

# Όγιάαός ΙΎού Όçäåöþñĩõ êáé Ôåß÷ĩò Ðñĩóôáóßàò óôĩ FreeBSD

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\$FreeBSD: doc/el\_GR.ISO8859-7/articles/dialup-firewall/article.sgml,v 1.20  
2008/12/08 03:10:51 keramida Exp \$

Ôĩ FreeBSD áβιάέ Υία éáôĩ÷õñùĩΥĩĩ àìðñééÛ óγìáĩēĩ ôĩõ FreeBSD Foundation.  
ÐñēēΥò áðù óéò ēΥìáéò ð õñÛóáéò ïé ïðĩßàð ÷ ñçóéìĩðñēĩγìóáé áðù ôĩõò éáóáóéäåóáóðΥò ð ôĩõò  
ðñēçðΥò ôĩõò áéá íá äéáēñßñĩôĩ óá ðñĩùũĩóá ôĩõò èàùññĩγìóáé àìðñééÛ óγìáĩēá. ¼ðĩò áóðΥò  
àìðáíßæñĩóáé óá áðùò ôĩ èáßìáñĩ éáé áéá ùóáð áðù áóðΥò àìùñßæáé ç ììÛáá ÁíÛðððĩçð ôĩõ FreeBSD ùóé  
åβιάé ðééáíũĩ íá áβιάé àìðñééÛ óγìáĩēá, éá åáßðá Υία áðù óá óγìáĩēá: “TM” ð “®”.

Áðùò ôĩ Ûñēñĩ ðåñéåñÛóáé ðñò ïðñåßðá íá ñðēĩßóáðá Υία ôåß÷ĩò ðñĩóðáóßàð (firewall) ÷ ñçóéìĩðñēĩγìóáð  
ìéá PPP óγìááç ìΎúò òçäåöþñĩõ óôĩ FreeBSD ìá ôĩ IPFW. Ðéĩ óðäēåñēĩΥία, ðåñéåñÛóáé çç ñγēìéçç áñùð  
ôåß÷ĩò ðñĩóðáóßàð óá ìéá óγìááç ìΎúò òçäåöþñĩõ ðñò Υ÷áé äñĩáíéēð IP äéåγēðĩçç. Áðùò ôĩ èáßìáñĩ åáí  
áç÷ñēåßðáé ìá ôĩ ðñò éá ñðēĩßóáðá ççĩ áñ÷éēð óáð óγìááç ìΎúò PPP. Áéá ðåñéóóùðåñåð ðēçññĩõñßàð  
ó÷åðéēÛ ìá ðéð ñðēĩßóáéð ìéáð óγìááç ìΎúò PPP åáßðá çç óåßßáá àñðéåáð ppp(8).

## 1 Ðññēĩñĩò

Áðùò ôĩ èáßìáñĩ ðåñéåñÛóáé ççĩ äéåäééáóßá ðñò ÷ñåéÛæåóáé áéá íá ñðēĩßóáðá Υία ôåß÷ĩò ðñĩóðáóßàð óôĩ  
FreeBSD ùðáí ç IP äéåγēðĩçç åβĩáðáé äñĩáíéēÛ áðù ôĩĩ ISP óáð. Ðåñññēĩ ðñò Υ÷ù ðñĩóðåðßóáé íá èÛñù áðùò ôĩ  
èáßìáñĩ ùóĩ ôĩ äñĩáðñĩ ðéĩ ðēðñåð éáé óùóðù, åßóðá äððññùóåäððñé íá óðåßæðá ðéð äéññēðóáéð, óá ó÷ñēéá ð ðéð  
ðññòÛóáéð óáð óçç äéåγēðĩçç ôĩõ óðååñåðΥá: <marcs@draenor.org>.

## 2 ÐåñÛìåðññé ôĩõ ððñßía

Áéá íá ìðñΥóáðá íá ÷ñçóéìĩðñēĩßóáðá ôĩ IPFW, ðñΥðåé íá áñóùìáðßóáðá ççĩ ó÷åðéēð ððñóðññēĩçç óôĩ ððñßía óáð.  
Áéá ðåñéóóùðåñåð ðēçññĩõñßàð ó÷åðéēÛ ìá çç ìåðåäēðððéçç ôĩõ ððñßía, åáßðá ôĩ ðñía ñðēĩßóáñĩ ôĩõ ððñßía óôĩ  
Åå÷åññßåēĩ ([http://www.FreeBSD.org/doc/el\\_GR.ISO8859-7/books/handbook/kernelconfig.html](http://www.FreeBSD.org/doc/el_GR.ISO8859-7/books/handbook/kernelconfig.html)). Éá ðñΥðåé íá  
ðññéçΥóáðá ðéð ðåñåéÛðñ ððēññΥð ððéð ñðēĩßóáéð ôĩõ ððñßía óáð áéá íá áñåñåññēĩßóáðá ççĩ ððñóðññēĩçç áéá ôĩ  
IPFW:

```
options IPFW2
```

Ἀἰῆῆῆῆῆῆῆ οἰ ἔῆῆῆῆ ὀᾶβ÷ἰδὸ Ὀνῖόοάοβᾶδὸ οἰδὸ Ὀῆῆῆῆῆῆ.

**Ὀγῖᾶῆῆῆῆῆ:** Ἀδῶῆ οἰ ἔᾶῆῆῆῆ ἔᾶῆῆῆῆ ῆῆῆ Ὀ÷ᾶῆᾶ ᾶᾶῆᾶῆᾶῆῆῆ ὀγῖ Ὀῆῆῆῆῆ 5.X οἰδὸ FreeBSD ῆ ἰῆᾶ Ὀῆῆ Ὀῆῆῆῆῆῆ. Ἀἰ ÷ῆῆῆῆῆῆῆῆῆῆ ὀγῖ Ὀῆῆῆῆῆ 4.X, ὀῆῆᾶ ἔᾶ ὈῆὈᾶῆ ἰᾶ Ἀἰῆῆῆῆῆῆῆῆῆῆ ὀγῖ Ἀῆῆῆῆῆῆῆῆῆῆ IPFW2 ἔᾶῆ ἰᾶ Ἀῆᾶᾶῆῆῆῆ ὀγῖ ὀᾶῆῆᾶ ᾶῆῆῆῆῆῆῆ ipfw(8) ᾶῆᾶ Ὀᾶῆῆῆῆῆῆῆῆῆ Ὀῆῆῆῆῆῆῆῆῆ ὀ÷ᾶῆῆῆῆῆ ἰᾶ ὀγῖ Ἀῆῆῆῆῆῆῆῆῆῆ IPFW2. Ὀῆῆῆῆῆῆῆ ἔᾶῆῆῆῆῆῆ ὀἰ ὀἰῆῆῆ *USING IPFW2 IN FreeBSD-STABLE*.

```
options IPFW2_VERBOSE
```

ὈῆὈῆῆῆῆ ὀᾶ ἰῆῆῆῆῆῆ ᾶῆᾶ ὀᾶ ἔᾶῆῆῆῆῆ ὈᾶῆὈᾶ ὀἰ log οἰδὸ ὀῆῆῆῆῆῆῆῆ.

```
options IPFW2_VERBOSE_LIMIT=500
```

Ἀῆᾶῆῆ ἔῆῆῆῆ ῆῆῆῆ ὀῆῆῆ ὀῆῆὈῆῆ Ὀῆῆ ἔῆῆῆῆ ᾶᾶᾶᾶῆῆ ἔᾶ ἔᾶῆᾶᾶῆῆῆῆῆῆ. ῆῆῆ ἰῆῆῆῆῆῆ ἰᾶ ἔᾶῆᾶᾶῆῆῆῆῆ ὀᾶ ἰῆῆῆῆῆῆ ὀἰ ὀᾶβ÷ἰδὸ Ὀνῖόοάοβᾶδὸ ÷ῆῆῆῆ ὀἰ ἔῆῆῆῆῆ ἰᾶ ᾶᾶῆῆῆῆῆ ὀᾶ ᾶῆ÷ᾶῆῆ ἔᾶῆᾶᾶῆῆῆῆ ὀἰδὸ ὀῆῆῆῆῆῆῆῆῆ ὀᾶῆ ἰᾶ ᾶᾶ÷ὀᾶῆῆῆ ἔῆῆῆῆῆ ᾶῆῆῆῆῆ. Ὀἰ ῆῆῆῆ 500 ἰῆῆῆῆῆῆ ᾶῆῆῆ ἰῆᾶ ᾶῆῆῆῆῆ ἔῆῆῆῆῆ ᾶῆῆῆῆῆ ὀῆῆῆῆῆῆῆῆ, ᾶῆῆῆ ἰῆῆῆῆῆῆ ἰᾶ Ὀῆῆῆῆῆῆῆῆῆῆ ᾶῆῆῆ ὀγῖ ὀῆῆῆ ᾶῆῆῆῆῆ ἰᾶ ὀῆῆ ᾶῆῆῆῆῆῆῆ ὀἰδὸ ᾶῆῆῆῆῆῆῆ ὀἰδὸ ᾶῆῆῆῆῆ ὀᾶῆ ᾶῆῆῆῆῆῆῆ.

```
options IPDIVERT
```

Ἀἰῆῆῆῆῆῆῆ ὀᾶ *divert* sockets, Ὀἰδὸ ἔᾶ ᾶῆῆῆ ᾶῆᾶῆῆῆῆ ὀῆ ἔῆῆῆῆῆ.

**Ὀῆῆῆῆῆῆῆῆῆῆ:** ῆῆῆῆ ὀᾶῆῆῆῆῆῆῆ ἰᾶ ὀῆῆ ῆῆῆῆῆῆῆῆ ἔᾶῆ ὀγῖ ἰᾶῆᾶῆῆῆῆῆῆῆ ὀἰδὸ Ὀῆῆῆῆῆ ὀᾶῆ ἰῆῆ ἔῆῆῆῆῆῆῆῆῆῆ. Ἀἰ ἔῆῆῆῆῆ ᾶῆᾶῆῆῆῆῆῆῆ ὀᾶ ᾶῆῆῆ ὀἰ ὀῆῆῆῆῆ ἰῆῆῆῆ ἰᾶ ἔῆᾶῆῆῆῆῆῆῆ ᾶῆὈῆῆ ᾶῆῆ ὀἰ ὀῆῆῆῆῆ ὀᾶῆ. ὈῆὈᾶῆ ἰᾶ Ὀᾶῆῆῆῆῆῆ ἰὈ÷ῆῆ ἰᾶ ᾶᾶῆᾶῆῆῆῆῆῆ ἰῆ ἔᾶῆῆῆῆ ὀἰδὸ ὀᾶβ÷ἰδὸ Ὀνῖόοάοβᾶδὸ ἔᾶῆ ἰᾶ Ἀἰῆῆῆῆῆῆῆῆ ῆῆᾶ ὀᾶ ὀ÷ᾶῆῆῆῆ ᾶῆ÷ᾶῆῆ ῆῆῆῆῆῆῆῆ.

### 3 ἈῆῆῆῆὈῆ ὀἰἰ /etc/rc.conf ᾶῆᾶ ἰᾶ ὀἰῆῆῆῆᾶῆᾶ ὀἰ ὀᾶβ÷ἰδὸ Ὀνῖόοάοβᾶδὸ

Ἀῆᾶ ἰᾶ Ἀἰῆῆῆῆῆῆῆῆῆῆ ὀἰ ὀᾶβ÷ἰδὸ Ὀνῖόοάοβᾶδὸ ἔᾶῆῆ ὀγῖ ᾶῆῆῆῆῆῆ ὀἰδὸ ὀῆῆῆῆῆῆῆῆ ἔᾶῆ ᾶῆᾶ ἰᾶ ῆῆῆῆῆῆ ὀἰ ᾶῆ÷ᾶῆῆ ἰᾶ ὀἰδὸ ἔᾶῆῆῆῆ ὀἰδὸ ὀᾶβ÷ἰδὸ Ὀνῖόοάοβᾶδὸ, ὈῆὈᾶῆ ἰᾶ Ἀἰῆῆῆῆῆῆῆῆ ὀἰ ᾶῆ÷ᾶῆῆ /etc/rc.conf. Ἀῆῆῆ Ὀῆῆῆῆῆῆῆ ὀῆῆ Ὀᾶῆῆῆῆῆῆῆῆῆ:

```
firewall_enable="YES"
firewall_script="/etc/firewall/fwrules"
```

Ἀῆᾶ Ὀᾶῆῆῆῆῆῆῆῆ Ὀῆῆῆῆῆῆῆῆ ὀ÷ᾶῆῆῆῆ ἰᾶ ὀγῖ ὀῆῆῆῆῆῆ ἔᾶῆῆῆῆῆ ᾶῆῆ ᾶῆῆῆῆ ὀῆῆ ᾶῆῆῆῆῆῆῆ, ῆῆῆῆῆ ἰῆᾶ ἰᾶῆῆῆῆ ὀἰἰ /etc/defaults/rc.conf ἔᾶῆ ᾶῆᾶῆῆῆῆ ὀγῖ man ὀᾶῆῆῆῆ rc.conf(5)

## 4 ΆíññìðìέΠóòά όçí ΑίούìάòùìΎίç ìάòÛññάόç Äέάðέýíóαùì όìò PPP

Άέά íά άðέòñÝòáòά óά Ûέέά ìç÷áíΠíάóά όìò äέέóýìò óάò íά óòíáÝìíóáέ ìά όìì Ýìù έùóìì ìΎóù όìò FreeBSD, ÷ñçóέììðìέΠíόάò όì ùò “ðýέç”, έά ðñÝðáέ íά áíñññìðìέΠóòάò όçí ΑίούìάòùìΎίç ìάòÛññάόç äέάðέýíóαùì όìò PPP (NAT). Άέά íά áβíáέ áòòù, ðñìóέΎóáò óòì áñ÷áβì /etc/rc.conf óέò ðáñáέÛòù áñáñìΎò:

```
ppp_enable="YES"
ppp_mode="auto"
ppp_nat="YES"
ppp_profile="ðñìòβέ_òçò_όγíääóçò"
```

Όόç èΎόç όìò ðñìòβέ\_òçò\_όγíääóçò ðñÝðáέ íά áÛέáòά όì ùíñά όçò óýíááóΠò óάò, ùòòù όì Ύ÷áòά áðìέçέáýóáέ óòì áñ÷áβì /etc/ppp/ppp.conf.

## 5 Ìέ έáíüíáò όìò firewall

Όì ìüñì όìò áðñìΎíáέ όΠñά áβíáέ íά ìñβóìòìά όìòð έáíüíáò όìò firewall. Ìέ έáíüíáò όìòð ìðìβìòð ðáñέáñÛóìòìά ááΠ áβíáέ áñέáòÛ έáέìβ áέά όìòð ðáñέóóùòáñìòð ÷ñΠóóáò ìά dialup óýíááόç, áέέÛ ìýóά óðì÷ñáùóέέìβ áβíáέ, ìýóά áβíáέ áóíáòùì íά óáέñέÛέìòì ìά óέò áíÛáέáò ùέùì óùì ÷ñçóòΠí dialup. Ìðìñìýí, ùìòð, íά ÷ñçóέìáýóìòì ùò Ύíá έáέù ðáñÛááέáìά ñòέìβóáùì όìò IPFW έάέ áβíáέ ó÷áòέέÛ áýέìì íά όìòð ðñìóáñìüóáòά óóέò äέέΎò óάò áíÛáέáò.

Áò áñ÷βóìòìά ùìòð ìά óέò ááóέέΎò áñ÷Ύò áíüò έέáέóóìý óáβ÷ìòð ðñìóóáóáò. Íá έέáέóóù óáβ÷ìò ðñìóóáóáò áðááññáýáέ έáò’ áñ÷Πí έÛέá óýíááόç. Ì áέá÷áέñέóóòΠò ìðìñáβ ýóóáñά íά ðñìóέΎóáέ έáíüíáò áέά íά áðέòñÝòáέ ìüñì óóáέáέñέìΎíáò óòíáΎóáέò íά ðáñìÛíá áðù όì óáβ÷ìò ðñìóóáóáò. Ç ðέì óðìçέέóìΎίç óáέñÛ óùì έáíüíüí óά Ύíá έέáέóóù óáβ÷ìò áβíáέ: ðñΠóά ìέ έáíüíáò όìò áðέòñÝòìòì ìáñέέΎò óòíáΎóáέò, έάέ óÝέìò ìέ έáíüíáò όìò áðááññáýìòì ìðìέááΠðìòά Ûέέç óýíááόç. Ç έìáέέΠ ðβóù áðù áòòù áβíáέ ùóέ ðñΠóά áÛέáòά όìòð έáíüíáò όìò áðέòñÝòìòì ðñÛáíáóά íά ðáñÛóìòì έάέ ýóóáñά ùέá óά Ûέέá áðááññáýìíóáέ áòòùìáóά.

ΌóέÛìòά, έìέðüí, Ύíá έáòÛέìáì óóìì ìðìβì έá áðìέçέáýìíóáέ ìέ έáíüíáò όìò óáβ÷ìòð ðñìóóáóáò. Óά áòòù όì Ûñέñì ÷ñçóέììðìέìýíá ùò ðáñÛááέáìά όìì έáòÛέìáì /etc/firewall. ΆέέÛìòά έáòÛέìáì ìΎóά óά áòòùì έάέ äçìέìòñáΠóóά όì áñ÷áβì fwrules όìò όì ùíñÛ όìò áβ÷áìá áñÛóáέ óòì rc.conf. ΌçìáέΠóóά ðùò ìðìñáβóά íά áέέÛíáòά όì ùíñά όìò áñ÷áβìò áòòìý óά ùóέ èΎέáòά. Áòòùò ì ìäçäùò áβíáέ áòòù όì ùíñά óáí ðáñÛááέáìά έάέ ìüñì.

Áò äìýíá όΠñά Ύíá ðáñÛááέáìά óáβ÷ìòð ðñìóóáóáò ìά áñέáòÛ áðáíçäçíáóέέÛ ó÷úέέá.

```
# Define the firewall command (as in /etc/rc.firewall) for easy
# reference. Helps to make it easier to read.
fwcmd="/sbin/ipfw"
```

```
# Define our outside interface. With userland-ppp this
# defaults to tun0.
oif="tun0"
```

```
# Define our inside interface. This is usually your network
# card. Be sure to change this to match your own network
# interface.
iif="fxp0"
```

```
# Force a flushing of the current rules before we reload.
$fwcmd -f flush
```

```
# Divert all packets through the tunnel interface.
```

```
$fwcmd add divert natd all from any to any via tun0

# Check the state of all packets.
$fwcmd add check-state

# Stop spoofing on the outside interface.
$fwcmd add deny ip from any to any in via $oif not verrevpath

# Allow all connections that we initiate, and keep their state,
# but deny established connections that don't have a dynamic rule.
$fwcmd add allow ip from me to any out via $oif keep-state
$fwcmd add deny tcp from any to any established in via $oif

# Allow all connections within our network.
$fwcmd add allow ip from any to any via $iif

# Allow all local traffic.
$fwcmd add allow all from any to any via lo0
$fwcmd add deny all from any to 127.0.0.0/8
$fwcmd add deny ip from 127.0.0.0/8 to any

# Allow internet users to connect to the port 22 and 80.
# This example specifically allows connections to the sshd and a
# webserver.
$fwcmd add allow tcp from any to me dst-port 22,80 in via $oif setup keep-state

# Allow ICMP packets: remove type 8 if you don't want your host
# to be pingable.
$fwcmd add allow icmp from any to any via $oif icmp-types 0,3,8,11,12

# Deny and log all the rest.
$fwcmd add deny log ip from any to any
```

Όþñá Ý÷áoá Ýία ðειέçñùιÝιí ðάβ÷ιò ðñïóóáóβáo, ðι ιðιβι óοίαÝóáέð óóέð εýñáo 22 έάέ 80 έάέ έáoáñÛóáέ ùέáo óέð Ûέέáo óοίαÝóáέð óοι áñ÷άβι έáoáññáoðò ðιò óóóðβίαðιò. ÐεÝιí άβóóά Ýðιειιέ áέα άðáíáέέβιçόç. Όι ðάβ÷ιò ðñïóóáóβáo έά áíáñáðιεçέάβ áóðυιáoά έάέ έά òñòðóáέ ðιò έáυιáo ðιò ðñιέÝóáoά. Áί άά άβίáέ áóðυ ð Ý÷áoά ιðιεάáðιòά ðñιáεβίαóά, ð áί Ý÷áoά εÛðιεáo ðñιòÛóáέð áέα ίά áειñεùέάβ áóðυ ðι Ûñèñι, áðέειέιυιβóóά ίάεβ ιιò ίά email.

## 6 Άñùòβóáέò

1. ΆεÝðυ ιçίýíáoά ùðυò “limit 500 reached on entry 2800” έάέ ίáoÛ áðυ ðι óýóðçÛ ιιò óóáíáoÛάέ ίά έáoáñÛóáέ óά ðáεÝóά ðιò άιðιαβæιíóáέ áðυ ðι ðάβ÷ιò ðñïóóáóβáo. Άιòέáýáέ áέυιá ðι firewall ιιò;

Áóðυ áðεÛ óçíáβíáέ ðυò Ý÷áε ðñóέιιðιεçέάβ ðι ιÝáέóοι ùñέι έáoáññáoðò (logging) áέα áóðυ ðι έáυιá. Ï έáυιáoð ι βáειò áíáειιέòέάβ ίά áιòέáýáέ, áεεÛ ááí έά óóÝεíáέ ðέα ιçίýíáoά óοι áñ÷άβι έáoáññáoðò ðιò óóóðβίαðιò ιÝ÷ñέ ίά ιçáíιβóáoά ðÛέέ ðιò ίáoñçòÝò. Ïðñάβóά ίά ιçáíιβóáoά ðιò ίáoñçòÝò ίά ðçί áιòιεð

```
# ipfw resetlog
```

ΆίάέέάέόέέÛ, ìðññáβóá íá áðñáóáðá òì ùñéì éáóáññáöðò óóέò ñòèìβóáέò òìò ðòñáíá óáo ìá όçí áðέέìáÐ IPFWALL\_VERBOSE\_LIMIT ùðòò ðáñέáñÛðáìá ðáñáðÛñ. Ìðññáβóá íá áέέÛíáðá áðóò òì ùñéì (÷ ùñβò íá ìáðááèòóðβóáðá ðÛέέ òì ðòñáíá óáo éάέ íá èÛíáðá reboot) ÷ ñçóέììðìέáðáð όçí sysctl(8) όέìÐ net.inet.ip.fw.verbose\_limit.

2. ÈÛðìéì èÛèò ðñÝðáé íá Ýáέíá. Áέèìéçóá óέò áíòìéÝò éáoÛ ãñÛíá éάέ όþñá èèáέäþέçéá áðÝñ.

Áðóòò ì ìäçäùð òðìéÝðáé ùóέ ÷ ñçóέììðìέáβóá òì *userland-ppp*, áέ áðóò èέ ìé éáfííáð ðìò áβñíóáέ ÷ ñçóέììðìέíýì òì tun0 interface, ðìò áíóέóòìé÷ áβ óόçí ðñþόç óýíááόç ðìò óðέÛ÷ íáðáέ ìá òì ppp(8) (áέέέþð áñóóò èάέ ùò *user-ppp*). Ç áðñíáíç óýíááόç éá ÷ ñçóέììðìέíýóá òì tun1, ìáðÛ òì tun2 éάέ ðÛáέ èÝáñíóáð.

Èá ðñÝðáé áðβόçò íá èòìÛóðá ùóέ òì pppd(8) ÷ ñçóέììðìέáβ òì interface ppp0, ìðòðá áí ìáέέíáóáðá όç óýíááόÐ óáo ìá òì pppd(8) éá ðñÝðáé íá áíóέέáóáóóðáðá òì tun0 ìá ppp0. ÐáñáέÛóò éá ááβñíòìá Ýíá áýέèì ðñùðì íá áέέÛíáðá òìòò éáfííáð òìò firewall éáoðÛέέçéá. Ìé áñ÷έέìβ éáfííáð όþæííóáέ óá Ýíá áñ÷áβì ìá ùññá fwrules\_tun0.

```
% cd /etc/firewall
/etc/firewall% su
Password:
/etc/firewall# mv fwrules fwrules_tun0
/etc/firewall# cat fwrules_tun0 | sed s/tun0/ppp0/g > fwrules
```

Άέά íá éáóáέÛááðá áí ÷ ñçóέììðìέáβóá òì ppp(8) Ð òì pppd(8) ìðññáβóá íá áíáðÛóáðá όçí Ýññáì όçò ifconfig(8) áóìý áíáñáñðìέçéáβ ç óýíááόÐ óáo. Ð.÷., áέά ìéá óýíááόç ðìò áíáñáñðìέþέçéá áðò òì pppd(8) éá ááβðá èÛóέ óáf áðóò (ááβ÷ñíóáέ ìùì ìé ó÷áðέέÝò ãñáñìÝò):

```
% ifconfig
(skipped...)
ppp0: flags=8051<UP,POINTOPOINT,RUNNING,MULTICAST> mtu 1524
    inet xxx.xxx.xxx.xxx --> xxx.xxx.xxx.xxx netmask 0xff000000
(skipped...)
```

Άðò όçí Ûέέç, áέά ìéá óýíááόç ðìò áíáñáñðìέþέçéá ìá òì ppp(8) (*user-ppp*) èÛ ðñáðá íá ááβðá èÛóέ ðáñññìέì ìá òì ðáñáέÛóò:

```
% ifconfig
(skipped...)
ppp0: flags=8010<POINTOPOINT,MULTICAST> mtu 1500
(skipped...)
tun0: flags=8051<UP,POINTOPOINT,RUNNING,MULTICAST> mtu 1524
    (IPv6 stuff skipped...)
    inet xxx.xxx.xxx.xxx --> xxx.xxx.xxx.xxx netmask 0xffffffff00
    Opened by PID xxxxx
(skipped...)
```