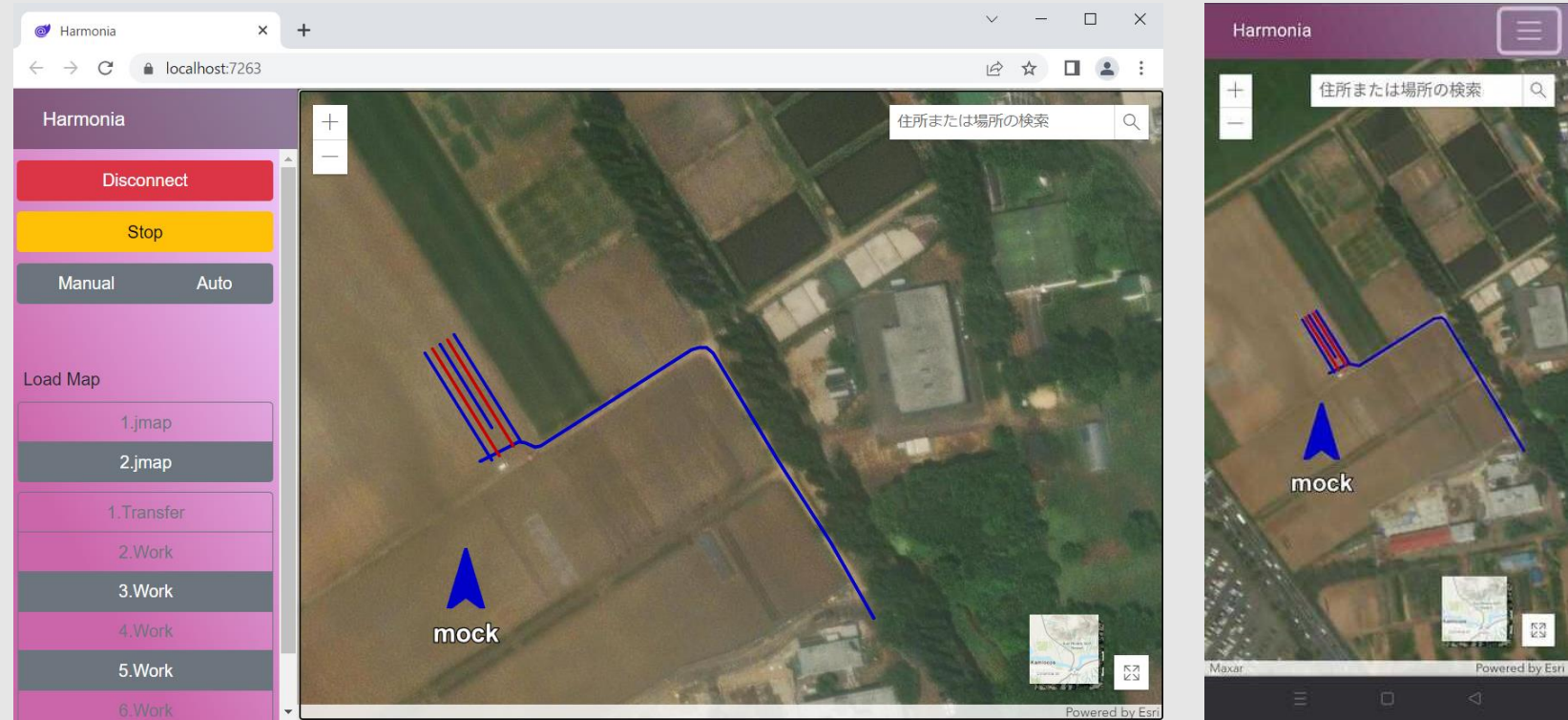# Harmonia

~ Handy & Responsive Monitor API ~

# What is Harmonia?

◆ "Harmonia" is a character from Greek mythology and the daughter of "Ares" ("Mars", in Roman region), who is closely associated with the laboratory of Vehicle Robotics.

◆ She is the god of harmony, which is exactly the concept that this repository is working on to harmonize all agents and other systems.

◆ This repository consists of following .NET projects.
- Harmonia.Core (common functions, classes, and configuration)
- Harmonia.RCL ("Razor Class Library" which includes web map API and  UI design framework)
- samples (parent and child process)

◆ The user interface will be written using .NET Blazor, but the agent processes can be in any language.

☐ GitHub: https://github.com/husty530/harmonia
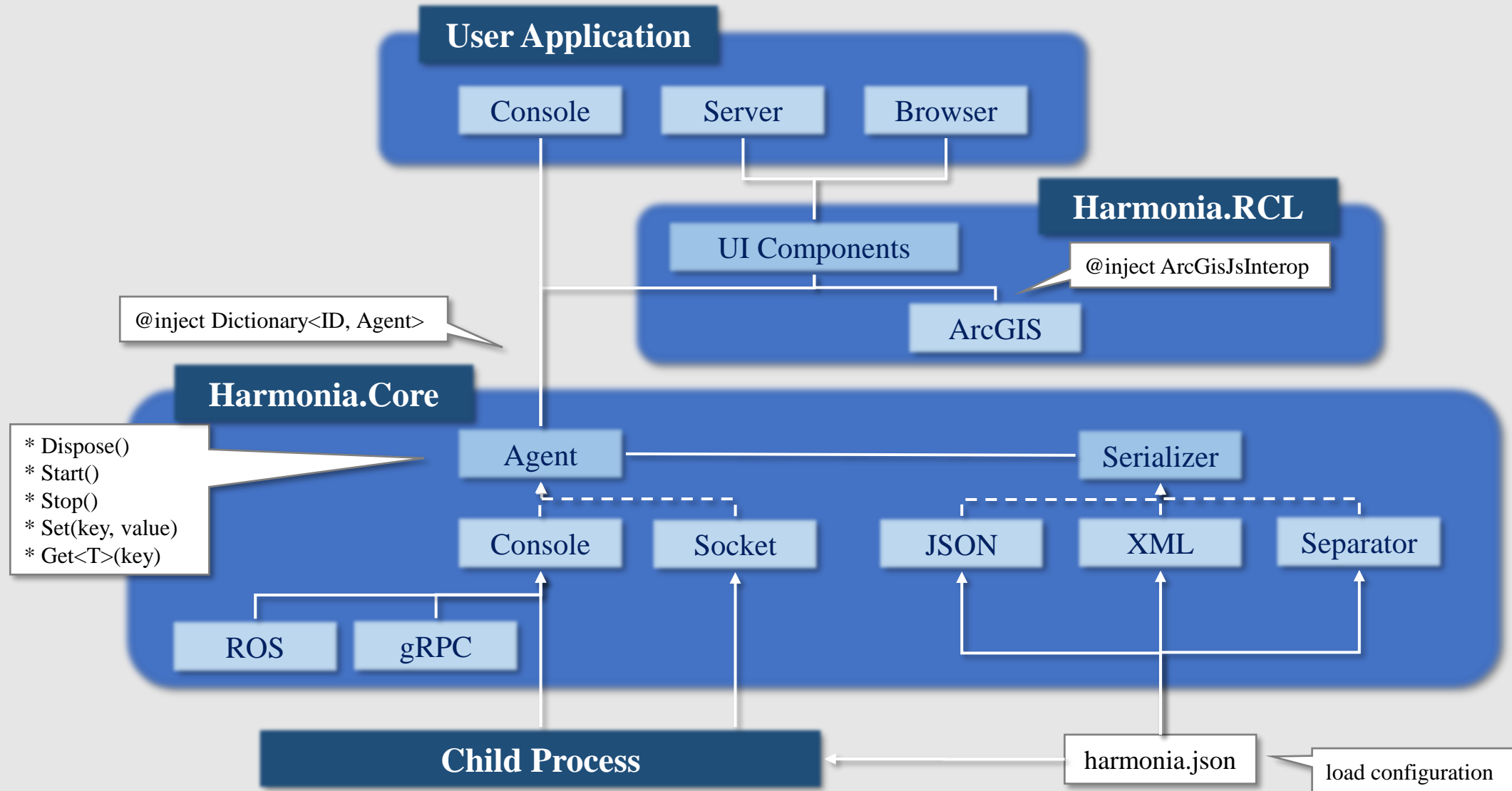☐ Author: Takumi Yamashita (husty530@gmail.com)

# Why Harmonia?

◆ Handy
- web interface

◆ Responsive
- data binding
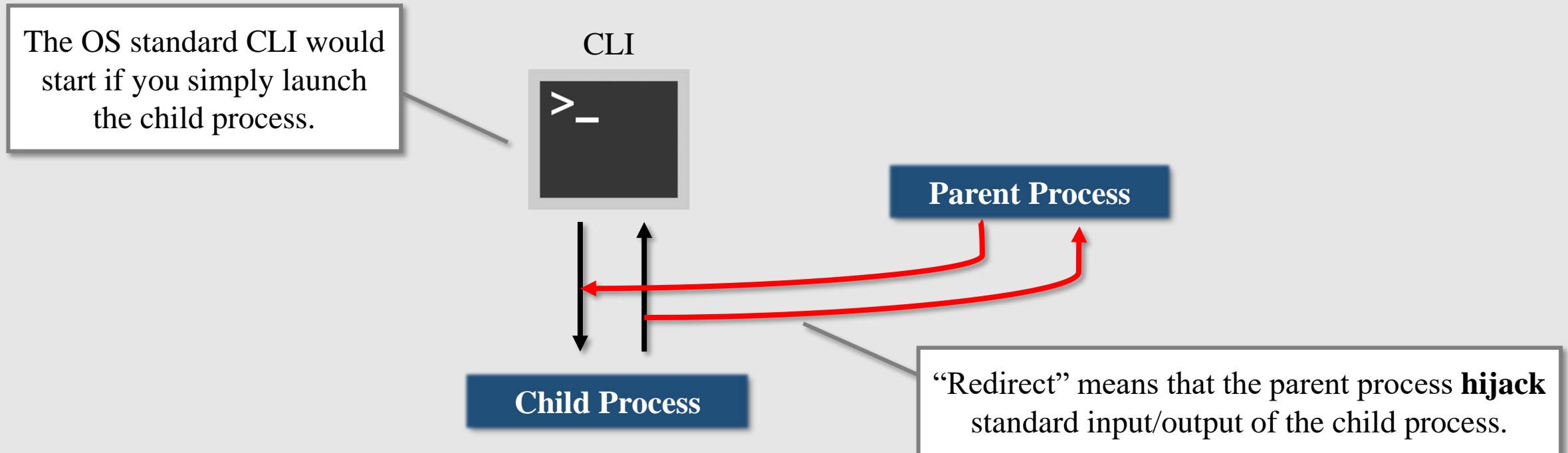


✓ Harmonia can monitor every agent state by redirecting standard input / output of the child process.
✓ This repository provides an easy way to create a unified monitoring system.

✓ Agent's state is described as a Dictionary<str, str>, therefore it can flexibly interconvert with JSON, XML, CSV, etc., and you don't need to consider any constraints in the design of the child process side.

# System Architecture

**User Application**

Console   Server   Browser

**Harmonia.RCL**

UI Components

@inject ArcGisJsInterop

ArcGIS

@inject Dictionary<ID, Agent>

**Harmonia.Core**

Agent   Serializer

* Dispose()
* Start()
* Stop()
* Set(key, value)
* Get<T>(key)

Console   Socket   JSON   XML   Separator

ROS   gRPC

**Child Process**

harmonia.json   load configuration

# About Std Input/Output Redirect

Harmonia.Core serves as a standard input/output redirector.

CLI

The OS standard CLI would start if you simply launch the child process.

**Parent Process**

**Child Process**

"Redirect" means that the parent process **hijack** standard input/output of the child process.

For detailed implementation references:
https://github.com/husty530/subprocess

# Use case

◆ Local server application which monitors a single agent

Web Browser Interface

https://x.x.x.x:vv

Server

Harmonia

**Child Process**
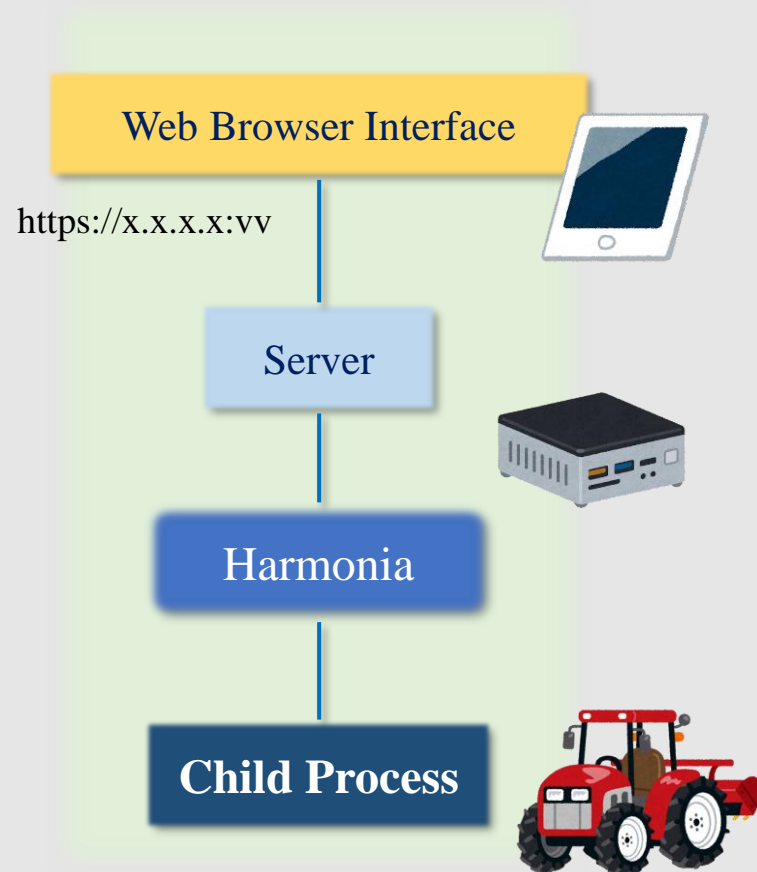
✓ Simply launch.

✓ Access the user interface via private network.

# Use case

◆ Remote server application which monitors multiple agents

| Client | Client |
|--------|--------|
| Server | Server |

Harmonia    Harmonia

**Child Process**    **Child Process**

Web Browser Interface

https://x.x.x.x:vv

Server

Harmonia

✓ Designed for multi-stage configurations.

✓ Stack custom layers recursively.