Multimedia Mail Meeting Notes

Status of this Memo

   This memo is a report on a meeting about the experimental multimedia
   mail system (and in a sense a status report on that experiment).
   Distribution of this memo is unlimited.

1. Introduction

   A meeting was held at Bolt Beranek and Newman on 23-24 July 1984 to
   discuss recent progress by groups who are building multimedia mail
   systems and to discuss a variety of issues related to the further
   development of multimedia systems. Representatives were present from
   BBN, ISI, SRI and Linkabit. The list of attendees appears at the end
   of this note.

   The result of this meeting is a series of agreements that will be
   incorporated in the next set of experiments with multimedia mail as
   well as a set of items for further action.

   Note: There are references in this document to notes in a series
   devoted to multimedia mail. These notes are available on-line in the
   directory [USC-ISIF]<MMM> and have the names MMM-N.TXT where N is the
   note number. The file MMM-INDEX.TXT is a list of all of the notes in
   the series. These public files may be copied via FTP using the FTP
   username ANONYMOUS and password GUEST.

2. Review of Status

   Status reports on work accomplished in the last year were given by
   each organization.

2.1. BBN

   The initial implementation of Diamond is complete and runs on the
   Jericho workstation. Diamond currently supports the exchange of
   compound documents which contain text, graphics, images, voice and
   spreadsheet/charts. A demonstration of this system was presented
   showing both the user's view of Diamond messages and message
   management as well as the interactions between the components of this
   distributed system. Diamond currently uses the TOPS-20 implementation
   of MPM for inter-cluster message transport but the plan is to
   integrate an implementation of MPM for the Sun Workstation into
   Diamond. Current activity is focused on porting Diamond to the Sun
   Workstation. A first version of Diamond for the Sun is nearly

completed and parts (the document editor) were demonstrated running
on the Sun. Diamond will be used in the ADDCOMPE testbed with
100-200 users expected in the next year or so. Future plans include
building on the experience gained with Diamond in the area of
multimedia conferencing, extending the use of multimedia into other
application areas and applying the distributed architecture of
Diamond to other application areas.

2.2. ISI

A new effort aimed at developing a user interface on a Xerox 1108
(Dandelion) workstation has just begun. All of the implementation is
being done in Interlisp. Initial work has been done to implement IP
and TFTP on the 1108 as well as a document editor that makes use of
the Interlisp-D window system. Work on the user interface that was
developed on the Perq will be cycling down. The implementation of
the MPM on TOPS-20 is essentially complete with the addition of MPM
to SMTP mail conversion; no major changes are anticipated. The
TOPS-20 MPM will be used as the message transport facility for the
1108 user interface implementation. TFTP will be used to get
messages from the 1108 to the TOPS-20.

2.3. SRI

The SRI multimedia mail system consists of three parts: The
Multimedia Mail Handler (MMH) which is the user's interface for
managing mail, the Structure Editor (SE) which is used to view and
compose multimedia messages and the MPM for mail transport. This
system is implemented on the Sun Workstation. The first release of
the MPM on the Sun will be ready for distribution at the end of this
summer. The SE is used to view and compose structures of multimedia
objects. Currently there is support for text, voice and graphics.

Another effort at SRI involves integration of applications to run in
the ADDCOMPE testbed. Diamond will be the first example of an
application which uses multimedia data in the testbed. SRI is
interested in examining the issues associated with multimedia systems
to determine how multimedia data can be used in other applications
that might be put into the testbed.

2.4. Linkabit

Linkabit has recently received a contract to work on protocol
evaluation, problems associated with working in a large internet
environment, and new real-time end-to-end services. They will be
working with Sun workstations. Areas of interest are protocols,
multimedia conferencing and domains.

3. Discussions and Agreements

3.1. Conversion to the New Multimedia Syntax

   There was general agreement that in future experiments we would all
   adopt the revised syntax for multimedia mail as described in the
   Final Report to SRI Project 5363. It was agreed that RFC767 should
   be revised to reflect these changes. The timing for switching over
   should be as soon as possible and should be completed by October 1,
   1984.

3.2. Graphics Representation

   A wide ranging discussion on the way in which graphics is to be
   represented in multimedia documents occurred. It was generally
   agreed that the first style of graphical object to be included in
   multimedia messages would be a simple line-drawing, such as those
   that can be produced by the many "draw" programs (e.g. LisaDraw)
   currently in existence. Attention was focused on the two existing
   standards (ACM-CORE and GKS) and the interim protocol used in the
   Diamond system. Two major problems with the existing standards were
   mentioned:

      o In both ACM-CORE and GKS grouping is inadequate or non-existent.
        This means that it is difficult or impossible to build up a
        composition of several graphical objects and then manipulate
        that composite as a single graphical object.

      o Neither ACM-CORE or GKS have specified a standard method for
        representing graphical drawings in memory (e.g. long term file
        storage). This is one of the most important aspects of a
        graphical standard for multimedia mail. The focus of graphical
        standards so far has been towards driving devices in a
        independent manner, not storing graphics in a standard
        representation.

   A presentation of the representation for graphical objects in Diamond
   was given. The protocol is documented in MMM-18 and MMM-23.
   Requests for hardcopies of the diagrams in those documents (sigh) can
   be sent to Travers@BBN.

   The discussion then focused on the level of effort required to switch
   from one representation to another. It was generally agreed that
   compared to the entire editor used to manipulate graphical objects
   (e.g., the "draw" program), the part that reads or writes objects
   from or to files is relatively simple. Most draw programs have a
   unique internal representation which is built when reading the file
   representation and used as the source when writing the file

representation. It is this relatively small portion of a graphics
editor which is impacted by switching from one file representation to
another. Thus it seemed that the approach of adopting one interim
representation now and planning to switch to a standard
representation when work on the standards solve the problems noted
above was reasonable.

After considerable examination of the issues, the following decisions
were reached:

    1. The representation for graphics used in Diamond and documented
       in MMM-18 and MMM-23 will be adopted as an interim
       representation for graphics in multimedia mail. It will be
       known as the MMGraphics1 protocol.

    2. We will actively track development of the GKS standard and also
       examine a GKS-subset that has been developed by Sandia Labs.

    3. We agreed to settle on an adopted international standard
       eventually.

3.3. Document Presentation Semantics

   There was a presentation of the ideas contained in MMM-22: "A Format
   for the Construction of Multimedia Messages". The resulting
   discussion addressed the following issues:

    o Presentation of documents on display devices with different
      characteristics (dimensions, resolutions, available fonts,
      etc.).

      The essence of the conversation was that there is no single set
      of fonts, or page sizes that will cover all of the
      possibilities. There was a strong feeling that as long as the
      display surface was of reasonable size that a document should
      be presented in a "correctly" formatted manner. Rather than
      the originator of a document specifying hard page boundaries,
      the intent of the originator regarding formatting and grouping
      of objects in the document should be preserved and used when
      the document is actually presented on a display device. A
      window on a bitmap display and a hardcopy page printer are both
      examples of display devices.

    o The desire to represent the kinds of documents that currently
      exist in the world of hardcopy as well as to represent documents
      that can take advantage of the new possibilities of electronic
      creation, storage and presentation.

Several points were made:

1. One of the first goals for multimedia systems should be to
   represent the types of documents that are prevalent in the
   hardcopy world. People are already familiar with these
   documents and will expect multimedia systems to, at least, be
   able to deal with them.

2. In an effort to provide the capabilities of electronically
   originated documents based on the hardcopy model of documents,
   we should not eliminate the great potential of electronic
   documents that have much greater reactive qualities. For
   example, a document where a graphical figure and a textual
   explanation of that figure are linked so that as long as the
   explanation is being read the figure is visible.

3. In many situations being able to carry away a paper copy of a
   document is a requirement even if the document was not
   primarily intended to be presented in hardcopy.

The following agreements were made:

1. A method for recording the author's intent regarding the
   presentation of a document should be developed. This
   representation would defer decisions on final presentation
   bindings of size, resolution and fonts to the reader's document
   presenter.

   Topics addressed by this representation will include:

       o Grouping of objects

       o Limited Font attributes (e.g., normal, bold, italic)

       o Headings, Footings

       o Sectioning

   Of course the reader's document presenter is free to ignore any
   of the author's intentions it cannot deal with. The point of
   this representation is to record the author's desires but to
   defer final decisions on how to use the intentions until the
   capabilities of the reader are known.

   This representation will lie some where between the rather
   loose spatial and temporal positioning commands currently in
   the protocol (Sequential, Simultaneous and Independent) and the

        absolute positioning of a system that defines rigid page
        boundaries and absolute positions for object placement on a
        page.

    2. We will NOT try to make this representation handle all of the
       issues addressed by modern document formatting systems.
       Instead we will skim off some of the most useful ideas but
       perhaps limit the flexibility present in these complex
       formatting systems.

    3. The document representation will be able to describe
       relationships between objects that make use of the capabilities
       of electronic document presentation, such as simultaneous
       presentation (i.e., two objects which are visible at the same
       time) and overlay presentation (i.e., two (possibly
       transparent) objects which occupy the same area in a document,
       which may also be separated under viewer control).

    4. Methods should be developed for all aspects of the document
       representation for presenting the document in a hardcopy form.
       This applies both electronic documents that fit the tradition
       hardcopy model as well as those that make use of the more
       reactive features of the representation.

3.4. Directory Service

   There is an increasing need to be able to determine attributes of
   users, hosts and domains throughout the DARPA Internet. For example,
   when composing the header fields of a message it is useful to be able
   to inquire about the mail box location of a person to whom the
   message is addressed. Likewise, there is need to determine the
   services provided by a host so that requests that will never be
   satisfied can be avoided.

   The feeling of the group was that work on the Internet Domain system
   (being done at ISI and Berkeley) would answer some of these problems
   and that we should examine the design documents to see how that
   system might help us (see RFCs 882 and 883). The WhoIs server is
   useful, but only for information about the text mail box of a person
   (see RFC812).

3.5. New Media Types

   The discussion dealt with three topics: A proposal for a new media
   type, ideas for other new media types and provisions for dealing with
   unknown media types.

   A description of the Diamond SpreadSheet/Chart media type was
   presented. This is documented in MMM-24. In this media it is
   possible to represent a table containing numbers, labels, dates and
   formulas. A unique attribute of this media type is that the
   spreadsheet model as well as the data are transmitted. The reader of
   a document containing a spreadsheet object can test what effect
   different data would have on conclusions suggested by the spreadsheet
   object. A spreadsheet may appear as a table and/or one of several
   alternative business charts (line graph, scatter graph, bar chart or
   pie chart). Rulings may be added to the tabular representation so
   that it is possible to achieve the appearance of sophisticated
   tabular data presentation. During the discussion, the point was made
   that a minimal implementation of the spreadsheet object could ignore
   the formulas and just present the values of the cells, thus allowing
   a minimal presentation of the tabular and chart information.

   Ideas for new media types included:

      Form

         A set of fields which are Name-Value pairs. Forms can be used
         for presentation and/or acceptance of information. The act of
         filling out a form might be used (under user approval) to
         trigger sending the completed form to the appropriate person
         who handles such forms.

      Animated Graphics

         A line drawing that has temporal information encoded in the
         presentation of its components. The idea is that parts of a
         graphics object could move about the object during its
         presentation. For example, an arrow could move about a map
         showing a route to be followed. There was some discussion
         about how this would interact with other media. For example,
         how could an arrow moving about a map be coordinated with voice
         instructions on how to get from one place to another. There
         were no decisions about how best to accomplish this.

   Finally, we agreed that all of our systems should be prepared to
   accept (and possibly ignore) media types that are not currently
   implemented. The common way of dealing with this is to include a
   statement of the form "An object of type <Type> appears here". With

the regularized syntax that has been adopted many of the common
attributes of all object types will be able to be understood but the
actual type may not be implemented. In Diamond we would like to use
the MPM to transfer Diamond messages between Diamond and non-Diamond
clusters. Currently if we were to include a spreadsheet in one of
these messages, all of the other implementations of multimedia mail
would probably end in the debugger when they went to process our
messages, rather than indicate that there was something that they
didn't quite understand.

3.6. MPM Support

   By the end of the summer there will be two implementation of the MPM:
   on TOPS-20 and on the Sun Workstation. We agreed to try to set up
   the following operational MPMs:

        Organization Host   MPM Implementation

        ISI   ISIF   TOPS-20
        ISI   ISIB   TOPS-20
        SRI   ?   Sun Workstation
        BBN   ?   Sun Workstation
        DARPA   ?   Sun Workstation
        Linkabit   DCN6   Sun Workstation

   The idea behind this agreement is to get wide geographic coverage to
   allow us to use multimedia mail on a regular basis and to test the
   impact of realistic use of multiple communicating MPMs using the
   Internet.

3.7. Floating Point Data Type

   In the representation for data defined in RFC759, there is no way to
   represent floating point numbers. We agreed that a new data type
   should be added, called Float64 which is the 64-bit IEEE standard
   floating point number representation.

3.8. Captions

   The idea of including a text caption as an optional property of every
   object was discussed. There are several uses of such a caption:

     o For media like voice which do not have an implicit visual
       representation, it is useful to include a caption indicating
       something about the object. This caption can serve as a visual
       indication of the presence of the non-visual object.

o When an implementation of a multimedia message system doesn't
support a given media type, it can be useful to give some
information about the object in the form of a text passage.

o In some situations, it is important to present an outline of a
document. Captions associated with each object could be used to
generate a shortened abstract of the document.

We agreed to add to all object types an optional property whose name
is "Caption" and whose value is of type Text String.

3.9. More Users of Multimedia Mail

We need to increase the use of multimedia mail to gain more
experience with issues that need attention. This can be done by:

o Encouraging more sites to participate in the experiments. There
are several possible sites which have Sun workstations that
could be configured to run an MPM and one of the multimedia
message systems.

o Making the MPMs perform translations to and from SMTP text-only
mail. At BBN, the Diamond Import/Export component performs
translations in both directions and this has proved very useful
in testing the operation of our system. In addition, the
inclusion of statements such as <Graphics appears here> might
spark interest from text-only mail recipients, although care
should be taken not to offend anybody with this kind of "class
differentiation".

To the extent possible, the Sun Workstation MPM will be modified to
perform translations to and from SMTP mail. The TOPS-20 MPM already
does the translation from multimedia mail to text-only mail. It may
be possible to add translation in the other direction.

3.10. Multimedia Exploder Mailing List

A mailing list devoted to Multimedia Mail will be set up at ISI.
This will be of the "exploding" variety so that sending a message to
the list will cause everybody on the list to receive a copy. To get
on or off the list send a note to MMM-People-Request@USC-ISIF.ARPA.
The exploder mailbox is MMM-People@USC-ISIF.ARPA.

3.11. Next Experiment

   The next experiment will be in January 1985. At that time we will
   try to demonstrate the following new features:

      o Use of the revised multimedia syntax described in section 3.1.

      o Inclusion of Graphics objects, in addition to Text, Images and
        Voice.

      o Use of the, as yet unspecified, document presentation semantics
        described in section 3.3.

      o Use of the Sun Workstation MPMs.

4. Further Actions

   Several of the agreements reached require further action. I have
   added dates which seem reasonable.

      Revision of RFC759 to include Float64 data type.
      Person: Greg Finn and Jon Postel.
      Due Date: 1 September 84.

      Conversion to the new Multimedia Syntax
      Person: All groups.
      Due Date: 1 September 84.

      Revision of RFC767 to reflect revised Multimedia Syntax and
      optional Caption property
      Person: Jose Garcia-Luna and Jon Postel
      Due Date: 1 October 84.

      Specification of Document Presentation Semantics (Section 3.3)
      Person: Harry Forsdick
      Due Date: 1 October 84.

      Acquisition of GKS and GKS-subset documentation
      Person: Lou Schreier
      Due Date: 1 September 84

      Completion of initial implementation of Sun Workstation MPM
      Person: Andy Poggio
      Due Date: 15 September 84

      Multimedia Exploder Mailing List
      Person: Greg Finn
      Due Date: 15 August 84   < COMPLETED >

        Addition of MPM<==>SMTP translation logic to Sun Workstation MPM
        Person: Mike O'Connor
        Due Date: 1 November 84

        Demonstrate Text-Graphics-Image-Voice Document Exchange
        Person: All
        Due Date: January 85

5. Attendees

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