



Minecraftは、ボクセルのWebになる

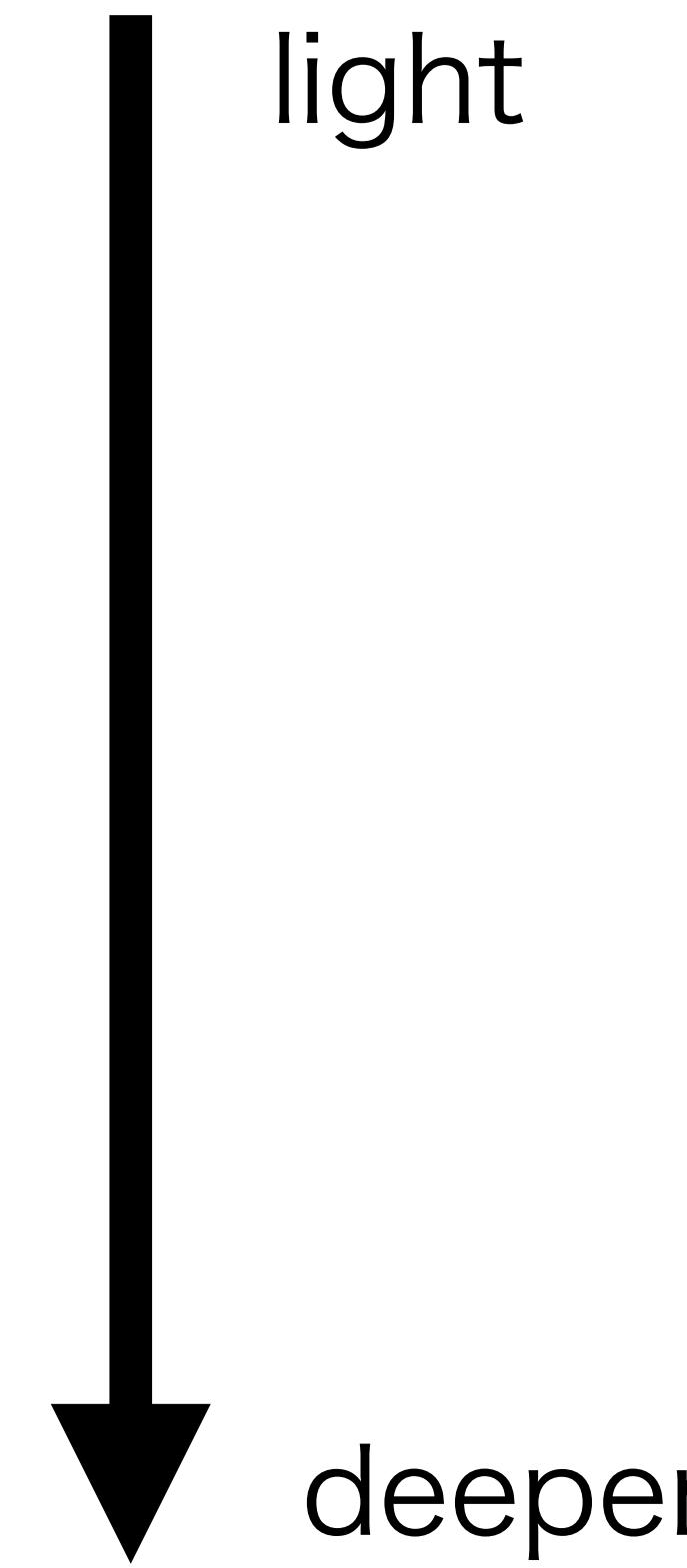
中嶋謙互, なかじま けんご, @ringo,

<https://github.com/kengonakajima> 2021-09-08



Minecraft を深く遊ぶ

- ・ サバイバルモード
- ・ クリエイティブモード
- ・ 配布ワールド、スキン
- ・ リソースパック
- ・ Realms
- ・ クライアントMODを入れる
- ・ MODクライアント
- ・ ハッククライアント
- ・ クライアントMODを作る
- ・ サーバーを立てる
- ・ サーバーMODを入れる
- ・ サーバーMODを作る
- ・ 互換プログラムを作る

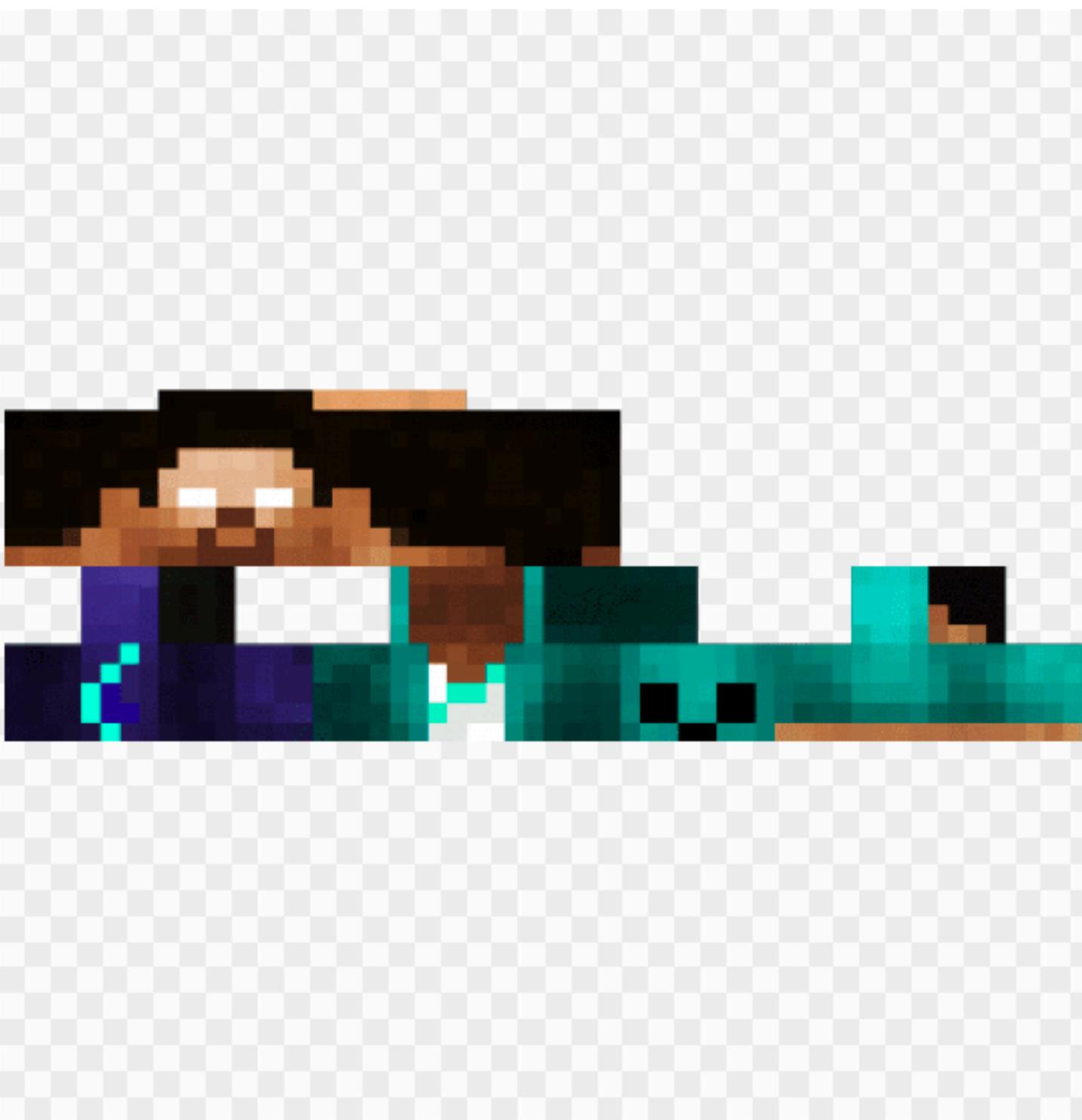


普通のMinecraft



スキン

スキン作成ツールやPhotoshopで誰でも変更できる



配布ワールド

Map 1.16.4-1.15

OneBlock 🇺🇸 🇩🇪

Last updated on December 10, 2020

Showcase

◀ Next Previous ▶

Keywords

- OneBlock
- One Block
- Infinite Block
- Game Mode
- Singleplayer
- Multiplayer

Articles

- How to Upgrade your OneBlock World from 1.15 to 1.16 2020/11/24

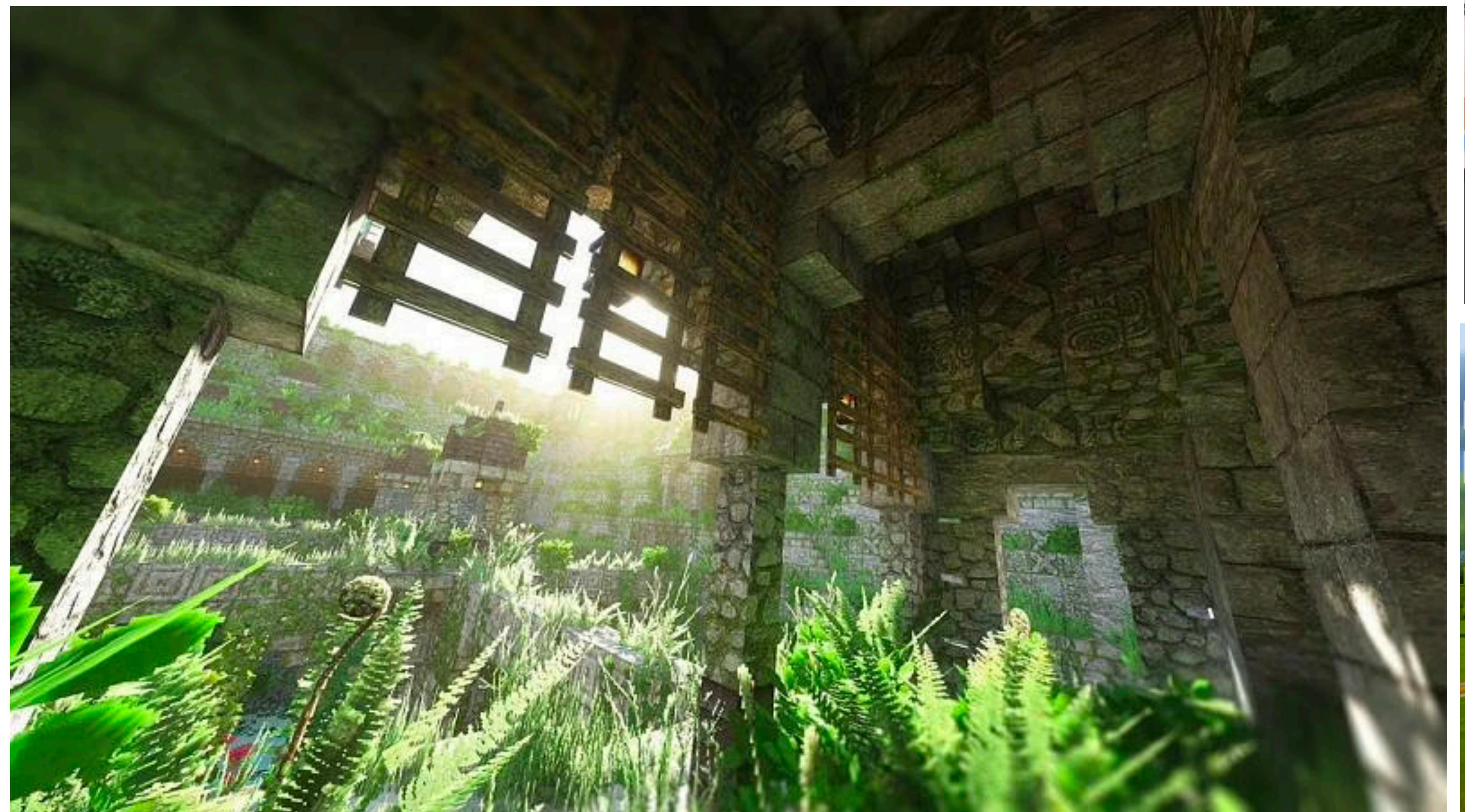
Tweets

**IJA** @IJAMinecraft 

OneBlock is now available for 1.16.4!
There's a few small changes and bug fixes as well!

Get it here: [Link Image](#)

リソースパック



Realms



シェーダーを入れ替えるMOD



Combat

Movement

World

Minigame

Exploit

ハッククライアント



バニラ Java サーバーの立ち上げ方

<https://www.minecraft.net/ja-jp/download/server>

MINECRAFT: JAVA EDITION のサーバーをダウンロードします

マルチプレイヤー サーバーのセットアップをお望みですか?

注意: このサーバー設定は Minecraft: Java Edition にのみ対応しています。

Minecraft マルチプレイヤーサーバーを自分で立てようと思っているのでしたら、状況はやや複雑になります ([この wiki の記事にチュートリアルがありますのでご覧になって下さい](#))。まず、必ず java をコマンドラインから使用できるようにして下さい。Linux および macOS では、これはすでにセットアップされているはずですが、Windows では、PATH 環境変数を操作する必要があるかもしれません。

[minecraft_server.1.17.1.jar](#) をダウンロードして以下のコマンドで実行しましょう:

```
java -Xmx1024M -Xms1024M -jar minecraft_server.1.17.1.jar nogui
```

Should you want to start the server with its graphical user interface you can leave out the "nogui" part.

ちなみに、このページ上のいずれかのソフトウェアをダウンロードすることで、あなたは [Minecraft 使用許諾契約とプライバシー ポリシー](#) に同意することになります。

Hypixel

同時接続10万以上のMODサーバー、 MMORPG+PvP+ミニゲーム



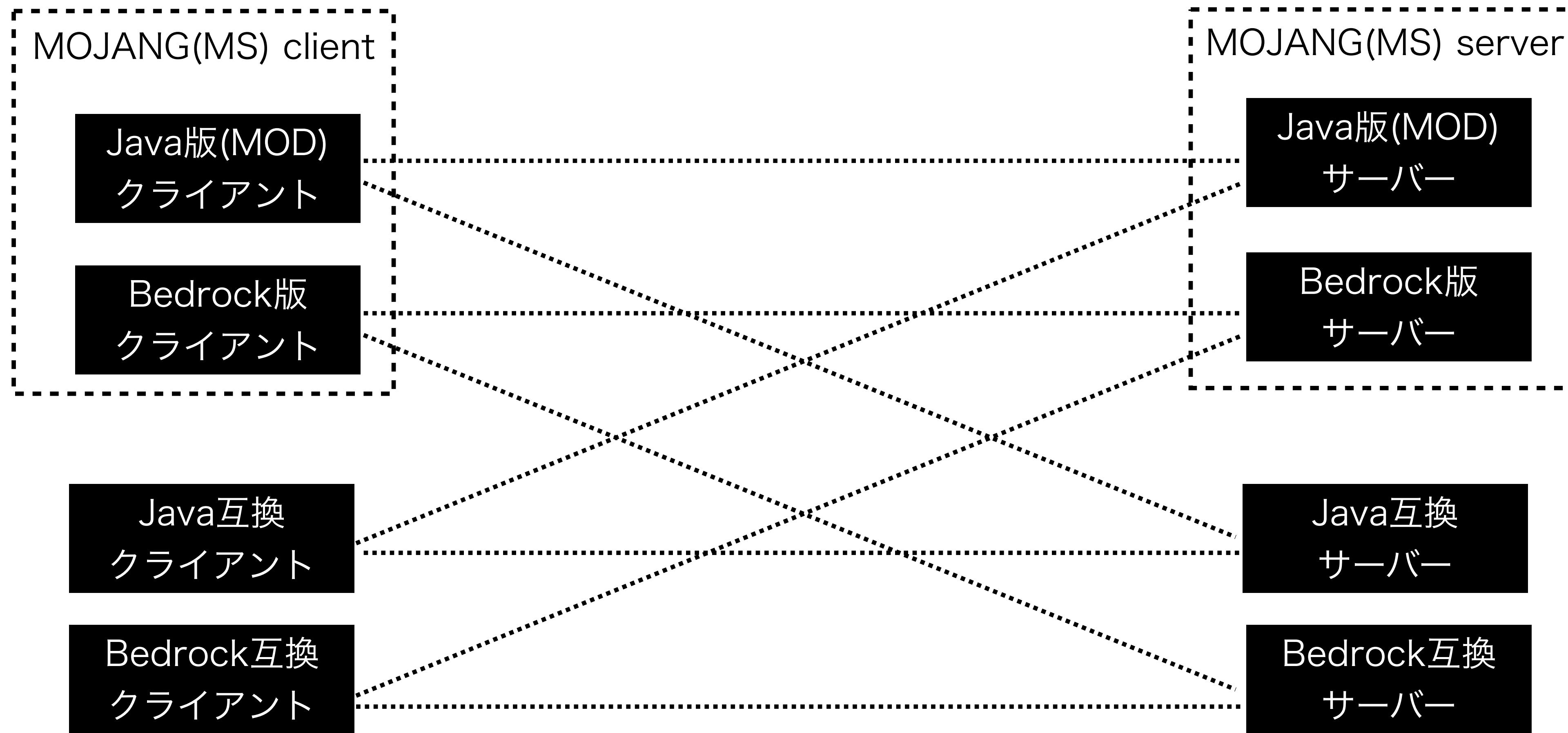
Java版のEULA

If you've bought the Game, you may play around with it and modify it by adding modifications, tools, or plugins, which we will refer to collectively as "Mods." By "Mods," we mean something original that you or someone else created that doesn't contain a substantial part of our copyrightable code or content. When you combine your Mod with the Minecraft software, we will call that combination a "Modded Version" of the Game. We have the final say on what constitutes a Mod and what doesn't. You may not distribute any Modded Versions of our Game or software, and we'd appreciate it if you didn't use Mods for griefing. Basically, Mods are okay to distribute; hacked versions or Modded Versions of the Game client or server software are not okay to distribute.

Reverse engineeringは禁じていない

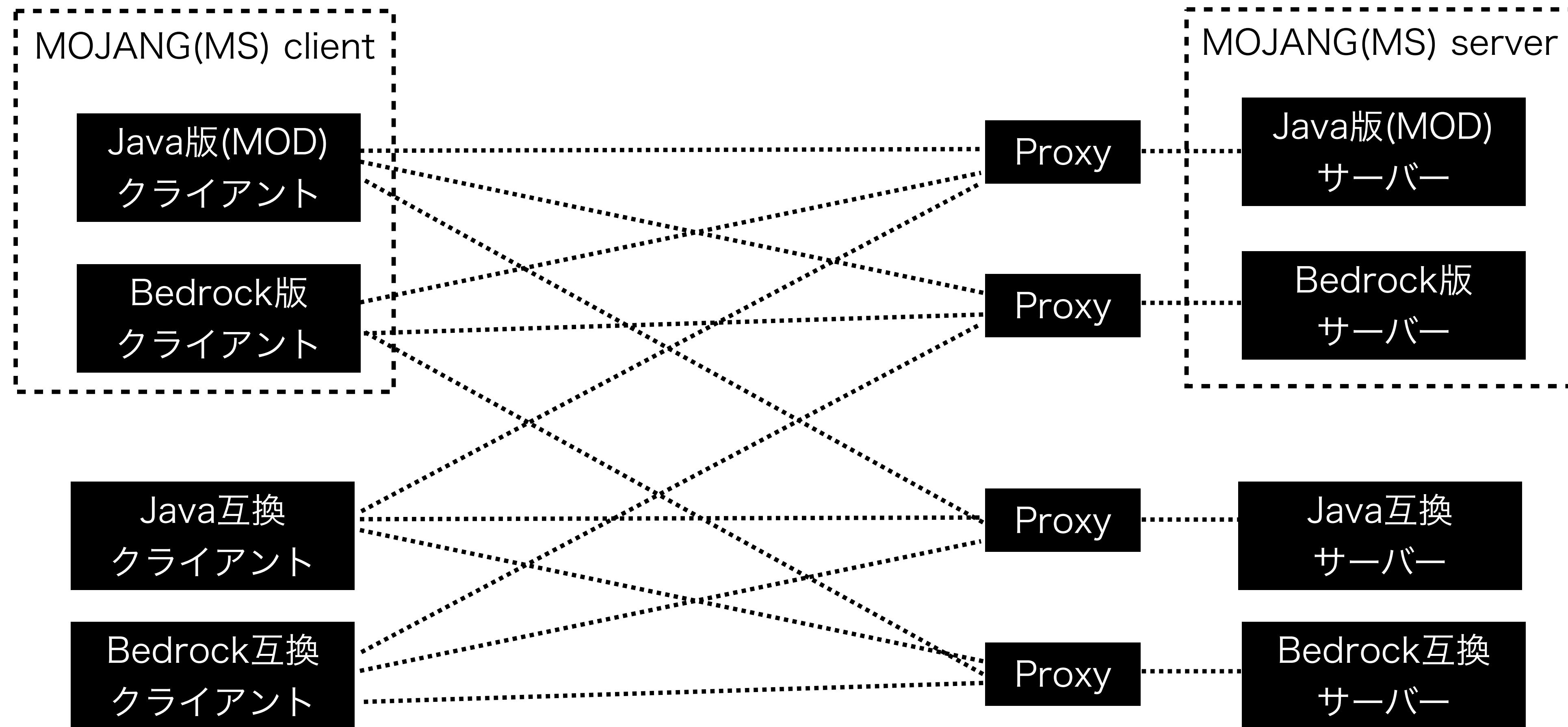
	デスクトップ	モバイル端末	最新のコンソール	その他の端末	
使用可能:	Windows Mac Linux (Java Edition)	Windows 10 (with Windows MR)	iOS Android	Xbox One Nintendo Switch PlayStation 4 (with PSVR)	Fire Devices Oculus
Windows 10、Xbox One、モバイル機器、 Nintendo Switch、 PlayStation 4 でのク ロスプラットフォーム プレイ。		✓	✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Java Edition でのクロ スプレイ (Windows、 Mac、Linux)		✓			
画面分割マルチプレ イ (オンラインマルチ プレイには別途有料登 録が必要です)				✓ ✓ ✓	✓
コントローラー、タッ チ操作に対応		✓	✓ ✓	✓ ✓ ✓	✓ ✓
Minecraft マーケット プレイス		✓	✓ ✓	✓ ✓ ✓	✓ ✓
ダウンロードコンテン ツ (DLC)		✓	✓ ✓	✓ ✓ ✓	✓ ✓
MOD		✓			

Minecraft の生態系



Minecraft の生態系

proxyを使って相互接続



Java版の互換プログラム

Client List											Minecraft: Modding Tools and Mods			
Clients Servers Description Libraries Utilities Wrappers														
Name	Features	Author(s)	Language	License	Threaded	Game Graphics	Last Version Supported	Development Status						
This is a list of Minecraft clients that users have worked on or are working on. This page only lists clients written from scratch for mod and wrappers, see the Utility List and the Wrapper List .														
Botula189	C++ Client Library	olipon189	C++	GPL-3.0	Yes	Yes	All release versions from 1.12.2 to 1.17.1			Active				
Another Minecraft Chat Clients	A MP-SU Minecraft Chat Client written from scratch in Java with basic movement and inventory handling.	Defoulest98	Java8	Apache V2.0	Yes	Partial	1.8 - 1.17			Active				
dataclients	A Minecraft Client for Mac OS X written in Swift	dataclients	Swift and Java Obj-C	GPL-3.0	Yes	Using Metal	1.16.1			Active				
premain-minecraft-client	Minecraft client in the browser using Prism Java modules	Kenny, from ST44g Awesomenode	Java8, Java 9+ module	MIT	Yes	Yes	1.8+; 1.16+			Active				
web-minecraft	Minecraft client in web browser using THREE.js	mkljazz8	Java8, Java 9+ module	MIT	Yes	Yes	1.16.5			Active				
go-mc9	Create Minecraft items with going	Tony	Go9	MIT	Yes	No	1.17			Active				
StevensonCraft	Multiprotocol	TaylorCheng, kylepig	Bridge	Apache V2.0	Yes	Yes	1.17.1, 1.16.5, 1.16.4, 1.16.3, 1.16.2, 1.16.1, 1.16, 1.15.2, 1.15, 1.14.2, 1.14, 1.13, 1.12, 1.11, 1.10.2, 1.10.1, 1.9, 1.8+32c, 1.8.2, 1.8.1-Forge, 1.8.1, 1.8.0			Active				
suchmc9	Minecraft client without mod, very WIP, no rendering	willmc9	Bridge	GPL-3.0	Yes	No	1.16.3 and 1.16.2 (very incomplete)			On status since November 2020				
shimakaze9	API for creating bot clients, also has built-in GUI for launching instances of the built-in chatbot, also works as a chat GUI supporting multiple servers at once using one main account	shimakaze9	Java8	GPL-3.0	Yes	No	1.16.3			On status since December 2020				
RikarBot9	Bot Client Framework	rikar9	Java9	Apache V2.0	Yes	No	1.16.4			Active				
Minosoft9	A skin open source client, that implements most of version and essentials from minecraft. Many improvements, modding API, threading, me, and the Reaction mod	BigDog, Lukas Essentius	Java9, Kotlin	GPL-3.0	Yes	Yes	Support for all versions from 1.9wA10 (id: 0) to latest			Active				
AtCrafts9	WIFI C++ client	zach0248	C++98	Apache V2.0	Yes	Yes	1.12.2			Active				
minesmb9	A work-in-progress FTM-LS Minecraft client that runs in your browser	Heath123g, TheAkash949, Gabe2W	Node.js	Under development	No	Yes, using noisy	1.12 (new version other versions but not tested)			Active				
mineflayer9	Create Minecraft bots with a powerful, flexible and highly-optimized API	Primer9, rafal	Node.js	MIT	Yes	No	1.14-1.15			Active				
mcGarry9	Work in progress client, displaying character animation	Amirul Aduzz, roba	Python3	Apache License 2.0	Yes	No	1.16.1			Active				
Minecraft Console Client9	Command-line client with GUI for support	CT9	C#	CC BY-NC	Yes	No	1.16.4			Active				
modding9	Tooling module aware for constant Minecraft connections	cto9	Python3	MIT	Yes	No	1.12.2			Active				
MinecraftCLI9	Command-line client with shell commands	Xander999	MarkII	BSD-2-Clause	Yes	No	1.12.2			On status since April 2018				
Litcraft9	Work in progress concurrent and Multi-Render backend	ZoeLi9, Team9	C9	Apache 2.0	Yes	Yes	1.12.2			On status since January 2019				
DraftProtocol9	Open source partial implementation of Minecraft network protocol in NBT in Python 2.7	Transmogrify9	Python3	MIT	Yes	No	1.14s, 1.15s, 1.17.2			On status since September 2018				
steering9	Compiler	Trinkethammer	Bridge	Apache V2.0	Yes	Yes	1.16.2			Active				
Domum9	Rendering Client in C	domum9	C9	GPL-3.0	Yes	Yes	1.8			On status since August 2018				
interior-go9	Compiler	Trinkethammer	C9	Apache V2.0	Yes	Yes	1.16.2			Active				
Revelation9	Rendering engine for Java. Works supported in conflicts	Polymer9, Dev9	Java9	MIT	Unknown	Yes	1.18			On status since February 2019				
SpecBot9	Stylish Bot framework based on Barney's code implementation	The SpecBot Project	Python3	MIT	No	Planned with plugin	1.17			On status since May 2016				
TardisBot9	Works in progress standard Java bot written in Java, currently supports: say features of game, inventory, item, world handling and plugin system	wocat92	Java8	GPL-3.0	Yes	No	1.12			On status since April 2018				
Reactive9	Java-based Minecraft system - Multicore API, Plugin system, etc	Eromi	Java8	Closed source, binaries	MIT	Yes	Yes, using Bundles	1.8			Website.com			
Minicraft9	Minecraft client in HTML5, it will show all the features of Minecraft and more	Phaser9	JavaScript	MIT	Maybe	OnGoing, Planned	1.8			On status since June 2019				
PhaseBot9	Actor that can move, interact with blocks, and lots of other things	Phase9	Java8	No License	Maybe	Controlled through API	1.8			On status since February 2018				
DarkBorg9	Bot framework with an easy-to-use API, full world representation, path finding, AI tasks (mining, farming, combat), and modular protocol handling	DarkStorm9	Java9	BSD-3	Yes	No	1.7.9			On status since July 2014				
GT Minibots9	Work in progress client for bot	Honey94	C9	MIT	Yes	No	1.8.4			On status since July 2016				
Brutal9	Minecraft 1.16P Client, simpler Minecraft on a lower (WTFP) level	Dev9	C9	GT-Lab9	Yes	Yes	1.8.2			On status since March 2014				
radiationbot9	What's farming, upgrading, flying speed, generic and most of world, but no automation yet	SamEBragg9	Ruby9	TBD	Yes	No	1.16.2			On status since December 2018				
Spout9 (With Vanilla plugin)	Open source, multi-threaded voxel game framework and platform that opens the doors for infinite possibilities. Features: infinite height worlds, infinite contents, advanced modelling support, and more	Spout9, G9, and community	Java8	Spout License v1.0	Yes	Yes, using LWJGL5	1.12			On status since December 2013				
TwistedBot9	Bot and proxy up to date information in real time using API	Link9	Python3, Twisted9	BSD-3	No	No	1.12			On status since May 2013				
reverb9	Minecraft MC-Engine	Reverb9	Python9, Python3, XML	Unknown	Yes	OnGoing, 2.0.0	1.12			On status since September 2018				
Minecraft PHP Client 2.0	Complete rewrite of Minecraft PHP Client! New worlds and entities, and no modular. Supports online mode and Bedrock	zhang9999	PHP9	WTFPL	No	Convert Map to PNG	1.14			Marked "Outdated". Last Commit: March 2013				
Charged Minecraft9	Minecraft: Minecraft connects to Minecraft servers	Charger9, edul	Java9, Java9	GPL-3.0	No	Yes	1.12			On status since August 2017				
Revolutionary Redstone9	Partial Redstone support	RevolutionaryRedstone9	C++9, Java9	Unknown	Yes	Yes	1.12			On status since July 2012				
Minecraft PHP Client 2.0	Superseded by Minecraft PHP Client 2.0! It now runs on other engines. Superseded!	shephard9	PHP9	CC BY-NC	Not Initially Free	No	1.2.5			Active				
ShadersCraft9	Work in progress Shaders (Light and GLTF) client	W3D9, Shephard9, ELM9	Java9	GLTF9	Yes	Shephard Shaders	1.2.5			Active				
mcw9	Draw the map on the screen. Can talk or move	mcw9	Java9	BSD-3	No	Yes	1.1			On status since October 2012				
reverb9	depends on updating and more automatically	reverb9	Python9, Twisted9	GPL-3	No	No	Beta 1.8.1			On status since September 2017				
TrueCraft9	Beta 1.7.2 client for Linux and Windows and OS X, somewhat	Shrimpm9 and others9	C9	MIT	Yes	Yes	Beta 1.7.2			Active				
mcclient9	Work in progress SMP client	The9	Python9, Java9, C9	GLib9	No	Yes	Beta 1.2.2			On status since September 2012				
minecrash9	Draw the map around, break stuff, gather stuff, can't sleep, doesn't appear to have networking	Bohan Banus, Dmitry Brusilovsky, Ajay Roccadasa, Senthil Tang	Java9 with Quark9	GPL-3										

- TracCraft is being actively developed against beta 1.7.3 and intentionally does not support newer versions.

Category: Microsoft Modern

Spigot Server のしくみ

<https://github.com/SpigotMC>

FabricやForgeも似たようなもの

1. Java版サーバーのJARをダウンロードする。
2. JARを逆コンパイルする。
3. 得られたソースにパッチをあてて人間用にする
4. プラグインAPIを追加する。
5. プラグインAPIを使ってバニラにはない機能を実装する。

1. MOJANGのJAR

```
[[@mbp2018 cache]$ l  
  
total 224840  
drwxr-xr-x  6 ringo  staff   192B  6 26 16:43 generated  
drwxr-xr-x  3 ringo  staff   96B   6 26 16:42 logs  
-rw-r--r--  1 ringo  staff   42M   7 22 06:12 mojang_1.17.1.jar  
-rw-r--r--  1 ringo  staff   68M   8 20 13:39 patched_1.17.1.jar  
[@mbp2018 cache]$ █
```

2. 逆コンパイルされたソース

クラス名も Aとかb2とかになってしまっていて、何かわからない

```
public void movementTick() {
    super.movementTick();
    this.b = this.a;
    this.bC = this.c;      バイトコードにはローカルスコープのシンボル名の情報がない
    this.bE = this.bD;
    this.bG = this.bF;
    this.bD += this.bI;
    if ((double) this.bD > 6.283185307179586D) {    計算済みの浮動小数の定数は複雑な値になっている
        if (this.world.isClientSide) {
            this.bD = 6.2831855F;
        } else {
            this.bD = (float) ((double) this.bD - 6.283185307179586D);
            if (this.random.nextInt(10) == 0) {
                this.bI = 1.0F / (this.random.nextFloat() + 1.0F) * 0.2F;
            }
            this.world.broadcastEntityEffect(this, (byte) 19);
        }
    }
}
```

3. パッチを当てたソース

イカの動きの一部 EntitySquid.java

```
@Override  
public void movementTick() {  
    super.movementTick();  
    this.xBodyRot0 = this.xBodyRot;  
    this.zBodyRot0 = this.zBodyRot;          人間が読める識別子をつける  
    this.oldTentacleMovement = this.tentacleMovement;  
    this.oldTentacleAngle = this.tentacleAngle;  
    this.tentacleMovement += this.tentacleSpeed;  
    if ((double) this.tentacleMovement > 6.283185307179586D) {  
        if (this.level.isClientSide) {  
            this.tentacleMovement = 6.2831855F;  
        } else {  
            this.tentacleMovement = (float) ((double) this.tentacleMovement - 6.283185307179586D);  
            if (this.random.nextInt(10) == 0) {  
                this.tentacleSpeed = 1.0F / (this.random.nextFloat() + 1.0F) * 0.2F;  
            }  
  
            this.level.broadcastEntityEffect(this, (byte) 19);  
        }  
    }  
}
```

4. プラグインAPIを追加

The screenshot shows a browser window displaying the Spigot API documentation at hub.spigotmc.org/javadocs/bukkit/. The page title is "Spigot-API 1.17.1-R0.1-SNAPSHOT API". The navigation bar includes links for OVERVIEW, PACKAGE, CLASS, USE, TREE, DEPRECATED, INDEX, and HELP, with "OVERVIEW" being the active tab. A search bar is located in the top right corner.

Spigot-API 1.17.1-R0.1-SNAPSHOT API

Bukkit, the plugin development framework.

The documentation is for developing plugins and is split into the respective packages for each subject matter. This documentation does not cover running a setting up a workspace. Working knowledge of the Java language is a prerequisite for developing plugins.

For basic plugin development, see the [plugin package](#). It covers the basic requirements of a plugin jar.

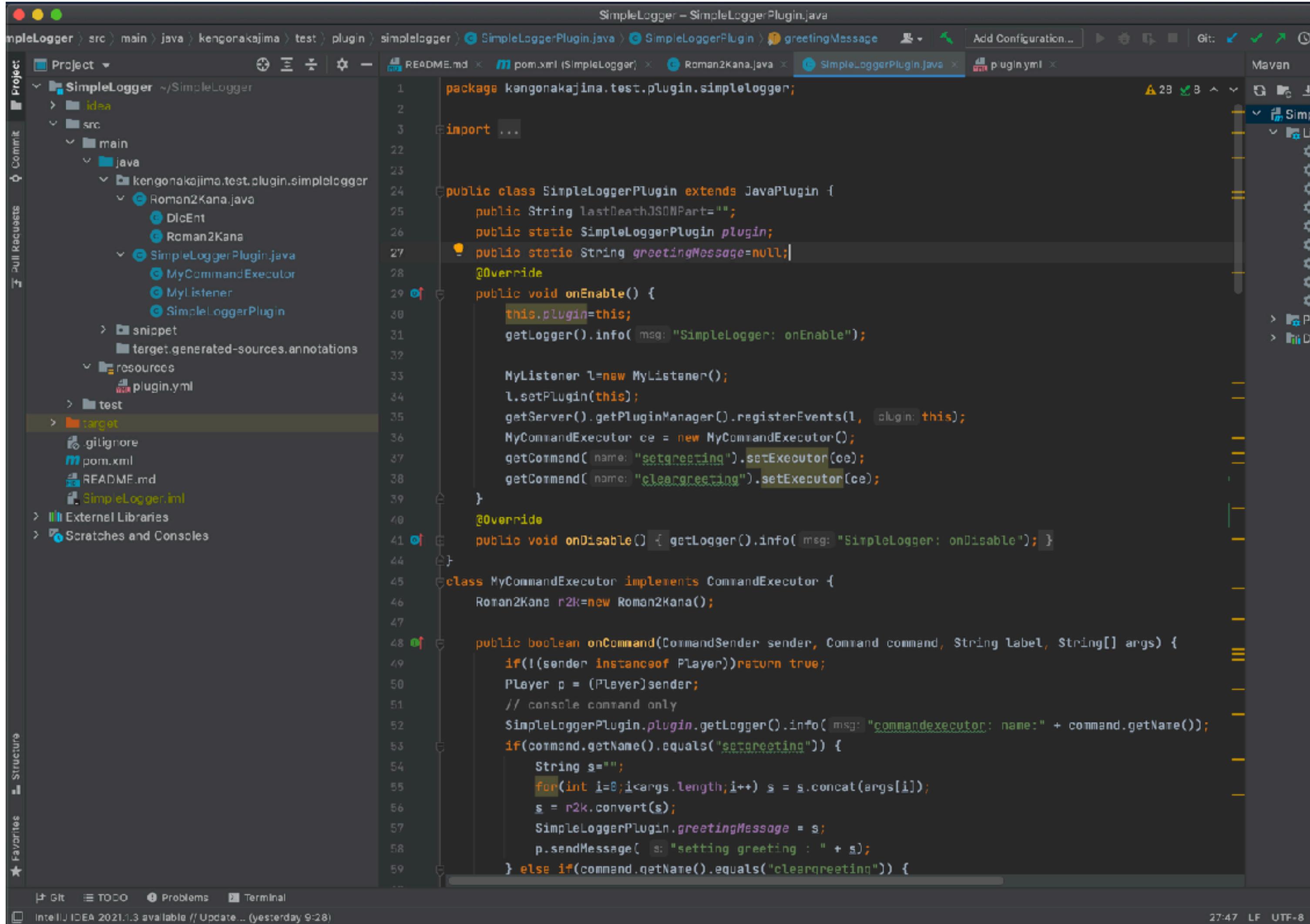
For handling events and triggered code, see the [event package](#).

Note: While the Bukkit API makes every effort to ensure stability, this is not guaranteed, especially across major versions. In particular the following is a (ir

- Implementing interfaces. The Bukkit API is designed to only be implemented by server software. Unless a class/interface is obviously designed for external use such, it should not be implemented by plugins. Although this can sometimes work, it is not guaranteed to do so and resulting bugs will be disregarded.
- Constructing inbuilt events. Although backwards compatibility is attempted where possible, it is sometimes not possible to add new fields to events without breaking them. As the API continues to evolve, event constructors are therefore not plugin API.
- Implementation classes. Concrete implementation classes packaged with Bukkit (eg those beginning with Simple) are not API. You should access the

Packages	
Package	Description
org.bukkit	The root package of the Bukkit API, contains generalized API classes.
org.bukkit.advancement	Classes relevant to advancements.
org.bukkit.attribute	Classes relevant to attributes.
org.bukkit.block	Classes used to manipulate the voxels in a world , including special states.
org.bukkit.block.banner	Classes relevant to banner blocks.
org.bukkit.block.data	Generalized BlockData classes.
org.bukkit.block.data.type	Specific BlockData classes relevant to only a given block or set of blocks.
org.bukkit.block.structure	Classes relevant to structure blocks.
org.bukkit.boss	Classes concerning the creation of boss bars that appear at the top of the player's screen.
org.bukkit.command	Classes relating to handling specialized non-chat player input.

5. プラグインAPIを使って現代的な開発 Javaを使う。IntelliJ IDEAがおすすめ



The screenshot shows the IntelliJ IDEA interface with the following details:

- Project Structure:** The left sidebar shows the project structure for "SimpleLogger". It includes a "src" folder containing "main" and "test" packages. "main" contains "java" and "resources" folders. "java" contains "kengonakajima.test.plugin.simplelogger" package with classes "Roman2Kana.java", "SimpleLoggerPlugin.java", and "MyCommandExecutor". "resources" contains "plugin.yml".
- Code Editor:** The central editor pane displays the "SimpleLoggerPlugin.java" file. The code implements a plugin for a Java application, handling commands like "setgreeting" and "cleargreeting". It uses a logger, command executor, and a Roman2Kana converter.
- Maven Tool Window:** The right sidebar shows the Maven tool window with sections for "Simple", "Lifecycle", and "Dependency Graph".
- Status Bar:** The bottom status bar shows the time as 27:47 and the encoding as UTF-8.

```
SimpleLogger - SimpleLoggerPlugin.java
package kengonakajima.test.plugin.simplelogger;
import ...
public class SimpleLoggerPlugin extends JavaPlugin {
    public String lastDeathJSONPart="";
    public static SimpleLoggerPlugin plugin;
    public static String greetingMessage=null;
    @Override
    public void onEnable() {
        this.plugin=this;
        getLogger().info( msg: "SimpleLogger: onEnable");
        MyListener l=new MyListener();
        l.setPlugin(this);
        getServer().getPluginManager().registerEvents(l, plugin: this);
        MyCommandExecutor ce = new MyCommandExecutor();
        getCommand( name: "setgreeting").setExecutor(ce);
        getCommand( name: "cleargreeting").setExecutor(ce);
    }
    @Override
    public void onDisable() { getLogger().info( msg: "SimpleLogger: onDisable"); }
    class MyCommandExecutor implements CommandExecutor {
        Roman2Kana r2k=new Roman2Kana();
        public boolean onCommand(CommandSender sender, Command command, String label, String[] args) {
            if(!sender instanceof Player) return true;
            Player p = (Player)sender;
            // console command only
            SimpleLoggerPlugin.plugin.getLogger().info( msg: "commandexecutor: name:" + command.getName());
            if(command.getName().equals("setgreeting")) {
                String s="";
                for(int i=0;i<args.length;i++) s = s.concat(args[i]);
                s = r2k.convert(s);
                SimpleLoggerPlugin.greetingMessage = s;
                p.sendMessage( s: "setting greeting : " + s);
            } else if(command.getName().equals("cleargreeting")) {
        }
}
```

Minecraft プログラミングの現在

- Minecraftは、プロトコルになりつつある。 そして、Webへと

wiki.vg : Minecraftのプロトコレ仕様書

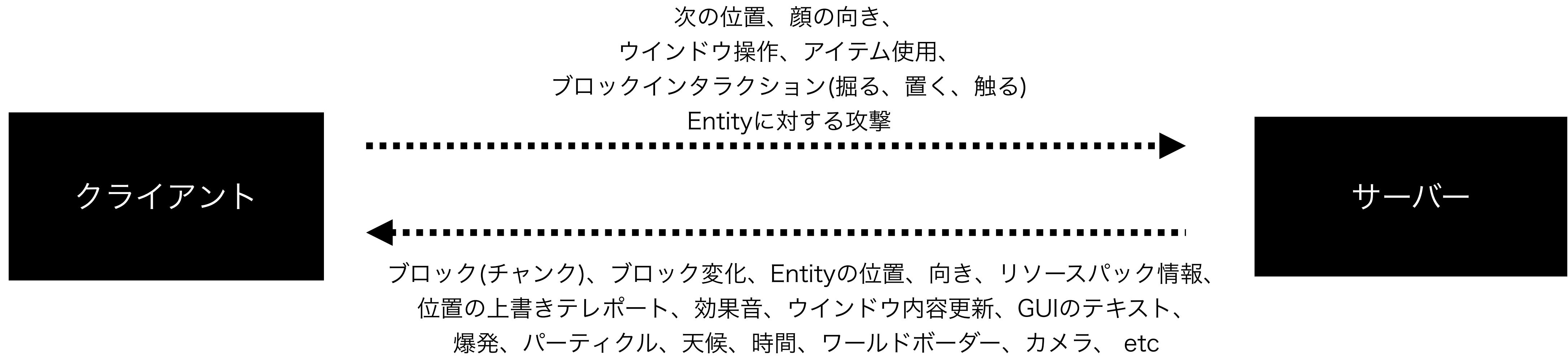
<https://wiki.vg/Protocol>

- Java版のプロトコル
 - TCP, 25565, Java Netty上の独自バイナリプロトコル
 - keyex: RSA 1024bit, PKCS8-public-pem + block: AES-128-CFB8
 - [varInt len][varInt packetID][bytearray data]
- Bedrock版のプロトコル
 - UDP, 19132, RakNet上のバイナリプロトコル
- セーブデータの完全な仕様書

Minecraft protocol

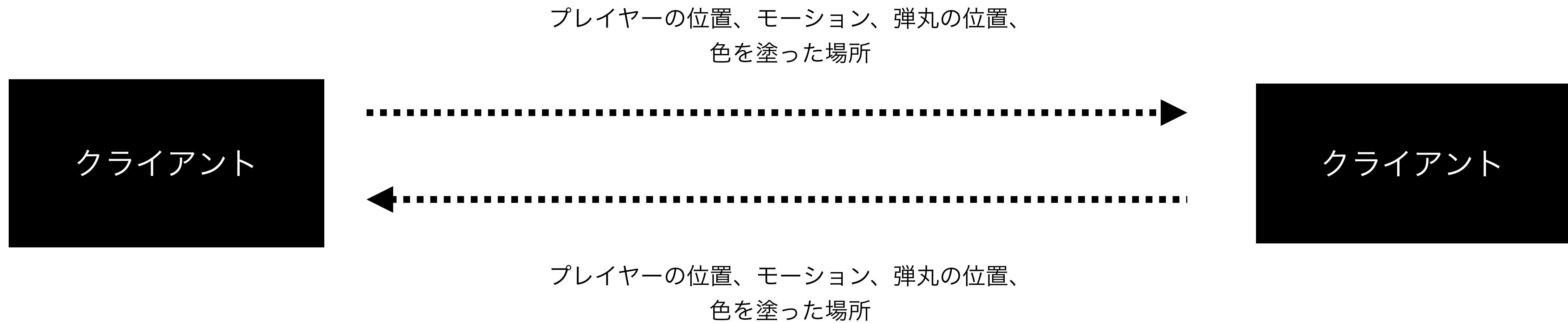
- Handshake
 - 鍵交換
 - Login
 - Play

Minecraft protocol



Webブラウザのように、あらゆる要素をS->Cパケットで変更できる。
どんなゲームでも作れてしまう。

ほかのゲームのプロトコル(比較)



パケットの変更でできることが限られている

CRYSTAL HOLLOW

SkyBlock

20,184 Playing

NEW PRACTICE MODE

Bed Wars

13,991 Playing

Wards
Playing

SKYBLOCK CRYSTAL HOLLOW

Murder Mystery

577 Playing

Arcade

12 Playing

Player Hol

2,160 Play

SkyWars

2,058 Playing

Build Battle

782 Playing

UHC Champions

256 Playing

HYPixel

09/07/21 L350

Rank: Default

Mystery Dust: 0

Achievements: 5

Level: 1

Lobby: 13

Players: 54,076

www.hypixel.net

>>> [MVP+++] bob.jr021 joined the lobby! <<<



SkyWars Levels

Worldwide Best

1. lifelong - **1918_65**
2. Espenode [PAIN] - **1630P**
3. Skywarskills [A] - **1318***
4. Virmah [A] - **1158***
5. chqv [PAIN] - **1108_65**
6. FineAlfieHD [WASHED] - **1024***
7. Thuntree [A] - **1024_65**
8. Lauras [X3] - **1007***
9. Joerich [WASHED] - **984***
10. BOLTAY [PODOS] - **197***

Click to learn more!

Lifetime Wins

All Modes

1. lifelong - 100,444
2. Espenode [PAIN] - 81,109
3. MAGICDUST [D] - 67,548
4. Joerich [WASHED] - 62,477
5. Skywarskills [A] - 57,374
6. chqv [PAIN] - 56,855
7. Virmah [A] - 48,937
8. AlfieAlfi [EWWD] - 48,445
9. FineAlfieHD [WASHED] - 48,270
10. a0e - 47,476

Click to toggle!

Lifetime Monthly Weekly

Lifetime Kills

All Modes

1. lifelong - 530,602
2. Espenode [PAIN] - 405,700
3. Skywarskills [A] - 400,616
4. Virmah [A] - 314,585
5. chqv [PAIN] - 309,392
6. FineAlfieHD [WASHED] - 307,447
7. Lauras [X3] - 292,575
8. BOLTAY [PODOS] - 281,566
9. JNHackers [A] - 271,366
10. Thuntree [A] - 266,484

Ranked Rating

Ranked Node

1. Thuntree - 2,538
2. Disintegration - 2,531
3. a0e - 2,449
4. Yuneida [D] - 2,426
5. Lauras [X3] - 2,363
6. Lekya - 2,306
7. JNHackers [PODOS] - 2,300
8. GoodHarmy [KNEEK] - 2,359
9. Reo_Taperovich - 2,259
10. Sugar-Shaun - 2,258

Click to toggle!

MIL Nodes
Laboratory Node
Corruption

SKYWARS

09/07/21 L31A 15

Your Level: 1*

Solo Kills: 0 11
Solo Wins: 0 10
Doubles Kills: 0 9
Doubles Wins: 0 8

Coins: 0 7
Souls: 10/100 5
Tokens: 0 4
Loot Chests: 0 3
www.hypixel.net 1

WELCOME BACK TO HYPIXEL!



SoulWell

RICK



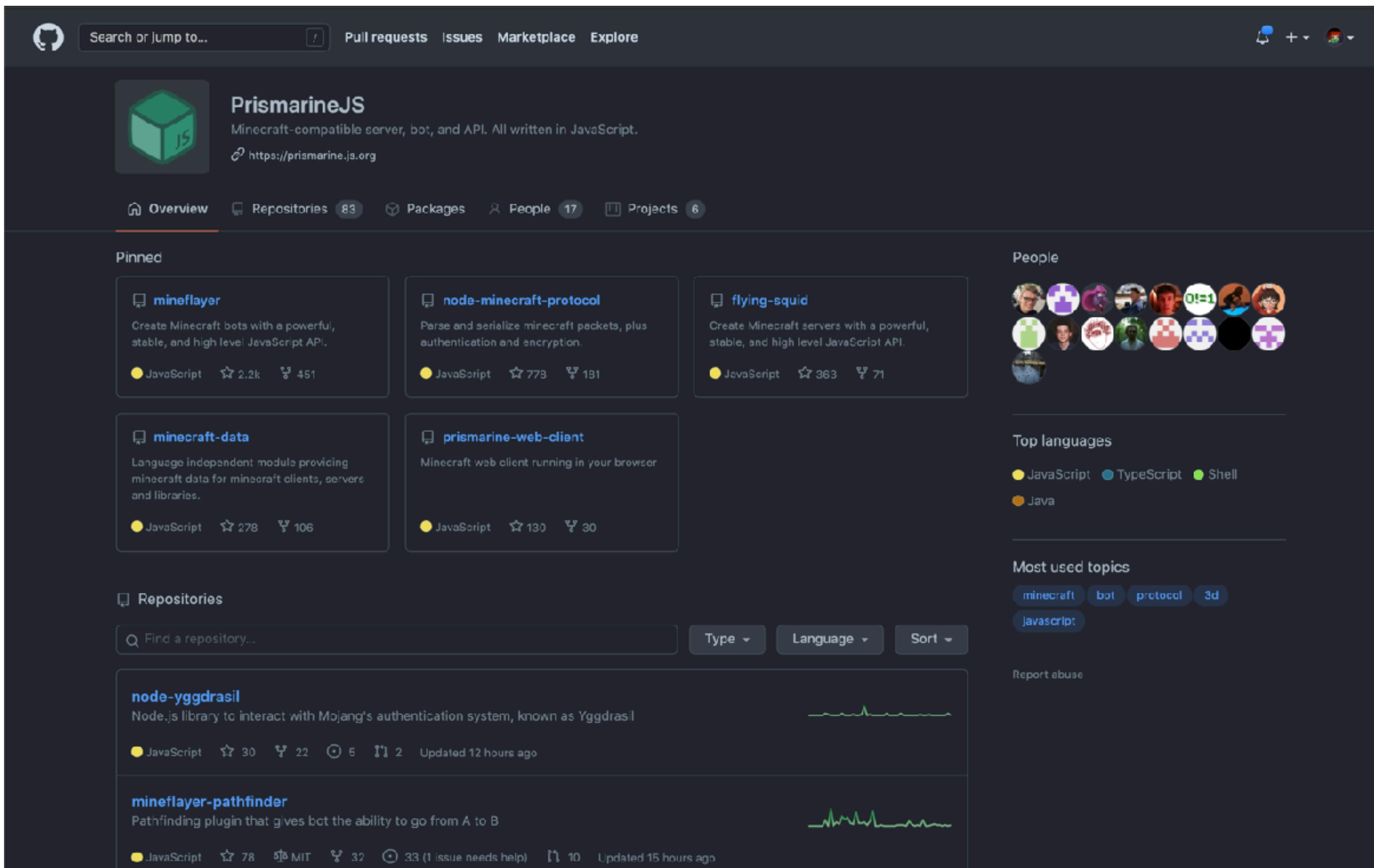
SKYWARS
09/07/21 LSIR 15
14
Your Level: 1x 13
12
Solo Kills: 0 11
Solo Wins: 0 10
Doubles Kills: 0 9
Doubles Wins: 0 8
7
6
5
4
3
2
1
Coins: 0
Souls: 10/100
Tokens: 0
Loot Chests: 0
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[MVP+] Mr_E_Man joined the lobby!
»» Achievement Unlocked: Hell, well. ««
»» [MVP+] o5olerr joined the lobby! ««
スクリーンショットを2021-09-09_12.12.46.pngとして保存しました



PrismarineJS

JavaScriptによるMinecraftプロトコル実装



Minecraft クライアント

```
var mc = require('minecraft-protocol');
var client = mc.createClient({
  host: "192.168.11.22",
  port: 25565,
  username: "nekofactory",
  password: "xxxxxxxx"
  auth: 'mojang'
});
client.on('chat', function(packet) {
  var msg = JSON.parse(packet.message);
  client.write("chat", {message: msg});
});

client.on("packet", function(data,meta) {
  if(meta.name=="named_entity_spawn") {
    if(data.playerUUID) {
      console.log("player spawn",data);
    }
  }
});
```

モジュールをロード

クライアントを作成、接続

チャットを受信

おうむ返し

ログインしてSpawnできたイベント

Minecraftサーバー

```
const Protocol = require('minecraft-protocol');

var server = Protocol.createServer({
  'online-mode': true,
  encryption: true,
  host: '0.0.0.0',
  port: 25565,
  version: "1.16.5"
});

server.on('login', function(client) {
  client.write("chat", {message: "hello"} );
  client.write('position', {
    x: 15,
    y: 10,
    z: 15,
    yaw: 137,
    pitch: 0,
    flags: 0x00,
  })
  client.on("packet", function(data,meta) {
    if(meta.name=="position") {
    } else if(meta.name=="arm_animation") {
    } else if(meta.name=="look") {
    } else if(meta.name=="position_look") {
    } else if(meta.name=="keep_alive") {
    } else if(meta.name=="block_dig") {
    } else {
      console.log("unhandled packet",meta,data);
    }
  });
});
```

モジュールをロード

サーバーを作成、接続

ログインイベントに反応
チャットを送信

各種パケットを受信

npm protodef

protobufのようなバイナリプロトコル定義用DSL

- protocol.json (5505行, 1.17.1)

```
[[@mbp2018 pc]$ ls  
0.30c      1.11.2      1.13.1      1.14.3      1.16-rc1    1.17        1.9.2      17w18b  
1.10       1.12        1.13.2      1.14.4      1.16.1     1.17.1     1.9.4      17w50a  
1.10-pre1  1.12-pre4  1.13.2-pre1 1.15       1.16.2     1.7         15w40b    20w13b  
1.10.1     1.12.1     1.13.2-pre2 1.15.1     1.16.3     1.8         16w20a    20w14a  
1.10.2     1.12.2     1.14        1.15.2      1.16.4     1.9         16w35a    21w07a  
1.11       1.13        1.14.1      1.16       1.16.5     1.9.1-pre2 17w15a    common
```

- ViaVersion

position構造体

```
"position": [
    "bitfield",
    [
        {
            "name": "x",
            "size": 26,
            "signed": true
        },
        {
            "name": "z",
            "size": 26,
            "signed": true
        },
        {
            "name": "y",
            "size": 12,
            "signed": true
        }
    ]
],
```

Minecraftはボクセルのインターネットへ

- Minecraftプロトコルという共有資産により、
- EULA違反の心配をせずに、
- プロトコルに準拠したプログラムを自由に作れる基盤ができつつある。
- オリジナルなサーバーやクライアントのアプリを作って
- MinecraftのWebをみんなで作っていけるようになりそう。
- ボクセルのインターネットがきっと産まれてくるでしょう。。。！