

Services Overview

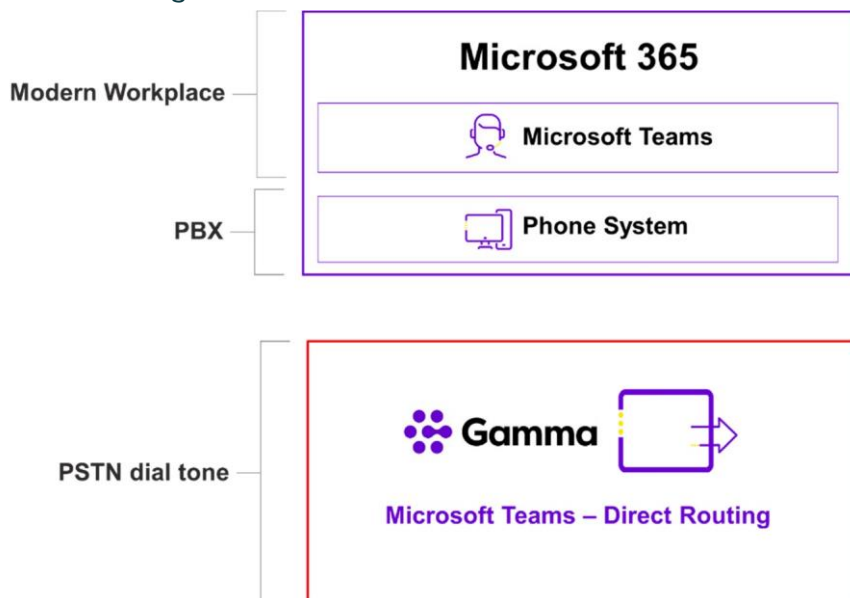
Microsoft Teams - Direct Routing provides the ability to enable PSTN calling within Microsoft Teams using Trustmarque's partner, Gamma Telecom, as the underlying infrastructure provider.

Microsoft 365, Teams and Phone System

Microsoft 365 is a cloud-based subscription service that brings together the Microsoft tools and applications for the way people work today. By combining apps like Excel and Outlook with cloud services like Teams, Microsoft 365 users create, share and communicate anywhere on any device.

Teams is the Unified Communications environment which Microsoft 365 users to create and share content and communicate in multiple ways (messaging, chat, voice, video).

Phone System is the feature description used by Microsoft as the PBX replacement or voice component of Microsoft Teams, which allows internal (within Teams) and external (PSTN) voice calls and a range of call control features.



What is the Microsoft Teams - Direct Routing Service?

Microsoft Teams - Direct Routing enables PSTN calling and a range of additional call control features for Microsoft Teams. The service provides VoIP connectivity for Phone System, allowing inbound and outbound telephony through Trustmarque's service for termination of both national and international destinations.

Microsoft Teams - Direct Routing is a solution available to Microsoft 365 customers who wish to use their preferred voice carrier to enable their users to make and receive PSTN calls in Microsoft Teams.

The service operates a cloud model, whereby Microsoft-certified SBCs (Session Border Controllers) are deployed as a bespoke architecture within the network, for interconnection to Microsoft Phone System for PSTN breakout.

The Microsoft Teams - Direct Routing Service provides SIP signalling as a method for Microsoft Teams Tenants to inter-connect with Gamma's VoIP network supporting calls to/from the PSTN. The following types of calls are supported across this interface:

- 📞 Voice calls to/from non-geographical, corporate or VoIP numbers (03, 05, 08)
- 📞 Voice calls to Premium numbers UK (09) and International
- 📞 Voice calls to/from Mobile destinations (07)
- 📞 Voice calls to/from International destinations (00..)
- 📞 Operator, Emergency and non-Emergency calls (100, 101, 111, 112, 116xxx, 118, 123 1800x, 195, 999)

Service Features

The following features will be supported:

- 📞 Calling Line Presentation (CLIP)
- 📞 Calling Line Restriction (CLIR)
- 📞 Call Park, Transfer & Conferencing
- 📞 Emergency Call Divert
- 📞 Fraud Alert
- 📞 CLI Flexibility
- 📞 Call Admission Control
- 📞 Call Barring
- 📞 DTMF support
- 📞 Emergency, Non-Emergency and other short code Calls

Codec / packetization support

G.711 a-law, G.711 mu-law, and G.729 @ 20ms are supported.

Call Definitions

- 📞 PSTN calls in Teams are calls in which the two parties to the call are not users in the same Microsoft 365 tenant or users in two tenants federated with each other and will be routed via Gamma.
- 📞 On-net calls in Teams are calls in which the two parties to the call are users in the same Microsoft 365 tenant or in two tenants federated with each other and will NOT be routed via Gamma.

Long Duration Calls

Trustmarque has agreed a policy with Gamma to terminate any call that exceeds eight hours, to protect our customers.

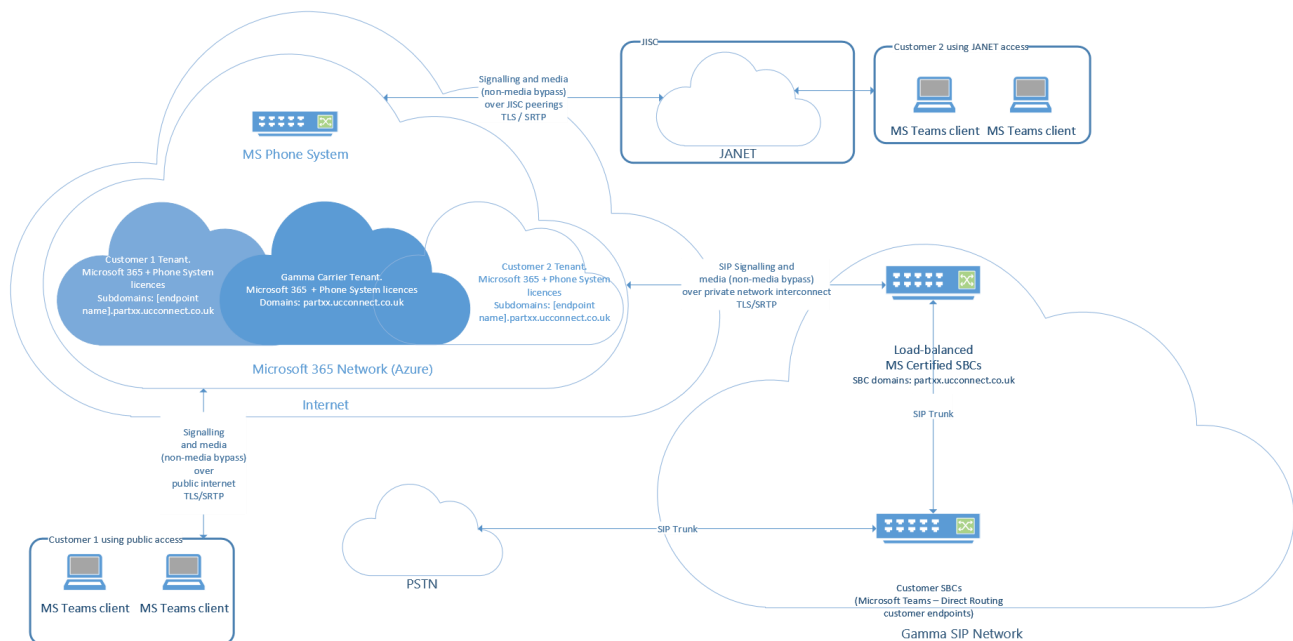
Architecture

High Level Design

This section provides a high-level design detailing how Microsoft Teams - Direct Routing is integrated into the Gamma network and outlines the routing requirements to enable calls to be routed to and from Microsoft.

Overview Diagram

The following diagram illustrates the high-level architecture that Gamma has developed to support the hosted deployment of Microsoft Direct Routing on behalf of its MS Teams customers.



The solution is resilient, offering two geographically diverse networks from Gamma, each hosted in a separate co-location space, and connected within an existing Gamma Point of Presence. Traffic is loadshared across the two diverse sites.

Each of the two resilient connections are defined by several Session Border Controllers (SBCs), interfacing on the public side to the Microsoft Teams Platform (in Azure), which has multiple connections of its own for resilience. The Gamma SBCs will route calls to and from specific subdomains in Microsoft Teams.

The elements of this architecture are described below.

Network Topology

MS Certified SBCs

The cloud-deployment model for MS Direct Routing requires Gamma to deploy Microsoft Certified SBCs into its network. The certification of devices/manufacturers is determined and conducted by Microsoft.

Customer SBCs

Each customer service is terminated on a PSTN connected SBC. It is this element that provides the ability to provision and manage services via the Trustmarque Portal and PSTN calling.

Network Resilience Model

Distributed MS Certified SBC clusters are deployed in the Gamma network, for geographic resilience, and for load-balancing of traffic, on both the public and private sides of the interface with the Microsoft 365 network.

These SBCs are connected to geographically distributed, load-balanced SBC clusters in the Gamma core network, for SIP connectivity and PSTN breakout.

Signalling and Media

Signalling in MS Direct Routing is never exchanged directly between the MS Teams client and the MS Certified SBCs on the Gamma network, but always indirectly, via a 'Call Controller' component in the Microsoft 365 network.

A 'SIP Proxy' component in the Microsoft 365 network exchanges SIP signalling with the MS Certified SBCs on the edge of the network. This is in turn exchanged between the MS Certified SBCs and interconnected SBCs in the core network, on which MS Teams endpoints will be built using the Trustmarque Portal, enabling signalling and media to be exchanged with the PSTN.

Media will not be exchanged directly between the MS Teams client and the MS Certified SBCs on the Gamma network, but indirectly, via the Microsoft 365 network.

Signalling and Media Encryption

Microsoft will only initiate and accept signalling connections secured by TLS 1.2.

As shown in the Architecture Overview diagram, this applies to the communication path between the MS Teams user and the Microsoft 365 network. It also applies to the path between the Microsoft 365 network and the MS Certified SBCs deployed on the Gamma network.

Media is encrypted using SRTP.

MS Teams environment

Within Microsoft Teams - Direct Routing, tenants need to be created and configured in Microsoft 365, for the carrier (Gamma), and for each customer.

Customer tenant

A tenant needs to be created in Microsoft 365 for each customer using Microsoft Teams - Direct Routing. Responsibility for the creation of the customer tenant lies with the customer. The customer tenant is where:

- 🔗 individual users are added,
- 🔗 licences and numbers needed for voice telephony are assigned,
- 🔗 the connection with Gamma is configured for routing.

Two Fully Qualified Domain Names (FQDNs) need to be registered in the customer's tenant, a process which includes a verification step. These FQDNs are subdomains of the domains of the SBCs on Gamma's network, which are themselves subdomains of the Gamma base domain, as explained in the following section. The FQDNs will be used by the Microsoft Phone System for routing calls between MS Teams users in that tenant and the SBCs on Gamma's network.

Additional notes and exceptions

Video

Currently, video is not supported using the PSTN, from the Teams environment. Microsoft Teams has a video calling facility that operates separately to any traffic traversing the Gamma network.

DTMF

DTMF as RFC 2833 with payload as 101 is the only end-2-end supported DTMF system.

FAX

FAX is not supported.

Diallers

Gamma does not accept any Dialler traffic and will take efforts to remove such traffic if/when detected.

This position is based on the operational need to safeguard the network and ensure that optimum service levels remain available to all customers across all SIP Trunking services. In addition, the following Ofcom guidelines regarding nuisance, silent and abandoned calls would be considered by be a regulatory requirement to be adhered to by any signatory to our contracts:

<http://stakeholders.ofcom.org.uk/consultations/silent-calls/statement/>.

For clarity, Gamma considers acceptable traffic to have an Average Call Hold Time (ACHT) of greater than 50 seconds and an Answer Seize Ratio (ASR) of greater than 60%.

In addition, please be aware that Gamma actively monitors all SIP traffic and will respond to endpoints that exhibit 'dialler like' call patterns. In the first instance, this will mean contacting the customer to help resolve the situation by reducing capacity and agreeing a resolution timeframe; however, this does not preclude the barring of an endpoint without notification in extreme circumstances.

Access and Network Connectivity

Connectivity between customer and Microsoft 365 network

Access to Microsoft Teams - Direct Routing is via public internet.

Trustmarque can support connectivity options include the following - Gamma IP Assured, Gamma Broadband (ADSL) - or Public internet via third party Internet Service Providers (ISPs).

Connectivity between Gamma and Microsoft 365 networks

Connectivity between the Microsoft 365 network and the Gamma network, for signalling and media, will use Private Network Interconnections (PNIs) between Gamma and Microsoft. Multiple links will be deployed to ensure resilience and to support capacity management.

Demarcation of Responsibilities

Microsoft Teams - Direct Routing is a service that enables customers to partner with Trustmarque for purposes of enabling PSTN voice calling within Microsoft Teams.

Gamma acts as the carrier in the Direct Routing partnership, which means that it provides the underlying infrastructure used to convey calls between the PSTN and the Microsoft 365 network.

This infrastructure includes Microsoft-certified SBCs deployed on the edge of Gamma's network. These SBCs serve as the SIP interface between the Microsoft 365 network on the public side, and the core Gamma network infrastructure on the internal side.

The Microsoft-certified SBCs deployed on the edge of Gamma's network, together with Gamma's Internet Gateways, represent the physical point of demarcation between the two networks involved in the Microsoft Teams - Direct Routing service model: the Gamma network and the Microsoft 365 / Azure network.

Trustmarque's responsibilities in regard to the different elements of the customer's Microsoft Teams - Direct Routing service extend no further than those assets that fall under its (and Gamma's) control, namely the assets deployed on or at the edge of its own network, as described above, together with the carrier tenant in Microsoft 365, in which the logical trunks used to provide connectivity to the Gamma SBCs are configured.

Trustmarque can assume no responsibility for the assets that form part of the customer's Microsoft Teams - Direct Routing service but are not supplied by Trustmarque, or are under Gamma's control, either directly or indirectly.

Except as detailed below, this means that Trustmarque is not responsible for any aspect of the supply, administration, provisioning, security or support of the customer's Microsoft 365 environment, beyond providing a guide to the required initial configuration of the customer's Microsoft 365 tenant, in order to enable connectivity to the Gamma network, and performance of service acceptance testing. Responsibility for performing this configuration will lie with the customer.

Beyond the provision of this guide, Gamma will not be responsible for any of the following aspects of the customer's Microsoft 365 environment:

-  Microsoft Phone System configuration and management
-  Microsoft Teams configuration and management
-  Microsoft 365 configuration and management

- 🔗 User data in the customer Microsoft 365 tenant.

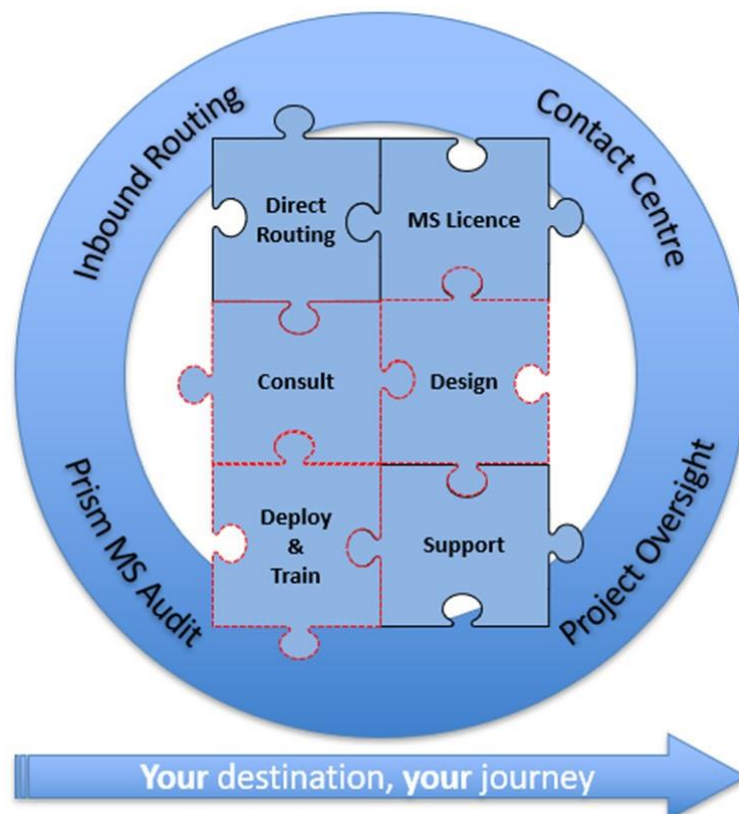
Similarly, Trustmarque will not be responsible for any third-party internet access that the customer may choose to procure for purposes of enabling access to the Microsoft 365 network.

Trustmarque Deployment and Consultancy Services

Where our customers require support to manage elements of work within their Microsoft 365 environment, Trustmarque offers the following services:

- 🔗 Consult – including Auto-Discovery to understand the environment being transitioned from and what functionality is required in the target environment
- 🔗 Design – assist in design of MS Phone System configurations to support requirements
- 🔗 Deploy – assist in deployment of features and configuration within Phone System
- 🔗 Train – user and support staff training to enable self-support in future
- 🔗 Support – in-life support for Moves, Adds, Changes, as required

All services are scoped and delivered through consultation with our customers, with Professional Services charges being applicable for the selected support services.



SIP Trunk Call Manager (STCM)

The following features are provided as standard as part of the Microsoft Teams Direct Routing service.

STCM provides a centralised inbound call management service, managed via a web portal or App that allows the customer to manage, control and report on their Inbound Telephone calls and numbers.

STCM delivers key features including: scalable call queuing; date, day and time of day call routing; hunt groups; voice mail; and access to call performance statistics.

STCM Features

STCM Feature	Description
Destination Control	The End User can change the termination number to which their inbound calls are routed. Termination numbers must be UK mobile or fixed line destination numbers. 08 and international termination are available on request.
Day of week Routing	The End User can set up specific call routing to be applied according to day of week from Monday to Sunday.
Time Control	The End User can set up specific call routing according to time of day.
Divert Control	The End User can divert calls according to no answer, busy or on failover.
Area Control	The End User can define the call routing or treatment of a call based on the caller's number or area code.
Distribution Control	Load balancing of incoming calls across multiple destination numbers. Routing options are percentage or serial.
Date Control	Date Control Nodes are used to define routing for calls made within a particular date range.
Hunt Groups	Hunt Group nodes are used to determine routing of calls to a specific group of users or destinations. Routing options are serial, prioritised, random or parallel.
Call Queuing	The Call Queue control feature is used to establish a network-based call queue within a call routing plan. Various properties can be programmed to determine the queuing experience for the caller.
IVR	The IVR (Interactive Voice Response) control feature enables the creation of a personalised menu announcement with up to 12 options, enabling defined routing/action based on the caller's selection on their keypad.
Announcements	Announcements can also be used in a call plan at any stage to play audio to callers. Users can upload their own files or choose from a selection of Gamma provided announcements.
Advanced Statistics	Displays Inbound call data for all Inbound numbers active on the End User Inbound account. The End User can search for results based on call outcomes, time/date stamp, by caller's telephone number, Inbound or destination number. Results can be downloaded by the User in .CSV format.
Call Whisper	The End User can record an announcement to be played as a prompt to the call answering agent but is unheard by the caller.
Voicemail	The End User can create a call plan with options to route calls to a voicemail node, with a range of email notification options.
STCM App	Call statistics and call plan changes can be accessed via a handheld smartphone/device application.

STCM Feature	Description
STCM Reports	User can sign up for daily, weekly or monthly emails containing either a .CSV file of all the advanced statistics for the specified period, or a summary csv file with the high-level statistics for each number within the account. Up to 3 email addresses can be designated to receive the emailed reports.
Limit Caller Admission	Calls to chosen destinations in your call plan can be limited to a configured number of concurrent calls. Once the threshold has been reached excess callers can be treated as follows; diverted, played a message, queued or sent to voicemail.
Shared Values	Calendars and schedules can be shared amongst multiple numbers, allowing for easy adds/moves/changes.
Aliasing	In many large numbering estates users may have many numbers that have the exact same routing plans. Aliasing allows the user to link numbers with the same routing plans together, so changes to one are reflected on any that are linked.
Virtual Numbers	Virtual Numbers allows the user to create sub plans or routing plans that can only be accessed only from another plan, this allows for complex routing to be shared across multiple numbers, reducing the need for repetition and providing simpler complex call plan management.
GoTo	GoTo is used in conjunction with Virtual Numbers to create routing links from one plan to another (to save on repeated building), i.e. 'go to this Inbound or Virtual Number xxxx from this point in the plan.
Custom Fields	Custom Fields allows the user to add their own unlimited number of column labels or text references (names etc.) to each Inbound number. This data can then be searched and filtered within the Advance Statistic and Push Reporting.

The following features are also available as optional, chargeable extras:

-  Auto Attend (IVR)
-  Announcement
-  Area Based Routing
-  Limit Caller Admission

Numbering

SIP Trunk Call Manager must be ordered in conjunction with at least one Microsoft Teams - Direct Routing endpoint and number per End User logon. The number must be live on the Microsoft Teams - Direct Routing Endpoint.

If you migrate endpoints or DDI's from one SIP Trunk Call Manager account to another then all existing call plans on the losing SIP Trunk Manager account will be lost, except for the basic SIP Trunk pass through plan.

Number Availability

The service can be ordered with a new number from the following ranges:

- 📞 0845
- 📞 0844
- 📞 0871
- 📞 0870
- 📞 0800/0808
- 📞 03XX
- 📞 01/02

Number Portability

Geographic or non-geographic numbers, once ported, can be provisioned on a Microsoft Teams - Direct Routing endpoint.

Please note that it is the number and not the service that ports therefore any existing advanced call plan routing will need to be re-built once the number is confirmed as live on the Gamma Network. Geographic number port orders will be placed and managed by Trustmarque's Voice Services team via the Online Geo Number Porting automated system.

Number porting is dependent upon live number porting agreements between the Originating and Losing Communications Provider and Gamma. Details of current porting agreements are available on request.

Directory Enquiry Registration

All Inbound numbers can be registered with the BT Directory Enquiries service.

Call Termination

All numbers provisioned must terminate to a valid destination from the following options:

- 📞 Endpoint
- 📞 UK fixed line geographic number (01 or 02)
- 📞 UK 03, 080x, 050x number
- 📞 UK Mobile number (please note that international roaming may affect the service)
- 📞 International number
- 📞 An 084 or 087 number
- 📞 SIP Trunk Call Manager system announcement (where applicable)
- 📞 SIP Trunk Call Manager voicemail (where applicable)

The following destination numbers are not guaranteed to work in conjunction with the service; international destinations/roaming (international) mobiles/IP destinations/destinations associated with a fax machine/data.

All 01 and 02 Inbound termination are inclusive with the rental fees, only new 03 traffic will qualify as being inclusive.

Service Level Availability

Service Availability

Service Availability is defined as the ability of a Service to perform its required function over a stated period of time. It is reported as the percentage of time that a Service is available for use by the Customer within agreed Service Hours. Availability is calculated as:

$$\frac{(Total\ number\ of\ minutes\ in\ the\ measurement\ period - Unplanned\ Downtime)}{Total\ number\ of\ minutes\ in\ the\ measurement\ period} \times 100$$

Note: If a Service is partially available then the Unplanned Downtime shall be calculated in equal proportion i.e. if a service is 50% available then the unplanned downtime will be calculated as 50% x elapsed period of the incident.

Provisioning Service Level

Trustmarque will take reasonable steps to provision the site user subscriptions and hardware in the timescales set out in the table below, unless agreed otherwise.

Activity	Time to Complete
Manual Build (CRF) Endpoint Creation	14 Business Days
Manual Build (CRF) Moves and Changes	14 Business Days

Notes

1. Service Credits are not applicable against Service Provisioning performance metrics unless stated otherwise in the Order.
2. Service Provisioning timescales for services that may be associated with the MS Teams - Direct Routing service, such as Number Porting or IP Access, will apply as for those standard services.

Service Availability

	Core (1)	Non-core (2)
Microsoft Teams Direct Routing Endpoint	99.99%	99.95%

Notes:

1. Core functions are defined as Gamma Switching infrastructure, transmission equipment and core network, the service that supports call routing and termination.
2. Non-core functions include the Supplier and Gamma Support Systems, access to the portal, and feature based services such as Call Divert.

Quality Standards & Security

Gamma's services are certified to:

-  ISO 9001
-  ISO 14001
-  ISO 22301
-  ISO 27001
-  Cyber Essentials
-  Cyber Essentials Plus
-  Carbon Neutral