

What do the Bukkit.yml "spawn-limits" really mean?

Short Answer

The number of naturally spawning mobs allowed to spawn around players based on loaded chunks. The default numbers are (roughly) optimized for a 15-50 player count. Servers with a <10 player average should increase the limits to more closely mimic vanilla rates and larger servers can slightly lower the numbers with less concern.

Long Answer:

The final equation for "number of mobs" is:

$$\text{world.a(enumcreaturetype.a())} \leq \text{limit} * (\text{b.size()} / 256)$$

Which simplified is " $M \leq L * (B / 256)$ "

M is the number of that mob type(monster, animal, etc) spawned in loaded chunks

L is the limit defined in the bukkit.yml

B is the number of currently loaded chunks around all players.

B works out to be 256 per player (16x16 when spawning radius = 4), meaning " $B / 256$ " is basically the player count before adjustments for overlapping chunks (players sharing loaded chunks). For simplicity, assume all players are far enough apart to have no overlap and call this **P**. This makes the final equation " $M \leq L * P$ ". This means as each player logs into the server, the number of mobs that can be spawned goes up by **L**, assuming we are still ignoring overlapping chunks.

Keep in mind that this limit is per-world. This does not change the equation because the values are determined by the number of loaded chunks on each world. This just means that if 10% of your players are on world_A and 90% are on world_B, the natural mob limits for each world will distribute at the same ratio.

Note

The only spawn type controlled by these limits is "SpawnReason.NATURAL". Meaning all other spawning reasons are not controlled by the limits set in the bukkit.yml. So spawn cages, eggs, breeding, village invasions, (etc...) can exceed your defined limits. Of course, once the limits are exceeded (regardless of means), mobs will stop naturally spawning until the limits balance out.

Extreme "What If" Example

If you have 4 players on your server and 1 player has 500 mobs in a mob spawner trap, the other 3 players will not see much(or any) natural monster spawns. Farm limiters and/or mob mergers prevent this issue, especially on smaller servers.