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Oracle SD-WAN Edge, WAN Optimization

Oracle SD-WAN Edge is enhanced with WAN optimization capabilities that reduce TCP transfers as well as compress and deduplicate data to get more traffic into existing bandwidth.

THE NEED FOR WAN OPTIMIZATION

Enterprises with two or more locations rely on wide-area networks (WANs) to support employees and partners. Yet, end users suffer when the WAN is slow, unreliable, and unable to respond to changing business demands and 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. Oracle's software-defined WAN (SD-WAN) helps lower costs, simplify network management, improve network and application reliability, optimize bandwidth efficiency, and secure networks and applications. Oracle SD-WAN Edge, WAN Optimization can help reduce TCP transfers. It also compresses and deduplicates data to accommodate more traffic into existing bandwidth.

SAME BANDWIDTH, MORE TRAFFIC

Oracle SD-WAN Edge performs WAN optimization on TCP flows so network administrators can 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. Oracle's WAN optimization is configured on a per-rule basis, performs TCP offload, and handles 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 Oracle SD-WAN Edge. This offers maximum bandwidth utilization and reliable data transfer across the WAN via a dynamic conduit. Also, end stations are not burdened with the retransmission of lost packets over the WAN since Oracle 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 hosting a website.

CAUSES OF POOR WAN PERFORMANCE

Following are some of the causes of poor WAN performance:

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

Features of Oracle SD-WAN Edge, WAN Optimization

All Oracle data sheets include a bulleted list of features.

- Data compression
- Data deduplication
- TCP optimization

Benefits of Oracle SD-WAN Edge, WAN Optimization

- 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

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- **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 is 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 two to three seconds for an application response. However, latency of 125ms might take up to eight seconds to respond, and 150ms of latency may create up to 25 seconds of 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:** Data such as text, images, attachments, and HTTP are often 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, lowering performance and limiting traffic volume. 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.

Better Together: The Benefits of Oracle SD-WAN and WAN Optimization Combined

- 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.

ORACLE SD-WAN WITH WAN OPTIMIZATION CAPABILITIES

Oracle SD-WAN Edge, WAN Optimization offers the following capabilities:

- **Data compression:** This reduces the payload size to deliver more data across the WAN, enabling unencumbered application delivery and the ability to handle more traffic. Oracle's compression technology uses data patterns applied to data flowing through an Oracle SD-WAN appliance to free up bandwidth by reducing consumption and improving application delivery performance.
- **Data deduplication:** This form of compression eliminates redundant data copies over the WAN and reduces storage overhead. Oracle's deduplication technology 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 data altered since the previous backup is transmitted. This deduplication eliminates redundant data transfer across the WAN by sending references instead of the actual data.
- **TCP optimization:** WAN optimization manages 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 responsibility from servers having to handle the overhead imposed by the high volume of TCP connections.

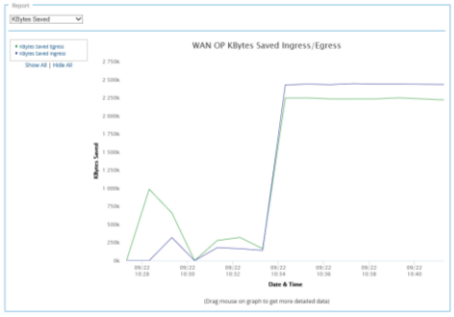

Figure 1. Data reduced in Kbytes between two sites using Oracle SD-WAN Edge, WAN Optimization.

Figure 2 .Data reduced, shown as a percentage, between two sites using Oracle SD-WAN Edge, WAN Optimization.

Oracle SD-WAN

Deployed in thousands of sites across more than 40 countries, the Oracle SD-WAN product family provides market-leading, trusted, failsafe SD-WAN technology. Oracle SD-WAN delivers superior application reliability and resiliency while unlocking the benefits of branch consolidation.

Related Products

- Oracle SD-WAN Edge
- Oracle SD-WAN Aware

Related Hardware Appliances

- Oracle Talari E50
- Oracle Talari E100
- Oracle Talari D2000
- Oracle Talari D6000

SUMMARY

Organizations rely on secure, dependable, and efficient WANs to support their operations. End users connecting to corporate offices, branches, and cloud services require a reliable WAN to do business in today's competitive environment. With Oracle SD-WAN Edge, WAN Optimization data volume is reduced and network and application protocol overhead is optimized. Combined with Oracle's software-defined bandwidth reservation and real-time queuing functionality, organizations are able to increase bandwidth availability to accommodate significantly more traffic into existing bandwidth.

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