

Ascend

Competitive Analysis

## Remote Access Concentrators

### Comparison Matrix

Ascend MAX TNT vs Cisco AS5200, Bay MSX 5399,  
Nortel Rapport 670 and USR Total Control Hub



## Key Feature Comparison: Carrier Class Access Switches

Carrier Class Access Switches	Ascend MAX TNT™	Cisco AS5200	Bay MSX 5399	Nortel Rapport 670	USR Total Control Hub	
Capacity/Scalability					current	planned**
Digital modem per shelf ports	288	48	576	48	48	336
ISDN ports per shelf	672	48	576	64	230	336
Shelves per 8 foot Telco rack	Single shelf system, 3 shelves per logical unit; 2 logical units per 8' rack	12 individual chassis stacked in Telco rack	Modular system, up to 12 modules per shelf, 4 shelves per 8" rack	6 shelf unit; individual shelves are Shiva LanRover 112 units connected with a Magellan Passport switch	N/A	6-shelf unit
Shelf connection	100 Mbps TAXI	10 Mbps Ethernet	10 Mbps Ethernet	10 Mbps Ethernet	10 Mbps Ethernet	100 Mbps Ethernet
Total digital modem connections per 8 foot Telco rack	2016	576	2034	288	288	2016
Total ISDN connections per 8 foot Telco rack	4032	576	2034	384	1380	2016
Total system capacity (analog and ISDN connections per 8 foot Telco rack)	4032	576	2034	670	1380	2016
<b>WAN connectivity</b>	T1/E1/PRI Frame Relay, Serial WAN, T3	T1/E1/PRI Frame Relay	T1/E1/PRI	T1/E1/PRI Frame Relay ATM, T3	T1/E1/PRI Frame Relay	
<b>LAN Connectivity</b>	10Base-T/100Base-T, FDDI, HSSI	10Base-T	10Base-T	10Base-T, FDDI	10Base-T, Token Ring	
<b>Fault Tolerance/Redundancy</b>						
Redundant power	Yes	Yes	Yes	No	Yes	
Hot swappable modules	Yes	No	Yes	No	Yes	
<b>Network Management</b>						
SNMP-based	Yes	Yes	Yes	Yes	Yes	
NMS	NetClarity	CiscoIOS	Optivity	Rapport Director	Total Control Manager	
<b>Protocol Support</b>	IP, IPX, OSPF, RIP2, IP, Multicast	IP, IPX, OSPF, RIP2, IP, Multicast	IP, IPX, RIP2	IP, IPX	IP, IPX	
<b>56 Kbps Modem Support</b>	K56flex	K56flex	x2 and K56flex	None	x2	
<b>XDSL Support</b>	IDSL, RADSL, SDSL	IDSL	None	None	RADSL	

\*\* USR's new Total Control Hub version is planned for summer 1997 announcement (preliminary information; subject to change)

## Selling Strategies: Carrier Class Access Switches

Carrier Class Access Switches	Ascend MAX TNT	Cisco AS5200	Bay MSX 5399	Nortel Rapport 670	USR Total Control Hub
Key Selling Points	<ul style="list-style-type: none"> <li>Designed for a carrier-class environment</li> <li>Proven leader in remote access market</li> <li>Market-tested system software</li> <li>Supports K56flex and MultiDSL</li> <li>Supports T3</li> <li>Supports VPN</li> <li>Optional integrated firewall</li> <li>Extended RADIUS support</li> <li>Multivendor network management support (NetClarity™)</li> <li>High end IP switch (GRF) on trunk side of MAX TNT</li> </ul>	<ul style="list-style-type: none"> <li>Modular design with migration path for ISPs and enterprise networks</li> <li>Protects investment in legacy systems by offering integrated protocol support through CiscoIOS</li> <li>Bandwidth management and optimization</li> </ul>	<ul style="list-style-type: none"> <li>High-density call platform designed for the Bay 5000 Multi-Service Access Switch (MSX)</li> <li>Modular design consolidates all ISDN and analog dial-in ports using Bay (Penril) integrated DSP technology - provides investment protection through migration path</li> </ul>	<ul style="list-style-type: none"> <li>Designed for the enterprise remote access market</li> <li>Shiva software</li> <li>Nortel experience and market share in the Central Office (CO)</li> <li>Magellan Passport ATM and Frame Relay switch adds to end to end solution</li> </ul>	<ul style="list-style-type: none"> <li>Designed for hybrid ISDN/ analog modem services for Telecommuting, Internet access and LAN-to-LAN routing</li> <li>Compatible with USR's 56K modem technology — x2</li> <li>Will feature rate-adaptive ADSL-CAP in future</li> <li>New high-density DSPs will handle two calls per modem</li> </ul>
Competitive Selling Strategies		<ul style="list-style-type: none"> <li>Not designed as a carrier-class product; redundancy limited to power supplies</li> <li>Software and network management features require significant additional expense; modem management requires software license for each modem card</li> <li>Modems are OEM from Microcom—uncertainty due to acquisition by Compaq</li> <li>Limited security support (No extended RADIUS, no integrated firewall)</li> <li>Single product—not a full, scaleable remote access line</li> <li>No high-speed chassis interconnection</li> <li>No T3 connectivity</li> </ul>	<ul style="list-style-type: none"> <li>New product with no track record — not a true carrier-class product, redundancy limited to power supplies</li> <li>No integrated Frame Relay — no T3 connectivity</li> <li>Limited security support (No extended RADIUS, TACACS/TACACS+, no encryption, no integrated firewall)</li> <li>No IP Multicast support</li> <li>No xDSL support</li> <li>Support for proprietary x2 56 Kbps technology limits interoperability with 70% of modem installed base</li> <li>No plans for high-speed WAN support (T3, ATM, etc.)</li> <li>No high-speed chassis interconnection</li> </ul>	<ul style="list-style-type: none"> <li>Not a carrier-class product — lower density, no redundancy, not hot swappable</li> <li>Single product - not a full, scaleable remote access line</li> <li>History of reliability problems with modems</li> <li>Limited security support (No integrated/dynamic firewall capability, limited RADIUS)</li> <li>No high-speed WAN support</li> <li>No xDSL support</li> <li>No IP Multicast support</li> <li>No high-speed chassis interconnection</li> </ul>	<ul style="list-style-type: none"> <li>Limited presence in digital port market : only 5% market share</li> <li>Limited high speed WAN support — no T3 connectivity</li> <li>Limited security support (No extended RADIUS, TACACS/TACACS+, no encryption, no integrated firewall)</li> <li>Proprietary x2 56 Kbps technology limits interoperability with 70% of modem installed base</li> <li>No IP Multicast support</li> <li>Limited carrier-class services and signaling conversion support</li> </ul>

## Price Comparison: Carrier Class Access Switches

Carrier Class Access Switches (single shelf)	Ascend MAX TNT	Cisco AS5200	Bay MSX 5399	Nortel Rapport	USR Total Control Hub-Current
Base Chassis	\$18,750 (single shelf system)	\$28,100 (bundled with T1/E1/PRI card)	\$4,495 (MSX 5000)	\$16,400 (Shiva List Pricing)	\$5,490 (new product pricing not available)
Software	\$4,000	\$7,200 per 48 modem card	~\$5,000 - 16,000	\$6,500	\$6,650 (Net Server card-required)
T1/E1/PRI	\$9,200 8 port card	\$8,195 dual port card	N/A	\$8,400 dual port card	\$4,738 dual port card
LAN Interface Card	\$6,000	N/A	\$4,995	N/A	N/A
Digital Modem Cards	\$24,000 48 port card	\$8,895 12 port card	\$19,995 48 DM/dual PRI card	\$8,500 12 port modem card	\$2,435 12 port modem card
Fully Configured* Shelf	\$200,750 (includes hybrid access)	~\$36,300	~\$249,500	~\$65,300	~\$44,126 (48 port bundle)
Price per Modem Port	\$697	~\$756	~\$433 <sup>#</sup>	~\$1,360	~\$919
Price per B channel	\$522	~\$585	~\$433 <sup>#</sup>	~\$1,020	~\$460

\* Full Configuration pricing is based on maximum modem cards/shelf, software, one Ethernet card, and additional T1/E1/PRI cards per slot capacity

# 5399 Remote Access Concentrator Module capacity is 48 analog or 2 PRIs; maximum modules per MSX 5000 chassis is 12.

Prices as of June, 1997. Subject to change.

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