

WatchWolf API Definition

WatchWolf Contributors

Keywords: *WatchWolf*; Minecraft plugin testing; Integration testing environment.

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1 Documentation conventions

1.1 Acronyms

MC Minecraft. 13, 105

1.2 Glossary

ASCII American Standard Code for Information Interchange. Is a 8-bit code where each individual bit represents a unique character. *ASCII table* (n.d.). 16

async Asynchronous; returned non-sequentially. 16, 105

IEEE 754 IEEE Standard for Floating-Point Arithmetic (IEEE 754) is a standard for computing floating-points operations. For more details about it check Rajaraman (2016). 17

Least significant bit The Least significant bit is the bit with the lowest index number. 7, 15, 17

Most significant bit The Most significant bit is the bit with the higher index number. 15, 106

Multidimensional array Array of arrays. 18

NOP No OPeration. It represents a valid operation that means 'do nothing'. 16

2 WatchWolf Introduction

WatchWolf is an integration testing environment for Minecraft plugins. It will validate that your plugin works using multiple real MC servers of different types and versions.

In order to achieve that, WatchWolf splits into 4 different programs, each one with one responsibility:

1. WatchWolf Tester

WatchWolf Tester is the entry point to the WatchWolf environment.¹ It will orchestrate all the setup/stop process and run the user tests.

2. WatchWolf Servers Manager

WatchWolf Servers Manager provides MC servers on-demand. It will start them and, after they have been closed, free the allocated resources.

3. WatchWolf Server

WatchWolf Server is the actual MC server. It will contain the plugin to test and run the commands sent by WatchWolf Tester.

4. WatchWolf Clients Manager

WatchWolf Clients Manager is the same as WatchWolf Servers Manager, but for clients. It will start clients on-demand and connect them to the servers allocated by WatchWolf.

5. WatchWolf Client

WatchWolf Client is a MC client, with the ability to connect to one server and interact with it.

You can see with more detail how the different programs relations on the Figure 2.1, Diagram representing WatchWolf's most important actuators.

¹The WatchWolf environment is the combination of all the WatchWolf parts: Tester, Servers Manager, Server, Clients Manager and Client.

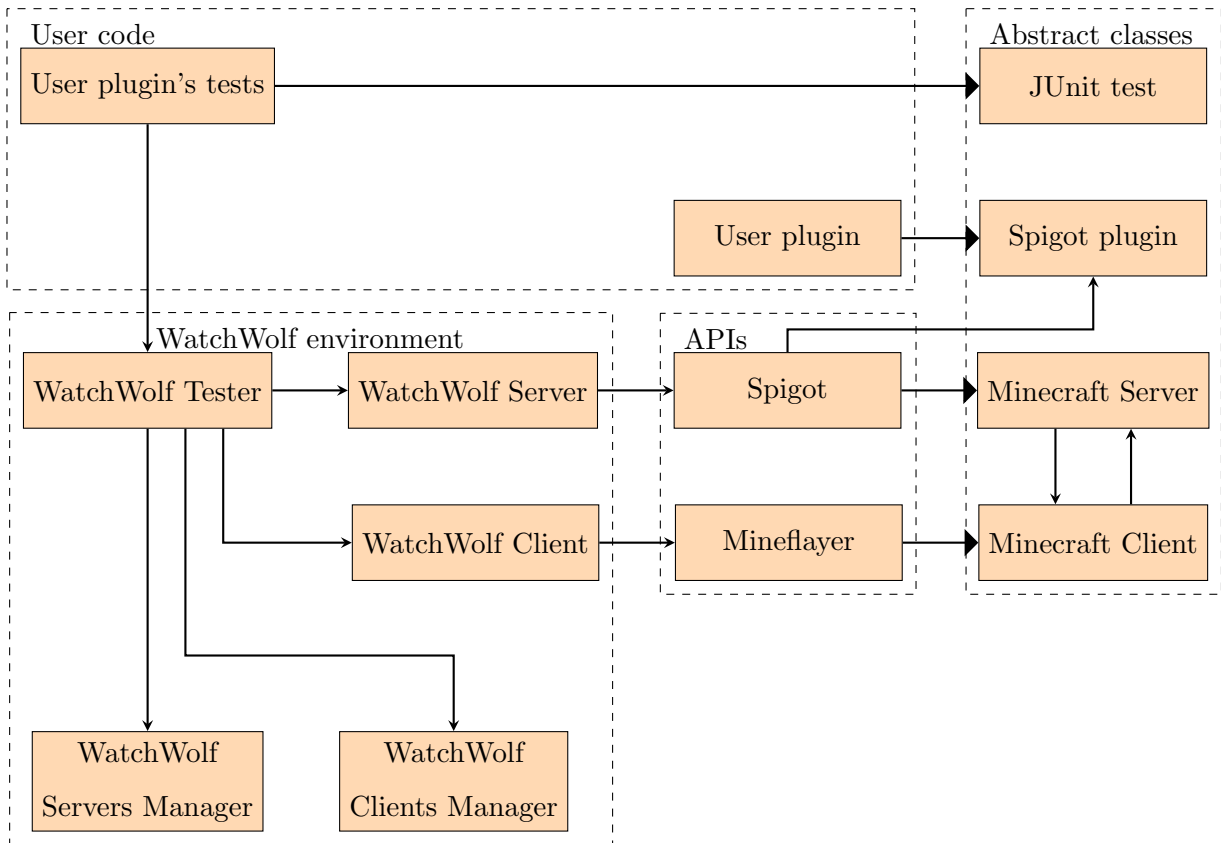


Figure 2.1: Diagram representing WatchWolf's most important actuators

3 API Introduction

In order to interact with the different WatchWolf modules, you'll have to follow the WatchWolf API: a series of supported operations in one program. All the packets sent & received will follow the structure shown in Figure 3.1, Packet structure.

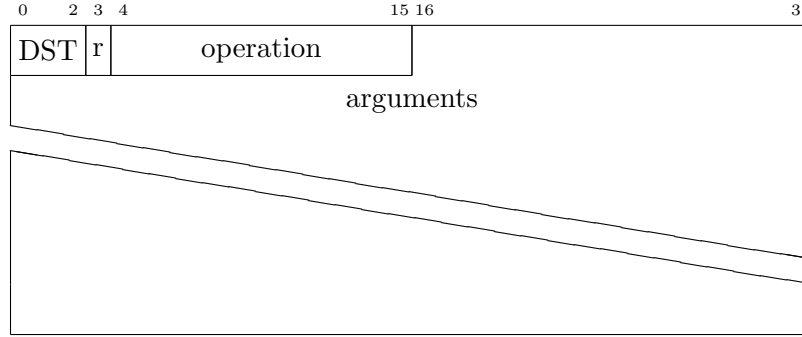


Figure 3.1: Packet structure

As a general rule, both MSB and LSB are preserved. This means that in a 2-bytes packet, the first part (0..7) will be the MSB, and the last (8..15) MSB.

3.1 Destiny

The first argument (*DST*) will be the destiny of that packet. This will specify one of the 4 modules connected to WatchWolf Tester (for more information refer to Section 2, WatchWolf Introduction). Note that WatchWolf Tester itself is not present, as it will be indicated with the Response bit at 1. You can see the different *DST* values for each module on the Figure 3.1, DST bits meaning.

DST[2]	DST[1]	DST[0]	Destination
0	0	0	ServerManagerPetition
0	0	1	ServerPetition
0	1	0	ClientsManagerPetition
0	1	1	ClientPetition
1	X	X	<i>Reserved</i>

Table 3.1: DST bits meaning

3.2 Response

Some of the petitions have return objects. Those petitions will return to the sender (Tester-Connector) with the same code, but with a '1' on the Response parameter. In that case, the parameter Destiny now means 'Origin'.

Some petitions have async "returns" (e.g. Error notification). Those will be sent directly marked as responses (Response bit at '1').

3.3 Operation

The Operation parameter specifies the desired request. Those change according to the Destiny, so they will be discussed in more detail in their respective sections.

The only exception is the all-zeroes operation (0b000000000000) which represents a NOP request. That way, if you need to perform a long test, you won't be kicked by inactivity² if you send this request every few minutes.

3.4 Arguments

The Arguments parameter specifies the arguments (if any) to the *Operation* request. Those change according to the Destiny, so the amount of arguments, and their types and order will be discussed in more detail in their respective sections.

Now there will be discussed the most common data types, so they will be independent of any programming language.

3.4.1 Character

Characters are sent as a 1-byte integer, representing its ASCII value.

3.4.2 Boolean

Booleans are 1-bit element that represents *true* (0b1), or *false* (0b0).

²This is a safety mechanism to avoid blocking a server to the same user forever. Besides being defined by the API it hasn't been implemented yet, and won't be until WatchWolf offers public servers.

For alignment reasons,³ booleans will be sent as 1-byte element. To avoid misunderstandings, let's define *false* as 0x00, and *true* as '*not false*'. That way, both figures 3.2 and 3.3 are valid *true* elements.

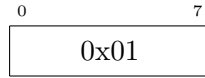


Figure 3.2: True packet with the LSB at 1

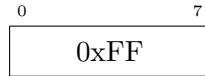


Figure 3.3: True packet with all bits at 1

3.4.3 Double

Doubles are 8-bytes floating-point numbers. They are represented following the IEEE 754⁴.

3.4.4 String

Strings are arrays of characters. Refer to the respective subsections for more information.

3.4.5 Array

Arrays are a set of n elements of the same type.

The structure is a 2-byte integer (representing the number of elements, n), followed by n elements of the same type. As a note here, by representing the size with a 2-byte integer the maximum number of elements per array is 65,535.

³In order to make the read/write more easy, we want to stick with (at least) 8 bits blocks.

⁴This standard is the one used by C and Java. **Cite needed here**

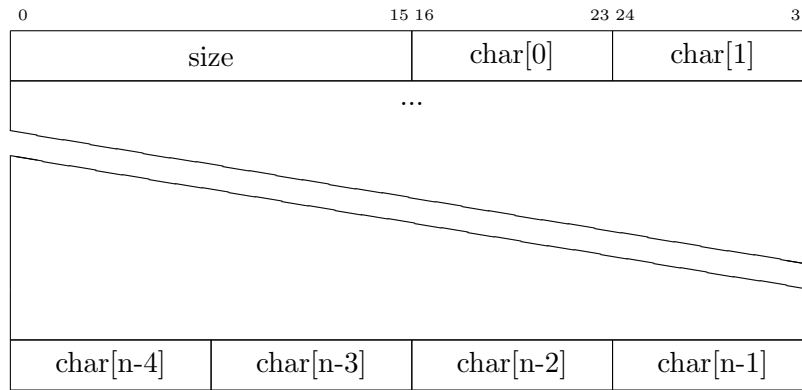


Figure 3.4: Structure of a String

Arrays can be multidimensional, holding n arrays of the same type. It's worth mentioning that they don't have to be arrays of the same length, as can be seen in Figure 3.5, Example of a string array.

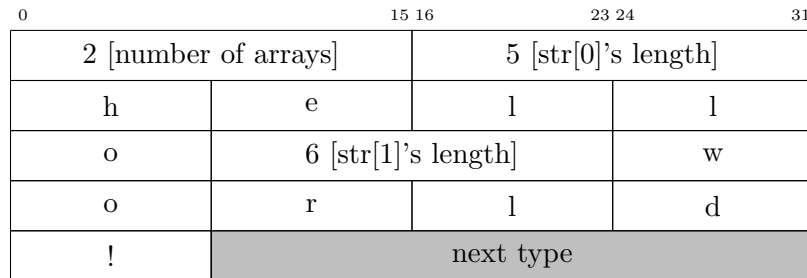


Figure 3.5: Example of a string array

3.4.6 File

Similar to the Array, a File is a name (String), followed by a group of bytes.

The problem here is that if we stick with the Array structure, the maximum size of a file will be around 8kB. To solve this, the File structure implements some kind of 'extended array', that extends the 'size' parameter to 32 bits. That way, the file size restriction by protocol definition⁵ is 4GB.

⁵Besides defining here what's allowed, remember that this packet will be inside a TCP payload. This means that the maximum file size will be probably redefined by the machine's TCP firewalls.

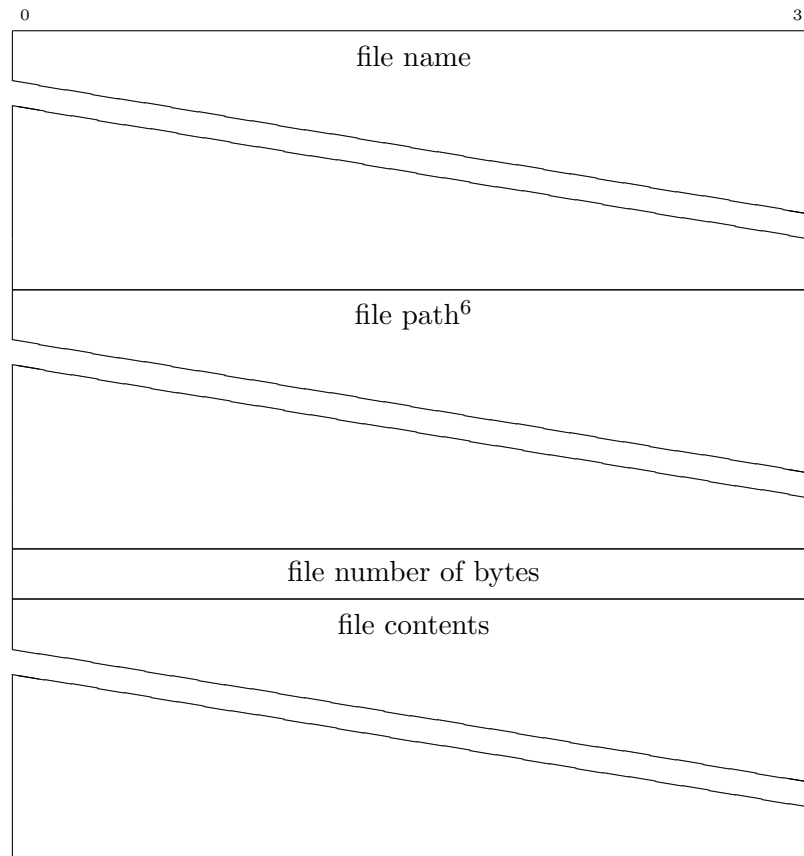


Figure 3.6: File structure

3.4.7 Server type

The Server type specifies the Minecraft server.

As a standard, we only support Spigot (*Spigot* (n.d.)) and Paper (*PaperMC* (n.d.)), but for scalability reasons this parameter is a String specifying the server type.

3.4.8 Position

One position represents a point in space (world & x-y-z). It can be used to find entities or blocks.

⁶The path must be relative, and you can't go outside the Server directory (using '..'). Both " and './' means the root of the Server directory.

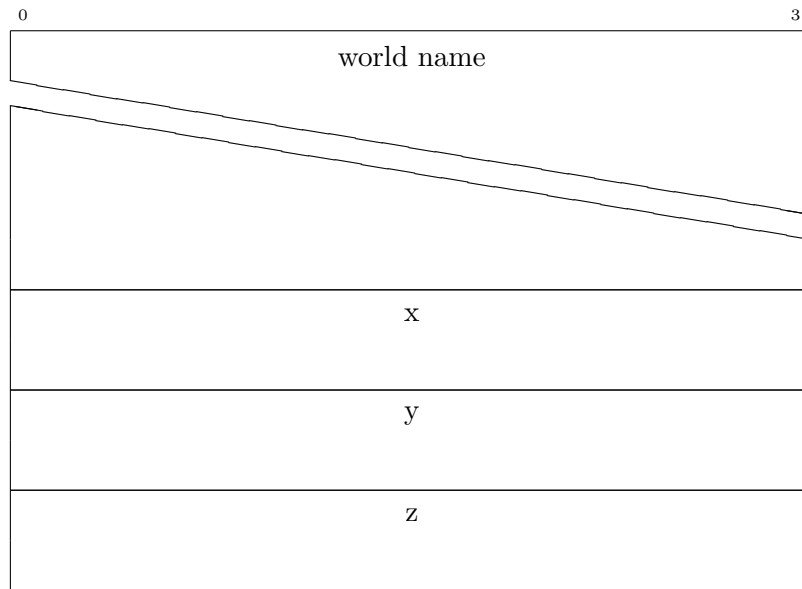


Figure 3.7: Position structure

3.4.9 Block

A block is a 56 bytes argument giving information about its type and (if applicable) properties.

For more information about block properties refer to Appendix A, Blocks.

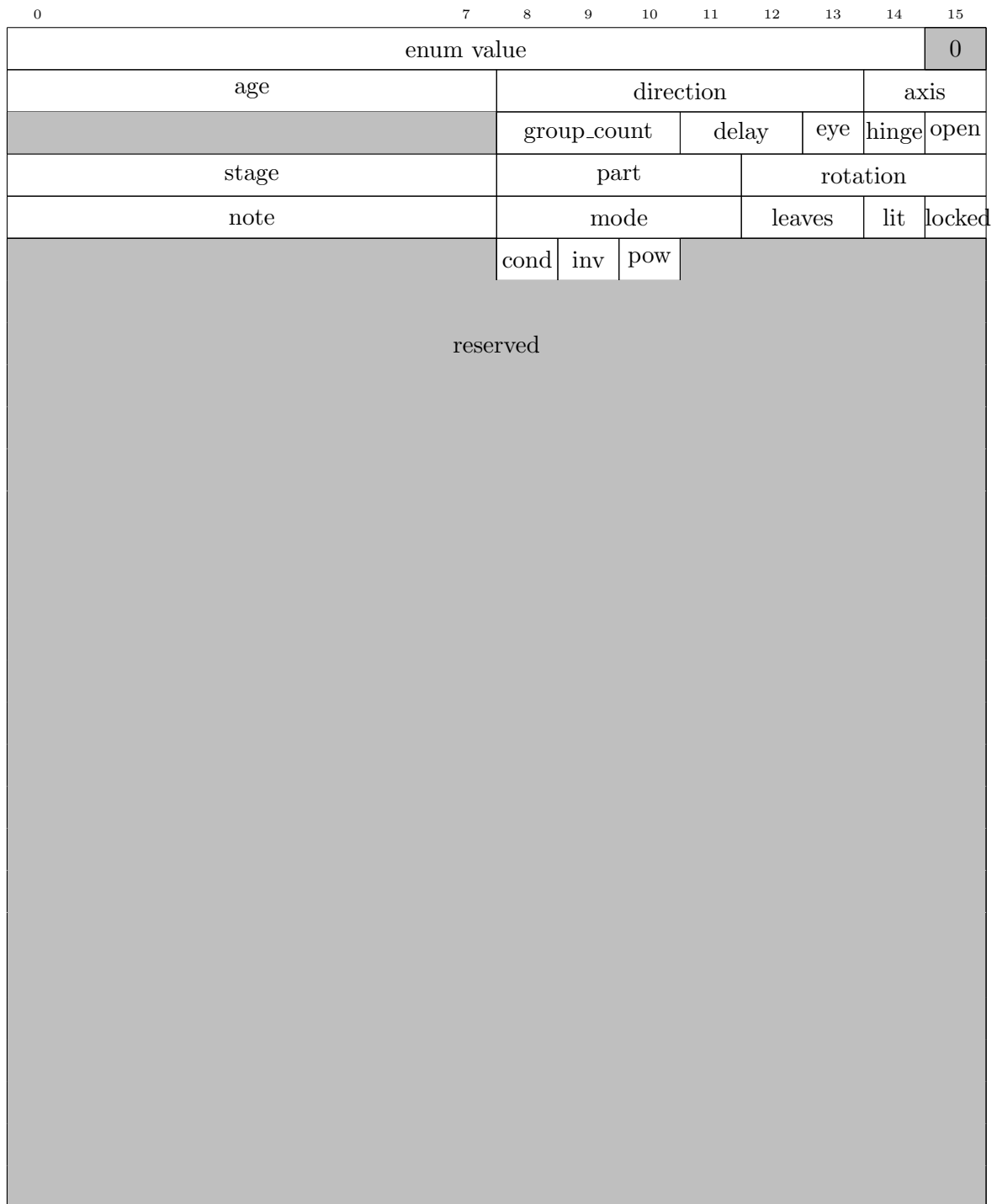





















































Figure 3.8: Structure of a Block





























Enum value	Block name	First Minecraft version
0	AIR	1.8
1	STONE	2
2	GRANITE	2
3	POLISHED_GRANITE	2
4	DIORITE	2
5	POLISHED_DIORITE	2
6	ANDESITE	2
7	POLISHED_ANDESITE	2
8	DEEPSLATE	2
9	COBBLED_DEEPSLATE	2
10	POLISHED_DEEPSLATE	2
11	CALCITE	2
12	TUFF	2
13	DRIPSTONE_BLOCK	2
14	GRASS_BLOCK	2
15	DIRT	2
16	COARSE_DIRT	2
17	PODZOL	2
18	ROOTED_DIRT	2
19	MUD	2
20	CRIMSON_NYLIUM	2
21	WARPED_NYLIUM	2
22	COBBLESTONE	2
23	OAK_PLANKS	2
24	SPRUCE_PLANKS	2
25	BIRCH_PLANKS	2
26	JUNGLE_PLANKS	2
27	ACACIA_PLANKS	2
28	DARK_OAK_PLANKS	2
29	MANGROVE_PLANKS	2

Enum value	Block name	First Minecraft version
30	CRIMSON_PLANKS	2.0
31	WARPED_PLANKS	2.0
32	OAK_SAPLING	1.0
33	SPRUCE_SAPLING	2.0
34	BIRCH_SAPLING	2.0
35	JUNGLE_SAPLING	2.0
36	ACACIA_SAPLING	2.0
37	DARK_OAK_SAPLING	2.0
38	MANGROVE_PROPAGULE	2.0
39	BEDROCK	2.0
40	SAND	2.0
41	RED_SAND	2.0
42	GRAVEL	2.0
43	COAL_ORE	2.0
44	DEEPSLATE_COAL_ORE	2.0
45	IRON_ORE	2.0
46	DEEPSLATE_IRON_ORE	2.0
47	COPPER_ORE	2.0
48	DEEPSLATE_COPPER_ORE	2.0
49	GOLD_ORE	2.0
50	DEEPSLATE_GOLD_ORE	2.0
51	REDSTONE_ORE	2.0
52	DEEPSLATE_REDSTONE_ORE	2.0
53	EMERALD_ORE	2.0
54	DEEPSLATE_EMERALD_ORE	2.0
55	LAPIS_ORE	2.0
56	DEEPSLATE_LAPIS_ORE	2.0
57	DIAMOND_ORE	2.0
58	DEEPSLATE_DIAMOND_ORE	2.0
59	NETHER_GOLD_ORE	2.0




Enum value	Block name	First Minecraft version
60	NETHER_QUARTZ_ORE	
61	ANCIENT_DEBRIS	
62	COAL_BLOCK	
63	RAW_IRON_BLOCK	
64	RAW_COPPER_BLOCK	
65	RAW_GOLD_BLOCK	
66	AMETHYST_BLOCK	
67	BUDDING_AMETHYST	
68	IRON_BLOCK	
69	COPPER_BLOCK	
70	GOLD_BLOCK	
71	DIAMOND_BLOCK	
72	NETHERITE_BLOCK	
73	EXPOSED_COPPER	
74	WEATHERED_COPPER	
75	OXIDIZED_COPPER	
76	CUT_COPPER	
77	EXPOSED_CUT_COPPER	
78	WEATHERED_CUT_COPPER	
79	OXIDIZED_CUT_COPPER	
80	CUT_COPPER_STAIRS	
81	EXPOSED_CUT_COPPER_STAIRS	
82	WEATHERED_CUT_COPPER_STAIRS	
83	OXIDIZED_CUT_COPPER_STAIRS	
84	CUT_COPPER_SLAB	
85	EXPOSED_CUT_COPPER_SLAB	
86	WEATHERED_CUT_COPPER_SLAB	
87	OXIDIZED_CUT_COPPER_SLAB	
88	WAXED_COPPER_BLOCK	
89	WAXED_EXPOSED_COPPER	

Enum value	Block name	First Minecraft version
90	WAXED_WEATHERED_COPPER	
91	WAXED_OXIDIZED_COPPER	
92	WAXED_CUT_COPPER	
93	WAXED_EXPOSED_CUT_COPPER	
94	WAXED_WEATHERED_CUT_COPPER	
95	WAXED_OXIDIZED_CUT_COPPER	
96	WAXED_CUT_COPPER_STAIRS	
97	WAXED_EXPOSED_CUT_COPPER_STAIRS	
98	WAXED_WEATHERED_CUT_COPPER_STAIRS	
99	WAXED_OXIDIZED_CUT_COPPER_STAIRS	
100	WAXED_CUT_COPPER_SLAB	
101	WAXED_EXPOSED_CUT_COPPER_SLAB	
102	WAXED_WEATHERED_CUT_COPPER_SLAB	
103	WAXED_OXIDIZED_CUT_COPPER_SLAB	
104	OAK_LOG	
105	SPRUCE_LOG	
106	BIRCH_LOG	
107	JUNGLE_LOG	
108	ACACIA_LOG	
109	DARK_OAK_LOG	
110	MANGROVE_LOG	
111	MANGROVE_ROOTS	
112	MUDDY_MANGROVE_ROOTS	
113	CRIMSON_STEM	
114	WARPED_STEM	
115	STRIPPED_OAK_LOG	
116	STRIPPED_SPRUCE_LOG	
117	STRIPPED_BIRCH_LOG	
118	STRIPPED_JUNGLE_LOG	
119	STRIPPED_ACACIA_LOG	

Enum value	Block name	First Minecraft version
120	STRIPPED_DARK_OAK_LOG	
121	STRIPPED_MANGROVE_LOG	
122	STRIPPED_CRIMSON_STEM	
123	STRIPPED_WARPED_STEM	
124	STRIPPED_OAK_WOOD	
125	STRIPPED_SPRUCE_WOOD	
126	STRIPPED_BIRCH_WOOD	
127	STRIPPED_JUNGLE_WOOD	
128	STRIPPED_ACACIA_WOOD	
129	STRIPPED_DARK_OAK_WOOD	
130	STRIPPED_MANGROVE_WOOD	
131	STRIPPED_CRIMSON_HYPHAE	
132	STRIPPED_WARPED_HYPHAE	
133	OAK_WOOD	
134	SPRUCE_WOOD	
135	BIRCH_WOOD	
136	JUNGLE_WOOD	
137	ACACIA_WOOD	
138	DARK_OAK_WOOD	
139	MANGROVE_WOOD	
140	CRIMSON_HYPHAE	
141	WARPED_HYPHAE	
142	OAK_LEAVES	
143	SPRUCE_LEAVES	
144	BIRCH_LEAVES	
145	JUNGLE_LEAVES	
146	ACACIA_LEAVES	
147	DARK_OAK_LEAVES	
148	MANGROVE_LEAVES	
149	AZALEA_LEAVES	




























Enum value	Block name	First Minecraft version
150	FLOWERING_AZALEA_LEAVES	
151	SPONGE	
152	WET_SPONGE	
153	GLASS	
154	TINTED_GLASS	
155	LAPIS_BLOCK	
156	SANDSTONE	
157	CHISELED_SANDSTONE	
158	CUT_SANDSTONE	
159	COBWEB	
160	GRASS	
161	FERN	
162	AZALEA	
163	FLOWERING_AZALEA	
164	DEAD_BUSH	
165	SEAGRASS	
166	SEA_PICKLE	
167	WHITE_WOOL	
168	ORANGE_WOOL	
169	MAGENTA_WOOL	
170	LIGHT_BLUE_WOOL	
171	YELLOW_WOOL	
172	LIME_WOOL	
173	PINK_WOOL	
174	GRAY_WOOL	
175	LIGHT_GRAY_WOOL	
176	CYAN_WOOL	
177	PURPLE_WOOL	
178	BLUE_WOOL	
179	BROWN_WOOL	

Enum value	Block name	First Minecraft version
180	GREEN_WOOL	
181	RED_WOOL	
182	BLACK_WOOL	
183	DANDELION	
184	POPPY	
185	BLUE_ORCHID	
186	ALLIUM	
187	AZURE_BUET	
188	RED_TULIP	
189	ORANGE_TULIP	
190	WHITE_TULIP	
191	PINK_TULIP	
192	OXEYE_DAISY	
193	CORNFLOWER	
194	LILY_OF_THE_VALLEY	
195	WITHER_ROSE	
196	SPORE_BLOSSOM	
197	BROWN_MUSHROOM	
198	RED_MUSHROOM	
199	CRIMSON_FUNGUS	
200	WARPED_FUNGUS	
201	CRIMSON_ROOTS	
202	WARPED_ROOTS	
203	NETHER_SPROUTS	
204	WEeping_VINES	
205	Twisting_VINES	
206	SUGAR_CANE	
207	KELP	
208	MOSS_CARPET	
209	MOSS_BLOCK	































Enum value	Block name	First Minecraft version
210	HANGING_ROOTS	
211	BIG_DRIPLEAF	
212	SMALL_DRIPLEAF	
213	BAMBOO	
214	OAK_SLAB	
215	SPRUCE_SLAB	
216	BIRCH_SLAB	
217	JUNGLE_SLAB	
218	ACACIA_SLAB	
219	DARK_OAK_SLAB	
220	MANGROVE_SLAB	
221	CRIMSON_SLAB	
222	WARPED_SLAB	
223	STONE_SLAB	
224	SMOOTH_STONE_SLAB	
225	SANDSTONE_SLAB	
226	CUT_SANDSTONE_SLAB	
227	PETRIFIED_OAK_SLAB	
228	COBBLESTONE_SLAB	
229	BRICK_SLAB	
230	STONE_BRICK_SLAB	
231	MUD_BRICK_SLAB	
232	NETHER_BRICK_SLAB	
233	QUARTZ_SLAB	
234	RED_SANDSTONE_SLAB	
235	CUT_RED_SANDSTONE_SLAB	
236	PURPUR_SLAB	
237	PRISMARINE_SLAB	
238	PRISMARINE_BRICK_SLAB	
239	DARK_PRISMARINE_SLAB	































Enum value	Block name	First Minecraft version
240	SMOOTH_QUARTZ	2
241	SMOOTH_RED_SANDSTONE	2
242	SMOOTH_SANDSTONE	2
243	SMOOTH_STONE	2
244	BRICKS	2
245	BOOKSHELF	2
246	MOSSY_COBBLESTONE	2
247	OBSIDIAN	2
248	TORCH	2
249	END_ROD	2
250	CHORUS_PLANT	2
251	CHORUS_FLOWER	2
252	PURPUR_BLOCK	2
253	PURPUR_PILLAR	2
254	PURPUR_STAIRS	2
255	SPAWNER	2
256	CHEST	2
257	CRAFTING_TABLE	2
258	FARMLAND	2
259	FURNACE	2
260	LADDER	2
261	COBBLESTONE_STAIRS	2
262	SNOW	2
263	ICE	2
264	SNOW_BLOCK	2
265	CACTUS	2
266	CLAY	2
267	JUKEBOX	2
268	OAK_FENCE	2
269	SPRUCE_FENCE	2

Enum value	Block name	First Minecraft version
270	BIRCH_FENCE	
271	JUNGLE_FENCE	
272	ACACIA_FENCE	
273	DARK_OAK_FENCE	
274	MANGROVE_FENCE	
275	CRIMSON_FENCE	
276	WARPED_FENCE	
277	PUMPKIN	
278	CARVED_PUMPKIN	
279	JACK_O_LANTERN	
280	NETHERRACK	
281	SOUL_SAND	
282	SOUL_SOIL	
283	BASALT	
284	POLISHED_BASALT	
285	SMOOTH_BASALT	
286	SOUL_TORCH	
287	GLOWSTONE	
288	INFESTED_STONE	
289	INFESTED_COBBLESTONE	
290	INFESTED_STONE_BRICKS	
291	INFESTED_MOSSY_STONE_BRICKS	
292	INFESTED_CRACKED_STONE_BRICKS	
293	INFESTED_CHISELED_STONE_BRICKS	
294	INFESTED_DEEPSLATE	
295	STONE_BRICKS	
296	MOSSY_STONE_BRICKS	
297	CRACKED_STONE_BRICKS	
298	CHISELED_STONE_BRICKS	
299	PACKED_MUD	































Enum value	Block name	First Minecraft version
300	MUD_BRICKS	
301	DEEPSLATE_BRICKS	
302	CRACKED_DEEPSLATE_BRICKS	
303	DEEPSLATE_TILES	
304	CRACKED_DEEPSLATE_TILES	
305	CHISELED_DEEPSLATE	
306	REINFORCED_DEEPSLATE	
307	BROWN_MUSHROOM_BLOCK	
308	RED_MUSHROOM_BLOCK	
309	MUSHROOM_STEM	
310	IRON_BARS	
311	CHAIN	
312	GLASS_PANE	
313	MELON	
314	VINE	
315	GLOW_LICHEN	
316	BRICK_STAIRS	
317	STONE_BRICK_STAIRS	
318	MUD_BRICK_STAIRS	
319	MYCELIUM	
320	LILY_PAD	
321	NETHER_BRICKS	
322	CRACKED_NETHER_BRICKS	
323	CHISELED_NETHER_BRICKS	
324	NETHER_BRICK_FENCE	
325	NETHER_BRICK_STAIRS	
326	SCULK	
327	SCULK_VEIN	
328	SCULK_CATALYST	
329	SCULK_SHRIEKER	































Enum value	Block name	First Minecraft version
330	ENCHANTING_TABLE	2
331	END_PORTAL_FRAME	2
332	END_STONE	2
333	END_STONE_BRICKS	2
334	DRAGON_EGG	2
335	SANDSTONE_STAIRS	2
336	ENDER_CHEST	2
337	EMERALD_BLOCK	2
338	OAK_STAIRS	2
339	SPRUCE_STAIRS	2
340	BIRCH_STAIRS	2
341	JUNGLE_STAIRS	2
342	ACACIA_STAIRS	2
343	DARK_OAK_STAIRS	2
344	MANGROVE_STAIRS	2
345	CRIMSON_STAIRS	2
346	WARPED_STAIRS	2
347	COMMAND_BLOCK	2
348	BEACON	2
349	COBBLESTONE_WALL	2
350	MOSSY_COBBLESTONE_WALL	2
351	BRICK_WALL	2
352	PRISMARINE_WALL	2
353	RED_SANDSTONE_WALL	2
354	MOSSY_STONE_BRICK_WALL	2
355	GRANITE_WALL	2
356	STONE_BRICK_WALL	2
357	MUD_BRICK_WALL	2
358	NETHER_BRICK_WALL	2
359	ANDESITE_WALL	2































Enum value	Block name	First Minecraft version
360	RED_NETHER_BRICK_WALL	
361	SANDSTONE_WALL	
362	END_STONE_BRICK_WALL	
363	DIORITE_WALL	
364	BLACKSTONE_WALL	
365	POLISHED_BLACKSTONE_WALL	
366	POLISHED_BLACKSTONE_BRICK_WALL	
367	COBBLED_DEEPSLATE_WALL	
368	POLISHED_DEEPSLATE_WALL	
369	DEEPSLATE_BRICK_WALL	
370	DEEPSLATE_TILE_WALL	
371	ANVIL	
372	CHIPPED_ANVIL	
373	DAMAGED_ANVIL	
374	CHISELED_QUARTZ_BLOCK	
375	QUARTZ_BLOCK	
376	QUARTZ_BRICKS	
377	QUARTZ_PILLAR	
378	QUARTZ_STAIRS	
379	WHITE_TERRACOTTA	
380	ORANGE_TERRACOTTA	
381	MAGENTA_TERRACOTTA	
382	LIGHT_BLUE_TERRACOTTA	
383	YELLOW_TERRACOTTA	
384	LIME_TERRACOTTA	
385	PINK_TERRACOTTA	
386	GRAY_TERRACOTTA	
387	LIGHT_GRAY_TERRACOTTA	
388	CYAN_TERRACOTTA	
389	PURPLE_TERRACOTTA	































Enum value	Block name	First Minecraft version
390	BLUE_TERRACOTTA	
391	BROWN_TERRACOTTA	
392	GREEN_TERRACOTTA	
393	RED_TERRACOTTA	
394	BLACK_TERRACOTTA	
395	BARRIER	
396	LIGHT	
397	HAY_BLOCK	
398	WHITE_CARPET	
399	ORANGE_CARPET	
400	MAGENTA_CARPET	
401	LIGHT_BLUE_CARPET	
402	YELLOW_CARPET	
403	LIME_CARPET	
404	PINK_CARPET	
405	GRAY_CARPET	
406	LIGHT_GRAY_CARPET	
407	CYAN_CARPET	
408	PURPLE_CARPET	
409	BLUE_CARPET	
410	BROWN_CARPET	
411	GREEN_CARPET	
412	RED_CARPET	
413	BLACK_CARPET	
414	TERRACOTTA	
415	PACKED_ICE	
416	DIRT_PATH	
417	SUNFLOWER	
418	LILAC	
419	ROSE_BUSH	

Enum value	Block name	First Minecraft version
420	PEONY	
421	TALL_GRASS	
422	LARGE_FERN	
423	WHITE_STAINED_GLASS	
424	ORANGE_STAINED_GLASS	
425	MAGENTA_STAINED_GLASS	
426	LIGHT_BLUE_STAINED_GLASS	
427	YELLOW_STAINED_GLASS	
428	LIME_STAINED_GLASS	
429	PINK_STAINED_GLASS	
430	GRAY_STAINED_GLASS	
431	LIGHT_GRAY_STAINED_GLASS	
432	CYAN_STAINED_GLASS	
433	PURPLE_STAINED_GLASS	
434	BLUE_STAINED_GLASS	
435	BROWN_STAINED_GLASS	
436	GREEN_STAINED_GLASS	
437	RED_STAINED_GLASS	
438	BLACK_STAINED_GLASS	
439	WHITE_STAINED_GLASS_PANE	
440	ORANGE_STAINED_GLASS_PANE	
441	MAGENTA_STAINED_GLASS_PANE	
442	LIGHT_BLUE_STAINED_GLASS_PANE	
443	YELLOW_STAINED_GLASS_PANE	
444	LIME_STAINED_GLASS_PANE	
445	PINK_STAINED_GLASS_PANE	
446	GRAY_STAINED_GLASS_PANE	
447	LIGHT_GRAY_STAINED_GLASS_PANE	
448	CYAN_STAINED_GLASS_PANE	
449	PURPLE_STAINED_GLASS_PANE	































Enum value	Block name	First Minecraft version
450	BLUE_STAINED_GLASS_PANE	
451	BROWN_STAINED_GLASS_PANE	
452	GREEN_STAINED_GLASS_PANE	
453	RED_STAINED_GLASS_PANE	
454	BLACK_STAINED_GLASS_PANE	
455	PRISMARINE	
456	PRISMARINE_BRICKS	
457	DARK_PRISMARINE	
458	PRISMARINE_STAIRS	
459	PRISMARINE_BRICK_STAIRS	
460	DARK_PRISMARINE_STAIRS	
461	SEA_LANTERN	
462	RED_SANDSTONE	
463	CHISELED_RED_SANDSTONE	
464	CUT_RED_SANDSTONE	
465	RED_SANDSTONE_STAIRS	
466	REPEATING_COMMAND_BLOCK	
467	CHAIN_COMMAND_BLOCK	
468	MAGMA_BLOCK	
469	NETHER_WART_BLOCK	
470	WARPED_WART_BLOCK	
471	RED_NETHER_BRICKS	
472	BONE_BLOCK	
473	STRUCTURE_VOID	
474	SHULKER_BOX	
475	WHITE_SHULKER_BOX	
476	ORANGE_SHULKER_BOX	
477	MAGENTA_SHULKER_BOX	
478	LIGHT_BLUE_SHULKER_BOX	
479	YELLOW_SHULKER_BOX	

Enum value	Block name	First Minecraft version
480	LIME_SHULKER_BOX	
481	PINK_SHULKER_BOX	
482	GRAY_SHULKER_BOX	
483	LIGHT_GRAY_SHULKER_BOX	
484	CYAN_SHULKER_BOX	
485	PURPLE_SHULKER_BOX	
486	BLUE_SHULKER_BOX	
487	BROWN_SHULKER_BOX	
488	GREEN_SHULKER_BOX	
489	RED_SHULKER_BOX	
490	BLACK_SHULKER_BOX	
491	WHITE_GLAZED_TERRACOTTA	
492	ORANGE_GLAZED_TERRACOTTA	
493	MAGENTA_GLAZED_TERRACOTTA	
494	LIGHT_BLUE_GLAZED_TERRACOTTA	
495	YELLOW_GLAZED_TERRACOTTA	
496	LIME_GLAZED_TERRACOTTA	
497	PINK_GLAZED_TERRACOTTA	
498	GRAY_GLAZED_TERRACOTTA	
499	LIGHT_GRAY_GLAZED_TERRACOTTA	
500	CYAN_GLAZED_TERRACOTTA	
501	PURPLE_GLAZED_TERRACOTTA	
502	BLUE_GLAZED_TERRACOTTA	
503	BROWN_GLAZED_TERRACOTTA	
504	GREEN_GLAZED_TERRACOTTA	
505	RED_GLAZED_TERRACOTTA	
506	BLACK_GLAZED_TERRACOTTA	
507	WHITE_CONCRETE	
508	ORANGE_CONCRETE	
509	MAGENTA_CONCRETE	






























Enum value	Block name	First Minecraft version
510	LIGHT_BLUE_CONCRETE	
511	YELLOW_CONCRETE	
512	LIME_CONCRETE	
513	PINK_CONCRETE	
514	GRAY_CONCRETE	
515	LIGHT_GRAY_CONCRETE	
516	CYAN_CONCRETE	
517	PURPLE_CONCRETE	
518	BLUE_CONCRETE	
519	BROWN_CONCRETE	
520	GREEN_CONCRETE	
521	RED_CONCRETE	
522	BLACK_CONCRETE	
523	WHITE_CONCRETE_POWDER	
524	ORANGE_CONCRETE_POWDER	
525	MAGENTA_CONCRETE_POWDER	
526	LIGHT_BLUE_CONCRETE_POWDER	
527	YELLOW_CONCRETE_POWDER	
528	LIME_CONCRETE_POWDER	
529	PINK_CONCRETE_POWDER	
530	GRAY_CONCRETE_POWDER	
531	LIGHT_GRAY_CONCRETE_POWDER	
532	CYAN_CONCRETE_POWDER	
533	PURPLE_CONCRETE_POWDER	
534	BLUE_CONCRETE_POWDER	
535	BROWN_CONCRETE_POWDER	
536	GREEN_CONCRETE_POWDER	
537	RED_CONCRETE_POWDER	
538	BLACK_CONCRETE_POWDER	
539	TURTLE_EGG	

Enum value	Block name	First Minecraft version
540	DEAD_TUBE_CORAL_BLOCK	
541	DEAD_BRAIN_CORAL_BLOCK	
542	DEAD_BUBBLE_CORAL_BLOCK	
543	DEAD_FIRE_CORAL_BLOCK	
544	DEAD_HORN_CORAL_BLOCK	
545	TUBE_CORAL_BLOCK	
546	BRAIN_CORAL_BLOCK	
547	BUBBLE_CORAL_BLOCK	
548	FIRE_CORAL_BLOCK	
549	HORN_CORAL_BLOCK	
550	TUBE_CORAL	
551	BRAIN_CORAL	
552	BUBBLE_CORAL	
553	FIRE_CORAL	
554	HORN_CORAL	
555	DEAD_BRAIN_CORAL	
556	DEAD_BUBBLE_CORAL	
557	DEAD_FIRE_CORAL	
558	DEAD_HORN_CORAL	
559	DEAD_TUBE_CORAL	
560	TUBE_CORAL_FAN	
561	BRAIN_CORAL_FAN	
562	BUBBLE_CORAL_FAN	
563	FIRE_CORAL_FAN	
564	HORN_CORAL_FAN	
565	DEAD_TUBE_CORAL_FAN	
566	DEAD_BRAIN_CORAL_FAN	
567	DEAD_BUBBLE_CORAL_FAN	
568	DEAD_FIRE_CORAL_FAN	
569	DEAD_HORN_CORAL_FAN	

Enum value	Block name	First Minecraft version
570	BLUE_ICE	
571	CONDUIT	
572	POLISHED_GRANITE_STAIRS	
573	SMOOTH_RED_SANDSTONE_STAIRS	
574	MOSSY_STONE_BRICK_STAIRS	
575	POLISHED_DIORITE_STAIRS	
576	MOSSY_COBBLESTONE_STAIRS	
577	END_STONE_BRICK_STAIRS	
578	STONE_STAIRS	
579	SMOOTH_SANDSTONE_STAIRS	
580	SMOOTH_QUARTZ_STAIRS	
581	GRANITE_STAIRS	
582	ANDESITE_STAIRS	
583	RED_NETHER_BRICK_STAIRS	
584	POLISHED_ANDESITE_STAIRS	
585	DIORITE_STAIRS	
586	COBBLED_DEEPSLATE_STAIRS	
587	POLISHED_DEEPSLATE_STAIRS	
588	DEEPSLATE_BRICK_STAIRS	
589	DEEPSLATE_TILE_STAIRS	
590	POLISHED_GRANITE_SLAB	
591	SMOOTH_RED_SANDSTONE_SLAB	
592	MOSSY_STONE_BRICK_SLAB	
593	POLISHED_DIORITE_SLAB	
594	MOSSY_COBBLESTONE_SLAB	
595	END_STONE_BRICK_SLAB	
596	SMOOTH_SANDSTONE_SLAB	
597	SMOOTH_QUARTZ_SLAB	
598	GRANITE_SLAB	
599	ANDESITE_SLAB	































Enum value	Block name	First Minecraft version
600	RED_NETHER_BRICK_SLAB	
601	POLISHED_ANDESITE_SLAB	
602	DIORITE_SLAB	
603	COBBLED_DEEPSLATE_SLAB	
604	POLISHED_DEEPSLATE_SLAB	
605	DEEPSLATE_BRICK_SLAB	
606	DEEPSLATE_TILE_SLAB	
607	SCAFFOLDING	
608	REDSTONE_TORCH	
609	REDSTONE_BLOCK	
610	REPEATER	
611	COMPARATOR	
612	PISTON	
613	STICKY_PISTON	
614	SLIME_BLOCK	
615	HONEY_BLOCK	
616	OBSERVER	
617	HOPPER	
618	DISPENSER	
619	DROPPER	
620	LECTERN	
621	TARGET	
622	LEVER	
623	LIGHTNING_ROD	
624	DAYLIGHT_DETECTOR	
625	SCULK_SENSOR	
626	TRIPWIRE_HOOK	
627	TRAPPED_CHEST	
628	TNT	
629	REDSTONE_LAMP	































Enum value	Block name	First Minecraft version
630	NOTE_BLOCK	2
631	STONE_BUTTON	2
632	POLISHED_BLACKSTONE_BUTTON	2
633	OAK_BUTTON	2
634	SPRUCE_BUTTON	2
635	BIRCH_BUTTON	2
636	JUNGLE_BUTTON	2
637	ACACIA_BUTTON	2
638	DARK_OAK_BUTTON	2
639	MANGROVE_BUTTON	2
640	CRIMSON_BUTTON	2
641	WARPED_BUTTON	2
642	STONE_PRESSURE_PLATE	2
643	POLISHED_BLACKSTONE_PRESSURE_PLATE	2
644	LIGHT_WEIGHTED_PRESSURE_PLATE	2
645	HEAVY_WEIGHTED_PRESSURE_PLATE	2
646	OAK_PRESSURE_PLATE	2
647	SPRUCE_PRESSURE_PLATE	2
648	BIRCH_PRESSURE_PLATE	2
649	JUNGLE_PRESSURE_PLATE	2
650	ACACIA_PRESSURE_PLATE	2
651	DARK_OAK_PRESSURE_PLATE	2
652	MANGROVE_PRESSURE_PLATE	2
653	CRIMSON_PRESSURE_PLATE	2
654	WARPED_PRESSURE_PLATE	2
655	IRON_DOOR	2
656	OAK_DOOR	2
657	SPRUCE_DOOR	2
658	BIRCH_DOOR	2
659	JUNGLE_DOOR	2

Enum value	Block name	First Minecraft version
660	ACACIA_DOOR	
661	DARK_OAK_DOOR	
662	MANGROVE_DOOR	
663	CRIMSON_DOOR	
664	WARPED_DOOR	
665	IRON_TRAPDOOR	
666	OAK_TRAPDOOR	
667	SPRUCE_TRAPDOOR	
668	BIRCH_TRAPDOOR	
669	JUNGLE_TRAPDOOR	
670	ACACIA_TRAPDOOR	
671	DARK_OAK_TRAPDOOR	
672	MANGROVE_TRAPDOOR	
673	CRIMSON_TRAPDOOR	
674	WARPED_TRAPDOOR	
675	OAK_FENCE_GATE	
676	SPRUCE_FENCE_GATE	
677	BIRCH_FENCE_GATE	
678	JUNGLE_FENCE_GATE	
679	ACACIA_FENCE_GATE	
680	DARK_OAK_FENCE_GATE	
681	MANGROVE_FENCE_GATE	
682	CRIMSON_FENCE_GATE	
683	WARPED_FENCE_GATE	
684	POWERED_RAIL	
685	DETECTOR_RAIL	
686	RAIL	
687	ACTIVATOR_RAIL	
688	STRUCTURE_BLOCK	
689	JIGSAW	




























Enum value	Block name	First Minecraft version
690	WHEAT	
691	OAK_SIGN	
692	SPRUCE_SIGN	
693	BIRCH_SIGN	
694	JUNGLE_SIGN	
695	ACACIA_SIGN	
696	DARK_OAK_SIGN	
697	MANGROVE_SIGN	
698	CRIMSON_SIGN	
699	WARPED_SIGN	
700	DRIED_KELP_BLOCK	
701	CAKE	
702	WHITE_BED	
703	ORANGE_BED	
704	MAGENTA_BED	
705	LIGHT_BLUE_BED	
706	YELLOW_BED	
707	LIME_BED	
708	PINK_BED	
709	GRAY_BED	
710	LIGHT_GRAY_BED	
711	CYAN_BED	
712	PURPLE_BED	
713	BLUE_BED	
714	BROWN_BED	
715	GREEN_BED	
716	RED_BED	
717	BLACK_BED	
718	NETHER_WART	
719	BREWING_STAND	































Enum value	Block name	First Minecraft version
720	CAULDRON	
721	FLOWER_POT	
722	SKELETON_SKULL	
723	WITHER_SKELETON_SKULL	
724	PLAYER_HEAD	
725	ZOMBIE_HEAD	
726	CREEPER_HEAD	
727	DRAGON_HEAD	
728	WHITE_BANNER	
729	ORANGE_BANNER	
730	MAGENTA_BANNER	
731	LIGHT_BLUE_BANNER	
732	YELLOW_BANNER	
733	LIME_BANNER	
734	PINK_BANNER	
735	GRAY_BANNER	
736	LIGHT_GRAY_BANNER	
737	CYAN_BANNER	
738	PURPLE_BANNER	
739	BLUE_BANNER	
740	BROWN_BANNER	
741	GREEN_BANNER	
742	RED_BANNER	
743	BLACK_BANNER	
744	LOOM	
745	COMPOSTER	
746	BARREL	
747	SMOKER	
748	BLAST_FURNACE	
749	CARTOGRAPHY_TABLE	



















Enum value	Block name	First Minecraft version
750	FLETCHING_TABLE	
751	GRINDSTONE	
752	SMITHING_TABLE	
753	STONECUTTER	
754	BELL	
755	LANTERN	
756	SOUL_LANTERN	
757	CAMPFIRE	
758	SOUL_CAMPFIRE	
759	SHROOMLIGHT	
760	BEE_NEST	
761	BEEHIVE	
762	HONEYCOMB_BLOCK	
763	LODESTONE	
764	CRYING_OBSIDIAN	
765	BLACKSTONE	
766	BLACKSTONE_SLAB	
767	BLACKSTONE_STAIRS	
768	GILDED_BLACKSTONE	
769	POLISHED_BLACKSTONE	
770	POLISHED_BLACKSTONE_SLAB	
771	POLISHED_BLACKSTONE_STAIRS	
772	CHISELED_POLISHED_BLACKSTONE	
773	POLISHED_BLACKSTONE_BRICKS	
774	POLISHED_BLACKSTONE_BRICK_SLAB	
775	POLISHED_BLACKSTONE_BRICK_STAIRS	
776	CRACKED_POLISHED_BLACKSTONE_BRICKS	
777	RESPAWN_ANCHOR	
778	CANDLE	
779	WHITE_CANDLE	

Enum value	Block name	First Minecraft version
780	ORANGE_CANDLE	
781	MAGENTA_CANDLE	
782	LIGHT_BLUE_CANDLE	
783	YELLOW_CANDLE	
784	LIME_CANDLE	
785	PINK_CANDLE	
786	GRAY_CANDLE	
787	LIGHT_GRAY_CANDLE	
788	CYAN_CANDLE	
789	PURPLE_CANDLE	
790	BLUE_CANDLE	
791	BROWN_CANDLE	
792	GREEN_CANDLE	
793	RED_CANDLE	
794	BLACK_CANDLE	
795	SMALL_AMETHYST_BUD	
796	MEDIUM_AMETHYST_BUD	
797	LARGE_AMETHYST_BUD	
798	AMETHYST_CLUSTER	
799	POINTED_DRIPSTONE	
800	OCHRE_FROGLIGHT	
801	VERDANT_FROGLIGHT	
802	PEARLESCENT_FROGLIGHT	
803	FROGSPAWN	
804	WATER	
805	LAVA	
806	TALL_SEAGRASS	
807	PISTON_HEAD	
808	MOVING_PISTON	
809	WALL_TORCH	

Enum value	Block name	First Minecraft version
810	FIRE	2
811	SOUL_FIRE	2
812	REDSTONE_WIRE	4
813	OAK_WALL_SIGN	2
814	SPRUCE_WALL_SIGN	2
815	BIRCH_WALL_SIGN	2
816	ACACIA_WALL_SIGN	2
817	JUNGLE_WALL_SIGN	2
818	DARK_OAK_WALL_SIGN	2
819	MANGROVE_WALL_SIGN	2
820	REDSTONE_WALL_TORCH	2
821	SOUL_WALL_TORCH	2
822	NETHER_PORTAL	2
823	ATTACHED_PUMPKIN_STEM	2
824	ATTACHED_MELON_STEM	2
825	PUMPKIN_STEM	4
826	MELON_STEM	2
827	WATER_CAULDRON	2
828	LAVA_CAULDRON	2
829	POWDER_SNOW_CAULDRON	2
830	END_PORTAL	2
831	COCOA	2
832	TRIPWIRE	2
833	POTTED_OAK_SAPLING	2
834	POTTED_SPRUCE_SAPLING	2
835	POTTED_BIRCH_SAPLING	2
836	POTTED_JUNGLE_SAPLING	2
837	POTTED_ACACIA_SAPLING	2
838	POTTED_DARK_OAK_SAPLING	2
839	POTTED_MANGROVE_PROPAGULE	2

Enum value	Block name	First Minecraft version
840	POTTED_FERN	
841	POTTED_DANDELION	
842	POTTED_POPPY	
843	POTTED_BLUE_ORCHID	
844	POTTED_ALLIUM	
845	POTTED_AZURE_BLUET	
846	POTTED_RED_TULIP	
847	POTTED_ORANGE_TULIP	
848	POTTED_WHITE_TULIP	
849	POTTED_PINK_TULIP	
850	POTTED_OXEYE_DAISY	
851	POTTED_CORNFLOWER	
852	POTTED_LILY_OF_THE_VALLEY	
853	POTTED_WITHER_ROSE	
854	POTTED_RED_MUSHROOM	
855	POTTED_BROWN_MUSHROOM	
856	POTTED_DEAD_BUSH	
857	POTTED_CACTUS	
858	CARROTS	
859	POTATOES	
860	SKELETON_WALL_SKULL	
861	WITHER_SKELETON_WALL_SKULL	
862	ZOMBIE_WALL_HEAD	
863	PLAYER_WALL_HEAD	
864	CREEPER_WALL_HEAD	
865	DRAGON_WALL_HEAD	
866	WHITE_WALL_BANNER	
867	ORANGE_WALL_BANNER	
868	MAGENTA_WALL_BANNER	
869	LIGHT_BLUE_WALL_BANNER	

Enum value	Block name	First Minecraft version
870	YELLOW_WALL_BANNER	
871	LIME_WALL_BANNER	
872	PINK_WALL_BANNER	
873	GRAY_WALL_BANNER	
874	LIGHT_GRAY_WALL_BANNER	
875	CYAN_WALL_BANNER	
876	PURPLE_WALL_BANNER	
877	BLUE_WALL_BANNER	
878	BROWN_WALL_BANNER	
879	GREEN_WALL_BANNER	
880	RED_WALL_BANNER	
881	BLACK_WALL_BANNER	
882	BEETROOTS	
883	END_GATEWAY	
884	FROSTED_ICE	
885	KELP_PLANT	
886	DEAD_TUBE_CORAL_WALL_FAN	
887	DEAD_BRAIN_CORAL_WALL_FAN	
888	DEAD_BUBBLE_CORAL_WALL_FAN	
889	DEAD_FIRE_CORAL_WALL_FAN	
890	DEAD_HORN_CORAL_WALL_FAN	
891	TUBE_CORAL_WALL_FAN	
892	BRAIN_CORAL_WALL_FAN	
893	BUBBLE_CORAL_WALL_FAN	
894	FIRE_CORAL_WALL_FAN	
895	HORN_CORAL_WALL_FAN	
896	BAMBOO_SAPLING	
897	POTTED_BAMBOO	
898	BUBBLE_COLUMN	
899	SWEET_BERRY_BUSH	

Enum value	Block name	First Minecraft version
900	WEeping_VINES_PLANT	
901	Twisting_VINES_PLANT	
902	CRIMSON_WALL_SIGN	
903	WARPED_WALL_SIGN	
904	POTTED_CRIMSON_FUNGUS	
905	POTTED_WARPED_FUNGUS	
906	POTTED_CRIMSON_ROOTS	
907	POTTED_WARPED_ROOTS	
908	CANDLE_CAKE	
909	WHITE_CANDLE_CAKE	
910	ORANGE_CANDLE_CAKE	
911	MAGENTA_CANDLE_CAKE	
912	LIGHT_BLUE_CANDLE_CAKE	
913	YELLOW_CANDLE_CAKE	
914	LIME_CANDLE_CAKE	
915	PINK_CANDLE_CAKE	
916	GRAY_CANDLE_CAKE	
917	LIGHT_GRAY_CANDLE_CAKE	
918	CYAN_CANDLE_CAKE	
919	PURPLE_CANDLE_CAKE	
920	BLUE_CANDLE_CAKE	
921	BROWN_CANDLE_CAKE	
922	GREEN_CANDLE_CAKE	
923	RED_CANDLE_CAKE	
924	BLACK_CANDLE_CAKE	
925	POWDER_SNOW	
926	CAVE_VINES	
927	CAVE_VINES_PLANT	
928	BIG_DRIPLEAF_STEM	
929	POTTED_AZALEA_BUSH	

Enum value	Block name	First Minecraft version
930	POTTED_FLOWERING_AZALEA_BUSH	?

Table 3.2: Block enum

3.4.10 Item

This section is under construction, as detailed properties cannot be specified.

An item specifies its type and its amount.

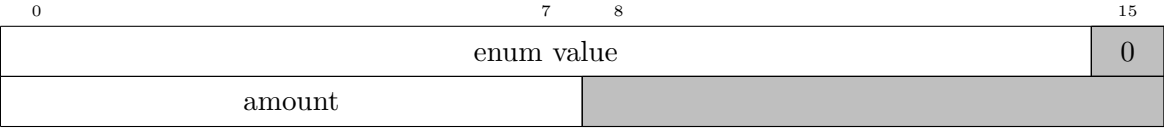















































































Figure 3.9: Structure of an Item

Enum value	Item name	First Minecraft version
0	AIR	1.8
1	STONE	?
2	GRANITE	?
3	POLISHED_GRANITE	?
4	DIORITE	?
5	POLISHED_DIORITE	?
6	ANDESITE	?
7	POLISHED_ANDESITE	?
8	DEEPSLATE	?
9	COBBLED_DEEPSLATE	?
10	POLISHED_DEEPSLATE	?
11	CALCITE	?
12	TUFF	?
13	DRIPSTONE_BLOCK	?
14	GRASS_BLOCK	?
15	DIRT	?



Enum value	Item name	First Minecraft version
16	COARSE_DIRT	
17	PODZOL	
18	ROOTED_DIRT	
19	MUD	
20	CRIMSON_NYLIUM	
21	WARPED_NYLIUM	
22	COBBLESTONE	
23	OAK_PLANKS	
24	SPRUCE_PLANKS	
25	BIRCH_PLANKS	
26	JUNGLE_PLANKS	
27	ACACIA_PLANKS	
28	DARK_OAK_PLANKS	
29	MANGROVE_PLANKS	
30	CRIMSON_PLANKS	
31	WARPED_PLANKS	
32	OAK_SAPLING	
33	SPRUCE_SAPLING	
34	BIRCH_SAPLING	
35	JUNGLE_SAPLING	
36	ACACIA_SAPLING	
37	DARK_OAK_SAPLING	
38	MANGROVE_PROPAGULE	
39	BEDROCK	
40	SAND	
41	RED_SAND	
42	GRAVEL	
43	COAL_ORE	
44	DEEPSLATE_COAL_ORE	
45	IRON_ORE	

Enum value	Item name	First Minecraft version
46	DEEPSLATE_IRON_ORE	
47	COPPER_ORE	
48	DEEPSLATE_COPPER_ORE	
49	GOLD_ORE	
50	DEEPSLATE_GOLD_ORE	
51	REDSTONE_ORE	
52	DEEPSLATE_REDSTONE_ORE	
53	EMERALD_ORE	
54	DEEPSLATE_EMERALD_ORE	
55	LAPIS_ORE	
56	DEEPSLATE_LAPIS_ORE	
57	DIAMOND_ORE	
58	DEEPSLATE_DIAMOND_ORE	
59	NETHER_GOLD_ORE	
60	NETHER_QUARTZ_ORE	
61	ANCIENT_DEBRIS	
62	COAL_BLOCK	
63	RAW_IRON_BLOCK	
64	RAW_COPPER_BLOCK	
65	RAW_GOLD_BLOCK	
66	AMETHYST_BLOCK	
67	BUDDING_AMETHYST	
68	IRON_BLOCK	
69	COPPER_BLOCK	
70	GOLD_BLOCK	
71	DIAMOND_BLOCK	
72	NETHERITE_BLOCK	
73	EXPOSED_COPPER	
74	WEATHERED_COPPER	
75	OXIDIZED_COPPER	



Enum value	Item name	First Minecraft version
76	CUT_COPPER	
77	EXPOSED_CUT_COPPER	
78	WEATHERED_CUT_COPPER	
79	OXIDIZED_CUT_COPPER	
80	CUT_COPPER_STAIRS	
81	EXPOSED_CUT_COPPER_STAIRS	
82	WEATHERED_CUT_COPPER_STAIRS	
83	OXIDIZED_CUT_COPPER_STAIRS	
84	CUT_COPPER_SLAB	
85	EXPOSED_CUT_COPPER_SLAB	
86	WEATHERED_CUT_COPPER_SLAB	
87	OXIDIZED_CUT_COPPER_SLAB	
88	WAXED_COPPER_BLOCK	
89	WAXED_EXPOSED_COPPER	
90	WAXED_WEATHERED_COPPER	
91	WAXED_OXIDIZED_COPPER	
92	WAXED_CUT_COPPER	
93	WAXED_EXPOSED_CUT_COPPER	
94	WAXED_WEATHERED_CUT_COPPER	
95	WAXED_OXIDIZED_CUT_COPPER	
96	WAXED_CUT_COPPER_STAIRS	
97	WAXED_EXPOSED_CUT_COPPER_STAIRS	
98	WAXED_WEATHERED_CUT_COPPER_STAIRS	
99	WAXED_OXIDIZED_CUT_COPPER_STAIRS	
100	WAXED_CUT_COPPER_SLAB	
101	WAXED_EXPOSED_CUT_COPPER_SLAB	
102	WAXED_WEATHERED_CUT_COPPER_SLAB	
103	WAXED_OXIDIZED_CUT_COPPER_SLAB	
104	OAK_LOG	
105	SPRUCE_LOG	

Enum value	Item name	First Minecraft version
106	BIRCH_LOG	2
107	JUNGLE_LOG	2
108	ACACIA_LOG	4
109	DARK_OAK_LOG	2
110	MANGROVE_LOG	2
111	MANGROVE_ROOTS	2
112	MUDDY_MANGROVE_ROOTS	2
113	CRIMSON_STEM	4
114	WARPED_STEM	2
115	STRIPPED_OAK_LOG	2
116	STRIPPED_SPRUCE_LOG	2
117	STRIPPED_BIRCH_LOG	2
118	STRIPPED_JUNGLE_LOG	2
119	STRIPPED_ACACIA_LOG	2
120	STRIPPED_DARK_OAK_LOG	2
121	STRIPPED_MANGROVE_LOG	2
122	STRIPPED_CRIMSON_STEM	2
123	STRIPPED_WARPED_STEM	2
124	STRIPPED_OAK_WOOD	2
125	STRIPPED_SPRUCE_WOOD	2
126	STRIPPED_BIRCH_WOOD	2
127	STRIPPED_JUNGLE_WOOD	2
128	STRIPPED_ACACIA_WOOD	2
129	STRIPPED_DARK_OAK_WOOD	2
130	STRIPPED_MANGROVE_WOOD	2
131	STRIPPED_CRIMSON_HYPHAE	2
132	STRIPPED_WARPED_HYPHAE	2
133	OAK_WOOD	2
134	SPRUCE_WOOD	2
135	BIRCH_WOOD	2































Enum value	Item name	First Minecraft version
136	JUNGLE_WOOD	
137	ACACIA_WOOD	
138	DARK_OAK_WOOD	
139	MANGROVE_WOOD	
140	CRIMSON_HYPHAE	
141	WARPED_HYPHAE	
142	OAK_LEAVES	
143	SPRUCE_LEAVES	
144	BIRCH_LEAVES	
145	JUNGLE_LEAVES	
146	ACACIA_LEAVES	
147	DARK_OAK_LEAVES	
148	MANGROVE_LEAVES	
149	AZALEA_LEAVES	
150	FLOWERING_AZALEA_LEAVES	
151	SPONGE	
152	WET_SPONGE	
153	GLASS	
154	TINTED_GLASS	
155	LAPIS_BLOCK	
156	SANDSTONE	
157	CHISELED_SANDSTONE	
158	CUT_SANDSTONE	
159	COBWEB	
160	GRASS	
161	FERN	
162	AZALEA	
163	FLOWERING_AZALEA	
164	DEAD_BUSH	
165	SEAGRASS	


























Enum value	Item name	First Minecraft version
166	SEA_PICKLE	
167	WHITE_WOOL	
168	ORANGE_WOOL	
169	MAGENTA_WOOL	
170	LIGHT_BLUE_WOOL	
171	YELLOW_WOOL	
172	LIME_WOOL	
173	PINK_WOOL	
174	GRAY_WOOL	
175	LIGHT_GRAY_WOOL	
176	CYAN_WOOL	
177	PURPLE_WOOL	
178	BLUE_WOOL	
179	BROWN_WOOL	
180	GREEN_WOOL	
181	RED_WOOL	
182	BLACK_WOOL	
183	DANDELION	
184	POPPY	
185	BLUE_ORCHID	
186	ALLIUM	
187	AZURE_BLUET	
188	RED_TULIP	
189	ORANGE_TULIP	
190	WHITE_TULIP	
191	PINK_TULIP	
192	OXEYE_DAISY	
193	CORNFLOWER	
194	LILY_OF_THE_VALLEY	
195	WITHER_ROSE	































Enum value	Item name	First Minecraft version
196	SPORE_BLOSSOM	2.4
197	BROWN_MUSHROOM	2.4
198	RED_MUSHROOM	2.4
199	CRIMSON_FUNGUS	2.4
200	WARPED_FUNGUS	2.4
201	CRIMSON_ROOTS	2.4
202	WARPED_ROOTS	2.4
203	NETHER_SPROUTS	2.4
204	WEEPING_VINES	2.4
205	TWISTING_VINES	2.4
206	SUGAR_CANE	2.4
207	KELP	2.4
208	MOSS_CARPET	2.4
209	MOSS_BLOCK	2.4
210	HANGING_ROOTS	2.4
211	BIG_DRIPLEAF	2.4
212	SMALL_DRIPLEAF	2.4
213	BAMBOO	2.4
214	OAK_SLAB	2.4
215	SPRUCE_SLAB	2.4
216	BIRCH_SLAB	2.4
217	JUNGLE_SLAB	2.4
218	ACACIA_SLAB	2.4
219	DARK_OAK_SLAB	2.4
220	MANGROVE_SLAB	2.4
221	CRIMSON_SLAB	2.4
222	WARPED_SLAB	2.4
223	STONE_SLAB	2.4
224	SMOOTH_STONE_SLAB	2.4
225	SANDSTONE_SLAB	2.4































Enum value	Item name	First Minecraft version
226	CUT_SANDSTONE_SLAB	
227	PETRIFIED_OAK_SLAB	
228	COBBLESTONE_SLAB	
229	BRICK_SLAB	
230	STONE_BRICK_SLAB	
231	MUD_BRICK_SLAB	
232	NETHER_BRICK_SLAB	
233	QUARTZ_SLAB	
234	RED_SANDSTONE_SLAB	
235	CUT_RED_SANDSTONE_SLAB	
236	PURPUR_SLAB	
237	PRISMARINE_SLAB	
238	PRISMARINE_BRICK_SLAB	
239	DARK_PRISMARINE_SLAB	
240	SMOOTH_QUARTZ	
241	SMOOTH_RED_SANDSTONE	
242	SMOOTH_SANDSTONE	
243	SMOOTH_STONE	
244	BRICKS	
245	BOOKSHELF	
246	MOSSY_COBBLESTONE	
247	OBSIDIAN	
248	TORCH	
249	END_ROD	
250	CHORUS_PLANT	
251	CHORUS_FLOWER	
252	PURPUR_BLOCK	
253	PURPUR_PILLAR	
254	PURPUR_STAIRS	
255	SPAWNER	































Enum value	Item name	First Minecraft version
256	CHEST	2
257	CRAFTING_TABLE	2
258	FARMLAND	2
259	FURNACE	2
260	LADDER	2
261	COBBLESTONE_STAIRS	2
262	SNOW	2
263	ICE	2
264	SNOW_BLOCK	2
265	CACTUS	2
266	CLAY	2
267	JUKEBOX	2
268	OAK_FENCE	2
269	SPRUCE_FENCE	2
270	BIRCH_FENCE	2
271	JUNGLE_FENCE	2
272	ACACIA_FENCE	2
273	DARK_OAK_FENCE	2
274	MANGROVE_FENCE	2
275	CRIMSON_FENCE	2
276	WARPED_FENCE	2
277	PUMPKIN	2
278	CARVED_PUMPKIN	2
279	JACK_O_LANTERN	2
280	NETHERRACK	2
281	SOUL_SAND	2
282	SOUL_SOIL	2
283	BASALT	2
284	POLISHED_BASALT	2
285	SMOOTH_BASALT	2































Enum value	Item name	First Minecraft version
286	SOUL_TORCH	
287	GLOWSTONE	
288	INFESTED_STONE	
289	INFESTED_COBBLESTONE	
290	INFESTED_STONE_BRICKS	
291	INFESTED_MOSSY_STONE_BRICKS	
292	INFESTED_CRACKED_STONE_BRICKS	
293	INFESTED_CHISELED_STONE_BRICKS	
294	INFESTED_DEEPSLATE	
295	STONE_BRICKS	
296	MOSSY_STONE_BRICKS	
297	CRACKED_STONE_BRICKS	
298	CHISELED_STONE_BRICKS	
299	PACKED_MUD	
300	MUD_BRICKS	
301	DEEPSLATE_BRICKS	
302	CRACKED_DEEPSLATE_BRICKS	
303	DEEPSLATE_TILES	
304	CRACKED_DEEPSLATE_TILES	
305	CHISELED_DEEPSLATE	
306	REINFORCED_DEEPSLATE	
307	BROWN_MUSHROOM_BLOCK	
308	RED_MUSHROOM_BLOCK	
309	MUSHROOM_STEM	
310	IRON_BARS	
311	CHAIN	
312	GLASS_PANE	
313	MELON	
314	VINE	
315	GLOW_LICHEN	































Enum value	Item name	First Minecraft version
316	BRICK_STAIRS	
317	STONE_BRICK_STAIRS	
318	MUD_BRICK_STAIRS	
319	MYCELIUM	
320	LILY_PAD	
321	NETHER_BRICKS	
322	CRACKED_NETHER_BRICKS	
323	CHISELED_NETHER_BRICKS	
324	NETHER_BRICK_FENCE	
325	NETHER_BRICK_STAIRS	
326	SCULK	
327	SCULK_VEIN	
328	SCULK_CATALYST	
329	SCULK_SHRIEKER	
330	ENCHANTING_TABLE	
331	END_PORTAL_FRAME	
332	END_STONE	
333	END_STONE_BRICKS	
334	DRAGON_EGG	
335	SANDSTONE_STAIRS	
336	ENDER_CHEST	
337	EMERALD_BLOCK	
338	OAK_STAIRS	
339	SPRUCE_STAIRS	
340	BIRCH_STAIRS	
341	JUNGLE_STAIRS	
342	ACACIA_STAIRS	
343	DARK_OAK_STAIRS	
344	MANGROVE_STAIRS	
345	CRIMSON_STAIRS	

Enum value	Item name	First Minecraft version
346	WARPED_STAIRS	
347	COMMAND_BLOCK	
348	BEACON	
349	COBBLESTONE_WALL	
350	MOSSY_COBBLESTONE_WALL	
351	BRICK_WALL	
352	PRISMARINE_WALL	
353	RED_SANDSTONE_WALL	
354	MOSSY_STONE_BRICK_WALL	
355	GRANITE_WALL	
356	STONE_BRICK_WALL	
357	MUD_BRICK_WALL	
358	NETHER_BRICK_WALL	
359	ANDESITE_WALL	
360	RED_NETHER_BRICK_WALL	
361	SANDSTONE_WALL	
362	END_STONE_BRICK_WALL	
363	DIORITE_WALL	
364	BLACKSTONE_WALL	
365	POLISHED_BLACKSTONE_WALL	
366	POLISHED_BLACKSTONE_BRICK_WALL	
367	COBBLED_DEEPSLATE_WALL	
368	POLISHED_DEEPSLATE_WALL	
369	DEEPSLATE_BRICK_WALL	
370	DEEPSLATE_TILE_WALL	
371	ANVIL	
372	CHIPPED_ANVIL	
373	DAMAGED_ANVIL	
374	CHISELED_QUARTZ_BLOCK	
375	QUARTZ_BLOCK	































Enum value	Item name	First Minecraft version
376	QUARTZ.BRICKS	
377	QUARTZ.PILLAR	
378	QUARTZ.STAIRS	
379	WHITE.TERRACOTTA	
380	ORANGE.TERRACOTTA	
381	MAGENTA.TERRACOTTA	
382	LIGHT.BLUE.TERRACOTTA	
383	YELLOW.TERRACOTTA	
384	LIME.TERRACOTTA	
385	PINK.TERRACOTTA	
386	GRAY.TERRACOTTA	
387	LIGHT.GRAY.TERRACOTTA	
388	CYAN.TERRACOTTA	
389	PURPLE.TERRACOTTA	
390	BLUE.TERRACOTTA	
391	BROWN.TERRACOTTA	
392	GREEN.TERRACOTTA	
393	RED.TERRACOTTA	
394	BLACK.TERRACOTTA	
395	BARRIER	
396	LIGHT	
397	HAY_BLOCK	
398	WHITE.CARPET	
399	ORANGE.CARPET	
400	MAGENTA.CARPET	
401	LIGHT.BLUE.CARPET	
402	YELLOW.CARPET	
403	LIME.CARPET	
404	PINK.CARPET	
405	GRAY.CARPET	


Enum value	Item name	First Minecraft version
406	LIGHT_GRAY_CARPET	
407	CYAN_CARPET	
408	PURPLE_CARPET	
409	BLUE_CARPET	
410	BROWN_CARPET	
411	GREEN_CARPET	
412	RED_CARPET	
413	BLACK_CARPET	
414	TERRACOTTA	
415	PACKED_ICE	
416	DIRT_PATH	
417	SUNFLOWER	
418	LILAC	
419	ROSE_BUSH	
420	PEONY	
421	TALL_GRASS	
422	LARGE_FERN	
423	WHITE_STAINED_GLASS	
424	ORANGE_STAINED_GLASS	
425	MAGENTA_STAINED_GLASS	
426	LIGHT_BLUE_STAINED_GLASS	
427	YELLOW_STAINED_GLASS	
428	LIME_STAINED_GLASS	
429	PINK_STAINED_GLASS	
430	GRAY_STAINED_GLASS	
431	LIGHT_GRAY_STAINED_GLASS	
432	CYAN_STAINED_GLASS	
433	PURPLE_STAINED_GLASS	
434	BLUE_STAINED_GLASS	
435	BROWN_STAINED_GLASS	














Enum value	Item name	First Minecraft version
436	GREEN_STAINED_GLASS	
437	RED_STAINED_GLASS	
438	BLACK_STAINED_GLASS	
439	WHITE_STAINED_GLASS_PANE	
440	ORANGE_STAINED_GLASS_PANE	
441	MAGENTA_STAINED_GLASS_PANE	
442	LIGHT_BLUE_STAINED_GLASS_PANE	
443	YELLOW_STAINED_GLASS_PANE	
444	LIME_STAINED_GLASS_PANE	
445	PINK_STAINED_GLASS_PANE	
446	GRAY_STAINED_GLASS_PANE	
447	LIGHT_GRAY_STAINED_GLASS_PANE	
448	CYAN_STAINED_GLASS_PANE	
449	PURPLE_STAINED_GLASS_PANE	
450	BLUE_STAINED_GLASS_PANE	
451	BROWN_STAINED_GLASS_PANE	
452	GREEN_STAINED_GLASS_PANE	
453	RED_STAINED_GLASS_PANE	
454	BLACK_STAINED_GLASS_PANE	
455	PRISMARINE	
456	PRISMARINE_BRICKS	
457	DARK_PRISMARINE	
458	PRISMARINE_STAIRS	
459	PRISMARINE_BRICK_STAIRS	
460	DARK_PRISMARINE_STAIRS	
461	SEA_LANTERN	
462	RED_SANDSTONE	
463	CHISELED_RED_SANDSTONE	
464	CUT_RED_SANDSTONE	
465	RED_SANDSTONE_STAIRS	































Enum value	Item name	First Minecraft version
466	REPEATING_COMMAND_BLOCK	
467	CHAIN_COMMAND_BLOCK	
468	MAGMA_BLOCK	
469	NETHER_WART_BLOCK	
470	WARPED_WART_BLOCK	
471	RED_NETHER_BRICKS	
472	BONE_BLOCK	
473	STRUCTURE_VOID	
474	SHULKER_BOX	
475	WHITE_SHULKER_BOX	
476	ORANGE_SHULKER_BOX	
477	MAGENTA_SHULKER_BOX	
478	LIGHT_BLUE_SHULKER_BOX	
479	YELLOW_SHULKER_BOX	
480	LIME_SHULKER_BOX	
481	PINK_SHULKER_BOX	
482	GRAY_SHULKER_BOX	
483	LIGHT_GRAY_SHULKER_BOX	
484	CYAN_SHULKER_BOX	
485	PURPLE_SHULKER_BOX	
486	BLUE_SHULKER_BOX	
487	BROWN_SHULKER_BOX	
488	GREEN_SHULKER_BOX	
489	RED_SHULKER_BOX	
490	BLACK_SHULKER_BOX	
491	WHITE_GLAZED_TERRACOTTA	
492	ORANGE_GLAZED_TERRACOTTA	
493	MAGENTA_GLAZED_TERRACOTTA	
494	LIGHT_BLUE_GLAZED_TERRACOTTA	
495	YELLOW_GLAZED_TERRACOTTA	

Enum value	Item name	First Minecraft version
496	LIME_GLAZED_TERRACOTTA	
497	PINK_GLAZED_TERRACOTTA	
498	GRAY_GLAZED_TERRACOTTA	
499	LIGHT_GRAY_GLAZED_TERRACOTTA	
500	CYAN_GLAZED_TERRACOTTA	
501	PURPLE_GLAZED_TERRACOTTA	
502	BLUE_GLAZED_TERRACOTTA	
503	BROWN_GLAZED_TERRACOTTA	
504	GREEN_GLAZED_TERRACOTTA	
505	RED_GLAZED_TERRACOTTA	
506	BLACK_GLAZED_TERRACOTTA	
507	WHITE_CONCRETE	
508	ORANGE_CONCRETE	
509	MAGENTA_CONCRETE	
510	LIGHT_BLUE_CONCRETE	
511	YELLOW_CONCRETE	
512	LIME_CONCRETE	
513	PINK_CONCRETE	
514	GRAY_CONCRETE	
515	LIGHT_GRAY_CONCRETE	
516	CYAN_CONCRETE	
517	PURPLE_CONCRETE	
518	BLUE_CONCRETE	
519	BROWN_CONCRETE	
520	GREEN_CONCRETE	
521	RED_CONCRETE	
522	BLACK_CONCRETE	
523	WHITE_CONCRETE_POWDER	
524	ORANGE_CONCRETE_POWDER	
525	MAGENTA_CONCRETE_POWDER	

Enum value	Item name	First Minecraft version
526	LIGHT_BLUE_CONCRETE_POWDER	
527	YELLOW_CONCRETE_POWDER	
528	LIME_CONCRETE_POWDER	
529	PINK_CONCRETE_POWDER	
530	GRAY_CONCRETE_POWDER	
531	LIGHT_GRAY_CONCRETE_POWDER	
532	CYAN_CONCRETE_POWDER	
533	PURPLE_CONCRETE_POWDER	
534	BLUE_CONCRETE_POWDER	
535	BROWN_CONCRETE_POWDER	
536	GREEN_CONCRETE_POWDER	
537	RED_CONCRETE_POWDER	
538	BLACK_CONCRETE_POWDER	
539	TURTLE_EGG	
540	DEAD_TUBE_CORAL_BLOCK	
541	DEAD_BRAIN_CORAL_BLOCK	
542	DEAD_BUBBLE_CORAL_BLOCK	
543	DEAD_FIRE_CORAL_BLOCK	
544	DEAD_HORN_CORAL_BLOCK	
545	TUBE_CORAL_BLOCK	
546	BRAIN_CORAL_BLOCK	
547	BUBBLE_CORAL_BLOCK	
548	FIRE_CORAL_BLOCK	
549	HORN_CORAL_BLOCK	
550	TUBE_CORAL	
551	BRAIN_CORAL	
552	BUBBLE_CORAL	
553	FIRE_CORAL	
554	HORN_CORAL	
555	DEAD_BRAIN_CORAL	

Enum value	Item name	First Minecraft version
556	DEAD_BUBBLE_CORAL	
557	DEAD_FIRE_CORAL	
558	DEAD_HORN_CORAL	
559	DEAD_TUBE_CORAL	
560	TUBE_CORAL_FAN	
561	BRAIN_CORAL_FAN	
562	BUBBLE_CORAL_FAN	
563	FIRE_CORAL_FAN	
564	HORN_CORAL_FAN	
565	DEAD_TUBE_CORAL_FAN	
566	DEAD_BRAIN_CORAL_FAN	
567	DEAD_BUBBLE_CORAL_FAN	
568	DEAD_FIRE_CORAL_FAN	
569	DEAD_HORN_CORAL_FAN	
570	BLUE_ICE	
571	CONDUIT	
572	POLISHED_GRANITE_STAIRS	
573	SMOOTH_RED_SANDSTONE_STAIRS	
574	MOSSY_STONE_BRICK_STAIRS	
575	POLISHED_DIORITE_STAIRS	
576	MOSSY_COBBLESTONE_STAIRS	
577	END_STONE_BRICK_STAIRS	
578	STONE_STAIRS	
579	SMOOTH_SANDSTONE_STAIRS	
580	SMOOTH_QUARTZ_STAIRS	
581	GRANITE_STAIRS	
582	ANDESITE_STAIRS	
583	RED_NETHER_BRICK_STAIRS	
584	POLISHED_ANDESITE_STAIRS	
585	DIORITE_STAIRS	

Enum value	Item name	First Minecraft version
586	COBBLED_DEEPSLATE_STAIRS	
587	POLISHED_DEEPSLATE_STAIRS	
588	DEEPSLATE_BRICK_STAIRS	
589	DEEPSLATE_TILE_STAIRS	
590	POLISHED_GRANITE_SLAB	
591	SMOOTH_RED_SANDSTONE_SLAB	
592	MOSSY_STONE_BRICK_SLAB	
593	POLISHED_DIORITE_SLAB	
594	MOSSY_COBBLESTONE_SLAB	
595	END_STONE_BRICK_SLAB	
596	SMOOTH_SANDSTONE_SLAB	
597	SMOOTH_QUARTZ_SLAB	
598	GRANITE_SLAB	
599	ANDESITE_SLAB	
600	RED_NETHER_BRICK_SLAB	
601	POLISHED_ANDESITE_SLAB	
602	DIORITE_SLAB	
603	COBBLED_DEEPSLATE_SLAB	
604	POLISHED_DEEPSLATE_SLAB	
605	DEEPSLATE_BRICK_SLAB	
606	DEEPSLATE_TILE_SLAB	
607	SCAFFOLDING	
608	REDSTONE	
609	REDSTONE_TORCH	
610	REDSTONE_BLOCK	
611	REPEATER	
612	COMPARATOR	
613	PISTON	
614	STICKY_PISTON	
615	SLIME_BLOCK	

Enum value	Item name	First Minecraft version
616	HONEY_BLOCK	
617	OBSERVER	
618	HOPPER	
619	DISPENSER	
620	DROPPER	
621	LECTERN	
622	TARGET	
623	LEVER	
624	LIGHTNING_ROD	
625	DAYLIGHT_DETECTOR	
626	SCULK_SENSOR	
627	TRIPWIRE_HOOK	
628	TRAPPED_CHEST	
629	TNT	
630	REDSTONE_LAMP	
631	NOTE_BLOCK	
632	STONE_BUTTON	
633	POLISHED_BLACKSTONE_BUTTON	
634	OAK_BUTTON	
635	SPRUCE_BUTTON	
636	BIRCH_BUTTON	
637	JUNGLE_BUTTON	
638	ACACIA_BUTTON	
639	DARK_OAK_BUTTON	
640	MANGROVE_BUTTON	
641	CRIMSON_BUTTON	
642	WARPED_BUTTON	
643	STONE_PRESSURE_PLATE	
644	POLISHED_BLACKSTONE_PRESSURE_PLATE	
645	LIGHT_WEIGHTED_PRESSURE_PLATE	

Enum value	Item name	First Minecraft version
646	HEAVY_WEIGHTED_PRESSURE_PLATE	
647	OAK_PRESSURE_PLATE	
648	SPRUCE_PRESSURE_PLATE	
649	BIRCH_PRESSURE_PLATE	
650	JUNGLE_PRESSURE_PLATE	
651	ACACIA_PRESSURE_PLATE	
652	DARK_OAK_PRESSURE_PLATE	
653	MANGROVE_PRESSURE_PLATE	
654	CRIMSON_PRESSURE_PLATE	
655	WARPED_PRESSURE_PLATE	
656	IRON_DOOR	
657	OAK_DOOR	
658	SPRUCE_DOOR	
659	BIRCH_DOOR	
660	JUNGLE_DOOR	
661	ACACIA_DOOR	
662	DARK_OAK_DOOR	
663	MANGROVE_DOOR	
664	CRIMSON_DOOR	
665	WARPED_DOOR	
666	IRON_TRAPDOOR	
667	OAK_TRAPDOOR	
668	SPRUCE_TRAPDOOR	
669	BIRCH_TRAPDOOR	
670	JUNGLE_TRAPDOOR	
671	ACACIA_TRAPDOOR	
672	DARK_OAK_TRAPDOOR	
673	MANGROVE_TRAPDOOR	
674	CRIMSON_TRAPDOOR	
675	WARPED_TRAPDOOR	

Enum value	Item name	First Minecraft version
676	OAK_FENCE_GATE	2.4
677	SPRUCE_FENCE_GATE	2.4
678	BIRCH_FENCE_GATE	2.4
679	JUNGLE_FENCE_GATE	2.4
680	ACACIA_FENCE_GATE	2.4
681	DARK_OAK_FENCE_GATE	2.4
682	MANGROVE_FENCE_GATE	2.4
683	CRIMSON_FENCE_GATE	2.4
684	WARPED_FENCE_GATE	2.4
685	POWERED_RAIL	2.4
686	DETECTOR_RAIL	2.4
687	RAIL	2.4
688	ACTIVATOR_RAIL	2.4
689	SADDLE	2.4
690	MINECART	2.4
691	CHEST_MINECART	2.4
692	FURNACE_MINECART	2.4
693	TNT_MINECART	2.4
694	HOPPER_MINECART	2.4
695	CARROT_ON_A_STICK	2.4
696	WARPED_FUNGUS_ON_A_STICK	2.4
697	ELYTRA	2.4
698	OAK_BOAT	2.4
699	OAK_CHEST_BOAT	2.4
700	SPRUCE_BOAT	2.4
701	SPRUCE_CHEST_BOAT	2.4
702	BIRCH_BOAT	2.4
703	BIRCH_CHEST_BOAT	2.4
704	JUNGLE_BOAT	2.4
705	JUNGLE_CHEST_BOAT	2.4

Enum value	Item name	First Minecraft version
706	ACACIA_BOAT	2.4
707	ACACIA_CHEST_BOAT	2.4
708	DARK_OAK_BOAT	2.4
709	DARK_OAK_CHEST_BOAT	2.4
710	MANGROVE_BOAT	2.4
711	MANGROVE_CHEST_BOAT	2.4
712	STRUCTURE_BLOCK	2.4
713	JIGSAW	2.4
714	TURTLE_HELMET	2.4
715	SCUTE	2.4
716	FLINT_AND_STEEL	2.4
717	APPLE	2.4
718	BOW	2.4
719	ARROW	2.4
720	COAL	2.4
721	CHARCOAL	2.4
722	DIAMOND	2.4
723	EMERALD	2.4
724	LAPIS_LAZULI	2.4
725	QUARTZ	2.4
726	AMETHYST_SHARD	2.4
727	RAW_IRON	2.4
728	IRON_INGOT	2.4
729	RAW_COPPER	2.4
730	COPPER_INGOT	2.4
731	RAW_GOLD	2.4
732	GOLD_INGOT	2.4
733	NETHERITE_INGOT	2.4
734	NETHERITE_SCRAP	2.4
735	WOODEN_SWORD	2.4

Enum value	Item name	First Minecraft version
736	WOODEN_SHOVEL	2
737	WOODEN_PICKAXE	2
738	WOODEN_AXE	2
739	WOODEN_HOE	2
740	STONE_SWORD	2
741	STONE_SHOVEL	2
742	STONE_PICKAXE	2
743	STONE_AXE	2
744	STONE_HOE	2
745	GOLDEN_SWORD	2
746	GOLDEN_SHOVEL	2
747	GOLDEN_PICKAXE	2
748	GOLDEN_AXE	2
749	GOLDEN_HOE	2
750	IRON_SWORD	2
751	IRON_SHOVEL	2
752	IRON_PICKAXE	2
753	IRON_AXE	2
754	IRON_HOE	2
755	DIAMOND_SWORD	2
756	DIAMOND_SHOVEL	2
757	DIAMOND_PICKAXE	2
758	DIAMOND_AXE	2
759	DIAMOND_HOE	2
760	NETHERITE_SWORD	2
761	NETHERITE_SHOVEL	2
762	NETHERITE_PICKAXE	2
763	NETHERITE_AXE	2
764	NETHERITE_HOE	2
765	STICK	2

Enum value	Item name	First Minecraft version
766	BOWL	2.4
767	MUSHROOM_STEW	2.4
768	STRING	2.4
769	FEATHER	2.4
770	GUNPOWDER	2.4
771	WHEAT_SEEDS	2.4
772	WHEAT	2.4
773	BREAD	2.4
774	LEATHER_HELMET	2.4
775	LEATHER_CHESTPLATE	2.4
776	LEATHER_LEGGINGS	2.4
777	LEATHER_BOOTS	2.4
778	CHAINMAIL_HELMET	2.4
779	CHAINMAIL_CHESTPLATE	2.4
780	CHAINMAIL_LEGGINGS	2.4
781	CHAINMAIL_BOOTS	2.4
782	IRON_HELMET	2.4
783	IRON_CHESTPLATE	2.4
784	IRON_LEGGINGS	2.4
785	IRON_BOOTS	2.4
786	DIAMOND_HELMET	2.4
787	DIAMOND_CHESTPLATE	2.4
788	DIAMOND_LEGGINGS	2.4
789	DIAMOND_BOOTS	2.4
790	GOLDEN_HELMET	2.4
791	GOLDEN_CHESTPLATE	2.4
792	GOLDEN_LEGGINGS	2.4
793	GOLDEN_BOOTS	2.4
794	NETHERITE_HELMET	2.4
795	NETHERITE_CHESTPLATE	2.4

Enum value	Item name	First Minecraft version
796	NETHERITE_LEGGINGS	
797	NETHERITE_BOOTS	
798	FLINT	
799	PORKCHOP	
800	COOKED_PORKCHOP	
801	PAINTING	
802	GOLDEN_APPLE	
803	ENCHANTED_GOLDEN_APPLE	
804	OAK_SIGN	
805	SPRUCE_SIGN	
806	BIRCH_SIGN	
807	JUNGLE_SIGN	
808	ACACIA_SIGN	
809	DARK_OAK_SIGN	
810	MANGROVE_SIGN	
811	CRIMSON_SIGN	
812	WARPED_SIGN	
813	BUCKET	
814	WATER_BUCKET	
815	LAVA_BUCKET	
816	POWDER_SNOW_BUCKET	
817	SNOWBALL	
818	LEATHER	
819	MILK_BUCKET	
820	PUFFERFISH_BUCKET	
821	SALMON_BUCKET	
822	COD_BUCKET	
823	TROPICAL_FISH_BUCKET	
824	AXOLOTL_BUCKET	
825	TADPOLE_BUCKET	

Enum value	Item name	First Minecraft version
826	BRICK	2.4
827	CLAY_BLOCK	2.4
828	DRIED_KELP_BLOCK	2.4
829	PAPER	2.4
830	BOOK	2.4
831	SLIME_BLOCK	2.4
832	EGG	2.4
833	COMPASS	2.4
834	RECOVERY_COMPASS	2.4
835	BUNDLE	2.4
836	FISHING_ROD	2.4
837	CLOCK	2.4
838	SPYGLASS	2.4
839	GLOWSTONE_DUST	2.4
840	COD	2.4
841	SALMON	2.4
842	TROPICAL_FISH	2.4
843	PUFFERFISH	2.4
844	COOKED_COD	2.4
845	COOKED_SALMON	2.4
846	INK_SAC	2.4
847	GLOW_INK_SAC	2.4
848	COCOA_BEANS	2.4
849	WHITE_DYE	2.4
850	ORANGE_DYE	2.4
851	MAGENTA_DYE	2.4
852	LIGHT_BLUE_DYE	2.4
853	YELLOW_DYE	2.4
854	LIME_DYE	2.4
855	PINK_DYE	2.4































Enum value	Item name	First Minecraft version
856	GRAY_DYE	
857	LIGHT_GRAY_DYE	
858	CYAN_DYE	
859	PURPLE_DYE	
860	BLUE_DYE	
861	BROWN_DYE	
862	GREEN_DYE	
863	RED_DYE	
864	BLACK_DYE	
865	BONE_MEAL	
866	BONE	
867	SUGAR	
868	CAKE	
869	WHITE_BED	
870	ORANGE_BED	
871	MAGENTA_BED	
872	LIGHT_BLUE_BED	
873	YELLOW_BED	
874	LIME_BED	
875	PINK_BED	
876	GRAY_BED	
877	LIGHT_GRAY_BED	
878	CYAN_BED	
879	PURPLE_BED	
880	BLUE_BED	
881	BROWN_BED	
882	GREEN_BED	
883	RED_BED	
884	BLACK_BED	
885	COOKIE	





Enum value	Item name	First Minecraft version
886	FILLED_MAP	
887	SHEARS	
888	MELON_SLICE	
889	DRIED_KELP	
890	PUMPKIN_SEEDS	
891	MELON_SEEDS	
892	BEEF	
893	COOKED_BEEF	
894	CHICKEN	
895	COOKED_CHICKEN	
896	ROTTEN_FLESH	
897	ENDER_PEARL	
898	BLAZE_ROD	
899	GHAST_TEAR	
900	GOLD_NUGGET	
901	NETHER_WART	
902	POTION	
903	GLASS_BOTTLE	
904	SPIDER_EYE	
905	FERMENTED_SPIDER_EYE	
906	BLAZE_POWDER	
907	MAGMA_CREAM	
908	BREWING_STAND	
909	CAULDRON	
910	ENDER_EYE	
911	GLISTERING_MELON_SLICE	
912	ALLAY_SPAWN_EGG	
913	AXOLOTL_SPAWN_EGG	
914	BAT_SPAWN_EGG	
915	BEE_SPAWN_EGG	

Enum value	Item name	First Minecraft version
916	BLAZE_SPAWN_EGG	2
917	CAT_SPAWN_EGG	2
918	CAVE_SPIDER_SPAWN_EGG	2
919	CHICKEN_SPAWN_EGG	2
920	COD_SPAWN_EGG	2
921	COW_SPAWN_EGG	2
922	CREEPER_SPAWN_EGG	2
923	DOLPHIN_SPAWN_EGG	2
924	DONKEY_SPAWN_EGG	2
925	DROWNED_SPAWN_EGG	2
926	ELDER_GUARDIAN_SPAWN_EGG	2
927	ENDERMAN_SPAWN_EGG	2
928	ENDERMITE_SPAWN_EGG	2
929	EVOKER_SPAWN_EGG	2
930	FOX_SPAWN_EGG	2
931	FROG_SPAWN_EGG	2
932	GHAST_SPAWN_EGG	2
933	GLOW_SQUID_SPAWN_EGG	2
934	GOAT_SPAWN_EGG	2
935	GUARDIAN_SPAWN_EGG	2
936	HOGLIN_SPAWN_EGG	2
937	HORSE_SPAWN_EGG	2
938	HUSK_SPAWN_EGG	2
939	LLAMA_SPAWN_EGG	2
940	MAGMA_CUBE_SPAWN_EGG	2
941	MOOSHROOM_SPAWN_EGG	2
942	MULE_SPAWN_EGG	2
943	OCELOT_SPAWN_EGG	2
944	PANDA_SPAWN_EGG	2
945	PARROT_SPAWN_EGG	2































Enum value	Item name	First Minecraft version
946	PHANTOM_SPAWN_EGG	
947	PIG_SPAWN_EGG	
948	PIGLIN_SPAWN_EGG	
949	PIGLIN_BRUTE_SPAWN_EGG	
950	PILLAGER_SPAWN_EGG	
951	POLAR_BEAR_SPAWN_EGG	
952	PUFFERFISH_SPAWN_EGG	
953	RABBIT_SPAWN_EGG	
954	RAVAGER_SPAWN_EGG	
955	SALMON_SPAWN_EGG	
956	SHEEP_SPAWN_EGG	
957	SHULKER_SPAWN_EGG	
958	SILVERFISH_SPAWN_EGG	
959	SKELETON_SPAWN_EGG	
960	SKELETON_HORSE_SPAWN_EGG	
961	SLIME_SPAWN_EGG	
962	SPIDER_SPAWN_EGG	
963	SQUID_SPAWN_EGG	
964	STRAY_SPAWN_EGG	
965	STRIDER_SPAWN_EGG	
966	TADPOLE_SPAWN_EGG	
967	TRADER_LLAMA_SPAWN_EGG	
968	TROPICAL_FISH_SPAWN_EGG	
969	TURTLE_SPAWN_EGG	
970	VEX_SPAWN_EGG	
971	VILLAGER_SPAWN_EGG	
972	VINDICATOR_SPAWN_EGG	
973	WANDERING_TRADER_SPAWN_EGG	
974	WARDEN_SPAWN_EGG	
975	WITCH_SPAWN_EGG	

Enum value	Item name	First Minecraft version
976	WITHER_SKELETON_SPAWN_EGG	
977	WOLF_SPAWN_EGG	
978	ZOGLIN_SPAWN_EGG	
979	ZOMBIE_SPAWN_EGG	
980	ZOMBIE_HORSE_SPAWN_EGG	
981	ZOMBIE_VILLAGER_SPAWN_EGG	
982	ZOMBIFIED_PIGLIN_SPAWN_EGG	
983	EXPERIENCE_BOTTLE	
984	FIRE_CHARGE	
985	WRITABLE_BOOK	
986	WRITTEN_BOOK	
987	ITEM_FRAME	
988	GLOW_ITEM_FRAME	
989	FLOWER_POT	
990	CARROT	
991	POTATO	
992	BAKED_POTATO	
993	POISONOUS_POTATO	
994	MAP	
995	GOLDEN_CARROT	
996	SKELETON_SKULL	
997	WITHER_SKELETON_SKULL	
998	PLAYER_HEAD	
999	ZOMBIE_HEAD	
1000	CREEPER_HEAD	
1001	DRAGON_HEAD	
1002	NETHER_STAR	
1003	PUMPKIN_PIE	
1004	FIREWORK_ROCKET	
1005	FIREWORK_STAR	

Enum value	Item name	First Minecraft version
1006	ENCHANTED_BOOK	
1007	NETHER_BRICK	
1008	PRISMARINE_SHARD	
1009	PRISMARINE_CRYSTALS	
1010	RABBIT	
1011	COOKED_RABBIT	
1012	RABBIT_STEW	
1013	RABBIT_FOOT	
1014	RABBIT_HIDE	
1015	ARMOR_STAND	
1016	IRON_HORSE_ARMOR	
1017	GOLDEN_HORSE_ARMOR	
1018	DIAMOND_HORSE_ARMOR	
1019	LEATHER_HORSE_ARMOR	
1020	LEAD	
1021	NAME_TAG	
1022	COMMAND_BLOCK_MINECART	
1023	MUTTON	
1024	COOKED_MUTTON	
1025	WHITE_BANNER	
1026	ORANGE_BANNER	
1027	MAGENTA_BANNER	
1028	LIGHT_BLUE_BANNER	
1029	YELLOW_BANNER	
1030	LIME_BANNER	
1031	PINK_BANNER	
1032	GRAY_BANNER	
1033	LIGHT_GRAY_BANNER	
1034	CYAN_BANNER	
1035	PURPLE_BANNER	

Enum value	Item name	First Minecraft version
1036	BLUE_BANNER	
1037	BROWN_BANNER	
1038	GREEN_BANNER	
1039	RED_BANNER	
1040	BLACK_BANNER	
1041	END_CRYSTAL	
1042	CHORUS_FRUIT	
1043	POPPED_CHORUS_FRUIT	
1044	BEETROOT	
1045	BEETROOT_SEEDS	
1046	BEETROOT_SOUP	
1047	DRAGON_BREATH	
1048	SPLASH_POTION	
1049	SPECTRAL_ARROW	
1050	TIPPED_ARROW	
1051	LINGERING_POTION	
1052	SHIELD	
1053	TOTEM_OF_UNDYING	
1054	SHULKER_SHELL	
1055	IRON_NUGGET	
1056	KNOWLEDGE_BOOK	
1057	DEBUG_STICK	
1058	MUSIC_DISC_13	
, 1059	MUSIC_DISC_CAT	
1060	MUSIC_DISC_BLOCKS	
1061	MUSIC_DISC_CHIRP	
1062	MUSIC_DISC_FAR	
1063	MUSIC_DISC_MALL	
1064	MUSIC_DISC_MELLOHI	
1065	MUSIC_DISC_STAL	

Enum value	Item name	First Minecraft version
1066	MUSIC_DISC_STRAD	2
1067	MUSIC_DISC_WARD	2
1068	MUSIC_DISC_11	2
, 1069	MUSIC_DISC_WAIT	2
1070	MUSIC_DISC_OTHERSIDE	2
1071	MUSIC_DISC_5	2
, 1072	MUSIC_DISC_PIGSTEP	2
1073	DISC_FRAGMENT_5	2
, 1074	TRIDENT	2
1075	PHANTOM_MEMBRANE	2
1076	NAUTILUS_SHELL	2
1077	HEART_OF_THE_SEA	2
1078	CROSSBOW	2
1079	SUSPICIOUS_STEW	2
1080	LOOM	2
1081	FLOWER_BANNER_PATTERN	2
1082	CREEPER_BANNER_PATTERN	2
1083	SKULL_BANNER_PATTERN	2
1084	MOJANG_BANNER_PATTERN	2
1085	GLOBE_BANNER_PATTERN	2
1086	PIGLIN_BANNER_PATTERN	2
1087	GOAT_HORN	2
1088	COMPOSTER	2
1089	BARREL	2
1090	SMOKER	2
1091	BLAST_FURNACE	2
1092	CARTOGRAPHY_TABLE	2
1093	FLETCHING_TABLE	2
1094	GRINDSTONE	2
1095	SMITHING_TABLE	2

Enum value	Item name	First Minecraft version
1096	STONECUTTER	
1097	BELL	
1098	LANTERN	
1099	SOUL_LANTERN	
1100	SWEET_BERRIES	
1101	GLOW_BERRIES	
1102	CAMPFIRE	
1103	SOUL_CAMPFIRE	
1104	SHROOMLIGHT	
1105	HONEYCOMB	
1106	BEE_NEST	
1107	BEEHIVE	
1108	HONEY_BOTTLE	
1109	HONEYCOMB_BLOCK	
1110	LODESTONE	
1111	CRYING_OBSIDIAN	
1112	BLACKSTONE	
1113	BLACKSTONE_SLAB	
1114	BLACKSTONE_STAIRS	
1115	GILDED_BLACKSTONE	
1116	POLISHED_BLACKSTONE	
1117	POLISHED_BLACKSTONE_SLAB	
1118	POLISHED_BLACKSTONE_STAIRS	
1119	CHISELED_POLISHED_BLACKSTONE	
1120	POLISHED_BLACKSTONE_BRICKS	
1121	POLISHED_BLACKSTONE_BRICK_SLAB	
1122	POLISHED_BLACKSTONE_BRICK_STAIRS	
1123	CRACKED_POLISHED_BLACKSTONE_BRICKS	
1124	RESPAWN_ANCHOR	
1125	CANDLE	



























Enum value	Item name	First Minecraft version
1126	WHITE_CANDLE	
1127	ORANGE_CANDLE	
1128	MAGENTA_CANDLE	
1129	LIGHT_BLUE_CANDLE	
1130	YELLOW_CANDLE	
1131	LIME_CANDLE	
1132	PINK_CANDLE	
1133	GRAY_CANDLE	
1134	LIGHT_GRAY_CANDLE	
1135	CYAN_CANDLE	
1136	PURPLE_CANDLE	
1137	BLUE_CANDLE	
1138	BROWN_CANDLE	
1139	GREEN_CANDLE	
1140	RED_CANDLE	
1141	BLACK_CANDLE	
1142	SMALL_AMETHYST_BUD	
1143	MEDIUM_AMETHYST_BUD	
1144	LARGE_AMETHYST_BUD	
1145	AMETHYST_CLUSTER	
1146	POINTED_DRIPSTONE	
1147	OCHRE_FROGLIGHT	
1148	VERDANT_FROGLIGHT	
1149	PEARLESCENT_FROGLIGHT	
1150	FROGSPAWN	
1151	ECHO_SHARD	

Table 3.3: Item enum

3.4.11 Entity

This section is under construction, as detailed properties cannot be specified.

One entity is represented by its type. Additionally, it has a unique ID (*UUID*) and a position.

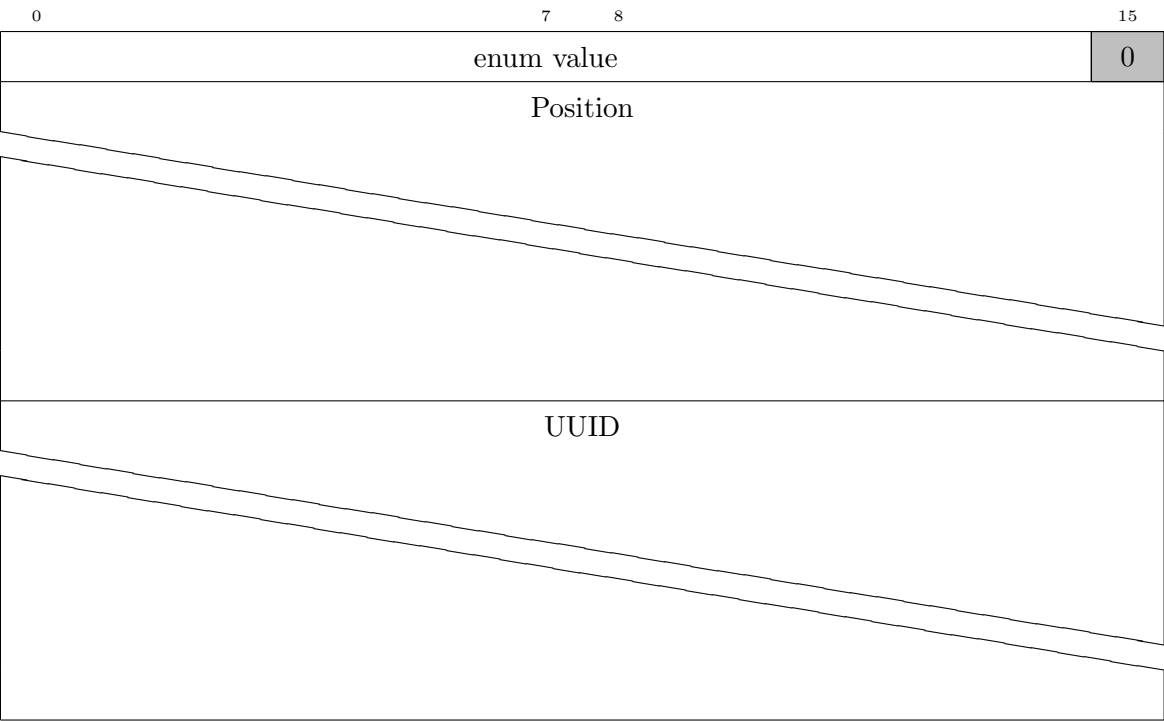
































Figure 3.10: Structure of an Entity

Enum value	Entity type	First Minecraft version
0	DROPPED_ITEM	1.8
1	EXPERIENCE_ORB	2
2	AREA_EFFECT_CLOUD	2
3	ELDER_GUARDIAN	2
4	WITHER_SKELETON	2
5	STRAY	2
6	EGG	2
7	LEASH_HITCH	2
8	PAINTING	2

Enum value	Entity type	First Minecraft version
9	ARROW	1.2
10	SNOWBALL	1.2
11	FIREBALL	1.2
12	SMALL_FIREBALL	1.2
13	ENDER_PEARL	1.2
14	ENDER_SIGNAL	1.2
15	SPLASH_POTION	1.2
16	THROWN_EXP_BOTTLE	1.2
17	ITEM_FRAME	1.2
18	WITHER_SKULL	1.2
19	PRIMED_TNT	1.2
20	FALLING_BLOCK	1.2
21	FIREWORK	1.2
22	HUSK	1.2
23	SPECTRAL_ARROW	1.2
24	SHULKER_BULLET	1.2
25	DRAGON_FIREBALL	1.2
26	ZOMBIE_VILLAGER	1.2
27	SKELETON_HORSE	1.2
28	ZOMBIE_HORSE	1.2
29	ARMOR_STAND	1.2
30	DONKEY	1.2
31	MULE	1.2
32	EVOKER_FANGS	1.2
33	EVOKER	1.2
34	VEX	1.2
35	VINDICATOR	1.2
36	ILLUSIONER	1.2
37	MINECART_COMMAND	1.2
38	BOAT	1.2

Enum value	Entity type	First Minecraft version
39	MINECART	2
40	MINECART_CHEST	2
41	MINECART_FURNACE	2
42	MINECART_TNT	2
43	MINECART_HOPPER	2
44	MINECART_MOB_SPAWNER	2
45	CREEPER	2
46	SKELETON	2
47	SPIDER	2
48	GIANT	2
49	ZOMBIE	2
50	SLIME	2
51	GHAST	2
52	ZOMBIFIED_PIGLIN	2
53	ENDERMAN	2
54	CAVE_SPIDER	2
55	SILVERFISH	2
56	BLAZE	2
57	MAGMA_CUBE	2
58	ENDER_DRAGON	2
59	WITHER	2
60	BAT	2
61	WITCH	2
62	ENDERMITE	2
63	GUARDIAN	2
64	SHULKER	2
65	PIG	2
66	SHEEP	2
67	COW	2
68	CHICKEN	2

Enum value	Entity type	First Minecraft version
69	SQUID	
70	WOLF	
71	MUSHROOM_COW	
72	SNOWMAN	
73	OCELOT	
74	IRON_GOLEM	
75	HORSE	
76	RABBIT	
77	POLAR_BEAR	
78	LLAMA	
79	LLAMA_SPIT	
80	PARROT	
81	VILLAGER	
82	ENDER_CRYSTAL	
83	TURTLE	
84	PHANTOM	
85	TRIDENT	
86	COD	
87	SALMON	
88	PUFFERFISH	
89	TROPICAL_FISH	
90	DROWNED	
91	DOLPHIN	
92	CAT	
93	PANDA	
94	PILLAGER	
95	RAVAGER	
96	TRADER_LLAMA	
97	WANDERING_TRADER	
98	FOX	




















Enum value	Entity type	First Minecraft version
99	BEE	
100	HOGLIN	
101	PIGLIN	
102	STRIDER	
103	ZOGLIN	
104	PIGLIN_BRUTE	
105	AXOLOTL	
106	GLOW_ITEM_FRAME	
107	GLOW_SQUID	
108	GOAT	
109	MARKER	
110	ALLAY	
111	CHEST_BOAT	
112	FROG	
113	TADPOLE	
114	WARDEN	
115	FISHING_HOOK	
116	LIGHTNING	
117	PLAYER	

Table 3.4: Entity enum

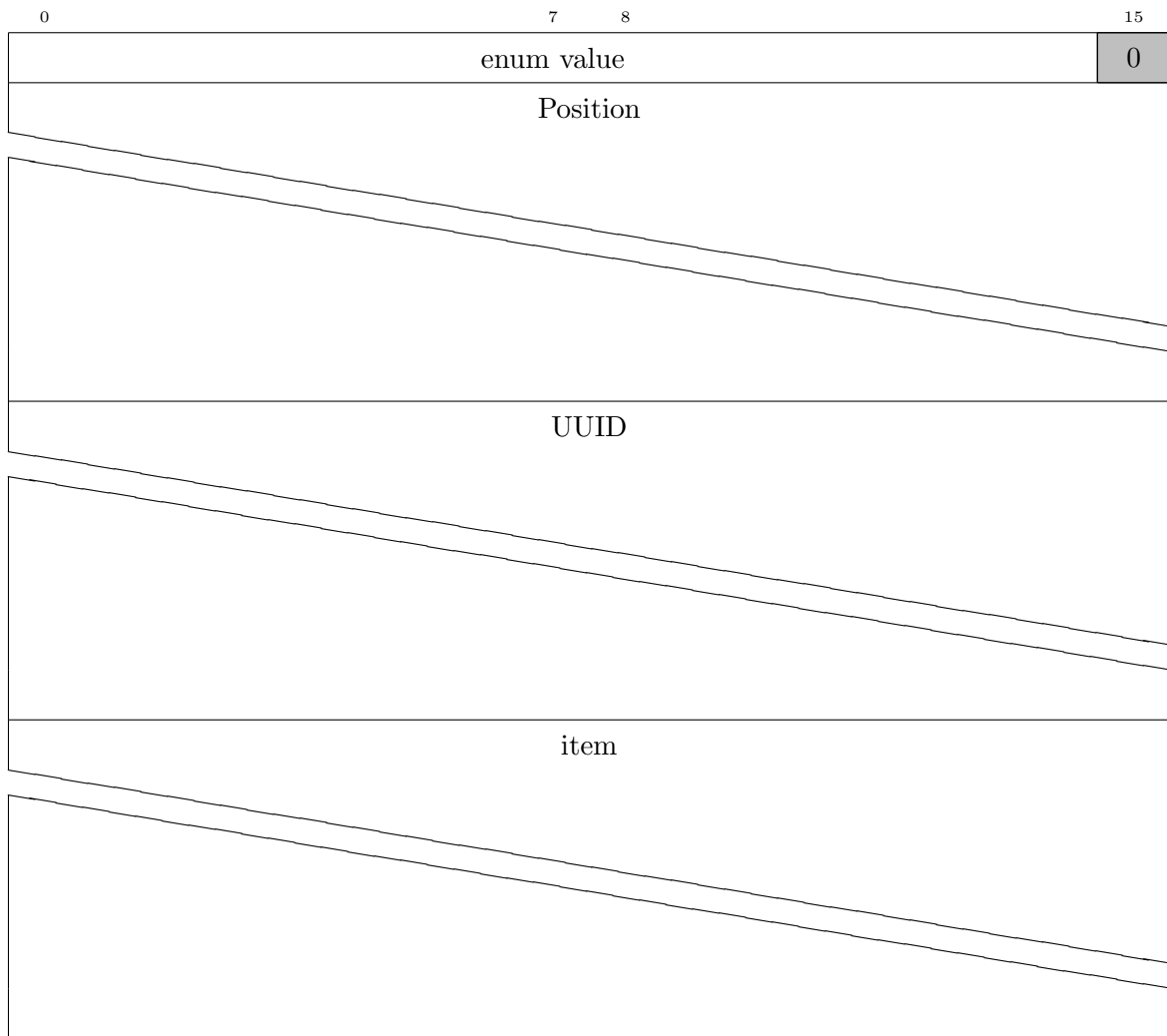


Figure 3.11: Structure of a `DroppedItem`

3.4.12 Container

This section was only made to get the players' inventories.

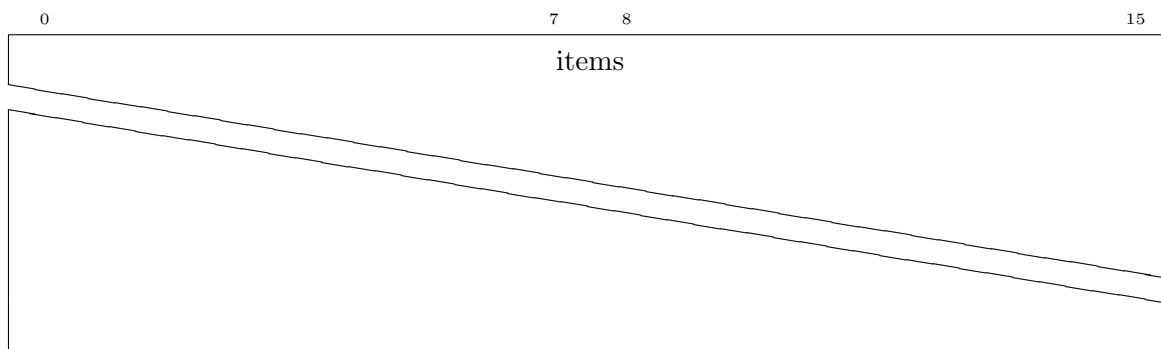


Figure 3.12: Structure of a Container

4 Servers manager petition

The Servers manager is the responsible for starting the servers with the desired configuration.

All the Servers manager petitions will follow the structure shown in Figure 4.1, Servers manager petition structure.

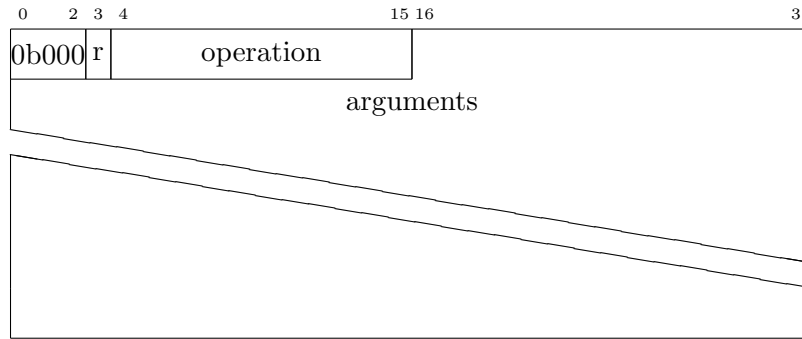


Figure 4.1: Servers manager petition structure

Once all the operations are implemented, here you'll find a table that shows a link to each one of the operations.

You don't have to implement the NOP operation in this destiny block because the timeout happens inside the Server petition block. That is, if you don't call operations (or send NOPs) to the Server petition for a long time, the server will stop, and because the server stopped the Server manager will close the established connection.

4.1 Start server operation

This operation allows WatchWolf Tester to start a server. It provides high customization, as you can specify plugins, worlds and config files (among other parameters).

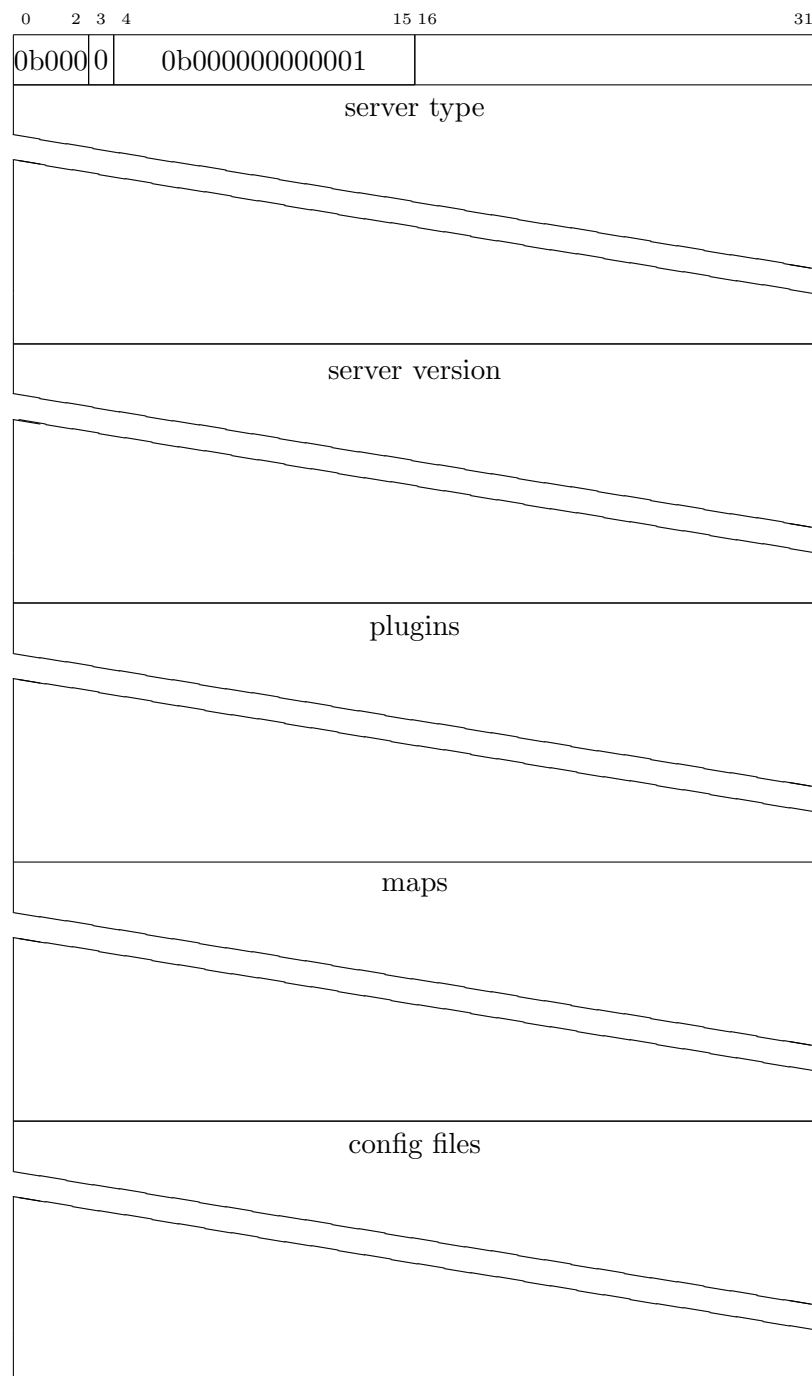


Figure 4.2: Start server petition structure

Once a 'start server' request is received the program should create a server with the specified arguments, and return its IP:Port (for example, '127.0.0.1:25565', a 15-characters string; see Figure 4.3, Start server response structure). The IP to send the Server Petitions is the same, but the next port (IP:<port+1>).

If it's not possible to create it (for example: one argument is invalid, the user sent a plugin when it's specified that only Usual Plugins are allowed,⁷ or there's no free servers of that type), then an empty IP is returned (see Figure 4.4, Start server error response structure).

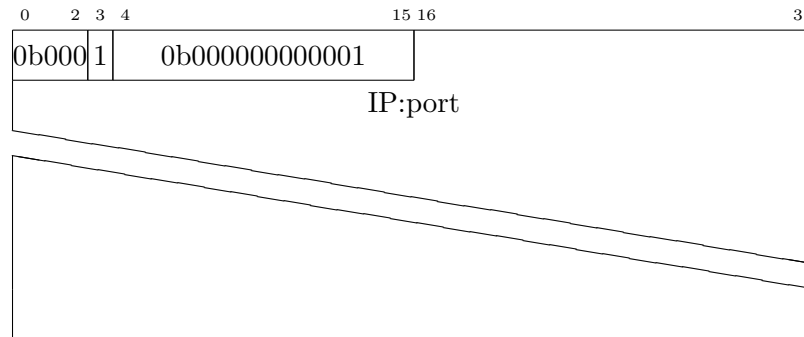


Figure 4.3: Start server response structure

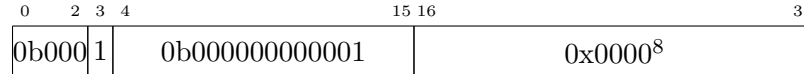


Figure 4.4: Start server error response structure

4.1.1 Maps

Array of maps (worlds; Map[]). To have more information about arrays check the subsection 3.4.5, Array.

About the Map type, Minecraft is divided on different worlds (*World - Minecraft Wiki* (n.d.)). By default there's only three, but with some plugins this number can increase.

In order to properly test some plugins, there may be needed some kind of known place. To avoid overusing the Set block operation you can send using this argument your world(s).

⁷To prevent possible viruses, some servers may have enabled one option that limits which plugins are allowed to be sent. Besides being defined by the API it hasn't been implemented yet, and won't be until WatchWolf offers public servers.

⁸Being the argument an array, the first 2 bytes specifies its size. As we must return an empty array, the argument should be exactly 16 zeroes.

Map explanation in more detail is needed.

4.1.2 Plugins

Array of plugins (Plugin[]). To have more information check the subsection 3.4.5, Array.

About the Plugin type, there's three types of plugins:

1. Usual plugins

The Usual plugins are plugins that you expect everyone to have for being extremely common, like WorldGuard (*WorldGuard* (n.d.)), or to allow the user to test plugins with Premium plugins⁹ dependencies. This allows both security and performance.

Something to highlight is the fact that, as mentioned in the operation Allows non usual plugins,¹⁰ some ServerManager will only allow plugins that are already in the machine.

As can be seen in the Figure 4.5, Usual plugin structure, the first argument (that specifies the Plugin type) is 0x00.

The plugin version is optional, and can't be specified in the parameter *name*. If no version is provided (an empty string) then the Server Manager will pick the plugin with the highest version that is compatible with the desired server version.

⁹Premium plugins are paid plugins. For that reason, only the purchaser can download them (so you can't send a link to the plugin), and sending them through the internet via file upload may not be legal, so the plugin must be already downloaded in the machine.

¹⁰Reference to the operation is needed here, but not yet implemented. It won't be until WatchWolf offers public servers.

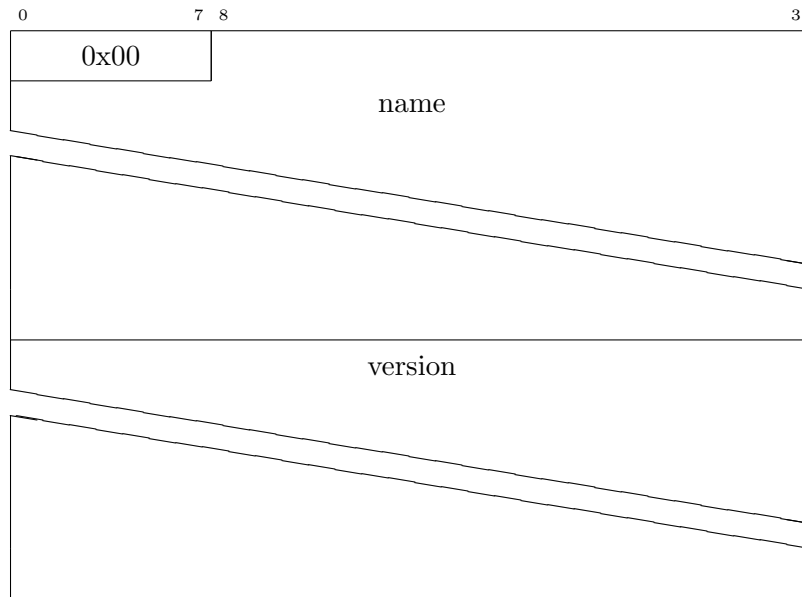


Figure 4.5: Usual plugin structure

2. Uploaded plugins

The Uploaded plugins are plugins available in some website, thus can be sent through an URL.

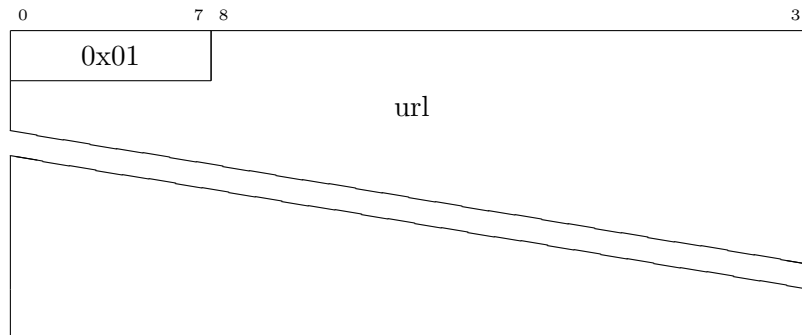


Figure 4.6: Uploaded plugin structure

3. File plugins

File plugins are plugins that are non-usual and aren't uploaded in any website, so they must be sent as a file.

As can be seen in the Figure 4.7, File plugin structure, the first argument (that specifies the Plugin type) is 0x02.

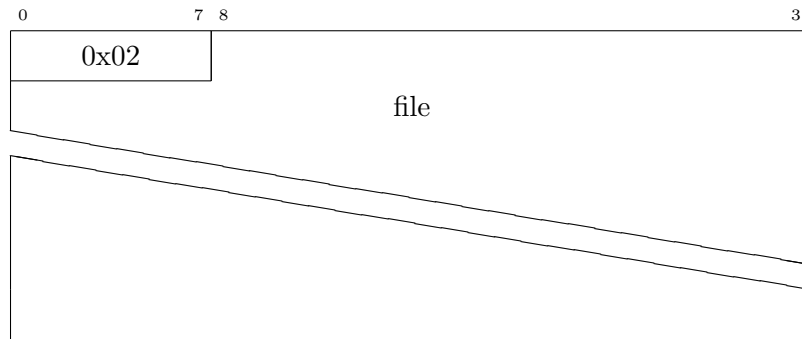


Figure 4.7: File plugin structure

A mixed example with different plugin types is needed here.

4.1.3 Server version

String specifying the server type's version. For example, '1.12.2'.

4.1.4 Config files

Array of files. Usually they have offset 'plugins/', as they provide the default configuration for a given plugin.

4.2 Server started notification

After a Start server operation the server will start. Due to the unpredictable amount of time that the server takes to start up you'll receive a Server started notification once the server socket is available.

You may notice that there's another Server started notification under the Server petition section. That notification goes to the ServerManager, while this one goes to the Tester, but both are used for the same purpose: notify the element "1 level up in the hierarchy" that the server has been started. Also, the Server one have a token that is only shared between Server and the ServerManager, and the Tester doesn't have to know it too.

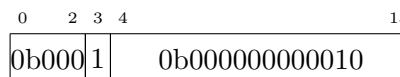


Figure 4.8: Server started notification structure

4.3 Error notification

As we're testing a MC plugin it's important to consider all the errors raised during the testing. The *Error notification* is an async petition that it is sent to the WatchWolf Tester orchestrator as a response, without any previous petition.

The *Error notification* will contain the full stack trace of the raised error, captured by the server console.

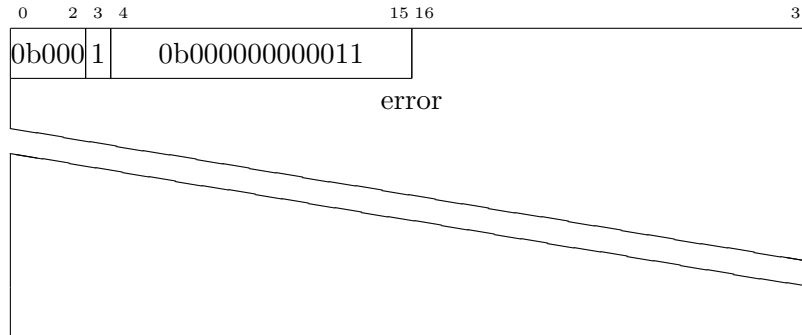


Figure 4.9: Error notification structure

5 Server petition



The server petitions are a bit different from the rest. The server petitions are designed in a way that everyone have some common operations, and then you can add some others optionally (and even non-standard ones). We'll define this 'set of operations' as groups.

For that reason, the operation field (defined on the Figure 3.1, Packet structure) becomes the group, and then the operation is defined on the next 2 bytes, as shown in the Figure 5.1, Server petition structure.

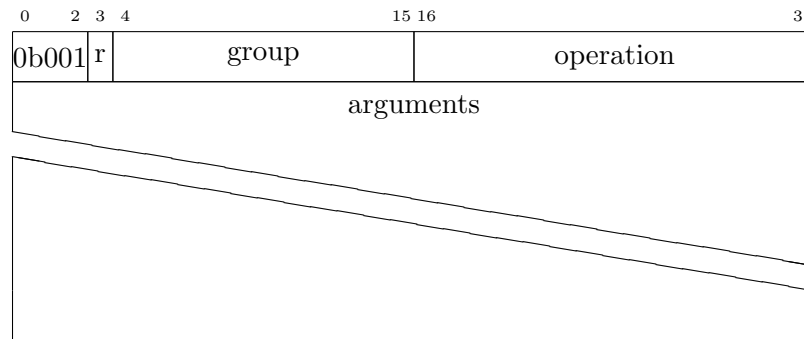


Figure 5.1: Server petition structure

5.1 Server petition group

The group tells which kind of petitions we're talking about.

The MSB tells if the group is one of the standards, thus must be followed by specification, or if it's non-standard, so the petition can be whatever the user want it to be. This is useful if you want to implement a petition not followed by the standard, or if the petition only makes sense in your personal environment.

The 0b00000000000001 group represents the 'base group'. This group implements some basic operations, and must be implemented. All the others are optional.

type[15]	type[14..4]	Extended type
0	0b000000000000	NOP ¹¹
0	0b000000000001	Base operations
0	0b000000000010	System operations
0	0b000000000011	Performance operations
0	0b00000010000	WorldGuard operations
0	0b00000010001	Residence operations
1	XXXXXXXXXXXX	Reserved for internal use

Table 5.1: Extended types

If you’ve implemented an extended type and you believe that it makes sense to be part of the standard contact contact@watchwolf.dev to reserve one of the addresses.

5.2 Server petition operation

Like the parameter Operation, it specifies the desired request. For more information, refer to the subsection 3.3, Operation.

The only reserved operation is the all-zeroes operation (0x0000). It represents the question ‘is this extended petition implemented?’. The server must response (with the response bit at 1) with *true* (group implemented on this machine) or *false* (unknown/unimplemented group), as it can be seen in Figure 5.2, Implemented group response structure.

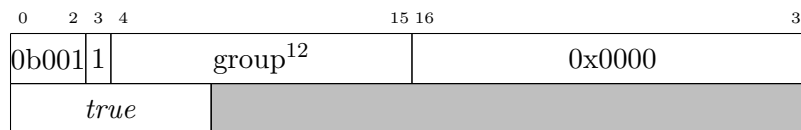


Figure 5.2: Implemented group response structure

5.3 Base operations

...

is implemented' (all zeroes) optional

¹¹As stated on the subsection 3.3, Operation, the all-zeroes operation represents a NOP request.

¹²except for groups 0b000000000000 and 0b000000000001

Once all the operations are implemented, here you'll find a table that shows a link to each one of the operations.

5.3.1 Server stop operation

...

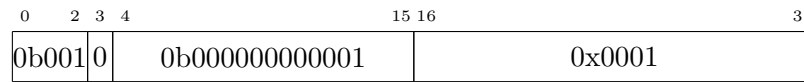


Figure 5.3: Stop server operation structure

5.3.2 Server stopped notification

... response to...

To have more information about the *server id* parameter check the Subsection 5.3.3, Server started notification.

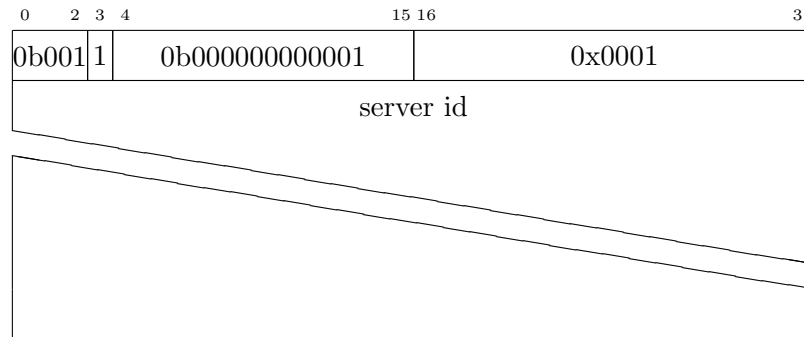


Figure 5.4: Server stopped response structure

5.3.3 Server started notification

This notification is sent to the Server Manager [ref?](#), as a response for the Start server operation, thus not really a response of a Server's operation.

As one IP can have multiple servers, a string that identifies the server must be sent with the response. This argument can be whatever you want (for example, <server ip>:<server port> will be unique), but must be shared between both the Server Manager and the Server. For security reasons [cite IP spoofing or similar](#) (because the Tester [ref?](#) also knows the server's IP and port) a hash function is encouraged to be used.

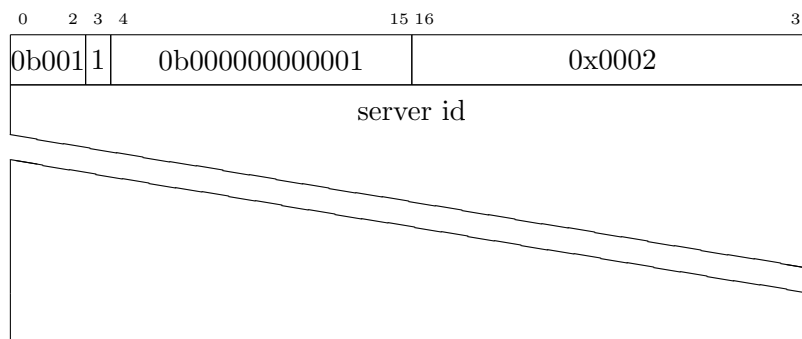


Figure 5.5: Server started response structure

5.3.4 Whitelist player operation

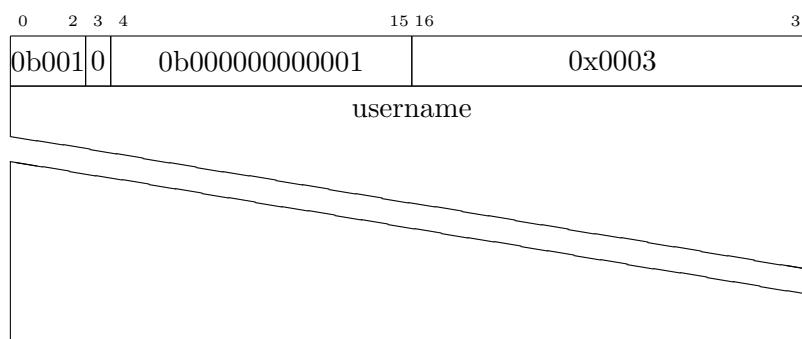


Figure 5.6: Whitelist player operation structure

5.3.5 OP player operation

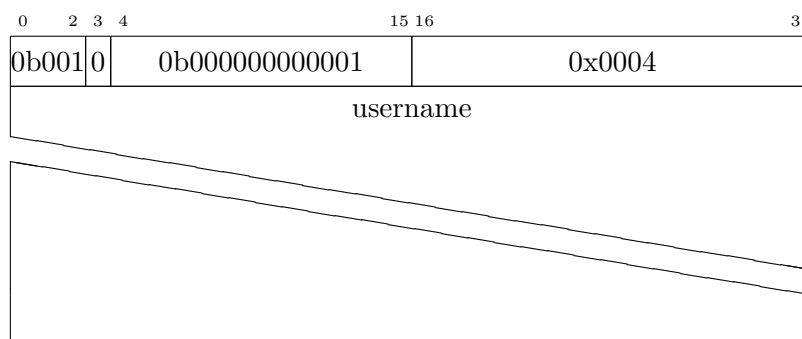


Figure 5.7: OP player operation structure

5.3.6 Set block operation

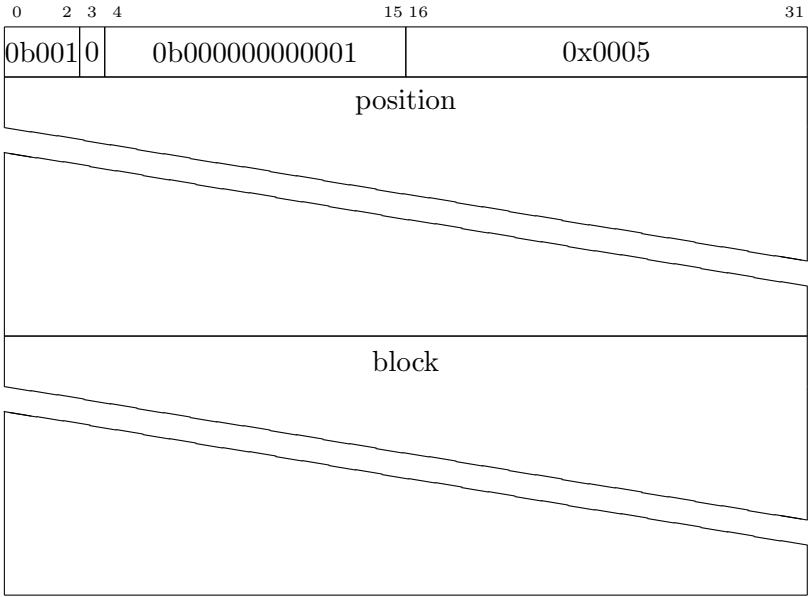


Figure 5.8: Set block operation structure

5.3.7 Get block operation

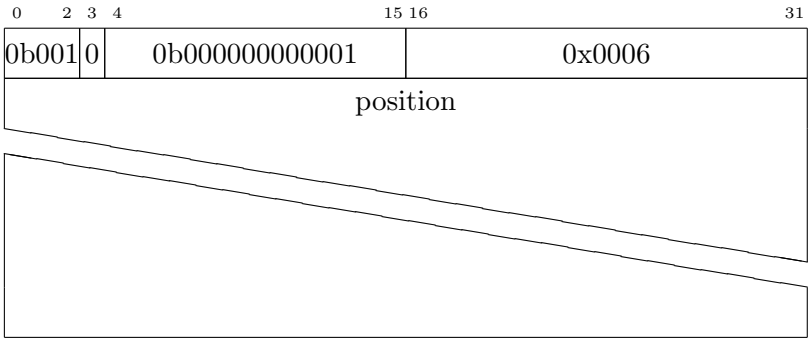


Figure 5.9: Get block operation structure

5.3.8 Get block response



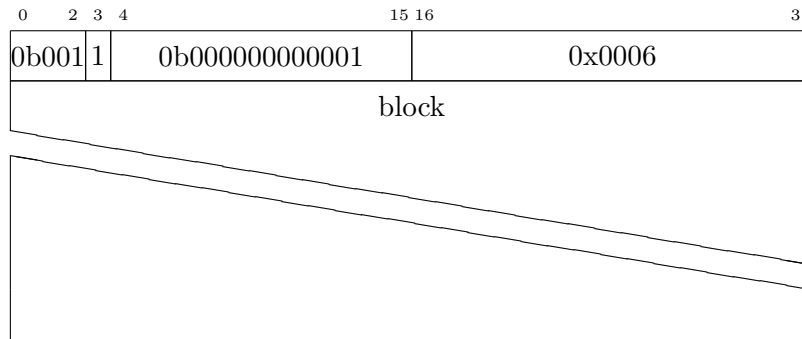


Figure 5.10: Get block operation structure

5.3.9 Get player position operation

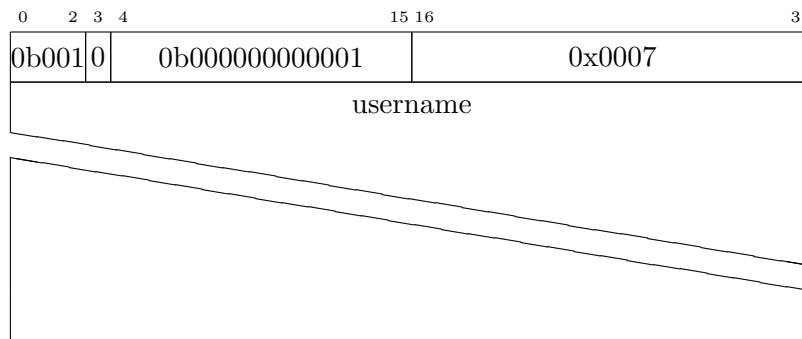


Figure 5.11: Get player position operation structure

5.3.10 Get player position response

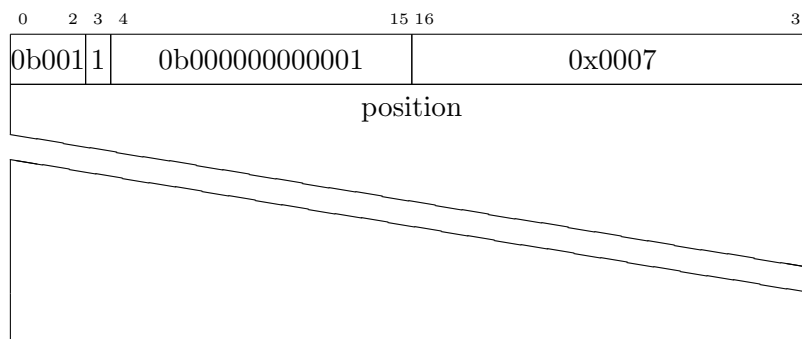


Figure 5.12: Get player position response structure

5.3.11 Give item to player operation

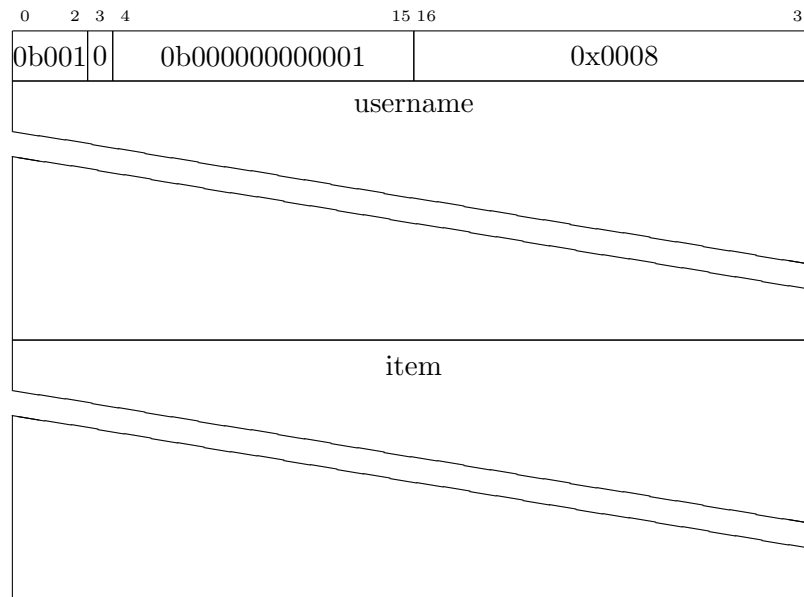


Figure 5.13: Give item to player operation structure

5.3.12 Run command operation

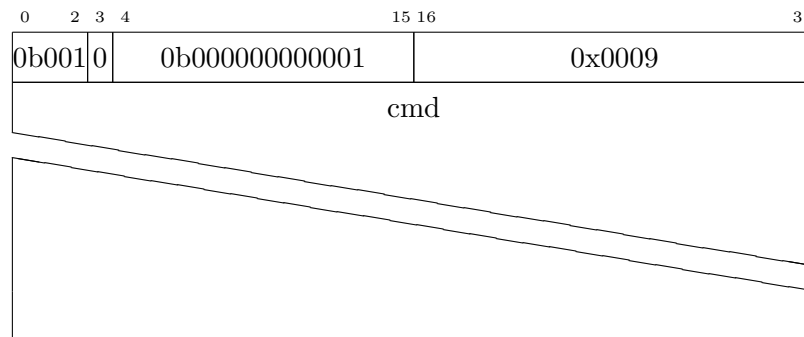


Figure 5.14: Run command operation structure

5.3.13 Get players operation



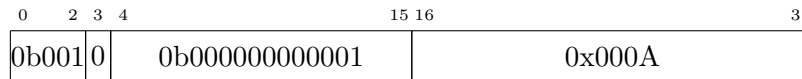


Figure 5.15: Get players operation structure

5.3.14 Get players response

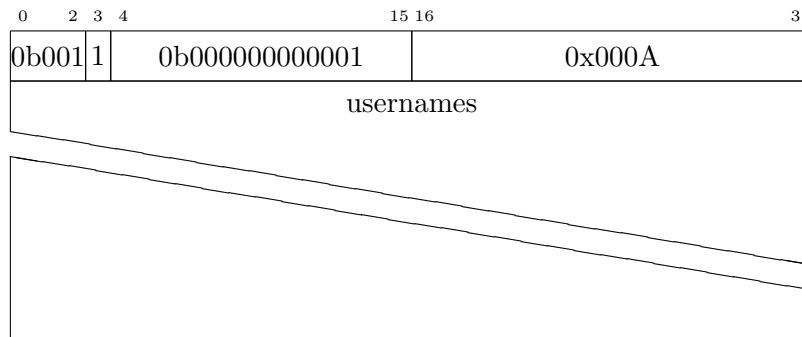


Figure 5.16: Get players response structure

5.3.15 Synchronize operation

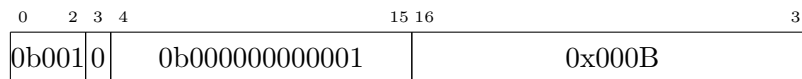


Figure 5.17: Synchronize operation structure

5.3.16 Synchronize response

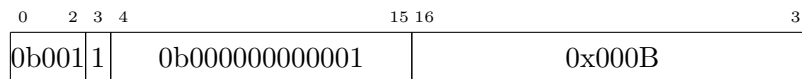


Figure 5.18: Synchronize response structure

5.3.17 Tp player operation



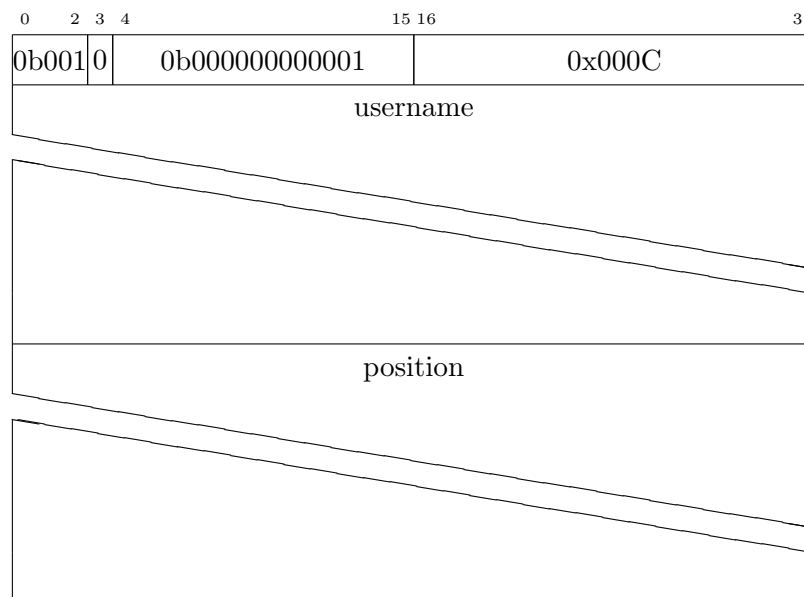


Figure 5.19: Tp player operation structure

5.3.18 Get player pitch operation

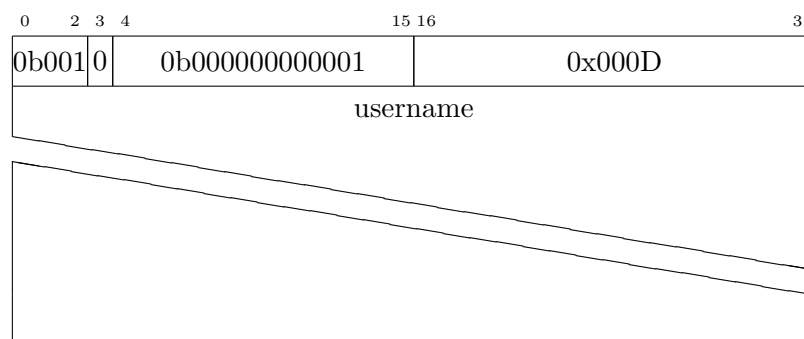


Figure 5.20: Get player pitch operation structure

5.3.19 Get player pitch response



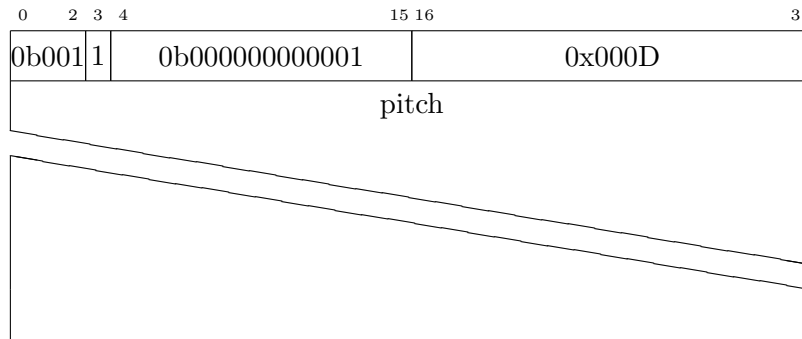


Figure 5.21: Get player pitch response structure

5.3.20 Get player yaw operation

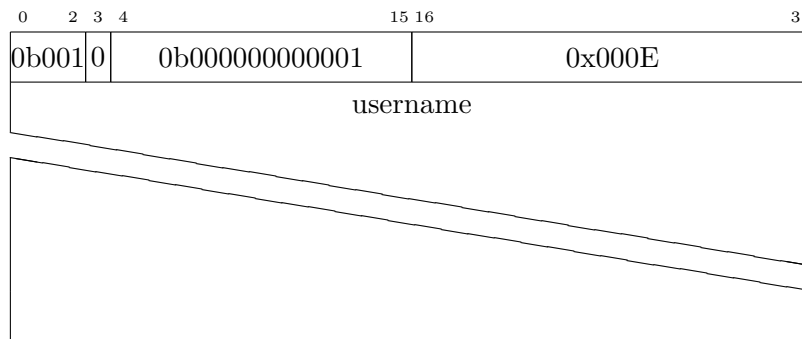


Figure 5.22: Get player yaw operation structure

5.3.21 Get player yaw response

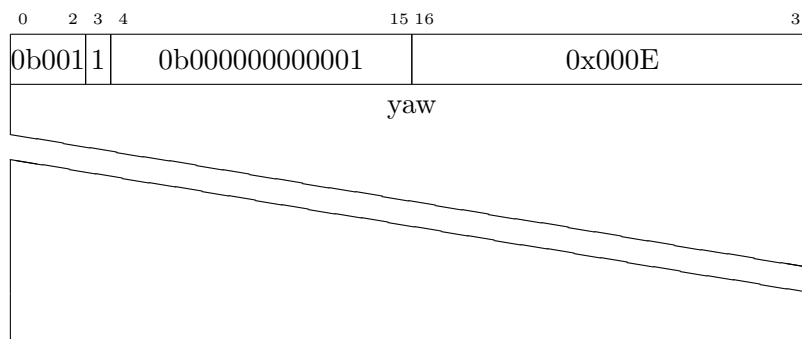


Figure 5.23: Get player yaw response structure

5.3.22 Get player inventory operation

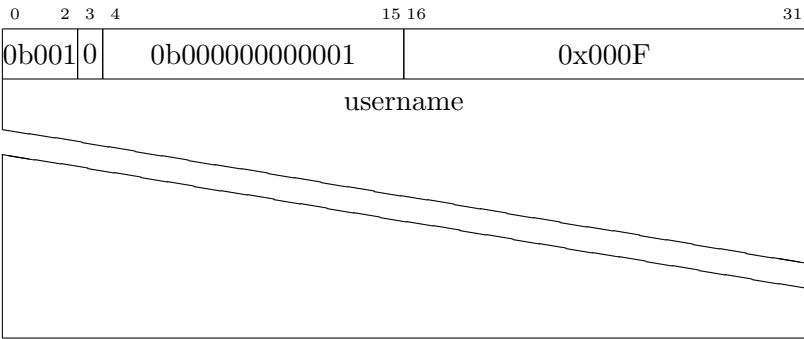


Figure 5.24: Get player inventory operation structure

5.3.23 Get player inventory response

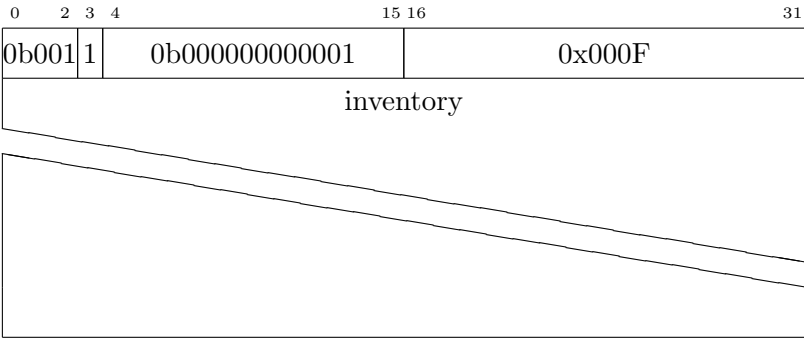


Figure 5.25: Get player inventory response structure

5.3.24 Get entities operation



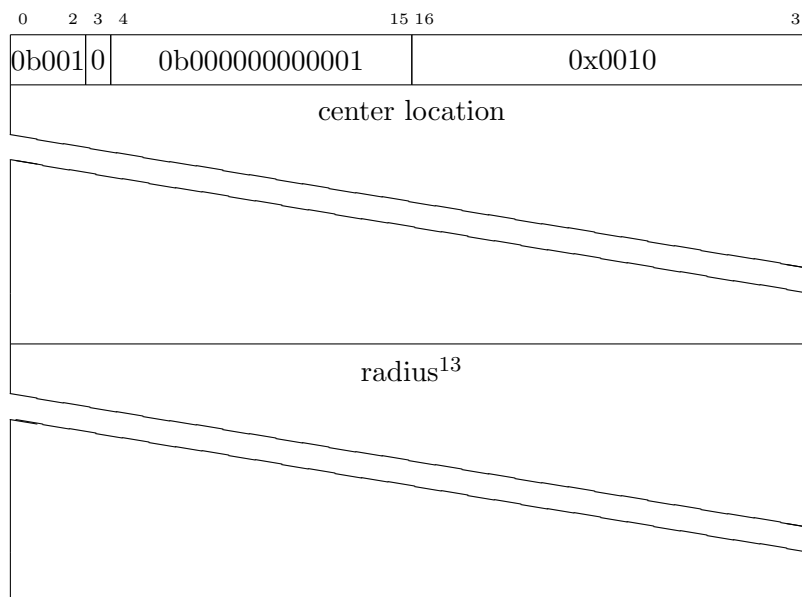


Figure 5.26: Get entities operation structure

5.3.25 Get entities response

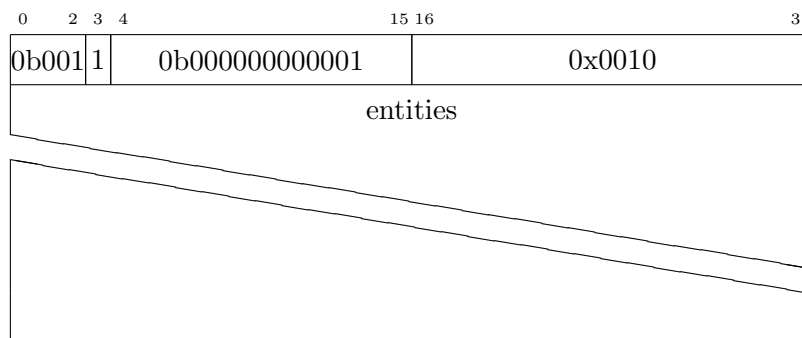


Figure 5.27: Get entities response structure

5.3.26 Spawn entity operation



¹³Large radius or locations in unloaded chunks may return unexpected data.

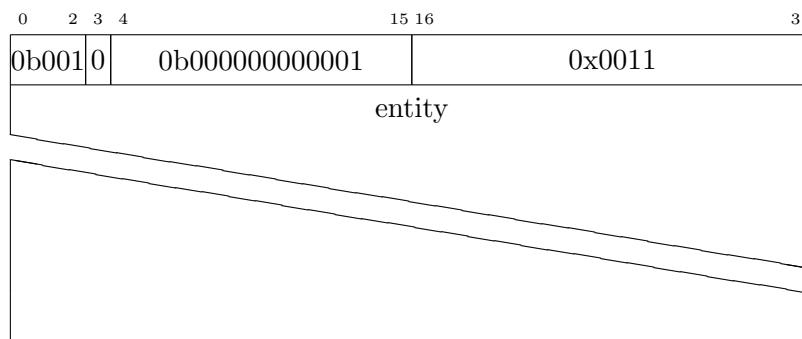


Figure 5.28: Spawn entity operation structure

5.3.27 Spawn entity response

...

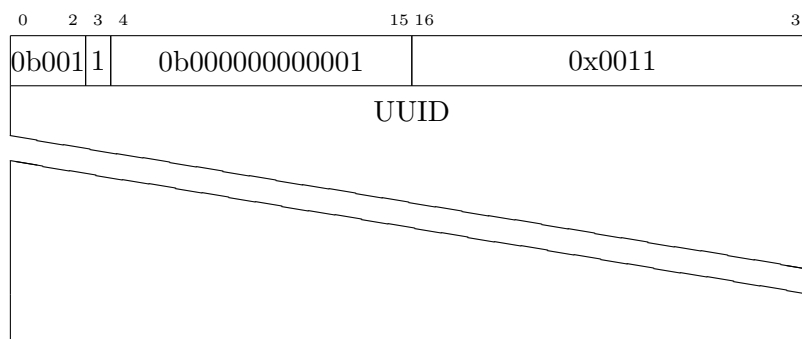


Figure 5.29: Spawn entity response structure

5.4 Performance operations

...

5.5 WorldGuard operations

...

5.6 Residence operations

...

6 Clients manager petition

...

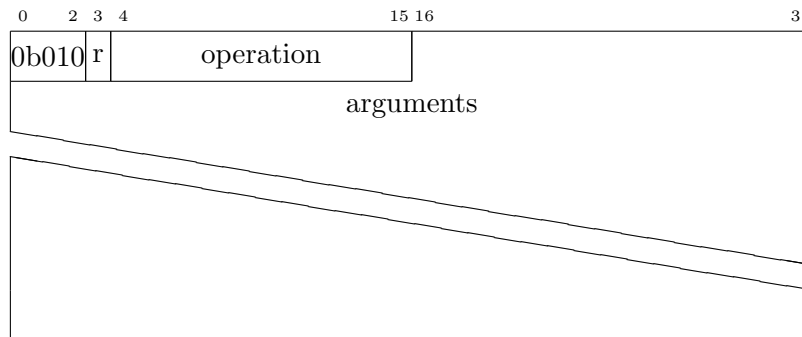


Figure 6.1: Clients manager petition structure

You don't have to implement the NOP operation in this destiny block because the timeout happens inside the Client petition block. That is, if you don't call operations (or send NOPs) to the Client petition for a long time, the client will timeout, causing the Clients manager to close the established connection.

Once all the operations are implemented, here you'll find a table that shows a link to each one of the operations:

6.1 Start client operation

...

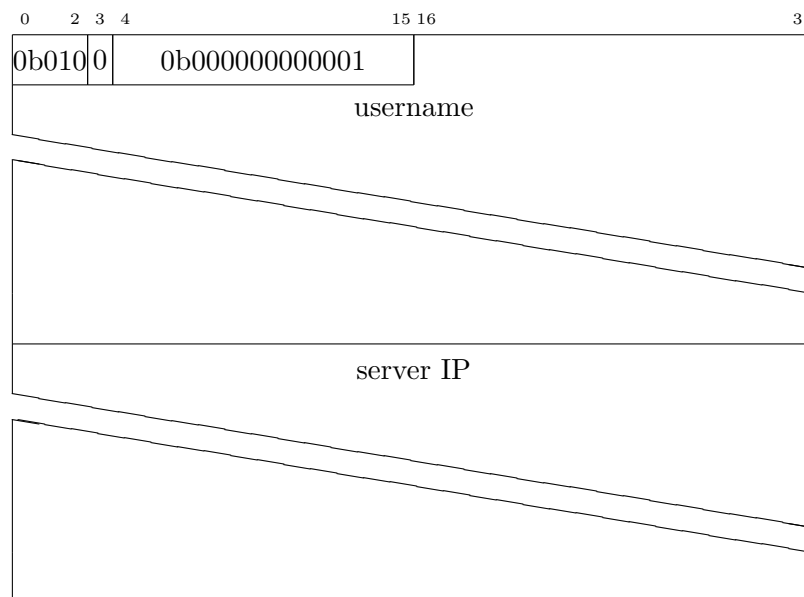


Figure 6.2: Start client petition structure

6.2 Client started response operation

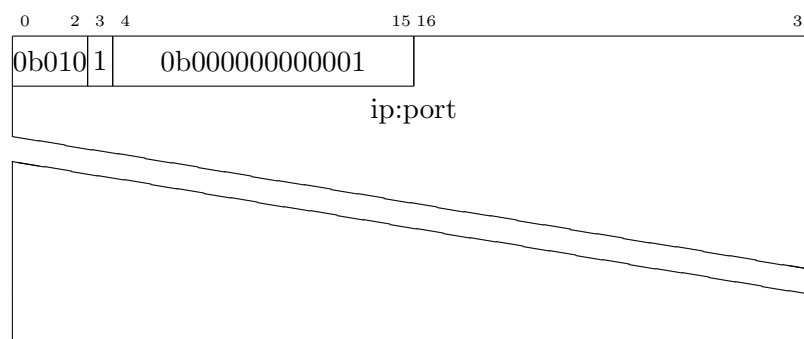


Figure 6.3: Client started petition response structure

7 Client petition

...

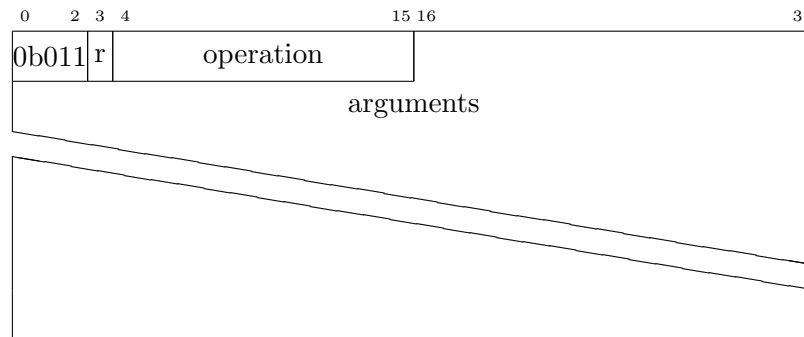


Figure 7.1: Client petition structure

Once all the operations are implemented, here you'll find a table that shows a link to each one of the operations.

7.1 Stop client operation

...

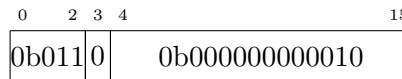


Figure 7.2: Stop client petition structure

7.2 Send message operation

... don't use this to run commands

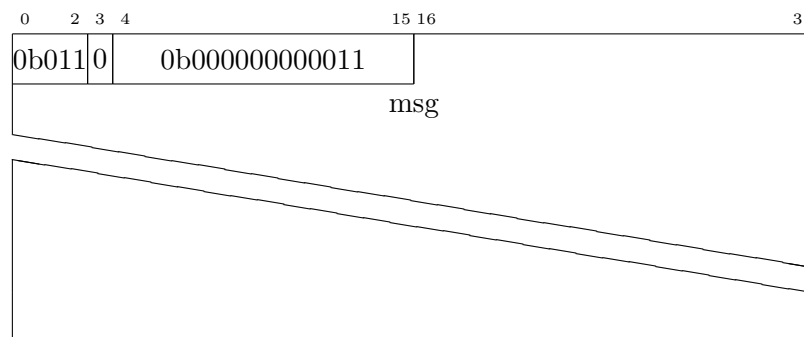


Figure 7.3: Send message petition structure

7.3 Got message notification

... async

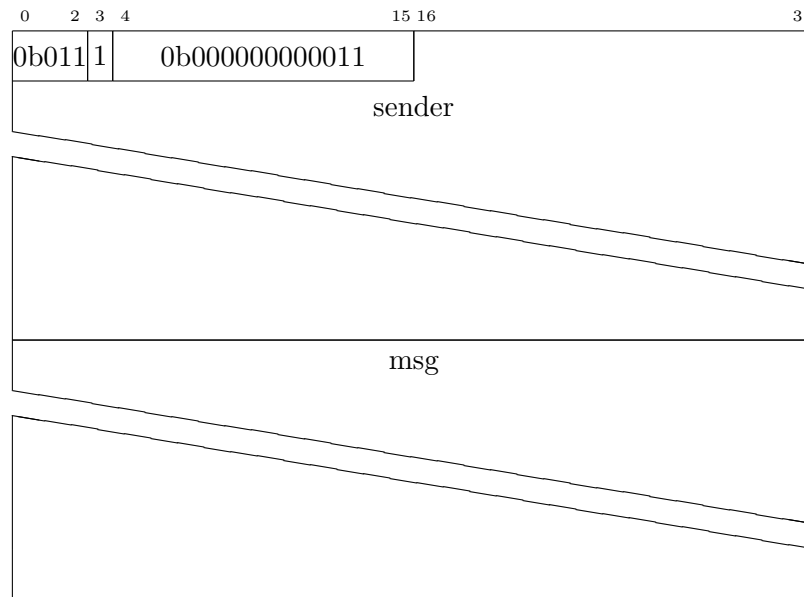


Figure 7.4: Got message notification structure

7.4 Run command operation

...

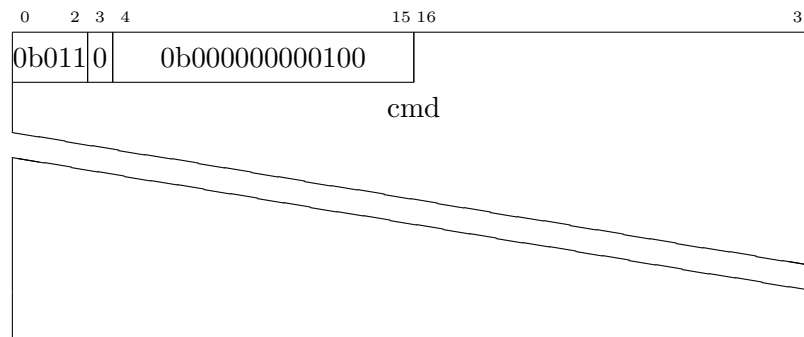


Figure 7.5: Run command petition structure

7.5 Break block operation

...

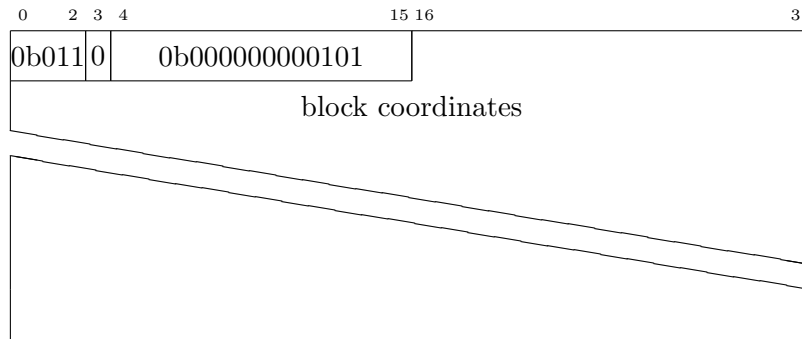


Figure 7.6: Run command petition structure

7.6 Equip item in hand operation

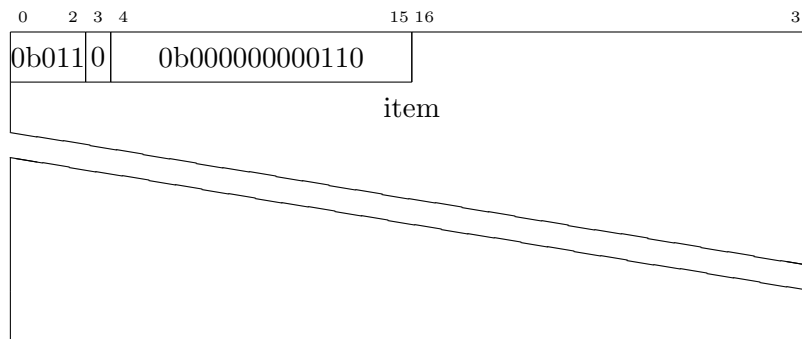


Figure 7.7: Run command petition structure

7.7 Move at operation

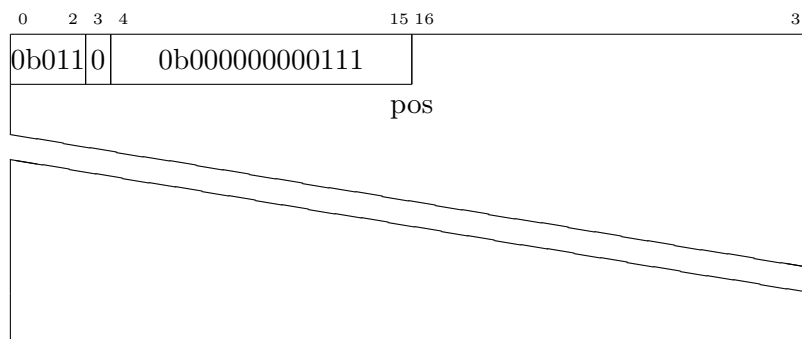


Figure 7.8: Move at petition structure

7.8 Look at operation

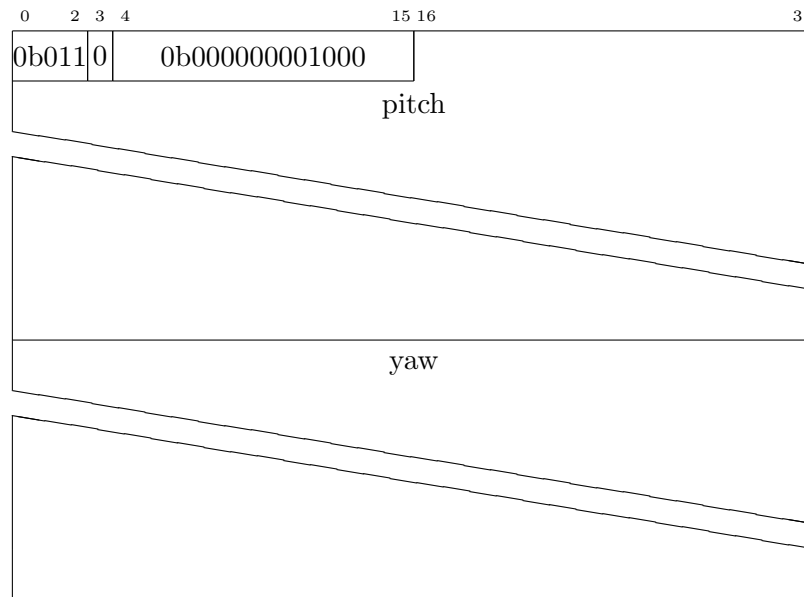


Figure 7.9: Move at petition structure

7.9 Synchronize operation

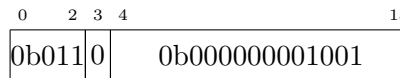


Figure 7.10: Synchronize petition structure

7.10 Synchronize response

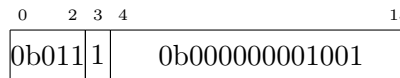


Figure 7.11: Synchronize petition response structure

7.11 Hit operation

... left click with item in hand

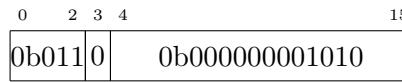


Figure 7.12: Hit petition structure

7.12 Use operation

... right click with item in hand

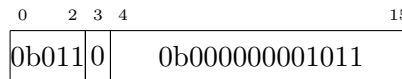


Figure 7.13: Use petition structure

7.13 Place block operation

... place current item in hand

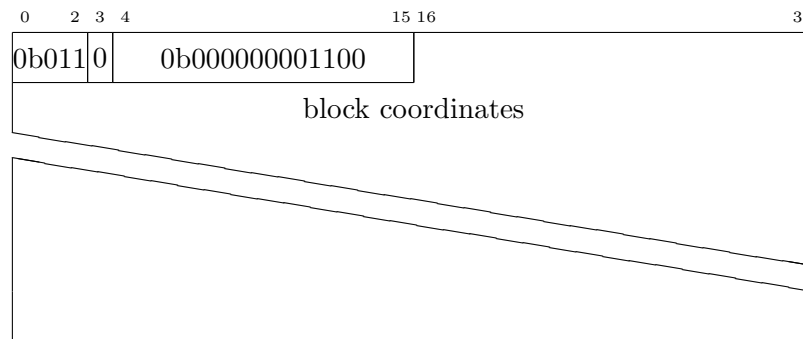


Figure 7.14: Place block petition structure

7.14 Hit entity operation

... attack

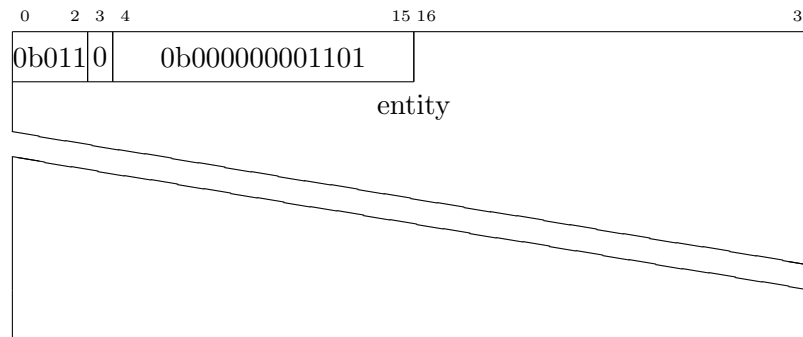


Figure 7.15: Place block petition structure

8 Revision history

Date	Revision	Changes
date	1	Initial public release, <i>v0.1.14</i> .

Table 8.1: Revision history

A Blocks

To generate the blocks enum Spigot 1.19 was used. That means that all the block names *should* be the exact same as *Spigot - Enum Material - 1.19* (n.d.).

A.1 Unused material modifiers

There's some Spigot modifiers that beside existing it won't be imported because there aren't a distinguished block in their own. You can find those in Figure A.1, Unused Spigot BlockData's modifiers.

Modifier name	Reason for discarding
has_bottle_X	Inventory dependent
has_record	Inventory dependent
enabled	Adjacent redstone dependent
triggered	Adjacent redstone dependent
instrument	Bottom-block dependent
occupied	Entity dependent
persistent	Admin block
unstable	Admin block
distance	Block dependent
stage	Same block
short	Tick dependent
attached	Block dependent
disarmed	Block dependent
power	Block/event dependent
tilt	Entity dependent
can_summon	Admin block
shrieking	Entity dependent
bloom	Admin block
bottom	Bottom-block dependent
has_book	Inventory dependent
sculk_sensor_phase	Admin block

Modifier name	Reason for discarding
signal_fire	Bottom-block dependent
north=tall	Top-block dependent
south=tall	Top-block dependent
east=tall	Top-block dependent
west=tall	Top-block dependent
hatch	Unable to concatenate
thickness	Block dependent
snowy	Block dependent
in_wall	Same block
moisture	Block dependent

Table A.1: Unused Spigot BlockData's modifiers

In addition to this, some modifiers applied to certain blocks doesn't change the block itself. Those are mentioned in Figure A.2, Unused Spigot BlockData's modifiers on certain blocks.

Block name	Modifier name
CAVE_VINES	age
CACTUS	age
FIRE	age
KELP	age
SUGAR_CANE	age
MANGROVE_PROPAGULE	age
TWISTING_VINES	age
WEeping_VINES	age
ANDESITE_WALL	up
BLACKSTONE_WALL	up
BRICK_WALL	up
COBBLED_DEEPSLATE_WALL	up
COBBLESTONE_WALL	up

Block name	Modifier name
DEEPSLATE_BRICK_WALL	up
DEEPSLATE_TILE_WALL	up
DIORITE_WALL	up
END_STONE_BRICK_WALL	up
GRANITE_WALL	up
MOSSY_COBBLESTONE_WALL	up
MOSSY_STONE_BRICK_WALL	up
MUD_BRICK_WALL	up
NETHER_BRICK_WALL	up
POLISHED_BLACKSTONE_BRICK_WALL	up
POLISHED_BLACKSTONE_WALL	up
POLISHED_DEEPSLATE_WALL	up
PRISMARINE_WALL	up
RED_NETHER_BRICK_WALL	up
RED_SANDSTONE_WALL	up
SANDSTONE_WALL	up
STONE_BRICK_WALL	up
ACACIA_DOOR	powered
ACACIA_FENCE_GATE	powered
ACACIA_TRAPDOOR	powered
ACTIVATOR_RAIL	powered
BELL	powered
BIRCH_DOOR	powered
BIRCH_FENCE_GATE	powered
BIRCH_TRAPDOOR	powered
CRIMSON_DOOR	powered
CRIMSON_FENCE_GATE	powered
CRIMSON_TRAPDOOR	powered
DARK_OAK_DOOR	powered
DARK_OAK_FENCE_GATE	powered

Block name	Modifier name
DARK_OAK_TRAPDOOR	powered
IRON_DOOR	powered
IRON_TRAPDOOR	powered
JUNGLE_DOOR	powered
JUNGLE_FENCE_GATE	powered
JUNGLE_TRAPDOOR	powered
LECTERN	powered
MANGROVE_DOOR	powered
MANGROVE_FENCE_GATE	powered
MANGROVE_TRAPDOOR	powered
NOTE_BLOCK	powered
OAK_DOOR	powered
OAK_FENCE_GATE	powered
OAK_TRAPDOOR	powered
POWERED_RAIL	powered
SPRUCE_DOOR	powered
SPRUCE_FENCE_GATE	powered
SPRUCE_TRAPDOOR	powered
TRIPWIRE	powered
WARPED_DOOR	powered
WARPED_FENCE_GATE	powered
WARPED_TRAPDOOR	powered
SMOKER	lit
FURNACE	lit
CHEST	type
TRAPPED_CHEST	type

Table A.2: Unused Spigot BlockData's modifiers on certain blocks

A.2 Material modifiers

A.2.1 Age

Represents the different growth stages that a crop-like block can go through.

Defaults to 0.

Material	Age range
BEETROOTS	0-3
BAMBOO	0-1
CARROTS	0-7
CHORUS_FLOWER	0-5
COCOA	0-2
FROSTED_ICE	0-3
MELON_STEM	0-7
NETHER_WART	0-3
POTATOES	0-7
PUMPKIN_STEM	0-7
SWEET_BERRY_BUSH	0-3
WHEAT	0-7

Table A.3: Ageable materials

A.2.2 Attachment

Denotes how the bell is attached to its block.

Defaults to floor.

Material	Options
BELL	ceiling/double_wall/floor/single_wall

Table A.4: Attachable materials

A.2.3 Axis

Represents the axis along whilst this block is oriented.

Except for NETHER_PORTAL (which defaults to x), it defaults to y.

Material	Age range
NETHER_PORTAL	x/z
ACACIA_LOG	x/y/z
ACACIA_WOOD	x/y/z
BASALT	x/y/z
BIRCH_LOG	x/y/z
BIRCH_WOOD	x/y/z
BONE_BLOCK	x/y/z
CHAIN	x/y/z
CRIMSON_HYPHAE	x/y/z
CRIMSON_STEM	x/y/z
DARK_OAK_LOG	x/y/z
DARK_OAK_WOOD	x/y/z
DEEPSLATE	x/y/z
HAY_BLOCK	x/y/z
INFESTED_DEEPSLATE	x/y/z
JUNGLE_LOG	x/y/z
JUNGLE_WOOD	x/y/z
MANGROVE_LOG	x/y/z
MANGROVE_WOOD	x/y/z
MUDDY_MANGROVE_ROOTS	x/y/z
OAK_LOG	x/y/z
OAK_WOOD	x/y/z
OCHRE_FROGLIGHT	x/y/z
PEARLESCENT_FROGLIGHT	x/y/z
POLISHED_BASALT	x/y/z
PURPUR_PILLAR	x/y/z
QUARTZ_PILLAR	x/y/z
SPRUCE_LOG	x/y/z
SPRUCE_WOOD	x/y/z

Material	Age range
STRIPPED_ACACIA_LOG	x/y/z
STRIPPED_ACACIA_WOOD	x/y/z
STRIPPED_BIRCH_LOG	x/y/z
STRIPPED_BIRCH_WOOD	x/y/z
STRIPPED_CRIMSON_HYPHAE	x/y/z
STRIPPED_CRIMSON_STEM	x/y/z
STRIPPED_DARK_OAK_LOG	x/y/z
STRIPPED_DARK_OAK_WOOD	x/y/z
STRIPPED_JUNGLE_LOG	x/y/z
STRIPPED_JUNGLE_WOOD	x/y/z
STRIPPED_MANGROVE_LOG	x/y/z
STRIPPED_MANGROVE_WOOD	x/y/z
STRIPPED_OAK_LOG	x/y/z
STRIPPED_OAK_WOOD	x/y/z
STRIPPED_SPRUCE_LOG	x/y/z
STRIPPED_SPRUCE_WOOD	x/y/z
STRIPPED_WARPED_HYPHAE	x/y/z
STRIPPED_WARPED_STEM	x/y/z
VERDANT_FROGLIGHT	x/y/z
WARPED_HYPHAE	x/y/z
WARPED_STEM	x/y/z

Table A.5: Orientable materials

A.2.4 Berries

Indicates whether the block has berries.

Defaults to false.

Material	Values
CAVE_VINES	true/false
CAVE_VINES_PLANT	true/false

Table A.6: Materials with berries

A.2.5 Bites

Represents the amount of bites which have been taken from this slice of cake.

Defaults to 0.

Material	Values
CAKE	0-6

Table A.7: Cake

A.2.6 Candles

Represents the number of candles which are present.

Defaults to 1.

Material	Values
BLACK_CANDLE	1-4
BLUE_CANDLE	1-4
BROWN_CANDLE	1-4
CANDLE	1-4
CYAN_CANDLE	1-4
GRAY_CANDLE	1-4
GREEN_CANDLE	1-4
LIGHT_BLUE_CANDLE	1-4
LIGHT_GRAY_CANDLE	1-4
LIME_CANDLE	1-4
MAGENTA_CANDLE	1-4
ORANGE_CANDLE	1-4
PINK_CANDLE	1-4

Material	Values
PURPLE_CANDLE	1-4
RED_CANDLE	1-4
WHITE_CANDLE	1-4
YELLOW_CANDLE	1-4

Table A.8: Materials with candles

A.2.7 Charges

Represents the amount of times the anchor may still be used.

Defaults to 0.

Material	Values
RESPAWN_ANCHOR	0-4

Table A.9: Charged materials

A.2.8 Conditional

Denotes whether this command block is conditional or not.

Defaults to false.

Material	Values
CHAIN_COMMAND_BLOCK	true/false
COMMAND_BLOCK	true/false
REPEATING_COMMAND_BLOCK	true/false

Table A.10: Conditionable materials

A.2.9 Delay

Propagation delay of a repeater.

Defaults to 1.

Material	Values
REPEATER	1-4

Table A.11: Delayable materials

A.2.10 Down

Set which faces of the block textures are displayed on.

Except for BROWN_MUSHROOM_BLOCK, MUSHROOM_STEM and RED_MUSHROOM_BLOCK (which defaults to true), it defaults to false.

Material	Values
CHORUS_PLANT	true/false
GLOW_LICHEN	true/false
SCULK_VEIN	true/false
BROWN_MUSHROOM_BLOCK	true/false
MUSHROOM_STEM	true/false
RED_MUSHROOM_BLOCK	true/false

Table A.12: Materials with down option

A.2.11 North, South, East and West

Set which faces of the block textures are displayed on.

As the *tall* option is unused (check Table A.1, Unused Spigot BlockData's modifiers), *none* and *low* will be considered as *false* and *true*, respectively.

Material	Options (default on bold)
ACACIA_FENCE	true/ false
BIRCH_FENCE	true/ false
BLACK_STAINED_GLASS_PANE	true/ false
BLUE_STAINED_GLASS_PANE	true/ false
BROWN_STAINED_GLASS_PANE	true/ false
CHORUS_PLANT	true/ false
CRIMSON_FENCE	true/ false

Material	Options (default on bold)
CYAN_STAINED_GLASS_PANE	true/ false
DARK_OAK_FENCE	true/ false
FIRE	true/ false
GLASS_PANE	true/ false
GLOW_LICHEN	true/ false
GRAY_STAINED_GLASS_PANE	true/ false
GREEN_STAINED_GLASS_PANE	true/ false
IRON_BARS	true/ false
JUNGLE_FENCE	true/ false
LIGHT_BLUE_STAINED_GLASS_PANE	true/ false
LIGHT_GRAY_STAINED_GLASS_PANE	true/ false
LIME_STAINED_GLASS_PANE	true/ false
MAGENTA_STAINED_GLASS_PANE	true/ false
MANGROVE_FENCE	true/ false
NETHER_BRICK_FENCE	true/ false
OAK_FENCE	true/ false
ORANGE_STAINED_GLASS_PANE	true/ false
PINK_STAINED_GLASS_PANE	true/ false
PURPLE_STAINED_GLASS_PANE	true/ false
RED_STAINED_GLASS_PANE	true/ false
SCULK_VEIN	true/ false
SPRUCE_FENCE	true/ false
TRIPWIRE	true/ false
VINE	true/ false
WARPED_FENCE	true/ false
WHITE_STAINED_GLASS_PANE	true/ false
YELLOW_STAINED_GLASS_PANE	true/ false
BROWN_MUSHROOM_BLOCK	true /false
MUSHROOM_STEM	true /false
RED_MUSHROOM_BLOCK	true /false

Material	Options (default on bold)
REDSTONE_WIRE	none /up/slide
ANDESITE_WALL	none /low/tall
BLACKSTONE_WALL	none /low/tall
BRICK_WALL	none /low/tall
COBBLED_DEEPSLATE_WALL	none /low/tall
COBBLESTONE_WALL	none /low/tall
DEEPSLATE_BRICK_WALL	none /low/tall
DEEPSLATE_TILE_WALL	none /low/tall
DIORITE_WALL	none /low/tall
END_STONE_BRICK_WALL	none /low/tall
GRANITE_WALL	none /low/tall
MOSSY_COBBLESTONE_WALL	none /low/tall
MOSSY_STONE_BRICK_WALL	none /low/tall
MUD_BRICK_WALL	none /low/tall
NETHER_BRICK_WALL	none /low/tall
POLISHED_BLACKSTONE_BRICK_WALL	none /low/tall
POLISHED_BLACKSTONE_WALL	none /low/tall
POLISHED_DEEPSLATE_WALL	none /low/tall
PRISMARINE_WALL	none /low/tall
RED_NETHER_BRICK_WALL	none /low/tall
RED_SANDSTONE_WALL	none /low/tall
SANDSTONE_WALL	none /low/tall
STONE_BRICK_WALL	none /low/tall

Table A.13: Orientable materials

A.2.12 Up

Set which faces of the block textures are displayed on.

Except for CHORUS_PLANT, FIRE, GLOW_LICHEN, SCULK_VEIN and VINE (which defaults to false), it defaults to true.

Material	Options
CHORUS_PLANT	true/false
FIRE	true/false
GLOW_LICHEN	true/false
SCULK_VEIN	true/false
VINE	true/false
BROWN_MUSHROOM_BLOCK	true/false
MUSHROOM_STEM	true/false
RED_MUSHROOM_BLOCK	true/false

Table A.14: Materials with up option

A.2.13 Eggs

Number of eggs which appear in the block.

Defaults to 1.

Material	Values
TURTLE_EGG	1-4

Table A.15: Materials with eggs

A.2.14 Extended

Denotes whether the piston head is currently extended or not.

Defaults to false.

Material	Values
PISTON	true/false
STICKY_PISTON	true/false

Table A.16: Extendable materials

A.2.15 Eye

Defaults to false.

Material	Values
END_PORTAL_FRAME	true/false

Table A.17: Materials with eye

A.2.16 Face

Represents the face to which a lever or button is stuck.

WALL_SIGN

Defaults to wall.

Material	Directions
ACACIA_BUTTON	wall/floor/ceiling
BIRCH_BUTTON	wall/floor/ceiling
CRIMSON_BUTTON	wall/floor/ceiling
DARK_OAK_BUTTON	wall/floor/ceiling
GRINDSTONE	wall/floor/ceiling
JUNGLE_BUTTON	wall/floor/ceiling
LEVER	wall/floor/ceiling
MANGROVE_BUTTON	wall/floor/ceiling
OAK_BUTTON	wall/floor/ceiling
POLISHED_BLACKSTONE_BUTTON	wall/floor/ceiling
SPRUCE_BUTTON	wall/floor/ceiling
STONE_BUTTON	wall/floor/ceiling
WARPED_BUTTON	wall/floor/ceiling

Table A.18: Directional materials

A.2.17 Facing

Represents the face towards which the block is pointing.

Material	Options (default on bold)
HOPPER	down /north/south/east/west

Material	Options (default on bold)
OBSERVER	up/down/north/ south /east/west
BARREL	up/down/ north /south/east/west
CHAIN_COMMAND_BLOCK	up/down/ north /south/east/west
COMMAND_BLOCK	up/down/ north /south/east/west
DISPENSER	up/down/ north /south/east/west
DROPPER	up/down/ north /south/east/west
PISTON	up/down/ north /south/east/west
PISTON_HEAD	up/down/ north /south/east/west
REPEATING_COMMAND_BLOCK	up/down/ north /south/east/west
STICKY_PISTON	up/down/ north /south/east/west
ACACIA_BUTTON	north /south/east/west
ACACIA_DOOR	north /south/east/west
ACACIA_FENCE_GATE	north /south/east/west
ACACIA_STAIRS	north /south/east/west
ACACIA_TRAPDOOR	north /south/east/west
ACACIA_WALL_SIGN	north /south/east/west
ANDESITE_STAIRS	north /south/east/west
ANVIL	north /south/east/west
ATTACHED_MELON_STEM	north /south/east/west
ATTACHED_PUMPKIN_STEM	north /south/east/west
BEEHIVE	north /south/east/west
BEE_NEST	north /south/east/west
BELL	north /south/east/west
BIG_DRIPLEAF	north /south/east/west
BIG_DRIPLEAF_STEM	north /south/east/west
BIRCH_BUTTON	north /south/east/west
BIRCH_DOOR	north /south/east/west
BIRCH_FENCE_GATE	north /south/east/west
BIRCH_STAIRS	north /south/east/west
BIRCH_TRAPDOOR	north /south/east/west

Material	Options (default on bold)
BIRCH_WALL_SIGN	north /south/east/west
BLACKSTONE_STAIRS	north /south/east/west
BLACK_BED	north /south/east/west
BLACK_GLAZED_TERRACOTTA	north /south/east/west
BLACK_WALL_BANNER	north /south/east/west
BLAST_FURNACE	north /south/east/west
BLUE_BED	north /south/east/west
BLUE_GLAZED_TERRACOTTA	north /south/east/west
BLUE_WALL_BANNER	north /south/east/west
BRAIN_CORAL_WALL_FAN	north /south/east/west
BRICK_STAIRS	north /south/east/west
BROWN_BED	north /south/east/west
BROWN_GLAZED_TERRACOTTA	north /south/east/west
BROWN_WALL_BANNER	north /south/east/west
BUBBLE_CORAL_WALL_FAN	north /south/east/west
CAMPFIRE	north /south/east/west
CARVED_PUMPKIN	north /south/east/west
CHEST	north /south/east/west
CHIPPED_ANVIL	north /south/east/west
COBBLED_DEEPSLATE_STAIRS	north /south/east/west
COBBLESTONE_STAIRS	north /south/east/west
COCOA	north /south/east/west
COMPARATOR	north /south/east/west
CREEPER_WALL_HEAD	north /south/east/west
CRIMSON_BUTTON	north /south/east/west
CRIMSON_DOOR	north /south/east/west
CRIMSON_FENCE_GATE	north /south/east/west
CRIMSON_STAIRS	north /south/east/west
CRIMSON_TRAPDOOR	north /south/east/west
CRIMSON_WALL_SIGN	north /south/east/west

Material	Options (default on bold)
CUT_COPPER_STAIRS	north /south/east/west
CYAN_BED	north /south/east/west
CYAN_GLAZED_TERRACOTTA	north /south/east/west
CYAN_WALL_BANNER	north /south/east/west
DAMAGED_ANVIL	north /south/east/west
DARK_OAK_BUTTON	north /south/east/west
DARK_OAK_DOOR	north /south/east/west
DARK_OAK_FENCE_GATE	north /south/east/west
DARK_OAK_STAIRS	north /south/east/west
DARK_OAK_TRAPDOOR	north /south/east/west
DARK_OAK_WALL_SIGN	north /south/east/west
DARK_PRISMARINE_STAIRS	north /south/east/west
DEAD_BRAIN_CORAL_WALL_FAN	north /south/east/west
DEAD_BUBBLE_CORAL_WALL_FAN	north /south/east/west
DEAD_FIRE_CORAL_WALL_FAN	north /south/east/west
DEAD_HORN_CORAL_WALL_FAN	north /south/east/west
DEAD_TUBE_CORAL_WALL_FAN	north /south/east/west
DEEPSLATE_BRICK_STAIRS	north /south/east/west
DEEPSLATE_TILE_STAIRS	north /south/east/west
DIORITE_STAIRS	north /south/east/west
DRAGON_WALL_HEAD	north /south/east/west
ENDER_CHEST	north /south/east/west
END_PORTAL_FRAME	north /south/east/west
END_STONE_BRICK_STAIRS	north /south/east/west
EXPOSED_CUT_COPPER_STAIRS	north /south/east/west
FIRE_CORAL_WALL_FAN	north /south/east/west
FURNACE	north /south/east/west
GRANITE_STAIRS	north /south/east/west
GRAY_BED	north /south/east/west
GRAY_GLAZED_TERRACOTTA	north /south/east/west

Material	Options (default on bold)
GRAY_WALL_BANNER	north /south/east/west
GREEN_BED	north /south/east/west
GREEN_GLAZED_TERRACOTTA	north /south/east/west
GREEN_WALL_BANNER	north /south/east/west
GRINDSTONE	north /south/east/west
HORN_CORAL_WALL_FAN	north /south/east/west
IRON_DOOR	north /south/east/west
IRON_TRAPDOOR	north /south/east/west
JACK_O_LANTERN	north /south/east/west
JUNGLE_BUTTON	north /south/east/west
JUNGLE_DOOR	north /south/east/west
JUNGLE_FENCE_GATE	north /south/east/west
JUNGLE_STAIRS	north /south/east/west
JUNGLE_TRAPDOOR	north /south/east/west
JUNGLE_WALL_SIGN	north /south/east/west
LADDER	north /south/east/west
LECTERN	north /south/east/west
LEVER	north /south/east/west
LIGHT_BLUE_BED	north /south/east/west
LIGHT_BLUE_GLAZED_TERRACOTTA	north /south/east/west
LIGHT_BLUE_WALL_BANNER	north /south/east/west
LIGHT_GRAY_BED	north /south/east/west
LIGHT_GRAY_GLAZED_TERRACOTTA	north /south/east/west
LIGHT_GRAY_WALL_BANNER	north /south/east/west
LIME_BED	north /south/east/west
LIME_GLAZED_TERRACOTTA	north /south/east/west
LIME_WALL_BANNER	north /south/east/west
LOOM	north /south/east/west
MAGENTA_BED	north /south/east/west
MAGENTA_GLAZED_TERRACOTTA	north /south/east/west

Material	Options (default on bold)
MAGENTA_WALL_BANNER	north /south/east/west
MANGROVE_BUTTON	north /south/east/west
MANGROVE_DOOR	north /south/east/west
MANGROVE_FENCE_GATE	north /south/east/west
MANGROVE_STAIRS	north /south/east/west
MANGROVE_TRAPDOOR	north /south/east/west
MANGROVE_WALL_SIGN	north /south/east/west
MOSSY_COBBLESTONE_STAIRS	north /south/east/west
MOSSY_STONE_BRICK_STAIRS	north /south/east/west
MUD_BRICK_STAIRS	north /south/east/west
NETHER_BRICK_STAIRS	north /south/east/west
OAK_BUTTON	north /south/east/west
OAK_DOOR	north /south/east/west
OAK_FENCE_GATE	north /south/east/west
OAK_STAIRS	north /south/east/west
OAK_TRAPDOOR	north /south/east/west
OAK_WALL_SIGN	north /south/east/west
ORANGE_BED	north /south/east/west
ORANGE_GLAZED_TERRACOTTA	north /south/east/west
ORANGE_WALL_BANNER	north /south/east/west
OXIDIZED_CUT_COPPER_STAIRS	north /south/east/west
PINK_BED	north /south/east/west
PINK_GLAZED_TERRACOTTA	north /south/east/west
PINK_WALL_BANNER	north /south/east/west
PLAYER_WALL_HEAD	north /south/east/west
POLISHED_ANDESITE_STAIRS	north /south/east/west
POLISHED_BLACKSTONE_BRICK_STAIRS	north /south/east/west
POLISHED_BLACKSTONE_BUTTON	north /south/east/west
POLISHED_BLACKSTONE_STAIRS	north /south/east/west
POLISHED_DEEPSLATE_STAIRS	north /south/east/west

Material	Options (default on bold)
POLISHED_DIORITE_STAIRS	north /south/east/west
POLISHED_GRANITE_STAIRS	north /south/east/west
PRISMARINE_BRICK_STAIRS	north /south/east/west
PRISMARINE_STAIRS	north /south/east/west
PURPLE_BED	north /south/east/west
PURPLE_GLAZED_TERRACOTTA	north /south/east/west
PURPLE_WALL_BANNER	north /south/east/west
PURPUR_STAIRS	north /south/east/west
QUARTZ_STAIRS	north /south/east/west
REDSTONE_WALL_TORCH	north /south/east/west
RED_BED	north /south/east/west
RED_GLAZED_TERRACOTTA	north /south/east/west
RED_NETHER_BRICK_STAIRS	north /south/east/west
RED_SANDSTONE_STAIRS	north /south/east/west
RED_WALL_BANNER	north /south/east/west
REPEATER	north /south/east/west
SANDSTONE_STAIRS	north /south/east/west
SKELETON_WALL_SKULL	north /south/east/west
SMALL_DRIPLEAF	north /south/east/west
SMOKER	north /south/east/west
SMOOTH_QUARTZ_STAIRS	north /south/east/west
SMOOTH_RED_SANDSTONE_STAIRS	north /south/east/west
SMOOTH_SANDSTONE_STAIRS	north /south/east/west
SOUL_CAMPFIRE	north /south/east/west
SOUL_WALL_TORCH	north /south/east/west
SPRUCE_BUTTON	north /south/east/west
SPRUCE_DOOR	north /south/east/west
SPRUCE_FENCE_GATE	north /south/east/west
SPRUCE_STAIRS	north /south/east/west
SPRUCE_TRAPDOOR	north /south/east/west

Material	Options (default on bold)
SPRUCE_WALL_SIGN	north /south/east/west
STONECUTTER	north /south/east/west
STONE_BRICK_STAIRS	north /south/east/west
STONE_BUTTON	north /south/east/west
STONE_STAIRS	north /south/east/west
TRAPPED_CHEST	north /south/east/west
TRIPWIRE_HOOK	north /south/east/west
TUBE_CORAL_WALL_FAN	north /south/east/west
WALL_TORCH	north /south/east/west
WARPED_BUTTON	north /south/east/west
WARPED_DOOR	north /south/east/west
WARPED_FENCE_GATE	north /south/east/west
WARPED_STAIRS	north /south/east/west
WARPED_TRAPDOOR	north /south/east/west
WARPED_WALL_SIGN	north /south/east/west
WAXED_CUT_COPPER_STAIRS	north /south/east/west
WAXED_EXPOSED_CUT_COPPER_STAIRS	north /south/east/west
WAXED_OXIDIZED_CUT_COPPER_STAIRS	north /south/east/west
WAXED_WEATHERED_CUT_COPPER_STAIRS	north /south/east/west
WEATHERED_CUT_COPPER_STAIRS	north /south/east/west
WHITE_BED	north /south/east/west
WHITE_GLAZED_TERRACOTTA	north /south/east/west
WHITE_WALL_BANNER	north /south/east/west
WITHER_SKELETON_WALL_SKULL	north /south/east/west
YELLOW_BED	north /south/east/west
YELLOW_GLAZED_TERRACOTTA	north /south/east/west
YELLOW_WALL_BANNER	north /south/east/west
ZOMBIE_WALL_HEAD	north /south/east/west
AMETHYST_CLUSTER	up /down/north/south/east/west
BLACK_SHULKER_BOX	up /down/north/south/east/west

Material	Options (default on bold)
BLUE_SHULKER_BOX	up /down/north/south/east/west
BROWN_SHULKER_BOX	up /down/north/south/east/west
CYAN_SHULKER_BOX	up /down/north/south/east/west
END_ROD	up /down/north/south/east/west
GRAY_SHULKER_BOX	up /down/north/south/east/west
GREEN_SHULKER_BOX	up /down/north/south/east/west
LARGE_AMETHYST_BUD	up /down/north/south/east/west
LIGHTNING_ROD	up /down/north/south/east/west
LIGHT_BLUE_SHULKER_BOX	up /down/north/south/east/west
LIGHT_GRAY_SHULKER_BOX	up /down/north/south/east/west
LIME_SHULKER_BOX	up /down/north/south/east/west
MAGENTA_SHULKER_BOX	up /down/north/south/east/west
MEDIUM_AMETHYST_BUD	up /down/north/south/east/west
ORANGE_SHULKER_BOX	up /down/north/south/east/west
PINK_SHULKER_BOX	up /down/north/south/east/west
PURPLE_SHULKER_BOX	up /down/north/south/east/west
RED_SHULKER_BOX	up /down/north/south/east/west
SHULKER_BOX	up /down/north/south/east/west
SMALL_AMETHYST_BUD	up /down/north/south/east/west
WHITE_SHULKER_BOX	up /down/north/south/east/west
YELLOW_SHULKER_BOX	up /down/north/south/east/west

Table A.19: Directional materials

A.2.18 Half

Denotes which half of a two block tall material this block is.

Material	Options (default on bold)
ACACIA_STAIRS	bottom /top
ACACIA_TRAPDOOR	bottom /top

Material	Options (default on bold)
ANDESITE_STAIRS	bottom /top
BIRCH_STAIRS	bottom /top
BIRCH_TRAPDOOR	bottom /top
BLACKSTONE_STAIRS	bottom /top
BRICK_STAIRS	bottom /top
COBBLED_DEEPSLATE_STAIRS	bottom /top
COBBLESTONE_STAIRS	bottom /top
CRIMSON_STAIRS	bottom /top
CRIMSON_TRAPDOOR	bottom /top
CUT_COPPER_STAIRS	bottom /top
DARK_OAK_STAIRS	bottom /top
DARK_OAK_TRAPDOOR	bottom /top
DARK_PRISMARINE_STAIRS	bottom /top
DEEPSLATE_BRICK_STAIRS	bottom /top
DEEPSLATE_TILE_STAIRS	bottom /top
DIORITE_STAIRS	bottom /top
END_STONE_BRICK_STAIRS	bottom /top
EXPOSED_CUT_COPPER_STAIRS	bottom /top
GRANITE_STAIRS	bottom /top
IRON_TRAPDOOR	bottom /top
JUNGLE_STAIRS	bottom /top
JUNGLE_TRAPDOOR	bottom /top
MANGROVE_STAIRS	bottom /top
MANGROVE_TRAPDOOR	bottom /top
MOSSY_COBBLESTONE_STAIRS	bottom /top
MOSSY_STONE_BRICK_STAIRS	bottom /top
MUD_BRICK_STAIRS	bottom /top
NETHER_BRICK_STAIRS	bottom /top
OAK_STAIRS	bottom /top
OAK_TRAPDOOR	bottom /top

Material	Options (default on bold)
OXIDIZED_CUT_COPPER_STAIRS	bottom /top
POLISHED_ANDESITE_STAIRS	bottom /top
POLISHED_BLACKSTONE_BRICK_STAIRS	bottom /top
POLISHED_BLACKSTONE_STAIRS	bottom /top
POLISHED_DEEPSLATE_STAIRS	bottom /top
POLISHED_DIORITE_STAIRS	bottom /top
POLISHED_GRANITE_STAIRS	bottom /top
PRISMARINE_BRICK_STAIRS	bottom /top
PRISMARINE_STAIRS	bottom /top
PURPUR_STAIRS	bottom /top
QUARTZ_STAIRS	bottom /top
RED_NETHER_BRICK_STAIRS	bottom /top
RED_SANDSTONE_STAIRS	bottom /top
SANDSTONE_STAIRS	bottom /top
SMOOTH_QUARTZ_STAIRS	bottom /top
SMOOTH_RED_SANDSTONE_STAIRS	bottom /top
SMOOTH_SANDSTONE_STAIRS	bottom /top
SPRUCE_STAIRS	bottom /top
SPRUCE_TRAPDOOR	bottom /top
STONE_BRICK_STAIRS	bottom /top
STONE_STAIRS	bottom /top
WARPED_STAIRS	bottom /top
WARPED_TRAPDOOR	bottom /top
WAXED_CUT_COPPER_STAIRS	bottom /top
WAXED_EXPOSED_CUT_COPPER_STAIRS	bottom /top
WAXED_OXIDIZED_CUT_COPPER_STAIRS	bottom /top
WAXED_WEATHERED_CUT_COPPER_STAIRS	bottom /top
WEATHERED_CUT_COPPER_STAIRS	bottom /top
ACACIA_DOOR	lower /upper
BIRCH_DOOR	lower /upper

Material	Options (default on bold)
CRIMSON_DOOR	lower /upper
DARK_OAK_DOOR	lower /upper
IRON_DOOR	lower /upper
JUNGLE_DOOR	lower /upper
LARGE_FERN	lower /upper
LILAC	lower /upper
MANGROVE_DOOR	lower /upper
OAK_DOOR	lower /upper
PEONY	lower /upper
ROSE_BUSH	lower /upper
SMALL_DRIPLEAF	lower /upper
SPRUCE_DOOR	lower /upper
SUNFLOWER	lower /upper
TALL_GRASS	lower /upper
TALL_SEAGRASS	lower /upper
WARPED_DOOR	lower /upper

Table A.20: Two-blocks materials

A.2.19 Hanging

Denotes whether the block is hanging.

Defaults to false.

Material	Values
LANTERN	true/false
MANGROVE_PROPAGULE	true/false
SOUL_LANTERN	true/false

Table A.21: Hangable materials

A.2.20 Hinge

Indicates which hinge this door is attached to and will rotate around when opened.

Defaults to left.

Material	Options
ACACIA_DOOR	left/right
BIRCH_DOOR	left/right
CRIMSON_DOOR	left/right
DARK_OAK_DOOR	left/right
IRON_DOOR	left/right
JUNGLE_DOOR	left/right
MANGROVE_DOOR	left/right
OAK_DOOR	left/right
SPRUCE_DOOR	left/right
WARPED_DOOR	left/right

Table A.22: Doors

A.2.21 Honey level

Represents the amount of honey stored in the hive.

Defaults to 0.

Material	Values
BEEHIVE	0/5 ¹⁴
BEE_NEST	0/5 ¹⁴

Table A.23: Hives

A.2.22 Inverted

Denotes whether this daylight detector is in the inverted mode.

¹⁴The block is the same from honey-level 0 to 4, and it changes in age 5. That's why age=5 is considered as age=1, and age=0-4 as age=0, as you may notice in Figure ??, Modifier concatenation.

Defaults to false.

Material	Values
DAYLIGHT_DETECTOR	true/false

Table A.24: Invertible blocks

A.2.23 Layers

Represents the amount of layers of snow which are present in this block.

Defaults to 1.

Material	Values
SNOW	1-8

Table A.25: Snow

A.2.24 Leaves

Represents the size of the leaves of the bamboo block.

Defaults to none.

Material	Values
BAMBOO	none/small/large

Table A.26: Bamboo

A.2.25 Level

Represents the amount of fluid contained within this block, either by itself or inside a cauldron.

Defaults on 0 except for POWDER_SNOW_CAULDRON and WATER_CAULDRON (which defaults on 1).

Material	Values
COMPOSTER	0-8
LAVA	0-7
WATER	0-7
POWDER_SNOW_CAULDRON	1-3
WATER_CAULDRON	1-3

Table A.27: Levelled materials

A.2.26 Lit

Denotes whether this block is currently lit.

Except for CAMPFIRE, REDSTONE_TORCH, REDSTONE_WALL_TORCH and SOUL_CAMPFIRE (which defaults to true), it defaults to false.

Material	Options
BLACK_CANDLE	true/false
BLACK_CANDLE_CAKE	true/false
BLAST_FURNACE	true/false
BLUE_CANDLE	true/false
BLUE_CANDLE_CAKE	true/false
BROWN_CANDLE	true/false
BROWN_CANDLE_CAKE	true/false
CANDLE	true/false
CANDLE_CAKE	true/false
CYAN_CANDLE	true/false
CYAN_CANDLE_CAKE	true/false
DEEPSLATE_REDSTONE_ORE	true/false
GRAY_CANDLE	true/false
GRAY_CANDLE_CAKE	true/false
GREEN_CANDLE	true/false
GREEN_CANDLE_CAKE	true/false
LIGHT_BLUE_CANDLE	true/false

Material	Options
LIGHT_BLUE_CANDLE_CAKE	true/false
LIGHT_GRAY_CANDLE	true/false
LIGHT_GRAY_CANDLE_CAKE	true/false
LIME_CANDLE	true/false
LIME_CANDLE_CAKE	true/false
MAGENTA_CANDLE	true/false
MAGENTA_CANDLE_CAKE	true/false
ORANGE_CANDLE	true/false
ORANGE_CANDLE_CAKE	true/false
PINK_CANDLE	true/false
PINK_CANDLE_CAKE	true/false
PURPLE_CANDLE	true/false
PURPLE_CANDLE_CAKE	true/false
REDSTONE_LAMP	true/false
REDSTONE_ORE	true/false
RED_CANDLE	true/false
RED_CANDLE_CAKE	true/false
WHITE_CANDLE	true/false
WHITE_CANDLE_CAKE	true/false
YELLOW_CANDLE	true/false
YELLOW_CANDLE_CAKE	true/false
CAMPFIRE	true/false
REDSTONE_TORCH	true/false
REDSTONE_WALL_TORCH	true/false
SOUL_CAMPFIRE	true/false

Table A.28: Lightable materials

A.2.27 Locked

Denotes whether the repeater is in the locked state or not.

Defaults to false.

Material	Values
REPEATER	true/false

Table A.29: Repeater

A.2.28 Mode

Indicates what mode the block will operate in.

Material	Options (default on bold)
COMPARATOR	compare /subtract
STRUCTURE_BLOCK	load /corner/save

Table A.30: Materials with mode

A.2.29 Note

Specified tuned pitch that the instrument will be played in.

Defaults to 0.

Material	Values
NOTE_BLOCK	0-24

Table A.31: Note block

A.2.30 Open

Denotes whether this block is currently opened.

Defaults to false.

Material	Values
ACACIA_DOOR	true/false
ACACIA_FENCE_GATE	true/false

Material	Values
ACACIA_TRAPDOOR	true/false
BARREL	true/false
BIRCH_DOOR	true/false
BIRCH_FENCE_GATE	true/false
BIRCH_TRAPDOOR	true/false
CRIMSON_DOOR	true/false
CRIMSON_FENCE_GATE	true/false
CRIMSON_TRAPDOOR	true/false
DARK_OAK_DOOR	true/false
DARK_OAK_FENCE_GATE	true/false
DARK_OAK_TRAPDOOR	true/false
IRON_DOOR	true/false
IRON_TRAPDOOR	true/false
JUNGLE_DOOR	true/false
JUNGLE_FENCE_GATE	true/false
JUNGLE_TRAPDOOR	true/false
MANGROVE_DOOR	true/false
MANGROVE_FENCE_GATE	true/false
MANGROVE_TRAPDOOR	true/false
OAK_DOOR	true/false
OAK_FENCE_GATE	true/false
OAK_TRAPDOOR	true/false
SPRUCE_DOOR	true/false
SPRUCE_FENCE_GATE	true/false
SPRUCE_TRAPDOOR	true/false
WARPED_DOOR	true/false
WARPED_FENCE_GATE	true/false
WARPED_TRAPDOOR	true/false

Table A.32: Openable materials

A.2.31 Orientation

Direction the block is facing.

Defaults to north_up, and can take any of the values shown in Table A.33, Jigsaw orientations.

Orientation
north_up
south_up
east_up
west_up
up_north
up_south
up_east
up_west
down_north
down_south
down_east
down_west

Table A.33: Jigsaw orientations

Material
JIGSAW

Table A.34: Jigsaw

A.2.32 Part

Denotes which half of the bed this block corresponds to.

Defaults to foot.

Material	Values
BLACK_BED	foot/head

Material	Values
BLUE_BED	foot/head
BROWN_BED	foot/head
CYAN_BED	foot/head
GRAY_BED	foot/head
GREEN_BED	foot/head
LIGHT_BLUE_BED	foot/head
LIGHT_GRAY_BED	foot/head
LIME_BED	foot/head
MAGENTA_BED	foot/head
ORANGE_BED	foot/head
PINK_BED	foot/head
PURPLE_BED	foot/head
RED_BED	foot/head
WHITE_BED	foot/head
YELLOW_BED	foot/head

Table A.35: Openable materials

A.2.33 Pickles

Indicates the number of pickles in this block.

Defaults to 1.

Material	Values
SEA_PICKLE	1-4

Table A.36: Materials with pickles

A.2.34 Powered

Indicates whether this block is in the powered state or not (emitting current).

Defaults to false.

Material	Powered value
ACACIA_BUTTON	true/false
ACACIA_PRESSURE_PLATE	true/false
BIRCH_BUTTON	true/false
BIRCH_PRESSURE_PLATE	true/false
COMPARATOR	true/false
CRIMSON_BUTTON	true/false
CRIMSON_PRESSURE_PLATE	true/false
DARK_OAK_BUTTON	true/false
DARK_OAK_PRESSURE_PLATE	true/false
DETECTOR_RAIL	true/false
JUNGLE_BUTTON	true/false
JUNGLE_PRESSURE_PLATE	true/false
LEVER	true/false
LIGHTNING_ROD	true/false
MANGROVE_BUTTON	true/false
MANGROVE_PRESSURE_PLATE	true/false
OAK_BUTTON	true/false
OAK_PRESSURE_PLATE	true/false
OBSERVER	true/false
POLISHED_BLACKSTONE_BUTTON	true/false
POLISHED_BLACKSTONE_PRESSURE_PLATE	true/false
REPEATER	true/false
SPRUCE_BUTTON	true/false
SPRUCE_PRESSURE_PLATE	true/false
STONE_BUTTON	true/false
STONE_PRESSURE_PLATE	true/false
TRIPWIRE_HOOK	true/false
WARPED_BUTTON	true/false
WARPED_PRESSURE_PLATE	true/false

Material	Powered value
----------	---------------

Table A.37: Powerabled materials

A.2.35 Rotation

Denotes where the block is looking.

Defaults to 0 and goes up to 15.

Rotation value	Direction
0	South
4	West
8	North
12	East

Table A.38: Relation between rotation and where is looking

Material
ACACIA_SIGN
BIRCH_SIGN
BLACK_BANNER
BLUE_BANNER
BROWN_BANNER
CREEPER_HEAD
CRIMSON_SIGN
CYAN_BANNER
DARK_OAK_SIGN
DRAGON_HEAD
GRAY_BANNER
GREEN_BANNER
JUNGLE_SIGN
LIGHT_BLUE_BANNER
LIGHT_GRAY_BANNER

Material
LIME_BANNER
MAGENTA_BANNER
MANGROVE_SIGN
OAK_SIGN
ORANGE_BANNER
PINK_BANNER
PLAYER_HEAD
PURPLE_BANNER
RED_BANNER
SKELETON_SKULL
SPRUCE_SIGN
WARPED_SIGN
WHITE_BANNER
WITHER_SKELETON_SKULL
YELLOW_BANNER
ZOMBIE_HEAD

Table A.39: Directional materials

A.2.36 Shape - Rails

Represents the current layout of a minecart rail.

Defaults to north_south, and it can take any value of those mentioned in Table A.40, Rail directions.

Shape
north_south
east_west
north_east
north_west
south_east

Shape
south_west
ascending_north
ascending_south
ascending_east
ascending_west

Table A.40: Rail directions

Material
ACTIVATOR_RAIL
DETECTOR_RAIL
POWERED_RAIL
RAIL

Table A.41: Rails

A.2.37 Shape - Stairs

Represents the texture and bounding box shape of these stairs.

Defaults to straight.

Material	Shape
ACACIA_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
ANDESITE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
BIRCH_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
BLACKSTONE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
BRICK_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right

Material	Shape
COBBLED_DEEPSLATE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
COBBLESTONE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
CRIMSON_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
CUT_COPPER_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
DARK_OAK_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
DARK_PRISMARINE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
DEEPSLATE_BRICK_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
DEEPSLATE_TILE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
DIORITE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
END_STONE_BRICK_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
EXPOSED_CUT_COPPER_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
GRANITE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
JUNGLE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
MANGROVE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
MOSSY_COBBLESTONE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right

Material	Shape
MOSSY_STONE_BRICK_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
MUD_BRICK_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
NETHER_BRICK_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
OAK_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
OXIDIZED_CUT_COPPER_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
POLISHED_ANDESITE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
POLISHED_BLACKSTONE_BRICK_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
POLISHED_BLACKSTONE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
POLISHED_DEEPSLATE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
POLISHED_DIORITE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
POLISHED_GRANITE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
PRISMARINE_BRICK_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
PRISMARINE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
PURPUR_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
QUARTZ_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right

Material	Shape
RED_NETHER_BRICK_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
RED_SANDSTONE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
SANDSTONE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
SMOOTH_QUARTZ_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
SMOOTH_RED_SANDSTONE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
SMOOTH_SANDSTONE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
SPRUCE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
STONE_BRICK_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
STONE_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
WARPED_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
WAXED_CUT_COPPER_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
WAXED_EXPOSED_CUT_COPPER_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
WAXED_OXIDIZED_CUT_COPPER_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
WAXED_WEATHERED_CUT_COPPER_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right
WEATHERED_CUT_COPPER_STAIRS	straight/inner_right/inner_left/ outer_right/inner_right

Material	Shape
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Table A.42: Stairs

A.2.38 Type

Represents the type of piston which that block corresponds to, or represents what state the slab is in.

Material	Options (default on bold)
ACACIA_SLAB	bottom /top/double
ANDESITE_SLAB	bottom /top/double
BIRCH_SLAB	bottom /top/double
BLACKSTONE_SLAB	bottom /top/double
BRICK_SLAB	bottom /top/double
COBBLED_DEEPSLATE_SLAB	bottom /top/double
COBBLESTONE_SLAB	bottom /top/double
CRIMSON_SLAB	bottom /top/double
CUT_COPPER_SLAB	bottom /top/double
CUT_RED_SANDSTONE_SLAB	bottom /top/double
CUT_SANDSTONE_SLAB	bottom /top/double
DARK_OAK_SLAB	bottom /top/double
DARK_PRISMARINE_SLAB	bottom /top/double
DEEPSLATE_BRICK_SLAB	bottom /top/double
DEEPSLATE_TILE_SLAB	bottom /top/double
DIORITE_SLAB	bottom /top/double
END_STONE_BRICK_SLAB	bottom /top/double
EXPOSED_CUT_COPPER_SLAB	bottom /top/double
GRANITE_SLAB	bottom /top/double
JUNGLE_SLAB	bottom /top/double
MANGROVE_SLAB	bottom /top/double
MOSSY_COBBLESTONE_SLAB	bottom /top/double

Material	Options (default on bold)
MOSSY_STONE_BRICK_SLAB	bottom /top/double
MUD_BRICK_SLAB	bottom /top/double
NETHER_BRICK_SLAB	bottom /top/double
OAK_SLAB	bottom /top/double
OXIDIZED_CUT_COPPER_SLAB	bottom /top/double
PETRIFIED_OAK_SLAB	bottom /top/double
POLISHED_ANDESITE_SLAB	bottom /top/double
POLISHED_BLACKSTONE_BRICK_SLAB	bottom /top/double
POLISHED_BLACKSTONE_SLAB	bottom /top/double
POLISHED_DEEPSLATE_SLAB	bottom /top/double
POLISHED_DIORITE_SLAB	bottom /top/double
POLISHED_GRANITE_SLAB	bottom /top/double
PRISMARINE_BRICK_SLAB	bottom /top/double
PRISMARINE_SLAB	bottom /top/double
PURPUR_SLAB	bottom /top/double
QUARTZ_SLAB	bottom /top/double
RED_NETHER_BRICK_SLAB	bottom /top/double
RED_SANDSTONE_SLAB	bottom /top/double
SANDSTONE_SLAB	bottom /top/double
SMOOTH_QUARTZ_SLAB	bottom /top/double
SMOOTH_RED_SANDSTONE_SLAB	bottom /top/double
SMOOTH_SANDSTONE_SLAB	bottom /top/double
SMOOTH_STONE_SLAB	bottom /top/double
SPRUCE_SLAB	bottom /top/double
STONE_BRICK_SLAB	bottom /top/double
STONE_SLAB	bottom /top/double
WARPED_SLAB	bottom /top/double
WAXED_CUT_COPPER_SLAB	bottom /top/double
WAXED_EXPOSED_CUT_COPPER_SLAB	bottom /top/double
WAXED_OXIDIZED_CUT_COPPER_SLAB	bottom /top/double

Material	Options (default on bold)
WAXED_WEATHERED_CUT_COPPER_SLAB	bottom /top/double
WEATHERED_CUT_COPPER_SLAB	bottom /top/double
PISTON_HEAD	normal /sticky

Table A.43: Type materials

A.2.39 Vertical direction

Represents the dripstone orientation.

Defaults to up.

Material	Values
POINTED_DRIPSTONE	up/down

Table A.44: Dripstone

A.2.40 Waterlogged

Denotes whether this block has fluid in it.

Besides underwater blocks¹⁵ (which defaults to true), it defaults to false. All the possible options are true or false.

Material	Aquatic block ¹⁶
ACACIA_FENCE	✗
ACACIA_LEAVES	✗

¹⁵BRAIN_CORAL, BRAIN_CORAL_FAN, BRAIN_CORAL_WALL_FAN, BUBBLE_CORAL, BUBBLE_CORAL_FAN, BUBBLE_CORAL_WALL_FAN, CONDUIT, DEAD_BRAIN_CORAL, DEAD_BRAIN_CORAL_FAN, DEAD_BRAIN_CORAL_WALL_FAN, DEAD_BUBBLE_CORAL, DEAD_BUBBLE_CORAL_FAN, DEAD_BUBBLE_CORAL_WALL_FAN, DEAD_FIRE_CORAL, DEAD_FIRE_CORAL_FAN, DEAD_FIRE_CORAL_WALL_FAN, DEAD_HORN_CORAL, DEAD_HORN_CORAL_FAN, DEAD_HORN_CORAL_WALL_FAN, DEAD_TUBE_CORAL, DEAD_TUBE_CORAL_FAN, DEAD_TUBE_CORAL_WALL_FAN, FIRE_CORAL, FIRE_CORAL_FAN, FIRE_CORAL_WALL_FAN, HORN_CORAL, HORN_CORAL_FAN, HORN_CORAL_WALL_FAN, SEA_PICKLE, TUBE_CORAL, TUBE_CORAL_FAN and TUBE_CORAL_WALL_FAN

Material	Aquatic block ¹⁶
ACACIA_SIGN	✗
ACACIA_SLAB	✗
ACACIA_STAIRS	✗
ACACIA_TRAPDOOR	✗
ACACIA_WALL_SIGN	✗
ACTIVATOR_RAIL	✗
AMETHYST_CLUSTER	✗
ANDESITE_SLAB	✗
ANDESITE_STAIRS	✗
ANDESITE_WALL	✗
AZALEA_LEAVES	✗
BIG_DRIPLEAF	✗
BIG_DRIPLEAF_STEM	✗
BIRCH_FENCE	✗
BIRCH_LEAVES	✗
BIRCH_SIGN	✗
BIRCH_SLAB	✗
BIRCH_STAIRS	✗
BIRCH_TRAPDOOR	✗
BIRCH_WALL_SIGN	✗
BLACKSTONE_SLAB	✗
BLACKSTONE_STAIRS	✗
BLACKSTONE_WALL	✗
BLACK_CANDLE	✗
BLACK_STAINED_GLASS_PANE	✗
BLUE_CANDLE	✗
BLUE_STAINED_GLASS_PANE	✗
BRICK_SLAB	✗
BRICK_STAIRS	✗
BRICK_WALL	✗

Material	Aquatic block ¹⁶
BROWN_CANDLE	✗
BROWN_STAINED_GLASS_PANE	✗
CAMPFIRE	✗
CANDLE	✗
CHAIN	✗
CHEST	✗
COBBLED_DEEPSLATE_SLAB	✗
COBBLED_DEEPSLATE_STAIRS	✗
COBBLED_DEEPSLATE_WALL	✗
COBBLESTONE_SLAB	✗
COBBLESTONE_STAIRS	✗
COBBLESTONE_WALL	✗
CRIMSON_FENCE	✗
CRIMSON_SIGN	✗
CRIMSON_SLAB	✗
CRIMSON_STAIRS	✗
CRIMSON_TRAPDOOR	✗
CRIMSON_WALL_SIGN	✗
CUT_COPPER_SLAB	✗
CUT_COPPER_STAIRS	✗
CUT_RED_SANDSTONE_SLAB	✗
CUT_SANDSTONE_SLAB	✗
CYAN_CANDLE	✗
CYAN_STAINED_GLASS_PANE	✗
DARK_OAK_FENCE	✗
DARK_OAK_LEAVES	✗
DARK_OAK_SIGN	✗
DARK_OAK_SLAB	✗
DARK_OAK_STAIRS	✗
DARK_OAK_TRAPDOOR	✗

Material	Aquatic block ¹⁶
DARK_OAK_WALL_SIGN	✗
DARK_PRISMARINE_SLAB	✗
DARK_PRISMARINE_STAIRS	✗
DEEPSLATE_BRICK_SLAB	✗
DEEPSLATE_BRICK_STAIRS	✗
DEEPSLATE_BRICK_WALL	✗
DEEPSLATE_TILE_SLAB	✗
DEEPSLATE_TILE_STAIRS	✗
DEEPSLATE_TILE_WALL	✗
DETECTOR_RAIL	✗
DIORITE_SLAB	✗
DIORITE_STAIRS	✗
DIORITE_WALL	✗
ENDER_CHEST	✗
END_STONE_BRICK_SLAB	✗
END_STONE_BRICK_STAIRS	✗
END_STONE_BRICK_WALL	✗
EXPOSED_CUT_COPPER_SLAB	✗
EXPOSED_CUT_COPPER_STAIRS	✗
FLOWERING_AZALEA_LEAVES	✗
GLASS_PANE	✗
GLOW_LICHEN	✗
GRANITE_SLAB	✗
GRANITE_STAIRS	✗
GRANITE_WALL	✗
GRAY_CANDLE	✗
GRAY_STAINED_GLASS_PANE	✗
GREEN_CANDLE	✗
GREEN_STAINED_GLASS_PANE	✗
HANGING_ROOTS	✗

Material	Aquatic block ¹⁶
IRON_BARS	✗
IRON_TRAPDOOR	✗
JUNGLE_FENCE	✗
JUNGLE_LEAVES	✗
JUNGLE_SIGN	✗
JUNGLE_SLAB	✗
JUNGLE_STAIRS	✗
JUNGLE_TRAPDOOR	✗
JUNGLE_WALL_SIGN	✗
LADDER	✗
LANTERN	✗
LARGE_AMETHYST_BUD	✗
LIGHTNING_ROD	✗
LIGHT_BLUE_CANDLE	✗
LIGHT_BLUE_STAINED_GLASS_PANE	✗
LIGHT_GRAY_CANDLE	✗
LIGHT_GRAY_STAINED_GLASS_PANE	✗
LIME_CANDLE	✗
LIME_STAINED_GLASS_PANE	✗
MAGENTA_CANDLE	✗
MAGENTA_STAINED_GLASS_PANE	✗
MANGROVE_FENCE	✗
MANGROVE_LEAVES	✗
MANGROVE_PROPAGULE	✗
MANGROVE_ROOTS	✗
MANGROVE_SIGN	✗
MANGROVE_SLAB	✗
MANGROVE_STAIRS	✗
MANGROVE_TRAPDOOR	✗
MANGROVE_WALL_SIGN	✗

Material	Aquatic block ¹⁶
MEDIUM_AMETHYST_BUD	✗
MOSSY_COBBLESTONE_SLAB	✗
MOSSY_COBBLESTONE_STAIRS	✗
MOSSY_COBBLESTONE_WALL	✗
MOSSY_STONE_BRICK_SLAB	✗
MOSSY_STONE_BRICK_STAIRS	✗
MOSSY_STONE_BRICK_WALL	✗
MUD_BRICK_SLAB	✗
MUD_BRICK_STAIRS	✗
MUD_BRICK_WALL	✗
NETHER_BRICK_FENCE	✗
NETHER_BRICK_SLAB	✗
NETHER_BRICK_STAIRS	✗
NETHER_BRICK_WALL	✗
OAK_FENCE	✗
OAK_LEAVES	✗
OAK_SIGN	✗
OAK_SLAB	✗
OAK_STAIRS	✗
OAK_TRAPDOOR	✗
OAK_WALL_SIGN	✗
ORANGE_CANDLE	✗
ORANGE_STAINED_GLASS_PANE	✗
OXIDIZED_CUT_COPPER_SLAB	✗
OXIDIZED_CUT_COPPER_STAIRS	✗
PETRIFIED_OAK_SLAB	✗
PINK_CANDLE	✗
PINK_STAINED_GLASS_PANE	✗
POINTED_DRIPSTONE	✗
POLISHED_ANDESITE_SLAB	✗

Material	Aquatic block ¹⁶
POLISHED_ANDESITE_STAIRS	✗
POLISHED_BLACKSTONE_BRICK_SLAB	✗
POLISHED_BLACKSTONE_BRICK_STAIRS	✗
POLISHED_BLACKSTONE_BRICK_WALL	✗
POLISHED_BLACKSTONE_SLAB	✗
POLISHED_BLACKSTONE_STAIRS	✗
POLISHED_BLACKSTONE_WALL	✗
POLISHED_DEEPSLATE_SLAB	✗
POLISHED_DEEPSLATE_STAIRS	✗
POLISHED_DEEPSLATE_WALL	✗
POLISHED_DIORITE_SLAB	✗
POLISHED_DIORITE_STAIRS	✗
POLISHED_GRANITE_SLAB	✗
POLISHED_GRANITE_STAIRS	✗
POWERED_RAIL	✗
PRISMARINE_BRICK_SLAB	✗
PRISMARINE_BRICK_STAIRS	✗
PRISMARINE_SLAB	✗
PRISMARINE_STAIRS	✗
PRISMARINE_WALL	✗
PURPLE_CANDLE	✗
PURPLE_STAINED_GLASS_PANE	✗
PURPUR_SLAB	✗
PURPUR_STAIRS	✗
QUARTZ_SLAB	✗
QUARTZ_STAIRS	✗
RAIL	✗
RED_CANDLE	✗
RED_NETHER_BRICK_SLAB	✗
RED_NETHER_BRICK_STAIRS	✗

Material	Aquatic block ¹⁶
RED_NETHER_BRICK_WALL	✗
RED_SANDSTONE_SLAB	✗
RED_SANDSTONE_STAIRS	✗
RED_SANDSTONE_WALL	✗
RED_STAINED_GLASS_PANE	✗
SANDSTONE_SLAB	✗
SANDSTONE_STAIRS	✗
SANDSTONE_WALL	✗
SCAFFOLDING	✗
SCULK_SENSOR	✗
SCULK_SHRIEKER	✗
SCULK_VEIN	✗
SMALL_AMETHYST_BUD	✗
SMALL_DRIPLEAF	✗
SMOOTH_QUARTZ_SLAB	✗
SMOOTH_QUARTZ_STAIRS	✗
SMOOTH_RED_SANDSTONE_SLAB	✗
SMOOTH_RED_SANDSTONE_STAIRS	✗
SMOOTH_SANDSTONE_SLAB	✗
SMOOTH_SANDSTONE_STAIRS	✗
SMOOTH_STONE_SLAB	✗
SOUL_CAMPFIRE	✗
SOUL_LANTERN	✗
SPRUCE_FENCE	✗
SPRUCE_LEAVES	✗
SPRUCE_SIGN	✗
SPRUCE_SLAB	✗
SPRUCE_STAIRS	✗
SPRUCE_TRAPDOOR	✗
SPRUCE_WALL_SIGN	✗

Material	Aquatic block ¹⁶
STONE_BRICK_SLAB	✗
STONE_BRICK_STAIRS	✗
STONE_BRICK_WALL	✗
STONE_SLAB	✗
STONE_STAIRS	✗
TRAPPED_CHEST	✗
WARPED_FENCE	✗
WARPED_SIGN	✗
WARPED_SLAB	✗
WARPED_STAIRS	✗
WARPED_TRAPDOOR	✗
WARPED_WALL_SIGN	✗
WAXED_CUT_COPPER_SLAB	✗
WAXED_CUT_COPPER_STAIRS	✗
WAXED_EXPOSED_CUT_COPPER_SLAB	✗
WAXED_EXPOSED_CUT_COPPER_STAIRS	✗
WAXED_OXIDIZED_CUT_COPPER_SLAB	✗
WAXED_OXIDIZED_CUT_COPPER_STAIRS	✗
WAXED_WEATHERED_CUT_COPPER_SLAB	✗
WAXED_WEATHERED_CUT_COPPER_STAIRS	✗
WEATHERED_CUT_COPPER_SLAB	✗
WEATHERED_CUT_COPPER_STAIRS	✗
WHITE_CANDLE	✗
WHITE_STAINED_GLASS_PANE	✗
YELLOW_CANDLE	✗
YELLOW_STAINED_GLASS_PANE	✗
BRAIN_CORAL	✓
BRAIN_CORAL_FAN	✓
BRAIN_CORAL_WALL_FAN	✓
BUBBLE_CORAL	✓

Material	Aquatic block ¹⁶
BUBBLE_CORAL_FAN	✓
BUBBLE_CORAL_WALL_FAN	✓
CONDUIT	✓
DEAD_BRAIN_CORAL	✓
DEAD_BRAIN_CORAL_FAN	✓
DEAD_BRAIN_CORAL_WALL_FAN	✓
DEAD_BUBBLE_CORAL	✓
DEAD_BUBBLE_CORAL_FAN	✓
DEAD_BUBBLE_CORAL_WALL_FAN	✓
DEAD_FIRE_CORAL	✓
DEAD_FIRE_CORAL_FAN	✓
DEAD_FIRE_CORAL_WALL_FAN	✓
DEAD_HORN_CORAL	✓
DEAD_HORN_CORAL_FAN	✓
DEAD_HORN_CORAL_WALL_FAN	✓
DEAD_TUBE_CORAL	✓
DEAD_TUBE_CORAL_FAN	✓
DEAD_TUBE_CORAL_WALL_FAN	✓
FIRE_CORAL	✓
FIRE_CORAL_FAN	✓
FIRE_CORAL_WALL_FAN	✓
HORN_CORAL	✓
HORN_CORAL_FAN	✓
HORN_CORAL_WALL_FAN	✓
SEA_PICKLE	✓
TUBE_CORAL	✓
TUBE_CORAL_FAN	✓
TUBE_CORAL_WALL_FAN	✓

Table A.45: Waterlogged materials

A.3 Material modifiers aggregation

some modifiers are similar, so let's add them together

A.3.1 Direction aggregation

modifier, followed by the condition to set the bit to 1

Property	U	D	N	S	E	W
up	true					
down		true				
north			true			
south				true		
east					true	
west						true
face	ceiling	floor				
attachment	ceiling	floor				
half	top or upper	bottom or lower				
facing	up	down	north	south	east	west
vertical-direction	up	down				
type	top or double	bottom or double				

¹⁶If it's an underwater block (defaults to true).

Property	U	D	N	S	E	W
orientation	up_ <i>X</i>	down_ <i>X</i>	<i>X</i> _north or north_up	<i>X</i> _south or south_up	<i>X</i> _east or east_up	<i>X</i> _west or west_up
shape	ascending_ <i>X</i>		ascending_north or north_ <i>X</i>	ascending_south or south_ <i>X</i> or north_south	ascending_east or <i>X</i> _east or east_west	ascending_west or <i>X</i> _west
hanging	true					

Table A.46: Direction aggregation

A.3.2 Axis aggregation

modifier up to 2b

Property	MSB	LSB
axis	Y or Z	X or Z
attachment	double_wall	single_wall

Table A.47: Axis aggregation

A.3.3 Age aggregation

modifier up to 8b

Property
age
berries
honey_level

Table A.48: Age aggregation

A.3.4 Grouped materials aggregation

modifier up to 3b

Property
candles
eggs
pickles

Table A.49: Grouped materials aggregation

A.3.5 Stages aggregation

modifier up to 8b

Property
charges
level
bites
layers

Table A.50: Stages aggregation

A.3.6 Parts aggregation

modifier; up to 4b

Property
part
piston_head
stair_shape

Table A.51: Parts aggregation

References

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