Printing QR codes with pfSense

Basic Linux skills are very helpful for the Linux part… ;).

If you have installed and configured the Template Roll Printer files found at
https://forum.netgate.com/topic/97205/template-roll-printer-with-options-for-2-2-6-2-3-2-3-4-2-4-0-2-4-4, you need not to remove this files, you can just overwrite them.
If you do not use this files, you need not to install them first.
Anyhow, the files are contained in archive.

In addition, to grant access by scanning a voucher code, you need the modified index2.html file
found at https://knobelbecher.net/vouchergenerator/.

All of these files are also attached in the archive, so the archive contains all required files.

Mandatory is a Linux host at which you need to install qrencoder and a NFS server.
At a raspberry Pi you can install qrencoder by typing `sudo apt-get install qrencode`.

Create an export which can be mounted from pfSense, in my case the export is named „/export“.

Create a user for qr encoding (or use your default user), in this example a user pfsense was
created.
In users home directory place following script (all scripts are attached in archive):

```
#!/bin/bash
#
# Ver 1.0 - December, 10 - 2022
#

FILE="/export/$1"

if [[ -f "$FILE" ]] ;
then
   echo "File found"
   sed -i "1,7d" $FILE
   sed -i 's/"//g' $FILE
   sed -i 's/^[ \t]*//;s/[ \t]*$//' $FILE
   else
   echo "Nothing to do"
   exit
fi

ANZV=$(cat $FILE | wc -l)
echo "Voucher: $ANZV"

for (( X=1 ; X<=$ANZV; X++ )); do
    VO=$( sed -n ${X}p < $FILE )
    echo "VO: $VO"
    qrencode -s 6 -l H -o "/export/$1_qr_$X.png" "http://<your pfSense IP>:8002/captiveportal-index2.php?zone=<your CP zone>&auth_voucher=$VO&accept=Continue"
done
```

Dont forget to replace the variables in < > with your values!

Mount the /export at your pfSense to a mountpoint, i.e. /qrcode

Note: if using https the port is 8003 by default!

At pfSense create following scripts:

Script for monitoring the mount:

```
#!/usr/bin/env sh
#
# Ver 1.0 - December, 10 - 2022
#

CFILE="/qrcode/pfsense.txt"

if [ -f "$CFILE" ]
then
   echo "File found"
   touch /qrcode/check
   else
   echo "No filesystem found!"
   cat /usr/local/www/voucherfiles/script/myfile.txt | /usr/local/bin/mail.php -s"No filesystem for
QR codes found!"
   exit
fi
```

Add the script in cron (package can be installed by package manager).
The script runs periodically, if the file pfsense.txt is not found (mount not available) a mail is triggered.
The file myfile.txt can contain any text you like, the content is not important, but a useful idea is to write a line „mount point not available."
An empty file „check" is created.
If no SMTP is configured, you can use this file to see at the Linux host when the pfSense has last monitored the file system.

Create a script qrmount.sh (use any name you like) for mounting the file system exported from the Linux host, add this script in cron too with the option @reboot, so that file system is available after system boot.

```
mount -t nfs -o soft <ip-of-host>:/export /qrcode
```

These two scripts can be created in /root, the last script triggers the qrcode creation and its location is /usr/local/www/voucherfiles/script:

```
#!/usr/bin/env sh
#
# Ver 1.0 - December, 10 - 2022
#
rm -f /qrcode/$1
rm -f /qrcode/$1_qr_*.png
rm -f /usr/local/www/voucherfiles/qrcodes/$1_qr_*.png
cp /usr/local/www/voucherfiles/csv/$1 /qrcode/
ssh -l pfsense <IP_of_Linuxhost> ./qr.sh $1
cp /qrcode/$1_qr_*.png /usr/local/www/voucherfiles/qrcodes
```

The $1 is the current voucher_role file and provided from the php file.
The script first deletes previous files at the remote and local host, copies the current voucher_role file to the Linux, starts qrencode and copies finally the qrcode images back to pfSense.

Clearly seen, you need to create SSH keys in advance so that no password is interactively needed.

Installing the files

Use for example WinSCP to transfer the files to pfSense.

The directory names in archive give you a hint, in which directory the files should be placed.

If you do not use CP portal now, setup the service and create a zone.
No further steps needs to be taken by now.

Its recommended to backup at first all files which will be modified/overwritten!

Copy all files from www to /usr/local/www.
Create directory voucherfiles (if not already existent) and subdirectories csv, script and qrcodes.
Copy all files in voucherfiles to the referring destination in pfSense.
Copy qrmount.sh and check_mount.sh to /root
Copy create_qrcodes.sh to /usr/local/www/voucherfiles/script

Remember to set permissions to 755 for all .sh files!

Generate SSH keys at pfSense (if not already existing) and add the public key to the
authorized_keys file at your Linux host.

Run any command from pfsense to this host to generate the known_hosts entry and check if
passwordless access is possible!

Copy portalprint.priv.inc to /etc/inc/priv.

Upload the file index2.php in CP with the Filemanager

Your are done!

In next step you can print the QR codes.
I did not modify the php for printing, I just copied the page so that you will have to choices in printing: a printout without the QR codes and a printout with QR codes (for mobile devices)
Following files from CP pages have been modified:
voucherprint.css (actually it is mostly the origin file, I created a second file, qrvoucherprint.css)

services_captiveportal_vouchers.php (some lines added)

services_captiveportal_vouchers_options.php
services_captiveportal_vouchers_print.php

Both files are copied for the printing of qr codes, a „_2" is added to file name.

QR codes can also be printed with an non-admin account, grant the referring privileges to the user (a file portalprint.priv.inc is in archive and needs to be placed in /etc/inc/priv.

Improvements tdb:
Currently the directories are hardcoded in the files, if you like to use other names, you need to edit the files for a proper function.

The additional directories I created are:*

usr/local/www/voucherfiles/csv
usr/local/www/voucherfiles/qrcodes
usr/local/www/voucherfiles/script

* the directory voucherfiles is to be created when installing the Template Roll Printer files!

May be in a future version I will add the directories as an „input form".
Also the decision of printouts QR code/non-QR-code is may be better done at the voucher print page instead of using two pages.

I confess, I was a bit lazy at this point ;), it was faster (and easier) to copy and modify the pages than creating a complete different one.

In pfsense CP it looks like:

Configuration	MACs	Allowed IP Addresses	Allowed Hostnames	Vouchers	File Manager

Voucher Rolls

Roll #	Minutes/Ticket	# of Tickets	Comment	Actions
0	30	4	For testing only	

More in details:

| Comment	Actions
For testing only	Print voucher roll
Test	

Comment	Actions
For testing only	Print QR codes
Test	

The left printer symbol is for printing the original template, the right printer for printing with QR codes.

Here are examples of the printouts:

The origin printout from https://knobelbecher.net/vouchergenerator/:

(The German text „Laufzeit" (=valid for...) is also a reason, I prefer an own local generator.)
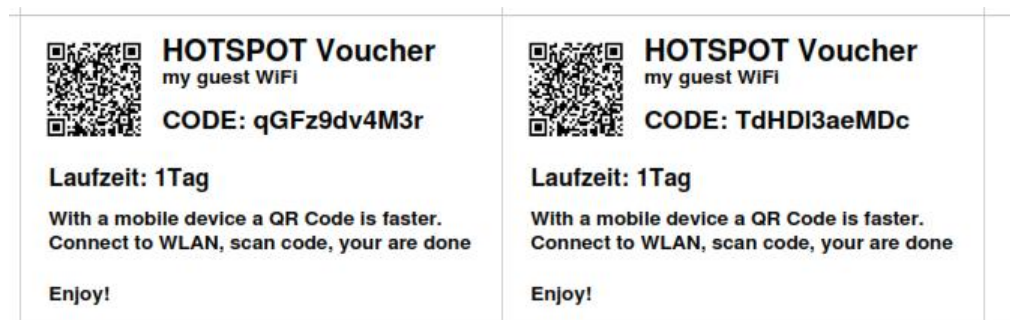
Examples from pfSense:

After installing the Template Printer Roll files:

Instead of a logo, you can add a QR code for access to WLAN (left), or QR code for CP (right):

And finally you can have two QR codes:
left for WLAN access, right for internet access through CP:

Note: the left logo is static and the same for all vouchers, the right QR code is dynamic and refers to the vouchercode! (Layout of printouts can be modified in the .css files in voucherfiles directory.)

Additional new pages.

If you decide to create a user/group without access to the captive portal services but access to the captive portal status only, these users can be downloading/printing the voucher codes too.
For that the individual user/group permissions are shown in the screenshots.
Two groups are created*:
manage captive portal
status captive portal (with download/print option)
*A third role was created, just for testing and in my opinion without any use case: a role which can only service captive portal,but without access to the CP status pages.

ManageCP:

Assigned Privileges

| Name	Description	Action
WebCfg - Services: Captive Portal	Allow access to the 'Services: Captive Portal' page.	🗑
WebCfg - Services: Captive Portal HA	Allow access to the 'Services: Captive Portal High Availability' page.	🗑
WebCfg - Services: Captive Portal Voucher Rolls	Allow access to the 'Services: Captive Portal Edit Voucher Rolls' page.	🗑
WebCfg - Services: Captive Portal Vouchers	Allow access to the 'Services: Captive Portal Vouchers' page.	🗑
WebCfg - Services: Captive Portal Zones	Allow access to the 'Services: Captive Portal Zones' page.	🗑
WebCfg - Services: Captive Portal: Allowed Hostnames	Allow access to the 'Services: Captive Portal: Allowed Hostnames' page.	🗑
WebCfg - Services: Captive Portal: Allowed IPs	Allow access to the 'Services: Captive Portal: Allowed IPs' page.	🗑
WebCfg - Services: Captive Portal: Edit Allowed Hostnames	Allow access to the 'Services: Captive Portal: Edit Allowed Hostnames' page.	🗑
WebCfg - Services: Captive Portal: Edit Allowed IPs	Allow access to the 'Services: Captive Portal: Edit Allowed IPs' page.	🗑
WebCfg - Services: Captive Portal: Edit MAC Addresses	Allow access to the 'Services: Captive Portal: Edit MAC Addresses' page.	🗑
WebCfg - Services: Captive Portal: Edit Zones	Allow access to the 'Services: Captive Portal: Edit Zones' page.	🗑
WebCfg - Services: Captive Portal: File Manager	Allow access to the 'Services: Captive Portal: File Manager' page.	🗑
WebCfg - Services: Captive Portal: Mac Addresses	Allow access to the 'Services: Captive Portal: Mac Addresses' page.	🗑
WebCfg - Status: Captive Portal	Allow access to the 'Status: Captive Portal' page.	🗑
WebCfg - Status: Captive portal print Vouchers	Allow access to the 'Status: Captive portal print Vouchers' page.	🗑
WebCfg - Status: Captive portal print Vouchers Option	Allow access to the 'Status: Captive portal print Vouchers option' page.	🗑
WebCfg - Status: Captive portal print Vouchers Option 2	Allow access to the 'Status: Captive portal print Vouchers option 2' page.	🗑
WebCfg - Status: Captive Portal Voucher Rolls	Allow access to the 'Status: Captive Portal Voucher Rolls' page.	🗑
WebCfg - Status: Captive Portal Vouchers	Allow access to the 'Status: Captive Portal Vouchers' page.	🗑
WebCfg - Status: Captive portal Vouchers Options	Allow access to the 'Status: Captive portal Vouchers Options' page.	🗑
WebCfg - Status: Captive portal Vouchers Options 2	Allow access to the 'Status: Captive portal Vouchers Options 2' page.	🗑
WebCfg - Status: Captive portal Vouchers Print	Allow access to the 'Status: Captive portal Vouchers print' page.	🗑
WebCfg - Status: Captive portal Vouchers Print 2	Allow access to the 'Status: Captive portal Vouchers print 2' page.	🗑
WebCfg - Status: Captive Portal: Expire Vouchers	Allow access to the 'Status: Captive Portal: Expire Vouchers' page.	🗑
WebCfg - Status: Captive Portal: Test Vouchers	Allow access to the 'Status: Captive Portal: Test Vouchers' page.	🗑

+ Add

Status CP:

Assigned Privileges

Name	Description	Action
WebCfg - Status: Captive Portal	Allow access to the 'Status: Captive Portal' page.	🗑
WebCfg - Status: Captive portal print Vouchers	Allow access to the 'Status: Captive portal print Vouchers' page.	🗑
WebCfg - Status: Captive portal print Vouchers Option	Allow access to the 'Status: Captive portal print Vouchers option' page.	🗑
WebCfg - Status: Captive portal print Vouchers Option 2	Allow access to the 'Status: Captive portal print Vouchers option 2' page.	🗑
WebCfg - Status: Captive Portal Voucher Rolls	Allow access to the 'Status: Captive Portal Voucher Rolls' page.	🗑
WebCfg - Status: Captive Portal Vouchers	Allow access to the 'Status: Captive Portal Vouchers' page.	🗑
WebCfg - Status: Captive portal Vouchers Options	Allow access to the 'Status: Captive portal Vouchers Options' page.	🗑
WebCfg - Status: Captive portal Vouchers Options 2	Allow access to the 'Status: Captive portal Vouchers Options 2' page.	🗑
WebCfg - Status: Captive portal Vouchers Print	Allow access to the 'Status: Captive portal Vouchers print' page.	🗑
WebCfg - Status: Captive portal Vouchers Print 2	Allow access to the 'Status: Captive portal Vouchers print 2' page.	🗑
WebCfg - Status: Captive Portal: Expire Vouchers	Allow access to the 'Status: Captive Portal: Expire Vouchers' page.	🗑
WebCfg - Status: Captive Portal: Test Vouchers	Allow access to the 'Status: Captive Portal: Test Vouchers' page.	🗑

+ Add

Service CP (no access to status):

Effective Privileges

Inherited from	Name	Description	Action
	WebCfg - Services: Captive Portal	Allow access to the 'Services: Captive Portal' page.	🗑
	WebCfg - Services: Captive Portal HA	Allow access to the 'Services: Captive Portal High Availability' page.	🗑
	WebCfg - Services: Captive Portal Voucher Rolls	Allow access to the 'Services: Captive Portal Edit Voucher Rolls' page.	🗑
	WebCfg - Services: Captive Portal Vouchers	Allow access to the 'Services: Captive Portal Vouchers' page.	🗑
	WebCfg - Services: Captive Portal Zones	Allow access to the 'Services: Captive Portal Zones' page.	🗑
	WebCfg - Services: Captive Portal: Allowed Hostnames	Allow access to the 'Services: Captive Portal: Allowed Hostnames' page.	🗑
	WebCfg - Services: Captive Portal: Allowed IPs	Allow access to the 'Services: Captive Portal: Allowed IPs' page.	🗑
	WebCfg - Services: Captive Portal: Edit Allowed Hostnames	Allow access to the 'Services: Captive Portal: Edit Allowed Hostnames' page.	🗑
	WebCfg - Services: Captive Portal: Edit Allowed IPs	Allow access to the 'Services: Captive Portal: Edit Allowed IPs' page.	🗑
	WebCfg - Services: Captive Portal: Edit MAC Addresses	Allow access to the 'Services: Captive Portal: Edit MAC Addresses' page.	🗑
	WebCfg - Services: Captive Portal: Edit Zones	Allow access to the 'Services: Captive Portal: Edit Zones' page.	🗑
	WebCfg - Services: Captive Portal: File Manager	Allow access to the 'Services: Captive Portal: File Manager' page.	🗑
	WebCfg - Services: Captive Portal: Mac Addresses	Allow access to the 'Services: Captive Portal: Mac Addresses' page.	🗑
	WebCfg - Status: Captive portal Vouchers Options	Allow access to the 'Status: Captive portal Vouchers Options' page.	🗑
	WebCfg - Status: Captive portal Vouchers Options 2	Allow access to the 'Status: Captive portal Vouchers Options 2' page.	🗑
	WebCfg - Status: Captive portal Vouchers Print	Allow access to the 'Status: Captive portal Vouchers print' page.	🗑
	WebCfg - Status: Captive portal Vouchers Print 2	Allow access to the 'Status: Captive portal Vouchers print 2' page.	🗑

+ Add

Troubleshooting

If any issue occurs after installing/modifying the pages and scripts, do the following basics to pinpoint the cause:

Logon via SSH to pfSense (admin account)

Run any command against the Linux, no password should be prompted!

```
ssh -l <username> <IP-of-Linux-host> uname -a
```

The -l is a lowercase L, not figure 1!

Run the script for mounting the Linux file system manually.
Is file system available?
Yes: proceed at pfSense
No: login to Linux host

In case of yes: check, if all directories exist as required:
/usrl/ocal/www/voucherfiles and subdirectories csv, script, qrcodes.

Note that at Linux all names are case-sensitive!

Check if there is any .csv file in /usrl/ocal/www/voucherfiles/csv.
Run create_qrcodes.sh manually, i.e.
```
/usr/local/www/voucherfiles/script/create_qrcodes.sh <name-of-a-csv-file>.
```

You can run the script in following way to see errors during processing:

```
sh -x /usr/local/www/voucherfiles/script/create_qrcode.sh <name-of-a-csv-file>.
```


If filesystem from Linux host is not available:

Run
```
showmount e <IP-of-Linux-host>
```

(you can use the hostname if you have a proper name resolution in place).

If an export is seen, try remounting and check for errors during mount.
If no export is seen, SSH to Linux host.

At Linux host:

Check status of nfs server (i.e. `systemctl status nfs-kernel-server.service`)
Check /etc/exports and /etc/fstab.
Check /home/<user> and run the script qr.sh manually to see any errors.

In general: if something is not as expected, try to run all commands/scripts at command line first.