



# Advanced Solutions of Microsoft Exchange Server 2013

Exam Ref 70-342

Brian Reid  
Steve Goodman

# **Exam Ref 70-342 Advanced Solutions of Microsoft Exchange Server 2013**

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# Introduction

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Most Exchange Server books take the view of telling how to complete each task. For the designer of Exchange Server organizations, this is not sufficient. This is why there is both an exam on how to complete tasks, and also a second exam on why to complete tasks. This book covers the objective domain of Microsoft Exam 70-342, and the “why” for why you would do something in the product, as well as some of the “how” for the more in-depth features.

This book covers every exam objective, but it does not cover every exam question. Only the Microsoft exam team has access to the exam questions themselves and Microsoft regularly adds new questions to the exam, making it impossible to cover specific questions. You should consider this book a supplement to your relevant real-world experience and other study materials. If you encounter a topic in this book that you do not feel completely comfortable with, use the links you’ll find in text to find more information and take the time to research and study the topic. Great information is available on MSDN, TechNet, and in blogs and forums.

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## Acknowledgments

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It is not an easy effort writing a book on Exchange Server. As you can probably guess from the scope of the chapter headings, this book for Microsoft Exam 70-342 covers a large portion of Exchange Server and Exchange Online in Office 365. It is therefore not possible to write a book that covers this data, though some of it is similar to that in Exchange Server



2010, by far a lot has changed subtly and also in detail. That is not including Office 365, and specifically here, the pieces on Exchange Online and Office 365. This appears to change daily, and although it is not that frequent, there will be bits of this book that may well work differently from between when we wrote it and when you read it—that is the effect of cloud computing.

There are many people that are involved with writing a book, not least I would like to start with thanking Steve Goodman my co-author, and Nicolas Blank my co-director at NB Consult whose idea it was that I should write this book and not the one for Exam 341! Paul Robichaux and Bhargav Shukla are writing the book for 70-341, so that at least there is a pair of these books for both exams! I would also like to thank Andrew Higginbotham for his technical review and his BBQ, Ashley Poxon for reading early chapter proofs for me, and for the help from various MVPs, including Justin Harris.

But finally, and most importantly, I would like to thank Jenny my wife, for the evenings lost writing, sorry! For your support and care, thanks! For the love you give me in modeling our savior Christ, my love back.

—Brian Reid

I'd like to mirror Brian's sentiments and thank my fellow MVPs who have supported both the writing and editing of this book, along with Microsoft Press. In particular I'd like to thank Brian Reid my co-author, Paul Robichaux for recommending me to Microsoft Press, and Karen Szall for her support and patience.

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—Steve Goodman

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## Preparing for the exam

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Note that this Exam Ref is based on publicly available information about the exam and the author’s experience. To safeguard the integrity of the exam, authors do not have access to the live exam.

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# Configure, manage, and migrate Unified Messaging

Unified Messaging provides a voice interface in Exchange Server 2013, providing features including voicemail and audio access to individual mailboxes. The Unified Messaging features are part of the Client Access and Mailbox roles in Exchange, and are available in every Exchange 2013 deployment. This is a big change from the previous two versions of Exchange where Unified Messaging was a separate role. Both the Client Access and Mailbox Server Roles contain parts of Unified Messaging, with the former hosting the Unified Messaging Call Router service, and the latter hosting the Unified Messaging service itself.

In this chapter, you explore how to configure Unified Messaging to talk to a typical Internet Protocol Private Branch Exchange (IP-PBX) using the Session Initiation Protocol (SIP). SIP is the modern phone system equivalent of the Simple Mail Transfer Protocol (SMTP) used for email. Coverage of topics that you should expect to be on the exam include understanding how to set up Unified Messaging, along with areas of consideration when designing for high availability.

This chapter also discusses managing Unified Messaging after it is in use within the organization. Tasks once deployed include managing settings and features for individual users and configuration of policies, along with managing additional language packs. Alongside the management of Unified Messaging, this chapter covers troubleshooting various aspects of a Unified Messaging deployment such as troubleshooting security settings, monitoring call statistics, or troubleshooting SIP communications.

To ensure that you are equipped with the right knowledge to perform an upgrade of Exchange where a deployment of a previous version of Unified Messaging is already in place, this chapter covers migration of Unified Messaging to Exchange 2013, including the necessary preparation, planning, and considerations for coexistence. Additionally, this chapter also covers how to move Unified Messaging enabled mailboxes, move voice services, and removing the legacy Unified Messaging environment.

**IMPORTANT*****Have you read page xix?***

It contains valuable information regarding the skills you need to pass the exam.



## Objectives in this chapter:

- Objective 1.1: Configure Unified Messaging (UM)
- Objective 1.2: Manage Unified Messaging
- Objective 1.3: Troubleshoot Unified Messaging
- Objective 1.4: Migrate Unified Messaging

## Understanding Unified Messaging

Before you explore how to configure Unified Messaging in Exchange Server 2013, take a few moments to gain a better understanding of what it offers, and how it fits into the overall Exchange Server product.

Unified Messaging provides a voice interface to the Exchange Server. This forms a key tenet of integrating Exchange into a Unified Communications solution, the theory being that a single set of communications systems work together providing the user with a streamlined experience no matter how they access the system. From an administrator perspective, the Unified Messaging role provides administrators with a feature set that they would otherwise require third-party products for, allowing an organization that has chosen to implement the Microsoft stack (often referred to as a Microsoft Shop) the ability to fully function just using Microsoft products, often allowing the removal of old expensive systems.

Features provided with Unified Messaging include:

- **Voice mail** A comprehensive voice mail system using existing mailboxes as the underlying store for voice mail messages. This feature-rich voice mail includes basic functionality like enabling message waiting indicators on desk phones and integration with Microsoft Lync.
- **Transcription of voice messages** In supported locales the Exchange Server can process the audio recording and insert a transcription of the message for the recipient to read in Outlook, allowing the user to quickly triage voice mail.
- **Protected Voice Mail** When enabled, Protected Voice Mail allows private messages to be encrypted using Active Directory Rights Management Services. This provides the same enterprise-grade protection offered for Office documents and standard email messages.
- **Missed call notifications** In addition to just allowing callers to record voice mail, Unified Messaging also provides notifications when a call is missed. When a call is transferred to voicemail, but the caller neglects to leave a voicemail message, a notification is sent instead.
- **Call Answering Rules** Those familiar with rules in Outlook will find the concept of Call Answering Rules straightforward. Multiple rules can be configured specifying conditions, such as the calendar status of the call recipient, with actions to be taken. This includes diverting the call to a colleague, presenting a menu of options to the caller, or

Exchange can even attempt to reach the call recipient on alternative phone numbers before transferring to voice mail.

- **Play on phone** Outlook 2007, 2010 and Outlook 2013 along with Outlook Web App allows the voice mail recipient to choose to play the voice message on the desk phone (or another number, if allowed) rather than through the PC speakers. This functionality extends to the Outlook Web App options pages and allows the user to initiate a call from OWA to record greetings. This is a big improvement over navigating the voice mail options menus via a desk phone.
- **Outlook Voice Access** Unified Messaging is not just about providing access to voice mail in the email client. Outlook Voice Access provides functionality allowing a user to call into their mailbox from any phone and manipulate their own mailbox. The user can either via speech recognition, or using the phone keypad, request the server to read messages, reply to messages, or even adjust appointments. A great example of how this can work is if a person is running late for a meeting, they can dial into Outlook Voice Access and ask Exchange to push the meeting back 15 minutes. All attendees will receive an updated invitation.
- **Auto attendant** Most people have called a company and instead of speaking directly to a person, have been greeted by a computer presenting options to direct the call. For example, "If you are calling to open a new account, please press one; if you are calling to enquire about your bill, please press two." This functionality is called an auto attendant and is included within Unified Messaging. The Exchange auto attendant features include the common keypad-operated menus along with speech recognition. Trees of menus can be combined through the use of multiple, linked auto attendants and if enabled, callers can search the global address list and then be directed straight to the right person. Auto attendants are not necessary for a Unified Messaging implementation.
- **Inbound fax support** When Unified Messaging was first introduced within Exchange Server 2007, Unified Messaging was capable of interpreting fax messages directly and delivering them to a user mailbox. While inbound fax support is still included, Exchange 2013 requires a third-party product to be used to perform the fax conversation. This works by, after detecting a fax, Exchange performing a redirect to the fax solution.

Because Exchange Server 2013 always includes the Unified Messaging services as part of the Mailbox and Client Access Server roles, the installation is no more complicated than a standard installation of Exchange Server 2013.

During the installation of prerequisites for Exchange Server, some unusual prerequisites are required, including the Desktop Experience and the Microsoft Unified Communications Managed API Core Runtime. In the context of Unified Messaging, these prerequisites begin to make a lot of sense.

The Unified Communications Managed API Core Runtime is particularly important because this bundle provides the core software that underpins the voice functionality of Exchange 2013, including Automatic Speech Recognition and Text-to-Speech (TTS).



#### **EXAM TIP**

The PowerShell cmdlets and parameters lend themselves well to exam questions. Ensure that you understand the differences between relevant UM cmdlets and the usage of various parameters.

## **Objective 1.1: Configure Unified Messaging (UM)**

The basic configuration of Unified Messaging is necessary to enable your Exchange infrastructure to communicate with your telephone system, and requires an understanding of both your Exchange environment and your phone system.

### **This objective covers how to:**

- Configure an IP gateway
- Configure a UM call router
- Create and configure an auto attendant
- Configure a call answering rule
- Design Unified Messaging for high availability
- Create a dial plan

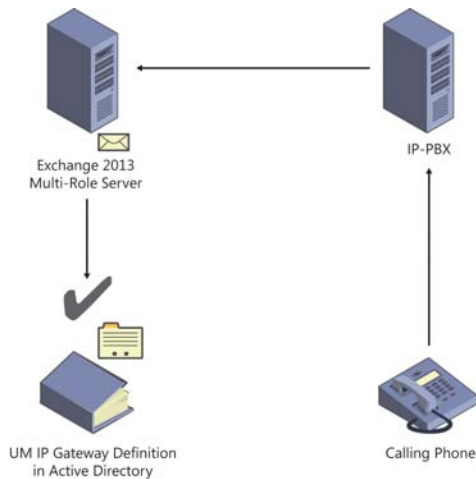
## **Configuring an IP gateway**

In computing terms an IP gateway can mean many things. In the context of Unified Messaging, it represents the phone system's last hop before it reaches Microsoft Exchange Unified Messaging. In most cases, this will be the IP address of the IP-PBX, or if it is an analogue or IP-PBX system that is not compatible directly with the Unified Messaging service, a gateway device that translates from one phone system language to another, often called a session border controller.

### **The UM IP gateway object**

The IP gateway is used by Exchange Server 2013 to ensure it understands the mapping between each phone system and the relevant configuration, such as dial plans in Exchange Server. Dial plans are covered later in detail later, but simply put, they are used to group extensions together.

In Figure 1-1, you see an example of a simple phone system connected to Exchange. The IP-PBX connects directly to Exchange Server and is defined as the IP gateway. Upon connection, the Exchange 2013 server will verify that it has a definition in Active Directory.



**FIGURE 1-1** An example of an IP gateway connected to an Exchange 2013 server

## What you need to know before configuring an IP gateway

When configuring an IP gateway in Exchange Server, you will need to know a number of details about the device before you can add it to Exchange:

- A descriptive name you will use to name the IP gateway in Exchange Unified Messaging.
- The IP address or Fully Qualified Domain Name (FQDN) of the device.
- The dial plan that the IP gateway should be associated with.
- Whether the IP gateway supports outgoing calls from Exchange Unified Messaging.
- Whether the IP gateway can process Message Waiting Indicator (MWI) notifications, used to light up or extinguish the Message Waiting lamp on IP phones.

### **IMPORTANT** USING THE FQDN FOR THE ADDRESS OF THE IP GATEWAY

If you are using the SIP Secured or Secured encryption setting on the associated dial plan, you must use the Fully Qualified Domain Name for the address of the IP gateway. This is because a valid, matching SSL certificate is required, and the SSL certificate name must match the IP gateway address.

The IP gateway, whether it is a gateway device providing an interface between both systems, or if it is an IP-PBX, will need to be configured too. This configuration will typically include:

- The Fully Qualified Domain Name of the Exchange 2013 Client Access Servers it will route calls to, sometimes defined as another IP gateway in the IP-PBX, or a trunk.
- Definitions for the numbers that will be routed to the UM servers. These may be contact objects in the case of a Lync/Skype for business system.

- Configuration of the IP gateway can be accomplished using either the Exchange Admin Center, which is the web browser user interface for managing Exchange 2013, or via the Exchange Management Shell, which is the command line interface based upon PowerShell.

Via the Exchange Admin Center the basic settings can be configured. The settings that can be configured include:

- The name of the IP gateway.
- The address of the IP gateway.
- Whether outgoing calls are allowed through the IP gateway.
- If the Message Waiting Indicator signals are allowed.

Via the Exchange Management Shell the same settings can be configured, using the Set-UMIPGateway cmdlet, and in addition a wider range of settings are exposed for configuration:

- **Port** This parameter specifies the port that the IP gateway is expected to listen on. By default Unified Messaging expects the IP gateway to listen on TCP port 5060. If this is not the case, a port can be specified here and Exchange Unified Messaging will attempt to contact the IP gateway on the alternative port.
- **IPAddressFamily** This allows IP version 4 and/or IP version 6 to be used. By default, *IPv4Only* is chosen. If *IPv6* is chosen, IP version 6 will be used first, then in the event of failure, IP version 4 will be used. If *IPv6only* is chosen, the call will fail if the inbound or outbound request to or from the IP gateway does not support IP version 6.
- **ForceUpgrade** This allows the UM IP gateway object definition to be upgraded.
- **DelayedSourcePartyInfoEnabled** This allows the incoming call from the IP gateway to be delayed if the SIP invite request contains no calling party and diversion information.
- **Simulator** This parameter allows an administrator to specify that client will attempt to connect to the server directly, rather than an actual IP gateway device. This is used for testing.
- **Status** This parameter allows the IP gateway to be disabled. This is typically used to disable one of multiple gateways when it the IP-PBX team need to perform maintenance on it.

## Additional IP gateway configuration cmdlets available

The Exchange Management Shell is always used under the hood by the GUI to make configuration changes to Microsoft Exchange, and in most cases only the most common actions are available via the GUI. To make complex or non-routine configuration changes, the Exchange Management Shell is usually required. In the previous section you saw an example of the range of parameters available for configuring all relevant attributes for the IP gateway definition.

As you saw, a range of cmdlets are available that expose the full range of functionality. These are as follows:

- **New-UMIPGateway** Used to create a new IP gateway configuration object in Microsoft Exchange.
- **Remove-UMIPGateway** Used to delete configuration settings for the IP gateway in Microsoft Exchange.
- **Disable-UMIPGateway** Used to rapidly prevent a UM IP gateway from being available for use within Microsoft Exchange.
- **Enable-UMIPGateway** Used to rapidly enable a UM IP gateway previously disabled.
- **Get-UMIPGateway** Used to retrieve either all UM IP gateways configured within the Exchange organization, or examine settings for a particular gateway.
- **Set-UMIPGateway** As described in the previous section, used to make core configuration changes to an IP gateway configuration within Microsoft Exchange, or when combined with Get-UMIPGateway can be used for making changes en-mass.

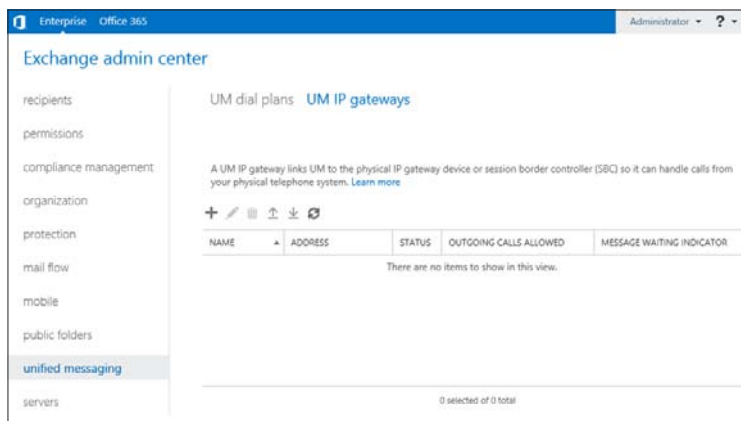
#### MORE INFO THE PARAMETERS

Each gateway cmdlet listed above has a set of parameters. These can be discovered from the Exchange Management Shell using the Get-Help cmdlet followed by the cmdlet you want to know more about. Use the Online parameter with Get-Help to view the list of parameters and their descriptions, along with examples of use on the Microsoft TechNet website.

## Configuring an IP gateway using the Exchange Admin Center

To create a new IP gateway, open the Exchange Admin Center, as shown in Figure 1-2, and complete the following steps:

1. Log in as an administrative user and navigate to the Unified Messaging section.
2. Select the UM IP Gateways tab.



**FIGURE 1-2** The Exchange Admin Center in the UM IP Gateways section with no IP gateways defined



3. To add a new UM IP gateway, choose the Add (+) button. This opens the New UM IP Gateway window, shown in Figure 1-3.

new UM IP gateway

UM IP gateways represent a physical session border controller (SBC), IP gateway, or IP PBX in Active Directory. You have to configure a UM IP gateway before UM can accept calls from the device.

\*Name:  
Nuneaton IP-PBX

\*Address:  
nun-pbx.contoso.com

UM dial plan:  
Nuneaton X browse...

save cancel

100%

**FIGURE 1-3** Creating a new UM IP gateway using the Exchange Admin Center

4. In the Name text box, enter the descriptive name chosen. This is for the administrator reference.
5. In the Address text box, enter the IP address or Fully Qualified Domain Name.
6. Select the correct UM dial plan to associate with this UM IP gateway.

After creating a UM IP gateway within the Exchange Admin Center, its properties can be altered either via the Exchange Admin Center or via the Exchange Management Shell. Before examining a UM IP gateway, it is important to understand what changes can be made.

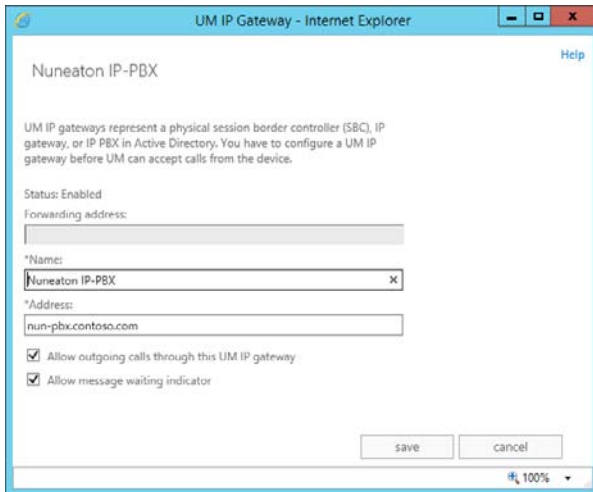
The toolbar icons in the UM IP Gateway tab, shown in Figure 1-4, provide additional options after selecting an individual UM IP gateway. The option to Add a new IP gateway is always shown first on the left. The other options are to Edit, Delete, Disable, Enable IP gateways, followed by the ability to refresh the list. These toolbar icons correspond to being able to use the New-UMIPGateway, Set-UMIPGateway, Disable-UMIPGateway, Enable-UMIPGateway cmdlets and the refresh button calls the Get-UMIPGateway command to retrieve the full list of UM IP gateways configured.

For each UM IP gateway, a number of columns are disabled. These are based on the output of Get-UMIPGateway and represent the current attributes configured in Exchange.

NAME	ADDRESS	STATUS ▲	OUTGOING CALLS ALLOWED	MESSAGE WAITING INDICATOR
Nuneaton IP-PBX	nun-pbx.contoso.c...	Enabled	Yes	On

**FIGURE 1-4** A UM IP gateway selected with toolbar icons providing access to common functionality

To make configuration changes to the attributes of an individual UM IP gateway, click the Edit button to open the properties window for the selected UM IP gateway, as shown in Figure 1-5. You can alter the basic configuration of the UM IP gateway.



**FIGURE 1-5** Editing the UM IP gateway via the Exchange Admin Center

## Configuring an IP gateway using the Exchange Management Shell

To create a new IP gateway using the Exchange Management Shell, you will use the `New-UMIPGateway` cmdlet. In addition to defining the name, address, and associated dial plan for the UM IP gateway, you can define the IP address family settings at the time of creation if you need to change the default. This example creates a UM IP gateway with the same settings as used in the previous section.

### # Creating a New UM IP gateway

```
New-UMIPGateway -Name "Nuneaton IP-PBX" -Address nun-pbx.contoso.com -UMDialPlan "Nuneaton"
```

To view the configuration of the newly defined UM IP gateway, use the following.

### # Get UM IP gateway configuration

```
Get-UMIPGateway -Identity "Nuneaton IP-PBX"
```

To make a configuration change, such as updating the address value, use the following.

### # Set UM IP gateway configuration

```
Set-UMIPGateway -Identity "Nuneaton IP-PBX" -Address nun-pbx.contoso.com
```

## Configuring the UM call router

The UM call router is newly introduced with Exchange Server 2013. In previous versions of Exchange, the Unified Messaging service was responsible for dealing with and diverting calls where necessary.

Changes to the architecture of Exchange Server in Exchange 2013 mean that the UM call router service is necessary to ensure that the server hosting the active copy of the mailbox performs all relevant actions for the user.

## UM Call Router role within Exchange Unified Messaging

The UM call router service runs on each server hosting the Client Access role. The Client Access role in Exchange 2013 typically is a protocol-aware proxy, or performs redirection, and this concept applies to Unified Messaging. The UM call router performs the redirection functions for traffic arriving from IP gateway devices.

## Understanding call redirection via the UM call router

Understanding how this works requires a very basic understanding of the protocol used for Voice over IP (VoIP) signaling, the Session Initiation Protocol (SIP).

SIP traffic does not contain any call audio but the traffic instead is a text-based conversation between the two systems, and is used to provide some information about the call, such as the caller, and information about the number or person they are calling. Only after the initial transaction in the SIP message completes does the dialog box start, and the two systems use Session Description Protocol (SDP) within the SIP dialog box to decide what Real Time Protocol (RTP) audio codec to use for the audio streams.

The UM call router will only participate in the initial SIP message because, as the role it fulfils is to redirect, it will use the information provided about the recipient to look up the mailbox server that hosts the recipient's mailbox, and then respond with a *302 redirect message* providing the Fully Qualified Domain Name of the mailbox server and port. The conversation with the UM call router ends at this point.

## Ports and addresses used by the UM call router

The ports that the UM call router can listen for communications from an IP gateway are set by default to the following ports:

- Port 5060, used for unencrypted TCP traffic.
- Port 5061, used for traffic secured by TLS.

As Unified Messaging in Exchange Server 2013 fully supports IP version 6, the UM call router is able to accept connections from IP gateway devices using either IP version 4, or IP version 6. This can be configured based on requirements.

SIP traffic can use both TCP unencrypted and be secured by the TLS protocol. The choice typically depends on your security requirements and the supported methods that your IP gateway can use. Microsoft Lync/Skype for business must use TLS, however some third-party IP-PBX systems must use TCP.

## Configuring the UM call router using the Exchange Management Shell

All configuration for the UM call router service must be performed using the Exchange Management Shell. There are very few options available for configuration and most organizations will not need to change the default settings.

Because both the UM call router service and the UM service share a common history, they have similar options within each services' respective `Get/Set-UMCallRouterSettings` and `Get/Set-UMService` cmdlets. Naturally the UM service cmdlets have the vast majority of attributes available.

When making modifications to the UM call router service, the following parameters are available using the `Set-UMCallRouterSettings` cmdlet:

- **Server** This parameter is used to define the Client Access Server that the cmdlet will make configuration changes against.
- **SipTcpListeningPort** This parameter defines the TCP/IP port that the UM call router service will listen on for incoming requests from an IP gateway using an unencrypted protocol.
- **SipTlsListeningPort** This parameter specifies the TCP/IP port that the UM call router service listens for encrypted communications on.
- **UMStartupMode** This parameter is used to define if the UM call router service will use just the TCP mode, just the TLS mode, or startup in Dual mode where it listens on both ports.
- **Dial Plans** This parameter, when using Microsoft Lync/Skype for business, is used to list all of the Unified Messaging dial plans that this UM call router will service. It can contain multiple dial plans.
- **IPAddressFamily** and **IPAddressFamilyConfigurable** These parameters can be used to alter whether the IP address family is configurable, and if it should listen on IPv4Only, IPv6Only or Any. By default this is set to Any.

Additional parameters are available, however these are marked as reserved for Microsoft Internal Use. Usually this means they are used within Microsoft Office 365, which also runs Microsoft Exchange Unified Messaging services.

In the example below, the `Set-UMCallRouterSettings` cmdlet is used to change the UM Startup mode from the default TCP to Dual, then restart the UM call router service to apply the changes.

# Altering the UM Startup mode to Dual

```
Set-UMCallRouterSettings -Server LJD-E1501 -UMStartupMode Dual  
Restart-Service MExchangeUMCR
```

# Creating and configuring an auto attendant

Auto attendants are used in many organizations that need to deal with volumes of inbound calls and transfer calls to the right person, or right part of the organization easily, and without requiring an operating to handle each and every call.

## Features provided by auto attendants

The most common use for the auto attendant is to provide a menu to the caller offering them some high-level options. The call is then transferred either to people, or another automated system (often to another automated attendant).

The options, known as *prompts* allow up to nine options to be presented to callers. They typically match with auto attendants that are using dial pad entry rather than voice entry, and of course to avoid annoying callers more than necessary.

The attendant voice language support is tied directly to the language packs installed on the Exchange environment. Each auto attendant has a single language defined.

By default, the auto attendant will announce itself as the Microsoft Exchange auto attendant to callers; however for many customers this is not desired. The most basic feature to replace this is to define a company name, which will then be used via the Text-to-Speech (TTS) engine in Unified Messaging to read the company name instead. Many organizations will prefer to use either whoever has the most appropriate sounding voice in the company, or use a professional to record a set of custom greetings. If these are defined and uploaded, these will be used.

Auto attendants also have the ability to, based on your definition of business hours in your region, play a different set of prompts to the caller. This is useful because some departments within the organization may only operate during business hours, and sometimes a different extension will deal with enquires outside of normal hours.

For each prompt a label is defined. The label itself can be associated with a custom prompt or will be read to the caller using the TTS functionality. If the auto attendant has been configured to respond to voice commands, the labels defined will be used to match what the caller asks for. Otherwise, the caller will be expected to press a number on the dial pad of their phone.

Finally, auto attendants can provide functionality called *dial by name*. This allows access to the caller to, depending on configuration, get transferred to someone or leave a voice message. The caller can have access to the following:

- The whole Global Address List, useful for internal callers.
- People within the same dial plan as the auto attendant, which is useful for switch-board-style functionality when a caller phones a particular office.
- A particular address list, allowing curation of a list of people that callers are allowed to search through.

If people using the dial by name feature can't find who they want, the ability to transfer to an operator still exists; likewise Exchange Unified Messaging also allows callers to choose from multiple matches; for example if two people named John Smith work for the same organization.

## Defining an auto attendant

An auto attendant is stored as an object in Active Directory within the Configuration partition alongside organization-wide settings for Exchange. This means that each UM auto attendant is, by design, available to all Exchange Servers within the organization.

Although each auto attendant is stored within a dedicated UM auto attendant container, logically an auto attendant is associated with a dial plan. When managing auto attendants from the Exchange Admin Center, each auto attendant appears to be stored within the configuration of a dial plan. Although this is an abstraction because the UM auto attendants are not child Active Directory objects within dial plans, it does illustrate the relationship and how they are intended to be managed.

From the Exchange Management Shell, the auto attendant related tasks are managed through dedicated auto attendant cmdlets, reflecting their nature as standalone configurations that are mapped to dial plans. However, this does not change the fact that dial plans can have many auto attendants mapped, but an individual auto attendant can only be mapped to a single dial plan.

## Example auto attendant defined

In the following examples, the process to create an auto attendant is shown using both the Exchange Admin Center and using the Exchange Management Shell. Both methods will create an auto attendant with the following configuration:

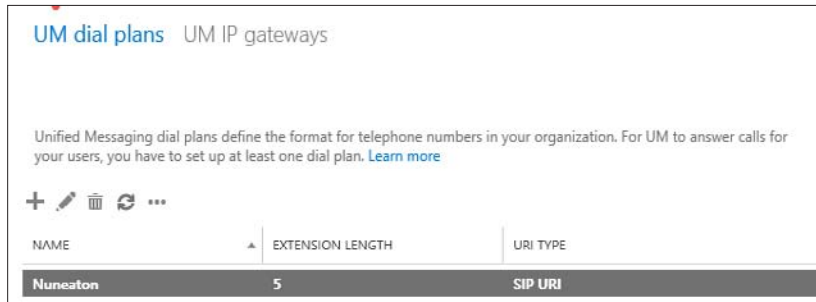
- Associated with a dial plan named Nuneaton.
- Named customer services.
- Does not respond to voice commands.
- An access number of +44 1234 555 555.
- Uses the UK English for the voice interface.
- A business name of Contoso.
- Uses the default business hours and non-business hours greetings.
- No informational announcement.
- Business hours defined as 9:00 until 17:00.
- Business hours menu enabled with the following options:
  - Press 1 to speak to Sales on extension 10001.
  - Press 2 to speak to Billing on extension 10002.
  - Press 3 to speak to Customer Care on extension 10003.
- Dial by name disabled.

## Creating an auto attendant using the Exchange Admin Center

In this example, you will apply the definition for a Unified Messaging auto attendant to our Exchange Server environment using the Exchange Admin Center.

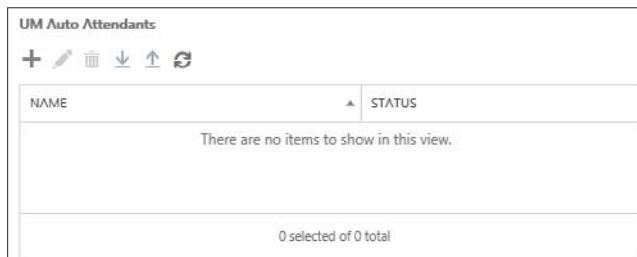
You start by creating the new auto attendant object.

1. To find the user interface for creating, managing, and removing auto attendants, navigate to the Unified Messaging section of the Exchange Admin Center, and select the UM Dial Plans tab.
2. Select the dial plan for the auto attendant from the list, and then select the Edit (pencil) icon to open the Dial Plan properties, as shown in Figure 1-6.



**FIGURE 1-6** The list of existing dial plans

3. On the Dial Plan properties page, scroll down to the UM Auto Attendants section. To create a new UM auto attendant shown in Figure 1-7, select Add.



**FIGURE 1-7** The management UI for viewing the list of existing UM auto attendants

4. The New UM auto attendant page will open. On this page you can create the basic configuration of the auto attendant, including:
  - The name of the auto attendant.
  - Whether or not the auto attendant is created as enabled.
  - Whether or not the auto attendant will be voice-command enabled, or whether it will require the caller to use the dial pad for navigation.

- The access numbers that will be associated with the auto attendant, for example the customer services number that the IP-PBX system will forward to Unified Messaging.

**FIGURE 1-8** Using the new UM Auto Attendant Wizard to configure the basic settings

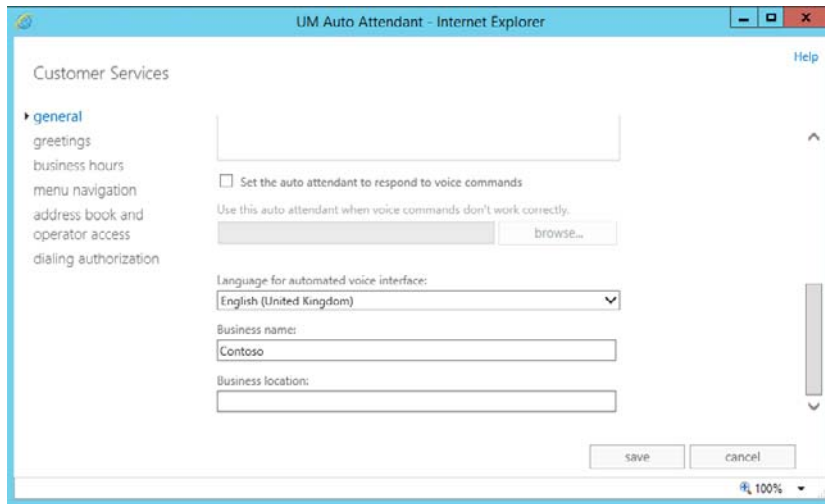
5. After entering the relevant details, choose Save.

## Configuring an auto attendant using the Exchange Admin Center

The newly created auto attendant will require additional configuration after creation to meet the defined requirements. To add this information, complete the following steps:

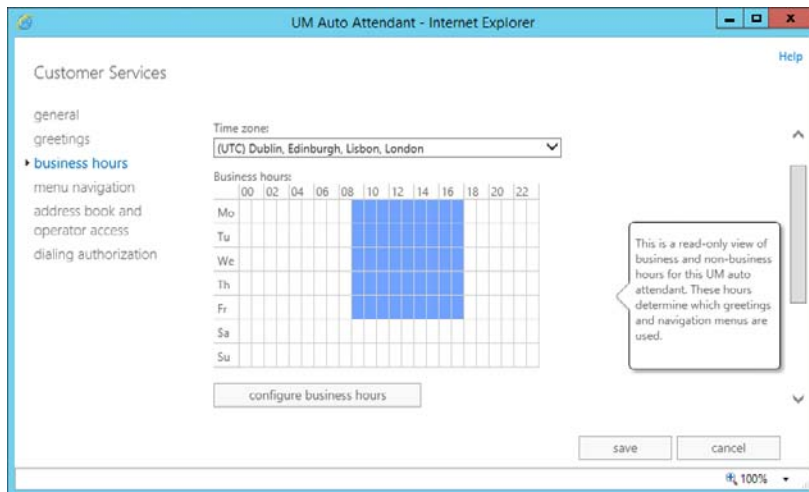
1. Select the new auto attendant from the list of auto attendants on the opened Dial Plan page, and select Edit to open the newly defined auto attendant.
2. The first change is to define the Language and Company Name, on the General tab. Select General, and scroll down to the relevant sections. In Figure 1-9, English (United Kingdom) has been selected from the Language For Automated Voice Interface drop-down list, and the Business Name **Contoso** entered.





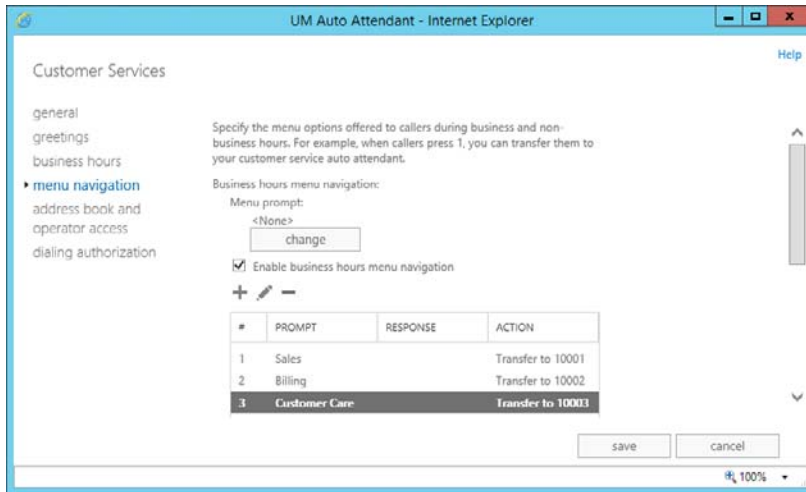
**FIGURE 1-9** Configuring the General properties of the new auto attendant

3. The next settings that must be chosen are on the Business Hours tab. Select the Configure Business Hours option, and use the mouse to select the correct business hours to match the organizations' working day and working week, as shown in Figure 1-10.



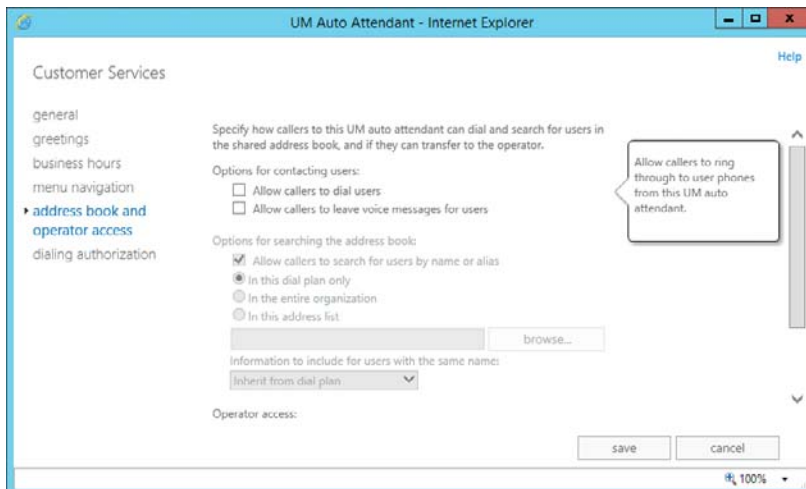
**FIGURE 1-10** Editing the business hours for the auto attendant

4. The Menu Navigation tab, shown in Figure 1-11, provides the main configuration options for the auto attendant. This is the location where you define the menu structure that the user will hear. Select the Enable Business Hours Menu Navigation check box to make the menu active and enabled during the defined hours. Next, use the Add button to create each prompt to meet the specification defined.



**FIGURE 1-11** Using the EAC to edit the menu prompts

5. Finally, your specification has defined that inbound calls will not have the option to search the Global Address List. Therefore, you need to disable this feature within the auto attendant. To disable this feature, select the Address Book And Operator Access tab, and then clear both check boxes under Options For Contacting Users, as shown in Figure 1-12.



**FIGURE 1-12** Functionality to enable a caller to search the GAL is disabled

## Creating an auto attendant using the Exchange Management Shell

The same auto attendant can be created with the same settings using the Exchange Management Shell. To create a new auto attendant with the same settings required, the following PowerShell code can be used.

# Create a new auto attendant

```
New-UMAutoAttendant -UMDialPlan 'Nuneaton' -Name 'Customer Services'
-SpeechEnabled:$false -PilotIdentifierList @('+44123455555') -Status Enabled
```

## Configuring an auto attendant using the Exchange Management Shell

Because the Exchange Admin Center uses the same PowerShell commands under the hood, the same two-step approach must be used to perform post-creation configuration.

In the following example, the key mapping and business hours schedule can look complex because both use arrays to pass a list containing multiple values to a single parameter.

# Configure the auto attendant

```
Set-UMAutoAttendant -Identity 'Customer Services' -BusinessHoursKeyMapping @('1,Sales,10001,,,,,,','2,Billing,10002,,,,,,','3,Customer Care,10003,,,,,,')
-BusinessHoursSchedule @( 'Mon.09:00-Mon.18:00','Tue.09:00-Tue.18:00','Wed.09:00-Wed.18:00','Thu.09:00-Thu.18:00','Fri.09:00-Fri.18:00') -InfoAnnouncementEnabled False
-BusinessName 'Contoso' -BusinessHoursKeyMappingEnabled:$true -CallSomeoneEnabled:$false
-InfoAnnouncementFilename '' -Language 2057
```

### **TIP** EXCHANGE MANAGEMENT SHELL COMMANDS

Learn how to perform complex Exchange Management Shell commands via the Exchange Admin Center. In the EAC, select the Help icon in the upper-right corner, and then select Show Command Logging. The EAC provides a line-by-line report of the equivalent commands that would be required via the Exchange Management Shell.

## Configuring a call answering rule

Call answering rules are similar to rules used in Outlook to automatically move messages and give users the ability to decide for themselves how inbound callers who are transferred to voice mail should be dealt with.

Although call answering rules can be configured by administrators using PowerShell, call answering rules are generally managed by a user in the Outlook Web App options page.

Just like Outlook Rules, a user can configure multiple rules within their mailbox and, based on a number of parameters, perform a different action rather than just send the caller to voice mail.

The flow for call answering rules is simple. If a call answering rule is defined, and the conditions match the incoming call, the rule will be used. Otherwise the call will go to voice mail. A call answering rule can use the following conditions when determining if it should be triggered, including:

- If the user has Out of Office set.
- If the user's calendar is set to Free, Busy, Tentative, or Out of Office.
- In the case that the user has multiple extensions, perform an action based on the extension that the call was received by.
- The time window that the call fits into.
- Who is calling.
- Or a catch-all to trigger on all incoming voicemails.

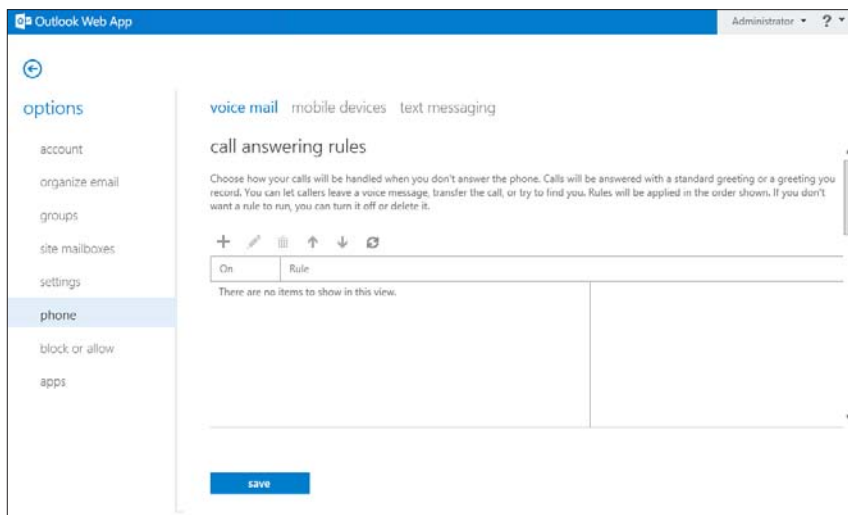
Once a condition has been met, a number of actions can be performed against the inbound call including:

- Transfer of the call to an extension.
- Transfer of the call to an external number, if allowed by administrator policy.
- Automatically attempt to ring a number of alternative numbers and if answered, transfer the call (an automatic "Find me" option).
- Present an auto-attendant style menu to the caller.

## Self-service configuration as a user

The primary method for configuring call answering rules is via the Outlook Web App options pages, and where possible users should manage their own call answering rules to avoid unnecessary administrator intervention.

The interface for call answering rule management is located within the Phone section of OWA options, underneath the Voice Mail tab. As shown in Figure 1-13, users are provided a list of call answering rules underneath a toolbar providing the ability to Add, Edit, Delete, and change the rule order.



**FIGURE 1-13** The Outlook Web App Options pages with the Call Answering Rules panel selected