SERVICE SPECIFICATION

JANET txt is a comprehensive suite of SMS-based text messaging services for use by JANET connected organisations and the education community. **JANET txt** is delivered by PageOne and powered by Oventus, PageOne's secure and high performance messaging infrastructure.

JANET txt supports both manual, user initiated one and two-way text messaging as well as fully integrated messaging from third party software systems through the provision of the following:-

a) Simple and intuitive, secure web-based messaging console for the provision of multi-lingual SMS messaging to individuals and groups, to UK and over 450 networks worldwide.

b) Flexible and secure integration API's and development support allowing third party software systems throughout the JANET community to deliver SMS and associated messaging via in-house MIS systems (e.g. SIMS and SITS) and VLE systems (Blackboard and Moodle).

c) A range of desktop plug-ins and services to integrate SMS into existing desktop software, such as Microsoft Excel and email systems.

JANET txt Web-based Messaging

Access and Security

- Unique, secure log-in username and password
- 128-bit SSL encryption ensuring all messaging traffic is encrypted
- Secure JANET txt log-in at http://www.pageone.co.uk/JANETtxt
- Secure connectivity to the JANET network

JANET txt User Account Web-Messaging Functionality

Each **JANET txt** web-account includes the following features:-

- Send to individuals or groups by mobile number or name
- Supports messaging to SMS, email, landline and pager numbers
- Auto-concatenation of long messages (> 160 characters)
- Message character count, detailing number of messages to be sent
- Enter recipient numbers directly, select from address book or import list
- Address book capability with sort, search and filter, group tag and import/export function
- Dynamic filter/search function – lists immediately narrow as characters are typed
- In-built 'profanity' filter to prevent inappropriate messages being sent*
- Click and select facility for selecting multiple recipients from Address book
- Create and manage group lists which can include any combination of SMS, email, landline or pager addresses
- Immediate message acceptance confirmation that a sent message has been accepted by PageOne
- Delayed messaging capability allowing messages to be sent at a future time/date
- 2-way SMS inbox for inbound SMS replies (2-way accounts only)
- Multi-lingual support with auto-recognition of different character sets

User Account Types

JANET txt User accounts can be specified as either:-

- 1-way - supports outbound messaging only. Outbound messages will sent using a 'JANETtxt' alpha-tag. Organisations can optionally specify a unique alpha-tag.

- 2-way – supports full 2-way SMS messaging. Each account will be allocated a unique 2-way virtual mobile number (MSISDN). Outgoing messages will be received on a mobile as 'from' the accounts 2-way number. Mobile users can either reply of text direct to a 2-way number with messages being received in the accounts Inbox.

Master Account

PageOne will provide on a per contracting Organisation basis, a 'parent' or master account, against which all individual User (child) accounts will reside for billing purposes. The master account will in the future include the following administration capability:-

- Create/provision additional User accounts*
- View the sent message Outbox of individual child user accounts*
- Allocate Broadcast group view/edit rights to child accounts*
- View how many SMS messages are currently left on the account*

Supported Message Types

JANET txt web-accounts directly access the full capability of the PageOne's Oventus messaging infrastructure and is therefore able to deliver a variety of SMS and associated messaging types:-

- SMS (160 characters per message, dependent upon character sets)
- Multi-lingual SMS messages (note message length per character may be reduced)
- Supports non-SMS messaging to:-
  - email addresses
  - UK paging networks – send message to any UK paging network
  - UK landlines and DDI numbers (as supported by BT text to speech service)
- Flash-text support – message immediately appears on screen
- VCard message support – send a business card direct to a handset (handset dependent)
- VCal calendar support – send a diary entry direct to a handset
- Wap-push – for sending a URL message to direct handsets to a particular web-page

Note that some of the above services are handset or mobile network dependent.

International Delivery & Character Sets

JANET txt supports the international delivery of messages (subject to international roaming agreements) to over 450 networks worldwide. The service supports the GSM 03.38 Character Set and will automatically recognize extended character sets and encode messages accordingly to support multi-lingual messaging. Note that mobile network or handset restrictions may apply and that the number of characters per message is reduced when using extended character sets.

Reporting and Auditing

JANET txt web-accounts provide a number of reporting tools to help users manage their messaging, including:-

- Immediate on-screen message acceptance for each message sent
- Outbox message history log showing message delivery status– provides an on-line audit log of all messages sent in the last month and their delivery status as failed, pending or delivered
- Filter/Search functions – message logs can be instantly sorted by clicking on a column header and a dynamic search/filter function allows you to type text and see the log immediately, narrowed down to only those entries that match you typed text
- Failed message log highlighting persistently failed numbers and reason - allows users to readily identify persistently failed messages allowing user to take appropriate action *
- Export capability - message logs can be exported to Microsoft Excel

Template Messages

JANET txt web-accounts include the ability to define message templates which can include simple merge fields, including time, date, and custom data. An example of a message template could be; *"Dear [custom1], your interview is scheduled for [time] on the [date] at [custom2]. We look forward to meeting you then." W*here [Custom1], [time], [date] and [Custom2] are variable fields.

Microsoft Excel plug-in

PageOne can provide a MS Excel plug-in which enables secure text-messaging direct from spreadsheet data. It also includes a sophisticated merge-field capability which allows the auto-creation and sending of templated messages using user data in specified data-fields.

Group Messaging

JANET txt supports powerful and flexible group messaging through the following means:-

- Multiple 'To' addresses – simply enter (or select by clicking on Address book entries) multiple recipients for a message. Ideal for ad-hoc messaging to multiple recipients
- Group Tags – tag users within their address book entry with specific group names (e.g. department) and use the filter function to select recipients by a specific group tag or individual users by any group identifier in the notes field of the address book
- Broadcast groups – these are hosted recipient lists ideal for larger and more permanent group messaging. Recipient lists can be created and managed by a JANET txt web-account. See below for more details.

Broadcast Groups

A Broadcast group is a defined recipient list which can be any combination of SMS, email, pager or landline held against a unique alert number (and name), allowing broadcast messages to be quickly sent by sending a message to the alert number (or selecting by group name). Send a message to a broadcast group number (or select by name) and the message is automatically disseminated to all addresses in the group, to any network. Since each broadcast groups has its own alert number it is possible to nest groups inside each other groups.

Broadcast groups can also optionally be assigned a dedicated Bureau DDI (direct dial in) number which can be used to initiate a broadcast via PageOne's 24-hour bureau. This is typically used for incident management/cascade applications where organisations cannot be sure they can access their normal message sending systems.

Third party MIS systems can also populate and manage Broadcast groups via PageOne's SOAP/XML API with the group being available to operators to send to the current group recipient list. This may allow groups to automatically be managed according to records held on third party systems such as SIMS/SITS.

Broadcast groups can also be configured to allow individuals to opt themselves in or out of a group via an SMS text message to the Broadcast group number. **JANET txt** web-accounts allow for the population and management of Broadcast Groups with add, edit, search and sorting functions as well as defining the default expiry time for undelivered messages. A group recipient list can also be selected from the address book or imported from an Excel spreadsheet.

The service automatically checks for duplicate entries and when sending a message to any recipient list which contains nested groups will remove any duplicate messages that may be a result of individuals being a member of more than one group.

Service Branding/Styling

JANET txt is provided with a branding scheme as agreed by UKERNA and PageOne. Should any organisations require bespoke branding for their service, then PageOne are able to provide such as a costed option.

Message Origination 'Branding'

The **JANET txt service** offers several options to allow outgoing SMS messages to be branded as coming from:-

- An alphanumeric tag (e.g. JANETtxt). Note that due to mobile network limitations the recipient will be unable to reply to messages received from an alpha-tag and that messages sent from an alpha-tag cannot be sent to UK landlines.
- A Long Code – a 'virtual' mobile number (MSISDN)
- A Short Code – a 5 digit Short Code. Note that Short Codes can only be used for UK messaging
- Short Code + keyword – a unique combination of short code and keyword

The **JANET txt** Campaign Manager service is specifically designed to assist users in the creation and management of SMS Short Code, Long Code and keyword based campaigns (see 14. below)

Campaign Manager - Short Codes and Keyword Optional Services

For short-codes/keyword services PageOne provides an optional web-based **JANET txt** Campaign Manager console, which allows user organisations to quickly and easily define their own inbound and/or outbound SMS-based campaigns by;

- Specifying the short-code or long-code to be used (as the 'from' number)
- Specifying the time/date between which the campaign is to be live
- Specifying the keyword to be used - if using a dedicated short-code or MSISDN then the user can create unlimited unique keywords. If using a shared keyword, the keyword must be pre-registered (subject to availability)
- Specifying auto-response to each inbound message (either SMS or wap-push message), e.g. "Thank you for your message. Your brochure will be sent shortly"
- Specifying whether the campaign is a subscriber list (in which case campaign manager automatically enters users into a group). Recipients can at any time opt-out of the group by sending the universal 'STOP' command to the short-code
- Any responses to a campaign are logged in the inbox and can viewed or exported as required
- Shortcodes, keywords and dedicated MSISDN numbers are available as optional subscription services

Note: * Items marked with an asterisk are development items and may not be available at service launch.

JANET txt Integration API's

PageOne can be seamlessly integrated within an institutions existing MIS, Library or VLE system. Whether you want to integrate SMS into a new application or add text messaging capability into an existing application, PageOne will work with you to ensure that you get all the necessary support and documentation to get you up and running quickly.

The PageOne SOAP gateway provides a secure environment in which client applications can send messages, access message delivery reports and 2-way SMS replies as well as the management and population of stored distribution lists. SOAP is supported by most programming environments including Java, Delphi, PHP and .NET

PageOne are able to provided sample developers code for Web Services including C#.NET, V.NET, Java, PHP and Delphi. PageOne also provide a number of other connectivity options such as email to SMS (SMTP), Peer to Peer messaging (SMPP) as well as simple browser messaging using an AJAX interface.

Details and sample code for download can be found at www.pageone.co.uk/JANETtxt. For further information please contact us at JANETtxt@pageone.co.uk.

NETWORK ARCHITECTURE

Powered by Oventus

PageOne has developed, owns and operates its own network independent messaging architecture, known as Oventus, which powers PageOne's range of mobile messaging services including **JANET txt.**

Oventus Connectivity and Integration

PageOne's Oventus platform offers a flexible approach to messaging to cater for differing client systems and operational requirements. Options include:-

- Web – messages can be sent from secure (https) web-based accounts
- Web Services – a secure XML/SOAP interface can be used to send messages, delivery reports, as well as 2-way, and group management, via a secure SOAP/XML interface
- Secure VPN – messages can be sent via secure IP tunnelling with encryption based on Triple DES and MD5 IPSEC authentication
- SMTP – messages can be sent from standard e-mail clients
- Microsoft Excel plug-in delivers secure 2-way SMS messaging direct from this popular spreadsheet application, includes template and merge-field messaging

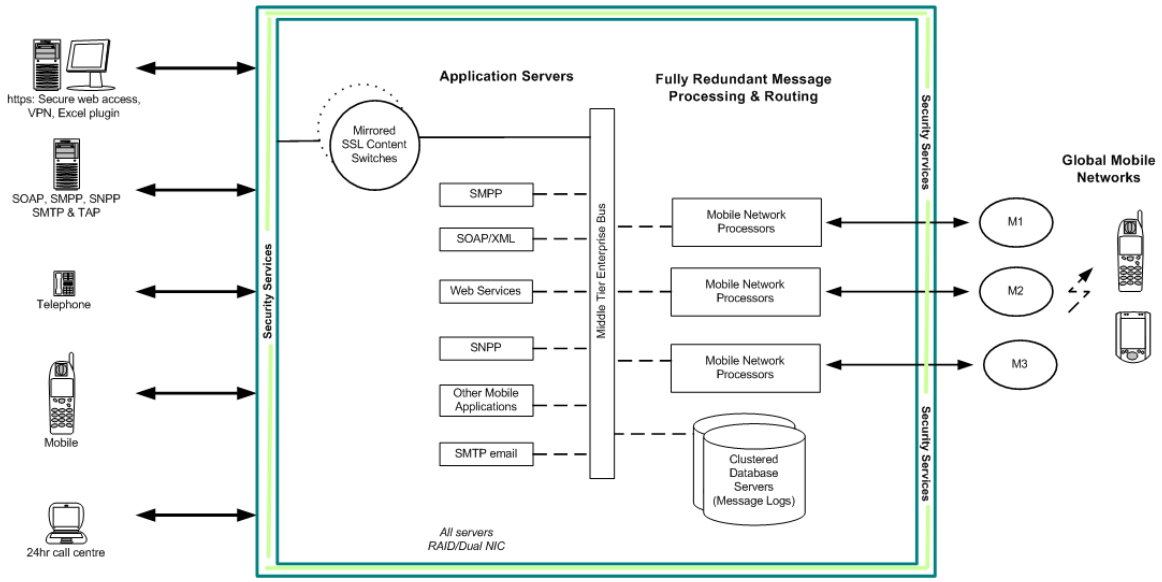

Fig 1. PageOne Oventus gateway architecture

The Oventus platform consists of multiple-server architecture using distributed processing systems with full redundancy and hot swappable RAID storage, linked by a powerful BEA Weblogic Server middle tier. The system is monitored and managed 24/7 via SNMP to all components and PageOne has its own 24-hour support personnel.

Network Connectivity

External IP connectivity is provided through independent ISP's via separately routed network links with security provided by a fully clustered, carrier-grade firewall system with Layer 5 content switches managing load distribution and

session management. PageOne operates fully redundant clustered stateful inspection firewall appliances running the latest CheckPoint firewall operating system.

Web services are then further secured by authenticated reverse proxy servers, which encrypt the traffic at 128-bit Secure Socket Layer technology. All services are accessed through the firewall system. Following authentication, customer connections are routed by multiple Cisco content switches to the appropriate application server. The switches are linked via HSRP, ensuring there is no individual point of failure on the network. Intelligent routing ensures that each request is directed for optimum performance. The content switches are fully capable of routing requests to application servers located in an alternative location.

PageOne's external PSTN connectivity is fully diverse at both network and physical cable routing level and external IP connectivity is via high-capacity links through two independent ISP's. PageOne's managed SMS messaging gateway services are served by mobile network connectivity including fixed link, IP and ISDN, together with a fallback route via three alternative networks. The three contingency routes are automatically activated in the event of primary route failure, and can load balance based on network performance delivering increased throughput and ensuring full network independence. As well as providing increased resilience and throughput capacity the Oventus dynamic routing capability also ensures the widest possible international SMS delivery.

JANET Network Connectivity

PageOne and UKERNA provide a secure IP connection to the JANET network, ensuring all JANET txt services are afforded direct and secure connection to PageOne's Oventus messaging gateway.

User Authentication and Encryption

The PageOne service uses 128-bit SSL encryption for all web interactions, whether via the web-portal or via SOAP API. Services are based on http and are HTTPS (SSL v3) PKI encrypted. Each user/operator account is allocated a unique username and password, which are required for authentication. SOAP API's also require a username/password for session authentication. The JANET txt service includes an automatic time-out facility after a defined period of inactivity. Thereafter the user will need to log-in again using the correct username and password. Note that PageOne does not allow multiple log-ins from the same username/password. Operator credentials are not stored in cookies or on local files on the client device. PageOne can agree in advance the process for orders including a necessary authorisation process (restricted users with password or PIN, etc.) and the method of advising user credentials.

Site Security

PageOne's Oventus infrastructure and connectivity is housed in two 24–hour manned, secure exchange-grade buildings. Access is strictly controlled through pass badges and written authorisation in advance. The site environment has barrier control access and full camera surveillance. Full fire alarm monitoring is in place and tested routinely. Power security is afforded via UPS with generator back-up sufficient for three days operation. PageOne employ SNMP monitoring to all aspects of the infrastructure including access and environment (e.g. temperature).

International Delivery & Character Sets

The service supports the international delivery of messages (subject to international roaming agreements) to over 450 networks worldwide . PageOne is able to flex its delivery mechanism to ensure the widest possible geographic coverage for international message delivery. PageOne supports the comprehensive international GSM 03.38 Character Set and can thus receive and transmit messages in any language that uses this character set.

Data Storage

PageOne have a highly developed set of supporting processes and underpinning technology to ensure data integrity to the highest standards. These include RAID storage on front-end and DB (SAN) infrastructure. The Oracle DB is mirrored in real time to an identical SAN in the second data-centre. Tape backup is carried out daily and the tapes stored offsite. All key customer subscription data is encrypted for maximum security. Billing integrity is ensured through the real-time authentication, validation and rating of all customer message requests.

Data Access Security

PageOne ensures that all data stored for message retrieval is anonymous to the extent that ID tags must be matched to the separate billing system to identify account ownership. Data stored as part of our on-line address book services, and administration user names and passwords are encrypted using Oracle's database encryption services. Support functions are run with anonymous data wherever possible. All access to support systems is password protected and restricted to the minimum of appropriate personnel. PageOne support functions differentiate between customer/billing data and user or message data. Thus the CRM team have access to service and billing information but not access to a customers user account (e.g. address book data or message data). The technical support team have restricted access to message data but have no visibility of which customer the data refers to. Staff who have access to appropriate data will, as appropriate, undergo Criminal Records Bureau checks and be specially trained in the data protection issues involved.