

Table 1: Overall Performance Comparison for Pentium

| Pentium100 FreeBSD 2.1 <i>See Comments for more M/B info.</i> | ASUS PCI- P54SP4 SIS 70ns | ASUS PCI/ I-P54TP4 Intel Triton 70-60ns | PN-2000 Intel neptune 70ns | Baby-AT Intel neptune 70-60ns | PT-2000 Intel Triton 60ns | (at 75MHz) ZAPPA Intel Triton P5/PCI 70-60ns | HP VECRA XV 5/90 Pentium 90 |
|---|---|---|-------------------------------------|---|--|--|-----------------------------------|
| Aligned Memory Copy | 27 MB/s | 31.5 MB/s | 23 | 21 | 1% slower than ASUS mother- board 120 MHz (60 Mhz bus - memory 70ns) the memory subsystem is better than ASUS SIS at 66 MHz bus speed | 22 | 27 |
| Unaligned Memory Copy | 27 MB/s | 31.6 | 23 | 21 | | 22 | 27 |
| Subroutine Call | 2 us | 2 | 4 | 1 | | 2 | 2 |
| Register to Memory (8 bytes) | 91 MB/s | 104 | 80 | 73 | | 77 | 86 |
| Register to Memory (4 bytes) | 45 MB/s | 52 | 40 | 36.5 | | 42 | 43 |
| Allocate & Clear Memory | 17 MB/s | 20.5 | 14 | 14 | | 15.5 | 16 |
| | | | | | | | |
| MIPS | 31.5 | 31.6 | 31 | 31 | 31.27 | 23.5 | 28.4 |
| mixed arith- metic bench- mark (ratio) | 28.5 | 28.7 | 28 | 28 | 28.2 | 21.25 | 25.8 |
| FMIPS | 19.26 | 19.15 | 19 | 19 | | 15 | 17.4 |
| VFFT — 128 ³ (BSD/OS) (FreeBSD) | 26s / 64MB 26s / 32MB 24s / 32MB | 25s / 64MB 25s / 32MB 21s / 64MB 24s / 32MB | 26s / 96MB 28s / 32MB | | | N/A | N/A |
| 128 x 256 ² (BSD/OS) (FreeBSD) | 2:24/64MB 7:31/32MB | 1:54/64MB 7:25/32MB 1:50/64MB 5:09/32MB | 2:03/96MB | | | N/A | N/A |
| Disk SCSI | NCR53c810 | | | | | | N/A |
| One controller MByte/sec. Two Controllers | 1R/Max 3R/8.4 3R/15.0 | 2R/8.3 4R/8.55 4R/16 | 3R/8.4 3R/14.8 | 4R/8.55 4R/16.5 | 1W/56-51%R 2W/6.0 3W/8.8 4W/11.6 | | |
| 3 Controllers | 5R/19 5W/13.5 6R/20 (4% Idle) 6W/14 | 5R/20.5 5W/15 6R/24.5 (70% Idle) 6W/17.75 | | similar to left 6R/24.6 (70% Idle) | | | |

Table 2: Overall Performance Comparison for Pentium (Continue)

| Pentium 133MHz FreeBSD 2.1.7 <i>See Comments for more M/B info.</i> | Intel Endeavor2 (120 MHz) 60ns | Intel Endeavor2 60ns | ASUS PCI/ P/I- P55TVP4 Triton II 70-60ns | ASUS PCI/ P/I- P55TVP4 Triton II 70-60ns FreeBSD2.2 | Same as left (SAL) FreeBSD2.2 use 2.1.x compiler | Same as left (SAL) but 200MHz | Same as left (SAL) but pure 2.2 |
|--|---|----------------------------|--|--|--|-------------------------------------|---------------------------------------|
| Aligned Memory Copy | 33.4 | 33.4 | 40 | 40 | SAL | SAL | SAL |
| Unaligned Memory Copy | 33.4 | 33.4 | 40 | 40 | SAL | SAL | SAL |
| Subroutine Call | 3 | 2-4 | 2-4 us | 2-3 | SAL | 1-3us | SAL |
| Register to Memory (8 bytes) | 155.75 | 172 | 173.6 | 174.5 | SAL | 174 | SAL |
| Register to Memory (4 bytes) | 78 | 86.7 | 87.8 | 87.8 | SAL | SAL | SAL |
| Allocate & Clear Memory | 30 | 33.3 | 33.5 | 60 | SAL | 63.5 | SAL |
| | | | | | | | |
| MIPS | 36 | 40 | 40.3 | 27.4 | 40.7 | 60.6 | 41 |
| mixed arith- metic bench- mark (ratio) | 33.4 | 37 | 37.4 | 30.6 | 37.6 | 55.9 | 45.8 |
| FMIPS | 22.7 | 25.3 | 25.6 | 26.3 | 25.6 | 38.3 | 39 |
| VFFT — 128 ³ (BSD/OS) (FreeBSD) | | | | | | | |
| 128 x 256 ² (BSD/OS) (FreeBSD) | | | | | | | |
| Disk SCSI | NCR53c825 Seagate ST15150W | | | | | | |
| One controller MByte/sec. | 1R/6.72 | 2R/13.5 | 1w/3.375 | 2w/6.75 | | | |
| Two Controllers | 3R/16 | 4R/16 | 3w/10.125 | 4w/13.25 | | | |
| | (90% idle) | | (92.5% idle) | | | | |
| 3 Controllers | 3R/20 | 4R/27 | | | | | |
| | 5R/33.6 | | | | | | |
| | 5W/16.875 | | | | | | |
| | 6R/40.35 | | | | | | |
| | (88% Idle) | | | | | | |
| | 6W/20.25 | | | | | | |

Table 3: Overall Performance Comparison for Pentium and Sun

| Pentium (Pro) 200MHz FreeBSD 2.1.7 <i>See Comments for more M/B info.</i> | ASUS PCI/ P/I- P55TVP4 Triton II 60ns FreeBSD2.2 | ASUS PCI/ P/I- P55TVP4 Triton II 60ns | AUSU P/I-P6NP5 Natoma 60 ns FBSD 2.2.1 | Tyan Pro S1662 Natoma 60ns | E-4000 167 MHz Solaris 2.6 | Spare Ultra6 450 MHz Solaris 2.7 | E4500 336 MHz Solaris 2.6 |
|--|---|---|--|-------------------------------------|--|--|---------------------------------|
| Aligned Memory Copy | 40 | 40 | 48 | 30 | 202 (222) | 267 | 300 |
| Unaligned Memory Copy | 40 | 40 | 48 | 30 | 202 | 235 | 300 |
| Subroutine Call | 2-3 | 1-3us | 1-2us | < 1us | 1us | <1us | < 1 us |
| Register to Memory (8 bytes) | 174 | 174 | 68 | 48 | 148 | 200 | 241 |
| Register to Memory (4 bytes) | 88 | 88 | 64 | 47 | 126 | 169 | 136 |
| Allocate & Clear Memory | 64 | 35 | 63 | 40 (44) | 63 | 120 | 77 |
| | | | | | psrinfo | | |
| MIPS | 39.5 | 60 | 78 | 78.8 | 28 | 60 | 56 |
| mixed arith- metic bench- mark (ratio) | 45 | 55.9 | 70 | 71 | 40 | 108 | 78 |
| FMIPS | 38 | 38 | 57 | 57.8 | 50 | 110 | 101 |
| VFFT — 128 ³ (BSD/OS) | 64MB | 64MB | 64MB | 64MB | 8s / 1GB | 3s/256MB | 4s |
| (FreeBSD) | 10s | 10s | 4.5s | 5s | | | |
| 128 x 256 ² (BSD/OS) | | | | | 37s / 1GB | 16s | 18s |
| (FreeBSD) | 45s | 44s | 22.7s | 31s | | | |
| 3dmask- 128 ³ | | | 23s | | | | |
| Disk SCSI | NCR53c825 | | | | Sun + ST423451W-0011 | | |
| One controller MByte/sec. | 1R/6.72 3R/16 | 2R/13.5 4R/16 | 1w/3.375 3w/10.125 | 2w/6.75 4w/13.25 | 1R/10 3R/18 | 2R/18 | 1w/5.4 3w/16 4w/17.5 |
| Two Controllers | 3R/20 | 4R/27 | | | | | |
| 3 Controllers | 5R/33.6 (95% Idle) | 6R/40.35 | 5W/16.875 | 6W/20.25 | 1-Controller + ST34501W-0013 1R/14~2R/18 1W/5.7 ~ 3W/17 | | |

Table 4: Overall Performance Comparison for Pentium Family (FBSD 2.1)

| Pentium 200MHz FreeBSD 2.1.7 <i>See Comments for more M/B info.</i> | ASUS PCI/ 97TX-E Triton II 60ns | ASUS PCI/ 97TX-E Triton II 60ns AMD-K6 | | | ASUS PCI/ P/I-P65UP5 Triton II 60ns | | |
|--|--|--|--|--|--|--|--|
| Aligned Memory Copy | 49 | 42 | | | | | |
| Unaligned Memory Copy | 49 | 42 | | | | | |
| Subroutine Call | 1-3us | 2-3us | | | | | |
| Register to Memory (8 bytes) | 175 | 74 | | | | | |
| Register to Memory (4 bytes) | 88 | 68 | | | | | |
| Allocate & Clear Memory | 36 | 37 | | | | | |
| | | | | | | | |
| MIPS | 60 | 94 | | | | | |
| mixed arith- metic bench- mark (ratio) | 56 | 75 | | | | | |
| FMIPS | 38 | 37.5 | | | | | |
| VFFT — 128 ³ (BSD/OS) (FreeBSD) | 9.8s /64MB | 9s / 64MB | | | | | |
| 128 x 256 ² (BSD/OS) (FreeBSD) | ?/64MB 43s/64MB | ?/64MB 40s/64MB | | | | | |
| Disk SCSI | NCR53c825 | | | | | | |
| One controller MByte/sec. | 1R/6.72 3R/16 | 2R/13.5 4R/16 | | | | | |
| Two Controllers | 3R/20 | 4R/27 | | | | | |
| 3 Controllers | 5R/33.6 5W/16.875 6R/40.35 (95% Idle) 6W/20.25 | | | | | | |

Table 5: Overall Performance Comparison for Pentium Family (FBSD 2.2)

| Pentium 200MHz FreeBSD 2.2.1 <i>See Comments for more M/B info.</i> | ASUS PCI/ 97TX-E Triton II 60ns | ASUS PCI/ 97TX-E Triton II 60ns AMD-K6 | ASUS P/I-P6NP5 P-Pro 60ns Linux2.0.25 | ASUS P/I-P6NP5 P-Pro 60ns | ASUS PCI/ P/I-P65UP5 Triton II 60ns | | |
|--|--|--|---|------------------------------------|--|--|--|
| Aligned Memory Copy | 49 | 42 | 78 / 42 | 48 45/70ns | | | |
| Unaligned Memory Copy | 49 | 42 | 33 | 48 45/70ns | | | |
| Subroutine Call | 1-3us | 2-3us | 3 | 1-2us | | | |
| Register to Memory (8 bytes) | 175 | 74 | 60 | 68 | | | |
| Register to Memory (4 bytes) | 88 | 68 | 58 | 64 | | | |
| Allocate & Clear Memory | 36 | 37 | 60 | 63 | | | |
| | | | | | | | |
| MIPS | 60 | 94 | 67.5 | 78 | | | |
| mixed arith- metic bench- mark (ratio) | 56 | 75 | 60.5 | 70 | | | |
| FMIPS | 38 | 37.5 | 45 | 57 | | | |
| VFFT — 128 ³ (BSD/OS) (FreeBSD) | 9.8s /64MB | 9s / 64MB | | | | | |
| 128 x 256 ² (BSD/OS) (FreeBSD) | ?/64MB 43s/64MB | ?/64MB 40s/64MB | | | | | |
| Disk SCSI | NCR53c825 | | | | | | |
| One controller MByte/sec. | 1R/6.72 3R/16 | 2R/13.5 4R/16 | | | | | |
| Two Controllers | 3R/20 | 4R/27 | | | | | |
| 3 Controllers | 5R/33.6 5W/16.875 6R/40.35 (95% Idle) 6W/20.25 | | | | | | |

Table 6: Overall Performance Comparison for different O.S.

| 200MHz .ASUS PCI/ 97TX-E Triton II 60ns | FreeBSD 2.2.5/8 cc 263/272 Pentium | FreeBSD 3.0.x aout/ELF Pentium | FreeBSD 2.2.5/8 ADM-K6 | FreeBSD 3.0.x aout/ELF ADM-K6 | Linux 2.0.32 Pentium/ AMD | BSDi 3.1 MMX/ AMD-K6 | Solaris 2.6.x Pentium MMX |
|---|---|---|------------------------------|--|------------------------------------|----------------------------|---------------------------------|
| Aligned Memory Copy | 49/44 | 44 | 42/37 | 35 | 37/52 | 43 | 42 |
| Unaligned Memory Copy | 49/44 | 44 | 42/32 | 30 | 36 | 43 | 42 |
| Subroutine Call | 1-3us | 1-3 | 2-3us | 1-3 | 1-2 us | 5-7 | 11 |
| Register to Memory (8 bytes) | 175 | 173 | 74/65 | 64 | 176/ | 87 | 88 |
| Register to Memory (4 bytes) | 88 | 88 | 68/64 | 63 | 88 | 87 | 88 |
| Allocate & Clear Memory | 63 | 56 | 37/54 | 49 | 42 | 33 | 7.8-28 |
| | | | | | | | |
| MIPS | 70/41 | 41/39.5 | 94/59 | 58.5 | 40.3/58 | 42/63 | 40 |
| mixed arith- metic bench- mark (ratio) | 62/46 | 46/45 | 75/58 | 58 | 42.3/54 | 36/43.5 | 43 |
| FMIPS | 38/39 | 39/38 | 37.5/35.5 | 35.5/37.5 | 34.4/33.4 | 27.6/29 | 34 |
| VFFT — 128 ³ | 9.8s /64MB | 9s / 64MB | 8.9 s | | | | |
| 256 ² x 128 | 43s/64MB | 40s/64MB | 38s/35s | | | | |
| 3dmask 256 ² x 6 | 12.1s | | 7.8 s | | | 7.75 s | |
| 128 ³ | 54.36 s | | 35.95 s | | | 35.23 s | |
| 256 ² x 128 | | | | | | | |

Table 7: Overall Performance Comparison for different O.S. (Cont.)

| 200MHz .ASUS P/I- P65UP5 + C-P55T2D Triton II dual Pentium | FreeBSD 3.0 | Solaris 2.6.0 | Linux | NT | | |
|---|--------------------------|------------------------|-------|----|--|--|
| Aligned Memory Copy | 49 | 33 | | | | |
| Unaligned Memory Copy | 49 | 33 | | | | |
| Subroutine Call | 1-3us | 15us | | | | |
| Register to Memory (8 bytes) | 175 | 60 | | | | |
| Register to Memory (4 bytes) | 88 | 60 | | | | |
| Allocate & Clear Memory | 36 | 9-16 | | | | |
| | | | | | | |
| MIPS | 70/77 | 39.5 | | | | |
| mixed arith- metic bench- mark (ratio) | 62/66 | 38 | | | | |
| FMIPS | 38 | 32 | | | | |
| VFFT — 128 ³ | 64 MB NA/9.8s/13s* | 64 <96> MB 11 <13>s | | | | |
| 256 ² x 128 | NA/43s/1:04* | 51s <55s> | | | | |
| SMP w/2-CPU VFFT 128 ³ | 96 MB | 64 <96> MB 6 <7>s | | | | |
| 256 ² x 128 | | 28s <33s> | | | | |
| 3dmask 256 ² x 6 | 96 MB 9.7/11.5/12.2s* | 64 <96> MB <10> s | | | | |
| 128 ³ | 46.4/54.8/59.4s* | 49 <53> s | | | | |
| 256 ² x 128 | 3:08/4:04/4:22* | 3:30 | | | | |
| SMP w/2-CPU 3dmask 256 ² x 6 | 96 MB 5.93 s | 64 <96> MB <5> s | | | | |
| 128 ³ | 25.49 s | 24 <25>s | | | | |
| 256 ² x 128 | 1:43.5 | 1:43 | | | | |

* If SMP enabled, the regular performance will drop. fork-2P/regular-1P/SMP-1P. <#> is for Solaris 2.5.1-U9

Table 8: Overall Performance Comparison for ASUS Family

| 200MHz FreeBSD 2.1.7 /2.2.8 <i>See Comments for more M/B info.</i> | ASUS PCI/ 97TX-E Triton II 60ns | ASUS PCI/ 97TX-E Triton II 60ns AMD-K6 | ASUS KN97-X 440FX 266MHz Pentium-II | SuperMicro 370DLE P-III 933 PC133 | ASUS K7V VIA83C572 FB4.1 AMD K7-750 PC133 | same as left overclock bus to 105MHz | same as left with F-BSD 4.6 |
|---|---|--|---|--|--|---|-----------------------------------|
| Aligned Memory Copy | 49 | 42/37 | 55-58 | 238 | 144 | 155 | 138/155 |
| Unaligned Memory Copy | 49 | 42/32 | 42 | 106 | 133 | 137 | 99/142 |
| Subroutine Call | 1-3us | 2-3us | 2 | 1 | 5 | 2-3 | |
| Register to Memory (8 bytes) | 175 | 74/64 | 82-90 /80 | 225 | 250 | 269 | 273 |
| Register to Memory (4 bytes) | 88 | 68/63 | 77-80 /78 | 223 | 256 | 261 | 263 |
| Allocate & Clear Memory | 36 | 37/54 | 75-83 /75 | 289 | 150 | 184 | 198 |
| | | | | | | | |
| MIPS | 70 | 94/59 | 165/106 | 576 | 416/559 | 592 | 475.7 |
| mixed arith- metic bench- mark (ratio) | 62 | 75/58 | 129/94 | 480 | 316/723 | 760 | 706 |
| FMIPS | 38 | 37.5/35 | 83/77 | 315 | 230/406 | 429 | 400 |
| VFFT — 128 ³ (BSD/OS) (FreeBSD) | 9.8s / 64MB | 9s / 64MB | 5s / 64MB | 0.88 | 1.5 | 1.46 | 1.46 |
| 128 x 256 ² (BSD/OS) (FreeBSD) | ?/64MB 43s/64MB | 64MB ?/ 40s/35s | ?/64MB 29s/64MB | 4.8 | 7 | 6.58 | |
| 3dmask - 128 ³ | | | 31.5s | 4 | 8 | | 7.82 |
| Disk | NCR53c875 + Seagate ST34501W | | UDMA33 + WD102AA (WDC 450AA is different) | | ST423451W / ST19171W | | |
| One controller MByte/sec. | 1R/14 2R/17.2 1W/5.70 2W/11.4 3W/14.5 4W/15 | | 1R/22.5 2R/43.6 1W/21.5 2W/43.2 | | 1R/10.9 2R/21.9 3R/32.1 4R/32.1 (saturated; CPU 93% idle) write on ST423451W | | |
| Two Controllers | 3R/31 4R/35 6W/29.0 | | 3W/65 4W/84.5 Note: (mixed or 450AA o) | | 1W/3.5 2W/7 4W/14 6W/21 write on ST19171W | | |
| 3 Controllers | 5R/48.5 6R/51 (95% Idle) 6W/34.2 9w/44 | | 2R/33 (mixed) 2R/25 (two 450AA) 1R/29 2R/19.7 (2 Maxtor 54098U8 next page) | | 1W/4.15 ~ 4W/16.6 | | |

Table 9: Overall Performance Comparison for Pentium Family (FBSD 3.1)

| FreeBSD 3.x aout (217) <u>ELF</u> | FIC xxx K6-II-400 8ns | ASUS P5A-B K6-II-400 | FIC xxx K6-III-400 8ns <60ns> | ASUS P5A-B K6-III-400 <110MHz> | ASUS P2B P-III-450 100/110Mh | ASUS P2B Celeron-400 66/83MHz* | Celeron-500 83Mhz gcc 2.95.2 |
|--|--|----------------------------|--|---|--|---|------------------------------------|
| Aligned Memory Copy | 64 | 71 | 77 <37.5> | (76) 75 <85> | 131/143 | 88/110 99/75MHz | 148 |
| Unaligned Memory Copy | 58 | 63 | 72 <35.5> | 69 <77> | 79/87 | 63/78.5 71/75MHz | 84 |
| Subroutine Call | 1-3 | 0 | 1-4 | 1-0 | 1-2us | 1-3 0 | 3 |
| Register to Memory (8 bytes) | 93.5 | 102 | 109 <54> | (94) 92 <99> | 189/208 160/112Mhz | 125/156 141/75MHz | 176 |
| Register to Memory (4 bytes) | 88 | 99 | 108 <52.5> | (89) 92 <104> | 186/204 | 125/156 141/75MHz | 170 |
| Allocate & Clear Memory | 76 | 80 | 95.5 <51> | (79) 84 <93> | 147/161 136/112Mhz | 106/133 124/75MHz | 165 |
| Last updated on 2000-12-13 | | | | | | | |
| MIPS: aout same as ELF | 123 (205) 120.5 | (205) 121 | 126 <124.7> | (206) 121 <141> | 176/194 | 155/195 175/75MHz | 283 |
| mixed arith- metic bench- mark (ratio) | 120 | (155) 120 | 122 | (155) 120 <137> | 158/174 177/112mhz 164/181 | 140/175 146/182 158/75MHz | 240 |
| FMIPS | 75 (77) 77 | 77 | 77 | (77) 77 <87> | 134.5/148 144.5/159 | 119/149 124/75MHz 128/160 | 153 |
| VFFT — 128 ³ (FreeBSD) | (4.8s) 4.4s | 5s | 3.4s | () 3.4s <3s> | 2s/110Mhz | 2s/83Mhz 2.38/75Mhz | |
| 128 x 256 ² (FreeBSD) | (20.6s) 19s | (21s) 21.77 | 15.5s <17> | 15.8s <14.6> | 9s/110Mhz | 13.9/83Mhz 15.6/75Mhz | |
| Disk | NCR53c825 | | WDC AC418000D | | ATA-66 | | |
| One controller MByte/sec. | 1R/6.72 | 2R/13.5 | 1R/17 MB/s | | 2R/21 (WDC 450AA mixed with Max- tor 54098U8) is better than two Maxtors The slower IDE seems having better bus arbitration | | |
| Two Controllers | 3R/16 | 4R/16 | | | | | |
| 3 Controllers | 5R/33.6 5W/16.875 6R/40.35 (95% Idle) 6W/20.25 | | WDC WD200BB 1R/27 MB/s | | | | |

Table 10: Overall Performance Comparison for Pentium Family (FBSD 4.5/4.6)

| FreeBSD 4.5/4.6 <u>ELF</u> | ASUS P5A-B K6-III-400 <105MHz> | ASUS P5A-B K6-II-500 | ASUS P2B P-III-450 110Mh | ASUS P2B Celeron-400 83Mhz* | P-III-450 100MHz Linux 2.4.9 | SuperMicro P4DPE 2.0 GHz P4 PC2100 | Tyan S2466N-4M 1.67GHz AMD MP PC2100 |
|---|---|----------------------|--------------------------|-----------------------------|-----------------------------------|------------------------------------|--------------------------------------|
| Aligned Memory Copy | 80 | 43 | 121.9 | 101.5 | 158.6 | 530-569 | 266-300 158-166 |
| Unaligned Memory Copy | 73 | 41 | 75.6 | 71.6 | 86.7 | 530-617 | 269-338 157-173 |
| Subroutine Call | 2us | 3us | 2 | 1 | 0 | 4.5us | 4.3 - 7.3 |
| Reg to Mem (8 bytes) | 90 | 65 | 162 | 125 | 217 | 678 | 460-482 286 |
| Reg to Mem (4 bytes) | 90 | 64 | 162 | 125 | 217 | 678 | 435/269 |
| Allocate & Clear Memory | 82 | 56 | 135 | 109 | 136 | | 406/253 The 2nd # is in dozing |
| Chipset and other info | | | BX | | | Intel E7500 | |
| MIPS: | 87 | 250 | 325.8 | 325 | 253 | 650-680 | 979/555 |
| mixed arithmetic benchmark (ratio) | 101.8 | 182.8 | 244 | 247 | 192 | 885 | 1450/823 |
| FMIPS | 51 | 91.8 | 160 | 160.7 | 119 | 445 | 821/465 |
| VFFT — 128 ³ 3dmask | 3.83s | 4.29s | 1.92 | 2s | 256 ³ 128 ³ | 3.02s | 16.76 3.37 |
| 128 x 256 ² 3dmask | 17.86 | 21.35 | 8.49 | 15 | 9.84 | 3.19 11.89 | 3.11/5.44 13.44 |
| Matrix 5 × 5 1e6 × 2π Op | | | | | | 30:45 | 4:47.8 |
| Disk | WD100AA 1R/22.5MBps | | WD200BB 1R/27MB | | WD800JB 1R/47MBps | | |
| One controller MByte/sec. Two Controllers | <p>Notice that all IDE buses on Intel E7500 will run at the lowest rate when the lowest drive is used.</p> <p>WD800JB and WD200BB on IDE bus-1 and two WD100AA on IDE bus-2</p> <p>read both disks on IDE bus-1 will result 27 x 2 MBps regardless which bus they are on</p> <p>read WD800JB on IDE-1 and WD100AA on IDE-2 will result 22.5 x 2 MBps</p> <p>read all disks simultaneously will get 14.5 x 4 =58 MBps</p> | | | | | | |
| IDE Controller | <p>The S2466 (AMD 760-MPX) IDE system is much better than the Intel chipset</p> <p>Two IDE buses are separately operated. With the same IDE configuration above, we got total 27x2+22x2 = 98 MBps</p> | | | | | | |
| <p>Network performance — TCP: (Any combination can achieve 960 Mbit/s UDP throughput)</p> <p>Between S2466 and P4DPE, SysKconnect SK-9843/9844 have 940 Mbps each way; and NetGear620 had 498 from P4DPE to S2466 and 511 reversely.</p> <p>NetGear on S2466 gets 776 Mbit/s from and sends 510 Mbit/s to SysKconnect on P4DPE.</p> <p>NetGear on D4DPE gets 782 Mbit/s from and sends 501 Mbit/s to SysKconnect on S2466.</p> <p>S2466 has total 1Gbit/s on two NICs, and P4DPE has 1.25 Gbit/s total over two NICs.</p> | | | | | | | |

Table 11: Overall Performance Comparison for Pentium Family (FBSD 4.6)

| FreeBSD 4.5/4.8 <u>ELF</u> | AMD XP 1.4 GHz SIS735 K7S5A Linux2.4.16 | ASUS A7v8X-X (2100+) 2700+2.166 GHz DDR400 | ASUS A7N8X XP 2100+ 1.7GHz 133 PC2100 | SuperMicro X5DE8-GG 3.0 GHz P4 PC2100 | SuperMicro P4DL6 2.4 GHz P4 PC2100 | SuperMicro P4DMS-6GM 2.2GHz P4 PC2100 | SuperMicro P4DC6+ 2.2 GHz P4 RDRAM |
|---|---|---|--|--|---|--|---|
| Aligned Memory Copy | 272-305 | (260) 326 | 357 | 616 | 672 | 545 | 590 |
| Unaligned Memory Copy | 306 | (268) 331 | 365 | 605 | 697 | 600 | 626 |
| Subroutine gettimeofday | 265 | 7 ns 4331 ns | 9 ns | | 4 4000 | 10 1000 | 11 4500 |
| Reg to Mem (8 bytes) | 373-449 | (391) 577 | 721 | 737 | 968 | 666 | 737 |
| Reg to Mem (4 bytes) | 368-432 | (340) 468 | 688 | 737 | ? | ? | ? |
| Allocate & Clear Memory | 329 | (325) 482 | 510 | 571 | 551 | 387.6 | 472 |
| Chipset and other info. | SIS 735 | VIA KT400 VT8235 | NVIDIA | ServerWorks GC-SL | ServerWorks GC-LE | Intel E7500 | Intel 860 |
| MIPS: | 866 | (1240) 1459 | 1245 | 1173 | 810 | 755/693* | 722 |
| mixed arith- metic bench- mark (ratio) | 1100 | (1687) 2093 | 1623 | 1438 | 1038 | 959 900* | 930 |
| FMIPS | 599.28 | (821) 1200 | 921 | 720 | 521 | 480/454* | 467 |
| VFFT — 256 ³ 128 x 256 ² | | | 15.5 2.79 | 7.19 2.08 | | | returned due to memory HUB issue |
| 3dmask 256 ³ 128 x 256 ² | 3.89 13.8 | | 26.1 13 | 15.42 7.79 | | | |
| Matrix 5 × 5 1e6 × 2π Op | | | | | | | |
| Disk | | | see [A4] | | * Linux2.4.18 | | |
| UDP rate: | 703 Mbit/s | | 688/66Mhz 539/32MHz (637 Linux) | | | | |
| TCP rate | | | 660/66MHz 572/in/32 (704 Linux) 513/out/32 (550 Linux) | | | | |

Table 12: Overall Performance Comparison for different FBSD (4.7/5.0)

| SuperMicro X5DL8-GG 2.8 GHz P4 (interleaved) DDR266 FreeBSD | 2 CPUs NonSMP 4.7 | 2 CPUs SMP 4.7 | 2 CPUs NonSMP 5.0 | 2 CPUs SMP 5.0 | 1 CPU NonSMP 5.0 | 1 CPU NonSMP 4.7 | AMD MP Opteron 1395 MHz 64GB linux 2.4.19- NUMA |
|---|-------------------|----------------|-------------------|----------------|------------------|--------------------|---|
| Aligned Memory Copy | 940 | 860 | 950 | 950 | 895 | 950 | 886 |
| Unaligned Memory Copy | 887 | 726 | 881 | 890 | 820 | 884 | 826 |
| Subroutine Call (μ s) | 3-5 | 3-5 | 0.6 | 3-5.8 | .6 | 4-5 | 0.169 |
| Register to Memory (8 bytes) | 1098 | 1120 | 1100 | 1178 | 1094 | 1097 | 1438 |
| Register to Memory (4 bytes) | 1098 | 1120 | 1100 | 1178 | 1094 | 1094 | 875 |
| Allocate & Clear Memory | 676 | 506 | 640 | 490 | 640 | 677 | 647 |
| Chipset and other info. | ServerWorks GC-LE | | | | | | |
| MIPS: | 1070 | 709 | 1031 | 776 | 1038 | 1070 | 1535 |
| mixed arithmetic benchmark (ratio) | 1316 | 821 | 1315 | 816 | 1319 | 1318 | 1558 |
| FMIPS | 661 | 648 | 661 | 646 | 662 | 662 | 812 |
| VFFT — 256^3 | 7.24 | 8.65 | | | | 7.21 | 4.39 |
| 128×256^2 | 2.21 | 2.79 | 2.21 | 2.72 | 2.20 | 2.21 | |
| 3dmask 256^3 | 16.96 | 23.74 | | | 16.93 | 16.95 | |
| 128×256^2 | 8.55 | 11.88 | 8.51 | 11.94 | 8.50 | 8.51 | |
| SMP 3dmask 256^3 | | 9.67 | | | | | |
| Matrix 5×5 $1e6 \times 2\pi$ Op | | | | | | 18:53.8 | |
| One controller MByte/sec. | | | | | | | |
| Two Controllers | | | | | | | |
| 3 Controllers | | | | | | | |
| UDP rate: | | | | | | 962 Linux2.4.25 | |
| TCP rate | | | | | | 941 Linux2.4.25 | |

Table 13: Memory and Interleave

| ASUS A7N8X XP 2100+ 1.7GHz FreeBSD 4.8 | single channel DDR266 | dual channel DDR266 | dual channel DDR266 | single channel DDR400 | single channel DDR400 | dual channel DDR400 | dual channel tri module DDR400 |
|---|--|--|--|--|--|---|--|
| BIOS setting: | optimal CPU auto m speed bus 133 MHz | aggressive CPU auto m speed bus 133 MHz | optimal CPU by m speed bus 133 MHz | optimal CPU auto m speed bus 133 MHz | optimal CPU by m speed bus 200 MHz | optimal CPU bus 133 MHz bus 200 MHz | optimal CPU by m speed bus 200 MHz (2271 MHz) |
| Aligned Memory Copy | 357 | 377 | 456 | 388 | 421 ECC 431 nECC | 465 475 | (488) 475 |
| Unaligned Memory Copy | 365 | 350 | 472 | 379 | 428 ECC 450 nECC | 501 511 | (519) 511 |
| Subroutine Call (ns) | 9 | 4-9 | | | 5-9 | 5-9 | (4.2) 5-9 |
| gettimeofday: | 4204 ns | 4204 ns | | | 4204 ns | | 4200 |
| I/O syscall (ns) | 591 / 882 | | | | 551/889 | | 400/646 |
| Register to Memory (8 bytes) | 721 | 746 | 741 | 742 | 698 ECC 694 nECC | 746 790 | (799) 790 |
| Register to Memory (4 bytes) | 688 | 731 | 730 | 718 | 694 ECC 683 nECC | 731 766 | (779) 766 |
| Allocate & Clear Memory | 510 | 600 | 598 | 592 | 581 ECC 575 nECC | 600 612 | (598) 607 |
| Chipset and other info. | NVIDIA | | | | | | |
| MIPS: | 1245 | | | | 1253 | 1247 | 1246 |
| mixed arith- metic bench- mark (ratio) | 1623 | 1766 | 1766 | 1762 | 1759 ECC 1711 nonE | 1766 1710 | (2206) 1708 |
| FMIPS | 921 | | | | 831 | 832 | 832 (1085) |
| VFFT — 256 ³ 128 x 256 ² | 15.5 2.79 | | | | | | |
| 3dmask 256 ³ 128 x 256 ² | 26.1 13 | | | | | | |
| SMP 3dmask 256 ³ | | | | | | | |
| Matrix 5 × 5 1e6 × 2π Op | | | | | | | |
| UDP rate: | | | | | | | |
| TCP rate | | | | | | | |

Table 14: Memory and Interleave

| | | | | | | | |
|---|----------------------------------|---|------------------------|--|---|---|---|
| FreeBSD 4.8 [6.0] DDR400 XP 2100+ 1.732GHz | ASUS A7v8X-X | ASUS A7V600 (2700+ 2.167GHz) | ASUS A7V600 | AMD Opteron240 1.4 GHz FreeBSD 5.2.1 | X5DPL-iGM intel Xeon 2.8 GHz Linux 2.4.20-31. | | |
| BIOS setting: | | auto memory interleave | non auto interleave | | 1 CPU | Dual CPU (SMP) | Dual CPU Hyper- thread |
| Aligned Memory Copy | 260 (326) | 360 [374] (425) | 336 (395) | 632.61 617 x 2p | 664.5 | 646 288 x 2p | 663/769 327 x 2p |
| Unaligned Memory Copy | 268 (331) | 369 (443) | 380 (376) | 433.99 432 x2p | 641 | 630 307 x 2p | 705/764 352 x 2p |
| Subroutine SysCsAvg (ns) | deviation= 7 cost = 4331 | 7 [3] ns 2026 [636] ns | | 3 ns 3724 ns | 4 ns 511 ns | 6 ns 572 ns | 6 ns 570 ns |
| gettimeofday: | ns | 4355 [916] ns | | 3599 ns | ns | ns | ns |
| I/O syscall (ns) | | 457/703 [345/643] | | 1105/1977 | 576/566 | 1265/1266 | 1224/1150 |
| TSC (ticks) | | 6.3 [11] | | | | | |
| Register to Memory (8B) | 391 (577) | 482 [501] (585) | 488 (583) | 1247.49 1095 x 2p | 745 | 761 461 x 2p | 862/945 461 x 2p |
| Regi to Mem (4 bytes) | 340 (468) | 456 (485) | 462 (480) | 793.89 746 x 2p | 745 | 761 461 x 2p | 862/945 461 x 2p |
| Allocate & Clear Memory | 325 (482) | 449 [428]i (526) | 446 (508) | 348.37 175 x 2p | 517 | 535 349 x 2p | 440/483 327 x 2p |
| Chipset and other info. | VIA KT400 VT8235 | VIA KT600 VT8237 | | | Intel E7501 | | |
| MIPS: | 1240 (1459) | 1236 [2023] (1464) | | 1168 | 997 | 980 | 982 |
| mixed arith- metic bench- mark (ratio) | 1687 (2093) | 1702 [1854] (2101) | | 1471 | 1180 | 1177 | 1177 |
| FMIPS | 821 (1200) | 826 [968] (1199) | | 817 | 599 | 596 | 596 |
| VFFT — 256 ³ 512 ³ SMP — 512 ³ | 2t/4t => | 15.56 s | [15.12] | 4.63 s 1:36.5 | 8.2 2:21 | 7.1 2:21 1:53/1:53 | 8.8 s 2:17 1:55/1:53 |
| 3dmask 256 ³ 320 ² | | 26.06 s | [22.89] | | 14.97 29.07 | 15 29.3 | 15 s 29.21 |
| Matrix 11 × 11 {default: -O3 Gcc 2.95} 5 × 5 1e6 × 2π Op | gcc 3.4.4 -O gcc 3.4.4 | 21.91 28.76 8:00 2:47.3 [3:47.21] | | SMP 3dmask 256 ³ (2p/4p) | 12.88 (320 ³) 21.69 | 6.81/6.80 (320 ³) 11.44/11.48 | 6.53 / 10.37 (320 ³) 11.9 / 19.93 |
| UDP rate: | | Tx 336 Mb/s | | | 960 | 960 | 962 |
| TCP rate | | Rx 604 / Tx 322 Mb/s | | | | | 941/941 |

Table 15: Memory (DDR400/PC3200) and Interleave continue [FreeBSD 6.0/Gcc 3.4.4]

| Intel D875PBZP4 2.4 GHz P4 FreeBSD 5.1 | ECC single- channel | Non-ECC single- channel | Non-ECC dual channel (interleave) | Intel SE7500CW2 1.8 GHz Xeon Dual CPU — 1 CPU | | ECS Intel P4 506+ (overclock to 150Mhz) | ECS VIA P4M800 P4 630 |
|--|---|-------------------------------|---|---|-----------|--|-----------------------------|
| Aligned Memory Copy | 783 | 821 | 1235 | 533 | 548 | 735 (828) | 652 |
| Unaligned Memory Copy | 802 | 833 | 1279 | 490 | 526 | 734 (829) | 664 |
| Subroutine Sys (ns) avg. | 7 | 7 | 6 | | | 3 (2~3) 969 (877) | 2~3 1168 |
| gettimeofday | 1671 ns | 1661 ns | 1660 ns | 5419 ns | 4719 | 1498 (1412) | 1215 |
| I/O syscall (ns) | 1106/1456 | 1107/1560 | 1119/1425 | 3429/2541 | 1790/1481 | 577/819 (512/706) | 712/1293 |
| TSC (ticks) | | | | | | 100 | 105 |
| Register to Memory (8B) | 1228 | 1242 | 1750 | 712 | 671 | 1103.9 (1238) | 752 |
| Register to Memory (4B) | 1227 | 1239 | 1749 | 712 | 671 | ditto | 748 |
| Allocate & Clear Memory | 641 | 647 | 728 | 326 | 431 | 611 (688) | 170 |
| Chipset and other info. | 875 | | | E7500 DDR266 PC2100 | | 848P-A7 ICH5 | VT8237 South- Bridge |
| MIPS: | 829 | 830 | 855 | 476 | 695 | 2097 (2345) | [2353.5] |
| mixed arith- metic bench- mark (ratio) | 1134 | 1134 | 1136 | 520 | 842 | 580 (653) | [1323] |
| FMIPS | 573 | 574 | 575 | 413 | 422 | 1166 (1309) | [660] |
| VFFT — 256 ³ 512 ³ | | | | | | 3.9 (3.51) 1:52 (1:39.5) | [4.23] [1:08] |
| 3dmask 256 ³ 512 ³ | | | | | | 16.7 (14.8) (1:56.8) | 14.85 1:57.74 |
| Matrix 11x11 | {gcc 2.95 — from FreeBSD 4.11 — has much better performance over gcc 3.4.4 -O3 from FreeBSD [6.0] on matrix operation. Gcc 3.4.4 -O/-O2 have better performance than -O3 on matrix} | | | | | 29.27 (25.95) | [26 s] {[16.2]} |
| Matrix 5 × 5 1e6 × 2π Op | | | | 30:45 | | 9:28.68 (8:23.93) {8:35.15 (7:36.28)} | [8:20] {[7:30]} |
| NIC | Intel PRO1000 1000B | | | Intel PRO1000 1000BSX SVR PCI-X | | RealTek 8139 | VT6102 10/100 |
| UDP rate: | > 1.3 Gb/s | > 1.3 Gb/s | | | | | |
| TCP rate Mb/s | > 950 | > 950 | | | | | |

Table 16: Memory (MB/s) and Arithmetic Computation

| AMD | Opteron 240 1.4 GHz FreeBSD 5.2.1 DDR 400 | DDR333 Turion ML-34 1.8GHz FreeBSD 6.1 i386 amd64 | ECS Intel P4 506+ (overclock to 150Mhz) FreeBSD 6.x | | | | |
|---|--|---|---|----------------|--|--------------|----------------|
| BIOS setting: | dual CPU | | | | 6.2 | 6.3 | 7.0 |
| Aligned Memory Copy | 632.61 617 x 2p | | 595 | 638 | 747 | 757 | 389 |
| Unaligned Memory Copy | 433.99 432 x2p | | 520 | 583 | 770 | 782 | 815 |
| Subroutine SysCall (ns) | deviation= 3 cost = 3724 | | 1035 | 999 | 900 | 880 | 1696 |
| gettimeofday: | 3599 ns | | 1999 | 1936 | 1412 | | 1415 |
| I/O syscall (ns) | 1105/1977 | | 499/765 | 297/764 | 504/737 | | 668/1298 |
| Register to Memory (8 bytes) | 1247.49 1095 x 2p | | 775 | 835 | 1245 | | 1258 |
| Register to Memory (4 bytes) | 793.89 746 x 2p | | | | 1245 | 1224 | 1257 |
| Allocate & Clear Memory | 348.37 175 x 2p | | 498 | 685 | 691 | | 530 |
| syscall cost (ns) - basic/mid/max | | | | | 44/1333.33/17699 (6.2) 43.7-1333.33-17699 (7.0) | | |
| MIPS: | X1168 | | 2420 | 2688/ X1520 | 2331 | 2323 | 2099 |
| mixed arith- metic bench- mark (ratio) | X1471 | | 1996 | 1951/ X1412 | 1321 | 1323 | 1718 |
| FMIPS | X817 | | 976 | 1013/X807 | 659 | 658 | 853 |
| VFFT — 256 ³ 512 ³ SMP — 512 ³ | 4.63 s 1:36.5 N/A | | 4.15 s | 3.65 s | 3.51 1:39 | 3.52 1:39 | 3.49 1:37.3 |
| 3dmask 256 ³ 320 ³ / 512 ³ | 24.5 47.68 / 3:15 | | 20.14 | 17.85 | 14.75 | 14.75 | 12.9 |
| SMP 3dmask 256 ³ (2p/4p) all use -O3 in <> use -g in [] use -O 320 ³ 512 ³ | <-g> 19.91/19.95 [9.3 / 9.4] 8.41/8.53 [15.6/15.67] 13.17 /13.25 [1:14/1:14.] 1:06 / 1:07 | | | | | | |
| UDP rate: | | | | | | | |
| TCP rate | | | | | | | |

Table 17: Memory (MB/s) and Arithmetic Computation

| AMD FreeBSD 7.1 | ECS GeForce6100PM-M2 Phenom 9600 | | DDR333 Turion ML-34 1.8GHz FreeBSD 7.1 i386 amd64 | | ECS 848P-A7 Intel P4 506+ (overclock to 150Mhz) | | |
|--|-------------------------------------|--------------------|---|----------------|--|-------|--------|
| BIOS setting: | DDR2 5300 | FreeBSD 6.3 | | | | | |
| Aligned Memory Copy | 1168 | 1601 | | | | | |
| Unaligned Memory Copy | 943 | 1475 | | | | | |
| Subroutine SysCall (ns) | 1 | 4 | | | | | |
| gettimeofday: TSC | 1692 ns 29.8 ns | 4614 29.8 | | | | | |
| I/O syscall (ns) | 251/524 | 296/516 | | | | | |
| Register to Memory (8 bytes) | 2185 | 2108 | | | | | |
| Register to Memory (4 bytes) | 2031 | 1902 | | | | | |
| Allocate & Clear Memory | 750 | 1125 | | | | | |
| syscall cost (ns) - basic/mid/max | 118/715/ 17659 | 133/5390/ 17659 | | | 44/1333.33/17699 (6.2) 43.7-1333.33-17699 (7.0) | | |
| MIPS: | 2912 | 3388 | 2420 | 2688/ X1520 | 2331 | 2323 | 2099 |
| mixed arith- metic bench- mark (ratio) | 2543 | 2275 | | | | | |
| FMIPS | 1456 | 1152 | 976 | 1013/X807 | 659 | 658 | 853 |
| VFFT — 256 ³ | 2.97 s | 3 | 4.15 s | 3.65 s | 3.51 | 3.52 | 3.49 |
| 512 ³ | 54.9 s | 54.4 | | | 1:39 | 1:39 | 1:37.3 |
| SMP — 512 ³ | 16.73 | 16.08 | | | | | |
| 3dmask 256 ³ | 12.1 | 12.55 | 20.14 | 17.85 | 14.75 | 14.75 | 12.9 |
| 512 ³ | 1:38 | 1:39.5 | | | | | |
| SMP 3dmask 512 ³ (4p) all use -O3 in <> use -g in [] use -O 320 ³ | <-g> 19.95 [] [1] 1 | | | | | | |
| UDP rate: | | | | | | | |
| TCP rate | | | | | | | |

Notice: Must perform bm from the console, not xterm.

<A> Motherboards

[A1] ASUS 60 ns motherboards can accommodate 70ns memory, and FreeBSD runs without problem.

[A2] ASUS motherboards can accommodate to overclock CPU clock one level up.

[A3] FIC - xxx includes PA-2013 and VA-503+

[A4] SuperMicro P4DC6+ uses Intel 860 PCI chipset which has bug in both 82806AA PCI 64 Hub (P64H) and 82860 Memory Controller Hub (MCH) chipsets to cause system to PCI bandwidth limited at 90 MB/s. Changing DT registers setting in P46H will improve this limitation to 105 MB/s (avg) or 117.5 MB/s (max).

Dev31, Fun0, Reg50h[2] = 1

Dev31, Fun0, Reg80h[1:0]=2

[A-5] VIA chipset (expecially KT400) for AMD XP has very low memory bandwidth.

[A-6] Although Intel claims that chipsets 91x and 92x support EM64T, but it seems only 94x and later do it. Intel says P-4 5xx are EM64T, but FreeBSD says no, which may be related to this issue.

 CPUs

[B1] AMD K6 is equivalent 1.5 horse power of Pentium in MIPs, and 0.95 in FLOPs. About 1.3 in average MixedMIPs. The K6-II/III are less overclockable than P-family. At the same clock rate, K6-III is about 12% faster than the Intel P-II/III CPUs.

[B2] Intel Celeron CPU can be over clocked 12% (400MHz --> 450MHz via increasing the bus clock from 66 to 75). It can be overclocked to 83 MHz bus frequency, but about 50% or more Celeron CPUs does not work stably in certain conditions. Celeron 433 and 466 CPU-BF can be set only to 75 MHz. Also [B2-3-O/R]

[B2-3-O] Please notice that the Bus Frequency Multiplex for K&P II/III CPU family is fixed. Celeron 400MHz is 6.0, P-III 450MHz is 4.5, etc.; if you change this setting, the performance will decrease. You may change only the CPU Bus Frequency (External Clock Rate) to overclock the CPU speed. For K6 II/III 400MHz family, the CPU-BF can be increased by 5%, and the K6-III-400 CPU-BF can be increased up to 10% but failed to pass "buildworld".

[B2-3-R] Celeron 433 is NOT recommended since its price is close to 466 and performance is lower than 400.

[B3] P-III: (measured on a 450MHz CPU) due to the DIMM speed limit (8ns), overclock Bus Speed more than 10%, the performance will be decreased. Also [B2-3-O]

[B6] Cyrix 6X86 is alleged little more faster than K6 and much cheaper, but less compatible for many motherboards.

<C> SMP

[C1] FreeBSD SMP kernel can get almost 200% CPU utilization on two CPU engines.

[C2] Both SMP FreeBSD and Solaris.x86 2.5.1-U9 will reduce one CPU utilization down 75-80%. Solaris.x86 doubles this power on two CPUs (160%), but SMP FreeBSD can get full power (200%) on two CPUs.

[C3] BSD/OS 4.0 will support SMP

<D> O.S.

[D1] Solaris.x86 has something related to motherboard. i.e., the system installed on Tyan S1662 Pro MB will not work on ASUS MB. The FreeBSD has no such problem.

<E> Compiler and libC.

[E1] All benchmark is compiled with -O3 option. libc.so.2.2 has 150% speed as libc.so.3.0 on overall and integer performance, but same for floating point performance, regardless the O.S. release version.

[E2] gcc 3.44 has low performance on Matrix than gcc 2.95.

<O> Others

[O1] VFFT benchmark also includes Input from I/O cache. The output is sent to /dev/null

[O2] FreeBSD 2.2.8/3.1 retesting was done on April 28, 1999. There is no major performance difference. The critical difference is the gcc 2.6.3.x v.s. 2.7.2.x. aout test for P/K6-II or later is default to 2.7.2.x (a.s.a. 228 FreeBSD); the "(217) means that gcc is 2.6.3.x.

<T> TEMP

<T1> K6-III with FIC benchmark is under FreeBSD 3.2; K7 benchmark is under FreeBSD 4.1 -- gcc 2.95.2

Since gcc 2.95.2 significantly improved integer operation, the 2.1.7.x is no longer needed for compiling purpose.