DINSTAR

Dinstar SBC for Microsoft Teams Direct Routing

Speaker: James. Zhu

Email： jameszhu@dinstar.net

Agenda

01

About Teams

02

Solutions

03

Benefits of Dinstar's SBC in Direct Routing

04

Why Choose Dinstar

05

Connection of SBC and Teams, Issues

DINSTAR | IP Communication Solutions

Complete IP Unified Communication products line, including VoIP Gateways, SBCs, IP PBXs, IP Phones, and SIP Intercoms.

No.1	20+	100+	10,000,000+
Market Share of VoIP Gateways & SBCs in China	Years Experience	R&D Experts	Lines
100+	1,000+	120,000+	200+
Countries	Channel Partners	Customers	Intellectual Properties

Products

For Service Provider

SBC

SBC3000

SBC8000

Digital Gateways

MTG3000

MTG5000

Analog Gateways

DAG2500

DAG3000

For Enterprise

Add-on Software

Recording

Attendant

PMSI

Billing

DTR NAT

IPPBX

UC120/UC200

UC350

UC350 Pro

UC8000

SBC & Gateway

FXS Gateway

FXO Gateway

Media Gateway

SBC

Endpoints

IP Phone

Video Phone

SIP Intercom

DinLink

NMS

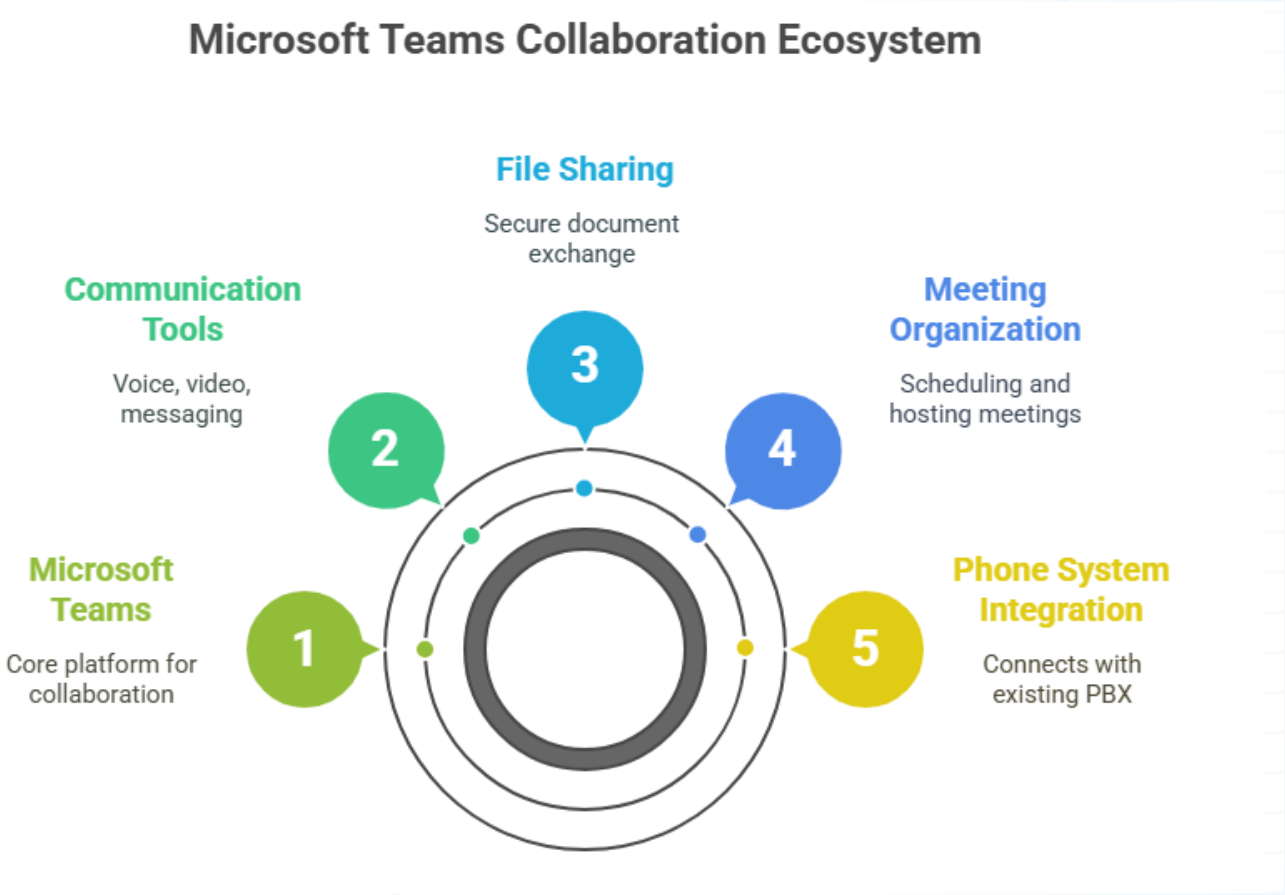
Session Border Controller

	SMB SBC	Enterprise SBC	Carrier SBC	Software-based SBC
				
	SBC300	SBC1000	SBC3000	SBC8000
SIP Sessions	5 to 50	50 to 500	500 to 5000	50,000
Transcoding Calls	50	200	1500	5000
Calls Per Second	25/s	25/s	200/s	800/s
SIP Registrations	1,000	5,000	20,000	100,000
SIP Registrations Per second	20/s	25/s	200/s	800/s

01 About Teams and Market Share

Introduction of Microsoft Teams

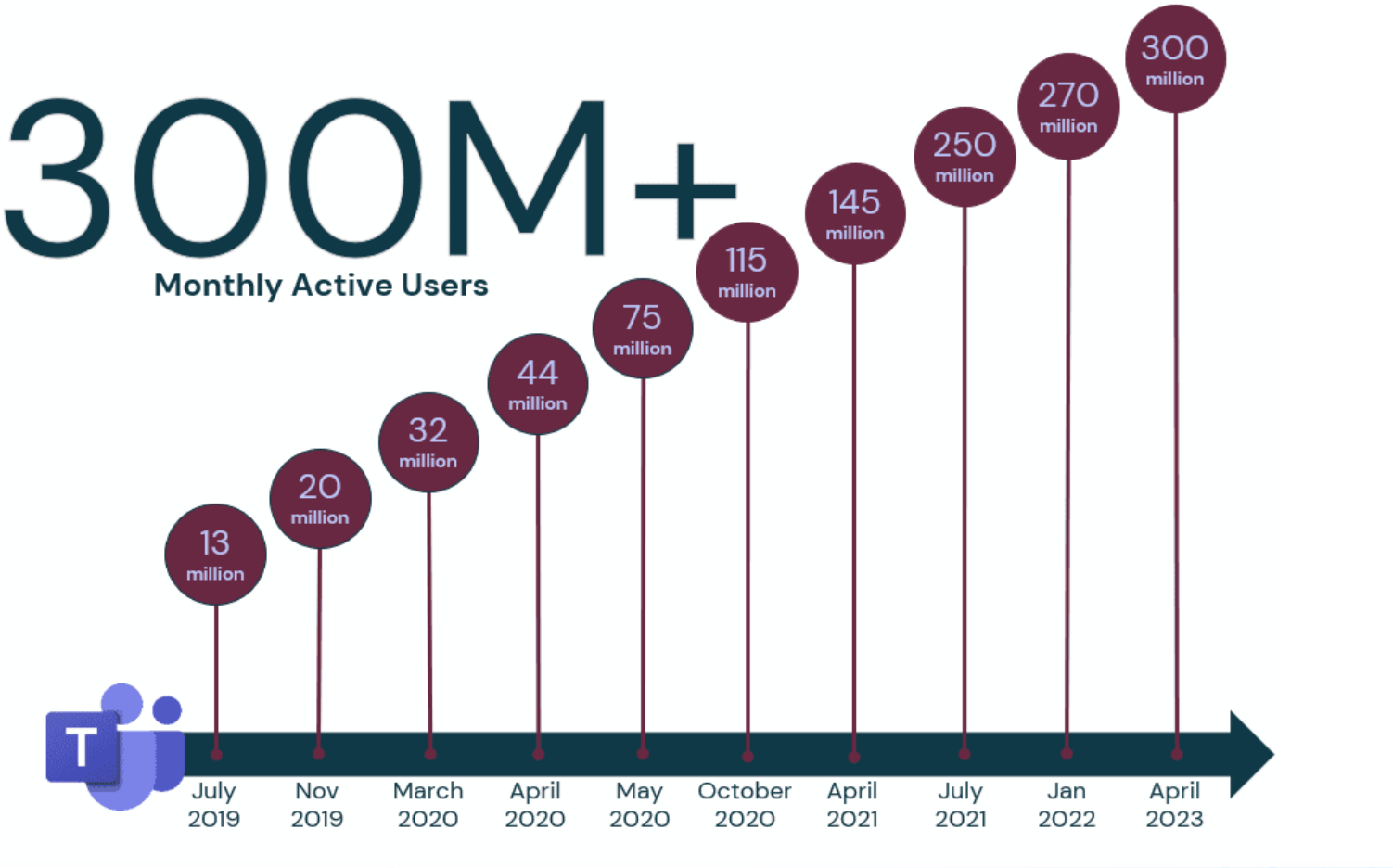
Microsoft Teams is an enterprise office collaboration platform developed by Microsoft, integrating voice calls, video calls, instant messaging, file sharing, online meetings, and more. It serves various scenarios, such as internal team collaboration, engagement with external users, project group participation, online meeting organization, and remote work. The Teams phone system offers the flexibility to replace or connect with the existing enterprise PBX system, establishing seamless communication and interconnection with the PSTN network.



Market Share for Teams

By 2023, Microsoft reported that Teams had 300 million monthly active users.

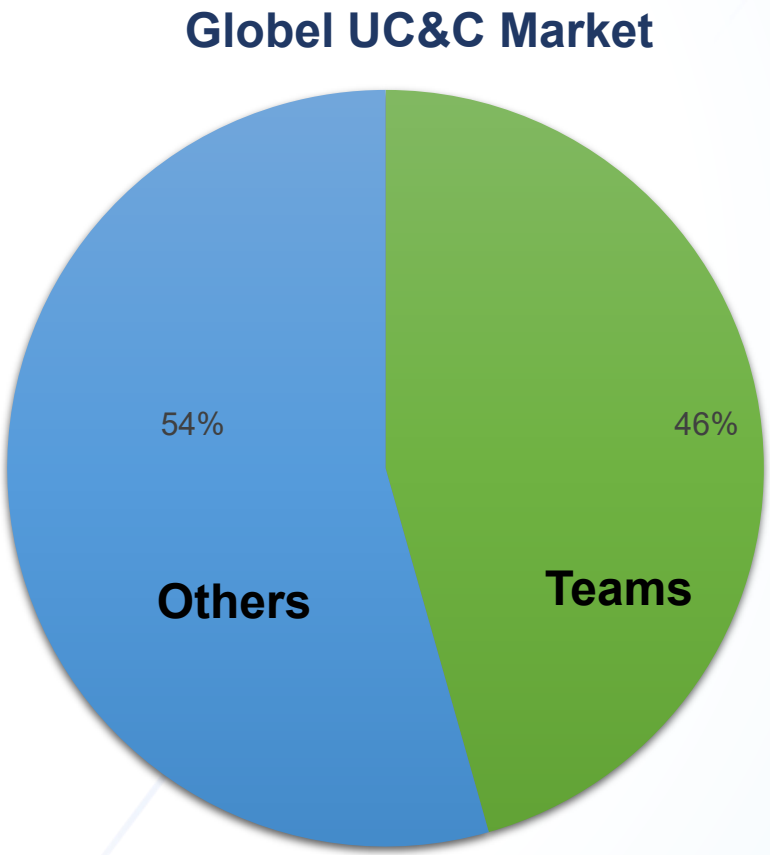
This time round, they increased the number by 20 million to 320 million within **5 years**.



Source: https://office365itpros.com/2023/10/26/teams-number-of-users-320-million/

Microsoft's UC&C revenues rose 14% YoY to $31.5 billion in 2024

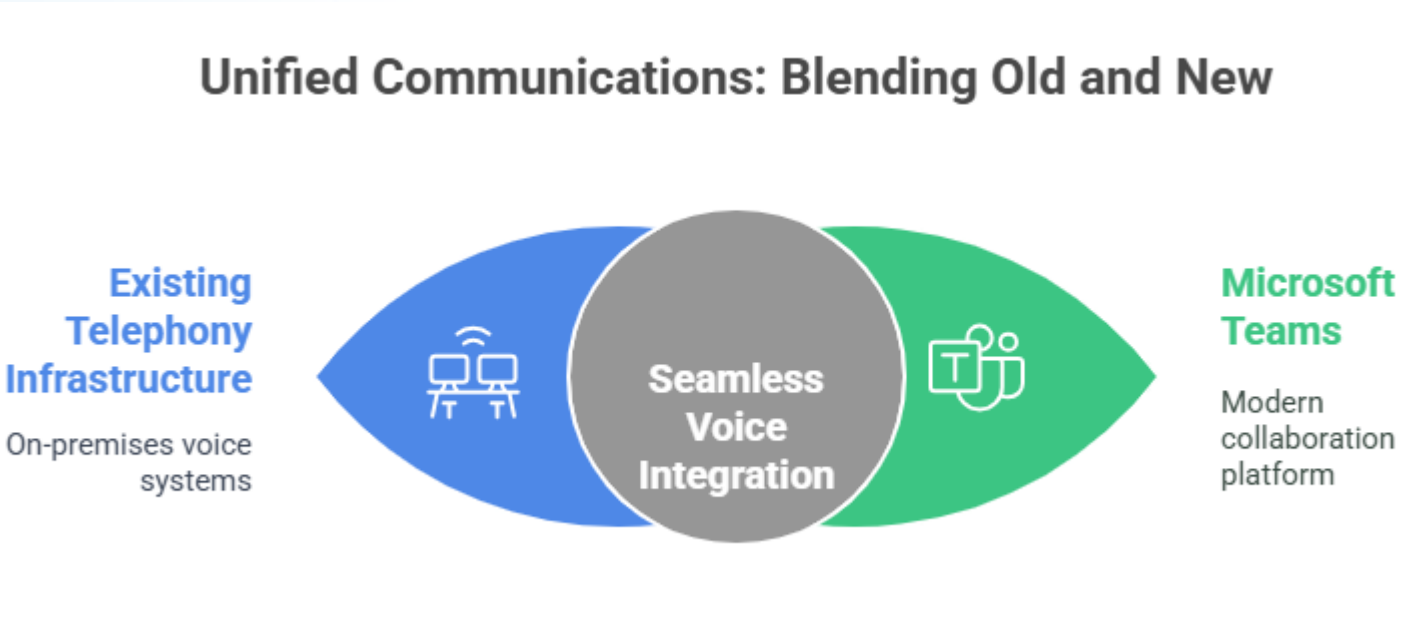
Accounting for a 45.6% share of the worldwide UC&C market

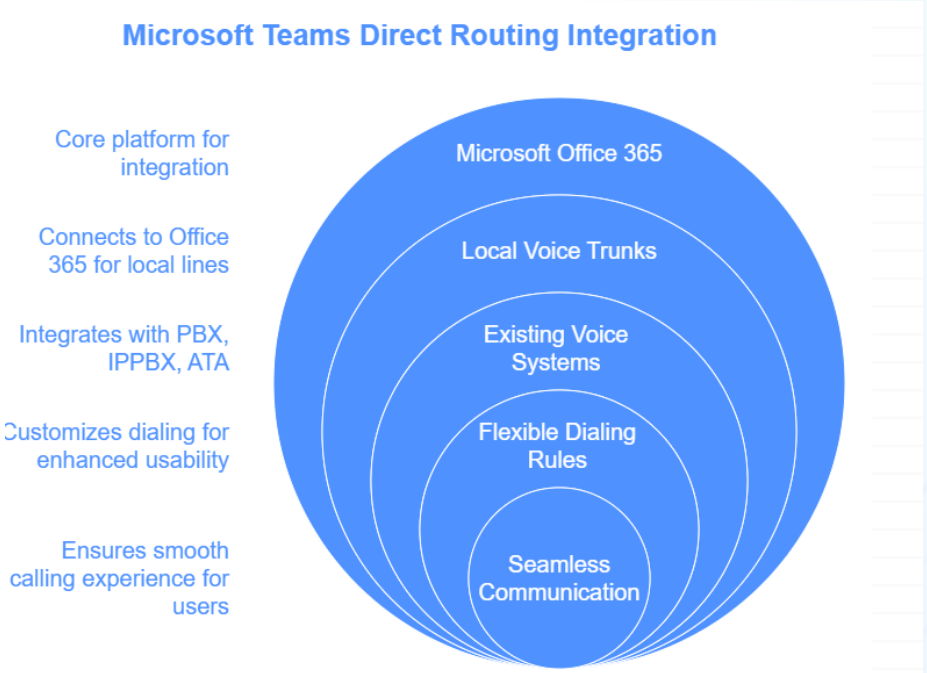


Source: https://my.idc.com/getdoc.jsp?containerId=prUS53355725

What is Microsoft Teams Direct Routing?

Microsoft Teams Direct Routing enables customers to connect local voice trunks directly to the Microsoft Office 365 system, facilitating the implementation of local lines. This allows customers with Microsoft Teams users to continue using their existing voice switching systems, such as PBX, IPPBX, and analog telephone adapter (ATA) , protecting their investments. When the Microsoft Office 365 system is linked to the user's local voice trunk, it offers flexible dialing rules to enhance the calling experience for Microsoft Teams users, ensuring a seamless integration of communication systems.



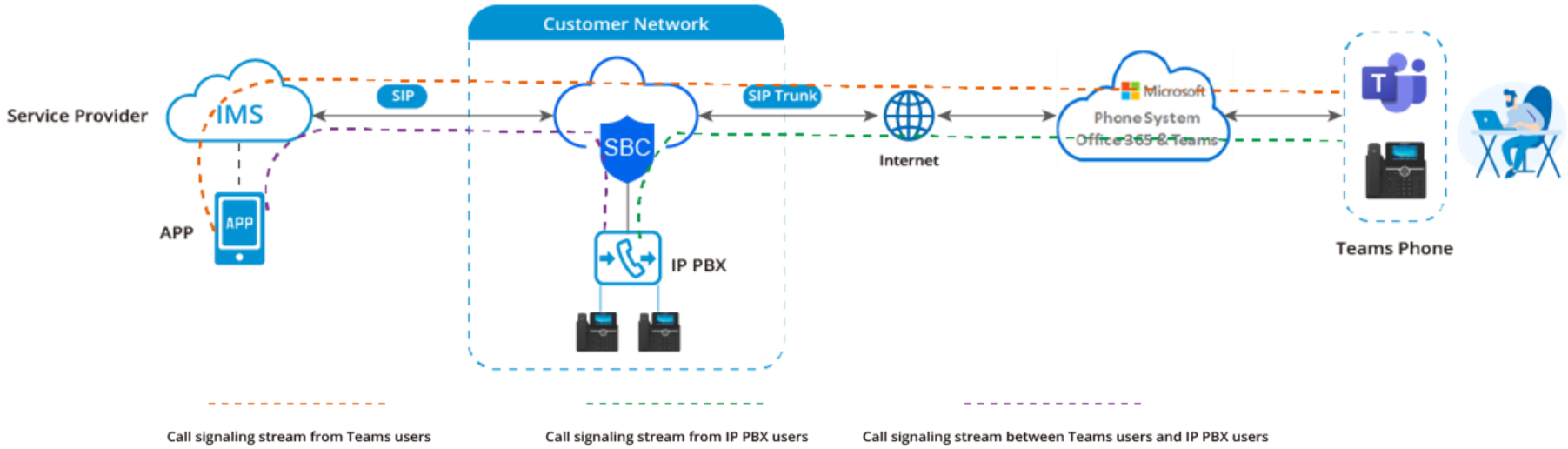


02

SBC Direct Routing Solutions for Microsoft Teams

Teams/Local IP PBX/IMS/SIP

Topology



Background

Enterprises seek to establish interconnectivity between the existing IP PBX communication system and Microsoft Teams, to build an enterprise voice communication system, enabling unified communications while protecting their initial investments on IP PBX system.

Solution

To achieve this, Dinstar SBC is deployed within the enterprise. The SBC establishes connections to the local operator's IMS line and bridges Microsoft Teams with the original IP PBX system.

The enterprise's original SIP trunk line connects to Dinstar SBC for voice implementation.
SBC establishes connections to Microsoft Teams via the Internet and the enterprise's local IP PBX system through the intranet.
Dialing rules are configured on the Teams platform, allowing users to make direct domestic calls to colleagues or customers, optimizing call costs.
Extension users from the enterprise's original IP PBX can initiate outbound calls through SBC.
Teams' users are seamlessly interconnected with the local IP PBX system. Incoming customer calls first enter the local communication system, then reach the employees' Teams accounts. This integration enables employees to answer customer calls through Teams, fostering free calls between IP PBX and Teams users.

Teams/Local IP PBX/T1/E1

Background

The enterprise currently operates a traditional PBX phone system, facilitating outbound calls through E1 trunk lines. In pursuit of a voice system transformation and a phased migration to Teams, the goal is to preserve the existing PBX and operator lines. The objective is to achieve seamless telephone interoperability between Teams users and the enterprise's existing PBX, leveraging the existing line resources of the enterprise.

Solution

Use the trunk/media gateway to connect both the local PBX and the operator's E1 trunk line, preserving existing operator lines and analog users.

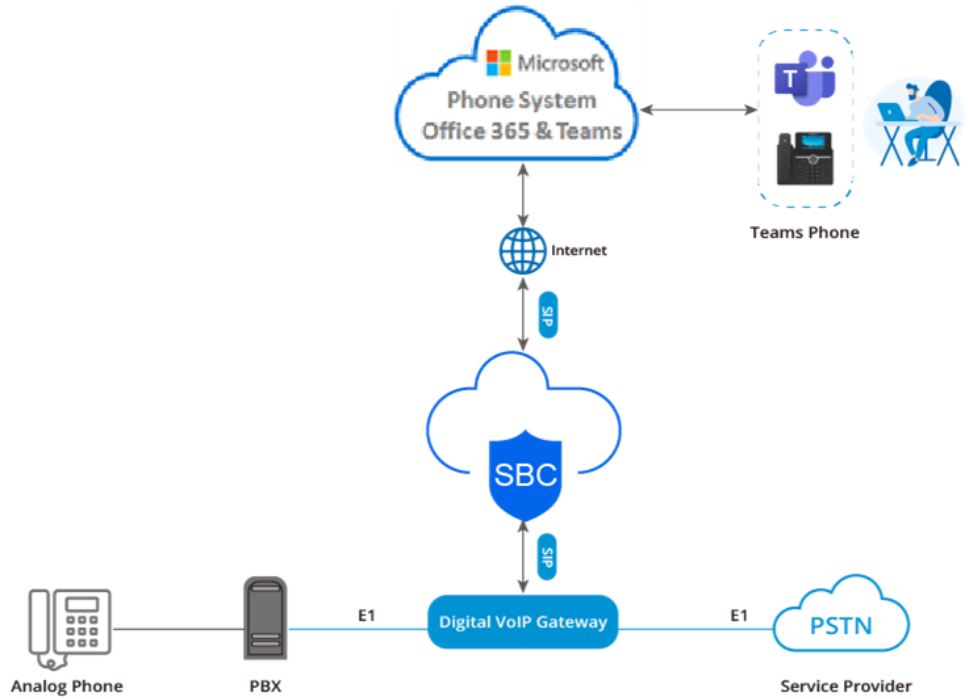
The trunk/media gateway connects to Dinstar SBC, and then SBC connects to Microsoft Teams, facilitating the interconnection between Teams and the enterprise’s local traditional PBX.

Teams Outbound Calls: Calls initiated on Teams are routed through Dinstar SBC and then transferred to the local E1 line for outgoing calls.

Calls Between PBX Extensions and Teams Users: PBX transfers the call to the trunk/media gateway via the E1 line. The trunk/media gateway then forwards the call to SBC, and SBC routes it to Teams, enabling seamless communication between analog extensions and Teams users.

The incoming and outgoing calling methods of the PBX system remain unchanged, the dialing habits of existing PBX users in the enterprise will not be altered.

Topology



SBC High Reliability

Solution

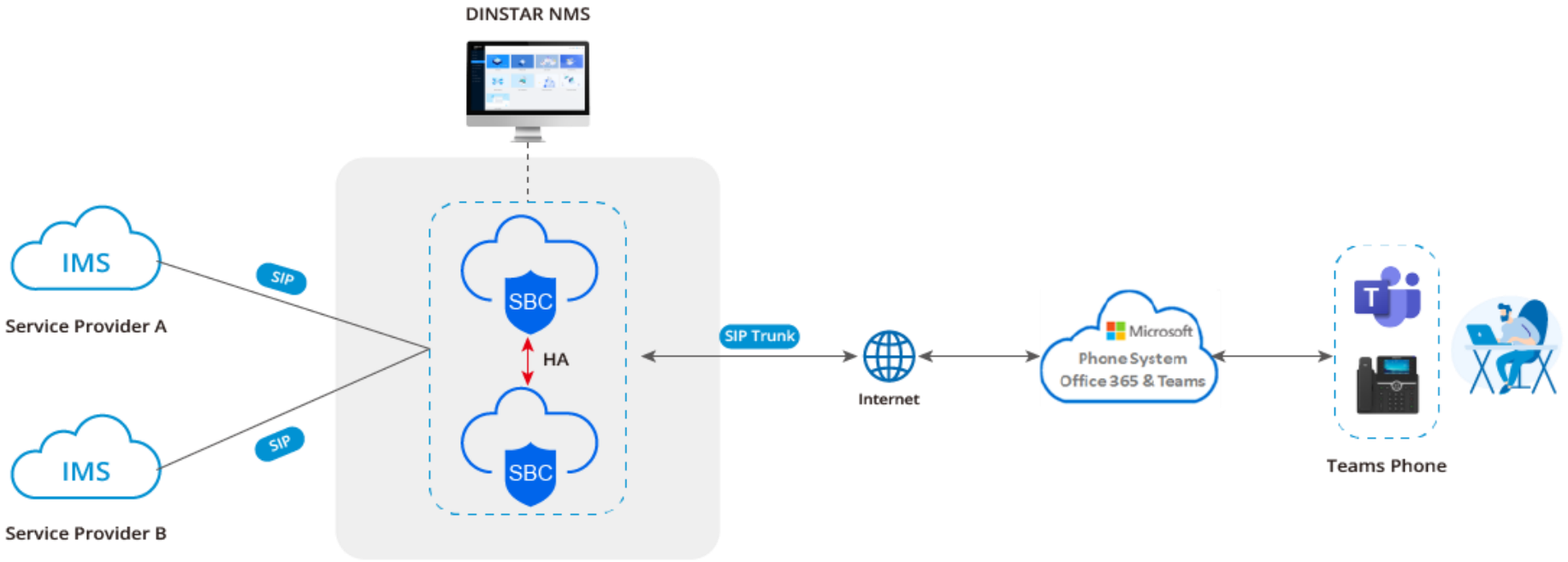
Dinstar SBC supports 1+1 redundancy, seamlessly and automatically switch to the backup device when the main SBC is faulty. This automatic switch ensures uninterrupted service during the transition between active and standby, maintaining business continuity.

SBC offers multiple network port access, enabling simultaneous connection to SIP trunks from different operators for line redundancy.

It provides a range of flexible routing strategies to achieve redundancy in call services.

The Device management system NMS platform centralizes the management and maintenance of SBCs, offering real-time monitoring of equipment operating status.

Topology



03

Benefits of Dinstar's SBC in Direct Routing

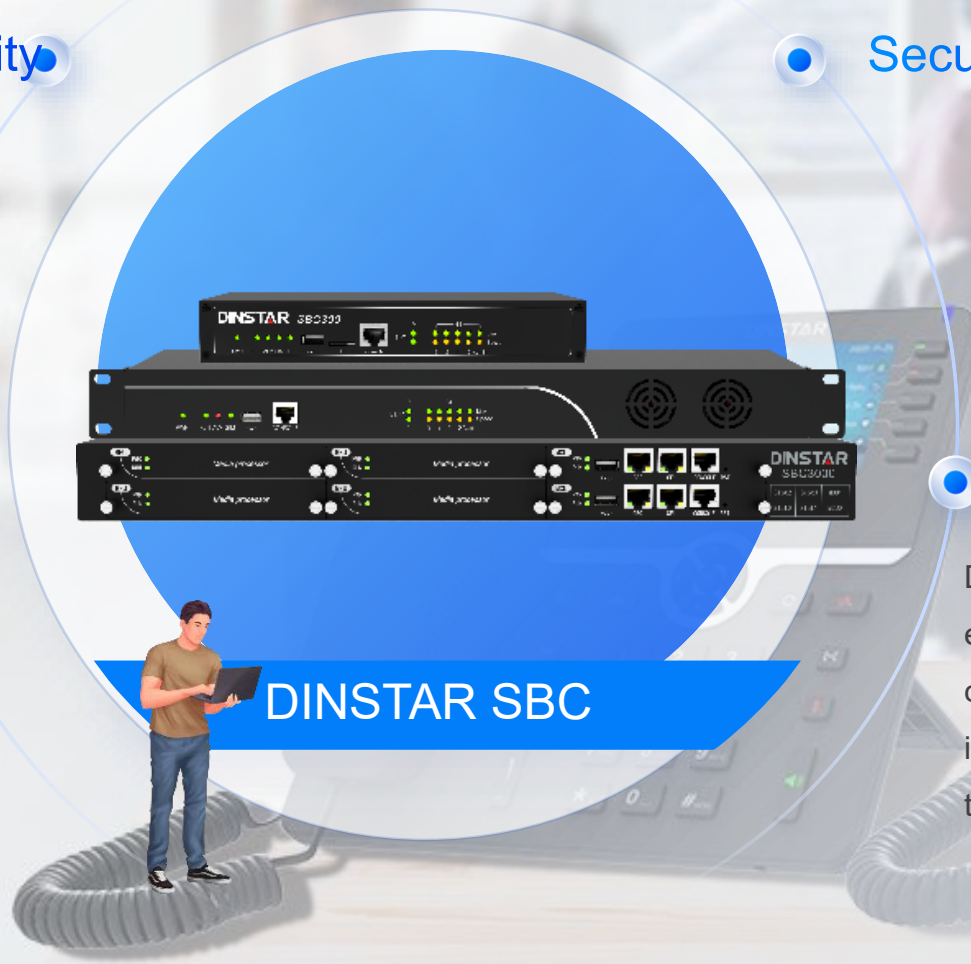
Benefits of Dinstar's SBC supporting Direct Routing

Compatibility and Interoperability

Different SIP Servers and SIP trunks may exhibit compatibility variations. Dinstar SBC facilitates the interconnection and interoperability of diverse platforms, ensuring seamless communication.

Smooth Migration

Enterprises often opt for gradual migration to Teams while still utilizing traditional PBX and IP PBX systems during the transition. Dinstar SBC enables a seamless connection between Teams users and the old PBX during this transitional period.



Security

SBC enhances security by providing voice firewalls and encrypting signaling and media. This safeguards voice communications, protecting against potential Internet-based malicious attacks.

Flexibility and Fault Tolerance

Dinstar SBC offers a range of redundancy. This ensures that your system can maintain normal connections even in the event of unforeseen incidents, providing flexibility, failover and fault tolerance.

04

Why Choose Dinstar

Six Reasons why Choose Dinstar SBC?

Competitive Price

With our competitive pricing, customers can enjoy great value for their money without compromising on quality.

Flexible Deployment

Providing both hardware and software SBC options, supporting on-premise/virtual machine/cloud deployment to cater to diverse deployment needs.

Simplicity of License

No additional license on any features, no additional cost.

Reliable Design

Up to 99.999% reliability, Dinstar SBC offers various disaster recovery solutions.

High Availability

Software-based Transcoding

New Features of Dinstar SBC

Video Call Encryption

SIPREC Recording Interface

Network Bonding Redundancy

HA Dual Heartbeat Management

Local Ringback Tone/Ringback Tone Pass-Through/ Ringback Tone Adaptive Mode

05

Connection of SBC and Teams, issues

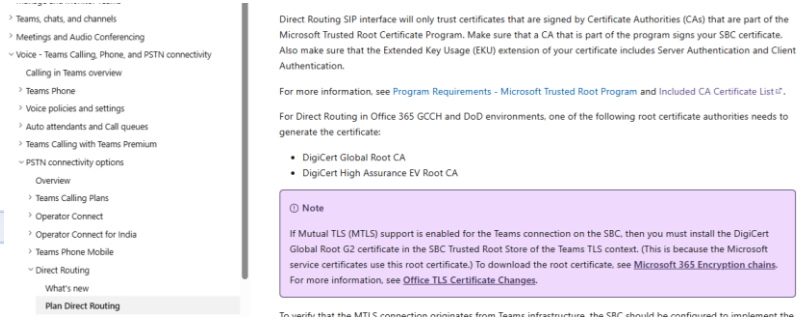
Prerequisites for the implementation of SBC & Teams

SBC Domain Name

The SBC domain name must be from one of the names registered in the Domains of the tenant.
Like sip.dinstar.com

TLS Certificate (**Public certificate issued by one of the supported CAs, refer to the source link**)

We need Public trusted certificate for the SBC. The certificate needs to have the SBC FQDN as the common name (CN) or the subject alternative name (SAN) field.
For Direct Routing in Office 365 GCCH and DoD environments, one of the following root certificate authorities needs to generate the certificate:
DigiCert Global Root CA
DigiCert High Assurance EV Root CA



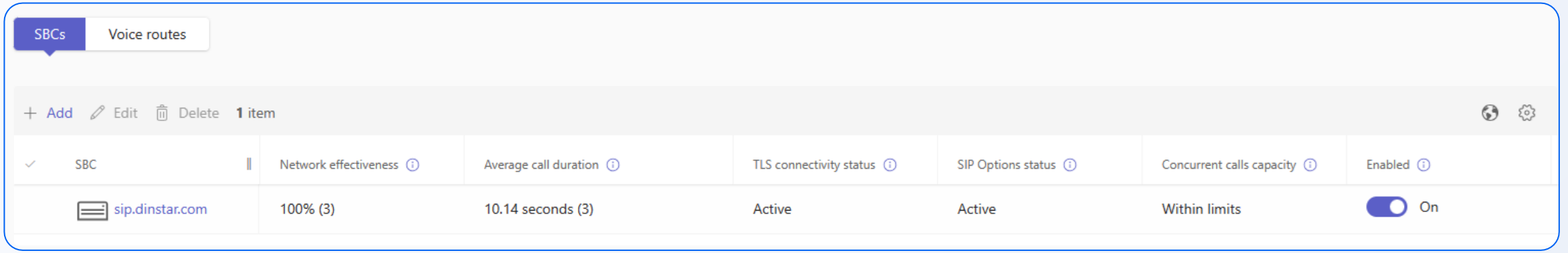
Microsoft 365 organization

A Microsoft 365 organization that you use to home your Microsoft Teams users, and the configuration and connection to the SBC. The Organization should Microsoft 365 E5 or enhance.

Source: https://learn.microsoft.com/en-us/MicrosoftTeams/direct-routing-plan#public-trusted-certificate-for-the-sbc

Teams side

Add the SBC’s domain in the Microsoft 365’s Domains List and Team’s Direct Route.



Planning your deployment of Direct Routing is key to a successful implementation.

Direct Routing lets you connect a supported, customer-provided SBC to Microsoft Teams Phone. With this capability, you can configure on-premises Public Switched Telephone Network (PSTN) connectivity with Teams.

Direct Routing enables you to:

Use virtually any PSTN trunk with Teams Phone.

Configure interoperability between customer-owned telephony equipment, such as a third-party private branch exchange (PBX), analog devices, and Teams.

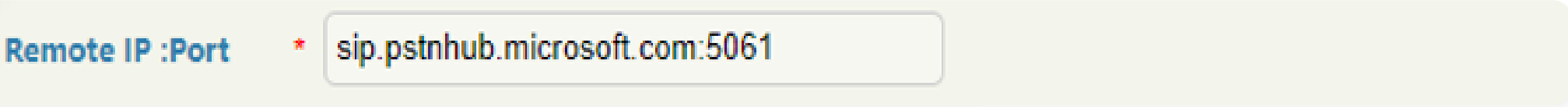
SBC side

1. Upload the TLS Certificate in SBC.

Certificate

Name	Certification	Key	CA
TLS_Teams	crt_sip_dinstar_com.crt	key_sip_dinstar_com.key	root_rootca.ca-bundle

2. Make SIP Trunk and call route to Teams.



With Dinstar SBC, we can connect the SBC to almost any telephony trunk or interconnect with third-party PSTN equipment.

Common Issues With Dinstar’s SBC

01

Initial Login Procedures

User attempts to log in to the system

02

Resetting Login Information

User resets their login credentials

03

Resolving Access Failures

User resolves issues preventing access

04

Addressing IMS Registration Problems

User addresses problems with IMS registration

05

Diagnosing Call Failures

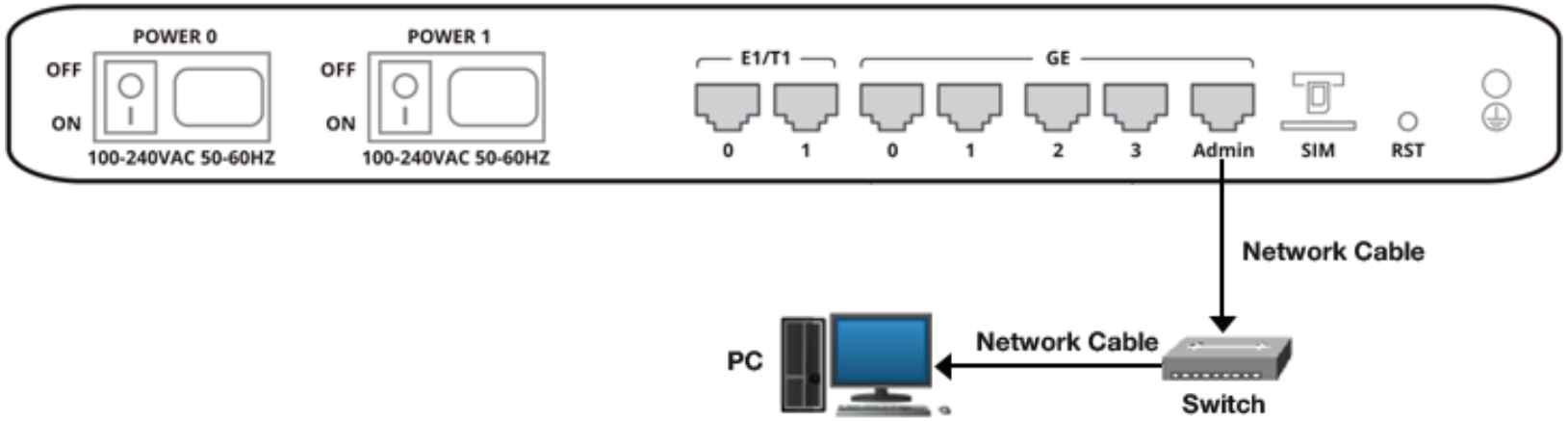
Incoming and Outgoing calls failed through IMS

06

Ensuring Proper Configuration of P-Preferred-Identity Header

User ensures correct configuration of the P-Preferred-Identity header

How to Log in the SBC for the First Time



The SBC has a port with a default static IP 192.168.11.1/24 for access; the user must log in to the SBC and change the IP before use.

1. Connect the SBC's port to local network, and recommend-accessing SBC from PC directly.
2. Add IP 192.168.11.X in your PC, like 192.168.11.20.
3. Access the https://192.168.11.1 in your web browser.

Note:

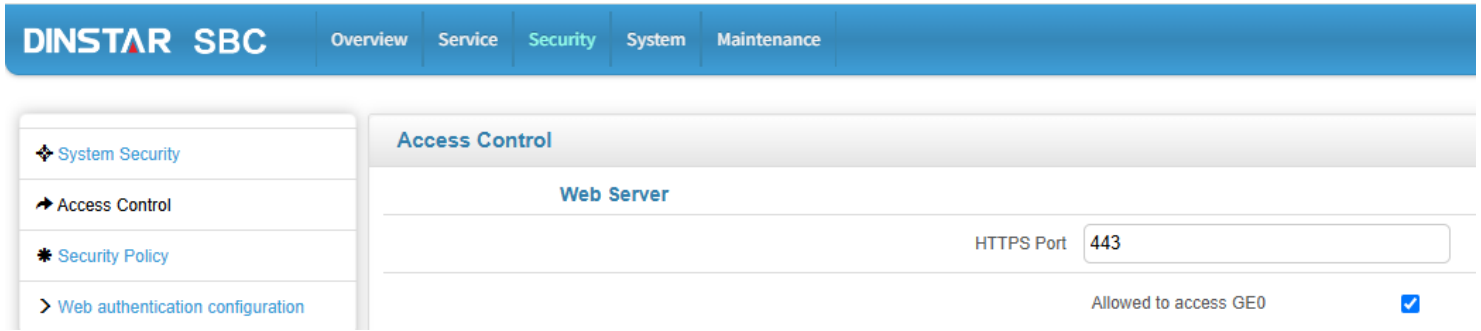
Different SBC models must use different ports: SBC300/1000: MGNT, SBC3000: GE1, SBC3000Pro: GE0

Access to the GUI of SBC failed

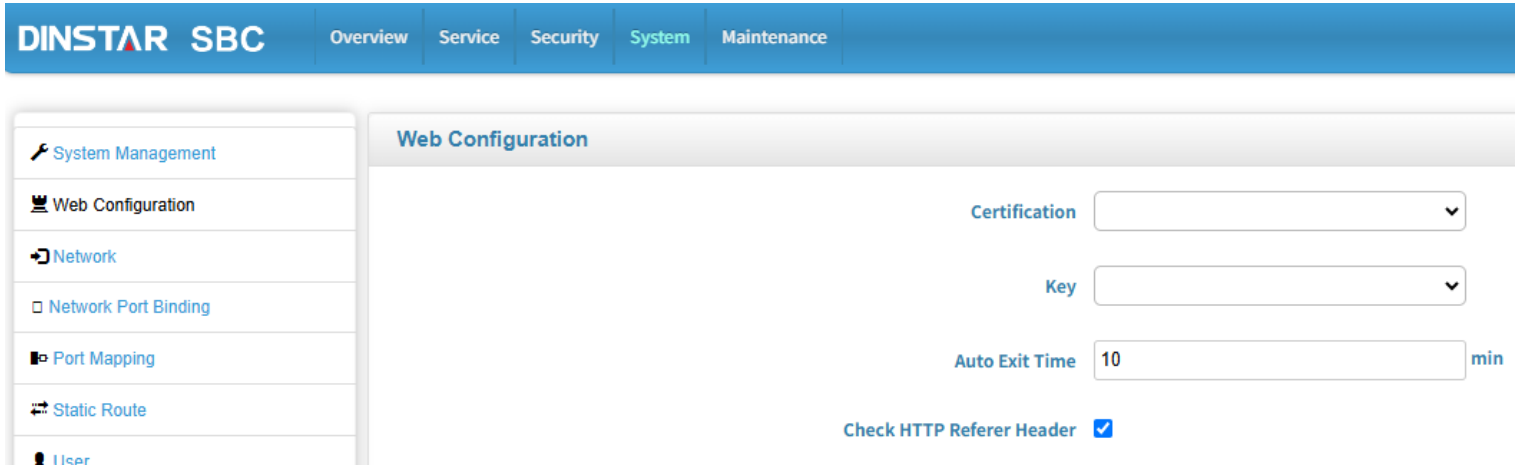
Q: The SBC interface set IP correctly and network connection has no issue, but the WEB access failed.

A: It may have two possibilities.

1. The access control had disabled the interface access.



2. The option "Check HTTP Referer Header" is disabled when the SBC is behind a router with NAT.



How to recover the system login information

Q: Customer forgot the system login info for the SBC.

A: The only solution is to flash the entire device completely.

Steps to go:

1. Set the PC with IP **192.168.1.3** and **run the TFTP**.

2. Connect the Console cable to SBC and **enable the Flash**.

```
boot check ok!
[      1.912]Hit any key to stop autoboot:  0
sunxi#
sunxi#setenv need_update 1
sunxi#saveenv
Saving Environment to SUNXI...
saveenv storage_type = 3
spinor write: start 0x300, sector 0x80
start = 0x300, cnt=0x80
nor page cnt=256
sunxi#reset
```

3. Connect the SBC by PC through net cable and **reboot**.

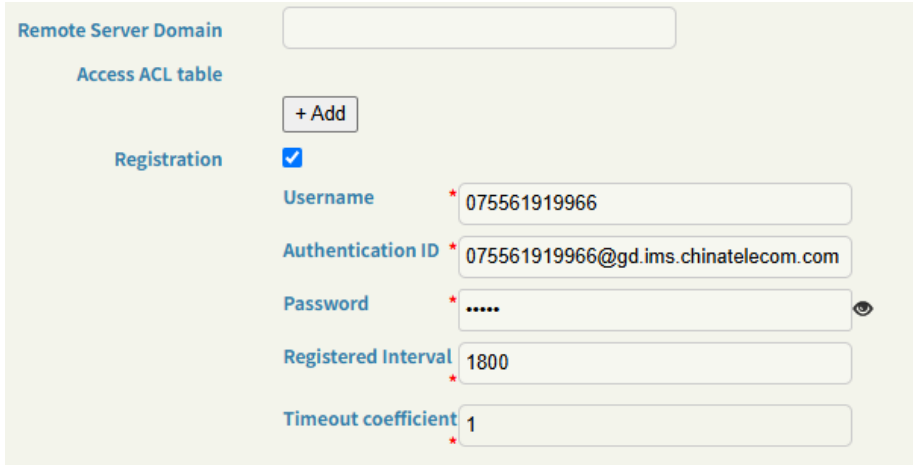
```
TFTP from server 192.168.1.3; our IP address is 192.168.1.120
Filename 'control_file'.
Load address: 0x43a00000
Loading: #
done
Bytes transferred = 458 (1ca hex)
board type : SBC
update policy:ALL
exec_policy exec ALL policy
Using eth0 device
TFTP from server 192.168.1.3; our IP address is 192.168.1.120
Filename './h8mains.19'.
Load address: 0x43a00000
Loading: ################################################################
         ################################################################
         ################################################################
         ################################################################
         ################################################################
         ################################################################
```

The IMS registration failed

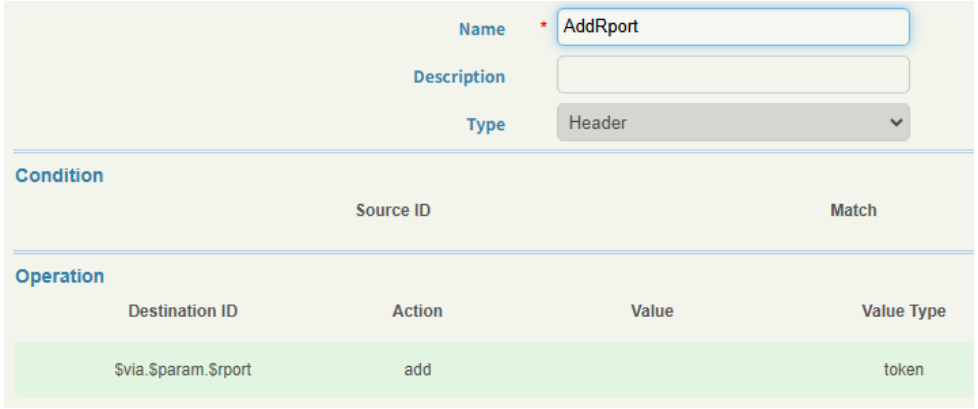
Q: The SBC registers to IMS failed, but with the correct SIP account and password.

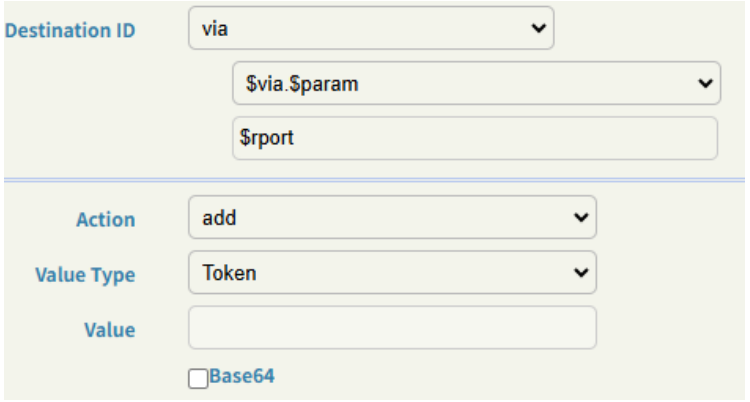
A: There might be two reasons:

1. The “Registered Interval” is set incorrectly. Most IMSs use **1800** for the timer



2. Some IMS platforms require the **rport** field in the register message. You may add **rport** to via in the SBC’s SIP Header Manipulation.





Outgoing Calls to IMS Failed

Q: Registered at the IMS, IMS incoming called Successful, but outgoing calls from SBC to IMS are rejected.

A: There might be a few reasons:

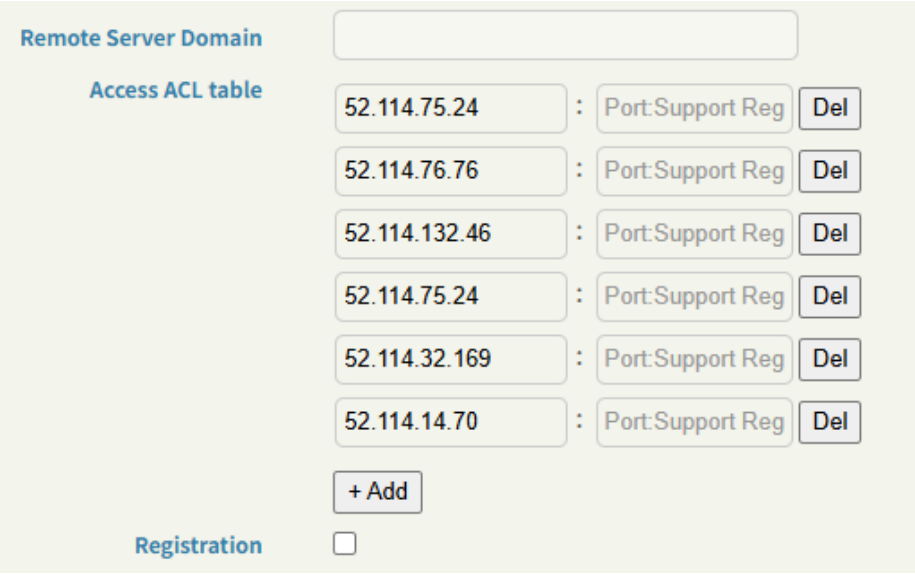
1. The format of called number is incorrect, most likely has or not has the country codec.
2. The caller number is incorrect; sometimes it needs to be the same as the registered account, sometimes it needs to be set to the range of the trunk’s DOD number.
3. The account in the “ contact “ field is incorrect; it may need to be set to the correct number.

Incoming Calls from IMS Failed

Q: Registered at the IMS, outgoing calls to IMS are successful, but incoming calls from IMS get rejected.

A: They may have followed possible reasons:

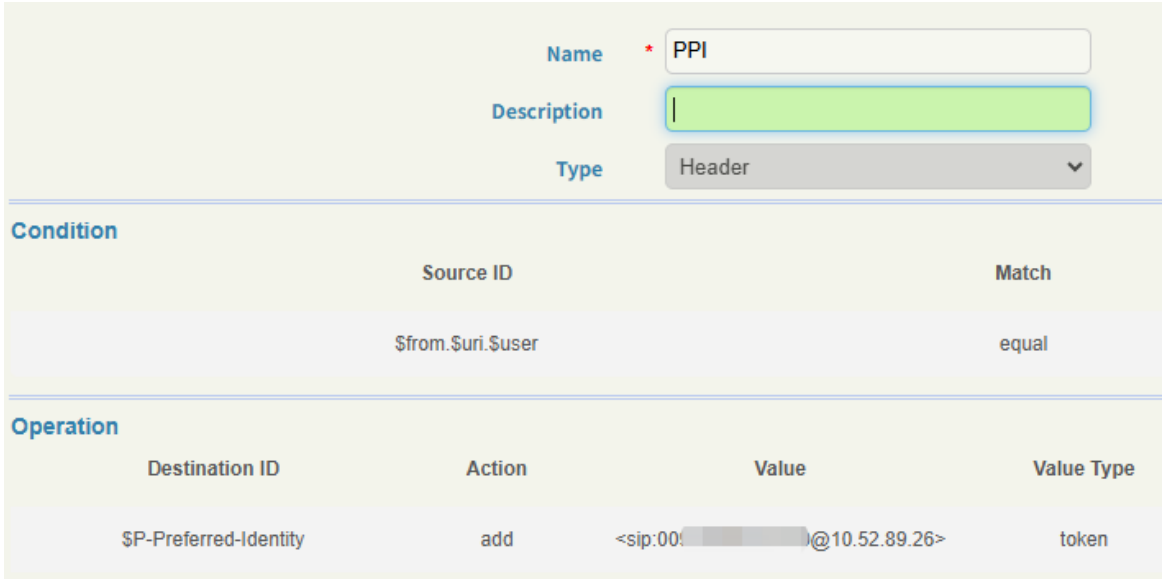
1. The incoming call route set issue. SBC needs to set the call route both ways.
2. The route priority issue. The call route index is priority(1 is the highest one). If matched some one, it will not continue to match other one.
3. The IMS uses a different source IP from the registered one. This happens in register to IMS with domain and the IMS domain have multiple IPs.



How to add the PPI(P-Preferred-Identity)

Q: Some IMS implementations require a Preferred Identity (P-Preferred-Identity) to be specified.

A: Need add the PPI node in SIP package in Header Manipulation.



From RFC3325， Source:
https://www.rfc-editor.org/rfc/rfc3325#section-9.2

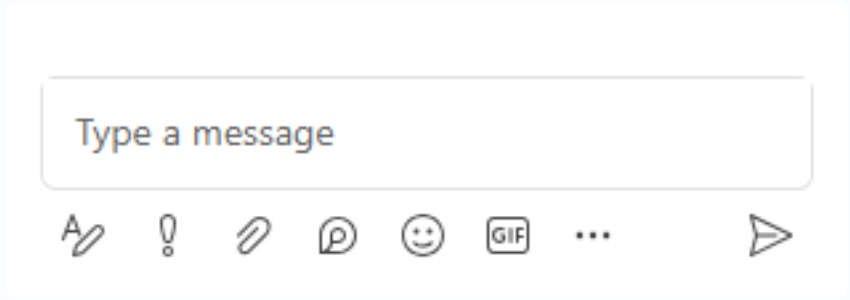
More details:

- User Control
- Multiple Identities
- Privacy Considerations
- Verification and Trust
- Network Behavior
- Legal and Regulatory Compliance

06
Q&A

Q&A

Enter your questions in the chat box



DINSTAR

Scan QR Code to Follow us

Thank You !

sales@dinstar.com

www.dinstar.com

+86 755 6191 9966