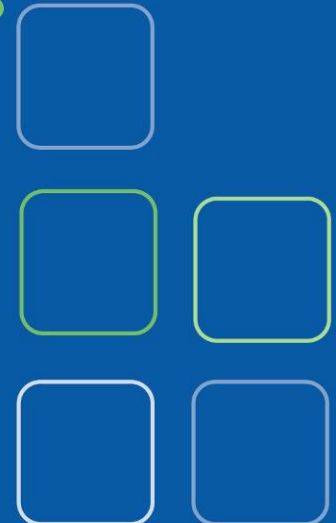


Managing and Controlling Application Performance

Steve Fulton

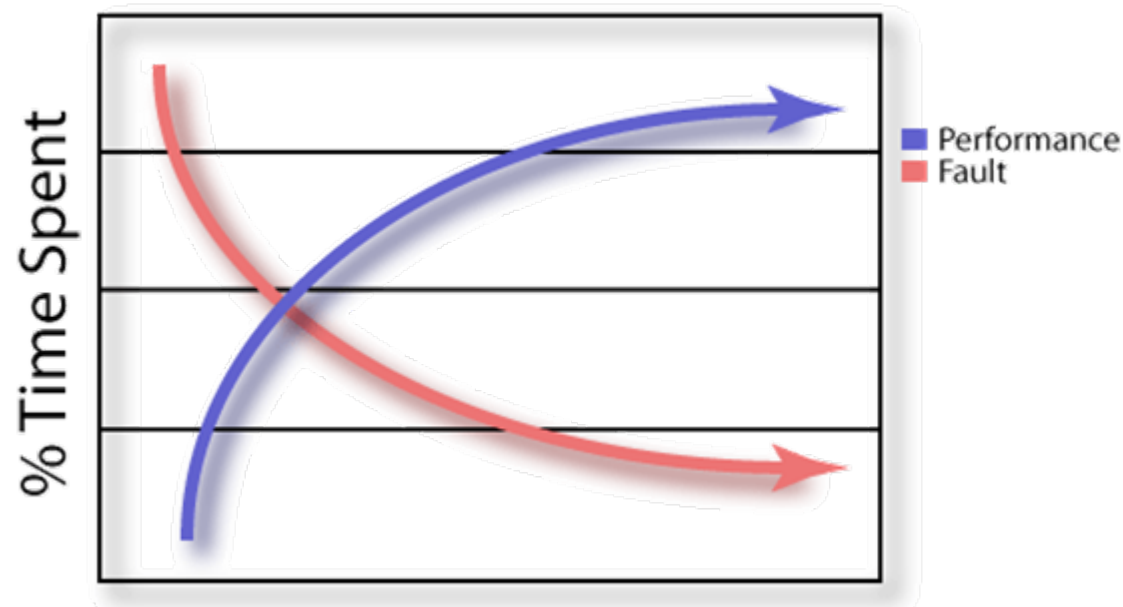
Sr. Director, Strategic Alliances



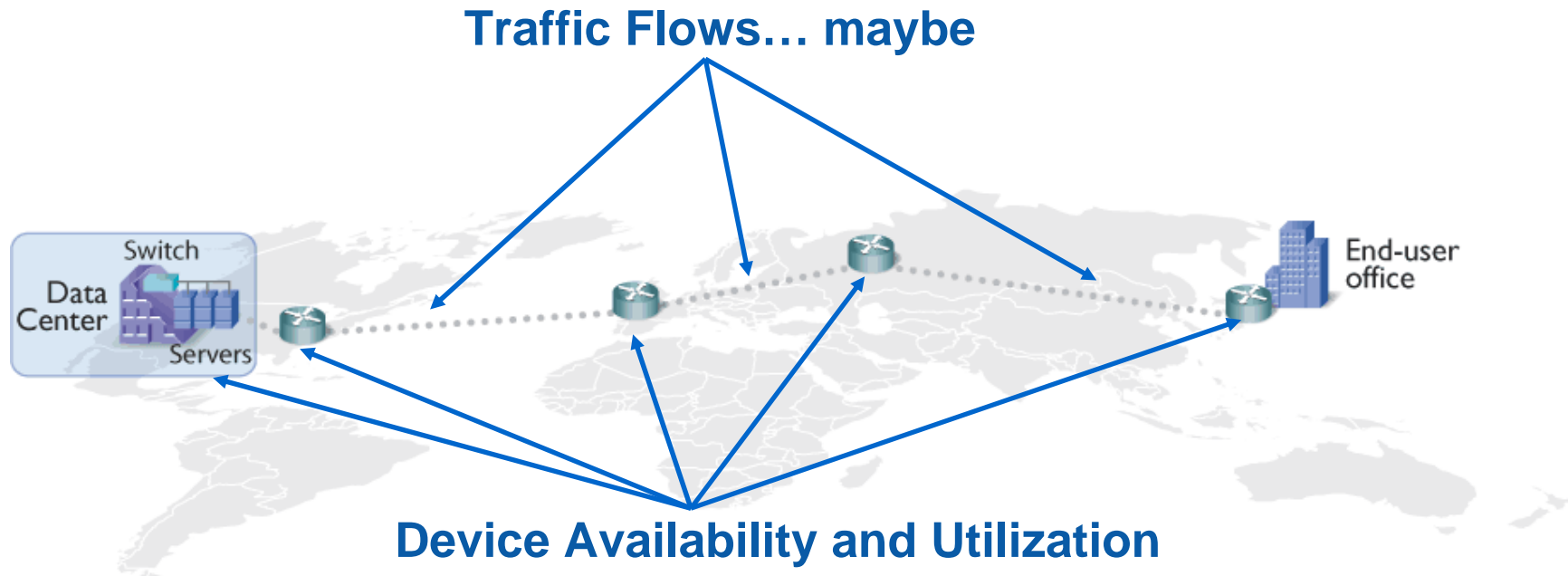
Fault vs. Performance



- Fault management has been streamlined with redundant networks, event correlation tools, etc.
- IT groups now spend more time addressing performance problems than faults



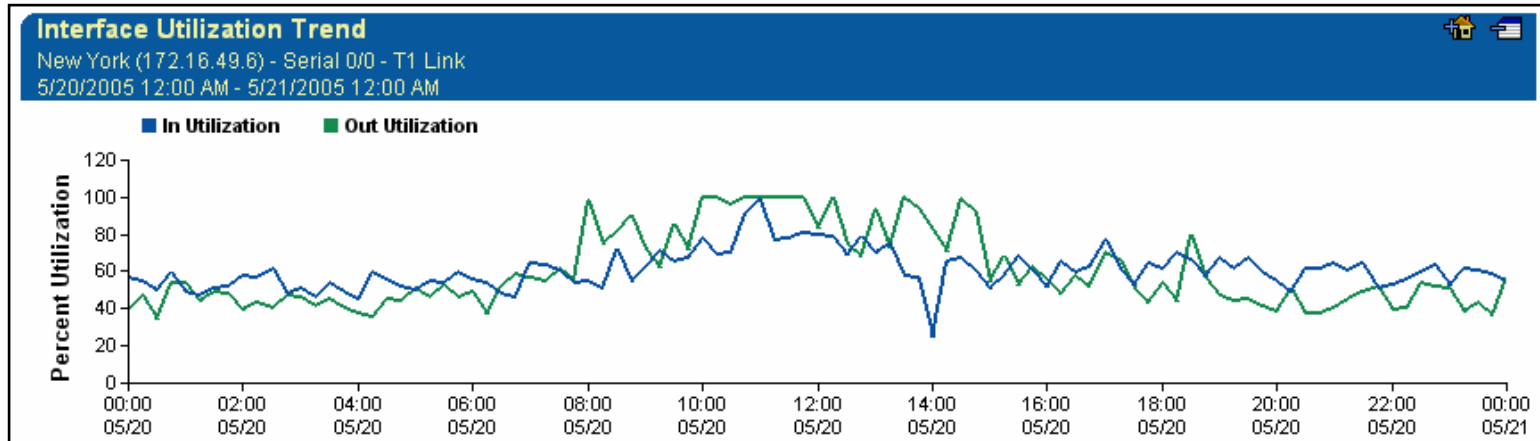
Traditional Network Management



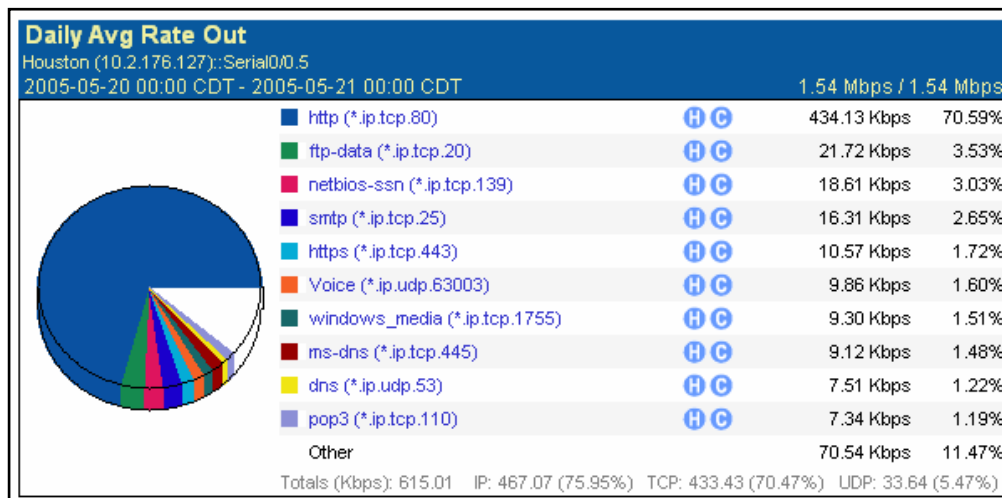
Utilization Is a Poor Proxy



- Should this circuit be upgraded?



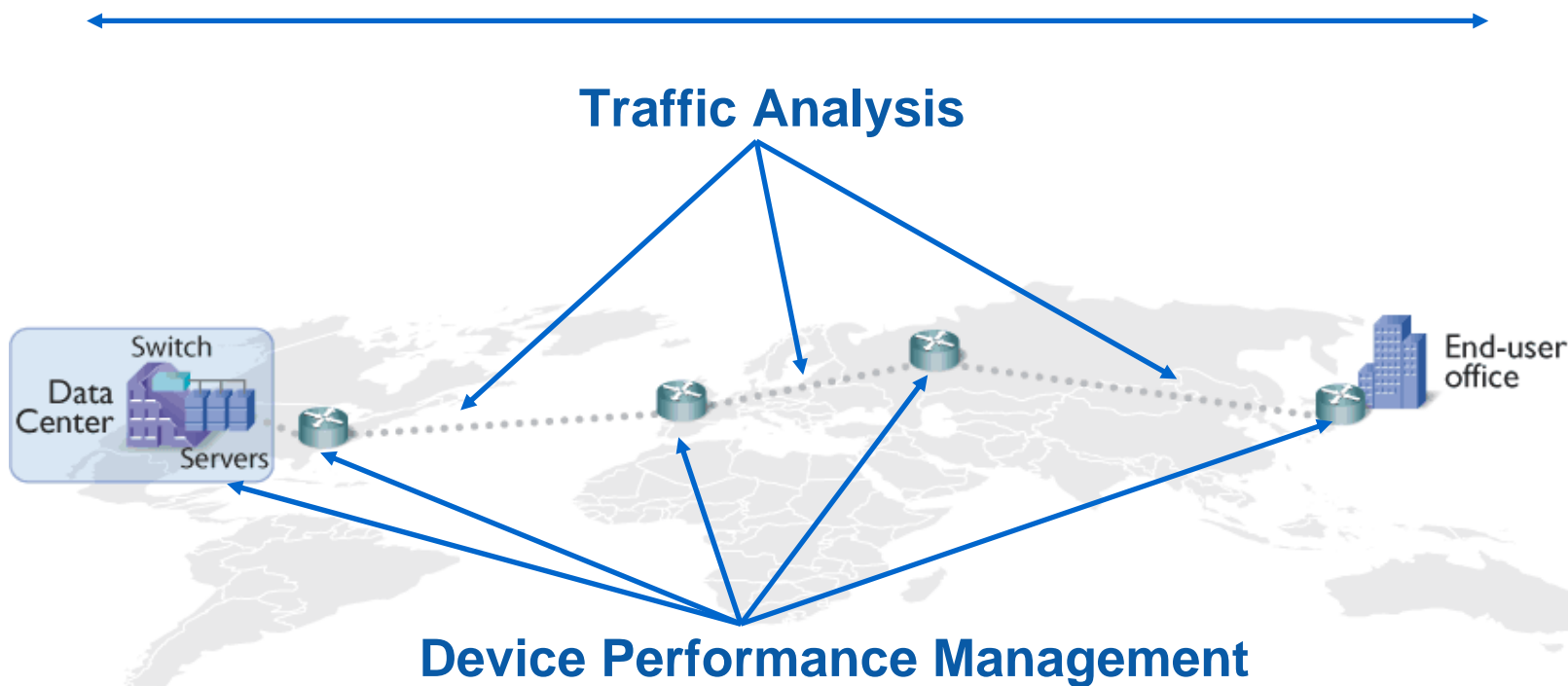
- How about now?





- The network infrastructure exists to ensure applications (services) are delivered efficiently to meet the business' needs
- Utilization and traffic flow statistics do not measure the end-user experience
- High utilization is only a problem if response time degrades (i.e. WAN Optimization)
- The best indication of how the application is performing for the end-user is to measure response times

End-to-End Performance Monitoring





- WAN Optimization – broad “umbrella” term
 - Products that broadly accelerate the performance of applications via a suite of techniques
 - Application-specific optimizations (caches)
 - QoS techniques: queueing, policing, shaping, etc.
 - Data compression
 - Data suppression/object-level caching
 - TCP optimizations (e.g., dynamic selection of standard options, proprietary protocol improvements)
 - Tunnels (pool sessions from 1 or more applications, replacing host/server IP addresses with those of the optimizers and usually using a different port from the original application)
 - All of these techniques can affect visibility
 - Usually sold as appliances operating in pairs



- Established
 - Blue Coat
 - Cisco WAAS
 - Citrix
 - Expand
 - F5
 - Juniper
 - Packeteer
 - Riverbed
- Niche
 - Certeon
 - Converged Access
 - Exinda
 - ICT
 - Ipanema
 - Silver Peak
 - Stampede
 - Streamcore
 - Etc...



- Distributed organizations
- End users demand consistent application performance
- Avoid unnecessary WAN expenditures
- Tighter IT budgets
- Improve performance of business-critical applications with WAN optimization tools

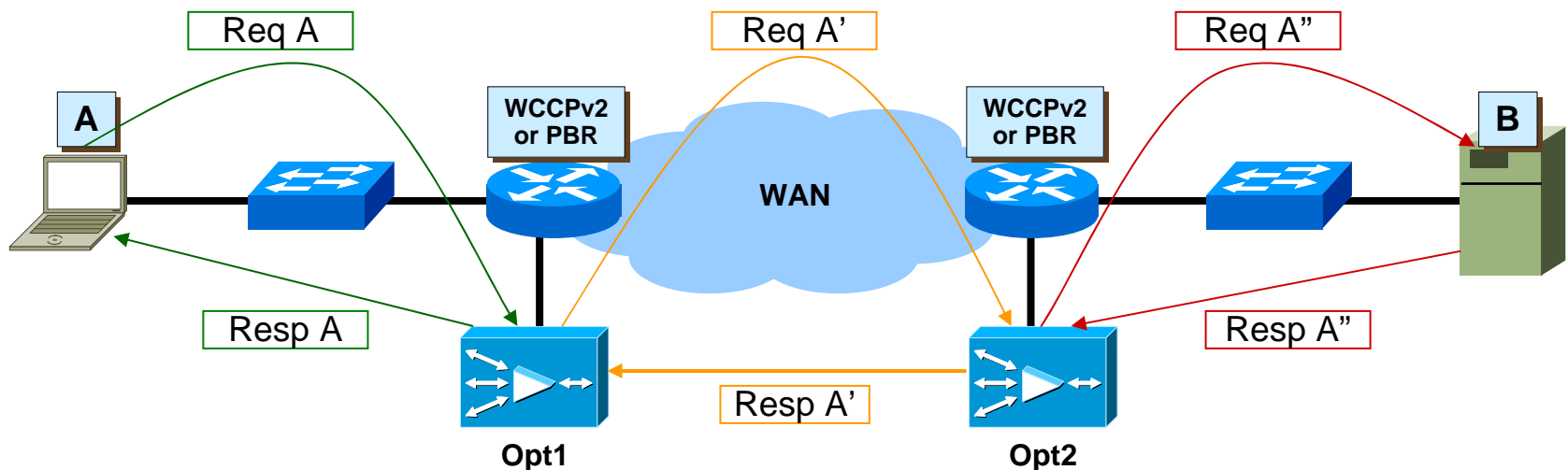
vs.

- Consolidated infrastructure
- Applications designed for the LAN must now traverse the WAN
- Improve application response times
- Improve performance
- Accurately quantify performance before and after WAN optimization is deployed

The WAN Optimization Challenge



- WAN Optimization breaks the TCP session between client and server into 3 segments:
 - Segment 1: Between the client and the remote WAN Optimization device
 - Segment 2: Between the 2 WAN optimization devices over the WAN
 - Segment 3: Between the central WAN optimization device and the server



Performance Maps



Performance by Application				
Application	Port(s)	Transaction Time		Observations
Wtd. Average: 4.93 sec Average: 4.99 sec				
CRM NonOptimized (Client Exp)	23	6.81 sec		220
CRM Optimized (Client Exp)	81	3.16 sec		233

Quantify application performance before and after WAN Optimization is deployed

Performance by Application				
Application	Port(s)	From Server Bytes		
Average: 11.15 MB				
CRM NonOptimized (WAN Perf)	10023	20.98 MB		
CRM Optimized (WAN Perf)	10081	1.32 MB		

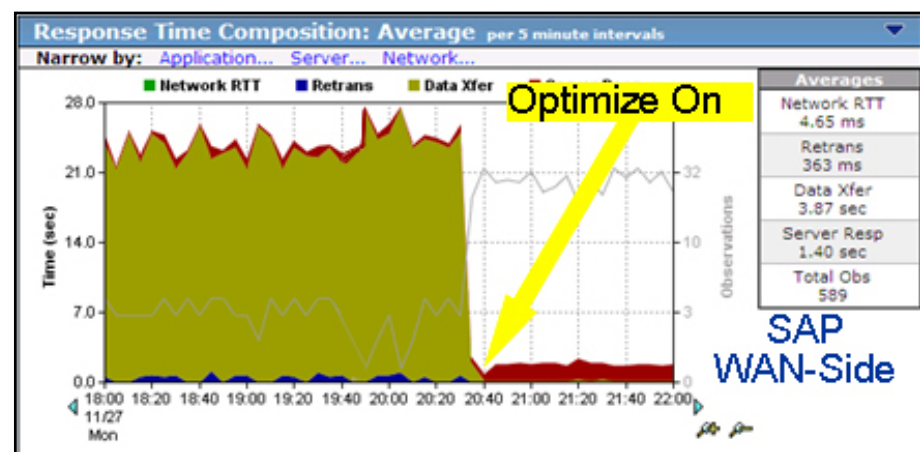
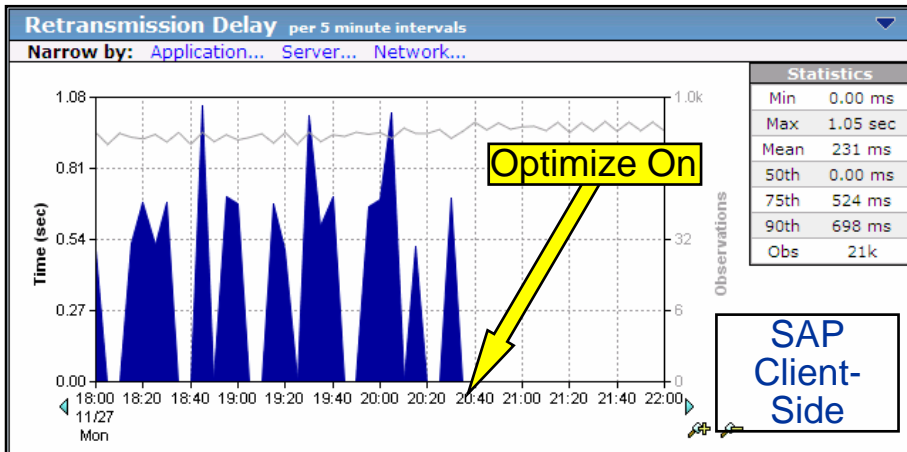
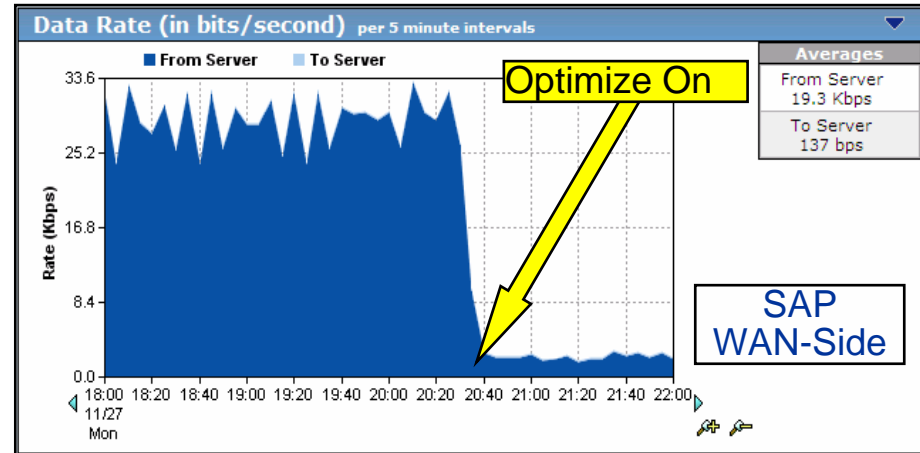
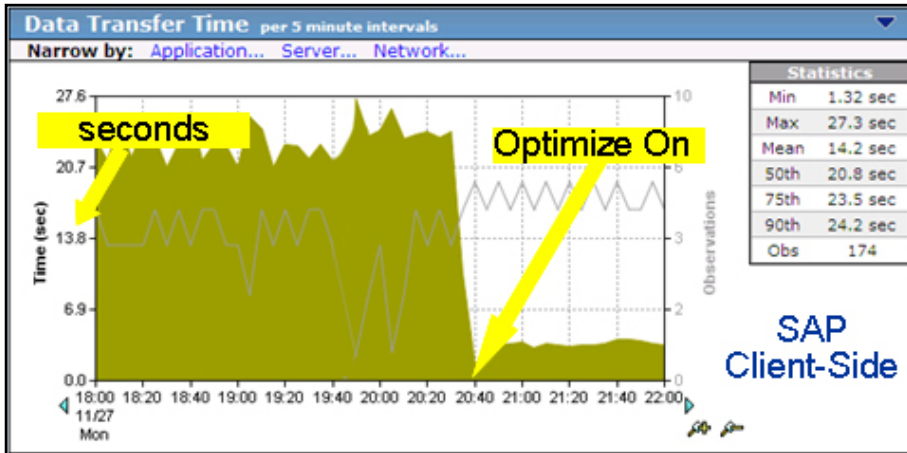
Daily Network Round Trip Time by Network Next >
Results Sorted By Measurement Descending
1 to 10 of 87 Networks are listed
 Application: SAP Web
 Server: All Servers
 Network: All Networks
 May 20 2005 00:00:00 CDT - May 21 2005 00:00:00 CDT

Identify network locations that would most benefit from a WAN Optimization deployment

Network Round Trip Time				
Weighted Average = 358.58, Average = 48.39				
Singapore - 172.15.92.128	424.92	3.13M		Observations
Vancouver - 172.18.125.64	300.61	3.09k		
Nome AK - 172.15.227.192	247.04	16		
Mobile AL - 172.15.187.64	157.19	1.87k		
Worldwide Users - 172.18.139.192	154.52	78		
Mexico City - 172.18.138.128	126.47	13.2k		
El Paso TX - 172.15.193.128	109.77	3.15k		
Development Lab - Austin - 172.15.148.0	108.85	7.03k		
Worldwide Users - 172.18.130.64	101.84	6.24k		
Dayton OH - 172.15.179.0	96.63	2.09k		

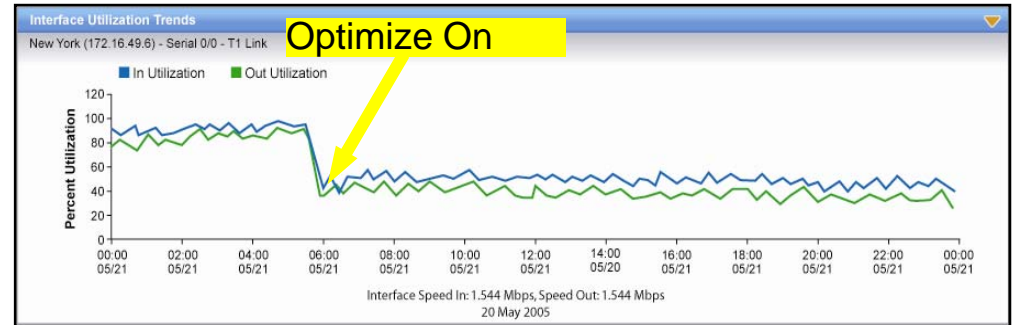
Network Round Trip Time in Milliseconds

Response Times with WAN Optimization

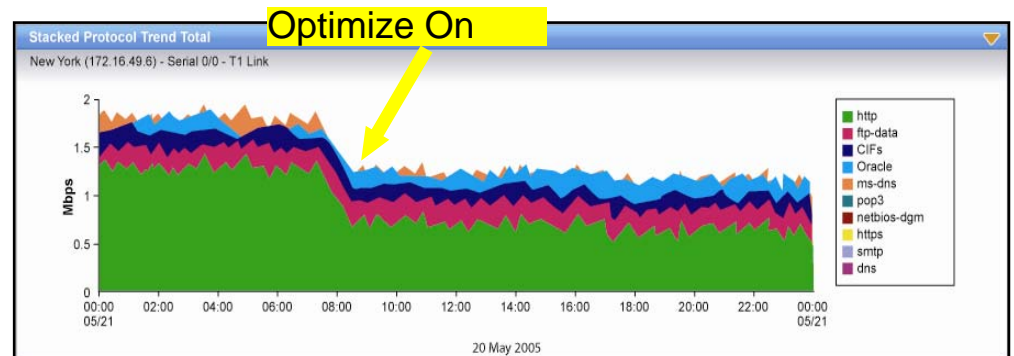


Traffic Distribution with WAN Optimization

- Utilization before/after WAN Optimization



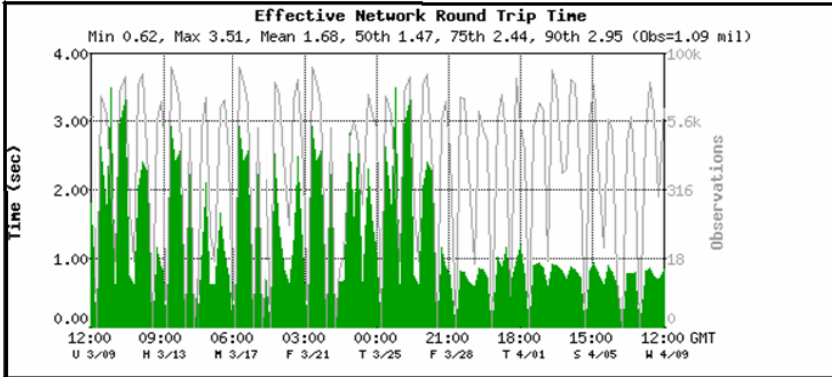
- Protocol distribution before/after WAN Optimization



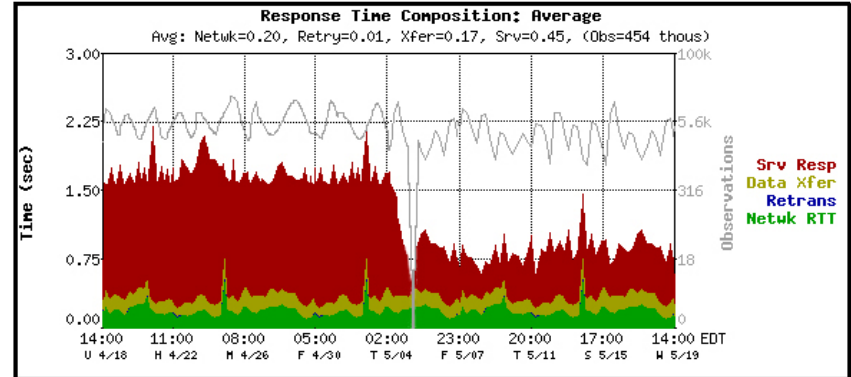
Mitigate the Risks of Change



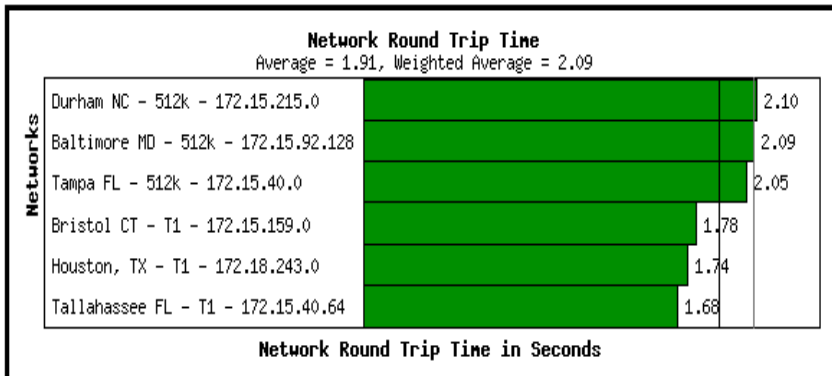
1. Document the results of QoS changes



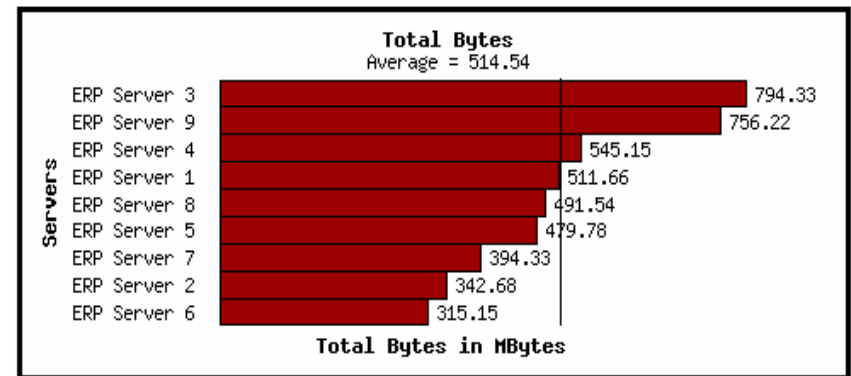
2. Prove the value of a server upgrade



3. Compare network latency across sites



4. Evaluate the performance of a load balancer





- Whether or not customers have deployed WAN Optimization, everyone still needs visibility – for exactly the same reasons as before
 - Intelligent planning: e.g., data center consolidation, new deployments, or normal planning for growth
 - Optimizing resources: e.g., users still need to access local rather than remote replication servers
 - Rapid/Proactive troubleshooting: e.g., software upgrade to gateway results in widespread issues
 - Quantifying change: e.g., measuring benefit of WAN Optimization



- From fault to performance
- Managing the Network for Application Performance
 - End-to-End Performance
 - Traffic Analysis
 - Device Performance
- Visibility Remains Crucial
 - WAN Optimization, MPLS, VoIP, Application Rollouts, etc.