Advanced Content Management and Distribution

AT&T

Agenda

- AT&T Content Services Overview
- DCM – Content Management
- Content Tools – Ingest, indexing, search
- ICDS – Distribution/Streaming
**AT&T’s Media Vision**

Growing amount of available video content:
- Broadcast television / cable / satellite / IPTV
- Enterprise videos – employee communications
- Educational – distance learning, training
- User Generated – camera phones, video blogs

AT&T provides services for:
- IPTV: U-verse / HomeZone
- Mobile Video
- Content distribution
- Content hosting
- Point to point video distribution
- Video conferencing

AT&T Labs is developing technologies for:
- Content based video searching and browsing
- Content personalization and adaptation for mobile users
- Efficient content distribution

**Content Value Chain**

- **Advertisers**
  - Revenues
  - Marketing Solutions

- **Shared Revenues**
  - Revenues

- **Content Providers**
  - UNIQUE EXPERIENCES
    - Information
    - Shopping
    - Entertainment
    - Communications
  - Searches/Tools/Content
  - Transactions
  - Fees

- **Fission**
  - Visits/Searches/Tools
  - Transactions
  - Fees

- **Affiliate Networks**
  - Content
  - Payment

- **ISP Alliances**
  - Revenues
  - Access Services
Digital Content Management
AT&T Digital Content Management

AT&T DCM assists customers in managing content from Ingest, asset management, and distribution to multiple content distribution channels.

MOBILE  PC  TV*  HD*

User Services
Content Distribution

MOBILE
MOBILE
MOBILE
MOBILE

PC
PC
PC
PC

TV*
TV*
TV*
TV*

HD*
HD*
HD*
HD*

AT&T Intelligent Content Distribution Service Network

Provisioning Maintenance

AT&T DCM – Content Pipeline
Service Delivery Platform, CSS and BSS Integration
Web Services- SOA
Microsoft Windows Server 2003, Windows Media 9, and SQL 2000

Managed Services & OSS
Managed Services & OSS
AT&T Enterprise Hosting Infrastructure Platforms
AT&T MIS / Internet, Cable, xDSL and Wireless* Provider Partners

Managed Servers & OS
Managed Servers & OS

Managed Storage
Managed Storage

Managed Hardware
Managed Hardware

Managed Network
Managed Network

Advanced Content Management and Distribution

DCM Portal Based Service

Create
Ingest
Manage
Distribute

Billing

1) Create ingest content

Content Creator

DCM Ingestion Porta
- Login
- Codecs Control
- Video Ingest
- File Ingest
- Metadatal Entry

DCM Management Functions
- Metadata Management
- Search & Retrieve
- Preview

Admin Porta

ICDS

User Porta
- Registration
- Distribution
- e-Commerce
- Self-Care

User accesses ports from billing

Ent User

6) ICDS sends media to consumer

Micros

7) Credit card transaction

N/Money Billing Generator

Bank Transaction Processing

Banking Processing

8) Bill receives funds

AT&T Billing Platform

9) Manage Billing Generation

Transaction Processing

Page 7
Simplified User Broadcaster Interface

Broadcasters:
- Set Up Channels
- Enter Description
- Set up Prices
- Upload Video
- Upload Images

DCM – Delivery of MultiMedia Content

The e-Commerce portal allows end-users to select, purchase and consume content.
- Based on a customized version of Microsoft Commerce Server
- The checkout credit-card payment system utilizes the ACUS financial backend

The Administration portal allows customers to ingest, categorize, price and publish content.
**Advanced Content Processing**

Video Search  
Content Personalization  
Adaptation for Devices

**Multimedia Technologies**

Enabling Technologies

- **Video Indexing**
  - Generates a pictorial index for visual browsing
  - Generates a compact representation suitable for a range of devices

- **Speech / Audio Processing**
  - Enables searching of spoken communications
  - Speaker segmentation improves browsing

- **Video Search**
  - Content-based and metadata-based indexing
  - Information Retrieval
  - AT&T Labs - Research maintains an archive of over 36,000 indexed television programs updated on a daily basis

- **Content Personalization**
  - Important for UI-constrained services like IPTV and mobile video services
Query Results with Extracted Paragraphs

Text Source

Metadata

Extracted Paragraph

Interface items are anchors to launch video

Navigating within a Video Program

Timeline indicates relevant segment

Highlight keywords and entities
3 Screen Content Personalization

Automated content personalization based on personal profiles filters video content to identify items of interest
150Kb/s - 2Mb/s video for multiple devices

AT&T - ICDS
Intelligent Content Distribution Services
AT&T ICDS

• The Exploding Rich Digital Content Market
• AT&T’s Intelligent Content Distribution Service
  - Web Acceleration & File Download
  - Streaming Media
  - Delivery Infrastructure
  - Portal and Reporting
• AT&T’s Competitive Advantage

ICDS Supports Our Customers’ On-Line Content Distribution Needs

<table>
<thead>
<tr>
<th>What is it?</th>
<th>What is handled by ICDS?</th>
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<tbody>
<tr>
<td>ICDS is a facilities based collection of Caching &amp; Streaming servers located in AT&amp;T’s IDC’s (Internet Data Centers) &amp; SNRC’s (Service Node Routing Complexes (AT&amp;T POPs)), which takes advantage of AT&amp;T’s superior IP backbone and ISP peering capabilities</td>
<td>Content – Specifically, web pages, images, web objects, audio on demand, video on demand, live streams, large downloadable files.</td>
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<tr>
<th>How is it geographically distributed?</th>
<th>How is it supported?</th>
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<tbody>
<tr>
<td>• 20 Domestic and 5 International Caching sites (more planned in 2006)</td>
<td>• 24x7 customer support via AT&amp;T's GCSC</td>
</tr>
<tr>
<td>• 8 Domestic and 5 International Streaming sites (more planned in 2006)</td>
<td>• Reporting via AT&amp;T’s award-winning Business Direct web portal</td>
</tr>
<tr>
<td>*ICDS serves content to any Internet-connected computer – on or off of AT&amp;T’s backbone</td>
<td>• Raw log files are available for customers wishing to do their own analysis</td>
</tr>
</tbody>
</table>
ICDS Core Features and Applications

<table>
<thead>
<tr>
<th>Caching Services</th>
<th>Streaming Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Web Acceleration</strong></td>
<td><strong>Live Webcasting</strong></td>
</tr>
<tr>
<td>Accelerated, efficient web site utilization by caching all or part of a website</td>
<td>Reserved capacity for congestion free web events with increased quality</td>
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<tr>
<td><strong>High Volume Web Sites, Special Events, Seasonal Promotions and Events</strong></td>
<td><strong>Entertainment Events, Sporting Events, Training, Speeches, Analyst Briefings, Town Halls</strong></td>
</tr>
<tr>
<td><strong>Large-File Downloads</strong></td>
<td><strong>Audio/Video-on-Demand</strong></td>
</tr>
<tr>
<td>Decreased downloading times for large user-downloadable objects</td>
<td>Enhanced viewer experience by combining caching and streaming technology at the edge</td>
</tr>
<tr>
<td><strong>Game and Software Distribution, Music and Video File Downloads, E-Books, Documents</strong></td>
<td><strong>Pay-Per-View, Archived Content (Training, Research etc.), Podcasts</strong></td>
</tr>
</tbody>
</table>

ICDS Caching Services and Features

**Web Acceleration**
- Acceleration of web pages and web page objects

**Large File Downloads**
- Distribution of large objects such as:
  - Software packages
  - Media files

**Enhanced Caching Services**
- Capacity On-Demand – Balances load across customer origin server(s) and ICDS
- Slim Mirror – Protects against Origin Server Failure

**Benefits**
- Performance improvements
- Rapid scaling to meet demand
- Cost control vs. do-it-yourself

**Options and Features**
- SSL caching
- Referring URL restriction
- In-network file storage/origin server (Large File Downloads only)
- Parent/child caching
- XML interface for purge and preload
- Cookie filtering/pass-through
- Custom cache headers
- AT&T or customer-provided domain name
- ICDS or Origin Server first authoring model
ICDS Streaming Services and Features

Protocols Supported: Windows Media and Real Networks

Live Streaming:
- Single Event Webcast, Frequent Webcasts (e.g., every Thursday), Continuous (24x7)
- Customer self provisioning of Webcasts via AT&T Business Direct

Optional Streaming Features (Live and On-Demand)
- Secure Streaming — authenticates users via embedded tokens before serving stream
- e-mail daily report
- Raw log file pickup
- AT&T or customer-provided domain name

On-Demand Streaming Options:
- Customer Origin Server (COS)
  - ICDS retrieves on-demand content from Customer’s Media Server
  - No need to ftp files
  - Customer’s Media Server must be always available and accessible from ICDS
- Network Origin Servers (NOS)
  - Customers upload Content via ftp/sftp to in-network ICDS origin servers to store and serve files
  - ICDS provides 10 GBytes standard storage in SPPOCs
  - Our NOS servers are redundant and geographically separated. They are housed in our SPPOCs.

ICDS Supports Customers Worldwide

- More in-region sites are under consideration
- Singapore (2006/2007)
- Sydney (2006/2007)
- Tokyo
- Hong Kong
AT&T’s Proprietary Intelligent DNS (iDNS) Servers Make Intelligent Routing Decisions

iDNS – a policy-driven DNS server that is smarter than a static DNS
Resolves DNS queries based on domain name, client site DNS server address, state of ICDS servers, and governing policies

Proximity-based Load Balancing - Uses network proximity measurements to distribute traffic across geographical nodes
Global Server Load Balancing - Distributes traffic across geographical dispersed Nodes
Local Server Load Balancing – Local switches distribute traffic across local servers

ICDS Utilizes the World’s Leading IP Backbone Network
• takes advantage of AT&T’s extensive peering relationships to provide superior service to all web users

Canada Region
- Private peering in 2 cities
- 2 links
- 50 Mbps

United States Region
- Private peering in 8 cities
- 166 Links
- 333.7 Gbps

Europe, Middle East, Africa Region
- 32 locations in 23 cities
- 22 countries
- 46 links
- 7.3 Gbps

Asia-Pacific Region
- 9 locations in 10 cities
- 9 countries
- 29 links
- 5.1 Gbps

Caribbean & Latin America Peering
- 9 locations in 7 cities
- 6 countries
- 12 links
- 223 Mbps

AT&T Global IP Network
Worldwide Peering
50 cities in 39 countries
346 Gbps capacity
255 Links
ICDS Customer Portal
Welcome Page

Welcome to ICDS
My Login
My Profile
My Donations

Welcome, User! Your last login was 25 Feb 2004 16:07 AM EST
ICDS Messages
- Service delivery center for ICDS
- New international media access in April 2004
- Learn more about secure streaming

Sites at a Glance
My Video Clip Site
My Music Clip Site
My News Clip Site

AT&T Content Technology Research & Media Services

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