



***Implementing Transparent Security
for BlackBerry Users***

Solutions to automate secure BlackBerry communication with external parties

February 2008

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1 Introduction

As employees are increasingly un-tethered from the desktop, RIM's extensive line of BlackBerry devices has become one of the cornerstones of office productivity tools — regardless of industry. From routine correspondence to conducting business-critical tasks, BlackBerrys are relied upon to get the job done.

With this new way of managing electronic communication, organizations must consider how their sensitive corporate information will be kept secure and confidential in a BlackBerry environment. From protecting confidential corporate financial information, intellectual property and client data, to adhering to emerging compliance regulations, e-mail encryption has become a fundamental tool to secure data in transit.

Addressing the need to secure e-mail communications, BlackBerry users have the option to encrypt e-mails locally on the device using the BlackBerry S/MIME encryption feature or other similar approaches. While the native BlackBerry solution is secure, it does introduce several usability issues associated with client-based e-mail encryption. This document will outline these challenges and describe what approaches can help streamline the encryption process, making it simple and transparent for BlackBerry users throughout the organization.

2 The Challenges of Client-based E-mail Encryption

Client-based e-mail encryption — sometimes referred to as end-to-end encryption — occurs when e-mail messages are locally encrypted on the device (e.g., personal computer or BlackBerry) that is used to create the e-mail message. Once encrypted, the message is sent through the e-mail network for delivery to the external recipient. Upon receipt, the recipient opens the encrypted message and decrypts the contents through some form of user authentication (e.g., password).

Client-based e-mail encryption introduces several new user considerations that are not encountered when sending clear-text (un-encrypted) e-mails. Some of these considerations include:

- In order to encrypt an e-mail message for a given recipient, you must have that recipient's credentials (i.e., public key or certificate)
- Users often do not know how to obtain and store recipient encryption credentials or, worst yet, a recipient may not even have encryption credentials at all
- Encrypting a message on the client device requires CPU processing and, depending on the situation, can introduce frustrating delays as the user waits for the completion of the encryption process
- Users cannot send messages in offline mode if they do not have all the recipients certificates

The result is that client-based e-mail encryption introduces barriers that make encryption not only frustrating for end-users, but also difficult for organizations to enforce since the decision of when and what to encrypt resides with the individual user.

Another key consideration with client-based e-mail encryption relates to the IT and security managers who have content scanners deployed within their e-mail network. Since e-mails are encrypted locally on the sender's device (e.g., BlackBerry or PC), messages cannot be deciphered until they reach the intended recipient. In turn, corporate security processes such as antivirus scanning and content analysis cannot be performed on encrypted mail traffic. The result is that critical IT processes are circumvented and security policies may be breached.

Fortunately, the Entrust Entelligence Messaging Server (EMS) is designed to address these issues and dramatically simplify e-mail encryption for not only BlackBerry users, but for desktop and Web-based e-mail users as well. In addition, EMS not only automates the process for end-users, but also centralizes an organization's encryption function to ensure that corporate policies are adhered to and activity can be logged and audited from a common platform.

3 Entrust Entelligence Messaging Server Overview

As a pioneer of e-mail encryption who understands the importance of user experience and seamless technology integration, Entrust developed an e-mail encryption server designed to automate the encryption process, thus making secure communication simple for both senders and recipients. Supporting a broad range of sending and delivery options, including leveraging the capabilities of client-based e-mail encryption available on the BlackBerry, Entrust facilitates the process of sending encrypted e-mail to make it virtually identical to sending clear-text (un-encrypted) messages.

Entrust Entelligence Messaging Server is an e-mail encryption appliance that integrates into an existing e-mail infrastructure. EMS works on behalf of e-mail senders to conduct a variety of tasks traditionally performed by the end-user during the e-mail encryption process.

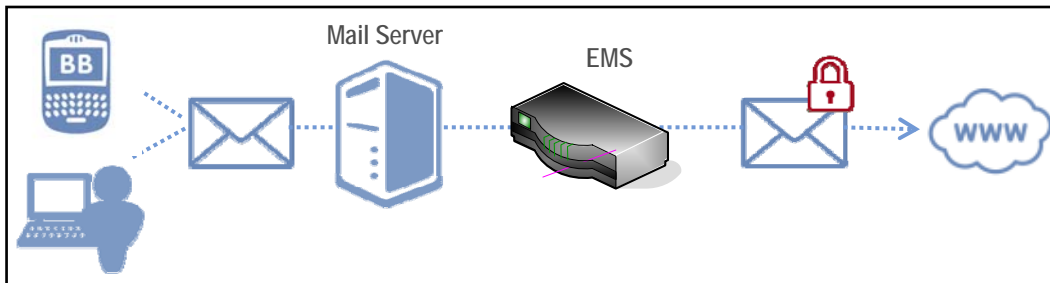


Figure 1: EMS deployed at the boundary of a corporate network

While the above diagram has been simplified to describe the solution concept, it shows how EMS can be deployed at the edge or boundary of a corporate network to handle all outbound and inbound encryption requests. In addition to streamlining e-mail encryption within the organization, EMS contains a variety of features that make e-mail encryption simple for external recipients outside of your organization.

4 Simplifying the User Experience

4.1 Certificate Lookup

E-mail encryption is based on the premise that the message must be encrypted specifically for each intended recipient. To do this, the sender must have the recipient's public credentials — encryption key, certificate, password, etc. — stored on their BlackBerry to perform the encryption process. While BlackBerry users may have access to encryption credentials for internal recipients through their corporate directory, they rarely possess credentials for external recipients and the process of sending the encrypted e-mail is stopped dead in its tracks. As seen in the following image, this user has attempted to send an encrypted message but has encountered a problem.



Figure 2: BlackBerry warning message

As noted in the image above, the message cannot be sent because the sender does not have certificates (i.e., public credentials) for the intended recipients. When a user encounters such warning messages, they must now manage the manual process of contacting the recipients — either through a separate, unsecured e-mail or through a phone call, etc. — to request the required credentials. While frustrating and often confusing for senders, the business process stops and productivity is compromised. Senders may have to wait several hours — or perhaps even several days — until they receive each recipient's certificates. In fact, there is the real possibility that the intended recipients do not even possess encryption credentials, making it impossible to send the message securely.

While some users may have the discipline to acquire recipient certificates and send the encrypted e-mail at a later date, others, in their frustration and need to keep business moving, may choose to reverse their decision to encrypt the message and send the sensitive information in clear-text format. The result? At best productivity and communications are slowed down; at worst, your organization may knowingly be violating regulatory legislation by compromising corporate or client information and risk severe financial loss and public trust.

Users who have deployed the BlackBerry S/MIME feature capability on their device can use Entrust EMS to act as an “encryption assistant.” EMS operates on the sender’s behalf to automatically execute all steps involved in delivering an encrypted e-mail to an external recipient. Once EMS is deployed in the organization, users select the “encrypt for EMS” feature on their device; from that point forward, sending encrypted e-mails is seamless. Users simply create e-mail messages, identify the intended recipients in the “to” and “cc” fields and select the “Send Encrypted” function. E-mails will be encrypted specifically for EMS, which then executes a number of tasks to get the message securely delivered to all recipients.

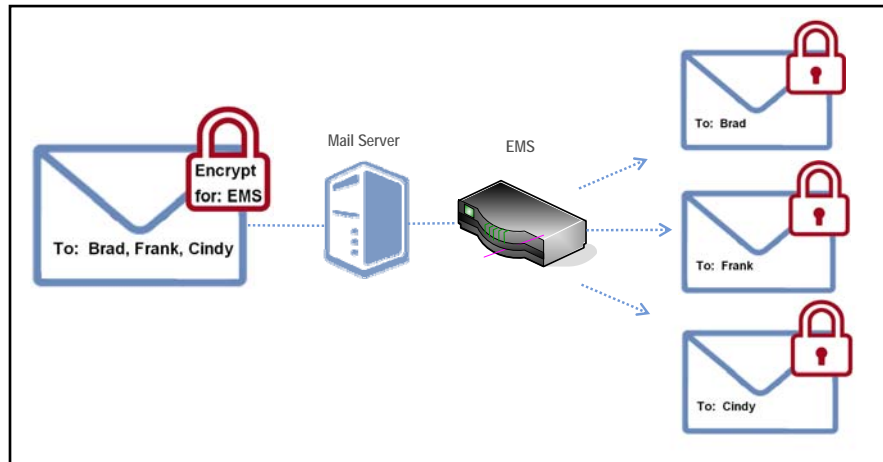


Figure 3: An encrypted message sent to three recipients via EMS

Once received, EMS first attempts to harvest encryption credentials from all the intended recipients. In a case where recipients do not have credentials, EMS automatically sets up secure message delivery capabilities to ensure all recipients can receive the encrypted message. Once credentials are in place, EMS encrypts the message for the various recipients according to their individual encryption capabilities and delivers the message securely. The result is that encryption has been dramatically simplified for the BlackBerry users using a centralized e-mail encryption gateway that automates and logs all encryption activity.

4.2 Sending Encrypted Messages Offline

Mobile users frequently encounter situations when they are not connected to the network, such as when they are on an airplane or in vicinities where network coverage does not exist. One of the primary benefits of mobile computing, however, is to be able to execute basic tasks such as creating e-mails in offline mode and having them automatically delivered when a network connection is re-established.

Sending encrypted e-mail can be difficult to use when offline because the sender's client software must have all the recipient credentials stored locally on the device; if certificates are not available, the e-mail cannot be sent and the user is forced to wait until they are connected to the network to retrieve certificates, or will often take the path of least resistance and revert to unencrypted e-mail.

Unfortunately, in order to avoid the dialog box warnings, this often encourages the sender to stop using encryption in the future. With the EMS credential stored locally on their device, offline BlackBerry users simply compose the e-mail, encrypt the message for EMS and send it to the “outbox.” When the user re-connects to the network, all messages in their outbox — both clear-text and encrypted — are transmitted through the network. Encrypted messages are intercepted by EMS server, which, in turn, proceeds with the certificate lookups, encryption and message delivery to all recipients as outlined in the previous section.

4.3 Offloading Message Encryption

Another consideration of encrypting e-mail locally on the client is the processing required to actually encrypt the message. Encrypting an e-mail involves running the text and associated attachments through a specific process that uses the recipient’s public key to cipher (i.e., encrypt) the message.

Consider a use case where a new e-mail message contains attachments and is addressed to a number of recipients. Since the encryption process for the message must be cycled for each individual recipient and takes longer based on message size, the message encryption process can introduce significant delay in completing the sending process. This delay can lead to user frustration and potentially cause them to avoid encryption in the future. With EMS, a high-speed e-mail encryption experience is introduced as the message is encrypted only for EMS, which, in turn, handles all encryption for the entire list of recipients, thereby offloading this process for the client.

In the end, with EMS deployed, secure e-mail becomes simple for users and allows them to communicate securely with virtually anyone, from anywhere — all while protecting sensitive data. The following table summarizes the various tasks that EMS will execute on behalf of the sender to dramatically simplify the e-mail encryption experience.

Function	Description
Determine Delivery Type	EMS will verify if the recipient is currently in the directory and, if so, will send the message in the preferred delivery method. EMS also can be programmed to enforce a delivery type based on customizable policies.
Harvest Existing Recipient Credentials	EMS will notify new recipients (i.e., not listed in the EMS directory) that a secure e-mail is waiting for them and will request their S/MIME or OpenPGP credentials.
Store Recipient Credentials for Shared Use	Once EMS receives a user’s credentials, it will store them in a local directory and make use of them for all future outgoing encrypted e-mail from any user within the organization.
Set Up Encryption Capabilities for Recipients without Encryption in Place	For recipients who do not have credentials, EMS can automatically generate an S/MIME certificate or set up secure delivery via Web mail pull or Web mail push. ¹

¹ For a complete description of Web mail pull and Web mail push, please see the Entrust “Secure E-mail Tutorial” at <http://www.entrust.com/entelligence/tutorial.htm>.

Encrypt and Deliver Messages to Recipients	EMS will handle the encryption process using the recipient's credentials and send the e-mail on for delivery.
Notify Sender of Delivery Issues	EMS will notify the sender, based on system configured parameters, when e-mails are not delivered to end-users.
Logging of Encryption	EMS logs all encryption activity providing corporate administrators with a centralized, auditable and enforceable encryption system

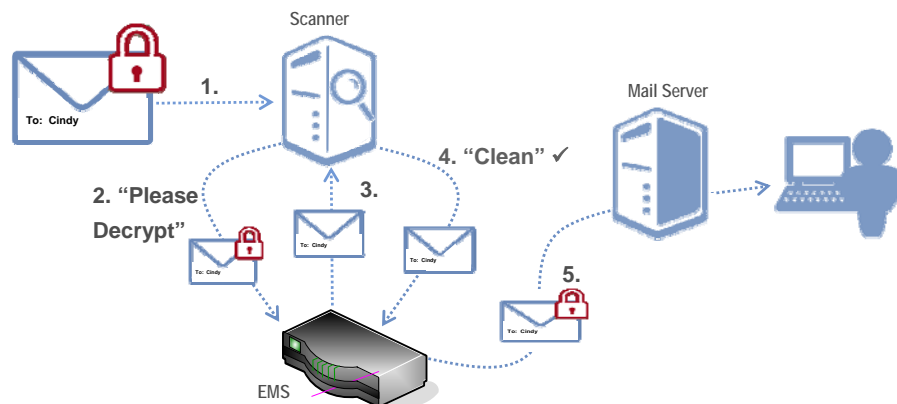
EMS supports a broad set of capabilities for other type of e-mail users/senders beyond the BlackBerry device, including PC-based environments such as Microsoft Outlook, Lotus Notes or even environments with an in-house, Web mail solution.

5 Virus- and Content-Scanning Encrypted E-mail

In addition to end-user considerations, organizations must also consider the impact that encryption may have on their existing e-mail security processes, such as virus- and content-scanning. The challenge manifests itself in that encrypted data is unreadable; to both man and machine, an encrypted message is nothing but a series of random characters. To that end, scanning applications that look for pre-defined message content such as word, numbers or virus patterns, or even file types would never detect a “match” within an encrypted message.

Without the ability to scan encrypted e-mails, organizations cannot identify and block viruses, malicious code or perhaps sensitive information that may be contained in e-mails. Content-scanning is a fundamental element of e-mail processing with organizations and, unfortunately, client-based e-mail encryption negates the ability for this process to occur ... or does it?

As described in the proceeding section, BlackBerry users who have the “Encrypt for EMS” feature enabled on their device have all their outgoing encrypted messages processed by EMS. One of the capabilities of EMS is the support of “Plain Text Content Scanning.” This feature provides tight integration with scanning applications by temporarily decrypting e-mail messages to allow scanning of the message prior to re-encrypting and sending them to their final destination. In the following diagram, we see how an outgoing encrypted message can be processed effectively by the scanner while maintaining the security of the e-mail message.



Step 1: The process begins when an outbound encrypted message arrives at the content scanner

Step 2: The content scanner identifies that the message is encrypted and, based on predefined routing rules, forwards* encrypted message to EMS for decryption

Step 3: EMS decrypts the message and forwards it to the content scanner for analysis

Step 4: Once the message is appropriately scanned — assuming the message is “clean” and no policy violations have occurred — the content scanner forwards the message back to EMS

Step 5: At this point, the message is then re-encrypted by EMS and sent to the intended recipient(s)

**Note: The connection between the EMS server and the content scanner can be encrypted with SSL if desired.*

With the ability to now deploy e-mail encryption alongside content-scanning, IT managers, security officers and compliance personnel no longer have to choose between encryption or virus-scanning, but can safeguard communication against the multitude of security threats that exist today.

6 Summary

As BlackBerry usage continues to increase, concerns about keeping information sent to and from these devices confidential will become a priority for more and more organizations. While securing the information itself is a key priority, ensuring the process is simple for internal users and external recipients is equally important. Deploying an e-mail encryption appliance such as the Entrust Entelligence Messaging Server cannot only help make e-mail encryption easy for all users, but also provides organizational managers with the capability of deploying a centralized e-mail encryption solution and will help ensure information security policies are automatically enforced and auditable.

7 About Entrust

Entrust [NASDAQ: ENTU] secures digital identities and information for consumers, enterprises and governments in 1,700 organizations spanning 60 countries. Leveraging a layered security approach to address growing risks, Entrust solutions help secure the most common digital identity and information protection pain points in an organization. These include SSL, authentication, fraud detection, shared data protection and e-mail security. For information, call 888-690-2424, e-mail entrust@entrust.com or visit www.entrust.com.