Direct Routing

Configuration Guide

This guidance is not intended to be comprehensive and is subject to change, including as a result of changes to Microsoft's software or licences. When using this guidance you should ensure that you are familiar with the latest version of Microsoft Teams, Office365 and any other relevant software as well as any guidance issued by Microsoft.

Contents

1. Direct Routing Overview

Direct Routing enables you to use your nominated Public Switched Telephone Network (PSTN) carrier with Microsoft Phone System for external outbound and inbound calls in Microsoft Teams.

Microsoft Phone System works with Teams clients and certified devices and allows you to replace your existing telephony system with a set of features directly delivered from Microsoft 365.

Internal calls between users in your organisation are handled internally within Phone System, and never go to the Public Switched Telephone Network (PSTN).

Types of Microsoft Teams users, applications and or resources that would use Direct Routing typically include:

- Individual Users
- Call Queues
- Auto Attendants
- Common Area Phones
- Meeting Room Phones

A Virgin Media Direct Routing User license is required for every licensed Microsoft Teams user, application and/or resource that wants to add external PSTN call capability. The numbers assigned to Users can be New, Transferred from an existing Virgin Media service, or Ported across from another carrier.

External call traffic is passed to and from Microsoft 365 through Microsoft certified direct routing Session Border Controllers (SBC's) located within the Virgin Media Business SIP Trunking Platform.

To add the Virgin Media Direct Routing service to your Microsoft 365 tenant, you will need to add two domains representing each of our geo-located direct routing SBC's.

Sufficient bandwidth must be made available to carry any external call traffic. For each concurrent external (PSTN) call, a minimum bandwidth of 100Kbps in each direction is required.

Anyone tasked with setting up or supporting the Direct Routing service should be familiar with Microsoft 365, Microsoft Teams, Telephony, PowerShell and associated management tools.

Should you decide you would like further support to deploy the Direct Routing service, Virgin Media Business offer different deployment options to help you with this.

The three deployment options currently available are:

Self-serve – where you complete all the Microsoft 365, Microsoft Teams & associated Direct Routing configuration

Standard – where we will work with you and setup our standard Voice service (PSTN Usage), Voice Route & Voice Routing Policy and our standard Dial plan (Normalised for UK dialling). We'll assign the service to two users and working together with you, we will validate the service is working. You can then go ahead and complete the setup for the rest of your Teams users.

Tailored – we will work with you to establish your specific requirements to setup your Direct Routing Service. This could include the Standard setup as well as adding the service to all your Teams users, assistance with domain setup, PowerShell scripting, creating custom Dial plans, configuring Auto-Attendants, Call-Queues, migration from Skype for Business etc. Test and validation criteria will be based around the agreed requirements.

2. Guide Overview

This configuration guide outlines the steps to add the Direct Routing service to your Microsoft 365 Tenant and Microsoft Teams. It also provides guidance on how to add the Direct Routing service for a user along with some simple test steps for that user.

This guide is an indicative guide and is to be used in conjunction with resources and guidance available from Microsoft. Whilst every endeavour has been made to keep this guide up to date, Microsoft, from time-to-time, do update and make changes to their products, administrative tools and supporting collateral. So always check on-line for the latest information.

All configuration information within this guide is as per the default Standard Virgin Media Business Direct Routing service setup.

If using any of the commands and settings in this guide, we recommend you copy and paste them into the Teams PowerShell module.

If no further customisation is required, the Standard service can be used. If alternative configuration is required e.g. different Dial plans, different naming conventions are to be used for the settings to keep them separate from the Standard setup. This will allow the Standard setup to remain intact and available for any testing and troubleshooting in relation to the service in-life, should the need arise.

Virgin Media Business will work with you to agree dates for the provisioning of any numbers to be used with the service. Microsoft Teams configuration should be completed and ready before any numbers are provisioned across.

If you are moving any existing business telephone numbers across to the Direct Routing service from another telephony service, to avoid any unnecessary disruption to your business, please ensure that your service has been set up and tested using the temporary telephone numbers that are available before any numbers are moved across.

The configuration and deployment of Direct Routing has been broken out into the following five areas:

1. Getting your Microsoft 365 tenant ready
2. Adding the domains to the Microsoft 365 tenant
3. Configuring the Direct Routing service
4. Assigning the Direct Routing service to an individual Teams user
5. Service Validation

3. Getting Your Microsoft 365 Tenant Ready

In preparation for your Direct Routing deployment there are a few decisions and steps that need to be taken.

Deployment Pre-requisites

Before proceeding with any Direct Routing service setup, you need to make sure you have the following:

- Your Microsoft 365 tenant is established
- Users taking the Direct Routing Service:
    - reside in the Microsoft 365 tenant, or are in your on-premises Active Directory (AD) and are synchronised with Azure AD
    - User endpoints have the Microsoft Teams Client installed and/or must be Teams compatible
    - have any licenses available for Microsoft Teams and Phone System (with Audio Conferencing if applicable). See Licenses and Apps below for a list of the licenses for an individual user.
    - there is a minimum of two user accounts available to test and validate the Direct Routing service
- For any parties configuring the Direct Routing service, they must have the correct accounts and levels of access to the following Administrative and Management tools. See Accounts & Access rights below for further information around the roles required.
    - Microsoft 365 Admin Center
    - Microsoft Teams Admin Center
    - Microsoft Teams PowerShell module (see PowerShell below for further information around the PowerShell module.
- You have received the Virgin Media Business supplied domain names and are ready to add the Direct Routing Domains representing the SBC's to your Microsoft 365 tenant
- Have made the decisions that will influence your configuration and any migration e.g. Telephone number movement and allocation, migration from an existing voice solution, call routing and Dial plans, emergency calling etc.
- You have in place the required internet connectivity and infrastructure for use with the service

It is important to ensure that all the deployment pre-requisites have been completed before getting started.

Accounts & Access rights

A user with global administrator rights is required for all Direct Routing configuration and setup.

Alternatively, you can share the responsibilities between multiple users by granting the roles to the users nominated to perform the individual tasks as broken out and listed in the table below:

Feature	Description
Domain Name Administrator	required to add the two domains to the Microsoft 365 tenant that will represent the Virgin Media Business SBC's.
User Administrator	required to create a user account for each of the domains to activate them.
Teams Administrator	required to create, manage and view the Teams Direct Routing configuration.

If you are taking the Standard or Tailored deployment options, user accounts and access will need to be created and provided for the Virgin Media Business Microsoft specialist working with you as follows:

- Standard – A Teams Admin Center and PowerShell module account with Teams Administrator permissions and 2 user accounts/credentials to complete service validation
- Tailored – We will work with you to establish what is required to carry out the deployment and service validation, based on the agreed scope of works

Important!

Any user accounts and associated access will need to be available in order to start any configuration or setup support activity.

Licenses and Apps

Listed below are the licenses required for any individual users who are to be enabled for Teams Direct Routing:

- E1, E3 or E5
- Phone system (this is an add-on license included as standard with the E5 license) and must be enabled for any Direct Routing Users.
- Microsoft Teams and Skype for Business Online (Plan 2) should also be enabled under Apps.
- Microsoft 365 Audio Conferencing (this is an add-on license included as standard with the E5 license). There is no license requirement or configuration necessary for meeting attendees to be able to call in to meetings. Audio conferencing only needs to be made available for people who plan to schedule or lead meetings.

The Microsoft 365 Audio Conferencing license is required should an external facing audio-bridge be required for meeting attendees to dial into the meeting from an external phone (PSTN/mobile phone). This is also needed if the user wants to be able to add external participants to a scheduled meeting by dialling out from the meeting to bring them in.

Audio conferencing dial in numbers are provided by Microsoft and are not currently available as part of Direct Routing configuration.

PowerShell

PowerShell is a command line interface for managing Teams. The Teams module introduces a set of cmdlets for managing Teams directly from the PowerShell command line.

PowerShell also provides powerful features for automation that can significantly reduce the Teams management workload i.e. granting a policy to large numbers of users by running a script takes seconds, compared to editing each user individually.

It is important to have some experience running commands in PowerShell. Currently, some of the setup commands for Direct Routing must be run via the Teams PowerShell module, as the configuration cannot be completed using the Microsoft Admin Centers.

Please ensure that you have the PowerShell version 5.1 or higher installed with the Microsoft Teams module and verify that you can connect to your Microsoft 365 tenant or Microsoft Teams using PowerShell.

4. Adding the Domains

The following steps will guide you through what's required to add the two Virgin Media Business domains that will represent the Virgin Media Business SBC's in your Microsoft 365 tenant. The service will be unable to operate without these domains being present.

These domains are to be created using domain names provided by Virgin Media Business.

DNS entries and records for these domains are created and managed on the Virgin Media Business DNS servers.

The domain names include a unique customer reference number for your service as part of the Virgin Media domain name.

These domains must be created and verified before you can start to configure the Direct Routing service.

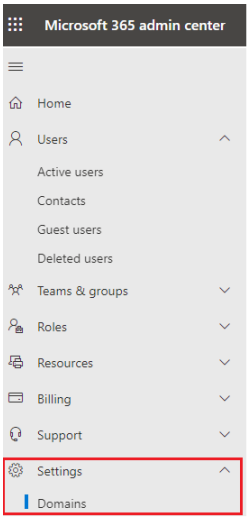
Step 1 - Add the Domains to your Microsoft 365 tenant

The following steps will take you through what's required in order to add the two Virgin Media Business domains that will represent the Virgin Media SBC's in your Microsoft 365 tenant.

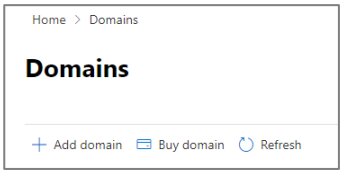
1. Sign into the Microsoft 365 Admin Center.

   https://admin.microsoft.com/

2. In the left navigation pane, browse to **Settings > Domains**



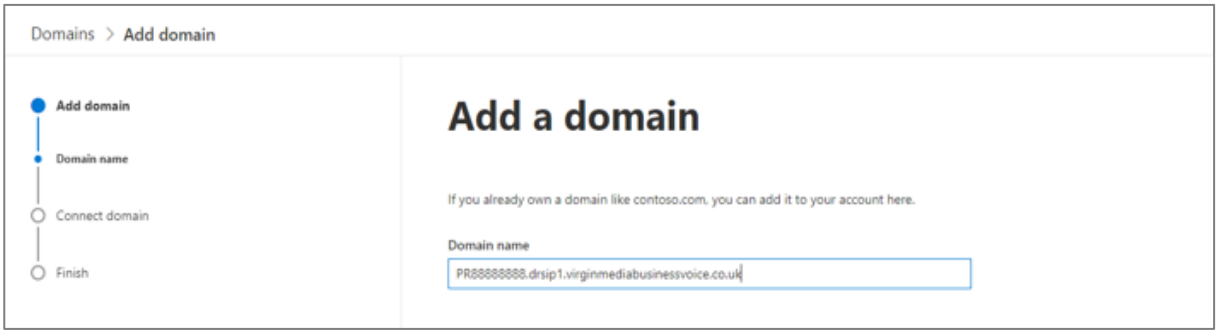
3. In the Domains window that opens, click the + Add domain



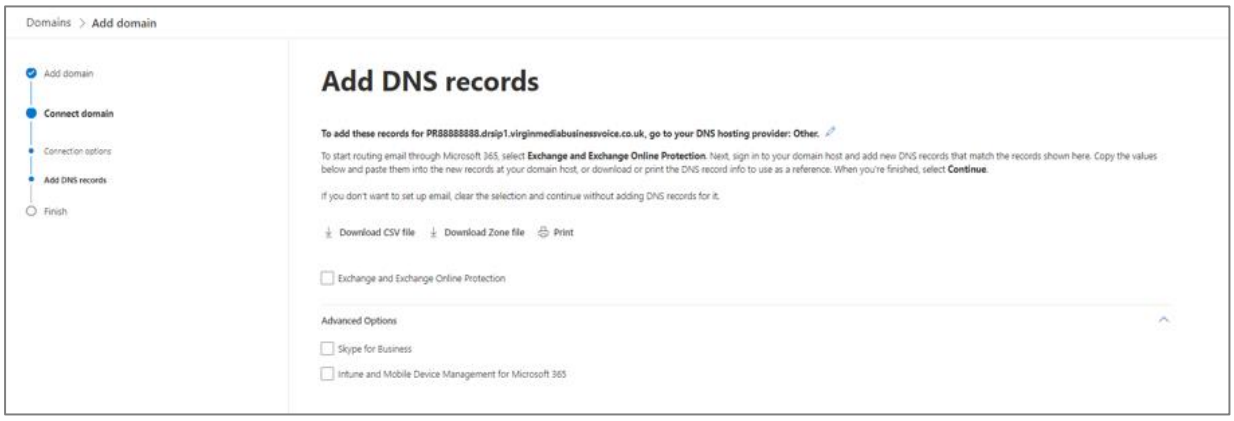
4. Enter whichever of the two Microsoft Teams Direct Routing domains provided by Virgin Media Business you are adding.

   The two domain names that need to be added are PRXXXXXXXX.**drsip1.virginmediabusinessvoice.co.uk** and PRXXXXXXXX.**drsip2.virginmediabusinessvoice.co.uk**

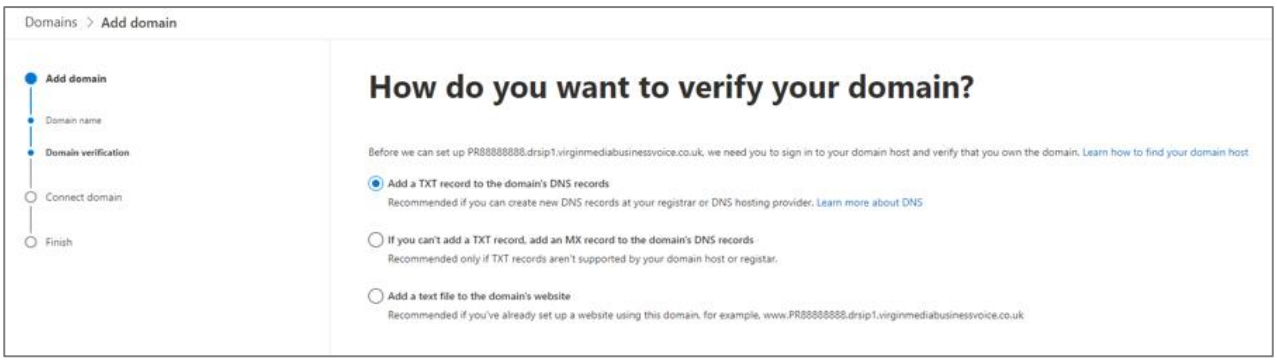
   Please replace PRXXXXXXXX in the domain names with the unique customer domain reference number issued by your order manager. Then select **Use this domain**.



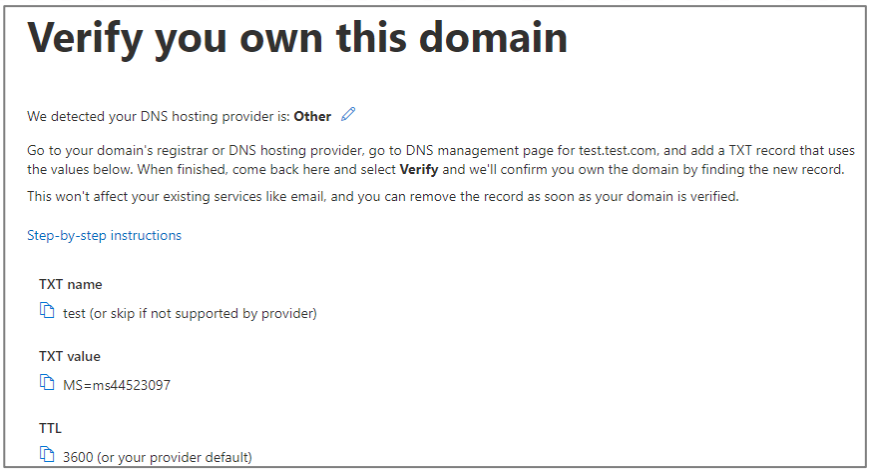
5. Please ensure that Exchange and Exchange online and any other services under Advanced Options are unchecked and select Continue



6. When prompted, select Add a TXT record to the domain's DNS records, and click Continue at the bottom of the page



7. Copy the whole TXT value string (MS=msxxxxxxxx) that's returned into an email ready to send the information to your Virgin Media Business Order Manager.



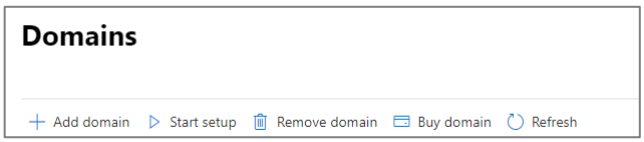
8. Once you've copied the TXT string, click the **Close** button to finish the setup for now. The domain setup will show **"Incomplete Setup".**

9. Repeat steps 3 – 8 to add the second domain name.

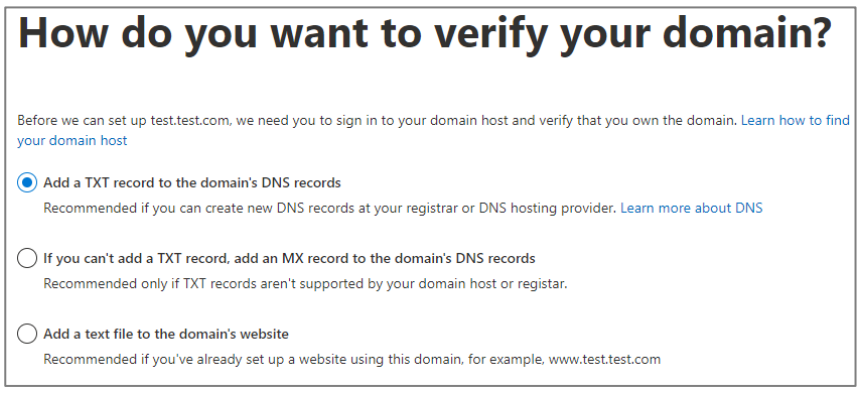
10. Email both the TXT records to your order manager. The TXT records for both domains need to be added to the Virgin Media Business DNS servers in order to verify them and allow completion of the domain setup. Once Virgin Media Business have confirmed that we've updated our DNS TXT records, you will be able to log back into the Microsoft 365 Admin Center and complete the setup.

11. As soon as your order manager confirms that the TXT records have been added to the Virgin Media Business DNS, setup of the Domains can be completed. To do this, log back into the Microsoft 365 Admin Center, go back to Domain setup by browsing to **Settings > Domains**

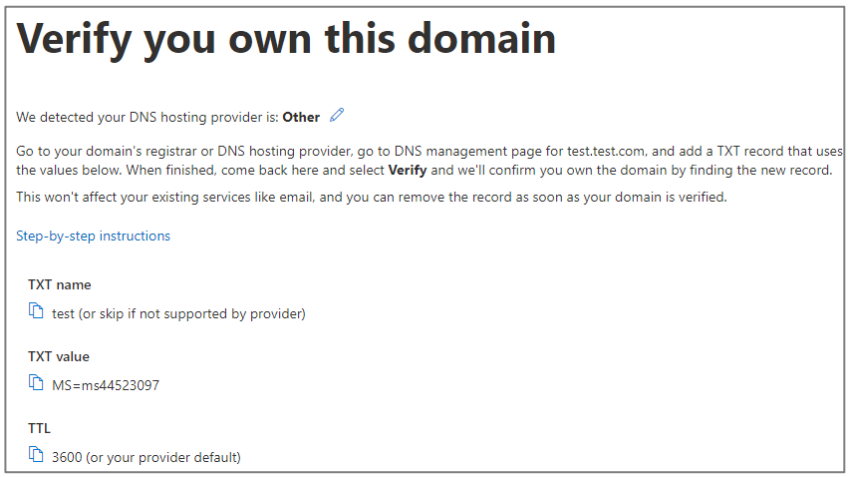
12. From the list of Domains, select the first domain you created and click on **+ Start setup**



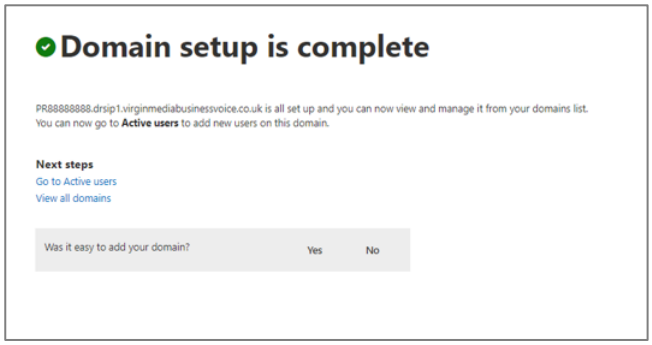
13. When prompted, select **Add a TXT record to the domain's DNS records** and click **Continue**



14. When prompted to confirm you own this domain, click on **Verify**



15. The screen should change to show **Domain Setup is Complete**



16. Repeat steps 10-15, this time selecting the second domain.

17. This should complete the setup of the two domains ready for Step 2 – Add a User Account for each Domain created.

Step 2 – Add a User Account for each Domain created

A user account is required for each of the two domains that you have just added to your tenant. This step is required to verify and activate the domains.

These user accounts must be licensed to use Teams and phone system (E1 or E3 with phone system, or E5).

In addition, they must also be in “Teams Only” mode. This is important otherwise you will be unable to complete the Direct Routing service configuration.

Notes:

Checking if a user is in “Teams Only” mode can only be carried out using a command in the Teams PowerShell module.

Once the domains have been activated and your Direct Routing service setup is complete, these user accounts and associated licenses can be removed, or re-assigned elsewhere.

IMPORTANT! From this point forward, all information and configuration provided is using the Teams PowerShell module.

5. Microsoft Teams Direct Routing Configuration

This section will step through the configuration steps necessary to set up the Direct Routing service in your Microsoft 365 tenant.

Step 1 – Connect to Microsoft Teams using PowerShell

Please ensure that the user configuring Microsoft Teams has sufficient technical knowledge and "Teams Service Administrator" rights assigned to their Microsoft user account.

Run the following commands to connect to the Microsoft Teams by launching PowerShell as an administrator. From the PowerShell command line:

1. Install the Microsoft Teams module

```
Install-Module MicrosoftTeams
```

2. Import Microsoft Teams module

```
Import-Module MicrosoftTeams
```

3. Connect to Microsoft Teams

```
Connect-MicrosoftTeams
```

Step 2 – Check Domain Users are set to Teams Only mode

Ensure the two user accounts assigned to the Direct Routing domains are in Teams Only mode. This is a necessary step, as if they are not it will prevent later configuration of the Direct Routing service.

Use the following command to verify that the user allocated to each of the domains has been created in Microsoft Teams with a Teams Only upgrade policy by running the PowerShell command below. Ensure you replace the username@domain with the user's User Principal Name (UPN).

```
Get-CsOnlineUser username@domain | FL DisplayName, SipAddress, Enabled, TeamsUpgrade*
```

Which should return the following but including the UPN you used and your organisations email domain name:

```
PS C:\> Get-CsOnlineUser "Joe Brown" | FL DisplayName, SipAddress, Enabled, TeamsUpgrade*

DisplayName                         : Joe Brown
SipAddress                          : sip:JoeBrown@DRDemo1.onmicrosoft.com
Enabled                             : True
TeamsUpgradeEffectiveMode           : TeamsOnly
TeamUpgradeNotificationEnabled      : False
TeamsUpgradePolicyIsReadOnly        : ModeandNotifications
TeamsUpgradePolicy                  : UpgradetoTeams
TeamsUpgradeOverridePolicy          :
```

If the user is not set for Teams Only mode, then run the following command replacing the username@domain with the user's User Principal Name (UPN).

```
Grant-CsTeamsUpgradePolicy -Identity username@domain -PolicyName UpgradeToTeams
```

Which should display the following, but including the UPN you entered:

```
PS C:\>Grant-CsTeamsUpgradePolicy -Identity "JoeBrown@DRDemo1.onmicrosoft.com" -PolicyName UpgradetoTeams

WARNING: Users with this policy will become full Teams only users. They will no longer be able to use Skype for Business
WARNING: Existing meetings organized by this user will be migrated to become Teams meetings.
```

The above steps are critical and need to be completed before moving to Step 3 – Configure PSTN Usage

Step 3 – Configure PSTN Usage

PSTN usage is the container for voice routes and can be shared in different voice routing policies.

The following PSTN usage needs to be created in Microsoft Teams for the Virgin Media Business Direct Routing service:

```
VirginMediaBusiness-PU-ALL
```

Using the PowerShell connected to the Microsoft Teams in the previous Step, run the following command to create it.

```
Set-CsOnlinePstnUsage -Identity Global -Usage @{Add="VirginMediaBusiness-PU-ALL"}
```

The following should be displayed:

```
PS C:\> Set-CsOnlinePstnUsage -Identity Global -Usage @{Add="VirginMediaBusiness-PU-ALL"}
```

To verify that the "`VirginMediaBusiness-PU-ALL`" PSTN usage has been added, run the following command:

```
Get-CsOnlinePstnUsage
```

Which should return the following:

```
PS C:\> Get-CsOnlinePstnUsage

Identity            : Global
Usage               : {Test-VirginMediaBusiness-PU-ALL, VirginMediaBusinessTest2-PU-ALL,
VirginMediaBusiness-PU-ALL}
```

Step 4 – Configure Online Voice Routes

Voice routes contain different number patterns for the destination numbers associated with PSTN gateways and act as pointers to the SBC's. They route calls to the SBC's when the calling pattern is a match to the called number.

This is where you will add the domain names that you added to your 365 tenant that represent the SBC's so they can be used to route call traffic.

A voice route needs to be created as shown below which will allow all Teams users to dial all number patterns.

The default Standard Direct Routing service from Virgin Media Business assigns the following name:

VirginMediaBusiness-VR-ALL

You will need to replace the [customer unique domain reference number] including the square brackets, in the PowerShell command syntax below. Please use the unique domain reference name you were issued with to create the two Direct Routing domains in your Microsoft 365 tenant. The naming convention used is ten characters in length and starts with the letters "PR" followed by an eight-digit number i.e. PR88888888.

Please also see a populated example below:

```
New-CsOnlineVoiceRoute -Identity "VirginMediaBusiness-VR-ALL" -NumberPattern ".*" -OnlinePstnGatewayList [Unique Reference Number].drsip1.VirginMediaBusinessvoice.co.uk,[Unique Reference Number].drsip2.VirginMediaBusinessvoice.co.uk -Priority 0 -OnlinePstnUsages "VirginMediaBusiness-PU-ALL"
```

A pre-populated example:

```
New-CsOnlineVoiceRoute -Identity "VirginMediaBusiness-VR-ALL" -NumberPattern ".*" -OnlinePstnGatewayList PR88888888.drsip1.VirginMediaBusinessvoice.co.uk,PR88888888.drsip2.VirginMediaBusinessvoice.co.uk -Priority 0 -OnlinePstnUsages "VirginMediaBusiness-PU-ALL"
```

The following should be displayed, but showing your unique domain reference in place of "PR88888888":

```
PS C:\> New-CsOnlineVoiceRoute -Identity "VirginMediaBusiness-VR-ALL" -NumberPattern ".*" -OnlinePstnGatewayList PR88888888.drsip1.VirginMediaBusinessvoice.co.uk,PR88888888.drsip2.VirginMediaBusinessvoice.co.uk -Priority 0 -OnlinePstnUsages "VirginMediaBusiness-PU-ALL"
```

Please verify that the voice route "VirginMediaBusiness-VR-ALL" has been created by running the following command:

```
Get-CSOnlineVoiceRoute -Identity "VirginMediaBusiness-VR-ALL"
```

Which should return the following:

```
PS C:\> Get-CSOnlineVoiceRoute -Identity "VirginMediaBusiness-VR-ALL"

Identity                : VirginMediaBusiness-VR-ALL
Priority                : 0
Description             :
NumberPattern           : .*
OnlinePstnUsages        : {VirginMediaBusiness-PU-ALL}
OnlinePstnGatewayList   : {PR88888888.drsip1.VirginMediaBusinessvoice.co.uk,
PR88888888.drsip2.VirginMediaBusinessvoice.co.uk}
Name                    : VirginMediaBusiness-VR-ALL
```

Step 5 – Online Voice Routing Policy

This creates the online voice routing policy that will be assigned to your users taking the service so they can make external calls. The default Standard Direct Routing service from Virgin Media Business assigns the following name:

VirginMediaBusiness-VRP-ALL

Run the following command in a PowerShell session connected to Microsoft Teams:

```
New-CsOnlineVoiceRoutingPolicy "VirginMediaBusiness-VRP-ALL" -OnlinePstnUsages
"VirginMediaBusiness-PU-ALL"
```

```
PS C:\> New-CsOnlineVoiceRoutingPolicy "VirginMediaBusiness-VRP-ALL" -OnlinePstnUsages
"VirginMediaBusiness-PU-ALL"
```

Please verify that the voice routing policy "`VirginMediaBusiness-VRP-ALL`" has been created by running the below command:

```
Get-CsOnlineVoiceRoutingPolicy "VirginMediaBusiness-VRP-ALL"
```

Which should return the following:

```
PS C:\> Get-CsOnlineVoiceRoutingPolicy -Identity "VirginMediaBusiness-VRP-ALL"

Identity                : Tag:VirginMediaBusiness-VRP-ALL
OnlinePstnUsages        : {VirginMediaBusiness-PU-ALL}
Description             :
RouteType               : BYOT
```

Step 6 – Add the Dial plan

A Dial plan is a set of rules that translate the telephone number that users dial into a standard E.164 number format for call authorisation and call routing.

The following Dial plan is a user-based Dial plan as opposed to it being global. This is just in case it interferes in some way with any other existing Dial plans. It provides a Standard set of rules that can be assigned to any or all users and allows them to call anywhere by providing normalisation rules for the following types of telephone numbers:

- International
- UK National
- UK Services Codes (i.e. any UK specific numbers like 999, 112, 100 etc.)

A different Dial plan would need to be created and assigned to any users should they require a different level of call restriction e.g. they were not allowed to make international calls.

The following steps will create a Dial plan variable to store the Dial plan and normalisation rules for the Standard Virgin Media service with the label **VirginMediaBusiness-TDP-ALL**

The normalisation rules are then added to the Dial plan after which the Dial plan can be assigned to the users.

Once all the following steps have been completed to enter the configuration for the Dial plan please see Verify the Dial plan to check all settings are correct.

Declare the variable

To declare the Dial plan variable label "**VirginMediaBusiness-TDP-ALL"** that will store the Dial plan name, run the following command in a PowerShell session connected to the Microsoft 365 tenant:

```
$DPParent = "VirginMediaBusiness-TDP-ALL"
```

The following should be displayed:

```
PS C:\> $DPParent = "VirginMediaBusiness-TDP-ALL"
```

Create the Dial plan

To create the Dial plan and description that the normalisation rules will be added to, run the following command in a PowerShell session connected to the Microsoft 365 tenant:

```
New-CsTenantDialPlan $DPParent -Description "Default Normalization rules for Virgin
Media Business"
```

The following should be displayed:

```
PS C:\> New-CsTenantDialPlan $DPParent -Description "Default Normalization rules for Virgin Media Business"C:\> Get-CsTenantDialPlan -Identity Tag:VirginMediaBusiness-TDP-ALL

Identity                : Tag:VirginMediaBusiness-TDP-ALL
Description             : Default Normalization rules for Virgin Media Business
NormalizationRules      : {}
ExternalAccessPrefix    :
SimpleName              : VirginMediaBusiness-TDP-ALL
OptimizeDeviceDialing   : False
```

Create the Normalisation rules

The following commands create the normalisation rules for each of the telephone number types, International, National and UK Service Codes. Run the following commands in a PowerShell session connected to Microsoft Teams ensuring that the round brackets are used:

To create the Number Rule array that will have normalisation rule added to it.

```
$NR = @()
```

The following should be displayed:

```
PS C:\> $NR = @()
```

Rule 1 - International

To create the Number Rule to allow international dialling, enter the following:

```
$NR += New-CsVoiceNormalizationRule -Name "International" -Parent $DPParent -Pattern '^00([1-9]\d*)' -Translation '+$1' -InMemory -Description "Normalisation - International Dialling"
```

The following should be displayed:

```
PS C:\> $NR += New-CsVoiceNormalizationRule -Name "International" -Parent $DPParent -Pattern '^00([1-9]\d*)' -Translation '+$1' -InMemory -Description "Normalisation - International Dialling"
```

Rule 2 - National

To add the number rule to allow UK National calls

```
$NR += New-CsVoiceNormalizationRule -Name "National" -Parent $DPParent -Pattern '^0([1-9]\d*)' -Translation '+44$1' -InMemory -Description "Normalisation - National Dialling"
```

The following should be displayed:

```
PS C:\> $NR += New-CsVoiceNormalizationRule -Name "National" -Parent $DPParent -Pattern '^0([1-9]\d*)' -Translation '+44$1' -InMemory -Description "Normalisation - National Dialling
```

Rule 3 - UK Service Codes

To add the number rule to allow UK Service Code calls

```
$NR += New-CsVoiceNormalizationRule -Name "UK Services" -Parent $DPParent -Pattern
'^[1-9]\d*' -Translation '$0' -InMemory -Description "Normalisation - UK Service Codes
(incl. 999, 100 etc.)"
```

The following should be displayed:

```
PS C:\> $NR += New-CsVoiceNormalizationRule -Name "UK Services" -Parent $DPParent -Pattern
'^[1-9]\d*' -Translation '$0' -InMemory -Description "Normalisation - UK Service Codes (incl. 999, 100
etc.)"
```

Add the normalisation rules to the Dial plan

To add the normalisation rules you have just created to the Dial plan, run the following command in a PowerShell session connected to the Microsoft 365 tenant. Ensure that you use the curly brackets with this command.

```
Set-CsTenantDialPlan -Identity $DPParent -NormalizationRules @{add=$NR}
```

The following should be displayed:

```
PS C:\> Set-CsTenantDialPlan -Identity $DPParent -NormalizationRules @{add=$NR}
```

Verify the Dial plan

To verify that the **VirginMediaBusiness-TDP-ALL** Dial plan has been correctly added with the default Standard settings, the normalisation rules have all been created correctly and added to the array, run the following command to check:

```
Get-CsTenantDialPlan -Identity "VirginMediaBusiness-TDP-ALL"
```

The following should be returned:

```
C:\> Get-CsTenantDialPlan -Identity Tag:VirginMediaBusiness-TDP-ALL

Identity                : Tag:VirginMediaBusiness-TDP-ALL
Description             : Default Normalization rules for Virgin Media Business
NormalizationRules      : {Description=Normalisation – International Dialling;Pattern=^00([1-
9]\d*);Translation=+$1;Name=International;IsInternalExtension=False, Description=Normalisation -
National Dialling;Pattern=^0([1-9]\d*);Translation=+44$1;Name=National;IsInternalExtension=False,
Description=Normalisation - UK Service Codes (incl. 999, 100 etc.);Pattern=^[1-
9]\d*;Translation=$0;Name=UK Services;IsInternalExtension=False}
ExternalAccessPrefix    :
SimpleName              : VirginMediaBusiness-TDP-ALL
OptimizeDeviceDialing   : False
```

This completes the Standard Direct Routing service configuration. You are now ready to assign the voice routes and policies created to users so they may use the Direct Routing service. Please see Assigning the Direct Routing service to an individual User for further information.

6. Assigning the Direct Routing service to an individual User

The following section includes the basic commands that need to be run for an individual user to enable them to make and receive external PSTN calls.

Each Direct Routing User should as a minimum have the following:

- Enterprise voice enabled
- Be set for Teams Only mode[1]
- A telephone number assigned to them
- An online Voice Routing Policy assigned
- A Dial plan policy assigned

[1] It's important that any users taking the Direct Routing service are in "Teams Only" mode. If they are not, their ability to use the Direct Routing service will be impacted.

Step 1 – Enable a user with Teams Only Mode

Run the following PowerShell command to set a user with the "Teams Only" mode policy. Replace the username@domain with the user's User Principal Name (UPN).

```
Grant-CsTeamsUpgradePolicy -Identity username@domain -PolicyName UpgradeToTeams
```

This is what should be displayed referencing the actual UPN used

```
PS C:\> Grant-CsTeamsUpgradePolicy -Identity "JoeBrown@DRDemo1.onmicrosoft.com" -PolicyName UpgradeToTeams
```

Step 2 – Enable a user for Enterprise Voice

Run the following PowerShell command to enable the user with enterprise voice. Replace the "<username@domain>" with the user's UPN.

```
Set-csphonenumberassignment -identity "<username@domain>" -enterprisevoiceenabled $true
```

A pre-populated example:

```
Set-csphonenumberassignment -identity JoeBrown@DRDemo1.onmicrosoft.com -enterprisevoiceenabled $true
```

Below is what should be displayed, referencing the User details you entered:

```
PS C:\> set-csphonenumberassignment -identity JoeBrown@DRDemo1.onmicrosoft.com -enterprisevoiceenabled $true
```

Step 3 – Assign a telephone number to a user

Run the following PowerShell command to assign the telephone number to the user. Replace the "<username@domain>" with the user's UPN. Then Replace "+44nnnnnnnnnn" with the telephone number to be assigned to that user.

```
Set-csphonenumberassignment -identity "<username@domain>" -PhoneNumber +44nnnnnnnnnn -PhoneNumberType DirectRouting
```

A pre-populated example:

```
Set-csphonenumberassignment -identity JoeBrown@DRDemo1.onmicrosoft.com -PhoneNumber +44123654789 -PhoneNumberType DirectRouting
```

Below is what should be displayed, referencing the User details you entered:

```
PS C:\> set-csphonenumberassignment -identity JoeBrown@DRDemo1.onmicrosoft.com -PhoneNumber +44123654789 -PhoneNumberType DirectRouting
```

Step 4 – Grant Online Voice Routing Policy

Once the Direct Routing service has been enabled, the Virgin Media Business Standard call routing policy can be assigned to allow Teams users to make and receive external PSTN calls

Run the following PowerShell command replacing the username details "<username@domain>" with the User you are configuring.

```
Grant-CSOnlineVoiceRoutingPolicy –identity "<username@domain>" –PolicyName "VirginMediaBusiness-VRP-ALL"
```

A pre-populated example:

```
Grant-CSOnlineVoiceRoutingPolicy –identity "JoeBrown@DRDemo1.onmicrosoft.com" –PolicyName "VirginMediaBusiness-VRP-ALL"
```

Below is what should be displayed, referencing any User details you have entered:

```
PS C:\> Grant-CSOnlineVoiceRoutingPolicy -identity "JoeBrown@DRDemo1.onmicrosoft.com" -PolicyName "VirginMediaBusiness-VRP-ALL"
```

Step 5 – Grant Dial plan

Assign the Virgin Media Business Standard Dial plan to the Users using the following command.

```
Grant-CsTenantDialPlan -Identity "username@domain" -PolicyName "VirginMediaBusiness-TDP-ALL"
```

Please see below for an example:

```
Grant-CsTenantDialPlan -Identity "JoeBrown@DRDemo1.onmicrosoft.com" -PolicyName "VirginMediaBusiness-TDP-ALL"
```

Below is what should be displayed, referencing any User details you entered

```
PS C:\> Grant-CsTenantDialPlan -Identity "JoeBrown@DRDemo1.onmicrosoft.com" -PolicyName "VirginMediaBusiness-TDP-ALL"
```

You can confirm the user configuration by running the following PowerShell command:

```
Get-CsOnlineUser -Identity "JoeBrown@DRDemo1.onmicrosoft.com" | Select-Object SipAddress, LineURI, TeamsUpgradePolicy, RegistrarPool, TenantDialPlan, OnlineVoiceRoutingPolicy
```

Below is what should be displayed, referencing any User details you entered

```
PS C:\> Get-CsOnlineUser -Identity "Joe Brown" | Select-Object DisplayName, SipAddress, EnterpriseVoiceEnabled, LineURI, TenantDialplan, OnlineVoiceRoutingPolicy, TeamsUpgradeEffectiveMode, HostingProvider

DisplayName                    : Joe Brown
SipAddress                     : sip:JoeBrown@DRDemo1.onmicrosoft.com
EnterpriseVoiceEnabled         : True
LineURI                        : tel:+44123456789
TenantDialPlan                 : Test-VirginMediaBusiness-TDP-ALL
OnlineVoiceRoutingPolicy       : Test-VirginMediaBusiness-VRP-ALL
TeamsUpgradeEffectiveMode      : TeamsOnly
HostingProvider                : sipfed.online.lync.com
```

7. Service Validation

As soon as the default Standard Direct Routing service has been configured and assigned to two Users, we recommend as a minimum that Tests 1, 2 & 3 listed below are completed.

We also recommend that these simple Service Validation tests are carried out before making any further configuration changes or adding any remaining users. This will confirm that the Direct Routing service setup is complete, working and ready for full User provisioning along with any remaining customisation as required.

To validate the service, please follow the test steps below:

Test 1 – Check for Dialpad Option

Once the user has been enabled with enterprise voice, Microsoft will update the user attributes on Azure AD and within their infrastructure. This can take anywhere from one to 72 hours. Usually, the attributes are updated within the hour.

When the User signs into their Microsoft Teams client they should see the calls option on left hand side navigation (see image 1 below).

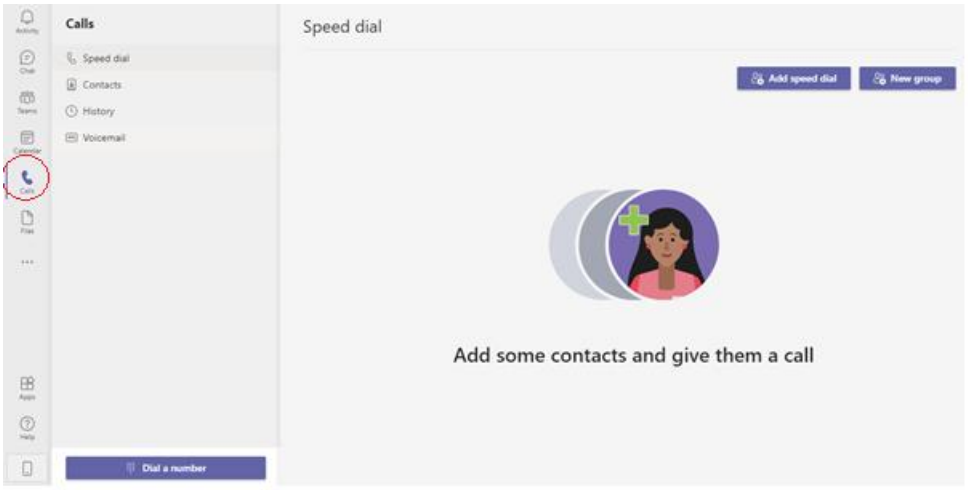


Image 1

If they select and click on the Calls option, they should see the dial pad with the telephone number they have been assigned (see image 2 below).

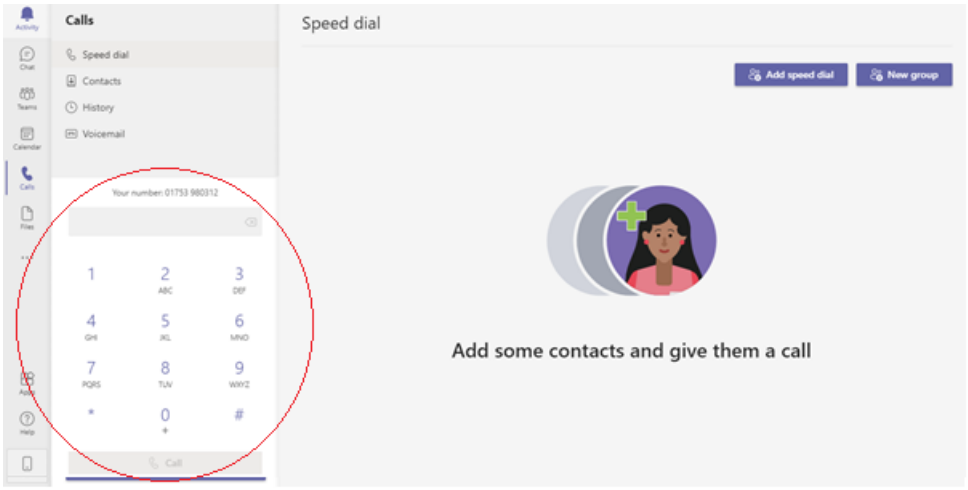


Image 2

Images 1 and 2 are for reference only. The user interface may differ depending on the users Teams client version and/or any Microsoft updates.

Test 2 – Make an Outbound external PSTN Call

From the Teams client make an outbound external call to a landline or mobile number. Ensure that the call connects, and you have two-way audio.

Test 3 – Make an Inbound external PSTN Call

From a mobile device or landline, generate an inbound call to the Teams User's Direct Routing telephone number. Ensure the call can be established with two-way audio.

Once you have successfully completed the above tests your service is ready for your Users to be added. As you add your Users, or should any further service configuration be added, additional validation and test steps should be carried out to check those changes.

Should you find you require further assistance deploying the Virgin Media Business Direct Routing service, please contact your order manager. If this results in the need for any additional professional services, charges may be incurred.

Thank you

Registered Office:

© Virgin Media Business Ltd.
500 Brook Drive
Reading
RG2 6UU

T: 0800 052 0800

Registered in England and Wales No. 01785381