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# WAN Optimization:

An Accenture point of view on optimizing data centers through application acceleration

Stuart Taylor, September 2009



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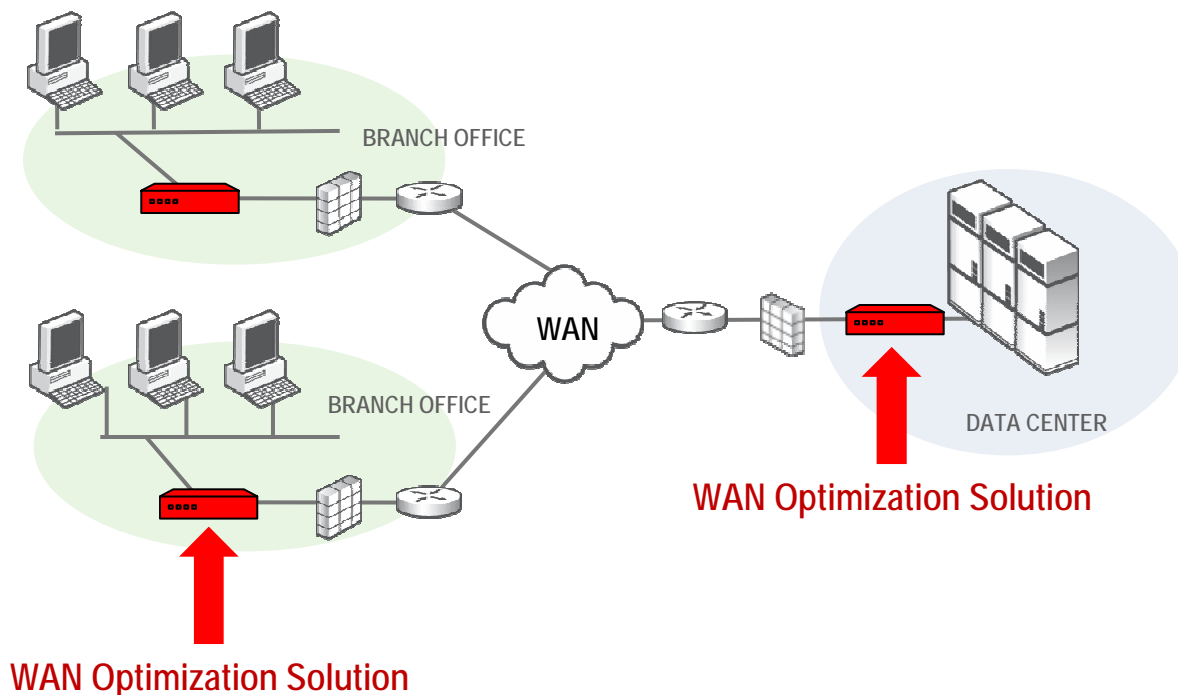
- What is WAN Optimization?
- Drivers, Challenges and Business Case
- WAN Optimization Technology
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- Case Study

# What is WAN Optimization?

WAN optimization is a technology designed to **improve application performance** by **increasing throughput** and **decreasing latency**



It is a **symmetrical technology** which requires hardware or software on both ends of the link to achieve **end-to-end optimization**



Optimized data center through optimizing application services to make better use of the network resources using ...

... an integrated long-term WAN Optimization solution





# Why do we care about WAN optimization?

## Data Center Consolidation



## Cloud Computing

IaaS / PaaS / SaaS

## Virtualization

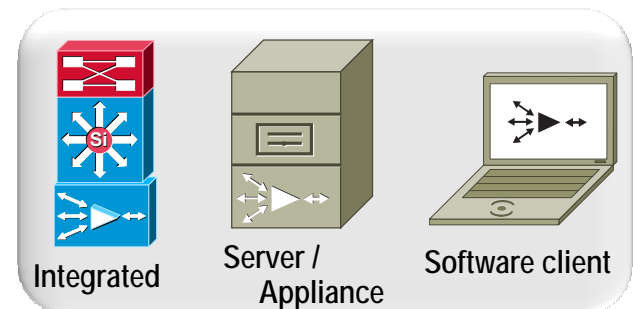


## Network Application View



## Common WAN Optimization Use Cases

1. Accelerate applications
2. Optimize bandwidth
3. Speed data migration
4. Consolidate IT Infrastructure
5. Optimize backup and replication
6. Improve disaster recovery
7. Meet customer SLAs
8. Support virtualization initiatives
9. Network visibility and application performance management

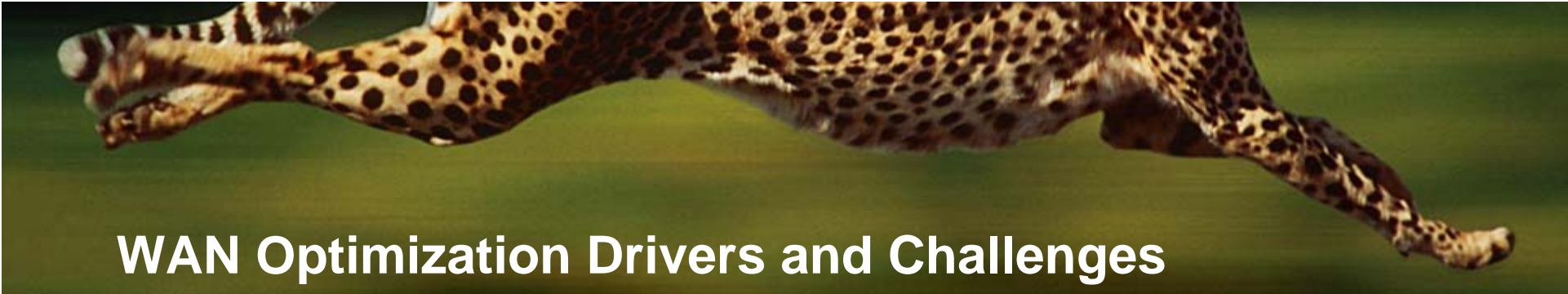




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# WAN Optimization Drivers and Challenges

Organizations are struggling to manage application performance and reduce network spend, as architectural paradigms shift and cost pressures increase

Drivers		Challenges		Benefits	
Applications are being upgraded to <b>Web-based</b> versions for easy distribution to remote workers, customers, and partners	<b>Performance problems</b> typically will occur as file and application servers become more centralized and <b>network congestion</b> and <b>latency</b> increases			<b>Less Equipment</b>	<ul style="list-style-type: none"> <li>Consolidation enables fewer servers, with higher utilization</li> <li>Avoid upgrading the network infrastructure</li> </ul>
<b>Disaster recovery</b> is spurred on by the maturation of IP-based storage and backup software that alleviate archiving concerns for branch offices	<b>Bandwidth</b> intensive backups need to complete within certain timeframes or they will complete for production network resources			<b>Reduce and Avoid OPEX</b>	<ul style="list-style-type: none"> <li>Alleviate ongoing facilities costs</li> <li>Cut ongoing expenses, such as higher bandwidth links</li> </ul>
<b>IT consolidation</b> allows for massive centralization of file and application servers into a reduced number of global data centers	<b>Increased load</b> on the WAN links forcing costly network upgrades and increasing monthly telecom spend			<b>Better Business Processes</b>	<ul style="list-style-type: none"> <li>Collaborate more productively</li> <li>Better application performance management</li> </ul>

WAN optimization drives meaningful gains today!



## Sample WAN Optimization Business Case

Business Benefits	IT Category	Savings/Results
Less Equipment	Server Hardware Consolidation	40 - 60%
	Tape Autoloader Consolidation	50 - 75%
	Back-up Media	20 - 30 %
Reduce OPEX	Bandwidth Costs	40 – 80%
	Server Maintenance	15 - 30%
	Real Estate & Facilities Cost	25 – 40%
Better Business Process	Worker Productivity	2 - 4 hrs/month/Employee
	Application performance increase	10X - 30X

Source: Accenture internal research 2009

**Payback period typically 6 – 18 months**

### Example of factors that will affect results:

- Root cause of the performance issues
- Volume of applications and end users
- Complexity of infrastructure in terms of network, servers and geographic locations





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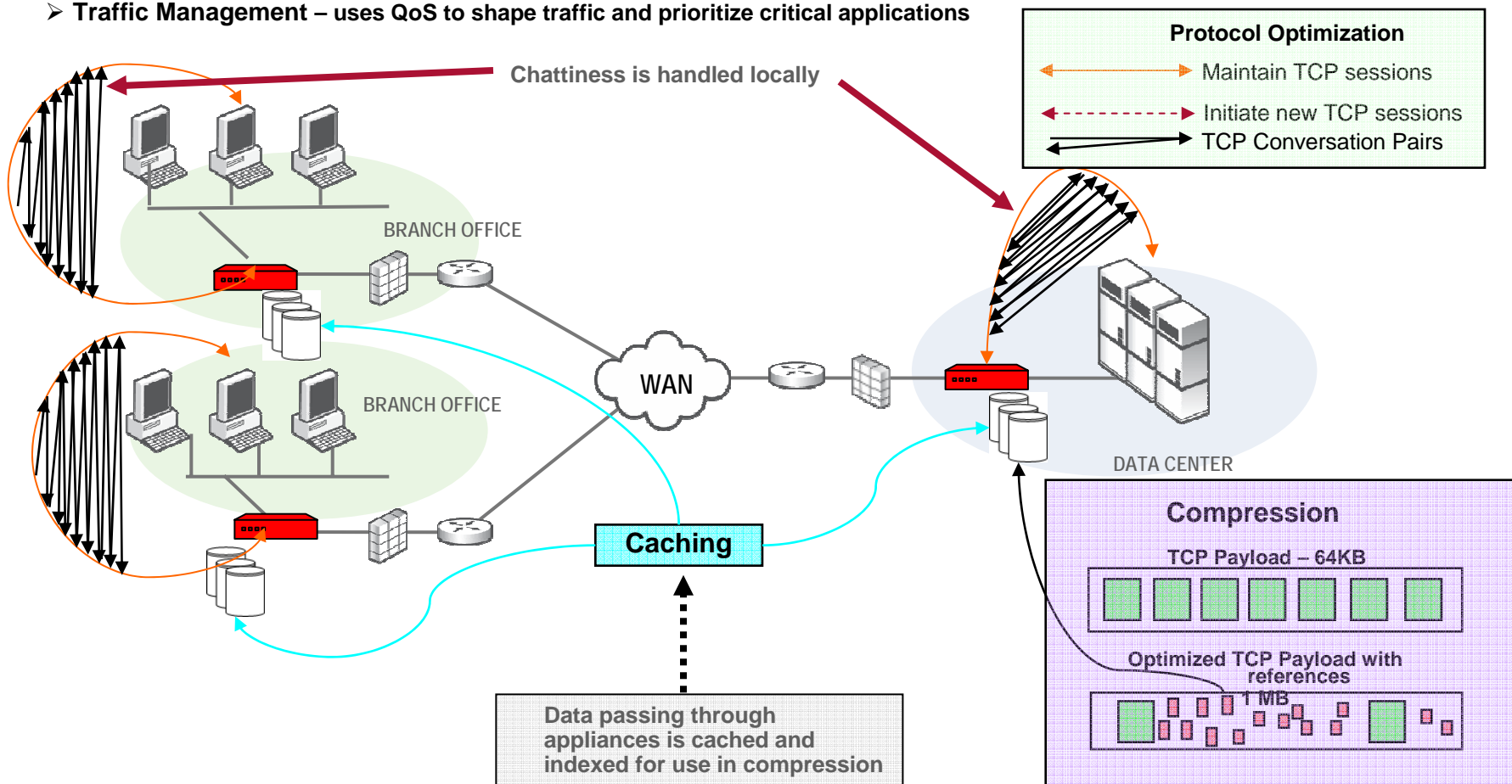
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# WAN Optimization – 4 techniques

- **Caching** – keeps local data at remote sites. Addresses throughput and latency by avoiding data transmission across the WAN
- **Compression** – removes redundant patterns in data by creating references to cached data and only transmits references
- **Protocol Optimization** – reduces latency by improving efficiency of protocols such as MAPI, CIFS, and SQL
- **Traffic Management** – uses QoS to shape traffic and prioritize critical applications

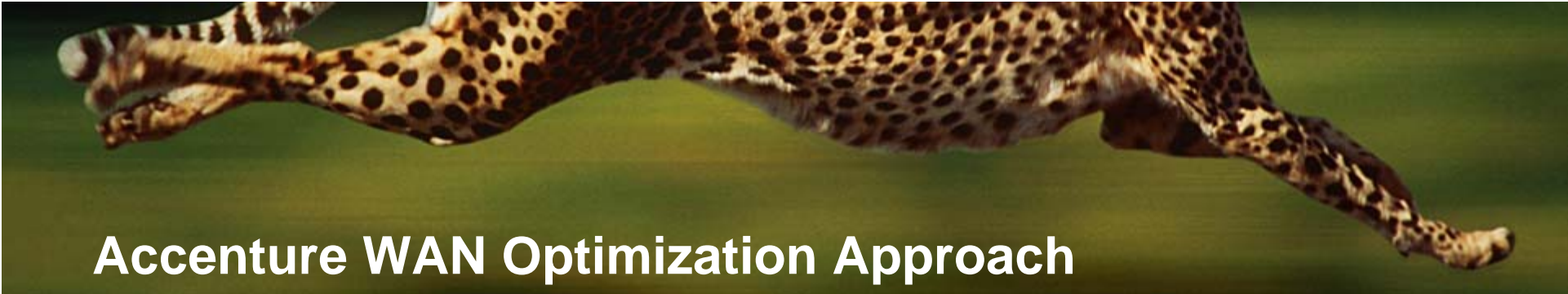




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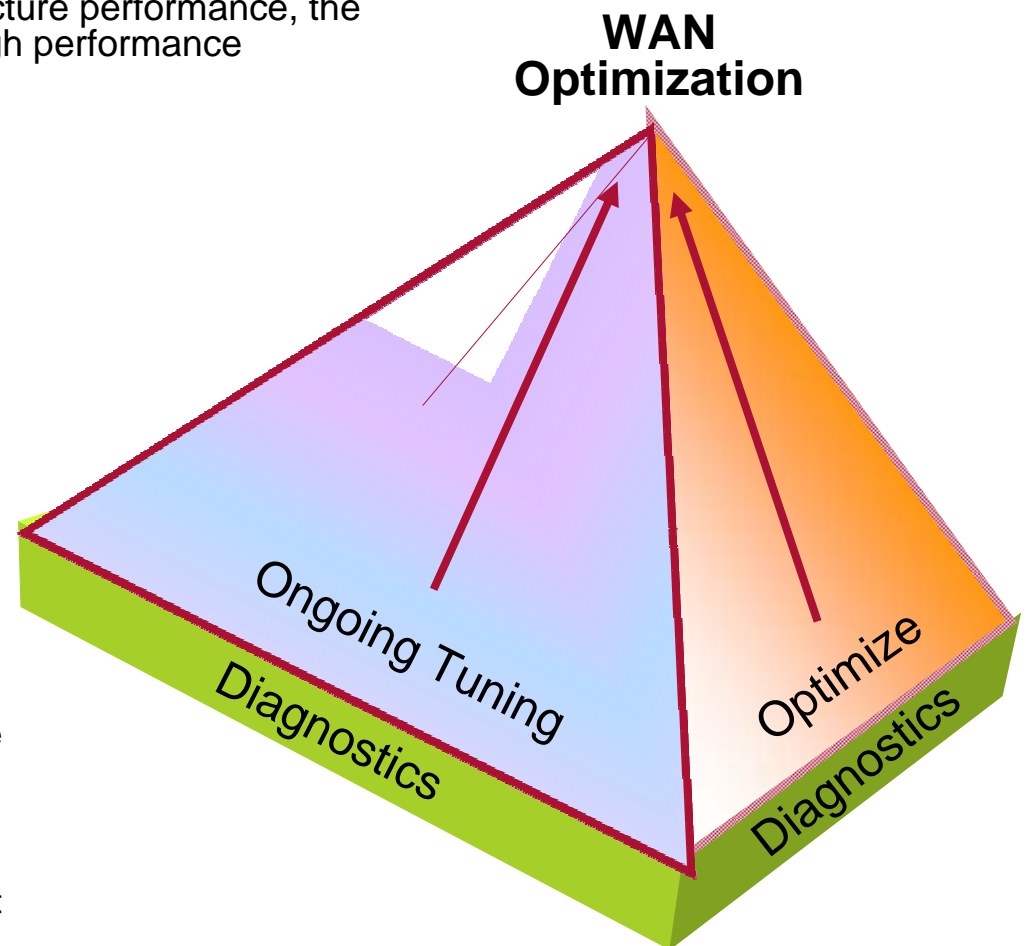


# Accenture WAN Optimization Approach

The **WAN Optimization Offering** provides a toolset, methodology and capability to quickly analyze the network infrastructure performance, the relative application performance and provide a high performance solution to meet critical business needs.

## WAN Optimization Solution Offering:

- **Diagnose** fundamental network and application behavior at the router, switch, firewall, load balancer, end-user, and associated network node(s) to **baseline existing performance** bottlenecks and establish consistent measurable metrics so performance improvements can be quickly implemented.
- **Optimize the performance** of the network architecture by **rationalizing** the existing application performance as it relates to the network architecture and existing business process to align required performance enhancements with tactical and strategic business goals by leveraging the performance optimization framework.
- **Ongoing Tuning** the newly designed environment on an ongoing basis via **monitoring and measurement** to ensure it stays within the required SLA/SLM's and meets the evolving and dynamic business needs of the enterprise.





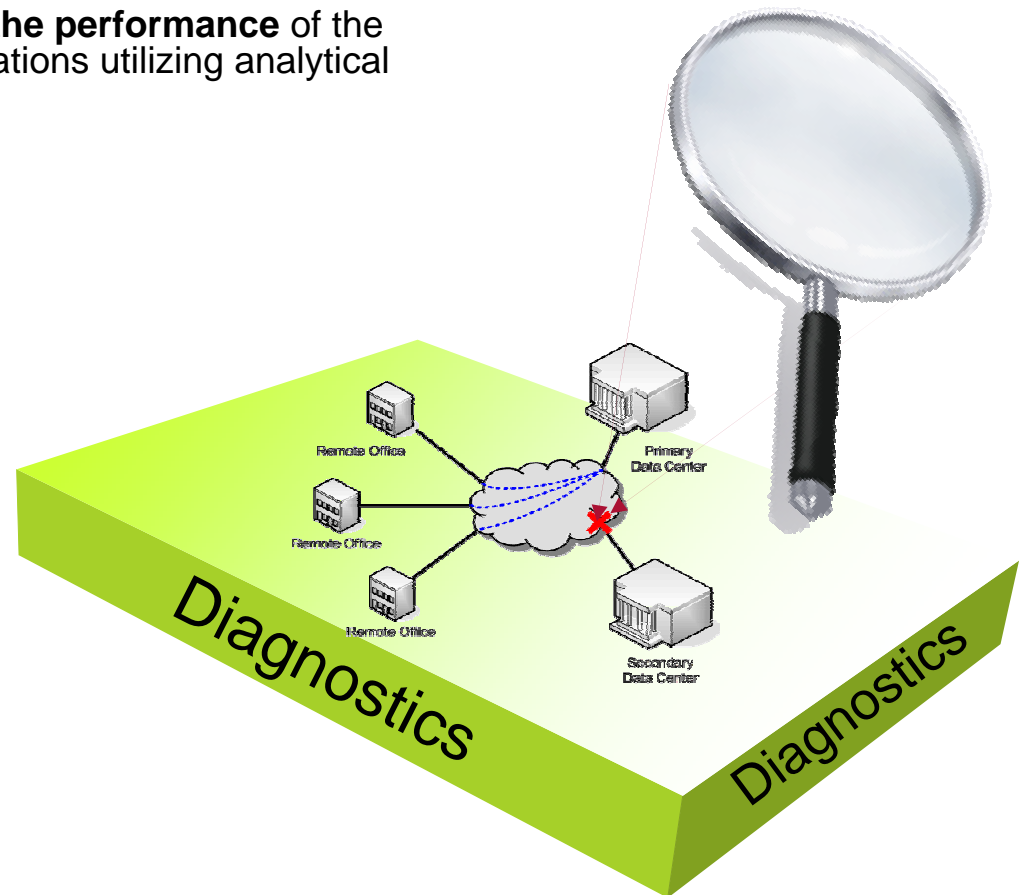


# WAN Optimization Approach - Diagnostics

This phase builds the ability to **rapidly examine the performance** of the core network infrastructure and networked applications utilizing analytical data and leveraging user experience.

## Diagnostics

- Series of questions and answers to **review the basic network and application** architecture of the environment and perceived performance challenges.
- Ability to quickly look at network elements across the enterprise or a subset of an enterprise to **baseline configurations, policies, and performance** against industry best practices.
- Understanding **application performance** relating to the **use of the underlying network** architecture and the true and perceived user experience. Additionally, understanding the business impact of the performance degradation.
- **Other Related Diagnostic Areas:**
  - Hardware performance
  - Security policies
  - Configuration management
  - Operational/Monitoring analysis tool







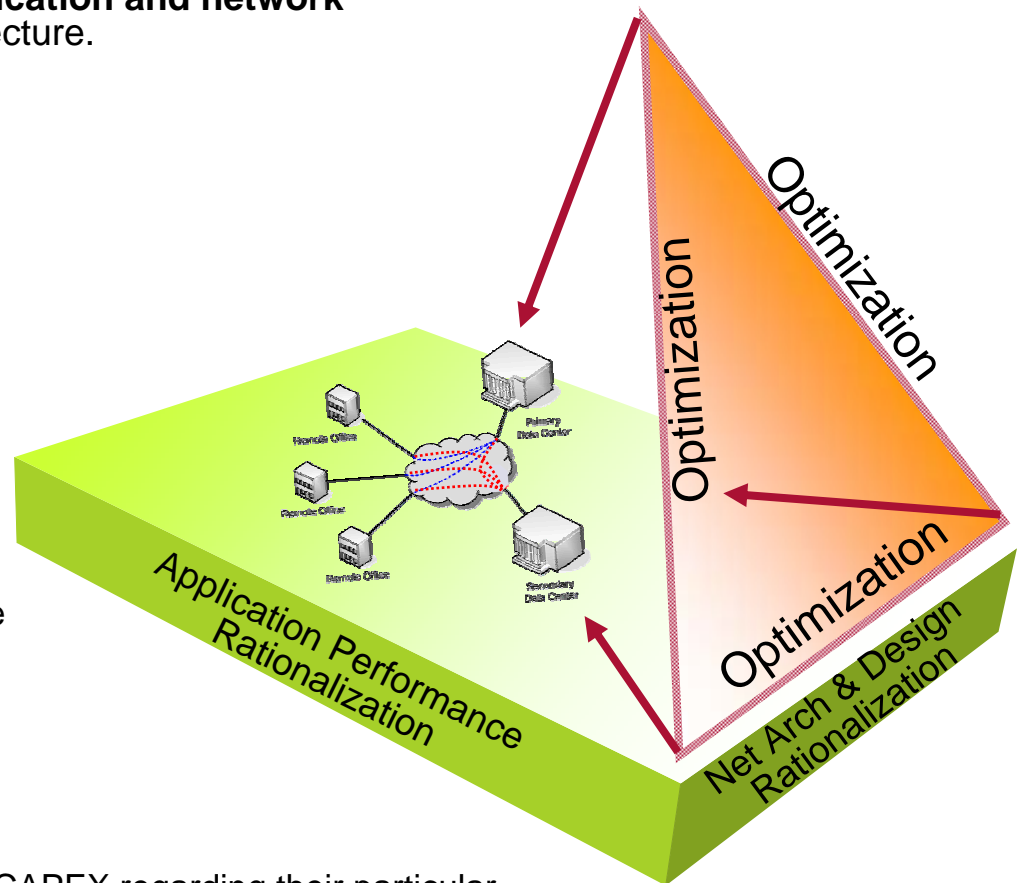
# WAN Optimization Approach - Optimization

This phase builds on the data gathered during the diagnostic phase to tactically and strategically address **specific application and network design issues** as it relates to the existing architecture.

## Optimization

- **Application Performance Rationalization** leverages the Network Technologies **Tool Kit** to best understand how individual applications perform or groups of applications within a division, datacenter, or across an enterprise. Additionally, the Application Performance rationalization capability will begin the early stage **Performance Engineering Analysis** that may be part of a broader application architecture reengineering effort.
- **Network Architecture and Design Rationalization** goes through a series of performance modeling exercises by leveraging the NT Tool Kit to create an accurate “**as-is**” model of the existing environment.

An iterative model is developed along with an appropriate strategy to migrate the environment to the future “**to-be**” target architecture.



The **Optimization** phase provides a view on OPEX/CAPEX regarding their particular network architecture and application suite and how that may be affecting their business.

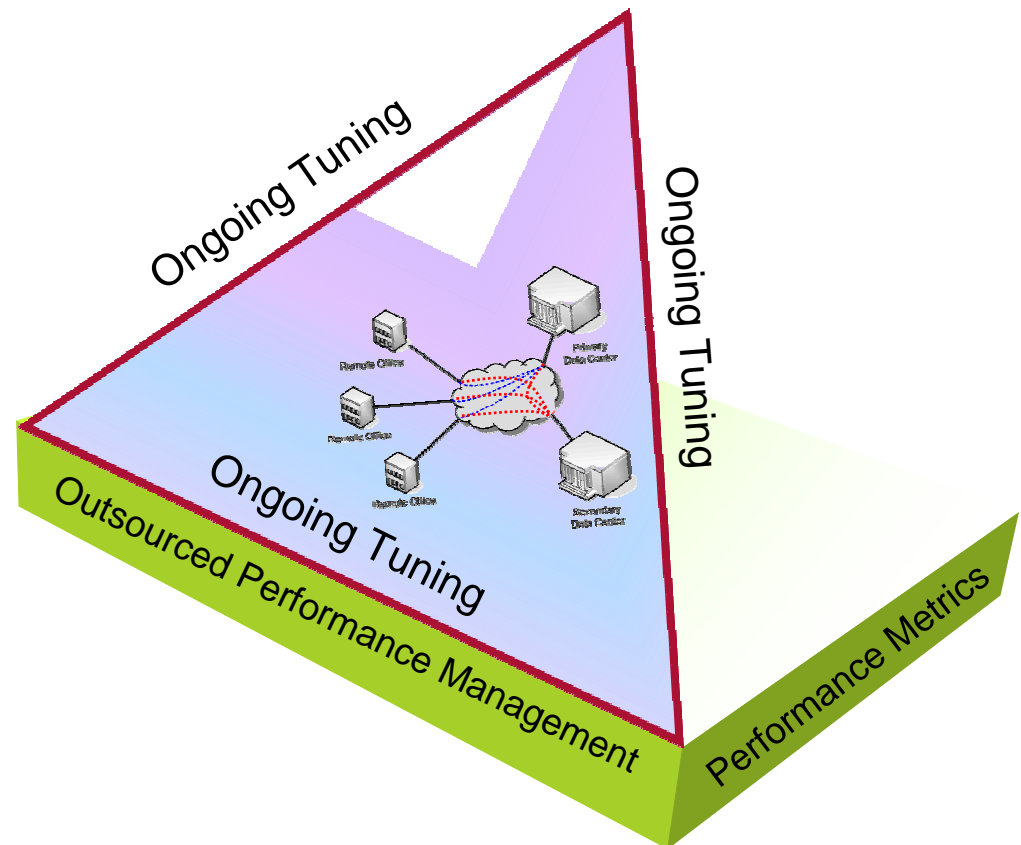


# WAN Optimization Approach - Ongoing Tuning

This phase **periodically tunes** the solution to ensure the optimized network infrastructure and applications continue to **perform efficiently** and **adapt to a dynamic business environment**.

## Ongoing Tuning

- Periodic measurement and baselining of network **performance metrics** and **adjustments** in the various parameters for network elements and the associated devices and appliances. Additional measurement of application performance and the dynamic changes that come with the business environment.
- Additionally many clients determine it is not within their core IT strategy or expertise to either continue to do these measurements on their own and/or make incremental adjustments. In those instances it will make sense for the client to **Outsource Performance Management** to Accenture to ensure the tuned environment stays **Performance Optimized**.





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# Implementation of a WAN Optimization Solution

## Client Business Challenge

- In 2008 a major global telecommunications provider experienced performance issues delivering centralised Sharepoint services over Internet links to many remote locations worldwide.
- Issues due to distance and poor link quality (high latency, packet loss and jitter) meant that a WAN optimization solution was needed, in order to retain the central solution architecture.
- After an RFP and proof of concept, that demonstrated considerable performance improvements, a supplier/vendor was chosen.
- Accenture was asked to provide Project Management (PM) and also Subject Matter Expertise (SME) in one to drive the implementation.

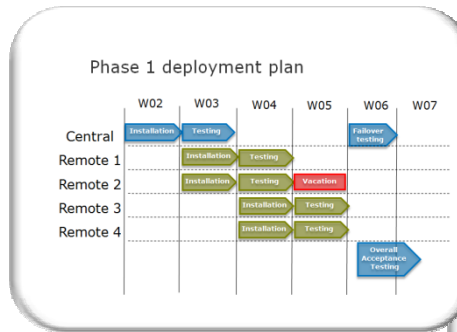
## Accenture Role

- Accenture led the design and deployment of a WAN optimization solution with 2 central and 8 remote WAN acceleration endpoints.
- PM: planning, issues, risks, status meetings, reporting and driving the operational handover process.
- SME: drive creation of a solution design (per remote location), coach employees on the solution and coordinate technical troubleshooting.

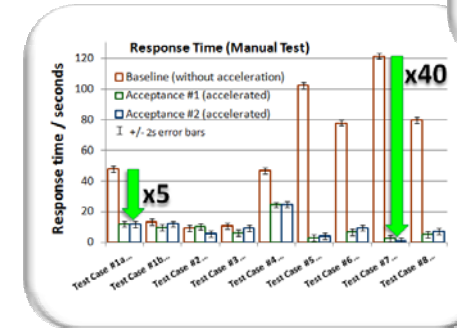
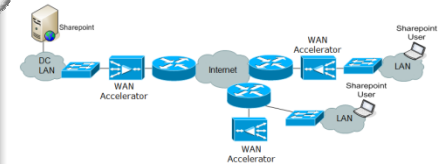
## Value Delivered

- Successful deployment of the WAN acceleration solution to all remote locations, through coordination of the supplier, 8 different remote locations worldwide and central operations.
- Solution design, implementation, testing and operational handover, within a 6 month timeframe.
- Strong relationships built with the remote location organisations, minimised the issues of language, culture and timezones.
- Excellent performance improvements achieved → consistently over **90% compression** and **2-40 times reduction in response times**.\*

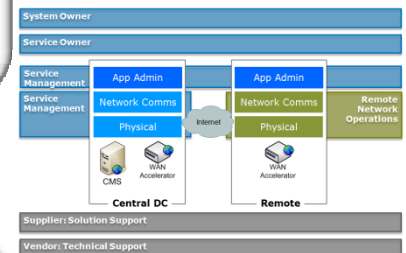
\* Consider loading a Sharepoint page (not cached in the browser) before WAN optimization would take 50 seconds and after took 10 seconds. Additionally, some download times for a 2MB file were reduced from 120s to just 3s.



## High Level Solution Blueprint



## Operating Model Blueprint







# Thank you for listening

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