GDC | March 20-24, 2023
San Francisco, CA

LAYERED BATTLES

GENERATING MULTIPLE QUALITATIVE TACTICAL BATTLES

FOR

MARIO + RABBIDS SPARKS OF HOPE

#GDC23

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FRÉDÉRIC GIRAUD - JULIEN VIAL

WHO AM I?

FREDERIC GIRAUD

LEVEL DESIGNER

(From Architecture Training)

MARIO + RABBIDS KINGDOM BATTLE

MARIO + RABBIDS SPARKS OF HOPE

UNDER THE SUPERVISION OF

JULIEN VIAL

LEVEL DESIGN DIRECTOR

(Previously QA Tester, Game Designer and Level Designer)

XIII · 1887 RIDE OR DIE · REDSTEEL · REDSTEEL 2 · RAVING RABBIDS TRAVEL IN TIME · RABBIDS LAND · MARIO + RABBIDS KINGDOM BATTLE · MARIO + RABBIDS SPARKS OF HOPE

1 MARIO+RABBIDS HISTORY

2 DEFINING THE GAME'S NEEDS

3 DESIGNING THE PROCEDURAL TOOLS

4 USING THOSE TOOLS IN OUR ADVENTURE

5 RECAP

A BIT OF HISTORY...

AUGUST 29, 2017

- Tactical Game
- Ubisoft Milan & Paris
- Nintendo Switch

Rabbids invaded the Mushroom Kingdom, defeat the corrupted Rabbids to save the Mushroom Kingdom from the MegaBug.

OCTOBER 20, 2022

- Tactical Game
- Ubisoft Milan & Paris
  + Pune, Montpellier, Chengdu
- Nintendo Switch

An entity named Cursa takes over the galaxy spreading Darkmess, defeat the corrupted Rabbids to save all planets from Cursa.

2017's KINGDOM BATTLE TEMPLATE

- Cursor: Programming Movement
- Grid-Based
- Covers
- Movement Tools

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KNOWLEDGE FROM KINGDOM BATTLE

PRAISED FOR

Big Emphasis on Movement: TeamJump, Dash, Stomp
Accessible take on Tactical

...BUT

Linear/Corridor Handcrafted Worlds
Limited Replayability

2022's SPARKS OF HOPE MANTRA

- ✔ Direct Control on Characters
- ✔ No-Grid / Radiuses
- ✔ More Covers, Panels & Props
- ✔ New Movement Tools

WHAT MAKES A GOOD MARIO+RABBIDS LEVEL?

NAVIGATION

Tools (Pipes & Trampolines)

Abilities (Hero Interaction)

CHAOS

Partial Predictability

Adaptation Effort

COMBOS

Hero / Enemy Synergies

Spread Opportunities

BATTLE PRODUCTION OPPORTUNITIES

NEW GAME STRUCTURE

Continuity from Explo to Combat

Levels set in Darkmess Dimension

NEW DETERMINISTIC APPROACH

SuperEffects chances based on %

SuperEffects linked to Sparks (100%)

OPPORTUNITY FOR GENERATED CONTENT

VARY SCENARIOS WITH LD SITUATIONS

NEW APPROACH TO TACTICAL LEVELS

BATTLE PRODUCTION PARADOX

MEMORABLE BATTLES

Handmade by Level Designers

Linked to Main Story

Custom - Unique Requirements
(Scripting / Dressing)

RPG PROGRESSION

Side Quest Battles

100+ Battles Scope

Replayability and Future DLCs

NEW APPROACH TO TACTICAL LEVELS

&

MORE BATTLES

THAN WE CAN PRODUCE

OUR TAKE ON PROCEDURAL

LAYERED BATTLES

GENERATIVE BATTLES BUILD ON HANDCRAFTED LAYERED-CAKE LEVELS

GOALS

CREATIVE DIRECTION

Need for quality and control

Maps that look natural at first look

As varied and fun as handcrafted levels

LEVEL DESIGN STAKES

Adaptable Size Battlefield

Time & Energy Gain

Contrasted Generations

PLAYER EXPECTATIONS

Expressing Tacticality & Playstyles

Everlasting varied experience

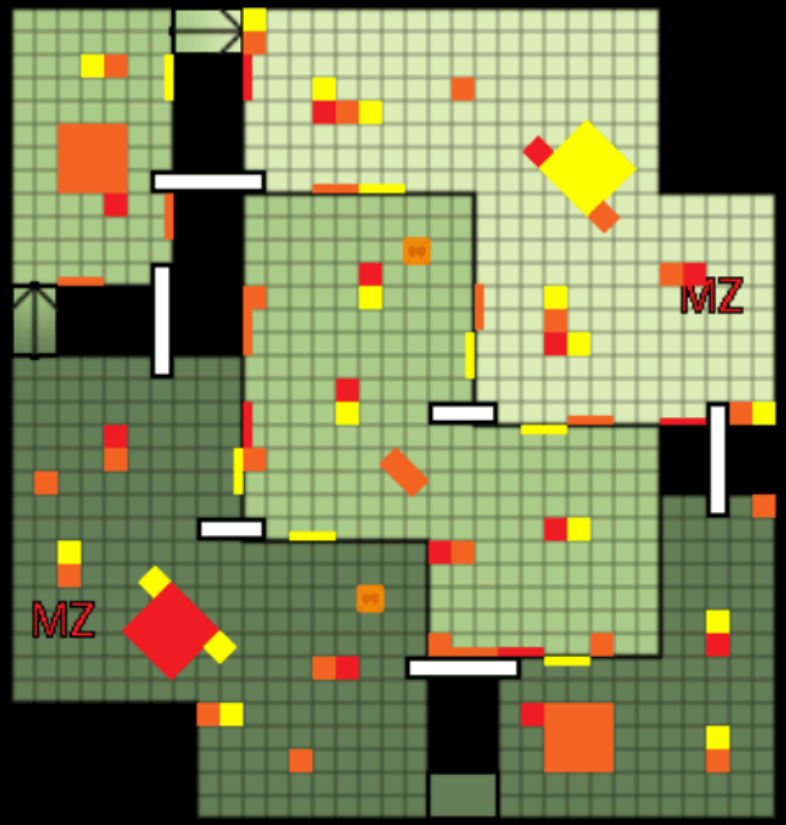
Avoid Repetitiveness

OUR INITIAL IDEA

Multiple Maps with:

- 3 Covers Layers
divided in Zones and 3 Density Layers

- 3 Navigation Layer
divided in 3 Density Layers

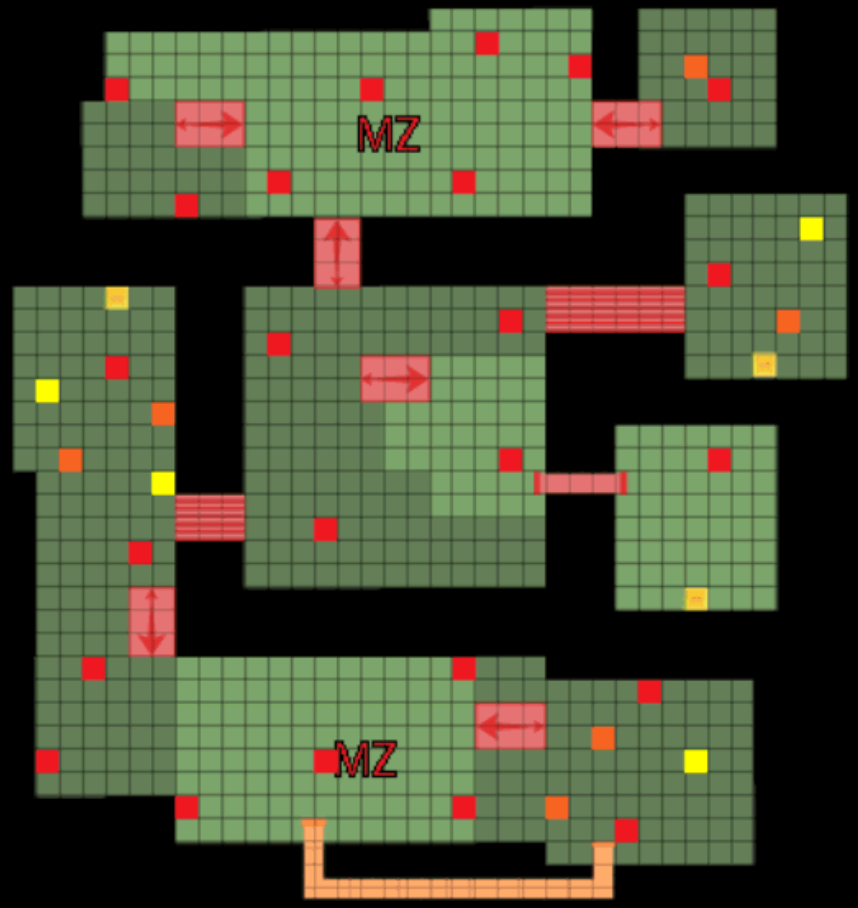


THE DRAWBACKS

Requiring:

- Multiple Maps Size
- Multiple Automatized Dressing
- High Memory Weight

This was not efficient.



NEW CONSIDERATIONS

OUR PROPOSAL SHOULD...

Adapt to any map size

Cost low amount of dressing time

Be suitable for hardware constraints

AND PROPOSE FLAVOURED BATTLES

STEP 1
BUILD LEVELS &
TAG LAYERS
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TOPOGRAPHY

1 Level for each environment

6 Grounds to Hide / Show:

Up to 63 Ground Combinations

Size, Shape, Elevation Keywords

TOPOGRAPHY
NAVIGATION

3 Navigation Layers for each level

Divided for each Ground Connections

Movement Type Keywords

TOPOGRAPHY

NAVIGATION

COVER LAYERS

9 Cover Layers for each level

Divided for each Grounds

Density, Cover Types, Distribution Keywords

TOPOGRAPHY
NAVIGATION
COVER LAYERS
VOLUMES / ZONING

Volumes are spread through the Battlefield:

Ground & Positioning Keywords

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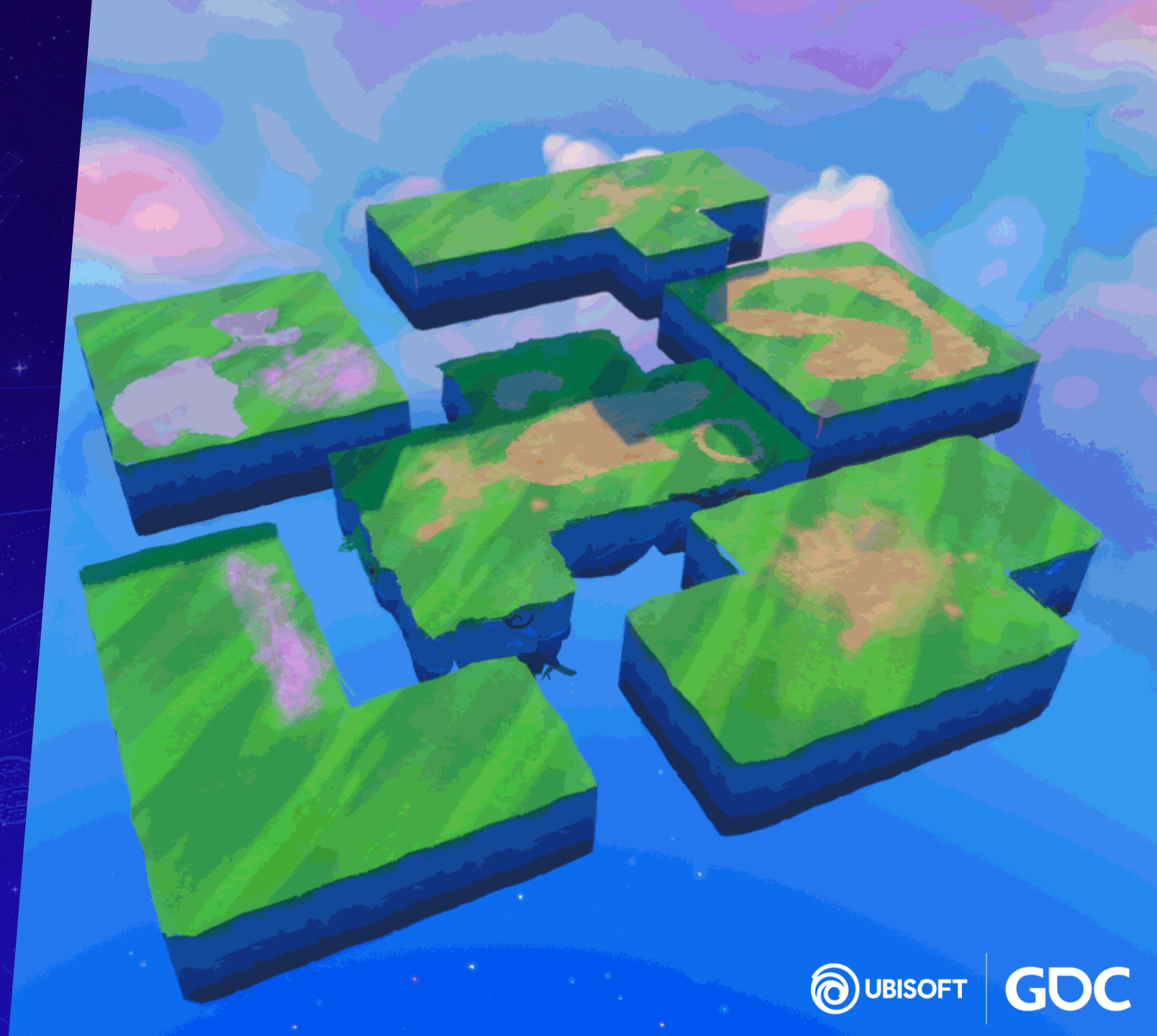
TOPOGRAPHY
NAVIGATION
COVER LAYERS
VOLUMES / ZONING
LEVEL LIST

1 Level per Environment



WE HAVE A GENERATED LEVEL
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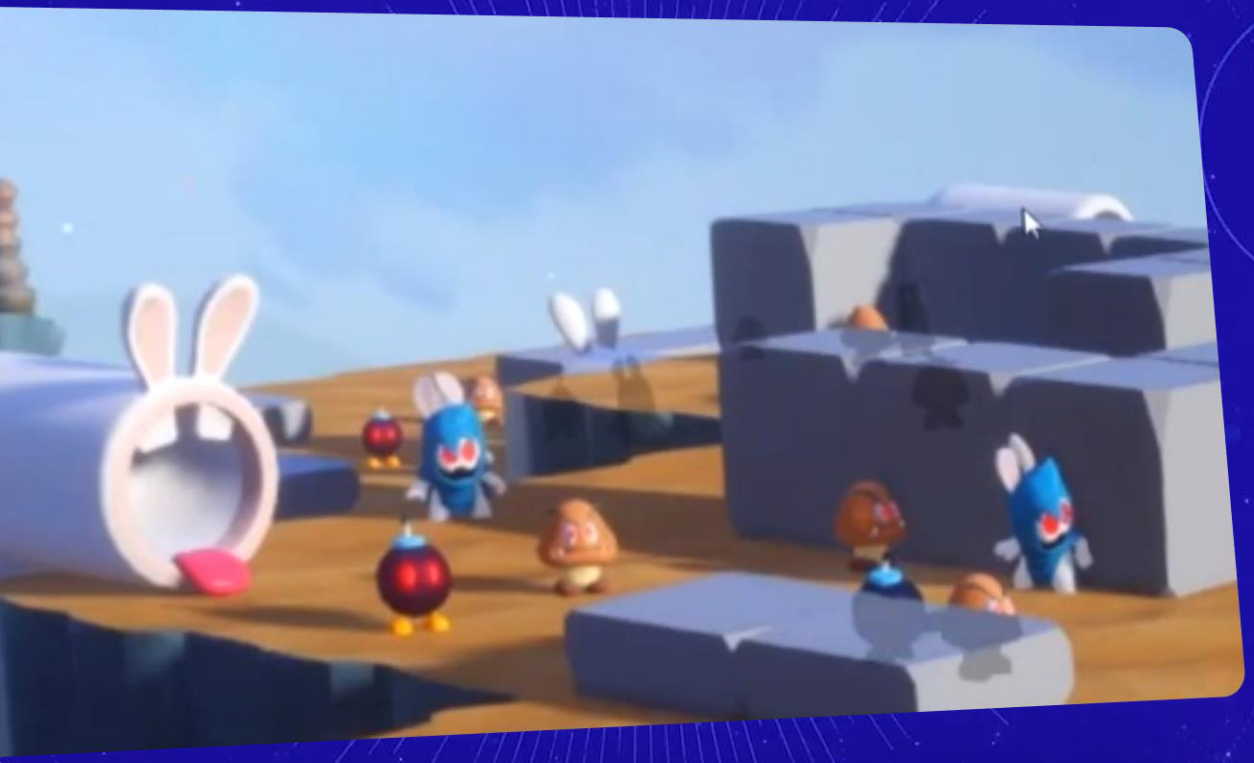
NEW CHALLENGES



WE TESTED SIMPLE BATTLES

Enemy List generated randomly

Characters located & oriented with no logic

SPAWNING IS CHAOTIC

STEP 2
IMPROVE HERO &
ENEMY SPAWNING
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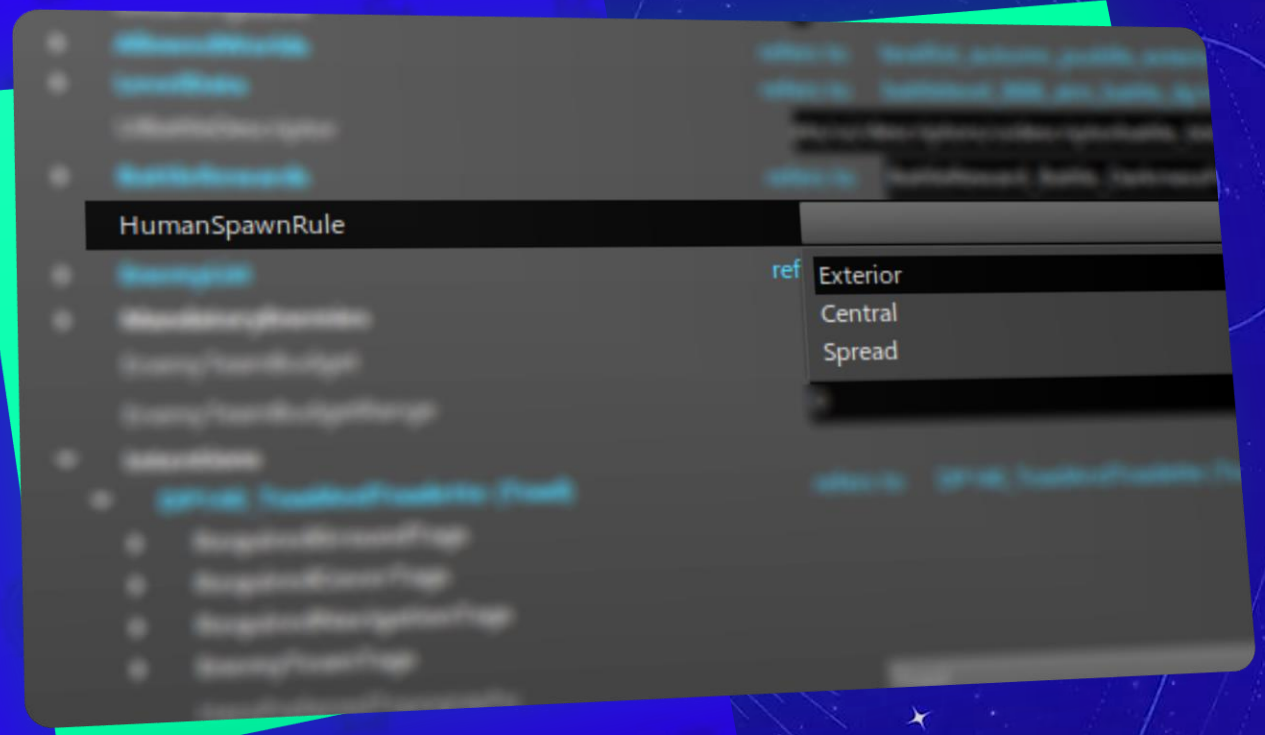


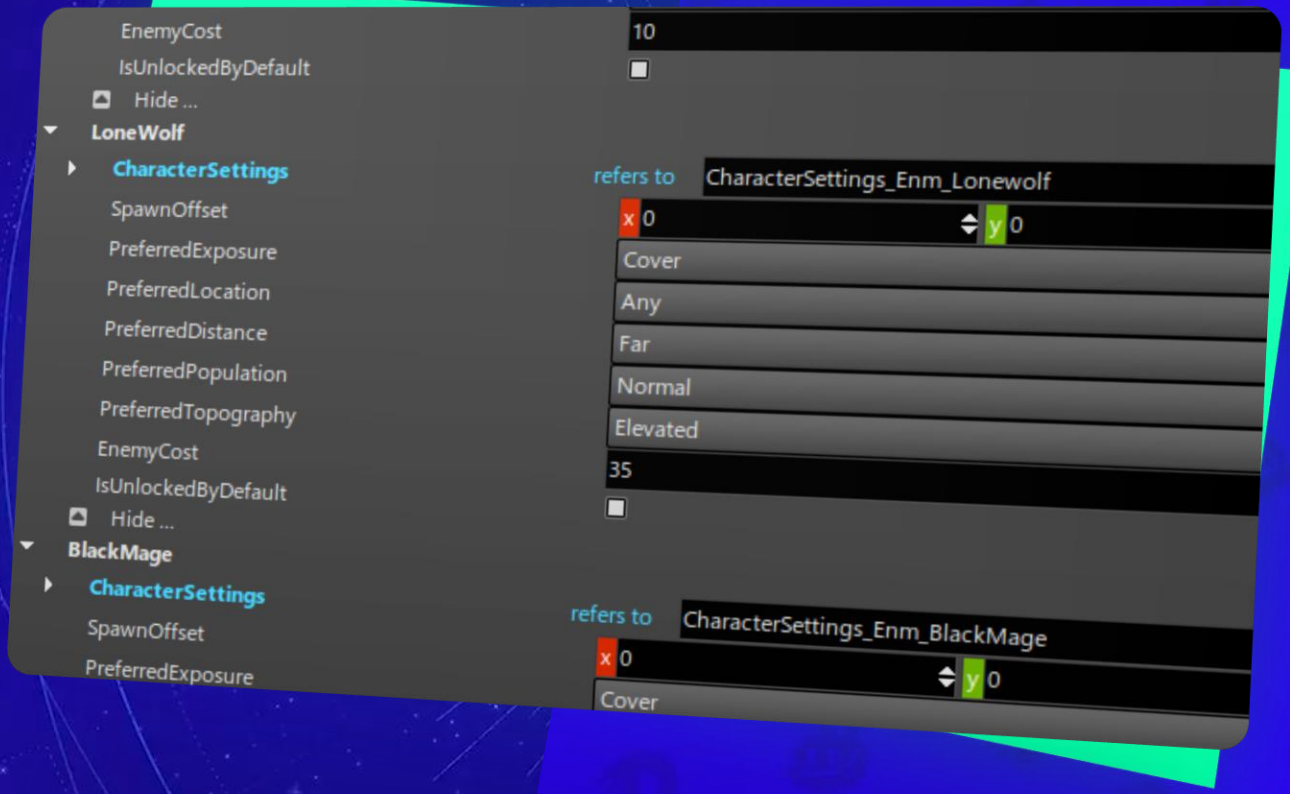
SPAWNING HEROES

3 Possibilities:

- Grouped in a Central Position
- Grouped in an Off-Centered Position
- Ungrouped

SPAWNING ENEMIES

All Enemies Archetypes get their own Spawning Preferences



LVL 20
DEFEAT ALL
0/10 Defeated
WE HAVE A GENERATED DEFEAT ALL
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NEW CHALLENGES

WE TESTED DEFEAT ALL OBJECTIVE

Lack of Variety (Defeat Only)

Approach was always the same

Some Enemy Archetypes not used at full potential

OBJECTIVES & DEPTH?

STEP 3
ADAPT A VARIETY OF OBJECTIVES
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OBJECTIVE LIST

6 Objectives:

Rationalizing, decomposing every objective

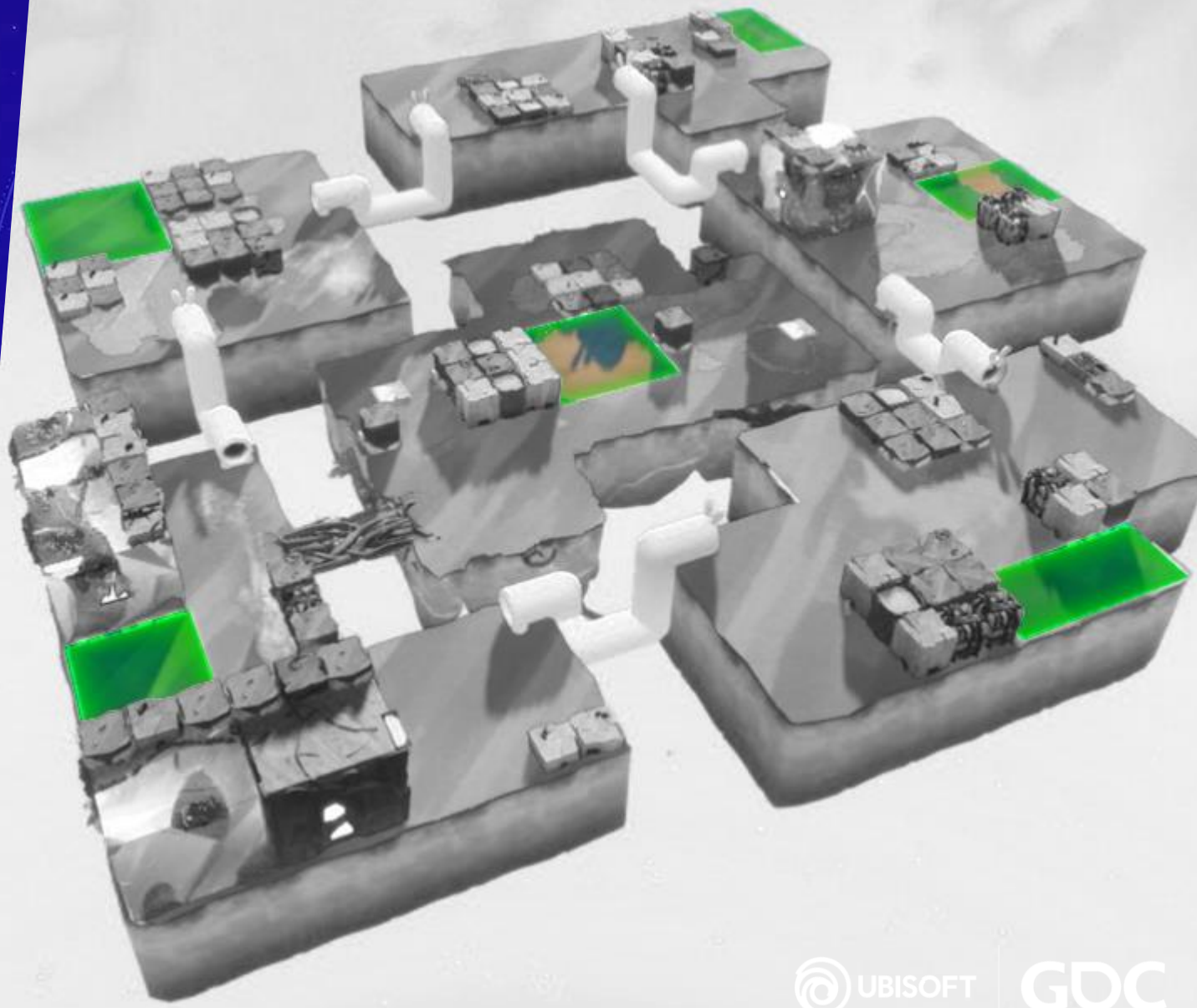
Defining requirement for each

Example: REACH

Requires: Reach Area

How / Where to set this area?

(Distant Volume from Hero Spawn)



ENEMY LIST

Handmade Enemylists pushing for synergies

Each Archetype is defined by multiple traits

Limiting number of Archetypes per Battle

LVL 24
REACH AREA
WE HAVE MULTIPLE GENERATED BATTLES
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NEW CHALLENGES

WE TESTED MANY OBJECTIVES, BUT...

Lack of consistency & contrast:

Gameplay (Link between topo to objective)

Progression (Generation fitting with current player experience)

Intention (Flavour given to each generations)

HOW TO GIVE A FLAVOUR?

STEP 4
APPLY & NARROW DOWN OUR INTENTION SYSTEM
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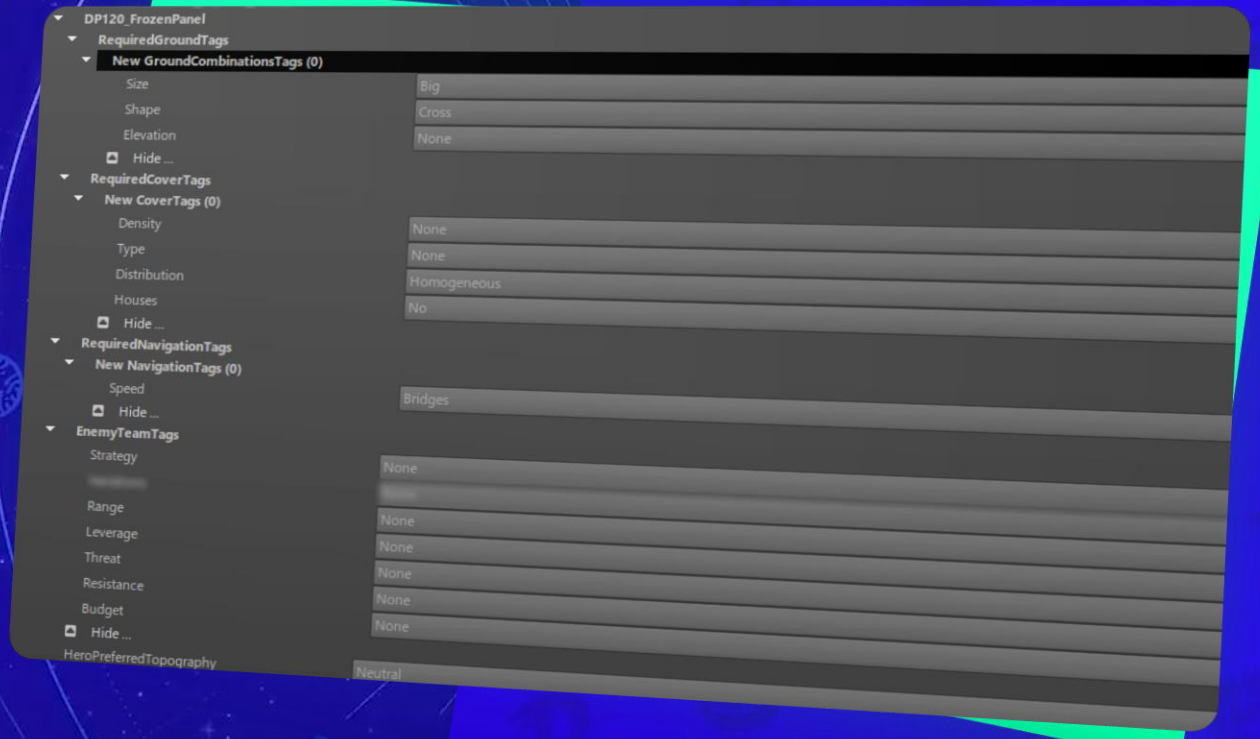
INTENTION LIST

Set of Keywords to search for specific generations

Either SET or LET RANDOM

Generation Themes:
Sniper,
HardToProgress,
Pinball, etc.



INTENTION EXAMPLE

SNIPER

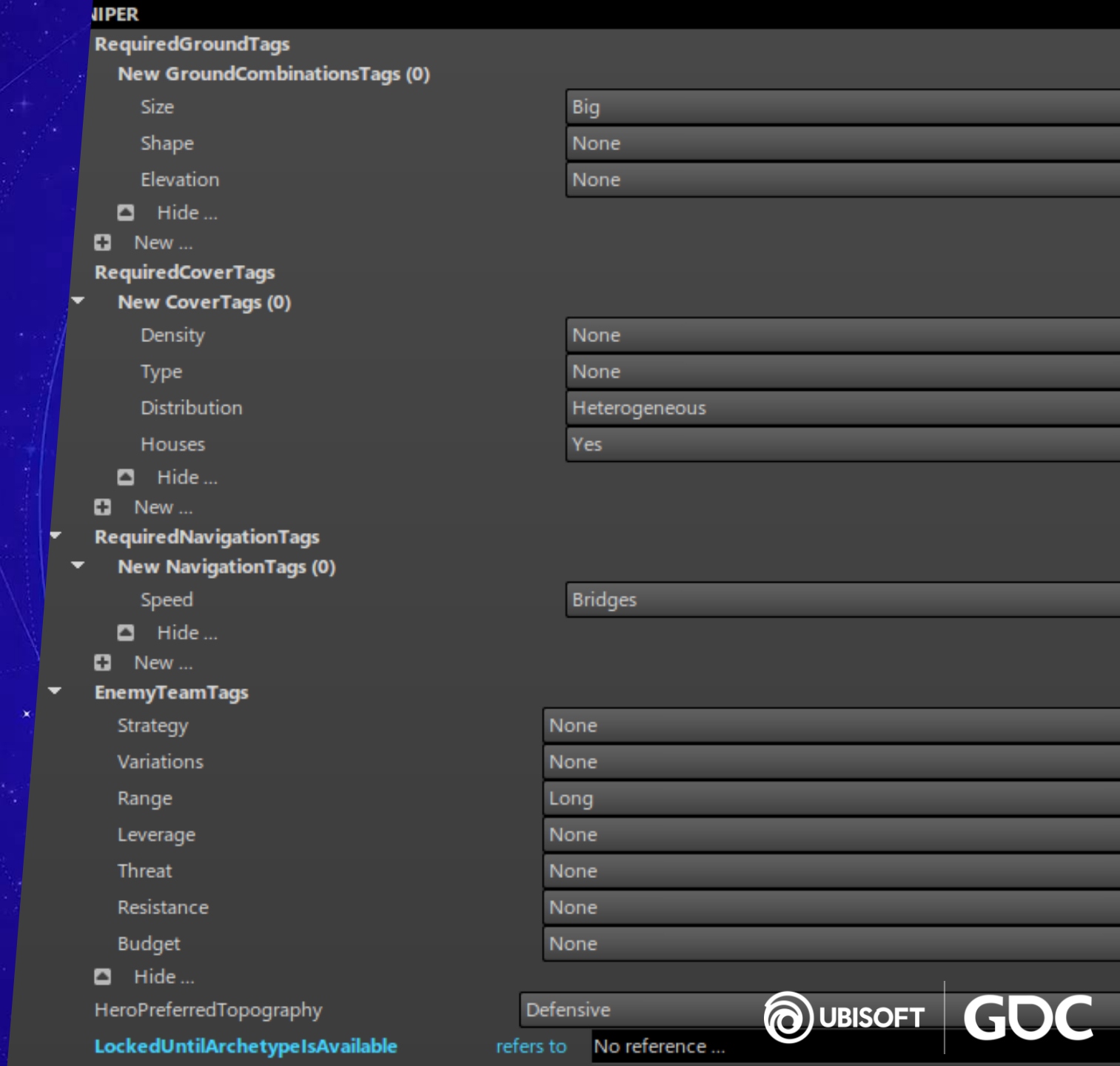
Topography: Large (Big)

Cover Layer: Houses, Polarized

Navigation: Bridges

Enemies: Range = Long

Hero Preferred Spawning Position: Defensive



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SNIPER

INTENTION EXAMPLE

EXPLOSIVE

Topography: Small

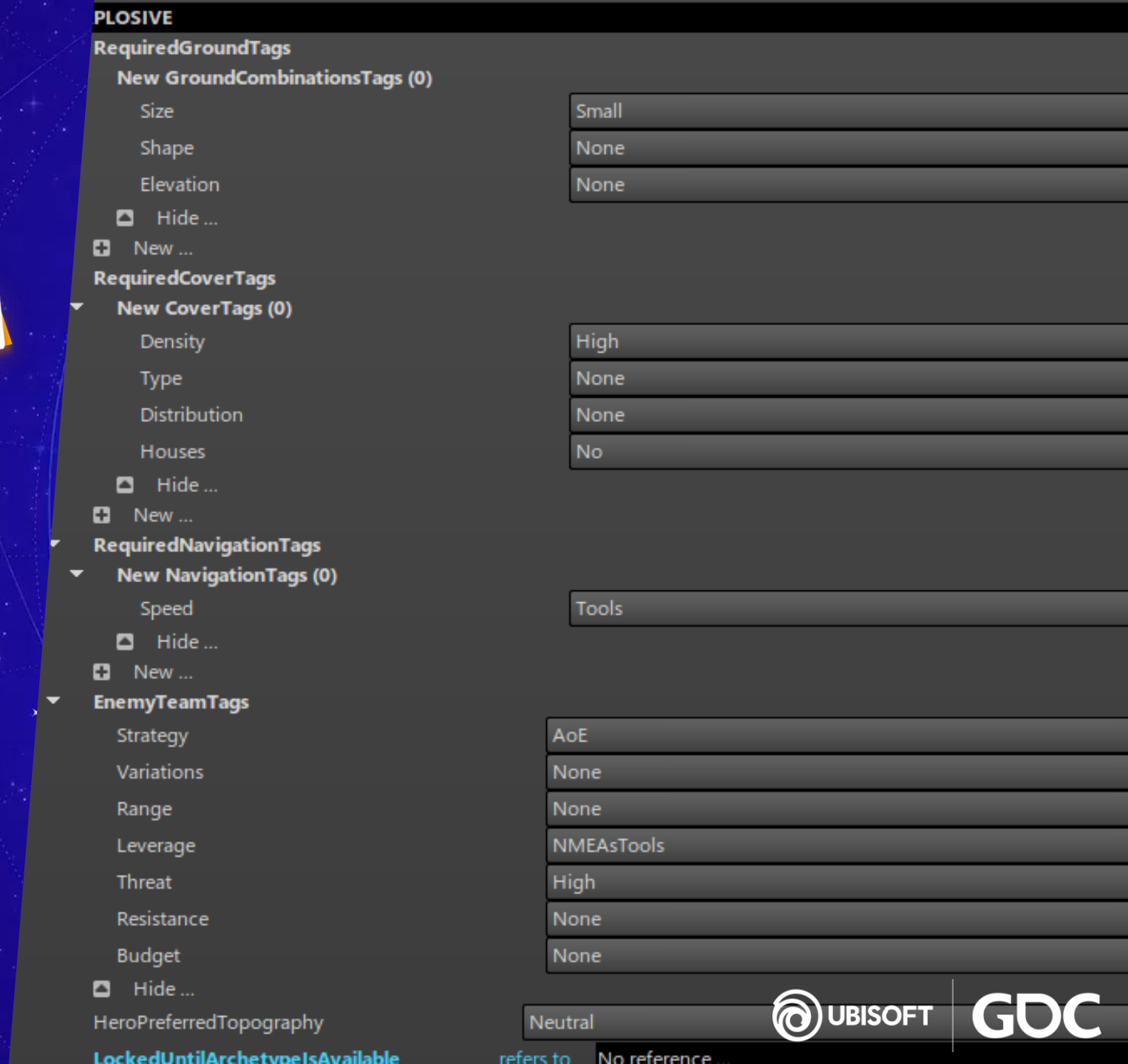
Cover Layer: High, No Houses

Navigation: Tools

Enemies: Attack = AoE

Threat = High

Leverage = EnemiesAsTools



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EXPLOSIVE

INTENTION EXAMPLE

CLIMBING

Topography: Shape = Corridor

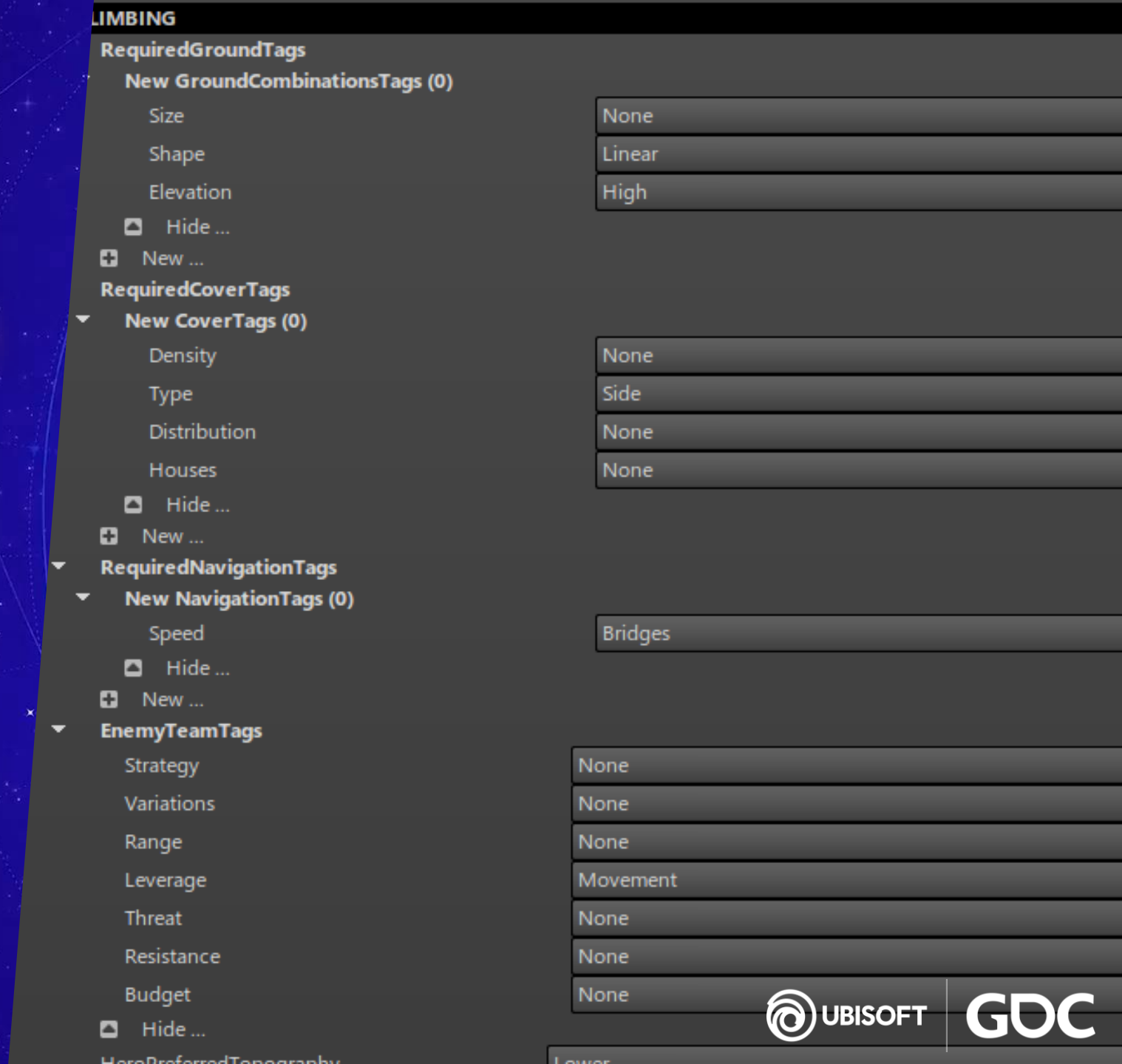
Elevation = High

Cover Layer: Side

Navigation: Bridges

Enemies: Leverage = Movement

Hero Preferred Spawning Position: Lower



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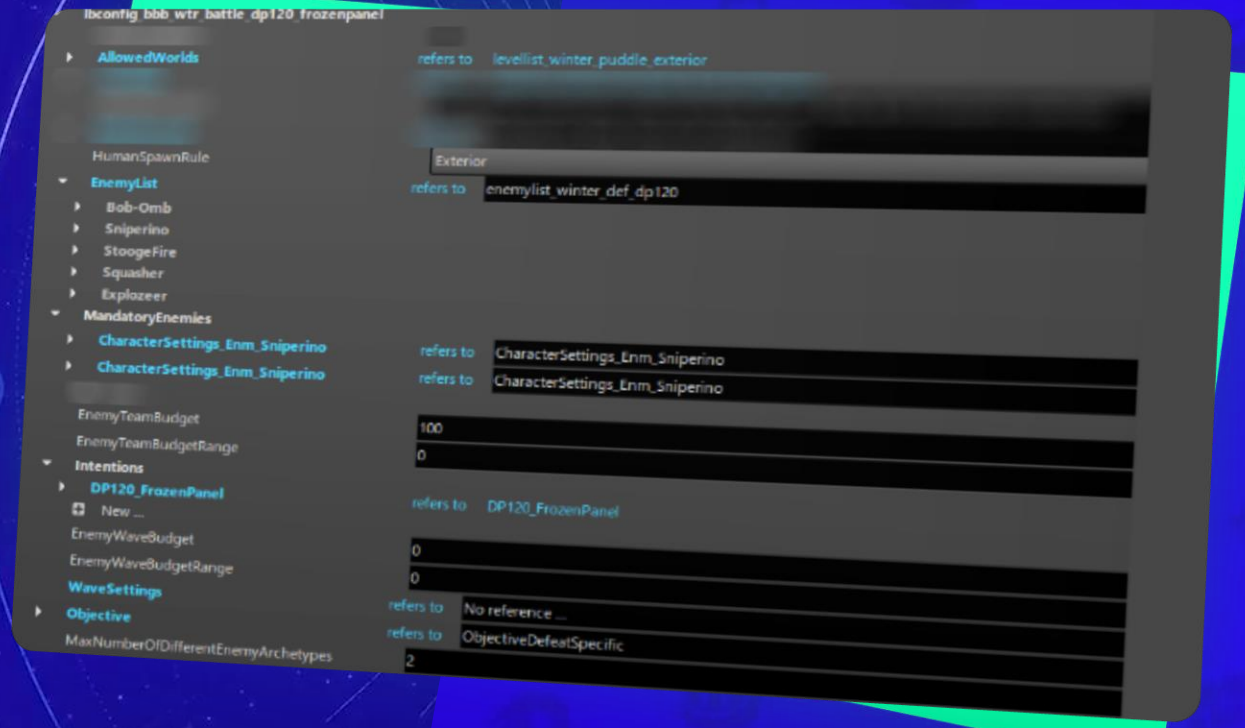
CLIMBING

LAYERED BATTLE CONFIG

Regroup all information for a single battle entity

Either SET or LET RANDOM



WE HAVE MULTIPLE GENERATED BATTLES BASED ON LEVEL DESIGN INTENTIONS

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HOW IT'S BEEN USED

Main Path:

~30 Handcrafted
and
~50 Layered Battle Instances

Side Content:

- Replayable Portals
- Roaming Enemies

All based on Layered Battles

TOWER OF DOOOOM DLC

Game Mode with Replayable structure:

10 Replayable Floors

LBConfig Generation = Infinite Content

PROS & CONS

ADVANTAGES

- Virtually Endless Content
- Intention System allows to keep Control
- Opens to unexpected yet interesting generation
- System suitable with our technical constraints
- Combinatorial dressing

DISADVANTAGES

- Intertwined Data Structure
- Very Iterative Design
- Non-Adaptative and Complex Dressing Process
- Tools required to be adapted with the system in mind

THE TAKEAWAYS

PROCEDURAL?

Procedural is singular for every project

What does Procedural mean for your Project?

DON'T BE AFRAID OF

- Trial and Error
- Prototyping and reevaluating needs

YOU SHOULD ABSOLUTELY

- Onboard people of your project into it
- Communicate steps to reassure production

THANK YOU

SPECIAL THANKS TO THE LAYERED BATTLE TEAM:

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Igor Cesi
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