Mobile Email Requirements

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Open Mobile Alliance

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1. Scope (Informative)

Mobile e-mail is defined as a e-mail service optimized to support e-mail usage in mobile devices and mobile networks. This document describes various use cases to illustrate key mobile e-mail usage patterns and will also provide a comprehensive set of high level requirements that can be derived from the use cases. High-level requirements can be used as a basis for more detailed architecture definition work.

Use cases and high level requirements are defined and described in a technology agnostic way and as such no specific technology implementation is suggested.

This Requirements Document focuses on requirements for the enabler specifications rather than for particular implementations of those. Whether the described features are optional or mandatory for implementations will be decided at a later stage.

2. References

2.1 Normative References

[RFC2119] "Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL:http://www.ietf.org/rfc/rfc2119.txt

[Privacy] OMA Privacy Requirements for Mobile Services: OMA-RD-Privacy-V1_0-20030827-D

http://www.openmobilealliance.org/ftp/PD/OMA-Privacy-V1_0_0-200310827-D.zip

[RFC2822] "IETF Internet Message Format"

(http://www.ietf.org/rfc/rfc2822.txt)

[RFC2045] "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies

(http://www.ietf.org/rfc/rfc2045.txt)

2.2 Informative References

3. Terminology and Conventions

3.1 Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except “Scope” and “Introduction”, are normative, unless they are explicitly indicated to be informative.

3.2 Definitions

Mobile E-Mail	Enabling technologies that facilitate end-to-end application level interoperable e-mail transactions (e.g. submission, retrieval, notification etc) to and from mobile devices.
E-Mail Events	Changes to the status of an e-mail (e.g. read/unread, flagged, deleted, etc…) that result for example from reading, moving, deleting etc an e-mail. They may be server or client side events depending on where the change takes place
Email Message	A sequence of data containing a Header and optionally: A Body, Meta data Email Message Headers and Bodies are defined in [RFC2822] "Internet Message Format"
Header	A sequence of lines of characters whose syntax includes a field name followed by a colon (":") and followed by a field body. Mandatory Headers included in e-mails are 'To:' and 'From:' Headers can also include additional custom end-to-end message headers Source: IETF [RFC2822] "Internet Message Format".
Body	A body consists of one or more parts that follow the header. A body could include a combination of some or all of the following: [RFC2822] defined plain text parts [RFC2045] defined MIME parts, e.g. inline multimedia content (e.g. SMIL, HTML) Attachment(s)
Attachment	A special body part within the message body. Attachments can be displayed in-line or separately based on the indicated presentation semantic, e.g. graphics or word processing files.
Meta Data	Machine-generated attributes applied at delivery time appearing in [RFC2822] header fields. Examples include "RESENT" header field, Message Context (voicemail, email, MMS, SMS) and Processing Rules results.
Filtering Rules	A set of actions and conditions where the conditions are evaluated to determine what e-mail events and what e-mail notifications should be sent from the client to the server or the server to the client. They also include rules to select what new e-mails should be delivered from the server to the mobile client. This may be based on several criteria like subject, date, sender, folder where it is located etc…
Processing Rules	Actions and conditions that are applied on new e-mail. They include: spam prevention, filtering rule, antivirus processing and other scans, attachment removal
Server to Client Notification	A means by which the server informs the client of status changes, e.g. a new message has arrived.

3.3 Abbreviations

OMA	Open Mobile Alliance

4. Introduction (Informative)

4.1 Overview

This section describes the challenges associated with the Mobile E-mail enabler.

4.1.1 Main Expectations

The main expectations for mobile e-mail are:

- To receive quasi-instantaneous notification of new e-mails when within coverage (if setup this way)
- To reflect quasi-instantaneously new e-mail or e-mail server events in the mobile client when within coverage
- To send quasi-instantaneously e-mail composed on mobile client from appropriate e-mail server when within coverage or as soon that coverage is established otherwise.
- To efficiently manipulate e-mails / drafts / attachment as needed or as preferred
- End-to-end secure when needed (e.g. e-mails may at no point be in clear outside of the enterprise domain)
- Low or at least bearable cost of usage (e.g. traffic / bandwidth optimization, predictable cost, manageable traffic, ...)

Note that the notion of quasi-instantaneous refers to the impression of the user and not to a particular precise duration: the user has the feeling that something happens in a way that is quasi-instantaneous. This may be equivalent to some desktop user experience or sometimes be faster or slower than desktop. That is not important as the user can usually not compare. On the other hand, some overall behavior clearly violate this principle (e.g. if the client waits for the user to "browse" its mailbox with a client to download the headers or even the whole messages).

4.1.2 Additional Considerations

The following considerations are also related to mobile e-mail:

- Need for graceful degradation and server-to-client notifications (that client can display instead if acting on and that informs the user).
- DRM rules: how to respect DRM rules like forward lock.
- Provisioning / setup: These are extremely challenging on mobile devices with limited or challenging input capabilities. Also average users are more easily confused and unable to correctly setup mobile phones.
- Charging: Operator want to maintain charging to create a viable business model. The support of charging will help the spread and proliferation of mobile email.
- Synchronization with other clients.
- Relationship to PIM (agenda / Address Book) that may be provided jointly or separately.

4.1.3 Main Actors

The main actors are:

- User
- Vendors
- Operators of the mobile network

- E-mail service providers:
  - Service providers (e.g. Operators, other e-mail server providers)
  - Enterprises

4.2 Challenges

4.2.1 Devices

Devices present the following challenges that directly impact mobile e-mail:

- Constrained memory / processing power (always improving):
  - Wide range to support
- Limited battery life (will remain a problem for a long time):
  - Constrains processing capability
  - Constrains the connectivity patterns (not always fully connected but may be awaken via outband notifications...)
    - > Notifications / wake-up are to be supported by mobile e-mail
  - Constraints acceptable bandwidth
- Exotic platforms:
  - Sometimes proprietary or closed
  - Challenging or controlled software distribution channels:
    - > Installing, provisioning, supporting, upgrading,...
      - E.g. DRM trusted clients
    - > Wide range of control models by:
      - device manufacturer, operator, enterprise, user

4.2.2 Networks and operators

Mobile networks and operators impose additional constraints that must be taken into account when designing mobile e-mail solutions:

- Different underlying network technologies / bearers with different behavior / capabilities
- Intermittent connectivity:
  - Loss of coverage
  - Nature of mobility (e.g. radio turned off in planes)
  - Temporary IP addresses
  - Unreliable delivery (Connection)
  - Underlying network layer (up to transport) may drop at any time. Even if then re-established, sessions at the transport level are maintained only if the transport protocol provide mechanisms to maintain it when the network connection is re-established. Otherwise, additional mechanisms are needed at the application protocol layer to establish and maintain/recover session if a session is needed or assumed.
  - Out band notification schemes:
    - > Unreliable
    - > But can be used as "wake up / notification scheme"
  - Limited bandwidth:

        - Limited capabilities shared across all users
        - Roaming within and across domain / operators / technologies
    - Cost of usage:
        - Multiple cost models (free, unlimited, per packet, per service / type of service, ...)
        - In general, ... Costly and in need of optimization to maintain cost acceptable enough to user and to allow operator to share network with enough users.
    - Controlled:
        - Walled garden:
            - Inbound and outbound traffic
            - Internal traffic
        - With it's own authentication mechanisms etc…
    - Regulated:
        - QoS
        - Privacy
        - Exchanged data
        - Reachability
        - Logging
        - Accountability,
        - Support desk (inexperienced users, hard to provision)

    - Huge subscriber sets
        - Server scalability is critical (e-mail server / mobile e-mail enabling server
            - Solutions that tie-up ports per devices / user are not scalable
                - e.g. IDLE sessions for each devices tie-up ports and create large queues.
        - Support desk challenges

4.2.3 Enterprises and other e-mail service providers

Enterprises must reconcile mobile e-mail deployments with the following requirements:

- Walled garden intranets:
    - Firewalls, VPN, ...
- IT Corporate security guidelines:
    - Wide range - in general VERY conservative e.g.
        - Require end-to-end security
        - Allowed applications / usages / content
        - Firewalls / ports / protocols
            - (e.g. only HTTP or HTTPS; no SSL/TLS)
        - No storage of company data outside intranet on defined servers (in clear or not). Current e-mail infrastructure with untraceable potential intermediate storage is accepted.
- Regulated:
    - E.g. Journaling / Storage of all corporate e-mails
- Control usage costs and support (including provisioning)

- Need to integrate with existing IT infrastructure (instead of replacing them).
- Similar scalability need of email servers / mobile email enabling servers.

4.3 Security Considerations

The mobile email enabler must address the security issues raised by the different deployment models identified above. In particular, it must be able to fulfill the high levels of security that the enterprise environment demands while being flexible to adapt to environments that do not require such high levels of security. Security considerations shall be made on the following non exhaustive list of areas:

- User data confidentiality and integrity
- End-to-end security
- Secure notifications
- Firewall traversal
- Protection against malicious use of e-mail (e.g. virus propagation)
- Protection against unsolicited messages (e.g. SPAM)
- No mandated storage (clear or encrypted) of e-mail in transport network

5. Use Cases (Informative)

5.1 Use Case P2P / CORP, Receiving an E-mail on the go

5.1.1 Short Description

An e-mail arrives at the e-mail server of a mobile worker. The client on the terminal is made aware of the new email without excessive delay (based on preferences) and in a secure manner via notification or by fetching the event. We denote this as an event. Based on the preferences of the user, the event is made available to the user or the client that, once authenticated securely, accesses the new e-mail or portions of it as needed (e.g., header, few first Kbytes, whole body without attachment or whole e-mail). The mobile user experience of delay appears negligible (quasi-instantaneous) and they are at least comparable to desktop email. Events may include sending portion or all of the e-mail; in which cases, no separate access step takes place. In addition, the client may receive the event (a la notification) or fetch it. The use case is general enough not to pre-suppose a technology solution.

5.1.2 Actors

- The user of mobile e-mail (e.g. employee)
- The owner of the e-mail server (e.g. enterprise)

5.1.2.1 Actor Specific Issues

- The user of mobile e-mail:
  - To receive new email (as desired as notification or full e-mail) as soon as possible and in ways that appear quasi-instantaneous (i.e. as soon as possible after the e-mail server receives the e-mail).
  - To have his client react on the event as set by preferences and based on the type of event
  - To be able to set preferences so that:
    - E-mail are automatically accessed and stored (in totality)
    - Portions of the e-mail are accessed, e.g.:
      - Information about the email (e.g. header, subject, sender, date, …)
      - A certain size
      - Everything but attachments
    - User may manually ask to access more of the e-mail (as above in whole or in parts) if it has not already been totally stored in the client
    - E-mail can be accessed when online or offline, e.g.:
      - Browsing WAP / browsing
      - Secure MMS /SMS actionable exchanges
      - On the device when out of radio coverage
      - Voice
- The owner of the e-mail server:
  - To allow users to set preferences on what to do when a new email is received
  - To generate an event to inform the user / user client of the new e-mail according to user preferences
  - To deliver email to the user according to the user preferences
  - To deliver the email in a manner is end-to-end secure
  - To allow the client / user to react accordingly to access and possibly download the e-mail as specified by the user preferences (and possible server settings).

5.1.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - Immediate notification or delivery of new e-mail according to preferences
  - Can immediately act on the e-mail
- The owner of the e-mail server:
  - Enterprise:
    - Increase in responsiveness of employees
    - Increase in productivity
  - Service provider:
    - Can provide secure “push e-mail” experience and service to its customers

5.1.3 Pre-conditions

- The user of mobile e-mail:
  - Has an account with e-mail providers
  - Has a device with a client able to receive / access new e-mail events
  - Support settings / preferences from the users or has hard coded ways to:
    - Receive or access events
    - Access and possibly download e-mail
  - Client is appropriately configured
  - Account is appropriately configured
- The owner of the e-mail server (E.g. enterprise)
  - User has account
  - User preferences that affect the server are known
  - Knows how to provide access to events, e.g.:
    - what device
    - device address
    - etc…

5.1.4 Post-conditions

- User is aware of the new e-mail (to the extent set by his or her preferences) and has or can access it.

5.1.5 Normal Flow

1) E-mail arrives in e-mail server (goes in inbox)
2) E-mail server generates an e-mail event
   - This (and next step) may be based on user preferences / settings that influence how the event is generated
3) E-mail event is made available to the e-mail client:
   - Via notification
   - Or by making event available for access by the client (e.g. for retrieval by the client)

4) Client reacts to the event possibly based on the preferences of the user (e.g. vibrate to announce event, display email sender / subject in inbox etc…)

5) Clients checks preferences of the user

6) Client access the e-mail and download the e-mail as specified by the settings / preferences

7) E-mail is downloaded in whole or in part (depending on settings or preferences)

8) User can read / manipulate the e-mail.

5.1.6 Alternative Flow

1) Step 3 may be skipped if the client performs traditional access to e-mail in the meanwhile (i.e. e-mail synchronization between client and server using appropriate e-mail protocol (e.g. IMAP4rev1, POP3, webdav, …). For example, this could take place after establishing a de3dicated connection with server (e.g. LAN or dial-up)).

2) Step 5 may be skipped if the client behaviour is hard coded (e.g. settings of client)

3) At step 6, the user may manually act on the event (to download, browse, ignore)

4) Step 7 may be replaced by graceful degradation to e-mail via browsing, messaging or voice as discussed above (step 6/7 combined). As a result, the e-mail may not be available offline at the difference of the other situations.

5) Step 7 may be iterated when the user wants to download more parts of an e-mail.

6) Step 7 may consist of downloading the whole body but not the attachment.

7) Steps 5, 6 and 7 may be skipped if the event provides enough information about the e-mail to the user.

8) Step 3 may be secure end-to-end or not (based on settings or preferences)

9) Step 6 and 7 may be end-to-end secure or not (based on settings or preferences)

10) Steps 3 and after may be delayed is device is not online

5.1.7 Operational and Quality of Experience Requirements

- Delays should be transparent to the user who should have the impression that the e-mail or event arrives as soon that the e-mail arrives to the e-mail server
- Events and access should be secured or at least securable if desired by user, e-mail server owner or settings of the client
- The flows above should work with e-mail server behind a firewall
- The flows above should be supported on any target network technology including 2.5G, 3G and WLAN
- The solution should be able to handle devices that are temporary offline.

5.2 Use Case P2P / CORP, Receiving a e-mail server event on the go

5.2.1 Short Description

An e-mail event takes place on the server. For example:

- An e-mail is deleted (e.g. via another client)

- A folder is created
- An e-mail is moved to a new folder
- An e-mail status is changed (read, unread, flagged, “has been replied to”, “has been forwarded to”, …)

The client on the terminal is made aware of the event without excessive delay (based on preferences) and in a secure manner. Based on the preferences of the user (e.g. are deletions or moves on the server to be reflected on the clients, are folder structures beyond inbox present on the client etc…), the event is made available to the user or, the client reflects the event. The mobile user experience of delay appears negligible (quasi-instantaneous) and they are at least comparable to desktop email.

5.2.2 Actors

- The user of mobile e-mail (e.g. employee)
- The owner of the e-mail server (e.g. enterprise)

5.2.2.1 Actor Specific Issues

- The user of mobile e-mail:
  - To receive server events as soon as possible and in ways that appear quasi-instantaneous (i.e. as soon as possible after the event takes place on the e-mail server).
  - To have his client react on the event as set by preferences:
    - Typically without informing the user unless if a conflict must be manually resolved or an action must be checked by the user
- The owner of the e-mail server:
  - To generate an event to inform the user / client of the server event.
  - To make available that event in a manner that is end-to-end secure, e.g.:
    - Via notification (options for that will be discussed later)
    - By making the event available for access by the user / client
  - To allow the client / user to react accordingly as specified by the user preferences (and possible server settings).

5.2.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - Immediate reflection of server side events
- The owner of the e-mail server:
  - Enterprise:
    - Increase in responsiveness of employees
    - Increase in productivity
  - Service provider:
    - Can provide secure “push e-mail” experience and service to its customers

5.2.3 Pre-conditions

- The user of mobile e-mail:
  - Has an account with e-mail providers

  - Has a device with a client able to receive / access new e-mail events
  - Support settings / preferences from the users or has hard coded ways to:
    - Receive or access events
    - How to act on the events
  - Client is appropriately configured
  - Account is appropriately configured
- The owner of the e-mail server (E.g. enterprise)
  - User has account
  - User preferences that affect the server are known
  - Knows how to provide access to events, e.g.:
    - what device
    - device address
    - etc…

5.2.4 Post-conditions

- Client reflects the server event (to the extent set by his or her preferences).

5.2.5 Normal Flow

1) E-mail server event takes place (e.g. e-mail is deleted from another client)
2) E-mail server generates an e-mail event
   - This (and next step) may be based on user preferences / settings that influence how the event is generated
3) E-mail event is made available to the e-mail client:
   - Via notification
   - Or by making event available for access by the client
4) Client reacts to the event possibly based on the preferences of the user (e.g. vibrates)
5) Clients checks preferences of the user
6) Client reflects the event as specified by the settings / preferences
7) User can see impact of event on mobile e-mail repository.

5.2.6 Alternative Flow

1) Step 3 may be skipped if the server knows that the preferences of user or settings of the client are such that the event will not be acted upon or if the client performs traditional access to e-mail in the meanwhile (i.e. e-mail synchronization between client and server using appropriate e-mail protocol (e.g. IMAP4rev1, POP3, webdav, …). For example, this could take place after establishing a de3dicated connection with server (e.g. LAN or dial-up)).
2) Step 5 may be skipped if the client behaviour is hard coded
3) At step 6, the user may intervene to confirm or resolve conflict/uncertainties on the action to take in answer to the event
4) Step 3 may be secure or not
5) Steps 3 and after may be delayed is device is not online

5.2.7 Operational and Quality of Experience Requirements

- Delays should be transparent to the user who should have the impression that event arrives as soon that the events occurs on to the e-mail server
- Events should be secured (e.g. encrypted) or at least securable if desired by user, e-mail server owner or settings of the client
- The flows above should work with e-mail server behind a firewall
- The flows above should be supported on any target network technology including 2.5G, 3G and WLAN
- The solution should be able to handle devices that are temporary offline.

5.3 Use Case P2P / CORP, Viewing e-mails attachments on the go

5.3.1 Short Description

The user views attachments in ways adapted to his or her device.

5.3.2 Actors

- The user of mobile e-mail (e.g. employee)
- The owner of the e-mail server (e.g. enterprise)

5.3.2.1 Actor Specific Issues

- The user of mobile e-mail:
  - To be able to view attachments on a mobile devices, adapted as needed to the device form factor and viewer capabilities
- The owner of the e-mail server:
  - To allow users to view attachments
  - To adapt attachments to the needs of the device used by the user

5.3.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - View attachments received with e-mail
- The owner of the e-mail server:
  - Enterprise:
    - > Increase in responsiveness of employees
    - > Increase in productivity
  - Service provider:
    - > Can provide its customers with the capability to handle attachments on their devices (e.g. view, download, edit, forward, save). As needed these attachments may first be adapted to the device characteristics and capabilities

5.3.3 Pre-conditions

- The user of mobile e-mail:
  - Has an account with e-mail providers
  - Has a device with a client able to access / view attachments
  - Support settings / preferences from the users or has hard coded ways to handle attachments
  - Client is appropriately configured
  - Account is appropriately configured
- The owner of the e-mail server (E.g. enterprise)
  - User has account
  - User preferences that affect the server are known
  - Knows how to provide adapted attachments, e.g.:
    - what device
    - device address
    - device characteristics (form factor) and document viewing capabilities
    - etc…

5.3.4 Post-conditions

- User can view the attachment on the devices

5.3.5 Normal Flow

1) An email with attachment arrives on the server for the user
2) The email is handled as described in section 5.1
3) Following 5.1, E-mail is been downloaded, but attachment has not
4) User selects to view the attachment.
5) Client requests to download the attachment
6) E-mail server adapts the attachment to
   - Device form factor
   - Viewer capabilities
7) Client downloads attachment
8) User views attachment

5.3.6 Alternative Flow

1) The steps 5 to 7 may take place at step 3 if set so by user preferences or client settings
2) Steps 5 to 7 may be replaced by a request from the user to browse the document. In such case, the server adapts the document to the device form factor and browsing capabilities. As a result, the attachment may not be available offline.
3) Step 7 may be take multiple iterations (where only portions of the attachment would be downloaded till the user requests for more).

4) Steps 2 and after may be delayed if device is not online

5.3.7 Operational and Quality of Experience Requirements

- Exchanges should be secured (e.g. encrypted) or at least securable if desired by user, e-mail server owner or settings of the client
- The flows above should work with e-mail server behind a firewall
- The flows above should be supported on any target network technology including 2.5G, 3G and WLAN
- For quality of the user experience, while downloading attachment, the client should provide indication of the download and if possible it should provides estimates of the time needed to download.
- The solution should be able to handle devices that are temporary offline

5.4 Use Case P2P / CORP, Sending e-mails on the go

5.4.1 Short Description

An e-mail is composed by a mobile worker. Upon selecting to send the e-mail, it is immediately securely sent from the e-mail server of the user (and not another server, e.g., operator provided SMTP server). A mobile user composes a mobile e-mail. The composition of an e-mail can include editing desired messages, attaching various files, re-editing any saved drafts, and so forth. After choosing to send the e-mail, it is uploaded on the e-mail server of the user and immediately and securely sent from the server. (and not another server, e.g., operator provided SMTP server).

5.4.2 Actors

- The user of mobile e-mail (e.g. employee)
- The owner of the e-mail server (e.g. enterprise)

5.4.2.1 Actor Specific Issues

- The user of mobile e-mail:
  - To be able to send e-mails from mobile devices
- The owner of the e-mail server:
  - To allow users to send e-mail in a secure manner from the owner e-mail server

5.4.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - Can send e-mail while mobile
- The owner of the e-mail server:
  - Enterprise:
    - > Increase in responsiveness of employees
    - > Increase in productivity
    - > Send e-mail from e-mail server / corporate domain. This is important for:
      - = Audit / logging
      - = To control / monitor e-mail sent by employees
      - = To certify source of e-mails

= To satisfy legal requirements

- Service provider:
  - > Can provide secure ways to send e-mail its customers

5.4.3 Pre-conditions

- The user of mobile e-mail:
  - Has an account with e-mail providers
  - Has a device with a client able to compose and send e-mails
  - Has a device with applications which can create, manipulate, and attach various attachments.
  - Client is appropriately configured
  - Account is appropriately configured
- The owner of the e-mail server (e.g. enterprise)
  - User has account
  - User preferences that affect the server are known

5.4.4 Post-conditions

- E-mail sent by user has been sent from the e-mail server (located in appropriate domain)

5.4.5 Normal Flow

1) User completes composition of an e-mail on mobile client, which includes:
   - Editing a new desired message
   - Attaching various files (document files, media files, fully or not fully downloaded files, etc.)
   - Re-editing the saved draft
2) User selects to send the e-mail
3) Client connects with e-mail server and uploads the e-mail
4) E-mail is sent from e-mail server
5) E-mail may be saved in a sent folder (based on preference of user or behaviour/settings of e-mail server)
6) Sent e-mail in sent folder is reflected in e-mail sent folder as in 5 (based on preference of user or behaviour/settings of e-mail server).

5.4.6 Alternative Flow

1) Step 1 may be subject to DRM rules.
2) Step 7, may change with the e-mail saved from the client reconciled with the server as in 5.5. Other flows may be considered.
3) The steps 5 to 6 may each be skipped if the user does not want to save sent e-mail; that it be on the server or on the mobile client
4) Steps 3 and after may be delayed is device is not online. Based on settings or preference the e-mail can be queued and sent as soon that the connectivity is re-established or the user may be prompted to confirm desire to send them.

5.4.7 Operational and Quality of Experience Requirements

- Exchanges should be secured (e.g. encrypted) or at least securable if desired by user, e-mail server owner or settings of the client
- The flows above should work with e-mail server behind a firewall
- The flows above should be supported on any target network technology including 2.5G, 3G and WLAN
- The solution should be able to handle devices that are temporary offline

5.5 Use Case P2P / CORP, Filtering rule changes while mobile

5.5.1 Short Description

While mobile, a user can change filtering rules that specify what, when and how e-mails arriving at the e-mail server or e-mail server events must be reflected or sent in the mobile client.

5.5.2 Actors

- The user of mobile e-mail (e.g. employee)
- The owner of the e-mail server (e.g. enterprise)

5.5.2.1 Actor Specific Issues

- The user of mobile e-mail:
  - To be able to change while mobile what e-mail are to be sent/reflected to the client
  - To be able to change while mobile what events should be sent to the client
  - To be able to change while mobile what events should be immediately sent to the client and what event can wait other scheduled synchronization between the client and the e-mail server
- The owner of the e-mail server:
  - To support changes while mobile of filtering rules on e-mail / folder
  - To support changes while mobile of filtering rules on events / notifications

5.5.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - Can change while mobile filtering rules on e-mails seen on mobile client
  - Can change while mobile filtering rules on events sent to client (which ones and when)
- The owner of the e-mail server:
  - Enterprise:
    - > Increase in responsiveness of employees
    - > Increase in productivity
  - Service provider:
    - > Supports filtering rules
    - > Can provide management of filtering rules from mobile device to its customers

5.5.3 Pre-conditions

- The user of mobile e-mail:
  - Has an account with e-mail providers
  - Has a device with an appropriate e-mail client
  - Client is appropriately configured
  - Account is appropriately configured
  - Has setup filtering rules as described in 5.6
- The owner of the e-mail server (E.g. enterprise)
  - User has account
  - User preferences that affect the server are known
  - Filtering rules are known

5.5.4 Post-conditions

- Filtering rules have been changed (e.g. user is informed to expect an important e-mail from somebody. He updates the filtering rules to immediately (immediate notification) of the e-mail and to have the e-mail reflected in the mobile client)

5.5.5 Normal Flow

1) User decides to change a filtering rule
2) The new rule is transmitted to the e-mail server

5.5.6 Alternative Flow

1) Step 2 may determine that the event does not have to be reflected to the client (e.g. a folder that does not have to be synchronized with the client or an e-mail from a user that does not have to be sent to the mobile client)
2) Step 3 may determine that while the event should be reflected, it can wait later normal synchronization
3) Step 2 may be delayed is device is not online. Based on settings or preference the changes can be queued and sent as soon that the connectivity is re-established or the user may be prompted to confirm desire to send them

5.5.7 Operational and Quality of Experience Requirements

- Exchanges should be secured (e.g. encrypted) or at least securable if desired by user, e-mail server owner or settings of the client
- The flows above should work with e-mail server behind a firewall
- The flows above should be supported on any target network technology including 2.5G, 3G and WLAN
- The solution should be able to handle devices that are temporary offline

5.6 Use Case P2P / CORP, DS synchronization between clients

5.6.1 Short Description

The user can synchronize his e-mail over the air as mobile e-mail, using a pass through connection with another computer or client (e.g., cradle, Bluetooth, IRDA, over a direct LAN connection, …).

5.6.2 Actors

- The user of mobile e-mail (e.g. employee)
- The owner of the e-mail server (e.g. enterprise)

5.6.2.1 Actor Specific Issues

- The user of mobile e-mail:
  - To be able to synchronize over the air or through data synchronization over cradle (with laptop)
  - To be able to interrupt on mode and resume in the other
  - To maintain synchronized mobile client, laptop client and e-mail server
- The owner of the e-mail server:
  - To allow e-mail server to synchronize with different clients
  - To allow clients to also synchronize among each others and still maintain consistency

5.6.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - Can synchronize laptop over LAN or modem
  - Can synchronize mobile client and laptop client over cradle instead of over the air
  - Can then use client over the air as mobile e-mail:
    - Save cost of complete synchronization
    - Allow use of mobile client as a disconnected PDA when disconnected or on network that do not support mobile e-mail
- The owner of the e-mail server:
  - Enterprise:
    - Increase in responsiveness of employees
    - Increase in productivity
    - Reduce cost
  - Service provider:
    - Support different access models

5.6.3 Pre-conditions

- The user of mobile e-mail:
  - Has an account with e-mail providers
  - Has two devices with appropriate clients
  - Clients are appropriately configured
  - Account is appropriately configured
  - The clients can synchronize data between each others
  - For this example, one client use conventional e-mail over IP (e.g. IMAP4 rev 1). It could also be using over the air mobile e-mail. What matters is that that the client can synchronize with the e-mail server
- The owner of the e-mail server (E.g. enterprise)

- User has account
- User preferences that affect the server are known

5.6.4 Post-conditions

- The two clients are synchronized with the e-mail server

5.6.5 Normal Flow

1) First client synchronize with e-mail server
2) User synchronizes second client to the first using data synchronization (e.g. OMA DS)
3) Second client synchronizes with E-mail Server

5.6.6 Alternative Flow

- Step 1 can be interrupted before completion
- Step 2 can be interrupted before completion
- Step 1 can involve mobile e-mail synchronization over the air or conventional e-mail over IP (e.g. IMAP4 rev 1)
- Step 2 can involve data synchronization with the first client
- During step 2 the first client may be off line (synchronization is between the two clients) or online (the synchronization can be through the first client with the e-mail server).

5.6.7 Operational and Quality of Experience Requirements

- Exchanges should be secured (e.g. encrypted) or at least securable if desired by user, e-mail server owner or settings of the client
- The flows above should work with e-mail server behind a firewall
- The flows above should be supported on any target network technology including 2.5G, 3G and WLAN
- The solution should be able to handle devices that are temporarily offline

Meeting invitations and updates that contain attachments

5.7 Use Case Email with Attachment

5.7.1 Short Description

An e-mail with an attachment arrives at the mail server of a user. Since the email has an attachment and based on the preferences of the user the server only delivers either all or some of the text part of the email.

5.7.2 Actors

- The user of mobile email
- The e-mail system of the user

5.7.2.1 Actor Specific Issues

- The user of mobile e-mail can:

- Receive new email as soon as possible and in ways that appear quasi-instantaneous (i.e. as soon as possible after the e-mail server receives the e-mail).
- Set preferences for:
  - Automatic access and storage of E-mails on the device
  - The Portions of the e-mail that are to be stored on the device can be set

- The e-mail system of the user on the e-mail server:
  - To allow the user to set preferences so that upon receipt of a new email certain things will happen
  - To deliver email to the user according to the user preferences.
  - To deliver the email in a manner that is end-to-end secure.
  - To allow the user device / user to react accordingly to access and possibly download the e-mail in a secure way as specified by the user preferences with or without attachment, complete or only partially (and not necessarily sequential, but with identifiable parts), and possibly rendered in multiple ways applicable for the device.

5.7.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - Immediate delivery of new e-mail according to preferences
  - Can immediately act on the e-mail
- The owner of the e-mail server:
  - Enterprise:
    - Increase in responsiveness of employees
    - Increase in productivity
  - Service provider:
    - Can provide secure “push e-mail” experience and service to its customers

5.7.3 Pre-conditions

- The user of mobile e-mail:
  - Has an account with the enterprise
  - Has a client able to receive / access new e-mail events
  - Has a client that can support settings / preferences from the users or has them hard coded, to:
    - forward to other users and groups
    - compose new e-mail with selective parts of the received e-mail
    - etc.
  - Email client on users device is appropriately configured
  - Account is appropriately configured
- The e-mail system of the user
  - User has account
  - User preferences that affect the server are known
  - Knows how to provide access to events, e.g.:
    - what device

- device address
- Users email client Processing capabilities

5.7.4 Post-conditions

Email is read without downloading first.

5.7.5 Normal Flow

The user receives an email with an attachment in his inbox. The mail service, based on the users preference, delivers only the header of the message.

5.7.6 Alternative Flow

The user receives an email with an attachment in his inbox. The mail service, based on the users preference, delivers only the header of the message. The user having read the header decides to download some more of the text. The user starts reading selectively the attachment.

5.7.7 Operational and Quality of Experience Requirements

- It should be possible to read email including attachments without first downloading entire email and attachments
- It should be possible to read selective parts of the email and attachments without first downloading entire email.

5.8 Use Case Forwarding Email without Downloading Attachments

5.8.1 Short Description

An e-mail with an attachment arrives at the mail server of a user.. Since the email has an attachment and based on the preferences of the user, the server delivers either all or some of the text part of the email. The user reads the text and forwards the message to other users with some additional text and an attachment without first downloading the original attachment

5.8.2 Actors

- The user of mobile email
- The e-mail system of the user

5.8.2.1 Actor Specific Issues

- The user of mobile e-mail can:
  - Receive new email as soon as possible and in ways that appear quasi-instantaneous (i.e. as soon as possible after the e-mail server receives the e-mail).
  - Set preferences for:
    - Automatic access and storage of E-mails on the device
    - Portions of the e-mail that are to be stored on the device and forwarded
    - Forwarding options
- The e-mail system of the user:
  - To allow the user to set preferences that upon receipt of a new email certain things will happen
  - To deliver email to the user according to the users preferences.

- To deliver the email in a manner that is end-to-end secure.
- To allow the user to react accordingly to access and possibly download the e-mail in a secure way as specified by the user preferences .
- To allow the user to react accordingly to access and forward the e-mail in a secure way as specified by the user preferences (and possibly server settings) without having downloaded the e-mail

5.8.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - Immediate delivery of new e-mail according to preferences
  - Can immediately act on the e-mail, such as forwarding
- The owner of the e-mail server:
  - Enterprise:
    - Increase in responsiveness of employees
    - Increase in productivity
  - Service provider:
    - Can provide secure “push e-mail” experience and service to its customers

5.8.3 Pre-conditions

- The user of mobile e-mail:
  - Has an account with the enterprise
  - Has a client able to receive / access new e-mail events
  - Has a client that can support settings / preferences from the users or has them hard coded to :
    - forward to other users and groups
    - compose new e-mail with selective parts of the received e-mail
    - etc.
  - Email client on users device is appropriately configured
  - Account is appropriately configured
- The e-mail system of the user
  - User has account
  - User preferences that affect the server are known
  - Knows how to provide access to events, e.g.:
    - what device
    - device address
  - Users email client processing capabilities

5.8.4 Post-conditions

Email is forwarded without downloading first.

5.8.5 Normal Flow

The user receives an email with attachment in his inbox. The mail service, based on the users preference, delivers only the header of the message. Being out of the office he forwards the mail to his colleagues without first downloading the attachments or the entire text to his device. The mail server forwards the original mail with attachments to the users colleagues.

5.8.6 Alternative Flow

The user receives an email with attachment in his inbox. The mail service, based on the users preference, delivers only the header of the messages. Having read the header he downloads some more of the text of the message and realizes some of the attachments are relevant to his team. Being out of the office he forwards the email to his team with some additional text and an attachment on how to deal with this matter, without first downloading the attachments to his device. The mail server appends the new text and attachment to the original mail and forwards the mail to his colleagues.

5.8.7 Operational and Quality of Experience Requirements

- It should be possible to forward email including attachments without first downloading entire email
- It should be possible to forward modified email including attachments without first downloading entire email.
- The forwarding uses the user's enterprise email address.
- The forwarded email is placed in the user's enterprise email Sent folder, and the email (that was forwarded) shows in the user's enterprise email Inbox marked to indicate that the email was forwarded.
- Marking an email that was read on the mobile device as read in the user's enterprise mailbox

5.9 Use-case: configuring additional email accounts to be accessed

5.9.1 Short Description

A user wishes to configure his mobile-email client to access additional email accounts and merge the messages received from the different accounts. User is able to configure if merged messages are left on polled email server or removed.

5.9.2 Actors

- The user of mobile e-mail
- The owner of the e-mail server (e.g. mobile operator)
- The mobile operator (supplying the network)

5.9.2.1 Actor Specific Issues

- The user of mobile e-mail:
  - To be able to receive e-mails on his mobile device from all of his email accounts
- The owner of the e-mail server:
  - To allow users to receive e-mail in a secure manner while on the move.
- The mobile operator
  - To allow the subscribers to receive satisfactory service using his mobile terminal.

5.9.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - Gains access to all of his email messages, independent of the server location, while on the move
- The owner of the e-mail server:
  - Supplies email messages to his users and increases his service satisfaction
- Service provider:
  - Customers use mobile client for larger range of services

5.9.3 Pre-conditions

- The user of mobile e-mail:
  - Has an account with e-mail providers
  - Has a device with a client able to compose and send e-mails
  - Client allows user to configure additional mailbox accounts
- The owner of the e-mail server (e.g. enterprise)
  - User has account
  - User preferences that affect the server are known
  - Allows client to connect to user's account based on authentication information

5.9.4 Post-conditions

- The Client is properly configured to access the messages in the additional email account

5.9.5 Normal Flow

1) User activates the mobile email client on his terminal
2) User chooses the configuration option of the mobile email client
3) User supplies the authentication information necessary for accessing the email account together with the protocol information for the email server.
4) User indicates if the messages retrieved from additional account should be merged into a single Inbox or separate folders should be displayed.
5) User defines whether polled messages are left on polled email server or removed.
6) User is given the option to define the filtering rules for the new account.
7) Client authenticates the access to the new email account and notifies user that configuration is complete.

5.9.6 Alternative Flow

None identified at this timed

5.9.7 Operational and Quality of Experience Requirements

- User should be presented with proper configuration options to allow friendly definition of the email accounts.
- Configuration should allow user to securely access all of his email accounts

- The flows above should be supported on any target network technology including 2.5G, 3G and WLAN
- The solution should be able to handle devices that are temporary offline

5.10 Use-case: replying to messages that are retrieved from different accounts

5.10.1 Short Description

A user, who has configured his mobile email client to display messages from different accounts, wishes to send a reply message to a message that is displayed. When generating the reply the client should offer the user the capability to choose the "from field" which is used in the reply – to be either the original polled account "from field" or the main account "from field".

5.10.2 Actors

- The user of mobile e-mail
- The owner of the e-mail server (e.g. mobile operator)
- The mobile operator (supplying the network)

5.10.2.1 Actor Specific Issues

- The user of mobile e-mail:
  - To be able to distinguish between email accounts that his messages are retrieved from
  - To reply to his messages within the framework of the email accounts that the message was received at
- The owner of the e-mail server:
  - To allow users to receive e-mail in a secure manner while on the move.
  - To allow the users to conduct their email correspondence in a convenient manner
- The mobile operator
  - To allow the subscribers to receive satisfactory service using his mobile terminal.

5.10.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - Is able to reply to messages received from different accounts while maintaining the integrity of his correspondence
- The owner of the e-mail server:
  - Increased traffic of the email messaging
  - Supplies a reliable service to the users
- Service provider:
  - Customers use mobile client for larger range of services

5.10.3 Pre-conditions

- The user of mobile e-mail:

  - Has an account with e-mail providers
  - Has a device with a client able to compose and send e-mails
  - Client allows user to configure additional mailbox accounts
  - Client allows user to generate reply messages to messages in the user's mailbox folders
- The owner of the e-mail server (e.g. enterprise)
  - User has account
  - User preferences that affect the server are known
  - Allows client to connect to user's account based on authentication information

5.10.4 Post-conditions

- The reply message is sent to the originator of the original message from the email server originally addressed in a secure and private manner

5.10.5 Normal Flow

1) User activates the mobile email client on his terminal
2) User browses the messages in his inbox and selects a message to view.
3) User elects to generate a reply message to the message that he has selected
4) Client allows user to compose a new message that is a reply to the original.
5) Client identifies that email account that original message originates from and offers to send the message with the proper From: field
6) User chooses whether to retain this From: field or change to another From: account.
7) After composition is complete the user selects to send the reply message.
8) Email server for the account that is indicated by the From: receives the reply message and sends to the destination

5.10.6 Alternative Flow

None identified at this time

5.10.7 Operational and Quality of Experience Requirements

- User should be presented with proper configuration options to allow friendly definition of the email accounts.
- Configuration should allow user to securely access all of his email accounts.
- The flows above should be supported on any target network technology including 2.5G, 3G and WLAN
- The solution should be able to handle devices that are temporary offline

5.11 Open Issues

None identified at this time

6. Requirements (Normative)

Unless otherwise stated, all requirements apply to the Mobile E-mail Enabler

6.1 High-Level Functional Requirements

Label	Description	Enabler Release
HLF-1	It MUST be possible to minimize delays and bandwidth requirements (e.g. by minimizing the number of roundtrips between client and server, the bytes to exchange between client and server, etc…) for the following:· ▪ Events sent from the server to the client or accessed by the client to announce or describe new e-mail ▪ Exchanges to deliver new e-mail from the server to the client ▪ Events sent from the server to the client to announce or describe e-mail events on the server ▪ Events accessed by the client from the server to announce or describe e-mail events on the server ▪ Exchanges to reconcile the client after a e-mail event on the server ▪ Exchanges to access or manipulate attachments ▪ Sending e-mail from an assigned e-mail server ▪ Sending e-mail events on the client to the e-mail	

Table 1: High-Level Functional Requirements

6.1.1 Security

Label	Description	Enabler Release
SEC-1	Events sent from the e-mail server to the client to announce or describe new e-mail MUST support confidentiality and integrity.	
SEC-2	When used, events accessed by the client from the server to announce or describe new e-mail MUST be end-to-end confidential when desired.	
SEC-3	Exchanges to provide new e-mail arrived on server to the client MUST be end to end confidential when desired.	
SEC-4	When used, events sent from the server to the client to announce or describe e-mail events on the server MUST be end-to-end confidential when desired.	
SEC-5	When used, events accessed by the client from the server to announce or describe w-mail events on the server MUST be end-to-end confidential when desired.	
SEC-6	Exchanges to reconcile the client after an e-mail event on the server MUST be end to end confidential when desired.	
SEC-7	Exchanges to access or manipulate attachments MUST be end to end confidential when desired.	
SEC-8	Exchanges to send e-mail from the assigned e-mail server MUST be end to end confidential when desired.	
SEC-9	E-mail events sent from the client to the e-mail server MUST be end-to-end confidential when desired.	
SEC-10	The client MUST be able to be authenticated by the server when requesting data from the e-mail server.	
SEC-11	The server MUST be able to be authenticated by the client.	
SEC-12	Mobile email MUST support content screening.	
SEC-13	The mobile e-mail enabler MUST allow the mobile client to be protected by the same spam protection solutions as applied on the server.	

Table 2: High-Level Functional Requirements – Security Items

NOTE: When desired is used in the mobile e-mail RD in association to security requirements to emphasize the fact that seeking confidentiality of the exchanges between the client and the server MUST be supported when mandated by the actors BUT that it may be okay not to support them in cases where such additional confidentiality assurance is not required or desired.

For example, consumer internet email does not provide such extra confidentiality. In such cases, it may not be needed to provide it with mobile e-mail. Corporate e-mail requires such confidentiality. Therefore the requirement on the enabler is a MUST.

6.1.2 Charging

Charging is not intrinsic to the mobile e-mail enabler.

Label	Description	Enabler Release
CHRG-1	In order to support charging for e-mail traffic, the mobile e-mail enabler SHOULD provide ways to identify mobile e-mail exchanges (events, access, sending, synchronization) as e-mail data exchanges, even when the exchanges are end-to-end secure.	

Table 3: High-Level Functional Requirements – Charging Items

6.1.3 Administration and Configuration

Label	Description	Enabler Release
ADMIN-1	It MUST be possible to provision the mobile client from the server upon authentication and authorization of the user and pairing with a device.	
ADMIN-2	It SHOULD be possible for user preferences/filters/settings to follow the user across devices, when desired by the user or administrator.	
ADMIN-3	Authorized principals MUST be able to configure the settings of the user preferences/filters/configurable settings for a particular user.	
ADMIN-4	The mobile email enabler MUST support preventing or remotely revoking unauthorized usage of and access to e-mail data of a mobile device.	

Table 4: High-Level Functional Requirements – Administration and Configuration Items

6.1.4 Usability

Label	Description	Enabler Release
USAB-1	Mobile email SHOULD minimize event propagation delays and must not impose excessive delays according to user preferences.	
USAB-2	Mobile email SHOULD minimize delays in accessing email messages and must not impose excessive delays according to user preferences.	
USAB-3	When / if downloading an attachment, the client SHOULD be able to provide indication of the download and to estimate of the time needed to complete the download.	
USAB-4	E-mail sent from client MUST be sent to the e-mail server according to user preference if configurable or client settings otherwise, when network connectivity is available.	
USAB-5	When connectivity is not available or drops, if it is possible to compose and sent e-mail, it MUST be stored on the client until connectivity becomes available and then sent to the e-mail server as soon as possible.	
USAB-6	E-mail events on the client to the e-mail server MUST be sent to the e-mail server according to user preferences if configurable or client settings otherwise, when network connectivity is available.	

USAB-7	When connectivity is not available or drops, email events on the client that may take place MUST be stored on the client until connectivity becomes available and then sent to the e-mail server as soon as possible.	
USAB-8	The mobile email enabler MUST provide support for the user to be able to set filtering rules for the delivery of email based on: ▪ Email header fields ▪ Mailbox folder options. ▪ Server-determined spam score, Other criteria as needed.	
USAB-9	The mobile email enabler MUST provide support for the user to be able to change filtering rules from his mobile client.	
USAB-10	Rules (like filtering rules, processing rules, attachment removal, spam prevention, …) applied on the server MUST still apply to the repository on the client for what the user has selected to synchronize on the client.	
USAB-11	The mobile email enabler MUST provide support for the user to be able to select the default or available ways to be notified about new e-mails based on capabilities of client and network: ▪ what notification is used (e.g. SMS, Push, MMS, …) ▪ if events are accessed by client (when, how, what is initially part of the event)	
USAB-12	The mobile e-mail enabler MUST support the use of a number of different means to transport notifications (e.g. SMS, MMS, WAP Push, SIP Notification, UDP, in band, polled, …). This will allow. deployment on any target networks.	
USAB-13	The User MUST be able to select how e-mail server should present new e-mail events to the client and to select how the client reacts to such events and therefore how the new e-mail is reflected in the client repository: ▪ A few meta-data, no stored e-mail ▪ A given size of the e-mail ▪ The whole e-mail without attachment ▪ The whole e-mail with attachment	
USAB-14	The user MUST be able to manually initiate access to e-mail that has arrived on the server but is not yet on the client.	
USAB-15	The user MUST be able to manually access more e-mail data when only a portion is stored on the client (e.g. more of the body, a specific attachment, more of a specific attachment, the rest of the body, the whole e-mail with all attachments).	
USAB-16	Authorized principals MUST be able to select the default or available ways that -mail events are sent to or accessed by the client and other e-mail settings that may affect the server behaviour.	
USAB-17	The mobile e-mail enabler SHOULD NOT require repetitive actions by the user to provide robustness to intermittent or unreliable connectivity (e.g. loss of connectivity, loss of network transport packets and reconnect) (e.g. having to initiate client reconnect, initiation of synchronization, password entry for server authentication, VPN re-establishment, etc…).	
USAB-18	The mobile email enabler MUST enable the user to forward an e-mail with attachment without downloading the attachment to the client.	
USAB-19	The mobile email enabler MUST enable the user to forward an e-mail partially downloaded without having to download the remainder to the client.	
USAB-20	The mobile e-mail enabler SHOULD minimize the amount of information that a user must provide to provision an e-mail client to access the appropriate e-mail server.	

USAB-21	The client MUST allow the user to reply to an e-mail partially downloaded without first having to download the remainder of the e-mail to the client.	
USAB-22	The client MUST allow the user to edit a partially downloaded e-mail, for reply and have the resulting e-mail sent from the server.	
USAB-23	The client MUST allow the user to edit a partially downloaded e-mail , for forward and have the resulting e-mail sent from the server.	
USAB-24	The client MUST be able to download body parts or parts thereof that the user wants to edit when replying to an e-mail partially downloaded to the client.	
USAB-25	The client MUST be able to download body parts or parts thereof that the user wants to edit when forwarding an e-mail partially downloaded to the client.	
USAB-26	When replying to a long list of addressees, the client MUST allow the user to edit the addresses.	
USAB-27	Mobile-email Enabler SHOULD support multiple email accounts.	
USAB-28	Mobile-email Enabler MUST support configuration of email account information for connection and filtering on a per-account basis.	
USAB-29	Mobile-email Enabler SHOULD support definition of auto-reply messages for filtered messages. Automatically generated replies MUST conform to RFC 2821 and related RFCs and MUST NOT lead to mail loops.	
USAB-30	Mobile-email Enabler SHOULD support activation/deactivation of auto-reply from the client. Automatically generated replies MUST conform to RFC 2821 and related RFCs and MUST NOT lead to mail loops.	
USAB-31	Mobile-email Enabler MUST support replying to messages by using the email account that the original message was received on.	
USAB-32	Mobile-email Enabler SHOULD support organization of the retrieved email messages according to their source email account.	
USAB-33	The mobile enabler MUST support the user ability to forward only a selection of the attachments of an e-mail with attachments, without downloading the attachments to the client.	
USAB-34	The mobile e-mail enabler MUST provide mechanisms to access any desirable email part even when the email size is beyond the limit imposed on the size of the emails that can be delivered to mobile devices while remaining within the size constraints of the part to be downloaded	

Table 5: High-Level Functional Requirements – Usability Items

6.1.5 Interoperability

Label	Description	Enabler Release
IOP-1	Data exchanges between the client and server, such as Events, sending Mail, reconciliation, attachment manipulation MUST remain functional in the presence of firewalls between the mobile e-mail client and the users e-mail servers.	
IOP-2	When used, events sent from the server to the client to announce or describe new e-mail MUST be network neutral.	
IOP-3	When used, events accessed by the client from the server to announce or describe new e-mail MUST be network neutral.	
IOP-4	Exchanges to provide e-mail arrived on server to the client MUST be network neutral.	
IOP-5	Exchanges to reconcile the client after a e-mail event on the server MUST be network neutral.	
IOP-6	Exchanges to access or manipulate attachments MUST be network neutral.	

IOP-7	It MUST be possible to send e-mail from the e-mail server assigned to the user (e.g. not another SMTP server in another domain).	
IOP-8	Sending e-mail from an assigned e-mail server MUST be network neutral.	
IOP-9	Sending e-mail events on the client to the e-mail server MUST be network neutral.	
IOP-10	The mobile e-mail enabler MUST allow the e-mail repository on the mobile client to be synchronized with the appropriate backend server: ▪ Sometimes via the OMA Mobile e-mail enabler specifications (between client and server) ▪ Sometimes via the OMA DS specifications for e-mail between the client and another client, that it be o Connected to the server o Previously synchronized with the server and later re-synchronized with the server	
IOP-11	The e-mail enabler MUST support server-side adaptation of attachment to the device user by user.	
IOP-12	The server-side adaptation MUST be capable of being controlled by the client (e.g., with smart or intermediate clients).	
IOP-13	The design of the mobile e-mail enabler specifications SHOULD consider and aim at interoperability or gracefully degradation with relevant e-mail standards.	
IOP-14	The number of optional features in the Mobile E-mail enabler specifications SHOULD be minimised, while allowing efficient implementation of both consumer and enterprise mobile e-mail solutions.	
IOP-15	Server-side adaptation MUST preserve the ability of accessing e-mail via other channels (e.g. via other e-mail clients).	
IOP-16	Server-side adaptation MUST preserve the original e-mails and attachment stored in the e-mail server	

Table 6: High-Level Functional Requirements – Interoperability Items

6.1.6 Privacy

Label	Description	Enabler Release
PRIV-1	The mobile e-mail enabler MUST allow the mobile client to be protected by the same privacy protection rules / solutions as applied on the server (e.g. filtering rules, privacy alert detections on outgoing e-mail, read/unread notice interception).	
PRIV-2	The mobile e-mail enabler MUST support the use of privacy tools that require user's confirmation before allowing some e-mail events to take place.	

Table 7: High-Level Functional Requirements – Privacy Items

6.2 Overall System Requirements

Label	Description	Enabler Release
SYSREQ-1	The mobile e-mail enabler MUST be robust enough to operate normally and useably when there is a intermittent or unreliable connection between the client and server.	

SYSREQ-2	The mobile e-mail enabler security (authentication, authorization, confidentiality, integrity) MUST operate and be usable in the presence of intermittent or unreliable connectivity (loss of connectivity, loss of network transport packets and reconnect).	
SYSREQ-3	The mobile e-mail enabler MUST NOT rely on the storage of email data in intermediate systems outside the e-mail server domain or the terminal.[1]	
SYSREQ-4	Mobile e-mail enabler MUST permit highly scalable end-to-end implementations.	
SYSREQ-5	The mobile e-mail enabler SHOULD allow optimized implementations on constrained devices (e.g. power consumption, CPU overhead, memory and storage requirements). See also OMA-RPT-ApplicationPerformance-v1-20031028-A for additional informative details.	

[1] Note that this requirement does not prevent implementations or solutions to use intermediate storage. Also, note that transport and other transitory exchanges and manipulations of packets are not considered as cases of intermediate storage covered by this requirement.

Table 8: Overall System Requirements

6.3 System Elements

This section contains high-level functionality requirements of the mobile email system elements. The mobile email client interacts with the mobile email server to enable mobile email services. In addition to sending and receiving emails, other email-related capabilities, such as filtering, updating, forwarding etc., are also enabled through this interaction.

Requirements in this section do not assume any architecture in particular. The intention is to capture requirements on the functionality related to the email client and email server.

6.3.1 Mobile email client

Ref	Use Case Title(s)	Requirements
MEC-1		Mobile email client MUST be able to authenticate the mobile email server when a request is received from that server.
MEC-2		It MUST be possible to protect E-mail data on the mobile e-mail enabler client from unauthorized access.

6.3.2 Mobile email server

Ref	Use Case Title(s)	Requirements
MES-1		Mobile email server MUST be able to authenticate the mobile email client when a request is received from the client.

6.3.3 Network Interface

Ref	Use Case Title(s)	Requirements
NIF-1	P2P/Corp, Client email events	Interfaces between mobile email client and mobile email server MUST support secure transportation of data and event notification.

[1] Note that this requirement does not prevent implementations or solutions to use intermediate storage. Also, note that transport and other transitory exchanges and manipulations of packets are not considered as cases of intermediate storage covered by this requirement.

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
n/a	n/a	No prior version

A.2 Draft/Candidate Version 1.0 History

Reference	Date	Sections	Description
Draft Versions OMA-RD-MobileEmail-V1_0	11 Nov 2004		Initial document to address the basic starting point and includes Inputs docs approved. OMA-REQ-2004-0707R03-Mobile_email_usecases OMA-REQ-2004-0777R01-LATE-e-mail-PIM-use-case OMA-REQ-2004-0712r04-Moble_Email_usecases.zip OMA-REQ-2004-0755R03-Mobile_email_requirements
	12 Jan 2005		OMA-REQ-2004-0886R03-LATE-Mobile-e-mail,-use-case.doc OMA-REQ-2004-1118R01-LATE-Mobile-email-RD-section-1-draft OMA-REQ-2004-1091R03-Mobile_email_reply OMA-REQ-2004-1030R02-Mobile_email_problem_statement Sections 4,4.1,4.2 only
	04 Feb 2005		OMA-REQ-2005-0012R02-LATE-Requirements-for-Mobile-email-system-elements OMA-REQ-2005-0079R01-Mobile-Email-Meeting-Minutes-Jan-31-2005 OMA-REQ-2005-0078-Mobile_email_text_Ais OMA-REQ-2005-0072-Comments_0070_Memailconfig OMA-REQ-2005-0077-Components_Mobile_email
	09 Feb 2005		OMA-REQ-2005-0014R02--MEmail--New-Use-Cases
	16 Feb 2005		OMA-REQ-2005-0125-Mobile-Email-CC-2005-03-02-Minutes OMA-REQ-2005-0140-Suggested-RD-changes-from-REQ-informal-review
	03 May 2005		OMA-REQ-2005-0203-Mobile-Email-2005-03-30-Call-Minutes OMA-REQ-2005-0151R02-LATE-Mobile-Email-requirements-for-limited-size-of-emails OMA-REQ-2005-0204-LATE-Requirements-section-cleanup-of-Mobile-Email-RD OMA-REQ-2005-0243-Mobile-Email-2005-04-11-Meeting-Minutes
	25 May 2005		OMA-REQ-2005-0268-Mobile-Email-2005-04-27-Meeting-Minutes
	14 Jun 2005		Editorial updates to conform to template styles and requirement tables OMA-REQ-2005-0257R02-CR-to-Intro-Security-section OMA-REQ-2005-0269R01-M-Email_RD_Defns_CR OMA-REQ-2005-0295R02-M-Email_RD_CR_storage OMA-REQ-2005-0352R03-M-Email_RD_Missing_reqs_and_fixes OMA-REQ-2005-0360R02-LATE-Mobile-E-Mail-RD-client-reqs OMA-RD-Mobile-Email-0353R01-V1_0_20050525_commented_sm_6_3_05

Appendix B. Additional Use Cases (Informative)

B.1 Use Case P2P / CORP, Client E-Mail Events

B.1.1 Short Description

Changes (e-mail events as in 5.2) performed by the mobile worker in his or her e-mail client (e.g., deleting an e-mail or moving it from one e-mail folder to another) are properly reflected to the user mail box in the e-mail server, as prescribed by the user. If configured as such, drafts should be saved either locally or on the server.

B.1.2 Actors

- The user of mobile e-mail (e.g. employee)
- The owner of the e-mail server (e.g. enterprise)

B.1.2.1 Actor Specific Issues

- The user of mobile e-mail:
  - To reflect changes / actions taken on the client to the e-mail server as prescribed by users preferences
- The owner of the e-mail server:
  - To allow users to reflect changes performed on clients as prescribed by user preferences.

B.1.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - Can reflect changes / actions taken on the client to the e-mail server as prescribed by users preferences
- The owner of the e-mail server:
  - Enterprise:
    - Increase in responsiveness of employees
    - Increase in productivity
  - Service provider:
    - Provides synchronization between email clients and servers that reflects any changes made on the client or server. to its customers

B.1.3 Pre-conditions

- The user of mobile e-mail:
  - Has an account with e-mail providers
  - Has a device with an appropriate e-mail client
  - Support settings / preferences from the users or has hard coded ways to handle changes made on clients (e.g. are e-mail deleted on client also deleted on e-mail server)
  - Client is appropriately configured
  - Account is appropriately configured
- The owner of the e-mail server (e.g. enterprise)
  - User has account

- User preferences that affect the server are known

B.1.4 Post-conditions

- User changes on the clients are reflected on the e-mail server as prescribed by the user preferences

B.1.5 Normal Flow

1) User performs a change (e.g. reads an e-mail that results into changing the read/unread status of the e-mail)
2) If prescribed by user preferences or client settings, the change is sent to the e-mail server
3) E-mail server reflects the changes

B.1.6 Alternative Flow

1) Step 2 and 3 may be skipped if set so by user preferences or client settings
2) Step 3 may involve checking user preferences or settings. These check may take place on client, on server or on both
3) Steps 2 and after may be delayed is device is not online. Based on settings or preference the events can be queued and sent as soon that the connectivity is re-established or the user may be prompted to confirm desire to send them.

B.1.7 Operational and Quality of Experience Requirements

- Exchanges should be secured (e.g. encrypted) or at least securable if desired by user, e-mail server owner or settings of the client
- The flows above should work with e-mail server behind a firewall
- The flows above should be supported on any target network technology including 2.5G, 3G and WLAN
- The solution should be able to handle devices that are temporary offline

B.2 Use Case P2P / CORP, Filtering Rules

B.2.1 Short Description

While mobile, a user can set filtering rules that specify what, when and how e-mails arriving at the e-mail server or e-mail server events must be reflected or sent in the mobile client.

B.2.2 Actors

- The user of mobile e-mail (e.g. employee)
- The owner of the e-mail server (e.g. enterprise)

B.2.2.1 Actor Specific Issues

- The user of mobile e-mail:
  - To be able to set what e-mail are to be sent/reflected to the client
  - To be able to set what events should be sent to the client
  - To be able to configure the events sent to the client i.e. what events should be immediately and what events can wait for other scheduled synchronizations between the client and e-mail server
- The owner of the e-mail server:

- To support filtering rules on e-mail / folder
- To support filtering rules on events / notifications

B.2.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - Can set filtering rules on e-mails seen on mobile client
  - Can set filtering rules on events sent to client (which ones and when)
  - Effective in reducing client burden
- The owner of the e-mail server:
  - Enterprise:
    - Increase in responsiveness of employees
    - Increase in productivity
  - Service provider:
    - Supports filtering rules
    - Can provide management of filtering rules from mobile device to its customers
    - Reduced load, both in memory and bandwidth

B.2.3 Pre-conditions

- The user of mobile e-mail:
  - Has an account with e-mail providers
  - Has a device with an appropriate e-mail client
  - Client is appropriately configured
  - Account is appropriately configured
- The owner of the e-mail server (E.g. enterprise)
  - User has account
  - User preferences that affect the server are known
  - Filtering rules are known

B.2.4 Post-conditions

- Filtering rules are applied

B.2.5 Normal Flow

1) Server event affects some e-mails (see 5.1 or 5.2)
2) E-mail server checks that the event should be reflected to client
3) E-mail server checks that the event should be sent to the client (instead of awaiting later access)
4) Event or e-mail are reflected as described in 5.1 or 5.2

B.2.6 Alternative Flow

1) Step 2 may determine that the event does not have to be reflected to the client (e.g. a folder that does not have to be synchronized with the client or an e-mail from a user that does not have to be sent to the mobile client)

2) Step 3 may determine that while the event should be reflected, it can wait later normal synchronization

B.2.7 Operational and Quality of Experience Requirements

- Exchanges should be secured (e.g. encrypted) or at least securable if desired by user, e-mail server owner or settings of the client
- The flows above should work with e-mail server behind a firewall
- The flows above should be supported on any target network technology including 2.5G, 3G and WLAN
- The solution should be able to handle devices that are temporary offline

B.3 Use Case P2P / CORP, Replying or Forwarding to E-Mails 'On the Go'

B.3.1 Short Description

A user wants to reply to an e-mail received on his e-mail client.

B.3.2 Actors

- The user of mobile e-mail (e.g. employee)
- The owner of the e-mail server (e.g. enterprise)

B.3.2.1 Actor Specific Issues

- The user of mobile e-mail:
  - To be able to send e-mails from mobile devices
- The owner of the e-mail server:
  - To allow users to send e-mail in a secure manner from the owner e-mail server

B.3.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - Can efficiently reply to e-mail while mobile
- The owner of the e-mail server:
  - Enterprise:
    - > Increase in responsiveness of employees
    - > Increase in productivity
    - > Send e-mail from e-mail server / corporate domain. This is important for:
      - = Audit / logging
      - = To control / monitor e-mail sent by employees
      - = To certify source of e-mails
      - = To satisfy legal requirements

- Service provider:
  - > Can provide secure ways to send e-mail its customers

B.3.3 Pre-conditions

- The user of mobile e-mail:
  - Has an account with e-mail providers
  - Has a device with a client able to compose and send e-mails
  - Client is appropriately configured
  - Account is appropriately configured
- The owner of the e-mail server (e.g. enterprise)
  - User has account
  - User preferences that affect the server are known
- The user has received an e-mail that he wants to reply to or forward.

B.3.4 Post-conditions

- E-mail reply by user has been sent from the e-mail server (located in appropriate domain)

B.3.5 Normal Flow

1) User decides to reply to an e-mail (e.g. hits reply all)
2) User adds text and attachments to the reply.
3) User can modify forwarded e-mail:
   - Edit
   - Remove attachments
4) User completes composition of an e-mail on mobile client
5) User selects to send the e-mail
6) Client connects with e-mail server and uploads the e-mail
7) E-mail is sent from e-mail server
8) E-mail may be saved in a sent folder (based on preference of user or behaviour/settings of e-mail server)
9) Sent e-mail in sent folder is reflected in e-mail sent folder as in 5.2 (based on preference of user or behaviour/settings of e-mail server).

B.3.6 Alternative Flow

1) If whole e-mail body or attachments have not been downloaded to the client, the client does not have to download the missing parts.
   - In such a case, at step 7, the server completes the body and attachments before sending and saving (step 8).
2) In case 1 above, the user can request additional parts of the body if he / she want to edit missing part (e.g. change text).

- In such a case, at step 7, the server completes the remainder of the body and attachments before sending and saving (step 8).

3) In case 1 above, the user can remove attachments without downloading them
   - In such a case, at step 7, the server completes the remainder of the body and attachments (without the "removed attachments") before sending and saving (step 8).
4) If the list of address to reply to is long, the client truncates it at step 6.
   - In such a case, at step 7, the server completes the list of address to send the message to before sending and saving (step 8).
5) In case 4 above, the user can edit the list of users to reply to at step 3.
   - When determined appropriate, the client at step 6 sends the whole reply list or a truncated list with indications of the changes. In the latter case, at step 7, the server generates the list of address to send the message to before sending and saving (step 8).
6) The same flows can apply when forwarding an e-mail.

B.3.7 Operational and Quality of Experience Requirements

- Exchanges should be secured (e.g. encrypted) or at least securable if desired by user, e-mail server owner or settings of the client
- The flows above should work with e-mail server behind a firewall
- The flows above should be supported on any target network technology including 2.5G, 3G and WLAN
- The solution should be able to handle devices that are temporary offline

B.4 Use-case: Configuring Auto-Reply Message

B.4.1 Short Description

A user wishes to configure his mobile-email client to automatically reply that he is unavailable. This may apply to messages that the user has filtered out from being downloaded to his client and only to certain accounts

B.4.2 Actors

- The user of mobile e-mail
- The owner of the e-mail server (e.g. mobile operator)
- The mobile operator (supplying the network)

B.4.2.1 Actor Specific Issues

- The user of mobile e-mail:
  - To be manage e-mails from his mobile device in all of his email accounts
- The owner of the e-mail server:
  - To allow users to receive e-mail in a secure manner while on the move.
- The mobile operator
  - To allow the subscribers to receive satisfactory service using his mobile terminal.

B.4.2.2 Actor Specific Benefits

- The user of mobile e-mail:
  - Manages his email in a convenient manner from a single terminal
- The owner of the e-mail server:
  - Supplies email messages to his users and increases his service satisfaction
- Service provider:
  - Customers use mobile client for larger range of services

B.4.3 Pre-conditions

- The user of mobile e-mail:
  - Has an account with e-mail providers
  - Has a device with a client able to compose and send e-mails
- The owner of the e-mail server (e.g. enterprise)
  - User has account
  - User preferences that affect the server are known
  - Allows client to connect to user's account based on authentication information

B.4.4 Post-conditions

- The Client is properly configured to access the messages in the user's email accounts

B.4.5 Normal Flow

1) User activates the mobile email client on his terminal
2) User chooses the configuration option of the mobile email client
3) User selects the option to set an auto-reply message.
4) User indicates the email account to apply the auto-reply message to.
5) User is given the option to define the filtering rules for the messages that auto-reply is to be applied to.
6) Client forwards the setting to the appropriate email server.

B.4.6 Alternative Flow

None identified at this time

B.4.7 Operational and Quality of Experience Requirements

- User should be presented with proper configuration options to allow friendly definition of the email accounts.
- Configuration should allow user to set options in a friendly and usable manner.
- The flows above should be supported on any target network technology including 2.5G, 3G and WLAN
- The solution should be able to handle devices that are temporary offline