Microsoft

Voice Scenario and Integration Concepts - Direct Routing

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Agenda

Voice Scenarios

Voice Integration Concepts

Microsoft Teams Voice Overview

Replace your traditional PBX with Microsoft Teams Voice

Unify your legacy PBX system in Microsoft 365

Provide a complete voice solution in the cloud.* Reduce reliance on-premises hardware and eliminate points of failure.

Simplify IT

Increase agility and consolidate voice management with rapid provisioning, reporting, and diagnostics in the Teams admin center.

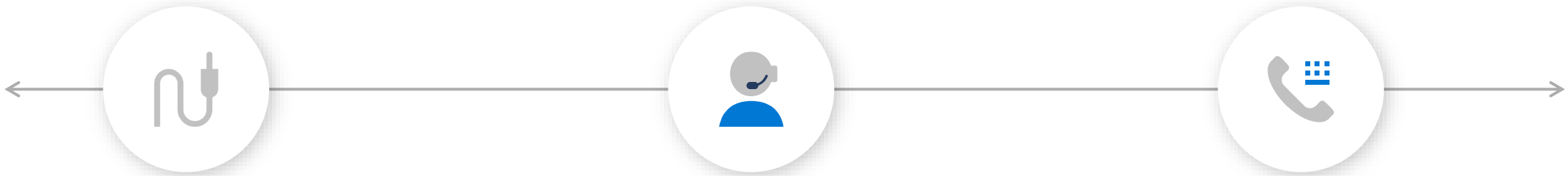
Scale globally

Connect your phone system to the Microsoft worldwide network, and get the power of the Microsoft cloud wherever your business goes.

*A complete voice solution is possible with a combination of Teams Phone, Calling Plans, Operator Connect and/or Direct Routing.

Customer Choice at the Center of Teams Phone Enablement

Microsoft meets your customers' diverse needs with flexible and simple options to bring calling to Teams. There are now three options for enabling Teams Phone.



Direct Routing

Highly customizable approach that allows customers to maintain existing service provider agreements and use on premises/hybrid hardware.

Available globally through partners.

Operator Connect

A quick and easy way to get started with calling while maintaining existing service provider agreements and leveraging the customization and flexibility of Direct Routing.

Available today through 39+ partners covering over 50 markets.

Microsoft Calling Plans

A fast and simple way to setup calling without additional technical configurations. It does not require a session border controller (SBC) or 'voice trunk'.

Available in 31 markets.

Microsoft Teams Voice Capabilities

Microsoft Teams Calling Plans

Microsoft is your operator

Operator Connect

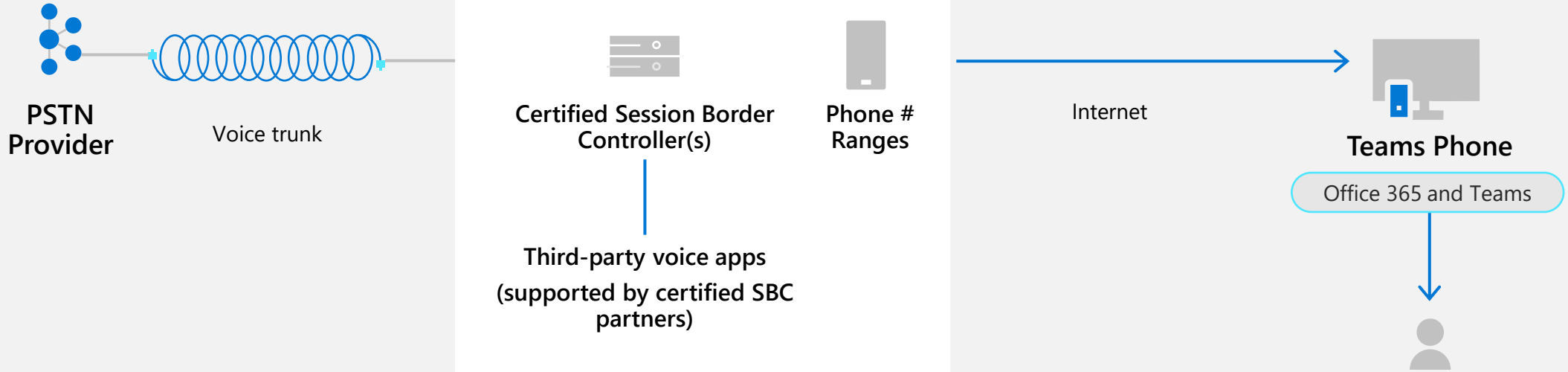
Simply and seamlessly integrate qualified operators

Direct Routing

Use your existing infrastructure, supported in >180 countries

Direct Routing

Direct Routing



Directly route dial tone to Microsoft Teams users

Direct Routing in Microsoft 365 allows customers to connect their SIP trunks directly from their network. Customers can work with their local telecommunications provider to enable Microsoft Teams users to make and receive telephone calls. No porting required – keep your numbers.

Interoperability with third-party systems

Direct Routing allows customers with users in the Microsoft cloud to continue using third-party systems such as PBXs, call center, and analog telephony adaptors (ATA) helping preserve key investments.

Session Border Controllers (SBCs) certified for Direct routing

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

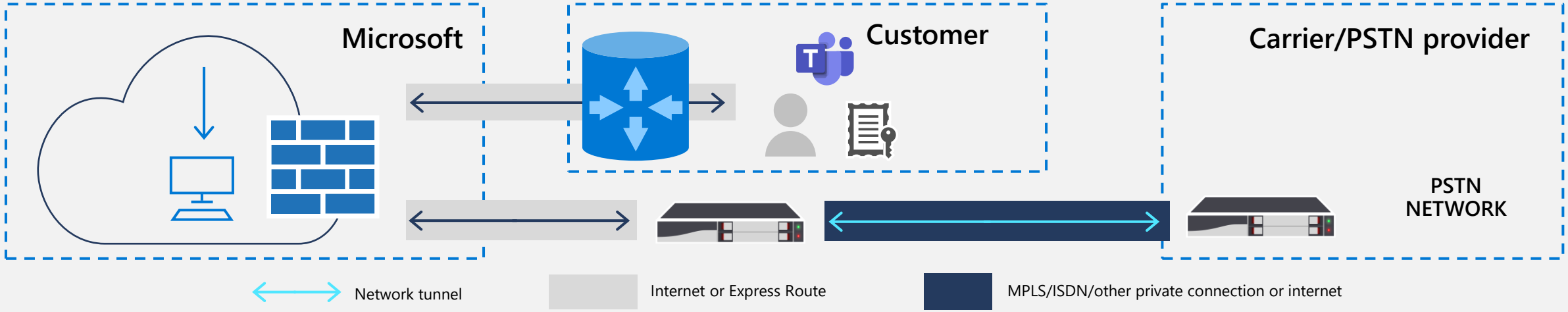
Microsoft works with each vendor to:

- 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.
- SBCs can be physical appliances, or deployed in the cloud.
- List of supported SBCs: https://aka.ms/dr-sbc

Session Border Controllers certified for Direct Routing

For the latest updates, please refer to: https://learn.microsoft.com/en-us/microsoftteams/direct-routing-border-controllers

Notional Direct Routing Deployment Model



Requirements to each involved party:

Microsoft	Customer	Carrier
Teams Phone Teams client Support (including incident transfers been Microsoft and SBC vendors) Configuration guidance/documentation	"E5" or "E3 + Microsoft Teams Phone licenses" Contract with carrier The supported SBC (including the support contract) Access to the SBC from the Office 365 Public IP FQDN Certificate Configuration of SBC with Office 365 and carrier	Telephony trunk Support

Configuration and support includes interaction between four entities: Microsoft, SBC vendor, customer support and consultants, carrier

Survivable Branch Appliance with Direct Routing

A Survivable Branch Appliance (SBA) provides the ability to survive telephony connectivity for Microsoft Teams clients in case the connection between Microsoft and the customer premises is not available

Components of an SBA

- Tenant data sync service
- Keep alive interface
- Router
- NGC to SIP protocol converter
- Registrar
- Lightweight routing engine
- CDR service

Supported vendors

audiocodes

ORACLE

anynode® The Software SBC

ribbon

Survivable Functionality when in Offline Mode

Available

- Inbound PSTN call
- Outbound PSTN call
- Mute/Unmute
- Hold/Un-hold
- DTMF
- Call history during outage updated once online
- Up to 24-hour limit for offline mode (per last authentication to the Teams service)

Not Available

- VOIP calls
- User interface features: Add/Remove contact, Search, Add/Remove to speed-dial, voice mail
- In Call: call escalation to multiparty
- Complex enterprise features: Call forwarding, call queue, merge, consult transfer, delegation, call queues, and auto attendants
- e911 or Dynamic 911 support
- More than 24-hours outage

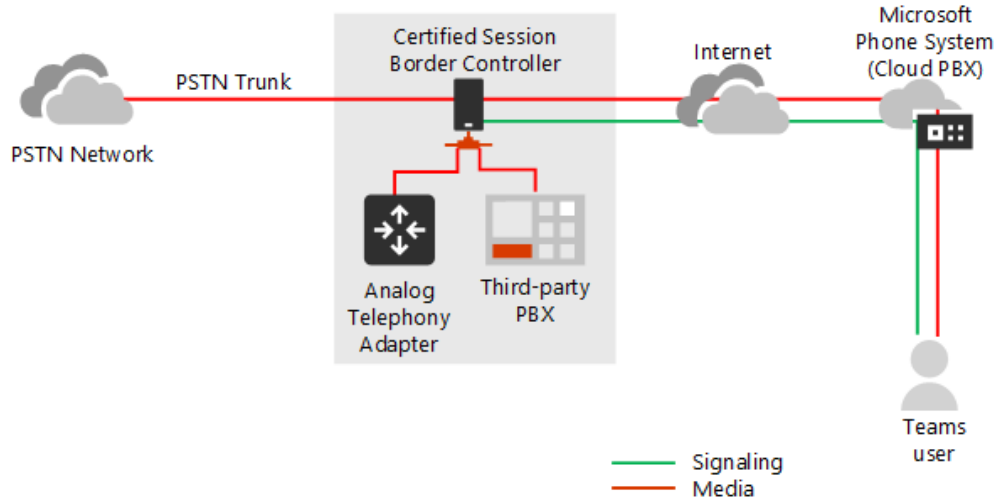
Note: Requires media bypass to be enabled within the SBC so that endpoints local to the branch site are able to route media to the SBC directly

For additional details, please refer to: https://learn.microsoft.com/en-us/microsoftteams/direct-routing-survivable-branch-appliance

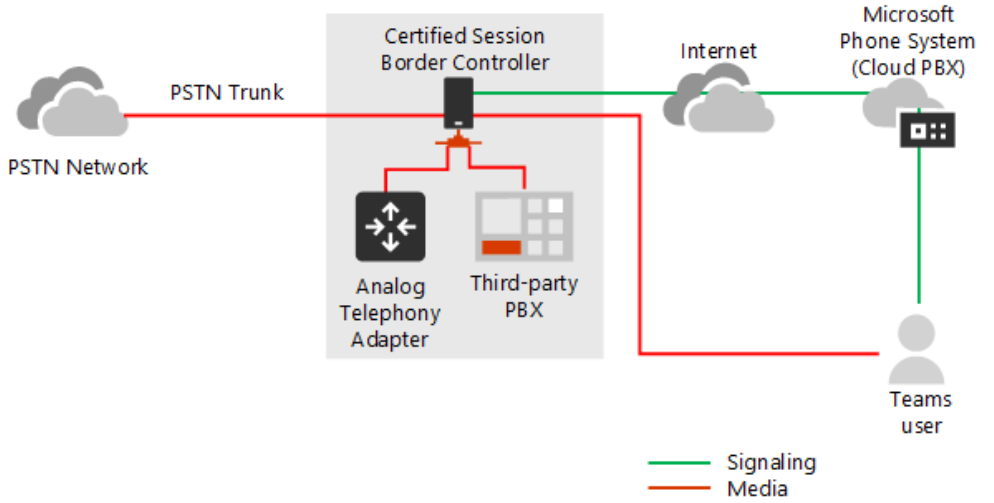
Direct Routing with Media bypass:

- Teams user needs access to the public IP address of the SBC (even from internal) unless utilizing local media optimization
- Recommended when user is in the same physical building/network as the SBC
- Signaling (SIP/TLS) is always through the Microsoft cloud

Call flow without media bypass



Call flow with media bypass



For additional details, please refer to: https://docs.microsoft.com/en-us/microsoftteams/direct-routing-plan-media-bypass

Direct Routing with Local Media Optimization:

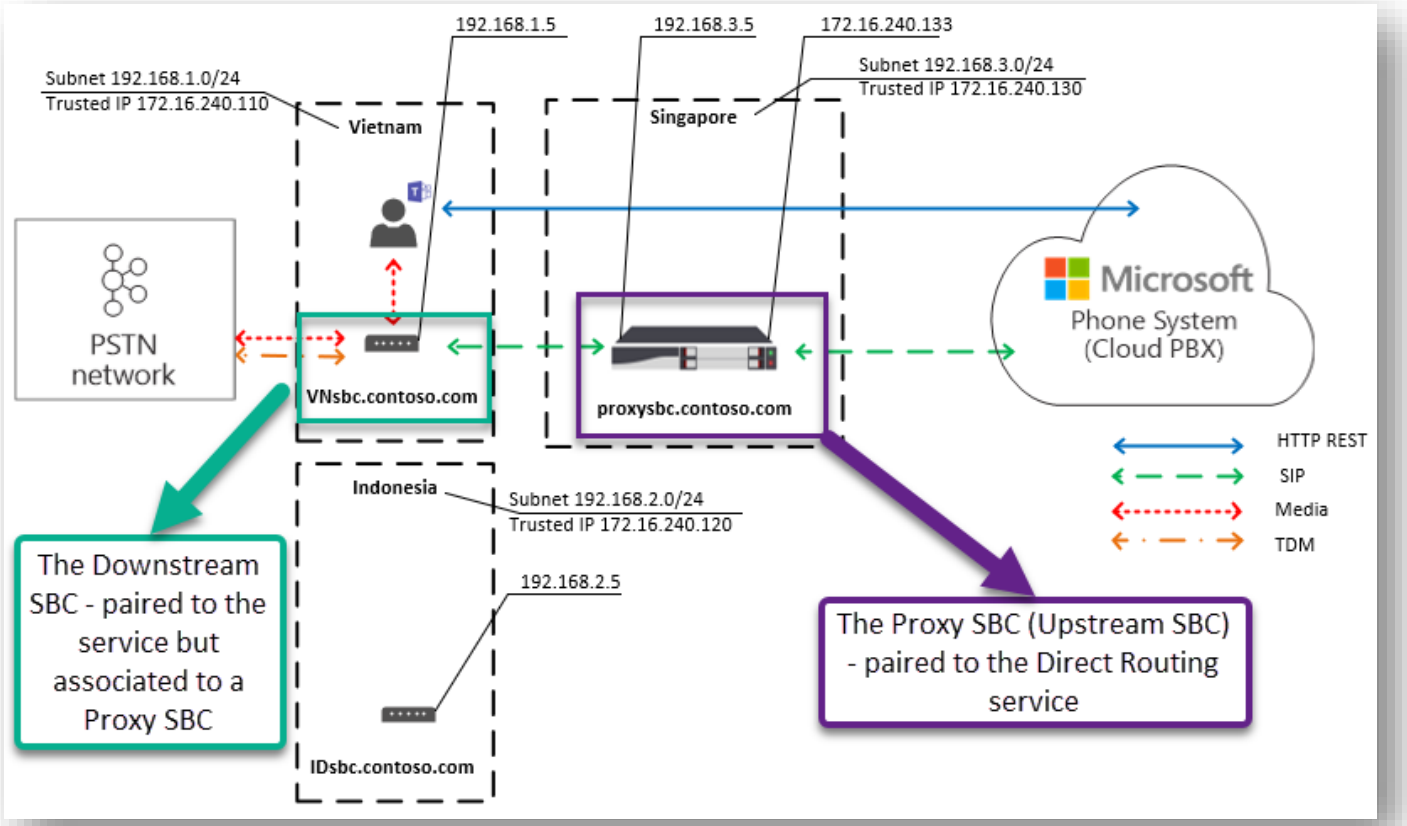
Proxy SBC

- Has a public IP address
- Deployed in the same manner as any SBC for Direct Routing
- Can be targets of Online Voice Routes

Downstream SBC

- Does not have a public IP address assigned
- Paired to the service with association to Proxy SBC
- Can be targets of Online Voice Routes

Call flow with Local Media Optimization

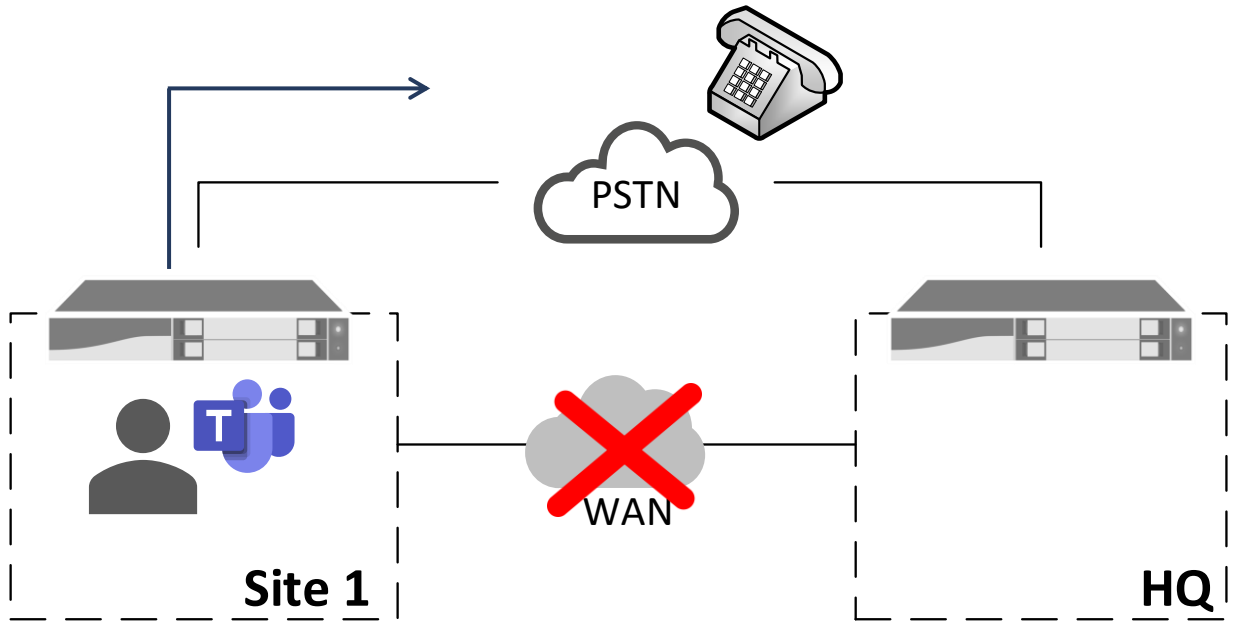


For additional details, please refer to: https://docs.microsoft.com/en-us/microsoftteams/direct-routing-media-optimization

Direct Routing with Location-based Routing:

- In some countries and regions, it's illegal to bypass the Public Switched Telephone Network (PSTN) provider to decrease long-distance calling costs.
- Location-based routing is a feature that lets you restrict toll bypass based on policy and the user's geographic location at the time of an inbound or outbound PSTN call.
- Location-based routing is intended to provide a mechanism to prevent toll bypass.
- It shouldn't be used as a mechanism to dynamically route PSTN calls based on the location of the user or unintended consequences may result.

Call flow with Location Based Routing



For additional details, please refer to:
https://docs.microsoft.com/en-us/microsoftteams/location-based-routing-plan

Dynamic Emergency Calling

Overview: Dynamic Emergency Calling

Route emergency calls based on the known location of the Teams client

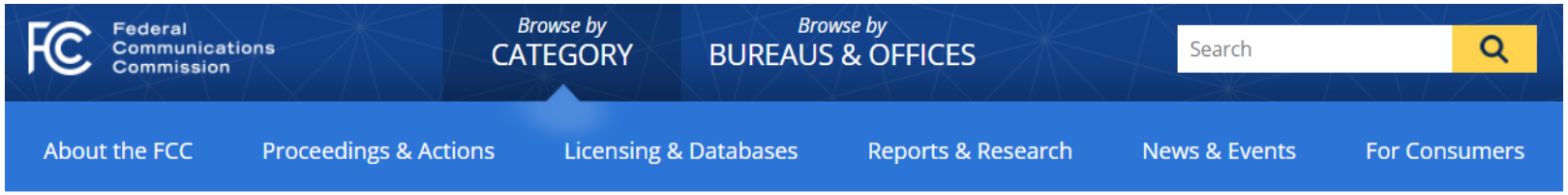
Call Routing Service included for Calling Plan Users

Direct Routing users must obtain additional service [Emergency Routing Service Providers – see https://aka.ms/dr-sbc]

Direct Routing can also leverage Emergency Location Identification Number [ELIN] gateways [upcoming support – see https://aka.ms/dr-sbc]

Configure security desk notifications

Legislation: Dynamic Emergency Calling (source FCC)



Home / Public Safety / Policy and Licensing Division / 911 Services /

Multi-line Telephone Systems – Kari's Law and RAY BAUM'S Act 911 Direct Dialing, Notification, and Dispatchable Location Requirements

911 Services

- Annual 911 Fee Reports
- 911 Strike Force
- 911 Master PSAP Registry
- Dispatchable Location
- PSAP Text-to-911 Readiness and Certification Form
- Task Force on Optimal Public Safety Answering Point Architecture (TFOPA)
- Indoor Location Accuracy Timeline and Live Call Data Reporting

In August 2019, the Commission adopted rules implementing two federal laws that strengthen emergency calling: Kari's Law and Section 506 of RAY BAUM'S Act.

Kari's Law – Direct Dialing and Notification for MLTS

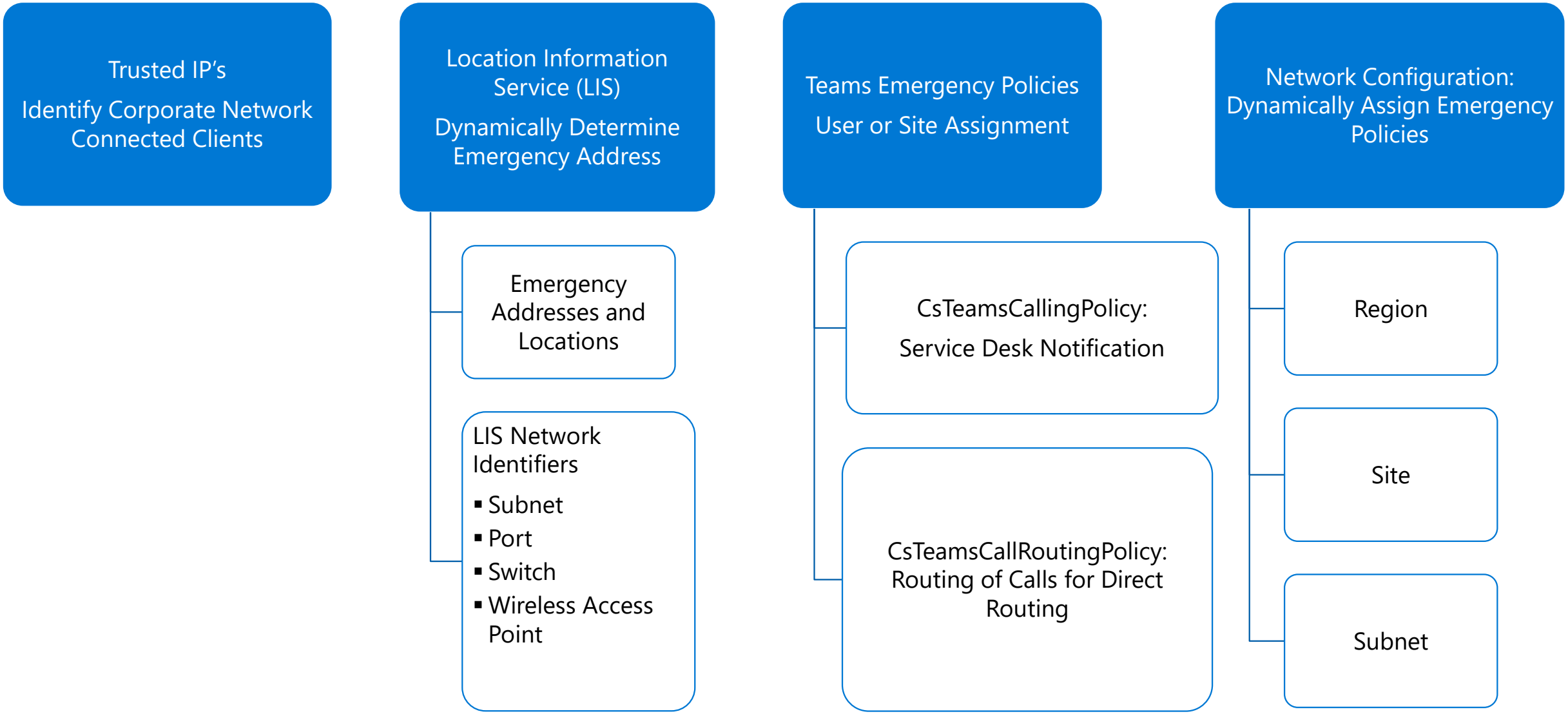
Kari's Law is named in honor of Kari Hunt, who was killed by her estranged husband in a motel room in Marshall, Texas in 2013. Ms. Hunt's 9-year-old daughter tried to call 911 for help four times from the motel room phone, but the call never went through because she did not know that the motel's phone system required dialing "9" for an outbound line before dialing 911.

Congress responded by enacting Kari's Law in 2018. Kari's Law requires direct 911 dialing and notification capabilities in multi-line telephone systems (MLTS), which are typically found in enterprises such as office buildings, campuses, and hotels. The statute provides that these requirements take effect on February 16, 2020, two years after the enactment date of Kari's Law. In addition, Kari's Law and the federal rules are forward-looking and apply only with respect to MLTS that are manufactured, imported, offered for first sale or lease, first sold or leased, or installed after February 16, 2020.

Under the statute and the Commission's rules, MLTS manufacturers and vendors must pre-configure these systems to support direct dialing of 911—that is, to enable the user to dial 911 without having to dial any prefix or access code, such as the number 9. In addition, MLTS installers, managers, and operators must ensure that the systems support

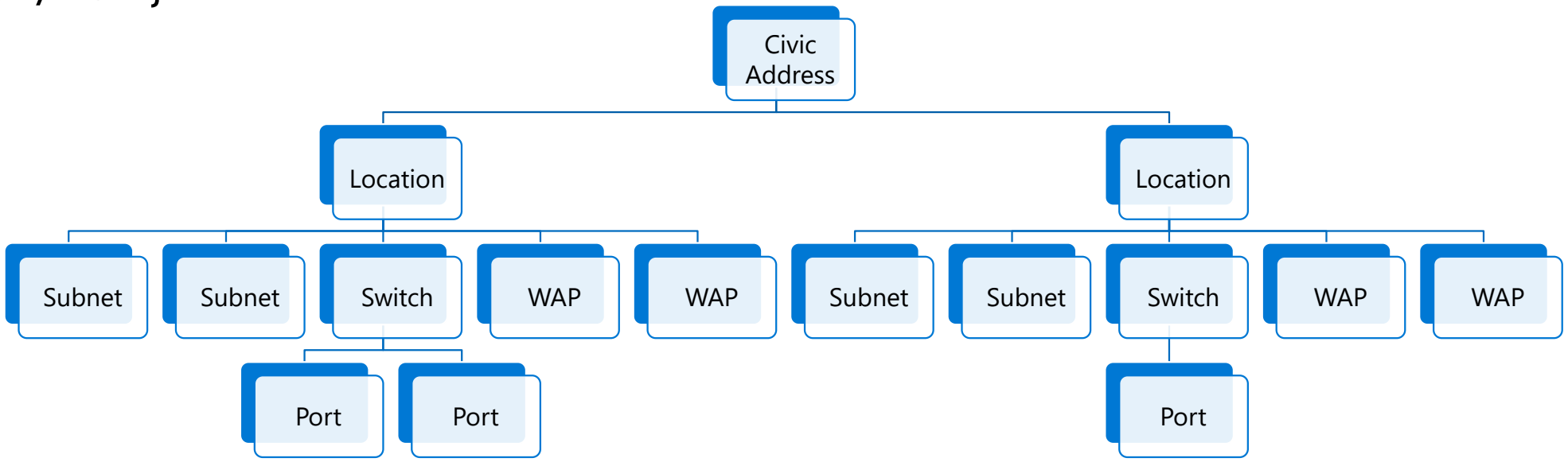
https://www.fcc.gov/mlts-911-requirements

Dynamic Emergency Calling Configuration Components



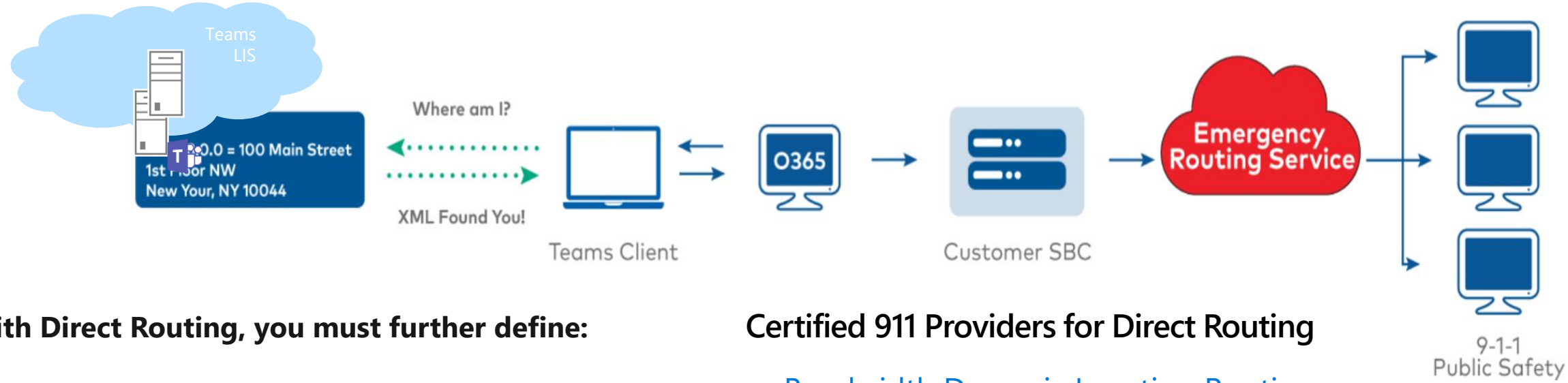
Defining Dynamic Emergency Calling Locations (LIS)

- Hierarchy and information should be detailed enough to allow emergency responders to easily locate a person.
- Civic Address ➔ specific building
- Location (also called Places) ➔ for example, a floor in the building
- In each location ➔ one (or more) network elements {subnet, Wireless Access Point, Switch/Port}



Dynamic Emergency Calling Considerations: Direct Routing

For Direct Routing, an Emergency Routing Service Provider is required for integration so that emergency calls with a dynamically acquired location will be automatically routed to the Public Safety Answering Point (PSAP) serving that location.



With Direct Routing, you must further define:

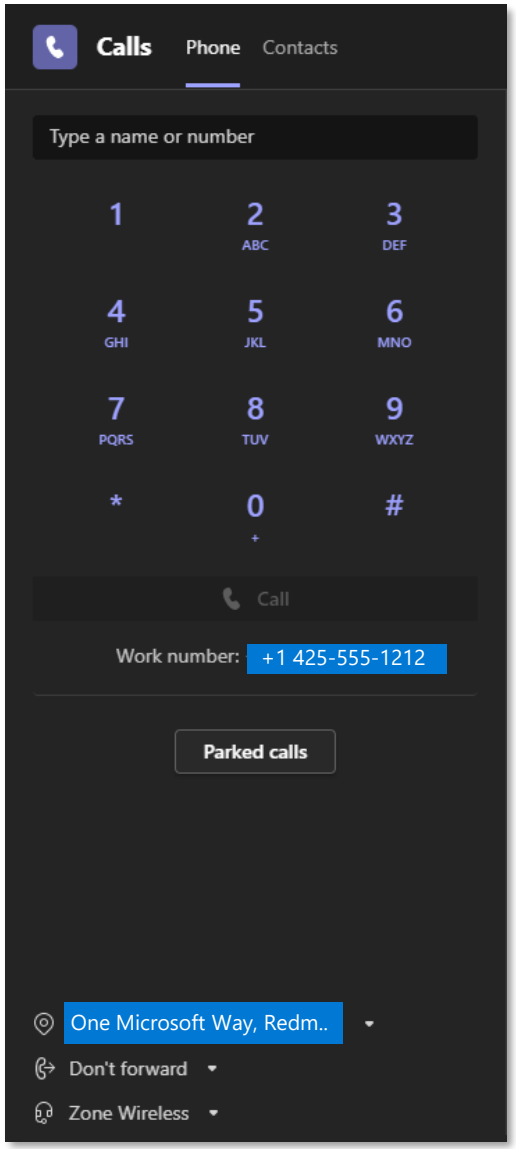
- Emergency calling policy**
- Emergency call routing policy
- Dialplan supporting emergency number routing
- Additional configuration as required for routing emergency calls with certified 911 Provider

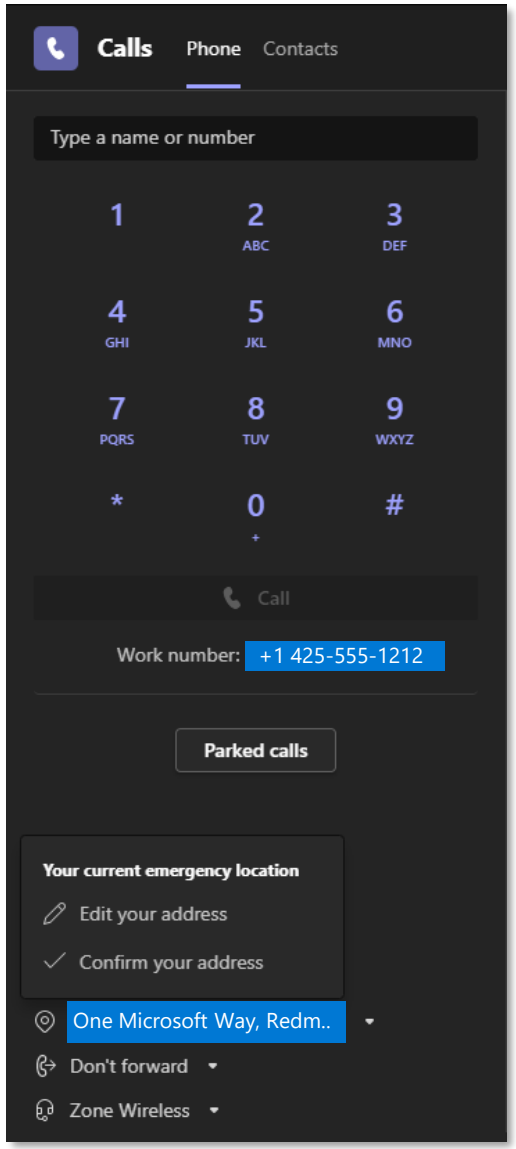
Certified 911 Providers for Direct Routing

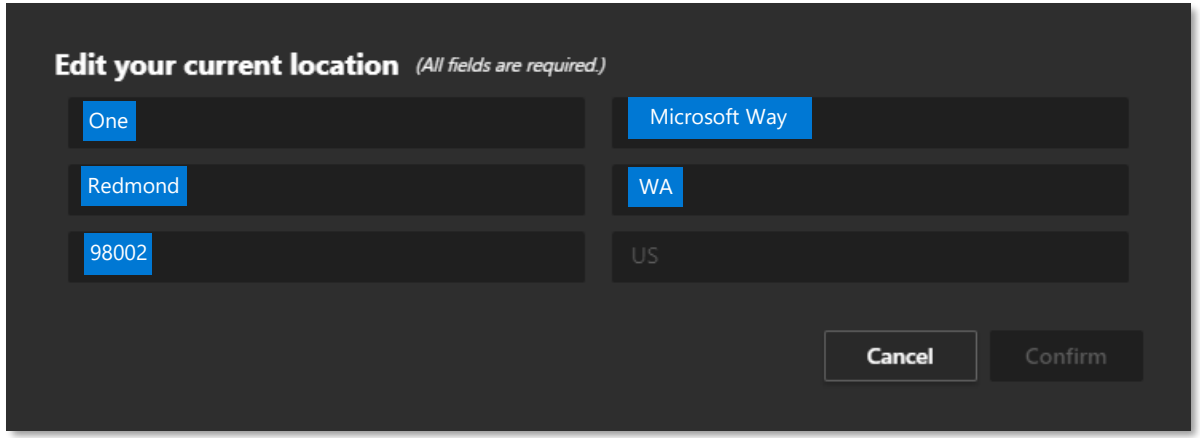
- Bandwidth Dynamic Location Routing
- Intrado Emergency Routing Service (ERS)
- Intrado Emergency Gateway (EGW)
- Inteliquent

For additional information, please refer to: https://aka.ms/tec

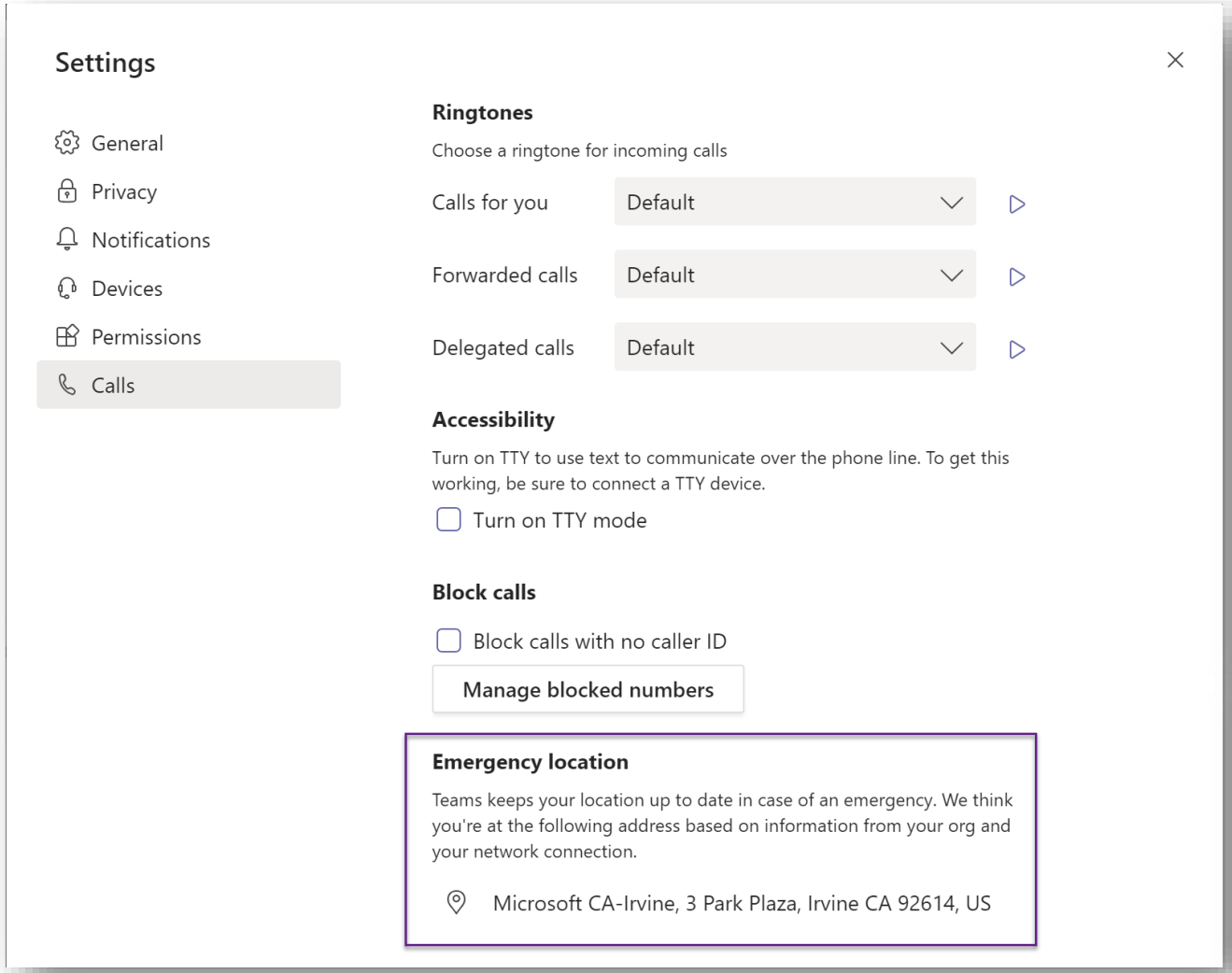
Dynamic Emergency Calling Work From Home Considerations

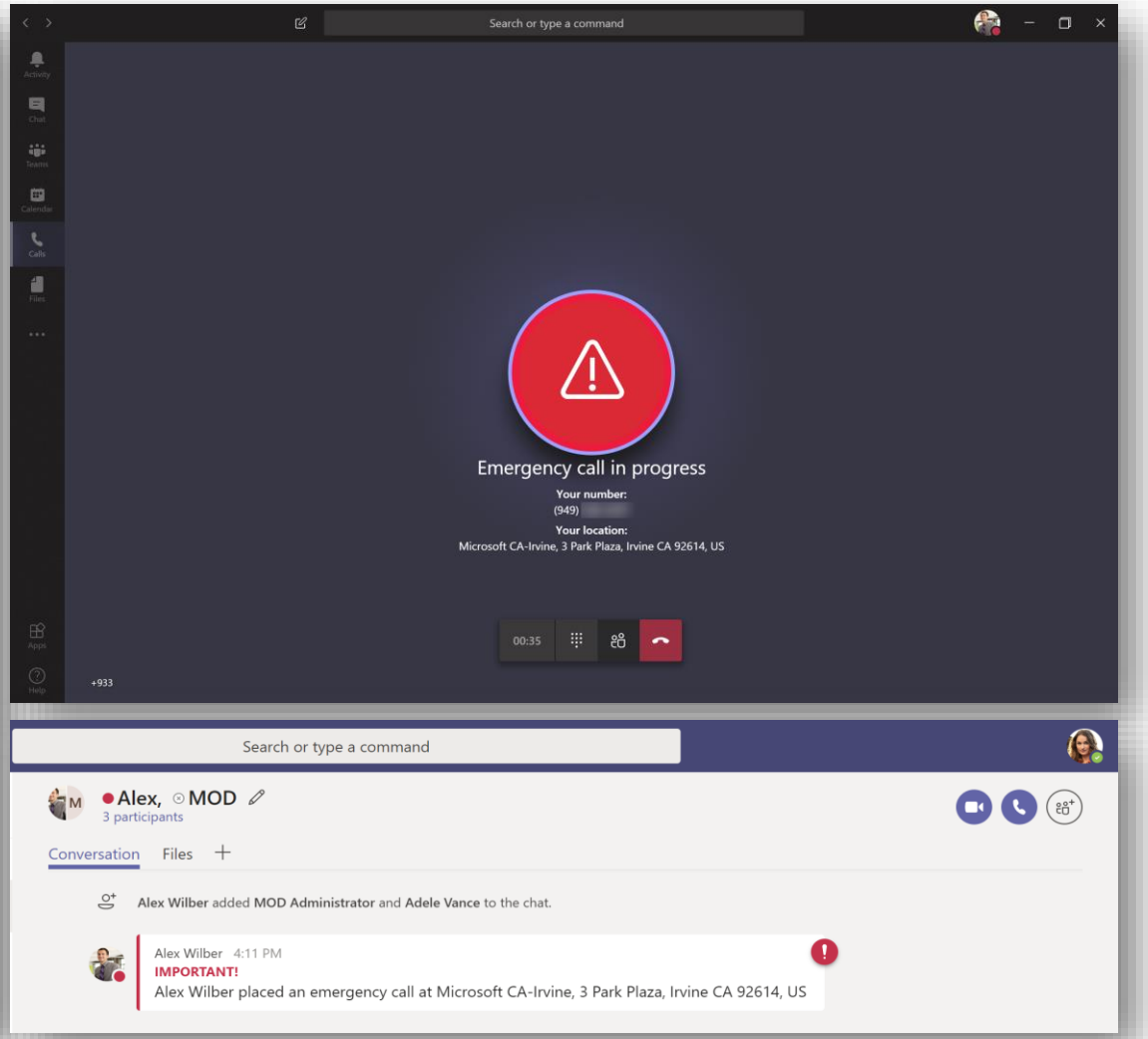




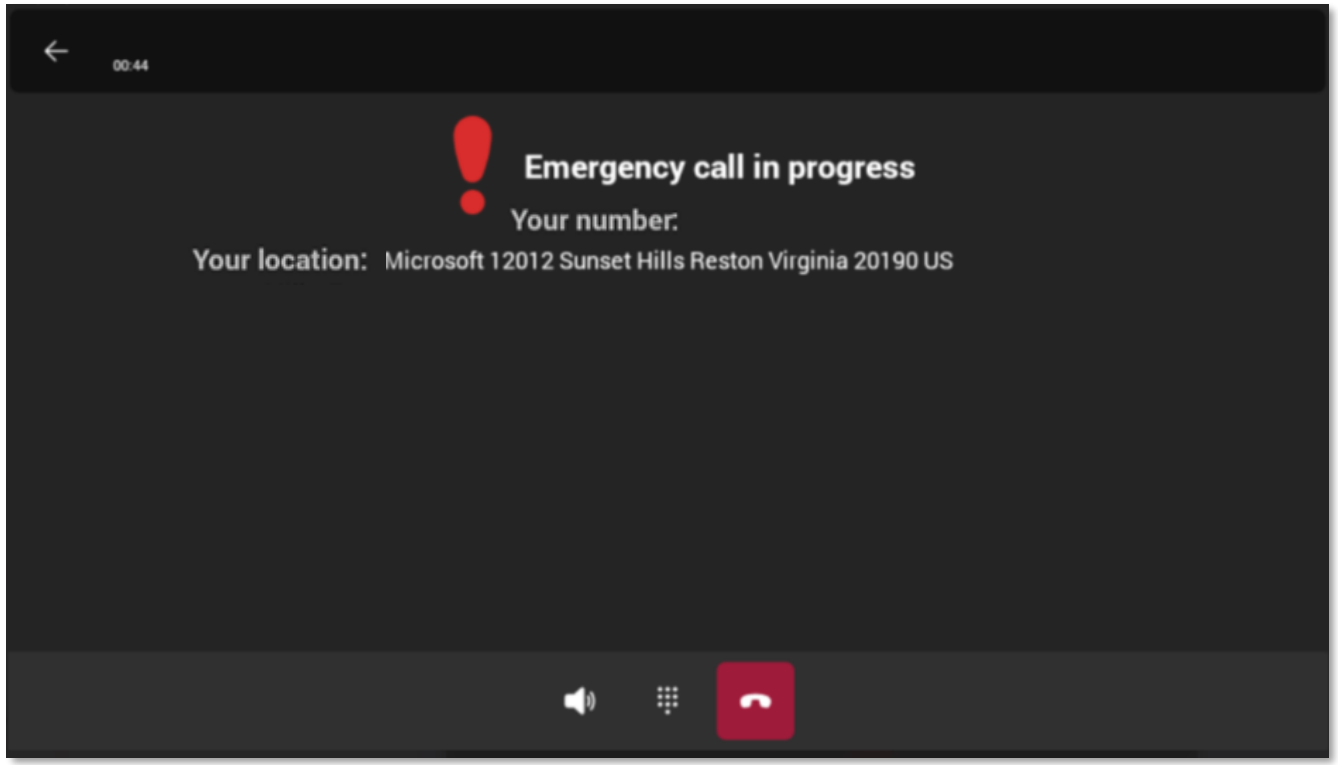


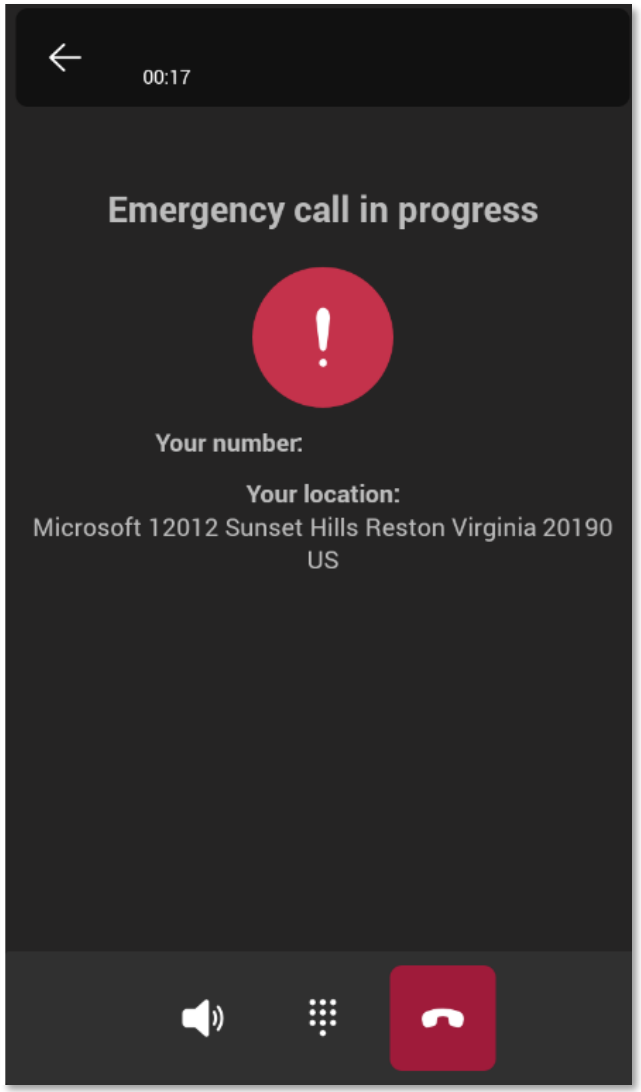
Desktop Client: Dynamic Emergency Calling User Experience



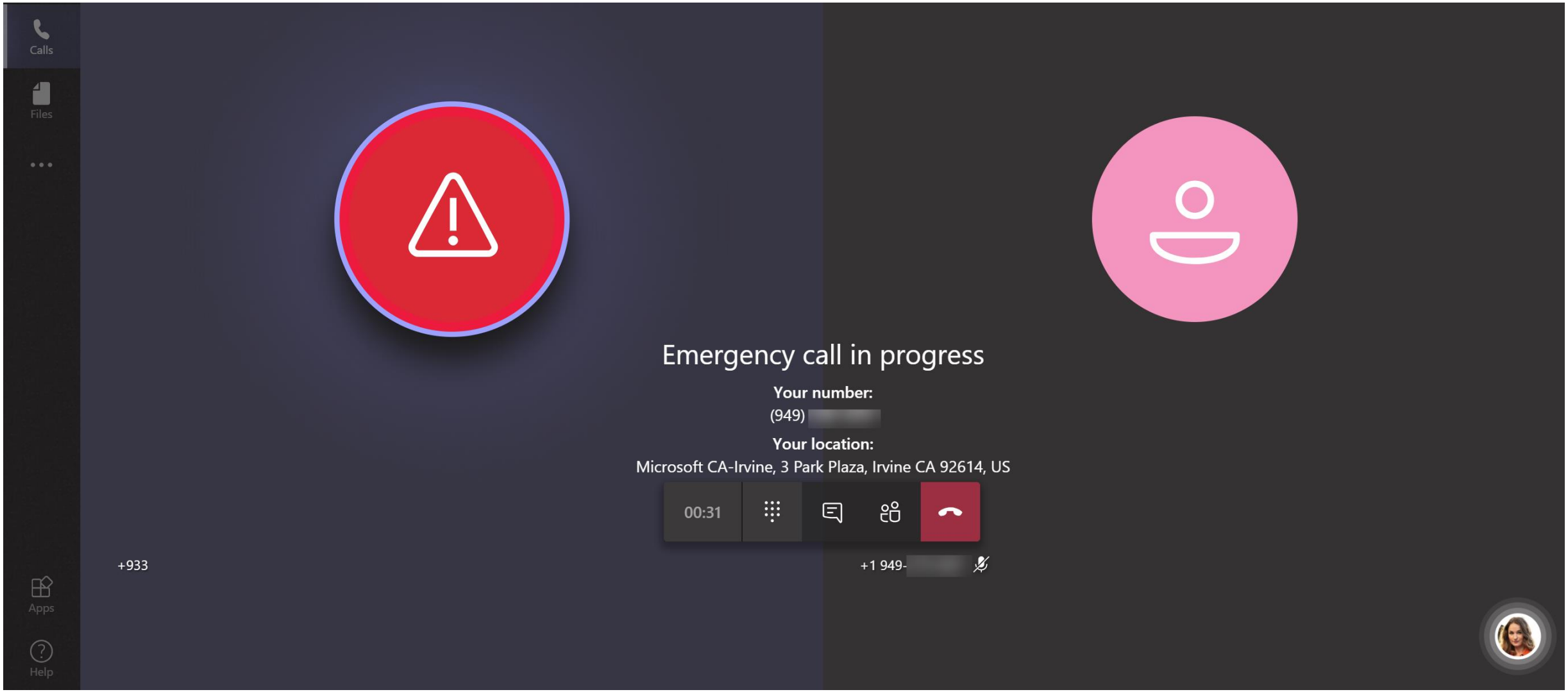


Teams Native Phone: Dynamic Emergency Calling User Experience



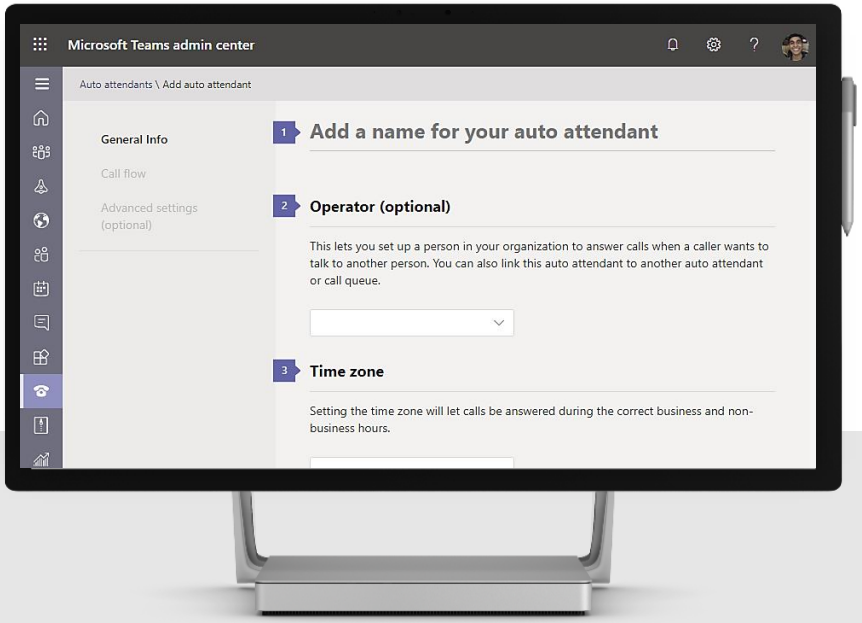


Dynamic Emergency Calling Security Desk Notification (e.g. Conferenced in, but muted)



Auto Attendants and Call Queues

Auto Attendant and Call Queues



Auto attendant

Toll-free and local service numbers

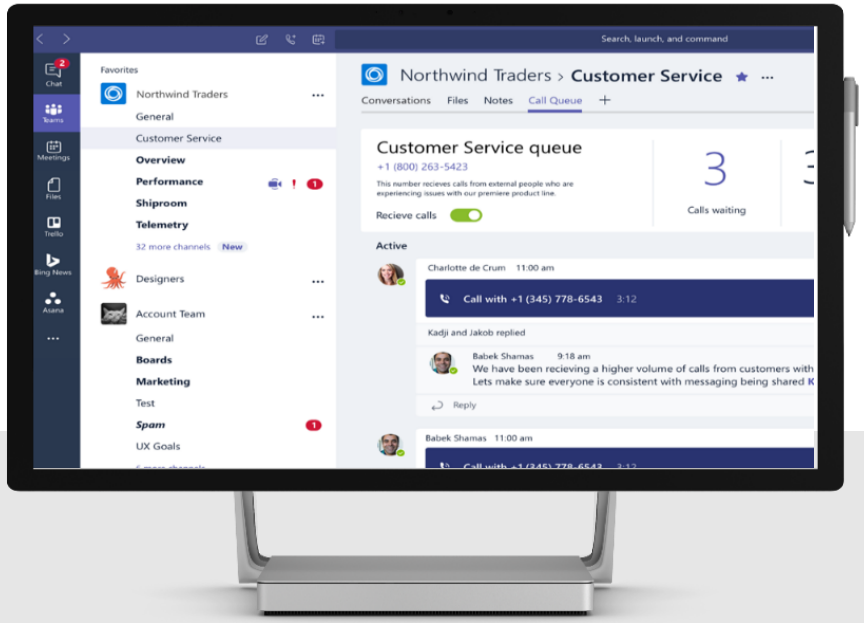
Dial-by-name directory search

Custom greetings and menus

Operator option

Speech recognition in 14 languages

Admin portal UI and PowerShell cmdlets



Call queues

Coordinate teams of people working together in a channel

Boost collaboration and efficiency with chat and call queues

Enjoy role-based for supervisor / agents and agent sign-in/out

Use supervisor listen, whisper, and barge with integrated chat for cross-agent support and teaming

Call queues and auto attendant prerequisites

To configure auto attendants and call queues, you need the following resources:

A resource account for each auto attendant and each call queue

Phone System Virtual User license for each resource account

At least one Microsoft service number, Direct Routing number, or a hybrid number for each resource account that you want to be directly dialable. The service number may be a toll or toll-free number.

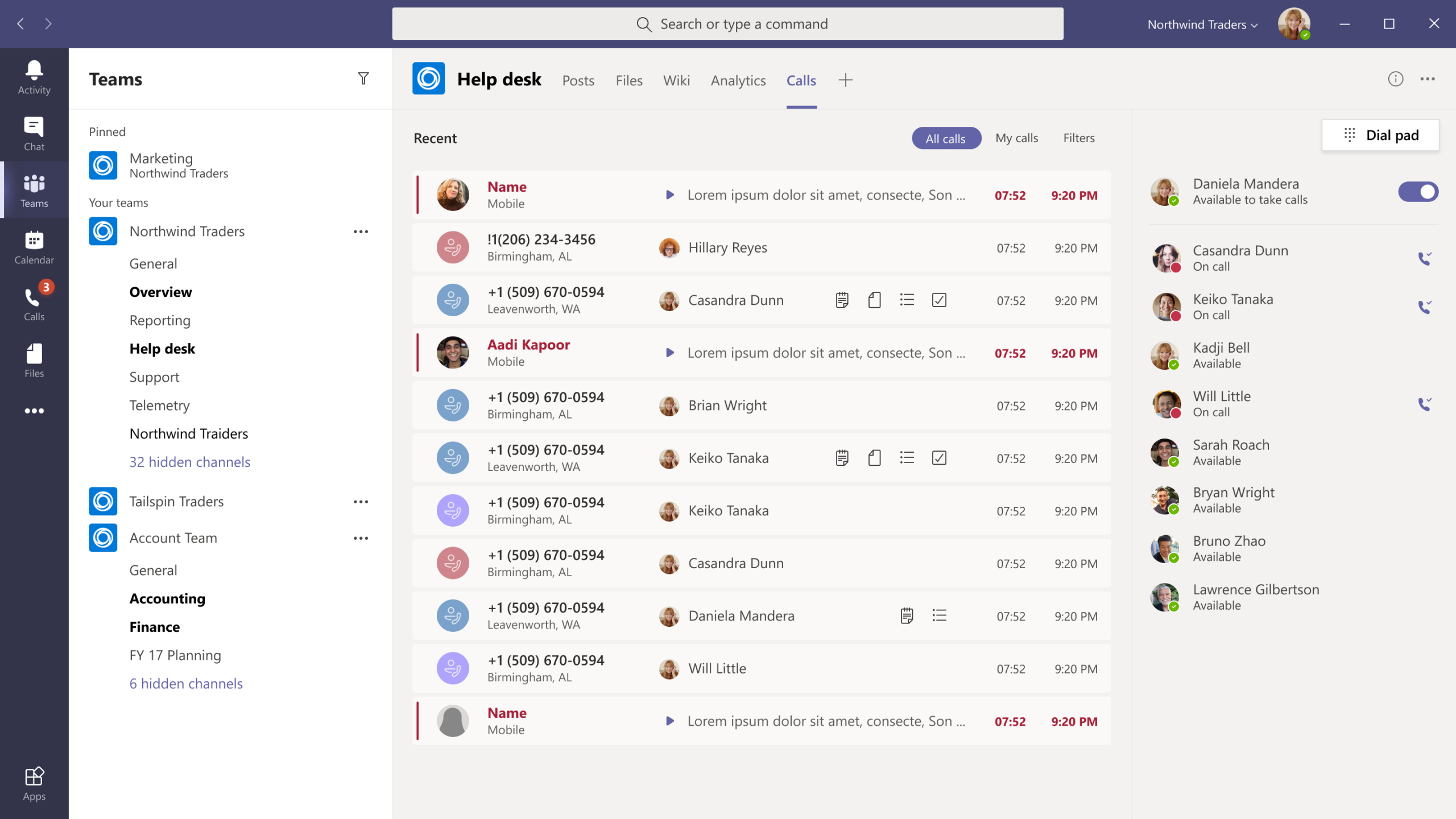
Agent prerequisites

Agents who receive calls from the call queues must be Enterprise Voice enabled online or on-premise users

In addition, if the call queues are using Direct Routing numbers, agents who need to conference or transfer calls also require:

1. An online voice routing policy assigned if the call queue uses transfer mode
2. An Audio Conferencing license or online voice routing policy assigned if the call queue uses conference mode

If your agents are using the Microsoft Teams app for call queue calls, they need to be in Teams Only mode


Search or type a command
Northwind Traders
Activity
Chat
Teams
Calendar
Calls
3
Files
Apps
Teams
Pinned
Marketing
Northwind Traders
Your teams
Northwind Traders
General
Overview
Reporting
Help desk
Support
Telemetry
Northwind Traiders
32 hidden channels
Tailspin Traders
Account Team
General
Accounting
Finance
FY 17 Planning
6 hidden channels
Help desk
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Leavenworth, WA
Casandra Dunn
Aadi Kapoor
Brian Wright
Keiko Tanaka
Daniela Mandera
Will Little
Daniela Mandera
Available to take calls
Casandra Dunn
On call
Keiko Tanaka
On call
Kadji Bell
Available
Will Little
On call
Sarah Roach
Available
Bryan Wright
Available
Bruno Zhao
Available
Lawrence Gilbertson
Available

Teams Voice Devices

Teamwork across spaces and devices

United by Microsoft Teams

Individual workspaces

Individual office or dedicated workspace

On the go or in transit at home

Group workspaces

Small, medium and large meeting rooms

huddle/focus spaces and touchdown spaces

collaboration workspaces

Personal devices

- Audio & video peripherals
- PCs and Mobile
- Phones

Shared devices

- Conference phones
- Teams Rooms
- Surface Hub

3PIP Gateway (Available today)

EoL: July 31st 2023

Features Supported

Authentication
Sign in with user credentials/Web Sign-in
Modern Authentication
Phone lock/unlock
Hot Desking Support

Calling
Incoming/Outgoing P2P calls from/to Teams users
In-call controls via UI (Mute/unmute, hold/resume, blind transfer, end call)
PSTN calls
Visual Voicemail
Static 911 support (e.g. **Dynamic 911 not supported**)

Device Update and Management
Device Update
In-band provisioning
QoE & Log Upload
Common Area Phone Support

Meetings
One-click Join for Pre-Scheduled Teams Meeting
Meeting Call controls (Mute/unmute, hold/resume, hang up, Add/remove participant)
Meeting Reminders
Add Skype for Business participant to ongoing meeting

Calendar and Presence
Calendar Access and Meeting Details
Presence Integration
Exchange Calendar Integration
Contact Picture Integration
Corporate Directory Access
Visual Voicemail

Features Not-Supported

Native Teams Device Features (e.g. Examples)
Call forwarding*
Setting presence
DND (calls will still land on 3PIP)
Anything not listed as supported is unsupported

For additional information, please refer to : https://techcommunity.microsoft.com/t5/microsoft-teams-blog/skype-for-business-phones-3pip-support-with-microsoft-teams/ba-p/789351

SIP Gateway

Leverage your existing SIP phone investments

User authentication

Core calling features

- Inbound / outbound calls to Teams or PSTN (hold/resume with music, mute/unmute, DTMF)
- Call transfer (single step/blind, consulted transfer)
- Dial in/out from a meeting (audio conferencing)
- Device-only “do not disturb”
- Voicemail and message waiting indicator

Integrated into Teams routing policies/regulations

Device inventory management in Teams admin center

Static emergency calling, static emergency location support with security desk notifications

Compatible SIP phones

Cisco IP Phones with MPP firmware (6821, 6901, 7800 series, 8800 series)

Polycom SIP phones (VVX series 100, 200, 300, 400, 500, 600 etc.)

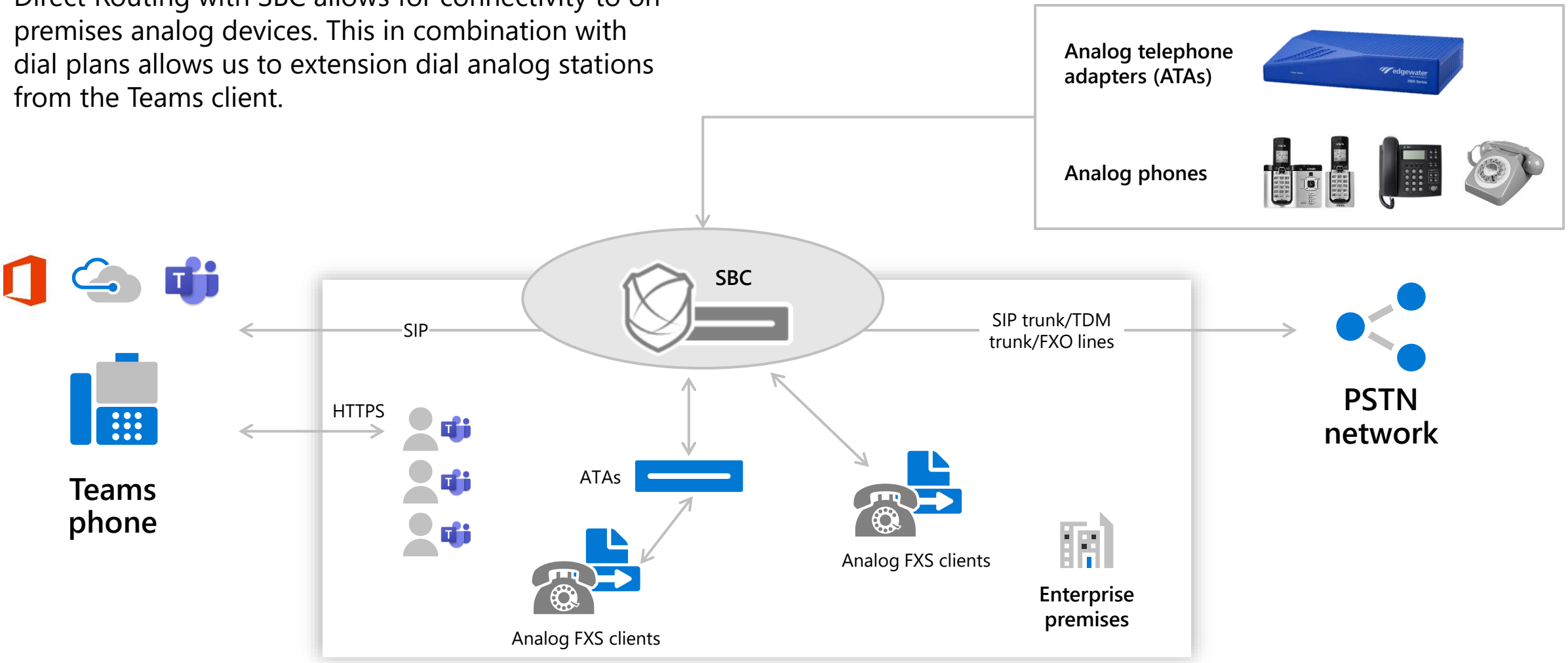
Yealink (T20 series, T30 series, T40 series, T50 series)

AudioCodes 400 HD series

For additional details, please refer to: https://learn.microsoft.com/en-us/microsoftteams/sip-gateway-plan

Analog device interoperability

Direct Routing with SBC allows for connectivity to on premises analog devices. This in combination with dial plans allows us to extension dial analog stations from the Teams client.



For additional information, please refer to: https://docs.microsoft.com/en-us/MicrosoftTeams/direct-routing-border-controllers#direct-routing-and-analog-devices-interoperability

Deploying Direct Routing

Direct Routing SBC FQDN Requirements

IP: 99.66.240.133
DNS Name: sbc1.contoso.com

Internet

Microsoft
Teams Phone

DNS name registered in Office 365 tenant	Can be used for SBC FQDN	Department
contoso.onmicrosoft.com		Executive leadership
contoso.com		**Valid names:** sbc1.contoso.com; ussbcs15.contoso.com; europe.contoso.com **Non-valid name:** sbc1.europe.contoso.com (requires registering domain name europe.contoso.com in "Domains" first)

Direct Routing SBC Certificate Requirements

IP: 99.66.240.133
DNS Name: sbc1.contoso.com

Validate identity of trusted SBC

Supported certificate root authorities

https://aka.ms/sbc-cert

	1 **Scenario** Minimize certificate cost	2 **Scenario** Balance the cost and security	3 **Scenario** Maximize security
Description	This scenario is for companies that want to pair many SBCs or change them frequently	This scenario is good for companies that do not change the gateways frequently. In the example below. a company has four SBCs (gw1.contoso.com; gw2.contoso.com; gw3.contoso.com; gw4.contoso.com).	In this scenario the company assigns a certificate to each gateway. There is only one certificate for every gateway.
Subject name	gw1.contoso.com	gw1.contoso.com	gw1.contoso.com
SAN	*.contoso.com	gw1.contoso.com gw2.contoso.com gw3.contoso.com gw4.contoso.com	gw1.contoso.com

Direct Routing Required IP Ports and Ranges

SBC requirements are different from client requirements

Check SBC vendor guidance if NAT can be used

Media ports (UDP/SRTP)

From IP	To IP	Source port	Destination port
Media processor	SBC	49,152 – 53,247	Defined on the SBC
SBC	Media processor	Defined on the SBC	49,152 – 53,247

SIP signaling ports (TLS/SIP)

From IP	To IP	Source port	Destination port
SIP proxy	SBC	1,024 – 65,6536	Defined on the SBC
SBC	SIP Proxy	Defined on the SBC	5061

IP ranges

SIP proxy	**Americas:** Traffic Manager FQDN sip-du-a-us.pstnhub.microsoft.com Datacenter FQDNs and IPs • sip-du-a-uswe2.pstnhub.microsoft.com - 52.114.148.0 • sip-du-a-usea.pstnhub.microsoft.com - 52.114.132.46 **Europe:** Traffic Manager FQDN sip-du-a-eu.pstnhub.microsoft.com Datacenter FQDNs and IPs: • sip-du-a-euwe.pstnhub.microsoft.com - 52.114.75.24 • sip-du-a-euno.pstnhub.microsoft.com - 52.114.76.76 **Asia:** Traffic Manager FQDN sip-du-a-as.pstnhub.microsoft.com Datacenter FQDNs and IPs: • sip-du-a-asea.pstnhub.microsoft.com - 52.114.7.24 • sip-du-a-asse.pstnhub.microsoft.com - 52.114.14.70
Media processors	52.112.0.0/14 (first IP address 52.112.0.1, last IP address 52.115.255.254)

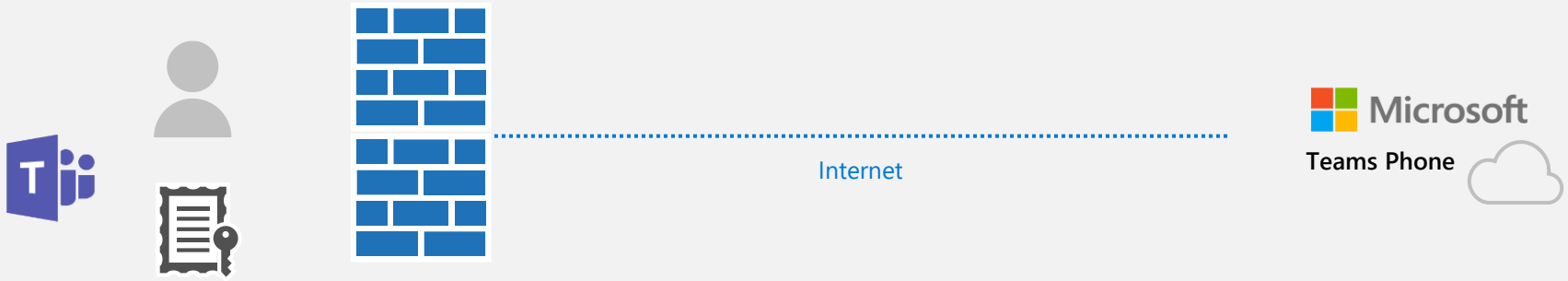
Registering an SBC for Direct Routing Integration

New-CsOnlinePSTNGateway -Fqdn <SBC FQDN> -SipSignallingPort <SBC SIP Port> -MaxConcurentSessions <Max Concurrent Session which SBC capable handling> -Enabled $true

```
PS C:\windows\System32\WindowsPowerShell\v1.0> New-CsOnlinePSTNGateway -Identity sbc1.contoso.com  SipSignallingPort 5068
 -ForwardCallHistory $true -ForwardPai $true -MaxConcurrentSessions 140

Identity              : sbc1.contoso.com
Fqdn                  : sbc1.contoso.com
SipSignallingPort     : 5068
ForwardCallHistory    : True
ForwardPai            : True
SendSipOptions        : True
MaxConcurrentSessions : 140
Enabled               : True
```

User Provisioning for Direct Routing



	Direct Routing only	Mixed Microsoft Calling Plan and Direct Routing
Licenses required	Skype for Business Online (Plan 2) Microsoft Teams Phone Microsoft Teams	Skype for Business Online (Plan 2) Microsoft Teams Phone Microsoft Teams Microsoft Calling Plan
Number provisioned	In on-premises or Azure Active Directory	Acquired from Microsoft or ported to Teams Phone
Routing	Only administrator configured routes evaluated. If no routes exist matching the callee number, the call drops.	Step 1. Routes configured by administrator evaluated. Step 2. If no routes matching the callee number exist on step 1, route the call via Microsoft Calling plan.

Defined Direct Routing Dialplan

Online PSTN Gateway

New-CsOnlinePSTNGateway -Fqdn sbc1.contoso.com -SipSignallingPort 5068 -Enabled $true

New-CsOnlinePSTNGateway -Fqdn sbc2.contoso.com -SipSignallingPort 5068 -Enabled $true

Usages

Set-CsOnlinePstnUsage -Identity Global -Usage @{Add="US and Canada"}

Voice Routes

Route for +1425 and +1206 (Priority 1):

New-CsOnlineVoiceRoute -Identity "Redmond 1" -NumberPattern "^\+1(425|206)(\d{7})$" -OnlinePstnGatewayList sbc1.contoso.com, sbc2.contoso.com -Priority 1 -OnlinePstnUsages "US and Canada"

Route for +1425 and +1206 (Priority 2)

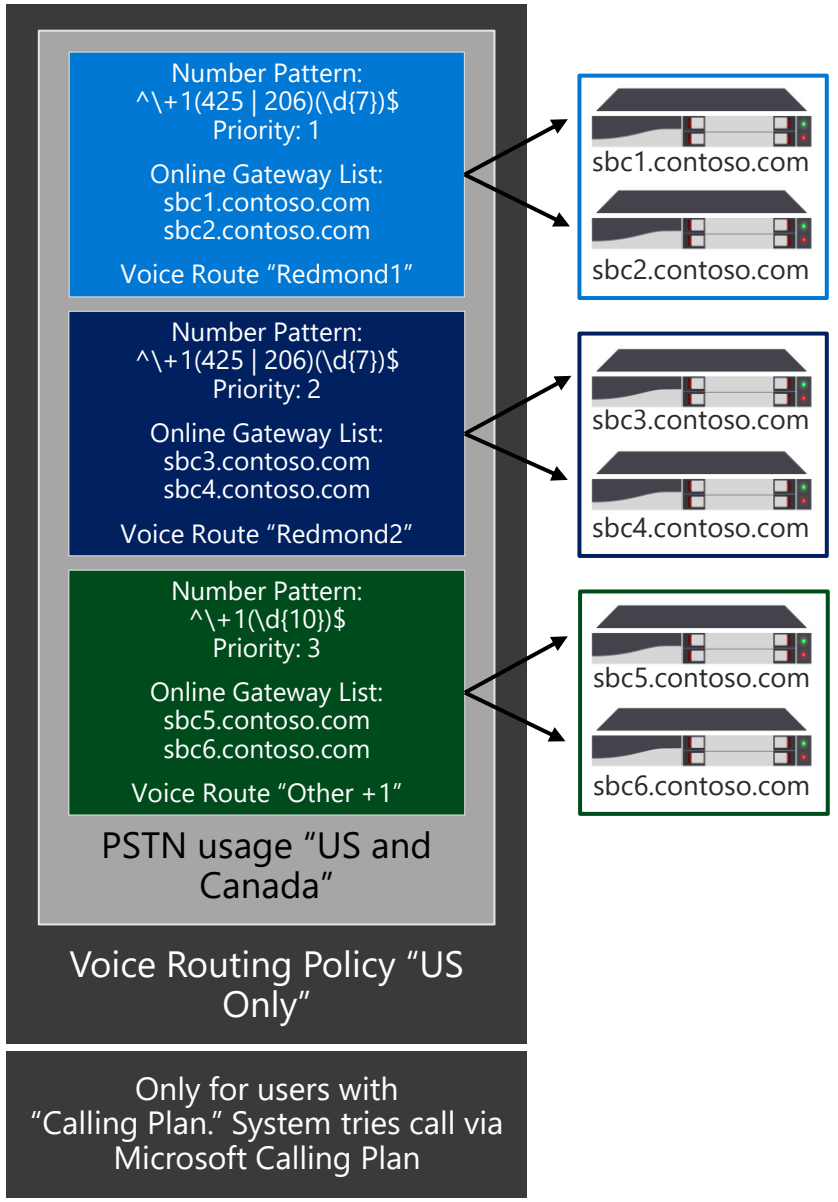
New-CsOnlineVoiceRoute -Identity "Redmond 2" -NumberPattern "^\+1(425|206)(\d{7})$" -OnlinePstnGatewayList sbc3.contoso.com, sbc4.contoso.com -Priority 2 -OnlinePstnUsages "US and Canada"

Route for other calls:

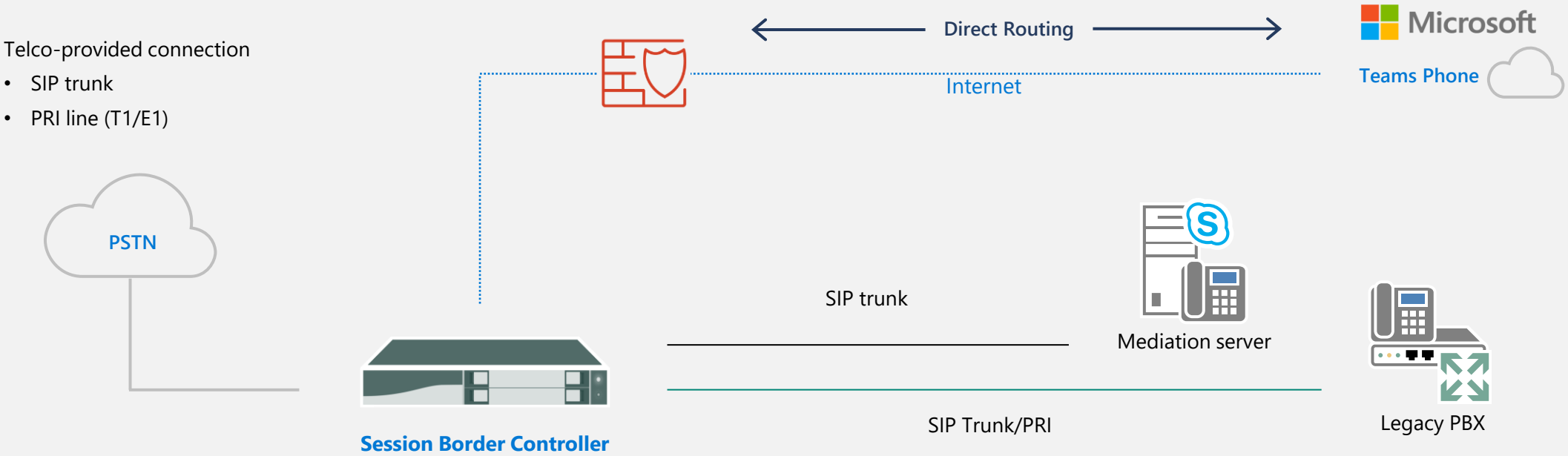
New-CsOnlineVoiceRoute -Identity "Other +1" -NumberPattern "^\+1(\d{10})$" -OnlinePstnGatewayList sbc5.contoso.com, sbc6.contoso.com -OnlinePstnUsages "US and Canada"

Voice Routing Policy

New-CsOnlineVoiceRoutingPolicy "US Only" -OnlinePstnUsages "US and Canada"
Grant-CsOnlineVoiceRoutingPolicy -Identity "Spencer Low" -PolicyName "US Only"



Migrating Existing Voice to Direct Routing



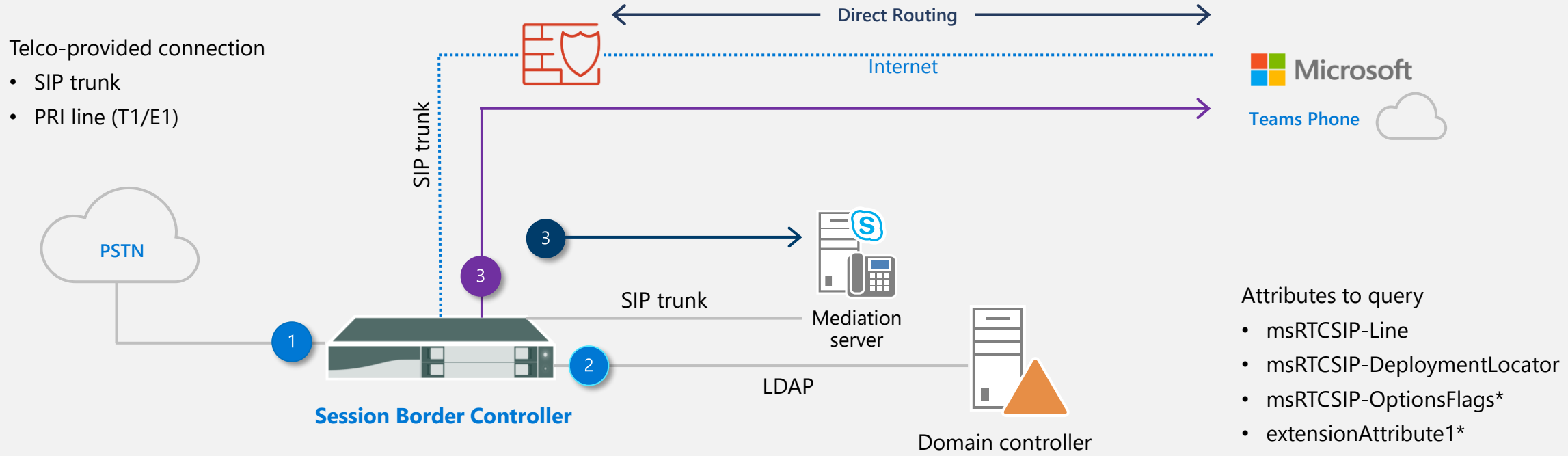
Session Border Controller is key

Recommend to place the SBC at the “front of the line”

Routing logic is anchored on the SBC

Option for directory-based lookups

Direct Routing Dynamic Routing Considerations



Attributes to query

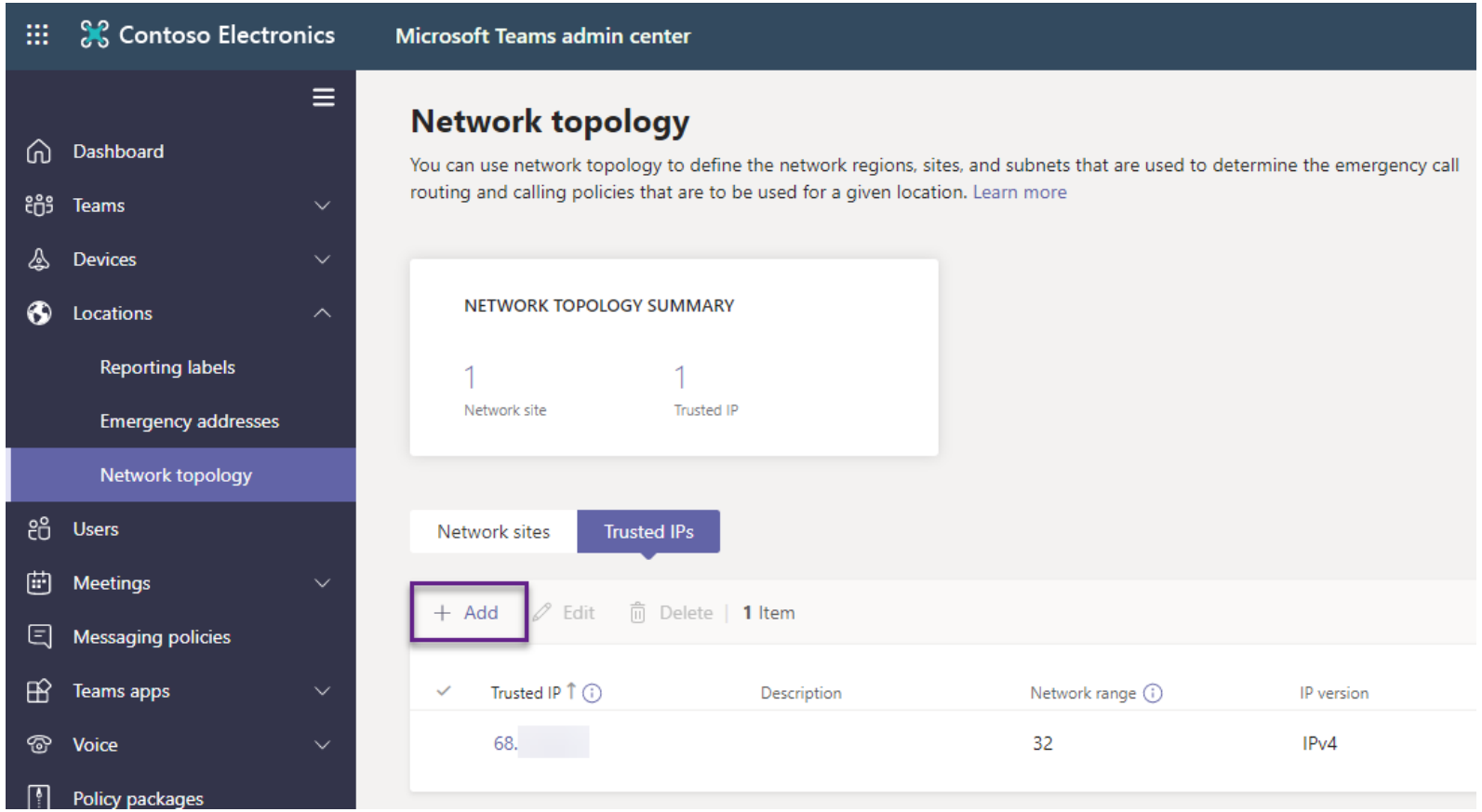
- msRTCSIP-Line
- msRTCSIP-DeploymentLocator
- msRTCSIP-OptionsFlags*
- extensionAttribute1*

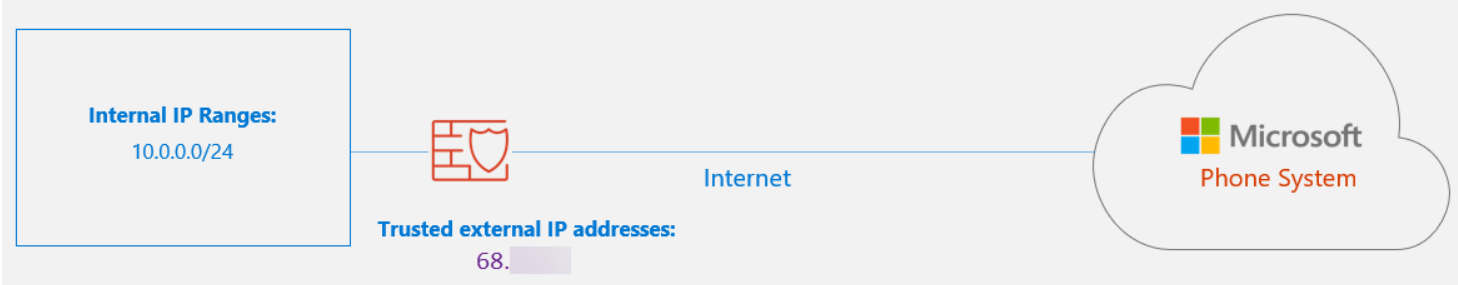
msRTCSIP-Line -> This is the anchor attribute, used to match with the incoming call.
msRTCSIP-DeploymentLocator -> This indicates where the user account is located.
"sipfed.online.lync.com" indicates the account is in the service (Route to Microsoft Teams).
"SRV:" indicates the account is on-premises (Route to Skype for Business).
*Optional items
msRTCSIP-OptionsFlags -> You can use this to also ensure the account is enabled for Enterprise Voice (value 385).
extensionAttribute1 (if Exchange is deployed) -> You can use this to help flag when a user has been migrated, or to differentiate between Skype for Business Online and Microsoft Teams.

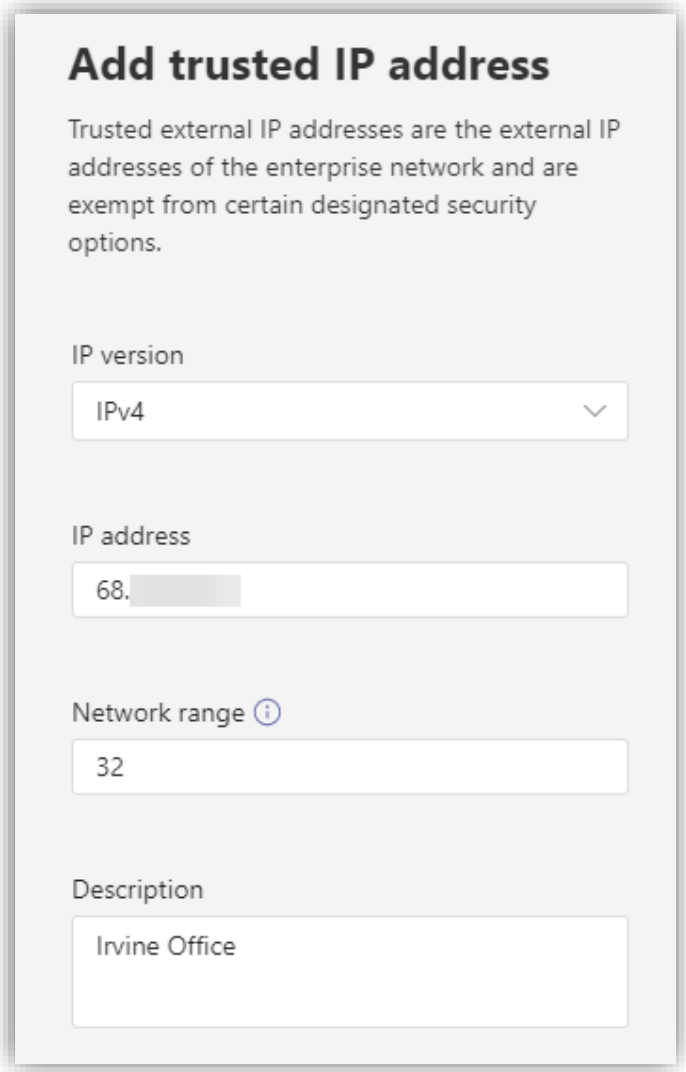
1. Inbound call to SBC
2. Lookup to AD (query)
3. Route to Microsoft Teams
3. Route to Skype for Business

Deploying Emergency Calling with Direct Routing

Defining Network Trusted IPs







Defining Regions, Sites, and Subnets

Network Region

- Interconnects various parts of a network across multiple geographic areas
- Collection of Network Sites

Network Site

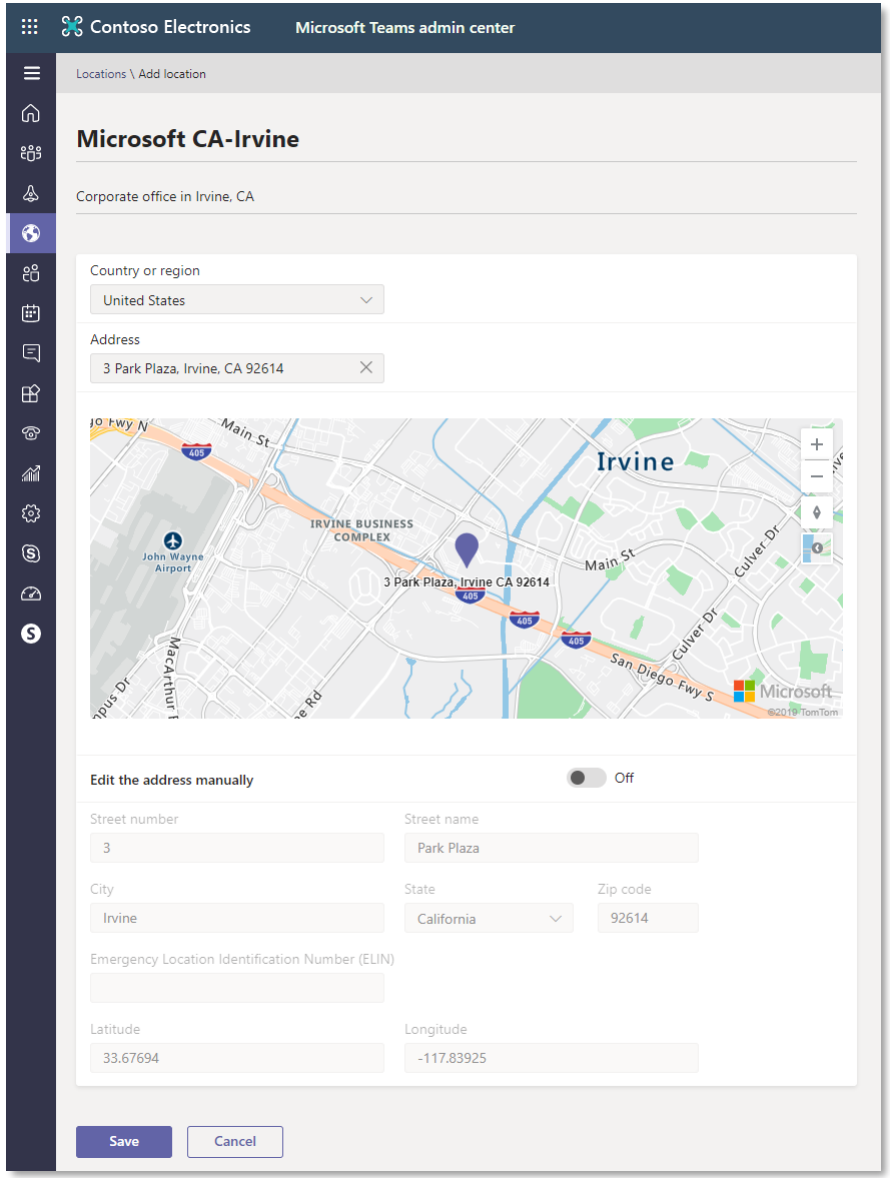
- Represents a location where the organization has a physical location
- Collection of unique IP subnets

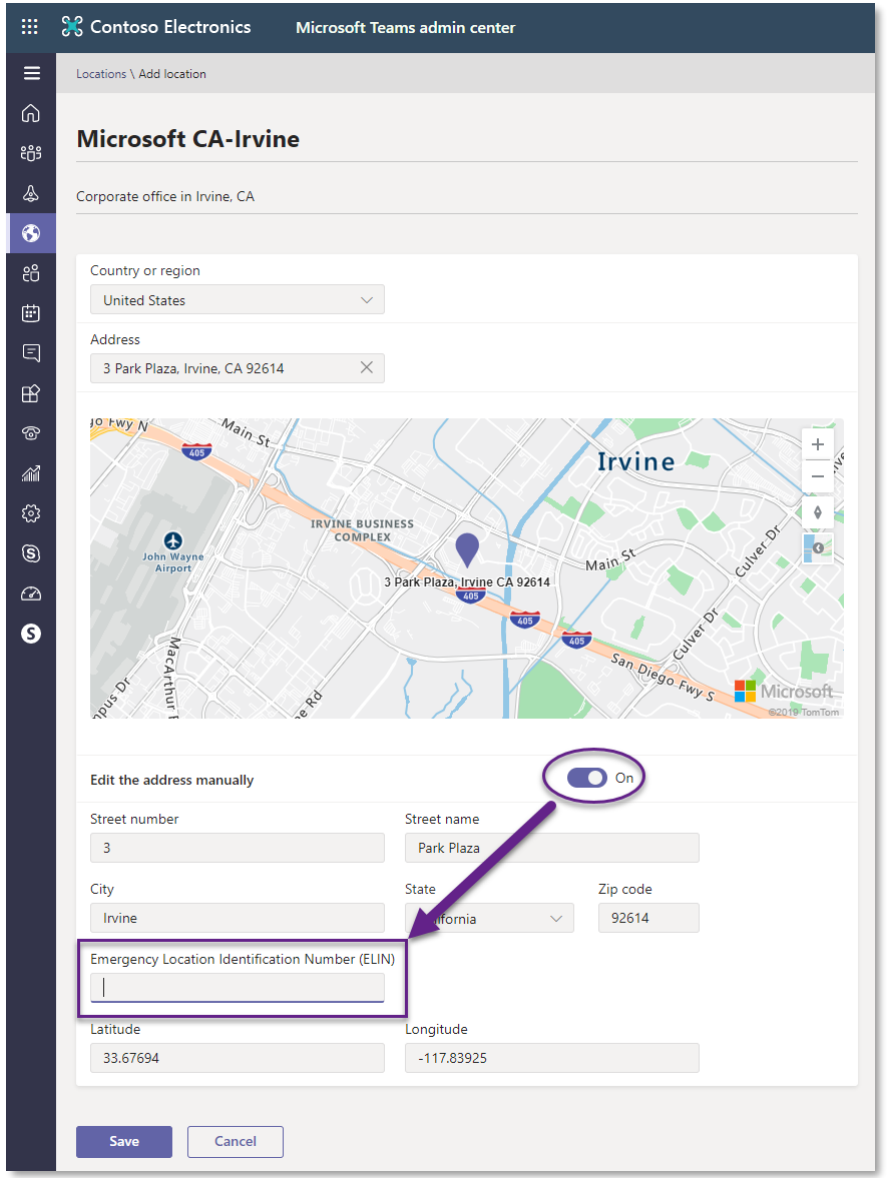
Network Subnets

- Internal IPv4/IPv6 subnets assigned to Network Sites; IPv4 takes precedence
- Multiple subnets may be associated with the same network site, but multiple sites may not be associated with a same subnet

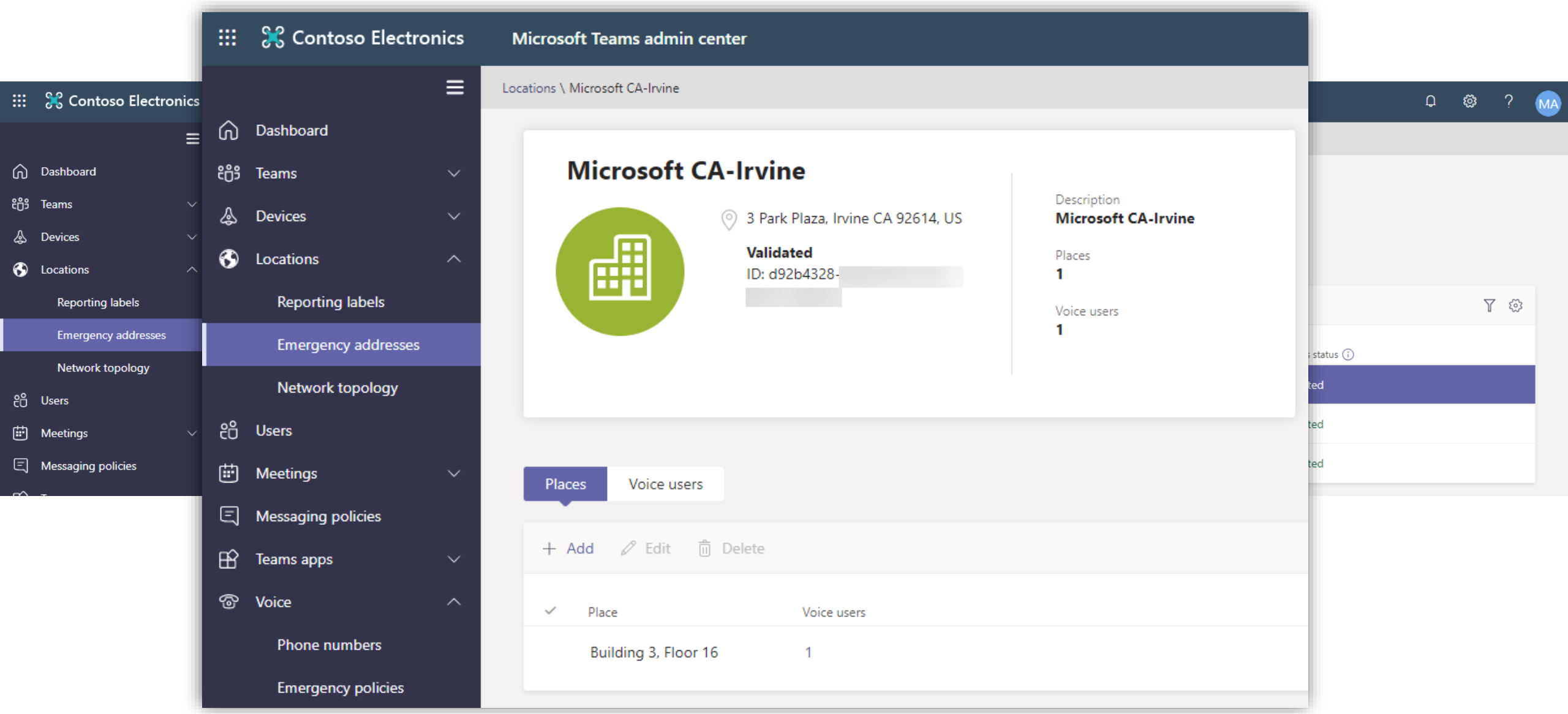
Network Configuration Service (NCS) has a 2-hour cache; newly created Tenant Network configuration items won’t be available for ~2 hours post creation

Defining Locations with Civic Address and Geo Coordinates [Teams Admin Center]



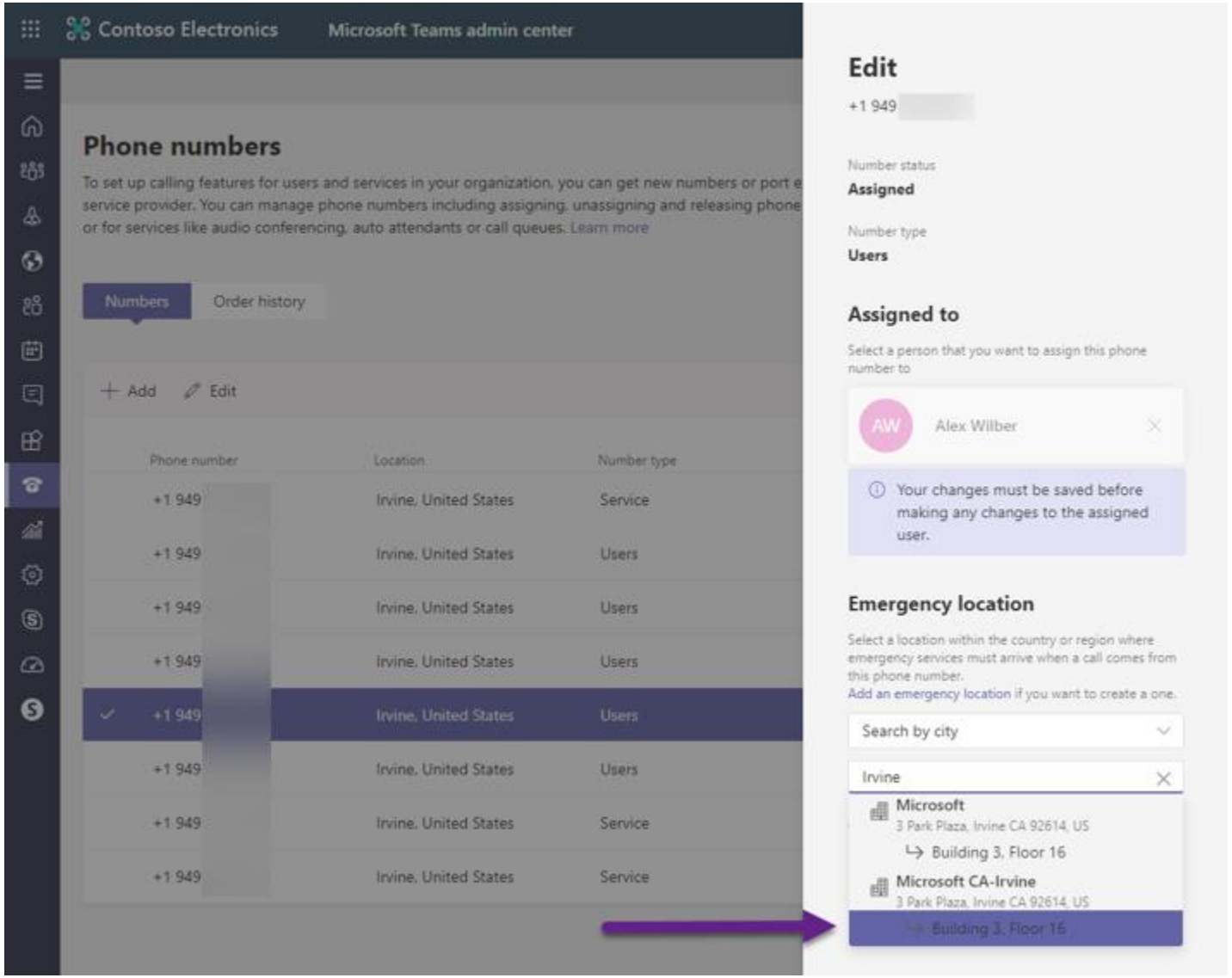


Defining and Associating Places to Locations [Teams admin center]



Direct Routing: Emergency Location Assignment Considerations

- For Direct Routing, to assign a phone number, an emergency location isn't required
- Can assign a new Civic Address/Location; not required; not supported



Defining Dynamically Assigned Locations

```
PS C:\Users\bryan> netsh wlan show interfaces

There is 1 interface on the system:

    Name                   : Wi-Fi
    Description            : Marvell AVASTAR Wireless-AC Network Controller
    GUID                   : 08ee686e-
    Physical address       : b4:ae:
    State                  : connected
    SSID                   :
    BSSID                  : a0:04:
    Network type           : Infrastructure
    Radio type             : 802.11ac
    Authentication         : WPA2-Personal
    Cipher                 : CCMP
    Connection mode        : Auto Connect
    Channel                : 48
    Receive rate (Mbps)    : 468
    Transmit rate (Mbps)   : 468
    Signal                 : 90%
    Profile                :

    Hosted network status  : Not available
```

Use LIS network elements to dynamically assign locations

Subnet

- Configure Network Subnet ID
  - Must match client computed root network ID based on client IP/CIDR
- Set-CsOnlineLisSubnet cmdlet (associate to location with LocationID)
- Must be unique within the tenant

Wireless Access Point (WAP) BSSID

- BSSID is entered in the form of a MAC address (##-##-##-##-##-##, or as ##:##:##:##:##:##) – should match what the client sees when connected
- Verify on PC: netsh wlan show interfaces
- Set-CsOnlineLisWirelessAccessPoint cmdlet (associate to location with LocationID)

Network Switch/Port (Support pending)

- Client/Switches must be configured to support LLDP
- Set-CsOnlineLisSwitch cmdlet -> MAC address used for the Chassis ID (##-##-##-##-##-##)
- Set-CsOnlineLisPort cmdlet -> associate to switch using Switch ID (find with Get-CsOnlineLisSwitch)

Defining Security Desk Notification

Applicable to Calling Plans, Direct Routing and Operator Connect

CsTeamsEmergencyCallingPolicy cmdlets

- **NotificationMode** – this defines how the notification should be done. The values can be:
  - NotificationOnly – this means that a Teams chat is created with all the members of the NotificationGroup and the chat contains the notification of the ongoing emergency call
  - ConferenceMuted – this means that all members of the NotificationGroup are added to the emergency call in a muted state and that they can't unmute themselves
  - ConferenceUnMuted – this means that all members of the NotificationGroup are added to the emergency call in an unmuted state and they can't mute themselves
- **NotificationGroup** – this is a mail-enabled security group or distribution list that will be notified of the emergency call
- **NotificationDialOutNumber** – this is an E.164 formatted phone number that will be notified of the emergency call

Can be assigned to

- Users with *Grant-CsTeamsEmergencyCallingPolicy* (or use the Global)
- Sites with *Set-CsTenantNetworkSite*

Also available through Teams admin center

Defining Emergency Call Routing Policy

Applicable to Direct Routing Only

Tenant Admin **must** configure:

Emergency Number: define the phone number to reach emergency services

- *New-CsTeamsEmergencyNumber* cmdlet, Teams Admin Center
- **EmergencyDialString** – this is the actual number for emergency services. In the US it is 911 in many countries in Europe it is 112
- **EmergencyDialMask** – this is a semicolon separated list of other phone numbers that should be translated into the emergency number specified in EmergencyDialString.
- **OnlinePSTNUsage** – this is the OnlinePSTNUsage that should be used for routing of the emergency call via Direct Routing using OnlineVoiceRoute

Defining Emergency Call Routing Policy

Applicable to Direct Routing Only

Tenant Admin **must** configure:

Emergency Call Routing Policy: ties the defined emergency numbers defined to a PSTN Usage

- *New-CsTeamsEmergencyCallRoutingPolicy* cmdlet, Teams Admin Center
- **EmergencyNumbers** – an array of emergency numbers defined by using New-CsTeamsEmergencyNumber
- **AllowEnhancedEmergencyServices** – this controls whether the feature is enabled and whether a call made to an emergency number is treated as an emergency call
- Assign to users using *Grant-CsTeamsEmergencyCallRoutingPolicy* cmdlet (explicitly) or through network site discovery

PSTN Gateway: enable the defined trunk for Emergency Calling

- *Set-CsOnlinePSTNGateway –Identity sbc1.contoso.com –PidfloSupported $true*

Thank you.