Ascend

COMPETITIVE ANALYSIS

NetSpeed Inc.

Author Richard Sekar

ASCEND

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Company Background

NetSpeed was founded in 1996 and is located at 12303 Technology Blvd., Austin, TX 78727. Telephone: 1-800-550-ADSL or 1-512-249-8055. In March 1998, Cisco Systems, Inc. announced that they were purchasing NetSpeed, Inc. for $236 Million.

Netspeed is focused mainly on ATM over ADSL technology and their target customers include RBOCs, ISPs, end users and corporations. They have ATM and Frame Relay egress to the network. To accommodate authentication using RADIUS etc. while maintaining the Layer-2 transport services at the Central Office (CO), they support PPP over ATM.

They also claim that they offer both CO-based DSLAM as well as hardened unit for outside plant.

Their marketed strength of the product is the ability to oversubscribe ADSL users to the ADSL modem (1:1, 2:1, 6:1) even though no major service provider has started to offer ADSL service based on over subscription. Currently they are shipping ADSL-CAP (GlobeSpan) and have announced ADSL-DMT (Motorola).

They also offer POTS splitters for customer premises as well as for CO.

Strengths of NetSpeed:

- ATM-focused, appealing to the RBOCs
- Wide range of products for ADSL-CAP
- Low cost per ADSL modem if oversubscribed
- DS3, OC-3 and DS1 interfaces
- Hardened equipment for remote sites
- Dial-up (over subscription) of ADSL users; leads to reduction on equipment cost and power consumption
- An inverse multiplexor that can bond up to 3 ADSL lines to obtain a data rate of 21 Mbps downstream and 3 Mbps upstream.

Weaknesses of NetSpeed Products:

- Focused on ADSL only; No announced plans for SDSL, HDSL and IDSL. Note there has been only 20,000 ADSL lines worldwide installed either for services or trials with no single service provider exceeding 3,000 lines.
- The products are suitable for Layer-2 transport services only. The LoopRunner does not support routing, RADIUS and other functionality required, should the service provider decide to offer Internet services from the CO as in the case of other non-RBOC carriers, they have to purchase another standalone router.
- Not suitable to offer DSL service to multi-dwelling units since routing is not supported on the LoopRunner (that terminates DSL lines). This will require another terminating node or router in addition to the LoopRunner.

Ascend's DSLTNT™ supports all routing functions required to offer different types of services without the need for an external router; cost effective, low space requirement, low power consumption.

- Lack of Frame Relay on the DSL line side; Note that ATM to desktop is not a reality today.

Ascend's DSLTNT supports DS3 Frame as well as DS3 ATM (May 1998).

- Lack of Frame Relay at the DS3 level on the network side on the LoopRunner; Frame Relay is supported only at the DS1 level.
- Low port density in a 1:1 configuration (64 ports per chassis) versus Ascend's DSL TNT that supports up to 90 ADSL ports per chassis.

- DSLAM (LoopRunner) is only a transport-based DSLAM – does not support Routing and other functionality.

Ascend's MAX TNT™ is a true multiservice platform that supports both transport services as well as routing functions ready to offer various services in crease revenue.

- Products for ADSL-CAP only; Netspeed has announced DMT for the future.

With Ascend's MAX TNT, service providers can offer Analog, ISDN, IDSL, SDSL, ADSL-CAP and ADSL-DMT on a single platform; ADSL DMT by Q2 1998.

- Dial-up DSL has not caught on other than having been evaluated by a few service providers, especially considering that the Universal ADSL Working Group (UAWG) is working on the G.Lite (or ADSL Lite) based on dedicated connection as the standard.

- Without Netspeed's router at the ISP or the Corporate site, the PPP over ATM from the DSLAM cannot be terminated; Not attractive since most of the ISPs and corporate customers already have routers that they would like to use.

With Ascend's solution, even when a service provider offers only Layer-2 based service using Frame Relay (most commonly used service), ISPs and Corporate Customers can continue to use their existing Routers.

- Since Frame Relay is the most commonly used connection than the ATM, ISPs and corporations cannot have high-speed (e.g. DS3) type Frame Relay connection to the DSL service provider since NetSpeed's products support only ATM at the DS3 speed.

- Ascend's DSLTNT supports DS3 Frame Relay, DS1 Frame Relay, V.35 Frame Relay as well as DS3 ATM (Q2 1998)

- Network Address Translation (NAT) not supported on the NetSpeed's CPE whereas Ascend's DSLPipe™ supports NAT for efficient use of registered IP addresses.

- CLECs and service providers cannot offer analog, ISDN, IDSL, SDSL and ADSL all in one unit with NetSpeed whereas with Ascend's MAX TNT service providers can offer all these various services on a single platform.

- NetSpeed LoopRunner does not support RADIUS.

NetSpeed Products

- The LoopRunner DSLAM is targeted at RBOCs and other CO based application for Layer-2 only transport services. It does not do Routing and other functionality.
- The FireRunner Broadband router is targeted at ISPs and corporations. Without this product, the PPP over ATM coming from the LoopRunner cannot be terminated.
- ADSL PCIadapter -the PCIRunner targeted at the residential market
- The SpeedRunner 202 ADSL business router, the SpeedRunner 300 inverse multiplexer and the SpeedRunner 204 residential router.

Central Office Equipment

Port Density:

Up to 64 ADSL-CAP modems per chassis:

- 2 ADSL modems per half slot
- Dual port DS3 card
- Dual port OC-3 card

Over subscription :

400 users may be oversubscribed to the 64 modems. The subscription rates are at 1:1, 2:1 and 6:1.

They claim that when a subscriber wants access, the LoopRunner connects to the ADSL network and during idle time, the protocol session is kept alive while the physical connection is dropped. When the subscriber continues working and initiates a network request, the physical connection is transparently re-established.

Egress :

ATM-based OC-3c, DS3 and DS1

Frame Relay-based DS1

DSLAM Aggregation:

Up to 7 LoopRunner can be aggregated to support up to 2800 subscriber lines (7 x 400 =2800 lines). But in a 1:1 modem assignment, the maximum is 448 ADSL modems (7 x 64 = 448). *This of course is NOT on a single 7-foot rack*.

Technology supported:

ADSL-CAP (Globespan) shipping

ADSL-DMT (Motorola) announced

Compliance:

NEBS and ETSI

Chassis:

Requires a DSLAM chassis (23"x15.75"x 12")

And a line concentration chassis (23"x7"x12") for over subscription

Environmentally hardened units for remote locations

32-half slots for interface cards and 2 full slots for controllers

Software features:

ATM (PVC/SVC), UNI 3.1

11,200 VCI/VPI connections

IP over AAL5 (RFC 1483)

Power requirements:
-48VDC, 11 AMP (for a 400 line system)

Speeds:
7.0 Mbps downstream and 1 Mbps upstream

Has software configurable speed control:

640K/270K: 21,800 feet

960K/680K: 21,000 Feet

2.5 Mbps/952K: 18,000 feet

4.5 Mbps/952K: 15,200 feet

7.0 Mbps/1 Mbps: 12,700 feet

Management:
SNMP, TL1, CMIP Q3, CORBA and APIs

Interfaces: RS-232, 10Base-T, 100Base-T

Price:
$500 per modem (gets reduced when oversubscribed)

POINT-OF-PRESENCE (POP) ISP/CORPORATION

The ***FireRunner 100*** broadband remote access server is a router that terminates multiple high speed PPP, IP or IPX connections from an ATM data network.

This is typically installed at the POP or the corporate head quarters where connections from the end user (e.g. PPP over ATM) gets terminated while the ATM traffic remaining transparent to the CO equipment (i.e. LoopRunner).

Interfaces:
10Base-T and 100Base-T

DS1 (via V.35) and DS3 (via HSSI)

Features:
ATM Forum UNI 3.1 signaling for SVC

IP over AAL5 and PPP over AAL5 (RFC 1483)

Routing and Bridging

RADIUS (RFC 2058/2059), PAP/CHAP/SecureID

Firewall (Packet filtering)

SERVICE PROVIDER EQUIPMENT

SpeedRunner 300 is an ADSL inverse multiplexing router.

Product Positioning:
Netspeed claims that this product can inverse multiplex up to 3 ADSL lines to obtain 21 Mbps downstream and 3 Mbps upstream. This router is installed in a POP or corporate headquarters.

Speeds:
Up to 21 Mbps downstream and 3 Mbps upstream

Technology:
RADSL-CAP

Features:
ATM Forum UNI 3.1 signaling for SVC

IP over AAL5 and PPP over AAL5 (RFC 1483)

Routing and bridging

RADIUS (RFC 2058/2059), PAP/CHAP/SecureID

Firewall (Packet filtering)

Remote management via Telnet, HTML interfaces

Bandwidth on demand

Price:
$8995

CUSTOMER PREMISES EQUIPMENT

SpeedRunner 200 is an Ethernet-ADSL router.

Product Positioning:
Positioned as a customer premises equipment that can connect transparently to an ADSL service provider over ATM/ADSL line.

Technology:
RADSL-CAP, 7 Mbps downstream and 1 Mbps upstream

Interfaces:
10Base-T, 100Base-T (Ethernet) and RJ-11 (ADSL), RS-232

Features:
ATM Forum UNI 3.1 signaling for SVC

IP over AAL5 and PPP over AAL5 (RFC 1483)

Routing and bridging

Remote management via Telnet, HTML interfaces

RADIUS, TFTP and Syslog

BCP

Price:
$1,295

CUSTOMER PREMISES EQUIPMENT

PCIRunner - An ADSL PCI modem adapter card for desktop computers

Technology:
RADSL-CAP, 7 Mbps downstream and 1 Mbps upstream

Interfaces:
RJ-11 (ADSL)

Features:
ATM Forum UNI 3.1 signaling for SVC

IP over AAL5 and PPP over AAL5 (RFC 1483)

Routing and bridging

Multiple PVCs and SVCs

Price:
$595

Competitive Matrix

Feature Description	Ascend's MAX TNT, DSLTNT	NetSpeed's LoopRunner
Multiservice platform	Yes	-
IDSL	Yes	-
SDSL	Yes	-
Multi-port SDSL	Yes	-
ADSL-CAP	Yes	Yes
ADSL-DMT	(Q2 1998)	(Future)
Analog dial-up	Yes (MAX TNT)	-
ISDN dial-up	Yes (MAX TNT)	-
T1 Frame Relay services	Yes	-
E1 Frame Relay services	Yes	-
ISDN PRI interface	Yes	-
Dial-up ADSL	-	Yes
Bonding of ADSL lines	-	Yes; up to 3 lines
Port Density		
IDSL	224 Ports/chassis	-
SDSL	240 ports/chassis	-
ADSL-CAP	90 ports/chassis	64 modems/chassis
ADSL-DMT	90-ports/chassis	-
ADSL over subscription	-	400 users per 64 modems
POTS splitter	Yes	Yes
AC Power supply	Yes	-
48 VDC	Yes	Yes
ChipSet		
SDSL	Rockwell	-
ADSL-CAP	GlobeSpan	GlobeSpan
ADSL-DMT	ADI/Aware	Motorola
Types of Services		
Layer-2 service (Frame Relay)	Yes	-
Layer-2 service (ATM)	Future	Yes
Routing	Yes	-
Routing protocols i.e. RIP, OSPF	Yes	-
RADIUS	Yes	Not in LoopRunner; Need separate router

Feature Description	Ascend's MAX TNT, DSLTNT	NetSpeed's LoopRunner
TACACS, TACACS+	Yes	-
Tunneling Protocols		
L2TP	Yes	-
ATMP	Yes	-
PPTP	Yes	-
IP Direct	Yes	-
Frame Relay Direct	Yes	-
Network Interface		
DS1 Frame Relay	Yes	Yes
DS1 ATM	-	Yes
DS3 Frame Relay	Yes	-
DS3 ATM	(Q2 1998)	Yes
OC-3	Future	Yes
10Base-T	Yes	-
100 Base-T	Yes	-

Worldwide and North American Headquarters
Ascend Communications, Inc.
One Ascend Plaza
1701 Harbor Bay Parkway
Alameda, CA 94502, United States
Tel: 510.769.6001
Fax: 510.747.2300
E-mail: info@ascend.com
Toll Free: 800.621.9578
FAX Server: 415.688.4343
Web Page: http://www.ascend.com

European Headquarters
Aspen House
Barley Way
Ancells Business Park
Fleet
Hampshire GU13 8UT
United Kingdom
Tel: +44 1252.360000
Fax: +44 1252.360001

Asia-Pacific Headquarters
Suite 1908
Bank of America Tower
12 Harcourt Road
Hong Kong
Tel: +852.2844.7600
Fax: +852.2810.0298

Japan Headquarters
Level 19 Shinjuku Daiichi-Seimei Bldg.
2-7-1 Nishi-Shinjuku
Shinjuku-ku, Tokyo 163-07, Japan
Tel: +81.3.5325.7397
Fax: +81.3.5325.7399
Web Site: http://www.ascend.co.jp

Latin, South America and the Caribbean Headquarters
One Ascend Plaza
1701 Harbor Bay Parkway
Alameda, CA 94502, United States
Tel: 510.769.6001
Fax: 510.747.2300

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