

WANO Case Studies For Banks

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What Banks are Facing:

| | | |
|-----------|-------------------------|--|
| Indonesia | Bank Papua | FTP/Portals (banking applications) |
| | BNI | CBS (core banking system)/VC/Net sharing/Soft-update |
| | MNC Bank | VSAT link/Bank app/Email/FTP |
| Malaysia | BSN | Exchange/CIFS/FTP/HTTP/Database |
| | Kenanga Investment Bank | Large file transmission |
| | RHB | BTX system |
| Myanmar | MOB | Large file transmission/Web application/core banking applications (Some internal developed applications and VMs) |
| | MAB | VSAT link/ Large file transmission |
| China | CMB | National Disaster Recovery Specifications of Information System/FTP/DC-DRC |

Indonesia

Bank Papua

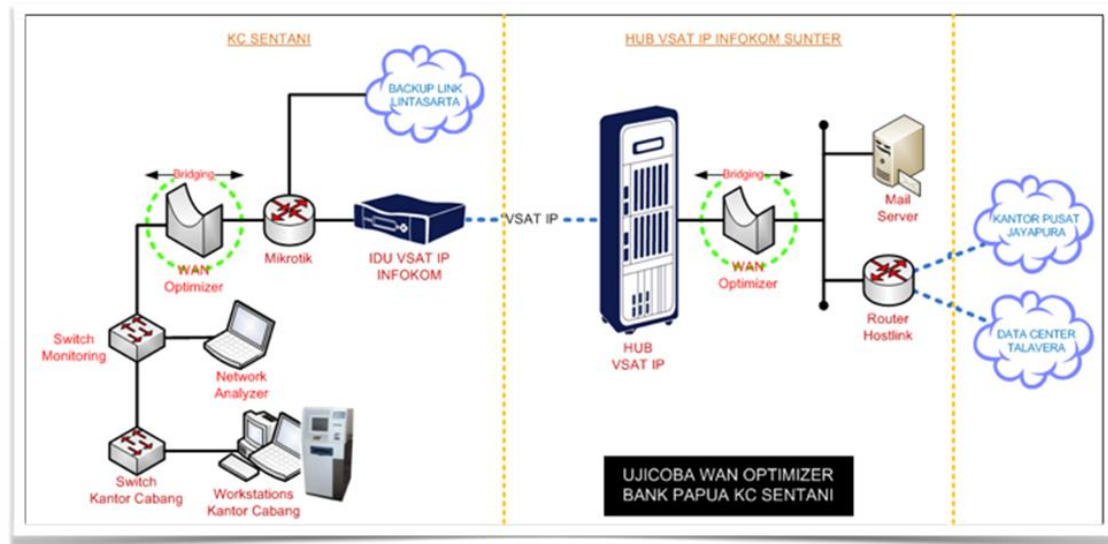


Bank Papua, formerly the Regional Development Bank Irian Jaya/BPD Irian Jaya, was established in 1966.

Challenges:

When using mail, FTP and portals (banking applications) across HQ and branches, customer felt network performance was far from ideal. Bandwidth was limited and VSAT link rental was expensive.

Solution:



1. WANO bridge mode is deployed, big changes in their original network have been avoided.
2. Use byte cache, compression and application proxy technology to reduce traffic between HQ and branches.
3. Use HTTP technology to optimize TCP/UDP protocol and enhance the capacity of the bandwidth.
4. Use bandwidth management to guarantee core application traffic.

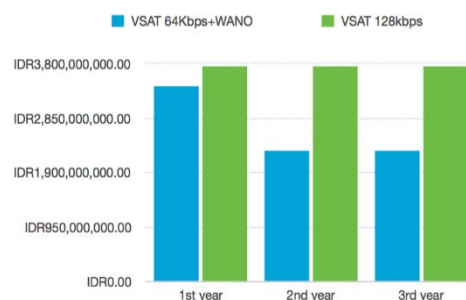
Result:

Redundant traffic is reduced by 75%; 3-year TCO is cut by 40%; speed is promoted obviously.

ROI Result

ROI Result

| YEAR | VSAT 64KBPS+WANO | VSAT 128KBPS | ROI PER YEAR | ROI TOTAL |
|----------|---------------------|---------------------|---------------------|---------------------|
| 1st year | IDR3,414,264,000.00 | IDR3,744,000,000.00 | IDR329,736,000.00 | IDR329,736,000.00 |
| 2nd year | IDR2,278,640,000.00 | IDR3,744,000,000.00 | IDR1,465,360,000.00 | IDR1,795,096,000.00 |
| 3rd year | IDR2,278,640,000.00 | IDR3,744,000,000.00 | IDR1,465,360,000.00 | IDR3,260,456,000.00 |



| | Name | LAN Data | WAN Data | Reduced | Reduction Ratio |
|-------|---------------|-------------|------------|-------------|-----------------|
| 1 | 150.150.1.109 | 953,334 KB | 123,287 KB | 830,048 KB | 87.07% |
| 2 | 150.150.1.104 | 462,912 KB | 59,962 KB | 402,950 KB | 87.05% |
| 3 | 150.150.1.110 | 403,635 KB | 68,753 KB | 334,881 KB | 82.97% |
| 4 | 172.17.1.180 | 203,111 KB | 103,523 KB | 99,588 KB | 49.03% |
| 5 | 172.24.100.12 | 228,266 KB | 145,137 KB | 83,129 KB | 36.42% |
| 6 | 150.150.1.113 | 65,519 KB | 11,241 KB | 54,278 KB | 82.84% |
| 7 | 179.17.1.200 | 50,388 KB | 9,428 KB | 40,960 KB | 81.29% |
| 8 | 150.150.1.102 | 76,116 KB | 46,216 KB | 29,900 KB | 39.28% |
| 9 | 192.168.32.8 | 37,370 KB | 15,117 KB | 22,253 KB | 59.55% |
| 10 | 150.150.1.33 | 14,909 KB | 7,507 KB | 7,403 KB | 49.65% |
| 11 | 172.17.1.15 | 20,490 KB | 15,119 KB | 5,371 KB | 26.21% |
| 12 | 150.150.1.80 | 2,069 KB | 492 KB | 1,578 KB | 76.24% |
| 13 | 150.150.1.50 | 1,674 KB | 1,137 KB | 537 KB | 32.08% |
| 14 | 150.150.1.82 | 335 KB | 194 KB | 140 KB | 41.91% |
| 15 | 150.150.2.82 | 293 KB | 200 KB | 93 KB | 31.81% |
| 16 | 150.150.2.102 | 164 KB | 133 KB | 32 KB | 19.25% |
| 17 | 172.17.1.254 | 44 KB | 24 KB | 20 KB | 45.41% |
| 18 | 179.17.1.254 | 41 KB | 40 KB | 1 KB | 2.58% |
| 19 | 172.24.100.2 | 2 KB | 2 KB | 0 B | 0.00% |
| 20 | 179.17.1.53 | 4 KB | 4 KB | 0 B | 0.00% |
| Total | | 2,461.60 MB | 607,515 KB | 1,868.32 MB | 75.90% |

Customer Evaluation:

“After the implementation of Sangfor WAN Optimization solution, we feel that using mail, FTP and portals have become faster and more stable. There is no obstacle in the validation of transaction and traffic between data center and ATM has been accelerated. Bandwidth is saved as a result and the security of data is guaranteed.”

BNI

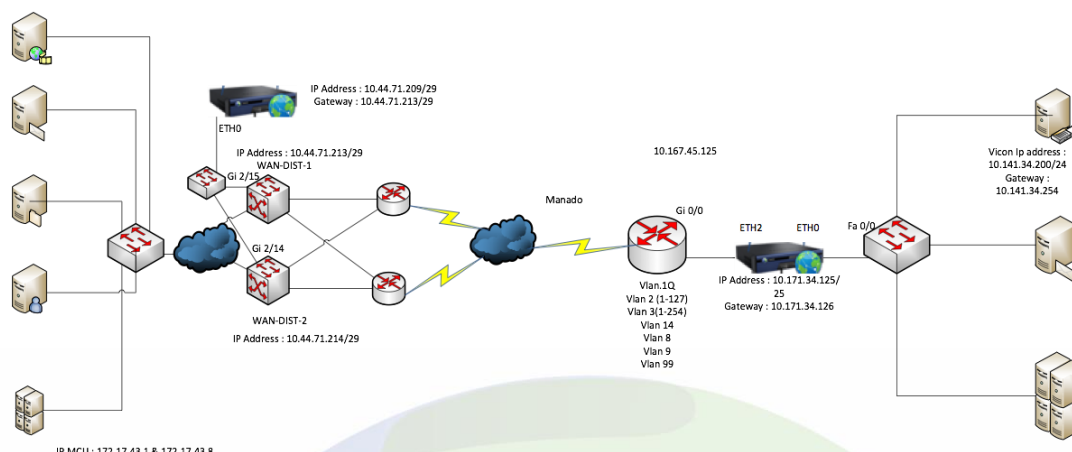


Bank Negara Indonesia is an Indonesian State Bank. It operates its business primarily in Indonesia, but it also has branches in Kuala Lumpur, Singapore, Hong Kong, Tokyo, London and New York. By 2006 it has 1000 branches and over 9 million customers. It is listed on the Indonesia Stock Exchange as "BBNI". Its market capitalization as of 12 March 2007 was 23.8 trillion rupiahs (approximately US\$2.6 billion). It is the 4th largest assets bank of Indonesia.

Challenges:

Productivity was affected as branch CBS (core banking system) access was slow with limited bandwidth. Besides, Video Conference suffered from mosaic and lag due to packet loss.

Solution:



1. Use application proxy to promote speed of CBS.
2. Reduce redundant traffic between HQ and branches.
3. Use bandwidth management to guarantee traffic for CBS and video conference, limiting other low priority application.
4. Use HTTP/UDP to reduce the packets loss rate and optimize Video Conference.

Result:

Traffic of HTTP application is reduced by 67%, traffic of other applications is reduced by up to 90%. Video conference no longer has mosaic problem.

| | Name | LAN Data | WAN Data | Reduced | Reduction Ratio |
|----|------------------|--------------|-------------|-------------|-----------------|
| 1 | HTTP Application | 6,553.37 MB | 2,167.99 MB | 4,385.38 MB | 66.92% |
| 2 | Net Sharing | 2,899.13 MB | 925,422 KB | 1,995.40 MB | 68.83% |
| 3 | OA | 344,309 KB | 57,970 KB | 286,340 KB | 83.16% |
| 4 | Database | 274,782 KB | 25,734 KB | 249,047 KB | 90.63% |
| 5 | Soft-update | 288,277 KB | 40,375 KB | 247,902 KB | 85.99% |
| 6 | NET Protocol | 364,514 KB | 192,198 KB | 172,316 KB | 47.27% |
| 7 | Unknown | 697,665 KB | 587,059 KB | 110,606 KB | 15.85% |
| 8 | Mail | 553,171 KB | 514,380 KB | 38,791 KB | 7.01% |
| 9 | Download Tools | 328,448 KB | 291,120 KB | 37,328 KB | 11.37% |
| 10 | SSL | 2,269.76 MB | 2,258.81 MB | 11,215 KB | 0.48% |
| 11 | Streaming Media | 916 KB | 614 KB | 303 KB | 33.02% |
| 12 | ProxyTool | 8,734 KB | 8,670 KB | 63 KB | 0.73% |
| 13 | Remote Login | 7,035 KB | 7,000 KB | 35 KB | 0.49% |
| 14 | Net Meeting | 754 KB | 69,618 KB | -70516999 B | -9135.19% |
| | Total | 14,523.64 MB | 7,083.21 MB | 7,440.43 MB | 51.23% |

MNC Bank

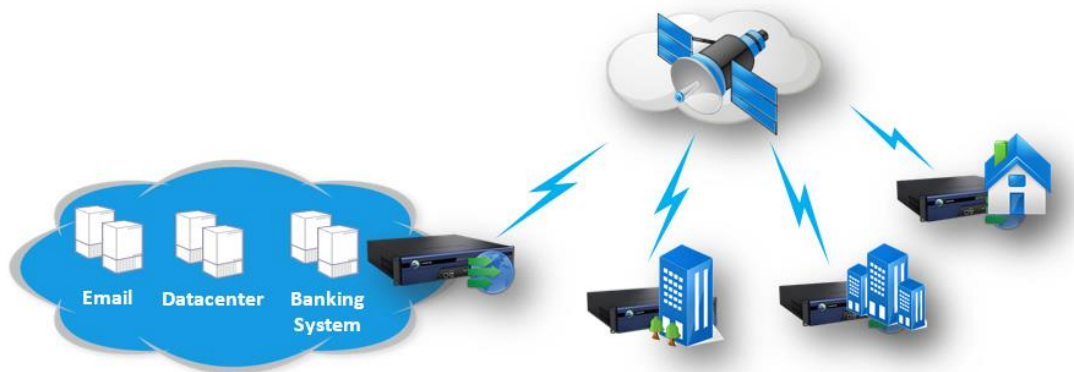


PT Bank MNC Internasional Tbk provides commercial banking services in Indonesia. Its deposit products include current accounts, demand deposits, saving deposits and time deposits. The company's loan product portfolio covers consumer loans (housing, car and other consumer loans), employee loans, working capital loans, investment loans, multi-purpose unsecured loans and syndicated loans. It also provides trade finance and foreign exchange services.

In addition, the company offers credit card, mobile banking, ATM, Internet banking and bill payment services. It operates through a network of 16 branch offices, 34 sub-branch offices, 40 cash offices, 2 payment points, as well as 76 automatic teller machines throughout the country. The company was formerly known as PT Bank ICB Bumiputera Tbk and changed its name to PT Bank MNC Internasional Tbk in April 2014. PT Bank MNC Internasional Tbk was founded in 1989 and is headquartered in Central Jakarta, Indonesia.

Challenges:

1. Expensive & slow VSAT link limited to 128KB.
2. Unified Internet outlet for all branches.
3. Slow access speed to email and intranet applications.

Solution:**Result:**

After deploying Sangfor WANO in the headquarter and remote branches, the connection speed has increased a lot with the data reduction and application acceleration technologies.

MNC's remote branches are now enjoying a stable and faster connection to the headquarter and can now smoothly send emails, upload files and access banking applications. With Sangfor WANO, the overall productivity of MNC's branches is increased; moreover, with the integrated comprehensive & unified reporting tools, they can now check & analyze the network status of each branch and create specific network policies for them separately.

Malaysia

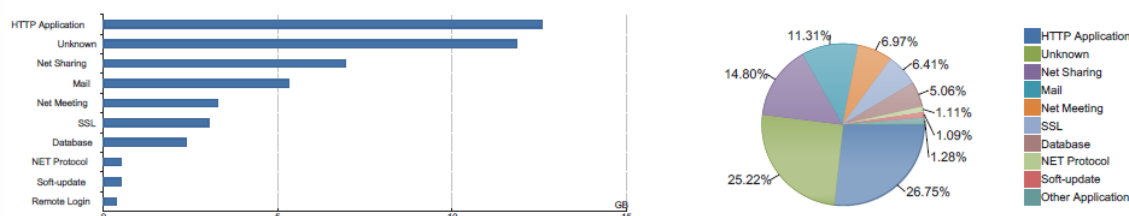
BSN



Being a government owned bank in Malaysia, BSN was incorporated on 1st December 1974 under the Ministry of Finance at that time, Tengku Razaleigh Hamzah. BSN has more than 5,100 employees and 382 branches nationwide and more than 7 million customers with savings worth more than RM 8 billion.

Challenges:

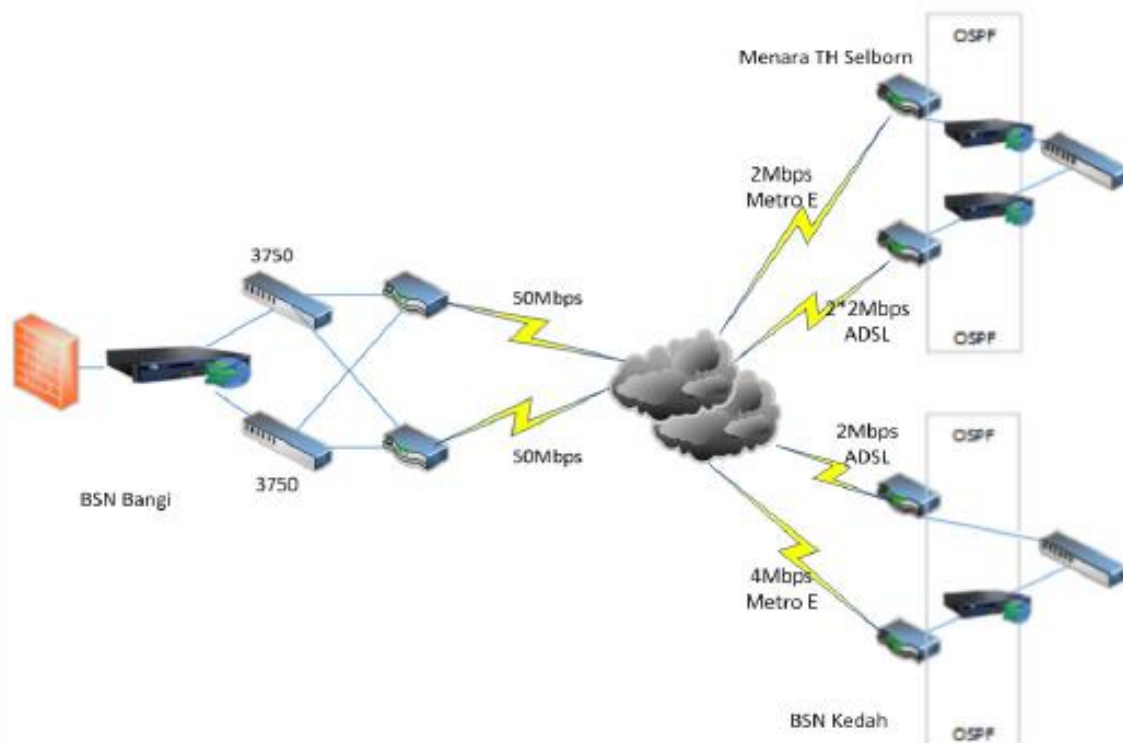
All business critical applications such as Exchange, CIFS (file transfer), Oracle, SQL and Polycom (video conference) had to go through the data center located in Bangi.



BSN had limited bandwidth at data center and branch offices (mostly less than 2Mbps). Many internal users were consuming the bandwidth for non-work related activities such as online video, which largely affected work productivity.

BSN also utilized video conference for business meetings, but the video and sound quality is poor due to unmanaged bandwidth.

Solution:

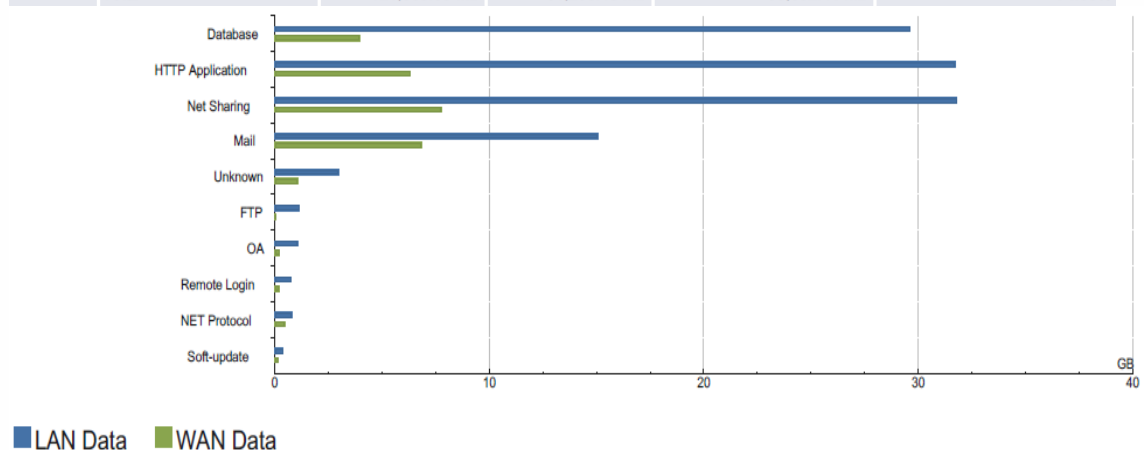


- 4 x M5900 for data center and HQ.
- 1 x M5400 for medium branches.
- 13 x M5100 for smaller branches.
- Whole network acceleration solution.

Result:

Traffic is reduced up to 74%, bringing higher speed for all applications in intranet. Network performance and work productivity are thus improved.

| | Name | LAN Data | WAN Data | Reduced | Reduction Ratio |
|----|-------------------|---------------|--------------|--------------|-----------------|
| 1 | Database | 30,354.33 MB | 4,048.25 MB | 26,306.08 MB | 86.66% |
| 2 | HTTP Application | 32,476.12 MB | 6,467.31 MB | 26,008.82 MB | 80.09% |
| 3 | Net Sharing | 32,563.83 MB | 7,959.22 MB | 24,604.60 MB | 75.56% |
| 4 | Mail | 15,427.28 MB | 6,992.23 MB | 8,435.05 MB | 54.68% |
| 5 | Unknown | 3,040.15 MB | 1,100.87 MB | 1,939.28 MB | 63.79% |
| 6 | FTP | 1,170.09 MB | 47,090 KB | 1,124.10 MB | 96.07% |
| 7 | OA | 1,089.42 MB | 240,167 KB | 875,395 KB | 78.47% |
| 8 | Remote Login | 815,549 KB | 201,086 KB | 614,463 KB | 75.34% |
| 9 | NET Protocol | 834,898 KB | 499,872 KB | 335,026 KB | 40.13% |
| 10 | Soft-update | 422,494 KB | 187,563 KB | 234,931 KB | 55.61% |
| | Other Application | 3,740.02 MB | 3,577.08 MB | 166,853 KB | 4.36% |
| | Total | 121,885.59 MB | 31,293.18 MB | 90,592.41 MB | 74.33% |



Kenanga Investment Bank

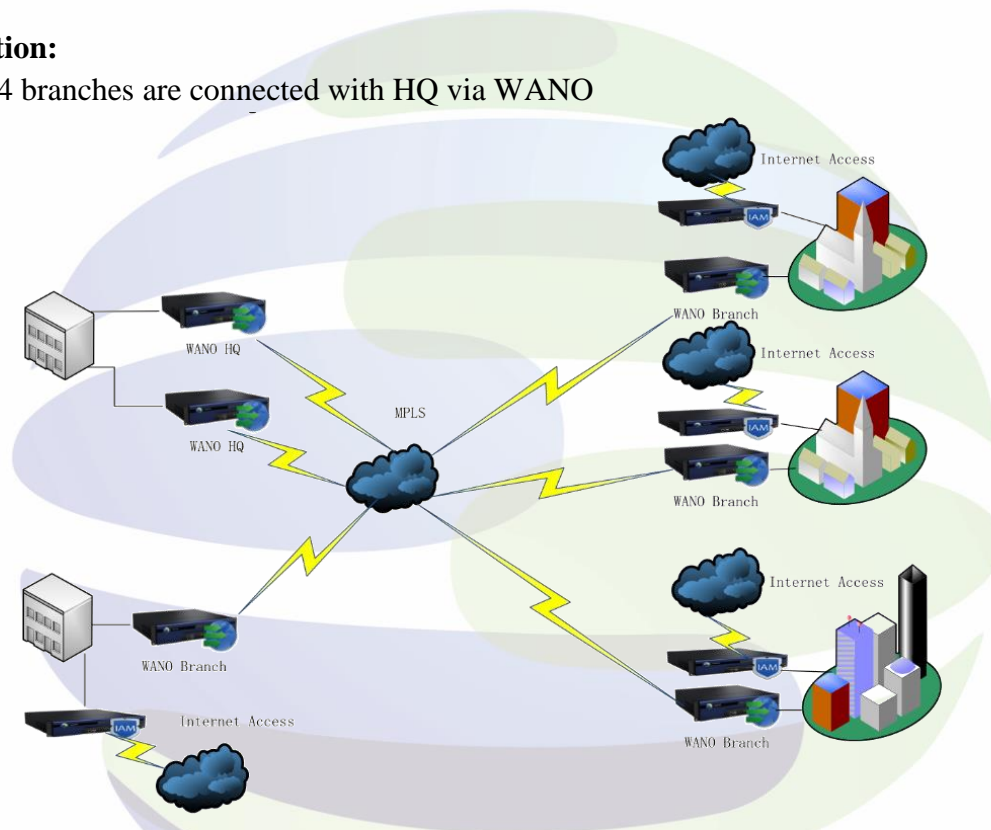
kenanga Kenanga Investment Bank Berhad is the No.1 Retail Broker in Malaysia named by Bursa Malaysia Berhad.

Challenges:

1. Transmission of large files.
2. Slow access to files in HQ.
3. Limited bandwidth.

Solution:

- 24 branches are connected with HQ via WANO



Result:

1. WAN is enabled to optimize & accelerate Exchange, Web applications and others.
2. 50% reduction rate for the flow (before/After).
3. The bandwidth network runs faster and holds more traffic flow for local users.
4. BM guarantees core application to run smoothly without interruption.

RHB



RHB Investment Bank Berhad

4th largest fully integrated financial services group in Malaysia. Main subsidiaries: RHB Bank Berhad / RHB Investment Bank Berhad / RHB Islamic Bank Berhad / RHB Insurance Berhad / RHB Asset Management Sdn Bhd / RHB Islamic International Asset Management Berhad. Coverage Area: Malaysia / Singapore / Thailand / Vietnam / Brunei / Cambodia / Indonesia / Hong Kong.

Challenges:

Branch faced problem with the operation speed of trading system, BTX hosted in Bursa Malaysia. For some branches with smaller bandwidth, it took more than 50 seconds to load the system. They needed to upgrade the line 4 times in order to get the loading speed to around 10 seconds.

Updating current market price is important for traders but their feed lagged almost 10 seconds behind due to bandwidth issue. The line upgrade solution costs too much. They had to look for an alternative solution for bandwidth upgrade for all 40 branches.

Solution:

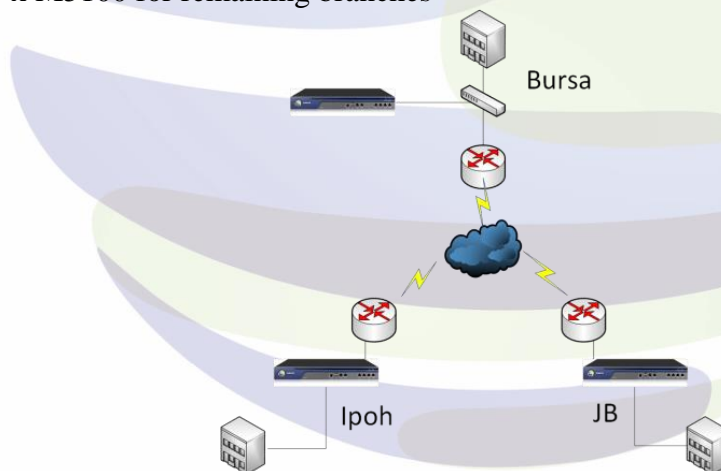
Sangfor WANO devices are installed at Bursa Malaysia Data Center, network performance of RHB Investment Bank branch offices has ever since been improved with work productivity elevated. Loading speed of BTX has improved around 10 seconds and market feed can now be updated within 2 seconds.

WANO that has already been deployed:

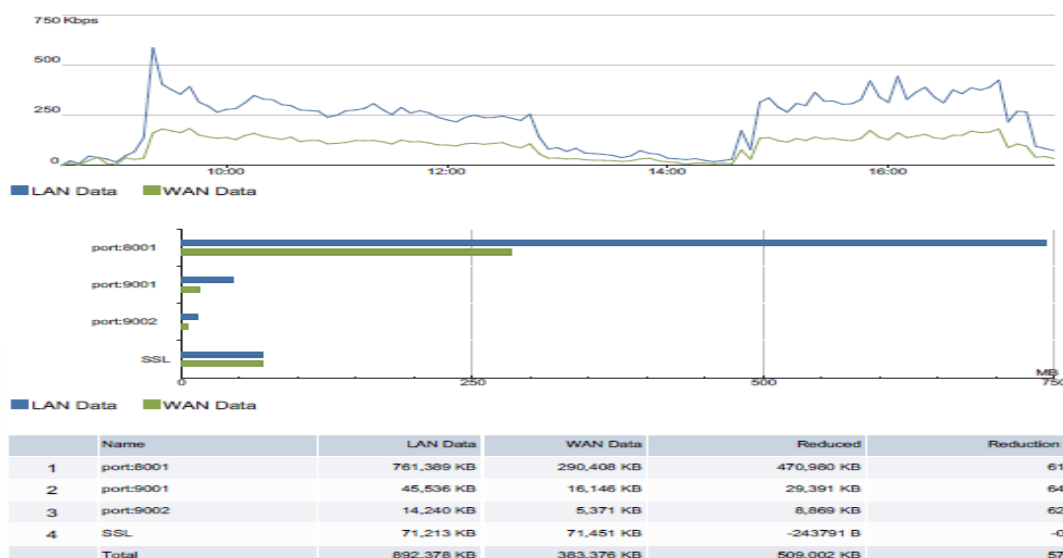
- 2 x M5600 for Bursa Malaysia
- 13 x M5100 for branches

Future purchase:

- 27 x M5100 for remaining branches

**Result:**

Traffic is reduced by 57%; the speed of core application BTX system has improved obviously. Loading speed of BTX is increased to around 10s, which is 40-50s before.



Other Regions

Myanmar-MOB



MOB BANK

မြန်မာ အကျိုး သမ္မတ ဝိုင်း ပုံ ဝိုင်း ကူညီ

Myanmar Oriental Bank (MOB) was founded on November 18, 1993 and it has till today over 30 branches in throughout the country. The bank is authorized to operate as an investment/development bank for the domestic market and approved banking activities include: Current/Fixed/Saving Deposits and Commercial Loans, etc. It is also one of the few banks that can has Currency Exchange Counter, as well as leader of Myanmar Payment Union (MPU).

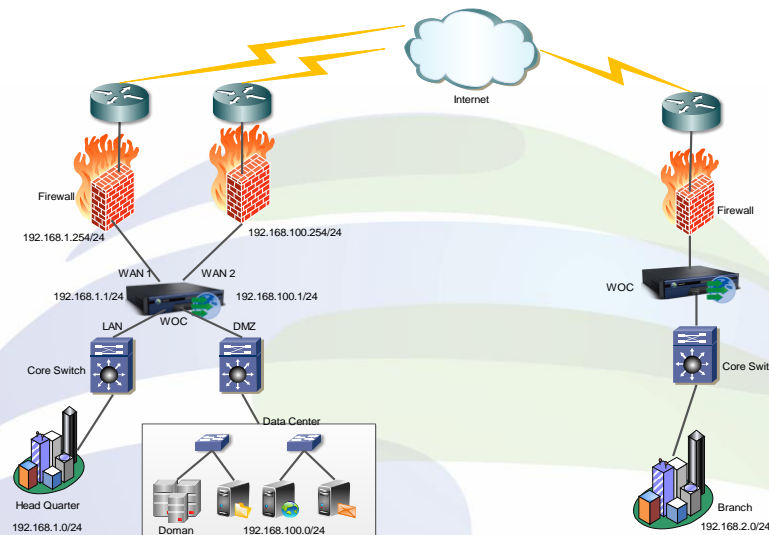
Challenges:

1. Transmission of large files/attachments between HQ and branches.
2. Slow access to files (especially the ones with customer information).
3. Applied guaranteed bandwidth to their core banking applications (some internal developed applications and VMs), thus limited bandwidth for others applications
4. Applied URL and app control as well.
5. Wanted to optimize the traffic between HQ and branches, especially files transmission.

Solution:

1. WANO M5000 is proposed for HQ and S4000 for branches.

2. The deployment is double bridge mode as they want to minimize network interruption and avoid big changes in their network. Double bridge mode is the most suitable solution for such scenario and accepted by the customer.
3. WANO is pre-configured and deployed after customer scheduled a short downtime for their HQ and branches. Simply plugged-in and the system is back online with no problem.



Result:

1. Web and other applications are optimized and accelerated.
2. Network runs faster and holds more traffic flow for local users.
3. Bandwidth management guarantees core applications running smoothly without interruption.

Myanmar-MAB



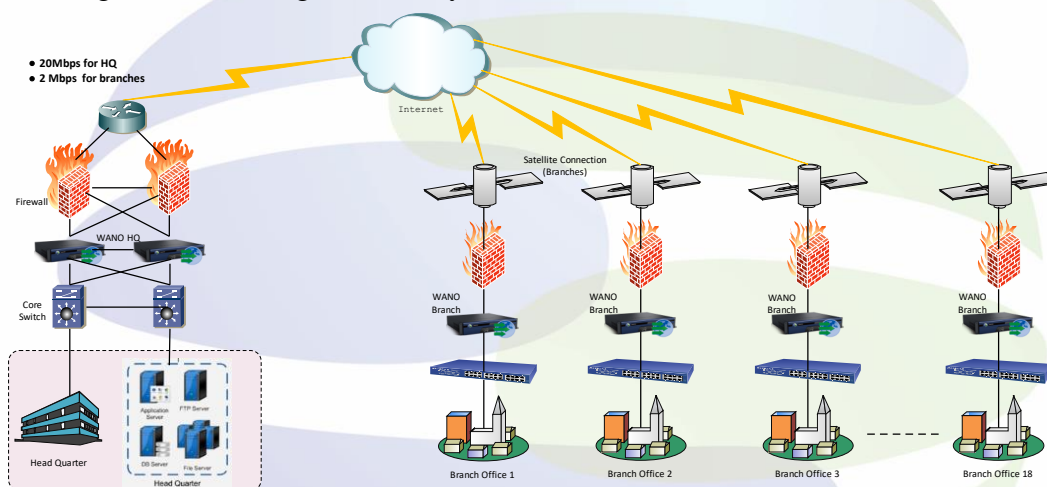
Myanmar Apex Bank Ltd (MAB) was incorporated on 2nd July, 2010 and opened its first branch office in Naypyitaw on 17th August, 2010. Since inception, they have extended their branch network steadily to facilitate commercial development and investment across all of Myanmar as well as to better serve their growing customer base through a larger banking network. Customer deposits have grown significantly since inception, due to their delivery of quality service, reliable performance, customer satisfaction and trust among the general public.

Challenges:

1. Transmission of large files/attachments.
2. Optimize the HQ - branch visit experience.

Solution:

1. WANO M5400-Q-1 for HQ and S5000-Q-1 for branches.
2. The deployment is Bridge Mode. As customer wants to optimize the HQ-branch visit experience while not changing their network topology.
3. WANO Double Bridge mode is deployed between router & switch, it can perform the acceleration without changing network topology and reduce traffic from HQ.
4. Traffic congestion and packet loss can be reduced with byte-cache technology.
5. WANO prevents repeated data transmission over WAN, eliminating redundant data which occupies up to 95% of WAN traffic. It can also deliver cached data at LAN speed.
6. Acceleration gateway uses GZIP and LZO high-speed flow compression algorithm with high efficiency.



Result:

1. Web applications and others are optimized and accelerated. Network can run faster and holds more traffic flow for local users. Link quality and transmission performance of applications are improved with HTP (High-Speed Transmission Protocol) technology, therefore ensures a better user experience.
2. Byte cache technology is utilized to ensure WAN data traffic is deduplicated and previously viewed data are served directly from the local cache to LAN. Shared cache among WANOs is also supported.
3. Dynamic compression technology (LZO, GZIP, Quick ZO) is utilized to boost efficiency.

China-CMB



Established in 1987 in Shenzhen, the forefront of China's reform and opening-up drive, China Merchants Bank ("CMB") is China's first joint-stock commercial bank and also the first bank to attend the national experiment for the promotion of China's banking industry reform driven by endeavors from outside the government.

Since its inception 24 years ago, CMB has grown with China's economic progress from a small bank with a capital of 100 million yuan, one branch and over thirty employees into a nationwide joint-stock commercial bank that has a total net capital of 140 billion yuan, a total asset of 2.6 trillion yuan, over 800 branches and over 50,000 employees, ranking it among the world's top 100 banks.

Challenges:

Data is extremely important for the banking industry. If a company loses its banking data, it will be very difficult for them to carry out business and even more importantly, that company will lose trust of its customers and as a result ceases to gain more market expansion. Serious loss of core data and interruption of business services may also cause the paralysis of the enterprise.

Therefore, a successful disaster recovery within a limited period of time should be a key component of the strategic plan for any financial or banking institution. Business continuity and data protection are becoming the keys to enhance core competitiveness in this industry.

Due to the rapid business growth of China Merchants Bank, the traffic of its core data is also significantly increasing. In response to the potential threats of disaster for the bank users and to comply with the requirements of the "Chinese National Disaster Recovery Specifications of Information System", as well as achieve data replication & data consistency between the source database of business system & the target database of backup system, CMB must fully protect the data security and ensure the high availability of business systems.

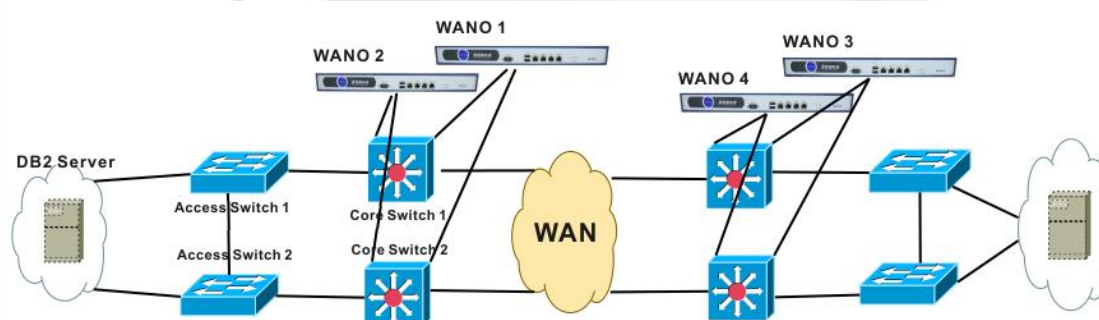
1. Limited bandwidth.
2. Must comply with local law for Disaster Recovery.
3. Lengthy & complicated backup of customers' data.

Solution:

Besides adopting Single Arm deployment for acceleration, we also use multi-devices stacked to increase the speed, superimposes WANO21 & WANO22, connect them to

the access switches and establishes a WCCP (Web Cache Communication Protocol) with the core switches.

1. WANO is deployed in the Headquarters and disaster recovery center of CMB in bypass mode.
2. Bypass mode deployment has a very small impact on the network structure. Based on the existing network structure, Sangfor's compression & cache optimization technology can greatly improve data transmission efficiency and reduce bandwidth occupancy of dedicated line.
3. The deployment of the entire solution is simple, flexible and easy to expand. The process of the entire operation is very simple and clear. More importantly, it doesn't need to change the network.



Result:

With Sangfor WANO in place, CMB is fully protected against network disasters and can realize quick & easy backup/restore of its data with the different data compression technologies integrated. CMB's can now concentrate on providing customers with the best financial products and services.

FTP

| File No. | File Name | File Size | Compression Ratio |
|----------|---|-----------|-------------------|
| 1 | CARD20101228.DAT | 19GB | 90% |
| 2 | HDRDB.0.hdrinst1.NODE0000.CATN0000.20111027195225.001 | 4.1GB | 40% |

| File No. | Transmission Time | | Transmission Speed | | Traffic Reduction | | |
|----------|-------------------|--------|--------------------|----------|-------------------|-------|-------|
| | Before | After | Before | After | Before | After | Ratio |
| 1 | 778s | 272.6s | 25MBps | 73.3MBps | 19GB | 4.9GB | 74.2% |
| 2 | 167s | 72.5s | 20MBps | 60.3MBps | 4.1GB | 2.1GB | 51.2% |

HADR

| Application Type | Data Size | Before | After | Before Traffic Reduction | After Traffic Reduction | Ratio of Traffic Reduction |
|--------------------------------|-----------------|--------|-------|--------------------------|-------------------------|----------------------------|
| HADR Real-time synchronization | 2.46GB *3 times | 152s | 127s | 7.4GGB | 0.9G | 81% |
| HADR remote cache | 2.2GB | 136s | 81s | 2.2GB | 0.25GB | 89% |