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| Document Title: | **ETU Technical Interface Specification: Horizon to e-pay** |
| Document Type: | Technical Interface Specification (TIS) |
| Release | BI3 S50 |
| Abstract: | This document defines the technical interface between Fujitsu Services (Post Office Account) and e-pay to support Electronic Top-Up transactions. |
| Document Status: | Approved |
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# Chapter 0 - Document Control

## 0.1 DOCUMENT HISTORY

| Version | Date | Reason for Issue | Associated CP/ PinICL Nos. |
|---|---|---|---|
| 0.1 | 25/04/03 | First Draft issued for comment and input to a number of outstanding questions. | None |
| 0.2 | 20/05/03 | Second draft incorporating comments | |
| 0.3 | 19/06/03 | Third draft taking account of comments from POL and Fujitsu | |
| 1.0 | 21/07/03 | Issued for Approval | |

## 0.2 REVIEW DETAILS

| | |
|---|---|
| Review Comments by: | |
| Review Comments to: | |

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## 0.3 ASSOCIATED DOCUMENTS

| Reference | Doc | Vers-ion | Date | Title | Source |
|---|---|---|---|---|---|
| [AIS] | ET/IFS/001 | | | Application Interface Specification Horizon to e-pay | Fujitsu Services |
| [OSI] | | | | OSI/ISO Reference Model, ISO Standard 7498 | |
| [FTP] | | | | RFC 959 FILE TRANSFER PROTOCOL (FTP) | http://www.faqs.org/rfcs/rfc959.html |
| [OLA] | | | | Operational Level Agreement | |

Unless a specific version is referred to above, reference should be made to the current approved versions of the documents. In particular later versions of some of these documents do exist; however, it is the versions indicated that have been used for the development of this interface.

## 0.4 ABBREVIATIONS & DEFINITIONS

### 0.4.1 Abbreviations

| Abbreviation | Definition |
|---|---|
| [A] | Authorisation Response message returned from e-pay to the Horizon Counter |
| [C] | Confirmation message |
| [C0] | Confirmation message indicating that the Outcome of a Transaction differs from that in the [A] received by the Counter (or that no [A] was received) |
| [R] | Request message |
| AES | Advanced Encryption Standard |
| AIS | Application Interface Specification; standard document type required for each external interface to the Horizon system |
| APACS | Association for Payment Clearing Services |
| ASCII | American Standard Code for Information Interchange |
| DCS | Debit Card System |
| DRS | Data Reconciliation Service |
| DTF | Daily Transaction Feed |
| ETS | Electronic Top-Up Service. |
| ETSM | ETS Management (Server) [same platform as the DCS Management Server] |
| ETU | Electronic Top-Up |
| FAD | Finance Accounts Division, part of Post Office Ltd |
| FS | Field Separator in APACS-format messages (hex 1C) |
| FTMS | File Transfer Management Service; Horizon process that provides configurable file transfer services between Horizon and Post Office Ltd's Clients. Services available include data compression and encryption |
| FTP | File Transfer Protocol |
| ICMP | Internet Control Message Protocol – defined in RFC 792 |
| IIN | Issuer Identification Number |
| IP | Internet Protocol – defined in RFC 791 |
| IPv4 | Internet Protocol version 4 |
| IPSEC | IP Security Protocol |
| MPLS | Multiprotocol Label Switching |
| MSB | Most Significant Bit |
| MSU | Management Support Unit (within Fujitsu Services POA Customer Services) |
| NO | Network Operator, e.g. Orange, Vodafone, O2 |
| OBC | Operational Business Change (procedures for change to Post Office Ltd Reference Data) |

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| | |
|---|---|
| OSI | Open System Interconnection |
| PAN | Primary Account Number. |
| PIN | Product Identification Number (*not Personal identification Number in the context of this document*) |
| RDS | Reference Data System; Post Office Ltd system that provides a Reference Data feed to Horizon and other systems |
| RFC | Request for Comments |
| RID | Registered Identifier: identifies the organisation to which a range of TIDs has been allocated. |
| TCP | Transmission Control Protocol – defined in RFC 793 |
| TID | Terminal Identity |
| TIP | (Post Office Ltd's) Transaction Information Processing system |
| US | Unit Separator (hex 1F) |
| VPN | Virtual Private Network |
| WAN | Wide Area Network |

## 0.4.2 Definitions

The following terms, when capitalised as here, have specific meanings as indicated.

| Term | Definition |
|---|---|
| Authorisation | On-line Authorisation [A] response by MA to on On-line Request. It can have a value of "Approve", "Decline" or "Refer"<br>A response of "Refer" will be treated as a "Decline" |
| Authorisation Agent | Software provided by Fujitsu Services POA used to interface from Horizon to e-pay in real-time |
| Campus | One of two data centres installed by Fujitsu Services POA in Bootle and Wigan. Each can handle the entire Horizon workload |
| Confirmation | Confirmation [C] message sent from the Counter in near time to the Campus stating the outcome of an ETS Transaction. |
| Counter | Counter PC installed in a Post Office Outlet |
| Counter Application | An application resident within the Counter that contains the business logic controlling the dialogue with the Clerk, or other business specific functions on the Counter (such as End of Day processing) |
| Customer | A member of the public transacting, or seeking to transact, business with Post Office Ltd through any of the Services |
| Data Reconciliation Service (DRS) | Service provided by Fujitsu Services POA to Post Office Ltd which matches Transaction flows from Counter and ETSM, and reports on these to Post Office Ltd |
| ETS Agent Server | Hardware platform on which the Authorisation Agent and its controlling processes run |
| ETS Transaction | A Transaction in the Electronic Top-Up Service: either an ETU Transaction or a PIN Transaction |
| ETU Transaction | Electronic Top-Up Transaction using a card supplied by the Customer's Network Operator |
| Horizon | Name that encompasses the totality of the systems provided by Fujitsu Services Post Office Account to support the automation requirements of Post Office Outlets |
| Network Operator | The provide of mobile phone services to a Customer |
| On-line | Where a system attempts to communicate with another system – in this context the Counter seeking immediate authorisation from a Network Operator |
| Operational Level Agreement | A non-contractual agreement between Fujitsu Services and Post Office Ltd on the nature and quality of specific elements of a service (e.g., Interface Agreement for Problem Management (CS/IFS/009)) |
| Outlet | Post Office location with one or more Counter PCs installed as part of the Horizon programme |
| PASV | PASV refers to an alternate mode for establishing File Transfer Protocol (FTP) connections. |

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| | |
|---|---|
| PIN Transaction | A Transaction for the sale of a mobile phone product (e.g. a ring tone) where a PIN is the activation number printed on the customers receipt. Known as a PIN or e-voucher product. |
| Receipt | A printed record of the Transaction at the Outlet |
| Reconciliation | Ensuring the financial integrity of Transactions across service boundaries |
| Reference Data | Configuration data and parameters for use by the rest of the system, within the Horizon Programme |
| Refund | A stand alone transaction separate to the original sale transaction which negates the original sale and where the customer has their money returned to them |
| Request | Authorisation Request message [R] sent On-line from Counter to e-pay |
| Reversal | At the interface to e-pay, it is a Transaction that nullifies the previous Transaction |
| Transaction | A recorded and auditable instance of business activity, involving service provision or Stock movement across organisational or service boundaries |

## 0.5 CHANGES IN THIS VERSION

Added a description of the Agent 'ping' process in section 4.2.

Added Appendix A to define IP addresses across the interface.

Minor typo corrections made.

Sections "4.2 Link Capacity" and "5.3 Link Capacity and File Transfer timing" have been removed.

## 0.6 CHANGES EXPECTED

## 0.7 CONTENTS

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## 0.8 TABLE OF FIGURES



## 0.9 TABLE OF TABLES

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# Chapter 1 - Introduction

## 1.1 PURPOSE

As part of the Horizon service capability, Electronic Top-Up (ETU) functionality is being introduced. ETU is a method of applying credit to pay-as-you-go mobile phone accounts and of selling specific type of 'content' or PIN products.

Post Office Ltd has appointed e-pay as their ETU 'acquirer' interfacing to the appropriate Network Operator.

This document defines the Technical level interfaces between the e-pay domain and the Horizon domain to support the Horizon Electronic Top-Up Service (ETS).

This document provides:

- An overview of those Application level data flows supporting Electronic Top-Up Functionality between components within Horizon and those situated in the e-pay Operational Domain. This overview provides a context for the lower level Technical interfaces.
- A Mapping of Application level data flows onto Technical interfaces
- A specification of the Technical Interfaces between Horizon and e-pay.

## 1.2 SCOPE

### 1.2.1 Interfaces

An interface exists whenever information is exchanged between two computer systems. For purposes of description, this interface can be considered to exist at three levels:

- The Application level, concerned with the application data passed across the interface.
- The Technical level, concerned with the mechanisms by which the data is passed across the interface.
- The operational level, covering manual procedures for maintaining the interface, for example resolution of network problems, access by to site for maintenance and key change.

This document covers the specification of the technical mechanisms by which information is passed between Horizon and the MA for live operation only. Instances of the Technical Interface for Application Test scenarios are excluded from this document.

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This document does not cover the description of the information in terms of record/field structure and the meaning ascribed to information by either party. This aspect is addressed in the Application Interface Specification [AIS].

Operational aspects of the Interface are documented in [OLA].

This document is concerned only with the specification of information that is both computer-generated and computer-consumed.

### 1.2.2 Components and Interface description

The Architectural description for the interface is documented in Chapters 3 through 5. This description contains all components that are concerned directly with the operation of the Interface being described in this document. The approach taken to determine if a component is directly concerned with the interface operation is based on the following:

- The Transport protocol used across the interface is TCP
- The Components directly concerned with the Interface are taken to be both those at each end of the TCP connection and all other components through which the Level 3 datagrams 'owned' by the connection may flow. These may be Servers, Network links, Network devices such as Routers and Network Services.

In order to structure the documentation of components, the OSI [OSI]Reference model is used.

### 1.2.3 Architecture overview

An overview of the architecture of the Horizon Electronic Top-Up system is given in

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Figure 1.

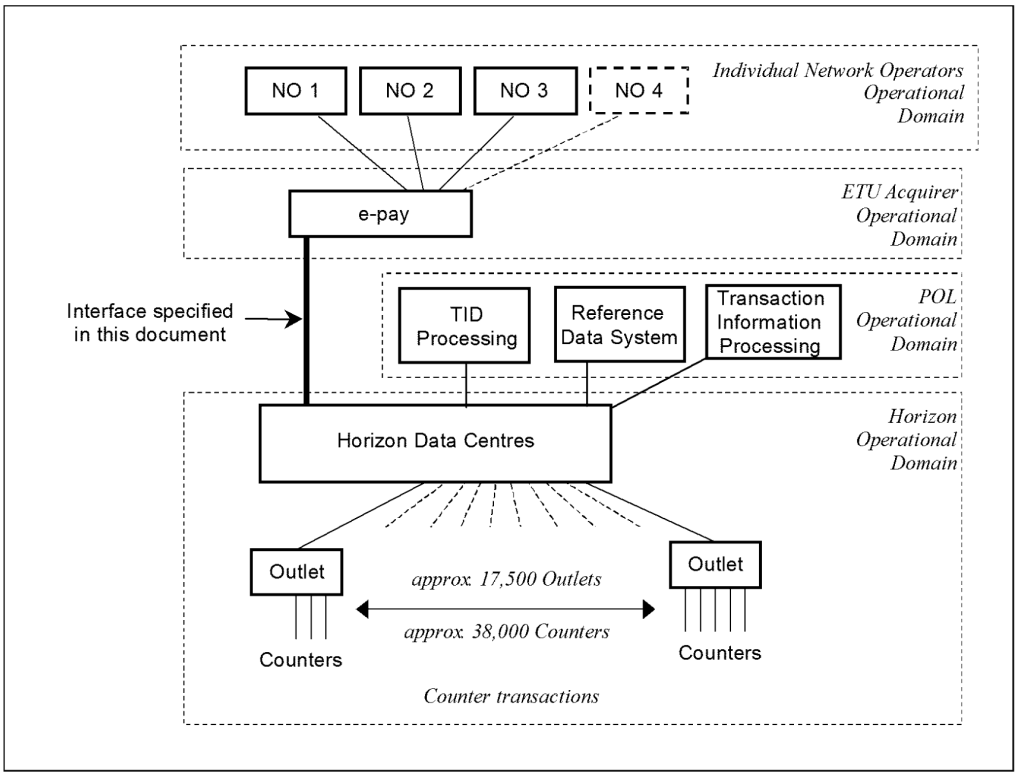


**Figure 1 – ETS Architecture**

## 1.3 STRUCTURE

This document is composed of the following chapters:

- Chapter 2 provides a high level summary of the Application Interfaces in order to provide a context for the underlying technical interfaces. Additionally the Application Interfaces are mapped to Technical Interfaces.
- Chapter 3 contains a description of the physical and network level interconnection arrangements between Horizon and e-pay.
- Chapter 4 contains a detailed description of the Transaction Technical Interface.
- Chapter 5 contains a detailed description of the DTF Batch Technical Interface.

## 1.4 READERSHIP

This document is intended for Technical Architects, application developers concerned with development of the ETS capability between Horizon and e-pay.

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## 1.5 RELATED DOCUMENTS

See section 0.3 for a full list of referenced documents.

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# Chapter 2 - Application Interfaces

## 2.1 INTERFACE COMPONENTS

The diagram following illustrates the Application data flows (message and file based) across the e-pay – Horizon interface.
These higher-level Application Interfaces rely on the lower-level Technical Interfaces and provide a context for definition and description of these Technical Interfaces.

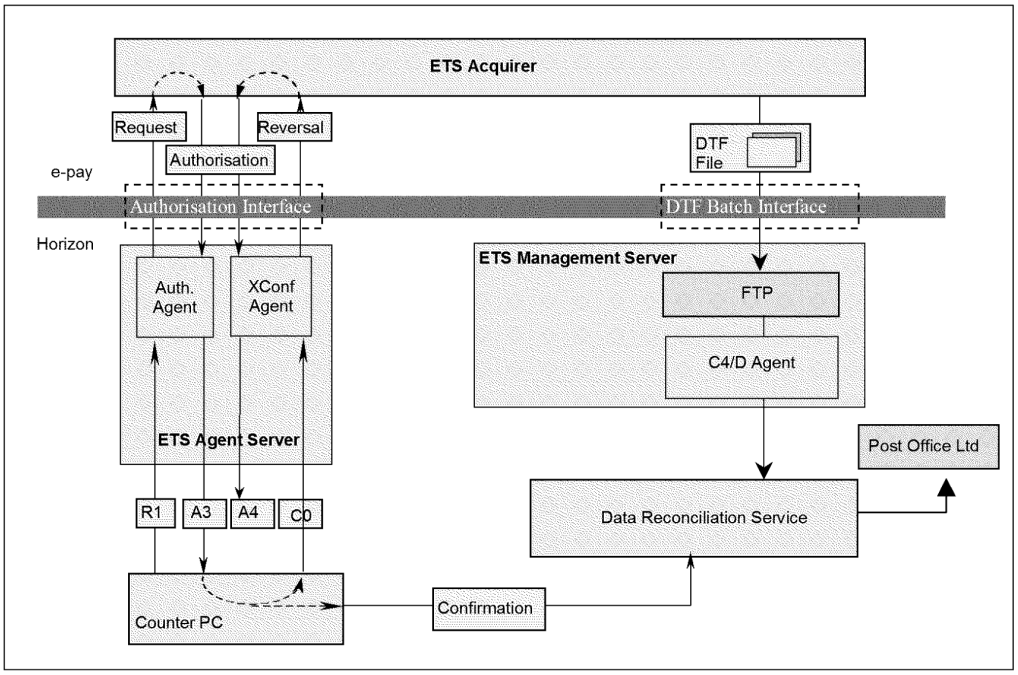


**Figure 2 Horizon – e-pay message flows**

## 2.2 TECHNICAL INTERFACES

To support the Application level data flows, 2 distinct Technical Level interfaces will be used. The following table summarises these Technical Interfaces.

| Technical level Interface name | Technology | Associated Application Interface name | Application Interface Usage |
|---|---|---|---|

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| | | | |
|---|---|---|---|
| Transactional | TCP/IP | Authorisation Interface | To support the ETU service at the counter, e-pay provide a real-time authorisation interface which supports the following message types:<br>▪ Sale<br>▪ Refund<br>▪ Reversal |
| Confirmation Batch | FTP | DTF Batch Interface | Once a day, e-pay generates a single Daily Transaction Feed (DTF) file that is retrieved by Horizon systems. The DTF records the outcome of each transaction from e-pay's perspective. It contains reconciliation information to be used by the Horizon Data Reconciliation Service. The file is generated and transferred every day of the year, weekends and bank holidays included.<br>The DTF contains records for the transactions as specified in [AIS], with Sales and Refunds being treated as separate Transactions. |

Table 1 Technical Interfaces

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# Chapter 3 - Interface Architecture

## 3.1 GENERAL

This section provides an overview of the Physical and Network interconnection arrangements between Horizon and e-pay. The following diagram identifies the key components.

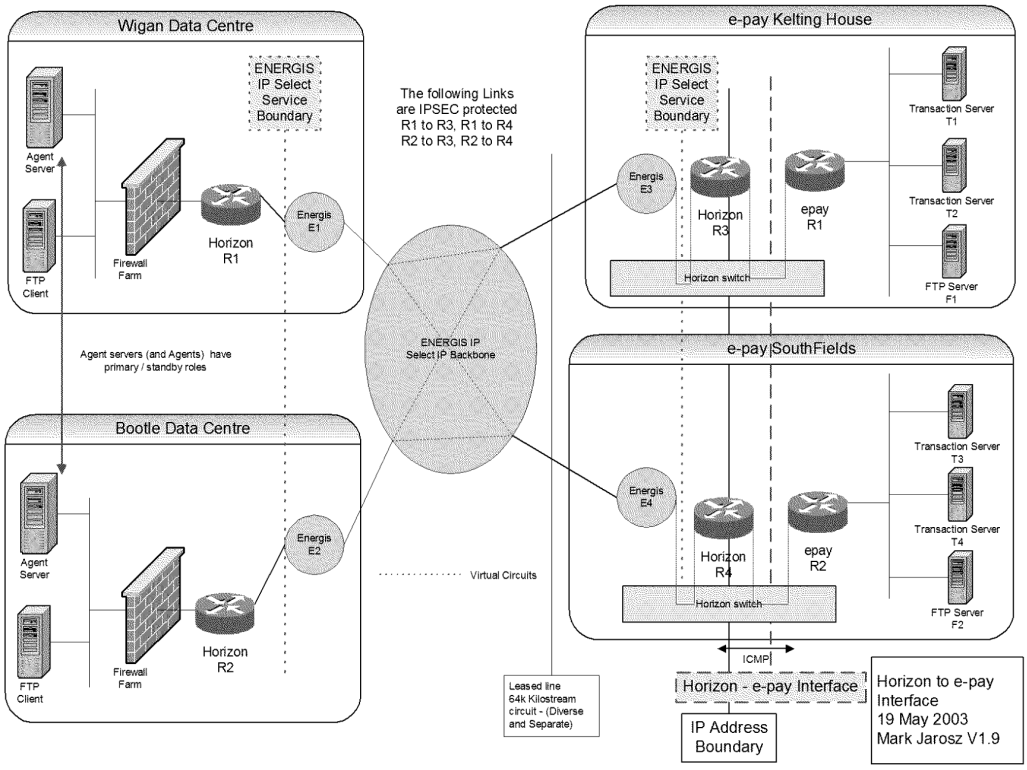


**Figure 3 Technical Interface Components**

## 3.2 CHARACTERISTICS OF INTERFACE LAYER 1 TO LAYER 3

This section provides a summary of the main characteristics of the Technical Interface up to and including layer 3. Characteristics from layer 4 up to and including layer 6 are described in the sections documenting the individual Technical Interfaces.

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### 3.2.1 Layers 1 and 2 – Physical and Link

Note that Fujitsu Services supply all the equipment to the left of the "Horizon – e-pay Interface" (as well as the switch) and will require rack provision etc. from e-pay as covered in [OLA].

| OSI Level | Property | Overview |
|---|---|---|
| 1 - 3 | Network Service | The Energis IP Select service will be used to provide an IPv4 Layer 3 backbone service. This provides full connectivity between Horizon and e-pay locations.<br>It should be noted that the service interface for the IP Select Service is a Router and this is shown in the above diagram.<br>Fujitsu Services will procure the IP Select service from Energis. |
| 1 | WAN Physical circuits | At each e-pay location there will be one 64k Kilo stream circuit terminating on an Energis Router. These circuits are provided as part of the Energis IP Select service.<br>At each Horizon location existing circuits will be used. Separation from other Horizon traffic will be achieved by using a different MPLS VPN. |
| 1/2 | Ethernet Interface | The actual Interface between Horizon and e-pay is deemed to exist on the Ethernet connection between the Horizon Router's at e-pay locations and the e-pay Routers. Horizon will provide a switch at each location and this will be used to connect the Horizon and e-pay Routers.<br>e-pay will provide one Router at each e-pay location as shown in Figure 3 |

**Table 2 Physical Interface characteristics**

### 3.2.2 Layer 3 – Network

This section is concerned with the interface description at layer 3 that is IP. For purposes of description this section is split into 4 subsections; -

- Control plane, concerned with IP Routing and ICMP
- Data plane, concerned with actual flow of IP datagrams and any encapsulation
- Virtual IP Addressing

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- IP Address spaces, concerned with enumeration of IP address space and translation schemes

| SubSection | Property | Overview |
|---|---|---|
| Control Plane | IP Routing | No IP Routing protocols are used across the interface.<br>It should be noted there is no direct Network path from Kelting to SouthFields as far as this interface is concerned.<br>Note that Horizon Agents will handle fail over between e-pay locations. Please refer to section 4.1.3 for an overview of how Agents handle fail over. |
| Control Plane | Network Management Traffic | Horizon Network Management station at Wigan issues ICMP Echo Request to Horizon facing Interface of Epay1 and Epay2 Routers. These Routers reply with ICMP Echo Response. Similarly for Network Management station at Bootle. |
| Data Plane | Protocol | All Level 3 traffic between Horizon and e-pay will IPv4. |
| Data Plane | Encapsulation | IPSEC encryption (AES) will be employed for all traffic between Horizon and e-pay locations over the Wide Area Network links as show in the above diagram.<br>The encryption will be applied between the Horizon Routers. |
| Virtual Addressing | | The e-pay Routers will create virtual IP addresses for the e-pay servers. Please refer to section 4.1.2 for a description of this scheme.<br>Note that a Virtual Address consists of the pair (Virtual IP address, port number). |

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| | | |
|---|---|---|
| IP Address space | NAT Addresses | The IP address Boundary is shown in Figure 3. The Horizon Routers R1 and R2 will perform Network Address Translation to implement this IP address boundary.<br>e-pay will need to allocate the following components IP addresses from their space;<br>4 Agent Servers at Wigan<br>4 Agent Servers at Bootle<br>1 ftp client at Wigan<br>1 ftp client at Bootle<br>1 Interface address for the Horizon Router R3<br>1 Interface address for the Hsorizon Router R4<br>1 Network Management Station at Wigan<br>(2 IP addresses needed – 1 per interface)<br>1 Network Management Station at Bootle (2 IP addresses needed – 1 per interface)<br>The above IP addresses will be listed a future version of this document. |

**Table 3 Interface Layer 3 characteristics**

### 3.2.3 Scalability

Upgrading the 64k links will increase the capacity of the interface. For example scaling points are 128k, 256k. It may be necessary for Energis and Fujitsu to change the models of Routers they deploy to support such a link speed upgrade.

### 3.2.4 Network management

The Horizon Routers and Wide area network links will be managed by HP Openview as per the existing Horizon Network equipment.

Additionally reachability of the e-pay Routers (show in Figure 3) will be monitored using HP Openview.

### 3.2.5 Security

Once the Interface is operational, all application data exchanged between the Routers R1 and R2 located at the Horizon Data Centres and Routers R3 and R4 located at the e-pay Data centres will be protected by encryption. Specifically IPSEC tunnels will be used with the following characteristics:

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- Payload encrypted using the AES Algorithm
- Authentication header present
- Session key lifetime (target 8 hours and no more than 24 hours)

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# Chapter 4 - Transactional Interface

## 4.1 LEVEL 4 TRANSPORT PROTOCOL LAYER CHARACTERISTICS

The Transport protocol used across the Interface is TCP/IP and follows the Client Server model with Horizon Agents acting as client and e-pay servers acting as servers. This section summarises characteristics of the Transport layer protocol used across the interface.

### 4.1.1 Message delimitation

TCP provides a byte stream interface to the application. Breaking up this byte stream into messages is the responsibility of the application and defined in the [AIS].

### 4.1.2 Endpoint Addressing

e-pay will perform network Address translation in their Routers (Epay1 and Epay2) to provide the following characteristics:

- To avoid the Interface Specification containing Computer System specific IP addresses.
- To provide for scaling the number of transaction servers transparently to Horizon.

The following Virtual Addresses are defined.

Site: Kelting House, 8 Addresses named $VT_{1A}$ through $VT_{8A}$

Site: SouthFields, 8 Addresses named $VT_{1B}$ through $VT_{8B}$

Note that a Virtual Address consists of the pair (Virtual IP address, port number).

### 4.1.3 Endpoint Mapping

The Collection of Horizon Agents is partitioned into 4 clusters. Each such cluster handles E-top up transactions for approximately 25% of the Post Office Outlets.

The Following table defines how Agent processes within each Cluster will determine the collection of Virtual addresses (IP address and port number) of the e-pay Transaction server.

| Cluster | Virtual Address Collection |
|---|---|
| 1 | $VT_{1A}$ . $VT_{2A,}$ $VT_{1B}$ . $VT_{2B}$ |
| 2 | $VT_{3A}$ .$VT_{4A,}$ $VT_{3B}$ . $VT_{4B}$ |
| 3 | $VT_{5A}$ . $VT_{6A,}$ $VT_{5B}$ . $VT_{6B}$ |

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| | |
|---|---|
| 4 | $VT_{7A}$ . $VT_{8A,}$ $VT_{7B}$ . $VT_{8B}$ |

**Table 4 Virtual Addressing**

Each Horizon Agent is associated with one Cluster. The Agent is partitioned into multiple work units or threads. Each such thread will be configured with 2 Virtual Addresses out of the possible collection for the Cluster subject to the criteria that each such Virtual address will be mapped to different physical data centre locations. So for example a valid pair would be $\{VT_{1A}, VT_{2B}\}$. As some Horizon Agents will have a natural bias towards running at Bootle, the Virtual Addresses used by Bootle Agents will predominate over those used by Wigan Agents.

The algorithm used by an Agent thread to select the Virtual IP address from the pair to use is not specified in this document. This Algorithm will ensure that in the event of one Virtual address not functioning (in the sense of establishing TCP connections) then the other Virtual address in the pair will be used.

### 4.1.4 Connection / session management

The following list defines the key characteristics of Session management across the Interface.

| Property | Session properties |
|---|---|
| Connection Initiation | Horizon Agent initiates a TCP connection to e-pay Transaction server. Endpoint is determined as described in Endpoint mapping section |
| Connection maintenance | Connection maintained long term (all day). So Idle condition does not explicitly terminate connection. |
| Connection Termination | Both the Horizon Agents and e-pay Servers can terminate Network connections. |
| Maximum Connections | The maximum number of TCP connections per Cluster is specified at 24. This results in an overall maximum of 96 TCP connections. |
| Connection Reset | An Application end point will issue a TCP reset if it cannot extract messages from the TCP byte stream due to a delineation problem. Either end can initiate a connection reset. |

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| | |
|---|---|
| Use of TCP Keep Alives | Both Horizon and e-pay will initiate and respond to TCP Keep Alives to maintain connections.<br><br>Note the purpose of TCP Keep Alive's is to detect disappearing endpoints and inform applications that a connection is broken. For example, in a client server environment, if a client fails then a listening server will not necessarily detect this. Over a period of time 100's of such stale connections may result in the server running out of resource and having to be reloaded. TCP Keep Alive's are only sent when the connection has been idle for a defined time interval and result in very little overhead (Network / Host CPU).<br><br>The Horizon Keep Alive interval is 10 seconds. |
| Application mapping of Requests | a) Multiple Requests are interleaved on single TCP Connection<br><br>b) Authorisation returned on same socket as Request<br><br>c) Reversal can be sent on any TCP Connection |

**Table 5 Connection Properties**

### 4.1.5 Level 6 Presentation

ASCII characters are used across this interface.

The code set across the interface must have a single byte Character encoding (i.e. 8 bits).

The 7-bit ASCII code set is a proper subset of the code set used across the interface. Additionally the encoding of ASCII characters is achieved by setting the most significant bit (MSB) to zero. Specifically no parity bit is used.

Note the Horizon Agent platforms use Code page 850 and this meets the above requirements. Within this Code page the ASCII characters are encoded with the most significant bit (MSB) zero in positions 0x20-0x7e.

Specifically this means that if character has ASCII 7 bit encoding xxxxxxx then in code page 850 it has encoding 0xxxxxxx.

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## 4.2 RESILIENCE MECHANISMS

This section provides a summary of the resilience and site disaster mechanism used across the interface.

| Property | Overview |
|---|---|
| Resilience to failure(s) of e-pay servers / e-pay data centre | The Horizon Agent initiates and maintains TCP connections to e-pay servers at both e-pay data centres. It is sufficient (*) for the Agent to set up a functioning TCP connection with just one such server. |
| Resilience to failure(s) of Horizon Agent / Horizon data centre / Network connection | Each Horizon Agent exists in a Active / Standby configuration. In the event of the Active either failing or being unable to connect to any e-pay server then the Standby will take over as Active.<br>The Standby Agent runs at a different Data Centre from the Active Agent. |
| Application level 'ping'. | The Horizon agent uses a ping process to detect whether it can reach an e-pay server. This consists of a TCP connect, read with timeout and immediate disconnect. |

(*) In the sense that transaction flow can take place across the interface

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# Chapter 5 - DTF Batch Interface

## 5.1 LEVEL 4 TRANSPORT PROTOCOL LAYER CHARACTERISTICS

The Transport protocol used across the Interface is TCP/IP and follows the Client Server model with Horizon acting as the FTP client and e-pay providing the FTP server.

### 5.1.1 Endpoint Addressing

e-pay will perform network Address translation in their Routers (Epay1 and Epay2).

The following Virtual Addresses are defined.

Site: Kelting House, 1 Addresses - $VF_{1A}$

Site: SouthFields, 1 Addresses $VF_{1B}$

Note that a Virtual Address consists of the pair (Virtual IP address, port number).

### 5.1.2 Connection / session management

The following list defined the key characteristics of Session management across the Interface.

| Property | Session properties |
|---|---|
| Session Initiation | Horizon Agent initiates an FTP session (*) to e-pay Transaction server. The FTP client will try both Virtual IP addresses in the event that a connection attempt fails.<br>(*) This maps to a TCP connection initiated from Horizon and a subsequent TCP connection initiated from e-pay. |
| Session Termination | FTP Session terminates once transfer complete. |
| Maximum Sessions | A maximum of 1 active FTP Session is specified. |
| Use of TCP Keep Alives | Both Horizon and e-pay will initiate and respond to TCP keep alives to maintain connections.<br>The Horizon Keep Alive interval is 10 seconds. |

**Table 6 Session Properties**

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### 5.1.3 Level 6 Presentation

This is the same as for Transactional interface (see 4.1.5).

## 5.2 FILE TRANSFER CHARACTERISTICS

Horizon will pull 1 file from the e-pay FTP servers on a daily basis. There will be one file produced by e-pay per calendar day.

| Property | Overview |
|---|---|
| File existence | For a given calendar day, the name of the file to be pulled can be derived in an algorithmic manner. The visibility of this file on either e-pay FTP server means that the file is in a suitable state to be downloaded by Horizon**.** Please refer to [AIS] for details of the file name.<br>The file is generated and transferred every day of the year, weekends and bank holidays included.<br>If no transactions occur on any given day, e-pay will generate an 'empty' file at the end of day that contains only a header and footer record. |
| Retention / Garbage collection | Each file will be retained for n (TBD) days past its calendar date.<br>e-pay will perform garbage collection of the files. |
| File Integrity | No external (to the file) measures will be employed. Therefore it is necessary for an application that relies on the contents of the file to perform any integrity checks based on file contents. |
| Checkpoint / Restart | These facilities will not be used |
| FTP Mode | The PASV command will not be used.<br>Please refer to [FTP] for an overview of the PASV command. |

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## 5.3 RESILIENCE MECHANISMS

This section provides a summary of the resilience and site disaster mechanisms used across the interface.

| Property | Overview |
|---|---|
| Resilience to failure(s) of e-ftp pay servers / e-pay data centre | The Horizon ftp client is configured with the address of two e-pay ftp servers, one at each e-pay data centre. In the event that the ftp client cannot establish an ftp session with its currently chosen ftp server it will attempt to establish a session with the other server. |
| Resilience to failure(s) of Horizon FTP Client platform / Horizon data centre / Network connection | The Horizon ftp client can be run at either Horizon data Centre. |

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# Appendix A IP Addressing across the Interface

## A.1 OVERVIEW

This section provides a summary of the IP address peering used across the interface. Note that all IP addresses stated are as seen from the e-pay side of the Horizon – e-pay Interface.

The Horizon port numbers have no been shown since these are dynamic, specifically in the range 1024 - 5000.

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