Virtual Office

Technical Requirements

Version 4.0

Revision 4.6

Purpose

The purpose of this document is to provide customers with a checklist of technical requirements, functionality, and capabilities necessary to prepare their network and workstations to interoperate with 8x8 Virtual Office and Virtual Office Pro. These changes include shaping traffic to guarantee bandwidth as well as ensuring specific ports are opened to allow proper connection to 8x8 services.

Requirements

Please work with your 8x8 engineer to run the 8x8 Network Utility on all your networks where you use an 8x8 endpoint. This will help diagnose most common network issues.

If you have a use case that requires the use of the 8x8 Virtual Office desktop app or Virtual Office mobile app over Wi-Fi, you must run the utility on your wireless network as well. If your phones are on a separate VLAN, and the Virtual Office apps are on a different VLAN, make sure to run the test on all applicable VLANs.

Network	
Wiring	At least Cat 5 (preferably Cat 6) wiring to each user
PoE (recommended)	For Polycom phone PoE requirements, please refer to: http://support.polycom.com/global/documents/support/setup_maintenance/products/voice/Power_Consumption_and_Management.pdf For Yealink Phone PoE requirements, please refer to: http://support.yealink.com/faq/faqInfo?id=204 For Cisco PoE requirements, please refer to: https://www.cisco.com/c/dam/en/us/products/collateral/collaboration-endpoints/sales-tool-c96-739424.pdf
Packet loss	0% packet loss
Jitter	< 20 ms jitter
Network latency	< 100 ms latency to 8x8 data centers. VoIP services are known to work even in higher latency conditions up to 150-200 milliseconds. However, this must be maintained consistently with no packet loss.
Bandwidth Requirement	• G711 Codec – 90 kbps symmetric/call • G722 Codec – 90 kbps symmetric/call • G729 Codec – 35 kbps symmetric/call

	Please make sure you have 50% of your available bandwidth free to accommodate any spike in usage. Always assume that at least 35% of your users are on call at any time. However, depending on your company's use case, you may have a higher percentage.
If running a converged network for voice and data	Configure VLANs to separate the traffic. Please ensure that the Phone VLAN has the following DNS and NTP in its DHCP scope: • Use 8x8 DNS (Global Traffic Managers) servers 192.84.18.11 and 8.28.0.9 • Use 8x8 NTP server 192.84.16.24 and 8.28.0.60 NOTE: The recommended DNS and NTP do not resolve any other domain except 8x8.com and packet8.net.
Quality of Service (QoS) and Traffic shaping	Configure on premises to prioritize voice traffic specific to 8x8 IP ranges on all UDP and TCP ports. Please define egress QoS.
QoS for Wi-Fi	If the majority of your users are on Wi-Fi rather than Ethernet, please make sure you follow the best practices in Wi-Fi deployment to ensure ample coverage.
Local DNS Consideration	If you use DNS situated on the LAN, please make sure that you are using local Internet service providers as your forwarders.
DHCP Scope	Ensure that there are no rules specified to force any provisioning server or NTP server to deviate from default 8x8 values. For example: • You must disable Option 66 for Provisioning server • You must disable Option 4 and 42 for NTP server (except for 8x8 NTP)
VPN Use Cases	If your remote users/Internet egress use a VPN tunnel, please make sure that the 8x8 traffic does not traverse it. You need to consider a Split Tunnel to have local Internet egress for 8x8 traffic. In addition, split DNS to resolve 8x8 domain queries locally. Speak to your 8x8 engineer for more information.
WAN Failover	We highly recommend that you use dual WAN connections in a failover state by using WAN link redundancy. Dual WAN connections in load balancing are not supported.
MTU (Maximum Transmission Unit)	Network must support an MTU of 1500 bytes per packet. MTU is the size of the largest protocol data unit that the layer can pass onward.

Subnets We recommend that you allow outbound traffic to the following 8x8 subnets through your firewall, and have all ports open to 8x8 subnets. Traffic from any IP port on your internal LAN to any IP port on 8x8's secure subnets outbound only.	

Subnets	• US West Coast:
	  ○ 192.84.16.0/22
	  ○ 162.221.236.0/23
	  ○ 8.5.248.0/23
	  ○ 63.209.12.0/24
	• US East Coast:
	  ○ 8.28.0.0/22
	  ○ 162.221.238.0/23
	• UK: 217.163.57.0/24
	• HK: 103.252.162.0/24
	• AU: 103.239.164.0/24
	• Brazil: 168.90.173.112/28
	• Amsterdam: 64.95.100.96/28
	• Singapore: 117.20.40.192/28
	• India: 124.124.82.224/28
	• Canada: 67.225.14.144/28
	• TBD (for future use): 209.94.72.0/22

Note: 8x8 employs third-party security measures against cyber-attacks, which requires traffic to be routed through that service's IP addresses. Please click here for the list of the latest ranges, and make sure to allow outbound TCP connections to them from your network.

Customer firewall must allow outbound TCP and UDP traffic for 8x8 services to function. (generally allowed by default by all firewalls)	
SIP Signaling	UDP/TCP 5196-5199 (5199 Primary)
Registration	UDP/TCP 5060-5061 (5060 Primary)
8x8 Activation Service	UDP/TCP 5299
DNS	UDP/TCP 53

Customer firewall must allow outbound UDP traffic for 8x8 services to function. (generally allowed by default by all firewalls)	
Polycom Phones	UDP 2222-2269
Cisco Linksys SPA and ATA	UDP 16384-16404
Astra Phones	UDP 3478-3480 (3479 Primary)
VO Mobile App	UDP 5199
NTP	UDP 123
8x8 Applications	UDP 5401
8x8 Applications	• UDP 24,000 to 30,999 RTP for Voice/Video • UDP 38,000 to 44,999 RTP for Voice/Video • UDP 52,000 to 58,999 RTP for Voice/Video • UDP 50000 to 65535 RTP VO meeting Video
Virtual Office Desktop App with Advanced Audio Codec	UDP 30000-30040
8x8 Network Diagnostics and Network Monitoring Tools	UDP 3478-3480
BPA	UDP 15044

Customer firewall must allow outbound TCP traffic for 8x8 services to function. (generally allowed by default by all firewalls)	
Switchboard	• TCP 15000 • TCP 20080-23080 • TCP 2098-2130

Virtual Office Pro/Virtual Office Meetings	• TCP 80 (HTTP) • TCP 443 (RTPM or HTTPS) • TCP 8443 (HTTPS exchange/Gmail) • TCP 23960 (Click2Pop)
LDAPS for Corporate Directory	TCP 636
SalesForce Plug-In	TCP 2097-2601
Act! Plug-In	TCP 2099
Virtual Office Desktop App Token Authentication	TCP 5401
Virtual Office Desktop and Online App XMPP	TCP 5222
SRTP for Polycom	TCP 5443
8x8 Application	• TCP 5960 • TCP 9443 • TCP 16443 • TCP 8243
UDP protocol priority	High
SPI (Stateful Packet Inspection)	Disabled
ALG/Helper and UDP flood detection	Disabled: For details on ALG and how to disable it, please refer to https://support.8x8.com/equipment/routers/how-do-i-disable-sip-alg-my-router-or-firewall.

Virtual Office Softphone / Pro / Virtual Office Meetings	
Operating Systems	▪ Windows 7 or newer, with: o 1 gigahertz (GHz) or faster 32-bit (x86) or 64-bit (x64) processor

	○ 1 gigabyte (GB) RAM (32-bit) or 2 GB RAM (64-bit) ○ 16 GB of available hard disk space (32-bit) or 20 GB (64-bit) ○ DirectX 9 graphics device with WDDM 1.0 or higher driver ▪ Mac OS 10.9 or newer: Mavericks (10.9), Yosemite (10.10), El Capitan (10.11), or Sierra (10.12) •	
Browsers	• Internet Explorer® 9.0 or newer • Google Chrome 5.0 or newer • Firefox® 2.0 or newer • Safari™ 3.0 or newer	
Bandwidth	Minimum 1.5 Mbps down/up (Cable modem, DSL or better)	
Other	Headset with microphone	
Packet Tagging Information		
Platform	**SIP**	**RTP**
Windows (normal user)	0xA0 (DSCP 40, CS5)	0xE0 (DSCP 56, CS7)
Windows (admin user)	0x68 (DSCP 26, AF31)	0xB8 (DSCP 46, EF)
Mac/iOS (pre-iOS 10/Sierra)	0x68 (DSCP 26, AF31)	0xB8 (DSCP 46, EF)
Platform	**SIP**	**RTP**
Mac/iOS (iOS 10/Sierra+)	0x68 (DSCP 26, AF31)	0xB8 (DSCP 46, EF)
Android	0x68 (DSCP 26, AF31)	0xB8 (DSCP 46, EF)
Polycom	0x68 (DSCP 26, AF31)	0xB8 (DSCP 46, EF)