

APN's from Vodafone

Technical Overview

Vodafone Professional Services

Mobilising Enterprise

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What is an APN

An Access Point Name (APN) is a point of entry onto an IP network for a mobile device; it is the radio access equivalent of an ISP's dialup phone number. The mobile device must be configured with the appropriate settings to connect to the customer specific APN.

The SIM inserted in the device must have the APN associated to it to be able to access the APN. This provisioning process involves adding the customer specific APN to the Vodafone UK Home Location Register (HLR).

The Serving GPRS Support Nodes (SGSN) uses the APN name to firstly determine whether the mobile user is permitted to access the APN by interrogating the users profile on the HLR. If the user is authorised to use the APN then the SGSN routes the connection request to the GGSN. The GGSN uses the APN configuration to assign an IP address and other parameters, as specified in the APN such as DNS, to the device.

Each dedicated customer APN is set up to route IP traffic from the GGSN to either an IPSec connection or private circuit (E1, E3 or Ethernet). Customers can access their APN via a GPRS, 3G or HSDPA enabled devices. Once the device is connected to the customer specific APN, the device is able to send traffic and receive traffic directly to and from the customer corporate network.

An APN can be private or public. Private indicates that the APN can only be associated with a number referenced to the corporate account to which the SIM sits within. Public means the APN can be associated to any SIM.

The accepted formats for a customer APN name are:

- vodafone.co.uk
- vodafone.com

Note: APN name must be a registered Domain name to the company requesting the APN.

The valid characters for an APN name are letters, numbers and a hyphen '-'. Other special characters like the underscore '_' or an exclamation mark '!' are **NOT** permitted. This APN name must be in lower case and be 20 characters or less.

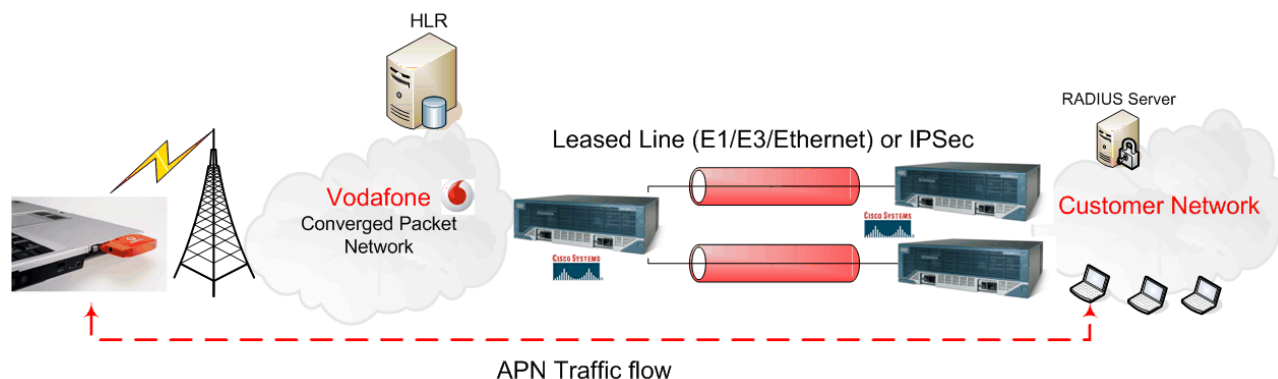
Note: The APN address is just a unique identifier and is not a qualified URL.

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APN Traffic Flow

The diagram below illustrates APN traffic flow.

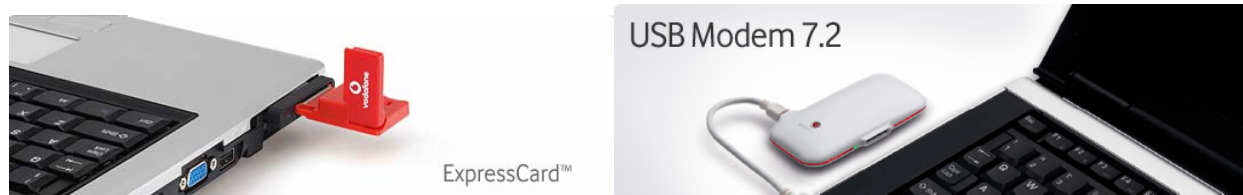


Note: Resilience is only an option with dual leased lines. This is covered in more detail in the fixed link document.

Access Devices

Current Vodafone UK devices allow access via GPRS, 3G or HSDPA.

The GPRS, 3G or HSDPA device connects the client device i.e. Handset, PDA or laptop to the Vodafone UK network.



The Access Point Name (APN) is used to activate a Packet Data Protocol (PDP) context, provided the user (SIM) has been provisioned with their customer specific APN. Once the connection is authenticated & established a routable path exists between the device & the remote customer network to enable the flow of data.

Note: Data transfer rates are dependant on device type.

Device IP Address Ranges

An APN is a mobile extension of the corporate Local Area Network (LAN); the customer must therefore specify the IP address range that they would like to be allocated to their devices to avoid routing or duplicate IP address issues.

There are a number of options available on the method of IP address allocation. These are covered further on in this document

Some of the addressing options will require configuration of the Vodafone UK mobile connect card software.

Vodafone UK recommend that customers configure two device IP ranges, one across each GGSN, for resiliency purposes.

There is also no size restriction on the address range the customer requests.

Basic Authentication

Each end user device will be authenticated and authorised via the Vodafone UK HLR to ensure that access is allowed to both the Vodafone UK network and customer specific APN.

GGSN Address Allocation

The attaching device IP addresses are dynamically assigned by the GGSN from the IP address range that has been specified by the customer.

Information such as the DNS server can be passed back to the connecting device.

The IP addresses can also be managed by the GGSN with RADIUS authentication included.

The user is authenticated by the corporate RADIUS server and an acknowledgment is sent to the GGSN which then releases an IP address to the device.

Note: It is the customer responsibility to install, configure and manage their own RADIUS server.

DHCP IP Address Allocation

If the customer wants to manage their IP address allocation, the GGSN can relay the DHCP request to a customer managed DHCP Server.

It is the customer responsibility to install, configure and manage their own DHCP server.

The request can be configured as a DHCP Proxy or Relay.

RADIUS IP Address Allocation

The customer's corporate RADIUS server can be utilised to carry out static IP address mapping on a per device basis.

This can be achieved by mapping a single IP address to a user name & password, MSISDN or a combination of both.

The level of configuration is dependant on the functionality of the customer RADIUS server.

It is the customer responsibility to install, configure and manage their own RADIUS server.

Primary and secondary RADIUS authentication is configurable.

The following features are available:

- Username/Password authentication
- RADIUS accounting message forwarding
- Static IP address mapping

Note: If fixed IP addressing is required, then a single GGSN will be utilised, reducing the level of resilience the solution offers.

Support

24/7 support is offered to corporate customers from the Vodafone Technical Customer Services team (TCS).

24/7 contact number: 08454 400040

Email address: tcsdatanetwork@vodafone.com

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Roaming

Users can connect to their UK based APN whilst in Vodafone roaming partner countries on GPRS, 3G and HSDPA enabled networks.

The mobile user seamlessly connects to the roaming partner's network and connects the user to their specific APN in exactly the same way as if they were in the UK.

Listed roaming partner link:

<http://www.abroad.vodafone.co.uk/index.cfm?do=abroad.datacard&me=a3&nu=1&le=3&business=true&sn=s8>

Glossary of Terms

3G

The term 3G is used to describe the next generation (3rd) of mobile network infrastructure that supports high-speed, high-bandwidth wireless services for advanced applications (Also known as UMTS).

E1

An E1 is a transmission technique, based on European standards, which multiplexes together thirty 64 KBit/s voice (or equivalent) channels into a 256 bit frame for transmission at 2.048 MBit/s. The term is used as shorthand for transmission rates of 2 MBit/s.

GGSN

GPRS Gateway Support Node is the gateway between a cellular network and a IP network. The GGSN uses the APN configuration to assign an IP address and other parameters, as specified in the APN such as DNS, to the device.

GPRS

General Packet Radio Service is a radio technology for GSM networks. It incorporates packet-switching protocols, has shorter set-up time for internet connections, and offers the possibility to charge by amount of data sent rather than connect time. It is designed to support flexible data transmission rates typically up to 20 or 30 Kbps (with a theoretical maximum of 171.2 Kbps).

HLR

The Home Location Register is the central database on a network that stores all the relevant information about valid subscribers, including the mobile phone number, access privileges, and the current location of the subscriber's handset.

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HSDPA

High-Speed Downlink Packet Access is a new mobile telephony protocol, and is sometimes referred to as a 3.5G (or '3G') technology. HSDPA provides an evolutionary path for Universal Mobile Telecommunications System (UMTS) networks allowing higher data capacity (up to 14.4 Mbit/s in the downlink). It is an evolution of the WCDMA standard, designed to increase the available data rate by a factor of 5 or more.

IP

Internet Protocol is a network and transport protocol used for exchanging data over the internet.

LAN

A Local Area Network is a network that is usually geographically limited, usually to the same building or office.

Leased Line

A leased line is a dedicated circuit that connects a user or network to another network or an ISP.

PDP

Packet Data Protocol is a network protocol which is used by packet switching external networks to communicate with GPRS networks. IP is an example of a PDP protocol supported by GPRS.

RADIUS

Remote Access Dial In User Service is a client/server protocol and software that enables remote access servers to communicate with a central server to authenticate dial-in users and authorize their access to the requested system or service. RADIUS allows a company to maintain user profiles in a central database that all remote servers can share. It provides better security, allowing a company to set up a policy that can be applied at a single administered network point.

Roaming

This is the general term that gives mobile phone users the ability to make or receive calls on other service providers' networks. Typically roaming takes place when outside the coverage (or country) of their own mobile network service provider.

SGSN

A Serving GPRS Support Node is responsible for the delivery of data packets from and to the mobile stations within its geographical service area.