Pushing for Large Scale Destruction FX

Lessons learned from Gears of War 3: Raam's Shadow DLC

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About RAAM's Shadow

- Gears of War 3 Downloadable Content
- Released December 13, 2011
- 3 Hours of campaign gameplay
- Play as Barrick and General RAAM
- More in-game destruction than any other Gears game to date

We Wanted Destruction

- Realism
- Player immersion
- Raise the stakes
- Water cooler moments

Conflicting Priorities

- It takes a lot of people to do destruction!
- Competition for system resources
- Small FX team with other priorities

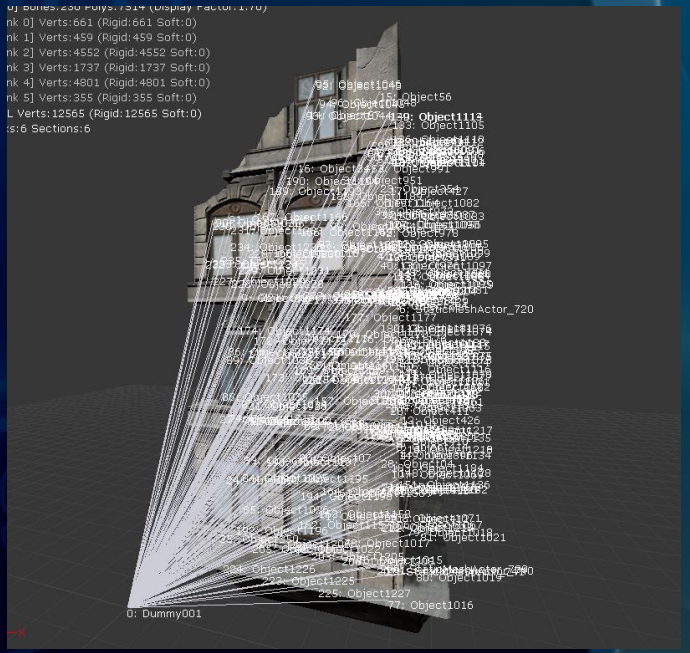
A challenge

- Tasked with
  - All the cinematic FX
  - A massive gameplay-destructible building
- More demolition tasks were added
  - LDs and Cinematics guys liked what they saw..
  - ..So they wanted more!

The approach I took

- Particle systems used as filler
  - Dust
  - Debris
- Particle systems for detail work
  - Shattering glass
  - Flying paper and misc atmospherics

- Skel mesh animation for baked sims
  - Playback of baked sims
  - Accurate motion
  - As good as time permits
  - Control over fracture shapes
  - Art-directable motion

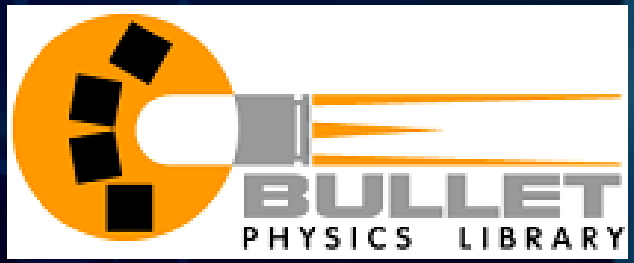


So what did I learn?

- 11 lessons.. A retrospective on what helped me:
  - Stay on schedule
  - Keep memory under control
  - Destroy as much as possible
  - Get results which fit the scope and the budget

1. Choose the right tools

- Work in a comfortable DCC environment
- Research a tool that fits the production needs and your time constraint
  - Decently accurate
  - Stable
  - Fast!!!
  - Tolerant of interpenetrations and mesh imperfections

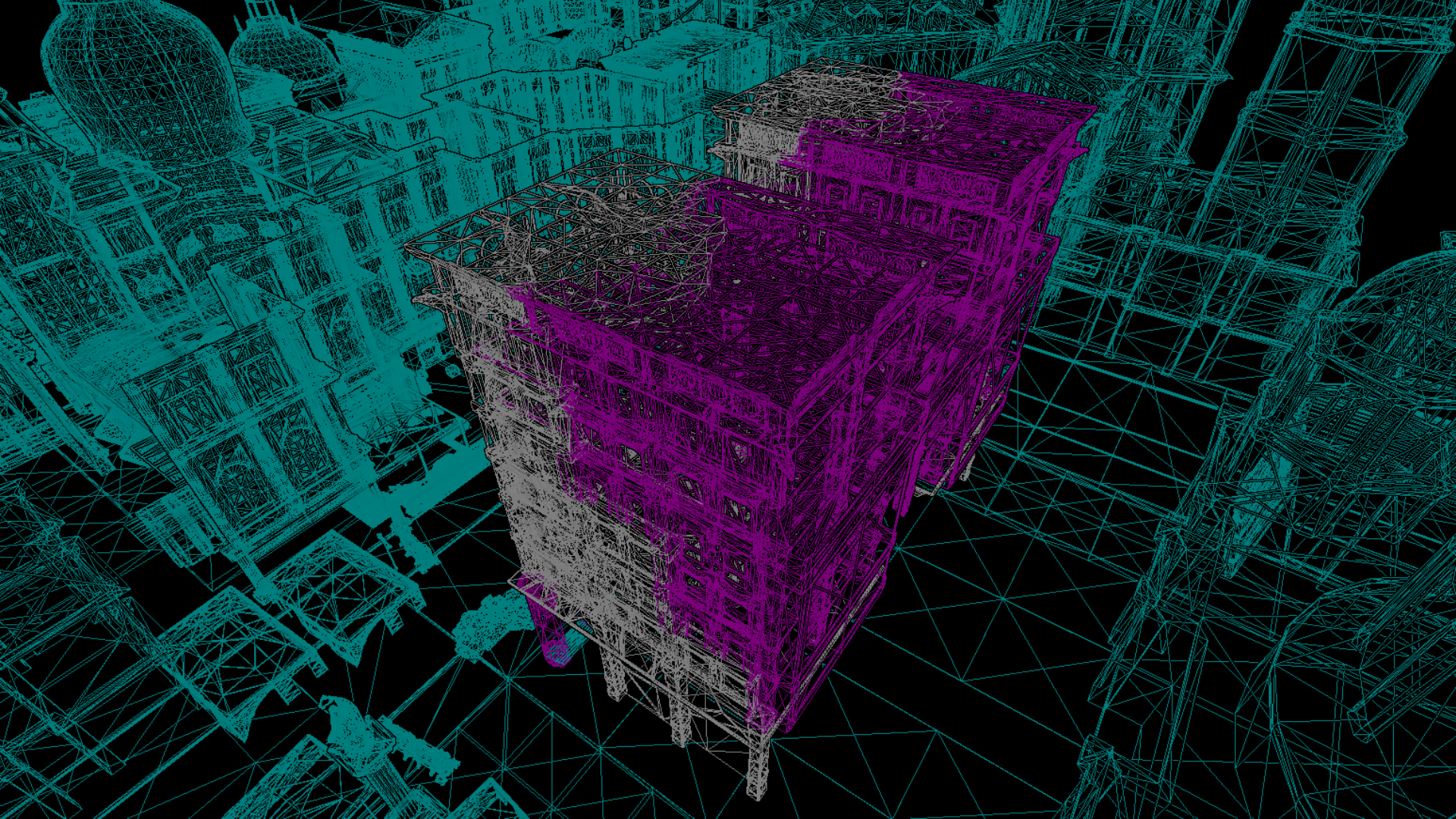


2. Get the facts

- What's the scope?
- What's the setting?
  - Cinematic or gameplay
  - Player interaction?
- Communicate with Stakeholders
  - What do they want to see?
  - What's the story behind the event?
  - Does it serve a particular purpose?

3. Cheat

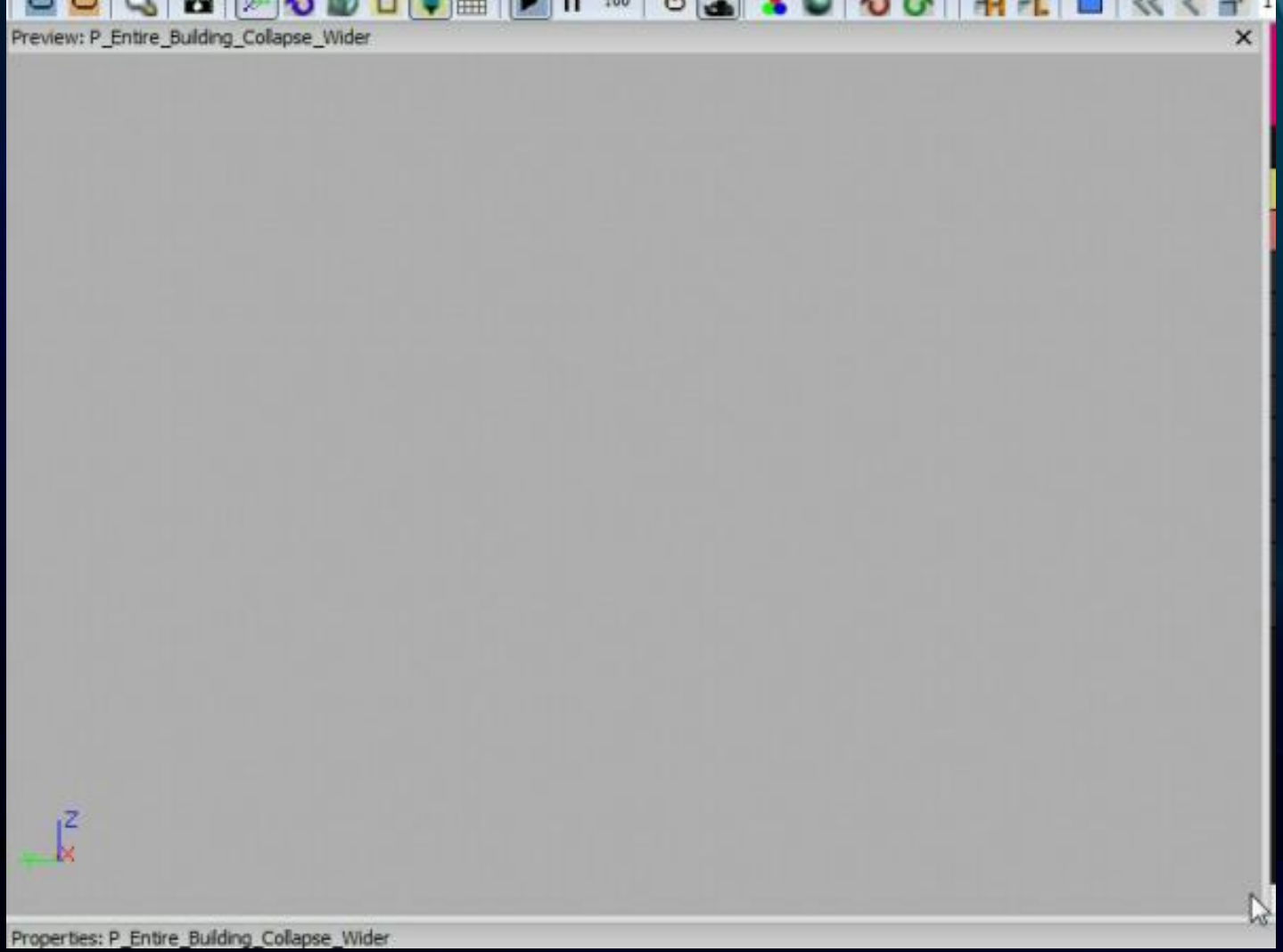
- Wherever you can
  - No kudos for doing it the hard way
- BG objects as animated meshes
- Hand animate hero debris
- Re-use
- Dust and debris fillers



4. Use fillers (not the pink slime..)

- Look at real destruction footage
  - Debris engulfed in dust
  - Fill the gaps in your sim
  - Hide issues with collisions and settling
- Fillers go in first to gauge the sim workload


SKY NEWS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5. Mix Techniques

- Physic simulations are time consuming
- Real destructions are a mix of materials
- Use that to your advantage
  - Particle dust
  - Particle debris
  - Material Debris
  - Sound design

6. Be sneaky (blocking early)

- Talk to the LD as early as possible
- Provide a quick initial sim
  - For blocking
  - Don’t optimize!
- Congrats! You just reserved your chunk of level memory
  - Promise it will look better and be more efficient

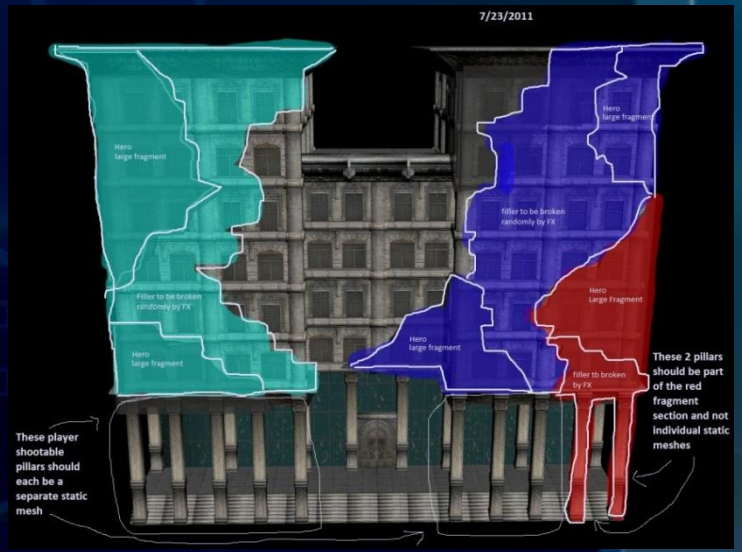
7. Two pass Approach

- Stub in early and quickly
- Resist re-sims until..
- ..the level is nearly locked down
- Call out for any additional comments
- Then do the second/final pass.

Tris: 0
Verts: 0

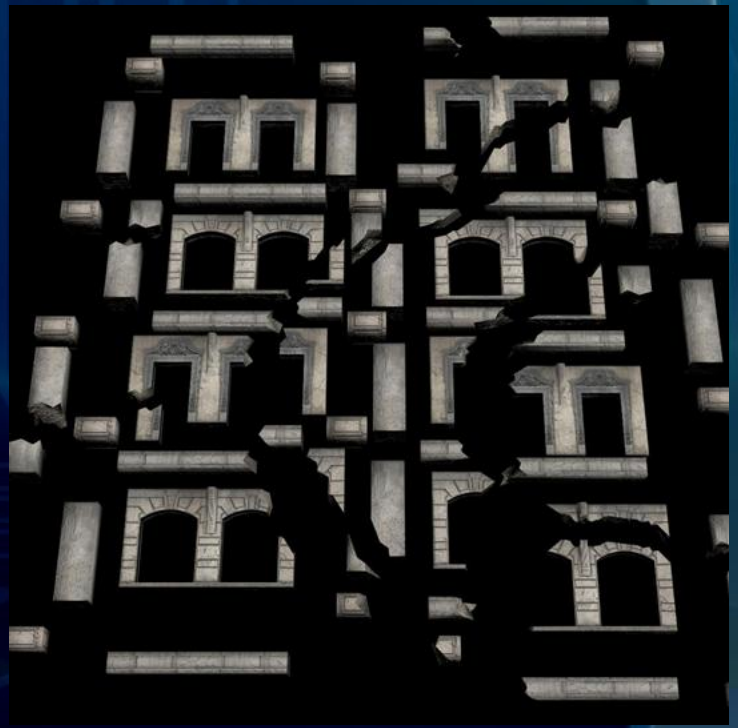
8. Plan

- Early communication with LDs
  - Break off into sublevels
- ..and with Cinematics guys
  - ‘Convenient’ camera work
  - Transitions and cutaways



9. Share the love

- Detail Fracturing
  - Mesh optimizations
  - Material and detail work
- UV work



10. Recycle

- Mirroring
  - Single mesh with multiple simulations
  - Hide symmetrical hole cutouts
  - Huge memory saver
- Modularity
  - Standalone destructions sims you can reuse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11. Optimize

- Mesh Optimizations
  - Simplify meshes before fracturing
  - Aim for larger sized Pieces
  - Consolidate nearby chunks into a larger solid chunk
  - Minimize the use of clustering simulation behavior

Parting sentence..

BANG FOR THE BUCK!

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