



Better Tower Defense

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Milestone 1 Progress

- ▶ Documents (Requirements, Design, Test)
- ▶ Implement Entity System
- ▶ Implement networking; local host discovery; connect to arbitrary public IP address
- ▶ Implement unit spawning and waves
- ▶ All 100%, but refactoring will likely be needed down the road (unpredicted requirements)

Requirements

- ▶ Entity System
 - ▶ Write code declaratively
 - ▶ Listen for when data changes (added, removed, modified)
 - ▶ Get the previous state of data
- ▶ Networking
 - ▶ Connect to another computer; LAN host discovery
- ▶ Unit Spawning
 - ▶ Spawn units in the correct order as specified in level designs
- ▶ Locomotion
 - ▶ Navigate from point a to point b successfully

Requirements (cont)

- ▶ Effects

- ▶ Detect effect combinations correctly
- ▶ Apply modifications based on effect combinations

- ▶ Building placement

- ▶ Cannot place in invalid locations (preventing path blocking)
- ▶ Only place if have resources
- ▶ Lock to a grid (hexagonal, rectangular, ...?)

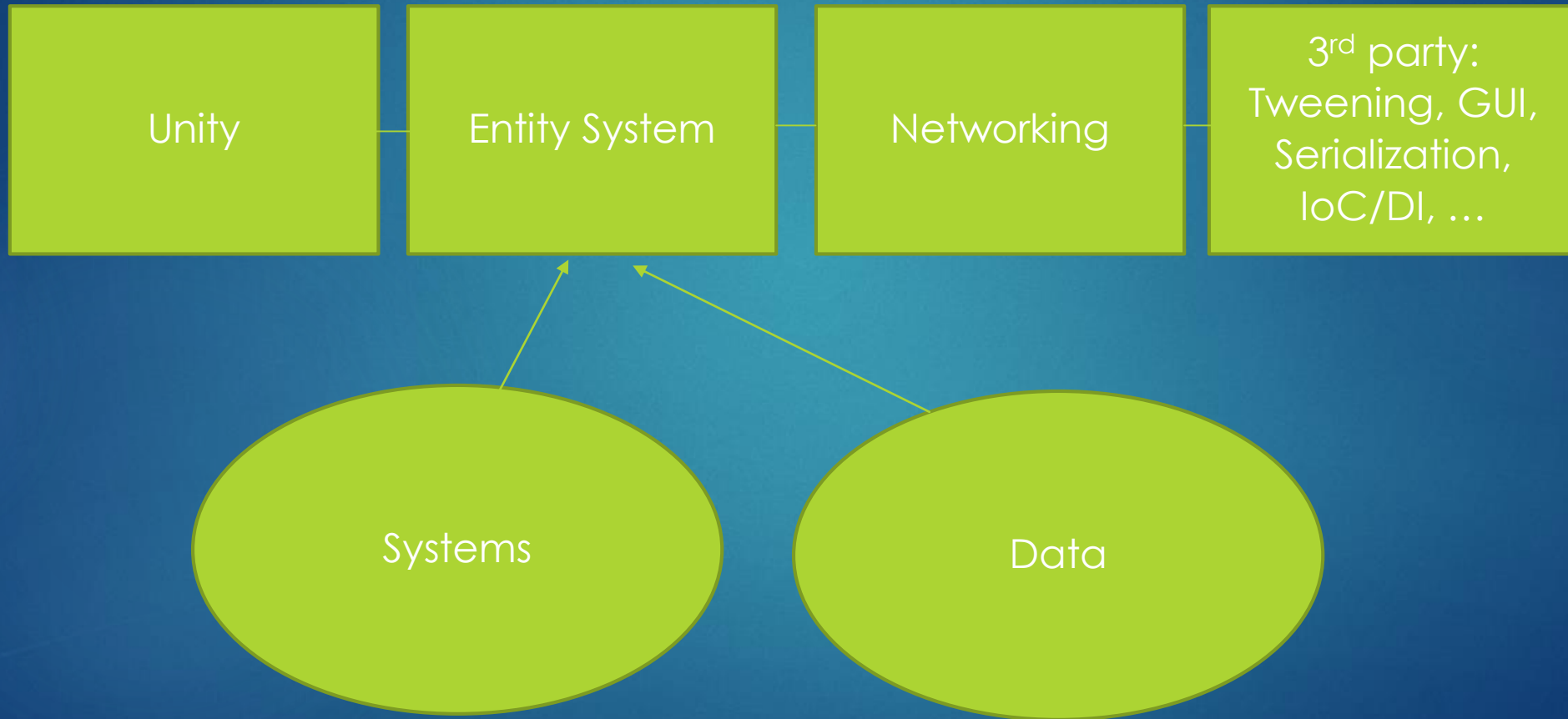
- ▶ Resources

- ▶ Player does not go below some minimum resource count
- ▶ Building buildings, powers, ... reduce player resource count

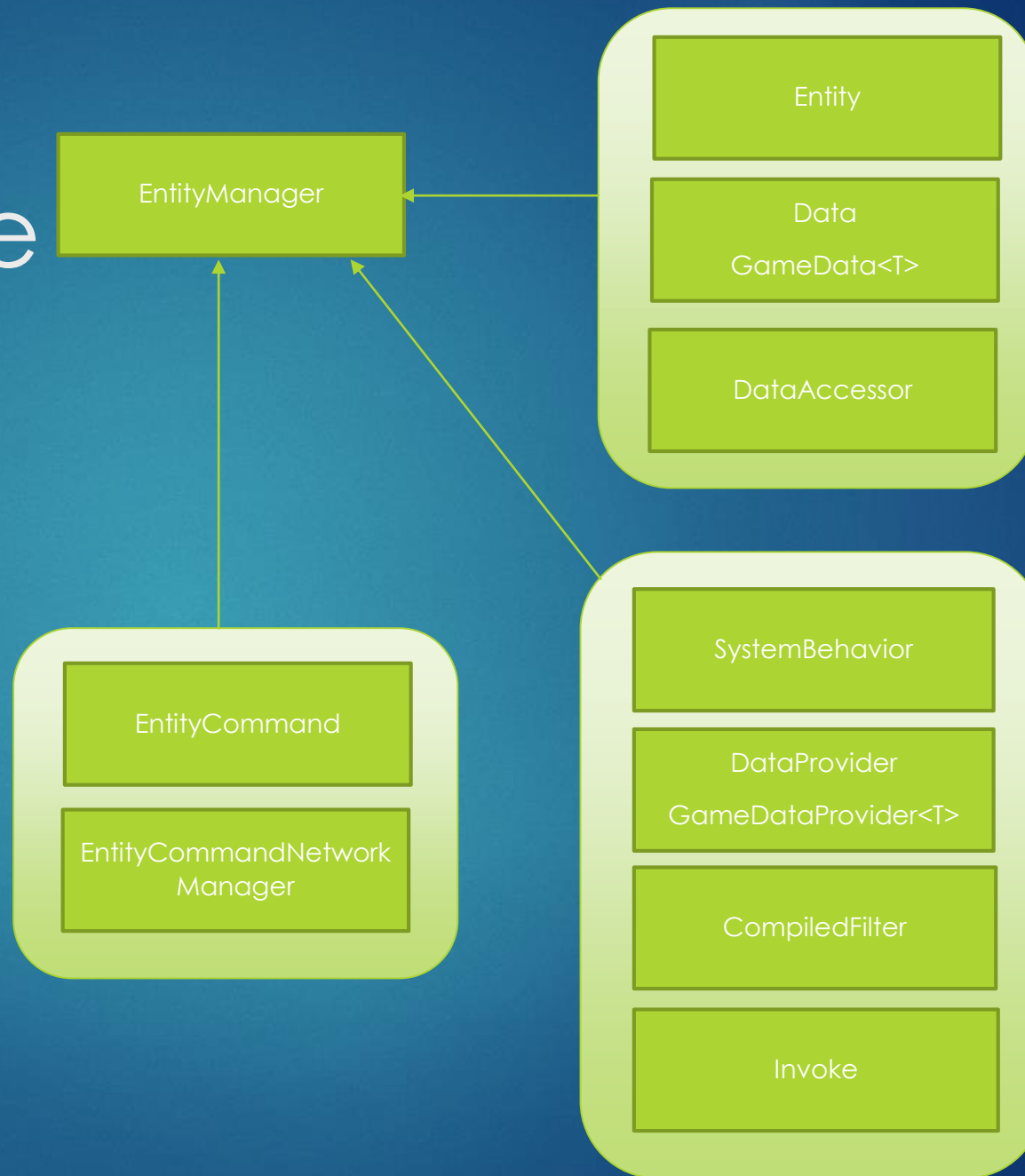
Requirements (cont)

- ▶ Power System
 - ▶ Player can place arbitrary effects on an area or on a unit
- ▶ Level Types
 - ▶ Who the player is fighting against
 - ▶ Consistent level operation
 - ▶ Allow a player to win
- ▶ Dynamic difficulty
 - ▶ Do not scale below some base minimum
 - ▶ Scale up increases difficulty; ie, spawning more enemies, increasing tower cost, ...

Design – 10000 Miles



Design – Entity System Example (1000 miles)



Test Plan

- ▶ Entity System
 - ▶ Creating entity, destroying entity, adding data to entity, adding data and then destroying the entity before a state sync, removing data from entity, destroying entity and removing data, modifying data twice, ...
- ▶ Networking
 - ▶ Connect to invalid ip, require password, invalid password, ...
- ▶ Unit Spawning
 - ▶ Spawn multiple units at the same time; zero spawn interval; no spawn groups; spawn and then immediately destroyed, ...
- ▶ Locomotion
 - ▶ Move to densely populated region; follow a path that crosses over itself; navigate through a sparsely populated region

Test Plan (cont)

- ▶ Building Placement
 - ▶ Can place on valid, cannot on invalid, cannot block paths
- ▶ Resource
 - ▶ Cannot build, research, use a power without minimum required
 - ▶ Resources gained over time
- ▶ Power System
 - ▶ Can apply to a region or target; reduces resources; not always available
- ▶ Level types
 - ▶ Loaded correctly; end-game works as expected
- ▶ Dynamic difficulty
 - ▶ Difficulty scales up/down (but not too far down); difficulty changes applied

Plan for Next Milestone

- ▶ Implement locomotion (navigating between two nodes on a graph, not finding the nodes to navigate)
- ▶ Implement effects
- ▶ Implement building placement
 - ▶ No resource system yet, so cannot be full buildings

Questions?

▶ Thanks!