

EMC DOCUMENT SCIENCES xPRESSION SERVICE-ORIENTED ARCHITECTURE

A customer communications management platform

Abstract

This white paper provides an overview of the architecture and components of the EMC® Document Sciences® xPression® software suite, an award-winning customer communications management solution. It describes how xPression's multitier service-oriented architecture (SOA) provides a set of tools and applications to administer, design, and publish a wide variety of highly customized and personalized communications in real time, near time, and/or high-volume batch. xPression's SOA is unique in that it provides both realtime, web-based document fulfillment and optimized high-volume batch generation, whereas competing products are designed exclusively as online systems and do not perform well for large-batch document production. xPression's Java EE SOA allows it to process online, realtime requests; near-time messaging requests; and batch requests equally well. Moreover, because xPression is built on the power of Java EE, it supports industry-leading operating systems, application servers, and databases.

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Executive summary

The award-winning EMC® Document Sciences® xPression® software suite is a market-leading customer communications management solution. xPression personalizes a wide range of customer communications through a technology called dynamic content publishing (DCP), which includes the creation, assembly, and multichannel delivery of a variety of highly customized and personalized communications.

xPression's multitier service-oriented architecture (SOA) provides a set of tools and applications to administer, design, and publish a wide variety of customer communications in real time, near real time, and/or high-volume batch.

By tightly integrating with existing systems, data, and workflows, the xPression architecture can significantly streamline business processes and help organizations deliver more accurate, relevant, and effective customer communications.

Audience

This white paper is intended for a technical audience, including current and potential users of xPression who seek an in-depth understanding of its architecture.

Introduction

This white paper provides an overview of xPression's SOA. It describes the major components of the [server](#) and [application](#) layers and its [integration capabilities](#), and concludes with a summary of why xPression is the best choice for consolidating all document generation and publishing needs within an enterprise or within a department in the enterprise.

This paper can be used as an aid in comparing xPression to other products. Readers are provided clear details on xPression's ability to easily integrate with other enterprise applications and business workflows to significantly streamline business processes and help organizations deliver more accurate, relevant, and effective customer communications.

xPression overview

EMC Document Science's award-winning xPression software suite enables organizations worldwide to optimize the customer experience by automating the creation and delivery of well-designed, highly personalized customer communications—from customized marketing collaterals, contracts, and policies to high-volume relationship statements and correspondence. The following information is designed to provide an overview of the architecture and various components of xPression. Rather than focusing on the functionality of xPression components or details of integrating xPression with other systems, this paper focuses on the

solution's architecture. Please refer to [other available white papers](#) for information on xPression functionality, integration, and/or connectivity.

xPression generates highly personalized and customized customer communications through DCP, which comprises the creation, assembly, and multichannel delivery of customer communications, including the following types of documents:

- Legal contracts and highly negotiated agreements, such as ISDA master agreements and group healthcare contracts
- Insurance policies, forms, and certificates
- Statements, financial reports, and consolidated investment reports
- Trade confirmations, correspondence, and other trading documentation
- Claims and customer service correspondence
- Printed and rich HTML email correspondence
- Invoices, bills, notices, and alerts
- Account opening and welcome kits
- 1:1 personalized marketing collateral, mailers, catalogs, and newsletters
- Personalized web landing pages for secure communications

The generation of such document types requires content assembly driven by rules that specify how to select the right version of the content and how to personalize the content based on data and business logic. Personalized documents also need to be properly formatted for distribution across many output channels—including web and email formats such as HTML and Adobe PDF—and high-volume print formats such as Adobe PostScript and IBM AFP. Customer communications management is typically part of an overall business process executed by an integrated set of systems, such as customer relationship management (CRM), enterprise content management (ECM), and claims administration systems. Therefore, xPression provides a variety of mechanisms for integration with other systems in the enterprise. This paper explains how the architecture and functionality of xPression make it uniquely qualified to provide a true enterprise document generation solution that is far superior to any other product in its class.

xPression architecture

xPression's multitier SOA provides a set of tools and applications to administer, design, and publish a wide variety of highly customized and personalized communications, in real time, near time, and/or high-volume batch. xPression's open architecture is based on the Java EE standard, web services, and XML. Its architecture is designed to ease integration into an organization's existing business workflows and data/content repositories. Figure 1 depicts the architecture of xPression at a high level.

The architecture is unique in that it provides both realtime, web-based document fulfillment and optimized high-volume batch generation. This clearly differs from other product offerings that are designed only as optimized batch engines and, therefore, are unable to support the requirements of realtime or near-realtime publishing systems. Whereas other products are designed exclusively as online systems and thus, do not perform well for large-batch document production, xPression's Java EE SOA allows it to process online, realtime requests; near-time messaging requests; and batch requests equally well. Moreover, because xPression is built on the power of the Java EE standard, it supports industry-leading operating systems, application servers, and databases.

In addition, xPression leverages operating system, application server, and database support for clustering. Therefore, it can scale up or down to run on a variety of platforms—from modest hardware (all components, including the database, can be run on a single laptop) to a horizontal cluster of many small servers, to a very large vertically clustered server, to anything in between.

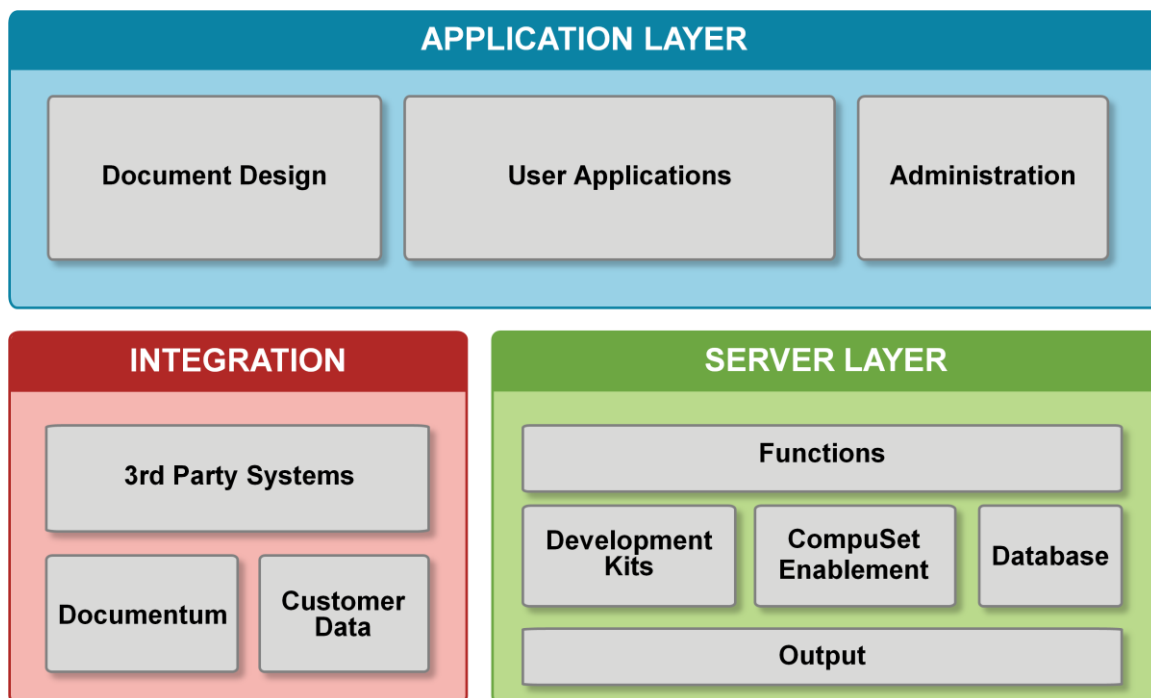


Figure 1. xPression architecture

xPression's architecture has the following major components:

Application layer

- **Document design tools:** Designed for ease of use and power of functionality for document designers.
- **Business user applications:** Built for business users, these solutions emphasize ease of use and domain-specific functionality.

- **Web-based administration applications:** Geared toward IT operations staff in charge of document production and system administration.

Server layer

- **xPression server:** Based on Java EE, XML, and web services, the xPression server enables IT architects to integrate xPression with other enterprise systems. It runs inside a Java EE application server. The server contains its own content database as an alternative to external data sources.
- **xPression Framework:** Web services toolkit for incorporating core xPression functionality in other applications or for developing custom applications.
- **Interactive Document Development Kit:** Web services toolkit that allows customers to add xPression interactive document development capabilities to third-party or custom line-of-business applications.
- **Multichannel output management and delivery:** Enables the design of a single document template that contains variations of content and styling suitable for email, print, Web, and archive delivery.

Integration

- **Third-party systems, EMC Documentum, and customer data:** xPression integrates with third-party ERP, CRM, and ECM systems to produce and distribute documents as well as update these systems using standards-based integration protocols and methods. An additional level of integration for EMC Documentum is included. xPression can leverage either XML or relational database customer data for personalization.

Each component is described in more detail in the sections that follow.

Document design tools

Unlike competitive offerings, xPression’s design philosophy is to enable document designers to use familiar and highly popular content authoring tools from Microsoft and Adobe. Rather than forcing designers to learn a new proprietary interface that must attempt to satisfy a broad range of document types and delivery channels through a “least common denominator” approach, xPression provides a universal plug-in technology called xPresso® to extend dynamic content design capabilities to the most popular content authoring tools, including Microsoft Word, and Adobe InDesign and Dreamweaver. xPression also provides a document packaging tool called xDesign for combining complex, hierarchical document packages.

In the pages that follow, we will explain the main concepts of xPresso, then describe the specific capabilities found within each of the xPresso products and provide an overview of xDesign.

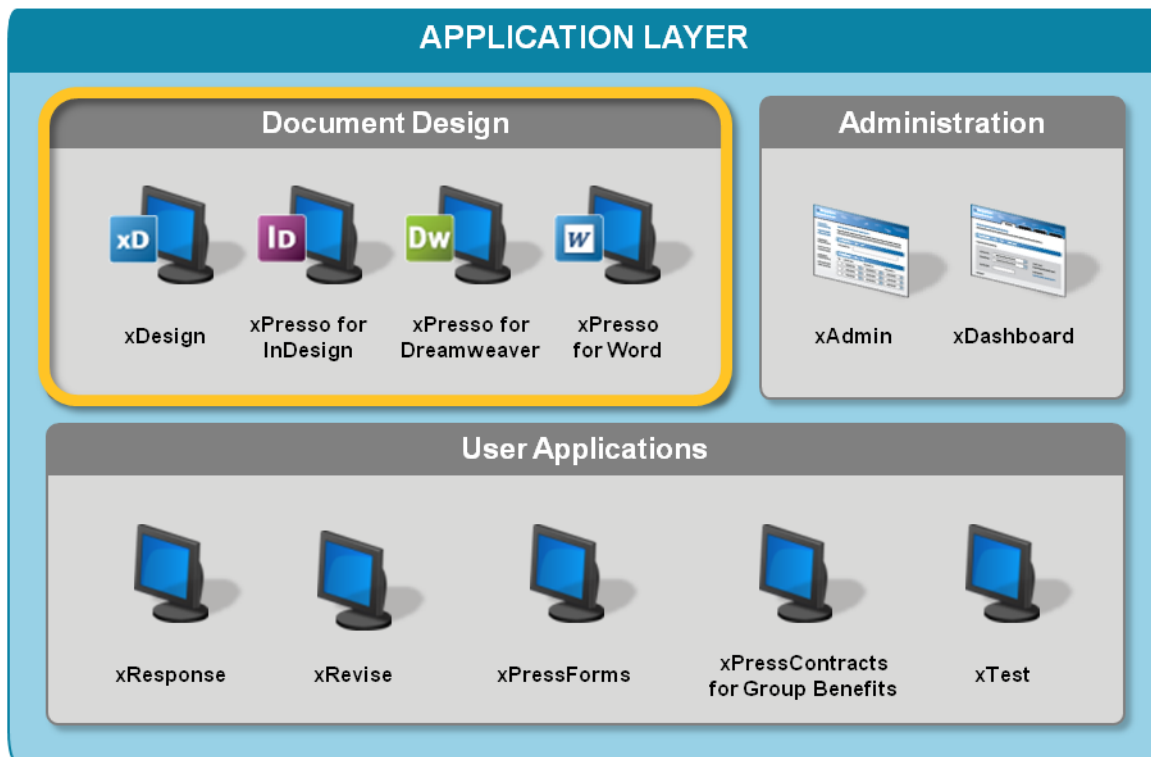


Figure 2. xPression document design tools

xPresso technology

xPresso is a plug-in technology that extends widely used content authoring tools with rules (for content customization), variables (for content personalization), and deployment for high-volume and multichannel production by the xPression server. xPresso comprises five main concepts:

- **WYSIWYG design:** The document designer works from within the content authoring tool, such as Microsoft Word, to develop a dynamic document template. The template is an XML specification that contains all of the rules and variables that make the document dynamic. The document designer can validate the document template by applying XML test data to generate personalized instances, all from within the content authoring tool.
- **Business logic:** The xPresso plug-in displays the template in a schematic palette, which allows the user to define and modify all of the business logic rules in the document for content selection and customization.
- **Variables:** Content is personalized with variables that are replaced at document generation time with values that come from customer data. xPresso provides a palette for defining all of the variables in a document and mapping these variables to data. A separate palette allows the user to load a data schema and map its elements to the variables.
- **Collaboration through subdocuments:** Each document template can be modularized into a set of subdocuments contained within a master document. As

a result, different document designers can work on different subdocuments at the same time and merge them into the master document for testing.

- **Deployment packaging:** Once the designer has completed template development and testing, it can be packaged for deployment to the xPression server. The packaging process transforms the template and all of its content into Java code, which the xPression server executes by applying variable data to generate many personalized documents from a single template.

These five concepts are used in all of the xPresso design tools, as explained below.

xPresso for Adobe InDesign

xPresso for Adobe InDesign is ideally suited for designing graphically rich, frame-based documents, including statements, financial reports, bills, invoices, marketing collateral, mailers, and catalogs. In addition to the main concepts described [above](#), xPresso for Adobe InDesign provides specific capabilities for designing statements and marketing collateral, such as advanced dynamic charting, table and page flows, image cropping, scaling and rotation, and calculations. xPresso for Adobe InDesign enables a document designer to quickly create simple documents, such as invoices and mailers, but also develop the most sophisticated statements, such as consolidated investment reports and complicated catalogs, with ease.

xPresso for Microsoft Word

xPresso for Microsoft Word uses the same technology and concepts as xPresso for Adobe InDesign, but it is based on Microsoft Word 2007. It is commonly used to design correspondence, proposals, contracts, and other textual documents that are a good fit for Word. It adds specific features that are relevant only to Word, such as text wraparound.

xPresso for Adobe Dreamweaver

xPresso for Adobe Dreamweaver is used to develop rich HTML emails, personalized web pages, and personalized HTML documents. It uses the same technology and concepts as the other xPresso tools but allows the document designer to work within an HTML authoring environment and use interactive HTML features, such as drop-down menus, action buttons, and hyperlinks.

xDesign

xDesign has been developed to design granular, complex documents with compliant, regulatory content, such as hierarchical, multipart contracts, insurance policies, and packages of multiple, mixed documents. It is a Microsoft Windows-based client application that allows a document designer to combine subdocuments from various xPresso templates as well as create dynamic content using Microsoft Word from within xDesign. xDesign benefits from all of the features provided by xPresso plus the following:

- **Content versioning:** The ability to store content fragments as objects in the xPression database and version the objects so that the appropriate version can be included in a personalized document based on customer data.
- **Multidata source access:** A single xDesign template can read data from multiple data sources through structured query language (SQL), enabling very powerful data access at document generation time.
- **Content approval workflow:** Each content fragment in an xDesign template can go through an approval workflow to ensure that only approved content versions are deployed to production for use during document generation.
- **Mixed document packaging:** A single xDesign template can contain subdocuments that are a mix of xPresso documents. Thus, designers can create a complex document that includes, for example, a cover letter that is an xPresso for Word document, a statement that is an xPresso for InDesign document, a marketing insert that is also an xPresso for InDesign document, and a set of legal disclosures that is created from within xDesign using Microsoft Word.

The combination of xPresso and xDesign provides document designers with the most comprehensive document design suite in the industry, enabling them to work within the tools that they use today. This unique approach eliminates the often daunting step of transferring a design that was originally created in Word or InDesign into a proprietary tool, which typically takes a long time and often results in differences between the approved design and the final result.

User applications

xPression includes several applications designed for business users that address requirements for quick, ad hoc responses, such as customer service; complex documents such as contracts; and specific vertical applications such as property and casualty insurance. A testing application is also included.

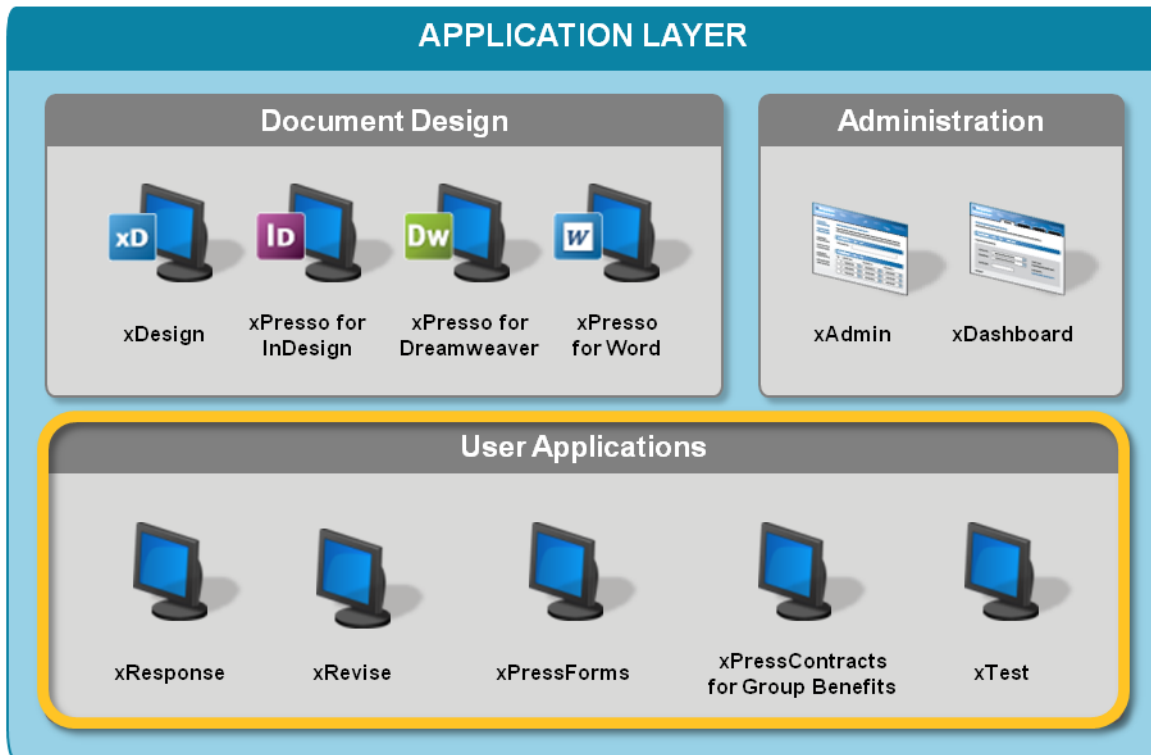


Figure 3. xPression user applications

xResponse

xResponse is a web-based application for realtime document previewing, editing, and generation. It is ideally suited for use anywhere realtime, customized customer communications are required, such as in call centers, agent automation environments, or within claims processing systems. xResponse provides secure access to one or more xPression servers and allows the user to generate a personalized document for a specific customer by pulling in customer data from a predefined source or capturing the data online. The user can then edit this document in an ad hoc fashion, select a distribution mechanism, and then submit the document for publication in either real time or as a scheduled batch job. xResponse also provides the ability to define and apply an approval process that ensures all documents are approved prior to distribution. xResponse can be used as a standalone solution or launched as an extension to another company's web-based environment, web portal, or workflow system using our FastPath mechanism. FastPath enables integration with a primary application through query string parameters and XML data, easily adding DCP to a front-end application. The Interactive Document Development Toolkit (IDDK) is the ideal choice when more complex customizations or complete custom applications are required. IDDK is covered in more detail in the [xPression development kits](#) section.

xRevise

xRevise is a web-based application that enables the controlled customization of complex documents. The exact changes performed on the document are stored, and

the user can generate multiple versions of the customized document. It is used most often to customize a base contract for a particular recipient. xRevise uses an enhanced version of Microsoft Word for a superior yet familiar interactive document editing environment. Figure 4 shows a screenshot example of xRevise.

To modify a specific document, users can choose to conduct the changes directly within the document or through its Table of Contents if they want to focus only on specific document sections. Search features allow users to quickly find and apply changes that other users may have performed to the same base document for other recipients. xRevise also provides facilities for automatically customizing a document based on the document's change history (that is, apply the same customizations performed for one recipient to hundreds or even thousands of other recipients). xRevise's built-in triggers alert users when customizations cannot be automatically applied and initiate manual review processes. Once a customized document is complete, users can deliver it directly to a customer via all supported xPression distribution mechanisms.

As in xResponse, xRevise supports the FastPath mechanism for launching the application from other web-based applications. xRevise also integrates with IDDK to support more complex customizations. All xPression applications depend on the interface provided by the xPression server components to provide their functionality. This interface has been packaged into a comprehensive framework that allows customers to write their own applications and solutions using xPression components. Through a set of data access components, the xPression server components access the lower layer of the architecture, which is the data/content layer.

xPressForms for P&C Insurance

xPressForms™, part of EMC Document Sciences' xPression software suite, is the all-encompassing solution for the creation, customization, and management of insurance forms. xPressForms consists of a web-based form management tool and a library of industry-standard forms from ISO and other leading bureaus, prebuilt in an xPression-ready format. Figure 4 shows a screenshot example of xPressForms.

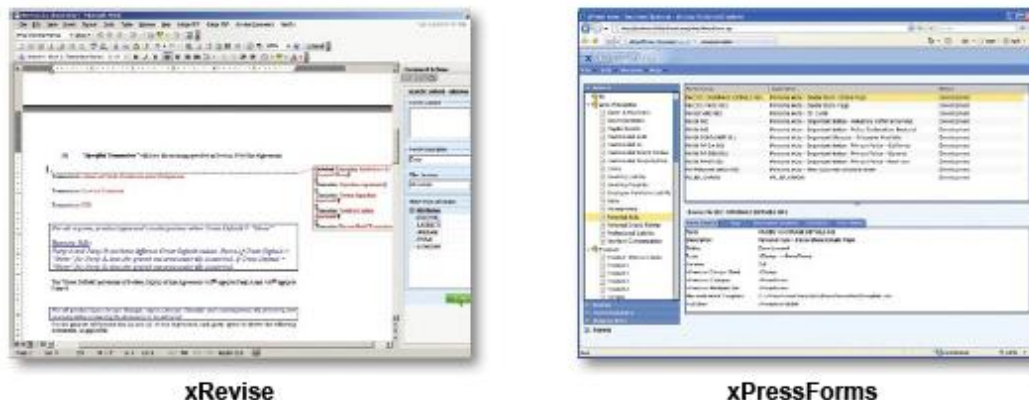


Figure 4. Screenshot examples of xRevise and xPressForms

xPressContracts for Group Benefits

EMC Document Sciences' xPressContracts for Group Benefits solution is a web-based, collaborative application designed to improve the workflow efficiency of the group benefit contract generation process. It uses Microsoft Word as the business authoring tool. xPressContracts for Group Benefits allows health insurers to customize and manage group benefit contracts within a centralized, online environment. It features a library of base contract templates driven by business rules and accessed via the Web, as well as detailed search, carry forward, and side-by-side comparison capabilities to facilitate annual contract revisions, and version tracking to support auditing and risk management.

xTest

xTest is a thick-client print stream comparison application. It displays two print streams side-by-side for verification, identifying changes to type fonts, images, and graphics with user-defined change marks such as circles, squares, and arrows. It eliminates the need to print volumes of sample documents and visually inspect each page to verify that any changes are intentional. xTest generates a detailed list of differences on specific pages to pinpoint the exact location of changed items. Expected changes can be easily accepted with a drag-and-drop feature, which also provides a mechanism for tracking all differences and generating an audit trail report.

Administration applications

The xPression software suite includes two web-based applications to administer and monitor the xPression server.

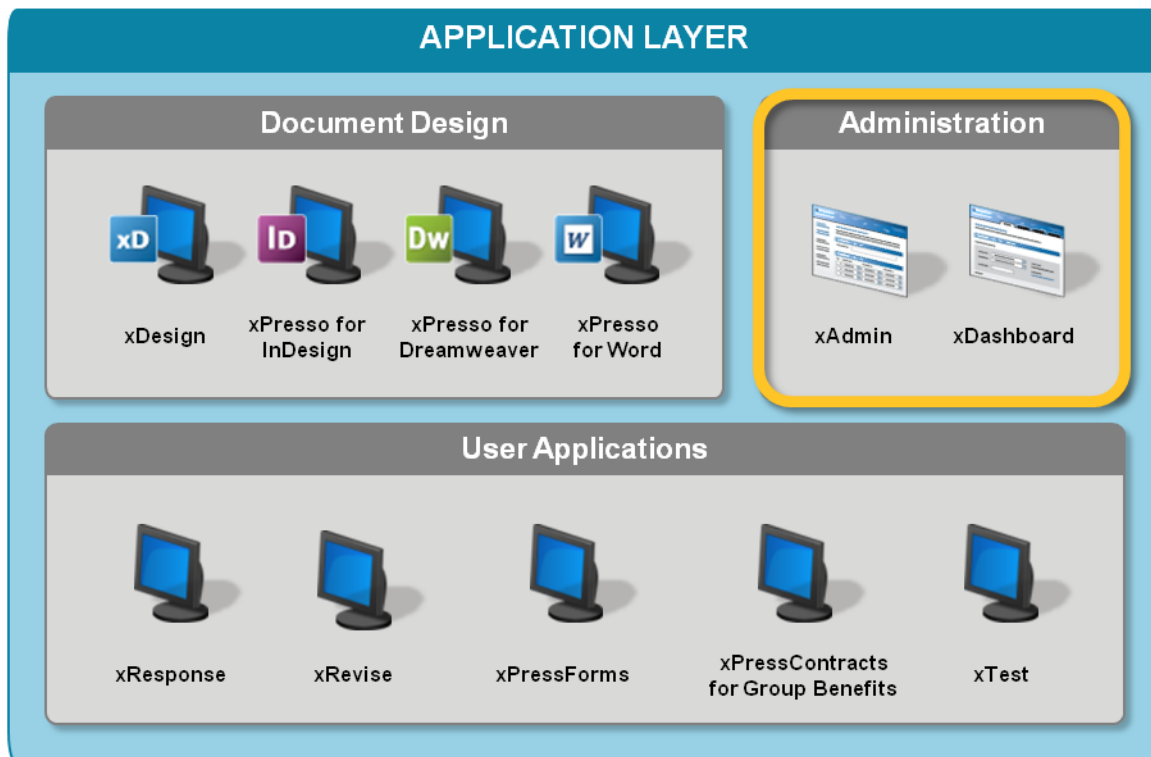


Figure 5. xPression administration applications

xAdmin

xAdmin is a web-based application for administering the xPression server. Its interface is geared toward IT operations/system administrators and designed to help them reduce system management costs by streamlining the configuration of the following aspects of xPression:

- **Template management:** Document designers can use any of the design tools provided by the xPression software suite to create document templates. The administrator can deploy these templates on the xPression server using xAdmin, which provides the following document management capabilities:
 - **Document categories:** Organize document templates into logical categories that are linked to predefined data sources, security permissions, and approval workflow definition.
 - **Data source groups:** Map Universal Content, relational data, XML, or XQuery sources of widely used formats, including flat files, mainframe data, and XML-based sources. Data sources can be grouped where each group shares the same unified schema.
 - **Attribute sets:** Define a set of attributes that are automatically applied to document templates.
- **Resource management:** Define and organize shared resources, such as fonts, images, connectors to ECM systems, and external content sources. These resources can then be used in any document publishing job.

- **Output management:** Define device details for print, email, and archive, including formatting, fonts, trays, finishing options such as bar coding and sorting, and packaging.
- **System management:** Configure license control, migrate from one xPression environment to another, and other system-related functions.
- **CompuSet:** Enable and configure the CompuSet composition engine.
- **Database:** Configure xPression's internal database.

xAdmin stores configuration details in the xPression database, where they can be accessed and read by other xPression components.

xDashboard

xDashboard is a web-based application for defining, executing, and monitoring batch publishing jobs. Its intuitive, easy-to-use interface enables IT operations staff to quickly run production batch jobs to produce millions of highly personalized and customized documents without any coding. Major features include:

- **Job management:** Create job definitions, execute batch jobs, and define input data sources, output profiles, and job logging.
- **Job monitoring:** Show the current jobs running in the system, including job names, start time, and progress.
- **Job history:** Display a searchable list of previously run batch jobs. View job status, start and end time, failure records, and detailed error messages.
- **Server management:** Lock management enables the removal of dangling locks that result from server communication errors. Concurrency management displays the congruent usage of the software by the number of seats used for the application. Distribution service management enables viewing the email, print, and archive distribution status for queued distribution tasks. Server statistics display information for executed jobs and documents.

xPression server

The xPression server is the core of the xPression software suite. It consists of all of the components necessary for assembling, publishing, and distributing documents. Figure 6 shows the details of the xPression server layer.

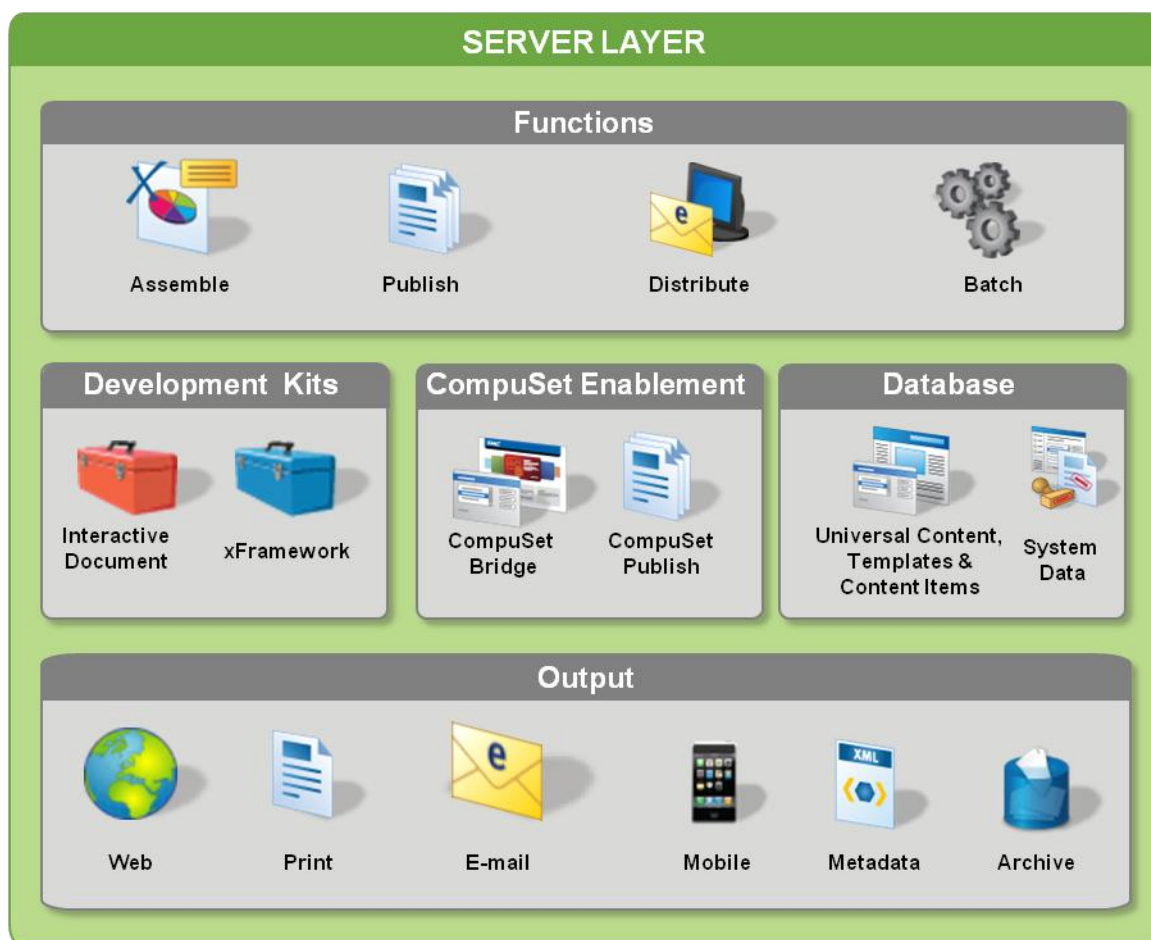


Figure 6. xPression server layer

The components in the xPression server are written in Java and are hosted on a Java EE application server. Supported server products include Apache Tomcat, IBM WebSphere, BEA WebLogic, and JBOSS. The use of Java in both the xPression components and the application server allows xPression to deliver multiplatform compatibility and run on several operating systems, including Windows Server 2008, IBM AIX, Oracle Solaris, Red Hat Linux, and SUSE Linux. The xPression server has four core components: xPression Assemble, xPression Publish, xPression Distribute, and xPression Batch. In addition, it provides a public interface called xPression Framework to enable writing additional applications on top of the server.

xPression Assemble

The xPression Assemble component assembles the appropriate content for a particular customer. It determines which content items or fragments to include by executing the set of assembly rules defined in the template produced by the xDesign or xPresso design environments (see [earlier](#)). xPression Assemble can retrieve content from a content management system, file system, or xPression's database.

xPression Assemble also handles the replacement of variables in content items with variable data obtained from various data sources. It is written as an Enterprise Java

Bean (EJB) that runs in a container provided by the application server. Multiple instances of the xPression Assemble EJB can be invoked to process simultaneous document assembly requests. xPression Assemble is written as a stateful session EJB in order to enhance the performance of client applications, such as xDesign, which employ user sessions that must pass information from one operation to the next. The EJB has a public API that can be accessed by each requesting application. To start sending requests to the xPression Assemble component, an application must first “start” the EJB by creating an instance of it. Once created, the instance will maintain its state and will handle all requests from the same application session until it is “stopped.” Starting and stopping the Assemble Engine EJB typically occurs at login/logoff from an xPression application.

xPression Assemble produces an XML object that contains the values for all of the resolved variables in the document template and the unique identifiers for all of the content fragments to be retrieved. The engine then uses this XML to produce an Assembled Document by retrieving and merging the actual content fragments identified in the Assembly List. The resulting assembled document is the input of the xPression Publish component.

xPression Publish

xPression Publish is responsible for the composition, formatting, and distribution of documents that are assembled by xPression Assemble. Composition involves determining all of the margins, line breaks, page breaks, headers/footers, fonts and colors, and so forth. Formatting involves laying out the document in a particular page description language, such as PDF, PostScript, or AFP. In addition, xPression Publish is responsible for any post-composition processing to create document packages, sort documents within packages, and add finishing information, such as barcodes. Distribution involves sending the formatted documents or packages of documents to the appropriate channel(s), including email, printer, Web, or an archive system. xPression Publish comprises multiple EJBs and Java classes to perform all of the services described above. xPression Publish comprises a state-of-the-art, multithreaded Java publishing engine that can process the document templates created by any of the xPresso products or xDesign with a speed that surpasses all other document composition engines. In addition, xPression enables users to use its legacy composition engine, CompuSet, which provides a sophisticated set of composition, emitter, and output-processing operations.

xPression Distribute

Within the xPression server there are several controllers. Prominent among these is the Distribution Controller, which is responsible for interfacing with the supported distribution channels in xPression, including SMTP email, print, and archive. Its archival capabilities include automatic, multithreaded output to EMC Documentum for high-volume online archival. The Distribution Controller is a stateless session EJB and operates asynchronously through a queuing mechanism to ensure reliable delivery of output to channels that do not reliably support multithreaded input. The

Distribution Controller determines which distribution channel(s) to use from information provided by the Output Processing Controller.

xPression Batch

xPression Batch is a multithreaded Java application that executes and manages high-volume batch jobs. It runs outside the application server in a separate process, and accesses the xPression Assemble and xPression Publish components through their public interfaces within the xPression Framework API. In order to produce the best performance possible, it is configurable to optimize the number of threads it runs of each component. Through the built-in scheduling services of the operating system, it can be started manually or scheduled to start at a certain time. xPression Batch receives its processing instructions through a Job Definition, an XML specification that can either be manually generated or created through xDashboard.

xPression development kits

Two development kits are packaged with xPression to add xPression capabilities to existing customer applications or to develop custom applications.

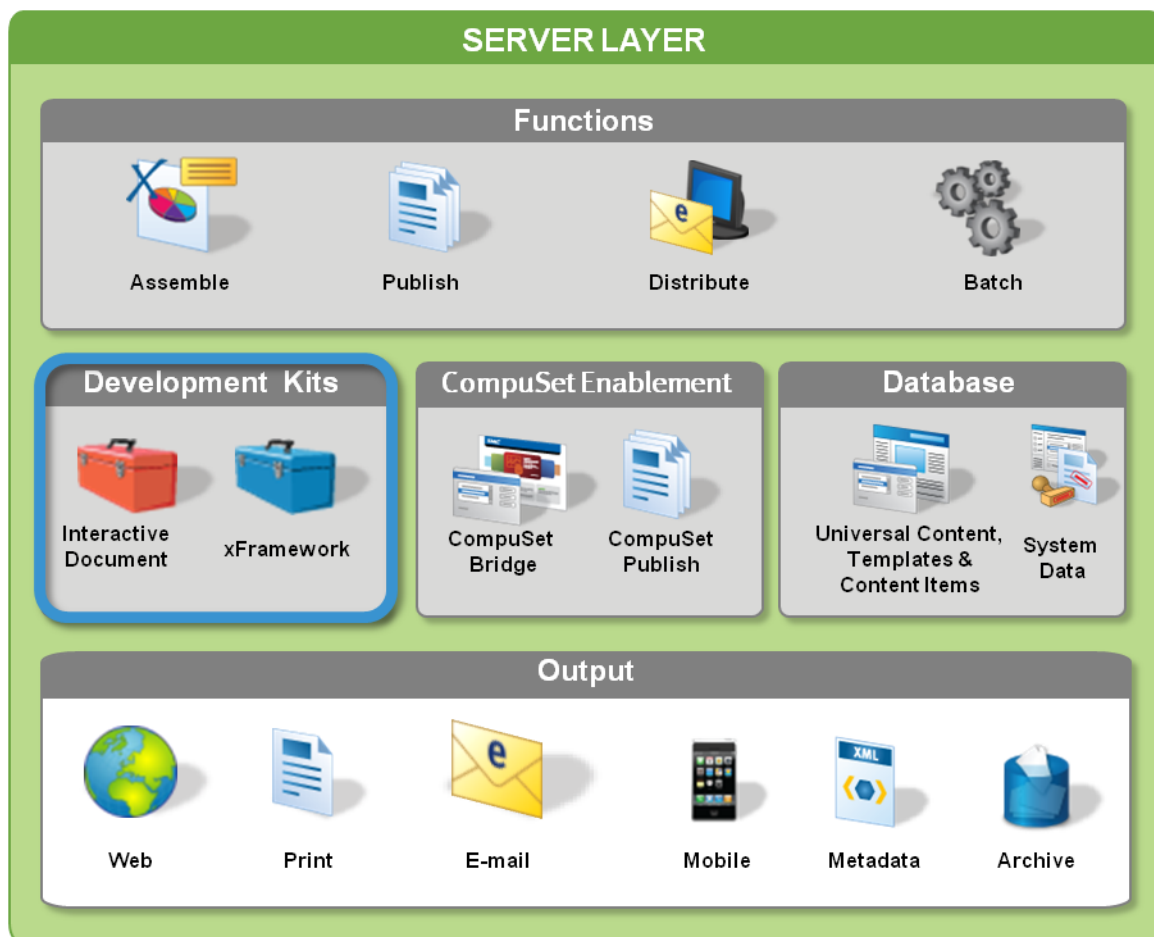


Figure 7. xPression development kits

xPression Framework

xPression Framework is a WS-I-compliant, SOAP-based web services toolkit for integrating xPression document assembly and publishing capabilities with external applications or for developing standalone custom applications. xPression Framework enables developers to integrate xPression's high-volume batch generation and publishing capabilities with virtually any kind of external system, including CRM, ECM, ERP, and/or line-of-business applications.

xPression Interactive Document Development Kit

The xPression Framework provides services for straight-through document assembly and publishing. The Interactive Document Development Kit (IDDK) enhances xPression Framework capabilities with a focus on interactive document features. IDDK capabilities include optional paragraph selection, external content selection, editing, tracking, and reporting capabilities. The services from both the xPression Framework and IDDK can be added into existing third-party applications or new standalone custom applications.

xPression Database

In standalone instances, xPression provides a fully indexed database that can store three types of information: xPression metadata objects, text objects, and binary objects such as images. It also provides version control on text and binary objects.

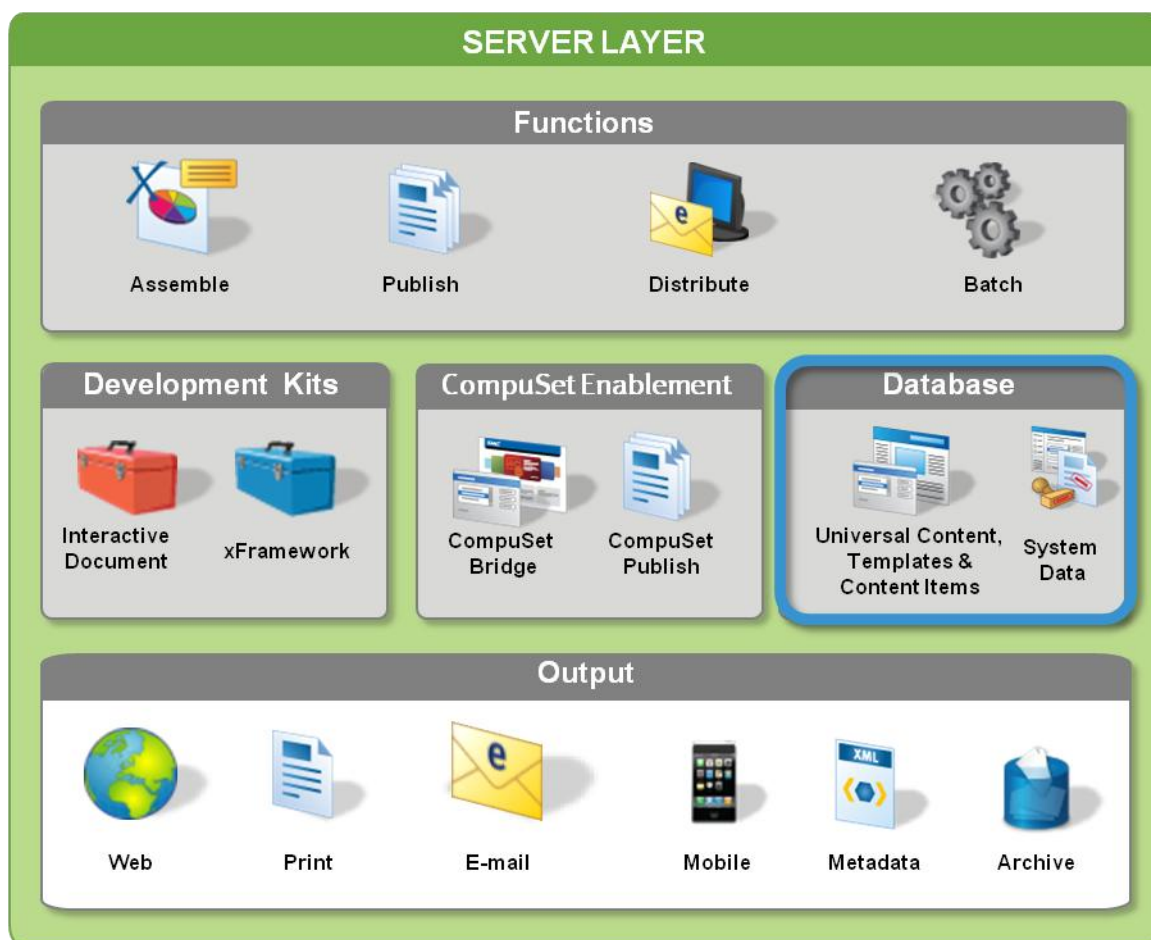


Figure 8. xPression database for standalone operation

The xPression Database can be installed on relational database platforms, including DB2/UDB, Oracle, and SQL Server. Note that only one xPression Database can exist for each installation of xPression. In a situation where multiple xPression servers exist in a cluster, the xPression Database is shared among all servers participating in the cluster.

Universal Content

xPression templates created in xDesign, xPresso for Word, and xPresso for InDesign can pull static content at document publishing time from an ECM system. Universal Content includes external PDF files that can be included on a page basis and Word format files (.doc, .docx) that can be included on either a page or subpage basis. For example, a legal disclosures section that is authored in Word can be inserted into an xPression template as Universal Content so that the legal team can continue to maintain and update this content using Microsoft Word. For customers that do not have an ECM system, Universal Content can be included from any file system path that is accessible to the xPression server at runtime.

Content and data integration

The dynamic generation of documents involves content, rules, and variable data. Content is comprised of fragments that may have variables in them. Assembly rules determine which content fragments belong in the dynamic content. Variable data is used to resolve the variables in the content and to execute assembly rules.

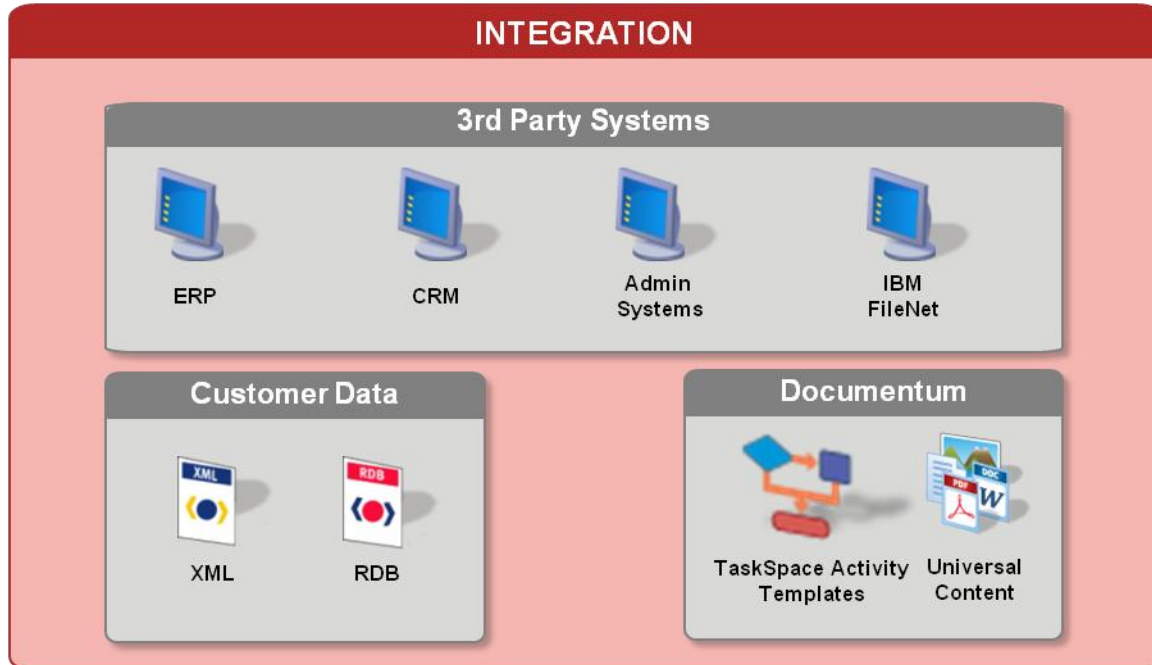


Figure 9. xPression content and data integration

Third-party systems

Third-party systems, such as ERP, CRM, and ECM systems, can integrate with xPression to produce and distribute documents using standards-based integration protocols and methods.

- **Realtime integration:** Directly calls HTTP(S)-based web services and GUI components in the xPression development kits for synchronous document display and editing.
- **Near realtime integration:** Integration broker technologies such as IBM WebSphere Process Server and Microsoft BizTalk can call development kit web services inside process workflows.
- **Batch integration:** The xPression Batch engine complies with batch processing industry standards. Enterprise-class job scheduling tools can integrate data collection, file transfer, xPression document production, and document distribution batch jobs in a coordinated sequence.

Customer (or variable) data

Variable data can be provided to xPression in any format. Natively, xPression can process data in a variety of XML formats or in one or more relational database

formats. The Customer Data Reader is a multithreaded Java component that is responsible for processing variable data. It is called by other xPression server components to retrieve either XML data or relational data. The Customer Data Reader can read any XML structure through a combination of XML Schema Definition (XSD) to define the schema and XPath to define where the data is within the XML data tree. To better facilitate querying XML data, the Customer Data Reader creates an in-memory database that stores all of the retrieved data from the XML file as in-memory relational tables. This functionality also allows the document designer to develop a single document that can be used with a variety of data sources, depending upon the business need.

The Customer Data Reader can also retrieve relational data from any RDB using Java Database Connectivity (JDBC). The certified databases supported by xPression are Oracle, DB2/UDB, and SQL Server. Instead of executing raw SQL statements directly against the databases, the Customer Data Reader takes Java objects and translates them into SQL code that is customized for each of the supported vendors' adaptations of SQL, allowing xPression to be database-independent. In addition to the Customer Data Reader component, xPression provides a "Java exit" mechanism whereby an external program can be called to access data from any source, including a VSAM file on a mainframe or a flat file, manipulate this data by performing calculations on it, and then produce streamlined XML data required for document assembly and publishing. xPression includes support for XQuery through integration with the industry-leading Data Direct XQuery drivers. XQuery allows you to access, merge, and transform many different types of data sources into a target XML file, which is then automatically fed into the xPression server for high-speed customized document production. Stylus Studio Enterprise Suite, a desktop data design and transformation application, makes it easy to design and test XQuery packages. The possibilities for integrating data into xPression are practically endless with this powerful toolset.

EMC Documentum integration

xPression integrates with the EMC Documentum content management system through its Universal Content capability as described above.

xPression document generation and publishing can also be integrated with transactional business processes through EMC Documentum TaskSpace. TaskSpace enables business users to build a transactional business process using a graphical, drag-and-drop interface. An xPression icon can be dropped anywhere within the process flow to generate or distribute documents.



Figure 10. A simple TaskSpace drag-and-drop workflow integration

Multichannel output

xPression provides a variety of powerful mechanisms for selecting the right content for the right output channel. For example, from a web portal, different documents that share some of the same content, but differ in other content, can be generated depending on the output channel selected by the user. A letter may contain detailed headers/footers and styling for printing on a color printer, whereas another version of the letter intended for plain-text email may contain only the crucial body in simple styling. This capability provides for a richer experience that is more channel-specific but still enables the reuse of common content across channels.

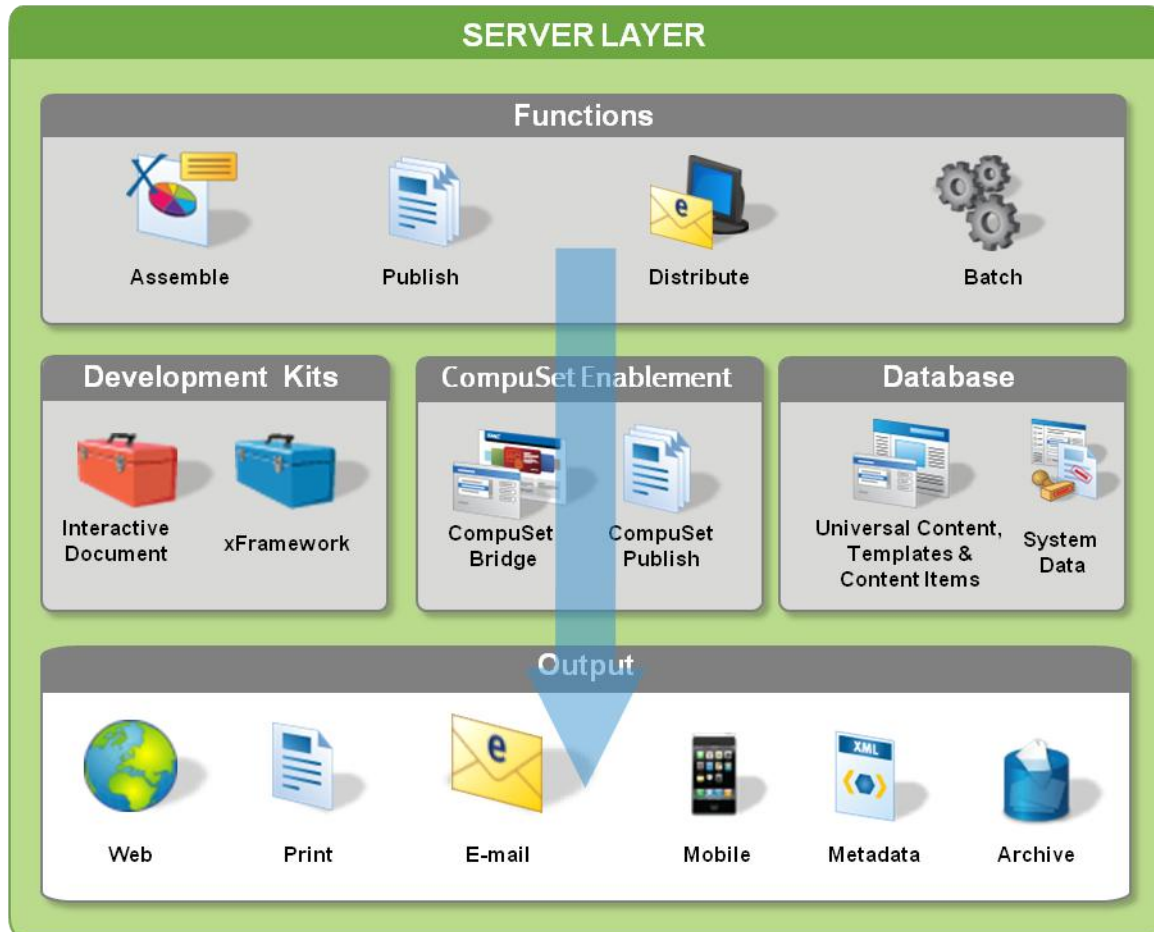


Figure 11. xPression multichannel output

xPression's multichannel support does not stop there. Because xPression enables the use of a set of fit-for-purpose design tools, the document designer may create totally different presentations that are best suited for specific channels, while reusing some of the same content, if appropriate. For example, the document designer can develop a rich HTML document in xPresso for Dreamweaver that would guarantee the richest and most interactive Web experience for the recipient. Some of the same content used in this HTML presentation may be reused in an xPresso for Adobe InDesign document to provide the most advanced print media experience through the use of creative layout, full-color, graphical design, and other print-specific concepts.

The document designer may also designate specific pieces of content for inclusion in a document to specific recipients. This enables simultaneous production of multiple document packages that contain different content because they are intended for different recipients (for example, the policy holder vs. the insurance agent). The different packages may also be channeled to different output devices to provide different levels of document quality as necessary.

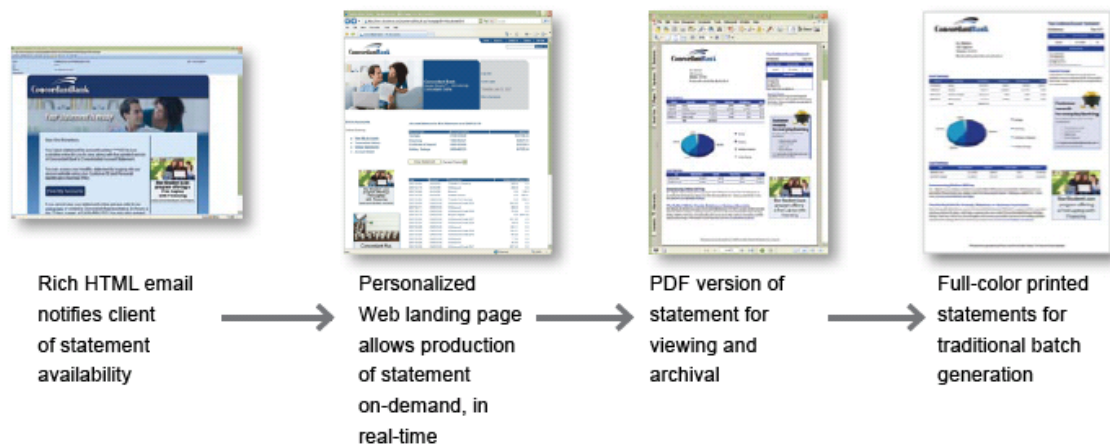


Figure 12. xPression's multichannel output capabilities

Migrate Utility

The Migrate Utility provides a mechanism to transfer documents and all related objects, including Web and print job definitions, output profiles, and document streams, from one xPression server environment to another. This utility is useful in situations where one server is used in a development environment and a second is used in a production environment. In such a case, the Migrate Utility can be used to retrieve documents created on the development server and import them into the production server.

xPression's Migrate Utility can also be used to export a document into a Portable Document Package (PDP) so that it can be delivered to another server for import. The Migrate Utility can be executed manually from xAdmin or scheduled to run at a specified date/time using the standard scheduling services of the operating system. The input provided for a scheduled migration is an XML Migrate Definition, which can either be generated manually or through xAdmin.

Conclusion

xPression is the leading platform for high-volume document generation. It is characterized by the following five facets that make it the best choice for consolidating all document generation and publishing needs within an enterprise or within a department in the enterprise:

- xPression provides best-in-class DCP performance and capabilities that allow organizations to assemble content fragments into highly customized and personalized documents in real time, near real time, and/or high-volume batch processing.
- xPression's Java EE/XML SOA makes it easy to integrate with other enterprise applications and business workflows.
- xPression's multichannel capabilities enable the publishing of the same content for traditional print (AFP, PostScript, PCL), online and email distribution (PDF and HTML), and archive (indexed PDF and AFP).
- xPression's open content authoring environments based on Microsoft Word, Adobe InDesign, and Adobe Dreamweaver enable importing of existing styled content from MS Word, the most widely used document editing format, Adobe InDesign, and QuarkXPress.
- xPression complies with open standards, enabling it to run on industry-leading operating systems, Java EE application servers, and databases.

By tightly integrating with existing systems, data, and workflows, the xPression architecture can significantly streamline business processes and help organizations deliver more accurate, relevant, and effective customer communications. For more information on the xPression architecture, visit EMC.com.