SANGFOR WANO 9.1R2 Video Conferencing Optimization guide

SANGFOR Technologies Inc.

15 Mar 2018

Your Future-Proof IT Enabler

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1 Introduction

1.1 Abbreviations and conventions

WANO in this article refers to the SANGFOR WAN Optimization device.

1.2 Feedback

If you find any questions of this documents, please feel free to give us feedback, email: tech.support@sangfor.com.

2 Pre-preparation

2.1 Network Environment

Understand customer network environment, verify and confirm on customer network environment, for better solution proposal later.

I. Type of connection (Leased line, VPN, public IP connection, satellite). Total bandwidth for Headquarters and branches.

Note: Satellite connection have high latency at about 500ms, high packet lost at more than 20%. HD video conferencing required at least 2Mbps for better optimization status.

II. Stability of connection (Packet lost status and network latency status). The quality of the video conferencing (Spike, lag or mosaic).

Note: If customer has very good network connection, smooth while using video conferencing, then the optimization status will not obvious.

III. Manufacturer of the video conferencing device. Video quality (Low definition, standard definition, or high definition).

2.2 Analysis and determination of proposal

WANO contains Bandwidth management and video packet loss optimization function to effectively optimize video conferencing by assured bandwidth and optimize it.

I. First of all, customer bandwidth must be able to support the video conferencing usage (Polycom video conferencing bandwidth requirement: 720p (uplink and downlink at least 2Mbps), 1080p (uplink and downlink at least 4Mbps). If customer is using PPPoE, must pay attention to the total bandwidth of both uplink and downlink. This is because most of the PPPoE have higher downlink but only 512Kbps of uplink.

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Video conferencing usually consume high bandwidth, therefore the total bandwidth must be able to support the bandwidth usage. Normally customer downlink able to support the bandwidth usage, but uplink is the problem as most of them do not have sufficient uplink bandwidth. Besides, if the traffic successfully optimized, WANO will add device information into each packet, then overall traffic will consume more bandwidth. Therefore, must ensure customer has sufficient total bandwidth.

II. Bandwidth management is a must. Assured bandwidth policy must be created for video conferencing.
   a. If user has very good internet connection with nearly no packet lost, then we just need to configure an assured bandwidth policy and do not need to enable Video Packet Loss Optimization.
   b. If user do not has a very good internet connection, but just enough for video conferencing usage, we just need to configure an assured bandwidth policy and do not need to enable Video Packet Loss Optimization. (Because the function will consume extra bandwidth that will make the packet lost increase and result even worse)
   c. If user has enough total bandwidth (total bandwidth must greater than at least 50% of the minimum requirement for video conferencing usage) and packet lost at lower than 20%, then we need to enable the Video Packet Loss Optimization and also configure an assured bandwidth policy to achieve the optimization result.

III. Deployment mode: Gateway and Bridge mode.
   a. Double bridge and Double arm do not support Video Packet Loss Optimization
   b. Bandwidth Management unable to fully function in Single arm deployment

3 Configuration Guide

3.1 Leased-line

I. Prior understand of the stability of leased line

Execute ***PING*** command from branch to headquarters to determine to the stability of leased line. For non-satellite connection, latency should below 500ms and packet lost should below 20%. (***Iperf*** is an alternative bandwidth testing tool that will display proper result)

Note: If the video conferencing quality is good, no packet loss, no mosaic or lag, then WANO only required to configure Bandwidth Management to enhance the user experience. If the video conferencing quality is average, try to configure Bandwidth Management to determine if the result become better. If the video conferencing quality did not show obvious improve, WANO should enable Video Packet Loss Optimization.

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II. Bandwidth Management

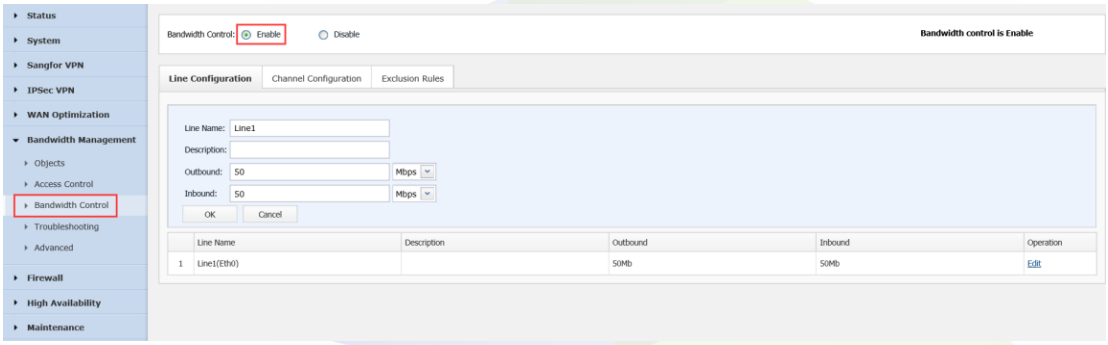
WANO 9.1 Bandwidth Management has similar feature as Sangfor IAM, which is Bandwidth Management can configure parent and child channel that highly benefits user while configuring Bandwidth Management for multiple branches.

a. Configuration of Bandwidth Management (Headquarters)

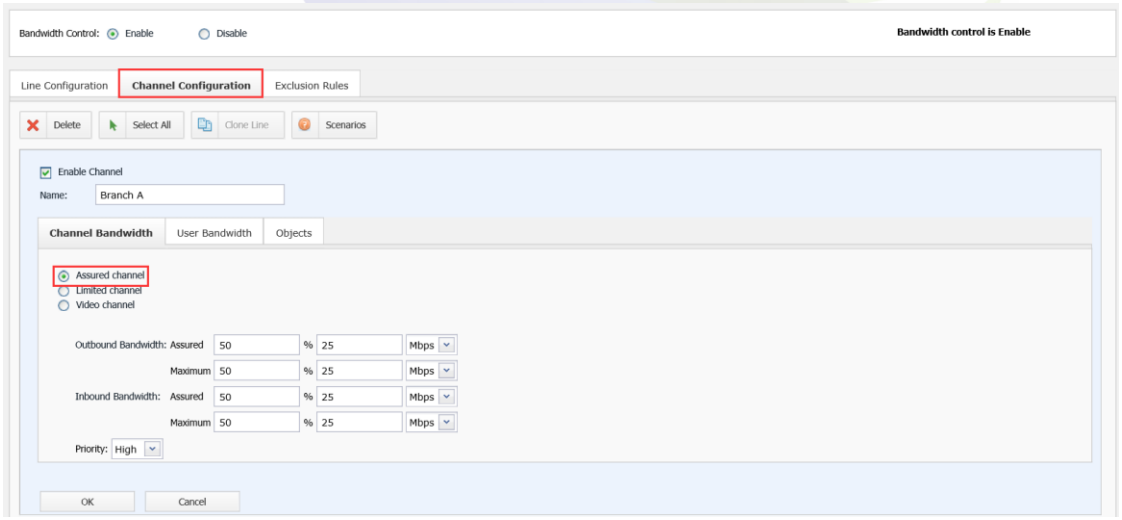
Example 1: Headquarters total bandwidth is greater than branches

Headquarters have total bandwidth of 50Mb, while branch A and branch B have total bandwidth of 25Mb each, the configuration of Bandwidth Management for Headquarters WANO will be as below:

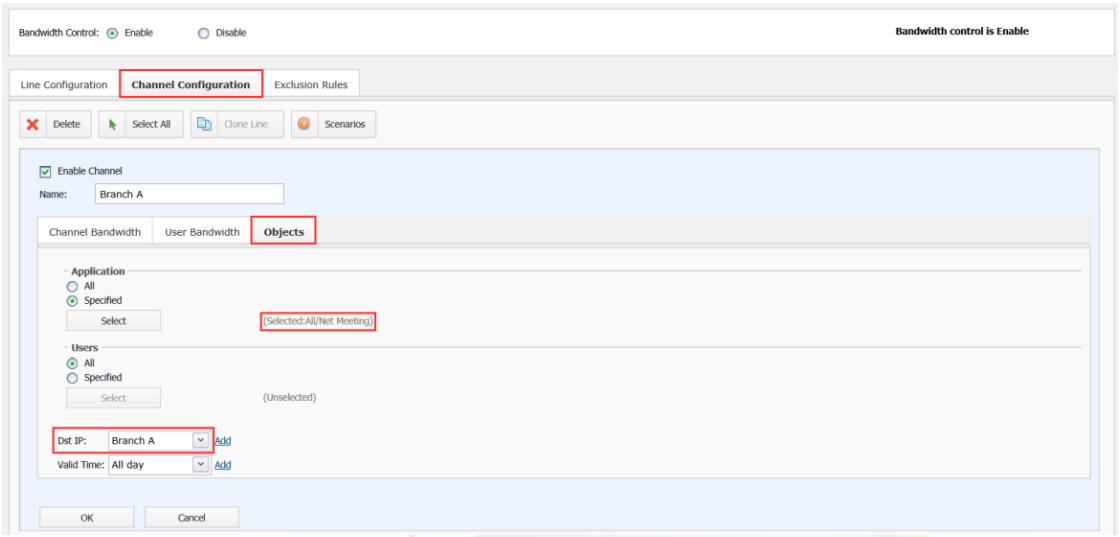
1. In headquarters WANO, enabled Bandwidth Management, edit the **Line 1** and configure total bandwidth.



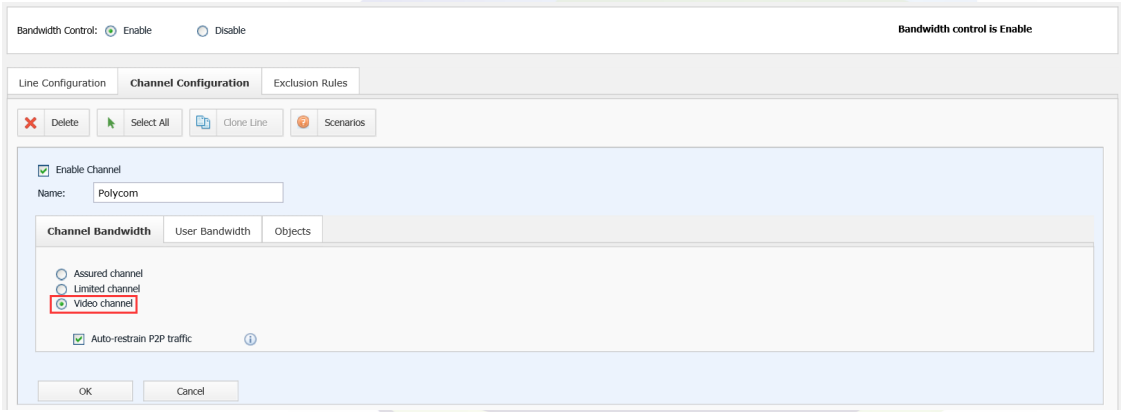
2. Create new parent channel for Branch A. Select Assured channel and 25Mb for Inbound and Outbound bandwidth.



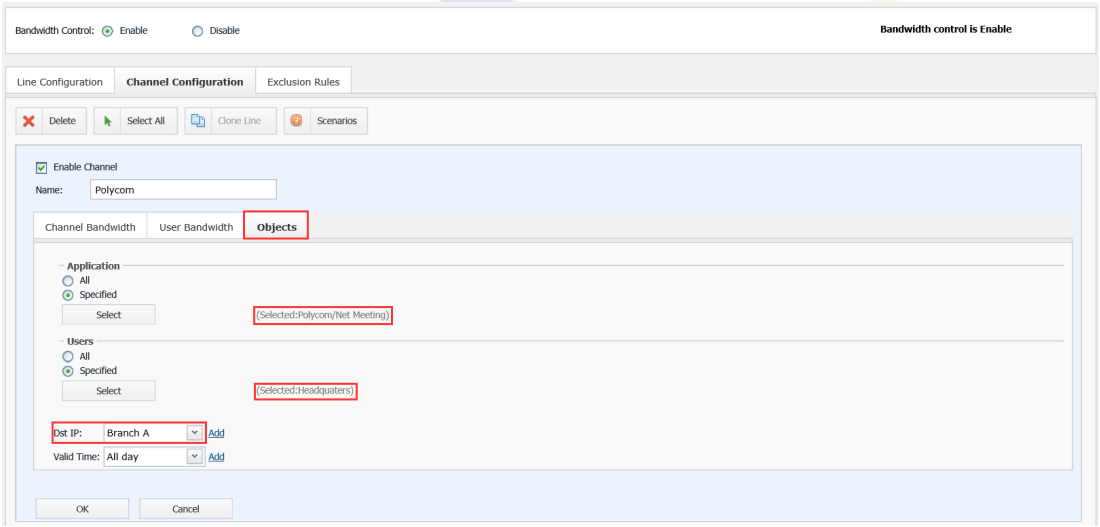
3. Select Application, applied user and also destination IP.



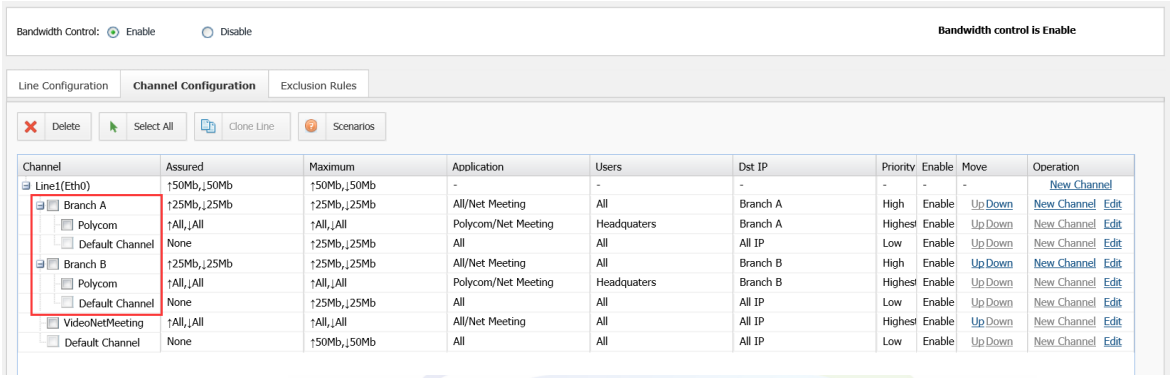
4. Create a child channel under Branch A parent channel.



5. Select Application (Polycom), applied user and also destination IP.

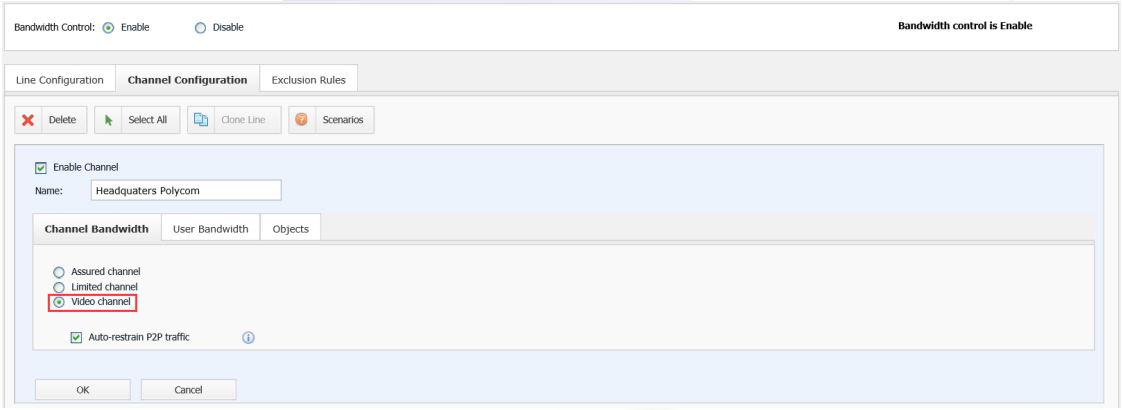


Create another channel for Branch B by using exactly the same configuration as above. After configuration completed, the result is as below:



b. Configuration of Bandwidth Management (Branches)

Configuration in branches will be slightly easier compared to headquarters configuration. Only 2 things need to be configured in branches, which is configure the actual total bandwidth and a video channel to assure the video conferencing bandwidth.



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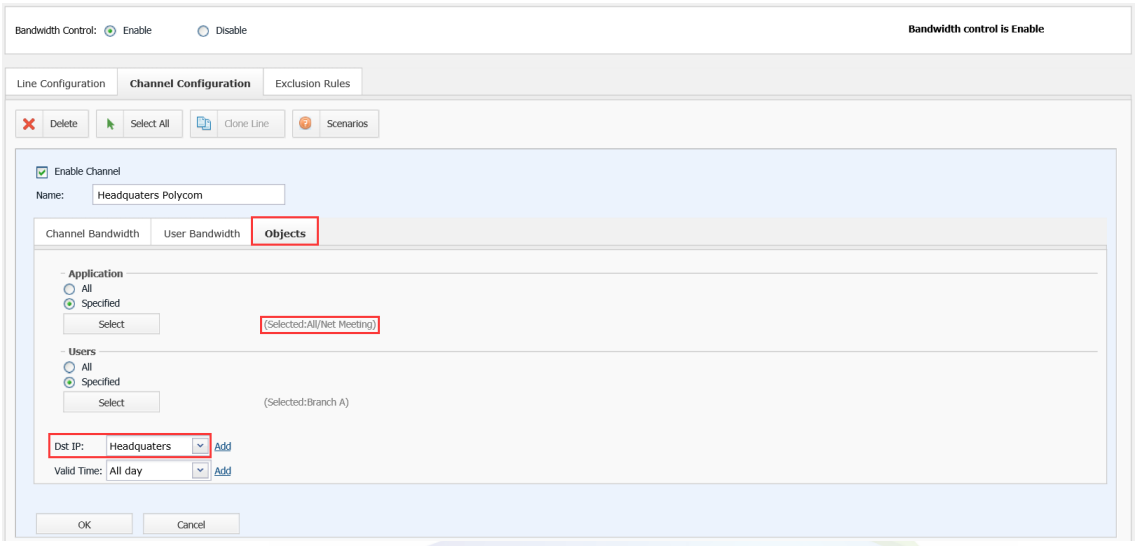
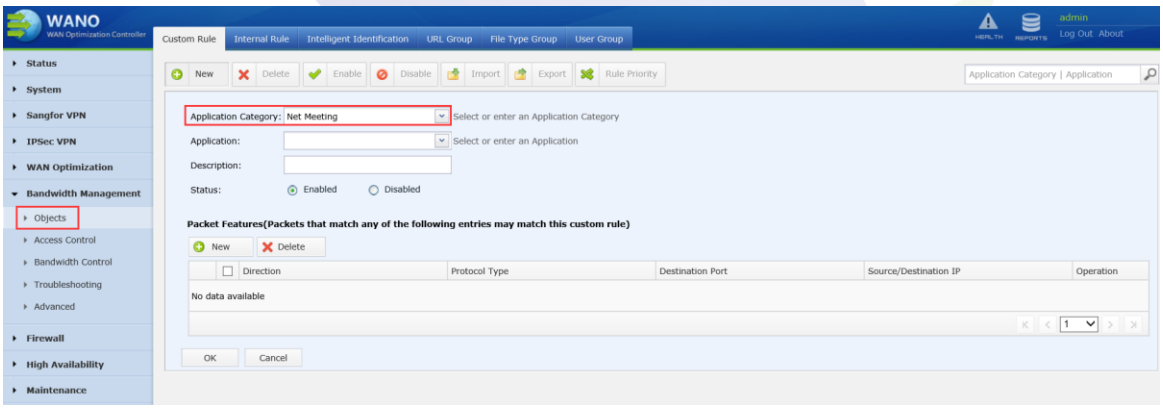


Example 2: Headquarters' total bandwidth is lower than the sum of total bandwidth of all branches.

Headquarters total bandwidth is 30Mb, Branch A total bandwidth is 20Mb and Branch B total bandwidth is 40Mb. While configuring Assured parent channel, suggest to configure 20Mb assured for Branch A and 10Mb assured for Branch B. (For configuration, kindly refer to Example 1)

If WANO unable to recognize the Polycom traffic as Net Meeting, the problem can be solved by either perform databases update or create a customized application rule.



Note: The Application Category must select Net Meeting, but the Application name can be defined by user by typing in the preferred name.

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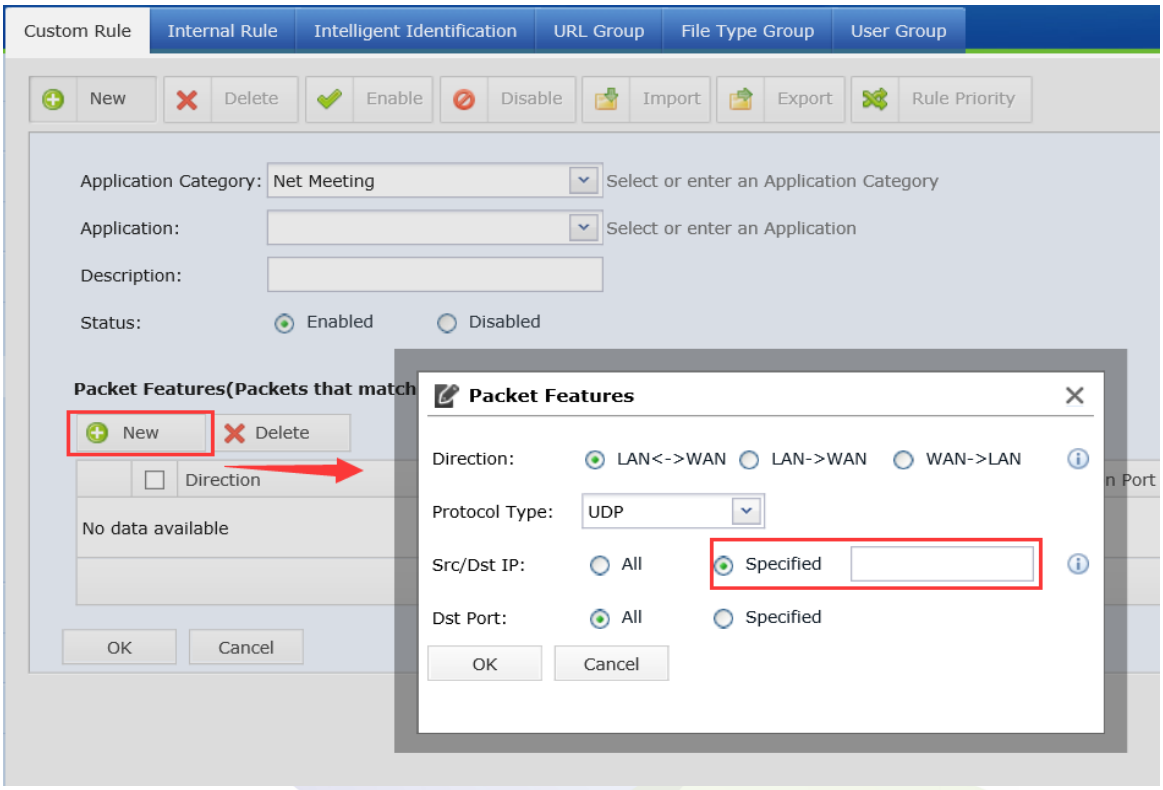
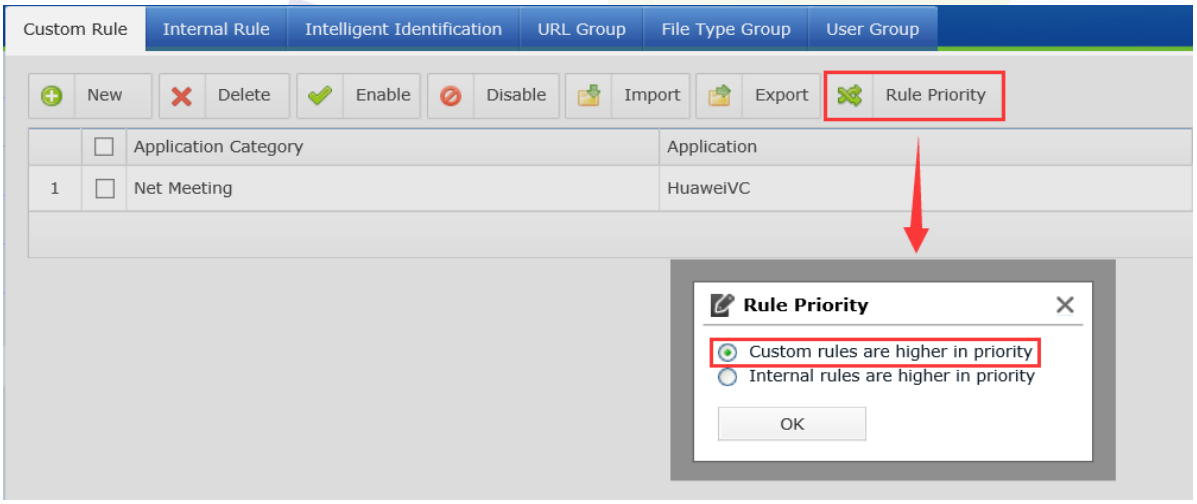


Insert the video conference device IP.

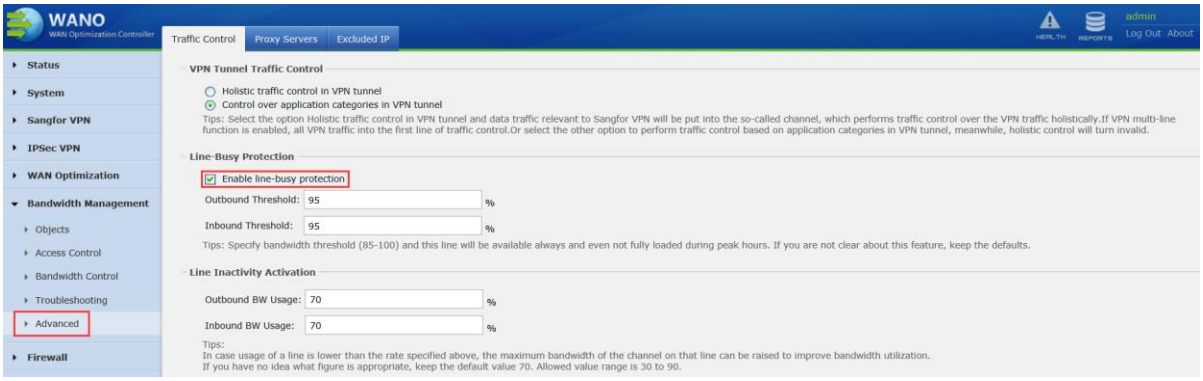


By following the steps provided, it can solve the video conferencing unable to recognize issue.

c. Line-busy Protection configuration (For headquarters and branches)

The feature Line-busy Protection is to prevent the total bandwidth as configured in Line Configuration to 100% fully utilized. For instance, the configuration set is 95% for both inbound and outbound, therefore there will always a 5% of bandwidth standby to prevent the total bandwidth fully

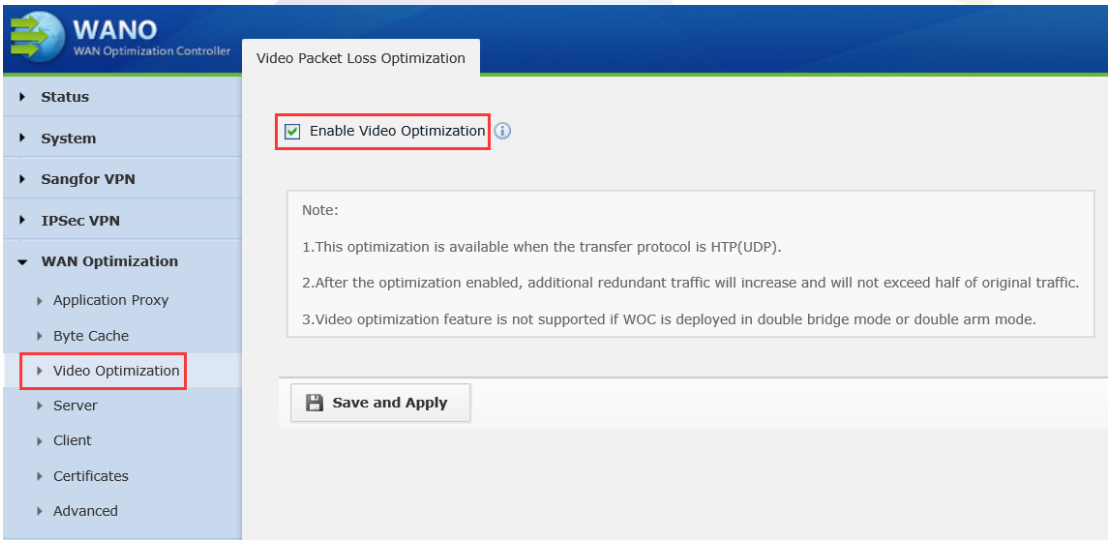
consumed.



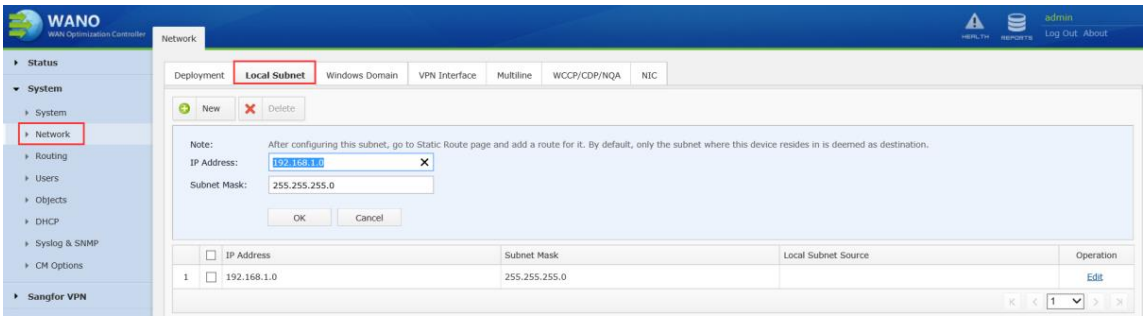
III. Video Packet Loss Optimization

If the video conferencing call quality did not improve even after configured Bandwidth Management, then Video Packet Loss Optimization should be enabled. This feature will enhance the mosaic and delay or lag problem that causes by packet lost. This feature only available from WANO 9.1 onwards.

a. Enable Video Optimization

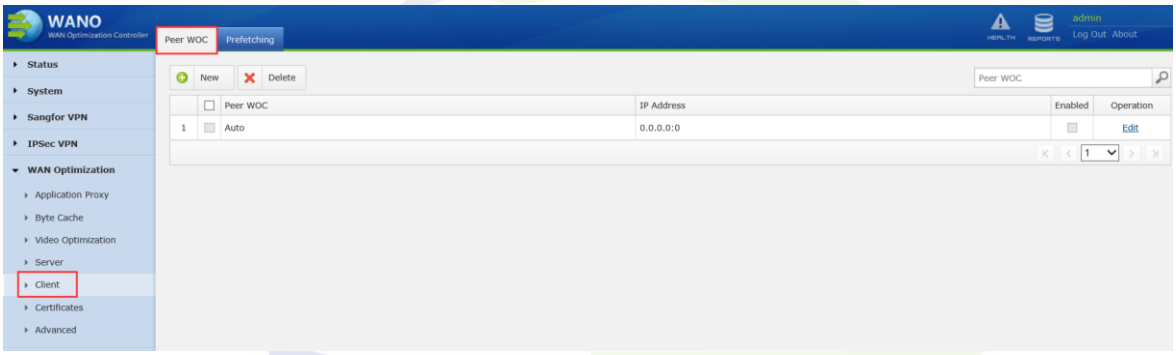


If the video conferencing system is not in the same IP segment with WANO, then the video conferencing system will need to add into WANO Local Subnet.

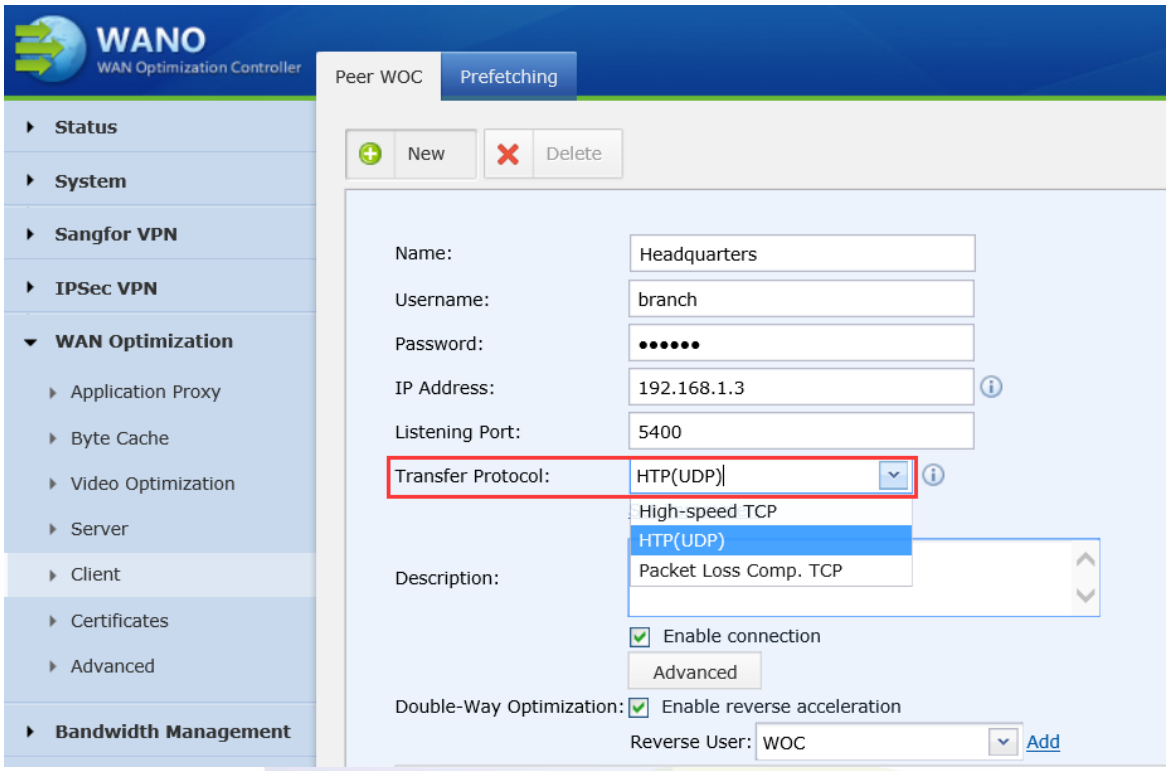


Note: From WANO 9.1 onwards, if WANO deployed with VPN + acceleration, the Local Subnet configured in VPN will automatically sync to device Local Subnet.

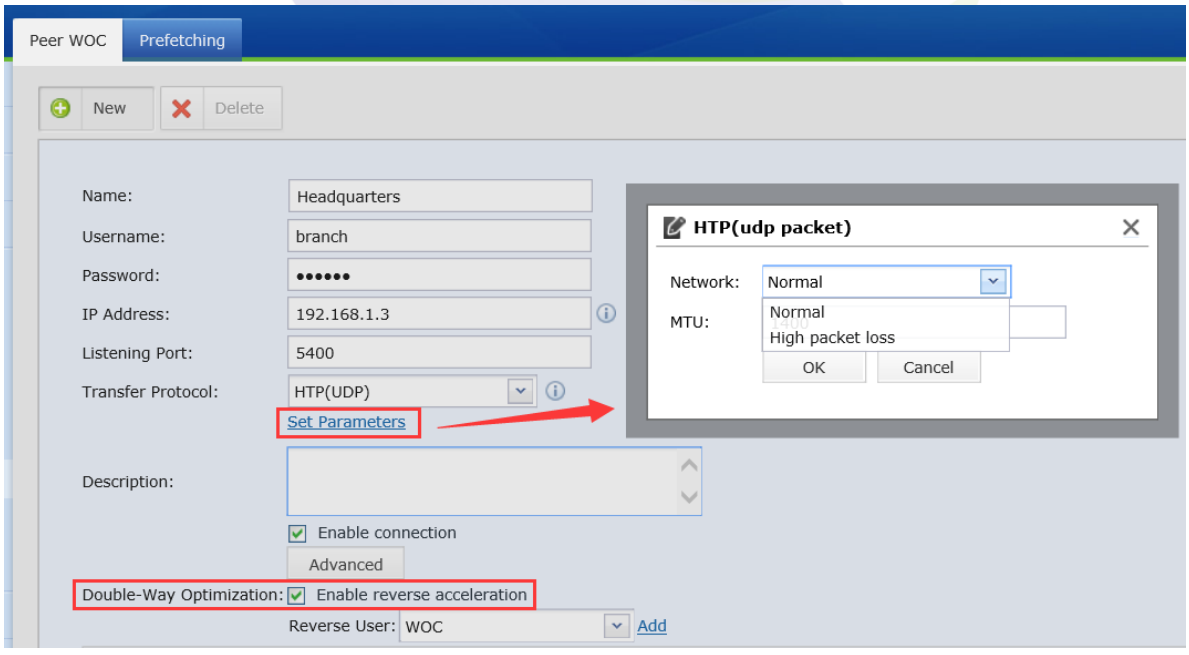
b. WAN Optimization configuration for Client (Branches)



WAN Optimization configuration remains the same as the previous WANO version. As for Video Packet Loss Optimization, it required to use HTP(UDP).



After select HTP(UDP), click on the "Set parameters" to choose the most suitable network condition (normal or high packet loss).



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Make sure Double-way Optimization has been enabled by tick the “Enable reverse acceleration”. Besides, make sure the Reverse User has been selected with the correct user. By default, WANO has a predefined account which is “WANO”, if user create a new acceleration account, can directly select in the Reverse User list.

3.2 VPN Connection

I. Prior understand of the stability of VPN

Execute ***PING*** command from branch to headquarters to determine to the stability of VPN. For non-satellite connection, latency should below 500ms and packet lost should below 20%.

If the VPN connection with nearly no packet lost, then we just need to configure an assured bandwidth policy and do not need to enable Video Packet Loss Optimization. If the call quality did not get any better, then only enable Video Packet Loss Optimization.

II. Configure VPN tunnel

There are 3 types of VPN connection that WANO supports, which are Sangfor VPN (TCP), Sangfor VPN (UDP) and IPsec VPN. For video conferencing optimization, it is not suitable to use Sangfor VPN (TCP).

After a lot of project and testing, it proves that IPsec VPN is much more stable than Sangfor VPN (UDP) in term of low packet loss. If there is very high packet loss while setting up VPN tunnel with Sangfor VPN (UDP), try to change it to IPsec VPN, IPsec VPN will have lower packet loss rate.

III. Bandwidth Management

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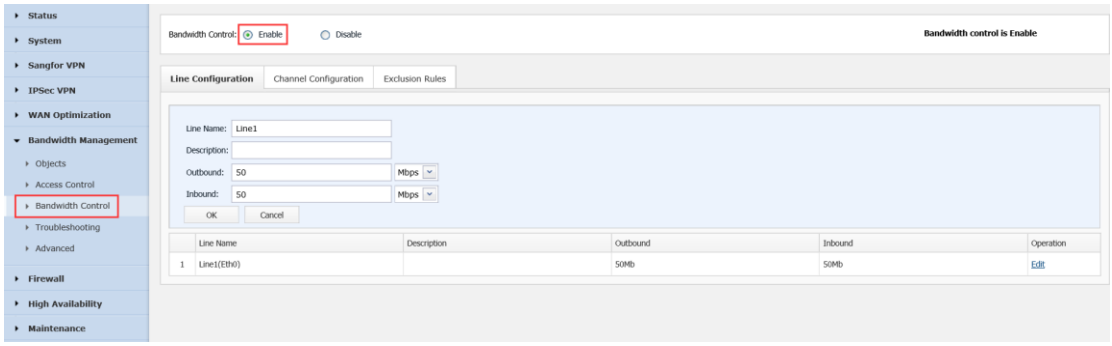
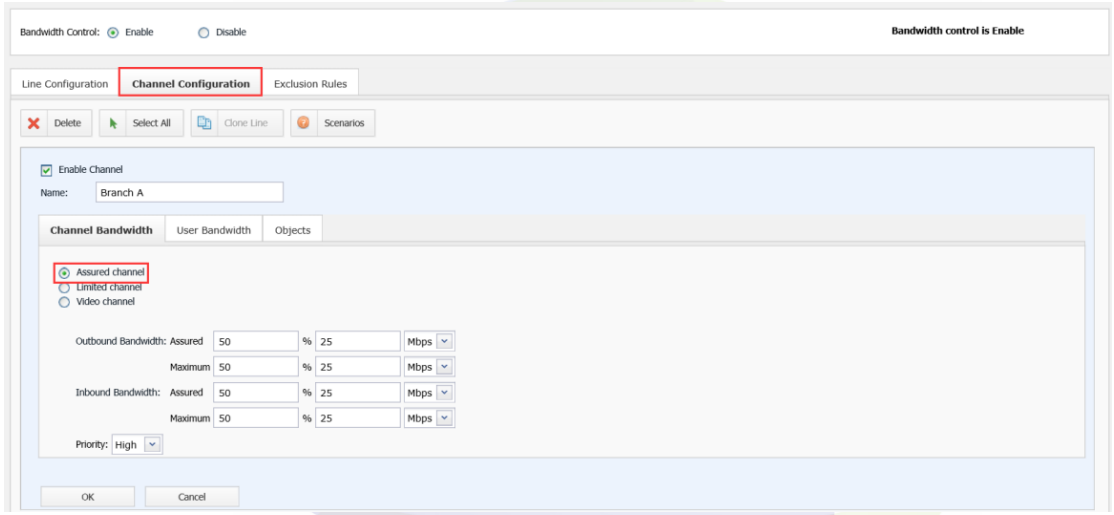
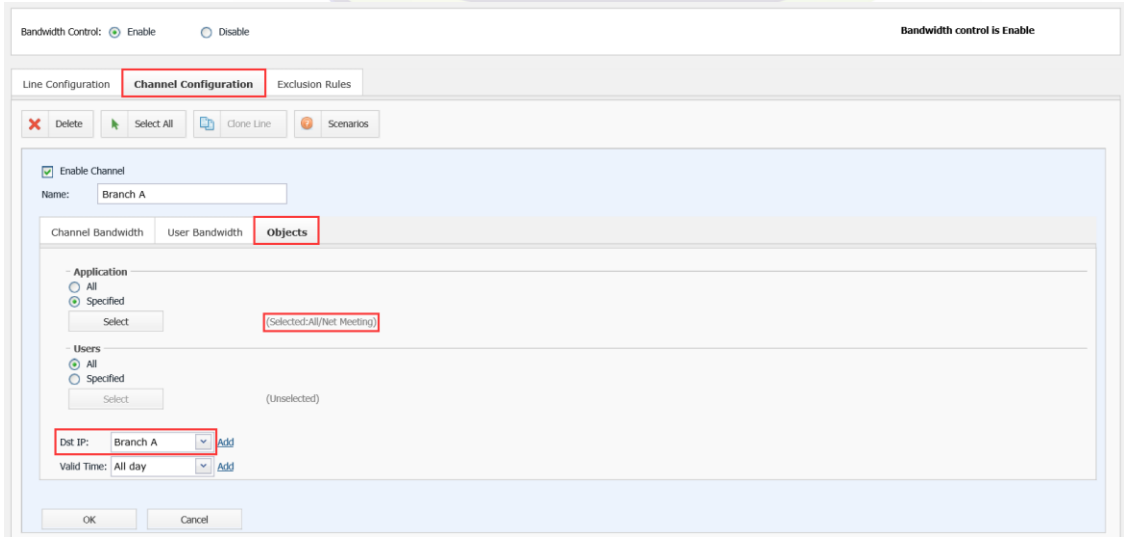


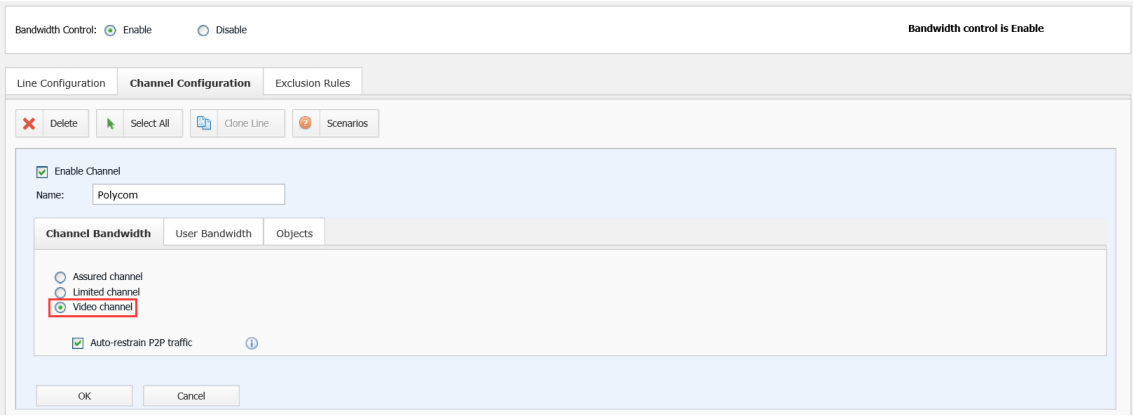
2. Create new parent channel for Branch A. Select Assured channel and 25Mb for Inbound and Outbound bandwidth.



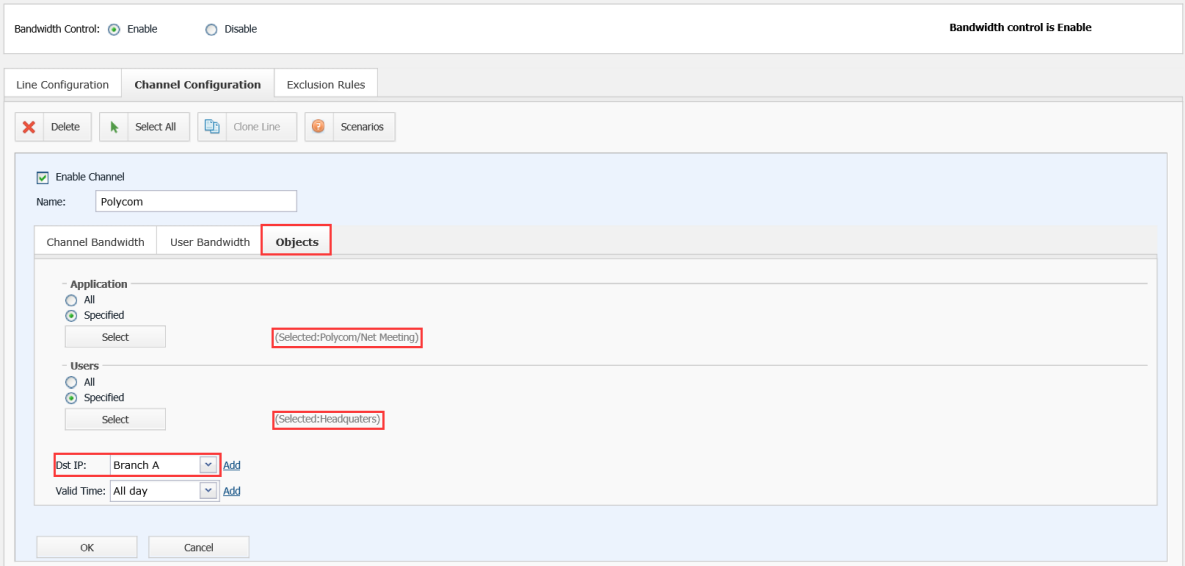
3. Select Application, applied user and also destination IP.



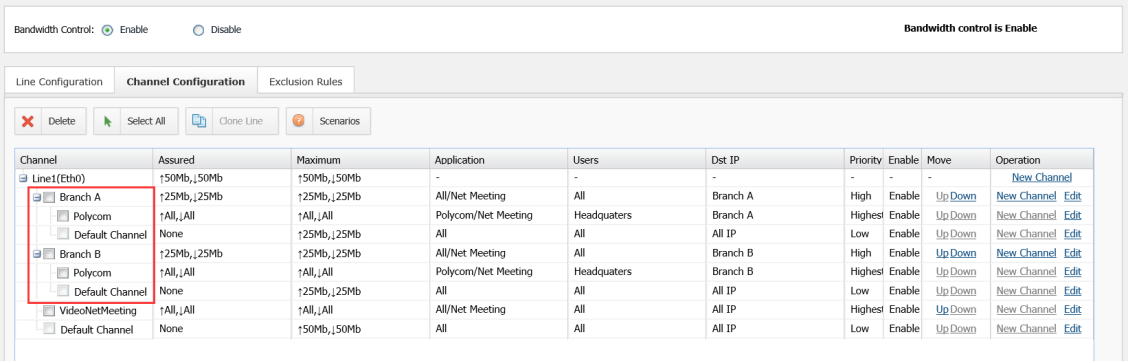
4. Create a child channel under Branch A parent channel.



5. Select Application (Polycom), applied user and also destination IP.



Create another channel for Branch B by using exactly the same configuration as above. After configuration completed, the result is as below:



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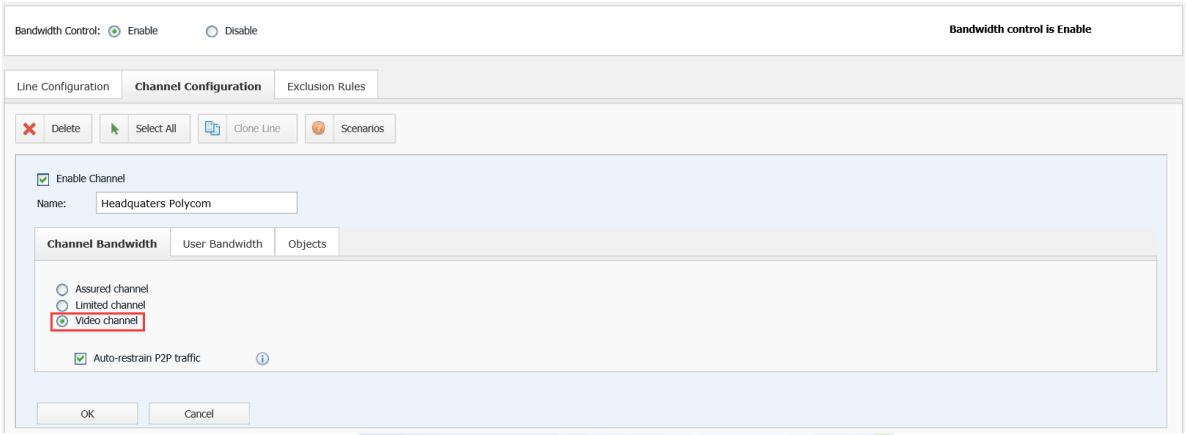
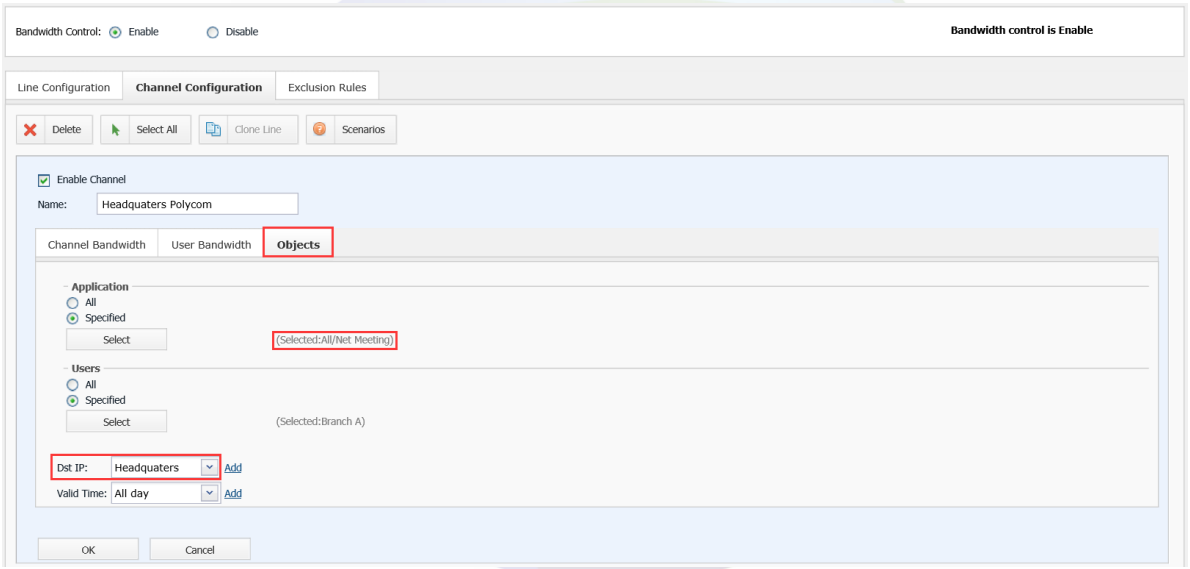


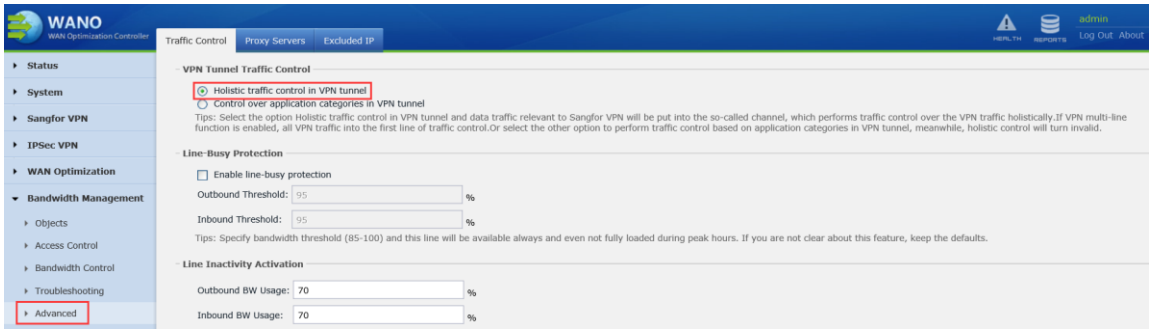


Example 2: Headquarters' total bandwidth is lower than the sum of total bandwidth of all branches

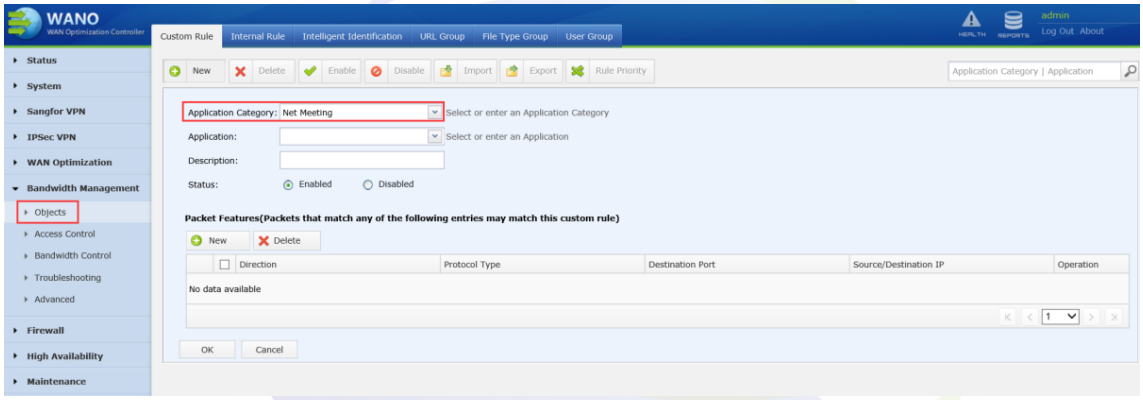
Headquarters total bandwidth is 30Mb, Branch A total bandwidth is 20Mb and Branch B total bandwidth is 40Mb. While configuring Assured parent channel, suggest to configure 20Mb assured for Branch A and 10Mb assured for Branch B. (For configuration, kindly refer to Example 1)

Making video conference call through VPN connection might cause the traffic did not recognize as Net Meeting and therefore did not apply with the Bandwidth Management video channel. This is because traffic go through VPN connection will be categorized under VPN category and thus unable to match the Bandwidth Management channel. In order to control the traffic that pass through VPN connection, just enable *Holistic Traffic Control in VPN Tunnel.*

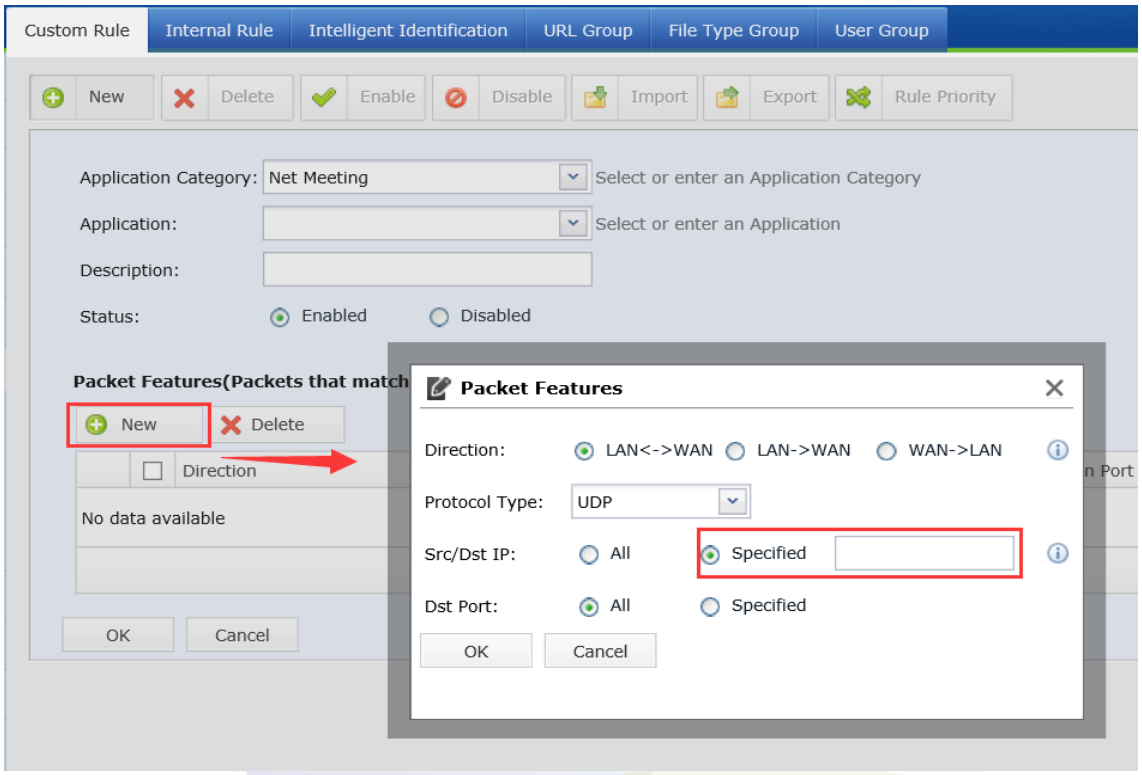
Note: Enabling Holistic traffic control in VPN tunnel to ensure the Bandwidth Management working properly



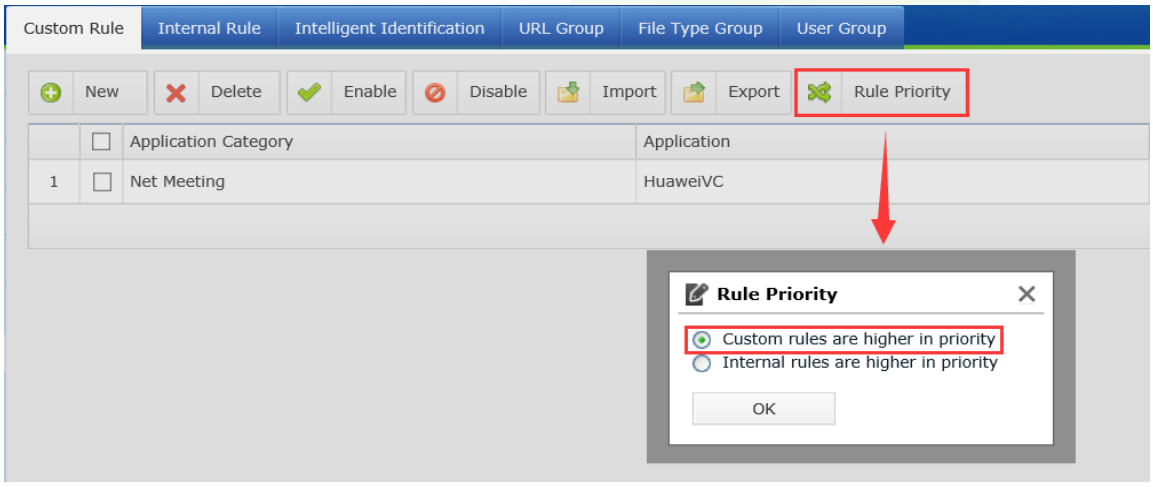
If WANO unable to recognize the Polycom traffic as Net Meeting, the problem can be solved by either perform databases update or create a customized application rule.



Note: The Application Category must select Net Meeting, but the Application name can be defined by user by typing in the preferred name.



Insert the video conference device IP.



By following the steps provided, it can solve the video conferencing unable to recognize issue.

Prevent other application traffic consume majority bandwidth in VPN tunnel

Monitor user bandwidth usage, ensure the bandwidth usage do not exceed 90% at most of the time, otherwise it will affect the video conferencing traffic. *Dynamic Bandwidth Limit* is an alternative to prevent the issue mentioned above to happen.

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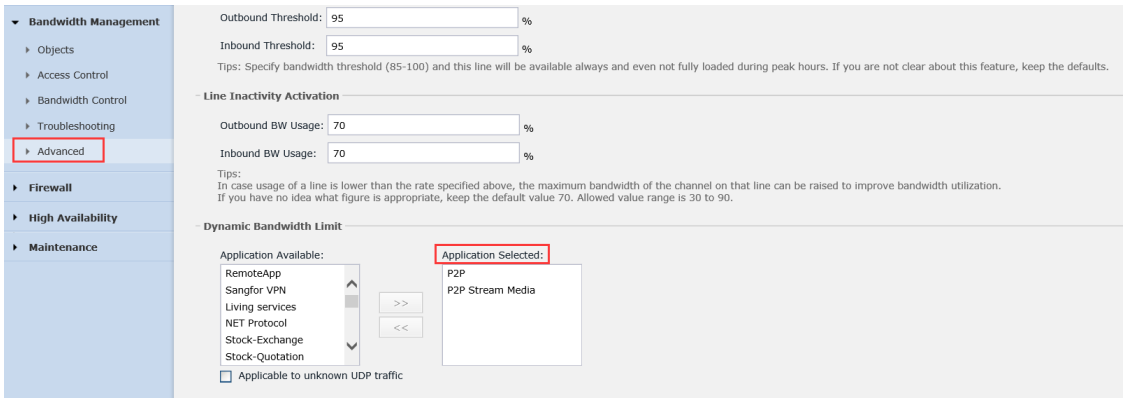
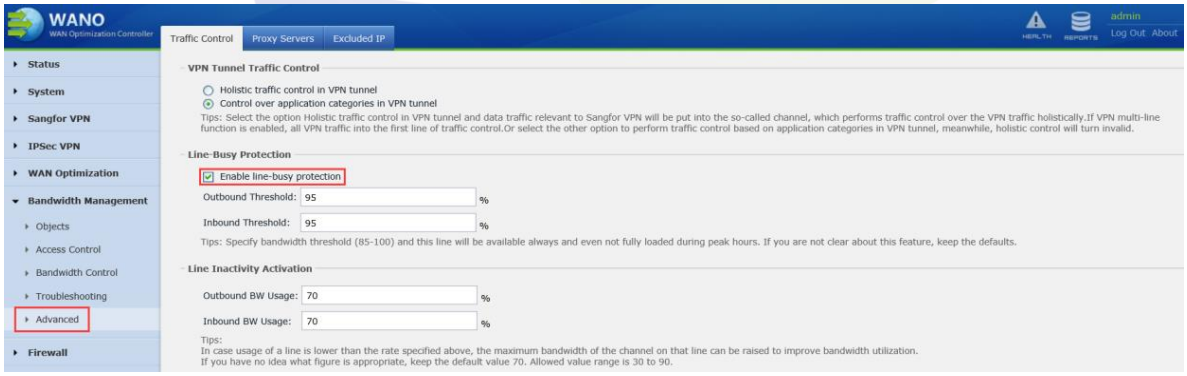


If there is other traffic fall into assured video channel, by enabling this feature, the selected application will be automatically limit to 5KB/s, then WANO will automatically create a limit channel named “Auto_Limit_Chn”.

If the unrecognized UDP traffic (such as P2P traffic) affect the video conferencing traffic, you can enable the “Application to unknown UDP traffic” feature to test out if it helps to limit the P2P traffic. Usually the feature do not recommend to enable.

c. Line-busy Protection configuration (For headquarters and branches)

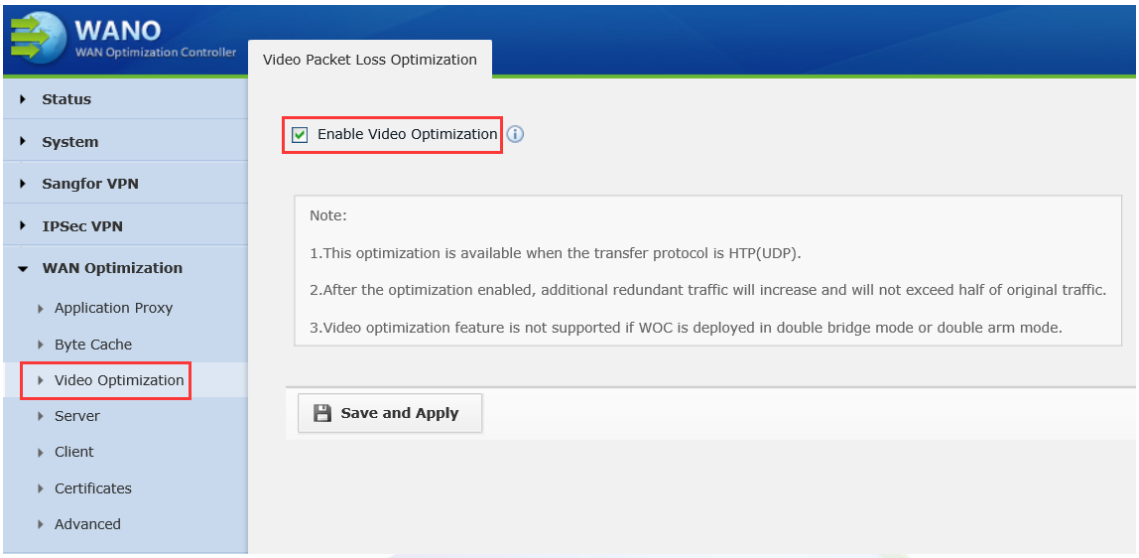
The feature Line-busy Protection is to prevent the total bandwidth as configured in Line Configuration to 100% fully utilized. For instance, the configuration set is 95% for both inbound and outbound, therefore there will always a 5% of bandwidth standby to prevent the total bandwidth fully consumed.



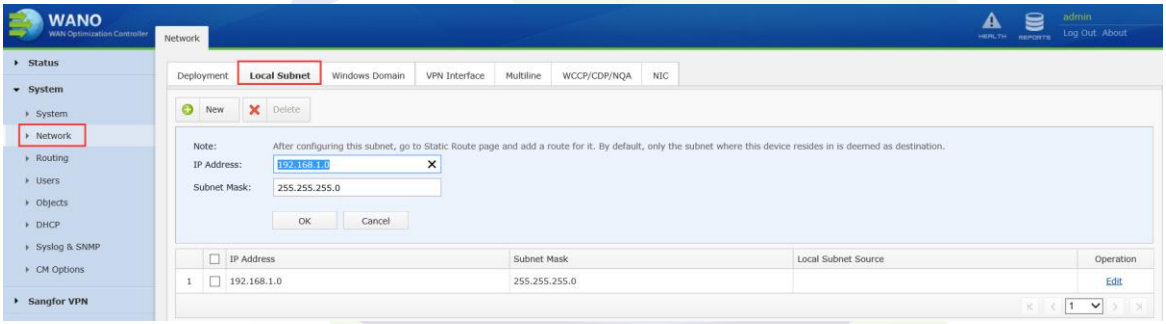
IV. Video Packet Loss Optimization

If the video conferencing call quality did not improve even after configured Bandwidth Management, then Video Packet Loss Optimization should be enabled. This feature will enhance the mosaic and delay or lag problem that causes by packet lost. This feature only available from WANO 9.1 onwards.

a. Enable Video Optimization

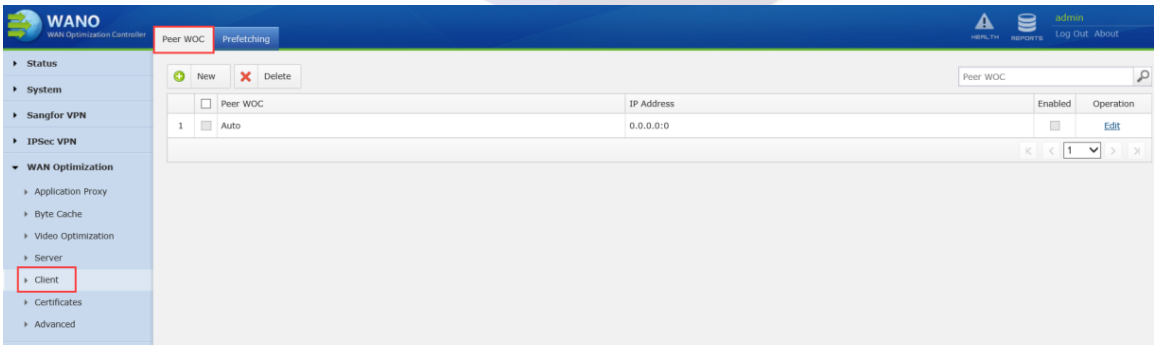


If the video conferencing system is not in the same IP segment with WANO, then the video conferencing system will need to add into WANO Local Subnet.



Note: From WANO 9.1 onwards, if WANO deployed with VPN + acceleration, the Local Subnet configured in VPN will automatically sync to device Local Subnet.

b. WAN Optimization configuration for Client (Branches)



WAN Optimization configuration remains the same as the previous WANO version. As for Video Packet Loss Optimization, it required to use HTP(UDP).

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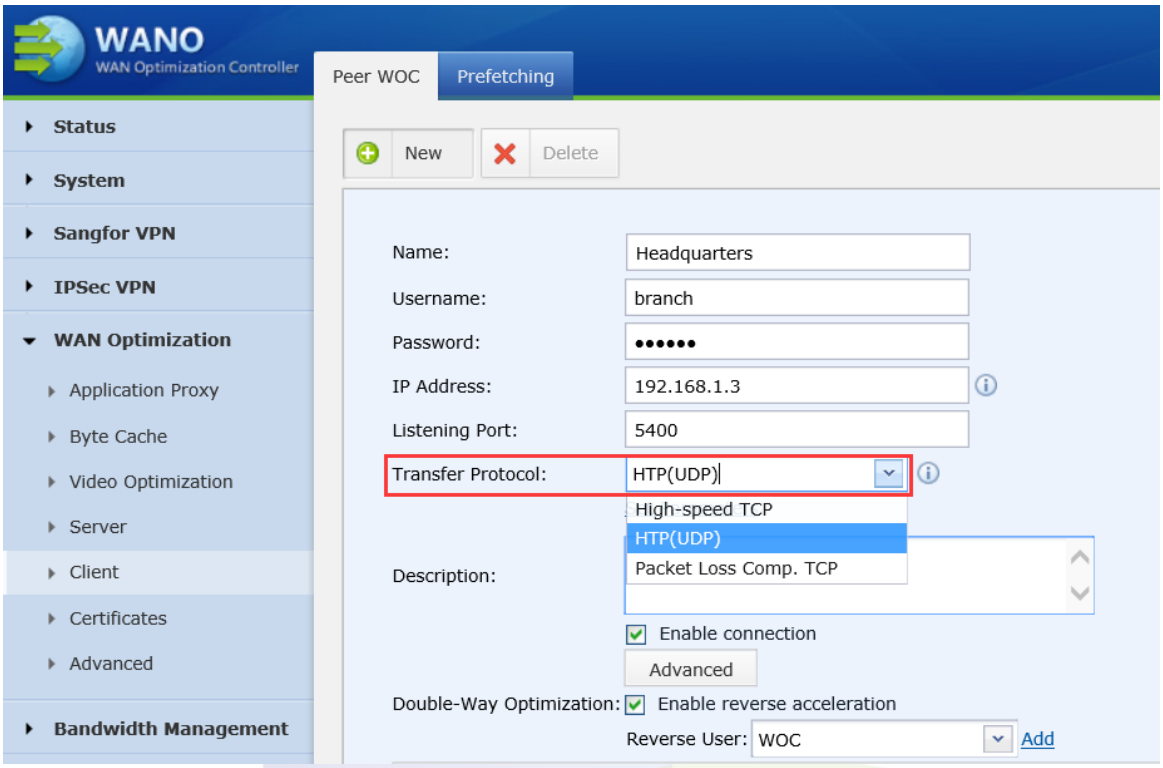
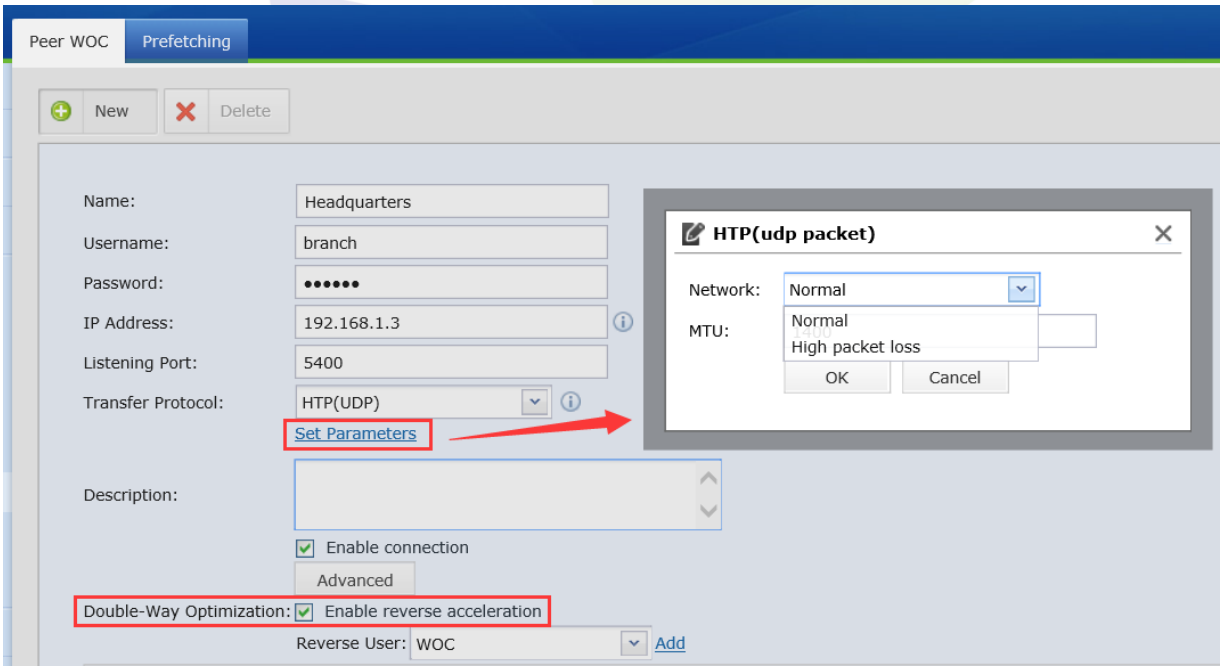


After select HTP(UDP), click on the "Set parameters" to choose the most suitable network condition(normal or high packet loss).



Make sure Double-way Optimization has been enabled by tick the "Enable reverse acceleration". Besides, make sure the Reverse User has been selected with the correct user. By default, WANO

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has a predefined account which is “WANO”, if user create a new acceleration account, can directly select in the Reverse User list.

4 Other Problem

4.1 Check Internal Network

Prepare an internal PC and execute Ping command destination to WANO LAN IP. If no packet loss, latency at 1ms, then the internal network is working fine. Must ensure no packet drop by in internal network.

Possible reasons of high packet drop in internal network

i. Overload of a network device
ii. Packet drop at Network Interface Card of an old device
iii. MTU or MSS value did not match
iv. Bandwidth fully consumed
v. Routing issue

4.2 Check Bandwidth Usage

Video Packet Loss Optimization feature in WANO will cause the traffic to consume more bandwidth. If the traffic become worse after passing through WANO acceleration tunnel, it means that the bandwidth is most probably do not enough.

4.3 P2P traffic and download application traffic limit

P2P traffic and any download application will drastically consume the bandwidth. If the video conferencing quality is bad, try to check if the internal environment contain P2P traffic or any download application traffic. If there is P2P traffic or traffic from download application, use WANO Bandwidth Management to limit the traffic.

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