



# One Net – Bring Your Own WAN (BYOW): Technical Pre-Requisites

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## 1. What is Bring Your Own WAN (BYOW)?

In simple terms, Vodafone deliver the One Net Business service using the Customer's router, ISP (Internet Service Provider) and switch (LAN). Vodafone will still provide desk phones for the solution, but no routers, switches or cables will be supplied.

It is recommended that Customers first consider the [One Net Mini Client](#) application to replace deskphones, before proceeding with a BYOW-based solution.

All on-site activities will need to be carried out by the Customer or a Customer-aligned IT specialist. Instructions for this are detailed below. Vodafone may be able to answer some queries as needed, but cannot support with deployment activity, either in-person or remotely.

The vendor of the broadband at the Customer site can be a Third-Party solution or a Vodafone WAN Product.

The Customer's access line installed should be a conventional data access line, also used for the Customer's existing broadband. A dedicated Voice line is not suitable for this solution.

**N.B.** The Customer should ensure they have admin level access to their broadband router to open/whitelist ports and have full ownership of the PoE (Power over Ethernet) switch they need to use.



## 2. Conditions / Limitations of the Service

### IT Resource Requirements

One Net BYOW is only suitable for Customers who have IT Specialist knowledge (networking specific), or who have access to IT Support to manage and deliver the solution.

- In the event of a fault, the Customer must be able to prove that their WAN (ISP), LAN or internal network/equipment are not at fault, as Vodafone are unable to support the Customer's Own Network, either remotely or through engineer site visits.
- The LAN/WAN (switch/router) are integral parts for this service. It is the Customer's responsibility to carry out the enablement & perform diagnostics on issues relating to the WAN/LAN.

### Routers

Most modern routers should be suitable for this solution. As mentioned previously, the Customer should ensure full admin rights access is available to facilitate any configuration changes required to communicate with Vodafone's One Net servers.

Vodafone cannot warrant the performance of the Customer's router. If poor service is experienced, the Customer may wish to adjust QoS/Traffic Prioritisation settings on the router to suit.

### Switches (LAN) and Cables

If a network PoE (Power Over Ethernet) switch or RJ45 patch cables are needed, these must be provided by the Customer. Most modern PoE network switches should be suitable, assuming it has sufficient RJ45/Ethernet PoE-enabled ports available for the required desk phones.

If the Customer does not wish to use a PoE Switch, Power Supplies must be used to power the desk phones, and sufficient Ethernet ports available on the router. These can be purchased from Vodafone.

### Compatible Desk phones & Features

There are only specific desk phones compatible with the One Net BYOW solution. These are:

- Cisco 7841 IP Phone, Cisco 8851 IP Phone, Cisco 7832 IP Conference Phone
- Cisco ATA 191 Analogue Adaptor

*Please note:*

- The Cisco 8800 Key Expansion Module is not supported by the BYOW solution.
- The User Presence (Busy Lamp Field) feature is not supported by the BYOW solution.
  - Customers who require the user presence feature should ensure they purchase Vodafone's Console Services - [One Net Mini Client](#) or Operator Console may be appropriate.

Vodafone One Net Business  
BYOW (Bring Your Own WAN) Pre-Requisites  
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## Bandwidth/Connection Speeds

The Customer should ensure their broadband line has sufficient bandwidth to support the One Net BYOW solution (voice traffic bandwidth) on top of other usage. The Customer can carry out a Bandwidth Speed test using the One Net Speed Assessment Tool – available [here](#). Recommended bandwidth speeds and other Network Requirements can be seen in *Section 3: Customer Installation Guide, Step 3* or in Section 4.

## 3. Customer Installation Guide

### Step 1 – Configuration of Firewall

The Customer must configure their firewall to allow inbound and outbound communications from and to all the below sources and destinations, on the specified ports and protocols. These are:

Source/Destination	Domain	IP Addresses	Ports	Protocol
Cisco	activate.cisco.com	173.36.127.128/26 72.163.15.64/ 26 192.133.220.0/26 192.133.220.64/26 173.36.127.0/ 26 72.163.15.128/26	80 443	TCP
VF Bootstrap HDM	https://vfcc.bootstrapacs.vodafone.co.uk:443/cwmpWeb/CPeMgt	62.208.95.65	443	TCP
VF Bootstrap HDM	http://vfcc.bootstrapacs.vodafone.co.uk:80/cwmpWeb/CPeMgt	62.208.95.65	80	TCP
VF Public HDM	https://vfcc.publicacs.vodafone.co.uk:443/cwmpWeb/CPeMgt	62.208.95.66	443	TCP
VF Public HDM	http://vfcc.publicacs.vodafone.co.uk:80/cwmpWeb/CPeMgt	62.208.95.66	80	TCP
VF SBC	sbccy.fixed.vodafone.co.uk	88.82.18.86	5061	TCP
VF SBC	sbcgr.fixed.vodafone.co.uk	88.82.18.214	5061	TCP
RTP Ports in SBC	sbcgr.fixed.vodafone.co.uk sbccy.fixed.vodafone.co.uk	88.82.18.86 88.82.18.214	29536 - 49535	UDP
Corporate Directory	https://onenetuk.vodafone.pt	45.60.76.192	80 443	TCP
VF NTP Server	ntp1.cw.net	62.208.224.163	123	UDP
VF NTP Server	ntp1.cw.net	194.221.217.147	123	UDP



## Step 2 – Turn off SIP ALG

Please ensure that SIP (Session Initiation Protocol) ALG (Application Layer Gateway) is turned off. The One Net Service does not require any manipulation of the SIP packets.

## Step 3 – Bandwidth Requirements

As mentioned previously, given that the One Net IP Phones will run over the Customer's Own Broadband connection, the Customer must ensure they have sufficient bandwidth. The One Net Speed Assessment Tool is linked above, but a rough guide may be seen below.

By default, the One Net IP Phones are set to operate on G711 Codec. This codec typically uses 110kb of downstream and upstream bandwidth per call: for concurrent calls to work on the internet connection, the Customer must have the relevant recommended bandwidth available:

Concurrent Calls	Recommended Bandwidth – Downstream & Upstream
1	110 Kbps
5	550 Kbps / 0.6 Mbps
10	1.1 Mbps
20	2.1 Mbps
30	3.1 Mbps
40	4.1 Mbps
50+	10+ Mbps


It should be noted that other applications/clients on the Customer's network will be using bandwidth. One Net Voice traffic can be protected by prioritising RTP and UDP (One Net Voice traffic protocols) on the Customer router. This will help to ensure maximal priority is given to One Net Voice calls and is not interrupted by other applications on the network.

## Step 4 (Optional) – Setting Up a VLAN (Virtual Local Area Network)

It is best practice to place any IP Phones on a separate VLAN. If the Customer chooses to do this, please ensure the firewall changes have made (in Step 1 above) are applicable to the VLAN allocated to the One Net IP Phones. Please note that for remote troubleshooting, the One Net Support team will require Customers to have a PC on the same VLAN as the relevant One Net IP Phone.



## Step 5 – Plugging in the IP Phones

Connect an RJ45/Ethernet Cable into the network ports on the back of the phone and switch (or router). There is usually this icon (  ) over compatible network ports on the back of the phone and switch. The IP Phone will take approximately 15 minutes to complete activation.

When the username and Vodafone Logo appears and there is a dial tone, the activation has completed. Please proceed with making inbound/outbound calls, ensuring both parties on the call are audible.

## Step 6 – Troubleshooting (if required)

*What should a Customer do if the device has not activated and is not giving a dial tone after 10-15 minutes?*

- Check that the firewall is allowing communications to the domains listed in Step 1.
- Perform a factory reset on the device – *details may be found by searching online for the steps to follow for the specific device. As an example* - Press the Settings Cog, Scroll to Admin Settings, Reset Settings, Factory Reset, Press OK.

*What should a Customer do if the device has activated/shows username but is not giving a dial tone?*

- Check the firewall is open to both the below ports (as seen in Step 1). The IP Phone requires both inbound and outbound communication to complete registration and provide a dial tone.

Source/Destination	Domain	IP Addresses	Ports	Protocol
VF SBC	sbccy.fixed.vodafone.co.uk	88.82.18.86	5061	TCP
VF SBC	sbcgr.fixed.vodafone.co.uk	88.82.18.214	5061	TCP

*What should a Customer do if they can make a call but it is only has one way/no audio?*

- Check the firewall is open to both the below ports (as seen in Step 1). The IP Phone requires both inbound and outbound communication to ensure 2-way audio.

Source/Destination	Domain	IP Addresses	Ports	Protocol
RTP Ports in SBC	sbcgr.fixed.vodafone.co.uk	88.82.18.86	29536	UDP
	sbccy.fixed.vodafone.co.uk	88.82.18.214	-	
			49535	



## 4. Customer Technical Pre-Requisites

- Network Health – Minimum Requirements

Properties	Minimum Requirements
Delay	<150ms (of One Way Latency)**
Packet Loss	<1%
Jitter	<30ms
Cisco VoIP – Per Call Bandwidth Consumption	<a href="https://www.cisco.com/c/en/us/support/docs/voice/voice-quality/7934-bwidth-consume.html">https://www.cisco.com/c/en/us/support/docs/voice/voice-quality/7934-bwidth-consume.html</a>
** Low latency is a critical requirement for VoIP Calls, as even small latency levels are noticeable and service-impacting. <a href="https://www.itu.int/rec/T-REC-G.114-200305-I/en">https://www.itu.int/rec/T-REC-G.114-200305-I/en</a>	

- Power Over Ethernet (PoE) Support on Switches

Switches must be PoE enabled and have sufficient free ports for the IP Phones/end devices.

Vodafone could supply power supplies for a charge, if the switch used does not have PoE capability.

- Uplink Capabilities

Full duplex and speed set to minimum 100Mbps for connecting to the Router.

- IP Assignment through DHCP

Provisioning on the Customer router to assign IP addresses to the devices.

- Fault Diagnostics

In the event of a fault report, the Customer must be able to provide Local Traces from their LAN side and WAN side when this required to triage a fault.

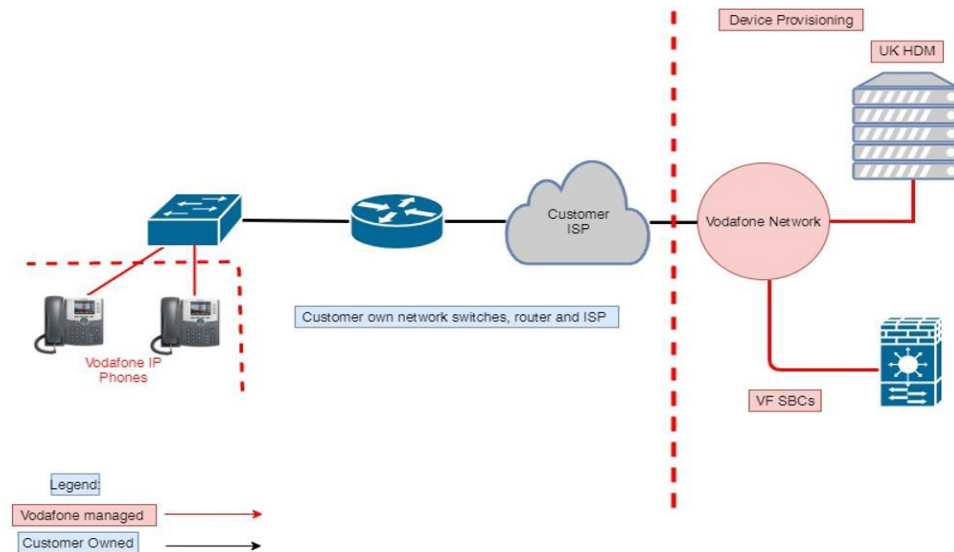
- Wide Area Network (IP Address)

A Static IP address is required and must be provided to Vodafone to ensure it is whitelisted on Vodafone firewalls for Device activations and updates.

- Whitelisting of domains, IP Addresses and Ports on Customer Network

Every enterprise network uses firewall and security policies to allow only legitimate traffic. For the proper operation of BYOW, Customer firewalls and routers need to whitelist domains, IP addresses and port numbers used by Vodafone for management and voice traffic as per Section 3 Step 1

## 5. High Level Diagram of BYOW solution.



## 6. BYOW Moves/Site Moves for In-Life Customers.

With the September [2023 Stop-Sell of all BT PSTN-dependent connectivity products](#), Vodafone is not currently able to offer new sites with a Fully Managed Solution, as Customers may be used to.

Our One Net Fully Managed Sites may require a selection of ADSL, FTTC, ISDN Ethernet and WLR lines, that can no longer be ordered from BT\*. This means all new site requests must be deployed as BYOW.

If a Customer is planning to move sites, they should inform Vodafone or their Partner as soon as possible ahead of the move date. Move SLA may be up to 25 working days dependent on request complexity. The Customer will need to review this Pre-Requisite document and confirm their new site WAN/LAN meets the stated requirements. Critical aspects include the supported desk phones, network router access, switch availability and overall network health.

BYOW Site Moves attract the standard Site Move Charges.

Vodafone does not expect to fund replacement of desk phones, procurement of a suitable switch or the cost of any 3<sup>rd</sup> Party IT Service work unless by prior agreement.

\*Work to migrate existing Vodafone customers impacted by the switch off to a new 'Post-PSTN Shutdown' solution is ongoing and will be announced in due course.

## 7. FAQ and Support.

Any questions, queries or clarifications should be directed to the Customer's Vodafone Account Manager, Partner, or Product contact as required.