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Automatic Fire Alarm Service Provider Computer Interface Specification

For Fire and Emergency New Zealand

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Document history

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1.4	Updated	15 December 2008	XAP content removed to new document. Made alarm summary rules advisory rather than mandatory.
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1.6	Updated	July 2017	References to NZFS removed and replaced with Fire and Emergency New Zealand (FENZ)
1.7	Updated	February 2019	Minor amendments to align specification to FENZ definitions and Agreement terms and conditions

Important note

No interface software should be produced without the inclusion of FENZ approved Application Programming Interface (API).

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List of terms and abbreviations

Term	Definition
Ack	Acknowledgement
AFAS	Automatic Fire Alarm System that includes the collection of equipment, software, transmission links, standards, specifications, protocols and processes necessary to transport messages between Fire Alarms and the Communications Centres
AFASP	Automatic Fire Alarm Service Provider [Contractor], providing Fire Alarm monitoring and transmission services as specified in the AFAS Code of Practice
AFASPCIS	Automatic Fire Alarm Service Provider Computer Interface Specification. The protocol specification, extended alarm protocol specification (XAP) and associated application programming interface specification for the computer interface between the FENZ Interconnection Device and the AFASP Domain System, as available on the FENZ public internet page, as amended from time to time
AFASP Domain System	A system under control of the Contractor that exchanges messages with the FENZ STSMHS domain, including the AFASP computer/server application, that conforms to the AFASP Computer Interface Specification
Agreement	Agreement for Automatic Fire Alarm Management, Monitoring and Transmission Services between the AFASP and FENZ
API	Application programming interface
Certified Fire Alarm	A Fire Alarm that has a Certificate of Compliance issued by a body accredited for Fire Alarm installation certification or a letter from a FENZ Area Manager authorising the connection of the Fire Alarm to the AFAS
Code of Practice	Code of Practice for Automatic Fire Alarm System document available on the FENZ public internet page, as amended from time to time
Contractor Interface	The AFASP computer/server application that conforms to the Computer Interface Specification
DB	Database

Term	Definition
FA	Fire alarm. An apparatus that performs specified fire-related functions in response to the operation of a sprinkler, detector, manual call point or other input, as defined in the relevant NZ standard, as amended from time to time, that is connected to the AFAS by the Contractor fire alarm
FENZ	means Fire and Emergency New Zealand or its appointed agent, as described in the Fire and Emergency New Zealand Act 2017: 1) FENZ is a Crown entity for the purposes of section 7 of the Crown Entities Act 2004. 2) The Crown Entities Act 2004 applies to FENZ except to the extent that this Act expressly provides otherwise. FENZ is the same body as the New Zealand Fire Service Commission constituted under section 4 of the Fire Service Act 1975.
FENZ STSMHS Domain	means the STSMHS servers that route messages received from the Contractor and Fire Alarms to FENZ
FENZ STSMHS Domain Service Provider (STSMHSSP)	means the entity that supports and manages the STSMHS under a contract and service level agreement with FENZ
Fire Alarm	means an apparatus that performs specified fire related functions in response to the operation of a sprinkler, detector, manual call point or other input, as defined in the relevant Standards New Zealand standard, as amended from time to time, that is connected to the AFAS by the Contractor
IP	Internet protocol
ISO	International Standards Organisation
LAN	Local area network
LLA	Longitude, latitude and altitude
MHS	Message handling server
NZFS	New Zealand Fire Service Commission (all references in the document to NZFS are replaced with FENZ)
FENZ STSMHS Domain Contractor	The entity that supports and manages the STSMHS under a contract and service level agreement with FENZ
NZS	New Zealand standard
OSI	Open systems interconnection
Protected Premises (or Relevant Building)	means a building or part of a building that is: (a) fitted with one or more Fire Alarms; and (b) physically separate from other buildings at a given location (provided that, in determining whether or not a building is

Term	Definition
	physically separate, common walls, walk ways and service tunnels must be ignored);
PtID	Point identification
RAM	Remote access software
Relevant Building	means a building or part of a building used for 1 or more of the following purposes: a) the gathering together, for any purpose, of 100 or more persons: b) providing employment facilities for 10 or more persons: c) providing accommodation for 6 or more persons (other than in 3 or fewer household units): d) a place where hazardous substances are present in quantities exceeding the prescribed minimum amounts, whatever the purpose for which the building is used: e) providing an early childhood education and care centre (other than in a household unit): f) providing nursing, medical, or geriatric care (other than in a household unit): g) providing specialised care for persons with disabilities (other than in a household unit): h) providing accommodation for persons under lawful detention (not being persons serving a sentence of home detention or community detention, or serving a sentence of imprisonment on home detention, or on parole subject to residential restrictions imposed under section 15 of the Parole Act 2002): i) any other prescribed purpose.
Service Agent	A person engaged by the owner of protected premises or relevant building to maintain and repair the protected premises fire alarm
SMART	means the FENZ Spatial Mapping And Reporting Tools database and applications environment associated with the Station Management System, which manages data and information supporting FENZ AFAS Fire Alarm System Commissioning process as described in the AFAS Code of Practice
STS	Signal Transport System. Hardware, software, transmission links, and processes to transport messages between fire alarms and the STSMHS
STSMHS	Signal Transport System Message Handling System. The collection of servers, equipment and transmission links between the AFASP Domain System and the Communications Centres alarm interface servers (which transport messages from the FENZ STSMHS domain to the Communications Centres alarm terminals), as contracted to and managed by the STSMHSSP

Term	Definition
STSMHSSP	Signal Transport System Message Handling System Service Provider
TCP/IP	Transmission control protocol
UDP	User datagram protocol
VPN	Virtual private network
WAN	Wide-area network
XAP	Extended alarm protocol
XML	Extensible markup language. Markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable
XML schema	Describes the structure of an XML document
ZID	Zone identification

1. Overview of Computer Interface Specification

1.1 Introduction

This document describes the protocol specification for the computer interface between the Fire and Emergency New Zealand (FENZ) Automatic Fire Alarm Communications server operated by FENZ and the Automatic Fire Alarm Service Providers (AFASPs) wide area alarm network. Each AFASP provide a communications network interface to FENZ that meets the specifications as detailed in this document together with any API and alarm data schema software code associated with it.

This document defines the basic protocol; it does not define the Extended Alarm Protocol (XAP). The XAP extensions to the basic protocol are defined in the document: Automatic Fire Alarm Service Provider Computer Interface Specification for Extended Alarm Protocol (XAP) Devices (PDF, 435KB) which can be found on the Automatic Fire Alarm Connection section of the FENZ website:

https://fireandemergency.nz/business-and-landlords/automatic-fire-alarm-connection/

1.2 Strategy

For reliability and performance tolerance the computer interface between FENZ and the AFASP must be delivered on at least two communications links where the signals are carried via independent telecommunications switches or processors.

1.3 General interface standard

The communications interface provided must be in accordance with the International Standards Organisation's (ISO) seven-layer model for Open Systems Interconnection (OSI). Figure 1 details the required structure:

No.	Layer	FENZ Standard	Function
7	Application	As per section 2, Application Layer Specification	High-level APIs, including resource sharing, remote file access
6	Presentation	FENZ AFASP API XML	Translation of data between a networking service and an application; including character encoding, data compression and encryption/decryption
5	Session	FENZ AFASP API	Managing communication sessions, i.e. continuous exchange of information in the form of multiple back-and-forth transmissions between two nodes

4	Transport	UDP	Reliable transmission of data segments between points on a network, including segmentation, acknowledgement and multiplexing
3	Network	IP	Structuring and managing a multi-node network, including addressing, routing and traffic control
2	Data Link	Includes PPP, FDDI, ATM, IEEE 802.5/ 802.2, IEEE 802.3/802.2, HDLC, Frame Relay	Reliable transmission of data frames between two nodes connected by a physical layer
1	Physical	Includes Ethernet, FDDI, B8ZS, V.35, V.24, RJ45	Transmission and reception of raw bit streams over a physical medium

Figure 1. Interface layered structure

1.3.1 Physical link layers

FENZ approved IP virtual private network (VPN) connection.

1.3.2 Network transport layers

TCP/IP is used for the network transport layer.

A private direct lease circuit shall be used by the AFASP to connect to the STSMHS. An interconnect over public accessible networks may be used provided that a VPN connection between the routers at the STSMHS and AFASP is used to ensure there is no unauthorised access into or monitoring of the network.

At both the STSMHS and AFASP end-points, the direct lease circuit or VPN must accept connectionless UDP broadcasts on a single fixed UDP port, and transmit those broadcasts to servers at the remote LAN. It is permissible to convert broadcasts to messages that are forwarded to specific server IP addresses, but it is preferable to maintain connectionless (and thus address-less) broadcasting, as this ensures changes in IP addresses or number of servers at either end will not impact router or VPN configuration.

Each AFASP is assigned a unique UDP port number for data transmission. Messages containing that UDP port number are transported across the VPN link. STSMHS operations staff ensure this port number is registered at the STSMHS and in the AFASP API configuration that is supplied to the AFASP. It is the responsibility of the AFASP to ensure that this UDP port number is configured in the VPN or router. No other network protocols or TCP/IP Ports are allowed across the VPN connection.

FENZ requires that all AFASPs keep this IP network physically and logically separate from their other internal networks. The only

	linked device between this IP network and the AFASP's internal networks is the AFASP's dedicated communications servers.
1.3.3 Session presentation layers	FENZ AFASP API with XML data encoding.
1.3.4 Application layer	The application data is communicated using three distinct and separately implemented protocols. Details on each of these are specified in the FENZ 'STSMHS - AFASP Application Programming Interface Design Specification', available on request from FENZ. 1. Log data protocol. For sending fire alarm and AFASP event transaction data to FENZ. 2. System data protocol. For sending AFASP fire alarm database information to FENZ. 3. Control data protocol. For implementing commands from FENZ to an AFASP fire alarm database.
1.4 Alarm data standard	For the purposes of data transmissions between FENZ STSMHS Domain and the AFASP alarm network, the XML container will house structured alarm data text. Because the target structure is a database, alarm data text is formulated into a format called the "Alarm Data Standard" which is designed as a database object for processing by the communication servers used by the AFASP and FENZ. Details regarding the alarm data standard specification are in section 6.
1.5 Data flow	Data transmissions are via the FENZ AFASPAPI library. For detailed descriptions of this library see the document 'STSMHS – AFASP Application Programming Interface Design Specification'. All message content is encoded as XML, please see the XML Schema definition file. Both the design specification and the schema definition are available on request from FENZ.
1.5.1 Priority processing	All three data transmission protocols contain data with varying priority so the AFASP server must process those messages with the highest priority first.
1.5.2 Interconnection integrity between AFASP & FENZ	The STSMHS server monitors the connection to an AFASP by issuing regular heartbeats, to which the AFASP responds with an acknowledgement. If the STSMHS fails to see an acknowledgement within a timeout then an operator alert is raised at the STSMHS. If the AFASP fails to receive a heartbeat within a timeout period, then the AFASP server can raise an alert to the AFASP operator.
1.5.3 Inter-connection integrity between fire	Following the interconnection and testing of the interconnection by passing fire alarms signals between the AFASP Domain System and the FENZ STSMHS Domain, FENZ will monitor the connection integrity between the fire alarm and the AFASP server.

alarm & AFASP	The FENZ server achieves this by making a system data request to the AFASP specifying a particular fire alarm ID along with a value “Poll” in the Data Transaction Type field. After this particular request the AFASP must respond with a value “interval” in the data transaction type field as well as the actual time and date of the last signal received by the AFASP from the fire alarm.
1.5.4 Error handling	Communication error handling is taken care of in other layers separate from the alarm data application layer. “Invalid” entries within the application layer data fields detected by the AFASP server or the FENZ server are given a data transaction type “Error” and the text value “?” placed in the field identified as faulty followed by all or part of the repeated invalid data. For example if the Site FA Status Summary is sent as “ping” and this entry does not match the assigned table in section 7.9 a response with the data transaction type (Error) would occur along the entry “?ping” in the Site FA Status Summary field.
1.5.5 Encryption	Encryption – when introduced – will be taken care of in other layers separately from the alarm data application layer.
1.5.6 Timeout period	Any timeout period must not exceed 60 seconds. Timeout periods will be determined later separately for each data type. That detail will be in the API.
1.6 AFASP to FENZ communications redundancy overview	To ensure there is no single point of failure in the FENZ/AFASP communication system, at least two hosts are required at each AFASP, with at least two connections from each host to two FENZ servers. The communications paths must connect over at least two physically and logical separate WAN networks. The following diagram (Fig. 2) is one possible implementation architecture and is used for illustrating how the protocols are implemented over diverse communications links. Considerations such as geographic separation will determine the actual architecture implemented at each AFASP.

Figure 2. Communication link redundancy overview

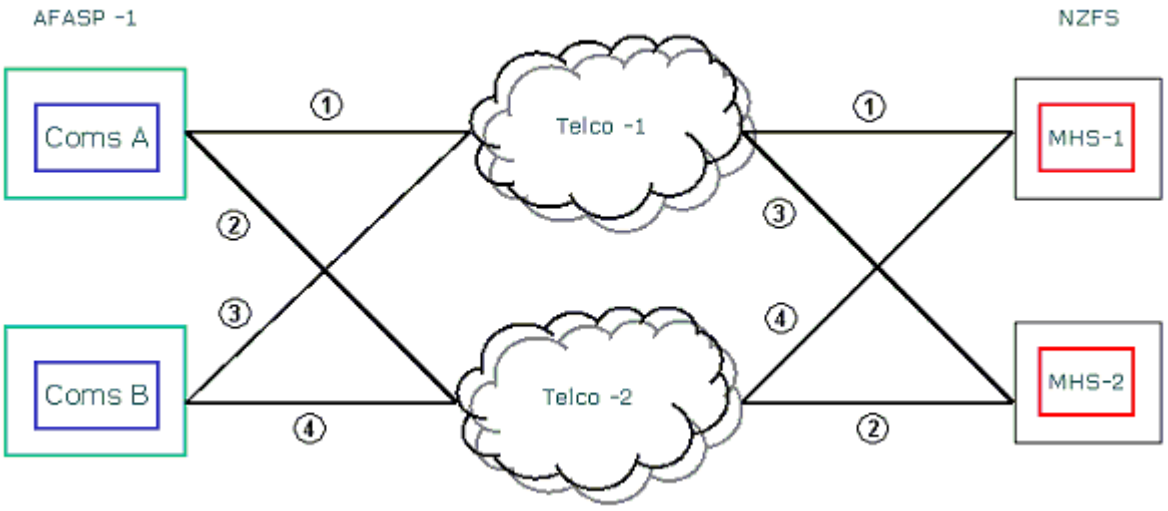

Figure 2 represents all the communication paths required for a single application protocol implementation. Each of the AFASP communication servers and FENZ STSMHS domain servers is connected via two links to the other servers. Each link is an FENZ AFASP API protocol link. With all three protocols running, there are a total of 12 (3 * 4) paths between two AFASP systems and two FENZ STSMHS domain servers.

The AFASP may add or replace servers as required for maintenance reasons; they will be assigned a range of FENZ STSMHS Domain IDs for their use. The use of a UDP broadcast architecture ensures that, provided the AFASP assigns the new or changed host an IP address within their agreed IP sub-net, the new or changed server will continue to function as expected.

1.7 Automatic Fire Alarm network overview

Figure 3 details the high level architecture of the Automatic Fire Alarm System and its major components. Each AFASP may have varying internal network infrastructures however each must contain at least two working communications servers which are both electrically and logically isolated from their internal networks.

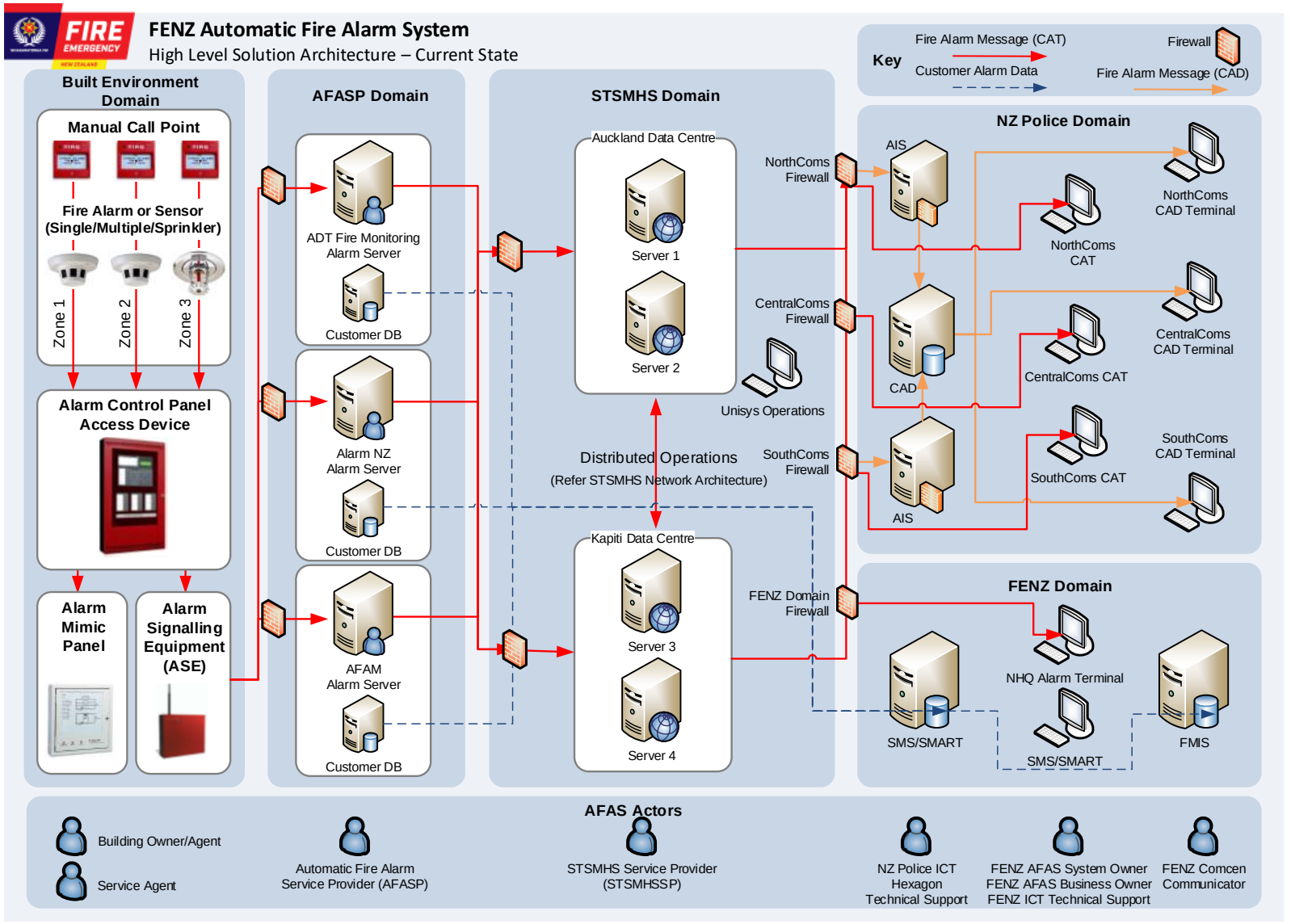

Figure 3. High level solution architecture of the Automatic Fire Alarm System (AFAS)

1.8 Time & date synchronisation	For time and date synchronisation use the following server(s): Measurement Standards Laboratory of New Zealand: http://msl.irl.cri.nz/services/time-and-frequency/ntp-server-information

2 Alarm data application layer

2.1 General

The alarm data application layer is where the key information transfer takes place between the communications servers operated by the AFASPs and the communications server operated by FENZ. The alarm data structure model as used in this document is based on the premise that there are only three protocols dealing with alarm data transactions.

This section gives an overview of the following alarm data structure types:

- Log data (FIRE ALARM events derived from state changes in AFASP fire systems network)
- System data (FIRE ALARM data from AFASP fire systems database)
- Control data (data commands from the FENZ STSMHS domain server).

The alarm data standard gives alarm software programmers and/or hardware developers an inclusive data structure/methodology for integration of numerous alarm systems into a single logical network.

The early dissemination and grouping of data types lead to more efficient process threads and removes all doubt as to the purpose of a transaction. For instance, log data is “historical” and should not be allowed to be re-edited, however over a long period of time it’s eventually deleted. While system data is “current” and must always be available for editing under hierarchical forms of ownership/operator rank and be retained long term. Control data on the other hand is “momentary” or temporary data information, which is often deleted almost immediately after use. The alarm data standard allows a greater degree of flexibility, process accuracy and design opportunities for alarm wide area network system integrators.

2.2 Alarm data structure overview

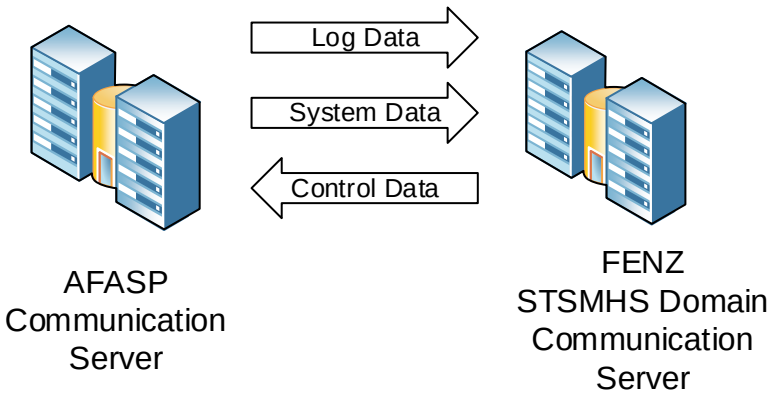

Figure 4. Overview of alarm data types & data flow

2.3

2.4 Log data overview

Log data sent from the AFASP server to the FENZ server that contains all the fire alarm event information necessary for FENZ to take appropriate response actions. This fire alarm event information could include AFASP database settings and

subsequent log data events depicting additional activity at the customer's site. After the FENZ communications server reads the log data information sent by the AFASP, a response from the FENZ server is generated for the AFASP as an "acknowledgment". Refer to figure 5 or section 3 for a complete explanation of the log data transmission protocol and sample XML code associated with these two messages.

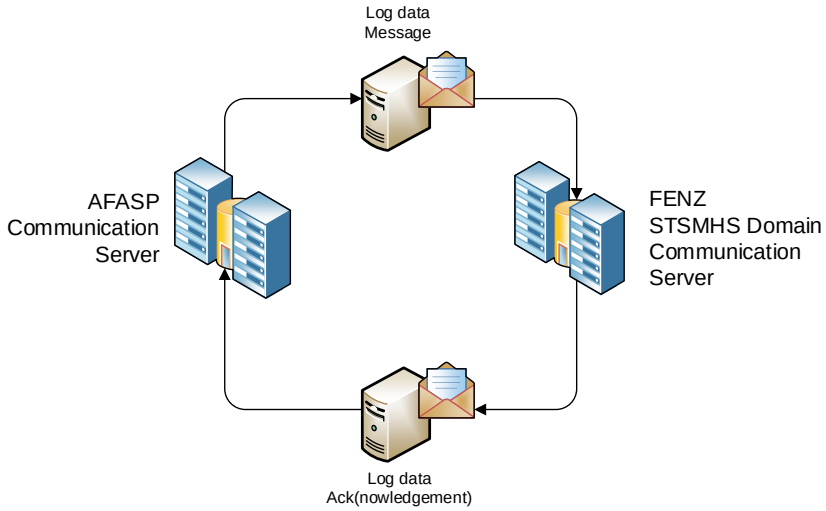

Figure 5. Overview of log data

2.5 System data overview

System data is sent from the AFASP server to the FENZ server and contains all the fire alarm database information necessary for FENZ to oversee a fire alarm connection. The AFASP communications server reads the system data message sent by FENZ and a system data response is generated. Refer to figure 6 or section 4 for a complete explanation of the system data transmission protocol and sample XML code associated with these two messages.

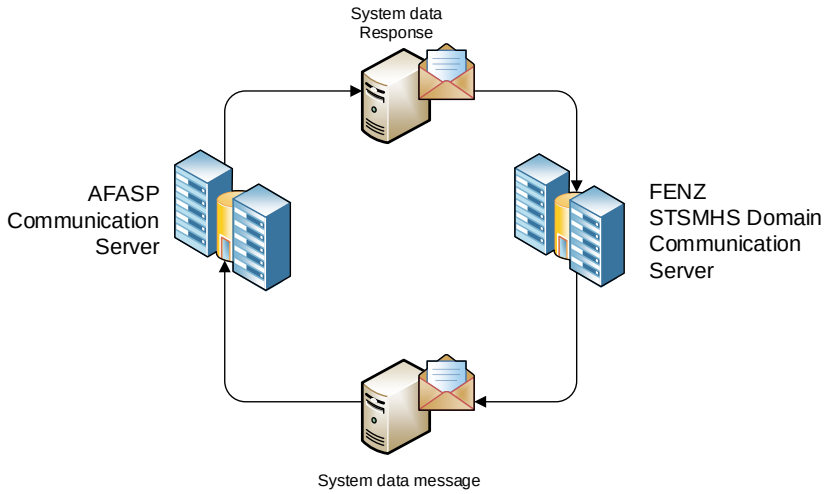

Figure 6. Overview of system data

2.6 Control data overview

Control data from FENZ involves commands to the AFASP server and sub system network that controls both fire alarm mode and

status at the customer's site and within the AFASP database. Refer to figure 7 or section 5 for an explanation of the control data transmission protocol and sample XML code associated with these two messages.

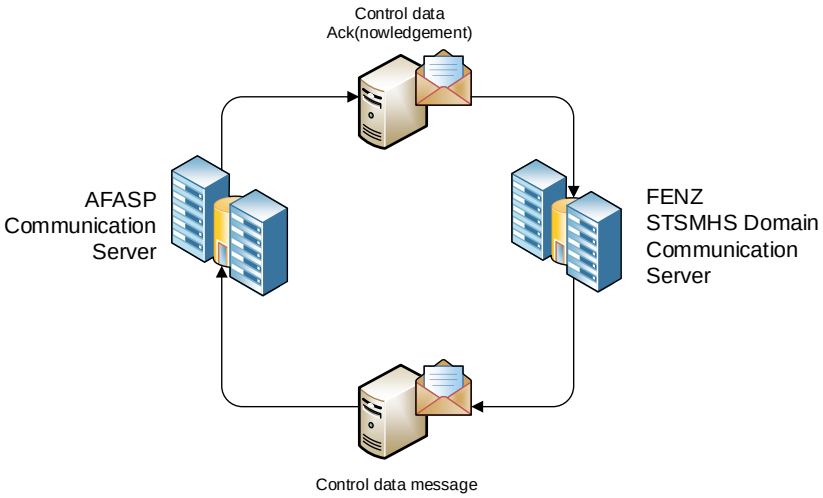

Figure 7. Overview of control data

3 Log data protocol

3.1 Description

The log data protocol is used for sending fire alarm event messages to the FENZ STSMHS domain. It is crucial that a fire alarm message is sent as soon and reliably as possible to FENZ. To ensure this, an alarm message is sent simultaneously over all four communications links to the two FENZ STSMHS domain servers (connections labeled 1, 2, 3 and 4 in the implementation architecture diagram (Fig. 2)).

Each message (including duplicates) over each communications link is individually acknowledged by the FENZ STSMHS domain. If an AFASP communications server fails to receive an acknowledgment after a timeout period, the message will be re-sent. After a configurable number of re-tries, the error will be reported to the AFASP operator, and no further retries attempted.

Flow control is implemented by not allowing any new message to be sent over a communications link until the previous message has been acknowledged over that link by FENZ.

Early detection of communications line failure is achieved by sending a heartbeat poll from the STSMHS to the AFASP, to which the AFASP server responds with an acknowledgement. If the FENZ servers detect no acknowledgement messages after a configurable timeout period, then the FENZ operators can be alerted to a communications link failure.

3.2 Log data protocol messages

3.2.1 Log data message

A log data message is sent by the AFASP client. The log data message is uniquely identified by the unique sequence number for each fire event or inter messaging signal.

A valid log data message must include all fields with profile ‘Essential’.

3.2.2 Log data Ack

A log data Ack message is sent to an AFASP client from the FENZ server in response to a log data message. This message confirms the receipt and processing of the original message. If the data is mal-formed, then this needs to be immediately notified to the FENZ operators for action. Even invalidly formed log data messages should be Ack’d as normal, so that they do not hold up subsequent alarm messages.

```
LogDataAck(

       DataType: <Type of data protocol>,
       UniqueSeqNo: <Unique Sequence No>,
       NZSDate: <NZST Date>,
       NZSTime: <NZST Time>,
       AFASPID: <AFASP Identifier>,
       DTransType: < Transaction Type Ack>,


)
```

4 System data protocol

4.1 Description

The system data protocol is used by the FENZ STSMHS domain for fetching current fire alarm status and other fire alarm information from an AFASP database. Because these requests are generally non-urgent they therefore carry a low priority and do not require processing prior to other higher priority data messages.

A message is sent simultaneously over all four communications links to the FENZ STSMHS domain (connections labeled 1, 2, 3 and 4 in the implementation architecture diagram [Fig. 2]).

Each message (including duplicates) over each communications link is individually acknowledged by the FENZ STSMHS domain. Flow control is implemented by not allowing any new message to be sent over a communications link until the previous message has been acknowledged over that link by the FENZ.

4.2 System data protocol messages

4.2.1 System data message

A system data message is sent by the FENZ STSMHS domain to the AFASP server when the FENZ sub systems want to query a fire alarm. The system data message is uniquely identified by the unique sequence number and the Brigade ID.

4.2.2 System data response

A system data response message is sent by an AFASP server in response to a system data message from the FENZ STSMHS domain. Upon receiving a system data message from the FENZ STSMHS domain the AFASP server must send a related system data response message to the FENZ STSMHS domain within 5 seconds.

It is important that all the fire alarm details are sent with the response message, as it is safest to assume that the AFASP has more accurate and up-to-date records for a fire alarm than FENZ. Any discrepancies between FENZ DB data and the AFASP data can be logged at FENZ for off-line manual resolution.

The NZSDate and NZSTime fields refer to the time of the last event the fire alarm status changed into its current state.

A valid system data response must include all fields with profile ‘Essential’.

5 Control data protocol

5.1 Description

The control data protocol is used by FENZ hosts for dispatching command instructions regarding fire alarm status and fire alarm mode information contained inside the AFASP database and the sub systems beyond (actual fire alarms at customers' sites).

A message is sent simultaneously over all four communications links from the FENZ STSMHS domain (connections labeled 1, 2, 3 and 4 in the implementation architecture diagram [Fig. 2]).

Every control data message is acknowledged by the AFASP servers. Any response messages that are mal-formed are logged to an issues log at FENZ for manual off-line handling.

Each message (including duplicates) over each communications link is individually acknowledged by the AFASP servers. Flow control is achieved by waiting for a response from any previous control data message before sending a new one.

5.2 Control data protocol messages

5.2.1 Control data message

A control data message is sent by the FENZ STSMHS domain when FENZ subsystems want to control the mode/status of a fire alarm site or area within the AFASP wide area alarm network. The system data message is uniquely identified by the unique sequence number and the Brigade ID.

5.2.2 Control data response

A control data response message is sent by an AFASP server in response to a control data message from the FENZ STSMHS domain.

The NZSDate and NZSTime fields refer to the time of the last event the fire alarm status changed into its current state.

A valid control data response must include all fields with profile 'Essential'.

6 Alarm data specification

The FENZ alarm data standard is based on a database table structure and applies to log, system and control data.

6.1 Alarm data structure overview

Below is the list of fields required by the AFASP and FENZ when sending log, system or control data. Log data provided by an AFASP to the FENZ communications server contains all new messages, repeats, unacknowledged messages and other data requested by FENZ. System data from the AFASP sent to FENZ uses the same alarm data structure and processes to communicate reports and updated information. Control data from FENZ sent to the AFASP also uses the same alarm data structure to communicate command and control functions.

The data is grouped into the following categories:

Header information	For message identification and message handling.
Site-related information	Information related to a site (e.g. hospital complex). A site is comprised of one or more areas.
Area-related information	Information related to a specific automatic fire alarm. FENZ assigns a unique identification number to each fire alarm. An area comprises one or more zones. For more information about zones, see the document 'Automatic Fire Alarm Service Provider Computer Interface Specification for Extended Alarm Protocol (XAP) Devices' on the Fire Alarms Connections section of the FENZ website: https://fireandemergency.nz/business-and-landlords/automatic-fire-alarm-connection/
Other information	Information related to a specific automatic fire alarm. FENZ assigns a unique identification number to each fire alarm. An area comprises one or more zones. For more information about zones, see the document 'Automatic Fire Alarm Service Provider Computer Interface Specification for Extended Alarm Protocol (XAP) Devices' on the Fire Alarms Connections section of the FENZ website: https://fireandemergency.nz/business-and-landlords/automatic-fire-alarm-connection/

6.2 Alarm data field structure details

Because fire protection equipment has varying technical capabilities and associated feature sets (legacy systems), the data fields listed below have different profiles. Please refer to the data profile table in section 7.11.

Messages must include all fields with profile 'Essential', and those requested fields that are necessary to process the data action. Whether fields with profiles 'Essential**' or 'Optional**' may, must or must not be included in a data message depends on whether specified conditions are met. These conditions are defined in section 6. They are also included in the data schema.

Optional fields that do not contain data must be marked with the value ‘unknown’ or ‘NA’ if not applicable, otherwise an ‘Error’ data event will be generated by the recipient server. Optional fields will not generate other errors.

For options regarding “Select Text” or “Select Number Field Types“ refer to section 7: Select alarm data parameters.

For precise detail regarding field specifications described below including ownership and/or authoritative data source refer to the Alarmdata schema document referred to in section 8 and available on request to FENZ.

6.2.1 Header information

6.2.1.1 Data type

Identifies the data type as log, system or control data. See the data type table in section 7.1 for valid entries.

Field name	Field type	Field size	Attributes	Profile	Data source
Data Type	Select text	32	Duplicates okay	Essential	AFASP, FENZ

6.2.1.2 Unique sequence number

Unique sequence identification number from the originating server. Please note that this number is “re-used” only in a control data acknowledgment or in repeat message requests.

Field name	Field type	Field size	Attributes	Profile	Data source
UniqueSeqNo	Auto number	12	No duplicates	Essential	AFASP, FENZ

6.2.1.3 New Zealand standard date

New Zealand date stamp from the message-originating server. The date of the originating server must be from a server as specified in section 1.8.
Note: The data transmitted must not be adjusted for daylight saving.

Field name	Field type	Field size	Attributes	Profile	Data source
NZSDate	dd/mmm/yyyy	12	Duplicates ok	Essential	AFASP, FENZ

6.2.1.4 New Zealand standard time

New Zealand local time stamp from the message-originating server. The time of the originating server must be from a server as specified in section 1.8.
Note: The data transmitted must not be adjusted for daylight saving.

Field name	Field type	Field size	Attributes	Profile	Data source
NZSTime	hh:mm:ss	9	Duplicates ok	Essential	AFASP, FENZ

6.2.1.5 Fire Service Brigade ID

Fire Service Brigade identification code. See the Fire Service Brigade ID table in section 7.2 for valid entries.

Field name	Field type	Field size	Attributes	Profile	Data source
BrigadeID	Select text	6	Duplicates ok	Essential	FENZ

6.2.1.6 AFASP ID

Identifies the message-originating AFASP. See the AFASP ID table in section 7.3 for valid entries.

Field name	Field type	Field size	Attributes	Profile	Data source
AFASPID	Select text	5	Duplicates ok	Essential	FENZ

6.2.1.7 Data priority

Priority code as assigned by the AFASP. Number range: 0-99 (1 not used) with the higher number having the highest priority. See priority allocation table in section 7.12 for priority classifications.

Field name	Field type	Field size	Attributes	Profile	Data source
DataPriority	General number	3	Duplicates ok	Essential	AFASP

6.2.1.8 Data transaction type

Assists the AFASP communications server/processor or the FENZ communications server/processor to determine the correct transaction actions. See the data transaction type table in section 7.4 for valid entries.

Field name	Field type	Field size	Attributes	Profile	Data source
DtransType	Select text	12	Duplicates ok	Essential	AFASP, FENZ

6.2.1.9 AFASP incident number

Reference number that assists the AFASP communications server/processor or the FENZ communications server/processor to group related transactions together. Fire alarm event information could include subsequent log data events depicting additional activity at the customer's site. This data set transaction number is attached to all subsequent log data events from the site and resumes incrementing once the site fire alarm status and mode both return to normal.

Field name	Field type	Field size	Attributes	Profile	Data source
AFASPIncNo	General number	32	Duplicates ok	Essential	AFASP

6.2.1.10 AFASP database systems FA mode

AFASP's database systems mode. See the AFASP systems FA mode table in section 7.5 for valid entries.

Field name	Field type	Field size	Attributes	Profile	Data source
AFASPFAMode	Select text	12	Duplicates ok	Essential	AFASP

6.2.1.11 AFASP database systems FA status

AFASP's database systems status. See the AFASP systems FA status table in section 7.6 for valid entries.

Field name	Field type	Field size	Attributes	Profile	Data source
AFASPFAStatus	Select text	12	Duplicates ok	Essential	AFASP

6.2.1.12 Alarm data standard version number

Each data event sent should contain the alarm data standard version number. The value should be as indicated on the front of this document.

Field name	Field type	Field size	Attributes	Profile	Data source
AlarmDataVer	General Number	6	Duplicates ok	Essential	AFASP, FENZ

6.2.2 Site-related information

If a message includes field 'SiteNZFSID', then this message must also include all fields in this section (6.2.2) with profile 'Essential**', and may include all fields in this section (6.2.2) with profile 'Optional**. If a message does not include field 'SiteNZFSID', then this message must not include any of the fields in this section (6.2.2).

6.2.2.1 Site NZFS ID

FENZ unique site reference number. If the site contains additional areas, then they are allocated individual fire alarm IDs attached to the subsequent area IDs (see sections 6.2.3.1 and 6.2.3.3). If an area fire alarm ID is not designated in a data message then the site NZFS ID number refers to all fire alarms within that site.
Note: FENZ does not assign unique site reference numbers at present. This field naming convention will be updated to "FENZ" in due course.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteNZFSID	Text	15	Duplicates ok	Optional	FENZ

6.2.2.2 Site AFASP ID

Site reference number, as assigned by AFASP.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteAFASPID	Text	10	Duplicates ok	Optional**	AFASP

6.2.2.3 Site description

Site description for site identification.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteDescription	Text	64	Duplicates ok	Optional**	AFASP

6.2.2.4 Site equipment location

Location description of the site display equipment (mimic panel).

Field name	Field type	Field size	Attributes	Profile	Data source
SiteEquipLoc	Text	32	Duplicates ok	Optional**	AFASP

6.2.2.5 Site FA mode summary

Mode summary of the site fire alarm. See the mode table in section 7.8 for valid entries, and section 6.4 for rules for mode and status summaries.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteFAMode	Text	12	Duplicates ok	Essential**	AFASP

6.2.2.6 Site FA status summary

Status summary of the site fire alarm. See the status table in section 7.9 for valid entries, and section 6.4 for rules for mode and status summaries.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteFAStatus	Text	12	Duplicates ok	Essential**	AFASP

6.2.2.7 Site LLA co-ordinates

Fire alarm site longitude, latitude and altitude coordinates (in that order, separated by a colon, ':') presented in the decimal degree format. This should be a GPS reading obtained from the site main entrance.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteLLA	Text	32	Duplicates ok	Optional**	AFASP

6.2.2.8 Site street from-number

Street number related to the fire alarm site; use the lower street number for compound numbers, e.g. '10 – 12'.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteStfromNo	Text	5	Duplicates ok	Optional**	AFASP

6.2.2.9 Site street from-letter

Street number letter related to the fire alarm site; use the lower street number letter for compound numbers, e.g. '120a – 120b'.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteStfromLet	Text	2	Duplicates ok	Optional**	AFASP

6.2.2.10 Site street to-number

Street number related to the fire alarm site; use the upper street number for compound numbers, e.g. '10 – 12'.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteSttoNo	Text	5	Duplicates ok	Optional**	AFASP

6.2.2.11 Site street to-letter

Street number letter related to the fire alarm site, use the upper street number letter for compound numbers, e.g. '120a – 120b'.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteSttoLet	Text	2	Duplicates ok	Optional**	AFASP

6.2.2.12 Site unit number

Unit number related to the fire alarm site.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteUnitNo	Text	8	Duplicates ok	Optional**	AFASP

6.2.2.13 Site street name

Street name related to the fire alarm site.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteStName	Text	25	Duplicates ok	Optional**	AFASP

6.2.2.14 Site street type

Street type related to the fire alarm site, e.g. 'Street', 'Road', 'Avenue' or 'Crescent'.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteStType	Text	12	Duplicates ok	Optional**	AFASP

6.2.2.15 Site street suffix

Street suffix related to the fire alarm site, e.g. 'East', 'West', 'Central' or 'Lower'.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteStSuffix	Text	10	Duplicates ok	Optional**	AFASP

6.2.2.16 Site suburb name

Suburb name related to the fire alarm site.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteSuburb	Text	24	Duplicates ok	Optional**	AFASP

6.2.2.17 Site town name

Town name related to the fire alarm site.

Field name	Field type	Field size	Attributes	Profile	Data source
SiteTown	Text	24	Duplicates ok	Optional**	AFASP

6.2.3 Area-related information

6.2.3.1 Area Fire Alarm ID

Unique fire alarm identifier, as assigned by FENZ.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaFAID	General number	12	Duplicates ok	Essential	FENZ

6.2.3.2 Area location

Location description of the area fire alarm display equipment (mimic panel).

Field name	Field type	Field size	Attributes	Profile	Data source
AreaLoc	Text	32	Duplicates ok	Optional	FAL, FAM

6.2.3.3 Area description

Area description for area identification.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaDescription	Text	48	Duplicates ok	Optional	AFASP

6.2.3.4 Area system type

Area equipment type description. See the fire alarm types table in section 7.7 for valid entries.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaSysType	Select text	8	Duplicates ok	Optional	AFASP

6.2.3.5 Area mode summary

Summary mode of the fire alarm area. See the modes table in section 7.8 for valid entries, and section 6.4 for rules for mode and status summaries.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaMode	Select text	12	Duplicates ok	Essential	FAL, FAM

6.2.3.6 Area status summary

Summary mode of the fire alarm area. See the status table in section 7.9 for valid entries, and section 6.4 for rules for mode and status summaries.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaStatus	Select text	12	Duplicates ok	Essential	FAL, FAM

6.2.3.7 Area LLA co-ordinates

Fire alarm area longitude, latitude and altitude co-ordinates (in that order, separated by a colon, ':') presented in the decimal degree format. This should be a GPS reading obtained from the area main entrance.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaLLA	Text	32	Duplicates ok	Optional	AFASP

6.2.3.8 Area street from-number

Street number related to fire alarm area; use the lower street number for compound numbers, e.g. '10 – 12'.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaStfromNo	Text	5	Duplicates ok	Optional	AFASP

6.2.3.9 Area street from-letter

Street number letter related to the fire alarm area; use the lower street number letter for compound numbers, e.g. '120a – 120b'.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaStfromLet	Text	2	Duplicates ok	Optional**	AFASP

6.2.3.10 Area street to-number

Street number related to the fire alarm area; use the upper street number for compound numbers, e.g. '10 – 12'.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaSttoNo	Text	5	Duplicates ok	Optional**	AFASP

6.2.3.11 Area street to-letter

Street number letter related to the fire alarm area; use the upper street number letter for compound numbers, e.g. '120a – 120b'.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaSttoLet	Text	2	Duplicates ok	Optional**	AFASP

6.2.3.12 Area unit number

Unit number related to fire alarm area.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaUnitNo	Text	8	Duplicates ok	Optional	AFASP

6.2.3.13 Area street name

Street name related to fire alarm area.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaStName	Text	25	Duplicates ok	Optional	AFASP

6.2.3.14 Area street type

Street type related to the fire alarm area, e.g. ‘Street’, ‘Road’, ‘Avenue’ or ‘Crescent’.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaStType	Text	12	Duplicates ok	Optional	AFASP

6.2.3.15 Area street suffix

Street suffix related to the fire alarm area, e.g. ‘East’, ‘West’, ‘Central’ or ‘Lower’.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaStSuffix	Text	10	Duplicates ok	Optional	AFASP

6.2.3.16 Area suburb name

Suburb name related to fire alarm area.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaSuburb	Text	24	Duplicates ok	Optional	AFASP

6.2.3.17 Area town name

Town name related to fire alarm area.

Field name	Field type	Field size	Attributes	Profile	Data source
AreaTown	Text	24	Duplicates ok	Optional	AFASP

6.2.4 Other information

If a message includes field 'UserID', then this message must also include all fields in this section (6.2.4) with profile 'Essential**', and may include all fields in this section (6.2.4) with profile 'Optional**'. If a message does not include field 'UserID', then this message must not include any of the fields in this section (6.2.4).

6.2.4.1 User ID

Unique user identifier, as assigned by an AFASP.

Field name	Field type	Field size	Attributes	Profile	Data source
UserID	Text	12	Duplicates ok	Optional	AFASP

6.2.4.2 User type

Identifies the user type. See the user type table in section 7.10 for valid entries.

Field name	Field type	Field size	Attributes	Profile	Data source
UserType	Text	14	Duplicates ok	Essential**	AFASP

6.2.4.3 User name

User name.

Field name	Field type	Field size	Attributes	Profile	Data source
UserName	Text	24	Duplicates ok	Essential**	AFASP

6.2.4.4 User phone type

User's phone type. For valid entries see Table 7.13: Phone types.

Field name	Field type	Field size	Attributes	Profile	Data source
UserPhType	Text	5	Duplicates ok	Optional**	AFASP

6.2.4.5 User phone area code

Area code of the user's phone, exclusive the leading 0.

Field name	Field type	Field size	Attributes	Profile	Data source
UserPhACode	General number	5	Duplicates ok	Optional**	AFASP

6.2.4.6 User phone number

User's phone number, excluding the area code.

Field name	Field type	Field size	Attributes	Profile	Data source
UserPhNo	General number	8	Duplicates ok	Optional**	AFASP

6.2.4.7 User email address

User's email address.

Field name	Field type	Field size	Attributes	Profile	Data source
UserEmail	General text	32	Duplicates ok	Optional**	AFASP

6.2.4.8 User log

User's log detailing a description related to the event referred to in the message.

Field name	Field type	Field size	Attributes	Profile	Data source
UserLog	Text	80	Duplicates ok	Optional**	AFASP, FENZ

6.3 Notes

The combination of unique sequence number plus the AFASP ID plus the data type represents a unique global transaction identifier.

6.4 Rules for mode and status summaries

The status summary and mode summary information of a parent element (site, zone, or area) is determined by the states and modes of the child elements (areas, zones or points) related to that parent element.

Figure 8 shows the relative rating levels of all status/mode combinations. '1' is the highest relative rating. It is **recommended** that the parent element is assigned the status/mode combination of the child element with the lowest number having the highest relative rating. In the case where a child has an ALARM or PREALARM status, then the parent element **must** inherit the highest relative rating.

Status	Mode						
	Water off	Evacuate	Normal	Isolate	Test	Shunt	Unknown
Alarm	1	2	3	19	20	21	22
Prealarm	4	5	6	23	24	25	26
Normal	7	8	9	27	28	29	30
Defect	10	11	12	31	32	33	34
Trouble	13	14	15	35	36	37	38
Unknown	16	17	18	39	40	41	42

Figure 8. Relative rating levels of all status/mode combinations

Note:
Figure 8 is not related to the priority allocation table. It is for the determination of mode and status summaries only.

7 Select alarm data parameters

7.1 Data type

Select text	Description
Log Data Message	Log data message from the AFASP to a FENZ server
Log Data Ack	Log data Acknowledgment from FENZ to a AFASP server
System Data Message	System data message from FENZ to a AFASP server
System Data Response	System data response from the AFASP to a FENZ server
Control Data Message	Control data message from FENZ to a AFASP server
Control Data Response	Control data response from the AFASP to a FENZ server

7.2 FENZ Brigade ID

Select text	Description
01	Fire and Emergency New Zealand
02	STSMHS1
03	STSMHS2
04	2nd Brigade
ALL	ALL Brigades

7.3 AFASP ID

Select text	Description
00	All
01	1st AFASP
02	2nd AFASP
03	3rd AFASP
04	4th AFASP

7.4 Data transaction type

Select text	Description
New	New data
Update	Update of data
Query	Query of data
Init	Initialise of service
Poll	Poll of service
Interval	Time interval of last transmission from fire alarm
Shutdown	Shutdown of service
Reply	Reply to a data transmission
Error	Error in data field
Repeat	Repeat of unacknowledged, missing or incomplete data transaction
Confirmed	Event being processed by FENZ Operations
Command	Command to AFASP and/or fire alarm to change mode/status

7.5 AFASP systems fire alarm mode

Select text	Description
Normal	AFASP database will pass all ALARMS normally
Test	AFASP database will “0” priority all ALARMS
Shunted	AFASP database will stop all ALARMS
Pending	AFASP database has not begun to pass ALARMS
Unknown	AFASP database has not set a mode

7.6 AFASP systems fire alarm status

Select text	Description
Offline	Fire alarm has lost communication with the AFASP concentrator
Online	Fire alarm is in communication with the AFASP concentrator
Unknown	AFASP database has not determined the status

7.7 Fire alarm types

Select text	Description
01	Manual fire alarm (not monitored)
02	Manual fire alarm (self monitored)
03	Automatic fire alarm with heat detectors and manual call points
04	Automatic fire alarm with smoke detectors and manual call points
04a	Automatic fire alarm with smoke detectors (battery powered)
04b	Automatic fire alarm with smoke detectors (hardwired 12-24v)
05	Automatic fire alarm with modified smoke detectors and manual call points
06	Automatic fire sprinkler system and manual call points
07	Automatic fire sprinkler system with smoke detectors and manual call points
08	Voice communication system
09	Smoke control in air-handing system
10	Natural smoke venting
11	Mechanical smoke extraction
12	Hold open device
13	Pressurisation of safe paths
14	Fire hose reels
15	Fire and Emergency NZ lift control
16	Emergency lighting in exit ways
17	Emergency electrical power supply
18	Fire hydrant system
19	Refuge areas
20	Fire systems centre
21	Gas flooding
22	Gas Detection
23	Security system – Heat / Smoke
24	Portable fire extinguishers
Unknown	AFASP database has not determined the equipment type

7.8 Modes

Select text	Description
Normal	Equipment is operating normally
Test	Equipment is being tested by service agent or AFASP
Isolate	Equipment is isolated by service agent or AFASP
Evacuate	Building is being evacuated
Shunt	Equipment is shunted by FENZ
Unknown	AFASP database has not determined the mode
Water off	Sprinkler system is disconnected from water supply.

7.9 Status

Select text	Description
Normal	Normal status
Alarm	Fire has been detected
Defect	Fire alarm equipment self-monitoring has determined that it is defective
Trouble	Fire alarm equipment has been tampered with
PreAlarm	Fire alarm equipment has detected that a fire alarm may be issued shortly
Unknown	AFASP database has not determined the current status

7.10 User type

Select text	Description
AFASP	AFASP staff
Key Holder	Key holder
BO Rep	Building owner representative
Build Owner	Building owner
FENZ	Fire and Emergency NZ staff
Other	None of the other user types
RAM	AFASP remote access software

Service Agent	Service Agent
Unknown	AFASP database has not determined the user type

7.11 Data profile

Text	Description
Essential	Fields with profile ‘Essential’ are necessary for any message to be processed. They must be included in every data message.
Essential**	Fields with profile ‘Essential**’ must be included in a data message if specified conditions are met.
Optional	Fields with profile ‘Optional’ contain data that could optionally be sent to FENZ.
Optional**	Whether fields with profile ‘Optional**’ may or must not to be included in a data message depends on specified conditions.

7.12 Priority allocation table

Priority	Description	
97–99	Verified (approved) automatic fire call	Fire
94–96	Unverified (approved) automatic fire call	
93	Verified (non approved) automatic fire call	
92	Verified manual fire call	
91	Unverified (non approved) automatic fire call	
90	Unverified manual fire call	
80–89	Hazardous materials or environments	Non-fire
70–79	Evacuations	
60–69	Equipment defects	
50–59	Equipment isolates	
40–49	Equipment troubles	
30–39	Database queries, changes and commands	
20–29	Operator logs and actions	
10–19	Equipment tests	
2–9	Normal events	

7.13 Phone types

Select text	Description
Land	Land line
Mob	Mobile phone
Pag	Pager

8 Alarmdata.xsd file, API

To assist development programmers in the design specification for the AFASP application, a programming interface (API) document will be supplied to qualified applicants on request to FENZ.

The alarmdata.xsd file defines both the basic and XAP protocol messages.

9 Change control

Version	Date	Page, Section	Change description
1.1	27 Apr 2005	20, 6.2.8	Changed: Field name 'Site Street Number' to 'Site Street From-Number'. Additional text, field size from 8 to 5.
1.1	27 Apr 2005	20, 6.2	Inserted new Fields: Site Street From-Letter, Site Street To-Number, Site Street To-Letter.
1.1	27 Apr 2005	20, 6.2.2	Field 'Site Street Type": Additional text, field size from 10 to 12.
1.1	27 Apr 2005	20,6.2.2.12	Inserted new field Site Street Suffix.
1.1	27 Apr 2005	21,6.2.3.1	Changed: field type to 'General Number' in field 'AreaFAID'.
1.1	27 Apr 2005	23, 6.3.8	Changed: Field name 'Area Street Number' to 'Area Street From-Number'. Additional text, field size from 8 to 5.
1.1	27 Apr 2005	23, 6.3	Inserted new Fields: Area Street From-Letter, Area Street To-Number, Area Street To-Letter.
1.1	27 Apr 2005	23, 6.2.3	Field 'Area Street Type': Additional text, field size from 10 to 12.
1.1	27 Apr 2005	23, 6.2.3.12	Inserted new field Area Street Suffix.
1.1	27 Apr 2005	32, 6.4	Note added.
1.1	27 Apr 2005	28,7.2	Changed: 02 = STSMHS1, 03 = STSMHS2, 04 = 2nd Brigade.
1.2	15 Sep 2005	6, 1.3.2	Added: TCP/IP UDP requirements.
1.2	15 Sep 2005	19,6.2.1.7	Changed: Number range
1.3	14 Oct 2005	26, 6.2.4.3	Changed: Field Size from 8 to 16.
1.3	14 Oct 2005	15, 4.2.2	Addition regarding System Data message response time.
1.4	15 Dec 2008	6.2.4 6.2.5	Removed Zone and Point data definitions as they are now part of the XAP documentation
1.4	15 Dec 2008	6.4	Changed non-Alarm summaries so that they are no longer mandatory.
1.5	March 2014	All	Reformatted and updated document. Section 6 – Alarm Data Specification unchanged. Section 7 – Select Alarm Data Parameters unchanged [7.11 removed - old specification].
1.6	July 2017	Various	References to FENZ removed and replaced with Fire and Emergency New Zealand (FENZ), enacted from the new Fire and Emergency New Zealand Act 2017

1.7	February 2019	Various	Minor amendments to align specification to FENZ definitions and Agreement terms and conditions