# **Entity metadata**

Revision as of 22:15, 23 June 2018 by <u>Cybermaxke</u> (<u>talk</u> | <u>contribs</u>) (<u>→Horse - Added forge armor</u> item.)

 $\overline{\text{(diff)}} \leftarrow \text{Older revision} \mid \text{Latest revision (diff)} \mid \text{Newer revision} \rightarrow \text{(diff)}$ 

Various **Entities** have different metadata fields and status codes.

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**Entity** 

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| Golem               |   |
|---------------------|---|
| IronGolem           |   |
| Snowman             |   |
| Shulker             |   |
| Monster             |   |
| Blaze               |   |
| Creeper             |   |
| Endermite           |   |
| Giant Zombie        |   |
| Guardian            |   |
| ElderGuardian       |   |
| Silverfish          |   |
| Abstract Illager    |   |
| VindicationIllager  |   |
| Spellcaster Illager |   |
| EvocationIllager    |   |
| IllusionIllager     |   |
| Vex                 |   |
| EvocationFangs      |   |
| AbstractSkeleton    |   |
| Skeleton            |   |
| Wither Skeleton     |   |
| Stray               |   |
| Spider              |   |
| Witch               |   |
| Wither              |   |
| Zombie              |   |
| Zombie Villager     |   |
| Husk                |   |
| Enderman            |   |
| EnderDragon         |   |
| Flying              |   |
| Ghast               |   |
| Slime               |   |
| LlamaSpit           |   |
| Minecart            |   |
| MinecartRideable    |   |
| MinecartContainer   | • |
| MinecartHopper      |   |
|                     |   |
|                     |   |
|                     |   |

Donkey Llama Mule Pig Rabbit Polar Bear Sheep

Ocelot Wolf Parrot Villager

TameableAnimal

MinecartChest
MinecartFurnace
MinecartTNT
MinecartSpawner
MinecartCommandBlock
TNTPrimed

## **Mobs**

Mobs are spawned via Spawn Mob.

▲ Some entities (marked in yellow) should only be spawned using <u>Spawn Object</u> and their <u>Object ID</u>. While they also have an entity ID, this ID is only used internally. Servers should not attempt to spawn these entities using <u>Spawn Mob</u> with that entity ID, although clients should accept such packets if they appear.

Additionally, a few other entities (marked in blue) must be spawned in their own special ways:

- Painting (https://minecraft.wiki/w/Painting)s should be spawned using Spawn Painting
- XP orbs should be spawned using Spawn Experience Orb.

| Туре | Name                  | bounding box x and z                      | bounding box y                                | ID                            |  |
|------|-----------------------|---|---|-------------------------------|--|
| 1    | Item                  | 0.25                                      | 0.25  | minecraft:item                |  |
| 2    | XPOrb                 | 0.5                                       | 0.5   | minecraft:xp_orb              |  |
| 3    | AreaEffectCloud       | 2.0 * Radius                              | 0.5   | minecraft:area_effect_cloud   |  |
| 4    | ElderGuardian         | 1.9975 (2.35 *<br>guardian)               | 1.9975 (2.35 *<br>guardian)                   | minecraft:elder_guardian      |  |
| 5    | WitherSkeleton        | 0.7                                       | 2.4   | minecraft:wither_skeleton     |  |
| 6    | Stray                 | 0.6                                       | 1.99  | minecraft:stray               |  |
| 7    | ThrownEgg             | 0.25                                      | 0.25  | minecraft:egg                 |  |
| 8    | LeashKnot             | 0.375                                     | 0.5   | minecraft:leash_knot          |  |
| 9    | Painting              | type width or 0.0625 (depth)              | type height                                   | minecraft:painting            |  |
| 10   | Arrow                 | 0.5                                       | 0.5   | minecraft:arrow               |  |
| 11   | Snowball              | 0.25                                      | 0.25  | minecraft:snowball            |  |
| 12   | Fireball (ghast)      | 1.0                                       | 1.0   | minecraft:fireball            |  |
| 13   | SmallFireball (blaze) | 0.3125                                    | 0.3125  | minecraft:small_fireball      |  |
| 14   | ThrownEnderpearl      | 0.25                                      | 0.25  | minecraft:ender_pearl         |  |
| 15   | EyeOfEnderSignal      | 0.25                                      | 0.25  | minecraft:eye_of_ender_signal |  |
| 16   | ThrownPotion          | 0.25                                      | 0.25  | minecraft:potion              |  |
| 17   | ThrownExpBottle       | 0.25                                      | 0.25  | minecraft:xp_bottle           |  |
| 18   | ItemFrame             | 0.75 or 0.0625<br>(depth)                 | 0.75  | minecraft:item_frame          |  |
| 19   | WitherSkull           | 0.3125                                    | 0.3125  | minecraft:wither_skull        |  |
| 20   | PrimedTnt             | 0.98                                      | 0.98  | minecraft:tnt                 |  |
| 21   | FallingSand           | 0.98                                      | 0.98  | minecraft:falling_block       |  |
| 22   | FireworksRocketEntity | 0.25                                      | 0.25  | minecraft:fireworks_rocket    |  |
| 23   | Husk                  | 0.6                                       | 1.95  | minecraft:husk                |  |
| 24   | SpectralArrow         | 0.5                                       | 0.5   | minecraft:spectral_arrow      |  |
| 25   | ShulkerBullet         | 0.3125                                    | 0.3125  | minecraft:shulker_bullet      |  |
| 26   | DragonFireball        | 1.0                                       | 1.0   | minecraft:dragon_fireball     |  |
| 27   | ZombieVillager        | 0.6                                       | 1.95  | minecraft:zombie_villager     |  |
| 28   | SkeletonHorse         | 1.3964844                                 | 1.6   | minecraft:skeleton_horse      |  |
| 29   | ZombieHorse           | 1.3964844                                 | 1.6   | minecraft:zombie_horse        |  |
| 30   | ArmorStand            | normal: 0.5<br>marker: 0.0 small:<br>0.25 | normal: 1.975<br>marker: 0.0 small:<br>0.9875 | minecraft:armor_stand         |  |
| 31   | Donkey                | 1.3964844                                 | 1.6   | minecraft:donkey              |  |
| 32   | Mule                  | 1.3964844                                 | 1.6   | minecraft:mule                |  |

| 33 | EvocationFangs            | 0.5               | 0.8                         | minecraft:evocation_fangs       |
|----|---------------------------|-------------------|-----------------------------|---------------------------------|
| 34 | EvocationIllager          | 0.6               | 1.95                        | minecraft:evocation_illager     |
| 35 | Vex                       | 0.4               | 0.8                         | minecraft:vex                   |
| 36 | VindicationIllager        | 0.6               | 1.95                        | minecraft:vindication_illager   |
| 37 | IllusionIllager           | 0.6               | 1.95                        | minecraft:illusion_illager      |
| 40 | MinecartCommandBlock      | 0.98              | 0.7                         | minecraft:commandblock_minecart |
| 41 | Boat                      | 1.375             | 0.5625                      | minecraft:boat                  |
| 42 | MinecartRideable          | 0.98              | 0.7                         | minecraft:minecart              |
| 43 | MinecartChest             | 0.98              | 0.7                         | minecraft:chest_minecart        |
| 44 | MinecartFurnace           | 0.98              | 0.7                         | minecraft:furnace_minecart      |
| 45 | MinecartTNT               | 0.98              | 0.7                         | minecraft:tnt_minecart          |
| 46 | MinecartHopper            | 0.98              | 0.7                         | minecraft:hopper_minecart       |
| 47 | MinecartSpawner           | 0.98              | 0.7                         | minecraft:spawner_minecart      |
| 50 | Creeper                   | 0.6               | 1.7                         | minecraft:creeper               |
| 51 | Skeleton                  | 0.6               | 1.99                        | minecraft:skeleton              |
| 52 | Spider                    | 1.4               | 0.9                         | minecraft:spider                |
| 53 | Giant                     | 3.6               | 10.8                        | minecraft:giant                 |
| 54 | Zombie                    | 0.6               | 1.95                        | minecraft:zombie                |
| 55 | Slime                     | 0.51000005 * size | 0.51000005 * size           | minecraft:slime                 |
| 56 | Ghast                     | 4                 | 4                           | minecraft:ghast                 |
| 57 | PigZombie                 | 0.6               | 1.95                        | minecraft:zombie_pigman         |
| 58 | Enderman                  | 0.6               | 2.9                         | minecraft:enderman              |
| 59 | CaveSpider                | 0.7               | 0.5                         | minecraft:cave_spider           |
| 60 | Silverfish                | 0.4               | 0.3                         | minecraft:silverfish            |
| 61 | Blaze                     | 0.6               | 1.8                         | minecraft:blaze                 |
| 62 | LavaSlime (Magma<br>Cube) | 0.51000005 * size | 0.51000005 * size           | minecraft:magma_cube            |
| 63 | EnderDragon               | 16.0              | 8.0                         | minecraft:ender_dragon          |
| 64 | WitherBoss                | 0.9               | 3.5                         | minecraft:wither                |
| 65 | Bat                       | 0.5               | 0.9                         | minecraft:bat                   |
| 66 | Witch                     | 0.6               | 1.95                        | minecraft:witch                 |
| 67 | Endermite                 | 0.4               | 0.3                         | minecraft:endermite             |
| 68 | Guardian                  | 0.85              | 0.85                        | minecraft:guardian              |
| 69 | Shulker                   | 1.0               | 1.0-2.0 (depending on peek) | minecraft:shulker               |
| 90 | Pig                       | 0.9               | 0.9                         | minecraft:pig                   |
| 91 | Sheep                     | 0.9               | 1.3                         | minecraft:sheep                 |

| 92  | Cow                            | 0.9                           | 1.4  | minecraft:cow            |
|-----|--------------------------------|-------------------------------|------|--------------------------|
| 93  | Chicken                        | ken 0.4 0.7 minecraft:chicken |      | minecraft:chicken        |
| 94  | Squid                          | 0.8                           | 0.8  | minecraft:squid          |
| 95  | Wolf                           | 0.6                           | 0.85 | minecraft:wolf           |
| 96  | MushroomCow<br>(Mooshroom)     | 0.9                           | 1.4  | minecraft:mooshroom      |
| 97  | SnowMan                        | 0.7                           | 1.9  | minecraft:snowman        |
| 98  | Ozelot (Ocelot)                | 0.6                           | 0.7  | minecraft:ocelot         |
| 99  | VillagerGolem (Iron<br>Golem)  | 1.4                           | 2.7  | minecraft:villager_golem |
| 100 | Horse (EntityHorse until 1.11) | 1.3964844                     | 1.6  | minecraft:horse          |
| 101 | Rabbit                         | 0.4                           | 0.5  | minecraft:rabbit         |
| 102 | PolarBear                      | 1.3                           | 1.4  | minecraft:polar_bear     |
| 103 | Llama                          | 0.9                           | 1.87 | minecraft:llama          |
| 104 | LlamaSpit                      | 0.25                          | 0.25 | minecraft:llama_spit     |
| 105 | Parrot                         | 0.5                           | 0.9  | minecraft:parrot         |
| 120 | Villager                       | 0.6                           | 1.95 | minecraft:villager       |
| 200 | EnderCrystal                   | 2.0                           | 2.0  | minecraft:end_crystal    |

# **Objects**

Objects are spawned via Spawn Object. See Object Data for more details.

Object IDs and Entity IDs are different. Most objects also have an entity ID, but should only ever be spawned via <u>Spawn</u> Object.

| ID | Name  | bounding box x and z                | bounding box y                          |
|----|---|-------------------------------------|---|
| 1  | Boat  | 1.375                               | 0.6                                     |
| 2  | Item Stack (Slot)                                       | 0.25                                | 0.25                                    |
| 3  | Area Effect Cloud                                       | 2.0 * Radius                        | 0.5                                     |
| 10 | Minecart  | 0.98                                | 0.7                                     |
| 50 | Activated TNT   | 0.98                                | 0.98                                    |
| 51 | EnderCrystal  | 2.0                                 | 2.0                                     |
| 60 | Tipped arrow (projectile; also used for regular arrows) | 0.5                                 | 0.5                                     |
| 61 | Snowball (projectile)                                   | 0.25                                | 0.25                                    |
| 62 | Egg (projectile)  | 0.25                                | 0.25                                    |
| 63 | FireBall (ghast projectile)                             | 1.0                                 | 1.0                                     |
| 64 | FireCharge (blaze projectile)                           | 0.3125                              | 0.3125                                  |
| 65 | Thrown Enderpearl                                       | 0.25                                | 0.25                                    |
| 66 | Wither Skull (projectile)                               | 0.3125                              | 0.3125                                  |
| 67 | Shulker Bullet  | 0.3125                              | 0.3125                                  |
| 68 | Llama spit  | 0.25                                | 0.25                                    |
| 70 | Falling Objects   | 0.98                                | 0.98                                    |
| 71 | Item frames   | 0.75 or 0.0625                      | 0.75                                    |
| 72 | Eye of Ender  | 0.25                                | 0.25                                    |
| 73 | Thrown Potion   | 0.25                                | 0.25                                    |
| 75 | Thrown Exp Bottle                                       | 0.25                                | 0.25                                    |
| 76 | Firework Rocket   | 0.25                                | 0.25                                    |
| 77 | Leash Knot  | 0.375                               | 0.5                                     |
| 78 | ArmorStand  | normal: 0.5 marker: 0.0 small: 0.25 | normal: 1.975 marker: 0.0 small: 0.9875 |
| 79 | Evocation Fangs   | 0.5                                 | 0.8                                     |
| 90 | Fishing Hook  | 0.25                                | 0.25                                    |
| 91 | Spectral Arrow  | 0.5                                 | 0.5                                     |
| 93 | Dragon Fireball   | 1.0                                 | 1.0                                     |

Since release 1.6 (https://minecraft.wiki/w/1.6), all minecarts are spawned with object type 10 and their functionality is then specified in the Data field within the packet. Also, their visual appearance may be sent via the Entity Metadata packet.

# **Entity Metadata Format**

Note that entity metadata is a totally distinct concept from block metadata. It is not required to send all metadata fields, or even any metadata fields, so long as the terminating entry is correctly sent.

Entity Metadata is an array of entries, each of which looks like the following:

| Name  | Туре   | Meaning   |
|-------|--|---|
| Index | dex Unsigned Byte Unique index key determining the meaning of the following value, see the table bel this is 0xff then the it is the end of the Entity Metadata array and no more is read. |   |
| Туре  | Optional VarInt<br>Enum  | Only if Index is not 0xff; the type of the index, see the table below |
| Value | Optional value of Type   | Only if Index is not 0xff: the value of the metadata field            |

| Value of Type<br>field | Type of Value field                       | Notes  |
|------------------------|---|--|
| 0                      | Byte                                      |  |
| 1                      | VarInt                                    |  |
| 2                      | Float                                     |  |
| 3                      | String                                    |  |
| 4                      | Chat                                      |  |
| 5                      | Slot                                      |  |
| 6                      | Boolean                                   |  |
| 7                      | Rotation                                  | 3 floats: rotation on x, rotation on y, rotation on z        |
| 8                      | Position                                  |  |
| 9                      | OptPosition (Boolean + Optional Position) | Position is present if the Boolean is set to true            |
| 10                     | Direction (VarInt)                        | (Down = 0, Up = 1, North = 2, South = 3, West = 4, East = 5) |
| 11                     | OptUUID (Boolean + Optional UUID)         | UUID is present if the Boolean is set to true                |
| 12                     | OptBlockID (VarInt)                       | 0 for absent otherwise, id << 4   data                       |
| 13                     | NBT Tag                                   |  |

Entity classes also recursively inherit fields from classes they extend.

# **Entity**

The base class.

| Index | Туре    |             | Meaning  | Default |
|-------|---------|-------------|--|---------|
|       |         | Bit mask    | Meaning  |         |
|       |         | 0x01        | On Fire  |         |
|       |         | 0x02        | Crouched   |         |
|       |         | 0x04        | Unused (previously riding)                                       |         |
| 0     | Byte    | 0x08        | Sprinting  | 0       |
|       |         | 0x10        | Unused (previously eating/drinking/blocking; use hand state now) |         |
|       |         | 0x20        | Invisible  |         |
|       |         | 0x40        | Glowing effect   |         |
|       |         | 0x80        | Flying with elytra (https://minecraft.wiki/w/Elytra)             |         |
| 1     | VarInt  | Air         |  | 300     |
| 2     | String  | Custom na   | me   |         |
| 3     | Boolean | Is custom i | name visible   | false   |
| 4     | Boolean | Is silent   | ls silent  |         |
| 5     | Boolean | No gravity  |  | false   |

# **Projectile**

 $\underline{\text{Extends}}\ \underline{\text{Entity}}.$ 

No additional metadata.

## **Snowball**

 $\underline{\text{Projectile}}.$ 

No additional metadata.

# Egg

Extends Projectile.

No additional metadata.

## **Potion**

Extends Projectile.

| Index | Туре | Meaning                | Default |
|-------|------|------------------------|---------|
| 6     | Slot | Potion which is thrown | Empty   |

# **FallingBlock**

#### Extends Entity.

| Index | Type     | Meaning        | Default   |
|-------|----------|----------------|-----------|
| 6     | Position | spawn position | (0, 0, 0) |

## **AreaEffectCloud**

Extends Entity.

| Index | Type    | Meaning   | Default       |
|-------|---------|---|---------------|
| 6     | Float   | Radius  | 0.5           |
| 7     | VarInt  | Color (only for mob spell particle)                     | 0             |
| 8     | Boolean | Ignore radius and show effect as single point, not area | false         |
| 9     | VarInt  | Particle ID   | 15 (mobSpell) |
| 10    | VarInt  | Particle parameter 1                                    | 0             |
| 11    | VarInt  | Particle parameter 2                                    | 0             |

#### **FishingHook**

Extends Entity.

| Index | Туре   | Meaning   | Default |
|-------|--------|---|---------|
| 6     | VarInt | Hooked entity id + 1, or 0 if there is no hooked entity | 0       |

#### **Arrow**

Extends Entity.

Abstract base class for TippedArrow (which is used for regular arrows as well as tipped ones) and Spectral Arrow.

| Index  | Туре  | Mea         | Default |   |
|--------|-------|-------------|---------|---|
| 6      | D. 4- | Bit mask    | Meaning | 0 |
| 6 Byte | 0x01  | Is critical | U       |   |

## **TippedArrow**

Extends Arrow.

Used for both tipped and regular arrows. If not tipped, then color is set to -1 and no tipped arrow particles are used.

| Index | x Type Meaning |                             | Default |
|-------|----------------|-----------------------------|---------|
| 7     | VarInt         | Color (-1 for no particles) | -1      |

#### **Boat**

Extends Entity.

| Index | Type    | Meaning   | Default |
|-------|---------|---|---------|
| 6     | VarInt  | Time since last hit   | 0       |
| 7     | VarInt  | Forward direction   | 1       |
| 8     | Float   | Damage taken  | 0.0     |
| 9     | VarInt  | Type (0=oak, 1=spruce, 2=birch, 3=jungle, 4=acacia, 5=dark oak) | 0       |
| 10    | Boolean | Right paddle turning  | false   |
| 11    | Boolean | Left paddle turning   | false   |

# **EnderCrystal**

Extends Entity.

| Index | Туре        | Meaning     | Default |
|-------|-------------|-------------|---------|
| 6     | OptPosition | Beam target | Absent  |
| 7     | Boolean     | Show bottom | true    |

#### **Fireball**

 $\underline{\text{Extends}}\ \underline{\text{Entity}}.$ 

No additional metadata.

#### WitherSkull

Extends Fireball.

| Index | Type    | Meaning      | Default |
|-------|---------|--------------|---------|
| 6     | Boolean | Invulnerable | false   |

## **Fireworks**

 $\underline{\text{Extends}}\ \underline{\text{Entity}}.$ 

| Index | Type   | Meaning   |       |
|-------|--------|---|-------|
| 6     | Slot   | Firework info   | empty |
| 7     | VarInt | Entity ID of entity which used firework (for elytra boosting) | 0     |

# Hanging

Extends  $\underline{\text{Entity}}.$ 

No additional metadata.

#### **ItemFrame**

Extends Hanging.

| Index | Туре   | Meaning  | Default |
|-------|--------|----------|---------|
| 6     | Slot   | Item     | Empty   |
| 7     | VarInt | Rotation | 0       |

#### Item

Extends Entity.

| Index | Туре | Meaning | Default |
|-------|------|---------|---------|
| 6     | Slot | Item    | Empty   |

# Living

 $\underline{\text{Extends}}\ \underline{\text{Entity}}.$ 

| Index | Туре    | Meaning   |  |     |
|-------|---------|---|--|-----|
|       | Byte    | Hand states, used to trigger blocking/eating/drinking animation.  |  |     |
| 6     |         | Bit mask  | Meaning                                  |     |
| 6     |         | 0x01  | Is hand active                           | 0   |
|       |         | 0x02  | Active hand (0 = main hand, 1 = offhand) |     |
| 7     | Float   | Health  |  | 1.0 |
| 8     | VarInt  | Potion effect color (   | or 0 if there is no effect)              | 0   |
| 9     | Boolean | Is potion effect ambient: reduces the number of particles generated by potions to 1/5 the normal amount |  |     |
| 10    | VarInt  | Number of arrows in entity  |  |     |

## **Player**

Extends Living.

| Index | Type    |  | Meaning   | Default |
|-------|---------|--|---|---------|
| 11    | Float   | Additional Hearts                                |   | 0.0     |
| 12    | VarInt  | Score  |   | 0       |
|       |         | The Displayed Skin                               | Parts bit mask that is sent in Client Settings    |         |
|       |         | Bit mask   | Meaning   |         |
|       |         | 0x01   | Cape enabled                                      |         |
|       |         | 0x02   | Jacket enabled                                    | 0       |
| 10    | Byte    | 0x04   | Left sleeve enabled                               |         |
| 13    |         | 0x08   | Right sleeve enabled                              |         |
|       |         | 0x10   | Left pants leg enabled                            |         |
|       |         | 0x20   | Right pants leg enabled                           |         |
|       |         | 0x40   | Hat enabled                                       |         |
|       |         | 0x80   | Unused  |         |
| 14    | Byte    | Main hand (0 : Left, 1 : Right)                  |   | 1       |
| 15    | NBT Tag | Left shoulder entity data (for occupying parrot) |   | Empty   |
| 16    | NBT Tag | Right shoulder entit                             | Right shoulder entity data (for occupying parrot) |         |

#### **ArmorStand**

Extends Living.

| Index | Type     | Meaning            |              | Default             |
|-------|----------|--------------------|--------------|---------------------|
|       |          | Bit mask           | Meaning      |                     |
|       |          | 0x01               | is Small     |                     |
| 11    | Byte     | 0x04               | has Arms     | 0                   |
|       |          | 0x08               | no BasePlate |                     |
|       |          | 0x10               | set Marker   |                     |
| 12    | Rotation | Head rotation      |              | (0.0, 0.0, 0.0)     |
| 13    | Rotation | Body rotation      |              | (0.0, 0.0, 0.0)     |
| 14    | Rotation | Left arm rotation  |              | (-10.0, 0.0, -10.0) |
| 15    | Rotation | Right arm rotation |              | (-15.0, 0.0, 10.0)  |
| 16    | Rotation | Left leg rotation  |              | (-1.0, 0.0, -1.0)   |
| 17    | Rotation | Right leg rotation |              | (1.0, 0.0, 1.0)     |

Note that armor stands with the <u>invisible flag from the base entity class</u> set also cannot be attacked or damaged, except for by the void.

#### Insentient

#### Extends Living.

| Index | Туре | Mo       | Default     |   |
|-------|------|----------|-------------|---|
|       |      | Bit mask | Meaning     |   |
| 11    | Byte | 0x01     | NoAl        | 0 |
|       |      | 0x02     | Left handed |   |

#### **Ambient**

Extends Insentient.

No additional metadata.

#### **Bat**

Extends Ambient.

| Index | Туре | Me       | Default    |   |
|-------|------|----------|------------|---|
| 12    | Pyto | Bit mask | Meaning    | 0 |
| 12    | Byte | 0x01     | Is hanging | U |

#### WaterMob

Extends Insentient.

No additional metadata.

## **Squid**

Extends WaterMob

No additional metadata.

#### Creature

Extends Insentient.

No additional metadata.

## **Ageable**

Extends Creature.

| Index | Type    | Meaning | Default |
|-------|---------|---------|---------|
| 12    | Boolean | Is baby | false   |

#### **Animal**

Extends Ageable.

No additional metadata.

#### **AbstractHorse**

Extends Animal.

| Index | Туре    |          | Meaning                   | Default |
|-------|---------|----------|---------------------------|---------|
|       |         | Bit mask | Meaning                   |         |
|       |         | 0x01     | Unused                    |         |
|       |         | 0x02     | Is Tame                   |         |
|       |         | 0x04     | Is saddled                |         |
| 13    | Byte    | 0x08     | Has bred                  | 0       |
|       |         | 0x10     | Is eating                 |         |
|       |         | 0x20     | Is rearing (on hind legs) |         |
|       |         | 0x40     | Is mouth open             |         |
|       |         | 0x80     | Unused                    |         |
| 14    | OptUUID | Owner    |                           | Absent  |

#### Horse

Extends AbstractHorse.

| Index | Туре   | Meaning                                       | Default  |
|-------|--------|---|----------|
| 15    | VarInt | Variant (Color & Style)                       | 0        |
| 16    | VarInt | Armor (0: none, 1: iron, 2: gold, 3: diamond) | 0 (none) |
| 17    | Slot   | Armor Item (Forge only)                       | Empty    |

#### **ZombieHorse**

Extends AbstractHorse.

## **SkeletonHorse**

Extends AbstractHorse.

#### ChestedHorse

Extends AbstractHorse.

| Index | Туре    | Meaning   | Default |
|-------|---------|-----------|---------|
| 15    | Boolean | Has Chest | false   |

## **Donkey**

Extends ChestedHorse.

#### Llama

Extends ChestedHorse.

| Index | Туре   | Meaning   | Default |
|-------|--------|---|---------|
| 16    | VarInt | Strength (number of columns of 3 slots in the llama's inventory once a chest is equipped) | 0       |
| 17    | VarInt | Carpet color (a dye color, or -1 if no carpet equipped)                                   | -1      |
| 18    | VarInt | Variant (0: llama_creamy.png, 1: llama_white.png, 2: llama_brown.png, 3: llama_gray.png)  | 0       |

#### Mule

Extends ChestedHorse.

#### Pig

Extends Animal.

| Index | Type    | Meaning  | Default |
|-------|---------|--|---------|
| 13    | Boolean | Has saddle   | false   |
| 14    | VarInt  | Total time to "boost" with a carrot on a stick for | 0       |

Whenever a carrot on a stick is used, if the pig is not currently boosting it will start to boost for 140 to 980 (inclusive) ticks. When boost time is changed, a counter is reset which counts up to the boost time, after which boosting will stop. The value remains set at its modified value even after boosting is stopped.

#### **Rabbit**

Extends Animal.

| Index | Туре   | Meaning | Default |
|-------|--------|---------|---------|
| 13    | VarInt | Туре    | 0       |

#### **Polar Bear**

Extends Animal.

| Index | Туре    | Meaning     | Default |
|-------|---------|-------------|---------|
| 13    | Boolean | Standing up | false   |

# Sheep

Extends Animal.

| Index | Туре |             | Meaning  |   |  |
|-------|------|-------------|--|---|--|
|       |      | Bit<br>mask | Meaning  |   |  |
| 13    | Byte | 0x0F        | Color (matches dye damage values (https://minecraft.wiki/w/Data_values%23D yes)) | 0 |  |
|       |      | 0x10        | Is sheared   |   |  |

#### **TameableAnimal**

Extends Animal.

| Index | Туре    |          | Meaning                          |        |  |
|-------|---------|----------|----------------------------------|--------|--|
|       |         | Bit mask | Meaning                          |        |  |
| 10    | Duta    | 0x01     | Is sitting                       | 0      |  |
| 13    | Byte    | 0x02     | Is angry (only used with wolves) | 0      |  |
|       |         | 0x04     | Is tamed                         |        |  |
| 14    | OptUUID | Owner    |                                  | Absent |  |

## **Ocelot**

Extends TameableAnimal.

| Index | Туре   | Meaning   | Default |
|-------|--------|---|---------|
| 15    | VarInt | Type (0 = untamed, 1 = tuxedo, 2 = tabby, 3 = siamese). Used to render regardless as to whether it is tamed or not. | 0       |

## Wolf

Extends TameableAnimal.

| Index | Type    | Meaning  | Default                     |
|-------|---------|--|-----------------------------|
| 15    | Float   | Damage taken (used for tail rotation)  | Value of health field (1.0) |
| 16    | Boolean | Is begging   | false                       |
| 17    | VarInt  | Collar color (values are those used with dyes (https://minecraft.wiki/w/Data_values%23Dyes)) | 14 (Red)                    |

## **Parrot**

Extends TameableAnimal.

| Index | Туре   | Meaning   | Default |
|-------|--------|---|---------|
| 15    | VarInt | Variant (0: red/blue, 1: blue, 2: green, 3: yellow/blue, 4: silver) | 0       |

# Villager

Extends Ageable.

| Index | Туре   | Meaning   | Default |
|-------|--------|---|---------|
| 13    | VarInt | Profession (Farmer = 0, Librarian = 1, Priest = 2, Blacksmith = 3, Butcher = 4, Nitwit = 5) | 0       |

#### Golem

Extends Creature.

No additional metadata.

#### IronGolem

Extends Golem.

| Index | Туре |          | Meaning           | Default |
|-------|------|----------|-------------------|---------|
| 12    | Byte | Bit mask | Meaning           | 0       |
| 12    |      | 0x01     | Is player-created |         |

#### **Snowman**

Extends Golem.

| Index | Туре | Meaning  |                    | Default |
|-------|------|----------|--------------------|---------|
|       |      | Bit mask | Meaning            |         |
| 12    | Byte | 0x10     | has pumpkin hat    | 0x10    |
|       |      | 0x00     | has no pumpkin hat |         |

## Shulker

Extends Golem.

| Index | Туре        | Meaning             | Default     |
|-------|-------------|---------------------|-------------|
| 12    | Direction   | Facing direction    | Down (0)    |
| 13    | OptPosition | Attachment position | Absent      |
| 14    | Byte        | Shield height       | 0           |
| 15    | Byte        | Color (dye color)   | 10 (purple) |

#### **Monster**

Extends Creature.

No additional metadata.

#### **Blaze**

Extends Monster.

| Index | Туре | Mea      | ning       | Default |
|-------|------|----------|------------|---------|
| 10    | Byte | Bit mask | Meaning    | 0       |
| 12    |      | 0x01     | Is on fire | 0       |

# Creeper

Extends Monster.

| Index | Type    | Meaning  | Default |
|-------|---------|--|---------|
| 12    | VarInt  | State (-1 = idle, 1 = fuse)                                      | -1      |
| 13    | Boolean | Is charged (https://minecraft.wiki/w/Creeper%23Charged_Creepers) | false   |
| 14    | Boolean | Is ignited   | false   |

# **Endermite**

Extends Monster.

No additional metadata.

## **Giant Zombie**

Extends Monster.

No additional metadata.

#### Guardian

Extends Monster.

| Index | Type    | pe Meaning           |       |
|-------|---------|----------------------|-------|
| 12    | Boolean | Is retracting spikes | false |
| 13    | VarInt  | Target EID           | 0     |

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Plays the guardian sound effect from this entity.

#### ElderGuardian

Extends Guardian.

## Silverfish

Extends Monster.

No additional metadata.

## **Abstract Illager**

Extends Monster.

| Index | Туре | Meaning  |                               | Default |
|-------|------|----------|-------------------------------|---------|
| 12    | Puto | Bit mask | Meaning                       | 0       |
| 12    | Byte | 0x01     | Has target (aggressive state) | 0       |

## VindicationIllager

Extends Abstract Illager.

## Spellcaster Illager

Extends Abstract Illlager.

| Index | Туре | Meaning  | Default |
|-------|------|--|---------|
| 13    | Byte | Spell (0: none, 1: summon vex, 2: attack, 3: wololo) | 0       |

## **EvocationIllager**

Extends Spellcaster Illager.

## IllusionIllager

Extends Spellcaster Illager.

#### Vex

Extends Monster.

| Index | Туре |          | Meaning           |   |
|-------|------|----------|-------------------|---|
| 12    | Byte | Bit mask | Meaning           | 0 |
| 12    |      | 0x01     | Is in attack mode | 0 |

## **EvocationFangs**

 $\underline{\text{Extends}}\ \underline{\text{Entity}}.$ 

No additional metadata.

#### **AbstractSkeleton**

Extends Monster.

| Index | Туре    | Meaning          | Default |
|-------|---------|------------------|---------|
| 12    | Boolean | Is swinging arms | false   |

#### **Skeleton**

Extends AbstractSkeleton.

#### Wither Skeleton

Extends AbstractSkeleton.

## **Stray**

Extends AbstractSkeleton.

## **Spider**

#### Extends Monster.

| Index   | Туре | Me       | Default     |   |
|---------|------|----------|-------------|---|
| 12 Byte | Duto | Bit mask | Meaning     | 0 |
|         |      | 0x01     | Is climbing | 0 |

#### Witch

#### $Extends\ \underline{Monster}.$

| Index | Туре    | Meaning            | Default |
|-------|---------|--------------------|---------|
| 12    | Boolean | Is drinking potion | false   |

#### Wither

#### Extends Monster.

| Index | Туре   | Meaning   | Default |
|-------|--------|---|---------|
| 12    | VarInt | Center head's target (entity ID, or 0 if no target)   | 0       |
| 13    | VarInt | Left(?) head's target (entity ID, or 0 if no target)  | 0       |
| 14    | VarInt | Right(?) head's target (entity ID, or 0 if no target) | 0       |
| 15    | VarInt | Invulnerable time                                     | 0       |

## **Z**ombie

Extends Monster.

| Index | Туре    | Meaning                  | Default |
|-------|---------|--------------------------|---------|
| 12    | Boolean | Is baby                  | false   |
| 13    | VarInt  | Unused (previously type) | 0       |
| 14    | Boolean | Are hands held up        | false   |

# **Zombie Villager**

Extends Zombie.

| Index | Type    | Meaning       | Default |
|-------|---------|---------------|---------|
| 15    | Boolean | Is converting | false   |
| 16    | VarInt  | Profession    | 0       |

## Husk

Extends Zombie.

#### **Enderman**

Extends Monster.

| Index | Туре        | Meaning       | Default |
|-------|-------------|---------------|---------|
| 12    | Opt BlockID | Carried block | Absent  |
| 13    | Boolean     | Is screaming  | false   |

#### **EnderDragon**

Extends Insentient.

| Index | Type   | Meaning      | Default    |
|-------|--------|--------------|------------|
| 12    | VarInt | Dragon phase | 10 (hover) |

Phases (according to the wiki page on dragon data values (https://minecraft.wiki/w/Ender\_Dragon%23Data\_values)) are:

- 0: circling
- 1: strafing (preparing to shoot a fireball)
- 2: flying to the portal to land (part of transition to landed state)
- 3: landing on the portal (part of transition to landed state)
- 4: taking off from the portal (part of transition out of landed state)
- 5: landed, performing breath attack
- 6: landed, looking for a player for breath attack
- 7: landed, roar before beginning breath attack
- 8: charging player
- 9: flying to portal to die
- 10: hovering with no AI (default when using the /summon command).

### **Flying**

Extends Insentient.

No additional metadata.

#### **Ghast**

Extends Flying.

| Index | Type    | Meaning      | Default |
|-------|---------|--------------|---------|
| 12    | Boolean | Is attacking | false   |

#### Slime

Extends Insentient.

| Index | Туре   | Meaning | Default |
|-------|--------|---------|---------|
| 12    | VarInt | Size    | 1       |

#### LlamaSpit

Extends Entity.

#### **Minecart**

Extends Entity.

| Index | Type    | Meaning                                       | Default |
|-------|---------|---|---------|
| 6     | VarInt  | Shaking power                                 | 0       |
| 7     | VarInt  | Shaking direction                             | 1       |
| 8     | Float   | Shaking multiplier                            | 0.0     |
| 9     | VarInt  | Custom block ID and damage                    | 0       |
| 10    | VarInt  | Custom block Y position (in 16ths of a block) | 6       |
| 11    | Boolean | Show custom block                             | false   |

If show custom block is false, then each type of Minecart will render its own type of block with its own properties. Note that one does *not* need to send these values for the metadata fields, as the client will automatically select them if show custom block is false. They are only provided for reference to help with swapping out other blocks.

- Rideable Minecarts contain air (0:0) and have a y position of 6
- Chest Minecarts contain chests facing north (54:0) and have a y position of 8
- Furnace Minecarts contain a normal furnace facing north when unpowered (61:0) and a lit furnace facing north when powered (62:0) and have a y position of 6 in both cases
- Hopper Minecarts contain a hopper (154:0) and have a y position of 1
- TNT Minecarts contain TNT (46:0) and have a y position of 6
- Command block minecarts contain a Command Block (137:0) and have a y position of 6
- Spawner Minecarts contain a spawner (52:0) and have a y position of 6

#### **MinecartRideable**

Extends Minecart.

No additional metadata.

#### **MinecartContainer**

Extends Minecart.

No additional metadata.

### MinecartHopper

Extends MinecartContainer.

No additional metadata.

#### **MinecartChest**

Extends MinecartContainer.

No additional metadata.

#### **MinecartFurnace**

Extends Minecart.

| Index | Type    | Meaning    | Default |
|-------|---------|------------|---------|
| 12    | Boolean | Is powered | false   |

#### **MinecartTNT**

Extends Minecart.

No additional metadata.

### MinecartSpawner

Extends Minecart.

No additional metadata.

## MinecartCommandBlock

Extends Minecart.

| Index | Туре   | Meaning     | Default     |
|-------|--------|-------------|-------------|
| 12    | String | Command     |             |
| 13    | Chat   | Last output | {"text":""} |

#### **TNTPrimed**

Extends Entity.

| Index | Туре   | Meaning   | Default |
|-------|--------|-----------|---------|
| 6     | VarInt | Fuse time | 80      |

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