

Escaping Engine Lock-In: Open Source Tech Stacks

About Alex

- IT & gamedev educator @ AIT since 2016
- Freelance & solo dev @ BigfootDS since 2012
- Began with graphic design & 3D animation, now 99% focused on programming
- Building open-source tools since 2020



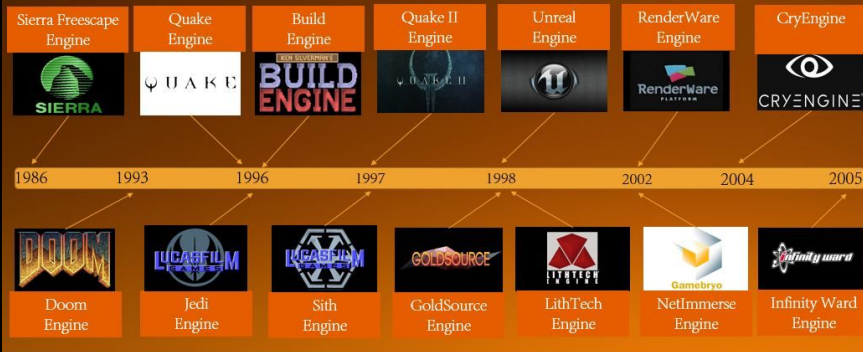
This Talk

- Gamedev Projects & Typical Dependencies
- Breaking Gamedev Projects Down
- Tools & Solutions

Why We Went To Engines In The First Place

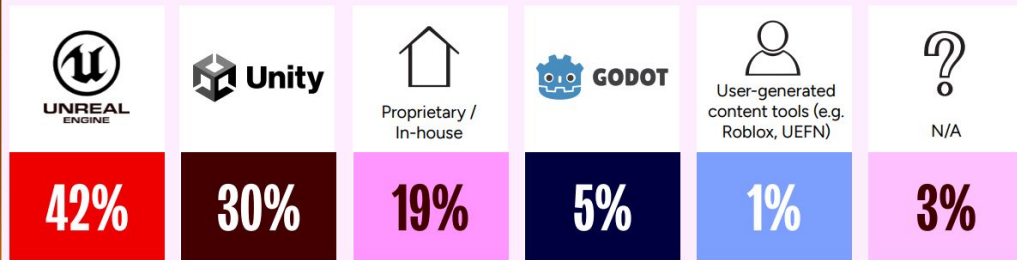
- Studios don't have to “reinvent the wheel”, saving time & resources
- Staff can find work more-easily and “hit the ground running” more quickly

Key Game Engines Timeline



Key Game Engine Timeline by Luca Jorgenson, 2017

What game engine do you primarily use for game development?



2026 STATE OF THE GAME INDUSTRY report from GDC, page 28, 2026

What is Engine Lock-In?

Choosing an engine creates dependencies that can be expensive to replace.

PROGRAMMING
LANGUAGE

3D MODEL FORMAT

COLLAB & COMMS

VERSION CONTROL

EMPLOYMENT POOL

CYBERSECURITY

PLATFORM TARGETS

3D ANIM FORMAT

2D ASSET FORMAT

You're "locked in" when it's too expensive to change your dependencies.

What is Engine Lock-In?

the Guardian

Game developers furious as Unity Engine announces new fees

Unity announces a 'Runtime Fee', which will charge developers each time a game using the engine is downloaded



Article from 2023:

<https://www.theguardian.com/games/2023/sep/12/unity-engine-fees-backlash-response>

GamesIndustry.biz

Tencent paid \$330m for 40% share in Epic Games

Chinese internet company Tencent paid \$330 million for a 40 per cent stake in Unreal Engine maker Epic Games, according...



Article from 2013:

<https://www.gamesindustry.biz/tencent-paid-usd330m-for-48-percent-share-in-epic-games>

What is Engine Lock-In? Not Just in Gamedev!

PP PetaPixel

It's Cheaper to Fly to the US to Buy Adobe CS6 Than to Buy it In Australia

Here's a crazy fact that's making the rounds on the Internet: if you live in Australia, it's currently cheaper for you to fly to the US and...

14 Feb 2013



M Macworld

Adobe launches Creative Suite 6 alongside new Creative Cloud subscription service

The suspense is over. Adobe CS6 Master Collection Adobe has launched the much-anticipated sixth version of its Creative Suite—14 separate...

22 Apr 2012



Creative Cloud Pro

~~A\$113.49/mo~~ **A\$84.99/mo**

(A\$1,019.88/yr)

How Open Source Fits In

- Save money
- Digital independence & sovereignty
- Own your work & assets
- Own your workflows & processes

OPEN SOURCE IS
FREE

CONTROL YOUR
UPDATES

MAKE TOOLS WORK
FOR YOU

ESCAPE THE WHIMS
OF OTHERS

How Open Source Fits In

Your game is your content.

Your tech stack is someone else's content.

Find a way to make your tech stack your content!

This is easier to do when you break gamedev down into its component parts!

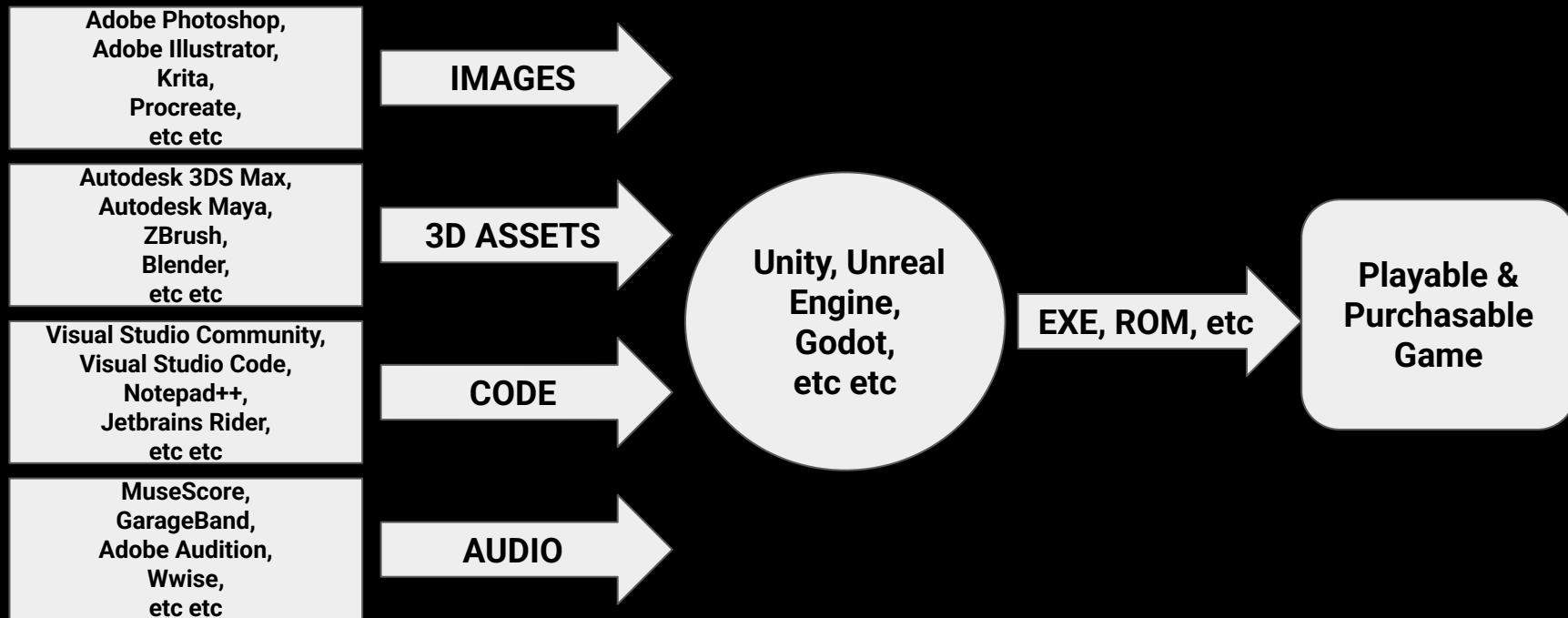
Your game

Godot Engine's license terms and copyright do not apply to the content you create with it; you are free to license your games how you see best fit, and will be their sole copyright owner(s).

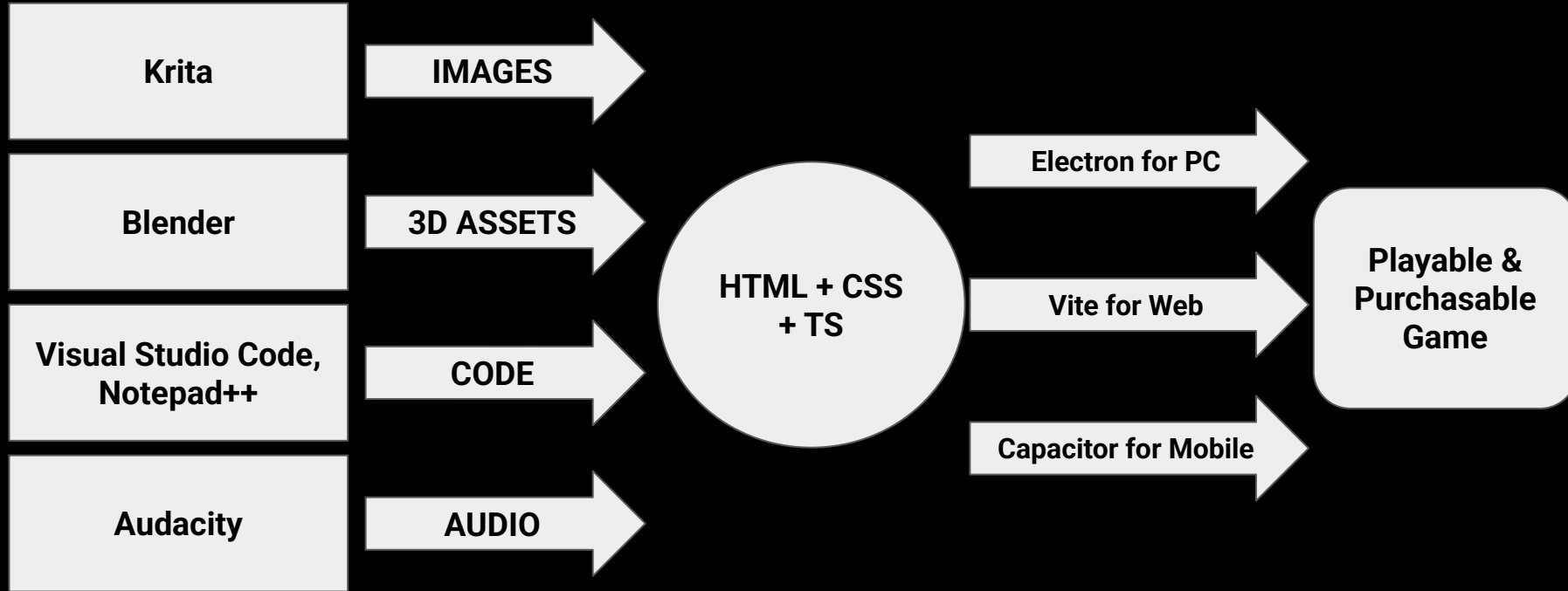
Note however that the Godot Engine binary that you would distribute with your game is a copy of the "Software" as defined in the license, and you are therefore required to include the copyright notice and license statement somewhere in your documentation.

<https://godotengine.org/license/>

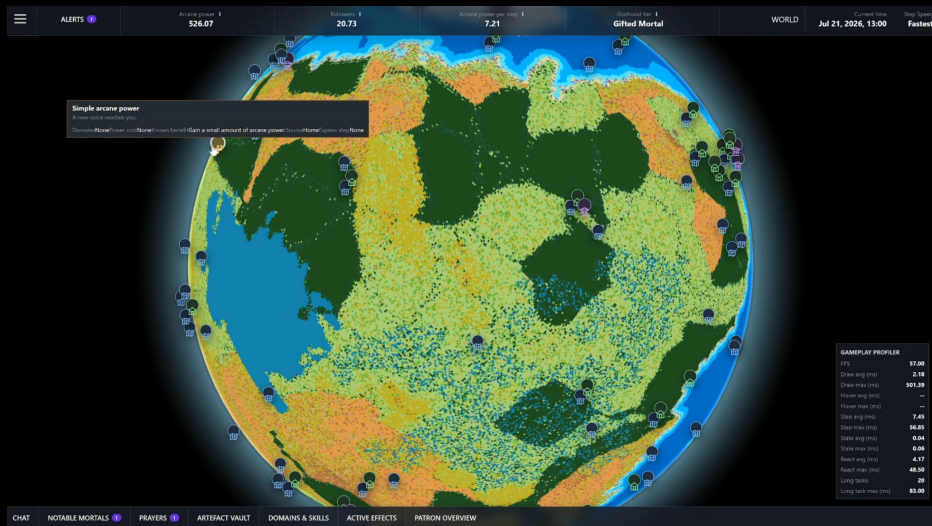
How Open Source Fits In



How Open Source Fits In - My Bubble



How Open Source Fits In - My Bubble



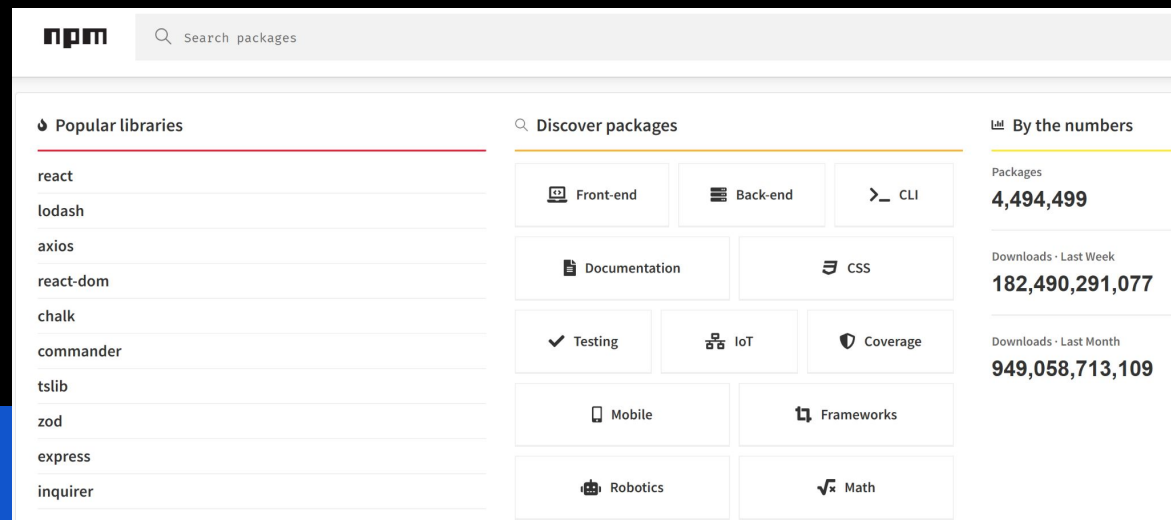
How Open Source Works In Business

1. How to find & evaluate open source tools for your teams
2. How to keep projects safe and maintainable for the long-term
3. Cool tricks & bespoke things that we can do with open source tools

How Open Source Works In Business

Don't reinvent the wheel.

- Videogames are software. Look at what other types of software do!
- Search for features, not the whole game.

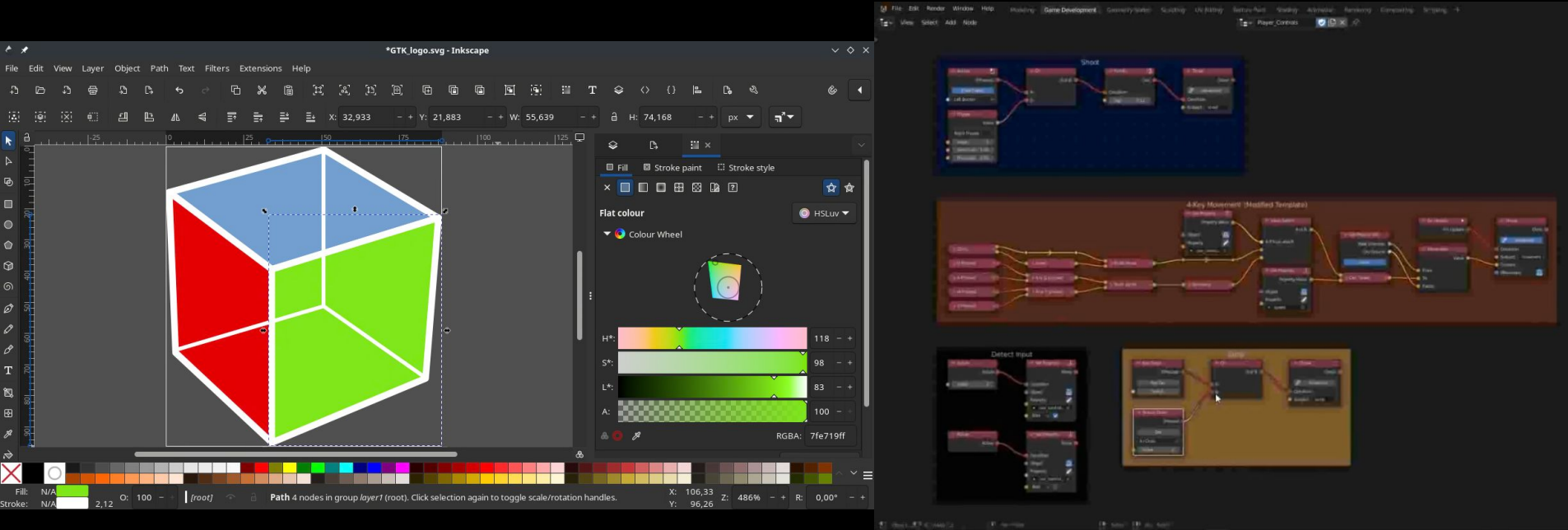


The screenshot shows the npm website interface. At the top, there's a search bar with the text "Search packages". Below this, the page is divided into three main sections:

- Popular libraries:** A list of popular libraries including react, lodash, axios, react-dom, chalk, commander, tslib, zod, express, and inquirer.
- Discover packages:** A section with various category icons and labels: Front-end, Back-end, CLI, Documentation, CSS, Testing, IoT, Coverage, Mobile, Frameworks, Robotics, and Math.
- By the numbers:** A section showing statistics: Packages (4,494,499), Downloads - Last Week (182,490,291,077), and Downloads - Last Month (949,058,713,109).

How Open Source Works In Business

Let your skilled specialists make their outputs using their field-specific tools!



How Open Source Works In Business

How to keep projects safe and maintainable for the long-term - ask questions!

- Does it support your development environment?
- Does it support your game's target platforms?
- Does it have good documentation and/or community for support?
- Does it work well for devs in my community?
- Does it have its own pain points if we have to replace it later?

How Open Source Works In Business

How to keep projects safe and maintainable for the long-term

Switching to custom internal tools (not FOSS)

Ludeon Studios – Announcing the Waylith Engine and Update 1.7



gatsu85vt • 16h ago

They didn't rewrite the game from scratch, and they definitely didn't fork Unity. The secret is that RimWorld was never built like a typical Unity game in the first place. Ludeon never relied on Unity's GameObject hierarchy, scene graph, or components. From day one, the entire simulation—pawn AI, pathfinding, temperature, combat—has just been decoupled C# running directly in memory.

Unity was basically just a rendering shell: handling the window, input, audio, and batch-drawing 2D sprites through raw draw calls. Switching to Waylith only required swapping out that outer presentation layer for their own custom backend and modern .NET runtime, leaving the actual simulation untouched. To keep the modding ecosystem alive, they use shim libraries that intercept and translate legacy Unity API calls. It sounds crazy from the outside, but it's just the huge payoff of keeping game logic strictly separated from engine rendering.



How Open Source Works In Business

How to keep projects safe and maintainable for the long-term

Switching to FOSS

MegaCrit's Godot transition experience is detailed here:

<https://caseyyano.com/on-evaluating-godot-b35ea86e8cf4>

Godot Engine

Slay the Spire 2 - Godot Engine

The iconic roguelike deckbuilder returns. Craft a unique deck, encounter bizarre creatures, and discover relics of immense power in Slay the Spire 2!



Slay the
Spire

The Mega Crit team has been hard at work these past 2+ years on a new game. But unlike with Slay the Spire, the engine we have been developing it in is Unity.

The retroactive pricing structure of Runtime Fees is not only harmful in a myriad of ways to developers--especially indies--it is also a violation of trust. We believe Unity is fully aware of this, seeing as they have gone so far as to remove their TOS from GitHub.

Despite the immense amount of time and effort our team has already poured into development on our new title, we will be migrating to a new engine unless the changes are completely reverted and TOS protections are put in place.

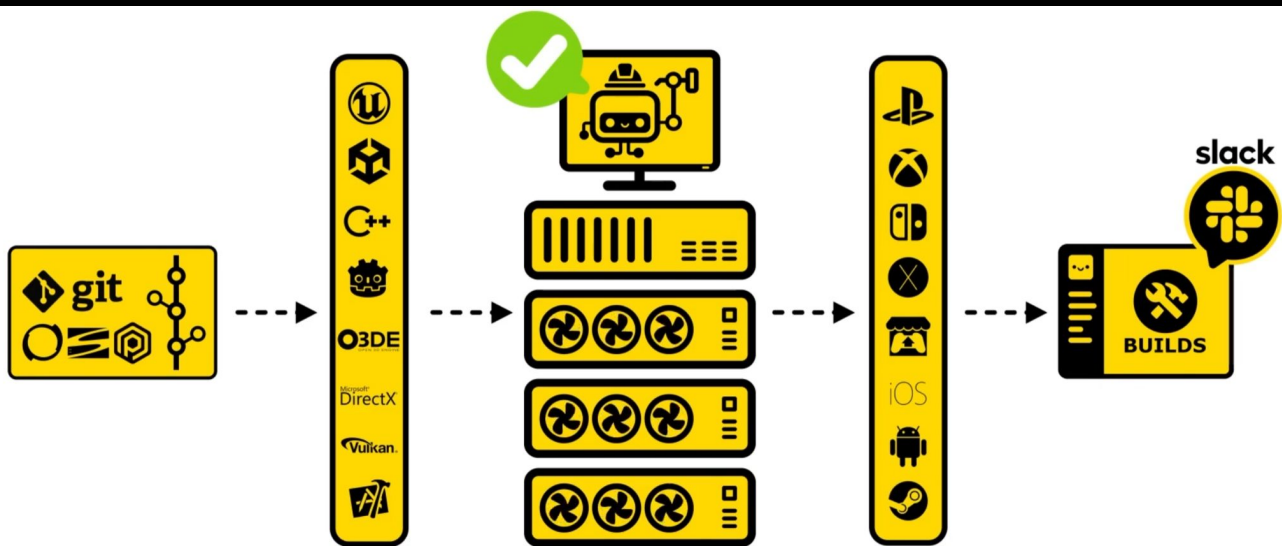
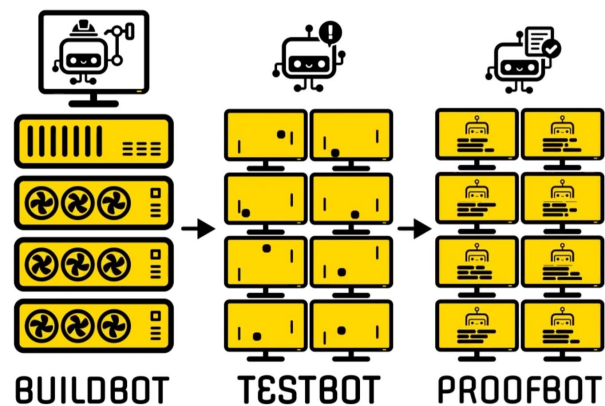
We have never made a public statement before. That is how badly you fucked up.



How Open Source Works In Business

Cool tricks & bespoke things that we can do with open source tools:

- Automation!
- Internal tools!
- New products!



All About Mighty Build and Test, 18th August 2023, <https://www.youtube.com/watch?v=gVcT2nz4V0U>

Open Source Gamedev Whirlwind Tour

The common stuff:

- Art via Krita and Inkscape
- Audio via Audacity and royalty-free soundpacks
- Code via Visual Studio Code
- Programming via HTML, CSS, JavaScript
- Compiled via ElectronJS and CapacitorJS

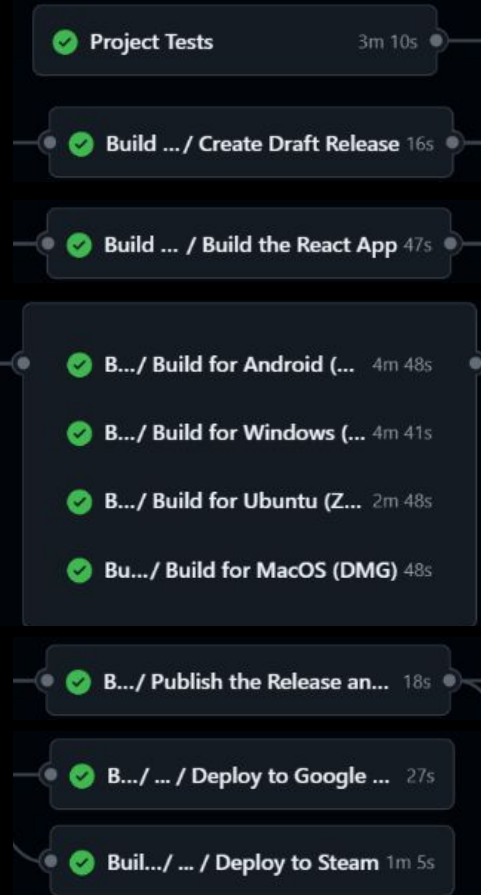
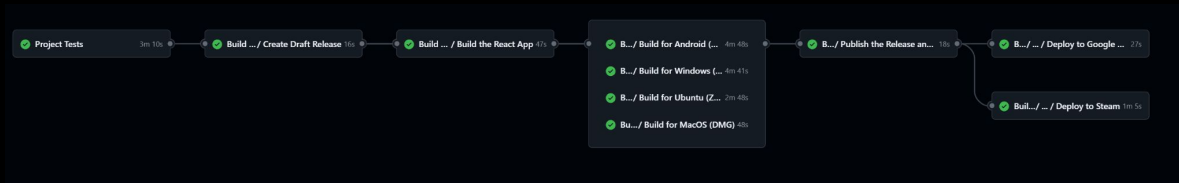
PC & smartphone multiplatform game
from a free tech stack



Open Source Gamedev Whirlwind Tour

The problem-solving stuff:

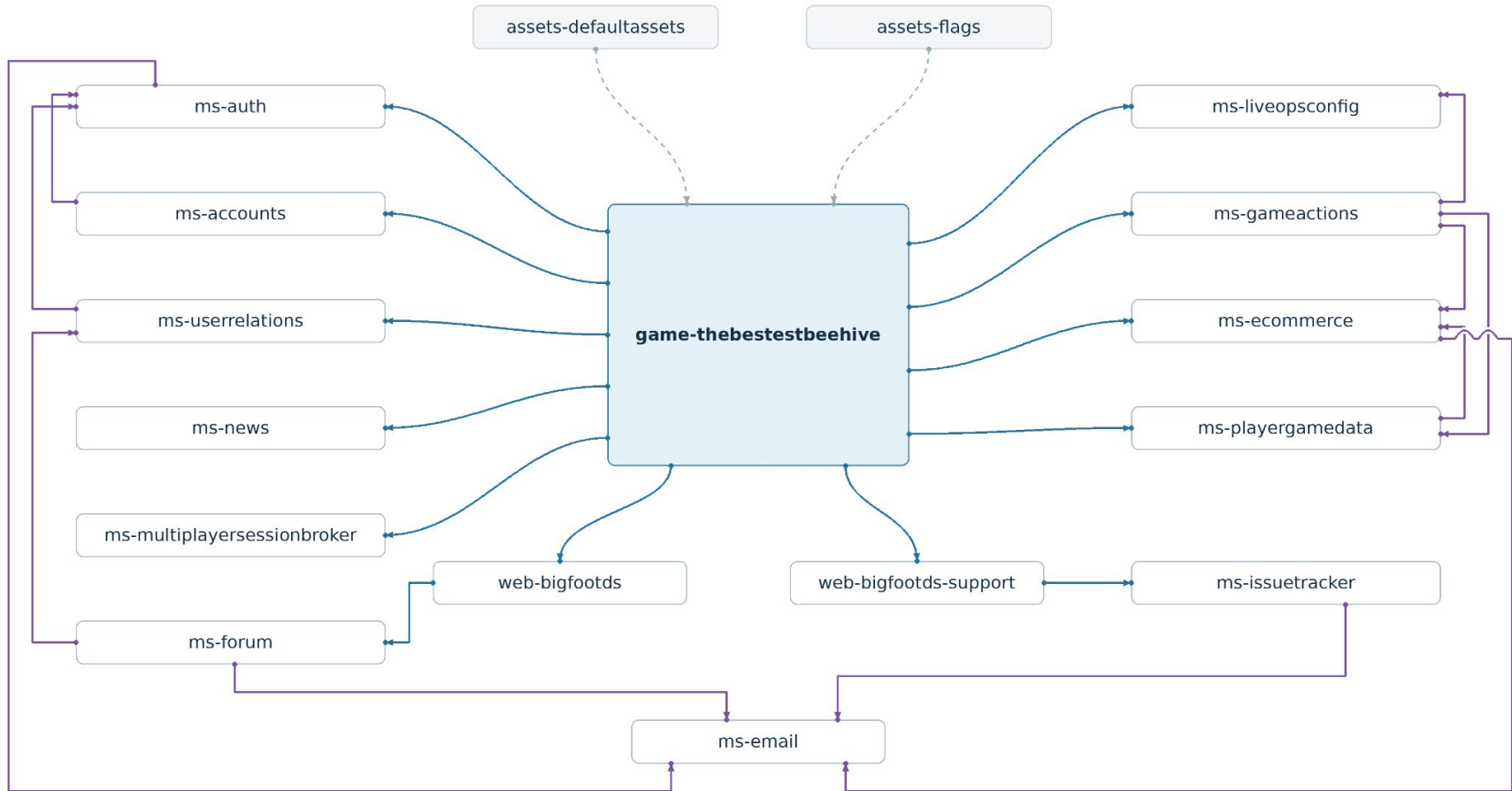
- “Waiting for the game to build sucks”
- “Testing is annoying”
- “Uploading to Steam is so tedious”



Open Source Gamedev Whirlwind Tour

- CI/CD
 - Automated testing
 - Automated building
 - Automated publishing
- Design Tools
 - Custom TCG card & set product designer
 - Data simulations for data-heavy games
 - Asset packers
 - Living design docs with engine integration
 - Literal typical software dev
- CI/CD/CC
 - Automated credits lists
 - Automated version numbering
 - SBOMs!
- Game Infrastructure
 - LiveOps
 - ChatOps
 - Literal typical webdev

Open Source Gamedev Whirlwind Tour



Solution Shopping List - Part 1

ASPECT	FREE or OPEN-SOURCE	TYPICAL TOOLS
Game Engine	Godot, UPBGE, a DIY framework	Unity, Unreal Engine
Programming	Visual Studio Code, VSCodium	Visual Studio Community
2D Illustration & Image Editing	Krita, GIMP, Darktable	Adobe Photoshop, Procreate, Adobe Lightroom
Vector Art	Inkscape	Adobe Illustrator
Pixel Art & Sprite Animation	Pixelorama	Asesprite
UI/UX Design & Prototyping	Penpot, Pencil	Figma, Sketch, Balsamiq
3D Modelling	Blender	Autodesk 3DS Max, Autodesk Maya
Digital Sculpting	Blender	Zbrush

Solution Shopping List - Part 2

ASPECT	FREE or OPEN-SOURCE	TYPICAL TOOLS
Texture Painting	Blender, ArmorPaint	Substance 3D Painter, Mari
Procedural Materials	Material Maker	Substance 3D Designer
Procedural Modelling	Blender Geometry Nodes	Houdini
2D Animation	OpenToonz, Krita, Synfig	Toon Boom Harmony, TVPaint, Moho
3D Animation & Rigging	Blender	Autodesk Maya, Autodesk MotionBuilder
Narrative Design	Ink, Twine	articy:draft
Music Composition & Production	LMMS, Ardour	FL Studio, Cubase, REAPER
Sound Editing & Recording	Audacity, Ardour	Adobe Audition, REAPER, Pro Tools

Solution Shopping List - Part 3

ASPECT	FREE or OPEN-SOURCE	TYPICAL TOOLS
Video Editing	Kdenlive, Shotcut	Adobe Premiere Pro, DaVinci Resolve
Gameplay Capture & Live Streaming	OBS Studio	Bandicam, Camtasia
Version Control & Large Assets	Git + Git LFS	Perforce P4
Version Control Hosting	Forgejo	GitHub, GitLab, Bitbucket
Automation	Forgejo Actions, Jenkins	GitHub Actions, TeamCity
Project Management & Issue Tracking	Forgejo Projects, OpenProject Community	GitHub Projects, Jira, Linear, Trello
Documentation & Design Wikis	Forgejo Wiki, BookStack, DIY website or wiki	Confluence, Notion
QA & Test-Case Management	Kiwi TCMS	TestRail

Solution Shopping List - Part 4

ASPECT	FREE or OPEN-SOURCE	TYPICAL TOOLS
Multiplayer & Game Back-ends	Nakama, DIY back-ends	PlayFab, Unity Gaming Services
Websites	WordPress, Astro, DIY front-ends	Squarespace, Webflow
Custom APIs & Back-ends for Data	DIY back-ends	Google Firebase
Feature Flags & Rollout Controls	Unleash Open Source, DIY back-ends	LaunchDarkly
Localisation Management	Weblate	Crowdin, Phrase
Graphics Debugging & Profiling	RenderDoc, Tracy	PIX, NVIDIA Nsight
Social Media Scheduling	Postiz	Buffer, Hootsuite
Player Support & Ticketing	Zammad Open Source	Zendesk, Freshdesk

Solution Shopping List - Part 123456789...

You need to explore open source!

Share your experiences, or better:
improve open source tools to meet
your needs!



Summary

- We don't have to use someone else's built-for-them solution for our goals
- Games are made up of work from multiple industries - we don't always need "built for gamedev" solutions to do not-strictly-gamedev work!
- There are a lot of solutions out there. Exploration helps everybody grow!

You don't need to rewrite your whole game project to try open source tools!
Break your project into smaller parts.
Give ANYTHING a go!

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These slides and more info:

