

A wide-angle photograph of a rugged, mountainous landscape. In the foreground, two individuals wearing backpacks and riding dirt bikes are standing on a rocky outcrop. One person is facing away from the camera, while the other is partially visible behind them. The background features a deep valley with a winding road, a large lake with small islands, and distant mountains under a blue sky with scattered clouds.

GAME PROGRAMMING IN C++

2020

Šta vi očekujete od ovog
kursa?



Kako?

- ❖ Pravićemo video igre „od nule“
- ❖ U timovima
- ❖ Koristićemo C++ i spoljne biblioteke
- ❖ U Windowsu
- ❖ Nije potrebno prethodno znanje grafike ili rada u Windowsu

Programiranje ≠ Razvoj igara

- ❖ 90ih su programeri bili absolutno dominantni u industriji
- ❖ Danas su timovi mnogo veći i specijalizovani
- ❖ Sad postoje alati koji omogućavaju pravljenje igara bez ikakvog znanja programiranja
- ❖ Postoje pozicije u timovima koje programiraju, ali nisu programeri
 - ❖ Technical artist
 - ❖ Technical game designer

Tipovi programera

- ❖ Gameplay
- ❖ AI
- ❖ Online
- ❖ Networking
- ❖ Engine
- ❖ Graphics
- ❖ Physics
- ❖ Sound
- ❖ UI
- ❖ 3C
- ❖ Tools

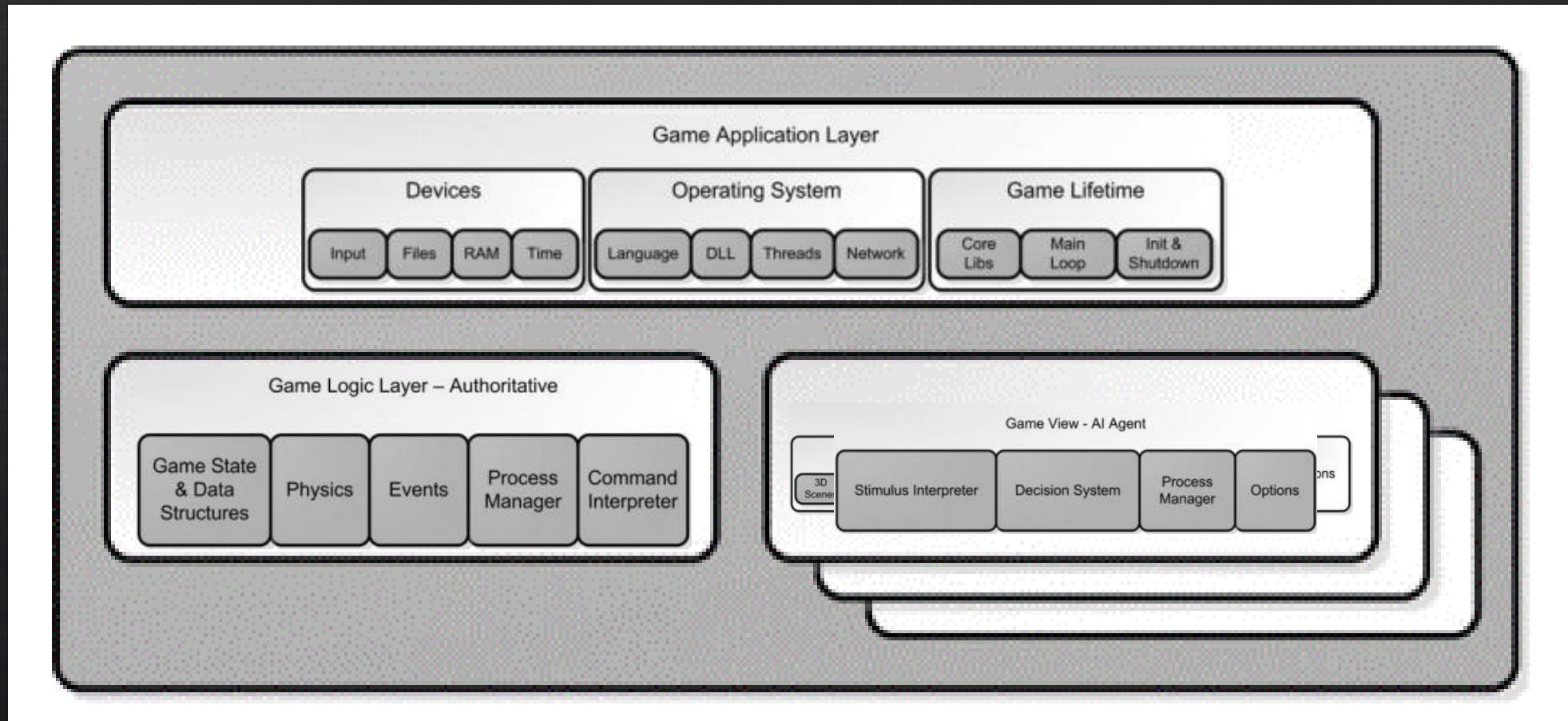
Specifičnosti programiranja video igara

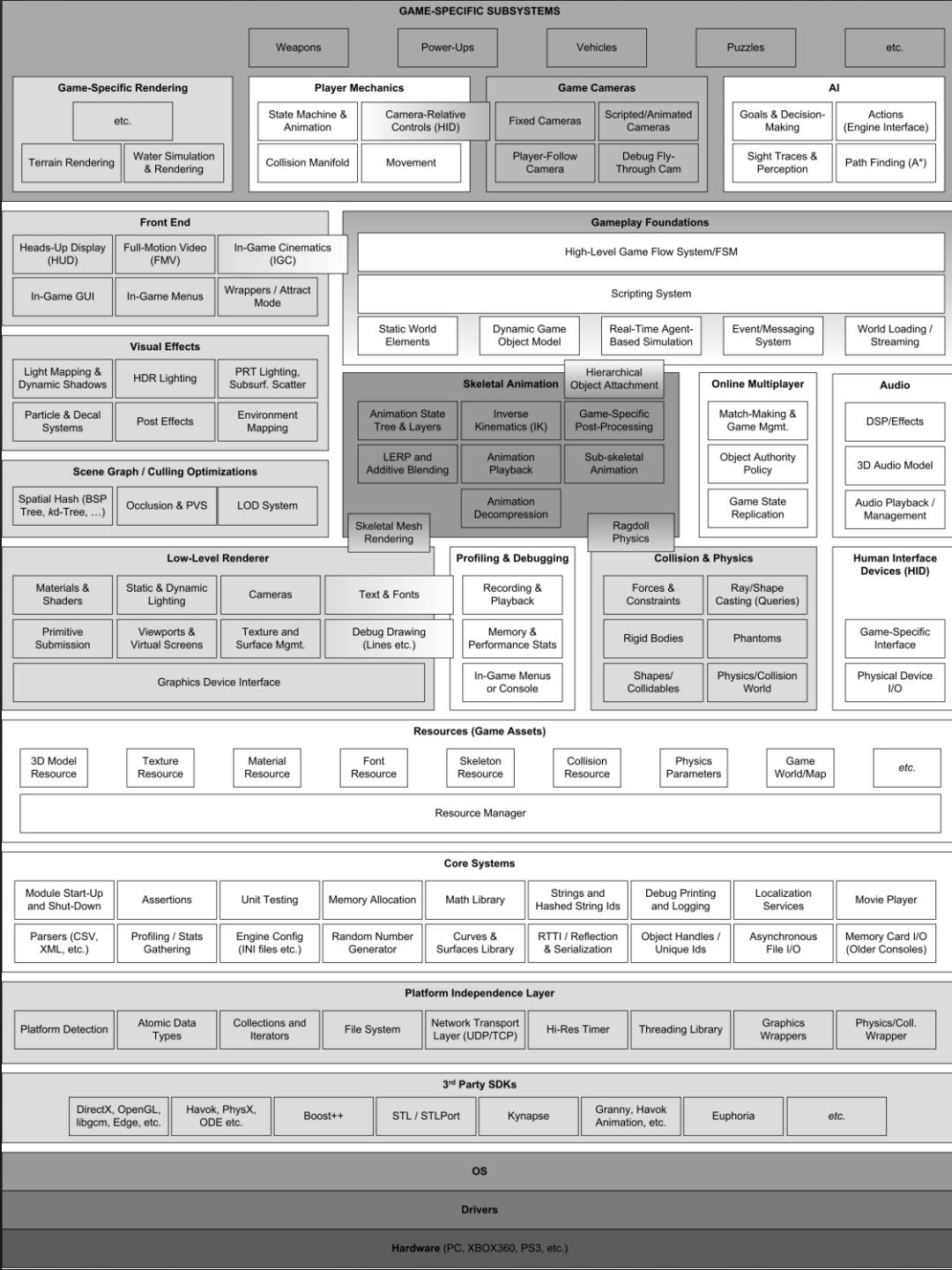
- ❖ Cool
- ❖ Dress code
- ❖ Umetnost koliko i tehnologija
- ❖ Direktan feedback
- ❖ Nove igračke*
- ❖ Najnovije tehnologije*
- ❖ Crunch
- ❖ Prilično težak posao
- ❖ Javni rokovi
- ❖ Direktan feedback
- ❖ Kako se programira zabava?

Programerski alati

- ❖ Engleski jezik
- ❖ Version control (Perforce, SVN, **git**)
- ❖ Programski jezik (**C++**, Lua, C#, Python)
- ❖ Compiler + Linker (**MSVC**, Clang, GCC)
- ❖ IDE (**Visual Studio**, PyCharm, Eclipse, vim)
- ❖ Profiling tools (**CPU**, GPU, Memory)
- ❖ Code analysis (clang-tidy, Coverity, UBSAN, ASAN, C++ Lifetime Profile)
- ❖ CI/CD
- ❖ Task management (Jira, Trello)

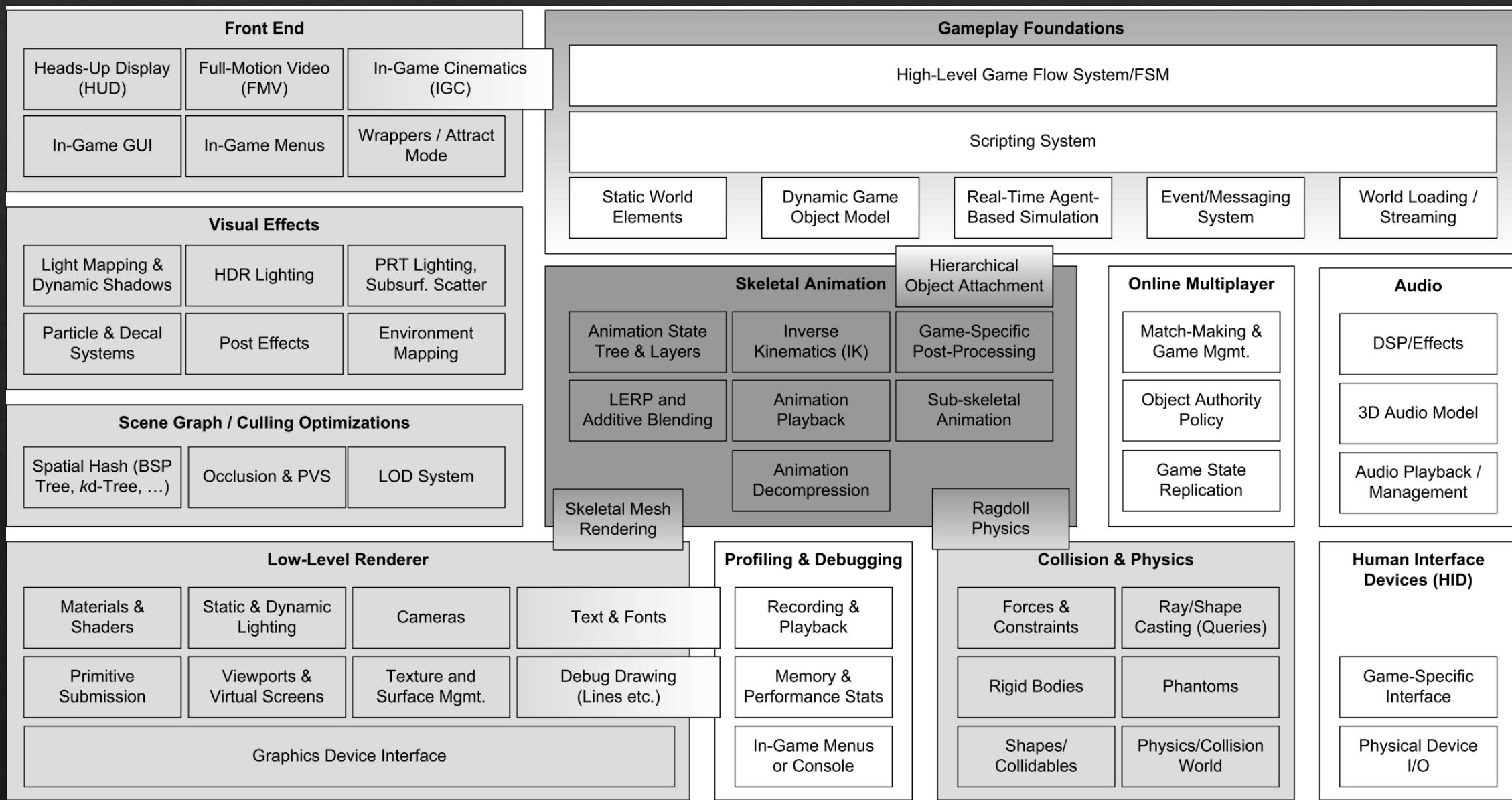
Arhitektura video igre

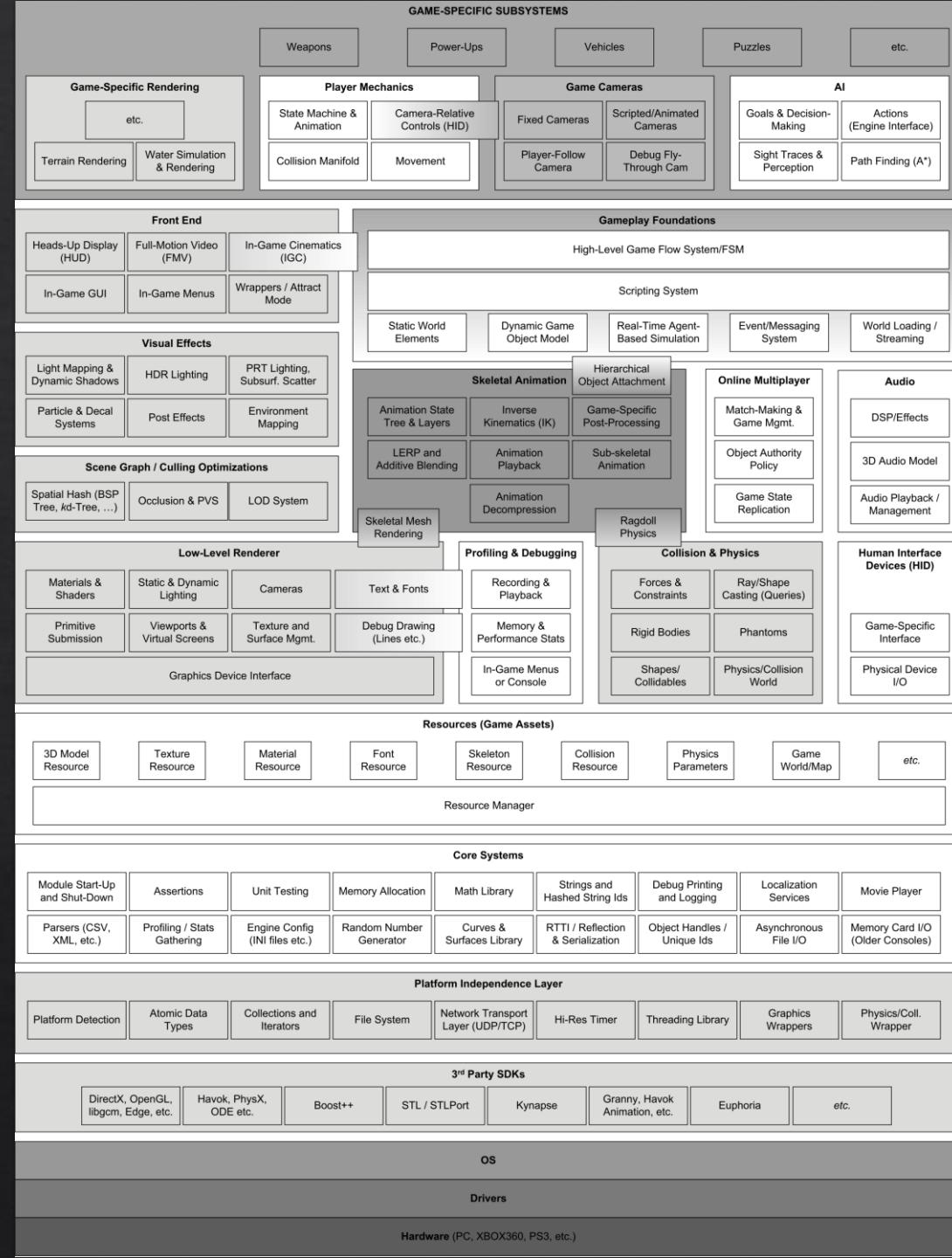




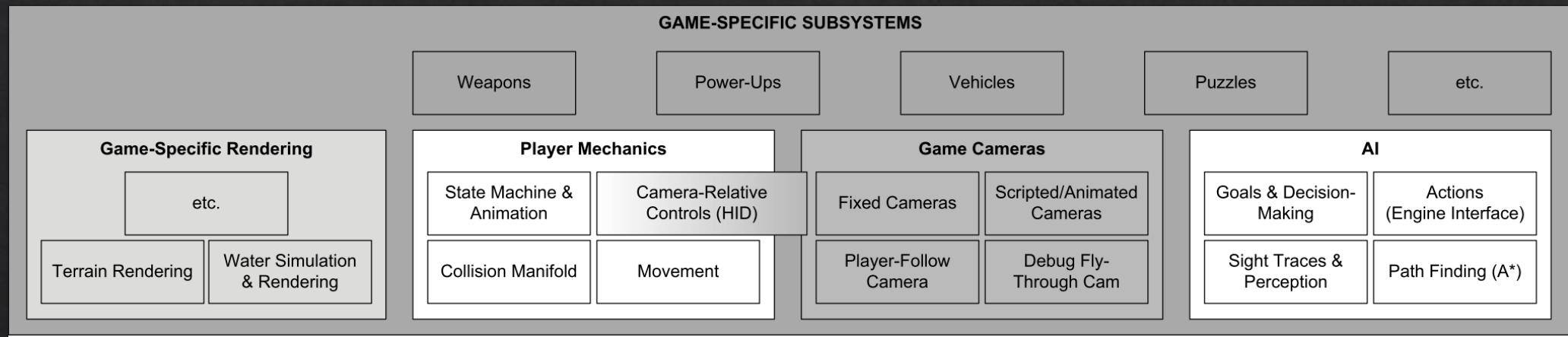
Tools and World Builder

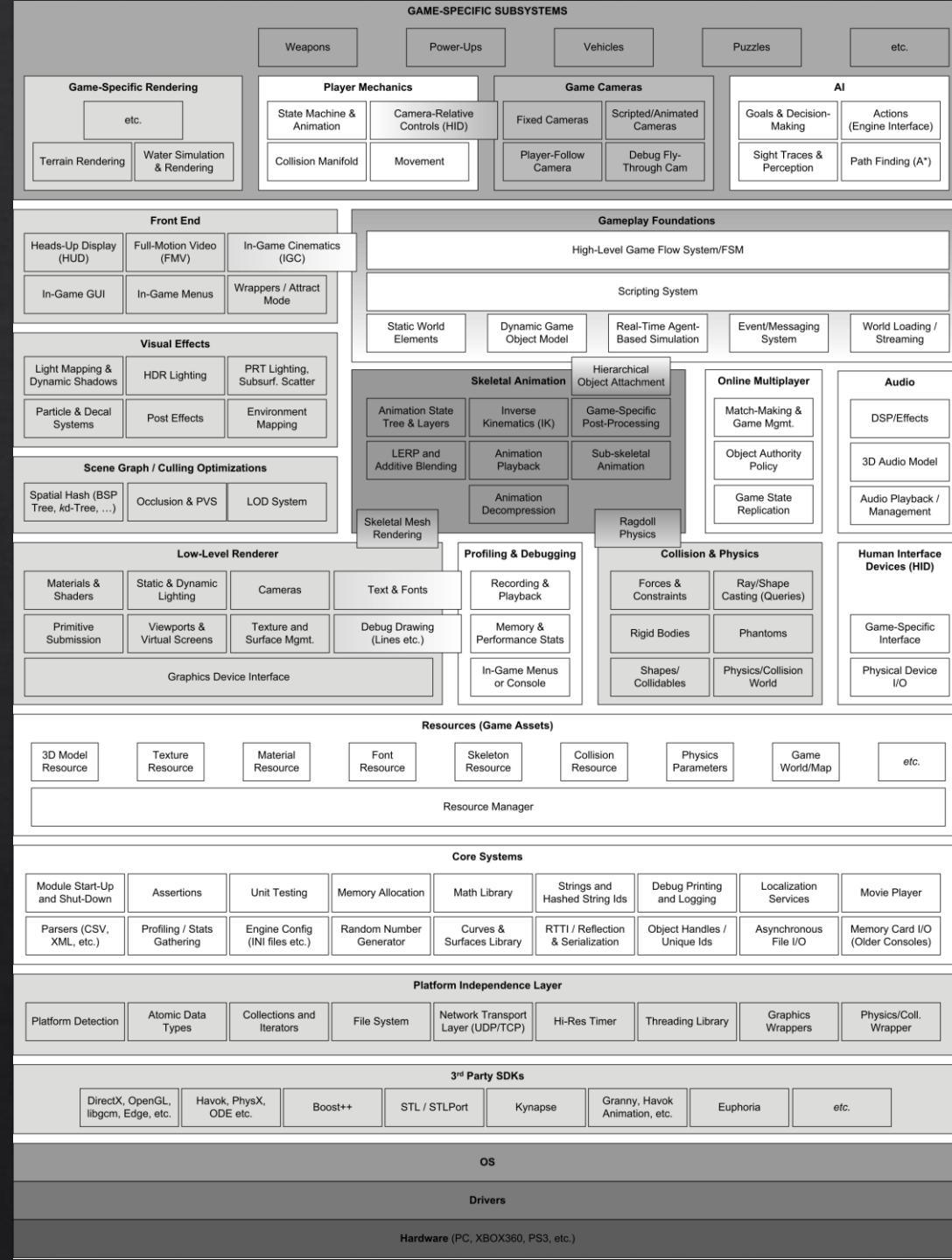
Engine

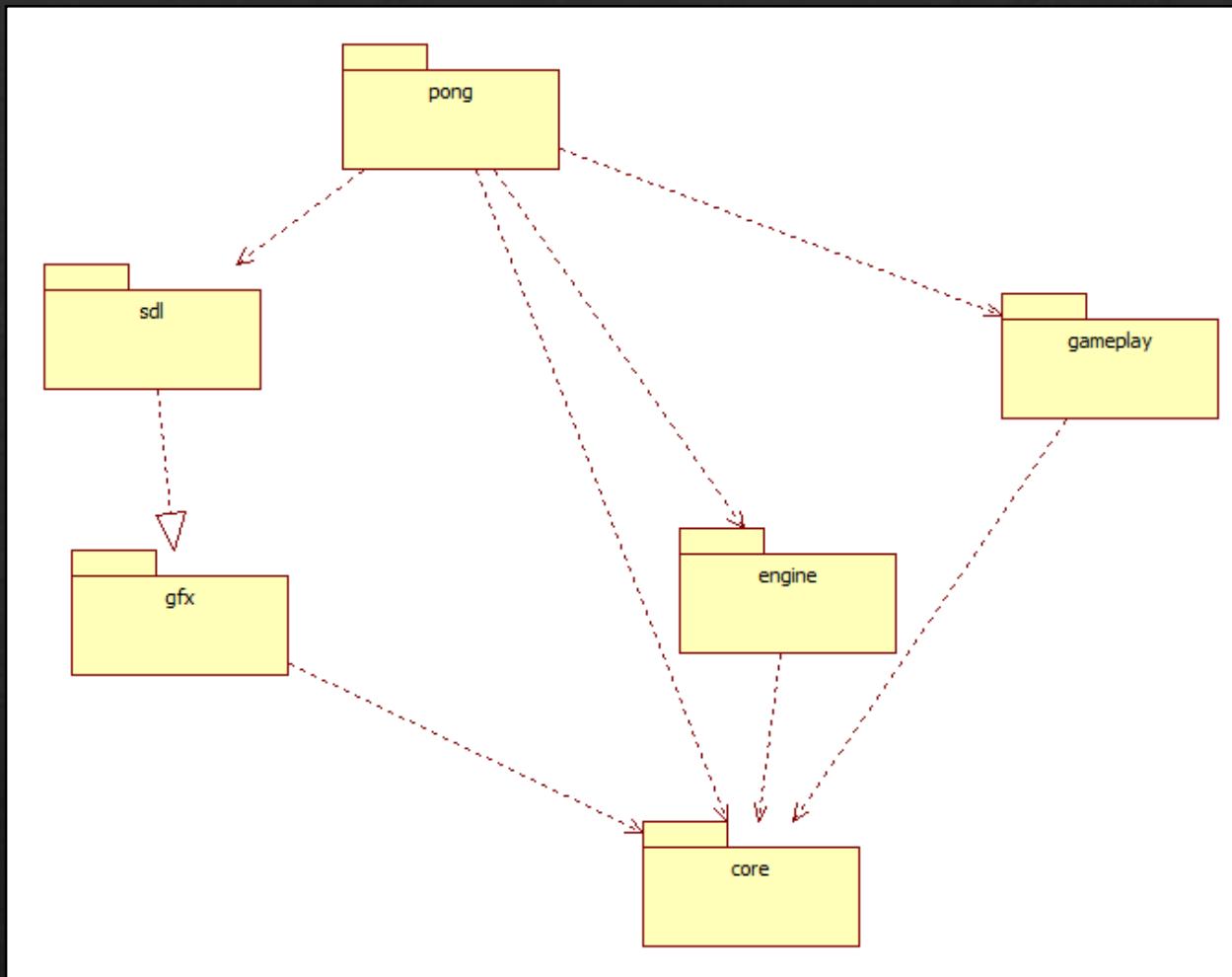


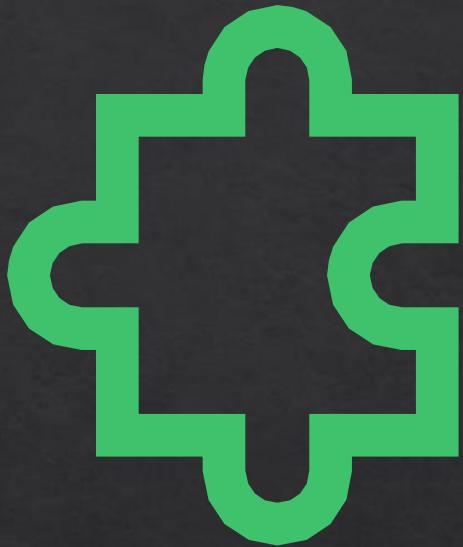


Gameplay









Arhitektura naše igre

Razvoj u Windowsu

- ❖ Visual Studio 2019
- ❖ git
- ❖ Organizacija projekta

Organizacija projekta

- ❖ Pitchfork - <https://github.com/vector-of-bool/pitchfork>

- ❖ engine/
 - ❖ src/
 - ❖ system1/
 - ❖ system2/
 - ❖ extern/
 - ❖ lib1/
 - ❖ lib2/
- ❖ game/
 - ❖ src/
 - ❖ system1/
 - ❖ system2/
- ❖ build/ & temp/
 - ❖ Not managed by git, results of the build process go here

git

- ❖ Git for Windows: <https://gitforwindows.org/>
- ❖ <http://gitignore.io/>
- ❖ GitHub / GitLab
- ❖ Initial commit

Visual Studio

- ❖ Creating a new project & solution
 - ❖ **Console application**
 - ❖ Windows desktop application

Configure your new project

Empty Project C++ Windows Console

Project name

Engine Ime biblioteke

Location

E:\sandbox\matf Putanja na disku



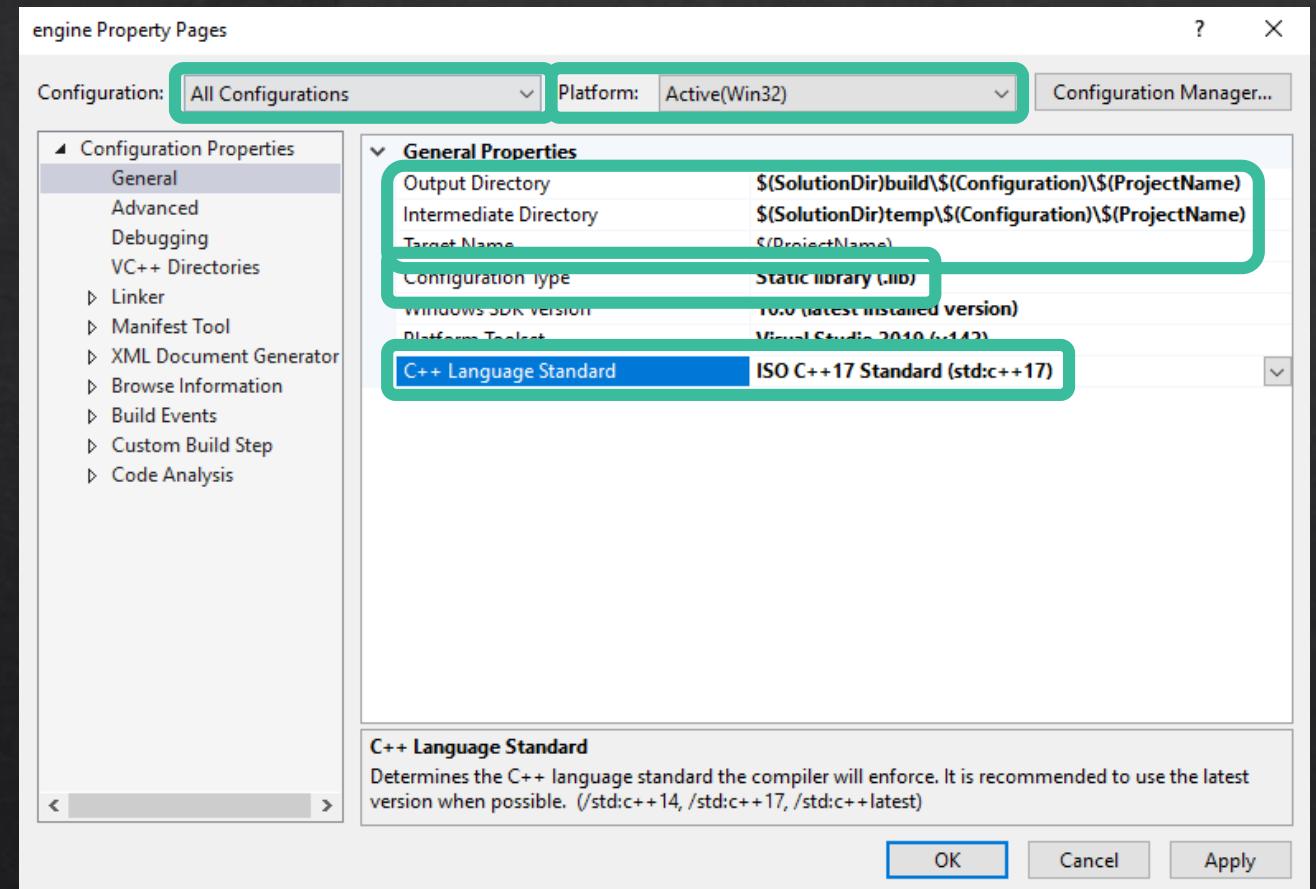
Solution name i

Game Ime igre

Place solution and project in the same directory

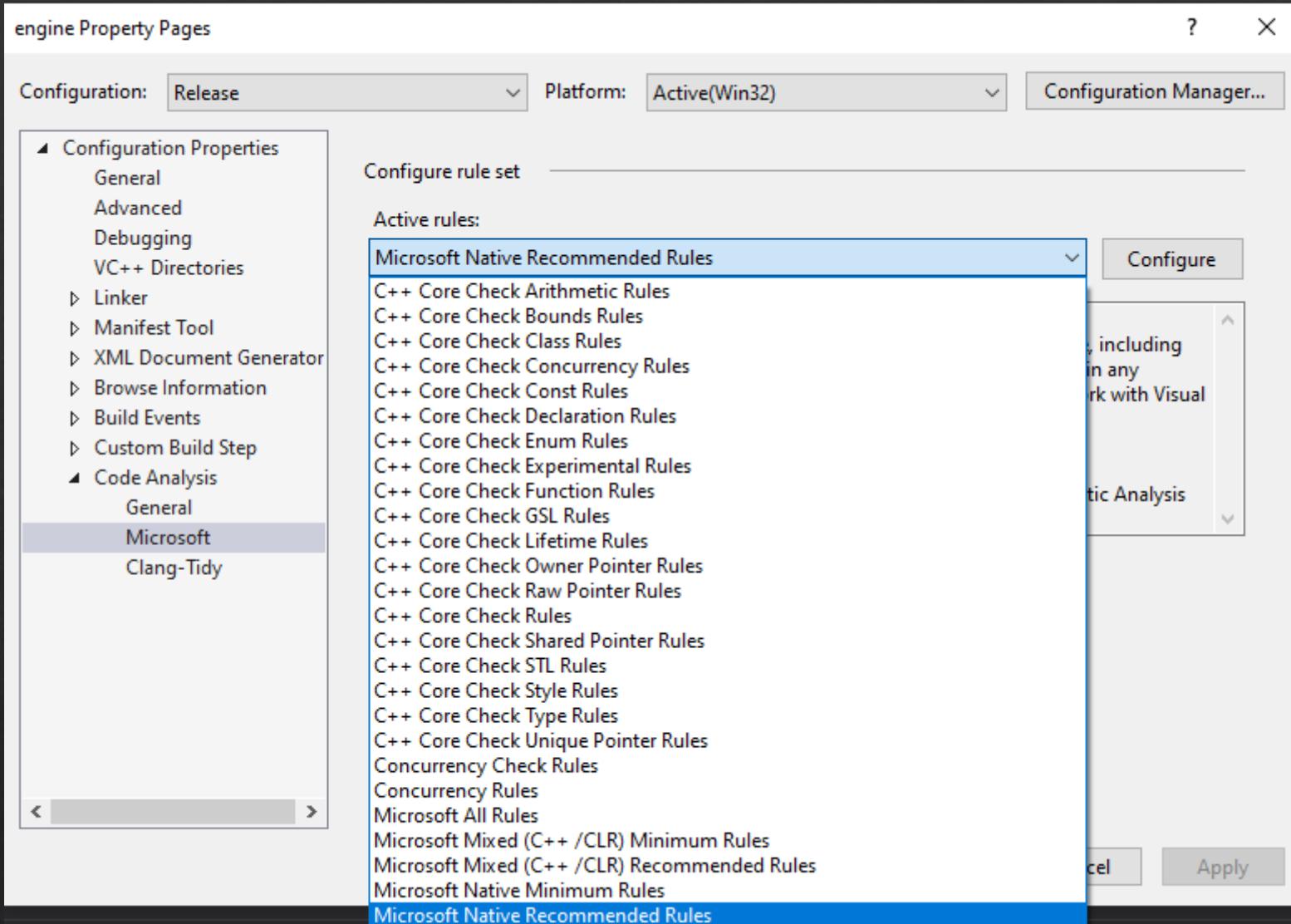
Visual Studio

- ❖ All Configurations
 - ❖ Debug
 - ❖ Release
 - ❖ ???
- ❖ Platform
 - ❖ Win32
 - ❖ x64
 - ❖ 🎮
- ❖ Configuration Type
 - ❖ Executable
 - ❖ Static library
 - ❖ Dynamic library



Visual Studio

- ❖ Nije obavezno
- ❖ Ne mora stalno
- ❖ Poboljšava kvalitet života
- ❖ Code Analysis
 - ❖ Microsoft Rules
 - ❖ Clang-Tidy



Coding Style

- ❖ Klase u Pascal Case: MyClass
- ❖ Funkcije i varijable u camelCase: myMethod
- ❖ Konstante u allcaps: const double PI=3.14159265358979323
- ❖ Atributi/članovi klase imaju prefiks m_: m_width
- ❖ Argumenti funkcija imaju sufiks: _: width_
- ❖ Svaki blok koda mora biti između { }
- ❖ Trudimo se da sve što može bude const
- ❖ Koristimo auto kad ima smisla

- ❖ Konzistentnost je najbitnija

main

- ❖ Entry point u program

- ❖ main vs wmain vs WinMain vs wWinMain

- ❖ int **main** () { ... }

- ❖ int **main** (int argc, char *argv[]) { ... }

- ❖ Domaći zadatak: CppCon 2018: Matt Godbolt “The Bits Between the Bits: How We Get to main()”
<https://youtu.be/dOfucXtyEsU>

Na sledećem
času

- ❖ Pravimo Logger
- ❖ Pravimo Application Layer, razdvajamo Engine i Game