Agency Implementation Steps

AT&T Hosted Skype for Business

DIVISION OF ENTERPRISE TECHNOLOGY

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INTRODUCTION

This document describes the steps required to implement the Hosted AT&T Skype4B service for the agencies, including the steps required to prepare and deploy a specific site. The responsible organization is listed after each step heading.

STEPS

1. SITE SURVEY

The Division of Enterprise Technology (DET) will proactively perform a Site Survey for all sites to identify the existing environment and to help determine any required upgrades or changes. Please note that the Site Survey may not involve an actual site visit but is rather a process used to gather the appropriate information required to get the site ready for the AT&T Hosted Skype4B service. The agency can also open a Service Request (SR) with DET to track the progress.

Some information that is identified during the Site Survey process:

a. Determine Resiliency Requirements for Access – **Agency and DET**

Low - Internet Only

Medium – BadgerNet Only

High – BadgerNet with Internet Backup

Custom – 4G Backup, Survivable Branch Appliance, etc.

b. Determine Capacity / Concurrent Audio Call Requirements – **DET**

100K per Concurrent Audio Call is required. Video bandwidth requirements are higher. If it is known that significant video conferencing will be used at a specific site, this should be communicated to DET.

c. Switch Configuration – **DET**

The Ethernet switch should be POE-capable or AC adapters will be required for each phone. All Skype4B phones included in the AT&T contract are 802.3af compatible (normal PoE). However, the Polycom Conference phone (Real Presence Trio) requires 802.3at (PoE+) if being used with the Visual + unit (for Video conferencing). A PoE+ adapter can be purchased on the AT&T contract for $120 (one required for each phone).

The switches must also support LLDP (Link Layer Discovery Protocol), which must be enabled.

2. SITE INFORMATION COLLECTION

DET will provide each agency a prepopulated Onboarding Workbook (a.k.a. Capture Document) with as much information as is available in the STAR system. It is the agency's responsibility to ensure that this information is accurate and complete. The Onboarding Workbook can be submitted to AT&T before it is complete but it should be resubmitted as soon as updates are made.

a. End-User Identification – **Agency**

At a minimum, the End-User's *Telephone Number*, *Email Address*, and *Site* must be correct. This is required for AT&T to configure the User in Skype4B, Port the user's number, and set up 911, etc. The agency should also ensure that any updated End-User information is reflected in STAR and AD.

It is the responsibility of the agency to verify End-User Microsoft Licensing (if required).

b. End-User Profile (Service Level) – **Agency**

Enhanced Profile

Basic Profile

Skype4B Online).

c. End-User Equipment – **Agency**

Skype4B Soft Client Only (Headset or USB Speakerphone)

Skype4B Phone (Model and MAC Address) and Skype4B Soft Client

d. Non-User Resource Telephone Lines – **Agency**

Includes Analog Lines, Room Resources / Conference Room phones, etc.

e. Identify any Response Group requirements – **Agency and DET**

Required for AT&T to configure Response Groups / Hunt Groups

3. SUBMIT CHANGE ORDER

Once the information is collected in the Onboarding Workbook, the agency will submit a Change order to AT&T to begin the implementation process. - **Agency**

4. SITE PREPARATION

Following are the steps required to get a site ready for the AT&T Hosted Skype4B service:

a. WAN Configuration - **DET**

BadgerNet, BCN and / or Internet Access buildout based on Bandwidth requirements.

b. QoS Configuration – **Agency and DET**

DET - QoS marking performed at the workstation and by Skype4B phones must be honored by all components in the following network paths:

- Between all workstation subnets (including Wi-Fi) / Voice VLAN subnets. This is required for User-to-User traffic.
- Between all workstation subnets (including Wi-Fi) / Voice VLAN subnets and the Skype4B servers (FE, Edge, and Mediation) at AT&T.
- Between all workstation subnets (including Wi-Fi) / Voice VLAN subnets and the Media end points (SBCs, etc.) at AT&T. This is required for media bypass.

The following table indicates the QoS values that will be used:

Traffic Type	Server Ports	Client Ports	QoS Value
Audio / SIP	UDP 50000 - 55999	UDP 50000 - 50049	DSCP 46 (EF)
Video / Media	UDP 56000 - 57999	UDP 50050 - 50099	DSCP 34 (AF41)
App Sharing / File Transfer	TCP 58000 - 59999	TCP 500100 - 50149	DSCP 24 (CS3)
Signaling / STUN / TURN	TCP 443, 5061 and UDP 3478	TCP 443, 5061 and UDP 3478	DSCP 24 (CS3)

Agency - This marking must be set at the Workstation via Group Policy (GPO). It is detailed in the attached document:

Skype for Business - QoS Group Policy Set

c. VLAN Configuration - **DET**

Separate Voice and Data VLANs will need to be configured at each site. The IP phones will join the Voice VLAN, while the workstations will join the Data VLAN.

d. DHCP Configuration - **DET and AT&T**

DET - There are several DHCP options that must be set to allow Skype4B phones to connect to the Skype4B servers. These include but are not limited to the following:

- Option 2: Time Offset
- Option 15: Domain Name
- Option 42: NTP Server
- Option 54: Server Identifier (AT&T Skype4B Server)
- Option 55: Parameter request list
- Option 60: Class-identifier
- Option 160: TFTP Server Address (for phone management)

AT&T - The following DHCP Options will be provided by the AT&T Skype4B server (the appropriate Firewall ports must be opened – UDP 67/68):

- Option 120: SIP Server DHCP Options
- Option 43: Vendor-specific info (includes the following sub options):
  - sub-option 1 <UC Identifier>:
  - sub-option 2 <URL Scheme>:
  - sub-option 3 <Web Server FQDN>:
  - sub-option 4 <Port>:
  - sub-option 5 <Relative Path for Cert Prov>:

Details can be found here:

https://technet.microsoft.com/en-us/library/gg398088(v=ocs.14).aspx

http://www.myskypelab.com/2015/11/skype4b-lync-dhcp-config-tool.html

e. DNS - **Agency**

If the agency is not using the Accounts Domain and/or does not have access to the GTM Delegated DNS, the following DNS records will be required in their Internal DNS Servers (please note that one of each record will be required for each domain name):

DNS Entry	Record Type	Target	Port / Service Protocol
lyncdiscoverinternal.vanitydomain.gov	A	AT&T FE Server Pool or Load Balancer	
_sipinternaltls._tcp.vanitydomain.gov	SRV	AT&T FE Server Pool or Load Balancer	TCP 5061

These are normally handled by GTM Delegated DNS Records.

Setting up a new vanity domain in Skype4B requires additional Local and External DNS entries (set by DET). This is described in a separate document.

Please note that the internet is used as a backup for the AT&T Virtual Private Network (AVPN). The Skype4B client initially queries the Internal DNS entry lyncdiscoverinternal.vanitydomain.gov record to obtain the Internal IP Address (routing over the AVPN). If the internal DNS query fails or the connection attempt to the resolved internal IP address fails, the client automatically queries the External DNS entry lyncdiscover.vanitydomain.gov to obtain the external IP addresses (routing over the internet).

f. Network Access Control (NAC) / Identity Services Engine (ISE) Setup – **Agency and DET**

The MAC addresses of the IP phones need to be provided from the agency to DET so they can be populated in NAC. For new deployments with several phones (bulk adds), the Agencies should open a Service Request in Cherwell and provide a list (preferably a spreadsheet) with all of the IP phone MAC addresses. This should be done as soon as the agencies have the MAC addresses and well before actual turn-up of the service. There is no need to associate each MAC address with a specific user or switch port.

g. Equipment Setup – **Agency, DET and AT&T**

- Switches - **DET**

  The Ethernet switch should be PoE capable. All Skype4B phones included in the AT&T contract are 802.3af compatible (normal PoE). However, the Polycom Conference phone (Real Presence Trio) requires 802.3at (PoE+) if being used with the Visual+ unit (for Video conferencing). A PoE+ adapter can be purchased on the AT&T contract for $120 (one required for each phone).

  The switches must also support LLDP (Link Layer Discovery Protocol), which must be enabled.

- Survivable Branch Appliance (SBA) – **DET and AT&T**

  An SBA is used for Site Resiliency. It provides a mechanism for the Skype4B phones to register locally and offer public switched telephone network (PSTN) connectivity if the connection to the AT&T Skype4B system is lost. There is an Audio Codes SBA listed in the AT&T Contract.

- Analog GWs - **DET and AT&T**

  The Analog GWs are used to support Analog / Plain Old Telephone Service (POTS) lines that cannot be converted to normal Skype4B lines or moved to another technology.

- IP Phones - **Agency or AT&T**

  Once the phones have been received by the agency, the MAC address of each phone should be recorded and listed in the Onboarding Workbook and provided to DET via an SR for the NAC / ISE configuration (if applicable). A Bar Code scanner works very well for accurately recording a MAC address in a spreadsheet.

  The phone is placed on the end user's desk and connected via the supplied Ethernet cable to the Ethernet wall jack. The end-user's PC is then connected to the phone. If a PoE switch is in use at the facility, no extra power connection is required.

  AT&T will perform these functions for an extra charge.

- Skype4B Client Install on PCs – **Agency**

  The Skype4B client is included with the latest Microsoft Office suite. A standalone version is also available (Enhanced Profile and Skype4B Online only).

- Better Together over Ethernet (BToE) App Install on PCs - **Agency**

  To facilitate integration between the end user's IP Phone and Skype4B client, a small app called BToE can be installed on the end user's workstation. The BToE app pairs the user's IP phone via Ethernet with the Skype4B client running on their PC / laptop. This allows the user to log the IP Phone in to Skype4B from their PC / laptop and control phone operations such as answering incoming calls, placing outgoing calls (click-to-dial), holding and resuming calls, and initiating/joining online meetings or Skype4B conferences using the Skype4B client. Details on BToE can be found in the FAQ (Enhanced Profile only).

h. Firewall Configuration – **DET**

The following ports should be opened between all workstation subnets (including Wi-Fi) / Voice VLAN subnets:

- TCP: 80, 443, 5061, 5223, 8057, 50000-50149
- UDP: 3478, 50000-50149

This is required for user-to-user traffic.

The following ports should be opened between all workstation subnets (including Wi-Fi) / Voice VLAN subnets and the Skype4B servers (FE, Edge and Mediation) at AT&T.

- TCP: 80, 443, 5061, 5223, 8057, 50000-59999
- UDP: 67, 68, 3478, 50000-59999

The following ports should be opened between all workstation subnets (including Wi-Fi) / Voice VLAN subnets and the Media end points (SBCs, etc.) at AT&T.

- TCP: 443, 50000-59999
- UDP: 3478, 50000-59999

This is required for media transport.

i. Zscaler Configuration (required for Skype4B Online) – **DET**

Zscaler should be used at all sites for access to Office 365 (O365) for Skype4B Online integration and Exchange Online UM for Voicemail. Both the Workstation Subnets and Voice VLAN subnets should route all traffic destined for O365 (e.g., *.lync.com) via Zscaler. Please note that this is applicable to agencies using Skype4B Online and not required for the AT&T Hosted Skype4B service.

j. Site Configuration in Skype4B - **AT&T**

k. End User Configuration in Skype4B - **AT&T**

l. Response / Hunt Group Configuration - **AT&T**

m. Training – **Agency and AT&T**

5. SITE TURN-UP

a. Follow Site Preparation steps (above) for users / sites – **DET and AT&T**

b. Set up new users in Skype4B – **AT&T**

c. Configure the Direct Inward Dialing (DID) in Skype4B – **AT&T**

d. Port Centrex numbers – **AT&T**

e. Testing – **Agency, DET and AT&T**

The attached Test Plan can be used to verify functionality:

Skype4B TestPlan.xlsx

Document Revision History

Date	Version	Editor / Author	Notes
8/10/2017	1.0	Daniel Foelker / R. Haile	Initial version
11/21/2017	2.0	Daniel Foelker / R. Haile	Updated info for QOS, NAC / ISE, IP Phones, BToE and Testing.