IISE Transactions LaTeX Template

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Abstract

...

Keywords: IISE Transactions; LaTeX; Manuscript format; Taylor & Francis.

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explicar los distintos protocolos que se hablaran a continuacion

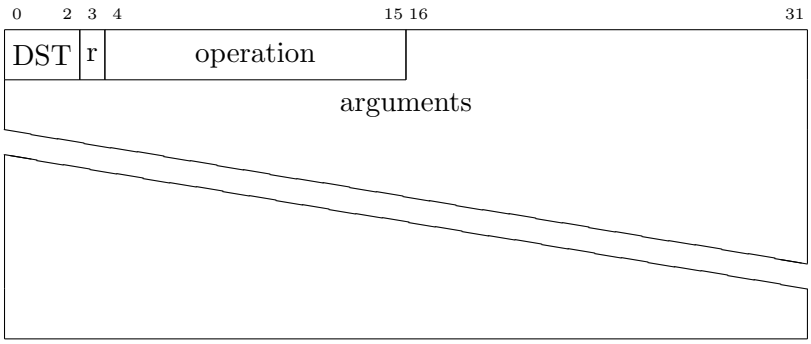

Figure 2.1: Packet structure

2.1 Destiny

explain

reference to the interconnected blocks

DST[2]	DST[1]	DST[0]	Destination
0	0	0	ServerManagerPetition
0	0	1	ServerPetition
0	1	0	ClientConnectorPetition
0	1	1	ClientPetition
1	X	X	*Reserved*

Table 2.1: DST bits meaning

2.2 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" (for example: examples). Those will be sent using petitions without return's operations (so, petitions without a mirror petition with a '1' as Response), marked as responses (Response bit at '1').

2.3 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 explain the 'kicked by inactivity' concept kicked by inactivity if you send this request every few minutes.

2.4 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.

2.4.1 Character

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

2.4.2 Integer

Integers are signed 4-bytes integers.

2.4.3 Boolean

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

For alignment define? reasons, booleans will be sent as 1-byte element. To avoid misunderstandings, let's define *false* as 0x00, and *true* as '*not define? false*'. That way, this two packets are valid *true* elements:

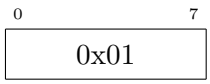

Figure 2.2: True packet with the LSB at 1

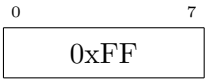

Figure 2.3: True packet with all bits at 1

2.4.4 Float

Floats are 4-bytes floating-point numbers. They are represented following the IEEE 754[1].

2.4.5 String

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

2.4.6 Array

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

The structure is a 2-byte first (0..7) MSB, then (8..15) LSB 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.

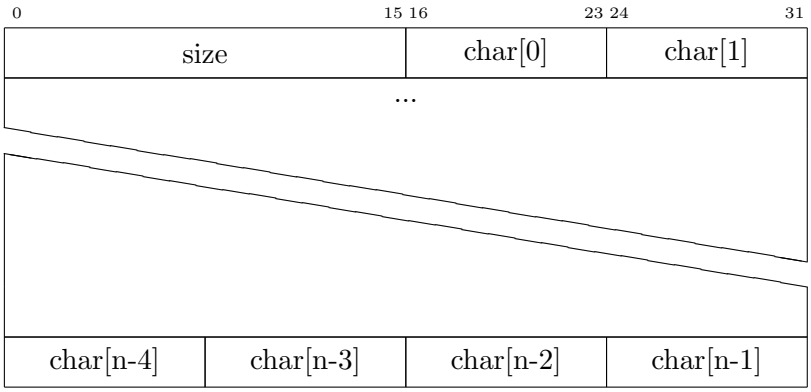

Figure 2.4: Structure of a String

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 2.5, Example of a string array.

[1]This standard should be used by C, Java and Python. cite?

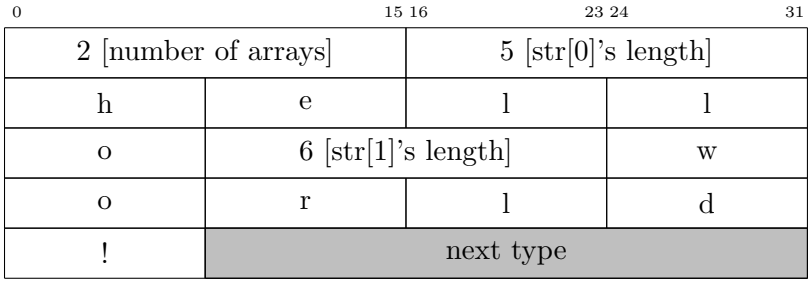

Figure 2.5: Example of a string array

2.4.7 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 definition[2] is 4GB.

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

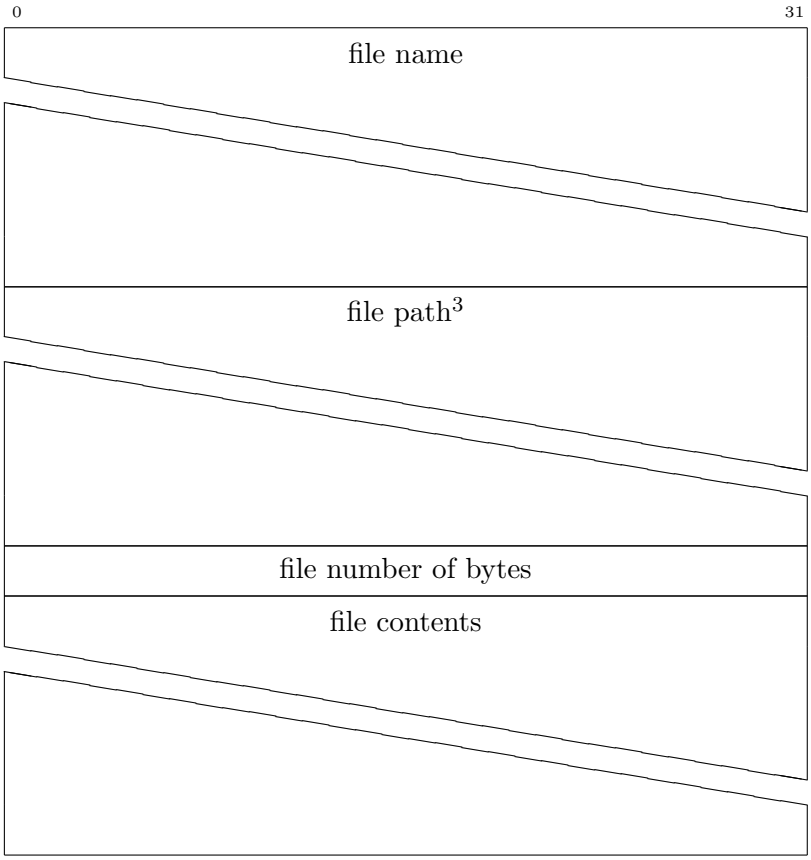

Figure 2.6: File structure

2.4.8 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.

2.4.9 Block

...

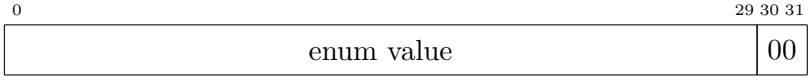

Figure 2.7: Structure of a Block

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

unsigned 4-bytes integer. 2MSB forced at 00 (01, 10 and 11 reserved for Complex/Basic Blocks (if made)), others as Enum value

Enum value	Block name	First Minecraft version
0	AIR	1.8

Table 2.2: Block enum

2.4.10 Item

...

3 Server manager petition

...

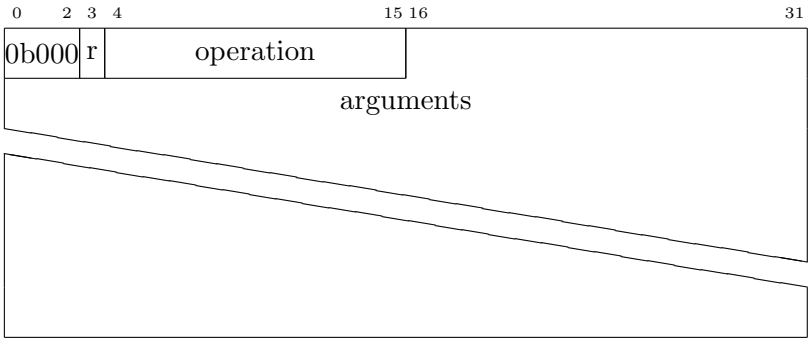

Figure 3.1: Server manager petition structure

Table of 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.

3.1 Start server operation

...

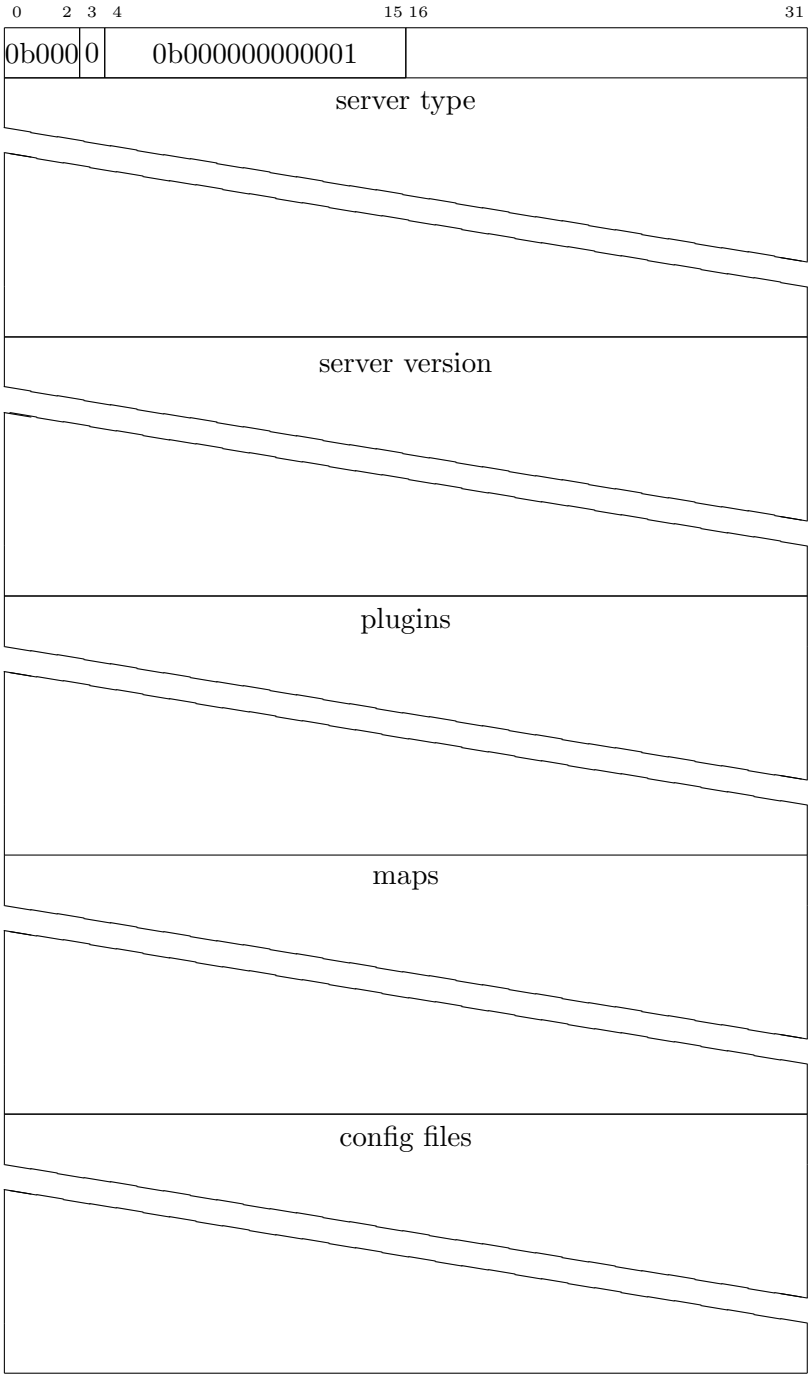

Figure 3.2: Start server petition structure

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 3.3, 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 explain, or there's no free servers of that type), then an empty IP is returned (see Figure 3.4, Start server error response structure).

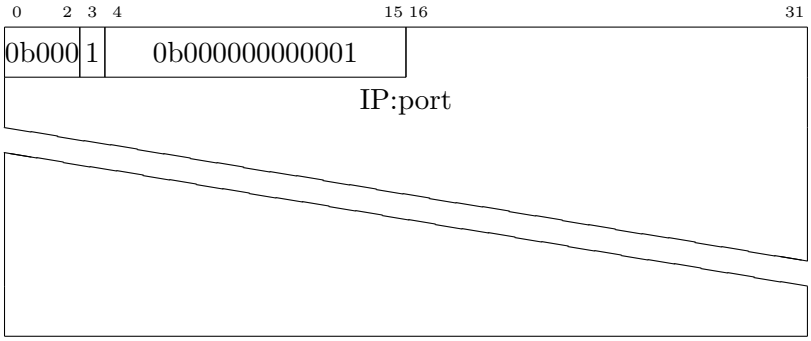

Figure 3.3: Start server response structure

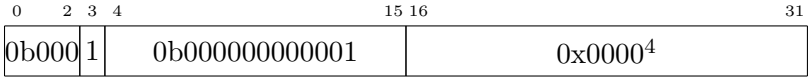

Figure 3.4: Start server error response structure

3.1.1 Maps

Array of maps (worlds; Map[]). To have more information about arrays check the subsection 2.4.6, 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 link you can send using this argument your(s) world(s).

Map in more detail

[4]Being 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.

3.1.2 Plugins

Array of plugins (Plugin[]). To have more information check the subsection 2.4.6, 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 plugins[5] dependencies. This allows both security and performance.

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

   As can be seen in the Figure 3.5, 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.

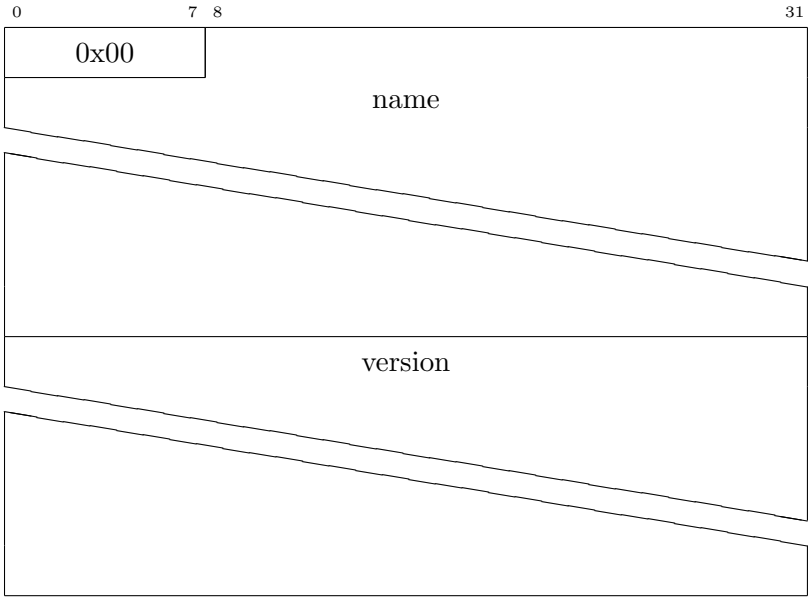

Figure 3.5: Usual plugin structure

[5]Premium 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.

2. Uploaded plugins

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

   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 3.6, File plugin structure, the first argument (that specifies the Plugin type) is 0x02.

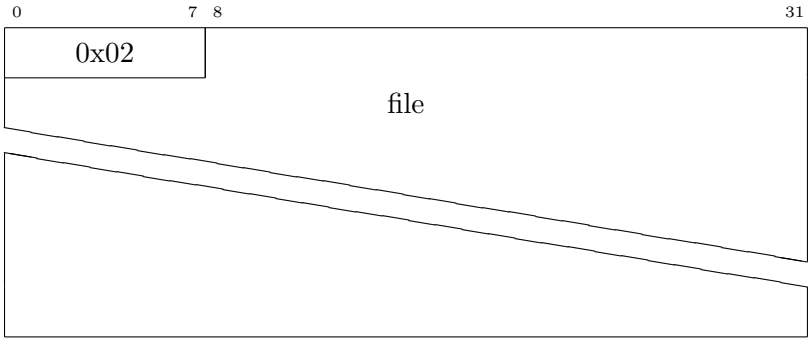

Figure 3.6: File plugin structure

mixed plugin types example?

3.1.3 Server version

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

3.1.4 Config files

...

3.2 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 ref?, while this goes to the Tester ref?. 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.

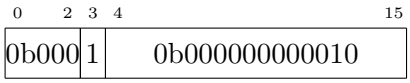

Figure 3.7: Server started notification structure

3.3 Error notification

...

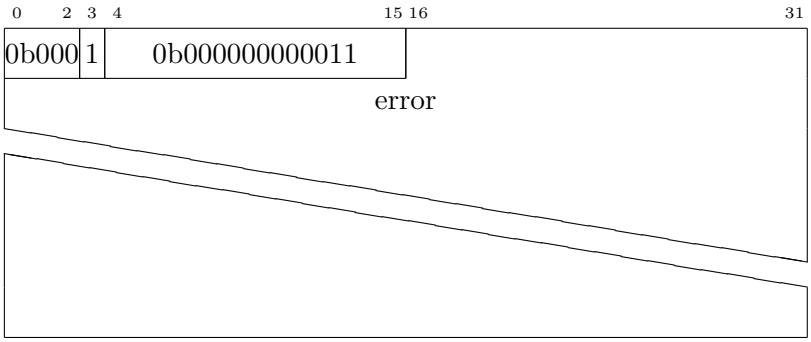

Figure 3.8: Error notification structure

4 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 2.1, Packet structure) becomes the group, and then the operation is defined on the next 2 bytes, as shown in the Figure 4.1, Server petition structure.

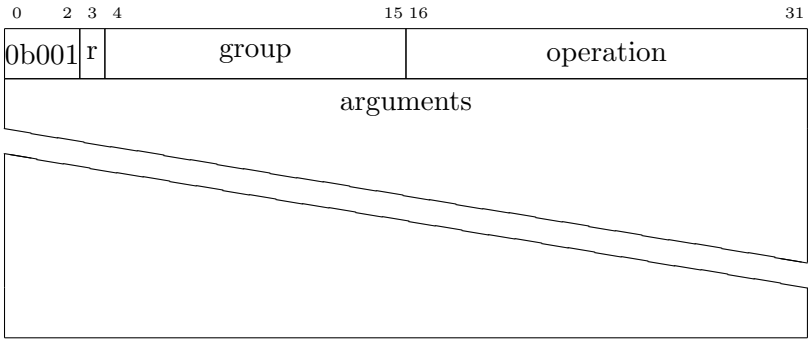

Figure 4.1: Server petition structure

4.1 Server petition group

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

The MSB abbreviation? 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 0b000000000001 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	0b00000000000	NOP[6]
0	0b00000000001	Base operations
0	0b00000000010	Performance operations
0	0b00000000011	WorldGuard operations
0	0b00000000100	Residence operations
1	XXXXXXXXXXX	Reserved for internal use

Table 4.1: 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.

4.2 Server petition operation

Like the parameter Operation, it specifies the desired request. For more information, refer to the subsection 2.3, 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 4.2, Implemented group response structure.

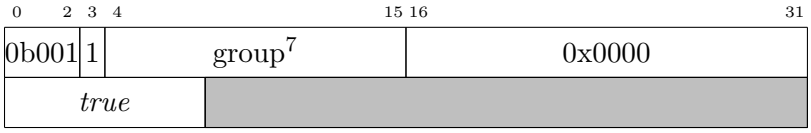

Figure 4.2: Implemented group response structure

4.3 Base operations

...

'is implemented' (all zeroes) optional

[6] As stated on the subsection 2.3, Operation, the all-zeroes operation represents a NOP request.

[7] except for groups 0b000000000000 and 0b000000000001

4.3.1 Server stop operation

...

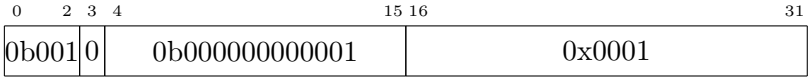

Figure 4.3: Stop server operation structure

4.3.2 Server stopped notification

... response to...

To have more information about the *server id* parameter check the Subsection 4.3.3, Server started notification.

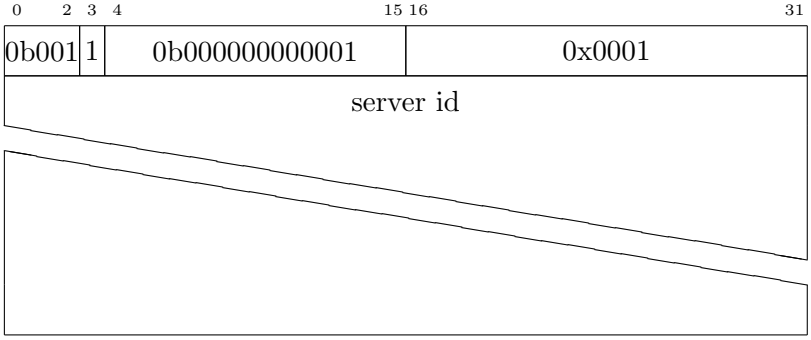

Figure 4.4: Server stopped response structure

4.3.3 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.

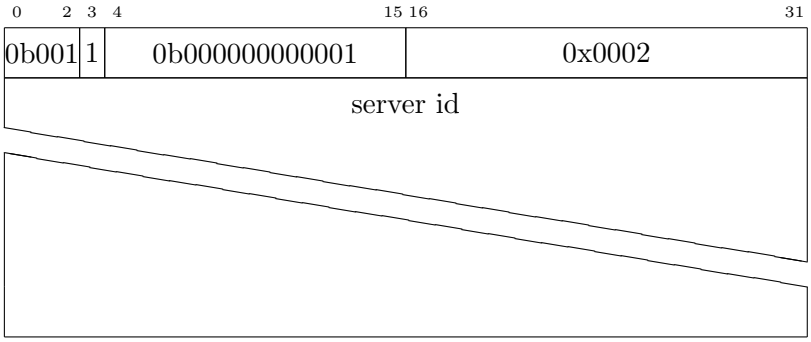

Figure 4.5: Server started response structure

4.3.4 Whitelist player operation

...

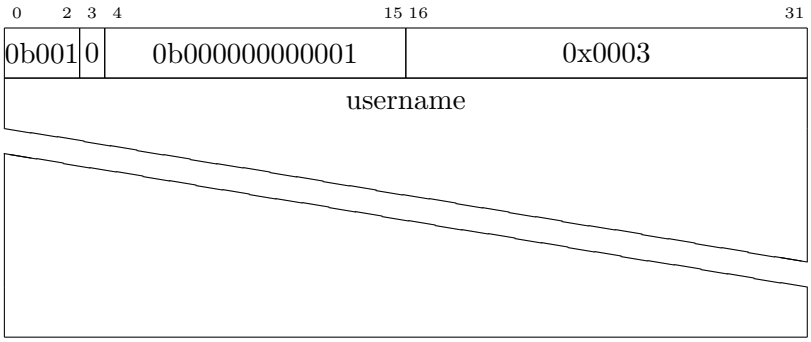

Figure 4.6: Whitelist player operation structure

4.3.5 OP player operation

...

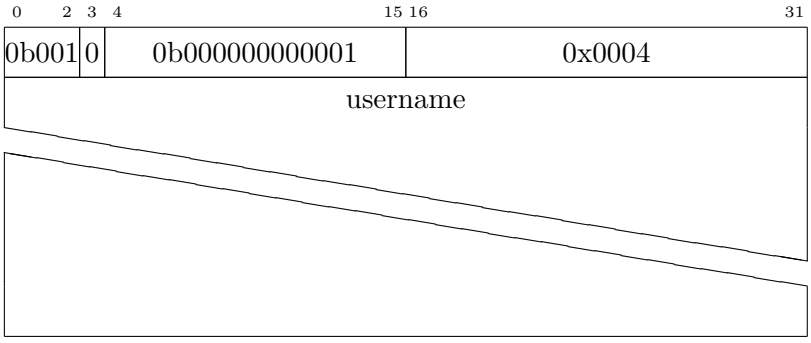

Figure 4.7: OP player operation structure

4.3.6 Error notification

...

4.4 Performance operations

...

4.5 WorldGuard operations

...

4.6 Residence operations

...

5 ? petition

First-level headings should be in bold.

5.1 *Subsection heading 3.1*

Second-level headings should be in bold italics.

5.1.1 *Sub-subsection heading 3.1.1*

Third-level headings should be in italics.

5.2 *Subsection heading 3.2*

5.3 *Subsection heading 3.3*

6 Revision history

Date	Revision	Changes
date	1	Initial release.

Table 6.1: 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 **?**.

A.1 Material modifiers

There's one downside on using Spigot's Material: it doesn't describes perfectly the block. In some aspects it will, for example, distinguish between wood types, but it won't differentiate between a wooden stair and a wooden stair with water.

That's why there's some prefixes and suffixes (that will be discussed in the following subsections) surrounding the original Spigot name, to make every possible Minecraft block combination appear in the block enum. Just to clarify, all the block modifiers has also been extracted from Spigot (all **?**'s subinterfaces).

A.1.1 Unused 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

Modifier name	Reason for discarding
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
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

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

Block name	Modifier name
ANDESITE_WALL	up
BLACKSTONE_WALL	up
BRICK_WALL	up
COBBLED_DEEPSLATE_WALL	up
COBBLESTONE_WALL	up
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

Block name	Modifier name
CRIMSON_DOOR	powered
CRIMSON_FENCE_GATE	powered
CRIMSON_TRAPDOOR	powered
DARK_OAK_DOOR	powered
DARK_OAK_FENCE_GATE	powered
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

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

A.1.2 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[8]
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.1.3 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.1.4 Axis

Represents the axis along whilst this block is oriented.

[8]The block is the same from age 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 A.1, Modifier concatenation.

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.1.5 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.1.6 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.1.7 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.1.8 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.1.9 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.1.10 Delay

Propagation delay of a repeater.

Defaults to 1.

Material	Values
REPEATER	1-4

Table A.11: Delayable materials

A.1.11 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.1.12 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)
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
REDSTONE_WIRE	**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.1.13 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.1.14 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.1.15 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.1.16 Eye

Defaults to false.

Material	Values
END_PORTAL_FRAME	true/false

Table A.17: Materials with eye

A.1.17 Face

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

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.1.18 Facing

Represents the face towards which the block is pointing.

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

Material	Options (default on bold)
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
BIRCH_WALL_SIGN	**north**/south/east/west

Material	Options (default on bold)
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
CUT_COPPER_STAIRS	**north**/south/east/west

Material	Options (default on bold)
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
GRAY_WALL_BANNER	**north**/south/east/west

Material	Options (default on bold)
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
MAGENTA_WALL_BANNER	**north**/south/east/west

Material	Options (default on bold)
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
POLISHED_DIORITE_STAIRS	**north**/south/east/west

Material	Options (default on bold)
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
SPRUCE_WALL_SIGN	**north**/south/east/west

Material	Options (default on bold)
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
BLUE_SHULKER_BOX	**up**/down/north/south/east/west

Material	Options (default on bold)
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.1.19 Half

half=bottom (ACACIA$_STAIRS)half = bottom(ACACIA_TRAPDOOR)half = bottom(ANDESITE_STAI$
$bottom(BIRCH_STAIRS)half = bottom(BIRCH_TRAPDOOR)half = bottom(BLACKSTONE_STAIRS)h$
$bottom(BRICK_STAIRS)half = bottom(COBBLED_DEEPSLATE_STAIRS)half = bottom(COBBLEST$
$bottom(CRIMSON_STAIRS)half = bottom(CRIMSON_TRAPDOOR)half = bottom(CUT_COPPER_STAI$
$bottom(DARK_OAK_STAIRS)half = bottom(DARK_OAK_TRAPDOOR)half = bottom(DARK_PRISMARI$
$bottom(DEEPSLATE_BRICK_STAIRS)half = bottom(DEEPSLATE_TILE_STAIRS)half =$

$bottom(DIORITE_STAIRS)half = bottom(END_STONE_BRICK_STAIRS)half = bottom(EXPOSED_CUT$
$bottom(GRANITE_STAIRS)half = bottom(IRON_TRAPDOOR)half = bottom(JUNGLE_STAIRS)half =$
$bottom(JUNGLE_TRAPDOOR)half = bottom(MANGROVE_STAIRS)half = bottom(MANGROVE_TRA$
$bottom(MOSSY_COBBLESTONE_STAIRS)half = bottom(MOSSY_STONE_BRICK_STAIRS)half =$
$bottom(MUD_BRICK_STAIRS)half = bottom(NETHER_BRICK_STAIRS)half = bottom(OAK_STAIRS)ha$
$bottom(OAK_TRAPDOOR)half = bottom(OXIDIZED_CUT_COPPER_STAIRS)half =$
$bottom(POLISHED_ANDESITE_STAIRS)half = bottom(POLISHED_BLACKSTONE_BRICK_STAIRS)$
$bottom(POLISHED_BLACKSTONE_STAIRS)half = bottom(POLISHED_DEEPSLATE_STAIRS)half =$
$bottom(POLISHED_DIORITE_STAIRS)half = bottom(POLISHED_GRANITE_STAIRS)half =$
$bottom(PRISMARINE_BRICK_STAIRS)half = bottom(PRISMARINE_STAIRS)half =$
$bottom(PURPUR_STAIRS)half = bottom(QUARTZ_STAIRS)half = bottom(RED_NETHER_BRICK_STAI$
$bottom(RED_SANDSTONE_STAIRS)half = bottom(SANDSTONE_STAIRS)half = bottom(SMOOTH_QU$
$bottom(SMOOTH_RED_SANDSTONE_STAIRS)half = bottom(SMOOTH_SANDSTONE_STAIRS)half =$
$bottom(SPRUCE_STAIRS)half = bottom(SPRUCE_TRAPDOOR)half = bottom(STONE_BRICK_STAIRS$
$bottom(STONE_STAIRS)half = bottom(WARPED_STAIRS)half = bottom(WARPED_TRAPDOOR)half$
$bottom(WAXED_CUT_COPPER_STAIRS)half = bottom(WAXED_EXPOSED_CUT_COPPER_STAIRS)hal$
$bottom(WAXED_OXIDIZED_CUT_COPPER_STAIRS)half = bottom(WAXED_WEATHERED_CUT_COPP$
$bottom(WEATHERED_CUT_COPPER_STAIRS)half = lower(ACACIA_DOOR)half =$
$lower(BIRCH_DOOR)half = lower(CRIMSON_DOOR)half = lower(DARK_OAK_DOOR)half =$
$lower(IRON_DOOR)half = lower(JUNGLE_DOOR)half = lower(LARGE_FERN)half =$
$lower(LILAC)half = lower(MANGROVE_DOOR)half = lower(OAK_DOOR)half =$
$lower(PEONY)half = lower(ROSE_BUSH)half = lower(SMALL_DRIPLEAF)half =$
$lower(SPRUCE_DOOR)half = lower(SUNFLOWER)half = lower(TALL_GRASS)half =$
$lower(TALL_SEAGRASS)half = lower(WARPED_DOOR)$

hanging=false (LANTERN) hanging=false (MANGROVE$_PROPAGULE)hanging =$
$false(SOUL_LANTERN)$

hatch=0 (TURTLE$_EGG)$

hinge=left (ACACIA$_DOOR)hinge = left(BIRCH_DOOR)hinge = left(CRIMSON_DOOR)hinge =$
$left(DARK_OAK_DOOR)hinge = left(IRON_DOOR)hinge = left(JUNGLE_DOOR)hinge =$
$left(MANGROVE_DOOR)hinge = left(OAK_DOOR)hinge = left(SPRUCE_DOOR)hinge =$
$left(WARPED_DOOR)$

honey$_l evel = 0(BEEHIVE) honey_l evel = 0(BEE_NEST)$

in$_w all = false(ACACIA_FENCE_GATE) in_w all = false(BIRCH_FENCE_GATE) in_w all = false(CRIMSON_FENCE_GATE) in_w all = false(DARK_OAK_FENCE_GATE) in_w all = false(JUNGLE_FENCE_GATE) in_w all = false(MANGROVE_FENCE_GATE) in_w all = false(OAK_FENCE_GATE) in_w all = false(SPRUCE_FENCE_GATE) in_w all = false(WARPED_FENCE_GA$

inverted=false (DAYLIGHT$_D ETECTOR$)

layers=1 (SNOW)

leaves=none (BAMBOO)

level=0 (COMPOSTER) level=0 (LAVA) level=0 (WATER) level=1 (POWDER$_S NOW_C AULDRON) leve$
$1(WATER_C AULDRON)$

lit=false (BLACK$_C ANDLE) lit = false(BLACK_C ANDLE_C AKE) lit = false(BLAST_F URNACE) lit =$
$false(BLUE_C ANDLE) lit = false(BLUE_C ANDLE_C AKE) lit = false(BROWN_C ANDLE) lit =$
$false(BROWN_C ANDLE_C AKE) lit = false(CANDLE) lit = false(CANDLE_C AKE) lit =$
$false(CYAN_C ANDLE) lit = false(CYAN_C ANDLE_C AKE) lit = false(DEEPSLATE_R EDSTONE_O RE)$
$false(FURNACE) lit = false(GRAY_C ANDLE) lit = false(GRAY_C ANDLE_C AKE) lit =$
$false(GREEN_C ANDLE) lit = false(GREEN_C ANDLE_C AKE) lit = false(LIGHT_B LUE_C ANDLE) lit =$
$false(LIGHT_B LUE_C ANDLE_C AKE) lit = false(LIGHT_G RAY_C ANDLE) lit = false(LIGHT_G RAY_C AND$
$false(LIME_C ANDLE) lit = false(LIME_C ANDLE_C AKE) lit = false(MAGENTA_C ANDLE) lit =$
$false(MAGENTA_C ANDLE_C AKE) lit = false(ORANGE_C ANDLE) lit = false(ORANGE_C ANDLE_C AK$
$false(PINK_C ANDLE) lit = false(PINK_C ANDLE_C AKE) lit = false(PURPLE_C ANDLE) lit =$
$false(PURPLE_C ANDLE_C AKE) lit = false(REDSTONE_L AMP) lit = false(REDSTONE_O RE) lit =$
$false(RED_C ANDLE) lit = false(RED_C ANDLE_C AKE) lit = false(SMOKER) lit =$
$false(WHITE_C ANDLE) lit = false(WHITE_C ANDLE_C AKE) lit = false(YELLOW_C ANDLE) lit =$
$false(YELLOW_C ANDLE_C AKE) lit = true(CAMPFIRE) lit = true(REDSTONE_T ORCH) lit =$
$true(REDSTONE_W ALL_T ORCH) lit = true(SOUL_C AMPFIRE)$

locked=false (REPEATER)

mode=compare (COMPARATOR) mode=load (STRUCTURE$_B LOCK$)

moisture=0 (FARMLAND)

note=0 (NOTE$_B LOCK$)

open=false (ACACIA$_D OOR) open = false(ACACIA_F ENCE_G ATE) open = false(ACACIA_T RAPDOO$
$false(BARREL) open = false(BIRCH_D OOR) open = false(BIRCH_F ENCE_G ATE) open =$

$false(BIRCH_TRAPDOOR)open = false(CRIMSON_DOOR)open = false(CRIMSON_FENCE_GATE)op$
$false(CRIMSON_TRAPDOOR)open = false(DARK_OAK_DOOR)open = false(DARK_OAK_FENCE_GAT$
$false(DARK_OAK_TRAPDOOR)open = false(IRON_DOOR)open = false(IRON_TRAPDOOR)open =$
$false(JUNGLE_DOOR)open = false(JUNGLE_FENCE_GATE)open = false(JUNGLE_TRAPDOOR)open$
$false(MANGROVE_DOOR)open = false(MANGROVE_FENCE_GATE)open = false(MANGROVE_TRA$
$false(OAK_DOOR)open = false(OAK_FENCE_GATE)open = false(OAK_TRAPDOOR)open =$
$false(SPRUCE_DOOR)open = false(SPRUCE_FENCE_GATE)open = false(SPRUCE_TRAPDOOR)open$
$false(WARPED_DOOR)open = false(WARPED_FENCE_GATE)open = false(WARPED_TRAPDOOR)$

orientation=north$_up(JIGSAW)$

part=foot (BLACK$_BED)part = foot(BLUE_BED)part = foot(BROWN_BED)part =$
$foot(CYAN_BED)part = foot(GRAY_BED)part = foot(GREEN_BED)part = foot(LIGHT_BLUE_BED)part$
$foot(LIGHT_GRAY_BED)part = foot(LIME_BED)part = foot(MAGENTA_BED)part =$
$foot(ORANGE_BED)part = foot(PINK_BED)part = foot(PURPLE_BED)part = foot(RED_BED)part =$
$foot(WHITE_BED)part = foot(YELLOW_BED)$

A.1.20 Pickles

Indicates the number of pickles in this block.

Defaults to 1.

Material	Values
SEA_PICKLE	1-4

Table A.20: Materials with pickles

A.1.21 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

Material	Powered value
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

Table A.21: Powerabled materials

A.1.22 Rotation

Defaults to 0.

rotation=0 (ACACIA$_S IGN)rotation = 0(BIRCH_S IGN)rotation = 0(BLACK_B ANNER)rotation = 0(BLUE_B ANNER)rotation = 0(BROWN_B ANNER)rotation = 0(CREEPER_H EAD)rotation = 0(CRIMSON_S IGN)rotation = 0(CYAN_B ANNER)rotation = 0(DARK_O AK_S IGN)rotation = 0(DRAGON_H EAD)rotation = 0(GRAY_B ANNER)rotation = 0(GREEN_B ANNER)rotation = 0(JUNGLE_S IGN)rotation = 0(LIGHT_B LUE_B ANNER)rotation = 0(LIGHT_G RAY_B ANNER)rotation = 0(LIME_B ANNER)rotation = 0(MAGENTA_B ANNER)rotation = 0(MANGROVE_S IGN)rotation = 0(OAK_S IGN)rotation = 0(ORANGE_B ANNER)rotation = 0(PINK_B ANNER)rotation = 0(PLAYER_H EAD)rotation = 0(PURPLE_B ANNER)rotation = 0(RED_B ANNER)rotation = 0(SKELETON_S KULL)rotation = 0(SPRUCE_S IGN)rotation = 0(WARPED_S IGN)rotation = 0(WHITE_B ANNER)rotation = 0(WITHER_S KELETON_S KULL)rotation = 0(YELLOW_B ANNER)rot 0(ZOMBIE_H EAD)

shape=north$_s outh(ACTIVATOR_R AIL)shape = north_s outh(DETECTOR_R AIL)shape = north_s outh(POWERED_R AIL)shape = north_s outh(RAIL)shape = straight(ACACIA_S TAIRS)shape = straight(ANDESITE_S TAIRS)shape = straight(BIRCH_S TAIRS)shape = straight(BLACKSTONE_S TA straight(BRICK_S TAIRS)shape = straight(COBBLED_D EEPSLATE_S TAIRS)shape = straight(COBBLESTONE_S TAIRS)shape = straight(CRIMSON_S TAIRS)shape = straight(CUT_C OPP straight(DARK_O AK_S TAIRS)shape = straight(DARK_P RISMARINE_S TAIRS)shape = straight(DEEPSLATE_B RICK_S TAIRS)shape = straight(DEEPSLATE_T ILE_S TAIRS)shape = straight(DIORITE_S TAIRS)shape = straight(END_S TONE_B RICK_S TAIRS)shape = straight(EXPOSED_C UT_C OPPER_S TAIRS)shape = straight(GRANITE_S TAIRS)shape = straight(JUNGLE_S TAIRS)shape = straight(MANGROVE_S TAIRS)shape = straight(MOSSY_C OBBLE straight(MOSSY_S TONE_B RICK_S TAIRS)shape = straight(MUD_B RICK_S TAIRS)shape = straight(NETHER_B RICK_S TAIRS)shape = straight(OAK_S TAIRS)shape = straight(OXIDIZED_C UT_C straight(POLISHED_A NDESITE_S TAIRS)shape = straight(POLISHED_B LACKSTONE_B RICK_S TAI straight(POLISHED_B LACKSTONE_S TAIRS)shape = straight(POLISHED_D EEPSLATE_S TAIRS)sh straight(POLISHED_D IORITE_S TAIRS)shape = straight(POLISHED_G RANITE_S TAIRS)shape = straight(PRISMARINE_B RICK_S TAIRS)shape = straight(PRISMARINE_S TAIRS)shape = straight(PURPUR_S TAIRS)shape = straight(QUARTZ_S TAIRS)shape = straight(RED_N ETHER_B RIC straight(RED_S ANDSTONE_S TAIRS)shape = straight(SANDSTONE_S TAIRS)shape =

$straight(SMOOTH_QUARTZ_STAIRS)shape = straight(SMOOTH_RED_SANDSTONE_STAIRS)shape =$
$straight(SMOOTH_SANDSTONE_STAIRS)shape = straight(SPRUCE_STAIRS)shape =$
$straight(STONE_BRICK_STAIRS)shape = straight(STONE_STAIRS)shape = straight(WARPED_STAI$
$straight(WAXED_CUT_COPPER_STAIRS)shape = straight(WAXED_EXPOSED_CUT_COPPER_STAIRS)$
$straight(WAXED_OXIDIZED_CUT_COPPER_STAIRS)shape = straight(WAXED_WEATHERED_CUT_C$
$straight(WEATHERED_CUT_COPPER_STAIRS)$

snowy=false $(GRASS_BLOCK)snowy = false(MYCELIUM)snowy = false(PODZOL)$

thickness=tip $(POINTED_DRIPSTONE)$

type=bottom $(ACACIA_SLAB)type = bottom(ANDESITE_SLAB)type = bottom(BIRCH_SLAB)type =$
$bottom(BLACKSTONE_SLAB)type = bottom(BRICK_SLAB)type = bottom(COBBLED_DEEPSLATE_SL$
$bottom(COBBLESTONE_SLAB)type = bottom(CRIMSON_SLAB)type = bottom(CUT_COPPER_SLAB)typ$
$bottom(CUT_RED_SANDSTONE_SLAB)type = bottom(CUT_SANDSTONE_SLAB)type =$
$bottom(DARK_OAK_SLAB)type = bottom(DARK_PRISMARINE_SLAB)type = bottom(DEEPSLATE_BRI$
$bottom(DEEPSLATE_TILE_SLAB)type = bottom(DIORITE_SLAB)type = bottom(END_STONE_BRICK_S$
$bottom(EXPOSED_CUT_COPPER_SLAB)type = bottom(GRANITE_SLAB)type = bottom(JUNGLE_SLAB)$
$bottom(MANGROVE_SLAB)type = bottom(MOSSY_COBBLESTONE_SLAB)type = bottom(MOSSY_STO$
$bottom(MUD_BRICK_SLAB)type = bottom(NETHER_BRICK_SLAB)type = bottom(OAK_SLAB)type =$
$bottom(OXIDIZED_CUT_COPPER_SLAB)type = bottom(PETRIFIED_OAK_SLAB)type =$
$bottom(POLISHED_ANDESITE_SLAB)type = bottom(POLISHED_BLACKSTONE_BRICK_SLAB)type =$
$bottom(POLISHED_BLACKSTONE_SLAB)type = bottom(POLISHED_DEEPSLATE_SLAB)type =$
$bottom(POLISHED_DIORITE_SLAB)type = bottom(POLISHED_GRANITE_SLAB)type =$
$bottom(PRISMARINE_BRICK_SLAB)type = bottom(PRISMARINE_SLAB)type = bottom(PURPUR_SLA$
$bottom(QUARTZ_SLAB)type = bottom(RED_NETHER_BRICK_SLAB)type = bottom(RED_SANDSTONE_S$
$bottom(SANDSTONE_SLAB)type = bottom(SMOOTH_QUARTZ_SLAB)type = bottom(SMOOTH_RED_SA$
$bottom(SMOOTH_SANDSTONE_SLAB)type = bottom(SMOOTH_STONE_SLAB)type =$
$bottom(SPRUCE_SLAB)type = bottom(STONE_BRICK_SLAB)type = bottom(STONE_SLAB)type =$
$bottom(WARPED_SLAB)type = bottom(WAXED_CUT_COPPER_SLAB)type = bottom(WAXED_EXPOSE$
$bottom(WAXED_OXIDIZED_CUT_COPPER_SLAB)type = bottom(WAXED_WEATHERED_CUT_COPPER$
$bottom(WEATHERED_CUT_COPPER_SLAB)type = normal(MOVING_PISTON)type =$
$normal(PISTON_HEAD)type = single(CHEST)type = single(TRAPPED_CHEST)$

$vertical_direction = up(POINTED_DRIPSTONE)$

A.1.23 Waterlogged

Denotes whether this block has fluid in it.

Besides underwater blocks[9] (which defaults to true), it defaults to false. All the possible options are true or false.

Material	Aquatic block[10]
ACACIA_FENCE	✗
ACACIA_LEAVES	✗
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	✗

[9] BRAIN_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[10]
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	✗
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	✗

Material	Aquatic block[10]
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	✗
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	✗

Material	Aquatic block[10]
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	✗
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	✗

Material	Aquatic block[10]
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	✗
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	✗

Material	Aquatic block[10]
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	✗
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	✗

Material	Aquatic block[10]
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	✗
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	✗

Material	Aquatic block[10]
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	✗
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	✗

Material	Aquatic block[10]
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	✓
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	✓

Material	Aquatic block[10]
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.22: Waterlogged materials

A.2 Material modifiers concatenation

... (how to join modifiers)

If a material doesn't have the attribute that the diagram is checking it will assume that the attribute value is the default one (0 or false, in most of the cases), resulting in ignoring that property.

[10] If it's an underwater block (defaults to true).

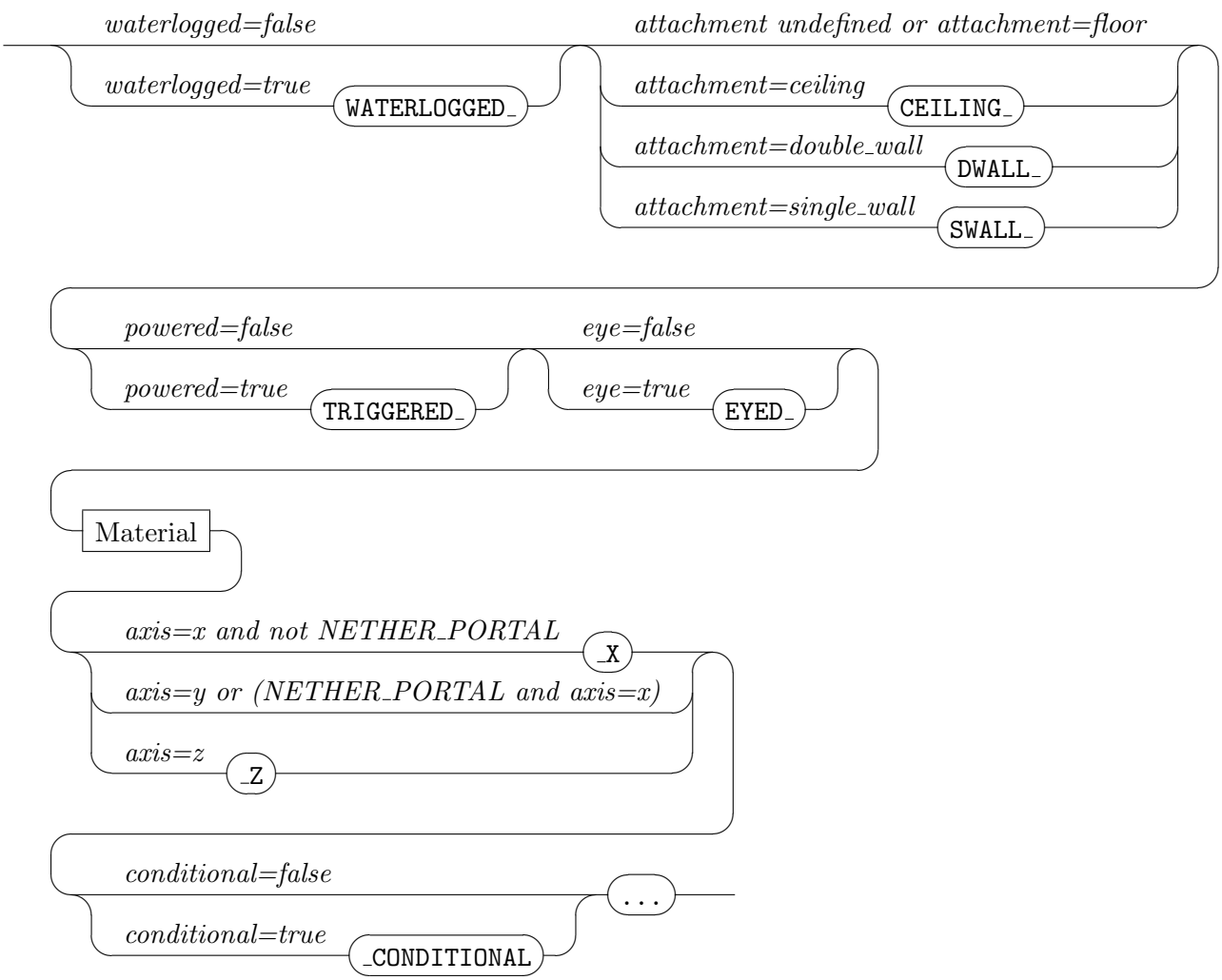

Figure A.1a: Modifier concatenation

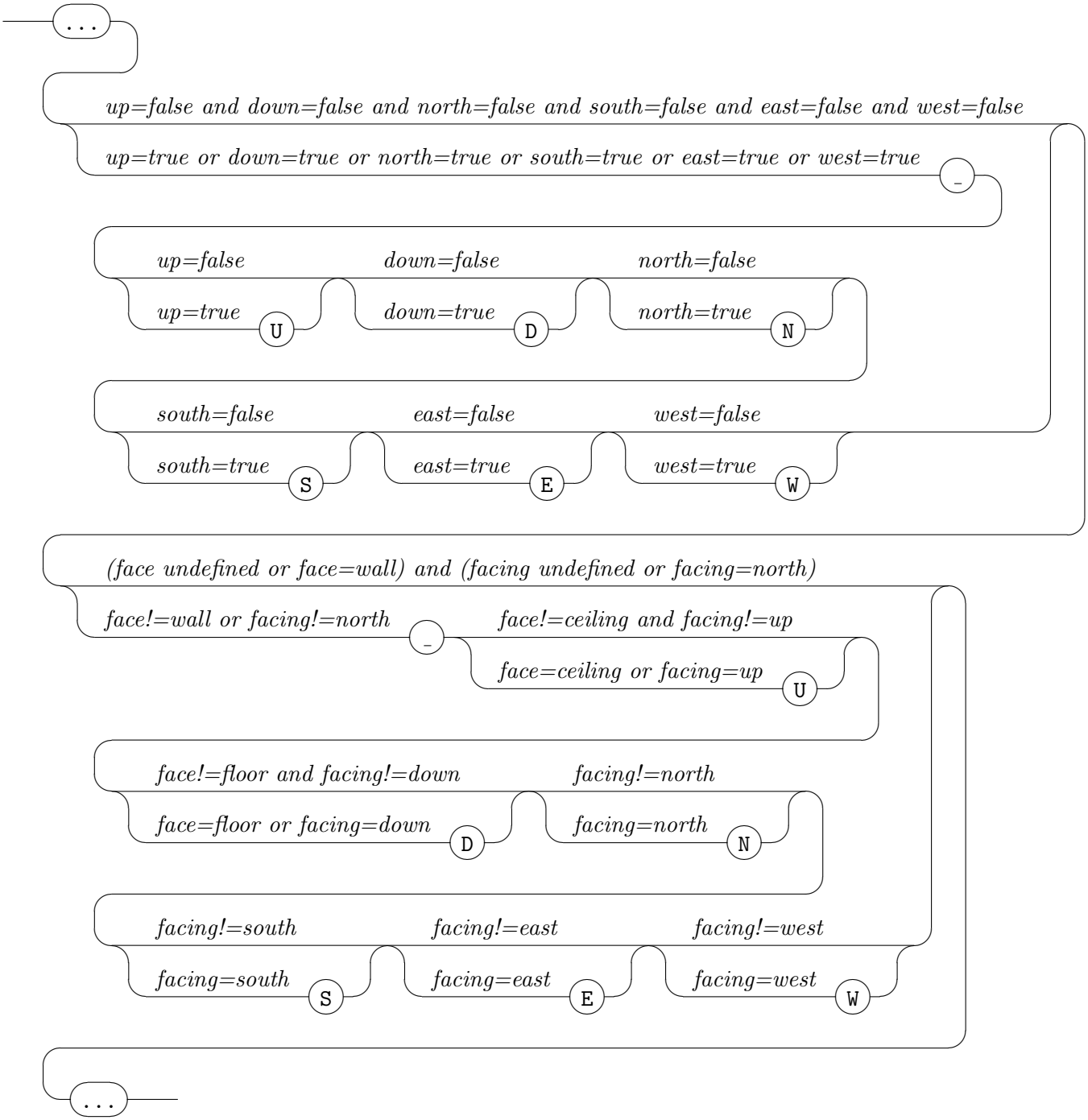

Figure A.1b: Direction modifier concatenation

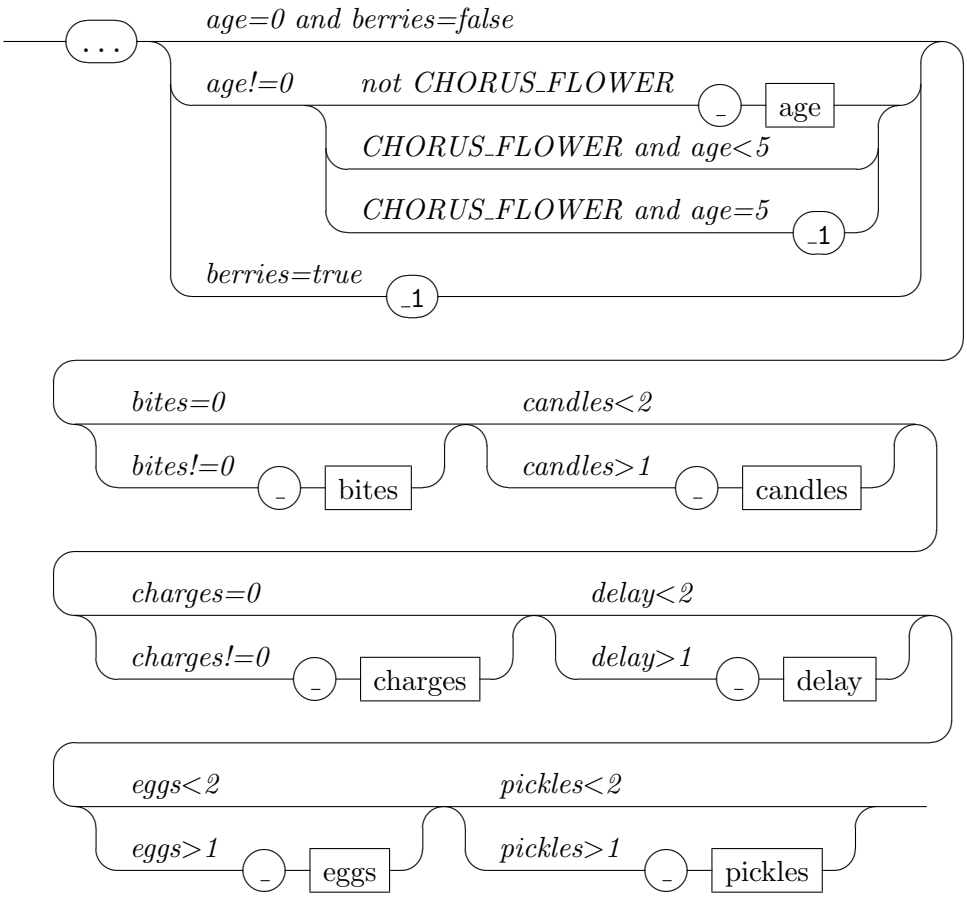

Figure A.1c: Integer modifier concatenation

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