WANO Case Studies
For Government

SANGFOR Technologies Co., Ltd.
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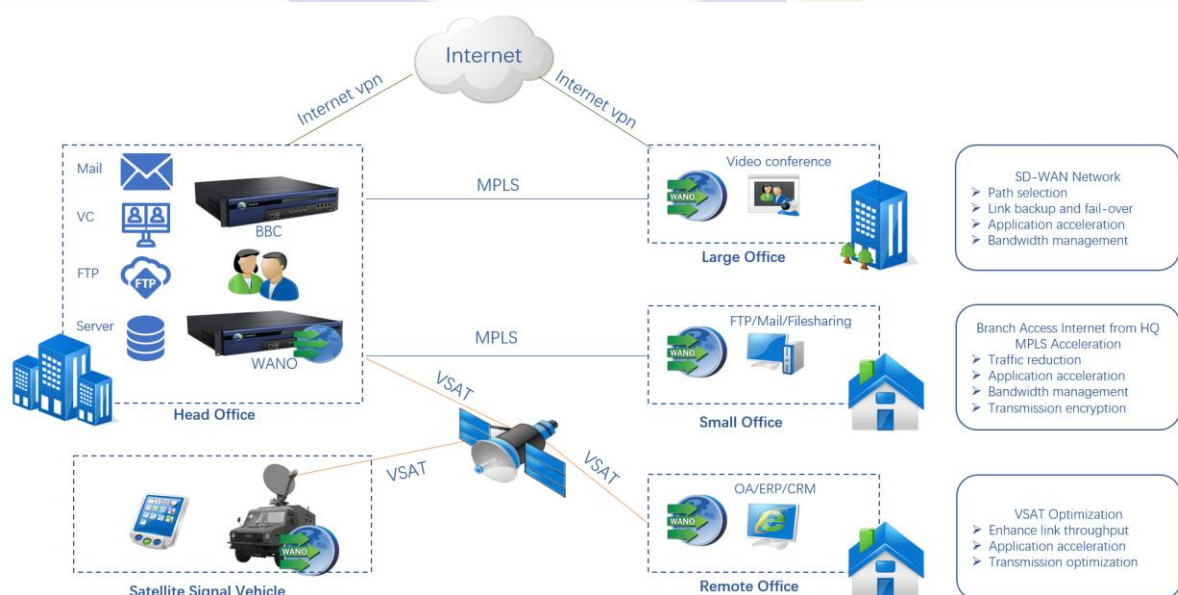# WANO Case Studies for Government

What Opportunities do we have in Government:

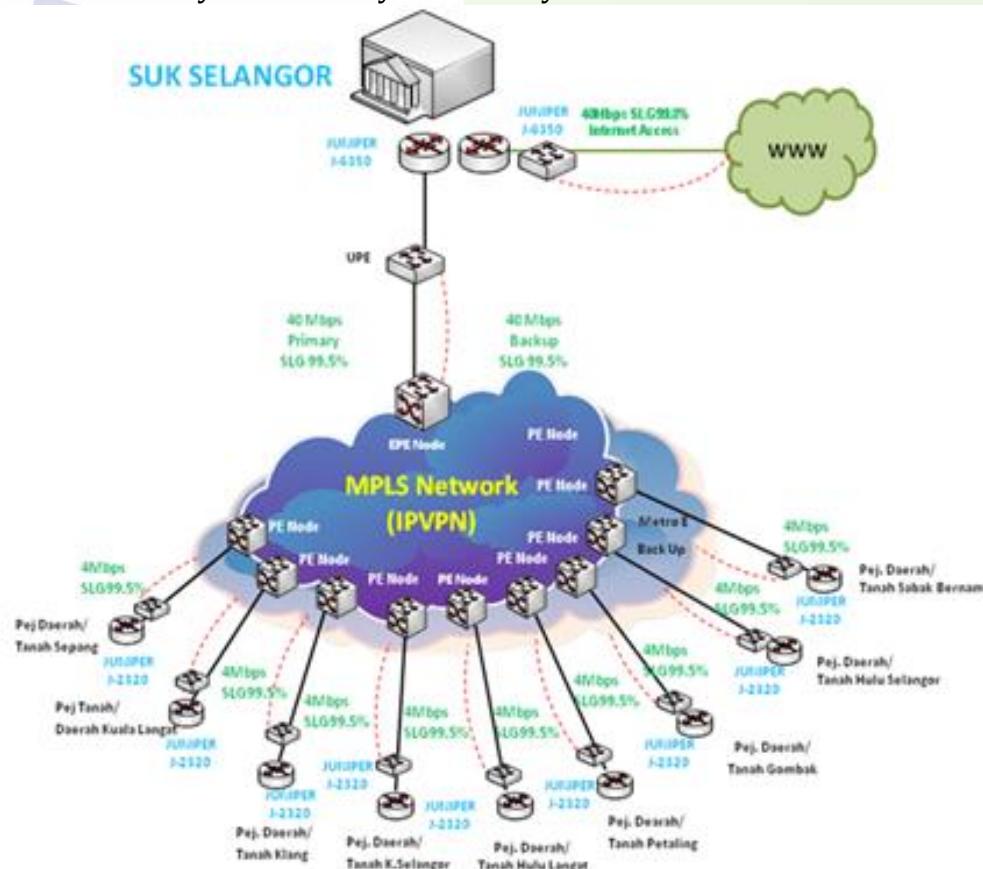| Malaysia	SUK Selangor	Branch visit internet from HQ via MPLS Traffic reduction Bandwidth management
Indonesia	MABES POLRI	Video conference optimization
	Ministry of Transportation Republic	Traffic light CCTV(MJPEG based) traffic reduction and acceleration
Thailand	The Crown Property Bureau	MPLS traffic reduction and acceleration Bandwidth management Visualization
	The Ministry of Interior of the Kingdom of Thailand	VSAT optimization for Satellite signal vehicle
	Social Security Office	Branch visit internet from HQ via MPLS Traffic reduction Bandwidth management
	The Department of Provincial Administration	Video conference optimization
HongKong	Official Receiver's Office	MPLS transmission encryption

Best Practice
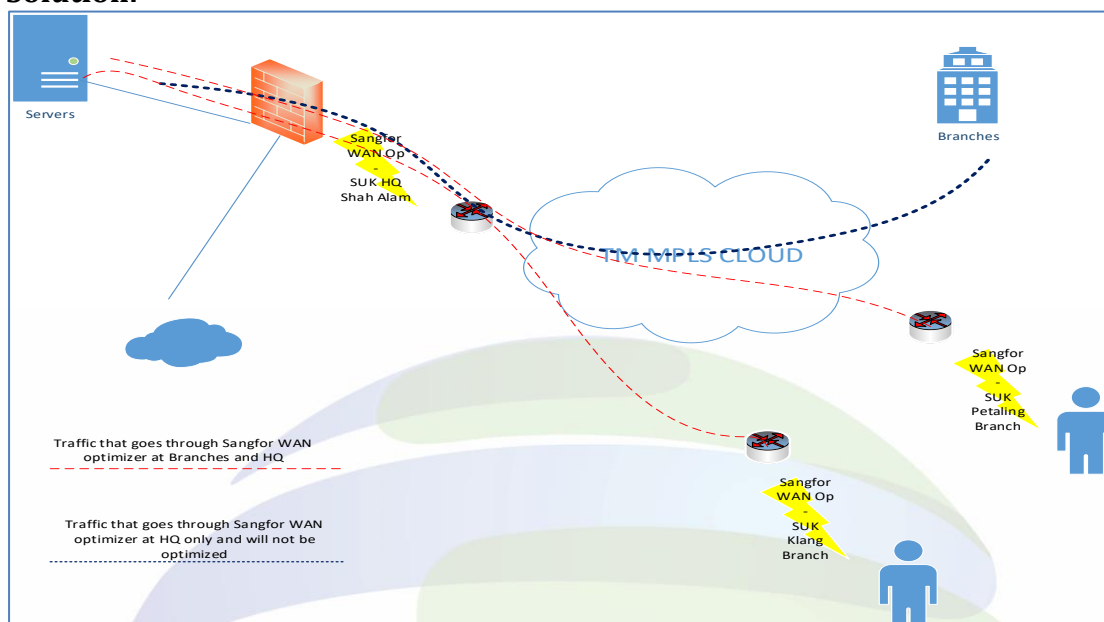
Malaysia

SUK Selangor

Selangor is one of the 13 states of Malaysia.
The state of Selangor has the largest economy in Malaysia in terms of gross domestic product (GDP), with RM 239.968 billion (roughly USD 55.5 billion) in 2015, comprising 22.6% of the country's GDP. It is the most developed state in Malaysia; it has good infrastructure such as highways and transport, and has the largest population in Malaysia, a high standard of living and the lowest poverty rate in the country.
SUK Selangor is the state government office of Selangor, most of political decisions comes from SUK office, it is the political center of state.

Challenges:
Most branch offices using 4M MPLS connect to head office, all branch user access to HQ server traffic and visit internet traffic both through this link. Due to limited bandwidth and no traffic QoS service in branch office, the network is congestion and work efficiency became very low in busy time.
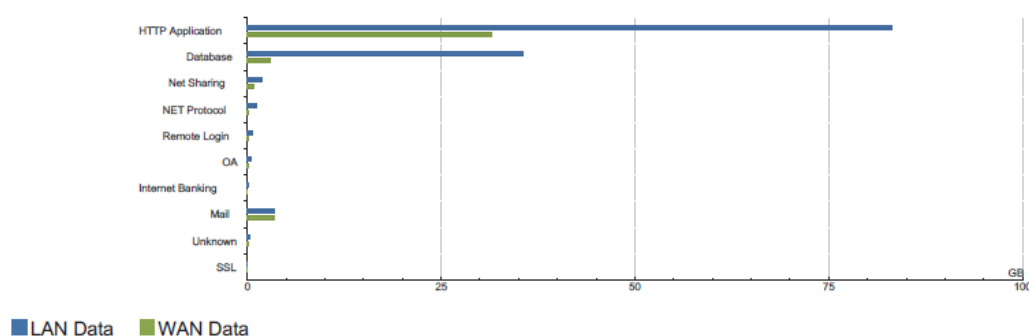
Solution:

Sangfor WANO bridge mode transparency deploy in head office and branch office without any network changes and bridge mode support hardware bypass once device crash avoid business down risk.
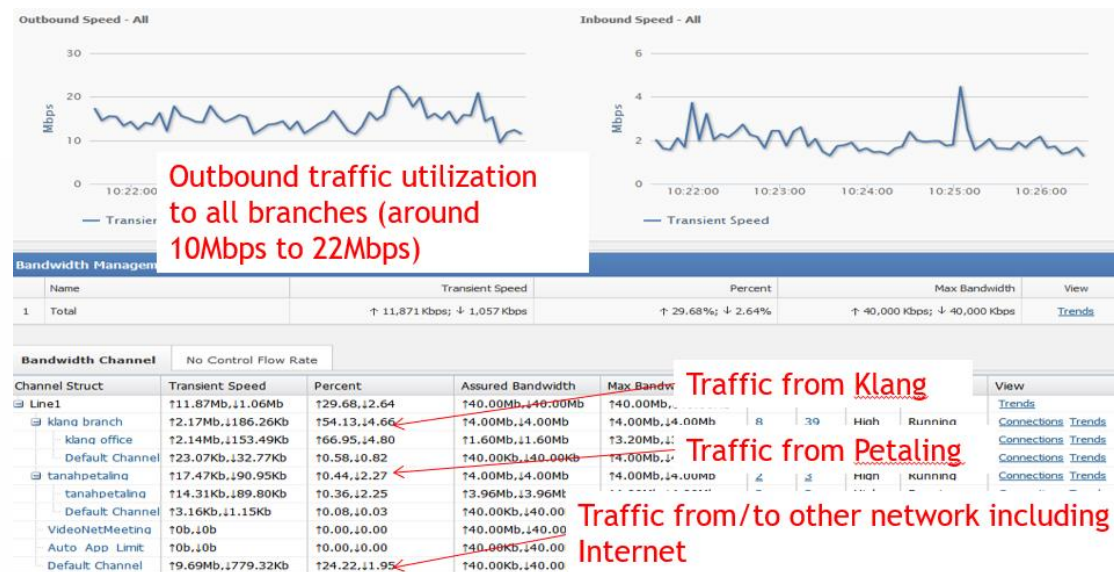
With Sangfor WANO strong byte cache and compression features, the total traffic between TM MPLS cloud reduce 70% off, network became smoothly, link throughput improve 2-3 times, delay bandwidth upgrades plan and investment.

■LAN Data ■WAN Data

	Name	LAN Data	WAN Data	Reduced	Reduction Ratio
1	HTTP Application	85,191.37 MB	32,276.06 MB	52,915.31 MB	62.11%
2	Database	36,396.74 MB	3,066.52 MB	33,330.21 MB	91.57%
3	Net Sharing	1,880.26 MB	785,903 KB	1,112.77 MB	59.18%
4	NET Protocol	1,150.25 MB	170,944 KB	1,006,915 KB	85.49%
5	Remote Login	684,542 KB	91,218 KB	593,324 KB	86.67%
6	OA	509,657 KB	198,340 KB	311,317 KB	61.08%
7	Internet Banking	150,464 KB	34,635 KB	115,830 KB	76.98%
8	Mail	3,611.26 MB	3,527.87 MB	85,387 KB	2.31%
9	Unknown	228,731 KB	165,107 KB	63,624 KB	27.82%
10	SSL	9,339 KB	8,949 KB	390 KB	4.18%
11	FTP	9 KB	5 KB	4 KB	45.73%
	Total	129,775.52 MB	40,291.45 MB	89,484.07 MB	68.95%

WANO also enable bandwidth management function to limit work non-work related traffic and guarantee core business to maximize bandwidth value and user work efficiency. WANO provides a full visualization for IT manager to know traffic status from different office.

Values of Sangfor Values:
- ✓ Enhance link throughput, reduce bandwidth investment.
- ✓ Improve user application experience and work efficiency.
- ✓ Visualization for full network traffic

Related Case:

PEJABAT SETIAUSAHA
KERAJAAN NEGERI
PULAU PINANG

Indonesia

MABES POLRI

MABES POLRI is the Indonesian National Police Headquarters. It had formerly been a part of the Indonesian National Armed Forces. The police were formally separated from the military in April 1999, a process which was formally completed in July 2000.

The strength of the Indonesian National Police stood at approximately 387,470 in 2011. The national police force was formally separated as a branch of the armed forces and placed under the Office of the President in 1999. It also includes 12,000 marine police and an estimated 40,000 People's Security (KAMRA) trainees who serve as a police auxiliary and report for three weeks of basic training each year.
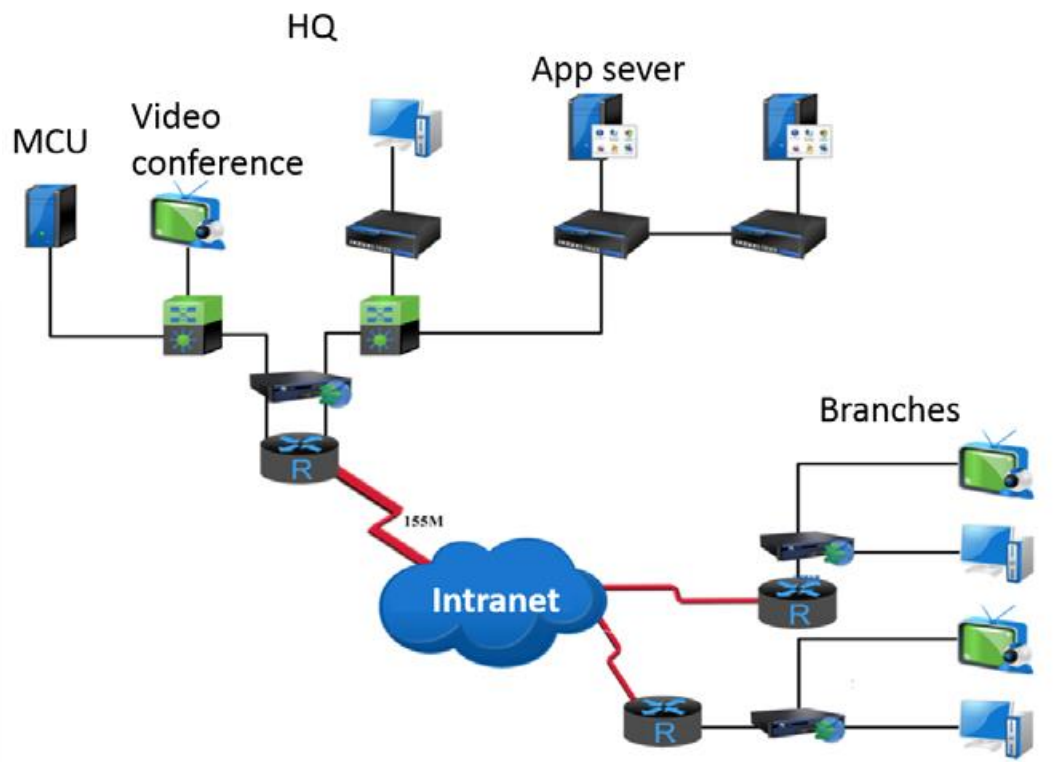

Challenges:
MABES POLRI as the main Headquarters of the Indonesian National Police has to manage all local branches, not only for Jakarta but for the whole country. In order to transmit all important information in real time and avoid any misunderstanding, they are using videoconference as the main communication tool.

The new project was to replace the old videoconference devices with new ones from Cisco. However the internet connection of the local branches are limited in terms of bandwidth and in order to improve the speed & quality of the network, MABES POLTI needed a solution to reduce the packet loss during videoconference.

Solution:

Sangfor WANO was chosen as the main network optimization solution. With a proven track record of successful deployments in many governments & enterprises, Sangfor WANO is the best solution to reduce packet loss and improve the network connectivity between HQ and branches through leading data reduction and application acceleration technologies.

In the case of MABES POLRI, UDP traffic was accelerated in order to reduce the loss of packets and improve the link quality of the network that carries video conference. The IT team can also now visualize the traffic status and build a manageable WAN network.

The results is that now the packet loss is below <1% and MABES POLRI'S HQ and branches can now enjoy smooth and good quality videoconference sessions.

Ministry of Transportation Republic of Indonesia

The Ministry of Transportation (Indonesian: Kementerian Perhubungan), formerly Department of Transportation or Departemen Perhubungan, is a government ministry responsible for the governance and regulation of transport in Indonesia. The Ministry is located in Jakarta.
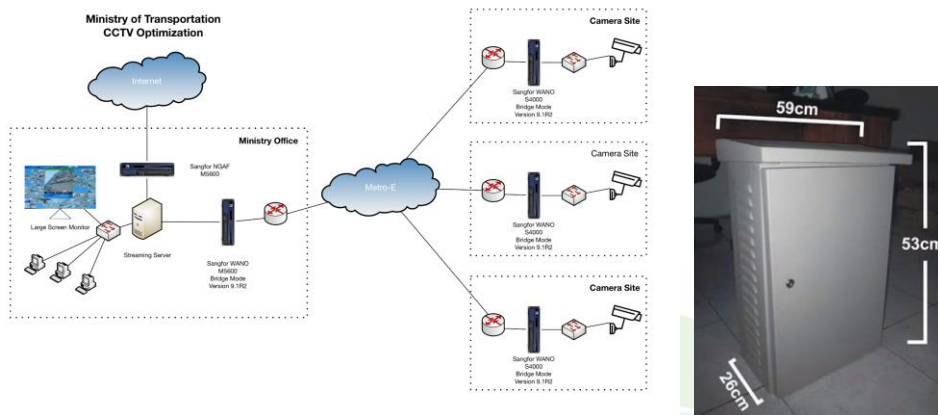
Challenges:

Ministry of Transportation republic of Indonesia deploy about 60 network CCTV in traffic lights, it used to know traffic status and solve traffic accidents. Most of these CCTV use 2Mb-3Mb Metro-E connect to HQ, and HQ monitor the real-time traffic via web browser. Because of the high cost of Metro-E bandwidth, they expect to reduce the CCTV traffic without quality decrease.

Detail requirements:
- ✓ Reduce 60% CCTV traffic and just use 1Mb Metro-E connect to HQ.
- ✓ CCTV frames can't delay more than 5S.
- ✓ At least 6 frames should be displayed in screen per seconds.
- ✓ Picture quality must not be decrease.
- ✓ Working temperature is about 50℃

Solution:

Small model WANOs deploy in network box near by the traffic lights, a large model WANO deploy in data center.

Due to the limited bandwidth and require high picture quality, we must keep the traffic received by MCU is the same with Cameras send out without compression and fluency transmission.

Through Sangfor WANO high efficiency algorithms to recognize the same pixel then delete the duplication data, data compression in branch device and de-compression in data center WANO, the traffic transmission in WAN reduce more than 80% off , the picture quality and latency also meet customer's requirements

Thailand

The Crown Property Bureau

The Crown Property Bureau (CPB) is a Thai quasi-government agency responsible for managing the property of the Crown of the Kingdom of Thailand, supervised by a board, which is chaired by the Finance Minister of Thailand.

The CPB is responsible for protecting and managing the royal assets and property as well as supporting other activities for the benefit of Thai subjects and society.

The CPB head office is located in Bangkok with 9 Branch offices all around the Kingdom: Nakornpathom, Chachaengsao, Ayuttaya, Bangpa-in, Nakornsawan, Lampang, Petchaburi, Ratchaburi and Songkhla.

Challenges:

The CPB is using MPLS WAN network to communicate with all branch offices with two different ISP providers for high network availability. Their challenges are described as below:
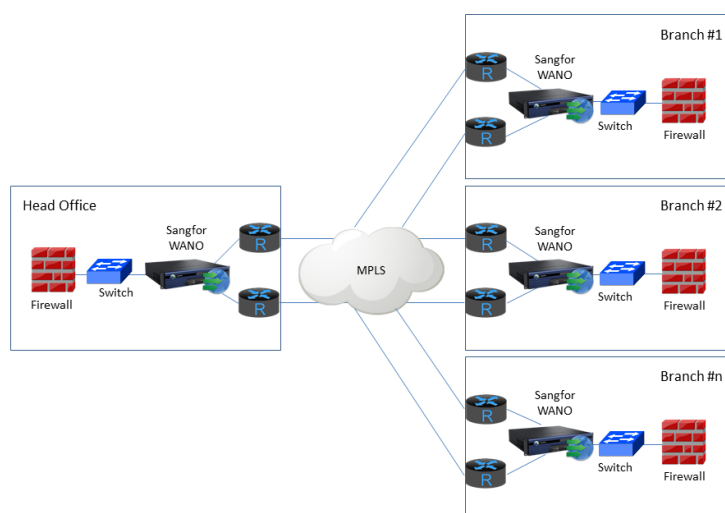
• No visibility report to show what applications are being used and who is connected to the network in each branch office.

• No guarantee of service in terms of connection speed and stability for business-critical applications (e.g. Email, Web Portal, Online Training, etc.) because there is no bandwidth management and QoS for each branch office.

• Many complaints from branch users about very slow access to intranet applications.

• High cost for MPLS WAN connection.

• The CPB Intranet web portal has a huge amount of data and to increase the WAN connection bandwidth is not a solution.

• Due to the CPB security policy, they would not allow direct access to internet at branch offices. They have to centralize the traffic to the Head office for both intranet and the internet.

• Since they have existing Cisco GLBP protocol running among Cisco Routers and Cisco Switch for the Traffic Load Balance between 2 WAN connections, WAN optimization products from other brands were incompatible and failed their POC.

Solution:

Sangfor WANO M5600/M5000/M5100 devices are installed at the CPB head office and branch offices to improve the network performance, security and increase work productivity.

Sangfor WANO solution was proposed with the following topology and specifications:
• Sangfor WANO deployed as "Double-bridge" in transparent mode with acceleration only.
• Easy and simple for the CPB who do no need to change any IP configuration or network routing.
• Sangfor WANO is working very well with existing Cisco GLBP protocol without any conflict.
• WAN Optimization, Bandwidth Management and QoS functions are all enabled.

Sangfor WANO reporting tools for Data Reduction of Application in terms of data amount and ratio.

Sangfor WANO weekly report describes the Data Reduction of Application in a period of time.

Sangfor WANO optimized the CPB business-critical applications up to 90.58%.

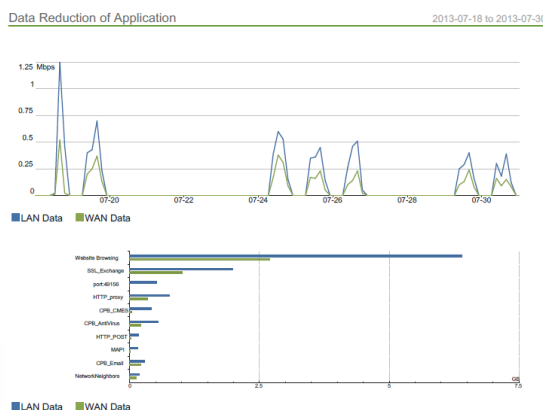|	Name	LAN Data	WAN Data	Reduced	Reduction Ratio
1	Website Browsing	6,557.79 MB	2,752.70 MB	3,805.09 MB	58.02%
2	SSL_Exchange	2,027.61 MB	1,038.35 MB	1,012,997 KB	48.79%
3	port:49156	539,634 KB	75 KB	539,559 KB	99.99%
4	HTTP_proxy	797,736 KB	364,362 KB	433,374 KB	54.33%
5	CPB_CMES	439,175 KB	41,349 KB	397,826 KB	90.58%
6	CPB_AntiVirus	565,816 KB	220,790 KB	345,026 KB	60.98%
7	HTTP_POST	180,413 KB	31,044 KB	149,369 KB	82.79%
8	MAPI	162,629 KB	13,678 KB	148,951 KB	91.59%
9	CPB_Email	306,224 KB	223,710 KB	82,514 KB	26.95%
10	NetworkNeighbors	199,166 KB	129,114 KB	70,052 KB	35.17%
11	Flash Video	255,197 KB	189,305 KB	65,892 KB	25.82%
12	DameWare	162,306 KB	108,741 KB	53,565 KB	33.00%
13	CPB_WSUS	43,882 KB	6,120 KB	37,762 KB	86.05%
14	FlashGet	150,571 KB	124,038 KB	26,533 KB	17.62%
15	Multithread	25,249 KB	12,135 KB	13,114 KB	51.94%
16	LDAP	15,828 KB	4,649 KB	11,179 KB	70.63%
17	SSL	791,389 KB	780,671 KB	10,718 KB	1.35%
18	CPB_Proxy	8,138 KB	4,112 KB	4,026 KB	49.47%
19	YouTube Video	88,729 KB	84,749 KB	3,981 KB	4.49%
20	MP4Video	128,901 KB	126,568 KB	2,333 KB	1.81%
	Other Application	76,497 KB	71,370 KB	5,126 KB	6.70%
	Total	13,407.16 MB	6,268.18 MB	7,138.98 MB	53.25%

Reduction Result

Critical Business App
- **CPB_CMES: 90.58%**

Others App
- Website Browsing: 58%
- CPB_WSUS: 86%
- CPB_Antivirus: 61%
- CPB_Proxy ~ 50%
- MAPI: 91%
- Dameware: 33%

Total = 53.25%

Values of Sangfor Solution:
• CPB have full visibilty of its network thanks to Sangfor reporting tools :
- Which users are using most of the bandwidth
- Which applications are using most of the bandwidth
- Analyse user behavior
• Increase their employees productivity after review of WANO full visibility report and re-design of their Internet usage policy.
• Improvement of user experience :
- Users at branch offices have quicker access time to their Intranet web portal reduced from 120 seconds to 20 seconds thanks to Sangfor WANO Caching function
- Users at branch offices have a guaranteed service for their business-critical applications thanks to our WANO Bandwidth Management function.
• Saving of WAN bandwidth upgrade cost. CPB has delayed their IT upgrade plan to increase WAN connection size.
• Enable the CPB to roll-out new bandwidth consuming applications such as Streaming Online Training.

The Department of Provincial Administration

The DoPA (Department of Provincial Administration) is one of the oldest department ever established in Thailand. Since it was founded in 1892, apart from Bangkok, the DoPAmanages all provinces over the country.
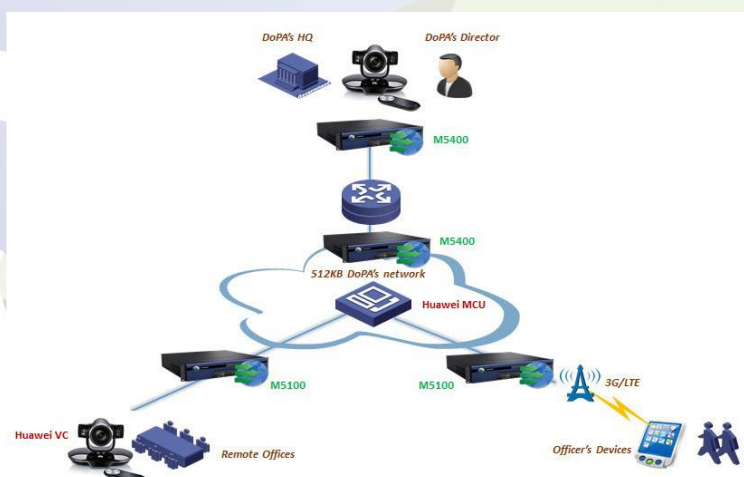
Currently, DoPA has more than 800 offices, which are taking care of the welfare and governing the Thai provinces and their sub-districts.

Challenges:

DoPA prepared new governments rules & regulations along with new policies for their field offices in the rural areas. Due to the huge distance between each office, video conference is used as the main communication tool, but the results were not what DoPA's director hoped.

DoPA was using the low quality Unified Communication system, established only by self-developed software for PBX, VOIP and Video Conference. The video quality and sound was not good enough to broadcast the message DoPA wanted to share with many interruptions caused by the packet loss & latency of DoPA's network. This was mainly due to the limited bandwidth resources available in the rural areas.

Solution:

Together with our partner Huawei, Sangfor proposed a solution to maximize the value of the customer's bandwidth. With only 512 kb allocated, it was in contradiction with the need of high quality video conference.

To solve this issue, HD videoconference devices from Huawei coupled with Sangfor WANO were deployed in DoPA's Headquarters and every field office. Every branch VC is now connected with Sangfor WANO deployed at the gateway of the HQ in order to reduce latency & packet loss to optimize and deliver HD quality video conference within the maximum usage of 512kb bandwidth.
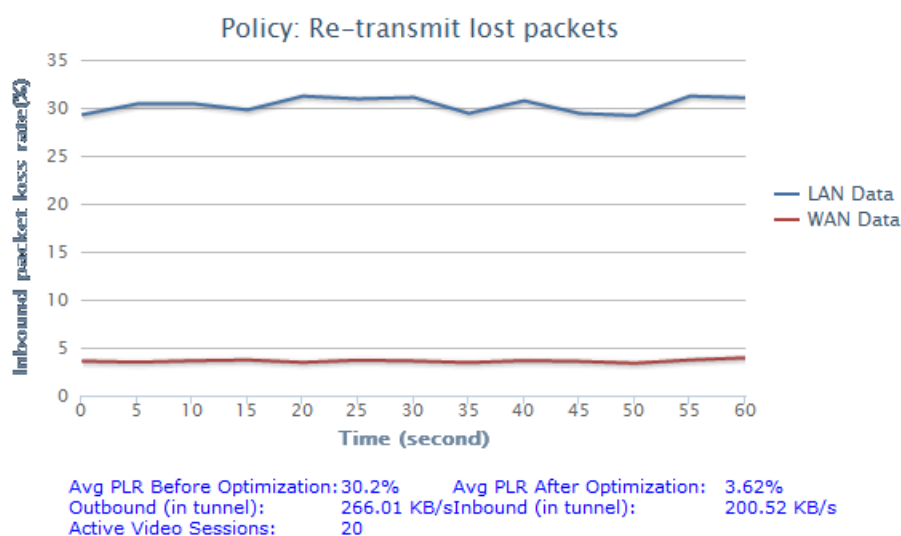
Values of Sangfor Solution:

DoPA improved the way they communicate by sharing the policies, government plans, etc. with their remote offices through video conference and also help the field offices increase their productivity by using video conference with their smartphones.

DoPA has already deployed 35 WANOs in the special provinces and plan to increase the numbers of Huawei VC + Sangfor WANO solutions in the near future.

The Ministry of Interior of the Kingdom of Thailand

The Ministry of Interior of the Kingdom of Thailand (Abbr: MOI) is a cabinet-level department in the Government of Thailand. The ministry is responsible for local administration, internal security, citizenship, disaster management, road safety, land management, issuance of national identity cards, and public works.
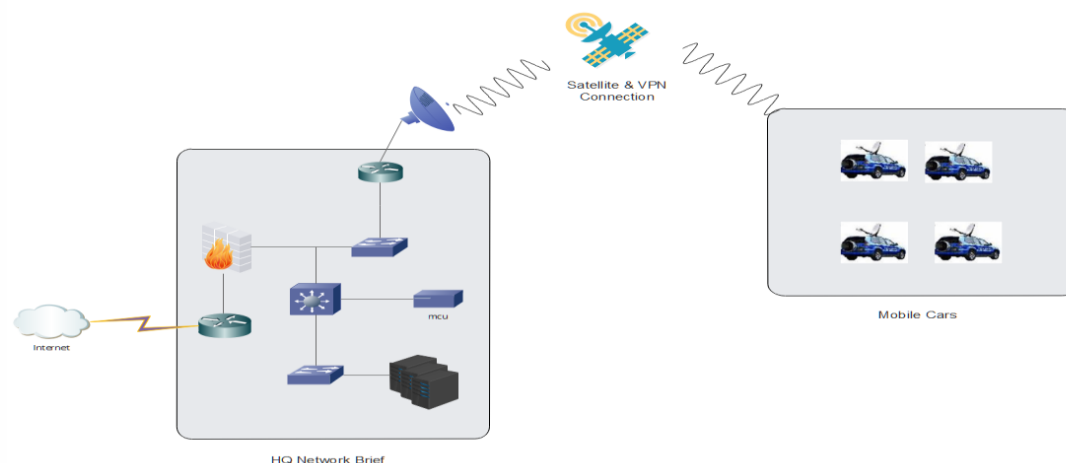
Challenges:

When it comes to managing work in urban area, systems need to connect to head office to transfer data. But sometimes it's hard to get Internet connection, so the ICT department of MOI try to use satellite communication vehicle to build up internet connection with head office.

Satellite has widely covered signal but also has some obvious limits:

➢ Satellite transmission experiences high latency and sometimes packet loss
➢ Satellite transmission is based on shared channel; the more communication vehicles using the channel, the less bandwidth for each vehicle.

Due to these limits, MOI decided to look for a solution to optimize network connection.
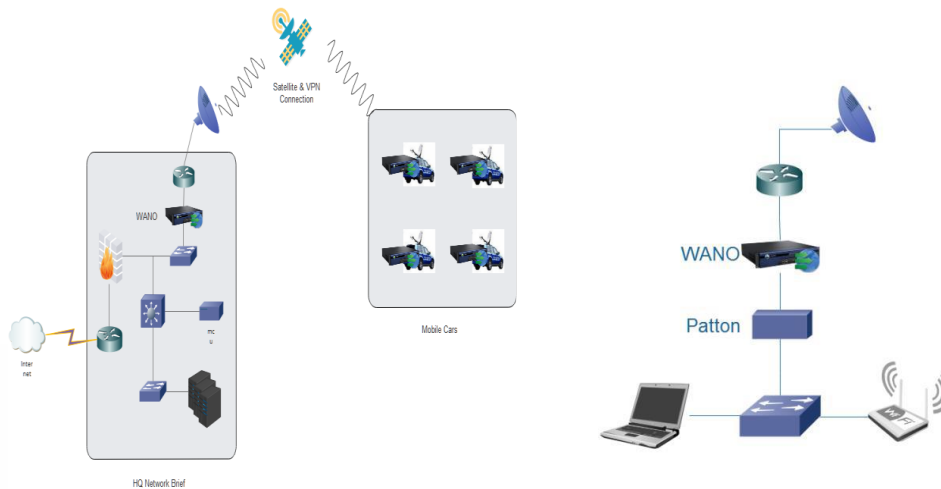

Solution:

With existing network, when designing deployment of Sangfor WANO, we have the following principles in mind:

✓ WANO should be deployed while causing minimum impact to network, which means deployment cannot change too much of the network.
✓ Considering that the device will be placed in communication vehicles, WANO deployment should be easy; easy for the first deployment, easy for bypass during device failure, easy for future expansion, etc.
✓ WANO should provide the best optimization performance.

Following the above-mentioned principles, bridge (transparent) mode was utilized to deploy WANO in both HQ and communication vehicles.

HQ Network Brief

During POC we tested FTP download from HQ server.

● When there was no WANO device, download speed was around 100KB/s

● After WANO deployment, download speed reached 150-160KB/s

● When download multiple times with WANO cache, the speed reached 2MB/s+

Values of Sangfor Solution:
1. Reduce satellite bandwidth upgrade cost.
2. Accelerate application speed, increase work efficiency.
3. Easy to implement and maintenance.

Social Security Office

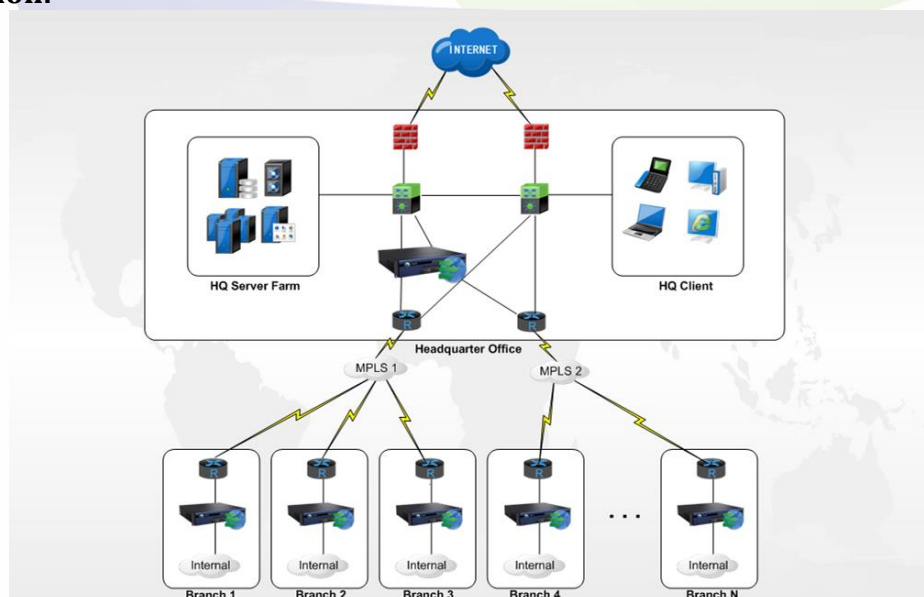The Office of Social Security is attached to the Ministry of Interior and was established on 3 September 1990. The work related to social security was transferred from the Department of Public Welfare; and the work of the Office of Compensation Fund, the Department of Labor, was then transferred to be under the management of the Office of Social Security.

The Social Security Office have more than 76 branches in each provides. Branch offices have to connect back to Headquarter for using internal server and access internet. Headquarter have internet bandwidth more than 100Mbps. But branches have bandwidth 2 or 5Mbps depend on location.

Challenges:
➢ Branches office using Internal services responding very slow and high latency in rush hours Eg. Web application, File transfer, Remote desktops, VOIP, Email, Etc..
➢ Branches office using internet for research information very slow.
➢ They have planned to provide online training system for each staff to each branch.
➢ Some branches using MPLS 5Mbps cost is too expensive they want to reduce to 2Mbps.

Solution:

It's easy to bundle up Sangfor WAN optimization in to core network system, because WAN optimization supported double-bridge deployment. This deployment customer didn't change and configuration and routing in his network. They can feel all of pain point can solved after integrate Sangfor WAN optimization.

- ✓ Sangfor provide technology optimization effect to all application is smoothly like they are using from headquarter. When user access HQ they can feel 10 times faster than before.
- ✓ Sangfor provide internet bandwidth management.
- ✓ Sangfor WAN optimization can optimized "Steaming Media" for video training.
- ✓ The IT manager have plan to reduce cost 5Mbps to 2Mbps.

After deployment Sangfor WAN optimization in double-bridge mode could reduce totally bandwidth around 50% before plug WAN optimization. Separate to each application Web Browsing 46%, Streaming Media (E-learning system) 40%, HTTP Download 76%, RDP 55%. Sangfor WAN optimized can reduce real transmission bandwidth from 4.16GB to 2.28GB per days.

HongKong

Official Receiver's Office 香港破产管理署

Established on 1 June 1992, the Official Receiver's Office performs various statutory duties relating to insolvency in the Hong Kong Special Administrative Region. Our mission is to provide an insolvency service of high quality on par with international standards and to ensure that the relevant legislation is commensurate with the objective of keeping Hong Kong to the forefront as a major International Financial Centre. We endeavor to provide an efficient insolvency service to the public in an open and accountable manner in accordance with the performance standards and targets set.

破产管理署成立于 1992 年 6 月 1 日，负责于香港特别行政区执行各项与破产／清盘相关的法定职务。本署的使命是确保香港能够提供符合国际标准的高质素破产／清盘服务，而有关法例亦能配合香港站于主要金融中心前列位置的目标。我们会切实履行职责，致力为商界、债权人和市民提供有效率的破产／清盘服务。
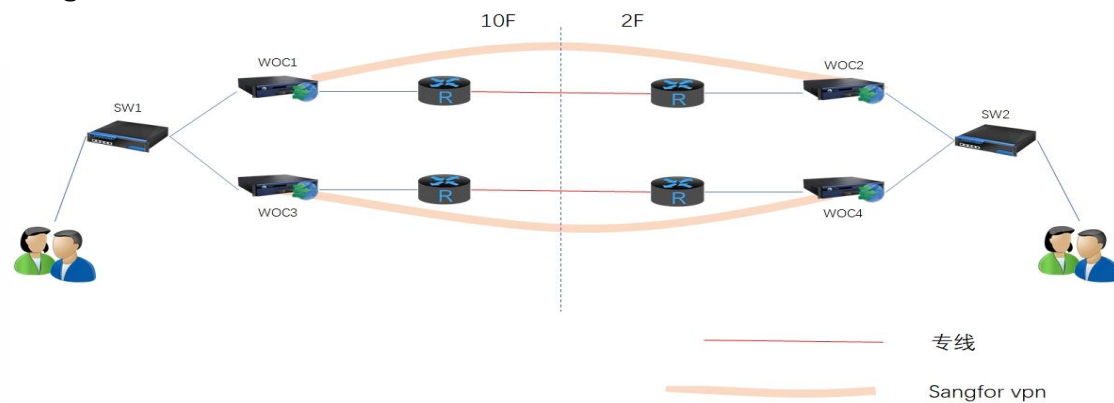
Challenges：

Official Receiver's Office using MPLS connect branch office to head office, as a matter of fact, MPLS IP VPN usually doesn't offer any encryption services, but Government data is very sensitive, customer require data encryption between point and point.

破产管理署新建分支采用 MPLS 线路连回总部，但 MPLS 线路并不提供数据加密服务，而政府数据十分敏感，客户要求每个点之间的数据传输都必须加密。

Solution:

WANO transparency mode deploy in both side office with out any network changes and enable Sangfor VPN encrypt all transmission data.

WANO 在不改变原有网络环境前提下透明部署在总部和分支办公室，通过 Sangfor VPN 进行数据加密。

专线

Sangfor vpn

Benefits：

✓ Transparency deploy without network changes.
✓ Transmission security.
✓ WANO also support EOIP, support VPN in both side same subnet network environment.

✓ 透明部署不改变源网络环境
✓ 传输安全
✓ WANO 支持 EOIP 在总部分支同网段大二层环境下建 VPN 加密数据