Office 365 Cloud PBX
Sonus SBCs/GWs for a Microsoft Cloud PBX
On-Premises PSTN Deployment
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Introduction

Skype for Business within Your Enterprise

Congratulations, you’ve discovered that Skype for Business can provide increased productivity and collaboration to your employees and improve business market competitiveness.

Now that you have decided to adopt Skype for Business in your Unified Communications (UC) environment, the next step is to determine which implementation option would make the most sense given the specific needs of your business. There are several different approaches you could consider including a self managed on-premises deployment, a managed service of an on-premises deployment, a hosted deployment with a Communications Service Provider (CSP), or Microsoft's Office 365 Cloud PBX. This white paper will focus on the Microsoft Office 365 Cloud PBX deployment option.

Migration Scenarios

On-Premises or Cloud?

There are two main options when migrating to Skype for Business – On-Premises or Cloud.

Skype for Business on-premises makes perfect sense for those customers that have the expertise and staff to deploy, manage, and maintain their Skype for Business environment. If you have had a PBX in the past, there’s a good chance that this type of deployment makes sense for you today. Skype for Business, like Lync before it, is a VoIP (Voice over Internet Protocol) offering. The premises-based option delivers the most calling features and flexibility with the most options for failover and backup, but will require staff to manage it. Skills such as Active Directory, database (SQL), ISA (Internet Security and Acceleration), patch management, and certificate deployment are all necessary to successfully deploy and operate a secure environment. If you don’t have the staff or expertise for an on-premise solution, you should consider a managed option.

Managed Premises comes in many flavors:

- Service Integrator (SI) deploys and manages your own hardware and software (located on-premises)
- Communication Service Provider (CSP) manages the hardware and software
  - In their private cloud
  - In a public cloud

Each of these managed solution options provides a slightly different value, but in general this path frees up resources and alleviate risks. The overall value of this offering is that every feature that is available as a part of the on-premises Skype for Business deployment can be made available to your enterprise. Some of the prominent features include:

- Enterprise voice functionality (Call Park, Response Groups, etc.) including location-based routing, CAC (Call Admission Control), Survivability with SBA (Survivable Branch Appliance)
- Interoperability with video teleconferencing systems
- Persistent chat
- Rich API's to integrate communications with business processes

Cloud can be provided by a CSP or by Microsoft itself. Microsoft’s Office 365 cloud voice features are called “Cloud PBX.” You can deploy Cloud PBX with PSTN Calling provided by Microsoft or Cloud PBX with on-premises PSTN connectivity (provided by you). Cloud PBX with on-premises PSTN connectivity is where most enterprises will fit in the short term. “Currently, most UC and enterprise voice deployments are premises-based, though that is expected to drop as future deployments move more to the cloud. Hybrid deployments are the preferred approach to UC in the future” and “hybrid UC solutions will eventually outpace premises-based solutions” according to Webtorials 2015 Unified Communications, SIP, and SBC Plans and Priorities.

Cloud PBX, sometimes also referred to as “Skype for Business Online Enterprise Voice,” makes it very easy to scale up or down based upon your service needs. Cloud PBX is a multi-tenant version of Skype for Business Enterprise Voice which customers can leverage by purchasing E5 licenses or by adding the Cloud PBX feature to their existing enterprise license agreement. You can also acquire PSTN connectivity from Microsoft, which is offered in the United States at the time of this document and is purchased as a separate
option alongside the E5 license. Microsoft refers to this feature as PSTN Calling. Another way to think of it: you can use the Cloud PBX features without using Microsoft-provided PSTN connectivity. This provides enterprises with their own local PSTN connectivity “on-premises” in conjunction with the Microsoft Multi-tenanted cloud; this deployment is referred to as Cloud PBX on-premises PSTN connectivity.

Since most businesses have existing PBXs and existing PSTN contracts and operate worldwide, Cloud PBX with on-premises PSTN would be an ideal choice for them. Customers with the ability to make a rapid cutover of both voice infrastructure and voice access services (e.g., trunking) are rare, and would need to consider whether it makes sense to move fully to the Cloud PBX with the PSTN Calling option or purchase PSTN connectivity from a service provider other than Microsoft and have on-premises PSTN connectivity.

A note on “Hybrid” – Hybrid has been used to talk about a lot of different Microsoft options in the past, including:

- Hybrid Architecture – Users homed to the Active Directory in the Office 365 Cloud or on-premises
- Hybrid Licensing – Consume your Microsoft licenses in the Office 365 Cloud or on-premises
- Hybrid Workload – Deploy certain highly fluctuating traffic to the Office 365 Cloud vs. deploying on-premises
- Hybrid Voice – PSTN Connectivity that is provided in the Office 365 Cloud vs. locally on the customer premises via TDM or IP

In a Microsoft Office 365 Cloud PBX world, hybrid architecture encompasses the ability to use an E5 licensing option to put some users on Cloud PBX and others on-premises with Skype for Business. For example, all the United States users could be using Cloud PBX with PSTN Calling from Microsoft, while users in Germany could stay on the on-premises Skype for Business Server and receive PSTN on-premises via their current provider. The license structure that Microsoft has put together allows for enterprises to have per-user flexibility as to Active Directory location and features. The Microsoft E5 SKU includes the Office 365 for Cloud PBX feature in the license, but the various features of the E5 license (it’s not just for Skype for Business) can be deployed on your own servers in your own data centers if you so choose. By deploying certain workloads in your own data center and others in the Microsoft Office 365 cloud you can, in theory, have the best of both worlds. It makes sense to consume certain workloads like conferences and broadcast meetings (e.g., town hall style meetings) in the cloud, as local resources don’t have to be designed for huge spikes (broadcast meetings support up to 10,000 attendees). Some of these workloads are easier than others to back out of, so determining whether you want to move to the cloud before doing so will have an impact on your architecture.

Cloud PBX Architectures

Cloud PBX with PSTN Calling

Microsoft is rolling out Cloud PBX worldwide. The PSTN Calling add-on, after a successful rollout in the United States is completed, will be available in other countries. It is anticipated the next region will be Western Europe, and will continue to progress to additional regions over the next several years. This Microsoft offering provides DIDs (Direct Inward Dialing) and management of all calling functions (cost, features) through Microsoft. Everything from number porting to telephony functions and more are provided by Microsoft for an additional fee.
Cloud PBX with On-Premises PSTN Connectivity

This deployment fits somewhere between the traditional Skype for Business on-premises and Cloud PBX with PSTN Calling deployment models. Many deployments moving forward will fit into this category, due to the fact that this model provides customers with the best implementation in terms of cost, control, reliability, and security. So if you’re not doing business entirely in the United States – that’s quite all right! Microsoft has made the Cloud PBX compatible with on-premises SIP trunking or TDM trunking from any vendor, as long as you use an appropriate Session Border Controller/Gateway such as the Sonus SBC series.

Cloud PBX vs On-Premises Features

Differences between Skype for Business Deployments

The table on the next page shows feature differences between on-premises Skype for Business deployments (which could be managed as a service, or fully outsourced by a CSP) and the Cloud PBX feature from Microsoft with and without PSTN connectivity. The Cloud PBX with on-premises PSTN Connectivity requires an on-premises SBC, which then allows support for analog devices (fax machines) and common area phones, integration with on-premises PBX, and legacy voice mail and IVR.
# Skype for Business Capabilities

<table>
<thead>
<tr>
<th>Skype for Business Capabilities</th>
<th>Skype for Business On-Premises</th>
<th>Cloud PBX with On-Premises PSTN Connectivity</th>
<th>Cloud PBX with PSTN Calling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Call Features (Hold/Retrieve, Transfer, Forwarding)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Voice Mail</td>
<td>✔ Exchange UM</td>
<td>✔ Cloud PBX Voice Mail</td>
<td>✔ Cloud PBX Voice Mail</td>
</tr>
<tr>
<td>USB Peripherals</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Delegation, Team Call</td>
<td>✔</td>
<td>✔ User should be in the same environment</td>
<td>✔</td>
</tr>
<tr>
<td>Voice Resiliency</td>
<td>✔</td>
<td>✔</td>
<td>✔ Secured by SLA</td>
</tr>
<tr>
<td>Branch Survivability</td>
<td>✔</td>
<td>❌</td>
<td>❌</td>
</tr>
<tr>
<td>Location-Based Routing</td>
<td>✔</td>
<td>❌</td>
<td>❌</td>
</tr>
<tr>
<td>Call Admission Control</td>
<td>✔</td>
<td>❌</td>
<td>❌</td>
</tr>
<tr>
<td>Integration with On-Premises PBX</td>
<td>✔</td>
<td>✔</td>
<td>❌</td>
</tr>
<tr>
<td>Call Via Work</td>
<td>✔</td>
<td>❌</td>
<td>❌</td>
</tr>
<tr>
<td>Private Line</td>
<td>✔</td>
<td>❌</td>
<td>❌</td>
</tr>
<tr>
<td>911</td>
<td>✔</td>
<td>✔ Static 911 Only</td>
<td>✔ Static 911 Only</td>
</tr>
<tr>
<td>RGS/Call Park Service (CPS)</td>
<td>✔</td>
<td>❌</td>
<td>❌</td>
</tr>
<tr>
<td>Media Bypass</td>
<td>✔</td>
<td>❌</td>
<td>❌</td>
</tr>
<tr>
<td>IP Phones “Optimized for Skype for Business”</td>
<td>✔</td>
<td>✔ Polycom CX600, CX3000*; Mitel, HP, etc., w/latest firmware, Polycom VVX201-VVX600 series with UCS 5.4.0A firmware 5.4.0.10182</td>
<td>✔ Polycom CX600, CX3000*; Mitel, HP, etc., w/latest firmware, Polycom VVX201-VVX600 series with UCS 5.4.0A firmware 5.4.0.10182</td>
</tr>
<tr>
<td>IP Phones “Compatible with Skype for Business”</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Analog Devices</td>
<td>✔</td>
<td>✔ Using on-premises deployment</td>
<td>❌</td>
</tr>
<tr>
<td>Common Area Phone</td>
<td>✔</td>
<td>✔ Using on-premises deployment</td>
<td>❌</td>
</tr>
</tbody>
</table>

✔ Supported  ❌ Not Supported

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**Sonus SBCs and Skype for Business for Business**

**How Best to Migrate to the Office 365 Cloud PBX**

If your business has no pre-existing equipment on-premises, is in the United States, and wants the PSTN Calling option from Microsoft, the migration is relatively simple. However, if you already have on-premises PSTN connectivity, you may use a Sonus SBC or Gateway on-premises for the following:

- SIP Interworking – (TCP/UDP, Authentication etc.)
- Analog Device Integration
- TDM and IP-PBX Interworking
- Software Defined Wide Area Network

Sonus SBCs and Gateways are certified for Microsoft Lync and Microsoft Skype for Business.
SIP Interworking and Security

Interworking is the ability to ensure that two systems are able to communicate effectively. We’ll cover two aspects of that here: legacy systems and SIP trunking. With legacy systems, there are 10-15 years of variants of SIP out in the marketplace, as well as TDM support that the Skype for Business Mediation server doesn’t currently offer.

Microsoft already has an ecosystem of partners with the capabilities to deliver on TDM support, and this is done with Enhanced Gateways which is often included as part of an SBC appliance. The same is true for Direct SIP – if that’s to another system via a SIP connection (e.g., Avaya, Cisco, etc.). There are a number of systems that Microsoft has qualified, but your version or vendor may not be in the list. While the list will expand over time, the last list provided by Microsoft for Lync (Supported IP-PBXs Infrastructure qualified for Microsoft Lync\(^2\)) gives a good idea of what to expect with Skype for Business on the Mediation to Legacy System support.

On that same premise, there’s also a limited support of SIP trunking (smaller list if you’re interested in advanced security such as TLS & SRTP) provided by Microsoft (SIP trunking services qualified for Lync Server 2013\(^3\)). Many providers cannot be hooked directly to Skype for Business due to SIP Authentication. Simply stated, a Sonus SBC enables the use and connectivity of non-qualified PBX systems and SIP trunk providers.

Analog Device Connectivity

A Sonus SBC can connect the analog lines you have in your business to SIP so that you can use an overhead paging intercom or fax machine. At the time of this writing, Office 365 Skype for Business doesn’t have a native way to connect analog devices without an SBC or GW – no support for common area phones\(^4\), overhead paging, or fax machines.

Software-Defined Wide Area Network (SD-WAN)

Deploying into the cloud has a major impact on where your traffic is going – most notably, it’s going across your WAN! If you haven’t provisioned your WAN for the spikes that you might see with a large amount of traffic leaving the premises, be prepared to do the calculations to determine the investments you might need to make in hardware as a CapEX expense (e.g., you might need a new router that can handle the increased traffic) as well as the OpEx expense of high-quality data links (e.g., ExpressRoute, MPLS, etc.) to get the traffic to the Office 365 data center. Optionally, the ability to prioritize the Skype for Business real-time traffic going to Office 365 above the needs of the OneDrive backup traffic or other non-real-time sensitive traffic will be something that you can look into to reduce your OpEx expenses on data services. Sonus’ VellOS is one such example of a way to leverage the power of the Skype for Business UC SDN API to drive down costs, increase performance, and provide a better experience for end users.

Summary

Sonus SBCs allow easy migration to any of the Skype for Business deployment options – on-premises or Cloud PBX – and allow enterprises to do so at their own pace. Sonus SBCs are deployed throughout the world in a variety of environments, supporting Lync Enterprise Voice and Skype for Business deployments and a wide range of IP-PBXs and legacy TDM PBX systems in different configurations. Sonus has a broad range of compatibility and interoperability in the industry. And if physical connection to the legacy devices or PSTN trunking is not a requirement, then the Sonus SBC SWe is the industry’s only software-based SBC architected to deliver unlimited scalability with the same advanced features and functionality of hardware on a virtualized platform. Sonus provides support for a wide range of virtualization platforms with the same carrier heritage and software stack as those used in the largest telcos that demand scalability without sacrificing availability. And of course, all have the ability to define session count based on their business’s individual needs with the click of a mouse; no truck roll needed.

Sonus SBCs are certified for Microsoft Lync and Microsoft Skype for Business, and are the right choice for a Microsoft Office 365 Cloud PBX deployment.

References

About Sonus Networks

Sonus enables and secures real-time communications so the world’s leading service providers and enterprises can embrace the next generation of SIP and 4G/LTE solutions including VoIP, video, instant messaging, and online collaboration. With customers in more than 50 countries and nearly two decades of experience, Sonus offers a complete portfolio of hardware-based and virtualized Session Border Controllers (SBCs), Diameter Signaling Controllers (DSCs), Cloud Exchange Networking Platform, policy/routing servers, and media and signaling gateways. For more information, visit www.sonus.net or call 1-855-GO-SONUS. Sonus is a registered trademark of Sonus Networks, Inc. All other company and product names may be trademarks of the respective companies with which they are associated.

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