Ellhniko Linux IPX-HOWTO

Terry Dawson, terry@perf.no.itg.telstra.com.au v2.2, 29 Martioy 1997

Ayto to keimeno exei san skopo na perigracei pws na breite, na egkatasthsete kai na ry8misete diafora dia8esima ergaleia gia to leitoyrgiko susthma Linux poy xrhsimopoioun to prwtokollo yposthrijhs IPX toy Linux pyrhna.

Contents

1 Eisagwgh

Ayto einai to ellhniko Linux IPX-HOWTO. 8a prepei na diabasete to Linux NET-3-HOWTO se syndyasmo me ayto to keimeno.

1.1 Allages apo thn prohgoumenh ekdosh.

```
Pros8hkes:
        Proste8hkan merikes plhrofories sxetika me to Frame Type.

Dior8wseis/Enhmerwseis:
      To 0x apaiteitai gia thn IPX dieu8ynsh diktuoy sto /etc/ppp/options
      Enhmerw8hkan oi ekdoseis kai oi diey8unseis.
      Ligo symmazema, ergaleia Ektupwshs kai Diaxeirishs.
```

1.2 Eisagwgh

O pyrhnas toy Linux exei mia teleiws kainouria ylopoihsh diktuoy sygkrinomenh me alla leitoyrgika systhmata Unix. H ikanothta na xrhsimopoihsete ena kainourio tropo gia na anaptujete to logismiko diktuoy toy pyrhna, exei odhghsei sto na exei o pyrhnas toy Linux yposthrijh gia mia seira apo xtismena mh tcp/ip prwtokolla. To IPX prwtokollo einai ena apo ayta poy exoyn symperilhf8ei.

O pyrhnas toy Linux yposthrizei mono to IPX prwtokollo. Den yposthrizei akomh prwtokolla opws ta IPX/RIP, SAP h NCP, ayta yposthrizontai apo allo logismiko opws ayta poy anaferontai parakatw se ayto to keimeno.

H yposthrijh gia to IPX anaptux8hke arxika apo ton Alan Cox <`alan@lxorguk.ukuu.org.uk`>kai exei ejelix8ei shmantika apo ton Greg Page <`greg@caldera.com`>.

2 Apokurhjh Ey8ynwn.

Den jerw kai den mporw na jerw ta panta sxetika me to Linux logismiko diktuoy. Dexteite parakalw kai katalabete oti ayto to keimeno einai pi8ano na exei la8h. Diabaste parakalw ola ta arxeia README poy symperilambanontai me opoiadhpote tmhmata logismikou exoyn perigrafei se ayto to keimeno gia perissoteres leptomereies kai akribeis plhrofories. 8a epixeirhsw na krathsw ayto to keimeno xwris la8h kai oso to dynaton pio epikairo. Oi ekdoseis toy logismikou einai prosfates th stigmh ths syggrafhs toy keimenoy.

Me kanena tropo egw h oi syggrafeis toy logismikou se ayto to keimeno prosferoyn prostasia apo tis dikes sas prajeis. An ry8misete ayto to logismiko, akomh kai opws exei perigrafei se ayto to keimeno kai sas dhmioyrgei problhmata sto diktyo sas, tote eiste o monos ypeu8ynos. Symperilambanw ayth thn proeidopoihsh giati o sxediasmos kai h ru8mish enos diktuoy IPX den einai panta aplh ypo8esh kai merikes fores mporei na odhghsei se anepi8umhth allhlepidrash me alloys dromologhtes (routers) kai diakomistes arxeiwn (fileservers), an den sxediasete kai ry8misete to diktyo sas prosextika. Epishs, symperilambanw aythn thn proeidopoihsh giati rwth8hka apo kapoion arketa atyxo poy anakalyce ayto to ma8hma me ton duskolo tropo.

3 Sxetikh Tekmhriwsh.

Ayto to keimeno ypo8etei pws katalabainete pws na dhmioyrghsete enan Linux pyrhna me tis katallhles epiloges diktuwshs kai oti katalabainete pws na xeiris8eite ta basika diktyaka ergaleia opws ta *ifconfig* kai *route*. An oxi, prepei na diabasete to *NET-3-HOWTO* `<NET-3-HOWTO.html>` se syndyasmo me ayto edw to keimeno, mia poy ejhgei ta parapanw.

lla keimena Linux HOWTO poy mporei na fanoun xrhsima einai ta ejhs:

To *Ethernet-HOWTO* `<Ethernet-HOWTO.html>`, poy perigrafei tis leptomereies gia th ru8mish syskeywn Ethernet gia to Linux.

To *PPP-HOWTO* `<PPP-HOWTO.html>` ka8ws h yposthrijh gia to IPX einai dia8esimh gia thn 2.2.0d ekdosh kai tis epomenes ths, sthn ylopoihsh toy Linux PPP .

3.1 Nees ekdoseis aytou toy keimenoy

An to antigrafo sas aytou toy keimenoy einai perissotero palio apo dyo mhnwn, sas synistw anepifulakta na apokthsete mia neoterh ekdosh. H diktyakh yposthrijh gia to Linux allazei polu grhgora me nees beltiwseis kai xarakthristika, kai epomenws kai ayto to keimeno allazei sxetika syxna. H teleytaia ekdosh poy toy keimenoy mporei panta na apokth8ei me anonymous ftp apo to:

sunsite.unc.edu

```
/pub/Linux/docs/HOWTO/IPX-HOWTO
```

h:

```
/pub/Linux/docs/HOWTO/other-formats/IPX-HOWTO{-html.tar,ps,dvi}.gz
```

mesw World Wide Web apo to *Linux Documentation Project Web Server* `<http://sunsite.unc.edu/LDP/linux.html>`, sth selida: *IPX-HOWTO* `<http://sunsite.unc.edu/LDP/HOWTO/IPX-HOWTO.html>` h apey8eias apo emena, `<terry@perf.no.itg.telstra.com.au>`. Mporei akomh na dhmosieuetai sta newsgroups: `comp.os.linux.networking`, `comp.os.linux.answers` kai `news.answers` .

3.2 Anadrash/Sxolia.

Gia sxolia, parathrhseis, dior8wseis, enhmerwseis peri ths Ellhnikhs metafrashs aytou toy HOWTO, steilte email sthn Boula Sanida : `voulariba@hellug.gr` h ston Eyripidh Papakwsta : `evris@hellug.gr` kai enallaktika : `ep@rocketmail.com`

Parakalw steilte moy opoia sxolia, enhmerwseis, protaseis, `<terry@perf.no.itg.telstra.com.au>`. Oso grhgorotera parw thn anadrash sas, toso pio grhgora 8a mporesw na enhmerwsw kai na dior8wsw ayto to keimeno. An synanthsete problhmata me ayto, parakalw steilte moy apey8eias email, ka8ws twra polu spania diabazw ta newsgroups.

3.3 Yposthrijh apo Lista Mhnymatwn/Allhlografias.

Exei idry8ei mia lista mhnymatwn gia syzhthsh peri twn diaforwn paketwn logismikou gia Linux IPX poy exoyn perigrafontai se ayto to keimeno. Mporeite na eggrafeite se ayth, stelnontas ena mhnyma sto `'listserv@sh.cvut.cz'` me thn grammh `'add linware'` sto kurio meros toy mhnumatos. Gia na steilete sth lista, steilte thn allhlografia sas sto `'linware@sh.cvut.cz'`.

H lista allhlografias arxeio8eteitai sto *www.kin.vslib.cz* `<http://www.kin.vslib.cz/hypermail/linware/>`.

4 Merikoi apo toys oroys poy xrhsimopoiountai se ayto to keimeno.

8a deite syxna toys oroys `client` kai `server` na xrhsimopoiountai se ayto to keimeno. Einai synh8ws arketa sygkekrimenoi oroi alla se ayto to keimeno exw genikeusei ligo toys orismous toys, etsi wste na shmainoyn ta ejhs:

pelaths (client)

To mhxanhma h programma poy jekina mia prajh h mia sundesh gia to skopo ths apokthshs kapoiwn yphresiwn h dedomenwn.

diakomisths (server)

To mhxanhma h to programma poy dexetai eiserxomenes syndeseis apo pollapla apomakrysmena mhxanhmata kai parexei yphresia h dedomena se ayta.

Aytoi oi orismoi den einai oute polu egkyroi, alla parexoyn ena meso gia na jexwrisoyme tis duo akres twn syndesewn systhmatwn pros shmeio, opws to *SLIP* h to *PPP* poy pragmatika den exoyn pelates (clients) kai diakomistes (servers).

Alloi oroi poy 8a deite einai oi ejhs:

Bindery

To *bindery* einai mia ejeidikeymenh bash dedomenwn apo8hkeyshs plhrofories ry8misewn toy diktuoy se enan diakomisth arxeiwn Novell . Pelates toy Netware mporoun na rwthsoyn to *bindery* gia na paroyn plhrofories gia dia8esimes yphresies, dromologhseis kai plhrofories xrhstwn.

Frame Type

einai enas oros poy xrhsimopoieitai gia na perigracei to pragmatiko prwtokollo poy xrhsimopoieitai gia na metaferoyme ta IPX (kai IP) datagrams sta diafora tmhmata diktuoy Ethernet. Yparxoyn tessera koina. Einai ta:

Ethernet-II

Ayto einai mia ananewmenh ekdosh toy arxikou protupoy ethernet DIX. Sto Novell exei do8ei mia epishmh taytothta anagnwrishs prwtokolloy kai ayto shmainei oti kai to IPX kai to IP mporoun na synyparxoyn armonika se ena periballon Ethernet-II. Ayto xrhsimopoieitai syxna se periballonta Novell kai einai mia kalh epilogh.

802.3

Ayto einai ena prwtokollo ths I.E.E.E. poy orizei ena mhxanismo Anixneyshs Ferontos Pollaplwn Prosbasewn me Entopismo Sygkrousewn (Carrier Sense Multiple Access me Collision Detection (CSMA/CD)). Basisthke sto arxiko protypo Ethernet DIX, me mia shmantikh tropopoihsh, o tupos toy pedioy ths taytothtas toy prwtokolloy metatraphke se ena pedio mhkoys (length field). Gi' ayto to logo to IPX pragmatika den prepei na to trejoyme edw. To IEEE 802.3 sxediasthke gia na metaferei **MONO** paketa IEEE 802.2 alla yparxoyn pragmatopoihseis toy poy to xrhsimopoioun gia na metaferoyn paketa IPX amesa kai periergws leitoyrgei. Na to apofugete ektos kai an epixeireitai na allhlepidrasete me diktyo poy exei hdh exei ry8mistei na xrhsimopoiei.

802.2

Ayto einai ena I.E.E.E. prwtokollo poy orizei ena sunolo apo diadikasies Elegxoy Logikwn Syndesewn (Logical Link Control). Parexei enan aploiko tropo synuparjhs diaforetikwn prwtokollwn, alla einai arketa periorismeno se ayto to 8ema. To Novell xrhsimopoiei ena anepishmo Service Address Point (ws taytothta prwtokolloy) alla afou epishs oloi to xrhsimopoioun, den exei akomh paroysiasei megalo problhma.

SNAP

To SNAP einai ena Prwtokollo Prosbashs se ypodiktya. Ayto einai sxediasmeno panw apo ta 802.3 kai 802.2. Epekteinei thn ikanothta yposthrijhs pollaplwn prwtokollwn toy 802.2 kai parexei orismena metra symbatothtas me yparxontes tupoys paketwn Ethernet kai Ethernet-II.

IPX

To Internet Packet eXchange (IPX) einai ena prwtokollo poy xrhsimopoieitai apo thn Novell gia na parexei endodiktyakh yposthrijh gia to proion toys netware (tm). To IPX einai paromoio se leitoyrgia me to prwtokollo IP to opoio xrhsimopoieitai apo to thn koinothta toy tcp/ip.

Dieu8ynsh Diktuoy IPX

Ayth einai enas ari8mos poy prosdiorizei monadika ena sygkekrimeno IPX diktyo. H synh8hs grafh ths dieu8ynshs ayths einai se dekaejadiko susthma. Ena paradeigma mporei na moiazei me:`0x23a91002`.

Eswteriko Diktyo IPX

Ayto einai ena eikoniko IPX diktyo. Einai eikoniko giati den antistoixei se kapoio fysiko diktyo. Xrhsimopoieitai gia na parexei ena meso monadikhs taytopoihshs kai diey8ynsiodothshs enos sygkekrimenoy IPX mhxanhmatos. Ayto einai genika mono xrhsimo se mhxanhmata me IPX poy anhkoyn se perissotera apo ena fysika IPX diktya san diakomistes arxeiwn. H dieu8ynsh einai kwdikopoihmenh sthn idia morfh opws kai gia ta fysika IPX diktya.

RIP

To Prwtokollo Plhroforiwn Dromologhshs (Routing Information Protocol) einai ena prwtokollo poy xrhsimopoieitai gia na diadwsei aytomata dromologhshs diktuwn se ena diktyo IPX. Einai paromoio se leitoyrgia me to RIP poy xrhsimopoieitai apo thn koinothta tcp/ip.

NCP

To Basiko Prwtokollo Netware (Netware Core Protocol) einai ena prwtokollo diktyakou systhmatos arxeiwn, sxediasmeno apo thn etaireia Novell gia proion to Netware(tm). To NCP einai paromoio se leitoyrgia me to NFS poy xrhsimopoieitai apo thn koinothta tcp/ip.

SAP

To Prwtokollo Diafhmishs Yphresias (Service Advertisement Protocol) einai ena prwtokollo sxediasmeno apo thn etaireia Novell, poy xrhsimopoieitai gia na diafhmisei yphresies diktuoy se ena periballon Netware (tm).

Dieu8ynsh Ylikou (Hardware address)

Ayto einai enas ari8mos monadika prosdiorizei ena mhxanhma se ena fysiko diktyo, sto epipedo prosbashs sto fysiko meso. Paradeigmata tetoioy tupoy einai oi : *Diey8unseis Ethernet (Ethernet Addresses)* Mia dieu8ynsh Ethernet einai genika kwdikopoihmenh ws eji dekaejadikes times xwrismenes metaju toys me ton xarakthra "anw katw teleia" p.x. `00:60:8C:C3:3C:0F`

Diadromh - dromologio (route)

To *route* einai h diadromh poy ta paketa sas akoloy8oun mesa sto diktyo gia na f8asoyn sto proorismo toys.

5 Ta sxetika me to IPX arxeia sto susthma arxeiwn `/proc`.

Yparxoyn arketa arxeia sxetika me thn yposthrijh IPX sto Linux poy briskontai sto susthma arxeiwn `/proc`. Ayta einai ta ejhs:

/proc/net/ipx_interface

Ayto to arxeio periexei plhrofories sxetika me ta IPX interfaces poy einai ry8mismena sto mhxanhma sas. Ayta isws na exoyn ry8mistei xeirokinhta me kapoia entolh h na exoyn anixneytei kai ry8mistei aytomata.

/proc/net/ipx_route

Ayto to arxeio periexei mia lista apo diadromes poy yparxoyn ston IPX pinaka dromologhsewn. Aytes oi diadromes exoyn isws proste8ei xeirokinhta me kapoia entolh h aytomata apo enan IPX daimona dromologhsewn.

/proc/net/ipx

Ayto to arxeio einai mia lista apo IPX ypodoxes (sockets) poy einai ayth th stigmh anoixta gia xrhsh sto mhxanhma.

6 Ta IPX Ergaleia toy Greg Pages.

O Greg Page <`greg@caldera.com` ths Caldera Incorporated exei gracei ena sunolo apo ergaleia ru8mishs toy IPX kai exei epekteinei thn yposthrijh toy pyrhna toy Linux gia IPX.

Oi epektaseis toy pyrhna epitrepoyn sto Linux na ry8mistei san enas plhrws ikanos dromologhths h gefyra IPX. H employtismenh IPX yposthrijh exei hdh kykloforhsei mesw twn gnwstwn kuriwn dianomwn pyrhna, opote pi8ana na thn exete hdh.

Ta ergaleia ru8mishs toy diktuoy sas parexoyn th dynatothta na ry8misete tis syskeyes toy diktuoy sas wste na yposthrijoyn IPX kai sas epitrepoyn na ry8misete thn IPX dromologhsh kai alles eykolies katw apo to Linux. Ta Linux ergaleia toy diktuoy IPX einai dia8esima apo to: *sunsite.unc.edu* `<ftp://sunsite.unc.edu/pub/Linux/system/filesystems/ncpfs/ipx.tgz>`.

6.1 Ta ergaleia IPX me perissoteres leptomereies.

ipx_interface

Ayth h entolh xrhsimopoieitai gia na pros8esoyme, na diagracoyme h na elegjoyme xeirokinhta thn IPX ikanothta se mia yparxoysa syskeyh diktuoy. Fysiologika, h syskeyh diktuoy 8a htan mia syskeyh Ethernet opws `eth0`. Toylaxiston ena IPX interface prepei na einai prosdiorismeno san *primary* interface kai to *-p* flag se ayth thn entolh to kanei ayto. P.x. gia na energopoihsete th syskeyh Ethernet `eth0` gia dynatothta IPX san to kurio IPX interface xrhsimopoiwntas to IEEE 802.2 frame type kai th dieu8ynsh diktuoy IPX `39ab02222` 8a grafate to ejhs:

```
# ipx_interface add -p eth0 802.2 0x39ab0222
```

An emfanistei kapoio la8os ka8ws trexete ayto to programma kai etyxe na mhn exete ry8misei akomh to tcp/ip, tote 8a deite oti xreiazetai na jekinhsete xeirokinhta to `eth0` interface xrhsimopoiwntas thn entolh:

```
# ifconfig eth0 up
```

ipx_configure

Ayth h entolh energopoiei h apenergopoiei thn aytomath epilogh ths ru8mishs toy interface kai twn epilogwn toy kyrioy interface.

`--auto_interface`

Sas epitrepei na epilejete an oi nees syskeyes diktuoy 8a prepei na ry8mizontai aytomata san IPX syskeyes h oxi.

`--auto_primary`

Sas epitrepei na epilejete an to IPX logismiko 8a prepei na epilegei aytomata ena kurio interface h oxi.

Ena typiko paradeigma 8a htan na energopoihsete kai thn aytomath ru8mish toy interface kai thn aytomath epilogh toy kurioy interface me thn akoloy8h entolh:

```
# ipx_configure --auto_interface=on --auto_primary=on
```

ipx_internal_net

Ayth h entolh sas epitrepei na ry8misete h na apory8misete mia eswterikh dieu8ynsh diktuoy. H eswterikh dieu8ynsh diktuoy einai proairetikh, alla otan exei ry8mistei 8a einai panta to kurio interface. Gia na ry8misete mia dieu8ynsh diktuoy IPX toy `ab000000` se ena kombo IPX `1` 8a xrhsimopoihsete :

```
# ipx_internal_net add 0xab000000 1
```

ipx_route

Ayth h entolh sas epitrepei na tropopoihsete xeirokinhta ton pinaka IPX dromologhsewn. Gia paradeigma, gia na pros8esete mia diadromh sto IPX diktyo `39ab0222` mesw enos dromologhth me ari8mo komboy `00608CC33C0F` se ena IPX diktyo `39ab0108`:

```
# ipx_route add 0x39ab0222 0x39ab0108 0x00608CC33C0F
```

7 Ry8mizontas to Linux mhxanhma san ena IPX dromologhth (router).

An exete ena ari8mo apo IPX tmhmata (segments) ta opoia epi8ymeite na diasyndesete mesw diktuoy xreiazeste tis yphresies enos dromologhth. Se periballon Novell yparxoyn dyo plhrofories poy einai aparaithtes na diado8oun sto diktyo. Einai oi plhrofories dromologhshs diktuoy poy diadidontai xrhsimopoiwntas to Novell RIP kai oi plhrofories diafhmishs yphresiwn (service advertisement information) poy diadidontai xrhsimopoiwntas to Novell SAP. Opoiosdhpote dromologhths prepei na yposthrizei kai ta duo ayta prwtokolla ta opoia einai xrhsima stis perissoteres periptwseis.

To Linux yposthrizei kai ta duo ayta prwtokolla kai mporei eukola na leitoyrghsei san enas dromologhths plhrws symbatos me Novell.

H yposthrijh IPX toy pyrhna toy Linux diaxeirizetai to IPX paketo prow8wntas to dia mesoy twn interfaces, alla ayto to kanei sumfwna me toys kwdikopoihmenoys kanones ston IPX pinaka dromologhsewn. To Linux xreiazetai ena programma gia na ylopoihsei to Novell RIP kai SAP, gia na sigoyrecei oti o IPX pinakas dromologhsewn einai domhmenos swsta kai enhmerwnetai periodika wste na antanakla tis allages sthn katastash diktuoy.

O Volker Lendecke <`lendecke@namu01.gwdg.de`> exei anaptujei ena daimona dromologhshs poy 8a to kanei gia sas.

8a breite to *ipxripd* sto:

sunsite.unc.edu `<ftp://sunsite.unc.edu/pub/Linux/system/filesystems/ncpfs/ipxripd-0.7.tgz>`

h sth selida twn Volkers sto:

ftp.gwdg.de `<ftp://ftp.gwdg.de/pub/linux/misc/ncpfs/ipxripd-0.7.tgz>`

H ru8mish toy Linux mhxanhmatos sas wste na symperiferetai sa dromologhths einai profanhs. Ta bhmata poy prepei na kanete einai ta ejhs:

1. Xtiste ton pyrhna sas me yposthrijh IPX, Ethernet kai `/proc` .
2. Parte, metaglwttiste kai egkatasthste to *ipxd* daimona.
3. 3ekinhste me to neo pyrhna kai bebaiw8eite oti ka8e mia apo tis kartes Ethernet exei anagnwris8ei swsta kai den yparxoyn hardware sygkrouseis (conflicts).
4. Energopoihste to prwtokollo IPX se ka8e ena apo ta interfaces xrhsimopoiwntas thn entolh *ipx_interface* poy perigrafthke parapanw.
5. 3ekinhste to *ipxd* daimona.

As 8ewrhsoyme to akoloy8o aplo diktyo:

```
 IPX Diey8: 0x01000000  802.2
|----------------------------|
              |
              \_________________________
                                        \       Linux Dromologhths
 IPX Diey8: 0x02000000  802.2            \
|----------------------------|            \   eth0/-----------\
              |                            \--====|           |
              \_________________________          | IPX route |
                                        \     eth1|  Table    |
 IIPX Diey8: 0x03000000  etherII         \----====|    ^      |
|-------------------------------|                 |    |      |
              |                               eth2|  IPXd     |
              \______________________________/====|           |
                                                  |  SAPd     |
 IPX Diey8: 0x04000000  etherII               eth3|           |
|------------------------------|             /====|           |
              |                              |    \___________/
              \______________________________/
```

H ru8mish gia to parapanw diktyo 8a moiazei me :

```
# ipx_interface add eth0 802.2 0x0100000000
# ipx_interface add eth1 802.2 0x0200000000
# ipx_interface add eth2 etherii 0x0300000000
# ipx_interface add eth3 etherii 0x0400000000
# ipxd
```

8a prepei na perimenete gia ligo kai na elegjete to arxeio `/proc/net/ipx_route` kai prepei na to deite na exei employtis8ei me tis dromologhseis toy IPX sxetikes me tis ry8miseis sas kai me opoies alles diadromes ema8e apo alloys dromologhtes sto diktyo.

7.1 Xreiazetai na ry8misw ena eswteriko diktyo;

To Novell exei ena xarakthristiko poy onomazetai eswteriko diktyo, poy to xrhsimopoiei gia na aplopoihsei th dromologhsh se periptwseis opoy o host exei perissoteres apo mia syskeyes diktuoy syndedemenes. Ayto einai xrhsimo sthn periptwsh poy o diakomisths arxeiwn einai syndedemenos me pollapla diktya ka8ws shmainei oti mono mia diadromh xreiazetai na diafhmistei gia na f8asei to diakomisth asxeta apo poio diktyo prospa8eite.

Sth periptwsh ru8mishs opoy den trexete ton diakomisth arxeiwn kai to mhxanhma sas symperiferetai mono sa dromologhths IPX, h erwthsh den einai toso eukolo na apanth8ei. Exei anafer8ei oti h ru8mish gia IPX/PPP leitoyrgei 'kalutera' an ry8misete epishs ena eswteriko diktyo.

Se ka8e periptwsh einai eukolo na ginei, alla isws apaithsei na janaxtistei o pyrhnas sas. 1/4tan doyleuete mesw toy `make config` toy pyrhna prepei na apanthste `y` otan erwth8eite `Full internal IPX network`, opws deixnei parakatw:

```
 ...
 ...
Full internal IPX network (CONFIG_IPX_INTERN) [N/y/?] y
 ...
 ...
```

Gia na ry8mistei to eswteriko interface toy diktuoy, xrhsimopoihste thn entolh *ipx_internal_net* poy perigrafthke nwritera sto Tmhma Ergaleia gia IPX. Prepei na lhf8ei prosoxh sto na einai monadikh sto diktyo sas h IPX dieu8ynsh toy poy ana8esate kai oti kanena allo mhxanhma h diktyo den th xrhsimopoiei.

8 Ry8miste to Linux mhxanhma sas san NCP pelath (client).

An eiste xrhsths enos diktuoy diaforetikwn texnologiwn poy syndyazei kai ta dyo, IP kai IPX, prwtokolla einai pi8anon oti kapoia stigmh 8a 8elete to Linux na prospelaunei dedomena apo8hkeymena se ena diakomisth arxeiwn Novell toy diktuoy sas. H Novell exei prosferei ena paketo NFS server gia toys diakomistes arxeiwn, poy to kanei dynato, alla an eiste ena mikro site h exete mono enan mikro ari8mo an8rwpwn poy endiaferontai na to kanoyn ayto, einai duskolo na dikaiologhsete to kostos toy emporikou paketoy.

O Volker Lendecke <`lendecke@namu01.gwdg.de`> exei gracei ena Linux module gia systhmata arxeiwn poy yposthrizei ena yposunolo toy Novell NCP poy 8a sas epitrecei na prosarthsete diskoys Novell sto susthma arxeiwn toy Linux sas xwris na apaitountai pros8eta proionta gia ton diakomisth arxeiwn sas. o Volker onomase to paketo *ncpfs* kai apespase tis aparaithtes plhrofories kyriws apo to biblio "Netzwerkprogrammierung in C" toy Manfred Hill kai Ralf Zessin (perissoteres leptomereies toy biblioy periexontai mesa sto README arxeio sto paketo *ncpfs*).

To logismiko kanei to Linux na prosomoiazei me ena fysiologiko sta8mo ergasias Novell gia yphresies arxeiwn. Akomh symperilambanei mia mikrh ektypwtikh efarmogh poy sas epitrepei na typwsete se oyres ektupwshs Novell (Ayto tekmhriwnetai argotera sto Tmhma "Pelaths Ektypwsewn"). To paketo *ncpfs* 8a paijei me diakomistes arxeiwn Novell ths ekdoshs 3.x kai neoteroys, den 8a leitoyrghsei me to Novell 2.x. To *ncpfs* client 8a leitoyrgei me proionta poy einai isxyra symbata me Novell , alla dystyxws orismena proionta poy isxyrizontai oti einai symbata den einai kai toso. Gia na xrhsimopoihsete to *ncpfs* me diakomistes arxeiwn Novell 4.x , o diakomisths arxeiwn prepei na ry8mistei gia na leitoyrghsei se bindery emulation mode, giati to *ncpfs* den yposthrizei akomh to NDS.

8.1 Apoktwntas to *ncpfs*.

To neotero paketo *ncpfs* sxediasthke gia na xtistei me ton pyrhna ekdoshs `1.2.13` h pyrhnes meta apo th ekdosh `1.3.71` (ayto symperilambanei kai toys 2.x.x) An den xrhsimopoieite ena pyrhna kamias apo aytes tis kathgories, tote 8a prepei na anaba8misete ton pyrhna sas . To *Kernel-HOWTO* `<Kernel-HOWTO.html>` perigrafei leptomerws pws na to kanete.

Mporeite na parete to paketo *ncpfs* me anwnymo ftp apo to home site toy Volker sto: *ftp.gwdg.de* `<ftp://ftp.gwdg.de/pub/linux/misc/ncpfs/>` h *sunsite.unc.edu* `<ftp://sunsite.unc.edu/pub/Linux/system/filesystems/ncpfs>` h mirror site. H trexoysa ekdosh th stigmh poy grafw einai h ejhs: `ncpfs-2.0.10.tgz`

8.2 Xtizontas to *ncpfs* gia ton pyrhna 1.2.13.

Dhmioyrghste ena pyrhna me yposthrijh Ethernet kai IPX

. To prwto pragma poy xreiazeste na kanete einai na ejasfalisete pws o pyrhnas sas dhmioyrgh8hke me energopoihmenh yposthrijh IPX. Sto pyrhna ekdoshs `1.2.13` xreiazeste mono na sigoyrecete oti exete apanthsei `Y` sth erwthsh: '`The IPX protocol`' opws deixnei parakatw:

```
 ...
 ...
Assume subnets are local (CONFIG_INET_SNARL) [y]
Disable NAGLE algorithm (normally enabled) (CONFIG_TCP_NAGLE_OFF) [n]
The IPX protocol (CONFIG_IPX) [n] y
*
* SCSI support
 ...
 ...
```

Xreiazetai akomh na bebaiw8eite oti symperilabate ena katallhlo odhgo gia thn Ethernet karta sas. An den gnwrizete pws na kanete ayto, tote prepei na diabasete to *Ethernet-HOWTO* `<Ethernet-HOWTO.html>`.

Twra mporeite na proxwrhsete sto xtisimo toy pyrhna sas. 8ymh8eite na na trejete to *lilo* gia na ton egkatasthsete otan exete teleiwsei.

Kanete Untar to logismiko *ncpfs*

```
# cd /usr/src
# tar xvfz ncpfs-2.0.10.tgz
# cd ncpfs
```

Elegjte to Makefile

An skopeuete na xrhsimopoihsete to *kerneld* gia na fortwnete aytomata ta *ncpfs* module toy pyrhna, tote prepei na bgalete apo ta sxolia th grammh sto `Makefile` poy anaferete sto: `KERNELD`. An den eiste bebaios ti shmainei ayto tote prepei na diabasete to *Kernel-HOWTO* `<Kernel-HOWTO.html>` gia na ejoikeiw8eite me tis ry8miseis twn module toy pyrhna.

Kane make to logismiko *ncpfs*

To logismiko prepei na metaglwttistei aneta, xwris na apaiteitai kapoia allh ru8mish:

```
# make
```

Antigracte ta IPX ergaleia kapoy an den to exete hdh kanei.

Otan teleiwsei to *make* , prepei na breite ola ta ergaleia poy xreiazeste ston katalogo `ncpfs/bin`. Mporeite na xrhsimopoihsete to:

```
# make install
```

gia na egkatasthste ta ergaleia stoys katalogoys poy epeleje o Volkers. An trexete ena susthma basismeno se ELF, tote prepei na janatrejete to `ldconfig -v` gia na sigoyreyteite oti mporei na bre8ei h shared biblio8hkh.

Antigracte to module *ncpfs.o* se kapoio meros xrhsimo an einai aparaithto.

An metaglwttizete ena pyrhna `1.2.*` tote 8a breite ston katalogo `ncpfs/bin` ena arxeio poy onomazetai `ncpfs.o`, afou to *make* exei teleiwsei. Ayto einai to module toy pyrhna *ncpfs*. Prepei na to antigracete se kapoio meros xrhsimo. Sto *debian* susthma moy, to exw antigracei ston katalogo `/lib/modules/1.2.13/fs` kai exw pros8esei to `ncpfs` sto arxeio `/etc/modules` etsi wste na jekina aytomata kata thn ekkinhsh toy systhmatos. An xrhsimopoieite kapoia allh dianomh, 8a prepei na breite pou fylaei ta modules ths kai na to antigracete ekei, h apla antigracte to ston katalogo `/etc`. Gia na fortwsete ta modules xeirokinhta xrhsimopoihste thn entolh:

```
# insmod ncpfs.o
```

8.3 Xtizontas to *ncpfs* gia pyrhnes 1.3.71++/2.0.*.

Gia thn teleytaia ekdosh toy *ncpfs* 8a prepei na xrhsimopoihsete ton pyrhna `1.3.71` h newtero toy, symperilambanomenwn kai twn `2.0.*` .

An skopeuete na xrhsimopoihsete kapoion pyrhna poy einai ekdoshs `1.3.71` h pio prosfatos, tote o kwdikas toy *ncpfs* exei symperilhf8ei sth dianomh toy pyrhna. Xreiazetai mono na apanthsete `Y` sto:

```
Networking options  --->
    ...
    ...
    <*> The IPX protocol
    ...
Filesystems  --->
    ...
    ...
    <*> NCP filesystem support (to mount NetWare volumes)
    ...
```

Xreiazetai akoma na akoloy8hsete tis odhgies gia to xtisimo twn pyrhnwn `1.2.*`, etsi wste na dhmioyrghste ta ergaleia alla den 8a yparxei arxeio module na egkatasta8ei.

8.4 Ry8mizontas kai xrhsimopoiwntas to *ncpfs*.

Ru8mish toy logismikou enos diktuoy IPX

. Yparxoyn dyo tropoi ru8mishs toy logismikou enos diktuoy IPX. Mporeite na ry8misete xeirokinhta oles tis parametroys toy IPX diktuoy sas h na afhsete sto logismiko na apofasisei orismenes logikes ry8miseis, xrhsimopoiwntas thn entolh:

```
# ipx_configure --auto_interface=on --auto_primary=on
```

Ayto prepei na arkei stis perissoteres periptwseis, alla an den paizei se sas tote diabaste to tmhma 'Ergaleia IPX (IPX tools)' parapanw gia na to ry8misete xeirokinhta.

Elegxos ry8misewn

Afou to IPX diktyo sas exei ry8mistei 8a prepei na mporeite na xrhsimopoieite thn entolh *slist* gia na deite mia lista apo oloys toys diakomistes arxeiwn Novell toy diktuoy sas:

```
# slist
```

An h entolh slist bgalei kapoio mhnyma san ayto: `ncp_connect: Invalid argument` tote o pyrhnas sas isws na mhn yposthrizei IPX. Na elegjete oti pragmati exete ekkinhsei ton katallhlo pyrhna. Kata thn ekkinhsh, prepei na deite sta mhnumata ekkinhshs toy systhmatos mhnumata opws '`IPX`' kai '`ncpfs`'. An h entolh *slist* den emfanizei oloys toys diakomistes arxeiwn toy diktuoy sas tote isws na xreiastei na xrhsimopoihste th me8odo xeirokinhths ru8mishs toy diktuoy.

Prosarthsh enos diskoy (volume) Novell(tm).

An to logismiko diktuoy gia IPX leitoyrgei kanonika, 8a prepei twra na mporeite na prosarthsete ena disko enos diakomisth arxeiwn Novell sto susthma arxeiwn toy Linux sas. H entolh *ncpmount* xrhsimopoieitai gia ayto to skopo kai apaitei na prosdiorisete toylaxiston tis akoloy8es plhrofories:

1. To onoma toy diakomisth arxeiwn
2. Thn taytothta toy login sas sto diakomisth. An exete kai password 8a to xreiasteite kai ayto.
3. To shmeio prosarthshs px, ekei opoy 8elete na prosarth8ei o diskos. Ayto 8a einai enas yparxwn katalogos sto mhxanhma sas.

Yparxei mia antistoixh entolh *ncpumount* gia na apoprosarthsete ena prosarthmeno NCP susthma arxeiwn. Ta NCP systhmata arxeiwn apoprosarth8oun omala (cleanly) an katebasete (shutdown) to mhxanhma sas omala, etsi den xreiazetai na anhsyxhsete gia na kanete *ncpumoun* ta systhmata arxeiwn sas xeirokinhta prin to *halt* h to *shutdown*.

Ena paradeigma entolhs gia na prosarmosoyme to diakomisth arxeiwn `ACCT_FS01`, me ena login id `guest` kai kanena kwdiko, katw apo ton katalogo `/mnt/Accounts` mporei na moiazei me thn akoloy8h:

```
# ncpmount -S ACCT_FS01 /mnt/Accounts -U guest -n
```

Shmeiwste th xrhsh ths epiloghs `-n`, gia na deijete oti kanenas kwdikos den apaiteitai gia to login. To idio login otan prosdiorizoyme kai kwdiko (password) `secret` 8a moiazei me:

```
# ncpmount -S ACCT_FS01 /mnt/Accounts -U guest -P secret
```

An den prosdiorisete tis epiloges `-n` h `-P` 8a erwth8eite gia kwdiko.

Na elegjete to apotelesma ths entolhs mount

An h entolh mount einai epityxhmenh 8a exete toys diskoys aytous prosbasimoys, sto xrhsth me userid aythn poy xrhsimopoih8hke kata to login, ws katalogoys katw apo to shmeio prosarthshs. 8a prepei epishs na mporeite na diasxizete thn domh twn katalogwn gia na breite o,ti alla arxeia. Epeidh to NCP den parexei uid h gid idiothtes arxeiwn, ola ta arxeia 8a exoyn tis idies idiothtes idiokthsias me ton arxiko katalogo prosarthshs, exete to loipon sto noy sas, otan moirazete tis prosarthseis metaju Linux xrhstwn.

Ru8mish twn prosarthsewn wste ektelountai aytomata.

An exete anagkh gia kapoia monimh prosarthsh tupoy ncp tote 8a 8elhsete na ry8misete tis parapanw entoles sta arxeia *rc*, etsi wste na symbainoyn aytomata kata thn wra ths ekkinhshs. An h dianomh sas den parexei hdh kapoio tropo ru8mishs toy IPX, opws to debian, tote sas synistw na tis topo8ethsete sto `/etc/rc.local` arxeio sas, an exete ena. Isws na xrhsimopoihsete kati san:

```
#
# Start the ncp filesystem
/sbin/insmod /lib/modules/1.2.13/fs/ncpfs.o
```

```
# configure the IPX network
ipx_configure --auto_interface=on --auto_primary=on

# guest login to the Accounting diakomisth arxeiwn
ncpmount -S ACCT_FS01 /mnt/Accounts -U guest -n

#
```

Yparxei kai allo meso gia na ry8mistoun oi NCP prosarthseis kai ayto ginetai me th dhmioyrgia enos arxeioy `$HOME/.nwclient`. Ayto to arxeio periexei leptomereies gia tis proswrines prosarthseis h tis prosarthseis sygkekrimenwn xrhstwn, poy 8a ektelountai syxna. Sas epitrepei na apo8hkeusete tis leptomereies twn prosarthsewn etsi wste na mporeite na ta janadhmioyrghsete xwris na xreiazetai ka8e fora na prosdiorizete oles tis parametroys.

H suntajh einai sxedon aytonohth:

```
# The first entry is the 'preferred server' entry and is
# used whenever you do no specify a server explicitly.
#
# User TERRY login to DOCS_FS01 fileserver with password 'password'
DOCS_FS01/TERRY password
#
# Guest login to the ACCT_FS01 fileserver with no password.
ACCT_FS01/GUEST -
```

Gia na energopoihsete aytes tis prosarthseis mporeite na xrhsimopoihsete:

```
$ ncpmount /home/terry/docs
```

gia na prosarthsete to: DOCS_FS01 me TERRY ws login katw apo ton katalogo /home/terry/docs. Shmeiwste oti h kataxwrhsh ayth epilexthke, giati kanenas diakomisths arxeiwn den ka8oristhke sth entolh prosarthshs (mount). An dinate thn akoloy8h entolh :

```
$ ncpmount -S ACCT_FS01 /home/terry/docs
```

tote to ACCT_FS01 8a prosartiotan ekei me GUEST login .

Shmeiwsh: gia na leitoyrghsei aytos o mhxanismos oi idiothtes (permissions) toy `$HOME/.nwclient` arxeioy, 8a prepei na einai `0600`. 8a xreiasteite loipon na xrhsimopoihste th entolh:

```
$ chmod 0600 $HOME/.nwclient
```

An prokeitai na epitrapei se mh-root xrhstes na xrhsimopoioun ayto to mhxanismo tote h entolh *ncpmount* prepei na einai Set Userid Root, etsi 8a xreiastei na toy xorhghsete ta katallhla dikaiwmata:

```
# chmod 4755 ncpmount
```

Dokimaste th boh8htikh efarmogh *nsend*

, mia boh8htikh entolh gia apostolh mhnymatwn pros xrhstes Novell, h opoia epishs symperilambanete mesa sto paketo, legetai *nsend* kai xrhsimopoieitai ws ejhs:

```
# nsend rod hello there
```

8a steilei to mhnyma "hello there" se ena xrhsth poy einai mesa ston kurio diakomisth arxeiwn sas, san "rod" (ston prwto diakomisth poy emfanizetai sto arxeio `.nwclient`. Mporeite na prosdiorisete allon diakomisth arxeiwn me th idia suntajh opws kai gia thn entolh *ncpmount*.

9 Ry8mizontas to Linux mhxanhma sas ws ena NCP diakomisth.

Yparxoyn duo dia8esima paketa poy epitrepoyn sto Linux na parexei tis leitoyrgies enos Diakomisth Arxeiwn Novell. Kai ta dyo sas epitrepoyn na moirasete metaju toy Linux sas kai xrhstes poy exoyn logismiko pelatwn Novell NetWare. Oi xrhstes mporoun na prosarthsoyn kai na blepoyn ta systhmata arxeiwn san topikous diskoys sta mhxanhmata toys, opws 8a emfanizontan me ena pragmatiko diakomisth arxeiwn ths Novell. Isws na 8elete na ta dokimasete kai ta dyo gia na deite poio ejyphretei kalutera tis anagkes sas.

9.1 To paketo *mars_nwe*.

O Martin Stover <`mstover@freeway.de`> dhmiourghse to *mars_nwe* gia na epitrepei sto linux na parexei arxeia kai yphresies ektupwshs gia toys pelates toy Netware.

Se periptwsh poy anarwtieste gia to onoma: *mars_nwe* ,einai Martin Stovers Netware Emulator.

9.1.1 Dynatothtes toy *mars_nwe*.

mars_nwe Ylopoiei ena yposunolo toy plhroys Novell NCP gia yphresies toy arxeioy, bindery diskwn kai akomh yphresies ektypwsewn. Einai pi8anon na periexei problhmata (bugs), alla to xrhsimopoioun polloi an8rwpoi, kai o ari8mos twn problhmatwn meiwnetai stadiaka ka8ws bgainoyn kainouries ekdoseis.

9.1.2 Apoktwntas to *mars_nwe*.

Mporeite na parete to *mars_nwe* apo to *ftp.gwdg.de* `<ftp://ftp.gwdg.de/pub/linux/misc/ncpfs/>` h apo to `<ftp://sunsite.unc.edu/pub/Linux/system/filesystemspfs/>`.

H trexoysa ekdosh th stigmh poy grafw einai: `mars_nwe-0.98.pl8.tgz`.

9.1.3 Xtizontas to paketo *mars_nwe*.

Dhmioyrghste enan pyrhna me yposthrijh Ethernet kai IPX

se pyrhna ekdoshs `1.2.13`. To mono poy xreiazetai einai na bebaiw8eite oti exete apanthsei `Y` sthn erwthsh: `To IPX prwtokollo` kai `N` sthn erwthsh: `Full eswteriko IPX diktyo` opws deixnei parakatw:

```
 ...
 ...
The IPX protocol (CONFIG_IPX) [n] y
 ...
 ...
Full internal IPX network (CONFIG_IPX_INTERN) [N/y/?] n
 ...
 ...
```

Stoys newteroys pyrhnes efarmozetai mia paromoia diadikasia alla to ka8ayto keimeno ths erwthshs mporei na exei allajei ligo.

Akomh 8a xreiastei na bebaiw8eite pws symperilabate ena katallhlo odhgo gia thn Ethernet karta sas . An den gnwrizete pws na to kanete ayto, tote prepei na diabasete to *Ethernet-HOWTO* `<Ethernet-HOWTO.html>`.

Proxwrhste meta sto xtisimo toy pyrhna sas. Mhn jexasete na trejete to *lilo* gia na ton egkatasthsei otan 8a exete teleiwsei.

Kante Untar to paketo *mars_nwe*.

```
# cd /usr/src
# tar xvfz mars_nwe-0.98.pl3.tgz
```

Kante make to *mars_nwe*.

To na kanete make to paketo einai polu aplo. To prwto bhma einai na trejete apla to `make`, kai ayto 8a dhmioyrghsei ena arxeio `config.h`. Meta 8a prepei na dior8wsete to arxeio `config.h` , an einai aparaithto. Sas epitrepei na ry8misete pragmata opws toys katalogoys egkatastashs poy 8a xrhsimopoih8oun kai to megisto ari8mo syndesewn kai diskwn poy 8a yposthrijei o diaxeirisths. Oi pragmatika shmantikes kataxwrhseis poy prepei na koitajete einai:

```
FILENAME_NW_INI       the location of the initialisation file
PATHNAME_PROGS        where the executable support programs will be found.
PATHNAME_BINDERY      where the 'bindery' files will go.
PATHNAME_PIDFILES     the directory for the 'pid' files to be written.
MAX_CONNECTIONS       the maximum number of simultaneous connections allowed.
MAX_NW_VOLS           the maximum number of volumes mars_nwe will support.
MAX_FILE_HANDLES_CONN the maximum number of open files per connection.
WITH_NAME_SPACE_CALLS if you want to support ncpfs clients.
INTERNAL_RIP_SAP      whether you want mars_nwe to provide rip/sap routing.
SHADOW_PWD            whether you use shadow passwords or not.
```

Oi proka8orismenes times 8a einai pi8anotata swstes alla 8a prepei na tis elegjete etsi kai alliws.

Otan teleiwsete me ayto gracte:

```
# make
# make install
```

8a xtisoyme toys diakomistes kai 8a toys egkatasthsoyme ston katallhlo katalogo. To script egkatastashs egka8ista akomh kai to arxeio ru8mishs. `/etc/nwserv.conf`.

Ry8miste ton diakomisth.

Oi ry8miseis einai arketa aples. Xreiazetai na dior8wsete to arxeio `/etc/nwserv.conf`. H morfh toy arxeioy aytou mporei na moiazei sth arxh periergh, alla einai arketa aploikh. To arxeio periexei ena ari8mo apo antikeimena ru8mishs ths mias grammhs. H ka8e grammh einai xrhsimopoiei ton keno xarakthra ws to diaxwristiko twn pediwn ths kai jekina me ena ari8mo poy deixnei ta periexomena ths grammhs. Oloi oi xarakthres poy akoloy8oun to '`#`' xarakthra 8ewrountai sxolia kai agnoountai.

O Martin parexei sto paketo toy ena paradeigma ru8mishs arxeioy, alla 8a sas paroysiasw poio nomizw oti einai to pio aplo paradeigma gia na sas dwsw mia enallaktikh lush.

```
# VOLUMES (max. 5)
# Only the SYS volume is compulsory. The directory containing the SYS
# volume must contain the directories: LOGIN, PUBLIC, SYSTEM, MAIL.
# The 'i' option ignores case.
# The 'k' option converts all filenames in NCP requests to lowercase.
# The 'm' option marks the volume as removable (useful for cdroms etc.)
# The 'r' option set the volume to read-only.
# The 'o' option indicates the volume is a single mounted filesystem.
# The 'P' option allows commands to be used as files.
# The 'O' option allows use of the OS/2 namespace
# The 'N' option allows use of the NFS namespace
# The default is upper case.
```

```
# Syntax:
#    1 <Volumename> <Volumepath>   <Options>

1   SYS         /home/netware/SYS/              # SYS
1   DATA        /home/netware/DATA/      k      # DATA
1   CDROM       /cdrom                   kmr    # CDROM

# SERVER NAME
# If not set then the linux hostname will be converted to upper case
# and used. This is optional, the hostname will be used if this is not
# configured.
# Syntax:
#    2 <Servername>

2   LINUX_FS01

# INTERNAL NETWORK ADDRESS
# The Internal IPX Network Address is a feature that simplifies IPX routing
# for multihomed hosts (hosts that have ports on more than one IPX network).
# Syntax:
#    3 <Internal Network Address> [<Node Number>]
# or:
#    3 auto
#
# If you use 'auto' then your host IP address will be used. NOTE: this may
# be dangerous, please be sure you pick a number unique to your network.
# Addresses are 4byte hexadecimal (the leading 0x is required).

3   0x49a01010  1


# NETWORK DEVICE(S)
# This entry configures your IPX network. If you already have your
# IPX network configured then you do not need this. This is the same as
# using ipx_configure/ipx_interface before you start the server.
# Syntax:
#    4 <IPX Network Number> <device_name> <frametype> [<ticks>]
#                         Frame types: ethernet_ii, 802.2, 802.3, SNAP

4  0x39a01010  eth0  802.3  1

# SAVE IPX ROUTES AFTER SERVER IS DOWNED
# Syntax:
#    5 <flag>
#       0 = don't save routes, 1 = do save routes

5 0

# NETWARE VERSION
# Syntax:
#    6 <version>
#      0 = 2.15, 1 = 3.11

6 1
```

```
# PASSWORD HANDLING
# Real Novell DOS clients support a feature which encypts your
# password when changing it. You can select whether you want your
# mars server to support this feature or not.
# Syntax
#    7 <flag>
#    <flag> is:
#        0 to force password encryption. (Clients can't change password)
#        1 force password encryption, allow unencrypted password change.
#        7 allow non-encrypted password but no empty passwords.
#        8 allow non-encrypted password including empty passwords.
#        9 completely unencrypted passwords (doesn't work with OS/2)

7 1

# MINIMAL GID UID rights
# permissions used for attachments with no login. These permissions
# will be used for the files in your primary server attachment.
# Syntax:
#    10 <gid>
#    11 <uid>
#    <gid> <uid> are from /etc/passwd, /etc/groups

10  200
11  201

# SUPERVISOR password
# May be removed after the server is started once. The server will
# encrypt this information into the bindery file after it is run.
# You should avoid using the 'root' user and instead use another
# account to administer the mars diakomisth arxeiwn.
#
# This entry is read and encrypted into the server bindery files, so
# it only needs to exist the first time you start the server to ensure
# that the password isn't stolen.
#
# Syntax:
#    12 <Supervisor-Login> <Unix username> [<password>]

12  SUPERVISOR  terry  secret

# USER ACCOUNTS
# This associates NetWare logins with unix accounts. Password are
# optional.
# Syntax:
     13 <User Login> <Unix Username> [<password>]

13  MARTIN martin
13  TERRY  terry

# LAZY SYSTEM ADMIN CONFIGURATION
# If you have a large numbers of users and could not be bothered using
# type 13 individual user mappings, you can automatically map mars_nwe
# logins to linux user names. BUT, there is currently no means of making
# use of the linux login password so all users configured this way are
```

```
# will use the single password supplied here. My recommendation is not
# to do this unless security is absolutely no concern to you.
# Syntax:
#    15 <flag> <common-password>
#    <flag> is: 0  - don't automatically map users.
#               1  - do automatically map users not configured above.
#               99 - automatically map every user in this way.

15  0  duzzenmatta

# SANITY CHECKING
# mars_nwe will automatically ensure that certain directories exist if
# you set this flag.
# Syntax:
#    16 <flag>
#    <flag> is 0 for no, don't, or 1 for yes, do.

16  0

# PRINT QUEUES
# This associates NetWare printers with unix printers. The queue
# directories must be created manually before printing is attempted.
# The queue directories are NOT lpd queues.
# Syntax:
#    21 <queue_name> <queue_directory> <unix_print_cmd>

21  EPSON  SYS:/PRINT/EPSON lpr -h
21  LASER  SYS:/PRINT/LASER lpr -Plaser

# DEBUG FLAGS
# These are not normally needed, but may be useful if are you debugging
# a problem.
# Syntax:
#    <debug_item> <debug_flag>
#
#    100 = IPX KERNEL
#    101 = NWSERV
#    102 = NCPSERV
#    103 = NWCONN
#    104 = start NWCLIENT
#    105 = NWBIND
#    106 = NWROUTED
#                 0 = disable debug, 1 = enable debug

100 0
101 0
102 0
103 0
104 0
105 0
106 0

# RUN NWSERV IN BACKGROUND AND USE LOGFILE
# Syntax:
#    200 <flag>
```

```
#        0 = run NWSERV in foreground and don't use logfile
#        1 = run NWSERV in background and use logfile

200  1

# LOGFILE NAME
# Syntax:
#    201 <logfile>

201  /tmp/nw.log

# APPEND LOG OR OVERWRITE
# Syntax:
#    202 <flag>
#        0 = append to existing logfile
#        1 = overwrite existing logfile

202  1

# SERVER DOWN TIME
# This item sets the time after a SERVER DOWN is issued that the
# server really goes down.
# Syntax:
#    210 <time>
#        in seconds. (defaults 10)

210  10

# ROUTING BROADCAST INTERVAL
# The time is seconds between server broadcasts
# Syntax:
#    211 <time>
#        in seconds. (defaults 60)

211  60

# ROUTING LOGGING INTERVAL
# Set how many broadcasts take place before logging of routing
# information occurs.
# Syntax:
#    300  <number>

300  5

# ROUTING LOGFILE
# Set the name of the routing logfile
# Syntax:
#    301 <filename>

301  /tmp/nw.routes

# ROUTING APPEND/OVERWRITE
# Set whether you want to append to an existing log file or
# overwrite it.
# Syntax:
```

```
#    302 <flag>
#        <flag> is 0 for append, 1 for create/overwrite

302  1

# WATCHDOG TIMING
# Set the timing for watchdog messages that ensure the network is
# still alive.
# Syntax:
#    310 <value>
#        <value> =   0 - always send watchdogs
#                  < 0 - (-ve) for disable watchdogs
#                  > 0 - send watchdogs when network traffic
#                        drops below 'n' ticks

310  7

# STATION FILE
# Set the filename for the stations file which determine which
# machines this diakomisth arxeiwn will act as the primary diakomisth arxeiwn for.
# The syntax of this file is described in the 'examples' directory
# of the source code.
# Syntax:
#    400 <filename>

400  /etc/nwserv.stations

# GET NEAREST FILESERVER HANDLING
# Set how SAP Get Nearest Fileserver Requests are handled.
# Syntax:
#    401 <flag>
#        <flag> is: 0 - disable 'Get Nearest Fileserver' requests.
#                   1 - The 'stations' file lists stations to be excluded.
#                   2 - The 'stations' file lists stations to be included.

401  2
```

Ekkinhsh toy diakomisth

. An exete ry8misei to diakomisth sas na perimenei ejwterika programmata gia na ry8misei to diktyo sas kai/h gia na parexei tis leitoyrgies dromologhshs tote 8a prepei na ta jekinhsete prin jekinhsete ton diakomisth. Ypo8etontas pws exete ry8misei to diakomisth etsi wste na ry8misei ta interfaces gia sas kai na parexei tis leitoyrgies dromologhshs poy xreiazeste, apla dwste th entolh:

```
# nwserv
```

Elegxos toy diakomisth

. Gia na elegjete ton diakomisth 8a prepei prwta na epixeirhsete na synde8eite kai na kanete login apo ena NetWare pelath toy diktuoy sas. Meta 8a prepei na kanete ena `CAPTURE` apo ton pelath kai na epixeirhsete mia ektupwsh. An kai ta dyo einai epityxhmena tote o diakomisths leitoyrgei.

9.2 To paketo *lwared*.

O Ales Dryak <`A.Dryak@sh.cvut.cz`> dhmiourghse to *lwared* gia na epitrecei sto Linux na leitoyrgei ws enas NCP diakomisths arxeiwn.

O Ales exei onomasei to paketo *lwared*, mia syntomografia gia to *LinWare Daemon*.

9.2.1 Dynatothtes toy *lwared.*

O diakomisths *lwared* einai ikanos na parexei ena yposunolo yphresiwn toy plhroys Novell NCP. Enswmatwnei thn yphresia mhnymatwn alla den parexei kamia yphresia ektupwshs. Pros to paron de synergazetai swsta me pelates Windows95 h Windows NT. O diakomisths *lwared* basizetai se ejwterika programmata gia na dhmioyrghsei kai na enhmerwsei toys pinakes dromologhshs IPX kai SAP.

Pelates me kakh leitoyrgia mporei na prokalesoyn th diakoph ths leitoyrgias toy diakomisth. Oi yphresies metafrasews twn onomatwn twn arxeiwn den exoyn symperilhf8ei akoma.

O diakomisths den leitoyrgei gia ta kelufh NETX kai VLM .

9.2.2 Apoktwntas to *lwared*

To *lwared* paketo mporei na xtistei an exete pyrhna newtero apo ton `1.2.0`. Sas synistw na xrhsimopoihsete th ekdosh `1.2.13` afou etsi den apaiteitai kamia dior8wsh/ mpalwma toy pyrhna (kernel patch). Kapoies apo tis leitoyrgies toy IPX exoyn allajei me toys pyrhnes ekdoshs `1.3.*` kai ayto shmainei oti apaitountai twra dior8wseis gia na leitoyrghsei kanonika. Katallhla mpalwmata (patches) symperilambanontai gia toys neoys pyrhnes, kai ara akoma kai an prepei na xrhsimopoihsete ena alpha pyrhna, prepei kai pali na mporeite na kanete to *lwared* na leitoyrgei kanonika.

Mporeite na katebasete to paketo *lwared* xrhsimopoiwntas anwnymo ftp apo to: *klokan.sh.cvut.cz* `<ftp://klokan.sh.cvut.cz/pub/linux/linware/>`

h apo to :

sunsite.unc.edu `<ftp://sunsite.unc.edu/pub/Linux/system/network/daemons>` h mirror sites. H prosfath ekdosh thn wra toy gracimatos einai: `lwared-0.95.tar.gz`

9.2.3 Xtisimo toy *lwared*

Kante Untar to paketo *lwared*

Kati san:

```
# cd /usr/src
# tar xvpfz lwared-0.95.tar.gz
```

Dhmioyrghste ena pyrhna me yposthrijh Ethernet kai IPX

An xrhsimopoieite enan pyrhna alpha `1.3.*` , tote prepei na dokimasete na xrhsimopoihsete ton pyrhna ekdoshs `1.3.17` h newterh giati ta parexomena mpalwmata xtisthkan gia ayton. Oi pyrhnes `1.3.*` poy einai palioteroi apo to `1.3.17` 8a apaithsoyn xeirokinhtes dior8wseis gia na egkatasta8oun. (*kapoies plhrofories gia pws ginetai ayto symperilambanontai sto arxeio* `INSTALL` *toy paketoy.*). Gia na egkatasthsete ta mpalwmata se pyrhna `1.3.17` h newtero, dokimaste:

```
# make patch
```

Afou efarmosoyme ta mpalwmata, an xreiazetai, to epomeno pragma poy 8a prepei na ginei einai na bebaiw8eite pws o pyrhnas sas exei xtistei me dynatothtes yposthrijhs IPX. Se pyrhna ekdoshs `1.2.13` xreiazetai mono na sigoyrecete pws exete apanthsei

`Y` sth erwthsh: '`The IPX protocol`' opws deixnei parakatw:

```
 ...
 ...
Assume subnets are local (CONFIG_INET_SNARL) [y]
Disable NAGLE algorithm (normally enabled) (CONFIG_TCP_NAGLE_OFF) [n]
The IPX protocol (CONFIG_IPX) [n] y
*
* SCSI support
 ...
 ...
```

Stoys newteroys pyrhnes efarmozetai mia paromoia diadikasia alla to ka8eayto keimeno ths erwthshs mporei na exei ligo allajei.

8a xreiastei epishs na sigoyrecete pws symperilabate enan katallhlo odhgo gia thn Ethernet karta sas. An den gnwrizete pws na kanete ayto tote prepei na diabasete to *Ethernet-HOWTO* `<Ethernet-HOWTO.html>`.

Proxwrhste sto xtisimo toy pyrhna sas. Mhn jexasete na trejete to *lilo* gia na ton egkatasthsete otan teleiwsete.

Metaglwttiste kai egkatasthste *lwared*.

Gia na metaglwttisete to *lwared* prepei prwta na elegjete kai na dior8wsete, an xreiastei, to arxeio`server/config.h`. Ayto to arxeio periexei diafores ry8miseis poy 8a ka8orisoyn thn symperifora toy diakomisth sas. Oi proka8orismenes times einai logikes, parolo poy isws 8elhsete na elegjete oti oi kataxwrhseis gia toys katalogoys twn log arxeiwn sas, tairiazoyn sto susthma sas.

```
# make depend
# make
# make install
```

Parathrhsa pws to '`make depend`' parapone8hke pws den briskei to arxeio `float.h` sto susthma moy, alla telika leitourghse. Akomh anakalyca pws otan ekana metaglwttish me gcc `2.6.3` eprepe na allajw th grammh:

```
#include <net/route.h>
```

se

```
#include <net/if_route.h>
```

sto `lib/ipxkern.c` ka8ws ayto to arxeio metonomasthke kapoia stigmh.

To '`make install`' 8a prospa8hsei na egkatasthsei to diakomisth kai toys daimones dromologhshs ston katalogo `/usr/sbin`, to programma *lwpasswd* ston katalogo `/usr/bin`, tis efarmoges gia IPX ston katalogo `/sbin` kai telos, tis selides boh8eias ston katalogo `/usr/man`. An kapoies apo aytes tis topo8esies den antapokrinontai sto susthma sas, 8a prepei na dior8wsete to sxetiko `Makefile` kai na allajete toys katalogoys proorismou opws sas boleuei.

9.2.4 Ru8mish kai xrhsh toy *lwared*

Kai twra to diaskedastiko meros!

Ru8mish toy diktuoy IPX

To prwto pragma poy prepei na kanete einai na ry8misete ta Ethernet interfaces gia na yposthrijoyn ta IPX diktya poy o diakomisths sas 8a yposthrijei. Gia na to kanete 8a prepei na gnwrizete tis IPX diey8unseis diktuoy gia ka8e ena apo ta tmhmata (segments) toy LAN, poia syskeyh Ethernet (`eth0`, `eth1` klp.) einai se poio tmhma, ti tupoy prwtokollo paketwn (`802.3`, `EtherII` etc.) xrhsimopoieitai se ka8e tmhma toy LAN kai poia eswterikh dieu8ynsh diktuoy 8a prepei na exei o diakomisths sas (ayto xreiazetai mono an o diakomisths sas ejyphretei perissotera apo ena tmhmata LAN).

Mia ru8mish gia ton diakomisth brisketai se duo paromoia tmhmata me IPX diey8unseis diktuoy `23a91300` kai `23a91301` kai eswterikh dieu8ynsh diktuoy `bdefaced`, isws na moiazei me:

```
# ipx_internal_net add BDEFACED 1
# ipx_interface add eth0 802.3 23a91300
# ipx_interface add eth1 etherii 23a91301
```

3ekinhste toys daimones dromologhshs (routing daemons)

O idios o pyrhnas prow8ei to IPX paketo (IPX forwarding) opws kai gia to IP, alla apaitei pros8eta programmata gia na diaxeiristei tis enhmerwseis toy pinaka dromologhshs. Sthn periptwsh toy IPX xreiazontai duo daimones kai oi duo parexontai me *lwared*: To *ipxripd* diaxeirizetai tis plhrofories dromologhshs toy IPX kai to *ipxsapd* diaxeirizetai tis SAP plhrofories. Gia na jekinhsete toys daimones poy xreiazeste, ka8oriste mono to xwro poy 8a apo8hkeuoyn ta log mhnumata toys :

```
# ipxripd /var/adm/ipxrip
# ipxsapd /var/adm/ipxsap
```

Ry8miste ton *lwared* diakomisth

. Yparxoyn dyo arxeia poy prepei na ry8misete xeirokinhta gia na epitrecete to login xrhstwn ston *lwared* diakomisth. Ayta einai ta:

`/etc/lwpasswd`

. Edw fylassontai oi plhrofories gia toys logariasmous twn xrhstwn toy LinWare. To programma *lwpasswd* xrhsimeuei gia na to krata enhmero. Sthn aplousterh toy morfh, to arxeio `/etc/lwpasswd` moiazei ws ejhs:

```
ales:
terryd:
guest:
```

To format toy einai mia aplh lista apo login id poy akoloy8ountai apo ena ':' xarakthra kai meta th kwdikopoihmenh ekdosh toy kwdikou eisodoy sto susthma (login password). Merika shmantika 8emata einai ta ejhs:

No encrypted password shmainei kanena kwdiko (password), oi xrhstes toy LinWare prepei na exoyn logariasmo sto Linux (account), dhladh ka8e xrhsths poy prosti8etai sto `/etc/lwpasswd` prepei na emfanizetai epishs kai sto `/etc/passwd` kai `root` einai o monos logariasmos poy mporei na allajei ton kwdiko enos alloy xrhsth LinWare. An exete mpei san `root` mporeite na allajete ton kwdiko enos alloy toy xrhsth toy LinWare ws ejhs:

```
# lwpasswd rodg
Changing password for RODG
Enter new password:
Re-type new password:
Password changed.
```

`/etc/lwvtab`

Ayto einai to volume table toy Linware kai apo8hkeuoyn plhrofories gia to poioi katalogoi prepei na einai dia8esimoi stoys xrhstes toy LinWare (ayto to arxeio einai paromoio apo th fush toy me to NFS arxeio `/etc/exports`). Ena aplo paradeigma toy format toy einai ayto poy akoloy8ei:

```
SYS          /lwfs/sys
DATA         /lwfs/data
HOME         /home
```

Ayto to format einai aplo: Onoma Volume poy akoloy8eitai apo keno (whitespace) kai meta akoloy8ei o katalogos Linux poy 8a ginei export. Prepei na exete **toylaxiston** mia kataxwrish gia to volume `SYS` gia na jekinhsei o diakomisths. An 8elete oi xrhstes DOS na mporoun na xrhsimopoioun to LinWare diakomisth san kurio diakomisth, tote prepei na egkatasthsete mia stantar domh katalogoy `SYS` volume katw apo ton katalogo poy kanete export san to `SYS` volume. Mia kai ayta ta arxeia exoyn pneymatika dikaiwmata kai anhkoyn sth etaireia Novell, 8a prepei na exete adeia gia ayta. An oi xrhstes sas xrhsimopoioun Novell file diakomisth san kurio diakomisth, tote to parapanw den einai aparaithto.

3ekinhste ton diakomisth *lwared*.

Idou!

```
# lwared
```

Einai sxedon apogohteytiko, etsi den einai; Entajei, exete kati na rwthsete, etsi den einai; Poio einai to onoma toy diakomisth arxeiwn to opoio diafhmizetai; An jekinhsate to diakomisth, opws sas eipa, tote to onoma toy diakomisth LinWare poy diafhmizetai 8a basizetai se o,ti epistrefetai apo to *hostname* toy Linux. An 8elete na einai kati allo, tote mporeite na onomasete to diakomisth otan ton jekinate p.x.:

```
# lwared -nlinux00
```

8a jekinhsei to diakomisth me onoma `linux00`.

Elegjte to diakomisth *lwared* .

To prwto pragma poy prepei na elegjete einai an o diakomisths LinWare emfanizetai se ena *slist* apo ena DOS client sto diktyo sas. To programma *slist* einai apo8hkeymeno sto `SYS` volume enos Novell fileserver kai etsi prepei na to kanete apo mhxanhma poy einai hdh mesa sto diktyo. An den petuxei, tote bebaiw8eite oti trexoyn ta *ipxsapd* kai *lwared*. An to *slist* petuxei, tote prepei na dokimasete na kanete attach sto diakomisth kai na kanete map ena volume:

```
C:> attach linux00/ales
 ...
 ...
C:> map l:=linux00/data:
C:> l:
```

Prepei na eiste se 8esh na xeiris8eite to neo map opws kai opoiodhpote allo map. Ta permissions toy arxeioy poy 8a exete 8a einai basismena se ayta poy epitrepontai sto logariasmo *linux* poy trexei parallhla me to LinWare login.

10 Ry8mizontas to Linux mhxanhma san ena Novell Print Client.

To paketo *ncpfs* perilambanei dyo mikra programmata poy sas epitrepoyn na xeiris8eite tis ektypwseis apo to mhxanhma Linux se ena prosarthmeno ektypwth sto Novell diakomisth ektypwsewn (print server).

H entolh *nprint* sas epitrepei na ektypwsete se ena arxeio sthn NetWare print queue. H entolh *pqlist* sas epitrepei na deite th lista twn dia8esimwn oyrwn ektupwshs se ena NetWare diakomisth.

Gia na apokthsete kai na egkatasthsete aytes tis entoles, apla akoloy8hste tis odhgies sxetika me ton NCP pelath poy perigrafthke nwritera.

Kai oi dyo entoles apaitoun na dwsete username kai password, etsi logika mporei na skefteite na ftiajete merika shell scripts gia na kanete eykoloterh th diadikasia ths ektupwshs.

Ena paradeigma :

```
# pqlist -S ACCT_FS01 -U guest -n
# nprint -S ACCT_FS01 -q LASER -U guest -n filename.txt
```

H suntajh toy login einai paromoia me thn entolh *ncpmount*. Ta parapanw paradeigmata ypo8etoyn oti o fileserver `ACCT_FS01` exei ena logariasmo `guest` xwris kwdiko (password), oti yparxei mia oyra ektupwshs onomazomenh `LASER` kai oti o `guest` epitrepetai na typwsei se ayth.

11 Ry8mizontas to Linux mhxanhma san ena Novell Diakomisth Ektypwsewn.

Ena programma poy epitrepei sto Linux mhxanhma sas na symperiferetai san diakomisths ektypwsewn sto diktyo Netware symperilambanete sto paketo *ncpfs*>. Gia odhgies sxetika me to pws na to apokthsete kai na to xtisete, akoloy8hste tis odhgies toy parapanw tmhmatos 'Netware client'.

11.1 Proapaitoumena

H ru8mish ginetai apey8eias alla basizetai sto oti exete oloklhrwsei th ru8mish toy ektypwth kai doyleuei katw apo to Linux. Ayto kaluptetai se kapoio ba8os sto *Printing-HOWTO* `<Printing-HOWTO.html>`.

11.2 Ry8miseis

Otan exete mia ru8mish ektypwth poy doyleuei, kai exete dhmioyrghsei kai egkatasthsei th boh8htikh efarmogh *pserver* , tote xreiazetai na pros8esete tis entoles mesa sta arxeia `rc` gia na to jekinhsete.

To poia akribws entolh 8a xrhsimopoihsete, ejartatai apo to pws akribws 8elete na leitoyrghsei, alla sto pio aplh toy morfh kati san to akoloy8o 8a leitoyrghsei:

```
# pserver -S ACCT_01 -U LASER -P secret -q LASERJET
```

Ayto to paradeigma rwta th boh8htikh efarmogh *pserver* na kanei login sto diakomisth arxeiwn `ACCT_01` me onoma xrhsth `LASER` kai kwdiko `secret` kai na parei tis ergasies apo thn oyra ektypwsewn `LASERJET` . Otan lambanetai mia eiserxomenh ergasia ektupwshs, 8a xrhsimopoih8ei h ka8orismenh entolh ektupwshs *lpr* gia na trofodothsei thn ergasia ektupwshs sto Linux daimona ektypwsewn.

Mporeite an 8elete na xrhsimopoihsete opoiadhpote entolh Linux gia na dextei kai na ektypwsei thn ergasia ektupwshs. H parametros `-c` sas epitrepei na ka8orisete akribws thn entolh ektupwshs. Gia paradeigma :

```
# pserver -S ACCT_01 -U LASER -P secret -q LASERJET -c "lpr -Plaserjet"
```

8a exei akribws to idio apotelesma me to prohgoumeno paradeigma me th monh diafora oti 8a steilei thn ergasia ektupwshs sth ru8mish `laserjet` *printcap* anti gia thn proka8orismenh.

12 Mia epi8ewrhsh twn *ncpfs* entolwn xrhstwn kai diaxeirishs

Prosfates ekdoseis toy paketoy *ncpfs* toy Volker perilambanoyn ena megalo euros entolwn xrhstwn kai diaxeirishs poy mporei na sas fanoun xrhsimes. Ta ergaleia exoyn dhmioyrgh8ei kai egkatasta8ei san meros ths diadikasias egkatastashs toy *ncpfs* , etsi an den to exete hdh kanei, akoloy8hste tis odhgies poy yparxoyn sto parapanw tmhma toy Novell Client gia na ta dhmioyrghsete kai na ta egkatasthsete.

Leptomerhs plhrofories einai dia8esimes stis dosmenes *man* selides alla akoloy8ei mia suntomh perilhch twn entolwn :

12.1 Entoles xrhstwn.

ncopy

Network Copy - epitrepei thn apotelesmatikh antigrafh arxeiwn na ektelestei apo mia leitoyrgia toy Netware anti gia mia aplh antigrafh mesw diktuoy.

nprint

Network Print - sas epitrepei na typwsete ena arxeio sthn Netware oyra ektypwsewn se ena Netware diakomisth.

nsend

Network Send -sas epitrepei na steilete mhnumata se alloys xrhstes se ena Netware diakomisth.

nwbols

List Bindery Objects - sas epitrepei na deite th lista twn bindery periexomenwn enos Netware diakomisth.

nwboprops

List Properties of a Bindery Object - sas epitrepei na deite tis idiothtes enos Netware bindery antikeimenoy.

nwbpset

Set Bindery Property - sas epitrepei na 8esete tis idiothtes enos Netware bindery antikeimenoy.

nwbpvalues

Print Netware Bindery Objects Property Contents - sas epitrepei na ektypwsete ta periexomena mias Netware bindery idiothtas.

nwfsinfo

Fileserver Information - typwnei merikes perilhptikes plhrofories gia to Netware diakomisth.

nwpasswd

Netware Password - sas epitrepei na allajete ena kwdiko xrhsth netware.

nwrights

Netware Rights - emfanizei ta dikaiwmata poy sysxetizontai me ena sygkekrimeno arxeio h katalogo.

nwuserlist

Userlist - emfanizei toys xrhstes poy einai ekeinh th stigmh mesa ston diakomisth arxeiwn Netware (logged in).

pqlist

Print Queue List - emfanizei ta periexomena mias oyras ektypwsewn Netware.

slist

Server List - emfanizei th lista twn gnwstwn diakomistwn arxeiwn Netware.

12.2 Ergaleia Diaxeirishs.

nwbocreate

Create a Bindery Object - sas epitrepei na dhmioyrghsete ena Netware bindery antikeimeno.

nwborm

Remove Bindery Object - sas epitrepei na sbhsete ena Netware bindery antikeimeno.

nwbpadd

Add Bindery Property - sas epitrepei na 8esete thn timh mias yparxoysas idiothtas enos Netware bindery antikeimenoy.

nwbpcreate

Create Bindery Property - sas epitrepei na dhmioyrghsete mia nea idiothta gia ena yparxon Netware bindery antikeimeno.

nwbprm

Remove Bindery Property - sas epitrepei na afairesete mia idiothta apo ena Netware bindery antikeimeno.

nwgrant

Grant Trustee Rights - sas epitrepei na 8esete dikaiwmata diaxeiristh se enan katalogo sto Netware fileserver.

nwrevoke

Revoke Trustee Rights - sas epitrepei na afairesete ta dikaiwmata diaxeiristh apo enan katalogo ston Netware diakomisth arxeiwn.

13 Ry8mizontas to PPP gia yposthrijh IPX .

Oi nees ekdoseis toy *pppd* PPP daimona gia to Linux exoyn yposthrijh poy sas epitrepei na metaferete IPX paketa mesw mias seiriakhs sundeshs PPP. Xreiazeste toylaxiston thn ekdosh `ppp-2.2.0d` toy daimona. Deite to *PPP-HOWTO* `<PPP-HOWTO.html>` gia leptomereies sxetikes me to poy 8a to breite. Otan metaglwttizete to *pppd* prepei na sigoyrecete oti energopoihsate thn yposthrijh IPX pros8etontas tis dyo akoloy8es grammes:

```
IPX_CHANGE = 1
USE_MS_DNS = 1
```

sto arxeio : `/usr/src/linux/pppd-2.2.0f/pppd/Makefile.linux`.

To `IPX_CHANGE` einai o,ti ry8mizei h yposthrijh IPX sto PPP. To `USE_MS_DNS` epitrepei se mhxanes me Microsoft Windows95 na kanoyn Name Lookups.

To pragmatiko kolpo gia na to kanoyme na doylecei einai na gnwrizoyme pws na to ry8misoyme.

Yparxoyn polloi tropoi na to kanoyme ayto, alla 8a perigracw mono ta dyo gia ta opoia exw parei plhrofories. Den exw dokimasei kanenan apo toys duo akomh, gi' ayto 8ewrhste ayto to stadio peiramatiko, kai an leitoyrghsei kati, parakalw enhmerwste me.

13.1 Ry8mizontas ena IPX/PPP diakomisth.

To prwto pragma poy prepei na kanete einai na ry8misete to Linux mhxanhma san ena IP/PPP diakomisth. Mhn panikoballeste! Den einai duskolo. Akoloy8eiste pali tis odhgies sto *PPP-HOWTO* `<PPP-HOWTO.html>` kai de 8a exete problhma. 1/4tan teleiwsete me ayto, yparxoyn orismenes aples tropopoihseis poy prepei na kanete gia na leitoyrghsei to IPX panw sthn idia ru8mish.

13.1.1 Prwta bhmata.

Ena apo ta prwta bhmata poy prepei na akoloy8hsete einai na ry8misete to Linux mhxanhma san IPX dromologhth (router) opws perigrafthke sto katallhlo tmhma nwritera se ayto to keimeno. Den einai anagkh na xrhsimopoihsete th entolh *ipx_route* gia to `ppp` interface giati to *pppd* 8a ta ry8misei ayta gia sas opws kanei kai gia to IP. Otan trexei o *ipxd* daimonas, anixneuei aytomata ka8e neo IPX interface kai metabibazei tis diadromes toys. Me ayto to tropo ta dialup hosts 8a fainontai apo alla mhxanhmata aytomata me th sundesh toys.

13.1.2 Sxediasmos.

Otan trexete sa diakomisths, logika 8a einai dikh sas ey8unh na dwsete diey8unseis diktuoy se ka8e PPP edraiwmenh sundesh. Ayto einai ena shmantiko shmeio, ka8e PPP sundesh 8a einai ena IPX diktyo kai 8a exei mia monadikh dieu8ynsh diktuoy IPX. Ayto shmainei oti prepei na apofasisete pws 8a dianeimete tis diey8unseis kai poies 8a einai. Enas aplos tropos einai na dianeimete mia dieu8ynsh toy IPX diktuoy se ka8e seiriakh syskeyh poy 8a yposthrizei IPX/PPP. Mporeite na dianeimete diey8unseis toy IPX diktuoy me bash to login id toy syndedemenoy xrhsth, alla de blepw kapoion idiaitera kalo logo gia na to kanw ayto.

Ypo8etw oti ayto einai ayto poy exete kanei, kai oti 8a xrhsimopoihsoyme dyo seiriakes syskeyes (modems). Oi diey8unseis poy exw 8esei sto paradeigma einai:

```
Syskeyh Dieu8ynsh Diktuoy IPX
------  ---------------------
ttyS0    0xABCDEF00
ttyS1    0xABCDEF01
```

13.1.3 Ry8miste to *pppd*.

Ry8miste to arxeio `/etc/ppp/options.ttyS0` opws akoloy8ei:

```
ipx-network 0xABCDEF00
ipx-node 2:0
ipxcp-accept-remote
```

kai to arxeio `/etc/ppp/options.ttyS1` ws ejhs :

```
ipx-network 0xABCDEF01
ipx-node 3:0
ipxcp-accept-remote
```

Ayta 8a zhthsoyn apo to *pppd* na dia8esei sth sundesh tis katallhles diey8unseis toy IPX diktuoy otan h sundesh exei edraiw8ei, na 8esei ton ari8mo toy topikou komboy sto 2 h 3 kai 8a afhsoyn ton apomakrysmeno kombo (remote node) na gracei apo panw oti nomizei. Shmeiwste oti ka8e dieu8ynsh einai dekaejadikos ari8mos kai oti to `0x` einai aparaithto sth arxh ths dieu8ynshs toy diktuoy, alla den apaiteitai sth arxh ths dieu8ynshs toy komboy.

Yparxoyn alla merh opoy aytes oi plhrofories mporoun na ry8mistoun. An exete mono ena dialin modem tote mia eggrafh (entry) mporei na paei sto arxeio `/etc/ppp/options`. Enallaktika aytes oi plhrofories mporoun na perasoyn sth grammh entolwn toy *pppd*.

13.1.4 Elegjete th ru8mish toy diakomisth.

Gia na elegjete th ru8mish 8a xreiasteite mia ru8mish pelath (client) poy na jerete oti doyleuei sigoyra. Otan kapoios kalei, syndeetai (logs in) kai to *pppd* jekina, 8a dia8esei th dieu8ynsh toy diktuoy, 8a symboyleusei ton pelath toy ari8mou toy komboy toy diakomisth (server node number) kai 8a diapragmateytei ton ari8mo toy komboy toy pelath. Otan ayto exei teleiwsei, kai afou to *ipxd* exei anixneusei to neo interface o pelaths 8a prepei na mporei na edraiwsei IPX syndeseis sta apomakrysmena hosts.

13.2 Ry8mizontas ena IPX/PPP client.

Se mia ru8mish pelath, to an 8a ry8misete to Linux mhxanhma sas san ena IPX dromologhth h oxi ejartatai apo to an exete ena topiko LAN poy epi8ymeite na symperiferetai san enas IPX dromologhths gi' ayto. An exete ena standalone mhxanhma poy syndeetai me ena IPX/PPP dialin server tote den xreiazeste na trejete to *ipxd*, alla an exete ena LAN kai epi8ymeite ola ta mhxanhmata sto LAN na xrhsimopoioun ton dromologhth IPX/PPP, tote prepei na ry8misete kai na trejete to *ipxd* opws perigracame. Ayth h ru8mish einai polu aplousterh giati den exete na ry8misete pollaples seiriakes syskeyes.

13.2.1 Ry8mizontas to *pppd*

H aplousterh ru8mish einai ayth poy epitrepei sto diakomisth na parexei oles tis plhrofories ru8mishs diktuoy IPX. Ayth h ru8mish 8a einai symbath me th ru8mish toy diakomisth poy perigrafhke parapanw.

Pali prepei na pros8esete merikes epiloges sto arxeio `/etc/ppp/options` , poy einai:

```
ipxcp-accept-network
ipxcp-accept-remote
ipxcp-accept-local
```

Aytes oi epiloges lene sto *pppd* na symperiferetai teleiws pa8htika kai na dexetai apo to diakomisth oles tis leptomereies ru8mishs. 8a mporousate na parexete edw default times gia toys servers poy den parexoyn leptomereies, pros8etontas tis eggrafes (entries) gia ta `ipx-network` kai `ipx-node` paromoia me to ru8mish toy diakomisth.

13.2.2 Testarontas ton IPX/PPP pelath.

Gia na testarete ton pelath 8a xreiastei na kalesete ena diakomisth poy gnwrizete oti doyleuei. Afou ton exete kalesei kai to pppd trexei 8a prepei na blepete tis IPX leptomereies poy ry8misthkan sth syskeyh `ppp0` otan trexete th entolh *ifconfig* kai 8a prepei na mporeite na xrhsimopoieite thn *ncpmount*.

Den eimai sigoyros gia to an 8a prepei na pros8esete h oxi xeirokinhta tis IPX diadromes etsi wste na ftanete ton apomakrysmeno fileserver. Einai polu pi8ano. An kapoios poy exei ayth th ru8mish mporei na moy pei, 8a hmoyn eygnwmwn.

14 IPX tunnel enanti IP

Polloi apo sas 8a eiste se katastash opoy exete dyo Novell Local Area Netorks mono me mia IP sundesh metaju toys. Pws paizoyme to multiplayer deathmatch DOOM gia to DOS me ayth th diatajh pi8ana na rwthsete; O Andreas Godzina <ag@agsc.han.de> exei thn apanthsh gia sas sth morfh toy *ipxtunnel*.

To *ipxtunnel* parexei mia dieykolynsh tupoy gefyras (bridge-like facility) gia to IPX epitrepontas sta IPX paketa na einai kwdikopoihmena me diagrammata tcp/ip etsi wste na mporoun na metafer8oun mesw mias sundeshs tcp/ip. Perimenei gia IPX paketa kai otan emfanistei ena to "tyligei" me ena diagramma tcp/ip kai to dromologei se mia makrinh IP dieu8ynsh poy eseis ka8orizete. Gia na leitoyrghsei ayto fysika, 8a prepei to mhxanhma poy dromologeite to kwdikopoihmeno IPX na trexei epishs ena antigrafo ths idias ekdoshs toy *ipxtunnel* opws eseis.

14.1 Apoktwntas to *ipxtunnel*

Mporeite na apokthsete to *ipxtunnel* apo to *sunsite.unc.edu* <ftp://sunsite.unc.edu/pub/Linux/system/network/daemons> h apo kapoio mirror site.

14.2 Xtizontas to *ipxtunnel*

Extisa xwris problhma to *ipxtunnel* xrhsimopoiwntas tis akoloy8es entoles:

```
# cd /usr/src
# tar xvfz .../ipxtunnel.tgz
# cd ipxtunnel
# make
```

14.3 Ry8mizontas to *ipxtunnel*

H ru8mish toy *ipxtunnel* einai aplh. As ypo8esoyme oti to mhxanhma twn filwn sas einai to `gau.somewhere.com` kai to diko sas mhxanhma to `gim.sw.edu`. To *ipxtunnel* xrhsimopoiei ena arxeio ry8misewn poy legetai `/etc/ipxtunnel.conf`. Ayto to arxeio sas epitrepei na ka8orisete to default UDP port poy 8a xrhsimopoieite gia th tcp/ip sundesh, pou 8a steilete tis kwdikopoihmenes plhrofories kai poio apo ta topika interfaces toy *ipxtunnel* 8a prepei na akouei kai na perimenei na paradwsei ta paketa IPX.

Ena aplo arxeio ry8misewn 8a moiazei me to akoloy8o:

```
#
# /etc/ipxtunnel.conf for gim.sw.edu
#
# The UDP port to use:                       (default 7666)
port 7777
#
# The remote machine to send IPX packets to: (no default)
remote gau.somewhere.com
#
# The local interfaces to listen for IPX on: (default eth0)
```

```
interface eth0
interface eth1
```

Profanws to allo mhxanhma 8a exei ena paromoio arxeio ry8misewn to opoio 8a ka8orizei ayto to mhxanhma san ena `remote` host.

14.4 Elegxontas kai ry8mizontas to *ipxtunnel*

To *ipxtunnel* symperiferetai **san** mia gefyra IPX, etsi wste ta diktya IPX se opoiodhpote akro ths sundeshs 8a einai pi8ana ta idia. O Andreas den exei elegjei pote to *ipxtunnel* se periballon to opoio yposthrizei Novell file servers, etsi an to dokimasete se ena pragmatiko periballon enhmerwste ton Andrea an leitoyrgei h oxi.

An to *ipxtunnel* leitoyrgei, mporeite na jekinhsete ta DOOM mhxanhmata sas se ka8e akro ths sundeshs trexontas se IPX mode kai 8a prepei na blepete o enas ton allo.

O Andreas exei xrhsimopoihsei ayton ton kwdika mono mesw kalwn, grhgorwn grammwn kai den isxyrizetai tipota sxetika me thn apodosh toy otan h sundesh einai kakhs poiothtas. Pali, enhmerwste ton ti leitoyrgei gia sas kai ti oxi.

15 Emporikh yposthrijh IPX gia Linux.

15.1 To Network Desktop ths Caldera

H Caldera Inc., paragei mia Linux dianomh poy yposthrizei mia seira apo emporika xarakthristika symperilambanomenoy ths plhrhs leitoyrgikhs client yposthrijhs Novell NetWare. H basikh dianomh einai h eyrews ektimwmenh dianomh Red Hat Linux kai h Caldera exei pros8esei se ayto ta proionta "Network Desktop". H yposthrijh NetWare parexei ena client me ola ta xarakthristika toy Novell NetWare client basismeno sthn texnologia ths Novell Corporation me thn adeia ths. O client parexei plhrh client prosbash stoys Novell 3.x kai 4.x diakomistes arxeiwn kai perilambanei xarakthristika opws to NetWare Directory Service (NDS) kai RSA encryption.

Mporeite na parete polles perissoteres plhrofories kai leptomereies sxetika me paraggelies apo to: *Caldera Inc Web Server* `<http://www.caldera.com/>`.

An doyleuete se periballon Netware 4.x kai/h se NDS tote to Caldera Netware Client einai h monadikh dia8esimh lush.

An exete ena mia shmantikh efarmogh gia yposthrijh Novell gia to Linux tote to proion ths Caldera prepei na einai kati poy prepei na to ejetasete kala.

16 Orismenes syxnes erwthseis

Pou mporw na brw emporiko logismiko IPX gia Linux;

H etairia Caldera prosferei ena plhres yposthrigmeno Netware 3.x kai 4.x client kai me plhrh adeia. Mporeite na parete plhrofories gia ayto apo to *Caldera Inc Web Server* `<http://www.caldera.com/>`.

To logismiko IPX leitoyrgei me Arcnet/Token Ring/klp.;

To logismiko gia IPX sto Linux leitoyrgei me ArcNet kai Token Ring interfaces. Den exw akousei akomh kanenan na to exei dokimasei me to AX.25. H ru8mish einai idia me ayth toy ethernet ektos apo to oti prepei na antikatasthsete me katallhla onomata syskeywn anti gia 'etho' kai katallhles diey8unseis hardware opoy einai aparaithto.

Pws ry8mizw perissotera apo ena IPX interface;

An exete perissotera apo ena interface sto mhxanhma sas prepei na xrhsimopoihsete th entolh *ipx_interface* gia na ry8misete xeirokinhta to ka8ena, den prepei na xrhsimopoihsete th ru8mish 'plug n play'.

Pws epilegw IPX diey8unseis;

To IPX networking einai paromoio, alla oxi idio me to IP networking. Mia megalh diafora einai o tropos me ton opoio xrhsimopoiountai oi diey8unseis. To IPX den xrhsimopoiei thn ennoia toy subnetworking kai etsi ta eidh twn sysxetisewn poy exete metaju twn diey8unsewn toy diktuoy kai ta diktya einai diaforetika. Oi kanones einai sxedon aploi:

- Ka8e dieu8ynsh IPX diktuoy prepei na einai monadikh se ena diktyo megalhs perioxhs Ayto perilambanei diey8unseis eswterikou diktuoy. Polloi organismoi poy xrhsimopoioun IPX se ena diktyo megalhs perioxhs prepei na exoyn kapoio eidos protyphs diey8ynsiodothshs poy prepei na akoloy8hsete.
- Ka8e dieu8ynsh toy host se ena atomiko diktyo prepei na einai monadikh. Ayto shmainei oti ka8e host se ka8e IPX diktyo prepei na exei mia monadika orismenh dieu8ynsh. Sthn periptwsh toy diktuoy ethernet ayto den einai duskolo ka8ws ka8e karta exei monadikh dieu8ynsh. Sth periptwsh toy IPX/PPP ayto shmainei oti prepei na bebaiw8eite oti exete dia8esei monadikes diey8unseis se oloys toys hosts sto diktyo, asxeta apo poio telos twn syndesewn einai syndedemena. H dieu8ynsh toy host den xreiazetai na einai monadikh se ena diktyo megalhs perioxhs ka8ws h dieu8ynsh toy diktuoy xrhsimopoieitai se syndyasmo me th dieu8ynsh toy host gia na anagnwrizei monadika ena host.

Ti einai ta frame types, poia na xrhsimopoihsw;

Yparxei mia poikilia apo frame types se xrhsh panw sta opoia mporeite na trejete IPX. To pio synh8ismeno apo ayta perigrafetai sto tmhma 'koinoi oroi' aytou toy keimenoy (katw apo to '`Frame Type` entry').

An 8elete na egkatasthsete to mhxanhma sas se ena yparxwn diktyo tote prepei na xrhsimopoihsete otidhpote einai hdh se xrhsh gia na sas epitrecei na epikoinwnhsete me toys alloys hosts sto diktyo, alla an h egkatastash einai se olokainoyrio diktyo mporeite na xrhsimopoihsete opoiodhpote apo mia seira prwtokolla gia na metaferei to IPX traffic. Sas synistw an ry8mizete ena olokainoyrio diktyo kai an xreiazeste na metaferete kai ta dyo IPX kai IP traffic na xrhsimopoihsete to y`Ethernet_II` frame type.

Ta Windows95 mhxanhmata moy mperdeuontai kata thn aytomath anixneysh frame type;

Nai, profanws mporei na symbainei ayto. 8a mporousa na kanw asxhma sxolia, alla anti gi' ayto 8a proteinw mono na xrhsimopoihsete th xeirokinhth ru8mish frame type anti gia thn aytomath. Pi8anotata einai o kaluteros tropos.

Giati moy bgainei to mhnyma 'invalid argument' otan ry8mizw to IPX;

To pi8anotero einai oti den trexete ena pyrhna poy yposthrizei to IPX, etsi eite metaglwttiste jana ton pyrhna sas gia na to yposthrizei, h elegjte dipla oti exete pragmati xrhsimopoihsei to lilo gia na egkatasthsete kai na trejete to neo pyrhna.

Giati moy bgainei to mhnyma 'package not installed', otan ry8mizw to IPX;

To pi8anotero einai oti den trexete ena pyrhna poy yposthrizei to IPX, etsi eite metaglwttiste jana ton pyrhna sas gia na to yposthrizei, h elegjte dipla oti exete pragmati xrhsimopoihsei to lilo gia na egkatasthsete kai na trejete to neo pyrhna.

Giati moy bgainei to mhnyma 'IPX support not in kernel' apo to *pppd*;

Exete pi8anotata metaglwttisei to IPX san ena module kai de bebaiw8hkate oti htan fortwmeno prin jekinhsete to *pppd*.

Pws kanw NFS export ena mounted NCP filesystem;

Gia na xrhsimopoihsw to NFS gia na kanw export ena NCP susthma arxeiwn prepei na to prosarthsete xrhsimopoiwntas thn epilogh *ncpmount* `-V`. Ayth h epilogh sas epitrepei na prosarthsete mono ena volume enos diakomisth arxeiwn anti ths synh8ismenhs prosarthshs olwn. Otan to kanete ayto, o NFS daimonas 8a sas epitrecei na kanete export ekeino to susthma arxeiwn me to synh8ismeno tropo.

Giati de leitoyrgei to slist otan exw ena eswteriko diktyo me mars_nwe;

Prepei na exete energopoihsei ton kontinotero diakomisth. Ayto shmainei oti to entry 401 sto arxeio /etc/nwserv.conf, prepei na einai 0 ektos an exete kapoio logo gia na mhn apantate gia na breite toys kontinoteroys servers. An 8elete apla na kanete to slist na doylecei kai na mhn apantate se ka8e aithsh poy dexeste apo ton kontinotero diakomisth, symperilabete to eswteriko sas diktyo kai ton ari8mo komboy sto arxeio /etc/nwserv.stations kai 8este to entry 401 sto arxeio /etc/nwserv.conf se 2.

To paketo ncpfs leitoyrgei me mars_nwe ;

O kwdikas twn Martin kai Volker arxizei siga siga na sygklinei. Prosfates ekdoseis toy *mars_nwe* exoyn mia epilogh thn opoia energopoieite gia na leitoyrghsei me to *ncpfs*. Prepei na energopoihsete to `WITH_NAME_SPACE_CALLS` sto *mars_nwe* sto arxeio `config.h`>.

Yparxei kanena dwrean logismiko gia DOS to opoio na leitoyrgei me mars_nwe;

Mia epinohmenh erwthsh ajizei mia epinohmenh apanthsh. Xairomai poy rwthsate, o Martin exei ena paketo to opoio dianemei parapleyra me to paketo *mars_nwe* poy prosferei dwrean DOS client yposthrijh gia to *mars_nwe* diakomisth. Mporeite na to breite sta idia sites poy brhkate kai to diakomisth, kai 8a legetai `mars_dosutils-0.01.tgz`. Perilambanei C phgaio kwdika gia programmata opws ta *slist.exe*, *login.exe*, *map.exe* klp. O kwdikas mporei na metaglwttistei me Borland(tm) C.

17 Pneymatika Dikaiwmata.

18 Diafora kai Eyxaristies.

Oi David E. Storey <`dave@tamos.gmu.edu`> kai Volker Lendecke <`lendecke@namu01.gwdg.de`> boh8hsan polu parexontas moy plhrofories gia ayto to keimeno. Oi Gilbert Callaghan <`gilbert@pokey.inviso.com`>, David Higgins <`dave@infra.com`> kai Chad Robinson <`chadr@brtgate.brttech.com`> proseferan plhrofories gia to pws na ry8misoyme to IPX/PPP. O Bennie Venter <`bjv@Gil-galad.paradigm-sa.com`> syneisfere dinontas merikes xrhsimes plhrofories sxetika me ta frame types. O Christopher Wall <`vergil@idir.net`

ekane merikes xrhsimes protaseis gia na beltiwsoyme thn anagnwsimothta kai th domh aytou toy keimenoy. O Axel Boldt <`boldt@math.ucsb.edu`> prosefere orismenes xrhsimes protaseis kai feedback. O Erik D. Olson <`eriko@wrq.com`> prosfere xrhsimo feedback kai plhrofories gia pws na ry8misoyme to PPP gia IPX. O Brian King <`root@brian.library.dal.ca`> edwse mia erwthsh gia to tmhma FAQ.

"NetWare" einai ena kataxwrhmeno trademark ths *Novell Corporation* `<http://www.novell.com/>`. "Caldera" einai ena kataxwrhmeno trademark ths *Caldera Corporation* `<http://www.caldera.com/>`.

xairetismoi `Terry Dawson, VK2KTJ.`

<`terry@perf.no.itg.telstra.com.au`>