DreamWorks Animation

- Premiere CG Animation Company
- Ambitious Creative Targets
- Technical Innovation is Paramount
- Unprecedented Scale
- Virtualized Global Studio

“Technical Innovation enables Creative Ambition”
What It Takes to Make a DreamWorks Animated Film

• 24 months pre-production, 18 months production.
• 400 artists, animators and technicians.
• 200 characters modeled and surfaced.
• 45,000 story panels
• 1,500 set designs.
• 30+TB of disk space.
• 6000+ processors.
• 12+ million CPU render hours.
Strategy

- Leverage technology whenever possible.
- Make key strategic alliances with industry partners.
- Create tools that make artists more efficient.
- Create an environment for parallel work.
- Build flexibility into the studio.
Animation 101

- Typical project is 80 minutes
- Sub-divided into sequences, then scenes
- That’s 115,200 final images
- In 35-50 sequences; 1200-1500 scenes
- Sequences are worked whole
- Nightly renders feed daily reviews
“Art is never finished, only abandoned”
- Leonardo da Vinci
Where’s The Grid?

• We couldn’t do this without Grid computing
• Definitions vary – Grid of clusters?
• Dedicated Farms at each site
• Overflow via HP’s Utility Rendering Service (URS)
• Workstations join at night, when idle
• Varied machine configuration
And, it’s batch scheduled

- Scenes represented as a dependency graph of nodes, called a ”group”
- Each node is a scheduled “job”
- Jobs are “steered” based on resource need, priority, affinity, more
- Platform LSF at the heart
- With our own glue ware
Challenges

- Security for Content and Applications
- Agile Artists across geography
- Databases and File systems define the state of a sequence; Large file counts
- Expected machine configuration
- Job complexity is always climbing
- Visibility and Control
Challenges (cont)

- Just in Time delivery
- Additional post-delivery content
- Internationalization of content
- Additional play out venues
Meeting the Challenge

- Scalable distributed file systems; P2P file sharing at runtime; Aggressive caching
- Virtualization to get Hardware Normalization
- WAN Optimization; Wide Area file service
- Smaller schedulable jobs thru finer grained dependency graphs
Meeting the Challenge (cont)

- Affinity and history-based job scheduling
- Fair share allocations, market based barter system for trading allocations
- True Grid – Utility computing