5 Reasons On-Premises Telephony Remains Key, even when moving to UCaaS

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About

About This Paper

This paper discusses the continued relevance of on-premises telephony connectivity in 5 specific scenarios. The aim is to inform organisations on a journey to UCaaS or cloud telephony.

This paper is written by Tom Arbuthnot of Empowering.Cloud, supported by Ribbon, a benefactor of Empowering.Cloud.

Tom Arbuthnot is a respected figure in the Microsoft technology community. He has been recognized as a Microsoft Most Valuable Professional (MVP) since 2011. He actively shares his insights and industry updates through various channels, including his blog (Tomtalks.blog), Empowering.Cloud, the UC Today Microsoft Teams Podcast, and his Microsoft 365 Perspective newsletter.

About Empowering.Cloud

Empowering.Cloud is dedicated to unlocking the transformative potential of Microsoft Teams and Microsoft 365 for industry professionals through community and research. Empowering.Cloud brings together the community to share knowledge with in-person and online events, subject matter expert briefings, the newsletter and Teams Insider podcast.

About Ribbon

Ribbon has a long history of providing some of the largest telecommunications providers in the world with their core telephony controllers as well as equipment for enterprises of all scales. They are extremely familiar with all the cloud phone connectivity models for the major UCaaS providers.

Ribbon is a long-standing Microsoft partner with a certified session border controller since the on-premises OCS, Lync, and Skype for Business Server days and continues to be a leading provider for Microsoft Teams.

Ribbon is also certified as an Operator Connect Accelerator provider. Operator Connect Accelerator is a Microsoft certified program designed to help telecom operators quickly onboard and deliver services through Operator Connect for Microsoft Teams. Indeed, Ribbon equipment and services are behind several certified Operator Connect providers.

Ribbon is also certified for Cisco's Webex Local Gateway program and Zoom’s Premises Peering to integrate to on-premises devices, as well as the Cisco Webex Cloud Connect and Zoom Provider Exchange programs for Operator cloud-cloud integration.

Cloud Phone / UCaaS is Growing Rapidly

Cloud/SaaS-based Phone solutions are rapidly replacing traditional on-premises phone systems. When the move to the cloud began, organizations tended to select cloud-based services that emulated traditional office phone behaviour. Since this was a phone system buying decision, telecom operators, typically using BroadSoft-based software, were the solution of choice.

In 2020, organizations were forced to adopt hybrid work tools rapidly, and as a result, web collaboration services became the primary buying criteria for IT managers. Today, the phone portion is more likely to "come along for the ride" with Unified Communications as a Service (UCaaS) solutions from key players such as Microsoft Teams, Cisco Webex, Zoom, Ring Central, and 8x8.

Cloud-based solutions provide organisations flexibility, scalability, less upfront setup, no hardware maintenance, increased security, and ever-improving features. The rise of remote/hybrid working has driven this trend. With a per-user pricing model, UCaaS allows organisations of all sizes to rapidly take advantage of sophisticated Unified Communications services at a lower starting cost. More recently, AI is offering new capabilities that wouldn't be possible without cloud scale and architecture.

According to Cavell's research, there are 84+ million global UC users[1], and the global Unified Communications as a Service (UCaaS) market is set to grow to more than 131 million users by the end of 2028, with a compound annual growth rate of 10.3% over the next five years. Only 4% of organisations surveyed never plan to migrate their PBX to the cloud.

Microsoft Teams has 320 million monthly active users.[2] Over 20 million users[3] have added Teams Phone services. Webex reached 15 million Calling users worldwide in April 2023[4], up from 10 million. In April 2023, Zoom's Phone segment reached 7 million paid user seats[5], in less than five years.

[1] https://www.cavell.com/cavell-group-brings-you-its-top-ten-unified-communication-and-cloud-calling-facts-and-stats-from-global-user-numbers-to-growth-forecasts-and-data-on-which-markets-are-the-biggest-and-fastest-growing/
[2] https://www.microsoft.com/en-us/Investor/events/FY-2024/earnings-fy-2024-q3.aspx
[3] https://www.microsoft.com/en-us/Investor/events/FY-2024/earnings-fy-2024-q3.aspx
[4] https://blog.webex.com/collaboration/webex-calling-at-webexone-2023/
[5] https://www.cxtoday.com/contact-centre/zoom-reaches-700-ccaas-customers-virtual-agent-growth-soars

Getting UCaaS connected to the PSTN

Subscribing to a cloud-based phone system/UCaaS is only half the story. Every UCaaS solution needs access to the PSTN (via a telecom operator). There are four ways to add a telecom operator/PSTN connectivity to a UCaaS service. Unfortunately, different UCaaS vendors use different nomenclatures to describe their offerings. Let's start by covering the four options, then add the vendor labels for each.

- Option 1: Telecom services come from or bundled with the UCaaS service. The UCaaS provider sends the customer one bill for everything. This is especially compelling for small businesses that want a simple solution.
- Option 2: Telecom services are delivered to the customer via a SIP trunk from an operator, terminated on a Session Border Controller (voice firewall), and then connected to the UC provider. The telecom provider bills the customer separately from the UC service provider.
- Option 3: The telecom provider and UCaaS provider have a structured relationship that allows the two organisations to establish a direct cloud-to-cloud connection; services do not go to the customer premises, and no session border controller is required at the enterprise edge. The telecom provider bills the customer separately from the UC service provider.
- Option 4: Cellular/Mobile provider and UCaaS provider have a structured relationship that allows the two organisations to establish a direct cloud-to-cloud connection. A single number is the user's cellular and UCaaS/VoIP number. The telecom provider bills the customer separately from the UC service provider.

Telephony Connectivity	Microsoft Teams	Webex	Zoom
Option 1 – UCaaS native PSTN	Microsoft Teams Calling Plans[6]	Cisco Calling Plans[7]	Zoom Phone[8]
Option 2 – Connect a session border controller	Direct Routing[9]	Local Gateway[10]	Bring Your Own Carrier" (BYOC)[11]
Option 3 – wireline Operator Integrated to UCaaS Provider	Operator Connect[12]	Cloud Connect for Webex Calling[13]	Zoom Phone Provider Exchange (PPE)[14]
Option 4 – cellular Operator Integrated to UCaaS Provider	Teams Phone Mobile	Webex Go Mobile Operator[15]	NA – mobile app only

[6] https://learn.microsoft.com/en-us/microsoftteams/calling-plans-for-office-365
[7] https://www.webex.com/products/calling-global-availability.html
[8] https://zoom.us/pricing/zoom-phone
[9] https://learn.microsoft.com/en-us/microsoftteams/direct-routing-plan
[10] https://help.webex.com/en-us/article/n4cprps/Prepare-your-environment
[11] https://explore.zoom.us/docs/doc/Zoom%20Phone%20-%20Bring%20Your%20Own%20Carrier.pdf
[12] https://learn.microsoft.com/en-us/microsoftteams/operator-connect-plan
[13] https://www.webex.com/products/calling-global-availability.html
[14] https://www.zoom.com/en/products/voip-phone/features/provider-exchange/
[15] https://help.webex.com/en-us/article/n2fha94/What-is-Webex-Go

Why do UCaaS providers offer multiple telephony connectivity options?

- Offering telephony services in every country is nearly impossible. Most countries have very specific (and often changing) legal requirements, licences, and tax implications, which can be complicated and costly for providers.

- Although pure cloud telephony connectivity is possible in many countries, it is not available globally.

- Customers want the choice of operator and may have legal, technical, and commercial reasons to work with specific telephony service providers.

Customers can mix and match several types of connectivity on a site or even a user-by-user preference to meet their global site/user requirements.

For example, most Microsoft Teams Phone users are connected to the PSTN using Option 2 (Direct Routing) or Option 3 (Operator Connect).

5 reasons on-premises Telephony Connectivity is here to stay

Cloud is the future, but sometimes it's easier said than done

It is widely agreed that moving your PBX and PSTN connectivity to the cloud is favoured by organisations and the prevailing trend in the industry. However, there are several reasons why organisations, or parts of organisations, will still require local on-site Phone and/or PSTN connectivity.

This is the case even if their strategy is to move to a UCaaS service and cloud PSTN where they can.

Here are five reasons why on-premises telecom services still have a role to serve, even as we move to cloud telephony systems such as Microsoft Teams, Webex, or Zoom.

1. SIP trunks are not available or not reliable

Many countries don't have suitable internet connectivity for VoIP telephone connectivity. There are also a few that have legal restrictions on using VoIP.

While traditional switched PSTN networks with physical circuit connections are being phased out in many Western markets, they still play a vital role in countries with unreliable internet/IP networks - especially in Africa, the Middle East, and parts of Asia and South America. With voice and other real-time traffic, it is not just about bandwidth throughput but also quality, reliability and consistency.

Examples of countries with limited broadband average speeds:

- Venezuela: 3.31 Mbps
- Libya: 3.81 Mbps
- Algeria: 4.10 Mbps
- Lebanon: 4.51 Mbps
- Bolivia: 5.15 Mbps
- Niger: 5.22 Mbps
- The Gambia: 5.34 Mbps

Africa has some of the slowest internet speeds, with many countries ranking in the bottom 10 globally.

There are many reasons for their internet connectivity being less robust:

- Lack of infrastructure and investment in telecom networks
- Political instability and conflict disrupting connectivity
- Economic challenges limiting resources for upgrades
- Large rural and remote populations underserved by Internet providers

In these locations, there are advantages to maintaining dedicated local PSTN connectivity.

- Telephony is less dependent on internet quality and is generally more reliable for call connectivity and voice quality.
- Provides business continuity during internet outages, as PSTN will still function
- It is more accessible in rural and remote areas that may lack broadband infrastructure
- Considered more reliable for emergency services and location tracking than VoIP
- It may also be that quality bandwidth is expensive.

In these scenarios, organisations may choose a cloud phone provider with local telephony connectivity or keep a phone system local to the site. In both cases, there is a physical telephony network connection on site, and there is a need for a local SBC/Gateway.

2. Site Resilience / Disaster Recovery / Survivability

For some organisations, Telephony is mission-critical and requires continued service even with internet or UCaaS provider issues.

There are multiple approaches to mitigating service risks. Organisations can leverage diverse internet connectivity or local 4G/cellular data connections to provide backup network connectivity. However, not all locations offer resilient internet options.

These scenarios and requirements for resiliency require local telephony network connectivity that will continue to work independently of the internet connection.

Several UCaaS providers offer resilience in the form of on-site equipment that can provide continued telephony service in case of an internet outage or an issue with their cloud service. For Microsoft Teams, these are Survivable Branch Appliances. Survivable Branch Appliances combine a Microsoft-certified Session Border Controller with Microsoft software to allow Teams Telephony to continue working during an internet or cloud service outage.

Zoom offers a similar solution called Zoom Phone Local Survivability (ZPLS). Zoom's ZPLS offer is a bit more robust than Teams as it offers a greater degree of feature transparency during an outage.

A simpler option than survivable branch appliances is to terminate a few emergency analog phones directly to a local onsite SBC or Gateway to keep some key phones working in case of a UCaaS or internet outage. Effectively, an on-site mini-PBX. Ribbon Edge SBCs can offer this capability out of the box

3. Regulatory requirements to use an approved telephony service provider that requires local connectivity

Some countries require telephony providers to have a local business presence to offer phone numbers and services within their borders. Countries that require local presence for telephony service providers include:

- Austria
- Brazil
- China
- India
- Indonesia
- Mexico
- Saudi Arabia
- United Arab Emirates

This is often due to regulations aimed at protecting domestic telecom industries and ensuring government oversight.

- **Protecting domestic telecom companies** - Requiring a local presence prevents foreign providers from bypassing domestic carriers and undercutting their business.
- **Ensuring regulatory compliance** - Having providers operate locally makes it easier for authorities to enforce telecom laws and monitor for illegal activities like toll bypass.
- **Generating tax revenue** - Mandating a domestic presence allows countries to collect taxes and fees from telecom providers in their jurisdiction.
- **Maintaining data sovereignty** - Some countries want citizen and business data to reside within their borders for privacy and national security reasons.

Regulations requiring the telephony provider to have a local/in-country presence does not mean the provider cannot offer telephony connectivity as a cloud service (for example, Teams Operator Connect or Direct Routing as a Service), but some country-approved providers only offer service to customers as a dedicated per-customer connection, whether traditional telephony circuits that require a gateway or over IP that require a customer session border controller. India, China and the UAE typically have this scenario.

In these cases, the customer cannot opt for a pure cloud service for telephony connectivity, even when moving to a UCaaS service. To terminate the operator connection, they will require a local Gateway or Session Border Controller (physical or virtual). Through Teams Direct Routing, Webex Local Gateway or Zoom Bring Your Own Carrier (BYOC), these can be integrated into the relevant UCaaS Service.

4. Connectivity for devices such as PA systems, elevator phones or the existing PBX

While most telephony endpoints can be migrated to the cloud, certain on-premises endpoints require physical connectivity, necessitating an on-site Session Border Controller (SBC) or gateway.

Customers likely want to decommission the PBX where possible to realise cost savings (power, maintenance, support) and reduce the risk of running on unsupported infrastructure. An SBC/Gateway is required for telephony network connectivity and/or UCaaS connectivity for these devices.

Example endpoints include:

- Lift/Elevator Phones
- Door phones
- Alarm Systems
- Fax / Modem
- Analog lines – hard to areas or long runs, for example, a university campus, military or government complex, or a sprawling manufacturing site. Speciality phones – for example, weather-resistant, chemical-resistant or devices that meet regulations for fire or explosion resistance

There may also be requirements for endpoints to run during a power disruption.

Customers may also want to connect to existing PBXs or IP-PBXs directly. This can be required for several reasons:

- Interop calling between UCaaS users and PBX users/phones, either as part of a phased migration or permanently.
- Keep traditional phones/PBX in service while moving to a single Session Border Controller architecture for telephony network connectivity
- Business Processes and call flows that are built around existing PBX or Contact centre solutions
- Continue to leverage existing telephony network connectivity via the PBX

Customers may also want to leverage existing site-terminated PSTN circuits, either temporarily as part of a migration to the cloud or more permanently for cost, contract term or supplier relationship reasons or as an emergency failover.

5. Critical infrastructure

Communication infrastructure is often considered critical in sectors such as government, defence, utilities, and other essential services. These organizations have specific needs and regulations that can necessitate on-premises phone connectivity.

Many critical infrastructure sectors are subject to strict regulations regarding data security, privacy, and continuity of operations. On-premises systems can provide greater control and compliance with these regulations.

To balance security needs with modern communication capabilities, many organizations opt for a hybrid approach:

- UCaaS for Non-Critical Roles - Cloud-based Unified Communications as a Service (UCaaS) solutions are used for less sensitive communications, offering flexibility and scalability.

- On-Premises PBX for Critical Functions - Traditional Private Branch Exchange (PBX) systems are maintained on-site for critical communications, ensuring control and security.

Organizations can leverage Session Border Controllers (SBCs) or Gateways in these hybrid scenarios to manage cloud-based and on-premises communications. This offers several benefits:

- Reduced Complexity - Using the same SBCs or Gateways for UCaaS and on-premises PBX simplifies the overall infrastructure.

- Cost Efficiency – A single SBC solution can save hardware, maintenance, and management costs.

- Streamlined Maintenance and Security – A single PSTN connectivity platform for patching, logging and management.

For example, Ribbon SBCs are certified for Microsoft Teams, Zoom, and Webex in the cloud, as well as for Cisco's on-premises Communications Manager IP PBX. They can be the single SBC/PSTN connectivity solution for the customer in all scenarios.

Conclusion

The transition from traditional on-premises telephony systems to cloud-based solutions is a significant shift in the telecommunications landscape. This whitepaper explores the evolution of telephony systems, the advantages of cloud-based solutions, and the continued relevance of on-premises connectivity.

While cloud-based telephony solutions offer numerous advantages, on-premises connectivity remains relevant for various reasons, including local connectivity needs, regulatory compliance, and critical infrastructure requirements.

UCaaS providers offer various telephony connectivity options to meet technical requirements and business preferences.

Despite the shift to cloud-based solutions, on-premises telephony connectivity remains crucial in regions with unreliable internet and for regulatory compliance, disaster recovery, and connecting speciality telephony devices like PA systems and elevator phones.

Certain sectors, such as military, healthcare, and utilities, have specific reliability, external dependency and security requirements. On-premises telephony connectivity is often necessary to meet the stringent requirements of these critical infrastructures.

Organisations must evaluate their specific needs and circumstances to determine the best telephony solution for their operations, ensuring they balance modern cloud capabilities and essential on-premises telephony connectivity.

About Ribbon Edge 8000 SBC & Router

The Ribbon Edge 8000 Series represents a significant leap forward in multi-service edge (MSE) technology, offering a highly scalable 10GB multi-tenant Ethernet router with rich layer 3 routing, tunnelling, and switching features, combined with full-featured Session Border Controller (SBC) functionality.

Addressing the need for increased bandwidth, secure edge communications, and legacy migration support in enterprise networks.

The Edge 8000 Series consists of three models: the Edge 8100, Edge 8300 and Edge 8500. All models provide:

- High-performance routing with 2.5, 5, or 10 Gbps throughput
- Ribbon's SBC Swe Edge Session Border Control software (licensed for up to 960 sessions)
- SBC certification for Microsoft Teams Phone, Zoom Phone, Cisco Webex, and Google Voice
- Virtual Network Function (VNF) environment for third-party applications
- Two SFP+ 10Gb ports and eight 10/100/1000 Ethernet ports
- Single or dual AC/DC power options

The Edge 8300 and Edge 8500 models additionally integrate analog endpoints (FXS, FXO) and T1/E1 PRI interfaces, supporting seamless connectivity between legacy PSTN and modern SIP-based networks.

The Edge 8500 has a modular design that allows different gateway configurations (up to 16 PRIs or up to 96 FXS ports, as well as an Application Module that will run Microsoft's SBA software.)

With billions of minutes of use underpinning each solution element, the Edge 8000 Series offers proven reliability. Its 10Gb routing throughput provides tremendous value, making it a cost-effective choice.

By combining high-performance routing, advanced SBC capabilities, and support for legacy systems, it offers a comprehensive solution for enterprises looking to modernize their communications infrastructure while maintaining compatibility with existing investments. As businesses continue to navigate the complexities of hybrid cloud environments and digital transformation, the Edge 8000 Series stands out as a versatile, scalable, and future-proof option for secure and efficient network edge management.