

# GOTO

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**Run Automated Tests  
on a Unity Game**

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# 398,640,575 Tests



# Abstract

- Hands-on demo about automated unit tests on a Unity game, using the **Test Runner** to run tests using the **Unity Test Framework (UTF)** on a real video game project.
- This talk does not require any knowledge of Unity or game development in general



- We will demonstrate **how to write tests** using the test framework and **build and run your tests** on either EditMode or PlayMode.
- We will also demonstrate **how to run the tests from the command line**, and **set up your own CI** to run Unity tests.



# Christian

Senior Software engineer  
Unity

- Speciality in Automated testing
- Software developer with 9+ years of commercial experience
- Hobby interests in mods/addons and game development

He works inside Test Platform team → responsible for maintaining the Unity Test Framework



# Florence

Senior Software engineer  
Unity

- 10+ years in software development and QA
- Designs internal training programs for Unity infrastructure
- CI/CD and test automation enthusiast

Works in Developer velocity team

→ leverages tooling and improves processes to deliver better software, faster



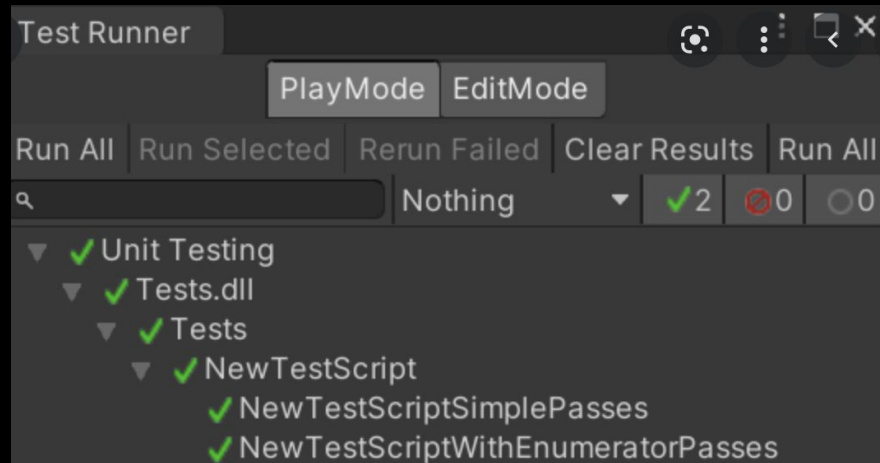
# 1. UTF, the UTF Package

UTF acronym means [Unity Test Framework](#)

- library based on NUnit that allows you to test your Unity code in EditMode and PlayMode
- also allows you to target platforms such as Standalone, Android, iOS, etc.

Available as [UTF Package](#) → customer-facing **Unity Package**

- also provides a UI to run these tests from the Unity Editor
- [Test Runner](#)





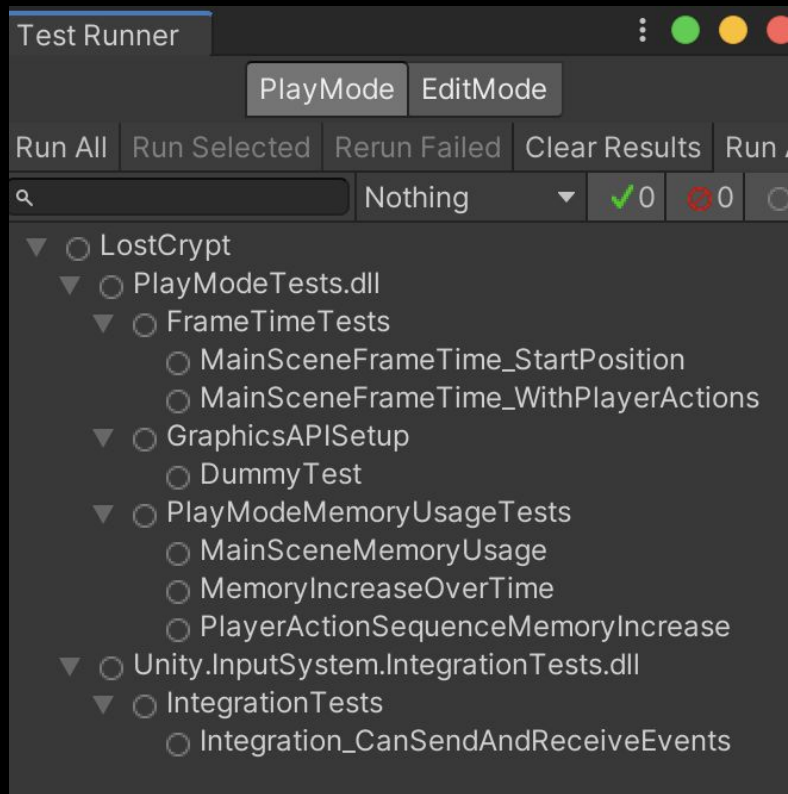


## 2. Test Runner

Using the Test Runner, you can

- execute the tests
- gather tests results

Pro tip: Attach the script debugger to the Editor to debug your tests.





### 3. EditMode and PlayMode

#### EditMode

- runs on the Unity editor and has access to Editor code
- Linux, MacOS, Windows
- used to test Editor extensions

#### PlayMode

- runs on a player (standalone) or through the Editor
- requires a player build
- all editor platforms + supported platforms (Mobile, WebGL, Consoles...)
- used to test the game itself

You can trigger automated tests through the UI, or using the command line.



### 3. What do we test automatically in a game?

#### Unit Tests

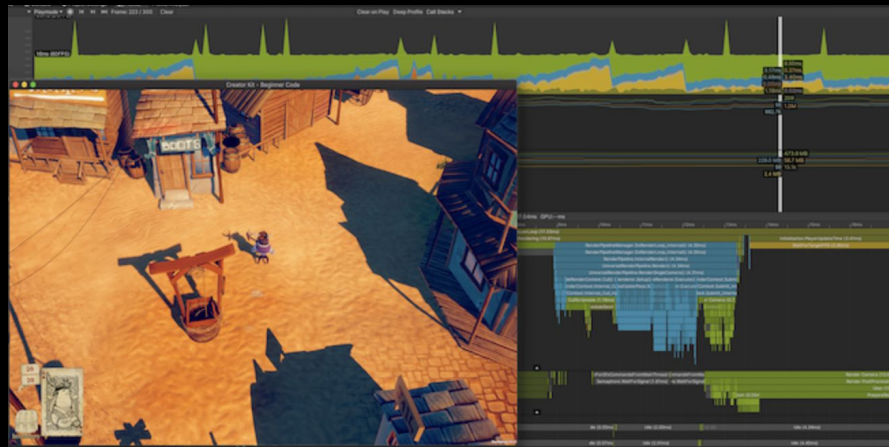
- Feature testing
- Rendering
- Level generation
- Serialization / deserialization

#### Integration Tests

- validate complex scenarios
- confirm bug fixes
- high coupling, high maintenance

#### Performance

- CPU / GPU usage
- Physics
- Audio
- Stress Tests





## 4. What do we test automatically in a game?

### Networking

- if multiplayer, runs correctly with several players
- reports data as expected

### Compatibility

- builds and runs on all supported platforms (25+ platforms)
- test on different hardware, graphics configurations, devices and headsets...





## 5. What do we test manually?

### Play Tests & Exploratory testing

- UI / UX Experience
- game coherence (difficulty, graphics, storytelling)
- advanced network testing (difficult to automate)
- game experience



## 6. Unity Profiler

The **Unity Profiler** collects data about your game performance and gives you the opportunity to investigate different performance areas

- automated testing through [low level native plugin Profiler API](#)
- manual testing through Unity Profiler window
- CPU / GPU usage
- Network bandwidth
- Memory usage

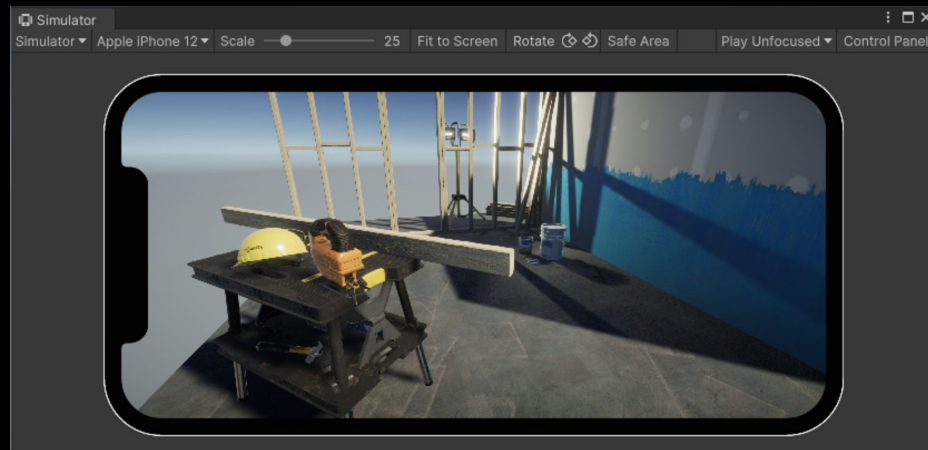




## 7. Device Simulator

The **Unity Device Simulator** allows you to visualise what your application would look like on different types of devices (iOS, Android)

- no physical device needed
- visualise game on device
- simulate device-specific behaviours
- simulate touch input
- useful for manual testing

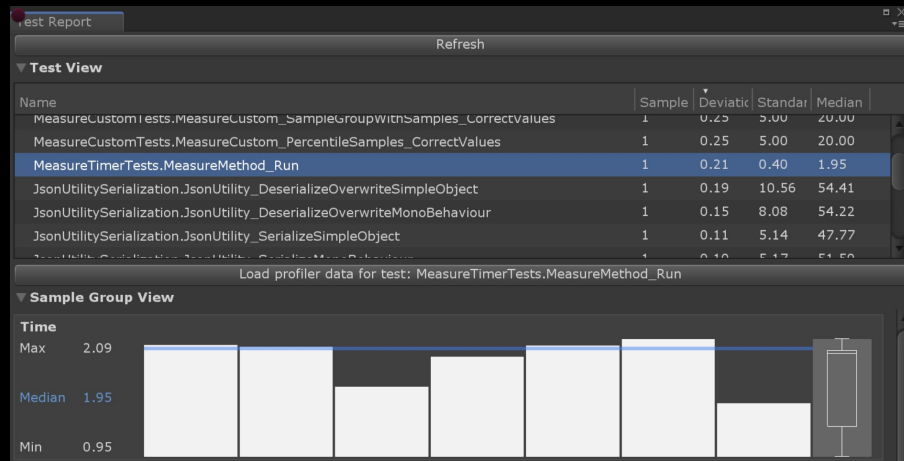




## 8. UTF Performance Testing extension

Unity package that allows you to investigate different performance areas using the [Unity Profiler](#), and other custom metrics outside of the Profiler.

- measure performance of the Unity Editor or built players
- run tests using the Test Runner
- perfect for collecting performance data on a nightly CI
- generates performance testing report







# 10. Demo project

## Lost Crypt

- Unity 2D Sample project
- runs on all Desktop platforms + iOS and Android
- available through the Unity Asset Store and GitHub
- no license or subscription required (free access)

## Setup

- Unity LTS 2020.3
- download the project through the Asset Store
- check the automated tests already available for the game





## 10. Demo time

→ automated tests  
on Lost Crypt project

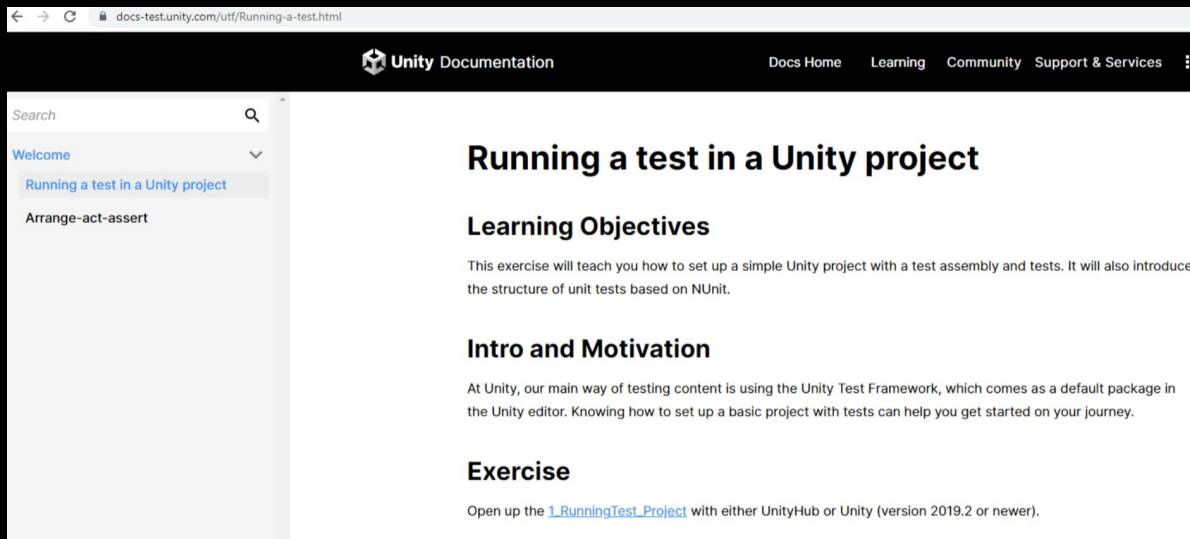




# Acknowledgements & Future plans

Special thanks to **Giovani Galicia** who reviewed our content and masterclass program.

We hope to make the **Unity Test Automation masterclass** available through the Unity Package manager soon (for free)!





# Questions?



Don't forget to  
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