



# Converged Private Networks

Service Description

Version	Date	Description
1.0	30/06/2015	Launch Version
2.0	14/07/2016	Integration of Talk Talk Business Ethernet tails
3.0	04/11/2016	Integration of Mitel UCaaS
3.1	09/02/2017	Removal of application monitoring and jitter reports as they are bespoke and non-standard
4.0	24/04/2017	Integration of Point to Point access service
4.1	10/07/2017	Point to Point service section updated
5.0	04/08/2017	Content updated by PM including: <ul style="list-style-type: none"> <li>• Service overview - diagram updated</li> <li>• Horizon Access - Service Configuration clarifications</li> <li>• Access Resilient Options - Section updated and renumbered</li> <li>• Cloud Based Next Generation Firewall - Clarifications on Application level security</li> <li>• 3rd Party Connectivity - Mitel Voice Traffic Monitoring</li> <li>• Monitoring &amp; Management - Modifications to traffic profiling and CoS</li> <li>• Service Level Agreement - SLA Parameters modified</li> <li>• Service Level Guarantee - Credits clarified</li> </ul>
5.1	08/11/2017	Added 1GB Fibre Ethernet availability to Access Technologies table
6.0	09/04/2018	Cloud Exchange added
7.0	16/08/2018	Updated document format and reviewed content

# Contents

Contents .....	3
Service Overview .....	5
Access Technologies.....	6
Availability.....	7
<i>General Limitations</i> .....	7
<i>Physical Presentation</i> .....	7
TalkTalk EFM Service Notes .....	8
Point to Point Services .....	11
Customer Premise Equipment (CPE).....	12
Cloud Internet Access .....	13
Ordering and Provisioning .....	16
Service Levels .....	18
<i>Service Charges and Billing</i> .....	18
<i>Gamma SIP Trunks</i> .....	19
<i>Service Configuration</i> .....	20
<i>Horizon Access</i> .....	20
Service Demarcation Boundary .....	21
<i>Access Resilience Options</i> .....	21
<i>Pricing</i> .....	23
<i>Limitations of Resilience options</i> .....	23
Cloud Based Next Generation Firewall .....	25
<i>Service Overview</i> .....	25
<i>Feature details</i> .....	25
<i>Installation and Provisioning</i> .....	27
<i>Configuration Changes</i> .....	27
<i>SSL VPN Remote Access</i> .....	27
<i>IP SEC VPN Remote Access</i> .....	27
<i>Ethernet QoS</i> .....	28
<i>Class of service operating behaviours</i> .....	28
<i>Broadband QoS</i> .....	29
3rd Party Connectivity .....	30
<i>MiCloud Enterprise Unified Communications as a Service (UCaaS)</i> .....	30
Pricing Tool.....	31

Solution Design & Delivery.....	32
Ordering a CPN Service.....	33
Gamma Provided Customer Router.....	34
<i>Gamma Router Support</i> .....	34
Monitoring & Management.....	35
<i>Bandwidth utilisation broken down by connection</i> .....	35
<i>Bandwidth utilisation broken down by Class of Service</i> .....	35
<i>Latency, Packet Loss &amp; Jitter</i> .....	36
<i>Application Insight</i> .....	36
Onsite Router Installation Service (Optional).....	37
Support & Business Hours.....	38
Contract Options & Invoicing.....	39
<i>Cancellation</i> .....	39
Service Level Agreement.....	40
<i>Hours of Operation</i> .....	40
<i>Methods of Contact</i> .....	40
<i>Raising an Incident</i> .....	40
<i>Service Credits</i> .....	40
<i>Service Demarcation</i> .....	41
<i>Access Service Levels</i> .....	41
<i>Next Generation Firewall Service Levels</i> .....	42
<i>3rd Party Connectivity Service Levels</i> .....	43
Service Level Guarantee.....	45
<i>Access Provisioning Service Credits</i> .....	45
<i>Access Availability and Performance Credits</i> .....	45
<i>Firewall Availability Service Credits</i> .....	46
<i>Wires-Only Service</i> .....	47
Gamma Responsibilities.....	48
Partner Responsibilities.....	49
Contacts.....	50

# Service Overview

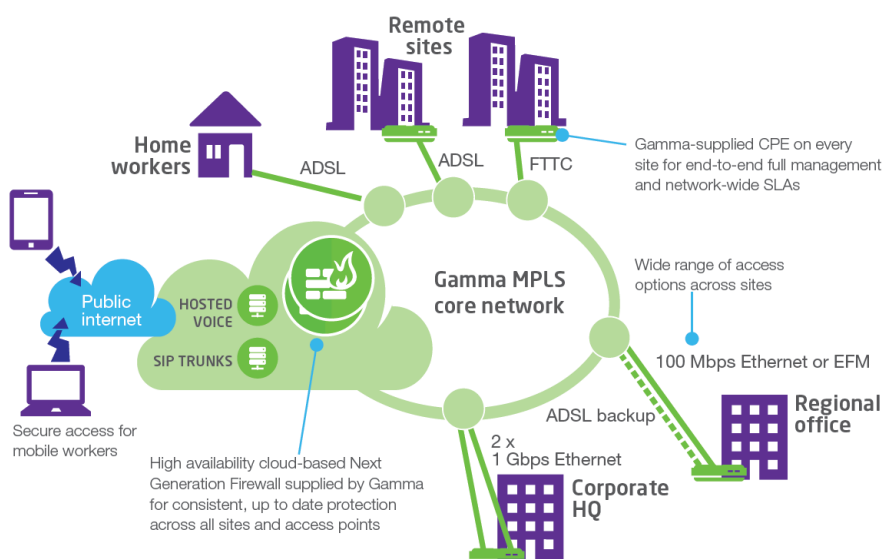
Converged Private Networks are Gamma's MPLS based wide area networking solution that allows customers to send voice and data securely and quickly between the sites on their network using the Gamma network as a single converged communications platform.

Delivered as a fully managed Layer 3 MPLS VPN, it provides any-to-any IP connectivity between any number of customer locations. By default, the network is "closed", with no connectivity to the internet. There is complete logical separation between customers on this platform.

The service consists of true end to end support including the initial network consultation and design with our pre sales team, ordering, project managed order delivery and configuration through to in life support and change requests. In life service management and reporting is available 24\*7 to Partners.

The service can be comprised of several key service components:

- Wide range of access types (including site and carrier resilience options)
- Remote access for home workers
- Cloud based Centralised Internet Access
- Cloud based Next Generation Firewall in High Availability (HA)
- Gamma IP Telephony (SIP Trunks / Horizon Hosted Voice)
- Application prioritisation using QoS mechanisms
- Intuitive Partner portal (quoting & monitoring)
- Network monitoring tools for resellers and end-users
- Pre-sales and project management support
- In depth product and sales training
- 4 hr onsite engineer router support
- 24\*7\*365 Support and proactive fault logging (Partner alerts)
- Service Level Agreement for availability, delivery and performance guarantees



# Access Technologies

Wide range of access types and resilience options from the following;

Circuit Type	Bandwidth	Bandwidths	Tail Provider	QoS Capabilities
ADSL IPStream	Up to 8Mb (non-symmetrical)	Up to 8Mbps / 832Kbps	BT Wholesale	Limited (2 classes queued)
ADSL2+	Up to 24Mb (non-symmetrical)	24Mbps / 1.3Mb	BT Wholesale	Limited (2 classes queued)
ADSL AnnexM	Up to 24Mb (non-symmetrical)	24Mbps / 2.5Mb	BT Wholesale	Limited (2 classes queued)
FTTC Broadband	Up to 80Mb (non-symmetrical)	80Mb / 20Mb / 40Mb/10Mb	BT Wholesale	Limited (2 classes queued)
FTTC Ethernet	Up to 80Mb (non-symmetrical)	1-10Mbps (1Mbps increments), 10, 15 and 20 Up to max available downstream in 10Mbps increments of 10-80Mb	BT Wholesale	Full (4 classes)
EFM	Up to 35Mb (symmetrical)	1-10Mbps (1Mb increments) 10-35Mbps (5Mb increments)	BT Wholesale	Full (4 classes)
EFM	Up to 20Mb (symmetrical)	2 pairs (up to 10Mbps) 4 pairs (up to 20Mbps)	Talk Talk	Limited (2 classes) Currently no voice prioritisation
Fibre Ethernet	Up to 1Gb (symmetrical)	2-10Mbps (2Mb increments) 10-100Mbps (10Mb increments) 100-500Gbps (100Mb increments) 500 and 1Gbps	BT Wholesale Virgin Media Business Talk Talk	Full (4 classes)
Point to Point	Up to 1Gb (symmetrical)	2-10Mbps (2Mb increments) 10-100Mbps (10Mb increments) 100-500Mbps (100Mb increments) 500 and 1Gbps	BT Wholesale Virgin Media Business	Full (4 classes)

**The available IP throughput will be lower than standard port speeds advertised owing to management and encapsulation overheads.**

# Availability

## UK Coverage

Fibre Ethernet is available to over 95% of UK businesses from over 3,000 nodes UK-wide with copper Ethernet or EFM being available from over 1,800 nodes and FTTC Ethernet being available from over 65,000 cabinets across the UK.

## Local Availability

Where available, Fibre Ethernet can be provided where the maximum radial distance from the node does not exceed 25km. The maximum supported route distance is 40km.

As EFM is delivered over aggregated copper pairs, and the availability in an area that is EFM enabled will depend on the distance from the exchange. As a rule, sites within 5km of an enabled exchange can receive service. Service speeds up to 35mbps are possible.

## General Limitations

The following applied to all Ethernet services:

- The provision of services is strictly subject to availability and available Ethernet is available across the UK and Northern Ireland with the exception of Isle of Man, Isles of Scilly and the Channel Isles.
- Where available, the service is offered as 'subject to survey'; excess construction charges will apply if new access network build is required to serve a site.
- Upgrades from 100Mb to 1Gb are treated as a cease and new provide.

## Physical Presentation

All services from Gamma will be delivered to the Partner via an Ethernet interface on the Gamma managed router. Several options are available and Gamma will confirm exact delivery specification at time of design.

- 100Mbps RJ45
- 1Gbps Multi Mode (1000Base SX)

Gamma will be responsible for the WAN service up to the customer-facing interface on the Gamma router including any installed optical elements such as SFPs. The Partner is responsible for providing any cabling from this point onwards.

Gamma monitoring and SLAs will be based on reachability and performance from the Gamma router towards the Gamma core.

# TalkTalk EFM Service Notes

Access bandwidth speeds are up to 20Mbps on the 4 pair option, and 10Mbps on the 2 pair option.

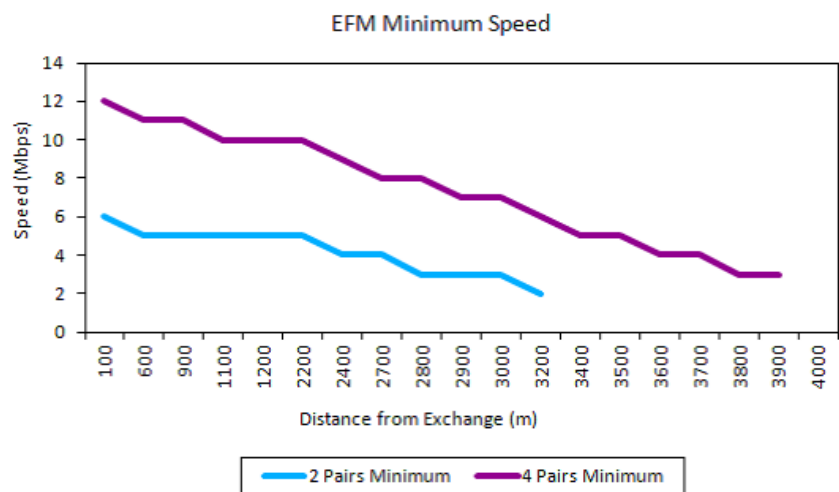
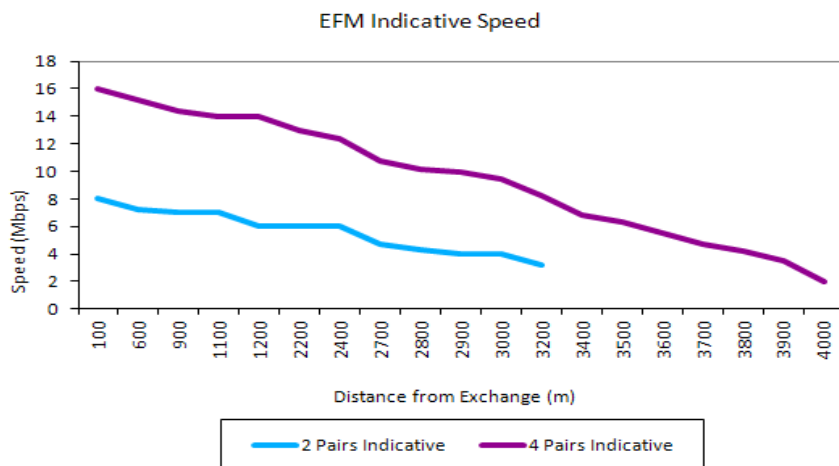
Speeds depend on availability, distance from the exchange and quality of the lines. The speed will be the optimum speed available delivered over the desired number of pairs. The site must be within 3900 metres in line length from the exchange for 4 Pair and 3200 meters for 2 Pair.

## Bandwidth speeds

EFM is rate adaptive, and bandwidth speeds can vary due to a number of different variants. It is important to note, that the quality of the copper wire pair and the length of the copper wire between the exchange and the premise will affect speeds achieved.

With each price check, an indicative speed and a minimum speed will be received.

Please note these indicative speeds are based against average copper quality and are not guaranteed. Good quality copper on short lines may give performance above these indicative levels.





Should a circuit not meet the minimum speeds then, from handover, the Partner has 3 days to choose to either:

- Cancel the circuit at no cost
- Keep the current circuit at the provided speed

## Resilience Options

### Copper Pairs

There are only two services offered with TalkTalk Business EFM, a two copper pair and a four copper pair option. This allows an automatic built in resilience if one copper pair fails; rather than the service being lost, it will continue running at a degraded speed until an engineer arrives to fix the copper pair. The speed that is achieved would be dependent on the speed of the remaining copper pairs.

For example: with a typical 8Mb product on two copper pairs, if one copper pair failed, the speed expected to be obtained would be 4Mb. Where there are four pairs, the reduction in bandwidth through the loss of a single pair would have even less effect on the percentage of the original bandwidth available and would be expected to obtain 6Mb.

### Use of Gamma IP telephony

At launch of Talk Talk Business EFM it will not be possible to run Gamma SIP Trunks or Horizon over this access. It is therefore limited to non-voice enabled services for e.g. VPN data and Internet access.

### Regrades or Shifts

TalkTalk Business EFM cannot be regraded to increase bandwidth or numbers of copper pairs. Should there be an existing two copper pair circuit, and demand increased to required four copper pairs, a new order will need to be placed and the existing service must be ceased as two discrete actions by the Partner.

### Internal and external shifts

An Internal shift for TalkTalk EFM is only applicable if it is the physical copper entry ports used for the EFM circuit and the Network Terminating Equipment (NTE) are moving internally within a building for e.g. from the third floor to the basement.

An External shift is not possible. These include moving the circuit to another location within the same exchange region, or to another location altogether. For these requests, a cease and re-provide will need to be instigated

### Network Termination Equipment (NTE)

The NTE that has been chosen to use is the RAD LA-210. This is a SHDSL modem. The NTE supplied for every EFM circuit is owned by Gamma. At the time of termination of the circuit, the Partner will be obliged to return the equipment to Gamma.

The End Customer NTE has the following Specifications:

- Shelf Mounted – The NTE is not rack mountable
- 4 x 10/100 Base-T Ethernet ports
- RJ-45 Connector
- AC Power
- Installed within 1.5m of the BTOR Access Point
- CAT 5 Grey UTP patch cable 2M length
- RJ45 to BT6312 “Y” grey cable 2M length
- Dimension: 217mm x 43.7mm x 170mm (W x H x D)
- There are two NTEs that can be provided depending on the number of copper pairs which have been requested. There is either a 2 Pair RAD box or a 4 Pair RAD box, however, at TalkTalk Business discretion, a 4 Pair RAD box can be provided on a 2 Pair EFM circuit.

## Lead times

EFM services provided using Talk Talk Business will be delivered to either 45 or 90 working days.

This is determined by the availability of copper tie pairs in the exchange. Where these exist, a lead time of 45 working days is achievable however if these need to be ordered the lead time will increase to 90 working days. Lead time may also be affected if the Address Key is not Gold as Silver and Bronze Address Keys require a site survey in order to proceed.

# Point to Point Services

Gamma will provide a fully managed Point to Point access circuit with Gamma supplied switch at each end of the circuit. ADSL will be installed at one of the sites for the monitoring and support of the service.

We will provide a Layer 2 delivery, and, that should the Customer desire any layer 3 functionality, then the Customer would be required to deploy a routed overlay independently of this solution.

## IP Telephony and Internet Services

Should a customer wish to route either internet access or one of Gamma's IP Telephony services to either site of the Point to Point connection then a separate access service will be required in to at least one of the two sites. This can be shared with the other site across the Point to Point link. The configuration of any layer 3 routing and additional layer 2 requirements across the Point to Point circuit are not the responsibility of Gamma and will have to be setup and managed by the Partner.

**Wires only:** Not available

# Customer Premise Equipment (CPE)

Gamma will provide a managed router to terminate any access circuit. The CPE (router) will be provided, configured and monitored by Gamma. Actual router type will be chosen according to specific requirements defined during the detailed design stage of the solution. Hardware will be chosen based on access-type, bandwidth, voice requirements, QoS requirements and services delivered.

Gamma will be responsible for:

- Configuration & dispatch
- Maintenance including replacements and upgrades
- Monitoring & alarming (see below)
- Fault diagnostics

The Partner will be responsible for:

- Installation (except for when Onsite Router Installation is taken by the partner)
- On-site fault diagnostic work

# Cloud Internet Access

By default, a CPN does not have a default route in its routing table and does not have access to the internet. Several options are available.

## Local (Customer location) Internet Access

Gamma supports the delivery of "raw" public internet connectivity to any Customer site on the MPLS L3VPN with an Ethernet access circuit (as opposed to Cloud Internet Access).

This service is delivered to the customer as a logically separate service, on the existing router, but tagged with a different VLAN to the L3VPN traffic. (Note: This VLANID is the customer's choice and can be any number except VLAN1). This allows the internet service to be delivered to the outside of a local customer firewall, enabling the customer to retain ownership/maintenance of their firewall platform.

Note: Local **Internet Access bandwidth is limited to 500Mb and available on Ethernet access circuits only**

## Cloud (Gamma core network) Internet Access

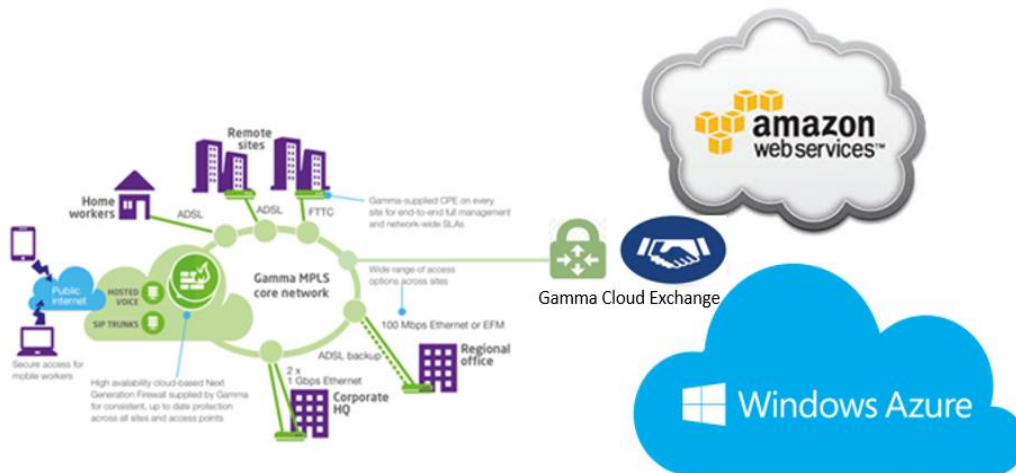
Cloud based Internet breakout from the Converged Private Network can be added as an option to provide customers with internet access. A default route will be injected into the Converged Private Network, directing internet traffic to the inside of a firewall. This firewall sits on Gamma's core network and is a **mandatory option** when Internet Access is taken. This is in order to provide a protected 'clean' route in and out of the private network.

The firewall operates in HA (High Availability) located on Gamma's core network and fully managed by Gamma.

Note: Cloud **Internet Access bandwidth is limited to 500Mb**

## Cloud Exchange

Gamma provides customers using the CPN product for their WAN with secure dedicated access to Microsoft's Azure and to Amazon's AWS platforms.



Using Cloud Exchange the customer can ensure they have a resilient, high performant secure connection to their cloud provider. Customers will benefit from using a secure and geographically resilient connection and avoid the need to invest in a dedicated circuit or using public internet services for key application access.

Gamma currently offers connections to Microsoft Azure and to Amazon AWS. For Azure the public and private peering is provisioned using separate routing domains over a single Expressroute connection, whilst for AWS we treat all services as private via AWS Direct Connect through which the customer is able to establish VPN tunnels to access public AWS services. In both cases public traffic must terminate on the Gamma firewall.

A resilient service is established by connecting to dual Gamma Cloud Exchange gateways over which Virtual Circuits are created to enable connectivity from office locations on the customers WAN to each Cloud Service Provider. Each customer will be assigned a Primary and a Secondary gateway on Cloud Exchange depending upon location.

Each of the Cloud Exchange variations is explained below together with their individual requirements including the need for firewall services.

### Microsoft Azure - Private Peering

The private peering domain is considered to be a trusted extension of the customer's core network into Microsoft Azure. Gamma will set up bi-directional connectivity between the customer's core network and the Azure virtual networks. This will allow customers to connect virtual machines and cloud services directly to their WAN i.e. within their private IP addressing scheme.

The customer may connect more than one Azure virtual network to their WAN via private peering but will require an additional cloud exchange connection for each additional instance.

### Microsoft Azure - Public Peering

The customer can privately connect to services hosted on public IP addresses, including the VPNs of their Cloud Service Provider, through the public peering routing domain. The customer may elect to use public IP addresses if the traffic is destined to stay on the Internet or they can connect the public peering domain to their DMZ using a firewall instance which will provide the NAT to connect the public Azure services to their Managed WAN without having to connect through the internet.

Connectivity is always initiated from the customer's Managed WAN to Microsoft Azure services. Microsoft Azure services will not be able to initiate connections into Customer's network through this routing domain. Once public peering is enabled, the customer will be able to connect to all Azure services.

## AWS – Private and Public Peering

In Cloud Exchange AWS services are provided via a single 'Amazon Direct Connect' connection that may contain public and private services. AWS Private Services can be connected directly. However AWS Public Services require a further step during service establishment.

- Customers requiring access to AWS Public Services will need to create a VPN tunnel inside their Private AWS connection which would then need to be terminated onto the Gamma Firewall (and also provide NAT to the dynamic IP Address Allocation used by AWS). The customer will need to provide Gamma with the information that is generated by AWS when they configure the VPN.

## Firewall requirements

The cloud providers mandate a number of Firewall requirements to access their services. Gamma can help if the customer does not currently have a Firewall or Firewall service. If the customer requires Public Cloud services and is not already using the Gamma Managed Firewall service Gamma can provide this as an additional service. This requirement will be identified during the Pre-Sales stage.

A summary is shown below:

Azure Public Peering	Azure Private Peering	AWS
Use of a firewall incidence is obligatory to separate the publicly accessible services and the customer WAN	Use of a firewall incidence is optional. It is for the customer	Use of a firewall incidence is optional for private Services

## Cloud Exchange connectivity speeds

Gamma Cloud Exchange services are offered with the following connectivity speeds:

Throughput	50 MB	100MB	200MB	300MB	400MB	500MB	1GB
AWS	Y	Y	Y	Y	Y	Y	N/A
Azure	Y	Y	Y	Y	Y	Y	Y

# Ordering and Provisioning

## Customer Pre Requisites

To connect to Cloud Exchange services via Gamma, the customer must have:

- ◆ An active Converged Private Network (CPN) WAN service with Gamma.
- ◆ A valid and active account with their chosen Cloud Service Provider as detailed below:-

Azure	AWS
An active account is required to set up the ExpressRoute circuit. ExpressRoute circuits are resources within Azure subscriptions. An Azure subscription is a requirement even if connectivity is limited to non-Azure Microsoft cloud services, such as Office 365 services and CRM online	An active account is required to set up an AWS Direct Connect account

N.B. Gamma do not currently offer Cloud Exchange services via our standalone Ethernet or Broadband circuits, CPN is a mandatory requirement.

Gamma’s ordering and provisioning teams operate within standard UK business hours, Monday to Friday (excluding Bank Holidays) 8AM to 6PM.

## Customer Journey

To quote Gamma Cloud Exchange on CPN, contact [data@gamma.co.uk](mailto:data@gamma.co.uk).

Quotes will be provided with a Converged Private Network CRF (Customer Requirements Form) for Partners to confirm additional order details.

In confirming service requirements to Gamma the channel partner must provide their customer’s S-Key issued by Azure or Access Key ID issued by AWS. This being the way in which access to their services is associated.

For customers using Azure. This will mean that they must notify Microsoft of the following detail in order to be provided with the S-Key:

1. Provider = Equinix
2. Peering location = London

For customers using AWS this additional step does not apply as the Access Key ID is already known by the customer.

Gamma will produce a solution design for the requirements given.

Gamma will confirm requirements with the channel partner and, subject to acceptance, will initiate ordering process.



Gamma Provisioning will create the Virtual Connection (VC) using the service key provided.

The Solution Delivery Manager will complete the handover and inform the channel partner of the required detail they need to complete the customer set-up with the service provider.

## Monitoring and Alerting

Gamma monitors the physical interconnection using the Highlight monitoring platform. Highlight monitors both the Cloud Exchange connections as well as each customer's individual connections. Monitoring is at the (Ethernet Flow Point) exit from our network.

The channel partner can define who will receive Highlight reporting on the Availability and Throughput of each of their Cloud Exchange connections. The customer will see an additional Highlight watcher for each of the primary and secondary links to the Cloud Exchange Gateways and for each of their possibly multiple Cloud Service connections. For a customer who has one Cloud Exchange connection, Highlight will show two watchers; for a customer with two, it will show four, etc.

These reports will be delivered via Highlight in the following format

For more information on using the Highlight Monitoring service please see the Gamma Academy courses.

# Service Levels

## Cloud Service Provider Service Levels and Support

Gamma does not provide the Cloud Services or support of AWS or Azure services as part of the Gama Cloud Exchange product.

Support of any Microsoft Azure and/or Office 365 service is provided to the customer by Microsoft as part of a separate customer relationship with Microsoft (or other third party). Service availability levels and response times must be requested from Microsoft.

Support of Amazon Web Services is provided to the customer by AWS as part of a separate customer relationship with AWS (or other third party). Service availability levels and response times must be requested from AWS.

## Target Service Level

Gamma shall endeavour to provide Cloud Exchange so as to meet or exceed the following Target Service Level:

Gamma Cloud Exchange	Service Level Availability
Target service availability	99.99%

## Adds, Changes and Deletions

Gamma Cloud Exchange Change Type	Target Deployment Time
Set up of new Cloud Exchange service	30 working days from receipt of order
Increase in port speed (Mb)	15 working days from receipt of order
Cancellation of Cloud Exchange connection	30 working days from receipt of cancelation request

## AWS and Azure Service Levels and Support

Support of any AWS and Azure services are provided directly by the vendor and as part of their existing relationship with the customer. Service availability levels and response times must be requested from the vendors

# Service Charges and Billing

## Gamma Cloud Exchange charges

Gamma Cloud Exchange service is provided and charged for as a monthly rental. Invoicing will commence from the point that the first access service is installed and then on a rolling monthly basis for a minimum contract term of 12 months.

## Cease and Cancellation charges

The Cloud Exchange Service is provided on a 12 month minimum term. Any request for a Cloud Exchange throughput level to be downgraded or cancelled during this term must be submitted to the CPN Solution Delivery Manager as charges may apply.

## Billing queries

Any query regarding the detail for Cloud Exchange on the channel partner invoice should be directed to Gamma. Contact details, FAQs, and billing guides can be found in the Gamma Portal billing pages.

## Microsoft Azure and AWS Service Charges

AWS and Azure services are billed directly to the customer by the Vendor. This includes any charging for data downloaded over this connection that may be part of the customer's contract with the vendor(s).

# Gamma SIP Trunks

## Overview

This service is provided as a managed layer 3 service that delivers a guaranteed number of SIP channels. An end-to-end service design is provided in order to guarantee the performance of SIP and RTP data streams. QoS is used across the service from the Gamma provided router through to serving SBCs, configured specifically to support the number of channels and codec as provided in the Partner order.

The SIP trunking service is privately addressed end to end; from the customer voice platform, through the VPN/Gamma core network to the Gamma SIP trunking platform. At no point does the SIP traffic traverse the public Internet, therefore providing a completely private SIP trunking service.

## Single circuit access

As standard, SIP trunks are provided as standalone SIP trunks.

Although a single SIP trunk into the Gamma core has a single point of failure (this physical link), once the traffic hits the edge of the core, MPLS ensures that the best of path is taken to get to Gamma's SIP platform. In the event of a link failure anywhere in the core, a resilient path will be taken.

## Dual circuit access

It is highly recommended that Partners employ multiple IP connections into the Gamma network for their end customers' connectivity to the SIP platform in order to give a resilient service, with the associated higher SLA's. The Partner can choose to send (end customer) traffic down either SIP

Trunk at any time. The service will be configured with Gamma to be either Active/Standby or Load Balanced for delivery of calls from Gamma to the end customer site.

## Service Configuration

The service is privately addressed from customer endpoint through the core to the Gamma SIP endpoints. At no point does the SIP traffic traverse the internet, giving the customer the peace of mind that their SIP is secure.

All private IP addressing is discussed and agreed at the design phase to ensure no conflict of IP addressing occurs. The SIP service is provided to the end customer from local router via the existing L3VPN access circuit.

## Horizon Access

### Overview

This service is provided as a managed layer 3 service that delivers a guaranteed number of channels of IP voice. An end-to-end service design is provided in order to guarantee the performance of relevant SIP and RTP streams. QoS is configured across the service from the router through to the core platform, dimensioned to support to the number of channels and codec required.

Connectivity to Gamma's hosted IP telephony platform (Horizon) is currently reached via a public IP address. Connectivity to this from within a Gamma L3 MPLS VPN will need to be via local customer internet access, or cloud internet access from the Gamma VPN (see above). In the local internet access scenario, connectivity to the internet (and onwards to Horizon) will need be protected by a customer's own firewall whereas cloud internet access will be protected by Gamma's firewall.

In the future, if private access to Horizon becomes available, access to this private gateway will be possible directly from the L3 VPN, without the need to traverse the internet.

### Service Configuration

The Horizon service, which requires NAT and DHCP to drive the IP phones, can be configured in 2 ways:

- Where a separate physical network is installed for Horizon:  
One customer-side router port will be provided with a NAT configuration and the DHCP will be provided by the Gamma router
- For a converged voice and data LAN environment:  
Here the customer LAN provides the NAT and DHCP needed for Horizon.

# Service Demarcation Boundary

## Access

The Fully Managed service includes a Gamma router located at the customer site, which is specifically required for the delivery of the Gamma service. The demarcation point of the Service provided to the Partner by Gamma is represented by the customer facing port of the router.

## Next Generation Firewall

The service includes the delivery of the Gamma cloud firewall service on the Gamma network. The demarcation point of the Service provided to the Partner by Gamma is represented by the customer facing port of the Gamma provided router.

The customer's local area network, its configuration and management is the responsibility of the end-user or the serving channel Partner.

## IP Addressing

Gamma will provide a public subnet for the customers use - a /31 (single IP address) will be allocated as standard. Larger allocations can be made upon request and justification. A charge will be made for non-standard subnets.

Please note that customer-owned (Provider Independent (PI) address space) public addressing is not supported.

## Access Resilience Options

A resilient backup solution offers your end customer the assurance of enhanced service availability levels for the onward support of business-critical applications and high protection against unforeseen network incidents meaning they can focus on running their business.

Where voice is taken, we will choose the most suitable form of backup and backup all calls from the primary. Internet access will be supplied as best efforts until the primary service is restored.

### Available Resilience Options Matrix

Primary connection / secondary	Fibre	EFM	FTTC Ethernet	ADSL	FTTC Broadband
Fibre Ethernet	2 x CPE 2 x Gamma PoPs	2 x CPE 2 x Gamma PoPs	2 x CPE 2 x Gamma PoPs	2 x CPE 1 x Gamma PoP	2 x CPE 1 x Gamma PoP
EFM	-	-	2 x CPE 2 x Gamma PoPs	2 x CPE 1 x Gamma PoP	2 x CPE 1 x Gamma PoP
FTTC Ethernet	-	-	-	2 x CPE 1 x Gamma PoP	2 x CPE 1 x Gamma PoP

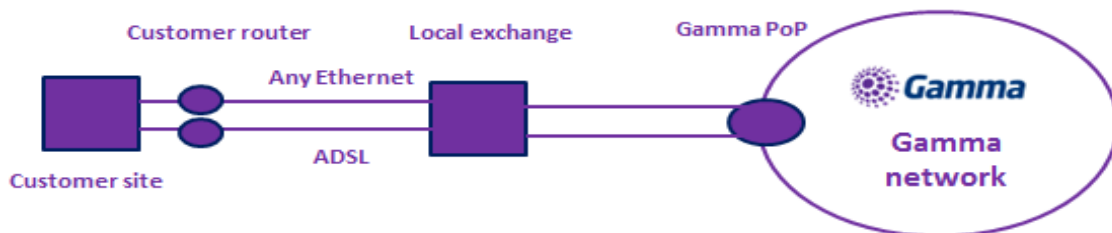
Primary connection / secondary	Fibre	EFM	FTTC Ethernet	ADSL	FTTC Broadband
ADSL	-	-	-	-	-
FTTC Broadband	-	-	-	-	-

### Resilience Availability %

Primary Access Service	Secondary Access Service	Availability %
Ethernet	None	99.90%
Ethernet	Broadband	99.93%
Ethernet	Ethernet	99.99%

### Ethernet with Broadband backup

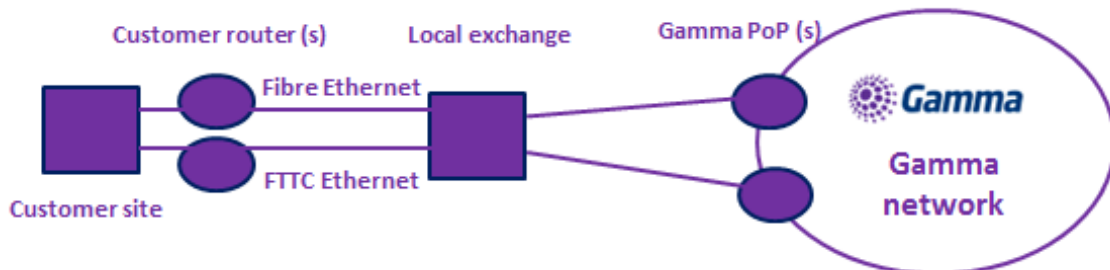
Primary connection	Secondary connection	CPE	Local Exchange	Gamma PoPs	Automatic failover
Any Ethernet	ADSL2+, AnnexM or FTTC Broadband	Dual	Single / Dual	Single	Yes



Where a Virgin fibre and BT ADSL circuit is used different exchanges will be used as standard.

### Fibre/EFM with FTTC Ethernet backup

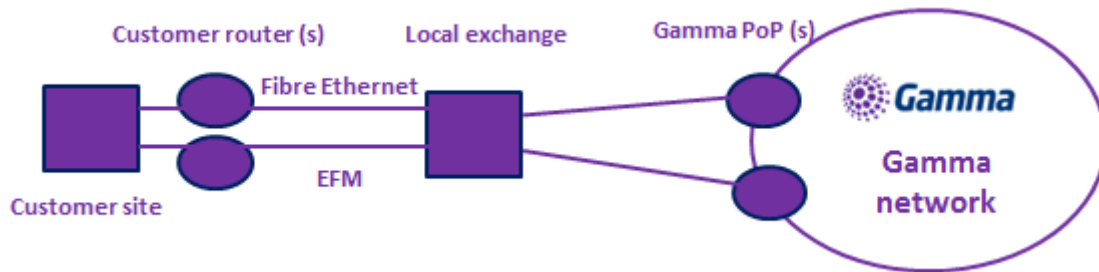
Primary connection	Secondary connection	CPE	Local Exchange	Gamma PoPs	Automatic failover
Fibre Ethernet / EFM	FTTC Ethernet	Dual	Single/ Dual	Dual	Yes



Where a Virgin fibre and BT FTTC circuit is used different exchanges will be used as standard.

### Fibre Ethernet with EFM backup

Primary connection	Secondary connection	CPE	Local Exchange	Gamma PoPs	Automatic failover
Fibre Ethernet	EFM	Dual	Single / Dual	Dual	Yes

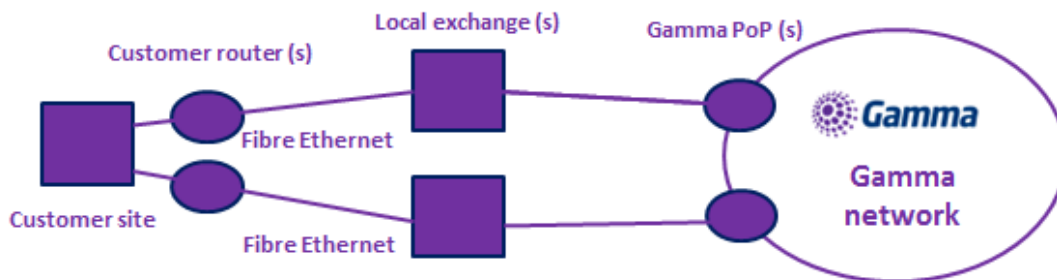


Where a Virgin fibre and BT EFM circuit is used different exchanges will be used as standard.

### Fibre Ethernet with Fibre Ethernet backup (Active/Passive)

Primary connection	Secondary connection	CPE	Local Exchange	Gamma PoPs	Automatic failover	Dual circuit providers
Fibre Ethernet	Fibre Ethernet	Dual	Dual	Dual	Yes	Yes

Total separation can be achieved using a single provider or using dual circuit providers which are BT Wholesale or Talk Talk and Virgin Media Business.



## Pricing

Pricing for resilience options above is obtained via the Converged Private Network Pricing Tool on the Gamma Portal with the exception of the below which should be requested via email to [cpn@gamma.co.uk](mailto:cpn@gamma.co.uk);

- Fibre Ethernet with Fibre Ethernet backup using same tail provider (Active / Passive)
- Connectivity with the Data Centre

## Limitations of Resilience options

## ADSL2+, Annex M, MAX and FTTC Broadband Backup

The following limitations apply to the provisioning of these backup services;

- Simultaneous provide of both line and Broadband service is not supported
- The WLR line over which the backup service will operate must already be installed
- The WLR line must be within two metres of the router and primary service installation point
- Where this backup is taken as a secondary service to EFM, it is likely that both services will share the same route and equipment in the local exchange. This is because both services operate over copper that is provided within the same duct unless both BT and Virgin are used.
- These services are only available on Fibre Ethernet 100Mb not 1Gbps Fibre Ethernet for performance suitability reasons. Any service operating at over 100Mb and/or running over a 1Gbps services should be backed up using an Ethernet based secondary circuit.
- This backup option is based on underlying Broadband technology and as such does not come with the same guaranteed service levels as Ethernet. If the requirement is for a guaranteed secondary service then a secondary Ethernet service should be considered.

## Fibre/EFM Ethernet with FTTC Ethernet Backup

The following limitations apply to the provisioning of these backup services;

- Both services will terminate in the same exchange as it is not possible to route to different exchanges (please use Fibre with Fibre backup for this requirement) both BT and Virgin are used

## Fibre Ethernet with EFM Backup

The following limitations apply to the provisioning of these backup services;

- Both services will terminate in the same exchange as it is not possible to route to different exchanges (please use Fibre with Fibre backup for this requirement) unless both BT and Virgin are used

## Fibre Ethernet with Fibre Ethernet Backup

The following limitations apply to the provisioning of these backup services;

- Actual achievable diversity of both Fibre connections will only be confirmed after site survey.
- Partner will have option not to proceed if a shared route (or partial shared route) without incurring any cost.



# Cloud Based Next Generation Firewall

## Service Overview

Gamma can offer Partners the required security when routing traffic in and out of a customer's Converged Private Network. We do this by routing all Internet traffic via the firewalls in our core network. These devices are provided as a fully-managed high availability firewall instances on our Next Generation firewalls. SSL traffic through the firewall cannot be inspected.

**This option is mandatory when Cloud Internet Access is taken.**

Key service features include;

- High Availability (HA) design in Active/Passive mode
- Fully managed on a 24\*7 basis
- Intrusion Prevention System (IPS) functionality
- Application Visibility and Control
- Threat Prevention against both known and unknown threats
- Anti-virus, anti spyware and anti malware
- File and Data blocking
- Application Aware Web URL filtering (whitelist & blacklist)
- SSL VPN / IPSec Remote Access (for remote workers)
- Support of Security Zone (DMZ)

Cloud Based Next Generation Firewall

## Feature details

### High Availability (HA) design in Active/Passive mode

Our Next Generation Firewalls are designed and built as a pair in High Availability mode and are designed to operate in an active/passive mode whereby your service will automatically fail over to the standby device ensuring business continuity.

### Fully managed on a 24\*7 basis

Your service is monitored and supported round the clock and our team of experts are at hand to resolve any issues on a 24\*7 basis. Change requests should be submitted during office hours however there is some flexibility for making the change out of office hours to suit your end customer's operating hours to keep disruption to a minimum.

### Intrusion Prevention System (IPS) functionality

Inspects application layer traffic for patterns and protocols associated with malicious attacks and prevents these from damaging critical digital assets and services on your customer's network. Operates a database of known threats and updates firewall with up to date defences against network level threats.

## Application Visibility and Control

Detailed information about the applications, users and content traversing your network to quickly determine any risks they pose, prevent attacks and limit impact of non-productive bandwidth consumption. In order for customer's to regain visibility and control over the applications traversing the network, we provide a solution with the following set of capabilities:

- ◆ Identifies all applications traversing the network, not a select few that are deemed “bad”.
- ◆ Applies application identification techniques across all ports as opposed to the most commonly used.
- ◆ Facilitates visibility into application details such as risk level, who is using it, how much traffic it is generating and what are its source and destination.
- ◆ Enables positive control of all applications based on a wide ranging set of criteria from a single, centralised policy.

## Threat Prevention against both known and unknown threats

Operating from a continually updated global database, our threat protection provides protection against both the known and unknown threats.

## Anti-virus, anti spyware/malware

Malicious viruses or spyware/malware programmes that are typically embedded in files, web pages or emails are identified and removed to prevent propagation and unwanted access to your private network, financial and intellectual property.

## File and Data blocking

File blocking will operate by inspecting not just attachments but inspecting the actual data packets to identify, control and prevent the unauthorised transfer of sensitive company information being transferred outside of your business for e.g. customer credit card numbers.

## Application Aware Web URL filtering

The ability to specify certain website addresses that you do not wish your staff to have access to during business hours. Blacklisting known compromised websites that have malicious content to prevent this from reaching your private network or allowing (whitelisting) access to business critical applications.

## Support of Security Zone (DMZ)

A secure protected zone (DMZ) on the end customer's network containing external facing services such as a mail or web server that is being isolated by the firewall restricting network traffic to and from hosts contained within the isolated network.

## Installation and Provisioning

The installation and provisioning on to the cloud based firewall is carried out by our certified firewall engineers as part of a fully managed service on your behalf.

The two physical units will operate in an Active/Standby HA setup in our data centres providing you with platform resilience.

## Configuration Changes

All required changes to your firewall service must be submitted to our firewall engineers and are managed by this team on your behalf. Initially, Partners will not have any administrative or ability to change their firewall service at launch.

We offer a service level agreement in the form of target implementation times for change requests. These range from 4 hrs to 5 days depending on complexity and the anticipated impact on your Converged Private Network. Changes will be classified upon the submission of a change request to Gamma's firewall engineers.

## SSL VPN Remote Access

Secure Sockets Layer (SSL) VPN remote access to your Converged Private Network is permitted and allows remote business users that require secure and encrypted access to the head office LAN resources from any location (trusted or untrusted) and any connectivity.

It is possible to create a secure tunnel with which a trusted or untrusted user gains access to the head office resources under resilient, secure and controlled access conditions. This product provides functionality and support for SSL tunnelling encapsulation using our high availability cloud based Firewall platform connecting remote users in a secured manner through the use of a locally installed SSL VPN client (installed and supported by the Partner/Customer).

## IP SEC VPN Remote Access

IP Sec (Internet Protocol Security) VPN remote access to your Converged Private Network is permitted and allows remote business users that require encrypted access to the Converged Private Network resources from any fixed location. In a situation where critical services need to be accessed, it is possible to create a secure tunnel extending the VPN to users with either restricted (3rd party) or unrestricted (1st party or internal staff) access rights under resilient, secure and controlled access conditions.

## Quality of Service / Class of Service

End to end Quality of Service is provided using Class of Service (CoS) options to prioritise business critical traffic across the network.

## Ethernet QoS

Ethernet access circuits are available with or without QoS. Where the QoS option is taken, we will support up to four CoS markings as follows:

Class	Description	Typical Applications	Typical Application Characteristics
Real Time including Gamma Voice	Offers the lowest levels of delay, jitter and packet loss.	Gamma Voice (Horizon and SIP Trunking) Third Party Voice Proprietary Voice (Cisco Skinny etc)	Real time and interactive. Very sensitive to latency, jitter and packet loss.
Video	Offers low levels of delay, jitter and packet loss suitable for high quality video.	Specialist video conferencing applications - e.g. Polycom Telepresence	Real time and interactive. Sensitive to latency, jitter and packet loss.  This class is specifically to be used when both video and IP voice applications are in use.
Enhanced	Offer priority for delay sensitive business applications.	Citrix, SQL, IM&P, cloud-based video conferencing. This class can also be used for customer management traffic.	Less sensitive to jitter but still delay-sensitive, due either to their nature or business criticality. Allocating applications to an Enhanced CoS can protect them from high-bandwidth, low-priority traffic such as FTP and HTTP downloads.
Default	Lowest level class. Best-effort forwarding no priorities offered.	Email, web browsing, FTP and HTTP downloads.	Non-time-critical traffic

Where real time voice is ordered, to ensure voice call quality and call control functionality, Gamma will reserve a small proportion of the overall bandwidth for voice signalling, and forward this traffic through the network with appropriate priority

## Class of service operating behaviours

Class	Behaviour when traffic exceeds subscribed rate
Real Time including Gamma Voice	This class will be policed at the subscribed rate. If the subscribed rate is exceeded, packets will be dropped and will not be queued. Degradation to the service in this scenario is likely and it is the customer's responsibility to ensure they have specified the required bandwidth accurately to reflect their needs. Inter-site traffic levels need to be factored in to any bandwidth calculations.
Video	This class will be policed at the subscribed rate. If the subscribed rate is exceeded, packets will be dropped and will not be queued. Degradation to the service in this scenario is likely and it is the customer's responsibility to ensure they have specified the required bandwidth accurately to reflect their needs.
Enhanced	Traffic will burst into excess bandwidth that is not being used by other classes (including Real Time), but anything over the purchased rate will be treated as best-effort. If there is no available bandwidth, packets will be queued and then dropped.
Default	Traffic will burst into excess bandwidth that is not being used by other classes (including Real Time), but anything over the purchased rate will be treated as best-effort. If there is no available bandwidth, packets will be queued then dropped.

## Broadband QoS

Broadband access circuits do not support QoS marking but we will provide inbound and outbound queuing, based on customer markings. This allows for voice (RTP) and SIP traffic to be prioritised over default data, allowing for reliable voice services over broadband (subject to available local bandwidth)

Gamma router will respect existing customer QoS markings and, if required, are able to mark traffic for the customer (at ingress into their local site router) based on various information such as source IP, destination IP or application type.

All QoS solutions will be discussed and agreed in detail with the Partner at the detailed design stage.

## 3rd Party Connectivity

### MiCloud Enterprise Unified Communications as a Service (UCaaS)

As part of a CPN, we can provide you with private network access to Mitel's 'MiCloud Enterprise Unified Communications as a Service (UCaaS)' offering via the resilient links that exist between the Gamma and Mitel networks.

The service operates in HA (High Availability) as standard ensuring that your voice traffic fails over to both a secondary geographic Gamma network location and Mitel platform.

Gamma will provide support up to the demarcation point on the Mitel platform and any support of the Mitel platform and MiCloud service will be provided to the customer directly from Mitel.

For full information on Mitel's UCaaS please see: <http://mitel.co.uk/solutions/cloud-enterprise-ucaas>

# Pricing Tool

Gamma provides an online pricing tool as a part of the Gamma Portal. The pricing tool gives instant quotes for multi-sited Converged Private Network solutions which include both the access and voice components. With regards to Broadband Backup, the pricing tool selects the most suitable backup option based on your voice and data requirements.

It will also generate pricing for Internet Breakout and associated Next Generation Firewall as part of an indicative quotation.

ADSL/FTTC Broadband Backup pricing is subject to availability which will be displayed separately. All quotes can be stored and downloaded (excluding manually generated quotes requested via the cpn@gamma.co.uk email address).

# Solution Design & Delivery

## Solution Design

Gamma's team of expert network consultants are on hand to offer you consultative network advice and work with you to understand your needs and design an appropriate solution based on a comprehensive and flexible range of service options.

We will work you to help review the existing customer estate with a view to highlighting any services that could be immediately taken over, provide you with solution design documentation and support you at customer meetings.

## Solution Delivery

Delivery of the service will be co-ordinated by one of Gamma's Solution Delivery Managers who will work you to provide regular updates and manage the delivery of your solution.

A project plan will be agreed with you in advance, detailing which sites are installed and provisioned when, based on your business needs.

It is the Channel Partners responsibility to perform the following;

- Manage the overall delivery of the solution to the end customer including data, voice and other solution components.
- Manage the build and configuration of Horizon component
- Provide regular updates to the end customer.
- Install the Gamma supplied routers (except where Onsite Router Installation service is purchased)



# Ordering a CPN Service

All Converged Private Network Services are ordered manually using the following documents;

- Gamma Converged Private Network CRF (Customer Requirements Form) - available by request to [cpn@gamma.co.uk](mailto:cpn@gamma.co.uk)
- High level network design
- Acceptance of Terms and conditions

All received orders are reviewed and validated before services are ordered with our supplier.

Before submitting an order you will be required to confirm acceptance of the Gamma Converged Private Network Terms and conditions as well as the individually taken Gamma product Terms including but not limited to; Gamma's Ethernet, Broadband, Horizon and SIP Trunking Terms and Conditions.

Once an order has been validated and accepted, ordering activities will follow the target as set out in the Service Level Agreement below.

# Gamma Provided Customer Router

Gamma will always supply a fully managed router for all access services. The router will be provided, configured and monitored by Gamma. The actual router model provided will vary according to the service ordered and will be shipped to the installation site in advance of the circuit installation.

**The Partner is responsible for the installation of this router and must have the necessary installation skills unless they opt for Gamma to install as the Onsite Router Installation option.**

Typically the router:

- May stand alone, be wall mounted or be rack mounted
- Dimensions will vary according to model
- Power supplies will vary according to model (either 1 or 2 x AC, not all models will accept DC)
- Power Consumption will vary according to model
- Is accompanied with an NTE (Network Termination Equipment) to which the router must be connected and have adequate space to be housed within.

The temperature and humidity range of the environment used to house the router must not exceed the following:

- 0 to 40 degrees Celsius and humidity range of 0 to 90% non-condensing

For installation up two 13 amp AC outlets will be required depending on the model of router. The Partner is responsible for the AC power supply and arranging alternative power supplies if any temporary supply fails. The Partner may be liable for payment of abortive visit charges if an engineer is required to attend site as a result of a failure of a power supply. Installing engineers may refuse to install equipment if they perceive a hazard or risk.

## Gamma Router Support

All routers are provided with enhanced support levels in the form of a 4 hr onsite engineer support and replacement service as standard.

A Gamma engineer will attend site within 4 hrs (once diagnosed that this is required) and in the first instance attempt to resolve issue with the Gamma supplied router. Failing this they will provide a replacement router which they will have taken to site with them. The engineer will not leave site until the service is back up and working.

# Monitoring & Management

Network level visibility of applications and performance provides both Partners and end users with an instant view of the health and performance of their Converged Private Network solution.

The core features available for each site on the network are:

- Bandwidth utilisation by class of service and connection
- Network availability
- Network performance trend analysis
- Easy to interpret graphical network representations
- Real time visibility of network health and performance
- Fault management email alerts
- Automatic service summary e-mails – weekly, monthly

Application monitoring for Ethernet circuits is an optional feature that can be provided. Please advise Gamma if this is a requirement.

Gamma shall monitor its performance of each of the services by reference to the Service Level(s) for that service. Gamma shall provide the Partner with an online performance monitoring portal which shall include:

- Notifications to the Partner of Service Failures and other defects in Gamma's performance and/or delivery of the Services;
- Gamma self-monitoring using an industry recognised help desk tool

## Bandwidth utilisation broken down by connection

Within the main traffic panel, the Partner will see data flows for a selected day, week or month using clear, colour coded graphics. Traffic trends in 24 and business hour views are also available.

## Bandwidth utilisation broken down by Class of Service

We can provide additional insight into any Class of Service provided over the main network by showing you graphically how the different classes are performing. Each graphic is designed to make patterns and problems stand out and easy to read, putting classes graphically below the bearer they run on to show how individual classes make up overall traffic. This has the combined benefit of being able to identify performance problems on the class of service, the bearer and its sub-components (Tunnels, Queues, etc.) giving a broader view of the network.

This is dependent on enabling NBAR/Netflow on the customer CPE hence an extra consideration when selecting the CPE type and licence costing on enabling it on per customer site basis within Highlight.

## Latency, Packet Loss & Jitter

These line health details include discarded packets, queued/delayed packets, bad packets and link outages.

This information can be exported and shown as statistics if required.

## Application Insight

Available for Ethernet connections only, the Application Insight Panel within our monitoring provides a real time application breakdown that is overlaid on the line utilisation statistics. This will help the Partner identify unauthorised application use and ensure critical WAN applications do not suffer. This is an optional feature that can be provided. Please advise Gamma if this is a requirement

# Onsite Router Installation Service (Optional)

The Onsite Router Installation is a chargeable and optional extra service feature that can be selected during the quote stage on the Gamma Portal and within the CRF when ordering.

The Installation Service is available within the UK and Northern Ireland (for an increased charge) with the exception of Isle of Man, Isles of Scilly and the Channel Isles.

The Installation Service shall be performed by a Gamma engineer between the hours of 09:00 to 17:30, Monday to Friday excluding public holidays. Any installations outside of these hours will be subject to an out of hours charge. Charges are generated on a per visit basis and will also apply to visits made to add or replace a new router to a live Ethernet service for e.g. where ADSL Backup is added to a live Ethernet service.

## **The installation tasks will include:**

- Configuration of the router to act as a terminating device to the Ethernet or ADSL Service.
- The installation of the proposed router appliance(s)
- The allocated installation period is up to 3hr 45mins
- Any bespoke requests as agreed in a Project Managed delivery
- Connect cable between Gamma router and Gamma NTE
- The performance of operational tests to check connectivity between the Gamma network and the router
- Contact Gamma Support Team to check connectivity and management, monitoring is setup
- Where appropriate, the setup of additional resilience (dual routers)
- Labelling of the router, power lead and cat-5 cable to the Gamma NTE
- Remove all packaging and ensure site is left as found

## **Out of scope;**

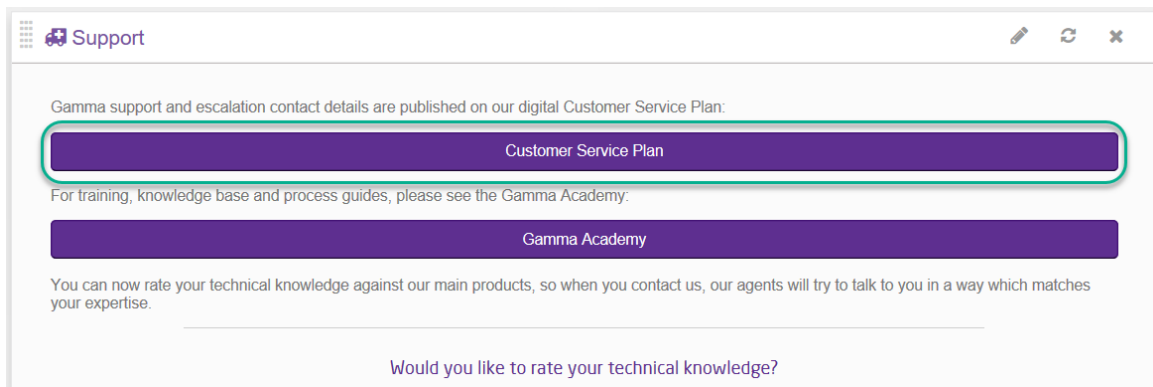
- Connection of Gamma supplied router to the End User Local Area Network (LAN)
- Any work or support of devices on the End User LAN

# Support & Business Hours

Gamma's support team for service issues operates 24 hours a day and 7 days a week, including Public and Bank Holidays, and are available on 0808 178 8000. We request that all urgent or service impacting issues are reported to the service desk by phone, as emails are not monitored outside of standard UK business hours.

Before raising a Cloud Exchange fault, channel partners are required to perform the appropriate first line diagnosis with the customer and cloud services provider, including first line checks for the underlying CPN Data services such as Ethernet or Broadband. To help diagnose the issue as quickly as possible, confirmation on what checks have been performed will be asked by our support teams.

1. To help with diagnostics for the Gamma CPN or underlying Ethernet or Broadband tail services we have troubleshooting guides on the Gamma Academy. This can be found within the support widget on the landing page of the Gamma Portal.



2. For more detail on the appropriate contacts or for escalation information, please see the Customer Service Plan (CSP) which can be found within the support widget on the landing page of the Gamma Portal.
3. For larger scale issues affecting multiple channel partners, we have a Service Status Notice Board where we share the most up to date information on service issues. The Service Status can be found on the Gamma Portal, under Help and Support, also a widget is shown on the landing page.

# Contract Options & Invoicing

Partners can purchase this solution on the following contract term options: one to five years. All two to five year contracts are provided on an operational expenditure (rental) invoicing model.

Gamma invoices for all services one month in advance and from the 1st of every month. For services installed mid-month, a pro-rated rental charge is raised to cover the date of install to the end of the month. We will invoice you as a part of the main, monthly invoice and a separate electronic back up file will also be issued.

Invoicing will commence from the point that the first access service is installed and then on an 'as delivered' basis.

Our single unified billing platform enables us to achieve a billing accuracy of 99.9%. Any queries raised by our Partners will be answered within 48 hours.

## Cancellation

The cancellation of individual Ethernet circuits will be calculated as follows;

Description	Cancellation Charge (as % of installation charge unless stated otherwise)*
Partner cancels before Day 2	0%
Partner cancels between Day 2-10	10-100%
Partner cancels after CDD (Contractual Delivery Date) has been issued	100%**
Partner cancels once service is live and within initial contract term	100%** of remaining contracted rental

*\*Where install is £0 on 3 to 5 year terms the appropriate install cancellation fee will be equivalent to that of a 1yr contract term.*

*\*\*Any ECC (excess Construction Charges) either paid or not yet paid at time of cancellation are due to be paid also.*

The cancellation of the overall Converged Private Network solution will be calculated as follows;

- Partner pays charges as set out above on a per site basis
- Cancellation of voice services are subject to the SIP / Horizon and Broadband cancellation terms and conditions
- Cancellation of other service components including Next Generation Firewall will be subject to charges incurred to date for any work or pre work completed by Gamma and in accordance with initial contract term.
- Once the service is live then all remaining contracted rental charges will apply in full for any mid-term cancellation requests.

# Service Level Agreement

Gamma will use reasonable endeavours to comply with the service levels set out in this section but these levels are target service levels only and Gamma has no liability for any failure to meet them except as set out in this section.

## Hours of Operation

The Gamma Service Desk will provide the Partner with access to support for Gamma provided services, 24 hours a day, 7 days a week.

## Methods of Contact

Our Service Desk can be contacted in a number of ways, each request for support can be raised by sending an e-mail or by calling or for major service incidents, service information can be gained from the Gamma website at [www.gamma.co.uk](http://www.gamma.co.uk). Please consult the Customer Service Plan for nominated points of contact.

## Raising an Incident

If the Partner suspects an incident with any Gamma service they should immediately raise this with the Service Desk via the contact telephone number or email address provided in the Customer Service Plan. To help Gamma successfully log the issue the Partner should be able to communicate to the Service Desk the following minimum information:

- The customer name
- Site address of the incident
- Service affected?
- Does this issue affect multiple users? Single or multiple sites?
- Full description of the fault or issue identified

On supply of this information Gamma will provide the Partner with a Service Desk incident number that is automatically raised from our ticketing system and emailed to the pre-arranged Partner contact detailed in the service handbook. The email will detail a unique tracking number that allows the Partner to automatically update the ticket via email. If the above information cannot be provided, this may result in support being delayed.

## Service Credits

Gamma will provide the Partner service credits where it fails to provide services in line with the service level guarantee metrics that follow. For the purpose of calculating the service credits, any failures that occur within periods of agreed outages and maintenance windows will not be taken into account. Delays in identifying or repairing the fault attributable to the Partner/customer shall be disregarded in the calculation of credits.



The total of all service credits applied in any given month will be limited to the service credit cap identified in the following pages.

## Service Demarcation

For all services, the service demarcation point is the LAN-side port/ports of the Gamma customer premises router.

## Access Service Levels

### Access Availability Targets

Different network architectures are used to deliver each of these services and will be delivered and measured to the following target availability;

Total Service Availability of:	Target Availability	Target Resolution
Single ADSL / FTTC sites	98.50%	22 clock hours (Enhanced Care) 42 clock hours (Standard Care)
Single Copper Ethernet sites	99.90%	8 Hours
Single Fibre Ethernet sites	99.90%	6 Hours
Ethernet with ADSL / FTTC Broadband backup sites	99.93%	6 Hours
Dual Ethernet sites	99.99%	< 4 Hours
Point to Point	99.90%	6 Hours

### Access Performance Quality

The performance measures below are for the end-to-end primary access service, from the Gamma core network (source) to the service demarcation point. They are measured using IP SLA probes and based on a average measure between our core data centres and demarc points to our suppliers at the edge of our network only. The measure excludes performance measures to the customer CPE, this can be reviewed on a per case basis.

Network Metrics	Description	Performance
Latency	Monthly average of end to end latency	< 15ms
Jitter	Monthly average of Jitter	< 5ms
Packet Loss	Monthly average of Packet Loss	< 0.1%

### Access Provisioning

Gamma will use reasonable endeavours to make services live as per the following:

Access Product	Access Type	Supplier	Target lead time (working days)
Ethernet	EFM	BT Wholesale	30
Ethernet	EFM	Talk Talk	45 or 90

Access Product	Access Type	Supplier	Target lead time (working days)
Ethernet	FTTC-40	BT Wholesale	20
Ethernet	FTTC-80	BT Wholesale	20
Ethernet	100Mb Fibre	BT Wholesale/Talk Talk	60
Ethernet	1Gb Fibre	BT Wholesale/Talk Talk	80
Ethernet	100Mb Fibre	Virgin Media	80
Ethernet	1Gb Fibre	Virgin Media	90
DSL	ADSL Max Premium	BT Wholesale	10
DSL	ADSL2+	BT Wholesale	10
DSL	Annex M	BT Wholesale	10
DSL	FTTC-40/10	BT Wholesale	10
DSL	FTTC-80/20	BT Wholesale	10
Point to Point	Fibre 100Mbps or 1Gbps	BT Wholesale & BT Openreach	60
Point to Point	Fibre 100Mbps or 1Gbps	Virgin Media	90

## Gamma Onsite Router Support

All customer premise routers are provided with enhanced support levels in the form of a 4hr onsite engineer support and replacement service as standard.

## Incident Updates

Gamma will provide the Partner updates on the progress of the incident based on its severity, each update will be communicated by email or telephone with major service outages also being published on the Gamma website.

## Next Generation Firewall Service Levels

### Firewall Availability

The Next Generation Firewall Service is provided in HA (High Availability) operation mode. This design allows for automatic failover of traffic routed via the centralised cloud based firewall in the event of failure.

Total Service Availability of:	Target Availability
Gamma Cloud Firewall (HA)	99.99%

The following shall not be included when calculating the above service level(s):

- Outages or delays which are deemed by Gamma to be the result of matters outside its direct control
- Planned or notified maintenance whether in response to an emergency or otherwise.

## Firewall Provisioning

Gamma will build the firewall service in an active/passive high availability mode as standard.

Gamma will use reasonable endeavours to make services live:

- For Next Generation Firewall, within **30 working days** after the acceptance of a CRF and Order Form or within planned timeframes as outlined between the Gamma Solution Delivery Manager and the Partner.

## Firewall Change Types and Target Resolution Times

The table below describes the main types of Change and Change Type Category

Feature	Target Implementation Time
Reporting	On Partner Request
Access Rules	2 business days
Client VPN (SSL VPN/IPsec VPN)	5 business days
URL Filtering (blacklist / whitelist)	2 business days
Anti-Virus	2 business days
Malware Protection	2 business days
File Blocking	2 business days
DMZ	Refer to PreSales
Data Filtering	Refer to PreSales
Application Control	Refer to PreSales
Emergency Changes*	4 hours

\* Emergency changes should be raised by telephone in to our Firewall Engineering Team and are performed at customers own risk

## Firewall Fault Severity Incident Classifications

Feature	Description	Target Resolution Time
Priority 1 (High)	Service unavailable, significant affect to customer's business, significant risk to customer's data security	4 clock hours
Priority 2 (Medium)	Minor problem in operation, no significant business or security risk	1 working day
Priority 3 (Low)	No business or security risk	3 working days

## 3rd Party Connectivity Service Levels

## Mitel MiCloud Enterprise UCaaS Availability

The Mitel MiCloud Enterprise UCaaS Service is provided in HA (High Availability) operation mode. This design allows for automatic failover of voice traffic routed between our north and south network locations in the event of failure.

Total Service Availability of:	Target Availability
MiCloud Enterprise UCaaS (Unified Comms as a Service) connection	99.99%

## Mitel MiCloud Enterprise UCaaS Provisioning

Gamma will use reasonable endeavours to make services live:

- For Mitel UCaaS, within **30 working days** after the acceptance of a CRF and Order Form or within planned timeframes as outlined between the Gamma Solution Delivery Manager, Mitel and the Partner.

# Service Level Guarantee

## Access Provisioning Service Credits

Gamma will activate the service by midnight on the Installation Date.

If Gamma does not activate the service by midnight on the Installation Date, then Gamma will credit the Company with a compensation entitlement in accordance with the following table:

Number of working days activation is beyond the Installation Date	Compensation Entitlement - reduction in the connection charge for the circuit (per affected site)
1-10	5%
11-15	10%
16-20	15%
More than 20	20%

Connection charges for any other Gamma product associated with the service are to be excluded from the calculation of the compensation entitlement.

## Access Availability and Performance Credits

For Priority 1 faults only, if Gamma does not resolve a fault on a circuit within the relevant timeframe set out above, then Gamma will credit the Company with a compensation entitlement in accordance with the following table:

	Service Level	Target Service Level	Service Credit
1	Target Site Availability	Availability for any Ethernet site (rounded down to the nearest minute) is less than following in any calendar month; 99.90% (single Ethernet) 99.93% (single Ethernet+ADSL) 99.99% (dual Ethernet) 99.90% (Point to Point)	10% of the Service Charges of affected sites.
2	Packet Loss	For all messages within the UK, standard packet loss is 0.01% or more.	2% of the monthly Service Charges of affected sites.
3	Jitter	Within the UK, Jitter on any traffic is more than 5ms	2% of the monthly Service Charges of affected sites.

Credits will be applied on a per fault basis and the total of all Service Credits applied in any given month will be limited to a maximum of 100% of the Service Charges for that month.

For the purpose of calculating the service credits only, any failures that occur within periods of planned and approved outages and maintenance windows will not be taken into account.

Where a backup service is taken and in the unlikely event that both the primary and secondary services are not working the focus of the support team will be to get the primary link back in to service. Effort will therefore be applied to this and not to fixing the secondary service.

We need to caveat the Jitter/latence in line with 20.6.2.

## Firewall Availability Service Credits

Total Service Availability of:	Target Availability	Target Resolution	Service Credit (% of monthly charge)
Gamma Cloud Firewall (HA)	99.99%	< 30 Minutes	10%

Service credits are paid on a per hour basis for each hour the fault persists beyond the target availability % and subject to a maximum limit of 100% of the monthly rental charge.

We can provide firewall availability stats.

### Exclusions from SLA / SLG

A service level, service level guarantee and any compensation entitlement will not apply if:

- the failure by Gamma is due to its Partner's or Partner's end customer's own network or equipment or any other network (including but not limited to the internet) or equipment outside the Gamma network or beyond the demarcation points;
- the failure on Gamma's and/or the customer's network and/or equipment caused due to the customer's actions or omissions or those of its servants, agents and/or sub-contractors.
- the customer is in breach of any part of these terms and conditions or the Supply Agreement and such breach affects Gamma's ability to comply with the service level and/or service level guarantee or if Gamma's underlying service provider suspends the service or any part of it as a result of any such breach;
- delays in the provision of the Service and in fixing any faults in the Service, where such delays are caused due to; faults, acts, omissions or outages on the customer side of the Demarcation Point;
- through no fault of its own or because of circumstances beyond its reasonable control, Gamma is unable to carry out any necessary work at, or gain access to the end customer's site or either party fails to agree an appointment date or planned work is aborted (save at Gamma's request);
- reasonable assistance is required or information is reasonably requested by Gamma from its Partner or end customer or a third party and such assistance or information is not provided or is not provided in a timely fashion;
- through no fault of its own, Gamma is unable to obtain any necessary permissions or consents required in connection with the performance of a particular service level or service level guarantee;
- the failure is due to Force Majeure or some other event outside Gamma's reasonable control;
- the failure is due to a planned or emergency service interruption;
- the failure is due to an inaccurate Order Form having been submitted;
- a fault is not reported in accordance with the fault reporting procedures contained in the Gamma Handbook; or

- It's Partner or end customer has failed to implement any reasonable and explicit instructions issued by Gamma in relation to the service.
- outages or delays which are a result of a WLR3 fault that affects the availability of the FTTC Ethernet/Broadband service
- The fault handling resolution times for FTTC Ethernet do not include any time taken to first resolve any WLR3 faults affecting the availability or performance of the FTTC Ethernet service. The 8 hour fault target resolution time will commence from the time that it is established that the WLR3 line is in working order and is not affecting the FTTC Ethernet service.
- FTTC Ethernet downstream speed related faults will only be accepted for speeds performing slower than the purchased speed where the purchased speed is 20Mbps or less. Upstream faults will be accepted for speeds performing lower than the purchased speed up to a maximum of 20Mbps.
- outages or delays which are a result of a WLR3 fault that affects the availability of the FTTC Ethernet/Broadband service

## Wires-Only Service

Initially, Wires-only service is **not** available. All services will be provided via a Gamma-supplied router as well as, where applicable, the relevant NTE.

# Gamma Responsibilities

As part of the Converged Private Network Service, Gamma is responsible for responsible for;

- Capacity planning and network infrastructure to deliver Converged Private Network services
- Provision of a portal or other method to allow quoting, to perform availability checks and manage the Converged Private Network Service in life
- Providing consultative pre sales technical advice with regards to solution design
- Provision of detailed design document, pricing and contract before accepting an order
- Provision of data services and delivery coordination with Partner
- Provision of IP addressing
- Provision of a helpdesk for second and third line fault resolution and escalation
- Configuration & dispatch of router
- Providing router maintenance including replacements and upgrades
- Updates to Service Orders and Fault Tickets
- Detailed wholesale invoice to allow for accurate end user billing
- Providing access to pricing information or access to an online quote tool for both new service installs and making any MAC's (moves, adds or changes) to live services
- Providing access to monitoring to both the Partner and their end customer
- An account team who will be responsible for the co-ordination of all aspects of the service including a Business Development Manager, Technical Consultants and Product Managers
- A documented Issues Management and Escalation process owned by the Senior Escalations Manager which is in place to allow any service related issues to be raised and tracked through to resolution
- Notification of any upgrades or enhancements to the service



# Partner Responsibilities

As part of the Converged Private Network Service, the Partner is responsible for responsible for the following:

- Ownership of end customer solution design including any resilience options
- Completion of the Converged Private Network Request Form
- Placing orders using Converged Private Network CRF Form and managing through to completion
- Installation of Customer Premises Equipment (customer router)
- Installation and maintenance of your own onsite firewall where Internet Access 'Local Site' from a customer site is taken instead of Gamma's cloud based firewall service or where a separate end customer or partner internet solution is used.
- Provision of any onward service for the end user
- Ordering of Horizon products using existing portal access
- In life administration of Gamma SIP Trunks and Horizon
- Provision of accurate forecasts to enable Gamma to effectively capacity plan
- Contractual and billing relationship with the end user
- Provision of first line technical support to the end user
- Reporting of faults into/working with Gamma to identify faults relating to any customer site and Interconnects
- Provision of all Customer Services functions for the end user
- Notifying the end user of all network and systems outages that are service affecting
- Notifying Gamma of any changes to Partner / Customer key contacts as required
- Taking reasonable steps to ensure/arranging access to an end user site for provisioning and fault diagnosis as required and notifying Gamma of any access restrictions to the applicable customer site (e.g. landlord's consent, security restrictions) when placing an order
- Notifying Gamma of any change at a customer site during installation or in life that may impact the performance of the Converged Private Networks Service.
- Approving any excess construction works carried out to any end user site

# Contacts

Name	Guy Easterbrook
Role	Product Manager - Networking
@	Guy.easterbrook@gamma.co.uk
📞	03300538279
📞	07458085375

Name	Harry Singh
Role	CPN Sales Specialist
@	harry.singh@gamma.co.uk
📞	0333 006 5930
📞	07458085375

Name	Alan Hall
Role	CPN Pre Sales Technical
@	alan.hall@gamma.co.uk
📞	0333 006 5982
📞	07776 769972