

# **Agilent Technologies**

## **Agilent Advisor - ATM**

Product Overview



### Solve ATM Problems the First Time You Connect

No matter where you are in the process of bringing up your ATM network, the Agilent Advisor gives you visibility to help you know what's happening. The Advisor is the complete ATM troubleshooting tool. No other portable analyzer offers statistical performance measurements, stimulus and response testing, protocol decoding tools, and more. From installation, maintenance and troubleshooting to performance optimization and remote monitoring, the Advisor lets you connect anywhere on the network, capture all the necessary data, and comprehend that information as it reveals problems and suggests solutions.

ATM Testing Made Easy To install or troubleshoot an ATM link, you need to test for many things: physical errors, equipment interoperability, ATM cell congestion, and even LAN traffic problems. The Advisor offers integrated ATM, WAN, and LAN protocol analysis capabilities, along with BERT (bit error ratio testing), stimulus/ response measurements, and statistical analysis capability — everything you require to get a good look at the physical layer, ATM layer, and the upper layer protocols.

The monitoring and analysis capabilities for ATM are supported by an interface specific slide-in module or undercradle. This highly portable and economical package features a built-in, rugged personal computer with full keyboard, large display, pointing device, and Microsoft<sup>®</sup>Windows<sup>®</sup> 98 user interface.

No matter what the traffic level, the Advisor will capture every cell on your fullduplex network connection. It non-intrusively monitors and decodes ATM data at full line speed. In addition, it can simulate either direction of a line and process previously captured data from the buffer or from a file. The analyzer doesn't just capture traffic when the network is working; it gives you information when the network is broken — when you need it the most.



Isolating an ATM problem or testing a network often requires searching through hundreds or thousands of captured frames and cells to decide what is important. Even a highly skilled troubleshooter can be quickly overwhelmed. The Vitals feature saves valuable time by automating this process, providing a quick view of overall network health (Figure 1). You can then drill down to determine the problem. For instance, when utilization suddenly spikes to 100%, examine the Counts view. If the physical layer statistics (highlighted) reveals values other than zeros, check the Line Status view.

Values in the Vitals display are given in tabular form and are cumulative from the start of a test, except the instantaneous utilization, which is also displayed in graphical format for a quick look at overall usage of the network. Vitals data are provided for both the line (network) side and the equipment (user) side and include such statistics as average utilization in percent, instantaneous utilization in percent, total cells, idle cells, busy cells, header ("HEC") errors, code violations, and frame alignment errors.



Figure 1. The Vitals feature provides an instantaneous view of overall network health.

#### Simultaneous Measurements

The user-interface of the Advisor is intuitive, simple, and extremely easy to learn. Standard Windows capabilites allow you to mix and match various simultaneous measurements as you please (Figure 2).

ATH Advisor ATM	
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Idle Cells 0 73203	70- 60-
Busy Cells 0 1.72E+007	50
HEC Errors 0 5	30
Code Violation 0 0	10
D13D2 D130032	17:38:16 17:38:31 17:38:46
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Cell Time	VPI.VCI AAL Prot Description 🗮
(LN) 35 17:38:41.7567	7928 10.100 5 ATM: CLP=Low PTI=SDU1
	AAL-5: Type=EOM Len=7
	RFC 1483: DSAP=aa SSAP=a
	SNAP: OUI=Bridged PID=80
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Ready	

Figure 2. Multiple views can be combined and customized by the user.

#### **True Multi-tasking**

Unix-based data acquisition hardware makes the Advisor a true multi-tasking instrument whose various measurements can be executed simultaneously, in real time. You won't have to choose between statistical performance measurements and frame capture, or between traffic generation and network monitoring. With the Advisor, you can simulate a network load and observe its effect on the performance of a switch or on an individual conversation. You can even actively verify station connectivity (PING) while still monitoring the performance of the overall network (Figure 3).



Figure 3. You can PING while still monitoring the performance of the overall network.

#### Optical Power and Pulse Amplitude Meter

The STM-1/OC-3 module for the Advisor has a built-in optical power meter that allows you to check power levels, in addition to full ATM analysis. Optical power sensitivity is +/- 0.5 dB (Figure 4), and can also be used for power measurements at 622 Mb/s (STM-4c/OC-12). For most electrical ATM interfaces, pulse amplitude measurements ( $mV_{peak}$ ) are similarly available.



Figure 4. The STM-1/OC-3 module has a built-in optical power meter.

#### Get a Statistical Picture of Visibility on the health of the physical interface is often critical in determining the cause of network problems. Therefore, the Advisor tracks errors at the **Your Network** physical layer. Signal events are recorded on the display for both the line (network) side as well as the equipment (user) side. Events are time stamped and saved in the buffer and can be logged to disk. To alert you immediately to problems at the physical link, critical parameters appear at the bottom of all screens - whether you are looking at line status or other displays -- and these parameters are shown in red if a physical problem has occured. They include such events as loss of signal, loss of frame, loss of cell delineation and applicable parameters for the STM-1/OC-3, STM-1e/EC-3, UTP155, E3/T3, J2, and E1/T1 line interfaces currently supported by the Advisor. The Advisor monitors the network, captures data, and decodes it in real time. Monitor and Decode ATM and Data capture can be started manually, or automatically by setting a trigger. **Upper Layer Protocols in Real** The analyzer can selectively capture data using its 12 hardware capture filters, Time so that the memory buffer contains just the information you want to see. The Advisor fully decodes frames and cells and displays all fields in summary, detail, or hexadecimal format (Figure 5). In addition, being Microsoft Windows-based enables you to view different protocol decodes, vitals, statistics, and other displays simultaneously. Data can be printed, or stored to a file and retrieved for later analysis.

Advisor users now have powerful, user-configurable time-stamp options as follows:

- Delta shows the time interval between adjacent cells; gives another view into delay and delay variation.
- Relative shows the time difference between critical events and other cells in the traffic flow; for example, if a ping is considered time-zero, cells which arrived before or after will be time-stamped with their corresponding relative arrival time.
- Absolute actual time, with 100ns resolution.

#### **Advanced Decode View**

Today's Advisor has a very user-friendly, 'one-line' read out in the summary view. It also offers "Hex to detail mapping" by highlighting an element in the detailed view, the corresponding hex element is highlighted in color in the header 'Hex' section of the decodes. The reverse is also true.

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Summary 🔽 Detailed 🔽	Hex	Filter Search Repeat	
Cell Time	VPI.VCI	AAL Prot Descripti	on 🔺
(LN) 1 13:36	:15.2761072 10.5	ATM: CLP=Low PTI	=SDUO HEC=Bad ATM: >>> ERROL
(LN) 2 13:36	:15.2761099 10.5	ATM: CLP=Low PTI	=SDU1 HEC=Bad ATM: >>> ERROF
(LN) 3 13:36	:15.2761382 25.75	5 ATM: CLP=Low PTI	=SDU1 HEC=Good AAL-5: Type=H
(LN) 4 13:36	:15.2761415 8.100	5 ATM: CLP=Low PTI	=SDU0 HEC=Good AAL-5: Type=P
(LN) 5 13:36	:15.2761442 8.100	5 ATM: CLP=Low PTI	=SDU1 HEC=Good AAL-5: Type=1
(LN) 6 13:36	:15.2761469 10.150	5 ATM: CLP=Low PTI	=SDUO HEC=Good AAL-5: Type=N
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Figure 5. Real-time decodes are customizable to suit your needs.

#### Powerful Post-processing Capability

Post-processing display filters let you quickly zoom in on selected criteria, from the traffic passing between specific devices to individual conversations.

With post-processing you can:

- Search through the data by record or by time stamp
- Search for events, strings or addresses
- Verify event-to-event timing
- View protocol errors
- Print the current display or the entire buffer
- Export data to other programs or reports
- Analyze statistics from the buffer data

You'll spend less time searching through frames, and more time focusing on problems.

#### **Expert Charts and Graphs**

With the addition of the optional Advisor Reporter software you can generate unmatched reports and graphs to benchmark your network performance. The Advisor Reporter helps you optimize network elements to ensure peak performance for mission-critical applications (Figure 6).



Figure 6. Agilent Advisor Reporter Expert charts and graphs.

## Decodes for All Layers of the ATM Protocol Stack

The Advisor provides decodes for every layer of the ATM protocol.

- ATM physical layer: IMA Control Protocol
- ATM cell layer: cell header details
- ATM adaptation layer: AAL-1, AAL-2, AAL-3/4, and AAL-5 (with complete reassembly)
- Services layer:
  - Encapsulated protocols such as frame relay, X.25, and LAN (using RFC 2684/1483, RFC 2225/1577 or LANE 1.0/2.0)
    MPEG-2 decode
  - Signaling: UNI 3.0, 3.1, 4.0 PNNI, B-1SUP, B-ICI, SPANS (Fore systems)
- All major protocol suites are supported, including TCP/IP, 3Com, AppleTalk, Banyan, Cisco, DECnet, H.323, IBM/SNA, LLC, Microsoft LAN manager, Novell, OSI, SUN, XNS, ISO, SIP, MEGACO, MGCP, SGCP, RTP, GPRS, W-CDMA, and more.

The analyzer can capture all cells or filter certain cells, to maximize your capture buffer space. Events are time-stamped with 100 ns resolution. Protocol decodes can run simultaneously over all active VP.VCs, allowing the analyzer to decode all channels in real-time or in post-process mode.

#### **BERT (Bit Error Ratio Testing)**

Many times problems on the network can be attributed to the transmission medium. Although the physical medium may be good for normal data transmission, it may not be able to handle cell-based ATM data. That is why the Advisor has a powerful, built-in bit error ratio tester that performs not only frame-based (physical layer) BERT, but also cell-based BERT, in which the bit patterns are carried in the payload of the ATM cell (Figure 7).

Whether installing a new fiber or cable line, or troubleshooting an existing network, the Advisor provides for all your test needs, under one handle.

Ate Advisor ATM - IBun Time : Line Vital 9	itatistics]
☐ File Run View GoTo Setup Window	v Help
The Instantaneous Utilization Graph is disabled for BERT operation.	BERT Runtime Control
	Cell Bert Parameters
	Tx Bx
	VP: 255 255
Equipment	VC: 65535 65535
BEBT Bits 7.60E+007 0	PCR: 80000
	- Patterns Frrors -
BERTErrors 76141 U	
BERT Rate 1.00E-003 0	Reset
BERT Sync 0 0	
	/ LN
Signal Loss: LN	

Figure 7. Verify link and ATM-layer integrity by using the BERT capability.

### VP.VC Autodiscovery and Statistics

The Advisor can auto-discover up to 1024 virtual channels and for each collect and display VPI.VCI, maximum and instantaneous utilization (%) and throughput (kb/s), cell and octet counts, header ("HEC") errors and CLP status (Figure 8).

Agilent Ad	visor ATM -	Stopped :	VP.VC Stati	stics]						_ 8 ×
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4.4	27	0	833478	15726	424	0	12	0	0	
5.5	27	0	987231	18627	424	0	15	0	0	
6.6	27	0	1272530	24010	424	0	19	0	0	
7.7	27	0	1408740	26580	424	0	21	0	0	
8.8	27	0	1588940	29980	424	0	24	0	0	
9.9	27	0	1764476	33292	424	0	26	0	0	
10.10	27	0	1938263	36571	424	0	29	0	0	
11.11	27	0	2207874	41658	424	0	33	0	0	
12.12	27	0	2362528	44576	424	0	36	0	0	
13.13	27	0	2845093	53681	424	0	43	0	0	
VP.VC	Max Util %	Inst Util %	Total Octets	Total Cells	Max Thru kbps	Inst Thru kbps	Avg Thru kbps	Header Error	s CLP	
4.4 (EQ)	27	0	831941	15697	424	0	12	0	0	
4.4 (LN)	27	0	833478	15726	424	0	12	0	0	
Readv						Mon 🙆 0:10:18	8 kbps: EQ 0 (	) LN 0.0	%Util: EQ 2	7.6 LN 27.6

Figure 8. VPI.VCI Autodiscovery and statistics for each.

Whether you have PVCs or SVCs or both, you can select a VP.VC and view statistics on full duplex sampled data on that channel. You can also see in real-time a graph of that channel's utilization (Figure 9). VPI/VCIs with header ("HEC") errors, tagged cells (CLP ->1), or both, are color-coded for easy identification.

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X.						
			▶ ▶ Rec	# Time	P	rint
L V	P.VCs analyzed					<b>_</b>
	15.150	10.105	0.10	10.5		5.100
	10.100	10.10	1.1	255.655	35	25.75
	Total Detected (12)		🖾 HEC	🗆 CLP 🔳 Bo	oth	
S	elected VP.VC					
	¥P.¥C 10.100	Port 1	Port 2	2000 Ins	stantaneous T	hroughput (kbps)
	Max Utilization %	14	5	T		
	Inst Utilization %	4	0	1500	$\sim$	
	Total Bytes	26483981	15447120			
	Total Cells	499697	291455	1000		
	Maz Thru kbps	4944	1828	500		
	Inst Thru kbps	1681	0			
	Avg Thru kbps	859	512	0		- <del> - </del>
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•						F
Signal Lo	oss: LN			MON 2	0:03:59	%Util: EQ 99.0 LN 0.0

Figure 9. Real-time VP.VC statistics.

#### **VP.VC Decode View**

With VP.VC decode view, you can see a log of VPI.VCIs showing which AAL and LAN encapsulation protocol is running on each VPI.VCI (Figure 10).

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Label	VPI.VCI	AAL	Service	More		
AUTO	10.150	AAL-5	RFC 1483			
AUTO	8.100	AAL-5	RFC 1483			
AUTO	25.75	AAL-5	RFC 1483			
AUTO	255.65535	AAL-5	RFC 1483			
AUTO	1.1	AAL-5	RFC 1483			
AUTO	10.10	AAL-5	RFC 1483		I able Entry	
AUTO	10.100	AAL-5	RFC 1483		Add	
AUTO	25.250	AAL-5	RFC 1483			
AUTO	5.100	AAL-5	RFC 1483		Incert	
AUTO	10.5	AAL-5	RFC 1483			
AUTO	0.10	AAL-5	MPEG-2		-	
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Figure 10. Automatic assiciation of VP.VCs with AAL and types of traffic.

Using the cell generation editor or one of the many predefined quick tests, you can create normal or abnormal protocol behavior on demand to help isolate protocol implementation problems. For example, a quick test lets you send an ATM ping to check for continuity. You simply enter the IP address and the analyzer creates an ATM AAL-5 ICMP frame that uses IP addresses to test network operation and connectivity.

Other quick tests provide traffic filters for OAM, ILMI, and various LAN stacks, IP filtering templates, all of which can generate traffic up to full bandwidth. Other tests focus on statistics for particular monitoring tests, such as signaling statistics. Test scripts can be customized or created from scratch to a library of test sequences tailored to your individual application.

#### **Traffic Generation**

Network faults related to traffic levels are often difficult to isolate. Few analyzers can capture every packet, frame, or cell at wire speed, and such problems are often intermittent and difficult to recreate. With the Advisor, you will never miss a cell, no matter what the data rate. You can also generate traffic and make measurements simultaneously, so that you can recreate problems and analyze them for solutions.

Powerful traffic generation capabilities in the Advisor lets you transmit virtually any type of message or cell onto the network – one time, a specified number of times, or continuously (Figure 10). To generate traffic for network simulation, you can leverage the many testing scenarios already defined in the analyzer. Previously captured cells in the capture buffer can be used to duplicate events or to create complex messages.

If you are using previously captured traffic, you can modify the VPI.VCI and/or the payload (to change the IP addresses, for example) and the HEC and/or AAL-5 CRC-32 is automatically recalculated.

Advisor ATM - [S	itopped <u>G</u> o To <b>G</b> E	:Conf <u>S</u> etup 王 開開 日	iguration] Window Help		<b>F</b>	Hec #	A Send Control repeat cell table send unassigned cells repeat cell table send cell table once	
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Ready							мон 🕒 0:04:11	Paste

Figure 11. Traffic generation using user-defined or previously captured data.

#### **Quality of Service**

Service providers are very interested in maintaining a high level of 'Quality of Service'. Large enterprise network operators are likewise interested in maintaining a given level of service for the departments and applications they are supporting. Unlike the traditional Internet, which suffers slow response and high packet loss under load, ATM networks are designed to control traffic before it is even allowed admission into the network, and to maintain high performance characteristics at all times, while offering the benefit of different service level guarantees. In today's increasingly competitive telecom environment, and with the rise of diverse traffic types like multi-media and voice-over-IP, ATM networks need to be able to ensure a consistent quality of the service being provided.

Today's Advisor has greatly enhanced Quality of Service (QoS) capabilities (Figure 12). QoS tests comprise a set of measurements designed to assess things like delay, delay variation, cell loss, and cell misinsertion. The core suite of QoS tests on the Advisor includes:

- Cell delay including Cell Delay Variation (CDV) and Mean Cell Transfer Delay
- Cell Loss Ratio (CLR)
- Cell Misinsertion Rate (CMR)
- Cell Error Ratio (CER)
- Severely Errored Cell Block Ratio (SECBL)
- Background traffic while running QoS

Advisor ATM - [Stopped : Configuration]	_ 6	×
▲■ Eile Bun View Go To Setup Window Help	<u>_ </u> 8	×
Network Contract Parameters		
Inter		
GCRA VBR.1/SBR1 (PCR CLP = 0	H+1, SCR CLP = 0+1)	
PCR CLP = 0+1 VBR.1/DBR IPCR CLP = 0+	+1, SCR CLP = 0+1)	
VBR.2-3/SBR2-3 (PCR CLP	= 0+1, SCR CLP = 0)	
PCR 21216 000 cells/sec	SCB 12400.000 cells/sec	
26.520 % bandwidth	15.500 % hand dill	
8 9955840 Mb/sec	5.2576000 Michae	
	MD/sec	
CDVT 103.00 usec	MBS 51 cells	
	IBT 1678.47 usec	
	IV LDVI  465.39 usec	
ОК	Cancel	
Ready	Miön 🛑 0:04:11 🏾 %Util: EQ 99.0 LN 0.0	)

Figure 12. Cell loss testing.

Shaping allows the user to control the characteristics of the traffic entering the ATM network. During QoS tests, being able to shape the test traffic coming into the network according to a traffic contract yields more meaningful test results by simulating real-world ATM traffic. QoS tests utilize the industry standard '0.191' test cells to ensure interoperability with other vendor's test equipment (Figure 15).

The Advisor already has the capability to generate traffic at a constant rate which is specified in the send control dialog box. The shaping feature allows the user to specify several additional parameters, including PCR (peak cell rate), SCR (sustainable cell rate), MBS (maximum burst size), and CDVT (cell delay variation tolerance), to define a traffic "shape", i.e., one which will check the quality of service of the network in terms of CDV, cell loss, etc.

#### Policing and Traffic Contract Measurements

Is the Customer Complying? Am I getting what I'm paying for? These are common questions from service providers and customers of ATM networks. One of the most important premises of the deployment of ATM networks is the ability to maintain a given level of performance within the core network. The user will specify the Peak Cell Rate (PCR), Cell Delay Variation Tolerance (CDVT), Sustainable Cell Rate (SCR), and Maximum Burst Size (MBS) (Figure 13). The Advisor's policing tests are real time measurements that are done in service to check a cell stream's conformance to the traffic contract (Figure 14). Often, the user will complain that the service provider is not delivering the agreed QoS when, in fact, it is the user's traffic that is at fault the Advisor will show this.

The user may specify one of the following Generic Cell Rate Algorithms (GCRA), to determine how many cells in the cell stream are conforming or non-conforming:

CBR.1/DBR (PCR CLP=0+1) VBR.1/SBR.1 (PCR CLP=0+1, and SCR + MBS CLP=0+1) VBR.2/SBR.2 (PCR CLP=0+1, and SCR + MBS CLP = 0) VBR.3/SBR.3 (PCR CLP=0+1, and SCR + MBS CLP = 0 with tagging)

ATH Advisor ATM - [Stopped : Configuration]	_ 8 ×
⚠ <u>F</u> ile <u>R</u> un <u>V</u> iew <u>G</u> o To <u>S</u> etup <u>W</u> indow <u>H</u> elp	_ <u>- 181 ×</u>
	Rec # Time Print
Interface/Protocols Decode Table Filters/Counters	Simulate Log Policing Cell Loss/Cell Delay Signalling
VPI.VCI 12.130 Entire VP	
GCRA VBR.3/SBR3 (PCR CLP=0+1, and	d SCR CLP=0 with tagging)
CBR.1/DBR (PCR CLP=0+1) PCR CLP = 0+1 - VBR 1/SBR1 (PCR CLP=0+1) and	d SCR CLP=0+1)
VBR.2/SBR2 (PCR CLP=0+1, and VBR.3/SBR3 (PCR CLP=0+1, and	d SCR CLP=0) d SCR CLP=0 with tagging)
PCR 2720.000 cells/sec	SCR 2720.000 cells/sec
3.400 % bandwidth	3.400 % bandwidth
1.1532800 Mb/sec	1.1532800 Mb/sec
<b>₹</b>	T D
CDVT 164.03 usec	MBS 201 cells
	IBT 0.00 usec
	CDVT 54.36 usec
Ready	Min 🕒 0:04:11 %Util: EQ 99.0 LN 0.0

Figure 13. Policing matches customer traffic contract parameters.



Figure 14. Contract conformance and switch performance.

Advisor ATM - [Stopped : Configuration]     File Run View Go To Setup Window Help	_ 8 ×
Rec#. Time Pint	
Interface/Protocols   Decode Table   Filters/Counters   Simulate   Log   Policing Cell Loss/Cell Delay   Signalling   Connection © Loop Back © End-to-End (Advisor-to-Advisor) © End-to-End (Advisor-to-Other)	
Test Cell Traffic Setup         Test Cell CLP           Iransmit VP.VC         1.50              © CLP = 0 (High)            Beceive VP.VC         1.50              © CLP = 1 (Low)            C CLP = 0+1 (Mixed)                ©	
Background Traffic Setup	
Test Cell Stream Background Cell Stream	
Ready 0.02:20 %Utit EQ 14.4	LN 0.0

Figure 15. 0.191 test cell customization.

#### **Signaling and Call Placement**

"Can I bring up a Switched Virtual Circuit (SVC)?" "Can I bring up a LANE session?" This is very similar in concept to a PING, which has the function of "Can I reach an IP host?"

During initial service turn-up, service providers will benefit by being able to confirm the ability to establish UNI 3.0, 3.1 or 4.0 connections, all while emulating either the user device or the network equipment (the edge switch).

The Advisor includes Signaling and LANE emulation to provide connectivity testing. The signaling and call placement feature supports UNI 3.0, 3.1, and 4.0. Users may specify the UNI that they wish to use in bringing up the SVC. In addition, the user will be able to specify and edit the Information Elements placed on Call Connect messages that specify what type of SVC to bring up and with what level of service (Figure 16).

**Note:** While ITU-T Q.2931 signaling is not explicitly supported, the ATM Forum's UNI 4.0 was derived from Q.2931 and Q.2971 and, with the exception of a few rarely used Information Elements, UNI 4.0 will work in most situations where ITU-T signaling is in use.

Advisor ATM - [Run File Run View Go	<b>n Time: Signalling Results)</b> Sa Ta Setup Window Help	_ @ ×
K	▲ • ► ► Rec # Time Print	
Signalling Statistics Total Packets Calls Initiated Calls Completed	Tz     Rz       S29     18       Image: Sign of the second seco	
Calls Progressing	s 10 4 s 4 0 d 0 0 Release 1 Calls	
Signalling State Informal HPIL (1): 08.13.98.14( HPIL (1): 08.13.98.14( HPIL (1): 08.13.98.14( HPIL (1): 08.13.98.14( HPIL (1): 08.13.98.14( HPIL (1): 08.13.98.14( HPISAAL (1): 08.13.98 HPSAAL (1): 08.13.98 I	ation 100:14 Event: GetRsp: user side: d5fafc 100:14 HEADLINE: User GetNex/Request 100:14 Msg Traffic: Outgoing GetNex/, Regid:43 100:14 fur REG - Started 100:14 ULM State: REG ATM ADDRESS 814:00:15 Tmr POLL: Expired 814:00:15 Tmr POLL: Started	
SSCOP	Signalling         ILMI         LANE         Clear	
Ready	0.01	:50 %Util: EQ 0.0 LN 0.0

Figure 16. Results of signaling emulation.

#### **Real-time IP Filtering**

Do you need to perform applications-level, LAN-centric troubleshooting on your ATM network? The Advisor offers real time, packet-level IP/LAN filtering and capture. This allows the user to isolate and analyze LAN conversations taking place on an ATM circuit. This feature maximizes valuable buffer space for optimal data collection of targeted LAN traffic (Figure 17).

The users can even filter on IP addresses of packets encapsulated in Frame Relay (to RFC 2427/1490) which is, in turn encapsulated in AAL-5 (FRF.5).

The skilled user of the Advisor can also create capture filters and counters by copying cell sequences into the filters/counters buffer then editing this to add "don't cares" where a match is not desired.



Figure 17. Real-time filters allow customized LAN analysis.

# Expert Analysis of LAN Traffic Within ATM Cells

More and more, service providers and enterprise net managers want to know the specific types of LAN traffic and the users involved in events running over their ATM network. The new expert feature on the Advisor allows expert commentary, connection statistics, expert analysis, and troubleshooting of LAN sessions running over an ATM network path. This analysis is done in a postprocess mode, and can be done on any standard Windows-based PC with the Advisor software. ATM Advisor customers now get all the benefits of the LAN in Windows product without the LAN hardware (Figure 17).



Figure 18. LAN utilization with unmatched ease of use to drill down to specific network anomalies.

#### **Commentators**

LAN commentators allow LAN traffic running over ATM to be examined for unusual events, giving rise to "warnings" and "alerts". The commentators work by "state following" PDU sequences to detect unusual behavior e.g. TCP windowing problems, etc. (Figure 19).

LanAdvisor LAN - [Capture Buffer : TCP/IP, XoIP, Novell, Oracle, Sybase, AppleTa	ik, VINES, OSI, DECnet, Y2K Events 📮 🗗 🗙
₩ <u>File R</u> un <u>V</u> iew <u>G</u> oTo <u>S</u> etup <u>W</u> indow <u>H</u> elp	_ <u>_8</u> ×
Rec #	26 MB
E 😰 IP Warning Events	<u> </u>
E I Display Node Events sorted by overt coverit	
⊞ ₩ 192.168.0.224 A=0 ₩=2 Y HP Internet Adv	
Help I opics Back     A=0 V=1 Help I opics Back	Options
	or: Q931 Release Complete Error
B Display Connection Eventssorted b	te message is considered a WARNING event.
B ₩ 192.168.0.218 :1720 <-> 192.	
E W 1 Q931: Release Complete Error   A Release Complete	Error event is generated when a Q931 Release
Q931: Release Complete Error Complete Message	assMalue listed below. This event summarizes all the
Port: 8066 1720 information tracked	for the specific call.
RelComp Reason : No Bandwid Cause class	s (0) - Normal Event
Call Reference / Type : 280 Cause class	s (1) - Normal Event
H245 IP : <unknown> :&lt; C</unknown>	ause Value 0 - Normal Call Clearing
Call Connect not seen	ause Value 1 - User Busy
Call Duration : 00:00:00.00	ause Value 2 - No user responding
No KIP entries seen c	ause Value 3 - No answer from user (user alerted)
Kuntime Frame Number: /804	- D
	e Reasons ale:
Adaptive Busy	New Connection Needed
Bad Format Ad	dress No Bandwidth
P Display All Events	t Registered No Permission 🗾
• W 1 RAS: Excessive Gatekeeper Regs [Warning]	
🕀 🗑 1 RAS: Disengage Rejection [Warning]	
🗊 🖬 1 0931: Release Complete Error [Warning]	· · · · · · · · · · · · · · · · · · ·
Ready FastEth Mainfr	ame 🗋 🕎 🔿 🌑 TX 🛛 100 Mb Node HDX 🛛 📼
🕃 Start 🛛 🏈 🏐 📝 🕴 LAM Internet Advisor LAN 🔍 Exploring - InterOp_Portland	HP Internet Advisor LAN H 🛛 🎲 🖓 5:33 PM

Figure 19. LAN commentator warns or alerts you to unusual protocol sequences.

#### Remotely gather MIB Statistics from Around Your Network

The Switch Advisor gives you the capability to trend switch port utilization and other vital statistics without leaving your chair. Simultaneously monitor a suspect ATM link and any other Management Information Base (MIB) supported device to correlate problems between the two. Discover switches and other MIB supported devices via user directed search or directly enter device management IP address and graphically view current port utilization levels. Switch Advisor sends SNMP messages over your Ethernet connection and gathers MIB data including utilization, packet information and errors.



Figure 20. The Switch Advisor collects MIB data.

This raw data is correlated and displayed on an easy to understand display. Five separate views organize the MIB device data, allowing the user to concentrate on the data of interest, presenting pertinent statistical and graphical information needed to assess the health of the data being processed by the switch. Select which port to monitor via the "explorer" navigation menu or "clicking" on the port of interest.

- Management displays System information including switch part number, location, designated name and site contact information. Displays each port # by customizable "Alias" name with Interface description, associated Media type and whether RMON capability is supported, per interface.
- MIB Statistics displays per port statistics including in/out octets, unicasts, discards and errors.
- Port Usage graphically displays switch-port utilization, per port, over time. Also, allows same measurements to be taken during a user-initiated test.
- Single Port Statistics displays per-port information including graphical representation of "In" and "Out" port utilization, octets, unicasts, broadcasts, discards, and errors. Also, allows same measurements to be taken during a user-initiated test.
- MIB Browser allows user directed MIB data collection.

Related Literature	Agilent Advisor Agilent Advisor ATM/WAN	Brochure Technical Specifications	5980-1093E 5980-0786E
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A Path to the Future	Powerful as they are, the capabilities of the Advisor continue to expand with every software release, ensuring that your investment in these testing tools will be returned for many years to come. Agilent's Software Upgrade Subscription Service will keep you up-to-date on the very latest enhancements to the Advisor.		
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Notes \_\_\_\_\_

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