Yoshimitsu TRIAD

Tiny Hash Booklet

Revision 1

This tiny booklet is an attempt to shed some sky-night-light on hashing.

On 2012-Oct-30 'Night-Light Sky' or (**Night-Sky Light**) hash package r.1 come out.
For reference: www.sanmayce.com/Fastest_Hash/index.html#NightLightSky

Purpose: It is a 32bit package (all C sources included) testing several top-gun hash functions with 38 different keys/files. The idea is to shed light on how they fare when hash-table lookups are needed.
Execution: Simply run RUNME.BAT either from Windows Explorer or Command Prompt.
Duration: On Core 2 T7500 2200MHz it took 67 minutes.
Output: The whole output is redirected to Results.txt which is automatically loaded into NOTEPAD when the test is complete.
Optimizer: Intel 12.1 compiler generates faster code than Microsoft 16 (VS2010), see longer keys.
Hardware: It is not a surprise that AMD and Intel execute even the small etudes with significant speed-performance margins, e.g. AMD favors YoshimitsuTRIAD before Yorikke, who knows why?
Bottomline: **FNV1A_Yorikke** is really a gem etude, see further below.

Fantasy's Black-and-Red Rig:
Core i7 3930K 4500 MHz (busspeed: 125 MHz) @ 1.34V, Sandy Bridge-E, 32nm
Cache L1 Data: 32KBytes
Cache L2: 256KBytes
Cache L3: 12MBytes
Corsair Dominators GT 16GB 4GBX4 (quad channel) OCed @ 2400MHz @ 10-12-11-28 @ 1.61V

Sanmayce's Bonboniera laptop:
Mobile Intel Core 2 Duo T7500, 65 nm
CPU Clock: 2194.7 MHz (original: 2200 MHz)
L1 Data Cache: 32 KB per core
L2 Cache: 4 MB (On-Die, ECC, ASC, Full-Speed)
Front Side Bus Properties:
– Real Clock: 200 MHz (QDR)
– Effective Clock: 800 MHz
Memory Bus Properties:
– Bus Type: Dual DDR2 SDRAM
– Real Clock: 333 MHz (DDR)
– Effective Clock: 667 MHz
Memory Timings: 5-5-5-13 (CL-RCD-RP-RAS)

Contents

The following excerpts show time (first number) and collisions (the second).

#1 Test: ~3 million IPs (dot format)

```
E:\Night_Light_Sky_hash_package_r1>dir IPS.TXT
10/31/2012  03:59 AM        42,892,307 IPS.TXT
E:\Night_Light_Sky_hash_package_r1>type IPS.TXT
0.0.0.0
0.0.0.2
0.0.0.3
0.1.0.3
0.2.0.3
0.4.0.3
...
0.66.1.3
0.67.1.3
0.137.1.3
0.138.1.3
...
0.176.42.4
48.176.42.4
```

```
64.176.42.4
184.176.42.4
192.176.42.4
0.179.42.4
0.180.42.4
...
88.44.43.4
96.44.43.4
112.44.43.4
0.47.43.4
0.48.43.4
0.49.43.4
192.49.43.4
...
192.113.43.4
...
E:\Night_Light_Sky_hash_package_r1>dir IPS.TXT/b> IPS.lst
E:\Night_Light_Sky_hash_package_r1>Linereporter.exe IPS.lst
Linereporter: Encountered lines in all files: 2,995,394
Linereporter: Longest line: 16
```

Excerpts from Results_Fantasy's_Black_and_Red_Rig.txt:

```
~3 million IPs (dot format), sorted by time:
2995394 lines read
8388608 elements in the table (23 bits)
           iSCSI CRC:    1150351 [479542]
             Yorikke:    1238372 [476699]
              Meiyan:    1247326 [593723]
          Yoshimitsu:    1250603 [476699]
           Jesteress:    1275828 [691369]
     YoshimitsuTRIAD:    1285032 [476699]
             Murmur2:    1324889 [476330]
             Murmur3:    1413358 [476845]
              Larson:    1509838 [475575]
              FNV-1a:    1589784 [477067]
              CRC-32:    1618942 [472854]
         XXHstrong32:    1682059 [476358]
           XXHfast32:    1689050 [476358]

First (above) test is '~3 million IPs (dot format)' which is in IPS.TXT, the longest key is 16 bytes.
The fastest hasher is 'iSCSI CRC', the second-best is 'Yorikke'.
Note: 'YoshimitsuTRIAD' slashes well despite all the keys <3x8 (his stride is 24).
```

Excerpts from Results_Core_2_Duo_T7500.txt:

```
~3 million IPs (dot format), sorted by time:
2995394 lines read
8388608 elements in the table (23 bits)
             Yorikke:    1929823 [476699]
           Jesteress:    2009035 [691369]
              Meiyan:    2016033 [593723]
          Yoshimitsu:    2091687 [476699]
     YoshimitsuTRIAD:    2149997 [476699]
              CRC-32:    2243287 [472854]
             Murmur2:    2279899 [476330]
             Murmur3:    2326894 [476845]
         XXHstrong32:    2345651 [476358]
           XXHfast32:    2346340 [476358]
              Larson:    2349683 [475575]
              FNV-1a:    2389574 [477067]

The fastest hasher is 'Yorikke'.
Note: 'YoshimitsuTRIAD' slashes well despite all the keys <3x8 (his stride is 24).
```

#2 Test: 3333 Latin Powers

```
E:\Night_Light_Sky_hash_package_r1>dir LP3.TXT
10/31/2012  03:59 AM            98,848 LP3.TXT
E:\Night_Light_Sky_hash_package_r1>type LP3.TXT
thousand
million
```

```
billion
trillion
quadrillion
quintillion
sextillion
septillion
octillion
nonillion
decillion
undecillion
dodecillion
tredecillion
quattuordecillion
quindecillion
sexdecillion
septendecillion
...
octingenseptennonagintillion
octingenoctononagintillion
octingennovemnonagintillion
nongentillion
nongenuntillion
nongendotillion
...
milliaunnonagintillion
milliadononagintillion
milliatrenonagintillion
milliaquattuornonagintillion
...
E:\Night_Light_Sky_hash_package_r1>dir LP3.TXT/b> LP3.lst
E:\Night_Light_Sky_hash_package_r1>Linereporter.exe LP3.lst
Linereporter: Encountered lines in all files: 3,333
Linereporter: Longest line: 44
```

Excerpts from Results_Fantasy's_Black_and_Red_Rig.txt:

```
3333 Latin Powers, sorted by time:
3333 lines read
8192 elements in the table (13 bits)
          Jesteress:       457 [  576]
            Yorikke:       466 [  579]
             Meiyan:       480 [  583]
     YoshimitsuTRIAD:       482 [  615]
          Yoshimitsu:       484 [  609]
           iSCSI CRC:       500 [  594]
             Murmur2:       588 [  600]
            XXHfast32:       593 [  596]
         XXHstrong32:       614 [  571]
             Murmur3:       652 [  583]
              Larson:       874 [  581]
              FNV-1a:       891 [  604]
              CRC-32:       942 [  613]

The fastest hasher is 'Jesteress'.
Note: 'YoshimitsuTRIAD' slashes very well since many keys >3x8 (his stride is 24).
```

Excerpts from Results_Core_2_Duo_T7500.txt:

```
3333 Latin Powers, sorted by time:
3333 lines read
8192 elements in the table (13 bits)
          Jesteress:       764 [  576]
            Yorikke:       779 [  579]
             Meiyan:       783 [  583]
          Yoshimitsu:       784 [  609]
     YoshimitsuTRIAD:       802 [  615]
           XXHfast32:       845 [  596]
         XXHstrong32:       868 [  571]
             Murmur2:       955 [  600]
             Murmur3:      1012 [  583]
              CRC-32:      1196 [  613]
              FNV-1a:      1293 [  604]
```

```
            Larson:      1299 [  581]

The fastest hasher is 'Jesteress' as on i7.
Note: 'YoshimitsuTRIAD' slashes very well since many keys >3x8 (his stride is 24).
```

#3 Test: 5,000,000 Knight Tours

```
E:\Night_Light_Sky_hash_package_r1>dir KT5million.txt
09/29/2012  04:30 AM       650,000,000 KT5million.txt
E:\Night_Light_Sky_hash_package_r1>type KT5million.txt
A8C7E8G7H5G3H1F2H3G1E2C1A2B4A6B8D7F8H7G5F7H8G6H4G2E1C2A1B3A5B7D8C6A7C8E7G8H6G4H2F1D2B1A3B5D6F5D4F3E5C4B2D3F4E6C5A4B6D5F6E4C3D1E3
A8C7E8G7H5G3H1F2H3G1E2C1A2B4A6B8D7F8H7G5F7H8G6H4G2E1C2A1B3A5B7D8C6A7C8E7G8H6G4H2F1D2B1A3B5D6F5D4F3E5C4B2D3F4E6C5A4B6D5E3D1C3E4F6
A8C7E8G7H5G3H1F2H3G1E2C1A2B4A6B8D7F8H7G5F7H8G6H4G2E1C2A1B3A5B7D8C6A7C8E7G8H6G4H2F1D2B1A3B5D6F5D4F3E5C4B2D3F4E6C5E4F6D5B6A4C3D1E3
A8C7E8G7H5G3H1F2H3G1E2C1A2B4A6B8D7F8H7G5F7H8G6H4G2E1C2A1B3A5B7D8C6A7C8E7G8H6G4H2F1D2B1A3B5D6F5D4F3E5C4B2D3F4E6C5E4F6D5E3D1C3A4B6
...
E:\Night_Light_Sky_hash_package_r1>dir KT5million.txt/b> KT5million.lst
E:\Night_Light_Sky_hash_package_r1>Linereporter.exe KT5million.lst
Linereporter: Encountered lines in all files: 5,000,000
Linereporter: Longest line: 129
Note: In hash test longest line is 128, 'Linereporter' sees CRLF ending and counts CR as well.
```

Excerpts from Results_Fantasy's_Black_and_Red_Rig.txt:

```
5,000,000 Knight Tours, sorted by time:
5000000 lines read
16777216 elements in the table (24 bits)
            Yorikke:    4458158 [677478]
          Yoshimitsu:   4497790 [675312]
              Meiyan:   4560650 [676877]
           Jesteress:   4562409 [676877]
     YoshimitsuTRIAD:   4601132 [676878]
           XXHfast32:   4671484 [675637]
           iSCSI CRC:   4695385 [676111]
         XXHstrong32:   5043364 [675834]
             Murmur2:   5339850 [675965]
             Murmur3:   5647758 [676857]
              CRC-32:   8279700 [676997]
              FNV-1a:  11013126 [2080003]
              Larson:  26046348 [4475748]

The fastest hasher is 'Yorikke'.
Note: 'YoshimitsuTRIAD' slashes very well since all the keys >3x8 (his stride is 24).
```

Excerpts from Results_Core_2_Duo_T7500.txt:

```
5,000,000 Knight Tours, sorted by time:
5000000 lines read
16777216 elements in the table (24 bits)
            Yorikke:    5756076 [677478]
          Yoshimitsu:   5792165 [675312]
           XXHfast32:   5895699 [675637]
     YoshimitsuTRIAD:   5900649 [676878]
              Meiyan:   5936034 [676877]
           Jesteress:   5953182 [676877]
         XXHstrong32:   6192335 [675834]
             Murmur3:   6674323 [676857]
             Murmur2:   6753946 [675965]
              CRC-32:   9227276 [676997]
              FNV-1a:  13623685 [2080003]
              Larson:  43305093 [4475748]

The fastest hasher is 'Yorikke' as on i7.
Note: 'YoshimitsuTRIAD' slashes very well since all the keys >3x8 (his stride is 24).
```

#4 Test: enwiki's 20,718,196 8bytes long (order 4) HEX BBs

```
E:\Night_Light_Sky_hash_package_r1>dir enwiki-20120403-pages-articles.xml.sorted.4BB.txt
10/30/2012  07:51 PM       207,181,960 enwiki-20120403-pages-articles.xml.sorted.4BB.txt
E:\Night_Light_Sky_hash_package_r1>type enwiki-20120403-pages-articles.xml.sorted.4BB.txt
09090909
0909090A
09090920
```

```
09090921
09090923
09090924
09090925
09090926
09090927
09090928
09090929
...
E:\Night_Light_Sky_hash_package_r1>dir enwiki-20120403-pages-articles.xml.sorted.4BB.txt/b> enwiki-20120403-pages-articles.xml.sorted.4BB.lst
E:\Night_Light_Sky_hash_package_r1>Linereporter.exe enwiki-20120403-pages-articles.xml.sorted.4BB.lst
Linereporter: Encountered lines in all files: 20,718,196
Linereporter: Longest line: 9
Note: In hash test longest line is 8, 'Linereporter' sees CRLF ending and counts CR as well.
```

Excerpts from Results Fantasy's Black and Red Rig.txt:

```
enwiki's 20,718,196 8bytes long (order 4) HEX BBs, sorted by time:
20718196 lines read
67108864 elements in the table (26 bits)
             Larson:    5508666 [2808080]
          iSCSI CRC:    7143019 [3013629]
             CRC-32:    8774680 [2813084]
            Yorikke:    8808986 [2980029]
          Yoshimitsu:    9060533 [2980029]
              FNV-1a:    9267575 [2892374]
     YoshimitsuTRIAD:    9361807 [2980029]
             Murmur2:   10010501 [2891602]
             Murmur3:   10097206 [2893702]
         XXHstrong32:   10225270 [2874143]
           XXHfast32:   10241551 [2874143]
           Jesteress:   10546396 [8079674]
              Meiyan:   10546467 [8079674]
```

Here 'Larson' is outstanding. But don't be fooled, his mix is one of the best while his speed is deceptive since these keys are 200MB in total which favors his one byte stride (no penalty during fetching the keys), of course the lower number of collisions weights more. See the Zarathustra's low orders (fittable in L2 where penalties for fetching 4bytes at once are minimal): all my functions outspeed 'Larson'.
Note1: '**YoshimitsuTRIAD**' cannot swing since all the keys <3x8 (his stride is 24).
Note2: The obvious bad mix (stride 8) of Jesteress & Meiyan prompts for arriving of a new variant (2 hashlines with stride 4) - not so successful after a quick check.

Excerpts from Results_Core_2_Duo_T7500.txt:

```
enwiki's 20,718,196 8bytes long (order 4) HEX BBs, sorted by time:
20718196 lines read
67108864 elements in the table (26 bits)
             Larson:    7445145 [2808080]
            Yorikke:   12526678 [2980029]
          Yoshimitsu:   12713455 [2980029]
     YoshimitsuTRIAD:   12850620 [2980029]
             CRC-32:   15205181 [2813084]
              Meiyan:   15945270 [8079674]
           Jesteress:   15979675 [8079674]
              FNV-1a:   16825627 [2892374]
             Murmur2:   18209947 [2891602]
             Murmur3:   18452613 [2893702]
           XXHfast32:   18604290 [2874143]
         XXHstrong32:   18628259 [2874143]
```

Here 'Larson' is outstanding as on i7.
Not only for strings 8bytes long, since my old OSHO BBs tests 'Larson' is superfast up to 10bytes long.
However 11bytes long and longer strings are **Yorikke**'s realm. For OSHO's BBs we have:

```
D:\_KAZE\_KAZE_hash_Yorikke_BB>hash BB003.txt
46486 lines read
131072 elements in the table (17 bits)
            Yorikke:       5112 [ 7397]
             Larson:       4443 [ 5988]

D:\_KAZE\_KAZE_hash_Yorikke_BB>hash BB004.txt
```

```
248019 lines read
524288 elements in the table (19 bits)
             Yorikke:      65086 [50467]
              Larson:      46738 [47351]

D:\_KAZE\_KAZE_hash_Yorikke_BB>hash BB005.txt
855682 lines read
2097152 elements in the table (21 bits)
             Yorikke:     421928 [153008]
              Larson:     304538 [151731]

D:\_KAZE\_KAZE_hash_Yorikke_BB>hash BB006.txt
2236138 lines read
8388608 elements in the table (23 bits)
             Yorikke:    1155453 [273706]
              Larson:     973776 [272316]

D:\_KAZE\_KAZE_hash_Yorikke_BB>hash BB007.txt
4803152 lines read
16777216 elements in the table (24 bits)
             Yorikke:    2947983 [627020]
              Larson:    2536957 [625113]

D:\_KAZE\_KAZE_hash_Yorikke_BB>hash BB008.txt
8956496 lines read
33554432 elements in the table (25 bits)
             Yorikke:    5153872 [1104020]
              Larson:    5309546 [1097682]

D:\_KAZE\_KAZE_hash_Yorikke_BB>hash BB009.txt
15006172 lines read
33554432 elements in the table (25 bits)
             Yorikke:   10675057 [2905550]
              Larson:   12020960 [2906063]

D:\_KAZE\_KAZE_hash_Yorikke_BB>hash BB010.txt
22992127 lines read
67108864 elements in the table (26 bits)
             Yorikke:   18901435 [3526499]
              Larson:   18451360 [3523757]

D:\_KAZE\_KAZE_hash_Yorikke_BB>hash BB011.txt
32707519 lines read
67108864 elements in the table (26 bits)
             Yorikke:   31331954 [6821463]
              Larson:   31433023 [6817853]
```

Note: '**YoshimitsuTRIAD**' cannot swing since all the keys <3x8 (his stride is 24), yet he slashes well.

#5 Test: Zarathustra's (order 1..32) HEX BBs i.e. strings 2,4,6,...,64 bytes long

```
E:\Night_Light_Sky_hash_package_r1\Leprechaun_BBhex_rev15fixfix_subrevA_32bit_64bit>dir TreeToRip
10/31/2012  03:59 AM           522,911 Thus Spake Zarathustra by Friedrich Nietzsche, revision 4.txt
E:\Night_Light_Sky_hash_package_r1\Leprechaun_BBhex_rev15fixfix_subrevA_32bit_64bit>dir
11/02/2012  12:55 AM               324 TreeToRip.01bb.txt
11/02/2012  12:55 AM             9,450 TreeToRip.02bb.txt
11/02/2012  12:55 AM            79,888 TreeToRip.03bb.txt
11/02/2012  12:55 AM           331,650 TreeToRip.04bb.txt
11/02/2012  12:55 AM           938,460 TreeToRip.05bb.txt
11/02/2012  12:55 AM         1,993,110 TreeToRip.06bb.txt
11/02/2012  12:55 AM         3,386,432 TreeToRip.07bb.txt
11/02/2012  12:55 AM         5,011,110 TreeToRip.08bb.txt
11/02/2012  12:55 AM         6,744,480 TreeToRip.09bb.txt
11/02/2012  12:55 AM         8,443,908 TreeToRip.10bb.txt
11/02/2012  12:55 AM        10,042,824 TreeToRip.11bb.txt
11/02/2012  12:55 AM        11,524,708 TreeToRip.12bb.txt
11/02/2012  12:55 AM        12,907,888 TreeToRip.13bb.txt
11/02/2012  12:55 AM        14,211,720 TreeToRip.14bb.txt
11/02/2012  12:55 AM        15,455,968 TreeToRip.15bb.txt
11/02/2012  12:55 AM        16,655,478 TreeToRip.16bb.txt
11/02/2012  12:55 AM        17,820,612 TreeToRip.17bb.txt
11/02/2012  12:55 AM        18,958,770 TreeToRip.18bb.txt
```

```
11/02/2012  12:55 AM        20,075,960 TreeToRip.19bb.txt
11/02/2012  12:55 AM        21,177,114 TreeToRip.20bb.txt
11/02/2012  12:55 AM        22,266,904 TreeToRip.21bb.txt
11/02/2012  12:55 AM        23,348,818 TreeToRip.22bb.txt
11/02/2012  12:55 AM        24,426,096 TreeToRip.23bb.txt
11/02/2012  12:55 AM        25,500,700 TreeToRip.24bb.txt
11/02/2012  12:55 AM        26,571,792 TreeToRip.25bb.txt
11/02/2012  12:55 AM        27,641,142 TreeToRip.26bb.txt
11/02/2012  12:55 AM        28,709,744 TreeToRip.27bb.txt
11/02/2012  12:55 AM        29,777,490 TreeToRip.28bb.txt
11/02/2012  12:55 AM        30,844,980 TreeToRip.29bb.txt
11/02/2012  12:55 AM        31,915,430 TreeToRip.30bb.txt
11/02/2012  12:55 AM        32,982,528 TreeToRip.31bb.txt
11/02/2012  12:55 AM        34,046,628 TreeToRip.32bb.txt
11/02/2012  12:55 AM        67,679,170 TreeToRip.64bb.txt
E:\Night_Light_Sky_hash_package_r1\Leprechaun_BBhex_rev15fixfix_subrevA_32bit_64bit>type TreeToRip.01bb.txt
46
48
31
76
4B
4D
78
21
...
E:\Night_Light_Sky_hash_package_r1\Leprechaun_BBhex_rev15fixfix_subrevA_32bit_64bit>type TreeToRip.32bb.txt
206C61737420666F72206120706C656173616E742064656174682E0D0A4F6E65
6574682065766572792063617573652E0D0A57617220616E6420636F75726167
652061626F7574207769746820 6D65210D0A417320796574206861766520 4920
65732E0D0A5768656E2C20686F77657665722C20686520686164 20616C726561
696C6C206272696E67206974206F757420616761696E3F0D0A47756172642061
6562726572077686F6D207468652070726561368657273206F6620736C6F77
2061206F6E652C20616C736F2C207761786574682074 6F6F206F6C6420666F72
616E6765210D0A486F7720646F746820746869732061726D6F6E6973653F0D
...
```

Excerpts from Results_Fantasy's_Black_and_Red_Rig.txt:

```
Zarathustra's BBs order 1, sorted by time:
81 lines read
256 elements in the table (8 bits)
          iSCSI CRC:         4 [    0]
             Larson:         4 [    2]
             Meiyan:         5 [    9]
          Jesteress:         5 [    9]
             FNV-1a:         5 [   11]
             CRC-32:         5 [   11]
         Yoshimitsu:         5 [   12]
     YoshimitsuTRIAD:        5 [   12]
            Yorikke:         5 [   12]
            Murmur2:         5 [   14]
            Murmur3:         6 [    7]
          XXHfast32:         6 [   14]
        XXHstrong32:         6 [   14]

Zarathustra's BBs order 2, sorted by time:
1575 lines read
4096 elements in the table (12 bits)
          iSCSI CRC:       101 [  289]
             Meiyan:       105 [  259]
          Jesteress:       106 [  391]
             Larson:       109 [  253]
            Yorikke:       115 [  271]
         Yoshimitsu:       117 [  271]
            Murmur2:       119 [  247]
             FNV-1a:       119 [  282]
     YoshimitsuTRIAD:      120 [  271]
             CRC-32:       121 [  236]
            Murmur3:       139 [  273]
        XXHstrong32:       156 [  297]
          XXHfast32:       157 [  297]
Zarathustra's BBs order 3, sorted by time:
```

```
9986 lines read
32768 elements in the table (15 bits)
          iSCSI CRC:        774 [ 1476]
          Jesteress:        776 [ 1360]
             Meiyan:        840 [ 1439]
            Yorikke:        847 [ 1318]
         Yoshimitsu:        867 [ 1318]
     YoshimitsuTRIAD:       878 [ 1318]
             Larson:        931 [ 1364]
            Murmur2:        950 [ 1380]
             FNV-1a:        971 [ 1395]
            Murmur3:       1071 [ 1360]
             CRC-32:       1084 [ 1714]
        XXHstrong32:       1100 [ 1397]
          XXHfast32:       1106 [ 1397]
Zarathustra's BBs order 4, sorted by time:
33165 lines read
131072 elements in the table (17 bits)
          iSCSI CRC:       3212 [ 4078]
          Jesteress:       3292 [ 4631]
             Meiyan:       3296 [ 4631]
            Yorikke:       3341 [ 3937]
         Yoshimitsu:       3408 [ 3937]
     YoshimitsuTRIAD:      3497 [ 3937]
             Larson:       3957 [ 3899]
            Murmur2:       3999 [ 3837]
             FNV-1a:       4294 [ 3979]
            Murmur3:       4427 [ 3845]
             CRC-32:       4476 [ 4135]
        XXHstrong32:       4883 [ 3952]
          XXHfast32:       4896 [ 3952]
Zarathustra's BBs order 5, sorted by time:
78205 lines read
262144 elements in the table (18 bits)
          Jesteress:       8646 [11187]
             Meiyan:       8667 [11187]
          iSCSI CRC:       8694 [10745]
            Yorikke:       9131 [10636]
         Yoshimitsu:       9277 [10636]
     YoshimitsuTRIAD:      9468 [10636]
            Murmur2:      10938 [10649]
            Murmur3:      12068 [10518]
             Larson:      12089 [10825]
             FNV-1a:      12337 [10678]
        XXHstrong32:      12631 [10483]
          XXHfast32:      12677 [10483]
             CRC-32:      12956 [10842]
Zarathustra's BBs order 6, sorted by time:
142365 lines read
524288 elements in the table (19 bits)
          Jesteress:      15535 [19448]
          iSCSI CRC:      16454 [17643]
            Yorikke:      17766 [17816]
             Meiyan:      18184 [18861]
         Yoshimitsu:      18223 [17816]
     YoshimitsuTRIAD:     18633 [17816]
            Murmur2:      20961 [17633]
            Murmur3:      23225 [17821]
             Larson:      23930 [17688]
             FNV-1a:      25010 [17781]
             CRC-32:      25568 [17848]
        XXHstrong32:      26503 [17670]
          XXHfast32:      26540 [17670]
Zarathustra's BBs order 7, sorted by time:
211652 lines read
524288 elements in the table (19 bits)
          Jesteress:      27727 [39257]
          iSCSI CRC:      29847 [37684]
            Yorikke:      32123 [37823]
         Yoshimitsu:      32581 [37823]
             Meiyan:      32739 [38398]
     YoshimitsuTRIAD:     33208 [37823]
```

```
            Murmur2:      37753 [37627]
            Murmur3:      40629 [37631]
        XXHstrong32:      44389 [37534]
          XXHfast32:      44451 [37534]
             Larson:      45015 [37714]
             FNV-1a:      45595 [37298]
             CRC-32:      47362 [37321]
Zarathustra's BBs order 8, sorted by time:
278395 lines read
1048576 elements in the table (20 bits)
              Meiyan:      37523 [51565]
          Jesteress:      37532 [51565]
          iSCSI CRC:      42203 [34034]
         Yoshimitsu:      44184 [33838]
            Yorikke:      45328 [33838]
    YoshimitsuTRIAD:      49608 [33838]
            Murmur2:      53291 [34051]
            Murmur3:      58257 [34004]
        XXHstrong32:      62758 [33796]
          XXHfast32:      63130 [33796]
             Larson:      65282 [33913]
             FNV-1a:      66714 [33809]
             CRC-32:      70499 [34028]
Zarathustra's BBs order 9, sorted by time:
337224 lines read
1048576 elements in the table (20 bits)
              Meiyan:      52115 [66182]
          Jesteress:      52215 [66182]
          iSCSI CRC:      62578 [49125]
         Yoshimitsu:      64182 [48801]
            Yorikke:      65153 [48801]
    YoshimitsuTRIAD:      69068 [48801]
            Murmur2:      82842 [48841]
            Murmur3:      85410 [48797]
          XXHfast32:      93711 [48621]
             Larson:      96638 [49052]
        XXHstrong32:      98057 [48758]
             FNV-1a:      98192 [48858]
             CRC-32:     100190 [48517]
Zarathustra's BBs order 10, sorted by time:
383814 lines read
1048576 elements in the table (20 bits)
          Jesteress:      64122 [84612]
          iSCSI CRC:      80464 [62258]
         Yoshimitsu:      83213 [62510]
            Yorikke:      83422 [62510]
    YoshimitsuTRIAD:      86229 [62510]
              Meiyan:      90933 [76863]
            Murmur2:     103701 [62557]
            Murmur3:     111184 [62212]
          XXHfast32:     117342 [62230]
        XXHstrong32:     123116 [62268]
             Larson:     125327 [62557]
             CRC-32:     126860 [62577]
             FNV-1a:     127218 [62851]
Zarathustra's BBs order 11, sorted by time:
418451 lines read
1048576 elements in the table (20 bits)
          Jesteress:      76598 [88420]
          iSCSI CRC:      97351 [73705]
         Yoshimitsu:     101941 [73433]
            Yorikke:     104349 [73433]
              Meiyan:     106385 [82083]
    YoshimitsuTRIAD:     106416 [73433]
            Murmur2:     130025 [73524]
            Murmur3:     137885 [73515]
          XXHfast32:     139035 [73255]
        XXHstrong32:     145834 [73329]
             Larson:     154302 [73608]
             FNV-1a:     155770 [73457]
             CRC-32:     159415 [73523]
Zarathustra's BBs order 12, sorted by time:
```

```
443258 lines read
1048576 elements in the table (20 bits)
          Jesteress:     87317 [106593]
             Meiyan:     87347 [106593]
          iSCSI CRC:    108535 [81383]
         Yoshimitsu:    111361 [81595]
            Yorikke:    112222 [81595]
    YoshimitsuTRIAD:    127145 [81765]
            Murmur2:    149753 [81623]
            Murmur3:    154635 [81745]
          XXHfast32:    155502 [81331]
        XXHstrong32:    163745 [81644]
             Larson:    176546 [81574]
             FNV-1a:    178903 [81923]
             CRC-32:    179414 [81889]
Zarathustra's BBs order 13, sorted by time:
460996 lines read
1048576 elements in the table (20 bits)
          Jesteress:     97608 [106565]
             Meiyan:     97798 [106565]
          iSCSI CRC:    122748 [88088]
         Yoshimitsu:    127874 [88333]
            Yorikke:    131190 [88333]
    YoshimitsuTRIAD:    148895 [87917]
            Murmur2:    167178 [87982]
          XXHfast32:    172135 [87607]
            Murmur3:    172379 [87955]
        XXHstrong32:    177309 [87976]
             Larson:    199111 [87914]
             FNV-1a:    202317 [88079]
             CRC-32:    205381 [88315]
Zarathustra's BBs order 14, sorted by time:
473724 lines read
1048576 elements in the table (20 bits)
          Jesteress:    104331 [112340]
          iSCSI CRC:    133972 [92174]
         Yoshimitsu:    141455 [92770]
            Yorikke:    151528 [92770]
             Meiyan:    152537 [104891]
    YoshimitsuTRIAD:    159421 [92535]
            Murmur2:    178688 [92539]
          XXHfast32:    182864 [92557]
            Murmur3:    187343 [92394]
        XXHstrong32:    188382 [92716]
             Larson:    216821 [92421]
             CRC-32:    221797 [92822]
             FNV-1a:    223689 [92759]
Zarathustra's BBs order 15, sorted by time:
482999 lines read
1048576 elements in the table (20 bits)
          Jesteress:    112104 [107836]
          iSCSI CRC:    148266 [96088]
         Yoshimitsu:    157975 [95834]
            Yorikke:    160552 [95834]
             Meiyan:    165392 [102413]
    YoshimitsuTRIAD:    174178 [95832]
          XXHfast32:    191636 [95834]
            Murmur2:    193518 [96155]
        XXHstrong32:    198833 [96300]
            Murmur3:    201258 [96240]
             FNV-1a:    237793 [95739]
             Larson:    238451 [96154]
             CRC-32:    241271 [96147]
Zarathustra's BBs order 16, sorted by time:
489867 lines read
1048576 elements in the table (20 bits)
             Meiyan:    118031 [116276]
          Jesteress:    118672 [116276]
          iSCSI CRC:    155505 [98144]
         Yoshimitsu:    172253 [98457]
    YoshimitsuTRIAD:    174904 [98657]
            Yorikke:    175229 [98591]
```

```
          XXHfast32:     200241 [98364]
            Murmur2:     204120 [98328]
         XXHstrong32:     206106 [98497]
            Murmur3:     212533 [98456]
             Larson:     251584 [98403]
             FNV-1a:     253468 [98529]
             CRC-32:     258975 [98576]
Zarathustra's BBs order 17, sorted by time:
495017 lines read
1048576 elements in the table (20 bits)
          Jesteress:     122860 [114065]
             Meiyan:     123115 [114065]
          iSCSI CRC:     170334 [100435]
            Yorikke:     172648 [100385]
          Yoshimitsu:     179432 [100489]
     YoshimitsuTRIAD:     186161 [100062]
            Murmur2:     212344 [100541]
          XXHfast32:     212905 [100485]
            Murmur3:     221375 [100218]
         XXHstrong32:     224963 [100317]
             Larson:     266994 [100300]
             FNV-1a:     268094 [100188]
             CRC-32:     271070 [100364]
Zarathustra's BBs order 18, sorted by time:
498915 lines read
1048576 elements in the table (20 bits)
          Jesteress:     125671 [115572]
          iSCSI CRC:     174525 [102065]
            Yorikke:     179911 [101763]
             Meiyan:     185938 [110194]
          Yoshimitsu:     187050 [102057]
     YoshimitsuTRIAD:     191807 [101879]
            Murmur2:     218892 [101680]
          XXHfast32:     219799 [101981]
            Murmur3:     228053 [101845]
         XXHstrong32:     230629 [102179]
             Larson:     279895 [102176]
             CRC-32:     281354 [102377]
             FNV-1a:     281981 [102199]
Zarathustra's BBs order 19, sorted by time:
501899 lines read
1048576 elements in the table (20 bits)
          Jesteress:     129986 [110428]
          iSCSI CRC:     182703 [103007]
            Yorikke:     188780 [103325]
             Meiyan:     193931 [107405]
          Yoshimitsu:     195420 [102652]
     YoshimitsuTRIAD:     201367 [102965]
          XXHfast32:     224041 [103032]
            Murmur2:     229734 [103031]
            Murmur3:     236530 [102852]
         XXHstrong32:     236699 [102896]
             Larson:     296365 [103198]
             FNV-1a:     297878 [103195]
             CRC-32:     299237 [103036]
Zarathustra's BBs order 20, sorted by time:
504217 lines read
1048576 elements in the table (20 bits)
             Meiyan:     132986 [115506]
          Jesteress:     133568 [115506]
          iSCSI CRC:     187587 [104112]
            Yorikke:     190273 [104070]
          Yoshimitsu:     195810 [103646]
     YoshimitsuTRIAD:     200744 [103628]
          XXHfast32:     230020 [103782]
            Murmur2:     233760 [103919]
         XXHstrong32:     240378 [104013]
            Murmur3:     244303 [104087]
             Larson:     305545 [103821]
             CRC-32:     306149 [103608]
             FNV-1a:     307798 [103864]
Zarathustra's BBs order 21, sorted by time:
```

```
506066 lines read
1048576 elements in the table (20 bits)
          Jesteress:     139008 [113012]
             Meiyan:     139136 [113012]
          iSCSI CRC:     195118 [104678]
            Yorikke:     196739 [104316]
         Yoshimitsu:     204286 [104705]
     YoshimitsuTRIAD:     208856 [104679]
          XXHfast32:     236242 [104662]
            Murmur2:     243714 [104888]
        XXHstrong32:     245528 [104573]
            Murmur3:     251765 [104387]
             Larson:     319144 [104532]
             FNV-1a:     323125 [104835]
             CRC-32:     325231 [104742]
Zarathustra's BBs order 22, sorted by time:
507583 lines read
1048576 elements in the table (20 bits)
          Jesteress:     140366 [114105]
          iSCSI CRC:     197859 [104859]
            Yorikke:     202304 [105351]
             Meiyan:     208902 [110571]
         Yoshimitsu:     212941 [105729]
     YoshimitsuTRIAD:     216023 [104978]
          XXHfast32:     237138 [104940]
            Murmur2:     246802 [104749]
        XXHstrong32:     248923 [105016]
            Murmur3:     258395 [105199]
             Larson:     330561 [105175]
             CRC-32:     330933 [104998]
             FNV-1a:     333918 [104935]
Zarathustra's BBs order 23, sorted by time:
508877 lines read
1048576 elements in the table (20 bits)
          Jesteress:     145290 [110050]
          iSCSI CRC:     207331 [105659]
            Yorikke:     210491 [106022]
             Meiyan:     214938 [108624]
         Yoshimitsu:     222277 [105431]
     YoshimitsuTRIAD:     227550 [105832]
          XXHfast32:     244814 [105902]
        XXHstrong32:     255320 [106024]
            Murmur2:     257680 [105805]
            Murmur3:     267454 [105502]
             Larson:     344342 [105396]
             FNV-1a:     346649 [105400]
             CRC-32:     349471 [105419]
Zarathustra's BBs order 24, sorted by time:
510014 lines read
1048576 elements in the table (20 bits)
          Jesteress:     145693 [113461]
             Meiyan:     146644 [113461]
          iSCSI CRC:     208658 [105928]
            Yorikke:     211333 [106407]
         Yoshimitsu:     217545 [105923]
     YoshimitsuTRIAD:     230566 [106208]
          XXHfast32:     245386 [106017]
        XXHstrong32:     256466 [106302]
            Murmur2:     259301 [106382]
            Murmur3:     271261 [106158]
             CRC-32:     354612 [106558]
             Larson:     355370 [106059]
             FNV-1a:     358046 [106203]
Zarathustra's BBs order 25, sorted by time:
510996 lines read
1048576 elements in the table (20 bits)
             Meiyan:     152449 [112020]
          Jesteress:     152870 [112020]
            Yorikke:     214700 [106324]
          iSCSI CRC:     218439 [106014]
         Yoshimitsu:     229952 [106773]
     YoshimitsuTRIAD:     236008 [106416]
```

```
          XXHfast32:     256106 [106431]
            Murmur2:     269635 [106283]
         XXHstrong32:     272904 [106816]
            Murmur3:     280985 [106673]
             Larson:     368362 [106146]
             FNV-1a:     371700 [106601]
             CRC-32:     374757 [106727]
Zarathustra's BBs order 26, sorted by time:
511873 lines read
1048576 elements in the table (20 bits)
          Jesteress:     152507 [112029]
            Yorikke:     219929 [106809]
          iSCSI CRC:     220148 [106719]
             Meiyan:     227547 [110117]
          Yoshimitsu:     236678 [107101]
     YoshimitsuTRIAD:     241897 [106390]
          XXHfast32:     257396 [106803]
            Murmur2:     270708 [106937]
         XXHstrong32:     273662 [106789]
            Murmur3:     284069 [106915]
             Larson:     377108 [106834]
             CRC-32:     377599 [107142]
             FNV-1a:     379093 [106616]
Zarathustra's BBs order 27, sorted by time:
512674 lines read
1048576 elements in the table (20 bits)
          Jesteress:     160774 [110664]
          iSCSI CRC:     229759 [107097]
            Yorikke:     231864 [107081]
             Meiyan:     240965 [108734]
          Yoshimitsu:     244770 [107065]
     YoshimitsuTRIAD:     252580 [107459]
          XXHfast32:     265342 [107129]
            Murmur2:     282993 [107228]
         XXHstrong32:     283161 [107180]
            Murmur3:     295437 [107518]
             Larson:     395118 [107253]
             CRC-32:     396752 [106804]
             FNV-1a:     398381 [107304]
Zarathustra's BBs order 28, sorted by time:
513405 lines read
1048576 elements in the table (20 bits)
             Meiyan:     160996 [111704]
          Jesteress:     161302 [111704]
            Yorikke:     227824 [107525]
          iSCSI CRC:     229897 [107386]
          Yoshimitsu:     241398 [107441]
     YoshimitsuTRIAD:     246079 [107536]
          XXHfast32:     265077 [107423]
         XXHstrong32:     281642 [107503]
            Murmur2:     282127 [107103]
            Murmur3:     298014 [107594]
             CRC-32:     399212 [107235]
             Larson:     401412 [107204]
             FNV-1a:     404445 [107505]
Zarathustra's BBs order 29, sorted by time:
514083 lines read
1048576 elements in the table (20 bits)
          Jesteress:     167932 [110581]
             Meiyan:     168089 [110581]
            Yorikke:     236937 [107784]
          iSCSI CRC:     239683 [107226]
          Yoshimitsu:     252157 [107548]
     YoshimitsuTRIAD:     260059 [107458]
          XXHfast32:     271223 [107060]
         XXHstrong32:     288398 [107740]
            Murmur2:     294335 [107782]
            Murmur3:     307859 [107727]
             Larson:     418354 [107831]
             CRC-32:     419300 [107796]
             FNV-1a:     421728 [107694]
Zarathustra's BBs order 30, sorted by time:
```

```
514765 lines read
1048576 elements in the table (20 bits)
          Jesteress:     169210 [111111]
          iSCSI CRC:     239854 [108091]
            Yorikke:     241621 [108033]
             Meiyan:     254144 [109944]
         Yoshimitsu:     255183 [108111]
     YoshimitsuTRIAD:     261804 [107908]
          XXHfast32:     273700 [108096]
        XXHstrong32:     290823 [107658]
           Murmur2:     294337 [108015]
           Murmur3:     310646 [107985]
            CRC-32:     423621 [107596]
            Larson:     425198 [108133]
            FNV-1a:     428364 [108377]
Zarathustra's BBs order 31, sorted by time:
515352 lines read
1048576 elements in the table (20 bits)
          Jesteress:     175358 [110505]
          iSCSI CRC:     247967 [108088]
            Yorikke:     255610 [108335]
             Meiyan:     260848 [108715]
         Yoshimitsu:     262256 [107736]
     YoshimitsuTRIAD:     270565 [108361]
          XXHfast32:     278150 [107998]
        XXHstrong32:     295119 [108267]
           Murmur2:     303717 [108399]
           Murmur3:     316905 [108381]
            Larson:     438644 [108199]
            CRC-32:     440917 [108324]
            FNV-1a:     443102 [108608]
Zarathustra's BBs order 32, sorted by time:
515858 lines read
1048576 elements in the table (20 bits)
             Meiyan:     175913 [111346]
          Jesteress:     176050 [111346]
          iSCSI CRC:     250346 [108197]
            Yorikke:     252470 [108144]
         Yoshimitsu:     265755 [108467]
     YoshimitsuTRIAD:     268524 [108605]
          XXHfast32:     279688 [108792]
        XXHstrong32:     296693 [108703]
           Murmur2:     305201 [108191]
           Murmur3:     322249 [108233]
            CRC-32:     444670 [107992]
            Larson:     449601 [108719]
            FNV-1a:     451509 [108269]
Zarathustra's BBs order 64, sorted by time:
520609 lines read
1048576 elements in the table (20 bits)
             Meiyan:     250158 [110190]
          Jesteress:     250191 [110190]
            Yorikke:     343299 [109926]
         Yoshimitsu:     349583 [110169]
     YoshimitsuTRIAD:     356380 [110354]
          XXHfast32:     366001 [110172]
          iSCSI CRC:     368246 [110170]
        XXHstrong32:     404415 [110020]
           Murmur2:     435561 [110482]
           Murmur3:     466358 [110343]
            CRC-32:     745229 [110499]
            FNV-1a:     758438 [109761]
            Larson:     758453 [110226]
```

The most striking result is the speed domination of 'Jesteress', she is slightly slower than 'iSCSI CRC' only for smallest orders 1,2,3 and 4. Since order 5 she is unstoppable.
Another observation: my 5 functions are always in TOP 6 starting from order 3.

Well, in my view **FNV1A_Jesteress** and **FNV1A_Yorikke** are fastest and best.

Kaze,
2012-Nov-02

```
; mark_description "Intel(R) C++ Compiler XE for applications running on IA-32, Version 12.1.1.258 Build 20111011";
; mark_description "-Ox -TcHASH_linearspeed_FURY.c -FaHASH_linearspeed_FURY_Intel_IA-32_12 -FAcs";

;;;     for(; wrdlen >= 2*2*sizeof(uint32_t); wrdlen -= 2*2*sizeof(uint32_t), p += 2*2*sizeof(uint32_t)) {

  02a31 83 fa 10        cmp edx, 16
  02a34 72 2c           jb .B5.5 ; Prob 10%
                              ; LOE eax edx ecx ebx ebp esi
.B5.3:                        ; Preds .B5.1 .B5.3

;;;         hash32 = (hash32 ^ (_rotl_KAZE(*(uint32_t *)(p+0),5) ^ *(uint32_t *)(p+4))) * PRIME;

  02a36 8b 38           mov edi, DWORD PTR [eax]
  02a38 83 c2 f0        add edx, -16
  02a3b c1 c7 05        rol edi, 5
  02a3e 33 78 04        xor edi, DWORD PTR [4+eax]
  02a41 33 cf           xor ecx, edi

;;;         hash32B = (hash32B ^ (_rotl_KAZE(*(uint32_t *)(p+8),5) ^ *(uint32_t *)(p+12))) * PRIME;

  02a43 8b 78 08        mov edi, DWORD PTR [8+eax]
  02a46 c1 c7 05        rol edi, 5
  02a49 33 78 0c        xor edi, DWORD PTR [12+eax]
  02a4c 83 c0 10        add eax, 16
  02a4f 33 f7           xor esi, edi
  02a51 69 c9 e7 d3 0a
        00              imul ecx, ecx, 709607
  02a57 69 f6 e7 d3 0a
        00              imul esi, esi, 709607
  02a5d 83 fa 10        cmp edx, 16
  02a60 73 d4           jae .B5.3 ; Prob 82%
                              ; LOE eax edx ecx ebx ebp esi
.B5.5:                        ; Preds .B5.3 .B5.1

; Listing generated by Microsoft (R) Optimizing Compiler Version 16.00.30319.01

$LL7@FNV1A_Hash:

; 122  :         hash32 = (hash32 ^ (_rotl_KAZE(*(uint32_t *)(p+0),5) ^ *(uint32_t *)(p+4))) * PRIME;

  00030 8b 18           mov     ebx, DWORD PTR [eax]
  00032 c1 c3 05 rol    ebx, 5
  00035 33 58 04 xor    ebx, DWORD PTR [eax+4]
  00038 83 ea 10 sub    edx, 16
  0003b 33 f3           xor     esi, ebx

; 123  :         hash32B = (hash32B ^ (_rotl_KAZE(*(uint32_t *)(p+8),5) ^ *(uint32_t *)(p+12))) * PRIME;

  0003d 8b 58 08 mov    ebx, DWORD PTR [eax+8]
  00040 69 f6 e7 d3 0a
        00              imul    esi, 709607
  00046 c1 c3 05 rol    ebx, 5
  00049 33 58 0c xor    ebx, DWORD PTR [eax+12]
  0004c 83 c0 10 add    eax, 16
  0004f 33 cb           xor     ecx, ebx
  00051 69 c9 e7 d3 0a
        00              imul    ecx, 709607
  00057 4f              dec     edi
  00058 75 d6           jne     SHORT $LL7@FNV1A_Hash
```

```
; mark_description "Intel(R) C++ Compiler XE for applications running on IA-32, Version 12.1.1.258 Build 20111011";
; mark_description "-Ox -TcHASH_linearspeed_FURY.c -FaHASH_linearspeed_FURY_Intel_IA-32_12 -FAcs";

.B4.3:                          ; Preds .B4.2 .B4.3

;;;             hash32 = (hash32 ^ (_rotl(*(uint32_t *)(p+0),5) ^ *(uint32_t *)(p+4))) * PRIME;

  0292f 8b 31           mov esi, DWORD PTR [ecx]
  02931 83 c2 e8        add edx, -24
  02934 c1 c6 05        rol esi, 5
  02937 33 71 04        xor esi, DWORD PTR [4+ecx]
  0293a 33 de           xor ebx, esi

;;;             hash32B = (hash32B ^ (_rotl(*(uint32_t *)(p+8),5) ^ *(uint32_t *)(p+12))) * PRIME;

  0293c 8b 71 08        mov esi, DWORD PTR [8+ecx]
  0293f c1 c6 05        rol esi, 5
  02942 33 71 0c        xor esi, DWORD PTR [12+ecx]
  02945 33 fe           xor edi, esi

;;;             hash32C = (hash32C ^ (_rotl(*(uint32_t *)(p+16),5) ^ *(uint32_t *)(p+20))) * PRIME;

  02947 8b 71 10        mov esi, DWORD PTR [16+ecx]
  0294a c1 c6 05        rol esi, 5
  0294d 33 71 14        xor esi, DWORD PTR [20+ecx]
  02950 83 c1 18        add ecx, 24
  02953 33 ee           xor ebp, esi
  02955 69 db e7 d3 0a
        00              imul ebx, ebx, 709607
  0295b 69 ff e7 d3 0a
        00              imul edi, edi, 709607
  02961 69 ed e7 d3 0a
        00              imul ebp, ebp, 709607
  02967 83 fa 18        cmp edx, 24
  0296a 73 c3           jae .B4.3 ; Prob 82%

; Listing generated by Microsoft (R) Optimizing Compiler Version 16.00.30319.01

$LL9@FNV1A_Hash@2:

; 195  :               hash32 = (hash32 ^ (_rotl(*(uint32_t *)(p+0),5) ^ *(uint32_t *)(p+4))) * PRIME;

  00174 8b 01           mov     eax, DWORD PTR [ecx]
  00176 c1 c0 05 rol    eax, 5
  00179 33 41 04 xor    eax, DWORD PTR [ecx+4]
  0017c 83 eb 18 sub    ebx, 24
  0017f 33 f0           xor     esi, eax

; 196  :               hash32B = (hash32B ^ (_rotl(*(uint32_t *)(p+8),5) ^ *(uint32_t *)(p+12))) * PRIME;

  00181 8b 41 08 mov    eax, DWORD PTR [ecx+8]
  00184 69 f6 e7 d3 0a
        00              imul    esi, 709607
  0018a c1 c0 05 rol    eax, 5
  0018d 33 41 0c xor    eax, DWORD PTR [ecx+12]
  00190 83 c1 18 add    ecx, 24
  00193 33 f8           xor     edi, eax

; 197  :               hash32C = (hash32C ^ (_rotl(*(uint32_t *)(p+16),5) ^ *(uint32_t *)(p+20))) * PRIME;

  00195 8b 41 f8 mov    eax, DWORD PTR [ecx-8]
  00198 69 ff e7 d3 0a
        00              imul    edi, 709607
  0019e c1 c0 05 rol    eax, 5
  001a1 33 41 fc xor    eax, DWORD PTR [ecx-4]
  001a4 33 e8           xor     ebp, eax
  001a6 69 ed e7 d3 0a
        00              imul    ebp, 709607
  001ac 4a              dec     edx
  001ad 75 c5           jne     SHORT $LL9@FNV1A_Hash@2
```

```
uint32_t FNV1A_Hash_YoshimitsuTRIAD(const char *str, uint32_t wrdlen)
{
    const uint32_t PRIME = 709607;
    uint32_t hash32 = 2166136261;
    uint32_t hash32B = 2166136261;
    uint32_t hash32C = 2166136261;
    const char *p = str;

    for(; wrdlen >= 3*2*sizeof(uint32_t); wrdlen -= 3*2*sizeof(uint32_t), p += 3*2*sizeof(uint32_t)) {
                hash32 = (hash32 ^ (_rotl(*(uint32_t *)(p+0),5) ^ *(uint32_t *)(p+4))) * PRIME;
                hash32B = (hash32B ^ (_rotl(*(uint32_t *)(p+8),5) ^ *(uint32_t *)(p+12))) * PRIME;
                hash32C = (hash32C ^ (_rotl(*(uint32_t *)(p+16),5) ^ *(uint32_t *)(p+20))) * PRIME;

/*
// Intel(R) C++ Compiler XE for applications running on IA-32, Version 12.1.1.258 Build 20111011 gave this:
// 216a-212f+2= 61 bytes, No CARAMBA anymore.
;;;     for(; wrdlen >= 3*2*sizeof(uint32_t); wrdlen -= 3*2*sizeof(uint32_t), p += 3*2*sizeof(uint32_t)) {

  02127 83 fa 18        cmp edx, 24
  0212a 72 43           jb .B4.5 ; Prob 10%
                              ; LOE eax edx ecx ebx ebp esi edi
.B4.2:                        ; Preds .B4.1
  0212c 89 34 24        mov DWORD PTR [esp], esi
                              ; LOE eax edx ecx ebx ebp edi
.B4.3:                        ; Preds .B4.2 .B4.3

;;;             hash32 = (hash32 ^ (_rotl(*(uint32_t *)(p+0),5) ^ *(uint32_t *)(p+4))) * PRIME;

  0212f 8b 31           mov esi, DWORD PTR [ecx]
  02131 83 c2 e8        add edx, -24
  02134 c1 c6 05        rol esi, 5
  02137 33 71 04        xor esi, DWORD PTR [4+ecx]
  0213a 33 de           xor ebx, esi

;;;             hash32B = (hash32B ^ (_rotl(*(uint32_t *)(p+8),5) ^ *(uint32_t *)(p+12))) * PRIME;

  0213c 8b 71 08        mov esi, DWORD PTR [8+ecx]
  0213f c1 c6 05        rol esi, 5
  02142 33 71 0c        xor esi, DWORD PTR [12+ecx]
  02145 33 fe           xor edi, esi

;;;             hash32C = (hash32C ^ (_rotl(*(uint32_t *)(p+16),5) ^ *(uint32_t *)(p+20))) * PRIME;

  02147 8b 71 10        mov esi, DWORD PTR [16+ecx]
  0214a c1 c6 05        rol esi, 5
  0214d 33 71 14        xor esi, DWORD PTR [20+ecx]
  02150 83 c1 18        add ecx, 24
  02153 33 ee           xor ebp, esi
  02155 69 db e7 d3 0a
        00              imul ebx, ebx, 709607
  0215b 69 ff e7 d3 0a
        00              imul edi, edi, 709607
  02161 69 ed e7 d3 0a
        00              imul ebp, ebp, 709607
  02167 83 fa 18        cmp edx, 24
  0216a 73 c3           jae .B4.3 ; Prob 82%
                              ; LOE eax edx ecx ebx ebp edi
.B4.4:                        ; Preds .B4.3
  0216c 8b 34 24        mov esi, DWORD PTR [esp]
                              ; LOE eax edx ecx ebx ebp esi edi
.B4.5:                        ; Preds .B4.1 .B4.4
*/

    }
        if (p != str) {
                hash32 = (hash32 ^ _rotl(hash32C,5) ) * PRIME;
                //hash32B = (hash32B ^ _rotl(hash32D,5) ) * PRIME;
        }

    // 1111=15; 10111=23
```

```
    if (wrdlen & 4*sizeof(uint32_t)) {
                hash32 = (hash32 ^ (_rotl(*(uint32_t *)(p+0),5) ^ *(uint32_t *)(p+4))) * PRIME;
                hash32B = (hash32B ^ (_rotl(*(uint32_t *)(p+8),5) ^ *(uint32_t *)(p+12))) * PRIME;
                p += 8*sizeof(uint16_t);
    }
    // Cases: 0,1,2,3,4,5,6,7,...,15
    if (wrdlen & 2*sizeof(uint32_t)) {
                hash32 = (hash32 ^ *(uint32_t*)(p+0)) * PRIME;
                hash32B = (hash32B ^ *(uint32_t*)(p+4)) * PRIME;
                p += 4*sizeof(uint16_t);
    }
    // Cases: 0,1,2,3,4,5,6,7
    if (wrdlen & sizeof(uint32_t)) {
                hash32 = (hash32 ^ *(uint16_t*)(p+0)) * PRIME;
                hash32B = (hash32B ^ *(uint16_t*)(p+2)) * PRIME;
                p += 2*sizeof(uint16_t);
    }
    if (wrdlen & sizeof(uint16_t)) {
        hash32 = (hash32 ^ *(uint16_t*)p) * PRIME;
        p += sizeof(uint16_t);
    }
    if (wrdlen & 1)
        hash32 = (hash32 ^ *p) * PRIME;

    hash32 = (hash32 ^ _rotl(hash32B,5) ) * PRIME;
    return hash32 ^ (hash32 >> 16);
}

/*
E:\_KAZE_hash_Yoshimitsu>hash KT5million.txt
5000000 lines read
16777216 elements in the table (24 bits)
           Jesteress:    5822662 [676877]
              Meiyan:    5826998 [676877]
             Yorikke:    5632624 [677478]
          Yoshimitsu:    5668882 [675312]
     YoshimitsuTRIAD:    5710968 [676878]
E:\_KAZE_hash_Yoshimitsu>hash KTR5million.txt
5000000 lines read
16777216 elements in the table (24 bits)
           Jesteress:    6025023 [676000]
              Meiyan:    6030337 [676000]
             Yorikke:    5821302 [676570]
          Yoshimitsu:    5866276 [676009]
     YoshimitsuTRIAD:    5897596 [676097]
E:\_KAZE_hash_Yoshimitsu>hash "Word-list_00,584,879_Russian_Spell-Check_Unknown-Quality.slv"
584879 lines read
2097152 elements in the table (21 bits)
           Jesteress:     323976 [75404]
              Meiyan:     326688 [75377]
             Yorikke:     324387 [74661]
          Yoshimitsu:     336713 [74661]
     YoshimitsuTRIAD:     342237 [74661]
E:\_KAZE_hash_Yoshimitsu>hash "Word-list_12,561,874_wikipedia-en-html.tar.wrd"
12561874 lines read
33554432 elements in the table (25 bits)
           Jesteress:   10658052 [2121868]
              Meiyan:   10631710 [2111271]
             Yorikke:   10555782 [2084954]
          Yoshimitsu:   10794577 [2084954]
     YoshimitsuTRIAD:   10896792 [2084931]
E:\_KAZE_hash_Yoshimitsu>hash "Word-list_22,202,980_wikipedia-de-en-es-fr-it-nl-pt-ro-html.tar.wrd"
22202980 lines read
67108864 elements in the table (26 bits)
           Jesteress:   20307680 [3355676]
              Meiyan:   20331294 [3345260]
             Yorikke:   20185216 [3300245]
          Yoshimitsu:   20536618 [3300245]
     YoshimitsuTRIAD:   20781243 [3299941]
E:\_KAZE_hash_Yoshimitsu>hash 100MB_as_one_line.TXT
1 lines read
4 elements in the table (2 bits)
```

```
           Jesteress:     201175 [    0]
              Meiyan:     201123 [    0]
             Yorikke:     179552 [    0]
          Yoshimitsu:     177676 [    0]
     YoshimitsuTRIAD:     179518 [    0]
E:\_KAZE_hash_Yoshimitsu>hash LP3.TXT
3333 lines read
8192 elements in the table (13 bits)
           Jesteress:        776 [  576]
              Meiyan:        790 [  583]
             Yorikke:        774 [  579]
          Yoshimitsu:        792 [  609]
     YoshimitsuTRIAD:        821 [  615]
E:\_KAZE_hash_Yoshimitsu>
*/
```

Yoshimitsu TRIAD

http://www.sanmayce.com/Fastest_Hash/index.html#NightLightSky