

SERVICE SPECIFICATION /

INTECHNOLOGY'S Next Generation Ethernet Service
Version: 3.0 Date last amended: 12th July 2012

SECTION 1: OVERVIEW

SERVICE OVERVIEW

The Next Generation (NG) Ethernet Service is one of the connectivity options available within the InTechnology LANnet portfolio. It is a high quality service aimed at businesses wishing to connect small, medium and large offices, data centres, DR sites, etc. to the rest of the corporate network. The Service includes a high specification terminating device that acts as the service demarcation point.

SECTION 2: SERVICE DEFINITION

SERVICE CHARACTERISTICS

Several connectivity options exist depending on the site location and the bandwidth required.

Ethernet over Fibre Services running at 10, 100 or 1000 Mbps can be used to connect premises to the InTechnology core network.

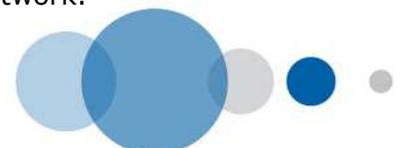
Ethernet over Copper Service is provided using up to 8 copper pairs which are bonded together to provide the required bandwidth. Bandwidths between 1Mbps and 35Mbps can be achieved depending on site location. The maximum available bandwidth at a particular site and the number of pairs required to achieve a chosen bandwidth depend on the distance between the customer site and the Exchange.

Ethernet connectivity provides a cost-effective and scalable solution for higher bandwidth requirements. It is not necessary to use all of the capacity on the circuit initially. It is possible to order, for example, a 100Mbps circuit and initially only use (and pay for) 10Mbps of VPN traffic. There is capacity in future to increase the amount of VPN connectivity delivered to the site, or to add one or more other Bandwidth Services such as an Internet feed.

The LANnet NG Ethernet Service delivers as many 'Bandwidth Services' as capacity will allow on the circuit. For example, if a 100Mbps line is ordered, any combination and number of our Bandwidth Services can be ordered as long as the combined bandwidth of the services does not exceed 100Mbps.

SERVICE DESIGN

A 'short-haul' Ethernet Service is used to connect the customer premises to the InTechnology MPLS core via one of our supplier's next generation networks. A router or switch is installed on the customer premises and this terminates the circuit. This Customer Premises Equipment (CPE) is polled so that failures are identified quickly. Typically, the various bandwidth services are delivered to different ports on the CPE for straightforward deployment. Software on the CPE allows the various bandwidth services to occupy overlapping IP address space. The end of the circuit that connects to the InTechnology core is delivered with several others as part of an aggregate. The various layer-two virtual LANs carrying the different Bandwidth Services are delivered to the appropriate VPN as they enter the equipment at the edge of the core network. MPLS is used in the core to offer secure and efficient data transfer to all sites on the network.



COVERAGE

Short-haul optical Fibre Ethernet Services generally operate at distances of up to 25Km. Ethernet over Copper services can only operate up to about 4.5Km from the serving Exchange. Consequently UK coverage for these services is extensive but there are parts of the UK that cannot be covered.

CUSTOMER PREMESIS EQUIPMENT

InTechnology deploys a high quality device on the customer's premises to provide demarcation of the Bandwidth Services.

- The device deployed on 100Mbps circuits and below has multiple 10/100 Ethernet interfaces.
- The device deployed on 1Gbps circuits has either multiple 10/100 Ethernet interfaces or multiple gigabit interfaces depending on the quantity of each of the Bandwidth Services ordered.

If each of the Bandwidth Services is less than 100Mbps in capacity, a device with 10/100 interfaces will be deployed. If any of the Bandwidth Services is in excess of 100Mbps or the customer requests, at the ordering stage, all services to be delivered on a single (trunk) port, a device with Gigabit interfaces will be deployed.

Each Bandwidth Service will only be presented on a single interface on any piece of CPE. For example, despite having seemingly unused interfaces, the InTechnology CPE cannot be used to provide connectivity to end-user devices. In almost all circumstances, the customer will need to provide a LAN switch on customer sites to provide connectivity for end-user devices.

IMPROVING AVAILABILITY OF CONNECTIVITY

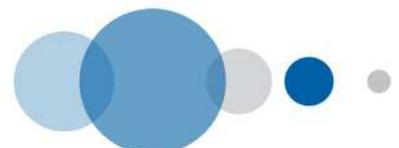
For sites that require extremely high levels of availability, a second Ethernet, ADSL or other circuit can be provided to 'back up' some or all of the Bandwidth Services delivered over the primary circuit should a failure occur. Failover from the primary circuit to the secondary circuit takes less than one minute (except where one of the circuits is LANnet Direct Ethernet with standard CPE).

Please note that requirements to minimise failover time must be agreed prior to order placement.

QUALITY OF SERVICE (QOS)

InTechnology can deliver multiple Bandwidth Services on a single Ethernet WAN link. Engineers apply Quality of Service configuration as necessary to support some of these services. Most notably, QoS is required to deliver InTechnology voice services.

InTechnology offers 4 Classes of Service (CoS) using the Differentiated Service (Diff-Serve) QoS model. This satisfies the vast majority of customer requirements and can be implemented on cost-effective CPE.



QoS is also used to ensure that certain customer traffic is treated differently to other traffic. For example, customers may wish to identify and prioritise business critical application traffic (such as CRM or Citrix) to ensure that it gets a better level of service than, say, email or Internet traffic. The most common requirement for QoS is to ensure that real-time traffic (like interactive voice and video) is given the highest possible CoS.

When required, InTechnology technical consultants will work with a customer to gather QoS requirements, before designing and documenting a policy which will be implemented on InTechnology network components.

InTechnology hardware can be configured to identify traffic based on IP addresses, protocol number, customer DSCP packet markings, etc. The hardware will 'classify' each packet by marking, re-marking or trusting any existing customer markings as required. Core devices treat individual packets according to their classification at various places in the network.

For maximum efficiency, the volume of traffic is specified as follows:

- **'Real-time'** Class is specified in terms of the bandwidth required
- **'Priority'** and **'Standard'** Classes are specified in terms of the percentage of bandwidth
- **'Best Effort'** Class refers to any remaining traffic

Note: hardware constraints can dictate certain 'steps' for the bandwidths above.

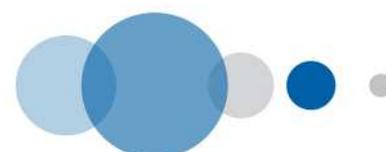
E.g. if a customer wanted 10Mbps 'VPN' bandwidth; of which 2Mbps would be used as an inter-site voice trunk and approximately 2Mbps was required for voice signalling and Citrix, bandwidths could be defined like this:

Traffic Class	Traffic assigned	Bandwidth
Real-time	Inter office voice	2Mbps
Priority	Voice signal + 'Citrix'	25% remaining (i.e. 2Mbps is 25% of 8Mbps)
Standard		
Best Effort	All other traffic	(This will be the remainder i.e. 6Mbps)

Good design practice dictates that limits should be placed on the percentage of traffic allocated to the various classes. InTechnology consultants will provide best advice, and document these percentages in the QoS policy.

The table below shows typical traffic allocation along with default QoS actions.

Traffic Class	Typical traffic assigned	Default action on traffic exceeding the allocation
Real-time	Real Time Voice/Video payload	Drop
Priority	Business Critical	Re-mark - place in Standard queue
Standard	Normal Business	Re-mark - place in Best Effort queue
Best Effort	All other traffic	Drop



The various Access Circuit options (e.g. ADSL, leased Line, Ethernet etc.) have different QoS capabilities as dictated by the underlying infrastructure. Traffic requires end-to-end QoS support. Therefore traffic travelling between two locations effectively has the QoS capability equal to the lower of the links. For example, traffic travelling from an ADSL connected site to an Ethernet connected site (and vice versa) will have the end-to-end QoS capability of the ADSL line.

InTechnology currently deploys one of two CPE devices, one for lower throughput requirements and one for higher requirements. InTechnology consultants will help determine which device is most suitable for deployment taking into account initial and potential future requirements. If the lower specification device is installed initially and at some future point the higher specification device is required (most likely due to upgrading Service bandwidths), a CPE upgrade charge will be applied.

No QoS performance reporting information is available at present. This may be available at some future point and the service may be chargeable.

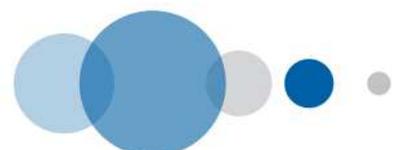
LEAD TIMES

The typical lead time to provide the fibre based Ethernet Service is 65 working days. If the majority of infrastructure is in-place, this can drop to as low as 35 working days. If additional construction work is required to deliver the service; lead times can be in excess of 65 days.

The standard lead time to provide the Copper based Ethernet Service is 30 working days. If the majority of infrastructure is in place, this can drop to as low as 20 working days. If additional construction work is required to deliver the service, lead times can be in excess of 30 days.

UPGRADES AND SITE MOVES

The ability for InTechnology to offer access circuit upgrades and circuit shifts depends on a number of factors including the technology, the circuit supplier and the term commitment we make with our supplier when we order the circuit. Customers are encouraged to discuss any possible upgrade or move requirements they are likely to have prior to contract signature. Circuit upgrades and moves will incur one-off and often increased recurring charges. If we understand these requirements prior to ordering circuits from suppliers, we can minimise the commercial impact as much as possible.



SECTION 3: CHARGING POLICY

PROFESSIONAL SERVICES: DESIGN, DEPLOYMENT & INTEGRATION

Charging for the Next Generation Ethernet Service consists of a one-off **Service Activation Charge**, a one-off **Installation Charge** and a **Recurring Charge** which is payable monthly in advance. Service Activation quotes assume that fibre or copper pair(s) is/are present at the customer site and therefore no 'excess construction charges' are applied by our circuit provider.

Service Activation Charges specific to Next Generation Ethernet connections include the components listed below:

- CPE procurement
- Circuit installation
- Implementation platform licensing costs

Installation Charges specific to Next Generation Ethernet connections include the components listed below:

- Pre-sales consultation
- Replacement WAN design
- Device configuration
- Project management
- Engineer installation of CPE
- Service testing and internal documentation

The **Monthly Recurring Charge** for the service consists of three components:

- A charge for the access circuit from the customer site to the edge of the supplier's network
- A charge for the total Bandwidth required across the suppliers core
- A charge for each of the Bandwidth Services delivered over the circuit.

EXCESS CONSTRUCTION CHARGES (ECC)

Once an order is placed for the service, InTechnology places an order on the circuit supplier. The circuit supplier undertakes a site survey within a few weeks of receiving the order and any excess construction charges are identified. If ECC are applied, InTechnology will re-calculate and submit the revised installation price and monthly charges to the customer. If the revised price is unacceptable, the customer has the option to cancel the order.



MINOR CONFIGURATION CHANGES

InTechnology undertakes change work on a fair use basis (please see the Customer Service Plan [CSP] for details), this meets the requirements of the vast majority of customers. If InTechnology feels that a disproportionate amount of resource is required to undertake change work for a particular customer, we will notify the customer and subsequent work may be chargeable.

Changes are scheduled to be completed by InTechnology's own engineers, using a priority system with Emergency changes undertaken first. Non-emergency changes will usually be scheduled to be completed during office hours. If non-emergency changes are required outside of office hours, the request will be accommodated where possible and may again be subject to additional charge.

SUPPORT

InTechnology supports products and services to meet the Service Level Agreement **which forms part of the contract**. Any support requests beyond this will be considered, and may be chargeable if implemented. For example, any major reconfiguration work required on a customer's systems/network to provide a work-round fix for a customer disaster.

ADDITIONAL CHARGING

If additional charging is necessary:

- Where possible, InTechnology will issue an estimate for any chargeable work in advance.
- The figure will be calculated based on the 'standard' or 'out-of-hours' rate for the type of work and consultancy/engineering skills required.
- Travel and/or other expenses will be detailed separately when applicable.

As an illustration, please refer to the pricing below:

STANDARD RATES		OUT-OF-HOURS RATES	
ENGINEER day	£750	ENGINEER 'day'	£900
ENGINEER hour (from)	£100	ENGINEER hour (from)	£115
CONSULTANT day	£1000	CONSULTANT 'day'	£1200
CONSULTANT hour (from)	£120	CONSULTANT hour (from)	£140

Day rates apply to work carried out 9am – 5pm on weekdays, including 30 mins lunch break. Rates inclusive of 2 hours' travel time.

'Day' rates apply to work carried out on bank holidays & weekends, or between 5pm and 9am on weekdays. Rate shown is per 8 hour project including 30 mins break.

Project specific quotes are available on request. Discounts may be available when 'multi-day' service bundles are purchased.



SECTION 4: SERVICE LEVEL AGREEMENT

SERVICE AVAILABILITY

Service Availability is measured at the on-site router as the percentage up-time seen by the InTechnology Network Management System. This percentage availability is reported on a monthly and 'last 12 months' basis. The Service Level Agreement offered is that over a 12 month period the percentage up-time will be at least 99.8% for Ethernet over Fibre and 99.5% for Ethernet over Copper.

Service Element	Percentage Up-Time over 12 Months
Ethernet over Fibre Access	99.8%
Ethernet over Copper Access	99.5%

SERVICE CREDITS

After the access circuit has been in service for 12 months, the customer may claim any service credits due. A service credit will be due if the availability has fallen below the specified minimum availability percentage averaged over the last 12 months, as reported by the InTechnology Network Management System, adjusted for the following instances:

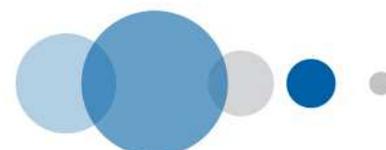
- Service unavailable due to planned or emergency maintenance or during the maintenance window specified in the Customer Service Plan (CSP)
- Loss of power to the InTechnology equipment at the customer site
- Unauthorised interference with the cabling to the on-site InTechnology equipment
- Faults traced to the customer or to faults on the customer's side of the service termination point including local power or local area network failure
- Service unavailable due contractual service suspension or to Force Majeure

Planned maintenance can involve a temporary suspension of parts or all of the services in order to enable us to undertake vital remedial, maintenance or upgrade work. Controlled outages will always be notified to the customer at least 7 days in advance and be planned in such a way as to have minimum impact on the customer's operations.

Emergency maintenance required as a result of identifying a problem through ongoing monitoring and management, that could potentially cause an outage or failure of the Service, will be notified to the customer at the earliest possible time and be managed in such a way as to have minimum impact on the customer's operations.

Any service credits due are calculated as follows:

If the availability of a site, measured over 12 months, is lower than the committed figure, a proportionate amount of the annual charge will be refunded by way of a service credit. The proportion will be the committed availability percentage minus the achieved availability percentage. For example, if the committed availability is 99.8% and the achieved availability is 99.5%, the service credit is 0.3% of the annual charge.



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