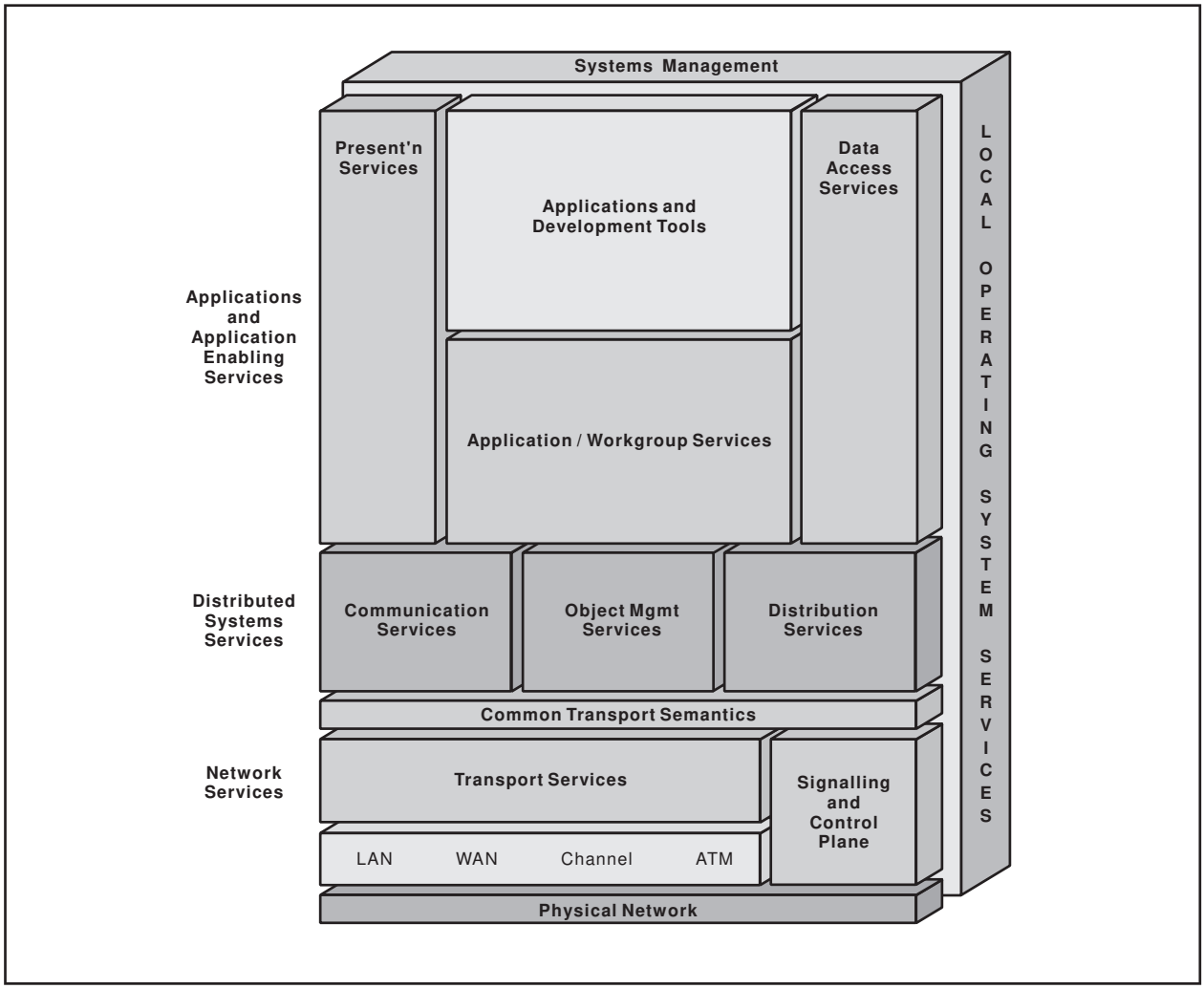
Open Blueprint

View Resource Manager



GC23-3934-01

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About This Paper

Open, distributed computing of all forms, including client/server and network computing, is the model that is driving the rapid evolution of information technology today. The Open Blueprint structure is IBM's industry-leading architectural framework for distributed computing in a multivendor, heterogeneous environment. This paper describes the View resource manager component of the Open Blueprint and its relationships with other Open Blueprint components.

The Open Blueprint structure continues to accommodate advances in technology and incorporate emerging standards and protocols as information technology needs and capabilities evolve. For example, the structure now incorporates digital library, object-oriented and mobile technologies, and support for internet-enabled applications. Thus, this document is a snapshot at a particular point in time. The Open Blueprint structure will continue to evolve as new technologies emerge.

This paper is one in a series of papers available in the *Open Blueprint Technical Reference Library* collection, SBOF-8702 (hardcopy) or SK2T-2478 (CD-ROM). The intent of this technical library is to provide detailed information about each Open Blueprint component. The authors of these papers are the developers and designers directly responsible for the components, so you might observe differences in style, scope, and format between this paper and others.

Readers who are less familiar with a particular component can refer to the referenced materials to gain basic background knowledge not included in the papers. For a general technical overview of the Open Blueprint, see the *Open Blueprint Technical Overview*, GC23-3808.

Who Should Read This Paper

This paper is intended for audiences requiring technical detail about the View Resource Manager in the Open Blueprint. These include:

- Customers who are planning technology or architecture investments
- Software vendors who are developing products to interoperate with other products that support the Open Blueprint
- Consultants and service providers who offer integration services to customers

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Summary of Changes

This revision includes a description of the relationship between the View resource manager and the World Wide Web.

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Open Blueprint View Resource Manager

The growth in PCs, local area networks (LANs), and distributed computing has brought with it fundamental changes in how documents are created and used. Once, documents were limited to simple text pages which were printed, then mailed or filed, or both. Today, a document can consist of a rich set of formatted text, images, fonts, and perhaps even video or sound clips, which can simultaneously exist in printed and electronic format. Increasingly, documents are electronically stored so they can be inexpensively accessed and exchanged over networks, or reprinted exactly as they appeared months or years prior. This change has created the need for sophisticated online viewing technology, which allows an end user to visualize and interact with a document just as if it were physically printed on paper.

Introduction

The basic function of the View resource manager is to display print-formatted documents on the workstation. A key requirement is an effective means of navigating through a document to the page of interest, then faithfully reproducing the page (within reasonable latitudes) just as it would appear on paper. This requires a very different type of viewing technology than, for example, an online help facility, which does not require faithful reproduction of the printed page.[1]

The real motivation for online viewing is worker productivity and customer service. Traditionally, many mission critical business processes, such as the production of insurance forms and utility billing statements, have left the customer-service agent with little to rely on other than data representations which differ in form from the printed document received by the customer. Consider the example of a telephone company customer calling with a billing question: “The billed amount seems too high; the bill is five pages long and many phone calls do not appear to belong to me. The monthly rate also appears too high.” To respond, the agent must have access to customer-related data for the month in question.

Given access to a customer database, the customer-service agent has all the relevant data immediately available. But “all of the calls on page two do not belong to me” is a statement that can only be discussed if the customer-service agent has a page-content view of the data. Without this, a prolonged discussion will follow regarding the individual calls on “page two.” Not having the concept of a page is a drawback to using the database approach.

Alternatively, the customer-service agent can refer to a physically filed copy of the bill in question. However, paper or microfiche can take a long time to retrieve and then re-file, and physical files are relatively expensive to maintain.

Electronic document viewing offers a solution to the shortcomings of both these methods. Retrieval and re-filing from an electronic archive are measured in seconds, and the retrieved information looks the same to the customer-service agent as it does to the customer holding the printed document. The viewable electronic document also allows the customer-service agent to capture (annotate) the discussions with the customer, and then store this information with the original document. This same document, with or without the annotation, can then be faxed, printed, or mailed to the customer, or it can be shared (interchanged) with another service agent.

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End-User Functions

The View resource manager relies on other document services, such as the Digital Library resource manager, to locate and access the document of interest. When a document, or pages of a document, have been retrieved, an end user can begin to interact with the document on the desk-top. This interaction takes the form of navigation, changing views, annotation, copying and printing.

Navigation

Navigation is the process of moving from point-to-point in a document to find a target for viewing. Four navigation schemes are described as follows:

- **String search** is based on finding a contiguous collection of text data in the document. For example, finding all of the instances of the month January and then noting these by highlighting them in the text.
- **Page search** is based on a page number or page name. This is the unique identifier that appears at the bottom of a given page. For example, find page xiii or page 572.
- **Sheet search** is based on the physical sheet number (as if the document had been printed). For example, the 27th sheet could have a page number of 15 if the preface is 12 pages (pages i-xii).
- **Index search** is the process of navigating through a document based on finding selected values of previously indexed attributes. An end user, or application, can be presented with a list of subjects or keys (for example, customer name, customer address, or account number) to search on. Selecting a specific instance of a key, such as account number 123456, yields a list of the corresponding page number(s) where the instance can be found. The index structure provides the basis for either retrieving selected pages from a document archive system, or navigating through an entire document which resides on a local system.

Changing Views

The document view can be manipulated by scrolling from page-to-page, rotating the image (90, 180, or 270 degrees), viewing as portrait or landscape, zooming in on a specific area of a page, or viewing multiple pages at a time (2-up, 4-up, and so on). View profiles, which define the look and feel of the view, can also be saved.

Annotation

The View resource manager prevents direct modification or revision of the document. This protection is driven by the need to preserve the original document, a requirement from many industries such as insurance and finance. What is provided is the ability to attach annotations to a document. The annotation function provides a means of giving the user a way to add external information to a document (information that does not change the source document itself) that can be viewed or printed with the document when using the View resource manager. For example, customer comments that were discussed during a service-representative telephone call could be added to an invoice. Annotation information can include key strokes, voice, video, or other forms of input available through the appropriate resource managers.

Copying

Any viewable document can be copied as an image using user-interface specific clipboard facilities, for example, the OS/2 Presentation Manager or Windows clipboards. Text documents can be copied in text format, again using an appropriate clipboard facility. These files are then revisable using a desktop editor appropriate for the file format (ASCII text, bitmap, and so on).

Printing

The View resource manager provides the ability to print all or part of a document to either a printer driven by the Human Computer Interaction resource manager (for example, the OS/2 Graphical Programming Interface (GPI)), or through the Print resource manager.

Integration

The View resource manager is intended to be loosely or tightly integrated with the client component of an application, and can be used by other resource managers. Varying degrees of integration are possible.

The nucleus of the View resource manager, or kernel, is a platform-independent set of functions which contain its core viewing services, for example, data stream transformation, font mapping, and the handling of navigation and the changing of views. In all forms of integration, the kernel is used intact.

The View resource manager can be loosely coupled to an application using a command line interface (CLI) or Dynamic Data Exchange (DDE) to integrate the viewing function in a relatively unchanged manner. In doing so, a target file (document) and a list of permissible operations (zooming, copying, printing, and so on), are associated with the View resource manager. The look and feel of the View resource manager remains distinct from the calling application. For example, the View resource manager can be invoked from most Web browsers simply by adding the Multipurpose Internet Mail Extension (MIME) type (application/afp) to their .ini file and pointing to the View resource manager as the viewer for that document.

Extensions to the View resource manager will be developed to integrate it with the Web Browser resource manager such that if a Uniform Resource Locator (URL) references a print formatted document, that document can be viewed through the View resource manager under the control of a Web browser.

The View resource manager also provides a set of application programming interfaces (APIs) that deliver a high level of integration of the viewing function with another application. The resulting integration appears seamless, with viewing operations under the direct control of the application. Finally, the View resource manager provides an API that supports the attachment of various output drivers, adding support for a different presentation interface or output data stream.

Considerations

Because end users will want to view documents created on one of many operating systems platforms, and by a variety of commercial or private applications, the View resource manager is able to render a variety of industry-standard print data streams, document objects (for example text, image or graphics), and fonts (for example, the Adobe Type 1 or True Type Formats). Thus far, the discussion of viewing function has remained somewhat independent of the format of the document being viewed. But viewing operations are influenced by the architecture of the print data stream and the structure of the document.

Document fidelity, or the degree to which a viewed document matches the printed version, is a function of the device and resolution independence of the underlying data stream. For example, a data stream that provides a document structure based on independent pages will in turn facilitate page-based processing. With such a document structure, it is possible to efficiently locate and render an arbitrary page without requiring any preceding pages to be processed. Also, to take full advantage of navigation, a document must support indexed-based search. This, in turn, requires a supporting structure to be added to the document before or after formatting. Two data streams which provide these attributes are IBM's Mixed Object: Document Content Architecture - Presentation (MO:DCA-P) and Adobe's Portable Document

Format (PDF). More linear print streams, such as ASCII, SNA Character String (SCS) or non-coded files such as TIFF or GIF files are viewable, but with much less navigation function.

The following list describes the set of data formats supported or planned to be supported in the near future. Additional formats will be added over time to meet customer requirements.

- ASCII files, while ignoring graphics controls
- Common image formats, including the following:
  - Tag Image File Format (TIFF)
  - PC Paintbrush file Format (PCX)
  - Graphical Interchange Format (GIF)
  - JPEG File Interchange Format (JFIF)
- SNA Character String (SCS)
- Advanced Function Presentation Architecture (MO:DCA-P), including the following:
  - Presentation Text Object Content Architecture (PTOCA)
  - Image Object Content Architecture (IOCA)
  - Graphics Object Content Architecture (GOCA)
  - Resource objects such as overlays and page segments
- PostScript files which have been converted to Adobe's Portable Document Format (PDF)

[1] The View resource manager provides viewing capability for print-formatted documents. It does not provide viewing support for Collaboration resource manager documents or Web Browser resource manager (HTML) documents. Viewing support for these documents is provided by those resource managers.

Appendix A. Bibliography

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Appendix B. Notices

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