Brief – Networked Resource Management

**What it is:**

It is a modular network resource management system that will be easy to implement by a developer, this can be used for developing online City Builders and Colony Sims. The package will contain pre-made **(what it contains)** the developer can use to speed up their workflow, this will allow the developer to integrate their systems and the other game mechanics, fast tracking their development cycle, rather than spending time developing the underlining systems for the base game to work.

**Third party libraries:**

|  |  |  |
| --- | --- | --- |
| **Name** | **License** | **Version** |
| Mirror | Extension Asset | 66.0.9 |
| Animation Rigging | Unity Companion Package License 1.0 | 1.0.3 |
| Cinemachine | Unity Companion Package License 1.0 | 2.6.11 |
| Universal RP | Unity Companion Package License 1.0 | 10.4.0 |
| Input System | Unity Companion Package License 1.0 | 1.0.2 |
| 2D Sprite | Unity Companion Package License 1.0 | 1.0.0 |

**Game Idea:**

* Resource nodes generate resources like wood, food, and water
* Storage nodes hold specific collected resources to be used by player
* Player has set inventory space that shows what they are holding and how much, can free up space by putting resources in specific storage nodes
* Resources are automatically depleted from storage nodes over time for upkeep on house/firewood, hunger, and thirst
* Each player has own storage nodes but competes for shared resources
* Once a resource is depleted last player alive wins

**Resources:**

* Trees – Collect for wood and saplings
* Food – Trees produce apples, can harvest for food, cannot harvest if tree is cut down
* Water – Comes from lake/river/well

**Storage:**

* Wood – Is used as firewood
* Saplings – Used to plant trees, can also be used as firewood if specified by player but depletes quicker as firewood
* Food – Used to keep players hunger up, need trees for food
* Water – Used to keep players thirst up, if water source is depleted no more water, thirst depletes faster than food

----------- put somewhere else

**What will be contained in the Resource Management part:**

* Ways of collecting food:
* Hunting different animals – extension
* Gathering wild, natural, random spawning vegetation
* Farming food
* How big is a single node
* Does it naturally respawn
* Does it move. E.g. an animal – extension
* What does it look like
* Ways of collecting water:
* Well
* River
* Lake – extension
* Rain collection – extension
* How big is a single node – extension
* What does it look like – extension
* Custom natural resource spawning
* Spawn in clusters or as single node – tag if harvestable
* How close together they spawn – extension
* How rare it is
* Is it farmable
* Is it plantable
* How steep can the terrain it spawns on be – extension
* How big is a single node – extension
* What does it look like
* What resource/s does it drop
* How much of that resource does it drop
* Does it auto respawn
* Does it need a specific “fertility” to spawn, if so what level – extension
* Storage:
* What resources can use it
* How big can it be – model of it – extension
* Are the resources visualised on it
* How much can it hold
* What does it look like – the model used - visualised
* Buildings: – extension
* Are there buildings
* How big is it
* What does it look like
* Can it hold items
* Can it hold livestock
* Can it hold farmable resources
* Does it produce anything
* What’s its purpose
* Does it convert resources
* Does it take time to build
* Does it take resources to build
* Is there a max terrain steepness that it can be placed on, if so how steep
* Paths: – extension
* Are there paths
* How big is it
* What does it look like
* Does it take resources to build
* Is it a simple texture, or is it a model
* Can things be placed on top of it
* Can it go over water
* Can it tunnel through terrain
* Is there a max terrain steepness that it can be places on, if so how steep
* Agents: – extension
* Are there agents
* Do they carry out tasks automatically
* Do they have specific jobs
* The AI will have to be coded by user

What specifically will be given access to ^

**Mathematical equations:**

Basic addition, subtraction, division, and multiplication.

Math behind graph showing rate of decay

**Advanced Algorithms:**

Constant rate of decay on resources no matter how many.

Graph showing rate of decay, can control with graph ^

More is two parts above

**How the systems will be modular:**

**Networking:**

Will allow for the developer to specify what variables are to be passed to and from the server. Will have default variables to be passed in for the resource management system that can be overridden.

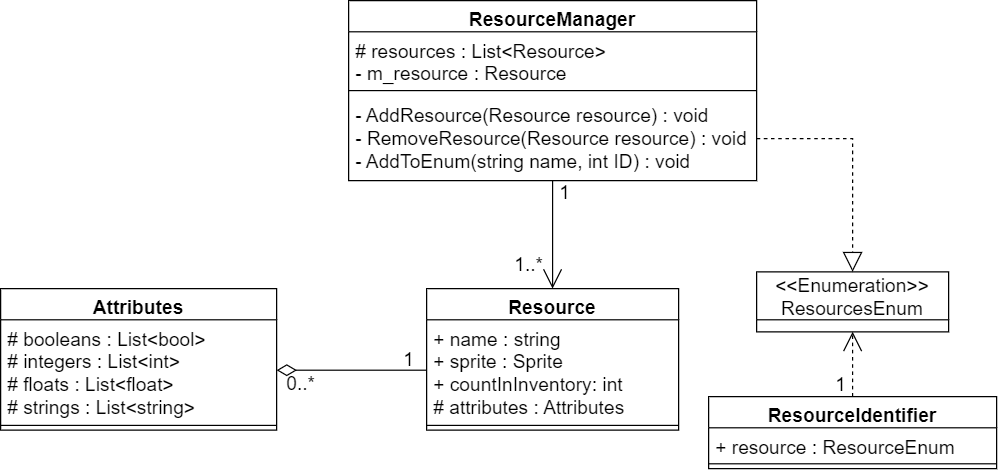
What kind of connection, what to do if no response / unexpected response, every interaction made and if it is expected

**Resource attribute system:**

A scriptable object will be used to create the resources and their attributes as two separate list.

The resources and attributes will be accessible from other components and scripts.

A similar system will be implemented for creating tools.



**Resource nodes:**

Will contain following information:

* Its position (Vector3)
* Rate it grows at (if viable) (float)
* Time it takes to harvest (float)
* What resource it is / what resource it drops (enum)
* How much of that resource it drops (int)
* How depleted it is (if viable) (int)
* What tool is used to harvest (enum)
* If it auto respawns (bool)
* Model it uses (Mesh)

As well as the option to add custom variables.

**How it will be integrated:**

How everything is set up in unity

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Make unity window for list of in game items

Each player has list of what they have

Look up applications like this on unity asset store, or unreal

Target market – game jammers

Networking first, two players moving on plane, can see each other moving and bump into each other

Look at early Oxygen not included – markiplier

7 days to die

List of every object in game that has counter

Look at data oriented programming

How to mod terraria for ^ this information