

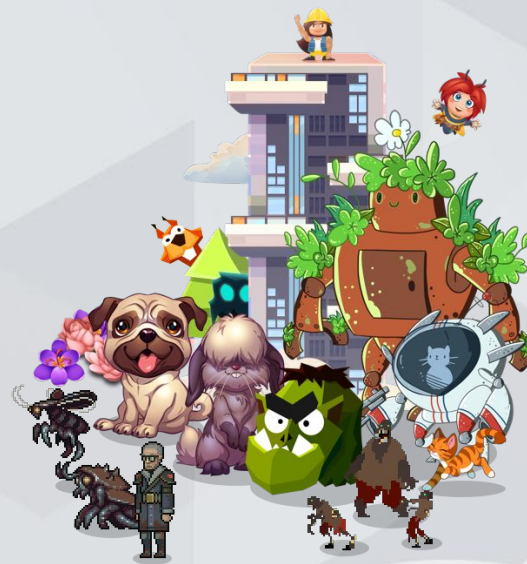
Defold Training - Day 1

<https://goo.gl/cpZCRx>



Agenda

- Welcome!
- Setup
- King and the Defold Story
- Hands on - Introduction to Defold
- Lua in Defold
- Hands on - Creating a game
- Games showcase
- Advanced topics



The background is a solid blue color with a subtle geometric pattern. A large, three-dimensional cube-like shape is centered in the frame, rendered in a lighter shade of blue to create a sense of depth. The word "Welcome" is written in a clean, white, sans-serif font, positioned in the center of the image.

Welcome



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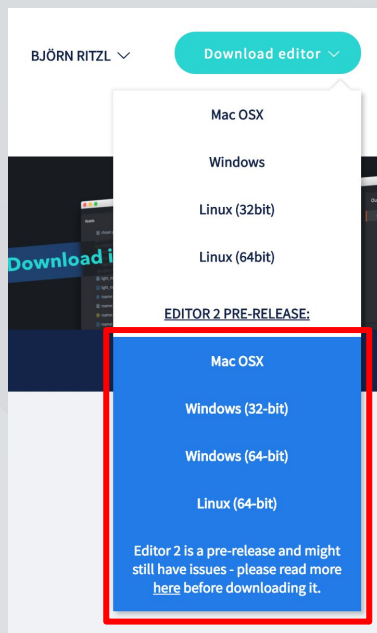
Sven Andersson

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Setup

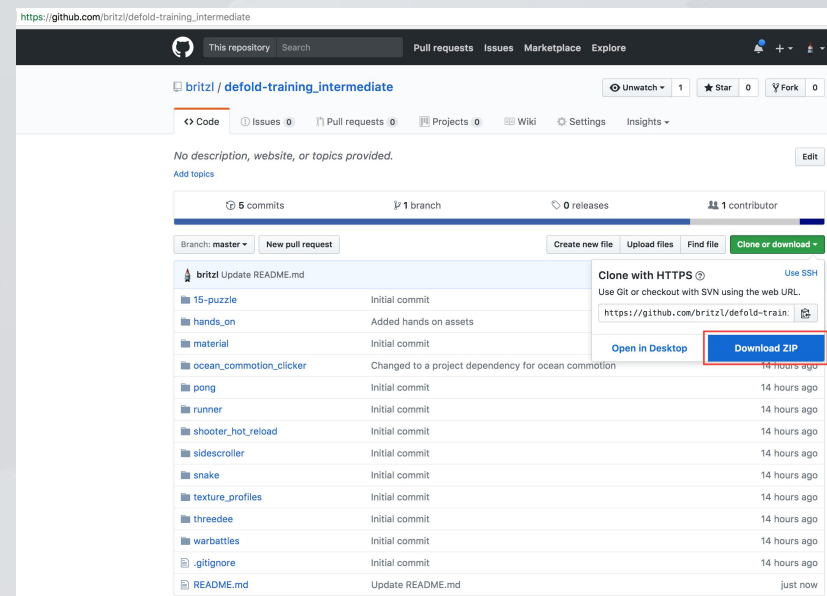
1) Download Defold

<https://dashboard.defold.com>



2) Download Sample Projects

<https://goo.gl/cpZCRx>



About King and Defold



Hands on - Introduction

Hands on introduction to Defold

Create a project

Working with the editor

Core concepts

Cross platform - bundling an application

Where to learn more

- Defold manuals: <https://www.defold.com/manuals/introduction/>
- API reference: <https://www.defold.com/ref/>



Lua in Defold

Lua in Defold

- Short intro to Lua
- Lua in Defold

What is Lua?

- Scripting language, similar to Python, Ruby and JavaScript.
- Lua is designed, implemented, and maintained by a team at PUC-Rio, the Pontifical Catholic University of Rio de Janeiro in Brazil
- "Lua" (pronounced LOO-ah) means "Moon" in Portuguese.
- Lua is widely used in games.



Why use Lua?

- **Lua is Fast**
 - Beats almost every other scripting language
 - Near C performance in many cases
- **Lua is Portable**
 - Runs on all flavors of Windows, Unix and microprocessors
- **Lua is embeddable**
 - Easy to extend programs written in other languages
- **Lua is small**
 - Add between 300kb to 600kb to main executable
- **Lua is free**
 - Open-source MIT license

Lua characteristics

- **Untyped (dynamic)**
 - Values carry the type, not the variables
- **Interpreted**
 - Bytecode as intermediate format
- **Procedural**
 - Functions are first class citizens
- **Simple syntax**
 - Human readable and without cryptic semantics
- **Small set of general features**
 - Adaptable to solve domain specific problems

Lua in Defold - script types

Defold has four different types of script files:

1. `*.script` files - Game objects
2. `*.gui_script` - GUI components
3. `*.render_script` - Rendering pipeline
4. `*.lua` - Modular Lua code

Lua in Defold - lifecycle functions

The engine hooks into the scripts using these functions:

- `function init(self)`
- `function final(self)`
- `function update(self, dt)`
- `function on_message(self, message_id, message, sender)`
- `function on_input(self, action_id, action)`
- `function on_reload(self)`

Lua in Defold - callback driven code

Prefer to let the game engine do the work and notify the game code when something interesting happens:

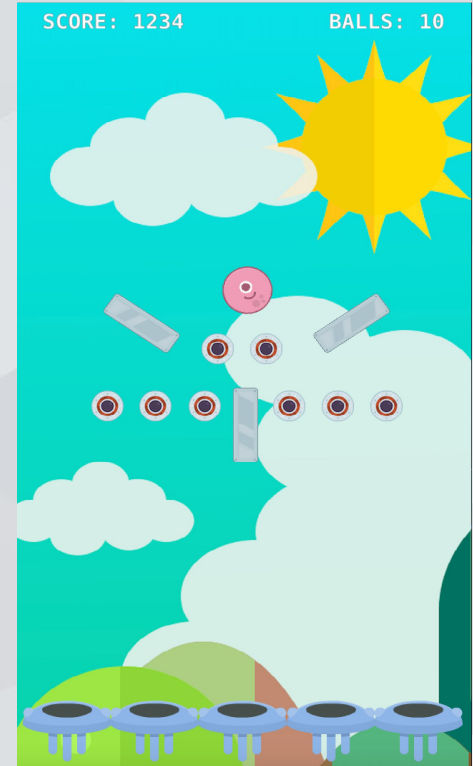
- Input received (keyboard, mouse, gamepad, touch)
- Collisions detected
- Animations have completed
- System events
 - Window resize
 - Purchase
 - Push notification



Hands on - Creating a game

Hands on - Creating a game

- User input
- Spawning of game objects
- Physics and collisions
- Particle effects
- Sound effects
- Score counter



101 games



Blossom Blast SAGA

287

286

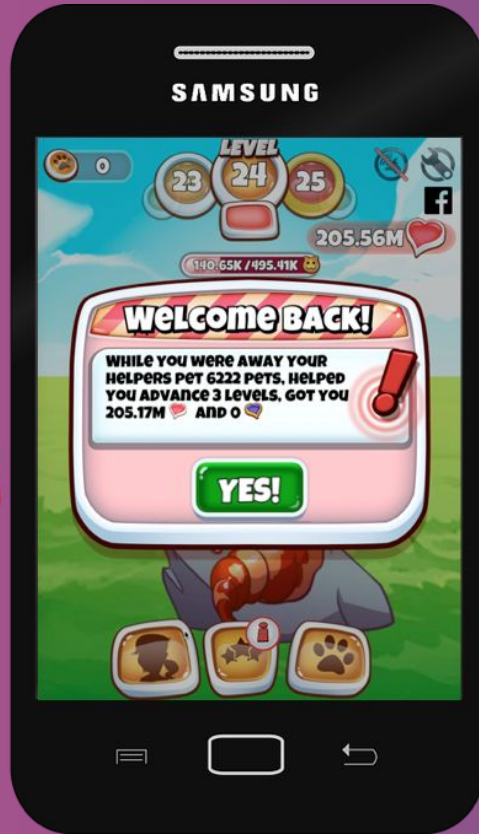
285



BRING ME CAKES

Red Riding Hood Puzzle





\$450



TALK TO CHASHIN





ROBO Settlers





The image shows a large, complex industrial control panel, likely for a power plant or nuclear reactor. The panel is filled with numerous buttons, lights, and displays. At the top, there are several rows of buttons labeled with numbers and codes, such as "325 RHR / CS-B", "326 RHR / CS-B", and "ECCS-B". Below these, there are several rows of buttons labeled with "CONTAINMENT ATMOSPHERE". The panel also features several large displays, including a central one with a yellow background and two smaller ones on the right. The right side of the panel is dominated by a large array of buttons, many of which are illuminated with red or green lights. The overall appearance is that of a highly sophisticated and complex control system.

Advanced topics

Advanced topics

- Render scripts and Materials/Shaders
- Profiler
- Hot-reload
- 3D
- Native Extensions

Advanced topics - Render scripts and Materials

- Render Scripts
 - Scriptable rendering loops; control the rendering of one frame in Lua.
 - Render state setup and issue draw commands.
- Tags, Materials and renderable components
 - Draw commands need to specify a “predicate” for the engine to know what objects to render.
 - A predicate can be one or more tags.
 - Tags are set on materials, and materials are used by renderable components; such as sprite, GUIs and particles.

Advanced topics - Render scripts and Materials

Materials

- Tags
- Shader resources (vertex + fragment shader files)
- Uniform configurations (matrices supplied from engine, or own vec4 inputs)
- Texture/sampler configurations

DEMO: geometrywars

Advanced topics - Profiler

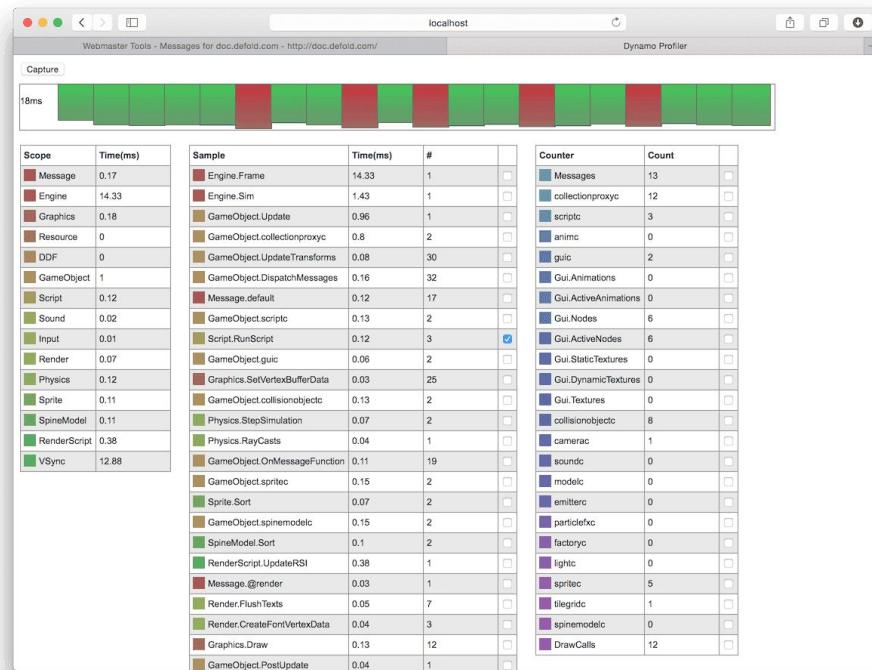
Web profiler

- Browser based

localhost:8002

device_ip:8002

- Captures 20 frames

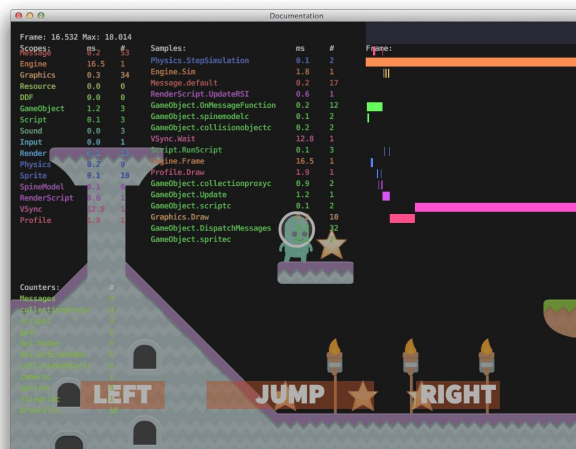


Advanced topics - Profiler

On screen profiler ([manual](#))

- Enabled via a message:

```
msg.post("@system:", "toggle_profile")
```



Advanced topics - Hot-reload

Hot-reload: Reload changed assets into a running game

- Tweak script values
- Tweak shader code
- Setup a specific game state
- Debugging

PROJECT: shooter_hot_reload

Advanced topics - 3D

3D in Defold? Yes!

- Model components
 - Mesh (Collada) - Only required input
 - Skeleton (Collada)
 - Animations (Collada or AnimationSet)
 - Default animation
 - Textures



PROJECT: threedee

Advanced topics - Native Extensions

Makes it possible to write runtime extensions in C/C++ (and Java for Android)

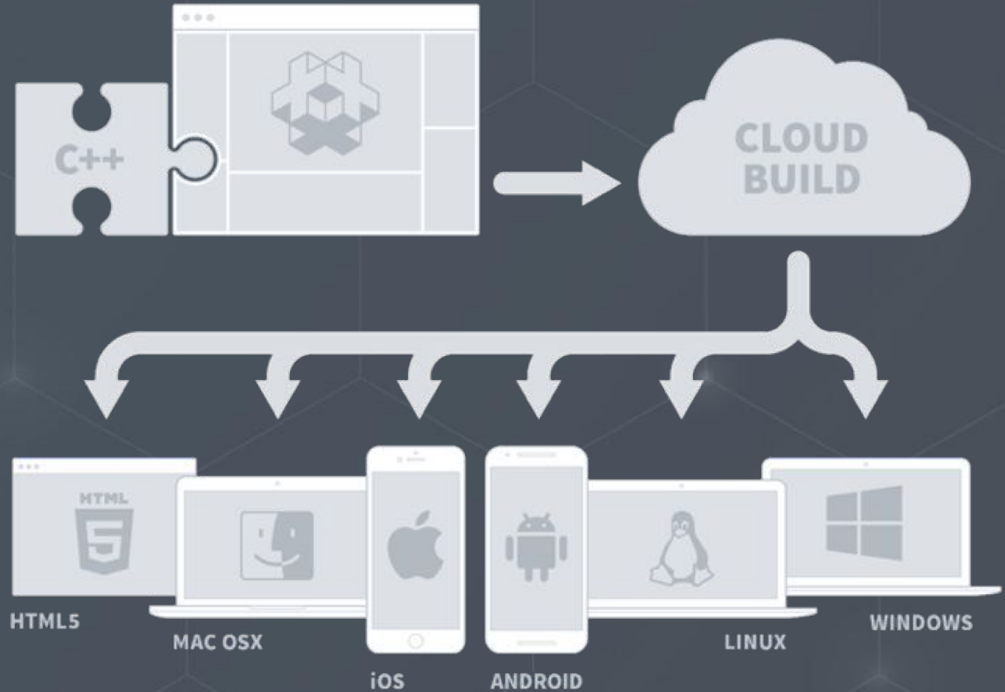
- Access native functionality currently not exposed in Defold
 - Examples; Vibration API, camera/photos access etc
- Perform performance critical computations
- Incorporate third-party C/C++/Java libraries
- Extension source is included in project directory/structure, will synchronize with rest of team just as all other resources.
- No need for build tools/pipeline setup, every extension is built on our cloud build server for all platforms.

DEMO: facesnap

Advanced topics - Native Extensions

Extend the engine with C, C++,
Obj-C, Java and Javascript
(Defold SDK)

Cloud build (zero config)



Advanced topics - Native Extensions

Community created extensions



That's it for today!
Thank you!
Q&A

