

crypto\_hash  
knot256v2  
implementations

T:opt

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https://bench.cr.yp.to  
20230702

amd64 Bobcat  
amd64 K8  
amd64 K10 65nm  
amd64 K10 45nm  
amd64 K10 32nm  
amd64 Bulldozer  
amd64 Piledriver  
amd64 Zen  
amd64 Zen 2  
amd64 Zen 3  
amd64 Knights Landing  
amd64 Golden Cove  
amd64 Cascade Lake  
amd64 Tiger Lake  
amd64 Skylake+512x2  
amd64 Ice Lake  
amd64 Comet Lake  
amd64 Cannon Lake  
amd64 Coffee Lake  
amd64 Kaby Lake  
amd64 Skylake  
amd64 Broadwell+AES  
amd64 Haswell+AES  
amd64 Ivy Bridge+AES  
amd64 Sandy Bridge+AES  
amd64 Sandy Bridge  
amd64 Westmere  
amd64 Core 2 45nm  
amd64 Core 2 65nm  
amd64 Gracemont  
amd64 Tremont  
amd64 Goldmont Plus  
amd64 Goldmont  
amd64 Airmont  
amd64 Silvermont  
amd64 Bonnell  
ppc32 G3  
riscv64 U54  
mips32 Octeon II  
armeabi Armada  
armeabi Cortex-A7  
armeabi Cortex-A8  
armeabi Cortex-A9+NEON  
armeabi Cortex-A15  
aarch64 X-Gen  
aarch64 Cortex-A53  
aarch64 Cortex-A53+crypto  
aarch64 Cortex-A57+crypto  
aarch64 Cortex-A72  
aarch64 Cortex-A72+crypto  
aarch64 ThunderX2

131072

262144

524288



bbobcat: 2 x 1650MHz; 2011 AMD G-T56n; amd64; Bobcat (600F10); supercop-20230630  
m4e50: 2 x 1650MHz; 2011 AMD E-450; amd64; Bobcat (600F20); supercop-2020618  
naca: 2 x 2000MHz; 2006 AMD Athlon 64 X2; amd64; K8 (40fb2); supercop-201710105  
gcc16: 8 x 2194MHz; 2008 AMD Opteron 8354; amd64; K10 65nm (100f23); supercop-20171218  
hydra3: 6 x 3300MHz; 2010 AMD Phenom II X4 1100T; amd64; K10 45nm (100fa0); supercop-20171218  
sonnigstar: 4 x 3200MHz; 2009 AMD Phenom II X4 955; amd64; K10 45nm (100fa2); supercop-20170904  
hdnaw: 1 x 1700MHz; 2010 AMD Athlon II Neo K125; amd64; K10 45nm (100fb3); supercop-201710105  
hydra4: 4 x 2600MHz; 2011 AMD A6-3650; amd64; K10 32nm (300f10); supercop-20230630  
hydra5: 4 x 2900MHz; 2011 AMD A8-3850; amd64; K10 32nm (300f10); supercop-20230630  
bobcat: 4 x 4000MHz; 2012 AMD FX-8350; amd64; Bulldozer (600F20); supercop-20171218  
calista: 4 x 4000MHz; 2012 AMD FX-8350; amd64; Bulldozer (600F20); supercop-20171218  
hydra4: 4 x 3100MHz; 2011 AMD FX-8120; amd64; Bulldozer (600F12); supercop-20171218  
saber210: 4 x 4000MHz; 2012 AMD FX-8350; amd64; Bulldozer (600F20); supercop-20230630  
hydra9: 2 x 3800MHz; 2012 AMD A10-5800K; amd64; Piledriver (610F01); supercop-20171218  
fpriority: 2 x 2000MHz; 2012 AMD A10-4655M; amd64; Piledriver (610F01); supercop-2020618  
zebra: 8 x 3000MHz; 2017 AMD Ryzen 7 1700; amd64; Zen (800f11); supercop-20170865  
zebra: 8 x 3000MHz; 2017 AMD Ryzen 7 1700; amd64; Zen (800f11); supercop-20170865  
rubbah: 4 x 3100MHz; 2011 AMD A10-5600; amd64; Zen (800f11); supercop-20211232  
rubbah: 4 x 3100MHz; 2011 AMD A10-5600; amd64; Zen (800f11); supercop-20211232  
dali: 2 x 2000MHz; 2012 AMD A10-5600; amd64; Zen (800f11); supercop-20191017  
rozo: 64 x 2250MHz; 2019 AMD EPYC 7742; amd64; Zen 2 (830f10); supercop-20230630  
rozo: 64 x 2250MHz; 2019 AMD EPYC 7742; amd64; Zen 2 (830f10); supercop-20230630  
lucienne: 4 x 2600MHz; 2021 AMD Ryzen 9 5950X; amd64; Zen 3 (a50f01); supercop-20230630  
gwj1346: 64 x 2000MHz; 2019 AMD EPYC 7702; amd64; Zen 2 (830f10); supercop-20191017  
bealix: 6 x 4062MHz; 2021 AMD Ryzen 5 5600G; amd64; Zen 3 (a50f00); supercop-20211221  
saw: 16 x 3400MHz; 2020 AMD Ryzen 9 5900X; amd64; Zen 3 (a50f10); supercop-20230630  
cezanne: 6 x 3900MHz; 2021 AMD Ryzen 5 PRO 5650G; amd64; Zen 3 (a50f00); supercop-20230630  
gwj1291: 68 x 1400MHz; 2016 Intel Xeon Phi 7250; amd64; Knights Landing (50671); supercop-20180818  
gwj1154: 64 x 1300MHz; 2016 Intel Xeon Phi 7210; amd64; Knights Landing (50671); supercop-20170228  
alder: 4 x 3300MHz; 2022 Intel Core i3-12100; amd64; Golden Cove (90673-00); supercop-20230630  
alder2.1f62690.5600000: 2 x 1600MHz; 2022 Intel Core i3-1215U performance cores; amd64; Golden Cove (906A4-40); supercop-20230630  
avx512mash: 18 x 3000MHz; 2019 Intel Core i9-10980K; amd64; Cascade Lake (50657); supercop-20210126  
jemo476: 20 x 2500MHz; 2019 Intel Xeon Gold 6248; amd64; Cascade Lake (50657); supercop-20191017  
panther: 4 x 2800MHz; 2020 Intel Core i7-1165G7; amd64; Tiger Lake (806c1); supercop-20230630  
sandy1024: 16 x 2100MHz; 2017 Intel Xeon Gold 6150; amd64; Skylake+512x2 (806a1); supercop-20170865  
sandy1024: 16 x 2100MHz; 2017 Intel Xeon Gold 6150; amd64; Skylake+512x2 (806a1); supercop-20170865  
sandy1024: 16 x 2100MHz; 2017 Intel Xeon Gold 6150; amd64; Skylake+512x2 (806a1); supercop-20170865  
sandy1024: 16 x 2100MHz; 2017 Intel Xeon Gold 6150; amd64; Skylake+512x2 (806a1); supercop-20170865  
icelake2: 4 x 1000MHz; 2019 Intel Core i3-1035G1; amd64; Ice Lake (706e5); supercop-20221005  
icelake2: 4 x 1100MHz; 2020 Intel Core i5-1030NG7; amd64; Ice Lake (706e5); supercop-20200626  
cubio: 2 x 2100MHz; 2019 Intel Core i3-10110U; amd64; Comet Lake (806ec); supercop-20230630  
cosat: 2 x 2100MHz; 2019 Intel Core i3-10110U; amd64; Comet Lake (806ec); supercop-20230630  
cannon: 2 x 2200MHz; 2018 Intel Core i3-8121U; amd64; Cannon Lake (90663); supercop-20190910  
r3000: 4 x 3300MHz; 2018 Intel Xeon E-2124; amd64; Coffee Lake (906a3); supercop-20230630  
blitvia: 6 x 3200MHz; 2017 Intel Core i7-8700; amd64; Coffee Lake (906a3); supercop-20190910  
kizamba: 4 x 3000MHz; 2017 Intel Xeon E3-1220 v6; amd64; Kaby Lake (906e9); supercop-20230630  
shoalshars: 2 x 2400MHz; 2017 Intel Core i3-7100; amd64; Kaby Lake (906e9); supercop-20211222  
italaui8: 4 x 3100MHz; 2018 Intel Core i7-8809G; amd64; Kaby Lake (906e9); supercop-20191017  
sant: 2 x 3300MHz; 2015 Intel Pentium G4400; amd64; Skylake (506e3); supercop-20171218  
samba: 4 x 3000MHz; 2015 Intel Xeon E3-1220 v5; amd64; Skylake (506e3); supercop-20230630  
gwj1461: 28 x 2400MHz; 2016 Intel Xeon E5-2650 v4; amd64; Broadwell+AES (406f1); supercop-20180818  
Banyan1: 16 x 2400MHz; 2016 Intel Xeon E5-2650 v4; amd64; Broadwell+AES (406f1); supercop-20170228  
Banyan2: 16 x 2400MHz; 2016 Intel Xeon E5-2650 v4; amd64; Broadwell+AES (406f1); supercop-20170228  
Banyan3: 16 x 2400MHz; 2016 Intel Xeon E5-2650 v4; amd64; Broadwell+AES (406f1); supercop-20170228  
bolsh: 8 x 1700MHz; 2015 Intel Core i3-5005G1; amd64; Broadwell+AES (506d4); supercop-20230630  
bolsh: 8 x 1700MHz; 2015 Intel Core i3-5005G1; amd64; Broadwell+AES (506d4); supercop-20230630  
gwj1465: 20 x 2000MHz; 2014 Intel Xeon E5-2650 v3; amd64; Haswell+AES (306d1); supercop-20190918  
Intel Core 2 Duo E6700; 2006 Intel Core 2 Duo E6700; amd64; Haswell+AES (306d1); supercop-20230630  
Intel Core 2 Duo E6700; 2006 Intel Core 2 Duo E6700; amd64; Haswell+AES (306d1); supercop-20230630  
Intel Core 2 Duo E6700; 2006 Intel Core 2 Duo E6700; amd64; Haswell+AES (306d1); supercop-20230630  
Intel Core 2 Duo E6700; 2006 Intel Core 2 Duo E6700; amd64; Haswell+AES (306d1); supercop-20230630  
Intel Core 2 Duo E6700; 2006 Intel Core 2 Duo E6700; amd64; Haswell+AES (306d1); supercop-20230630  
sandyv13: 12 x 2700MHz; 2013 Intel Xeon E5-2697 v2; amd64; Ivy Bridge+AES (306d4); supercop-20180818  
sandyv13: 12 x 2700MHz; 2013 Intel Xeon E5-2697 v2; amd64; Ivy Bridge+AES (306d4); supercop-20180818  
sandyv13: 12 x 2700MHz; 2013 Intel Xeon E5-2697 v2; amd64; Ivy Bridge+AES (306d4); supercop-20180818  
hydra6: 4 x 3500MHz; 2012 Intel Xeon E3-1275 V2; amd64; Ivy Bridge+AES (306d9); supercop-20230630  
hedera: 4 x 2500MHz; 2012 Intel Xeon E3-1265L V2; amd64; Ivy Bridge+AES (306d9); supercop-20210326  
hedera: 4 x 2500MHz; 2012 Intel Xeon E3-1265L V2; amd64; Ivy Bridge+AES (306d9); supercop-20210326  
robia281: 8 x 2600MHz; 2012 Intel Xeon E5-4650L; amd64; Sandy Bridge+AES (206d7); supercop-20170228  
hydra7: 4 x 3100MHz; 2011 Intel Xeon E3-1225; amd64; Sandy Bridge+AES (206a7); supercop-20230630  
hsandy: 2 x 2100MHz; 2011 Intel Core i3-2310M; amd64; Sandy Bridge (206a7); supercop-20221122  
glyse: 2 x 3200MHz; 2010 Intel Core i5-650; amd64; Westmere (20652); supercop-201710105  
wolfdale: 2 x 3060MHz; 2009 Intel Core 2 Duo E7600; amd64; Core 2 45nm (1067a); supercop-20230630  
kistana: 2 x 2137MHz; 2006 Intel Core 2 Duo E6400; amd64; Core 2 65nm (6f6); supercop-201710105  
tsrdant: 2 x 2000MHz; 2007 Intel Core 2 Duo T7300; amd64; Core 2 65nm (6f6); supercop-20230630  
nagrad: 4 x 2604MHz; 2007 Intel Core 2 Quad Q6600; amd64; Core 2 65nm (6f6); supercop-20230630  
latur: 4 x 2394MHz; 2007 Intel Core 2 Quad Q6600; amd64; Core 2 65nm (6f6); supercop-20201130  
alder2.1f62690.3300000: 4 x 1600MHz; 2022 Intel Core i3-1215U efficiency cores; amd64; Gracemont (906A4-20); supercop-20230630  
jasper2: 2 x 1100MHz; 2021 Intel Celeron N4500; amd64; Tremont (906c0); supercop-20230630  
jasper3: 4 x 2000MHz; 2021 Intel Celeron N5105; amd64; Tremont (906c0); supercop-20230630  
jasper: 4 x 1100MHz; 2021 Intel Pentium Silver N6000; amd64; Tremont (906c0); supercop-20230630  
gemini: 2 x 1100MHz; 2019 Intel Celeron N4020; amd64; Goldmont Plus (706a8); supercop-20230630  
wooden: 4 x 1500MHz; 2016 Intel Celeron J3455; amd64; Goldmont (506c9); supercop-20230630  
scv1M8h1: 16 x 2100MHz; 2017 Intel Atom C3955; amd64; Goldmont (506f1); supercop-20191017  
mcccc: 4 x 1600MHz; 2015 Intel Pentium N3700; amd64; Airmont (406c3); supercop-20230630  
cherry: 4 x 1440MHz; 2016 Intel Atom i5-Z8350; amd64; Silvermont (406c4); supercop-20230630  
bbaton: 2 x 1866MHz; 2011 Intel Atom D2500; amd64; Bonnell (30661); supercop-20230630  
alntendosilluixang: 1 x 720MHz; 2006 IBM PowerPC Broadway; ppc32; G3 (G3); supercop-20191221  
hifiveunleashedriscv: 4 x 1400MHz; 2017 SiFive Freedom U540; riscv64; U54 (sifive,u54-mc); supercop-20191221  
riscvunleashed000: 4 x 1000MHz; 2017 SiFive Freedom U540; riscv64; U54 (sifive,u54-mc); supercop-20210326  
gcc23: 2 x 2000MHz; 2011 Cavium Octeon II CN6120; mips32; Octeon II (cmnips64v2); supercop-20230630  
gcc23: 2 x 2000MHz; 2011 Cavium Octeon II CN6120; mips32; Octeon II (cmnips64v2); supercop-20220213  
offaz2: 2 x 2000MHz; 2011 Cavium Octeon II CN6120; mips32; Octeon II (cmnips64v2); supercop-20220213  
teside: 1 x 1200MHz; 2010 Marvell Armada 310; armeabi; Armada (562f3111); supercop-20170718  
berry2: 4 x 900MHz; 2016 Broadcom BCM2836; armeabi; Cortex-A7 (410fc075); supercop-20230630  
bblack: 1 x 1000MHz; 2012 TI Sitara XAM3359AZC2100; armeabi; Cortex-A8 (413fc082); supercop-20230630  
noveblue: 4 x 1200MHz; 2011 Freescale i.MX6 Quad; armeabi; Cortex-A9+NEON (412fc09a); supercop-20200702  
artix: 4 x 1200MHz; 2012 Samsung Exynos 44127; armeabi; Cortex-A9+NEON (413fc090); supercop-20191221  
noveblue: 4 x 1200MHz; 2011 Freescale i.MX6 Quad; armeabi; Cortex-A9+NEON (412fc09a); supercop-20191221  
jtsosati: 4 x 2065MHz; 2014 NVIDIA Tegra K1; armeabi; Cortex-A15 (413fc0f3); supercop-20170728  
gcc16: 8 x 1600MHz; 2014 APM 88320B-X1; aarch64; X-Gen (500f000); supercop-20171218  
pi3hplm: 4 x 1400MHz; 2018 Broadcom BCM20837B0; aarch64; Cortex-A53 (410fc034); supercop-20230630  
pi3hplm: 4 x 1400MHz; 2018 Broadcom BCM20837B0; aarch64; Cortex-A53 (410fc034); supercop-20221122  
leeds: 8 x 1500MHz; 2015 ARM Cortex-A53; aarch64; Cortex-A53+crypto (410fc034); supercop-20170728  
leeds: 8 x 1500MHz; 2015 ARM Cortex-A53; aarch64; Cortex-A53+crypto (410fc034); supercop-20170728  
leeds: 8 x 1500MHz; 2015 ARM Cortex-A53; aarch64; Cortex-A53+crypto (410fc034); supercop-20170728  
leeds: 8 x 1500MHz; 2015 ARM Cortex-A53; aarch64; Cortex-A53+crypto (410fc034); supercop-20170728  
leeds: 8 x 1500MHz; 2015 ARM Cortex-A53; aarch64; Cortex-A53+crypto (410fc034); supercop-20170728  
jtsosati: 4 x 1734MHz; 2015 NVIDIA Tegra X1; aarch64; Cortex-A57+crypto (418f071); supercop-20191017  
varbear: 8 x 2000MHz; 2016 AMD Opteron A1100; aarch64; Cortex-A57+crypto (411f0673); supercop-20200626  
pi4h: 4 x 1500MHz; 2019 Broadcom BCM2711; aarch64; Cortex-A72 (410f083); supercop-20221122  
rpi4bunleashed: 4 x 1500MHz; 2019 Broadcom BCM2711; aarch64; Cortex-A72 (410f083); supercop-20191221  
a7: 2 x 2100MHz; 2015 Mediatek MT8173; aarch64; Cortex-A72+crypto (418f080); supercop-20170904  
jmo145: 64 x 2500MHz; 2018 Cavium ThunderX2 CN9980; aarch64; ThunderX2 (431f0af1); supercop-20191017