Unreal Engine 5 - Lesson 7 - UI & UMG

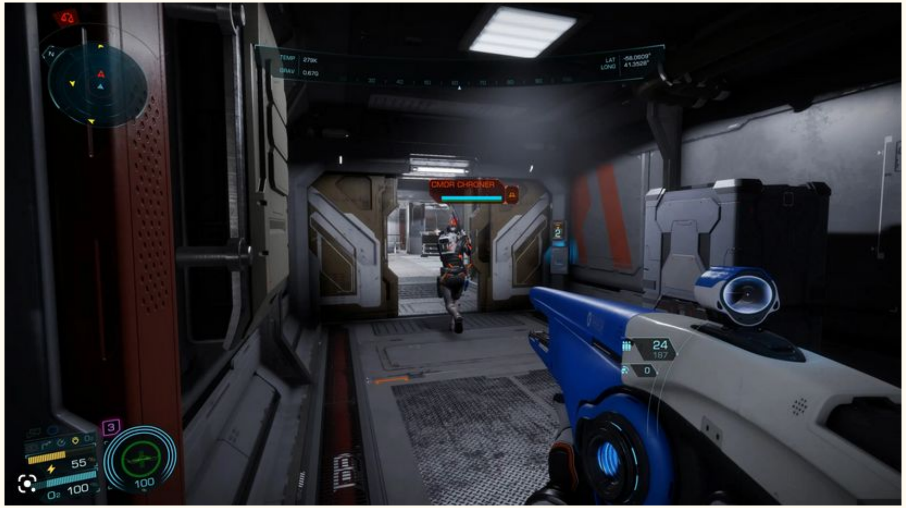
Nicolas Serf - Gameplay Programmer - Wolcen Studio
serf.nicolas@gmail.com

Summary

- HUD
- UMG
  - Designer View
  - Nesting and Slots
  - Anchors
  - Clipping
- User Widget
- C++ for UI
  - UMG and Slate
  - UserWidget in C++
  - UWidget in C++
  - Slate in C++
- Optimization
  - Event Driven Update
  - Loading & Construction
  - Layout & Positioning

HUD

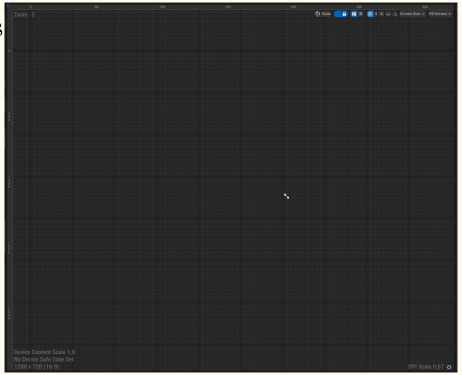
- First things first, we'll talk about the **HUD** standing for **Head Up Display**
- HUD is basically the **interface** that **allow** your game to **transfer information** from the **gameplay** to the **player** in front of the screen
    - Health bar
    - Experience bar
    - Skills
    - Etc...
- Most **likely**, **HUD** is a **cosmetic only** thing that is always display on screen and is **free of user interaction**
    - **Inventory** is for example **not an HUD thing** as it requires **interaction** with player and is not always displayed
- It is important to understand that **AHUD** is a **legacy class** from **UE3** and **UDK**
    - It was **created before UMG** get introduced and facilitate by a lot interface development on the engine
    - It is kind of **replace** by **UMG** but it is still **part** of the **engine** and **gameplay framework**
    - It has some **uses**
- **HUD** can be accessed from anywhere as it is part of the **gamemode** for the **CDO**, and part of the **player controller** as the **instantiation**

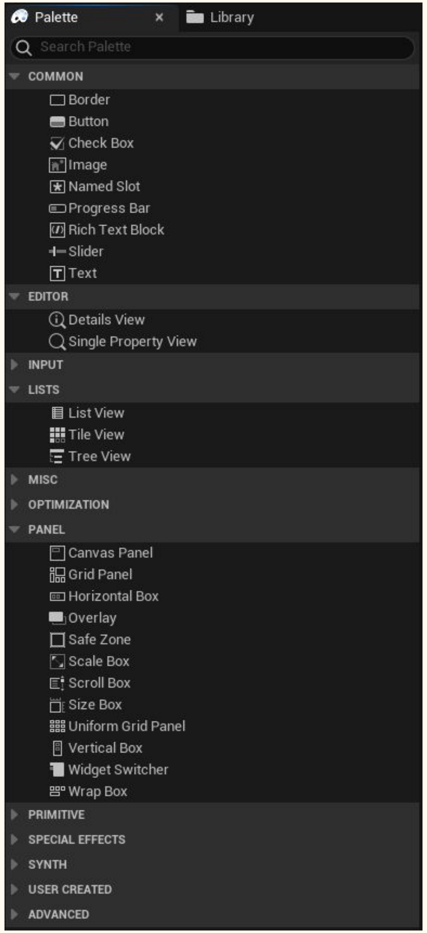


UMG

- **UMG** stands for **Unreal Motion Graphics**
- UMG is the name given by Unreal to there **latest UI system**
- **Before UMG**, UI create was more **cumbersome** and **less visual**
- It is **built on top** of the already existing **Slate system**
  - Slate being the **old system** doesn't mean it's **obsolete**. It is needed for **more complex functionality** for UIs
  - **Unreal editor** is also **built** on **slate**

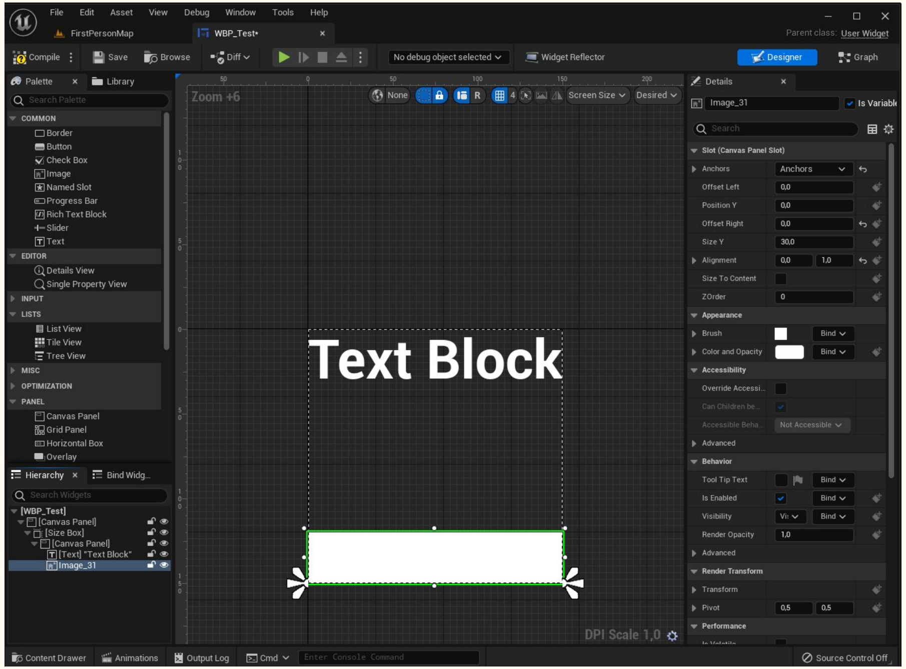
- UMG system can feel quite **daunting** at first with all options
- It **offers** a proper **interface** in order to create your user interface : The **Designer View**
- It offers a **Graph View** like **standard blueprint**, which is directly **linked** to the **panel** you create in the **designer view**
  - You can set your **logic** in it
  - You can **control** how the widget **behave**
  - Etc...





Designer View

- Let's see how the designer view is composed
- **Palette**
  - It **lists** all **widgets** that are available to you
  - Keep in mind that you can **create custom widget** which will also appears here
  - From Engine's widget are already **stored** in **section**
- **Hierarchy**
  - It is the treeview of your **UserWidget**
  - **UserWidget's root** is at the very **top** and can't be **alter**
  - Widget in bold are "IsVariable" widget
    - It means that this **widget will appears** in the **Graph view** variable and be accessible to **interact** from your **blueprint code**
- **Viewport**
  - It is where you **design** the layout of your UI
  - A **selected widget** will be shown with **green border**
- **Details**
  - It shows **property according** to the **selected widget**
  - It will **differs** from **widget to widget**
  - It is much like a standard **detail panel**
- **Animations**
  - It list animations within the current **UserWidget** and **Timeline** allows to show the **currently selected anim**



[WBP_Test]
[Canvas Panel]
[Size Box]
[Canvas Panel]
[Text] "Text Block"
Image_31

Image_31 ✓ Is Variable

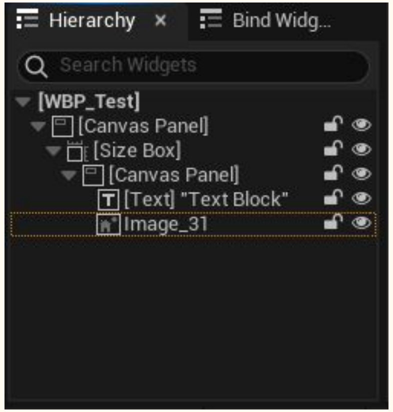
Slot (Canvas Panel Slot)	
Anchors	Anchors
Offset Left	0,0
Position Y	0,0
Offset Right	0,0
Size Y	30,0
Alignment	0,0 1,0
Size To Content	☐
ZOrder	0
Appearance	
Brush	Bind
Color and Opacity	Bind
Accessibility	
Override Accessi...	☐
Can Children be...	✓
Accessible Beha...	Not Accessible
Advanced	
Behavior	
Tool Tip Text	Bind
Is Enabled	✓ Bind
Visibility	Vi: Bind
Render Opacity	1,0
Advanced	
Render Transform	
Transform	
Pivot	0,5 0,5
Performance	

Nesting and Slots

- Nesting is the **core system** to understand how **widget behave** all **together**
- UMG is a **tree of nested widgets**. When you put a widget inside another widget, we control how they are **arranged** on the screen
  - There is a **parent - child** relation just like actors that get **created**

- This nesting relation count **vary depending** on the **widget**
  - 0 : The parent **cannot** contain children (Image, Text Block, etc...)
  - 1 : The parent can contain **at most one** child (Root, Border, NamedSlot, etc...)
  - Many : The parent can contain **many children** (CanvasPanel, Overlay, WidgetSwitcher, HorizontalBox, etc...)

- When a **widget** is inside another, we can **custom** how it **behave inside** its parent through **Slot property**. There is 2 possible slot type
  - **Overlay** : We can set how **stretched** or **aligned** it is according to parent
  - **Canvas** : We can set at **pixel level** how **offsetted** and **anchored** it is
- Slotting system is fundamental for organisation but also when it comes to responsivity of UIs



[WBP_Test]
- [Canvas Panel]
  - [Size Box]
    - [Canvas Panel]
      - [Text] "Text Block"
      - Image_31

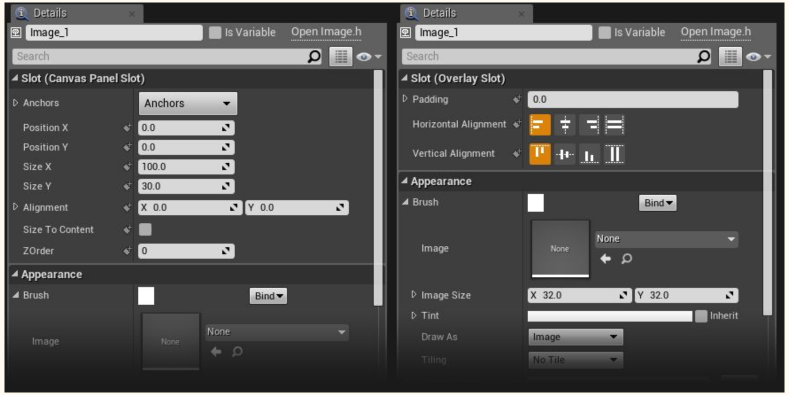


Image_1

Slot (Canvas Panel Slot)
- Anchors: Anchors
- Position X: 0.0
- Position Y: 0.0
- Size X: 100.0
- Size Y: 30.0
- Alignment: X 0.0, Y 0.0
- Size To Content
- ZOrder: 0

Appearance
- Brush
  - Image: None

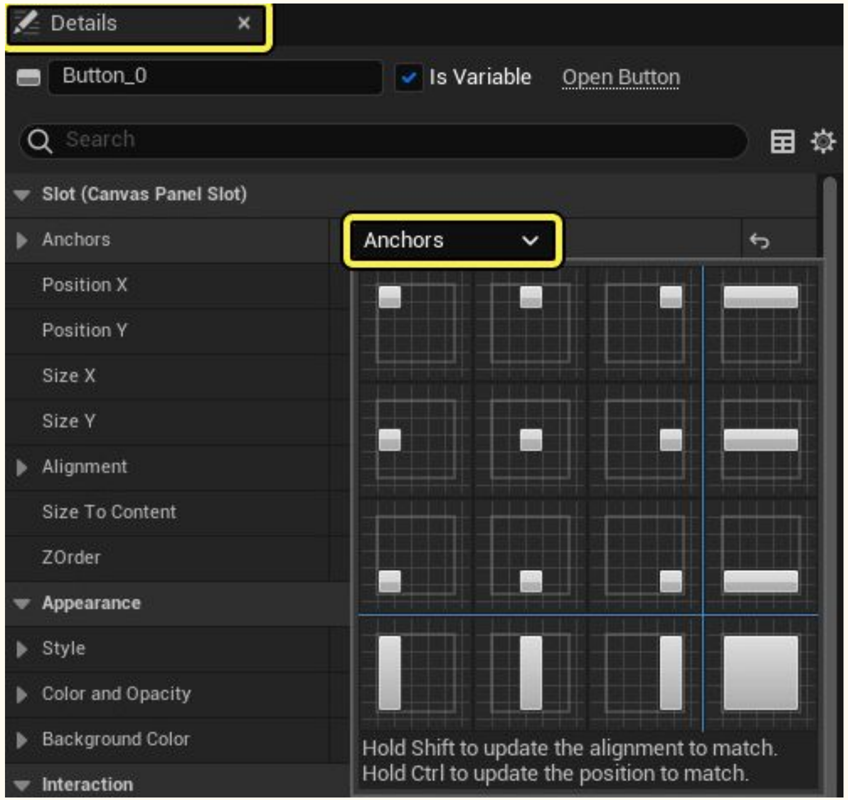
Image_1

Slot (Overlay Slot)
- Padding: 0.0
- Horizontal Alignment
- Vertical Alignment

Appearance
- Brush
  - Image: None
  - Image Size: X 32.0, Y 32.0
  - Tint: Inherit
  - Draw As: Image
  - Tiling: No Tile

Anchors

- Use **Anchors** to set **location of the UI** widgets on a **Canvas Panel**. The Anchors supports **settings** with **different screen sizes** and **aspect ratios**.
- **Minimum (X,Y)** and **Maximum (X,Y)** Anchors parameters and **offset** parameters determine **location** of each **widget**.
- You are able to select from a number of **Anchors presets** or set up it manually by the **Minimum (X,Y)** and **Maximum (X,Y)** parameters (where **Min (0,0)** and **Max (0,0)** determine the **upper left corner** of the Canvas Panel; **Min(1,1)** and **Max(1,1)** determine the **bottom right corner** of the Canvas Panel). Anchors presets differ in the set of offset parameters.

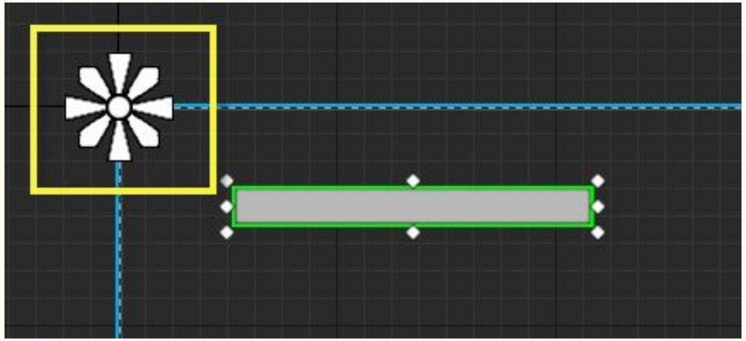


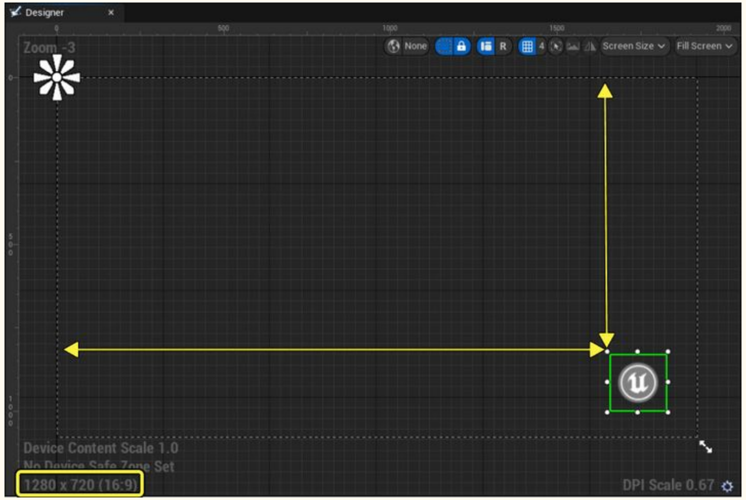
Hold Shift to update the alignment to match.
Hold Ctrl to update the position to match.

Anchors Medallion

- **Anchor Medallion** shows the **Anchor position** in the Canvas Panel.
- By **default**, when you place an **element** into a **canvas**, it uses default settings of Anchors (**top left corner** location).
- The **horizontal yellow** line is **X-axis Button offset**. It determines **distance** in **Slate Units** from **Anchor Medallion** to the **Image** in the **X-direction**.
- The **vertical yellow** line is **Y-axis Button offset**. It determines **distance** in **Slate Units** from **Anchor Medallion** to the **Image** in the **Y-direction**.
- The **offset parameters** based on **Canvas Panel size** and **adapt** to **size changes**.

- Click the **Screen Size Button** in the graph to **change** the **currently** used **size**. It is very useful to test the **UI widget** layout with **different screen sizes** or **aspect ratios** and adjust accordingly.
- It is important to take into **account differences** in **device screen sizes** and **aspect ratios**, when you set Anchors and offset parameters of the widgets. You should **avoid shifting widget** out of the **viewport**. It could happen in case **inappropriate Anchors settings** for some **screen sizes**.

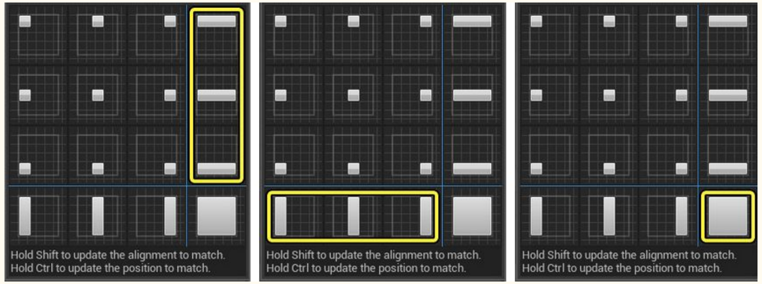




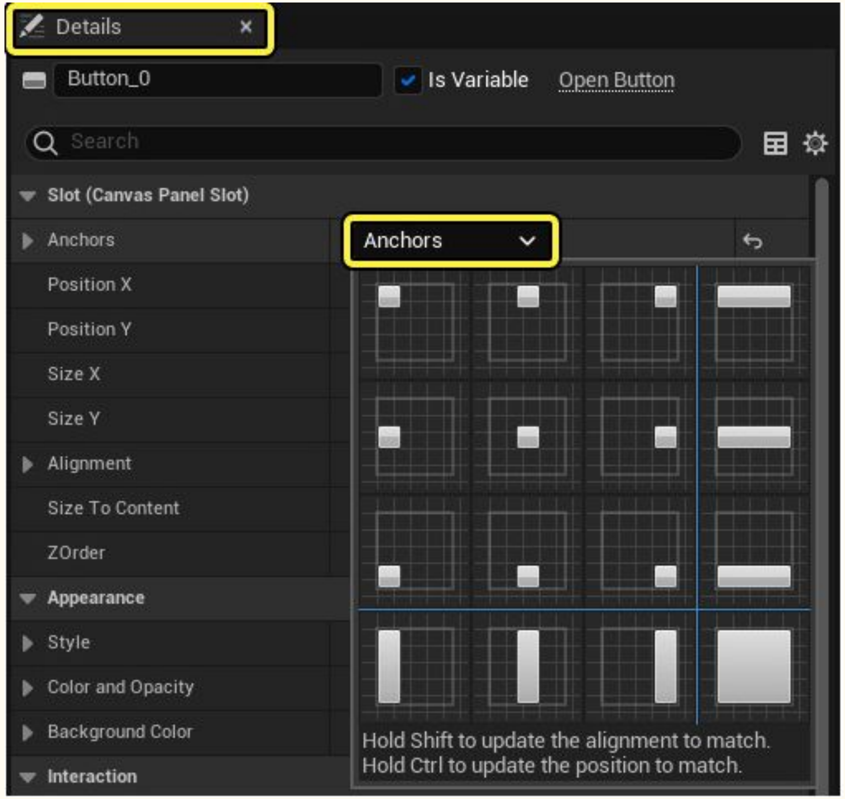
Device Content Scale 1.0
No Device Safe Zone Set
1280 x 720 (16:9)
DPI Scale 0.67

Anchors Preset

- **Preset Anchors** is the **most common** method of Anchor point setting for widgets. With the help of this, you will be able to **cover most** of your **needs** in **setting position of UI widget**.
- Select **preset** from **Anchors drop-down** window at the **details panel.** Each preset determines the **Anchor point location**. The silver box marks this **location**.
- There are also **preset stretching** methods of the Anchor Medallion, when it is **splitted into several components**.

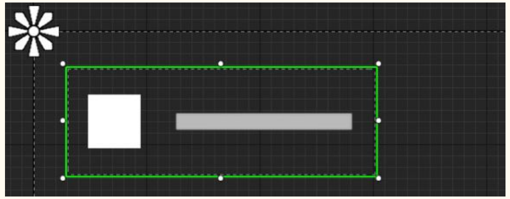
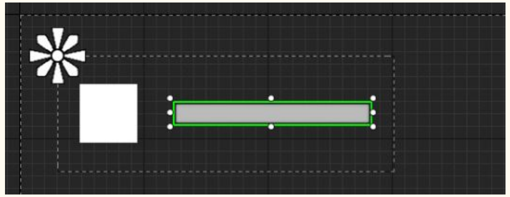
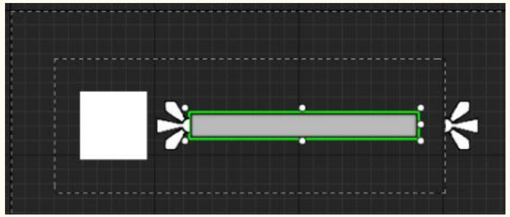

Hold Shift to update the alignment to match.
Hold Ctrl to update the position to match.
Hold Shift to update the alignment to match.
Hold Ctrl to update the position to match.
Hold Shift to update the alignment to match.
Hold Ctrl to update the position to match.

- With the help of this, you will be able set up **widget to stretch** along with the viewport, based on **screen size**.



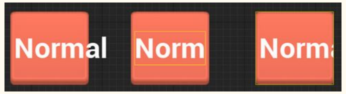
Anchors Manual

- In some cases, it is **necessary** to set **Anchors manually**. For example, this is useful, when you need to **anchor widgets** to **each other**.
- **Anchors Manual** are **case to case** dependant and therefore there is **no general explanation** about them
- Keep in mind that it is comes with **medaillon** placement and **splitting it** according to your needs

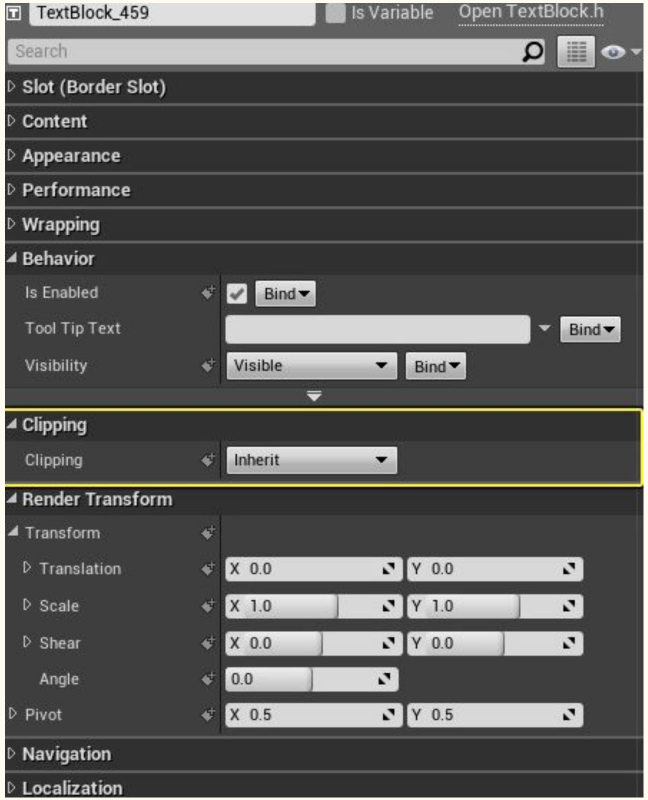




Clipping

- The **clipping system** in UMG uses **Slate's Clipping System** as a framework to control how text, images, or content is shown for **Widgets** (as well as the rest of the Editor). Clipping works by **restricting rendered objects** (graphics and text) to a region using a **bounding box** so that anything outside of it is not shown. The clipping system is now **axis-aligned meaning** that it can clip any rotation, which was not possible before because of the way transforms were handled.



- In this example, each of the buttons is a parent to the **displayed** text. These examples demonstrate **whether** the button or the text is responsible for **clipping**.
  - Left - No clipping is enabled on the button or the text.
  - Center - Clipping is enabled on the text
  - Right - Clipping is enabled on the button.
- You can configure how you set your **clipping** to **behave** from the **details panel**


TextBlock_459 Is Variable Open TextBlock.h

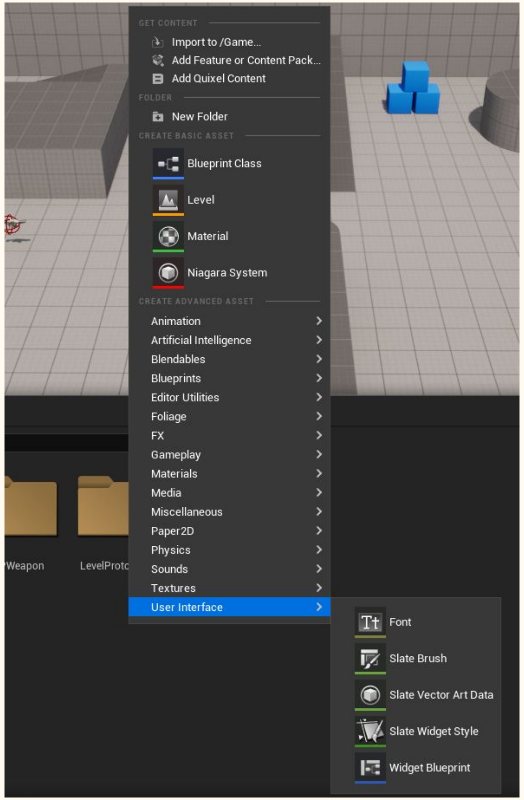
Search

Slot (Border Slot)
Content
Appearance
Performance
Wrapping
Behavior
Is Enabled ✓ Bind
Tool Tip Text Bind
Visibility Visible Bind
Clipping
Clipping Inherit
Render Transform
Transform
Translation X 0.0 Y 0.0
Scale X 1.0 Y 1.0
Shear X 0.0 Y 0.0
Angle 0.0
Pivot X 0.5 Y 0.5
Navigation
Localization

User Widget

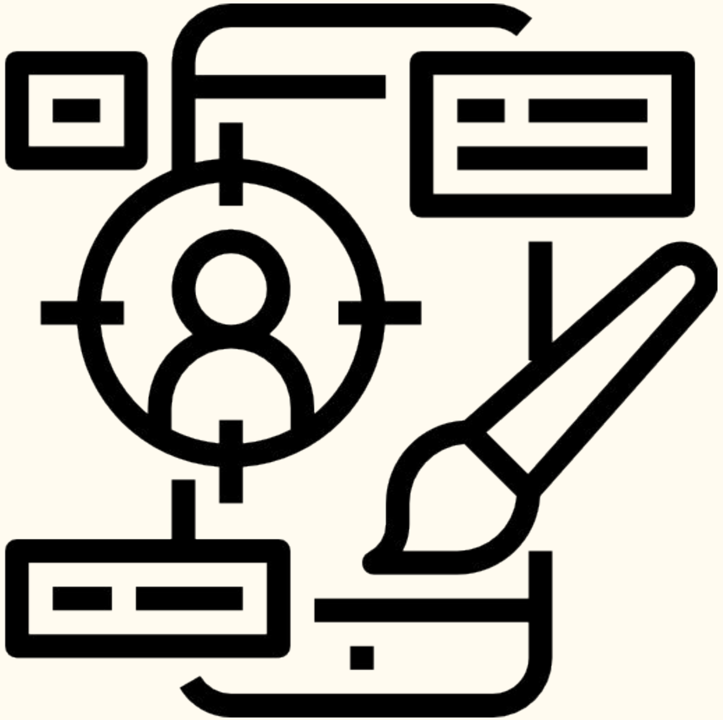
- When you are dealing with **UMG**, you are dealing with **UserWidget asset**. It is the **base asset type** that is use to have a **UMG representation into the game**
- In order to **create** a **User Widget**, you simply need to **right click** in the content browser go into **User Interface** and select **Widget Blueprint**
- The naming convention is generally to make every widget blueprint **prefix** with **WBP_**
- **Similar** to the way **Blueprint classes** are used to **create reusable object**, **UserWidgets** are used to c**reate reusable objects** with custom logic about user interfaces.

- Some examples of **UserWidgets**
    - A **custom button** that includes a **Button** instance, a **TextBlock** for the label, and a **general behavior** that needs to be **shared** by **all button from your game**
    - An **health bar**
    - A **tooltip** when you are **hovering** an **item** in the **inventory**
- It is your role as an **UI programmer** to decide if you need to **create** a new User Widget or **implement** the UI directly into the **parent widget**
- It is also your choice to decide if you need **to** implement the base class as a **blueprint** or c++ **class**



C++ for UI

- It is possible to **entirely** create a **UI** for a game in **blueprint**
- However, **creating** a **professional-level UIs** will require to use **C++**
    - May be **needed to communicate on c++ level** even if it is **generally a bad idea to couple UI and gameplay** in two direction
    - You are likely to **hit performance problems** in large Blueprint-based UI. Especially for **blueprint** called **every frame** with **complex code**
    - Blueprint is quite **verbose**, and **complicated logic** is a **nightmare** to **maintain**, leading to **spaghetti** graph
    - Blueprint will more **easily leads** to **no separation** of **acquisition**, **processing** and **data presentation.** Blueprint having access to **everything**, it is more likely that you'll **end-up mixing** in the same graph **data acquisition**, **formatting** and **displaying**
    - Blueprint are **binary assets**, meaning they're **impossible to merge** so only **1 person** can work at the same time. It means that if the UI **developer** want to update the **blueprint logic** and UI artist change some **appearance**, it is **not possible at the same time**
- There is hundred ways to do the same thing but are **3 ways** of using **C++ in UIs**
    - **Subclassing UUserWidget**
    - **Subclassing** or creating a new **UMG widget**
    - **Subclassing** or creating a new **Slate widget**
- **Generally** speaking, it is a **common approach** to declare the class in **C++** to handle **logic** in it, and implement **details** in the **BP inheriting** from **that c++** class, just like gameplay

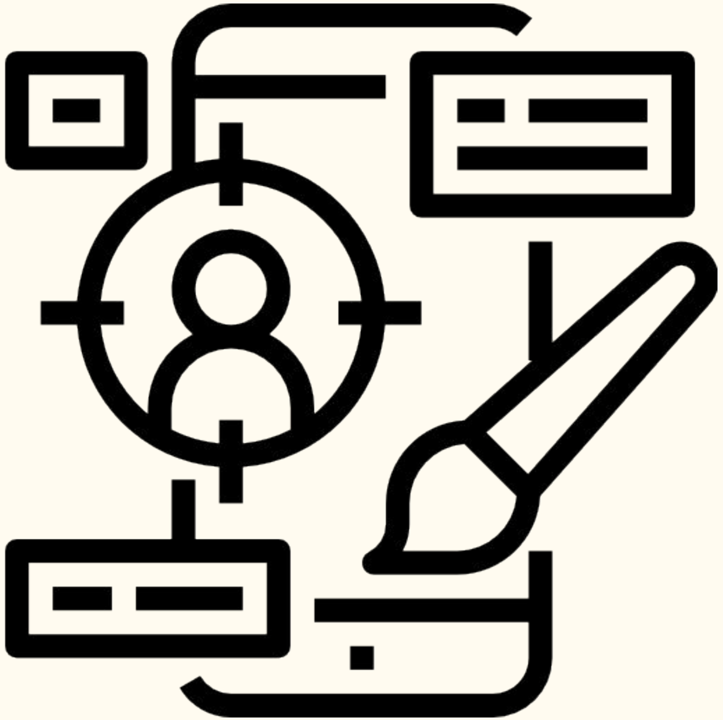


Important point about UMG and slate

- I'll emphasize again that **UMG is built on top of Slate.**
- **Before** version **4.0** of the engine, the system called **Slate** was the **standard.**
- It was **designed** to make **UI creation in C++ as simple as possible**
- UMG is a simple **wrapper** around **Slate**, to make it **easier** to use from **blueprint**, and let **UI designers create custom UIs** from the **editor** with a direct **visual feedback**

- This direct **implication** means that **everything** you'll find in UMG will exists in Slate as it is a simple wrapper
  - For example, a **UImage** which is the **UMG** class wrapper contains a **SImage** instance inside it
  - The **Slate** class handles **most of the logic** while the **UMG** allow to **display it in the editor and play with it**

- Generally speaking the **lower** you goes into the **UI hierarchy**, meaning that you get **closer** to **Slate**, the **more customization** you'll be able to do but the **more work** it may involve

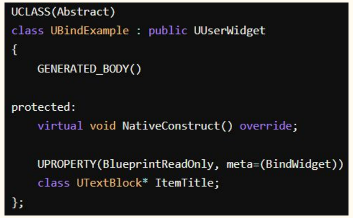


Create a UserWidget in C++

- We need to **declare** a **class** that inherit from **UUserWidget**
- **NativeConstruct** function is **similar** to **C++ constructor** but **should** be **used** instead because it is **integrated** into the **UMG**
    - You'll typically **bind delegates**
    - Set up **default appearance**
    - Etc...
- You'll then create a **UserWidget** in **blueprint**, **inheriting** from the **C++** class we just created
- Keep in mind that if you have **already created a widget**, you can **reparent** the blueprint

Create a UserWidget in C++ - Bind widget

- A **common issue** when we are **dealing** with **C++-based UIs** is how to control blueprint created widget from C++o
- **BindWidget meta property** is the answer

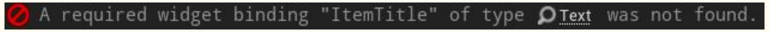


```
UCLASS(Abstract)
class UBindExample : public UUserWidget
{
    GENERATED_BODY()

protected:
    virtual void NativeConstruct() override;

    UPROPERTY(BlueprintReadOnly, meta=(BindWidget))
    class UTextBlock* ItemTitle;
};
```

- This meta property will create an **identically-named widget** in a **blueprint subclass** of that c++ class
- As it is **declared in the class,** the blueprint at **runtime** will **access** it from the **c++**
- You'll see that **after compiling** and **inheriting** from the class, you may have **an error** like so



```
A required widget binding "ItemTitle" of type Text was not found.
```

  - The reason is that you have not **created** in the **blueprint view** a widget **named ItemTitle**
- **BindWidget** is a strong tool for making it **easier to main complex logic** in C++ and **ease collaboration**
- **BindWidgetOptional** is the **same logic** without the compiling error

Create a UserWidget in C++ - Updating UserWidgets

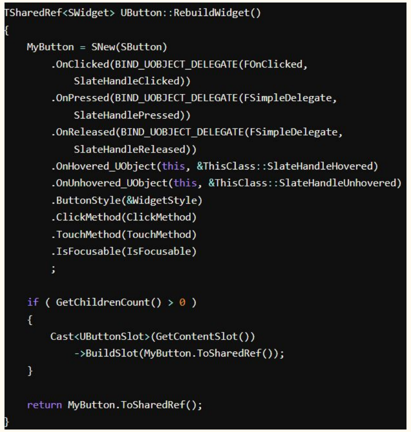
- When you'll be **developing more and more complex UI**s, that may be **very different** to their **final appearance** in-game based on data
- It is possible that you may want to **develop** a **User Widget** that will be used **for multiple visual purpose**, for example in an **inventory**
- You may gives a **widget class** in order to know which **representation** needs to be used, but still the visual in the **blueprint viewport editor** will **not change**

- In order to do so, you needs to use **SynchronizeProperties** function
  - This function comes from **UUserWidget**
  - It is called in **editor every time a property is modified** or blueprint is **compiled**
  - You can **override** it and **initialize** your widget the same way it will be **set up in-game**.

- It is worth mentioning that after Unreal 4.16, in Blueprint, the node **PreConstruct** can be used a bit like **SynchronizeProperties**.

Create a UWidget in C++

- As kind of everything is extendable in the engine, it is also possible to **extend** of **create** a new **UWidget**
- It is the way to go if you want to create **new compound widget** that needs to be re-use **everywhere**
  - For example, a button with an icon and a text
- The function **RebuildWidget()** is the place where the **stuff needs to be done**
- It is directly **requiring** to **write Slate code** in it, as you know, **UUserWidget** are just **wrappers around Slate.**
- This is an example of a slate code for buttons



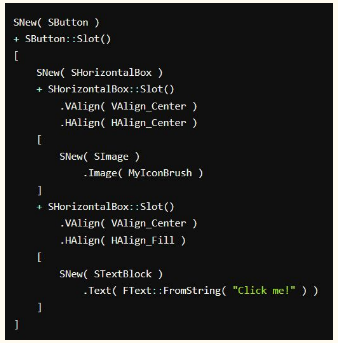
```cpp
TSharedRef<SWidget> UButton::RebuildWidget()
{
    MyButton = SNew(SButton)
        .OnClicked(BIND_UOBJECT_DELEGATE(FOnClicked,
            SlateHandleClicked))
        .OnPressed(BIND_UOBJECT_DELEGATE(FSimpleDelegate,
            SlateHandlePressed))
        .OnReleased(BIND_UOBJECT_DELEGATE(FSimpleDelegate,
            SlateHandleReleased))
        .OnHovered_UObject(this, &ThisClass::SlateHandleHovered)
        .OnUnhovered_UObject(this, &ThisClass::SlateHandleUnhovered)
        .ButtonStyle(&WidgetStyle)
        .ClickMethod(ClickMethod)
        .TouchMethod(TouchMethod)
        .IsFocusable(IsFocusable)
        ;

    if ( GetChildrenCount() > 0 )
    {
        Cast<UButtonSlot>(GetContentSlot())
            ->BuildSlot(MyButton.ToSharedRef());
    }

    return MyButton.ToSharedRef();
}
```

Manipulating Slate from C++

- Because using slate, let's try to pin down some reasons to use it
  - **Creating Editor UI** : Custom **asset inspectors**, **windows**, or other visual tool to be used inside the engine have to be implemented using Slate.
    - In 4.22, **EditorUtilityWidgtets** was introduce, which can be written with **UMG + Blueprint**
    - It **ease the process** but still **asset inspectors** must be written in **Slate**
  - **Implementing low level functionality** : Some things are not **supported** from **UMG**, for example complex **graph-drawing** which may be better written in **Slate** than **UMG**
- A slate code will always looks like this



```
SNew( SButton )
+ SButton::Slot()
[
    SNew( SHorizontalBox )
    + SHorizontalBox::Slot()
        .VAlign( VAlign_Center )
        .HAlign( HAlign_Center )
    [
        SNew( SImage )
            .Image( MyIconBrush )
    ]
    + SHorizontalBox::Slot()
        .VAlign( VAlign_Center )
        .HAlign( HAlign_Fill )
    [
        SNew( STextBlock )
            .Text( FText::FromString( "Click me!" ) )
    ]
]
```

- We are declaring here a **button** with an **icon** and **text**, **side** by **side**
- Last important note, **Slate** is a **module**, as such, it **needs** to be added in **dependencies**

Manipulating Slate from C++

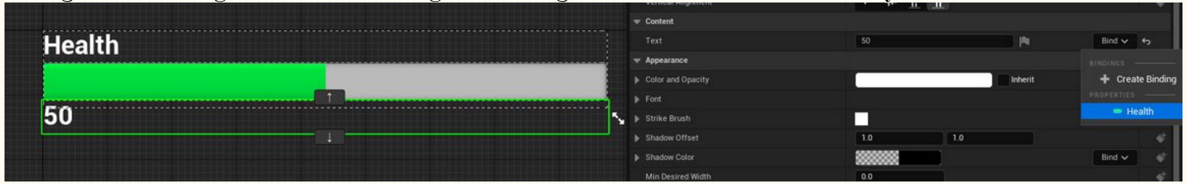
- Let's see some **key functions** when you want to duplicate and **extend** an **existing widget**
  - **Construct** : Is how the slate widget is setup
  - **SLATE_BEGIN_ARGS** : Argument **allowed** by the widget are defined
  - **OnPaint** : It is where the widget defines how it is rendered
- It is **more likely** that if you want to **add** some **specific behavior** to **existing widget**, **extending** one is the way to go
- In this case, do not **hesitate** to check how the **original** was **implemented**, pick up the code and then make your **modifications**

- In some other cases, you may want to create a new Slate widget from scratch, not based on anything, in this case you have a few choices for subclass
  - **SCompoundWidget** : CompoundWidget is the **base** from which **non-primitive widget** should be built. It has a protected member named **ChildSlot**.
  - **SLeafWidget** : LeafWidget is a Widget that has **no slots** for children. It is usually **intended** as **building blocks** for aggregate widget. The names speaks for itself, it should be used for **leaf widget** like **SImage**
  - **SPanel** : SPanel is a Widget that allows to arranges its child widget on the screen. It offers the **slotting system**

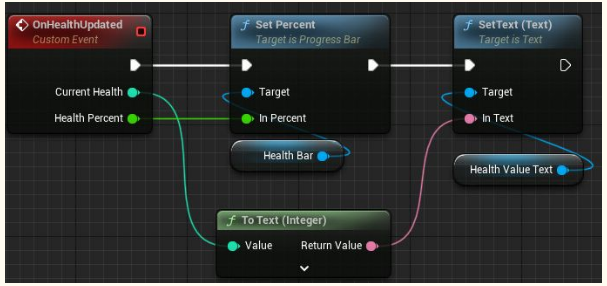
Optimization - Event Driven Update

- Whenever **possible**, you should **avoid** using **On Tick** or On **Paint** to run **logic** in your UI. **Event Dispatchers** and **Delegates** can help you create logic that responds to specific events **without needing** to rely on **Tick.**

- When you **bind attributes to fields** in your UI, they **poll** the **attribute** every frame. For example, if you bind the **Text value** of a **Text Field** to an **integer**, that Progress Bar will assign the **integer's value** to that field **every tick**. This is **inefficient**, so you should avoid using bound attributes.



- Instead, you should set up your project to call **functions** and **events in your UI to update these fields**. For instance, instead of **binding a health bar** to a **Health attribute**, you should call an **OnHealthChanged** event in **your UI's Blueprint script** to change the necessary fields in your UI.



- While setting these up is more **time consuming**, this ensures that the **UI only changes** on the frame when the value changes instead of **each frame**.

Optimization - Loading & Construction

- **Reduce Unused Widgets As Much as Possible**
  - All children **inside a widget** are **loaded** and **constructed** regardless of whether they are **visible**. Even if your UI does **not render them**, they will use **memory** and require **loading** and **construction time**.
  - At a basic level, your **UI designers** should regularly check for **any unused widgets** and remove them before **committing** their work. Regular cleanup will help with **organization** as well as **performance**.

- **Break Complex Widgets Into Pieces that can Load at Runtime**
  - An especially complex widget for a major system could have well over **1000 children** to **handle** all of its **functionality**, but only need to **display** a few **hundred widgets** at a time. In these situations, if you were to load the entire widget as one big piece, **hundreds** of **inactive children** would take up **space** without being used. Depending on how specialized these child widgets are, **users** may spend hours **without seeing** them.
  - In these cases, you should break up your widgets into categories:
    - Widgets that are **always visible**.
    - Widgets that **must be shown as quickly as possible**.
    - Widgets that **can afford to have a small amount** of latency when shown.
  - Any widgets that require f**ast response times** should be **loaded** in the **background** even when not **displayed**. For example, an **inventory screen** in a competitive shooter is used very frequently and should be highly responsive due to its **crucial function for the player**, so **keeping** it **loaded** but not **visible** is good practice.
  - **Any widgets** that are not present for **long periods** of time and do not **require fast response should be loaded asynchronously** at **runtime** and destroyed when **dismissed**. For complex widgets with diverse functions, this may entail keeping a **base** widget **loaded** at **all times**, but loading different sets of child widgets asynchronously depending on what mode or function is needed. This can save a **great deal of memory** and reduce the **CPU impact** on initialization.

Optimization - Layout & Positioning

- **Use Canvas Panels Sparingly**
  - The Canvas Panel is a **powerful container widget** that can position other widgets using a **coordinate plane** and **per-widget anchors.** This makes it easy to both position widgets exactly where you want them, and also to maintain widgets' positions relative to the corners, edges, or center of the screen.
  - However, Canvas Panels also have **high performance demands**. **Draw calls in Slate** are grouped by **widgets' Layer IDs**. Other container widgets, such as **Vertical** or **Horizontal Boxes**, **consolidate their child widgets' Layer IDs**, thus reducing the **number of draw calls**. However, Canvas Panels **increment** their child widgets' IDs so they can render on top of one another if need be. This results in Canvas Panels using multiple draw calls, thus making them **highly CPU-intensive** compared with alternatives.
  - As a **rule of thumb**, if your widget consists of a **single element**, you definitely do **not need** a Canvas Panel. Even with full menus and HUDs, you can **often avoid** using Canvas Panels altogether by using **Overlays** and **Size Boxes** together with **Horizontal**, **Vertical**, and **Grid Boxes** to handle **layouts**.

- **Use Spacers Instead of Size Boxes When Possible**
  - **Size Boxes** use **multiple passes** to calculate their **size** and **render** themselves. If you need content to take up a certain **size** in **width** and **height**, **Spacers** are significantly cheaper
- **Use Rich Text Widgets Sparingly**
  - **Rich Text** widgets provide robust **formatting** for text, but are **very expensive** compared with standard text boxes due to the **wide range** of extra **capabilities** they add. If you want text to be stylized or expressive, but do not need the full functionality of rich text, you should **choose** or **create** a font that **reflects** the sense of stylization you want by default and **fall back** on **standard Text** widgets.

Time to…. highlight a concept

Hierarchy and professions

Practice

- **General**
    - Create a UMG UI representing a main menu, you do not need to make it interactable but just as an introduction to UMG placement
        - 3 buttons : Play, Options, Exit
        - Buttons with 20 spacing in vertical
        - Buttons of the exact same size
        - Make sure that if you add a button, it will not break your UI
    - Understand how BindWidget works by creating a base c++ UserWidget and making sure that the BP inheriting from it has an image and a text
    - Create a 3 slot inventory-like system purely in blueprint without any logic involve but which contains
        - Drag & Drop feature (Optional, but worth taking a look at how drag & drop is working on UMG)
        - Regardless of UI size, the 3 slots have always the same size

- **Follow-through project**
    - You'll create your whole interface for your game, think the best way to do it, drive value change through events, etc...
    - Display the number of ingot the player has already collected
    - Display a skill icon for both skill you created last week with
        - An icon representing the skill
        - A text representing the cooldown of the skill
    - Display a message when you collected an ingot notifying the player like "Ingot collected"
    - Display a kind of alert on your HUD which will be displayed when a guard is tracking you