

DOOM on JSLinux

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Who am I

Name Mitsuru Takigahira

Belonging to Student of Tokyo University of Science

- Faculty of Science Division I
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Part-time job Engineer

- JavaScript (Node.js, React.js, Vue.js, etc. . .)
- PHP (Symfony2)

Operation System I like Arch Linux

PGP fingerprint 7D69 EF8C B2EF AD91 3F49 7591 F1FB 3296 0137 ED43

What is DOOM?



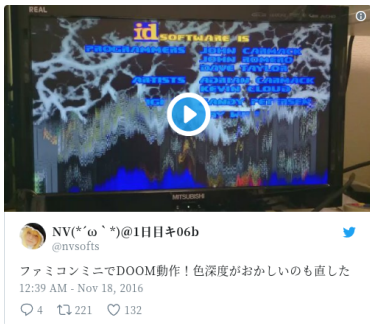
It is Video Game for PC-DOS
Developed By Id-Software
Since 1993
Genre First Person Shooting
Where Does It Run? Anywhere

Where Does DOOM Run?

- Id-Software Released Open DOOM Engine Source Code in Ancient era.
 - <https://github.com/Id-Software/DOOM>
 - GNU Public LICENSE
- This triggered to develop many third-party DOOM client.
 - ZDOOM
 - Chocolate-DOOM
 - etc. . .
- So now DOOM is running on
 - Windows
 - Linux
 - *BSD
 - macOS
 - UEFI
 - Raspberry Pi
 - and video game hardware (Play Station, wii, wii U, . . .)
- More interesting examples are introduced in

・【特集】初代『DOOM』トンデモ移植 10 選—プリンタから ATM まで！ <https://www.gamespark.jp/article/2016/05/21/65997.html>

DOOM on Video game hardware



<https://www.youtube.com/watch?v=Li3dXuHR-UM>

https://www.ns-koubou.com/blog/2016/11/17/doom_on_nes_classic/

About of JSLinux

It is Virtual Machine running on Browser.

Developed By Fabrice Bellard (He developed QEMU, FFmpeg, Tiny C Compiler)

Architecture x86 emulated by x86.js built with emscripten

- It can run
- Linux (X Window System, busybox), built with buildroot
 - Win 2k
 - FreeDOS

And it also runs **DOOM**

What is buildroot?



It is Makefiles to build bootable Linux environment for embedded system

This makes environment of JSLinux

This prepares not only Linux Environment but also **Chocolate-DOOM**

How to run DOOM on JSLinux

- 1 Build Linux System includes Chocolate-DOOM with Buildroot.
Target for i386 architecture
Config
 - to build Chocolate-DOOM
 - to include shareware DOOM wad file
- 2 Access JSLinux Page (X Window, i386) and send rootfs.tar to JSLinux.
- 3 Stop X Server and extract rootfs.tar to / of the system.
 - DOOM runs in VGA Screen, However JSLinux not support VGA Screen.
 - But Chocolate-DOOM can run in framebuffer screen,
so there is no problem to play DOOM
- 4 In `-s /dev/zero /dev/mouse && ln -s /dev/zero /dev/input/mouse0`
 - Because DOOM could not grab mouse device without this process
- 5 `/usr/games/chocolate-doom \
-iwad /usr/share/games/doom/doom1.wad \
-geometry 640x480 -bpp 24`

buildroot config: Target Architecture

```
/home/mysticdoll/jslinuxkernel/buildroot-2017.02.6/.config - Buildroot 2017.02.6
6→ Target options
```

Target options

Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are hotkeys. Pressing <Y> selects a feature, while <N> will exclude a feature. Press <Esc><Esc> to exit, <?> for Help, </> for Search. Legend: [*] feature

Target Architecture (i386) --->

Targe**T** Binary Format (ELF) --->

Targe**T** Architecture Variant (i486) ---->

<Select> < Exit > < Help > < Save > < Load >

buildroot config: Target Packages of Games

```
/home/mysticdoll/jslinuxkernel/buildroot-2017.02.6/.config - Buildroot 2017.02.6 Conf
g→ Target packages → Games
```

Games

Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are hotkeys. Pressing <Y> selects a feature, while <N> will exclude a feature. Press <Esc><Esc> to exit, <?> for Help, </> for Search. Legend: [*] feature is selected [] feature is

- [*] chocolate-doom
- [*] shareware Doom WAD file
- [] gnuchess
- [] LBreakout2
- [] LTris
- [] OpenTyrian
- [] prboom
- [] sl
- [] stella

<Select> < Exit > < Help > < Save > < Load >

DEMO

Conclusion

- Like many examples, DOOM runs on JSLinux in Browser.
- JSLinux contains a lot of interesting technologies (and restrictions).
 - So when studying OS and kernel, JSLinux become one of entrance to them.
- If you are interested this slides, let's run DOOM any hardware you like!

Thanks for listening