

## redcoal EmailSMS for MS Outlook and Lotus Notes

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## 1. Overview

This document provides an overview of the redcoal EmailSMS service. It highlights the main features within the solution, explains the application architecture, reviews the business benefits of EmailSMS and covers the functionality, management and administration capabilities of the solution. It can be used by IT managers and administrators as a tool to assess the suitability of the EmailSMS service within a corporate environment.

### **1.1 Short Message Service (SMS) for businesses**

Short Message Service (SMS) is the transmission of short text messages to and from a mobile phone. Messages must contain alphanumeric characters and contain no images or graphics. Although services based on SMS have been feasible for many years, the recent mobile phone penetration and large-scale adoption of SMS by users have made the SMS a necessary medium for business communication.

### **1.2 EmailSMS solution**

EmailSMS is essentially a feature rich, convenient and cost effective way to enable reliable 2-way messaging between email users and mobile devices. It expands the capability of existing email client applications to include SMS.

EmailSMS solution provides a simple and quick way to incorporate SMS into the existing corporate email system. From this perspective, the primary benefit is the ability to use the existing email client application (such as MS Outlook, Lotus Notes, Outlook Express) with familiar interfaces to send text messages to remote mobile phones. EmailSMS is a software based solution and requires no additional hardware to be installed on the corporate network. With its web based management and administration capability EmailSMS can be quickly and seamlessly rolled out across an enterprise with virtually any number of users.

EmailSMS solution consists of the following components:

- Add in software for existing email client applications.
- Web based administration and management interface for deployment and management of the service.
- Lotus Notes EmailSMS database (emailsms.nsf).

## 2. EmailSMS Client Software

### 2.1 EmailSMS Client Features

redcoal EmailSMS enhances the functionality of MS Outlook and Lotus Notes to allow users to send SMS from their desktop to a mobile phone and receive SMS replies back to the email inbox. redcoal EmailSMS maintains the standard look and feel of Outlook or Lotus Notes and integrates smoothly with many MS Outlook or Lotus Notes features and functions. Depending on the type and version of the email client used EmailSMS provides different feature sets.

Some of the supported features are:

- Send SMS to contacts in local or global address lists.
- Send SMS to multiple destinations at a time.
- Schedule messages to be sent at a certain time and date.
- Forward incoming email via SMS to the mobile phone.
- Send SMS reminders for calendar events.
- Optimise or compress messages .

### 2.2 Integration into MS Outlook

redcoal EmailSMS integrates with MS Outlook 2000 or higher and with limited features with MS Outlook Express and MS Outlook 98. Installing the EmailSMS MS Outlook client will add the following components to the MS Outlook client:

- EmailSMS Menu Items for options, account settings and help files.
- EmailSMS toolbar buttons for sending SMS, checking of message status, adding SMS reminders and email notifications.
- Dialog boxes for service activation, SMS message preview, EmailSMS options and settings.

### Outlook COM Add-Ins

Integration of EmailSMS with MS Outlook is based on Microsoft COM Add-In technology. COM add-ins provide a secure way to develop and distribute 3<sup>rd</sup> party Outlook applications. Essentially a COM add-in is a compiled DLL that is written and registered so that Office knows how to load and communicate with the add-in. The Outlook object model allows developers to extend Outlook functionality by adding toolbar buttons to Outlook Explorer, responding to events from the Outlook Application object, adding a property page to the Tools | Options dialog box or a folder's Properties dialog box, enforcing administrative policies and adding functionality too complex to code into an Outlook form.

EmailSMS for MS Outlook can retrieve contacts and mobile phone numbers from the local contact database and from global MS Exchange contact lists.

The MS Outlook or MS Exchange contact database is accessed via the Microsoft Extended MAPI interface.

*Communication with Gateway:*

Communication between the MS Outlook EmailSMS add-in and the EmailSMS gateway is via the SOAP/XML protocol.

SOAP/XML works on top of HTTP. I.e. all communication between the client software and the gateway is via a standard Internet connection using HTTP over port 80.

redcoal EmailSMS can be configured to work with most proxy network configurations.

*Login Details:*

Upon first using the service an end-user must activate the service by providing a username and password. This information is stored in the local registry in RSA encrypted form.

*Audit Trail:*

All SMS activity is logged in XML history file stored on the local machine. Sent messages are stored in the 'Sent Items' folder in specially created subfolder.

## **2.3 Integration into Lotus Domino**

### *Integration:*

redcoal EmailSMS integrates into Lotus Domino via a separate EmailSMS database (NSF file). Users link to the EmailSMS database from their desktop via the Lotus Domino workspace. redcoal EmailSMS for Lotus allows users to select names from the Lotus Notes client local address book and or corporate domino directory (names.nsf) and resolve the selected users names to mobile phone numbers stored in the person's contact documents. Outbound SMS messages can be stored in the Sent Message folder. For further integration EmailSMS for Lotus provides templates for Notes mail components so that if organizations want to incorporate the SMS functionality into their Notes mail template they can cut and paste all the relevant design elements from this Notes template database (.ntf file) and have integrated SMS functionality. The template file includes agents that hook into the calendaring functionality of Lotus Notes for sending reminders as SMS messages to users mobile phones, as well as SMS messages for alerting of mail.

### *Communication with Gateway:*

Communication between the redcoal EmailSMS for Lotus Notes and the EmailSMS gateway is via the SOAP/XML protocol. SOAP/XML works on top HTTP . I.e. all communication between the client software and the EmailSMS gateway is via a standard Internet connection-using HTTP over port 80.

redcoal EmailSMS can be configured to work with most proxy network configurations.

### *Login Details:*

Upon first using the service end-user must activate the service by providing a username and password. This information is stored in the local registry in RSA encrypted form.

### 3 EmailSMS Service Administration

The EmailSMS web based Administration and Service Management Interface serves as the primary control tool to define messaging services and settings for every company. It allows administrator to easily add or delete users, auto-generate passwords for end user accounts, create "departments" or "cost centres" and allocate end user to these departments for combined reporting and management.

#### **3.1 EmailSMS Service Management Features.**

Service Management Interface allows for setting of the following service security and administration features:

*User Provisioning:* Service Management Interface allows account administrators to provision new users either individually or via bulk upload. Service Management auto-generates passwords and sends emails to end users with activation instructions.

*Reporting:* Service Management provides extensive reporting to the administrator for better control of the service usage. Detailed summary and transaction reports allow administrator to view SMS transactions by end user or destination number, individually or by department (cost centre).

*Daily Quota:* company wide and departmental; sets the maximum number of SMS messages that can be sent by the company in general or an individual department per day. This feature allows for better cost control of the service.

*Confirmation of handset delivery:* made via email to the sender and confirms that the message has been delivered to the receiver's handset. This feature is available for a limited number of networks only.

*Destination restrictions:* SMS message destinations can be limited to specific mobile numbers if required. Service Management allows to set these numbers within seconds and restrict mobile destinations to which the messages can be sent to.

*Split long messages:* EmailSMS allows you to optionally split long messages (longer than 160 characters) to multiple messages.

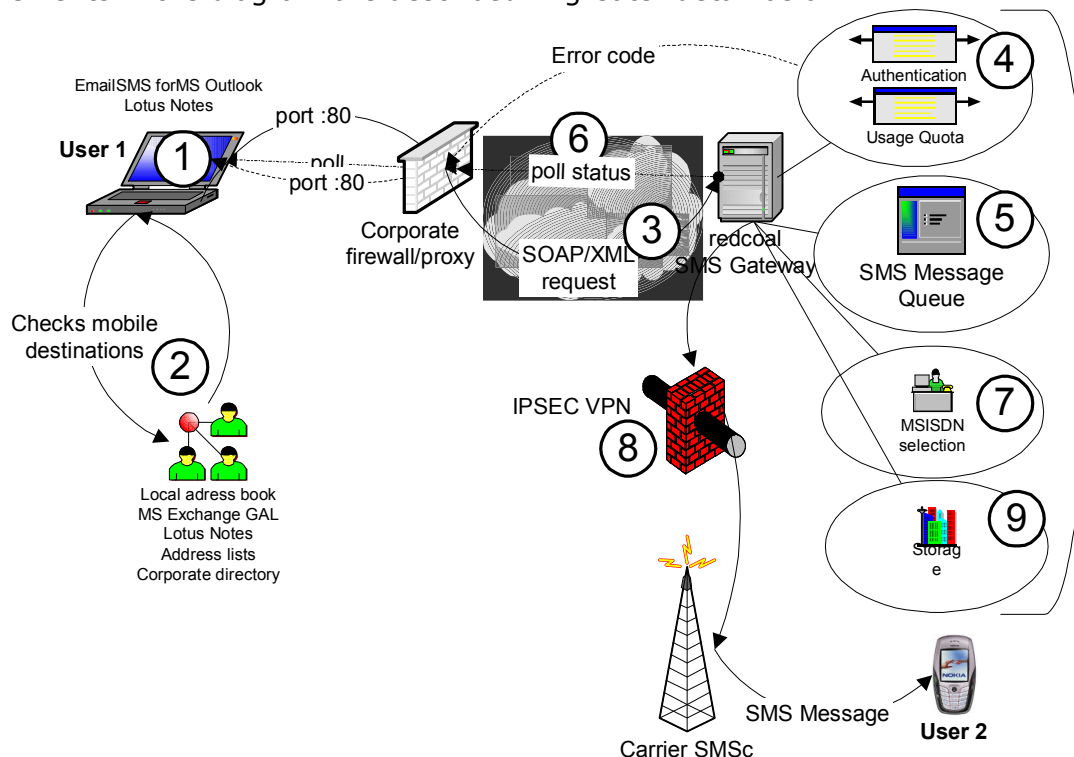
## 4. System Architecture

Unlike other email to SMS solutions that use SMTP as a transport mechanism to deliver SMS messages from email to the central gateway, EmailSMS uses SOAP/XML protocol, which provides significant benefits:

- Real time status confirmations of the SMS messages sent (delivered, failed, pending)
- No additional load on the corporate SMTP server as the SMS messages are delivered via http:80
- SOAP/XML delivers messages directly to the external gateway which is faster and more reliable way of delivering messages
- Allows for additional security and management features (message quotas, capping)

### 4.1 Message Routing Desktop to handset

The following diagram illustrates the route that a message travels between the desktop and handset. The path that the message follows, the messaging process, and the numbered elements in the diagram are described in greater detail below.



1. User 1 sends a message to User 2 from a desktop computer using MS Outlook or Lotus Notes.

2. The EmailSMS client application checks whether the contact and mobile phone number of User 2 can be found in the Lotus local address list, lotus domino corporate directory (Lotus Notes EmailsMS), MS Outlook local address book or MS Exchange global address list (GAL)



3. The EmailSMS Application issues a SOAP/XML request to the redcoal EmailSMS gateway via HTTP port 80.

4. redcoal EmailSMS verifies whether the user is authenticated for sending messages, whether the account is active and whether the mobile phone number is a valid local destination and whether no daily quota limits have been reached. If any of these checks fail then the SOAP/XML request responses with the appropriate error code.

5. The message is stored in the redcoal EmailSMS message queue with status 'PENDING'.

6. The EmailSMS client polls the gateway in regular intervals for changes to the status of the message and updates the SMS progress window.

7. From its pre-allocated pool of mobile phone numbers redcoal selects a number which ensures that a recipient's replies can be forwarded by to the sender.

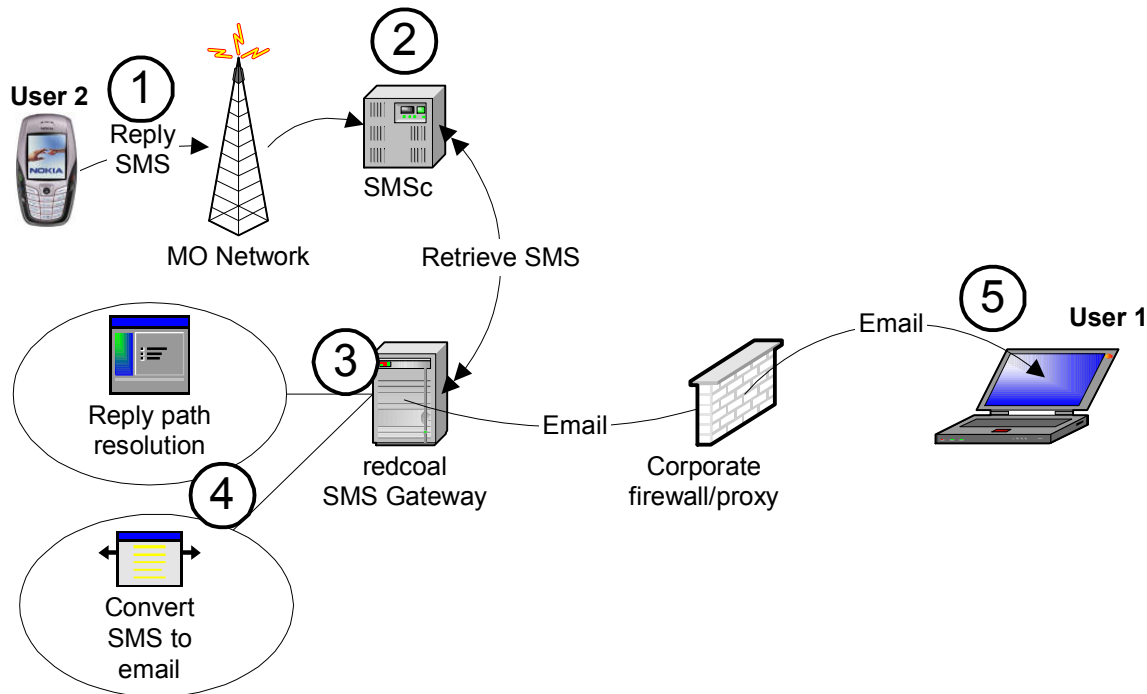
8. redcoal deposits the message with the carrier's SMS-C via SMPP over a IPSEC VPN:

- If message deposit is acknowledged by the carrier SMS-C the status of the SMS message is changed to 'OK' .
- If message deposit with the carrier fails (no acknowledgement from carrier), because the VPN is disconnected, the SMPP link is broken or the carrier SMS-C experiences an outage then the status of the message is changed to 'FAIL'. In this case redcoal SMS gateway retries to send the message up to 10 times in 2 minutes interval before the status is changed to 'ABORT'.
- If message delivery fails with status 'ABORT', User 1 (the sender) is notified via error email.

9. Messages sent to the redcoal EmailSMS gateway are stored in system databases for 3 months. Message content but not destination and sender information is stored in encrypted form.

## 4.2 Message Routing handset to desktop

The following diagram illustrates the route that a message travels between the handset and the desktop. The path that the message follows, the messaging process, and the numbered elements in the diagram are described in greater detail below.



1. User 2 the SMS message recipient hits the reply button types an SMS message and sends it off.
2. The message is sent to the carrier SMS-C
3. redcoal EmailSMS gateway retrieves the message from the carrier SMS-C and stores it in its Inbound SMS queue.
4. redcoal EmailSMS gateway performs reply path resolution and finds the correct email recipient for the message.
5. The SMS message is converted into an email message and forwarded via email to User 1's email client inbox

### **4.3 Service Activation**

Users must activate the redcoal EmailSMS upon first usage. Activation consists of accepting the end user license agreement and entering their service user name and password. Each end user is provided with his/her own unique login credentials by the account administrator or service provisioning team.

Login credentials are verified against the redcoal end user database via remote account lookup. This account lookup is based on SOAP/XML communication with the redcoal EmailSMS gateway. SOAP/XML for account verification is via secure socket layer (SSL) communication using HTTPS on port 443.

Upon successful authentication of an end user, the redcoal EmailSMS gateway returns a 16 digit serial number which identifies the end user in all subsequent communication with the EmailSMS gateway.

redcoal EmailSMS allows for 10 wrong password attempts. An account gets blocked for up to one hour if more than 10 authentication attempts fail in a certain time span.

### **4.4 Security Considerations**

#### **Integrity, Confidentiality**

SMS Messages are sent to the gateway via HTTP. Replies are sent back to the user via standard SMTP email. The company's internal network and Internet links used to transmit SMS messages to the external gateway are generally assumed to be sufficiently secure. Communication between the redcoal EmailSMS gateway and the carrier is via a IPSEC VPN. EmailSMS as a minimum matches the security levels of standard corporate email communication. With standard email, all traffic between the sender's desktop and receiver's desktop is unencrypted both ways. redcoal EmailSMS communication between the desktop and gateway is unencrypted, but all traffic between the gateway and the SMS recipient is encrypted both ways.

#### **Authenticity**

***Authentication is via SOAP requests to the EmailSMS gateway over an SSL secured Internet connection (HTTPS).***

***Users are prevented from entering more than 10 invalid login details in a row. IP addresses are logged for all login attempts.***

***Login credentials are never transmitted in SMS message dispatches. User names and passwords are stored locally on the users desktop in RSA encrypted form.***

#### **Message Content Storage**

SMS message content is stored in databases in encrypted form for three months. After three months messages are archived (encrypted) offline in secure data centers. All databases are hosted in secure server environments behind hardware firewalls as per 4.5.

### **Usage Restrictions and Abuse prevention**

redcoal EmailSMS solution provides system administrators with an effective means of managing EmailSMS users. redcoal EmailSMS enables system administrators to monitor user activity and manage all login credentials on a server. System administrators can disable individual users or groups. The main features for abuse prevention built into redcoal EmailSMS are:

- Define total daily usage quota for all accounts.
- Define daily usage quota for a specific cost center or department.
- Disable users or departments.
- Change end user login criteria.
- Restrict usage to a limited number of mobile phone destinations.
- Monitor the transactions of end users.

### **4.6 Server and Network Architecture**

redcoal servers are co-located in carrier strength environment in a 3<sup>rd</sup> party industrial data center. The servers' redundant hardware architecture allows for the elimination of a single point of failure and allows for upgrades to be performed without interrupting the network. Four independent high-bandwidth Internet connections guarantee a continuous Internet uptime.

High capacity Uninterruptible Power Supply (UPS) provides rapid switch over in the event of power outages, capable of sustaining the network until the Diesel generators kick in on-site diesel generators are capable of sustaining power during extended outages.

A combination of hardware and software based firewalls and intrusion detection systems provide high-level security for all redcoal services. Network traffic is monitored on a 24/7 basis for any signs of suspicious activity.

redcoal connects to the carrier via an IP based VPN using Cisco hardware routers.

All critical services and network components are monitored by external applications including: internet connectivity, redcoal-carrier VPN/SMPP connection, system resources, disk space, mail servers, SOAP servers and database components.

## 5. Benefits of EmailSMS client integration

Many companies have invested significantly in their email infrastructure. This investment can be further leveraged when integrated with the EmailSMS solution. Integrating SMS and email provides a number of benefits to the company, system administrators and the users.

### Company Benefits

- Leverage existing email infrastructure spend.
- Improve internal and customer communications.
- Quick solution deployment on proven platform with minimal training requirements.
- Cost control.
- Low system maintenance.

### System Administrators

- Cost control.
- Ease of deployment.
- Low system maintenance.

### Users

- Improved productivity and communications
- No new client application to learn
- Maintains the standard look and feel of Outlook and integrates smoothly with existing Outlook and Lotus Notes features and functions.
- Operates with Outlook versions 98, 2000, 2002 (XP) and 2003.
- Operates with Lotus Notes 5.0 or higher
- Sends a single or multiple SMS messages to a single or multiple recipients.
- Automatically optimizes (compresses) SMS messages using a user configurable dictionary.
- Schedules message sending and delivery.
- Receives replies to SMS messages into Outlook's Inbox. (Two-way messaging).
- Automatically sends SMS messages to the user when new e-mail is received.
- Automatically sends SMS messages to the user when reminders are displayed for Appointments, Meetings, Tasks, Contacts and Messages.
- Creates a log file of all SMS activity in XML format.

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