

	Cabletron	Bay Networks	Cisco
1) UNI Signalling:			
a) ATM UNI Signalling, Version 4.0	N	Q3'98?	Y
b) Signalling ABR addendum	Q4'97?	Q2'98?	N, but provides similar functionality
c) ATM UNI 3.1	Y	Y	Y
d) optional features	?	multimedia support planned	Y
2) LAN Emulation Over ATM Version 2 - LANE v2:			
a) LANE v2	Q2'98?	Q3'98?	NY
b) optional features:			
Quality of Service	per UNI 3.1	Q3'98?	NY
Multicast Services	Q2'98?	Q3'98?	NY
Support for UNI SIG 4.0	NY	Q3'98?	Y
c) other LANEv2 features	?	Redundant LECS & BUS, plan multimedia support	will include VC muxing
d) # LE Clients per edge switch	32	15	4,000
e) ELAN membership configuration	com port, Spectrum, by NSAP address Spectrum	By "bridge group", per port	by port# or MAC address
f) LECS,LES and BUS implemented where	On 9A000 or unix system	Software	software
g) redundancy for the LECS, LES and BUS	Y	Y	Y
h) # hosts allowed per ELAN?	#of VCs	256 hosts/ELAN; 16,000 MAC addresses/switch	16,000
i) # ELANs per LES, LECS, and BUS?	1	15	Reassembly of 256 packets simultaneously, 4096 VC
j) BUS latency and cps rate	9A000: <11us & 1400cps other <11us & 1800cps	20 microseconds; 30,000 pps	18.8 usec, 94,339,622 cps
3) Private Network-Network Interface Specification Version 1.0			
a) PNNI 1.0	9A000 - Q4'98 other - Q1'98	Y	Y
b) optional features:			
Alternate routing as a result of Crankback	NY	Y	Y
Switched Virtual Path (VP) Service	NY	Y	NY
Soft PVPC and PVCC support	NY	Y	Y
ABR Signalling for Point-to-point Calls	NY	Q1'98?	Y
Frame Discard	Y	Y	Y
ILMI over PNNI links	?	Y	N?
c) other features	plans for load sharing over interswitch links		Y
d) IPNNI	?	N	N
e) MPLS	?	NY	tag switching
4) Integrated Local Management Interface (ILMI) 4.0			
a) ILMI 4.0	NY	Q1'98?	Y
5) Traffic Management 4.0			
a) Traffic Management 4.0	NY (w/UNI 4.0)	Q3'98?	Y

	Cabletron	Bay Networks	Cisco
b) traffic management functions:			
Connection Admission Control (CAC)	Y	Y	Y
Feedback controls	EFCI	?	Y
Usage Parameter Control (UPC)	Y	N	Y
Cell Loss Priority (CLP) Control	Y	Y	Y
Traffic shaping	Y	N	Y
Network Resource Management	Y	Y	Y
Frame Discard	Y	N	cell discard?
ABR Flow Control	Y	N	Y
c) maximum buffering per port?	9A000 - 13,312 cells/port/switch HSIM-A6DP - 256 frames/port other 32000cells/port/switch 9A426-02 2Mbp buffer	16,384 cell buffers per switch	65,536 cells of buffer memory per switch
6) Multiprotocol Over ATM (MPOA)			
a) MPOA	Q2'98?	Q3'98?	NY
b) NHRP interoperability	NY	Q1'98?	Y
7) Multicast Support			
a) multicast support	9A000- logical multicast other - spatial multicast under Lane 2.0	IGMP on the switch	Y On switches
8) PVC's, SVC's and SPVC's:			
a) What is your PVC support?	PVC's & Fore Smart PVC's	?	UNI 3.0, 3.1, 4.0
b) What is your SVC support?	UNI 3.0/3.1	?	UNI 3.0, 3.1, 4.0
c) Do you support Soft PVC's (SPVC's)?	Fore Smart PVC's	?	Y
d) # concurrent PVC's per port? per switch?	9A000 - 16,000 VCs other - 8,000 VCs	?	32,000 per switch
e) # concurrent SVC's per port? per switch?	9A000 - 16,000 VCs other - 8,000 VCs	?	32,000 per switch
f) # concurrent SPVC's per port? per switch?	9A000 - 16,000 VCs other - 8,000 VCs	?	256 per switch
g) What is the SVC call set-up time?	1-2ms	?	50 ms
g) # calls per second? (per port/switch?)	45	?	100 calls/sec per switch
g) # calls per port/switch		?	
9) Which of the following bit rates do you support:			
Available Bit Rate (ABR)	Y	N	Y
Constant Bit Rate (CBR)	Y	Y	Y
Unspecified Bit Rate (UBR)	Y	Y	Y
Variable Bit Rate - Real Time (VBR-RT)	Y	Y	Y
Variable Bit Rate - Non-Real Time (VBR-NRT)	Y	Y	Y
10) Which ATM Adaptation Layers do you support?			
AAL-1 - CBR	Y	Y	Y
AAL-2 - VBR	Y	Y	Y
AAL-3/4 - VBR	Y	Y	Y
AAL-5 - VBR	Y	Y	Y
11) Edge Switch Specific Questions:			
a) 802.1d	Y	Y	Y

	Cabletron	Bay Networks	Cisco
b) packet throughput	9A000 - 750K pps HSIMA6P - 420K pps 6A000 - 420K pps MAC based	?	10: 14400 pps, 100: 144,000 pps, FDDI: 120,000
c) filtering capabilities		64 filters/port	Y
d) edge switch-to-edge switch communication	N	Y	Y
12) Fault Tolerance:			
a) fault tolerant features	Y	Y	Y
b) hot-swappable	Y	Y, except for MCP	Y
13) Performance:			
a) # MAC addresses allowed per port? per switch?	SS2200 & 6000 - 8,192 SS in MMAC+ - 16,000	16,000	16,000 per switch
b) maximum aggregate backplane throughput?	2.5Gbps	6.4Gbps (400Mbps for management)	5500: 3.6Gb as frame switch, 8.6Gb as cell switch 1010: 5Gb; GSR: 60Gb backplane
c) maximum aggregate backplane throughput available for user data?	2.5Gbps	6.4Gbps	5500: 3.6Gb as frame switch, 8.6Gb as cell switch 1010: 5Gb; GSR: 60Gb backplane
14) Configuration			
a) What fixed configuration interfaces are present on the equipment?		C50N - 16 ethernet I/f & 2 OC3 I/f	5XXX: 2 switched 100 ports
b) # expansion modules or modular slots	4	1-6 C100 Type, 12 5000BH Type	1010: 8 ATM slots, 5500: 12 frame/8 ATM slots
c) min & max # interfaces			
OC-12 ATM	Y	Y	Y
OC-3 ATM	Y	Y	Y
Gigabit Ethernet	Y	Y	Y
FDDI	Y	N	Y
100BaseTX	Y	Y	Y
100BaseFX	Y	Y	Y
10BaseT	Y	Y	Y
d) Traffic between same module/card is shared or switched?	either	switched	switched
e) Traffic between different modules/cards is shared or switched?	either	switched	switched
f) any modules/cards required to run? e.g. management cards?	N	MCP module	Supervisor/ASP module
15) Network Management (is there overlap with ILMI?)			
a) Network Management Software	Spectrum, or any SNMP & ATM NMS	Optivity NMS	AtmDirector, CiscoWorks, CiscoView, Vlan Director Traffic Director
b) Does your equipment support the following?			
SNMP	Y	Y	Y
RMON	Y	Y	Y
MIB II	Y	Y	Y
c) port mirroring or call tapping?	both	Y, "conversation steering"	port mirroring
d) NMS for ILMI	Spectrum/Foreview	console or Optivity NMS	ATM Director

	Fore	3COM	Newbridge
1) UNI Signalling:			
a) ATM UNI Signalling, Version 4.0	Most	Q1'98?	Q4'98?
b) Signalling ABR addendum	NY	Q1'98?	NY
c) ATM UNI 3.1	Y	Y	Y
d) optional features	N	?	N
2) LAN Emulation Over ATM Version 2 - LANE v2:			
a) LANE v2	LANEv2 TLVs for MPOA & QoS	Q1'98?	NY, but as part of their MPOA
b) optional features:			
Quality of Service	Y	?	N/A in MPOA?
Multicast Services	NY	?	N/A in MPOA?
Support for UNI SIG 4.0	NY	?	N/A in MPOA?
c) other LANEv2 features		?	NY
d) # LE Clients per edge switch	32	12-36 depends on switch	N/A in MPOA?
e) ELAN membership configuration	ELAN: MAC or NSAP, VLAN: port# or MAC	per Port, MAC, IP or NW layer protocol	N/A in MPOA?
f) LECS,LES and BUS implemented where	software	switch processor	N/A in MPOA?
g) redundancy for the LECS, LES and BUS	Y	Y	N/A in MPOA?
h) # hosts allowed per ELAN?	FT 4.x: 250, FT 5.0 > 1000	no limit, but limited to 350 LEC per LES/BUS pair	N/A in MPOA?
i) # ELANs per LES, LECS, and BUS?	1 ELAN / (LES/BUS); 30+ ELANs / LECS	LECS: no limit; 1 per LES/BUS pair	N/A in MPOA?
j) BUS latency and cps rate	50,000-80,000 pps; x2 cps	10-20 usec; 64 byte pps: 12800 for switch engine 178,572 for Fast Bus card (optional)	N/A in MPOA?
3) Private Network-Network Interface Specification Version 1.0			
a) PNNI 1.0	Y	Q4'97?	Q2'97?
b) optional features:			
Alternate routing as a result of Crankback	Y	Y	NY
Switched Virtual Path (VP) Service	NY	N	NY
Soft PVPC and PVCC support	PVCC: Y; Soft PVPC: NY	N	NY
ABR Signalling for Point-to-point Calls	NY	?	NY
Frame Discard	Y	Q1'98?	NY
ILMI over PNNI links	Y	N	NY
c) other features	Y	N	NY
d) IPNNI	N	?	N
e) MPLS	N	?	N
4) Integrated Local Management Interface (ILMI) 4.0			
a) ILMI 4.0	NY	?	NY
5) Traffic Management 4.0			
a) Traffic Management 4.0	partial, more in next release	Q1'98?	Q4'98?

	Fore	3COM	Newbridge
b) traffic management functions:			
Connection Admission Control (CAC)	Y	Q1'98?	Q4'98?
Feedback controls	?	N	Q4'98?
Usage Parameter Control (UPC)	Y	Q1'98?	Q4'98?
Cell Loss Priority (CLP) Control	Y	Q1'98?	Q4'98?
Traffic shaping	Y	N	Q4'98?
Network Resource Management	Y	Y	Q4'98?
Frame Discard	Y	Q1'98?	Y
ABR Flow Control	NY	Y	Q4'98?
c) maximum buffering per port?	32,000 cells	1875 cells	?
6) Multiprotocol Over ATM (MPOA)			
a) MPOA	Y (in FT 5.0)	N	Interoperable Q2'98, Compliant Q3'98
b) NHRP interoperability	Y; PowerHub 7000 & 8000	Q1'98	Y, Fore
7) Multicast Support			
a) multicast support	via LANE & MPOA	via BUSes	?
b) Where do the support services reside?	MPS or ATM switches	switch engine	?
8) PVC's, SVC's and SPVC's:			
a) What is your PVC support?	?	Y	P2MP
b) What is your SVC support?	?	UNI 3.0,3.1 (4.0 Q1'98), IISP, (PNNI 1.0 Q4'97)	Y
c) Do you support Soft PVC's (SPVC's)?	Y	N	Y
d) # concurrent PVC's per port? per switch?	?	20,000 P2P; 800 P2MP	600 per switch
e) # concurrent SVC's per port? per switch?	?	20,000 P2P; 800 P2MP	P2P: 2000; P2MP: 100; both per switch
f) # concurrent SPVC's per port? per switch?	?	N/A	50 per switch
g) What is the SVC call set-up time?	?	30 msec	20msec
g) # calls per second? (per port/switch?)	?	33 calls/sec/switch	200 calls/sec
g) # calls per port/switch	?	?	
9) Which of the following bit rates do you support:			
Available Bit Rate (ABR)	EFCI	Y	Y
Constant Bit Rate (CBR)	Y	Y	Y
Unspecified Bit Rate (UBR)	Y	Y	Y
Variable Bit Rate - Real Time (VBR-RT)	?	Y	N
Variable Bit Rate - Non-Real Time (VBR-NRT)	?	Y	Y
10) Which ATM Adaptation Layers do you support?			
AAL-1 - CBR	Y	Y (but doesn't look into the AAL 1 timing)	Y
AAL-2 - VBR	?	Y	Y
AAL-3/4 - VBR	?	Y	Y
AAL-5 - VBR	?	Y	Y
11) Edge Switch Specific Questions:			
a) 802.1d	Y	Y	Y

	Fore	3COM	Newbridge
b) packet throughput	7000: 150,000; 8000: 300,000; 3810: 720,000	CB 7X00: Full line rate for 100B-T & 10B-T CB 2500 100000 (100) 14880 (10) 70000 FDDI	100Bt: 87% full wire speed, 10BT: full wire speed
c) filtering capabilities	Y	CB 7X00: broadcasts, CB 2500 64 byte pattern	NY
d) edge switch-to-edge switch communication	Y	?	N?
12) Fault Tolerance:			
a) fault tolerant features	Y	CB7000: Y	Y, if there are redundant paths
b) hot-swappable	Y	Y	N
13) Performance:			
a) # MAC addresses allowed per port? per switch?	8192	8192 - 32,000	CS1000: N/A; OR: 4000 local, 2000 remote; YR: 4000 local, 4000 remote
b) maximum aggregate backplane throughput?	200BX: 3.2Gbps; ASX1000: 10Gbps	CB7000HD: 5.0Gbps	CS1000: 1.6G; OR & YR: 100,000 pps
c) maximum aggregate backplane throughput available for user data?	200BX: 3.2Gbps; ASX1000: 10Gbps	CB7000HD: 5.0Gbps	CS1000: 1.6G; OR & YR: 100,000 pps
14) Configuration			
a) What fixed configuration interfaces are present on the equipment?		None	OR: 12 auto 100BT/10BT; YR: 12 10BT or 10BFL
b) # expansion modules or modular slots	200BX: 4; ASX1000: 16	4	CS1000: 6, OR: 1, YR: 2
c) min & max # interfaces			
OC-12 ATM	Y	0-8	CS3000 only
OC-3 ATM	Y	0-32	Y
Gigabit Ethernet	N	0-8 Q1'98?	N
FDDI	Y	CB7000: 0; CB2500: 1	Red Ridge only
100BaseTX	Y	64	Orange Ridge only
100BaseFX	Y	64	N
10BaseT	Y	144	Yellow Ridge
d) Traffic between same module/card is shared or switched?	switched	switched	switched
e) Traffic between different modules/cards is shared or switched?	switched	switched	switched
f) any modules/cards required to run? e.g. management cards?	N	switch engine	?
15) Network Management (is there overlap with ILMI?)			
a) Network Management Software	ForeView	Transcend Enterprise Manager	?
b) Does your equipment support the following?			
SNMP	Y	Y	?
RMON	Only first 4 levels	Y	?
MIB II	Y	Y	?
c) port mirroring or call tapping?	port monitoring	ATM VC tapping in Q1'98	?
d) NMS for ILMI		?	

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1) UNI Signalling:		
a) ATM UNI Signalling, Version 4.0	Y	NY
b) Signalling ABR addendum	Y?	N
c) ATM UNI 3.1	Y	Y
d) optional features	Y	?
2) LAN Emulation Over ATM Version 2 - LANE v2:		
a) LANE v2	Q1'98?	N
b) optional features:	N	
Quality of Service		Y?
Multicast Services		N
Support for UNI SIG 4.0		Q?'98?
c) other LANEv2 features	N	N
d) # LE Clients per edge switch	64	
e) ELAN membership configuration	MSS; Protocol Virtual LANs	
f) LECS,LES and BUS implemented where	hardware (MSS module in switch)	
g) redundancy for the LECS, LES and BUS	see white paper?	
h) # hosts allowed per ELAN?	?	
i) # ELANs per LES, LECS, and BUS?	63 per MSS module	
j) BUS latency and cps rate	.04 usec (64B) - .3 usec (1516B) 100,000 cps (64B frame)	
3) Private Network-Network Interface Specification Version 1.0		
a) PNNI 1.0	Y	Y
b) optional features:		
Alternate routing as a result of Crankback	Y	
Switched Virtual Path (VP) Service	Y	
Soft PVPC and PVCC support	Y	
ABR Signalling for Point-to-point Calls	Y	
Frame Discard	Y	
ILMI over PNNI links	Y	
c) other features	Y	
d) IPNNI	N	N
e) MPLS	Q4'97?	N
4) Integrated Local Management Interface (ILMI) 4.0		
a) ILMI 4.0	Y	NY
5) Traffic Management 4.0		
a) Traffic Management 4.0	Y	

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b) traffic management functions:	Plus others not listed below	
Connection Admission Control (CAC)	Y	
Feedback controls	Y	
Usage Parameter Control (UPC)	Y	
Cell Loss Priority (CLP) Control	N	
Traffic shaping	Y	
Network Resource Management	Y	
Frame Discard	Full packet level discard	
ABR Flow Control	Y: Relative Rate	
c) maximum buffering per port?	4 port OC3: 8000 cells in, 2000 cells out 1 port OC12: 8000 cells in, 2000 cells out	
6) Multiprotocol Over ATM (MPOA)		
a) MPOA	Q4'97?	NY (pre-standard implementation)
b) NHRP interoperability	Y; Fore, DEC, GDC, Bay, NET & Cisco	NY (pre-standard implementation)
7) Multicast Support		
a) multicast support	Y	
b) Where do the support services reside?	switch	
8) PVC's, SVC's and SPVC's:		
a) What is your PVC support?	Y	Y
b) What is your SVC support?	Y	Y
c) Do you support Soft PVC's (SPVC's)?	Y?	Y
d) # concurrent PVC's per port? per switch?	512, 512, 512	1023/port
e) # concurrent SVC's per port? per switch?	?	1023/port
f) # concurrent SPVC's per port? per switch?	?	Soon: 117,400
g) What is the SVC call set-up time?	call teardown rate 1360	10msec
g) # calls per second? (per port/switch?)	136 calls/sec/switch	100 calls/sec
g) # calls per port/switch		
9) Which of the following bit rates do you support:		
Available Bit Rate (ABR)	Y	Y
Constant Bit Rate (CBR)	Y	Y
Unspecified Bit Rate (UBR)	Y	Y
Variable Bit Rate - Real Time (VBR-RT)	Y supported as CBR	Y
Variable Bit Rate - Non-Real Time (VBR-NRT)	Y supported as CBR	Y
10) Which ATM Adaptation Layers do you support?		
AAL-1 - CBR	Y	Y
AAL-2 - VBR	?	N
AAL-3/4 - VBR	?	N
AAL-5 - VBR	Y	Y
11) Edge Switch Specific Questions:		
a) 802.1d	Y	Y

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- b) packet throughput ?
- c) filtering capabilities ?
- d) edge switch-to-edge switch communication Y
- 12) Fault Tolerance:
- a) fault tolerant features Y
- b) hot-swappable Y
- 13) Performance:
- a) # MAC addresses allowed per port? per switch? 4096 per module, 13000 per switch
- b) maximum aggregate backplane throughput? 24.6 Gbps full duplex ATM backplane
- c) maximum aggregate backplane throughput available for user data? non-blocking OC-3 & OC-12, depends on modules
- 14) Configuration
- a) What fixed configuration interfaces are present on the equipment? N
- b) # expansion modules or modular slots ATM: 17, Edge: 8
- c) min & max # interfaces
- | | |
|------------------|----------------|
| OC-12 ATM | 1-14 |
| OC-3 ATM | 4-56 |
| Gigabit Ethernet | NY |
| FDDI | 2-16 |
| 100BaseTX | Edge: 12-96 |
| 100BaseFX | Edge: 8 - 64 |
| 10BaseT | Edge: 12 - 256 |
- d) Traffic between same module/card is shared or switched? switched
- e) Traffic between different modules/cards is shared or switched? switched
- f) any modules/cards required to run? e.g. management cards? ATM: controller Module; Edge: mgmt processor
- 15) Network Management (is there overlap with ILMI?)
- a) Network Management Software Nways Campus Manager Suite
- b) Does your equipment support the following?
- | | |
|--------|---|
| SNMP | Y |
| RMON | Y |
| MIB II | Y |
- c) port mirroring or call tapping? Y
- d) NMS for ILMI console or Nways