Modernizing the Edge of Your Enterprise

A RIVERBED EBOOK

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What is the Edge?

How we work is rapidly changing. In a move that parallels the industrial revolution[1], enterprises have become increasingly distributed. First, in order to locate closer to where business actually happens, enterprises have repositioned a large part of their workforce away from the main office and out to the remote "edge" locations.

Today, these remote sites are home to nearly half the world's workforce[2]. But edge locations are home to more than just people. As the Internet of Things (IoT) ramps up, enterprises are placing all manner of devices and sensors at the edge.

Maybe it is oil sensors capturing extraction rates from wells in the Gulf of Mexico, or meters measuring water usage in a small town in Kansas. It might be sensors keeping an eye on HVAC equipment in retail locations around the globe, or taking high-resolution images of supplier parts on an auto assembly line, or even sensors monitoring the temperature of the oil that cooks french fries in a fast food chain. In fact, analysts estimate that the number of IoT devices in business will grow exponentially to over 30 billion devices by 2020[3].

All of these changes are creating a new focus for enterprise IT: The Edge. Whereas in years past the central office and the data center garnered most of IT's attention; more recently, the cloud came with a promise of greater efficiency and simplicity, though never truly delivered on that promise for maintaining remote places of business. Going forward the relationship between the cloud and the edge, Cloud Edge, is where IT will focus.

How well IT does at the edge will drive how well the organization does overall.

Key for IT is enabling enterprise agility by making sure edge locations have the flexibility to change at a moment's notice to react to changing business needs and environmental conditions. IT must build-in this agility and velocity at the infrastructure level, in how data is accessed, stored, protected and analyzed, and in how applications are delivered.

This e-book will discuss the specific things IT should consider when designing and deploying remote infrastructure not only to maximize business agility and velocity today, but also to have the flexibility, security and application performance to adapt to a rapidly changing future.

To begin, we'll look at the three different types of edge ...

1 World Economic Forum, The Fourth Industrial Revolution: what it means, how to respond

2 Gallup, State of the American Workforce 2017

3 Gartner IoT Research

The Three Edge Types

Not all remote sites are the same. It follows that not all cloud edge implementations are the same from a technological standpoint. IT needs to consider many variables when designing and deploying edge infrastructure to support a remote site. In general, there are three common types:

1 Internet-Only Edge: This style of edge is popular for small shops, stores or offices that predominantly rely on local productivity apps (such as Microsoft Office) and SaaS apps (such as Salesforce.com or Square POS). To support this use case, IT will provision simple broadband access to the Internet and wireless LAN (WLAN) within the office for basic connectivity.

2 Hybrid-Edge: In some remote sites, staff requires access to both public cloud/SaaS applications as well as traditional data center centralized services such as VPN, Active Directory, DHCP and DNS. In such cases, IT will configure a hybrid-edge, which provides a mix of connectivity options such as public Internet broadband and private MPLS, and WLAN for user access.

3 Stateful-Edge: Internet-only edge and hybrid-edge approaches work when users only need centralized productivity apps or SaaS apps. Often, however, remote users need to run mission-critical enterprise applications such as ERP, CAD/CAM or other database-driven local applications such as enterprise POS systems.

With application performance and high availability as priority requirements, this edge type is comprised of remote sites that run critical, data-generating and database-rich line-of-business applications locally. As a result, these site types need their own local servers.

The dilemma at edge locations is that while the technology challenges are often tougher at the edge, there are often fewer enterprise resources to support the edge. This makes managing edge locations very tricky for IT, ultimately limiting business opportunity.

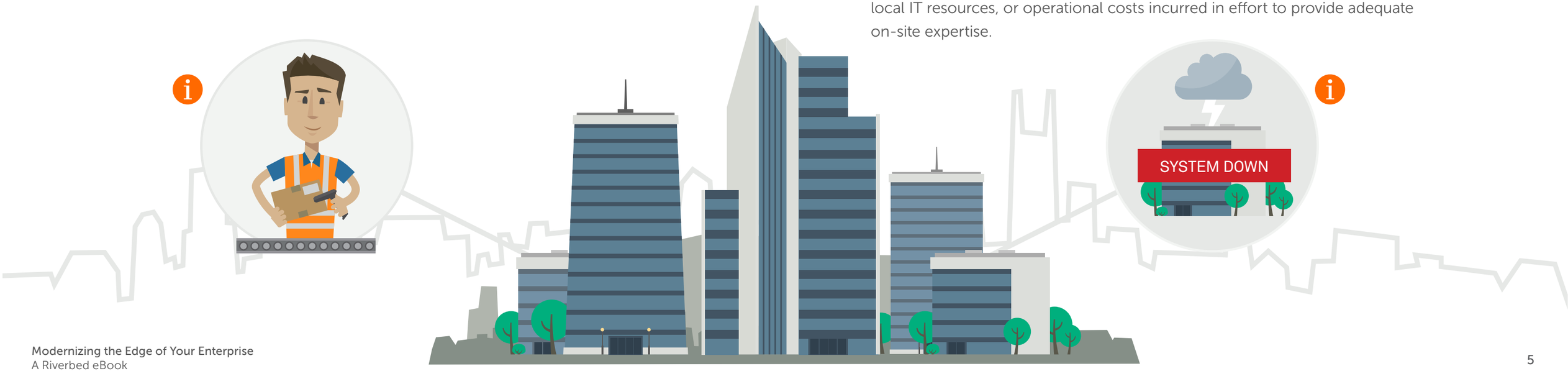
Yesterday's Edge Technologies Hold Back Tomorrow's Enterprise

The problem IT faces today is that while the enterprise edge has changed dramatically over the past few years, edge technology has not. Let's explore how yesterday's edge technologies fall short from the perspective of what enterprises actually want and need from their edge technology platforms in a perfect world:

AGILITY & VELOCITY

What today's enterprises need: The point of an edge location is to place staff close to where business happens. By extension, edge locations have a fundamental need to react quickly to changing business conditions. This could be fulfilling a massive order, rolling out a new store or branch, immediately executing a top-secret mission on the other side of the world, reacting at a moment's notice to an outage that is affecting revenue-generating transactions or units coming off an assembly line far away from expert IT staff.

How yesterday's technology falls short: Legacy IT architectures are complex and rigid. Configuration is done one device at a time, often with command line interfaces or complex homegrown scripts. Maintaining increasingly complex infrastructures at some edge locations, often from multiple vendors, adds to this complexity and time wasted. This problem is exacerbated at edge locations (which often number in the hundreds). Hand configuring and maintaining so many remote edge locations leads to the precise opposite of the agility and velocity the edge requires. This is further compounded by a lack of local IT resources, or operational costs incurred in effort to provide adequate on-site expertise.



SECURITY

What today's enterprises need: Security is a growing problem for IT and a priority-one focus for enterprises. Company data assets are rapidly growing in the digital age, not only from local applications but also from IoT devices. Today, roughly half of these vulnerable data assets sit at edge locations, and with the onset of IoT said to be exponentially increasing industrial data into the hundreds of zettabytes over the next 5 years, the vulnerability of data assets at the edge is a critical concern.

Adding to the risk, networks are also increasingly vulnerable with a growing number of ransom-ware, malware and virus-related attacks that can ultimately present grave consequences to a business. As the ability to stay competitive at the edge increases, enterprises will need to find the most cost-effective ways to meet compliance and security requirements without increasing risk. Enterprises will need to choose edge technology that ensures optimal control to those who hold ultimate accountability.

How yesterday's technology falls short: Legacy IT architectures present a security nightmare. They place a heavy footprint of infrastructure at the edge with compute, storage, networking devices, and an enormous number of IoT devices, all of which presents an enlarged attack surface. Worse, legacy architectures place huge amounts of vulnerable data at minimally protected and minimally managed edge locations leading to an unacceptable risk of loss, attack or misappropriation.

PERFORMANCE

What today's enterprises need: As with security, achieving performance is more difficult at the edge — but application performance in today's digital climate is the way work gets done, so it's a top priority. Increased distances from the cloud or data center make application performance suffer, and for some applications such as database-driven ERP, POS or Line-of-Business systems, the health of the business counts on high availability and always-on local performance. For some sites, it is not always possible to cost-justify high-quality MPLS links to the edge, and a new generation of SaaS and public-cloud based apps have also brought about a hybrid approach to business apps and networks.

Today's enterprises must be able to achieve increased control over the performance of Internet-based apps if they are to play a key role in business being transacted. And with the increased use of IoT at the edge to capture and analyze data, enterprises must also have the ability to run some data analytics close to the point of capture in order to stay agile.

How yesterday's technology falls short: As previously discussed, it is difficult to deliver high performance at the edge due to distance, unreliable connectivity and a lack remote IT staff or clear visibility to troubleshoot issues that may arise. So, for mission critical apps where a lacking of local performance can cost in reputation, revenue and competitive advantage, edge locations often become costly-to-maintain, power-consuming, mini-data centers.

This traditionally means a significant server, storage, backup, WAN Op and networking infrastructure footprint on site at the edge location, often cobbled together with many systems to maintain from multiple vendors without the luxury of expert data center staff and resources. This exacerbates the problems described above of agility, velocity and security.

Blueprint for the Modern Edge IT Architecture

So, if yesterday's legacy architectures fail to serve the enterprise edge, what can IT do? What are the design considerations IT needs to make in order to design and build a technology platform that will allow edge locations to achieve their goals for agility, velocity, security and performance?

Note that the questions you're answering in each of the following areas would be for today as well as in the reasonable future.

DOWNLOAD THE AUDIT SHEET

1 **Audit:**
The first step is to perform an audit of your edge locations.

2 **Infrastructure:**
Next, take stock of the infrastructure currently required at each edge location.

3 **Applications and Services:**
What applications and services do each location require?

4 **Risk:**
Ask basic questions to gauge the level of risk exposure at each edge location:

Rollover each step for additional audit questions

5 **Agility & Velocity:**
Ask basic questions to gauge the level of agility and velocity required at each edge location:

6 **Visibility:**
What kind of visibility do you require for each site in terms of network performance, application performance and end-user experience. What visibility would be ideal?

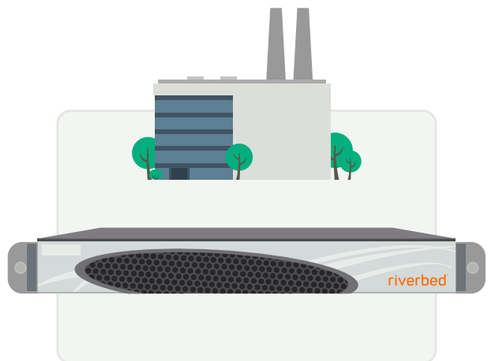
7 **Cost:**
Explore your current cost structures for each edge location:

8 **Data Center:**
Even if your focus is on edge locations, it is important to consider your data center technology platform as well. What does your infrastructure look like today? How will your on-premises data center evolve in the next 3-5 years?

9 **Cloud:**
Where is your use of cloud today, and how will that evolve going forward?

10 **IoT:**
IoT devices are forecast to explode in number over the next few years. You need to take stock of your IoT plans to make sure you future-proof your edge technology plans.

11 **High-Level Analysis:**
Finally, analyze how your current edge infrastructure affects core business initiatives:



Rollover each step for additional audit questions

Future-Proofing your Edge with Riverbed

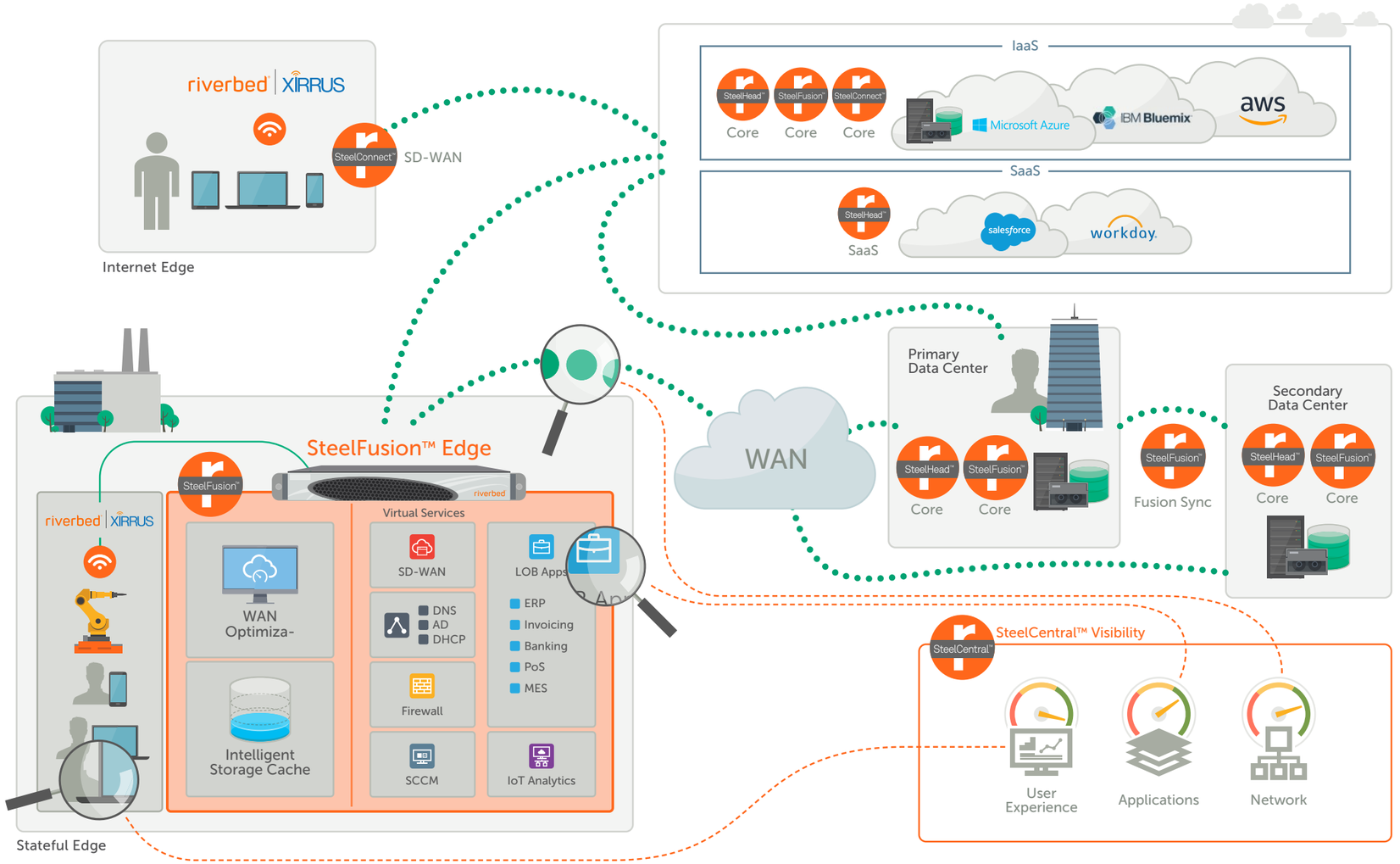
riverbed® Cloud Edge

Today's Riverbed enables businesses to push boundaries and fundamentally rethink what is possible with a unified and integrated portfolio of digital performance solutions purpose-built to dramatically accelerate business outcomes at the edge.

Over the last 15 years, Riverbed has been helping its customers achieve better business performance by making applications, websites, networks, data centers, and remote offices work better. In today's digital era, Riverbed continues to apply that performance know-how by helping organizations take better advantage of the cloud while also addressing speed, reliability, and security gaps that are often of concern at the edge.

The Riverbed Cloud Edge helps to future-proof the enterprise edge with a fully-integrated, software-defined, and easily extensible solution that eliminates complex, legacy approaches to edge networking, compute, and storage. Through this solution, Riverbed helps put IT back in control no matter where business is happening, by increasing business agility and velocity, ensuring business continuity, and delivering the best possible user experience to employees and customers alike.

The Cloud Edge solution delivers a unique set of capabilities that transform edge IT for the cloud-first digital era:



An extensible services platform for tighter integration and easier management of critical third-party services

Edge data services to protect data and simplify and accelerate IT operations

SD-WAN for simplifying hybrid network design, management and cloud connectivity

Integrated WAN optimization to accelerate cloud, SaaS and on-premises apps

Performance monitoring for apps, networks, and user experience, on and off the cloud

Secure and scalable Wi-Fi connectivity for users and IoT

Rollover Riverbed Cloud Edge features to highlight them on the diagram

The Riverbed Cloud Edge comprises four main components:

SteelFusion is an extensible edge services platform that includes patented technology purpose-built to simplify and accelerate edge IT operations, deliver unsurpassed data security, and optimized application performance for the most critical edge sites, all without traditional trade-offs. With the SteelFusion Software-Defined Edge solution, you can:

- Converge remote storage, server, backup, optimization and networking infrastructure into a single 1U or 2U device (also available for high availability)
- Extend data center and cloud infrastructure investments to every edge in the business, regardless of distance
- Secure 100% of your company's edge data in the data center or public cloud while delivering optimized application performance over any network
- Encrypt all data at rest and in flight
- Provision new remote services, line of business applications, and entirely new sites in minutes
- Eliminate all remote backup operations, and achieve near real-time RPO and significantly reduce RTO in the case of a site outage
- Minimize the operational costs associated with remote expert staff, power, real estate and maintenance
- Process and secure incremental data associated with digital applications (IoT)

SteelConnect is a revolutionary application-defined SD-WAN solution. It provides an intelligent and simplified approach to designing, deploying and managing distributed networks for today's cloud-centric world. SteelConnect leverages the principles of software-defined control to provide:

- Simple yet powerful workflows for policy definition based on a new set of primitives to reflect the natural language of business: Applications, Users, Sites, Performance and Security
- Single-click setup of SD-WAN and application acceleration capabilities in Microsoft Azure and Amazon Web Services cloud environments
- User-to-server control, wherever the user (static or mobile) or server (cloud or on-premises) might be
- Scalability for large environments, including data centers. No rip-and-replace needed
- Integrated application acceleration and visibility capabilities, provided as a single-box, dual-box, virtual or cloud-based solution

SteelCentral provides visibility into your users' experience. SteelCentral enables you to understand performance levels, resolve performance issues and improve service performance. It is the only end-to-end solution that blends device-based end-user experience, infrastructure, application, and network monitoring to give you a holistic view of your users' digital experience.

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Xirrus Wi-Fi is the industry's most powerful cloud-enabled Wi-Fi that is designed to dynamically adapt to real-time demands of all users, applications and IoT connectivity, ensuring high-quality experiences in any environment.

Future-proof your edge with:

riverbed® Cloud Edge

The Riverbed Cloud Edge

Only Riverbed provides an intelligent, zero-touch approach to deploying and managing the applications, data, and IT infrastructure that power edge locations in today's cloud-centric world.

Riverbed Cloud Edge disrupts legacy, hardware-based approaches to edge storage, compute, and networking with a software-defined solution that is customizable to every location's size and needs, delivering an unprecedented combination of Agility and Velocity, Security, and Performance for a cloud-like experience that businesses need to succeed in the digital age.

Need More Information?

Call Us:
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1-877-483-7233

Visit:
https://www.riverbed.com/solutions/cloud-edge.html

About Riverbed

Riverbed enables organizations to modernize their networks and applications with industry-leading SD-WAN, application acceleration, and visibility solutions. Riverbed's platform allows enterprises to transform application and cloud performance into a competitive advantage by maximizing employee productivity and leveraging IT to create new forms of operational agility. At more than $1 billion in annual revenue, Riverbed's 28,000+ customers include 97% of the Fortune 100 and 98% of the Forbes Global 100. Learn more at riverbed.com.

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