
Subject: Re: BufferPainter::Clear() optimization
Posted by [mirek](#) on Thu, 21 May 2020 11:28:28 GMT
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OK, so I could not stop digging and found last important ingredient: alignment matters!

```
void FillX(void *p, dword data, int len)
{
    dword *t = (dword *)p;
    if(len < 4) {
        if(len & 2) {
            t[0] = t[1] = t[len - 1] = data;
            return;
        }
        if(len & 1)
            t[0] = data;
        return;
    }

    __m128i val4 = _mm_set1_epi32(data);
    auto Set4 = [&](int at) { _mm_storeu_si128((__m128i *) (t + at), val4); };

    Set4(len - 4); // fill tail
    if(len >= 16) {
        Set4(0); // align up on 16 bytes boundary
        const dword *e = t + len;
        t = (dword *)(((uintptr_t)t | 15) + 1);
        len = e - t;
        e -= 16;
        if(len >= 1024*1024) { // for really huge data, bypass the cache
            huge_memsetd(t, data, len);
            return;
        }
        while(t <= e) {
            Set4(0); Set4(4); Set4(8); Set4(12);
            t += 16;
        }
    }
    if(len & 8) {
        Set4(0); Set4(4);
        t += 8;
    }
    if(len & 4)
        Set4(0);
}
```

This is about twice as fast as Fill7a for len > 60 (up to cache bypass limit).
