

Enemy/AI Design Sample Work

This document was created as an exercise in Enemy/AI design.

Numerical values (attack timings, durations, attack ranges, etc) should be interpreted as a stake in the ground and not a final value. Numbers would be tweaked in the prototype/testing/iteration stage.

Likewise, non-numerical values are a design intention and are left vague to allow them to be fit into multiple different combat systems.

Units used are seconds (s), and meters (m).

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FPS Enemies

These enemies are designed with a modern FPS in mind, specifically PvE centric shooters in which AI/Enemies pose the primary challenge (Ex. Halo, Destiny, Borderlands, Doom).

Assumed Mechanics

Player:

- Regenerating Health (Player can take multiple hits before dying and can recover health either by taking cover or by seeking health kits).
- Jump/Mobility (Player is mobile enough to jump and reposition around the environment).
- Multiple weapons (Long-range rifles, shotguns, melee weapons, pistols, etc).
- One or more AoE weapons (Grenades, lasers, fireballs, melee weapons, rocket launchers).

Enemies:

- Non-Regenerating Health by default.
- Multiple shots to kill.
- Possible shield or armor that reduces or absorbs incoming damage.
- Weak-spots that cause critical damage (Headshots, etc).
- Staggering (Large amount of incoming damage in a short period stuns or interrupts attacks).
- Both ranged and melee enemies already exist in the game in some form.

Environment:

- Cover (solid pieces of the environment that block projectiles and damage).
- Height Differences (High grounds, low grounds, platforms)
- Environmental Threats (Death pits, lava, spikes, explosions, water)

Slaver

Concept:

High health, armored brute that can snare and reposition the player.

Design Goals:

The purpose of the Slaver is to create a low to moderate threat that combos with other enemies though a new threat: snares and repositioning.

- Dangerous up close
- Intuitive to fight
- Enables other enemies

Overview / Stats	
Health	High
Armor	Medium
Offense	<i>Energy Net</i> (Low Damage) <i>Energy Whip</i> (Moderate Damage)
Defense/Utility	<i>Side-Hop</i> (Evade)
Movement Speed	Slow
Solo Threat Level	Low
Group Threat Level	Moderate

Offensive Abilities:

Energy Net (Core ability, Snare attack)

The Slaver fires an arcing projectile at the player with the intent of snaring them and pulling them into danger. The Primary threat of this weapon is the vulnerability to other attacks the snare causes and the potential to be brought into range of *Energy Whip*.

After a 1s Tell/Windup, the Slaver fires out an arcing projectile at the target player.

- Projectile homes towards the player at the start of its trajectory, but less at the end, allowing evasion.
- The projectile has a wide (2m) hit radius.
- A trailing energy 'rope' tracing back to the Slaver is left behind as it moves.

If the player is hit:

- Deals minor damage to the player.
- The 'rope' visually flares with energy to signal that a player is caught.
- The player is **snared** for 3.0s (massively reduced move speed), during this time:
 - After another brief windup, the Slaver attempts to **pull** the player up to 15m towards them.
 - The player can still jump while **snared**, but its effectiveness is reduced.
 - At the end of the **snare** the player is **slowed** by 25-50% for 1s as they 'break free'.
- If the caught player takes severe damage or a melee attack, the net **breaks** and all effects end.
- If the Slaver is staggered at any time while a player is caught, the net **breaks** and all effects end.

If no player is hit:

- The net lands and remains active at that position for an additional 3s before despawning.
- If a player steps on the net, it is the same effect as if it had hit them.

The Energy Net has a ~7s cooldown that begins after the net despawns or is broken.

Energy Whip (Short Range weapon)

The Slaver swings their whip (Right to Left/Left to Right), damaging all players in a 10m, 90° arc in front. The attack deals a moderate amount of damage.

Defensive/Utility Abilities:

Side-Hop

The Slaver will perform a short-range side-hop towards cover if under sustained fire and not staggered.

Synergies:

Melee Enemies

- Can take advantage of the **snare** to catch up to the player and attack them.
- If near the Slaver when an Energy Net hits a player, they can wait near the Slaver and attack the player when they get pulled into range.

Ranged Enemies

- Can take advantage of the **snare** to attack the player while they are unable to evade.

Player Strategy:

Players of all skill levels will generally try to keep the Slaver at range and take advantage of the Slaver's inability to deal long-range damage. Coordinated players will focus fire the Slaver if a friend is caught by *Energy Net* to stagger the Slaver and break the net.

Alone the Slaver is not a significant threat due to the Slaver's limited damage range and movement. Even if a player is caught by *Energy Net*, getting away from the Slaver after the Energy Whip attack should not be difficult if other enemies are not pressuring the player.

As part of an enemy squad, the Slaver will not be a priority target again due to its low sustained damage. This should allow its presence to influence the fight longer, keeping players moving and on their toes for a potential Energy Net while they focus down other higher priority targets.

Design Notes:

The threat level of multiple Slavers is not linear due to the potential for Energy Net attacks to combo off each other. A player getting caught by two Slaver *Energy Nets* in sequence should never happen due to the potential frustration and limited player options in that scenario.

Potential Variants:

Shielded Slaver

A Slaver armed additionally with a heavy shield that protects them from ranged fire. Lowers their shield when they throw *Energy Net* becoming vulnerable to damage until the net despawns.

Flavor/Setting Notes:

Sci-Fi

The Slaver should easily fit into Sci-Fi settings with some form of tech armor and Energy accents on their weapons.

Fantasy

The Slaver should fit in Fantasy settings as a sort of Slave-Master looking brute with whip and net. Alternatively, they can be flavored as a spellcaster using magic to create the net effects and 90° attack.

Warp Assassin

Concept:

An unpredictable assassin capable of pressuring the player with self-repositioning abilities.

Design Goals:

The intent for this enemy is to create a moderate threat that pressures players regardless of their location and challenges them to be aware of their surroundings.

- Forces player movement
- Clearly conveyed teleportation
- Player should never be hit 'without warning'

Offensive Abilities:

Hunter's Warp (Core ability)

The Warp Assassin attempts to position itself so that it has line of sight with the player.

Upon establishing line of sight, they begin to **channel** a teleportation ability for 2.0s.

- While **channeling** a **dimensional rip** appears at a destination near the player
- The **rip** emits a high priority audio cue alerting the player as it appears with an additional cue 0.5s before the Warp Assassin comes through.
- At the end of the **channel** the Warp Assassin teleports to the **rip** location.
- A trail effect from the Warp Assassin's origin to the **rip** appears to help attacking players track the Warp Assassin.
- Upon appearing at the destination, the Warp Assassin immediately initiates *Entropic Blade*.
- *Hunter's Warp* can only be used once every 10s.

Entropic Blade (Short Range Melee Weapon)

If in medium-close range, the Warp Assassin closes the distance to the target player and performs a short windup.

- At the end of the windup, the Warp Assassin dashes forward and swings their blade in a 50° arc in front of them, damaging the first player hit.

Phase Pistol (Mid-Long Range Weapon)

If in mid-long range and unable to initiate *Hunter's Warp*, the Warp Assassin fires a series of non-tracking projectiles at the player.

Defensive/Utility Abilities:

Dimensional Escape

When under fire, the Warp Assassin will choose another position in range and in line of sight to teleport to. After turning to face the direction, they will **channel** for 1s and teleport. This is similar to *Hunter's Warp* only quicker and without the **dimensional rip**.

Overview / Stats	
Health	Medium
Armor	Low
Offense	<i>Hunter's Warp</i> <i>Entropic Blade</i> (Moderate Damage) <i>Phase Pistol</i> (Low Damage)
Defense/Utility	<i>Dimensional Escape</i>
Movement Speed	Slow
Solo Threat Level	Moderate
Group Threat Level	Moderate

Synergies:

Ranged/Melee Enemies

- Other enemies can distract the player while the Warp Assassin prepares it's *Hunter's Warp*.
- The Warp Assassin's **dimensional rip** may pull a player's attention away from their current target.
- A player may be forced out of cover to get away from the Warp Assassin's attack, giving enemies an opportunity to attack.

Player Strategies:

Once players become aware of a **dimensional rip** they will instinctively back away either to line up a shot, or just get away from the impending *Entropic Blade* attack.

If the player is not heavily pressured, they generally will back away, take aim, and fire at the Warp Assassin as soon as they appear, or set up a similar heavy attack. A skilled player should be able to kill a Warp Assassin before it can escape.

A heavily pressured player may not have the bandwidth to prepare to attack the Warp Assassin and instead will likely simply run from the area, fulfilling the forced movement intention of the enemy.

Design Notes:

Depending on the level/environment, the line of sight rules for teleporting may need to be more flexible. This however may make the Warp Assassin frustrating to fight if it can teleport from a position not visible to the player.

If players are too mobile and getting away becomes too easy, the **dimensional rip** may need to gain the ability to move with the target up until a certain point. A more specific language and rhythm of SFX will need to be made to communicate timing for when the **rip** opens, stops, and just before the Warp Assassin appears. Without this language players may spend evasion abilities (such as jumping away) too soon before the **rip** stops its movement.

Flavor/Setting Notes:

Sci-Fi

The Warp Assassin fits in Sci-Fi settings with some sort of dimensional shifting equipment. Teleportation effects should be flavored as wormholes or other sorts of rips.

Fantasy

The Warp Assassin fits in Fantasy as a sort of Magus or melee spellcaster. Teleportation effects should be flavored as dipping into a dark dimension of some-sort and emerging.

Boar

Concept:

An aggressive enemy that attacks by building up speed in a charge. Uses group tactics to protect itself.

Design Goals:

The intent of the Boar is to create a low-threat enemy that can be spawned in variable numbers to adjust the difficulty of an existing encounter.

- Simple to understand and exploit.
- Easy to avoid.
- Dangerous if ignored.

Overview / Stats	
Health	Low
Armor	Moderate
Offense	<i>Charge</i> (Moderate Damage) <i>Gore</i> (Low Damage)
Defense/Utility	<i>Follow Through</i> <i>Formation</i>
Movement Speed	Average (Normal) Fast (Charging)
Solo Threat Level	Trivial
Group Threat Level	Low

Offensive Abilities:

Charge (Core Ability)

The Boar begins running at the player, building up speed over time. As the Boar reaches its top speed, its ability to turn diminishes allowing players to evade as it gets close.

If the Boar hits the player it deals moderate damage, and **knocks** the player away.

The Boar initiates *Follow Through* at the end of its charge regardless if it hits or misses the player.

Gore (Short Range Melee Weapon)

If the Boar passes by a player before it has built up enough speed, it lashes out at them, dealing a minor amount of damage.

Defensive/Utility Abilities:

Follow Through

The Boar's charge contains momentum allowing it to continue its movement regardless if its attack succeeds or misses. This allows a Boar to potentially get away before they are killed in a counter-attack.

Upon passing by a player during a *Charge* the Boar will continue its movement forward and attempt a wide turn to bring itself back around for another *Charge*.

If there is not enough maneuvering room, the Boar will slow itself and end the *Charge* before turning and starting a new *Charge*.

If a solid obstacle is immediately in the path, the Boar may collide with the obstacle and become staggered.

Formation

When multiple Boars are present, they will attempt to *Charge* together in a tight formation. This way Boars in front will block some damage for those behind and increase the chance of a successful impact.

The Formation follows the same rules as a single Boar and maneuver as a single unit. Colliding with obstacles will **stagger** all Boars momentarily in a pileup.

Synergies:

Ranged Enemies

- Other enemies that take priority over the Boar may distract the player and allow a Boar to potentially land a *Charge*.
- The Boar will force the Player to evade them occasionally, allowing other enemies to set up an attack, or get into cover if under attack.

Player Strategies:

Players of all skill levels will intuitively try to jump or dodge away from a charging Boar. The Boar's predictable behavior and path makes them easy to track and fire down.

Players of all skill levels will be able to use AoE attacks to damage Boars using *Formation*.

High skill players can exploit the limited turn ability of *Charge* to cause Boars to collide into hazards when the player evades.

Design Notes:

A maximum *Formation* size will likely need to be defined to allow multiple groups of Boars to operate simultaneously.

Potential Variants:

Flying Boar

Complex environments may call for this creature to be a flying or pseudo-flying enemy. This variant would have less armor to compensate for its more difficult to hit nature. It likely would also have more complex pathfinding but function the same otherwise with its tendency to follow through on movements and potentially collide with the environment.

Flavor/Setting Notes:

Sci-Fi

The Boar fits in Sci-Fi with a few potential tweaks. It could be a simple-minded machine, or aggressive alien creature.

Fantasy

The Boar fits naturally into Fantasy almost as is, as a literal Boar or Warthog. It also could be flavored as a more monstrous sort of adversary.