

Unity Best Practices

Performance

Unity Best Practices

- <https://storm8.atlassian.net/wiki/display/UNITY/Best+Practices>
- <https://storm8.atlassian.net/wiki/display/UNITY/Performance+Guide>
- <https://storm8.atlassian.net/wiki/display/UNITY/UI+Optimization+Guide>
- <https://storm8.atlassian.net/wiki/display/UNITY/Hidden+Allocations>

Presentation

- these slides

DebugObjectLogger Tool

- <https://storm8.atlassian.net/wiki/display/UNITY/GameObject+Profiling>

Incorporating Unity's advice to optimize our games and upcoming Unity on-site

- <https://storm8.atlassian.net/browse/PIPE-399>

General Goals

- Fewer GameObjects, Update()s and coroutines
- Never use LINQ or features that cause hidden GC
- Pool/recycle GameObjects as much as possible
- Limit use of GetComponent() and GetComponent()
- Try not to use Find() or FindObjectsOfType() at all
- Use basic for () and while () loops instead of foreach
- Try to batch UI and objects as much as possible
- Don't use GameObjects for non-visual purposes
- Don't use reflection methods such as GetMethod()

GameObject

Update()

Coroutine

GameObject

GameObject

FixedUpdate()

Coroutine



These aren't inherently bad

The key is “everything in moderation”

Alternatives



A large green recycling symbol, consisting of three chasing arrows forming a triangle, is centered in the background. Overlaid on the center of the symbol is a black rectangular box containing white text.

**Re-use GameObjects
as much as possible**



Re-use GameObjects as much as possible

Instead of creating new ones each time



A man in a dark suit is walking on a city street. He is holding a notepad and a pen in his right hand and a laptop in his left hand. The background shows tall buildings and other pedestrians. A large black rectangle with white text is overlaid on the image.

**Use Controllers to
do the work**

A man in a dark suit is standing on a city street, looking down at a smartphone in his hands. The background shows tall buildings and a busy street with cars and pedestrians. The image is split horizontally by two black text boxes.

Use controllers to do the work

Instead of each object having an Update()

GameObject.Find()

GetComponent()

AddComponent()

foreach ()

FindObjectsOfType()

HasComponent()

LINQ



Restrictions

Never use `GameObject.Find()` or `FindObjectsOfType()`

Only use `GetComponent()` and `AddComponent()` in `Awake()/Start()`

Don't use LINQ (S8Linq OK) or "foreach" (creates GC)



A man in a dark suit and tie is sitting on a tall, thin wooden stool. He is holding binoculars to his eyes and looking towards the horizon. The background is a vast, flat, light-colored landscape under a clear blue sky. A large, solid black rectangular box is centered over the image, containing white text.

**Don't use
GameObject.Find()**

A person in a dark suit and tie is shown from the chest up, looking through binoculars. They are positioned in the upper center of the frame. The background is a clear, light blue sky. Below the person, a blurred wooden stool is visible. Two black rectangular boxes with white text are overlaid on the image. The top box contains the main title, and the bottom box contains a subtitle.

Don't use GameObject.Find()

Connect property “outlets” in the scene



A 3D rendered image of a heavy metal chain. One link in the upper right portion of the chain is broken, with several small metal shavings flying away from the point of fracture. A solid black rectangular box is centered horizontally across the middle of the image, containing white text. The chain continues from the bottom left and top right corners of the frame.

Don't use System.Linq



Don't use System.Linq

But Storm8.S8Linq is OK

DrawCall()

DrawCall()

DrawCall()

DrawCall()

DrawCall()

DrawCall()

DrawCall()





**Batch Draw Calls
as much as possible**





Batch Draw Calls as much as possible

Draw calls are expensive, fewer the better



A photograph of two white cats sitting on a brown, textured ledge. A mirror is positioned in front of them, reflecting their faces. The cats are looking directly at the camera. A black rectangular box with white text is superimposed over the middle of the image.

**Don't use Reflection
until last resort**

A photograph of two white cats with green eyes looking over a dark ledge. In the background, a gold chain hangs vertically. The image is used as a background for a text overlay.

Don't use Reflection until last resort

Reflection is slow, and can bloat binary