

# *Bi-Directional Satellite Internet: Using STARBAND*



Dave Thewlis  
DCTA Inc.

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## *About DCTA Inc.*

- Small one+ person IT consulting firm
- Based in small city (Eureka, California) until mid-2001
- Home office with 4-5 peer clients
- DSL access for internet

# *Eureka Network*



- Alcatel DSL Modem
- Netgear Internet Router
- Asante 100mbs Switch
- Peer network for File/Print Sharing
- Three Ethernet-attached systems
  - Two desktop clients; OS/2 data/print “server”
- Two laptops with 802.11b connectivity

# *Why Use Satellite?*



- Moved to remote location June 2001
  - No DSL or cable service
  - Poor telephone service (underground cables)
  - No local ISP; \$350/month dialup charges
  - No local newspaper or mail delivery
  - No local population for point-to-point RF

# *What Options Existed?*

- Satellite Services:
  - Starband
    - (at that time linked to Dish Network)
  - DirecPC (now called DirecWay)
- Starband supported current (XP) systems
- Bought Dish TV and Internet as package

# *What is Starband<sup>TM</sup>?*

- Bi-directional Satellite internet service
  - Telstar 7 and GE 4 satellites
- Broadband, persistent, self-contained
  - No phone link required
- Financial partnership between Starband, Echostar, Gilat Technologies, Microsoft
- About 40,000 subscribers as of 12/2002

# *Installation*

- Acquire through local Dish installer
  - Cannot set up yourself
- Can combine with Dish TV service
  - 24x36 VSAT dish for both TV and Internet
- Satellite modem must attach to Windows system via USB or Ethernet NIC
- Cost about \$800 for equipment, installation
  - Monthly cost ~ DSL/Cable service

# *Kane Ridge Network*

- Satellite dish (Internet and Dish TV)
- Satellite modem (Starband 360)
  - Dynamic IP Address?
    - IP tends to not change but wouldn't if always on
    - Starband says static; some users say dynamic
- Ethernet connection to e-machines “server”
  - USB not highly recommended by Starband
  - Will not be supported in future

# *Kane Ridge Network*

- “Server” (e-machines XP/home system)
  - Mission control & accelerator software
  - WinProxy for Starband (NAT, DHCP, etc.)
  - Acts as file and printer server for other systems
  - Two NIC cards; modem and LAN
  - Internal network still 192.168.0.x

# *Kane Ridge Network*



- Asante 100mbs switch
- SMC Wireless Access Point
- Two Ethernet-attached clients
- Two wireless-attached laptops
  - Solves morning newspaper problem
- Network printers attached to “Server”

# *How Does Starband Work?*

- Gilat proprietary technology
- Broadcast downlink; time-sliced? uplink
  - Modem has lat/long, group/subgroup, unique id
  - Slowdown with increased uplink load
  - Contract limitations on amount of uploading
- Proprietary accelerator software
- Asymmetric speeds
  - >500K download; ~50KB upload

# *How Well Does Starband Work?*

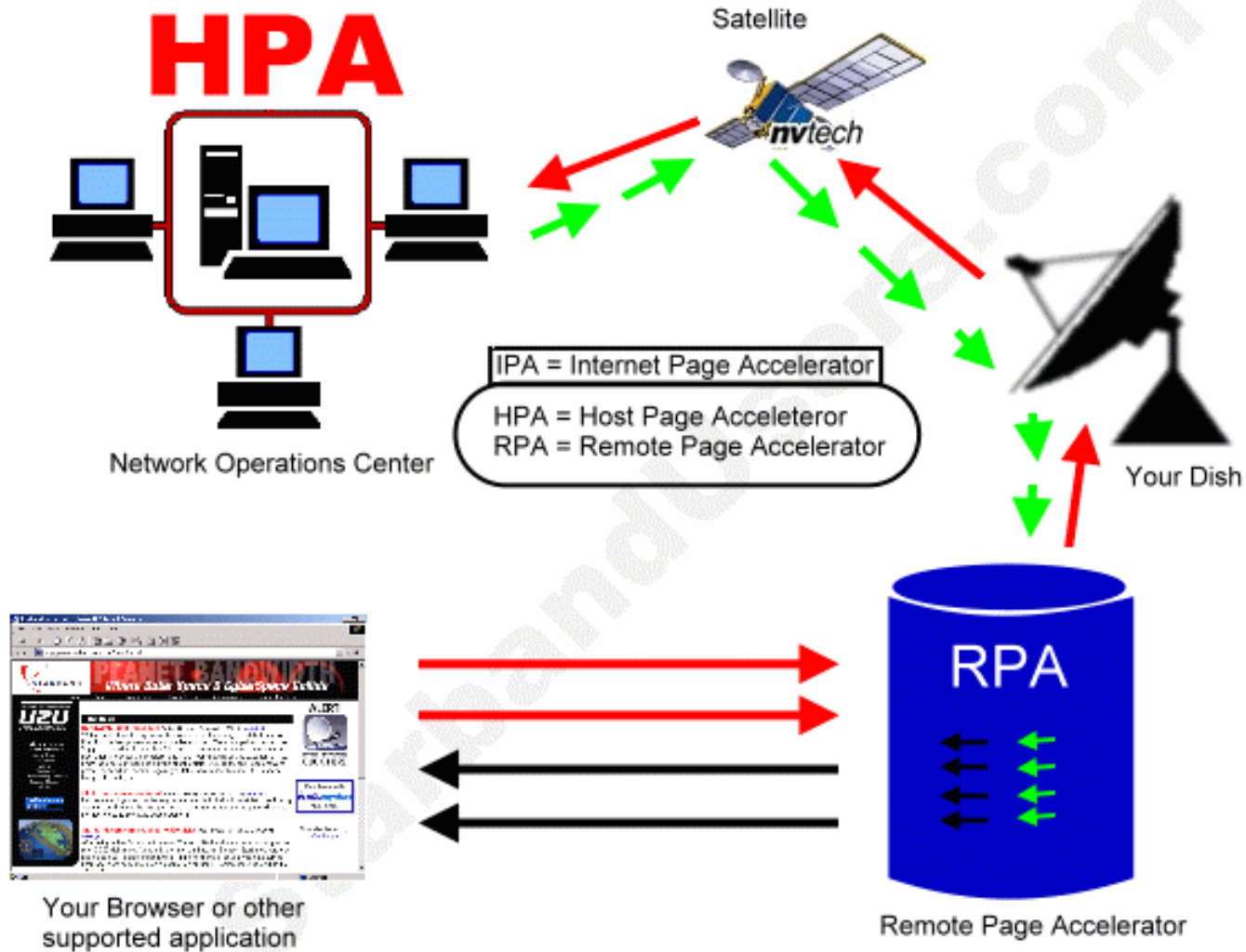
- Good given intrinsic limits
- ~670ms roundtrip for each access
  - You-->satellite-->Net Op Ctr-->web server
  - And back
- Occasional 5-15 minute outages
  - Not enough data to see pattern as yet
  - No worse than DSL outages in Eureka

# *How Well Does Starband Work?*

- Reasonable for web browsing
- Good for bulk downloads
- Acceptable for streaming audio and video
- Poor to unacceptable uses:
  - FTP (large files)
  - Online gaming
  - VPN
  - VOIP

# *Accelerator Software*

- **Nettgain**
  - Converts TCP to BST (Band Segmented Transmission) and/or UDP (User Datagram Protocol)
  - Specifics are unclear and probably Gilat proprietary
- **Internet Page Accelerator**
  - RPA (Remote Page Accelerator) at client
  - HPA (Host Page Accelerator) at Net Op Ctr
  - Decomposes and parallelizes requests and responses



Courtesy of Ken Knight, President, Help Consulting, founder of Starbandusers.com

# *Accelerator Software*

- Appears that website design can defeat accelerators
  - Many fetches, esp. from different sites
  - Some server-side pages, esp. ASP
  - Computed internal URLs
- Parallelized requests returned as unordered elements; assembled in RPA
  - Pages may not display until structure is complete

# *Value of Accelerator*

- Tried setup with Starband modem direct to a Netgear router
- No Mission Control or Accelerator software
- Ran at about 50K both ways
- Accelerator software provides about an order of magnitude improvement in download

# *Miscellaneous Issues*

- No direct connect to non-Windows systems
  - But they are fine on local LAN w/”server” gateway
- Cannot host web sites
  - Dynamic IP; too slow; contract prohibits
- Originally no business offering
  - Initial business offering didn’t offer much
    - More expensive, multiple e-mail ids, more web site space on Starband servers
    - higher traffic load legitimate, same performance

# *Miscellaneous Issues*

- Installers know satellites but not computers
  - Took some time to get things going initially
- Starband says Internet Explorer required
  - Not true; have used Mozilla, Phoenix, Firebird
- Client system browsers should be set for proxy server to gateway system IP, port 9877
  - Points to RPA on server
  - Didn't matter much with Winproxy; significant speed difference with ICS (below)

# Winproxy Problems

- Problems with early Winproxy (V4 R1g)
  - Not load all graphics; some sites don't load at all
- Newer Winproxy (V4 R1p)
  - Loading works but problem with XP clients
    - WinXP client talking to WinXP Winproxy host
    - Sometimes exposes NetBIOS request as IP; thread hangs
    - Osis Software says is XP Problem, only if client and server both XP systems; workaround will come with V5 R1c
    - May require installing NetBEUI on XP systems
      - (\VALUEADD\MSFT\Net\NetBEUI\ on XP CD)

# *Winproxy Problems*

- Installed Winproxy V5 R1p
  - Partial loading problem returned
  - had XP thread hang as well
- Went to Windows 2000 Pro on Server
  - still had XP hang problem
- Reverted to XP on Server
- Replaced Winproxy with ICS (Internet Connection Sharing)

# *ICS Issues*

- ICS (Internet Connection Sharing) is part of Windows
  - Server must run Win2K or newer for Starband
- Easy to set up and use
  - Provides NAT to 192.168.0.xxx
- Had to set client browsers for proxy server
  - More to adjust when traveling with laptop

# *Firewall Issues*

- Server IP address is essentially static and is exposed on internet
- Winproxy had firewall technology built in
  - Without WinProxy server was wide open
- Looked at ICF (Internet Connection Firewall) but leaves ports open by default
  - Must know specifics of software to configure

# *Firewall Issues*

- Installed ZoneAlarm on server
  - All ports closed by default
  - Need to “tune” access (authorizations) for specific programs which access internet
  - Still have an issue with pop-ups from someone apparently using messenger port
    - Says people will start using this mechanism for spam so buy their product!

# *Things I Haven't Tried*



- Passive FTP
  - Recommended for satellite connections
  - FTP package I use doesn't offer it so I haven't evaluated it

# *On the Horizon*

- About to emerge from Chapter 11
  - Resulted from failure of marketing arrangement w/Echostar; new financing seems to be in place
- 480pro Modem
  - Internal control, accelerators, router software
  - Four Ethernet ports; an Ethernet-based client
  - Download >1Mbs, Upload 100-150Kbs
  - Apparently has NAT but not enabled
  - Comes with 1-5 static IP addresses

## *Conclusion*

- Not as good as DSL or Cable Modem
  - But lots better than dialup or nothing
- The true difference between dialup and broadband access is not speed, it's the always-on nature of broadband.
- Persistent access changes how you work.

# *For more information*

- [www.starband.com](http://www.starband.com)
- [www.starbandusers.com](http://www.starbandusers.com)  
(good reference, good networking, useful tools)
- Dave Thewlis, DCTA Inc.  
1460 Kane Ridge Road, POB 670  
Trinidad, CA 95570  
707-488-9978  
[dthewlis@dcta.com](mailto:dthewlis@dcta.com); [www.dcta.com](http://www.dcta.com)