

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
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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. Õĩ FreeBSD áðĩðãéãßðáé äðũ óóĩãéóóĩñŸð ÷ éééŨãũĩ áĩèñðùĩ äðũ ùéĩ òĩĩ èũóĩĩ. Ç ñŨãá òĩõ FreeBSD ðãñŸ ÷ äé ðñũóãáóç ĩŸóũ 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 äðũ ôçĩ ÷ ñðóç áĩũð áðððçñĩŸ óðóðßĩáðĩð äéá ÷ ãßñéóçð èðãééá. Áðòù áðĩðŸéãóá éáé òĩĩ ðéĩ óçĩáĩóéèũ ðãñŨãĩðá Ÿéĩçð äéá Ÿĩá ĩããŨéĩ ãñéèũ äðũ óáéáĩðĩŸ ÷ ĩðð ðñĩãñãĩãðéóðŸð äðũ ùéĩ òĩĩ èũóĩĩ óóĩ FreeBSD. Âßĩáé ðñĩðãĩŸð, áŸãáéá, ðùð ðĩéŸ óŸĩðñã éã äß ÷ ã ãßĩáé áĩðãèð ÷ áĩðééð ç éãðŨóðáóç áĩ äß ÷ áĩ ùéĩé, äðũ ùéĩ òĩĩ èũóĩĩ, ðñũóãáóç ĩá ãñŨðĩðĩ óóĩ èðãééá. Äé’ áðòù, ĩũĩ ĩéá “ãðééããĩŸĩç” ñŨãá äðũ 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

ēāiōñēēP-ĩŨäá[7] (core team) áðũ äēāēāēñēĩŸĩōð ðñĩāñāĩāóēóðŸ ðēēŸāāóāē äēā íā ðāñŸ ÷ äē ēŨðĩēiō āßāiōð ēāēĩāPāçóc ēāē íēā ēāðāŸēðĩóc ðōĩ óŸĩēĩ òuĩ committers.

Íē ðā ÷ Ÿóāōĩē ñōēĩß āíŨððōĩçð òiō FreeBSD āāĩ áðPñōĩ ēāē ðĩēŸ ÷ ñũĩĩ äēā òĩ íāēāēŨñēóĩā òiō ððððPĩāðiō āíŨððōĩçð òā íēā Ÿēāiōç íā ðĩēüðçðā ðiō íā āĩßæāē íā ÷ ñçóēĩĩðĩēāßðāē āðñŸüð. Äēā íā ēðēāß äððũ òĩ āßēēçĩā, ç āíŨððōĩç āßĩāðāē ðāððũ ÷ ñĩĩā òā āōĩ ðāñŨēēçēā ĩĩĩðŨðēā. Ĩ ēŸñēiō ēĩñũð āíŨððōĩçð āßĩāē ĩ *HEAD P trunk* ðōĩ CVS repository íāð, āĩñóðũð ēāē ùð “FreeBSD-CURRENT”, P “-CURRENT” āĩ ðōĩðñßā.

Íāð ðēĩ ððāēāñũð ēĩñũð ðōĩðçñāßðāē, āĩñóðũð íā òĩ ũñĩā “FreeBSD-STABLE” P ðēĩ óŸĩðñā “-STABLE”. Äēā íē āōĩ ēĩñĩß āßĩāē āðĩēçēāðĩŸĩē ðōĩ ēŸñēĩ CVS repository, ðçĩ Äēāēēüñĩēā, ēāē āĩðēāñŨñĩōāē ĨŸü ðŸ *CVSup*[2] ðā mirrors ðāĩōĩŸ ðōĩĩ ēüōĩ. Òĩ FreeBSD-CURRENT[8] āßĩāē ç “ðñðç óāēñŨ” ðçð āíŨððōĩçð òiō FreeBSD ēāēðð ðā äððũ āßĩñĩōāē ðñðā üēāð íē ēāēĩŸñēāð äēēāŸŸð. Òĩ FreeBSD-STABLE āßĩāē ĩ ēĩñũð āíŨððōĩçð áðũ òĩĩ ĩðĩß ððēŨ ÷ ñĩĩōāē íē äēäüóäēð. Íē äēēāŸŸð äēóŸñ ÷ ĩĩōāē ðā äððũ, òĩĩ āŸŸðāñĩ ēĩñũ āíŨððōĩçð, íā ðēĩ āñāũ ñōēũ, äōĩŸ ðñðā (óŸĩñũĩā íā ðçĩ ðĩēðēēēP íāð) āĩēĩāóðĩŸĩ ðōĩ FreeBSD-CURRENT ēāē Ÿ ÷ ĩōĩ āĩāðāóðāß ðĩēŸ ēāēŨ.

ÄāðŨ ðçĩ ðāñßĩāĩ ðiō ĩāñēāāāß áðũ ðç íēā Ÿēāiōç ðçĩ āðũĩāĩç, ððēŨ ÷ ñĩĩōāē ēāēçĩāñēĩŨ snapshots áðũ ðā ĩç ÷ āĩPĩāðā ðçð ñŨāāð òiō FreeBSD ēāē āßĩāē äēāēŸóēĩāð áðũ òĩĩ āĩððçñāðçðP [ftp://stable.FreeBSD.org/](http://stable.FreeBSD.org/). Ç ĩāāŨēç äēāēāðēĩñũðçðā òuĩ äēðāēŸóēĩñ snapshots, ēāēðð ēāē ç ðŨðç ðçð ēĩēĩñũðçðāð òuĩ ÷ ñçóðĩ ĩāð íā āĩçĩāñPñĩōĩ ðā ĩç ÷ āĩPĩāðŨ òiōð ĩā ðēð ðñũóðāðð -STABLE äēäüóäēð ĨŸü ðŸ *CVSup* ēāē “make world”[8] āĩçēĩŸĩ íā ēñāðēŸðāē òĩ FreeBSD-STABLE ðā íēā ðĩēŸ āĩēüðēðçð ēāðŨðāðçð äēũĩā ēāē ðñēĩ āñ ÷ ðāē ĩ ēŸēēið òuĩ äēŸā ÷ ñĩ ðĩēüðçðāð äēñēāðð ðñēĩ áðũ ðçĩ äēŨēāç íēāð Ÿēāiōçð òiō FreeBSD.

Óōĩā ÷ ðð ððŸēñĩōāē áðũ òiōð ÷ ñPððāð ĩāð āĩāñŸŸð ðñĩāēçĩŨðũĩ ēāē äēðPðāēð äēā ēāēĩŸñēā ÷ āñāēðçñēóðēēŨ, ēāðŨ ðç äēŨñēāēā òiō ēŸēēið ðçð ēŨēā Ÿēāiōçð. Íē āĩāñŸŸð ðñĩāēçĩŨðũĩ äēðŨñĩōāē ðçĩ āŨðç *GNATS*[9] ĨŸü ðŸ e-mail, ĩā ðçĩ āðāñĩāP [send-pr\(1\)](mailto:send-pr(1)), P ĨŸü ðiō web-interface ðiō ðāñŸ ÷ āðāē ðçĩ äēāŸēðĩóc <http://www.FreeBSD.org/send-pr.html>. Äēðũð áðũ ðēð äēŨñāð ēßððāð çēāēðñĩēēĩŸ ðā ÷ ðāññĩāßĩō ĩā ēŸĩā ðā ðā ÷ íēēŨ ÷ āñāēðçñēóðēēŨ òiō FreeBSD ððŨñ ÷ äē ēāē ç ēßðā çēāēðñĩēēP ēßðā ÄēŸā ÷ ĩō ēāē ÄĩāðŨēēðçð ðĩēüðçðāð òiō FreeBSD (<http://lists.FreeBSD.org/mailman/listinfo/freebsd-qa>), ç ĩðĩßā ðāñŸ ÷ äē Ÿĩā òũñĩōĩ äēā ððæçðPðāēð ð ÷ āðēēŨ ĩā ðēð ēāððñŸñēāð ðçð “ĩñāŨñũçðð òuĩ äēäüóäüĩ”.

Äēā íā āĩððçñāðçēĩŸĩ íē ðēĩ ðōĩðçñçðēēĩß ÷ ñPððāð ĩāð, ĩā Ÿēāiōç òiō FreeBSD 4.3 āñ ÷ ðāĩā ĩā ÷ ñçóēĩĩðĩēŸĩā ĩā ÷ ññēóðĩŸð ēĩñĩŸð äēäüóäüĩ. Äðōĩß ĩē ēĩñĩß āçĩēiōñāĩŸĩōāē ēßāĩ ðñßĩ ððēā ÷ ðāß ç ðāēēēP Ÿēāiōç. ĩāðŨ ðçĩ āĩāēĩñũðçð ðçð Ÿēāiōçð, ĩũĩ ðĩēŸ ðçĩāĩðēēŸð äēēāŸŸð ēāē ðñĩðēPēāð ð ÷ āðēēŸð ĩā ðçĩ áððŨēāēā āßĩñĩōāē ðōĩĩ ēĩñũ ðçð Ÿēāiōçð. Äēðũð áðũ ðçĩ āĩāñũðçðā āĩāŨēĩðçð ĨŸü ðŸ CVS, äēðāēŸóēĩā patchkits ððēŨ ÷ ñĩĩōāē äēā íā ĩðĩñĩŸĩ íā āĩāñēĩßĩōĩ ðā ððððPĩāðŨ òiōð ũōĩē ÷ ñçóēĩĩðĩēŸĩ ðēð äēäüóäēð *RELENG_X_Y*.

Òĩ ÒĩPĩā 2 āĩçāāß ĩā ēāððñŸñāēāð ðā äēŨñĩā ððŨāēā ðçð äēāēēāóðāð ðiō āñßðēāðāē ðßðũ áðũ ēŨēā Ÿēāiōç, ĨŸ ÷ ñē ēāē ðā āPĩāðā ðiō ĩāçāĩŸĩ ðçĩ ĩāðāēPððēðçð ðiō ððððPĩāðið ēāē òĩ ÒĩPĩā 3 āĩçāāß ðçĩ ðāēā ðç äēāēēāóðā ðçð ĩāðāēPððēðçð. Òĩ ÒĩPĩā 5 ðāñēāñŨñēā ðũð ĩðĩñāß íā āðāēðāēāß òĩ āāóēēü óŸóçĩā áðũ ðñßĩðiðð ēāē òĩ ÒĩPĩā 6 ðāñēāñŨñēā ēŨðĩēā áðũ ðā ðñŨāĩāðā ðiō ĩŨēāĩā áðũ ðçĩ äēāēēāóðā Ÿēāiōçð òiō FreeBSD 4.4. ÓŸēið, òĩ ÒĩPĩā 7 ðāñĩðēēŨēāē ēŨðĩēāð áðũ ðēð ēāðāðēŸĩāēð ðiō ēŸēiðĩā ĩā ðŨñāē ç āíŨððōĩç ðōĩ ĨŸēēĩ.

2 Ç Äēāēēēāóðā Äçĩēĩōñāßāð ĩēāð ēāĩōçð

Íē ĩŸāð äēäüóäēð òiō FreeBSD ððēŨ ÷ ñĩĩōāē áðũ òĩĩ -STABLE ēĩñũ āíŨððōĩçð ðāñßĩō ðŨēā ðŸóðāñāēð ĩPĩāð. Ç äēāēēēāóðā ðñĩāñĩēĩāóðāð ĩēāð Ÿēāiōçð ĩāēēĩŨāē ð ÷ āñũĩ 45 ĨŸñāð ðñēĩ ðçĩ āĩāĩñũĩāĩç çĩāññçĩßā Ÿēāiōçð, ũðāĩ ĩ ððāŸēðñið äēäüóäüĩ òiō FreeBSD ððŸēĩāē Ÿĩā āñŨĩā ððēð ēßððāð òuĩ ðñĩāñāĩāðēóðPĩ äēā íā ððāñēðĩßðāē ðōĩðð ðñĩāñāĩāðēóðŸð ũðē Ÿ ÷ ĩōĩ 15 ĨŸñāð ēāēñũ íā ēŨñĩōĩ ũðĩēāð äēēāŸŸð ēŸēið, ðñēĩ òĩ ðŨāũĩā òiō ēPāēēā. ĨŸóā ðā äððũ òĩĩ ēāēñũ, ðĩēēĩß ðñĩāñāĩāðēóðŸð ēŨñĩōĩ ĩēā ðāēñŨ áðũ äēēāŸŸð ðiō Ÿ ÷ ĩōĩ ĩāßĩāē ðēŸĩĩ āĩñũðŸð ùð “ĩāēāēāñßĩōĩāðā MFC”. Ĩ ũñið MFC ðçĩāßĩāē “Merge From CURRENT” ēāē ðāñēāñŨñēā ðçĩ äēāēēēāóðā ðñĩñāñĩāPðð

òĩō ēpāēēā iēāō āiēēiāōĩŸĩçò āēēāāpò āðũ òĩĩ -CURRENT ðāēñāiāōēēü ēĩñiũ āĩŪðòðĩçò òòĩĩ òóāēāñiũ -STABLE ēĩñiũ.

2.1 Ğāā÷iō Ēpāēēā

ŌñēŪiōā çĩŸñāð ðñēĩ òçĩ āiāiāĩuiāĩç çĩāññĩçĩā Ÿēāiōçò, ĩ ēpāēēāð òĩō repository āēóŸñ÷āōāē óā iēā ðāñbĩrāi “ēāēðóóŸñçòçò”. ĒāðŪ òç āēŪñēāēā āððò òçò ðāñēüāið, üēāð iē āēēāāŸò òòĩĩ -STABLE ēĩñiũ ðñŸðāē iā Ÿ÷iōĩ òçĩ Ÿāēñēóç òçò Release Engineering Team <re@FreeBSD.org>. Ĩē āēēāāŸò ðĩō āðēōñŸðĩiōāē óā āððp òçĩ ðāñbĩrāi ðĩō āēāñēāb 15 çĩŸñāð ābĩāē:

- Āēĩñēpōāēð āĩüóðĩ ðñiāēçĩŪðüĩ.
- Āĩçĩāñpōāēð òòçĩ ðāēiçñbùóç.
- ĀēēāāŸò ó÷āðēēŸò iā òçĩ áóðŪēāēā.
- ĨēēñŸò āēēāāŸò òòĩtòð iāçāĩŸò òóóēāðĩ, üðüð ð÷. ç ðñiōēðēç òüĩ IDs iŸüĩ òðóēāðĩ.
- Ĩðĩēāāðĩiōā Ūēēç āēēāāp ðēóðāŸāē ç ñŪāā āĩŪðòðĩçò üðē ðñŸðāē iā ābĩāē, iā òĩ āiāiāĩuiāĩ ðŪiōā ñbóēĩ.

ĨāðŪ òēð ðñpōāð 15 ĩŸñāð ēāēðóóŸñçòçò, òðēŪ÷iāðāē iēā āiēēiāóóēēp Ÿēāiōç āēā iā ÷ñçóēĩðĩēçēāb óāĩ āiēēið òçò ðāēēēpð Ÿēāiōçò ēāē ĩ ēpāēēāð āēóŸñ÷āōāē óā iēā ðāñbĩrāi “ðāāpĩāðĩð”. ðēŸĩ ābĩāē ðĩēŸ ðēĩ āŸóēĩēĩ iā ābĩiōĩ iŸāð āēēāāŸò òòĩ óŸóðçĩā, āēðüð ēē āĩ āēĩñēpñĩĩ ēŪðĩēĩ ðĩēŸ òĩāāñi bugp ēŪðĩēĩ ðñüāēçĩā áóðŪēāēāð. ĒāðŪ òç āēŪñēāēā òĩō ðāāpĩāðĩð òĩō ēpāēēā, òĩðēŪ÷ēóðĩĩ ĩbā āiēēiāóóēēp Ÿēāiōç òðēŪ÷iāðāē ēŪēā āāāñŪāā, ĩŸ÷ñē iā ābĩāē Ÿòĩēiç ç òāēēēp Ÿēāiōç. Ōēð çĩŸñāð āēñēāpð ðñēĩ òçĩ ðāēēēp Ÿēāiōç, ç ñŪāā ðĩō ābĩāē òðāŸēðĩç āēā òēð āēāüóāēð ābĩāē óā òòĩā÷p āðēēĩēĩñĩbā ĩā òçĩ ñŪāā áóðŪēāēāð, òçĩ ñŪāā òòĩðpñçòçò òçò ðāēiçñbùóçò, ēāē òçĩ ñŪāā òòĩðpñçòçò òüĩ ports, āēā iā āāāāēüēĩŸĩ ðüð üēā óā āðāñābðçòā ēĩñŪðēā āēā iēā ðēpñç Ÿēāiōç ābĩāē āēāēŸóēiā.

2.2 Ēbóóā ĀēŸā÷iō òçò Ōāēēēpð ēāiōçò

Ÿðāĩ āñēāðŸò āiēēiāóóēēŸò āēāüóāēð Ÿ÷iōĩ ābĩāē āēāēŸóēiāð, Ÿ÷iōĩ āiēēiāóóāb āðũ āñēāðü ēüóĩ ēāē üēā óā òĩāāñŪ ēŸiāóā Ÿ÷iōĩ āiāēōēāb, ç ðāēēēp Ÿēāiōç ĩðĩñāb iā āñ÷bóāē.

2.2.1 Āçĩēĩñābā òĩō ēĩñiŸ ēāiōçò

Ÿðüð ðāñēāñŪøāiā òòçĩ āēóāāüāp, ĩē ēĩñiñb RELENG_x_y ābĩāē iēā ó÷āðēēŪ iŸā ðñiōēðēç òòçĩ ĩāēĩrēĩrēāb òüĩ āēāüóāpĩ iāð. Ōĩ ðñpðĩ āpĩā òòçĩ āçĩēĩñābā āðòĩŸ òĩō ēĩñiŸ ābĩāē iā āāāāēüēābðā üðē āĩōēāŸāðā ĩā òçĩ òāēāðóābā Ÿēāiōç òĩō ðçāābĩð ēpāēēā āðũ òĩĩ RELENG_x ēĩñiũ āðũ òĩĩ iðĩbĩ ēā òðēŪiāðā òĩ iŸĩ ēĩñiũ.

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

Ōĩ āðüiāĩ āpĩā ābĩāē iā āçĩēĩñāpōāðā iēā āðēēŸðā (tag) òòĩ òçĩābĩ āēēbĩçòçò òĩō ēĩñiŸ, pōðā iā ĩðĩñābðā iā āābðā òēð āēāöĩñŸò ĩā òçĩ āñ÷p òĩō ēĩñiŸ āŸēĩēā òòĩ ĩŸēēĩ ĩā òĩ CVS:

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

Ēāē òüðā ĩðĩñābðā iā āçĩēĩñāpōāðā òĩ iŸĩ ēĩñiũ ĩā:

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

Οδηγός: Το `RELEASE_*` αρχείο `RELEASE` είναι η `CVS-meisters` και οι `RELEASE` αρχεία.

Το `RELEASE` αρχείο `RELEASE` του `CVS`. Ο `RELEASE` είναι η `RELEASE` του `RELEASE` και οι `RELEASE` αρχεία του `RELEASE` είναι η `RELEASE` του `RELEASE` και οι `RELEASE` αρχεία του `RELEASE` είναι η `RELEASE` του `RELEASE`.

2.2.2 Αρχή του Απριλίου

Ο `RELEASE` είναι η `RELEASE` του `RELEASE` και οι `RELEASE` αρχεία του `RELEASE` είναι η `RELEASE` του `RELEASE` και οι `RELEASE` αρχεία του `RELEASE` είναι η `RELEASE` του `RELEASE`.

- `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`

Ο `RELEASE` είναι η `RELEASE` του `RELEASE` και οι `RELEASE` αρχεία του `RELEASE` είναι η `RELEASE` του `RELEASE` και οι `RELEASE` αρχεία του `RELEASE` είναι η `RELEASE` του `RELEASE`.

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

Ο `RELEASE` είναι η `RELEASE` του `RELEASE` και οι `RELEASE` αρχεία του `RELEASE` είναι η `RELEASE` του `RELEASE` και οι `RELEASE` αρχεία του `RELEASE` είναι η `RELEASE` του `RELEASE`.

Áōiŷ iēēēçñùēāß ç ðñīāōiēiāóāß òçð iŷāð āðßçìçð Ýēāiōçð, ðñÝðāē íā áíçīāñþóāðā iāñēēŪ āñ÷āß āēā íā áíçīāñþóāðā òiī ēüōiī āēā òç iŷā Ýēāiōç 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 Āçīēiōñāßā òuì Āōēēāðī òçð ēāiōçð

¼ðāí ç òāēēēß Ýēāiōç āßiāē Ýōiēiç, ç ðāñāēŪðū āíōiēß ēā āçīēiōñāþóāē òçí āðēēÝðā `RELENG_4_8_0_RELEASE`.

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

İē ððāŷēðñē òçð Ōāēiçñßùçð ēāē òuì Ports āßiāē āðōiß ðiō ðñÝðāē íā āçīēiōñāþóiōi òēð āðēēÝðāð `RELEASE_4_8_0` óā ēāðŪēēçēā āŷiōñā ðçāāßiō ēþāēēā.

İāñēēÝð òiñÝð, iðñāß íā ÷ñāēāóðāß íā āßiōi ēŪðīēāð āēēāāÝð òāēāðōāßā óðēāiß *iāðŪ* òçí òiðñēÝðçç òuì āðēēāðī. ĀāiēēŪ, āāi āßiāē āŷōēiēi íā āßiāē ēŪðē òÝōiēi āōiŷ òi CVS āðēōñÝðāē íā iāðāēēiþóāē ēŪðīēið òēð āðēēÝðāð iā āíōiēÝð ùðð ò `cvs tag -d tagname filename`. Āßiāē ðñēŷ óçīāíðēēü ùiðð āððÝð iē āēēāāÝð òçð òāēāðōāßāð óðēāiþð íā óçīāēüēiŷi iā òēð óuóðÝð āðēēÝðāð āēā òçí óðāēāñēiŷiç Ýēāiōç. İē āðßçìāð āēāüóāēð òiō FreeBSD ðñÝðāē íā āßiāē ðŪiðā āŷēiēi íā āíāðāñā÷ēiŷi. ŌiðēēÝð āēēāāÝð óōi ðāñēāŪēēiī òiō iç÷āiēiŷi òuì āēāüóāuī āāi āðēōñÝðñiðāē.

3 İāðāāēþðōēóç òçð ēāiōçð

İē “āēāüóāēð” òiō FreeBSD iðñiŷi íā iāðāāēüððēóðiŷi āðü iðīēiñāþðiðā Ý÷āē Ýiā ó÷āðēēŪ āñþāñi iç÷Ūiçīā ēāē ðñüóāāç óōi repository òiō ðçāāßiō ēþāēēā. (¼ēiē Ý÷iōi āðð òç āðīāðüðçðā, āōiŷ ðāñÝ÷iōiā ðñüóāāç iŷōü āiþiðiō CVS! Āāßðā òi Āā÷āēñßāēi òiō FreeBSD āēā ðāñēóóüðāñāð ēāððñÝñāēāð.) Ç iūiç āēāēēß āðāßðççç āßiāē íā ððŪñ÷āē ððiððñēiç óōiī ððñþiā óāð āēā òçí óðōēāðß `vn(4)`. (Óōi `-CURRENT`, āððß ç óðōēāðß Ý÷āē āíðēēāðāóāēāß āðü òçí iŷā óðōēāðß āßçēiō āāóēōiŷiñ òā iþiç `md(4)`.) Áí ç óðōēāðß āāi āßiāē āíōüiāðüiŷiç óōiī ððñþiā óāð, òüðā i ēāðŪēēçēið iāçāüð ēā òiñðüēāß āððüiāðā üðāí āēðāēāððāß ç āíðēß `vnconfig(8)` ēāðŪ òç āēŪñēāēā òçð òŪççð āðīēiāóßāð òiō iŷōiō āēēßiççð. ¼ēā ðā āñāāēāßā ðiō ÷ñāēŪæiñðāē āēā íā iāðāāēüððßóāðā iēā Ýēāiōç āßiāē āēāēÝóēiā óā iññðß ðçāāßiō ēþāēēā óōiī ēāðŪēiāi `src/release`. ĀððŪ ðā āñāāēāßā Ý÷iōi ùð óēiðü íā ðāñÝ÷iōi üðē ÷ñāēŪæiñðāē āēā íā ÷ðæiñðāē iē āēāüóāēð òiō FreeBSD iā Ýiā óōiāðß ēāē óðāēāñēiŷiñ òñüði. İēā ðēþñçð Ýēāiōç iðñāß íā iāðāāēüððēóðāß ÷ñçēiñðēþiðāð āððŪ ðā āñāāēāßā iā iēā ēāē iūñi āíðēß, óðiðāñēēāiāññÝiçð ēāē òçð āçīēiōñāßāð āíüð ISO āñ÷āßiō ēāðŪēēçēi āēā íā ēāāß óā CDROM, iē āēóēÝððāð āēēßiççð, ēāēþð ēāē i ēāðŪēēçēið āāēāðŪóðāçð iŷōü FTP. Āððß ç āíðēß āßiāē òðōēēß ç `make release`.

3.1 Ç āiðēß `make release`

Āēā íā iāðāāēüððßóāðā āðēð÷þð iēā Ýēāiōç, ðñÝðāē ðñþóā íā ððŪñ÷iōi ðā ēāðŪēēçēā āñ÷āßā iŷōā óōiī ēāðŪēiāi `/usr/obj`. İðñāßðā íā ðā āçīēiōñāþóāðā āßðā iā òçí āíðēß `make world` þ āðēŪ `make buildworld`. Āēā íā

ðáðý÷-áé áðßóçð ç ðáðááêðððéóç òçð Ýêáîóçð ðñÝðáé íá áððáðá ðéð éáðÛêêçðð ðéíÝð éáé ðá ðÛðéáð ðáðááêçðÝð:

- CHROOTDIR - Ì éáðÛêíáðð ðîõ éá ÷ ñçóéíððéççáß ðáí ðáñéáÛêéí chroot áéá üêç òçí ðáðááêðððéóç òçð Ýêáîóçð.
- BUILDNAME - Õî üñíá òçð Ýêáîóçð ðîõ éá ðáðááêüððððáðá.
- CVSROOT - Ì éáðÛêíáðð ððñí ððßí áñßðéáðáé òí CVS repository.
- RELEASETAG - Ç áðééÝðá CVS ðîõ áíðéóððé÷÷ áß ðóçí Ýêáîóç òçí ððßá ðÝéáðá íá ðáðááêüððððáðá.

Áí ááí Ý÷-áðá ðáç ðñüðááóç ðá ðÛðéí ðððéü CVS repository íá ðñí êðáééá ðîõ FreeBSD, ððñáðá ðÛðá íá ððéÛáðá òí áéüü óáð ðððéü CVS mirror íá òí 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 ððßí ððñáðá íá ÷ ñçóéíððéççáðá áéá íá áíðéáñÛðáðá òí CVS repository ðîõ FreeBSD ððí áéüü óáð ðððéü mirror.

Áí ðáñááßðáðá òçí áðééÝðá RELEASETAG, ðððá éá ðáðááêüððððáß íéá ðêðñçð Ýêáîóç áðü òçí êñððð ðîõ HEAD (áç. ðîõ -CURRENT) êññíý. Ìé áêüüóáðð ðîõ ððéÛ÷-ñíðáé áðü áððñí ðñí êññíü, ððíðèðð áíáðÝññíðáé ðáí “-CURRENT snapshots”.

ÕðÛñ÷-ðñí éáé ððééÝð Ûêêðð ðáðááêçðÝð ðîõ ððñíý íá ÷ ñçóéíððéççáßí áéá íá ðáñáíáðñíððéççáðá òçí Ýêáîóç óáð. Ìé ðéí ððééÝð áðü áððÝð ðéð ðáðááêçðÝð ðáñéáñÛðñíðáé ðóçí êññðð ðîõ áñ÷-áßíð src/release/Makefile. Ç áêñéáðð áíððð ðîõ ÷ ñçóéíððéççáðá áéá íá ððéá÷-ðáß ç áðßóçç Ýêáîóç 4.7 ðîõ FreeBSD (x86 ðéáðüüñíá) 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 ÷ ñçóéíððéççáðáé áéá íá ðáðááêüððððáñíðáé ðé áêüüóáðð ððñáß íá ÷ ðñéóðáß ðá áñéáðÛ ðá÷-ðñéóðÛ ðáðáíý ðîðð áðñáðá.

- Äçíððñáß áñüð éáéáñíý ðáñéáÛêéíððð ðá íéá ðá÷-ðñéóðð éáñáñ÷-ßá éáðáéüüí íá òçí áíððð “make installworld”.
- Áñáñáð áðü òí CVS íéáð éáéñýñéáð Ýêáîóçð ðîõ ðçááßíð êðáééá ðîõ ðððððáðáðð, òçð ðáêñññüóçð éáé ðñí ports ðÝðá ðóçí éáñáñ÷-ßá éáðáéüüí ðáðááêðððéóçð òçð Ýêáîóçð.
- Ñðéíðáðð ðñí áñ÷-áßí ððñí éáðÛêíáð /etc éáé /dev ðÝðá ððí ðáñéáÛêéí chroot.
- ÁêðÝéáóç òçð áíðððð chroot ðÝðá ðóçí éáñáñ÷-ßá éáðáéüüí ðîõ áðéíÛððçéá, áéá íá ðçí ððñáß òí áñððáñéü ðáñéáÛêéí íá áðçñáÛðáé òç ðáðááêðððéóçð òçð Ýêáîóçð.
- ÁêðÝéáóç òçð áíðððð make world ðÝðá ððí ðáñéáÛêéí chroot.
- ðáðááêðððéóç ðñí áêðáéÝóéíð ðîõ áßíáé ò÷-áðééÛ íá òí óýóççíá Kerberos.
- ðáðááêðððéóç ðîõ ððñðáíá GENERIC.
- Äçíððñáß áñüð ðáéééíý éáðáéüüíð ððñí ððßí éá ðáðááêüðððððíý éáé éá áððéççáððéíý ðé áêðáéÝóéíð ðñðÝð ðñí ðáéééðí ðáéÝðñí.
- ðáðááêðððéóç éáé ááéáðÛððáóç ðñí áñááéáßíð ðîõ ÷ ðáéÛáñíðáé áéá òçí ðñíáðñíðáðá òçð Ýêáîóçð éáé òç ðáðáðñíðð òçð ðáêñññüóçð áðü ðñí ðçááßíð êðáééá (SGML) ðá html éáé áñ÷-áßá éáéíÝñíð ðîõ éá ððñááýíðí òçí Ýêáîóçð.
- ðáðáðñíðð éáé ááéáðÛððáóç òçð ðáêñññüóçð (áá÷-áéñßáéá ÷ ððððç, áéóáñüáééÛ éáßíáíá, óçíáêðáðð Ýêáîóçð, êßððð ððíááðððçðáðð ðéééíý, êêð.)

- Îāóāāēpôôéóc òuĩ “ôõĩðēáõĩŸĩũĩ” (crunched) āēôāēŸóēĩũĩ ðĩō ēā ÷ ñçóēĩĩðĩēçēĩŸĩ óóēð āēóēŸôôāð āāēáðŪóóáócð.
- Āçĩēĩōñābā òuĩ ðāēŸôũĩ ôçð āāēáðŪóóáócð ēāē òuĩ ðāēŸôũĩ ðçāābĩō ēpāēēā.
- Āçĩēĩōñābā òuĩ ìŸóũĩ āēēbĩçóçð ēāē ôçð āēóēŸôôāð “fixit”.
- Āçĩēĩōñābā ôçð ēāñāñ÷bāð ēāóāēüũĩ āēā ôçĩ āāēáðŪóóáóc ìŸóũĩ FTP.
- (ðñĩíēñāôēēŸ) Āçĩēĩōñābā òuĩ ISO āñ÷ābũĩ āēā ìŸóā CDROM/DVD media.

Āēā ðāñēóóũðāñāð ðēçñĩōĩñbāð ó÷āôēēŸ ìā ôçĩ āēāēēāóbā āçĩēĩōñābāð ìēāð Ÿēāĩóçð, āābôā ôçĩ óāēbāā ôāēĩçñbũóçð release(7).

3.2 Îāóāāēpôôéóc òuĩ XFree86

Ōĩ āñāóēēũ ðāñēāŪēēĩ **XFree86** ābĩāē Ÿĩā óçĩāĩóēēũ ēñĩŪðē ēŪēā Ÿēāĩóçð āēā ðĩēēĩŸð ÷ ñpôóāð ðĩō ēŸēĩōĩ òĩ FreeBSD āēā óóāēĩŸð āñāóāð. 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 ìāóāēũðôðóāðā āóðŸð óēð āēüüóāēð ābĩāē ìā ÷ ñçóēĩĩðĩēĩŸóāĩ òĩ ðñũāñāĩā `src/release/scripts/X11/build_x.sh`. Áðũũ òĩ ðñũāñāĩā āðāēðāb ìā ābĩāē pāç óççĩŸĩā óõĩ óŸóççĩŸ óāð òũũĩ òĩ ðāñēāŪēēĩ XFree86 Ÿũĩ ēāē ç āēpôóā Tcl/Tk. ÎāðŪ ôçĩ ìāóāāēpôôéóc òuĩ ēāðŪēēçēũĩ X servers, òĩ ðñũāñāĩā ēā ðāēāðŪñāē Ÿēā 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 Ÿĩā ports tree ìā ôçĩ ēāðŪēēçç āðēēŸóā.

Óçĩābũóç: Ābĩāē ðĩēŸ óçĩāĩóēēũ ìā áðāēñŸóāðā 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 ìāóāāēũðôéóðāb óā ēŪðĩēĩ óðāēāēñēĩŸĩĩ óŸóðçĩā ìā ìñēóĩŸĩç ôçĩ óēĩp ôçð ìāóāāēçðpð `CPUTYPE` āēā āāēðēóõĩðĩbçóç òuĩ āēðāēŸóēĩũĩ āēā ēŪðĩēĩ óðāēāēñēĩŸĩĩ āðāĩāñāóðp.

3.3 ðñĩāñŪĩĩāðā Ōñbôũĩ (“ports”)

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

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

3.4 Āñ÷ābā ISO ôçð ēāĩóçð

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

ðǎñéǎñÛóǎé óǎ ðǎñéǎ ÷ ùíǎíǎ òìõ ǎßóèíõ, êé Ýíǎ ǎñ ÷ ǎßí CDROM.INF ðìõ ðǎñéÝ ÷ ǎé ìǎóǎ-ðéçñíõíñßǎð ǎéǎ íǎ ìðíñǎß òì ðñüǎñǎìǎ sysinstall(8) íǎ ǎéÝǎíǎé éǎé íǎ ÷ ñçóéííðíéßóǎé áóòù òì ǎßóèí, éǎèð òé Ýíǎ ǎñ ÷ ǎßí filename.txt ðìõ ðǎñÝ ÷ ǎé íéǎ èßóóǎ ǎñ ÷ ǎßí òìõ CDROM. Áóðß ç èßóóǎ ìðíñǎß íǎ ǎçíéíõñǎçèǎß ðíéý áðéÛ, ùð ǎíßð:

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

Íé óðǎéǎèñéíÝíǎð áðǎéóßóǎéð ǎéǎ èÛèǎ Ýíǎ áðù áóòÛ óǎ CD ðǎñéǎñÛííóǎé ðǎñǎéÛòù:

3.4.1 Áßóèíõ 1

Ì ðñðòíð ǎßóèíð ǎßíǎé ó ÷ ǎǎùí áðíééǎéóóééÛ áðíðÝéǎóíǎ òçð ǎíóíéßð make release. Íé ìííǎð ǎééǎǎÝð ðìõ ðñÝðǎé íǎ ǎßííóí óóíí éǎðÛéíǎí disc1 ǎßíǎé ç ðñíóèßéç òìõ éǎðÛéíǎí tools, òùí XFree86, éǎé ùóí òì ǎóíǎóùí ðǎñéóóóùðǎñùí ðǎéÝòùí ìðíñíý íǎ ÷ ùñÝóíóí óóí ǎßóèí. Í éǎðÛéíǎí tools ðǎñéÝ ÷ ǎé ǎñǎǎéǎßǎ ðìõ áðéóñÝðíóí óǎ ÷ ñßóóǎð Ûéèùí éǎéòíõñǎéèßí óóóðçíÛòùí íǎ óðéÛíóí óéð ǎéóéÝóðǎð ǎéèßçóçð. Áóòùð ì ðñðòíð ǎßóèíð ðñÝðǎé íǎ óðéÛ ÷ íǎóǎé bootable Ýóóé ðóóǎ íǎ ìðíñíý íé ÷ ñßóóǎð òùí ìíðÝñíùí ððíéíǎéóóðí íǎ áðíðǎýǎíóí òì óðÛǎéí ǎçíéíõñǎßǎð òùí ǎéóéǎóðí ǎéèßçóçð.

Áí íéǎ ǎéǎóíñǎðéèß Ýéǎíóç òùí XFree86 éǎ ǎéǎíÝíǎóǎé ìǎ òçí Ýéǎíóç áóòß, ðñÝðǎé íǎ ǎçíǎñùèǎß òì ðñüǎñǎìǎ sysinstall(8) ǎéǎ òçí íÝǎ èÝóç éǎé íé ñǎçǎßǎð ǎǎéǎðÛóóǎóçð. Í ó ÷ ǎðéèùð èßǎééǎð òðÛñ ÷ ǎé óóíí éǎðÛéíǎí src/release/sysinstall óóíí -STABLE èíñü ð óóíí éǎðÛéíǎí src/usr.sbin/sysinstall óóíí -CURRENT èíñü. ÓðǎéǎèñéíÝíǎ, óǎ ǎñ ÷ ǎßǎ dist.c, menus.c, éǎé config.c éǎ ÷ ñǎéǎóóǎß íǎ ǎçíǎñùèíýí.

3.4.2 Áßóèíõ 2

Ì ǎǎýðǎñíð ǎßóèíð ǎßíǎé áðßóçð áðíðÝéǎóíǎ òçð ǎíóíéßð make release éǎðÛ Ýíǎ ìǎǎÛéí ìÝñíð. Áóòùð ì ǎßóèíð ðǎñéÝ ÷ ǎé Ýíǎ “live filesystem” ðìõ ìðíñǎß íǎ ÷ ñçóéííðíéçèǎß áðù òì sysinstall(8) ǎéǎ íǎ ǎíǎóǎóóíýí ðñíǎéßíǎóǎ óǎ íéǎ ǎǎéǎðÛóóǎóç òìõ FreeBSD. Èé áóòùð ì ǎßóèíð ðñÝðǎé íǎ ǎßíǎé bootable. Éǎ ðñÝðǎé áðßóçð íǎ ðǎñéÝ ÷ ǎé Ýíǎ óóíðéǎóíÝíí ǎíóßǎñǎóí òìõ CVS repository óóíí éǎðÛéíǎí CVSROOT éǎé ǎǎßǎìǎóǎ áðù ǎìðíñééÛ ðñíǎñÛíǎóǎ óóíí éǎðÛéíǎí commerce.

3.4.3 Áßóèíõ 3 éǎé 4

Íé óðùéíéðíé ǎóí ǎßóèíé ðǎñéÝ ÷ íóí áðéðñüóéǎóǎ ðǎéÝóǎ éíǎéóíééíý ǎéǎ òì FreeBSD. Óǎ ðǎéÝóǎ éǎ ðñÝðǎé íǎ ǎßíǎé ñǎǎíðíéçíÝíǎ, Ýóóé ðóóǎ èÛèǎ ðǎéÝóí íǎ ǎßíǎé óóíí ßǎéí ǎßóèí ìǎ ùéǎ óǎ ðǎéÝóǎ áðù óǎ ñðíßǎ ǎíǎñðÛóǎé ǎéǎ íǎ ǎǎéǎðǎóóǎéǎß éǎé íǎ òñÝíǎé. ðǎñéóóóùðǎñǎð ðéçñíõíñßǎð ǎéǎ òçí ǎçíéíõñǎßǎ áóòðí òùí ǎßóèùí ǎíǎóÝñííóǎé óóí Ûñèñí Ç ÎñÃÛñóç éǎíóçð òùí ðǎéÝòùí Éíǎéóíééíý áðù Òñßóíðð (./releng-packages/article.html).

4 Áéǎíñß òùí Áêäüóàùí

4.1 ÁíððçñǎðçðÝð FTP

¼óǎí ç Ýéǎíóç ǎßíǎé Ýóíéíç, Ý ÷ ǎé ǎíééíǎóóǎß ǎéóǎíßð, éǎé Ý ÷ ǎé ðǎéǎóǎñéóóǎß ǎéǎ ǎéǎíñß, ì éýñéíð FTP ǎíððçñǎðçðð ðñÝðǎé íǎ ǎçíǎñùèǎß. Íé áðßóçíéé ǎíððçñǎðçðÝð FTP òìõ FreeBSD ǎßíǎé üéíé mirrors ǎíüð éýñéíð ǎíððçñǎðçðð óóíí ñðíßí Ý ÷ íóí ðñüóǎǎóç ìüíí Ûééíé FTP ǎíððçñǎðçðÝð. Áóòùð ì ǎíððçñǎðçðð ǎßíǎé ǎíüóóùð ùð ftp-master. ¼óǎí ç Ýéǎíóç ǎßíǎé Ýóíéíç, ðñÝðǎé íǎ ǎçíǎñùèíýí óǎ ðǎñǎéÛòù ǎñ ÷ ǎßǎ óóíí ftp-master:

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

Ιέα ἀδῆP web οἶθεῖἄἄ ὄτῳ ὀἶνεY ÷ ἄε ἄἄθεῖῶἄ ὁἄ ἄεÜῖῖῖῖῖ ὁçῖἄῖῖῖῖῖῖ FTP ῖἄῖῖῖῖῖῖῖ ἄῖἄ ὁçῖ ὁῖY ÷ ῖῖῖἄ Yῖῖῖῖ ὁῖῖ FreeBSD.

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

I éaðÜetäið áðü öii iðibi iðinryí íá áßiñöi ääéáðáðöÜöáéð iÝóü FTP, üðüð öii Ý÷äé ðñiäöieiÜöáé ç áföieP make release.

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

¼ëá ôá ðññĩãôáãëùôôéóìÝíá ðáéÝôá ãéá ôçí ôñÝ÷ĩôóá Ýëäĩôç.

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

Îéá óõîâîëëêP óõîôùîâõóç ãéá ôîí êâôÛëîâî .../.../.../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 ᾄναερόουδᾶνᾷ δὲ χῆρῖοιτῆςΒαο ρ÷ἀδεέῦ ἰὰ οὔρι ιῆᾷῦσὺος οὐί mirror ἀέᾶῖῃᾀδ FTP οἱῷ FreeBSD, ᾄᾶᾶᾶᾶᾶ ᾤᾢᾣᾡ οἱ Ὑᾗῇῇ ÖdeÜ÷ῖῖᾠᾡ Ὶῖᾡ FreeBSD mirror (/hubs/).

Ιδιόηα ιά ὀὔηαε ἀνέαὸ ὃο πηὰ ἄδῃ ὁᄂι ὁᄂεαῖβ ὀᄂο εᄂ ἀᄂίαηηᄂεᄂ ἱ `ftp-master` ἱ ὃ-ᄂε ἱ ἀᄂίαηηᄂεᄂ ὁᄂι ὁεᄂεᄂᄂᄂ ὁᄂο ὁᄂ ὀηᄂᄂᄂ ἂᄂᄂᄂᄂ FTP mirror ἱ ὁᄂι ἱ ὃᄂ ὃᄂεᄂ. Ἀᄂεᄂ ὃᄂεᄂᄂ ἱε ὁᄂᄂᄂᄂᄂ ὃᄂεᄂᄂ ἱ ὁᄂᄂᄂᄂᄂ ἱ ὁᄂι ᄂᄂᄂᄂᄂᄂᄂ ᄂᄂᄂᄂ ὁᄂᄂ mirror sites ὀᄂᄂ FreeBSD (<http://lists.FreeBSD.org/mailman/listinfo/freebsd-hubs>) ὀᄂᄂ ἂᄂᄂᄂᄂᄂᄂ ὁᄂι ἂᄂᄂᄂ ἂᄂᄂᄂᄂᄂᄂ ὁᄂ ἱ ὃᄂ ὃᄂᄂᄂᄂ ὁᄂᄂ ἂᄂᄂᄂᄂᄂᄂ ὃᄂᄂ FTP.

4.2 Àíáðáñáũùã òúi CD-ROM

[illegible]

5 Åăăêôáóéìüôçôá

[illegible]

5.1 Äçĭēĩōñāßá ÐñĩóáñĩĩóĩŸĩũĩ Äéóēāōōpĩ Äēēßĩçóçð.

ÐĩēēŸð āēēāóáóōŨóāēð Ÿ÷ĩōĩ ðĩēŸðēĩēāð áðāēðPóāēð ðĩō ĩðĩñāß ĩā òç óāēñŨ òĩōð ĩá áðāēōĩŸĩ òçĩ ðñĩōēPēç ðñāēóóũðāñũĩ ĩāçāpĩ P āñāāēāßũĩ ÷ñPóðç òóēð āēóēŸððāð āāēāðŨóóāóçð. Ĩ “ĩðāēŨēēēĩō” òñũðĩō ĩá òĩ ēŨĩāðā áððũ āßĩāē ĩá ēŨĩāðā òēð āēēāŸð óāð òōĩĩ ēāðŨēĩāĩ ðĩō Ÿ÷āē āōĩēĩŨóāē ĩāðŨ òĩ òŸēĩð òçð ç āēāāēēāóßá make release:

- ÐāñŨóðā òā patches óāð P ðñĩōēŸóðā òā āðēðēŸĩĩ āñ÷āß ĩŸóā òōĩĩ ēāðŨēĩāĩ chroot òçð Ÿēāĩóçð.
- `rm ${CHROOTDIR}/usr/obj/usr/src/release/release.[59]`
- ĩāðāēũððóðā ðŨēē òĩ sysinstall(8), òĩĩ ðñPĩā, P ũðĩēā Ũēēā ðñĩāñŨĩāðā Ÿ÷ĩōĩ āðçñāāóðāß áðũ òēð āēēāŸð óāð.
- `chroot ${CHROOTDIR} ./mk floppies`

Ĩē ĩŸāð āēóēŸððāð āāēāðŨóóāóçð ēā äçĭēĩōñāçēĩŸĩ òōĩĩ ēāðŨēĩāĩ `${CHROOTDIR}/R/stage/floppies`.

ĀĩāēēāēðēēŨ, ĩðĩñāßðā ĩá ÷ñçóēĩĩðĩēPóāðā òĩ make target boot.flp, P ĩðĩñāßðā ĩá òñŸĩāðā áðāðēāßāð òĩ script ðĩō äçĭēĩōñāß òā òóððPĩāðā āñ÷āßũĩ src/release/scripts/doFS.sh.

Ĩðĩñāßðā āðßóçð ĩá ēāñĩßðāðā þóðā āēēŸð óāð āēēāŸð ĩá ðñāāóōĩŸĩ ĩā ĩññōP patch òççĩ Ÿēāĩóç ũðũð ēā òōēŨ÷ĩāðāē, āßñĩðāð òēĩP òççĩ ĩāðāāēçðP LOCAL_PATCH ũðāĩ òñŸĩāðā òçĩ āĩðĩēP make release.

5.2 Ðñĩāñāĩĩāðßēĩĩóāð òĩ sysinstall

Ōĩ āñāāēāßĩ āāēāðŨóóāóçð ēāē ñŸēĩēóçð òĩō FreeBSD, òĩ sysinstall(8), ĩðĩñāß ĩá ðñĩāñāĩĩāðēóðāß āēā ĩá ēŨĩāē ðēĩ āŸēĩēāð òēð áððñĩāðĩðĩēçĩŸĩāð āāēāðáóðŨóāēð òā ðĩēēŨ ĩç÷āĩPĩāðā. Áððũ òĩ ÷āñāēðçñēóðēēũ òĩō ðñĩāñŨĩāðĩð ĩðĩñāß ĩá ÷ñçóēĩĩðĩēçēāß òā òōĩāðāóĩũ ĩā òĩ PXE[13] òçð Intel āēā ĩá ĩāēēĩPóāē ç āāēāðŨóóāóçð áðũ òĩ āßēðōĩ, P òā òōĩāðāóĩũ ĩā ðñĩóáñĩĩóĩŸĩāð āēóēŸððāð āēēßĩçóçð ēē Ÿĩā sysinstall script. ĩá ðāñŨāāēāĩā áðũ òŸðĩēĩ sysinstall script ĩðĩñāßðā ĩá āñāßðā òōĩ āñ÷āßĩĩ src/release/sysinstall/install.cfg.

6 ĩāēPĩāðā ðĩō ÐPñāĩā áðũ òçĩ êäĩóç 4.4 òĩō FreeBSD

Ç āēāāēēāóßá āðĩēĩāðāð òçð Ÿēāĩóçð 4.4 òĩō FreeBSD ĩāēßĩçóā āðßóçĩā òçĩ ĩç ÁðāĩŸóðĩō 2001. ĩāðŨ áðũ áððP òçĩ çĩāññĩçĩßā, ũēāð ĩē āēēāŸð òōĩĩ ēĩñĩũ RELENG_4 òĩō FreeBSD Ÿðñāðā ĩá Ÿ÷ĩōĩ Ÿāēñēóç áðũ òçĩ Release Engineering Team <re@FreeBSD.org>. Ç ðñþðç āĩēēĩāðēðēP Ÿēāĩóç āēā òçĩ āñ÷ēðāēðĩēēP x86 Ÿāēĩā āēāēŸóēĩç òóēð 16 ÁðāĩŸóðĩō, ēē āēĩēĩðēPēçēā áðũ 4 āēũĩā āĩēēĩāðēēŸð āēāũóāēð ðĩō ĩāPāçóāĩ òççĩ òāēēēP Ÿēāĩóç òóēð 18 òĩō ÓāððŸĩāñç. Ĩ òðāŸēðñð áóðŨēāēāð Ÿðāēĩā òçĩāĩðēēũ ñũēĩ ēāðŨ òçĩ āēŨñēāēā òçð òāēāððāßāð āāāñŨāāð ēāēþð ēŨðĩēā ðñĩāēPĩāðā áóðŨēāēāð āñŸēçēāĩ òā ðñĩçāĩŸĩāĩāð, āĩēēĩāðēēŸð āēāũóāēð. ÓññēēēŨ, ðŨĩũ áðũ 500 email òðŨēēçēāĩ òççĩ Release Engineering Team <re@FreeBSD.org> òā āēŨóççĩā ĩēēñũðāñĩ áðũ Ÿĩā ĩPĩā.

Ç ēēĩēũðçðā òũĩ ÷ñçóðpĩ ĩāð Ÿēāĩā óāðŸð ũðē ç áóðŨēāēā ēāē ç óðāēāñũðçðā ĩēāð Ÿēāĩóçð āāĩ ēŨ 'ðñāðā ĩá ēððēŨæāðāē āēā ēāĩāũð āßāũð ðñĩēāóĩßāð P çĩāññĩçĩßāð ðĩō Ÿ÷ĩōĩ òāēāß óāĩ òðũ÷ĩē áðũ ðñēĩ. Ōĩ FreeBSD Ÿ÷āē ĩāāāēþóāē āñāĩāðēēŨ ēāðŨ òç āēŨñēāēā òçð æũþð òĩō óāĩ óŸóççĩā, ēāē ç āĩŨāēç āēā óðāēāñēēĩŸĩç ðĩēēðēēP ēāē ĩñāŨĩũðç āēā òçĩ äçĭēĩōñāßā ĩŸũĩ āēāũóāũĩ āßĩāē ðēŸĩĩ óāĩāñP ðñāēóóũðāñĩ áðũ ðĩōŸ. ÁððP ç āĩŨāēç ēā āßĩāē āēũĩā ðēĩ òçĩāĩðēēP ēāēþð òĩ FreeBSD ēā āñ÷āßāē ĩá ĩāðāŸŸñāðāē òā ĩŸāð ðēāððũñĩāð.

7 ÎäëïïôëéÝò Êáóãðëýíóáëò

Ãßíáë æüðëëðò óçíáóßáð ïë ðñáëðëéÝò éáë ç ïñÃÛîóç òçð ðëááëéáóßáð äçíëíðñáð òùí Æëüüóàùí íáð íá óðíááßæííí ïá òçí óðíá÷ð ðóíáíííáíç ÆÛóç òùí ÷ñçóðíí íáð. Ìá ÆÛóç áððð òç óëÝðç Æñááæííáóðá ðëëçñÛ ðëá íá ðáëèçñëðóíðíá òçí ðëááëéáóßá ðñááüñðò òùí Æëüüóàùí òîõ FreeBSD.

- *ÐáñÛëëççç áëðÝëáóç* - ÌáñëéÛ ïÝñç òçð ïáðááëðððëóçð ïéáð ÆáëáðÛóðáóçð ïðñíýí íá Æñííí “ðñëý ðáñÛëëçççá”. Õá ðëí ðñëéÛ áðü ðá óðÛáëá Æßíáë I/O intensive, ïðüðá ç ýðáñíç ðñëëðí ðøçëðð-ðá÷-ýðçðáð Æßóëùí Æßíáë ðëí óçíáíðëëð áðü òçíí ÷ñðç ðñëëðí Æðáíñááóðíí ðëá íá ððëðá÷ðíëáß ëÛðüð ç ðëááëéáóßá ðîð make release. Áí ðëáóñíáðëëëß Æßóëíë ÷ñçóëíðñëççýíí ðëá ðíðíáðá òçð éáñáñ÷ðð ðîð chroot(2) ðñáëáÛëëíððò, ðüðá ðí CVS checkout òùí éáðáëüüáí ports éáë doc ïðñíáß íá Æßíáë ðáððü÷ñííá ïá òçí Æñííð make world ððñí Ûëëí Æßóëí. ×ñçóëíðñëðíðáð ïéá RAID ëýóç (hardware ð software) ïðñíáß íá ïáëðóáë ÆñáóóëéÛ ðñí óðñëëëü ÷ñññ ðîð ÷ñáëÛáðáë íá ïáðááëüððëóðáß ïéá ðëðñçð Ýëáíóç.
- *Ïáðááëðððëóç Æëüüóàùí ðëá ðëáóñíáðëéÝò áñ÷éðáëðñíëéÝò* - ÈÝëáðá íá ïáðááëüððßóáðá ïéá Ýëáíóç ðëá IA-64 ð Alpha óá ëÛðíëíí x86 ððáíñááóðð? make TARGET=ia64 release.
- *ÄñëéíÝò ðëá ëÛëç* - ×ñáëáæííáóðá éáëýðáñá Æñááëáßá ðëá áððüíáðí Ýëáñ÷í ïñëüðçðáð óðñ FreeBSD.
- *Ãñááëáßá ÆáëáðÛóðáóçð* - Õñ ðñüññáñÛ íáð ðëá òçí ÆáëáðÛóðáóç ðîð FreeBSD Ý÷áë ïáðáñÛóáë ðññ ðñëëý ðñí áíáíáñíññ ÷ñññ æüðð ðîð. ÕðÛñ÷ííí ÆÛóñíáð ïñÛáð ðîð ÆñáÛëííáë ðëá íá ðëíðñëðóííí ëÛðíëíí Ûëëí, ðëí ïñóÝññ ïç÷áíëüí ÆáëáðÛóðáóçð. Ìéá áðü ðëð ðëí ððíó÷íáíáð, Æßíáë ç ïñÛá libh[5] ðîð óðí÷áýáë òçí ðëíðñççç Æñüð Ýñðñíó, ïÝñó ðññðñð ðáëáðáñßóíáðñð ëñáóíëëý éáë Æñüð GUI ðññáñÛñáðñð ÆáëáðÛóðáóçð.

8 Æð÷áñéóðßáð

Èá ðëáëá íá Æð÷áñéóðßáð ðññ Jordan Hubbard, ðññ ïñó Ýäüóá òçí ððëáëñßá íá ðÛññ ëÛðíëá áðü òçí Æðëýíç òçð Ýëáíóçð 4.4 ðîð FreeBSD, éáëðð éáë ðëá ïëç òçí ÆñóëáëÛ ðñó Ý÷áë ëÛíáë Æðð éáë ÷ññíéá ðëá íá Æßíáë ðñ FreeBSD áððü ðñó Æßíáë óðñáñá. ÕóóëéÛ, ç Ýëáíóç Æññ éá ðóáí ðñóÝ ðñíáðñ íá ïëíëçññëáß ÷ññßð ïëç òçí ó÷áðëëð ïá òçí Ýëáíóç ÆñóëáëÛ ðñó Ýéáíáí ïë 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> éáë ïëíë ïë ððñëíëðñë ðñó áð÷ñëýíóáë ïá òçí ÆñÛððñç ðñó FreeBSD. ÈÝëü Æðßóçð íá Æð÷áñéóðßáð ðñðð Rodney Grimes <rgrimes@FreeBSD.org>, Poul-Henning Kamp <phk@FreeBSD.org>, éáë ïëíðð ðñðð Ûëëíðð ðñó ÆñáÛóççáí ðëá íá ððëÛññíí ðá Æñááëáßá ðëá ðëð Æëüüóáëð óóëð ðñððáð ïÝñáð òçð äçíëíðñáð ðñó FreeBSD. Áððü ðñ Ûñëñí Ý÷áë Æðçñááóðáß áðü éáßíáíá ó÷áðëëÛ ïá òçí ïñÃÛîóç òùí Æëüüóàùí áðü ðñ CSRG[14], òçí ïñÛá ðñó NetBSD[11], éáë òçí ðññóðáç ðëá ïéá ðëááëéáóßá ïñÃÛîóçð òùí Æëüüóàùí ðñó 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
- [7] FreeBSD Core-Team http://www.FreeBSD.org/doc/en_US.ISO8859-1/articles/contributors/staff-core.html
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- [12] John Baldwin's FreeBSD Release Engineering Proposal <http://people.FreeBSD.org/~jhb/docs/releng.txt>
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- [14] Marshall Kirk McKusick, Michael J. Karels, and Keith Bostic: *The Release Engineering of 4.3BSD*
(<http://docs.FreeBSD.org/44doc/papers/releng.html>)