

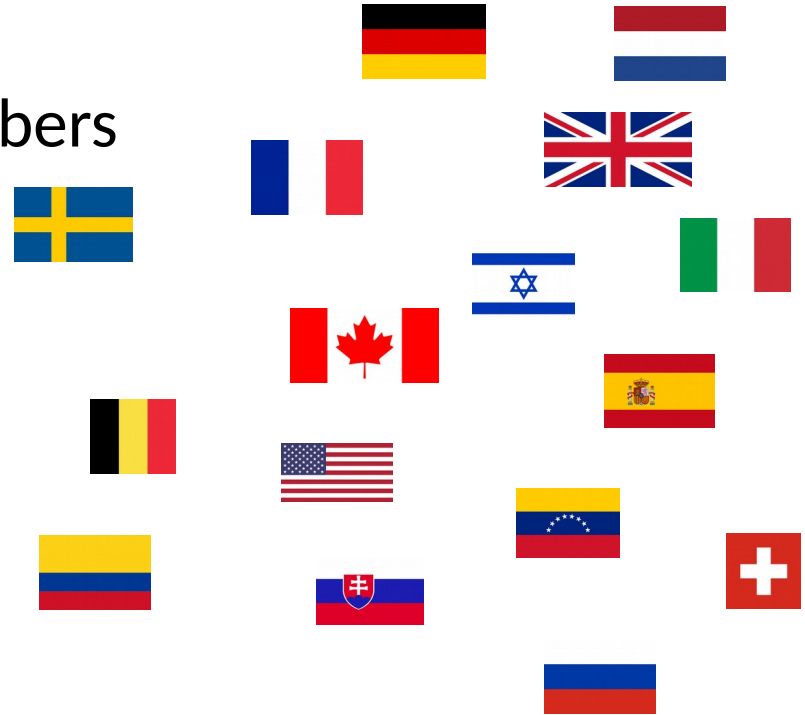


# Working with an international team on a FOSS game.

- 1) Features
- 2) Technical details
- 3) Funding
- 4) Community

# 0. Team behind

- Since 2000:
  - > 200 Wildfire Games staff members
  - > 500 External contributors
- Currently:
  - ~30 Staff (16 nationalities)
  - > 10 Active externals + Modders



## 0. Team -- Communication

- Staff forums
- IRC
  - Full logs and summaries are publicly available
  - [wiki.debian.org/MeetBot](https://wiki.debian.org/MeetBot)

# What is 0 A.D.?

- A historical, antiquity based, real time strategy...
- Free Open-Source Cross-platform...
- ...game



# What is 0 A.D.?

- A **historical**, antiquity based, real time strategy
  - It's writing history
    - Started in 2001 as mod of AoE II: AoK
    - Standalone in 2003
    - FOSS in 2009
  - History based



# What is 0 A.D.?

- A historical, **antiquity based**, real time strategy
  - 500 BC to 500 AD
  - “What if...?”





# What is 0 A.D.?

- A historical, antiquity based, **real time strategy**
  - “Build your base and obliterate your opponent”
  - Formations, Citizen Soldiers, Capturing





# What is 0 A.D.?

- A historical, antiquity based, real time strategy...
- Free Open-Source Cross-platform...

# What is 0 A.D.?

- Free Open-Source Cross-platform
  - Supported OS
    - Microsoft Windows ( $\geq$  XP)
    - Unix (MacOS ( $>$  Mavericks), GNU/Linux)
    - (ARM-Platform)
  - Source is available
  - Even engine is moddable

# Outline

- 1) Features
- 2) **Technical details**
- 3) Funding
- 4) Community



# Technics

- 1) Code
- 2) Source control
- 3) Workflow
- 4) Maintenance
- 5) CI/CD
- 6) Hosting

# Technics -- Features

- Homegrown engine (pyrogenesis, C++)
- Scripting using Mozilla Engine (JavaScript)
- Translation PO-files ([transifex.com](http://transifex.com))
- OpenGL 2.0, GLSL 1.10 / OpenGL 1.0, ARB Shaders
- Data in XML/JSON + XMB

# Technics -- Scripting Language

- Backend functionality FSMs:
  - Multiple script contexts
  - Ability to get/set a script variable value from within the engine.
  - Global variables are properties of the "global" object.
  - Ability to call script functions from the engine.
  - Ability to call engine functions from the script.
- Frontend functionality
  - Data types: int, float, string, Boolean, custom objects, null const, array
  - Data features: automatic conversion, basic types (no double, unsigned etc.), strong OOP
  - Other features: File Inclusion, Math library, Error handling, Regex
- Data Structures:
  - Ability to create variables, arrays, and objects
  - Ability to expose complex engine data structures and classes (possibly with a custom interface).
- General:
  - Ability to pause scripts during execution and, later, resume them.
  - Ability to restrict access to any unsafe features of the scripting language, if applicable: File I/O, network access, system diagnostic, etc.
  - Overall speed



# Technics -- Scripting Language

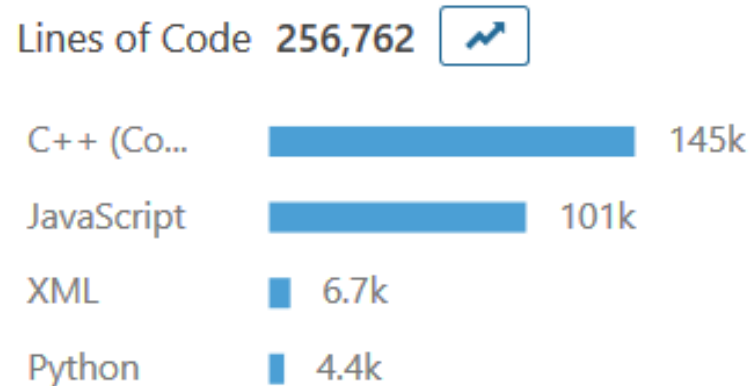
- Lua
  - Was the first choice
  - Was 9 years old
- JavaScript
  - SpiderMonkey (The Engine) was 8 years old
- Ferite
  - Was discontinued in 2004
- Python
  - Didn't fit as a core engine extension
  - Works better when standalone

# Technics -- Scripting Language

- Lua
  - Pros
    - Industry standard
    - Fast
  - Cons
    - Few developers knew it when the decision was made
    - Forgiving syntax
- JavaScript
  - Pros
    - More commonly used
    - Supports OOP
  - Cons
    - Slower

# Technics -- Scripting Language

- Additional
  - Might allow us to switch to TypeScript in the future if that's what we want
  - Allow us to quickly test things outside and generate graphs (node vuejs) without having to write extra code





# Technics

- 1) Code
- 2) **Source control**
- 3) Workflow
- 4) Maintenance
- 5) CI/CD
- 6) Hosting

# Technics -- SCM

- Apache Subversion known as SVN
  - Historical reasons (Git wasn't out yet in 2005)
  - Git clones everything while SVN only the current tree
  - Binary file management
    - 8 GB of files of which 5 GB binary files

# Technics -- SCM

- Self host to avoid hosting fees
- Git LFS is not worth the trouble switching to:
  - Setup mirrors
  - Administration required
- SVN easier for non-technical people
- Workflow is agnostic of the used system

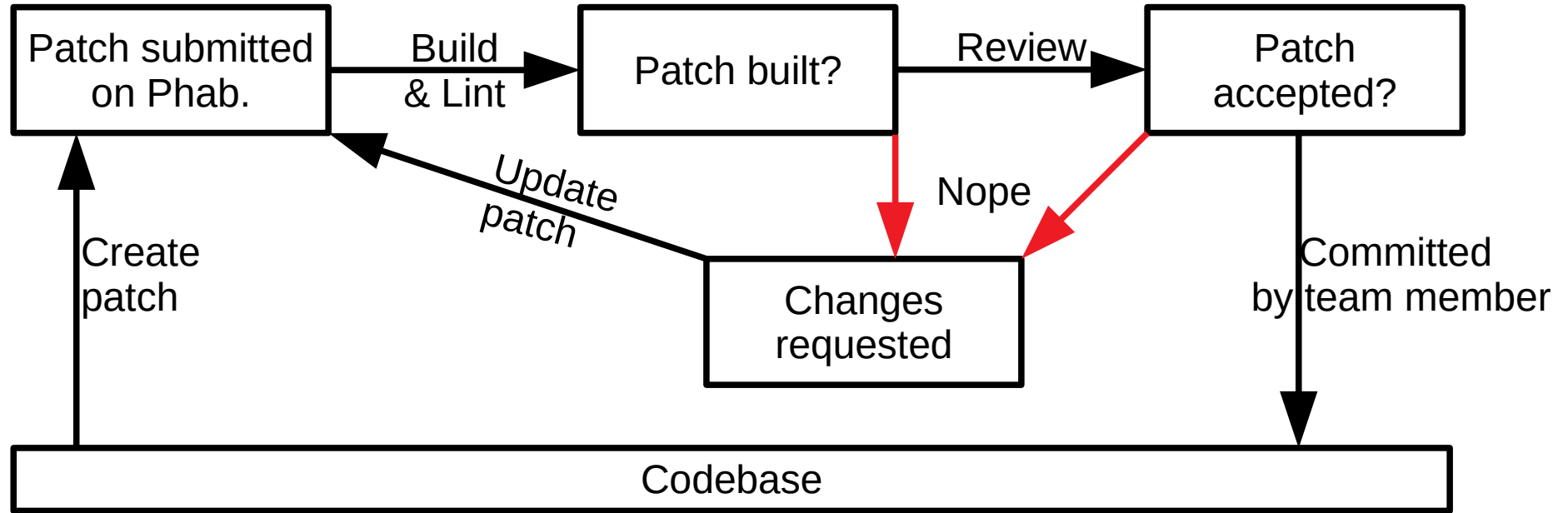
# Technics

- 1) Code
- 2) Source control
- 3) **Workflow**
- 4) **Maintenance**
- 5) CI/CD
- 6) Hosting

# Technics -- Workflow

- Phabricator ([code.wildfiregames.com](http://code.wildfiregames.com))
  - Web-based software development collaboration tools:
    - Differential code review tool
    - Diffusion repository browser
    - Herald change monitoring tool
    - Maniphest bug tracker
    - Arcanist command line tools
  - Integrates with Git, Mercurial, and Subversion

# Technics -- Workflow





# Technics -- Maintenance

- [trac.wildfiregames.com](http://trac.wildfiregames.com)
  - ~1300 open tickets
  - 3 Pet Peeves types
    - Graphics card specific bugs
    - Random freezes on some platforms
    - Permission bugs

**#5407** closed defect (invalid) Opened 6 days ago  
Closed 2 days ago  
Last modified 7 minutes ago

**Insufficient access rights to write persist-matchsettings files**

Reported by:	Camille	Owned by:
Priority:	Should Have	Milestone:
Component:	Core engine	Keywords:
Cc:		Patch:

Description

I have this message when I open the games : Reply Delete

Much to our regret we must report the program has encountered an error.

Please let us know at <http://trac.wildfiregames.com/> and attach the crashlog.txt and crashlog.dmp files.

Details: unhandled exception (Breakpoint)

Location: unknown:0 (?)

Call stack:

(error while dumping stack: No stack frames found)

errno = 13 (Insufficient access rights to open file)

OS error = 0 (no error code was set)

Can you help me ?

# Technics -- Maintenance

- [trac.wildfiregames.com/wiki](http://trac.wildfiregames.com/wiki)
  - Design documents (severely outdated)
  - Build instructions
  - Modding/map making instructions
  - Browser for source code

# Technics

- 1) Code
- 2) Source control
- 3) Workflow
- 4) Maintenance
- 5) **CI/CD**
- 6) **Hosting**



## Technics -- CI/CD

- **Jenkins**

- Manage build system (and autobuilds)
- Every patch is build
- Analyses syntax and Coding Conventions
- Tests are run

# Technics -- CI/CD

- Coala
  - Unified CLI for linting and fixing code, regardless of the programming languages
  - CPP-Check
  - Custom Python scripts
  - Eslint
  - JsHint



# Technics -- CI/CD

- Testing
  - Unit tests
  - “SVN Match”
  - Balance testing by renown players



# Technics -- Hosting

- 1 Server
  - Intel Xeon E5-1650V2
  - 64 GB RAM ECC
  - 2 x 2000 GB Enterprise HDD
  - € 50,42 monthly
- 11 Virtual Machines



# Technics -- Hosting

- Steam? Microsoft Store? Apple Store?
  - Entry price
  - Lack of control
  - Licence issues
  - Still in alpha-stage

# Technics

Code

Source control

Workflow

Maintenance

CI/CD

Hosting

# Outline

- 1) Features
- 2) Technical details
- 3) **Funding**
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# Funding

- Funds managed by SPI ([spi-inc.org](http://spi-inc.org))
  - Running costs (hosting, licensing)
  - Reimbursing expenses
  - Goodies and events:
    - FOSDEM (Brussels) (This weekend!)
    - JDLL (Lyon) (Next 4th 5th April 2020)
    - RMLL (Changing locations)
    - AFGRAL (Rennes)



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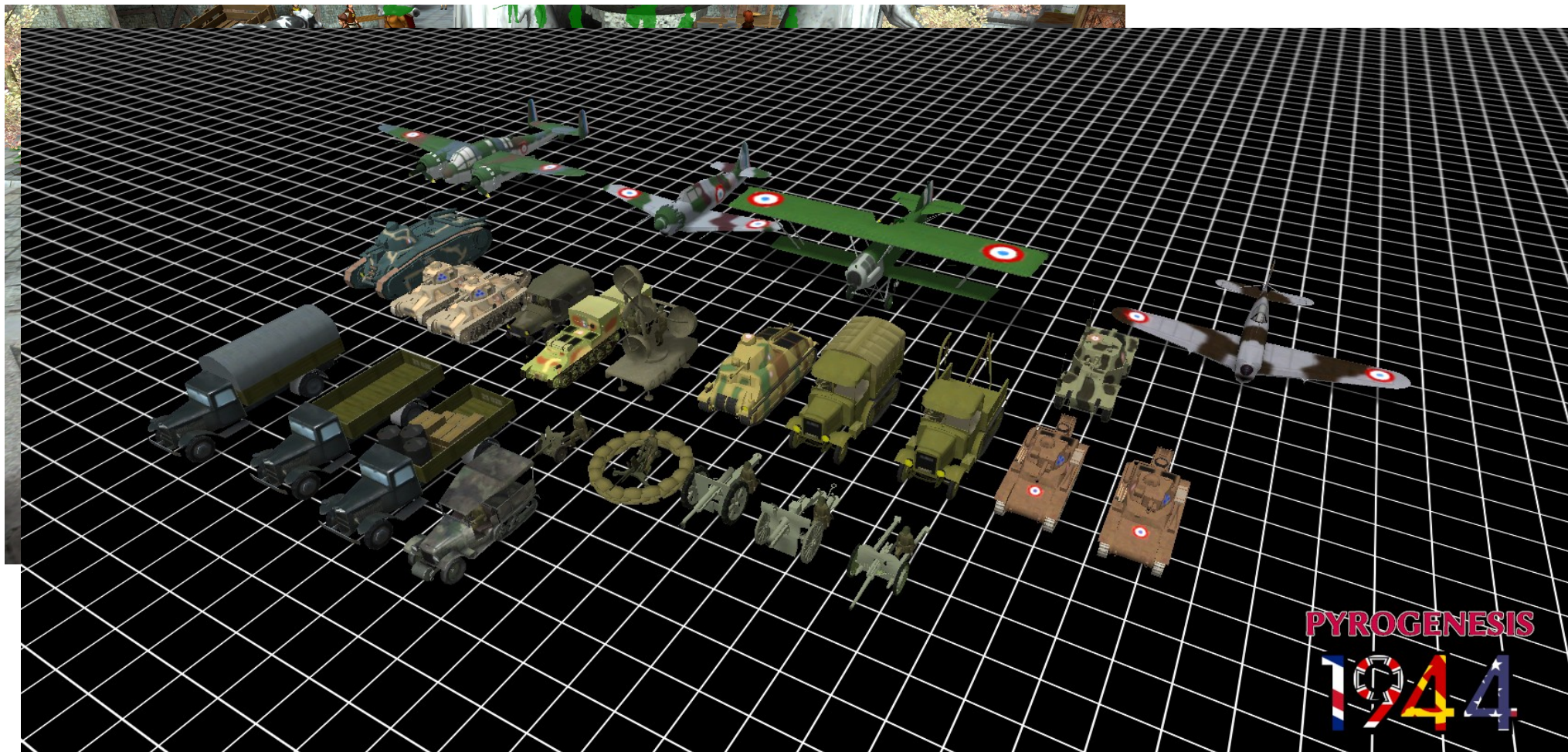


# Modding

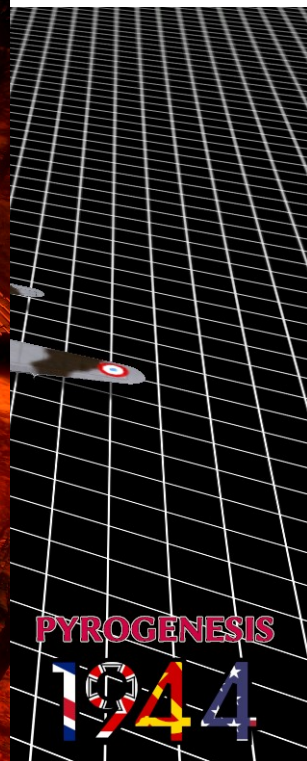
- Huge part of the game
  - Features
- mod.io integration
- Github ([github.com/0ADMods](https://github.com/0ADMods))
- Wide variety











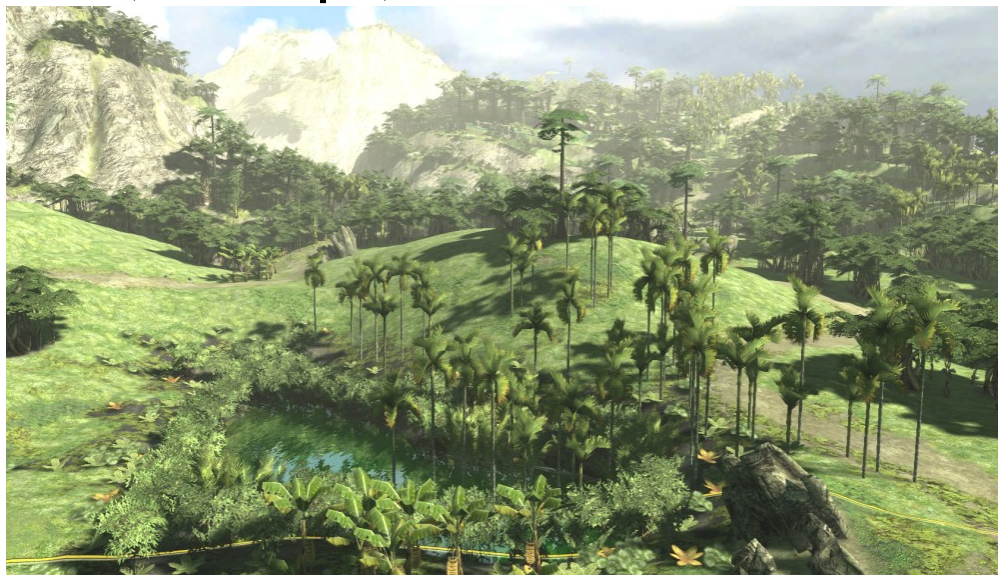






# [WIP]

- Art
  - 2D/3D, Animation, Environment, Sound
- Programming
  - AI, Engine, Maintainers, DevOps, Reviewers
- Documentation
- Translations
- Map Making





# [WIP]

- Art contributors sign legal waiver
- Contribution-based selection
- Translation always possible



# [WIP]

- Main website ([play0ad.com](http://play0ad.com))
- Forum ([wildfiregames.com/forum](http://wildfiregames.com/forum))
- IRC on QuakeNet.org ([#0ad](#) and [#0ad-dev](#))
- Social media.















“History is yours for the taking”

