Microsoft Teams Calling & Direct Routing

dummies
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Use Teams as your office phone system

Learn about Microsoft Direct Routing

Pick the right Session Border Controller (SBC)

Ribbon Special Edition

About Ribbon Communications

Ribbon Communications delivers communications software and network solutions to enterprises of all sizes and to over 1,000 communications service providers worldwide. It helps its customers modernize and secure their communications networks, improving their ability to securely connect and collaborate with employees, customers, and business partners. Ribbon solutions help organizations enhance and accelerate business outcomes, improving their competitive position. Its innovative portfolio of communications solutions delivers security, performance, and agility. To learn more visit **rbbn.com.**

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Microsoft Teams Calling & Direct Routing For Dummies®, Ribbon Special Edition

Publisher's Acknowledgments

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Introduction

Microsoft Teams is a cloud-based unified communication and collaboration (UC&C) platform that brings together video conferencing, file sharing, and persistent chat in a single digital workspace. Microsoft calls it the hub for teamwork in Microsoft 365 (formerly Office 365). Although many organizations are familiar with the powerful collaboration and file sharing capabilities in Teams, relatively few know much about how Teams can be used to make and receive business phone calls or how to enable Teams Calling by connecting Teams to a communications service provider (CSP) for dial tone. With Microsoft Phone System and Direct Routing, organizations can connect external phone lines and replace their entire office phone systems with Teams.

About This Book

Microsoft Teams Calling & Direct Routing For Dummies, Ribbon Special Edition, helps you discover the different options and use cases that exist for Microsoft Teams Calling to help you make the right decisions for your organization and enable seamless and secure calling for your end-users.

This book consists of five chapters that explore

- » What you need to do to add voice calling to Microsoft Teams (Chapter 1)
- » How to plan a successful migration to Teams Calling (Chapter 2)
- » The need for a Session Border Controller (SBC) (Chapter 3)
- » Teams Calling use cases (Chapter 4)
- » Choosing a Ribbon SBC (Chapter 5)

Each chapter is written to stand on its own, so if you see a topic that piques your interest, feel free to jump ahead to that chapter. You can read this book in any order that suits you (although I don't recommend upside down or backwards).

Throughout this book, I use terms related to Microsoft Team Calling. To help you keep them straight, here are two points to remember:

>> I refer to a communications service provider (CSP), telco, public switched telephone network (PSTN), or phone company as a *dial tone provider.*

>> I use the term Microsoft Phone System (or simply Phone System) unless I'm describing a specific aspect of Teams Calling, such as how to connect to your dial tone provider using Direct Routing (SIP trunking).

Foolish Assumptions

It's been said that most assumptions have outlived their uselessness, but I assume a few things, nonetheless. Mainly, I assume that you work for an organization that's already using Microsoft Teams in some capacity for video conferencing, file sharing, and persistent chat. As such, you probably have a good working knowledge of many of the out-of-the-box communication and collaboration capabilities in Teams but may be completely unaware that Teams can also replace your traditional desk phone or other office phone system.

Although this book is written primarily for technical readers, I don't assume that you have specific knowledge or experience in telephony (beyond using a phone, of course). As such, I'll be sure to explain any technical terms or concepts that may come up in this book.

If any of these assumptions describe you, then this is the book for you! If none of these assumptions describe you, keep reading anyway! It's a great book, and after reading it, you won't need to "phone a friend" when it comes to answering questions in your organization about Microsoft Teams Calling.

Icons Used in This Book

Throughout this book, I occasionally use special icons to call attention to important information. Here's what to expect:

This icon points out important information you should commit to your nonvolatile memory, your gray matter, or your noggin — along with anniversaries and birthdays.

Tips are appreciated, but never expected — and I sure hope you appreciate these useful nuggets of information.

These alerts point out the stuff your mother warned you about (well, probably not), but they do offer practical advice to help you avoid potentially costly or frustrating mistakes.

Beyond the Book

There's only so much I can cover in this short book, so if you want to find out more, check out these resources:

>> **Website:** The Ribbon website has a lot of great whitepapers, webinars, technical documents, case studies, datasheets, and more. Check it out at `ribboncommunications.com/solutions/enterprise-solutions`

>> **Blog:** The Ribbon blog is full of articles about current topics, events, and news. Learn more at `ribboncommunications.com/company/media-center/blog`.

>> *For Dummies* **book:** Download *Session Border Controllers For Dummies,* Ribbon Special Edition, to learn more about SBCs and what they can do for your UCC environment at `ribboncommunications.com/products/enterprise-products/session-border-controllers-enterprises`.

Chapter **1**

Microsoft Teams Calling 101

I n this chapter, you discover how Microsoft Teams has trans-formed enterprise communications and collaboration and how to get more out of your Teams deployment with Teams Calling. You also find out how to get your organization started with Microsoft Phone System.

Looking at the Rapid Growth of Microsoft Teams

Microsoft Teams is the fastest growing business application in Microsoft's history. Dubbed the "hub for teamwork," Microsoft Teams is a collaboration application that allows people to set up virtual teams where they can work together (that is, collaborate) on projects. It includes functionality for file sharing, persist-ent chat, calendar, and meetings, as well as plug-ins for other Microsoft and third-party applications such as Microsoft Planner, Adobe Creative Cloud, Atlassian Jira, and more.

Teams is included in a number of Microsoft 365 (formerly Office 365) bundles, including the popular E1, E3, and E5 enterprise licenses. This strategy — bundling Teams into the Office application suite — has led to Teams being used by more than half a million organizations, including more than 90 percent of Fortune 100 companies. In 2020, Microsoft reported massive growth in Teams users, predominantly driven by employees' need to work from home. At the time of publication, Microsoft had well over 100 million daily active Teams users.

REMEMBER

Microsoft 365 E1 is Microsoft's basic tier of enterprise licensing. It provides business services such as email, file storage and sharing, Office for the web, meetings and instant messaging (IM), and Teams. E1 typically only provides online access to apps (referred to as Office for the web). Microsoft 365 E3 adds the more common desktop versions of Office apps plus security and compliance capabilities. Microsoft 365 E5 adds advanced security, analytics, Microsoft Phone System, and Audio Conferencing.

Adding Voice Calling to Microsoft Teams — Phone System

Every Teams user has the ability to call another Teams user *inside* its organization. However, if users want to make calls outside their organizations, say to a business down the street, or receive calls from a customer across the country, they need their Teams client to be connected to a dial tone from a communication service provider (that is, a "dial tone provider"). Users also need the Microsoft Phone System license included in their subscriptions. Phone System provides a private branch exchange (PBX) service — or phone features — in the Microsoft 365 cloud. Phone System is included with E5 licenses and can be added to more basic Microsoft 365 bundles.

TIP

Organizations have the option to buy dial tone and phone numbers from Microsoft, referred to as Calling Plans, in 16-plus countries. These Calling Plans are sold per user with bundles of minutes for domestic and international calling. These plans are viable for very small customers (around 10 or so employees) in the supported countries, but if an organization has more than 12 or

15 employees, does business globally, or is outside these regions, these Calling Plans may not be the best fit.

However, Microsoft makes it easy for customers to buy their own dial tone from a service provider and connect it to Teams. Microsoft calls this *Direct Routing,* but you may also hear it referred to by the industry term, Session Initiation Protocol (SIP) trunking. To make it easy to connect to almost any dial tone provider, Direct Routing requires a Microsoft Certified Session Border Controller (SBC), which acts as a hand-off between Microsoft and the dial tone provider. Microsoft certification means that the SBC vendor has completed a formal approval process; in addition, certified SBC vendors continually work with Microsoft to be sure improvements to Phone System are fully supported before they're made generally available to customers. Microsoft Support works closely with certified SBC vendors to help resolve any issues in a timely manner.

REMEMBER

Depending on the context, Teams Calling is a reference to the ability to make phone calls outside of an organization. It's often referred to as Direct Routing or Microsoft Phone System (see Figure 1-1).

FIGURE 1-1: The Teams Calling route.

Getting Started with Phone System

Getting started with Phone System is easier than you may think. The four basic requirements include

» **Microsoft Phone System license in Microsoft 365:** This is typically included in the E5 package or as an add-on for E3. Some organizations may have other packages (such as education, government, and so on), so always check your contract for details.

- » **A dial tone provider that can deliver Session Initiation Protocol (SIP) trunks for Teams:** SIP trunks are the industry term for what Microsoft calls Direct Routing. If you choose a new dial tone provider, you need to either port (transfer) your existing phone numbers to the new provider or get new phone numbers (the provider can offer details and timing for each option).

- » **Microsoft-certified SBC (hardware or software) or a service that includes a certified SBC capability:** The SBC acts as a sophisticated voice firewall, manages media, and can mitigate interoperability issues.

TIP

    Ribbon has multiple certified SBCs and services that include Direct Routing capability.

- » **Ongoing monitoring and analytics:** As with any phone system, ongoing monitoring and analytics is necessary to provide visibility and proactively identify any performance or security issues.

CUSTOMER STORY: DELIVERING "MOVING EXPERIENCES" WITH TEAMS CALLING

Collaboration and communication are an *essential* part of the success of any organization, but if your business is creating great experiences for your customers, it's *critical.* So, when a well-respected Japanese design firm needed to improve communications between its customers and its Tokyo, Fukuoka, and Ho Chi Minh City offices, it turned to Teams Calling.

The design firm was already using Teams for internal meetings, so it was a natural fit to add external calling. The firm's designers spend most of the day on their computers creating award winning products and User Interfaces (UI), so integrating Teams Calling was a logical next step. However, given the firm's far-flung offices, it had to have a solution that could integrate different dial tone providers in different offices.

Microsoft Direct Routing provided a way for the design firm to connect Microsoft Phone System to its dial tone provider in different locations. Employees working on a project would be able to use Teams to make and receive calls to and from their customers and suppliers, regardless of location.

The design firm turned to Ribbon Communications and chose Ribbon's SBC 1000. The Ribbon SBC 1000 was ideal for the design firm's size and needs. It easily met the firm's existing requirements and had room for growth. The SBC 1000 has options for analog and digital interfaces, so it can be used to migrate existing infrastructure. It's also ready to support locations across the globe so multi-national organizations can replicate the same solution across the globe, making life easier for IT staff.

Assured with the knowledge that it has a secure, reliable conduit from its on-premises telephony to the Microsoft Phone System in place, the design firm is concentrating on delivering the "moving experiences" its customers expect.

Chapter **2**

Planning a Successful Migration to Microsoft Phone System

I n this chapter, you learn about different deployment models for connecting Microsoft Phone System to a dial tone provider using Direct Routing. You also discover how you can leverage your existing private branch exchange (PBX) with Microsoft Phone System and what other considerations need to be addressed as you plan your migration to Microsoft Phone System and Direct Routing.

Understanding How Phone Calls Flow In and Out of Teams

Microsoft Direct Routing has two typical deployment options that determine how phone calls will flow in and out of Teams. This decision is largely based on your organization's cloud strategy and any existing on-premises infrastructure your organization may own. Likewise, the Session Border Controller (SBC) deployment options are either in the cloud or on-premises, driven by the design of the Direct Routing implementation.

For organizations that have embraced a cloud-first strategy and don't have (or won't be using) an existing PBX, contact center, or numerous analog devices, the cloud-based Direct Routing option, shown in Figure 2-1, is generally a better option. Cloud-based Direct Routing provides lower latency and better support for remote and mobile users.
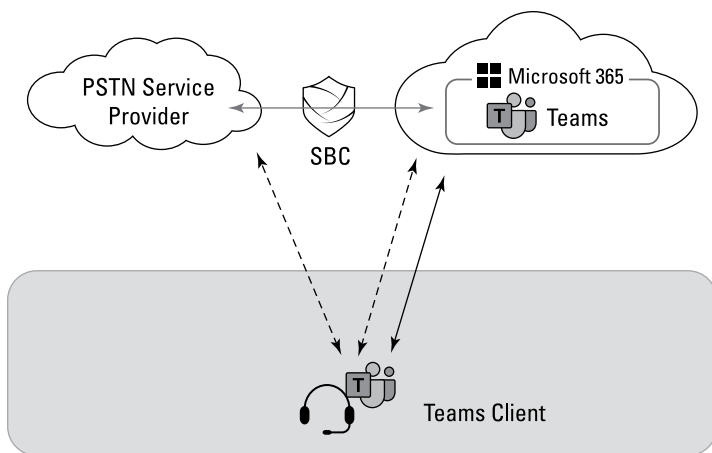
FIGURE 2-1: Cloud-based Direct Routing.

In the cloud-based Direct Routing model, your dial tone provider connects directly to the Microsoft 365 cloud via a cloud-based SBC. The SBC is either owned by the organization and hosted in the cloud (for example, AWS or Azure) or owned, hosted, and managed by the dial tone provider.

Deploying an SBC in Azure provides additional performance and efficiency benefits by having both your SBC and Microsoft Teams in the same cloud.

For organizations that have an existing PBX, a large contact center, or a lot of legacy devices (such as fax machines or analog phones), the on-premises Direct Routing option, shown in Figure 2-2, may make more sense. However, organizations should consider whether the benefits of modernizing their infrastructures with a cloud-based deployment model makes more long-term sense than continuing to pay to support and maintain their legacy on-premises devices.
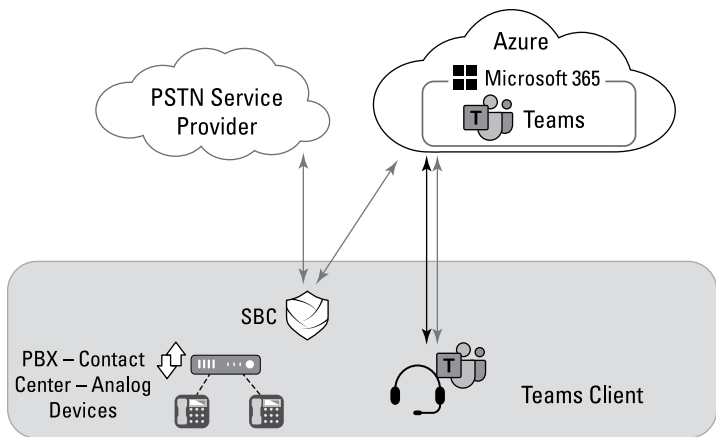
FIGURE 2-2: On-premises Direct Routing.

In the on-premises Direct Routing model, calls flow in and out through an on-premises SBC that's connected to your organization's dial tone provider and to the Microsoft 365 (Azure) cloud.

> **TIP**
>
> The cloud-based Direct Routing model provides organizations with the benefits of the cloud as well as quicker access to new features and capabilities. Maintaining legacy on-premises infrastructure and devices may be more costly and inefficient in the long term.

Can I Keep My Existing PBX?

Many organizations have a significant investment in an existing phone system, whether it's an on-premises IP-based PBX such as Avaya, Cisco, Mitel, and so on, or a multi-year contract for a cloud-based Unified Communications as a Service (UCaaS) offering such as 8x8 or RingCentral. They may also have complex business workflows, call routing rules, and dial plans configured — and moving these configurations to a new system is no trivial matter. For these organizations, migrating to Microsoft Phone System may be more of a journey that takes place in different phases, over time, rather than a quick "rip-and-replace" weekend cutover.

RIBBON CONNECT: MICROSOFT TEAMS DIRECT ROUTING AS A SERVICE

Ribbon Connect for Microsoft Teams Direct Routing is a cloud-based service that securely connects new or existing phone lines, numbers, and service plans to Microsoft Teams. Organizations can use Ribbon Connect to make Teams their primary phone system or use it to enhance an existing PBX or cloud UC experience.

Ribbon Connect is purchased on a per-user, "as-a-service" basis so organizations can deploy it for everyone or only a few employees in one location or globally. There's no hardware or software to buy, deploy, or manage and no startup, hidden, or one-time fees, so IT won't be tied down doing deployments, upgrades, and support — simply add users via an intuitive web portal.

Ribbon Connect integrates with existing communications systems, including on-premises PBXs and contact centers, and won't disrupt any existing dial tone contracts (see the sidebar figure). Businesses only pay for the licenses they use and can quickly scale up or down as business needs change.
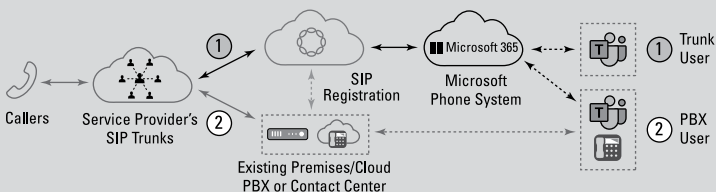
It's easy to get started with Ribbon Connect. You can take a test drive with a 30-day, 25-seat pilot at no cost in just minutes. Easily validate interoperability and demonstrate the value of the solution to your decision-makers and end-users, then complete your assessment and quickly add more users. Go to `rbbn.com/rbbn-connect` to get started.

A Microsoft-certified SBC (or service) offers organizations the option to leave their existing PBX or cloud unified communications (UC) solution in place and maintain their existing dial tone agreements. This gives organizations the flexibility to transition

a work group or a branch office with thousands of sites, over time, as business needs dictate. The SBC can be configured so that incoming calls ring the user's existing PBX phone and Teams client (desktop or mobile) at the same time.

REMEMBER You can leverage your existing PBX or UCaaS investment with Microsoft Phone System, while providing your users with a consistent Teams Calling experience that brings together all their co-workers, contacts, and collaboration in the Teams client.

Addressing Other Considerations

For many organizations moving to Microsoft Phone System, configuring Direct Routing and integrating an existing PBX (if needed) is one piece of the journey. As you plan your migration, you need to address several other considerations, such as

» Setting up emergency 911 services (will you need to do this yourself, or will your dial tone provider help?)

» Ensuring interoperability with a contact center (if you have one)

» Purchasing headsets and devices to use with Teams (if needed)

» Dealing with all those "one-off" services — such as door phones, pagers, fax machines, and more — that are critical to the business

E911 (emergency calling)

Real-time emergency 911 (E911) services can be a significant challenge when end-users are working from anywhere. Organizations implementing a UC solution with soft clients (desktop or mobile), such as Microsoft Teams, need a plan to determine a caller's physical location in an emergency.

Teams includes several tools to help organizations enable emergency calling services in Microsoft Phone System. The Teams client can provide information about which IP subnet and/or wireless access point (WAP) a caller's computer or phone is using. Teams uses this physical data in combination with a Location Information Service (LIS) function. If there's a match between

the IP subnet or WAP and the LIS, Teams can provide emergency services with a physical location for the Teams user.

Additionally, Teams allows site and user policies to be configured for emergency calling (both for 911 and to alert appropriate local building/company staff that an emergency call has been placed). A site policy normally takes precedence over a user policy. For example, a site policy may apply to users when they're on the corporate network, but the users' policies apply when they're off site.

An SBC enables even more granular location information to be provided to 911 operators or other personnel, such as a corporate security desk. The SBC can assign an Emergency Location Identification Number (ELIN), which is essentially an alias for the actual phone number, to provide more precise location information. For example, a site policy in Teams may associate a given phone number with the third floor of building X at the corporate address. The ELIN can provide additional information such as the caller's office number and which corner of building X.

WHAT IS AN ELIN?

An Emergency Location Identification Number (ELIN) is a ten-digit Direct Inward Dialing (DID) number purchased from your local dial tone provider that provides a way for organizations to give specific location information to the Public Safety Answering Point (PSAP) for a 911 call.

First, enterprise administrators assign an ELIN to each Emergency Response Location (ERL). One ELIN can be used for many phones within an ERL, but each ERL requires at least one unique ELIN. This mapping of ELINs to ERLs must then be loaded into the regional Automatic Location Identification (ALI) database.

During a 911 call, the ELIN takes the place of the caller's telephone number as the Automatic Number Identification (ANI) and is used to route the call to the appropriate PSAP. The PSAP uses the ELIN to query the ALI database and retrieve the caller's location (that is, the ERL). Should the caller be disconnected, the PSAP can also use the ELIN to call back the extension directly (which requires a temporary mapping of the 911 caller's number to the ELIN), bypassing the PBX attendant or auto-attendant.

A policy must be defined to enable emergency calling in Teams.

Always consult your local rules and regulations as well as Microsoft Teams documentation when configuring and testing emergency 911 services for Microsoft Phone System. Microsoft documentation provides some helpful information to get you started. For more information, visit `docs.microsoft.com/en-us/microsoftteams/teams-overview`, and click "Voice - Phone System and PSTN connectivity" on the left side of the screen.

Contact centers

Many organizations also have large contact centers and specialized contact center software with complex configurations for dialing plans, calling groups, automatic call distributors (ACDs), skills-based routing, and more. In most cases, it's neither feasible nor desirable to "rip and replace" these systems, because Teams itself isn't an ACD.

An SBC enables organizations to connect their Microsoft Phone System to their existing PBX and/or contact center so that calls can be routed between systems. For example, a contact center agent might need to transfer a customer from the contact center system to the accounts receivable person who uses Microsoft Phone System. The SBC can enable transfers between these disparate systems.

Teams phones

Recent events have forced many people to work from home where desk phones aren't available. This may accelerate the adoption of soft clients, but you still need to account for the usage of physical desk phones. Typical examples include retail locations, manufacturing, and healthcare.

In addition to softphones, headsets, and the Teams mobile client, users can choose from a variety of desk phones available for Teams from Lenovo, Poly, Yealink, and others.

Door phones, paging, and other stuff

Many technologies and systems still rely on analog services that are used for important functions within organizations. Door phones, elevator phones, and fax machines are some of the more obvious ones, but it's not uncommon to find a system that's still

connected to an analog modem somewhere. For example, supervisory control and data acquisition (SCADA) systems in manufacturing environments may be connected to a modem and a plain old telephone system (POTS) line for remote access. Even systems attached to the IP network may have be connected to an analog phone line for out-of-band management in case of a network failure.

Another less obvious example is emergency phones located in a parking lot or across a campus. These phones are typically configured to dial directly to a security desk (and perhaps simultaneously dial 911) and rely on traditional "landline" analog services.

TIP

An SBC incorporates tone detection (the ability to recognize and act on standard analog telephone touch tones) to recognize and then properly route fax and tone signals, among others.

Chapter **3**

Looking at the Role of the Session Border Controller in Direct Routing

n this chapter, I explain what a session border controller (SBC) is and what it does. You need to know its importance in the modern threat landscape, what to look for in an SBC, and how to choose the right deployment options for your Teams deployment.

Reviewing the Basics of SBCs

Modern telecommunications networks use the same foundations as modern Internet Protocol (IP) data networks. All the voice and data traverses IP networks. In order to manage call signaling (that is, ring, answer, hold, hang up, and so on), most voice networks use a protocol called Session Initiation Protocol (SIP). To manage how media (voice and video) traverses the network, they use Real-Time Protocol (RTP). RTP is thought of as the payload — the

actual voice or video content. SIP is the signaling that tells RTP traffic where to go and what to do.

SBCs, as the name implies, typically sit at the borders of different networks. If call traffic needs to move between networks, SBCs act as the border sentry between them. The SBC watches the SIP and RTP media traffic (the IP packets), not unlike the way a border guard watches vehicle traffic. The SBC makes sure packets have a valid "license plate" and inspects a packet's payload to be sure what's inside the packet matches what's being advertised on the outside. If the origination point or destination point looks sketchy, it may refuse entry altogether.

REMEMBER

SBCs don't always face outward — they can also be used to segment a network and protect two different segments of the same network. For example, a hospital may use multiple SBCs inside its campus to segregate patient calls from staff calls, or one building's calls from another to provide an additional level of privacy.

The SBC is also a fast worker. It must inspect every packet coming in or out of the network, in fractions of a second. If it were to delay the traffic, voice and video quality would suffer. In addition, the SBC must have plenty of spare capacity to combat voice-centric Denial of Service (DoS) attacks. These types of attacks try to overwhelm the SBC by flooding it with worthless traffic in the hopes that it will slow down the voice traffic (impacting quality) or fail completely. A robust SBC must be able to cast aside the attack traffic without adversely impacting normal conversations. This kind of cyberattack may sound techie, but imagine the impact of a successful DoS attack combined with a physical attack: Users would be unable to call for help when they needed it most.

How Do I Choose Between Hardware, Software, or Cloud SBCs?

Organizations implementing SBCs in their Teams Direct Routing environment have a lot of deployment options available. To help you choose the right option for your organization, take a look at the following questions:

>> **Do you need to maintain a legacy private branch exchange (PBX) or contact center in concert with your Teams deployment?** Read Chapter 2 to learn more about your deployment options if you need to keep your existing PBX (or "phone switch") or have a large contact center.

>> **Do you need to connect analog devices or fax machines?** Don't forget this can include door phones, elevator phones, paging systems, emergency phones in parking lots, or even legacy computer modems — yes, they still exist, too!

>> **Is there a limitation to where the SBC is located?** The SBC's location may be dependent on network topology and possibly regulatory requirements.

>> **Is there a strategic goal to move to the cloud?** Many organizations are trying to migrate all of their IT assets to the cloud to minimize overhead for their IT staff.

>> **Is the organization interested in paying for services as a one-time purchase or as a monthly service per user?** SBCs can be deployed as hardware or software on-premises, software in the cloud, or "as a service" in the cloud.

>> **Who will be responsible for monitoring and managing the SBC?** Organizations with the requisite expertise may wish to manage their own SBCs, while others may prefer to outsource monitoring and management to a cloud service provider.

Table 3-1 summarizes the different SBC deployment options I cover in this section.

TABLE 3-1 **SBC Deployment Options for Your Organization**

	Hardware	Software	Cloud	As a Service
Costs	CapEx	CapEx	CapEx or OpEx	OpEx
	Maintenance contract	Maintenance contract	Service and support often included	Service and support included
	Software upgrades	Software upgrades	SBC only	SBC and other elements
	Hardware support		Remote monitoring option	

(continued)

TABLE 3-1 *(continued)*

	Hardware	Software	Cloud	As a Service
Benefits	Migration (FXO, FXS T1/E1 ports; local PSTN connectivity) Local survivability (PSTN, WAN)	Local PSTN connectivity Easily deployed in datacenter	Ideal for cloud-to-cloud deployments Rapid deployment Low-touch support	Includes Teams and PBX configuration (not just SBC) Ideal for cloud-to-cloud deployments Rapid deployment Low-touch support

SBC in the data center

Organizations with more than one location have the option of utilizing a centrally located SBC or placing SBCs at multiple locations. For the past two decades, large, distributed organizations have placed PBXs in a data center and backhauled voice traffic to the data center over leased lines. This allowed organizations to concentrate expertise in a central location to manage their voice systems and centralize dial tone access to get the best volume pricing.

A hub and spoke network topology, where the data center is the hub and the remote offices are the spokes, makes placing an SBC in the data center a viable option. Subject matter experts are available locally to work on any issues, and voice traffic can egress to a communications service provider (CSP) from a single location, reducing the number of access points that need to be monitored and managed.

Positioning an SBC in the data center enables the SBC to handle a high call volume and provide service for many remote locations. With this architecture, the SBC is in a critical location, and many organizations choose to deploy SBCs in high availability pairs to help ensure that an outage or failure doesn't disrupt operations. Organizations can choose from appliances that scale to over 100,000 simultaneous conversations or virtualized software that runs on industry-standard servers.

SBC at the remote office

Cloud adoption is causing organizations to rethink their network topologies. Rather than accessing applications in the corporate data center, end-users access web and cloud-based applications via a regular Internet connection. It makes sense to shorten the path to the application server by avoiding the routing of traffic through the data center. Instead, routers can be positioned at remote locations to connect to the Internet locally, shortening the path to the application server.

Similarly, connecting SIP trunks to Microsoft Teams Phone System can be accomplished through an SBC located at a remote office. Shortening the network path is even more important with voice communications. Latency and packet loss can make voice communications intolerable, and a local Internet connection mitigates that risk. Microsoft recommends local egress to minimize the time needed to connect to their global network where traffic to their applications is optimized.

A local SBC can also be an important part of a resiliency plan because the SBC can seamlessly reroute voice traffic in the event of a wide-area network (WAN) failure. It can also be equipped with analog ports or even T1/E1 interfaces to keep local PBXs or contact centers connected. Microsoft has specially designed software for this function called Survivable Branch Appliance (SBA). A hardware-based SBC can run the SBA services to enable a location to have basic calling services even if the Microsoft 365 cloud isn't available.

The only downside to placing a hardware- or software-based SBC in a remote office is that you're moving it away from the subject matter experts in the corporate office that are best equipped to manage it. Ribbon's SBC 1000, SBC 2000, and SWe Lite series, as well as EdgeMarc devices (see the sidebar, "Simply powerful software-defined wide-area networking") overcome this challenge by enabling centralized configuration, management, and monitoring. Alert triggers can be set when performance falls below a threshold, allowing administrators to proactively investigate and address concerns. These advanced troubleshooting tools enable fast problem identification and resolution. Of course, it may also be the right time to consider a cloud SBC instead.

SIMPLY POWERFUL SOFTWARE-DEFINED WAN

Software-defined WAN (SD-WAN) has been getting a lot of attention as a replacement for costly multiprotocol label switching (MPLS) networks. Some typical features of SD-WAN include dynamically optimizing application performance, next-generation firewalls, bandwidth aggregation, and machine learning. The abundance of functionality is appealing, but the cost and complexity of deployment may not be viable for every organization.

Ribbon's EdgeMarc devices provide a simple set of functionalities that can be used to enhance the quality of VoIP without requiring a full SD-WAN deployment, providing a cost-effective alternative to a full SD-WAN. EdgeMarcs can be configured to prioritize Teams traffic over less critical traffic flows to provide a better user experience for all aspects of Teams. This configuration helps create a better first impression for those moving to Teams, and that promotes successful migrations for enterprises and reduces customer churn for service providers.

Redundant WAN links — whether a secondary wired circuit or a cellular (4G/5G) service — provide business continuity. This is especially important when the connection is used for critical real-time communications. Ribbon's EdgeMarc solution provides on-board redundant WAN connectivity, for both wired and wireless networks, to ensure that your critical services are always on.

Ribbon has also partnered with Yealink to provide another level of voice survivability. Yealink Teams phones can use Ribbon SBCs as a secondary registrar to make phone calls when the connection to Phone System is interrupted. When connected to Microsoft 365, users can take advantage of native functionality through the Teams client on the phone. When the connection is interrupted, users simply switch to a dial pad to continue to make phone calls. They can then switch back to the Teams client when connectivity is restored.

Software SBC — local or in the cloud

Software–only versions of SBCs are a popular choice for Microsoft Teams deployments, particularly when organizations are moving to an all–cloud model and don't need connectivity to legacy devices in their offices (legacy PBXs, contact centers, and analog devices). Products like Ribbon's SBC Software Edition and

Software Edition Lite (SWe and SWe Lite) run on virtual machines either on standard servers or in a public cloud such as Microsoft Azure or Amazon Web Services (AWS). Utilizing a public cloud for SBC functionality eliminates the capital expense and ongoing support of on-premises hardware.

Running SWe Lite on the Azure cloud (the same cloud Microsoft uses for Teams) further reduces deployment complexity and network latency, improving voice quality. This type of deployment is shown in Figure 3-1, where organizations can deploy Microsoft Phone System in the Azure cloud with Ribbon SWe Lite SBCs.
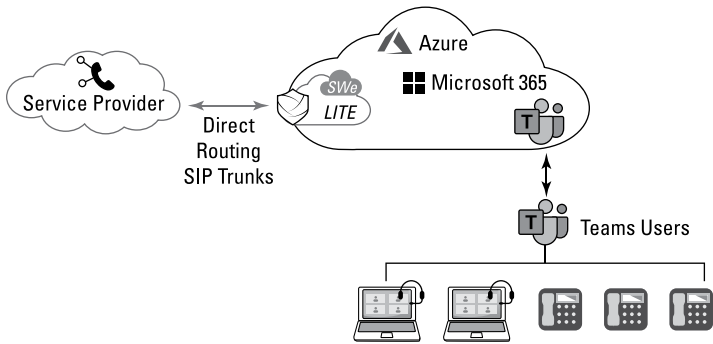
FIGURE 3-1: Running SWe Lite on the Azure cloud.

SBC as a Service

The public cloud offers many benefits to customers, including "as a service" delivery models that enable organizations to outsource their security and Teams integrations to a service provider. Just like Microsoft 365, organizations can just sign up for a monthly service that provides security and integration between Teams and their dial tone providers. Typically, the service is charged per user, per month, so understanding the cost is easy. This model also extracts IT staff from having to manage the solution.

The SBC-as-a-Service delivery model may be part of the value-added services from a dial tone provider, or it may be offered by a Microsoft Team's systems integrator or reseller. Some services include tools to better integrate an existing PBX with Teams. These may be of interest if your organization is trying to slowly migrate to Teams. There's no inherent advantage to acquiring the service from a service provider versus a local reseller or systems integrator. Like any other technology decision, buyers need to

investigate the value of the service, price points, and the reputa-
tion of the seller (see Figure 3-2).
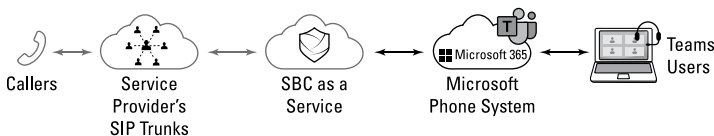
FIGURE 3-2: The "SBC-as-a-Service" delivery model.

REMEMBER

Enterprises don't have to move every user to Teams at the same
time. SBCs can replicate a call (SIP forking) to a legacy PBX and
Teams, keeping everyone connected until the migration is com-
plete. This capability makes it possible to test the new service
with smaller pilot groups, making it easier to work through any
initial issues. Microsoft often recommends this strategy as a way
of ensuring successful migrations. The same blueprint can be
used during mergers and acquisitions. SBCs can connect disparate
systems until a migration strategy can be implemented.

Recognizing the Expanded Threat Landscape

There was a time in the not too distant past when separate enter-
prise voice and data networks were the norm. SBCs could be
thought of as the firewalls of the voice network, protecting voice
traffic from threats such as eavesdropping, toll fraud, and teleph-
ony denial-of-service (T-DoS) attacks (although SBCs do much
more than just security); and firewalls were, well, the firewalls of
the data network protecting data traffic from unauthorized access.
Today, enterprise voice and data networks are, more often than
not, one and the same. As such, SBCs are an integral component of
a comprehensive network security strategy that typically includes
deploying firewalls, intrusion detection or intrusion prevention
systems (IDS/IPS), anti-malware, email security and spam pre-
vention, web content filtering, data loss prevention (DLP), web
application firewalls (WAFs), and much more.

REMEMBER

A weak link in any of these assets doesn't just impact that service;
it puts the entire network at greater risk. So, when considering an
SBC, it's more than just a consideration as to how to protect voice
traffic; it's a reflection of the entire network's security.

Deploying an SBC is a requirement to connect Microsoft Phone System to your dial tone provider, but it also helps to protect all aspects of your network from potential threat vectors that may be exploited for a data breach. SBCs have traditionally been deployed to protect voice networks against common VoIP attacks, such as service theft and fraud, spoofing, denial of service (DoS), and registration storms. Today, these same techniques are being used by threat actors to also try to infiltrate the broader data network. Here are a few examples:

>> **Service theft and fraud:** Attackers may access a VoIP system to redirect traffic and use network resources to exfiltrate sensitive data. Basically, the hackers are using VoIP systems as a "side door" into the broader network.

>> **Spoofing:** Attackers may use social engineering techniques to trick a user into disclosing valuable information (such as a username and password) by modifying or disguising an identity (for example, caller ID) on the network. The hackers then use this information to access other systems.

>> **DoS/Distributed Denial-of-Service (DDoS) attacks:** Attackers may flood a server or SBC with requests to overwhelm its available resources and run a vulnerability exploit that provides escalated privileges on the network. A DoS/DDoS attack also consumes technical resources (security teams) and may be used to hide the ultimate attack objective.

REMEMBER

If your voice and data networks are already converged, adding Microsoft Phone System doesn't increase the risk to any data in Teams. The risk is simply a reflection of the fact that hackers will constantly try to find a new path into your network. In fact, an SBC helps protect both your voice and data traffic more effectively from potential threats against your network.

What Matters When Choosing an SBC?

Beyond the basics of controlling and securing real-time communications on a network, you want to look for other essential functions in an SBC. This section explains some of those functions.

In addition to the technical functions in this section, many other considerations are important when choosing an SBC. I explain more about these considerations in Chapter 5.

Normalizing SIP

Enough variations exist in SIP that sometimes two systems connecting to each other using SIP find that they aren't speaking the same language — the basics are all there but with differing syntax and dialects in what otherwise appears to be a common language (kind of like American English versus British English). There's just enough difference to cause confusion. An SBC must be able to speak all the different dialects of SIP and do on-the-fly translations in both directions. So, if a call is crossing a border between a system using Dialect X and another system using Dialect Y, the SBC must find the parts of Dialect X and Y that don't quite match up and convert them back and forth as the call moves across the SBC.

Transcoding calls

Another one of the SBC's jobs is to transcode, or change, codecs as media sessions pass through the SBC. A *codec* is a technology that converts an analog signal to a digital stream of bits. Codecs can either be uncompressed or compressed to support the application in question. The SBC knows which codecs are supported on each side of the network border and is required, using a combination of software and/or special-purpose digital signal processors (DSPs), to decode and then re-encode the voice or video signal as it crosses the network border. In the case of Microsoft Teams, the SBC can transcode Microsoft's native codec SILK. This assures that users get the highest possible quality audio.

Supporting video

A wide range of video conferencing standards exists, but despite these standards, interoperability issues still prevail due to different protocols (such as SIP and H.323) or video/audio compression (such as H.264, H.263, G.722, and so on). Other issues may include basic connectivity and interoperability with devices that provide a less than optimal experience due to call speed and device type.

WHY DO I NEED A CERTIFIED SBC?

You need a certified SBC because Microsoft requires a certified SBC to support Direct Routing deployments. But it's not just because you "have to." Microsoft understands that an SBC provides a layer of voice-specific security that protects the voice assets but also makes it harder for bad actors to use that access as a point of ingress into the rest of your network.

In a Microsoft Direct Routing deployment, a certified SBC provides the following capabilities:

- **Security**
  - Secure access to the network
  - Protect internal assets
  - Ensure privacy and compliance
- **Session control**
  - Resource allocation
  - Overload and call admission controls
  - Redundant WAN links and Teams SBA services
- **Media services**
  - Dual tone multi frequency (DTMF) and fax
  - Media transcoding (changing media formats for interoperability)
  - Tones and announcements support
- **Interworking**
  - Multi-vendor consolidation
  - Media optimization
  - SIP migration

Certified SBCs are essential when moving to Microsoft Phone System. They are the fully supported way of connecting your existing telephony to Teams through Phone System. Certified SBCs are tested with the continuous improvements to Phone System, ensuring that new functionality can be taken advantage of immediately. Whether organizations want to manage their own SBC or have a service provider do that for them, the SBC is the glue that connects real-time communications on-premises, in the cloud, and in the service provider network.

Chapter 4
Exploring Teams Calling Use Cases

U nless you're a new business with no legacy phone equip-ment, you generally have three options when transitioning to Teams for voice services:

» Transition all your users to Teams, either all at once or by taking a phased approach.

» Create an integrated hybrid environment in which some of your users move to Teams for voice and the rest of your users stay on your existing private branch exchange (PBX), and both user groups are interconnected.

» Create a non-integrated hybrid environment in which some of your users move to Teams for voice and the rest of your users stay on your existing PBX, but the user groups aren't interconnected.

In this chapter, you find out more about these different scenarios.

Using Teams as a Standalone Phone System

The simplest transition model to Teams is to enable Microsoft Phone System for all your users, move your dial tone to Teams, and turn off your old PBX system. This process, shown in Figure 4-1, is simple to understand and cost effective when compared to the cost of operating and paying for two systems performing the same services. The smaller and less complex your organization is, the easier it is to transition to Teams Calling using this model.

Cutting over from an old to new system is a straightforward approach, but it does require appropriate planning. First, it assumes there's only one, or perhaps a few, sites to transition at once. Trying to transition more than a few sites at a time is probably not practical for most organizations. This kind of flash transition means ending the workday or work week on the old PBX system and starting the next day or next work week on Teams Phone System. A cutover such as this requires having everything planned in advance so everyone and everything is ready to transition, including

» There must be a plan to migrate your phone lines or trunks from where they are today to the Teams cloud. In most cases, your service provider will be part of this effort and require advance notice to make the change. You should assume there will be a period during the cutover when the phone lines are unavailable (which is why you'll typically want to cutover at night or over a weekend).

» You need a Microsoft Certified SBC deployed and tested, either in your building or in the cloud, to connect your voice trunks to Teams.

» You need to be sure existing business processes and call flows are transitioned. For example, automated attendant menus, hunt groups, call park groups, and similar call flows all need to be replicated. Fax lines, elevator phones, and door phones also need to be migrated. This can all be tested in advance.

» You need a plan to train your users on how to use Teams Phone System services and a well communicated plan for exactly when and how you'll make the cutover.

Before

Azure
Microsoft 365
T Teams

Service Provider

PBX for
Phones

Teams Client for
Collaboration
T

After

Azure
Microsoft 365
T Teams

Service Provider

SBC

Teams Client for
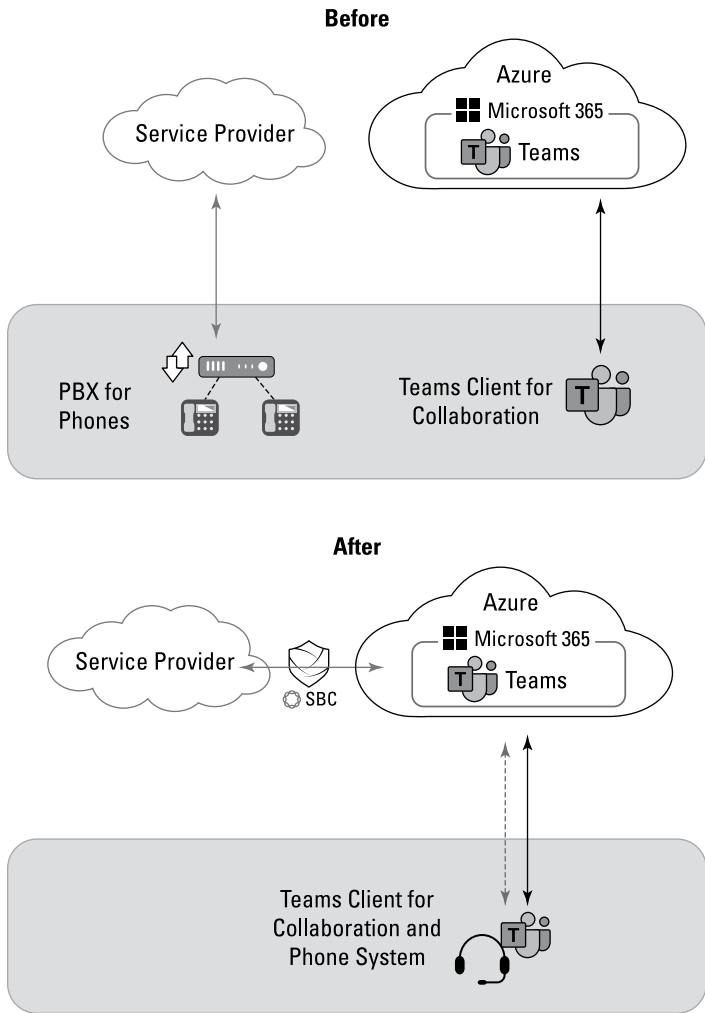Collaboration and
Phone System
T

FIGURE 4-1: Using Teams as a standalone system.

Transitioning and Interoperating with an Existing PBX

Transitioning to Microsoft Teams and integrating with an exist-ing PBX is perhaps the most common method to migrate to Teams. Even if the end goal is to get all your users to Teams, doing it incrementally and having a shared dial plan is a tried and

true way to achieve your organizational goals while minimizing disruption to your users and your customers.

As I discuss in the preceding section, planning a one-time cut-over requires multiple activities to occur concurrently and often involves extra costs and brief outages. Many organizations would rather leave the existing PBX in place and execute a gradual migration to provide a backup plan in case there are any unforeseen migration issues.

In some cases, completely removing an existing PBX may not be practical. Your existing PBX may be tied into existing systems such as manufacturing control systems or medical systems. Removing an existing PBX may not be financially feasible, for example, if an organization is interested in providing Teams Phone System access to busy executives and road warriors but doesn't have the budget to migrate thousands of other employees to Teams.

You can transition to Teams Calling and still leverage an existing PBX by following a few basic examples in this section.

Integrating via phone lines

When integrating phone lines (also known as *trunk-side integration*), one inbound call rings on multiple devices (called *simultaneous ringing*). As an incoming phone call enters the SBC, the SBC replicates the call signaling so multiple endpoints on multiple systems can ring at the same time. This approach works well for users that have a legacy PBX and want to use their Teams mobile client to make and receive calls, as well as users that frequently work remotely or from home.

In this use case, both the Teams client and the user's PBX phone would ring. When the user answers on either system, the call is connected, and the ringing stops on the other system. A user can make a call from either his Teams client (desktop or mobile) or PBX phone (see Figure 4-2).

This type of integration is simple and cost effective for incoming and outgoing calls. It is also simple to implement because the SBC does most of the work.
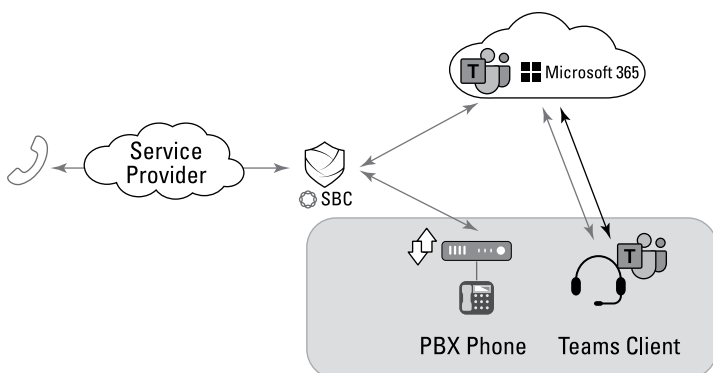
FIGURE 4-2: Trunk-side integration.

⚠️ **WARNING**

The limitation of this type of integration is that the Teams environment and the PBX environment are still separate. They're only connected where they meet the outside world, but they can't talk to each other. Here's a simple example of this limitation:

1. **Joe is extension 1001 on the PBX; Olivia is extension 1002 on the PBX.**

2. **Joe tries to call Olivia on extension 1002.**

   Because the call is internal and Teams isn't in the call path, the PBX is only going to ring Olivia's PBX phone, not her Teams client.

   Conversely, if Olivia uses the Teams directory to call Joe, Teams is only going to alert Joe's Teams client, not his PBX phone.

Integrating via phone stations

In some cases, it may be possible to leverage the existing PBX to help with the migration to Teams Calling. This model uses the PBX's ability to ring multiple devices to alert Teams clients and the PBX's desk phones. By using this *station-side integration*, calls are split after they reach the PBX (see Figure 4-3). The PBX does the call forking (called *simultaneous ringing*).
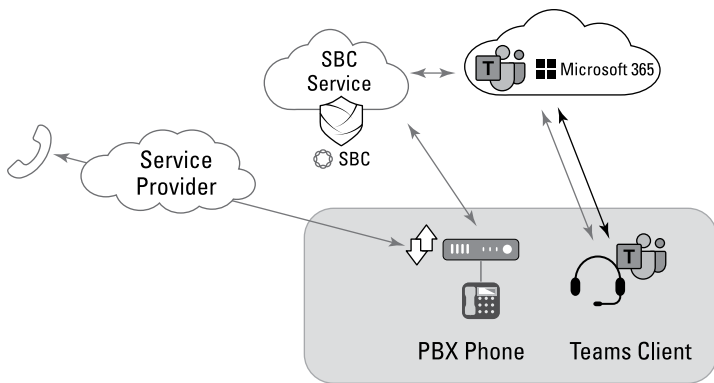
FIGURE 4-3: Station-side integration.

In this model every call always comes into the PBX, so if the call is for Olivia at extension 1002, the PBX routes the call to extension 1002 but it also rings Olivia's Teams client. This is accomplished by the SBC mimicking a "softphone" connected to the PBX. The PBX rings Olivia's desk phone and a softphone, which happens to be the SBC connected to Teams. The SBC then sends its call to the Teams client for call completion at Olivia's Teams softphone. Likewise, Olivia could place a call from either her desk phone or her Teams client.

From the perspective of your users, station-side integration handles external calls the same as trunk-side integration. However, with station-side integration, it's easier to stay connected internally. Because all the calls go through the PBX, anyone can call anyone internally by just dialing an extension. Users can see when someone's phone is busy, and the PBX can send calls directly to Teams users.

Station-side integration is also compelling because it's easy to leave a PBX in place, and just connect a small group of "power users" to Teams. As an example, this may the best solution for a manufacturing environment where most of the phones are on the plant floor but a few executives work in the building.

WARNING However, station-side integration may not be for everyone. Consider the following:

>> The existing PBX must stay in place, so it must be fully maintained (including licensing and support). Your

organization will also be paying for Microsoft Phone System licenses and SBC services for users that require Teams integration.

» The existing PBX must support (and if applicable, be licensed for) SIP-based soft clients so the SBC service can connect to the PBX. Therefore, there may be additional costs in keeping both PBX and Teams active for a single user.

Mixed environments

Some multi-site environments simply have too many sites to fully migrate or integrate with Teams Calling. The number of sites that need to be coordinated, the number of service providers involved, and the challenges with working across borders (or across oceans) often makes a rapid transition impractical. In many cases, financial constraints or contractual obligations may also delay transition plans.

Large organizations often need a plan to operate for months or even years in a diverse environment with both legacy systems and Teams Calling. Organizations may have some sites with only Microsoft Teams deployed, others with trunk-side integration, and still others with station-side integration. This may cause some short-term challenges in calling behavior across locations. Regardless of your technology or approach, successful migrations require adequate planning and realistic timelines. However, an end state vision of transitioning to an all Teams Calling environment will improve your organization's ability to connect and collaborate both internally and externally.

GLOBAL LOGISTICS COMPANY DELIVERS WITH MICROSOFT TEAMS

Deadlines are important in any organization, but if your business is global logistics, staying on schedule is what matters most to you and your customers, especially when those schedules need to be coordinated across more than 60 countries and 15,000 employees.

(continued)

Challenge

A global logistics organization needed a common communications platform to connect all its employees. Like many organizations, the company had grown through acquisition and opportunity, creating a disjointed communication environment. In addition, the company's mission had evolved from being a simple express shipping company into a strategic supply chain partner for multi-national companies. The organization needed a consistent way to connect with its customers, coworkers, and suppliers worldwide.

Solution

The logistics organization turned to Microsoft Phone System with Direct Routing to replace a mix of antiquated phone systems previously deployed across its locations. Adopting Teams company-wide assures a consistent experience for every employee, making it easier and faster for employees to connect. And, with Teams it's easier for employees to share different types of information (files, links, images, and so on) along with traditional phone calls. Employees and customers get the right information every time, which speeds up deliveries and reduces mistakes.

Traditionally, trying to deploy and maintain the same kind of communications hardware in so many sites would've been a huge challenge. That's one reason this global logistics company moved everything to the cloud, including its Session Border Controllers (SBCs). The logistics organization deployed seven Ribbon SBC SWe Lite instances in the Azure cloud. Using a cloud-based SBC eliminates the need to maintain any hardware on the sites. The company's IT organization can stay focused on its core business, not upgrading phone system hardware. And because the SBCs are in the same cloud as the Microsoft Teams deployment, there's less latency, which improves voice quality and reduces the potential points of failure.

Results

Today, the logistics company is one of the fastest growing in its region, and it continues to expand into new markets. Its Microsoft Teams Phone system with a cloud-based SBC continues to deliver great results as the company grows and expands.

IN THIS CHAPTER

» Choosing a trusted brand

» Partnering with vendor solutions for enterprises and service providers

» Taking advantage of flexible deployment options

» Getting management simplicity and robust security

» Scaling for growth and innovating for the future

Chapter **5**

Ten Reasons to Secure Microsoft Phone System with a Ribbon SBC

Whether you're an enterprise using Voice over Internet Protocol (VoIP) or unified communications (UC) or a service provider offering VoIP or UC services to your customers, your choice of session border controllers (SBCs) is integral to your real-time communications (RTC) architecture — including Microsoft Teams Calling — and the success of those services.

In this chapter, I give you ten reasons to choose a Ribbon session border controller (SBC) to secure your Teams Calling deployment.

Proven Brand

SBCs perform a mission-critical role for enterprises and service providers. As such, you want to make sure you're working with a vendor who has the experience and expertise to deliver a resilient,

high availability solution with no single point of failure. Whether you're deploying an SBC as an appliance or in a virtual, cloud-based solution, make sure your SBC vendor understands what you need for success.

REMEMBER Ribbon SBCs are certified by Microsoft and fully support Microsoft Phone System. Ribbon has extensive experience (approximately 15 years) working with Microsoft. Ribbon SBCs are used in Microsoft's labs, and new Phone System features are tested on Ribbon SBCs before being rolled out.

Solutions for Enterprises and Service Providers

Whether you're a small or mid-sized business (SMB), a large enterprise supporting hundreds of branch offices, or a global service provider offering services to thousands of customers, Ribbon SBCs are designed to fit your unique requirements:

» SBC SWe Lite, SBC 1000, and SBC 2000 series for SMBs and branch offices

» SBC SWe, SBC 5400, and SBC 7000 series for large enterprises and communications service providers

» EdgeMarc Intelligent Edge Portfolio (2900, 4806, 4808, 6000, and 7301) for communications service providers and multi-site deployments

» Ribbon Connect as a Service offers that include ready-to-use SBC services and cloud-based provisioning tools for enterprises and communications service providers

Multiple Deployment Options

Ribbon SBCs are available as either hardware appliances or software that can be deployed on-premises, in data centers, and at branch offices, or in a public cloud, such as Microsoft Azure or Amazon Web Services (AWS).

Virtual software appliances can run on Microsoft Hyper-V, VMware vSphere Hypervisor, or Linux KVM as a virtual machine on industry standard servers, as a Virtual Network Function (VNF) in an OpenStack cloud infrastructure, or as a VNF in a public cloud.

TIP

Ribbon also offers turnkey cloud services that include ready-to-use SBC services and web-based provisioning tools, which can be purchased as a one-time license or as a consumption-based (as a service model) monthly recurring expense. When deployed in the AWS or Azure cloud, Ribbon's SBCs can help organizations reduce costs by making the most efficient use of cloud resources.

Simple to Deploy and Manage

Ribbon SBCs are designed for ease of deployment and growth. Both session and port expansion can be remotely enabled via a simple license, which eliminates the need for a site visit. Configuration and management can be performed in a single, secure, web-based graphical user interface (GUI) with an easy configuration wizard for quick provisioning and real-time monitoring.

TIP

Other Ribbon SBC configuration and management features include

>> Representational State Transfer (REST) based API to remotely manage multiple SBCs

>> Simple Network Management Protocol (SNMP) v2c/v3 for comprehensive network management using third-party management systems

>> Configuration backup and restore, configuration upload from one site to another, partial configuration import export through REST

>> Call Detail Record (CDR) reporting

>> Syslogs for troubleshooting, with support for Ribbon LX syslog server and log parser tool

>> Historical statistics and Threshold Crossing Alerts (TCAs)

Robust Security

Securing Session Initiation Protocol (SIP) traffic on the network is a high priority for enterprises and service providers alike. Ribbon SBCs are designed to

>> Provide end-to-end encryption on both the media and the signaling components of network traffic.

>> Hide the topology of the private portions of your network with Back-to-Back User Agent (B2BUA).

>> Protect the network from denial-of-service (DoS) distributed DoS (DDoS), and telephony DoS (T-DoS) attacks, while maintaining the capability to still connect legitimate sessions.

>> Implement allowed and disallowed lists, as well as gray lists to explicitly identify country codes, area codes, and phone numbers that should always be blocked (disallowed lists), always be allowed (allowed lists), or temporarily be blocked (gray lists).

REMEMBER Voice and data traffic run over the same IP–based network. Voice can be an attack vector for bad actors to access your data traffic and vice versa (data can be an attack vector to your voice traffic). You must ensure robust security across your entire network to protect against all types of IP–based voice and data threats.

Media Optimization

Today's SBCs need a robust media component that has both the computational horsepower and the sophisticated software to per–form on–the–fly transcoding and transrating of all sorts of media. It also has to manage media flows so internal calls don't send media out and back from the Microsoft 365 cloud. The SBC is an important component to

>> Support Microsoft's SILK codec, assuring calls have the highest voice quality with the most efficient use of bandwidth.

>> Provide Quality of Service (QoS) to ensure an outstanding customer experience.

- » Manage media streams between the Teams clients and the SBCs, even if the SBCs are behind corporate firewalls and not visible externally.

- » Perform the necessary media transcoding, including SILK, to interoperate between Teams and dial tone providers or third-party devices.

Endpoint Interoperability

Different vendors and different VoIP networks may speak in slightly incompatible ways when they use SIP. This can make initial configuration challenging. This incompatibility can also result in calls that can't be completed or are degraded in some way (or perhaps missing some functionality). The SBC plays a huge role in understanding the different variants of SIP. Ribbon SBCs have extensive configuration parameters to fine tune connectivity.

TIP Ribbon SBCs support all known variants of SIP through SIP normalization (translating between different SIP variants) using static rules configured on the SBC, or on-the-fly as different varieties of SIP are encountered by the SBC.

World Class Support

Ribbon has support personnel and technical resources located around the world to help customers whenever and wherever they're needed. With annual revenues of more than $900 million and 4000+ employees, Ribbon is well-positioned to provide world class support to enterprises and service providers.

Seamless Scalability for Any Size Organization

Ribbon uses a three-dimensional approach to scalability by separating the processing functionality of the SBC so individual tasks, such as transcoding or encryption, can scale up or down without impacting the performance of other SBC tasks.

Ribbon divides the SBC processing into three categories:

>> Signaling and general computing

>> Media processing for networking

>> Transcoding

With this approach, when certain functions in your VoIP network need more horsepower, you have it. But you don't lose capacity in other areas that already have a comfortable degree of overhead. Best of all, this architecture works for both hardware appliances as well as virtual and cloud-native deployments.

Ready for What Comes Next

Ribbon offers innovative, standards-based solutions built on world-class technology that delivers intelligent, secure, embedded real-time communications for today and the future. Ribbon SBCs support a broad array of media services, signaling, authentication, security, and QoS standards and protocols helping customers avoid vendor lock-in and prepare for the future of real-time communications.

Choose Microsoft Teams for your phone system

Organizations everywhere are already using Microsoft Teams collaboration features, including web meetings, instant messaging, file sharing, calendar, and third-party software integrations. Why not use the same solution to make and receive office phone calls, replacing a stand-alone phone system? Microsoft Direct Routing makes it easy to connect Teams to a dial tone provider so employees can stay connected to customers and business partners. It's easy, and in this book, you find out how.

Inside…

- Make Teams your office phone system
- Learn about Microsoft Direct Routing
- Get securely connected to the cloud
- How to reuse existing equipment
- Learn the ABCs of SBCs

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