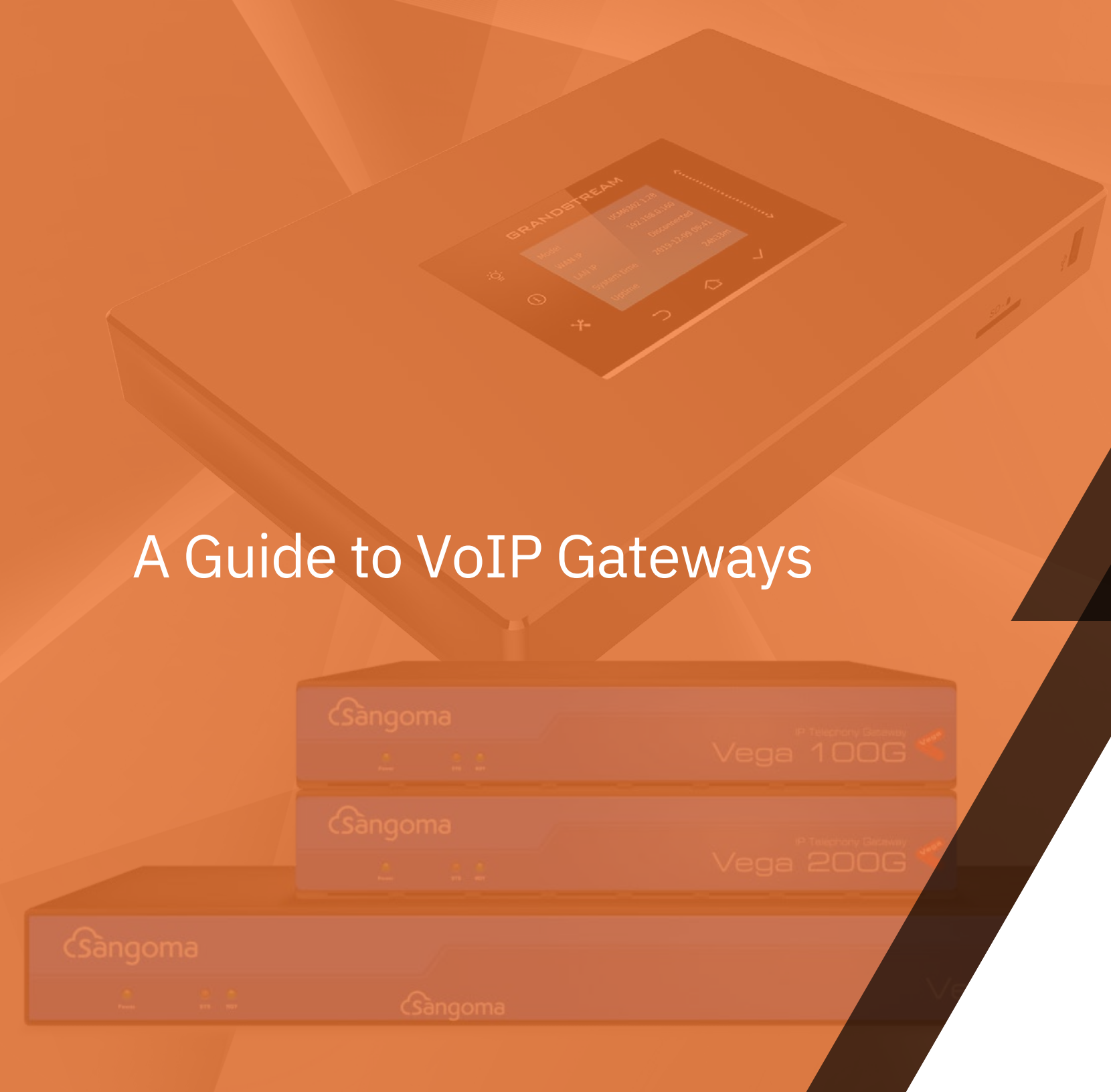
A Guide to VoIP Gateways



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Introduction to Learn More:

A Guide to VoIP Gateways

VoIP gateways are powerful devices that often confuse people. It's probably why they have the highest return rate of any type of VoIP equipment.

That's because most people just never take the time to learn about them before buying one.

But that's not going to be you. You're already here, and hopefully, you're ready to learn.

What you're about to read is a guide to VoIP gateways written in layman's terms that:

- Educates you on VoIP gateways
- Defines and demystifies the underlying technology of a VoIP gateway
- Describes the different types of VoIP gateways
- Explains the important features of VoIP gateways
- Tells you how to go about purchasing a VoIP gateway

This guide might not answer all of your questions about VoIP gateways, but that's why we are here to help.

Since 2002, VoIP Supply has helped over 100,000 people just like you create, deploy and maintain a VoIP solution. If at any point in this guide, you get stuck, are unsure of what is being discussed, or just want to skip the details and have someone select the right VoIP Gateway for you, then please give us a call at 1-800-398-8647.

One of our experienced, vendor-neutral representatives will be more than happy to walk you through the process of selecting the VoIP gateway that is right for you.

Thank you for your time and enjoy the read.

VoIP Gateways Explained

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What is a VoIP Gateway?

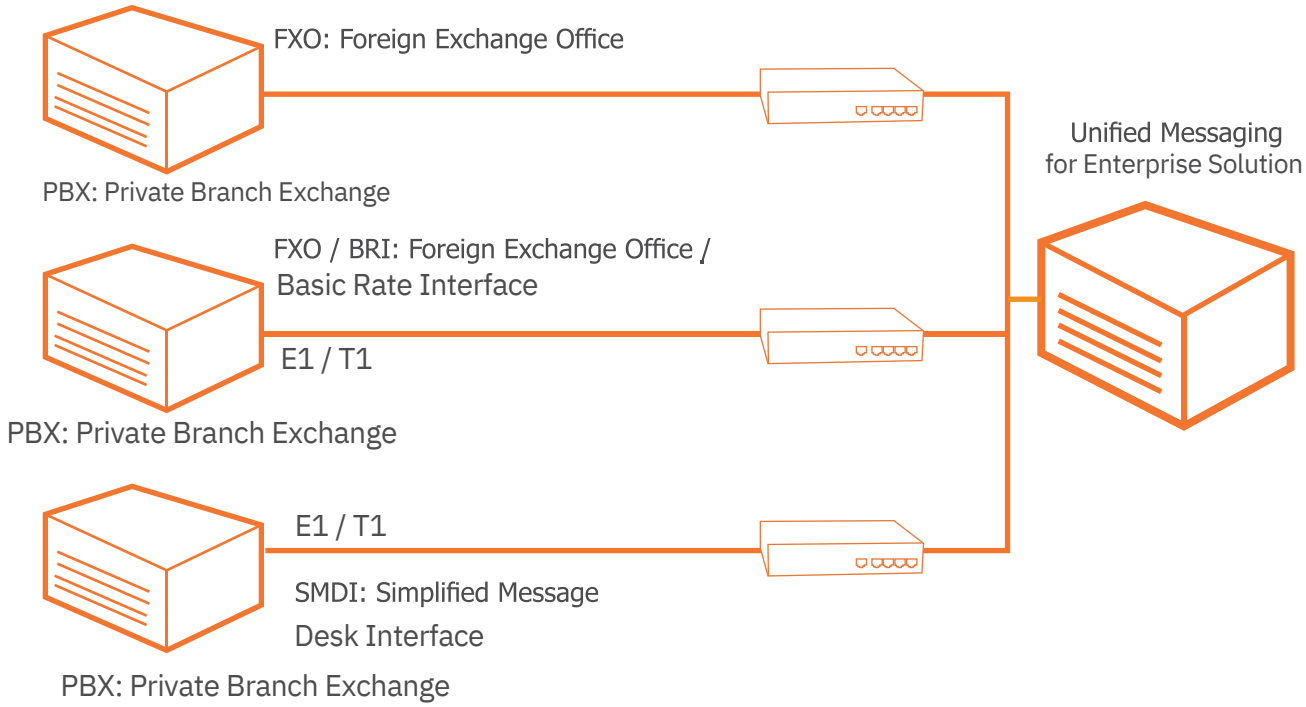
A VoIP gateway is a piece of hardware with the standard purpose of converting Time Division Multiplexing (TDM) telephony traffic from the PSTN into digital IP packets for transport over an IP network (such as your LAN). A VoIP gateway can also convert digital IP packets into TDM telephony traffic for transport across the PSTN (Publicly Switched Telephone Network).

How does a VoIP gateway work?

VoIP gateways are rather simple. A VoIP gateway works as a bridge between an IP network and the PSTN. Depending on where the voice traffic originates, a VoIP gateway will convert the voice traffic into the proper form for receipt by the destination network (IP or TDM).

If the voice traffic is originating from the PSTN the VoIP gateway will convert the analog voice signal into a digital signal. This digital signal is then compressed using a codec and broken into a series of packets that are transferred across the IP network using a signaling protocol.

If the voice traffic is originating from an IP network the VoIP gateway will decompress the digital packets into a digital signal that is then converted into an analog signal to be sent across the PSTN.



VoIP Gateway Protocols and Codecs

VoIP gateway protocols & codecs

Hopefully your head's not spinning from the explanation of how a VoIP gateway works. Because it's now time to talk about VoIP protocols and voice codecs.

Even if you're not technical, you still need a basic understanding of VoIP protocols and codecs. In order for your gateway to work properly, it must use a protocol and codec that is compatible with your VoIP Phone system and/or VoIP service. The protocol and codec you use can also drastically increase or decrease the quality of your calls.

VoIP protocols

A VoIP protocol determines how your voice packet is transported across a network. A VoIP gateway will typically support a single protocol.

The most common VoIP protocols are:
SIP (Session Initiation Protocol) – SIP is a standards-based protocol that is used and supported by the vast majority of VoIP Phone systems and services.
SCCP (Cisco Skinny Client Control Protocol) – SCCP is a proprietary protocol used by Cisco's Call Manager and VoIP Phones.
MGCP – MGCP is an older VoIP protocol you might come across. It is no longer widely used or supported.
H.323 – Similar to MGCP, H.323 is an older VoIP protocol that you might come across, but is no longer widely used or supported.

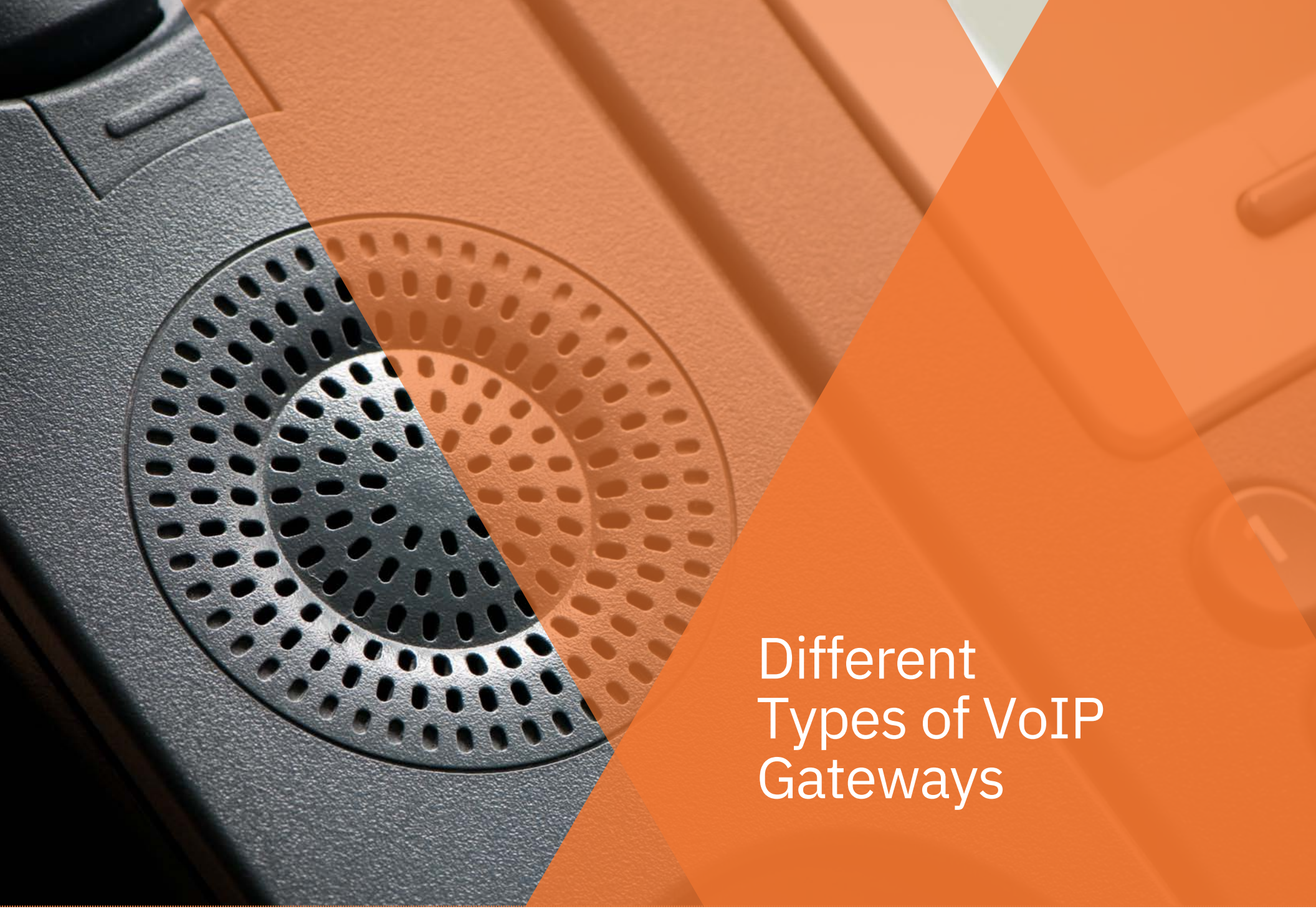
Voice codecs

A voice codec is responsible for the compression of your voice stream within a digital packet. It also determines sound quality and bandwidth required to send the packet. A VoIP gateway typically supports multiple voice codecs.

The most common voice codecs are:
GSM - 13 Kbps
iLBC - 15 Kbps
G.711 - 64 Kbps
G.722 - 48/56/64 Kbps
G.726 - 16/24/32/40 Kbps
G.728 - 16 Kbps
G.729 - 8 Kbps

If you're the person responsible for the setup, installation and maintenance of a VoIP gateway, you will want to further your knowledge in the area of protocols and codecs. If not, simply make sure your VoIP gateway supports the same protocols and codecs that your VoIP service and/or VoIP Phone system supports.

Confused by protocols and codecs? Feel free to give VoIP Supply a call at 800-398-8647. We'd be happy to help.



Different Types of VoIP Gateways

The types of VoIP gateways

With the technobabble out of the way, it is time for you to dig into the different types of VoIP gateways.

There are two main types of gateways that you need to concern yourself with – analog and digital.

Analog

An analog VoIP gateway is used to connect your traditional analog telephones to a VoIP Phone system or to connect your VoIP Phone system to the PSTN. Due to this dual purpose, an analog VoIP gateway comes in two different forms – FXS and FXO.

FXS gateway

An FXS gateway is used to connect your traditional telephones and fax machines to a VoIP Phone system.

FXO gateway

An FXO gateway is used to connect your VoIP Phone system to your PSTN lines.

Digital

A digital VoIP gateway is used to connect your VoIP Phone system to your digital voice lines such as T1/E1/BRI. A digital VoIP gateway can also be used to connect your traditional PBX system to an IP network.

You might be thinking that analog and digital gateways both do the same thing. This is correct.

The real difference between an analog VoIP gateway and a digital VoIP gateway are the interfaces each one uses to connect various solution components together.

Before we take a closer look at the applications mentioned above, let's take a few minutes to take a look at the features and configurations of a VoIP gateway.

Various Features of a VoIP Gateway

Features of a VoIP gateway
VoIP gateways are very robust devices. The vast majority of VoIP gateways come with the following features:

- Compliant with multiple protocols including SIP, H.323 and MGCP
- Support for G.711, G.723.1, G.726, and G.729A voice codecs
- T.38 compliant (for faxing)
- Echo cancellation, Jitter Buffer, VAD and CNG
- Web based administration/ management
- Automatic provisioning via TFTP/HTTP
- Call routing and least cost call routing capability

These are merely the standard features found in the majority of VoIP gateways. Each VoIP gateway has subtle differences. For more information on a specific VoIP gateway please refer to its full product description on VoIPSupply.com.

Standard VoIP gateway Configurations VoIP gateways can be found in the following configurations:

FXS Gateways	FXO Gateways	Digital Gateways
2 Port	2 Port	Patton SmartNode 4970A PRI VoIP Gateway 30 VoIP Calls SN4970A/4E30V120RHP/EUI
4 Ports	4 Ports	Patton SmartNode GW-eSBC, 4 E1/T1 PRI, SN4980A/4E30V120RHP/EUI
8 Ports	8 Ports	

The number of ports you will need on your VoIP gateway is dependent on the number of lines and or devices you are looking to connect to the VoIP gateway. For instance, if you want to connect your VoIP Phone system to your two PSTN lines, you will need a two FXO analog VoIP gateway.

VoIP gateway applications

VoIP Gateway Applications

There are three primary applications for a VoIP gateway. These applications are also the most popular or common uses of a VoIP gateway.

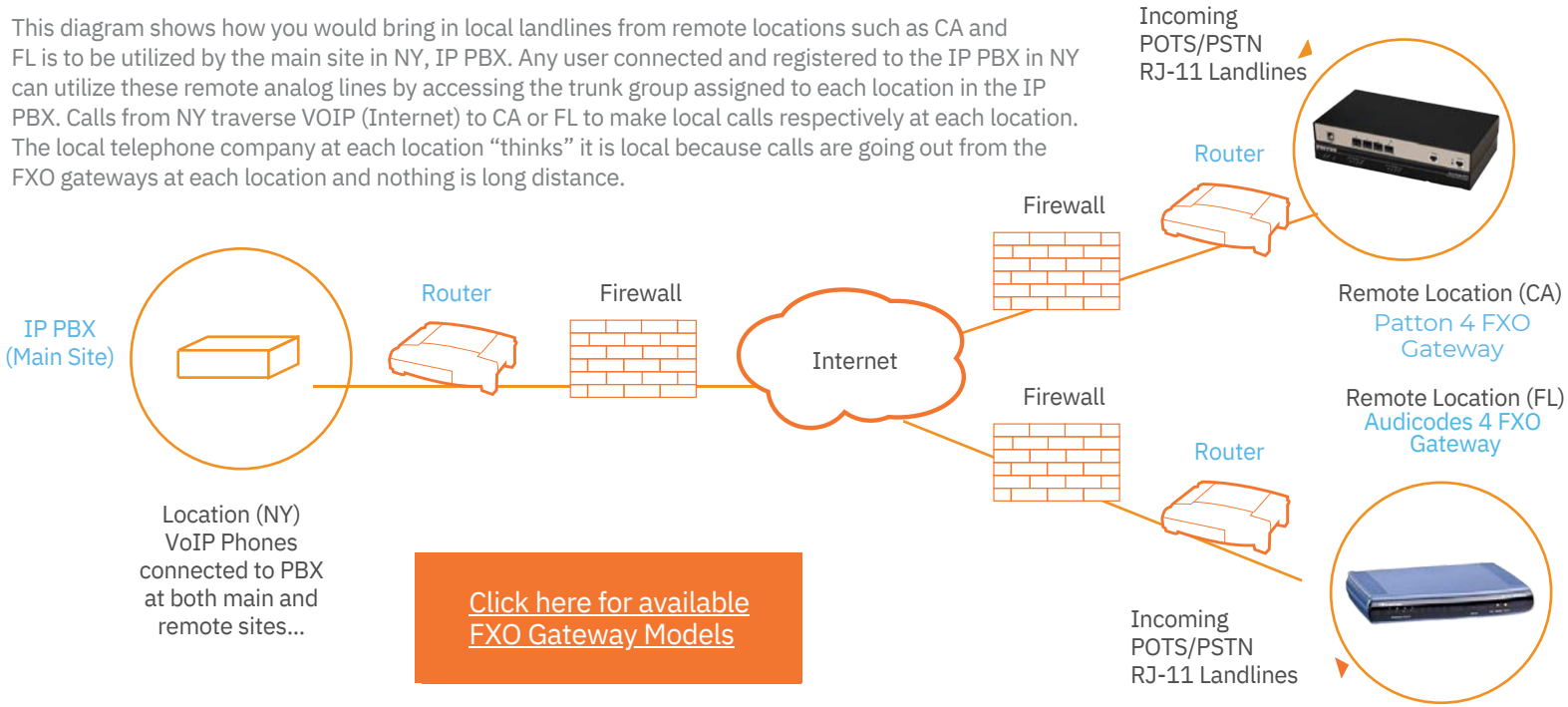
Utilizing Local PSTN from Remote Locations

1. PSTN connectivity for your VoIP Phone system

Your communications are critical to your business's operations. You can't be without the ability to send and receive phone calls. With VoIP, if your network goes down or you lose Internet connectivity you will not be able to send or receive calls – even emergency calls. To prevent this you can use an FXO or digital VoIP gateway to connect to the PSTN giving you failover and life-line capability.

Bringing in local analog POTS/PSTN lines from remote sites to be utilized by IP PBX at the main location

This diagram shows how you would bring in local landlines from remote locations such as CA and FL is to be utilized by the main site in NY, IP PBX. Any user connected and registered to the IP PBX in NY can utilize these remote analog lines by accessing the trunk group assigned to each location in the IP PBX. Calls from NY traverse VOIP (Internet) to CA or FL to make local calls respectively at each location. The local telephone company at each location "thinks" it is local because calls are going out from the FXO gateways at each location and nothing is long distance.

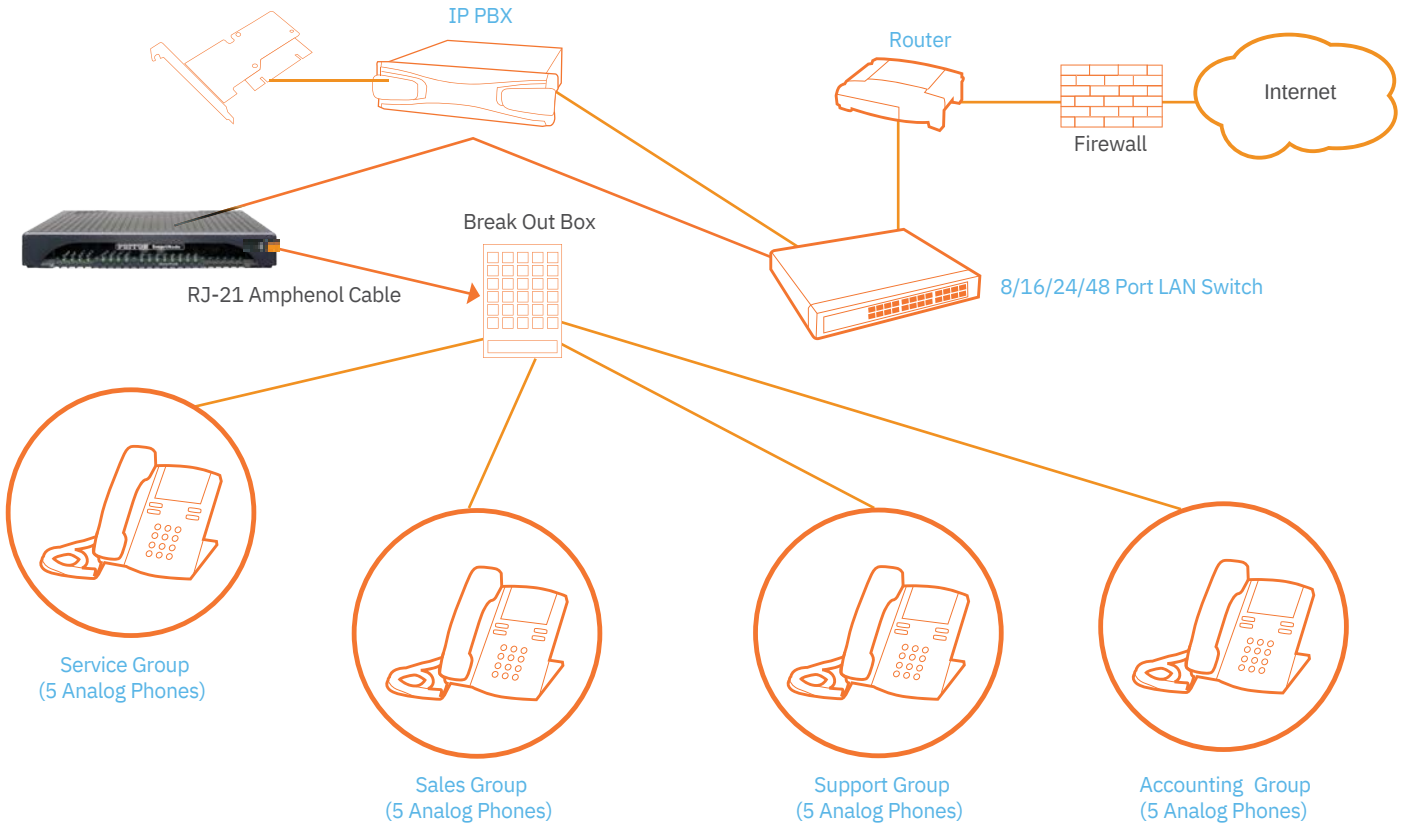


Click here for available FXO Gateway Models

Using Analog Endpoints on Your VoIP System

2. Connecting traditional telephones to your VoIP Phone system

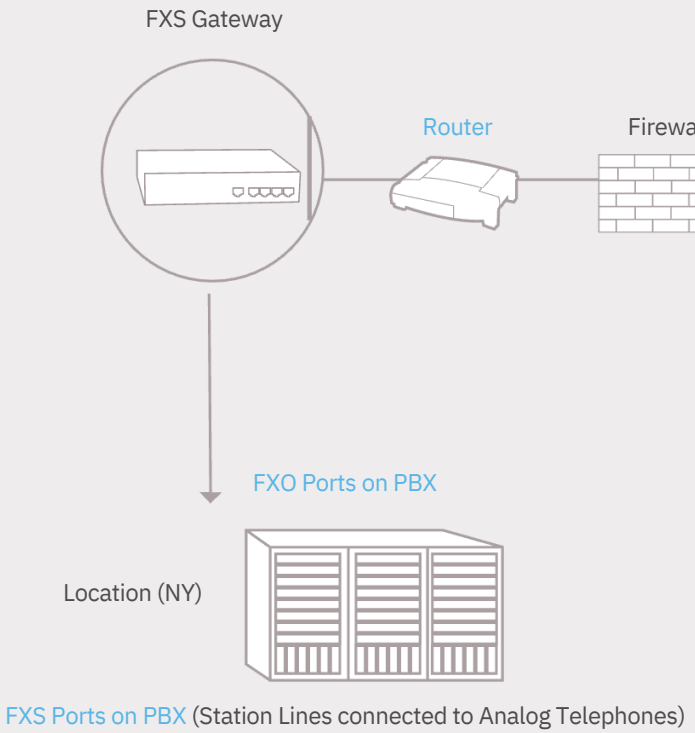
If you've recently made a substantial investment in your existing analog telephones, you certainly don't want to throw them away if you deploy a VoIP Phone system. Using an FXS gateway, you can connect these traditional analog phones to your VoIP Phone system giving you the ability to further recoup the cost of those phones.



Using SIP Trunking with Your Legacy Analog PBX

3. VoIP connectivity for your traditional PBX system

You might not be ready to tear out your entire PBX system in favor of a new VoIP system. Perhaps you just purchased it or your organization is too large for an all-at-once tear-out. Using an FXS analog VoIP gateway or a digital VoIP gateway, you can VoIP-enable your existing PBX system. This gives you the benefits of VoIP calling without the costs associated with installing a new VoIP system.



Click here for available FXS Gateway Models

Bringing in SIP Trunks to an Analog Legacy PBX

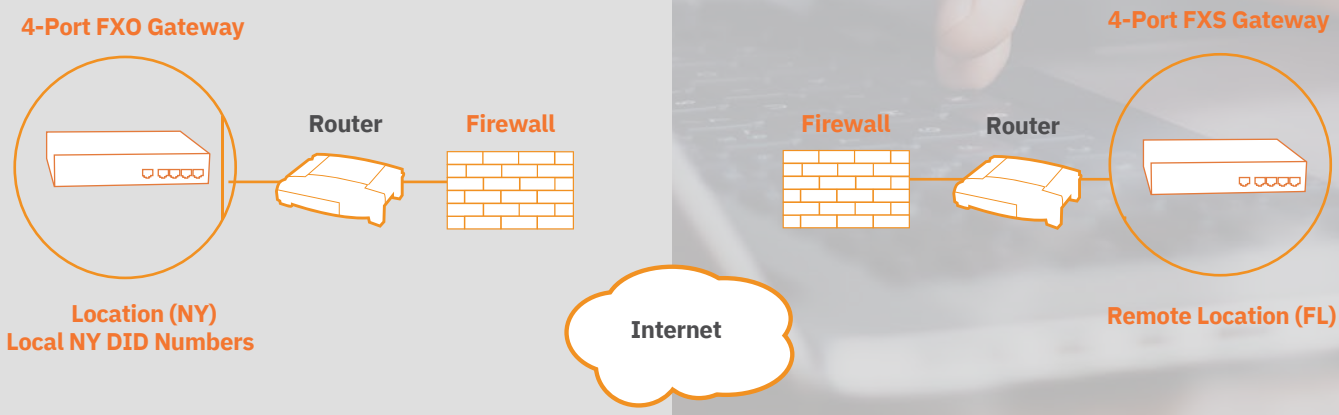
This diagram describes how you would use an FXS gateway to “land” SIP Trunk lines from a SIP Trunk provider to be utilized by an Analog Legacy PBX. SIP Trunks being provided by the provider (Like Bandwidth.com) are sent over the Internet to the premise LAN and then brought in and interfaced with an Analog PBX via the FXS Gateway. This new method of facilitating Direct Inward Dialing (DID) takes the place of PSTN Landline services from your local telephone company and drastically reduces telecom costs.

Extending PSTN Dial Tone Over IP to a Remote Location

4. Extending analog lines from one location to a remote location

If you need increased flexibility, then extend your analog lines from one location to a remote location. This is accomplished by unitizing your existing IP infrastructure and internet without the use of any analog or VoIP PBX.

This diagram describes how you would use an FXO Gateway to extend analog dial tone from Landlines in NY to a remote office in FL with analog phones connected to an FXS Gateway. Since both gateways interface with IP networks, dial tone from the local CO in NY can easily be extended to the remote location in FL via the internet and is FREE. This analog setup works in a 1:1 ratio, 1 landline connected to an FXO port is extended to 1 analog phone connected to an FXS port.



Selecting the Right VoIP Gateway for You

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Selecting the right VoIP gateway in five steps

Phew. You're almost done. The last thing for you to learn is how to go about selecting the right VoIP gateway. The following selection process is simple. It is based on a series of questions that once answered will point you towards the right VoIP gateway.

Let's get started!

1. What do you want to do?

You can't even consider looking at which VoIP gateway to buy until you've decided on exactly what you want to do. There are numerous uses for each of the different types of VoIP gateways. Make sure you know what you want to do first.

2. Which protocols and codecs are supported by your other systems?

In order for your VoIP gateway to work with your other systems, you need to know which protocols and codecs are supported. You then need to ensure that your VoIP gateway supports them.

3. What's your budget?

Budget should never be the most important part of your purchasing decision, but the cost of a VoIP gateway varies greatly. Having a set budget before you select your VoIP gateway will ensure that you don't over – or under – spend.

4. Can you configure and install a VoIP gateway by yourself?

You read earlier that VoIP gateways have a high return rate. This is because most people don't know what they're doing, at least when it comes to configuring and installing a VoIP gateway. Before you pull out your wallet consider having a professional do it for you.

5. What's the warranty period and support like?

With any piece of VoIP equipment, it is important to know the warranty period. Equipment breaks. Make sure you're covered. It is also not uncommon for you to have questions or possibly need assistance. You should check out the company you are purchasing from to make sure they can offer quality support before buying from them.

Now you will want to take some time to answer these questions. The answers are very important to a successful VoIP gateway deployment.

If you're feeling unsure as to what to do once you have those answers (or what the answers mean) don't stress. The experts at VoIP Supply can walk you through your answers and ensure you get the right VoIP gateway for your needs.

Before we finish, we thought it'd be helpful to give you a couple of VoIP gateway recommendations that might be right for you.

VoIP Gateway Recommendations

VoIP gateway suggestions

To provide your IP PBX connectivity to PSTN/POTS lines or to extend dial-tone to remote and home offices, you will need a VoIP Gateway with FXO or T1 interfaces:

Patton SmartNode 4141 Analog Gateway 8 FXO
(Connects 2 or 4 PSTN/POTS Lines)
Sangoma Vega 60GV2 4 Port FXO Media Gateway
(Connects up to 4 PSTN/POTS lines)
Grandstream GXW4108 8 Port FXO VoIP Gateway
(Connects up to 8 devices)

To VoIP enable analog devices (phones, fax, etc.), you will need a VoIP Gateway with FXS interfaces:

Patton SmartNode SN200 Gateway
(Connects 1 Device)
AudioCodes MP114 FXS MP114/4S/SIP Gateway
(Connects up to 14 devices)
AudioCodes MediaPack 5xx analog VoIP Gateway
(Connects up to 18 devices)

To use SIP Trunks with a legacy analog or digital PBX, you will need a VoIP Gateway with FXS or T1 interfaces:

Sangoma Vega 400G 120 VoIP Channels Gateway
(Allows up to 120 Voice Channels via T1/E1/PRI)
Sangoma Vega 100G Gateway
(Allows up to 30 Voice Channels via T1/E1/PRI)

Conclusion

Well, that's it. We here at VoIP Supply appreciate the time you invested in learning more about VoIP Gateways and hope that you have found this content helpful in your pursuit of VoIP Gateways.

In closing, we'd like to once again extend our services at VoIP Supply to you. Since 2002, VoIP Supply has helped over 100,000 people just like you create, deploy and maintain a VoIP solution – adding you as a customer would be a great privilege.

So after leaving this guide to further dive into the process of purchasing a VoIP Gateway, if you ever find yourself confused, frustrated, or simply in need of expert advice, please do not hesitate to give us a call at 1-800-398-8647 and we will do our best to give you honest, accurate, and helpful information that will help you make the right choice.

Thanks again for your time – the VoIP Supply team.

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