A Standards-based Data Broadcasting Network

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Topics

✓ What is iBlast?
✓ Content Distribution over the Internet
✓ Data Broadcast System Architecture
✓ Standards
✓ Conclusions
Standards Activities

- ATSC
- SMPTE
- ISO
- IETF
- MPEG
What is iBlast?

1. A Nationwide Content Distribution Network
2. Using datacasting technology over Terrestrial DTV stations
3. An IP transport, using open standards
4. An inexpensive way to connect content owners with content consumers
5. Owned by leading broadcasters
Founding Broadcast Partners

TRIBUNE BROADCASTING  GANNETT  The Washington Post  COX BROADCASTING

SCRIPPS  McGraw-Hill  Media General  NORTHWEST BROADCASTING

LEE ENTERPRISES  GRAY COMMUNICATIONS SYSTEMS, INC.  Meredith Corporation  EMIS

SMITH ENTERPRISES  The New York Times  Evening Post  BONNEVILLE

Cosmos Broadcasting  RAYCOM Media  Bahakel Communications  iBlast
Network Coverage

- 90% of US Households
- 225 TV Stations
- 143 Markets
- All top-30 markets
- 57 Markets with 2 or more
- 88 of top 100 Markets

Covers a population of 238 million
Digital Content Distribution
Delivering Content today

Content Owners

Content Consumers
Delivering Content today
Delivering Content today
Delivering Content today

Content Owners

Content Consumers

iBlast
Delivering Content today

Content Owners

Content Consumers
Data Capacity of selected media

How to Deliver these Electronically?

GigaBytes Stored

CD  CD ROM  DVD  VHS  HDCAM  FILM  DTF-2

70 MB  500 MB  2.5 GB  3.6 GB  126 GB  192 GB  200 GB
Current State of Data Distribution

A New Media Network consists of three components

- Bandwidth
  - Internet Backbone
  - Last Mile Connection
- Processing
  - PC CPU
  - Game Console
- Storage
  - Memory Stick
  - Hard Drive
Current State of Data Distribution

but bandwidth growth is lagging...

- Backbone: +8% CAGR
- Last mile: SLOW!

- "Moore’s Law"
  - Doubles every 18 months
  - Now 1 GHz

- Doubling every 9 months
  - Now < $10 US / GB
Current State of Data Distribution

Notes:
1) Storage doubles every 9 months. 1 GB of storage is <$10.00
2) According to Moore’s Law, processing speed doubles every 18 months. It is now about 1 Ghz (1000 Mhz)
Turn On the Fun

59.99

VisioNeeR Scan objects or pictures with a Primascan 2400P Scanner ($52.99)

Best Buy

Pentium III Processor 800MHz Computer with 17" HP Monitor
(28 dot pitch, 15.7" viewable image size)

- Windows Me preloaded
- Burn your own Photo & Music CDs with 4X max CD-RW drive
- 64 MB SDRAM memory
- 30.0 gigabyte hard drive
- 48X CD-ROM drive
- Intel Direct 3D AGP graphics
- V.90 high-speed modem
- 10/100 network card
- Premium Polk Audio speakers ($87.50 each)

$400 TOTAL SAVINGS: $1349.99

949.99

New

Grandpa, I made the team! My next game is at home, can you come? Jacob

299.99

Olympus 1.3 Megapixel CCD Digital Camera with 2X Digital Zoom ($360)

No Interest Financing 'Til January

2002 On All Computers Plus

Instantly Save Up To $400 Toward ANY Best Buy Purchase when you sign up in store for up to 3 years of MSN Internet Access for just $1.95 a month.

Same as cash, with payments. Applies to all computers and notebooks, including Computer Creation Station PCs and notebooks. Required minimum monthly payment is greater than 10% or 2.25% of balance, interest will be charged to your account from the date of purchase if plan balance is not paid in full before January 2002 or if minimum monthly payments are not made. See inside back cover for details. (Code 7)

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Pentium® III Processor 800MHz Computer with 17" HP Monitor
(.28 dot pitch, 15.7" viewable image size)

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- 64 MB shared SDRAM memory
- 30.0 gigabyte hard drive
- 48X CD-ROM drive
- Intel® Direct 3D AGP graphics
- V.90 high-speed modem
- 10/100 network card
- Premium Polk Audio speakers (8754C/M70)

$400 TOTAL SAVINGS "1349.99 - 400 MSN Instant Rebate" = "949.99

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Without MSN Instant Rebate™
The Traditional Internet
The Traditional Internet

Network Congestion & Choke Points

LEGEND
WEB SERVER
ROUTER
ACCESS DEVICE
Internet Edge Caching

[Diagram showing the flow of information between hosting providers, backbone networks, local ISPs, and consumers.]
Internet Edge Caching

Content Cached near End user
Internet Edge Caching

Delivery Remains Dependent on Thin Pipes
How iBlast Works

Digital TV Antenna
Datacasting 19.4 Mbps
vs. DSL/Cable 385 Kbps

Satellite

Content Publishers, Distributors

iBlast N.O.C.
Encoding, Storage, Program Servers, Network Management

Local Network Affiliates / TV Stations

Consumer

Fiber Optic Cable
160,000 minutes of music, 52,000 songs, 2,200 CDs
6,048 movie trailers, 66 full-length motion pictures, 60 DVDs
37,800 new worlds/characters, 3,034 rentals, 605 full games
Book-of-the-Month, newspaper delivery, magazine subscription
300 CD-ROMs, automatic updates
Universal upgrades, virus updates

150 GB per Market per Day
Comparative Speed and Capacity

24 Hour Minimum Download Capacity per Station

- HDSL, SDSL: 16.5 GB
- Avg. DSL/Cable (384 Kbps): 4.2 GB
- ISDN: 1.5 GB
- Analog Modem (56 Kbps): 0.6 GB

75 GB
Data Broadcasting Systems Architecture
Data Broadcast Standards

- ATSC A/90 Data transport mechanisms
  - Data Download Protocol
  - DSM-CC Addressable sections
  - Asynchronous data
  - Synchronous Streaming
  - Data Piping
Mb/s Usage in HDTV

19.4 Mb/s

0 Mb/s
Mb/s Usage in HDTV

19.4 Mb/s

0 Mb/s
Mb/s Usage in HDTV

19.4 Mb/s

0 Mb/s
Mb/s Usage in HDTV

19.4 Mb/s

0 Mb/s
Data Client: Form Factors

PC-Centric
- PCI Card
- USB Sidecar

Home Gateway/
Digital Refrigerator

Standalone Appliance
- Set top Box, PVR
- Game Console
- MP3 Player

Standalone Appliance
- Set top Box, PVR
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Antenna design
Client Software stack

Software

- Applications
  - Installation
  - Antenna Positioning
  - Diagnostics
  - Content Provider Apps

- Browser
  - iBlast Content Provider UI

- UserPrefs
- Tuning
- PSIP

- Local Proxy Server
- Local Cache
- Metadata Filter

- HTTP
- Sockets
- Decrypt
- TCP/UDP
- IP

- T3/S13 IP Extraction
- MP2 TS Splitter

Drivers

Hardware

- RF Tuner
- VSB Demod
- FEC
- CA
- 19 Mbps MPEG2 Transport Stream
- PCI Bus
- DU Modem
- ADSL Cable Modem

Software

- iBlast

Hardware

- PCI I/F

Drivers

Software

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- Drivers

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It seems to work...
Conclusions

- Large, popular files “break” the internet
- Data Broadcasting provides a solution for content distribution
- Standards exist from ATSC, IETF, SMPTE, ISO and others to support IP transport
- Benefits are: Speed, low cost and rapid deployment
- Available now!
Questions?