

Configuring Direct Routing



Rizwan Ullah

Cloud Engineer

@RizwanDarvesh

www.rizinbiz.com

<https://t.me/learningnets>



Overview



Plan and Design Direct Routing Call Flows

- **Different certified SBCs for PSTN Connectivity options**
- **Licensing Required for Direct Routing**
- **Steps Required to deploy Direct Routing**
- **Optimizing media flow**



Microsoft Certified SBCs



Microsoft Certified SBCs

**Ribbon
Communications**

AudioCodes

Oracle

Cisco

Avaya

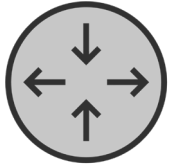
TE-Systems



Teams with SBCs



Microsoft Phone System is hosted in the Cloud (As Cloud PBX)



SBC can be hosted either in Cloud or on premises



Users are working in hybrid model



Service Providers Connect the user to the PSTN World



Licensing Required for Direct Routing



Requirement for Direct Routing

**Microsoft 365
Account**

Active Account

Microsoft Teams

Teams License
Added to tenant

**Microsoft
Phone System**

Add-on License



Licensing for Direct Routing

E1 or E3

You Need Both
Teams and Phone
System add-on

E5

Phone System add-on
is included but not
Teams

Teams Included

Business Basics
Business Standard
Business Premium etc.



Steps For Direct Routing



Step Required for Direct Routing

**On-Premise Or
Cloud Based SBC**

**Endpoint
Licensing**

Certified SBC

**FQDNs and
Certificates**

**IP Ranges
and Firewall**

Voice Routing



Optional Step

7. Optimize Media



Step 1. On-Premises Vs. Cloud Based SBC

On-Premises

Full control over SBC

Connectivity to existing PBX

Customer responsible for SBC Configuration

Need to purchase, maintain, and host

Public IP

Cloud-Based

No need to purchase, maintain and host

Less control over SBC

Support model more complex

SBC As A Service



Step 2: Licensing Required

E1 or E3

You Need Both
Teams and Phone
System add-on

E5

Phone System add-on
is included but not
Teams

Teams Included

Business Basics
Business Standard
Business Premium etc.



Step 2: Endpoint Support

Any Teams Client

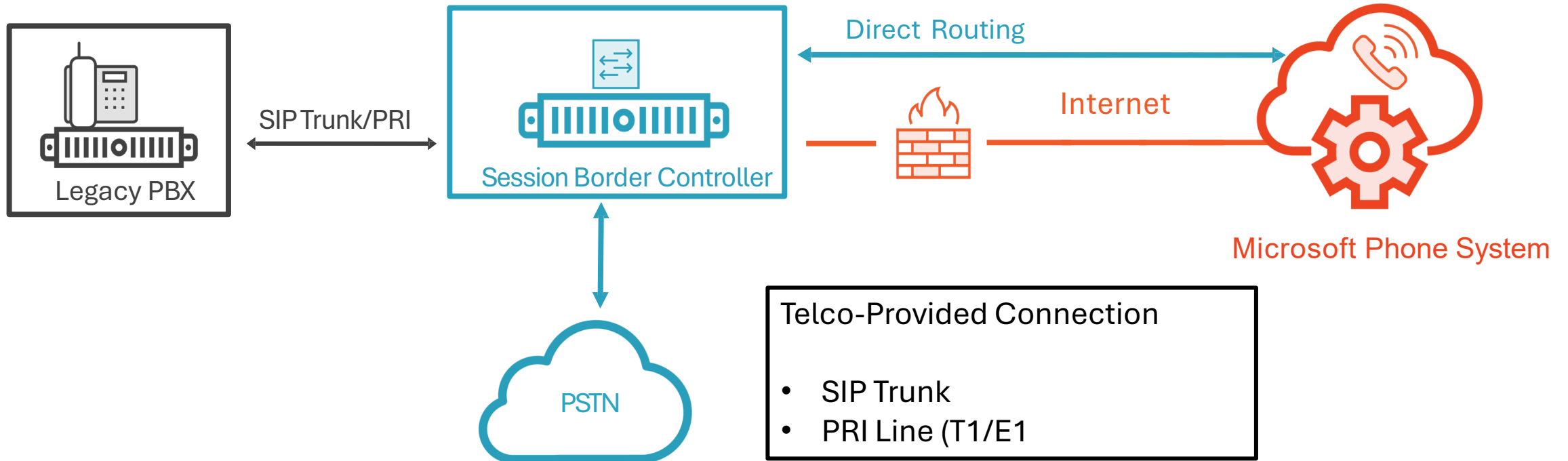
Installed Anywhere

Common Area Phones

Set up as Devices



Step 3: Session Border Controller



✓ Transcodes and Supports Voice and Video Calls



Step 2: Licensing Required

Connectivity

Allows teams to
Interconnect with
other Voice
Components

Security

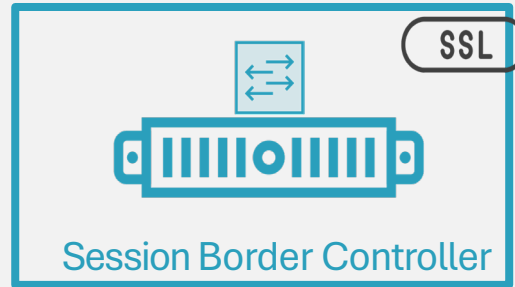
Acts as a Firewall for
Session Initiation
Protocol (SIP) Traffic

Media Services

Transcodes and
Supports Voice and
Video Calls



Step 4: Fully Qualified Domain Names (FQDNs) and Certificates



IP: 22.33.44.55

DNS Name: sbc.rizinbiz.net

DNS name registered in Office 365 tenant

Can be used for SBC FQDN

Examples of FQDNs

rizinbiz.onmicrosoft.com



Using *.onmicrosoft.com domains is not supported for SBC names

contoso.com



Valid names:

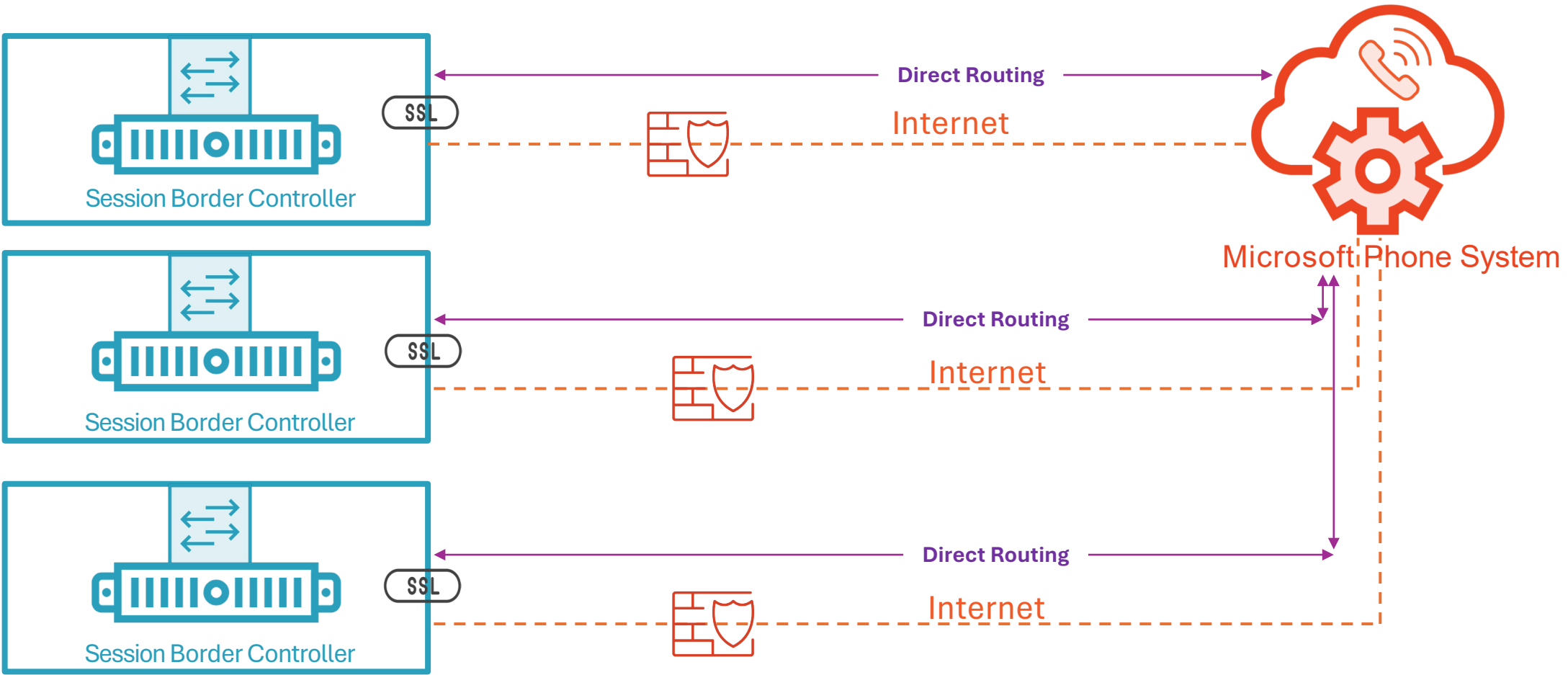
- sbc1.contoso.com;
- ussbcs15.contoso.com;
- europe.contoso.com

Non-valid name:

- sbc1.europe.contoso.com (requires registering domain name europe.contoso.com in “Domains” first)



Certificates



Step 4: IP Ranges and Firewall

**IP Ranges and
Firewall**



Step 5: IP Ranges and Firewall

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

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

Recommend at least two ports per concurrent call on the SBC.

FQDNs and IP ranges

FQDN Connection Points (in order):

sip.pstnhub.microsoft.com – Global FQDN [**must be tried first**]
sip2.pstnhub.microsoft.com – Secondary FQDN
sip3.pstnhub.microsoft.com – Tertiary FQDN

IP Address Connection Points:

The above FQDNs resolve to one of the following IPs:

SIP Proxy

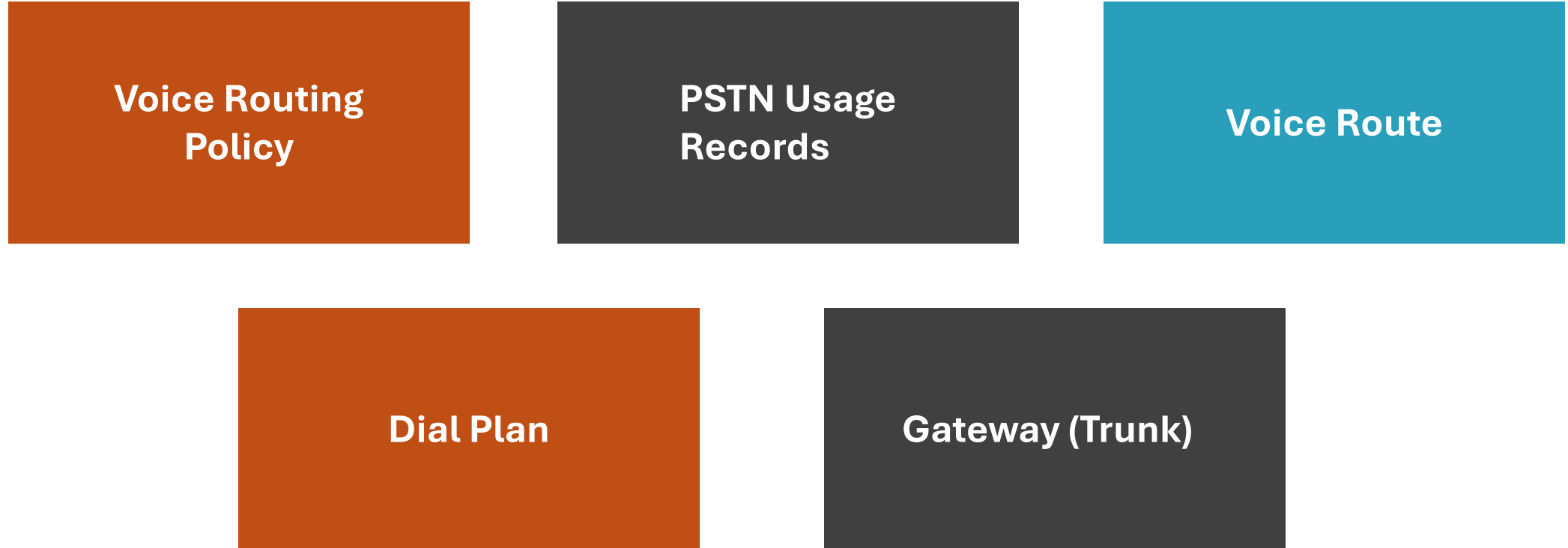
52.114.148.0
52.114.132.46
52.114.75.24
52.114.76.76
52.114.7.24
52.114.14.70

sip-all.pstnhub.microsoft.com also resolves to all above IPs

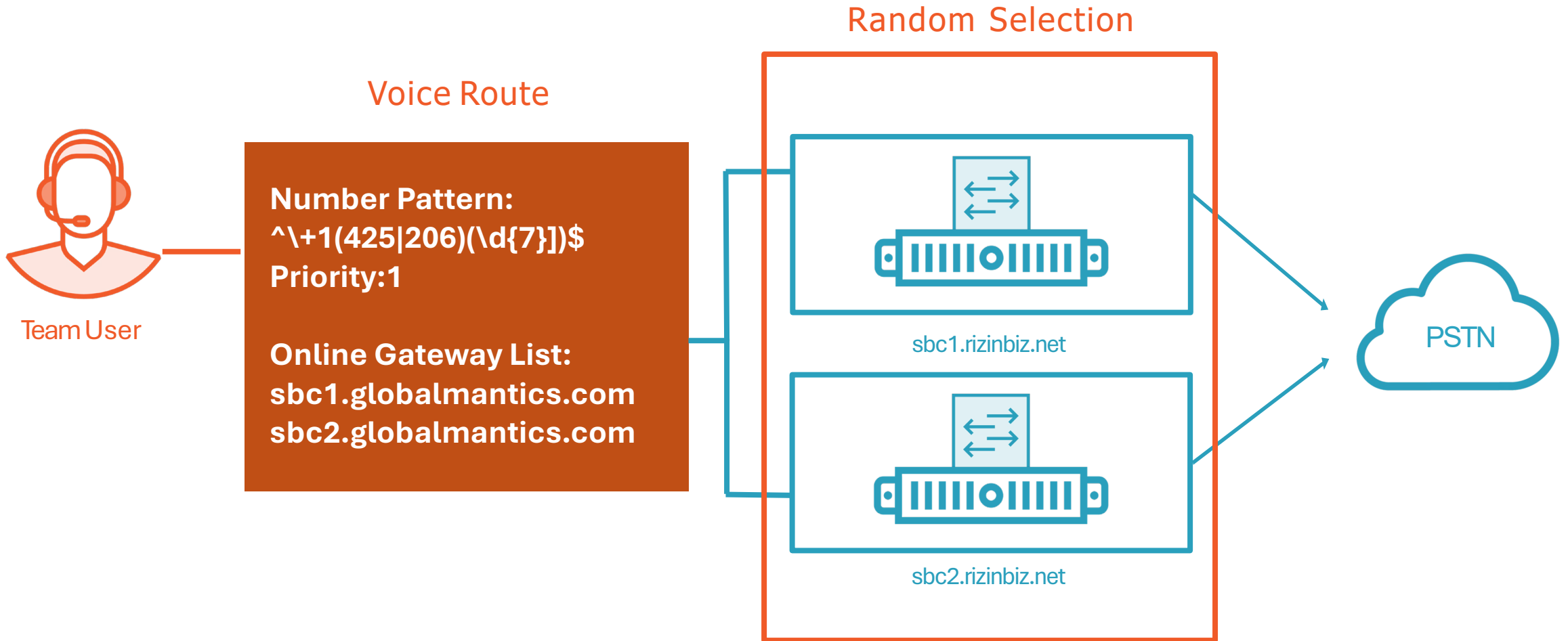
Media Processors	52.112.0.0/14
	52.120.0.0/14



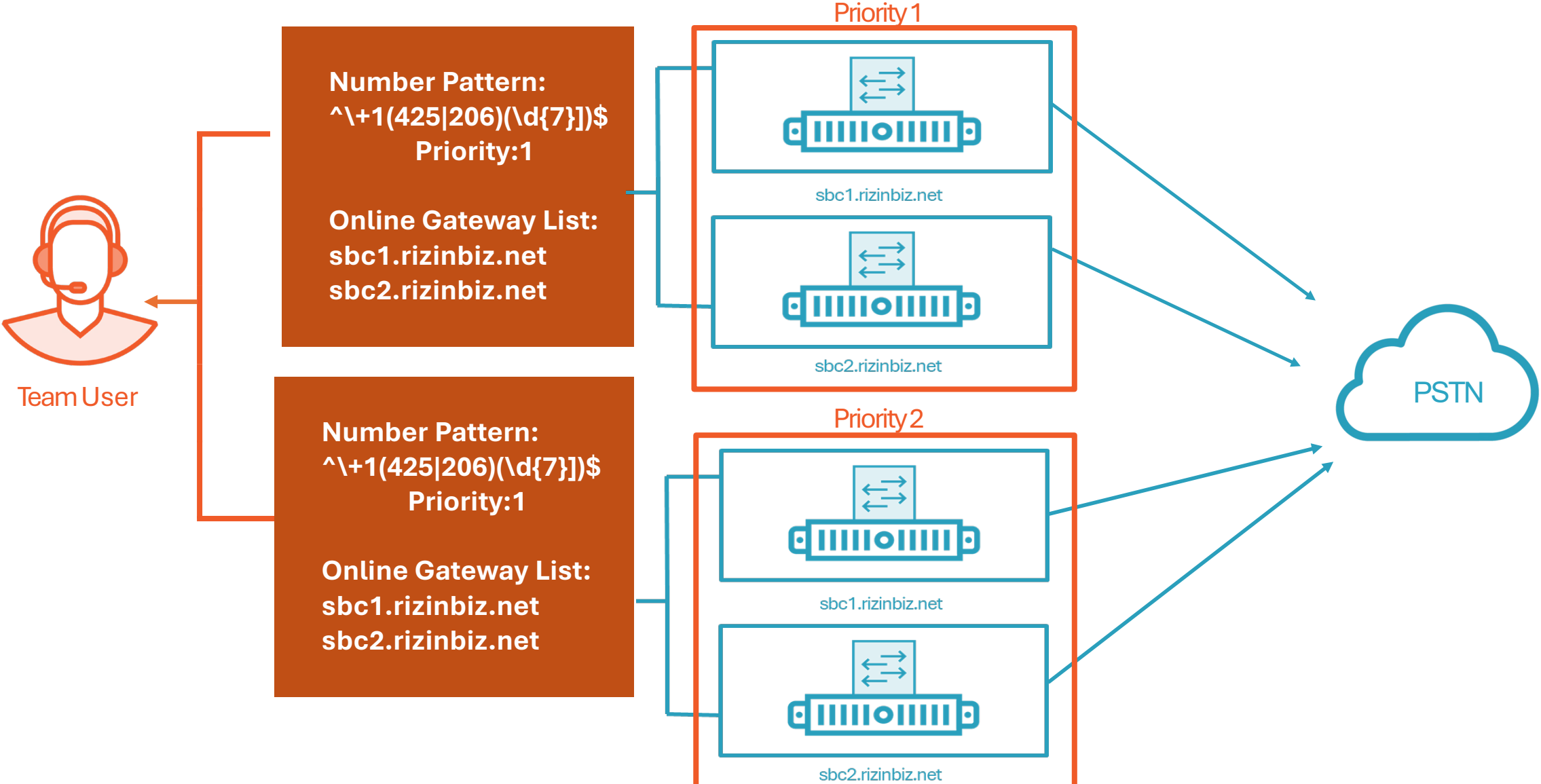
Step 6. Voice Routing



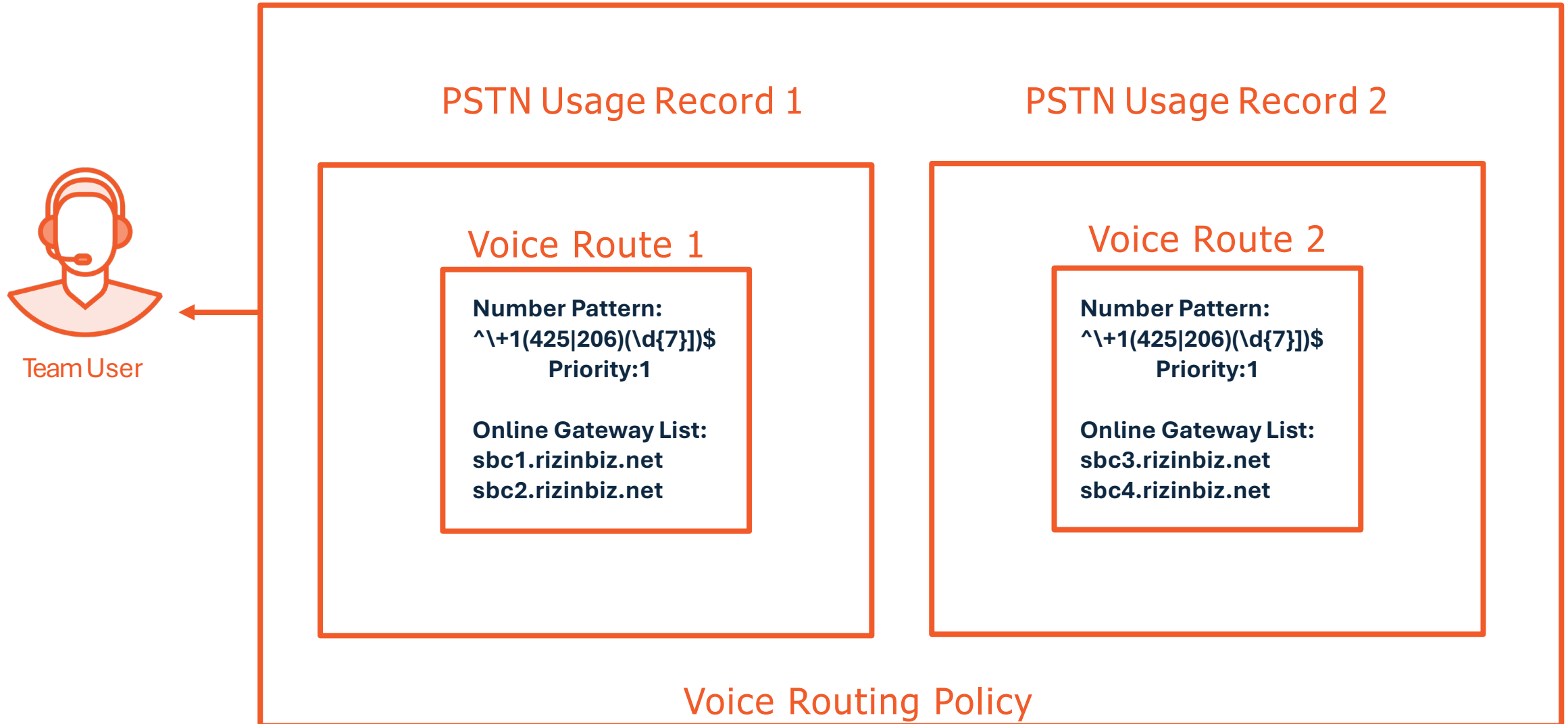
Voice Routing



Voice Routing



Voice Routing



Optimize Media

Media Bypass

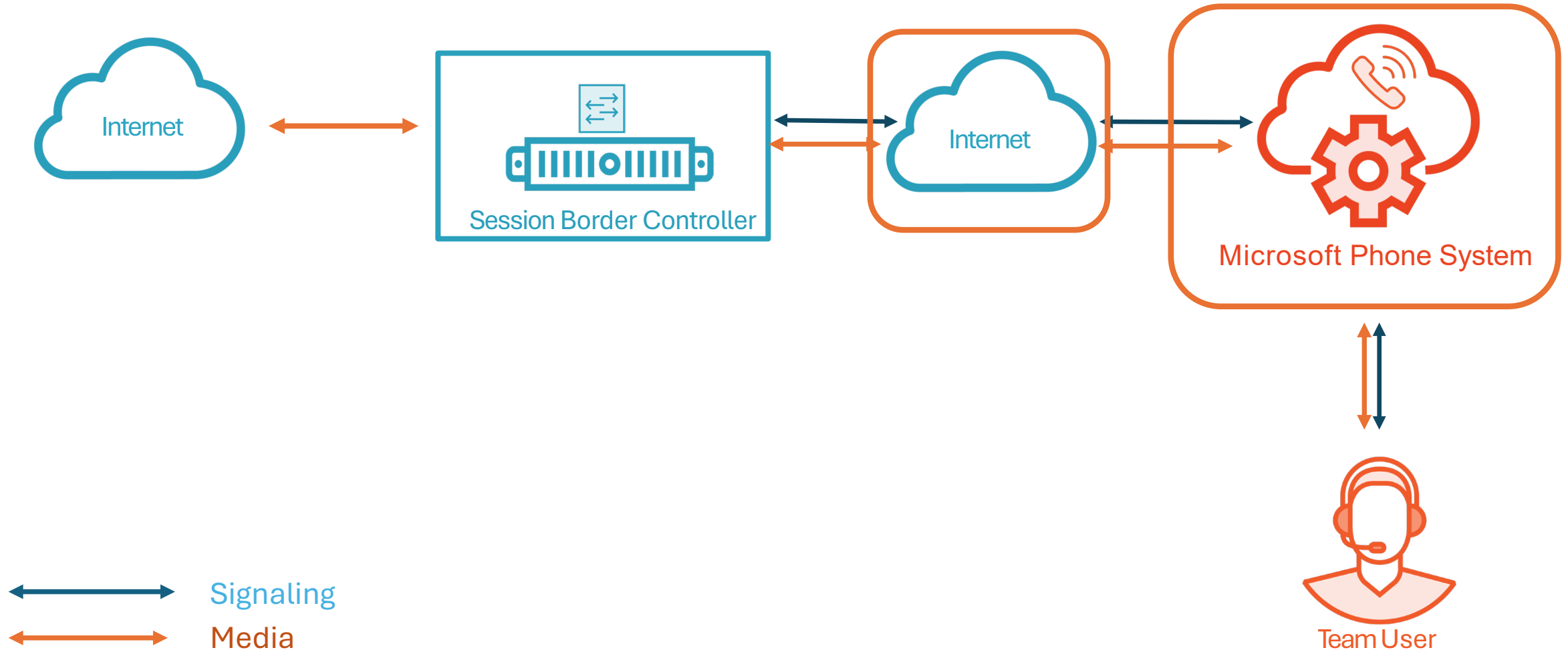
Direct Media through SBC

Local Media Optimization

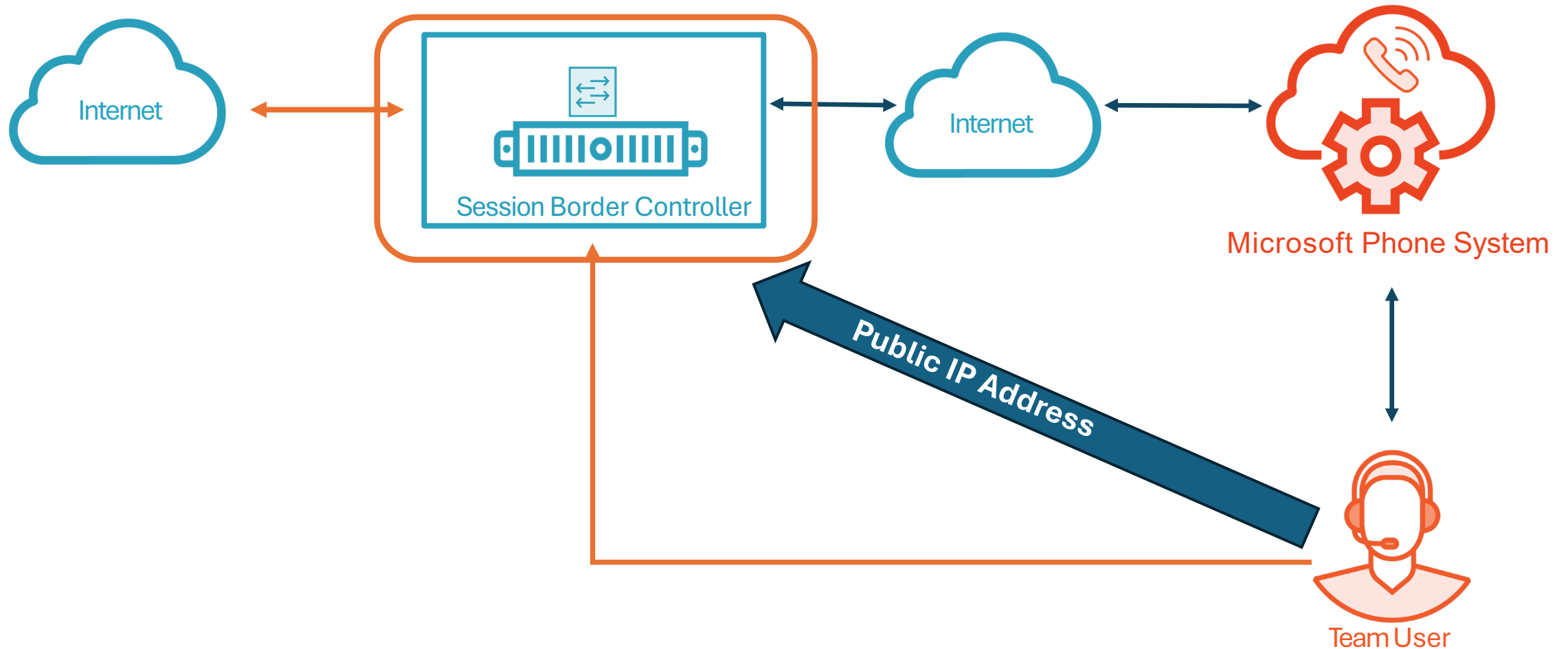
Advanced Media Optimization



Media Optimization: Normal Media



Media Optimization: Media Bypass



Demo



Configure Direct Routing

- **Connect SBC**
- **Configure PSTN Usage and Voice Routing**
- **Create Voice Routing Policy**
- **Validate SBC Connectivity**



Summary



Direct Routing Configuration

- Certified SBCs and Deployment Models
- 6 Steps planning for Direct Routing
- IP Addresses, Firewall and Certificates
- Voice Routing and Media Optimization
- SBC Connection to Teams Admin Center
- Call Routing
 - PSTN Usages
 - Voice Routing Policy

