

! " # \$ % & ' () * (# " " + , () * - " . / " + ' (O (& " FreeBSD

! " # \$ % & ' (

) \$ % * \$ % \$ + (# , ' * - . % / \$, 0 % 0 " % ' 1234 ' 5 # 67 % 8 # 5 * 9 # 7521 ' 7 # . % \$ + ' # \$, 7 % . ' \$ + * ## 6 : / " ' / # , 7 # 61 / 5 / . ; 7 # / 0 \$ FreeBSD.

! " 4 (/ 9 %) * (

1. D61%*\$+, 7' 5/" /" ' (>" " #E *\$%\$+'	1
2. G. />/" ' /	1
3. L#B>% " 2A" # # \$, 7% . 1(\$+ *##6: /" ' / # , 7#61/5/	2
4. ; #>B#\$#. 0%	4
5. I % , ' *% " ' / *##6: /" ' (# , 7#61/5/	4
6. L#0 , ' *%\$+ @#7#4' / *##6: /" ' (# , 7#61/5%@ . Bugzilla	5
7. ; 7/A>/ . */B#	7
8. G1#A/" ' ' / , %\$3/E ' 1' 9%E1#	7
9. K% , #1"/" ' / 9#75- Bugzilla	8
10. D\$*1/A' . % " ' /	10
11. M*1' . #8" ' 01' , 7#61/5-	12
12. Q1 (>%1+" /E4/B# #8" %0#51/" ' (.....	12

1. 1 + ' % # \$ 2 . / * O () () * 3 4 %) " - # \$ % \$ 2 *

<8 "%3%1+" # = \$ % * \$ % \$ + (6- 1% " % , ' *% " % >1 (# , ' *% " ' (# \$, 7% . 0' # \$ 3 ? \$ # . # , 7#61/5%@ 3/7/8 Bugzilla, " # " / 0 # \$ # 7- / / ? 7% 8 > / 1- \$ % 0 A / , 7' 5 / " ' 5- , 7' # \$, 7% . 0 / 3 / 7 / 8 * ' * \$ / 52 7 / & / " 8' 7 # . % " ' (Phabricator ' 1' 3 / 7 / 8 # 7 B " ' 8 % & ' C FreeBSD " % Github.

2. 5 & (4 () * (

D>" #E ' 8 *%5- @ 7%8#3%7#. - .%C: ' @ , 7%0\$' 0, 0#\$#72C 5#A"# , #123' \$+ . 0%3/*\$. / , #1+8#. %\$ / 1 (, 7#B7%55" #B# #6/*, /3/" ' (, (. 1 / \$ * (# \$, 7% . 0% *##6: /" ' (# , 7#61/5/, 0#\$#7#/. *0#7/ 8%07- . % / \$ * (* 07%\$0' 5 ' " ' 3/52 " / , #5#B#C: ' 5 #6F(*" /" ' / 5 \$' , % "= \$ # " / , 7#61/5% " ' 1' " " / , 7% . ' 1+" - E # \$ 3 / \$ " . ; # > # 6 " - 5 A / # 67 % 8 # 5 # > " # E ' 8 *%5- @ 7%8#3%7#. - .%C: ' @ , 7%0\$' 0, 0#\$#72C 5#A"# , #123' \$+ . 0%3/*\$. / 7%87%6#\$3' 0% , 7#B7%55" #B# #6/*, /3/" ' (, (. 1 / \$ * (, #123/" ' / 5%*- *##6: /" ' E # , 7#61/5%@, 0#\$#7- / "% *%5#5 > / 1 / " / (. 1 C \$ * (*##6: /" ' (5' # , 7#61/5%@, % 8%, 7#*%5' " % , #123/" ' / , # > > / 7A0' , ' 1' 0#\$#7- / *# > / 7A%\$ 5%1# ' 1' . ##6: / " / *# > / 7A%\$ " ' 0%0#E ' " 9#75%&' ' # *2\$'

, 7#61/5- ' 1' *, ##6/ /?. #*, 7# 8. />/' ' (.

G =\$#5 >#025/" \$/ >/1/\$*(, #, - \$0% #, ' *\$+\$ #, 0%0 **\$%. 1(\$+ @#7#4' / **6: /"' (# , 7#61/5#@. H\$# A/, *, 7#*' \$/ . - , (. 1(/\$*(@#7#4' 5 **6: /"' /5 # , 7#61/5/? I 2, /*1' , /7/ES' , 7(5# 0 *2\$' , \$# @#7#4' 5 **6: /"' /5 #6 , 7#61/5/ (. 1(/\$*(\$#, 0#\$#7#/ 5#A/\$ 6- \$+ 6- *\$7# , 7#%" %1' 8' 7#. %" # ' # \$7%6#\$%" #, 0 #6#C>" #52 2>#. 1/\$. #7/" ' C 0%0 , #1+8#. %\$/1(, \$%0 ' 7%87%6#\$3' 0%.

J#\$ (. #' " #. " #5 *\$%\$+(9#02*' 72/\$*(" % \$, 7%. 0/ **6: /"' E # , 7#61/5#@ . # FreeBSD * , #5#: +C Bagzilla, 6#1+4 /E 3%*\$+C # " % >#1A" % @#7#4 # , #>@#>' \$+ ' >72B' 5 *123%(5.

K%5/\$+\$/, 3\$# =\$% *\$%\$+(#7B%" ' 8#. %" % , # \$/5%\$' 3/*0#52 , 7' " &' , 2, % " / @7#" #1#B' 3/*0' , \$%0 3\$# . - >#1A" - , 7#3/*\$+ >#025/" \$ &/1' 0#5 , 7/A>, 3/5 , #*- 1%\$+ **6: /"' / # , 7#61/5/, ' " / . #*, 7' " ' 5%\$+ *\$%\$+C 0%0 , #4%B#. #/ 720#. #>*\$. #.

3. 6" 74%) 89) " " \$. /%&' 3\$2 # " " +, () * (" . /" +' (O(

<5//\$(5" #B# 01%**#. #4' 6#0, ' " / . */ # " ' >#1A" - , 7' . #>' \$+ 0 , # (. 1/" ' C **6: /"' (# , 7#61/5/. L#" /3" # A/, " /\$ ' >/%1+" - @ 1C>/E, ' 62>2\$ 5#5/" \$- , 0#B>% . - 7/4' \$/, 3\$# "%41' #4' 602 . , 7#B7%55/, % " % *%5#5 >/1/ . - " /, 7%. ' 1+" # , # (1' *' "\$%0*' * 0#5%" >- ' 1' *>/1%1' #, /3%\$02 . 0#" 9' B27%&' # " " #5 9%E1/ (@#\$(%5# , # */6/ =\$# " " #B>% B#. #7' \$ # , 1#@#E >#025/" \$%&' ' ' 1' " /, 7%. ' 1+" #E #67%6#\$0/ #4' 6#0 . , 7' 01%>" #E , 7#B7%55/). M*\$+ /: ? 5" #B# *123%/ . , 0#B>% , #*- 10% **6: /"' (# , 7#61/5/ (." # !" (. 1(/\$*(, 7%. ' 1+" - 5 >/E*\$. ' /5, % \$#1+0# , 7' . #>' \$ 0 7%8#3%7#. %" ' C . %* ' 7%87%6#\$3' 0#.. < "%#6#7#\$, /*\$+ *123%' , 0#B>% 5#A/\$ 6- \$+ " 2A" # , #*1%\$+ **6: /"' / # 3/5-\$, " / (. 1(C: /5*(#4' 60#E - 0 , 7' 5/72, 8%, 7#* " % >#7%6#\$02 ' 1' 7%*4' 7/" ' / 92" 0&' # " %1+" #*\$' .

I # 0%0 A/ #, 7/>/1' \$+, 3\$# (. 1(/\$*(#4' 60#E, % 3\$# " /\$? ; 7#*\$- 5 , 7%. ' 1#5, 0#\$#7#52 " 2A" # *1/>#. %\$+, (. 1(/\$*(*1/>2C: // - . %4% , 7#61/5% !" (. 1(/\$*(#4' 60#E, /*1' # " % 9#7521' 72/\$*(0%0 . #, 7#* (#6- 3" # . 9#75/ "L%0 *>/1%\$+ X?" ' 1' "N>/ 5#A" # " %ES' Y?). I / . */B>% =\$# \$%0 #>" #8" %3" #, " # , 7%. ' 1# . #, 7#*% , #07- . %/\$ 6#1+4' " *\$. # *123%/ . M*1' G%5 " 2A/" #\$. /\$, 1234 / . */B# * " %3%1% , 7#0#" *21+\$' 7#. %\$+*(" % 9#725% @ FreeBSD, . IRC ' 1' . 0, ' *#0 7%*- 10' , , #*. (: ?" " - E . #, 7#*%5' #\$. /\$%5 , #1+8#. %\$/1/E FreeBSD.

G#\$ " /0#\$#7- / *123%' , . 0#\$#7- @ 5#A/\$ #0%8%\$+*(, #1/8" - 5 #\$, 7%. ' \$+ **6: /"' / # 3/5-\$# , 3\$# " / (. 1(/\$*(#4' 60#E:

¥ P. />#51/" ' / #6 #6" #. 1/" ' ' , 7#B7%55" #B# #6/*, /3/" ' (, 0#\$#7#/ , #>>/7A' . %/\$*(*\$#7#" " ' 5' 7%87%6#\$3' 0%5' (. #' " #. #5 , #7\$- , " # \$%0A/ ' 0#5, # " /" \$- 6#8#. #E *' *\$ /5- , 7%87%6%\$- . %/5- / *\$#7#" " ' 5' #7B%" ' 8%&' (5' , \$%0' /, 0%0 BIND ' 1' 7%81' 3" - / 2\$' 1' \$- GNU).

¥ Q1(" / , #>>/7A' . %/5- @ " ' 0/5 , #7\$#. (, /7/5/" "%(MAINTAINER *#>/7A' \$ ports@FreeBSD.org) #3? \$ # , 7#61/5/ 6/8 , 7' 1#A/" " #B# 9%E1% * ' * , 7%. 1/" ' (5' />. % 1' 62>/ \$ 8%5/3/" 0#55' \$\$/7#5. H\$#6- *\$%\$+ * , 7#. #A>%C: ' 5 , #7\$%, 2 0#\$#7#B# " / 6- 1# * , 7#. #A>%C: /B# , #\$, 7%. +\$/ #3? \$ * 8%, 7#*#5 (9%E1 * ' * , 7%. 1/" ' /5 A/1%\$/1/" , " # " /

#6(8%\$/1/").

¥ G 1C6#5 *123%/ , *1/>#. %" ' / , 7#&/**2, #, ' *%" "#52 . R20#. #>*\$. / , # *#8>%" ' C , #7\$#. >*\$ \$ "%' 1234' / 7/821+\$%\$- . (S%0A/ 5#A" # #8" %0#5' \$+*(* *\$%\$+/E G01%> . 0#11/0&' C , #7\$#. FreeBSD.)

D4' 60%, 0#\$#72C " /1+8(. #*, 7# ' 8. /*\$' , . 7(> 1' 62>/ \$ ' * , 7%. 1/" % . M*1' #4' 60% . #8" ' 01% \$#1+0# />' " #A>- , ' . - " / 5#A/\$/ /? . #*, 7# ' 8. /*\$' , 0 \$#52 A/ "' 0\$# * "/E 6#1+4/ "/ *\$%10' . %1*(, "/\$ "' 0%0' @ 4%" *#. , 3\$# 7%87%6#\$3' 0' *5#B2\$ /? . #*, 7# ' 8. /*\$' ' 1' , # (\$+, 3\$# >/1%/ \$*(" / , 7%. ' 1+" #.) \$# " / 8" %3' \$, 3\$# \$%0#B# " / *123%/ \$*(, " # = \$# 8" %3' \$, 3\$# 4%" *#. 2 . %4/B# **##6: /"' (>#E\$' 0#B>-1' 6# ># *\$%>' ' ' * , 7%. 1/" ' (#4' 60' #3/" + 5%1- . H%*\$# = \$' . ' >- #4' 6#0 . #8" ' 0%CS ' 8-8% " /2>#. 1/\$. #7' \$/1+" #E 7%6#\$- A?*\$0' @ >' *0# . , /7/B7/. 4' @*(, 7#&/**#7#. . G*/B>% , 0#B>% = \$# . #85#A" # . - >#1A" - # \$*1/A' . %\$+ \$%0' / *123%' , /7/> , #* - 10#E **##6: /"' (#6 #4' 60/.

S/, /7+, 3\$#6- #, 7/>/1' \$+ 0#52 . - >#1A" - # \$, 7%. ' \$+ . %4/ **##6: /"' / #6 #4' 60/ , . - >#1A" - , #"' 5%\$+, 3\$# , 7#B7%55" #/ #6/* , /3/" ' / , 0#\$#7#/ . @#>' \$. # FreeBSD, **\$%. 1(/\$*(' 8 " /*0#1+0' @ 7%81' 3" - @ 3%*\$E:

¥ L#> . 6%8#. #E *' *\$/\$/5/, 0#\$#7- E , ' 4/\$*(' , #>>/7A' . %/\$*(0#" \$7' 6+C\$#7%5' FreeBSD. S%0#E, 0%0 (>7#, 6' 61' #\$/0% C, >7%E. /7% 2*\$7#E*\$. (@#>(\$. 0%\$/B#7' C kern); 2\$' 1' \$- (bin); *\$7%" ' &- * , 7%. #3" ' 0% ' >#025/" %\$&' (docs); . /6-*\$7%" ' &- (www). G*/ #4' 60' . = \$' @ #61%*\$(@ >#1A" - 6- \$+ **##6: /"- 7%87%6#\$3' 0%5 FreeBSD.

¥ L#> . 6%8#. #E *' *\$/\$/5/, 0#\$#7- E , ' 4/\$*(' , #>>/7A' . %/\$*(>72B' 5, ' 5, #7\$' 72/\$*(. # FreeBSD ' %>, \$' 72/\$*(. ; 7' 5/7- . 01C3%CS . */6(: bind, gcc(1) ' sendmail(8). T#1+4' "\$. # #4' 6#0, #, %>%C: ' / . >" " - / #61%*\$' >#1A" - 6- \$+ **##6: /"- 7%87%6#\$3' 0%5 FreeBSD, " # . "/0#\$#7- @ *123%(@ #"' >#1A" - 6- \$+ # \$, 7%. 1/" - ' 8" %3%1+" - 5 7%87%6#\$3' 0%5, /*1' , 7#61/5- " / (. 1(C\$*(* , /&' 9' 3" - 5' >1(FreeBSD. D6- 3" # #4' 60' \$%0#B# 7#>%, #, %>%CS , #> 0%\$/B#7' ' bin' 1' gnu.

¥ D\$>/1+" - / , 7' 1#A/" ' (, "/ . @#>(: ' / . 6%8#. 2C *' *\$/\$/52, " # (. 1(C: ' /*(3%*\$+C L#11/0&' ' ; #7\$#. FreeBSD (0%\$/B#7' (ports). T#1+4' "\$. # = \$' @ , 7' 1#A/" ' E " / , ' 4/\$*(7%87%6#\$3' 0%5' FreeBSD; 3\$# , 7/>#*\$%. 1(/\$ FreeBSD, \$%0 = \$# \$#1+0# 1' 4+ ' " 97%*\$720\$272 >1(2*\$%" #. 0' , 7' 1#A/" ' (. 01/>#. %\$/1+" #, . - >#1A" - # \$, 7%. 1(\$+ **##6: /"' / #6 #4' 60/ 7%87%6#\$3' 0%5 FreeBSD \$#1+0# \$#B>%, 0#B>% . - 2. /7/" - . \$#5, 3\$# , 7#61/5% * , /&' 9' 3" % >1(FreeBSD - "' %3/ # \$, 7%. 1(E\$/ /? % . \$#7%5 , 7#B7%55" #B# #6/* , /3/" ' (.

K%\$/5 . - >#1A" - 26/>' \$+*(, >/E*\$. '\$/1+" # 1' , 7#61/5% *2: /*\$. 2/\$. 02: /*\$. 2/\$. */B# " /*0#1+0# . /: /E, 0#\$#7- /7%8>7%A%CS 7%87%6#\$3' 0% 6#1+4/ , 3/5 , #123/" ' / **##6: /"' (#6 #4' 60/ , 0#\$#72C # " 2A/ ' * , 7%. ' 1.

M*1' , 7#61/5% . 6%8#. #E *' *\$/\$/5/, \$# . %5 " 2A" # *"%3%1% , 7#3/*\$+ 7%8>/1 R20#. #>*\$. % FreeBSD # ./7*' (@, /*1' . - /: ? " / 8" %0#5- * >%" " #E \$/5#E. Q1(FreeBSD . #85#A" # ' * , 7%. 1(\$+ , 7#61/5- \$#1+0# >1(" /0#\$#7- @ " />%. "' @ ./ \$#0 6%8#. #E *' *\$/\$/5- , # = \$#52 # \$, 7%. 0% **##6: /"' (#6 #4' 60/ >1(6#1// *\$%7#E . /7*' ' , 7' . />?\$ 0 \$#52, 3\$# 7%87%6#\$3' 0 , **#. /\$2/\$. %5 #6" #. ' \$+*(># , #>>/7A' . %/5#E . /7*' ' , 3\$#6- , #*5#7/\$+ , 7' *2*\$. 2/\$ 1' . " /E , 7#61/5%. L#5%" >% #9' &/7#. 6/8#, %" *\$' , #>>/7A' . %/\$ * , ' *#0 , #>>/7A' . %/5- @ ./7*' E..

M*1' , 7#61/5% . , #7\$/ , 7%**5#\$7' \$/ . #85#A" #*\$+ *##6: ' \$+ #6 #4' 60/ 7%87%6#\$3' 0%5
' *@#>" #B# , 7#/0\$% . ; 7#/0\$ FreeBSD " / 5#A/\$ ' * , 7% . 1(\$+ . */ #4' 60' . # . *?5 , 7#B7%55" #5
#6/* , /3/" ' ' .

4. : " 47" \$" & ; %

I 2A" # *1/>#. %\$+ @#7#4/52 , 7% . ' 12 . */B>% *"%3%1% . - , #1" (\$+ ># , #1" ' \$/1+" - /
' **1/>#. %" ' (, /7/> \$/5 , 0%0 , #*1%\$+ *##6: /" ' / # , 7#61/5/. U#A/\$ 6- \$+ , # . %4/E
, 7#61/5/ 2A/ *##6: /" # ; 5#A/\$ 6- \$+ , # " % " />% . " # #6*2A>%1*+ ' 1' #6*2A>%/\$(. * , ' *0%
7%** - 10' ; # " % 5#A/\$ 6- \$+ 2A/ ' * , 7% . 1/" % . 6#1// " # . #E . /7* ' ' , 3/5 \$% , 3\$# . -
' * , #1+82/\$/ . ; #=\$52 . - >#1A" - , 7# . /7' \$+ . */ #6- 3" - / 5/*\$% ># \$B# , 0%0 , #*1%\$+ . %4/
*##6: /" ' / # , 7#61/5/. Q1(FreeBSD =\$# 8"%3' \$:

¥ G#- , /7. - @ , . */B>% , 7# . /7(ES/ , " / # , ' *% " 1' =\$#\$. # , 7#* . R20# . #>\$. / .

¥ 0 , ' *#0 H%*\$# 8%>% . %/5- @ . # , 7#*# . (FAQ) , # FreeBSD . FAQ *#>/7A' \$ #\$. /\$- " % " / *0#1+0#
. # , 7#*# . , \$%0' @ 0%0 . # , 7#*- , 0%*%C: ' /* (*# . 5/*\$' 5#*\$' #6#72># . %" ' (.

¥ 0 , ' *0' 7%** - 10' Ñ / *1' G- " / , #> , ' *% " - " % " ' @ , . #* , #1+82ES/*+ , # ' *0#5 . %7@' . %@ " %
*%ES/ FreeBSD . M*1' . %4% , 7#61/5% " / #6*2A>%1*+ . * , ' *0%@ 7%** - 10' , . - 5#A/\$/
, # , - \$%\$+*(# , 261' 0# . %\$+ *##6: /" ' / # " /E ' , #>#A>\$+ " / *0#1+0# > " /E Ñ . #85#A" # ,
0\$#-\$# 8%5/\$' \$ \$# , 3\$# 6- 1# 2 , 2: /" # .

¥ L%0 #5/3%1#*+ . - 4/ , 9#725- FreeBSD ' IRC.

¥ L%0 . %7' " \$, . /*+ . /6-' * , #1+82ES/ . %42 1C6' 52C , # ' *0# . 2C *' *\$/52 >1(, # ' *0% 0%0' @-
1' 6# ** - 1#0 , # . %4/E , 7#61/5/ . G- 5#A/\$/ >%A/ 2. ' >/+\$ ** - 10' " % %7@' . - * , ' *0# .
7%** - 10' ' 1' \$/1/0#" 9/7/" & ' E , # 0#\$7- @ . - " / 8" %1' ' 1' " / >25%1' \$%5' *0%\$+ .

¥ 01/>2C: ' 5 , 2" 0\$5 >#1A" % 6- \$+ 6%8% >% " - @ FreeBSD Bugzilla . M*1' \$#1+0# . %4%
, 7#61/5% " / " # . % ' 1' 7/>0% , /*\$+ " /0#\$7- E 4" * , 3\$# # " /E 2A/ *##6: /" # .

¥ < *%5#/ . %A" #/ , . - >#1A" - , #*5#\$7/\$+ " / 8%\$7%B' . %/\$ 1' >#025/" \$%&' (. 6%8# . #E
*' *\$/5/ . %42 , 7#61/52 .

Q1(#" # . " #B# 0#>% FreeBSD . - >#1A" - \$: %\$/1+" # ' 823' \$+ *#>/7A' 5#/ 9%E1%
/usr/src/UPDATING ' 1' /B# \$/02: 2C . /7*' C , # %>7/*2
<https://cgit.freebsd.org/src/tree/UPDATING> . (M*1' . - , /7/@#>' \$/ * #>" #E . /7* ' ' " % >72B2C ,
*##6/" " # /*1' . - #6" # . 1(/\$/*+ ># FreeBSD-CURRENT, \$# . =\$#5 9%E1/ . - 5#A/\$/ " %ES'
5" #B# . %A" #E " " 9#75%&' ') .

M*1' A/ . %4% , 7#61/5% * . (8% " % * 0#11/0&' /E , #7\$# . FreeBSD , . - >#1A" - #67%\$' \$+*(0
9%E12 /usr/ports/UPDATING (' 85/" /" ' (, 0%*%C: ' /*(' ">' . ' >2%1+" - @ , #7\$# .) ' 1' 0
/usr/ports/CHANGES (' 85/" /" ' (, 0%*%C: ' /*(. */E 0#11/0&' ' , #7\$# .) . D" ' \$%0A/
>#*\$2 , " - 3/7/8 ' " \$/79/E* cgit: <https://cgit.freebsd.org/ports/tree/UPDATING> '
<https://cgit.freebsd.org/ports/tree/CHANGES> .

5. < % . * #%) * (# " " + , () * 3 " . /" + ' (O (

S/ , /7+ , , #*1/ \$#B# , 0%0 . - 7/4' 1' , 3\$# . %4 . # , 7#* , #> , %>/\$, #> 0%\$B#7' C *##6: /" ' (#
, 7#61/5/ , ' =\$# , 7#61/5% FreeBSD , %5#/ . 7/5(" % , ' *%\$+ *#6*\$. /" " # *##6: /" ' / # , 7#61/5/

(PR). ; 7/A>/ 3/5 5- 2B126' 5*(. 3%*\$"#\$' ' *, #1+8#. %"' (, 7#B7%55- >1(*#8>%"' (' #\$, 7%. 0' PR . Bugzilla, . # \$ "/*0#1+0# *#. /\$#, 0#\$#7- / , #5#B2\$. %5 *>/1%\$+ *##6: /"' / 6#1// =99/0\$' . "- 5.

6. 6%; . * #%\$2 = " / " > * (# " " + , () * 3 "

. / " + ' (0% = & Bugzilla

¥ # " \$%&' () *+&" , \$) " "Summary" (-. ' &- \$" \$, /% ' ! / ") , 0%&12. 0##6: /"' (# , 7#61/5% @ , #, %>%C\$ 0%0 . *, ' *0' 7%*- 10' , 0#\$#7- / 8%\$/5 7%*#@>(\$*(, # . */52 5' 72 (. "' @ , #1/ "Summary" #, 7/>/1(\$ \$/52 , ' *+5%), \$%0 ' . 6%82 >% " - @. ; 7#*5%\$7' . %C: ' E = \$2 6%82, 0%0 , 7%. ' 1# , , 7#E>/ \$ 5' 5# PR * , 2*\$- 5 07%\$0' 5 #, ' *% "' /5. I / 8%62>+\$/ , 3\$# PR #*\$%?*\$* (. 6%8/ >\$ #/@ , #7, , #0% 0\$#-1' 6# " / 8%07#/\$ /B#; *##6: /"' /-% " # "' 5, *0#7// . */B#, , 7#*\$# , #\$/7(\$*("% #6: /5 9# " /.

¥ 345"6' +&" &02' !! 17 \$, /% ' ! /+ (, \$) " "Summary". I / *\$# ' \$, 7/>, #1%B%\$+, 3\$# 3' %C: ' E . %4 / *##6: /"' / . 1%>//\$ 0# " \$/0*\$#5; , #=\$#52, 3/5 , #>7#6" // . - #, ' 4/\$/ *' \$2%&' C, \$/5 1234/. G 3%*\$"#\$' , 0 0%0#E 3%*\$' *' *\$/5- # \$ " # ' \$*(. %4% , 7#61/5%? ; 7#(. 1(\$*(1' # " % " % = \$% , / 2*\$% " #. 0' ' 1' . # . 7/5 (" #75%1+" #E 7%6# \$- ? I % , 7' 5/7, . 5/*\$# *\$7#0' Summary: portupgrade is broken *1/>#. #1# 6- " % , ' *%\$+ 3\$#-\$# . 7#>/ Summary: port ports- mgmt/portupgrade coredumps on -current. G *123%/ , #7\$' 7#. % " " - @ , 7' 1#A/" ' E . , #1/ "Summary" , #1/8" # 20%8- . %\$+ " / \$#1+0# ' 5(, #7\$% , " # ' 0%\$/B#7' C.

¥ 8%) / 0 (' % "%&9 , ' &: , %\$5; /&" \$5 <&\$2. I %1' 3' / , %\$3% 8"%3' \$/1+" # 2, 7#: %/\$ #67%6#\$02 # \$3? \$%.

V I / ' * , #1+82E\$/ 01C3/. - / *1#. % patch ' 1' patch-ready Ñ # "' 2*\$%7/1' . G5/*\$# =\$#B# , 7' 07/, ' \$/ , %\$3 0%0 . 1#A/" ' / ' # \$5/\$+\$/ 91%A#0 [patch]. M*1' 91%A#0 " / # \$ #67%A%/\$*(, "%A5' \$/ Show Advanced Fields (; #0%8%\$+ 7%*4' 7/" " - / , #1() . 1/. #5 . /7@ " /5 2B12.

V ; 7/>, #3\$' \$/1+" - 9%E1- *' * , 7%. 1/" ' (5' * MIME-\$' , #5 text/plain.

V ; 7/>, #3\$' \$/1+" - , %\$3' , *#. 5/*\$' 5- / * git.

¥ 8%) / (1 %\$, . \$(\$ = >' "&" , \$. & , 0- ' = /&" <&\$. M*1' . - *# , 7#. #A>%/ \$/ 3%*\$+ ' *@#>" #B# 0#>% (" % , 7' 5/7, *2: /*\$. 2C: ' E , #7\$) , #6(8%\$/1+" # 2*\$% " #. ' \$/ , #1/ maintainer-feedback . . %4/5 *##6: /"' ' # , 7#61/5/ . +. S%0' 5 #67%8#5, 1C6#E 0#55' \$\$/7, #67%6%\$- . %C: ' E . %4 PR, " / 62>/\$. - " 2A>/" , 7#. /7(\$+=\$#.

¥ ?0>9&" &\$: ! 1 (@\$. 20) / . \$(- ' 7. H/5 6#1+4 / " " 9#75%&' ' . - 5#A/\$/ , 7/>#*\$%. ' \$+ # , 7#61/5/, \$/5 6#1+4 / 2. %* 4% " *#. , #123' \$+ #\$. /\$.

V G01C3' \$/ . /7*' C FreeBSD, 0#\$#72C . - ' * , #1+82/\$/ (>1(=\$#B# /*\$+ * , /&' %1+" #/ , #1/ , *5. " ' A/), ' %7@' \$/0\$272. P0%A' \$/ , ' * , #1+82/\$/ 1' . - 7/1' 8 (" % , 7' 5/7, * CD-ROM ' 1' 8%B72A/" " - E) ' 1' *' *\$/52, , #>>/7A' . %/52C 3/7/8 Git (' , /*1' >% , 20%A' \$/ @=4 ' . /\$02). M*1' . - ' * , #1+82/\$/ . /\$02 FreeBSD-CURRENT, 20%A' \$/ =\$# . , /7. 2C #3/7/>+, \$%0 0%0 ' * , 7%. 1/" ' ((#*6/" " # >1(' 8. /*\$" - @ , 7#61/5) 3%*\$# >#6%. 1(C\$*(#3/" + 6- *\$7#, ' , #1+8#. %\$/1' FreeBSD-CURRENT >#1A" - *1/>' \$+ 8% #6" #. 1/" ' (5' .

V G01C3' \$/ " " 9#75%&' C # \$#5, 0%0' / B1#6%1+" - / #, &' ' . - 20%8%1' . make.conf. I % 8%5/\$02: D6F(. 1/" ' / #, &' E " % , #>#6' / -02 ' >72B' @, #, ' *% " " - @ . gcc(1) . # 5" #B' @ *123%(@ 5#A/\$ 6- \$+ , 7' 3' " #E #4' 6#0. J#\$(' 7%87%6# \$3' 0' FreeBSD 62>2\$

, 7' "' 5%\$+, %\$3', 2 "' @ " / 62>/ \$ A/1%" ' (' **1/>#. %\$+ \$%0' / *123%' ' 8-8% # \$*2\$*\$.' (. 7/5/" ' ' >#67#. #1+&/., ' . 5/*\$# = \$#B# # "' 5#B2\$ #\$. /\$' \$+, 3\$# = \$# " / , #>>/7A' . %/\$*(.

V M*1' , 7#61/52 5#A" # 1/B0# , #. \$#7' \$+, . 01C3' \$/ " /#6@#>' 52C ' " 9#75%&' C, 3\$#6-7%87%6#S3' 0 *5#B. #*, 7# 8. /*\$' /? *%5#*\$#(\$/1+" #. M*1' , 7#61/5% , 7#(. 1(/\$*(, 7' "/0#\$#7- @ . . #>' 5- @ >" "- @, \$#, , # . #85#A" #*\$', , 7' ./>' \$/ ' @ . 5/*\$/ * , #123%/5- 5 ' #A' >/5- 5 . . #>#5. M*1' A/ . . #>' 5- @ >" "- @ 5" #B# ' 1' A/ ' @ "/1+8(7%8B1%4%\$+, \$# , #, 7#62ES/ . - >/1' \$+ ' 8 " ' @ 1' 4+ " /6#1+4#E 97%B5/" \$, , 7' . #>(: ' E 0. #8" ' 0" #. /" ' C , 7#61/5- , ' . 01C3' \$/ /B# . PR.

V M*1' . %4% , 7#61/5% *. (8%" % * (>7#5, 62>+\$/ B#\$#. - , 7/>#*\$%. ' \$+ *1/>2C: 2C ' " 9#75%&' C (. %5 " / #6(8%\$/1+" # . 01C3%\$+ /? . *C, #"% , #E>?\$ 1' 4+ "% 8%, #1" /" ' / 6%8- >" "- @, " # . - >#1A" - . 01C3' \$+ ' " 9#75%&' C, 0#\$#7%(, # . %4/52 5" /" ' C %0\$2%1+" %):

WG%420#" 9' B27%&' C (>7%, . 01C3%(\$#, 0%0' / 2*\$7#E*\$%. % 2 . %* 2*\$%" #. 1/" -

WG01C3/" - 1' 2 . %* #, &' ' #S1%>0' (" %, 7' 5/7, WITNESS), ' /*1' \$%0, \$# *2: /*\$. 2/\$ 1' , 7#61/5% , #*1/ ' 85/" /" ' (8" %3/" ' (= \$#E #, &' ')

W; #1" - E . . #> #67%\$ " #E \$7%* 7# 0' (backtrace), , %" ' 0' ' 1' ' " #B# 0#" #*1+" #B# . . . #>, ' 1' A/ 8%, ' * ' 8/var/log/messages, /*1' #"' 6- 1' *B/" /7' 7#. %" -

WG- . #> 0#5%" >- pci conf -l, % \$%0A/ *###\$. /\$*\$\$. 2C: ' / 3%*\$' . . . #>% dmesg, . *123%/ , /*1' , 7#61/5% *. (8%" % * 0#" 07/\$" - 5 #6#72>#. %" ' /5

W; 7#31' 1' . - src/UPDATING, #, ' *%" % 1' \$%5 . %4% , 7#61/5% (0\$#-" ' 62>+ * , 7#*' \$ #6(8%\$/1+" #)

WK%, 2*0%/\$*(1' >72B#/ (>7# (= \$# >1(\$/@ *123%/., 0#B>% , 7' 3' " #E *6#(*\$%1# #6#72>#. %" ' / , " %, 7' 5/7 #S0%8- . %C: ' / . ' " 3/*\$/7- ' 1' , /7/B7/. 4' /*(, 7#&/**#7- , 3\$# 5#A/\$ 5%*0' 7#. %\$+ , 7#61/5- (>7%)

V M*1' A/ . %4% , 7#61/5% *. (8%" % * , #7\$5' , \$#, 7/>#*\$%. +\$/ *1/>2C: 2C ' " 9#75%&' C (. %5 " / #6(8%\$/1+" # . 01C3%\$+ /? . *C, #"% , #E>/ \$ 1' 4+ "% 8%, #1" /" ' / 6%8- >" "- @, " # . - >#1A" - . 01C3' \$+ ' " 9#75%&' C, 0#\$#7%(, # . %4/52 5" /" ' C %0\$2%1+" %):

WL%0' / , #7\$- . - 2*\$%" % . 1' . %1'

W<5/C\$*(1' 0%0' /-1' 6# , /7/5/" " - / #072A/" ' (, 0#\$#7- / , /7/, ' *- . %C\$, /7. # " %3%1+" # - 2*\$%" #. 1/" " - / . bsd.port.mk, \$%0' / 0%0, PORTSDIR)

W; 7#31' 1' . - ports/UPDATING, ' #, ' *%" % 1' \$%5 . %4% , 7#61/5% (0\$#-" ' 62>+ * , 7#*' \$ #6(8%\$/1+" #)

¥ 345"6' +&" !": "&- /7 4', . \$%\$(\$!\$(17 (\$42\$ = ! \$%&*7. 0#6#: /" ' / \$', % "0\$#-\$# #6(8%\$/1+" # >#1A/" *>/1%\$+ \$%0, 3\$#6- \$%0%(-\$# 2\$' 1' \$% . /1% */6(\$%0-\$# ' 5// \$ 02>% 5/" +4/ 4%" *#. . *\$7/\$' \$+ , #8' \$' . - E #S01' 0, 3/5 6#1// 3/\$0# *9#7521' 7#. %" " - E 8%, 7#*. ; #5" '\$/, 3\$# ' *@#>" - / \$/0*\$- >#*\$2, " - . */5, \$%0 3\$# /*1' . %5 " 2A" % 7/%1' 8%&' (0%0#B#-\$# " #. #B# * . #E*\$%. %, 1234' E * , #*#6 Ñ . 8(\$+*(8% 7%6#S2 *%5#52! I / 8%62>+\$/ \$%0A/, 3\$# \$%0' / 5#5/" \$- 1234 / #6*2A>\$+ . * , ' *0%@ 7%*- 10' , \$%0' @ 0%0 freebsd-questions, 3/5 >/1%\$+ = \$#, #*7/>*\$. #5 6%8- >" " - @ PR.

¥ A5">/&"%9, : &\$ (' B' , . \$5) "2' "; C!/- "2 !" \$, /%!' ' . U- 2A/ B#. #7' 1' #6 = \$#5, " #*\$# \$, #. \$#7' \$+*(. ; #7%\$+\$ / , %72 5' " 2\$ " % *#*\$%. 1/" ' / 8%, 7#*#. . Bugzilla:

<https://bugs.freebsd.org/bugzilla/query.cgi>. (I /*5#S7("% , #. \$#7- , #6 =\$#5 , #*\$#(" "# 8%6- .%CS)

¥ D\$S5; '+&" \$5 \$>! \$+ , . \$5) "2" (\$>! \$2 PR. <86/B%ES/ #, ' *%"' (>. 2@ ' 6#1// , 7#61/5 . #>" #5 *##6: /" ' ' (' *01C3/" ' /5 (. 1(CS*(. 8%' 5#*. (8%" " - / , 7#61/5-). D9#751((, %\$3' , "/ , - \$%ES/*+ . " ' @ >#6%. 1(\$+ 5" #A/*\$. # 92" 0&' #' %1+" - @ . #85#A" #*\$ /E ' 1' ' * , 7%. 1(\$+ ' 5' " /*0#1+0# #4' 6#0 . #>" #5 ' \$5 A/ *##6: /" ' ' # , 7#61/5/ (#, (\$+ A/ , 8%' *01C3/" ' /5 . 8%' 5#*. (8%" " - @ , 7#61/5) - >1(\$%0' @ PR-# . , #S7/62/\$*(8"%3' \$/1+" # 6#1+4/ . 7/5/" ' " % #67%6#S02.

¥ 345"6'+&" , \$) "2/-/. M*1' . %4/ *##6: /" ' / 0%*%/\$*(#61%*\$' ' 1' * , *##6#. 7/%1' 8%&' ' , 0#\$#7- / 7%" // . - 8. %1' 7%8" #B1%*' (, . %5 *\$#' \$ 6- \$+ B#\$#. - 5 , 7/>#*\$%. ' \$+ " / \$#1+0# , %\$3' , "# ' . " (\$" - / %7B25/" \$- , , #3/52 *1/>2/\$, #*\$2, %\$+ ' 5/" "# \$%0 (\$# /*\$+ , =\$# " ; 7%. ' 1+" - E ; 2\$+). L#0 #S5/3#1#*+ . - 4/ , %0027%\$"- E , #' *0 , # %7@' . 2 * , ' *0#. 7%*- 10' <https://www.FreeBSD.org/search/#mailinglists> " ' 0#B>% " / , #5/4%/S.

¥ ?0>9&" ("=) / (1. ; #3S' 0%A>- E ' 8 \$/@, 0\$# 5#A/\$ 8%" ' 5%\$+*(. %4' 5 *##6: /" ' /5, (. 1(/\$*(>#67#. #1+&/5. I ' 0#52 " / , # 7%. (\$*(20%8%" ' (, 0%0' 3\$# >/1%\$+ , 0#B>% # " ' \$%0 8%" ' 5%/\$*(=\$' 5, >% /: ? ' , # 0%0' 5-1' 6# , 7' 3' "%5, #S1' 3" - 5 #S 9' "%" *#. - @. G##6: / B#. #7(, =\$#B# , #>@#>% *1/>2/\$, 7' >/7A' .%\$+*(, ' 5/(>/1# * 1C6- 5 , 7#/0\$#5 * DS07- \$- 5' <*@#>" - 5' \$/0*\$%5' (Open Source).

7. : / (94(&#(7"

01/>2C: ' / *##67%A/" ' (, 7' 5/" ' 5- 0' * , #1+8#. %" ' C . /6-9#75- Bugzilla >1(#\$, 7%. 0' PR. T2>+\$/ #*\$#7#A"- * # , /7%&' (5' 0# , ' 7#. %" ' (' . *\$%. 0' , 0#\$#7- / 5#B2\$ ' 85/" ' \$+ , 7#6/1- ' 1' >72B#/ 9#75%\$' 7#. %" ' / \$/0*\$%.

< "%0#" /& , /*1' . %4/ *##6: /" ' / 62>/ \$ #6F?5"- 5, . - >#1A"- , 7' B#\$#. ' \$+ /B# . offline, 3S#6- " ' 3/B# " / , #S/7(1#*+ . *123%/ , /*1' 62>/ \$, 7#61/5% , 7' /B# #\$, 7%. 0/.

8. 5' " 9() * (. %\$?(- * ' * @%- ' " &

01/>2C: ' / ' "\$*720&' ' , 7' 5/" ' 5- " / \$#1+0# 0 #\$, 7%. 0/ #S3?S#. # , 7#61/5% @ 3/7/8 Bugzilla, "# \$%0A/ 3/7/8 Phabricator ' 1' #7B%" " 8%&' C FreeBSD "% Github (. ' >/ , 21- 7/0. /*\$#.).

G #6: /5, 5- "%*\$#(\$/1+" # 7/0#5/" >2/5 ' * , #1+8#. %\$+ git format-patch >1(*#8>" ' (#>" #B# ' 1' */7' ' 2" ' 9' &' 7#. %" " - @ diff-9%E1#. #S" #*' \$/1+" # 6%8#. #E ./S0' (" , 7' 5/7, origin/main). ; %\$3' , *#8>" " - / \$%0' 5 #67%8#5, 62>2\$ *#>/7A%\$+ @/4' Git, % \$%0A/ . %4/ ' 5(' %>7/* =1/0\$7#" "#E , #3\$- , 3\$# 2, 7#*\$' \$, 7' 5/" /" ' / . %4/B# , %\$3% 0#55' \$\$/7%5' ' , 7%. ' 1+" #/ 20%8%" ' / . %* 0%0 % . \$#7% (* , #5#: +C git am). Q1("/6#1+4' @' 85/" /" ' E, B>/ . - , 7/>, #3' \$%/ \$/ " / ' * , #1+8#. %\$+ git, 26/>' \$/*+ , 3\$# ' * , #1+82/\$/ diff(1) * # , &' /E -u >1(*#8>" ' (2" ' 9' &' 7#. %" " #B# diff-9%E1%, \$%0 0%0 =\$# >%*\$ 7%87%6#S3' 0%5 6#1+4/ 0#" \$/0*\$% ' *>/1%/ \$ /B# 6#1// 3' \$%/5- 5 , # *7%. " /" ' C * >72B' 5' 9#75%\$%5' diff. P6/>' \$/*+ , 3\$# . %4' , %\$3' *#8>" - #S 0#7" (*##\$. /\$*\$. 2C: /B# >/7/ . %7/ , #8' \$#7' (.

Q1(, 7#61/5 * (>7#5' 1' 6%8#. - 5' 2\$' 1' \$%5' , 7/>, #3S' \$/1/" , %\$3 >1(FreeBSD-CURRENT (#" #. " #E ./S0' Git), , #*0#1+02 . //*+ " #. - E 0#> >#1A/" *"%3%1% , 7' 5/" (\$+*(')

\$/ *\$' 7#. %\$+*(\$%5. ; #*1/ , 7#. />/' ' (*##\$. /\$*\$\$. 2C: ' @ ' 1' >#*\$%\$#3"- @ \$/*\$#. 0#> 62>/ \$ #6F/>' " ?" /, /7/" /*?" . . /\$02 FreeBSD-STABLE.

U- , 7/>, #3' \$%/5, 3\$#6- 9%E1- * ' *, 7%. 1/' ' (5' #\$, 7%. 1(1' *+, 0%0 .1#A/' ' / 0 *##6: /' ' C. D>"%0#, /*1' . - . *\$%. 1(/\$/ , %\$3 . \$/1# *##6: /' ' (, 23\$' \$/, 3\$# "/0#\$#7- / , #3\$#. - / , 7#B7%55- ' 5/C\$ \$/" >/' &' C 8%5/" (\$+ \$%621(&' ' */7' /E , 7#6/1#., 3\$# , #1' #*\$+C 7%8724' \$, "%, 7' 5/7, 3%*\$+ 9%E1% *6#70' (Makefile).

I / #*\$- 1%ES/ , %\$3' . . ' >/ . 1#A/' ' E, ' *, #1+82(Content-Transfer-Encoding: quoted-printable.)\$# . - , #1"' \$ =07%"' 7#. %"' / (escaping) *' 5. #1#. ' . /*+ , %\$3 62>/ \$ 6/*, #1/8"- 5. ; #A%12E*\$%, , 7#*\$# ' *, #1+82ES/ \$' , MIME `text/plain'.

01/>2/\$ \$%0A/ 8%5/\$' \$+, 3\$# . 01C3/' ' / "/6#1+4' @ , %\$3/E . 8%, 7#*% " % ' 85/" /' ' / (pull request) Github (. 1(/\$*(, 7' /51/5#E , 7%0\$' 0#E, . #*#6/" " #*\$' /*1' #"' 7/4%CS , 7#61/52, #, ' *% " 2C . 8%, 7#*/ " % ' 85/" /' ' /, 6#1+4' / A/ , %\$3' , % . #*#6/" " #*\$' " #. - E 0#>, 0#\$#7- E 5#A/\$ \$7/6#. %\$+ 8" %3' \$/1+" #B# , 7#*5#\$7% , /7/> \$/5, 0%0 # " 62>/ \$. "/ *?" . >/7. # ' *@#>" - @ \$/0*\$#. , >#1A"- 6- \$+ 7%85:/ / - " % web- ' 1' ftp-*/7. /7/, % . 8%, 7#* " % ' 85/" /' ' / >#1A/" 6- \$+ . 01C3?" \$#1+0# URL 20%8- . %C: ' E " % =\$\$, %\$3. D3/" + 3%*\$# , %\$3' , , /7/*- 1%/5- / , # =1/0\$7#" " #E , #3\$/, 6- . %C\$ ' *0%A/" - , ' , 0%0 *1/>*\$.' /, 3/5 6#1+4/ , %\$3, \$/5 \$72>" // 62>/ \$ >1(8%' "\$/7/*#. %" " - @ 1C>/E, 7' . /*\$' /B# 0 " #75%1+" #52 . ' >2. S%0A/ \$#, 3\$# , %\$3 62>/ \$ 7%85:/ ?" # \$>/1+" # # \$ *##6: /' ' (# , 7#61/5/, >? \$. #85#A" #*\$+ ' 85/" (\$+ /B# " / #*\$- 1%(, #1"- E , %\$3 . >#, #1/" /' ' / 0 ' 8" %3%1+" #52 *##6: /' ' C # , 7#61/5/. < " %0#" /&, 6#1+4' / , %\$3' , 7#*\$# 2. /1' 3' . %C\$ 7%85/7 6%8- >" " - @, \$%0 0%0 8%07- \$- / *##6: /' ' (#6 #4' 60% @ " % *%5#5 >/1/ " / 2>%1(C\$*(, % *#%7%" (C\$*(' , #5/3%CS*(, 0%0 closed.

G- >#1A"- \$%0A/ , #5"' \$+, 3\$# , #0% . - (" # " / 20%A/\$/ #67%\$" #B# . . %4/5 8%, 7#*/ ' 1' . *%5' @ , %\$3% @, 62>/ \$, 7/>, #1%B%\$+*(, 3\$# #"' , #>, %>%CS , #> \$/ A/ 2*1#. ' (1' &/" 8' 7#. %"' (, 3\$# ' #7' B' " %1+" - E 9%E1, ' 85/" /' " - E . %5' .

9. A%. "') () * (@"/OB Bugzilla

01/>2C: ' / ' "\$720&' ' , 7' 5/' ' 5- \$#1+0# 0 #\$, 7%. 0/ 3/7/8 Bugzilla.

!

<*, #1+82/5- E . %5' %>7/* =1/0\$7#" " #E , #3\$- *\$%"/\$ #6: />#*\$2, " #E ' " 9#75%&' /E' 5#A/\$, #, %*\$+ 0 * , %5/7%5. P . %* >#1A"- 6- \$+ , 7#&/>27- #67%6#\$0' * , %5% ' 1' *1/>2/\$ ' * , #1+8#. %\$+ . 7/5/" " - E , #3\$#. - E %00%2" \$. D>"%0# 23\$' \$/, 3\$# /*1' . - . ##6: / " / ' * , #1+82/\$/ >/E*\$.' \$/1+" - E , #3\$#. - E %00%2" \$, 5- " / *5#A/5 8%>\$+. %5 . #, 7#*- #. %4/5 *##6: /' ' ' .

; 7' , #>%3/ *##6: /' ' (#6 #4' 60/ . - 2. ' >' \$/ *1/>2C: ' / , #1(:

¥ E. ' &- \$" \$, /% ' !/" : K%, #1"' \$/ =# 07%\$0' 5 ' \$#3"- 5 #, ' *% "' /5 , 7#61/5- . L7%\$0#/ #, ' *% "' / ' * , #1+82/\$*(0%0 \$/5% , ' *+5% * #3?#\$5 # , 7#61/5/, % \$%0A/ . * , ' *0% @ ' * . #>0% @ #3?#\$# . ; #3?#\$- * "/(*"- 5' #, ' *% "' (5' 3%*\$# #*\$%C\$*(6/8. "' 5%" ' (.

¥ D". 9"4! \$%&9: D>" # ' 8 8" %3/" ' E: !"#"\$%&' "(# #)*+,) -(./ (Affects only me), !"#"\$%&' "(# .(.)#\$01 *23(4 (Affects some people) ' 1' !"#"\$%&' "(# -.)%&1 *23(4 (Affects many people). I / , /7/#&/' ' . %ES/ , 7#61/52; ' 86/B%ES/ # \$5/3%\$+ /? 0%0 !"#"\$%&' "(# -.)%&1 *23(4, /*1'

= \$ # " / \$ % 0 . R % 8 7 % 6 # \$ 3 ' 0 ' Free BSD " / # 6 (8 % \$ / 1 + " # 6 2 > 2 \$ 7 % 6 # \$ % \$ + " % > . % 4 / E , 7 # 6 1 / 5 # E 6 - * \$ 7 // , / * 1 ' . - , 7 / 2 . / 1 ' 3 ' \$ / / ? . % A " # * \$ + , , # * 0 # 1 + 0 2 5 " # B ' / > 7 2 B ' / 2 A / , # * \$ 2 , % 1 ' \$ # 3 " # \$ % 0 A / .

¥ E ' & " 6 \$. / * : G - 6 / 7 ' \$ / , # > @ # > (: 2 C 0 % \$ / B # 7 ' C .

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V M*1' , 7#61/5% , 7' "%>1/A' \$ 0 6%8#. #E *' *\$ /5/ ' 0%*%/\$*(*#61C>/' ' (*\$%">%7\$#. , \$%0' @ 0%0 POSIX" , , 7%. ' 1+" - 5 . - 6#7#5 62>/ \$ standards.

V M*1' . - 2./7/" - , 3\$# , 7#61/5% . #8" ' 0"/\$ \$ #1+0# " % ' * , #1+82/5#E . %5' %7@' \$/0\$27/ , 7#&/**#7% , . - 6/7' \$/ #>" 2 ' 8 %7@' \$/0\$27" #8%. ' *' 5- @ 0%\$/B#7' E: #6- 3" # i386 >1(Intel-*# . 5/*\$' 5- @ 5%4' " . 32-6' \$" #5 7/A' 5/; amd64 >1(5%4' " AMD, 7%6#%C: ' @ . 64-6' \$" #5 7/A' 5/ (= \$# \$%0A/ . 01C3%/\$ Intel-*# . 5/*\$' 5- / 5%4' " - , 7%6#%C: ' / . 7/A' 5/ EMT64); ' 7/A/ arm, powerpc ' 1' riscv64.



XC>' 3%*\$# #4' 6%C\$*(. . - 6#7/ 0%\$/B#7' ' . M*1' . - "/ 2./7/" - . , 7%. ' 1+" #*\$' . - 6#7%, \$# 1234 / " / B%>\$+, % . - 67%\$+ misc.

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¥ Environment: D" # >#1A" # 5%0* 5%1+" # \$#3" # #, ' * - . %\$+ #072A/" ' / , . 0#\$#7#5 . *\$7/3%/\$*(, 7#61/5%. 0C>% . 01C3%/\$*(. /7*' (#, /7%&' # " #E *' *\$ /5- , . /7*' (0#" 07/\$" #E , 7#B7%55- ' 1' 9%E1%, *#>/7A%: /B# , 7#61/52, ' 1C6%(>72B(" 9#75%&' (, \$%0%(, 0%0 0#" 9' B27%&' (*' *\$ /5- , >72B#/ , 7#B7%55" #/ #6/*, /3/" ' / , 0#\$#7#/ . 1' (/ \$ " % , 7#61/52, ' \$%0 >%1//-, 7#*\$# . * / , 3\$# 7%87%6#S3' 0 >#1A/" 8" %\$+ >1(*#8>% " ' (2*1#. ' E , #(. 1/" ' (, 7#61/5- .

¥ G, /% ' !/" : ; #1" #/ ' \$#3" #/ #, ' *% " ' / , 7#61/5- , * 0#\$#7#E . - *\$#10" 21' *+. 0\$%7%ES/*+ ' 86/B#\$+, 7/>, #1#A/" ' E # , 7' 3' "%@ , 7#61/5- , /*1' " / 2./7/" - . * . #/E , 7%. #\$/ , \$%0 0%0 = \$# 5#A/\$. . /*\$' 7%87%6#S3' 0% . 8%612A>/" ' / ' , 7' . /*\$' 0 " / . /7" - 5 . - . #>%5. G #, ' *% " ' ' >#1A" - 6- \$+ 20%8%" - >/E*\$. ' (, "/ #6@#>' 5- / >1(. #*, 7# 8. />/" ' (, 7#61/5- . M*1' . %5 ' 8. /*\$/" #6@#>" #E , 2\$+, 20%A' \$/ /B#.) \$# " / \$ #1+0# , #5#A/\$ >72B' 5 1C>(5 * \$#E A/ , 7#61/5#E . 7/5/" "# /? 7/4' \$+, " # ' 5#A/\$, #5#3+ 7%87%6#S3' 02 , # (\$+ , 7' 3' " 2 . #8" ' 0" #. /" ' (, 7#61/5- .

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2. />#51/" ' / , . 0#\$#7#5 62>/ \$ 20%8" " #5/7 >1(# \$*1/A' .%"' (, 0#\$#7- E 6- 1 "%8"%3/' . %4/52 *##6: /" ' C # , 7#61/5/ ' URL, 0#\$#7- E . - 5#A/\$/ ' * , #1+8# . %\$+ >1(, 7# . /70' /B# *##\$#("' (. G *123%/ 2>%3' 0\$#-' 62>+ , 7#(. ' \$ ' '\$/7/* 0 . %4/E , 7#61/5/ ' , # , - \$%/S*(/? 7/4' \$+ , ' 1' , 0%0 =# 6- . %/\$, # , '%\$+ , , #3/52 =# " / (. 1(/S*(, 7#61/5#E . G- 62>/ \$/ % . \$#5\$' 3/*0' # , # . /: %\$+*(# 1C6#5 ' 85/" /" ' ' *##\$#("' (' , #123%\$+ 0# , ' ' . */@ 0#55/" \$%7' / . ' 1' , %\$3/E , 0#\$#7- / 62>2\$, 7' *#/>' " (\$+*(. , 7#&/**/ # \$7%6#\$0' . %4/B# *##6: /" ' (# , 7#61/5/ .

M*1' 0\$#-\$# 8% , 7#*' \$ 2 . %* ># , #1" '\$/1+" 2C " ' 9#75%&' C , ' 1' . - . * , #5" '\$/ ' 1' #6"%72A' \$/ 3\$#-\$# , 3\$# " / 2 , #5(" 21' . , /7 . # "%3%1+" #5 # \$3?\$/ , , #A%12E*\$% , # \$, 7% . +\$/ 2\$#3" /" ' / . D*" # . "%(, 7' 3' "% , , # 0#\$#7#E #4' 60% " / ' * , 7% . 1(/S*(, Ñ =# # \$*2\$*\$. ' / * . (8' * % . \$#7#5 # \$3?\$/ . ; 7# : / . * /B# . * , #1+8# . %\$+*(# , &' /E 0#55/" \$%7' (" % . /6-*\$7%" ' &/ Bugzilla 0# " 07/\$" #B# PR , 0#\$#72C 5#A" # # \$07- \$+ * *\$7%" ' &- , #' *0% PR Bugzilla .

M*1' , 7#61/5% ' *3/81% , " # # \$3?\$/ # " /E #*\$%?S*(# \$07- \$- 5 , 7#*\$# >#6% . +\$/ 0#55/" \$%7' E * 20%8%" ' /5 , 3\$# # \$3?\$/ 5#A" # 8%07- \$+ , ' , , # . #85#A" #*\$' , #6F(" '\$/ , 0%0 ' 1' 0#B> , 7#61/5% 6- 1% 2*\$7%" /" % .

<" #B>% . #8" ' 0%/\$ 8%>/7A0% . #>" 2-> . / " />/1' , 0#B>% # \$3?\$/ # , 7#61/5/ #*\$%?S*(6/8 . " ' 5%" ' (Ñ " ' 0\$# " / "%8"%3%/S*(" % " /B# ' " / #*\$% . 1(/\$ 0#55/" \$%7' / . S%0# / 5#A/\$, 7# ' 8#E\$' , 7' 2 . /1' 3/" ' ' #3/7/>' # \$3?\$/ . # , 7#61/5% @ ' 1' . # . 7/5(, 7%8>" ' 3" #B# */8#" % . M*1' # \$3?\$/ # , 7#61/5/ " / , #123' 1 . " ' 5%" ' (. \$/3/" ' / " / *0#1+0' @ " />/1+ , *\$# ' \$ "%E\$' 0#55' \$\$/7% , *##6/" " # 8% " '\$/7/*# . %" " #B# . 7%6#\$/ " %> " ' 5 .

02: /*\$. 2/\$ " /*0#1+0# * , *##6# . *>/1%\$+ =#\$, A/1%\$/1+" # . *1/>2C: /5 , #7(>0/ , * , /7/7- . #5 . " /*0#1+0# >" /E 5/A>2 , # , - \$0%5' ' * , #1+8# . %" ' (0%A>#B# 0%" %1% * . (8' :

¥ D\$, 7% . ' \$+ , ' *+5# , # =1/0\$7#" " #E , #3\$/ . *##\$. /\$*\$. 2C: ' E * , ' *#0 >1(, #123/" ' (0#55/" \$%7' / . 0 # \$3?\$/2 .

¥ ; 7' *#/>' " '\$/*+ 0 *##\$. /\$*\$. 2C: ' 5 IRC-0%" %1%5 . H%*\$' 3" - E * , ' *#0 >#*\$2 , /" 8>/*+ : <https://wiki.freebsd.org/IRC/Channels> . 0##6: '\$/ 23*\$" ' 0%5 0%" %1% # , 7#61/5/ ' 8% , 7#*' \$/ , #5# : + . T2>+\$/ \$/7 , /1' . - ' #*\$% . %E\$/*+ . 0%" %1/ , #*1/ # \$, 7% . 0' *##6: /" ' (, 3\$#6- 2 1C>/E ' 87%8" - @ 3%*# . - @ , #(*# . 6- 1% . #85#A" #*\$+ # \$7/%B' 7# . %\$+ .

¥ I %E>' \$/ 0#55' \$\$/7# . , 8% " '\$/7/*# . %" " - @ . *##6: /" " #E , 7#61/5/ . M*1' , 7#61/5% 0%*/S*(0# " 07/\$" #B# ' " *\$725/" \$% , 6' "%7" #B# 9%E1% , #7\$% , >#025/" \$% ' 1' ' *@#>" #B# 9%E1% , , 7# . /7+\$/ [Git Repository](#) . D , 7/>/1' \$/ , #*1/>" ' @ 0#55' \$\$/7# . , . " /*4' @ *2: /*\$. /" " - / ' 85/" /" ' (. 9%E1 , ' , # , - \$%E\$/*+ * . (8%\$+*(* " ' 5' 3/7/8 IRC ' 1' =1/0\$7#" " 2C , #3\$2 . 0 , ' *#0 0#55' \$\$/7# . ' ' @ %>7/*% =1/0\$7#" " #E , #3\$- 5#A" # "%E\$' . *\$%\$+/ P3*\$" ' 0' , 7#/0\$% FreeBSD .

; #5" '\$/ , 3\$# =#\$' 1C>' Ñ >#67# . #1+&- , 0%0 ' *# , 7# . #A>%C: ' / ' , #1+8# . %\$/1' , , #=\$#52 #"' 5#B2\$ 6- \$+ " / *7%82 >#*\$2 , "- >1(, #5# : ' * # \$3?\$/5 # , 7#61/5/ . S/7 , /" ' / ' , #*1/># . %\$/1+" #*\$+ . >#1+" /E4' @ >/E*\$. ' (@ 07%E" / 7/0#5/" >2CS*(' &/) (\$*(. ; 7' >#*\$%\$#3" #5 . " ' 5%" ' ' ' 2* ' 1' (@ , #* . (: ?" " - @ =#\$52 , 7#&/**2 , "%E\$' 0#55' \$\$/7% , 0#\$#7- E 8%E5?S*(# \$3?\$/5 # , 7#61/5/ Ñ 1' 4+ . # , 7#* . 7/5/" ' .

11. C#' * &" D) * ; ' * . /" +' (OB

M*1' . - #6"%72A' 1' , 7#61/52 . *' *\$/5/ #S*1/A' .%" ' (#4' 6#0, *##6: ' \$/ #6 #4' 60/! Q1(=S#B# *2: /*\$. 2/S *, /&' %1+"%(0%\$/B#7' (. M*1' 2 . %* " / , #123%/\$*(=S# *>/1%\$+, *. (A' \$/*+ * #\$. /\$*\$. /" "- 5' 8% #67%6#\$02 #4' 6#0 , # %>7/*2 bugmeister@FreeBSD.org.

12. E' 3 4%' 2) (- > (7" " D) %; " O' () * 3

)\$# * , ' *#0 ' " 9#75%&' #"" - @ 7/*27*#. , #S" #*(: ' @*(0 , 7%. ' 1+" #52 "% , ' *%" ' C ' #67%6#\$0/ *##6: /" ' E # , 7#61/5%@. D" , 6/8 *#5" /" ' (, " / , #1#" .

¥ [How to Report Bugs Effectively](#)-, 7/07%" #/ =**/, 0#\$#7#/ "% , ' *%1 Simon G. Tatham # *##\$%. 1/" ' ' , #1/8" - @ (" / * , /&' 9' 3" - @>1(FreeBSD) *##6: /" ' E # , 7#61/5%@.

¥ [R20#](#). #>*\$. # , # #67%6#\$0/ #S?S#. # , 7#61/5%@ Ñ ' " \$/7/*" - E . 8B1(> "% #67%6#\$02 *##6: /" ' E # , 7#61/5%@ *%5' 5' 7%87%6#\$3' 0%5' FreeBSD.