

# Skype for Business Integration Guide

Integration Guide  
18 December 2018



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# How to use StarLeaf with Skype for Business Server 2015

## Pre-requisites

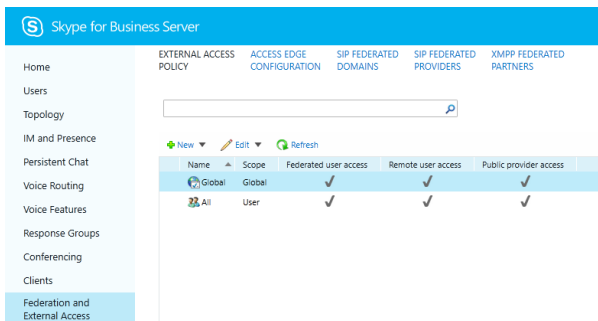
To be able to call outside of your Skype for Business deployment, the Skype for Business server requires certain ports to be open on the firewall. Your Edge Server needs to conform to the requirements in Microsoft's [Port summary for the Edge Server](#).

## Step One: Federate between the Skype for Business Server and StarLeaf

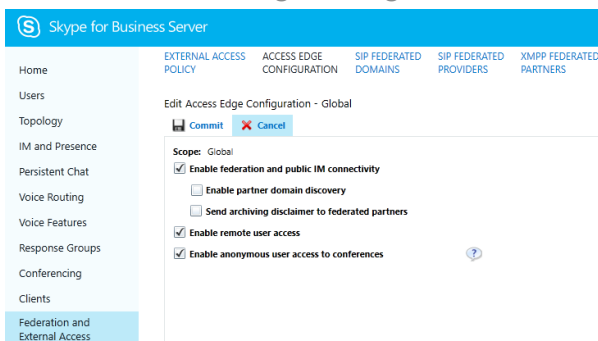
If your Skype for Business deployment is configured as open federation, skip this step and go directly to [Step two: Configure your firewall \(p5\)](#).

If your Skype for Business deployment is not configured as open federation, you need to add your organization's call.sl subdomain (**<your organization name>.call.sl**) among your list of federated partners. You also need to add the call.sl domain for any other StarLeaf organization that you want to communicate with. This is described here:

1. Log in to the Skype for Business Front End or Standard Edition Server and open the Skype for Business Control Panel.
2. Go to **Federation and External Access > External Access Policy** and ensure that **Federated User Access** is checked. If not, enable it by clicking on **Edit > Show Details** and check **Enable Communications with Federated users**.



3. To enable federation at a system level, select **Access Edge Configuration** from the top navigation.
4. Under **Edit Access Edge Configuration**: Select **Enable federation**.



5. To add the StarLeaf Skype for Business domain, go to **SIP Federated Domains** from top navigation.

6. Now add a new domain pointing to **<organization name>.call.sl** and edge server pointing to **<organization name>.call.sl**.

The screenshot shows the 'Skype for Business Server' administration console. The left-hand navigation pane includes 'Home', 'Users', 'Topology', 'IM and Presence', 'Persistent Chat', 'Voice Routing', 'Voice Features', 'Response Groups', 'Conferencing', 'Clients', and 'Federation and External Access'. The top navigation bar contains 'EXTERNAL ACCESS POLICY', 'ACCESS EDGE CONFIGURATION', 'SIP FEDERATED DOMAINS', 'SIP FEDERATED PROVIDERS', and 'XMPP FEDERATED PARTNERS'. The main content area is titled 'New SIP Federated Domains' and features a 'Commit' button and a 'Cancel' button. Below these are three input fields: 'Domain name (or FQDN):' with the value 'example.call.sl', 'Access Edge service (FQDN):' with the value 'example.call.sl', and 'Comment:' with the value 'Example StarLeaf Organisation'.

## Step two: Configure your firewall

For each StarLeaf domain you wish to call, ensure your firewall allows traffic to/from the organization's **<organization name>.call.sl** domain in the following tables. This assumes you have a deployment where the ports 50,000 - 59,999 are used for media. If your firewall requires you to use IP addresses rather than DNS names, contact [StarLeaf Support](#) for the IP addresses. These port requirements are for connections, not for packet data.

### Inbound port requirements

Type	StarLeaf side (source)	Edge server (destination)	Reason
TCP	Ephemeral (1024-65535)	5061	Call signaling

### Outbound port requirements

Type	Edge server (source)	StarLeaf side (destination)	Reason
TCP	Ephemeral (1024-65535)	5061	Call signaling
UDP*	50000-59999	50000-59999	Audio/video media
TCP	50000-59999	50000-59999	Audio/video and screen-share media

\*Recommended for best user experience, but not strictly necessary.

## Step three: Update SRV record

Ensure you have an up-to-date federation SRV record for your Skype for Business domain (Skype for Business server domain). For example, where a domain is **example.com**, the SRV record would be:

**\_sipfederationtls.\_tcp.example.com**

# How to use StarLeaf with Lync Server 2013

## Pre-requisites

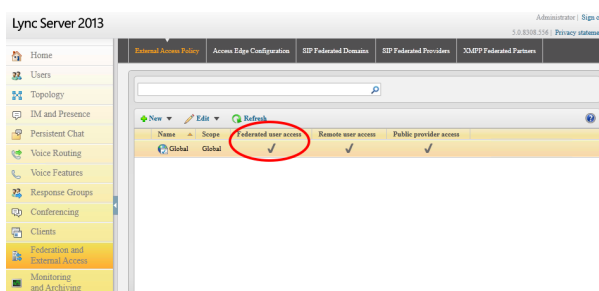
To be able to call outside of your Lync deployment, the Lync server requires certain ports to be open on the firewall. Your Edge Server needs to conform to the requirements in Microsoft's [Port summary for the Edge Server](#).

## Step One: Federate between the Lync Server and StarLeaf

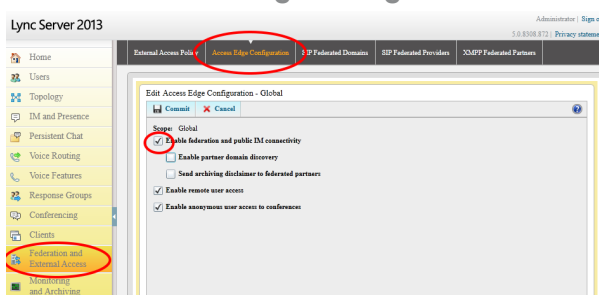
If your Lync deployment is configured as open federation, skip this step and go directly to [Step two: Configure your firewall \(p8\)](#).

If your Lync deployment is not configured as open federation, you need to add your organization's call.sl subdomain (**<your organization name>.call.sl**) among your list of federated partners. You also need to add the call.sl domain for any other StarLeaf organization that you want to communicate with. This is described here:

1. Log in to the Lync Front End or Standard Edition Server and open the Lync Control Panel.
2. Go to **Federation and External Access > External Access Policy** and ensure that **Federated User Access** is checked. If not, enable it by clicking on **Edit > Show Details** and check **Enable Communications with Federated users**.

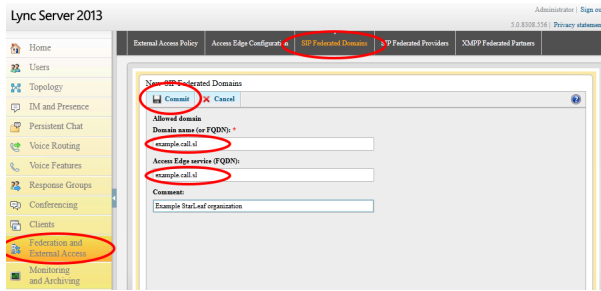


3. To enable federation at a system level, select **Access Edge Configuration** from the top navigation.
4. Under **Edit Access Edge Configuration: Select Enable federation**.



5. To add the StarLeaf Lync domain, go to **SIP Federated Domains** from top navigation.

6. Now add a new domain pointing to **<organization name>.call.sl** and edge server pointing to **<organization name>.call.sl**.



## Step two: Configure your firewall

For each StarLeaf domain you wish to call, ensure your firewall allows traffic to/from the organization's **<organization name>.call.sl** domain in the following tables. This assumes you have a deployment where the ports 50,000 - 59,999 are used for media. If your firewall requires you to use IP addresses rather than DNS names, contact [StarLeaf Support](#) for the IP addresses. These port requirements are for connections, not for packet data.

### Inbound port requirements

Type	StarLeaf side (source)	Edge server (destination)	Reason
TCP	Ephemeral (1024-65535)	5061	Call signaling

### Outbound port requirements

Type	Edge server (source)	StarLeaf side (destination)	Reason
TCP	Ephemeral (1024-65535)	5061	Call signaling
UDP*	50000-59999	50000-59999	Audio/video media
TCP	50000-59999	50000-59999	Audio/video and screen-share media

\*Recommended for best user experience, but not strictly necessary.

## Step three: Update SRV record

Ensure you have an up-to-date federation SRV record for your Lync domain (Lync server domain). For example, where a domain is **example.com**, the SRV record would be:

**\_sipfederationtls.\_tcp.example.com**



# How to use StarLeaf with Skype for Business Online

## Step one: Configure Skype for Business Online in the cloud

For your own StarLeaf organization, and for all other StarLeaf organizations with which you want to communicate, you need to ensure that Skype for Business Online (Office 365) allows communication as follows:

1. Log in to **portal.microsoftonline.com** as an administrator for the Skype for Business organization.
2. Click on the **Admin** tile. This takes you to the Admin center.
3. Click on **Admin centers > Skype for Business** in the left-side panel. This takes you to the Skype for Business admin center.
4. Click on **Organization** then click on the **external communications** tab. Either:
  - a. Configure external access to **On except for blocked domains** and ensure **<organization name>.call.sl** is NOT present in the blocked or allowed domains table.  
or
  - b. Configure external access to **On only for allowed domains** and ensure **<organization name>.call.sl** IS present in the blocked or allowed domains table.  
or
  - c. Configure external access to **Off completely**. However, StarLeaf does not recommend this option as it is a security risk.

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**Note:** You must allow up to 24 hours for the changes to the **external communications** settings to take effect before you contact StarLeaf technical support.

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## Step two: Configure firewall for communication with StarLeaf

For each StarLeaf domain you wish to call, ensure your firewall allows traffic to/from the organization's **<organization name>.call.sl** domain on the following in the following tables. If your firewall requires you to use IP addresses rather than DNS names, contact [StarLeaf Support](#) for the IP addresses. The following requirements are for outbound connections. Your firewall should also allow packets to flow inbound on established and related connections.

### Outbound port requirements

From 365 Client	To StarLeaf Cloud	Reason
UDP 50000-50059	UDP 50000-59999	Audio/video media
TCP 50000-50059	TCP 50000-59999	Screen-share media

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**Note:** This configuration allows media to flow directly to StarLeaf Cloud to provide the best experience for the end user. If this configuration isn't applied, you need to follow step

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three carefully to allow media to flow via the 365 servers . If you opt to follow step three without also following the instructions in step two, be aware that the quality may not be as good.

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## Step three: Configure firewall for communication with 365 servers in the cloud

Successful communication between your Skype for Business Online (Office 365) clients and the StarLeaf Cloud also relies on your firewall being correctly configured for communication between the clients and the 365 server in the cloud. This is extensively documented at:

[https://support.office.com/en-gb/article/Office-365-URLs-and-IP-address-ranges-8548a211-3fe7-47cb-abb1-355ea5aa88a2?ui=en-US&rs=en-GB&ad=GB#BKMK\\_LYO](https://support.office.com/en-gb/article/Office-365-URLs-and-IP-address-ranges-8548a211-3fe7-47cb-abb1-355ea5aa88a2?ui=en-US&rs=en-GB&ad=GB#BKMK_LYO)

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**Note:** Ensure that both UDP and TCP connectivity is allowed.

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# How to use StarLeaf with a Microsoft AVMCU

The StarLeaf Cloud supports calls into meetings hosted by a Microsoft AVMCU.

The following calling scenarios are supported:

- From inside a Skype for Business meeting, you can add a StarLeaf Cloud registered endpoint as a participant. This scenario includes all StarLeaf and third-party endpoints that are registered to the StarLeaf Cloud, and includes both on-premise Skype for Business and Skype for Business Online deployments. Refer to [How to add a StarLeaf Cloud endpoint from within a Skype for Business meeting \(p11\)](#), below
- You can escalate a point-to-point Skype for Business call into an AVMCU meeting by 'inviting' a StarLeaf Cloud-registered endpoint to that call. This scenario includes all StarLeaf and third-party endpoints that are registered to the StarLeaf Cloud, and includes both on-premise Skype for Business and Skype for Business Online deployments. Refer to [How to escalate a point-to-point call to a Skype for Business meeting \(p12\)](#), below
- You can cause the Join Now button on StarLeaf Cloud room systems to light for AVMCU scheduled meetings. This scenario includes both on-premise Skype for Business and Skype for Business Online deployments. Refer to [How to invite a StarLeaf Cloud room system to a Skype for Business meeting \(p12\)](#), below. This scenario does not include third-party endpoints that are registered to the StarLeaf Cloud (and does not include StarLeaf Personal Telepresence or software clients)
- H.323 endpoints can call into on-premise Skype for Business-hosted meetings by utilizing the Skype for Business IVR (Interactive Voice Response). Refer to [How to allow H.323 endpoints to call into on-premise Skype for Business-hosted meetings](#)

**Note:** Skype for Business federation and firewall requirements apply. The Skype for Business deployment hosting the conference must either have open federation or be federated with the attendee's **subdomain.call.sl** address. For more information on federation and firewall requirements, refer to one of: [How to use StarLeaf with Skype for Business Server 2015 \(p3\)](#), [How to use StarLeaf with Lync Server 2013 \(p6\)](#), [How to use StarLeaf with Skype for Business Online \(p9\)](#). Note that for Skype for Business Online, you do not need to open any additional ports on the firewall; the ports that you have opened for your Skype for Business clients to connect to the 365 server in the cloud are sufficient.

## How to add a StarLeaf Cloud endpoint from within a Skype for Business meeting

When you are in a Skype for Business meeting, you can add a StarLeaf Cloud endpoint to the meeting. In the conversation window, click the **Add participant** control in the top-right of the Skype for Business meeting:

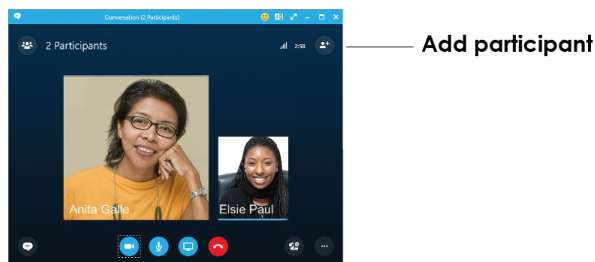


**Add participant**

Type the video address of the participant or room system; this must be in the format: **subdomain.call.sl**. This causes the AVMCU to dial out to that participant. When the participant answers the call, they are added to the Skype for Business meeting.

## How to escalate a point-to-point call to a Skype for Business meeting

When you are in a Skype for Business point-to-point call with a StarLeaf Cloud endpoint, you can escalate the call to a meeting with additional Skype for Business or StarLeaf participants. In the conversation window, click the **Add participant** control in the top-right of the Skype for Business call screen:



Type the video address of the participant or room system; this must be in the format: **subdomain.call.sl**. This causes the AVMCU to escalate the call to a meeting and to dial out to that participant. When the participant answers the call, they are added to the Skype for Business meeting.

## How to invite a StarLeaf Cloud room system to a Skype for Business meeting

Schedule a Skype for Business meeting and invite the StarLeaf Cloud room system to that meeting. This invite must be sent to the room's **subdomain.call.sl** video address. In the example below, we have invited **london@example.call.sl**:

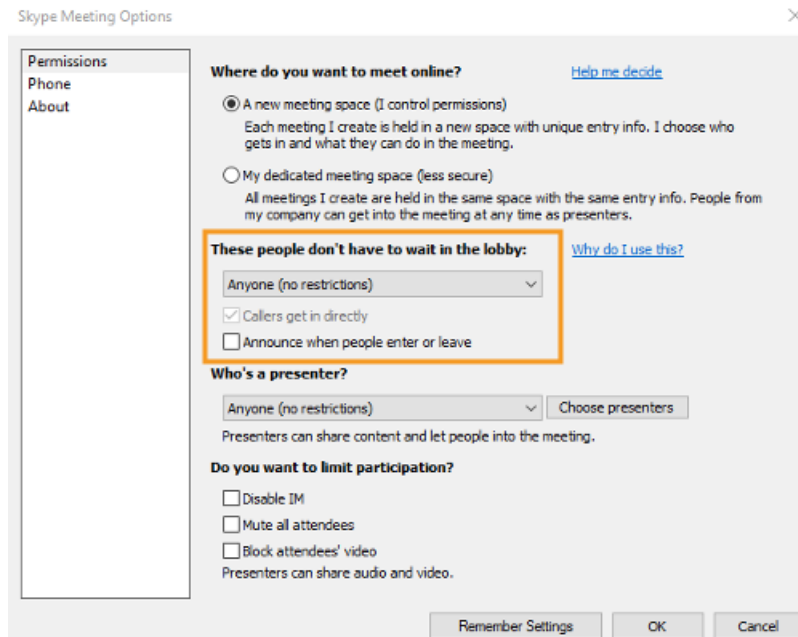
Send	From	jad.elhage@365.starleaf.com		
	To...	london@example.call.sl		
	Subject	Sales update		
	Location	Skype Meeting		
	Start time	Tue 12/13/2016	4:30 PM	<input type="checkbox"/> All day event
	End time	Tue 12/13/2016	5:00 PM	

Provided that the room system has been registered in the StarLeaf Portal with this video address, the green Join Now button lights for the scheduled meeting when it begins.

**Note:** StarLeaf Cloud room systems can also receive forwarded invites. This means you can send the invite to any email address and that email recipient can forward it to a StarLeaf Cloud room system and that will also cause the Join Now button to light for that meeting.

**Note:** You can also integrate your StarLeaf systems with MS Exchange room booking, refer to [How to integrate Skype meetings with Exchange room booking and StarLeaf \(p15\)](#). (This allows users to simply add the room to the meeting rather than having to know the **call.sl** video address of a room.)

If the meeting permissions have not been set up correctly, the StarLeaf room system may be directed to the lobby on joining the meeting. The meeting creator can add callers into the meeting from the lobby manually, or the permissions for the meeting can be edited in the **Skype Meeting Options** dialog. Under **Permissions**, set **These people don't have to wait in the lobby** to *Anyone (no restrictions)*.



By default, participants are not allowed to present or share their PC unless they are a "presenter" in the meeting. Permissions for presenting need to be set in the **Skype Meeting Options** under **Permissions**.

## How to allow H.323 endpoints to call into on-premise Skype for Business-hosted meetings

**Note:** This method is for H.323 endpoints that are either registered with the StarLeaf Cloud or connected to a network that allows them to call to the StarLeaf Cloud. If your endpoints are not connected to the StarLeaf Cloud, you might need to configure your firewall; refer to [Firewall configuration for calling from H.323 endpoints to the StarLeaf Cloud](#).

You can allow H.323 endpoints to call into on-premise Skype for Business hosted meetings.

1. Ensure that your Skype for Business server has the Conferencing Attendant service enabled. This provides your deployment with IVR capability (Interactive Voice Response).
2. Create a SIP dial-in URI for Skype for Business-hosted meetings. Microsoft has provided instructions:

- **Lync Server 2013:** [https://technet.microsoft.com/en-us/library/gg398126\(v=ocs.15\).aspx](https://technet.microsoft.com/en-us/library/gg398126(v=ocs.15).aspx)
  - **Skype for Business Server 2015:** [https://technet.microsoft.com/en-us/library/mt346050.aspx?f=255&mspperror=-2147217396#Anchor\\_2](https://technet.microsoft.com/en-us/library/mt346050.aspx?f=255&mspperror=-2147217396#Anchor_2)
3. Contact StarLeaf Technical Support and ask for a StarLeaf video address that redirects to that SIP URI. (In this way, H.323 endpoints dialing into a meeting will be redirected via the StarLeaf Cloud where the necessary transcoding for the call will take place.)
  4. Modify your meeting-invite email template so that participants using H.323 endpoints will know to dial the StarLeaf video address. Microsoft has provided instructions for modifying email templates:
    - **Lync Server 2013:** <https://technet.microsoft.com/en-us/library/gg398638.aspx>
    - **Skype for Business 2015:** <https://technet.microsoft.com/en-us/library/mt426640.aspx>

# How to integrate Skype meetings with Exchange room booking and StarLeaf

**Note:** The integration documented in this article is supported from Cloud 5.4 onwards.

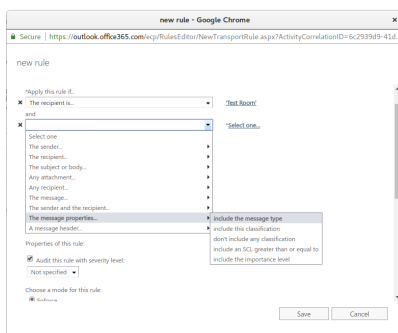
In an organization with both Skype for Business users and StarLeaf Cloud room systems, people will probably want to invite those meeting room systems to meetings hosted on Skype for Business. To do this, a user must invite the **.call.sl** address of the StarLeaf Cloud room system to the Skype for Business meeting. However, users are unlikely to know that address. In addition, if your organization also uses MS Exchange for room booking, then MS Outlook auto completes the room's Exchange address (making it less likely that users will enter the correct **.call.sl** address for the room system). (Skype for Business meetings are sometimes known as AVMCU meetings.)

The solution is to integrate Skype for Business meetings with MS Exchange room booking and the StarLeaf Cloud. In this way, users can continue to invite rooms to their meetings (as they usually do) and the Exchange system will redirect those invites to the StarLeaf room system. There are two steps:

- Configure the Exchange mailbox to redirect meeting invitations to the room's **.call.sl** address
- Configure the StarLeaf Cloud room system with the Exchange email address

## How to configure the Exchange mailbox to redirect meeting invitations to the '.call.sl' address

1. Log in to the Exchange admin enter (as an admin).
2. Go to **Mail flow > Rules**.
3. Create a new rule.
4. At the bottom of this screen, select **More options**.
5. Set **Apply this rule if...** and add the following two rules:
  - **The recipient is...** and select the name of the room account
  - **The message properties...** > **include the message type** and choose **Calendaring**



6. Do the following... Cc the message to... (enter the **\*.call.sl** address of the room using Check names)

## 7. Choose **Save**.

Forward invites to StarLeaf

Name:

Apply this rule to:

- The recipient is:
- and
- The message type is:

add condition

Do the following:

- Cc the message to:

add action

except if:

- add exception

Properties of this rule:

Priority:

Add this rule with severity level:

# How to configure the StarLeaf Cloud room system with the exchange email address

1. Ensure that your organization allows room systems to be configured with an email address. If it does not, you will need to contact StarLeaf Support to have this feature enabled.
2. On the Portal, edit the room system. Add the room's Exchange email address in the **email address** field. In the image below, the meeting room's Exchange email address is **green.room@example.com**:

Add room system

- ▼ Meeting room

Name:

Email address:

and the room's **.call.sl** address is **greenroom@example.call.sl**.

Video address: @example.call.sl

autocomplete

Directory number: 3001

Legacy video address: 800853001@example.call.sl

## Testing the configuration

After you have redirected meeting invitations to the room system's '.call.sl' address and you have configured the StarLeaf Cloud room system with the exchange email address for that room, test that this works. For example, invite the meeting room to a conference using the room's email address and see if the Join Now button lights for the meeting.



# Troubleshooting Skype for Business integration

## Participants disconnect after 90 minutes

There is an issue where non-Skype for Business participants will drop from a Skype for Business meeting after exactly 90 minutes. This is due to the Microsoft settings.

If you have on-premise Skype for Business, you can control these settings; for Skype for Business Online, you cannot.

Skype for Business Server has a setting which controls how long anonymous users are allowed in a meeting.

The setting is **AnonymousUserGracePeriod** and the default value is 90 minutes.

You can check the value with this shell command:

### **Get-CsUserServicesConfiguration**

For more information, refer to Microsoft documentation.

## Legal information

### Third party software acknowledgments

Acknowledgments of third-party software are available at:

[www.starleaf.com/support/legal](http://www.starleaf.com/support/legal)

### Disclaimers and notices

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