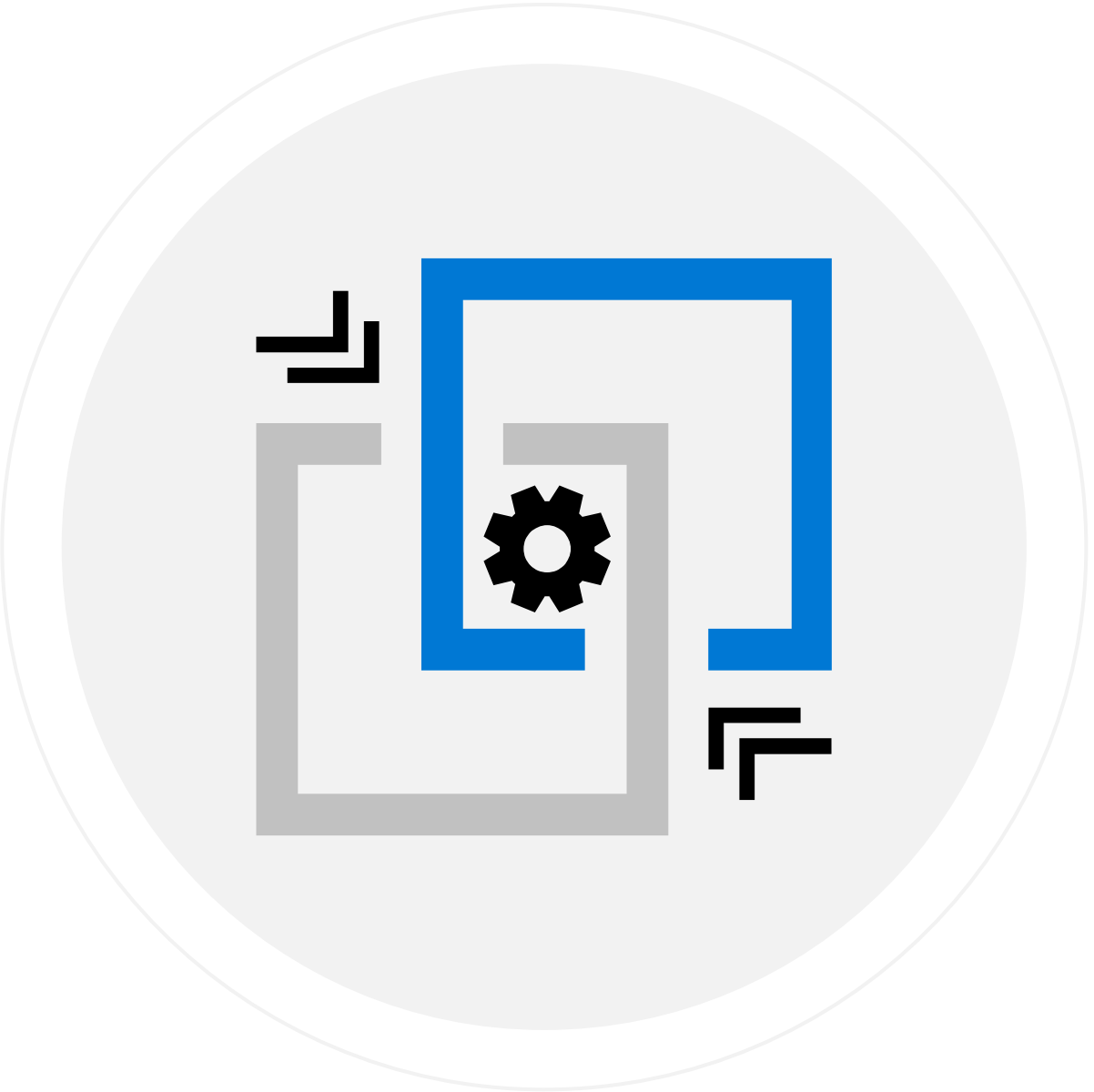
Microsoft 365

Microsoft Teams Phone

Microsoft 365

Plan and configure Teams Phone



Agenda

Plan Teams Phone

Plan and optimize network performance for Teams Phone

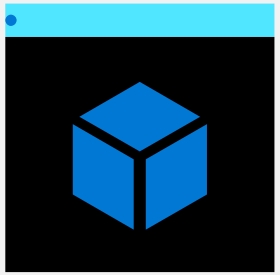
Configure Teams Phone

Configure Auto Attendants and Call Queues

Configure and deploy Direct Routing

Extend Teams Phone with additional services

Plan Teams Phone



Agenda

Plan Usage Scenarios for services and users

Determine licensing requirements

Plan for Teams Phone Devices

Plan and design Teams Phone Features

Plan for Voice Mail

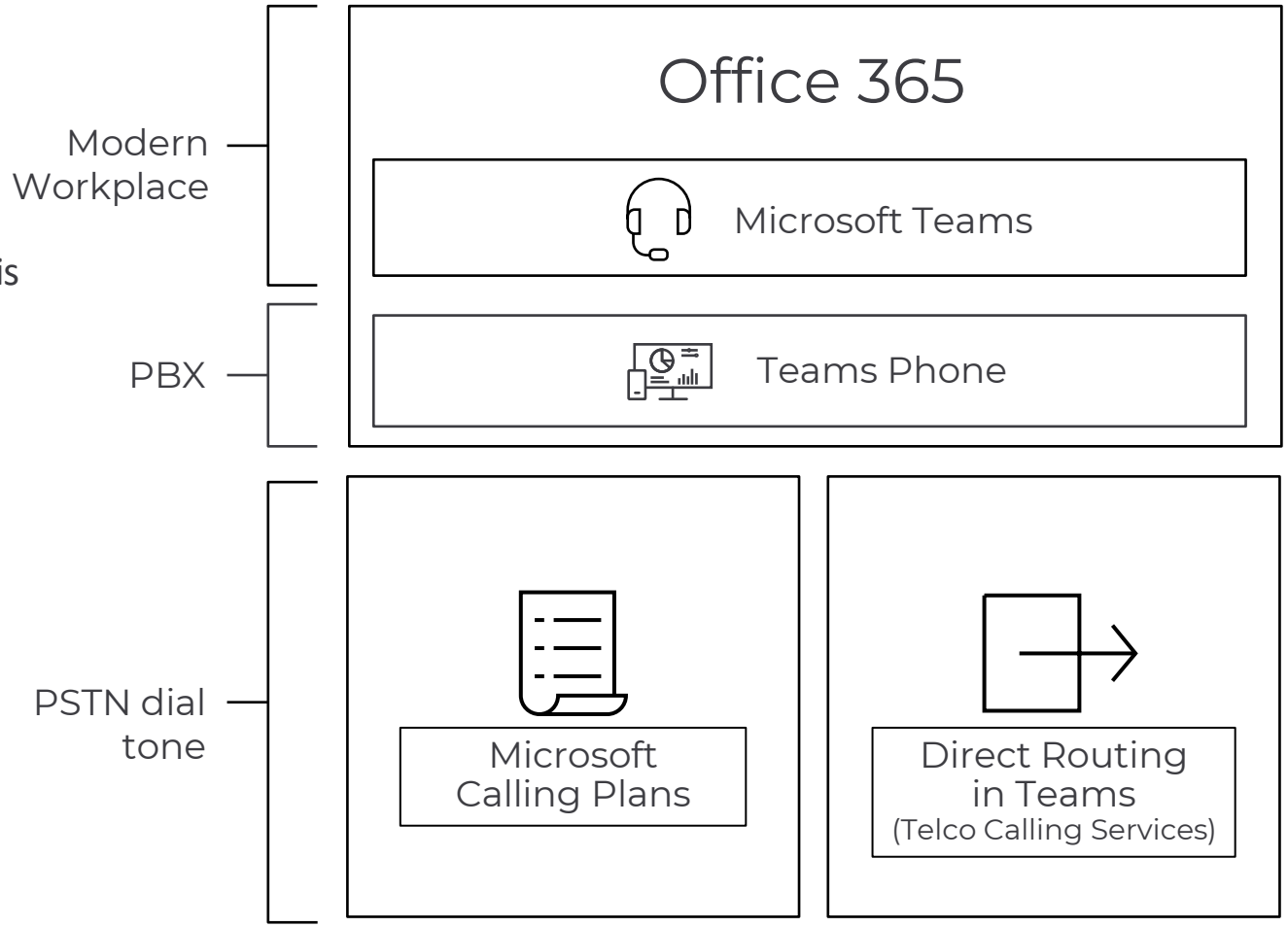
Plan Usage Scenarios for services and users

A Private Branch Exchange (**PBX**) is a **phone system within a business**. **Microsoft Teams Phone** is Microsoft's technology for enabling call control and Private Branch Exchange (PBX) capabilities in the **Microsoft 365 cloud with Microsoft Teams**.

Calls **between two users in your organization** are handled **within Teams Phone** and never go to the Public Switched Telephone Network (PSTN). This also applies to multiparty calls between users in your organization, irrespective if they are located in same or different geographical areas, removing long-distance costs on these internal calls.

To connect Teams Phone to the PSTN, you can choose:

- **Teams Phone with Calling Plan** An all-in-the-cloud solution with Microsoft as your PSTN carrier.
- **Teams Phone with your own PSTN carrier** by using Direct Routing to connect your on-premises environment to Teams.



Determine licensing requirements

Add-on licenses are licenses for specific Microsoft Teams features. They give you the flexibility to add features only for users in your organization who need them. To add a feature, buy one add-on license for each user who will use it.

Calling Plan

Domestic /
D& International

E5

Phone System and PSTN Conferencing
Advanced Security and Compliance
End User and Organizational Analytics

Full IT & End User Value

Voice in the Cloud

E1

Phone System

PSTN Conf Addon

Voice in the Cloud

E3

Phone System

PSTN Conf Addon

Plan for Teams Phone Devices

Microsoft Teams supports a portfolio of desk phones for users who require a traditional phone experience. This article provides an overview of Teams phones and can help in planning, delivering, and managing Microsoft Teams phones as part of your Microsoft Teams Phone solution.

To deliver a high-quality and reliable Microsoft Teams experience on phones, we are partnering and actively working with Yealink, Crestron, Lenovo, Polycom, and AudioCodes to develop and certify a wide portfolio of desk phones and conference room audio devices.

Permissions to manage phones: **Global admin**, **Teams Service admin**, or **Teams Device admin**.

Features supported by Teams phones

Teams-certified phones have a broad array of features to help your users do their jobs, and help you manage their use. Here's a summary of the features available in Teams-certified phones:

- **Authentication** Phones use Modern Authentication to simplify signing in and to improve security. Users can sign in by entering their username and password on the phone or by signing in from another device like a PC/smartphone.
- **Speed dial and call history** Users have quick access to their contacts, call history, and voicemail. They can easily manage their contacts and speed dial entries directly from their phone.
- **Meetings and calls** Users can view their schedules and easily join meetings using Teams' one-touch join.
- **Call groups** Phone agents who participate in call groups can easily manage their availability and accept or decline incoming calls from the call queue.
- **User delegation** Executive assistants and admins can manage their executives' phones - intercept incoming calls; make calls on behalf of the executive; take over calls that the executive has placed on hold; and monitor whether the executive is on a call, on hold, and so on.
- **Hot desking** Users can get their contacts, meetings, and other preferences, just by signing into a phone. When they're done, they can sign out and leave the phone ready for the next user.
- **Video Phones** with video support let users join calls and video conferences just like they were at their computers. Users can keep their privacy by using a phone's camera shutter and microphone mute switch when available.
- **Better together** Phones can lock and unlock in an integrated fashion when connected to their Windows PC running a 64-bit Teams desktop client.
- **Accessibility** Phones have several accessibility features, such as high contrast text, to make it easier for anyone to use them.
- **Dynamic and enhanced E911 support** Signed-in users who call 911 will see their location on the phone.

Plan and design Teams Phone Features

To use **Teams Phone features**, your organization must have a **Phone System license**.

Once the **license is active** in your tenant it provides the following features:

Call answer / initiate (by name & number)

Call hold / retrieve

Call History

Call Delegation & Call On-behalf

Call Transfer (Blind, Consult & Mobile)

Camp-on

Caller ID

Call Waiting

Call forwarding & simultaneous ring

Clients for PC, Mac & Mobile

Device switching

Distinctive ringing

Do-not-disturb routing & call blocking

Enterprise calendar call routing

Financially-backed SLA

Integrated dial-pad

Music on Hold

Qualified IP Desk Phones

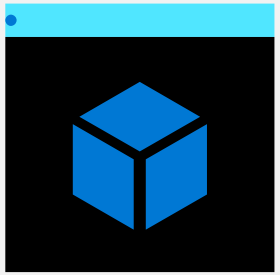
Skype & Federated calling

Team calling

Video call monitor

Voice Mail

Configure Teams Phone



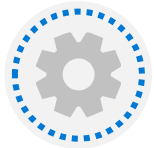
Agenda

Configure Emergency Calling for Calling Plans

Manage and configure Microsoft PSTN numbers

Configure Operator Connect

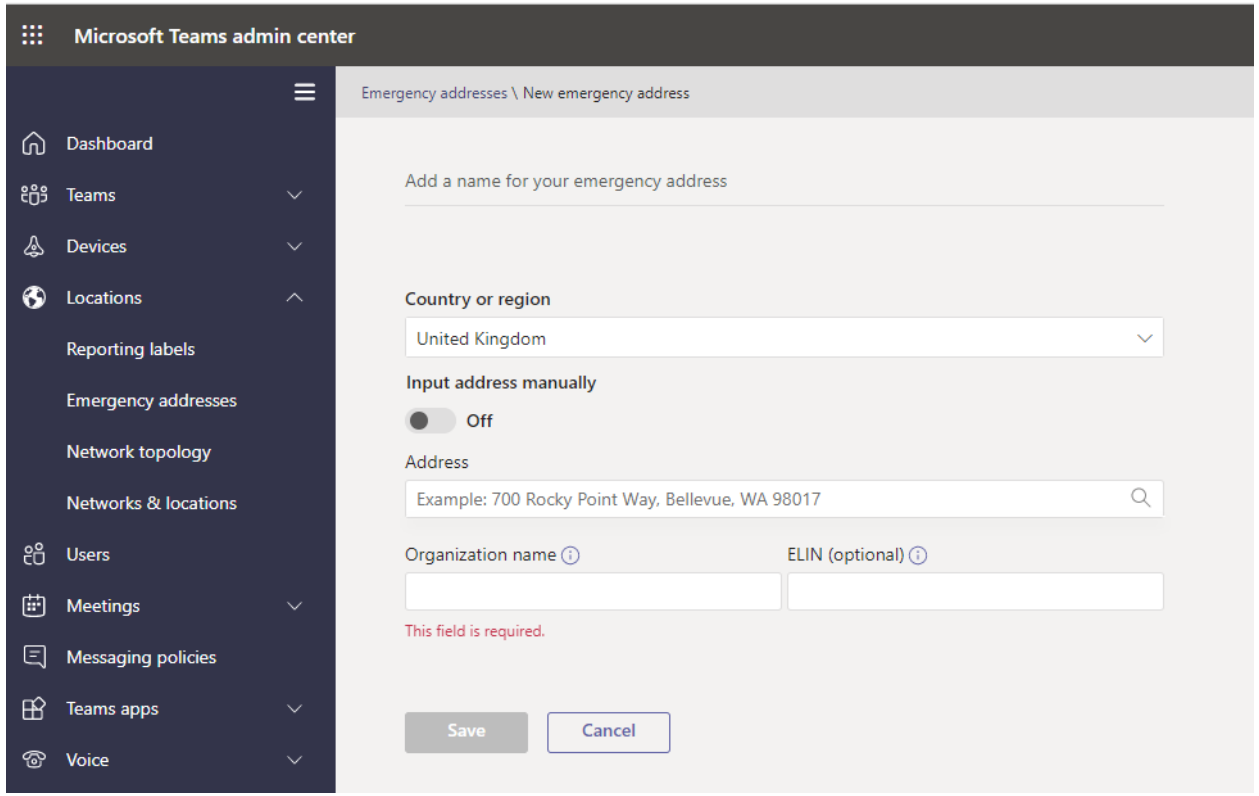
Configure Teams Phone policies



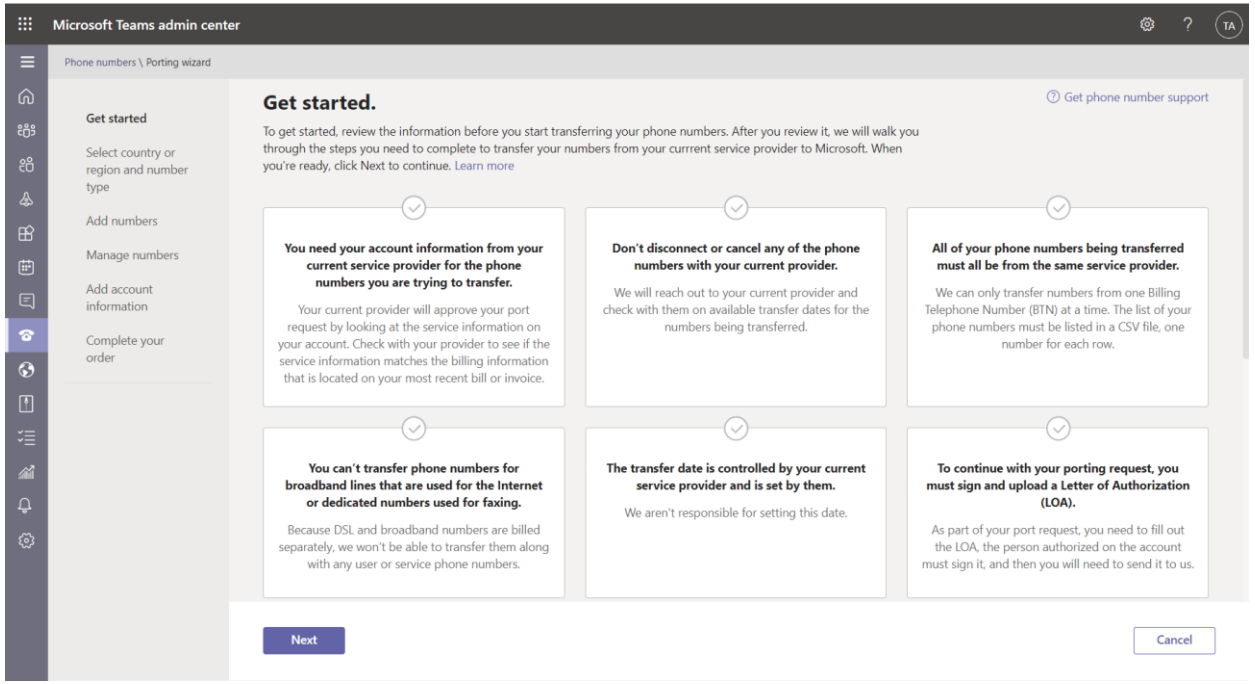
Configure Audio Conferencing

Configure Emergency Calling for Calling Plans

- **Define Emergency Calling Addresses First**
- **Configure Emergency Calling Policies**
  - Send notification only
  - Conferenced in muted and unable to unmute
  - Conferenced in muted but can unmute
- **Configure network locations for dynamic emergency calling**
  - Network sites – a group of subnets
  - Trusted IPs - enterprises public external IP addresses
  - Map a network to an emergency address



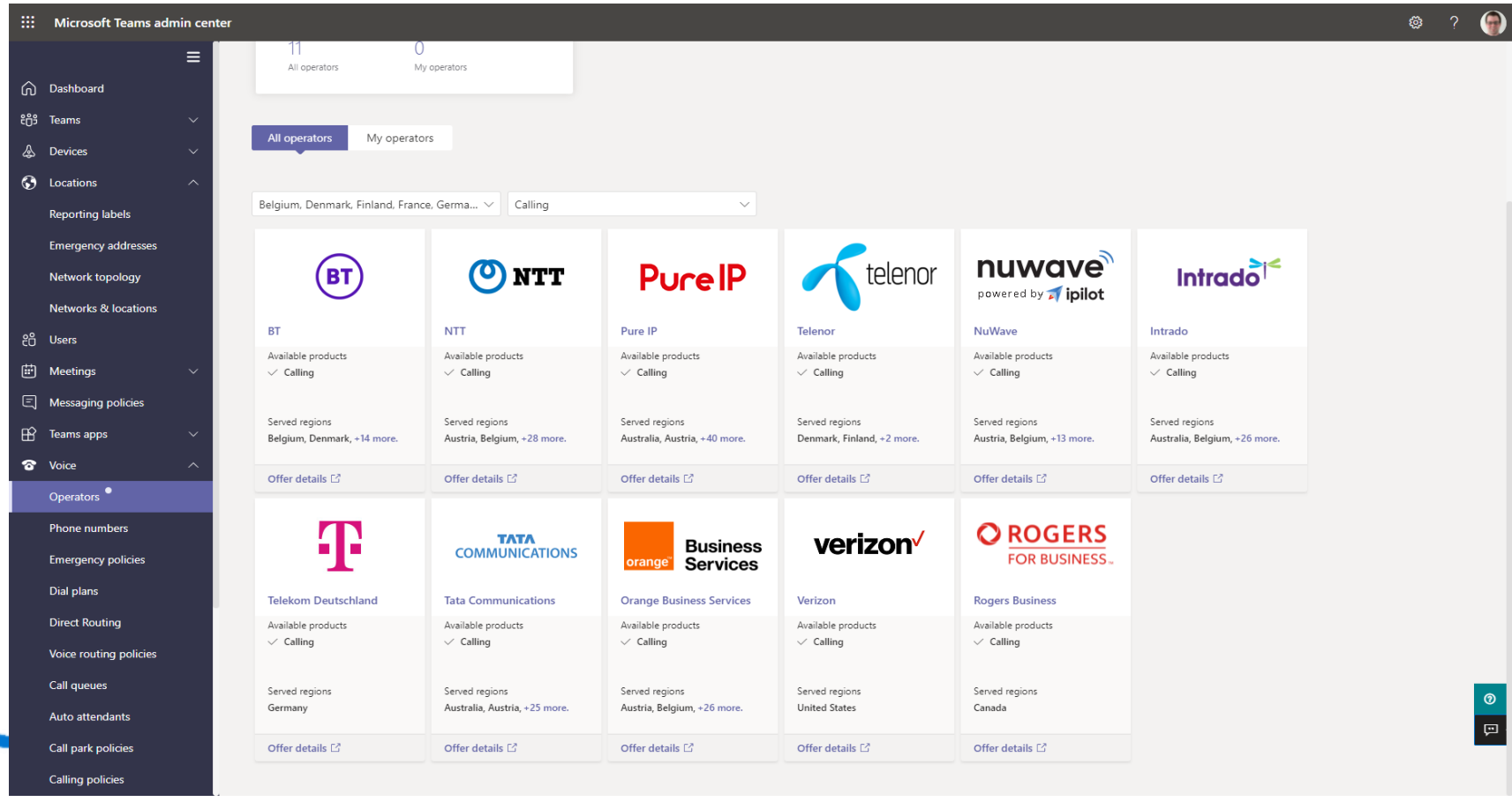
Manage and configure Microsoft PSTN numbers



- Teams Phone, Audio Conferencing, Calling Plan and Communication Credits are all specific licences
- You can acquire phone numbers from Microsoft
  - Subscriber/Users numbers
  - Service numbers – for Auto Attendants and Call Queues
- You can port numbers into Microsoft via service requires

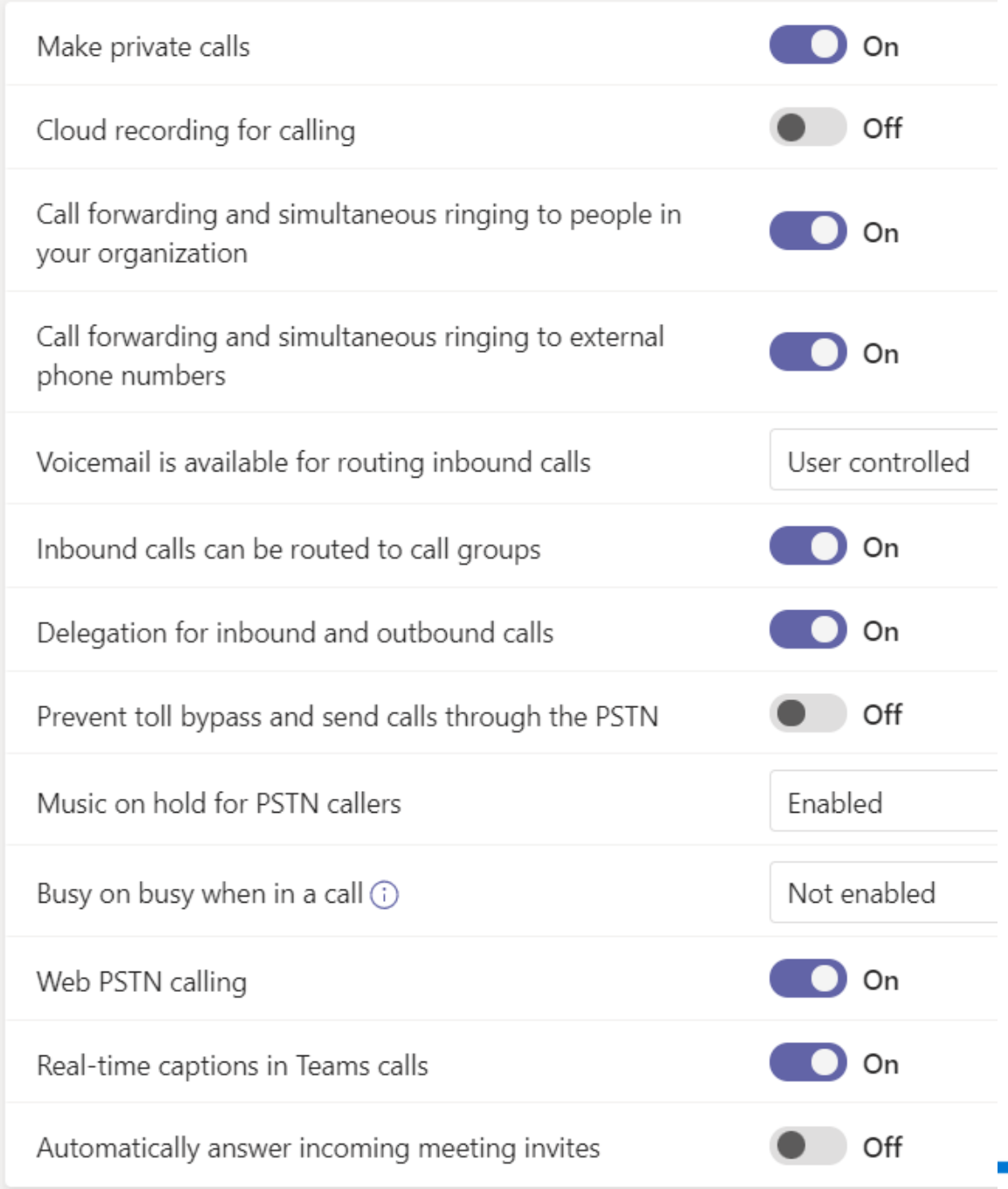
Configure Operator Connect

- Operator Connect – PSTN connectivity via third party operator
- Numbers are managed just like Calling plan numbers



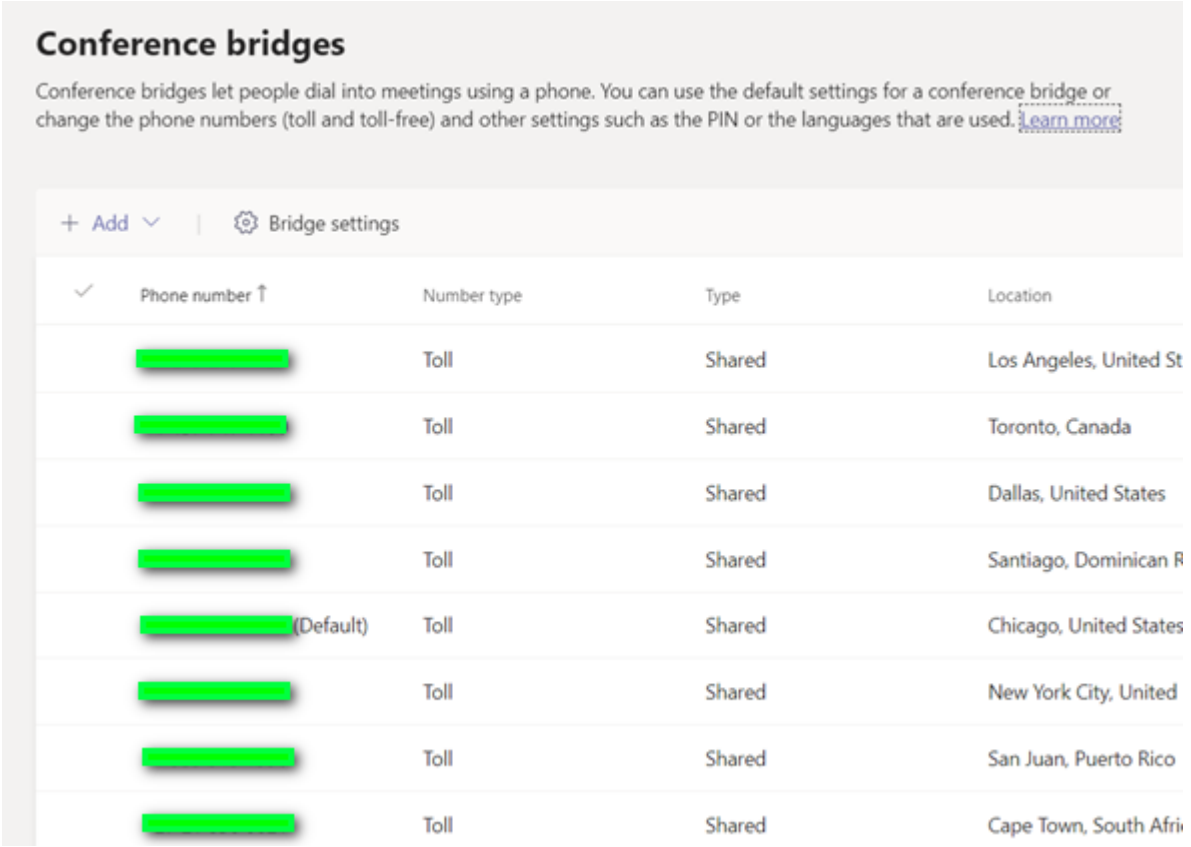
Configure Teams Phone policies

- Calling policies - control calling and call forwarding features
- Dial Plans – normalization (regex) rules that translate dialled phone numbers
- Call Park policies – enables call park
- Caller ID policies - change or block the number presented when users PSTN call out
- Inbound call blocking - blocking inbound calls from the Public Switched Telephone Network (PSTN) with regex patterns

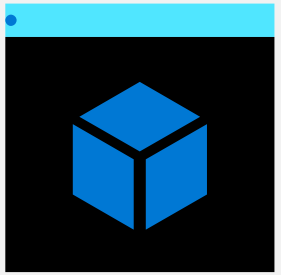


Configure Audio Conferencing

- Option to change default Audio Bridge number
- Communication Credits used for specific scenarios
- Option to add additional toll and toll-free numbers



Configure Auto Attendants and Call Queues



Agenda

Design call flows for AA/CQ

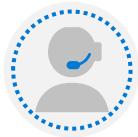
Configure AA/CQ

Deploy a channel-based CQ

Configure Resource Accounts

Configure O365 Groups for VM

Interpret CQ Conference Mode



Interpret CQ Routing Methods

Configure Holidays for AA/CQ

Configure custom Music on Hold for CQ/AA/VM

Design call flows for AA/CQ

- Understand what an Auto Attendant is
- Assess the business needs for Auto Attendants
- Design and mock-up the Auto Attendant
- Understand what a Call Queue is
- Assess the business needs for a Call Queue
- Design and mock-up the Call Queues
- Writing the scripts that will formulate how Auto Attendants and Call Queues work together.

Understand what an Auto Attendant is

Auto attendant

The primary purpose of an auto attendant is to direct a caller to an appropriate person or department based on the caller's input to the provided menu options. Callers can be directed to specific people within your organization, to call queues where they wait to talk to the next available agent, or to voicemail. Different call routing options can be specified for business hours, off hours, and holidays.

Menu prompts can be created by using text-to-speech (system-generated prompts) or by uploading a recorded audio file. Speech recognition accepts voice commands for hands-free navigation, but people calling in can also use the phone keypad to navigate menus.

Each auto attendant has a specific language and time zone. If you do business in multiple languages or multiple parts of the world, you can create as many different auto attendants as you need to accommodate your callers.

For each auto attendant, you can configure an operator. While you can configure operator calls to go to a variety of destinations, the operator feature is designed to allow callers to talk to a specific person in your organization who can help them.

Auto attendants can be configured to allow callers to search your organization's directory, either by name or by extension number. Within an auto attendant, you can specify who is available for the directory search by choosing groups of users to include or exclude. (This is known as *dial scope*.)

Callers can reach an auto attendant either by direct phone number, if configured, or by being redirected from another auto attendant or a call queue.

Assess the business needs for Auto Attendants

- Who are the people in the business? - List of users/roles/abilities (knowledge based routing)
- Why are the customers calling? - most frequent customer needs should get addressed first
- What special considerations does each job function in the office have? - different roles have different requirements
- What language requirements do the customers have? – countries where you do business in are likely to influence your language needs
- What are the business hours, non-business hours and holidays? – you may want distinct initial greetings for business, after hours and holidays.
- For each of the job functions in the office, what issues do they handle for customers? You may be surprised by what issues the various office workers usually handle

Design and mock-up the Auto Attendant

To complete the initial design, you'll need a flexible and easy way to work out hierarchies and structures of users and auto attendants. You can do this on any blank wall or whiteboard, using several colors of pen and some sticky notes or index cards

Understand what a Call Queue is

Call Queue

A call queue is analogous to a waiting room in a physical building. Callers wait on hold while calls are routed to the agents in the queue. Call queues are commonly used for sales and service functions. However, call queues can be used for any situation where the number of calls exceeds your internal capacity, such as a receptionist in a busy facility.

Call queues allow for specific routing of calls in cases where the total number of callers in the queue or the wait time exceeds the limits that you specify. Calls can be routed to specific people, voicemail, other call queues, or auto attendants.

Like auto attendants, call queues each have a language setting. You can use different call queues if you do business in multiple languages. Agents can be members of more than one queue if they're multi-lingual.

For each call queue, you can specify if agents in the queue can opt out of taking calls and if calls should be routed to them based on their presence indication in Teams.

You can assign a phone number to a call queue, however call queues do not provide separate call routing for off hours and holidays. Unless your call queue is staffed 24/7, we recommend assigning the phone number to an auto attendant that redirects to the call queue during business hours.

Assess the business needs for a Call Queue

The first stage in planning a call queue is to understand the business needs. This can be done by using the following steps.

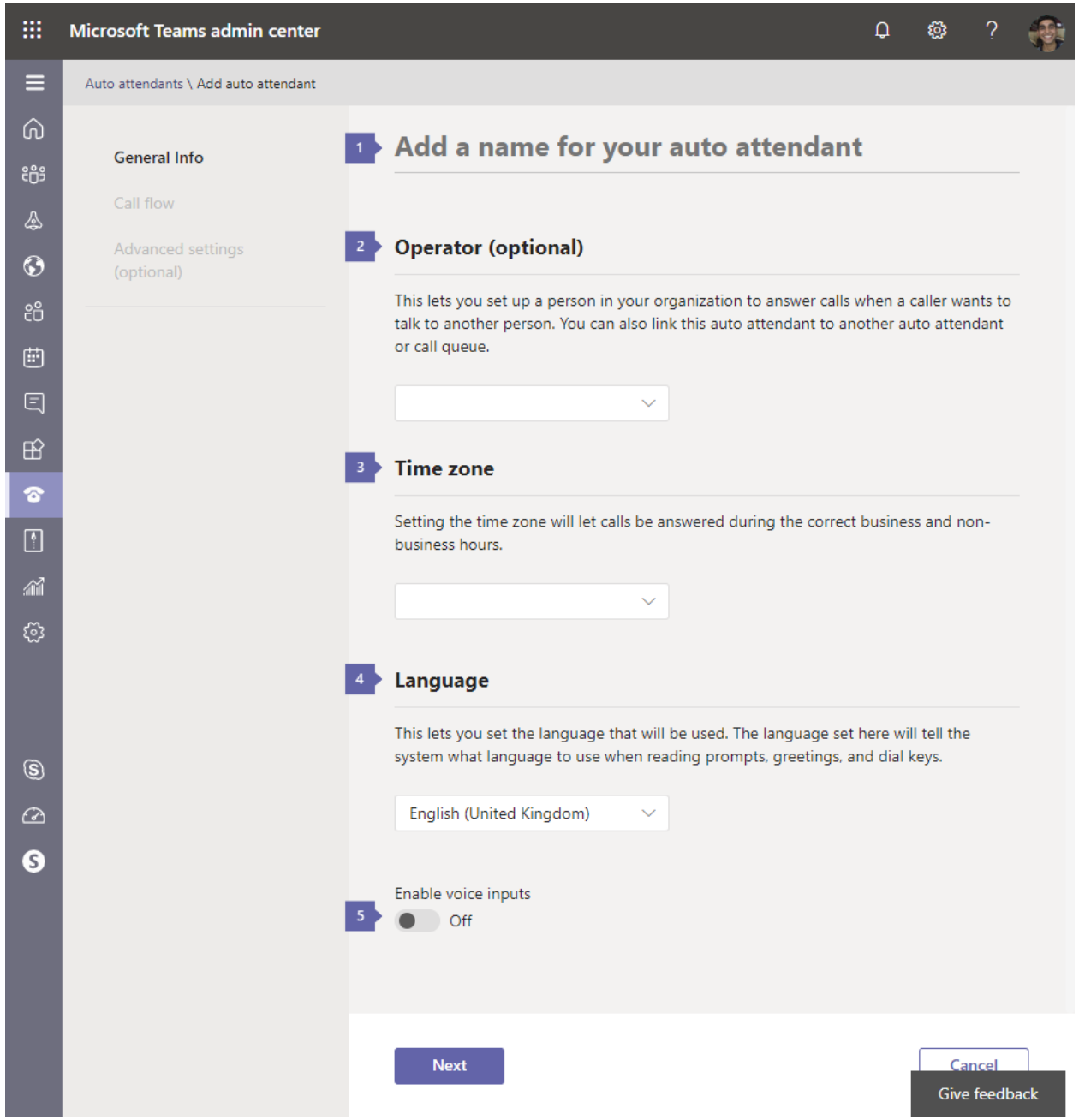
- How many call agents will you assign to the queue?
- How is the existing system setup, and what changes do you want to make?
- Will the call center be active 24 hours a day, or only during business hours?
- Do you want distinct initial greetings for business hours, after-hours, weekends, or holidays?
- How are the agents compensated?
- What is the usual size of the call queue in the existing call center?
- Do you want to play hold music?

Design and mock-up the Call Queues

- Organization should decide whether to assign a number directly to the queue or to have callers connect to an auto attendant first.
- Organization should decide whether to have an initial greeting as part of the call queue. Alternatively, an auto attendant can provide a greeting.
- Organization should decide what hold music to use.
- Organization should decide how to distribute the calls among the available agents.

Configure AA/CQ

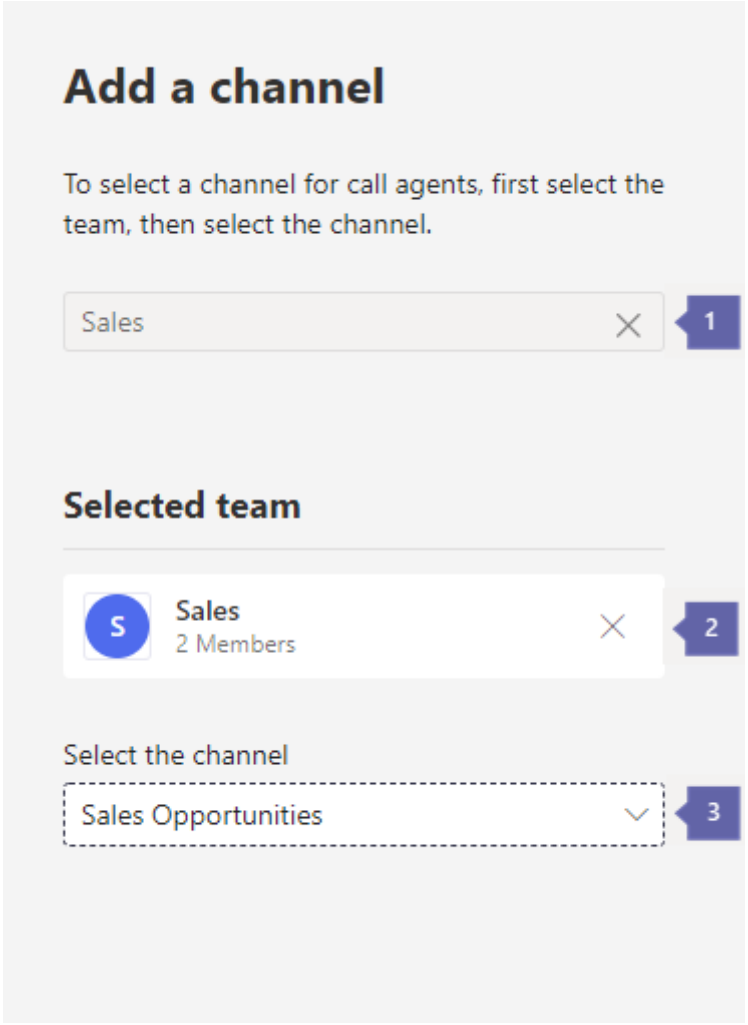
- Implementation of Auto Attendants
- Implementation of Call Queues



Deploy a channel-based CQ

- Deploy a channel based CQ

Channel based Call Queues allow for a quick and easy way of managing a queue by team membership.



Configure Resource Accounts

- Assign a license to resource account
- Assign a calling ID to resource account

Resource Account
A resource account is a disabled user object in Azure AD, and can be used to represent resources in general. For example, a resource account may be used in Exchange to represent conference rooms and allow them to have a phone number and calendar. A resource account can be homed in Microsoft 365 or on premises using Skype for Business Server 2019.
In Microsoft Teams, a resource account is required for each auto attendant or call queue. Resource accounts may also be assigned service telephone numbers. This is how you assign phone numbers to auto attendants and call queues allowing callers from outside Teams to reach the auto attendant or call queue.

Configure O365 Groups for VM

- Configure O365 Groups for VM

Voice Mail
Voicemail can be configured for Office 365 groups, so that way when someone leaves a voicemail for an Auto Attendant or a Call Queue it can be obtained, delivered to, and listen to by members of a Office 365 group.

Interpret CQ Conferencing Mode

Conference mode significantly reduces the amount of time it takes for a caller to be connected to an agent, after the agent accepts the call. Conference mode control how calls are connected to agents. When the administrator turns this off, a call is connected to a call agent using a traditional transfer. If you select Conference Mode On, a call is connected to a call agent much faster than if it uses a traditional transfer by spinning up a conference and bringing in relevant agents and hosted number.

Interpret CQ Routing Methods

- Interpret CQ Routing Methods

You can choose either **Attendant, Serial, Longest idle**, or **Round Robin** as the distribution method. All new and existing call queues have attendant routing selected by default.

- **Attendant routing** causes the first call in the queue to ring all call agents at the same time. The first call agent to pick up the call gets the call.
- **Serial routing** incoming calls ring all call agents one by one, from the beginning of the call agent list. Agents can't be ordered within the call agent list. If an agent dismisses or doesn't pick up a call, the call will ring the next agent and will try all agents until it's picked up or times out.
- **Longest idle** routes the next available call to the call agent whose has been idle the longest time. The idle time is defined as the length of time a call agent's presence state is set to Available or Away (if less than 10 minutes), at the time of the call. If a call agent's presence is set to Away for more than 10 minutes, the idle timer resets. Presence states of users are queried every minute.

Configure Holidays for AA/CQ

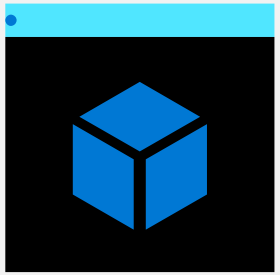
- **Configure Holidays for AA/CQ**

You can use the Teams Holidays feature to provide alternate messages and routing to callers for specific dates and times when departments, call queues or people in your organization will be following different working hours or won't be available. For example, you might create a holiday for New Year's day when your organization may be closed.
The holidays you create here are available when you set up an auto attendant, each with its own greeting and call routing settings.

Configure custom Music on Hold for CQ/AA/VM

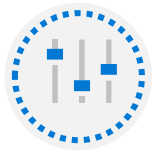
- Implementing a custom hold music for music on hold.

Configure and deploy Direct Routing



Agenda

Design Direct Routing call flows



Implement SIP Trunking with Direct Routing

Configure Emergency Calling for Direct Routing

Extend Teams DR Infrastructure

Deploy and Maintain an SBA

Design Direct Routing call flows

- Connecting the SBC with Microsoft Teams Phone
- Enable the users for Direct Routing, voice, and voicemail
- Create a custom voice routing policy
- Create a number translation

Connecting the SBC with Microsoft Teams Phone

Microsoft partners with selected Session Border Controllers (SBC) vendors to certify that their SBCs work with Direct Routing.

Microsoft works with each vendor to:

- Jointly work on the SIP interconnection protocols.
- Perform intense tests using a third-party lab. Only devices that pass the tests are certified.
- Run daily tests with all certified devices in production and pre-production environments. Validating the devices in pre-production environments guarantees that new versions of Direct Routing code in the cloud will work with certified SBCs.
- Establish a joint support process with the SBC vendors.

Enable the users for Direct Routing, voice, and voicemail

When you are ready to enable users for Direct Routing, follow these steps:

1. Create a user in Microsoft 365 or Office 365 and assign a Phone System license.
2. Ensure that the user is homed in Microsoft Teams.
3. Configure the phone number and enable enterprise voice and voicemail.
4. Assign Teams Only mode to users.

Create a custom voice routing policy

A voice routing policy is a container for PSTN usage records. You create and manage voice routing policies by going to **Voice** > **Voice routing policies** in the Microsoft Teams admin center or by using Windows PowerShell. You can use the global (Org-wide default) policy or create and assign custom policies. Users will automatically get the global policy unless you create and assign a custom policy. Keep in mind that you can edit the settings in the global policy but you can't rename or delete it.

It's important to know that assigning a voice routing policy to a user doesn't enable them to make PSTN calls in Teams. You'll also need to enable the user for Teams Phone Direct Routing and complete other configuration steps. To learn more, see Configure Direct Routing.

Create a number translation

Sometimes tenant administrators may want to change the number for outbound and/or inbound calls based on the patterns they created to ensure interoperability with Session Border Controllers (SBCs). This article describes how you can specify a Number Translation Rules policy to translate numbers to an alternate format.

You can use the Number Translation Rules policy to translate numbers for the following:

- **Inbound calls**: Calls from a PSTN endpoint (caller) to a Teams client (callee)
- **Outbound calls**: Calls from a Teams client (caller) to a PSTN endpoint (callee)

The policy is applied at the SBC level. You can assign multiple translation rules to an SBC, which are applied in the order that they appear when you list them in PowerShell. You can also change the order of the rules in the policy.

Implement SIP Trunking with Direct Routing

- Add a domain to Microsoft 365 tenant
- Understand Office 365 Voice Routing
- Customer tenant SBC paring
- Validating custom domain

Add a domain to Microsoft 365 tenant

Before you can continue configuring your Direct Routing setup, you must make sure you have your desired custom domains added to your tenant. Without a custom domain in your tenant, you will not be able to accept the signaling and will ultimately reject the information from the SIP trunk provider. If you didn't already do this, follow these steps to add, set up, or continue setting up a custom domain in your tenant.

There must be a user for every domain in which is a trusted domain. After you register the domain names, you need to activate it by adding at least one user for each domain. These will need to have the newly added domain after the @.

The user’s created for each domain would need a single E3 / E5 license assigned to activate the domain. Once the domain is activated then the license can be removed from each respective user.

Important: Do not delete these accounts for the duration of your Teams direct routing service.

Understand Office 365 Voice Routing

Office 365 voice routing is comprised of three configuration items: voice routing policy, PSTN usage, and voice route.

- **Voice Routing Policy:** This item is granted to users (via the Grant-CsOnlineVoiceRoutingPolicy cmdlet) and polices what calls the user can make.
- **PSTN Usage:** Global configuration item to map a voice routing policy to a voice route. It serves no other purpose.
- **Voice Route:** Voice routes, based on a number pattern to match (using regular expressions), route calls to a specified gateway (in the OnlinePstnGatewayList array). There are also priority options to control which routes should be higher priority than others; this is useful for failover configuration.

Customer tenant SBC paring

If you're not tied to an existing phone system, many experts recommend using the carrier hosting model. In this model, the customer picks the provider of their choice to host the Direct Routing SBC and to handle telephony services. Customers will use a carrier's SBC, which is paired with their Office 365 domain and then tied to multiple Office 365 tenants via subdomains. Here are some key facts about the carrier hosting model:

- Since calls are not routed based on DID, each customer instead gets a unique SBC FQDN as a subdomain to the carrier base domain, which is then added as a domain in the customer's tenant. Notably, all customers will have the same SBC.
- For each carrier-hosted SBC, organizations will only need to set up a configuration once per tenant. This will cover all SIP domains within that Office 365 tenant.

Validating custom domain

With the user account created, Microsoft 365 needs to update the domain URL map before the remaining configuration can be completed.

Configure Emergency Calling for Direct Routing

- **Create a custom emergency voice routing policy**

In the United States the FCC requires that providers of interconnected VoIP telephone services using the Public Switched Telephone Network (PSTN) meet Enhanced 911 (E911) obligations. E911 systems automatically provide emergency service personnel **with a 911 caller's call-back number** and, in most cases, location information.

Extend Teams DR Infrastructure

- Setting up multiple SBCs
- Configure a usage
- Create multiple voice routes
- Physical vs Virtual SBC considerations

Setting up multiple SBCs

If you have multiple SBCs, each SBC can be referenced by the same SIP port (5061, for instance). The port is a child object that is always paired/matched with the SBC FQDN, so there's no restriction on being able to use port 5061 with one, or potentially hundreds, of SBCs. If you've got an SBC showing offline, items you may want to check:

- NTP server configured on SBC
- DNS configured on SBC
- Proper TLS certificate
- TLS certificate trust (root cert)
- SBC NAT (if applicable)
- SBC IP Routing
- Ingress/Egress Firewall rules for SBC

Configure a usage

Online PSTN usages are string values that are used for call authorization. An online PSTN usage links an online voice policy to a route. The Set-CsOnlinePstnUsage cmdlet is used to add or remove phone usages to or from the usage list. This list is global so it can be used by policies and routes throughout the tenant.

Create multiple voice routes

Online voice routing policies are used in Microsoft Teams Phone Direct Routing scenarios. Assigning your Teams users an online voice routing policy enables those users to receive and to place phone calls to the public switched telephone network by using your on-premises SIP trunks.

Note that simply assigning a user an online voice routing policy will not enable them to make PSTN calls via Teams. Among other things, you will also need to enable those users for Teams Phone and will need to assign them an appropriate online voice policy.

Deploy and Maintain an SBA

- Understanding prerequisites
- Supported teams clients
- How it works
- Configuration of the SBA

Understanding prerequisites

The SBA is distributable code provided by Microsoft to SBC vendors who then embed code into their firmware or distribute it separately to have SBA run on a separate VM or hardware.

To get the latest Session Border Controller firmware with the embedded Survivable Branch Appliance, contact your SBC vendor. In addition, the following is required:

- The SBC needs to be configured for Media Bypass to ensure that the Microsoft Teams client in the branch site can have media flowing directly with the SBC.
- TLS1.2 should be enabled on the SBA VM OS.

Supported teams clients

- Microsoft Teams Windows desktop
- Microsoft Teams macOS desktop

How it works

During an internet outage, the Teams client should switch to the SBA automatically, and ongoing calls should continue with no interruptions. No action is required from the user. As soon as the Teams client detects that the internet is up and any outgoing calls are finished, the client will fall back to normal operation mode and connect to other Teams services. The SBA will upload collected Call Data Records to the cloud and call history will be updated so that this information is available for review by the tenant administrator.

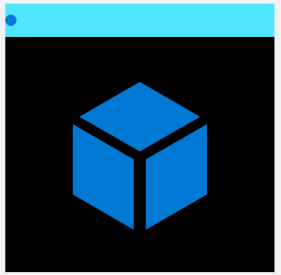
Configuration of the SBA

For the SBA feature to work, the Teams client needs to know which SBAs are available in each branch site, and which SBAs are assigned to the users in that site.

To connect your SBA to Microsoft Teams Phone, follow these steps:

1. Create the SBAs.
2. Create the Teams branch survivability policy.
3. Assign the policy to users.
4. Register an application for the SBA with Azure Active Directory.

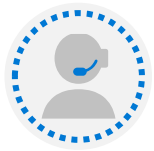
Extend Teams Phone with additional services



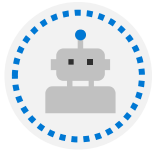
Agenda

Understand how Teams Phone interacts with other Microsoft services

Configure and integrate third-party policy-based compliance recording solutions



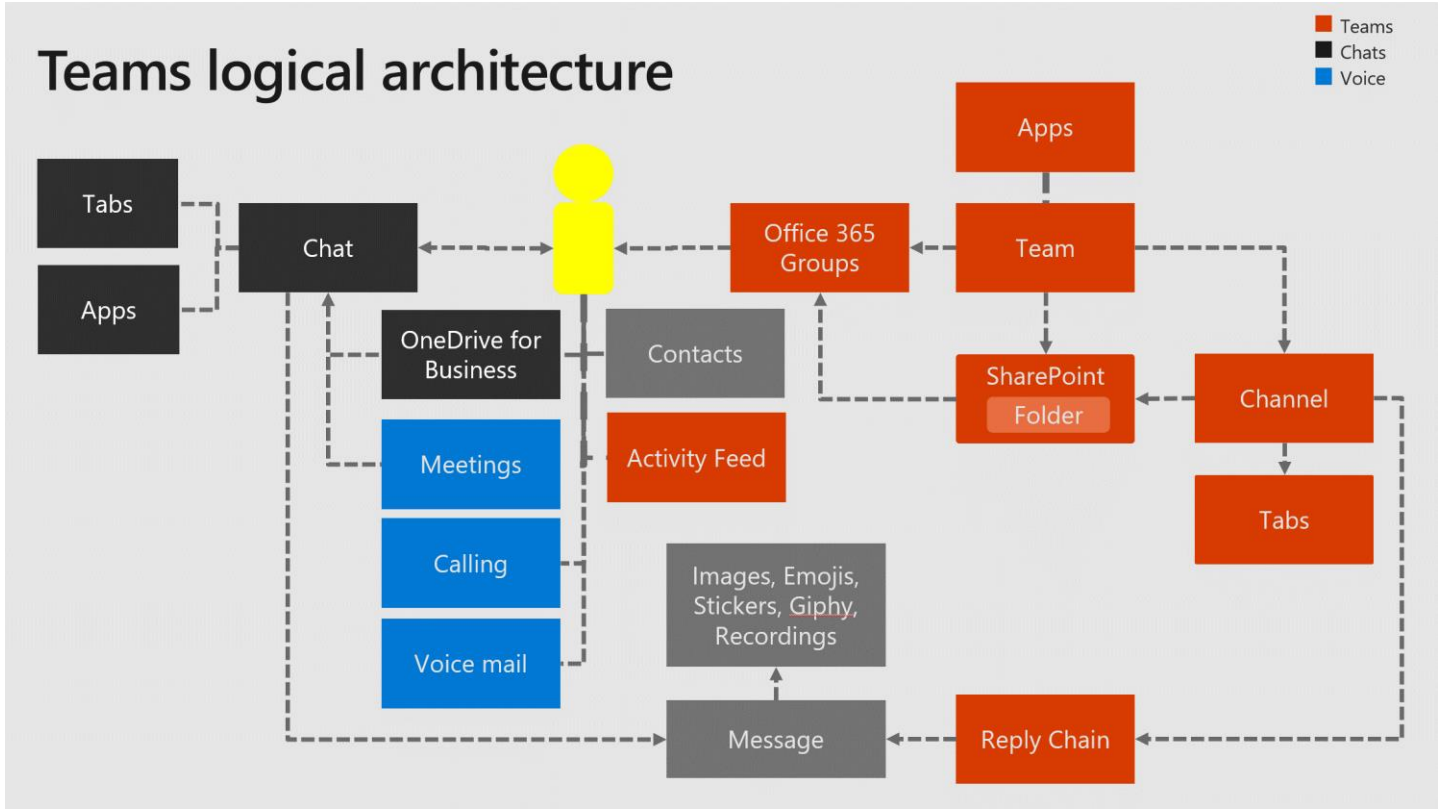
Configure and integrate third-party contact center solutions



Design and register Voice Bots for custom solutions

Understand how Teams Phone interacts with other Microsoft services

- Azure Active Directory (AAD) - sign in authorization and authentication
- Exchange hosts cloud voicemail
- Teams is a group of services on Azure
- Auto Attendants and Call Queues are Azure Services
- Media Processors, Media Controllers and Media Transport Relays are Azure Services
- Meeting recording is an Azure service



Configure and integrate third-party policy-based compliance recording solutions

- Teams convenience recording is the in the box optional recording
- Compliance recording is forced recording with a third party solution
- Compliance recording is managed by Teams Policies
- The third party solution requires additional configuration
- “strict mode” will block calls if they cannot be recorded

Type	Convenience recording	Compliance policy-based recording
Requires a third-party solution	No	Yes
Recording Initiator	User	Automatically records, configured by an administrator
Target	Recording is per-call / meeting	Per-user – system can be configured to record all calls and/or meetings involving that user
Where is the recording stored	User OneDrive or Team OneDrive – accessible to users	Separate storage, controlled Admin team / compliance team
Owner of the recording file	User	Admin / compliance team
Notification of call being recorded required?	Yes- always on	On by default but can be disabled by customer/vendor if required and disclaimer signed.
Access Owner	User	Compliance
Retention Policy?	On by default, can be configured	Can be configured

Configure and integrate third-party contact center solutions

- **Certified Contact Center with Direct Routing route PSTN calls to Teams**
  - Simple configuration, basic integration

- **Certified Contact Center with Microsoft API**
  - Tighter integration to Teams
  - Option to use Microsoft calling plan numbers
  - Requires Azure AD permissions approval to Graph APIs