INTERNATIONAL IBERIAN
NANOTECHNOLOGY
LABORATORY

# PSTN em Microsoft Teams

## Reformulação da Infra-estrutura VoIP e integração de SIP Trunk com Microsoft Teams

# A Equipa

**Adelino Correia**

IT Operations Manager

**Marcelo Viegas**

Systems Administrator – Head of IT Infrastructure

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# Agenda

01 Driver do Projeto

02 Arquitetura

03 A escolha do SBC

04 Licenciamento

05 Gestão da Solução

Microsoft Teams

ribbon®

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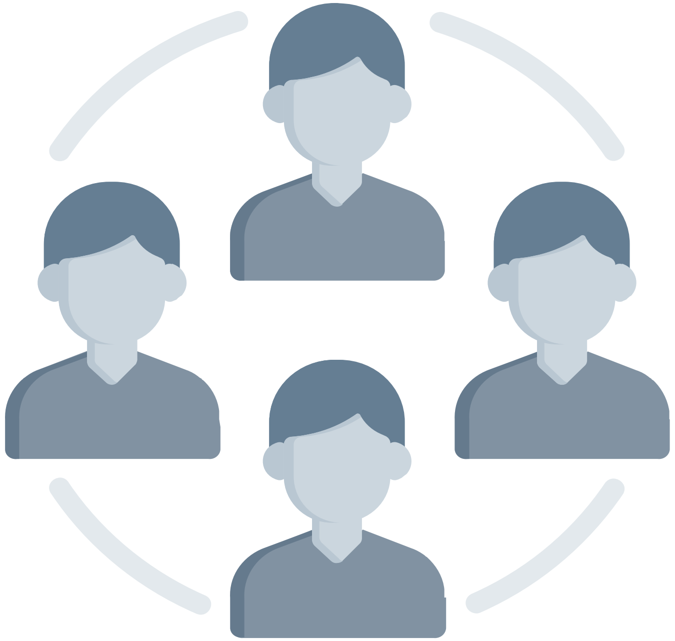
# Driver do projeto



## Integrar PSTN calling em Microsoft Teams

O Teams tornou-se a ferramenta central do trabalho colaborativo, é essencial ter PSTN embebido

## Descontinuar o Lync/Skype4b

O Skype4b Online foi descontinuado e a solução Lync Server 2013 on-prem tem o EOL anunciado para 2023

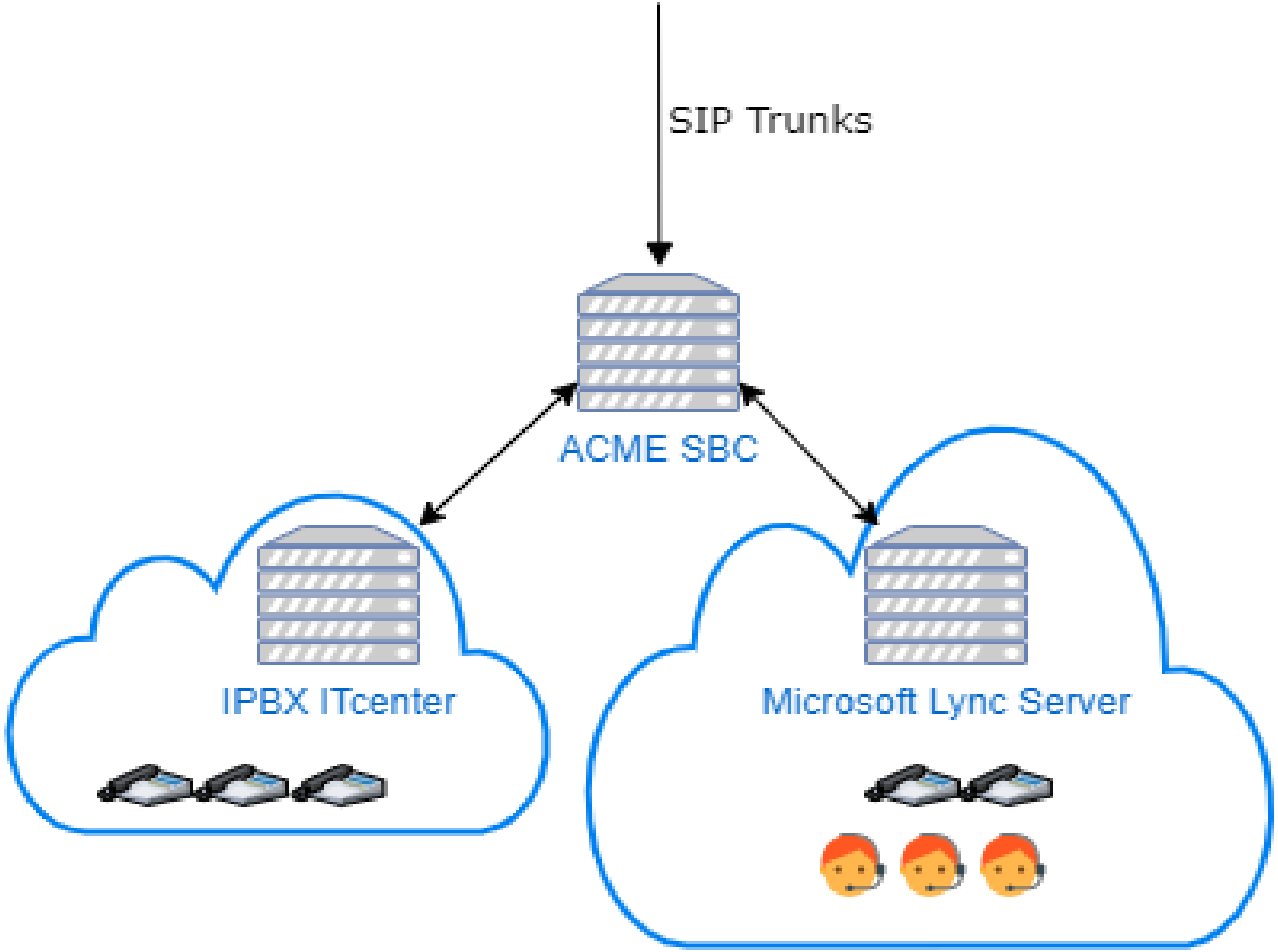
## Permitir chamadas PSTN em mobilidade

Dado o modelo hibrido de trabalho que tínhamos adotado, acelerado depois pela pandemia, é necessário fazer e receber chamadas PSTN em qualquer local e dispositivo

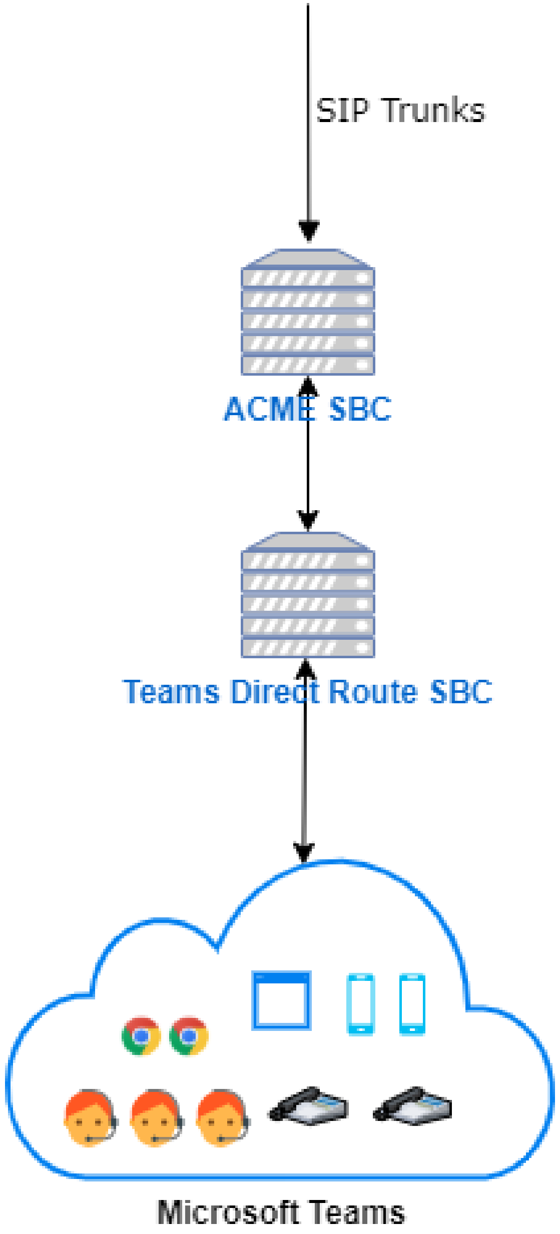
## Descontinuar solução de voz ITCenter

Toda a solução de voz implementada em 2012 tornou-se obsoleta e pouco ágil

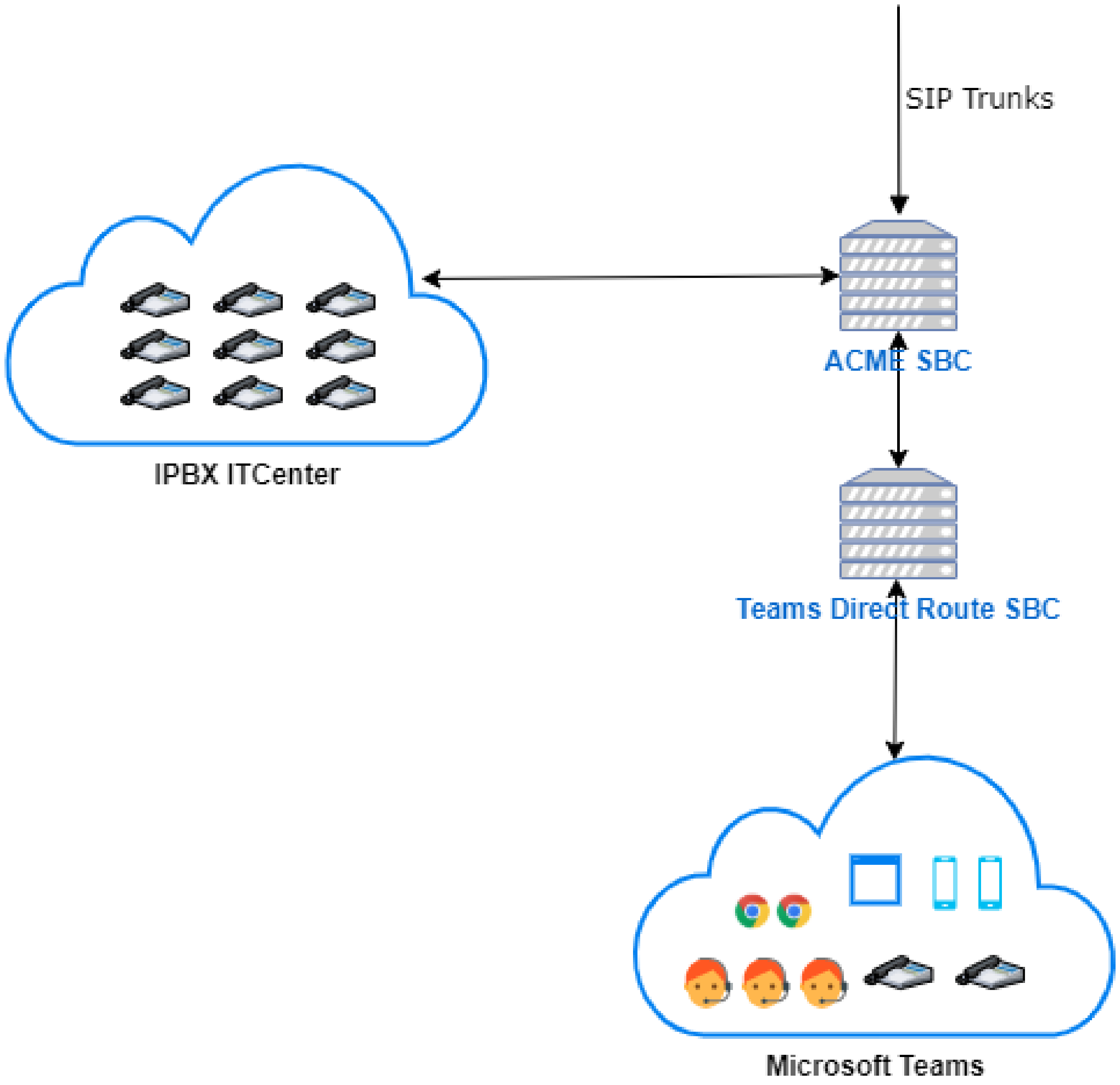
# Arquitetura inicial


SIP Trunks
ACME SBC
IPBX ITcenter
Microsoft Lync Server

# Arquitetura definida


SIP Trunks
ACME SBC
Teams Direct Route SBC
Microsoft Teams

# Arquitetura Atual

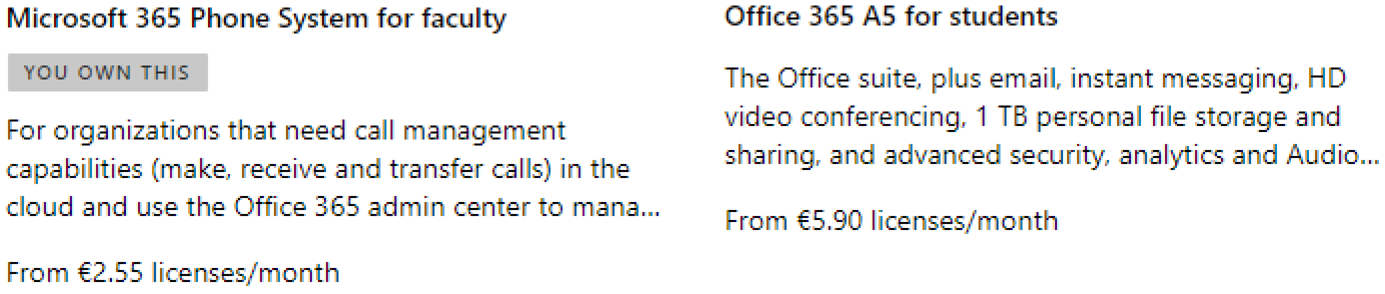

SIP Trunks
ACME SBC
IPBX ITCenter
Teams Direct Route SBC
Microsoft Teams

# Escolha do SBC

- É recomendado um SBC para sessão Direct Routing certificado pela Microsoft
- O ENUM
- Registo de Endpoints. Sim ou não?
- Preço e modelo de licenciamento
  - Sessões concorrentes
  - Conferências de voz
  - Endpoints a registar
  - Físico VS Virtual

# Licenciamento Microsoft

## - A1 / A3 + Microsoft Phone System ou A5



**Microsoft 365 Phone System for faculty**

YOU OWN THIS

For organizations that need call management capabilities (make, receive and transfer calls) in the cloud and use the Office 365 admin center to mana...

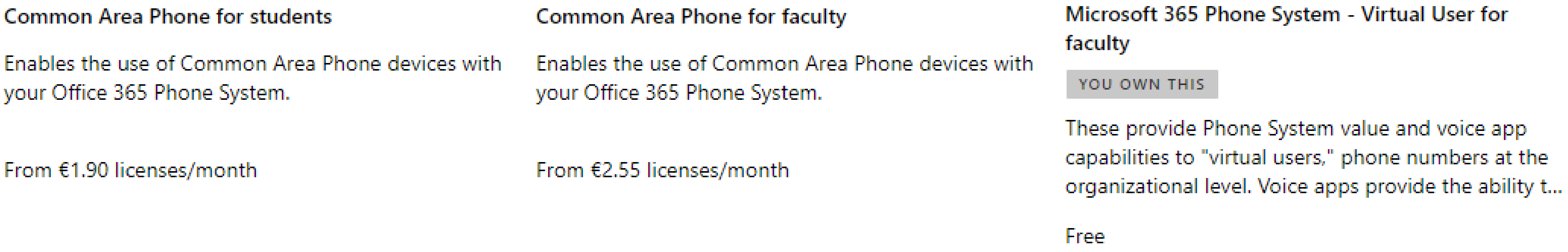
From €2.55 licenses/month

**Office 365 A5 for students**

The Office suite, plus email, instant messaging, HD video conferencing, 1 TB personal file storage and sharing, and advanced security, analytics and Audio...

From €5.90 licenses/month

## - Microsoft Phone System – Virtual User (auto-attendant) / Common Area Phone



**Common Area Phone for students**

Enables the use of Common Area Phone devices with your Office 365 Phone System.

From €1.90 licenses/month

**Common Area Phone for faculty**

Enables the use of Common Area Phone devices with your Office 365 Phone System.

From €2.55 licenses/month

**Microsoft 365 Phone System - Virtual User for faculty**

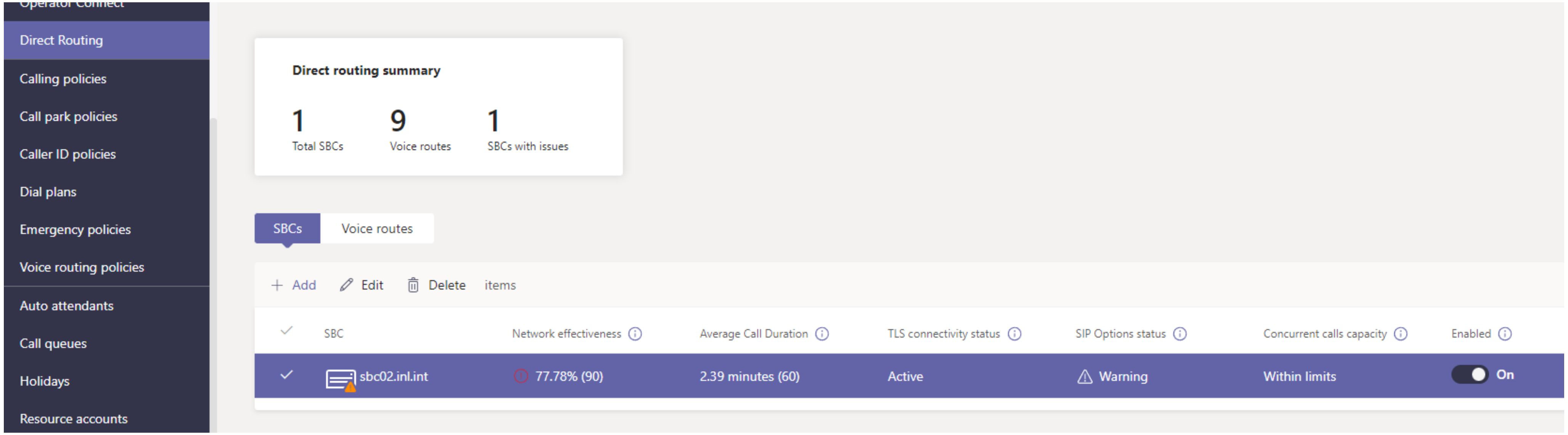
YOU OWN THIS

These provide Phone System value and voice app capabilities to "virtual users," phone numbers at the organizational level. Voice apps provide the ability t...

Free

# Gestão da Solução

## Microsoft Teams Admin Center


Operator Connect
Direct Routing
Calling policies
Call park policies
Caller ID policies
Dial plans
Emergency policies
Voice routing policies
Auto attendants
Call queues
Holidays
Resource accounts
SBCs
Voice routes
+ Add
Edit
Delete
items

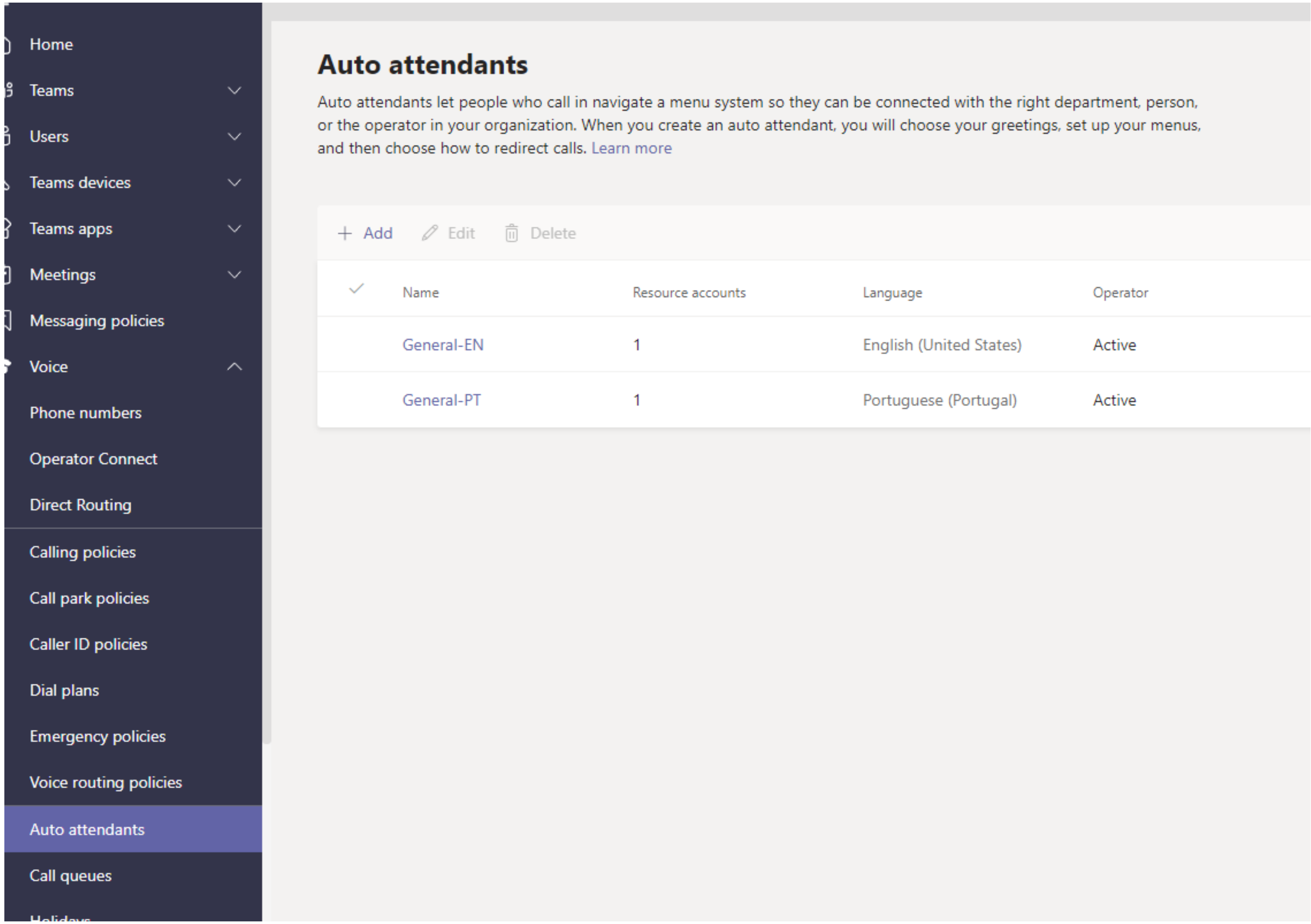
**Direct routing summary**

| 1 | 9 | 1 |
|---|---|---|
| Total SBCs | Voice routes | SBCs with issues |

| ✓ | SBC | Network effectiveness ⓘ | Average Call Duration ⓘ | TLS connectivity status ⓘ | SIP Options status ⓘ | Concurrent calls capacity ⓘ | Enabled ⓘ |
|---|---|---|---|---|---|---|---|
| ✓ | sbc02.inl.int | 77.78% (90) | 2.39 minutes (60) | Active | ⚠ Warning | Within limits | On |

# Gestão da Solução

## Microsoft Teams Admin Center


Home
Teams
Users
Teams devices
Teams apps
Meetings
Messaging policies
Voice
Phone numbers
Operator Connect
Direct Routing
Calling policies
Call park policies
Caller ID policies
Dial plans
Emergency policies
Voice routing policies
Auto attendants
Call queues
+ Add
Edit
Delete

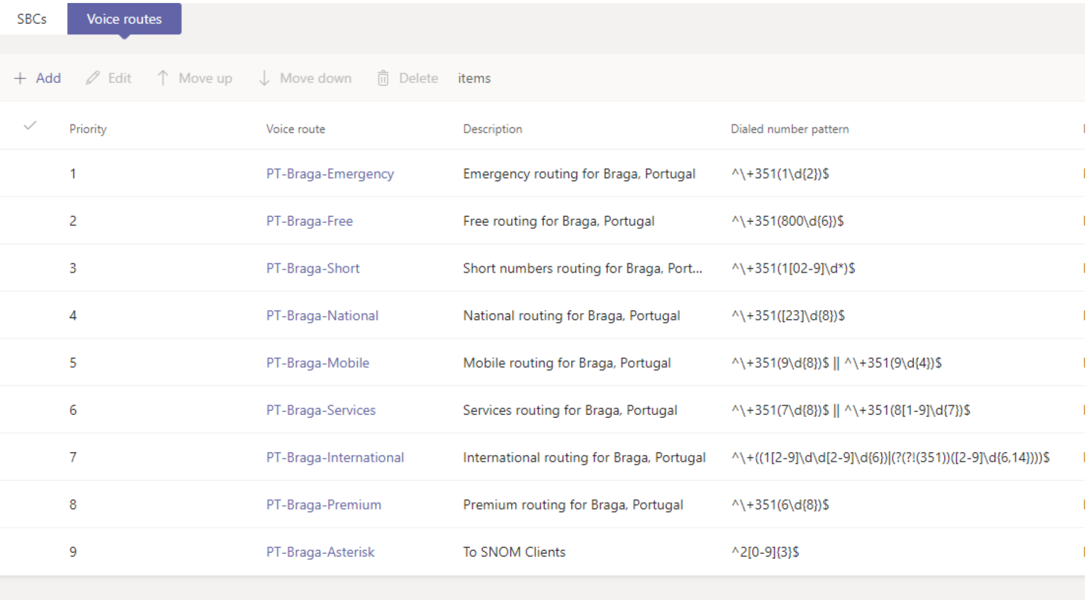
### Auto attendants

Auto attendants let people who call in navigate a menu system so they can be connected with the right department, person, or the operator in your organization. When you create an auto attendant, you will choose your greetings, set up your menus, and then choose how to redirect calls. Learn more

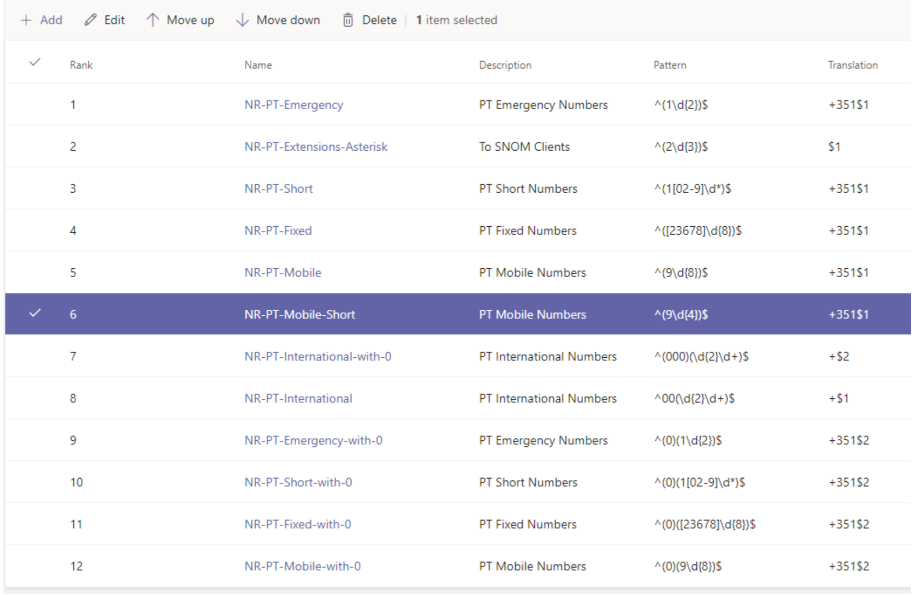
| ✓ | Name | Resource accounts | Language | Operator |
|---|---|---|---|---|
| | General-EN | 1 | English (United States) | Active |
| | General-PT | 1 | Portuguese (Portugal) | Active |

# Gestão da Solução

## Microsoft Teams Admin Center



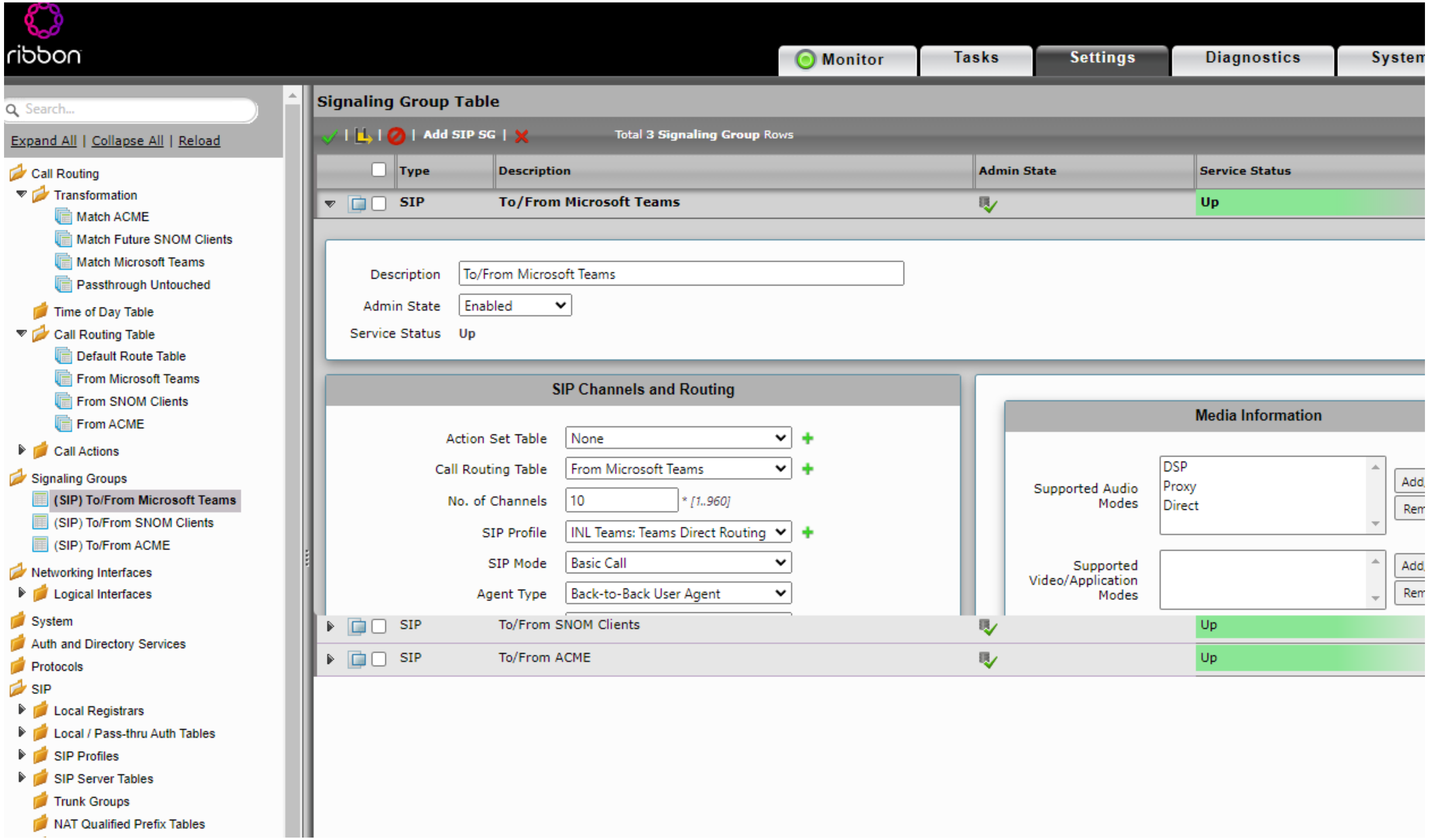
| Priority | Voice route | Description | Dialed number pattern |
|---|---|---|---|
| 1 | PT-Braga-Emergency | Emergency routing for Braga, Portugal | ^\+351(1\d{2})$ |
| 2 | PT-Braga-Free | Free routing for Braga, Portugal | ^\+351(800\d{6})$ |
| 3 | PT-Braga-Short | Short numbers routing for Braga, Port... | ^\+351(1[02-9]\d*)$ |
| 4 | PT-Braga-National | National routing for Braga, Portugal | ^\+351([23]\d{8})$ |
| 5 | PT-Braga-Mobile | Mobile routing for Braga, Portugal | ^\+351(9\d{8})$ \|\| ^\+351(9\d{4})$ |
| 6 | PT-Braga-Services | Services routing for Braga, Portugal | ^\+351(7\d{8})$ \|\| ^\+351(8[1-9]\d{7})$ |
| 7 | PT-Braga-International | International routing for Braga, Portugal | ^\+((1[2-9]\d\d[2-9]\d{6})\|(?(?!(351))([2-9]\d{6,14})))$ |
| 8 | PT-Braga-Premium | Premium routing for Braga, Portugal | ^\+351(6\d{8})$ |
| 9 | PT-Braga-Asterisk | To SNOM Clients | ^2[0-9]{3}$ |



| Rank | Name | Description | Pattern | Translation |
|---|---|---|---|---|
| 1 | NR-PT-Emergency | PT Emergency Numbers | ^(1\d{2})$ | +351$1 |
| 2 | NR-PT-Extensions-Asterisk | To SNOM Clients | ^(2\d{3})$ | $1 |
| 3 | NR-PT-Short | PT Short Numbers | ^(1[02-9]\d*)$ | +351$1 |
| 4 | NR-PT-Fixed | PT Fixed Numbers | ^([23678]\d{8})$ | +351$1 |
| 5 | NR-PT-Mobile | PT Mobile Numbers | ^(9\d{8})$ | +351$1 |
| 6 | NR-PT-Mobile-Short | PT Mobile Numbers | ^(9\d{4})$ | +351$1 |
| 7 | NR-PT-International-with-0 | PT International Numbers | ^(000)(\d{2}\d+)$ | +$2 |
| 8 | NR-PT-International | PT International Numbers | ^00(\d{2}\d+)$ | +$1 |
| 9 | NR-PT-Emergency-with-0 | PT Emergency Numbers | ^(0)(1\d{2})$ | +351$2 |
| 10 | NR-PT-Short-with-0 | PT Short Numbers | ^(0)(1[02-9]\d*)$ | +351$2 |
| 11 | NR-PT-Fixed-with-0 | PT Fixed Numbers | ^(0)([23678]\d{8})$ | +351$2 |
| 12 | NR-PT-Mobile-with-0 | PT Mobile Numbers | ^(0)(9\d{8})$ | +351$2 |

# Gestão da Solução

## Ribbon SBC


ribbon
Monitor
Tasks
Settings
Diagnostics
System
Search...
Expand All | Collapse All | Reload
Call Routing
Transformation
Match ACME
Match Future SNOM Clients
Match Microsoft Teams
Passthrough Untouched
Time of Day Table
Call Routing Table
Default Route Table
From Microsoft Teams
From SNOM Clients
From ACME
Call Actions
Signaling Groups
(SIP) To/From Microsoft Teams
(SIP) To/From SNOM Clients
(SIP) To/From ACME
Networking Interfaces
Logical Interfaces
System
Auth and Directory Services
Protocols
SIP
Local Registrars
Local / Pass-thru Auth Tables
SIP Profiles
SIP Server Tables
Trunk Groups
NAT Qualified Prefix Tables
Add SIP SG
Add
Rem
Add
Rem

**Signaling Group Table**

Total 3 Signaling Group Rows

| ☐ | Type | Description | Admin State | Service Status |
|---|---|---|---|---|
| ☐ | SIP | To/From Microsoft Teams | ✓ | Up |
| ☐ | SIP | To/From SNOM Clients | ✓ | Up |
| ☐ | SIP | To/From ACME | ✓ | Up |

Description: To/From Microsoft Teams
Admin State: Enabled
Service Status: Up

**SIP Channels and Routing**

Action Set Table: None
Call Routing Table: From Microsoft Teams
No. of Channels: 10 * [1..960]
SIP Profile: INL Teams: Teams Direct Routing
SIP Mode: Basic Call
Agent Type: Back-to-Back User Agent

**Media Information**

Supported Audio Modes: DSP<br>Proxy<br>Direct
Supported Video/Application Modes:

# Obrigado!

**Adelino Correia** - adelino.correia@inl.int

**Marcelo Viegas** - marcelo.viegas@inl.int