

System Design Review

27th November 2002





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Requirements Specification

Chris Aust





Requirements Specification

Develop SWORD

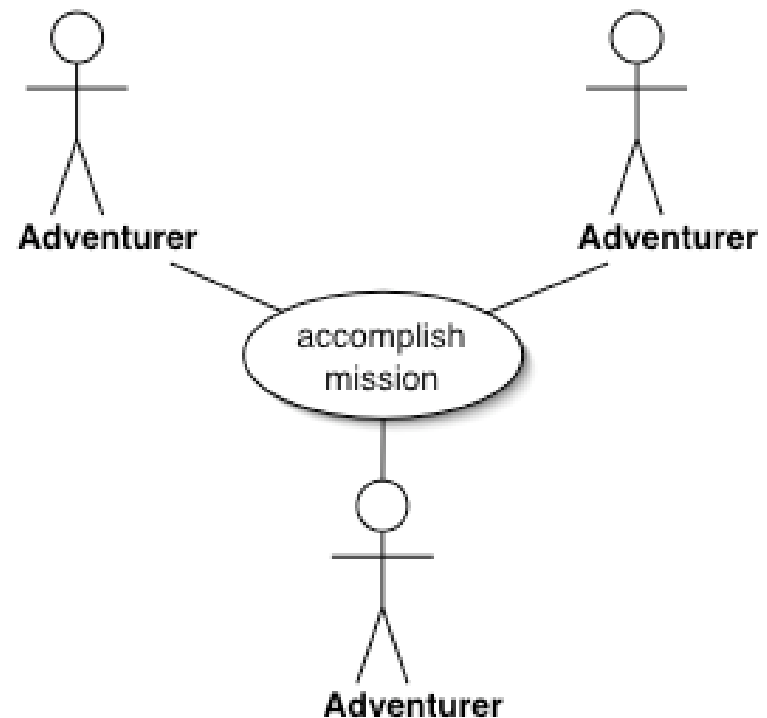
- the peer-to-peer multiplayer online game
- on top of the FRAG framework
- Mission: demonstrate a functional prototype



Requirements Specification

The Story

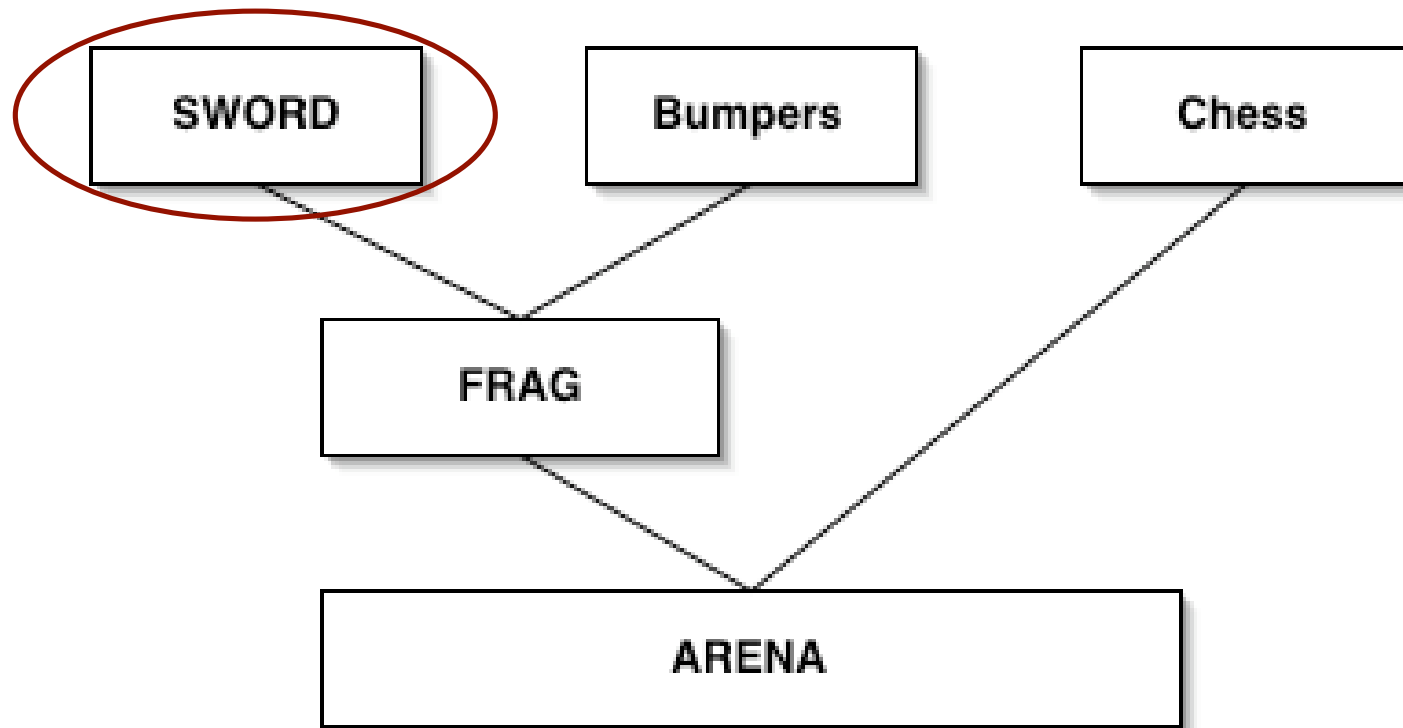
... is to be set in a fantasy world, where a large number of Adventurers need to accomplish missions.





Requirements Specification

The Big Picture: ARENA Architecture





Requirements Specification

Functional Requirements

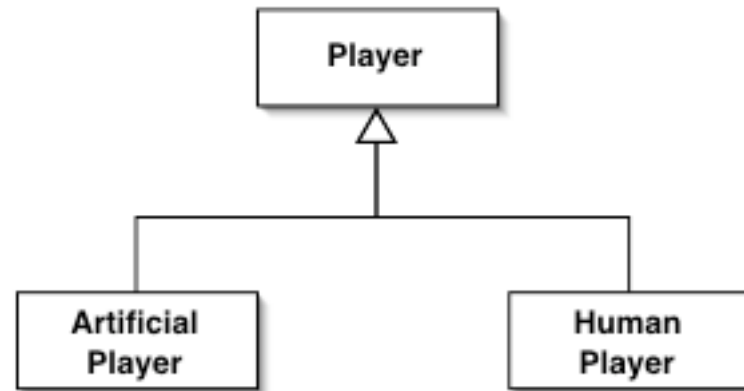
- Start SWORD
- Pick up a running game
- Suspend
- Disconnect/Reconnect
- Broadcast game data
- Hand Over



Requirements Specification

Actors

- Artificial Player
- Human Player
- Player





Requirements Specification

Use Cases

- Join Game
- Move
- Look at item
- Use item with
- Drop item
- *... and 6 other Use Cases*

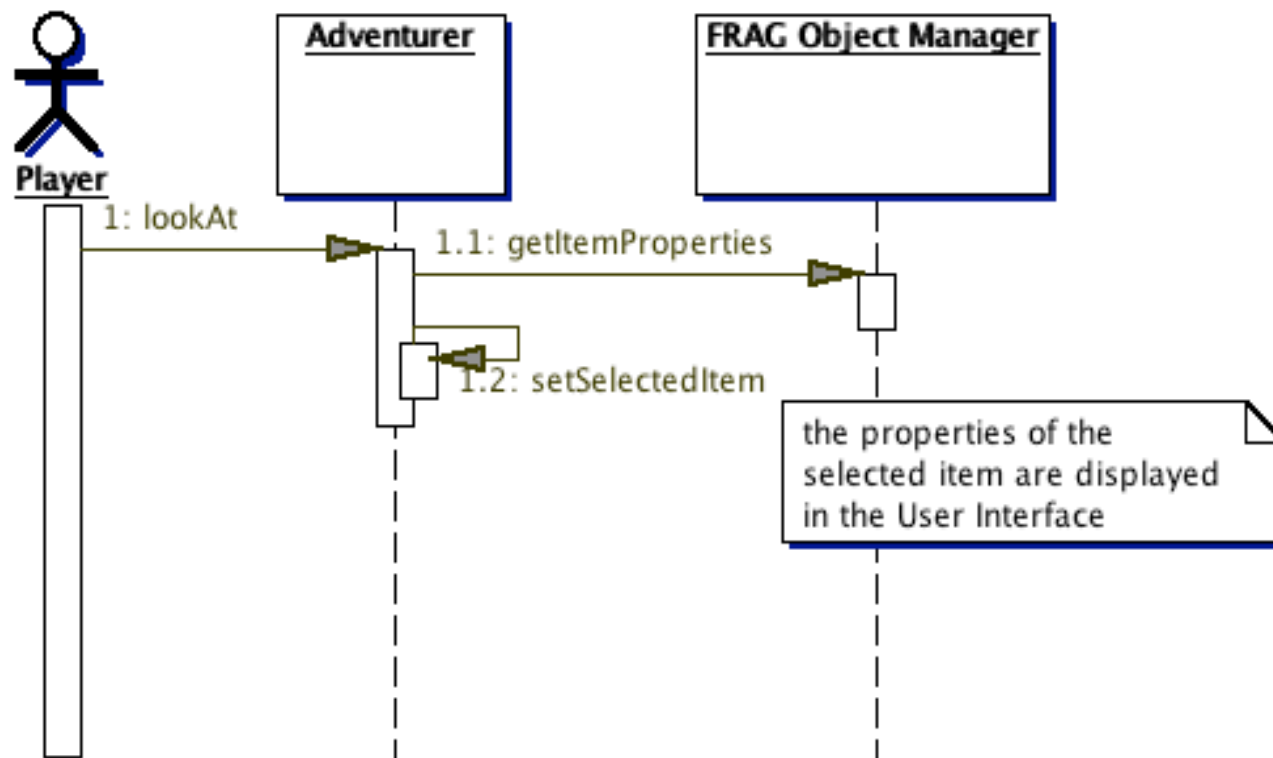


Requirements Specification

Nonfunctional Requirements

- Game setup without network connection
- No connection to a server
- Platform independent, open standard-based game design
- *... and 5 other Nonfunctional Req.*

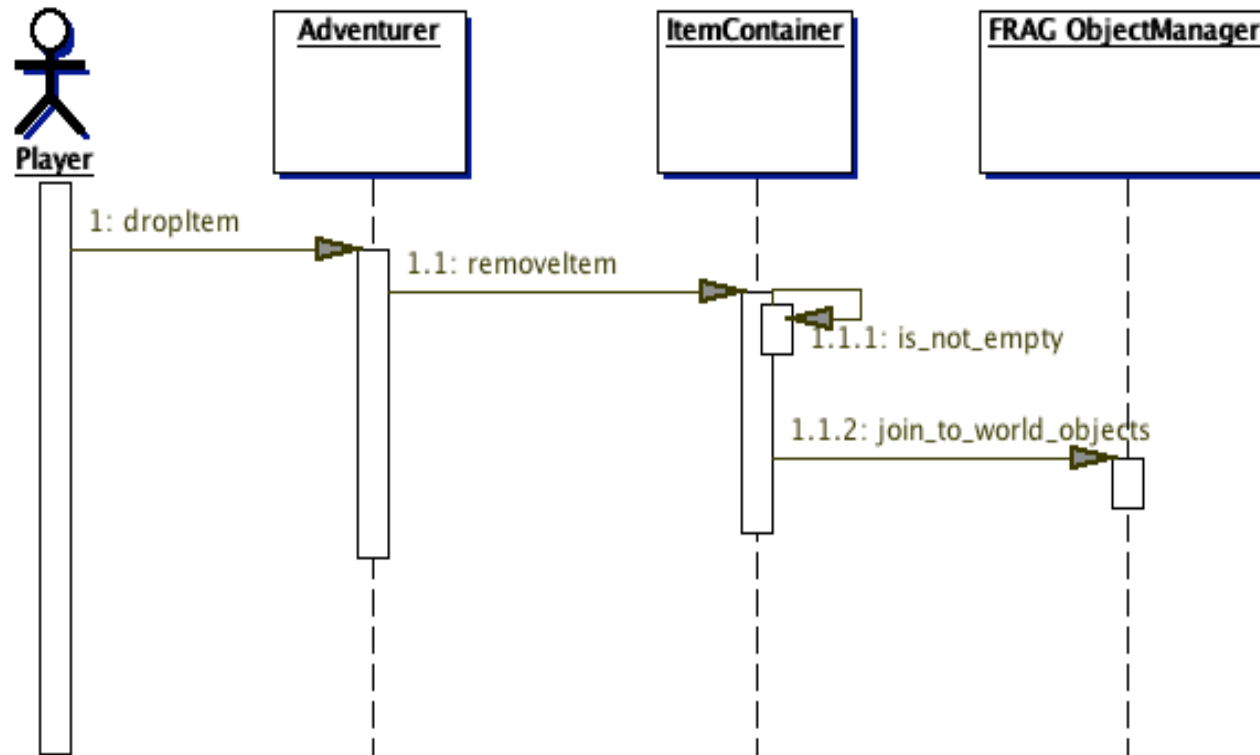
Look at item





Requirements Specification

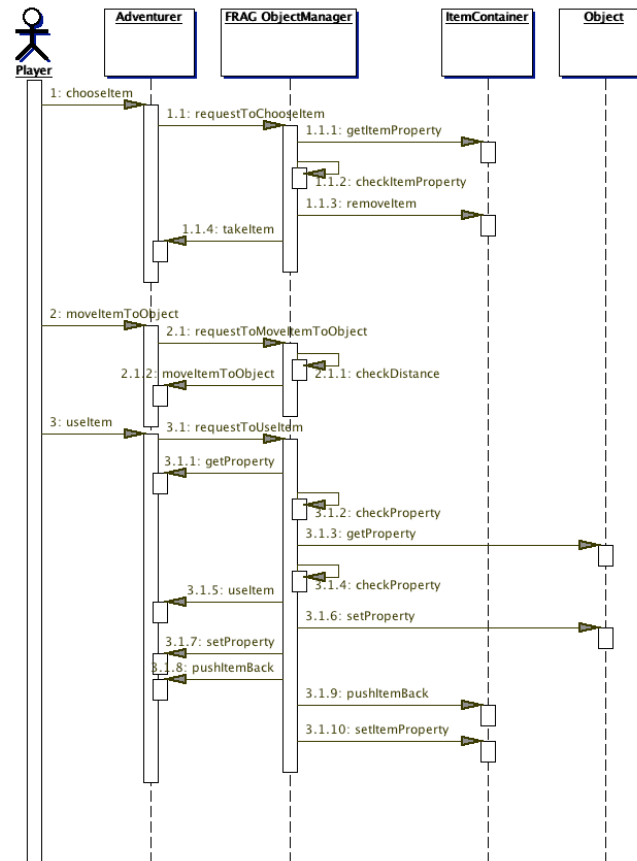
Drop item





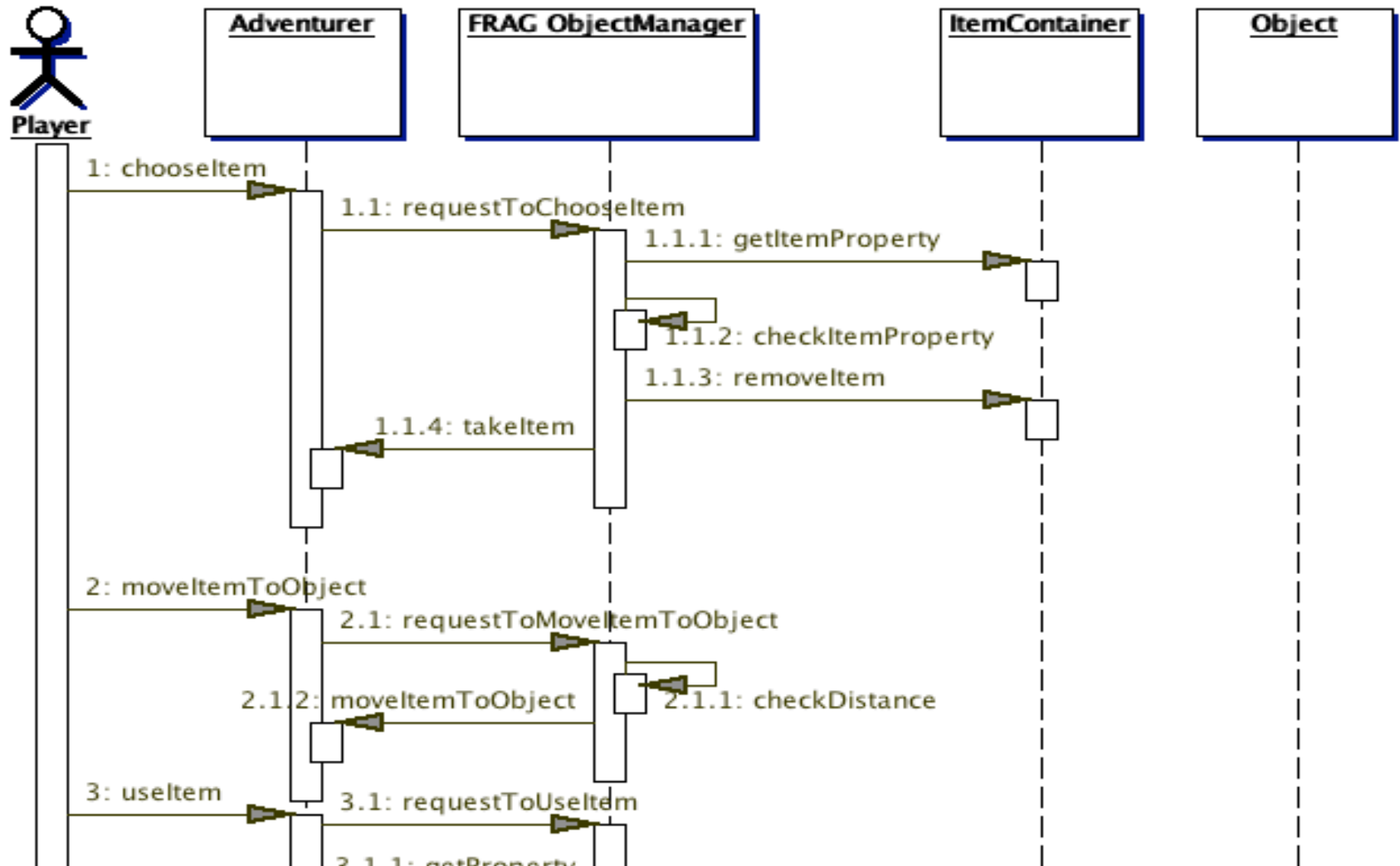
Requirements Specification

Use item with



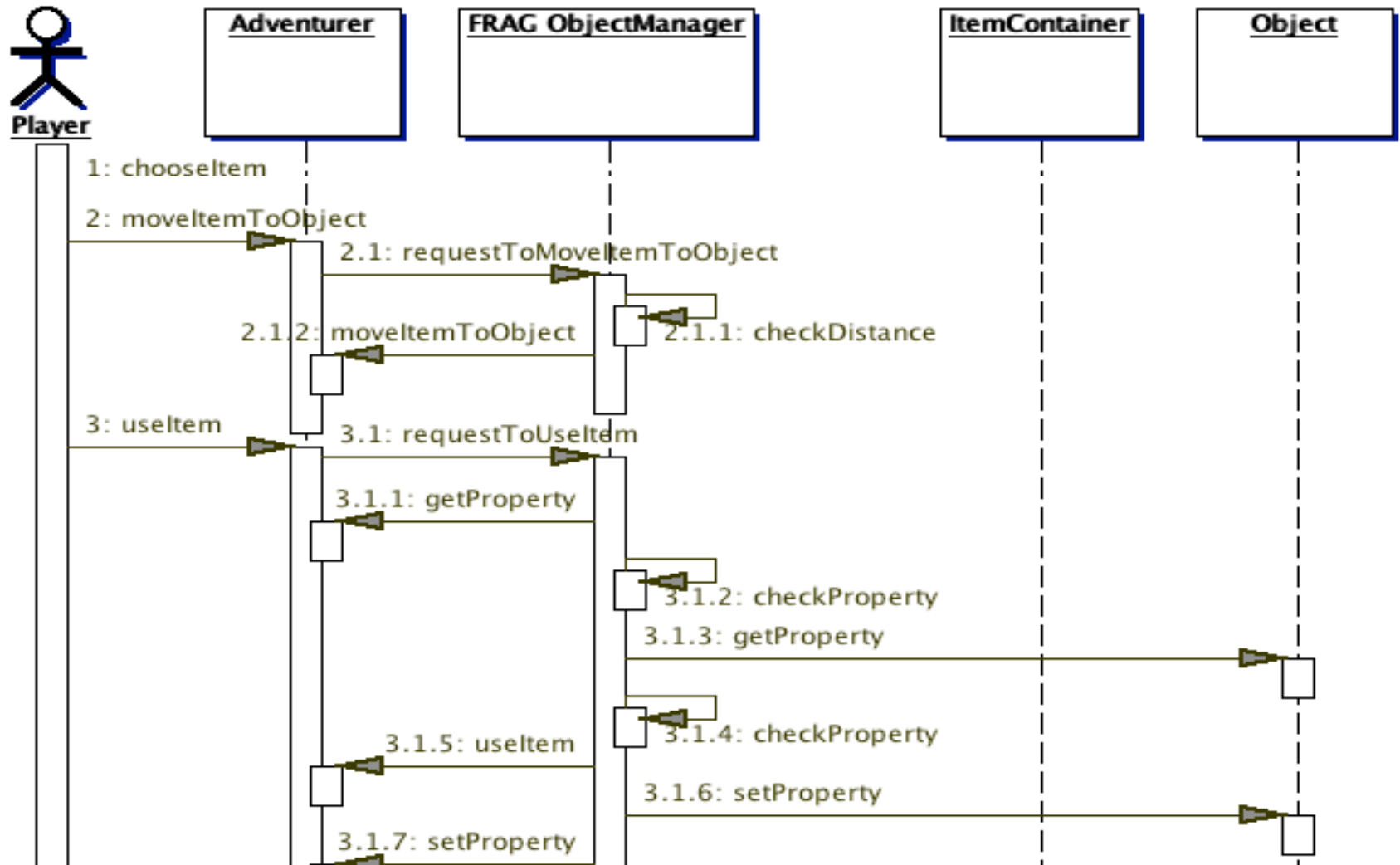


Requirements Specification



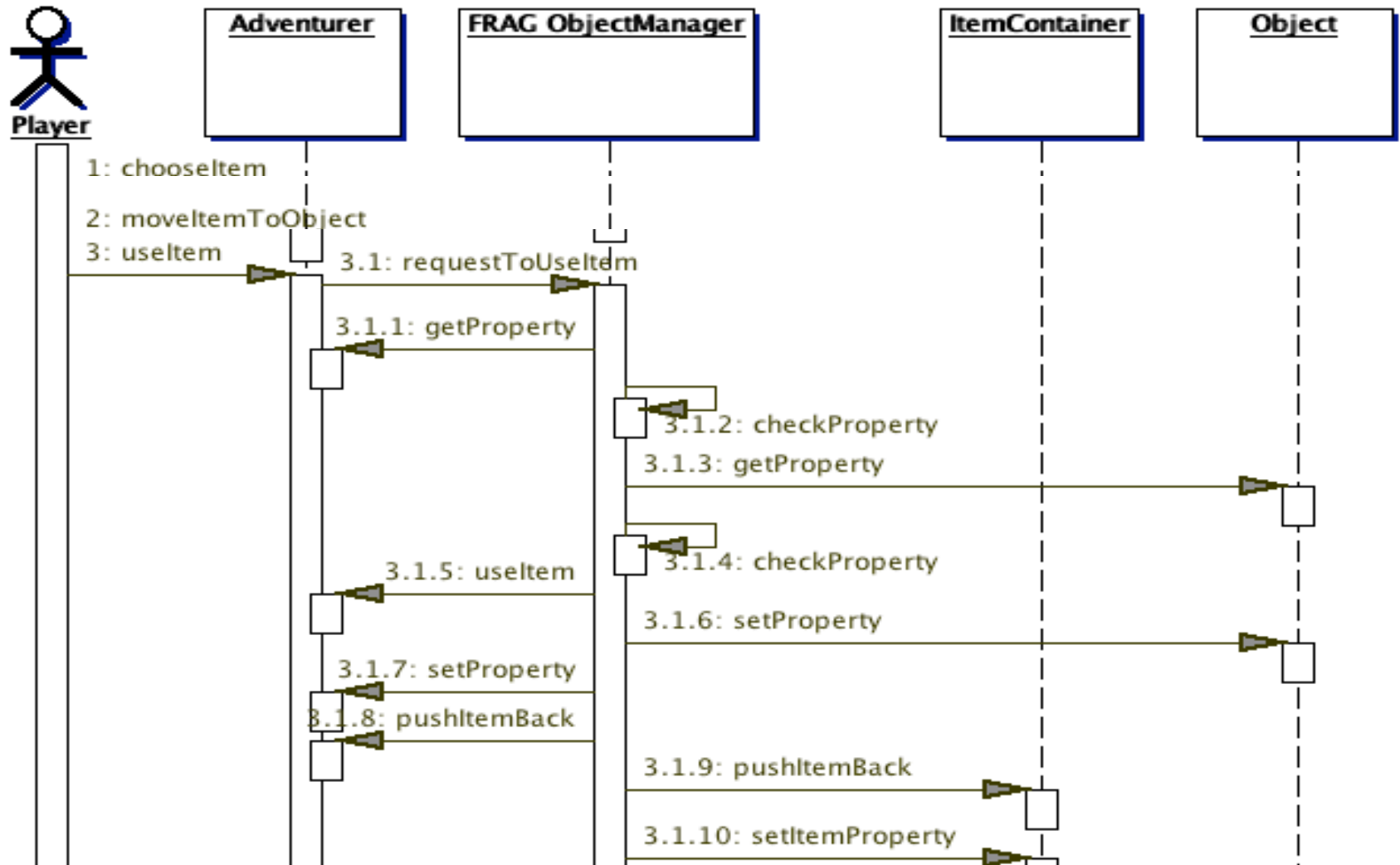


Requirements Specification





Requirements Specification



Subsystem Decomposition

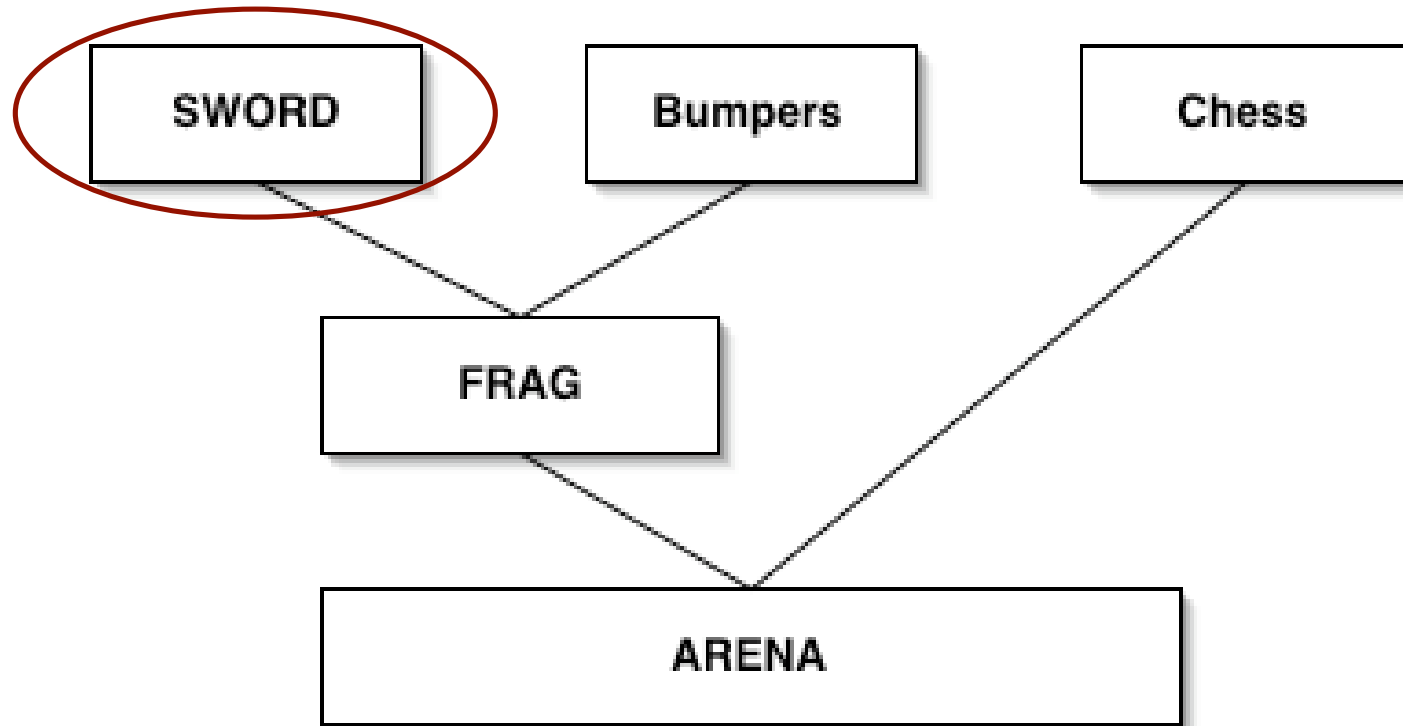
Simeon Penev





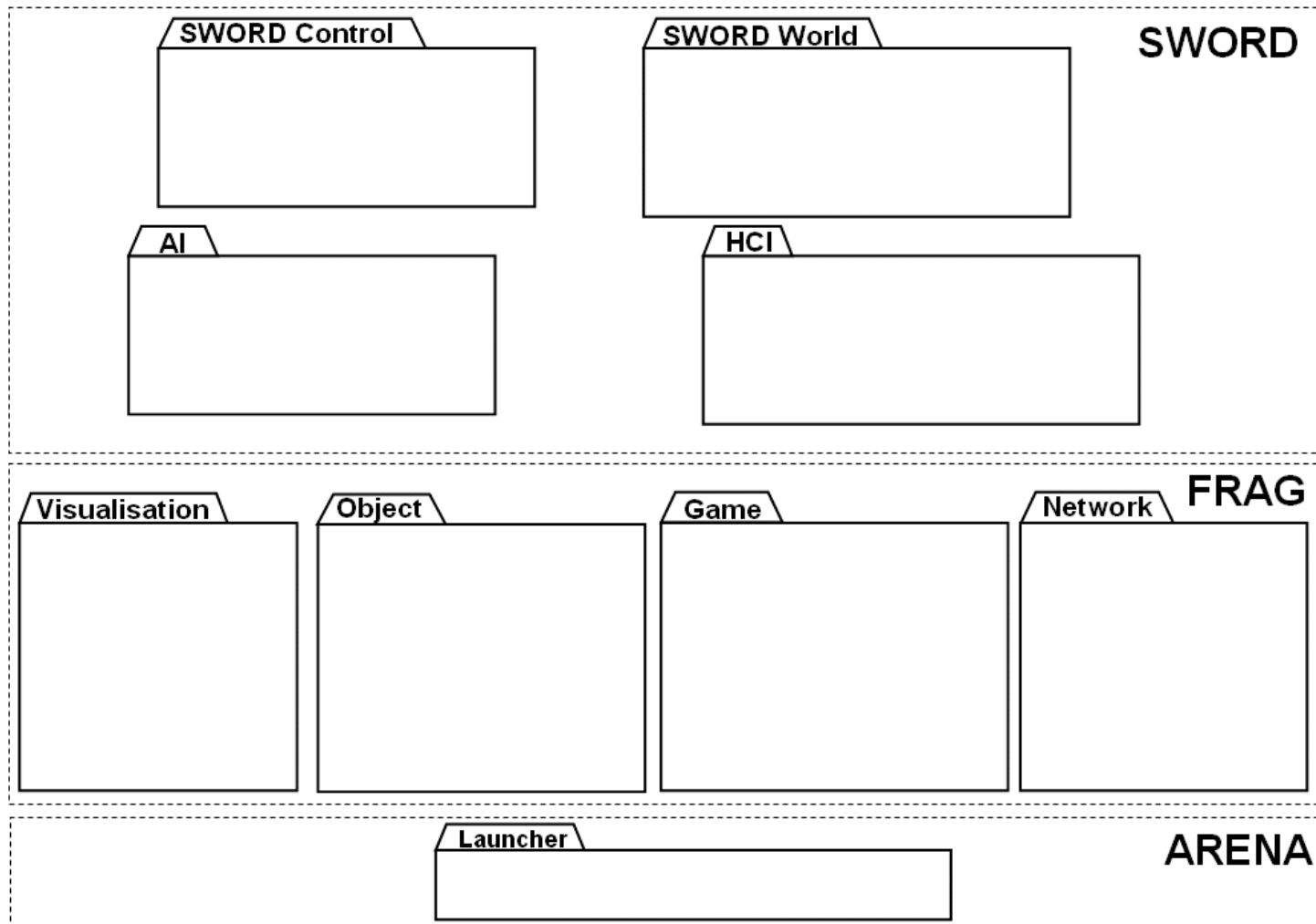
Requirements Specification

The Big Picture: ARENA Architecture



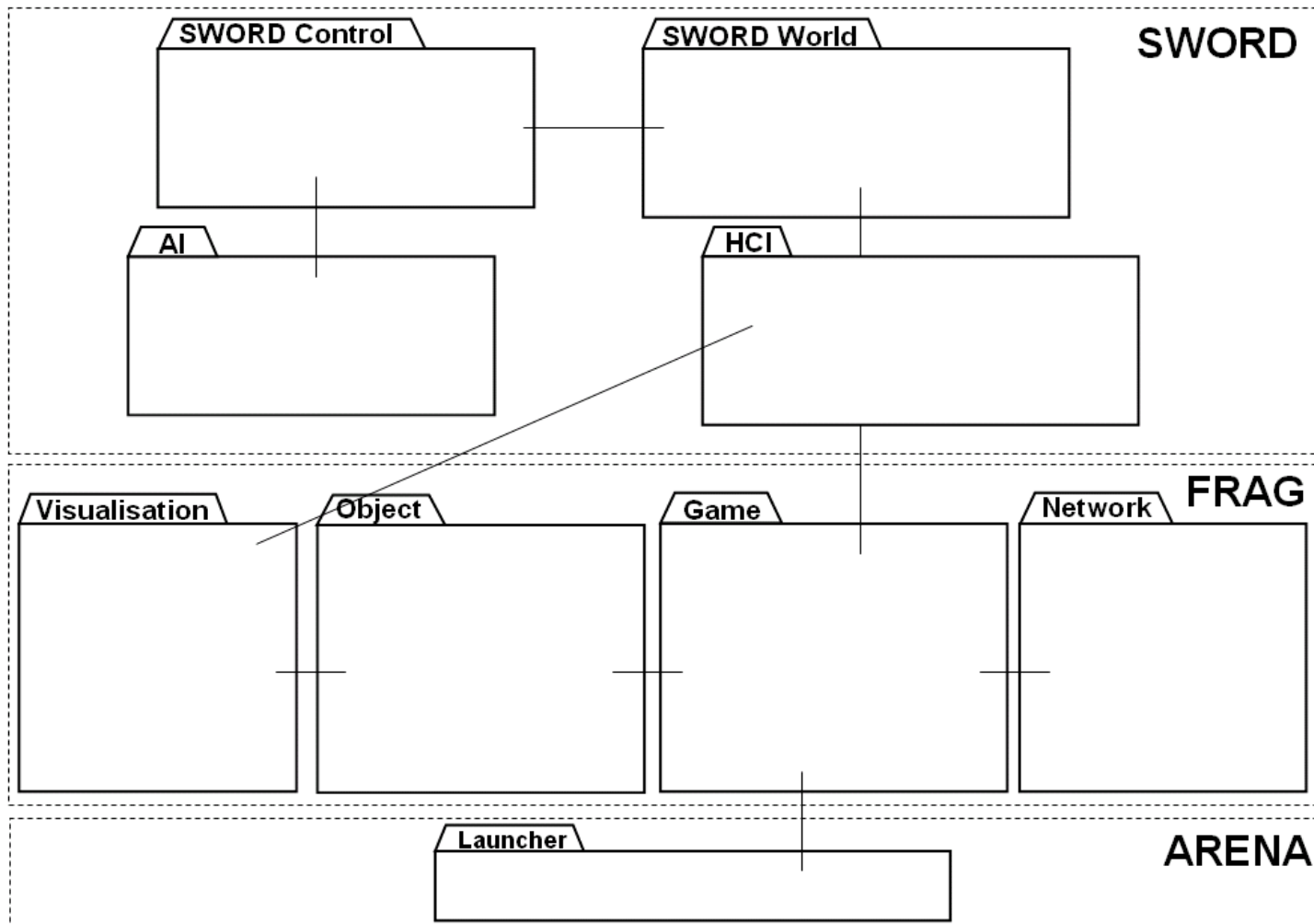


Layers



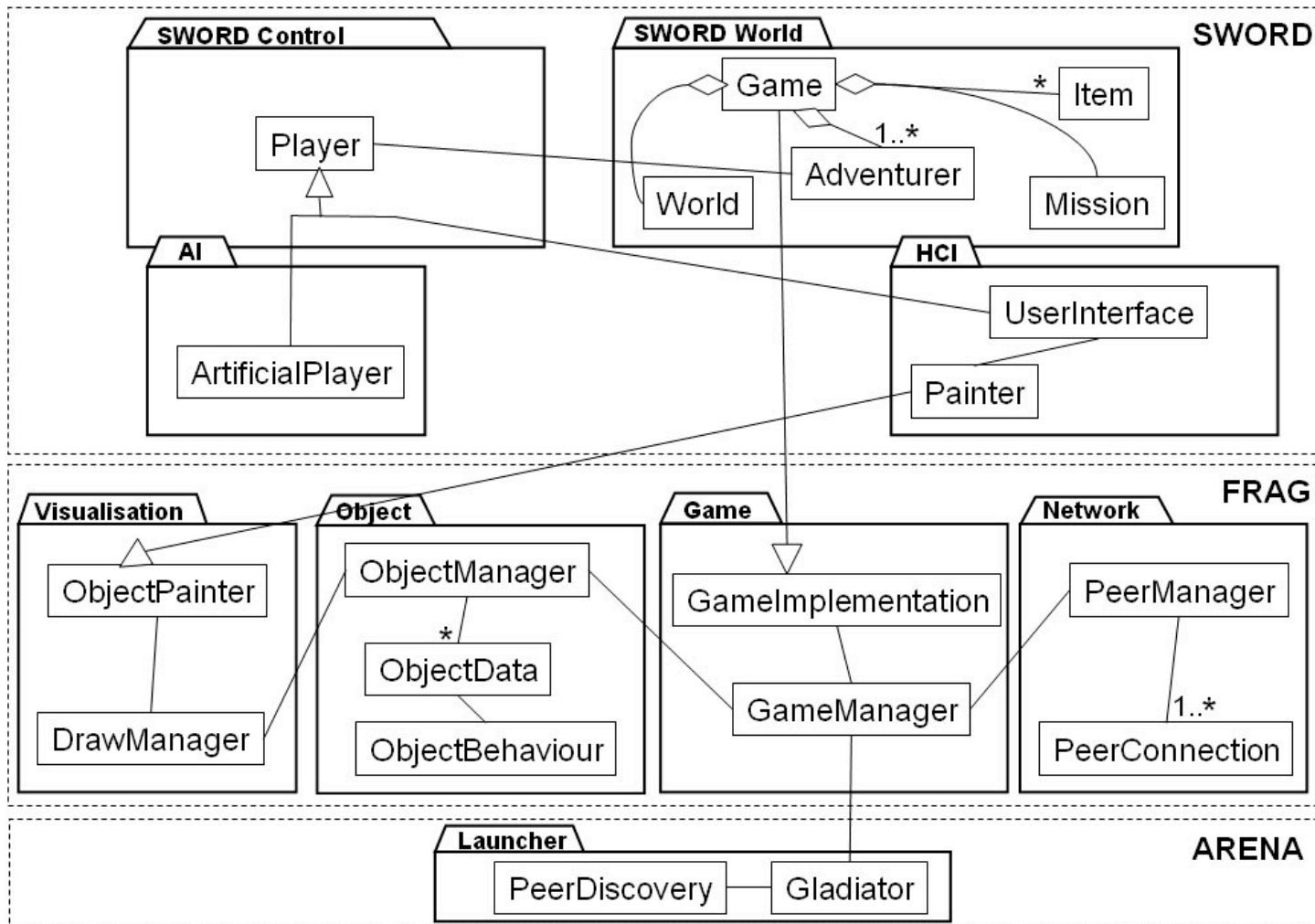


Subsystem Interaction



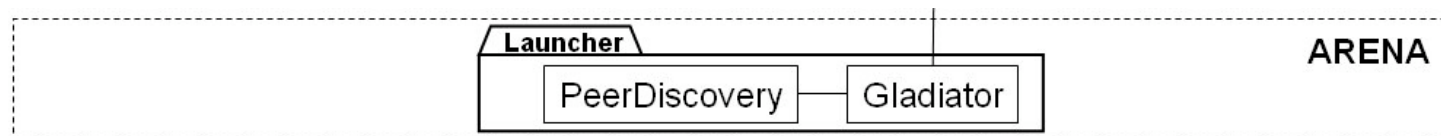


Subsystems

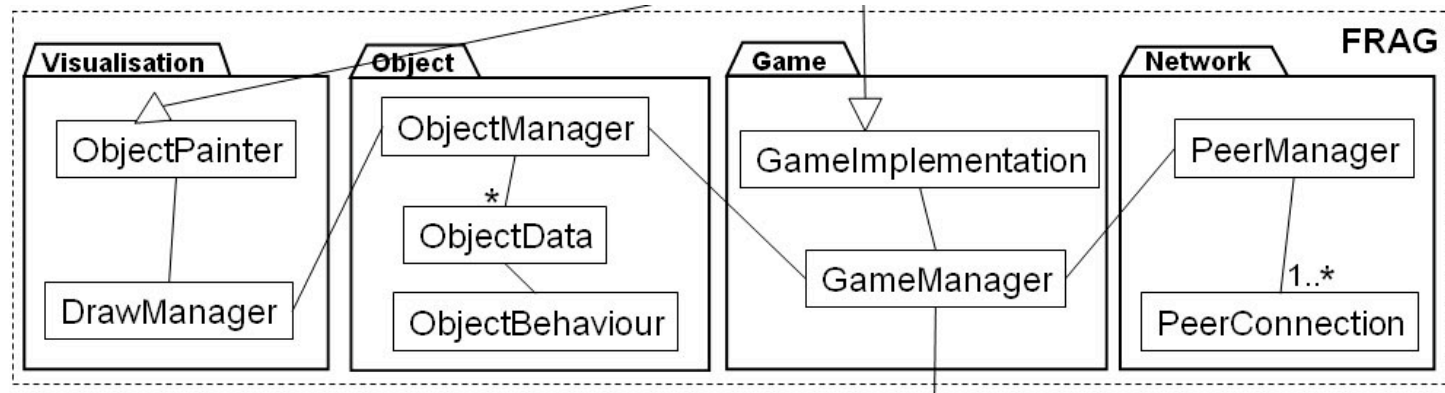




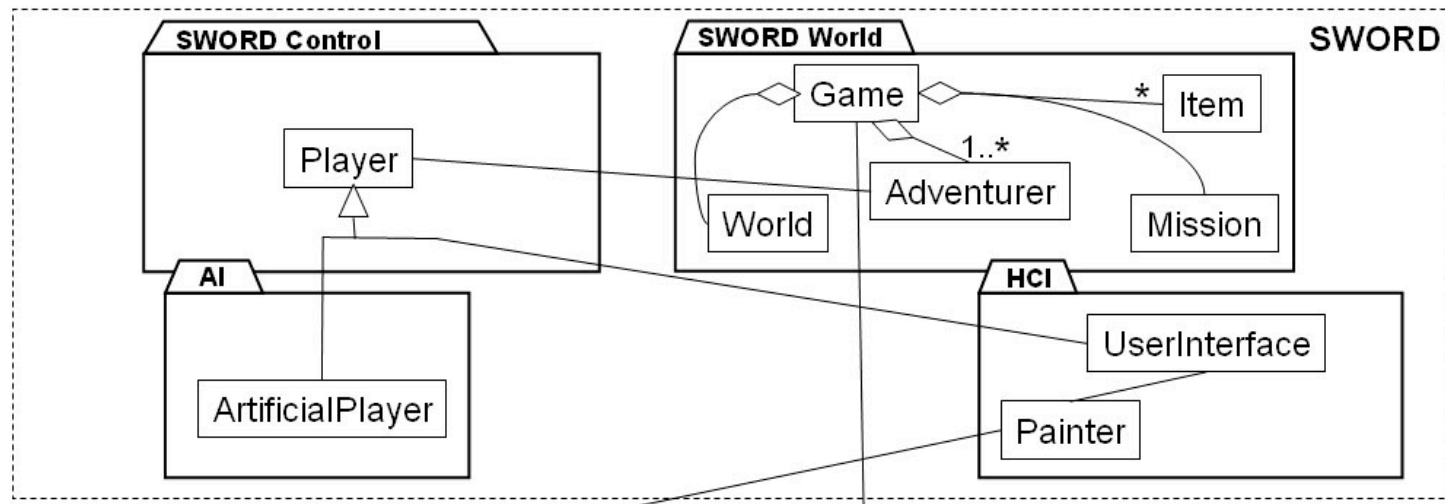
Arena layer



- Launcher – responsible for the initialization of the game
 - PeerDiscovery – finds peers on the network and establishes connection; also responsible for discovering started games on the connected peers
 - Gladiator (ARENA User) – the initiator of the game; s/he starts the game and selects a mission



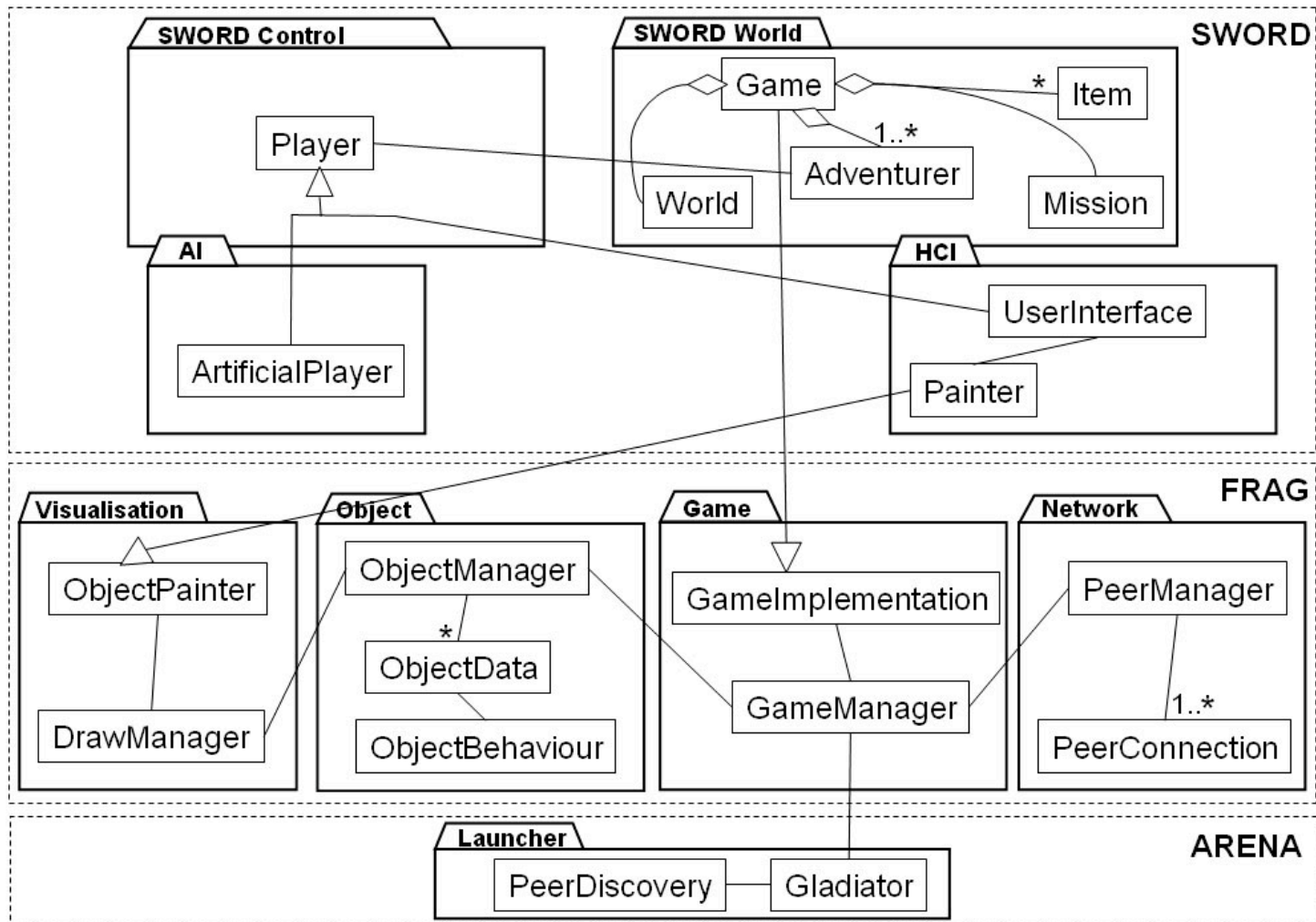
- Visualisation – draws the visual objects
- Object – manages the objects
- Game – game initialization
- Network – manages the connected peers



- SWORD Control – controls the game objects
- SWORD World – creates the game world
- AI – instantiates the Artificial Players, which are opponents of the real players (humans)
- HCI – provides user interface, used by the human player to navigate his adventurer in the game world

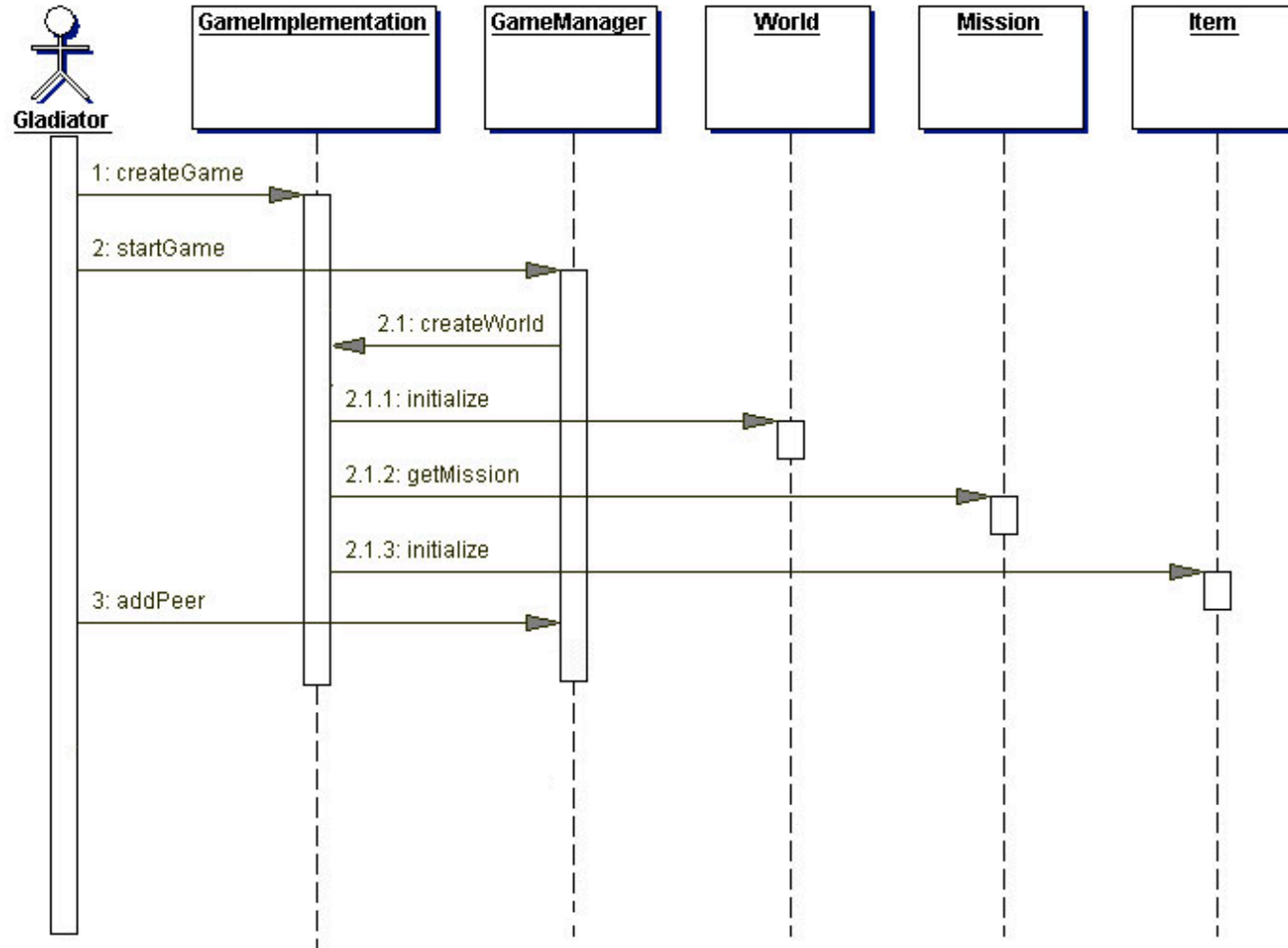


Subsystems





Flow of Events



Summary and Demonstrations

Hristo Dakev



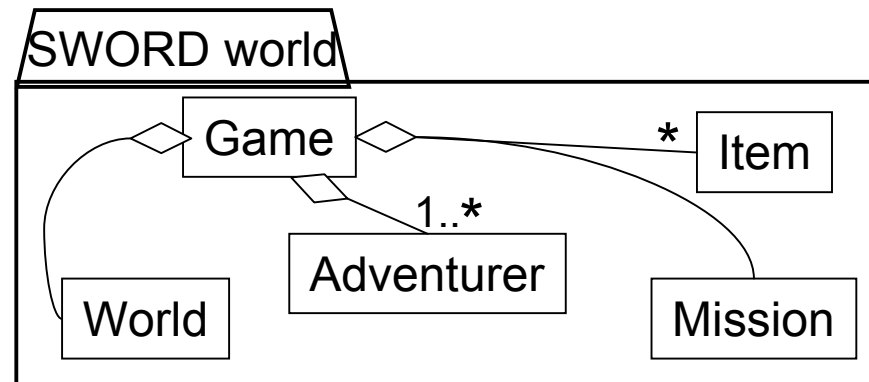


ARENA Reusable components

- All components implemented in Java
- Games employing the FRAG Framework
 - Only creation of new algorithms and objects needed
- Easy to substitute GUI of the Game World
- P2P Networks with JRendezvous integration
 - Dynamical peer discovery
 - List of services, provided by the peer



Our current focus



- SWORD-Engine
 - SWORD World and SWORD Control
- Algorithm for the Artificial Player
- How do we define different Adventurer characters?
- Mission Description Language
- GUI/User Interface and its interactions with the other components
- An alternative input device



Demonstration 1

- Network Team: discover peers (JRendezvous)
 - Register new service with its name
 - Browse peers by name of the service
 - Dynamical update of the list of available services
 - Additional information about the service

- Significance: ad-hoc network games with neither server nor configuration (Zeroconf)



Demonstration 2

- FRAG Team: draw FRAG objects
 - Universal drawing component for FRAG
 - Example: Two moving FRAG objects

- Significance: dynamic hand-over of object control



Demonstration 3

- Algorithm Team: invent and implement world generation algorithm
 - Generated world is infinite (by adding even more tiles)
 - Various resolutions are supported (user defined)
 - Each coordinate has attributes for altitude and landscape features (water, forest, etc.)
- Significance: distributed calculation of infinite game world

Thank you for the attention!

