west ®

Application-Aware Network

AN APPLICATION-AWARE NETWORK IS KEY TO MAXIMIZING PRODUCTIVITY

By Zeus Kerravala -

INTRODUCTION: IT CHANGES EVOLVE THE NETWORK

Enterprise IT has seen several major transitions. The strategic IT platform evolved from the mainframe to client/server to Internet-based computing, and is now at the precipice of the biggest transition ever - the evolution to cloud computing. Each transition saw costs fall dramatically as computing became a pervasive resource. These transitions also continually raised the value of the network (see Exhibit 1).

Exhibit 1: Computing Through the Ages

	Mainframe	Client Server	Internet	Cloud / Mobile
Time frame	1960s, 1970s	1980-1995	1995-2010	2010+
Role of network	None	Local connectivity	WAN connectivity	Strategic enabler
Connected devices	Tens of thousands	Hundreds of thousands	Millions	Billions
Reach of network	None	Departmental	Enterprise-wide	Ubiquitous

Source: ZK Research, 2013

Application-Aware Network

AN APPLICATION-AWARE NETWORK IS KEY TO MAXIMIZING PRODUCTIVITY

By Zeus Kerravala -

INTRODUCTION: IT CHANGES EVOLVE THE NETWORK Enterprise IT has seen several major transitions. The strategic IT platform evolved from the mainframe to client/server to Internet-based computing, and is now at the precipice of the biggest transition ever - the evolution to cloud computing. Each transition saw costs fall dramatically as computing became a pervasive resource. These transitions also continually raised the value of the network (see Exhibit 1).

Exhibit 1: Computing Through the Ages

Source: ZK Research, 2013

Cloud and mobile computing have a profound impact on network-centric computer paradigms. The network has evolved from "dumb pipes" to a strategic enabler for IT. As IT continues to migrate and evolve, the following trends will emerge:
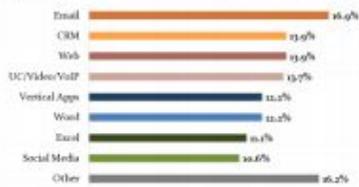
- **Mobility is a high priority.** Cloud computing and mobility move the industry closer to delivering any application or content to any device over any network.
- **Applications are more network-dependent.** Legacy applications were built in static IT silos with dedicated storage, compute and network resources for each application. Today, multiple virtual and cloud-based resources deliver greater intelligence. This makes applications heavily dependent on the network for performance and functionality.
- **Optimizing user experience is a key IT initiative.** Poor application performance causes, on average, a 14 percent reduction in productivity. Improving user experience means double-digit improvement in productivity.
- **The network is application-aware.** Historically, the network treated all traffic equally. An application-aware network prioritizes real-time and mission-critical traffic above applications that operate effectively over best-effort networks. This aligns the network with the needs of the business.
- **Cloud computing is a key enabler of mobile computing.** Mobile computing is predicated on content being accessible from anywhere.

This report defines an application-aware network, provides insight on how to evaluate service providers, and profiles West Communications, a leading provider of application-aware networks.

SECTION II:
BUILDING AN APPLICATION-AWARE NETWORK

For decades the corporate network was considered a necessary evil or even a commodity. Technologies up the stack, such as the compute infrastructure, applications and even end-clients were considered the IT resources with the most strategic value.

Exhibit 2: How Much is Productivity Impacted by Poor Application Performance and Availability?

Email	16.9%
CRM	13.9%
Web	13.9%
UC/Video/VoIP	13.7%
Vertical Apps	12.2%
Word	12.2%
Excel	11.1%
Social Media	10.6%
Other	16.2%

Source: ZK Research, 2013

The concept of an application-aware network may not be obvious, since the network and application tiers historically have had no linkage. To better understand the concept, IT professionals should consider a network with the following characteristics:

- **Application intelligence.** An application-aware network can discern application types such as cloud, virtual and premise-based.
- **Optimized for real-time applications.** The network needs the ability to prioritize real-time multimedia applications above other applications. VoIP and video are particularly sensitive to network issues and must be treated uniquely to ensure a high quality and consistent user experience. As these real-time applications are pushed to the cloud, the network needs to expand its awareness of them.
- **Classification of non-real-time applications.** Although non-real-time applications do not have the same latency and jitter requirements, many are bandwidth intensive and mission critical. An application-aware network discovers these applications and maps them to an appropriate class of service.

However, this thinking is outdated and incorrect. Fulfilling the any vision - the capability to deliver any content or application to any device over any network - while maintaining a consistent user experience, requires a highly intelligent and secure application-aware network. Exhibit 2 shows on average, workers lose about 14 percent productivity annually due to poor application performance.

- **Knowledge of application protocols.** Many applications behave differently on a network. Some are chatty, consume huge bandwidth and are not designed to run over WANs. The network should recognize application traffic types and apply the right optimization technique to ensure the best user experience.
- **Network visibility.** Cloud, virtual and mobile computing are network-centric compute models. An application-aware network provides unprecedented network visibility. IT leaders must know their network to ensure productivity.
- **Available as a managed service.** Not every organization has the skill set to deploy and run an application-aware network. Increasingly, these skill sets are available as a part of a managed service. Organizations with skills deficits should look to leverage a managed service to deploy an application-aware network.

we connect. we deliver. **west**

Cloud and mobile computing have a profound impact on network-centric computer paradigms. The network has evolved from "dumb pipes" to a strategic enabler for IT. As IT continues to migrate and evolve, the following trends

will emerge:

• Mobility is a high priority. Cloud computing and mobil- ity move the industry closer to delivering any application or content to any device over any network.

• Applications are more network-dependent. Legacy applications were built in static IT silos with dedicated storage, compute and network resources for each application. Today, multiple virtual and cloud-based resources deliver greater intelligence. This makes applications heavily dependent on the network for performance and functionality.

• Optimizing user experience is a key IT initiative. Poor application performance causes, on average, a 14 percent reduction in productivity. Improving user experi- ence means double-digit improvement in productivity.

• The network is application-aware. Historically, the network treated all traffic equally. An application-aware network prioritizes real-time and mission-critical traffic above applications that operate effectively over best- effort networks. This aligns the network with the needs of the business.

• Cloud computing is a key enabler of mobile computing. Mobile computing is predicated on content being accessible from anywhere.

This report defines an application-aware network, provides insight on how to evaluate service providers, and profiles West Communications, a leading provider of application- aware networks.

SECTION II: BUILDING AN APPLICATION-AWARE NETWORK For decades the corporate network was considered a necessary evil or even a commodity. Technologies up the stack, such as the compute infrastructure, applications and even end-clients were considered the IT resources with the most strategic value.

Exhibit 2: How Much is Productivity Impacted by Poor Application Performance and Availability?

Source: ZK Research, 2013

The concept of an application-aware network may not be obvious, since the network and application tiers historically have had no linkage. To better understand the concept, IT professionals should consider a network with the following characteristics:

• Application intelligence. An application-aware network can discern application types such as cloud, virtual and premise-based.

• Optimized for real-time applications. The network needs the ability to prioritize real-time multimedia applications above other applications. VoIP and video are particularly sensitive to network issues and must be treated uniquely to ensure a high quality and consistent user experience. As these real-time applications are pushed to the cloud, the network needs to expand its awareness of them.

• Classification of non-real-time applications. Although non-real-time applications do not have the same latency and jitter requirements, many are band- width intensive and mission critical. An application-aware network discovers these applications and maps them to an appropriate class of service.

However, this thinking is outdated and incorrect. Fulfilling the any vision - the capability to deliver any content or application to any device over any network - while maintaining a consistent user experience, requires a highly intelligent and secure application-aware network. Exhibit 2 shows on average, workers lose about 14 percent productivity annually due to poor application performance.

• Knowledge of application protocols. Many applica- tions behave differently on a network. Some are chatty, consume huge bandwidth and are not designed to run over WANs. The network should recognize application traffic types and apply the right optimization technique to ensure the best user experience.

• Network visibility. Cloud, virtual and mobile comput- ing are network-centric compute models. An applica- tion-aware network provides unprecedented network visibility. IT leaders must know their network to ensure productivity.

• Available as a managed service. Not every organi- zation has the skill set to deploy and run an applica- tion-aware network. Increasingly, these skill sets are available as a part of a managed service. Organizations with skills deficits

should look to leverage a managed service to deploy an application-aware network.

For the past decade, IT has been in a state of change. Almost every part of the IT stack has been transformed, except for the network. The shift to an application-aware network will bring the network into better alignment with the evolving IT landscape.

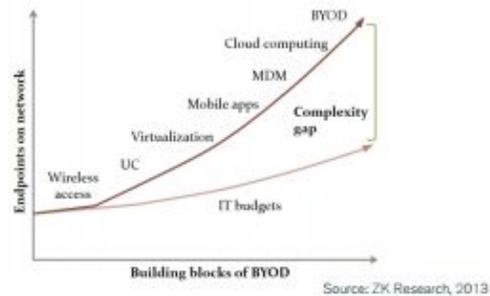## SECTION III:
CHOOSING A SOLUTION PROVIDER

Historically, network operations were justifiably low on the CIO priority list. The network offered no real opportunities for competitive differentiation. Application-aware networks can be a significant point of competitive advantage for companies that deploy the right solution. This requires serious consideration by c-level executives and IT leaders.

However, the choice of service provider may not be obvious. IT leaders and network managers may use decision criteria meant for legacy networking. The following should be used as criteria for selecting an application-aware network service provider:

- **Robust MPLS network.** This is the foundation for an application-aware network. Once applications are categorized they can be placed into multiple tiers for appropriate categorization. This ensures that tier-one applications are isolated from lower-tier and best-effort traffic.
- **Granular quality of service (QoS).** QoS can further optimize real-time applications. This is particularly important with latency and jitter-sensitive VoIP and real-time video.
- **Intelligent application-based routing.** The network should automatically recognize various applications and route them based on policy.
- **Detailed visibility of the network.** It's critical today that network managers and IT leaders know the network and how it is performing over time. This includes understanding what normal traffic flows and baselines are, as well as having visibility into the high-bandwidth applications. This can only be done with a high degree of detailed visibility into the network.
- **Feature-rich user portal.** The portal is the face of the network. A feature-rich, robust portal must let customers self-manage the network and provide management and reporting capabilities.
- **World class peering.** The network service provider should have private peering with leading ISPs, internet exchanges and data-center providers, providing unparalleled levels of choice and the best possible user experience.
- **A broad range of converged services.** Over the past few years, many organizations have preferred to buy more services from fewer providers. The service provider should offer a range of complimentary services such as hosted voice and other communication services.

- **24x7x365 NOC services.** Maintenance windows for the network are a thing of the past. IT leaders must ensure network services are continuously available to compete in an increasingly global economy. Problems can occur at any time: 24x7x365 is a must.
- **Fully managed services.** Running an application-aware network can allow for a significant shift in internal IT talent. As the technology environment becomes increasingly complicated, a widening complexity gap is created (see Exhibit 3). Fully managed services mean IT can focus on strategic initiatives, not on day-to-day network tasks.
- **A range of SLAs.** When it comes to SLAs, one size definitely does not fit all. Service providers must offer basic SLAs when best-effort traffic is good enough - and stringent plans for those using the network as a competitive differentiator.
- **Wide range of network capacities.** The corporate WAN connects small branches, large branches, intercompany communications, data centers and other parts of the extended enterprise. Providers must offer services to accommodate a wide range of bandwidth needs.

Exhibit 3: The Widening IT Complexity Gap

Source: ZK Research, 2013

SECTION IV:
PROFILE OF WEST UNIFIED
COMMUNICATIONS SOLUTIONS

There are many choices available to customers when it comes to network services. However, most network service providers do not understand application traffic and offer no real competitive differentiation for its customers. ZK Research has done extensive research in this area and believes West Unified Communications Solutions is one of the leading application-aware network service providers.

About West Communications
Headquartered in Louisville, Kentucky, West UC is a unit of West Corporation, a global telecommunications provider with locations in 26 countries, providing services in 141 countries

we connect. we deliver. **west**

---

evolving IT landscape.

SECTION III: CHOOSING A SOLUTION PROVIDER Historically, network operations were justifiably low on the CIO priority list. The network offered no real opportunities for competitive differentiation. Application-aware networks can be a significant point of competitive advantage for companies that deploy the right solution. This requires serious consider- ation by c-level executives and IT leaders.

However, the choice of service provider may not be obvious. IT leaders and network managers may use decision criteria meant for legacy networking. The following should be used as criteria for selecting an application-aware network service provider:

• Robust MPLS network. This is the foundation for an application-aware network. Once applications are cate- gorized they can be placed into multiple tiers for appro- priate categorization. This ensures that tier-one applica- tions are isolated from lower-tier and best-effort traffic.

• Granular quality of service (QoS). QoS can further op- timize real-time applications. This is particularly important with latency and jitter-sensitive VoIP and real-time video.

• Intelligent application-based routing. The network should automatically recognize various applications and route them based on policy.

• Detailed visibility of the network. It's critical today that network managers and IT leaders know the network and how it is performing over time. This includes understand- ing what normal traffic flows and baselines are, as well as having visibility into the high-bandwidth applications. This can only be done with a high degree of detailed visibility into the network.

• Feature-rich user portal. The portal is the face of the network. A feature-rich, robust portal must let customers self-manage the network and provide management and reporting capabilities.

• World class peering. The network service provider should have private peering with leading ISPs, internet exchanges and data -center providers, providing unparal- leled levels of choice and the best possible user experi- ence.

• A broad range of converged services. Over the past few years, many organizations have preferred to buy more services from fewer providers. The service provider should offer a range of complimentary services such as hosted voice and other communication services.

• 24x7x365 NOC services. Maintenance windows for the network are a thing of the past. IT leaders must ensure network services are continuously available to compete in an increasingly global economy. Problems can occur at any time: 24x7x365 is a must.

• Fully managed services. Running an application-aware network can allow for a significant shift in internal IT tal- ent. As the technology environment becomes increasing- ly complicated, a widening complexity gap is created (see Exhibit 3). Fully managed services mean IT can focus on strategic initiatives, not on day-to-day network tasks.

• A range of SLAs. When it comes to SLAs, one size definitely does not fit all. Service providers must offer basic SLAs when best-effort traffic is good enough - and stringent plans for those using the network as a competitive differentiator.

• Wide range of network capacities. The corporate WAN connects small branches, large branches, intercom- pany communications, data centers and other parts of the extended enterprise. Providers must offer services to accommodate a wide range of bandwidth needs.

Exhibit 3: The Widening IT Complexity Gap

SECTION IV: PROFILE OF WEST UNIFIED COMMUNICATIONS SOLUTIONS There are many choices available to customers when it comes to network services. However, most network service providers do not understand application traffic and offer no real competitive differentiation for its customers. ZK Research has done extensive research in this area and believes West Unified Communications Solutions is one of the leading application-aware

network service providers.

About West Communications Headquartered in Louisville, Kentucky, West UC is a unit of West Corporation, a global telecommunications provider with locations in 26 countries, providing services in 141 countries

Source: ZK Research, 2013

West has a broad portfolio of services that help businesses communicate effectively while lowering costs, creating significant competitive differentiation.

West UC understands each customer is different. It develops customized solutions that helps each customer meet its technical and business goals. West is a leading provider of cloud based, mission-critical voice, video and data networking services and delivers solutions to companies of all sizes in a number of different verticals.

The Maxxis Application Network

Legacy corporate networks are built ad hoc over a number of years, and can significantly impair the performance of applications and services that fuel a company's growth.

West UC Maxxis application network gives companies the ability to deploy an all-IP, converged network with unparalleled levels of application performance, flexibility and resiliency. Additionally, the Maxxis application network is offered as a fully managed service; companies can start taking advantage of the application network immediately. The Maxxis solution optimizes delivery of real-time communications, centralized applications and cloud-based services across the entire enterprise network.

West utilizes multiple tier-one carriers to offer flexible service delivery, giving customers wide geographic coverage combined with a variety of network interfaces, including DS1, DS3, OC3 and Metro Ethernet services up to 1 Gig in speed, for resiliency levels unmatched by single-network carriers.

West Service Differentiators

Unlike traditional network operators, West UC differentiates its services based on criteria that can directly lead to improved application performance and competitive differentiation. These differentiators are as follows:

- **Unique QoS management:** Most legacy service providers offer QoS based on prioritized tagged packets. This offers basic application optimization. West QoS is determined by assigning tags to traffic based on real-time packet analysis, source and destination, as well as business use case, which prioritizes mission-critical traffic to business requirements.

  The West Application Network can automatically determine QoS settings for an Internet destination based on the importance of the traffic. The application-aware network understands the difference between best-effort for Web surfing and use of a business-critical application such as CRM from Salesforce.com or NetSuite, and will automatically prioritize data accordingly across the entire network.

Advanced QoS management allows for a higher degree of traffic analysis, ensuring application traffic is handled and prioritized appropriately, relative to the rest of the network traffic. For example, latency-sensitive multimedia traffic is given a higher priority than applications that do not have the same stringent requirements.

This business-oriented QoS offered by West UC delivers levels of application performance that cannot be achieved with legacy MPLS networks with basic traffic tagging.

- **Network transparency and control:** Almost all legacy service providers and carriers offer very basic levels of visibility that show network throughput of individual links. While this was sufficient years ago, it does not meet the challenges of the networked computing era. West UC offers deeper levels of visibility, giving customers the tools to properly manage and control the network based on the application environment.

  The West IT Command Console (ITC) gives detailed views of traffic and application tagging and performance data associated with every aspect of the network connection. ITC gives a complete picture of the network; not only circuits, but routing hardware and performance. It also provides visibility into the data center environment, power consumption and NetFlow statistics for real-time statistics and alerts.

  ITC gives customers detailed views of traffic tagging and bandwidth data associated with application performance. ITC provides end-to-end insight into application transport performance - a single tool designed to help customers know their network by understanding the entire application environment.

- **Network-optimized for cloud-based applications:** West IP was one of the first providers of converged services across advanced MPLS networks, and is a pioneer in delivery of cloud-based applications. Delivering extended SLAs, security policies and traffic controls is challenging with single networks but becomes even more difficult when delivered over ISPs, internet exchanges and data center providers. West combines its peering relationships with advanced tools to define policies that control network behavior and shape bandwidth, for end-to-end application SLAs.

  West's private peering relationships combined with network management tools and application-focused QoS

we connect. we deliver. **west**

---

significant competitive differentiation.

West UC understands each customer is different. It devel- ops customized solutions that helps each customer meet its technical and business goals. West is a leading provider of cloud based, mission-critical voice, video and data networking services and delivers solutions to companies of all sizes in a number of different verticals.

The Maxxis Application Network Legacy corporate networks are built ad hoc over a number of years, and can significantly impair the performance of appli- cations and services that fuel a company's growth.

West UC Maxxis application network gives companies the ability to deploy an all-IP, converged network with unparal- leled levels of application performance, flexibility and resilien- cy. Additionally, the Maxxis application network is offered as a fully managed service; companies can start taking advantage of the application network immediately. The Maxxis solution optimizes delivery of real-time communications, centralized applications and cloud-based services across the entire enterprise network.

West utilizes multiple tier-one carriers to offer flexible service delivery, giving customers wide geographic coverage com- bined with a variety of network interfaces, including DS1, DS3, OC3 and Metro Ethernet services up to 1 Gig in speed, for resiliency levels unmatched by single-network carriers.

West Service Differentiators Unlike traditional network operators, West UC differentiates its services based on criteria that can directly lead to im- proved application performance and competitive differentia- tion. These differentiators are as follows:

• Unique QoS management: Most legacy service providers offer QoS based on prioritized tagged pack- ets. This offers basic application optimization. West QoS is determined by assigning tags to traffic based on real-time packet analysis, source and destination, as well as business use case, which prioritizes mission-critical traffic to business requirements.

The West Application Network can automatically de- termine QoS settings for an Internet destination based on the importance of the traffic. The application-aware network understands the difference between best-effort for Web surfing and use of a business-critical application such as CRM from Salesforce.com or NetSuite, and will automatically prioritize data accordingly across the entire network.

Advanced QoS management allows for a higher degree of traffic analysis, ensuring application traffic is handled and prioritized appropriately, relative to the rest of the network traffic. For example, latency-sensitive multimedia traffic is given a higher priority than applications that do not have the same stringent requirements.

This business-oriented QoS offered by West UC delivers levels of application performance that cannot be achieved with legacy MPLS networks with basic traffic tagging.

• Network transparency and control: Almost all legacy service providers and carriers offer very basic levels of visibility that show network throughput of individual links. While this was sufficient years ago, it does not meet the challenges of the networked computing era. West UC offers deeper levels of visibility, giving customers the tools to properly manage and control the network based on the application environment.

The West IT Command Console (ITC) gives detailed views of traffic and application tagging and performance data associated with every aspect of the network con- nection. ITC gives a complete picture of the network; not only circuits, but routing hardware and performance. It also provides visibility into the data center environment, power consumption and NetFlow statistics for real-time statistics and alerts.

ITC gives customers detailed views of traffic tagging and bandwidth data associated with application performance. ITC provides end-to-end insight into application transport performance - a single tool designed to help customers know their network by understanding the entire applica- tion environment.

• Network-optimized for cloud-based applications: West IP was one of the first providers of converged services across advanced MPLS networks, and is a pioneer in delivery of cloud-based applications. Deliver- ing extended SLAs, security policies and traffic controls is challenging with single networks but becomes even more difficult when

delivered over ISPs, internet ex- changes and data center providers. West combines its peering relationships with advanced tools to define poli- cies that control network behavior and shape bandwidth, for end-to-end application SLAs.

West's private peering relationships combined with net- work management tools and application-focused QoS

ensures the best possible performance for centralized and cloud-based applications. The peering relationships ensure traffic only crosses West and peering partner networks, never the public Internet. Application traffic reaches its destination with a minimum number of router hops, increasing the speed of transport and minimizing packet. This makes it an ideal network for cloud-based applications.

- **Fully managed service offering with comprehensive SLAs:** The center of the West UC managed service offering is customer service led by the West IP NOC, staffed 24x7x365 with Cisco Certified Engineers. This and advanced network management tools enables the West NOC to act as an extension of their customers' IT staff.

West backs up its managed service with comprehensive SLAs. Exhibit 4 shows how the West SLAs offers both network and application-level SLAs to give its customers the best possible user experience.

Exhibit 4: West Offers Comprehensive SLAs

Service delivery for continental US	99.999%
Packet delivery – normal plane	99.9%
Packet delivery – priority plane	99.9%
Packet delivery – critical plane	99.99%
Voice plane	100% in sequence
Video plane	100% in sequence
Latency	<40ms POP to POP
Voice and video	<1ms POP to POP

Use of multiple tier-one transport providers gives West the ability to design, build and manage complete network solutions optimized for application performance. The architecture also gives customers wide geographic coverage with the broadest set of network interfaces to deliver the right network to every location with a level of resiliency that cannot be achieved by a single carrier network.

- **Multiple tier-one transport service:** West UC brings together multiple carrier transport infrastructure to act as a single network solution with unified routing tables, holistic QoS and end-to-end visibility, operating under a single network infrastructure.

West offers customers a wide array of network interface capabilities including DS1, DS3, OC3 and 10/100/100 Mbps Metro Ethernet services over multiple tier-one transport providers.

SECTION V:
CONCLUSION AND RECOMMENDATIONS

The IT environment has evolved rapidly over the past decade. Applications are moving to the cloud, workers are becoming increasingly mobile, infrastructure is becoming more virtual and the use of VoIP and video is at an all-time high. These changes are driving the biggest shift in networks ever; and building an application-aware network has never been a more important initiative for IT and business leaders.

An application-aware network brings the network into better alignment with the current and future direction of IT. Additionally, an application-aware network will optimize application performance for real-time, non-real-time, cloud and traditional applications better than legacy architectures. Although network strategies have typically fallen below the CIO's radar, it's now time for forward-thinking companies to leverage the network as a competitive differentiator. However, the roadmap to an application-aware network may not be obvious - and ZK Research offers the following recommendations to help companies get started:

- **Know the network.** It's difficult to make any kind of change to a network without understanding the network environment. What applications are running on it, what's consuming bandwidth, where choke points are and how real-time applications perform are all points to consider. IT leaders must ensure they know the network to leverage it fully.
- **Use a managed service to deliver an application-aware network.** IT organizations are under tremendous pressure to cut costs and move the company into a better competitive position. The use of a managed network service allows companies to focus on core strategic initiatives while ensuring the network runs optimally 24x7x365.
- **Consider alternative network operators.** The easy decision to make with IT initiatives is to stay with your incumbent solution provider. However, legacy service providers have networks that were designed in an era of best-effort traffic used to delivering nondifferentiated service. Customers should consider networks designed for this era of computing, not one optimized for two to three decades ago.

we connect. we deliver. **west**

---

its destination with a minimum number of router hops, increasing the speed of transport and minimizing packet. This makes it an ideal network for cloud-based applications.

• Fully managed service offering with comprehensive SLAs: The center of the West UC managed service offering is customer service led by the West IP NOC, staffed 24x7x365 with Cisco Certified Engineers. This and advanced network management tools enables the West NOC to act as an extension of their customers' IT staff.

West backs up its managed service with comprehensive SLAs. Exhibit 4 shows how the West SLAs offers both network and application-level SLAs to give its customers the best possible user experience.

Exhibit 4: West Offers Comprehensive SLAs

Use of multiple tier-one transport providers gives West the ability to design, build and manage complete network solutions optimized for application performance. The architecture also gives customers wide geographic coverage with the broadest set of network interfaces to deliver the right network to every location with a level of resiliency that cannot be achieved by a single carrier network.

• Multiple tier-one transport service: West UC brings together multiple carrier transport infrastructure to act as a single network solution with unified routing tables, holistic QoS and end-to-end visibility, operating under a single network infrastructure.

West offers customers a wide array of network interface capabilities including DS1, DS3, OC3 and 10/100/100 Mbps Metro Ethernet services over multiple tier-one transport providers.

SECTION V: CONCLUSION AND RECOMMENDATIONS The IT environment has evolved rapidly over the past decade. Applications are moving to the cloud, workers are becoming increasingly mobile, infrastructure is becoming more virtual and the use of VoIP and video is at an all-time high. These changes are driving the biggest shift in networks ever; and building an application-aware network has never been a more important initiative for IT and business leaders.

An application-aware network brings the network into better alignment with the current and future direction of IT. Addition- ally, an application-aware network will optimize application performance for real-time, non-real-time, cloud and tradi- tional applications better than legacy architectures. Although network strategies have typically fallen below the CIO's radar, it's now time for forward-thinking companies to leverage the network as a competitive differentiator. However, the road- map to an application-aware network may not be obvious - and ZK Research offers the following recommendations to help companies get started:

• Know the network. It's difficult to make any kind of change to a network without understanding the network environment. What applications are running on it, what's consuming bandwidth, where choke points are and how real-time applications perform are all points to consider. IT leaders must ensure they know the network to lever- age it fully.

• Use a managed service to deliver an applica- tion-aware network. IT organizations are under tre- mendous pressure to cut costs and move the company into a better competitive position. The use of a managed network service allows companies to focus on core strategic initiatives while ensuring the network runs optimally 24x7x365.

• Consider alternative network operators. The easy decision to make with IT initiatives is to stay with your incumbent solution provider. However, legacy service providers have networks that were designed in an era of best-effort traffic used to delivering nondifferentiated service. Customers should consider networks designed for this era of computing, not one optimized for two to three decades ago.