

NAKAMICHI 'Loonette' a.k.a. 'The Rabbit Girl'

Rabid (far-out) LZSS decompressor: <http://www.sanmayce.com/Hayabusa/index.html>

```
unsigned int Decompress (char* ret, char* src, unsigned int srcSize) {
    char* retLOCAL = ret; char* srcLOCAL = src;
    char* srcEndLOCAL = src+srcSize;
    unsigned int DWORDtrio;
    while (srcLOCAL < srcEndLOCAL) {
        DWORDtrio = *(unsigned int*)srcLOCAL;

#ifdef _N_GP
#ifdef _N_prefetch_4096
        _mm_prefetch((char*)(srcLOCAL + 64*64), _MM_HINT_T0);
#endif
#endif
        // |1stLSB |2ndLSB |3rdLSB |
        // |00|L|xxxxx|xxxxxxxx|xxxxxx|xx|
        // |1bit 16bit 24bit|
        // L = 0b means Long MatchLength, (12-L) or 12
        // L = 1b means Short MatchLength, (12-L) or 8
        // 00 = 00b means Literal
        // 00 = 01b MatchOffset, 0xFFFFFFFF>>(3-00), 2 bytes long i.e. SW is 2*8-L-00=(1+00)*8-3=13 or 8KB
        // 00 = 10b MatchOffset, 0xFFFFFFFF>>(3-00), 3 bytes long i.e. SW is 3*8-L-00=(1+00)*8-3=21 or 2MB
        // 00 = 11b MatchOffset, 0xFFFFFFFF>>(3-00), 4 bytes long i.e. SW is 4*8-L-00=(1+00)*8-3=29 or 512MB
        DWORDtrio = DWORDtrio & (0xFFFFFFFF >> ((3-(DWORDtrio & 0x03))<<3));
        if ( (DWORDtrio & 0x03) == 0x00 ) {
            #ifdef _N_GP
            memcpy(retLOCAL, (const char *) ( (uint64_t)(srcLOCAL+1) ), 16);
            #endif
            #ifdef _N_XMM
            SlowCopy128bit( (const char *) ( (uint64_t)(srcLOCAL+1) ), retLOCAL );
            #endif
            retLOCAL+= (DWORDtrio>>3);
            srcLOCAL+= (DWORDtrio>>3)+1;
        } else {
            #ifdef _N_GP
            memcpy(retLOCAL, (const char *) ( (uint64_t)(retLOCAL-(DWORDtrio>>3)) ), 16);
            #endif
            #ifdef _N_XMM
            SlowCopy128bit( (const char *) ( (uint64_t)(retLOCAL-(DWORDtrio>>3)) ), retLOCAL );
            #endif
            srcLOCAL+= 1+(DWORDtrio&0x03); // 4|3|2
            retLOCAL+= 12-(DWORDtrio&0x04);
        }
    }
    return (unsigned int)(retLOCAL - ret);
}
```

```
/*
; 'Loonette' decompression loop, 76-14+2=100 bytes long:
; mark_description "Intel(R) C++ Intel(R) 64 Compiler XE for applications running on Intel(R) 64,
; Version 15.0.0.108 Build 20140";
; mark_description "-O3 -QxSSE2 -D_N_XMM -D_N_prefetch_4096 -Facs";
```

```
.B7.3:
00014 41 0f 18 8a 00    prefetcht0 BYTE PTR [4096+r10]
10 00 00
0001c b8 ff ff ff ff    mov eax, -1
00021 41 8b 12          mov edx, DWORD PTR [r10]
00024 89 d1            mov ecx, edx
00026 83 f1 03          xor ecx, 3
00029 c1 e1 03          shl ecx, 3
0002c d3 e8            shr eax, cl
0002e 23 d0            and edx, eax
00030 89 d0            mov eax, edx
00032 83 e0 03          and eax, 3
00035 75 18            jne .B7.5
.B7.4:
00037 f3 41 0f 6f 42    movdq xmm0, XMMWORD PTR [1+r10]
01
0003d c1 ea 03          shr edx, 3
00040 f3 41 0f 7f 01    movdq XMMWORD PTR [r9], xmm0
00045 4c 03 ca          add r9, rdx
00048 ff c2            inc edx
0004a 4c 03 d2          add r10, rdx
0004d eb 24            jmp .B7.6
.B7.5:
0004f 89 d1            mov ecx, edx
00051 83 e2 04          and edx, 4
00054 c1 e9 03          shr ecx, 3
00057 f7 da            neg edx
00059 ff c0            inc eax
0005b 48 f7 d9          neg rcx
0005e 83 c2 0c          add edx, 12
00061 49 03 c9          add rcx, r9
00064 4c 03 d0          add r10, rax
00067 f3 0f 6f 01      movdq xmm0, XMMWORD PTR [rcx]
0006b f3 41 0f 7f 01    movdq XMMWORD PTR [r9], xmm0
00070 4c 03 ca          add r9, rdx
.B7.6:
00073 4d 3b d0          cmp r10, r8
00076 72 9c            jb .B7.3
*
```

Decompressor	Compressed Size	Decompression Speed (1 thread)
memcpy()	273,401,856	2757 MB/s
LZ4	117,125,927	902 MB/s
Nakamichi 'Tengu'	107,237,997	768 MB/s
Nakamichi 'Loonette'	???,???,???	???
7-zip ZIP	97,569,200	273401856/3.026/1024/1024= 86 MB/s

Note: Results were obtained on laptop with Core 2 Q9550s @2833MHz and 4GB RAM running Windows 7. Testdatafile is: [Autobiography_411-ebooks_collection.tar](#)

rabid:

- Extremely zealous or enthusiastic; fanatical: *a rabid football fan*.
- Irrationally extreme in opinion or practice.
- Furious or raging; violently intense.

etymology:

[Latin *rabidus*, from *rabere*, to rave.]

[C17: from Latin *rabidus* frenzied, mad, from *rabere* to be mad]

[1605-15: < Latin *rabidus* raging, rabid < *rabere* to rave]

/ <http://www.thefreedictionary.com/rabid/>


































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