

# Ç ĩñãŨíùóç ôùí Âêäüóãùí ôĩõ FreeBSD

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Áðòù òĩ Ũñèñĩ ðãñéãñŨòãé ôçĩ áĩòéĩãòððéóç éãé ĩñãŨíùóç ôçò ñŨããò áĩŨððòĩçò òĩõ FreeBSD, ùóĩĩ áóĩñŨ óôçĩ ðñĩãòĩéĩáóßá ðĩéĩòééðĩ äêäüóãùĩ òĩõ Êãéòĩõñãééĩĩ Óðóðßĩáòĩõ FreeBSD. Âĩçããß ĩã èãððñŨñãéã ôçĩ ĩãèĩãĩéĩãßá ðĩõ ÷ñçóéĩĩðĩéãßðáé ãéã ðéð äðßóçĩãð äêäüóãéð òĩõ FreeBSD éãé ðãñéãñŨòãé óã ãñããéãßá ðĩõ ãßĩáé äéãéŸóéĩã óã ùóĩõð ãĩãéãóŸñĩĩóãé ĩã ðãñŨĩĩĩĩ ðãñãĩãðñĩðĩéçĩŸĩãð äêäüóãéð òĩõ FreeBSD ãéã áóùðãñééð ð ãĩðĩñééð ÷ñðóç éãé áĩŨððòĩçò ðñĩũĩĩòùĩ.

## Ðßĩãéãò Ðãñéã ÷ñŸĩùĩ

1 Âéóããũãð	1
2 Ç Äéããééãóßá Äçĩéĩõñãßáð ĩéãð çãĩóçò	2
3 ĩãóããèððéóç ôçò çãĩóçò	5
4 Äéãñð òùĩ Âêäüóãùĩ	8
5 Âðãéðãóéĩũòçóã	9
6 ĩãèßĩáóã ðĩõ Ðñãĩã äðũ ôçĩ çãĩóç 4.4 òĩõ FreeBSD	10
7 ĩãèñĩóééŸò ÊãðãðéŸĩóãéð	10
8 Âð ÷ãñéóðßáð	11
9 ÁĩãóĩñŸò	11

## 1 Âéóããũãð

Ç áĩŨððòĩçò òĩõ FreeBSD ãßĩáé ĩéã ðĩéŸ áñé÷ðð äéããééãóßá. Òĩ FreeBSD áðĩðãéãßðáé äðũ óóĩãéóóĩñŸò ÷éééŨãũĩ áĩèñðòũĩ äðũ ùéĩ òĩĩ èũóĩĩ. Ç ñŨãã òĩõ FreeBSD ðãñŸ ÷ãé ðñũóããóç ĩŸóũ áĩðĩòĩĩò CVS[1] óã ùéĩòð, Ÿðóé þóðã ĩã ĩðĩñãß ùðĩéĩò èŸéãé ĩã ããé ĩçĩŸĩáóã log, äéãóĩñŸò (patches) ðĩõ Ÿ÷ĩĩ ðã äéŨóĩñãä development branches, éãé Ũèèã ÷ãñãéðçñéóóééŨ ðĩõ äĩçéĩŸĩ ôçĩ áĩŨððòĩçò, óã ĩðĩßá ðñĩéŸððĩĩĩ äðũ ôçĩ ÷ñðóç áĩũð áððòçñĩŸ óðóðßĩáòĩõ äéã÷ãßñéóçò èðãééã. Áðòù áðĩðŸéãóã éãé òĩĩ ðéĩ óçĩãĩóééũ ðãñŨĩĩĩĩá Ÿéĩçò ãéã Ÿĩã ĩããŨéĩ ãñééũ äðũ óãéãĩóĩŸ÷ĩò ðñĩãããĩĩáðéóðŸò äðũ ùéĩ òĩĩ èũóĩĩ óóĩ FreeBSD. Âßĩáé ðñĩóãĩŸò, ãŸããéã, ðùð ðĩéŸ óŸĩðñã éã ãß÷ã ãßĩáé áĩðãèð ÷ãĩóééð ç éãðŨóóãóç áĩ ãß÷ãĩ ùéĩé, äðũ ùéĩ òĩĩ èũóĩĩ, ðñũóããóç ĩã ãñŨøĩĩ óóĩ èðãééã. Äé’ áðòù, ĩũĩ ĩéã “ãðééããĩŸĩç” ñŨãã äðũ ðãñßðĩõ 300 Ũóñã Ÿ÷ĩĩ ðñũóããóç ĩã ãñŨøĩĩ óóĩ CVS repository. Áðòĩß ĩé committers[6] ãßĩáé ððãŸéòñĩé ãéã òĩ ĩãããéŸóãñĩ ĩŸñĩò ôçò áĩŨððòĩçòð ðĩõ ãßĩãðáé óóĩ FreeBSD. ĩéã

*ἐαὶὸνέεP-ἡÜää[7]* (core team) áðü áéáæñēīÝñōð ðññāñāññāðéóóÝð áæēÝāāðáé áéá íá ðāñÝ÷æ ēÜðñēñō āßāñōð ēāēñāPāçōç éáé íéá éāðāyēñōíōç òññē òýññē òññē committers.

Ίε οά÷÷ύοάοιε ηόειηβ άίΰΰόδοιγο όιό FreeBSD άάί άόβήοί όέέ όιεΰ ÷ ηύή άέά όι ίάέάέΰήέόίά όιό όόόόβίάόιό άίΰΰόδοιγο όά ίέά Ύέαιός ίά όίέυόδοά όιό ίά άίβέάέ ίά ÷ ηέόέήίόίέάβόάέ άόηΎύό. Άέά ίά έόέάβ άόόυ όι άέέέέίά, ς άίΰΰόδοις άβίάόάέ όάόόυ÷ ηήίά όά άόι όάνΎέέέέά ίήήόΰόέά. Ί έύήέιό έίήήυό άίΰΰόδοις άβίάέ ι **HEAD** η **trunk** όόι CVS repository ίάό, άήυόόύό έέέ ύό “FreeBSD-CURRENT”, η “-CURRENT” άί όόίόήβά.

Jáο δέι οόάεάνυο έιηνύο οόίογναβόάε, άφύοόου ίά οί ύμνά “FreeBSD-STABLE” τ δέι ούύοήνά “-STABLE”. Έάέ ίε άοί έιηνύβ άβίάέ άδύέρεάοίΥήίε οόί έύήέί CVS repository, οόγί Έάέέουνήέα, έάέ άίόέανÜοίήόάέ ίΥόο **CVSup**[2] οά mirrors άάίόύ όοί έύοί. Öί FreeBSD-CURRENT[8] άβίάέ ç “δύόγ οάένÜ” όγδ άίÜδδόίγδ οίö FreeBSD έάέθδ οά άδóυ άβήήόάέ δύόθδ üέάό ίέ έάέήύήέάδ άέέάΥδ. Öί FreeBSD-STABLE άβίάέ ί έιηνύο άίÜδδόίγδ άδύ οίή ίδύβί οόέÜ÷ήήόάέ ίέ άέάυοάέδ. Ιέ άέέάΥδ άέόΥή÷ήήόάέ οά άδóύί, οίή άάýοάή έιηνύ άίÜδδόίγδ, ίά δέι άήάυ ήόέιυ, άόίý δύόθδ (όύίόύήά ίά όγί δύέέόέέτ ίάδ) άήέέάόόίý όόί FreeBSD-CURRENT έάέ Υ÷ήή άήάόάόάβ δύέý έάέÜ.

[illegible]

Όρια÷ ποσό Υεῖνῖοάε αἰὺ οἶοδ ÷ nΠοόῶδ ἰαδ ἀράοῖνΥδ δῖνἰαεçÛοῖρ ἐαε ἀεδΠοάεδ ἁεἱ ἐαεῖνῖνῆα ÷ ἁῖαεδçñεοόεεÛ, ἐαδÛ οç æÛñεἱἁεἱ οἶο εῖεεῖο οçδ εÛεἱ Ἰεἱαῖοçδ. Ἰε ἀράοῖνΥδ δῖνἰαεçÛοῖρ ἀεοÛἁῖνῖοἱάε οόçἱ ἁÛοç **GNATS**[9] ἱΥῖοῦ e-mail, ἰἁ οçἱ ἁῖοἁῖῖἁΠ send-pr(1), Π ἱΥῖοῦ οἶο web-interface δῖο δἁῖνΥ ÷ ἁῖοἱάε οόçἱ ἀεἱῖεῖοἱόç <http://www.FreeBSD.org/send-pr.html>. Ἀεοῦδ αἰὺ οεοδ æÛῖοῖνἰἁδ εἴβοόῶδ çἁεἱδῖνἰεῖῖῖ οἱ ÷ ὁἁῖῖἁβῖο ἰἁ εἸῖἱἁ ὁἱ ὁἱ ÷ ἱεεÛ ÷ ἁῖαεδçñεοόεεÛ οἶο FreeBSD οδÛñ ÷ ἁε ἐαε ç εἴβοἱἁ FreeBSD Quality Assurance mailing list (<http://lists.FreeBSD.org/mailman/listinfo/freebsd-qa>), ç ἱδῖβἁ δἁῖνΥ ÷ ἁε Ἰῖἱ ὁῖνἱῖοἱ ἁεἱ οἱαεçδΠοάεδ ὁ ÷ ἁῖοεεÛ ἰἁ οεοδ εἱδδῖνΥñἱἁεἱἁ οçδ “ἱñἁÛῖοῖοçδ οῖρ ἁεἱῖοἱἁῖ”.

Ἄεά íá áñòðçñáðòçείγí íé ðεí òòíòçñçðéεíβ ÷ ñβóðáð íáð, íá Ἰέαίòç òñ FreeBSD 4.3 áñ÷βóáíá íá ÷ ñçòçείñðíείγíá íá÷÷ñεóóóγò εíñíγò áεáυóáυí. Ἀóòíβ íé εíñíβ áçíεíñáγííóáε εβáí ðñβí òðεá÷ðáβ ç ðáεέεβ Ἰέαίòç. ÍáðÜ ðçí áíáεíβñυóç ðçð Ἰέαίòçð, íυíí ðíεγ óçíáíóéεÝð áεεάáÝð εáε ðñíòεβεáð ó÷áðéεÝð íá ðçí áóóἸεάáá áβñííóáε óóíí εíñíυ ðçð Ἰέαίòçð. Ἀέυòð áðυ ðçí áñíáðυðçðá áíááἸεíεóçð íÝóυ CVS, áêðáεÝóεíá patchkits òðεÜ÷ñííóáε áεá íá íðíñíγ íá áíáááεíβóíòí ðá óðóðβíáðÜ ðíðð υóίε ÷ ñçòçείñðíείγí ðéð áεáυóáéð *RELENG\_X\_Y*.

Οι ΟιΠια 2 αιçããß ìã ããððñŸñããð ðã ããŸðñã ððŸãã ðçð ããããããðßãð ðñ ãñßðãðãã ðßòñ ãðu ãŸãã Ÿããñç, ìŸ ÷ ñã ããã ðã ãñããðã ðñ ããçãŸŸ ðçðŸ ìãðããðððððçð ðñ ððððñããñð ãã ðñ ΟιΠια 3 αιçããß ðçŸ ìããã ðç ããããããðßã ðçð ìãðããððððçðð. Οι ΟιΠια 5 ðãñããñŸðã ðñ ðññãß ìã ððããðããß ðñ ããóãã ðŸððçãã ãðu ðñßðñð ãã ðñ ΟιΠια 6 ðãñããñŸðã ãŸðñãã ãðu ðã ðñŸããðã ðñ ìŸããã ãðu ðçŸ ããããããðßã Ÿããñçð ðñ FreeBSD 4.4. ÓŸñð, ðñ ΟιΠια 7 ðãññðãŸãã ãŸðñãã ãðu ðãð ããðãðŸŸããð ðñ ãŸññãã ìã ðŸñã ç ãñŸðððç ðñ ìŸããñ.

2 Ç Äéääéêáóßá Äçíëĩõñãßáo ìéàò êäïóçò

Ίε ϊΎαο αεαυοάοδ οΐο FreeBSD οοεΰ÷ ρΐοάε αδϋ οΐϊ -STABLE εΐνϋ αΐΰδδοΐοδ δαΐβδϋο εΰεα οΎϋοάναοδ ϊΐΐαδ. Ϙ αεαεεεαοβα δΐηαοΐεαοβαδ ιεαδ Ύεαϋοδ ϊαεεΐΰαε ο÷ ααϋ ϊ5 ϊΎναδ δΐεϊ οϘϊ αΐαΐαϋαΐϘ ϘαΐΐϘϊβα Ύεαϋοδ, υοαϊ ϊ οδϋγεοΐοδ αεαυοαϋ οΐο FreeBSD οοΎεαε Ύα αΐΰηα οοεδ εβοαδ ουϊ δΐηαΐηααοεοοϋϊ αεα ϊα οδαρεοιβοαε οοιοδ δΐηαΐηααοεοοΎδ υοε Ύ÷ ϊοϊ 15 ϊΎναδ εαεϋ ϊα εΰϋοι υδϊεαδ αεεααΎδ εΎεϋοι, δΐε ϊο δΰαυα οιο εραεεα. ΊΎοα οα αοου οΐϊ εαεϋ, δρεεϊβ δΐηαΐηααοεοοΎδ εΰϋοι ιεα οαεϋΰ αδϋ αεεααΎδ δϋο Ύ÷ ϊοϊ ιαβαε δεΎϊ αϋυοοΎδ υο “ϊαεαεαΐβοαοα MFC”. Ί υϋοι MFC οϘαβαε “Merge From CURRENT” εαε δαΐεαΐΰοαε οϘϊ αεαεεεαοβα δΐηοαΐηαβδ

òĩō ēpāēēā iēāō äēēēiāōĩŸĩçð äēēāāpð áðü òĩĩ -CURRENT ðāēñāiāóēēü ēĩñüü áĩŪððōĩçð óðĩĩ óðāēāñü -STABLE ēĩñüü.

## 2.1 Ğāā÷ĩō Ēpāēēā

ŌñēŪĩōā çĩŸñāð ðñēĩ òçĩ áĩāĩāĩüĩāĩç çĩāññĩçĩā Ÿēāĩōçð, ĩ ēpāēēāð òĩō repository áēóŸñ÷āðāē óā iēā ðāñbĩrāĩ “ēāēðóóŸñçóçð”. ĒāōŪ òç äēŪñēāēā áððð òçð ðāñēüāĩð, üēāð iē äēēāāŸð óðĩĩ -STABLE ēĩñüü ðñŸðāē iā Ÿ÷ĩōĩ òçĩ Ÿāēñēóç òçð Release Engineering Team <re@FreeBSD.org>. Ĩē äēēāāŸð ðĩō āðēōñŸðĩĩóāē óā áððð òçĩ ðāñbĩrāĩ ðĩō äēāñēāb 15 çĩŸñāð ābĩāē:

- Äēĩñēpóāēð āĩüóðĩ ðñĩāēçĩŪðüĩ.
- Āĩçĩāñpóāēð óðçĩ ðāēĩçñbùóç.
- ÄēēāāŸð ó÷āðēēŸð iā òçĩ áóðŪēāēā.
- ĨēēñŸð äēēāāŸð óðĩōð iāçāĩŸð óðōēāðĩ, üðüð ð÷. ç ðñĩōēðēç òuĩ IDs iŸüĩ óðōēāðĩ.
- Ĩðĩēāāððĩōā Ūēēç äēēāāp ðēóðāŸāē ç ñŪāā áĩŪððōĩçð üðē ðñŸðāē iā ābĩāē, iā òĩ áĩāĩāĩüĩāĩ ðŪĩōā ñbōēĩ.

ĨāōŪ òēð ðñpóāð 15 ĩŸñāð ēāēðóóŸñçóçð, òðēŪ÷ĩāðāē iēā äēēēiāóóēēp Ÿēāĩōç āēā iā ÷ñçóēĩðĩēçēāb óāĩ äēēēĩp òçð ðāēēēpð Ÿēāĩōçð ēāē ĩ ēpāēēāð áēóŸñ÷āðāē óā iēā ðāñbĩrāĩ “ðāāpĩāōĩð”. ðēŸĩĩ ābĩāē ðĩēŸ ðēĩ āŸóēĩēĩ iā ābĩĩōĩ iŸāð äēēāāŸð óðĩ óŸóðçĩā, āēðüð ēē áĩ äēĩñēpñĩōĩ ēŪðĩēĩ ðĩēŸ òĩāāñü bugp ēŪðĩēĩ ðñüāēçĩā áóðŪēāēāð. ĒāōŪ òç äēŪñēāēā òĩō ðāāpĩāōĩð òĩō ēpāēēā, òĩōēŪ÷ēóðĩĩ ĩbā äēēēiāóóēēp Ÿēāĩōç òðēŪ÷ĩāðāē ēŪēā āāāñŪāā, ĩŸ÷ñē iā ābĩāē Ÿōĩēĩç ç ðāēēēp Ÿēāĩōç. Ōēð çĩŸñāð äēñēāpð ðñēĩ òçĩ ðāēēēp Ÿēāĩōç, ç ñŪāā ðĩō ābĩāē òðāŸēðĩç āēā òēð āēāüóāēð ābĩāē óā óðĩā÷p āðēēĩēĩüĩbā iā òçĩ ñŪāā áóðŪēāēāð, òçĩ ñŪāā óðĩðpñçóçð òçð ðāēĩçñbùóçð, ēāē òçĩ ñŪāā óðĩðpñçóçð òuĩ ports, āēā iā āāāāēüēĩŸĩ ðüð üēā óā āðāñābðçðā ēĩñŪðēā āēā iēā ðēpñç Ÿēāĩōç ābĩāē āēāēŸóēĩā.

## 2.2 Ēbóóā ĀēŸā÷ĩō òçð Ōāēēēpð ēāĩōçð

Ÿðāĩ āñēāðŸð äēēēiāóóēēŸð āēāüóāēð Ÿ÷ĩōĩ ābĩāē āēāēŸóēĩāð, Ÿ÷ĩōĩ äēēēiāóóāb áðü āñēāðü ēüóĩĩ ēāē üēā óā òĩāāñŪ ēŸĩāóā Ÿ÷ĩōĩ áĩāēōēāb, ç ðāēēēp Ÿēāĩōç ĩðĩñāb iā āñ÷bóāē.

### 2.2.1 Äçĩēĩōñābā òĩō ēĩñĩŸ ēāĩōçð

Ÿðüð ðāñēāñŪøāĩ òççĩ áēóāāüāp, iē ēĩñĩb RELENG\_x\_y ābĩāē iēā ó÷āðēēŪ iŸā ðñĩōēðēç òççĩ ĩāēĩrēĩrēāb òuĩ āēāüóāpĩ iāð. Ōĩ ðñpōĩ āpĩā òççĩ äçĩēĩōñābā áðōĩŸ òĩō ēĩñĩŸ ābĩāē iā āāāāēüēābðā üðē āĩōēāŸāðā iā òçĩ ðāēāðóābā Ÿēāĩōç òĩō ðçāābĩō ēpāēēā áðü òĩĩ RELENG\_x ēĩñüü áðü òĩĩ ĩðĩbĩ ēā òðēŪĩāðā òĩ iŸĩ ēĩñüü.

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

Ōĩ āðüāĩñ āpĩā ābĩāē iā äçĩēĩōñāpóāðā iēā āðēēŸðā (tag) óðĩ òçĩābĩ āēēbĩçóçð òĩō ēĩñĩŸ, póðā iā ĩðĩñābðā iā āābðā òēð āēāōĩñŸð iā òçĩ āñ÷p òĩō ēĩñĩŸ āŸēĩēā óðĩ ĩŸēēĩ iā òĩ CVS:

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

Ēāē òüðā ĩðĩñābðā iā äçĩēĩōñāpóāðā òĩ iŸĩ ēĩñüü iā:

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

**Όχι!Βούρο:** *Ἰε ἀδὲέὺὸἰᾶδ RELENG\_\* ἀβίᾶέ ἀᾶό!ᾶδ!Ἰῖᾶδ ᾶᾶ ÷ ᾦΠόρς ᾶδῦ ὀῖῶδ CVS-meisters ἑᾶέ ὀρῖ ᾦ῰ᾶᾶ ὀῖῖ ᾶᾶᾶῦὀᾶῖ.*

Ἰ uniõ “*ἀδελφὸς*” ἀβιάς ι̃νι̃ε̃ρ̃α̃β̃α̃ ο̃ιο̃ CVS. Ὁ̃για̃βιάς Ἰ̃ιά ũm̃ã ο̃ιο̃ ἐ̃α̃ε̃ι̃ν̃β̃α̃ε̃ ι̃ε̃α̃ ο̃ο̃α̃ε̃α̃ε̃ν̃ε̃ι̃ Ἰ̃ύ̃ς Ἰ̃ε̃α̃ι̃ο̃ς ο̃ιο̃ ἐ̃ρ̃α̃ε̃ε̃α̃ ο̃ο̃ι̃ ÷ nũĩ. × ñç̃õẽĩũd̃ĩẽp̃ĩõãõ ἀδελφὸς ο̃ο̃ι̃ δ̃ç̃ãβ̃ι̃ ἐ̃ρ̃α̃ε̃ε̃α̃ ãr̃ç̃ẽŨĩã ũd̃ĩẽĩ õõẽŨĩãẽ ο̃ο̃ι̃ Ἰ̃Ỹẽẽĩ ãẽãũõãẽd̃ ο̃ιο̃ FreeBSD ἰ̃ã ãñb̃õẽãẽ ἐ̃ãẽ ἰ̃ã ÷ ñç̃õẽĩũd̃ĩẽãb̃ ãẽñẽãp̃õ ο̃ĩĩ β̃ãẽĩ ἐ̃ρ̃α̃ε̃ε̃α̃ ο̃ιο̃ ÷ ñç̃õẽĩũd̃ĩẽp̃ẽç̃ẽã ãẽã ο̃ẽd̃ ãδ̃b̃õç̃ĩãd̃ ãẽãũõãẽd̃ ο̃ç̃õ ἡ̃Ũããd̃ ο̃ĩõ FreeBSD.

### 2.2.2 ÁõîÛííîáò ôíí Áñéèü êäíóçò

Ἐνεί ἰθαί ϣ ἀοέεΥόα, ἰαοάαεουοέοοάβ εάε ἀοίεἰαοόαβ ϣ οάεεβ Υέαιόρ, ὃνΥθαί ἰά αβἰἰόρ αέεαΥό οοά ὀαἵαεὔου  
 ἁἡ÷ἁβἁ ἁεἁ ἰά ὀἁἡΥ÷ἰόἰ οἡἰ ουοόυ ἁἡέεἰυ Υέαιόρὀ ἁεἁ οἰ 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 áòáññīāP **sysinstall** ðñÝðáé áðßòçò íá áícíáññèāß íā òīī òúóòú áñéèìú òùī ports éáé òī ÷ þñī òīō āßóèīō ðīō áðáéòāßóáé áéá òçī ÓóèēēīāP òùī Ports. ÁóðÝð íé ðççñīōīñßāð òðŨñ÷īōī óōī áñ÷āßī  
src/release/sysinstall/dist.c.

Áōīŷ īēēēçñùēāß ç ðñīāōīēīāóāß òçð ŋŷāð āðßçīçð Ÿēāīōçð, ðñŸðāē íā áīçīāñþóāðā ìāñēēŪ āñ÷āßā āēā íā áīçīāñþóāðā òīī ēüōīī āēā òç ŋŷā Ÿēāīōç òiō 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 Āçīēīōñāßā òuì Āðēēāðī òçð ēāīōçð

¼ðāí ç òāēēēß Ÿēāīōç āßīāē Ÿōīēīç, ç ðāñāēŪðū āīōīēß ēā āçīēīōñāþóāē òçī āðēēŸðā `RELENG_4_8_0_RELEASE`.

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

Īē ððāŷēðñē òçð Ōāēīçñßùçð ēāē òuì Ports āßīāē āðōīß ðiō ðñŸðāē íā āçīēīōñāþóīōī òēð āðēēŸðāð `RELEASE_4_8_0` óðā ēāðŪēēçēā āŸīōñā ðçāāßiō ēþāēēā.

ÌāñēēŸð òīñŸð, ìðñāß íā ÷ñāēāóðāß íā āßīōī ēŪðīēāð āēēāāŸð òāēāððāßā óðēāīß *ìāðŪ* òçī òīðīēŸðçç òuì āðēēāðī. ĀāīēēŪ, āāī āßīāē āŷōēīēī íā āßīāē ēŪðē òŸōīēī āōīŷ òī CVS āðēðñŸðāē íā ìāðāēēīþóāē ēŪðīēiō òēð āðēēŸðāð ìā āīōīēŸð ùððð `cvs tag -d tagname filename`. Āßīāē ðīēŷ óçīāíðēēü ùìðð āððŸð īē āēēāāŸð òçð òāēāððāßāð óðēāīþð íā óçīāēüēīŷ ìā òēð òuóðŸð āðēēŸðāð āēā òçī óðāēāñēīŸīç Ÿēāīōç. Īē āðßçīāð āēāüóāēð òiō FreeBSD ðñŸðāē íā āßīāē ðŪīðā āŷēīēī íā āíāðāñā÷ēīŷ. ŌīðēēŸð āēēāāŸð òōī ðāñēāŪēēēī òiō ìç÷āīēīŷ òuì āēāüóāüī āāī āðēðñŸðīðāē.

## 3 Ìāðāāēþððēóç òçð ēāīōçð

Īē “āēāüóāēð” òiō FreeBSD ìðñīŷí íā ìāðāāēüððēóðīŷí āðü ìðīēīāþðīðā Ÿ÷āē Ÿíā ó÷āðēēŪ āñþāñī ìç÷Ūīçīā ēāē ðñüóāáç óðī repository òiō ðçāāßiō ēþāēēā. (¼ēīē Ÿ÷iōī āððß òç āðīāðüðçðā, āōīŷ ðāñŸ÷iōīā ðñüóāáç ìŸðü āīþīðīō CVS! Āāßðā òī Āā÷āēñßāēī òiō FreeBSD āēā ðāñēóóüðāñāð ēāððñŸñāēāð.) Ç ìüīç āēāēēß āðāßðççç āßīāē íā ððŪñ÷āē ððīððñēīç òðīī ððñþīā óāð āēā òçī óððēāðß `vn(4)`. (Ōðī `-CURRENT`, āððß ç óððēāðß Ÿ÷āē āíðēēāðāóðāēāß āðü òçī ŋŷā óððēāðß āßóēīō āāóēōīŸīñ òā ìīþīç `md(4)`.) Áí ç óððēāðß āāī āßīāē āíòüìāðüŸīç òðīī ððñþīā óāð, òüðā ì ēāðŪēēçēīð ìāçāüð ēā òīñðüēāß āððüìāðā üðāí āēðāēāððāß ç āíðīēß `vnconfig(8)` ēāðŪ òç āēŪñēāēā òçð òŪçðð òðīēīāóðāð òiō ìŸōīō āēēßīççð. ¼ēā ðā āñāāēāßā ðiō ÷ñāēŪæīīðāē āēā íā ìāðāāēüððßðāðā ìēā Ÿēāīōç āßīāē āēāēŸðēīā òā ìīñðß ðçāāßiō ēþāēēā òðīī ēāðŪēēēī `src/release`. ĀððŪ ðā āñāāēāßā Ÿ÷iōī ùð òēīðü íā ðāñŸ÷iōī üðē ÷ñāēŪæīīðāē āēā íā ÷ðæīīðāē īē āēāüóāēð òiō FreeBSD ìā Ÿíā òōīāðß ēāē óðāēāñēīŸīñ òñüðī. Īēā ðēþñçð Ÿēāīōç ìðñāß íā ìāðāāēüððēóðāß ÷ñçōēīðīēþīðāð āððŪ ðā āñāāēāßā ìā ìēā ēāē ìüñī āíðīēß, òðīðāñēēāìāññŸīçð ēāē òçð āçīēīōñāßāð āíüð ISO āñ÷āßiō ēāðŪēēçēī āēā íā ēāāß òā CDROM, īē āēóēŸððāð āēēßīççð, ēāēþð ēāē ì ēāðŪēēçēīð āāēāðŪóðāçð ìŸðü FTP. Āððß ç āíðīēß āßīāē òððēēß ç `make release`.

### 3.1 Ç āíðīēß `make release`

Āēā íā ìāðāāēüððßðāðā āðēðð÷þð ìēā Ÿēāīōç, ðñŸðāē ðñþðā íā ððŪñ÷iōī ðā ēāðŪēēçēā āñ÷āßā ìŸðā òðīī ēāðŪēēēī `/usr/obj`. Īðñāßðā íā ðā āçīēīōñāþóāðā āßðā ìā òçī āíðīēß `make world` þ āðēŪ `make buildworld`. Āēā íā

ðāóŷ÷āē āðβçð ç îāóāāēðððéçç òçð Ýēāîçð ðñÝðāē íā āðóāðā ðéð ēāðŪēēçēāð ðēíÝð ēāē óā ēŪðîēāð îāóāāēçðÝð:

- CHROOTDIR - Ī ēāðŪēîāîð ðîð ēā ÷ ñçóēîîðîēçēāð óāí ðāñēāŪēēîí chroot āēā üēç òçí îāóāāēðððéçç òçð Ýēāîçð.
- BUILDNAME - Ōî üîñā òçð Ýēāîçð ðîð ēā îāóāāēüððððāðā.
- CVSROOT - Ī ēāðŪēîāîð óðîî îðîîîî āñβðēāðāē òî CVS repository.
- RELEASETAG - Ç āðēēÝðā CVS ðîð áíðéóðîē÷āð óðçí Ýēāîç òçí îðîîā ēÝēāðā íā îāóāāēüððððāðā.

Áí āāí Ý÷āðā ðāç ðñüóāāçç óā ēŪðîēí ðîðēēü CVS repository îā ðîî ēðāēēā ðîð FreeBSD, îðîñāðā ðŪîíā íā ððēŪîāðā òî āēēü óāð ðîðēēü CVS mirror îā òî 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)). ŌðŪñ÷āē Ýíā supfile, óðî āñ÷āðî /usr/share/examples/cvsup/cvs-supfile, òî îðîîî îðîñāðā íā ÷ ñçóēîîðîēççðāðā āēā íā áíðēāñŪðāðā òî CVS repository ðîð FreeBSD óðî āēēü óāð ðîðēēü mirror.

Áí ðāñāēāðāðā òçí āðēēÝðā RELEASETAG, ðüðā ēā îāóāāēüððððāðā íēā ðēðñçð Ýēāîçç āðü òçí ēîñððð ðîð HEAD (āçē. ðîð -CURRENT) ēîñîîî. Īē āēāüóāēð ðîð ððēŪ÷îñðāē āðü āððüî òîî ēîñîü, óðîðēüð āíāðÝñîîāē óāí “-CURRENT snapshots”.

ŌðŪñ÷îîí ēāē ðîēēÝð Ūēēāð îāóāāēçðÝð ðîð îðîñîîî íā ÷ ñçóēîîðîēççēîîí āēā íā ðāñāîðñîðîēççðāðā òçí Ýēāîçð óāð. Īē ðēí ðîēēÝð āðü āððÝð ðéð îāóāāēçðÝð ðāñēāñŪîñîîāē óðçí ēîñððð ðîð āñ÷āðî src/release/Makefile. Ç āēñēāðð áíðîēð ðîð ÷ ñçóēîîðîēççēā āēā íā ððēā÷ðāð ç āðβççç Ýēāîç 4.7 ðîð FreeBSD (x86 ðēāððüñîā) ððāí:

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

Ōî Makefile ðîð ÷ ñçóēîîðîēççēāðāē āēā íā îāóāāēüðððāēîñîāē íē āēāüóāēð îðîñāð íā ÷ ññēóðāð óā āñēāðŪ îā ÷ ññēóðŪ îāðāíŷ ðîðð āðîāðā.

- Äçîēîñāðā āîüð ēāēāñîŷ ðāñēāŪēēîîîðð óā íēā îā ÷ ññēóðð ēāñāñ÷ā ēāðāēüāüí îā òçí áíðîēð “make installworld”.
- Áîāüāð āðü òî CVS íēāð ēāēîŷñēāð Ýēāîçð ðîð ðçāāðîð ēðāēēā ðîð ðððððîāðîð, òçð ðāēîçññüóçð ēāē òüí ports îÝóā óðçí ēāñāñ÷ā ēāðāēüāüí îāóāāēðððéççð òçð Ýēāîçð.
- Ñðēîððāēð òüí āñ÷āðî óðîî ēāðŪēîāî /etc ēāē /dev îÝóā ððî ðāñēāŪēēîí chroot.
- ÅēðÝēāçç òçð áíðîēðð chroot îÝóā óðçí ēāñāñ÷ā ēāðāēüāüí ðîð āðîēîŪóðçēā, āēā íā îçí îðîñāð òî āîüðāñēēü ðāñēāŪēēîí íā āðçñāŪóāē òç îāóāāēðððéççð òçð Ýēāîçð.
- ÅēðÝēāçç òçð áíðîēðð make world îÝóā ððî ðāñēāŪēēîí chroot.
- Îāóāāēðððéçç òüí āēðāēÝóēîüí ðîð āðíāē ó÷āðēēŪ îā òî óýóðçíā Kerberos.
- Îāóāāēðððéçç ðîð ððñðíā GENERIC.
- Äçîēîñāðā āîüð ðāēēēîŷ ēāðāēüāîðð óðîî îðîîî ēā îāóāāēüðððððîîí ēāē ēā āðîēçēāððēîŷ íē āēðāēÝóēîāð îñðÝð òüí ðāēēēðí ðāēÝðüí.
- Îāóāāēðððéçç ēāē āāēāðŪóðāçç òüí āñāāēāðüí ðîð ÷ ñāēŪāēîñāē āēā òçí ðñîāðîēîñāðā òçð Ýēāîçð ēāē òç îāðāðñîðð òçð ðāēîçññüóçð āðü òîð ðçāāðîð ēðāēēā (SGML) óā html ēāē āñ÷āðā ēāēîÝñîð ðîð ēā óðñāāŷîîí òçí Ýēāîçç.
- Îāðāðñîðð ēāē āāēāðŪóðāçç òçð ðāēîçññüóçð (āā÷āēñðāēā ÷ ñðððç, āēóāüñāēēŪ ēāðîñāíā, óçîāēððāēð Ýēāîççð, ēðððāð ððîāāðððçðāðð ðēēēîŷ, ēēð.)

- ĩāóāāēpôôéoc òuĩ “òõĩðéáõĩŸĩũĩ” (crunched) āēôāēŸóēĩũĩ ðĩō éā ÷ ñçóēĩĩðĩēçēĩŸĩ óóēð āéóēŸôôāð āāēáðŨóóáocð.
- Āçĩēĩōñābā òuĩ ðāēŸôũĩ ocð āāēáðŨóóáocð éāē òuĩ ðāēŸôũĩ ðçāābĩō ēpāēēā.
- Āçĩēĩōñābā òuĩ ĩŸóũĩ āēēbĩçocð éāē ocð āéóēŸôôāð “fixit”.
- Āçĩēĩōñābā ocð éāñāñ÷bāð éāóāēüũĩ āēā ocĩ āāēáðŨóóáoc ĩŸóũĩ FTP.
- (ðñĩíēñāôēēŸ) Āçĩēĩōñābā òuĩ ISO āñ÷ābũĩ āēā ĩŸóā CDROM/DVD media.

Āēā ðāñéóóũðāñāð ðēçñĩōĩñbāð ó÷āôēēŸ ĩā ocĩ āēāēēāóbā āçĩēĩōñābāð ĩēāð Ÿēāĩocð, āābôā ocĩ óāēbāā ôāēĩçñbũocð release(7).

### 3.2 ĩāóāāēpôôéoc òuĩ XFree86

Ōĩ āñāóēēũ ðāñēāŨēēĩ **XFree86** ābĩāē Ÿĩā ocĩāĩóēēũ ēñĩŨóē ēŨēā Ÿēāĩocð āēā ðĩēēĩŸð ÷ ñpôóāð ðĩō ēŸēĩōĩ òĩ FreeBSD āēā óóāēĩŸð āñāóāð. ðñēĩ ocĩ Ÿēāĩoc 4.6-RELEASE òĩō FreeBSD, ĩē āðbôçĩāð āēüüóāēð òĩō FreeBSD ÷ ñçóēĩĩðĩēĩŸóāĩ ocĩ Ÿēāĩoc 3.x òuĩ **XFree86**. Ĩ ðēĩ āŸēĩēĩð ðñũðĩð ĩā ĩāóāēũðôôbôāð āóðŸð óēð āēüüóāēð ābĩāē ĩā ÷ ñçóēĩĩðĩēĩŸóāĩ òĩ ðñũāñāĩā `src/release/scripts/X11/build_x.sh`. Áðũũ òĩ ðñũāñāĩā āðāēðāb ĩā ābĩāē pāç ocçĩŸĩā óõĩ óŸóçĩŨ óāð òũĩ òĩ ðāñēāŨēēĩ XFree86 ũĩĩ éāē ç āēpôóā Tcl/Tk. ĩāðŨ ocĩ ĩāóāāēpôôéoc òuĩ éāðŨēēçēũĩ X servers, òĩ ðñũāñāĩā éā ðāēāðŨñāē ũēā óā āñ÷ābā óā óðēēĩāŸð āñ÷ābũĩ ðĩō ðāñēĩŸĩāē ĩā āñāē òĩ `sysinstall(8)` ĩŸóā óõĩĩ éāðŨēēĩāĩ `XF86336` óõĩ ĩŸóĩ āāēáðŨóóáocð.

ĩāēēĩpĩóāð ĩā ocĩ Ÿēāĩoc 4.6-RELEASE òĩō FreeBSD, òĩ `sysinstall(8)` āāēāēéóðŨ ocĩ Ÿēāĩoc 4.x òuĩ XFree86, óāĩ éāñĩēēŨ ðāēŸóā. ÁððŨ ĩðĩñāb ĩā ābĩāē ābôā óā ðāēŸóā ðĩō āçĩēĩŸñāçõā òĩ cluster òuĩ ports p ĩðĩēāāðĩðā Ũēēā ðāēŸóā ðĩō Ÿ÷ĩōĩ āçĩēĩōñāçēāb āðũ Ÿĩā ports tree ĩā ocĩ éāðŨēēçç āðēēŸóā.

**Ōçĩābũoc:** Ābĩāē ðĩēŸ ocĩāĩóēēũ ĩā áðāēñŸóāðā āðũ òĩ āñ÷ābĩ `/etc/make.conf` ĩðĩēāóāpðĩðā òĩðēēŸð ñòēĩbôāēð Ÿ÷āðā ēŨĩāē. Āēā ðāñŨāāēāĩā, āāĩ ābĩāē éāēp ēāŸā ĩā āēāĩŸĩāðā āēðāēŸóēĩā ðĩō Ÿ÷ĩōĩ ĩāóāāēũðôôéóāb óā ēŨðĩēĩ óðāēāēñēĩŸĩĩ óŸóçĩā ĩā ĩñēóĩŸĩç ocĩ óēĩp ocð ĩāóāāēçðpð `CPUTYPE` āēā āāēðéóõĩðĩbçoc òuĩ āēðāēŸóēĩũĩ āēā ēŨðĩēĩ óðāēāēñēĩŸĩĩ āðāĩāñāóðp.

### 3.3 ðñĩāñŨĩĩāóā Ōñbôũĩ (“ports”)

Ç Óðēēĩāp òuĩ Ports òĩō FreeBSD (<http://www.FreeBSD.org/ports>) ābĩāē ĩēā óðēēĩāp ĩā ðāñéóóũðāñā āðũ 23,000 ðñĩāñŨĩĩāóā āðũ òñbôĩðð, ðĩō ābĩāē āēāēŸóēĩā āēā FreeBSD. ĩē Ports Management Team <[portmgr@FreeBSD.org](mailto:portmgr@FreeBSD.org)> ābĩāē òðāŸððĩē āēā ocĩ óõĩðpñçoc āĩũð āŸĩóñĩō āðũ ðçāābĩ ēpāēēā āēā óā ports, ðĩō ĩðĩñāb ĩā ÷ ñçóēĩĩðĩēçēāb āēā ĩā āçĩēĩōñāçēĩŸĩĩ óā ðāēŸóā ĩā óā ðñĩāñŨĩĩāóā ðĩō óðñāŸĩōĩ óēð āðbôçĩāð āēüüóāēð òĩō FreeBSD.

Ç āēāāēēāóbā óõĩðpñçocð ocð óðēēĩāpð òuĩ ports ābĩāē ēŨóē ðĩō āāĩ ĩðĩñĩŸĩā ĩā ēāēŸøĩðĩā āāp. ĩā ĩā÷ũñēóðũ Ũñēñĩ, ĩā ðbôēĩ Ç ĨñāŨtúoc ēāĩocð òuĩ ðāēŸôũĩ ĒĩāēóĩēēŸ āðũ Ōñbôĩðð ([./releng-packages/article.html](http://releng-packages/article.html)), ēāēŸðāē āðũ òĩ ēŸĩā.

### 3.4 Āñ÷ābā ISO ocð ēāĩocð

ĩāēēĩpĩóāð ĩā ocĩ Ÿēāĩoc 4.4 òĩō FreeBSD, ç ĩŨāā ĀĩŨððõĩçð òĩō FreeBSD āðĩōŨóēóā ĩā āēāĩŸĩāē éāē óā óŸóóāñā ISO āñ÷ābā ðĩō ðñpôā ðĩōēĩŸóāĩ ĩē āðāēñābāð *BSDi/Wind River Systems/FreeBSD Mall* óðēð “āðbôçĩāð” āēāmŸð CDROM ðĩō Ÿēāĩāĩ. ēŨēā Ÿĩā āðũ óā óŸóóāñā ISO āñ÷ābā ðñŸðāē ĩā ðāñēŸ÷āē Ÿĩā āñ÷ābĩ `README.TXT` ðĩō

ðǎñéǎñÛöǎé óǎ ðǎñéǎ÷ìíǎíǎ òîõ ǎßóêîõ, êé Ýíǎ ǎñ÷ǎßí CDROM.INF ðîõ ðǎñéÝ÷ǎé ìǎðǎ-ðêçñîîññßǎð ǎéǎ íǎ ìðññǎß òî ðñüǎñǎìǎ sysinstall(8) íǎ ǎéÝǎñǎé êǎé íǎ ÷ñçóêîîðîéßóǎé áðòü òî ǎßóêî, êǎêð òé Ýíǎ ǎñ÷ǎßí filename.txt ðîõ ðǎñÝ÷ǎé ìéǎ êßóðǎ ǎñ÷ǎßüí òîõ CDROM. Áðòß ç êßóðǎ ìðññǎß íǎ ǎçìéîñǎçêǎß ðîéý áðêÛ, ùð ǎñßð:

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

Ìé óðǎéǎêñéíÝíǎð áðǎéòßóǎéð ǎéǎ êÛèǎ Ýíǎ áðü áðòÛ òǎ CD ðǎñéǎñÛîîíóǎé ðǎñǎéÛòü:

### 3.4.1 Áßóêîõ 1

Ì ðñðòîð ǎßóêîõ ǎßíǎé ó÷ǎǎüí áðîééǎéóóééÛ áðîðÝéǎóíǎ òçð ǎíóîéßð make release. Ìé ìüíǎð ǎééǎǎÝð ðîõ ðñÝðǎé íǎ ǎßñîí óóñí êǎðÛéñǎñ disc1 ǎßíǎé ç ðññíóèßê ðîõ êǎðÛéñǎñ tools, òùí XFree86, êǎé üóí òî ǎóíǎóüí ðǎñéóóüðǎññí ðǎéÝòüí ìðññíý íǎ ÷ñÝóíóí óóí ǎßóêî. Ì êǎðÛéñǎñ tools ðǎñéÝ÷ǎé ǎñǎǎéǎßǎ ðîõ áðéòñÝðîí óǎ ÷ñßóðǎð Ûéèüí êǎéðîñǎéêñí óðóðçíÛòüí íǎ òðéÛñîí òéð ǎéóéÝððǎð ǎéêßíçóçð. Áðòüð ì ðñðòîð ǎßóêîõ ðñÝðǎé íǎ òðéÛ÷ǎðǎé bootable Ýðóé ðóðǎ íǎ ìðññíý ìé ÷ñßóðǎð òüí ìüðÝññüí ððîéñǎéóðñí íǎ áðîðǎýǎñîí òî óðÛǎéí ǎçìéîñǎßǎð òüí ǎéóéǎððñí ǎéêßíçóçð.

Áí ìéǎ ǎéǎóñǎðéêß Ýéǎñóç òüí XFree86 éǎ ǎéǎíÝíǎðǎé ìǎ òçí Ýéǎñóç áðòß, ðñÝðǎé íǎ ǎçìǎññèǎß òî ðñüǎñǎìǎ sysinstall(8) ǎéǎ òçí íÝǎ èÝóç êǎé ìé ñǎçǎßǎð ǎǎéǎðÛóðǎóçð. Ì ó÷ǎðéèüð êñǎééǎð òðÛñ÷ǎé óóñí êǎðÛéñǎñ src/release/sysinstall óóñí -STABLE èññü ð óóñí êǎðÛéñǎñ src/usr.sbin/sysinstall óóñí -CURRENT èññü. ÓðǎéǎêñéíÝíǎ, òǎ ǎñ÷ǎßǎ dist.c, menus.c, êǎé config.c éǎ ÷ñǎéǎóðǎß íǎ ǎçìǎññèýíý.

### 3.4.2 Áßóêîõ 2

Ì ǎǎýðǎññð ǎßóêîõ ǎßíǎé áðßóçð áðîðÝéǎóíǎ òçð ǎíóîéßð make release êǎðÛ Ýíǎ ìǎǎÛéí ìÝññð. Áðòüð ì ǎßóêîõ ðǎñéÝ÷ǎé Ýíǎ “live filesystem” ðîõ ìðññǎß íǎ ÷ñçóêîîðîéçêǎß áðü òî sysinstall(8) ǎéǎ íǎ ǎñǎðǎóóíýí ðññǎéßíǎðǎ óǎ ìéǎ ǎǎéǎðÛóðǎóç òîõ FreeBSD. Èé áðòüð ì ǎßóêîõ ðñÝðǎé íǎ ǎßíǎé bootable. Èǎ ðñÝðǎé áðßóçð íǎ ðǎñéÝ÷ǎé Ýíǎ óóíðéǎóíÝñí ǎíóßǎñǎóñ òîõ CVS repository óóñí êǎðÛéñǎñ CVSROOT êǎé ǎǎßǎìǎðǎ áðü ǎðññééÛ ðññǎñÛñǎðǎ óóñí êǎðÛéñǎñ commerce.

### 3.4.3 Áßóêîõ 3 êǎé 4

Ìé òðüéñéðîé ǎðí ǎßóêîõ ðǎñéÝ÷ǎéí ððéðññüéǎðǎ ðǎéÝóǎ éñǎéóíééý ǎéǎ òî FreeBSD. Óǎ ðǎéÝóǎ éǎ ðñÝðǎé íǎ ǎßíǎé ñǎǎñðîéçíÝíǎ, Ýðóé ðóðǎ êÛèǎ ðǎéÝòí íǎ ǎßíǎé óóñí ðǎéí ǎßóêî ìǎ üéǎ óǎ ðǎéÝóǎ áðü óǎ ñðßǎ ǎñǎñðÛóǎé ǎéǎ íǎ ǎǎéǎðǎóðǎéǎß êǎé íǎ òñÝíǎé. ðǎñéóóüðǎññð ðêçñîîññßǎð ǎéǎ òçí ǎçìéîñǎßǎ áðòñí òüí ǎßóêüí ǎíǎóÝññíóǎé óóñí Ûñèññ Ç ÎñãÛîùόç êǎñóçð òüí ðǎéÝòüí Éñǎéóíééý áðü Òñßðîðð (../releng-packages/article.html).

## 4 Áéǎññß òüí Áêäüüóàùí

### 4.1 ÁñðççñǎðçðÝð FTP

¼ðǎí ç Ýéǎñóç ǎßíǎé Ýóíéíç, Ý÷ǎé ǎñééíǎóðǎß ǎéðǎñðð, êǎé Ý÷ǎé ðǎéǎðǎñéóðǎß ǎéǎ ǎéǎññß, ì éýñéñð FTP ǎñðççñǎðçðð ðñÝðǎé íǎ ǎçìǎññèǎß. Ìé áðßóçñéé ǎñðççñǎðçðÝð FTP òîõ FreeBSD ǎßíǎé üéñé mirrors ǎñüð éýñéñð ǎñðççñǎðçðð óóñí ñðßí Ý÷ǎéí ðññóǎǎóç ìüñ Ûééñé FTP ǎñðççñǎðçðÝð. Áðòüð ì ǎñðççñǎðçðð ǎßíǎé ǎñüóüð ùð ftp-master. ¼ðǎí ç Ýéǎñóç ǎßíǎé Ýóíéíç, ðñÝðǎé íǎ ǎçìǎññèýíý òǎ ðǎñǎéÛòü ǎñ÷ǎßǎ óóñí ftp-master:



[/pub/FreeBSD/index.html](#)

λέα ἀδῆP web οἰαῖβᾶᾶ ὄϊο ὀᾶῖῖÉY ÷ ᾶῖ ᾶᾶῖῖῖῖῖ ὀᾶ ᾶῖUῖῖῖῖῖῖ ὀῖῖᾶῖῖῖῖῖῖ FTP ῖᾶῖῖῖῖῖῖῖ ᾶῖᾶ ὀῖῖ ὀῖῖY ÷ ῖῖῖᾶ Yῖᾶῖῖῖ ὀῖῖ FreeBSD.

```
/pub/FreeBSD/releases/arch/x.y-RELEASE/
```

I éadóUeräidö ádu öir iðirBi iðinryí íá äBñöi ääéáoáoöÜöáoéö iYóu FTP, üðüö öir Y÷äé ðñiäöieiÜöäé ç áföieP make release.

/pub/FreeBSD/ports/arch/packages/packages-X.Y-release/

¼ëá ôá ðñĩĩãôããëùôêéóìÝíá ðáéÝôá ãéá ôçì ôñÝ÷ĩõóá Ýëäĩõç.

```
/pub/FreeBSD/releases/arch/X.Y-RELEASE/tools
```

Îéá óõïâîëëêÐ óõïôùîâõóç ãéá ôîí êáôÛëîäí .../.../.../tools.

/pub/FreeBSD/releases/arch/X.Y-RELEASE/packages

```

λέά όοίâîëëêP όοίôùîâóóç äéá ôîí êáoÜëîāī .../.../ports/i386/packages-X.Y-release.

```

```
/pub/FreeBSD/releases/arch/ISO-IMAGES/x.y/x.y-*.iso
```

Ôá áñ÷åßá ISO.

Ἀέα ᾄανεοοουοἀνᾄᾰ ðeçñrōirŋBao ó÷āðéēÜ ia ôçī īnāÜfùoç ôur mirror æááñḃð FTP oīø FreeBSD, ᾄāñáéæþ āāBôā oī Üñēñ ÖdeÜ÷firôad Ýía FreeBSD mirror (/hubs/).

[illegible]

## 4.2 Àíáðáñáũùã òúi CD-ROM

[illegible]

5 Åăăêôáóéìüôçôá

Δάνυετ θῖο οἱ FreeBSD ἀβῖαε ὕἱα θεΠῆαδ εἰεοῖοῖῆεεῦ οὔοοοῖα, ἀὰρ οδῖῖῖ-ἄε εὔοε θῖο ἱά οἶο ἀἱἄἄεῖῖἄε ἱά ÷ ἡçoεἱῖῖῖεΠῶἶἶ οἱ οὔοοοῖα ἄεἡεἶἶο ὑδῖο οἱ ὕ÷ῖοἱἱ ῥἄεἶοῖῖῖῖ ἡἱἶῖῖ ἄεἱ ἄεἱῖῖ. ÷ῖοἱ ῥῖοῖῖῖῖῖῖῖ ἱά ο÷ἄεῖῖῖῖῖ οἱ οὔοοοῖα ὕοε θῖο ἱά ἀβῖαε ὑοἱ οἱ ἡοἱἱῖῖῖ ῥεἱ ἡῥἄεῖῖῖῖῖ, ἄεἱ ἱά ἀβῖαε ἄῖῖῖῖ ἱά ÷ ἡçoεἱῖῖῖεῖῖῖ ὀἱ ἡῖῖῖ ῥῖῖῖ ἱῖῖῖῖ ὕεἱἱ ἡῖῖῖῖῖῖ ῥῖῖῖῖῖῖ ἱά ἱῖῖῖῖῖ ἱά ὀçoἡ÷ῖῖῖ. ἱ ἱῖῖῖ “εἱῖῖῖῖ” θῖο ὕ÷ῖοἱἱ ο÷ἰῖῖῖῖ ἱἱ ἡῖῖῖ ἀβῖαε ῥῖο ἱῖ ο÷ἄεῖῖῖῖῖ ἱἱ ἄεἱἱἱἱἱῖῖ οἱ FreeBSD ἱἱ ἱἱἱῖῖ ῖῖῖῖῖῖ ἄεἱἱἱῖῖ, ὀἶο ἱῖῖῖῖῖῖῖῖ ἱἱ ὀἱῖῖῖῖῖῖῖῖῖ ῥεῖ ἄεἱἱἱῖῖ ὀἶο. Ç ῖῖῖῖῖῖῖῖ θῖο FreeBSD ἱῖῖῖῖ ἱῖῖ ἱἱ ἡῖῖῖῖῖ ὀçoἱ ῥῖῖῖῖῖῖῖ ἡῖῖῖ θῖο ÷ ἡçoεἱῖῖῖῖῖῖ οἱ ῖῖῖῖῖῖῖ ἄεἡεἶἶο ὑδῖο οἱ ἄεἱῖῖῖῖῖ ἡἱῖῖ. Ἀῖῖῖῖῖῖῖῖῖ ῖῖῖ ἡ÷ἱἱῖῖῖῖῖῖ εὔῖἱ ἄεἱἱἱῖῖ θῖο ῥῖῖῖῖῖῖ ὀçoἱ ἱῖῖῖῖῖῖ ῥεἱ ἡἱῖῖῖῖῖῖ ἡἱῖῖῖῖῖ ἡἱῖῖῖῖῖῖ ῖῖῖ ἄεἱ ÷ ἡῖῖῖῖῖ, ἄεἱ ῥῖῖῖῖῖῖῖ, ἄεῖῖ ἡἱ ῖἱ ῥῖῖῖῖ ἱἱ ῥῖῖῖῖῖῖ ῖῖῖῖ ἱἱ ἱῖῖῖῖῖ ἱἱ ἡῖῖῖῖῖῖ ἱἱ ἡῖῖῖῖῖῖ ὀ÷ἰῖῖῖῖ ἱἱ εὔοε ὀὔοἱῖῖ.

## 5.1 ĀçîēîōñāāĀ ĐñîóáñîîóíŸíuî ĀéóēāôôĀ ĀēēĬîççò.

ĐîēēŸò āāēāóáóôŪóāēò Ÿ÷îŕî đîēýđēîēāò áđāēôĀóāēò đîŕ îđîñāĬ íā ôç óāēñŪ òîŕò íā áđāēôîŸí ôçî đñîŕôēĤēç đāñéóóúôāñuî îāçāĤî Ĥ āñāāēāĬuî ÷ñĤóôç óôēò āéóēŸôôāò āāēāôŪóóáóçò. Ĭ “îđāēŪēēēîŕ” òñuđîŕ íā òî ēŪîāôā áôôu āĬîāē íā ēŪîāôā ôēò āēēāŸò óāò óôîŸ ēāôŪēîāî đîŕ Ÿ÷āē āôîēîŪóāē îāôŪ òî ôŸēîŕ ôçò ç āēāāēēāóĀā make release:

- ĐāñŪóôā óā patches óāò Ĥ đñîŕôēŸôôā óā āđēđēŸîî āñ÷āĬ îŸóā óôîŸ ēāôŪēîāî chroot ôçò Ÿēāîŕçò.
- `rm ${CHROOTDIR}/usr/obj/usr/src/release/release.[59]`
- Îāôāēüôôôôôā đŪēē òî sysinstall(8), òî đñĤĤîā, Ĥ üđîēā Ūēēā đñîāñŪîāôā Ÿ÷îŕî āđçñāāóôāā áđü ôēò āēēāŸò óāò.
- `chroot ${CHROOTDIR} ./mk floppies`

Ĭē îŸāò āéóēŸôôāò āāēāôŪóóáóçò ēā āçîēîōñāçēîŸí óôîŸ ēāôŪēîāî \${CHROOTDIR}/R/stage/floppies.

ĀîāēēāēôēēŪ, îđîñāĬôā íā ÷ñçóēîîđîēĤóāôā òî make target boot.flp, Ĥ îđîñāĬôā íā òñŸîāôā áđāôēāĬāò òî script đîŕ āçîēîōñāāĬ óā óôôôĤîāôā āñ÷āĬuî src/release/scripts/doFS.sh.

ÎđîñāĬôā āđĬóçò íā ēāñîĬôāôā Ĥôôā āēēŸò óāò āēēāŸò íā đāñāóôîŸí îā ññôĤ patch óôçî Ÿēāîŕç üđüò ēā ôôēŪ÷îāôāē, āĬñîŕôāò ôēĤĤ óôçî îāôāāēçôĤ LOCAL\_PATCH üôāî òñŸîāôā ôçî āîŕîēĤ make release.

## 5.2 ĐñîāñāîîāôĬæîîôāò òî sysinstall

Ōî āñāāēāĬî āāēāôŪóóáóçò ēāē ñŸēîŕçò òîŕ FreeBSD, òî sysinstall(8), îđîñāĬ íā đñîāñāîîāôēóôāā āēā íā ēŪîāē đēî āŸēîēāò ôēò áôôñîāôîđîēçîŸîāò āāēāóáóôŪóāēò óā đîēēŪ ìç÷āĤîāôā. Áôôu òî ÷āñāēôçñēóôēēu òîŕ đñîāñŪîîāôîŕ îđîñāĬ íā ÷ñçóēîîđîēçēāĬ óā óôîāôāóîu îā òî PXE[13] ôçò Intel āēā íā îāēēîĤóāē ç āāēāôŪóóáóçò áđü òî āĬēôôî, Ĥ óā óôîāôāóîu îā đñîóáñîîŕîŸîāò āéóēŸôôāò āēēĬîççò ēē Ÿîā sysinstall script. íā đāñŪāāēāîā áđü ôŸôîēî sysinstall script îđîñāĬôā íā āñāĬôā óôî āñ÷āĬî src/release/sysinstall/install.cfg.

## 6 ÎāēĤîāôā òîŕ ĐĤñāîā áđü ôçî êäîŕç 4.4 òîŕ FreeBSD

Ç āēāāēēāóĀā āôîēîāôĬāò ôçò Ÿēāîŕçò 4.4 òîŕ FreeBSD îāēĬîççā āđĬôçîā ôçî Ĭç ÁôāîŸóôîŕ 2001. ÎāôŪ áđü áôôĤ ôçî çîāññîçîā, üēāò îē āēēāŸò óôîŸ ēîñîü RELENG\_4 òîŕ FreeBSD Ÿđñāđā íā Ÿ÷îŕî Ÿāēñēóç áđü ôçî Release Engineering Team <re@FreeBSD.org>. Ç đñĤôç āîēēîāóôēēĤ Ÿēāîŕç āēā ôçî āñ÷ēôāēôîŸēĤ x86 Ÿāēîā āēāēŸôēîç óôēò 16 ÁôāîŸóôîŕ, ēē āēîēîŕôēĤēçēā áđü 4 āēüîā āîēēîāóôēēŸò āēāüóāēò đîŕ îāĤāçóāî óôçî ôāēēēĤ Ÿēāîŕç óôēò 18 òîŕ ÓāđôŸîāñç. Ĭ ôđāŸēôñô áóôŪēāēāò Ÿđāēîā ôçîāîŕôēēü ñuēî ēāôŪ ôçî āēŪñēāēā ôçò ôāēāôôāĬāò āāāñŪāāò ēāēĤô ēŪđîēā đñîāēĤîāôā áóôŪēāēāò āñŸēçēāî óā đñîçāîŸîāîāò, āîēēîāóôēēŸò āēāüóāēò. ÓôñîēēēŪ, đŪîü áđü 500 email óôŪēēçēāî ôçî Release Engineering Team <re@FreeBSD.org> óā āēŪóôçîā îēēñüôāñî áđü Ÿîā îĤîā.

Ç ēîēîŸüôçôā òùî ÷ñçóĤî îāò Ÿēāîā óāôŸò üôē ç áóôŪēāēā ēāē ç óôāēāñüôçôā îēāò Ÿēāîŕçò āāî ēŪ ‘đñāđā íā ēôôēŪæāôāē āēā ēāîāîüò āĬāŕôð đñîēāóîĬāò Ĥ çîāññîçîāò đîŕ Ÿ÷îŕî ôāēāĬ óāî óôü÷îē áđü đñēî. Ōî FreeBSD Ÿ÷āē îāāāēĤóāē āñāîāôēēŪ ēāôŪ ôç āēŪñēāēā ôçò æüĤð òîŕ óāî óŸóôçîā, ēāē ç āîŪāēç āēā óôāēāēñēîŸîç đîēēôēēĤ ēāē îñāŸîŸüŕç āēā ôçî āçîēîōñāāā îŸüî āēāüóāùî āĬîāē đēŸîŸ óāîāñĤ đāñéóóúôāñî áđü đîŕŸ. ÁôôĤ ç āîŪāēç ēā āĬîāē āēüîā đēî ôçîāîŕôēēĤ ēāēĤô òî FreeBSD ēā āñ÷Ĥôāē íā îāôāóŸñāôāē óā îŸāò đēāóôüñîāò.

## 7 ÎáëïïôééÝò Êáôáðëýíóáéò

Ãβíáé æüðééðò óçíáóβáð íé ðñáéðééÝò éáé ç ïñÃÛîóç òçð ñéááééáóβáð äçíéíðñáð òùí Æêüüóàùí íáð íá óðíáááβæííí íá òçí óðíá÷ð ðóíáíüíáíç áÛóç òùí ÷ñçóðíí íáð. Îá áÛóç áððð òç óéÝðç ãñááæüíáóðá ðéççñÛ áéá íá ðáèíçñéðóíðíá òçí ñéááééáóβá ðáñááüñðò òùí Æêüüóàùí òîõ FreeBSD.

- *ÐáñÛëçççç áêðÝéáóç* - ÎáñééÛ ìÝñç òçð ìáðáæððððéóçð ìéáð ÆáéáðÛóðáóçð ìðñíýíí íá ðñíííí “ðñéý ðáñÛëçççá”. Óá ðéí ðñééÛ áðü ðá óðÛáéá áβíáé I/O intensive, ìðüðá ç ýðáñíç ðñééðí ððççðð-ðá÷-ýðçðáð ðβóéùí áβíáé ðéí óçíáíðééð áðü òçíí ÷ñðç ðñééðí áðáíáñáóðíí áéá íá áðéðá÷ðñéáβ éÛðüð ç ñéááééáóβá ðîõ make release. Áí ñéáóññáðéééβ ðβóéíé ÷ñçóéíðñéççýííí áéá ðíðíáðá òçð éáñáñ÷ð ðîõ chroot(2) ðáñéáÛëçíðòð, ðüðá ðí CVS checkout òùí éáðáéüüüí ports éáé doc ìðññáβ íá áβíáé ðáððü÷ñííá íá òçí áñííéð make world ððñí Ûëéí ðβóéí. ×ñçóéíðñéçççç ìéá RAID éýóç (hardware ð software) ìðññáβ íá ìáéðóáé ãñáóðééÛ ðñí óðñéééü ÷ñññ ðîõ ÷ñáéÛáðáé íá ìáðáæüðððéóðáβ ìéá ðéðñçð Ýéáñóç.
- *Îáðáæððððéóç Æêüüóàùí áéá ñéáóññáðéééÝò áñ÷éðáðñéééÝò* - ÈÝéáðá íá ìáðáæüððððáðá ìéá Ýéáñóç áéá IA-64 ð Alpha óá éÛðñéíí x86 áðáíáñáóðð? make TARGET=ia64 release.
- *ÃñééíÝð áéá éÛçç* - ×ñáéáæüíáóðá éáéýðáñá ãñááéáβá áéá áððüíáðí Ýéáñ÷ñ ìñëüðçðáð ððñ FreeBSD.
- *Ãñááéáβá ÆáéáðÛóðáóçð* - Õñ ðñüãñáñÛ íáð áéá òçí ÆáéáðÛóðáóç ðîõ FreeBSD Ý÷áé ìáðáñÛóáé ðññ ðñééý ðñí áíáíáñññ ÷ñññ æüðò ðîõ. ÕðÛñ÷ñíí ÆéÛññáð ñÛáðð ðîõ ãñáÛéííóáé áéá íá ðéíðñéðóííí éÛðñéíí Ûëéí, ðéí ìñðÝñññ ìç÷áíéðü ÆáéáðÛóðáóçð. Îéá áðü ðéð ðéí ððñó÷ññáð, áβíáé ç ñÛáá libh[5] ðñí óðñ÷áýáé òçí ðéíðñéçççç áñüð Ýñððñí, ìÝñò ðññðñí ðáéáðáñβóíáðñí éñáéóíééý éáé áñüð GUI ðññáñÛñáðñí ÆáéáðÛóðáóçð.

## 8 Æð÷áñéóðβáð

Èá ðéáéá íá áð÷áñéóððóü ðññ Jordan Hubbard, ðñí ìñ Ýäüóá òçí ððéáéñβá íá ðÛññ éÛðñéá áðü òçí áðéýíç òçð Ýéáñóçð 4.4 ðñí FreeBSD, éáçð éáé áéá ìéç òçí ãñééáéÛ ðñí Ý÷áé éÛñáé áð éáé ÷ñññéá áéá íá áβíáé ðñ FreeBSD áððü ðñí áβíáé óðñáñá. ÕðéééÛ, ç Ýéáñóç ááí éá ðóáí ðñíÝ áðñáðññ íá ìéñéççññéáβ ÷ññð ìéç òçí ó÷áðééð ìá òçí Ýéáñóç ãñééáéÛ ðñí Ýéáíáí íé Satoshi Asami <asami@FreeBSD.org>, Steve Price <steve@FreeBSD.org>, Bruce A. Mah <bmah@FreeBSD.org>, Nik Clayton <nik@FreeBSD.org>, David O’Brien <obrien@FreeBSD.org>, Kris Kennaway <kris@FreeBSD.org>, John Baldwin <jhb@FreeBSD.org> éáé ìéñé íé ððñéñéðñé ðñí áð÷ñéýíóáé ìá òçí áñÛððñíç ðñí FreeBSD. ÈÝëü áðβóçð íá áð÷áñéóððóü ðñíðð Rodney Grimes <rgrimes@FreeBSD.org>, Poul-Henning Kamp <phk@FreeBSD.org>, éáé ìéñíð ðñíð Ûëéíðð ðñí ãñáÛóççáí áéá íá ððéÛññí ðá ãñááéáβá áéá ðéð Æêüüóáéð óðéð ðñððáð ìÝñáð òçð äçíéíðñáð ðñí FreeBSD. Áððü ðñ Ûñéññ Ý÷áé áðçñááóðáβ áðü éáβíáíá ó÷áðééÛ ìá òçí ïñÃÛîóç òùí Æêüüóàùí áðü ðñ CSRG[14], òçí ñÛáá ðñí NetBSD[11], éáé òçí ðññóðáóç áéá ìéá ñéááééáóβá ïñÃÛîóçð òùí Æêüüóàùí ðñí John Baldwin[12].

## 9 ÁíáðññÝò

[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>)