

# Version: 9.0

## Case Study: 1

### Contoso, Ltd

#### General Overview

Contoso, Ltd., is a manufacturing company that has 4,000 employees. The company has a sales department, a marketing department, a research department, and a human resources department.

#### Physical Locations

The company has four offices. The offices are configured as shown in the following table.

Office location	Number of users	Extension prefix	Client subnet
New York	1,500	1	192.168.8.0/21
Miami	100	2	192.168.20.0/24
Los Angeles	400	3	192.168.30.0/23
Houston	200	4	192.168.40.0/24

The New York office contains the main data center. Communications for all of the offices is routed through the New York office.

All telephone calls from the Los Angeles office and the Miami office are routed through a public switched telephone network (PSTN) gateway in the New York office.

All offices connect to each other by using a wide area network (WAN) link. Each office connects directly to the Internet.

#### Existing Environment

##### Active Directory Environment

The company has an Active Directory Domain Services (AD DS) forest named contoso.com. The forest contains a single domain. All domain controllers run Windows Server 2008 R2.

Each office contains two domain controllers. Each office is configured as an AD DS site.

Each office contains DHCP servers that run on 32-bit servers.

##### Skype for Business Server Environment

The company has nine servers. The servers are configured as shown in the following table.

Server name	Office	Role	Software
Server1.contoso.com	New York	Front End Server	Skype for Business Server 2015
Server2.contoso.com	New York	Front End Server	Skype for Business Server 2015
Pool1.contoso.com	New York	Front End pool	n/a
Server3.contoso.com	New York	Mediation Server	Skype for Business Server 2015
Server4.contoso.com	New York	Edge Server	Skype for Business Server 2015
Gtwy1.contoso.com	New York	Media gateway	<i>None</i>
Gtwy2.contoso.com	Miami	Media gateway	<i>None</i>
Sba1.contoso.com	Houston	Survivable Branch appliance	Skype for Business Server 2015
Exch1.contoso.com	New York	Client Access Hub Transport Mailbox Unified Messaging	Microsoft Exchange Server 2010

The company uses a SIP domain of contoso.com. The voice infrastructure is configured as shown in the following table.

Office	Phone number range	User dialing habit
New York	+1 212 555 1000-3000	<ul style="list-style-type: none"> <li>• Local PSTN: 10-digit phone number</li> <li>• Long distance within North America: 11-digit phone number</li> <li>• International: 011 + phone number</li> </ul>
Miami	+1 425 555 1000-1100	<ul style="list-style-type: none"> <li>• Local PSTN: 7-digit phone number</li> <li>• Long distance within North America: 11-digit phone number</li> <li>• International: 011 + phone number</li> </ul>
Los Angeles	+1 310 555 4000-4500	<ul style="list-style-type: none"> <li>• Local PSTN: 10-digit phone number</li> <li>• Long distance within North America: 11-digit phone number</li> <li>• International: 011 + phone number</li> </ul>
Houston	+1 713 555 4000-4200	<ul style="list-style-type: none"> <li>• Local PSTN: 10-digit phone number</li> <li>• Long distance within North America: 11-digit phone number</li> <li>• International: 011 + phone number</li> </ul>

All users are enabled for Enterprise Voice.

The company also contains two Edge Servers that have Skype for Business Server 2015 deployed. The servers are configured as shown in the following table.

Component	IP addressing	FQDN
A/V Edge service	131.107.100.3/24	Av.contoso.com
Access Edge service	131.107.100.1/24	Sip.contoso.com

The Miami office has a dial plan. The dial plan is configured as shown in the following table.

Normalization rule	Match pattern	Translation pattern
Internal New York	^1(\d{4})\$	+1212555\$1
Internal Houston	^4(\d{4})\$	+1713555\$1
Local 7 Digits	^(555\d{4})\$	+1425\$1
Long Distance	^(1\d{10})\$	+\$1
International	^(011\d{2}\d+)\$	+\$1

The Skype for Business Server 2015 configuration has five routes. Location-based routing is not configured. The routes are configured as shown in the following table.

Route name	Pattern to match	Description
LocalHouston	+1713	Local calls in Houston through the gateway in the Houston office
LocalLA	+1310	Local calls in Los Angeles through the gateway in the Los Angeles office
LDNY	+1	Long distance calls through the gateway in the New York office
LDHouston	+1	Long distance calls through the gateway in the Houston office
LDLA	+1	Long distance calls through the gateway in the Los Angeles office

The PSTN usage for the users in the Los Angeles office is configured as shown in the following table.

PSTN usage name	Description
LocalDialing	Local calls within the area code
PrimaryLongDistanceDialing	All long distance calls within North America
BackupLongDistanceDialing	Backup for all long distance calls if PrimaryLongDistanceDialing fails

**Problem Statements**

The company identifies the following issues with the current infrastructure:

- Los Angeles users report that the audio quality during calls to the New York office is poor and that the calls often disconnect.
- Users in the Miami office report that when their WAN link fails, they cannot establish calls to the PSTN.
- The Miami users report that they cannot call the Los Angeles users by using a five-digit internal phone number.

**Requirements**

**Planned Changes**

The company plans to implement the following changes:

- Provide voice resiliency in all of the offices if a WAN link fails.
- Implement Call Pack
- Implement an unassigned number range that has a voice announcement.
- Add an additional auto attendant.
- Implement a gateway in the Los Angeles office that uses the local PSTN.
- Migrate several users to Skype for Business Online. The users will use instant messaging (IM) with Skype for Business users only. Client computers will use automatic configuration and open federation. The migrated users will use a SIP domain of cloud.contoso.com.
- Provide a backup route for each office if a gateway fails.
- Provide each office with access to the local PSTN.

**Technical Requirements**

The company identifies the following technical requirements:

- Enable five-digit internal dialing that uses the site code and the last four digits of the phone number range.
- Configure the New York gateway as the backup route for the local gateway in each office.

**Business Requirements**

Changes to the infrastructure must minimize the number of new servers deployed.

**Question: 1**

**HOTSPOT**

You need to ensure that the Miami users can use a five-digit extension when they call the Los Angeles users.

What should you include in the normalization rule? To answer, configure the appropriate match pattern and translation pattern in the dialog box in the answer area.

Normalization rule	Match pattern	Translation pattern
Internal Los Angeles	<div style="border: 1px solid black; padding: 5px;"> <div style="text-align: right; border-bottom: 1px solid black; margin-bottom: 5px;">▼</div> <div style="border-bottom: 1px solid black; padding: 2px;">^1(\d{5})\$</div> <div style="border-bottom: 1px solid black; padding: 2px;">^2(\d{4})\$</div> <div style="border-bottom: 1px solid black; padding: 2px;">^3(\d{4})\$</div> <div style="padding: 2px;">^3(\d{5})\$</div> </div>	<div style="border: 1px solid black; padding: 5px;"> <div style="text-align: right; border-bottom: 1px solid black; margin-bottom: 5px;">▼</div> <div style="border-bottom: 1px solid black; padding: 2px;">+1\$1</div> <div style="border-bottom: 1px solid black; padding: 2px;">+1310\$1</div> <div style="border-bottom: 1px solid black; padding: 2px;">+1310555\$1</div> <div style="padding: 2px;">+555\$1</div> </div>

**Answer:**

Normalization rule	Match pattern	Translation pattern
Internal Los Angeles	<div style="border: 1px solid black; padding: 5px;"> <div style="text-align: right; border-bottom: 1px solid black; margin-bottom: 5px;">▼</div> <div style="border-bottom: 1px solid black; padding: 2px;">^1(\d{5})\$</div> <div style="border-bottom: 1px solid black; padding: 2px; background-color: #e0ffe0;">^2(\d{4})\$</div> <div style="border-bottom: 1px solid black; padding: 2px;">^3(\d{4})\$</div> <div style="padding: 2px;">^3(\d{5})\$</div> </div>	<div style="border: 1px solid black; padding: 5px;"> <div style="text-align: right; border-bottom: 1px solid black; margin-bottom: 5px;">▼</div> <div style="border-bottom: 1px solid black; padding: 2px;">+1\$1</div> <div style="border-bottom: 1px solid black; padding: 2px;">+1310\$1</div> <div style="border-bottom: 1px solid black; padding: 2px; background-color: #e0ffe0;">+1310555\$1</div> <div style="padding: 2px;">+555\$1</div> </div>

**Question: 2**

DRAG DROP

You need to configure the unassigned numbers range to support the planned changes.

Which four actions should you perform?

To answer, move the four appropriate actions from the list of actions to the answer area and arrange them in the correct order.

Actions

Answer Area

Run the **Import-CsAnnouncementFile** Skype for Business Management Shell cmdlet.

Run the **New-CsAnnouncement** Skype for Business Management Shell cmdlet.

Create an .mp3 file that contains the announcement.

Create an unassigned number range.

Run the **Set-CsApplicationServer** Skype for Business Management Shell cmdlet.

Create a .wav file that contains the announcement.



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**Answer:**

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Create a .wav file that contains the announcement.

Run the **Import-CsAnnouncementFile** Skype for Business Management Shell cmdlet.

Run the **New-CsAnnouncement** Skype for Business Management Shell cmdlet.

Create an unassigned number range.

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**Question: 3**

You collect the following call statistics for users in Los Angeles:

Peak call concurrency is 25 percent.

Fifty percent of all placed calls are routed to the public switched telephone network (PSTN)

Thirty percent of all placed calls are internal calls to users in the other offices.

Twenty percent of all placed calls are conference calls.

The average bandwidth for peer-to-peer calls is 65 kilobits per second (Kbps).

The average bandwidth used for conference calls is 100 Kbps.

You need to allocate the minimum amount of bandwidth required on the wide area network (WAN) link for the planned implementation of the voice gateway in the Los Angeles office. All calls to the PSTN will be routed through the local voice gateway in the Los Angeles office.

How much bandwidth in megabits per second (Mbps) should you allocate?

- A. 7.20 Mbps
- B. 3.95 Mbps
- C. 10.00 Mbps
- D. 2.25 Mbps

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**Answer: B**

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**Question: 4**

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DRAG DROP

You need to create the DHCP options required for Skype for Business Phone Edition devices.

Which three actions should you perform? To answer, move the three appropriate actions from the list of actions to the answer area and arrange them in the correct order.

Actions

Answer Area

From a DHCP server, run **dhcpcfgscript.bat**.

Copy **Dhcpconfigscript.bat** to a Skype for Business Server 2015 server.

From a Skype for Business Server 2015 server, run **dhcputil.exe**.

Copy **Dhcpconfigscript.bat** to a DHCP server.

From a DHCP server, run **dhcputil.exe**.

From a Skype for Business Server 2015 server, run **dhcpcfgscript.bat**.



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**Answer:**

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## Answer Area

Copy Dhcpconfigscript.bat to a DHCP server.

From a DHCP server, run dhcputil.exe.

From a DHCP server, run dhcpconfigscript.bat.

### Question: 5

DRAG DROP

You need to plan the subnets for Call Admission Control (CAC) and media bypass.

Which subnet or subnets should you use for each office?

To answer, drag the appropriate subnet or subnets to the correct office in the answer area

a. Each subnet may be used once, more than once, or not at all. Additionally, you may need to drag the split bar between panes or scroll to view content.

Subnets	Answer Area
192.168.0.0/16	New York Subnet Subnet
192.168.8.0/21	Los Angeles Subnet
192.168.20.0/24	Miami Subnet
192.168.30.0/23	Houston Subnet
192.168.40.0/24	
131.107.100.0/24	
131.107.100.1/32	
131.107.100.3/32	

**Answer:**



### Answer Area

New York	192.168.8.0/21	131.107.100.3/32
Los Angeles	192.168.30.0/23	
Miami	192.168.20.0/24	
Houston	192.168.40.0/24	

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### Question: 6

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HOTSPOT

You need to design the Call Park solution.

Which Call Park design should you choose? To answer, select the appropriate range and application server in the dialog box in the answer area.

Range:

	▼
0-99	
100-199	
200-9999	
999-10000	

Application server:

	▼
Server1.contoso.com	
Server2.contoso.com	
Server3.contoso.com	
Pool1.contoso.com	

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**Answer:**

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Range:

	▼
0-99	
100-199	
200-9999	
999-10000	

Application server:

	▼
Server1.contoso.com	
Server2.contoso.com	
Server3.contoso.com	
Pool1.contoso.com	

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**Question: 7**

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HOTSPOT

You need to deploy the Skype for Business components that are necessary to support the planned changes for voice resiliency.

Which component should you deploy at each office? To answer, select the appropriate component for each office in the answer area.

## Answer Area

Office	Component to Deploy
New York	<div data-bbox="879 386 1497 419" style="border: 1px solid gray; background-color: #e0e0e0; padding: 2px;">▼</div> <div data-bbox="879 419 1497 586" style="border: 1px solid gray; padding: 2px;">a voice gateway a Standard Edition Front End server a Survivable Branch Appliance Do not deploy additional components</div>
Miami	<div data-bbox="879 609 1497 641" style="border: 1px solid gray; background-color: #e0e0e0; padding: 2px;">▼</div> <div data-bbox="879 641 1497 829" style="border: 1px solid gray; padding: 2px;">a voice gateway a Standard Edition Front End server a Survivable Branch Appliance Do not deploy additional components</div>
Los Angeles	<div data-bbox="879 852 1497 885" style="border: 1px solid gray; background-color: #e0e0e0; padding: 2px;">▼</div> <div data-bbox="879 885 1497 1073" style="border: 1px solid gray; padding: 2px;">a voice gateway a Standard Edition Front End server a Survivable Branch Appliance Do not deploy additional components</div>
Houston	<div data-bbox="879 1095 1497 1128" style="border: 1px solid gray; background-color: #e0e0e0; padding: 2px;">▼</div> <div data-bbox="879 1128 1497 1316" style="border: 1px solid gray; padding: 2px;">a voice gateway a Standard Edition Front End server a Survivable Branch Appliance Do not deploy additional components</div>

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**Answer:**

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## Answer Area

Office	Component to Deploy
New York	<div data-bbox="879 384 1497 419">▼</div> <ul data-bbox="879 419 1497 588" style="list-style-type: none"><li>a voice gateway</li><li>a Standard Edition Front End server</li><li>a Survivable Branch Appliance</li><li><b>Do not deploy additional components</b></li></ul>
Miami	<div data-bbox="879 605 1497 639">▼</div> <ul data-bbox="879 639 1497 829" style="list-style-type: none"><li>a voice gateway</li><li>a Standard Edition Front End server</li><li><b>a Survivable Branch Appliance</b></li><li>Do not deploy additional components</li></ul>
Los Angeles	<div data-bbox="879 850 1497 885">▼</div> <ul data-bbox="879 885 1497 1075" style="list-style-type: none"><li>a voice gateway</li><li>a Standard Edition Front End server</li><li><b>a Survivable Branch Appliance</b></li><li>Do not deploy additional components</li></ul>
Houston	<div data-bbox="879 1099 1497 1134">▼</div> <ul data-bbox="879 1134 1497 1312" style="list-style-type: none"><li><b>a voice gateway</b></li><li>a Standard Edition Front End server</li><li>a Survivable Branch Appliance</li><li>Do not deploy additional components</li></ul>

### Question: 8

DRAG DROP

You need to ensure that least cost routing is used in the Los Angeles and Houston offices for local calls after the gateway is deployed. The solution must meet the technical requirements.

Which route should you assign to each public switched telephone network (PSTN) usage?

To answer, drag the appropriate route to the correct PSTN usage in the answer are

a. Each route may be used once, more than once, or not at all. Additionally, you may need to drag the split bar between panes or scroll to view content.

### Routes

- LocalHouston
- LocalLA
- LDNY
- LDHouston
- LDLA



### Answer Area

	Route	Route
LocalDialing	Route	Route
PrimaryLongDistanceDialing	Route	
BackupLongDistanceDialing	Route	

**Answer:**

### Routes

- LocalHouston
- LocalLA
- LDNY
- LDHouston
- LDLA



### Answer Area

LocalDialing	LocalLA	LocalHouston
PrimaryLongDistanceDialing	LDLA	
BackupLongDistanceDialing	LDNY	

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