Npppd: easy vpn with OpenBSD

Giovanni Bechis
giovanni@openbsd.org

Institute of Biostructures and Bioimaging,
Napoli, Italy
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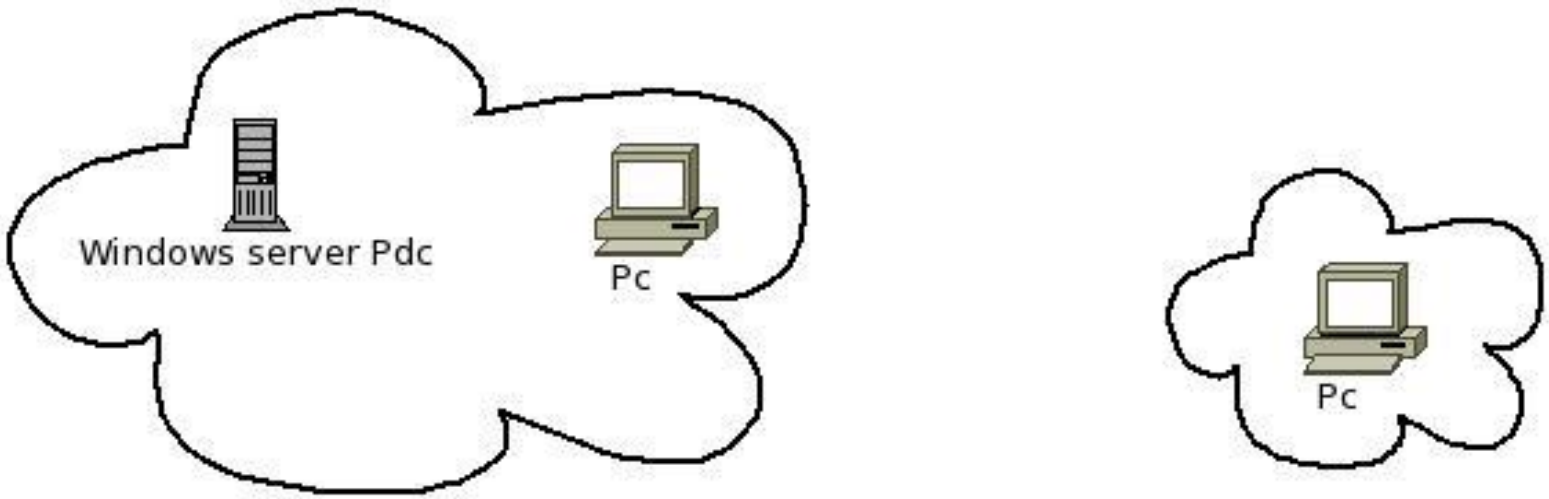
A little presentation

- sysadmin and web developer at SnB, my own software house
- developer for OpenBSD
- every now and then, developer for some other open source software

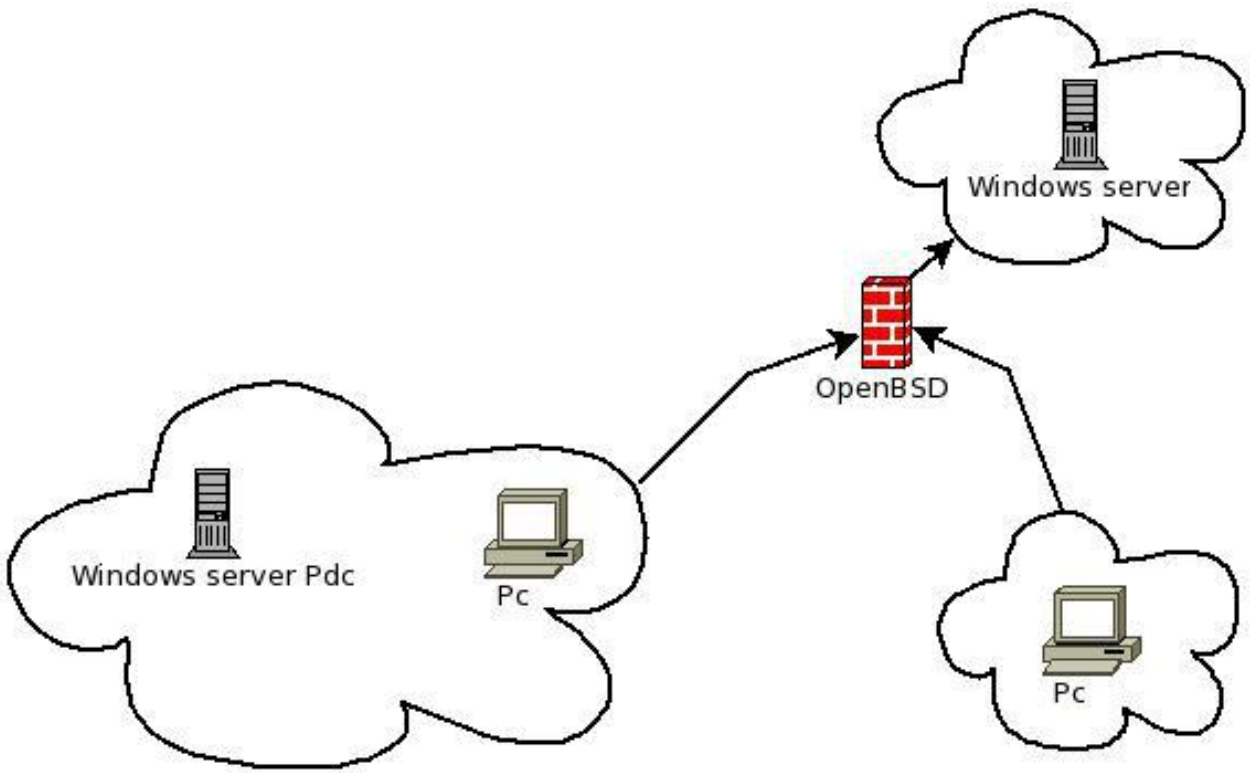
The initial problem

- two offices and some people with their laptop who wish to use their main software remotely



The proposed solution

- the two offices has been connected to a Windows Server in a web farm with the terminal server connections protected by a vpn



Vpn software

- Vpn software that could be used for this setup on our OpenBSD firewall:
- iked(8)
- openvpn
- poptop
- npppd(8)

npppd(8) main features

- it is a PPP and tunneling daemon which supports PPTP, L2TP and PPPoE
- it can authenticate using a local file or a remote radius server
- it can use pipex(4) to accelerate ip packets forwarding
- it can use tun(4) or pppx(4) interfaces to tunnel packets

npppd(8) short story

- npppd(8) has been initially developed by IIJ
- it first appeared in OpenBSD 5.3

npppd(8) configuration

- the configuration file is /etc/npppd/npppd.conf
- the configuration file format has changed a lot during development

npppd.conf(5)

"Basic" npppd(8) configuration

```
authentication LOCAL type local {
    users-file "/etc/npppd/npppd-users"
}

tunnel PPTP_ipv4 protocol pptp {
    listen on 0.0.0.0
}

ipcp IPCP {
    pool-address 10.0.0.2-10.0.0.100
    dns-servers 192.168.0.254
}

interface pppx0 address 10.0.0.1 ipcp IPCP
bind tunnel from PPTP_ipv4 authenticated by LOCAL to pppx0
```

npppd-users(5)

npppd-users(5) file format

```
alex:\
        :password=alex's password:\
        :framed-ip-address=10.0.0.33:
john:\
        :password=john's password:
```

npppd.conf(5)

"Advanced" npppd(8) configuration

```
authentication RADIUS type radius {
    authentication-server {
        address 192.168.0.1 secret "hogehoge"
    }
}

tunnel L2TP_ipv4 protocol l2tp {
    listen on 0.0.0.0
}
ipcp IPCP {
    pool-address 10.0.0.2-10.0.0.100
    dns-servers 192.168.0.254
}

interface pppx0 address 10.0.0.1 ipcp IPCP
bind tunnel from L2TP_ipv4 authenticated by RADIUS to pppx0
```

l2tp setup

- to setup an l2tp tunnel you have to configure both npppd.conf and ipsec.conf
- your pf.conf setup should be changed accordingly

ipsec.conf(5)

Ipsec setup for l2tp tunnels

```
public_ip = "1.2.3.4"
ike passive esp transport \
        proto udp from $public_ip to any port 1701 \
        main auth "hmac-sha1" enc "aes" group modp2048 \
        quick auth "hmac-sha1" enc "3des" \
        psk "mysecret"
```

pf.conf(5)

Pf setup for l2tp tunnels

```
pass quick proto { esp, ah } from any to any
pass in quick on egress proto  udp from any to any \
    port {500, 4500, 1701} keep state
pass on enc0 from any to any keep state (if-bound)
```

npppd monitoring

To monitor npppd vpn sessions you can use npppctl

```
# npppctl session all
Ppp Id = 18
          Ppp Id                      : 18
          Username                    : giovanni
          Realm Name                  : radius
          Concentrated Interface      : tun1
          Assigned IPv4 Address       : 192.168.255.205
          Tunnel Protocol             : PPTP
          Tunnel From                 : 151.71.144.16:31342
          Start Time                  : 2013/02/04 11:35:24
          Elapsed Time                : 131 sec (2 minutes)
          Input Bytes                 : 11256 (11.0 KB)
          Input Packets               : 130
          Input Errors                : 0 (0.0%)
          Output Bytes                : 19241 (18.8 KB)
          Output Packets              : 160
          Output Errors               : 17 (9.6%)
```

npppd monitoring

If you use pppx(4) interfaces you can have some info from the ifconfig command too

```
# ifconfig pppx0
pppx0: flags=8051<UP,POINTOPOINT,RUNNING,MULTICAST> mtu 1360
        description: giovanni
        priority: 0
        groups: pppx
        inet 192.168.255.1 --> 192.168.255.205 \
        netmask 0xffffffff
```

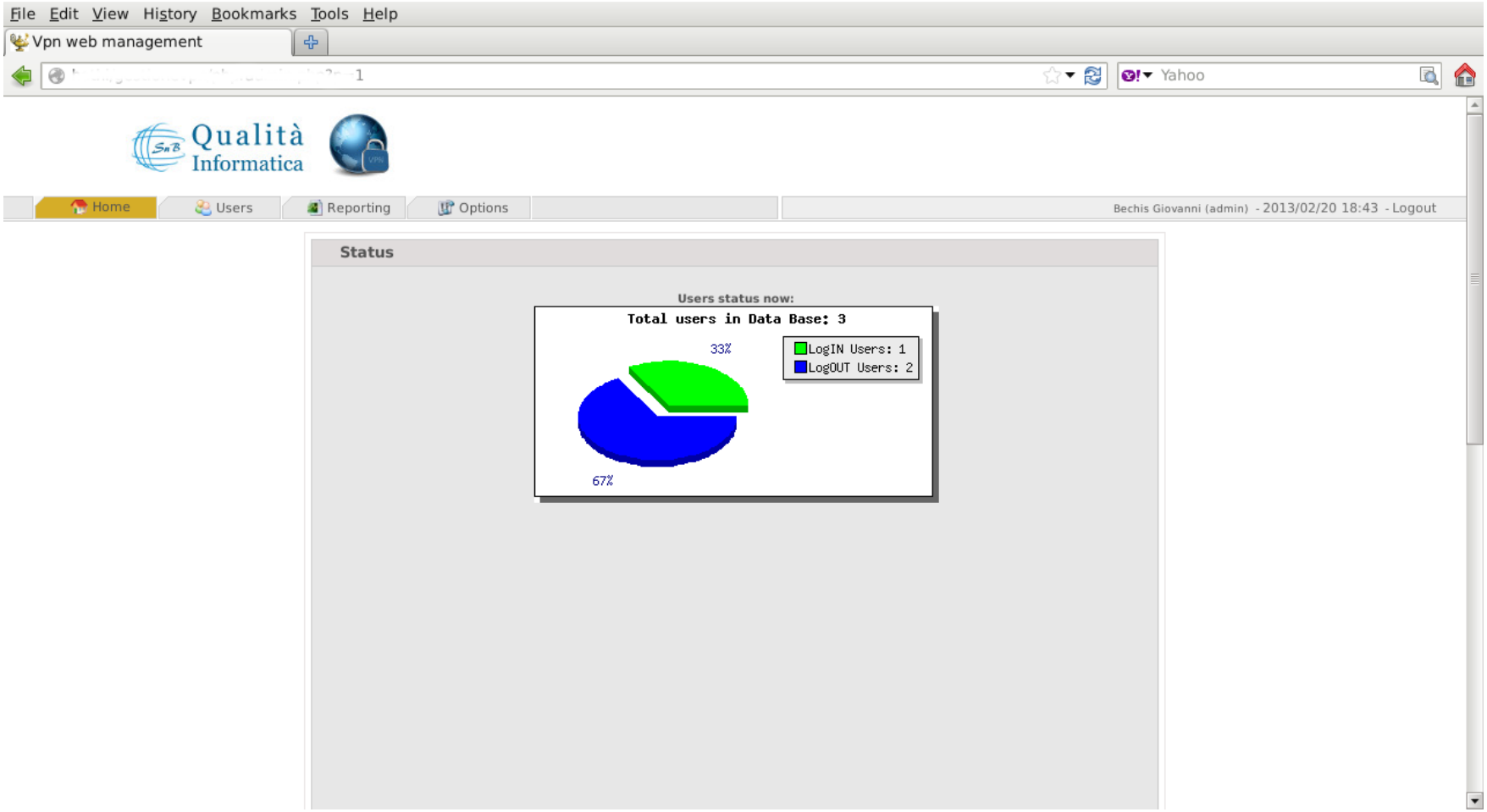
npppd monitoring

As usual, with ipsec, ipsecctl is your friend

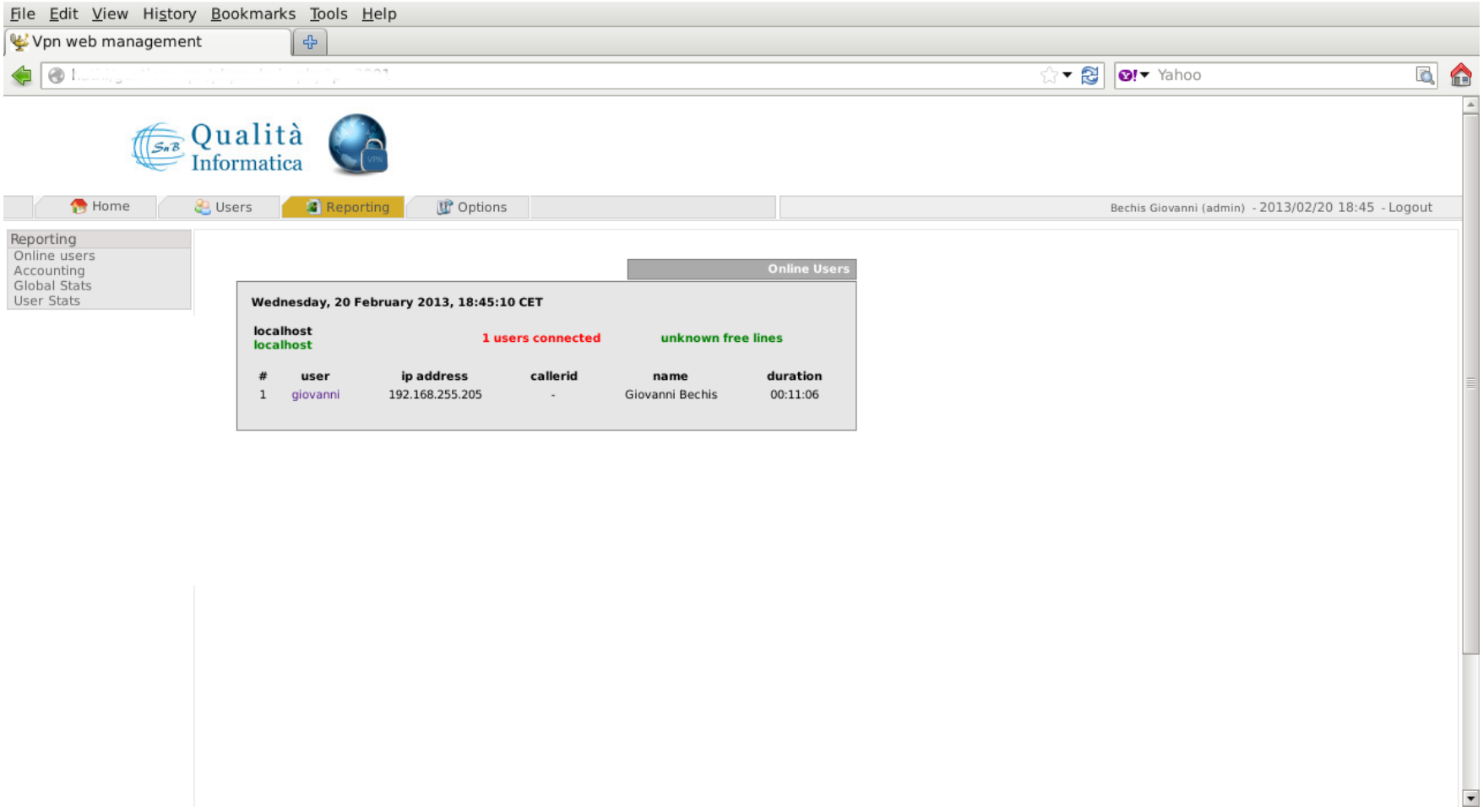
```
# ipsecctl -s all
FLOWS:
flow esp in proto udp from 9.2.71.195 port l2tp \
    to 192.168.2.250 port l2tp peer 9.2.71.195 \
    srcid 192.168.2.250/32 dstid 192.168.1.101/32 type use
flow esp out proto udp from 192.168.2.250 port l2tp \
    to 9.2.71.195 port l2tp peer 9.2.71.195 \
    srcid 192.168.2.250/32 dstid 192.168.1.101/32 type require

SAD:
esp transport from 192.168.2.250 to 9.2.71.195 \
    spi 0x41f46e6a auth hmac-sha1 enc aes
esp transport from 9.2.71.195 to 192.168.2.250 \
    spi 0x6d7d8716 auth hmac-sha1 enc aes
```

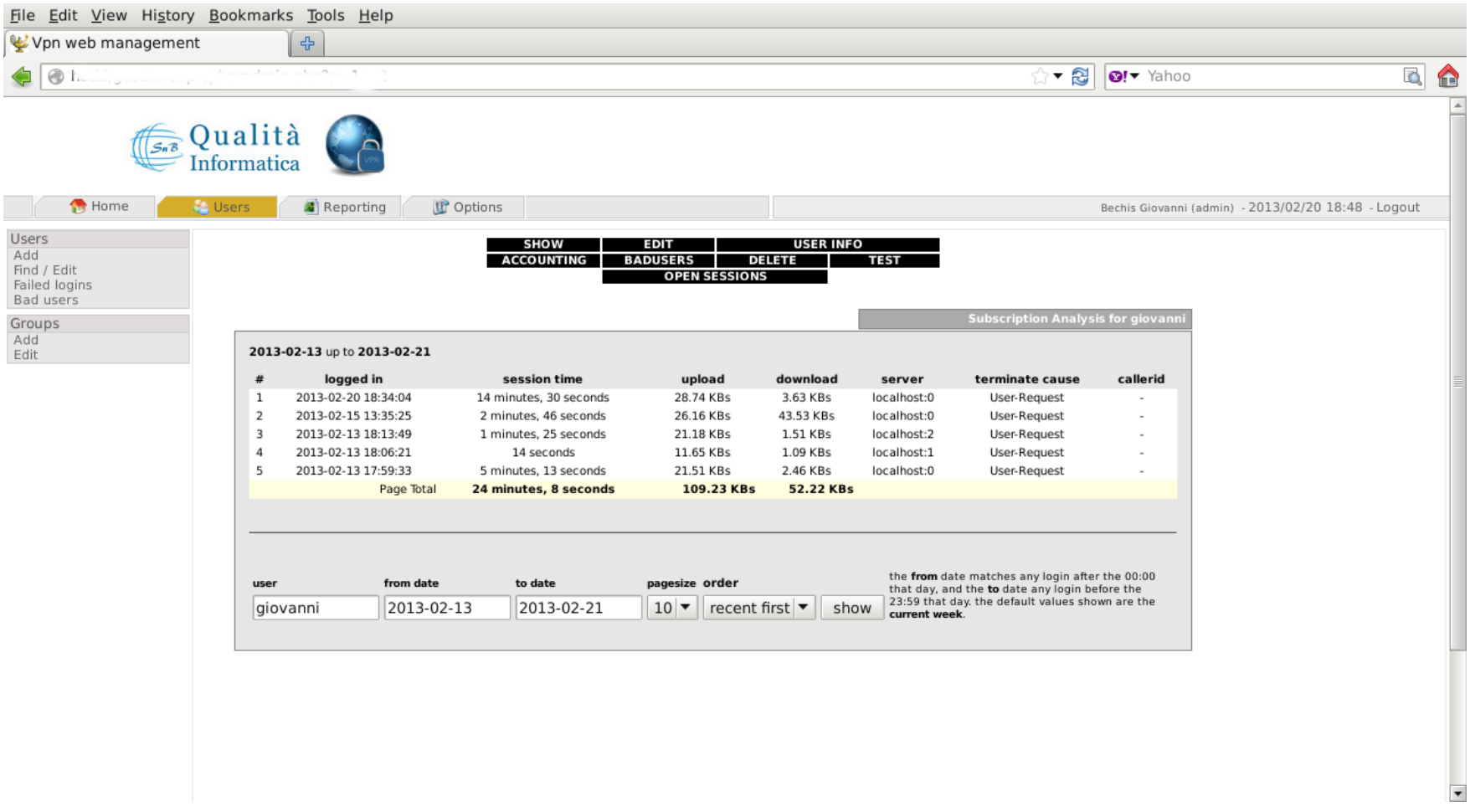
Vpn gui interface



Vpn gui interface

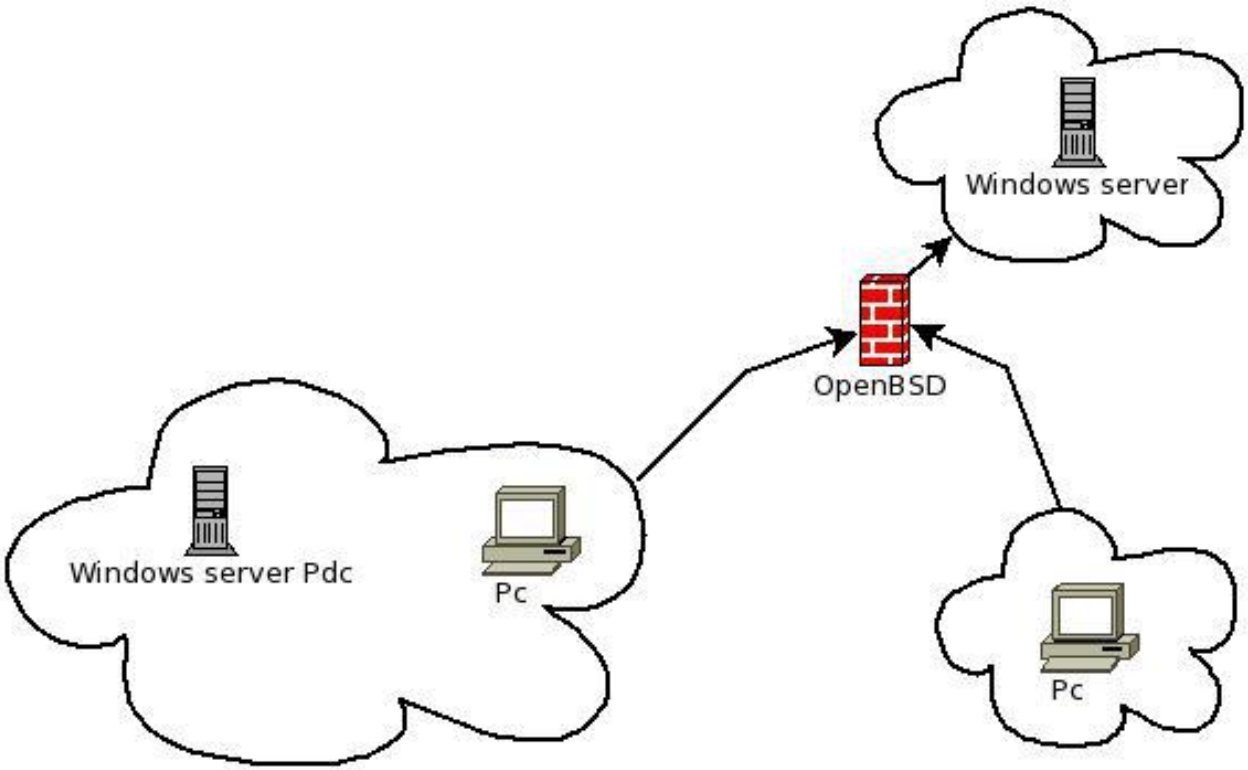


Vpn gui interface



Microsoft tips and Microsoft bugs

Microsoft, dns, kerberos and mtu



Microsoft tips and bugs

ipsec nat-t support

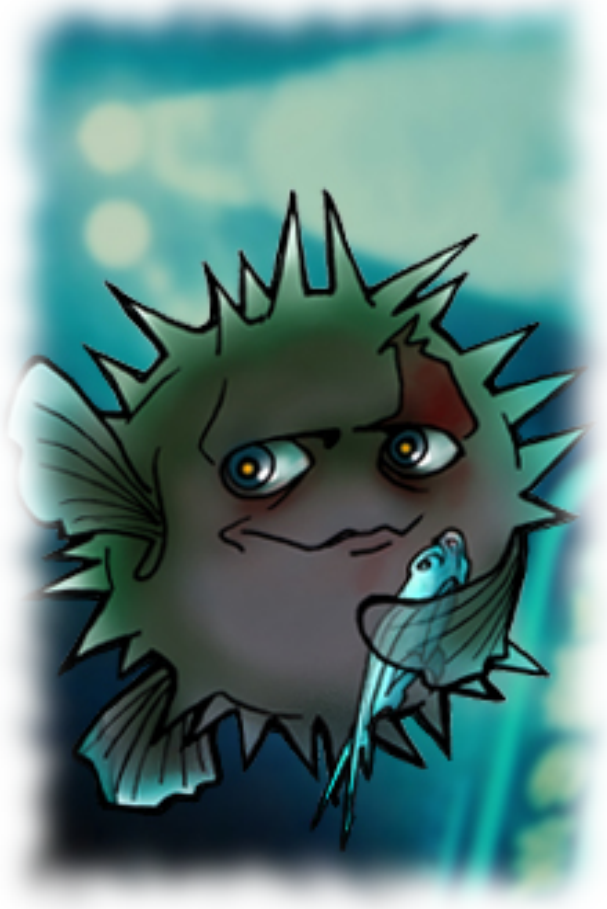
```
Windows Registry Editor Version 5.00

[HKLM\SYSTEM\CurrentControlSet\Services\PolicyAgent]
"AssumeUDPEncapsulationContextOnSendRule"=dword:00000002
```

npppd future

- fixing bugs
- better integration with pf
- arp cache support

Thank you for your attention!



Questions?