



# Are You VoIP Ready?

## A Six-Step Guide to a Successful VoIP Experience

If you are considering Voice over IP (VoIP) for your business, the very first step you need to take is determining whether your existing network is ready for VoIP. Current network issues become much more obvious when VoIP services are deployed. This six-step guide will help you:

- Conduct an effective pre-deployment network assessment
- Understand the most common setup and deployment issues

### **Step 1: Define Your High-Level Needs**

Whether your office will experience good quality VoIP services depends on a variety of factors—including your patterns of traffic and usage, existing network capacity, and existing data bandwidth. Get started by creating a clear picture of your VoIP needs:

- What are your calling habits? For example, does your office have primarily outbound calls or inbound calls? Domestic or international dialing? Are employees local, remote or mobile?
- Do you need to intelligently route calls to multiple users?
- Do you have SIP phones?
- Do you have power and Ethernet ports at each employee location?
- Do you have an IT-savvy professional to assist with a network assessment and installation?

### **Step 2: Identify Your Current Network Capabilities**

Problems with call quality are usually related to limited bandwidth within the local network. To protect against quality issues, it is essential to assess your current environment and budget for VoIP usage. You may need to make additional investment in a new Internet Service (ISP) provider, increased bandwidth or a QoS (Quality of Service) router—an investment that will be recouped through your new VoIP service. QoS refers to the ability of your network to deliver traffic with minimum delay and maximum ability. You can assess your network and budget by asking yourself the following questions:

What kind of Internet access does your office use?

- Many ISPs are adequate for residential service, but not for business use. We recommend using an ISP that offers a business-grade service that can meet your bandwidth needs. Establish a Service Level Agreement to quickly respond to quality issues caused from delayed packets such as audio delay and jitter.
- DSL offers a dedicated connection and tends to be more stable and reliable across the network, but is offered in low bandwidth speeds. This solution may be suitable for customers who do not require or use excessive bandwidth.



- Fiber optics offers higher speed and better consistency, but is not offered in all locations.
- T1 offers substantial bandwidth connection for companies with larger data/voice traffic support needs or for those wanting to make the investment for reliable voice quality.

What is your current bidirectional (upload and download) bandwidth for all points of internet traffic?

- Points of traffic include: phones, PCs (e.g., downloading files, Web content management, watching video tutorials), VPN and hosted servers (e.g., email).
- We also recommend that you perform a VOIP quality test. Examples are at [voiptest.8x8.com](http://voiptest.8x8.com) and [www.voipspear.com](http://www.voipspear.com). The Speed Test analyzes the upload and download speeds between your network and the host. The actual speeds may differ from the rated connection of your line due to traffic passing through several network providers along the way. Speeds can also be affected by existing traffic on your network. Note that with VoIP, the upload speed is as important as download.

How many employees will utilize the VoIP service? How many simultaneous calls in and out of your office do you expect during the high peak times?

- Take a look at your current phone bill to estimate call volume.
- Don't forget to consider any potential growth in employees which would add to call volume.

With the results of your Speed Test, you can map your VoIP bandwidth requirements onto your network's available bandwidth. The methodology is to take the smaller of the two numbers (likely the upload speed) and divide by 100. The resulting number is the number of concurrent calls you effectively handle without impact to call quality. In general, about 80kbps per conversation should be reserved for each simultaneous call. For situations where bandwidth is extremely constrained, there are options available to shrink the requirements for a phone call to 30kbps

### **Step 3: Verify Your Network Components & Readiness**

Now that we have a picture of your network's existing bandwidth, let's take a look at other components that will impact VoIP quality.

**1. Gateway** – The Gateway is a modem/router combination and is often provided by your ISP to allow Internet connection for multiple network devices (e.g., PC, phone and printer). For customers with Gateway devices, skip to the "Switch" definition below.

- If your gateway was provided by your ISP, it must be set up to allow phone connectivity (VoIP traffic) and for QoS. Your ISP will need to verify if these requirements are possible and assist you with setting them up.

**2. Modem** – The modem is often provided by your ISP to allow you connection to the Internet. This device cannot be used by itself to support ProPhonos's VoIP service. You must connect a router to it in order to use your ProPhonos phones and your computers.



**3. Router** – A router provides additional private IP addresses that enable you to use ProPhonos’s VoIP service and maintain access to the Internet on your PC. This device will connect directly to your modem (if it is not combined with the modem in a Gateway device).

- If your router was provided by your ISP, it must be set up to allow phone connectivity (VoIP traffic) and for QoS. Your ISP and technology consultant will need to verify if these requirements are possible and assist you with setting them up.
- ProPhonos offers an all-in-one router solution for businesses who want to enhance the performance of their VoIP service.

**4. Wireless LANs/Routers** – Wireless LANs introduce significant impairments into the packet stream and should be checked carefully before using them for voice traffic. Customers who choose to use a wireless router must physically connect the phones to the router in order to deploy a quality voice solution.

**5. Switch** – A switch is necessary for customers who require more ports than are offered by the router. The number of phones you will use and how you connect your phones to the network will determine the number of ports you will need on your switch, or the number of switches you will need. Customers who want to set up local QoS will need a VLAN (Virtual LAN) capable switch.

**6. SIP Phones** – SIP phones are required for business-quality VoIP services. We recommend a separate LAN/WAN connection be used for SIP phones. Although there are quite a few hardware manufacturers available, ProPhonos sells Polycom, Aastra and Cisco/Linksys phones and provides free support for phones purchased through us.

**7. Hosted Servers** (e.g., Exchange servers, FTP servers, Web servers) – These servers require significant bandwidth and can cause poor audio quality experiences including dropped calls, one-way audio or hissing. To avoid these issues caused by competing traffic, we recommend that you set up local QoS on your network via a VLAN-aware switch and/or purchase an Edgemark 4500 series or similar router. It may even be advantageous to move some servers to a co-location facility.

**8. Firewalls** – A firewall blocks unsolicited traffic. If your firewall (usually this is functionality inside a router) is not set to allow VoIP traffic, you may experience connectivity issues including one-way audio, dropped calls and phone registration errors. To support VoIP traffic, set up your firewall for to favor VOIP traffic:

#### **Step 4: Engage a 3<sup>rd</sup> Party for Pre-Qualification Assistance**

Your ProPhonos representative can get a technical engineer involved who can walk you through any questions or concerns about your network’s VoIP preparedness. We recommend that you speak with a ProPhonos engineer prior to VoIP deployment to verify that you have the equipment and solutions that best fit your office’s environment.



### **Step 5: Deploy Your Network and VoIP Solution in Stages**

It's best to plan and execute your VoIP network deployment in stages. First deploy all network upgrades including Internet access bandwidth and router installations. Then ProPhonos will assist with phone registration and setup of the hosted PBX capabilities:

- 1. Qualify your network.** Using this white paper as a guideline, conduct a network assessment and determine if any network upgrades are necessary.
- 2. Install any necessary network upgrades**—including Internet access bandwidth and router installations.
- 3. Design your experience.** ProPhonos provides a thorough “Onboarding Worksheet” to capture auto-attendant, greeting and call routing requirements. Your ProPhonos Representative will engage a specialist will review your requirements to ensure you needs are met.
- 4. Order and setup your hardware.** ProPhonos partners with Net-How who can help you get your phone and QoS routers up and running. \*
- 5. Enable your phone numbers.** ProPhonos will activate your new local, toll-free and vanity numbers. We can also port your existing phone number(s) to your new ProPhonos account. Porting may take up to 3 weeks but can be managed as a parallel process.
- 6. Customize your new services.** A ProPhonos Implementation Specialist can help you set up departments, add users and rules and activate other customizable features.

### **Step 6: Manage and Maintain Your Network**

Any changes to your network or configuration settings after establishing service can affect your phone quality or cause your phones to lose registration and stop working. Network changes include—but are not limited to—adding new users (phones), purchasing new or replacing existing network devices (router, firewall, hosted servers) or changing the settings within network devices. It's important to plan for network changes in advance:

- Network changes should always be made by an IT administrator. If you don't have an IT administrator on-staff, we recommend contacting an IT professional. ProPhonos contracts with Net-How to support our clients IT needs. Please ask us for a referral.
- Ensure that changes to your network will not affect your phone service. If your IT person is not capable of this, we can help you ensure that this is done correctly through Net-How.

\*ProPhonos offers free configuration assistance for all VOIP hardware purchased through ProPhonos. A service fee will be assessed for assistance with other equipment.

**ProPhonos by Exwire, Inc.**

233 S. Auburn St., Colfax, CA 95713

Tel 530 820 1020 Fax 530 579 8992 [www.exwire.com](http://www.exwire.com) [www.prophonos.com](http://www.prophonos.com)

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