ISDN TO SJP

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PROTECTING YOUR PBX INVESTMENT

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Chapter 1. Got a PBX and ISDN? You need to consider SIP.



Millions of businesses around the world have invested in a PBX (private branch exchange) to give their employees advanced telephony features.

Just about all of those PBXs will be connected to ISDN (Integrated Services Digital Network) lines, or their PSTN (public switched telephone network) equivalent, such as TDM technology, in other countries.

But now telecommunications companies (telcos) throughout the world have plans to shut down their conventional PSTN/ISDN networks in favour of more versatile Internet connections. Chapter 2 shows when some of the major markets plan to withdraw their current telephony networks.

The reason telcos want to make the switch is that they have spent billions in recent years to install the latest fibre optic cables and switching systems for Internet users ... and the old PSTN/ISDN networks simply aren't cost-effective any more. Nor do PSTN/ISDN networks offer the rich variety of features and benefits that Internettelephony offers.

But where does that leave companies who have invested in a PBX for their business? In most cases, they will be able to switch to what is called a SIP connection.

SIP: The next step for companies with a PBX

PBX hardware can represent a considerable investment for companies. Many organizations will have entered into financing and maintenance contracts for their hardware. They have also invested in manuals and training, so employees know how to make the most of their PBX features.

So by making a full or partial switch from PSTN/ISDN lines to Internet-connected SIP lines, those companies will be able to protect their PBX investment ... and still carry on making and receiving calls exactly as before.

What is SIP? It stands for Session Initiation Protocol, and it is the way that Internet lines and switches will handle voice, data and video traffic in the future.

Get a free PBX-to-SIP compatibility report

The majority of PBXs made since 2010 will be SIP compatible. Just look for IP (Internet Protocol) <u>compatibility</u> in the technical specification of your PBX.

In some cases, even older PBXs can be fitted with an adapter which will enable a SIP connection. As a special offer, the author's sponsor (<u>https://gotrunk.com</u>) will give readers of this ebook free advice on if your PBX can be connected to a SIP network.

Simply email your PBX make and model number to contact@gotrunk.com to understand your SIP options.

Read on to understand the benefits of SIP

Even though it will be a few years before the PSTN/ISDN network is switched off, it is worth starting to migrate to SIP now.

SIP connects you to the future of VoIP (Voice over Internet) telephony, which promises exciting new features and impressive cost savings on national and international calls.

In the next chapter, you'll read how telcos around the world are planning to close their current PSTN/ISDN networks. Even companies like AT&T in the US have to find spares for their older network exchange switches on places like eBay.

By switching - fully or partially - to SIP now, you are taking the first step into the future of telephony.

More research:

The GoTrunk Blog Article on What SIP is. https://gotrunk.com/what-is-sip/

The GoTrunk Blog Article Explaining What SIP Trunking is. https://gotrunk.com/what-is-sip-trunking/ Chapter 2. ISDN is set to disappear. The global timetable.



In 1972, the year when the idea for a 'data friendly' ISDN telephone network was first presented, the 'plain old telephone system' (POTS) was already almost a century old.

The POTS had been around since the age of the horse and carriage, before petrol powered cars were invented. With its copper wires and old-fashioned switches, the POTS simply wasn't equipped for the emerging age of data. Even the slow and relatively primitive data of the 1970s wouldn't work on the old infrastructure.

So telcos began to invest in ISDN, or ISDN-equivalent, lines and switches which could handle data. In those days data was created by devices like fax machines, and relatively slow computer-to-computer connections.

Of course, it wasn't until another ten years had passed that, in 1983, the first Internet network (called Arpanet) was introduced ... and in the following 30 years the Internet exploded, along with the speed of computers and computer connections.

So once again a popular technology, ISDN, found that it couldn't keep pace with the

evolving voice, data and video needs of users. As the telco investment in Internetcabling and switches overtook the investment in the POTS/PSTN/ISDN network, ISDN started to become an obsolete technology.

The successor to the ISDN protocol is SIP. First accepted in 2000 as a global standard for telecommunications, SIP was updated to SIP 2.0 in 2014 and is now the preferred migration route for telecos and corporations.

So, what is the timetable for ISDN lines to disappear? You might be surprised to learn the in some countries it is only a few years away, and that many telcos have already stopped investing in new ISDN/PSTN lines and/or switches.

USA: AT&T aims to switch off PSTN by 2020

As consumers move from a home phone to using mobile phones and Internet options like Skype, the conventional POTS network is being abandoned. In fact AT&T report that over 70% of home consumers in the 22 states where they run the POTS network have cancelled their subscription to the old-fashioned phone system.

The US FCC wrote that: "The majority of the capital investments made by U.S. telephone companies from 2006 to 2011 went toward maintaining the declining telephone network, despite the fact that only one-third of U.S. households use it at all."

With a diminishing return on their investment, many switch and associated hardware manufacturers are ceasing production of equipment for the POTS network. AT&T recently admitted that they had to look for spare parts to keep their exchanges running on eBay!

Conversely, AT&T is investing heavily in Internet-compatible infrastructure. Their 'Velocity' project aimed to connect 57 million homes and offices to high-speed broadband during 2016.

UK: British Telecom aims for a 2025 ISDN switch off

BT is scaling down its investment in ISDN infrastructure with a view to turning off the ISDN network around 2025. In the meantime the telco will doubtless reduce ISDN the resources allocated to ISDN in an effort to migrate business customers to Internet-enabled telephony.

A major part of the effort in migrating customers from ISDN to SIP will involve educating the managers responsible for corporate telecommunications about the benefits and compatibility of SIP.

In a recent article (link below) titled '10 years to go: what the end of ISDN means for your business', the website Information Age reported on the awareness of SIP amongst IT managers. "While it sounds like a job for the telecoms department, is that job role dwindling? A survey by Timico last year found that 52% of IT managers now also have responsibility for telecoms. In spite of this, the same survey revealed that a shocking 67% of IT managers don't know what SIP is, despite its status as the next big shift in telecoms."

EU: Deutsche Telekom upgrades 100k users a week to IP. 2018 vision

Deutsche Telekom is one of Europe's leading telcos and infrastructure providers. By 2018 DT aims to have IP technology at the heart of all its network.

The company plans to invest 6 billion euros in IP networks by 2018. "We are consistently pursuing this path and, in the meantime, are migrating up to 100,000 customer lines across Europe to IP technology each week," said Claudia Nemat, Deutsche Telekom Board Member for Europe and Technology. "No other company is currently migrating more lines than Deutsche Telekom in Europe."

Deutsche Telekom state that more than eight million lines have already been migrated to IP technology across Europe, with five million in Germany alone. All telcos in Europe will have a similar strategy to move from ISDN to IP technology.

More reading: http://www.telekom.com/media/company/269056

AMEA: Orange aim to be 100% IP by 2020

As an example of developments in Asia, the Middle East and Africa, Marc Rennard, Orange's senior executive vice president in charge of international operations in AMEA, reported that the company was aiming to shut down all of it PSTN networks and migrate 100% of customers to all IP-technology by 2020.

Of course, Orange is just one of many telcos and networks operators in this vast region, but every network player in the area will have similar goals.

More research:

The VoIPstudio Blog Article: What You Need to Know about the PSTN Switch Off https://voipstudio.com/pstn-switch-off/

Chapter 3. Should I go straight to Cloud/Hosted PBX?



The central theme of this ebook is how companies can use SIP to protect the investment they have made in their PBX hardware.

However, many companies will prudently ask themselves if they should simply retire their current PBX hardware and migrate to a <u>cloud-based 'Hosted PBX' solution</u>.

In the majority of cases, the easiest option for a company is to stay with its current PBX hardware and simply change from ISDN to a SIP connection. This gives the SIP Internet advantages of lower call costs, but also enables employees to continue using the PBX features they are used to.

But there are a few scenarios where companies could consider jumping straight to a Hosted PBX solution:

1. The company is expanding rapidly, and the likely number of users will soon exceed the capacity of the PBX in use. Hosted PBX gives extreme flexibility to increase or reduce the number and location of users. 2. The company is considering relocating to new premises. A cloud-based, Hosted PBX has no geographical restrictions, whereas a conventional PBX is much harder to physically relocate.

3. The PBX needs replacing anyway, or the contract is due to expire within 12 to 24 months. If the PBX investment has matured, then a Hosted PBX will be easier to manage in the future.

For other companies, SIP is actually a very manageable and cost effective way to take a hardware PBX through to its natural end of life. SIP connectivity will also enable a much smoother transition to a Hosted PBX solution, when the time inevitably comes to replace a hardware PBX.

The author has written a separate Amazon ebook about the capabilities and benefits of Hosted PBX products. Please see chapter 15, or preview the Amazon Kindle version of the book at:

https://www.amazon.co.uk/VoIP-Business-Internet-Telephony-Increaseebook/dp/B019H2M8EC/ref=sr 1 1?ie=UTF8&qid=1463129484&sr=8-1&keywords=voip+kindle+book

Readers who are interested in a free trial of a high-quality Hosted PBX could visit: <u>https://voipstudio.com/</u>

Adopting a hybrid SIP/ISDN solution

Apart from the three examples listed above, any company with a PBX should consider changing all or some of its connections to SIP.

An interesting option adopted by many companies to is to have a hybrid solution, where a mix of ISDN and SIP connections are employed. This enables companies to get used to SIP technology and features, whilst enjoying the reassurance of also having trusted ISDN lines still in place.

As a special offer, the author's sponsor (<u>https://gotrunk.com/</u>) will give readers of this ebook free advice on if <u>your PBX can be connected to a SIP network</u>.

Chapter 4. SIP benefits: six highlights for the C-Suite.



Making the change from ISDN to SIP - or even a partial change with a hybrid SIP/ISDN solution - will tick a lot of boxes for companies who want to extend their PBX investment.

- **Risk management.** Telcos will invest less in supporting ISDN, even ahead of the published switch-off dates. So a partial SIP change will reduce the risk of a deteriorating ISDN infrastructure.

- **Cost benefits.** With SIP, calls made between company locations are free. Calls to the outside world typically cost 40% to 50% less.

- **Flexibility.** ISDN lines, with fixed line numbers that are printed on company stationery and brochures, etc, tie a company to a fixed location. SIP enables relocation anywhere, whilst retaining the same number.

- **Security.** If an ISDN line has a network failure, communications are lost. With SIP, if there is a network fault then calls be be instantly re-routed.

- **Integration**. Voice, data, video and Internet can all be channeled over SIP lines. Companies can develop an integrated communications strategy.

- **Future-ready.** When the company is ready to change from their current PBX hardware to a cloud-based Hosted PBX, their SIP lines will make the transition seamless.

The next three chapters go into more detail about three specific areas in which SIP can benefit any size of business:

- cost and quality
- employee and geographic flexibility
- future proof and robust technology

Chapter 5. SIP benefits: increased quality & reduced call costs.



Telcos around the world are investing billions in Internet-based IP communications. From fiber optic lines to sophisticated switches, IP infrastructure is the number one priority for every telco.

This results in high call quality due to the extra bandwidth available.

Because consumers might have had a bad experience with voice over Internet services (for example with Skype, where they are sharing a platform with around 300 million other people at the same time), many people think that VoIP is low quality.

But the reverse is true. Due to the huge investment in bandwidth, fiber optic lines and sophisticated data exchanges, business-class SIP voice communications invariably equals or exceeds the call quality that ISDN delivers.

Plus there are the costs savings of SIP ...

Free calls between offices and teleworkers

The most widely known cost benefit of VoIP (voice over Internet) and SIP technology is reduced call charges. Put simply, SIP offers:

- Calls between offices worldwide. Free.
- Calls with Internet-connected home/teleworkers. Free.
- Calls with SIP mobile apps on WiFi. Free.
- Calls to landlines worldwide. Free or fractions of a penny.
- Calls to mobiles worldwide. Up to 80% cheaper.
- Customer 'calls from website'. Free.

Those savings can significantly cut a company's communications costs. But the reduction in call costs is only part of the equation. Organizations switching to SIP will also save month after month on their line rental charges.

Multi-location companies can reduce line rental costs by 50%

ISDN lines are fixed to a specific termination point (or geographic location). So a company might find they are under-utilizing their lines because, for example, one freephone number has to terminate at the sales center in town A, but another premium number terminates at the after-sales center in town B.

With SIP, fewer channels can be used to handle the same amount of traffic because calls are re-routed 'in the cloud' to different locations.

When a company measures its communications needs in a bandwidth-centric way rather than a location-centric way, the efficiency with which it utilises lines can approach 100%.

A US study found that companies switching to SIP technology could reduce their trunk(US) / channel(EU) requirement by 35% to 50%.

UK example saves 90% a year on line rental

In the UK, an ISDN30e connection has an installation fee and a cost per channel from ± 22 (about \$31). For a company with 30 channels, that's a monthly ISDN line rental of around \$1000.

To handle the same about of traffic with SIP lines would cost under \$94 per month.

Sources: UK ISDN figure / May 2016. https://business.bt.com/products/voice/isdn/

SIP line rental / May 2016. https://gotrunk.com

US example saves >80% a year on line rental

In the US, PR1 and T1 TDM lines typically cost \$450 to \$600 per month. These lines offer 23 trunks for voice and data (plus a 24th trunk reserved for signaling purposes).

To handle the same amount of traffic with SIP lines would cost around \$75 per month.

Sources: US SIP trunking article / May 2016. https://business.bt.com/products/voice/isdn/

SIP line rental / May 2016. https://gotrunk.com

Other cost benefits of SIP technology

- **Unlimited calls.** There is no limit to the free calls that can be made.

- Free call forwarding. No more billing when forwarding to free destinations.

- **Consolidated billing.** Internet-based telephony offers unified billing, detailed analysis and sophisticated dashboards.

- **Reduced hardware costs.** When a company eventually migrates from their conventional PBX to a cloud-based Hosted PBX, the savings in hardware are considerable.

More reading:

Gartner: SIP Trunking Slashes U.S. Telecom Expenses by Up to 50%. https://www.gartner.com/doc/2845422/sip-trunking-slashes-telecom-expenses

Chapter 6. SIP benefits: teleworking and apps.



By connecting their PBX to a SIP line, businesses can immediately start to use many of the features associated with a <u>cloud-enabled Hosted PBX</u>.

One of the key benefits of Internet telephony with SIP is mobility. Installing a free or low-cost app on your smartphone or computer enables your office extension to effectively follow you wherever you go.

That means employees can work from home or a foreign hotel room exactly the same as if they were in the office.

Check out the apps for your smartphone

All you need for business-class VoIP on your smartphone is a SIP app. You simply install the softphone app for your device, enter your SIP details, and the world is your office!

There are softphone apps for Android, Apple, Blackberry and Windows smartphone. Search your device app store for the keywords 'softphone', 'sip' or 'voip'. For example, a popular SIP app is called Zoiper, and it gives your smartphone, Mac or Windows PC these telephony features:

- Call waiting
- Call transfer
- Call statistics
- Call recording
- Conference calls
- Video calls
- Instant messaging (SIP simple)
- Call encryption

If your mobile phone runs at least Android 2.3, you don't even need an app to <u>make</u> <u>SIP calls on Android</u> (click to learn more on how to do it).

Save money on your mobile calls

Lots of people use their softphone app and SIP VoIP service to save money on mobile calls, both at home and abroad.

When you are in your home country, you can connect to WiFi and make/receive calls from your mobile app. With a good 4G connection and a generous data plan, it is also possible to connect to SIP features from the mobile network.

In either case, the app looks and works like a normal phone dialer, so there is no complicated learning curve. This can be an economical alternative to using the call minutes included in your monthly phone plan. Your VoIP account will include free calls to other VoIP numbers worldwide, and will possibly include low cost national and international calls too.

When you are abroad you will save even more by avoiding the expense of international calls and network roaming charges. Connect to any WiFi network (hotel, bar, restaurant, airport) and you'll be able to make calls at the same rates as you do from your home country. If you have a landline or direct-dial office extension number connected to your SIP VoIP number, customers or family can even call your home country number ... and you'll receive the call wherever you are in the world!

Popular features when traveling

Whether you are going out for lunch or travelling abroad, your SIP VoIP account and smartphone app keep you in touch with your business resources.

Here's some of the most popular VoIP features for people on the move.

- Global extension

With a Hosted VoIP package, it's simple to make your smartphone app function as your extension number at work. So when colleagues or customers call your extension number, your smartphone will ring.

- Voicemail

If you are not connected to WiFi, your office number can have a voicemail feature. You'll be able to retrieve your voicemails, free, from any WiFi connection. You can also access your PIN protected voicemail from a landline or mobile network at the usual call rates.

- Call forwarding

If you are going to be out of touch while traveling, you can log-in to your Hosted VoIP system and have your calls transferred to a colleague. This is a popular for people going on long flights who don't want incoming callers to be simply directed to voicemail.

- Other popular mobile apps

The author's Hosted PBX website shows a constantly updated list of popular VoIP softphone apps, along with details of how to link them to a VoIP account. <u>http://voipstudio.com/manual/User_Third-party-softphones/</u>

It is also possible to configure an Android phone to use VoIP without installing an app. This article shows regularly updated instructions: <u>http://voipstudio.com/sip-calls-on-android/</u> Chapter 7. SIP benefits: business re-sizing and office relocations.



A hardware PBX and an ISDN line have a tendency to fix a business in one location. This is in part because a conventional hardware PBX will be expensive to relocate from one office to another. But the other factor is that ISDN lines - and, more importantly, the phone number associated with them - are hardwired to a specific town or geographic location.

This ISDN limitation means that if a business wants to move from, say, London to Birmingham ... then it needs to get a new phone number. Which means re-printing all the businesses cards, brochures, contracts, etc, etc.

While SIP in itself can't save the engineering costs associated with moving a PBX, it does eliminate the way that a phone number is 'hard wired' to a specific location. With SIP, the PBX hardware could be moved from London to Birmingham (or to Shanghai or Adelaide, for that matter) without any change to the inbound number.

Of course SIP could avoid the need to move the PBX altogether. Say the company was opening a branch office in Birmingham but keeping the PBX at its head office in

London. In this case the Birmingham office could have SIP lines and install an inexpensive voice router to enable incoming and outgoing calls. In this scenario the office phones in Birmingham work like extensions on the London PBX, with free calls between the two locations.

In that scenario, SIP can extend the working life and geographic reach of a conventional PBX.



Example use case.

Inexpensive hardware like the \$50 'Cisco Small Business Pro SPA3102 Voice Gateway with Router' can turn a branch office into an extension of a SIP-enabled PBX at the head office.

https://www.amazon.co.uk/gp/product/B000TSJ5JK

Chapter 8. SIP benefits: robust disaster recovery & future planning.



Instant and automatic disaster recovery

Take two scenarios of a busy office with road works taking place outside their offices. Disaster happens when a digger accidentally cuts through cables outside the building.

For the company who relies entirely on ISDN for their voice communications, this truly is a catastrophe. As the ISDN number is literally hard-wired to their office location, the company has to wait until the telco engineers can repair the line.

By the time the telco have been contacted and the ISDN engineering works completed, maybe two weeks will have passed.

For the company who has SIP lines for their voice (and data/video) communications, their lines of communication can instantly and automatically be assigned to another location, or to other undamaged lines leading to their current location.

The company with SIP will have perhaps a one second break in communications while the pre-programmed automatic disaster recovery plan is initiated.

With SIP, disaster recovery can even be triggered by problems further down the line. For example, if Telco A providing SIP lines has a flood or fire at their data center, then the company can switch all traffic to SIP lines from Telco B.

Redundancy, being fail-safe and disaster recovery are built into the DNA of the Internet. SIP takes full advantage of these characteristics to give companies a very robust connection.

Risk management and continuity planning for voice and data communications is a major concern for companies. With SIP, the threat rating is effectively cut from medium to negligible.

The threat of ISDN unavailability

As mentioned in a previous chapter, AT&T is the US has been known to purchase spare parts for their phone exchanges from eBay.

As telcos reduce their investment in ISDN infrastructure and engineer training, the ISDN network must be viewed as an increasing risk as it nears its end of life stage.

Implementing the future technology now

Even companies who have decided to retain their hardware PBX for now will probably decide to replace it with a cloud-based Hosted PBX when it has reached its end of life.

By installing SIP lines now, the company will have taken the first step on that almost inevitable migration to a hosted PBX solution.

Chapter 9. SIP network: business features checklist.



A SIP line protects the investment in a conventional hardware PBX. But it is also the first step in the migration to a cloud-based Hosted PBX solution in the future.

The author of this book has also published a book on Hosted PBX systems for business users. This bonus chapter is copied from that book. You can purchase the Hosted PBX on Amazon. See chapter 15.

Free Internet Calls

SIP and VoIP provides free calls between all your SIP endpoints – which means your people can talk to each other for free no matter where in the world they are located – be it in the same building or on a different continent. Everyone in the organization is easily within reach at no cost – helping you to improve communications and save money.

Reduced Call Rates

Call rates are typically much lower than with traditional telecoms operators, because they are routed over the Internet. You can even save money compared to many VoIP offerings. SIP not only delivers a more reliable and more easily managed telephony solution, it also helps you reduce business expenses.

Pay As You Grow

With SIP you can add as many SIP channels as you need. So as your business grows you can add users at any time. Creating new accounts with instant activation is simple to set up. You can remove users just as easily to scale up or down – which is ideal for coping with streamlining, seasonal fluctuations or special events.

Instant Deployment

Get up and running in next to no time. There's no hardware to install, which means you can have your new SIP telephony system fully operational within minutes. Most clients can go live within around 10 minutes of signing up.

No Contract

Unlike ISDN lines which often have a lengthy contract period, the most reputable SIP providers offer cancellation periods of as little as one month. With SIP, businesses have a lot more freedom to shop around for the best service and value.

One Second Billing

Some telecoms providers round up your call time to the nearest minute. Reputable SIP providers only charge per second, so you only ever pay for the call time you actually use. Business class SIP providers like GoTrunk have no call setup fee either – which represents another big saving compared to other providers.

Numbers Porting

Your existing incoming telephone numbers may be valuable and important to your business. It's quick, easy and FREE to transfer them from your current provider to a reputable SIP service – and the whole process can be managed from your control panel.

Flexible Call Rates

Large enterprises have special requirements when it comes to call rates. Business class SIP providers can offer flexible call rates to large and rapidly growing businesses to help you contain and reduce your communications cost.

Free Inbound Calls

All incoming calls are completely free*. And because the calls are routed over the Internet, you can use powerful and sophisticated software solutions to route calls and manage call volumes. * – Toll Free numbers excluded

Centralized Billing

Handling multiple bills and invoices from different telcos around the world can be a major headache – and prevents larger business from getting a grip on expenditure. With a business class SIP provider you benefit from one single account, one bill and one invoice for all your telephony services, saving you time and money.

Worldwide Telephone Numbers

SIP providers like GoTrunk can provide customers with local numbers from more than 4,000 cities worldwide to quickly establish a global presence and project the right image.

Disaster Recovery Options

Ensuring business continuity is vital for organizations large and small. Because your calls are routed over the Internet, your people are never tied to one location. They can set up in a new building and get back to work in minutes.

Hybrid VoIP

Some business can benefit from SIP trunking for major premises and Cloud PBX in smaller offices or for home workers. Use both through one unified account with a business class provider like GoTrunk and their sister service VoIPstudio. Visit <u>https://voipstudio.com</u>

Free Trial

Choose a SIP provider who offers a free 30-day trial lets you try out the service for yourself.

Visit <u>https://gotrunk.com</u>

Chapter 10. SIP network: technical features checklist.



When looking for a provider of SIP lines/trunks, it's important to make sure you have access to the full range of SIP features and benefits. The major features are shown below.

Before finally selecting a supplier (see chapter 14), it's also worth looking for a company who will offer a free trial ... and who don't tie you into a long term contract. Ideally your cancellation period should only be one month. A few companies meet these criteria, including the author's sponsor at <u>www.gotrunk.com</u>

Virtual Numbers

Use virtual telephone numbers to provide a local presence in more than 4000 cities worldwide. By routing the incoming number to your Virtual Reception, you can easily manage the call and transfer the caller to the right department or extension number.

Call Recording

Record calls easily and automatically as well as use them to train staff, improve sales performance and meet legal requirements.

Unlimited Storage

Store your recorded calls indefinitely with unlimited storage. Create an invaluable business record which helps you to meet legal requirements and business regulations.

Emergency Calling Services

Make calls to the emergency services in the UK (999 and 112) and the United States through the E911 service.

Web Panel

An easy to use web panel gives you total control over your SIP configuration from any PC, smartphone or other internet enable device.

Vendor Independent

Be sure to choose a SIP provider who supports open SIP standards, so your line will work with any SIP compatible PBX. Check that you can easily move from one SIP compatible PBX to another.

Live Traffic

Monitor your SIP traffic in real time to troubleshoot or diagnose any issues and optimize call handling.

IP Interconnect Monitoring

Business class providers like GoTrunk run regular fully-automated checks to ensure the IP link between their network and your IP PBX is fully operational at all times.

Multiple SIP Endpoints

Create as many IP PBX SIP endpoints as your business needs – all under one unified account. This results in simplified billing and management.

Call Statistics

Easily analyze your call spending and call history. This feature delivers improved management information.

FTP CDR Access

Quickly and easily access your Call Detail Records (CDR) using simple FTP tools.

Chapter 11. IT teams use SIP to migrate from hardware PBX to a cloud PBX.



People reading this book will likely have a hardware PBX that they want to continue using in the future.

That PBX will currently be connected to the ISDN or TMD public switched telephone network, depending on location.

It might seem to companies in this situation that they have some tough decisions to make. For example:

- "What will I do when the ISDN network closes?"
- "What will I do when my PBX needs replacing?"

Start the journey into the future with a SIP line

The easiest way to find a solution to both of those challenges is to make a small investment in adding SIP lines (or channels, as they are often called) to your PBX.

By starting the migration to SIP lines, IT managers will:

- Be ready with an alternative voice channel, if ISDN services are withdrawn or disrupted.

- Have easy access to a cloud-based Hosted PBX in the future.

Developing a hardware strategy

SIP hardware is both simple and inexpensive. A simple voice router (see chapter 7) costing around \$50 is all it takes to connect an IP-enabled PBX to the Internet. Older PBX models which are not IP-enabled can often be fitted with a simple voice-to-IP adapter. See the offer from SIP specialist GoTrunk below.

By connecting a voice router to their network. IT managers will have taken the first step in developing a hardware strategy, and in understanding how to combine voice and data traffic.

As a special offer, the author's sponsor (<u>https://gotrunk.com/</u>) will give readers of this ebook <u>free advice on what hardware is required to connect your PBX to a SIP network</u>.

Working towards Unified Communications

In addition to protecting the investment in a hardware PBX and eliminating the risk of being completely dependent on the dying technology which is ISDN, connecting a SIP line is also the first step for IT managers to implement a truly Unified Communications solution for their organization.

UC enables a company to consolidate their voice, video and data communications into a single hardware investment. The key benefits are:

- Significantly reduced costs.
- Ability to upsize/downsize easily.
- Freedom to move location at any time.
- Failsafe redundancy of IP architecture.

Chapter 12. Thinking of getting more ISDN lines? Try a hybrid PBX connection.



Caption. A SIP-ISDN Gateway enables even PBX without IP-compatibility to be connected to a SIP line.

Many companies like the potential economies and security of SIP telephony but are worried about the call quality and compatibility of SIP lines with their PBX.

For companies like this, and for companies who are about to order more ISDN capacity, a hybrid SIP+ISDN solution is recommended.

- If your PBX is IP-enabled, your SIP provider will give advice for connecting the PBX.

- If your PBX is not IP-enabled, then a SIP-ISDN gateway will usually provide a solution. The gateway is a small device, usually rack mounted, which sits between the PBX and the SIP connection.

Installing a fail-safe hybrid system

With a hybrid solution, most companies opt to leave the ISDN trunk for accepting incoming calls, just as it does now. The SIP channel is then used for outgoing calls, as

this is where the savings are made. Many companies report that their phone bill is reduced by 50% or more when outgoing calls are made via their SIP line.

The SIP connection can be configured so that in the unlikely event of a network failure, outgoing calls can automatically be routed through the ISDN lines. In this way a hybrid approach can give a company all the benefits of migrating from ISDN to SIP, but without any risk.

As ISDN lines are withdrawn or experience service problems as they approach their end of life, companies who have taken the early step of installing a hybrid solution will be able to avoid being without communications.

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Simply email your PBX make and model number to ebook@gotrunk.com to understand your SIP options, and how to connect your PBX to voice over IP.

Speed of installation advantages with SIP

For companies who are about to order new ISDN capacity, another benefit of opting instead for a SIP hybrid option is speed of installation.

ISDN lines typically take 30 to 120 days to implement, but SIP connectivity can be implemented in just a few working days.

SIP lines also cost a fraction of ISDN lines, and the capacity of SIP can be near instantly updated to give more or less bandwidth, depending on the needs of the business.

Chapter 13. SIP implementation: Seven--point planning checklist for IT teams.



Research by a supplier of voice over Internet services found that 52% of IT managers also have responsibility for voice communications within their organization. Yet 67% of IT managers did not have more than a superficial awareness of SIP and how to implement it.

This chapter will help IT teams to plan the implementation of their first SIP trunk.

1 - Make sure your PBX is SIP enabled

If you have a modern PBX, it is almost certainly SIP enabled. If it has a data or ethernet port, then it is SIP enabled. Check your user manual to make sure. If your PBX is not SIP enabled, you can still use SIP Trunking. You'll need to get an Analog Telephone Adapter.

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ebook free advice on what hardware is required to connect your PBX to a SIP network.

Simply email your PBX make and model number to ebook@gotrunk.com to understand your SIP options, and how to connect your PBX to voice over IP.

2 - Make sure you have enough bandwidth

Your voice calls will be routed over your data network. If you don't have sufficient bandwidth, your call quality will suffer.

As a rule of thumb, a SIP line rated at 10Mb/s upload speed would be sufficient for around 100 simultaneous voice calls. It is good practice to dedicate voice channels to voice only, so large data downloads do not use up all the voice bandwidth.

One voice call requires one channel, but as not every employee will be on the phone at once, then less channels than people will be required. Your SIP provider can help define the most cost-effective number of channels for your individual needs. For example, a busy call center will need a higher ratio of channels-to-people than an accountancy firm would need.

The good news is that, unlike ISDN, it is easy and near instantaneous to add/remove SIP channels via your SIP account dashboard.

3 - Prioritise voice traffic

Your router controls your access to your data network. It should allow you to enable QoS, which stands for Quality of Service. This will prioritise your voice traffic over data. If your router doesn't have such a setting, you might want to get a new router.

Many companies dedicate SIP channels to voice only. Whereas voice is relatively lowbandwidth and predictable in terms of volume, data usage can have marked spikes in bandwidth consumption. For example, downloading video content can consume extreme amounts of bandwidth.

4 - Set up your PBX

Depending on model, you'll need to make some changes to the settings in your PBX. Your SIP provider should be able to help.

5 - Think about security

In an age of high profile hacking, a high priority for organizations is to close any vulnerability within their IT infrastructure. The SIP equivalent of a firewall is a Session Border Controller (SBC) device.

You should also ask your SIP provider to review the way in which your PBX handles SIP connections. Differing ways of how a PBX handles 'SIP proxy elements' can affect line security, although an SBC can usually be configured to address any potential vulnerabilities.

6 - Test everything

Test the system the make sure your SIP trunk, PBX, router and internet connection are all getting along and co-operating with each other. If your chosen SIP provider offers a free trial (as does, for example, www.gotrunk.com), you can test your entire SIP infrastructure without any line rental or call charges.

7 - Ongoing maintenance and quality control

Choose a SIP provider who offers automated call quality checking. This feature replaces manual checking with automated alerts if there are any issues which affect the quality or availability of your voice service. There is more information about this in the next chapter.

Chapter 14. Five-point checklist for choosing a SIP supplier.



1. Open standards and compatibility

When evaluating potential SIP suppliers, the first point to check is that they have an open approach to other SIP technologies, and support the most widely adopted codecs.

Other products and solutions

The other SIP systems that you might want compatibility with in the future are:

3CX

3CX provides a software-based IP PBX developed specifically for Microsoft Windows. It is based on the SIP standard, so you can use any SIP phone. Installation and management are relatively simple and can be achieved using a web-based configuration interface. GoTrunk offers seamless, painless and simple integration with 3CX.

Asterisk

Asterisk is one of the world's leading unified communications solutions. It is an engine, built by and for communication systems developers, which manages the process of initiating, maintaining and manipulating calls between phones (or 'endpoints' as they are known). Asterisk has been developed, improved and maintained by a worldwide community of more than 80,000 developers and integrators. GoTrunk offers seamless, painless and simple integration with Asterisk. Our worldwide network of IP connections and the advanced features of GoTrunk, designed with business needs in mind, give you the powerful communications tools you require to take full advantage of Asterisk's capabilities. By ensuring SIP trunk compatibility with leading solutions such as Asterisk, GoTrunk helps you get more from your SIP solutions.

Elastic

Elastix is server software that delivers unified communications. It combines an IP PBX with email, IM, faxing and collaboration capabilities. It also provides call centre software and predictive dialling. Elastix is based on open source projects including Asterisk, FreePBX, HylaFAX, Openfire and Postfix. It is free software and is released under the GNU General Public License. GoTrunk offers seamless, painless and simple integration with Elastix.

FreePBX

FreePBX provides a web-based graphical user interface that controls and manages the Asterisk PBX solution. It is possibly the most widely deployed open source PBX platform in the world. FreePBX is an open source solution licensed under the GNU General Public License. It is included in many other open source SIP solutions including FreePBX Distro and AsteriskNow. GoTrunk offers seamless, painless and simple integration with FreePBX.

FreeSWITCH

FreeSWITCH is free and open source communications software providing both voice and messaging capabilities. It provides an application programming interface and includes additional modules that provide telephony applications, such as IVR, PSTN, VoIP, SIP and conferencing. It is licensed under the Mozilla Public License, which is a free software license. GoTrunk offers seamless, painless and simple integration with FreeSWITCH.

sipXecs

sipXecs provides an open source unified communications solution popular with the small to mid-enterprise market. sipXecs includes a SIP routing core integrated with a suite of communications services such as video calling, voicemail, unified messaging, auto-attendant, conferencing, presence and call centre capabilities. It can be implemented on a single server or across a distributed infrastructure for larger deployments. The solution is managed through a unified web based management application. GoTrunk offers seamless, painless and simple integration with sipXecs.

source: <u>https://gotrunk.com/sip-compatibility/</u>

Open standards and Codecs

To give the best quality of service and the biggest selection of hardware options, you chosen SIP supplier should also support a wide range of codecs, including:

- ALAW (G711)
- ULAW (G711)
- GSM
- G722
- G723
- G726
- G729
- speex
- H264 (Video)

Tip: using G.711u delivers the best sound quality, providing you have sufficient bandwidth. If bandwidth is an issue, you should try one of the other codecs, such as G.729.

2. Own their own infrastructure

Even if you only do business in one country, it's worth making sure your VoIP provider has servers in multiple locations. This is because servers can be affected by external conditions, such as a power line being cut, flooding, etc.

If you have international offices, or are making international calls, it's even more important that your SIP/VoIP supplier has servers in different regions. This is to ensure that there is 'redundancy' in your VoIP network (ie, if one server fails, another takes over automatically), and also to ensure that you get fast, high-quality connections around the world.

For example, the author's sponsor has servers in the USA, Europe and Asia.

If a VoIP company doesn't promise redundancy and multi-server locations, delete them from your shortlist.

3. Help desk support

It's worth testing the responsiveness of a potential SIP supplier by asking their helpdesk a support question. If a company doesn't respond quickly and helpfully, delete them from your list of prospective partners.

As a special offer, the author's sponsor (www.gotrunk.com) will give readers of this ebook free advice on what hardware is required to connect your PBX to a SIP network, and answer any other questions you have about SIP/VoIP.

Simply email your PBX make and model number to ebook@gotrunk.com to understand your SIP options, and how to connect your PBX to voice over IP.

4. Hosted VoIP migration

If your company has less than 700 employees, then at some stage in the future you will likely want to change your hardware PBX for a cloud-based Hosted PBX.

Ask your potential SIP partner if they can help you migrate from a hardware to a cloud solution in the future.

The author's sponsor has a fully featured Hosted PBX solution. More details are at https://voipstudio.com. There is a seamless upgrade path from the SIP-only solution to the HostedPBX-solution, including using the same management dashboard and payment methods.

If ever your PBX fails (note: like ISDN lines, hardware PBXs will likely have less support and spares as time goes by) it is important that you can quickly switch employees to a hosted solution. Many companies say that even two hours without voice communications would result in financial loss and reputation damage. With the right SIP partner, you can develop a bulletproof emergency and planned-migration plan.

By the way, if you'd like to know more about Hosted PBX features, the author has written a book on that subject. Please see the next chapter.

5. Free trial

Once all the other boxes have been checked, you'll need to see if your SIP partner offers a free trial.

A free trial has two functions. First, it demonstrates the your potential supplier has the necessary resources and confidence in their solution. Two, it gives you a no-risk way to ensure that SIP will connect with your PBX and deliver the promised call quality and savings.

The author's sponsor offers a free trial at <u>www.gotrunk.com</u>.

Chapter 15. Want to know more about VoIP and Hosted PBX?



The author is a specialist in voice over internet solutions for businesses.

In addition to the book you are reading now, she has also written the popular guide titled 'VoIP For Business: Using Internet Telephony to Increase Service Levels and Cut Costs.'

'VoIP For Business' will be valuable for companies who plan to replace their current hardware PBX with a cloud-based Hosted PBX in the future.

The Amazon description for the book says:

"In 14 easy-to-read chapters, we will take you through the basics of VoIP technology, explain the key terms, and highlight the features that you could use to save money, give outstanding customer service and grow your business."

"Best of all, we give you step-by-step instructions for implementing VoIP in your business. And although we have our own VoIP company, this book isn't a plug for our

own services. This book gives you tips on assessing the right VoIP supplier for your needs, and points you to the website of some respected VoIP leaders."

The Kindle edition price is UK £1.47 on amazon.co.uk and the readers of this book can <u>download it for free from the VoIPstudio website</u>.



"I had been thinking about VoIP, but it all seemed very complex. This book showed me how easy it was to implement a voice over the Internet solution for my small packaging company. We've got 12 employees in three locations, and we started saving money after the first month. I wish we'd done this a few years ago."

"Getting rid of our old-fashioned PBX and replacing it with a cloud-based phone system seemed like hard work. But the simple guidelines from the book made it a breeze. The telephone features we can use are awesome. It's like we went from the 19th century to the 21st century in a month."

"There's only three of us in our business, so we thought VoIP and a hosted PBX package was overkill. But our customers say that it's much easier to get hold of us now. Plus we have much greater control over our communications costs."

End note. Creation of this e-book was sponsored by GoTrunk.

GoTrunk sponsored the author's time to write this guide to SIP solutions for companies who want to preserveGoTrunk has customer service centers in the UK and US.

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Please visit <u>https://gotrunk.com/</u> for more information about SIP solutions, and <u>https://voipstudio.com/</u> for more information about Hosted PBX solutions.