

Long time no see :=)

Here I will explain weak points of current version and plans to its improvement.

Issue 1: Bootrom

Bootrom emulation is not fully supported.
Segher reversed bootrom scrambling, so we can emulate it nicely.

For the first time we need bogus IPL, which simply load DVD game and continues.

Later we need to disasm production IPLs (PAL/NTSC) and write own open-source IPL clone, based on it.

Bootrom HLE is still required for .DOL/.ELF loading

Issue 2: Single threading

Current Dolwin implementation is single threaded :sick:

We should maintain at least following threads:

- GUI Thread
- Gekko Thread
- Debug Console Thread
- Flipper GX Thread (FIFO rendering) / Video Thread
- Flipper DSP

Also Debugger is weak on Gekko JITC integration and breakpoints.
Breakpoints should work in same manner for Interpreter / JITC.

Issue 3: Gekko JITC

Not implemented. And very badly designed.

Issue 4: Gekko MMU / Memory management

Bad design.

MMU is not working. Cache emulation is not supported.

Its miracle how Gekko gather buffer is working in current version :)

Issue 5: GX Fifos

GX command processor stuff should be redesigned.
This is also related to Gekko gather buffer.

In other words Gekko → GX pipe need to be fixed and reimplemented.

Issue 6: Save states

Not implemented.

Issue 7: Flipper DSP emulation.

Not implemented.

Although we have highly speculative DSP reversing by Duddie/Tratax, we still can use it for DSP emulation (Dolphin-emu does).

DSP interpreter / JITC should be implemented in own thread.
(and also supported in Debugger with breakpoints, memory/code view and other neat stuff)

Can we decomp Flipper and reverse engineer its DSP on silicon-level?

Issue 8: GMP is obsolete

No one is using GMP compressed DVD images. So we should wipe it out from the project.

Issue 9: BBA Support

Not implemented. Can be easily added as virtual TAP.

Issue 10: Config in registry

Why not using simple .INI files in Data directory?

Issue 11: Plugin system

Who need plugins in open-source emu? :)

Issue 12: Flipper GX

DolwinVideo is very noob GX implementation :)

Issue 13: Video EFB and XFB

New GX implementation should support fast EFB blitting to XFB for output.

Actually this is weird solution from Nintendo engineers, but it must be implemented (as it seen in many games).

Can we use OpenCL/shaders as Flipper GX pipeline and just render XFB as video output? Need to investigate it.

Issue 14: More HLE

Using hotquik's Symbol scanner we can add support for many resource-consuming Dolphin SDK libs (MTX, THP)

Issue 15: Crossmixed GUI and Debugger controls

Current version is using unclean design of emu states management.

Should redirect all GUI actions to debug commands.

Issue 16: Outdated/missing Docs

Rewrite Docs on better English :) Add more reversing of Dolphin SDK libs. Add more GC hardware docs (DSP, BBA).

Issue 17: Analog Pads

PAD plugin has no DirectX joypads support.

Issue 18: RTC

EXI RTC is not supported. Gamecube time starts over 1 Jan 2000 after every next game run.

Issue 19: Audio support

Not implemented. Enjoy the silence :P

Issue 20: Debugger cleanup

Need to separate conhost-related Windows code and actual debugger stuff.

Issue 21: x64 support

Add support for x64.

Gekko x64 Jitc. DSP x64 Jitc.

Issue 22: GUI and Unicode

All internal strings should be TCHARs. Also watch for correct Kanji/JIS-to-TCHAR conversion (some DVD Banners contain Japan strings).

These issues must be fixed in order to advance Dolwin to version 1.0 :)

These changes may involve serious source tree refactoring.

High-priority list:

- Issue 2: Single threading
- Issue 4: Gekko MMU / Memory management
- Issue 5: GX Fifos
- Issue 7: Flipper DSP emulation.
- Issue 8: GMP is obsolete
- Issue 10: Config in registry
- Issue 11: Plugin system
- Issue 12: Flipper GX
- Issue 13: Video EFB and XFB
- Issue 15: Crossmixed GUI and Debugger controls
- Issue 19: Audio support
- Issue 20: Debugger cleanup

Middle-priority (optimization):

- Issue 3: Gekko JITC
- Issue 14: More HLE
- Issue 21: x64 support

Lower-priority (Features):

- Issue 1: Bootrom
- Issue 6: Save states
- Issue 9: BBA Support
- Issue 16: Outdated/missing Docs
- Issue 17: Analog Pads
- Issue 18: RTC
- Issue 22: GUI and Unicode

Have fun :)