Skype for Business Server 2015

1. část

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Agenda

- Intro
- Features and Architecture
- On-prem vs. Cloud
- Installation, Configuration and Administration
- Conferencing
- External Access and Federation
- Voice on-prem and in the Cloud

Intro

Intro

Skype for Business Server 2015 Evolution:

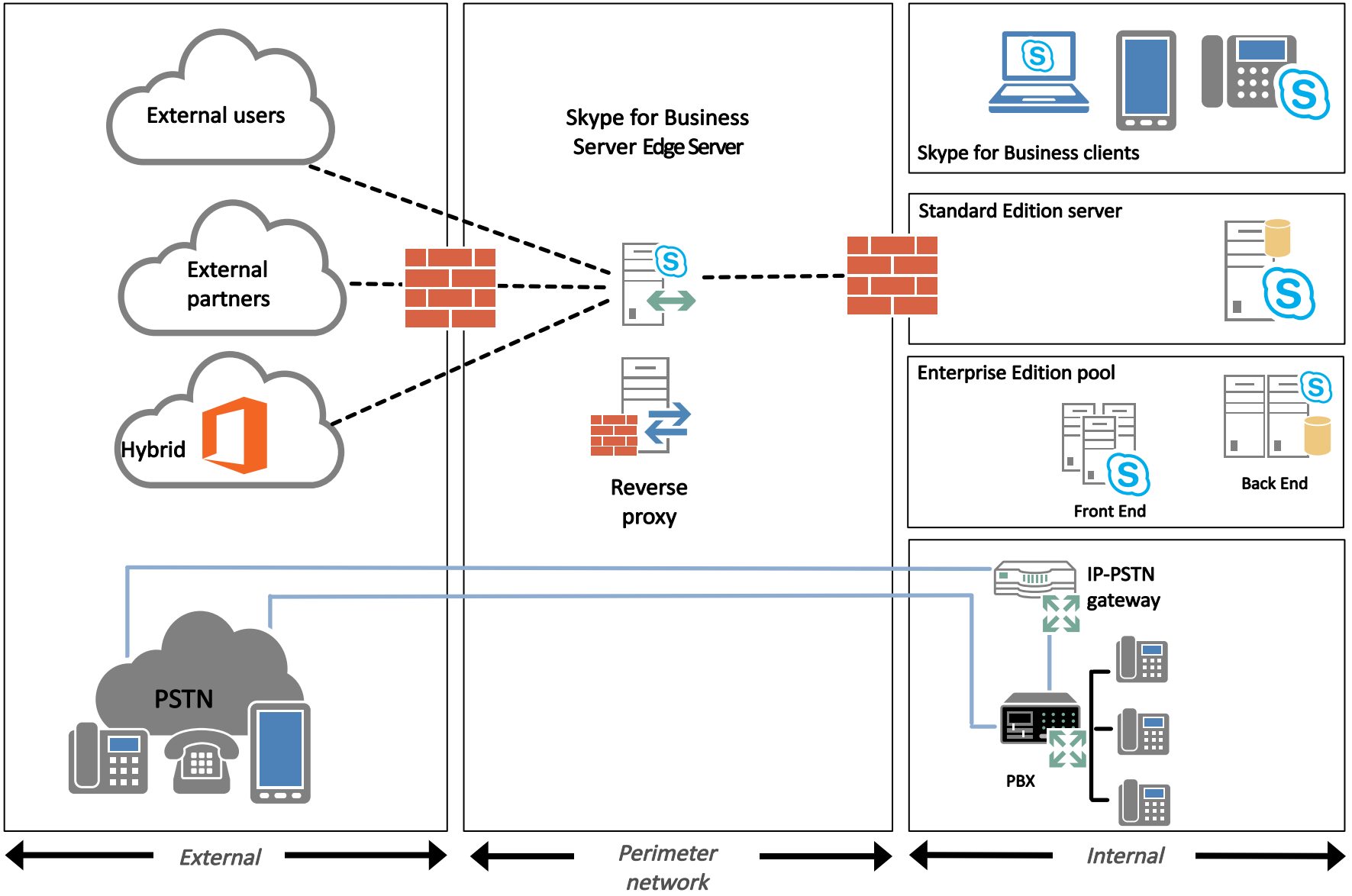
Features and Architecture

Skype for Business Server Features

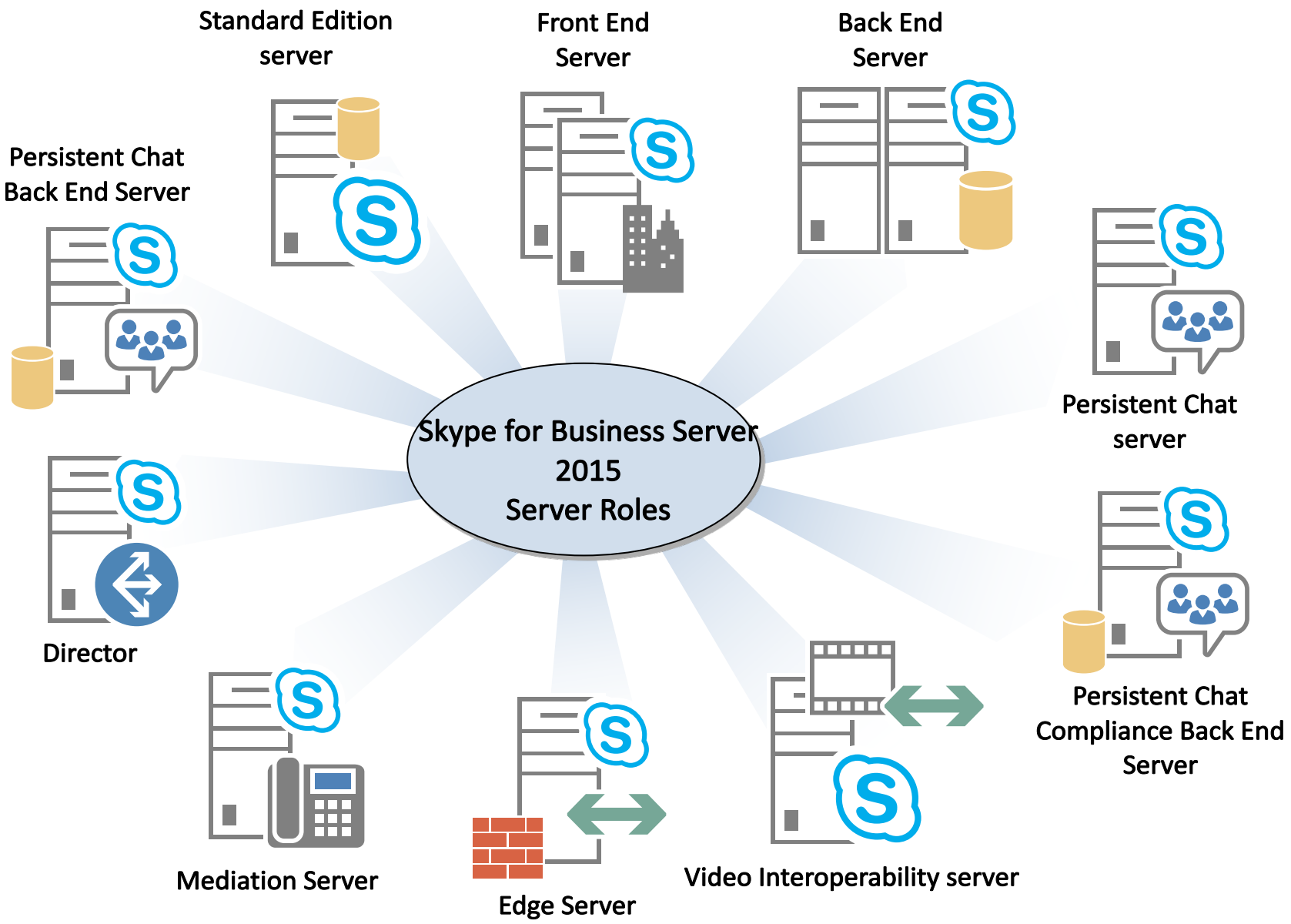
Skype for Business Server 2015 provides:

- Instant messaging
- Presence information
- Web conferencing
- Audio and video conferencing
- Integration with Microsoft Office 2013 or later apps
- Unified Contact Store
- Voice over Internet Protocol (VoIP) telephony
- Support for remote users
- Support for federation
- Server-side conversation history

Skype for Business Server Architecture



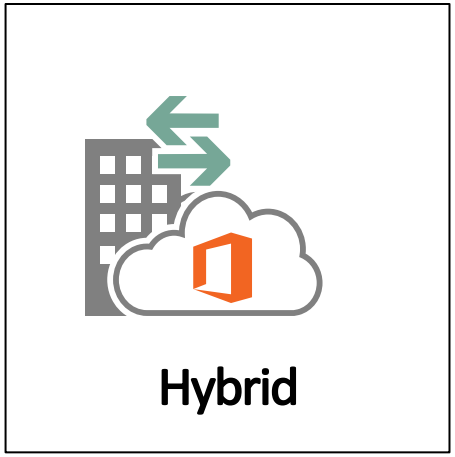
Server Roles in Skype for Business Server



On-prem vs. Cloud

Skype for Business Deployment Options

Skype for Business Server 2015



Split-domain with shared SIP address space

Skype for Business Online in Microsoft Office 365

Enabling gradual migration and coexistence between Skype for Business Server 2015 private and public cloud

Overview of Skype for Business Online

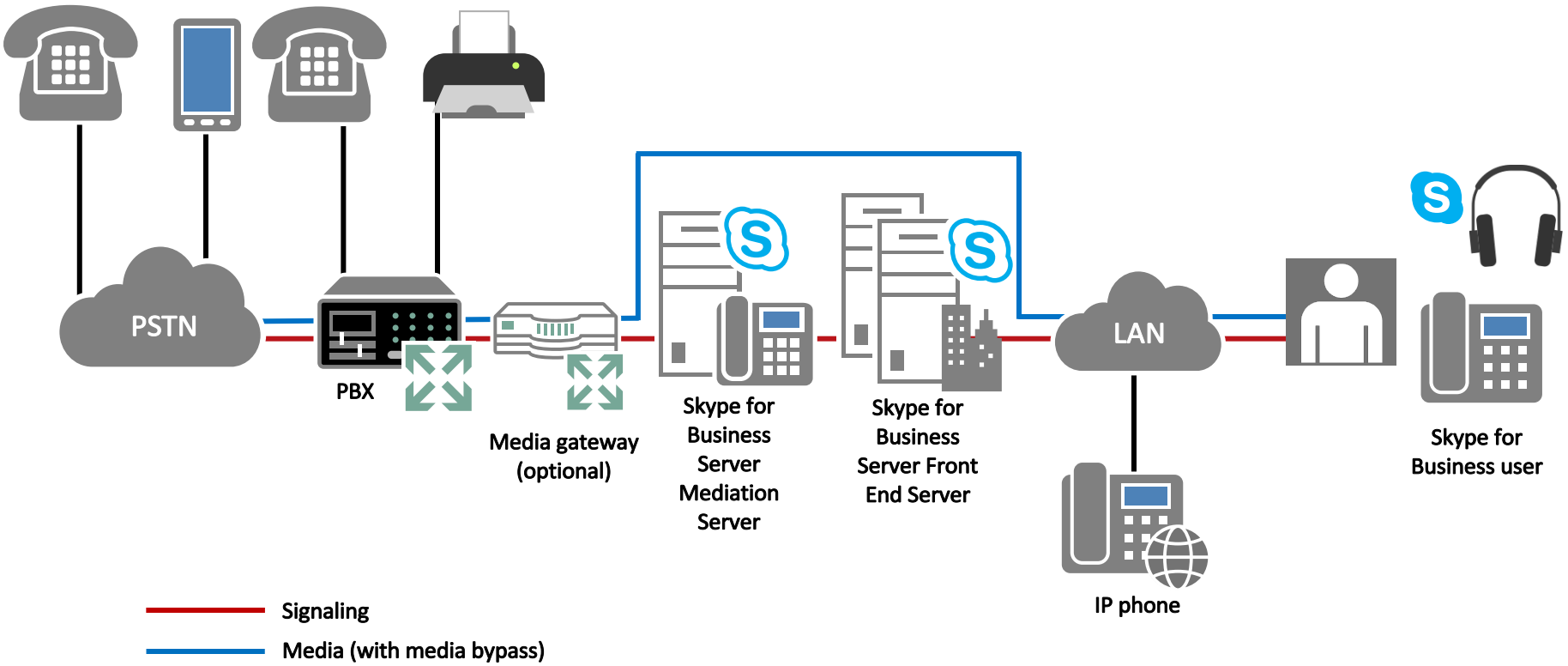
Advantages:

- Cloud-based; Microsoft deploys and maintains the required server infrastructure
- Cost-effective and agile

Disadvantages:

- The only admin tools available are Skype for Business admin center and the Windows PowerShell command-line interface
- Some features that are available in an on-premises deployment are not available online

Overview of Enterprise Voice

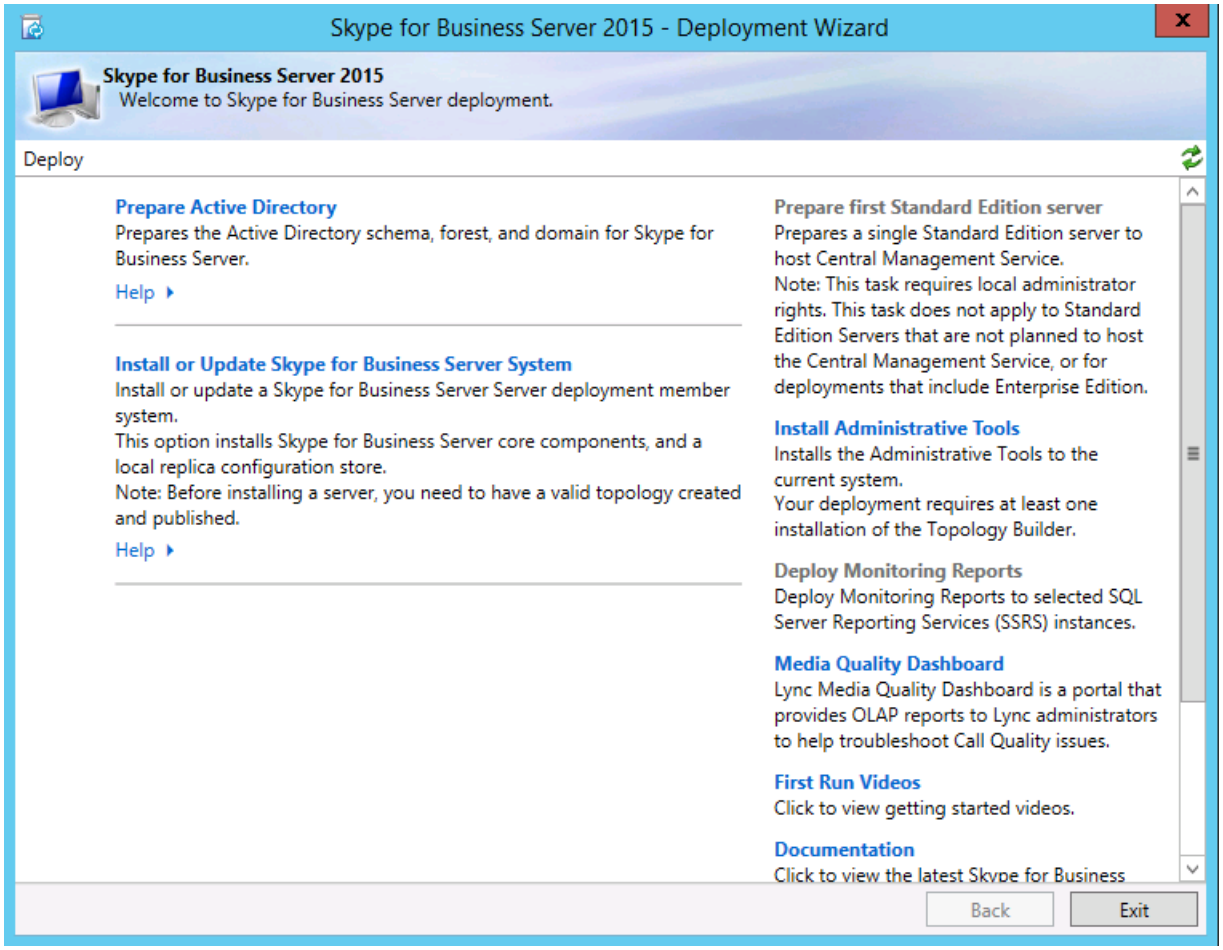


Skype for Business Server Protocols and Media

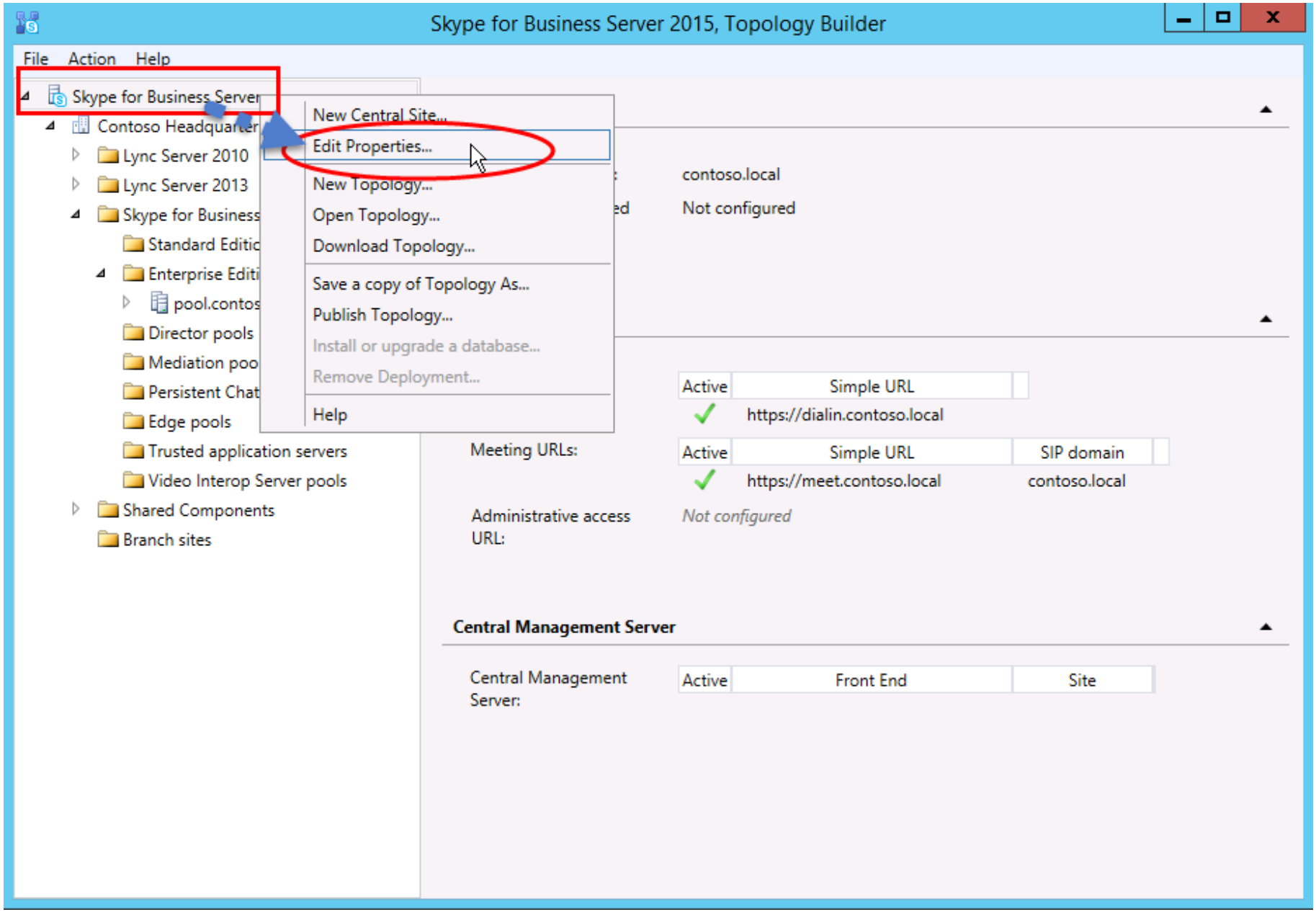
- SIP is an application-layer control or signaling protocol for creating, modifying, and terminating sessions among one or more participants
- Sessions include Internet-based phone calls, multimedia distribution, and multimedia conferences
- SIP-related RFCs and over 200 IETF Internet drafts and proposed standards form the basis of the Microsoft unified communications design

Installation, Configuration and Administration

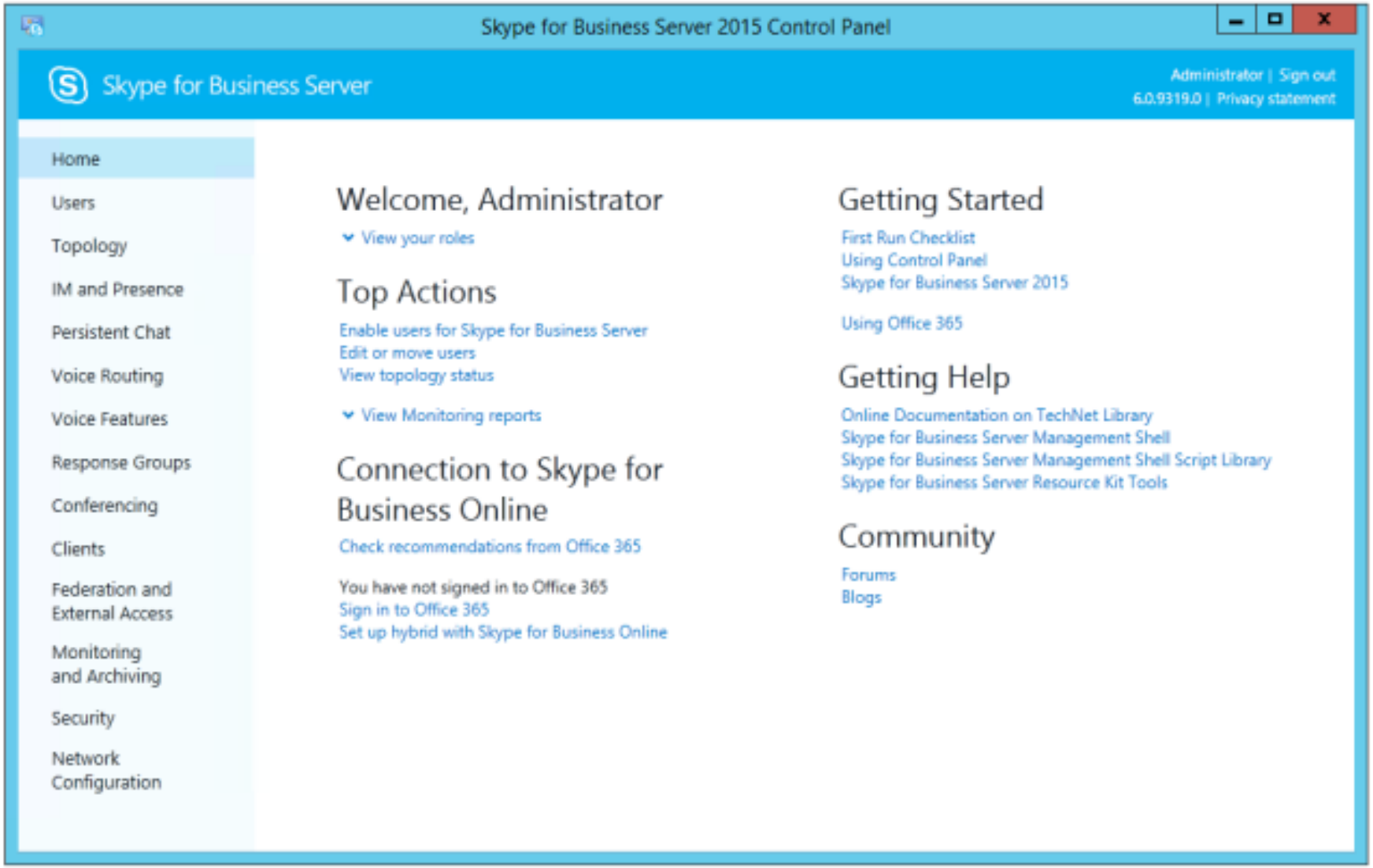
Skype for Business Server Deployment Wizard



Skype for Business Server Topology Builder

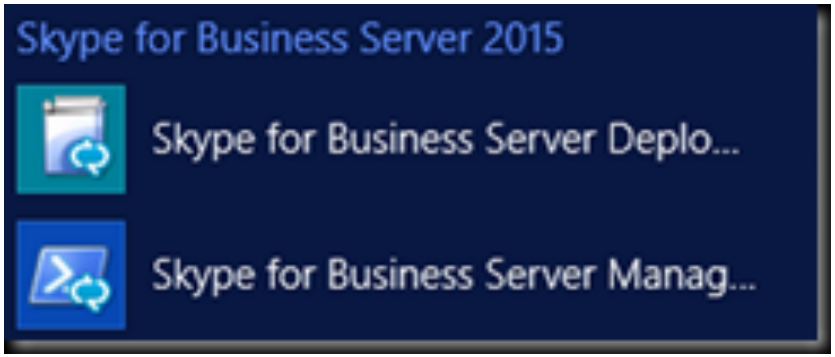


Skype for Business Server Control Panel



Skype for Business Server Management Shell

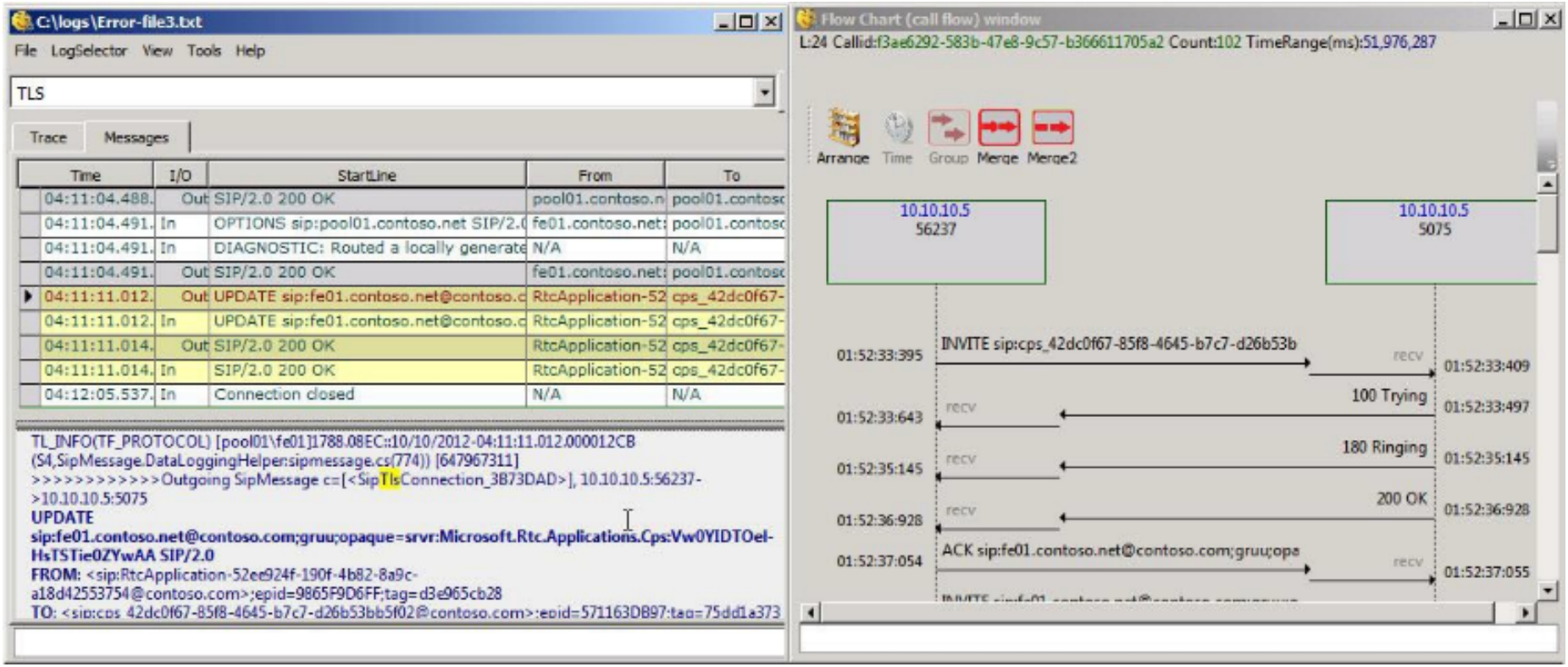
Built on Windows PowerShell. Includes a comprehensive set of cmdlets for Skype for Business Server 2015.



Topology Builder and Skype for Business Server 2015 Control Panel implement subsets of these cmdlets

Skype for Business Server Centralized Logging Service

Snooper, a Skype for Business Debugging Tool, in the protocol message viewer



Role of AD DS for Skype for Business Server

AD DS stores the following objects:

- User object schema extensions
- Schema extensions to maintain backward compatibility with previous supported versions
- User SIP URI, phone number, and other user settings
- Contact objects for applications (for example, the Response Group and Conferencing Attendant application)
- Security groups for RBAC
- Data published for backward compatibility
- A service control point for the Central Management store
- Kerberos Authentication Account

How Skype for Business Server Uses DNS

Skype for Business Server uses DNS to:

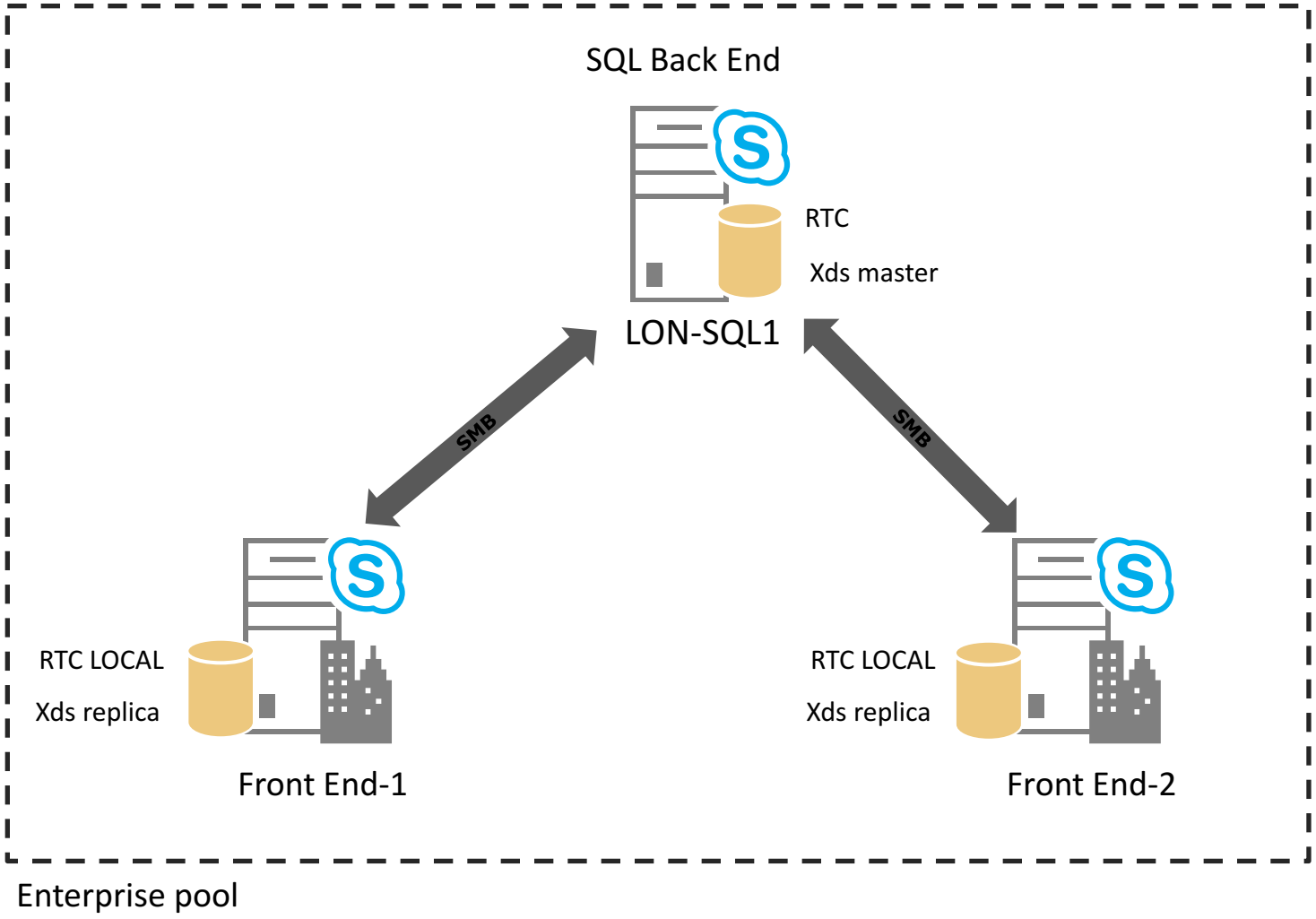
- Discover internal servers or pools for server-to-server communication
- Enable clients to discover the Front End pool
- Associate simple URLs for conferences
- Enable external servers and clients to connect to Edge Servers or reverse proxy for IM and conferencing
- Enable UC devices to obtain updates and to send logs
- Enable external UC devices to obtain updates
- Provide DNS load balancing

How Skype for Business Server Uses Certificates

Skype for Business Server uses certificates for:

- TLS connections between client and server
- Mutual TLS connections between servers
- Federation that uses automatic DNS discovery of partners
- Remote user access for IM
- External user access to audio/video sessions, application sharing, and conferencing
- Communicating with web applications and Outlook Web App
- Mobile requests that use automatic discovery of web service
- Persistent Chat web services for file upload/download

SQL Server Databases in Skype for Business Server



Planning SIP Domains and Simple URLs

- You can use a SIP domain:
  - As a namespace for creating user IDs
  - For federation with other systems

- The three simple URLs that Skype for Business Server communications software supports:
  - meet. Used as the base URL for all conferences in the site or organization
  - dial-in. Enables access to the Dial-in Conferencing Settings webpage
  - admin. Enables quick access to the Skype for Business Server Control Panel

Support for Multiple SIP Domains

- Three naming options for SIP URLs:
  - Option 1. A SIP domain for each simple URL

    https://meet.contoso.com, https://meet.fabrikam.com
  - Option 2. Simple URLs are based on a common name

    https://lync.contoso.com/Meet
  - Option 3. Separate meet URLs, but minimal DNS records

    https://lync.contoso.com/contosoSIPdomain/Meet

    https://lync.contoso.com/fabrikamSIPdomain/Meet
- The complexity for certificates increases with multiple SIP domains:
  - The web conference service only needs one reference in SAN
  - Dial-in URL needs only one reference in SAN
  - All other URLs require a SAN entry per SIP domain

The Need for a Single SIP URI

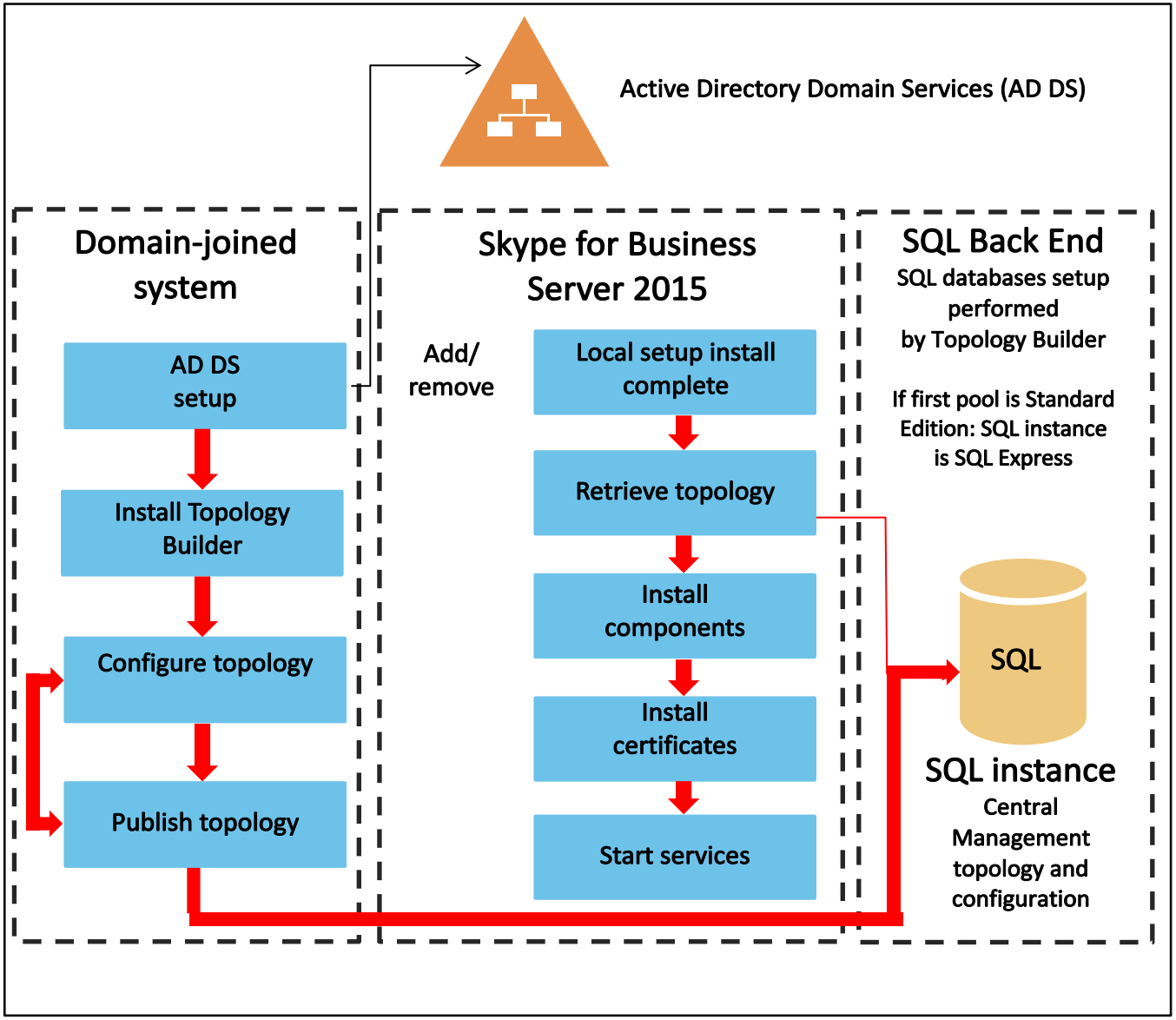
When planning your SIP domain names based on existing SMTP domain names, you should:

- Use only one or a few SIP domains
- Use one SIP domain for every SMTP domain
- Determine how to choose the SIP address for users who have different email addresses, for example:
  - claus.hansen@contoso.com
  - claush@contoso.com
  - claus@contososales.com

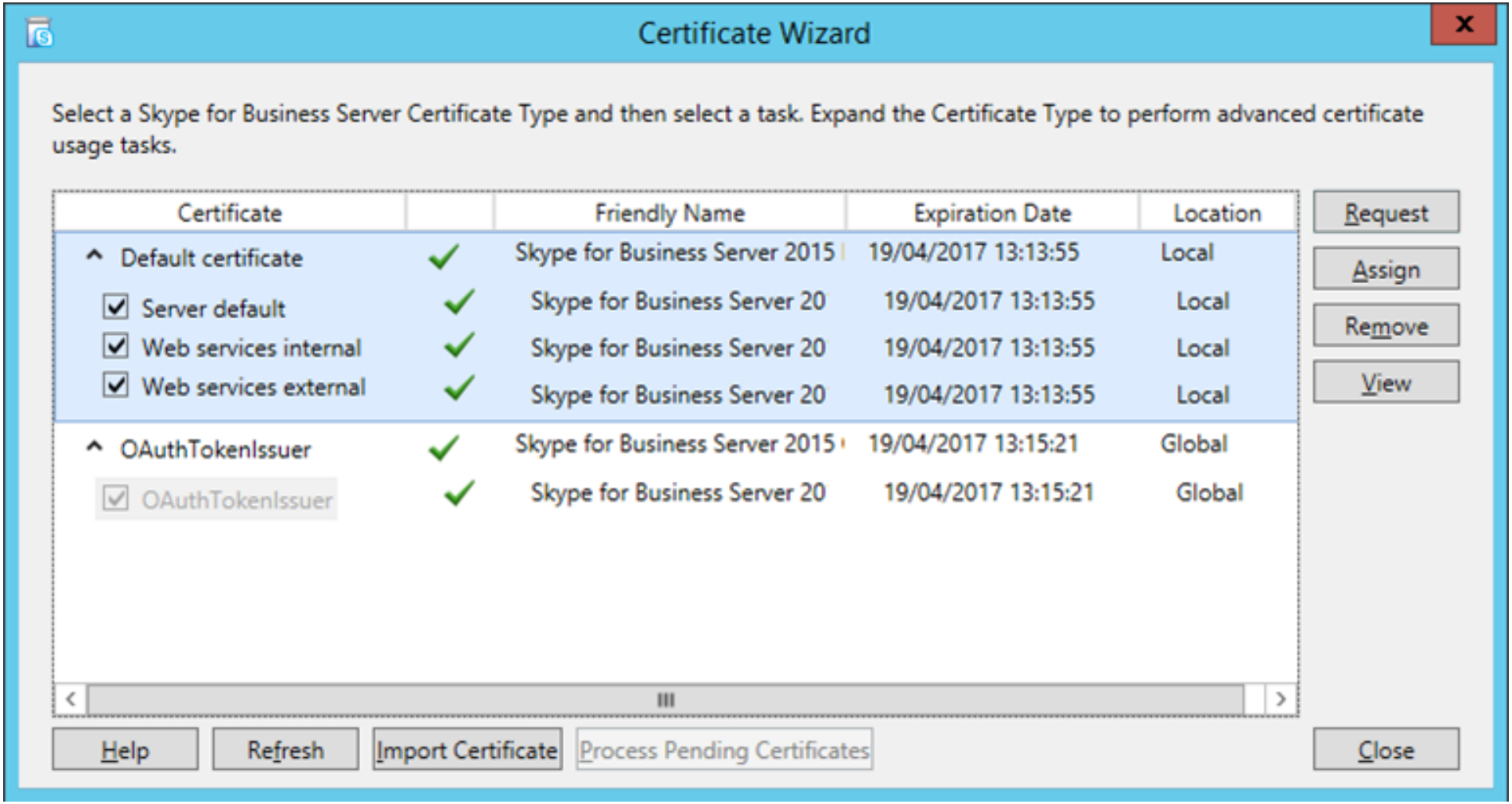
Simple URL Certificate Impact

- Dial-in and meet URLs required on the subject alternative name list:
  - dialin.adatum.com
  - meet.adatum.com
  - meet.contoso.com
- Same listener on reverse proxy:
  - Lyncdiscover
  - Skype external web service
  - Office Online
- Wildcard certificate support

GUI-Based Installation of Skype for Business Server



Requesting and Assigning Certificates



Planning for SQL Databases

Skype for Business Server 2015 supports the following SQL Server high-availability options:

- Database mirroring
- AlwaysOn Availability Groups
- AlwaysOn failover cluster instances
- SQL failover clustering

Conferencing

Conferencing Modes in Skype for Business Server

- A/V conferencing:
  - Schedule real-time audio and video conferences without the need for external services
- Web conferencing:
  - Share and collaborate on documents, such as PowerPoint presentations, during online conferences
- Dial-in conferencing:
  - Join the audio portion of a conference through a phone that uses PSTN
- Broadcast meetings:
  - Meet with up to 10,000 participants by using the Microsoft Office 365 infrastructure

Conferencing Features in Skype for Business Server

- Client features:
  - Meeting Invite Customization
  - Join Launcher
  - Video enhancements
  - VDI plug-in
- Administrative features:
  - Meeting Invite Customization (Outlook scheduling add-in)
  - Dial-out conferencing for users who are not Enterprise Voice–enabled
  - Integration with Microsoft Office setup

Conferencing Features in Skype for Business Server

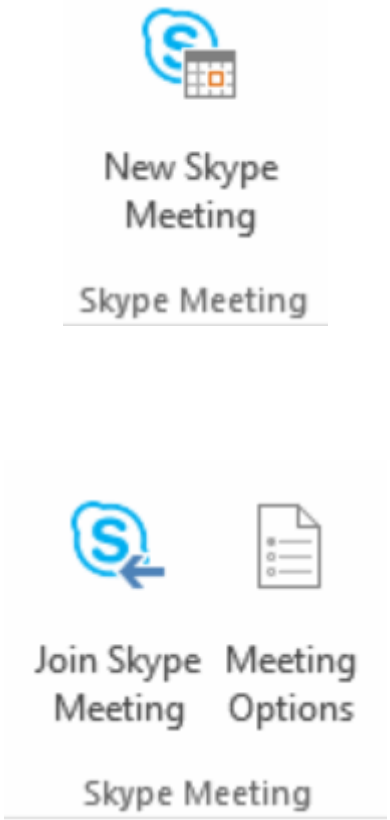
- Participant features:
  - Presence while sharing
  - Merge This Call Into
  - View or show participants
- Presenter features:
  - Manage presentable content
  - Share content and lead meeting activities
  - Presence while sharing
  - Presentation mode

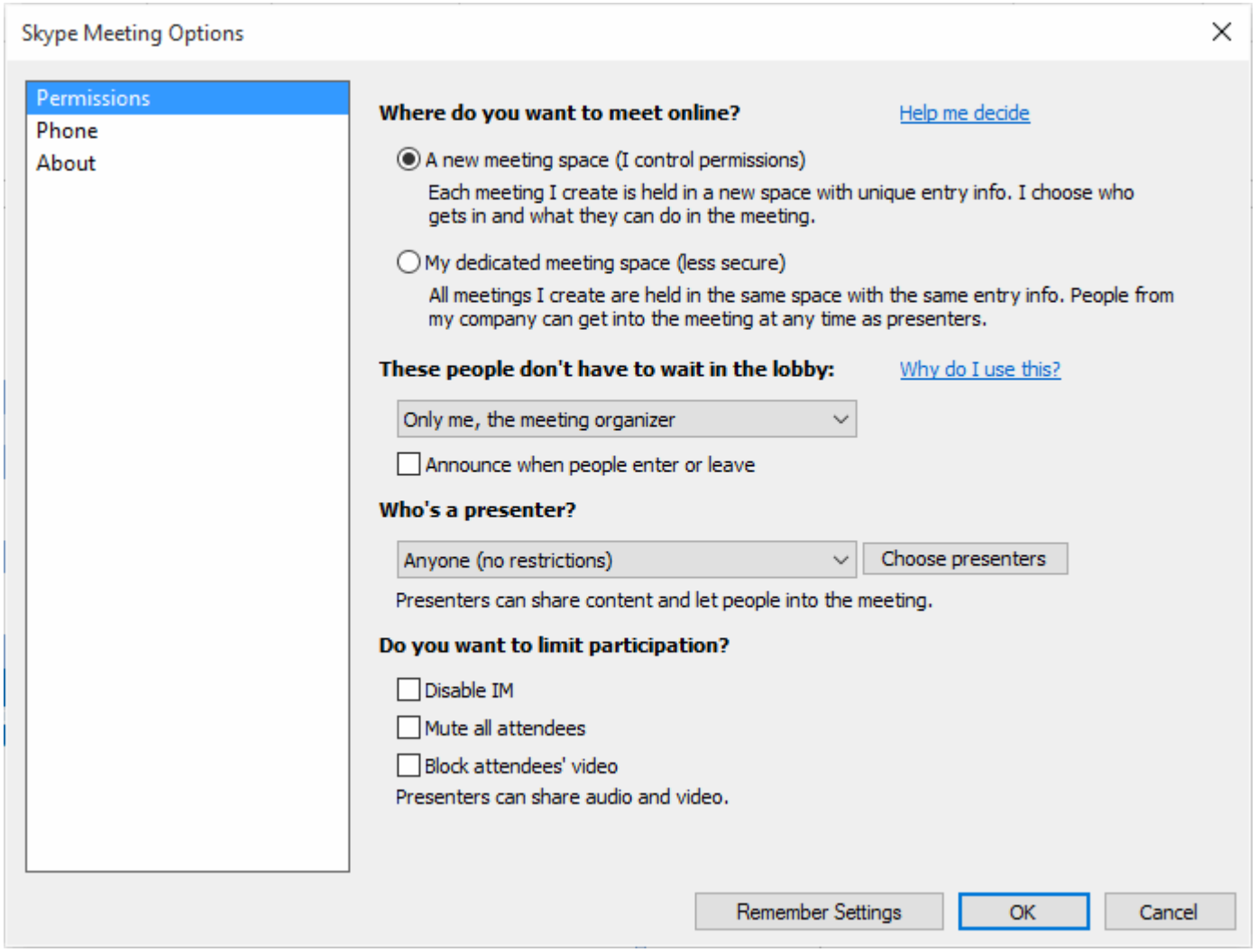
Conferencing Clients

- Microsoft Lync 2010
- Microsoft Lync 2013
- Skype for Business 2015
- Skype for Business 2016
- Microsoft Lync Windows Store app
- Microsoft Lync for Mac 2011
- Mobile clients:
  - Windows
  - iOS
  - Android
- Tablets
- Skype for Business Web App

Skype for Business Web App

Outlook Integration

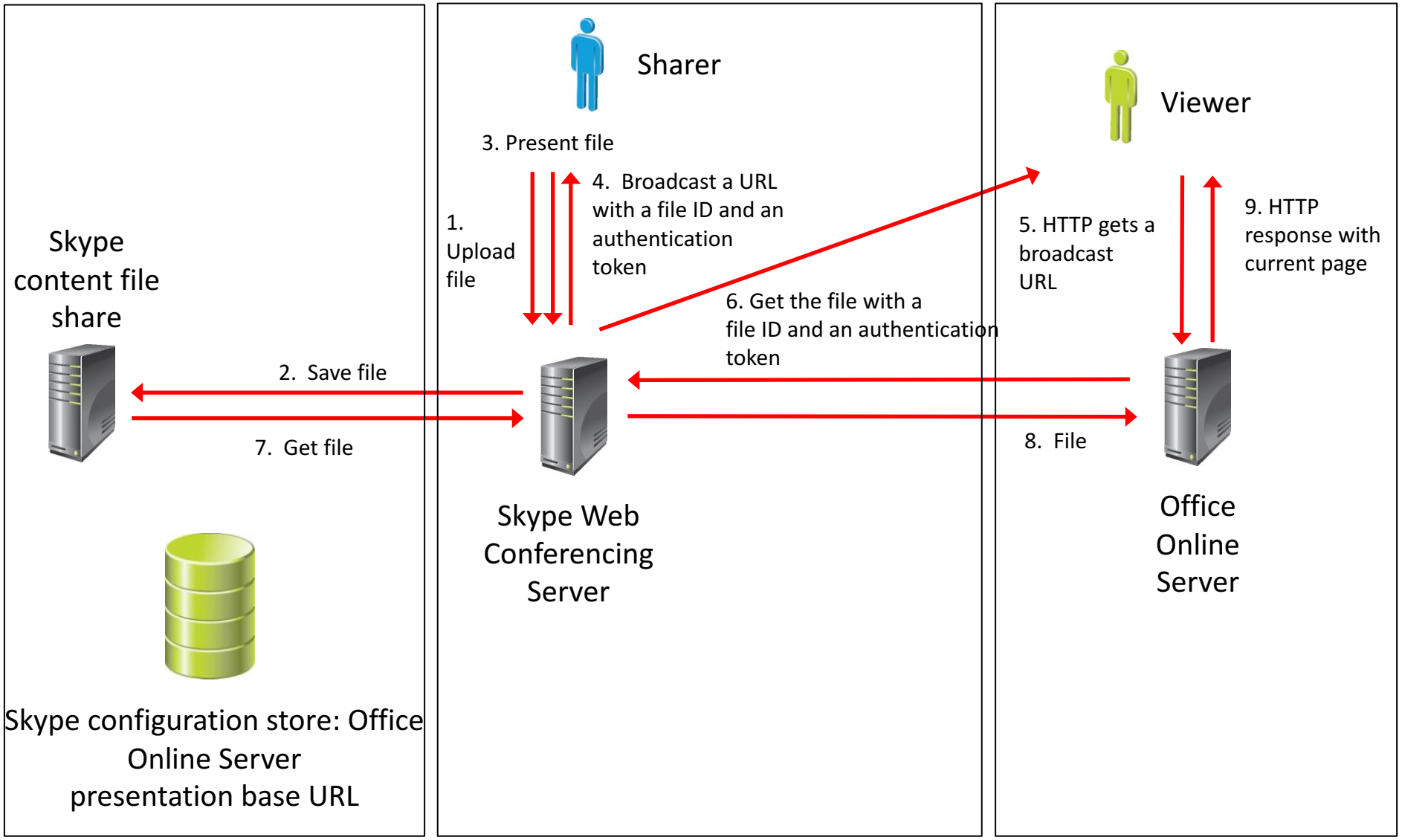




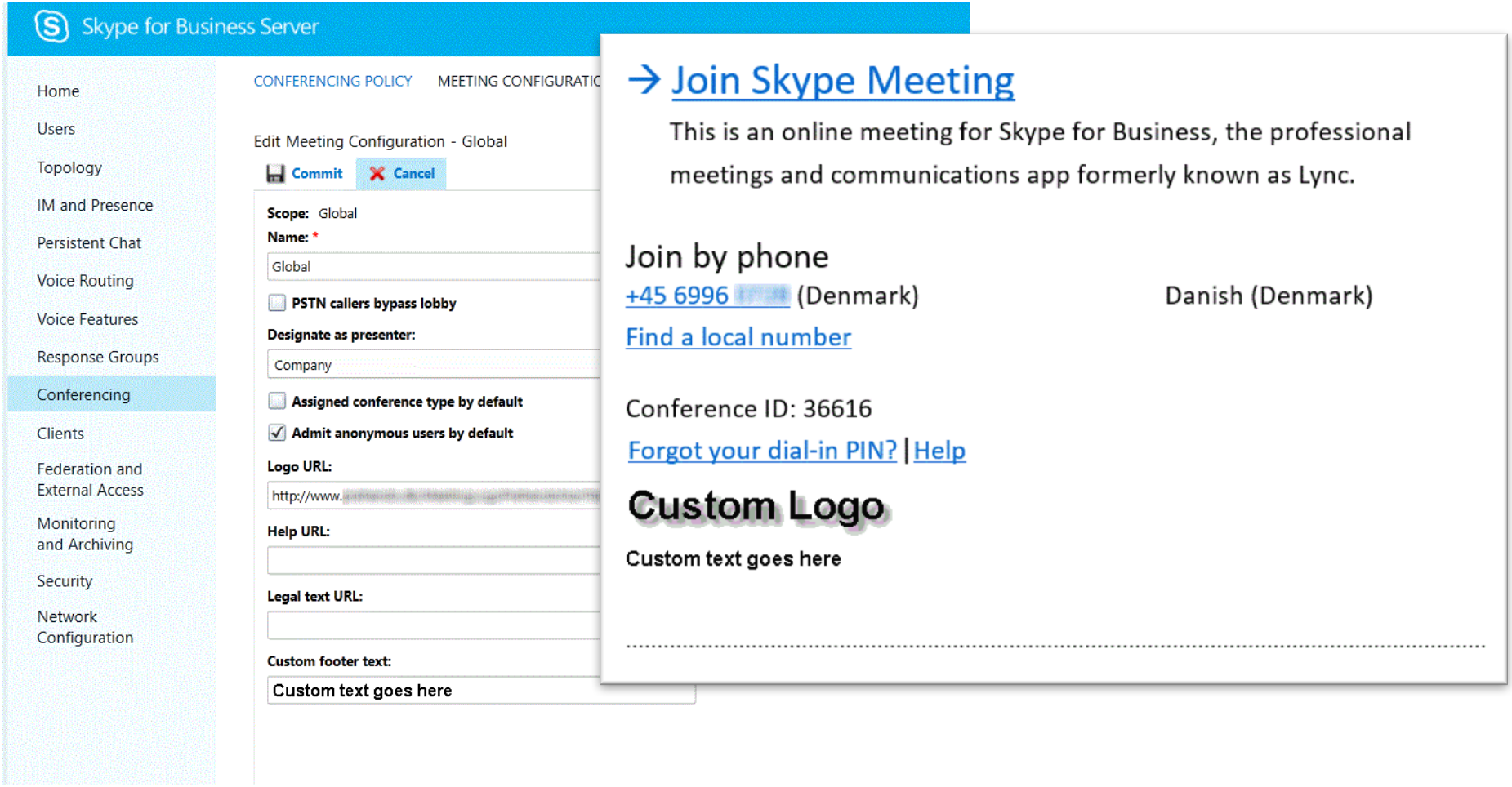
Overview of Office Online Server

- Streams PowerPoint files in meetings
- Allows local playback
- Allows embedded video (H.264 and .mp4)
- Reduces bandwidth requirement compared to app sharing
- Used in read-only mode
- Can be shared with Microsoft SharePoint and Microsoft Exchange

Office Online Server Integration



Meeting Invitation Customization



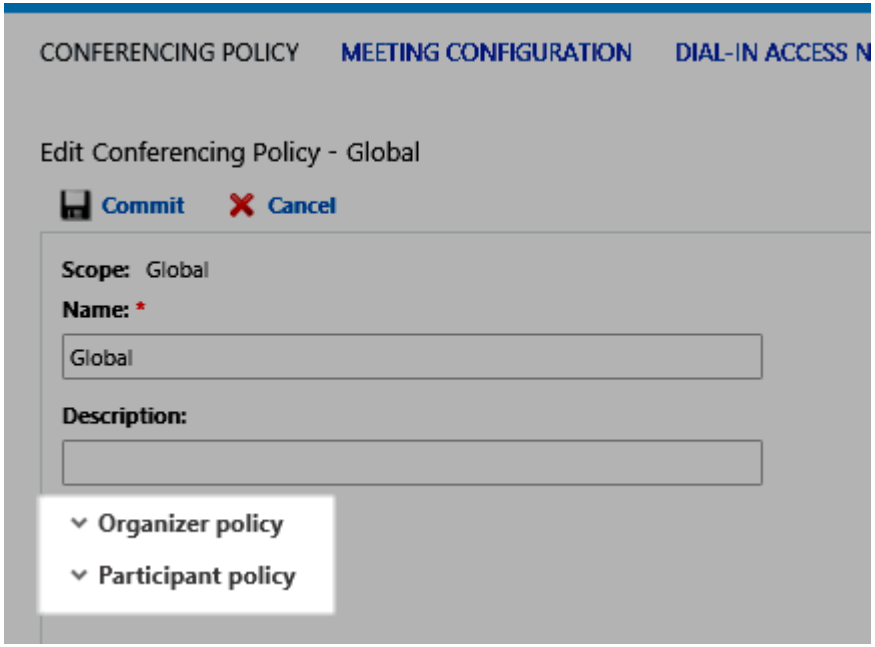
- Logo URL is for a customer-hosted logo icon
- Help URL is for a customer-hosted help/support page
- Legal disclaimer URL is for a customer-hosted legal information page
- Custom footer text

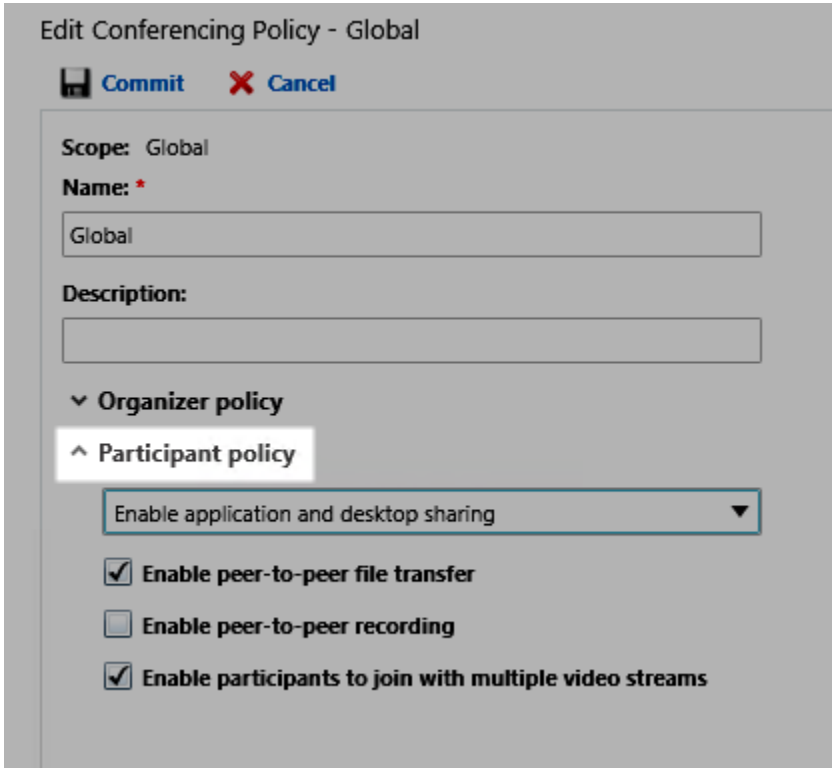
Default Conferencing Policy

- Default global policy = Enterprise CAL
- Standard CAL requires reconfiguration:
  - Global conferencing policy = Standard CAL
  - User-level conferencing policy = Enterprise CAL
- Standard CAL limits include:
  - No app or desktop sharing
  - No web conferencing
  - No audio/video conferencing
  - Multiparty instant messaging and file transfer allowed

Organizer and Participant Policy

Conferencing policy = Organizer policy + Participant policy





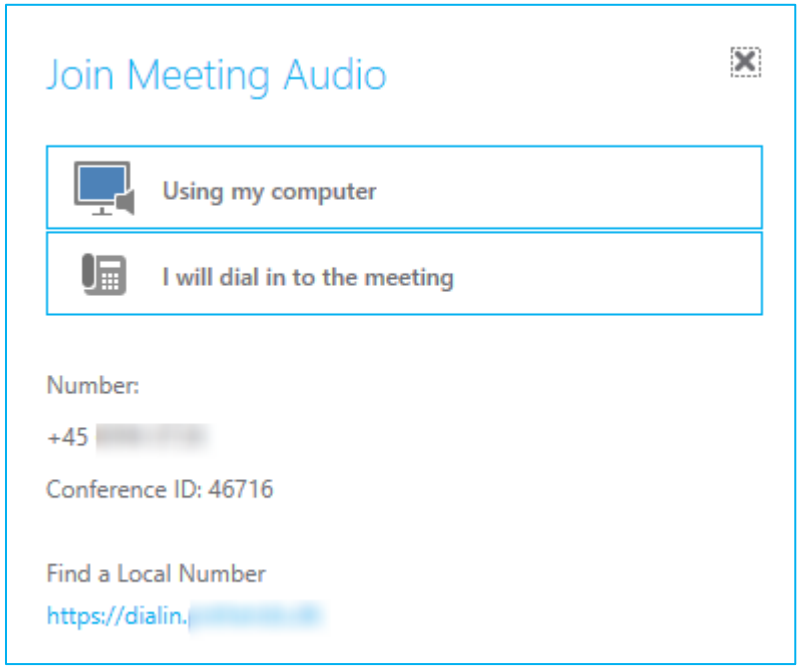
Control Panel vs. Management Shell

- Settings found only in the Skype for Business Server Management Shell:
  - AudioBitRateKb (default 200)
  - VideoBitRateKb (default 50,000)
  - AppSharingBitRateKb (default 50,000)
  - FileSharingBitRateKb (default 50,000)
  - TotalReceiveBitRateKb (default 50,000)
  - MaxVideoConferenceResolution CIF/VGA (default VGA)
- Audio, video, file, and app sharing bit rate also applies to peer-to-peer sessions

The Dial-In Conferencing Features in Skype for Business Server

- When no PC or other client for audio
- Using PSTN to get audio when:

Connect by using Skype for Business Web App (not installing the plugin):



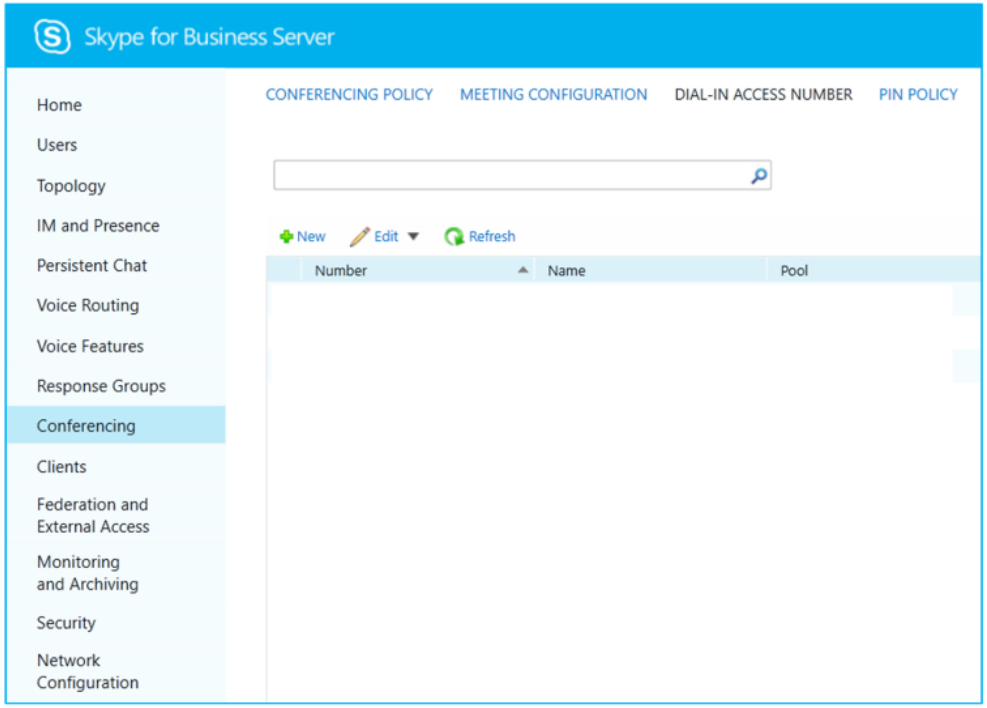
Connect by dialing directly to the number in the meeting invitation:

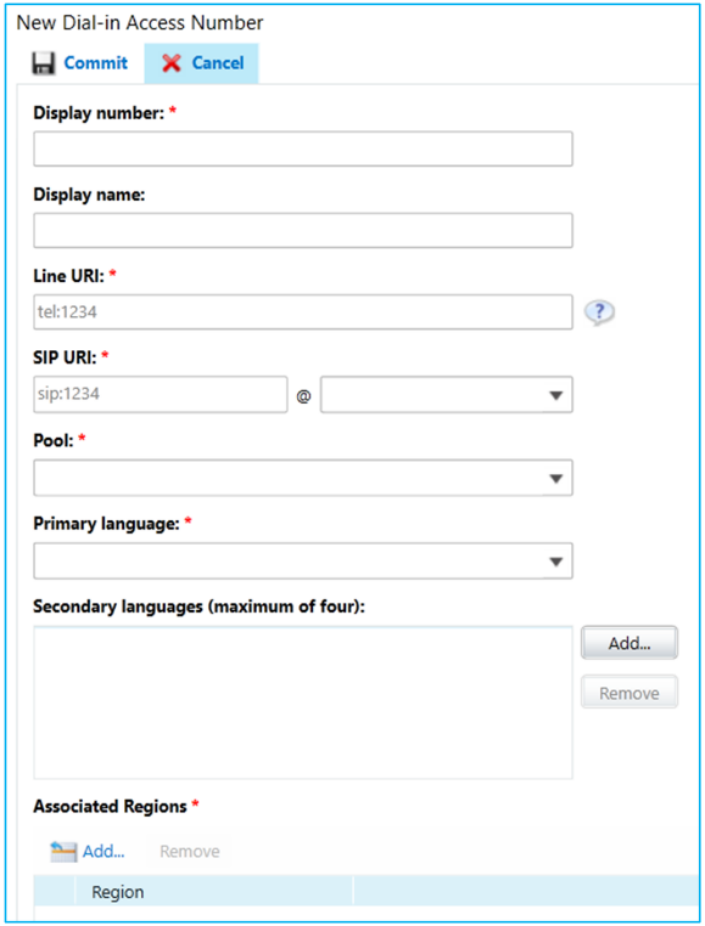
Configuration Options for Dial-In Conferencing

- Dial-in conferencing depends on:
  - Application service
  - Conferencing Attendant service
  - Conferencing Announcement service
- Dial-in conferencing settings webpage:
  - Numbers, languages, and DTMFs
- Skype for Business Server Control Panel
- Skype for Business Server Management Shell

Dial-In Conferencing Deployment Steps

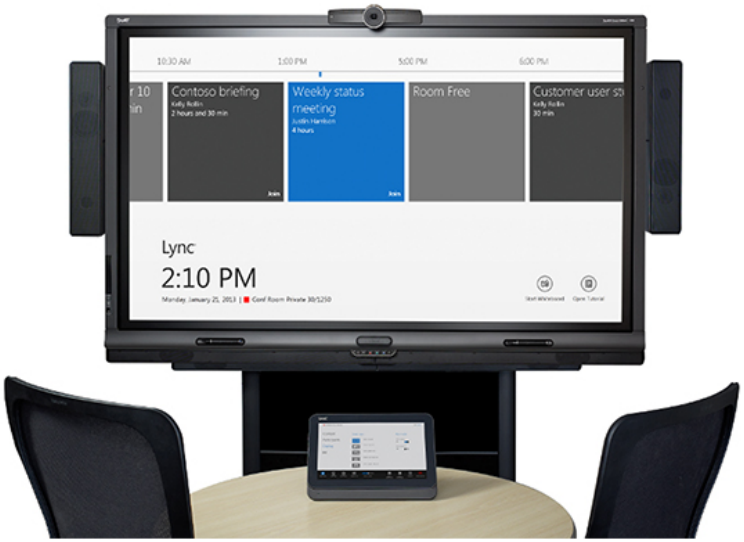
- Enterprise Voice setup:
  - Gateway, trunk, dial plan, voice policy
- Configure dial-in access numbers:
  - Name, Line URI, SIP URI
  - Pool, languages, regions





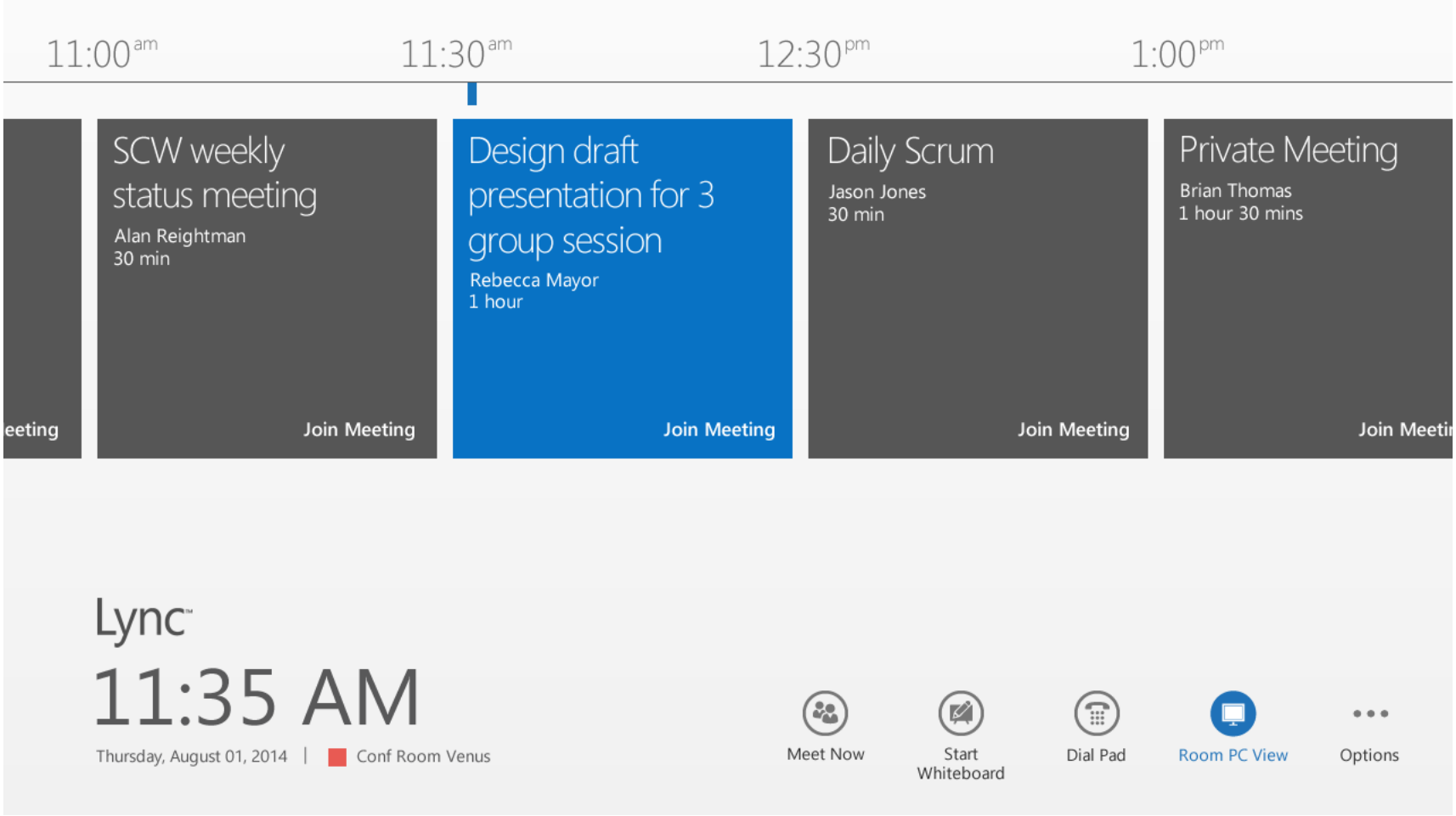
Overview of the Lync Room System

- Available through Microsoft Partners
- Microsoft delivers the software and interface
- A full VTC system—HD, touch, camera, audio, web



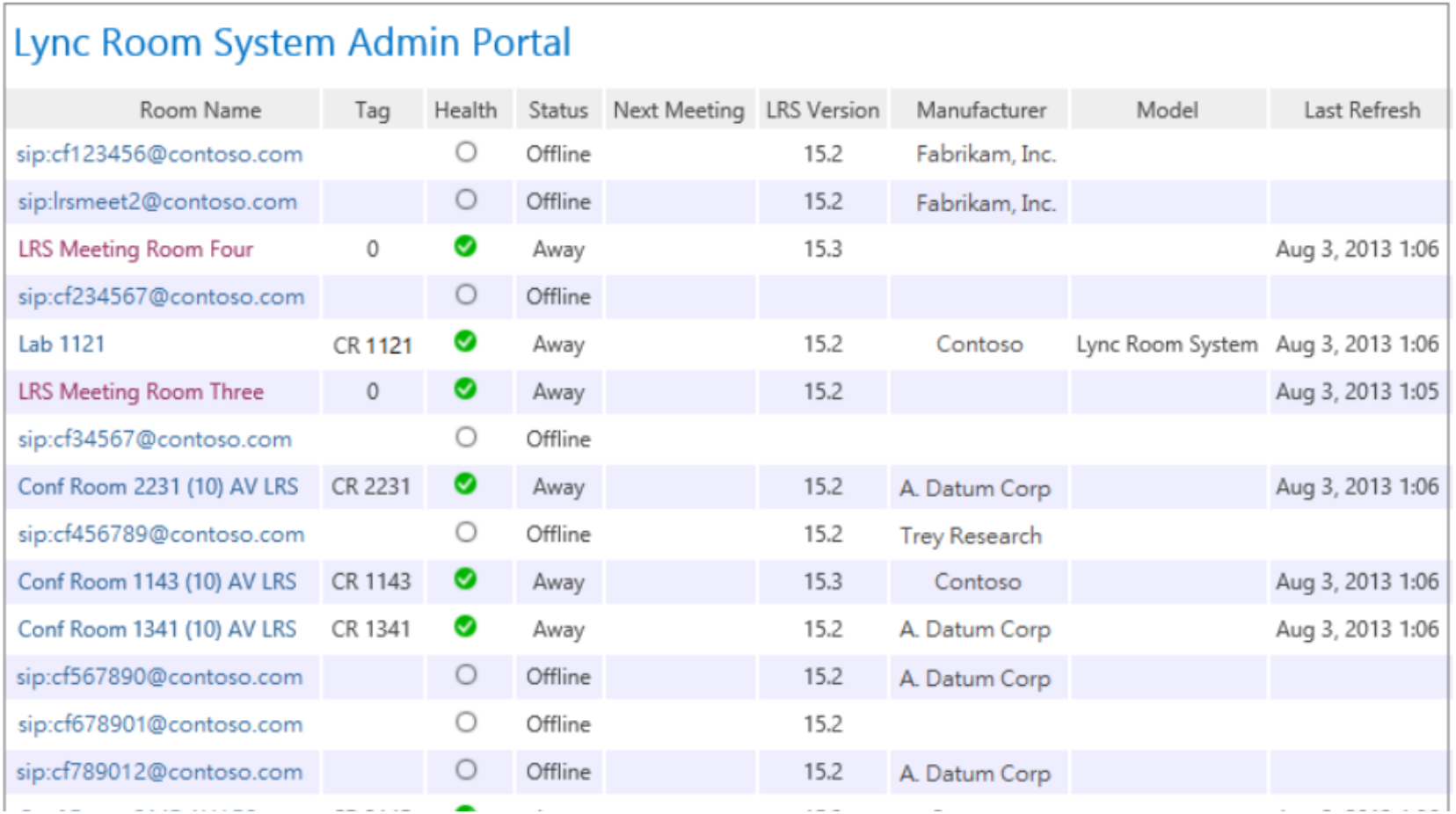
- Connects seamlessly to Exchange and Skype for Business Server 2015
- Configured as a resource mailbox in Exchange
- Requires specific integration steps

LRS Home Screen



LRS Administrative Web Portal

Access through https://webint.*adatum*.com/LRS



Lync Room System Admin Portal

Room Name	Tag	Health	Status	Next Meeting	LRS Version	Manufacturer	Model	Last Refresh
sip:cf123456@contoso.com		○	Offline		15.2	Fabrikam, Inc.		
sip:lrsmeet2@contoso.com		○	Offline		15.2	Fabrikam, Inc.		
LRS Meeting Room Four	0	✓	Away		15.3			Aug 3, 2013 1:06
sip:cf234567@contoso.com		○	Offline					
Lab 1121	CR 1121	✓	Away		15.2	Contoso	Lync Room System	Aug 3, 2013 1:06
LRS Meeting Room Three	0	✓	Away		15.2			Aug 3, 2013 1:05
sip:cf34567@contoso.com		○	Offline					
Conf Room 2231 (10) AV LRS	CR 2231	✓	Away		15.2	A. Datum Corp		Aug 3, 2013 1:06
sip:cf456789@contoso.com		○	Offline		15.2	Trey Research		
Conf Room 1143 (10) AV LRS	CR 1143	✓	Away		15.3	Contoso		Aug 3, 2013 1:06
Conf Room 1341 (10) AV LRS	CR 1341	✓	Away		15.2	A. Datum Corp		Aug 3, 2013 1:06
sip:cf567890@contoso.com		○	Offline		15.2	A. Datum Corp		
sip:cf678901@contoso.com		○	Offline		15.2			
sip:cf789012@contoso.com		○	Offline		15.2	A. Datum Corp		

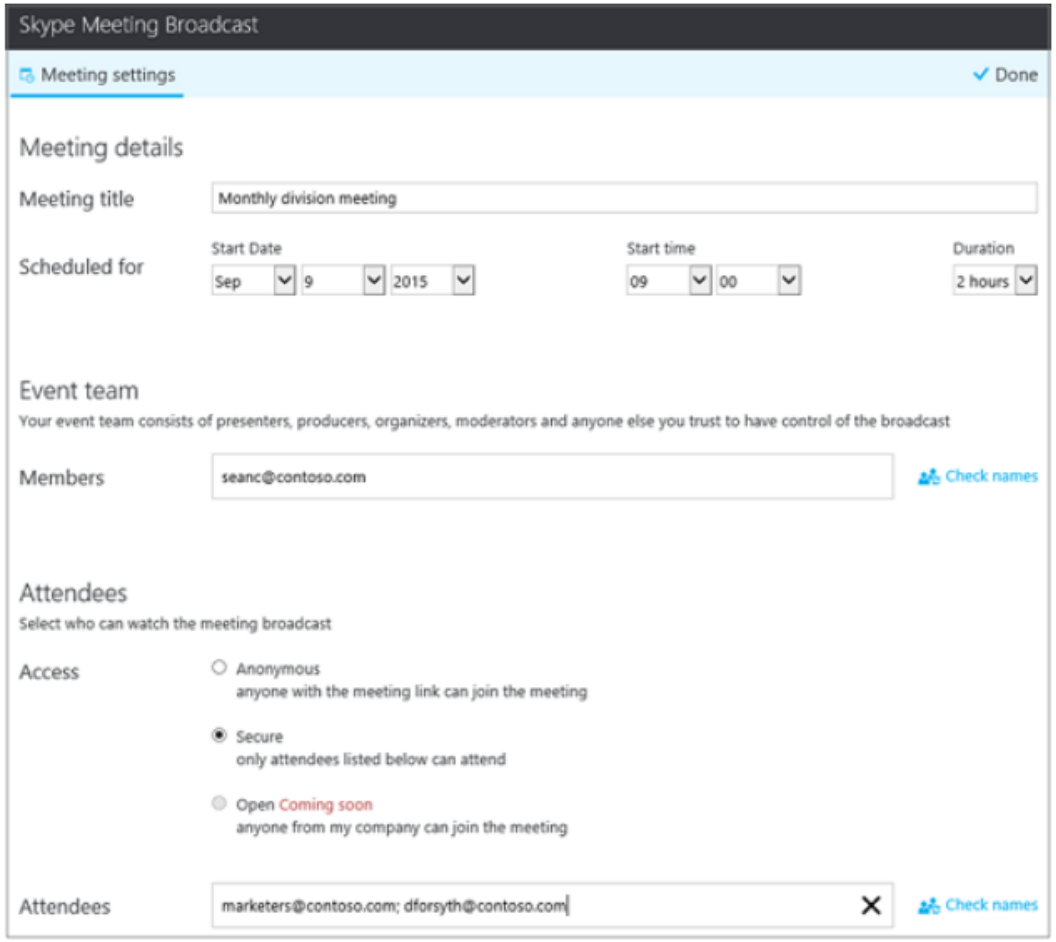
Skype for Business for Large Meetings

- Skype for Business large meetings support:
  - More than 250 participants
  - Up to 1,000 participants (not a hard limit)
- Large meetings require:
  - No users on reserved pool, only the scheduling account
  - Scheduling account is for setting up large meetings
  - All meetings occur on the organizer’s pool
  - Scheduling account should not have any contacts in Skype for Business; others should not add the scheduling account to their own list

Overview of Skype Meeting Broadcast

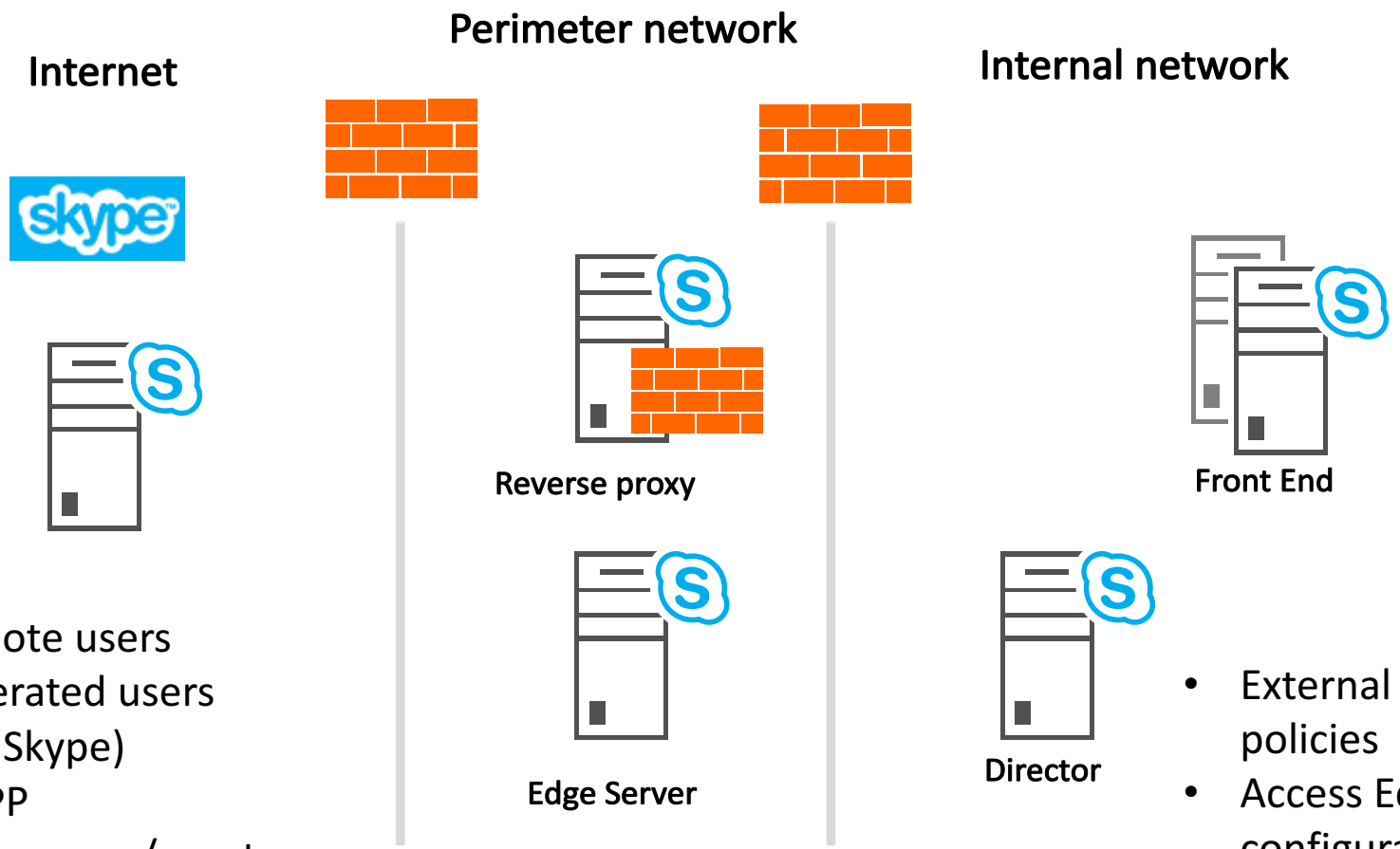
Setting up a hybrid solution to work with Skype Meeting Broadcast:

- Configure access to LyncOnlineResources (hybrid configuration)
- Add allowed domains to avoid throttling on incoming messages
- Schedule by using the https://broadcast.skype.com web service



External Access and Federation

Edge Server and Reverse Proxy



- Remote users
- Federated users
- PIC (Skype)
- XMPP
- Anonymous/guest users

- External access policies
- Access Edge configuration

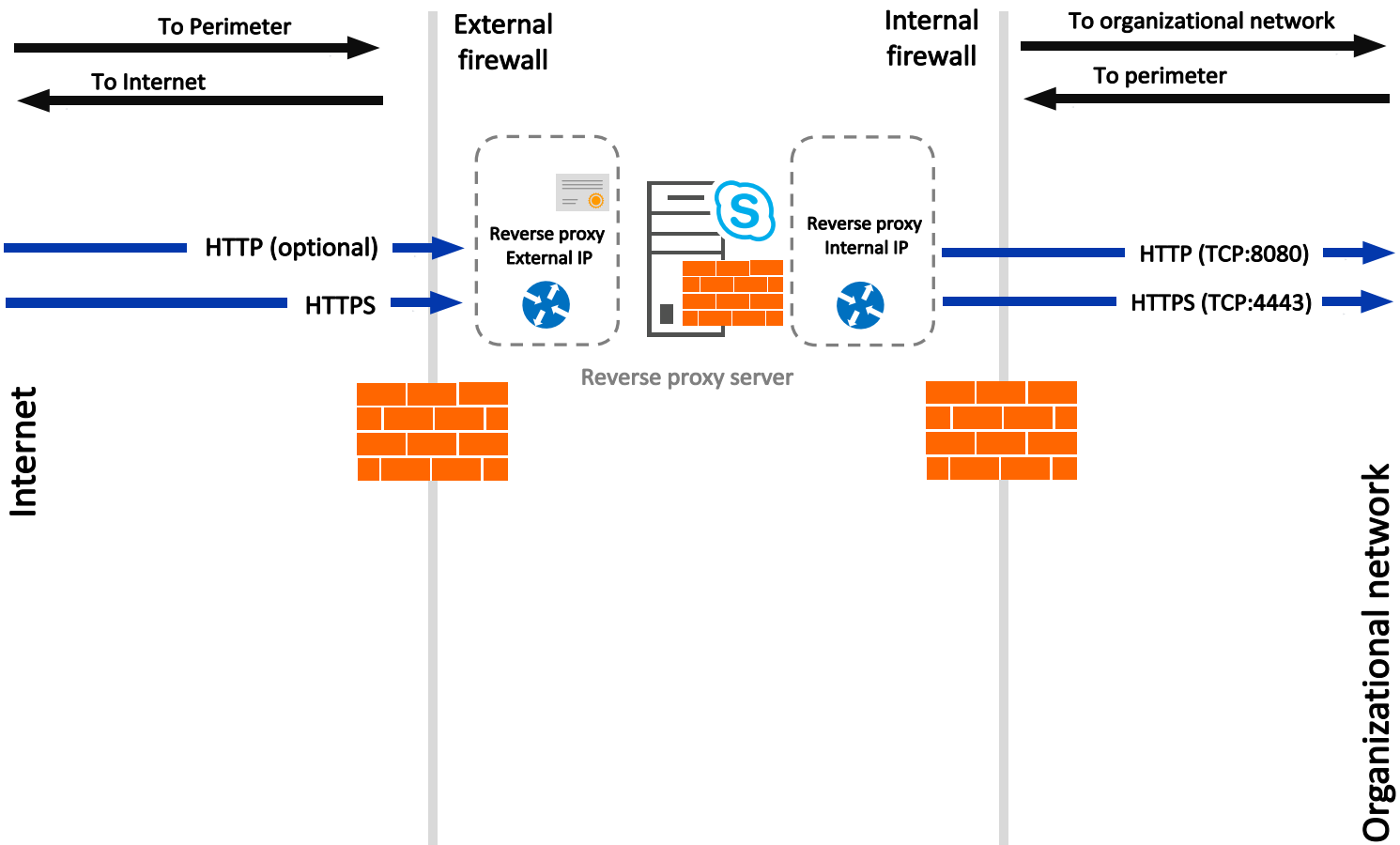
Defining Remote Users

- Remote users:
  - From the internal organization
  - Authenticate in internal AD DS
  - Same experience as internal users
- Federated users and authenticated users:
  - Authenticate in their respective infrastructures
  - Display information controlled by respective administrators
- Skype Public (PIC):
  - No conference: one-to-one only
  - Presence, IM, audio, video
- XMPP:
  - IM and presence only
- Anonymous and guest:
  - Conference only (IM, Audio, Video, Sharing, and so on)

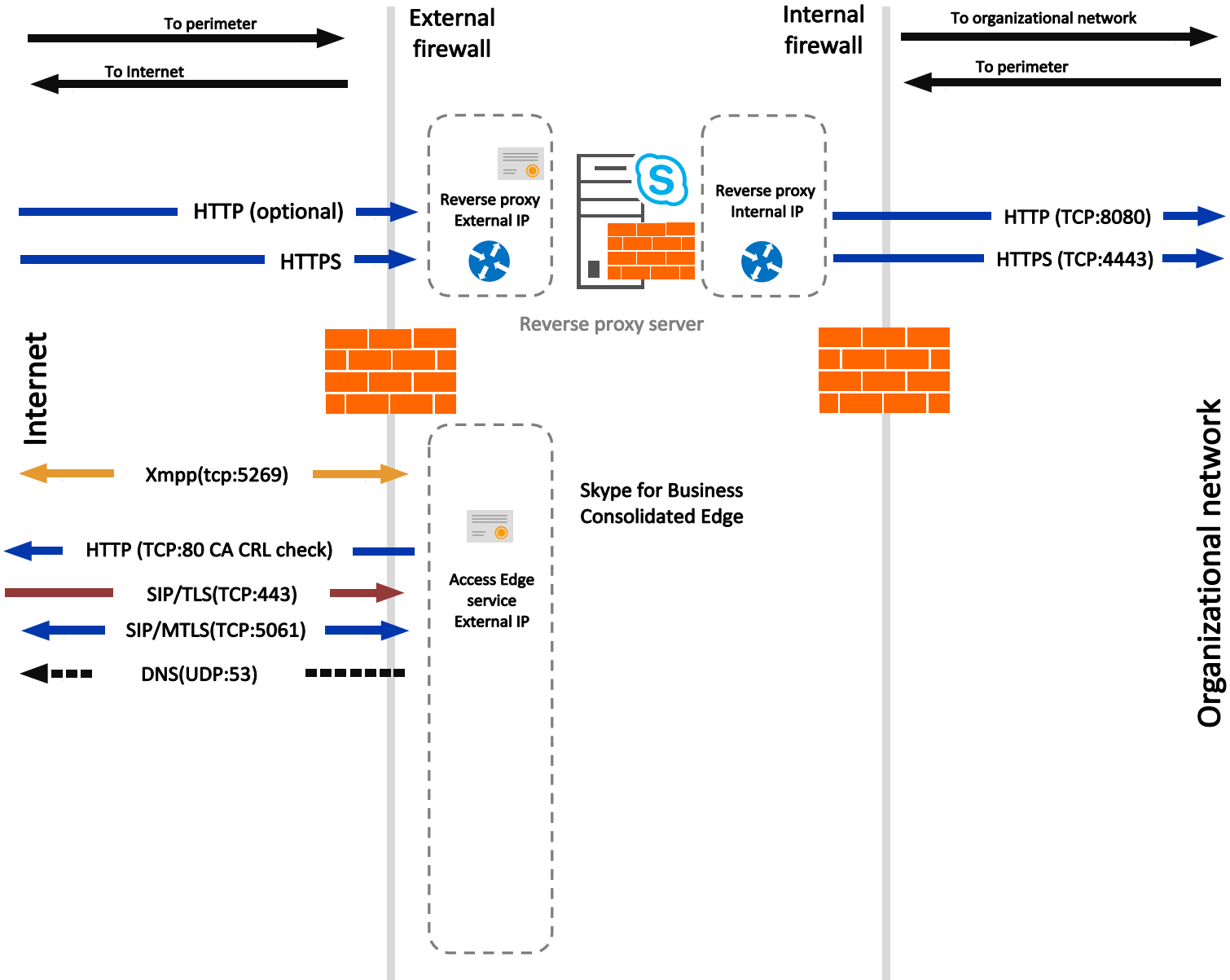
Edge Server Services

- The Skype for Business Server Edge Server role requires two network adapters:
  - One configured as the external, Internet-facing network adapter
  - Another configured as the internal, LAN–facing network adapter
- If you can use three public IP addresses per Edge server, most of the traffic can communicate on port 443
- If you set aside only one public IP address per Edge server, traffic differentiates based on port rather than IP address

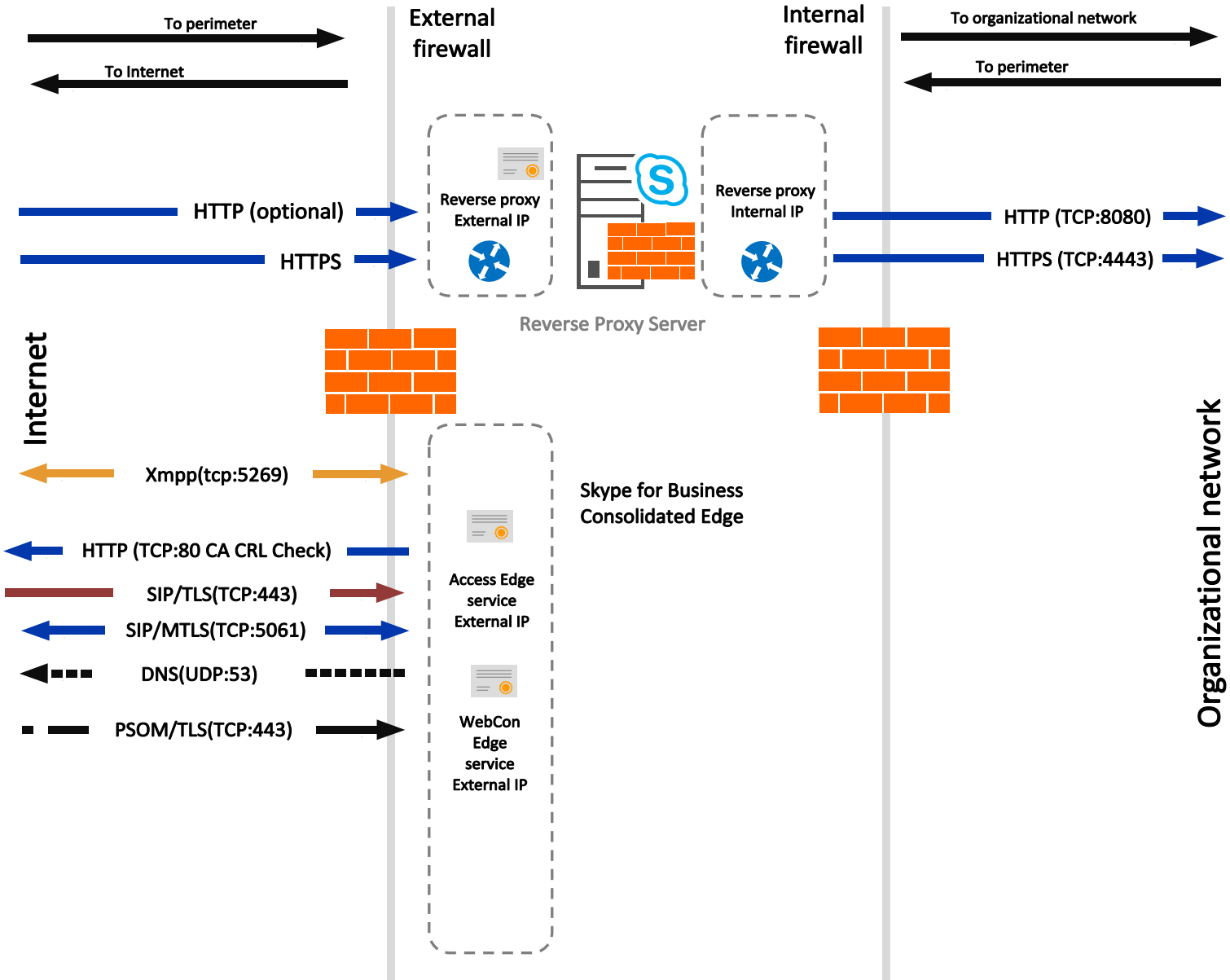
Edge Server Services



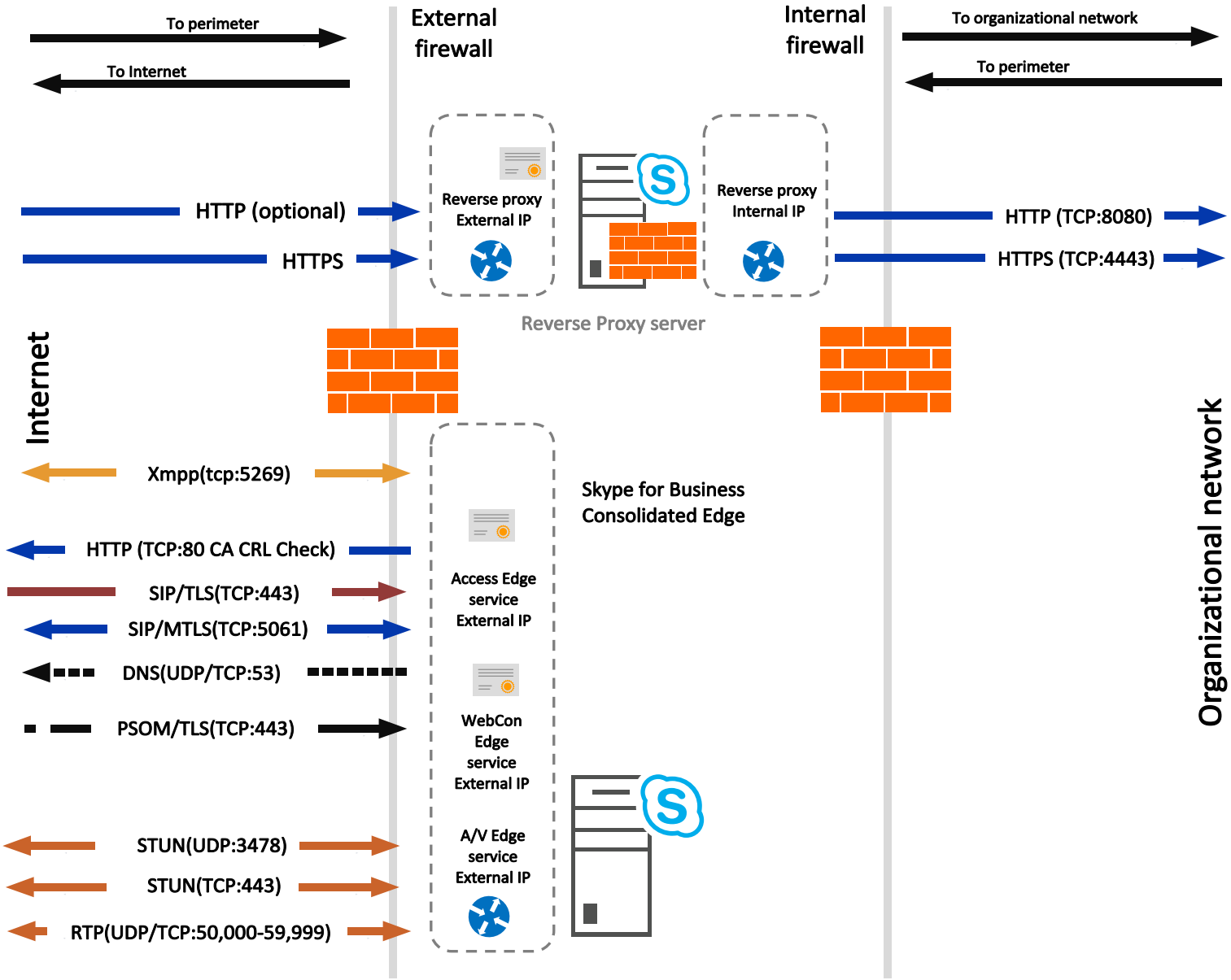
Edge Server Services



Edge Server Services



Edge Server Services



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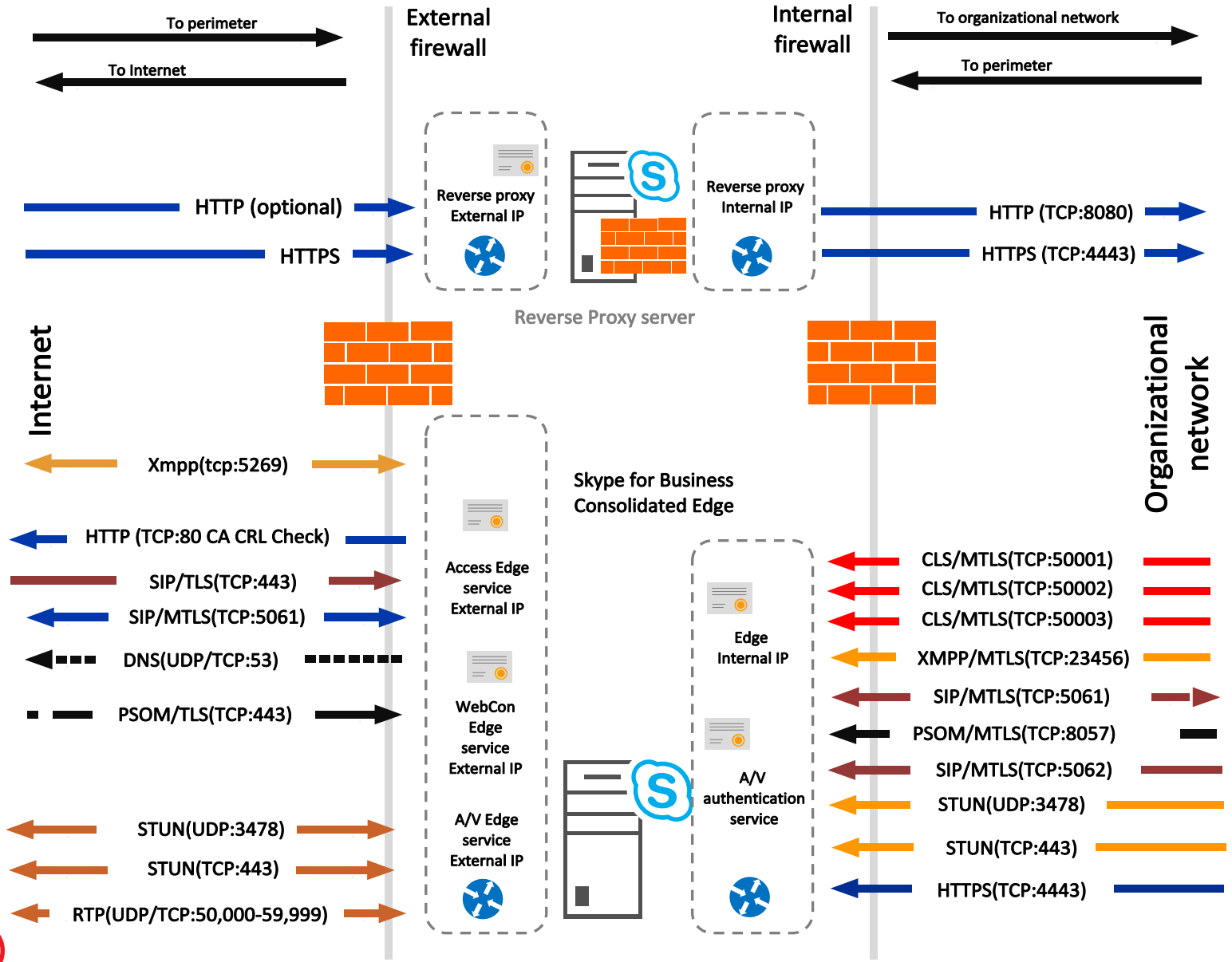
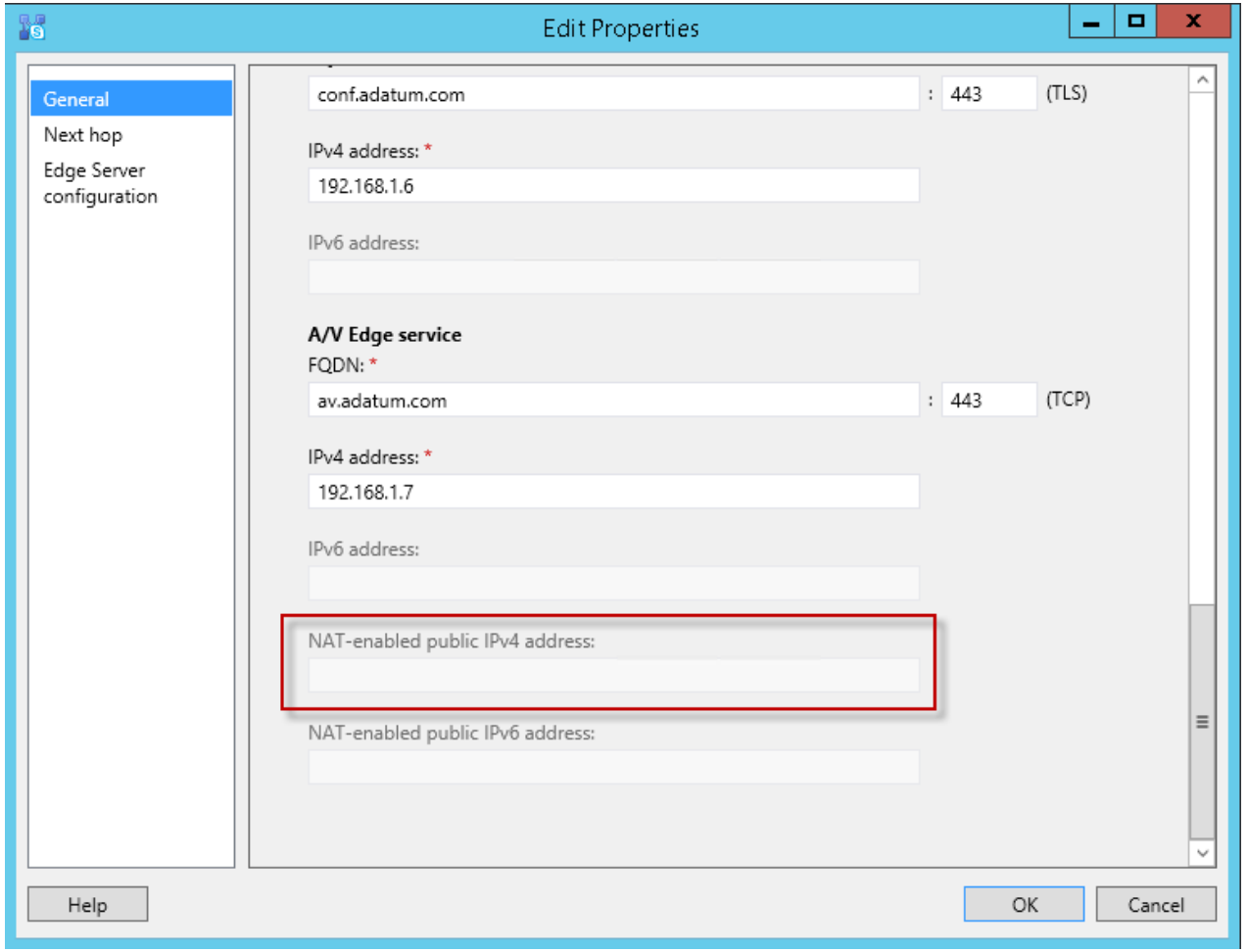


Network Address Translation

- External firewall handles NAT
- Public IP address, configured by using Skype for Business Server Topology Builder
- NAT-enabled public IPv4 address will be used in SDP



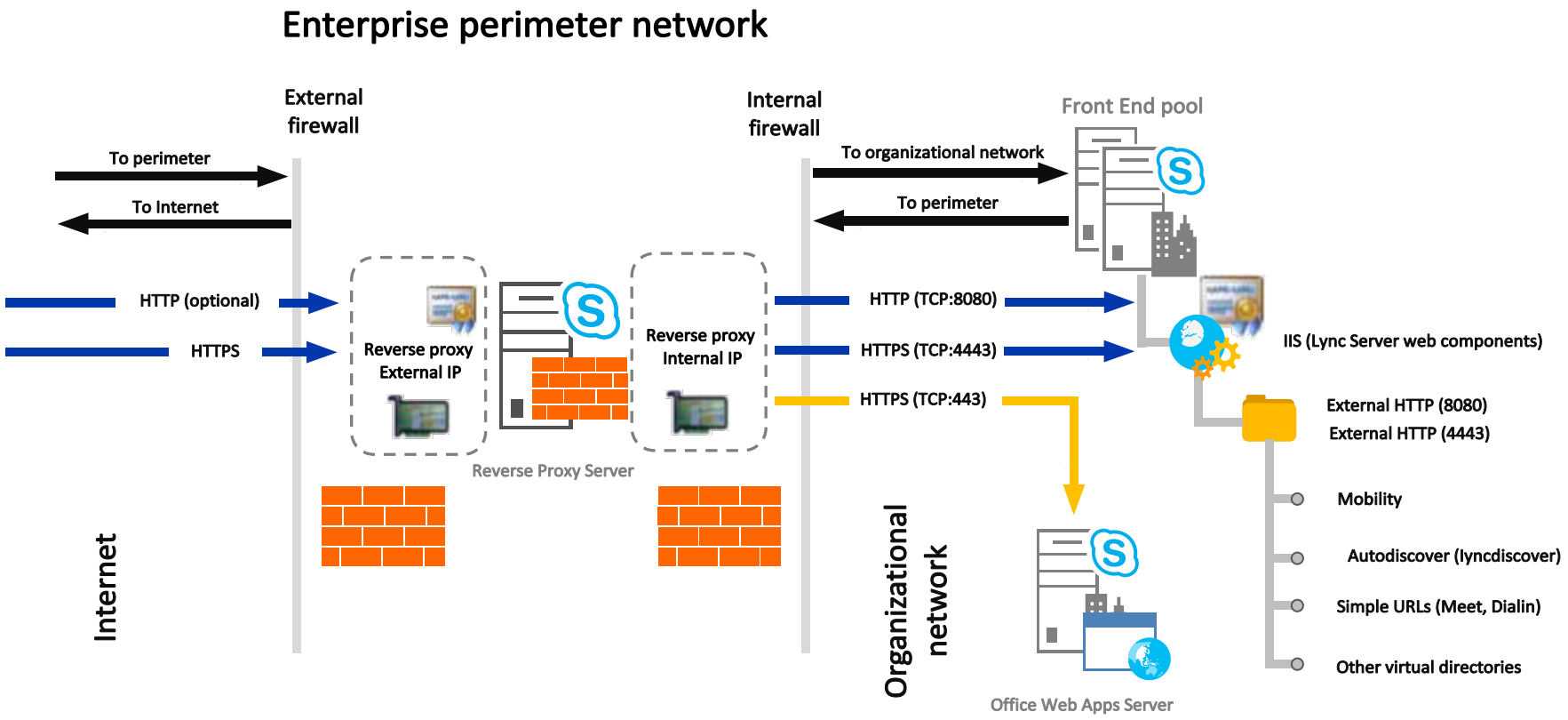
Internal and External DNS

- Split-brain DNS:
  - External and internal DNS resolves the same name differently
- Typical external service (SRV) resource records include:
  - _sip._tls.adatum.com SRV 0 0 443 sip.adatum.com
  - _sipfederationtls._tcp.adatum.com SRV 0 0 5061 sip.adatum.com
  - _xmpp-server._tcp.adatum.com SRV 0 0 5269 sip.adatum.com
- Firewall must block internal Skype for Business clients from connecting to external Edge server addresses

Configuring Edge Server Certificates

- Public certificates used on the external network adapter with three IP addresses:
  - Sip.adatum.com
  - Conf.adatum.com
  - If servers are pooled, same public certificate and private key on servers
  - Use a public CA, which external parties trust
- Internal, private certificates on the internal network adapter:
  - Individual server names
  - Pool name
  - If servers are pooled, same private certificate and private key on servers
  - Use a private CA if internal clients only need trust

Using Reverse Proxy in Skype for Business



Configuring Reverse Proxy

- Reverse proxy:
  - Requires a TLS/443 listener on the Internet
  - Inspects traffic and only allows true HTTPS
  - Port redirection from external 443 to internal 4443
  - Port redirection from external 80 to internal 8080 but only if allowing unencrypted connections!
  - Performs additional inspection depending on make and brand
  - Resides in the perimeter network
- Microsoft offerings for reverse proxy:
  - Web Application Proxy, which is a Remote Access component in Windows Server 2012 R2 that requires AD FS
  - IIS-ARR, which is a downloadable add-in to IIS

Configuring Reverse Proxy Certificates

- Only external clients and participants use a reverse proxy
- Use public certificates when using HTTPS
- For the TLS channel to establish a connection, a reverse proxy must trust the internal CA
- Wildcard support is limited

Using the Windows Server Web Application Proxy

- New in Windows Server 2012 R2
- Requires AD FS
- Skype for Business Server uses pass-through authentication
- IIS ARR as an alternative?

Mobile Device Capabilities

- Skype for Business Mobile app
- Lync 2013 mobile
- Presence and IM
- Wi-Fi and/or data channel for VoIP and video
- If VoIP is unavailable, use PSTN callback
- Server-side conversation history
- Calendar for today and tomorrow
- Mobility policy

Autodiscover Service

- Automatic discovery = lyncdiscover and lyncdiscoverinternal
- Mobile devices are directed to the external web service by default
- Hairpinning occurs when an internal client goes out and back in through the same firewall
- **Set-CsMcxConfiguration** used to configure whether the mobility service web service publishes the internal or external web service URL

Configuring a SIP Federated Domain

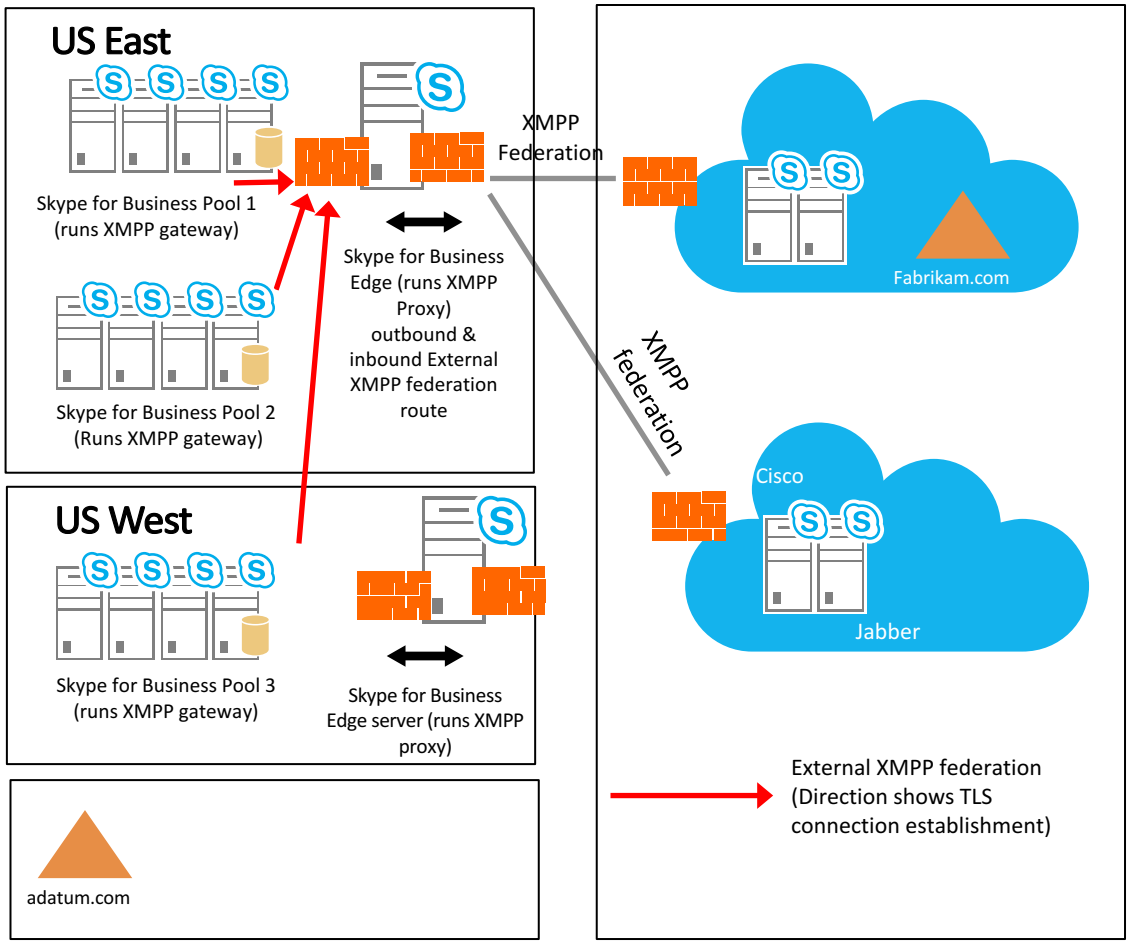
- Allowed Partner Server allows communication with domains with configured Edge server addresses
- Allowed Partner Domain enables communication with allowed domains and automatic discovery of Edge server addresses and port
- Discovered Partner Domain enables automatic discovery of partners by using DNS

PIC Provisioning

- https://pic.lync.com
- Required information to initiate the PIC process:
  - Microsoft agreement number
  - Access Edge service FQDN
  - SIP domains
  - Any additional Access Edge service FQDNs
  - Contact information

XMPP Federation

- XMPP natively integrates with the Skype for Business Front End Server and Edge Server:
  - A separate gateway is not necessary
  - Integrated setup and management
- Scale-out and high availability are consistent with the rest of Skype for Business
- Cisco and Jabber interoperability



Voice on-prem and in the Cloud

Background: History of Microsoft Voice Solutions

- Traditional telephony operates on “circuit switched” network requiring dedicated circuit for each conversation
- Data networks allow multiplexing multiple streams of data over the same medium
- VoIP brings voice on to the data network with some challenges that must be handled – connect to the PSTN
- Microsoft’s solutions that work with VoIP technology

Microsoft Office Communications Server 2007

Microsoft Office Communications Server 2007 R2

Microsoft Lync Server 2010

Microsoft Lync Server 2013

Skype for Business

Overview of Voice Architecture Options

- On-Premises integration with:
  - IP/PSTN Gateway
  - IP-PBX
  - Session Border Controller to ITSP via SIP Trunk
- In-cloud services offered as part of Office 365
  - Cloud PBX with PSTN Calling
  - Cloud PBX with On-Premises PSTN Connectivity
  - PSTN Conferencing

Background Definitions

- Public Switched Telephone Network (PSTN)
- Private Branch eXchange (PBX)
- Voice over IP (VoIP)
- Session Initiation Protocol (SIP)
- Internet Telephony Service Provider (ITSP)

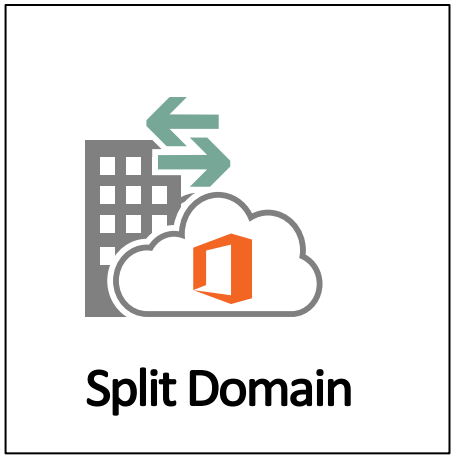
Office 365 Core Components

Skype for Business Deployment Options

Cloud

Microsoft Office 365, Skype for Business Server 2015

Partner-hosted multi-tenant



Split Domain

Single domain and directory

Users split–server / online

On-premises

Skype for Business Server 2015

Private cloud / dedicated

Enabling gradual migration and coexistence between Skype for Business Server 2015 and Skype for Business Online

The Office 365 Tenant Account

- An administrative presence in the Office 365 cloud
- Required to acquire and provision Office 365 cloud based services
- Requires providing a valid e-mail account for verification

Azure Active Directory and Azure AD Connect

- Synchronizes changes between Active Directory Domain Services (AD DS) on premises and Azure Active Directory Services (AADS)
- Provides for easier Identity Management between to the two directories
- Azure Active Directory Connect
  - Replaces DirSync from earlier Office 365 Split Domain type deployments
- Active Directory Domain Services becomes the authoritative source for information
- Recommended to also enable Password Synchronization

Skype for Business Voice Workloads

- Enterprise Voice (on-premises)
- Dial-in Conferencing (on-premises)
- Cloud PBX with PSTN Calling
- Cloud PBX with On-Premises PSTN Connectivity
  - Cloud PBX with existing Skype for Business Server Deployment
  - Cloud Connector Edition
- PSTN Conferencing

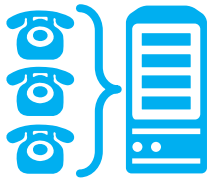
Skype for Business PSTN Connectivity Options

Online

- Cloud PBX in Office 365
- PSTN services provided by Microsoft

Split Domain

- Users hosted in Office 365
- Customer PSTN services integrated on-premises

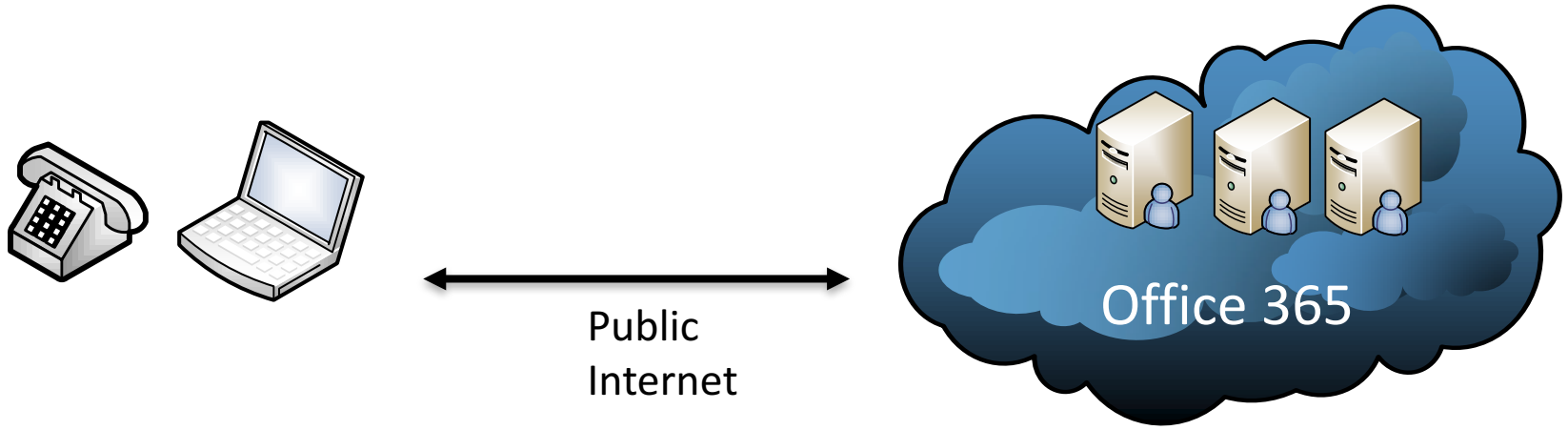


On Premises

- End-user features & customer PSTN services integrated on-premises

Cloud PBX with PSTN Calling

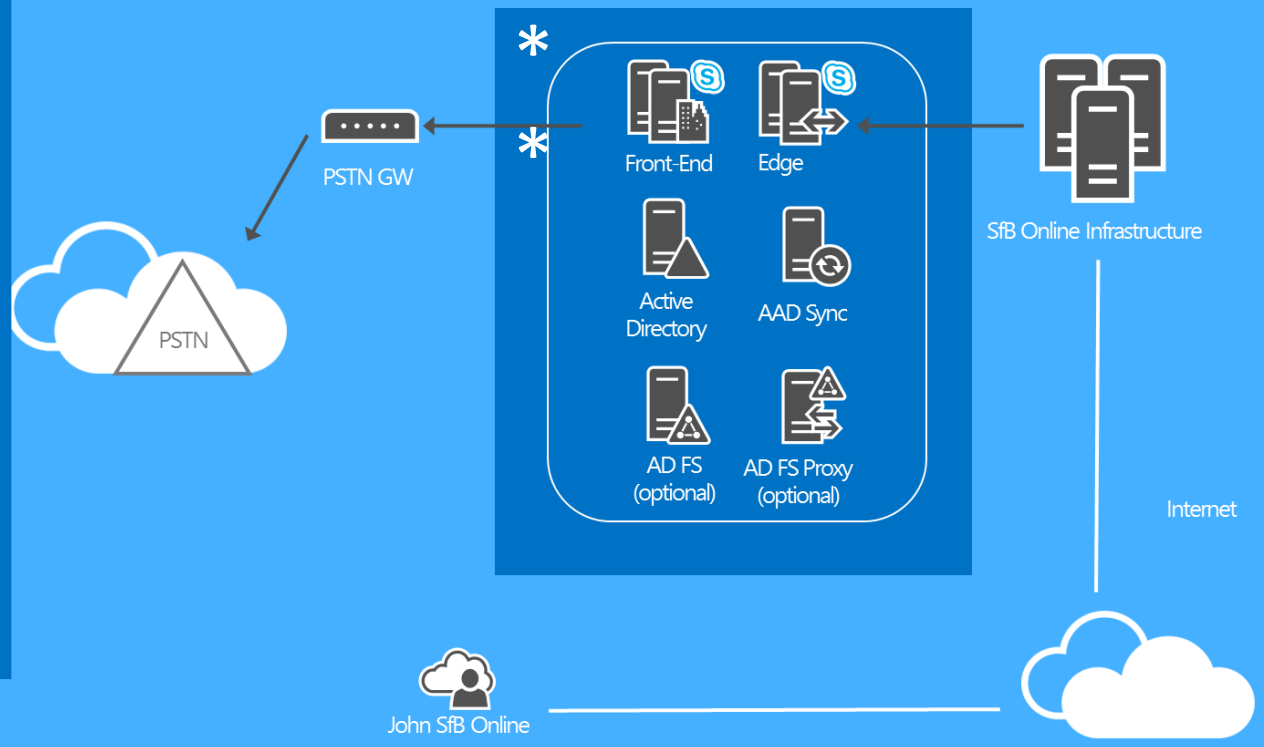
Two core parts always in the cloud
- Cloud-based call control for end-users
- Tenant admin user experience for IT Pros



Independent of PSTN Services and On-Premises PSTN Connectivity

Cloud PBX with On-Premises PSTN Connectivity

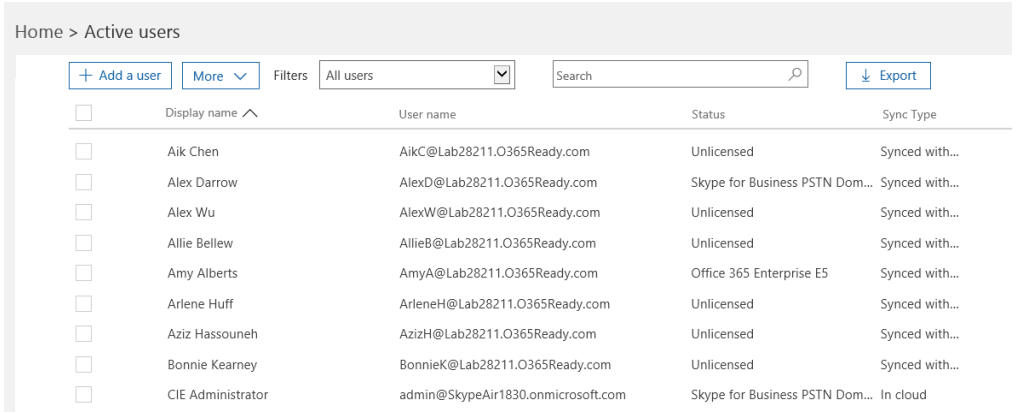
Enables Public Switched Telephone Network (PSTN)/PBX connectivity for cloud users through the PSTN infrastructure that is part of the on-premises deployment



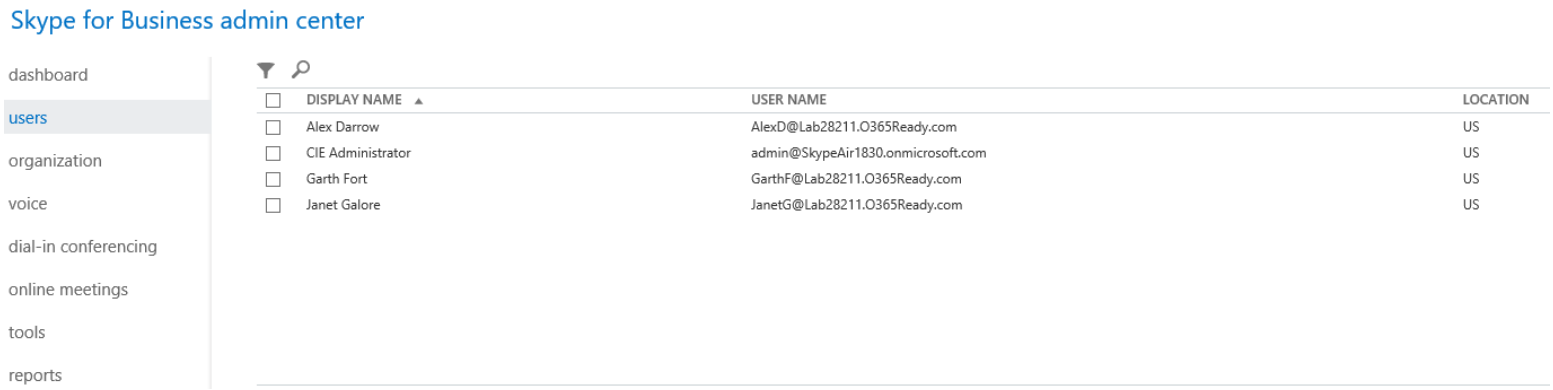
**On-Premises Environment could also be supported by Cloud Connector Edition

User Management in the Cloud

- Office 365 Portal



- Skype for Business Online



Děkuji za pozornost