Suppliers' Information Note

For The BT Network

The BT Cardway Service
SERVICE DESCRIPTION

This SIN is available in Portable Document Format (pdf) from: http://www.btplc.com/sinet/

Enquiries relating to this document should be directed to: sinet.helpdesk@bt.com.

CONTENTS

1. Introduction

This Suppliers' Information Note (SIN) describes the BT Cardway service. The service offers a means of accessing card company hosts in order to obtain automatic authorisation for credit card transactions.

2. Description of the BT Cardway service

2.1 General

BT Cardway is a PCI-DSS compliant secure, flexible network that provides connectivity options for the delivery of all types of card payments, currently delivering in excess of 4 billion financial transactions per annum.

Transactions that originate from Point of Sale (PoS) terminals, Smart Phones, ATM's or Host Servers can be securely delivered to Acquiring Banks, Payment or other processors globally, conformant to the latest Payment Card Industry Data Security Standards (PCI-DSS).

The BT Cardway service has been designed to help merchants and acquirers alike overcome the complexity of implementing card industry security standards. BT Cardway provides a secure payment network environment for anyone accepting payment card transactions.
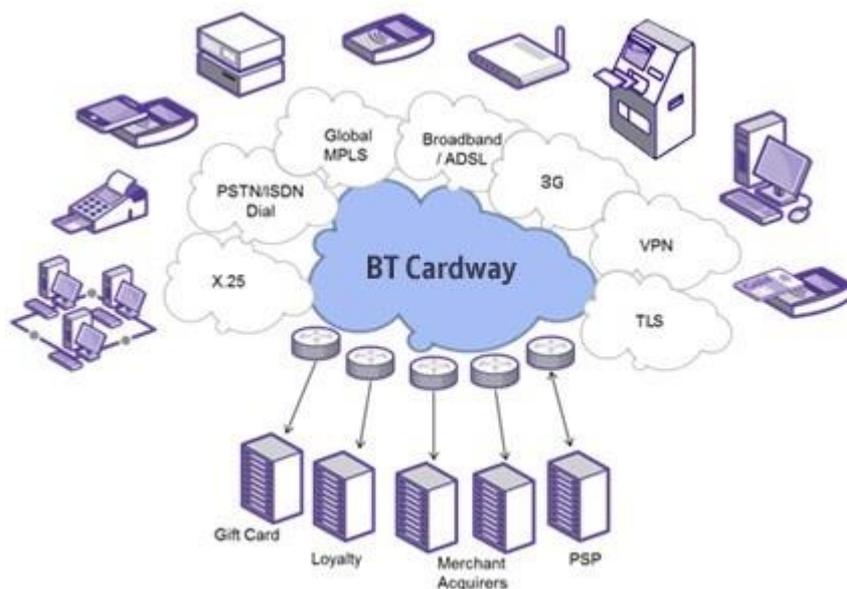
Figure 1 Cardway Network

2.2 BT Cardway product options

2.2.1 Dial

The BT Cardway PSTN/ISDN Dial Service provides dial-up merchant connectivity to deliver transactional data to the acquiring host.

The service utilises BT inbound services numbering (shared or customer exclusive numbers) to provide connectivity for payment card authorisations from customer devices connected via PSTN and ISDN lines into the Cardway service dial access nodes.

2.2.1.1 PSTN Support
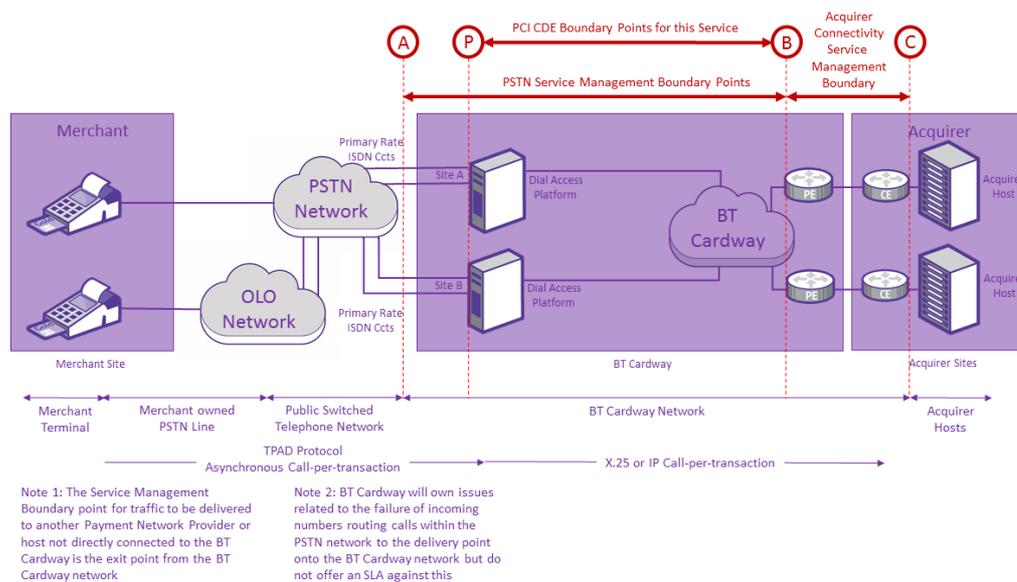
The BT Cardway network provides the TPAD functionality for PSTN dial-up Point of Sale (POS) terminal and EPoS (Electronic Point of Sale) connections.

2.2.1.1.1 Analogue

PSTN dial–up for transactions is available via modems conforming to CCITT V.21, V.22, V.22bis, V.23, V.32, V.32bis, V.34 & V.90 standards.

2.2.1.2 ISDN Support

2.2.1.2.1 0800i - X.25 over the B-channel
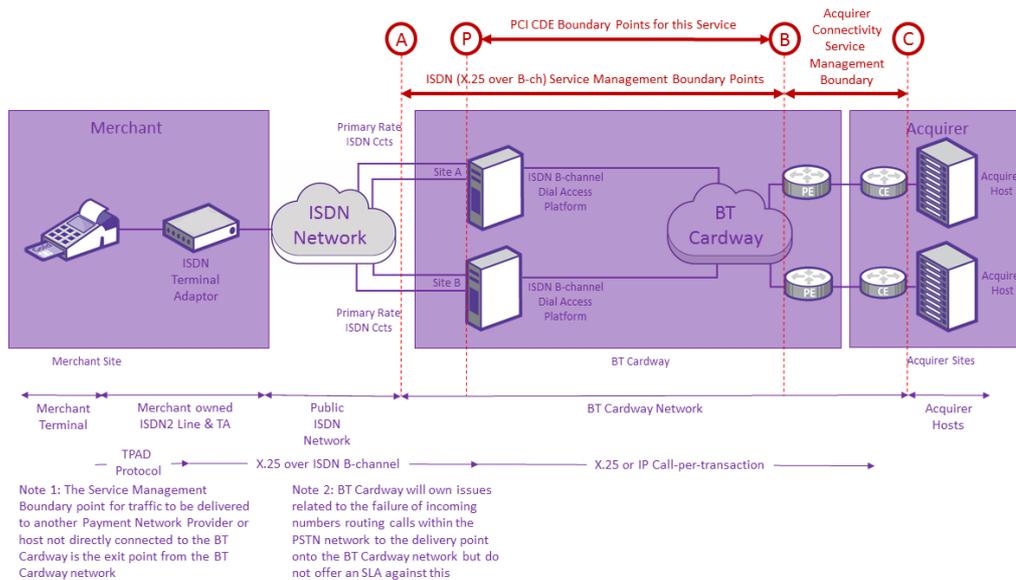
Support for ISDN B Channel dial-up operation is provided at a maximum data rate of 64 Kbps, where the ISDN Terminal Adapter provides X.25 and TPAD functionality.

2.2.1.3 Digital

ISDN dial–up for transactions is available via modems conforming to CCITT V.110 & V.120 standards, including support for GSM mobile circuit switched calls.

2.2.2 MPLS

Both merchants and acquirers connect to BT Cardway via BT MPLS connections as shown in the diagrams below. Acquirers would always take a resilient connection.

2.2.2.1 Standard
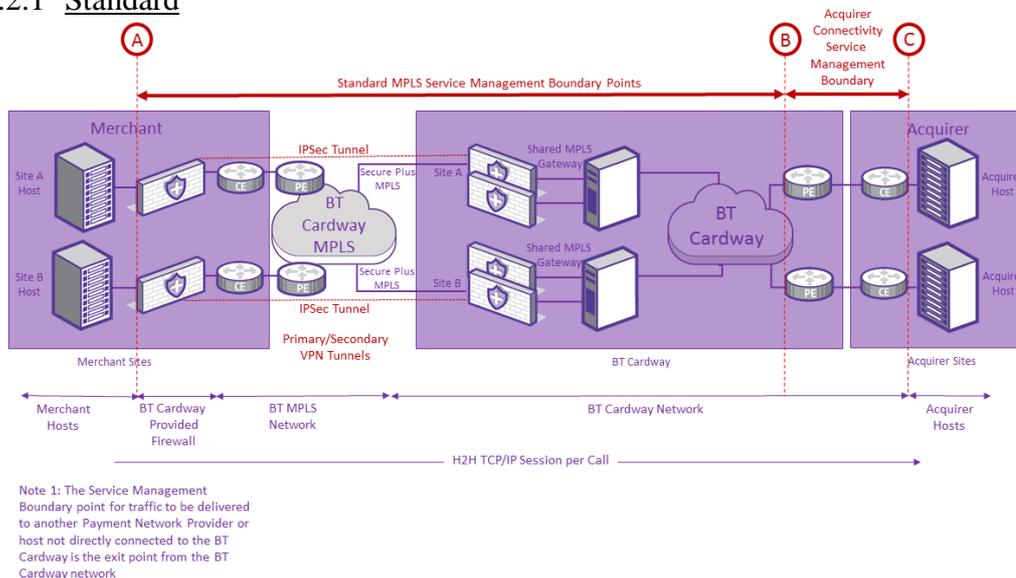
The standard service is delivered using a single circuit with no resilience or redundancy.

2.2.2.2 Secure Plus
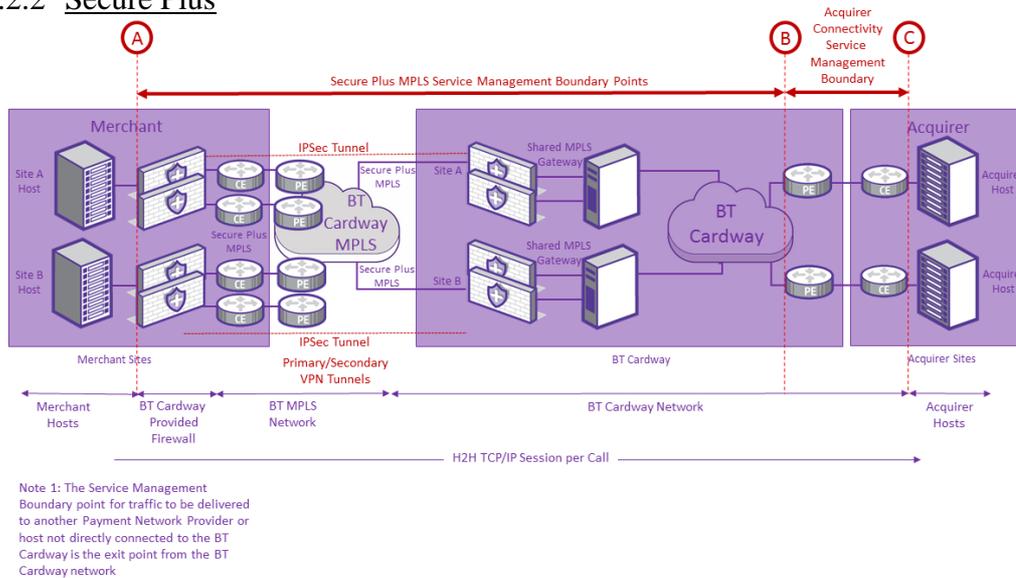
The Secure Plus service is delivered using dual circuits with diverse routing into each Customer site i.e. two diversely routed circuits per site.

2.2.2.3 Split Site Secure Plus

The Split Site Secure Plus service is delivered using two (or more) diversely routed circuits into two (or more) Customer sites i.e. one circuit per site.

2.2.3 Internet VPN
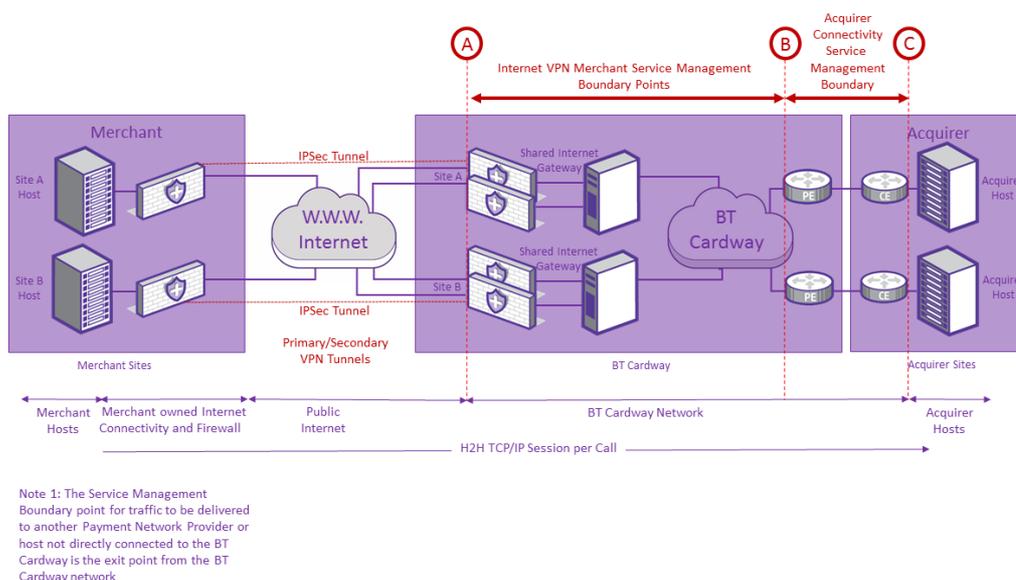
The BT Cardway VPN Service provides internet connected merchants with secure connectivity to deliver transactional data to their acquiring host.

The service utilises the merchant's standard internet connectivity to route into the BT Cardway shared internet gateways to provide connectivity for payment card authorisations from Merchant terminals and servers. Transactions are routed over secure, encrypted IPSec tunnels that are established between the Merchants Internet connection router and the BT Cardway ingress firewall that interfaces the BT Cardway Internet Gateway with the public Internet.

2.2.4 Internet TLS
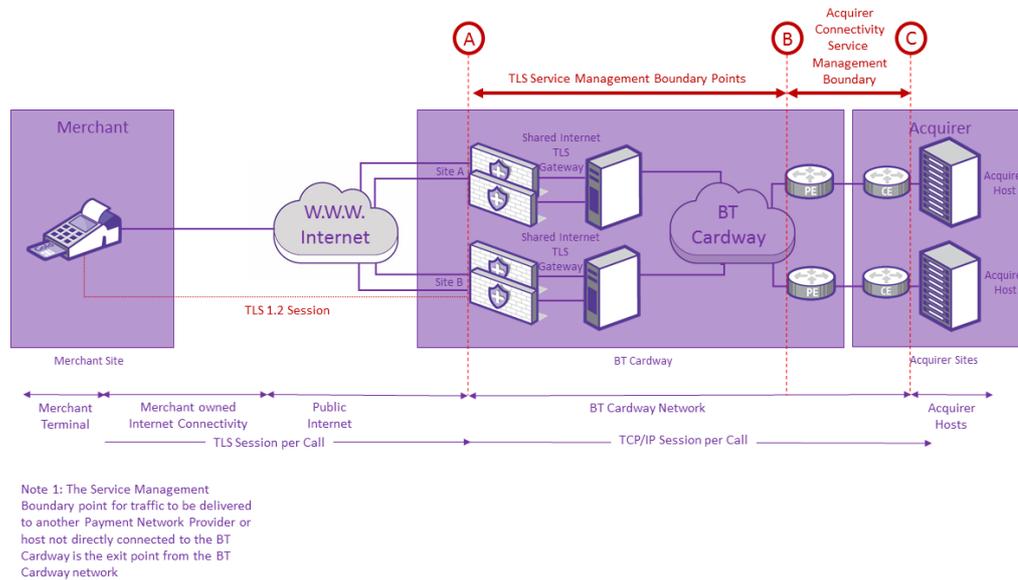
The BT Cardway TLS (Transport Layer Security) Service provides internet connected merchants with secure connectivity to deliver transactional data to their acquiring host.

The service utilises the merchants' standard internet connectivity to route into the BT Cardway shared internet gateways to provide connectivity for payment card authorisations from customer devices supporting the TLS 1.2 standard for encryption and transaction security.

TLS sessions are established between the Merchant device (IP terminal or server) and are terminated within the BT Cardway network on the ingress firewall that provides the interface between the BT Cardway Internet Gateway and the public Internet.

Transmitted data is encrypted using custom algorithm's with BT trustwise certificates.

The connection is reliable because each message transmitted includes a message integrity check using a message authentication code to prevent undetected loss or alteration of the data during transmission.

2.2.5 X.25
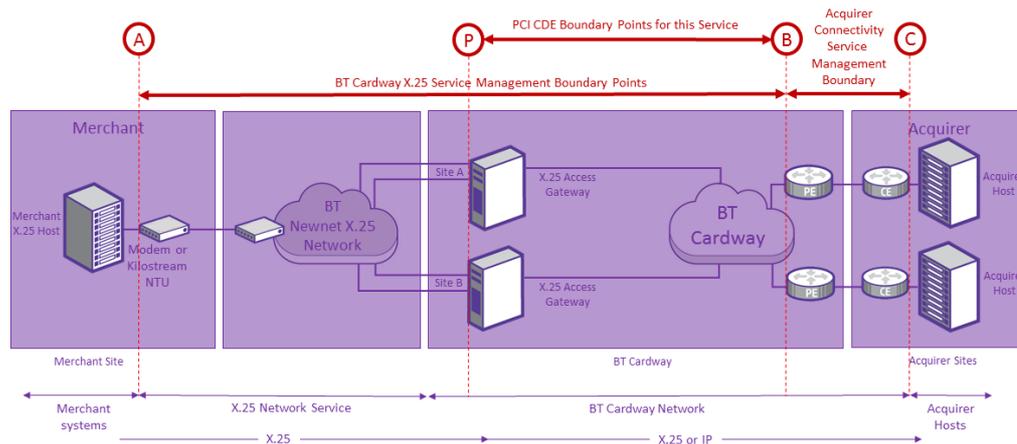
Note 1: The Service Management Boundary point for traffic to be delivered to another Payment Network Provider or host not directly connected to the BT Cardway is the exit point from the BT Cardway network

The BT Cardway X.25 Service provides X.25 connectivity for merchants or acquirers/processors to deliver transactional data to the acquiring host as described in SIN 295**Error! Reference source not found.**.

The service utilises the BT Newnet X.25 access service network to provide connectivity for X.25 payment card authorisations from customer devices to connect into the BT Cardway Core network. Gateway nodes are provided at multiple locations, geographically distributed around the UK.

3. Technical Specification

The network supports terminals using a number of different access methods. For Dial access BT uses the codes t3, t24, t24+, x and i to identify PSTN/ISDN interfaces. The technical characteristics of each are shown in the table below. The terminal must dial the appropriate PSTN number for the access method used.

Access method	Access	Modem standard	Protocol
t3	PSTN	V.21	APACS30/40
t24	PSTN	V.22 bis	APACS30/40
t24+	PSTN	V.22 bis	APACS30/40 *
x	PSTN	V.22 bis, V.42 LAPM	X.28 #
i	ISDN	N/A	X.25
Note 1	GSM	V110	APACS30/40
MPLS (IP	Ethernet, ADSL	N/A	IP, BGP, XOT, optional headers: bin2,

Connect)			bin3, bin4, vap, asc4, asc5, bcd2, bcd4, bin2E, bin3E,bin4E and mbit
BTnet (Internet Connect UK)	Ethernet, ADSL	N/A	IP, BGP, XOT, optional headers: bin2, bin3, bin4, vap, asc4, asc5, bcd2, bcd4, bin2E, bin3E,bin4E and mbit

Table 1 Access and Protocols

V.21, V.22 bis, V110, V.42, X.25 and X.28 are Recommendations published by the International Telecommunications Union (ITU-T) APACS30 and APACS40 are standards published by the Association for Payment Clearing Services. With the introduction of Chip and Pin cards the APACS30 & 40 standards are now part of the APACS 70 standard.

* The t24+ service uses a modified form of the APACS30 and APACS40 standards where the maximum size of each data block is increased from 128 to 2048 bytes. All other protocol features are unchanged.

The Visa II protocol, used by the current ATMs on Cardway, is transported using the X28 protocol.

The Cardway Delivery Connection uses the X.25 protocol via an interface as described in SIN 57[Error! Bookmark not defined.] for the 64 Kbits per second Kilostream X.21 interface or via MPLS.

For MPLS this can either be BT Cardway shared customer access MPLS where Multiple VPN connections are supported on an Ethernet access by configuring the access as an IEEE 802.1q VLAN trunk with each VPN using an individual VLAN associated with a VLAN ID. The VLAN ID associated with each VPN connection will be allocated by BT at the time of subscription. Dedicated customer access MPLS is when the customer provides his own circuit and router into the BT core site. Whether shared or dedicated connection compatible CPE will connect to an IP network which will allow an MPLS VPN to be established as described in SIN 385[0]. Data is encrypted using IPSEC tunnels. The BT Cardway Network makes no assumptions as to the physical connectivity to the CPE, other than that it conveys an MPLS VPN over IPv4. Terminal designers would need to be able to design a compatible terminal with respect to appropriate RFCs/Standards.

For Internet connection compatible CPE will connect to an IP network which will allow a VPN over Ipv4 to be established and data is encrypted using IPSEC or TLS.

Note 1. The GSM service is provided through dialup of the Cardway access number using mobile GSM transaction terminals.

The firewall specific Protocols, Encryption, Authentication and Cryptography that the network supports is shown in the table below.

Protocols	Timers	Encryption	Authentication	Cryptography
IPSEC, TLS	Key Lifetime (secs) 28800	AES256, 3DES	SHA256	Diffie-Hellman Group 5

3.1 IP Message Support

The merchant and acquirer gateway devices (ACP's) have the capability to support various message headers and parity settings.

3.1.1 TCP Header Length

The following are valid entries to specify the length of the message in the header for TCP messages.

Options	
None	None defined
Mbit	Same as "none" with MBIT support enabled (default)
bin2	Two-byte header containing the packet length as a binary value
bin3	Three-byte header containing the packet length as a binary value
bin4	Four-byte header containing the packet length as a binary value
VAP	Four-byte header containing the packet length in the first two bytes. The other two bytes are padded with 0's
ASC4	Four-byte header containing the packet length in ASCII format Example: A value of 37 will be represented as "0037" and in hex as (30, 30, 33, 37).
ASC5	Five-byte header containing the packet length in ASCII format. Example: A value of 37 will be represented as "00037" and in hex as (30, 30, 30, 33, 37).
Bcd2	Two-byte header containing the packet length as a bcd value
Bcd4	Four-byte header containing the packet length as a bcd value
Bin2E	Two-byte header containing the packet length plus the header length as a binary value.
Bin3E	Three-byte header containing the packet length plus the header length as a binary value.
Bin4E	Four-byte header containing the packet length plus the header length as a binary value.

3.1.2 Network Parity

This option governs the network parity of outgoing TCP/IP traffic.

Options	
Transparent	Transparent pass-through (default)

7E1	Set parity to 7E1 for outgoing data and strip off parity bit for incoming data.
8N1	Strip off parity bit for outgoing data
8N1E	Strips off parity bit for outgoing data and set parity to 7E1 for incoming data

4. Service Availability

For further information on service availability and tariffs, please contact:

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5. Abbreviations

ADSL	Asymmetric Digital Subscriber Line
APN	Access Point Name
ATM	Automatic Teller Machine
APACS	Association for Payment Clearing Services
BGP	Border Gateway Protocol
FTP	File Transfer Protocol
GPRS	General Packet Radio Service
GSM	Global System for Mobile
IEEE	IEEE 802.1q, Recommendations for Virtual LANs
IP	Internet Protocol
IPSEC	Internet Protocol Security
ISDN	Integrated Services Digital Network
LAPM	Link Access Protocol for Modems
MPLS	Multi Protocol Label Switching
PSTN	Public Switched Telephone Network
RFC	Request for Comment (IETF)
SIN	Suppliers Information Note
TLS	Transport Layer Security
VLANs	Virtual Local Area Networks
VPN	Virtual Private Network
XOT	X25 over TCP

7. References

ITU-T Recommendations

V.21	300 Bits Per Second Duplex Modem Standardized For Use In The General Switched Telephone Network
V.22 bis	2400 Bits Per Second Duplex Modem Using The Frequency Division Technique Standardized For Use On The General Switched Telephone Network And On Point-To-Point 2 Wire Leased Telephone-Type Circuits
V.42	Error-Correcting Procedures For DCEs Using Asynchronous-To – Synchronous Conversion
X.25	Interface Between Data Terminal Equipment (DTE) And Data Circuit-Terminating Equipment (DCE) For Terminals Operating In The Packet Mode And Connected To The Public Data Networks By Dedicated Circuit
X.28	DTE/DCE Interface For A Start-Stop Mode Data Terminal Equipment Accessing The Packet Assembly/Disassembly Facility (Pad) In A Public Data Network Situated In The Same Country
V110	V110 ISDN protocol technology, making use of the ISDN subset capabilities of GSM handsets
RFC 1613	Cisco Systems X.25 over TCP (XOT)
RFC 791	Internet Protocol

Suppliers' Information Notes

[1]	SIN 295	X.25 Service Description
[2]	SIN57	BT KiloStream X.21 Interface, Service Description
[3]	SIN 385	IP Connect UK Service Description

Standards published by the Association for Payment Clearing Services:

APACS30	Specification For A Credit Authorisation Terminal
APACS40	Acquirers' Interface Requirements For Electronic Data Capture Terminals
APACS70	Redrafting of a number of previous APACS standards

IP related information

IP Bin header	An optional IP header that defines the IP packet length as a binary or ASCII value.
XOT	X25 over TCP. Cisco related protocol catered for by the Cardway product line. X.25 Over TCP (XOT) enables you to send X.25 packets over a TCP/IP network instead of a Link Access Procedure, Balanced (LAPB) link. XOT also allows you to tunnel X.25 traffic through an IP network.

MPLS VPN	Multiprotocol Label Switching (MPLS) is a protocol for speeding up and shaping network traffic flows.
	MPLS allows most packets to be forwarded at Layer 2 (the switching level) rather than having to be passed up to Layer 3 (the routing level). Each packet gets labelled on entry into the service provider's network by the ingress router. All the subsequent routing switches perform packet forwarding based only on those labels—they never look as far as the IP header. Finally, the egress router removes the label(s) and forwards the original IP packet toward its final destination. A customer VPN used as a secure path across the BT MPLS network.

For information on where to obtain these referenced documents please see the document sources list at http://www.btplc.com/sinet/

8. History

Issue	Date	Changes
Issue 1	November 1988	First published.
Issue 2	December 1998	
Issue 2.1	June 2003	Format Updated. Section on Terminal Equipment Approvals removed. "Private circuit" replaced by "Cardway Delivery Connection" with interface defined by reference to SIN 57.
Issue 3.0	July 2004	GSM access added.
Issue 4.0	July 2006	IP/MPLS facility added
Issue 4.1	August 2007	Contact information amended in Clause 4, Service Availability
Issue 5.0	December 2008	Information on GPRS and IP connectivity now included
Issue 6.0	February 2011	General amendments. Addition of the Cardway PPP service.
Issue 6.1	May 2011	Minor editorial improvements
Issue 7	October 2014	Updates and amendments Change SINet site references from http://www.sinet.bt.com to http://www.btplc.com/sinet/
Issue 8	February 2016	Updates and amendments
Issue 9	June 2017	Updates and amendments. Section 2 updated to include the following: - MPLS access in section 2.2.2 - Internet VPN in Section 2.2.3 - Internet TLS in section 2.3.4 Section 3 updated to reflect all BT Cardway access types and associated protocols in particular Section 3.1 added to cover the IP message types New contact details added to Section 4

- **END -**