

## TALARI SD-WAN WITH INTEGRATED WAN OPTIMIZATION

Many enterprises with two or more locations, rely on wide-area networks (WANs) to support their employees and partners. Yet, their end-users will suffer when the WAN is slow and unreliable, and unable to respond to changing business demands and new market opportunities.

The WAN must be reliable, agile, efficient and fast, if companies are to succeed in today's competitive and demanding market. An enterprise WAN is the heartbeat of business connectivity and communications for users connecting to corporate offices, branches and cloud services.

Talari's software-defined WAN (SD-WAN) addresses these requirements and more. Talari helps lower costs, simplify network management, improve network and application reliability, optimize bandwidth efficiency, and secure networks and applications. Talari's failsafe SD-WAN is now enhanced with WAN optimization that reduces TCP transfers, and compresses and de-duplicates data to get more traffic into existing bandwidth.

### Talari WAN Optimization

The Talari SD-WAN performs WAN optimization on TCP flows, allowing network administrators to simplify network infrastructure by consolidating SD-WAN and WAN-optimization services with a single device. WAN optimization increases efficiency across the WAN for bulk file-transfer traffic, specifically for data requested by more than one user at the same location. Talari WAN optimization is configured on a per-rule basis, performs TCP offload, and data deduplication and compression.

When WAN optimization is enabled for a flow, TCP termination splits a single TCP connection into three separate connections, all managed and maintained by the Talari SD-WAN. This offers maximum bandwidth utilization and reliable data transfer across the WAN via the Talari Dynamic Conduit. Also, end stations are not burdened with the retransmission of lost packets over the WAN since Talari nodes will handle this issue resulting in an improved user Quality of Experience (QoE) while freeing end station resources to handle core functions such as host a website.

### What causes the WAN to perform poorly?

**Inadequate bandwidth:** Multiple WAN links can be expensive, particularly MPLS links. Techniques, such as caching and compression, squeeze more bandwidth into every WAN link.

**Latency:** Latency reduces the amount of data that can be reliably transmitted through a WAN link, regardless of how much bandwidth is available. This results in an increase in

the price per bit on a given WAN link due to latency-induced bandwidth reduction. Latency can occur due to network congestion, distance, delay, packet loss and jitter. How WAN latency affects response times depends on the length of the delay. For example, less than 75ms of latency might only take 2-3 seconds for an application response. However, latency of 125ms might take up to 8 seconds of response time, and 150ms of latency may create up to 25 seconds of response time delay.

**Chatty protocols:** Transport and application protocols require many turns (often hundreds or thousands of turns) to complete a transaction while noisy-neighbor packets can inflate congestion.

**Non-essential data:** Very often data (text, images, attachments, HTTP) are sent over WAN links with non-essential elements that can cause those links to become slow and suffer bottlenecks. The WAN fills with unnecessary data, thus lowering performance and limiting traffic volume. For example, applications that display JPEG images use high resolutions typically not required for "normal" displays. This results in large amounts of bandwidth being utilized and much longer load times for those images.

**Repeatedly accessed data:** When large amounts of repeatedly retrieved data are routinely accessed by end-users, WAN links can become saturated with requests for the same files. This can impact users with long response times for mission-critical data.

### The Talari SD-WAN with WAN-Optimization Capabilities

**Data compression** – reduces the payload size to deliver more data across the WAN, enabling unencumbered application delivery, and the ability to handle more traffic. Talari compression uses data patterns applied to data flowing through a Talari appliance to free up more bandwidth by reducing bandwidth consumption and improve application delivery performance.

**Data deduplication** – is a form of compression that eliminates redundant copies of data over the WAN, and reduces storage overhead. Talari deduplication ensures that only one, unique instance of data is retained at the requesting site. Redundant data blocks are replaced with a reference to the unique data copy, so only the data that have changed since the previous backup are transmitted. Talari deduplication eliminates the transfer of redundant data across the WAN, by sending references instead of the actual data.

**TCP optimization** – Talari SD-WAN appliances use WAN optimization to manage all TCP sessions, establishing and tearing down TCP connections locally (at LAN speeds) to avoid WAN congestion. This increases link utilization and improves the user experience. TCP termination offloads the responsibility from servers having to handle the overhead imposed by the high volume of TCP connections.

### Talari WAN Optimization Benefits

- Increase WAN bandwidth utilization and application throughput
- Accelerate data replication traffic across the WAN
- Remove adverse effects of distance that cause latency
- Get the most out of bandwidth expenditures; surplus bandwidth on reserve
- Improve server capacity by offloading compute-intensive TCP turns

### Better Together - Talari SD-WAN and WAN Optimization Combined Benefits

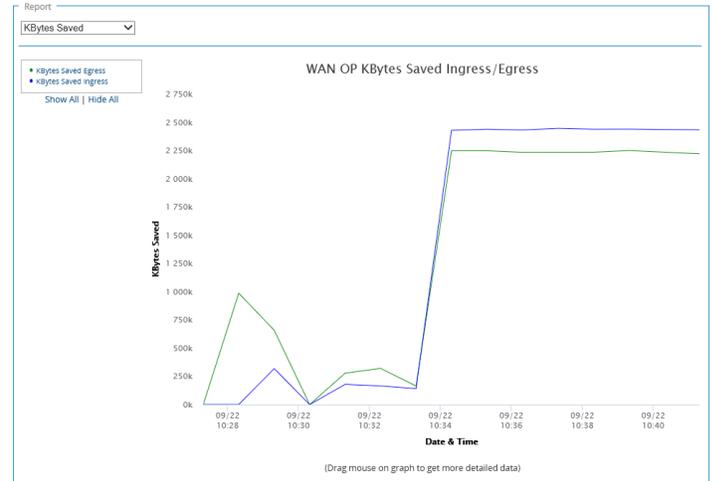
- Improved QoE and performance for end-users (applications) by eliminating loss across the WAN and intelligent path selection that is based on latency, jitter and loss avoidance
- Reduced costs due to efficient use of bandwidth and increased WAN reliability

### Summary

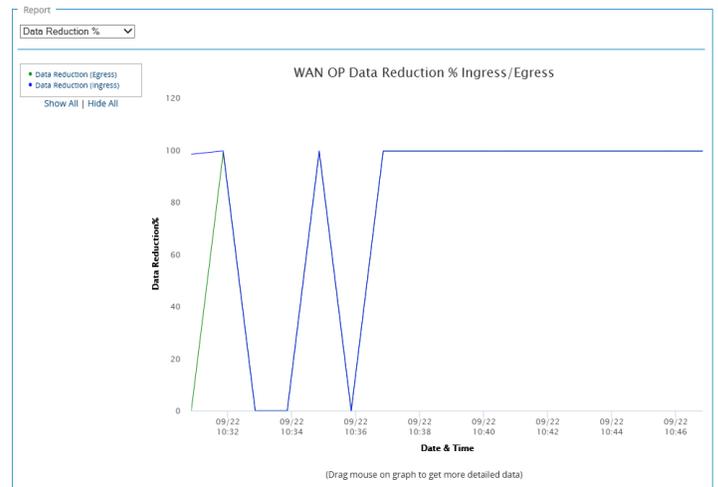
Organizations rely on WANs to support their operations, and suffer when the WAN is slow and unreliable. The WAN must be secure, dependable and efficient, if companies are to succeed in today’s competitive market. Their users connecting to corporate offices, branches and cloud services depend upon it.

With WAN optimization integrated into Talari’s failsafe SD-WAN reducing data volumes, and network and application protocol overhead, combined with Talari’s software-defined bandwidth reservation and real-time queuing functionality, organizations are able to increase bandwidth availability to get significantly more traffic into existing bandwidth.

### Data reduced (KBytes) between two Talari sites:



### Data reduction % between two Talari sites:



### Data reduction % between two Talari sites:

Monitor / WAN Optimization Talari Support

Site-Wide Statistics  
This screen represents the site-wide calculations since the last restart of the WAN Optimization subsystem.

Show data for last minute.

Note: Statistics updated once per minute. [Click here](#) to view detailed statistics per connection.

WAN Ingress		WAN Egress	
Data Reduction Percentage:	1.5 %	Data Reduction Percentage:	0.2 %
Total KBytes Saved:	78891	Total KBytes Saved:	207
Compression Ratio:	1.0 : 1		
Deduplication Ratio:	1.0 : 1		
Fixed Cache Size:	64 GB		

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