Gimme Somethin' to Shoot

Filming the Cinematics of

Blizzard Entertainment will explore the creation of the StarCraft II: Wings of Liberty sequences, and the challenges the Blizzard Film Department faced in making them. The viewer will have insight into some of the techniques used by this group of artists and technicians. The presentation will also show how the growing demands of the industry have molded them from a small boutique effects house to the equivalent of a small movie studio over the course of a few years. The intention is to allow for insight into how the department went through both immense philosophy and pipeline changes, which has in turn given support to the rapid growth of an award winning team of individuals. gl hf!

Department History

- Blizzard Entertainment
    - 20 years old
- Blizzard Film Department
    - 15 years old
- WarCraft II
    - First rendered cinematics for Blizzard game
- StarCraft
    - Debut of full cinematics
    - Birth of the department

# How do you build a Marine???

Starting the Teaser…

Previz

At the time done by the director

The Push to the Next Step...

New challenges arise

- Concepting and Modeling
  - Polygon counts are incredibly high
    - Unable to render both the scene and character together
    - Several separate passes are required to render the scene

- The need for change in our renderer is seen as a high priority
  - Needs to be able to handle true displacement for the Zerg
  - Needs to handle large renders
  - Needs to support a larger department because...
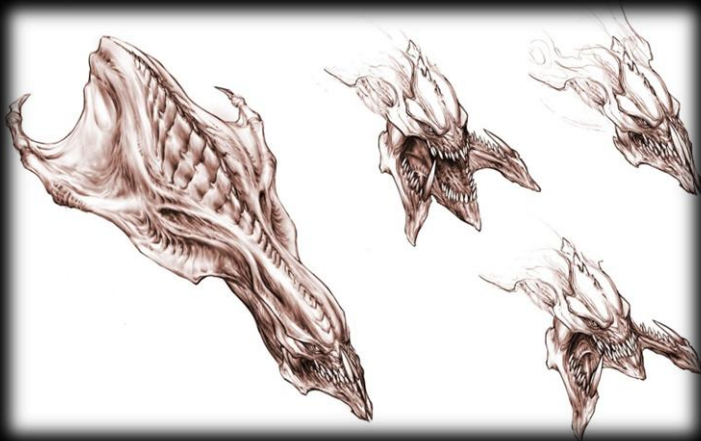
Demand for Cinematics Increases

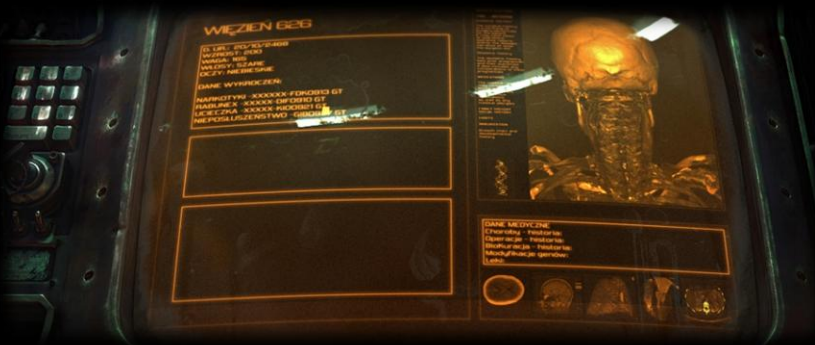Need to support all of our current projects
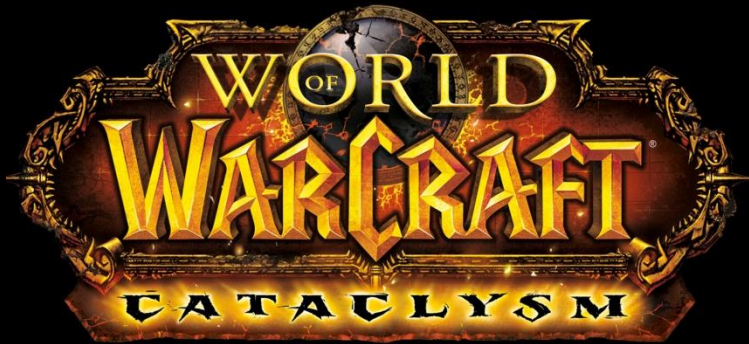
Demand for Quality increases

A continual push to increase the artistic quality of our images

Global Impact

Localized Text

Localized Voice

Need for a More Robust Pipeline

To Support Growth of the Department

Creation of New Departments

- Concepting team
- Storyboard team
- Previz team
- Production Staff
- Finishing team split
  - Effects
  - Lighting & compositing
- Tech team split
  - R&D
  - Production Tech

Move to New Software

- Previous Software
  - Max/Brazil/Digital Fusion
- Current Software
  - Max/Maya/Mudbox/Houdini/XSI/PRman/ Nuke
- Software Use
  - Maya for animation
  - Max/Mudbox for modeling
  - Custom software/tools
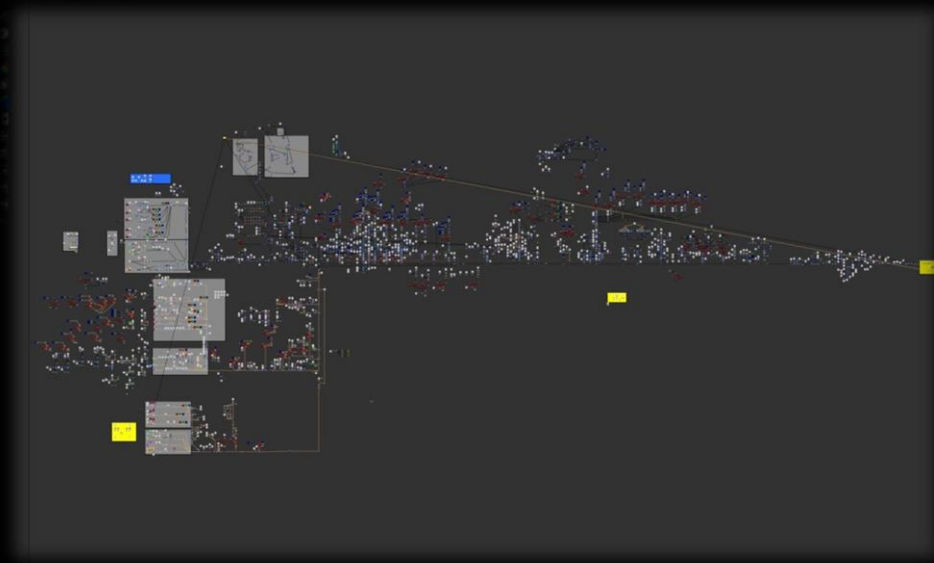
Tools

Pixar's RenderMan was seen as the next step in allowing us to get detail.

Unfortunately, 3dsmax had no native RenderMan hooks, and PRMan only supported Maya out of the box.

3dsmax to Maya – *The Bad*...

3dsmax to Maya – *The Bad*…

What we lost

- All custom internal tools in 3dsmax
- Fast raytracing, easy materials integrated in the base package
- Great off the shelf tools like Afterburn and FumeFX

3dsmax to Maya – *The Good*...

3dsmax to Maya – *The Good*...

What we gained

- PRMan - handles displacement, high resolution textures, and 3D motion blur with grace
- AoV's – balance between render time and composite complexity
- Reimplimented the FumeFX and Afterburn renderers in RenderMan, with source data still authored in 3dsmax.

FumeFx in RenderMan

- Implemented a custom RIB generator to create atmospheric slice planes based on FumeFx data
- Texturing handled via custom ShadeOp

FumeFx

RenderMan

Platform Diversity

- Blizzard started as a Windows-centric game studio, existing farm was Windows based, and grown on a budget.
- Began using Nuke, which had Linux origins. OSX was brought in to run it as a stop-gap on client machines.
- Now using four platforms (32 and 64 bit Windows, 32 bit OSX, and 64 bit Linux)

BCD

- Blizzard Cache Data
- Needed a flexible, package neutral file format
- Container format that stores data in channels, and the core library has the concept of a data stack. Each layer adds or overrides the layers below.
- Our typical use case:
  - One file stores static base topology, geometry, normals, UVs, etc.
  - Another file adds animated position data.
  - Library takes care of combining the data from all files and returns final data for display/processing.

Hair Render

Hair occlusion point cloud

Hair occlusion baked to texture
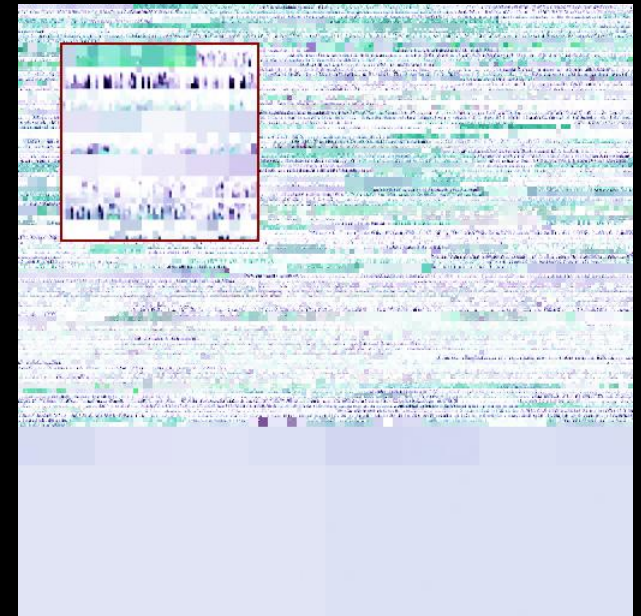
Hair Render

Full Hair Render, 22m45s

Baked Hair Render, 5m50s

FX Department

- Particle Iterator
    - Initially developed for the Wrath of the Lich King cinematic
    - Creates mass particle counts by re-running particle simulations with different seed values and using read archives

FX Department

- Work lead to the creation of a suite of different RiFilters to manipulate particle data at render time
- Control particle size, blur, and rotation speed
- Convert particle points into read archive calls for debris
- Multi-point creates a cluster of particles for each source particle
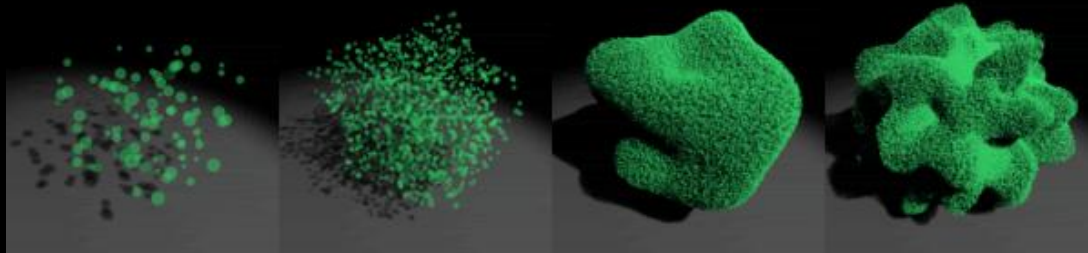
In-Game Cinematics

Concepts

Character

Lighting

CONCEPT   HOTSPOT LOCATIONS

Interactive-Mode

- Work with Pre-Render
  - Previously created characters are used with the same concept
  - Many times the look will be created for In-Game first
    - This will be driven from the game team and their designs for sets
    - Most of the story will be told in In-Game
      - Pre-Render will many times look to In-Game for direction of set models/concepts
- Character Descriptions
  - Driven from Game Story Teams
  - Versatility is limited for character look
    - Need a new "character" created for every clothing or hair change
    - Color contrasts can use the same model
- Interactive-Mode
  - Concepts driven from game team
  - Need transition ability between game play and Interactive mode
- Lighting Concepts
  - Lighting can differ slightly from the game
    - Limited to quantity of lights allowed
    - Movement and placement is more versatile
  - The concepts can give the overall vibe, and then the scene will dictate the amount of lights allowed
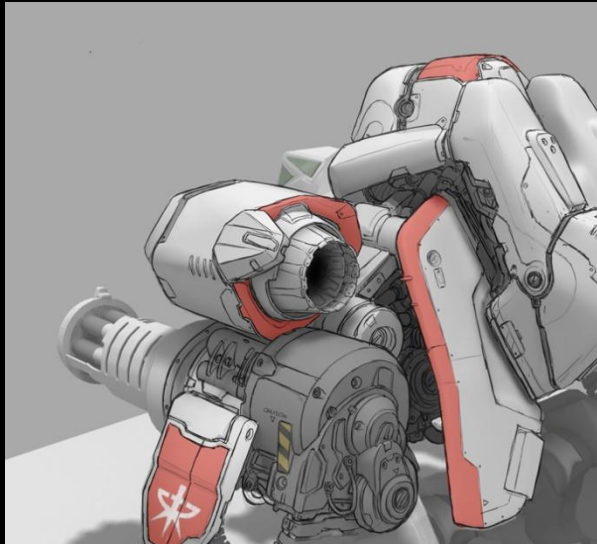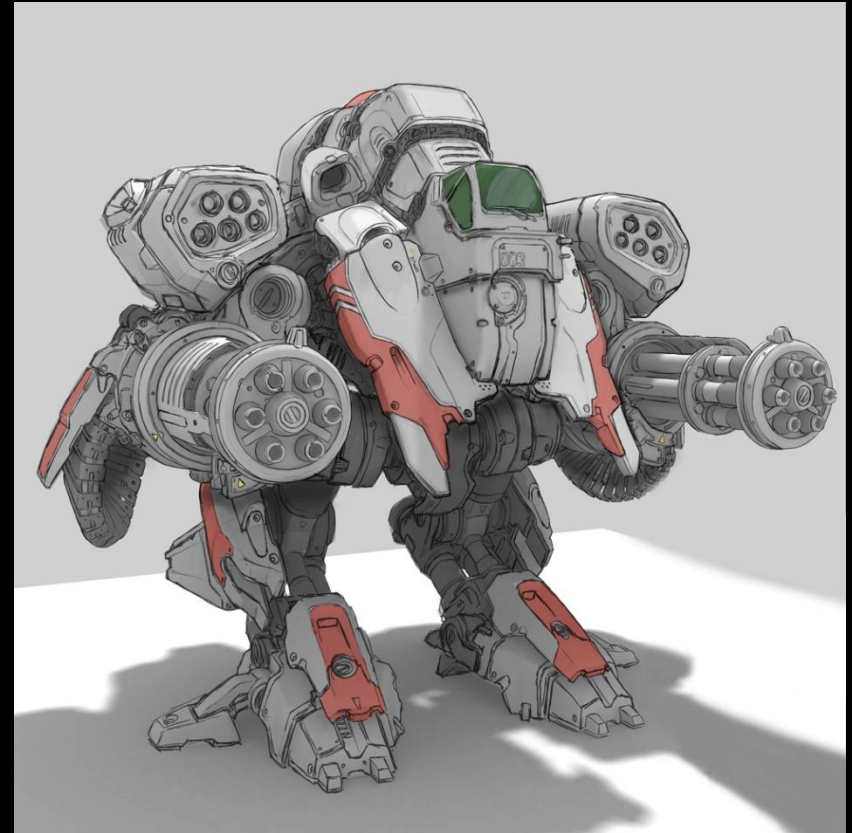
Viking Concepts

Game concept
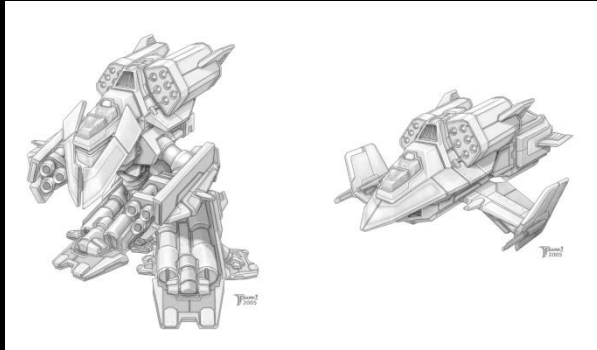
Cinematic concept

Cinematic concept - detail

Storyboards

- Focus is on the story that will be told throughout the entire game
  - Animatics are born
  - Quick turnaround and editing
  - Game team will always be present and giving final approvals
- The approved storyboards will translate the following to the artists
  - Character
  - Mood
  - Framing
  - Horizontal Line

Layout

- Cinematography focus
  - Type of lens
  - Camera angle
  - Depth of field
  - Boujou camera
  - Staging characters
- Scene editing
  - Adobe premiere
  - Cut timing
  - Character movement speed between shots
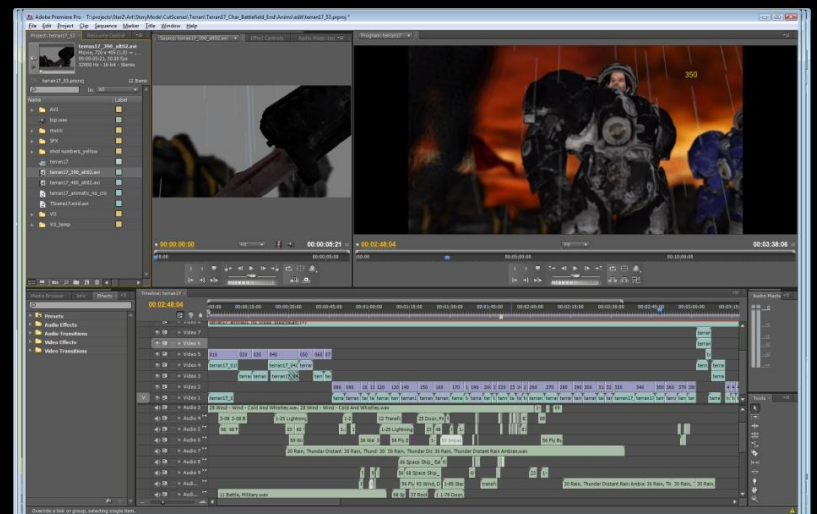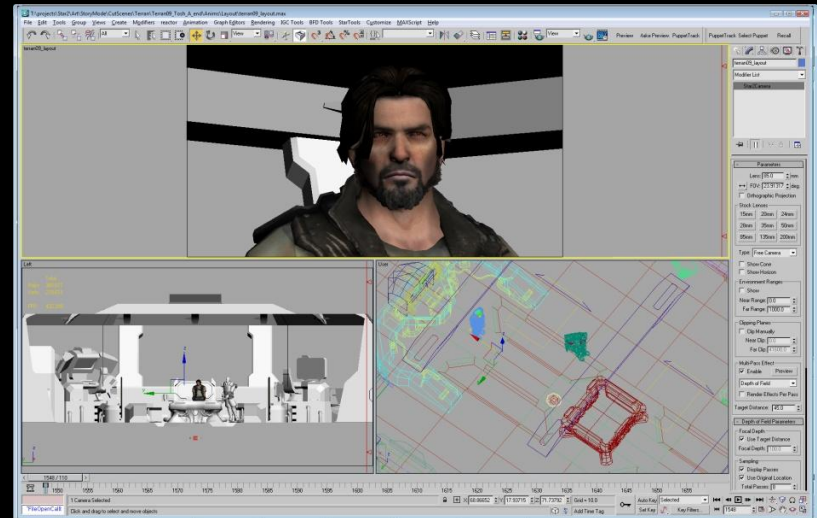
Animation

Live Action Footage

- Live action footage shot
  - Reference for animators
  - Try to use the same camera lens used in 3D layout
  - Ability to see intricacies of movement
  - Ability to see the extent and restraint of real movements with the environment and on the body

Animation
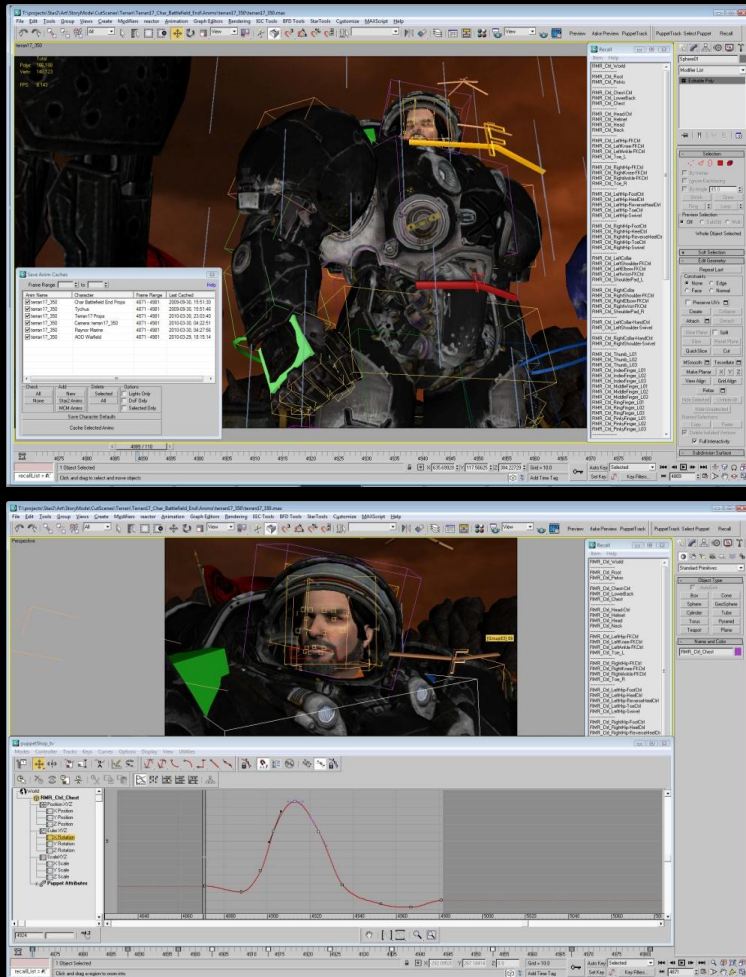
- Scene files
  - Individual scene files are created from 3D layout file

- Key Frame animation
  - Emphasis on realistic character acting and weight
  - 1st pass animation
  - 2nd pass animation
  - 3rd pass animation

- Lip-Sync
  - Face FX only
  - Tweaking needed after to help smooth out some of the animation curves

Modeling

- Creation of all sets and characters based on the approved concepts
- Pre-Render Characters
  - Can use in the In-Game scenes
  - Need to reduce the poly count
- Most sets are created separate from Pre-Render
  - More sets are needed for In-Game vs. Pre-Render
  - Follow alongside game play
- Restrictions
  - Poly counts need to fit within the game engine
  - Geo and Texture sizes are limited
    - Priorities are decided upon where to spend time / quality
    - Upper body will usually have more detail than the lower body
      - Have to choose about what is going to be seen by the player
      - Focus will be on how the character is seen in the scene

In-Game Tychus

Pre-Render Tychus

Character Set-up

Raynor Rig

- •Rigs
  - •Needed specifically for each character
  - •Each characters has 120 bone count limit
- • No sims are used on In-Game Characters
- • Rigs are done by using puppet shop rig in 3dsMax
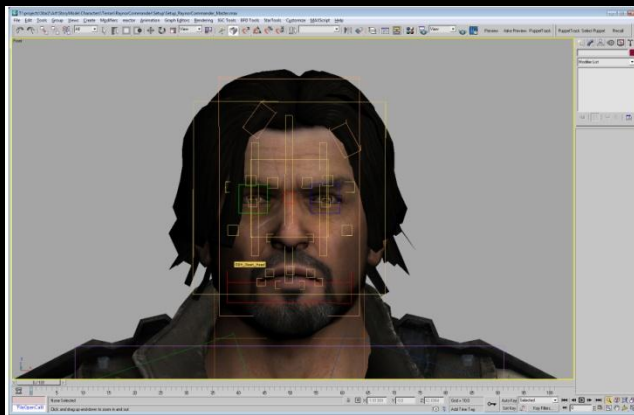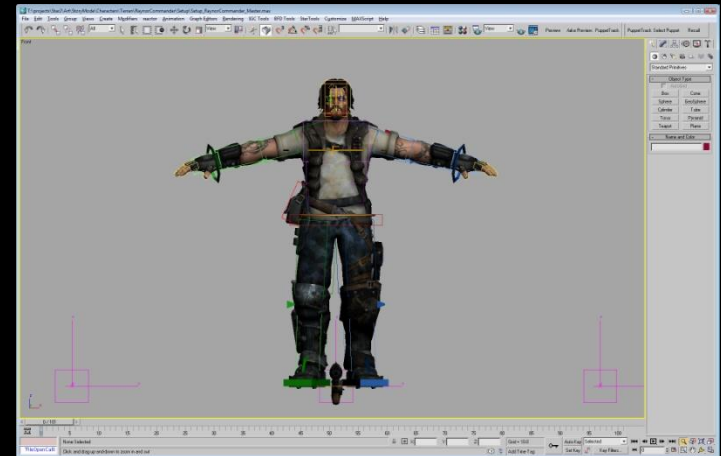
Raynor Facial Close-up
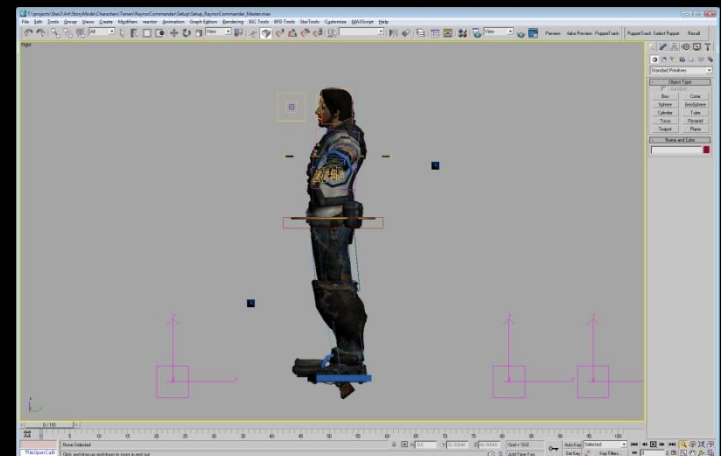
Lighting

- Helps to create the look and feel of the environment
  - Limitation to the amount of lights allowed in a scene
  - Manipulation of placement will help to create the look
- Shot Concepts used as a basis for establishing the look
  - Hot Spots are created to focus the attention
  - These are able to be translated for the focus with specific lights

Shot Concept & Inspiration
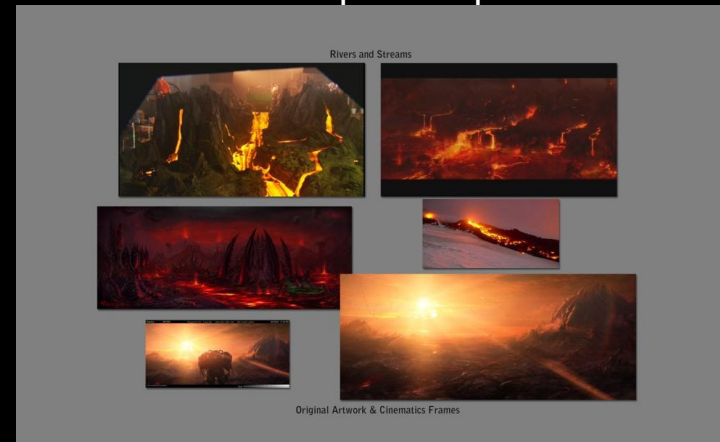
Final Look

Light Passes

- Scene concepts and finding hotspots
- Fog to add depth
- Starting from engine ambient light
- Adding rim lighting to separate characters from BG

Rim Light

Rim Lighting on Raynor

No Lights(diffuse map only)

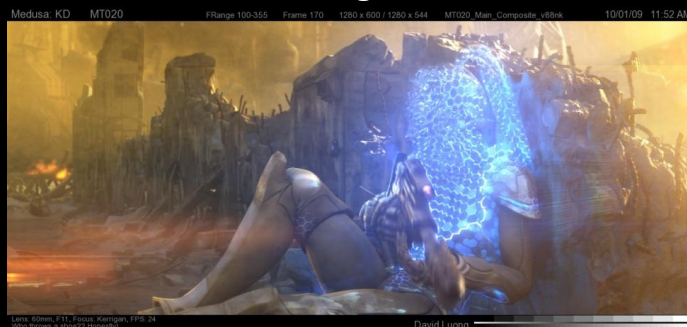Diffuse Maps

Ambient Lighting

Engine Ambient Setting

FX

- Don't have a specialized FX team for In-Game
  - Use of Pre-Render support
- Use of FX in the scene is limited
  - Space in the engine
  - Ability of the engine to output the correct look
- Practical Footage has also been used

In-Game Ghost Cloaking FX
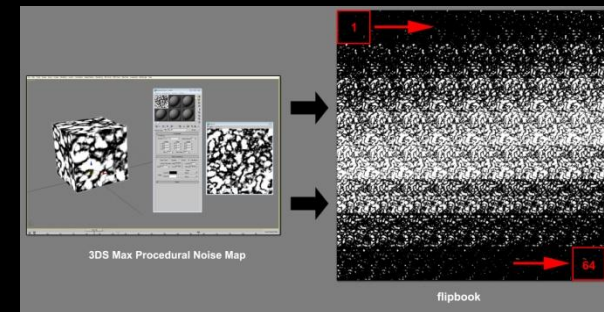
Ghost Cloaking FX - Look
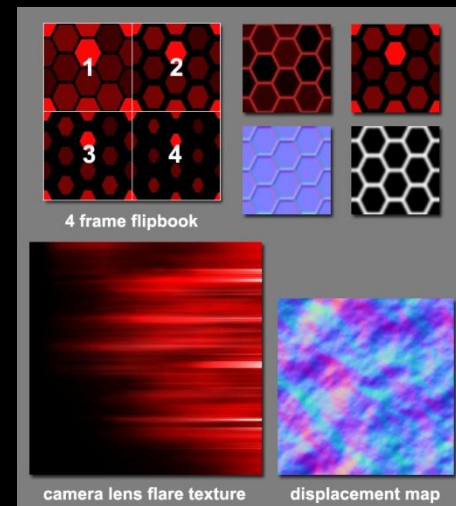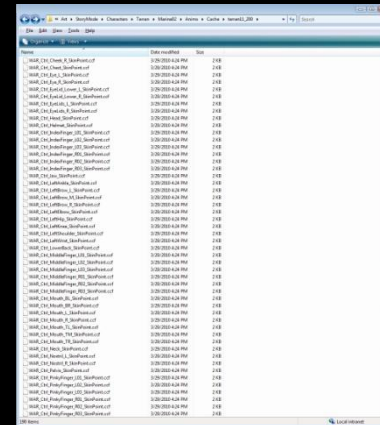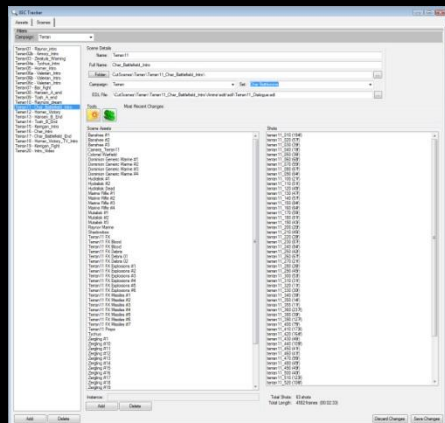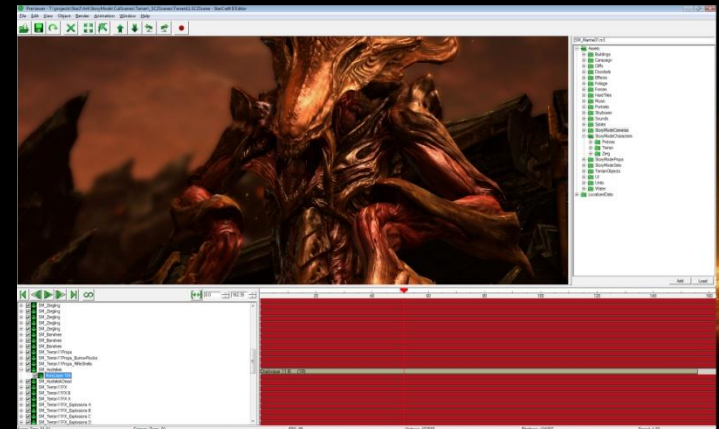
Scene Assembly

Max Final File
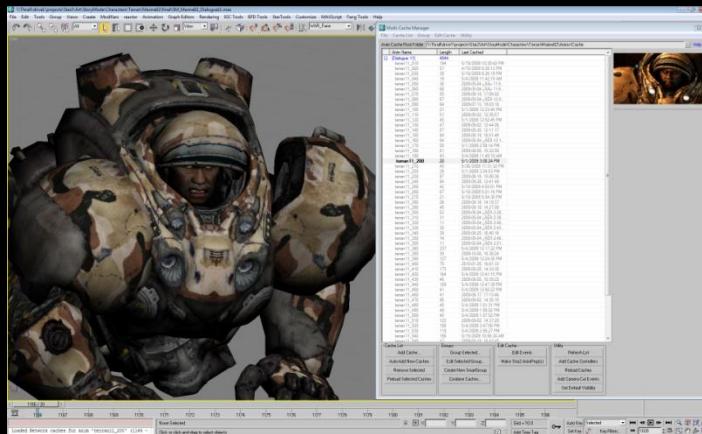
Cache Management / Loading

Asset Breakdown

Previewer

Localization

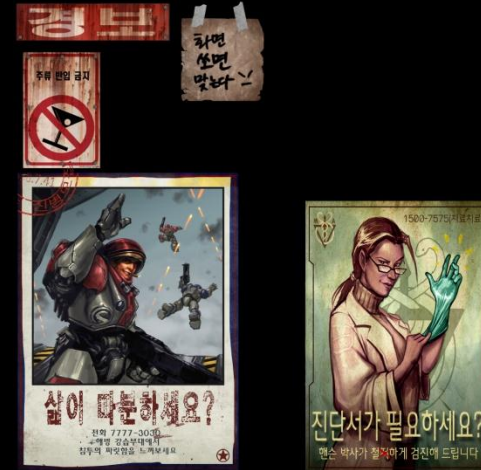- Artworks and lip-sync animation
 for 11 languages
        - Korean
        - German
        - English
        - Spanish – Spain
        - Spanish – Mexico
        - French
        - Italian
       - Polish
        - Russian
        - Chinese
        - Taiwanese
        - Brazilian Portuguese

In-Game Cutscene localization

Korean
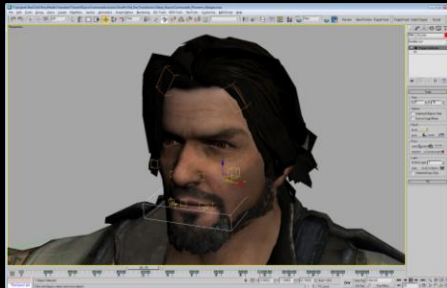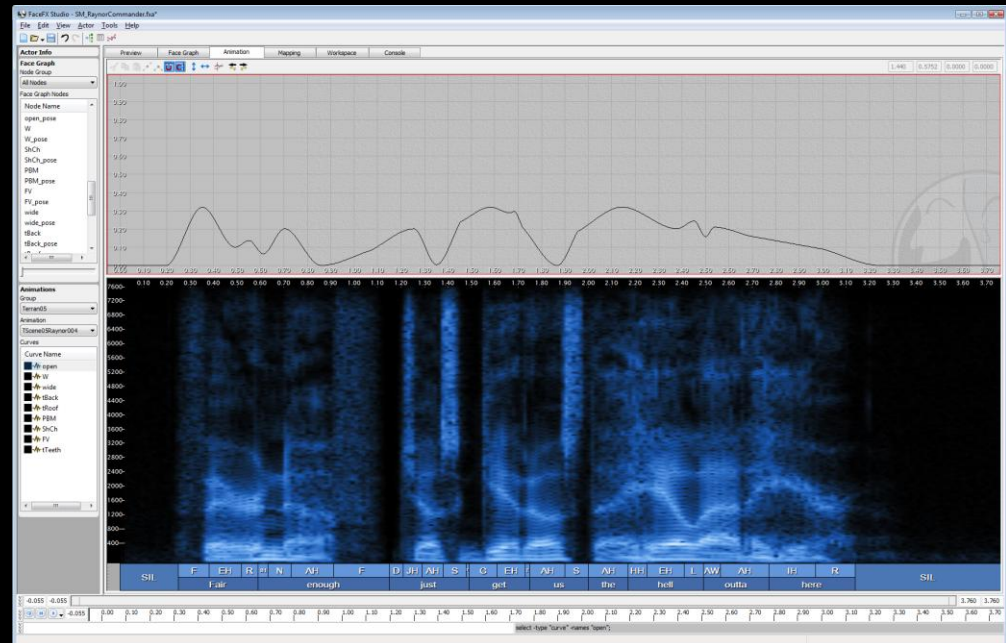

English

Localization for Lip-sync
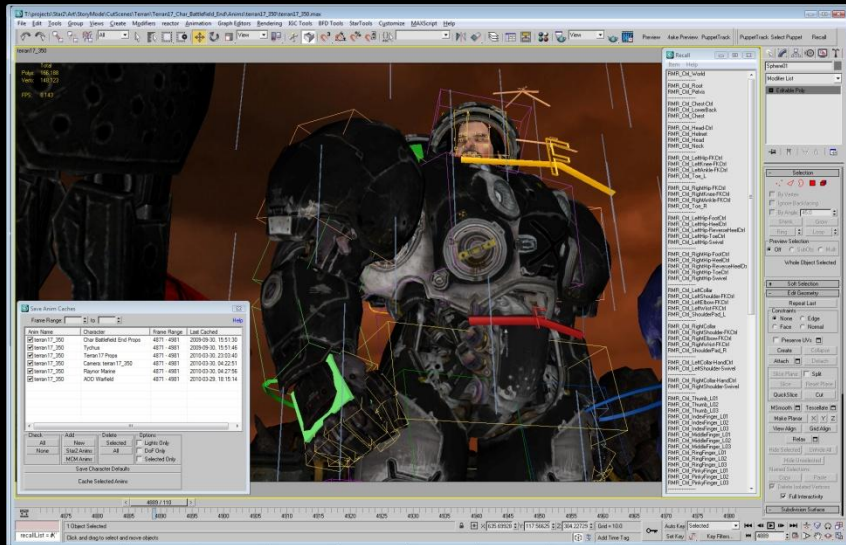
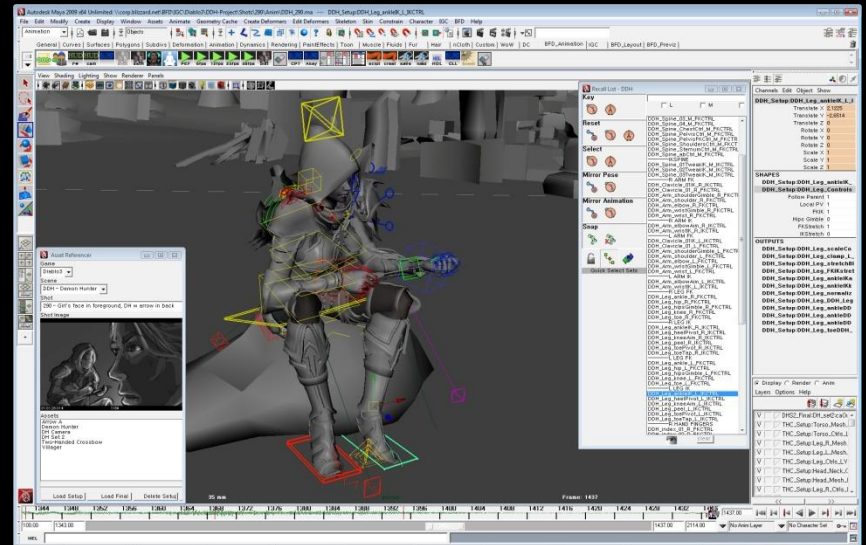8 Basic mouth phonemes from 3dsMax

FaceFX

Max to Maya
(For the Animation Pipeline)

Current Version

Maya Version

What does the Future Hold?

- Previous focus was on establishing a new pipeline
- Current focus is becoming better at what we do
  - More efficient
  - Capable of faster turnaround with large quantities of content to output
- Continue to maintain the "small studio" focus with the "large studio" team
  - Keep the core values present in all of the production work