

Bi-Directional Satellite Internet: Using STARBAND



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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 StarbandTM?

- 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?

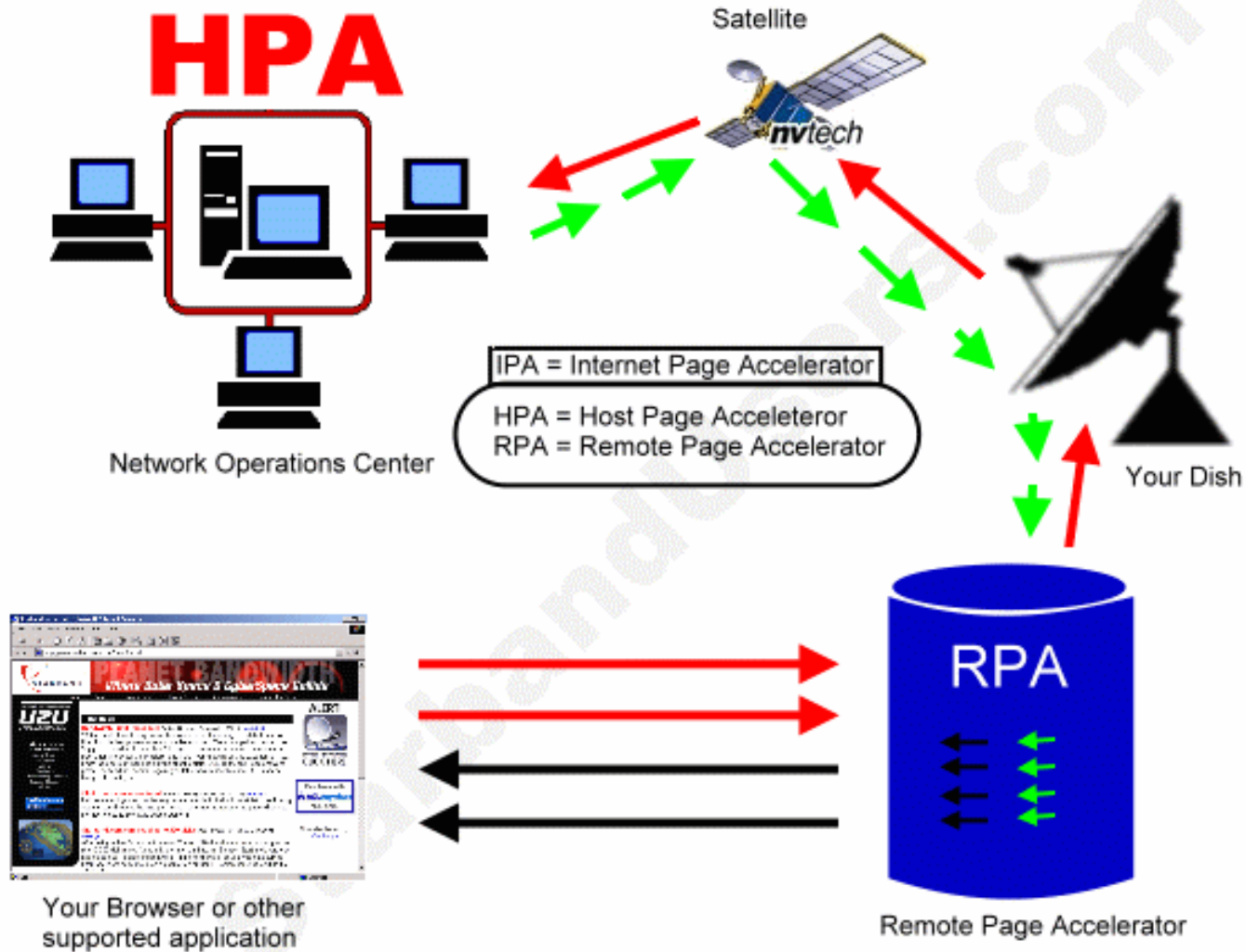
- Good given intrinsic limits
- ~670ms roundtrip for each access
 - You-->satellite-->Net Op Ctr-->web server
 - And back
- Occasional 5-15 minute outages
 - Not enough data to see pattern as yet
 - No worse than DSL outages in Eureka

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
- www.starbandusers.com
(good reference, good networking, useful tools)
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