

# ΆέόάãùãP óôï NanoBSD

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## ÊõñéÛêïò ÊáíõñùôPò

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Ôï FreeBSD áβíáé Ýíá éáôï÷ ðñùìÝíï àìðñéêéù óýìáìêï òïò FreeBSD Foundation.  
ÐñéêôÝò áðù óéò ëÝíáéò P òñÛóáéò íé ïðñáò ÷ ñçóéïïðñéçýíóáé áðù òïò éáðáóéáðáóôÝò P òïò  
ðñéêôÝò òïò áéá íá áéáêñβíïí óá ðñíúííóá òïò èáññíýíóáé àìðñéêéÛ óýìáìêá. ¼ðñò áðôÝò  
àìðáíβæííóáé óá áðôù òï éáβíáíí éáé áéá ùóàò áðù áðôÝò àíùñβæáé ç ÌiÜää ÁíÛððóçò òïò FreeBSD ùóé  
áβíáé ðéááííí íá áβíáé àìðñéêéÛ óýìáìêá, éá ááβòá Ýíá áðù óá óýìáìêá: “TM” P “®”.

Ôï Ýáñáóïí áðôù ðáñÝ÷áé ðéçññïññáò áéá óá áñááéáβá òïò NanoBSD, óá ïðñá ïðñíýíí íá ÷ ñçóéïïðñéçýíí  
ðññéáêéÝíï íá àçìéíðñéçýíí áβáùêá òïò óðóðPíáðïò FreeBSD áéá embedded áðáññíáÝò, éáðÛéçéáð áéá  
÷ñPòç áðù êÛñðá Compact Flash (P Ûéëï ìÝóï áðñèPéáðóçò).

## Table of Contents

1 ΆέόάãùãP óôï NanoBSD .....	1
2 Ñýèìéόç òïò NanoBSD .....	2

## 1 ΆέόάãùãP óôï NanoBSD

Ôï NanoBSD áβíáé Ýíá áñááéáβï òï ïðñí áíáððýóóáðáé áíáñáÛ áðù òïí Poul-Henning Kamp <phk@FreeBSD.org>.  
Àçìéíðñáβ Ýíá áéêñéêéù áβáùêï òïò óðóðPíáðïò FreeBSD áéá embedded áðáññíáÝò, éááíéêéù áéá êÛñðá Compact  
Flash (P Ûéëï ìÝóï áðñèPéáðóçò).

Ìðñáβ íá ÷ ñçóéïïðñéçéáβ áéá íá òéá÷ òïýíí áñáéáééáðïíÝíáð áéêñíáð, ó÷ááéáðïíÝíáð áéá áýêñéç ááéáðÛóóáç éáé  
óðíðPñçόç óðóðçìÛòíí óýðñò “computer appliance”. Óá óðóðPíáðá òÝðñéíò áβáñòò Ý÷ïí òï ðéêéù éáé ðñéóíéêéù  
òïò áññðñéçÝíá ìÝóá òðï ðñíúíí. Áðôù óçìáβíáé ðùð óð÷íÛ áβíáé ðññááéáðáðóçìÝíá ùéá óá áðáñáβðçðá  
ðññáñÛñáðá. Ç óðóéáðP óðñáÝáðáé óá Ýíá ððÛñ÷ñí áβéððïí éáé ìðñáβ íá éáéðññáPóáé (ó÷ááñ) áíÝóùð.

Óá ááóéêéÛ ÷ áñáéðçñéóðéêéÛ òïò NanoBSD áβíáé:

- Óá ports éáé óá ðáéÝóá éáéðññáýíí ùðùð óðï FreeBSD — ïðñéñáPðñòá ðññáñáñíá ìðñáβ íá ááéáðáðáéáβ éáé íá  
÷ ñçóéïïðñéçéáβ òïò FreeBSD ìðñáβ íá áíóñíáðùêéáβ éáé óá Ýíá áβáùêï NanoBSD éáé íá éáéðññáPóáé ìá òïí βáéí  
ðññðñ.

- Άα όόόάαα όα έαέόιόναέέέέέέ — Αί αβίαέ άέέέέέ ία αβίαέ έÜόέ ία όι FreeBSD, όüόά αβίαέ άέέέέέ ία αβίαέ όι βαέι όηÜía έαέ ία όι **NanoBSD**, άέόüό άί όι όόάέάέήέίÝí ÷ άήάέόçñέόόέέü Ý ÷ άέ όέüðέíá áóáέñάέάβ áðu όι αβάüέí όιό **NanoBSD**.
- Όι **NanoBSD** όñÝ ÷ άέ ία όι όýόόçíá όά έάόÜόόάόç όñíόόάόβáό áðu ááñάöP. Ìðíñáβóá áέüíá έαέ ία όι áðíόóíáÝóáόá áðu όι ñáyíá όçí þñá ðíó έαέόιόνααβ. Άάí αβίαέ áíáάέάβí ία έέόάέάόόάβ όι fsck(8) ίάόÜ áðu íέá Üááñíόç áέάέíðP έαέόιόνααβ όíό όόόóPíáόíó.
- Άβίαέ áýέíέí ία áçíέíόñάçέάβ έαέ ία όñíόáñííόόάβ Ýíá αβάüέí **NanoBSD**. Ìá όç ÷ ñPόç áíüό íüíí όáíáñβíó όέíέíý έαέ áíüό áñ ÷ áβíó áέáíüñüόόçό áβίαέ άέέέέP ç áüíόç όñíόáñííóíÝíüí áέáþέüí ðíó έέáñðíέíýí ðíέάáPðíóá áíÜάέç.

## 2 Ñýèìέόç όíó NanoBSD

### 2.1 Ç Ö ÷ ááβάόç όíó NanoBSD

Άόíý áñáόόάβ Ýíá αβάüέí όíó **NanoBSD** όά έÜðíέí áðíέçέáðóέέü íÝóí, ðíñάβ ία ÷ ñçóέííðíέçέάβ áέá ίá íáέέíPóáέ Ýíá όýόόçíá FreeBSD. Ç όñíέáέíñέóíÝíç áέáíüñüόόç όíó íÝóíό áέέβίçόçό áðíόáέáβóáέ áðu όñβá íÝñç:

- Άýí áέáíáñβóíáόά áέέβίçόçό: code#1 έαέ code#2.
- Όí áέáíÝñέóíá ñðèíβóáüí, Άόóü ðíñάβ ία όñíόáñόçέάβ όóíí έáόÜέíāí /cfg όçí þñá έαέόιόνααβ όíó **NanoBSD**.

ΆόóÜ όá όñβá áέáíáñβóíáόά έáñíέέÜ áβίαέ όñíόáñόçíÝíá íüíí áέá áíÜáíüόç.

Ìέ έáόÜέíāíέ /etc έαέ /var áβίαέ áέέííέέíβ áβóέíέ md(4) (malloc).

Όí áέáíÝñέóíá ñðèíβóáüí ðíñάβ ία όñíόáñόçέάβ όóíí έáόÜέíāí /cfg. ÐáñέÝ ÷ άέ áñ ÷ áβá όá ðíβá áíόέáñÜóííόáέ όóíí έáόÜέíāí /etc. ΈáόÜ όçí áέέβίçόç όíó όόόóPíáόíó όí áέáíÝñέóíá ñðèíβóáüí όñíόáñóÜóáέ όñíóüñέíÜ íüíí áέá áíÜáíüόç έαέ áíόέáñÜóííόáέ όá áñ ÷ áβá όíó όóíí έáόÜέíāí /etc. Ìðuόá áέá ίá áβίαέ έÜðíέá áέέááP ñðèíβóáüí ðέí “íüíέíç” έαέ ίá έó ÷ ýáέ áέüíá έαέ ίáόÜ áðu áðáíáέέβίçόç όíó όόόóPíáόíó, όñÝðáέ ίá áíόέáñÜóáόáέ áðu όíí έáόÜέíāí /etc όóíí áέáíÝñέóíá ñðèíβóáüí, áóíý áόóü όñíόáñόçέάβ áέá áñÜøέíí όóíí έáόÜέíāí /cfg.

#### Example 1. ΈÜñííóáó íüíέíáó áέέááÝð όóíí /etc/resolv.conf

```
# vi /etc/resolv.conf
[... ]
# mount /cfg
# cp /etc/resolv.conf /cfg
# umount /cfg
```

**Note:** Όí áέáíÝñέóíá όí ðíβíð ðáñέÝ ÷ άέ όíí έáόÜέíāí /cfg όñÝðáέ ίá όñíόáñóÜóáέ íüíí έáόÜ όçí áέέβίçόç έαέ üóáí Ý ÷ íóí όñíόáñάέüόçόά όá áñ ÷ áβá ñðèíβóáüí όíó /cfg.

Άάí αβίαέ έáέP έáÝá ίá íÝíáέ íüíέíá όñíόáñόçíÝíí όí áέáíÝñέóíá /cfg. Αί Ýíá áέáíÝñέóíá áβίαέ όñíόáñόçíÝíí áέá áñÜøέíí έαέ όí áðíέçέáðóέέü íÝóí όíó **NanoBSD** áðέόñÝðáέ ðáñέíñέóíÝíí áñέέíü έýέέüí ááñάόPó (üðüό ð.÷. íáñέέÝó έÜñóáó CF), ðíñάβ ίá áðçñááόόάβ áñíçóέέÜ όí áðíέçέáðóέέíü íÝóí áðáέáP í ðóñPíáó áñÜóáέ έÜèá έβāí όóíóó áβóέíóó όíó όόόóPíáόíó (syncer).

## 2.2 ΆçìέìõñāBā Āíũò ĐñĩóáñĩĩóĩYĩĩõ ÓõóõPìáõĩò NanoBSD

Όῖ ᾱBāũēĩ όῖõ **NanoBSD** ᾱçìέìõñāBāóáέ ᾱδũ Yĩá ᾱδēũ óáῖŨñēĩ ēĩíóũēᾱò, όῖ `nanobsd.sh`, όῖ ἰðĩBĩ ἰðĩñāB ἰᾱ ᾱñāēᾱB óóῖῖ ἑᾱòŨēĩᾱĩ /usr/src/tools/nanobsd. Ἀóõũ όῖ óáῖŨñēĩ ᾱçìέìõñāB Yĩá ᾱBāũēĩ ᾱBóēĩõ, όῖ ἰðĩBĩ ἰðĩñāB ἰᾱ ᾱíóēᾱñᾱóᾱB ᾱðᾱòēᾱBᾱò óᾱ ēŨðēĩ ᾱðĩçēᾱᾱóóēēũ ἰᾱóῖ ÷ñçóēĩἰðĩēPῖᾱò όῖ ðñũᾱñᾱἰᾱ dd(1).

Ἰέ ᾱðᾱñᾱBóçõᾱò ᾱíóῖēYò ðññēᾱēĩYĩĩõ ἰᾱ ᾱçìέìõñāçēᾱB Yĩá ᾱBāũēĩ όῖõ **NanoBSD** ᾱBῖᾱέ ἰē ᾱῖPò:

```
# cd /usr/src/tools/tools/nanobsd ❶
# sh nanobsd.sh ❷
# cd /usr/obj/nanobsd.full ❸
# dd if=_disk.full of=/dev/da0 bs=64k ❹
```

- ❶ ἈēēᾱᾱP ᾱδũ όῖῖ ðñY ÷ῖῖᾱ ἑᾱòŨēĩᾱĩ óóῖῖ ᾱᾱóēēũ ἑᾱòŨēĩᾱĩ όῖõ óᾱῖᾱñBῖõ ᾱçìέìõñāBᾱò όῖõ **NanoBSD**.
- ❷ ἈēēBῖçóç όçò ᾱçìέìõñāBᾱò όῖõ ᾱēᾱPēĩõ.
- ❸ ἈēēᾱᾱP ᾱδũ όῖῖ ðñY ÷ῖῖᾱ ἑᾱòŨēĩᾱĩ óóῖῖ ἑᾱòŨēĩᾱĩ ðῖõ ðᾱñēY ÷ᾱέ όῖ ᾱBāũēĩ όῖõ **NanoBSD**.
- ❹ ἈíóēᾱñᾱóP όῖõ **NanoBSD** óᾱ Yĩá ἰYóῖ ᾱðĩēPēᾱðóçò.

## 2.3 Đñĩóáñĩũæĩíóᾱò όῖ ᾱBāũēĩ όῖõ NanoBSD

Ἀóõũ ᾱBῖᾱέ ðēēᾱῖũᾱᾱóᾱ όῖ ðēĩ óçᾱíóēēũ ἑᾱέ ðēĩ ᾱῖᾱἑᾱóYñῖ ÷ᾱñᾱēóçñēóóēēũ όῖõ **NanoBSD**. Ἀóõũ ᾱBῖᾱέ ἑᾱέ όῖ ἰYñῖõ όçò ᾱēᾱᾱēᾱóBᾱò ᾱῖŨððῖçò όῖõ ᾱēᾱPēĩõ **NanoBSD** ᾱἑᾱ όῖ ἰðĩBĩ ἑᾱ ῖᾱᾱYᾱᾱóᾱ Yĩá ἰᾱᾱŨēĩ ðῖóῖóõũ όῖõ ÷ñũῖῖõ ðñᾱðῖēῖᾱóBᾱò όῖõ ᾱēᾱPēĩõ.

Ç ᾱēũēĩõç ᾱíóῖēP ἑᾱ ēŨῖᾱέ όῖ `nanobsd.sh` ἰᾱ ᾱēᾱᾱŨᾱέ óēð ñðēῖBᾱᾱéð όῖõ ᾱδũ όῖ ᾱñ ÷ᾱBῖ `myconf.nano` ðῖõ ᾱñBᾱēᾱᾱᾱέ óóῖ ðñY ÷ῖῖᾱ ἑᾱòŨēĩᾱĩ:

```
# sh nanobsd.sh -c myconf.nano
```

Ç ðñῖóᾱñῖᾱP ἑᾱέ ðᾱñᾱᾱðñῖῖBçóç όῖõ **NanoBSD** ᾱBῖᾱᾱέ óῖῖPēũð ἰᾱ ᾱYῖ ðñũðῖõð:

- ἈðēēῖᾱYð ᾱēᾱῖũñðũóçò
- ĐñĩóáñĩĩóĩYĩᾱð óóῖᾱñðPᾱᾱéð

### 2.3.1 ἈðēēῖᾱYð ᾱēᾱῖũñðũóçò

Ἰέ ñðēῖBᾱᾱéð όῖõ **NanoBSD** ἰðĩñῖYῖ ἰᾱ ÷ñçóēĩἰðĩēçēῖYῖ ᾱἑᾱ ἰᾱ ἰñēóõῖYῖ ðñῖóᾱñῖᾱYῖᾱð ᾱðēēῖᾱYð ἰᾱᾱᾱēPðᾱēóçò ἑᾱέ ᾱᾱἑᾱòŨᾱᾱóçò όῖõ FreeBSD. ἈóðYð ἰē ᾱðēēῖᾱYð ᾱðçñᾱŨᾱῖῖῖ óᾱ óðŨᾱἑᾱ `buildworld` ἑᾱέ `installworld` όῖõ **NanoBSD**, ἑᾱēPð ἑᾱέ Ũēᾱð ᾱðēēῖᾱYð όçò ᾱçìέìõñāBᾱò όῖõ óᾱēēῖYῖ ᾱēᾱPēĩõ. Ἰᾱ óēð ἑᾱòŨēççᾱð ñðēῖBᾱᾱéð όῖ **NanoBSD** ἰðĩñāB ἰᾱ ἰēēñYῖᾱέ ᾱñᾱᾱŨ óᾱ ἰYᾱᾱēĩð. ἰðĩñāB ἰᾱ ÷ñYᾱἑ Yĩá ðῖēYῖ ἰēēñũ ððῖóYῖῖῖ όῖõ ᾱᾱóēῖYῖ FreeBSD óᾱ ÷Pñῖ ἰēēñũðᾱñῖ ᾱδũ 64MB. ἸðĩñāBᾱ ᾱðBóçò ἰᾱ ÷ñçóēĩἰðĩēPᾱᾱᾱ óēð ᾱðēēῖᾱYð όῖõ **NanoBSD** ᾱἑᾱ ἰᾱ ᾱçìέìõñāPᾱᾱᾱ Yĩá ᾱBāũēĩ ðῖõ Y ÷ᾱέ ἰũῖ όῖῖ ðñPῖᾱ ἑᾱέ ᾱðῖ-ðñBᾱ ᾱñ ÷ᾱBᾱ óóῖ ᾱᾱóēēũ óYóççᾱ.

Όῖ ᾱñ ÷ᾱBῖ ñðēῖBᾱᾱῖ όῖõ **NanoBSD** ðᾱñēY ÷ᾱέ ᾱíóῖēYð ἰē ἰðĩBᾱð ἰñBᾱῖῖῖ ῖYᾱð óēῖYð ᾱἑᾱ ēŨðῖᾱ ᰄñῖᾱēῖñēóῖYῖç ἰᾱᾱᾱēçòP P ᰄᾱᾱᾱᾱῖῖῖ óēð ððŨñ ÷ῖõᾱð ñðēῖBᾱᾱéð. Ἰέ ðēĩ óçᾱíóēēYð ἰᾱᾱᾱēçòYð ᾱBῖᾱέ ἰē ᾱῖPò:

- `NANO_NAME` — Όῖ ῖũῖᾱ όῖõ ᾱēᾱPēĩõ **NanoBSD** ðῖõ ἑᾱ ᾱçìέìõñāçēᾱB (÷ñçóēĩἰðĩēᾱBᾱἑ ᾱἑᾱ ἰᾱ òðēŨῖᾱέ óᾱ ῖῖῖᾱᾱᾱ ðũῖ ἑᾱòŨēĩᾱῖ ᾱñᾱᾱóBᾱð).

- NANO\_SRC — C αεάάνηP όiό αYiόñiό δcάάβiό εpάεεά όi iόβi εά ÷ñcόeiiδiεcεάβ αεά iά iάόαεuόόeόόάβ όi άβάuεi.
- NANO\_KERNEL — Όi uñá όiό άñ÷άβiό ñeìβóáui δōñPiá όi iόβi εά ÷ñcόeiiδiεcεάβ αεά iά ÷όeόόάβ i δōñPiáό όiό áεāpεiό.
- CONF\_BUILD — ΆδeεiāYό δiό δāññiYi όói óóŬāeī buildworld όcό iάόάāēpόόeόόό όiό FreeBSD.
- CONF\_INSTALL — ΆδeεiāYό δiό δāññiYi όói óóŬāeī installworld όcό δñiāóieiaóóáό όiό áεāpεiό.
- CONF\_WORLD — ΆδeεiāYό δiό δāññiYi εάe óóá āYi óóŬāeā όcό δñiāóieiaóóáό όiό áεāpεiό, εάe óói buildworld εάe óói installworld.
- FlashDevice — Ĩñβāē όii óYđi όiό iYóio áðēðēāóόόό δiό εά ÷ñcόeiiδiεcεάβ. Áεá δāñeóóuóāñāό ēāðōñYñāeāό āāβóā όi άñ÷āβi FlashDevice.sub.

### 2.3.2 ΔñiόāñiioiYiāó ÓóiañōPóāeó

Όói άñ÷āβi ñYēiεόόό όiό NanoBSD iđiñāβ iά ñeìeóóáβ ó÷āāui ēŬēā ēāðōñYñāeā όcό δñiāóieiaóóáό όiό áεāpεiό εάe όiό óāeēēYi áεāpεiό όi iόβi εά ācieiōñācēāβ. ×ñcόeiiδiεpíóáό iēēñYó óóiañōPóāeó oēiēYi, iđiñiYi iά ñeìβóioiā óā ðŬiόā. Áεá δāñŬāāēāiā, iđiñiYi iά óñYñoiā āeēYó iāó āiόēYó iē iđiβāó δāñāiāóñiδiēiYi ói óāeēēu āβāuēi uó āiPó:

```
cust_foo () (
    echo "bar=topless" > \
        ${NANO_WORLDDIR}/etc/foo
)
customize_cmd cust_foo
```

iά δeī ÷ñPóeii δāñŬāāēāiā óoiŬñόcόό oēiēYi, c iđiβā ñeìβāēāē ēŬđiēā δāñŬiāóñi óiό óāeēēYi áεāpεiό, āβiāē áóóu δiό áēiēiōēāβ. C óoiŬñόcόc cust\_etc\_size āēēŬāē όcī δñiāðēēāiYiYi óeīP iāāYēiōó όiό ēáóāēuāiō /etc áđu 5MB óā 30MB:

```
cust_etc_size () (
    cd ${NANO_WORLDDIR}/conf
    echo 30000 > default/etc/md_size
)
customize_cmd cust_etc_size
```

Όi óāiŬñēi oēiēYi δiό ācieiōñāāβ όi NanoBSD Y÷āē iāñēēYó Yóieiaó óóiañōPóāeó oēiēYi iē iđiβāó āeðāēiYi óYóieāó āðēðēYiñ ñeìβóāeó:

- cust\_comconsole — Άðāiñāñiđiēāβ ói getty(8) óóeó ēiíóuēāó VGA (iē óóóēāōYó /dev/ttyv\*) εāē āiñāñiđiēāβ όcī ÷ñPόc όcό óāēñēāēPó ēYñāó COM1 uó ēiíóuēā óóóóPiāóio.
- cust\_allow\_ssh\_root — ΆðēōñYðāē όcī āβóiiāi óiό ÷ñPόc root iYóu óiό sshd(8).
- cust\_install\_files — ΆāēāeéóóŬ άñ÷āβā áđu óii ēáóŬēiāñ nanobsd/Files. Óā áóóu óii ēáóŬēiāñ āñβóēiioāē iāñēēŬ ÷ñPóeīā óāiŬñēā oēiēYi āeā όc āeā÷āβñeóc āiuó óóóóPiāóio NanoBSD.

### 2.3.3 ΔñiόēYóiiioáó ΔāēYóá

Óā Yiā āβāuēi NanoBSD iđiñiYi iā δñiόóāēiYi εāē Yóieia δāēYóá, δiό Y÷iōi óóēā÷óāβ áđu δñēi ÷ñcόeiiδiēpíóáό όc ÓōēēiāP óui Ports. Iēā óoiŬñόcόc oēiēYi iđiñāβ iā āāēāóāóóPóāē Yiōñā δāēYóá όcī pñā δiό δñiāóieiŬāeāē ói

ãßãũẽ. Άέά ðãñŨããéãĩá, ç ðãñãêŨòũ óõĩŨñôçóç èá åãéãóáóôðóãé óõĩ ãßãũẽĩ üëá óá ðãêŸóá ðĩõ ãñßóẽĩĩóáé óõĩĩ éãóŨẽĩãĩ /usr/src/tools/tools/nanobsd/packages:

```
install_packages () (
mkdir -p ${NANO_WORLDDIR}/packages
cp /usr/src/tools/tools/nanobsd/packages/* ${NANO_WORLDDIR}/packages
chroot ${NANO_WORLDDIR} sh -c 'cd packages; pkg_add -v *;cd ../'
rm -rf ${NANO_WORLDDIR}/packages
)

customize_cmd install_packages
```

### 2.3.4 ðãñŨããéãĩá Áñ÷ãßĩõ ñõèĩßóãũĩ όĩõ NanoBSD

ĩá ðẽðñãð ðãñŨããéãĩá ãñ÷ãßĩõ ñõèĩßóãũĩ áéá õĩ **NanoBSD**, ìã æéŨõĩñãð ñõèĩßóãéð áéá ôç ìãóããẽðóðéóç όĩõ FreeBSD éáé ôçĩ ðñĩãóĩéĩáóßá όĩõ ôãéééĩŸ áéãðẽĩõ, ìðñĩãß ìá ìéŨæãé éŨðũð Ÿóóé:

```
NANO_NAME=custom
NANO_SRC=/usr/src
NANO_KERNEL=MYKERNEL
NANO_IMAGES=2
```

```
CONF_BUILD='
NO_KLDLOAD=YES
NO_NETGRAPH=YES
NO_PAM=YES
'
```

```
CONF_INSTALL='
NO_ACPI=YES
NO_BLUETOOTH=YES
NO_CVS=YES
NO_FORTTRAN=YES
NO_HTML=YES
NO_LPR=YES
NO_MAN=YES
NO_SENDMAIL=YES
NO_SHAREDOCS=YES
NO_EXAMPLES=YES
NO_INSTALLLIB=YES
NO_CALENDAR=YES
NO_MISC=YES
NO_SHARE=YES
'
```

```
CONF_WORLD='
NO_BIND=YES
NO_MODULES=YES
NO_KERBEROS=YES
NO_GAMES=YES
NO_RESCUE=YES
NO_LOCALES=YES
```

```
NO_SYSCONS=YES
NO_INFO=YES
'

FlashDevice SanDisk 1G

cust_nobeastie() (
    touch ${NANO_WORLDDIR}/boot/loader.conf
    echo "beastie_disable=\"YES\" " >> ${NANO_WORLDDIR}/boot/loader.conf
)

customize_cmd cust_comconsole
customize_cmd cust_install_files
customize_cmd cust_allow_ssh_root
customize_cmd cust_nobeastie
```

## 2.4 Άίçìåñþííîáò òï NanoBSD

Ç äéääééáóβά áίçìÝñòçð òïò **NanoBSD** áβíáé ó÷-áðééÛ áðēP:

1. Άçìéïñāβā áñüð íÝïò äéåþēïò **NanoBSD**, íā òï óðíçèéóìÝíí ðñüðï.
2. ÁíÝāáóíā òïò íÝïò äéåþēïò óā íéā á÷-ñçóéíñðíçç ìéåðÛðíççç íéåð óðóéāðPð ðïò ðñÝ÷-äé **NanoBSD**.  
Ç ðēí óçíáíðéēP äéáóíñÛ áððíý òïò óçíāβïò áðñü óçí āñ÷-éēP āāéáðÛóðáóç òïò **NanoBSD** áβíáé üðé ðþñā áíðβ òïò āñ÷-āβïò `_.disk.full` (òï ïðñβí ðāñéÝ÷-äé òï āβāñēï áñüð ïēüēēçñïò āβóēïò), āāéáðáóðÛēçēā òï āñ÷-āβïò `_.disk.image` (òï ïðñβí ðāñéÝ÷-äé òï āβāñēï íéåð ïññ éåðÛðíçççð òïò āβóēïò).
3. Êēāβóéñ éāé āðáíāēēβíççç òïò óðóðPíāðïò áðñü óçí íÝā āāéáðáóççìÝíç éåðÛðíççç.
4. Áí üēā ðÛíā éāēÛ, ç áíāāÛēìéóç ðāēāβñóā.
5. Áí ïðēāPðñïā ðÛāé óðñāāÛ, āðáíāēēēPóðā òç óðóéāðP áðñü óçí ðñíçāñýíāíç éåðÛðíççç (ç ïðñβā ðāñéÝ÷-äé òï ðāēéü āβāñēï, ðïò ēāéðïññāβ óñóðÛ). ðóé ïðññāβðā íā āðáíāóÝññāðā Ûñāóā òï óýóðçíā óā ēāéðïññāēēP éåðÛóðáóç. Äēññēþðā ïðñéāāPðñïā ðññāēPíāðā Ý÷-äé òï íÝí āβāñēï, éāé āðáíāēÛāāðā òçí äéääééáóβά.

Äéā íā āāéáðáóðāēāβ òï íÝí āβāñēï óā Ýíā óýóðçíā **NanoBSD**, òï ïðñβí þāç āñβóéāðāé óā ēāéðïññāβā, ïðññāβ íā ÷-ñçóéññðñēçēāβ āβðā òï óāñÛñēï `update1` āβðā òï `update2`. ÁððÛ óā äýí óāñÛñēā ðēñēý āñβóéññāé óðñ éåðÛēññ /root.

ÁñÛēñā íā ðéð ððçññāóβāð òïò óðóðPíāðïò óðñ ïðñβí āçìéïññāβðāé Ýíā āβāñēï **NanoBSD**, ïðññāβ íā ïāðáðññēāβ Ýíā íÝí āβāñēï óðñ ðāēéü óýóðçíā íā äēÛññïòð ðñüðïòð:

### 2.4.1 ×ñçóéññðñēççð òï ftp(1)

Áí óāð áñāéáóÝññāé ç éāēP óā÷ýðçðā ïāðáóññÛð, ÷-ñçóéññðñēççð òï FTP äéā òç ïāðáóññÛ òïò äéåþēïò:

```
# ftp myhost
get _.disk.image "| sh update1"
```

## 2.4.2 ×ñçόείiðēpíóáo ðī ssh(1)

Αί όáo άάέάöÝñάε ç ιάόάöiñÛ ðið áέäpēið íá αβίάέ ιά άόöáεP ðñüði éάé äáí Ý÷άöá άöáέñÝóάέ áðü ði άñ÷έéü άβäüēi ði ssh(1), ðñiðēiðóóá ðç ιάόάöiñÛ iÝóù SSH:

```
# ssh myhost cat __.disk.image.gz | zcat | sh updatepl
```

## 2.4.3 ×ñçόείiðēpíóáo ðī nc(1)

Αί ði όýóðçιά óði iðiβi Ý÷άέ äçìēiðñāçèåβ ði iÝi άβäüēi ðið **NanoBSD** äáí ðñÝ÷άέ iýóå ftpd(8) iýóå sshd(8), iðiñåβðå íá ÷ñçόείiðēPóóå Üēéá åñāéååβá áéá ðç ιάόάöiñÛ, üðüð ði nc(1):

1. Ðñpóå áñiβiðå Ýíá áiððçñåðçðP TCP óði όýóðçιά ði iðiβi éå ðånÝ÷άέ ði iÝi άβäüēi, éάé iñβóðå ði iÝi άβäüēi üð áβóñiñ áéá ðç ιάόάöiñÛ ðið éå αβίάέ άñäüðåñå:

```
myhost# nc -l 2222 < __.disk.image
```

**Note:** Ðñéí áðü áðöü ååååéüèåβðå üðé ç èýñå ðið ÷ñçόείiðēååβðå áéá ði áiððçñåðçðP iðiñåβ íá åä÷èåβ áéóåñ÷üiáíð óóíäÝóáéð áðü ði όýóðçιά **NanoBSD** ðñið ði όýóðçιά ðið áiððçñåðçðP, éάé äáí åiðiåβæåðåé, áéå ðånÜååéåíå, áðü èÜðēið ååβ÷ið ðñiðóóóóåð (“firewall”).

2. Óóíäæååβðå áðü ði **NanoBSD** óði áiððçñåðçðP, i iðiβið áβίάέ Pæç Ýðēiðíó íá ðånÝ÷άέ ði iÝi άβäüēi, éάé ðñiðñiðååβðå ði óáíÜñēið öēiēý updatepl ιå ðçí Ýñiñi ðið åñāéååβið nc(1):

```
# nc myhost 2222 | sh updatepl
```