ms)	Port	1.1.8		
2016-01-26 14:29:29.095	3093	Info	stal00	Link-Down	Port stal	00 is Link DOWN.		Port	1.1.8		
2016-01-26 14:29:29.105	3094	Info	stal00	Disconnect	sta100 (p	hy #0): disconnected (local	request)	Port	1.1.8		
2016-01-26 14:29:29.143	3095	Info	stal00	Link-Up	Port stal	00 is Link UP.		Port	1.1.8		
2016-01-26 14:29:29.143	3096	Info	stal00	Connect	stal 00 (p	hy #0): connected to 00:0e	8e:08:db:e9	Port	1.1.8		
2016-01-26 14:29:29.897	3097	Info	default	Login	User: defa	ault logged in from: 127.0.0.	1	Shelf	0		
2016-01-26 14:29:29.932	3098	Info	stal00	Custom	first_page	oad 0.023978		Event	0		
2016-01-26 14:29:29.963	3099	Info	stal00	Custom	submit_lo	gin 0.067714		Event	0		
2016-01-26 14:29:29.965	3100	Info	stal00	Custom	portal_log	jin: OK 0.069664		Event	0		
2016-01-26 14:29:29.967	3101	Info	stal00	IFUP-OK	stal00: (OK portal login: OK (71ms)		Port	1.1.8	=	
2016-01-26 14:29:29.967	3102	Info	default	Logout	User: defa	ault logged out.		Shelf	0	-	
									•	•	
Logged in to: jedtest:40	002 as	: Admin					N				

get_explanation

Some web applications can provide customized error messages in their response. You can add a get_explanation() function to your bot to collect this information. The botlib::dbgdie() method will

take advantage of this method if available. Below is an excerpt from the method found in **bp.pm**:

```
sub get_explanation {
   for $line (@$ra_result) {
      ($err_code) = $line =~ /^X-err-no: (.*)$/
        if ($line =~ /^X-err-no: /);
        ($err_msg ) = $line =~ /^X-err-msg: (.*)$/
        if ($line =~ /^X-err-msg: /);
        }
        return "$err_code, $err_msg";
}
```

Notice how this parses out the HTTP headers found if the parameter **username** were missing when doing a POST to **basic-portal/login.php**:

```
header("X-err-no: 9400");
header("X-err-msg: missing username");
```

You will see these messages show up in the LANforge Events log:

LANforge Manager Version(5.3.3)								
Control Reporting Tear-Off Info Plugins								
Stop All Restart Manager Refresh	HELP							
Layer-4 Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr vAP Stations Messages Status Layer-3 L3 Endps VolP/RTP VolP/RTP Endps Armageddon WanLinks Attenuators Collision-Domains File-IO Configure Events Select All Create Modify Delete								
Events								
Time-Stamp ID Priority Name Event Event Description Type	EID							
2016-01-27 11:53:08.314 98 Info default Login User: default logged in from: 127.0.0.1 Shelf	0							
2016-01-27 11:53:08.352 99 Info sta100 Custom first_page_load 0.028131 Event	0							
2016-01-27 11:53:08.368 100 Info sta100 Custom HTTP[400] 9400,missing username HTTP/1.1 400 Bad Request Event	0							
2016-01-27 11:53:08.371 101 Info default Logout User: default logged out. Shelf	0							
Logged in to: jedtest:4002 as: Admin								

submit_logout

Many captive portals do not publicise their logout URLs, so it might be available only on an admin page for the AP. You will know when the *logout_url* parameter works if you can do a logout with that station, and then successfully log back in using the same station and seeing the captive portal sign-in page again.

randomDelay

The delay parameter to **botlib::request()** has many overloads to the call:

- A simple number is a simple delay in seconds. No other units are used.
- If you specify 'random' in the *delay* parameter, the **botlib::randomDelay()** is called, producing a range between [1 119] seconds.
- If you specify '3-16', randomDelay(3, 16) is called to produce a random range between [3 16] seconds.
- If you specify two numbers separated by a comma, it looks at your @::delays list, and picks the second argument if it can, the last item of @::delays if the list is too short, or the first argument if there are no items in the delay list.

We have now covered all of the scripting development areas for the portal-bot.pl plugin you will write.

Configuring your Stations

A Single Station

We assume you have **portal-bot.bash** working at this point. This is how you can configure a single station:

- 1. Use the portal-bot.pl --print command to print out the arguments.
- 2. Copy the result (starting with "portal-bot.pl") into the Port->Misc window. Avoid populating this field while you are developing the script! If you place a value into that field, your portal-bot script will not only execute, but the Manager process will also execute the script specified in the POST_IFUP field. This can be really confusing.

4		sta10	1 (jedtest.can	delatech.	con	n) Configure Setti	ings		_ _ _ ×		
Port Status Information Current: LINK-UP GRO Authorized Driver Info: Port Type: WIFI-STA Parent: wiphy0											
Port Configurables											
Star	Standard Configuration Advanced Configuration Misc Configuration Custom WiFi										
	More wiri Settings										
	OCSP: Disabled (0)										
	Freq-2.4:		0xfffffff			Freq-5:	0xfffffff				
	AMPDU-Facto	or:	OS Default		•	AMPDU-Density	y: OS Default	•			
	Max-AMSDU:		OS Default		•	Bridge-IP:	0.0.0.0				
	X-Coordinate	e:	0			Y-Coordinate:	0				
	Z-Coordinate	e:	0			Venue-ID:					
	Post IF-UP So	ript:	./portal-bot.pllogin -pass secretap_ur	_form login.ph I http://basic-p	pu orta	iser bobbot bp.pmlogo I/start_url http://basic-po	ut_url logout.phplogi ortal/start	n_action login.p			
	Custom 🎽		WDA Cfa								
	Scan Hi	4		r	18	anforge@jedtest:-	~				
	Restart	reynolds@)cyrano3:~ 🛛 🕅	jreynolds	@cy	/rano3: 🗶 jreyn	olds@cyrano3:	≫ lanforge@	≬jedtest:~ Ж		
Print Vi	Image: Print View Details Print View Details Image: Print P										

Multiple Stations

To get multiple virtual stations logging in an out using the GUI, we just need a few of those parameters for the station configuration. We will use the *Batch Modify* feature to alter a series of stations.

1. In the **Ports** tab, create a series of stations. In this example we will create them with:

۲	Create VLANs on	Port: 1.1.05					
0	○ MAC-VLAN ⑧ WiFi STA	○ 802.1Q-VLAN ○ ○ WiFi VAP ○ WiFi I	Redirect 🔾 Bri Monitor 🔾 WiFi	dge 🛛 GRE Tunn Virtual Radio	el		
0	Shelf:	1 🔻	Resource:	1 (jedtest) 🔻		Port: 5	(wiphy2) 🔻
8	VLAN ID:		DHCP-IPv4				
ę	Parent MAC:	00:0e:8e:3e:27:5b	DHCP Client ID:	None	-		
	MAC Addr:	xx:xx:xx:*:*:xx 💌	IP Address:			Global IPv6:	AUTO
	Quantity:	10	IP Mask or Bits:			Link IPv6:	AUTO
			Gateway IP:			IPv6 GW:	AUTO
	#1 Redir Name:		#2 Redir Name:				
	STA ID:	300	SSID:	jedtest			•
	WiFi AP:		Key/Phrase:	jedtestl			
	WPA	WPA2	WEP				
4	Down	1			\Im		
	Apply	<u>C</u> ancel					
0	Port: wiphy2	2					
0	Select DHC	P-IPv4					
0	Quantity: 10)					
0	STA ID: 300						

• SSID: jedtest

- Passphrase: jedtest1
- Select WPA2
- Select Down

2. Highlight them and click **Batch Modify**.

• LANfor	ge Manaş	er Version(!	5.3.2)										● 🛛 😣
<u>Control</u> <u>R</u> ep	orting <u>1</u>	ear-Off Info	<u>P</u> lugins										
					Sto	op All		Resta	art Manag	er		Refresh	HELP
Test Mar	Test G		urce Mar	Event I	oa	Alerts	Port	Mar	Message	s			
WanLi	nks	Attenu	Jators		Collis	sion-Don	nains		File-I	0	Laver	r-4 G	eneric
Status		Laver-3	L3En	dos	7	VolP/RT	P		VolP/RTP	Endos			don
		1					- 1					j	
Disp: 192	2.168.100	0.51:0.0	Sniff Pa	kets		Clear	Counte	ers	Reset I	Port	Delete	e	
Rpt Timer	r: medium	(8 s) 🔻	Арр	у		<u>V</u> iew	/ Detai	ls	Cr <u>e</u> at	te	<u>M</u> odify	y <u>B</u> atch	Modify
	All Ethernet Interfaces (Ports) for all Resources.												
Port Pha	a Down	IP		Alias			MAC						
1.1.00		192.168.100.	26	eth0	00:90	0:0b:29:0)6:f8						
1.2.0		192.168.100.	42	eth0	00:90	0:0b:2f:0a	a:0e						
1.1.01		10.26.1.2		ethl	00:90	0:0b:29:0)6:f9						
1.2.1		10.26.1.1		ethl	00:90	0:0b:2f:0a	a:0f						
1.1.02		10.26.2.31		sta300	00:00	e:8e:a2:b	9:5b						
1.1.06		10.26.2.35		sta301	00:00	e:8e:68:f(0:5b						
1.1.07		10.26.2.33		sta302	00:00	e:8e:64:3	32:50						
1.1.08		10.26.2.40		sta303	00:00	e:8e:d4:4	13:50						
1.1.09		10.26.2.37		sta304	00:00	e:8e:26:1	.C:5b						
1.1.10		10.26.2.39		sta305	00:00	e:8e:ca:2	2:50						
		10.26.2.30		sta306	00:00	e:8e:71:50							
		10.20.2.38		sta307	00:00	e:8e:25:7	0.55						
1114		10.20.2.34		sta300	00:00	a Saif2ib	a:5b						
125		10.26.2.32		van0	00.00	a-8a-da-4	18-63						
1103		0.0.0.0		winbv0	00.0	0.00.ud:4	a:56						
1.2.2		0.0.0.0		wiphy0	00:00	e:8e:43:3	36:e9						
1.1.04		0.0.0.0		wiphv1	00:0	e:8e:4e:5	57:91					Ν	
1.2.3		0.0.0.0		wiphv1	00:0	e:8e:43:3	3a:62					12	
1.1.05		0.0.0.0		wiphy2	00:00	e:8e:3e:2	27:5b						
1.2.4		0.0.0.0		wiphy2	00:00	e:8e:43:3	37:63						

Logged in to: jedtest:4002 as: Admin

3. Click the **Down** button.

LANforge Port Ba	tch Modifier		🖨 🗈 😣
+ - All	Search:	-	Apply OK Cancel
Clear DHCP	Up Down	Down Logout	
Portal Re-login	Portal Logout Portal Logi	n	
	NA	DHCP Release	NA
DHCP-IPv4	NA	DHCP Client ID	NA
DHCP Vendor ID	NA	мти	NA
DNS Servers	NA	IPv6 GW	
Reset Port IP	NA	Global IPv6	
IP Mask	NA	Link IPv6	
Gateway IP	NA	DHCP-IPv6	NA
MAC	NA	TX Q Len	NA
Rpt Timer	NA	WiFi Bridge	NA
FTP	NA	НТТР	NA

4. In your terminal, invoke the **portal-bot.bash** with the **--print** argument:

./portal-bot.bash --print portal-bot.pl --bot bp.pm --user bob --pass bob1 --ap_url http://basic-portal/ --start_url http://basic-portal/start --login_form login.php --login_action login.php --logout_form logout.php

5. Use the [+] button to expand to Box 2. We will enter the following version of our command into the *Post IF-UP Script* area. (The picture shows the short switches.)

<u></u>		LANforge Po	ort l	Batch Modifier							
+ - All		Search:		•		Арр	ly	<u>о</u> к		<u>C</u> ance	
Reset Port IP	NA		•	Global IPv6							
IP Mask	NA			Link IPv6							
Gateway IP	NA			DHCP-IPv6	NA						
MAC	NA		•	TX Q Len	NA						
Rpt Timer	NA		•	WiFi Bridge	NA					-	
FTP	NA		•	нттр	NA					-	Ц
		/									
2 SSID	NA			lanforge@jedtest:~							
Key/Phrase	NA	jreynolds@cyrano3:~ 💥 jreyn	old	@cyrano3: 🗶 jreynolds@	@cyrano3:.	×	lanfor	ge@je	dtest:	~ ×	
Freq/Chan		. (names] had back and								^	
RTS		> ./portal-bot.bashpri Not forking	nt								
AMPDU-Factor	NA	./portal-bot.pllogin_fo	rm	login.phpuser bob	bot bp.p	om10	ogout	_url]	logou	it.ph	
Max-AMSDU	NA	ttp://basic-portal/start		pass secretap_uri nt	tp://bas	атс-ро	rta I/	Sta	art_u		
WPA	NA	lanforge@iedtest .								=	
WEP	NA	>								\sim	
Disable HT40	NA		•	Disable SGI	NA					-	
Scan Hidden	NA		•	Allow Migration	NA					-	
Verbose Debug	NA		•								
Post IF-UP Script	./portal-t	bot.pllogin_form login.phpuser bobbot b	p.pm	logout_url logout.phplogin_action lo	ogin.phppas	s secret ·	-ap_url	http://bas	sic-porta	al/sta	
										4	
											-

Click **OK**

6. In the **Ports** tab, double click *sta300* and in the *Misc Configuration* tab, you will see the *Post IF-UP Script* values.

Testing a Station

Exercising these stations starts with bringing them up and down using the *Batch Modify* tool.

- 1. Highlight one station, sta300, and click Batch Modify.
- 2. Click the **Down** button to admin-down the station.

LANforge Port Bat	tch Modifier					
+ - All	Search:	•		<u>A</u> pply	<u>0</u> K	<u>C</u> ancel
Clear DHCP	Up Down	Down Logout				
Portal Re-login	Portal Logout Portal Login					
Up/Down	NA	DHCP Release	NA			-
DHCP-IPv4	NA	DHCP Client ID	NA			-
DHCP Vendor ID	NA	MTU	NA			
DNS Servers	NA	IPv6 GW				
Reset Port IP	NA	Global IPv6				
IP Mask	NA	Link IPv6				
Gateway IP	NA	DHCP-IPv6	NA			-
MAC	NA	TX Q Len	NA			
Rpt Timer	NA	WiFi Bridge	NA			-
FTP	NA	нттр	NA			-

3. In a shell on the LANforge, got to /home/lanforge/wifi and tail the log for station 300:

۲	lanforge@jedt	est:~/wifi -	Termi	nal					•••
јгеуг	nolds@atlas:~/btb	its/x64_btbit				×	lanforge@jedte	st:~/wifi	
-rw-r	r 1 root	root	653 Ju	l 23	15:16	wpa_supplicant	-wiphy0-sta102.c	onf	
-rw-r	rr 1 root	root	653 Ju	l 23	15:16	wpa_supplicant	-wiphy0-sta103.c	onf	
-rw-r	rr 1 root	root	653 Ju	l 23	15:16	wpa_supplicant	-wiphy0-sta104.c	onf	
-rw-r	rr 1 root	root	653 Ju	l 23	15:16	wpa_supplicant	-wiphy0-sta105.c	onf	
-rw-r	r 1 root	root	653 Ju	l 23	15:16	wpa_supplicant	-wiphy0-stal06.c	onf	
- r-w- r	rr 1 root	root	653 Ju	l 23	15:16	wpa_supplicant	-wiphy0-sta107.c	onf	
-rw-r	r 1 root	root	653 Ju	l 23	15:16	wpa_supplicant	-wiphy0-stal08.c	onf	
-rw-r	r 1 root	root	653 Ju	l 23	15:16	wpa_supplicant	-wiphy0-sta109.c	onf	
-rw-r	r 1 lanforge	lanforge	653 Ju	l 23	15:16	wpa_supplicant	-wiphy0-sta100.c	onf	
-rw-r	r 1 root	root	653 Ju	l 23	17:03	wpa_supplicant	-wiphy2-sta301.c	onf	
-rw-r	r 1 root	root	653 Ju	l 23	17:03	wpa_supplicant	-wiphy2-sta303.c	onf	
-rw-r	rr 1 root	root	653 Ju	l 23	17:05	wpa_supplicant	-wiphy2-sta307.c	onf	
- rw- r	rr 1 root	root	653 Ju	l 23	17:05	wpa_supplicant	-wiphy2-sta306.c	onf	
- rw- r	r 1 root	root	653 Ju	l 23	17:05	wpa_supplicant	-wiphy2-sta300.c	onf	
-rw-r	r 1 root	root	653 Ju	l 23	17:06	wpa_supplicant	-wiphy2-sta302.c	onf	
-rw-r	r 1 root	root	653 Ju	l 23	17:06	wpa_supplicant	-wiphy2-sta304.c	onf	
-rw-r	r 1 root	root	653 Ju	l 23	17:06	wpa_supplicant	-wiphy2-sta305.c	onf	
-rw-r	r 1 root	root	653 Ju	l 23	17:06	wpa_supplicant	-wiphy2-sta308.c	onf	
-rw-r	r 1 root	root	653 Ju	l 23	17:14	wpa_supplicant	-wiphy2-sta309.c	onf	
-rw-r	r 1 root	root	74 Ju	l 23	17:15	portal-bot.sta	300.log		
lanfo > ta	orge@jedtest ~/wi ail -f portal-bot	fi .sta300.log		I					

- 4. Click the **Up** button to admin-up the station.
- 5. Click the **Portal Login** button force the station to login if you do not see any messages in the log file you are tailing.

Troubleshooting Techniques

If your station cannot talk to the captive portal, like you have a time-out, these steps will help identify where there is a misconfiguration:

1. Ping the portal from LANforge: ping basic-portal



2. Ping the portal from sta300 ping -I 10.27.0.16 basic-portal

```
[lanforge@kedtest ~]$ ping -I 10.26.2.1 10.26.1.254
PING 10.26.1.254 (10.26.1.254) from 10.26.2.1 : 56(84) bytes of data.
64 bytes from 10.26.1.254: icmp_seq=1 ttl=64 time=0.108 ms
64 bytes from 10.26.1.254: icmp_seq=2 ttl=64 time=0.148 ms
64 bytes from 10.26.1.254: icmp_seq=3 ttl=64 time=0.174 ms
^C
--- 10.26.1.254 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 1999ms
rtt min/avg/max/mdev = 0.108/0.143/0.174/0.028 ms
[lanforge@kedtest ~]$ []
```

- 3. Use curl to download the portal page by hand: curl -sqv http://basic-portal/login.php
- 4. Check the route on the portal side if you are routing. Some examples:

route -n										
route add	-net	10.27.0.0/	23 aw 10.26	5.1.1						
20000 000		10.11,00.07	20 90 20020							
		💿 root@atl	as:~/btbits/x64	4_btbits - Termi	inal			- 6		
		> mine T 10 00	1 054 10 00 1 0							
		> ping -1 10.26	(10.20.1.2) from	10 00 1 054 1 5	(04)		6 J.+			
	-	A bytes from 16	10.20.1.2) Trom	10.20.1.254 . 50	-0 100	mc	data.			
	0	A bytes from 10) 26 1 21 jamp se		-0.190	ms				
	6	A bytes from 16) 26 1 2: jcmp_se	ag=3 ttl=64 time:	-0.105	mc				
	~	C	12011121 Temp_se	eq-5 ccc-64 crille	0.201	1115				
	_	10.26.1.2 pi	ng statistics							
	3	3 packets transmitted 3 received RM packet loss time 1998ms								
	r	tt min/avg/max/	mdev = 0.185/0.1	L94/0.207/0.009 r	ns					
		, 0, ,		, , , ,						
	r	oot@atlas ~/btb	its/x64_btbits							
		> route -n								
	K	ernel IP routin	ng table							
	D	estination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface	
	Θ	0.0.0	192.168.100.1	0.0.0.0	UG	Θ	Θ	Θ	br0	
	1	0.26.0.0	0.0.0.0	255.255.255.0	U	Θ	Θ	Θ	brl	
	1	0.26.1.0	0.0.0.0	255.255.255.0	U	Θ	Θ	Θ	br2	
	1	0.26.2.0	0.0.0.0	255.255.255.0	U	Θ	Θ	Θ	br3	
	1	0.26.3.0	0.0.0.0	255.255.255.0	U	Θ	Θ	Θ	br4	
	1	.69.254.0.0	0.0.0.0	255.255.0.0	U	1000	Θ	Θ	brl	
	1	92.168.100.0	0.0.0.0	255.255.255.0	U	0	0	Θ	br0	

5. Check access logs for the portal. There might be a hostname issue.

> route add -net 10.26.2.0/24 gw 10.26.1.1

root@atlas ~/btbits/x64_btbits

• root@atlas:/var/log/apache2 - Terminal	
root@jedtest:/home/la 🗙 lanforge@jedtest:~ 🗙 root@jedtest:/home/la 🗙 root@atlas:/var/log/apa 💥 lanforge@kedtest:~	
==> other_vhosts_access.log <==	
portal-test.candelatech.com:80 10.26.2.48 [23/Jul/2015:17:58:26 -0700] "POST /logout.php HTTP/1.1" 200 385 "-" "curl/7.41.0-DEV"	
portal-test.candelatech.com:80 10.26.2.43 [23/Jul/2015:17:58:26 -0700] "POST /logout.php HTTP/1.1" 200 385 "-" "curl/7.41.0-DEV"	
portal-test.candelatech.com:80 10.26.2.42 [23/Jul/2015:17:58:26 -0700] "POST /logout.php HTTP/1.1" 200 385 "-" "curl/7.41.0-DEV"	
portal-test.candelatech.com:80 10.26.2.49 [23/Jul/2015:17:58:26 -0700] "POST /logout.php HTTP/1.1" 200 385 "-" "curl/7.41.0-DEV"	
portal-test.candelatech.com:80 10.26.2.41 [23/Jul/2015:17:58:26 -0700] "POST /logout.php HTTP/1.1" 200 385 "-" "curl/7.41.0-DEV"	
portal-test.candelatech.com:80 10.26.2.45 [23/Jul/2015:17:58:26 -0700] "POST /logout.php HTTP/1.1" 200 385 "-" "curl/7.41.0-DEV"	
portal-test.candelatech.com:80 10.26.2.50 [23/Jul/2015:17:58:26 -0700] "POST /logout.php HTTP/1.1" 200 385 "-" "curl/7.41.0-DEV"	
portal-test.candelatech.com:80 10.26.2.47 - [23/Jul/2015:17:58:26 -0700] "POST /logout.php HTTP/1.1" 200 385 "-" "curl/7.41.0-DEV"	
portal-test.candelatech.com:80 10.26.2.44 - [23/Jul/2015:17:58:26 -0700] "POST /logout.php HTTP/1.1" 200 385 "-" "curl/7.41.0-DEV"	
portal-test.candelatech.com:80 10.26.2.46 [23/Jul/2015:17:58:29 -0700] "POST /logout.php HTTP/1.1" 200 385 "-" "curl/7.41.0-DEV"	
T T	
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Using the Port Bringup Plugin

Using the Port Bringup Plugin is a much more fun way to get data than looking at log files.

1. In the *Plugins* menu, select **Port Bringup Test**.

LANforge Manager Version(5.3.2)																	
<u>C</u> ontrol	<u>R</u> epor	ting 1	ear-Off Info	<u>P</u> lugins													
				Groovy Scr	ipting					Stop	All		Restart M	anager		Refresh	HELP
Attenu				Attenuato	Motion Te	est									L		
File-IO Layer-4 Generic Create Simple					ple VoIP		Reso	urce M	gr 🗍	Event Log	Ale	erts	Port Mgr	Message	s		
Statu	s	Layer	-3 L3 En	Enforce Fa	irness		VoIP/RTI	P Endp	s	Armage	don	1	WanLinks	Attenu	lators	Collision	-Domains
		Disc	: 192.168.10	Port Bring	up Test		ckets		Cle	ar Countei	· s	Res	et Port	Delete]		
				Port Monit	or 🗟						_			Delete	 		
		Rpt	Timer: mediu	Port Reset	Port Reset Test		ly		<u>V</u> iew Details			Cr <u>e</u> ate		<u>M</u> odify	Batch Modify		
				VoIP Repo	ting		thernet	Interf	aces	(Ports) for	all R	esour	ces. ——				
				WiFi Capac	ity Test												
Port	Pha	Down	IF	WiFi Mobili	y			MAG	С		DHC	P (ms)	Retry	Login-0K	Login-Fail	Logout-OK	Logout-Fail
1 1 00			102102100	20	-++-0	00.0		00.60				0		0	0		
1.1.00			192.168.100	42	eth0	00:9	0:00:29:	00:18				0	0	0	0	0	0
1 1 01			10 26 1 2	.42	eth1	00.3	0.00.21.0	06.fg				0	0	0	0	0	
1.2.1			10.26.1.1		eth1	00:9	0:0b:25:	00.15 Da:0f				0	0	0	0	0	0
1.1.02			10.26.2.48		sta300	00:0)e:8e:61:	8f:5b				1,464	0	1	0	3	1
1.1.06			10.26.2.43		sta301	00:0)e:8e:24:	1f:5b				1,564	0	1	0	3	1
1.1.07		~	0.0.0.0		sta302	00:0	e:8e:fd:0	d6:5b				1,877	0	1	0	3	1
1.1.08		~	0.0.0.0		sta303	00:0)e:8e:ed:	40:5b				1,572	0	1	0	3	1
1.1.09		~	0.0.0.0		sta304	00:0)e:8e:a2:	cb:5b				5,571	0	1	0	3	1
1.1.10		~	0.0.0.0		sta305	00:0)e:8e:9f:7	7e:5b				2,042	0	1	0	3	1
1.1.11		~	0.0.0.0		sta306	00:0)e:8e:90:	7a:5b				1,837	0	1	0	3	1
1.1.12		~	0.0.0.0		sta307	00:0)e:8e:d5:	56:5b				1,358	0	1	0	3	1
1.1.13		~	0.0.0.0		sta308	00:0)e:8e:3f:0	d8:5b				1,324	0	1	0	3	1
1.1.14		~	0.0.0.0		sta309	00:0)e:8e:4b:	f0:5b				1,888	0	1	0	3	1
1.2.5			10.26.2.1		vap0	00:0)e:8e:da:	48:63				0	0	0	0	0	0
1.1.03			0.0.0.0		wiphy0	00:0)e:8e:4e:	5a:56				0	19	0	0	0	0
1.2.2			0.0.0.0		wiphy0	00:0)e:8e:43:	36:e9				0	51	0	0	0	0
1.1.04			0.0.0.0		wiphy1	00:0)e:8e:4e:	57:91				0	0	0	0	0	0
1.2.3			0.0.0.0		wiphy1	00:0)e:8e:43:	3a:62				0	0	0	0	0	0
1.1.05			0.0.0.0		wiphy2	00:0)e:8e:3e:	27:5b				0	3	0	0	0	0
1.2.4			0.0.0.0		wiphy2	00:0)e:8e:43:	37:63				0	0	0	0	0	0

Logged in to: jedtest:4002 as: Admin

2. Highlight a series of stations and click Add Port:

Port Bringup Test				● 🛛 😣			
Concurrent Ports to Bringu	b :	Ten	(10)	-			
Minimum Time between Brir	ngups:	5 seconds (5	ōs)	-			
Maximum Time between Bri	ngups:	10 seconds (1	LO s)	-			
🗹 Do Portal Logout		Random Port Selection					
🗹 Only Do Portal Login/Log	jout	Show Events					
	Po	orts		1			
Ports in Use	← Ad	ld Port	Free Port	s			
1.1.2 sta300			1.1.1 eth1				
1.1.7 sta302	Remove	e Port ⇒	1.2.5 vap0				
1.1.8 sta303							
1.1.9 sta304 1.1.10 sta305							
1.1.11 sta306							
1.1.12 sta307							
1.1.14 sta309							
		2					
			Start	Close			

3. Click Start

4. You will see the reporting window. It often takes many seconds or a few minutes for stations to aquire DHCP addresses and start reporting information into the plugin.



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