

The CIO's New Guide to Design of Global IT Infrastructure

Five Principles Driving Radical Redesign

Technology has enabled businesses to become highly distributed. Whether “distributed” means across a region, a country, or around the globe, one thing is certain: headquarters isn’t where all of the action is. With about two-thirds of the workforce operating in locations other than HQ, and an estimated 450 million mobile workers around the world, businesses now operate everywhere, and all the time.

The ability to take advantage of business opportunities, people, and resources in previously distant markets has created a vast new set of challenges for organizations. Taken together, they present a difficult dilemma to a CEO or CIO: Continue to deliver acceptable IT services by throwing money, bandwidth, and infrastructure at the problem? Or, save money by consolidating at the expense of the end-user experience? Or, use IT to drive new business initiatives?

What do businesses demand from IT?

1. *Flexibility*
2. *Simplicity*
3. *Security*
4. *Continuity*

Is it possible to do both? How does a business in today’s global marketplace bring the world closer? Is it possible to eliminate the impact of distance on business? Is it possible to work smarter by leveraging global talent and exploit a geographic arbitrage that globalization has enabled?

This paper will explore these questions and the business imperatives that are driving enterprise IT design today, and then presents five key principles CIOs are using to redesign business infrastructure at companies of all sizes. Finally, this paper will discuss the importance of WAN optimization solutions and explains how they can help to cohesively tie together distributed and highly mobile organizations.

The business imperative

Before considering an information technology strategy for a globalized world, it is valuable to understand the fundamental trends that are pushing businesses to redesign their operations around a small set of broad-based imperatives.

1. **Flexibility:** Businesses that operate across traditional borders must be able to respond to opportunities and challenges faster than ever before. They are usually battling well-resourced organizations that may be based where the opportunity originated, or other globalizing companies that are reaching out for new opportunities. In order to compete, a business has to be faster to deliver a product or service as good, or better, than that of potentially any other company in the world.
2. **Simplicity:** Less has always been more for enterprises, yet an increase in technology has typically led to increased complexity. While per unit costs of technology are always decreasing, in aggregate, companies see an increase in cost. With the pressure on IT to act less as a cost center and more as a way to increase the profitability of business units, just adding more storage, more bandwidth, or additional technologies is no longer an acceptable approach to managing information technology. Instead, smart CIOs are investing in technologies like continuous data protection, virtualization, and wireless connectivity to help IT slim down while increasing competitive advantages. So the IT team is typically in a difficult position. They must assess where to cut costs while still moving forward with a plan to continually enhance IT services to the business.
3. **Security:** With the growing importance of digital applications and data, the threats to enterprise data have multiplied dramatically. Everything from natural disasters to criminals to corrupt sources within the company puts data at risk. While businesses do everything that they can to stop these threats in the first place, they still must be prepared to recover from these threats as quickly as possible.
4. **Continuity:** Business expansion has made anytime, anywhere application access a requirement. At the same time, “follow the sun” (global 24/7) operations have shrinking maintenance windows and are on the hook for making applications run at all times. Delay or loss of data for any reason – system failure, natural disasters – has a domino-like effect across the entire organization.

Redefining the enterprise workplace

Businesses that succeed at becoming distributed enterprises do not necessarily do so just by adding technology components that

make back-office operations more efficient. They do not usually become successful by starting with massive overseas business. Usually, businesses that are truly trying to become successful everywhere hit an inflection point, where growing distributed operations force them to radically rethink the structure of their organization. As a result, they strategically redirect their information technology investments to bring the global workforce closer together.

Historically, decision-making power was concentrated in the headquarters. As a result, IT infrastructure development mostly focused on that location. Data centers were routinely housed as close to headquarters as possible where most employees worked, while “remote” workers were often relegated to small, disconnected islands of branch offices. Typically these were sales representatives who only needed to receive information from headquarters. The major decisions – including the tools and data to make those decisions – were essentially in one place. Mobile workers were almost an anomaly. Those that traveled among offices were simply out of touch, with no ability to access applications and data, and had few decision-making requirements while they were on the road.

Five principles of enterprise design:

- 1. Distance doesn't matter*
- 2. Applications and data must be everywhere, and in one place.*
- 3. Knowledge must be harnessed, and data must be managed*
- 4. Business never stops*
- 5. There are no second-class enterprise citizens*

Today's enterprise looks significantly different. Location – headquarters, branch office, co-working spaces, home office, or no office – simply doesn't matter anymore. While data lives in a data center, it can be used by anyone everywhere. Decision-making has become significantly more decentralized, with mobile workers and branch office employees making critical decisions on a regular basis. Distributed employees are no longer just ‘sales reps’ fulfilling orders, but are also highly paid, highly leveraged knowledge workers. They do everything from designing products, implementing projects at customer sites, programming computers, and engaging customers in highly complex sales cycles. Moreover, these individuals do not only work with local teams or businesses, but also engage in many-phased collaborations with specialists distributed across the company. The cross-functional nature of the distributed workforce significantly changes how a business needs to allocate resources and support both the branch office and the mobile worker.

Many organizations have made a 180-degree change in how they view employees who work outside of headquarters. In the past decisions were handed down to them whereas now remote workers' decisions help define the path of the organization. It is now impossible for the CIO to develop an IT strategy without accounting for a distributed and mobile workforce. In fact, a recent Forrester survey notes that 80 percent of businesses are trying to set a mobile strategy and policy in their organizations in 2012.

With such a pressing need for redesigning IT strategies to encompass global, follow-the-sun business practices, how does the CIO begin to sketch out the path forward?

The five principles that support the global workforce

There are five key principles that CIOs must take into account when thinking about how business is changing today.

- 1. Distance doesn't matter:** Employees now expect to be able to collaborate in real time with any co-worker. They expect to have access to whatever data or services the company offers no matter where they happen to be. *Where* in the world that co-worker actually works is irrelevant. They may be working from home, different offices, at airports, manufacturing facilities, or even on a ship somewhere. Knowledge workers need the flexibility to work wherever they must in order to best complete their jobs. That may mean on-site, at customer's office, or from home. IT must therefore be an enabler for the way business needs to operate. Waiting 20 minutes for a file to be sent between workers – even if they are across the world from each other – is no longer acceptable for the employee or for the customer project that they are working on.
- 2. Business never stops:** With a globalized workforce and a rapidly globalizing customer base businesses cannot afford their operations to be stopped for even a few minutes. Responsiveness to disaster or failure – often characterized by recovery point objective (RPO) and recovery time objective (RTO) – must go far beyond responding to common problems like a failed SAN or a downed fiber connection. Disasters like hurricanes or flu pandemic might force workers to operate from home for an unspecified period of time. Compromised data centers may require enterprise to rapidly switch operations to secondary locations with no loss in information.

- 3. Applications and data must be available everywhere but all in one place:** With organizations working harder to protect their valuable data and sensitive customer information, many IT organizations are engaging in IT consolidation projects. Consolidating data makes it easier to track, protect, and restore. Beginning with remote tape backup and progressing to more complicated projects like file servers, document management applications, PLM systems, and web applications, CIOs are demanding that data be brought back from remote offices. At the same time, businesses recognize that the data and applications were “out there” for a reason – that’s where they needed to be accessed. So while consolidation is an important strategy for data protection and cost control, it can negatively impact business operations unless LAN-like performance can be maintained everywhere.
- 4. Knowledge must be harnessed and data must be managed:** Consolidation helps to eliminate the ‘islands’ of storage and data that evolve over time. But with organizations being required to react quickly in the face of change, or move in order to take advantage of an opportunity, flexibility in moving data and applications is essential. CIOs must be able to quickly move massive amounts of data, and potentially set up application infrastructure in remote locations overnight. New offices and merged/acquired businesses must quickly be absorbed into the fabric of the existing organization by providing them immediate access to new systems and data.
- 5. There are no second-class enterprise citizens:** The days of the “important” people working at corporate HQ are rapidly fading. Employees everywhere are now empowered to make important decisions. Whether it is designing or manufacturing a product, working with a customer, or working on a localized version of an advertising campaign, work happens everywhere. And the work of the distributed employee isn’t less important than anyone else’s work. Just as importantly, these workers need to interact with their colleagues, applications, and data everywhere. CIOs and IT managers may no longer prioritize workers based on their geographic location. Every member of the enterprise needs to have access to the same applications and at the same level of application performance.

WAN optimization: bringing the distributed enterprise closer

No single technology can allow a CIO to accomplish these large goals for an enterprise, regardless of size. Applications, storage, networking, and security will all play into the mix. But no matter which of these technologies – and vendor solutions – are chosen, one thing remains certain: WAN optimization is the fabric that can tie all of these elements together.

WAN optimization solutions combine the benefits of WAN optimization and application acceleration to allow workers anywhere to feel as if the files, applications, and data they need are always local. Regardless of bandwidth limitations, regardless of application design, regardless of distance and network latency, employees are coming to expect this performance and require it in order to perform their jobs efficiently.

The benefits of WAN optimization are very tangible across a range of different IT projects. WAN optimization solutions allow individuals to collaborate more easily; IT to complete tasks like backup and consolidation more quickly and effectively; and, virtualized infrastructures to live anywhere and migrate at faster speeds than ever before.

WAN optimization solutions are architected (and should be evaluated) for three key characteristics:

- **Speed:** What type of acceleration will the solution provide across the broad range of applications that a business uses?
- **Scale:** Can the solution meet the needs of the largest offices, data centers, and mobile workers alike?
- **Simplicity:** What is the overhead associated with deploying and managing the solution?

Moreover, once IT implements a WAN optimization fabric, the way that they implement services can be dramatically simplified. What if distance were no longer an issue? How would that change the way document management systems, ERP systems, and backup systems are architected? The possibilities are endless. But in order to fully take advantage of WAN optimization in the enterprise, CIOs must choose a solution that can reach out to the key areas of the business: the branch office, the mobile worker, the data center, and the cloud.

Branch office

WAN optimization solutions have typically been known for accelerating applications in the branch office. If the solution has proven itself to accelerate the broad range of applications that an enterprise needs, it also must prove it has a broad enough range of appliances to make WAN optimization cost-effective for the typical heterogeneity found among office sizes. Branch office

acceleration forms the basis of a WAN optimization fabric. Since most employees work in an office at least some of the time, significant levels of investment go into distributed office infrastructure today. With an effective branch WAN optimization solution, CIOs can engage in meaningful consolidation projects that are “de-risked” by the fact that application performance will still be maintained. Employees who work in branch offices can more effectively share data with colleagues across the organization, without significant investment in bandwidth or infrastructure.

Mobile worker

CIOs today have a strong focus on the mobile worker. The executives, engineers, and sales representatives that are on the move are often responsible for bringing in new revenue and dealing with the customer in times of crisis. As such, it's essential that these employees have fast access to any and all of the corporate resources that are available to employees at the office.

WAN optimization solutions have a primary role in ensuring that users everywhere can access applications with LAN-like performance even if they are accessing data from low-bandwidth Wi-Fi connections. The introduction of a mobile user use case adds a number of requirements for any proposed WAN optimization solution: Does the mobile solution provide the same level of acceleration to mobile workers as available in branch offices? Is the WAN optimization solution architected so that the mobile accelerator connects directly to the existing appliance solution? Can the appliances support potentially thousands of mobile workers effectively? Does the mobile software use the same code base and functionality as the appliance solution?

IT-empowered mobile workers can also enable new and innovative work arrangements within an organization. For example, businesses that are hoping to expand to a new region often want to hire professionals in that region. At first, however, those professionals might not have enough work to occupy them and justify the expenses required to get regional business opportunities moving. With a mobile WAN optimization solution, both the cost and revenue side of the business can benefit. The office can be set up with virtually no infrastructure since a mobile worker simply needs a laptop with WAN optimization software installed to be up and running. That dramatically reduces the necessary up-front investment in IT. Once in place, the workers can “source” work from other offices, collaborating in real time with colleagues on projects in other parts of the world.

Data center

The idea of application acceleration has a special place in the data center. Of course it must tie in to what is happening in the branch office, but a different set of challenges await with sometimes massive amounts of data that need to be managed *among* data centers.

Massive backup and replication jobs are now a regular occurrence. Data center migrations for storage and applications, relocated virtual images of servers, and snapshots are becoming essential. As a result, many companies are regularly trying to move terabytes each day in a window that is continually shrinking to support 24x7 operations.

These requirements require a WAN optimization solution that can scale up to handle massive data transfers, and that can be clustered to handle the simultaneous load of inter-data center transfers as well as data center-to-branch transfers. Large-scale solutions between data centers need to be able to handle different bandwidth conditions, higher bandwidth connections, and high latency between DR centers. In combination, the special conditions of the data center, the branch office, and those of mobile users require an intelligent, adaptable WAN optimization solution.

Cloud

Public, private, and hybrid cloud environments all face the performance limitations inherent in today's applications and networks. In order for enterprises to maximize the flexibility and cost savings of the public cloud they must overcome the same latency and bandwidth constraints that challenge distributed IT infrastructure environments. By overcoming application and network performance problems, cloud-oriented WAN optimization accelerates the process of migrating data and applications to the cloud, and accelerates access to that data from anywhere.

As organizations migrate their initial data and later broaden their application footprint into the cloud, WAN optimization ensures that they can meet application performance SLAs regardless of network latency and enterprise bandwidth limitations to ensure seamless public cloud integration.

Conclusion

The way that businesses operate is always changing. CIOs must be prepared to adapt their IT infrastructures in a way that supports distributed employees, anytime anywhere collaboration, and the need for business continuity in times of change or disaster. Using WAN optimization solutions, CIOs now have a technology that can tie together their distributed enterprises. Mobile and branch office workers can have the same level of application performance as users at headquarters. Data centers are more protected, and organizations can respond faster in the event of disaster. Infrastructure can be consolidated without performance loss to far-off locations, yet retain the flexibility to move data and applications, often providing faster response than ever before. With WAN optimization solutions, CIOs now have a way to bring their distributed enterprise closer together.

About Riverbed

Riverbed delivers performance for the globally connected enterprise. With Riverbed, enterprises can successfully and intelligently implement strategic initiatives such as virtualization, consolidation, cloud computing, and disaster recovery without fear of compromising performance. By giving enterprises the platform they need to understand, optimize and consolidate their IT, Riverbed helps enterprises to build a fast, fluid and dynamic IT architecture that aligns with the business needs of the organization. Additional information about Riverbed (NASDAQ: RVBD) is available at www.riverbed.com.



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