

SANGFOR WAN OPTIMIZATION

Sangfor WANO (WAN Optimization) is a connectivity and optimization solution providing seamless connectivity among data center, disaster recovery and public cloud features for multiple office locations or branches, enhancing both productivity and business continuity with a low WAN investment.

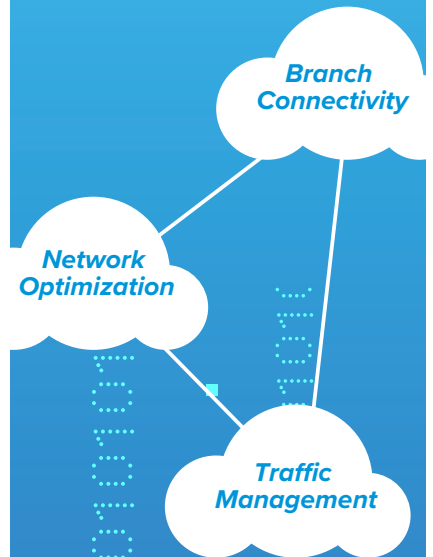
*One-Step Connectivity and Optimization:
Enjoy a LAN Speed on Your WAN*



- Quickly Build Reliable Connectivity
- Optimize Your User Application Experience
- Maximize Bandwidth Value
- WAN Investment Reduced by 70%



SANGFOR

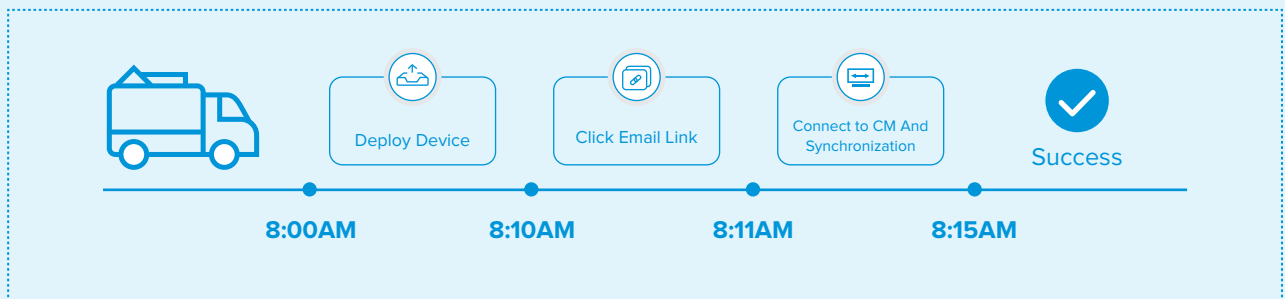




Quickly Build Reliable Connectivity

Sangfor WANO not only support built-in IPSEC VPN with other brand products, public cloud, but also has its own patented Sangfor VPN, quickly build connections with Sangfor network and security products with simple configurations. Based on link QoE (packet loss rate/latency/jitter) detection, Sangfor VPN supports critical applications by dynamically choosing the best quality link and fail-over without any user perception, improving business availability when the WAN link down.

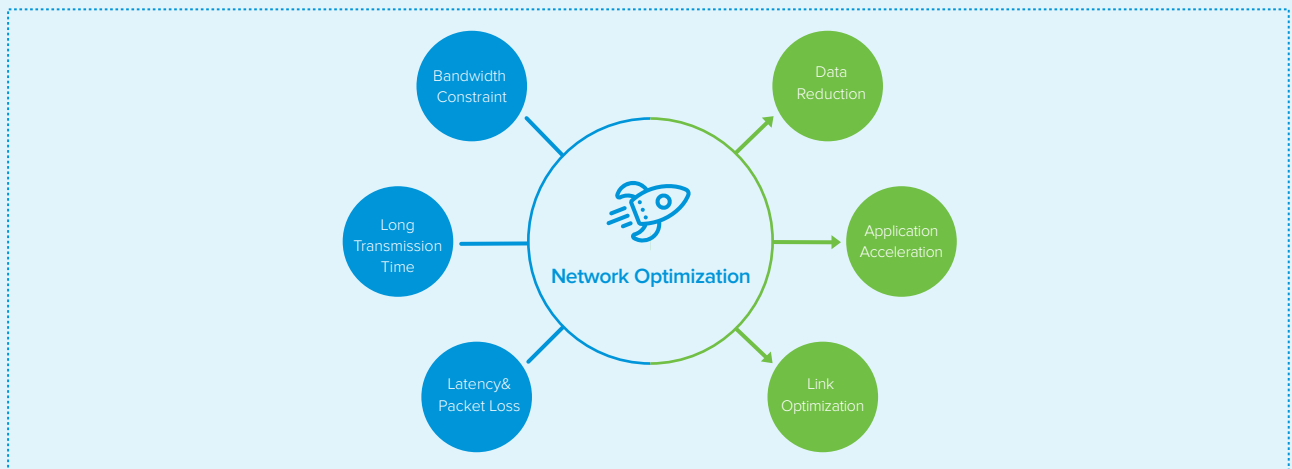
Deployment is easier and more cost effective when integrated with Sangfor centralized management platform, Sangfor CM (Central Manager). CM's email deployment feature makes deployment easy for anyone in branch offices without the need for on-site engineers, thus reducing cost and online business cycle.



Optimize Your User Application Experience

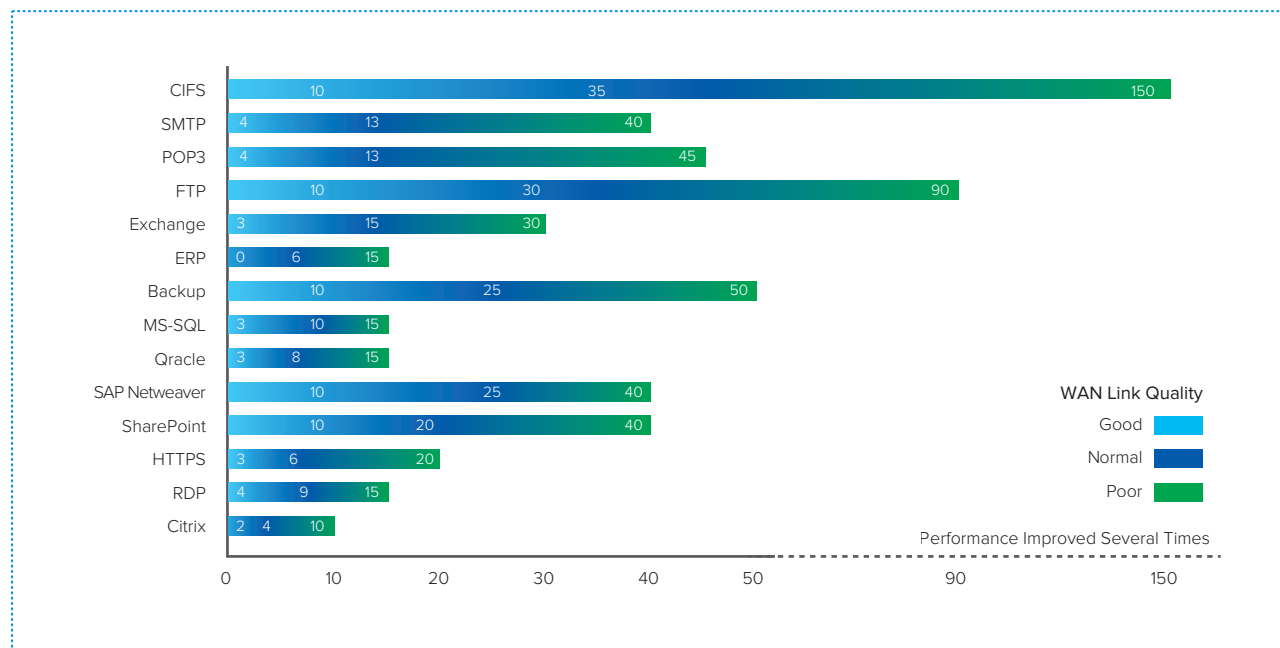
Most business applications perform well on LAN, yet they don't operate or transmit efficiently on WAN due to bandwidth constraints, protocol limitations and latency. Businesses often resort to upgrading their bandwidth to solve this problem, usually with less than effective results.

With the deployment of Sangfor WAN, headquarters, branch offices and partners in different locations can experience accelerated network performance where business-critical applications aren't hindered and data exchange is immediate. All told, Sangfor WAN provides a LAN-like experience over WAN.



Laboratory Test Results

The performance improvement is even more obvious when the link quality is bad.



Data Reduction

95% reduction in redundant data occupying bandwidth.

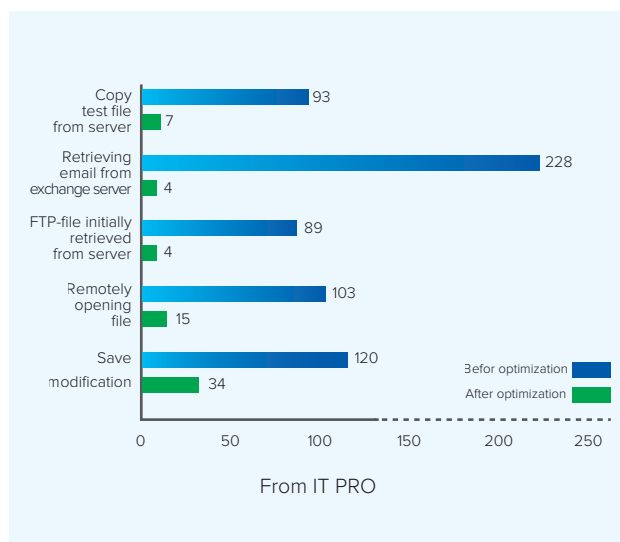
“The appliance clearly delivers an impressive WAN acceleration performance for a wide range of applications and is remarkably easy to deploy.”

—From IT PRO

Sangfor WANO uses leading Byte Cache Technology, allowing deduplication of data across WAN on subsequent transmissions. Once data is transmitted from one end to the other, it is cached at byte level.

As we know, different compression algorithms have different compression efficiency for different data. A single compression algorithm is unable to achieve a maximum compression ratio. Equipped with 3 built-in compression algorithms and dynamic compression technology, Sangfor WANO can substantially minimize the amount of data transmission.

WANO also eliminates redundant data transmission which can occupy up to 95% of WAN traffic, delivering cached data at LAN speed!





Application Acceleration

Business application speed improved 3-10 times

Operation	Performance Increase	
File copy	✓	8-31x
Email	✓	57-64x
FTP	✓	22-64x

Operation	Performance Increase	
Remote file open	✓	8-31x
Remote file save	✓	57-64x
Remote Desktop	✓	22-64x

From BINARY TESTING 

"They come with an extensive range of optimization technologies as standard, are extremely easy to deploy and capable of delivering impressive boosts to WAN performance across a wide range of applications."

--From BINARY TESTING

Sangfor acceleration technology is based on TCP acceleration technology which can accelerate virtually any application.

Sangfor application acceleration is specially designed to accelerate the most critical business applications up to 10X, performing proxy to protocols of MAPI, HTTP/HTTPS, CIFS, Oracle, EBS, Citrix, RDP and SMTP. In addition it boosts the performance of a wide range of applications including Exchange, SharePoint, ERP, CRM, Lotus Notes, Backup, SAP, Disaster Recovery and FTP.

Link Optimization

Elevate WAN Link Quality

HTP (High-Speed Transmission Protocol) technology is the equivalent of upgrading a dirt road to a highway. Based on the transmission layer, it improves link quality and transmission performance of applications, vastly improving user experience.

Sangfor WANO optimizes the TCP and UDP protocols, reducing the impact of latency and packet loss over long distance transmission.

HTP-TCP enhances WAN transmission by selective and quick re-transmission of lost packets, improving the efficiency of congestion control mechanisms in traditional TCP protocol and significantly boosting WAN link performance. HTP-UDP can also reduce UDP packet loss using two built-in algorithms; UDP Proxy and FEC Technologies, significantly improving transmission of UDP based applications like video conferencing.



Local Image



Remote Image

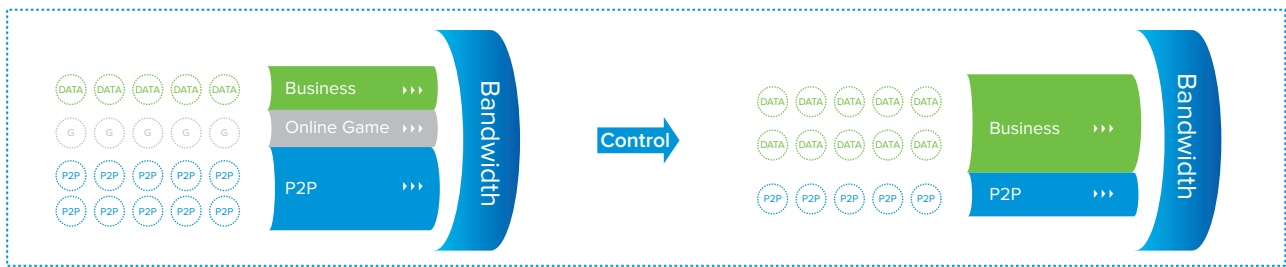


Remote Image with WANO

Maximize Bandwidth Values

Where traffic is uncontrolled, we find traffic accidents and congestion. Branch user internet access is similar to road traffic. Users playing online games, streaming videos or even accessing non-business-related sites within compliance occupies bandwidth with file sharing and P2P traffic, causing poor performance of critical business applications.

Based on Sangfor's +3000 application signature database and URL library of 10 million, Sangfor WANO is capable of intercepting non-compliant browsing activities and limiting unproductive traffic. WANO's effective traffic management guarantees maximum core business application bandwidth and improves staff efficiency and productivity.



WANO Best-Practice Networking Scenarios

SD-WAN Branch Network Access

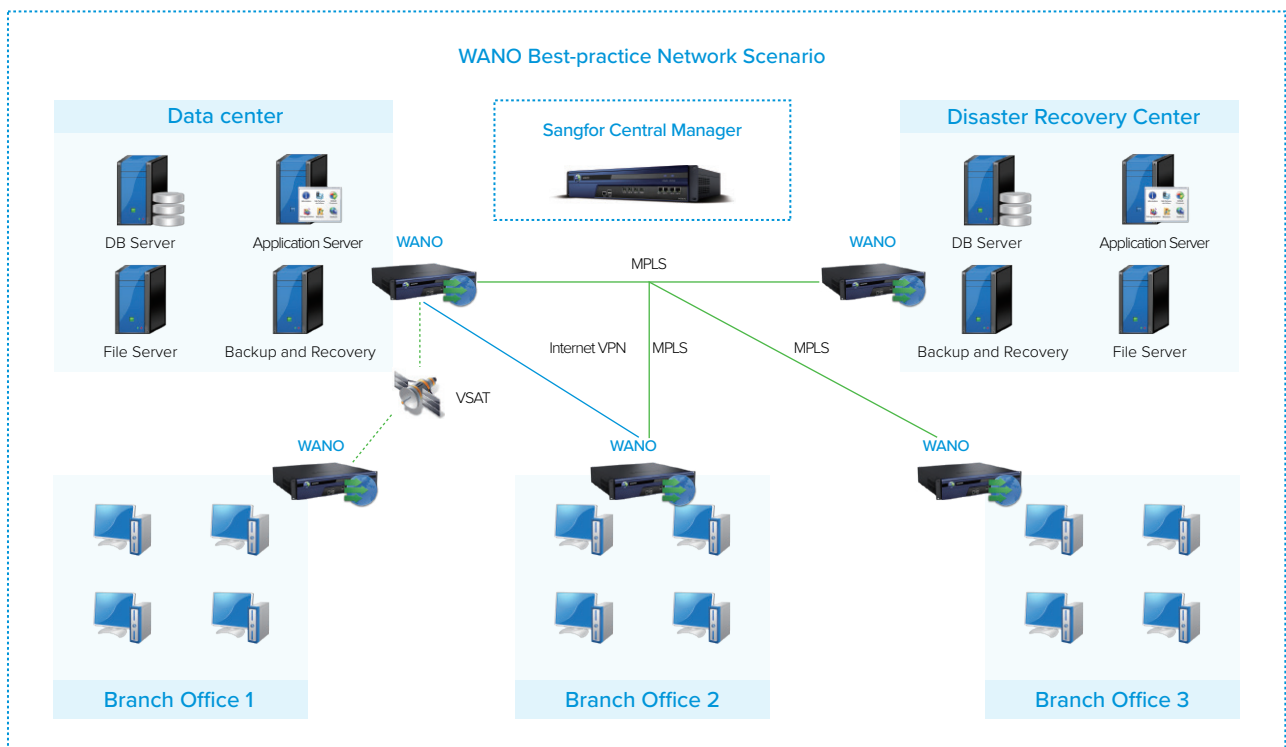
- Quickly build high speed connections from branches to data centers
- Hybrid WAN improves business reliability
- Internet VPN replaces MPLS network to increase bandwidth and reduce cost

Production and Office Application Optimization Over MPLS/VSAT Link

- Application acceleration improves user application experience
- Data reduction increases link throughput and reduces bandwidth cost
- Link optimization improves link transmission efficiency

DC-DRC Data Backup and Recovery Optimization

- Reduce RTO/RPO, decrease potential loss and satisfy compliance requirements
- Reduce MPLS bandwidth cost





SANGFOR

WAN Optimization (WANO)



Main	Model	SDW-W4000	SDW-W4500	SDW-W5000	SDW-W5100	SDW-W5400	SDW-W5500	SDW-W5800	SDW-W5900	SDW-W6000
Hardware Parameters	Use Case	Small Branch	Small Branch	Medium Branch	Medium Branch/Small DC	Medium Branch/Small DC	Large Branch/DC	Large Branch/DC	Large Branch/DC	Large Branch/DC
	Profile	1U	1U	1U	1U	1U	1U	2U	2U	2U
	RAM	2G	2G	2G	4G	8G	16G	24G	32G	48G
	HD Capacity	64G	64G	128G	128G	240G	480G	960G	960G	1.92T
Network Interfaces	10 / 100 / 1000 Base-T	6*GbE	6*GbE	6*GbE	6*GbE	6*GbE	6*GbE	4*GbE	4*GbE	5*GbE
	Max. WAN Port	4	4	4	4	4	4	4	4	4
	SFP/SFP+ Port	N/A	N/A	N/A	2*1G SFP (WAN or LAN)	N/A	2*10G SFP (WAN or LAN)	4*1G SFP (WAN or LAN)	4*1G SFP (WAN or LAN)	4*10G SFP+ (WAN or LAN)
	Bypass (Copper)	N/A	1	1	0	3	3	2	2	2
	Serial Port	1	1	1	1	1	1	1	1	1
	USB Port	2	2	2	2	2	2	2	2	2
Physical Specifications	Dual Power Supplies	N/A	N/A	N/A	N/A	N/A	N/A	✓	✓	✓
	Power[Watt] (Typical)	22W	22W	22W	30W	180W	55W	212W	212W	332W
	Temperature Range	0 C~45 C	0 C~45 C	0 C~45 C	0 C~45 C	0 C~45 C	0 C~45 C	0 C~45 C	0 C~45 C	0 C~45 C
	Relative Humidity	5%~90% non-condensing	5%~90% non-condensing	5%~90% non-condensing	5%~90% non-condensing	5%~90% non-condensing	5%~90% non-condensing	5%~90% non-condensing	5%~90% non-condensing	5%~90% non-condensing
	System Dimensions (mm)	300*430*44.5	300*430*44.5	300*430*44.5	300*430*44.5	400*430*44.5	400*430*44.5	600*440*90	600*440*90	600*440*90

Main	Model	SDW-W4000	SDW-W4500	SDW-W5000	SDW-W5100	SDW-W5400	SDW-W5500	SDW-W5800	SDW-W5900	SDW-W6000
Physical Specifications	Sytem/ Packaged Weight	3.4Kg/5.4Kg	3.4Kg/5.4Kg	3.4Kg/5.4Kg	3.8Kg/5.9Kg	6.7Kg/8.7Kg	6.1Kg/9Kg	18.5Kg/21Kg	20Kg/24Kg	20Kg/24Kg
	Regulatory Compliance	CE,FCC	CE,FCC	CE,FCC	CE,FCC	CE,FCC	CE,FCC	CE,FCC	CE,FCC	CE,FCC
	Optimized WAN Bandwidth	10 Mbps	20 Mbps	30 Mbps	50 Mbps	60 Mbps	200 Mbps	400 Mbps	650 Mbps	1.5 Gbps
	Optimized Connections	500	1000	2500	3000	4000	15000	30000	80000	100000
	VPN Throughput	100 Mbps	120 Mbps	150 Mbps	200 Mbps	300 Mbps	600 Mbps	1 Gbps	1.5 Gbps	3 Gbps
	Max. Acceleration & VPN Branches	10	20	30	50	100	450	600	1000	10000
	Traffic Shaping Throughput	20 Mbps	40 Mbps	100 Mbps	150 Mbps	300 Mbps	600 Mbps	1 Gbps	2 Gbps	5 Gbps

vWANO®

SANGFOR Virtual WANO Appliance

Models			vWANO-10 vmWANO-5000	vWANO-30 vmWANO-5400L	vWANO-50 vmWANO-5400H	vWANO-100 vmWANO-5600	vWANO-200 vmWANO-5800
Speed on Optimized WAN Port			10Mbps	30Mbps	50Mbps	100Mbps	200Mbps
No.of TCP Cons.Accelerated			1500	3000	4000	8000	20000
No.of Sites and PACCs Supported			10	100	100	300	500
VM Config Requirements	CPU	Recommended	>=2	>=4	>=4	>=8	>=8
		Range	2-64	4-64	4-64	8-64	8-64
	Memory (GB)	Recommended	4	7	7	14	14
		Range	4-256	7-256	7-256	14-256	14-256
	Cache Disk Size (GB)		100-2000	100-2000	100-2000	250-2000	250-2000
	Performance (IOPS)		>=100	>=200	>=200	>=500	>=1000
	I/O Throughput (MB/s)		>=25	>=50	>=50	>=125	>=250
NIC			3	3	3	3	3
Supported Platforms			VMware vSphere, Microsoft Hyper-V, SANGFOR HCI & aBOS				



System Requirements for Mobile Client (Portable Accelerator)

WANO Mobile System Requirements	
Operating System	Windows XP, Windows 7 & 8 (32/64 bit), Windows 8 (32/64 bit), Windows 10 - No support for tablets & smartphones.
CPU	Celeron1.5GHz
Memory	256MB
Disk Space	2GB

SANGFOR WAN Optimization (WANO)



Network and Deployment	
Deployment Mode	Gateway, Single Bridge, Double Bridge, Single Arm, Double Arm, Hands Free mode.
Quick Deploy	Email deploy integrated with Sangfor Central Manager
High Availability	<ul style="list-style-type: none">- Active/Passive HA- Hardware Bypass- CDP + PBR, WCCP, NQA
Web Management Console	Intuitive management console makes management easier and more effective.
Hierarchical Administration	Functionality of different modules can be assigned to different administrators as needed via a hierarchical management paradigm.
Auto-Path Discovery	Configuration free for connection between WANO gateways.
Configuration Backup	Support restore and backup of WANO configurations.
Network Diagnosis	<ul style="list-style-type: none">- Real-time health status detection by monitoring networkports compatibility, disk information, routing settings, Windows domain, IP conflict, etc.- Able to perform WAN diagnosis such as ping, route, show ARP, tracert, gwinfo, netstat via WebUI and offload maintenance.
Integrity	Support SNMP, Syslog.
DNAT	Visitors are provided a public IP intranet server.
SNAT	Intranet users can access the internet using a public IP gateway.

Connectivity

Sangfor VPN	Sangfor patented VPN provides a secure VPN tunnel between Sangfor devices with easy configuration and high function scalability
Auto VPN	Integrated with Sangfor CM and supports branch devices, automatically building a VPN tunnel to HQ devices without any additional WANO configuration
Tunnel NAT	Allows access between multiple branches and HQ when branches have the same subnet
IPSec VPN	<ul style="list-style-type: none">- Offers IPSec VPN with third-party brand VPN gateways- IPSec Protocol: AH, ESP- D-H Group: Group 1/2/5/14/15/16/17/18- IPSec Authentication Algorithm: MD5, SHA1, SHA2-256, SHA2-384, SHA2-512- IPSec Encryption Algorithm: DES, 3DES, AES-128, AES-192, AES-256
Generic Routing Encapsulation	Build GRE tunnel between different sites

Routing & Path Selection

Policy-Based Routing	Select path in WANs and VPN tunnel based on link survival status, applications, URLs and user groups
SD-WAN Path Selection	<ul style="list-style-type: none">- Link detection based on link QoE (packet loss, latency, jitter).- Automatical fail-over- Select optimal path for critical App's traffic- Select path based on bandwidth ratio
VPN Tunnel Bonding	Bonding multiple VPN tunnels as a path to transfer core business applications
Dynamic Routing	BGP and OSPF
DNS Proxy	Proxy DNS requests, combine with URL path selection

Data Reduction

Byte Cache	<ul style="list-style-type: none">- Data cache at byte level to ensure the WAN data traffic is deduplicated and previously viewed data are served directly from the local cache to LAN- Support shared cache among multiple WANOs
Dynamic Compression	Built-in with 3 kind of compression algorithms with dynamic mechanism to choose the most proper compression (LZO, GZIP, Quick LZ)
HTTP and FTP file pre-fetching	Pre-fetch the static data from remote HTTP/FTP server to local WANO per configurable timetable

Application Acceleration

Application Identification	Automatically identify the application with the built-in Application Signature Database
Application Proxy	Boost application performance for Exchange, SharePoint, CRM, Lotus Notes, Backup, SAP, Disaster Recovery and FTP with application protocol proxy technology supporting Exchange, HTTP/HTTPS, CIFS, Oracle EBS, Citrix, RDP and SMTP
TCP Proxy	Dynamically optimizes transmission control protocol with TCP proxy by intelligently emulating the cumulative acknowledgments
HTTPS Optimization	Support certificate import method, identify and accelerate HTTPS protocol based applications



Link Optimization

High-Speed Transmission Protocol (HTP)	Designed to streamline data packets experiencing high packet loss in high latency network environments like satellite, wireless and cross-border
HTP-TCP	HTP-TCP improves TCP transmission efficiency by expanding the transmission window, improving the congestion control algorithm and performing selective quick retransmission
HTP-UDP	HTP-UDP supports FEC and UDP Proxy technologies and guarantees the stability of UDP based applications such as video conferencing by reducing packet loss and ensuring it runs with the highest priority

Traffic Management

Access Control	<ul style="list-style-type: none">-Application Control-HTTP URL Filtering
Bandwidth Control	<ul style="list-style-type: none">- Traffic guarantee or limitation policy for upload and download- Exclusion policy based on applications, websites, files, users, schedules, destination IPs, etc.- Dynamic bandwidth policy for core business applications
ACL	Packet filtering based on source/destination IP and service
Anti-DoS	Protects users and servers from DoS attack
ARP Protection	Avoid network confusion from MAC disguise attack

Visibility

Real-Time Monitor	System status, application connections, flow and network optimization status
Reporting	<ul style="list-style-type: none">- Comprehensive reports include flow and optimization monitoring, allowing effective monitoring of the ever changing network environment- Provides visibility of a wide range of network information, including logs for alarms, errors and debugging- Report of real-time and historical traffic, analysis of accelerated, non-accelerated traffic and sessions- Generates/export reports in PDF format, support email subscription- Traffic visibility based on users, IPs, applications, etc.
Traffic Visibility	<ul style="list-style-type: none">- Visibility of URLs with built-in dataset and customizable resources- Intelligent identification of traffics from P2P, IM, SSL, Proxy, etc. for full network visibility and control- Support basic direction traffic, port and custom application

Scalability

Virtualization Platform	vWANO in Sangfor HCI/aBOS, VMware, Hyper-V
Public Cloud	vWANO in Alibaba Cloud, AWS, CT Clouds
Portable Accelerator(PACC)	Install software client on Windows PC to improve access speed and increase productivity of remote workers
Centralized Management Console	Sangfor's centralized management controller, Sangfor CM (Central Manager)

Please contact us by email if you need more information about our WANO features.

COMPANY PROFILE



Make Your Digital Transformation Simpler and More Secure. This is Sangfor Technologies' commitment to our customers. Since forming in 2000, Sangfor has been a global leader of IT infrastructure, security solutions and cloud computing. Five business groups deliver industry leading products for Hyper-Converged Infrastructure, Virtual Desktop Infrastructure, Next Generation Firewall, Secure Web Gateway, Endpoint Protection, Ransomware Protection, Incident Response, WAN Optimization, and SD-WAN. Constant innovation and dedication to creating value for our customers are the heart of our corporate strategy.

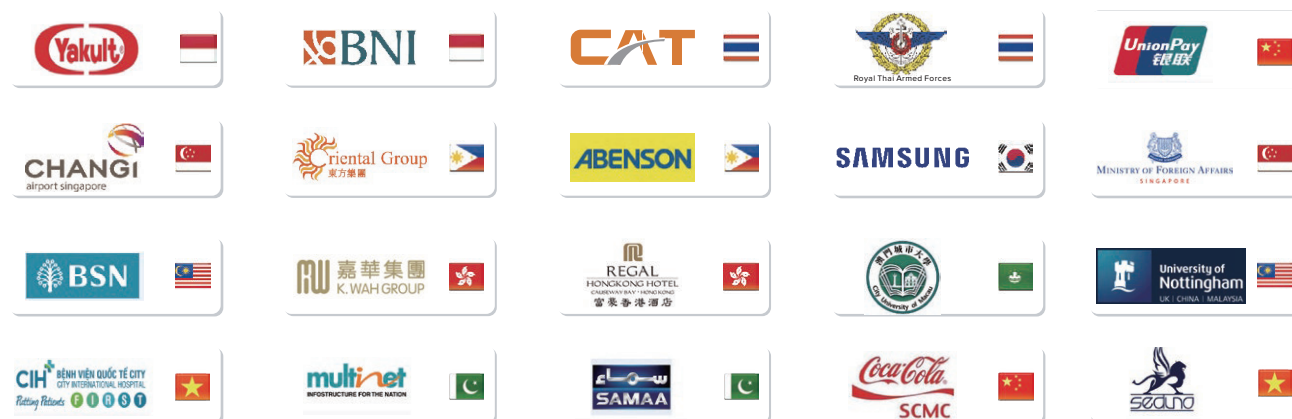
Sangfor's 9500+ employees take customer's business needs and user experience seriously by servicing and supporting them at over 60 branch offices globally in exciting locations like Hong Kong, Malaysia, Thailand, Indonesia, Singapore, Philippines, Vietnam, Myanmar, Pakistan, UAE, Italy, and the USA.

CONTINUOUS INNOVATION & EXCELLENT SERVICE

Sangfor invests at least 20% of annual revenue in R&D to improve products and develop new solutions at our five R&D centers located. With over 2,200+ patents, Sangfor has more patent applications submitted in 2022. This dedication to innovation enables us to release product updates every quarter and launch new products annually.

We pride ourselves on our excellent service. Customers enjoy fast 24x7 online support 365 days a year and personalized on-site service support from over 10,000 certified engineers at our three Customer Service Centers in Malaysia & China.

Sangfor has more than 100,000 satisfied customers worldwide, including Fortune Global 500 companies. Governments, universities & schools, financial institutions, manufacturing, and other industries trust us to protect them from the next generation of cyberthreats and help them on their journey to digital transformation with a future-proof IT infrastructure.



SANGFOR WAN OPTIMIZATION

SANGFOR INTERNATIONAL OFFICES

SANGFOR SINGAPORE

8 Burn Road # 04-09, Trivex,
Singapore (369977)
Tel: (+65) 6276-9133

SANGFOR HONG KONG (China)

Unit 1612-16, 16/F, The Metropolis Tower, 10 Metropolis Drive,
Hung Hom, Kowloon, Hong Kong
Tel: (+852) 3845-5410

SANGFOR INDONESIA

MD Place 3rd Floor, Jl Setiabudi No.7, Jakarta Selatan
12910, Indonesia
Tel: (+62) 21-2966-9283

SANGFOR MALAYSIA

No. 47-10 The Boulevard Offices, Mid Valley City, Lingkaran
Syed Putra, 59200 Kuala Lumpur, Malaysia
Tel: (+60) 3-2702-3644

SANGFOR THAILAND

6th Floor, 518/5 Maneeya Center Building, Ploenchit Road,
Lumpini, Patumwan, Bangkok, 10330 Thailand
Tel: (+66) 22-517700

SANGFOR PHILIPPINES

7A, OPL Building, 100 Don Carlos Palanca, Legazpi, Makati,
122 Metro, Manila, Philippines.
Tel: (+63) 917-117-9346

SANGFOR VIETNAM

4th Floor, M Building, Street C, Phu My Hung,
Tan Phu Ward, District 7, HCMC, Vietnam
Tel: (+84) 287-1005018

SANGFOR SOUTH KOREA

Floor 17, Room 1703, Yuwon bldg. 116, Seosomun-ro,
Jung-gu, Seoul, Republic of Korea
Tel: (+82) 2-6261-0999

SANGFOR EMEA

D-81 (D-Wing), Dubai Silicon Oasis HQ Building, Dubai, UAE.
Tel: (+971) 52855-2520

SANGFOR PAKISTAN

44, Navy Housing Scheme, ZamZamma, Karachi, Pakistan
Tel: (+92) 333-3365967

SANGFOR ITALY

Floor 8, Via Marsala, 36B, 21013 Gallarate VA, Italia
Tel: (+39) 3395-7110-78

AVAILABLE SOLUTIONS

IAG

Simplify User & Network Management

NGAF

Smarter Security Powered By AI

Endpoint Secure

The Future of Endpoint Security

Cyber Command

Powerful Intelligent Threat and Detection Platform

TIARA

Threat Identification, Analysis and Risk Management

Incident Response

Closed-loop Incident Response Service Solution

HCI

Driving Hyperconvergence to Fully Converged

MCS

Your Digital Infrastructure Exclusive Store

VDI

Ultimate User Experience that Beats PC

SD-WAN

Boost Your Branch Business With Sangfor

SIER

Simplify & Intelligence Your Branch Network

ACCESS

Cloud-based SASE for Branch Offices & Remote Users

WANO

Enjoy a LAN Speed on your WAN



Sales: sales@sangfor.com

Marketing: marketing@sangfor.com

Global Service Center: +60 12711 7129 (or 7511)

www.sangfor.com

OUR SOCIAL NETWORKS



<https://twitter.com/SANGFOR>



<https://www.linkedin.com/company/sangfor-technologies>



<https://www.facebook.com/Sangfor>



<https://plus.google.com/+SangforTechnologies>



<https://www.youtube.com/user/SangforTechnologies>