

# Ç ĩñãŨíùóç ôùí Âêäüóãùí ôĩõ FreeBSD

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\$FreeBSD: doc/el\_GR.ISO8859-7/articles/releng/article.sgml,v 1.8 2008/12/08  
03:10:52 keramida Exp \$

Áðòù òĩ Ũñèñĩ ðãñéãñŨöáé ôçĩ áĩòéĩãððéóç éáé ĩñãŨíùóç ôçò ñŨãáð áĩŨððòĩçð òĩõ FreeBSD, ùóĩĩ áðĩñŨ óôçĩ ðñĩãðòĩéĩáóßá ðĩéĩðééðĩ äêäüóãùĩ òĩõ Êäéðĩðñäéçĩ Óðóðßĩáðĩð FreeBSD. Âĩçããß ĩã äãððñŨŨñáéá ôçĩ ĩãèĩãĩèĩãßá ðĩõ ÷ ñçóéĩĩðĩéãßðáé äéá ðéð äðßóçĩãð äêäüóãéð òĩõ FreeBSD éáé ðãñéãñŨöáé óá ãñãáéãßá ðĩõ äßĩáé äéáéŸóéĩá óá ùóĩðð áĩãéáóŸñĩóáé ĩá ðãñŨãĩðĩ ðãñãĩãðñĩðĩéçĩŸĩãð äêäüóãéð òĩõ FreeBSD äéá áóùðãñééð ð ãĩðĩñééð ÷ ñðóç éáé áĩŨððòĩç ðñĩũĩĩðùĩ.

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## 1 Áéóáãũãð

Ç áĩŨððòĩç òĩõ FreeBSD äßĩáé ĩéá ðĩéŸ áĩñé ÷ ðð äéãäééãóßá. Òĩ FreeBSD áðĩðãéãßðáé áðũ óóĩãéóóĩñŸð ÷ éééŨãũĩ áĩèñðùĩ áðũ ùéĩ òĩĩ èũóĩĩ. Ç ñŨãá òĩõ FreeBSD ðãñŸ ÷ äé ðñũóãáóç ĩŸóù áĩðĩðĩð CVS[1] óá ùéĩðð, Ÿðóé þóðã ĩá ĩðĩñãß ùðĩéĩð èŸéãé ĩá äãé ĩçĩŸĩáðá log, äéãðĩñŸð (patches) ðĩõ Ÿ ÷ ĩðĩ óá äéŨðĩñã development branches, éáé Ũèãá ÷ ãñãáðçñéóðééŨ ðĩõ äĩçèĩŸĩ ôçĩ áĩŨððòĩç, óá ĩðĩßá ðñĩéŸððĩðĩ áðũ ôçĩ ÷ ñðóç áĩũð áðððçñĩŸ óðóðßĩáðĩð äéá ÷ ãßñéóçð èðãééá. Áðòù áðĩðŸéãóá éáé òĩĩ ðéĩ óçĩáĩóéèũ ðãñŨãĩðá Ÿéĩçð äéá Ÿĩá ĩããŨéĩ ãñéèĩũ áðũ óáéáĩðĩŸ ÷ ĩðð ðñĩãñãĩãðéóðŸð áðũ ùéĩ òĩĩ èũóĩĩ óóĩ FreeBSD. Âßĩáé ðñĩðãĩŸð, áŸãáéá, ðùð ðĩéŸ óŸĩðñã éã äß ÷ ã ãßĩáé áĩðãèð ÷ áĩðééð ç éãðŨóðáóç áĩ äß ÷ áĩ ùéĩé, áðũ ùéĩ òĩĩ èũóĩĩ, ðñũóãáóç ĩá ãñŨðĩðĩ óóĩ èðãééá. Äé’ áðòù, ĩũĩ ĩéá “ãðééããĩŸĩç” ñŨãá áðũ ðãñßðĩð 300 Ũðñã Ÿ ÷ ĩðĩ ðñũóãáóç ĩá ãñŨðĩðĩ óóĩ CVS repository. Áðòĩß ĩé committers[6] äßĩáé ððãŸéðñĩé äéá òĩ ĩããáéŸðãñĩ ĩŸñĩð ôçò áĩŨððòĩçðð ðĩõ äßĩãðáé óóĩ FreeBSD. ĩéá

*ἐπιτοῖες*-*nÜaa*[7] (core team) ἄδὺ ἀέαεᾶñēīYfirōð ðñĩāñāĩłáóeóóŸð āæYāãóáé áéá íá ðānY÷-āé ēÜðĩéíōð āBäiřōð ēāērāPāçóc éāé łéá ēáoăyēōĩóç óõĩ óýfĩēĩ õũĩ committers.

Ίε οά÷ýðáoðιε ñðειñß ářŨðððñçð ðιò FreeBSD áář áðßññí έάε ðιεύ ÷ ñññí άέα ðι ίάέάεŨñέοίá ðιò ððððßιάðιð  
 ářŨðððñçð ðά ίέα Ύέαιòç ίά ðιεύðçðά ðιò ίά áñßάέε ίά ÷ ñççέñιððιέάßðάέ áðñŨýð. Άέα ίά εðέåß áððñ ðι áßέέçíá, ç  
 ářŨðððñçð áßíáðάέ ðáððñ÷ ññíá ðά áñ ðáñŨέέçέá ίññðŨðέα. Ĩ έýñέιð έññññð ářŨðððñçð áßíάέ Ĩ **HEAD** ð *trunk* ððι CVS  
 repository ίάð, áññððñð έάέ ùð “FreeBSD-CURRENT”, ð “-CURRENT” ář ððñññßá.

[illegible][illegible]

Όρία÷πο οόÝεirióáé áðu ôiôð ÷ñPóðáð iáo áíáoiñÝð ðñiáεçiÜôui éáé áéðPóáéð áéá éáéirýnéá ÷áñáéðçñéóóééÜ, éáôÜ ôç áéÜñéáéá ôiô éýééiô ôçð éÜèá Ýéáioçð. Ié áíáoiñÝð ðñiáεçiÜôui áéóÜáñióáé óôçi áÜôç **GNATS**[9] iÝóu e-mail, iá ôçi áóáñiãP send-pr(1), P iÝóu ôiô web-interface ôiô ðáñÝ÷áðáé óôçi áéáýéôióç <http://www.FreeBSD.org/send-pr.html>. Áêôüð áðu óéð áéÜôüñáð éßóðáð çáêôññiééý óá÷óáññáßiô iá éÝiá óá ðá÷íééÜ ÷áñáéðçñéóóééÜ ôiô FreeBSD ôðÜñ÷áé éáé ç éßóðá çáêôññiééP éßóðá ÁéÝá÷iô éáé ÁíáóóÜééóçð Ðiéúôçóáð ôiô FreeBSD (<http://lists.FreeBSD.org/mailman/listinfo/freebsd-qa>), ç iðiá ðáñÝ÷áé Ýiá öüñiôí áéá óðæçðPóáéð ó÷áðééÜ iá óéð éáððñÝñáéáð ôçð “ññáÜñúôçð ôui áéäüóäñ”.  


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Ἄεά íá áñòðçñáðòçείρýí íé ðεί òòíòçñçðéeίß ÷ ñÞóðáð íáð, íá Ἰέαίòç òñ FreeBSD 4.3 áñ÷ßáíá íá ÷ ñçòçείñðίείρýíá íá÷÷ñέóóóóò çíñíñýð áεáυóáυí. Ἀðòίß íé çíñíñß áçίείññáñýíóáε εßáí ðñßí òðεá÷ðáß ç ðáεέεß Ἰέαίòç. ἸáðÜ ðçí áíáείßñύòç ðçð Ἰέαίòçð, íυñ ðίεý ççίáíðéeÝð áεεááÝð εáε ðñíòεÞεáð ó÷áðéeÝð íá ðçí áóðÜεάá áßñííóáε óðίí çíñíñ ðçð Ἰέαίòçð. Ἀέυòð áðñ ðçí áñíáðύðçðá áíááÜείεòçð íÝóύ CVS, áέðáεÝóεíá patchkits òðεÜ÷ñííóáε áεá íá ðίñíñý íá áíáááειßòίòí ðá óðóðÞíáðÜ ðíðð υóίε ÷ ñçòçείñðίείρýí ðéð áεáυóáεð *RELENG\_X\_Y*.

Οι ΟιΠια 2 αιçããß ìã ããððñŸñããð ðã ããŸðñã ððŸãã ðçð ããããããðßãð ðñ ãñßðãðãã ðßòñ ãðu ãŸãã Ÿããðç, ìŸ ÷ ñã ããã ðã ãñããðã ðñ ããçãŸŸ ðçðŸ ìãðããðððððçð ðñ ððððñããðñ ãã ðñ ΟιΠια 3 αιçããß ðçŸ ìããã ðç ããããããðßã ðçð ìãðããððððçðð. Οι ΟιΠια 5 ðãñããñŸðã ðñ ðññãß ìã ððããðããß ðñ ããðãã ðŸððçãã ãðu ðñßðñð ãã ðñ ΟιΠια 6 ðãñããñŸðã ãŸðñãã ãðu ðã ðñŸãããðã ðñ ìŸããã ãðu ðçŸ ããããããðßã Ÿããðçð ðñ FreeBSD 4.4. ŸŸñð, ðñ ΟιΠια 7 ðãñððãŸãã ãŸðñãã ãðu ðãð ããðãðŸŸããð ðñ ãŸñðãã ìã ðŸñã ç ãñŸðððç ðñ ìŸãã.

2 Ç Äéääéêáóßá Äçïéïõñãßàò ìéàò êäïóçò

Ίε ιΎάο άέαυόάέο όις FreeBSD όόεΰ÷-σίοάέ άδύ όις -STABLE έιμιύ άίΰόόόις όάσβδισ έΰέα όΎόόάσάέο ιΰίάο. ϸ έέάέέέάόβá όσισόίειάόβáό έέάό Ύέαιόςόό ίάέέΰάέ ό÷άαί 45 ιΎσάό όσεί όςί άίάίάίάίς ϸάσσςίβá Ύέαιόςόό, υόάί ι όόάγέόσίο άέάυόάίς όις FreeBSD όόΎέίάέ Ύίá άσΰίá όόέό έβόόá όυί όσισάσάέόέόόίς άέá ίá όόάέέόίβáέ όόίςόό όσισάσάέόέόόΎό υόέ Ύ÷ίς 15 ιΎσάό έάέσυ ίá έΰίςίς υόίέάό άέέάáΎό έΎέίς, όσεί όί δΰάσá όις έπáέέá. ΊΎόá όá άόόυ όις έάέσυ, όέέέίβ όσισάσάέόέόόΎό έΰίςίς ίέá όάέσΰ άδύ άέέάáΎό όίς Ύ÷ίς ίáβίáέ όέΎίς άίυόόΎό υόό “ίáέάέάσβόίάόá MFC”. Ί υίςίς MFC όςίáβίáέ “Merge From CURRENT” έάέ όάέέάσΰάέ όςί έέάέέέάόβá όσισάσάέόό

òĩō ēpāēēā iēāō āiēēiāōĩŸĩçð āēēāāpð áðũ òĩĩ -CURRENT ðāēñāiāóēēũ ēĩñĩũ áĩŪððōĩçð óðĩĩ óðāēāñũ -STABLE ēĩñĩũ.

## 2.1 ĩēāā ÷ iō ēpāēēā

ŌñēŪiōā çĩŸñāð ðñēĩ òçĩ áĩāĩāĩũĩāĩç çĩāññĩçĩā Ÿēāiōçð, ĩ ēpāēēāð òĩō repository āēóŸñ ÷ āðāē óā iēā ðāñbĩrāĩ “ēāēðóóŸñçóçð”. ĒāðŪ òç āēŪñēāēā āððð òçð ðāñēũāĩð, ũēāð iē āēēāāŸð óðĩĩ -STABLE ēĩñĩũ ðñŸðāē iā Ÿ ÷ iōĩ òçĩ Ÿāēñēóç òçð Release Engineering Team <re@FreeBSD.org>. Ĩē āēēāāŸð ðĩō āðēōñŸðĩiōāē óā āððp òçĩ ðāñbĩrāĩ ðĩō āēāñēāb 15 çĩŸñāð ābĩāē:

- Āēĩñēpóāēð āĩüóðĩĩ ðñĩāēçĩŪðũĩ.
- Āĩçĩāñpóāēð óðçĩ ðāēĩçñbũóç.
- ĀēēāāŸð ó ÷ āðēēŸð iā òçĩ áóðŪēāēā.
- ĨēēñŸð āēēāāŸð óðĩið ïāçāĩŸð óðōēāðĩ, ũðũð ð. ÷. ç ðñĩōēðēç òũĩ IDs iŸũĩ óðōēāðĩ.
- Ĩðĩēāāððĩōā Ūēēç āēēāāp ðēóðāŸāē ç ñŪāā áĩŪððōĩçð ũðē ðñŸðāē iā ābĩāē, iā òĩ áĩāĩāĩũĩāĩ ðŪiōā ñbōēĩ.

ĨāðŪ òēð ðñpóāð 15 ĩŸñāð ēāēðóóŸñçóçð, òðēŪ ÷ iāðāē iēā āiēēiāóóēēp Ÿēāiōç āēā iā ÷ ñçóēĩĩðĩēçēāb óāĩ āiēēĩp òçð ðāēēēpð Ÿēāiōçð ēāē ĩ ēpāēēāð āēóŸñ ÷ āðāē óā iēā ðāñbĩrāĩ “ðāāpĩāðĩð”. ðēŸĩĩ ābĩāē ðĩēŸ ðēĩ āŸóēĩēĩ iā ābĩĩĩ iŸāð āēēāāŸð óðĩ óŸóðçĩā, āēðũð ēē áĩ āēĩñēpñĩĩ ēŪðĩēĩ ðĩēŸ ðĩāāñũ bugp ēŪðĩēĩ ðñũāēçĩā áóðŪēāēāð. ĒāðŪ òç āēŪñēāēā òĩō ðāāpĩāðĩð òĩō ēpāēēā, òĩðēŪ ÷ éóðĩĩ ĩbā āiēēiāóóēēp Ÿēāiōç òðēŪ ÷ iāðāē ēŪēā āāāñŪāā, ĩŸ ÷ ñē iā ābĩāē Ÿĩēĩç ç ðāēēēp Ÿēāiōç. Ōēð çĩŸñāð āēñēāpð ðñēĩ òçĩ ðāēēēp Ÿēāiōç, ç ñŪāā ðĩō ābĩāē òðāŸēðĩç āēā òēð āēāũóāēð ābĩāē óā óðĩā ÷ p āðēēĩēĩũĩā iā òçĩ ñŪāā áóðŪēāēāð, òçĩ ñŪāā óðĩðpñçóçð òçð ðāēĩçñbũóçð, ēāē òçĩ ñŪāā óðĩðpñçóçð òũĩ ports, āēā iā āāāāēũēĩŸĩ ðũð ũēā óā āðāñābðçðā ēĩñŪðēā āēā iēā ðēpñç Ÿēāiōç ābĩāē āēāēŸóēĩā.

## 2.2 Ēbóóā ĀēŸā ÷ iō òçð Ōāēēēpð ēāĩōçð

Ÿðāĩ āñēāðŸð āiēēiāóóēēŸð āēāũóāēð Ÿ ÷ iōĩ ābĩāē āēāēŸóēĩāð, Ÿ ÷ iōĩ āiēēiāóóðāb áðũ āñēāðũ ēũóĩĩ ēāē ũēā óā òĩāāñŪ ēŸĩāóā Ÿ ÷ iōĩ áĩāēōēāb, ç ðāēēēp Ÿēāiōç ĩðĩñāb iā āñ ÷ bóāē.

### 2.2.1 Āçĩēĩñābā òĩō ēĩñĩŸ ēāĩōçð

Ÿðũð ðāñēāñŪøāĩ òççĩ āēóāāũāp, iē ēĩñĩb RELENG\_x\_y ābĩāē iēā ó ÷ āðēēŪ iŸā ðñĩōēðēç òççĩ ĩāēĩāēĩābā òũĩ āēāũóāĩ iāð. Ōĩ ðñpðĩ āpĩā òççĩ āçĩēĩñābā áðōĩŸ òĩō ēĩñĩŸ ābĩāē iā āāāāēũēābðā ũðē āĩōēāŸāðā iā òçĩ ðāēāðóābā Ÿēāiōç òĩō ðçāābĩð ēpāēēā áðũ òĩĩ RELENG\_x ēĩñĩũ áðũ òĩĩ ĩðĩbĩ ēā òðēŪiāðā òĩ iŸĩ ēĩñĩũ.

```
/usr/src# cvs update -rRELENG_4 -P -d
```

Ōĩ āðũāĩ āpĩā ābĩāē iā āçĩēĩñābāðāðā iēā āðēēŸðā (tag) óðĩ òçĩābĩ āēēbĩçóçð òĩō ēĩñĩŸ, pððā iā ĩðĩñābðā iā āābðā òēð āēāóĩñŸð iā òçĩ āñ ÷ p òĩō ēĩñĩŸ āŸēĩēā óðĩ ĩŸēēĩ iā òĩ CVS:

```
/usr/src# cvs rtag -rRELENG_4 RELENG_4_8_BP src
```

Ēāē òũðā ĩðĩñābðā iā āçĩēĩñābāðāðā òĩ iŸĩ ēĩñĩũ iā:

```
/usr/src# cvs rtag -b -rRELENG_4_8_BP RELENG_4_8 src
```

**Όχιὰβὺός:** *Ἰέ ἀθεέῃ Ὑδαῶ RELENG\_\* ἀβιάε ἀἀόιἀδὶ Ὑῖἀδ ἀέά ÷ ἡΠόϋ ἀδῦ οἶῶδ CVS-meisters ἐάέ ὄϋι ἡῪἀά οὐῖ ἀἔᾶῦῶᾶῖ.*

Ἰ uniõ “*ἀδελφὸς*” ἀβραάε ι̃νι̃ερα̃βὰ οἷο CVS. Ὁ γὰρ ἀβραάε ἦν ἡμῶν οἷο ἐαδὲν βαρὰε ιεᾶ ὁ ἀδελφὸς τοῦ ἐπαεᾶ οἷο ÷ nũfi. × η̃ççœĩĩd̃iẽp̃iõað̃õ ἀδελφὸς οἷο δççabĩ ἐπαεᾶ ἀρε̃Ü̃iã ũd̃iẽĩĩ ὁ δὲ Ü̃iã οἷο ι̃Ỹẽẽĩĩ ἀεαυοᾶεδ οἷο FreeBSD ιᾶ ἀνβὸεᾶε ἐᾶε ιᾶ ÷ η̃ççœĩĩd̃iẽãb̃ ἀεᾶε̃ap̃õ οἷο βαε̃ĩ ἐπαεᾶ οἷο ÷ η̃ççœĩĩd̃iẽp̃ẽçç̃ã ἁεᾶ οἷο ἀδβὸçĩãd̃ ἀεαυοᾶεδ οἷο ἦ Ü̃iãd̃ οἷο FreeBSD.

### 2.2.2 ÁóîÛííîáò ôíí Áñéèü êäïóçò

Ἐνῆι ἰθαῖ ἡ ἀοέεΥόα, ἰαοάαεουοοεοοάβ ἑαῖ ἀοιείαοοάβ ἡ οάεεῆβ Υέαιόρ, ὃνΥῆαῖ ἰά ἀβῖῖόι ἀεῖάαΥό οοά ῥαῖάεῆῆου  
 ἂν÷ἂβἂ ἑάἂ ἰά ῥαῖεΥ÷ῖόι ὀῖῖ οὐοοῆ ἂῖεῆῆι Υέαιόρὸ ἑάἂ ὀῖ FreeBSD:

- doc/en\_US.ISO8859-1/books/handbook/mirrors/chapter.sgml
- doc/en\_US.ISO8859-1/books/porters-handbook/book.sgml
- doc/share/sgml/freebsd.ent
- src/Makefile.incl
- src/UPDATING
- src/gnu/usr.bin/groff/tmac/mdoc.local
- src/release/Makefile
- src/release/doc/en\_US.ISO8859-1/share/sgml/release.dsl
- src/release/doc/share/examples/Makefile.relnotesng
- src/release/doc/share/sgml/release.ent
- src/share/examples/cvsup/standard-supfile
- src/sys/conf/newvers.sh
- src/sys/sys/param.h
- src/usr.sbin/pkg\_install/add/main.c
- www/en/docs.sgml
- www/en/cgi/ports.cgi
- ports/Tools/scripts/release/config

[illegible]

- `src/release/doc/en_US.ISO8859-1/relnotes/common/new.sgml`
- `src/release/doc/en_US.ISO8859-1/errata/article.sgml`

Ç ăoăniñăP **sysinstall** ðñÝðăe ăđđóçò íá áíçiaññùeăă ïă ôñí òùóóù áñéèùì òùì ports éác ôí ÷pñí ôiō ăăóéiō ðiō ăđăéóăăóăé ăéă ôçí ÔóëëiăP òùì Ports. ÁôôÝò íé ðëçñiôitñăă òđŰñ÷iôí ôóí ăñ÷ăăi  
src/release/sysinstall/dist.c.

Áöŷŷ îēēēçñùēāß ç ðñîāôîēíāóßá ôçð ŷŷáð āðßóçîçð ŷēāîóçð, ðñŷðāē íá áîçîāñþóāðā îāñēēŪ āñ÷āßá āēá íá áîçîāñþóāðā ôîŷ ēüôîŷ āēá ôç ŷŷá ŷēāîóç òîō FreeBSD.

- `www/en/includes.xml`
- `www/en/includes.sgml`
- `www/es/includes.sgml`
- `www/en/releases/*`
- `src/share/misc/bsd-family-tree`

### 2.2.3 Āçîēîññāßá òùí Āðēēāðîŷ ôçð ēāîîóçð

¼ðāí ç ðāēēēß ŷēāîóç āßíāē ŷôŷēîç, ç ðāñāēŪðù āŷôŷēß ēā āçîēîññāþóāē ôçí āðēēŷôā `RELENG_4_8_0_RELEASE`.

```
/usr/src# cvs rtag -rRELENG_4_8 RELENG_4_8_0_RELEASE src
```

Îē ððāŷēðŷŷē ôçð Ôāēîçñßùóçð ēāē òùí Ports āßíāē āðôŷß ðîō ðñŷðāē íá āçîēîññāþóîŷîŷ ðēð āðēēŷôāð `RELEASE_4_8_0` óðā ēāðŪēēçēā āŷîñā ðçāāßîð ēþāēēā.

Îāñēēŷð òîñŷð, îðñāß íá ÷ñāēáððāß íá āßŷîŷî ēŪðŷēāð āēēāāŷð ðāēāððāßá óðēāîß *îāðŪ* ôçí òîðŷēŷôçðç òùí āðēēāðîŷ. ĀāŷēēŪ, āāŷ āßíāē āŷôēŷēŷ íá āßíāē ēŪðē ôŷôŷēŷ āöŷŷ òŷ CVS āðēðñŷðāē íá îāðāēŷþóāē ēŪðŷēŷð ðēð āðēēŷôāð îā āŷôŷēŷð ùððð `cvs tag -d tagname filename`. Āßíāē ðŷŷŷ óçîāŷôēēü ùîðð āððŷð îē āēēāāŷð ôçð ðāēāððāßāð óðēāîßð íá óçîāēüŷŷŷ îā ðēð óùóðŷð āðēēŷôāð āēá ôçí óðāēāñēŷŷŷŷ ŷēāîóç. Îē āðßóçîāð āēāüóāēð òîō FreeBSD ðñŷðāē íá āßíāē ðŷŷôā āŷēŷŷŷ íá āíāðāñā÷ēŷŷŷ. Ôŷðēēŷð āēēāāŷð óðŷ ðāñēāŪēēŷŷŷ òîō îç÷āŷēŷŷ òùí āēāüóäüŷ āāŷ āðēðñŷðŷŷôāē.

## 3 Îāðāāēþððēóç ôçð ēāîîóçð

Îē “āēāüóāēð” òîō FreeBSD îðñŷŷŷ íá îāðāāēüððēóðŷŷŷ āðü îðŷŷŷāþðŷîā ŷ÷āē ŷŷá ó÷āðēēŪ āñþāñŷŷ îç÷ŷîçîā ēāē ðñüóāāóç óðŷ repository òîō ðçāāßîð ēþāēēā. (¼ēŷē ŷ÷ŷŷî āððß ôç āðŷāðüðçðā, āöŷŷ ðāñŷ÷ŷŷîā ðñüóāāóç îŷôü āŷŷŷîŷō CVS! Āāßðā òŷ Āā÷āēñßāēŷ òîō FreeBSD āēā ðāñēóóüðāñāð ēāððñŷñāēāð.) Ç îüŷç āēāēēß āðāßðçðç āßíāē íá ððŪñ÷āē ððŷîððñēŷç óðŷŷ ððñþŷŷá óāð āēá ôçí óððēāðß `vn(4)`. (Óðŷ -CURRENT, āððß ç óððēāðß ŷ÷āē āŷôēēāðāóāēāß āðü ôçí ŷŷá óððēāðß āßóēŷô āāóēóŷŷŷŷ óā îŷþç `md(4)`.) Áŷ ç óððēāðß āāŷ āßíāē āŷôüŷāðüŷŷŷç óðŷŷ ððñþŷŷá óāð, òüðā îē ēāðŪēēçēŷð îāçāüð ēā òŷñðùēāß āððüŷāðā üðāŷ āēðāēāððāß ç āŷôŷēß `vnconfig(8)` ēāðŪ ôç āēŪñēāēā ôçð òŪóçð ðôŷŷŷāðßāð òîō îŷôŷô āēēßŷçðçð. ¼ēā óā āñāāēāßā ðŷð ÷ñāēŪæŷŷôāē āēá íá îāðāāēüððßóāðā îēā ŷēāîóç āßíāē āēāēŷôēŷá óā îŷñðß ðçāāßîð ēþāēēā óðŷŷ ēāðŪēŷŷŷ `src/release`. ĀððŪ óā āñāāēāßā ŷ÷ŷŷŷ ùð óēŷðü íá ðāñŷ÷ŷŷŷ üðē ÷ñāēŪæŷŷôāē āēá íá ðßæŷŷôāē îē āēāüóāēð òîō FreeBSD îā ŷŷá óŷŷāðß ēāē óðāēāñēŷŷŷŷ òñüðŷŷ. Îēā ðēþñçð ŷēāîóç îðñāß íá îāðāāēüððēóðāß ÷ñçŷŷŷðŷŷŷŷāð āððŪ óā āñāāēāßā îā îēā ēāē îüŷŷ āŷôŷēß, óðŷðāñēēāŷāŷŷŷŷŷçð ēāē ôçð āçîēîññāßāð āŷüð ISO āñ÷āßîð ēāðŪēēçēŷŷŷ āēá íá ēāāß óā CDROM, îē āēóēŷôðāð āēēßŷçðçð, ēāēþð ēāē îē ēāðŪēēçēŷð āāēāðŪóðāóçð îŷôü FTP. Āððß ç āŷôŷēß āßíāē òððēēß ç `make release`.

### 3.1 Ç āŷôŷēß `make release`

Āēā íá îāðāāēüððßóāðā āðēðð÷þð îēā ŷēāîóç, ðñŷðāē ðñþðā íá ððŪñ÷ŷŷŷ óā ēāðŪēēçēā āñ÷āßā îŷôā óðŷŷ ēāðŪēŷŷŷŷ `/usr/obj`. Îðñāßðā íá óā āçîēîññāþóāðā āßðā îā ôçí āŷôŷēß `make world` þ āðēŪ `make buildworld`. Āēā íá

ðáðý÷-áé áðßóçð ç ìáðááëðððéóç òçð Ýêäîóçð ðñÝðáé íá äðáððá ðéð éáðÛëëçéäð ðéíÝð éáé ðá èÛðíéäð ìáðááëçðÝð:

- CHROOTDIR - Ì éáðÛëíäðð ðîõ èá ÷ ñçóéíðíéçéäß ðáí ðáñéáÛëëí chroot áéá üëç òçí ìáðááëðððéóç òçð Ýêäîóçð.
- BUILDNAME - Õî üñíá òçð Ýêäîóçð ðîõ èá ìáðááëüðððáððá.
- CVSROOT - Ì éáðÛëíäðð ðóñí ððíßí áñßðéáðáé òí CVS repository.
- RELEASETAG - Ç áðééÝðá CVS ðîõ áíðéóðíé÷÷ß ðóçí Ýêäîóç òçí ððíßá èÝéäðá íá ìáðááëüðððáððá.

Áí ááí Ý÷-áðá ðäç ðñüóááóç ðá èÛðíéí ðíðéëü CVS repository ìá ðñí èðáééá ðîõ FreeBSD, ððíñáððá ðÛíðá íá ððéÛíáððá òí áéëü óáð ðíðéëü CVS mirror ìá òí CVSup ([http://www.FreeBSD.org/doc/en\\_US.ISO8859-1/books/handbook/synching.html#CVSUP](http://www.FreeBSD.org/doc/en_US.ISO8859-1/books/handbook/synching.html#CVSUP)). ÕðÛñ÷-áé Ýíá supfile, ððí áñ÷-áßí /usr/share/examples/cvsup/cvs-supfile, òí ððíßí ððíñáððá íá ÷ ñçóéíðíéçéäððá áéá íá áíðéñÛððá òí CVS repository ðîõ FreeBSD ððí áéëü óáð ðíðéëü mirror.

Áí ðáñáëáßðáððá òçí áðééÝðá RELEASETAG, ðüðá èá ìáðááëüðððéóðáß íéá ðëðñçð Ýêäîóç áðü òçí èíñððð ðîõ HEAD (äç. ðîõ -CURRENT) èíññí. Ìé áêäüóáéð ðîõ ððéÛ÷ñíðáé áðü áððüí ðñí èíññí, ððíðèðð áíáðÝññíðáé ðáí “-CURRENT snapshots”.

ÕðÛñ÷-íðí éáé ððééÝð Ûëëäð ìáðááëçðÝð ðîõ ððíññí íá ÷ ñçóéíðíéçéçíí áéá íá ðáñáíáðñíðíéçéäððá òçí Ýêäîóç ðáð. Ìé ðéí ððééÝð áðü áððÝð ðéð ìáðááëçðÝð ðáñéñÛðñíðáé ðóçí èíñððð ðîõ áñ÷-áßíð src/release/Makefile. Ç áêñéáðð áíðíð ðîõ ÷ ñçóéíðíéçéäð áéá íá ððéá÷-ðáß ç áðßóçð Ýêäîóç 4.7 ðîõ FreeBSD (x86 ðéáððüñíá) ððáí:

```
make release CHROOTDIR=/local3/release \
    BUILDNAME=4.7-RELEASE \
    CVSROOT=/host/cvs/usr/home/ncvs \
    RELEASETAG=RELENG_4_7_0_RELEASE
```

Õí Makefile ðîõ ÷ ñçóéíðíéçéäð áéá íá ìáðááëüðððáíðáé ìé áêäüóáéð ððíñáß íá ÷ ññéóðáß ðá áñéäðÛ ìá÷-ññéóðÛ ìáðáíý ðîõð áðíáðá.

- Äçíéíðñáß áñüð éáéáññý ðáñéáÛëëíððð ðá íéá ìá÷-ññéóðð éáñáñ÷-ßá éáðáëüüí ìá òçí áíðíðð “make installworld”.
- Áíáñüáð áðü òí CVS ìéáð éáéññéñéáð Ýêäîóçð ðîõ ðçäáßíð èðáééá ðîõ ðððððíáððð, òçð ðáèíçññüóçð éáé ðñí ports ìÝðá ðóçí éáñáñ÷-ßá éáðáëüüí ìáðááëðððéóçð òçð Ýêäîóçð.
- Ñðéíðáéð ðñí áñ÷-áßí ððñí éáðÛëíäð /etc éáé /dev ìÝðá ððí ðáñéáÛëëí chroot.
- ÁéðÝéáóç òçð áíðíðð chroot ìÝðá ðóçí éáñáñ÷-ßá éáðáëüüí ðîõ áðíéíÛððçéä, áéá íá ìçí ððíñáß òí áñüðáñéëü ðáñéáÛëëí íá áðçñáÛðáé òç ìáðááëðððéóçð òçð Ýêäîóçð.
- ÁéðÝéáóç òçð áíðíðð make world ìÝðá ððí ðáñéáÛëëí chroot.
- Ìáðááëðððéóç ðñí áéðáëÝóéíð ðîõ áßíáé ò÷-áðééÛ ìá ðí òýóóçíá Kerberos.
- Ìáðááëðððéóç ðîõ ððñðíá GENERIC.
- Äçíéíðñáß áñüð ðáéééñý éáðáëüüíð ððñí ððíßí èá ìáðááëüðððéóðíñí éáé èá áðíèçéäððéññí ìé áéðáëÝóéíð ìñðÝð ðñí ðáéééðí ðáéÝðñí.
- Ìáðááëðððéóç éáé ááéáðÛððáóç ðñí áñááéáßí ðîõ ÷ ñáéÛáñíðáé áéá òçí ðñíáðíéíáððá òçð Ýêäîóçð éáé òç ìáðáðñíðð òçð ðáèíçññüóçð áðü ðñí ðçäáßí èðáééá (SGML) ðá html éáé áñ÷-áßá éáéíÝñð ðîõ èá ððññáññíðí òçí Ýêäîóçð.
- Ìáðáðñíðð éáé ááéáðÛððáóç òçð ðáèíçññüóçð (áá÷-áéñßáéá ÷ ñððóç, áéóáñüáééÛ éáßíáíá, òçíáéðáéð Ýêäîóçð, èßððáð ððíááðððçðáðð ðéééñý, èèð.)

- Îāóāāēpôóéóc òuĩ “òõĩðéáõĩŸĩũĩ” (crunched) āēðāēŸóēĩũĩ ðĩō éā ÷ ñçóēĩĩðĩēçēĩŸĩ óóēð āéóēŸôðāð āāēáðŪóóáócð.
- Āçĩēĩōñābā òuĩ ðāēŸôũĩ ôçð āāēáðŪóóáócð éāē òuĩ ðāēŸôũĩ ðçāābĩō ēpāēēā.
- Āçĩēĩōñābā òuĩ ìŸóũĩ āēēbĩçóçð éāē ôçð āéóēŸôðāð “fixit”.
- Āçĩēĩōñābā ôçð éāñāñ÷bāð éāóāēüũĩ āēā ôçĩ āāēáðŪóóáóc ìŸóũĩ FTP.
- (ðñĩíēñāôēēŸ) Āçĩēĩōñābā òuĩ ISO āñ÷ābũĩ āēā ìŸóā CDROM/DVD media.

Āēā ðāñéóóũðāñāð ðēçñĩōĩñbāð ó÷āðēēŸ ìā ôçĩ āēāāēēáóbā āçĩēĩōñābāð ìēāð Ÿēāĩóçð, āābôā ôçĩ óāēbāā ôāēĩçñbũóçð release(7).

### 3.2 Îāóāāēpôóéóc òuĩ XFree86

Ōĩ āñāóēēũ ðāñēāŪēēĩ **XFree86** ābĩāē Ÿĩá óçĩáĩóēēũ ēñĩŪðē ēŪēā Ÿēāĩóçð āēā ðĩēēĩŸð ÷ ñpóóāð ðĩō ēŸēĩōĩ òĩ FreeBSD āēā óóāēĩŸð āñāáóbāð. ðñēĩ ôçĩ Ÿēāĩóç 4.6-RELEASE òĩō FreeBSD, ìē āðbóçĩāð āēüüóāēð òĩō FreeBSD ÷ ñçóēĩĩðĩēĩŸóāĩ ôçĩ Ÿēāĩóç 3.x òuĩ **XFree86**. Ĭ ðēĩ āŸēĩēĩð ðñũðĩð ìā ìāóāāēũððóðāðā áððŸð óēð āēüüóāēð ābĩāē ìā ÷ ñçóēĩĩðĩēĩŸóāĩ òĩ ðñũāñāĩā `src/release/scripts/X11/build_x.sh`. Áðũũ òĩ ðñũāñāĩā áðāēðāb ìā ābĩāē pāç óççĩŸĩá óõĩ óŸóççĩŸ óāð òũũĩ òĩ ðāñēāŪēēĩ XFree86 üũĩ éāē ç āēpóóā Tcl/Tk. ÎāðŪ ôçĩ ìāóāāēpôóéóc òuĩ éāðŪēēçēũĩ X servers, òĩ ðñũāñāĩā éā ðāēāðŪñāē üēā óā āñ÷ābā óā óðēēĩāŸð āñ÷ābũĩ ðĩō ðāñēĩŸĩāē ìā āñāē òĩ `sysinstall(8)` ìŸóā óõĩ ēāðŪēēĩāĩ `XF86336` óõĩ ìŸóĩ āāēáðŪóóáócð.

Îāēēĩpĩóāð ìā ôçĩ Ÿēāĩóç 4.6-RELEASE òĩō FreeBSD, òĩ `sysinstall(8)` āāēāēéóðŪ ôçĩ Ÿēāĩóç 4.x òuĩ XFree86, óāĩ ēāñĩēēŪ ðāēŸóā. ÁððŪ ìðĩñāb ìā ābĩāē ābôā óā ðāēŸóā ðĩō āçĩēĩŸñāçóā òĩ cluster òuĩ ports p ìðĩēāāðĩðā Ūēēā ðāēŸóā ðĩō Ÿ÷ĩōĩ āçĩēĩōñāçēāb āðũ Ÿĩá ports tree ìā ôçĩ éāðŪēēçç āðēēŸóā.

**Óçĩābũóç:** Ābĩāē ðĩēŸ óçĩáĩóēēũ ìā áðāēñŸóðāðā āðũ òĩ āñ÷ābĩ `/etc/make.conf` ìðĩēāóāpðĩðā òĩðēēŸð ñòēĩbóāēð Ÿ÷āðā ēŪĩāē. Āēā ðāñŪāāēāĩā, āāĩ ābĩāē ēāēp ēāŸā ìā āēāĩŸĩāðā āēðāēŸóēĩā ðĩō Ÿ÷ĩōĩ ìāóāāēũððéóðāb óā ēŪðĩēĩ óðāēāēñēĩŸĩĩ óŸóççĩā ìā ìñéóĩŸĩç ôçĩ óēĩp ôçð ìāóāāēçðpð `CPUTYPE` āēā āāēðéóõĩðĩbçóç òuĩ āēðāēŸóēĩũĩ āēā ēŪðĩēĩ óðāēāēñēĩŸĩĩ āðāĩāñāáóðp.

### 3.3 ðñĩāñŪĩĩāóā Ōñbôũĩ (“ports”)

Ç Óðēēĩāp òuĩ Ports òĩō FreeBSD (<http://www.FreeBSD.org/ports>) ābĩāē ìēā óðēēĩāp ìā ðāñéóóũðāñā āðũ 20,000 ðñĩāñŪĩĩāóā āðũ òñbôĩðð, ðĩō ābĩāē āēāēŸóēĩā āēā FreeBSD. Ĭē Ports Management Team <[portmgr@FreeBSD.org](mailto:portmgr@FreeBSD.org)> ābĩāē òðāŸððĩē āēā ôçĩ óõĩðpñçóç āĩũð āŸĩóñĩō āðũ ðçāābĩ ēpāēēā āēā óā ports, ðĩō ìðĩñāb ìā ÷ ñçóēĩĩðĩēçēāb āēā ìā āçĩēĩōñāçēĩŸĩ óā ðāēŸóā ìā óā ðñĩāñŪĩĩāóā ðĩō óðñāŸĩōĩ óēð āðbóçĩāð āēüüóāēð òĩō FreeBSD.

Ç āēāāēēāóbā óõĩðpñçóçð ôçð óðēēĩāpð òuĩ ports ābĩāē ēŪðē ðĩō āāĩ ìðĩñĩŸĩā ìā ēāēŸðĩðĩā āāp. Ĭā ìā÷ũñéóóũ Ūñēñĩ, ìā ðbôēĩ Ç ÎñāŪtūóc ēāĩóçð òuĩ ðāēŸôũĩ ĒĩāēóĩēēŸ āðũ Ōñbôĩðð ([./releng-packages/article.html](http://releng-packages/article.html)), ēāēŸððāē áðũ òĩ ēŸĩā.

### 3.4 Āñ÷ābā ISO ôçð ēāĩóçð

Îāēēĩpĩóāð ìā ôçĩ Ÿēāĩóç 4.4 òĩō FreeBSD, ç ñŪāā ĀĩŪðððĩçð òĩō FreeBSD áðĩōŪóēóā ìā āēāĩŸĩāē éāē óā òŸóóāñā ISO āñ÷ābā ðĩō ðñpóā ðĩōēĩŸóāĩ ìē āðāēñābāð *BSDi/Wind River Systems/FreeBSD Mall* óðēð “āðbóçĩāð” āēāmŸð CDROM ðĩō Ÿēāĩāĩ. ĒŪēā Ÿĩā āðũ óā òŸóóāñā ISO āñ÷ābā ðñŸðāē ìā ðāñēŸ÷āē Ÿĩā āñ÷ābĩ `README.TXT` ðĩō

ðǎñéǎñÛöǎé óǎ ðǎñéǎ÷ìíǎíǎ òìò ǎßóèìò, êé Ýíǎ ǎñ÷ǎßí CDROM.INF ðìò ðǎñéÝ÷ǎé ìǎðǎ-ðéçñìòìñßǎð ǎéǎ íǎ ìðìñǎß òì ðñüǎñǎìǎ sysinstall(8) íǎ ǎéÝǎíǎé éǎé íǎ ÷ñçóéìðìéßóǎé áðòü òì ǎßóèì, éǎèð òé Ýíǎ ǎñ÷ǎßí filename.txt ðìò ðǎñÝ÷ǎé íéǎ èßóðǎ ǎñ÷ǎßüí òìò CDROM. Áðòß ç èßóðǎ ìðìñǎß íǎ ǎçìéìñǎçèǎß ðìéý áðéÛ, ùð ǎíßð:

```
/stage/cdrom# find . -type f | sed -e 's/^\.\\/' | sort > filename.txt
```

Ìé óðǎéǎèñéíÝíǎð áðǎéòßóǎéð ǎéǎ èÛèǎ Ýíǎ áðü áðòÛ óǎ CD ðǎñéǎñÛöìíóǎé ðǎñǎéÛòü:

### 3.4.1 Áßóèìò 1

Ì ðñðòìò ǎßóèìò ǎßíǎé ó÷ǎǎüí áðìééǎéóóééÛ áðìòÝéǎóíǎ òçð ǎíòìéßð make release. Ìé ìüíǎð ǎééǎǎÝð ðìò ðñÝðǎé íǎ ǎßíòìí óðìí éǎðÛèìǎí disc1 ǎßíǎé ç ðñìóèèèç òìò éǎðÛèìǎíò tools, òùí XFree86, éǎé üóì òì ǎðíǎðüí ðǎñéóóüðǎñüí ðǎéÝòüí ìðìñíý íǎ ÷ñÝóìòìí óðìí ǎßóèì. Ì éǎðÛèìǎíò tools ðǎñéÝ÷ǎé ǎñǎǎéǎßǎ ðìò áðéòñÝðìòìí óǎ ÷ñßóðǎð Ûèèüí éǎéòìòñǎéèßí óðóðçìÛòüí íǎ òðéÛìòìí òéð ǎéóéÝððǎð ǎéèßíçóçð. Áðòüð ì ðñðòìò ǎßóèìò ðñÝðǎé íǎ òðéÛ÷ǎéǎé bootable Ýðóé ðóðǎ íǎ ìðìñíý íé ÷ñßóðǎð òùí ìüíòÝñíüí òðìéìǎéóðì íǎ áðìòǎýǎìòìí òì óðÛǎéì ǎçìéìñǎßǎð òùí ǎéóéǎððìí ǎéèßíçóçð.

Áí íéǎ ǎéǎóìñǎðéèß Ýéǎìóç òùí XFree86 éǎ ǎéǎíÝíǎðǎé ìǎ òçí Ýéǎìóç áðòß, ðñÝðǎé íǎ ǎçìǎñüèǎß òì ðñüǎñǎìǎ sysinstall(8) ǎéǎ òçí íÝǎ èÝóç éǎé íé ìǎçǎßǎð ǎǎéǎðÛóðǎóçð. Ì ó÷ǎðééüð èßǎééǎð òðÛñ÷ǎé óðìí éǎðÛèìǎí src/release/sysinstall óðìí -STABLE èìñüí ð óðìí éǎðÛèìǎí src/usr.sbin/sysinstall óðìí -CURRENT èìñüí. ÓðǎéǎèñéíÝíǎ, óǎ ǎñ÷ǎßǎ dist.c, menus.c, éǎé config.c éǎ ÷ñǎéǎóðǎß íǎ ǎçìǎñüèíýí.

### 3.4.2 Áßóèìò 2

Ì ǎǎýðǎñìò ǎßóèìò ǎßíǎé áðßóçð áðìòÝéǎóíǎ òçð ǎíòìéßð make release éǎðÛ Ýíǎ ìǎǎÛèìíÝñìò. Áðòüð ì ǎßóèìò ðǎñéÝ÷ǎé Ýíǎ “live filesystem” ðìò ìðìñǎß íǎ ÷ñçóéìðìéçèǎß áðü òì sysinstall(8) ǎéǎ íǎ ǎíǎðǎóóìýí ðñìǎéßíǎðǎ óǎ íéǎ ǎǎéǎðÛóðǎóç òìò FreeBSD. Èé áðòüð ì ǎßóèìò ðñÝðǎé íǎ ǎßíǎé bootable. Èǎ ðñÝðǎé áðßóçð íǎ ðǎñéÝ÷ǎé Ýíǎ óðìðéǎóìÝíí ǎíðßǎñǎöìí òìò CVS repository óðìí éǎðÛèìǎí CVSROOT éǎé ǎßǎìǎðǎ áðü ǎìðìñééÛ ðñìñǎÛìǎðǎ óðìí éǎðÛèìǎí commerce.

### 3.4.3 Áßóèìò 3 éǎé 4

Ìé òðüèìéðìé ǎðìí ǎßóèìé ðǎñéÝ÷ǎéìí áðéðñüóéǎðǎ ðǎéÝóǎ èìǎéóìééý ǎéǎ òì FreeBSD. Óǎ ðǎéÝóǎ éǎ ðñÝðǎé íǎ ǎßíǎé ñǎǎìðìéçíÝíǎ, Ýðóé ðóðǎ èÛèǎ ðǎéÝòì íǎ ǎßíǎé óðìí ðǎéìí ǎßóèì ìǎ üéǎ óǎ ðǎéÝóǎ áðü óǎ ìðìßǎ ǎíǎñðÛóǎé ǎéǎ íǎ ǎǎéǎðǎóðǎéǎß éǎé íǎ òñÝíǎé. ðǎñéóóüðǎñǎð ðéçñìòìñßǎð ǎéǎ òçí ǎçìéìñǎßǎ áðòßí òùí ǎßóèüí ǎíǎóÝñìíóǎé óðìí Ûñèñí Ç ÎñãÛîùόç èǎìóçð òùí ðǎéÝòüí Èìǎéóìééý áðü Òñßòìòð (../releng-packages/article.html).

## 4 Áéǎíñß òùí Áêäüüóàùí

### 4.1 ÁìòðçñǎðçðÝò FTP

¼ðǎí ç Ýéǎìóç ǎßíǎé Ýòìéìç, Ý÷ǎé ǎìééìǎóðǎß ǎéðǎíßð, éǎé Ý÷ǎé ðǎéǎðǎñéóðǎß ǎéǎ ǎéǎíñß, ì éýñéìò FTP ǎìòðçñǎðçðð ðñÝðǎé íǎ ǎçìǎñüèǎß. Ìé áðßóçìéé ǎìòðçñǎðçðÝò FTP òìò FreeBSD ǎßíǎé üèìé mirrors ǎíüð éýñéìò ǎìòðçñǎðçðß óðìí ìðìßí Ý÷ǎéìí ðñüóǎǎóç ìüíí Ûèèìé FTP ǎìòðçñǎðçðÝò. Áðòüð ì ǎìòðçñǎðçðð ǎßíǎé ǎíüóüð ùð ftp-master. ¼ðǎí ç Ýéǎìóç ǎßíǎé Ýòìéìç, ðñÝðǎé íǎ ǎçìǎñüèíýí óǎ ðǎñǎéÛòü ǎñ÷ǎßǎ óðìí ftp-master:





## 5.1 ĀçîēîōñāāĀ ĐñîóáñîîóíŸíuî Āéóēāôôpí Āēēβîçôçð.

ĐîēēŸð āāēāóáóôŨóáēð Ÿ÷îîí đîēýđēîēāð áđāēðĀóáēð đîō ðîñāāĀ ìā ôç óāēñŨ òîōð íā áđāēôîŸí ôçî đñîóēĤēç đāñēóóúðāñuî ðāçāpí Ĥ āñāāēāĤuî ÷ñĤóðç óðēð āēóēŸôðāð āāēāðŨóóáóçð. Ĭ “îðāēŨēēēîð” òñuðîð íā òî ēŨíāðā áððu āĤíāē íā ēŨíāðā òēð āēēāāŸð óáð óôñî ēāðŨēîāî đîō Ÿ÷āē āôîēîŨóāē ìāðŨ òî ôŸēîð ôçð ç āēāāēēāóĀā make release:

- ĐāñŨóðā òā patches óáð Ĥ đñîóēŸóðā òā āðēðēŸîí āñ÷āĤ íŸóā óôñî ēāðŨēîāî chroot ôçð Ÿēāîôçð.
- `rm ${CHROOTDIR}/usr/obj/usr/src/release/release.[59]`
- ìāðāēüððóðā đŨēē òî sysinstall(8), òî đðñĤíā, Ĥ üðîēā Ũēēā đñîāñŨîāðā Ÿ÷îîí āðçñāāóðāā áðu òēð āēēāāŸð óáð.
- `chroot ${CHROOTDIR} ./mk floppies`

Ĭē íŸāð āēóēŸôðāð āāēāðŨóóáóçð ēā āçîēîōñāçēîŸí óôñî ēāðŨēîāî \${CHROOTDIR}/R/stage/floppies.

ĀíāēēāēðēēŨ, ðîñāāĀ ìā ÷ñçóēîîđîēĤóáðā òî make target boot.flp, Ĥ ðîñāāĀ ìā òñŸíāðā áðāðēāĤāð òî script đîō āçîēîōñāāā òā óðððĤíāðā āñ÷āĤuî src/release/scripts/doFS.sh.

ĬðñāāĀ āðĤóçð íā ēāñîĤóðāð Ĥóðā āēēŸð óáð āēēāāŸð íā đāñāóôîŸí ìā ðñðĤ patch óôçî Ÿēāîôç üðuð ēā òēēŨ÷îāðāē, āĤñîðāð òēĤĤ óôçî ìāðāāēçðĤ LOCAL\_PATCH üðāî òñŸíāðā ôçî āîðîēĤ make release.

## 5.2 ĐñîāñāîîāôĤæîîóáð òî sysinstall

Œî āñāāēāĤî āāēāðŨóóáóçð ēāē ñŸēîôçð òîō FreeBSD, òî sysinstall(8), ðîñāāĀ íā đñîāñāîîāðēóðāā āēā íā ēŨíāē đēî āŸēîēāð òēð áððñîāðîđîēçîŸíāð āāēāðáóðŨóáēð òā đîēēŨ ìç÷āĤíāðā. Áððu òî ÷āñāēðçñēóðēēu òîō đñîāñŨîîāðîð ðîñāāĀ íā ÷ñçóēîîđîēçēāā òā óôñîāóáðu ìā òî PXE[13] ôçð Intel āēā íā ðāēēĤóāē ç āāēāðŨóóáóçð áðu òî āĤēððî, Ĥ òā óôñîāóáðu ìā đñîóáñîîóíŸíāð āēóēŸôðāð āēēβîçôçð ēē Ÿíā sysinstall script. íā đāñŨāāēāîā áðu ôŸðîēî sysinstall script ðîñāāĀ ìā āñāāĀ òðî āñ÷āĤuî src/release/sysinstall/install.cfg.

## 6 ìāēĤíāðā òîō ĐĤñāîā áðu ôçî êäîôç 4.4 òîō FreeBSD

Ç āēāāēēāóĀā āðîēîāóĤāð ôçð Ÿēāîôçð 4.4 òîō FreeBSD ðāēβîçāā āðĤóçîā ôçî Ĭç ÁðāîŸóðîð 2001. ìāðŨ áðu áððĤ ôçî çîāññîçîā, üēāð îē āēēāāŸð óôñî ēîñîü RELENG\_4 òîō FreeBSD Ÿðñāðā íā Ÿ÷îîí Ÿāēñēóç áðu ôçî Release Engineering Team <re@FreeBSD.org>. Ç đñĤðç āîēēîāóðēēĤ Ÿēāîôç āēā ôçî āñ÷ēðāēðîēēĤ x86 Ÿāēîā āēāēŸóēîç óðēð 16 ÁðāîŸóðîð, ēē āēîēîðēĤēēā áðu 4 āēüîā āîēēîāóðēēŸð āēüüóáēð đîō ðāĤāçóāî ôçî òāēēēĤ Ÿēāîôç óðēð 18 òîō ÓāððŸîāñç. Ĭ òðāŸēðñð áóðŨēāēāð Ÿðāēîā ôçîāîðēēü ñuēî ēāðŨ ôçî āēŨñēāēā ôçð òāēāððāĤāð āāñŨāāð ēāēðð ēŨðîēā đñîāēĤíāðā áóðŨēāēāð āñŸēçēāî òā đñîçāîŸîāîāð, āîēēîāóðēēŸð āēüüóáēð. ÓðñîēēŨ, đŨîü áðu 500 email óðŨēēçēāî ôçî Release Engineering Team <re@FreeBSD.org> òā āēŨóðçîā ìēēñüðāñî áðu Ÿíā ðĤíā.

Ç ēîēîüðçðā òùí ÷ñçóðĤî ìāð Ÿēāîā óáðŸð üðē ç áóðŨēāēā ēāē ç óðāēāñüðçðā ìēāð Ÿēāîôçð āāî ēŨ 'ðñāðā íā ēððēŨæāðāē āēā ēāíāüð āĤāüðð đñîēāóîĤāð Ĥ çîāññîçîāð đîō Ÿ÷îîí òāēāā óāî óðu÷îē áðu đñēî. Œî FreeBSD Ÿ÷āē ìāāāēĤóāē āñāîāðēēŨ ēāðŨ ôçî āēŨñēāēā ôçð æüðð òîō óāî óŸóóçîā, ēāē ç áŨāēç āēā óðāēāñēîŸîç đîēēðēēĤ ēāē ðñāŨîüôç āēā ôçî āçîēîōñāāā íŸuî āēüüóáñî āĤíāē đēŸîŸí óāíāñĤ đāñēóóúðāñî áðu đîōŸ. ÁððĤ ç áŨāēç ēā āĤíāē āēüîā đēî ôçîāîðēēĤ ēāēðð òî FreeBSD ēā āñ÷āĤāē íā ìāðāŸŸñāðāē òā íŸāð đēāððüñîāð.

7 ìǎëëĩĩôéêÝò Êáôǎõèýíóǎéo

[illegible]

- *ḐānÜēēçç̄ äēðÝēäöç - İlaneēÜ İYñç öçð ìäöäāēpōdēöçð ìēäö äēäēäöÜöäöäçð ìðññīōī íä äßññīōī “ðīēý ðānÜēēçēā”.* Ōā ðēī ðīēēÜ äðü öā ööÜäēä äßīäē I/O intensive, ìðüöā ç ýðāññīç ðīēēpī öðççēðð-ðā÷ýðçðäð äßöēüī äßīäē ðēī öçīäīöēēp̄ äðü öçñī ÷ñp̄öç ðīēēpī äðāññāñäöðp̄ äēä íä äðēöä÷÷öēäß ēÜðüð ç äēääēēäöäß öīō make release. Áí äēäöññäðēēīēß äßöēīē ÷ñçöēīññīēçēīý äēä öīðīäöä öçð ēāññāñ÷ßäð öīō chroot(2) ðāñēäÜēēññīöìð, öüöä öī CVS checkout öñī ēäðäēüäññī ports ēäē doc ìðññāß íä äßīäē öäðöü÷ññīä íä öçī äññōēp̄ make world öññī Üēēī äßöēī. ÷ñçöēīññīēpīöäð ìēä RAID ēýöç (hardware p software) ìðññāß íä ìäēpōäē āñäööēēÜ öññī öññēēēü ÷ñññ öīō ÷ñāēÜäöäē íä ìäöäēüöðöçöäß ìēä ðēp̄ñçð Ýēäñöç.
- *Ìäöäāēpōdēöç äēüüöäññī äēä äēäöññäðēēÝð āñ÷ēðäēðññēÝð - ÈÝēäöä íä ìäöäēüöðößöäöä ìēä Ýēäñöç äēä IA-64 p Alpha öä ēÜðīēñī x86 äðāññāñäöðp̄ make TARGET=ia64 release.*
- *ÄñēēīÝð äēä vÜēç - ÷ñāēäæññīäöä ēäēýöðāñä āññāēäßä äēä äðöññäöññī Ýēäā÷ñññēüöðäð öðñ FreeBSD.*
- *Āñāäēäßä ĀäēäðÜöðäöçð - Öñ ðññāññññÜ ìäð äēä öçī ääēäöÜöäöç öññ FreeBSD Ý÷äē ìäðāñÜöäē ðññ ðīēēñý öññ äññäññññññ ÷ñññ æùðð öññ. ÖðÜñ÷ñññ äēÜöññäð ññāäð ðññ āñäÜäññöäē äēä íä öēñññēpōñññ ēÜðīēññ Üēēī, ðēī ñññöÝñññ ñç÷äñöññ ääēäöÜöäöçð. Ìēä äðü öēð ðēñ öðññ÷ñññäð, äßīäē ç ññāä libh[5] ðññ öðñ÷äýäē öççī öēñññççç äññö Ýñðñññ, ñÝññ ðññðññ ðäēäðāññññäñññññ ēñäöññēñññ ēäē äññö GUI ðñññññññäñññ ääēäöÜöäöçð.*

# 8 Å ÷ á ñ é ó ô ß à ò

[illegible]

## 9 ÁíáöïñÝò

- [1] CVS - Concurrent Versions System <http://www.cvshome.org>
- [2] CVSup - The CVS-Optimized General Purpose Network File Distribution System  
<http://www.polstra.com/projects/freeware/CVSup>
- [3] <http://bento.FreeBSD.org>
- [4] FreeBSD Ports Collection <http://www.FreeBSD.org/ports>
- [5] The libh Project <http://www.FreeBSD.org/projects/libh.html>

- [6] FreeBSD Committers  
[http://www.FreeBSD.org/doc/en\\_US.ISO8859-1/articles/contributors/staff-committers.html](http://www.FreeBSD.org/doc/en_US.ISO8859-1/articles/contributors/staff-committers.html)
- [7] FreeBSD Core-Team [http://www.FreeBSD.org/doc/en\\_US.ISO8859-1/articles/contributors/staff-core.html](http://www.FreeBSD.org/doc/en_US.ISO8859-1/articles/contributors/staff-core.html)
- [8] FreeBSD Handbook [http://www.FreeBSD.org/doc/en\\_US.ISO8859-1/books/handbook](http://www.FreeBSD.org/doc/en_US.ISO8859-1/books/handbook)
- [9] GNATS: The GNU Bug Tracking System <http://www.gnu.org/software/gnats>
- [10] FreeBSD PR Statistics <http://www.FreeBSD.org/prstats/index.html>
- [11] NetBSD Developer Documentation: Release Engineering <http://www.NetBSD.org/developers/releng/index.html>
- [12] John Baldwin's FreeBSD Release Engineering Proposal <http://people.FreeBSD.org/~jhb/docs/releng.txt>
- [13] PXE Jumpstart Guide [http://www.FreeBSD.org/doc/en\\_US.ISO8859-1/articles/pxe/index.html](http://www.FreeBSD.org/doc/en_US.ISO8859-1/articles/pxe/index.html)
- [14] Marshall Kirk McKusick, Michael J. Karels, and Keith Bostic: *The Release Engineering of 4.3BSD*  
(<http://docs.FreeBSD.org/44doc/papers/releng.html>)