The NASA Portal
NASA’s Window for the World
A Study in Successful Partnering

Douglas Hughes and Jeanne Holm
April 1-3, 2003
NASA Portal Team

- JPL
  - Jeanne Holm
  - Douglas Hughes
  - Jay Dyson
  - Greg Williams
  - Ellie Trevarthen

- eTouch Systems Corporation

- Critical Mass

- AT&T
  - Sandy Grotheer, Bill Ruvo, Kent Johnson, Paul Girardi
  - Gene Kelley, Kent Robinson, Sarina Jennings, Meg Coker
  - Brial Lampl, Mike Bouffard, Jonathan Sturges, Greg Smith
  - *The entire AT&T Army* including the “NOC at night”

- Oh yeah, and NASA HQ, our sponsor
The NASA Public Portal

- Was designed and intended to be a dramatic, interactive interface to NASA by the public, kids, media, educators, and students
  - To create “One NASA” on the web so the public can find what they want faster and easier
  - As a pre-eminent example of the President’s Management Agenda’s e-Gov initiative
  - To replace the NASA home page and tie together NASA’s public-facing web resources

- We selected the following partners to help us create the NASA portal
  - eTouch Systems Corporation as the prime technologists for content management and implementation
  - Critical Mass as the design firm focused on interactivity and usability
  - AT&T for the hosting and caching environment

- A dramatically different site that will engage and inspire the American public
  - Content management solution, search, information architecture, and design
  - http://km.nasa.gov/portal-white-paper.html
Challenges

- **Our known challenges included**
  - A highly competitive, two-step procurement process
    - Broad participation from industry, ranging from art firms to industrial-strength vendors
    - Madison Avenue style with industrial strength service
    - Detailed information can be found at [http://acquisition.jpl.nasa.gov/rfp/webportal/](http://acquisition.jpl.nasa.gov/rfp/webportal/)
  - An evolving architecture, with a 4-week deadline for deployment
  - Deploying a portal that provided
    - Quick and easy navigation for our many audiences
    - A simple-to-use, highly capable content management solution
    - Interactive design and flash modules
    - Content migration from top 2600 sites on NASA's web by September 28 (encompasses ~3.5M web pages)
    - Industrial strength hosting solution to handle ~142,000 hits per day

- **Our unknown challenge**
  - Hours after deployment, the Columbia tragedy would occur
Schedule

- Previously—Contractors selected and concept developed
- January 2—Accelerated schedule from NASA Administrator
- January 6—Designed interim portal
- January 17—AT&T contract awarded (minutes to midnight)
- January 21—Educator Astronaut site live with ICDS
- January 31, 11:45 p.m — Deployment
- February 1—75 million hits
- February 10 - NASA CIO visits Asburn, VA IDC
  - Personally thanks AT&T team for the Agency, the Administrator and the public
NASA Portal User Interface

Audiences

NASA Vision

02.10.03 Cold Winter? El Niño? Perhaps Not + View feature

02.01.03 Earth Imitates Art + View feature

02.01.03 Helping Houston Study Air Pollution + View feature

02.24.04 Highway to Honor Columbia Astronaut + View feature

02.18.03 Astronauts Observe Blue Clouds in Space + View feature

02.14.03 Interactive Columbia Tribute + View feature

02.20.03 Lunar Mystery Solved + View feature

02.19.03 Snow Gullies on Mars + View feature

02.11.03 Baby Pictures of the Universe + View feature

IMPROVE LIFE HERE

EXTEND LIFE TO THERE

FIND LIFE BEYOND

April 1-3, 2003
Architecture

- February 1 architecture and capabilities
  - Robust hosting solution at AT&T
  - Supported Educator Astronaut site with ICDS
    - A priority of the NASA Administrator with support from the White House
  - Provided front-line access for Columbia information
    - Updated design within hours of deployment
    - Added information architecture components
    - Continuing to publish significant content

- Intelligent Content Distribution System (ICDS)
  - ICDS allowed us to withstand record traffic during the Columbia incident and still serve the public and press with excellent performance
Software

♦ Web servers
  – Pages are flat HTML files designed for quick deployment
    • Final solution will be dynamically generated JSP files from Digital Asset Management
  – Running open-source Apache HTTP Server
  – Operating system is hardened Solaris 8
  – Security layer is IP filters, Port Sentry, and TripWire

♦ Search is Verity K2
  – Operating system is Windows 2000 Server
Hardware

- System runs behind the AT&T firewall, hosted at the AT&T Intelligent Data Center (IDC) in Ashburn, VA
- Caching is provided by AT&T’s Intelligent Content Distribution System (ICDS)
- NASA’s hardware includes
  - 2 Nokia Firewalls
  - 2 Foundry Load Balancers
  - 2 AT&T Intrusion Detection units
  - Web hosts
    - 2 Sun V480R servers
  - Search hosts
    - 3 Compaq DL 380 servers
Network Architecture
Caching Architecture

ICDS Request Flow

End User (near Denver)

DNS Request for www.nasa.gov
Closest Node's IP

http request/response for page

→← request for content only if cache doesn't currently have the object

Origin Servers (Ashburn, VA)

Cache Nodes
- Atlanta
- Austin
- Cambridge
- Denver
- Detroit
- Lisle
- Seattle

Parent Nodes
- Denver
- Dallas

Child Nodes
- NYC, NY
- Hawthorn, CA

1 Nodes contain from 2 to 6 servers each

April 1-3, 2003

NASA Portal - GSA/FTS 2003
Current Status

- Portal continues to be very stable and serving content
- Total hits as of March 26: 578,579,390
  - Total unique visitors: 5,503,473
  - Actual traffic: 3,119,821 hits per hour at peak
    - Expected traffic: 6,000 hits per hour
  - Traffic in first 5 days was the expected traffic for the six months
    - For example, we expected 20,000 queries/day on our search engines, designed for 20,000 queries/hour
      - Received ~1.5M search queries on February 1
- Total information transferred
  - 5.05 terabytes
A Snapshot of the Portal Traffic

Average Five Minute Bandwidth

NASA Portal

Columbia 01/29/2003 00:00 - 03/01/2003 00:59 GMT

Educator Astronaut Traffic

Report Run Date: Tue Mar 11, 2003 05:18 GMT

April 1-3, 2003

NASA Portal - GSA/FTS 2003
Press Coverage

- NASA Web Site Put to Test Early
  - http://www.nytimes.com/2003/02/03/technology/03WEB.html

- New NASA Site Withstands the Barrage

- Revamped NASA Web Site Performed Well During Disaster
  - http://www.computerworld.com/developmenttopics/websitemgmt/story/0,10801,78137,00.html

- NASA Officials Show the Right Stuff With Candor on Columbia
  - *St. Petersburg Times*, February 3, 2003
Lessons Learned

- Pick the right managed hosting provider for the job
  - Especially if it is for the premier government Web site with “out of this world” content
  - Especially if the schedule is “impossible”
  - Especially if close, technical collaboration is required
  - Especially if they share your vision...