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v2

## # Minecraft and the Management of Light

"We have entered the era of administered light. Our only role is to flick a switch. We have become the mere mechanical agents of a mechanical gesture." – Gaston Bachelard, "The Flame of A Candle," 1961

What is the ideology of light in Minecraft?

When considering the game from the perspective of communication studies, media studies, and media history, the question arises immediately. For Marshall McLuhan [slide], whose work emphasized the material and social form of media at the expense of any ostensible content, light, especially electric light, is a privileged example of communication media. Light has no explicit "content"; we don't see it, but we see everything through it. ((*Understanding Media*\_ 24)).

Subsequent thinkers, including Friedrich Kittler, Lisa Gitelman, Theresa Collins and John Durham Peters, have all expanded on McLuhan's point in various ways, with Marvin's work providing the most sustained analysis of the ideological dimensions of lighting. "According to McLuhan," she writes, "each medium also conveys a semiotic eloquence about the culture of which it is a part, which is expressively louder than any particular message content" ((*When Old Technologies Were New*\_ 158)). This notion of the semiotic eloquence of a given culture becomes the occasion for sustained analysis of the "community ideology" of electric light in the late nineteenth century ((*ibid*, 159)).

In "Medium Light," Gitelman and Collins ((11)) situate the

community ideology of light within a distinctive tendency of modernity that Raymond Williams calls "mobile privatisation." [slide] "The earlier period of public technology," Williams writes, "best exemplified by railways and city lighting, was being replaced by a kind of technology for which no satisfactory name has yet been found: that which served as an at-once mobile and home-centred way of living" ((\_Television\_ 19)). For Williams, early 20th century mobility was only partly about "the wish to go out and see new places." It was deeply tied to the historic migration away from rural communities of origin, increasing distances between home and work and the resultant birth of commuting, and the need to regularly supply the apparently "self-sufficient" small family homes of the emerging middle class [slide] with supplies from external sources ((\_Television\_ 20)). This interregnum between two periods of public technology is as close to an historical analog as I've been able to find for the ideology that informs the space of vanilla Minecraft.

Minecraft's world embodies the sort of dialectical tensions that Williams loved. When we arrive in the game, its technology is always at the same point of transition, between two periods of public technology. Even late-game play relies heavily on the same residual forms of early public technology that Williams mentions – railways and the most basic type of public lighting: torchlight. But in the guise of Redstone circuitry [slide] and simple machines like pistons and hoppers, Minecraft also contains the elements that allow for the emergence of sophisticated examples of electromechanical computing and networked technology [slide]. At the crux of these two technological phases, the basic activities of Minecraft players, homebuilding and exploring [slide], are yoked together in an ideological complex not unlike that of the early stages of mobile privatisation. And, I want to argue, the yoke itself consists of the game's lighting mechanics.

In order to demonstrate the ways in which a media-historical approach can be useful to understanding the ideology of technology in video games, consider the following as the starting point for an analysis of the residual part of mobile privatisation.

[slide] This is a digital file from the chromolithograph print of John Gast's 1873 allegorical painting "American Progress," sometimes called "Westward the course of destiny," "Westward ho!" or "Manifest destiny." The original is quite small – 12 3/4 x 16 3/4 inches (lithograph sheet is 37.6 x 49 cm, approximately the same size) – and most people never saw it. The image was commissioned by George Croffutt, a publisher of *Croffutt's Western World*, a popular travel guide, for use in his guidebooks and as a colour lithograph poster given as a free gift to subscribers. Such subscribers came from the exact class of people that Williams describes in his writing on mobile privatisation – working people living in small urban and suburban homes in need of decoration. [slide] These were people who did not have the means to purchase original oil paintings, but nevertheless had both a desire to see other parts of the world and an unprecedented degree of mobility in their lives.

In the image, the allegorical figure of Progress leads settlers westward. On her brow is a shining star. In one hand she cradles the Common School book, a metonymy for national enlightenment through public education; with the other, she strings a telegraph line, which runs in parallel with a locomotive (as James Carey famously noted, the combination of railway line and telegraph wire formed the first cybernetic network, capable of correcting its own operation while in motion). Ahead of the advancing settlers and farmers, with their stagecoaches, covered wagons, fast horses, oxen and ploughs, shovels, picks and weapons, the darkness is retreating. Fleeing into the darkness

are bison, bears, foxes ... and First Nations.

I find it somewhat sobering to consider how accurate this image remains as a diagram of the basic events that take place constantly on every Minecraft server [slide]. Whatever its merits, Minecraft gameplay is deeply imbricated in the logic of manifest destiny, colonization and plunder. The function of light, both literally and figuratively, is an important element of that logic. In "Electricity and Signs," David Nye observes that utility alone was not enough to account for the rapid development of the public lighting grid at the turn of the century. It "also developed as a response to local demands for symbols of progress"; [slide] "electrification was a form of conspicuous consumption that said, "We are progressive and growing."" (216) [slide]

Looking at "American Progress" again serves as a reminder that, as many media historians note, electric lighting does not make its first appearance as an illuminator of private spaces, but as a form of *\*staging\**, both literally, in theatres, and of public spectacles [slide] ((Marvin 162; Gitelman and Marvin 6; Schivelbusch 64)). (Darkness is also part of this staging: "'tucked away in dark corners' - [it] attends the scene as both provocation and risk, reconstructed and effectively denatured as the negative index of artificial illumination" ((Gitelman and Collins 4)).) For Marvin, the purpose of the illuminated public spectacle or stage show was to "remind attentive audiences of the existence and justification of vested power [slide], and to impress on them its size and majesty" [slide] ((Marvin 159)). No less than the settlers in the painting, avatars on the illuminated screen of a video game (Minecraft or otherwise) allow us to imagine ourselves performing for ourselves in a collective drama on a spectacular scale, with epic stakes [slide].

In the same sentence, Marvin indicates that she's fully aware that a major purpose of illumination is "to intimidate heathen hordes," but that's not her focus here. And indeed, lighting in Minecraft, as in "American Progress" and the early phase of public technology for which it stands, is a tool for policing. In closing, I want to gesture toward a few relevant points on this subject in the writing of yet another media historian, Wolfgang Schivelbusch.

Schivelbusch asserts that one of the first purposes of mobile public lighting (carrying a torch or lantern) is not only to illuminate your immediate environment as you move, but to identify yourself to others (including police and guards) for purposes of control. In vanilla Minecraft, carrying a torch doesn't function in this fashion, though mods like Dynamic Lights [slide] address this shortcoming.

In any event, light in the game is primarily an architectural technology for the management of social space. [slide] It identifies explored and civilized areas and demarcates them from the wilderness. In contrast to the wild farrago of vernacular architecture that characterizes the built environment of a typical Minecraft server, lighting is consistent, regular, quantifiable. [slide]

Torches in-games do what the first attempts at a public lighting system did. [slide] For Schivelbusch, hanging torches, candles and lanterns was "a first attempt to establish orientation points of light in the dark city, thereby structuring what hitherto had been totally chaotic." ("The Policing of Street Lighting" 61-62)). Fixed lanterns did not have the power to create a sense of space by flooding them with light, though. "Lanterns," writes Schivelbusch, "became beacons in the city, representing law and order" ((ibid., 64)). [slide]

Moreover, lighting was a class issue. Schivelbusch observes that “It would be tempting to chart out the political psychology of the middle classes against those of the lower classes on the basis of different attitudes towards lighting” (69). Revolutions and sneaking games take place in the dark for a reason.

Much of the rest of this paper in its final form will concern the actual mechanics of light in the game (torches, Redstone and otherwise), the complex history of changes to the game’s lighting engine, and popular discourse around the role of various kinds of lighting in the production of lag. Lighting things in Minecraft, I believe, is an ethical act; it affects the ability of others to play, for better and worse.

I’m going to stop here with a return to the place where I started, with Bachelard, and assert that Minecraft is many things, but in large part it is a game of light management. Postmodern though the setting might be, Minecraft is still part of the long trajectory of the modern ideology of mobile privatisation [slide]. As such, the secondary argument of this paper is that media history offers a compelling and useful set of tools for video game studies. This might be especially true when the object of study is an entertainment for commuters and precarious labourers, dreaming of our next bouldering and backpacking vacations while socking away money for a weekend trip to IKEA.

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## **# ROUGH NOTES**

### **## Light as Medium**

- McLuhan - “The electric light escapes attention as a communication medium because it has no ‘content.’ And this makes it an invaluable instance of how people fail to study

- media at all" ((*Understanding Media*\_ 24)) – “The message of the electric light is like the message of electric power in industry, totally radical, pervasive, and decentralized” ((*ibid.*, 25))
- Peters on Kittler: like McLuhan, Kittler positions light as a medium – we don’t see it but things happen through it ((*Optical Media*\_ 16))
  - Carolyn Marvin, *When Old Technologies Were New*: in the 1880s it was perhaps even more obvious than now that light is a medium: it communicated the possibility of technological utopia and new forms of profitability, but also a “community ideology” that makes assumptions about what people think and what the common good is; (electric) light is a sign of social power ((158–59))
  - Gitelman and Collins, “Medium Light”: “Darkness – 'tucked away in dark corners' – attends the scene as both provocation and risk, reconstructed and effectively denatured as the negative index of artificial illumination” ((4))
  - Lighting as stage lighting; players as actors in a collective drama: “The earliest spaces of electrical illumination thus served what Walter Benjamin called 'transitory purposes'.<sup>11</sup> Modern, urban subjects entered and exited lighted scenes, actors in a shared drama that public discourse painted rapturously as spectacle. Lighting at a distance captured the imagination of observers, but the qualities of ambient light were equally remarked.” ((*ibid.*, 6))
  - Lighting as both “distant scenery and as immersive experiences” ((*ibid.*))
  - “a teleology of domestication” ((*ibid.*)):

> They hint, that is, at electric lighting experienced doubly as system and component, as looking with and looking at.<sup>29</sup> If it is this double articulation which seems to offer a typological resource for the modern meaning of media in the technical or formal sense – system/component mapping to medium/content – then the varieties of electrical illumination suggest an early, incipient phase of what Raymond Williams called mobile privatisation. Mobile privatisation is that broad social pattern of modernity characterised at once 'by two apparently paradoxical yet deeply connected tendencies': 'on the one hand mobility, on the other hand the more apparently self-sufficient family home'. People moved more and more in the course of their lives and days, while the 'homecentered way of living' drew confirmation from the accelerated rhythms of mass consumption. ((ibid., 11))

- study of light in Minecraft requires paying attention to the mechanics of its operation

## **## History of Light and Policing**

- In vanilla Minecraft, light isn't portable – carrying a torch doesn't illuminate your immediate environment as you move, nor does it identify you to others (for purposes of control) – first functions of lighting
- mods like Dynamic Lighting address this ((<http://www.minecraftforum.net/forums/mapping-and-modding/minecraft-mods/1272478-dynamic-lights-portable-and-moving-lightsources>))
- in any event, light in the game is primarily a technology for the management of social space – identifying explored and civilized areas from wilderness
- deep relationship between illuminated architecture and modernity
- Minecraft has no state of nature; it is always already technologized, or ready to hand in Heidegger's sense – the

- imposition of the grid means that the world is always predisposed to be useful to players
- in vanilla Minecraft, torches are a stubbornly persistent form of residual media – they never really go away due to the scarcity of Glowstone (and now Sea Lanterns); no real redstone equivalent to the electric light bulb to replace them
  - lighting is also something that is consistent and regular, in contrast to the wild farrago of vernacular architecture that characterizes a typical Minecraft server
- Schivelbusch:
- torches in-games do what the first attempts at a public lighting system did: “a first attempt to establish orientation points of light in the dark city, thereby structuring what hitherto had been totally chaotic.” ((“The Policing of Street Lighting” 61-62))
  - “fixed public lanterns, more useful for revealing selected spots than for illuminating real spaces. Lanterns became beacons in the city, representing law and order.” ((ibid., 64))
  - “the original function of public lighting—at least in Paris—to be more a symbolic representative than a realistic light source.” ((ibid., 64))
  - “public lighting was closely connected with the police. Surveillance and light, visibility and control: these pairs complement each other, as much as crime/ conspiracy and darkness/night are paired in myth and psychology.” ((ibid., 65))
  - Lighting as a class issue: “It would be tempting to chart out the political psychology of the middle classes against those of the lower classes on the basis of different attitudes towards lighting.” (69)
- Bachelard: “We've entered the era of administered light. Our only role is to turn on the switch. We are but the mechanical subjects of a mechanical gesture.” ((qtd. in Schivelbusch 71))

- David Nye, "Electricity and Signs": "corporate research and advertising only partially account for the great popularity of street lighting in the United States, however, which also developed as a response to local demands for symbols of progress"; "electrification was a form of conspicuous consumption that said, "We are progressive and growing."" (216)

## **## Minecraft as a game of light management**

- It's not just the blocky physical world of the game that's highly stylized; lighting, too, behaves according to its own peculiar physics, ushering in a different world than ours
- despite the fact that we're looking at the game through a plane of light, light in game is always a metaphor: doesn't behave like real-world lighting – glass doesn't reflect anything; at night, windows illuminated from the outside should be transparent from the outside and from the (illuminated) inside should render the night opaque
- luminance as an attribute of every block
- Gamepedia's Minecraft Light page (([http://minecraft.gamepedia.com/Light#Light-emitting\\_blocks](http://minecraft.gamepedia.com/Light#Light-emitting_blocks)))
- stackxchange's "Leran About Light" ((<http://gaming.stackexchange.com/questions/12358/how-far-do-i-have-to-place-torches-so-that-mobs-will-not-spawn-near-me>))
- light value on a scale of 1-15
- visible in console ("Debug Screen") . Light level of player's location in console since official release 1.2.1 and 1.2-pre; after 14w05a, light level measures light at player's feet, not eyes
- The first number is the total light level where your feet are. Note that there are a few caveats here due to the sky light level showing the light level the block would get from the sun in full daylight, but does not account for the lower light levels at night or during a storm.

- The second number is the amount of light from the sky at the block your feet are in. Same caveat as above.
  - The third number is the amount of light from other blocks (e.g. torches) at the block your feet are in.
- (([http://minecraft.gamepedia.com/Debug\\_screen](http://minecraft.gamepedia.com/Debug_screen)))

- also visible in a variety of mods:

- light level overlay ((<http://www.minecraftforum.net/forums/mapping-and-modding/minecraft-mods/1284971-light-level-overlay>))
- NEI (Not Enough Items) ((<http://www.minecraftforum.net/forums/mapping-and-modding/minecraft-mods/1279956-chickenbones-mods>))
- What's My Light Level? ((<http://www.minecraftforum.net/forums/mapping-and-modding/minecraft-mods/1272449-whats-my-light-level-stable-57-22-jul-2013-test>)) – F7 key
- Hostile Spawn Overlay ((<http://www.minecraftforum.net/forums/mapping-and-modding/minecraft-mods/1287141-1-6-4-hostile-spawn-overlay>))
- Zombe's Modpack ((<http://www.minecraftforum.net/forums/mapping-and-modding/minecraft-mods/mod-packs/1272345-zombes-modpack-26-mods-v8-2-2-upd-11-jul>))
- Minecraft Myth Busting episode on mob breeding (([https://www.youtube.com/watch?v=30CztPp3arE&index=44&list=PL7VmhWGNRxEKi1ikLc2b\\_pi6EIG0CdF10d](https://www.youtube.com/watch?v=30CztPp3arE&index=44&list=PL7VmhWGNRxEKi1ikLc2b_pi6EIG0CdF10d))) – mob breeding in lightless traps increases over lighted traps by 765%
- in which releases were new lighting engines implemented? See <http://minecraft.gamepedia.com/Light>

## ## The ethics of play

- persistent belief in the effect of torches and large, constantly running Redstone systems on CPU load, though

there's little to prove this  
- "server lag machines"

- general sense in public discourses that too many torches cause lag but difficult to find specifics  
- (([http://www.reddit.com/r/Minecraft/comments/2js5j3/the\\_creator\\_of\\_optifine\\_sp614x\\_explains\\_the\\_18/](http://www.reddit.com/r/Minecraft/comments/2js5j3/the_creator_of_optifine_sp614x_explains_the_18/)))

[]M0dusPwnens 5 points 3 months ago\*

Redstone has an additional problem worth publicizing, though I've long since given up hope of it ever being fixed.

The thing that makes redstone laggy is the lighting updates. The fact that the torches and repeaters generate actual light (not just on their models, but illuminate their surroundings) is responsible for 99% of the lag. Without the lighting updates, you can build gigantic redstone contraptions and they don't lag at all.

You can get around this a little bit by lighting your contraptions so thoroughly that the light level doesn't actually change when they activate/deactivate, but it's a pain and doesn't totally eliminate the problem.

After I figured this out, I tweeted to jeb about it and he even responded! His response was that he knew about the issue and wouldn't ever fix it because if redstone torches and repeaters stopped generating light "people would complain" (I can't find the tweet since it was about two years ago, but I'm fairly sure those were his exact words). So apparently it's less important that a game element is essentially non-functional than that some people like glowy shit.

I generally like jeb and the things he does for the game, but I lost an enormous amount of respect for him after that.

- [permalink](#)
- [parent](#)

[~]RMCT#2 Champions: Whiskey BrigadeTrazLander 3 points 3 months ago

The fact that the torches and repeaters generate actual light (not just on their models, but illuminate their surroundings) is responsible for 99% of the lag.

Repeaters don't emit light anymore you know.

Also it's actually not the lighting updates anymore really (although skylighting has some issues), it's redstone dust. The redstone dust code is so inefficient has had so many things piled onto it and generates so many checks and updates everytime it gets activated or changes its power level, it's a bitch for Minecraft to run.

- Minecraft Myth Busting episode on lag ((<http://minecraftvideos.info/lag-busting-minecraft-myth-busting-65/>; [https://www.youtube.com/watch?v=QLk1If5EY7s&list=PL7VmhWGNRxEKilLc2b\\_pi6EIGOCdF10d&index=4](https://www.youtube.com/watch?v=QLk1If5EY7s&list=PL7VmhWGNRxEKilLc2b_pi6EIGOCdF10d&index=4)) )
  - glowstone does not cause lag
- substantial quantities of stained glass mixed with air blocks can
- BUT worst culprits are signs with lots of text, item frames, armor stands, player skulls, banners and chests - all tile entities - not lighting
- players empirically testing for "the ideal light perimeter" as defense ((<https://7daystodie.com/forums/showthread.php?9140-I-think-I-ve-found-the-ideal-light-perimeter-torch-spacing>))
- destroying torches or other light sources as a malevolent and potentially fatal act - lets in monsters
- Father Toast's Special Mobs mod: lets mobs steal torches [confirm?] ((<http://www.minecraftforum.net/forums/mapping-and-modding/minecraft-mods/1288315-forge-father-toasts-mob-mods-special-mobs-utility#SpecialMobs>))
- anecdotal: glitch with non-vanilla light sources not

- necessarily recognized in modded games unless a vanilla light source has "activated" the area
- fragility of Redstone systems vs torches – unlike IRL, networks are not more robust than individual sources, not do they require different tactics to snuff
  - fragility of Glowstone (but not Glowstone lamps)
  - fragility and expense of Sea Lanterns

## **## functionalism vs extravagance**

- light can also be simply for display – not always or necessarily a practical question

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Types of lag:

Summary

FPS/Client lag - More then likely its on your end, unless it falls into the server lag category, you need to fix it your self.

Server lag // TPS Lag - This is caused by players, and the player or staff Should fix the cause.

Connection Lag - More then likely only the owners ISP can fix. Don't expect staff to magically fix what we have no power to.

FPS Lag // Client Lag

This type of lag varies person to person, as its heavily based on your computers specs, your graphics card/chip, your computers processor, and your computers memory all effect this category. Things that make this type of lag worse are things that generate

particles like vanilla torches or mobs like blazes. Other things also can be heavy on the client side lag like Forge Microblocks, or tile entities (within 200 blocks of you) as your client has to keep tracking these things. Entities are Probably the biggest cause of FPS lag, I describe more what a Entity is later in the Server Lag section.

How to Fix.

Well starting off, having a decent computer helps, also a mod called Optifine can help with fps, although it can do MORE HARM then good, if used incorrectly. Another thing to do is avoiding building out of blocks that have high rendering like forge micro blocks which were designed for hiding cabling, not building a entire house out of. In a effort to help everyone I have usually made the underneath of spawn solid 1 type of block, so its easier on your clients for rendering. Also the biggest help can be having better computer specs, here are the Following Recommended requirements for VANILLA minecraft, aka modded minecraft should have higher specs.

Recommended Requirements:

CPU: Intel Core i3 or AMD Athlon II (K10) 2.8 GHz

RAM: 4GB

GPU: GeForce 2xx Series or AMD Radeon HD 5xxx Series

(Excluding Integrated Chipsets) with OpenGL 3.3

HDD: 1GB

Latest release of Java 7 from java.com

(obtained from Mojang)

Server lag // TPS Lag

This type Lag Effects everyone and everything on the server. To understand this type of lag, you need to understand how minecraft calculates timing of everything.

Timing

Minecraft does all its calculations within 1 tick. One tick is equal to 1/20th of a second. TPS stands for Ticks Per Second. You can see this in vanilla with redstone, if there is no lag, then 5 repeaters on 2 tick delay = exactly 1 second, and 150 repeaters on 4 tick delay = exactly 1 minute (1 redstone tick = 2 ticks). Now another concept to understand is how it fits it in within the timing. So i said earlier there are 20 ticks in 1 second on a healthy server, well it takes time to calculate everything in that tick, and its measured in a time measurement of milliseconds, 1 second = 1,000 milliseconds, so  $1,000 / 20 = 50$  milliseconds. Basically when minecraft runs all its calculations it has those 50 milliseconds to calculate stuff, if it takes more then 50 milliseconds, the tick rate drops as you can fit less then 20x (anything bigger then 50) within 1 second. The TPS can be measured with both bukkit Plugins and Mods in the pack, currently only mods in the pack can measure the millisecond timing. At the time of this post The modsauce server is at 20 TPS, with 14.76 millisecond for timing, which is 29.52% servers rate before it would start to experience lag at anything above 50.

#### Whats Effected by this

Since everything in minecraft, uses Tick rate to calculate everything, well everything is effected. When the TPS drops below 20, Often you will notice the sky moving, or machines running slow. Since this is a server thing, when TPS is down, its the entire server, all dimensions, everything is effected, regardless if anyone is online, so if TPS is below 20, your quarry/ farms will be going extra slow, And overall the server will just feel slow. This is a problem that plagues modded servers, and here at paradise I usually do a great job at keeping this in check.

#### What Causes It

Like i said in the Previous section about everything effecting

it, well everything contributes to its cause, the thing is, some contribute more then others.

There are 3 Main categories for issues effecting the TPS, they are Tile Entities, Entities, and the world tick rate. I guess I should explain what each thing is to help better understand what they are.

A Tile Entity is a block in the world, that requires the server to check for updates every single Tick, often are blocks that hold special extra data to them, some things in Vanilla that fit into this category are Furnaces, Chest, Hoppers, and note blocks. This is why even in vanilla you can create TPS Allot of TPS lag by having large amounts of Hoppers, because mojang was very inefficient with there code, and they are very heavy on usage. In Modded minecraft, the list of tile entities expands greatly, as basically everything. Some things are worse then others, and its mostly how the author codes his stuff. Reika as example its very inefficent with his code, and has his machines checking for allot of data often, to try and be more realistic. Another mod author like GregoriasT, may make your pack take ages to boot, but he is VERY efficient with his code, and you could run hundred of his machines with little problem. Example, 1 Reactor craft fusion reactor (reika) alone can kill a server, while running 100 Gregtech fusion reactors (Using only Gregtech blocks) will use very little timing, and be very tick friendly. Back in FTB monster i made a list of some of the worst tile entities the pack had here <http://paradise-minecraft.co.uk/forum/index.php/topic,1173.0.html>.

Entities Are probably the second biggest cause of TPS lag on the server. A Entity is any type of Item on the ground/in the world, Mob, or even a minecraft player. The main problem associated with entities is the server has to constantly be calculating there position in the world, and in the case of mobs the server has to constantly calculate their path finding, Often you will

see servers ban mob grinders/spawner systems, we chose to limit to use only when the player is online, as Mob grinders are very heavy, though they are also a combination of tile entities as well. I mentioned that items on ground are entities, lag from this usually occurs when a creeper blows up chest shooting thousands of items on the ground, but that happens rarely, most of the time you see lag from items on ground is when Quarries // Item networks overflow and start spewing items everywhere. Here on paradise we just require you to maintain proper systems and I keep a close eye on entity counts, Many servers out there resort to remove item plugins, which results in server automatically maintaining decent entity counts, however many mods suffer from this, like Ars magica mana, and AE2 items crafting in water are entities and would be deleted, making it very challenging to complete these mods. Finally i will mention there are some other types of entities, Archimedes Ships as example are a known laggy entity, some other entities are items frames, and paintings, one thing entities have in common is they can share a block space with a block like a fence/torch, while fence/torches cant share block spaces with each other because they are blocks.

World Tick is the Final main piece of what uses timing on the server. This category of things contains only a few thing, Flowing liquids I think fall in this category, But mostly world tick lag comes from people exploring, we have attempted to limit this by pregening the nether, 1/4 of the twilight, and 1/20 of the overworld, so there is less TPS lag from people exploring.

#### Connection Lag

This category of lag i know little about. Its effected on both the servers connection and the clients connection and requires both to be decent speed.

There are a few things ingame that transfer allot more data, and there for make it worse, modded minecraft in general requires

more bandwidth, and some blocks ingame like Microblocks use a crap load more data. But if issue is on the end of the servers ISP its up to the servers ISP to fix, if its on the clients isp, then you should contact your ISP and get them to fix. In Modsauce before the 1.0.1.0 update there was a bug with buildcraft lasers, which spammed data. Which caused connection lag for players, and tended to effect those furthest from the server, with weaker connections more.

« Last Edit: 15 January 2015 19:22:37 by J20Green »

<http://paradise-minecraft.co.uk/forum/index.php?topic=1366.0>

NB The lag caused by rapid transit (boats, fast rail, accelerates sprinting and flying in the modded game, which make the processor procedurally generate new chunks, which is resource-intensive to the point that it can crash the server if you're travelling too quickly) in the game is a sign of the hard-encoded grip of the ideology of mobile privatization in the game. It encourages you to explore ... but not too fast, or not too far from the other players, or they experience lag. Exploring, past a certain point, is unethical.

NB The appearance of economies supported by plug-ins like Towny is vindication of the notion of mobile privatization, because it turns Minecraft into a suburb where everyone receives a plot of land that is theirs and only theirs – other can't enter secure homes, open chests etc. [verify] Even "role-playing" on such servers is a synonym for getting a job and working to participate in the crude virtual economies.