



Crossplatform architecture

Cross-platform  
platform

[www.libretro.com](http://www.libretro.com)



# RetroArch

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## ○ RetroArch

- A cross-platform architecture
- The reference frontend to an API
- An app library/ecosystem of its own
- A no-strings-attached enduser program
- A project with multiple stakeholders
  - Open source development community
  - Hardware vendors
  - Allied open source projects (XBMC, OpenEmu)



# RetroArch

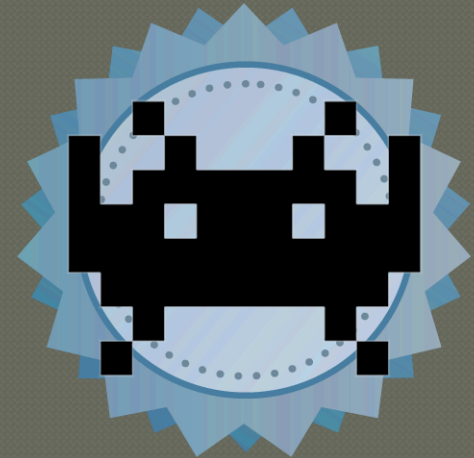
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## ○ RetroArch

- Goals/ambition
  - Create an all-encompassing platform on top of all existing platforms/operating systems/ecosystems
  - Any time, any place, any device
  - Backend and frontend compartmentalization
  - 1 Codebase per app

## ◉ Libretro

- A lightweight C/C++ API
- Works according to backend/frontend principle
  - Backend application talks with frontend by way of API
- Facilitates input/audio/video/camera/location streams
  - for use in games/media players/graphics applications
  - Augmented reality



- ◉ Runs on nearly all available platforms/operating systems
  - Apps run on every platform
    - With added value (shaders, rewinding, input support, etc)
    - Are loaded in as module inside the frontend app
      - Dynamic library (Position Independent Code)
    - No recompilation of the frontend (RetroArch) necessary

Dynamic or static library



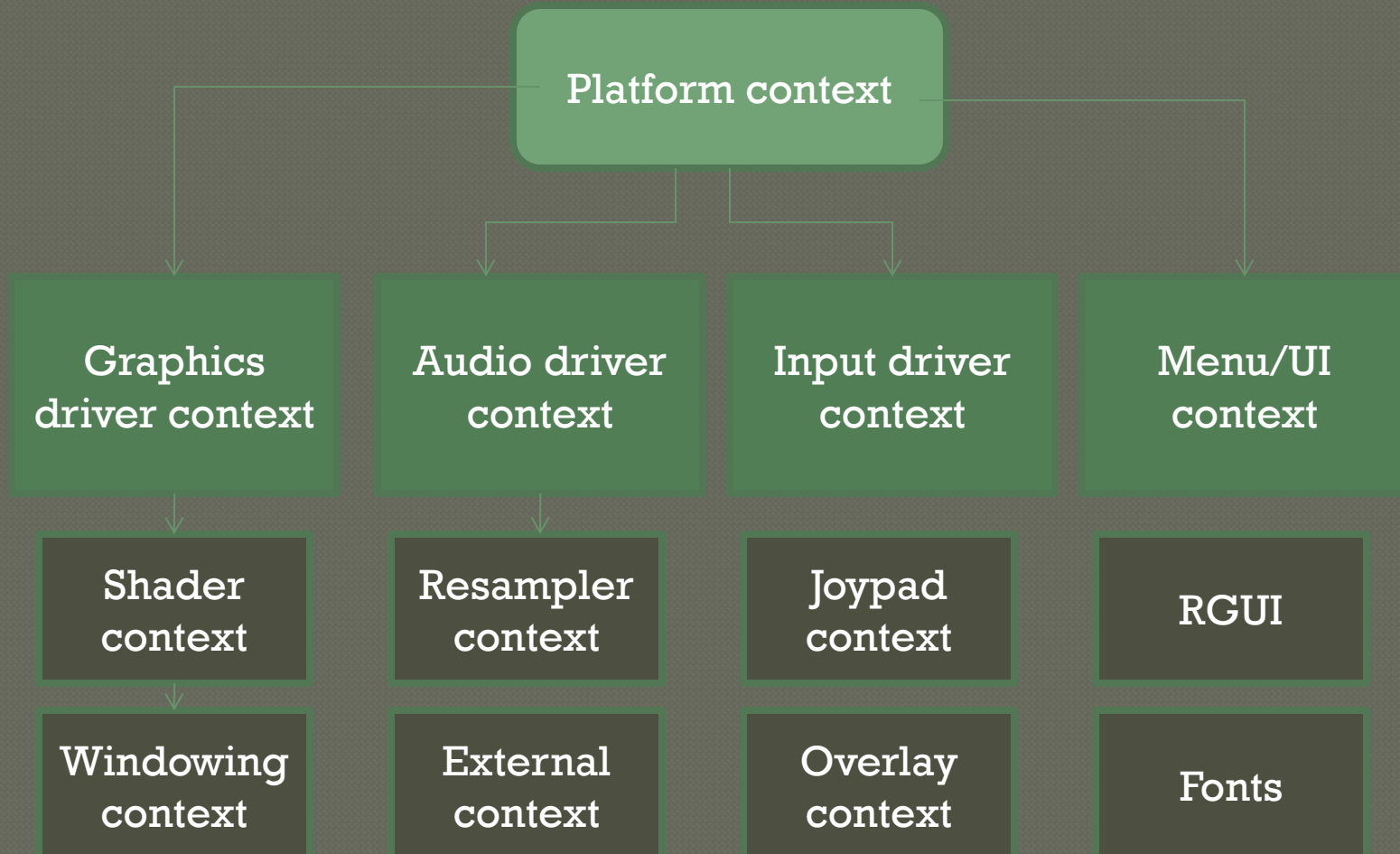


# RetroArch

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## ◉ Libretro frontend

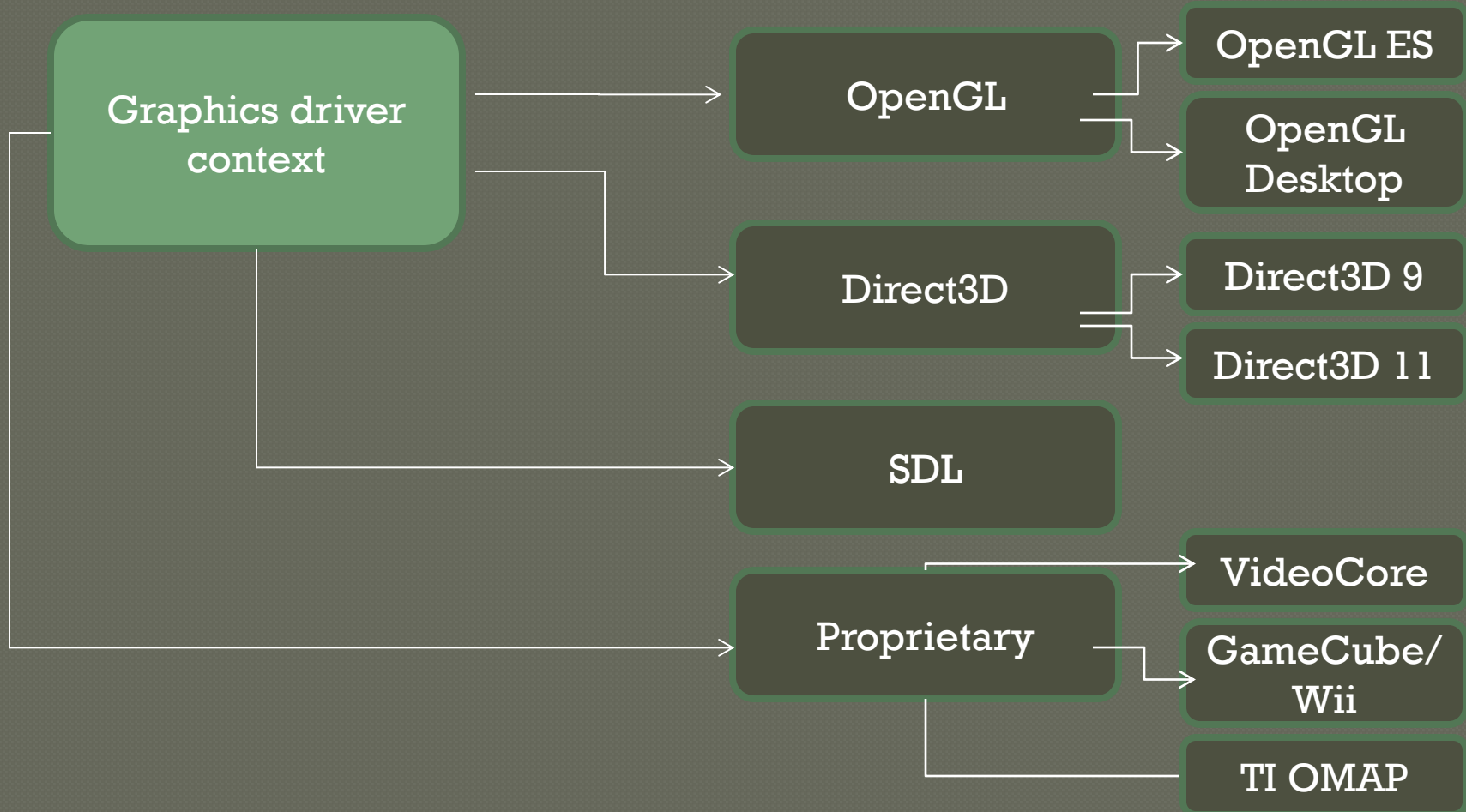
- Reference implementation
  - RetroArch
    - Platform agnostic
    - Performance-focused
    - Advanced features (shaders, overlays, rollback, etc)
    - Implements new features of the API first
    - Puts a heavy emphasis on performance and code clarity
- Other implementations
  - XBMC (RetroPlayer)
  - Arcan
  - Minir (upcoming)

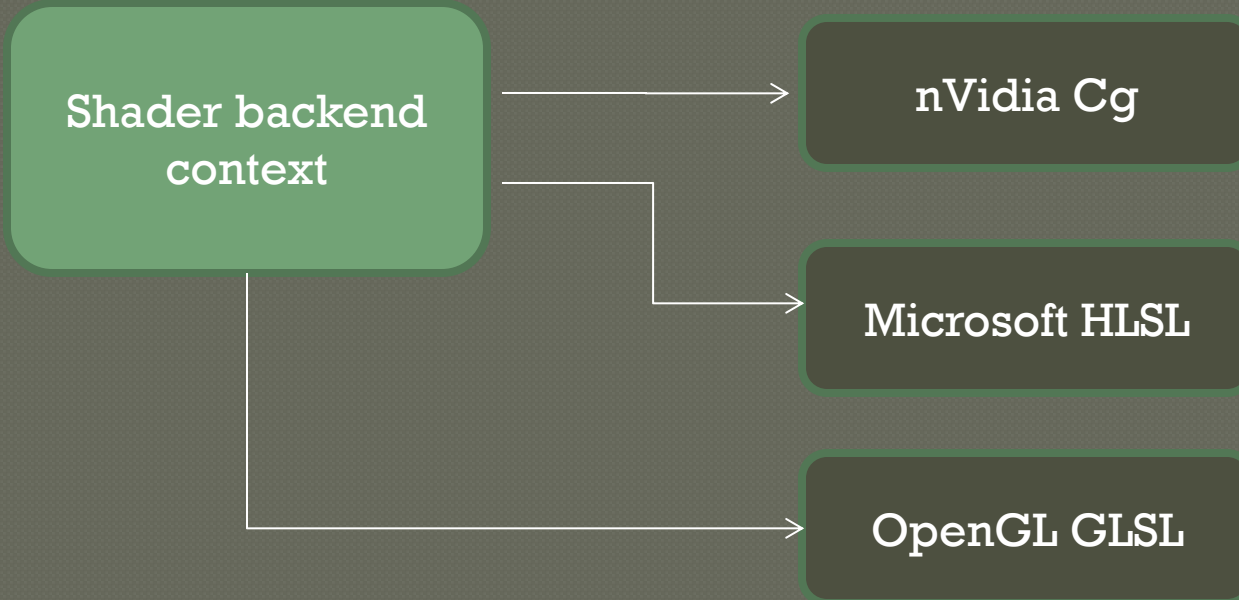






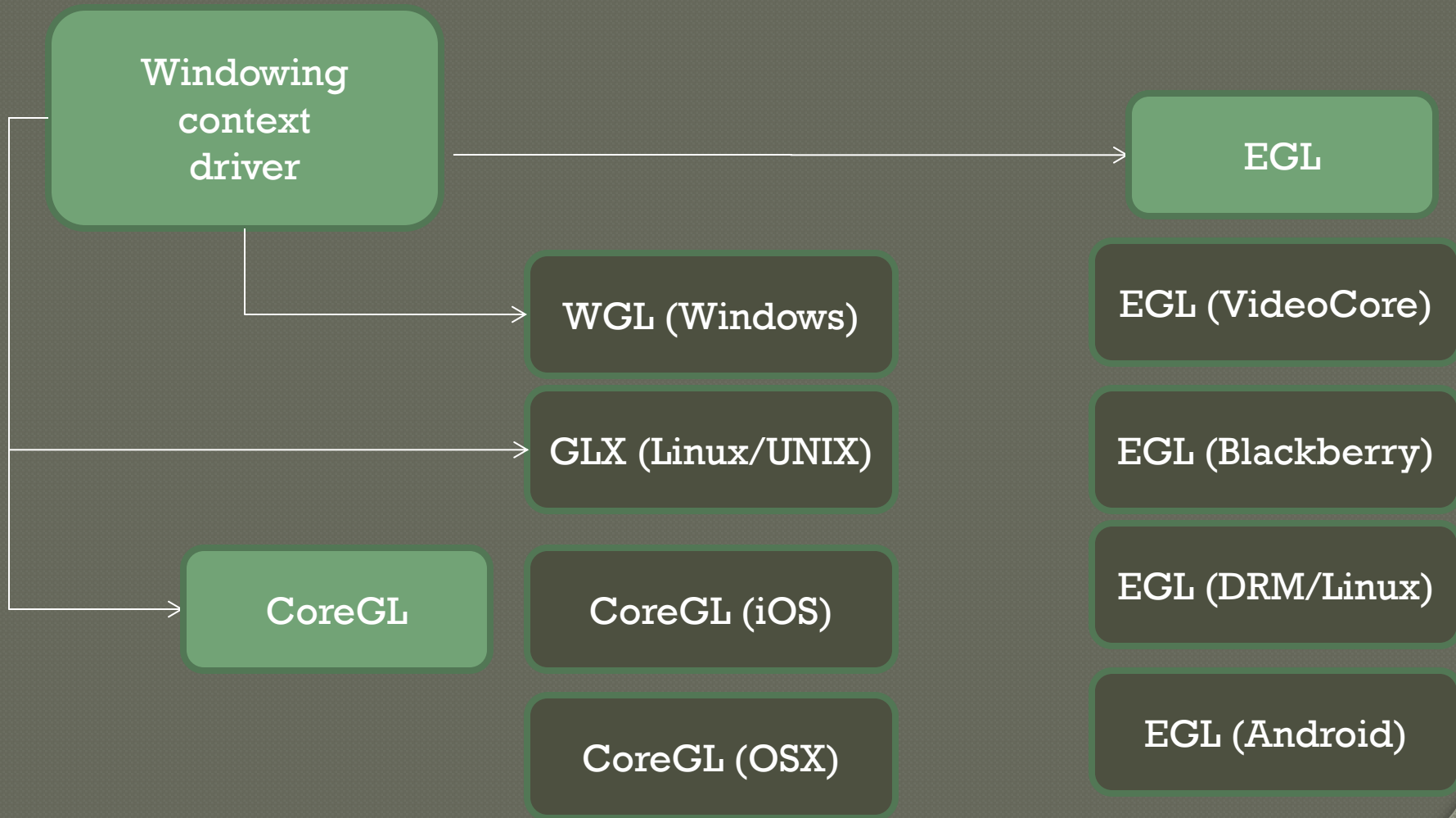
# RetroArch

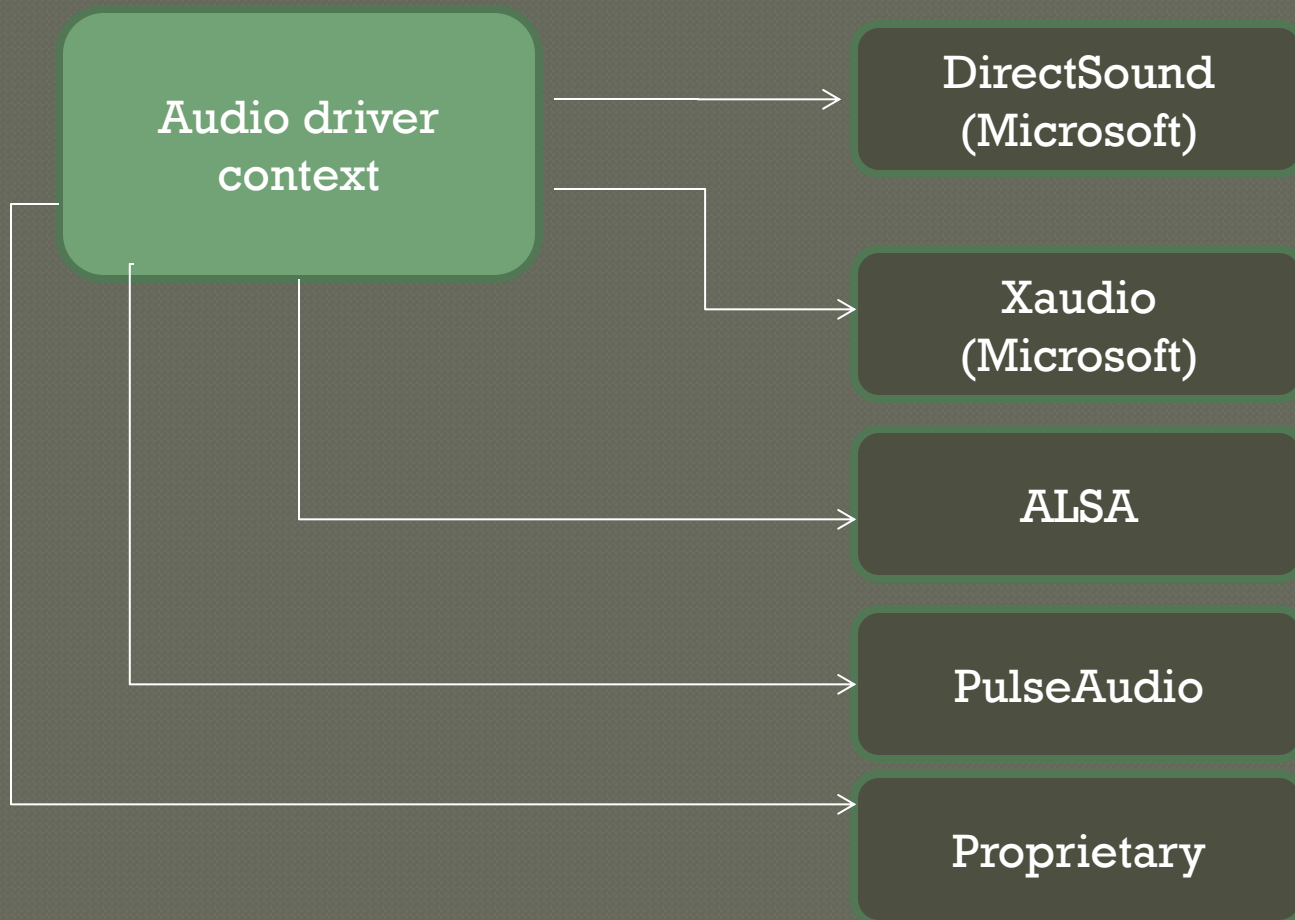


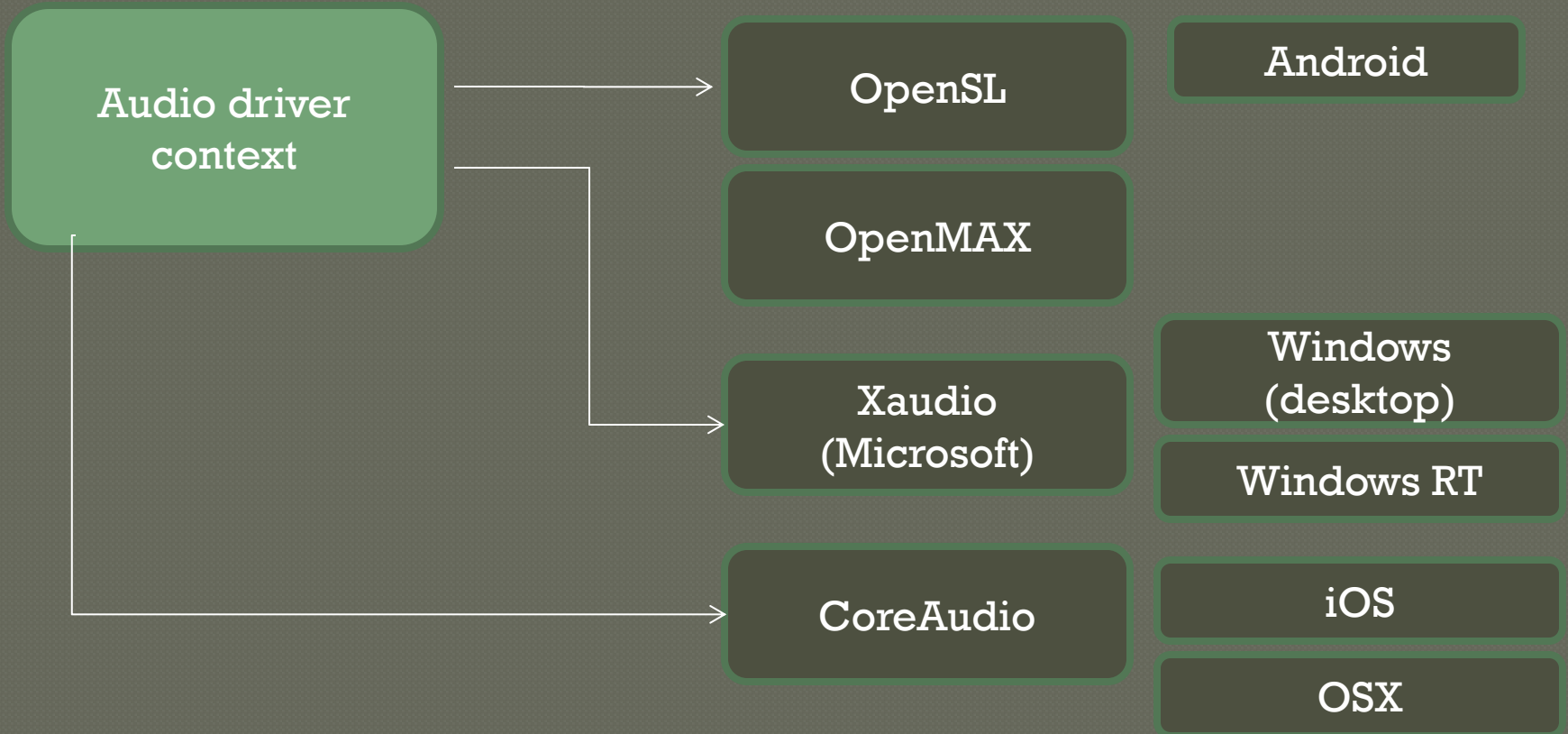


## ○ Shaders

- Three totally different implementations
  - 1 Codebase
    - Can convert Cg to GLSL through off-line conversion script
    - Cg maps mostly to raw HLSL

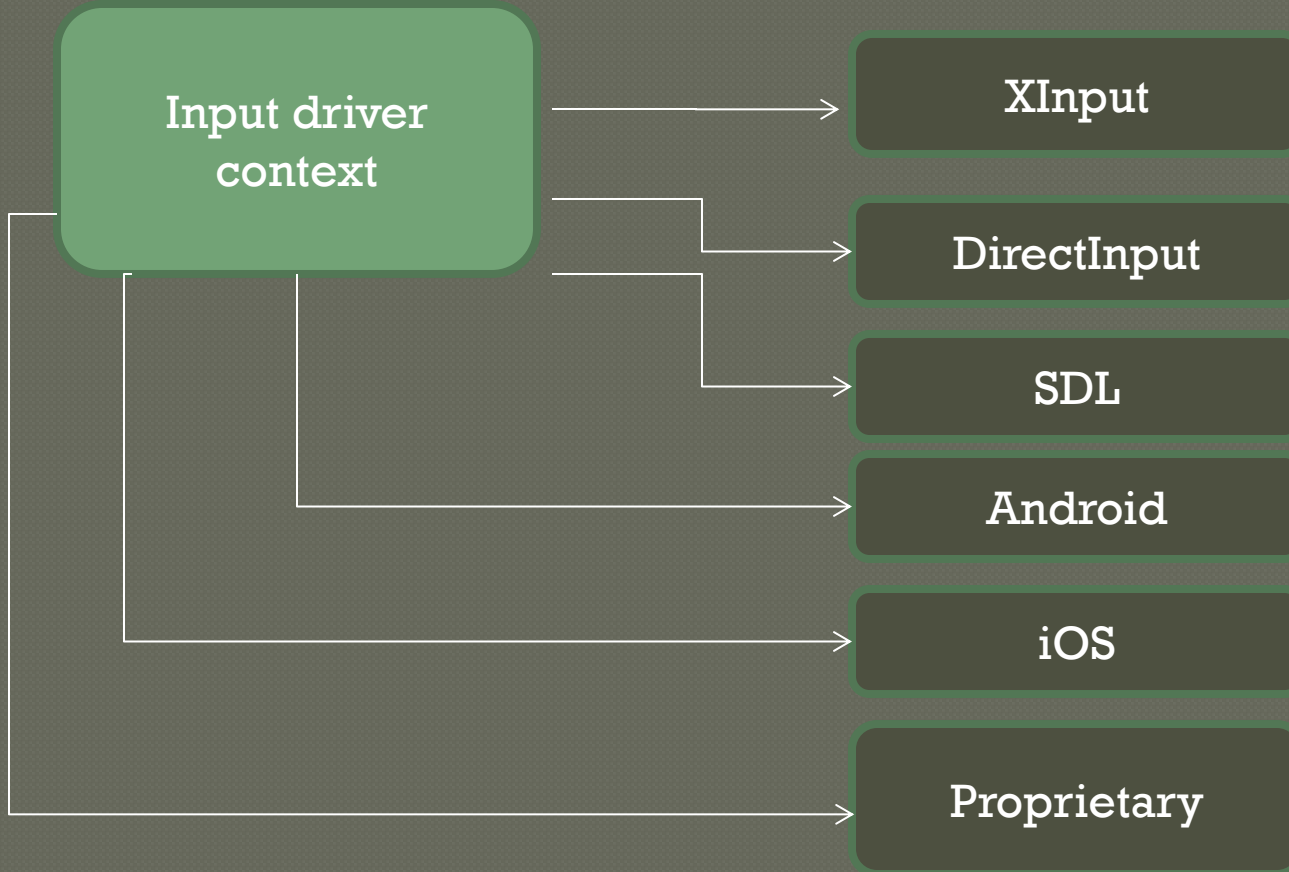






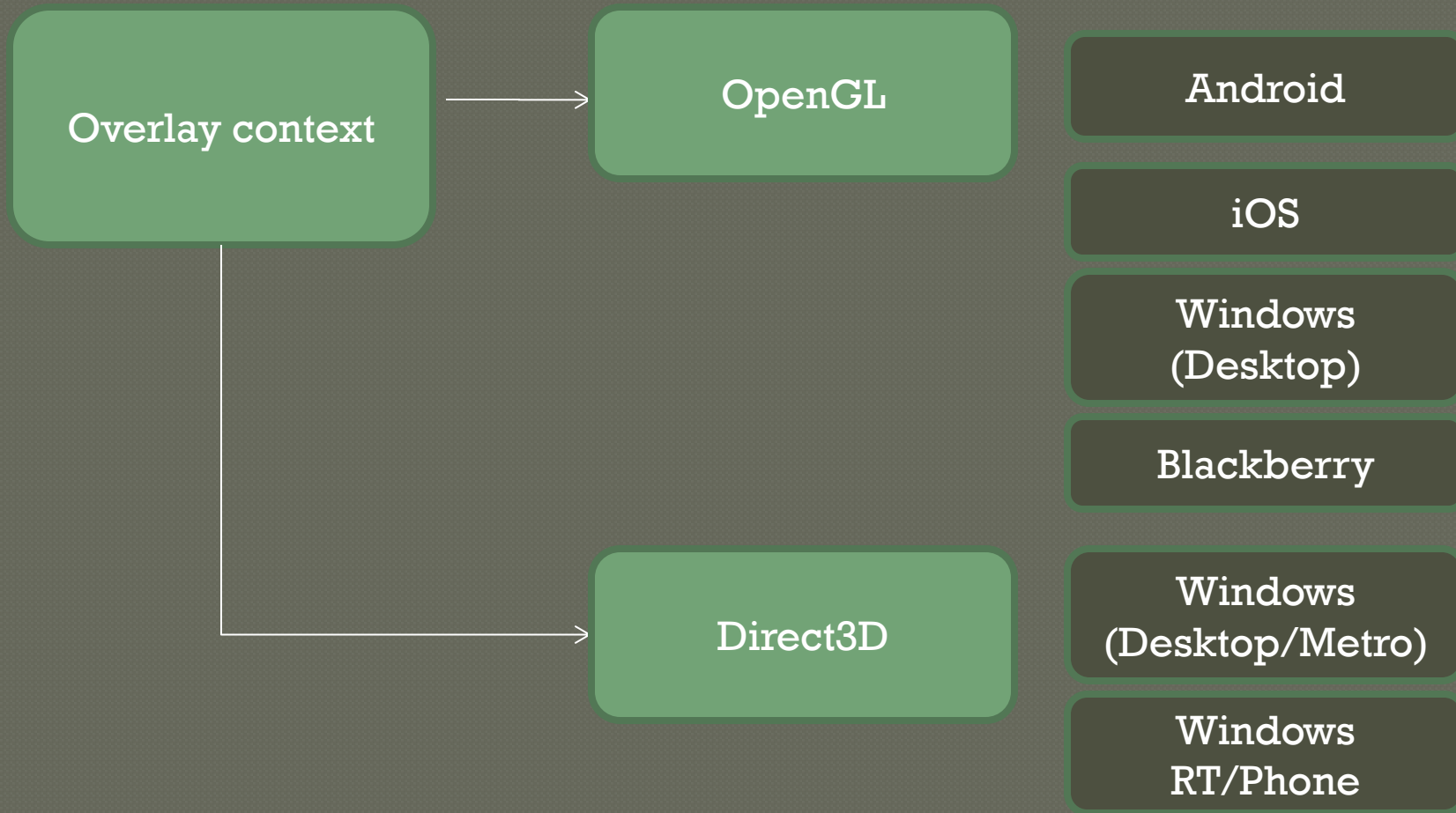


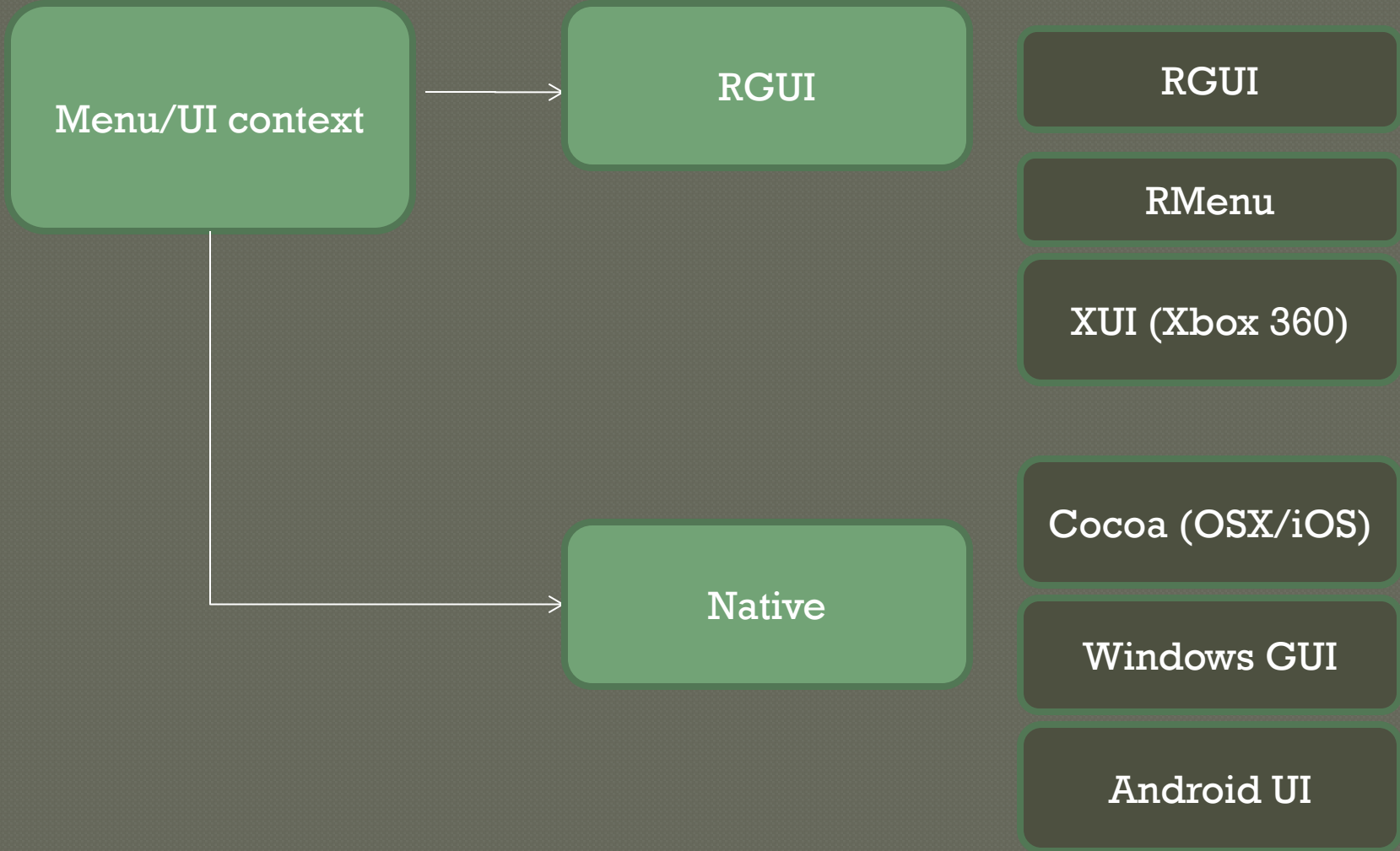
# RetroArch





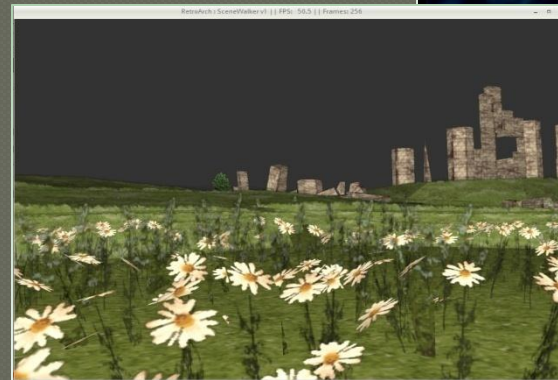
# RetroArch







- Has its own software library of apps
  - Made possible by libretro API
  - Collection:
    - Games
    - Emulators
    - Media players
    - 3D apps
    - Augmented reality



## ○ Usecase

- Playing games
  - Game ports
  - Emulators
- Movies/music/media
  - Media player implementations
- Streaming
- Augmented reality

## ○ Userbase

- Mobile (Android/iOS)
- PC (Windows/OSX)
- Game consoles
- Embedded



- What RetroArch/libretro is trying to achieve
  - A platform / ecosystem made available on top of all other pre-existing platforms
  - A real-time, open-source alternative for rapid-deployment, cross-platform development
  - Non-game/emulator usecases
    - Gaming is going to meet CAD, home automation, augmented reality, and more
  - A bare-bones, non-restrictive alternative to more restrictive would-be competitors
  - Is already in use worldwide, now up to 300,000 hits on Google Play Store)

- ◉ Extension to libretro
  - 3D rendering
    - By way of OpenGL / OpenGL ES
    - Crossplatform abstraction layer – Libretro GL
      - Is OpenGL not already crossplatform?



- What do most platforms have in common nowadays?



Allows us to write 3D graphics-based applications -

- In a platform-agnostic way
- Hardware-accelerated
- A universal language/API used worldwide by CAD developers, game developers, app developers, etc.

- What do these platforms NOT have in common?

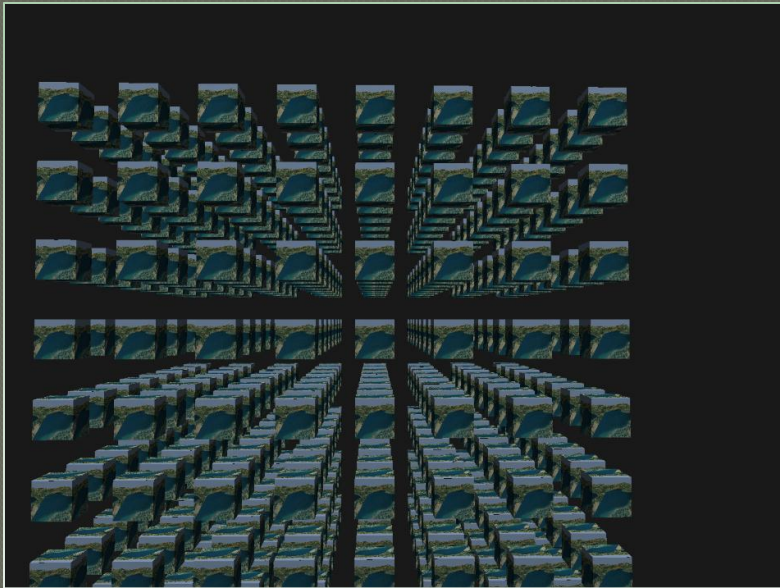
- Audio
- Input
- Shader
- Windowing implementations
- User interfaces
- Touchscreen overlays
- Camera
- Sensors
- Development environments
- And more...



- What is not-so portable about OpenGL?
  - Symbol wrapper lookup (necessary on Windows)
  - Divergent subsets of API functionality (GL ES 1/2/3, GL 1.5/2/3/4)
  - Windowing interfacing context drivers per platform
  - Display frontend for each platform
  - Post-processing by way of shaders
- What does Libretro GL provide?
  - A solution to all this and more...

# RETRO ARCH

# App World







- Continuously growing app library
- 47+ libretro cores
  - C/C++ codebases
  - Crossplatform

## ○ Gifts

- Hardware products and accessories
- For the purposes of porting RetroArch to it, enhancing support, features, etc.



## Also on the web

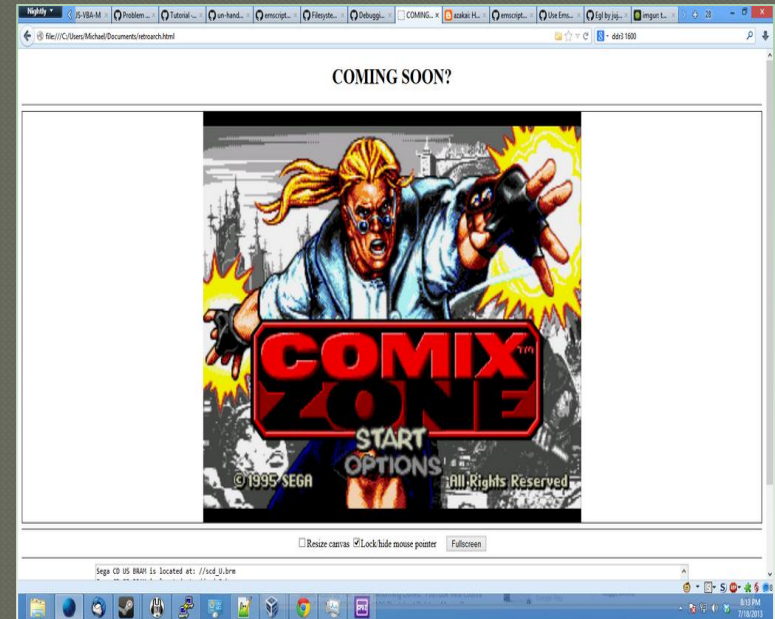
- Every app from the libretro ecosystem available on a web-browser
  - Using Javascript

## Webrowsers

- New platforms in their own right
  - Every platform has its own Javascript implementation

## Recompiling C/C++ code into Javascript

- Emscripten
- Native apps running inside webbrowser with decent performance



- Windows RT/Phone support
  - Being everywhere
  - On any device
- A big online services presence
  - Matchmaking
  - Chatlobby's
  - Live streaming
  - Augmented reality services
  - Etc





Crossplatform architecture

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