





## Company Overview

Founded in 2000 and a publicly traded company as of 2018 (SANGFOR STOCK CODE: 300454 (CH)), Sangfor Technologies is a global leading global vendor of IT infrastructure solutions specializing in Cloud Computing, Network Security and Network Optimization.

A number of Sangfor products are listed in Gartner Magic Quadrant for WAN Optimization, Enterprise Network Firewalls and Secure Web Gateways, proving Sangfor's powerful WAN optimization and network security capabilities.

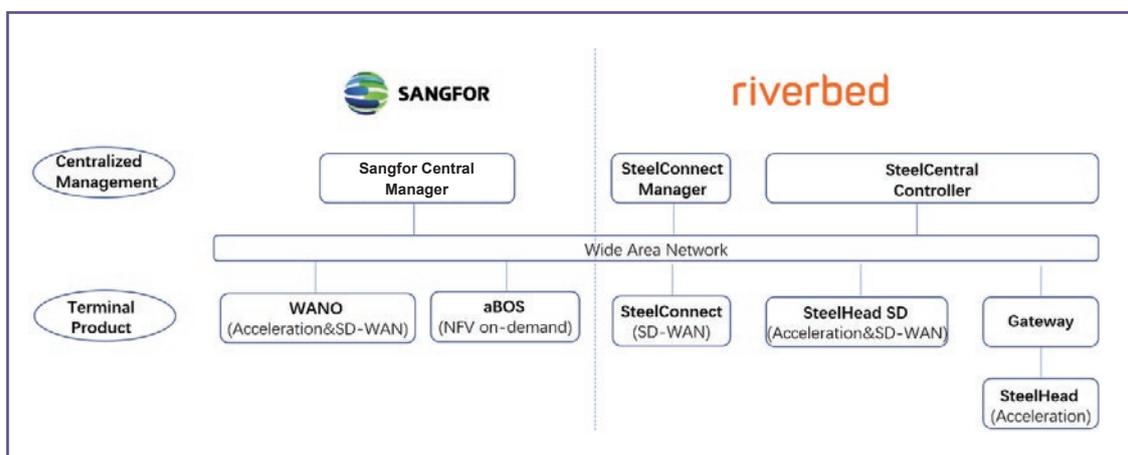
With a primary focus on Asian market until recently, Sangfor's products are developed internally and trusted by customers in a wide array of key verticals.

Riverbed Technology is an American information technology company (which was delisted from the NASDAQ stock exchange in 2015). Its products consist of software and hardware focused on network performance monitoring, application performance management, edge computing, Wi-Fi and wide area networks (WANs). With a focus on the European and American market, Riverbed has quickly improved their market share and solution capability by acquiring and partnering with compatible companies. However in 2019, Riverbed changed its go-to-market strategy by laying off its sales team in the APJ region, included India.

## WAN Solution Overview

Sangfor provides SD-WAN and acceleration (WAN optimization) features, 2-in-1 product WANO, NFV (security & acceleration), deploy on-demand aBOS, NGFW and their centralized management product Sangfor Central Manager, to comprehensively manage all Sangfor network products for enterprises, providing a one-stop centralized management solution for the issues of network connectivity, transmission and security.

Riverbed's SteelConnect and SteelConnect Manager products are a recent, rebranded acquisition of German-based Ocedo known for producing a range of SD-WAN features. Because the products were developed by a third party, Riverbed's acceleration and SD-WAN require 2 centralized management platforms, resulting in poor user experience for customers. In addition, Riverbed lacks a NFV deploy on-demand solution to reduce customer cost and requires cooperation with third-party firewall vendors for network security.



### Sangfor WANO VS Riverbed SteelHead

	De-duplication	Compression	Application Proxy	Video Optimization	Bandwidth Management	URL Filtering	VPN	Deployment	Pre-fetching
WANO	✓	✓	✓	✓	✓	✓	✓	✓	✓
SteelHead	✓	✓	✓	○	✓	○	○	✓	○
Score	✓ Good    ✓ Normal    ○ Not Support								

**Reference:**

[https://support.riverbed.com/bin/support/static/aeohu4i9e68gucosmn6rcsvr1g/html/i38d87tifiq6og6l6i8c1s8m4n/sh\\_cx\\_9.5\\_icg\\_html/index.html#page/sh\\_cx\\_9.5\\_icg%2Foverview.html%23ww292932](https://support.riverbed.com/bin/support/static/aeohu4i9e68gucosmn6rcsvr1g/html/i38d87tifiq6og6l6i8c1s8m4n/sh_cx_9.5_icg_html/index.html#page/sh_cx_9.5_icg%2Foverview.html%23ww292932)

### WAN Optimization

Sangfor WANO and Riverbed SteelHead both have strong WAN optimization capability, support powerful de-duplicate, compression and application proxy to reduce transmission data and enhanced link throughput to improve user application experience and increase productivity. Sangfor’s WANO transmission protocol optimization supports TCP and reduces UDP packet loss by employing duplication and FEC (forward error correction) methods, primarily used for video conference optimization.

### Bandwidth Manager

Both Sangfor WANO and Riverbed SteelHead have a bandwidth management function designed to support and guarantee business traffic and limit non-productive activities during office hours. The difference lies in Sangfor’s +2900 applications, 10 million level URL database and Sangfor’s update of URL and app identification database every 2 weeks. Riverbed SteelHead doesn’t support URL filtering and has just +1300 in their app identification database. Sangfor’s patented ‘dynamic bandwidth limit’ technology, used for VOIP or video conferencing, uses WANO to dynamically creates a priority tunnel for video conferencing, then reallocates the bandwidth when no video conferencing is needed.

### Deployment

Due to lack of firewall and VPN modules, Riverbed SteelHead only supports in-path and out-path deployment, requiring another device to provide gateway and VPN features. Sangfor WANO supports bridge (in-path) mode without any changes to the network, arm (out-path) mode to avoid overloading devices with heavy traffic and supports gateway mode deployment, provides VPN, dynamic path selection and link bonding features.

### Model Comparison

Sangfor	Optimization bandwidth	Riverbed	Series	Optimization bandwidth
SDW-W4000	6M	CX255	U	2Mbps
			L	6Mbps
			M	6Mbps
			H	6Mbps
SDW-W4500	10M	CX570	L	10Mbps
			M	10Mbps
			H	10Mbps
SDW-W5000	20M	CX770	L	20Mbps
			M	20Mbps
SDW-W5100	30M		H	30Mbps

Sangfor	Optimization bandwidth	Riverbed	Series	Optimization bandwidth
SDW-W5400	60M	CX3070	L	50Mbps
SDW-W5500	100M		M	100Mbps
			H	100Mbps
SDW-W5600	200M	CX5070	M	200Mbps
SDW-W5800	400M		H	400Mbps
SDW-W5900	650M	CX7070	L	622Mbps
SDW-W6000	1.5G		M	1G
			H	2G

## Product Competition Overview

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### Sangfor WANO VS Riverbed SteelConnect

	Quickly Deploy	Auto VPN	Centralized Management	Branch Map	Path Selection	Link Bonding	Fail-over	Acceleration Features	Bandwidth Management	Anti DoS	ARP Protection
WANO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SteelConnect	✓	✓	✓	✓	✓	○	✓	○	○	○	○
Score	✓ Good		✓ Normal		○ Not Support						

#### Reference:

[https://support.riverbed.com/bin/support/static/hgc5k5odj0e955sd2uk2qr4ir5/html/7h0cpt4lqflt1k1pfdpth18at9/sc\\_ug\\_html/index.html#page/sc\\_ug%2Fmibs.html%23](https://support.riverbed.com/bin/support/static/hgc5k5odj0e955sd2uk2qr4ir5/html/7h0cpt4lqflt1k1pfdpth18at9/sc_ug_html/index.html#page/sc_ug%2Fmibs.html%23)

## Deployment and Management

Sangfor WANO is deployed via an email link, requiring branch users to connect to a device and click the email link to import the configuration. It is suitable for new internet environments and any average branch user can easily deploy. Riverbed SteelConnect is based on the internet and requires internet access and a DHCP gateway to obtain an IP address. SteelConnect is suitable for an internet-ready environment and requires less user steps and less time for successful deployment. Both Sangfor WANO and Riverbed have a good performance record for centralized management, requiring an IT manager to provide unified management from the datacenter for all branch devices with full network visualization. The difference lies in SteelConnect's inability to support third party products, requiring customers using products like SteelHead to employ other centralized management solutions.

## WAN Network

As a SD-WAN solution, Sangfor WANO and Riverbed SteelConnect all support dynamic path selection based on link quality (packets loss, latency, jitter) and applications and dynamic fail-over for failed links to guarantee core application experience and improve business availability. Unfortunately, SteelConnect lacks a WAN link bonding feature to increase core apps throughput and lacks a series of WAN acceleration features to improve user application experience and transmission, especially in a poor network environment.

## Bandwidth Management and Security

Branch office customers often require fewer devices to meet basic traffic management and security requirements. Sangfor WANO supports more app identification and provides quicker updates for local apps or URL, improving user work efficiency and maximizing bandwidth value. Riverbed SteelConnect does not provide basic security features and requires a third-party security vendor to provide security features while Sangfor WANO supports anti-DoS and ARP protection, decreasing the risk of internet unavailability. In addition, if customers require SD-WAN, WAN optimization or simultaneous full security capabilities, Sangfor aBOS satisfies all these needs, requiring only one device.

VPN Throughput	Sangfor	Riverbed
25M	-	SDI-130/130W
50M	-	SDI-130/130W/330
100M	SDW-M1000 SDW-M1100 SDW-W4000	SDI-130/130W/330
120M	SDW-W4500	-
150M	SDW-W5000	-
200M	SDW-W5100	SDI-330/1030
300M	SDW-W5400	-
400M	SDW-W5500	-
600M	SDW-W5600	-
1G	SDW-W5800	SDI-1030/2030
1.5G	SDW-W5900	-
2.5G	-	SDI-1030
3G	SDW-W6000	-
5G	-	SDI-5030

## Product Competition Overview

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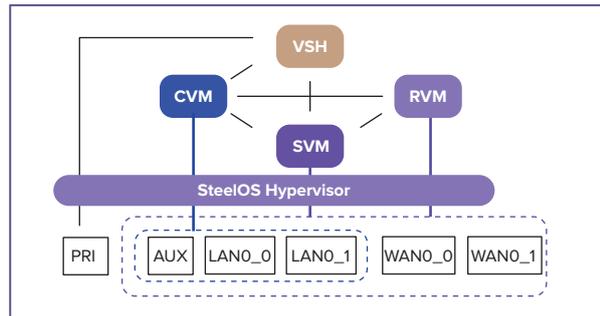
### Sangfor WANO VS Riverbed SteelHead SD

	Deployment	Auto VPN	Source NAT	Classic VPN	Centralized Management	Path Selection	Link Bonding	SSL Optimization	UDP Optimization	Bandwidth Management	Anti DoS	ARP Protection
WANO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SteelHead SD	✓	○	○	○	✓	✓	○	○	○	✓	○	○
Score	✓ Good    ✓ Normal    ○ Not Support											

#### Reference:

[https://support.riverbed.com/bin/support/static/226mfeckfqanne9jmt95lqbm8p/html/tb6lccbbgvd1h8sudojc02fs22/sh\\_sd\\_2.0\\_icg\\_html/index.html#page/sh\\_sd\\_2.0\\_icg\\_html%2Foverview.html%23ww336160](https://support.riverbed.com/bin/support/static/226mfeckfqanne9jmt95lqbm8p/html/tb6lccbbgvd1h8sudojc02fs22/sh_sd_2.0_icg_html/index.html#page/sh_sd_2.0_icg_html%2Foverview.html%23ww336160)

SteelHead SD combines SD-WAN and cloud networking capabilities (powered by SteelConnect) with Riverbed WAN optimization (powered by RiOS) in a single appliance.



## Architecture

Riverbed SD is comprised of 4 separate virtual machines install within the SteelOS hypervisor, routing virtual machine (RVM) used for underlay routing and centralized by SCM (SteelConnect Manager). Service virtual machine (SVM) is the core data plane of the appliance, which provides service chained network functions like QoS, encryption and traffic filtering. Virtual SteelHead (VSH) manages WAN optimization services with SteelCentral Controller (SCC) serving as a centralized management platform. The Controller virtual machine (CVM) controls and orchestrates the entire system as a control plane for SD-WAN and routing functions. Because different VM's are equipped with varying functions and controlled by a different centralized management platform, the SteelHead SD solution has a more complex product architecture, increasing the risk of failure and decreasing performance quality.

## Feature Restrictions

Although SteelHead SD combines SteelHead and SteelConnect, it does not retain all SteelHead and SteelConnect features. For example, in a deployment scenario, SteelHead SD does not support multiple in-path interfaces (double bridge) for WAN optimization, gateway mode PPPoE, Source NAT on underlay traffic and classic VPN, creating many restrictions when customers attempt to deploy. Because WAN AutoVPN memberships for zones are not supported operations are more difficult and require more administrative time for IT managers. In addition, when WAN optimization is enabled and the application target of a traffic rule is set to SSL, SteelConnect does not correctly classify SSL traffic and the traffic will not travel across the SteelHead optimized path.

## Inheritance

All SteelHead SD features are inherited from SteelHead and SteelConnect and have failed to include previously missing features like link bonding and security while continuing to provide limited application identification capability.

Sangfor	VPN Throughput	Optimization Bandwidth	Riverbed	VPN Throughput	Optimization Bandwidth
SDW-W4500	100M	10Mbps	CX570L/M/H	100M	10Mbps
SDW-W5000	150M	20Mbps	CX770L/M	200M	20Mbps
SDW-W5100	200M	30Mbps	CX770H	200M	30Mbps
SDW-W5400	300M	60Mbps	CX3070L	500M	50Mbps
SDW-W5500	400M	100Mbps	CX3070M/H	500M	75Mbps