The "Auto" fog_style is drawn by client-specific code (canvas_put_sprite_fogged()). It is used by at least hexemplio/toonhex, hex2t, isophex, and alio tilesets. (Other tilesets use client-independent fogging.)

Its implementation differs widely, so that fog-of-war looks very different between clients; it has widely differing brightness, and some clients show artifacts in fogged tiles.

The attached animation (taken with 2.6.0-beta1) demonstrates the differences. (It is probably a little degraded by the GIF format, but most of the artifacts it shows are real.)

- Gtk2: Looks OK to me? (Maybe just what I'm used to, and what tileset designers designed against.) (Gtk 2.24.23)
- Gtk3: Far too dark. Spuriously bright overlays (notably Wheat). (Gtk 3.10.8)
  - Qt: Bizarre colour effects in dark overlays (pink oasis). Spuriously bright overlays (desert dunes). (Qt 5.2.1)
    - (qtg_canvas_put_sprite_fogged uses CompositionMode_Difference, is that really the right thing?)
- SDL: Hills look too bright and stuck on. Bright seams between different terrains (grassland vs plains vs hills) and between hill overlays. Spuriously bright dunes, oasis etc. (SDL 1.2.15)
- SDL2: as SDL except the overlays look a bit more natural. (SDL 2.0.2)

The artifacts appear to be something like drawing fog(base) and fog(overlay) separately, with some combining function that is not equivalent to fog(base + overlay) (often in such a way that more overlays give brighter pixels), although I haven't looked at the code to work out exactly what's going on. Gtk2 alone looks like it more or less achieves the equivalence.

This has been going on a while; but I anticipate more complaints in 2.6, as (a) we're pushing Gtk3 (with its impenetrable fog) as the default client, (b) the new Hexemplio tileset debuts in 2.6.

(This is likely to become a metaticket, since I imagine fixes will be client-specific and might be somewhat involved.)

Related issues:
- Related to Freeciv - Bug #862186: Desert oil not visible when tile not seen (...
- Blocked by Freeciv - Bug #862511: Gtk3/3.22 fog-of-war is too dark with fog_s...

History

#1 - 2017-09-18 08:20 PM - Jacob Nevins
(I've just noticed that the SDL2 client has seams between hills in unfogged areas. That should probably be a new bug.)

#2 - 2017-09-18 08:38 PM - Jacob Nevins
Notably, in the Qt client, Oil resources are almost completely invisible through fog.

#3 - 2020-02-28 12:13 PM - Chippo Elder
- File coal.png added

QT client again. Coal resources are difficult to see. In the attached screenshot, three tiles are highlighted. The top (fogged) one has coal, but looks very much like the bottom right highlighted tile, which doesn't.

#4 - 2020-03-01 10:22 AM - Chippo Elder
- File tundra-reindeer.png added
- File is-reindeer.png added

I don't know if this is the same issue or a different one. Qt client, S3_0, civ2civ3.
In the first attached screenshot, there is a fogged tile with a picture that looks like a reindeer, but the middle-click popup claims it is just tundra. In the second screenshot, my explorer has unfogged the tile and now the picture and the popup concur and agree that there is indeed game on that tile.

#5 - 2020-03-01 02:45 PM - Jacob Nevins
- Related to Bug #862186: Desert oil not visible when tile not seen (S3_0, civ2civ3, hexamplio) added

#6 - 2020-03-01 04:29 PM - Jacob Nevins
- Blocked by Bug #862511: Gtk3/3.22 fog-of-war is too dark with fog_style "Auto" added

#7 - 2020-03-01 04:59 PM - Jacob Nevins
I think this is going to require a survey of compositing methods, which I've sort of started.

The Wikipedia article on alpha compositing is a good starting point.

The general idea in Freeciv is that the smallest individual sprites comprising a tile have "auto" fog applied (darkening them) in canvas_put_sprite_fogged(), and only then are they composited. (Rather than fog being applied to the result of compositing several sprites, such as those making up a water tile.) Thus, it's particularly important that the client-specific compositing operation needs to preserve brightness.

One client-specific variable is whether the pixel values manipulated by Freeciv code have "pre-multiplied alpha".

- Gtk2 uses gdk-pixbuf. Sprites are optionally darkened by manipulating R/G/B values (fog_sprite()), then the result composited onto a canvas using full alpha information from the sprite, using an unspecified and nonconfigurable algorithm in gdk_draw_pixbuf().
- Gtk3.x/4 uses Cairo. Cairo uses pre-multiplied alpha according to its documentation and the above gdk-pixbuf reference.
  - I am suspicious of our alpha calculations around fog. See animation attached to #862511 for subtle differences between Gtk2 and Gtk3 in fog.

#8 - 2020-03-03 10:47 AM - Chippo Elder
- File reindeer-fixed.png added

I don't know whether this has been fixed very recently, or whether I mixed up some versions during reporting, but the tundra problem I reported above, is gone in 3.0.0-alpha3+ (5c44719e48). See attached screenshot.

#9 - 2020-03-04 10:48 PM - Jacob Nevins
Your two reindeers in fog (tundra-reindeer.png, reindeer-fixed.png) look similar to me -- there is clearly a reindeer hiding there if you look closely / zoom, but its contrast is all wrong so it is hard to see against the tundra.

I think the Qt client is just using the wrong compositing mode or something, and all the various weirdness with resources in fog likely stems from that.

#10 - 2020-03-04 11:34 PM - Jacob Nevins
- File gtk3fog.apng added

Switching to Gtk3.x behaviour post #862511:

I've confirmed that the compositing still isn't quite right. In #862511-3 I wrote:

I tried to work out which client's behaviour is more correct. [...] Things like shadows at bright spots in fog remain more intense than in Gtk2. I suspect that it will show seams in hills and other multi-layered terrain if the fog darkness is artificially cranked up.

Yes, if I drop fog brightness to 10%, in Gtk3.22 there are obvious bright seams between tiles, at the edges of hills, and at the edges of resources where the upper sprite's alpha is less than 1.0. Gtk2 looks good.

Attached animation illustrates this (adjusted brightness/contrast afterwards to make it more visible).

Probably fixable by changing to adding darkness by adjusting R/G/B rather than messing with alpha. Pre-multiplied alpha or no, I think adjusting R/G/B by a linear factor should work the same.

#11 - 2020-03-05 07:25 AM - Chippo Elder
Jacob Nevins wrote:

Your two reindeers in fog (tundra-reindeer.png, reindeer-fixed.png) look similar to me

Yet again, I explained myself poorly. The pictures for these two attachments do look the same to me. It's the popup text that differs. In tundra-reindeer, it says "Terrain: Tundra" and the tile stats are 1/0/1. In reindeer-fixed, it says "Terrain: Tundra (Game)" and the tile stats are 3/1/0.
You did explain yourself clearly, I just didn't read comment 4 properly...

Please raise a new ticket for it, though, I think it's a different category to these rendering errors.

Jacob Nevins wrote:

You did explain yourself clearly, I just didn't read comment 4 properly...

Please raise a new ticket for it, though, I think it's a different category to these rendering errors.

"I didn't explain myself clearly" was a euphemism for 2 crimes:

- comment 4 should not have been made - it should have been a new ticket (in my defense, it was a rich time for bug hunting and I had 7 potential tickets open, 4 of which went on to be real tickets, I was getting confused amongst all the screenshots, savegames, browser tabs, terminals with various servers and clients, and I got lazy and clicked submit (and I had been drinking and smoking dagga))
- in comment 8, I should have said something like "the problem in comment 4, which should NOT have been part of this ticket, has gone away"

While writing comment 8, I did consider raising a new ticket, but rejected it 'cos how-do/why-should you say "this problem, that did exist, seems fixed"?

Files

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