Dawn

Milestone Breakdown

Interactive Laboratories

[Version: 0.0.0.1] [Date: 23|11|2012]

Dawn

Change Log

Version	Author	Changes
0.0.0.0	Rico	First-pass of document complete
0.0.0.1	Rico	Changed the DOC footer to MB on the right-hand pages

Dawn

Table of Contents

Milestones....1
- Alpha List....1
- Alpha | Milestone 1 – Create Rendering Surface....2
- Alpha | Milestone 2 – Scene Graph....2
- Alpha | Milestone 3 – Detach Render Update From Logic Update....2
- Alpha | Milestone 4 – Vectors and Matrices....2
- Alpha | Milestone 5 – Draw Polygon....2
- Alpha | Milestone 6 – Deferred Rendering....2
- Alpha | Milestone 7 – Resource Management....2
- Alpha | Milestone 8 – Draw Meshes Exported From Blender....2
- Alpha | Milestone 9 – UV mapped mesh....3
- Alpha | Milestone 10 – Get Input Into the Game....3
- Alpha | Milestone 11 – Camera System....3
- Alpha | Milestone 12 – GUI System....3
- Alpha | Milestone 13 – IK System....3
- Alpha | Milestone 14 – Skeletal Animation....3
- Alpha | Milestone 15 – Populate world with zombies....3
- Alpha | Milestone 16 – Culling and Clipping Optimisations....3
- Alpha | Milestone 17 – Shadows....3
- Alpha | Milestone 18 – Imbue Zombies With Intelligence....3
- Alpha | Milestone 19 – Audio System....4
- Alpha | Milestone 20 – Weapons....4
- Alpha | Milestone 21 – High-Score System....4
- Alpha | Milestone 22 – Particle System....4
- Alpha | Milestone 23 – Collision Detection....4
- Alpha | Milestone 24 – Dismemberment....4
- Alpha | Milestone 25 – Item Pickup System....4
- Alpha | Milestone 26 – Health System....4
- Alpha | Milestone 27 – Ragdoll Physics....4
- Alpha | Milestone 28 – City Generation....4
- Alpha | Milestone 29 – Octree System....4
- Alpha | Milestone 30 – Apartment Roof Access and Stairwell....5
- Alpha | Milestone 31 – Fire Escape....5
- Alpha | Milestone 32 – Shaders....5

Dawn

Preface

Herein lies a listing of milestones to be met, unbounded by time and detailed from a high-level overview.

Dawn

Milestones

Alpha List

Description	Milestone
Create rendering surface	1
Scene Graph	2
Detach render update from logic update	3
Vectors and Matrices	4
Draw polygon	5
Deferred Rendering	6
Resource Management	7
Draw mesh exported from Blender	8
UV mapped mesh	9
Get input into game	10
Camera system	11
GUI system	12
IK system	13
Skeletal animation	14
Populate world with zombies	15
Culling and clipping optimisations	16
Shadows	17
Imbue zombies with intelligence	18
Audio system	19
Weapons	20
High-score system	21
Particle system	22
Collision detection	23
Dismemberment	24
Item pickup system	25
Health system	26
Ragdoll physics	27

City generation 28
Octree system 29
Apartment roof access and stairwell 30
Fire escape 31
Shaders 32

Alpha | Milestone 1 – Create Rendering Surface

Create a hardware-accelerated surface for rendering. On Windows and Linux, a window and full screen surface is available. Xbox and Pandora will not require window decoration, thus they will render to a full screen surface only. A common rendering interface will need to be defined as well as an interface to provide the depth, stencil, and colour bits and size of the rendering surface.

Alpha | Milestone 2 – Scene Graph

To optimise rendering, a scene graph will be used to cull primitives before they are sent down to the GPU. Any renderable objects will be a scene graph node.

Alpha | Milestone 3 – Detach Render Update From Logic Update

In order to not lock the logic to the framerate of the game, separate the logic and render update operations.

Alpha | Milestone 4 – Vectors and Matrices

Vector and matrix classes for later use in rendering and other objects that use these constructs.

Alpha | Milestone 5 – Draw Polygon

Simply draw a polygon, proving that the winding order is correct and the vector class works.

Alpha | Milestone 6 – Deferred Rendering

As an optional render path, deferred rendering will be used. It will be implemented on both the Pandora and Xbox as well.

Alpha | Milestone 7 – Resource Management

Keep track of loaded resources and unload resources to free up memory for another resource.

Alpha | Milestone 8 – Draw Meshes Exported From Blender

This will require an external tool to load and process a Blender file to a more friendly format for the game. Meshes will not be optimised at this milestone, they will be triangle lists with normals exported.

Alpha | Milestone 9 – UV mapped mesh

Extending on the previous milestone, the mesh will now have UVs and the texture will need to be loaded. The mesh will also have it's UVs and texture name exported from the previous milestones' tool.

Alpha | Milestone 10 – Get Input Into the Game

Use the mouse and keyboard on Windows and Linux, for debugging on Pandora and Xbox. Gamepad support for the Razer Hydra and Xbox 360 controller will be supported on Windows and Linux. On Pandora and Xbox, their default game input devices shall be used.

Alpha | Milestone 11 – Camera System

Basic six-degree-of-freedom and FPS-style camera implementations.

Alpha | Milestone 12 – GUI System

Text labels, buttons, and lists. All items can be grouped together in a bounding rectangle. Modal groups are also possible which will behave like a dialogue box confined to the current window.

Alpha | Milestone 13 – IK System

Simple kinematic chain of joints, no constraints applied.

Alpha | Milestone 14 – Skeletal Animation

Using both forward and inverse kinematic joint-bone animation. Use quaternions to implement rotation of joints.

Alpha | Milestone 15 – Populate world with zombies

Zombies will be added which will have idle animations and will not be able to move. A test of 100 zombies rendered at once shall be the end result of this milestone.

Alpha | Milestone 16 – Culling and Clipping Optimisations

Standard culling such as backface, frustum and occlusion culling shall be implemented to aid further in preventing unnecessary primitives from being rendered.

Alpha | Milestone 17 – Shadows

Very simple shadow maps without any kind of filtering.

Alpha | Milestone 18 – Imbue Zombies With Intelligence

Give zombies the ability to wander around when idle and pursue a target for as long as it remembers the target exists.

Alpha | Milestone 19 – Audio System

Multi-channel audio. Compressed and uncompressed audio file playback. Start, stop, pause and loop sounds. Volume and pitch control.

Alpha | Milestone 20 – Weapons

Firearms: Shotgun, Pistol, Revolver, and Rifle. Melee: Knife, Pipe, and Baseball Bat.

Alpha | Milestone 21 – High-Score System

Each zombie killed is worth points, every in-game hour is worth points.

Alpha | Milestone 22 – Particle System

Billboarded textures that have a direction, velocity, time limit until it dies, and a maximum amount of particles present.

Alpha | Milestone 23 – Collision Detection

Bounding volumes for performing collision detection. Allow meshes to implement bounding hulls which are in-line with the vertices it represents.

Alpha | Milestone 24 – Dismemberment

Allow for the player and zombies to be dismembered based on stresses from blunt-force injuries, bullet impacts, and reach limits being over the limit.

Alpha | Milestone 25 – Item Pickup System

Random item dispersal. Ammunition, weapons, and health.

Alpha | Milestone 26 – Health System

Player health is affected by a zombie damaging the player, the player dies when their health is fully depleted. Players will bleed-out for a while until the wound heals over time or they find a health kit.

Alpha | Milestone 27 – Ragdoll Physics

When the player dies or a zombie is killed, a ragdoll physics simulation will be imparted on the remains of the entity. Dismembered limbs will be simulated as well.

Alpha | Milestone 28 – City Generation

A few building types will be used in the game; apartments, hotels, and office buildings.

Alpha | Milestone 29 – Octree System

An octree will be employed as the game does have objects above and below which may not be visible.

Alpha | Milestone 30 – Apartment Roof Access and Stairwell

The stairwell will have a random amount of zombies in it, if the player succeeds in securing a stairwell, then there will not be any more zombies should the player return. Only access from the roof to the ground floor is possible, the player will not be able to enter from the ground and go to the roof. A lobby will also be accessible, which will provide the exit to the city and the entrance to the stairwell.

Alpha | Milestone 31 – Fire Escape

For the apartments, there will be a fire escape present. The ladder connecting the stairway to the city will break if the player uses it too many times, the chance of breaking the ladder increases if a zombie latches onto the player as he is attempting to climb the ladder.

Alpha | Milestone 32 – Shaders

Various shaders will be applied to pretty-up the game. Screen-Space Ambient Occlusion, Radiosity, Depth of Field, and Sub-Surface Scattering.