RingCentral
Special Edition

Cloud Communications and Collaboration

For **dummies**®

A Wiley Brand

Get advanced
UC in the cloud

Integrate biz communications
and workflows

Boost collaboration
and productivity

Brought to
you by:

RingCentral®

Lawrence Miller

Ittai Geiger

About RingCentral

RingCentral, Inc. (NYSE: RING) is a global provider of cloud unified communications and collaboration solutions. More flexible and cost-effective than legacy on-premise systems, RingCentral empowers today's mobile and distributed workforces to be connected anywhere and on any device through voice, video, team messaging, collaboration, SMS/MMS, conferencing, online meetings, contact center, and fax. RingCentral provides an open platform that integrates with today's leading business apps while giving customers the flexibility to customize their own workflows. RingCentral is a leader in the 2017 Gartner Magic Quadrant for Unified Communications as a Service Worldwide for the third consecutive year. RingCentral is headquartered in Belmont, California.

Cloud Communications and Collaboration

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by Lawrence Miller and Ittai Geiger

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Cloud Communications and Collaboration For Dummies®, RingCentral Special Edition

Publisher's Acknowledgments

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Introduction

As businesses continue to embrace the cloud, many are migrating their most heavily used business applications — including office productivity, customer relationship management (CRM), customer care, and more. In today's increasingly "anytime, anywhere" workplace, this is a productivity booster for office employees, remote workers, IT staff, and others who need to stay connected with each other, as well as customers, business partners, and suppliers, regardless of their locations or devices.

The cloud is not only a powerful, flexible, and reliable platform for office productivity applications, but also an equally compelling platform for business communications solutions including phone, fax, voice, short message service (SMS) text, and video conferencing. Add the ability to integrate best-of-breed business communications solutions directly into Office 365, Salesforce, ServiceNow, and other cloud-based Software as a Service (SaaS) solutions, and the business benefits are huge.

Unified communications (UC) enables greater efficiency by integrating real-time communications (such as voice telephony, audio/web/video conferencing, and instant messaging) and non-real-time communications (such as email, voicemail, and fax). Productivity soars when you place business applications and business communications solutions on the same platform and make all those capabilities accessible from one familiar user interface. Bringing business communications and applications together in the cloud is a win for your entire organization. No more hassles and distractions due to switching between applications and devices; employees have everything they need right in front of them all the time on any device. Your IT staff also reaps big benefits and cost savings through reduced complexity and management requirements.

In this book, you learn how your organization can realize the benefits of the cloud with Unified Communications as a Service (UCaaS).

About This Book

Cloud Communications and Collaboration For Dummies, RingCentral Special Edition, consists of seven chapters that explore the following:

>> How business communications have evolved in the modern business and technical environment (Chapter 1)

>> Why businesses are migrating core applications and services to the cloud (Chapter 2)

>> What UCaaS is and the capabilities it can provide (Chapter 3)

>> How to get started with a UCaaS solution for your organization (Chapter 4)

>> Why open application programming interfaces (APIs) and custom integrations are needed and often only possible in UCaaS (Chapter 5)

>> How UCaaS can address different business use cases (Chapter 6)

>> What to consider when choosing a UCaaS solution for your organization (Chapter 7)

There's also a convenient glossary in the back of the book in case you get stumped!

Foolish Assumptions

It's been said that most assumptions have outlived their uselessness, but we assume a few things nonetheless!

Mainly, we assume that you are a line-of-business manager or an IT decision maker (such as a CIO, CTO, director, or IT manager) for a medium to large enterprise, and you're evaluating business communications solutions for your organization. Beyond an understanding of your business requirements and a basic awareness of cloud computing and other popular technology trends and challenges, we don't assume any deep technical knowledge. As such, this book is written primarily for nontechnical readers.

Icons Used in This Book

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

This icon points out information you should commit to your non-volatile memory, your gray matter, or your noggin — along with anniversaries and birthdays!

You won't find a map of the human genome here, but if you seek to attain the seventh level of NERD-vana, perk up! This icon explains the jargon beneath the jargon!

Tips are appreciated, never expected — and we sure hope you'll appreciate these tips. This icon points out 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 we can cover in 72 short pages, so if you find yourself at the end of this book, thinking, "Where can I learn more?," just go to `www.ringcentral.com`.

Where to Go from Here

With our apologies to Lewis Carroll, Alice, and the Cheshire Cat:

"Would you tell me, please, which way I ought to go from here?"

"That depends a good deal on where you want to get to," said the Cat — err, the Dummies Man.

"I don't much care where . . .," said Alice.

"Then it doesn't matter which way you go!"

That's certainly true of *Cloud Communications and Collaboration For Dummies*, which, like *Alice in Wonderland,* is also destined to become a timeless classic!

If you don't know where you're going, any chapter will get you there — but Chapter 1 might be a good place to start! However, if you see a particular topic that piques your interest, feel free to jump ahead to that chapter. Each chapter is written to stand on its own, so you can read this book in any order that suits you (though we don't recommend upside down or backward).

We promise you won't get lost falling down the rabbit hole!

IN THIS CHAPTER

» Looking at the role of the Private Branch
eXchange

» Calculating total cost of ownership for
your on-premises system

» Moving from an on-premises to cloud-
based communications

Chapter **1**

Tracing the Evolution of Business Communications

In this chapter, you learn about the evolution of business communications technology and the costs associated with an on-premises business communications system, as well as the future of business communications — Unified Communications as a Service (UCaaS).

A (Brief) History of Business Communications

For more than a half century, the Private Branch eXchange (PBX) has been a centerpiece of business communications. A PBX is a phone switching system used to concentrate telephone lines or trunks, route intraoffice calls, and manage phone features.

PBXs were originally purchased by businesses to improve the efficiency and reduce the expense of calls made within an office. Prior to the PBX, a call made by an employee to a coworker sitting at a desk in the same office had to be routed the same way as a call to

a customer across town. It had to be routed from the employee's desk phone to the telephone company's central office (CO) — perhaps several miles away — and then back to the coworker's desk phone. Businesses would incur phone charges for every call made — even for a call across the room! Ironically, today a PBX can be a "Pretty Big eXpense" for businesses, as many PBXs require a significant capital investment.

REMEMBER

With the proliferation of mobile phones today, it's easy to forget (or perhaps you're young enough to have never experienced it) that in the not too distant past, we had to pay for every phone call — long distance *and* local. We also had to walk a mile in the snow — uphill both ways — to fetch a pail of water!

In the '80s and '90s, PBXs used time-division multiplexing (TDM) technology to transmit and receive multiple phone calls over the same telephone circuit in circuit-switched networks, such as the public switched telephone network (PSTN). Most TDM PBXs are proprietary and expensive to maintain, scale, and upgrade. Additionally, businesses must maintain separate systems or services to support other communications needs such as audio and video conferencing, voicemail, and fax (see Figure 1-1). Another disadvantage of legacy TDM PBX servers is that they provide limited support for mobile and remote workers — unless your name is Gordon Gekko, you probably didn't have a mobile phone in the '80s!
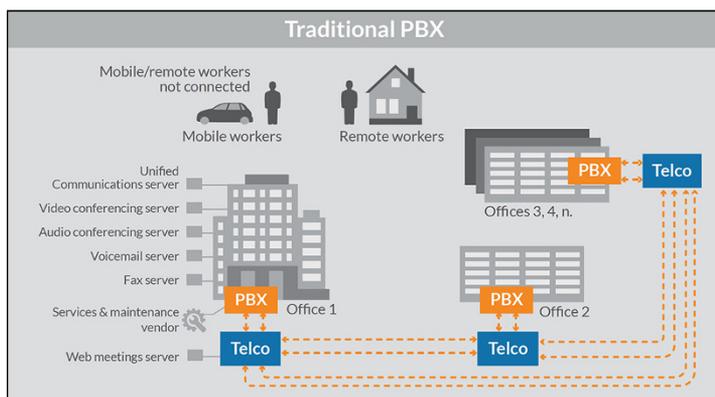
FIGURE 1-1: TDM PBXs provide limited integration with other apps and systems, and little or no support for mobile/remote workers.

Time-division multiplexing (TDM) essentially divides (or multiplexes) the available bandwidth in a circuit into time slots (known as *channels*) for each voice signal. For example, a T1 circuit, containing 24 channels, can carry up to 24 simultaneous calls.

In the late 1990s, the first Internet Protocol (IP) PBXs were introduced, and by 2008 the overwhelming majority of new PBX installations were IP-based. IP PBX systems take advantage of packet-switched networks using Voice over IP (VoIP) technology.

VoIP is a group of telephony protocols (such as H.323 and SIP) that transport voice and multimedia communications over packet-switched, IP-based networks (such as the Internet) rather than circuit-switched networks (such as the PSTN). H.323 was one of the first VoIP protocols and is still commonly used in videoconferencing equipment. *Session Initiation Protocol* (SIP) is an open signaling protocol standard for establishing, managing, and terminating real-time communications over IP-based networks.

One of the biggest advantages of VoIP technology (and IP PBXs) is that it enables businesses to use their Internet circuits (such as multiprotocol label switching, or MPLS) for both data *and* voice traffic (see Figure 1-2). By converging their data and voice networks, businesses can significantly reduce their recurring telco expenses. This benefit alone is often enough to justify the expense of an IP PBX. Additionally, IP PBXs are generally less expensive than TDM PBXs, and easier to maintain, scale, and upgrade.
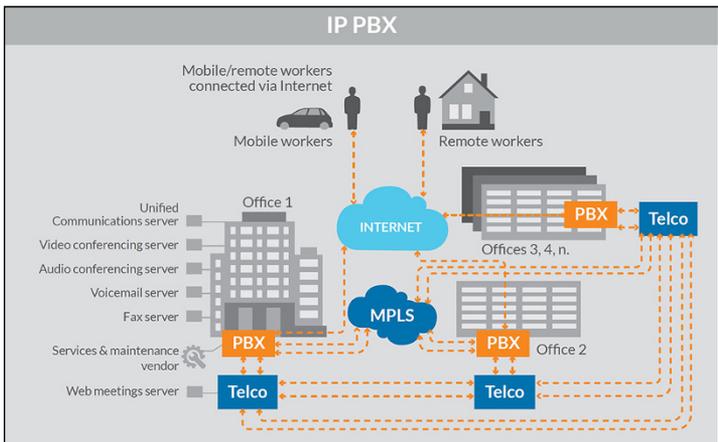
FIGURE 1-2: IP PBX systems enable converged networks and unified communications.

With voice and data systems sharing the same network backbone, it was only logical that these systems would also begin to converge. Thus, came the advent of converged communications. Well, not exactly. It seems *converged communications* isn't as catchy as *unified communications* — so thus came the advent of unified communications (UC)!

UC integrates real-time communications (such as voice telephony, audio/web/video conferencing, and instant messaging) and non-real-time communications (such as email, voicemail, and fax). More recently, UC has expanded to include file/desktop sharing and team collaboration tools (such as Microsoft Office 365, Google Apps, and RingCentral glip), under the umbrella of unified communications and collaboration (UC&C).

Considering the Real Cost of an On-Premises PBX

Although an IP PBX has many advantages over a legacy TDM PBX, many of the same challenges exist, including cost, manageability, and flexibility. When the time comes to replace your on-premises PBX — whether IP or TDM based — some of the first objections may come from your CIO, CFO, or controller. A new PBX typically has a price tag in the tens of thousands of dollars. If you require network upgrades or additional hardware to support multiple locations, the cost can easily grow to hundreds of thousands of dollars.

However, even those large numbers may not tell the whole story. Due to the siloed nature of the typical on-premises PBX, you rarely have complete visibility into the total cost.

The most obvious outlays for an on-premises business communications system are the ones you can see and touch — the PBX hardware and the phones that connect to it. At an average cost of $1,000 per employee, the PBX easily stands out as a big-ticket item. However, once you begin to probe below the surface, you may be surprised to find that the hidden costs of an on-premises phone system are nontrivial, making your total cost of ownership (TCO) greater than your original expectations. In fact, the initial capital investment in an on-premises PBX is only the tip of the iceberg (see Figure 1-3).
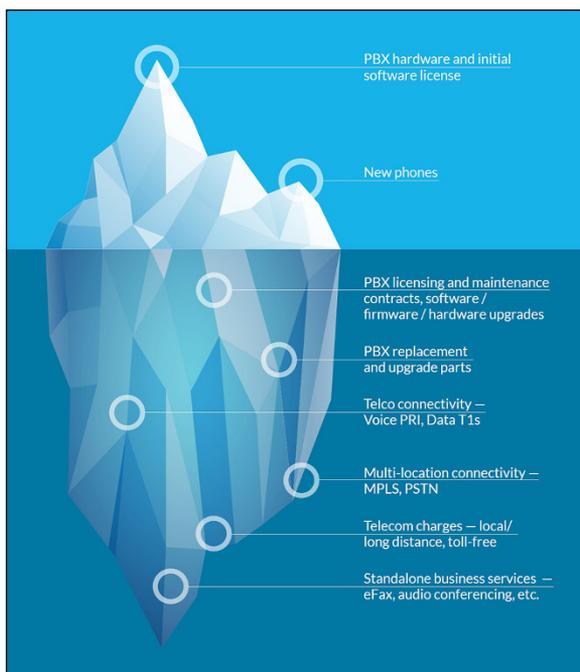
FIGURE 1-3: Many costs of a typical on-premises phone system lurk below the surface.

Looking at the details in Figure 1-3, you can see the larger story is not just about the PBX and phones. Many companies are surprised to find that these obvious components of a business phone system are not the largest contributors to the overall cost. A careful cost roll-up analysis typically uncovers the following:

>> **PBXs require upgrades, maintenance, and trained resources.** Network upgrades, license fees, installation, and separate building wiring can quickly add up to a surprisingly large number. In addition, as PBX systems continue to add functionality, they increasingly require highly trained support personnel to maintain the hardware and software, roll out system upgrades, and manage system use. The cost of IT professionals trained to manage and support PBX and other telephony equipment is, in itself, a significant expense.

>> **Telecom costs can be large enough to strain the IT budget.** Obviously, you need primary rate interfaces (PRIs), bonded T1s, or other trunk lines to connect the PBX in your

building to the local telco. Line items for local, long distance, and toll-free calling are also well known. However, more deeply hidden costs include the need to overprovision phone lines, and then continue paying for them.

» **Standalone services accumulate significant charges.** Costs for conference calling, video conferencing, and web meetings through third-party vendors add up to substantial line items. Or, you may find costs for services such as eFax that individual business units, managers, or employees have signed up for over time. And these charges are often applied on a per-minute basis, which can make budgeting for these bills unpredictable.

» **Connecting locations adds cost and complexity.** The need for MPLS, PSTN, or other business exchange lines to meet the demands of bandwidth-intensive communications between two sites, or among multiple sites, causes IT headaches and budget issues. And the presence of a disparate patchwork of hardware, such as PBXs from different vendors across multiple locations, can become a management nightmare. For example, if you have multiple locations, you may need additional IT resources to manage not only the connectivity but also the added PBX hardware.

» **Poor predictability of costs and feature availability — now and in the future.** With an on-premises PBX, each feature, service, or maintenance agreement can become an added cost to be negotiated. This lack of system future proofing is a looming TCO issue for any company considering an on-premises system.

Introducing Unified Communications as a Service

The on-premises PBX has served companies well for a long time. But the world has changed around it. A dynamic, fast-paced economy makes it necessary for organizations to become ever more agile. Business technologies have also changed. The original designers of your current PBX may never have envisioned advances like video conferencing, connecting a mobile workforce, or integrating with cloud-based business applications such as customer relationship management (CRM), contact centers, social media, and other popular services.

WARNING

According to *Network World,* the average lifespan of a PBX is 8½ years. But given the cost and difficulty of replacing one, you might find a PBX lurking in a back closet at one or more of your locations that's 10 or even 20 years old — in some cases, predating smartphones.

For any number of reasons — not least of which is the relatively large investment required for a new PBX — many businesses have delayed upgrading their on-premises PBX. Consequently, you may be straddled with a phone system that lacks the capabilities and flexibility to support the rapid growth and agility that your business demands.

As with many cloud-based applications used to run mission-critical parts of the business, UCaaS (also known as hosted or cloud VoIP) has come of age. The rapid adoption by businesses of all sizes attests to its reliability. In addition to carrier-grade reliability for your business phone calls, UCaaS offers dramatic advantages over on-premises systems. These include benefits for your business and employees, as well as your network, data infrastructure, and IT resources. A full-featured UCaaS solution also offers all the integrated capabilities to address the challenges of today's business environment.

Key business benefits of UCaaS include the following:

» **It unifies communications across your company.** The typical company with an on-premises PBX uses a patchwork of business communications tools — standalone fax machines, individual Internet fax accounts, third-party audio and video conferencing, and web meetings. This approach typically lacks connection or synergy among the various tools. In addition, as the service accounts have accumulated over time, you may need to manage multiple, and sometimes redundant, bills from the various providers.

UCaaS integrates your business communications into a single solution that includes voice, online faxing, text, web meetings, audio and video conferencing, voicemail, and other UC features. It also integrates with cloud-based and back-office business applications. This one-stop service not only saves costs and delivers the synergy of linking various modes of communication, but also eliminates the management, unwieldy billing, and cost tracking associated with multiple vendors.

UCaaS also unifies the image that your organization presents to the world — a single identity. All your employees — whether they work in an office or on the road — make and receive calls from a single business number, giving your company's communications a consistent and professional appearance. Even remote workers' outbound calls are routed through the cloud and appear as if they're calling from the corporate location. For example, a salesperson doesn't have to provide a personal mobile phone number to continue with business when out of the office; instead, the salesperson provides the same corporate number to all customers. When employees leave the office, calls automatically follow them to their smartphones.

» **It simplifies multi-location management globally.** Maintaining and administering phone systems at multiple locations — especially where there are PBX hardware and phones from different vendors at the various sites — can present a management nightmare for IT. However, by having the entire phone system in the cloud, UCaaS enables any IT person to manage the phone system from any location. This means you save the cost and headache of sending an IT person with telephony experience to remote locations to perform maintenance or make simple changes, such as adding numbers and provisioning new employees. Or, it can eliminate calls to a local service provider and the frustration of waiting for changes or repairs to be made on their schedule, not to mention the high cost of service calls.

UCaaS also allows you to quickly start up a new location. For new or existing locations, it does away with the cost and complexity of managing MPLS or other business exchange line connectivity between sites. Instead, all voice traffic travels over the Internet backbone.

» **It flexes when your business flexes.** When you're growing or simply competing in today's competitive markets, you can't afford anything that holds you back — including a business system. You can't wait for a service provider to add a new number, or send an IT person to a remote location every time you add an employee. And you can't afford to be locked into inflexible systems.

As your business grows or your business needs change, UCaaS adapts. For example, whether it's adding retail staff during the holidays or adding tax preparers during tax

season, plugging a phone into an Ethernet jack and making a simple change on an intuitive dashboard interface is all it takes to onboard a new phone user.

Additionally, you can't predict where your business will be in two or three years, how many phone lines you will need, or how many locations you will have. A cloud-based system is inherently flexible and scalable. This isn't the case with on-premises PBXs that still need PRI lines, for example, with each line limited to 23 simultaneous calls. UCaaS provides instant access to virtually limitless inbound and outbound call capacity.

>> **It reduces infrastructure management headaches and costs.** Buying and installing a new on-premises system can cost tens of thousands of dollars, or hundreds of thousands of dollars for multiple locations. UCaaS eliminates the need for upfront investments in costly PBX hardware, as well as separate building wiring for phones and data, and mainte-nance items such as additional cards required for adding new employees. Also, few companies can afford to invest in or support a PBX at every site.

With UCaaS, the entire infrastructure for your business communications resides in secure, redundant, and geo-graphically distributed data centers where telephony experts manage the system 24/7 (which results in carrier-grade reliability). This becomes an even bigger cost advantage with multiple locations as you eliminate more than one piece of PBX hardware, along with costly MPLS, PSTN, or other business exchange lines. You no longer need skilled IT staff to manage one or more PBXs, or the expense and distraction of traveling to remote locations or calling a local service provider to make changes or repairs.

>> **It connects mobile and remote workers globally.** On-premises PBXs inherently lack direct connectivity to remote and mobile workers, and more advanced systems can charge you separate licensing fees. With UCaaS, workers at remote locations or home offices are connected in the same way as employees in the main corporate office. Mobile and remote workers also have access to voicemail, fax, email, and all other company communications as if they're working in the office.

>> **It gives you instant access to the latest features.** Some legacy PBX systems come with a limited feature set, and more advanced products may charge extra for basic features such as voicemail or the latest UC tools as they become available. Additionally, risky upgrades to aging PBXs may be delayed, causing lost employee productivity and frustration. With UCaaS, the latest features and capabilities are continually integrated into the system.

>> **It gives you greater control.** Having an on-premises PBX might seem to provide control, but hosting your business communications in the cloud actually affords you greater control that includes easier management. For example, with UCaaS, you no longer need to be in the same physical location as the phone system to manage it. When you're traveling or at home, you can make urgent changes to the system via a simple web interface using your laptop or smartphone. This direct access to the system also means you no longer have to deal with a third party or wait for them to make adds, moves, or changes. For example, any IT person can add a new number in seconds using the web interface.

REMEMBER

Although many on-premises IP PBX systems can be integrated with some IT systems, such as email, they're inherently limited in their ability to support the latest business communication innovations and the requirements of a mobile workforce. On-premises PBX systems are designed primarily to support desk phones with traditional features, such as multi-line access, conference calling, dial plans, call forwarding, and hold/transfer functionality.

Chapter **2**

Deploying Cloud Solutions Simply and Globally

I n this chapter, we take a look at the cloud computing trend, the business benefits of a Unified Communications as a Service (UCaaS) solution, and an example comparison of the total cost of ownership (TCO) of an on-premises Private Branch eXchange (PBX) and UCaaS.

Recognizing the "Great Migration" to the Cloud

Businesses everywhere and in every industry today are adopting cloud strategies to drive growth and increase revenues. According to a study from Verizon Enterprise Solutions, 65 percent of enterprises today use cloud computing. It would be fair to say that future for most businesses is "mostly cloudy" — but that's a good thing!

So, what exactly is the cloud? The National Institute of Standards and Technology (NIST) defines five essential characteristics of the cloud:

» **On-demand self-service:** Services can be unilaterally and automatically provisioned.

» **Broad network access:** Services are available over the network through various platforms and devices.

» **Resource pooling:** Computing resources are pooled to serve various customers (multi-tenancy) and demand levels, and are dynamically assigned and reassigned, as needed.

» **Rapid elasticity:** Services can be provisioned and released, in some cases automatically, to scale (up/down and in/out) with demand.

» **Measured service:** Resource usage can be monitored, controlled, optimized, and reported.

NIST also defines four cloud deployment models:

» **Public:** A cloud infrastructure that is used by multiple organizations (multi-tenant) and is owned, managed, and operated by a third party (or parties) on the cloud provider's premises.

» **Private:** A cloud infrastructure that is used exclusively by a single organization and may be owned, managed, and operated by the organization or a third party (or a combination of both) either on or off premises.

» **Hybrid:** A cloud infrastructure that is composed of both public and private cloud models.

» **Community:** A cloud infrastructure that is used exclusively by a specific group of organizations (not common).

TIP

The RightScale 2017 State of the Cloud Report found that nearly 80 percent of application workloads are hosted in public (41 percent) and private (38 percent) clouds (see Figure 2-1).

Finally, NIST defines three cloud service models:

» **Software as a Service (SaaS):** Customers are provided access to applications running on a cloud infrastructure, but the customer has no knowledge of, and does not manage or control, the underlying cloud infrastructure.
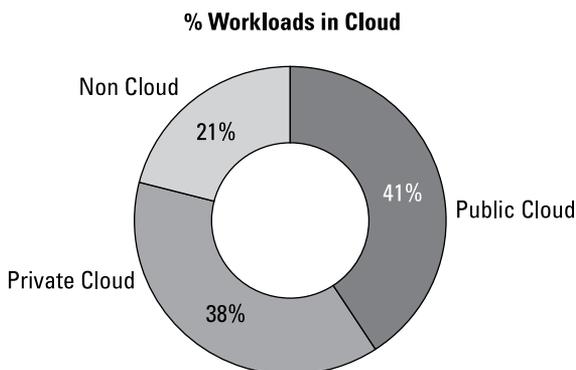
% Workloads in Cloud

FIGURE 2-1: Application workloads live in the cloud.

>> **Platform as a Service (PaaS):** Customers can deploy supported applications onto the provider's cloud infrastructure, but the customer has no knowledge of, and does not manage or control, the underlying cloud infrastructure.

>> **Infrastructure as a Service (IaaS):** Customers can provision processing, storage, networks, and other computing resources and deploy and run operating systems and applications, but the customer has no knowledge of, and does not manage or control, the underlying cloud infrastructure.

The *Cisco Global Cloud Index: Forecast and Methodology, 2015–2020* reports that (see Figure 2-2)

>> **SaaS** will grow at a 30 percent compound annual growth rate (CAGR) through 2020 and comprise 74 percent of cloud workloads worldwide.

>> **IaaS** will grow at 17 percent CAGR and comprise 17 percent of workloads.

>> **PaaS** will grow at 24 percent CAGR and comprise 8 percent of workloads.

UCaaS is a specialized SaaS offering that enables businesses to replace costly legacy on-premises PBX phone systems with a modern business communications system in the cloud. With UCaaS, all the hardware and software required for managing calls and unified communications and collaboration (UC&C) services runs in highly available, redundant data centers. All voice traffic runs over the Internet backbone. This approach delivers many benefits for your infrastructure, network, IT resources, and business.
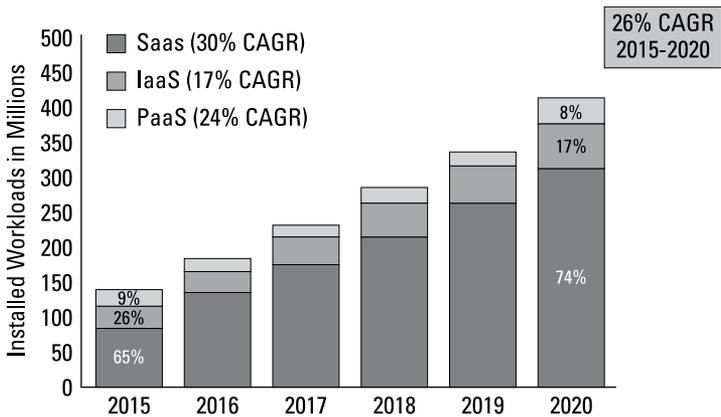
Figure 2-2: SaaS is the most popular cloud computing service model.

Looking at the Business Benefits of the Cloud

Major public cloud providers such as Google Cloud, Microsoft Azure, Amazon Web Services (AWS), and many others are enabling the next wave of innovation. Actually, it's more like a tsunami of innovation. Some increasingly common examples of business innovation in the cloud include Internet of Things (IoT) devices, autonomous vehicles, mobile applications, and communications–enabled business processes (CEBP). A common thread across these and many other cloud innovations is the requirement for reliable, high-quality communications and connectivity. Thus, a business communications system in the cloud can be a logical foundation or building block to enable further innovation for businesses.

Some typical business benefits of UCaaS include the following:

» **It eliminates the large upfront expenditures, licensing costs, and ongoing maintenance and management of hardware.** An obvious advantage of UCaaS is that the need for costly PBX hardware disappears, along with associated separate building wiring for phones and data, additional cards required to add new employees, and space and power to house a PBX in your network room or data center. This becomes an even bigger advantage when you have multiple locations, as you begin to eliminate multiple pieces of PBX hardware.

>> **It removes the cost and complexity of managing phone lines to the telco provider and between locations.** Because you no longer have a PBX, you don't need the costly trunk lines, primary rate interface (PRI) circuits, or bonded T1s of your various business locations to a telco provider. All voice calls will travel over the Internet backbone. Similarly, if you have multiple facilities, you can eliminate the cost and complexity of maintaining a multiprotocol label switching (MPLS) network, public switched telephone network (PSTN) equipment, or other business exchange lines to connect locations.

>> **It scales up or down when your business requirements change, and you only pay for what you need.** UCaaS eliminates the need to overprovision phone lines and PRIs, which can often take weeks or months for a telco provider to install. A PRI line, for example, limits you to 23 simultaneous calls to the outside world, while UCaaS furnishes virtually limitless inbound and outbound call capacity. You only need to ensure that you have enough bandwidth, devices, and people to answer the calls.

>> **It takes the burden of upgrades, maintenance, and repairs off IT while enabling easier control.** PBX hardware is complex and costly to support and maintain, whether you have a legacy PBX that requires ever harder-to-find technical skills, or a newer IP PBX requiring highly trained technicians or costly third-party support. This can mean employing dedicated resources at each of your business locations to ensure the proper care and feeding of your on-premises PBX hardware. Or, it puts you at the mercy of expensive truck rolls that happen on the local service provider's schedule — not your business's and customers' schedules.

>> **It provides the business benefits of advanced phone and UC&C features in a single service.** Lack of flexibility is often a major reason for replacing an on-premises PBX with UCaaS. UCaaS accommodates rapid growth and other business changes. For example, if your organization experiences a seasonal spike in staffing, adding a line to a legacy PBX would require the services of someone qualified in that particular hardware. However, UCaaS enables practically any authorized person to easily add, move, or change phone services — typically in seconds and often from anywhere, on any device.

REMEMBER

Moving to the cloud means the UCaaS provider furnishes all the manpower and expertise required for upgrades, maintenance, and repair. A centralized system in the cloud further eliminates the need for trained staff at multiple sites, calls to local third-party support services, or one person with telephony experience driving or flying to each of your business locations. Additionally, IT gains flexibility and greater administrative control over the system with easy online accessibility using any device to manage the system during off hours or when traveling.

How UCaaS Drives Business Growth and Success

Let's compare the TCO for a new on-premises PBX and a typical UCaaS offering. Figure 2-3 shows the hard costs to deploy a basic business communications system for a hypothetical 200-person company with four locations, and the comparable costs for UCaaS.

Traditional PBX or IP PBX Premises-Based Phone System Costs						
Cost Area	Qty	Unit Cost	One-Time Costs	Annual Subscription Cost	Cost Over 5 Years	
Initial Capital Outlay						
PBX hardware and initial software license	1	$53,300	$53,300		$53,300	Less visible costs often dwarf the upfront capital expense of the PBX hardware.
New phones (190 standard, 10 executive, 10 conf rooms)	210	$150	$31,500		$31,500	
Recurring Costs						
PBX licensing and maintenance contracts, software/firmware/hardware upgrades	1	$9,061		$9,061	$45,305	Over a 60-month life of a phone system, the cost for connectivity and bandwidth between locations alone can exceed the original price tag of the PBX.
Telco connectivity: Voice T1	3	$400		$14,400	$72,000	
Multi-location connectivity: MPLSs, PSTN	3	$350		$12,600	$63,000	
Telecom charges: Local/Long Distance	210	$8		$20,160	$100,800	
Standalone: eFax	200	$8		$19,200	$96,000	Added charges for standalone services like eFax, web meetings, and audio conferencing often constitute significant line items.
Standalone: Audio Conferencing	200	$10		$24,000	$120,000	
Total On-Premises			$84,800	$99,421	$581,905	

UCaaS System Costs						
Cost Area	Qty	Unit Cost	One-Time Costs	Annual Subscription Cost	Cost Over 5 Years	
Monthly Service	210	$19.99		$50,375	$251,875	
Phones	210	$150	$31,500		$31,500	
Total UCaaS			$31,500	$50,375	$283,375	

Total on-premises over 5 years: **$581,905**

Total UCaaS over 5 years: **$283,375**

Difference **$298,530**

SAVE OVER **50%**

FIGURE 2-3: TCO comparison of an on-premises PBX and associated costs, and UCaaS.

Like many businesses, this hypothetical company may be experiencing business communications challenges such as the following:

>> Rapid business growth requiring the addition of new locations and employees.

>> Seasonal fluctuations in employees or use of temps requiring many add/change orders to add new lines/phone numbers, and then scaling back in down periods.

>> Skyrocketing conference calling costs from business surges, which IT cannot easily control due to pricing models from the provider.

>> The need to unify communication, integrating everything from remote offices to mobile and remote workers, as well as consolidating disparate standalone business services such as online fax and video conferencing.

WARNING

Custom integrations between different SaaS business solutions and an on-premises PBX may not be possible, or may otherwise be prohibitively expensive.

Although a phone system is essential to any business, its costs are not typically high profile. In fact, in many companies, management may have never seen these costs rolled up in one place. Nonetheless, the sample numbers shown in Figure 2-3 — large as they are — only account for the basic system. When you add in the many hidden costs of an on-premises system, the total number may give management a real eye-opening experience.

A UCaaS cloud phone solution completely changes not only the business communication paradigm, but also the cost structure of both hard costs and soft costs. In fact, beyond eliminating the upfront expense of the PBX hardware, many of the line items in Figure 2-3 simply disappear. Here are some examples of these hard cost savings:

>> **Lower multi-site management costs:** Practically any IT technician or other authorized person can add phones or numbers, make changes, or handle moves from a simple web interface. There is no time-consuming reconfiguration of physical hardware, no new port or feature cards to buy and install, no requirement for training or certification, and no travel costs to support a remote location.

- **»** **Reduced IT maintenance and infrastructure:** It's all handled in the cloud by the service provider, eliminating operational expenses and manual IT involvement.

- **»** **Elimination of many telco costs:** It does away with line items ranging from PRIs to switches, because all voice and UC traffic travels over the Internet.

- **»** **Lower IT service provider costs for ongoing updates:** The service provider handles all updates and also provides continuous improvements and innovations.

- **»** **Increased worker productivity:** New capabilities such as direct extension dialing and the ability to forward calls and faxes to mobile phones make workers more productive. The provider also handles integrations with leading customer relationship management (CRM) systems like Salesforce and Microsoft business apps (see Chapter 5).

- **»** **Reduced capital expenditures (CapEx):** With UCaaS, you have the option to simply rent your phones and gain the flexibility to upgrade to the latest models.

- **»** **Decreased cost of supporting a mobile workforce:** Typical mobile apps for UCaaS enable you to turn any smartphone into a VoIP office phone — saving carrier costs, especially for conference calling, video meetings, and when traveling internationally.

TIP

Native support for mobile devices is a significant advantage of UCaaS offerings, enabling business communications functionality and integration capabilities with practically any mobile device, to support a rapidly growing mobile workforce.

Finally, there is a common misconception that with a cloud phone system, you still require costly MPLS, PRI, or PSTN leased lines to connect multiple locations to each other. On the contrary, all these costs go away because interoffice calls travel over the Internet backbone. You incur no costs for this connectivity, except, if you don't have one already, you may need a router with failover capability.

REMEMBER

Many companies switching to UCaaS experience cost savings of 30 percent to 70 percent or even higher compared to an on-premises PBX system. For example, some companies may have numerous locations, each with its own PBX hardware, plus the need to support home offices and mobile workers. In a case like this, the company could save hundreds of thousands of dollars with UCaaS.

Chapter **3**

Defining UCaaS Business Requirements

rofessional and prompt communication with customers and colleagues is critical to business success. The way businesses communicate and handle incoming calls — and everything from faxes to conference calls — affects public perception of the company. Evolving businesses can better serve customers and enhance the way employees work by adopting the most readily available and affordable technology. In this chapter, we help you identify which business requirements for a Unified Communications as a Service (UCaaS) solution matters most to your organization.

Recognizing Today's Business Requirements

In today's high-pressure world, a business communications system is a lifeline to customers, suppliers, and other key contacts. Businesses need a system that can be relied upon to serve employees in the office, as well as the flexibility to accommodate employees who are mobile or working remotely, allowing

employees to communicate and work with equal efficiency, no matter where they are or what devices they're using.

Modern businesses also need technological solutions that leverage cloud computing to enable the business benefits of the cloud, such as lower costs, greater agility, and enhanced productivity.

With cloud computing's "pay-as-you-go" subscription-based model, buying cloud-based services such as UCaaS is far easier than the typical capital budgeting and procurement processes required for a costly on-premises Private Branch eXchange (PBX).

Implementation is also easier without the need to install new hardware and supporting infrastructure (such as space, power, and cooling), or replace proprietary desktop phones. UCaaS offerings support a broad range of desktop phone systems, as well as PC softphones, smartphones, and tablets.

Finally, administration and management of UCaaS — such as moves, adds, and changes — is easier, with self-service capabilities that often enable an end user to simply plug a desktop phone into a port and login to a simple and intuitive portal to configure advanced features.

SIX KEY BUSINESS REQUIREMENTS FOR A UCAAS PROVIDER

When selecting a UCaaS provider, determine whether its offering meets the following six requirements:

- **Seamless operations:** In today's, always-connected work world, the concept of teamwork has shifted dramatically. Companies now need employees, remote workers, partners, suppliers, and customers to be able to collaborate with team members from anywhere using messaging, video, text, and other communication tools.

  By consolidating these various functions onto one platform, a UCaaS solution helps make teams more agile by allowing participants to share information and make decisions quickly and then move on to other projects. The result? Companies can better harness the collective knowledge of everyone across their extended enterprises, helping to ensure their long-term success in today's competitive business environment.

- **Global capabilities:** To be effective in a global and mobile workplace, your offices must all work in sync no matter where they're located. In essence, your company needs to find ways to operate in unison just as it did before you had an international presence. Yet it's easy for your company to lose track of critical business when time and distance are standing in its way. This is especially true when dealing with stand-alone legacy equipment that was never intended to connect to the rest of the world.

  A UCaaS solution can address these challenges head-on by employing the cost efficiency, reliability, and ubiquity of the cloud. Businesses can operate across geographic boundaries with one system that seamlessly unites collaboration and communication functionality. Businesses get a truly global communications system that's easy to manage and use plus offers the flexibility needed as they grow and change.

- **Mobile device and app support:** With the vast majority of people now using their mobile devices to stay connected to their work, the idea of a 9-to-5 workplace has changed. For many people, the work environment is now fluid, limited only by the number of reception bars on their wireless devices. This rise in workforce mobility creates new business communications challenges. And keeping pace with today's global and mobile workforce requires companies to reevaluate their current business phone systems to meet the changing needs of employees on the move.

  Look for a UCaaS provider with mobile, desktop, and integrated applications for its UCaaS solution that cross device and application boundaries, enabling you to collaborate with colleagues right from your personal mobile phone or laptop through a company-approved application, and make and receive calls directly from Microsoft Outlook, Google Apps for Work, Salesforce, and other productivity tools.

- **Flexible, integrated communication options:** In the modern office, business communications fall into two broad categories: real-time and asynchronous. Real-time communications (such as voice calls and video meetings) require people to actually participate in a conversation at the same time. Asynchronous communications (such as email) on the other hand, allow people to communicate independently of each other on their own time. But the increasing popularity of text messaging apps has led to a third category: near-real-time communications. Messaging apps now give people the

(continued)

added flexibility to carry on near-real-time conversations with others — when and if they choose.

A UCaaS solution should seamlessly bring together real-time, asynchronous, and near-real-time communications into one integrated system that offers text, voice, video, team collaboration, and more. Users must be able to easily choose the mode of communication that works best for them in each business situation (or scenario). Additionally, a UCaaS solution must be able to quickly and seamlessly scale up (or down) to meet business demand.

- **Vendor innovation (research and development):** Collaboration and unified communications solutions and technologies continue to evolve. A UCaaS vendor needs to have a culture of innovation, backed by significant research and development, to stay ahead of current and emerging trends.

- **Shared content:** Sharing files, photos, and documents with colleagues has become critical for businesses as they grow. But unfortunately, finding these files again when you actually need them can often be an exercise in frustration, costing you precious time as you search your computer desktop or email inbox.

A UCaaS solution can greatly simplify and streamline the process of sharing content with co-workers. Emails, scattered discussions, and disjointed resources are drastically reduced as people share information, files, tasks, and calendars in a team collaboration workspace. With UCaaS, cloud communications and team collaboration come together to help everyone at your company work more efficiently.

Understanding UCaaS Capabilities

Today, businesses have a wide range of options to address their business communications needs — everything from the complex Internet Protocol (IP) PBX systems traditionally used by businesses to new, feature-rich cloud-based solutions that provide an easy-to-use alternative. Until recently, this type of sophisticated communications solution was available only to companies with the necessary financial resources to design and implement their own customized phone system. Today, however, the Internet

and leading-edge technologies are driving down costs, lowering adoption barriers, and opening new communication options, allowing businesses of all sizes to afford a world-class business communications system.

Like a traditional on-premises PBX, UCaaS provides basic functionality, including voice calls, voicemail, faxing, and audio conferencing. But UCaaS also enables advanced unified communications and collaboration (UC&C) features and capabilities that simply aren't possible — or are cost-prohibitive — in an on-premises PBX, including the following:

» **Video meetings:** The days of large, expensive, and complex videoconferencing equipment in dedicated conference rooms that require IT support to set up in advance and standby to troubleshoot during meetings are quickly becoming a thing of the past. Simple and intuitive, self-service videoconferencing capabilities — using an IP camera mounted on a desktop monitor, or a built-in camera on a laptop or smartphone — are becoming more common as users become increasingly familiar and comfortable with videoconferencing as an everyday communications tool.

» **Web conferencing:** Like videoconferencing, web conferencing and desktop sharing is becoming increasingly popular among geographically dispersed teams that need to share content and collaborate on projects.

» **Team messaging:** Near-real-time team messaging tools such as instant messaging (IM) and short message system (SMS) and multimedia messaging service (MMS) texting, as well as team messaging apps like Glip and Slack, and asynchronous messaging options such as email, discussion boards and wikis, social media, blogs, and persistent chat help keep team members up to date.

Although email is still the dominant form of communication in most businesses, most people have trouble keeping up with their email. According to a recent study by Yahoo Labs and the University of Southern California, as the volume increases, people reply faster (47 minutes or less on average), with fewer words, and to less email (only about half). And as the inbox snowballs, users respond to only a small fraction of their messages — less than 5 percent when the load reaches about 100 emails a day. Although email has its place for longer or

more formal communication between individuals, it lacks the immediacy of texting. According to Dymark's *Mobile Intelligence Review Second Edition,* 90 percent of SMS text messages are read within three seconds of being received.

» **Team collaboration:** Integration with office productivity suites such as Google Docs/Drive and Microsoft Office 365/OneDrive enable real-time editing and collaboration of documents, presentations, spreadsheets, and more.

» **Presence and availability:** Providing presence and availability information enables team members to be more productive by knowing when and how other team members are available or busy, and the best way to contact them — for example, by office phone, mobile phone, text message, or email.

Exploring Endpoints

Although choosing desktop endpoint hardware — that is, phones — may seem like a simple decision at first glance, there are many important considerations that must be factored into your decision.

Many legacy on-premises PBX systems made the choice simple, albeit limited. It was a lot like buying a Ford Model T in the early 1900s — you could have any color, as long as it was black. Many legacy PBX systems require proprietary desktop phone hardware, effectively limiting your endpoint options, features, and functionality.

More recently, IP PBX systems have somewhat opened up the choice of desktop endpoints, often allowing a choice of Session Initiation Protocol (SIP) enabled phones from different vendors, as well as desktop software (softphones) that can be used.

The real challenge for many businesses operating their own IP PBX is supporting a mobile workforce that has wholeheartedly embraced the bring your own device (BYOD) trend. Many of these companies have lost control of their business communications when it comes to mobility, with employees simply using their personal mobile devices to conduct business.

UCaaS enables a broad spectrum of endpoint choices. A UCaaS provider will typically support plug-and-play functionality with an approved list of third-party SIP-enabled desktop phone vendors and models, as well as smartphones (either using the native dialer or via an installed app), and desktop software (softphones).

Looking at Advanced Functionality

UCaaS also supports advanced unified communications and team collaboration functionality that is either limited or simply not possible in traditional on-premises PBX phone systems:

>> **Third-party integrations:** Businesses haven't just changed the way they communicate. They've also changed the way they work. This includes organizing workflows around business software, such as customer relationship management (CRM), human resource management (HRM), and enterprise resource planning (ERP) applications. In recent years, many enterprises have moved these critical systems out of the data center and into the cloud. This includes not only Software as a Service (SaaS) models, such as Salesforce and Office 365, but also homegrown business applications developed by enterprise IT departments and deployed on public, private, or hybrid clouds.

Previously, any company that wanted to create a seamless workflow between phone calls or other communication methods and their business applications discovered it was costly, complicated, and often impossible to achieve.

This is primarily because of the inability of business apps to connect with closed, single-purpose PBX phone systems. Gaps can also exist between the various applications commonly used by companies and among the various communications tools used by their employees. The advent of truly enterprise-class UCaaS offerings now makes it possible to integrate business applications with business communications. We take a closer look at application integration in Chapter 5.

» **Advanced analytics:** Detailed metrics reporting and analytics enables businesses to optimize their UCaaS environment and increase business performance and productivity. Examples of useful reports might include the following:

- *Summary view:* Ideal for the business owner or executive staff, these reports provide an at-a-glance, high-level usage overview of the entire phone system. You can use the metrics to assess the volume of incoming and outgoing calls, or answered and missed calls, and then review your business hours to ensure they're consistent with caller patterns.

- *Queue activity view:* Ideal for group or department managers, these reports summarize call queue activity and volume for historical activity. You can use these reports to analyze the ratio of calls answered to calls missed, call wait times, and average talk time on a call, and then fine-tune your call queue responses accordingly.

- *User activity view:* Ideal for team leaders, these reports summarize inbound and outbound call volume and usage for historical activity. You can compare call volume metrics with a user's job performance or workload to understand how to optimize the calls for best results.

- *Phone number view:* Ideal for marketing and sales teams, these reports summarize the call activities of each purchased phone number (for example, associated with a particular campaign, promotion, or product), so you can understand which numbers get the most calls, which numbers result in the highest placement results, and which calls are getting answered or not.

- *Call detail view:* Ideal for IT managers, these reports list all inbound and outbound call activities during the given time frame, so you can view all call log information, including caller ID, destination, call duration, call results, and so on, to understand and control the company's usage of the UCaaS offering. More technical data can include quality of service (QoS) analytics to identify improper QoS tagging and call quality metrics to help IT staff troubleshoot poor call performance and voice/video quality issues.

» **Global availability:** UCaaS makes it easier for businesses to provision UC&C services from anywhere in the world, providing an instant global footprint to businesses of any size. Instead of dealing with country-specific telecommunications circuits and restrictions, proprietary equipment and protocols, and so on, businesses simply need an Internet connection and a compatible endpoint to connect their employees from anywhere.

» **Contact center:** Customer service today requires more than a "hotline" to a call center. Customers demand easy access to businesses via multiple modes of communication, whether phone, email, text, web-enabled chat, or video. They expect contact center agents to have instant access to relevant customer information and history, problem notes and history, and answers to their questions and issues. UCaaS enables these advanced contact center capabilities with third-party integration to CRM and ERP systems (among others), support for multiple modes of communications (both internally and customer-facing), and advanced features such as skills-based routing, interactive voice response (IVR), and automated call distribution (ACD).

Chapter **4**

Understanding UCaaS Technical Requirements

n this chapter, we explain several important technical considerations in a UCaaS offering, including performance, reliability, and security.

Call Quality and Performance

Every cellphone user has experienced spotty coverage and inconsistent reliability. You've come to expect this and you move to a better location. A business, however, can't move about in pursuit of a better, more reliable connection. Your business depends on your cloud vendor to provide consistent, high-quality coverage at your present location.

The following factors can profoundly impact call quality over a network.

Insufficient bandwidth

First and foremost, you need to ensure adequate bandwidth. Insufficient bandwidth can cause packet loss and other issues. A single Voice over Internet Protocol (VoIP) call consumes approximately

90 kilobits/second (kbps) of bandwidth, so you can safely have 10 to 11 concurrent calls per megabyte. Multiplying your expected maximum number of calls by 90 kbps makes it easy to estimate how much bandwidth you will need in your data pipe.

In the real world, relays in switches and other areas of your network can impact this estimate. You also need to allow for bandwidth hogs such as employees who are streaming music or uploading large image files. Consequently, you should allow for three to four times your original estimate.

Network delay

Two problems can arise from end-to-end delay in a voice network: echo and talker overlap. Round-trip delay in a voice network should be less than 50 milliseconds (ms) to avoid echo problems. Because VoIP typically has longer delays, echo control and echo cancellation methods must be employed.

Talker overlap (one caller interfering with another caller's speech) will be significant if the one-way delay in a network is greater than 250 ms. Network delays compound as the voice packet travels through the network.

TECHNICAL STUFF

Employing a fast coder/decoder (CODEC) such as G.279 code-excited linear prediction (CS-ACLEP) helps take care of accumulation and processing delays, while network delay can be minimized by a network design consisting of fewer hops and faster Layer 3 switching devices, such as multiprotocol label switching (MPLS) systems and ATM switches.

Jitter

Voice calls sent over the Internet and other packet-switched networks are divided into packets. Because each packet can travel a different path from sender to receiver, individual packets can arrive at the destination at different times and in a different order. *Jitter* is the variation in the arrival time of data packets, which results in gaps between the packets. The result of high jitter (over 50 ms) is speech that sounds jerky. Severe jitter can cause sounds to be jumbled.

Removing jitter requires collecting packets in buffers and holding them long enough to allow the slowest packets that arrive in time to be played in correct sequence (see Figure 4-1). Jitter buffers

can be used to remove the gaps in the packets, but jitter buffers themselves cause additional packet transit delays in the network. When these delays become excessive, call quality becomes difficult to maintain.
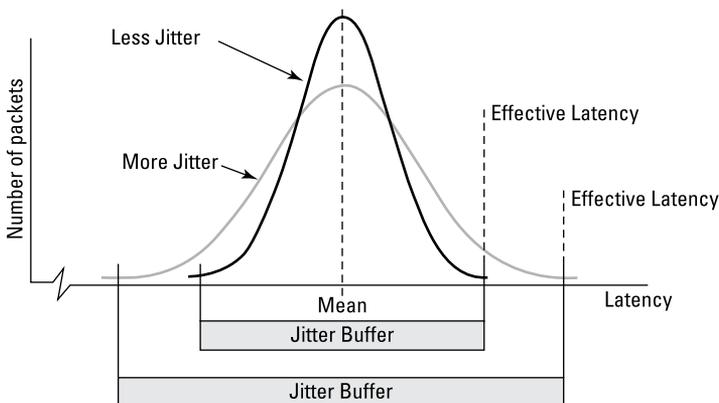
FIGURE 4-1: Jitter buffers can reduce jitter in VoIP calls.

Packet loss and out-of-order packets

IP networks can't guarantee delivery of every packet, much less their order of arrival. Packets will be dropped under peak load conditions and during periods of congestion.

Among the approaches used to compensate for packet loss are interpolation of speech by replaying the last packet, and sending redundant information.

Out-of-order packets are treated as irrevocably lost and are replaced by their predecessors (see Figure 4-2). When the late packet finally arrives, it's discarded. When packet loss rises above a certain level, call quality can no longer be assured.

Poor Internet connection

The best quality requires a solid Internet connection. Internet service providers (ISPs) provide network performance guarantees known as service-level agreements (SLAs). SLAs are based on achievable levels of consistent performance over a given network — meaning the ability of a given network to deliver the service needed by a specific network application from end to end.

This can also include edge to edge, as in the case of a network that connects to other networks rather than to hosts or end systems, with the network itself providing some control over bandwidth, jitter, delay, and packet loss.
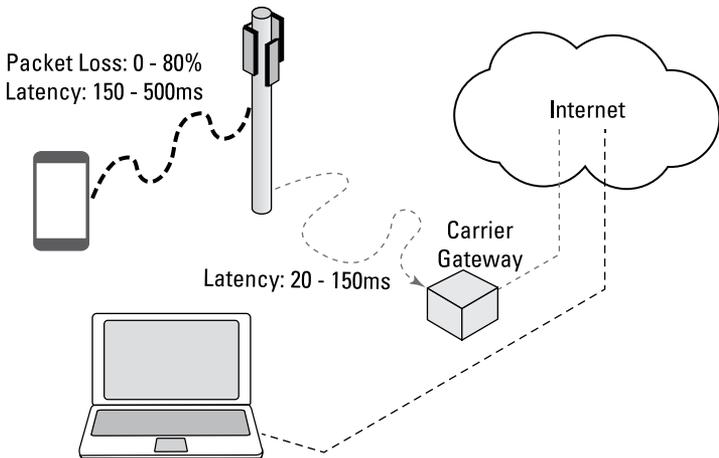
FIGURE 4-2: Packet loss and out-of-order packets cause latency in an IP network.

ISPs typically maintain SLAs with three levels of confidence:

» **Best effort:** Also known as lack of quality of service (QoS), best-effort service is basic connectivity with no priorities or guarantees. It provides basic queuing during congestion with first-in, first-out (FIFO) packet delivery on the link. High-speed broadband networks typically only offer best-effort SLAs.

» **Differentiated:** Differentiated service means some traffic will be treated better (given higher priority) than the rest — faster handling, more bandwidth on average, and lower loss rate on average. Even so, high QoS is still not guaranteed. Properly engineered, differentiated service can provide expedited handling appropriate for a wide class of applications, including lower delay for mission-critical interactive applications such as voice and video.

Typically, differentiated service is associated with packet classification, which means that traffic gets grouped or aggregated into a small number of classes, with each class receiving a particular QoS in the network. Thus, high-priority

critical traffic receives a higher level of QoS assurance, while lower-priority traffic receives a lower level. Differential service QoS is a reasonable trade-off between price and performance. MPLS networks typically offer differentiated SLAs.

» **Guaranteed:** Guaranteed service requires an absolute reservation of network resources, typically bandwidth, which calls for reservation of buffer space, appropriate queuing disciplines, and so on, to ensure that specific traffic receives a specific service level. Guaranteed service is intended for delay-sensitive traffic, such as voice and video. Guaranteed service SLAs are typically offered on point-to-point networks.

Inadequate network equipment

Unless you set up your network to split voice and data into separate pipes, you may need a QoS-enabled router. This device can prevent latency by prioritizing voice traffic over lower-priority data traffic, such as email or large downloads. QoS depends on support throughout the entire network, end to end. To achieve QoS from sender to receiver, all the network elements through which a traffic flow passes — such as network interface cards, switches, routers, and bridges — must support QoS. If a network device along this path does not support QoS, the traffic flow receives the standard first-come, first-served treatment on that network segment.

Routers supporting differentiated service configure their network scheduler to use multiple queues for packets awaiting transmission from bandwidth constrained (for example, wide area network, or WAN) interfaces. Router vendors provide different capabilities for configuring this behavior, to include the number of queues supported, the relative priorities of queues, and bandwidth reserved for each queue.

In practice, when a packet must be forwarded from an interface with queuing, packets requiring low jitter (for example, VoIP or video) are given priority over packets in other queues. Typically, some bandwidth is allocated by default to network control packets (such as Internet Control Message Protocol and routing protocols), while best-effort traffic might simply be given whatever bandwidth is left over.

Improperly configured network

Other important factors that can affect call quality and performance include dropped packets and errors, routing loops, misconfigured QoS on routers, inefficient rulesets or low throughput on perimeter firewalls, poor Wi-Fi coverage or inadequate bandwidth, and poorly defined virtual LAN (VLAN) segmentation.

Global Reliability

Natural disasters, power outages, and malicious network attacks can cause communications downtime that frustrates your customers and threatens your bottom line. There's a common misconception that on-premises PBX phone systems offer greater reliability than hosted solutions. But in fact, leading cloud UCaaS providers host their UC&C services on high-quality, high-availability systems that few customers could afford to own. These vendors also staff data centers with highly trained experts who manage systems 24/7 and perform all the latest upgrades to ensure reliability.

Consequently, today's enterprise-class UCaaS solutions ensure the highest levels of availability, reliability, and disaster recovery. Leading solutions house the infrastructure in geographically redundant data centers and guarantee uptime as high as 99.999 percent. The "elastic" nature of cloud architecture also means these systems can quickly scale up or down based on demand — whether due to business fluctuations or a disaster recovery event, such as a natural disaster or power outage.

Security and Compliance

There is no higher priority for companies than the security of their customer data. When businesses implement on-premises solutions, they take on full responsibility for data security and regulatory compliance. Companies in highly regulated industries, such as financial services and healthcare, have an even higher threshold to ensure that their solutions and vendors are compliant.

But few IT organizations can afford the resources or time to acquire the latest security measures required to meet today's increasingly strict privacy regulations. Maintaining strong physical security across many business locations — each with its own on-premises system — is neither practical nor cost effective.

With a hosted cloud solution such as UCaaS, companies have access to greater security measures to protect customer information than with traditional on-premises PBX systems. An enterprise-class UCaaS provider will typically house all customer data in secure tier 1 data centers with strong physical and network security audited by independent third parties. The data centers should be managed by highly trained, on-site engineering specialists, including experts in various aspects of security and regulatory compliance.

This shared security environment and policy platform offers an inherent advantage to businesses without large IT departments or those spread across multiple locations. Customers benefit from the economies of scale provided by leveraging the UCaaS provider's security expertise and hardened facilities. In this way, moving to a cloud-based business solution can actually raise an organization's security posture.

For enterprises that maintain large on-premises PBX phone systems, yet another layer of complexity typically exists within the security infrastructure required to safeguard the VoIP environment. Session border controllers (SBCs) are typically installed to control real-time communications signaling and media streams. SBCs provide many of the same security capabilities as a traditional packet filtering firewall, but they're specialized devices that are optimized for VoIP traffic.

TIP

SBCs aren't required, but they can be used with a UCaaS offering. Typically, all that is required to secure a UCaaS environment on the customer end is a packet-filter firewall or next-generation firewall (NGFW) with the appropriate Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) ports properly configured.

By choosing the right cloud phone/UCaaS vendor, your organization can gain the benefits of shifting business communications systems to the cloud, while actually enhancing your enterprise security position. Before earning a spot on your short list, a UCaaS

vendor should demonstrate that it provides comprehensive cloud security, including the following:

>> **Secure data center:** All infrastructure should be housed in facilities with strong physical protection, redundant power, and tested disaster recovery procedures. The highest levels of security and reliability should be backed by independent certifications.

>> **Secure voice:** All voice traffic within your corporate phone system should be encrypted to prevent eavesdropping on voice calls.

>> **Data encryption:** To ensure protection of valuable intellectual property and competitive information, and also to ensure regulatory compliance, all data — from competitive proposals to patient private information to smartphone screens shots — should be encrypted in transit and at rest.

>> **User access controls and management:** To ensure only authorized users access cloud communications accounts and services, the vendor should implement, at a minimum, strong password policies and ideally multi-factor authentication (MFA), as well as single sign-on (SSO) to avoid log-in fatigue.

>> **Fraud prevention:** Toll fraud, healthcare fraud, and credentials theft represent significant financial and legal risks for businesses. The service provider should have protections built in to the service layer and should conduct continuous monitoring for dangerous anomalies or other indicators of fraud. The provider should also offer guidance on best practices to eliminate the human factor in fraud risk.

>> **Account management and administration:** To prevent data loss, the solution should have provisions to instantly revoke user rights or demote an administrator's credentials of employees who leave the company or are terminated.

>> **Robust network security:** In addition to all the protections for the network perimeters typically in place for data, the UCaaS vendor must now add unique protections designed to prevent attacks on voice infrastructure.

Chapter **5**

Working with APIs and Custom Integrations

I n this chapter, you explore the importance of communications-enabled business processes (CEBPs) and workflows to customer experience, as well as the advantages of an open Unified Communications as a Service (UCaaS) platform.

Understanding Why Embedded Workflows Matter

Although cloud-based applications, such as Salesforce, Google Docs, Microsoft Office 365, Box, Dropbox, Google Drive, and Microsoft OneDrive, provide tremendous cost savings and are vital to greater efficiency and productivity, for the most part, these systems have not been integrated with business communications.

With the exception of email, most modes of communication — voice calls, text, voicemail, fax, and online meetings — still require inefficient, manual data entry to log a conversation or store information in call logs that are isolated from other systems. For example, if a sales rep uses a call, text, or web meeting to communicate with a customer, critical information gained by the rep during the conversation can easily be lost or forgotten.

This capability to break down barriers that isolate communications from business system applications and workflows is important for one of the most critical goals of any business today — improving customer satisfaction. Custom service integrations not only eliminate manual processes and human error but also represent a significant step forward because businesses want to connect with customers more effectively. Having communications well integrated into the tools and applications companies rely on every day is critical to eliminating inefficiencies and gaps that get in the way of achieving the best possible customer experience.

Integrating unified communications features into workflows improves customer response time and satisfaction.

A new type of consumer is driving organizations to put more focus on the customer experience. Smartphones, ubiquitous broadband connectivity, and services like Uber have created an on-demand society in which we all have a variety of content and services at our fingertips. As a result, consumers who in the past were comfortable waiting their turn in line now expect immediate gratification and instant answers to their questions. Whether it's a taxi, an airline seat assignment, or an answer about billing on an order, they not only want to get it now, but also want to get it via the communications channel of their choice. And that channel may change based on their location, the device they're using, the time of day, or other factors.

This new customer will abandon purchases after long hold times on the phone or ambiguous types of communication — and there is a high likelihood that their next call will be to a competitor. The Service Quality Measurement (SQM) Group recently found that only 3 percent of customers are at risk of defecting to competitors if their issue is resolved on the first call. By contrast, a whopping 38 percent are at risk of defecting if their issue isn't resolved on the first contact. And according to a recent White House report, poor customer satisfaction puts approximately $75 billion of business revenue in the United States at risk.

This shortage of satisfaction may be an indicator that most companies haven't yet adjusted to the fact that customers have changed in a fundamental way. This applies not just to consumers but also to business-to-business (B2B) customers who — armed with "perfect information" acquired online — increasingly look to themselves for buying advice rather than to the salesperson.

In other words, they have little patience for engaging with an employee who does not have ready and seamless access to all the data pertinent to a transaction.

Consequently, organizations that want to do business with these always-on customers need to invest in new integrated solutions. Building the capacity to respond to this new customer involves new processes that require integrations between systems that traditionally have been siloed and unable to work together. These integrated solutions give employees the customer-facing tools they need to deliver the best and most efficient customer interactions possible. For example, caller ID–based pop-ups that provide key customer data can result in employees or call center agents who feel less frustrated and more empowered to help customers. This access to the right tools and information to resolve issues or complete sales creates a virtuous circle because happier employees tend to make for happier customers.

Enabling access to data across previously isolated silos also enables line-of-business leaders to gain valuable insights by making it possible to perform business analytics on broader pools of data.

Thus, organizations that ignore the customer experience do so at their own peril. For example, in an always-connected and uber-social world, customers tend to share good experiences, but bad experiences tend to be shared even more quickly. According to the *Harvard Business Review,* 48 percent of customers who had negative experiences told ten or more others about their experience.

But the real key to achieving the levels of customer satisfaction that can be a business differentiator involves tightly connecting communications with data and business logic contained in core business systems such as CRM, ERP, and others.

Recognizing the Importance of Open Platforms

A key benefit of moving from inflexible, closed on-premises PBX systems to the cloud is the ability to extend a communications platform with new features and capabilities — and to tightly integrate communications into core business applications. Yet many

cloud-based solutions are also closed and proprietary, which makes integrating communications into workflows costly and complex. This either limits the capabilities that are possible or requires too much time and effort to deploy new capabilities.

Maximizing the potential business value of a cloud communications system requires an extensible platform based on open standards and open application programming interfaces (APIs). An open platform makes it significantly more time- and cost-effective to integrate communications into key business processes, enabling automated workflows. This allows IT departments and third parties to rapidly roll out solutions that enhance employee productivity and deliver higher levels of customer satisfaction.

A number of companies offer transport as a platform. That is, they provide closed APIs to add basic voice and text capabilities to custom applications. However, the end result of this approach is to simply add another layer of communications on top of the existing communications and customer service platforms, which basically results in sub-par telephony services and added complexity. And ultimately, these kinds of services cannot deliver the flexibility and capabilities required by enterprises and fast-growing companies.

An open platform goes far beyond these proprietary approaches. With an open API, independent developers and enterprise IT teams can access the power of real-time communications and messaging, supported by extensive business logic and customer data management and reporting. This open approach makes it simple for developers to not only enable applications to send and receive calls and texts, for example, but also deeply embed communication functionality into the business workflow of an application.

With an open API, developers can enable advanced business communications capabilities, such as the following:

» **Embedded communications:** Deliver amazing customer experiences by arming your customer representatives with rich, contextual customer data for every interaction.

» **Automation and integration:** Add communications triggers and custom call routing rules to automate your processes and workflows.

>> **Business insights:** Use customized real-time dashboards to gain deeper insights into how your company communicates. Access archived recordings to meet compliance requirements.

>> **Team messaging:** Embed team messaging capabilities into your apps, allowing users to create dynamically generated teams, or build alert text bots utilizing popular bot frameworks.

Chapter **6**

Making the Case with UCaaS Use Cases

I n this chapter, you explore three Unified Communications as a Service (UCaaS) use cases, from conservative organizations to "born in the cloud" startup enterprises, as well as several real-world RingCentral customer success stories.

Conservative

For many businesses, the journey to the cloud has become a strategic imperative. These organizations are often burdened with a large on-premises footprint of legacy Private Branch eXchange (PBX) equipment and phone systems from multiple vendors scattered across different locations. These systems may lack needed functionality, but costly upgrades and replacements have been delayed due to the enormous cost and inherent risk.

For these organizations, a controlled migration to the cloud with UCaaS is a viable alternative that can help the organization forgo major capital investments in new telco equipment altogether, while mitigating the business risk associated with an upgrade.

RINGCENTRAL FUNCTIONALITY, INTEGRATION, AND PROFESSIONAL SERVICES FIT THE NEEDS OF A NONPROFIT HUMANITARIAN ORGANIZATION

World Vision is known for its commitment to community development, disaster response, and child well-being. The organization employs 45,000 people in nearly 100 countries worldwide, including the United States, where, since 1981, World Vision US has been working with children and youth living in poverty. In 2015, 84 percent of World Vision's operating expenses were used for programs that benefit children, families, and communities in need.

Keeping administration costs down includes the phone system. When Randy Boyd took over as Infrastructure Architect at World Vision US, he inherited a 20-year-old PBX system that was expensive to manage and maintain. "It was actually nine separate phone systems involving six different telco providers for our 12 locations," Boyd recalls.

World Vision US wanted to reduce the risk posed by those old systems and reduce costs. One factor that added to the cost was the need for skilled technicians to manage the PBXs. At times, World Vision didn't have that expertise in house, so they hired consultants when necessary. "That was very expensive, but we had to do it from time to time," he says. "The cost savings potential for switching phone systems was sizeable." Cost wasn't the only consideration. "As we looked at a variety of options, from on-prem PBX to cloud-based solutions, we were also looking for a complete feature set for our end users," Boyd adds.

Professional services sealed the deal. One factor that helped World Vision decide on RingCentral was the availability of RingCentral Professional Services. "Early on, we realized we would need help with the implementation, so we prioritized companies that could provide that," Boyd explains.

World Vision engaged RingCentral's Professional Services to assist in conducting a two-month pilot program and then deploy RingCentral across the organization. "I really have nothing but praise for RingCentral Professional Services," Boyd says. "They helped us implement the system several months faster than we could have done it on our own."

Other features World Vision desired, and RingCentral delivered, included single sign-on and Active Directory integration. "We're an Office 365 shop, and we have our security credentials at Microsoft Azure," Boyd explains. "We were looking for a product that would allow single sign-on, and we've gotten that with RingCentral." RingCentral single sign-on integrates with any identity provider that supports SAML 2.0, such as Azure, which World Vision uses.

To get Active Directory integration, Boyd implemented RingCentral for Okta. "As we add and delete users in our Active Directory system, this allows us to automatically populate and depopulate that information in RingCentral," he explains.

Everyone gains, especially the aid recipients. With RingCentral, World Vision US employees now have the full communications feature set that the IT department wanted to provide. Boyd says as the users learn all the features that they now have available with RingCentral, they're really excited about functionality they didn't have previously, such as the mobile application and face-to-face online meetings. IT also gained the ease of administration they were hoping for and eliminated the need for deeply technical, onsite PBX skills. "We now are running our RingCentral system with technical people who don't have extensive telephony experience," Boyd says. World Vision also appreciates the fact that there is now only one bill for all communications functionality rather than 10 to 14 complicated bills. "All for one low price," Boyd adds.

Boyd puts the cost savings made possible by RingCentral in a broader perspective. "It's not to improve company profits that we look for cost efficiencies," he says. "One of the great things about my job is any cost savings we achieve result in money going directly to the field. In that sense, too, RingCentral is of great value."

Fast Growing

Fast-growing businesses often struggle to plan appropriately for adequate capacity in their on-premises PBXs, resulting in costly business delays, overprovisioning of circuits, line cards, and other equipment, and lack of flexibility and scalability in their legacy systems.

In these cases, UCaaS enables an organization to take full advantage of all the latest business communications features and functionality, without requiring a major capital investment or

long-term commitment. Capacity, such as additional bandwidth, phone extensions, or per-seat licensing, can be scaled up or down on a "pay as you go" basis, as dictated by the needs of the business.

SCCFD EASILY CONFIGURES RINGCENTRAL FOR COMPLEX COMMUNICATIONS NEEDS

Covering an approximately 20-mile arc around the southern end of Silicon Valley, the Santa Clara County Fire Department (SCCFD) operates 15 fire stations, an administrative headquarters, a maintenance facility, five other support facilities, 19 pieces of apparatus, and three command vehicles to cover 128.3 square miles and a population of more than 226,700.

SCCFD is one of the few departments in California with its own IT department. Led by Eric Prosser, SCCFD's Information Technology Officer, the department puts IT to use in ways that help first responders save lives. For example, every fire truck is currently equipped with two iPads. As soon as a call comes in, one iPad immediately displays the fastest route to the site, as well as relevant information (location of sprinklers, fire escapes, and so on) if it's a commercial facility.

The other iPad is used by medics to quickly enter information about the people being treated. This data is uploaded to the cloud and instantly available to the ambulance crews and hospital staff that take over their care.

Unique communications needs

When Prosser joined the department in 2012, each facility had its own limited PBX. These PBXs were old and constantly needing repairs with parts found on eBay. When a fire station's PBX went down, those employees couldn't receive or make calls until it was repaired. The department tasked Prosser with finding a solution to not only fix these redundancy issues but also have the ability to expand their current system at HQ. Through a request for proposals (RFP) process, Prosser looked at many solutions, but only a few met the needs of the department's unique environment such as a cloud-based UCaaS solution that would cover the entire organization.

"We had no redundancy with the PBXs and no room for growth at our current business site," Prosser explains. "By going with a UCaaS solution, we could achieve redundancy through multiple Internet connections and grow without limitations." He set up the department with three levels of redundancy by contracting with three different Internet service providers (ISPs), one being cellular Long-Term Evolution (LTE). Since the implementation, they have experienced one outage, which no one noticed.

In his search for the right UCaaS solution, one of Prosser's main considerations was the complexity of phone use by an organization in which phones are shared by three rotating shifts of people. This demands a lot more flexibility compared to a business office, for instance, where everyone has an assigned phone. Prosser needed to do things like set up speed dials and paging groups; integrate phones with third-party equipment such as external ringers, flashers, and a public address (PA) system; and have some calls but not others go to battalion chiefs, among others.

RingCentral: Robust, flexible, and easy to configure

After evaluating a number of solutions, Prosser chose RingCentral because it delivered the level of flexibility and configurability he needed at a great price. The department initially started to go with a different solution. "They promised we could do all of the things we needed to do, but ended up not delivering. It was a mess from both the user and administrative viewpoints," he recalls.

Prosser put in a lot of thought and time prior to the RingCentral deployment so that he could make the system as easy to use as possible. Actions like creating speed dials and ring groups, which would simplify the phones for end users, were easy for him using RingCentral's toolset through the administrative portal.

"From an application manager's point of view, RingCentral is easy to use," Prosser says. "RingCentral provides enough complexity in their basic toolset that I can get in there and do what I need to do. I don't have to call RingCentral every time I want to do something." Prosser did rely on RingCentral support for a few of the integrations, such as integrating the fire stations' PA systems and third-party ringers and flashers. "RingCentral's team was phenomenal in supporting us doing this," he adds.

Ultimately, RingCentral gives the fire department a robust communications system with both a higher level of functionality and greater security. "By going with RingCentral, I immediately gained redundancy, as well as the ability to manage the system from anywhere. If I happen to be somewhere outside the disaster area, I can keep my department connected as long as I have an Internet connection. We can redirect phone calls and set up an emergency center very quickly, without much effort, as we have preprogrammed this in the system. Plus, the added reliability of not having to maintain hardware on 17 different sites is much easier with RingCentral at the helm," Prosser says.

Cloud First

Many innovative startups today are "born in the cloud" and are a natural fit for cloud solutions. Even more established organizations are increasingly adopting a "cloud first" strategy to fully leverage the benefits of the cloud. For these businesses, the ability to integrate their business communications with core processes and services is key. The focus is on application programming interfaces (APIs) and other tools that enable rapid integration and customization.

TUFF SHED SEEKS BEST SALESFORCE INTEGRATION, FINDS THAT AND MUCH MORE WITH RINGCENTRAL

Since 1981, Tuff Shed has been supplying customers with the best garages, storage, and recreational buildings for their needs. The company has a network of 48 manufacturing facilities serving customers in 36 states. It displays its buildings at 124 Tuff Shed factory-direct locations, as well as in nearly 1,400 Home Depot stores. In addition to a headquarters in Denver, Tuff Shed operates a large customer contact center in Dallas.

As Tuff Shed expands and its workforce becomes more distributed, keeping everyone connected to each other and to the company's Salesforce customer relationship management (CRM) is crucial to maintaining the company's high standard of customer service. Its previous phone system, which lacked any messaging functionality, didn't help with this. Also, its spotty call quality at times gave the wrong impression to customers.

"We literally had a full-time VoIP engineer on staff for our PBX and still the situation was so bad that our legacy phone system was like a cuss word around here," explains Juan Ruiz, Director of Information Technology at Tuff Shed. Between frustration with call quality and the fact that he also had to contract with multiple providers for messaging needs, Ruiz decided to start over.

Salesforce integration critical; user-friendly features seal the deal

Before Ruiz started the search for the new communications system, Tuff Shed implemented Salesforce as its new CRM. Everyone was happy with Salesforce and wanted to prioritize its integration with the communications system. Ruiz invited eight cloud vendors to bring their phones to Denver, plug them in, and test the integration. "I quickly noticed that RingCentral was an easier and less complicated Salesforce integration," says Ruiz. "Things like click-to-dial and call analytics just worked right away. I hate the phrase *out-of-the-box* because everyone says that, but this was pretty close."

Although the Salesforce integration was critical, due to its ability to automate sales and service cycles, Ruiz was also impressed with RingCentral's full feature set and the integrated functionality of the platform. With RingCentral Office, RingCentral Contact Center, RingCentral Mobile, and RingCentral Glip, Tuff Shed is covered for telephony, call centers, mobile devices, team messaging and collaboration, and much more.

Ruiz deployed RingCentral Contact Center, a robust call center solution for Tuff Shed's business development center (BDC) and IT call centers in Denver right away. (Its main contact center is getting a network upgrade before the Contact Center deployment.) "I like the features and all the reports available in Contact Center," Ruiz says. "We had absolutely no visibility with our legacy call centers unless we wanted to pay a huge amount of money to get reports."

(continued)

He also values the fact that Contact Center is integrated with Salesforce, which is something call center employees are starting to realize the power of.

RingCentral Glip proves its value

Ruiz also rolled out RingCentral Glip, a user-friendly team messaging app that includes file sharing, video conferencing, screen sharing, and built-in task managing. "We have Glip groups that include marketing, IT, operations, and others. The groups are highly collaborative," says Ruiz. "Plus, with Glip conversations, entire meetings haven't had to happen because everyone gets answers to their questions that much faster."

Ruiz loves the speed of communication with Glip. "We communicate faster, which has reduced my emails from 300 per day to fewer than 100," he says. Ruiz has set up multiple Glip groups for IT. One group consists of employees who travel from site to site. "People can report to IT on the spot if they see anything that needs attention," explains Ruiz. "It gives them a voice, and their feedback allows me to make decisions faster."

Cloud-based communications platform saves money

Early in the decision-making process, Ruiz told his CEO and COO that the company would save money by moving to RingCentral. They were all a bit was skeptical at first. "If we had hired out to implement what we have with RingCentral, it would have cost hundreds of thousands of dollars and then tens of thousands to keep it running afterwards," says Ruiz. "Now instead of a full-time VoIP engineer managing the system, we have a guy on our help desk who is deploying RingCentral on his own."

Chapter **7**

Ten Things to Consider When Choosing a UCaaS Solution

When you're considering migrating your business communications solutions and applications to the cloud, it's important to evaluate Unified Communications as a Service (UCaaS) providers and platforms carefully to ensure you choose the best option for your organization to meet your requirements now and in the future.

In this chapter, we provide ten key considerations to help guide you through your evaluation of potential UCaaS providers.

Complete and Easy to Buy, Set Up, Use, and Manage

Although the ability to easily and seamlessly integrate with a broad ecosystem of third-party and custom apps (discussed later in this chapter) is an important capability to look for in a UCaaS solution, your solution also needs to provide core functionality without requiring a bunch of "add-on" features. Deploying multiple tools from multiple vendors across different locations can lead to interoperability issues and troubleshooting challenges. You want to avoid having to build "Frankenstein's monster" to support business communications — otherwise, your video conferences and calls may look and sound monstrous!

REMEMBER

A complete UCaaS solution offering provides business customers with ease of buying, setup, and management — particularly when compared to an on-premises PBX offering.

Cloud Native

The cloud enables many business advantages including agility, on-demand elasticity, and global scalability, among others. However, if your unified communications (UC) solution isn't designed for the cloud, it may not be optimized to fully leverage the benefits of the cloud. Simply, porting a business communications suite or "lifting and shifting" an on-premises UC infrastructure to the cloud won't necessarily deliver the benefits you and your business users are expecting. Look for a cloud-native solution that is built for the cloud and enables you to "pay as you go" and rapidly scale up or down to meet constantly changing business requirements and new growth opportunities.

Global Scalability

The cloud makes it possible for businesses of all sizes to go global. Employees located anywhere in the world — in remote offices, on the road, in airports and hotels — need to be on the same secure communications network with the ability to access the same robust business features from a single business phone system.

They and their global customers and partners require a secure, reliable voice, messaging, and collaboration solution that supports global reach and devices of their choice.

To meet their requirements and ensure a consistent, high-quality experience, you need a business communications solution built on a global, redundant service delivery architecture designed from the ground up to ensure superior, scalable, and secure service across worldwide distributed offices, employees, and customers.

Your global network also needs to be architected to enable easy and rapid international provisioning of offices and employees, with local points of presence (POPs) wherever you're doing business, to ensure high performance and maximum cost effectiveness.

Robust Reliability

For enterprise organizations moving to a cloud solution, reliability is a primary concern. Choosing a solution that offers carrier-grade reliability and quality of service (QoS) is critical. You should demand the following capabilities in any potential UCaaS provider:

» **Business continuity:** Natural disasters, outages, and cyberattacks can cause communications downtime that frustrates your customers and threatens your bottom line. Your UCaaS provider should have a distributed network that is fully redundant and provides a global infrastructure that ensures 24/7 business continuity.

» **End-to-end monitoring:** Your UCaaS provider should provide continuous end-to-end monitoring of network performance to ensure that key performance indicators (KPIs) such as quality metrics, completion rates, and availability remain at peak levels, and proactive alerting to warn of potential issues.

» **Self-service access to real-time system information:** A self-service portal enables business customers to log in 24/7 to check the overall health of the UCaaS solution. You should be able to confirm, in real-time, whether your communications services are up and running, and monitor the status of any system-wide issues that may occur.

» **Disaster recovery:** Your UCaaS solution should be archi-
tected to automatically failover in case of emergency — for
example, using Session Initiation Protocol (SIP) trunking to
provides real-time disaster recovery by switching active
services from one data center to another.

Seamless Collaboration

UCaaS enables seamless integration with business collaboration
tools such as office productivity suites (for example, Google Docs
and Microsoft Office 365), customer relationship management
(CRM) applications (for example, Microsoft Dynamics and Sales-
force), DevOps tools (for example, Slack), chatbots, desktop shar-
ing, and on-demand video conferencing.

Enterprise-Class Features

Look for enterprise-class features, including the ability to do the
following:

» Make or receive calls directly from your contact applications.

» Click-to-dial any phone number that appears in your
contacts.

» Send and receive text messages from your office productivity
interface.

» Schedule a meeting or audio conference from your calendar.

» Provision toll-free numbers as needed.

» Support large video conferences (for example, up to 50
participants) and voice conference calls (for example, up to
1,000 participants).

» Enable unlimited audio conference calling initiated within
your office productivity interface.

» Provide an auto-receptionist to greet callers and route them
to any employee, department, or phone extension.

» Allow automatic audio recording for inbound and/or
outbound calling.

» Provide a multi-level auto attendant to extend your auto-receptionist capability with easy-to-customize inbound call routing and telephone prompts that connect callers to their desired destinations.

» Capture and access voicemail (including standard voicemail, visual voicemail, and voicemail with email notifications) to allow users to manage their voice and fax messages directly within their office productivity and customer relationship management (CRM) apps.

» View complete communications history including calls, texts, faxes, and voicemails from email.

Open APIs to Support Custom Workflows

Your organization, business requirements, and user expectations are unique. To optimize your business performance, your UCaaS solution should provide the tools your developers need — specifically application programming interfaces (APIs) and a software development kit (SDK) — to seamlessly integrate business communications into your key business processes, so you can automate workflows, drive efficiency, and gain valuable insights. You want your developers to have direct access to voice, short message service (SMS) text, fax, account configuration, and communications data to ensure that your business communications solution is aligned and working to support your business objectives, and to allow them to make changes as needed in today's fast-paced business environment.

Security and Compliance

Secure and reliable communications are critical to business operations. As you consider UCaaS providers, you should be especially diligent in examining the security systems and policies they have in place to protect your business and to assure your customers and partners that their interactions with your company will be protected.

You'll want to be certain that your UCaaS provider has a comprehensive security strategy that comprises multiple layers and many components, from policies and methodologies to service architecture.

In doing your due diligence, insist on seeing and evaluating the strategies, tactics, end-to-end administration, application, network, infrastructure, physical, and environmental measures your prospective UCaaS provider has in place.

Specifically, determine if the solution has these standards of a comprehensive cloud security strategy:

» Secure, Statement on Standards for Attestation Engagements (SSAE) 16 Service Organization Controls (SOC) 2 and SOC 3 compliant data center with monthly audits

» Encrypted end-to-end voice transmission

» Encrypted data-at-rest, meeting regulatory compliance requirements and standards such as the U.S. Health Insurance Portability and Accountability Act (HIPAA), EU General Data Protection Regulation (GDPR), and Payment Card Industry Data Security Standards (PCI DSS)

» Support for multi-factor authentication (MFA) and single sign-on (SSO) user access

» Built-in service layer fraud protection and continuous monitoring for anomalies

» Advanced account management and administration from anywhere, at anytime

» Robust network security protection

Speak with customers to verify that a UCaaS provider's security and compliance controls are meticulously implemented and monitored — not just paper measures. Make sure they represent the most recent, relevant, and stringent industry standards for security and that they're audited regularly to ensure efficacy. And ask your provider how often they release updates and upgrades to continuously improve the effectiveness of their security measures.

Finally, be sure you understand your own role and responsibilities in ensuring the security of your communications solution.

Same Experience Across All Devices and Core Business Apps

The days of hopping in and out of multiple applications through-out the workday are disappearing. Enabling employees to access the applications they need and perform varied tasks through-out the day without frequently switching between applications improves productivity.

As you consider embedding UCaaS in your Software as a Service (SaaS) applications, you'll want to ensure that the result will be an implementation that features a consistent, elegant, easy-to-use user interface across all elements of your office productivity tools and other core applications. Your UCaaS interface, in particular, should follow your users as they work within your widely used SaaS applications, ensuring that the comprehensive telephony functionality they need is always visible and at hand.

REMEMBER Business communications today must be user-centric: The user decides how they want to communicate — whether by video con-ference, email, text message, or phone. In addition to the mode of communication, the device used for communication is a user choice as well. Business communications in the mode of choice must be supported on the device of choice, from anywhere and at any time.

Support and Service-Level Agreements

While moving applications to the cloud largely frees IT staff from service and support tasks, it's important to understand what ser-vices and support your UCaaS partner provides, and to get bind-ing assurances that hold them accountable for delivering those services and support.

In a recent Infonetics *UC Cloud and On-Premises Strategies and Vendor Leadership Survey,* respondents ranked service and support as the third most important criteria in selecting a cloud provider. Infonetics comments, "Without high-quality service and the accompanying support, businesses will quickly churn away from providers. Aside from the necessary features and capabilities and a high-quality service, the interaction with account and support teams is critical for businesses."

TIP

Like security and compliance (discussed earlier in this chapter), ensure your cloud provider's support and service-level agreements (SLAs) are not just paper measures. When things go wrong, the need for proactive account managers and responsive support teams is paramount. Ensure your support agreements and SLAs "have teeth" and your team understands the support and remediation processes that are defined in these agreements.

Glossary

API: *See* application programming interface (API).

application programming interface (API): A set of rules and specifications that software programs can follow to communicate with each other; serves as an interface between different software programs and facilitates their interaction.

central office (CO): In telecommunications, a central office (or telephone exchange) is a building that connects subscriber telephone lines in a local loop.

CO: *See* central office (CO).

CRM: *See* customer relationship management (CRM).

customer relationship management (CRM): A set of technologies and tools used to manage, improve, or facilitate sales, support, and related interactions with customers, prospects, and business partners.

enterprise resource planning (ERP): Software that stores and manages data created during every stage of business — from product planning, cost, and development to shipping and payment — to provide an integrated real-time view of core business processes.

ERP: *See* enterprise resource planning (ERP).

five 9s reliability: Refers to a high standard (99.999 percent) for the desired availability of a system. It is equivalent to approximately 5 minutes of downtime — planned or unplanned — in a given year.

GDPR: *See* General Data Protection Regulation (GDPR).

General Data Protection Regulation (GDPR): A European Union (EU) mandate that addresses personal data protection within the EU and the export of personal data outside the EU. The GDPR takes effect in May 2018 and replaces the EU Data Protection Directive (officially known as Directive 95/46/EC).

H.323: A VoIP protocol that is commonly used in videoconferencing equipment. *See also* Voice over IP (VoIP).

Health Insurance and Portability Accountability Act (HIPAA): A U.S. federal regulation that addresses security and privacy requirements for medical systems and protected health information (PHI). *See also* protected health information (PHI).

HIPAA: *See* Health Insurance and Portability Accountability Act (HIPAA).

integrated services digital network (ISDN): A low-bandwidth commu-nications protocol that operates over analog telecommunications voice lines.

Internet Protocol (IP): The principal communications protocol in the TCP/IP communications suite for routing across network boundaries (routers) and the Internet. *See also* Transmission Control Protocol (TCP).

Internet Protocol Private Branch eXchange (IP PBX): A private business telephone system that provides functionality similar to a PBX, but over data networks like a local area network (LAN) or wide area network (WAN) rather than traditional circuit-switched networks. An IP PBX typically can switch calls between VoIP on local lines or between VoIP and traditional telephone users. *See also* private branch exchange (PBX) and Voice over IP (VoIP).

IP: *See* Internet Protocol (IP).

IP PBX: *See* Internet Protocol Private Branch eXchange (IP PBX).

ISDN: *See* integrated services digital network (ISDN).

ISO/IEC 27001: An information security management system (ISMS) standard published by the International Organization for Standardiza-tion (ISO) and the International Electrotechnical Commission (IEC).

jitter: A variation in latency that occurs on packet-switched networks when individual packets travel different paths from sender to receiver, and then arrive at different times and in a different order. Jitter is typically caused by network congestion, route changes, or timing drift, and results in a call with poor or scrambled audio.

key performance indicator (KPI): A type of performance measurement that evaluates the success of an organization or service based on specific elements and criteria.

KPI: *See* key performance indicator (KPI).

MFA: *See* multi-factor authentication (MFA).

MPLS: *See* multi-protocol label switching (MPLS).

multi-factor authentication (MFA): A type of access control that only grants access after at least two forms of authentication are provided.

multi-protocol label switching (MPLS): A packet data transport service that uses a high-speed switching architecture rather than the typical routers seen in most IP networks. It transmits calls across a telco service provider's network in a cloud-like connection between the business customer's locations.

Payment Card Industry Data Security Standards (PCI DSS): An industry standard mandated for organizations that handle American Express, Discover, JCB, MasterCard, or Visa payment cards, such as credit and debit cards.

PBX: *See* Private Branch eXchange (PBX).

PCI DSS: *See* Payment Card Industry Data Security Standards (PCI DSS).

PHI: *See* protected health information (PHI).

point of presence (POP): A demarcation point or interface point between communication entities, typically containing servers, routers, switches, multiplexers, and other networking equipment.

POP: *See* point of presence (POP).

PRI: *See* primary rate interface (PRI).

primary rate interface (PRI): Phone circuits that are based on the integrated services digital network (ISDN) standard used for carrying multiple voice calls and/or data transmissions between two physical locations. *See also* integrated services digital network (ISDN).

Private Branch eXchange (PBX): A private telephone system that switches calls between business users on local lines while allowing all users to share a certain number of external phone lines.

protected health information (PHI): Any personal information about health status, or healthcare provisioning and payment that can be linked to a specific individual.

PSTN: *See* public switched telephone network.

public switched telephone network (PSTN): Also known as plain old telephone system (POTS), PSTN is the world's hard-wired phone system over which landline telephone calls are made. To connect one phone to another on the PSTN, a phone call is routed through a circuit sometimes comprising numerous switches operating on a local, regional, national, or international level.

QoS: *See* quality of service (QoS).

quality of service (QoS): The ability to prioritize various types of voice and data traffic based on operational needs such as response time, packet loss, and jitter.

SaaS: *See* Software as a Service (SaaS).

SAS 70: *See* Statement on Auditing Standards (SAS) 70.

SDK: *See* software development kit (SDK).

service-level agreement (SLA): An official commitment between a service provider and a client that addresses specific aspects of the service provided such as quality, performance, availability, and responsibilities.

Session Initiation Protocol (SIP): An open signaling protocol standard for establishing, managing, and terminating real-time communications over IP-based networks.

short message service (SMS): A text messaging service.

single sign-on (SSO): A system that allows a user to present a single set of log-on credentials, typically to an authentication server, which then transparently logs the user on to all other enterprise systems and applications for which that user is authorized.

SIP: *See* Session Initiation Protocol (SIP).

SLA: *See* service-level agreement (SLA).

SMS: *See* short message service (SMS).

Software as a Service (SaaS): A category of cloud computing services in which the customer is provided access to a hosted application that is maintained by the service provider.

software development kit (SDK): A set of software development tools that allows custom applications to be created for a specific software application.

SSAE 16: *See* Statement on Standards for Attestation Engagements (SSAE) 16.

SSO: *See* single sign-on (SSO).

Statement on Auditing Standards (SAS) 70: An auditing standard for service organizations superseded by SSAE 16. *See also* Statement on Standards for Attestation Engagements (SSAE) 16.

Statement on Standards for Attestation Engagements (SSAE) 16: A standard (supersedes SAS 70) put forth by the Auditing Standards Board (ASB) of the American Institute of Certified Public Accountants (AICPA) that addresses engagements undertaken by a service auditor for reporting on controls for organizations that provide services to user entities. It extends to "Security, Availability, Processing Integrity, Confidentiality, and/or Privacy" for Software as a Service (SaaS), cloud computing, managed service providers, and many other IT-related entities. *See also* Software as a Service (SaaS) and Statement on Auditing Standards (SAS) 70.

T1: A hardware specification for telecommunications trunking. A T1 circuits consists of 24 64-kilobits/second (kbps) channels totaling 1.544 megabits/second (mbps).

TCP: *See* Transmission Control Protocol (TCP).

TDM: *See* time-division multiplexing (TDM).

time-division multiplexing (TDM): A method of increasing the number of independent signals that can be transmitted and received over a single medium by dividing the different signals into separate time slots.

Transmission Control Protocol (TCP): TCP provides reliable, ordered delivery of a stream of bytes from a program on one computer to another program on another computer.

UC: *See* unified communications (UC).

UCaaS: *See* Unified Communications as a Service (UCaaS).

UC&C: *See* unified communications and collaboration (UC&C).

UDP: *See* User Datagram Protocol (UDP).

unified communications (UC): The integration of real-time communications (such as voice telephony, audio/web/video conferencing, and instant messaging) and non-real-time communications (such as email, voicemail, and fax).

unified communications and collaboration (UC&C): The integration of real-time communications (such as voice telephony, audio/web/video conferencing, and instant messaging), non-real-time communications (such as email, voicemail, and fax), and file/desktop sharing and team collaboration tools (such as Microsoft Office 365, Google Apps, and Ring Central glip).

Unified Communications as a Service (UCaaS): A category of business communication and collaboration applications and services delivered by a cloud service provider.

User Datagram Protocol (UDP): A network protocol that doesn't guarantee packet delivery or the order of packet delivery over a network.

Voice over Internet Protocol (VoIP): A group of telephony protocols (such as SIP), that transport voice and multimedia communications over packet-switched, IP-based networks (such as the Internet), rather than circuit-switched networks, such as the PSTN. *See also* Session Initiation Protocol (SIP) and public switched telephone network (PSTN).

VoIP: *See* Voice over Internet Protocol (VoIP).

Enterprise companies are moving to the cloud for more agility and increased savings.

The benefits of cloud communications are clear.

55%

of respondents believe that moving to the cloud offers obvious benefits.*

*"The State of Cloud Communications" 2016 No Jitter Industry Insights report

Cloud communications solutions are growing faster than on-premises.

Cloud (UCaaS) **22%**

On-Premise (UC) **-9%**

30%
20%
10%
0%
-10%

Q1 2017 YoY Growth
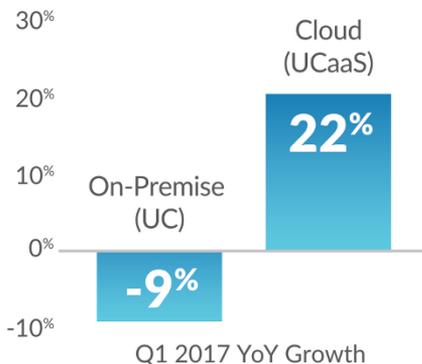
*Synergy Research Unified Communications as a Service (UCaaS) Revenue Tracker, Q1 2017

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Lawrence Miller has written more than 130 *For Dummies* books on numerous technology and security topics. **Ittai Geiger** is a customer experience expert with several years' experience in customer-facing roles for organizations small and large.

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