

FLUKE
networks.
.....

Slow Critical Apps®

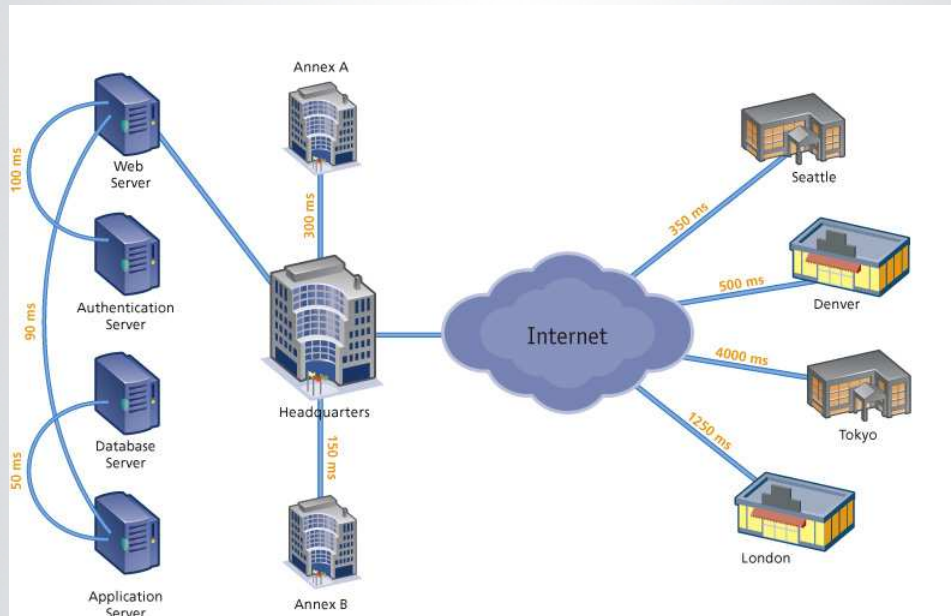


Does This Sound Familiar?

- **Are you blindsided by application performance problems from your users?**
- **When application performance problems occur, can you investigate the cause of the problem at the time it is affecting your users?**
- **Do you know where to invest in your infrastructure to improve performance? And when you do, can you show the impact of the change?**
- **Are you able to report any application performance statistics that you provide to your users?**
- **When application performance problems occur, does finger-pointing occur within your organization?**

The Typical Method of Troubleshooting

1. Where's the nearest analyzer? I thought it was at Joe's desk.
2. Is it available or still in use?
3. Where do I need to ship it? I can't believe it will cost that much!
4. Great, I shipped a **WAN** instead of a LAN analyzer!
5. Who knows how to set it up?
6. Where do I plug it in? Oops, forgot to send the cables!



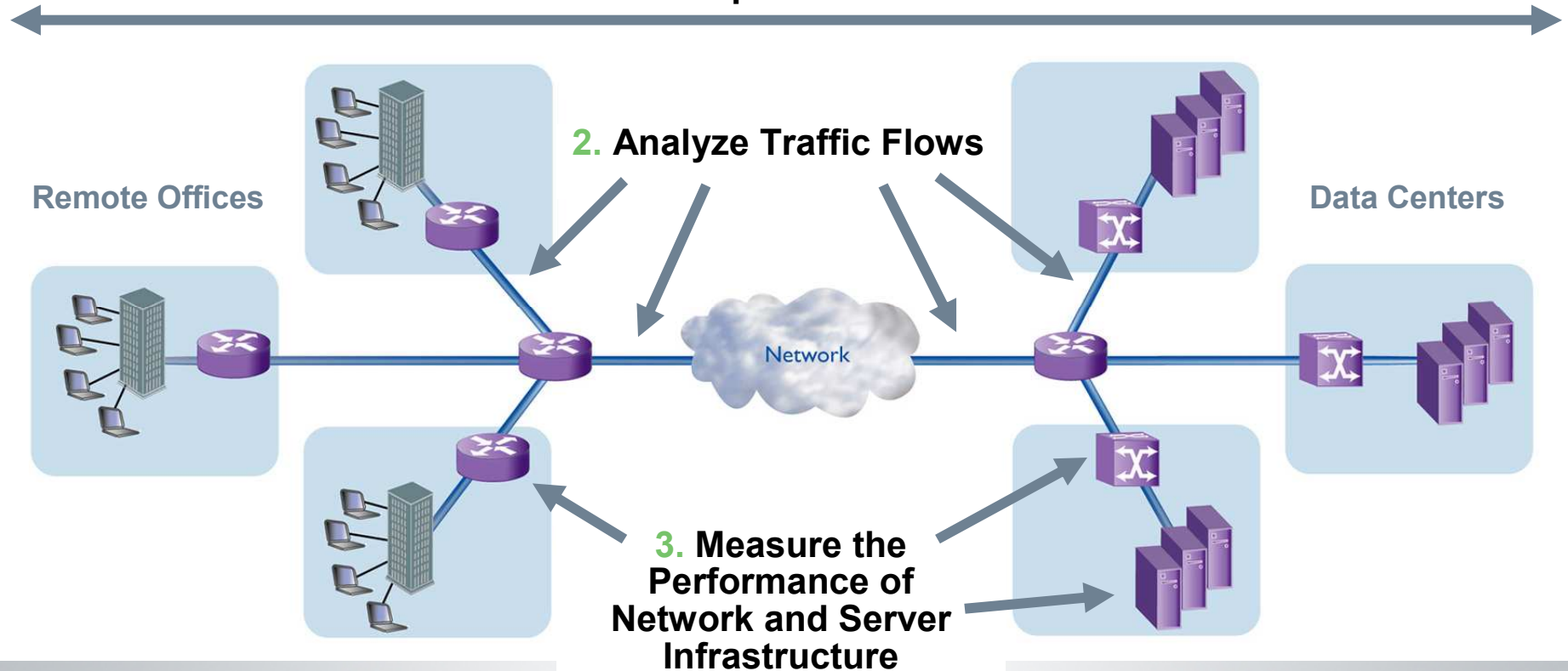
6. Do I SPAN or mirror, and can do it?
7. What do mean there aren't anymore available ports?
8. What type of address do I filter on?
9. Which protocols and ports are used by my applications?
10. How long do I capture for?

10. I captured a million packets, who can read this stuff?
11. What does "normal" traffic look like?
12. How do I capture data from multi-tiered applications?
13. What is the problem and is it still happening?
14. What do you mean the problem has 'gone'?

Performance-First Management

A three-layer approach...

1. Measure User Response Times End-to-End



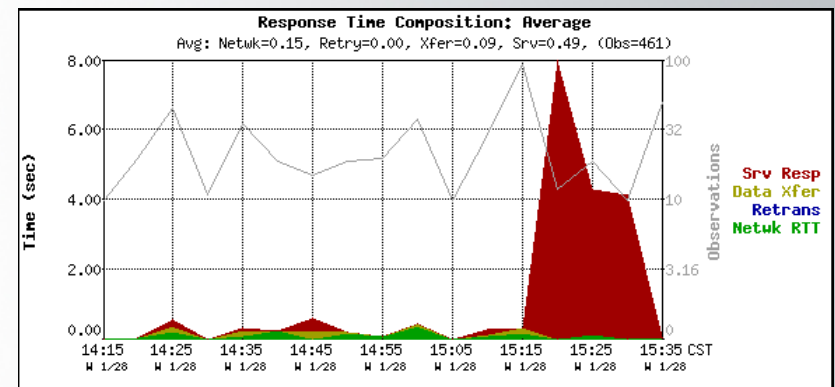
Key Benefits

1. **By placing the analyzer near the servers, there is little doubt when the server is accused of the main source of delay**
2. **Validate the impact of change within the infrastructure, planned or unplanned, to assist in optimizing end-to-end performance**
3. **Report the quality of service by measuring how well the network delivers applications to users**

Application List		
Application	Performance	Observations
Direct Hosting of SMB Over TCP/IP		27,947,174
NetBIOS over IP (MS Windows)		156,040
MySQL		361,466
Lightweight Directory Access Protocol		186,494
Hypertext Transfer Protocol		80,126
RPC		71,610
Altays		18,161
Exchange		2,320,938

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Unrated Normal Degraded Excessive



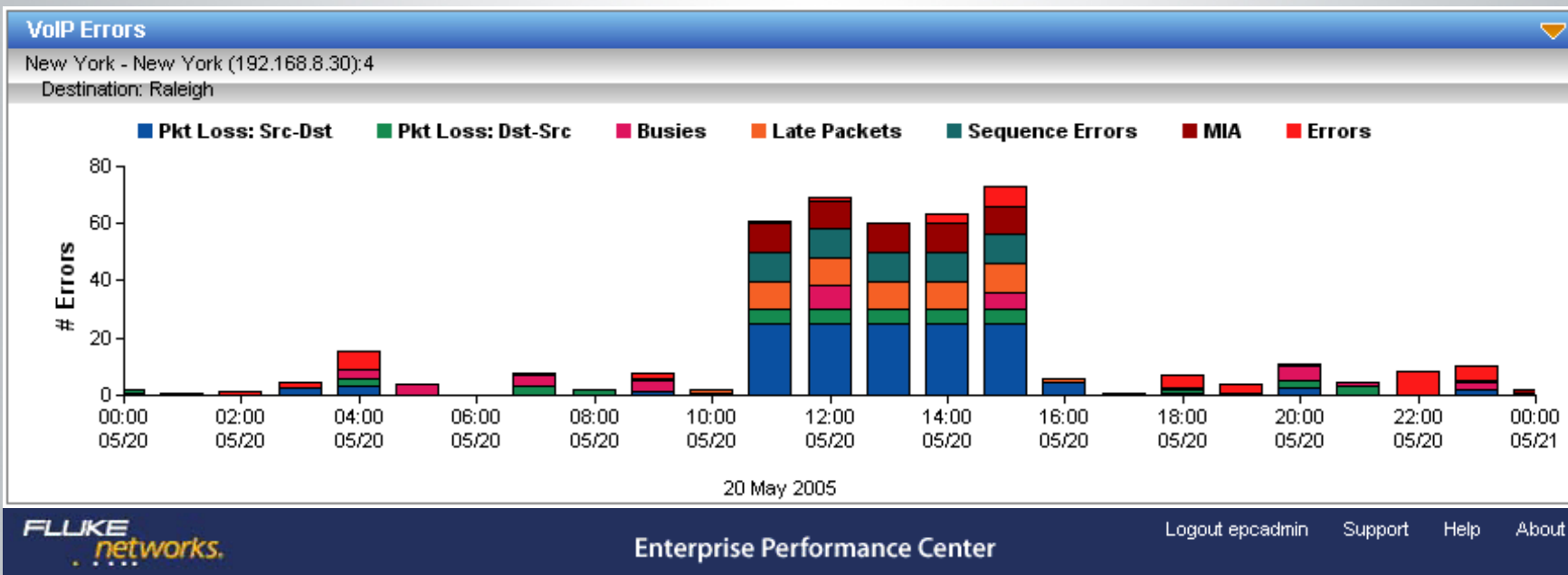
Enterprise Wide Visibility

- The most effective way to start learning about your users, is to have a way to measure their response times.
- Its is much easier to decide on which tool and staff to deploy if you can quickly determine if the problem is remote, or local.
- In this example New York looks as like it has some VOIP issues. No need to worry about the other sites.

Top VoIP RTT Deviation From Norm						
Name	Type	Src	Dst	Norm (ms)	Actual (ms)	Deviation (%)
New York	VoIP	New York	Raleigh	71.7	267.0	272.3
Austin	VoIP	Austin	Dallas	168.5	85.6	-49.2
Minnesota	VoIP	Minnesota	Cleveland	176.2	115.7	-34.3
San Francisco	VoIP	San Francisco	Los Angeles	70.4	46.3	-34.3
Seattle	VoIP	New York	Portland	139.7	119.2	-14.7
Houston	VoIP	Houston	Austin	130.4	148.9	14.2

Dig In Deeper

- Even though the previous screen indicated 'VOIP' as having problems, it would be more helpful if you had an approximate time frame and type of problem.



Traffic Analysis

- One of the most basic, but often difficult question asked is, “Which site is the busiest?”

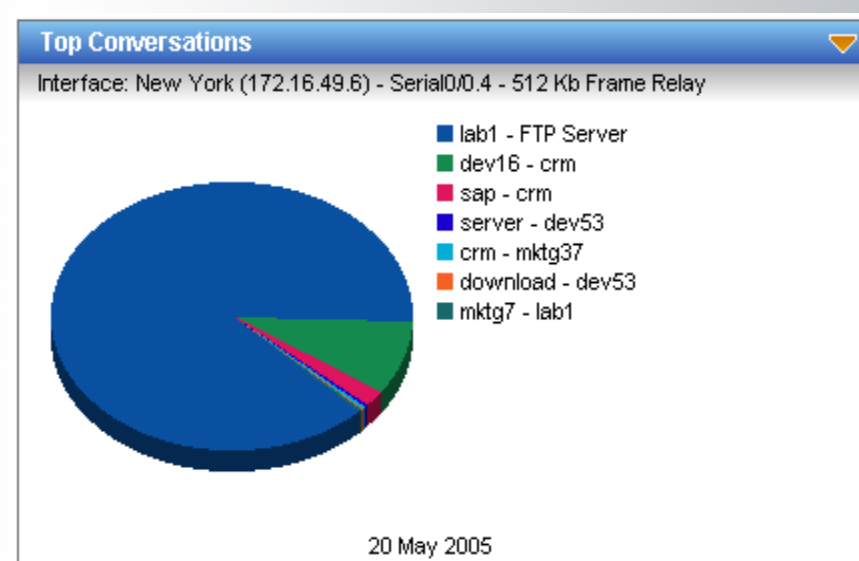
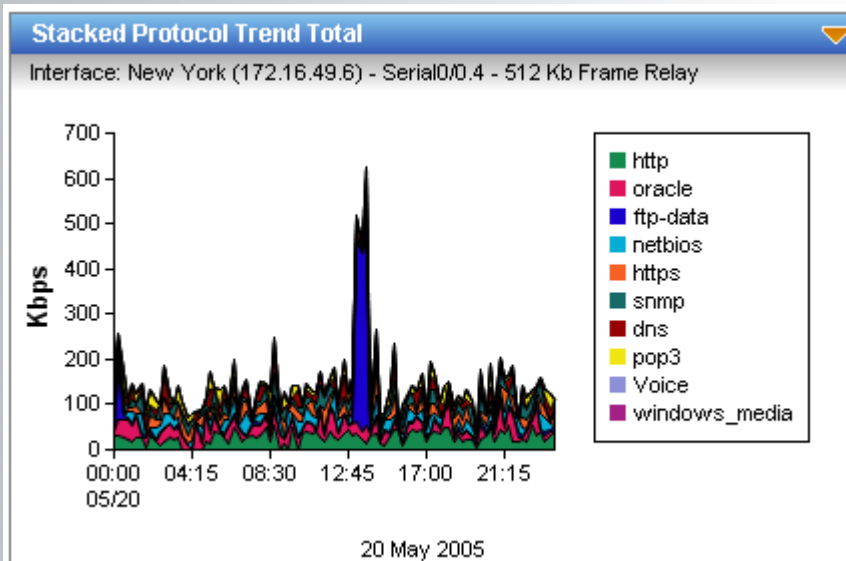
Interfaces Over Threshold						
■ Utilization >= 90.00% ■ Utilization >= 50.00% for 25.00% of reporting period						
Status	Interface	Traffic Direction	Speed (bps)	Avg. Util	Percent Time Util >= 50.00%	Percent Time Util >= 90.00%
■	Houston (10.2.176.127) (172.14.250.33) - Serial0/0.5 - T1	Out	1.54 M	92.88 %	98.91 %	87.92 %
■	Houston (10.2.176.127) (172.14.250.33) - Serial0/0.5 - T1	In	1.54 M	68.00 %	63.07 %	62.18 %
■	Houston (10.2.176.127) (172.14.250.33) - ATM1/0.5-aal5	Out	256.00 K	29.70 %	36.63 %	6.73 %
■	New York (172.16.49.6) - Serial 0/0 - T1 Link	Out	1.54 M	27.13 %	36.24 %	0.00 %
■	Houston (10.2.176.127) - POS0/1 - OC-3	In	155.00 M	26.19 %	32.57 %	5.64 %
■	Houston (10.2.176.127) (10.1.176.127) - VLAN 101 - Finance	Out	1.00 G	23.12 %	30.99 %	5.25 %

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20 May 2005




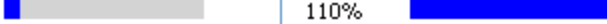




What Is Going On Out There?

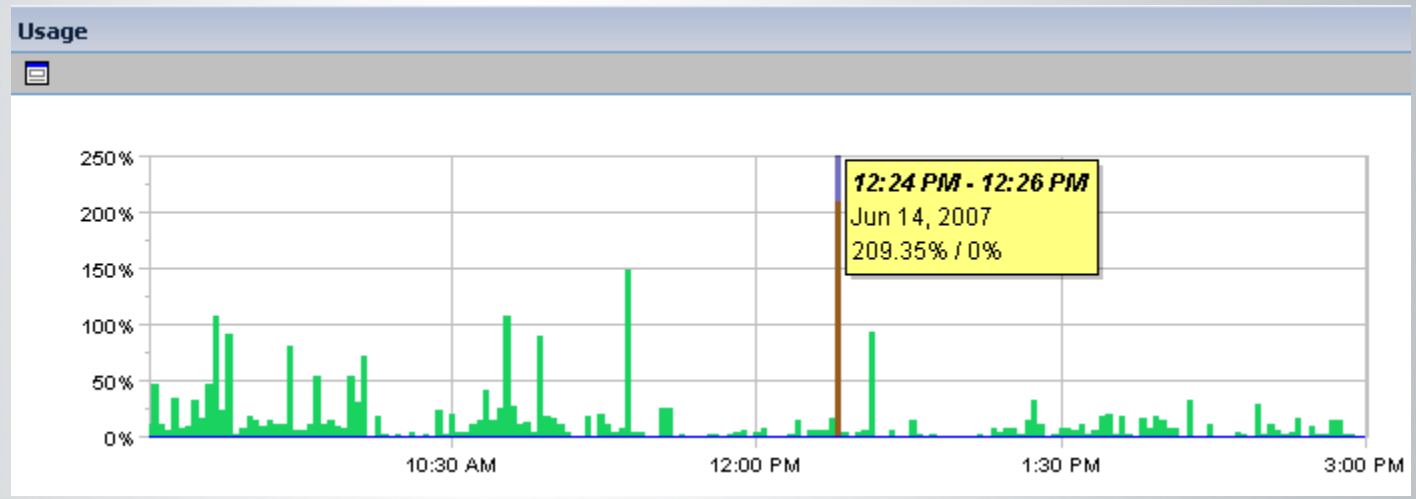
- One of the most basic, but often difficult question asked is, “Which site is the busiest, who is using the most bandwidth and what application is running?”



Which?

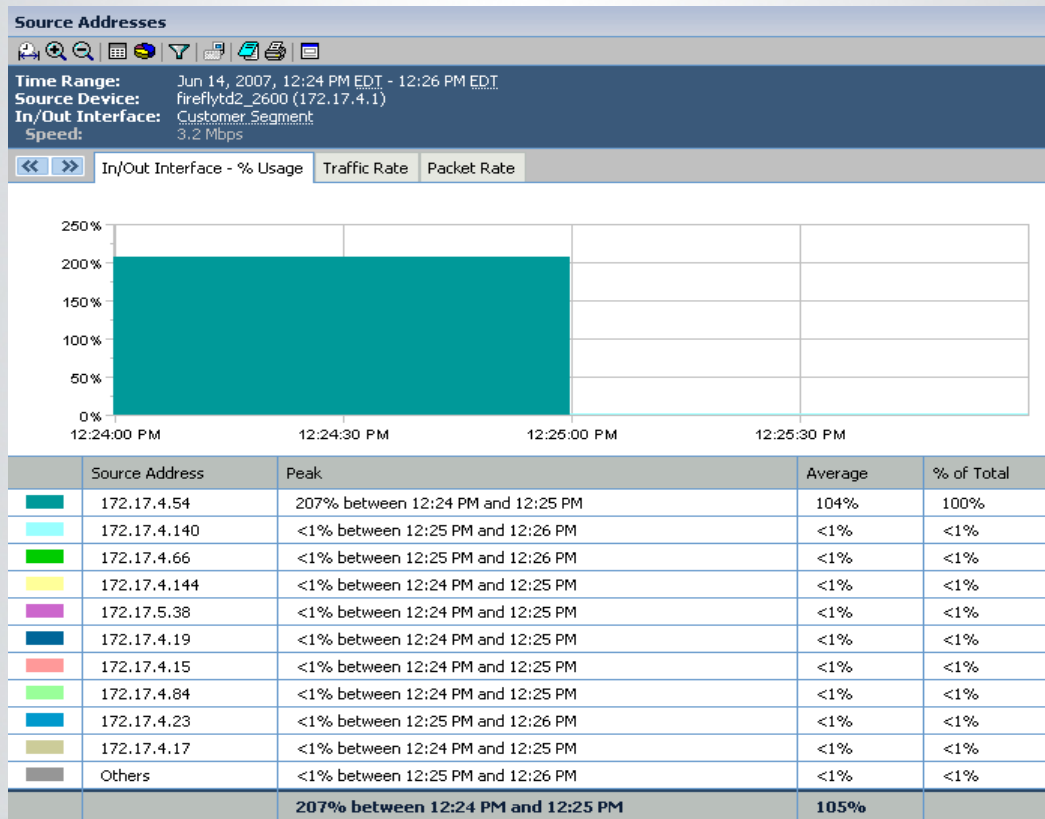
- One of the most basic, but often difficult question asked is, “Which site or interface is the busiest?”
- In this example the Inbound Customer Interface is the busiest.

Top Interfaces by % Usage				
Device Name	Interface	Dir.	Avg. % Usage	Peak % Usage ▾
fireflytd2_2600	Customer Segment	In	15% 	209% 
fireflytd2_2600	Internet - IASL	Out	8% 	110% 
fireflytd2_2600	Customer Segment	Out	0% 	<1% 
fireflytd2_2600	Internet - IASL	In	0% 	0% 



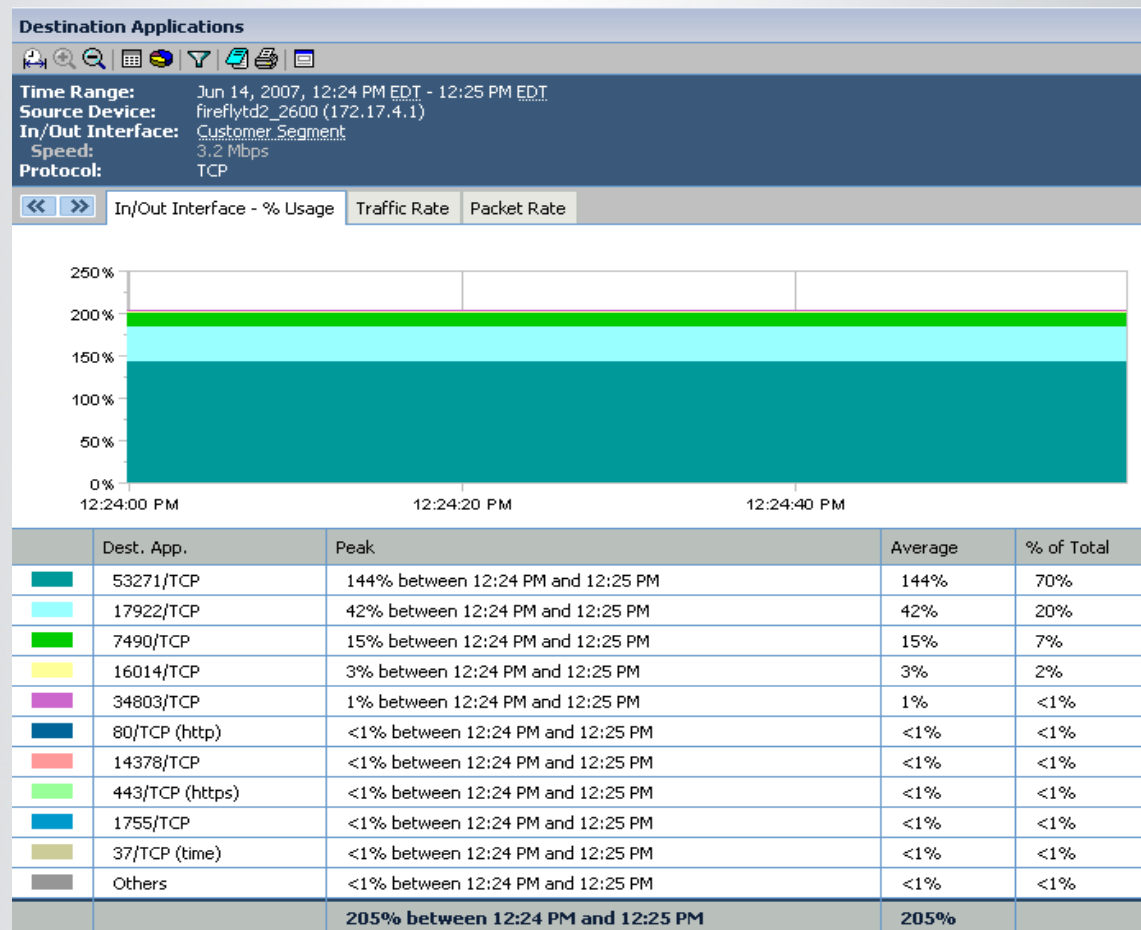
Who?

- After Which, the next question asked is, who is using the most bandwidth?”
- In this example 172.17.4.54 is responsible for 100% of the traffic.



What?

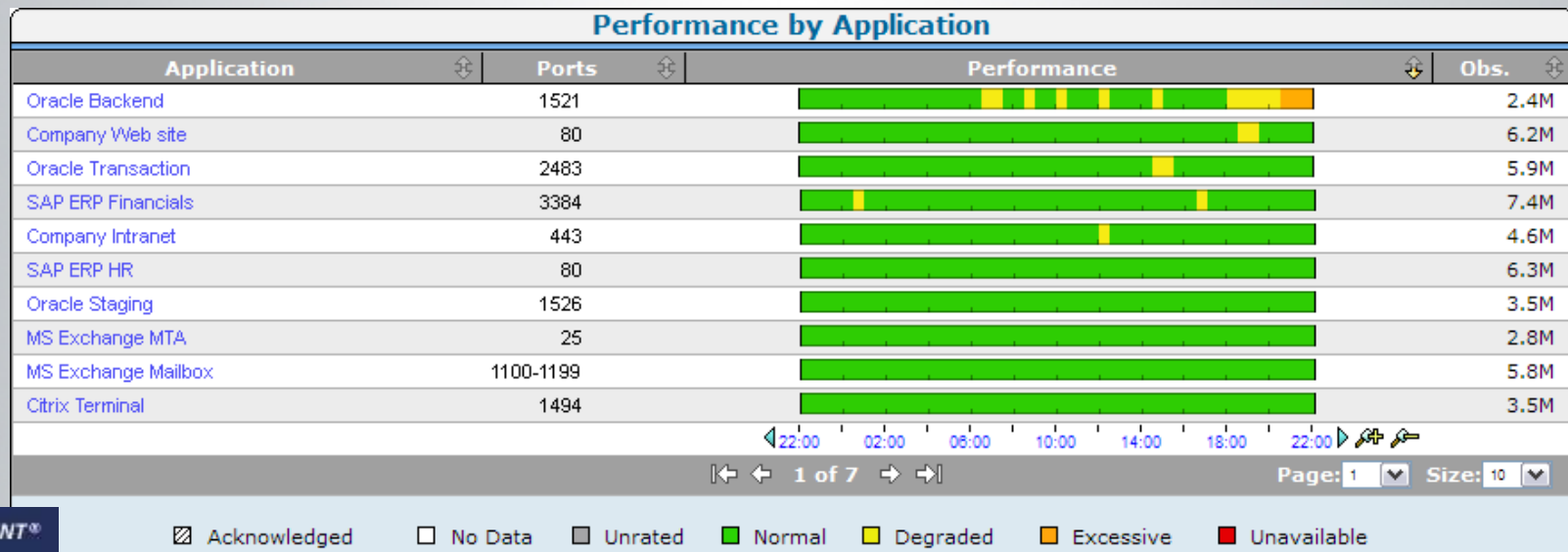
- The last question is, “What application are they running?”
- In this example the TCP application port number is 53271, or Bittorrent.



1. Solve Application Problems Faster

Situation

- IT Operations does their daily check to look for performance problems within the network infrastructure
- They notice performance on the Oracle database server starting to show excessive performance over the past 10 minutes
- They want to quickly understand the cause of the problem and how widespread the effect of the slowdown is for users.

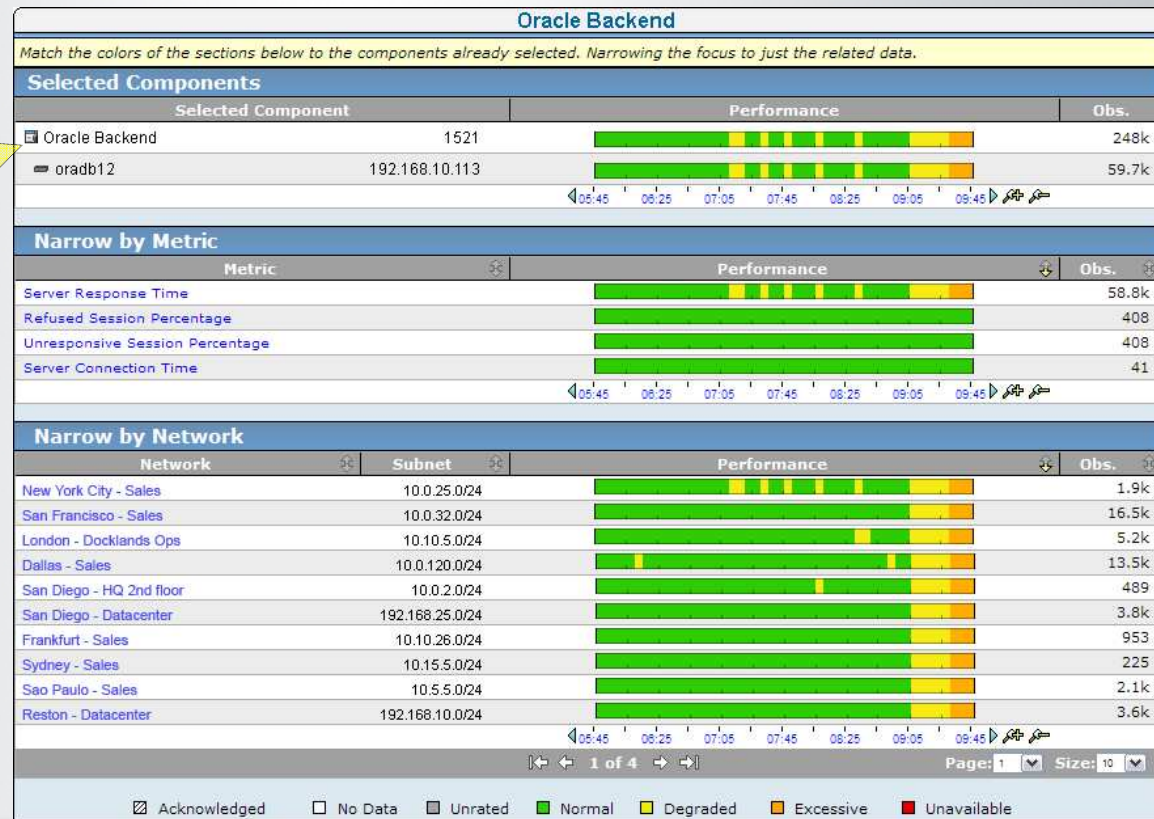


Solve Application Problems Faster (continued)

Isolation

- Quickly visualize the scope of the problem
- Identify the recency, duration, severity, and pervasiveness of your performance problem

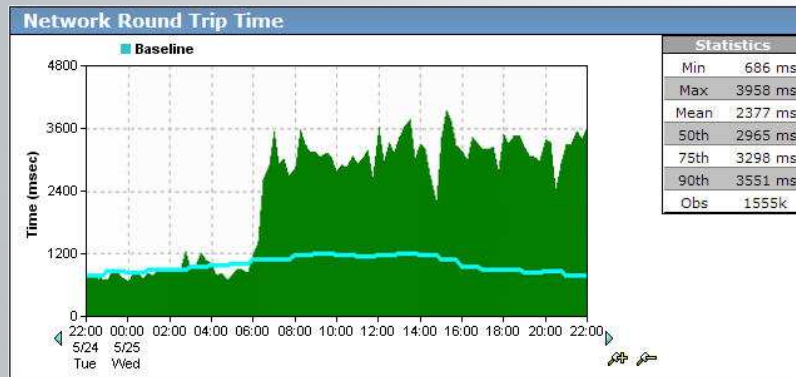
Oracle database server shows degraded and excessive server response time issues across multiple networks for the past 40 minutes



2. Solve Network Problems Faster

Issue

- Users in the Raleigh, NC office are complaining that everything seems slow



Trace Route Investigation 10/27/2004 16:41 CDT

Name	Address	Paths	Avg Delay	Protocol
Durham NC - 56k	172.15.215.0	1	> 3158 ms	TCP @ Port 80

Path	Hops	Min Delay	Max Delay	Avg Delay	Usage
1	4	3123 ms	3214 ms	3158 ms	100%

Trace Route Chart

Trace Route Table

#	Device		Delay		Performance		
	Name	Hop	Total	CPU	Memory	Report	
1	172.18.45.254	1.0 ms	1.0 ms	2.1%	2%		
2	172.18.22.1	2.5 ms	3.5 ms	2%	0.2%		
3	172.15.215.1	3,140.1 ms	3,143.5 ms	10%	10.98%		
4	172.15.215.22	15.0 ms	3,158.5 ms	2%	2.91%		

Solve Network Problems Faster (continued)

Result

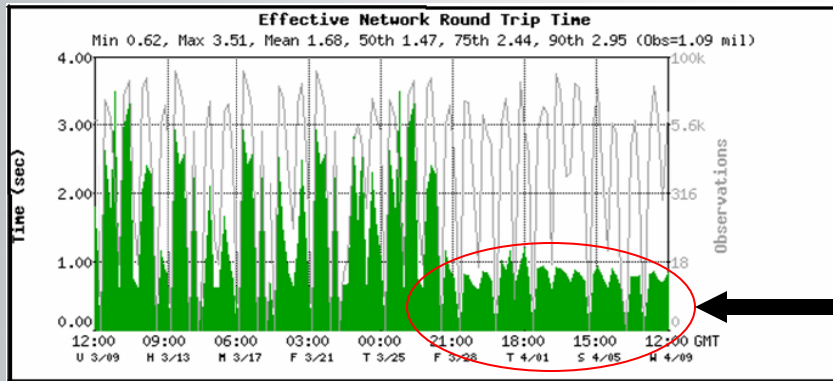
- ✓ SuperAgent detected network slowdown
- ✓ SuperAgent launched an investigation
- ✓ Trace Route and SNMP information immediately identifies an over-utilized link
- ✓ Network Engineer used ReporterAnalyzer™ to understand traffic flow on that link

Device		Performance	
Name	Address	Cpu	Memory
172.15.215.1	172.15.215.1	10%	11%
Agent Name: HQ			
Description: Cisco Internetwork Operating System Software IOS (tm) 3600 Software (C3640-JS-M), Version 12.3(9), RELEASE SOFTWARE (fc2) Copyright (c) 1986-2004 by cisco Systems, Inc. Compiled Fri 14-May-04 13:16 by dchih			
Up Since: 9/28/2004 5:35:26 PM			
Sampled Over: 60 seconds			
Free Memory		58.6 MB	
CPU Usage (Last minute)		10%	
CPU Usage (Last 5 minutes)		11%	
Serial 1/0			
IP Address	172.15.215.1	Bits/sec	1282.6 K
Physical Address	000196FD52C0	Packets/sec	143
Status	Up	Errors	1
Speed	1.5 Mbit/s	Discards	0
Ethernet1/0			
IP Address	192.168.0.250	Bytes/sec	0
Physical Address	000196FD52D0	Packets/sec	0
Status	Down	Errors	0
Speed	10.0 Mbit/s	Discards	0
FastEthernet2/0			
IP Address	192.168.100.254	Bytes/sec	4.2 K
Physical Address	000196FD52E0	Packets/sec	30
Status	Up	Errors	2
Speed	100.0 Mbit/s	Discards	0

Gathering the information as it occurs!

3. Validate the Impact of Change

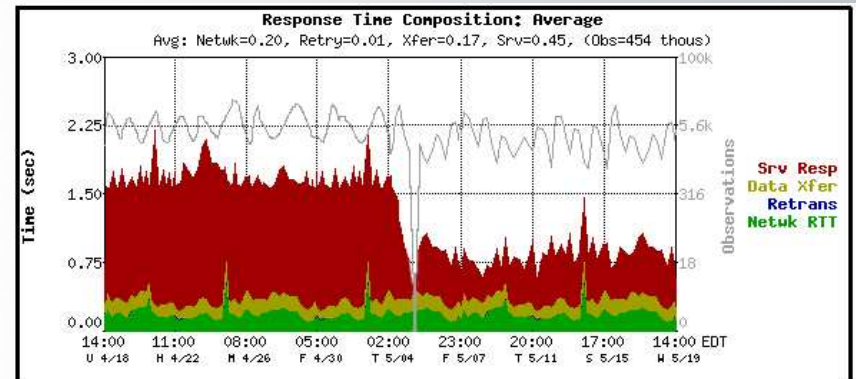
Results of QoS Changes



Proof that QoS implementation is working

Results of a Server Upgrade

Amazing what adding more RAM will do
















4. Report the Quality of Service

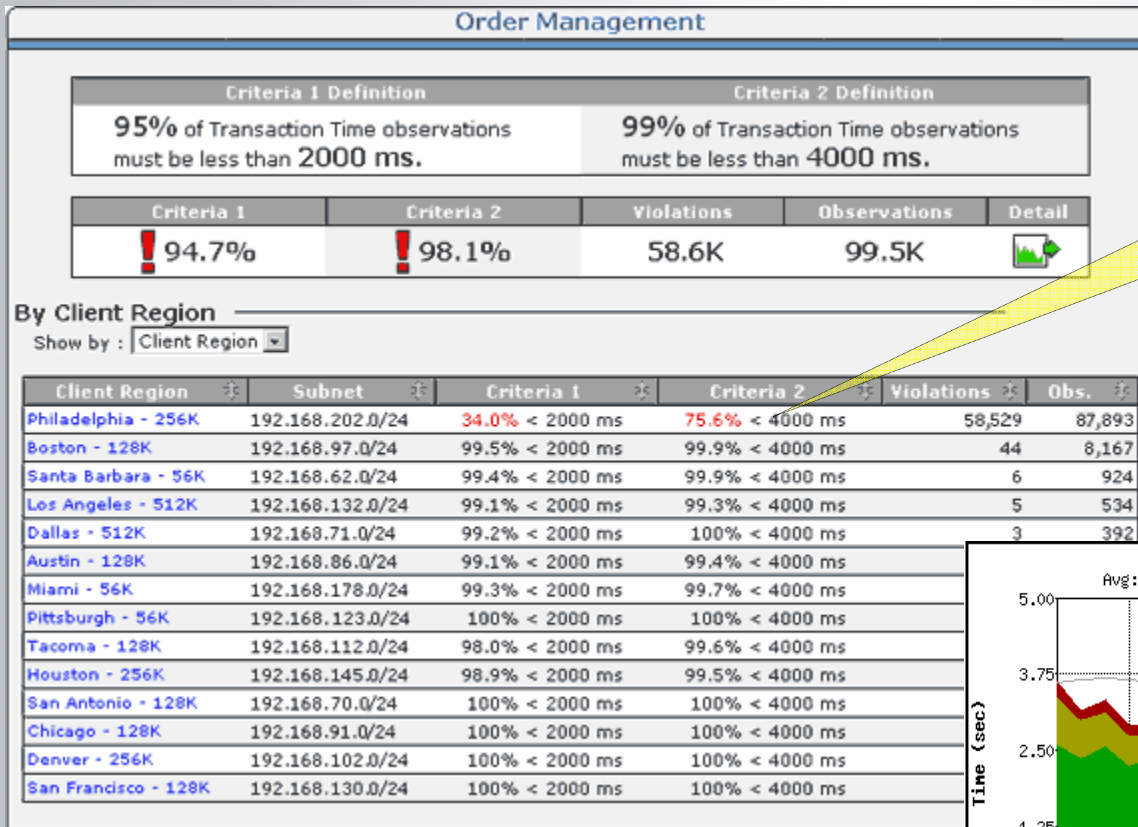
Issue

- Executives want to know that applications are available and performing according to commitments
- Management wants to understand the cause of underperforming applications

A quick high-level report detailing SLA compliance by application for a specific time period - In this case, one month.

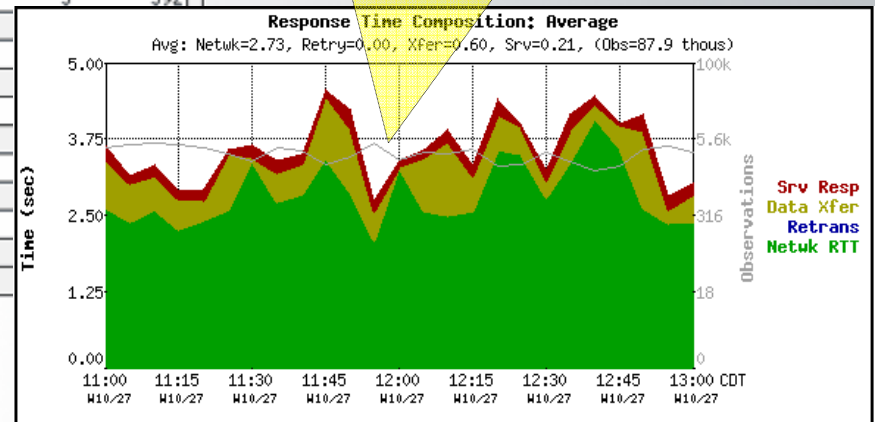
SLA Executive Summary Report	
 Print Preview	 E-Mail Report
	Transaction Time Service Levels
	10/01/2004 to 10/31/2004 CDT
	Order Management
	Exchange
	Citrix
	Peoplesoft
	Intranet-Sales
	Intranet-Help Desk
	Intranet-Operations
	Intranet-Research & Development
	Intranet

Report Quality of Service (continued)



Detail reports allow you to isolate a problem down to specific client region.

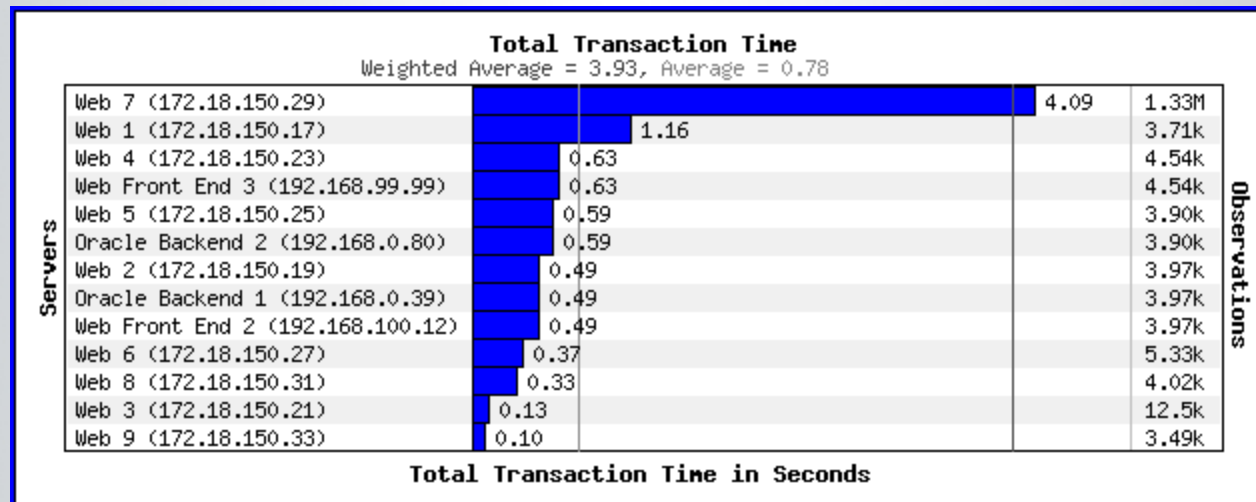
Response Time graph shows which component of the infrastructure needs to be improved in order to meet the SLA.



Metrics that make sense!

Learn about Response Time

- I always suggest you review response time charts before you run into a problem. This allows you to better understand how well applications and servers are running.
- In the example below Web 7 server has the slowest transaction time.



Fixing It A Bit At A Time

- When it come down to it, you can deploy the protocol Analyzer and find out exactly what, when and why.

Fluke Networks Optiview Protocol Expert - Detail View - [//Local/NDIS 802.3 Module (1)] - [Ndis_module1 - 100 MBPS - (Total 1825, Display 124) - Frame ID 14]

File Edit Configuration View Histogram Module Monitor Views Capture Views Tools Window Help

Capture CAP MON DSR TX

Display Filter: http.tcp.ip.ev2

FID	Delta [sec]	Size	Source	Destination	Summary
001558	0.000.028.7...	64	c26.statcounter.com	10.44.10.102	TCP SP=80 DP=2267 SEQ=185254272 ACK=1292826518 LEN=...
001559	0.000.424.6...	479	10.44.10.102	www.thetechfirm.c...	HTTP C Port=2264 GET /books/_derived/index.html_cmp_corpora...
001565	0.125.580.2...	641	www.thetechfirm.c...	10.44.10.102	HTTP R Port=2265 HTTP/1.1 200 OK
001566	0.000.649.2...	486	10.44.10.102	www.thetechfirm.c...	HTTP C Port=2265 GET /customer/_derived/CustomerList.htm_cm...
001567	0.039.178.2...	641	www.thetechfirm.c...	10.44.10.102	HTTP R Port=2264 HTTP/1.1 200 OK
001568	0.000.641.1...	488	10.44.10.102	www.thetechfirm.c...	HTTP C Port=2264 GET /customer/_derived/CustomerList.htm_cm...
001598	0.605.980.9...	692	www.thetechfirm.c...	10.44.10.102	HTTP R Port=2264 HTTP/1.1 200 OK
001599	0.000.242.2...	477	10.44.10.102	www.thetechfirm.c...	HTTP C Port=2264 GET /links/_derived/index.html_cmp_corporat1...
001615	0.169.659.8...	630	www.thetechfirm.c...	10.44.10.102	HTTP R Port=2264 HTTP/1.1 200 OK
001618	0.000.341.6...	479	10.44.10.102	www.thetechfirm.c...	HTTP C Port=2264 GET /links/_derived/index.html_cmp_corporat1...
001620	0.002.212.0...	692	www.thetechfirm.c...	10.44.10.102	HTTP R Port=2265 HTTP/1.1 200 OK
001621	0.000.278.2...	484	10.44.10.102	www.thetechfirm.c...	HTTP C Port=2265 GET /fluke_events/_derived/index.html_cmp_c...
001641	0.296.610.6...	630	www.thetechfirm.c...	10.44.10.102	HTTP R Port=2264 HTTP/1.1 200 OK
001642	0.000.155.3...	64	www.thetechfirm.c...	10.44.10.102	TCP SP=80 DP=2265 SEQ=1880282782 ACK=2817474981 LEN=...
001643	0.000.143.3...	486	10.44.10.102	www.thetechfirm.c...	HTTP C Port=2264 GET /fluke_events/_derived/index.html_cmp_c...
001644	0.001.416.3...	642	www.thetechfirm.c...	10.44.10.102	HTTP R Port=2265 HTTP/1.1 200 OK
001645	0.000.160.9...	484	10.44.10.102	www.thetechfirm.c...	HTTP C Port=2265 GET /presentation/_derived/index.html_cmp_c...
001661	0.146.823.1...	64	www.thetechfirm.c...	10.44.10.102	TCP SP=80 DP=2265 SEQ=1880283366 ACK=2817475407 LEN=...
001662	0.011.335.2...	642	www.thetechfirm.c...	10.44.10.102	HTTP R Port=2264 HTTP/1.1 200 OK

Ready... Total Frames: 1825, Packets Analyzed: 124 Arm Time: Thu Jun 14 16:36:38 2007 00:00:24 Display Filter: <http.tcp.ip.ev2> Li

Summary

- The Typical Method of Troubleshooting
- Performance - First Management – Three Layered Approach
- Key Benefits – Analyzer placement, Validate Change, Report
- Enterprise Wide Visibility
- Dig In Deeper
- Traffic Analysis
- Which? Who? What?
- Learn about Response Time
- Fixing It A Bit At A Time