

# 12345

## **BIG METAVERSE QUESTIONS**

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Raph Koster  
CEO, Playable Worlds Inc.



is a metaverse anyway?

**1** WHAT

**2** HOW

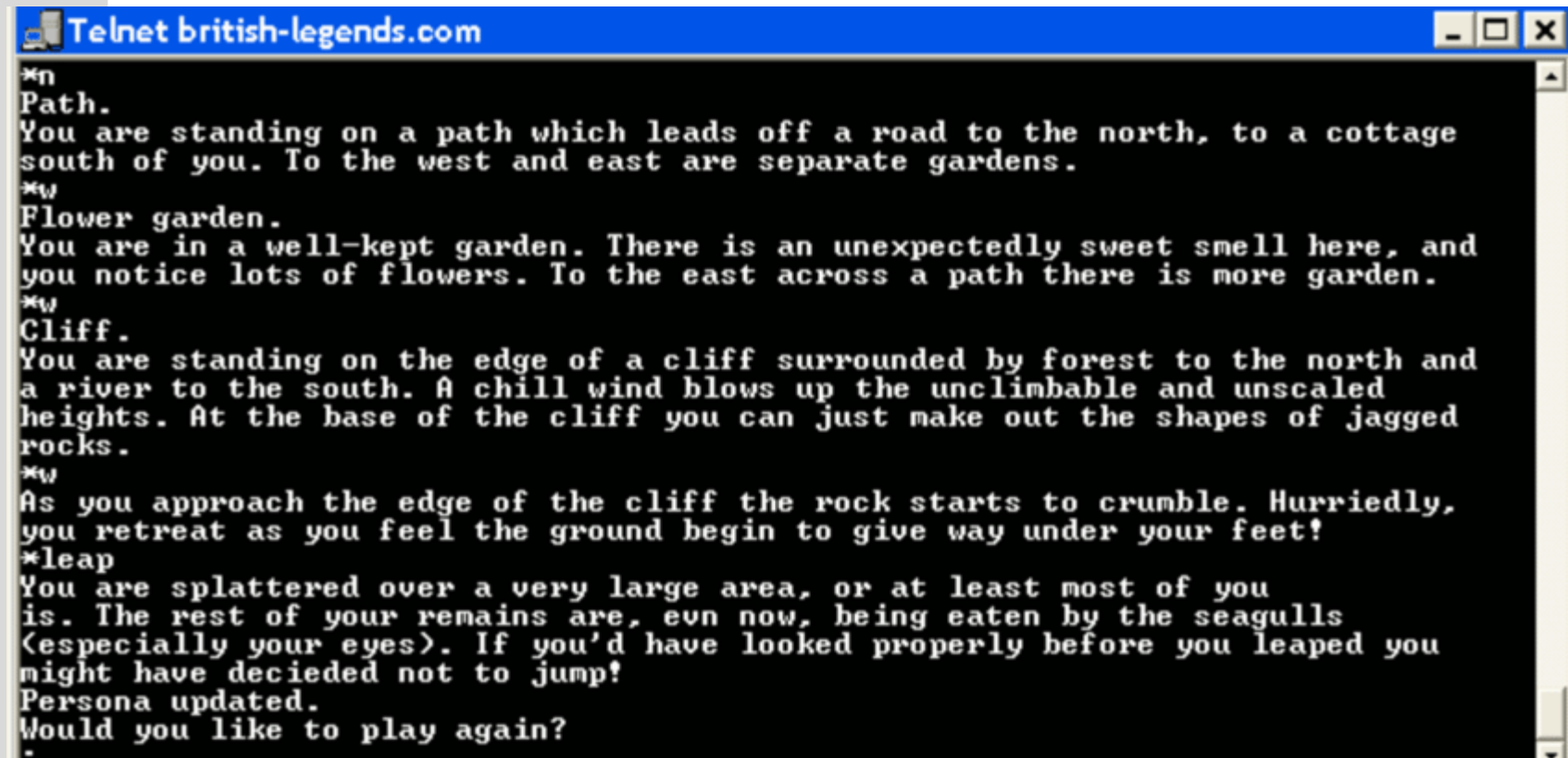
**3** WHERE

**4** WHO

**5** WHY

# WHAT

Everyone's conception of metaverses are shaped by online worlds.  
Text worlds came along in 1978.



```
Telnet british-legends.com
*~
Path.
You are standing on a path which leads off a road to the north, to a cottage
south of you. To the west and east are separate gardens.
*~
Flower garden.
You are in a well-kept garden. There is an unexpectedly sweet smell here, and
you notice lots of flowers. To the east across a path there is more garden.
*~
Cliff.
You are standing on the edge of a cliff surrounded by forest to the north and
a river to the south. A chill wind blows up the unclimbable and unscaled
heights. At the base of the cliff you can just make out the shapes of jagged
rocks.
*~
As you approach the edge of the cliff the rock starts to crumble. Hurriedly,
you retreat as you feel the ground begin to give way under your feet!
*leap
You are splattered over a very large area, or at least most of you
is. The rest of your remains are, evn now, being eaten by the seagulls
(especially your eyes). If you'd have looked properly before you leaped you
might have decieded not to jump!
Persona updated.
Would you like to play again?
:
```



# WHAT

Graphical worlds arrived in 1985.



# WHAT

Around 1989 we got the speciation that lives on to this day.

**mud**

**mush**

**moo**



# WHAT

InterMUD protocol gave us the first technical multiverse in 1992.

```
mssp = {  
  HOSTNAME = "stickmud.com",  
  VT100 = "1",  
  UPTIME = "1565657220",  
  MSDP = "0",  
  MCP = "0",  
  GMCP = "1",  
  PORT = "7680",  
  ["MINIMUM AGE"] = "13",  
  PUEBLO = "0",  
  INTERMUD = "-1",  
  SKILLS = "100",  
  ["HIRING BUILDERS"] = "0",  
  PLAYERS = "6",  
  CONTACT = "askstickmud@hotmail.com",  
  CODEBASE = "LDMud 3.5.0 (3.5.1)",  
}
```



A virtual mall?



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For **LOCAL** online information, you need:

★ [Online! Tuscaloosa](#)

**db Tech Games**

★ [QUAKE](#)

db Tech's Quake server...teams, action, 5 different mods per week, dare you check it out? (Watch out for Elmo)

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Cottondale, AL 35453

And of course - Email: [info@dbtech.net](mailto:info@dbtech.net)



# WHAT

In 1994??

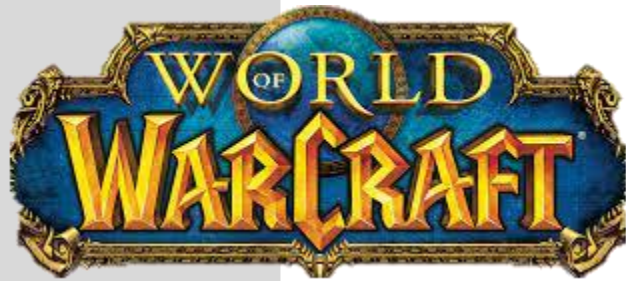
# WHAT

Massive concurrency came along with *Ultima Online* in 1997.



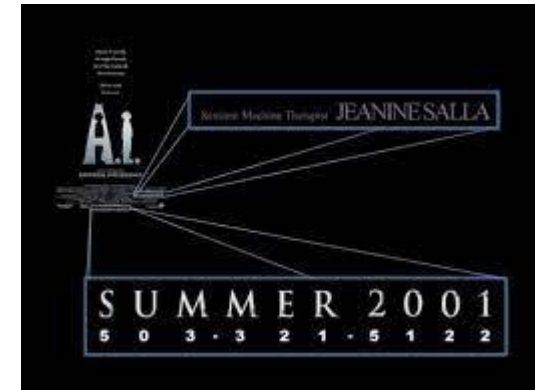
# WHAT

The classic species persisted into the graphical “MMO” age.



# WHAT

## Weaving in the real world with ARGs and pervasive games: 1999–2001



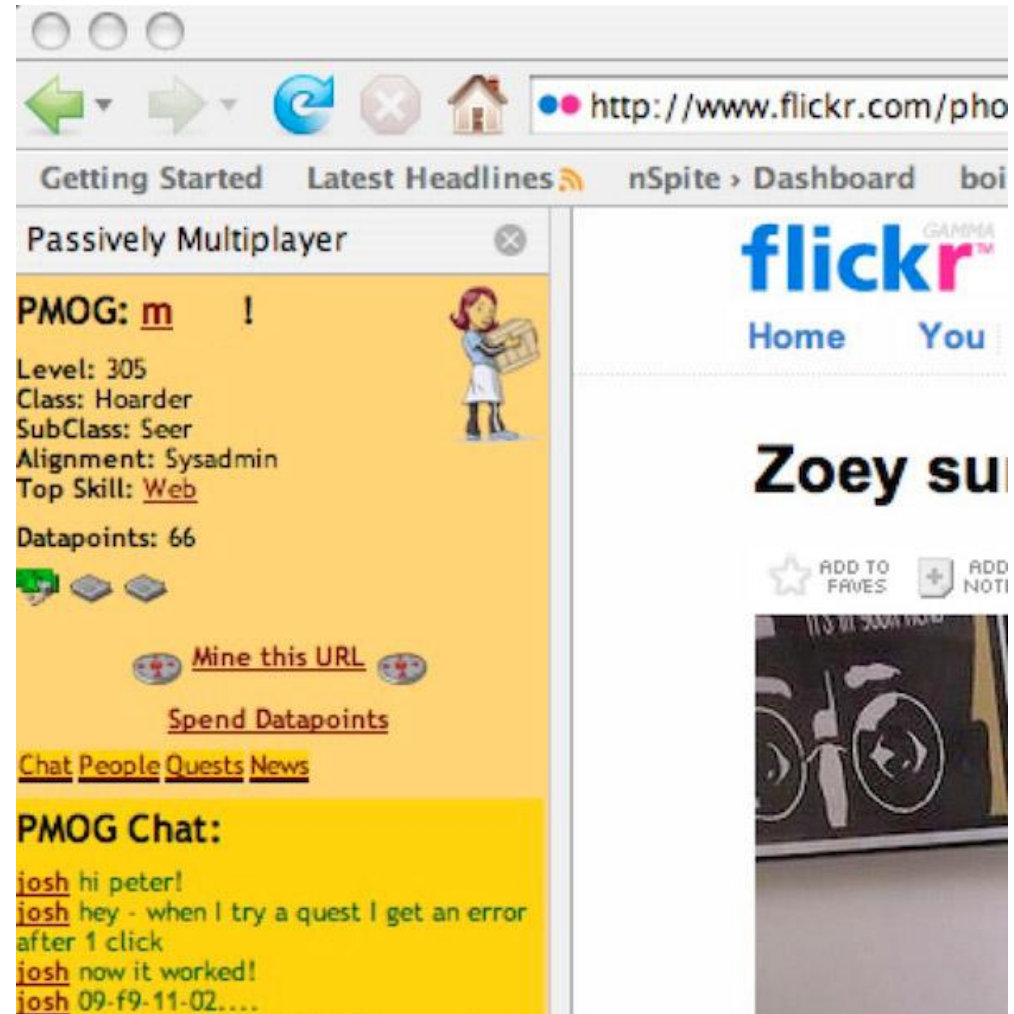
# WHAT

We hear a lot about live concerts as a metaverse application. Here's Suzanne Vega doing it in 2006.



# WHAT

## Cross website avatar identity: 2007



# WHAT

Educational integration: 2008.

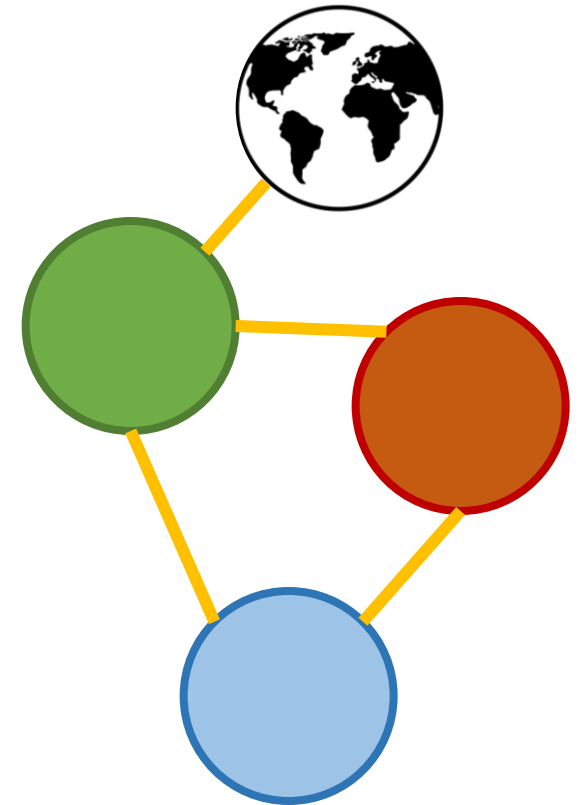
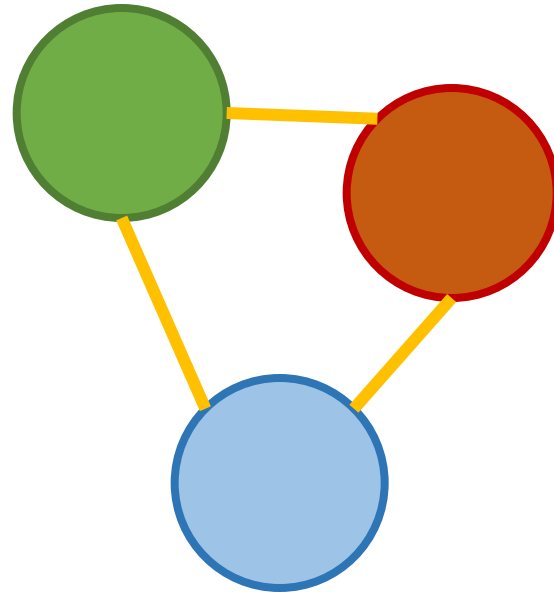
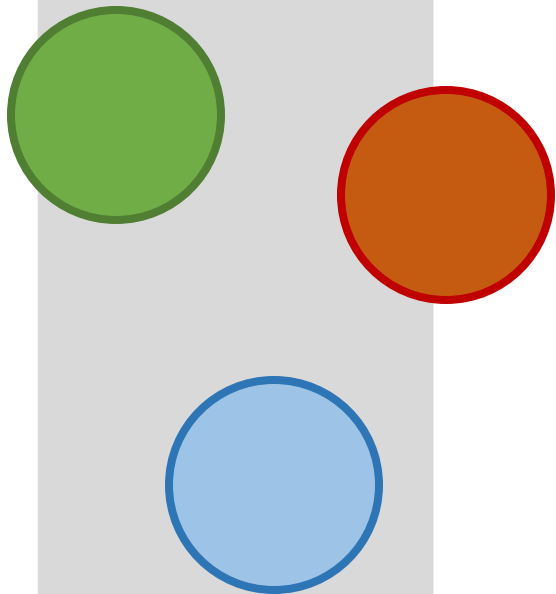


**sleaddle**  
Learning System for Virtual Environments



# WHAT

Worlds to multiverse to metaverse...



**1** WHAT

**2** HOW

**3** WHERE

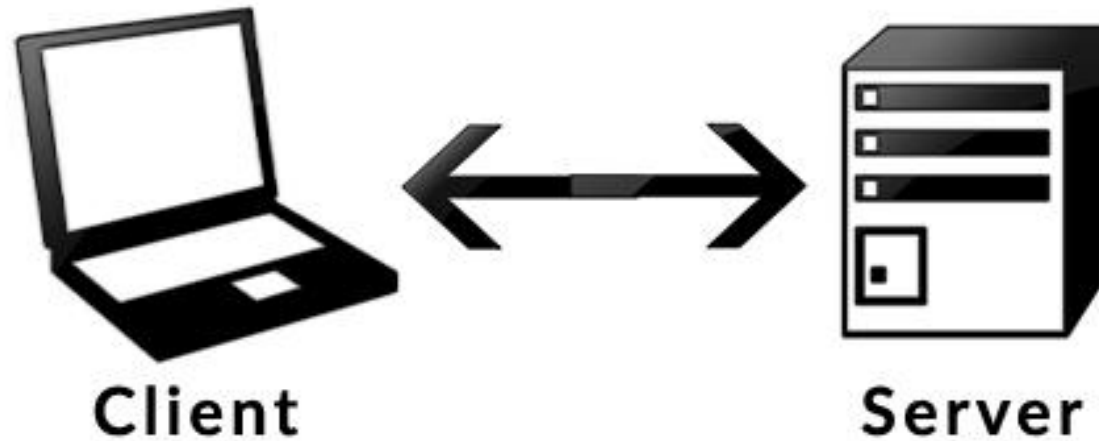
**4** WHO

**5** WHY

do you build one?

# HOW

This is a pretty misleading picture of what a virtual world is like.



The divide is nowhere near that clean.

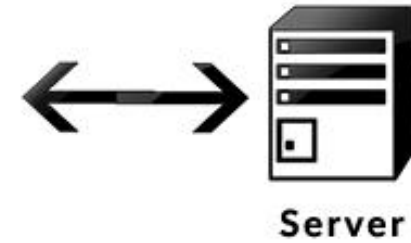


# HOW

For one thing, the visuals are usually packaged with the game client.



Client

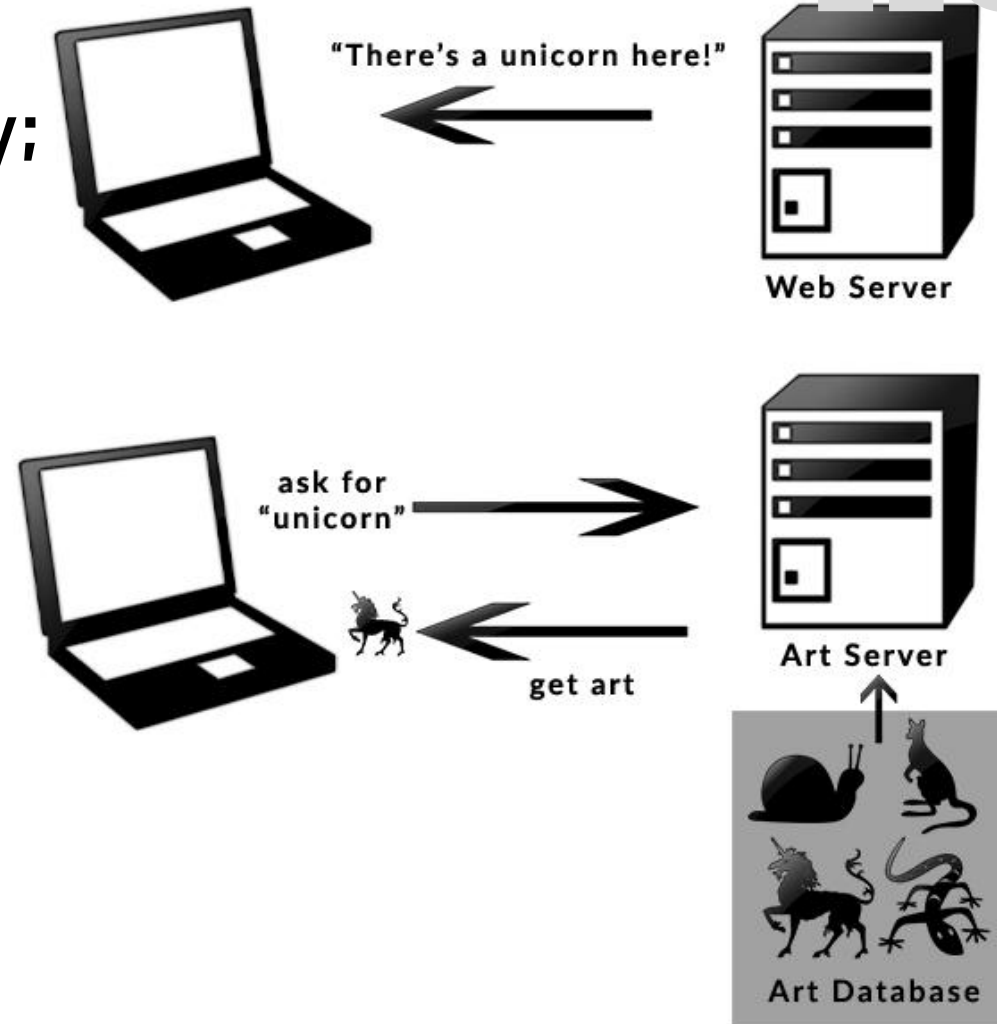


Server



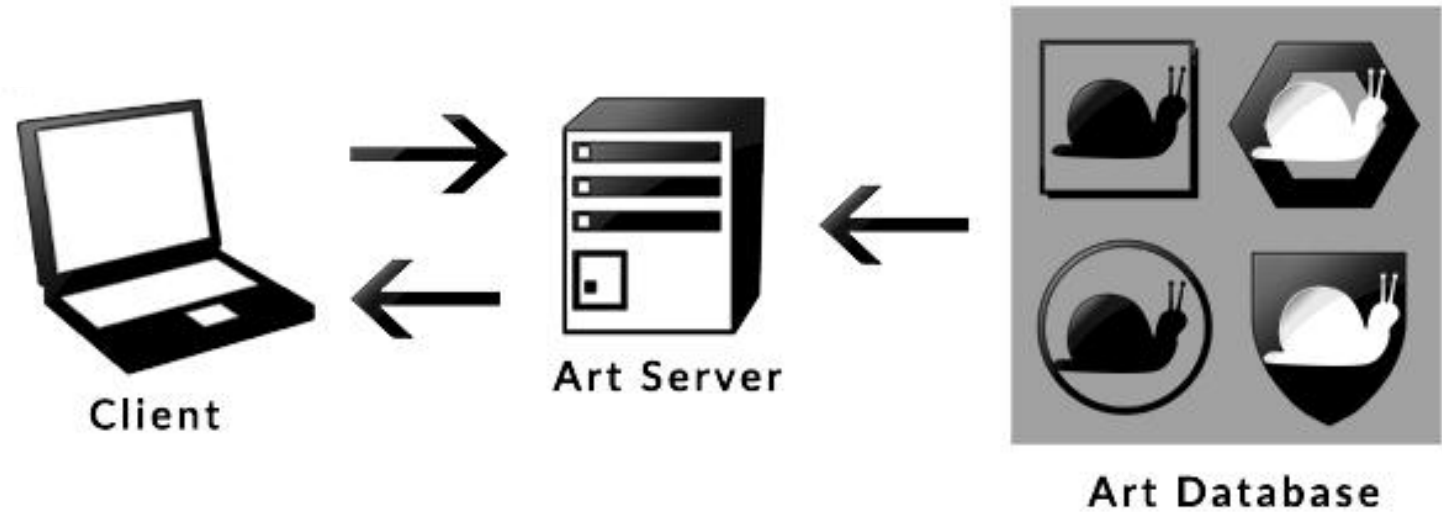
# How

It doesn't have to work that way;  
the web doesn't.



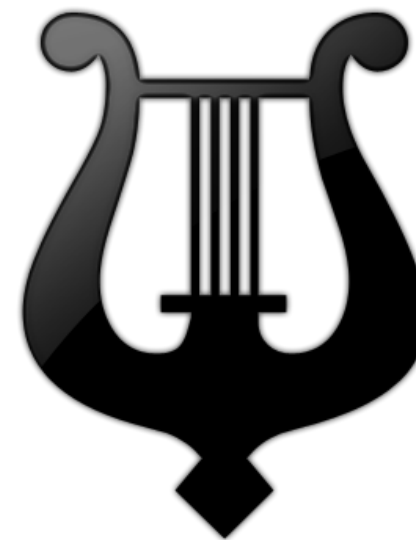
# HOW

That only works because we have  
*standard formats.*



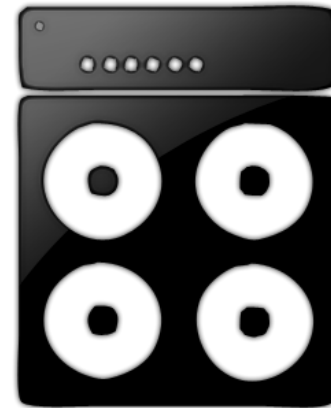
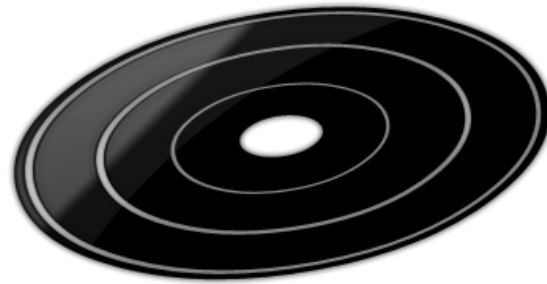
# HOW

1. The content
2. The format
3. The machine that can parse it



# HOW

1. The content
2. The format
3. The machine that can parse it



# HOW

1. The content
2. The format
3. The machine that can parse it

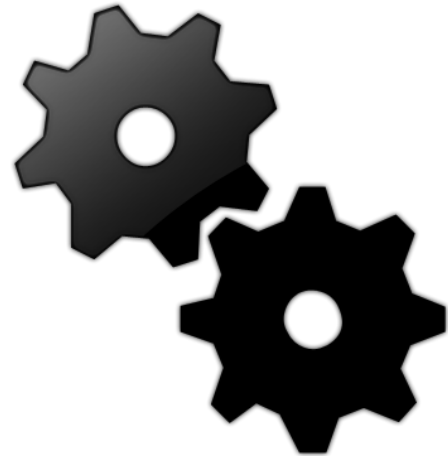


*mp3*



# HOW

1. The content: abstract ideas
2. The format: a data structure
3. The machine that can parse it: a system



## 3D graphics [ edit ]

See also: [3D file format](#) at *EduTech Wiki*

**3D graphics** are 3D models that allow building models in real-time or non-real-time 3D rendering.

- 3DMF – **QuickDraw 3D Metafile** (.3dmf)
- 3DM – **OpenNURBS Initiative** 3D Model (used by Rhinoceros 3D) (.3dm)
- 3MF – **Microsoft** 3D Manufacturing Format (.3mf)<sup>[3]</sup>
- 3DS** – **legacy 3D Studio Model** (.3ds)
- ABC – **Alembic (computer graphics)**
- AC – **AC3D Model** (.ac)
- AMF** – **Additive Manufacturing File Format**
- AN8 – **Anim8or Model** (.an8)
- AOI – **Art of Illusion Model** (.aoi)
- ASM – **PTC Creo assembly** (.asm)
- B3D – **Blitz3D Model** (.b3d)
- BLEND – **Blender** (.blend)
- BLOCK – **Blender** encrypted blend files (.block)
- BMD3 – **Nintendo GameCube** first-party J3D proprietary model format (.bmd)
- BDL4 – **Nintendo GameCube** and **Wii** first-party J3D proprietary model format (2002, 2006–2010) (.bdl)
- BRRES – **Nintendo Wii** first-party proprietary model format 2010+ (.brres)
- BFRES – **Nintendo Wii U** and later **Switch** first-party proprietary model format
- C4D – **Cinema 4D** (.c4d)
- Cal3D – **Cal3D** (.cal3d)
- CCP4** – X-ray crystallography voxels (electron density)
- CFL – **Compressed File Library** (.cfl)
- COB – **Caligari Object** (.cob)
- CORE3D – **Coreona 3D** Coreona 3D Virtual File(.core3d)
- CTM – **OpenCTM** (.ctm)
- DAE – **COLLADA** (.dae)
- DFF – **RenderWare** binary stream, commonly used by **Grand Theft Auto III**-era games as well as other RenderWare titles
- DPM – **deepMesh** (.dpm)
- DTS – **Torque Game Engine** (.dts)
- EGG – **Panda3D Engine**
- FACT – **Electric Image** (.fac)
- FBX – **Autodesk FBX** (.fbx)

- G – **BRL-CAD geometry** (.g)
- GLB – a binary form of **glTF** required to be loaded in **Facebook 3D Posts**. (.glb)
- GLM – **Ghoul Mesh** (.glm)
- glTF – the JSON-based standard developed by **Khronos Group** (.gltf)
- HEC– **Hector Game Engine - Flatspace** model format (.hec)
- IO - **Bricklink Stud.io 2.0 Model File** (.io)
- IOB – **Imagine (3D modeling software)** (.lob)
- JAS – **Cheetah 3D file** (.jas)
- JMESH** - Universal mesh data exchange file based on **JMesh** specification (.jmsh for text/**JSON** based, .bmsh for binary/**UBJSON** based)
- LDR - **LDraw Model File** (.ldr)
- LWO – **Lightwave Object** (.lwo)
- LWS – **Lightwave Scene** (.lws)
- LXF – **LEGO Digital Designer Model file** (.lxf)
- LXO – **Luxology Modo (software)** file (.lxo)
- M3D – **Model3D**, universal, engine-neutral format (.m3d)
- MA – **Autodesk Maya ASCII File** (.ma)
- MAX – **Autodesk 3D Studio Max file** (.max)
- MB – **Autodesk Maya Binary File** (.mb)
- MPD - **LDraw Multi-Part Document Model File** (.mpd)
- MD2** – **Quake 2** model format (.md2)
- MD3** – **Quake 3** model format (.md3)
- MD5** – **Doom 3** model format (.md5)
- MDX – **Blizzard Entertainment's** own model format (.mdx)
- MESH – **New York University**(.m)
- MESH – **Meshwork Model** (.mesh)
- MM3D – **Misfit Model 3d** (.mm3d)
- MPO – **Multi-Picture Object** – This **JPEG** standard is used for 3d images, as wit
- MRC** – voxels in cryo-electron microscopy
- NIF – **Gamebryo NetImmerse File** (.nif)
- OBJ – **Wavefront .obj file** (.obj)
- OFF – **OFF Object file format** (.off)
- OGEX – **Open Game Engine Exchange** (OpenGEX) format (.ogex)
- PLY** – **Polygon File Format / Stanford Triangle Format** (.ply)
- PRC – **Adobe PRC** (embedded in PDF files)
- PRT – **PTC Creo part** (.prt)
- POV – **POV-Ray document** (.pov)
- R3D – **Realsoft 3D (Real-3D)** (.r3d)
- RWX – **RenderWare Object** (.rwx)
- SIA – **Nevercenter Silo Object** (.sia)
- SIB – **Nevercenter Silo Object** (.sib)
- SKP – **Google Sketchup file** (.skp)
- SLDASM – **SolidWorks Assembly Document** (.sldasm)
- SLDPRT – **SolidWorks Part Document** (.sldprt)
- SMD – **Valve Studiomd! Data format** (.smd)
- U3D – **Universal 3D format** (.u3d)
- USD – **Universal Scene Description** (.usd)
- USDA – **Universal Scene Description , Human-readable text format** (.usda)
- USDC – **Universal Scene Description , Binary format** (.usdc)
- USDZ – **Universal Scene Description Zip** (.usdz)
- VIM – **Revizto** visual information model format (.vimproj)
- VRML97 – **VRML Virtual reality modeling language** (.wrl)
- VUE – **Vue scene file** (.vue)
- VWX – **Vectorworks** (.vwx)
- WINGS – **Wings3D** (.wings)
- W3D – **Westwood 3D Model** (.w3d)
- X – **DirectX 3D Model** (.x)
- X3D – **Extensible 3D** (.x3d)
- Z3D – **Zmodeler** (.z3d)
- ZBMX - **Mecabricks Blender Add-On** (.zbm)

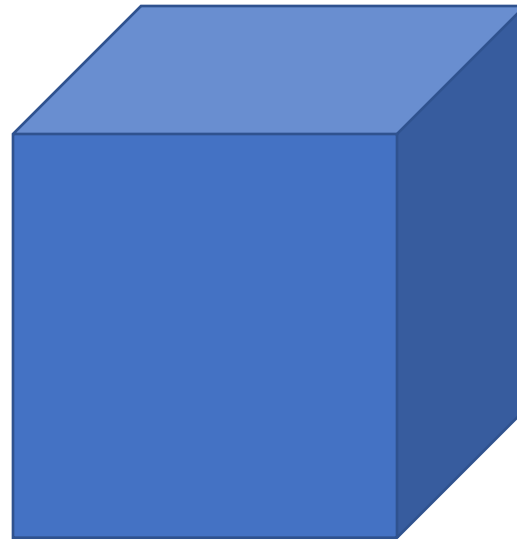


# HOW

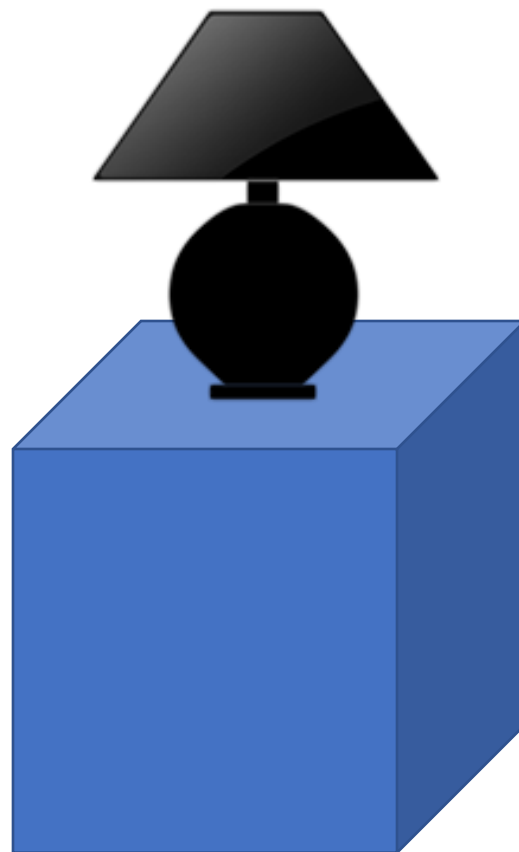
**This is why we only have a few web rendering engines.**



**So now we have managed to draw a cube.**

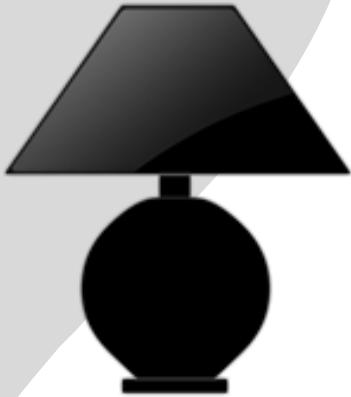


# HOW



## FOUR PARADOXES

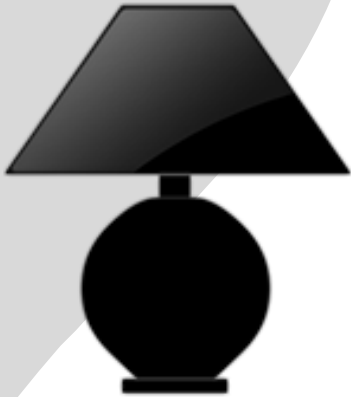
The container is not the content



# HOW

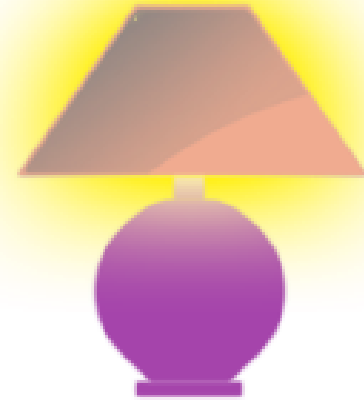
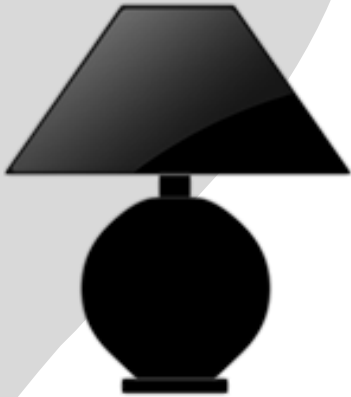
## FOUR PARADOXES

Appearance is not the thing



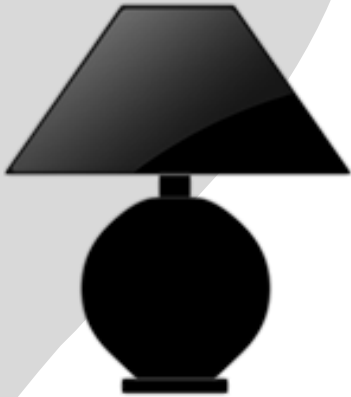
## FOUR PARADOXES

Data is not code



## FOUR PARADOXES

Ownership is not possession

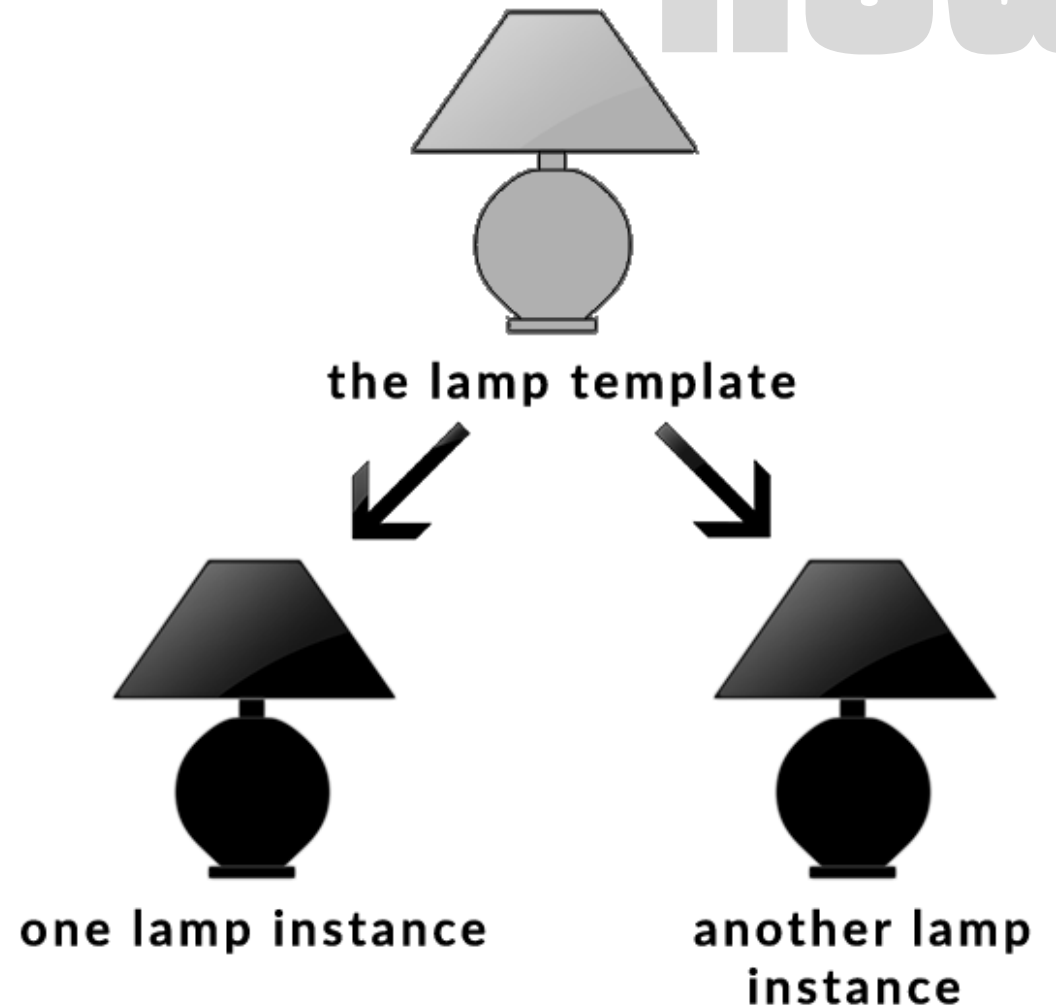


# HOW

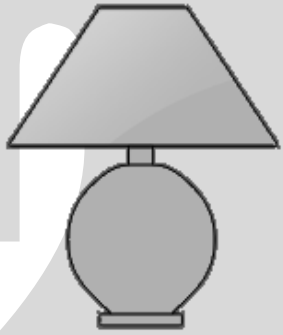
Typically online worlds use a "cookie cutter" approach.

These are different *databases*.

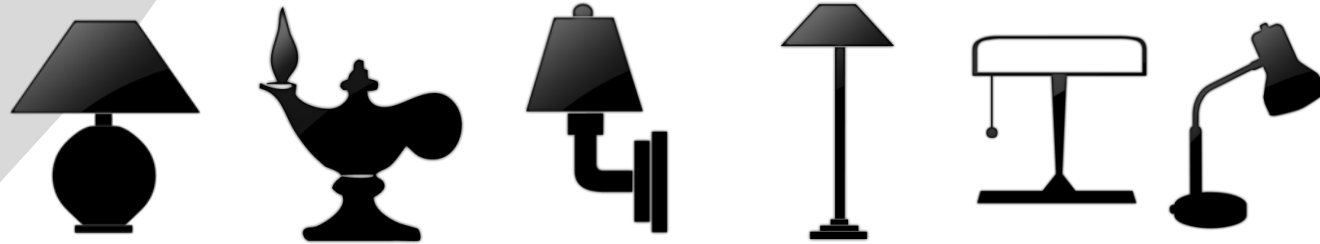
1. Definitions of things
2. Individual instances of things.



# HOW



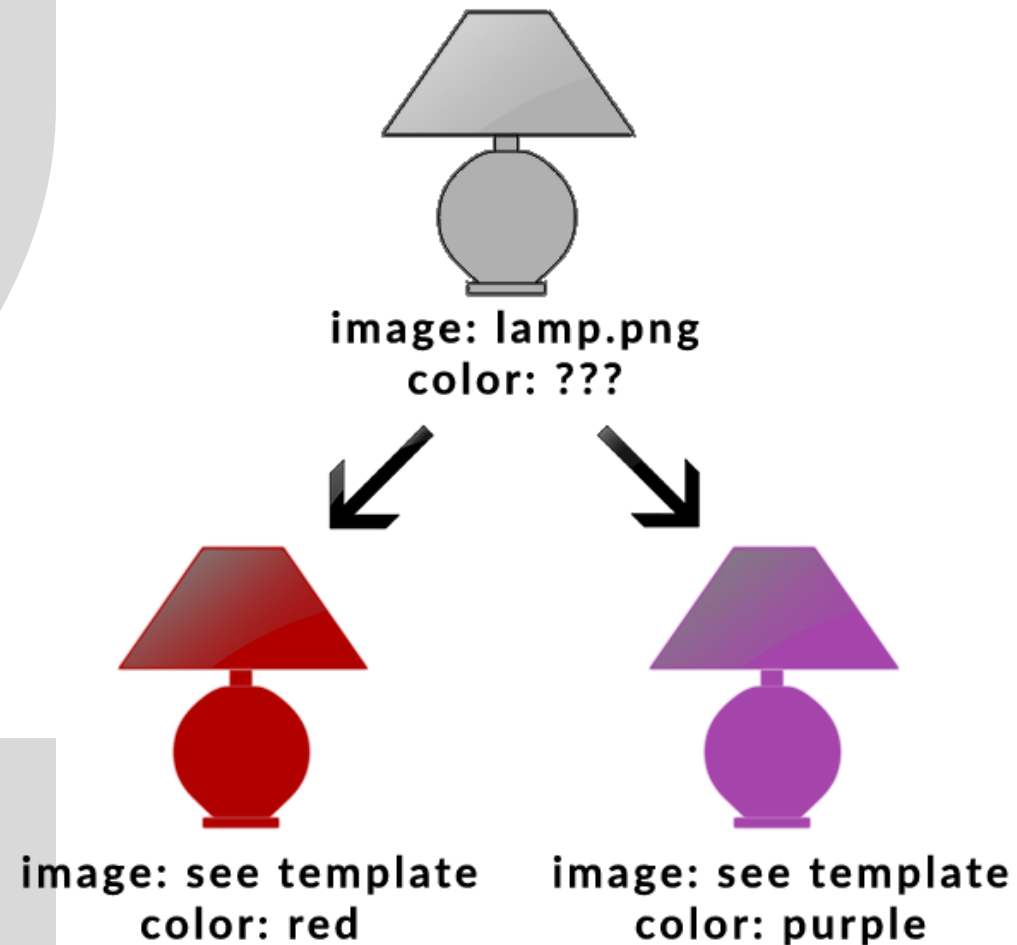
The lamp type: column headers in a spreadsheet.



Rows in the spreadsheet: sorts of lamps.



For economy's sake, most worlds don't have a lot of instance data.



# HOW

If we decentralize, which database are we decentralizing?



**Instances**



**Templates**



**Art**



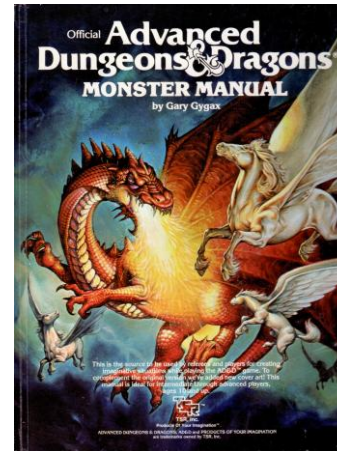
# HOW

If we decentralize, which database are we decentralizing?

There's precedent for some.



**Instances**



**Templates**



**Art**



# HOW

Of course, that's not what crypto wants to decentralize...



**Instances**



**Templates**



**Art**

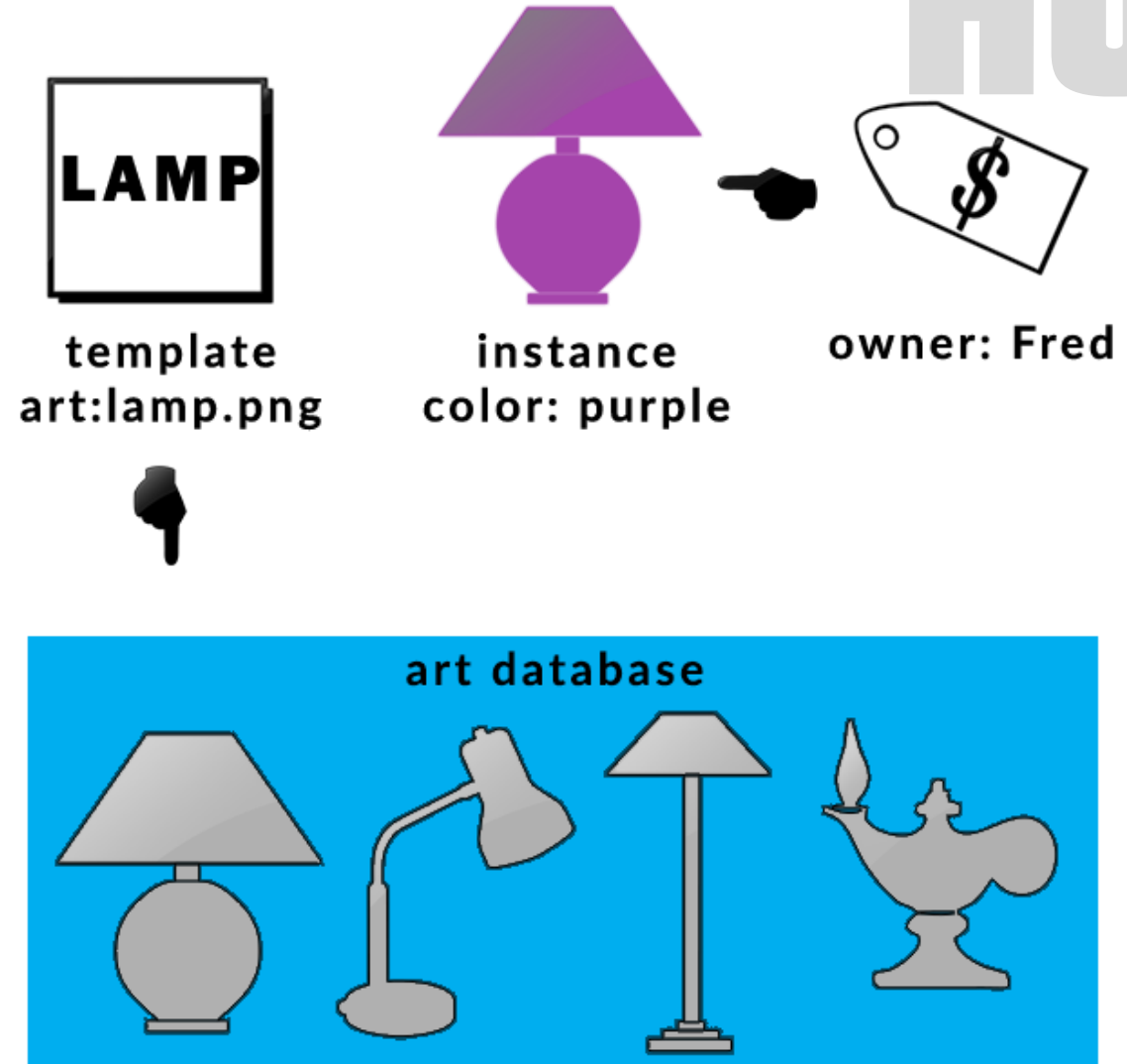


# HOW

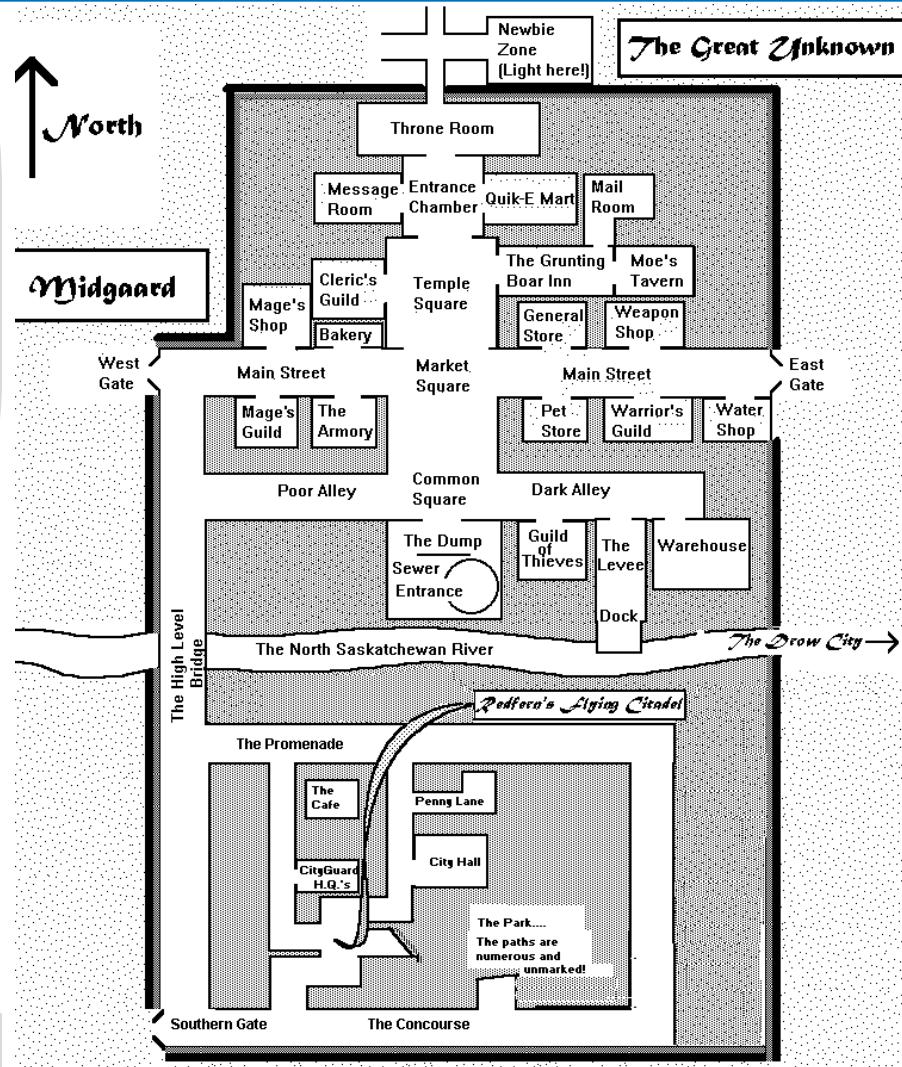
Fields are not just text.

The art is a pointer from one database to another database.

And there can be many sorts of pointers like that.



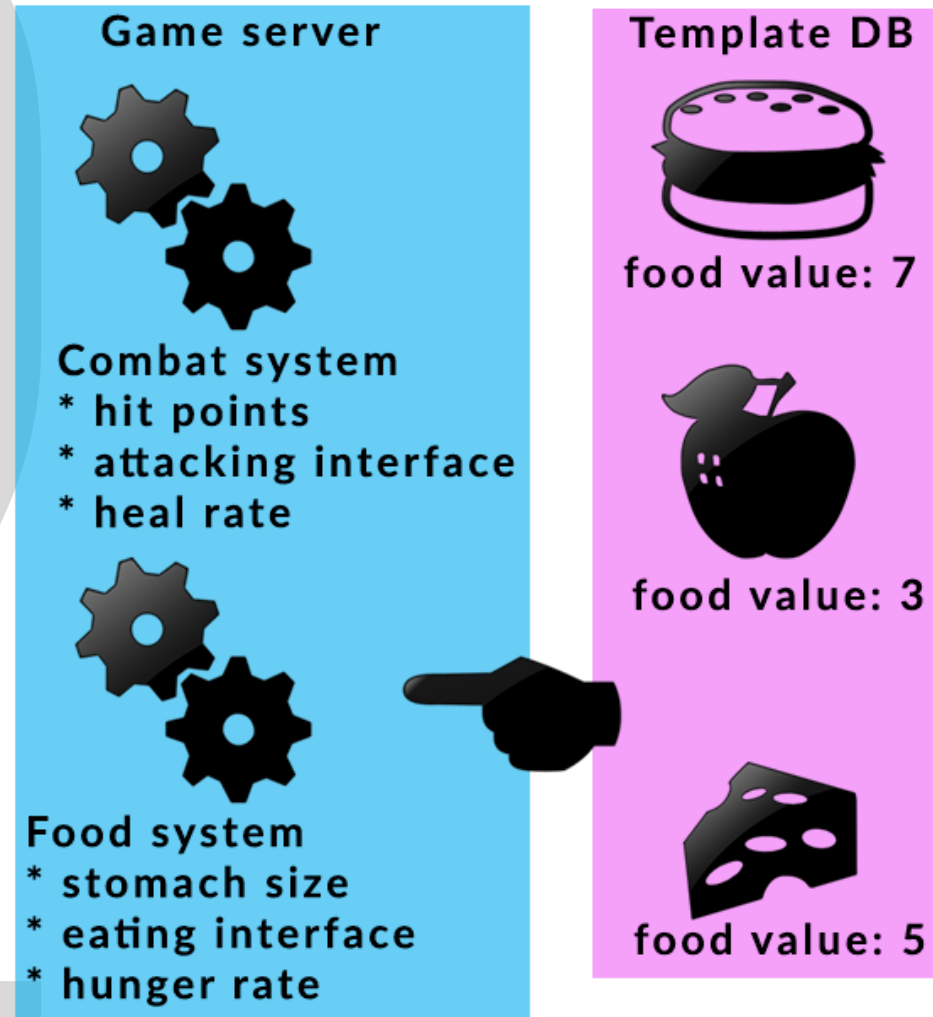
# HOW



It's been a long time since items were pure data.



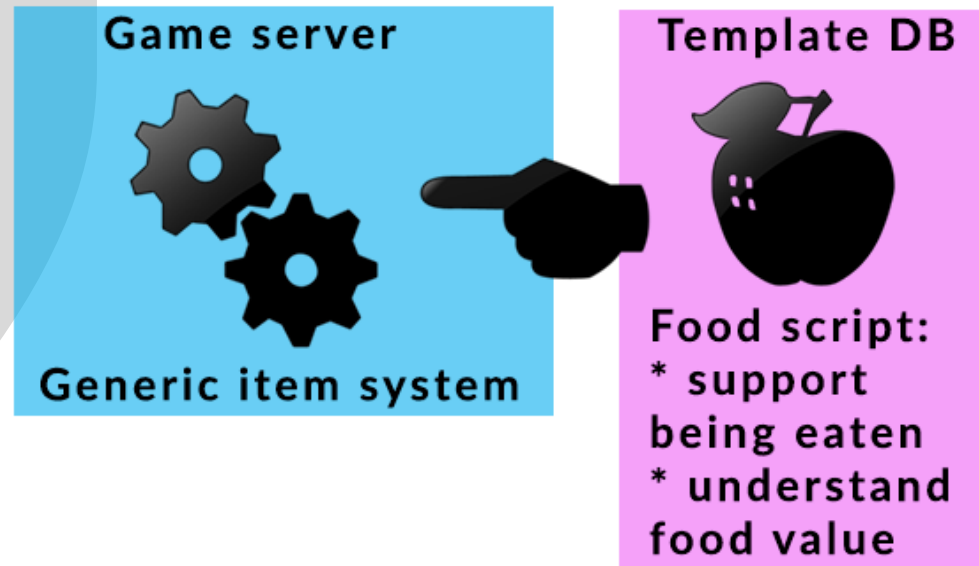
# HOW



On DIKUmuds, all systems were hardcoded, so all fields were predefined.



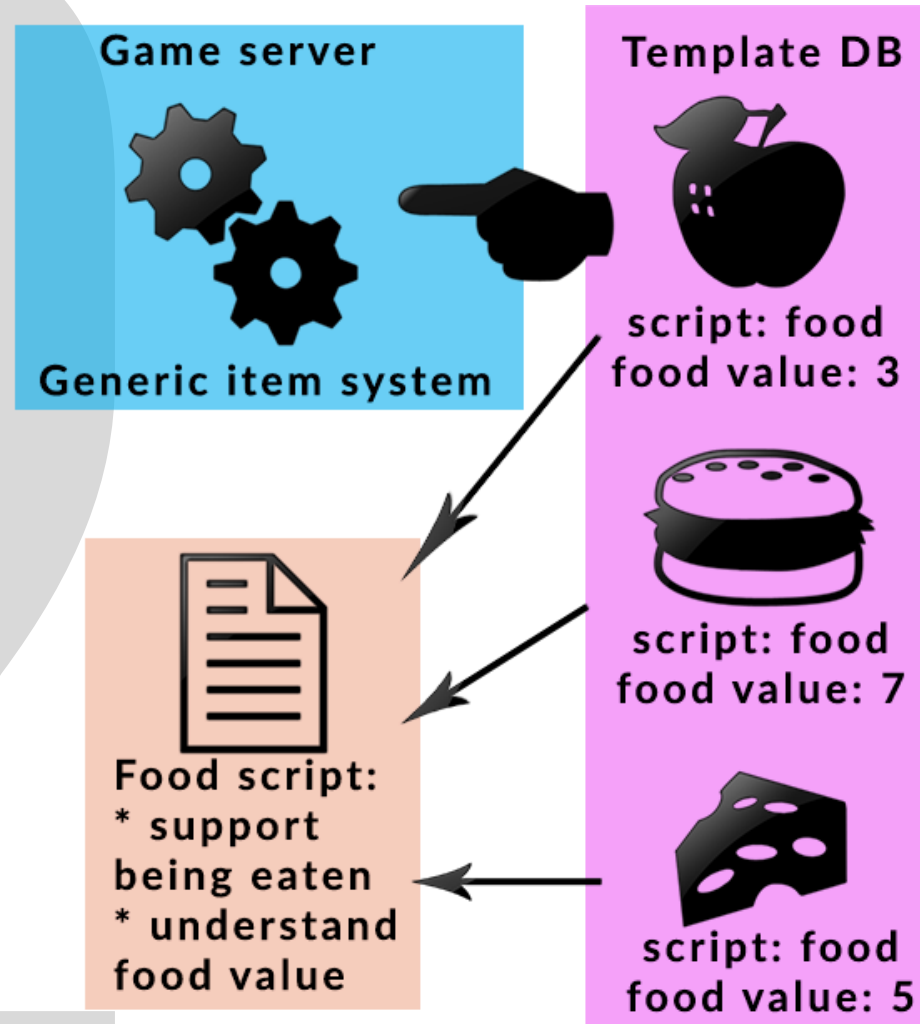
# HOW



More modern worlds allow *attaching* behavior components –  
at first right in the fields



# HOW



And then as standalone components *linked* to the template... Which means mixing and matching from a big library! A revolution!



**But there are dependencies... which prevent portability, unless you ruthlessly enforce default behaviors (as *Roblox* does).**

```
When this object is eaten
```

```
{
```

```
    Figure out how much food value the object has
```

```
    Increment my stomach's fullness by that much
```

```
    Make sure I don't go over the max stomach fullness!
```

```
    Delete the eaten object
```

```
}
```



**But there are dependencies... which prevent portability, unless you ruthlessly enforce default behaviors (as *Roblox* does).**

When this object is **eaten**

Implies a whole UI,  
the concept of food

{

Figure out how much food value the object has

Increment my stomach's fullness by that much

Make sure I don't go over the max stomach fullness!

Delete the eaten object

}



But there are dependencies... which prevent portability, unless you ruthlessly enforce default behaviors (as *Roblox* does).

When this object is **eaten**

{

Figure out how much **food value** the object has

Increment my stomach's fullness by that much

Make sure I don't go over the max stomach fullness!

Delete the eaten object

}

Where is the food  
value stored prior to  
script attachment?



But there are dependencies... which prevent portability, unless you ruthlessly enforce default behaviors (as *Roblox* does).

When this object is **eaten**

{

Figure out how much **food value** the object has

Increment my **stomach's** fullness by that much

Make sure I don't go over the max stomach fullness!

Delete the eaten object

}

So is there a "food eater" script?



But there are dependencies... which prevent portability, unless you ruthlessly enforce default behaviors (as *Roblox* does).

When this object is **eaten**

{

Figure out how much **food value** the object has

Increment my **stomach's** fullness by that much

Make sure I don't go over the **max stomach** fullness!

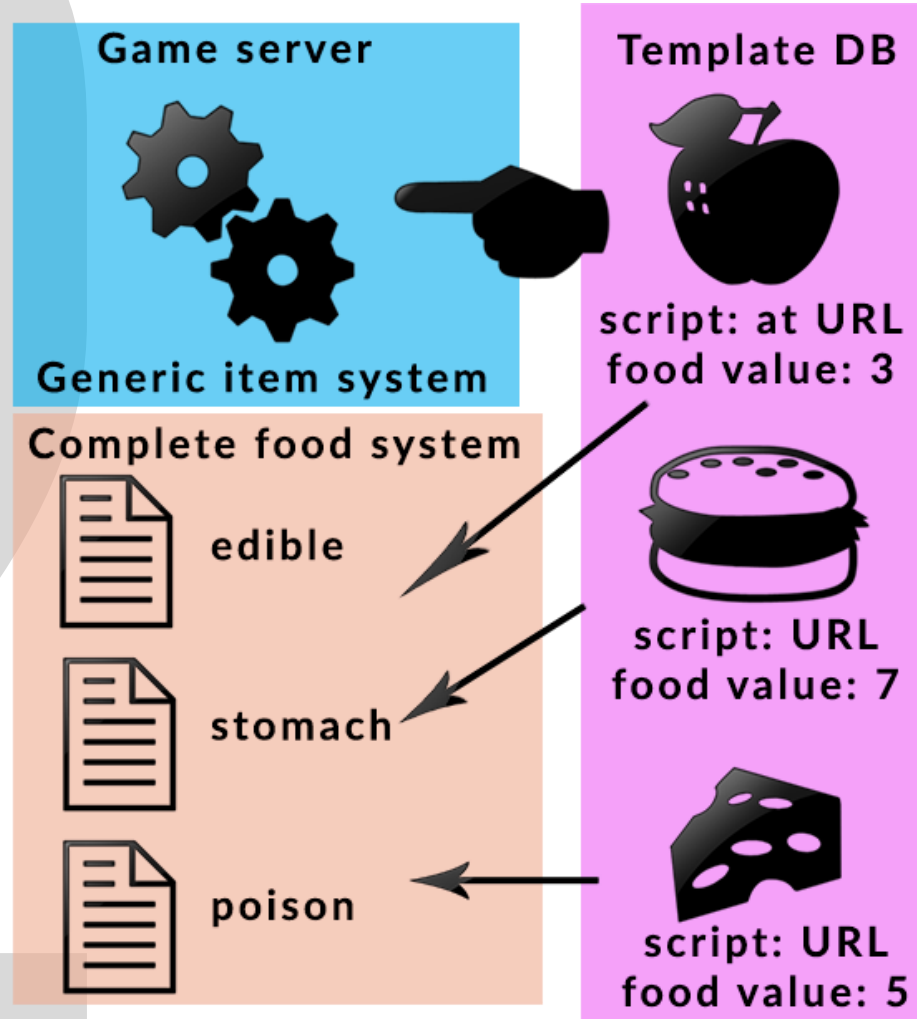
Delete the eaten object

}

The player has a  
stomach max?  
Where is that set?



# HOW



A "plugin" model (or "DOM subtree" as *Roblox* puts it) can solve this.



# HOW

BUT

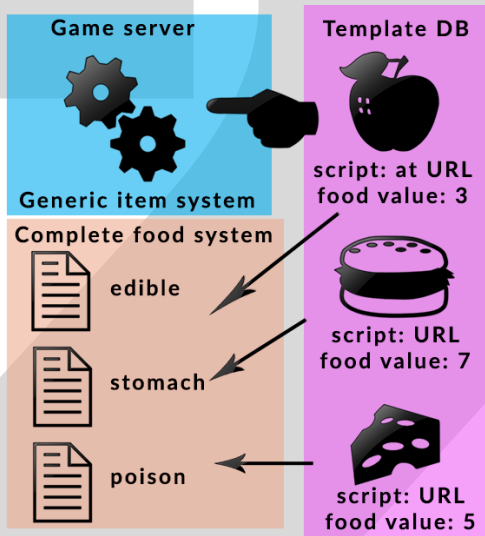
Now you have a centralized point of failure again...

If this is bugged, all eating stops working...

You need version control...

Forking...

Committees...



## SOME QUOTES

Ownership of anything digital is illusory, and always will be.

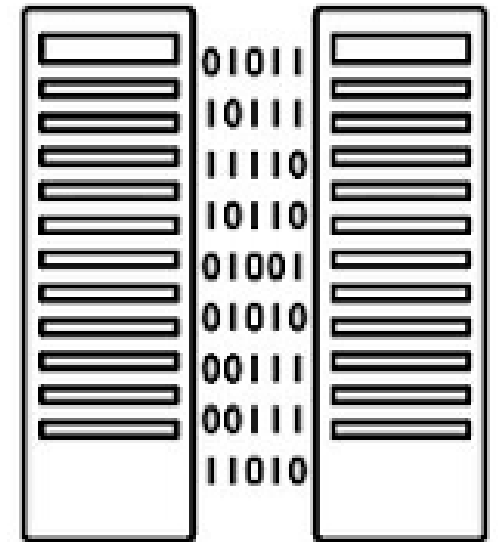
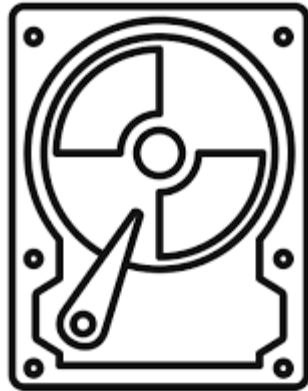
Possession is nine-tenths of the law.

Information wants to be free.



# How

Digital data does not exist without one of these.



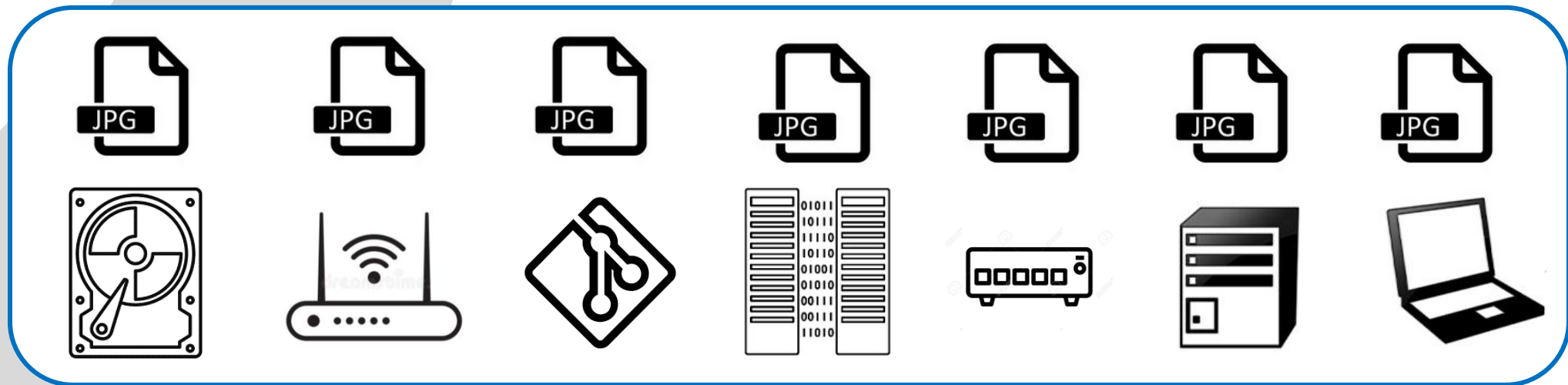
# HOW

Or these.



# HOW

It also basically works by making perfect copies. Everywhere.



# HOW

## **INFORMATION WANTS TO BE FREE.**

is a literal description of digital data,  
which wants to be an infinite resource.



# HOW

## INFORMATION WANTS TO BE FREE.



**No, wait!**

Software licenses

EULAs

Subscriptions

Dongles

DRM

DMCA

Crypto

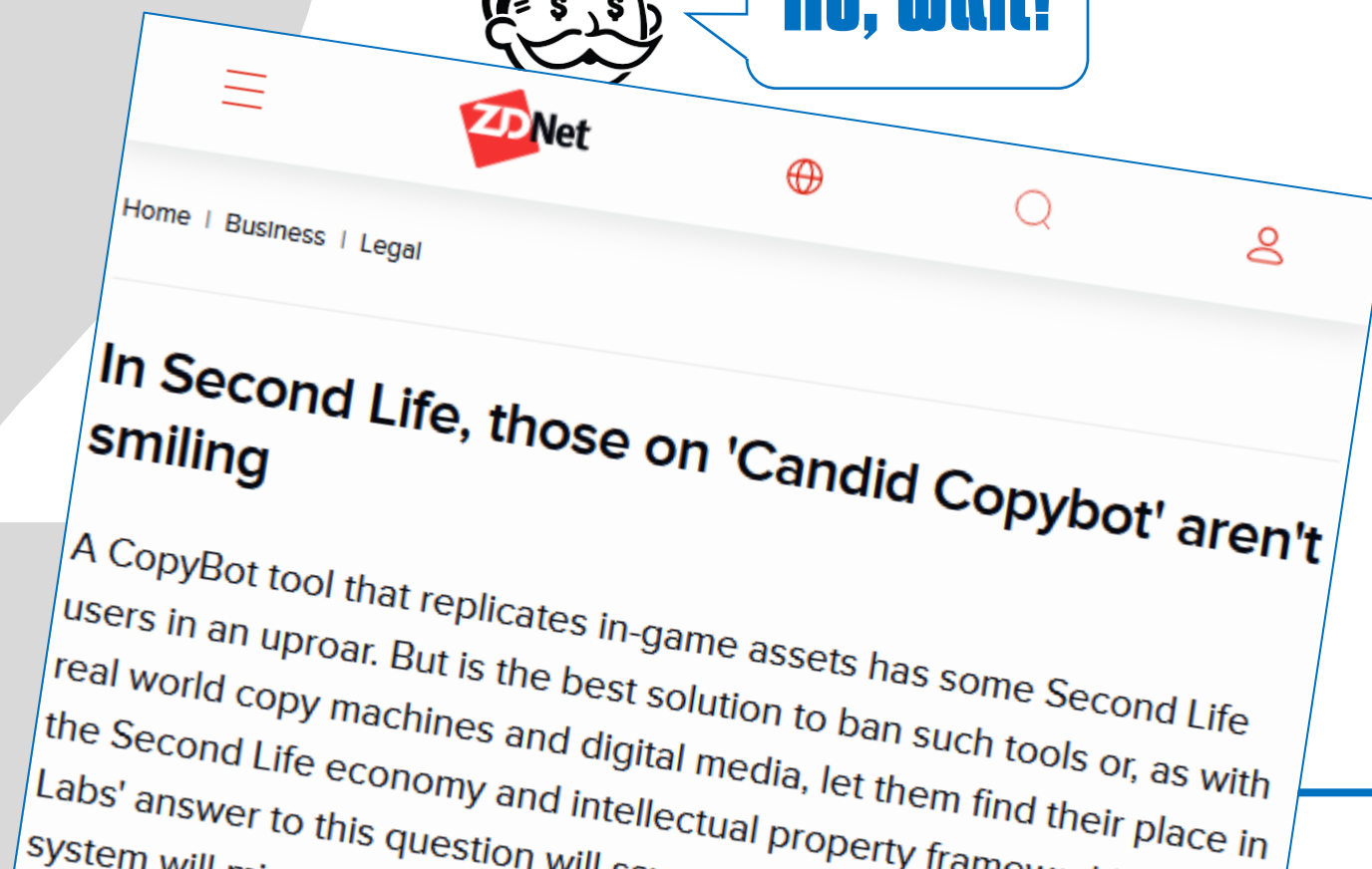


# HOW

## INFORMATION WANTS TO BE FREE.



No, wait!



# HOW

**INFORMATION WANTS TO BE FREE.**

**Information also wants to be expensive,  
because it's so valuable.**

**The right information in the right place  
just changes your life.**



-Stewart Brand

# HOW

**FREE.**

**Non-rival goods**

**VALUABLE.**

**Rivalrous goods**

**EXPENSIVE.**

**Veblen goods**



# HOW

Why is humanity taking  
our first truly infinite  
economic resource, capable  
of providing an economy of  
abundance, and choosing  
to hem it in with scarcity?



**1** WHAT

**2** HOW

**3** WHERE

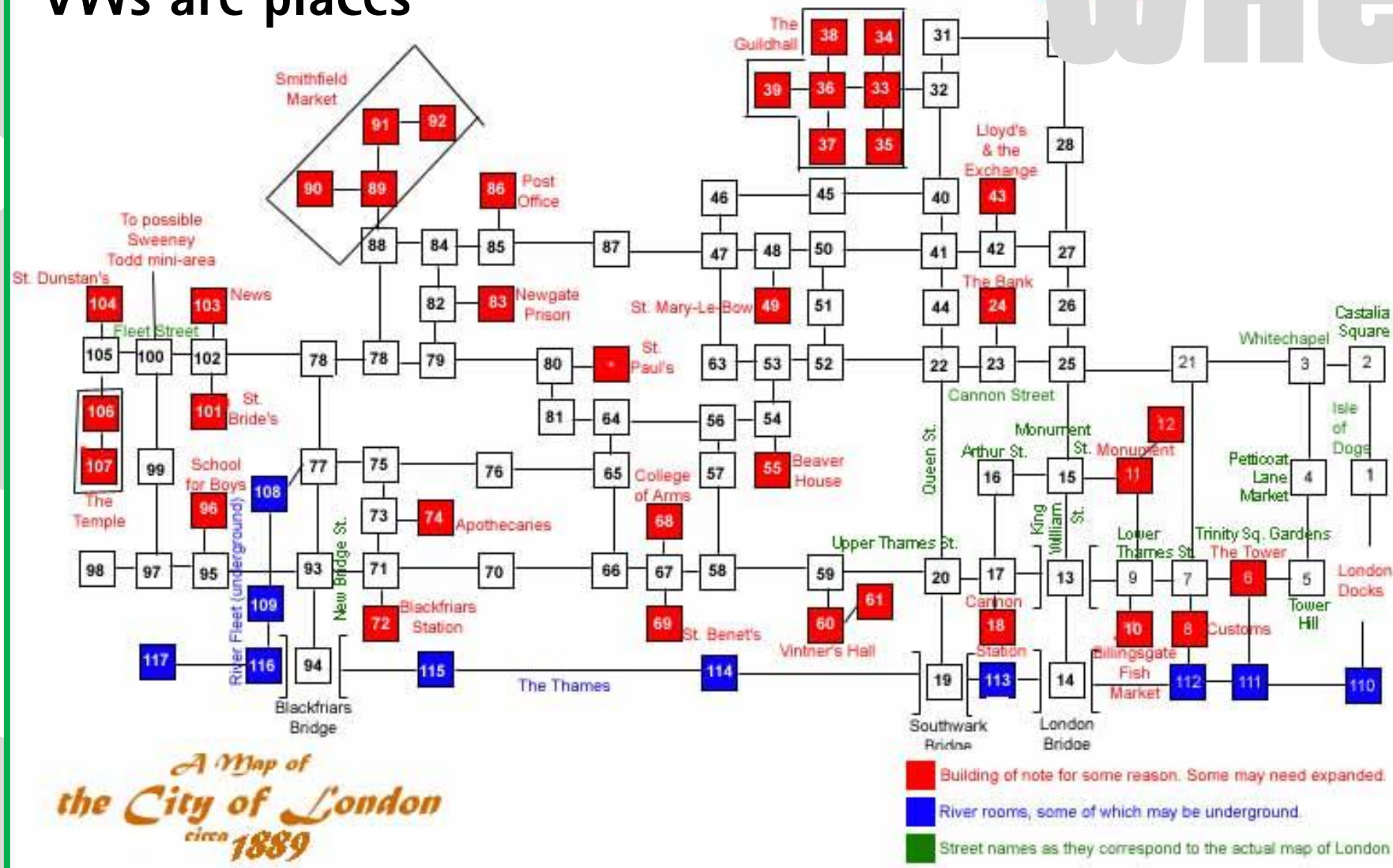
**4** WHO

**5** WHY

will we experience it?

## VWs are places

# WHERE



VWs are coordinate spaces

# WHERE



# WHERE



# WHERE

|                                | Real map                                                                      | Invented map                         |
|--------------------------------|-------------------------------------------------------------------------------|--------------------------------------|
| Move only in virtual space     | Yelp, Zillow, and pretty much all other apps that annotate real world places. | All MMOs.                            |
| Move in virtual and real space | Pretty much all GPS-enabled apps today.                                       | All AR games like <i>PokemonGO</i> . |



# WHERE

What if every person was an avatar all the time?

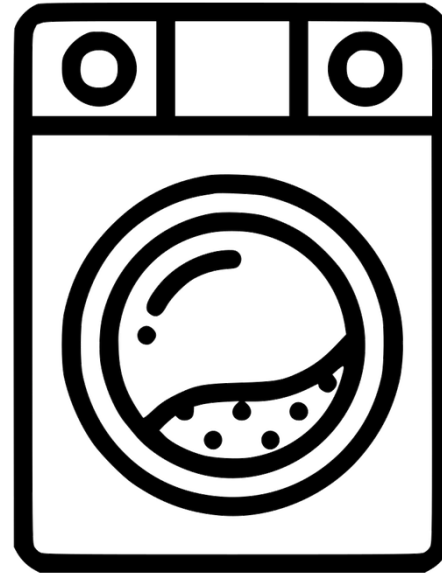
And every object was a virtual object?

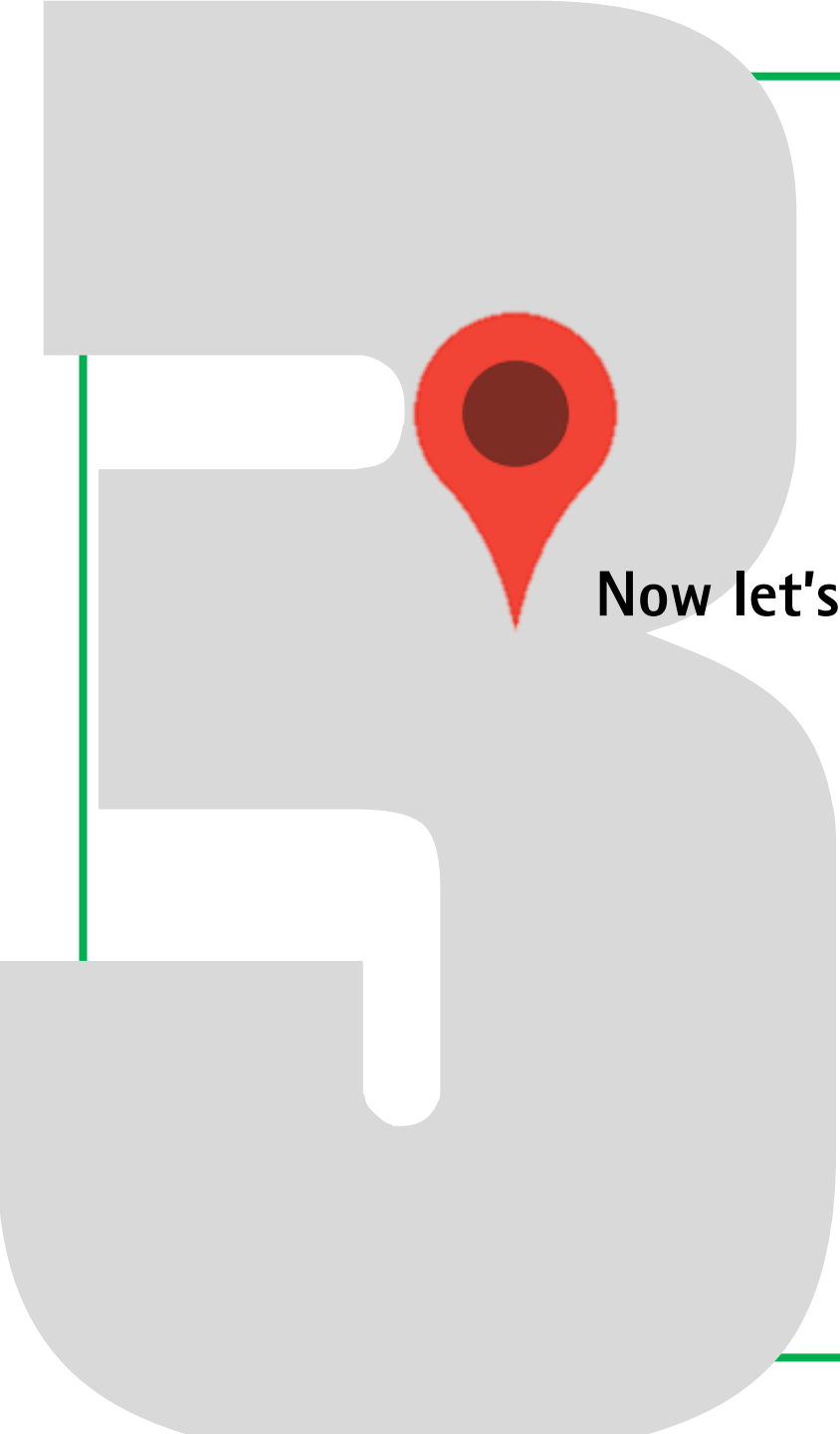
And every real place was also virtual?

And every virtual place was also real?



- If my real world washing machine
  - Has a matching template for its model number...
  - Has an instance id for its real world existence...





Now let's think about what we have already done this to.



A green line connects the Twitter bird, the circuit icon, and the Facebook logo, forming a path across the bottom of the slide.

**1** WHAT

**2** HOW

**3** WHERE

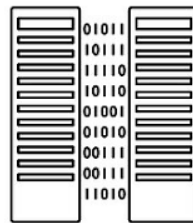
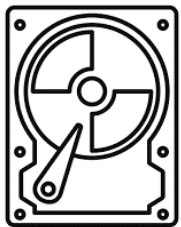
**4** WHO

**5** WHY

will run it?

# WHO

So who owns these containers?



The Statute of Anne in 1710, the First-Sale Doctrine in 1908, and the rest of our legal structure don't handle this particularly well.

An Act for the Encouragement of Learning, by vesting the Copies of Printed Books in the Authors, their Executors, Administrators, or Assigns, during the Times therein mentioned.



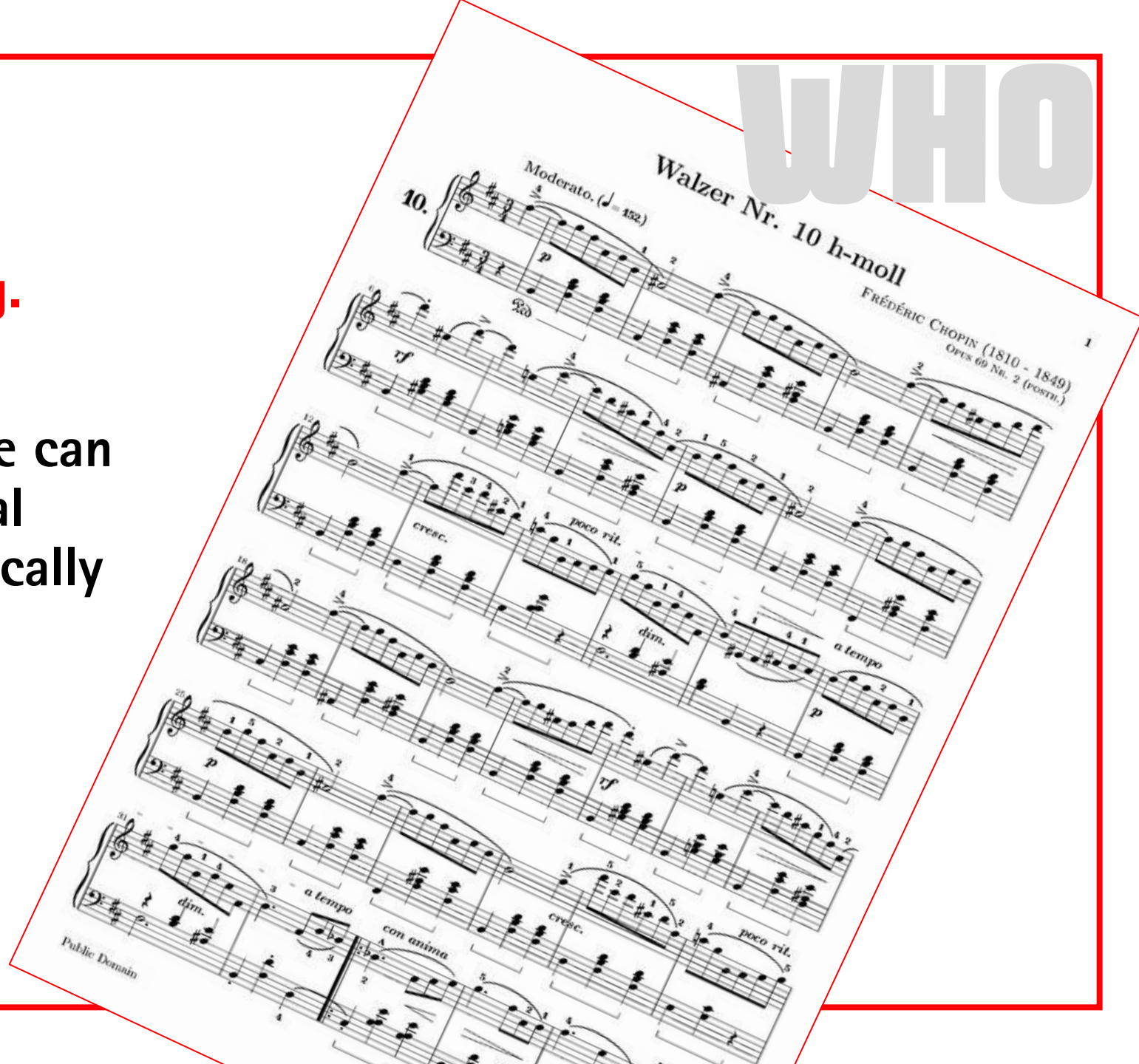
Whereas Printers, Booksellers, and other Persons have of late frequently taken the Liberty of Printing, Reprinting, and Publishing, or causing to be Printed, Reprinted, and Published Books, and other Writings, without the Consent of the Authors or Proprietors of such Books and Writings, to their very great Detriment, and too often to the Ruin of them and their Families: For Preventing therefore such Practices for the future, and for the Encouragement of Learned Men to Compose and Write useful Books: May it please Your Majesty, that it may be Enacted, and be it Enacted by the Queens most Excellent Majesty, by and with the Advice and Consent of the Lords Spiritual and Temporal, and Commons in this present Parliament Assembled, and by the Authority of the same, That from and after the Tenth Day of April, One thousand seven hundred and ten, the Author of any Book or Books already Printed, who hath not Transferred to any other the Copy or Copies of such Book or



# WHO

## 1. Someone wrote a song.

This is something someone can own, thanks to intellectual property law, most specifically copyright.



# WHO



**2. Someone then performed the song.**

A performance is actually the process of a human manually parsing the information data of a song, and turning it into a different set of data. This is also something someone can own.



# WHO

### 3. Someone recorded it.

This recording captures the owned performance as data, and puts it in a container. This is also something someone can own!



This container, the "master recording," is what burned in the Universal fire of 2008, which destroyed the original master copies of countless classic albums.



# WHO



#### 4. The master is then rendered into different formats.

These formats are each associated with a container. For a vinyl record, the format is literally a wiggly groove in plastic. For a digital recording, it's a set of bits and bytes.



# WHO

5. Then the data is put into the matching container.

Vinyl records. Cassette tapes. CDs.  
8-track tapes. MP3s.

Each of these is a *container* for the *format* for the *recording* of the *performance* of the *song*. And yes, someone can own this too!



6. Then you buy one.

If you still buy music, that is.

You own the *container*.

But each container is matched to a *playback device*.

An MP3 is useless without an MP3 player which knows how to parse the data in the container and turn it back into the *recording* of the *performance* of the *song*.



# WHO

**You tell yourself that you own the song.**

**But you really don't.**

**A songwriter does,  
a music publisher does,  
and so on.**

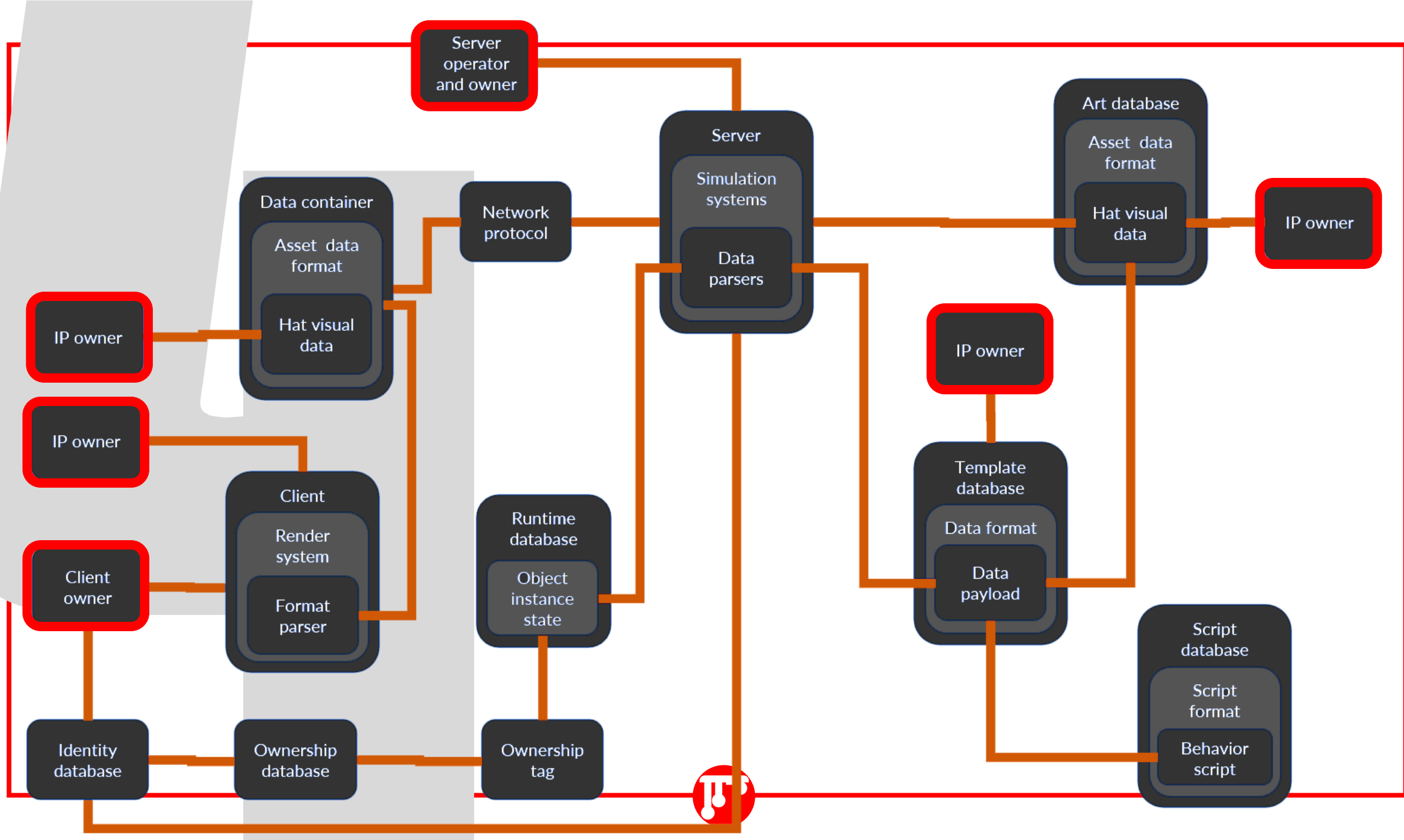
**You just own a container.**



**“Software is eating the world.”**

–Marc Andreessen, VC





**1** WHAT

---

**2** HOW

---

**3** WHERE

---

**4** WHO

---

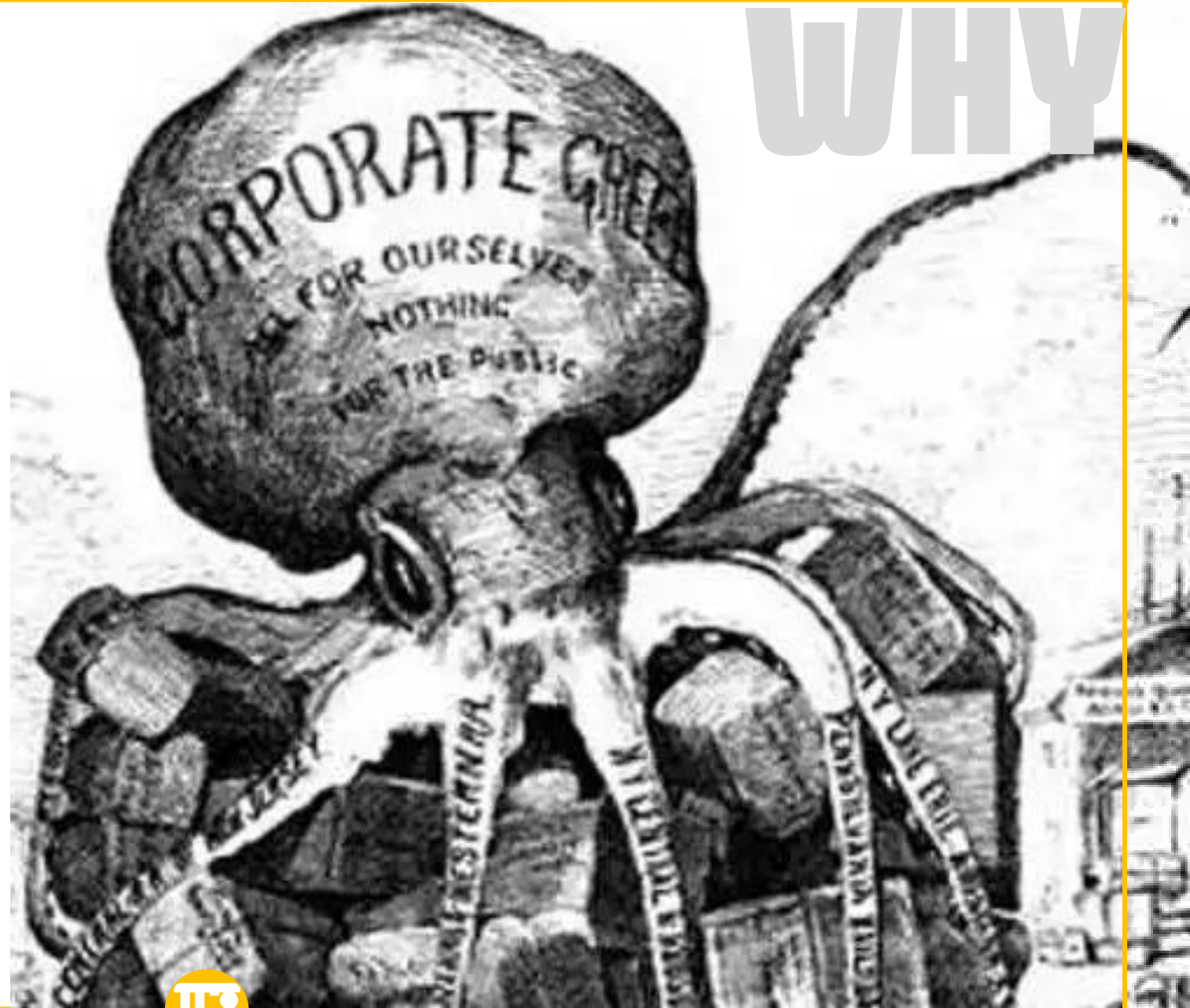
**5** WHY

---

bother?

# WHY

Some obvious spectres  
are raised.



# Consider what it means for governance

Virtual worlds are...

|                         |                      |
|-------------------------|----------------------|
| Panopticons             | Surveillance         |
|                         | Policing and justice |
|                         | Personal privacy     |
| Communications channels | Censorship           |
|                         | Propaganda           |
| Identity providers      | Credentialing        |
|                         | Reputation           |



"The Internet of Shit," as some call it.

# WHY

When software eats everything, **indigestion can crash the world.**

The NotPetya attack in 2017 took down Merck, Rosneft, TNTExpress, and Maersk.

Maersk is responsible for 1/5<sup>th</sup> of global shipping.

The average US city has three days of food.



# WHY

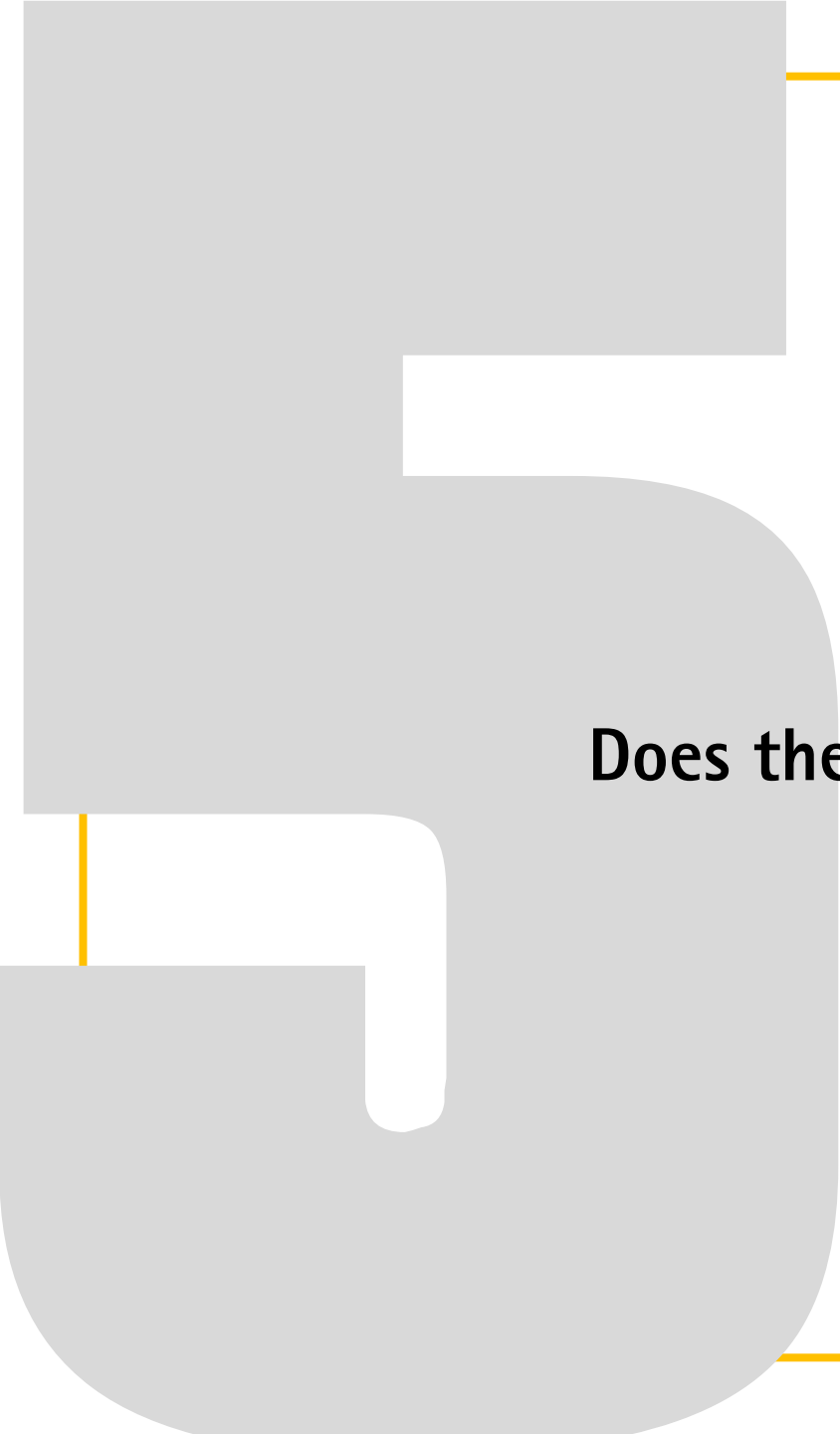
"Maersk staffers finally found one pristine backup in their Ghana office. By a stroke of luck, a blackout had knocked the server offline prior to the NotPetya attack, disconnecting it from the network. It contained a single clean copy of the company's domain controller data, and its discovery was a source of great relief to the recovery team."

*– Industrial Cybersecurity Pulse, Sept. 30, 2021*

Homogeneous networks are always more vulnerable.

As we network more of ourselves, at what point should we consider a singular metaverse an existential threat?



A large, light grey number '5' is positioned on the left side of the slide, partially overlapping the text area.

**So what's this all for?**

**Does the metaverse increase human potential?**



**I mean, we all do video games.**



**I mean, we all do video games.  
And video games UNDENIABLY DO.**

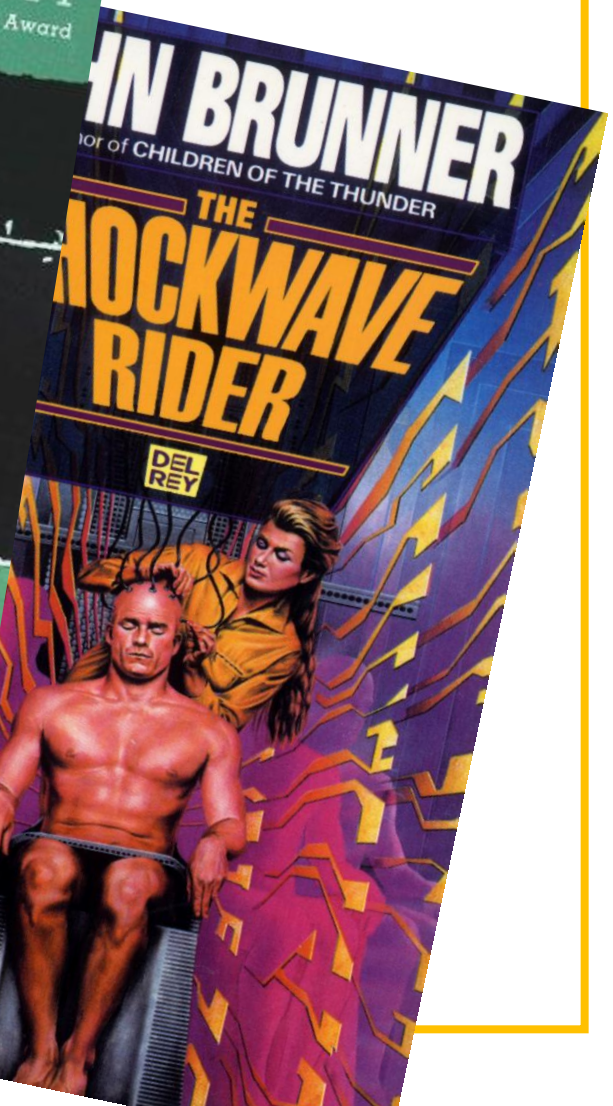
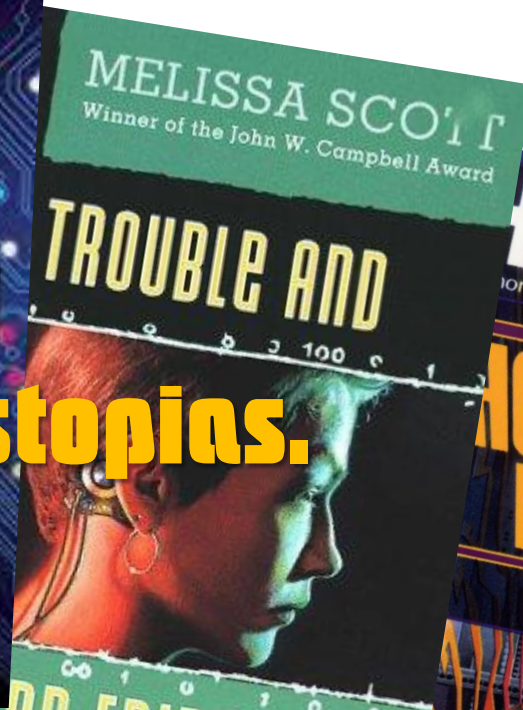


**We still built them with monetization traps and datamining.**



READY  
PLAY  
O  
ERN  
CL

NEUROMANCER

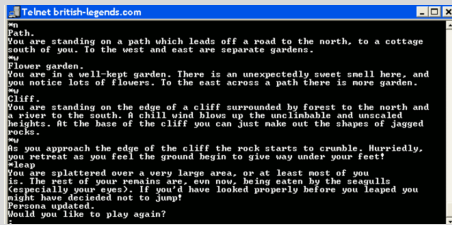


These were dystopias.



# WHY

We've had over 40 years of baby steps.



Let us, at minimum, take up this apparently inevitable future  
– this dream too big to stop dreaming –  
with *intentionality*.



The **WORST** answer to the metaverse would be

**WHY NOT?**  
**12345**

