# Riverbed Steelhead & Granite

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# The Riverbed Unified Performance Platform

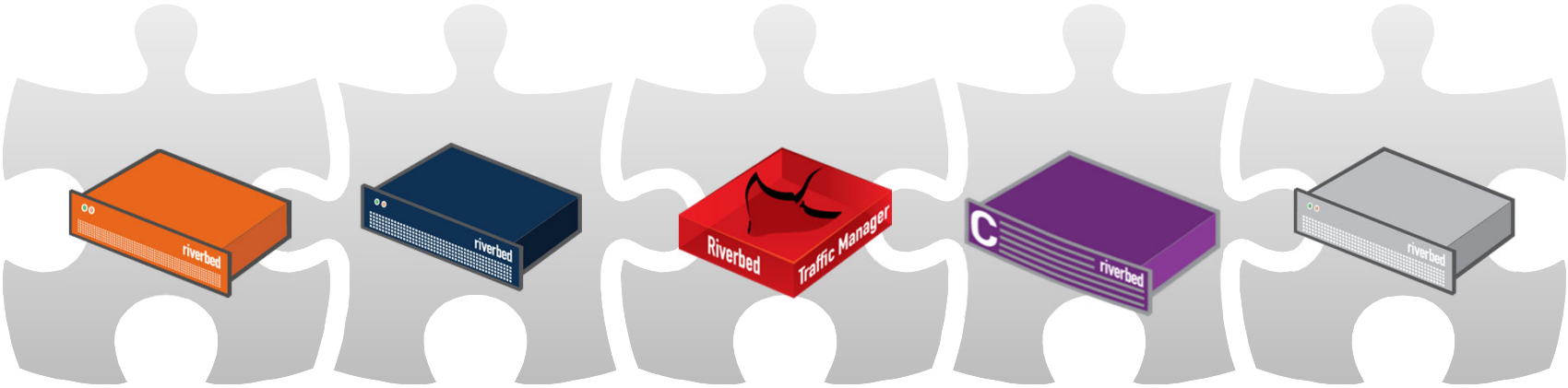
**STEELHEAD**
WAN Optimization

**GRANITE**
Edge Virtual Server Infrastructure

**STINGRAY**
Application Delivery Controller

**CASCADE**
Network Performance Management

**WHITEWATER**
Cloud Storage Gateway




"Think fast"

"Virtual Edge of your data center"

"Intelligent application delivery"

"Google for your network"

"Cloud data at your fingertips"



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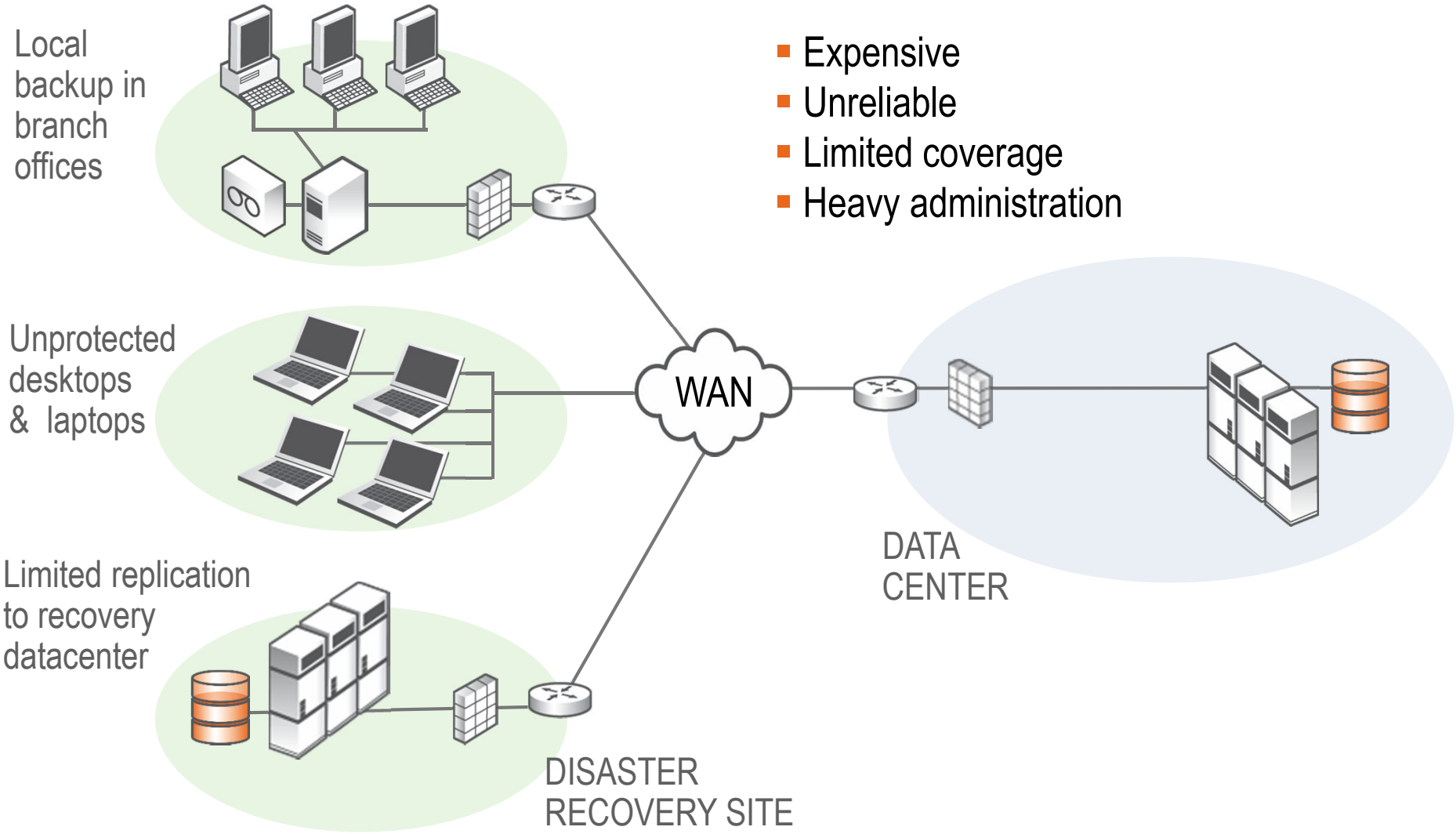
# Distributed Infrastructure




- Expensive
- Unreliable
- Limited coverage
- Heavy administration



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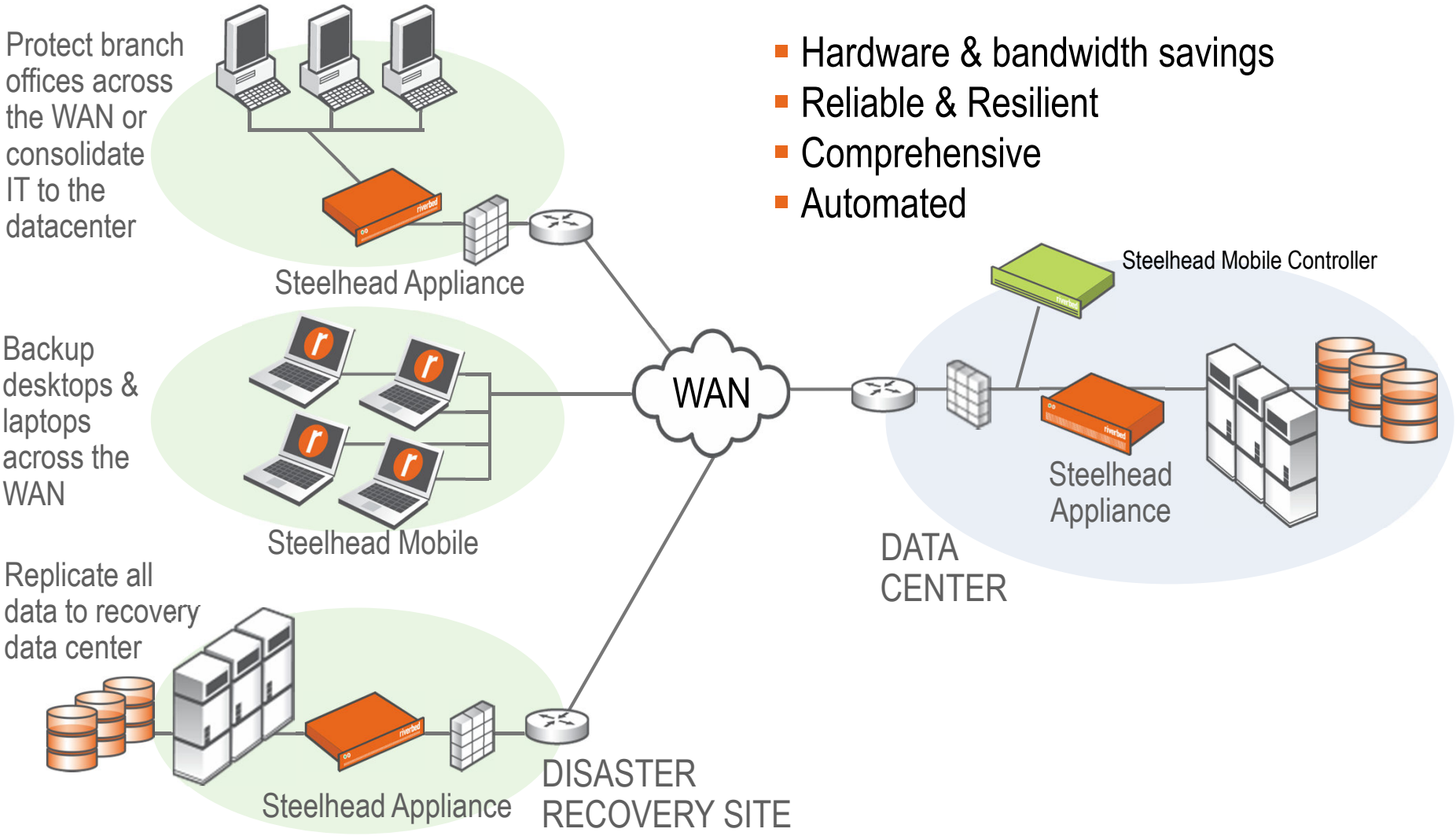
# Consolidated Infrastructure




- Hardware & bandwidth savings
- Reliable & Resilient
- Comprehensive
- Automated



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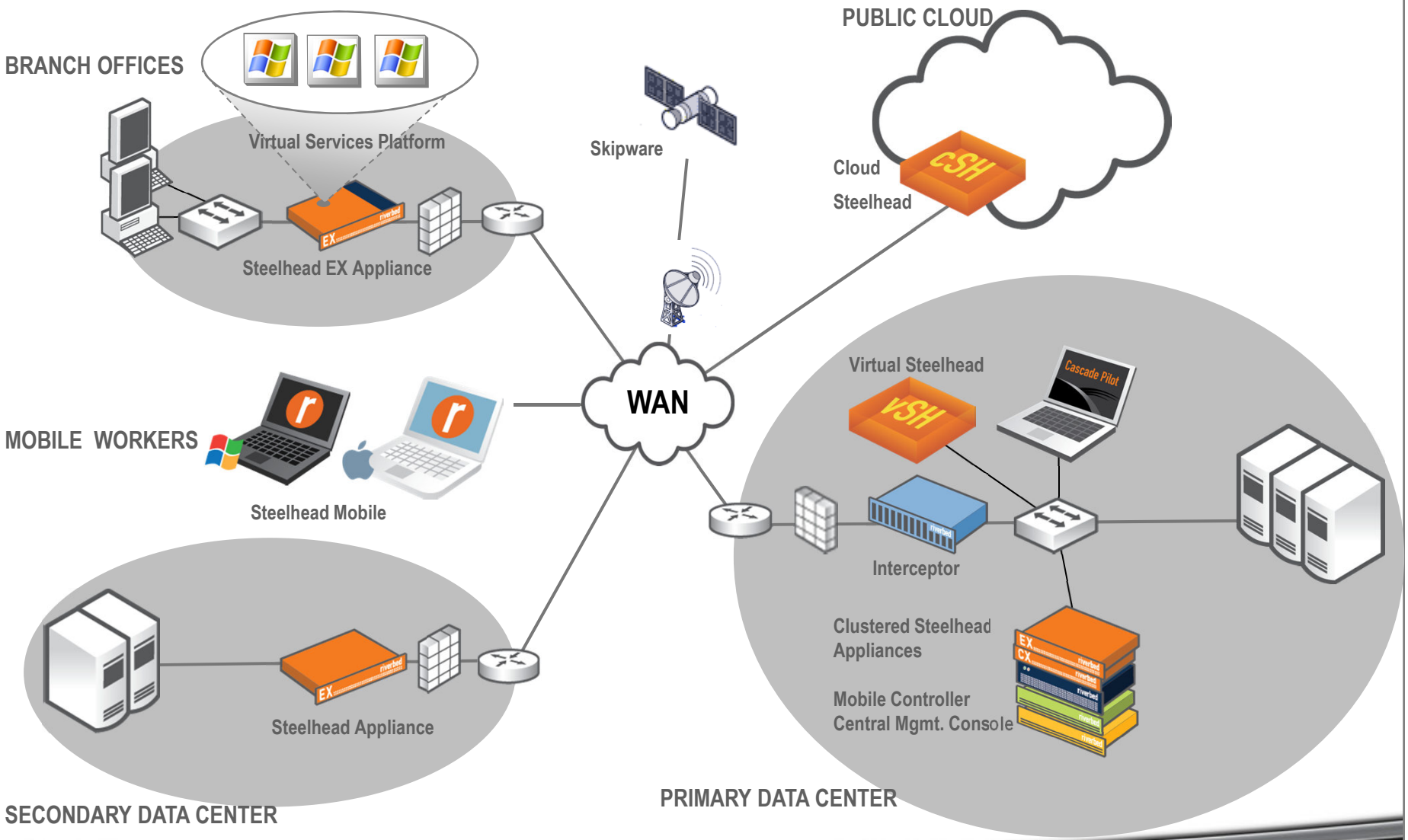
# Comprehensive Riverbed Product Deployment



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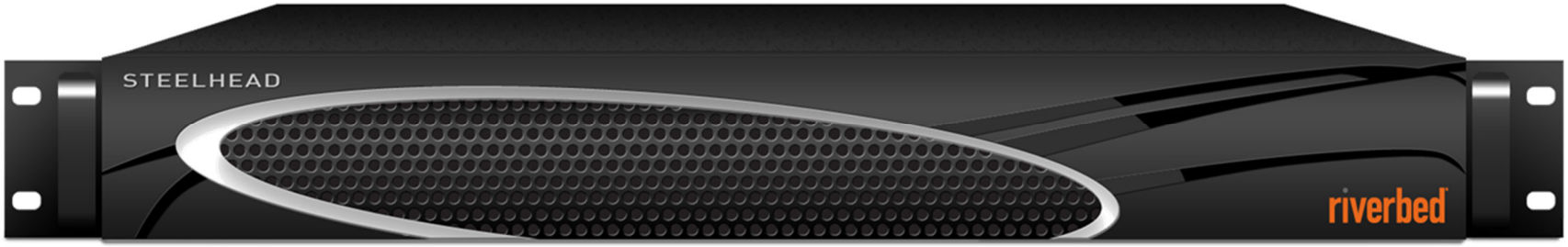
# Steelhead Acceleration




## Transport Streamlining

- Optimizes TCP Payload
- Repacks TCP packets into optimal payload sizes
- Additional TCP capabilities like HS-TCP and MX-TCP provide additional capabilities to significantly increase native throughput for all TCP applications

## Data Streamlining

- Byte level data deduplication is bi-directional, and works across protocols and apps
- Single instance Data Store scales linearly, providing industry leading scalability
- 60-99% reduction in WAN bandwidth needs

## Application Streamlining

- RiOS supports the largest number of application protocols
- Steelhead appliance intercepts and complete transactions locally
- Net result – 65-98% reduction in WAN round trips

**Steelhead optimized networks perform up to 100x faster!**



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# (Virtual) Steelhead Appliance

VSH

- Hardware-based and virtual appliance
- Enables Steelhead value to be delivered in unique form factors, hosting and cloud environments




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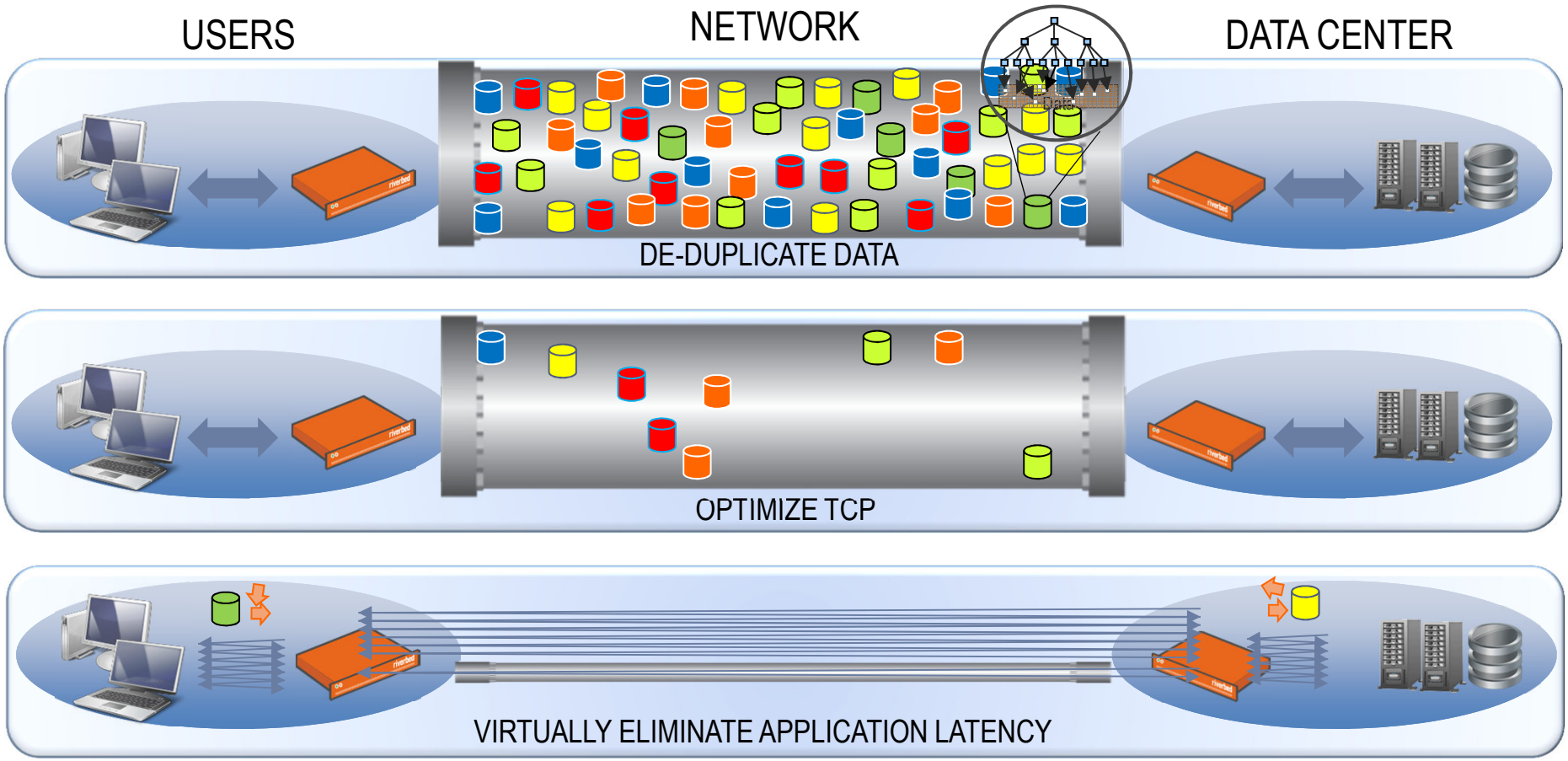
# Riverbed's patented technology advantage



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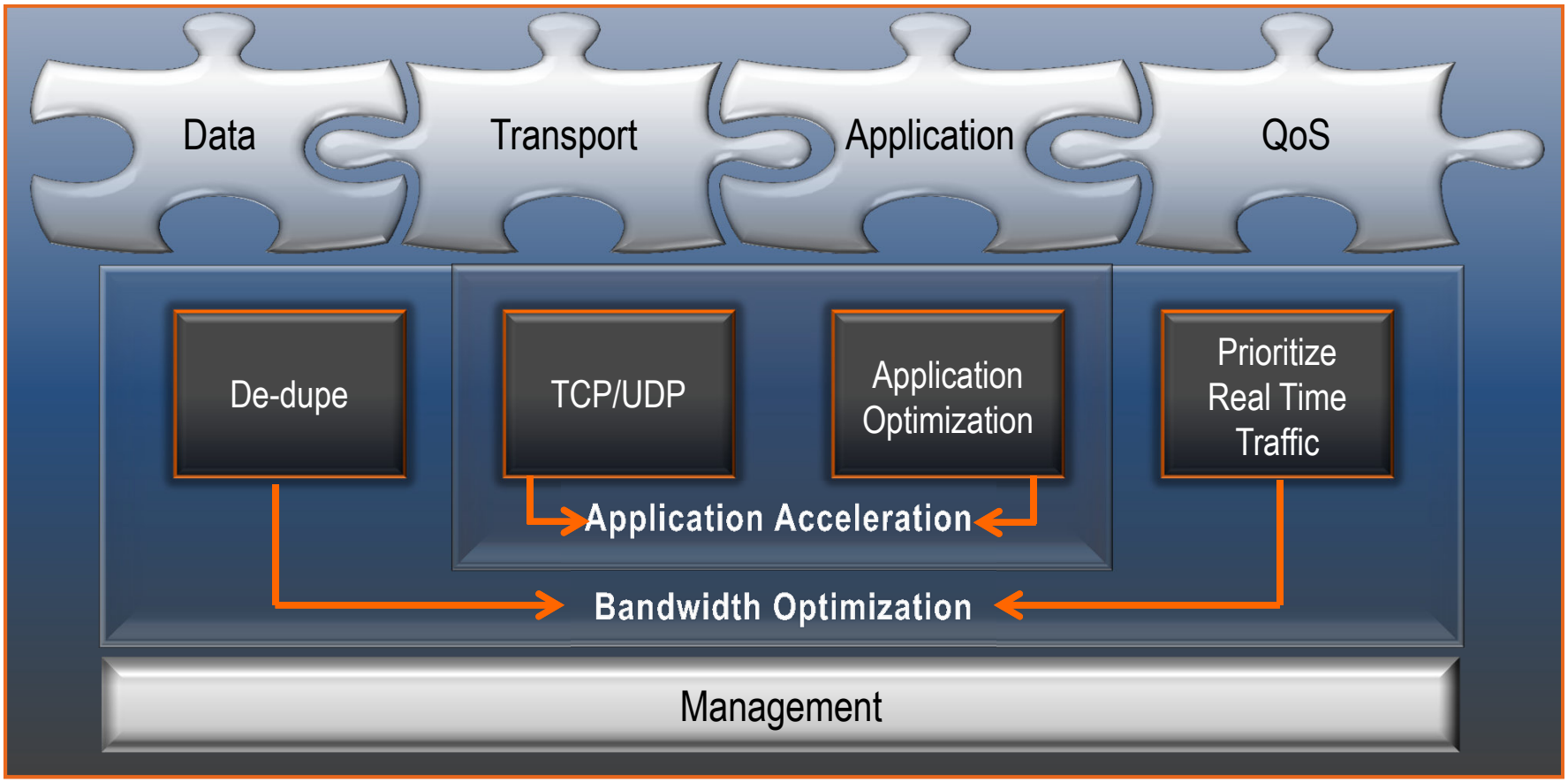
# Deliver Speed, Scalability, Simplicity, and Saving…

## Intelligent Network Optimization




## … with Riverbed Steelhead Technology!



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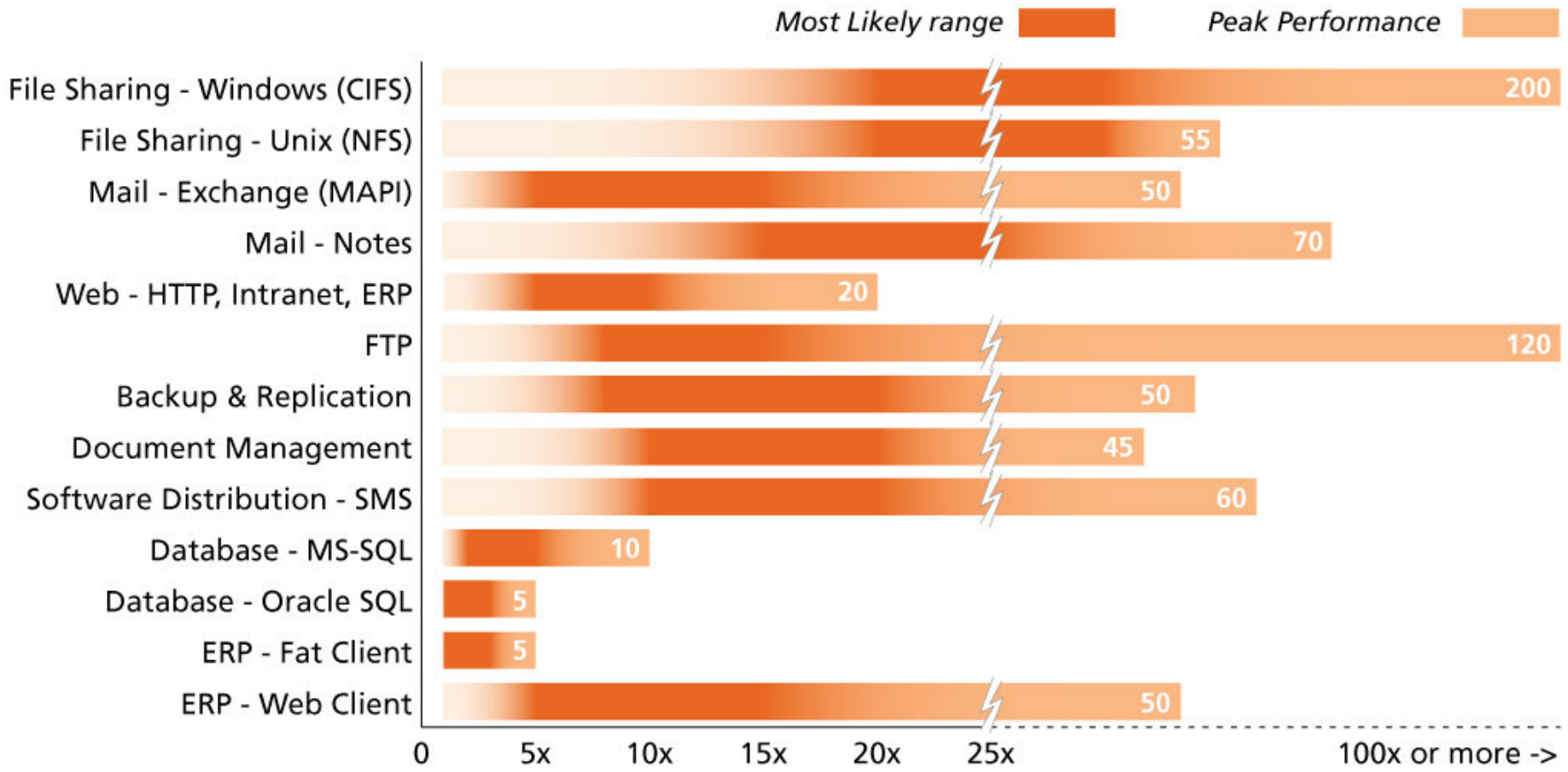
# Riverbed's approach accelerates popular applications



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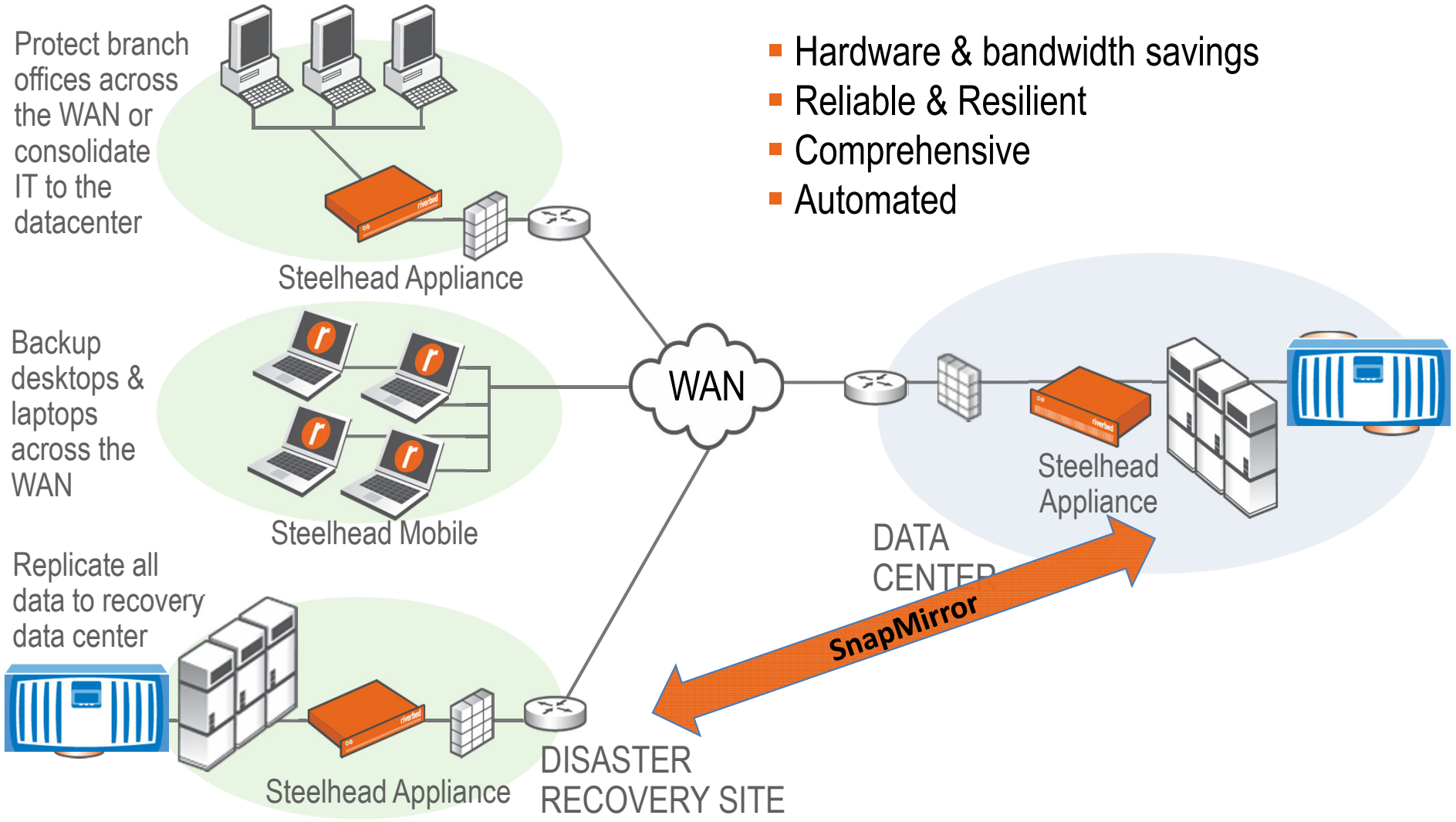
# Disaster Recovery with WAN Optimization




- Hardware & bandwidth savings
- Reliable & Resilient
- Comprehensive
- Automated



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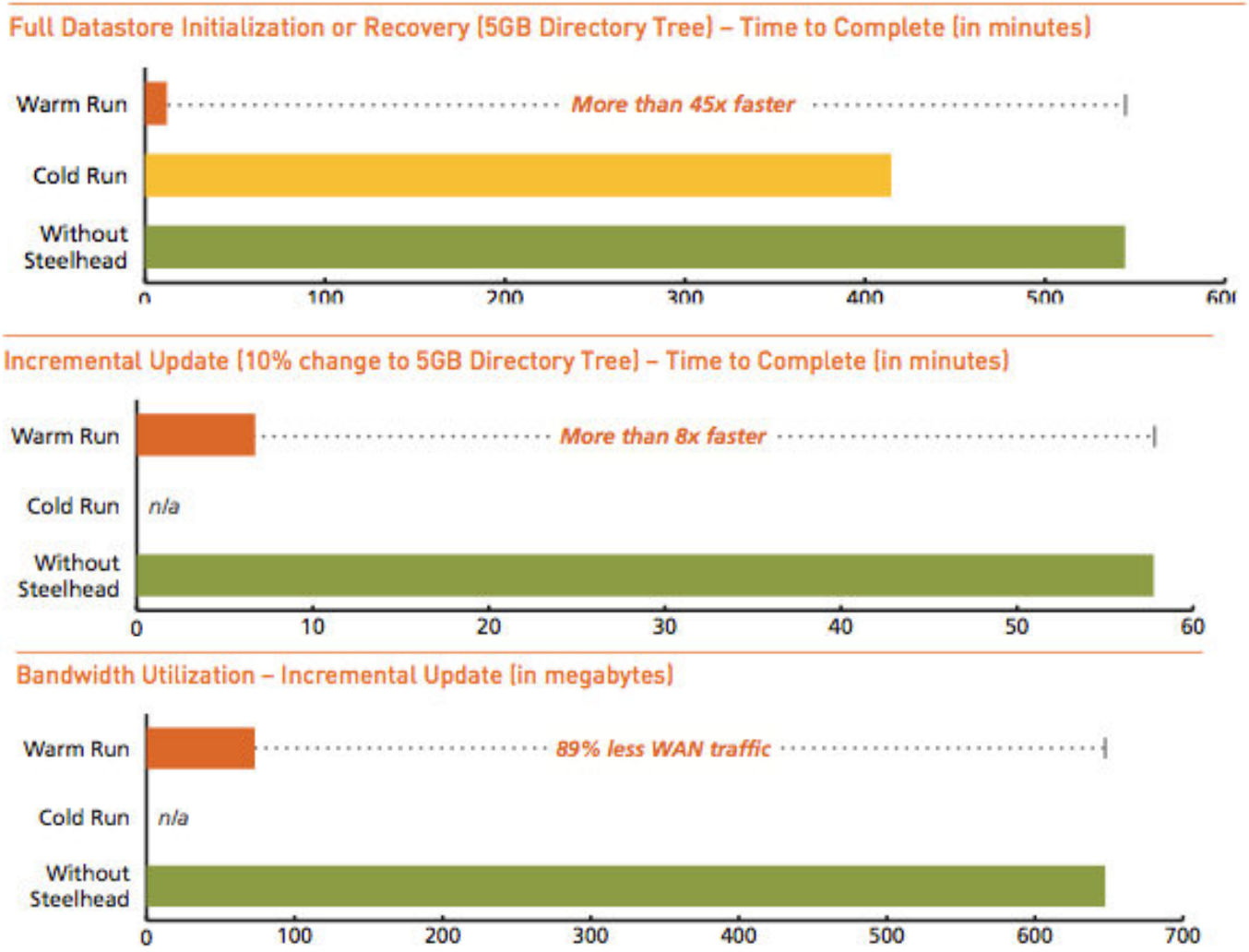
# Riverbed & Netapp SnapMirror




1.5Mbps with 100ms latency

http://www.riverbed.com/assets/media/documents/briefs/PerformanceBrief-Riverbed-SnapMirror.pdf



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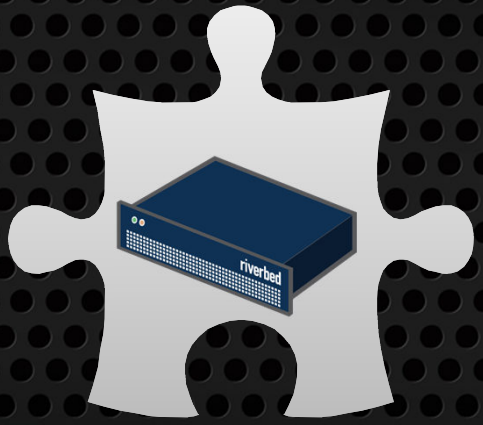
# GRANITE

Edge Virtual Server Infrastructure




Virtual Edge of your data center

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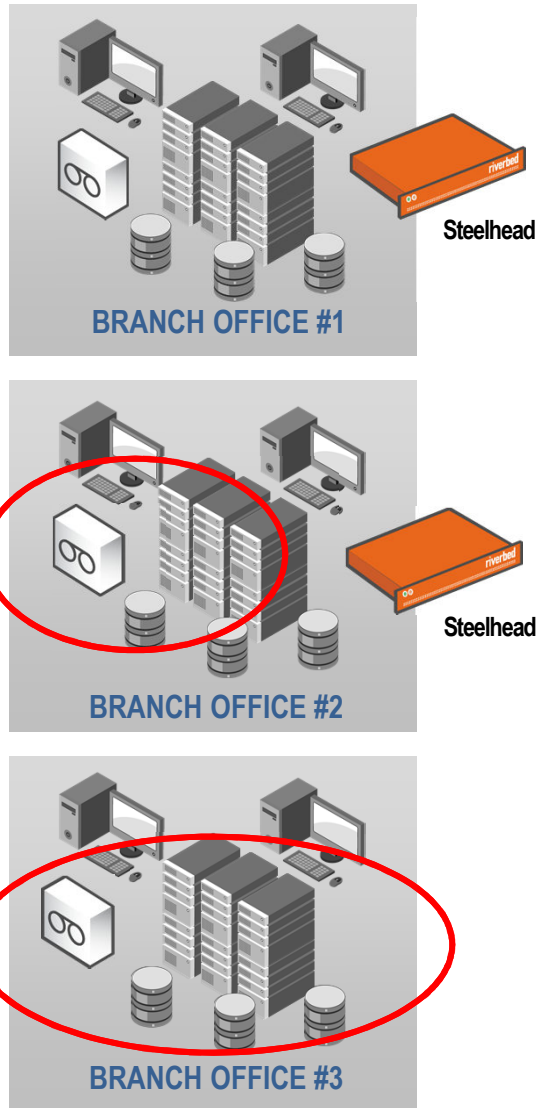
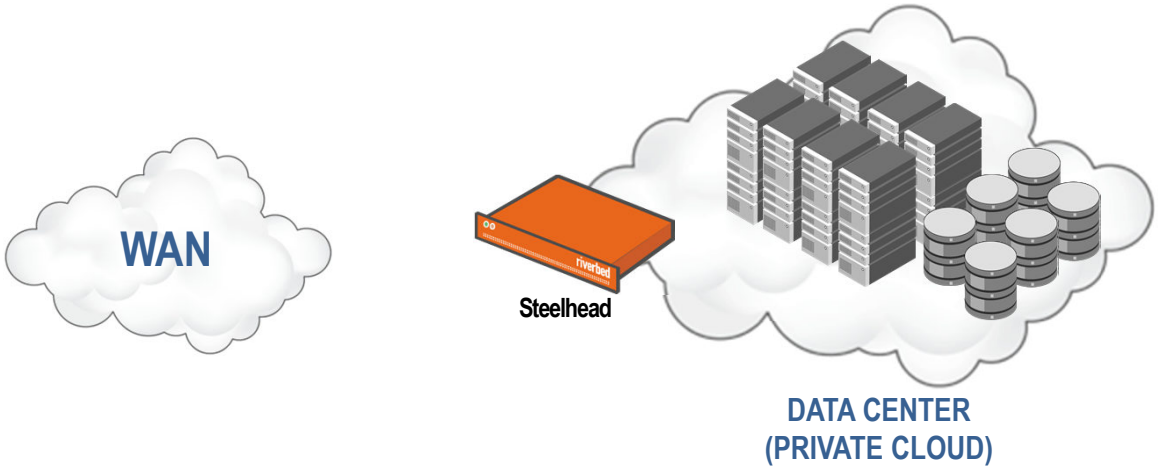
# Branch Office Consolidation Today




Steelhead accelerates access to consolidated applications




Yet some servers, applications – *and backup* – are left behind.



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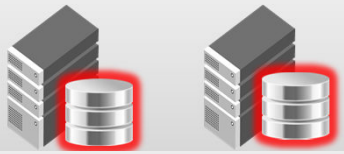
# Unable to Achieve 100% Consolidation

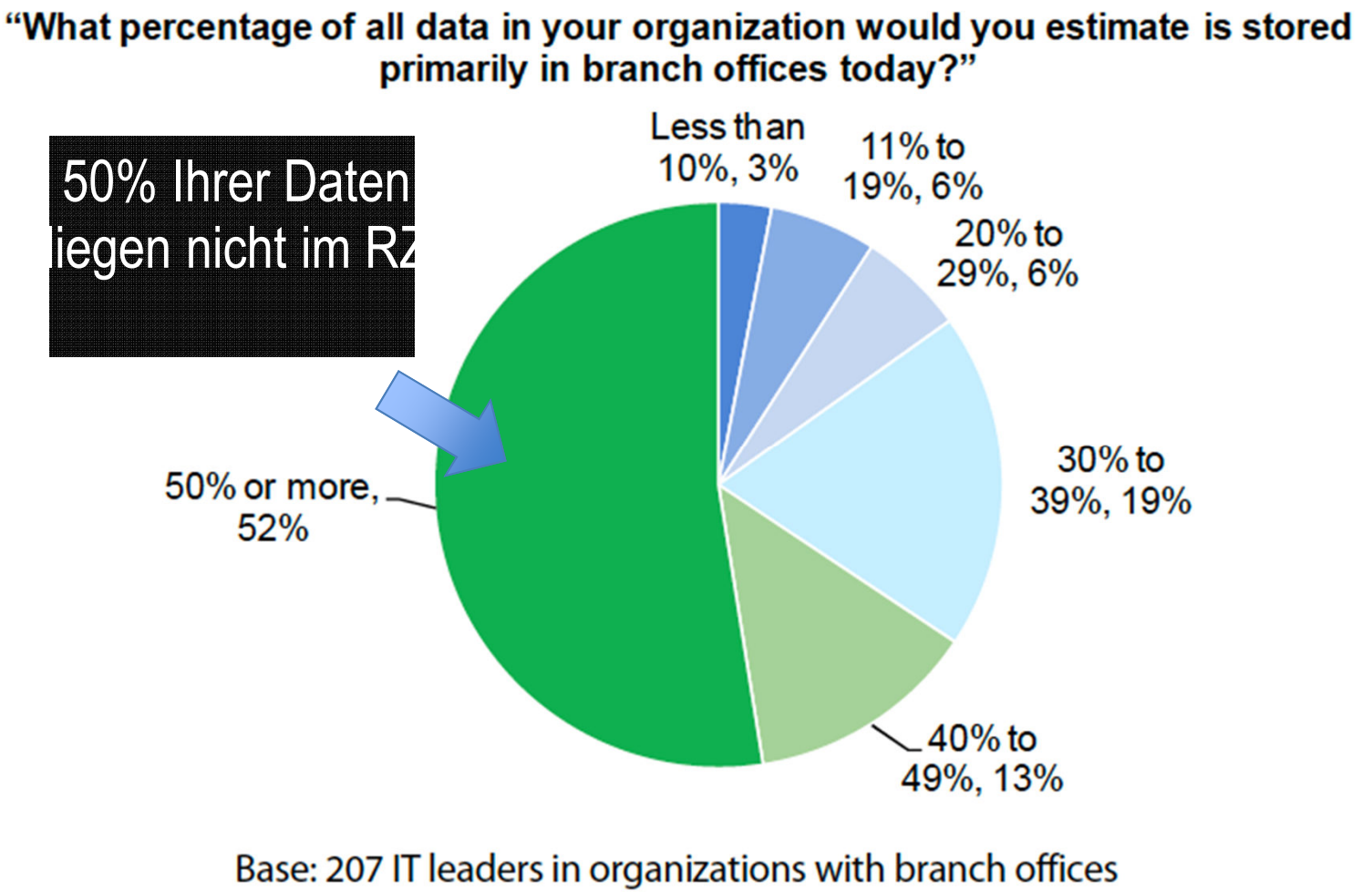
## Why?

| | |
|---|---|
| Apps & data that don't work well across the WAN | • Write-intensive<br>• Custom applications |
| Disconnected operations | • Need to work when the WAN is down |
| Politics | • You're not taking my server…. |



Keeps local compute and disk at branch

# Wo wird mit Ihren Daten gearbeitet?




**Forrester Consulting, October 2011** "Successfully Consolidating Branch-Office Infrastructure In The Face Of More Users, Services, And Devices"


MATU
SST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FEDERAL SUPPLEMENT
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# Steelhead vs. Granite – Compare/Contrast

## Steelhead – WAN Optimization

Solve Problem at **Application Level**


## Granite – Edge Virtual Server Infrastructure

Solve problem at **Block Level** – *decoupling server and storage*




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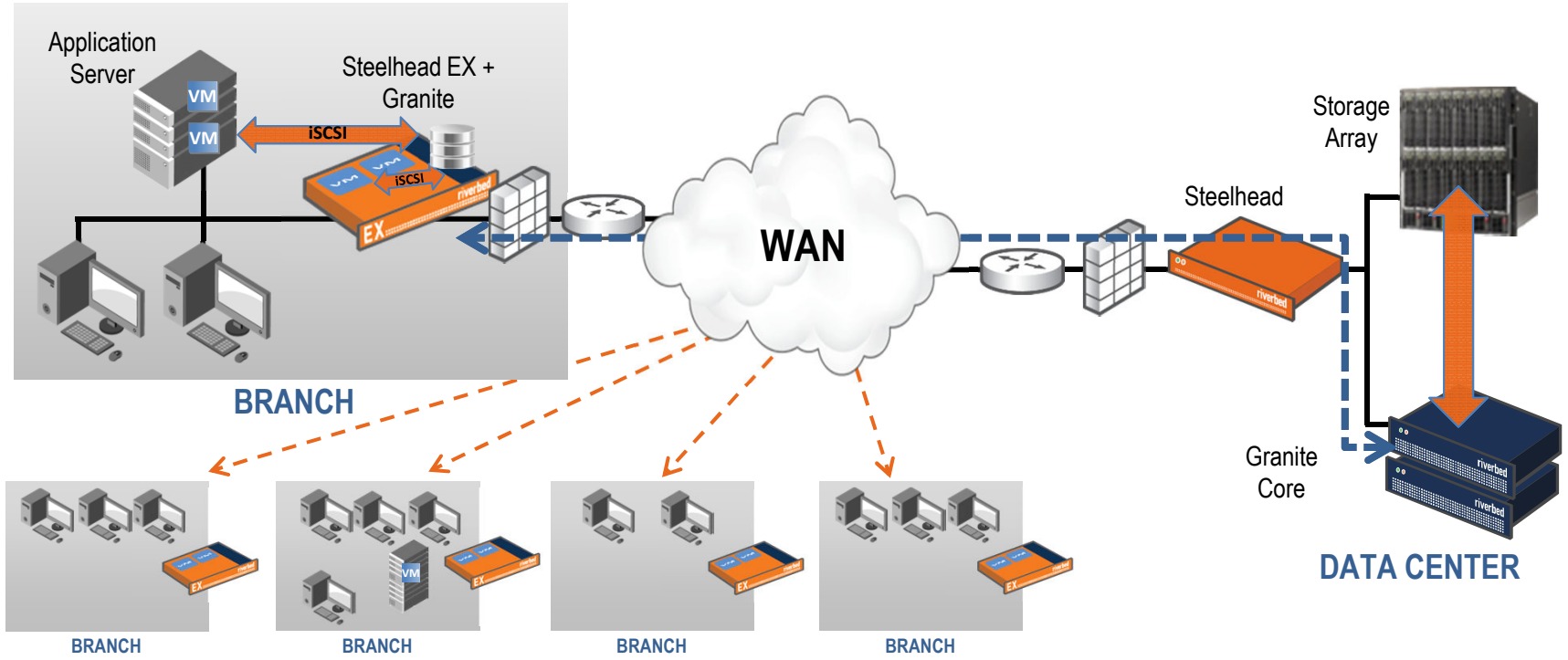
# Granite Environment



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# Granite – the Vacuum Cleaner



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# How it works – File system-aware block-based acceleration


**Fast Reads**

- Block prediction/prefetch accelerates branch access
- Edge read cache delivers LAN performance

**Fast Writes**

- Fully local write commits
- Accelerated asynchronous write-back to data center
- Edge is authoritative to ensure consistency



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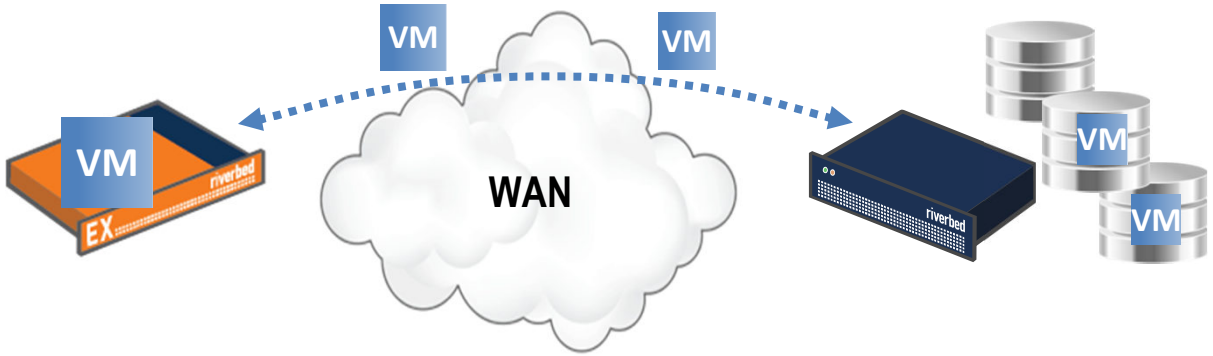
# Boot-over-the-WAN




- Boot virtual servers over-the-WAN from data center storage in minutes
- Instantly provision remote offices from data center LUNs
- Reconnect and instantly recover in the event of disaster



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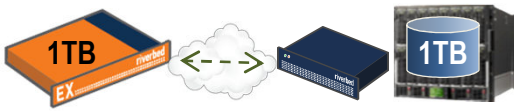
# Granite Edge Operating Mode Options

## Pin the LUN

- Reserves space at the edge for the entire LUN
- Allows all data blocks to be pre-populated
- Ideal for disconnected operations

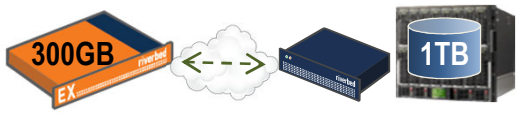
100% of space & blocks




## Working Set

- Active data blocks cached locally at the edge
- A subset of total data size
- Block misses retrieved from data center

Active blocks only




## Local LUN

- Writes are not synced back to the data center
- Used for swap partition, tmp_files, swap space, etc.

Local-only block storage

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# Three Primary Use Cases

## Consolidate Windows file servers

## Get rid of remote backup

## Data in scary places



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# Thank You!