

MMOS AND THE METAVERSE

TENERIFE.GG

13TH JULY, 2022

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INTRODUCTION

- RECENTLY, THERE HAS BEEN A LOT OF EXCITEMENT AROUND THE CONCEPT OF THE **METaverse**
- THE METAVERSE IS CONCEIVED TO BE LIKE THE **INTERNET** BUT WITH A **VIRTUAL REALITY** ("EMBODIED") INTERFACE
 - SO **AUGMENTED REALITY** TOO, MAYBE
- **MUCH** HAS BEEN SAID ABOUT HOW THIS WILL **IMPROVE** MMORPGS
- THIS TALK WILL **EXAMINE** SOME OF THESE CLAIMS
- **FIRST**, THOUGH, A LITTLE ABOUT WHO I **AM**...

FFXIV

- FINAL FANTASY XIV, SQUARE ENIX, 2014



- I CURRENTLY HAVE A /PLAYTIME OF 101 DAYS

SWL

- *SECRET WORLD LEGENDS, FUNCOM, 2017*



- I HAD A /PLAYED OF 45 DAYS WHEN I QUIT
– PLUS **150** DAYS ON THE SECRET WORLD...

SW:TOR

- *STAR WARS: THE OLD REPUBLIC*, BIOWARE, 2011



- I PLAYED ~6H/DAY FOR 137 DAYS IN 2012
 - 137 ELAPSED TIME, **33 DAYS** CPU TIME

WORLD OF WARCRAFT

- WORLD OF WARCRAFT, BLIZZARD, 2004:



245 DAYS

EVERQUEST

- EVERQUEST, SONY ONLINE ENTERTAINMENT, 1999

0 DAYS...



- DIKUMUD, COPENHAGEN UNIVERSITY, 1990

```
[x2] A barrel has been left here.  
An angry-looking statue of Hoturi is standing here.  
An angry-looking statue of Priapus is standing here.  
A statue of Odin is standing behind the altar.  
A Sign for Newbies is here.  
You are a guest here until you save yourself.
```

```
If you need  
to get to your guild, use the guild medallion in your inventory. If you lose  
it, pray to the statue of Odin for another.
```

```
105m/202e/38hlook
```

```
Temple of Udgaard
```

```
You are inside the small and humble village temple in Udgaard. A simple  
stone altar, with strange stone carvings, is placed against the north wall. A  
small humble donation room is to the east. The temple exit is south to the  
Village Square.
```

```
[x2] A barrel has been left here.  
An angry-looking statue of Hoturi is standing here.  
An angry-looking statue of Priapus is standing here.  
A statue of Odin is standing behind the altar.  
A Sign for Newbies is here.
```

```
105m/202e/38h_
```


- *ABERMUD, ALAN COX, 1987*

Your wimpy value is set to 15. See 'help change' to see what that means.

The Temple Of Paradise

You stand in the Temple of Paradise, a huge sandstone structure whose walls are decorated with ancient carvings and runes, some so old that even the priests no longer know their meanings.

A single set of steps lead south, descending the huge mound upon which the temple is built and ending in the forests below.

A roaring fire burns here. Its flames make the temple sparkle and glitter.

At your feet a huge sacrificial pit allows you to give valuables to the gods in the hope of being rewarded.

A furled umbrella lies here.

Obvious exits are:

North : Welcome Center

South : Forest Track

Down : Forest Track

Last login: Wed Sep 7 17:43:26 2005

>

MUD

- MUD, ROY TRUBSHAW & RICHARD BARTLE, 1978

Narrow road between lands.

You are stood on a narrow road between The Land and whence you came. To the north and south are the small foothills of a pair of majestic mountains, with a large wall running round. To the west the road continues, where in the distance you can see a thatched cottage opposite an ancient cemetery. The way out is to the east, where a shroud of mist covers the secret pass by which you entered The Land. It is raining.

*w

Narrow road.

You are on a narrow east-west road with a forest to the north and Gorse scrub to the south. It is raining. A splendid necklace lies on the ground.

*

- MUD DIDN'T COME FROM **ANYTHING**
- THIS EXPLAINS WHY THIS TALK IS BEING GIVEN BY AN **OLD MAN**

"THE"

- SO, LET'S BEGIN BY THINKING ABOUT WHAT WILL FORM THE **BASIS** OF THE METAVERSE
- THERE ARE A NUMBER OF **COMPETING** PLATFORMS
 - ROBLOX, FORTNITE, DECENTRALAND, SANDBOX, ... DOZENS MORE
 - META, MICROSOFT, GOOGLE, AMAZON, ...
- THE THING IS, IT'S **THE** METAVERSE, NOT **A** METAVERSE
 - IT WOULD BE LIKE CALLING FACEBOOK "**THE** INTERNET"
- IT TURNS OUT WE'VE **BEEN** HERE **BEFORE...**

1980S

- BACK IN THE **1970S** AND **1980S**, THE ONLINE WORLD WAS DOMINATED BY 5 AMERICAN **"SERVICE PROVIDERS"**
 - COMPUERVE, PRODIGY, AMERICA ONLINE, DELPHI, GENIE
- THEY WERE **WALLED GARDENS**
 - THEY DIDN'T TALK TO EACH OTHER OR TO ANYONE ELSE
- WHEN THE **INTERNET** WAS OPENED UP FOR COMMERCIAL USE IN **1993**, THEY THOUGHT IT WOULDN'T TAKE OFF
 - THEY HAD **ALL** THE USERS AND **ALL** THE CONTENT
- THEY WERE **WRONG**

ONE

- WE DON'T HAVE **FIVE** INTERNETS, WE HAVE **ONE** INTERNET
- IT'S THE **SAME** THING FOR THE METAVERSE
- WE WON'T GET A **PROPRIETARY** METAVERSE UNLESS THE MULTINATIONAL TECH COMPANIES CREATE IT **TOGETHER** (CHINESE INCLUDED?)
 - IT WOULD HAVE TO BE AN **OPEN** STANDARD, TOO
- A USEFUL WAY TO LOOK AT CLAIMS ABOUT THE METAVERSE IS MENTALLY TO CHANGE THE WORD "**METAVERSE**" TO "**INTERNET**"
- IF IT MAKES NO **SENSE**, BE WARY

UTILITY

- WHAT WILL PEOPLE **DO** IN THE METAVERSE?
- **MOST** ANSWERS BEGIN WITH "THEY CAN..."
- THAT DOESN'T **ANSWER** THE QUESTION!
- WHAT THEY **CAN** DO ISN'T THE SAME AS WHAT THEY **WILL** DO
- IN SOME RESPECTS, THE METAVERSE IS A **SOLUTION** LOOKING FOR A **PROBLEM**
- YOU CAN **BUY** THINGS, WATCH **MOVIES**, **CHAT** WITH FRIENDS AND PLAY **GAMES** IN THE METAVERSE – BUT DO YOU **NEED** TO?
- WHAT DOES THE METAVERSE **DELIVER**?

LOTS

- JUST BECAUSE IT'S NOT **OBVIOUS** WHAT THE METAVERSE WILL DELIVER, THAT DOESN'T MEAN IT **WON'T** BE POPULAR OR UNIQUE
- THE **VR** INTERFACE MAY GIVE IT CRITICAL MASS
 - ALTHOUGH IT'S **CLUNKY** AT THE MOMENT, ESPECIALLY WITH INPUT
 - PEOPLE WON'T WEAR **3D GLASSES** TO PLAY MMOS, SO VR GOGGLES ARE A **HARD** SELL
- IT CERTAINLY HAS THE **POTENTIAL** FOR **NEW** APPLICATIONS OR IMPROVED **OLD** ONES
 - ENOUGH TO **SUPERSEDE** THE INTERNET, THOUGH?

GAMES

- THIS IS WHERE **GAMES** COME IN
- MUCH OF THE TECHNOLOGY FOR THE METAVERSE HAS **ALREADY** BEEN DEVELOPED FOR GAMES
 - SPECIFICALLY, **VIRTUAL WORLDS** – MMORPGS
- METAVERSE EVANGELISTS ARE LOOKING FOR WAYS TO **IMPROVE** VIRTUAL WORLDS
- GAMERS ALREADY **UNDERSTAND** ALL THE IMPORTANT CONCEPTS
- **INTEGRATING** VIRTUAL WORLDS INTO THE METAVERSE WOULD **UNLOCK** ITS POTENTIAL AND PROVIDE COMPELLING INITIAL **CONTENT**

DESIGNERS

- SOME GAME DESIGNERS REALLY **LIKE** THIS
- THE METAVERSE WILL BRING **STANDARDS**
 - COMMON BUILDING BLOCKS AND FUNCTIONALITY
- THIS OUGHT TO MAKE CREATING GAMES MUCH **FASTER** AND LESS **EXPENSIVE**
- TECHNOLOGIES DEVELOPED FOR THE METAVERSE WILL **INDEED** BE VERY USEFUL FOR GAMES
 - THIS IS WHY **I** DON'T DISAPPROVE OF ATTEMPTS TO CREATE THE METAVERSE
- ITS HOW METAVERSE ADVOCATES SEE THIS AFFECTING GAME **DESIGN** THAT'S PROBLEMATIC

INTEROPERABILITY

- LET'S START WITH **INTEROPERABILITY**
- WOULDN'T IT BE **GREAT** IF YOU WERE PLAYING THE LATEST *SILENT HILL* AND SUDDENLY SAW A **POKÉMON** YOU COULD CAPTURE?
 - "PLAYERS CAN CREATE THEIR OWN EXPERIENCES!"
- IT BREAKS THE **FICTION** AND **AESTHETICS**
 - IT WOULD BE LIKE WATCHING A **STAR TREK** MOVIE IN WHICH **GANDALF** SHOWED UP
- IF IT'S OPT-IN **ONLY** AND PLAYERS CAN DECLINE TO **GROUP** WITH PEOPLE WHO **DO** OPT-IN, WELL I GUESS IT'S HARMLESS

TRANSFORMATION

- WHAT ABOUT TAKING OBJECTS FROM **ONE** GAME TO **ANOTHER**?
 - COULD YOU SET **CHARIZARD** ON PYRAMID HEAD?
- TO AVOID SPOILING THE **FICTION**, WE CAN **TRANSFORM** OBJECTS' LOOK & FEEL
- **ASSAULT RIFLES** IN SURVIVAL GAMES ARE **EPIC**, BUT DON'T **FIT** IN **FANTASY** WORLDS
 - SO TRANSFORM THEM INTO **WANDS** OR **BOWS**?
- BY HAVING **STANDARD** CATEGORIES OF OBJECTS AND LOCAL **EQUIVALENCES**, CAN'T MOVEMENT BETWEEN WORLDS **WORK**?

YES AND NO

- IT **CAN**, BUT IT'S UNACCEPTABLE TO DEVELOPERS
- THE 1992 **INTERMUD** PROTOCOL TRIED IT, BUT **FAILED** BECAUSE OF **TRUST** ISSUES
- **ANYONE** CAN MAKE THEIR **OWN** OBJECTS IN THEIR **OWN** WORLDS
 - THIS MEANS THAT **EVERYONE** HAS AN ASSAULT RIFLE EQUIVALENT
- GAMES COMPLETELY LOSE **BALANCE** THIS WAY
- BESIDES, WHAT'S **EPIC** IN ONE GAME MAY BE **STANDARD ISSUE** IN ANOTHER
 - ASSAULT RIFLES IN WAR GAMES **AREN'T** EPIC

FORM

- EVEN MOVING **IDENTICAL** OBJECTS FROM ONE GAME TO ANOTHER IS **PROBLEMATIC**
- THEIR IMPORTANCE **VARIES** GAME-TO-GAME
 - APPLES IN A **SURVIVAL** GAME
 - APPLES IN A **COOKING** GAME
- IF YOU **REALLY** WANT TO DO IT, GO THROUGH AN **INTERMEDIATE** FORM:
 - CONVERT THE ITEM **INTO** THIS INTERMEDIATE FORM
 - CONVERT **FROM** THE INTERMEDIATE FORM INTO SOMETHING IN THE TARGET GAME
- WE HAVE A **NAME** FOR THIS FORM: **MONEY**

DESTROYED

- INTEROPERABILITY REQUIRES **TRACKING**
- IF YOUR EPIC ITEM IS DESTROYED IN **ONE** GAME, IT SHOULD BE DESTROYED IN **ALL** GAMES
 - LIKEWISE IF YOU **SELL** IT
- HOW TO **DO** THAT?
- THIS IS WHERE **NON-FUNGIBLE TOKENS** COME IN
- NFTS ARE STORED ON **BLOCKCHAINS**
- IF **TWO** GAMES ACCEPT THE **SAME** BLOCKCHAINS, THEN THE OWNERSHIP AND STATUS OF OBJECTS CAN BE **VERIFIED**
 - ASSUMING THEY **TRUST** EACH OTHER'S CONTENT

TRUST

- HOLD ON ... IF THEY **DO** TRUST EACH OTHER'S CONTENT, WHY **BOTHER** WITH NFTS?
 - YOU DON'T NEED A **DISTRIBUTED** DATABASE, JUST A **SHARED** ONE
- ITS **ESPECIALLY** WEIRD WHEN THE NFT ONLY WORKS IN **ONE** GAME
 - IT DOESN'T TRUST **ITSELF**?
- WHAT DOES OWNERSHIP OF THE NFT ACTUALLY **GIVE** YOU ANYWAY?
 - "THE PRISON GUARDS **CAN'T** CONFISCATE MY WIRECUTTERS BECAUSE **I** OWN THE NFT!"?

SCARCITY

- NFTS ARE **POPULAR** AMONG METAVERSE FANS
- THEY INTRODUCE **SCARCITY** AND THEREFORE **VALUE**
 - BASICALLY, YOU CAN **SELL** THEM TO **SUCKERS**
- THEY HAVE SOME **ISSUES**, THOUGH...
- FIRST OF ALL, **DUPE** BUGS
- IN *RUNESCAPE*, 2,000,000 EXTREMELY RARE **PURPLE** PARTY HATS WERE DUPED IN **ONE** DAY
 - ROLLING BACK A DATABASE – **EASY** BUT PAINFUL
 - ROLLING BACK A **DISTRIBUTED** (BLOCKCHAIN) DATABASE – **FORGET** IT

INVENTORY

- IT'S ALSO HARD TO KEEP TRACK OF **INVENTORY** IN A BLOCKCHAIN DATABASE
- "TELL ME **EVERYTHING** IN THIS GAME THAT THIS PLAYER **OWNS**"
 - YOU HAVE TO GO THROUGH **ALL** THE OBJECTS IN THE GAME SEEING IF THE PLAYER OWNS THEM
 - YOU CAN'T INDEX BY **PLAYER**
- AS FOR **REAL ESTATE**, OWNERSHIP MAY MAKE SENSE IN **GAMES** BUT NOT IN GENERAL
 - IMAGINE THE INTERNET IF THERE WAS A HARD LIMIT ON THE NUMBER OF **WEB PAGES** IN EXISTENCE

TELEPORTATION

- REAL ESTATE IS **VALUELESS** IF YOU CAN **TELEPORT**
 - IT DOESN'T **MATTER** WHERE IT IS
- IF YOU **CAN'T** TELEPORT, WHO'S GOING TO WANT TO WALK PAST 20 **random** BUILDINGS TO GET WHERE THEY WANT TO GO?
 - IT WOULD BE LIKE A WEB SITE YOU COULD ONLY ACCESS BY SCROLLING PAST 20 **OTHER** WEB SITES
- THIS IS ALL **WELL**-UNDERSTOOD (*SECOND LIFE*)
- METAVERSE LAND IS IN EFFECTIVELY **INFINITE** SUPPLY, YOU JUST NEED A **HOSTING** SERVICE

- **INTELLECTUAL PROPERTY** IS GOING TO BE A **MESS** IN THE METAVERSE
 - AT LEAST UNTIL **LAW**-MAKERS SORT IT OUT
- IF A TEAM OF **AAA** ARTISTS CREATES **AAA** ART, THEY'LL WANT **ROYALTIES** IF YOU USE IT
 - OR IF SOMEONE VISITING YOUR **GAME** USES IT
- THEY MAY WISH TO **PROHIBIT** THE USE OF THEIR ART IN **COMPETITORS'** GAMES
 - **PLAYERS** MAY GET **LOW-RES** LOOKS FOR FREE
- IT'S NOT JUST **VISUAL** ART, EITHER
 - ITS SOUNDS, MUSIC, ANIMATION, FUNCTIONALITY, ...

CREATIVITY

- ONE OF THE **BIG** METAVERSE FEATURES THAT FANS PUSH IS **CREATIVITY**
 - YOU CAN **CREATE** CONTENT!
 - YOU CAN **SELL** CONTENT!
 - YOU CAN MAKE A **LIVING** OFF THE METAVERSE!
- YOU CAN DO THE SAME OFF THE **APP** STORE, **SPOTIFY**, **KINDLE** STORE, **ETSY** ETC.
 - BUT ONLY PEOPLE WITH LUCK OR CONNECTIONS **DO**
- **95%** OF CREATIVE WORK IS **RUBBISH**
 - UNFORTUNATELY, MOST PEOPLE THINK **THEIRS** IS IN THE **5%** THAT **ISN'T**

PLAY TO EARN

- ANOTHER BIG IDEA IS **PLAY-TO-EARN**
 - OR “**WORK**”, AS IT’S CALLED ELSEWHERE
- THIS IS **NOT** LIKE PROFESSIONAL ESPORTS
- THIS IS **15** GUYS IN **INDONESIA** PLAYING FOR LESS THAN MINIMUM WAGE TO MINT NFTS AND CRYPTOCOINS YOU’LL **BUY** OFF THEM
 - THAT THE DEVELOPER **COULD** GIVE YOU FOR **FREE**
- P2E WILL BE **DOMINATED** BY ORGANISED GROUPS (AS IN *SECOND LIFE* AND *EVE ONLINE*)
- **PAID** PLAY LOSES ITS **INTRINSIC** VALUE
 - GOOGLE “OVERJUSTIFICATION EFFECT”

ALSO

- SOME **OTHER** QUICK POINTS
- **TOXICITY** IS LIKELY TO BE **WORSE** IN THE METAVERSE THAN IN MMOS
 - CO-ORDINATED GUILDS OF **MILLIONS** OF JERKS
- CLIENT SOFTWARE CAN **RENDER** PEOPLE **DIFFERENTLY** TO HOW THEY SEE THEMSELVES
 - EVERYONE'S **ANIME!** EVERYONE'S A **CAT** PERSON!
- CAN **AI** NPCs MOVE BETWEEN WORLDS OF THEIR OWN VOLITION?
 - THIS IS A **50-SLIDE** TALK ON ITS OWN!
 - WWW.HOWTOBEAGOD.COM – FREE BOOK!

• THIS IS THE gITF FILE FORMAT FOR 3D OBJECTS

gITF - what the ?

An overview of the basics of the GL Transmission Format

gITF was designed and specified by the Khronos Group, for the efficient transfer of 3D content over networks.

The core of gITF is a **JSON** file that describes the structure and composition of a scene containing 3D models. The top-level elements of this file are:

- scenes, nodes**
Basic structure of the scene
- cameras**
View configurations for the scene
- meshes**
Geometry of 3D objects
- buffers, bufferViews, accessors**
Data references and data layout descriptions
- materials**
Definitions of how objects should be rendered
- textures, images, samplers**
Surface appearance of objects
- skins**
Information for vertex skinning
- animations**
Changes of properties over time

These elements are contained in arrays. References between the objects are established by indices. The objects to look up → the objects in the arrays.

It is also possible to store the whole asset in a single binary gITF file. In this case, the JSON data is stored as a string, followed by the binary data of buffers or images.

Further resources

The Khronos gITF landing page:
<https://www.khronos.org/gltf/>

The Khronos gITF GitHub repository:
<https://github.com/KhronosGroup/gltf>



cameras

Each of the nodes may refer to one of the cameras that are defined in the gITF asset.

```

{
  "camera": {
    "type": "perspective",
    "perspective": {
      "yfov": 1.1,
      "zfar": 100,
      "znear": 0.1
    },
    "orthographic": {
      "xmag": 1.0,
      "ymag": 1.0,
      "zfar": 100,
      "znear": 0.1
    }
  }
}
    
```

There are two types of cameras: **perspective** and **orthographic**.

The value for the far clipping plane distance of a perspective camera, **zfar**, is optional. When it is omitted, the camera uses a special projection matrix that defines the basic color of the objects, as well as physical properties that affect the object appearance.

When one of the nodes refers to a camera, then an instance of this camera is created. The camera matrix of this instance is given by the global transform matrix of the node.

textures, images, samplers

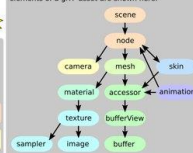
The textures contain information about textures that may be applied to rendered objects. Textures are referred to by materials to define the basic color of the objects, as well as physical properties that affect the object appearance.

The texture consists of a reference to the **source** of the texture, which is one of the **images** of the asset, and a reference to a **sampler**.

The **images** define the image data used for the texture. This data can be given via a **URI**, or by a reference to an **image file**, or by a reference to a **bufferView**.

The **samplers** describe the wrapping and scaling of textures. The constant **wrapMode**, values correspond to OpenGL constants that can directly be passed to **glTexParameters**.

Concepts



Binary data references

The images and buffers of a gITF asset may refer to external files that contain the data that are required for rendering the 3D content:

```

{
  "buffers": [
    {
      "uri": "buffers.bin",
      "byteLength": 1024
    }
  ],
  "images": [
    {
      "uri": "textures/texture.png",
      "mimeType": "image/png"
    }
  ],
  "samplers": [
    {
      "uri": "samplers/texture_sampler",
      "mimeType": "image/png"
    }
  ]
}
    
```

The data is referred to via URIs, but can also be included directly in the JSON using data URIs. The data URI defines the MIME type that contains the data as a base64 encoded string.

Buffer data:

```

{
  "buffer": {
    "uri": "buffers/buffer.bin",
    "byteLength": 1024
  }
}
    
```

Image data (PNG):

```

{
  "image": {
    "uri": "images/image.png",
    "mimeType": "image/png"
  }
}
    
```

Version 2.0a gITF version 2.0

This version is non-normative



skins

Each of the nodes may contain the information that is necessary to perform vertex skinning. With vertex skinning, it is possible to let the vertices of a mesh be influenced by the bones of a skeleton, based on its current pose.

A node that refers to a **mesh** may also refer to a **skin**.

```

{
  "skin": {
    "name": "Skin",
    "skeleton": {
      "uri": "skeleton.json",
      "mimeType": "application/json"
    },
    "joints": [
      {
        "name": "joint_0",
        "matrix": [
          [1, 0, 0, 0],
          [0, 1, 0, 0],
          [0, 0, 1, 0],
          [0, 0, 0, 1]
        ]
      }
    ]
  }
}
    
```

The **skins** contain an array of joints, which are the indices of nodes that define the skeleton hierarchy, and the **inverseBindMatrices**, which is a reference to an accessor that contains one matrix for each joint.

The skeleton hierarchy is modeled with nodes, just like the scene structure. Each joint node may have a local transform and an array of children, and the "bones" of the skeleton are given implicitly, as the connections between the joints.

The mesh primitives of a skinned mesh contain the **POSITION** attribute that refers to the accessor for the vertex positions, and two special attributes that are required for skinning: **JOINTS** and **WEIGHTS**. **JOINTS** is an array of joint indices, and **WEIGHTS** is an array of weights, each referring to an accessor that contains one weight for each joint.

The **JOINTS** attribute defines the joints that should affect the vertex.

The **WEIGHTS** attribute defines the weights indicating how strongly the joint should influence the vertex.

From this information, the **skinning matrix** can be computed.

This is explained in detail in **"Computing the skinning matrix"**

scenes, nodes

The gITF JSON may contain **scenes** (with an optional default **scene**). Each scene can contain an array of indices of nodes.

```

{
  "scenes": [
    {
      "name": "Scene",
      "nodes": [
        0, 1, 2, 3
      ]
    }
  ]
}
    
```

Each of the nodes can contain an array of indices of its children. This allows modeling a simple scene hierarchy:

```

{
  "nodes": [
    {
      "name": "Node 0",
      "children": [
        1, 2, 3
      ]
    },
    {
      "name": "Node 1",
      "children": [
        4, 5
      ]
    },
    {
      "name": "Node 2",
      "children": [
        6, 7
      ]
    },
    {
      "name": "Node 3",
      "children": [
        8, 9
      ]
    },
    {
      "name": "Node 4",
      "children": [
        10, 11
      ]
    },
    {
      "name": "Node 5",
      "children": [
        12, 13
      ]
    },
    {
      "name": "Node 6",
      "children": [
        14, 15
      ]
    },
    {
      "name": "Node 7",
      "children": [
        16, 17
      ]
    },
    {
      "name": "Node 8",
      "children": [
        18, 19
      ]
    },
    {
      "name": "Node 9",
      "children": [
        20, 21
      ]
    },
    {
      "name": "Node 10",
      "children": [
        22, 23
      ]
    },
    {
      "name": "Node 11",
      "children": [
        24, 25
      ]
    },
    {
      "name": "Node 12",
      "children": [
        26, 27
      ]
    },
    {
      "name": "Node 13",
      "children": [
        28, 29
      ]
    },
    {
      "name": "Node 14",
      "children": [
        30, 31
      ]
    },
    {
      "name": "Node 15",
      "children": [
        32, 33
      ]
    },
    {
      "name": "Node 16",
      "children": [
        34, 35
      ]
    },
    {
      "name": "Node 17",
      "children": [
        36, 37
      ]
    },
    {
      "name": "Node 18",
      "children": [
        38, 39
      ]
    },
    {
      "name": "Node 19",
      "children": [
        40, 41
      ]
    },
    {
      "name": "Node 20",
      "children": [
        42, 43
      ]
    },
    {
      "name": "Node 21",
      "children": [
        44, 45
      ]
    },
    {
      "name": "Node 22",
      "children": [
        46, 47
      ]
    },
    {
      "name": "Node 23",
      "children": [
        48, 49
      ]
    },
    {
      "name": "Node 24",
      "children": [
        50, 51
      ]
    },
    {
      "name": "Node 25",
      "children": [
        52, 53
      ]
    },
    {
      "name": "Node 26",
      "children": [
        54, 55
      ]
    },
    {
      "name": "Node 27",
      "children": [
        56, 57
      ]
    },
    {
      "name": "Node 28",
      "children": [
        58, 59
      ]
    },
    {
      "name": "Node 29",
      "children": [
        60, 61
      ]
    },
    {
      "name": "Node 30",
      "children": [
        62, 63
      ]
    },
    {
      "name": "Node 31",
      "children": [
        64, 65
      ]
    },
    {
      "name": "Node 32",
      "children": [
        66, 67
      ]
    },
    {
      "name": "Node 33",
      "children": [
        68, 69
      ]
    },
    {
      "name": "Node 34",
      "children": [
        70, 71
      ]
    },
    {
      "name": "Node 35",
      "children": [
        72, 73
      ]
    },
    {
      "name": "Node 36",
      "children": [
        74, 75
      ]
    },
    {
      "name": "Node 37",
      "children": [
        76, 77
      ]
    },
    {
      "name": "Node 38",
      "children": [
        78, 79
      ]
    },
    {
      "name": "Node 39",
      "children": [
        80, 81
      ]
    },
    {
      "name": "Node 40",
      "children": [
        82, 83
      ]
    },
    {
      "name": "Node 41",
      "children": [
        84, 85
      ]
    },
    {
      "name": "Node 42",
      "children": [
        86, 87
      ]
    },
    {
      "name": "Node 43",
      "children": [
        88, 89
      ]
    },
    {
      "name": "Node 44",
      "children": [
        90, 91
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PRACTICALITIES

- THERE ARE OUTSTANDING **TECHNICAL** PROBLEMS THAT HAVE **YET** TO BE SOLVED
- WE'VE HAD ALL THE **FUNCTIONALITY** THE METAVERSE NEEDS FOR **MANY** YEARS
 - JUST NOT ALL **INTEGRATED** TOGETHER
- EVEN AFTER ALL THIS **TIME**, THOUGH, CREATING **SIMPLE** WORKING OBJECTS SUCH AS **DOORS** IS **NOT** TRIVIAL
- THERE ARE **DOZENS** OF INTERACTIONS BETWEEN DIFFERENT **DATA** SETS
 - SHARING THOSE NEEDS STANDARDS WE DON'T **HAVE**

STANDARDS

- STANDARDS ARE GENERALLY A **GOOD** THING, BUT THEY CAN STIFLE **INNOVATION**
- TEXT MUDS ALL USED TO BE **DIFFERENT** UNTIL PEOPLE CREATED **ENGINES**
- THEN, WE GOT **STOCK MUD** SYNDROME
- SIMILAR THINGS ARE HAPPENING WITH UNITY
 - PEOPLE WRITE **ORIGINAL** GAMES THAT ARE JUST LIKE ALL THE **OTHER** ORIGINAL GAMES THAT USE THE SAME TOOLS AND ASSETS
- STOCK **UNITY** SYNDROME?
- STOCK **METAVEVERSE** SYNDROME?

SUMMARY

- ALL THE **COMPONENTS** OF THE METAVERSE HAVE **ALREADY** BEEN DONE IN MMOS
 - MORE WORK **IS** STILL NEEDED, THOUGH
 - SOME OF THIS WILL **HELP** MMOS
- NOT ALL OF THESE COMPONENTS ARE **POPULAR** AMONG **GAMERS**
- HOWEVER, IF THE PEOPLE WHO LIKE RMT, NFTS, **CRYPTO** AND BEING JERKS **MIGRATE** TO THE METAVERSE, THAT WOULD BE **WONDERFUL!**
- **GAMERS** WOULD FINALLY GET THEIR **GAMES** BACK!