



WHITE PAPER

Macromedia® Flash® Platform in the Government Enterprise

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As government agencies attempt to facilitate information exchange and interactions between citizens, businesses, and other government agencies, they must do so while satisfying their Enterprise Architecture requirements. At the same time, they need to address a number of issues, including supporting today's increasingly mobile workforce. Public sector program managers, system integrators, and chief information officers (CIOs) can accomplish this by bridging the gap between legacy applications and systems, while focusing on the front-end application experience. The Macromedia® Flash® Platform provides a next-generation, cross-platform, and device-independent delivery system that supports today's architecture and tomorrow's vision. By delivering superior digital experiences, the Platform enables information superiority, cost-effective training, and real-time collaboration.

Introduction

For decades, government agencies have operated independently of one another, creating and maintaining their own virtual "silos" of custom-built applications and information stored within standalone databases. Proprietary data formats, architectures, hardware, and systems made it difficult—if not impossible—for agencies to share information with each other and the public. Yet, as federal government agencies strive to improve the way they provide services both internally and to citizens, businesses, and state and local governments, they must also support initiatives such as homeland security while lowering the costs of business. Combined, these issues point to a driving need for information sharing at the federal level. The convergence of a changing workforce, external requirements such as Rapid Response—that is, the ability to effectively train personnel and rapidly disperse information in the event of a terrorist attack—and the increased tempo of today's government agencies is heightening the need to address the status quo in today's government agencies.

Over 50% of the United States Federal workforce will retire in the next 2-4 years. To address this reality, agencies must attract, retain, and empower the next generation of digital knowledge workers. According to Gartner e-Government analyst Chris Baum, "Agencies that fail to make this transition will lose workers at 2x the rate of agencies that make the necessary investments now."

As government becomes more focused on citizens and results, agencies must use information technologies—including the Internet and mobile computing—to facilitate information exchange and interactions between citizens and businesses and other government agencies. To support all of an agency's knowledge management and business needs, each agency must ensure its enterprise software reaches beyond the physical boundaries of the office to deliver degrees of freedom to its teams—freedom to choose how, when, and where they interact with the information necessary to drive the agencies' missions forward. At its core, this marks a shift from computer-centric to people-centric computing.

In response to these needs, governments are formulating structured technology architectures for their agencies to adopt. In the United States, the Office of Management and Budget has developed a Federal Enterprise Architecture (FEA) to provide a business-based framework for government-wide improvement. Enterprise architectures, and the benefits offered by them, are impacting all levels and types of agencies. In fact, many agencies are in the midst of a shift to Web-based and mobile technologies, and militaries are already aggressively pursuing this migration as they take the web to the battlefield. According to a new report released by the National Association of State Chief Information Officers (NASCIO) in the United States, 95 percent of respondents are using or planning to use enterprise architecture.

As government program managers find themselves facing the convergence of federal data and applications, challenged to convert volumes of data into usable information, and driven to take advantage of commercial information technology, they often wonder how to navigate all of these requirements. Federal agencies can look to the Enterprise Architecture as a management tool for transformation, but the real instrument of change will be a technology fundamentally focused on the government workforce and their business needs. Accordingly, the ability to turn data into knowledge and knowledge into action will be achieved only after a shift is made towards the "experience" of software across many platforms and devices, one that ensures applications meet the needs of the business user. While mandates like the U.S. Government's FEA consider business needs to determine *what* gets developed, the experience model takes into account business needs to decide *how* it is actually developed. The development of systems can no longer be designed from the bottom up; instead, the complexity and degrees of freedom to properly support today's business processes necessitates a technology focused on the front-end experience.

The real issue becomes identifying an application platform capable of supporting the number and types of business applications and devices that are needed and used in today's digital world. With a goal of streamlining processes and applications to deliver just-in-time knowledge in a person-centric, device-independent fashion, agencies must choose a platform that will enable them to seamlessly extend the enterprise beyond agency walls and out to mobilely connected workforces and constituents.

“Some people are hesitant to pursue enterprise architecture because of the amount of resources agencies must invest. They often want concrete proof that it's worth the investment a difficult task. By itself, a complete architecture counts for little. What matters is how you use it and what results come from it.”

**Dick Burk, Head of the Office of Management and Budget's
Federal Enterprise Architecture Program Management Office**

Degrees of Freedom

How many degrees of freedom does your software offer?

Are your agency teams tied to a device, or can they efficiently incorporate mission information and capabilities into their jobs, choosing when, where, and how they interact with a variety of applications?



Requirements of a Government Enterprise Platform

By helping agencies align business processes with IT systems, a government enterprise platform can support today's needs and tomorrow's vision. With that in mind, agencies should consider the following key characteristics as they evaluate options for an enterprise-wide application platform (see Appendix A for an evaluation checklist):

OS and browser independence: Government agencies cannot be locked into an operating system, browser, or services platform. The risks and limitations of doing so have already been felt and understood—in many ways removing those dependencies is at the crux of current transformation attempts. The next generation software platform must deliver this basic architectural independence.

Cross-platform device support: One of the real constants of the digital era is that devices will continue to multiply, while shrinking in footprint. The next generation government worker will demand the ability to perform their job from a variety of devices—not just from their desktop. The desire and need to deliver the best possible user experience over the web has forced a focus on this device independence and resultant cross-platform device support.

Reach: A platform must be able to seamlessly reach a large number of people - wherever they are - without sacrificing consistency in the user interface or forcing multiple development paths for each device. Otherwise, agencies will incur large development, testing, and support costs to reach multiple clients deployed on a variety of operating systems and devices.

Robust, active developer's community: If the platform is ultimately going to be a valid, successful choice for government enterprise, it must be supported by a worldwide network of active, loyal developers who are interested in growing the platform's capabilities.

Commercial enterprise adoption: The government cannot provide the sole source of active development on a platform or for a technology—to do so would be inefficient and cost prohibitive. For a platform to successfully support multiple devices, operating systems, and platforms, and be supported by a robust development community, it needs to be adopted and pervasive in the commercial enterprise.

Security and privacy: An enterprise-class platform must ensure the confidentiality of user and agency data. Organizations that fail to meet this requirement may face penalties for noncompliance, and risk diminished public goodwill.

Ease of deployment and maintenance: Evaluators should ensure that the platform is easy to deploy, manage, and maintain without requiring additional resources. New technologies should easily integrate with existing systems to enhance and extend their capabilities without negatively impacting their performance. In addition, both the server side and client side of the platform should lend themselves to simple maintenance.

Long-term viability: So that agencies can be confident that their investments will support future requirements as well as current short-term needs, agency IT leads should evaluate whether the platform is poised for long-term stability and growth. Platform roadmaps should also include pathways to future device technology.

In addition, the platform should unlock new value from existing systems through the following:

- Dramatically improved usability of existing applications, processes or systems
- Support of non-proprietary solutions and applications for business

Macromedia Flash Platform: Supporting Current and Future Needs

For a number of reasons, the Macromedia Flash Platform is an ideal solution for an enterprise platform initiative. It delivers the reach, power, flexibility, and extensibility that today's government agencies need, and can extract data from existing systems without requiring agencies to re-design and replace their back-end architecture. Because it is interoperable with any server, client, or digital device, it provides near limitless opportunities for delivering rich, interactive experiences to a global audience. The following describes the ways in which the Flash Platform can ensure a successful government technology transformation:

Technology agnostic: Government agencies worldwide have increased their focus on standardizing technology, particularly as it relates to infrastructure. Because the Macromedia Flash Platform and solutions are agnostic to the underlying application server and OS, they will remain relevant no matter which infrastructure choices an agency makes.

Supports all devices: One of the key benefits delivered by the Flash Platform is that it bridges the gap between an agency's applications and its users, allowing an agency to reach multiple clients without developing unique applications for separate clients. In this way, the Platform helps agencies extend their reach to the mobile environment to deliver superior digital experiences, without increasing the costs associated with end user devices.

Ubiquity: The Macromedia® Flash® Player, the core of the Flash Platform, is installed on more than 98% of personal computers and mobile and electronic devices worldwide, making the Flash Platform one of the most ubiquitous platforms in the world. With over 100 OEMs building Flash into their devices, the Flash Player makes it easy for agencies to make content globally available.

Community: With more than a million designers and developers working with the Flash Platform today—including the top 50 U.S. Department of Defense (DOD) system integrators who employ a large number of Macromedia-certified developers and in-house talent—novel applications are constantly being developed. The availability of a considerable community of Flash developers ensures that government agencies can easily find the right personnel to develop Flash content.

Adoption: The Flash Platform is used across a wide range of industries including consumer, media, financial services, telecommunications, education, and government. Typical uses of the Flash Platform across these industries are in the areas of content, applications, and communication, delivered not only to personal computers but also to the emerging world of mobile devices. By leveraging the capabilities and advances of the Flash Platform in other industries, governments can readily employ proven and trusted technologies and applications.

Security and privacy: The Flash Platform integrates with existing authentication, access control, data transport, and malicious code prevention solutions in a way that ensures it does not adversely affect an organization's ability to meet security requirements. Because the Flash Platform leverages SSL and authentication technologies and requires no changes to access control or other security settings, agencies do not need to deploy additional security solutions to use the Flash Platform. Equally important, Flash Player does not collect information about users. Users can fine-tune settings related to privacy and security, and network administrators can centrally control settings to ensure all clients conform to the agency's security policy. For more information on Flash Platform security, see the Macromedia white paper entitled "Macromedia® Flash® Platform Security and Macromedia Enterprise Solutions."

Ease of deployment and maintenance: Designed for easy deployment and maintenance within any standards-based enterprise infrastructure, the Flash Platform—already approved on many government agency gold disks - integrates seamlessly into an organization's existing architecture.

Stability and viability: The stability and viability of the platform is unquestionable, with numerous industry heavyweights such as SAP, HP, Nokia, Samsung already building on the Flash Platform. In fact, AOL has been using Flash technology on its site since 1999.

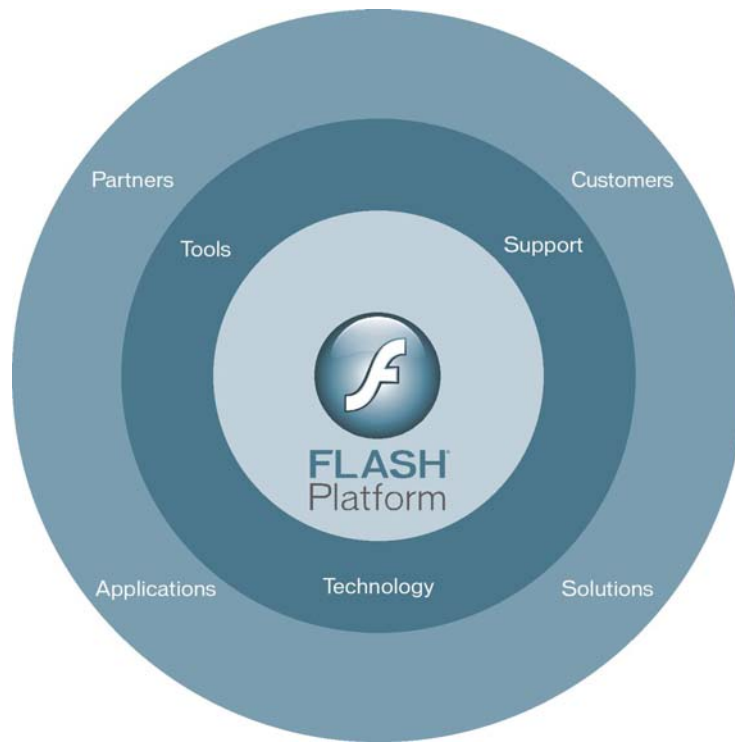
Unlocks new value from existing systems: By helping agencies extend the reach—and enhance the consumption—of existing applications and systems, the Flash Platform dramatically improves usability and offers the most effective experiences for users. The Platform also delivers real-time communication solutions that improve productivity and reduce communication costs within and across agencies. Perhaps most importantly, the Flash Platform can bridge the divide between numerous ubiquitous clients and enterprise servers, and between legacy applications and those of tomorrow.

What is the Macromedia Flash Platform?

The Macromedia Flash Platform is a rich and flexible Commercial-Off-The-Shelf (COTS) web-based platform that is readily deployable into any Internet Protocol (IP)-based or Service Oriented Architecture (SOA) environment. It offers a robust, extensible foundation that expands the reach of the client to multiple devices (both mobile and desktop), ties into multiple resource assets, and supports rich applications and next-generation enterprise functionality, such as Voice over IP (VoIP), video, on-demand training, and collaboration in an ultra light-weight footprint. The platform supports the extension of federal enterprise applications for knowledge management, information superiority, learning, and collaboration into a mobile setting, leveraging all necessary compression capabilities to ensure use in austere environments. Because it employs technologies already approved and deployed within the federal enterprise architecture, agencies save considerable time and resources when implementing this solution.

The Macromedia Flash Player—supported by a layer of tools, servers, components, patterns, and developer programs—is the backbone of the Flash Platform that provides the on-ramp for over a million designers and developers to build rich content and applications. An array of complete solutions, applications, and interfaces are built on the Platform, as shown in Figure 1.

Figure 1: The Flash Platform Ecosystem



The layered components of the Flash Platform perfectly complement a diverse range of infrastructures, including J2EE and .NET, and comprise the following key elements:

Rich client: The core of the Platform is Flash Player, a browser client which is deployed on the majority of personal computers and devices worldwide. This rich client provides an innovative, tested method of delivering applications, content, and on-demand data to users.

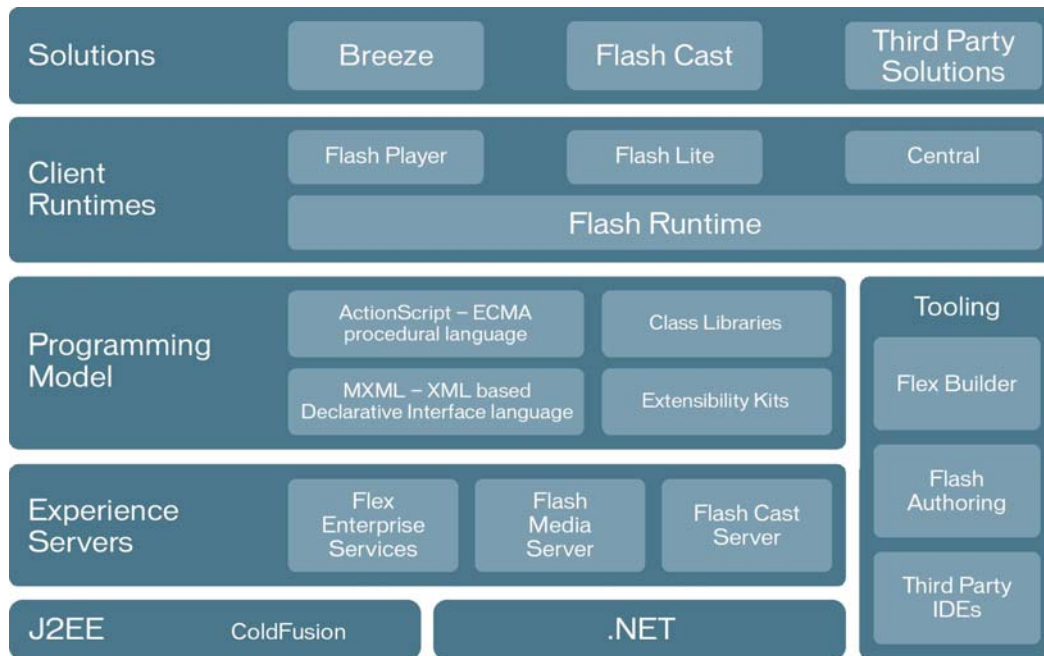
Programming model: The Flash Platform includes applications requiring no programming, along with development tools such as Macromedia® Flex™, which are built upon a robust, standards-based programming model grounded in industry best practices. This programming model combines ActionScript (an ECMAScript procedural language just like JavaScript) and MXML, which is an XML-based declarative language for rapidly developing user interfaces and data binding. The programming model extends across Flash rich clients and rich media servers.

Rich media servers: A set of high-performance server technologies work with existing back-end systems built on J2EE, .NET, or standard web servers to efficiently deliver Flash based applications, content, and communications without increasing administrative burden or infrastructure requirements.

Tools: The Flash Platform provides a comprehensive collection of tools—including the Flash authoring tool, the leading authoring tool for rich interactive content—for building interactive content and applications.

Solutions and Applications: To help address the increasingly complex communications issues facing today's government agencies, many companies have developed flexible and innovative applications on top of the Flash Platform, including Macromedia® Breeze™ applications for web conferencing and collaboration, and Macromedia® FlashCast™ applications for mobile phones.

Figure 2: The Flash Platform has a layered composition that encompasses the key elements shown.



The Flash Platform tightly integrates the following core products:

- Macromedia Flash Player, the ubiquitous, cross-platform client
- Macromedia Flex for rich Internet application development
- Macromedia Flash Professional 8 for creating engaging, interactive content
- Macromedia Flash Media Server for two-way audio/video streaming
- Macromedia® FlashCast™ Server for delivering mobile content
- Macromedia Breeze for delivering online communications
- Macromedia Flash Lite client runtime for use on small-footprint, mobile devices

Macromedia Flash Player for displaying content

Macromedia Flash Player forms the backbone of the Macromedia Flash Platform and is currently installed on nearly 600 million Internet-connected desktops and mobile devices. The Flash Player client runtime is a lightweight, full-featured, self-contained runtime that is easily downloaded to or deployed on end-user machines. Installed on more than 98% of all Internet-enabled PCs, more than 50 model lines, and a wide variety of other electronic devices, Flash Player client runtime is the most widely deployed client runtime in the world. Small, lightweight Flash players can be integrated into multiple types of handheld devices, extending an agency’s reach. This pervasive platform commands a million-strong developer community and leverages existing content on an array of devices.

Macromedia Flex Presentation Server for developing internet applications

The Flex Presentation Server—part of the Macromedia Flex presentation-tier system for developing and deploying rich internet applications (RIAs)—enables government agencies to create applications that combine the responsiveness and richness of the desktop with the reach and deployment characteristics of the web. The Flex Presentation Server fits seamlessly into an existing Java environment—without affecting underlying systems—and supports the development of presentation-tier applications that integrate data and business logic from a variety of sources.

The Flex system consists of three main elements:

- A programming model for building applications that uses the MXML and ActionScript programming languages. MXML is an XML-based language that is used to declaratively define the user interface, while ActionScript, an ECMAScript object-oriented language, is used to write the client-side logic of an application.
- A rich, object-oriented application framework for programming the presentation tier that runs in Flash Player. The framework provides a complete set of user interface components as well as advanced services for layout, data binding, and integration with remote data sources.
- A set of runtime services that runs natively on J2EE application servers and integrates the presentation tier with the other tiers of the application. Data services enable back-end connectivity using SOAP-based web services, XML over HTTP, and remote method invocation into Java objects. Other runtime services include dynamic compilation, caching, security, session management, and media transcoding.

Macromedia Flash Professional 8 for creating interactive content

Flash Professional 8 can be used by designers and developers to create rich interactive content for websites, interactive presentations, and mobile devices. Offering a number of features and the flexibility to create rich content, Flash Professional 8 supports a programmer's environment as well as a traditional designer's timeline.

Expressive features—such as effects and the revolutionary FlashType engine which enables high-quality text rendering with advanced anti-aliasing control—improve digital experiences. Not only does Flash Professional 8 provide a rich suite of design effects such as drop shadow and blur, but it also controls these advanced graphic effects at runtime within Flash Player.

Developers can easily design, encode, and deploy customized, interactive video using the Flash Video Encoder, which delivers DVD-quality video in the smallest file sizes. Support for 8-bit alpha channels at runtime makes it easier to combine semi-transparent video with other video, graphics, or digital assets.

With the included video plug-in, developers can export Flash Video (.FLV) files from professional video products. And for developers who want to create and deploy content and applications for mobile devices using the Macromedia Flash Lite player, interactive device emulators make it easy to build content once and test it on more than 70 mobile devices enabled with Flash Lite using preset, updatable profiles.

Macromedia Flash Media Server for two-way video streaming

Macromedia Flash Media Server is software that offers a unique combination of traditional streaming media capabilities and a flexible development environment for creating and delivering innovative, interactive media applications. While the majority of today's web video presents viewers with a bewildering array of options and downloads, the ubiquity of Flash Player coupled with the Flash Media Server reliably delivers a hassle free, instant-on video experience across platforms, various connection speeds, and browsers. Agencies can integrate video into their websites and applications with complete control over playback, interactivity, and branding for a seamless experience.

With a range of advanced audio and video options and support for interactivity, the Flash Media Server is ideally suited for the following:

- **On-demand video:** The Flash Media Server enables agencies to deliver on-demand video with advanced capabilities, including instant-on, playlist support, and rich interactive features.
- **Webcasts:** With audio and video capture, stream control, and text-chat capabilities, the Flash Media Server supports webcasts with compelling interactive capabilities.
- **Live communication and collaboration:** With real-time digital video capture, live audio and video streaming among multiple participants, and a range of control features, the Flash Media Server supports adding video chat and messaging to a website or designing custom collaboration applications.

The unique programmable streaming environment includes a robust API for precise code control over media streams, assets, and features like custom interactivity, user authentication, and bandwidth detection, to deliver truly distinct user experiences. The server takes advantage of the new high-quality video codec in Flash Player 8, complete with automatic detection of the client's bandwidth connection and capability to adjust the stream accordingly.

Agencies can leverage scalable Edge-Origin servers, which provide an optional, enterprise-ready architecture that simplifies load balancing, failover, and clustering to ensure greater reliability and scalability of streaming rich interactive experiences, even during peak traffic times.

Macromedia FlashCast Server for delivering mobile content

The Macromedia FlashCast Server offers an ideal solution for agencies that want to offer rich data to agency personnel via channel or "push-based" services. The FlashCast client resides on mobile devices, and allows personnel to view information and access applications using a channel metaphor (just like television channels). A channel is a small Flash application that has its own user interface, consumes streams of structured data—called feeds—provided by the FlashCast server, and presents information on its own in an easy-to-use, attractive manner. It can also seamlessly launch a browser, media players, or other device applications to access additional resources on the network.

With FlashCast, agencies can leverage existing services and investments—such as those based on WAP, SMS, MMS, J2ME, HTTP, and UDP—to enable personnel to consume existing content and services. The FlashCast Server offers a solid platform for agencies to launch completely new services without replacing existing infrastructure.

Macromedia Breeze for delivering online content

Macromedia Breeze is a rich web communication and collaboration solution that supports the delivery of high-impact content. Because Breeze is delivered through Macromedia Flash Player, users can instantly access Breeze from any standard web browser without downloading or installing software. Breeze's lightweight form factor makes it the perfect tool for agency-wide web conferencing and training that can extend into austere, forward environments. In fact, militaries worldwide are rapidly adopting Breeze because it provides a consistent experience for soldiers on base as well as in the field. It is also licensable behind the firewall and is U.S. Department of Defense Joint Interoperability Test Command (JITC) approved.

Rated "Excellent" in an InfoWorld review of real-time collaboration solutions, Breeze comprises the Breeze Communication Server and the following applications for real-time and on-demand communication:

- **Breeze Meeting for real-time meetings, web conferencing, and online seminars.** With features that include multipoint video conferencing and rich-content sharing, Breeze Meeting delivers real-time meetings and seminars that are easy to attend as well as manage and deploy. Reusable settings and content simplify the creation and administration of recurring and follow-up meetings. Breeze improves internal and external collaboration by making it easy to create ad hoc or scheduled meetings with multiple participants. Support for directory services simplifies the process of inviting or adding meeting participants. Meeting administrators can easily configure live meeting room layouts to suit their presentation and interaction style, and save the meeting rooms, including all content, to reduce preparation time for recurring meetings. Government agencies benefit from the scalability, flexibility, and extensibility of Breeze provided by the Flash Platform, while meeting attendees and training participants benefit from seamless access to engaging content without downloading additional software.
- **Breeze Training for managing e-learning courses and curriculum.** Breeze Training supports the design and delivery of both live and self-paced courses and curriculums, including courses created with other authoring tools. User completion and course results can be tracked using convenient dashboard reports or at a more detailed learner-by-learner and question-by-question level. With robust content creation and management tools, integration with third-party systems, comprehensive testing, tracking, and pacing features, and support for industry standards such as SCORM and AICC, Breeze offers an end-to-end learning solution ideal for government.

To meet the demands of large agencies, the Breeze Communication Server delivers enterprise-class scalability, with support for single-server or clustered environments that can handle thousands of concurrent users. Breeze can be integrated with enterprise applications through web services over HTTP/HTTPS, providing a number of integration options, including portal integration, directory services integration, and Flash user interface customization.

Macromedia Flash Lite client for mobile devices

The Flash Platform offers an end-to-end solution for designing, delivering, and viewing rich content, applications, and data on mobile devices. For government agencies that wish to deliver their content to mobile devices, the Flash Platform provides two key elements:

- **Flash client runtime:** The Flash client runtime for mobile devices—also known as Flash Lite—is a lightweight version of Flash Player optimized for mobile phones. It runs on a variety of embedded operating systems, supports integration with a phone's operating system, provides network support for dynamic data in applications, and utilizes hardware codecs when available. Flash Lite is used for a range of purposes on mobile phones, from content to applications to the actual phone user interface itself, and is already available on more than 70 mobile phone product lines of the largest mobile handset manufacturers in the world. These include manufacturers such as Nokia, Samsung, and Ericsson, to name a few.
- **Development tools:** The Flash authoring tool offers a range of device templates and emulators that ease content development for mobile devices. Flash Lite supports scripting integration with device capabilities - including keypad navigation, button presses, notification - and integration with general phone operating system functionality. Flash Lite also supports dynamic data and network access, enabling requests for information from Flash applications to be brought in over the wireless network and displayed in Flash Lite content and applications.

Deployment and Maintenance

Designed for easy deployment and maintenance within any standards-based federal enterprise infrastructure, the Flash Platform integrates seamlessly into an agency's existing architecture at the browser level through a plug-in and at the presentation tier through Flex software or a static HTML solution with script and Flash.

Flash Client Runtime Deployment and Administration

To provide agency administrators with flexibility in deploying the Flash client runtime within a managed networked computing environment or intranet, Macromedia supports a range of common installation methods, including disk images and remote software management systems. Supported deployment methods include a "silent installer" for Windows platforms as well as an installer and associated merge module that enables the incorporation of the Flash client runtime into compound install packages for deployment with technologies such as Microsoft® Windows® Installer. To improve security, administrators can customize individual installations with a configuration file that establishes defaults for a range of settings.

Flex Presentation Server Deployment and Administration

Because the Flex Presentation Server is a native Java application and is supported on a number of Java application servers—including IBM WebSphere®, BEA® WebLogic Server, Macromedia JRun, Apache Tomcat, Oracle® 10g, SAP NetWeaver®, and Fujitsu Interstage® 6—deployment and maintenance are as straightforward as managing any other application. The deployment of individual Flex applications on the J2EE platform is handled with Java web archive (WAR) files. For administrators, the Flex XML schema and file-based application model mean that individual Flex applications can be incorporated easily into existing administration and application lifecycle tools.

Streaming Video Deployment and Administration

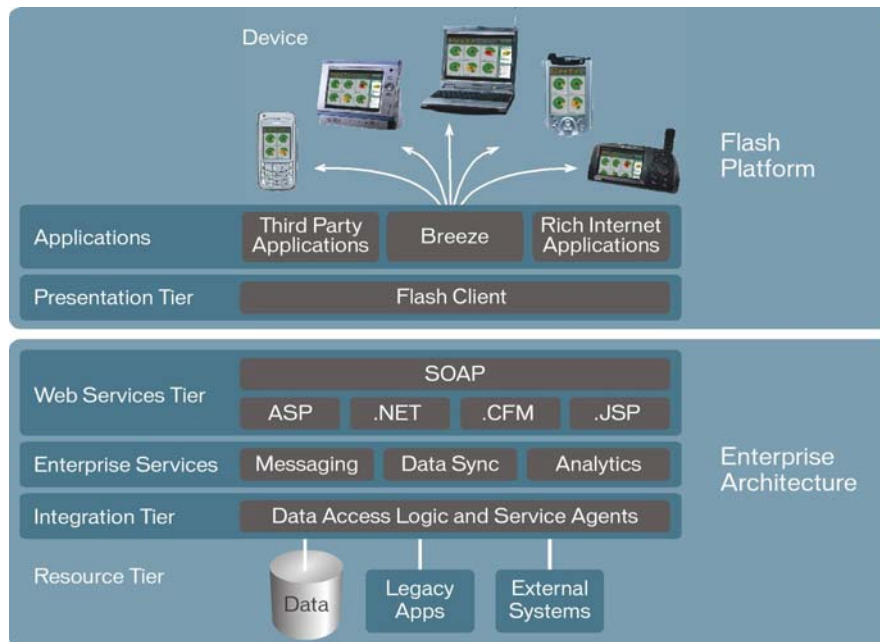
Flash Media Server can be deployed in a variety of ways to meet an agency's unique requirements:

- **Standalone:** This approach is best suited for agencies that only need to serve a relatively small number of simultaneous connections.
- **Clustered:** The Flash Media Server is designed to scale to support the needs of agencies of any size, and operates seamlessly in a networked server environment. An agency may deploy the Flash Media Server with a single content origin server and multiple edge servers, replicating content and automatically delivering it based on the requirements of the load-balancing system.
- **Content delivery networks (CDNs):** For agencies that want to deliver streaming video to the largest possible audience without the expense or burden of maintaining a video delivery infrastructure, Macromedia has partnered with industry-leading CDNs to offer Flash Video Streaming Service (FVSS), a hosted service for delivering Flash Video across reliable, high-performance networks. FVSS customers benefit from built-in load balancing and failover to ensure that video is delivered efficiently despite network traffic.

Macromedia Breeze Deployment and Administration

Macromedia Breeze is designed to integrate with existing enterprise systems; for example, Breeze Directory Services supports out-of-the-box integration with user management systems. Plug-ins and integration modules for Microsoft Outlook®, Microsoft PowerPoint®, and common enterprise applications, along with available APIs and SDKs, support integration with existing applications. This integration enables activities such as initiating a meeting directly from Outlook or launching an enterprise resource planning (ERP) application from within an existing meeting so that all participants can view the data. In addition, the Breeze solution is offered as a hosted service or as licensed software for behind-the-firewall implementations.

Figure 3: Typical Macromedia Flash Platform deployment in enterprise architectures



See Appendix B for a list of the server-side, client-side, network, security, and application standards supported by the Flash Platform.

How the Flash Platform Enables the Next Generation Government

For over 15 years, Macromedia has partnered with regional and federal government agencies to support their technology and business process transformation. One of the key advantages of the Flash Platform is that it enables government agencies to build a rich, interactive, extensible federal enterprise platform that can accommodate enterprise-level delivery of mission-essential knowledge and support solutions. The following examples illustrate the value delivered in three key application segments within the public sector:

- Enterprise transformation
- Training and e-learning
- Communication and collaboration

Enterprise transformation

Real-time communication and information sharing can increase public satisfaction and team readiness and allow quicker response to mission-critical decisions and immediate response to potential challenges in, for instance, battlefield environments. In order to achieve enterprise transformation and information superiority goals, government agencies must transform data into information, improving and streamlining how services are delivered to peers and constituencies throughout and beyond the agency. The following three examples demonstrate how the Flash Platform helps agencies achieve this transformation by supporting new application development and legacy migration that fulfill data sharing in support of managing the “business” of government.

Colorado Public Employees Retirement Association (PERA)

Colorado PERA (copera.org) provides retirement and other benefits to the employees of over 400 government and public entities—supporting over 171,000 workers—in the U.S. state of Colorado. The organization is the 25th largest public pension fund in the nation with over \$31.7 billion in assets. Prior to engaging Macromedia, the staff tracked data in multiple Excel spreadsheets and communicated via e-mail, making it difficult to efficiently analyze data, collaborate, or aggregate information, especially in response to member queries or information requests. Colorado PERA's objective was to develop a system in which the data was centrally located, viewed, and updated in a secure manner, integrated with other data types and sources, and presented in a way that was configurable to each user.

The software developers at Colorado PERA chose Macromedia Flex and the Macromedia Flash Platform to transform their business applications. These solutions helped the organization create a Flash-based Web accessible interface—the Vendor Issues Tracker—that provides a single, customizable interface across multiple data sets. With this, Colorado PERA managers and external vendors (such as health care carriers and 401k managers) gain the ability to access, manage, track, and update the retirement account data of agency members. The Vendor Issues Tracker facilitates communications between and among external vendors and internal staff by centrally locating data and enabling the automatic generation of e-mail messages and reports in Adobe® Acrobat® or Microsoft Excel® formats. The Flash platform delivers many benefits to the Colorado PERA, including the following:

- Enterprise-class interactive, customizable user interface across multiple platforms
- Lower development timeframes
- Ability to deliver application update to users without the need to re-install the client software

129th Rescue Wing of the U.S. Air National Guard

The mission of the 129th Rescue Wing (RQW) of the California Air National Guard is to provide manpower, material, and equipment to perform search and rescue anywhere in the world. The personnel of the RQW are tasked with the location and recovery of aircrew and non-aircrew personnel from both enemy-held and friendly territory (on both land and water). In addition, the unit aims to respond to state emergencies—such as natural disasters—and to assist civil authorities in the enforcement of the law.

Similar to many other government entities, key decision makers at the 129th RQW need real-time information in a single, user-friendly interface that allows them to rapidly evaluate various data sets—including operational and deployment viability data—and rapidly make mission-critical decisions. The data for the 129th resides in various legacy systems and is exported to Microsoft Excel, Word, and PowerPoint for presentation on a weekly basis, making it difficult to efficiently analyze critical and dynamic data needed to run the squadron and respond to emergencies.

Aviamedia, a full-service interactive design and development firm, teamed with Macromedia to develop a pilot application that illustrates how an RIA dashboard developed with Macromedia Flex and the Macromedia Flash Platform can aid in situational awareness and provide an instant command-level representation of key metrics across an entire organization. The resulting dashboard is a demonstration of how a presentation-layer RIA dashboard will allow the 129th RQW and other government enterprises to work with legacy data systems to present data in a meaningful and engaging manner. Aviamedia and the 129th RQW used sample data sets to study how budgets, personnel information, communications, fleet availability, performance appraisals, and calendar and tasking could be enhanced by the approach. They found that using the Flash Platform to develop and deliver a rich dashboard could yield the following benefits:

- Significantly reduced time for information gathering
- Ability to access multiple legacy data systems through a single, interactive cross-platform interface
- Increased situational awareness through real-time data feeds
- Deployment on an existing infrastructure, without requiring database integration

“Displaying operational metrics in a single interface, in real time, allows an organization to become proactive as opposed to reactive. Rather than placing a series of phone calls before reacting to a situation, leadership is able to assess and respond dynamically, shaving hours off decision cycles.”

Captain Roxanne Stern, Director of Personnel, 129th RQW

Training and e-learning

Government agencies must arm personnel to make the right decisions by delivering real-time and on-demand training instantly and securely to many devices, across any bandwidth. Supporting widely dispersed personnel with varied time-to-knowledge needs requires an environment that can flexibly and instantly deliver simulations, on-demand e-Learning, and live subject matter expert interaction in a consistent, familiar manner.

The Flash Platform enables the rapid delivery of information and knowledge to both the war fighter and civilian community in a secure network-centric environment. Data-driven information repositories, workflow systems, and learning management systems (LMSs) are fused with enterprise systems while integrating seamlessly with legacy and future enterprise systems. The following two examples demonstrate how the Flash Platform enables communication and content sharing that bridges geographically dispersed locations with seamless cross-platform compatibility and a device-independent delivery system.

Miami-Dade Police Department (MDPD)

Miami-Dade County in Florida, U.S.A. has a total population of more than 2.3 million and encompasses more than 2,000 square miles. As the largest metropolitan area in Florida, Miami-Dade County is home to 34 municipalities and one of the largest unincorporated areas in the country.

Internationally acclaimed for its law enforcement expertise, MDPD offers a large number of classroom-based training courses to uphold the quality and education of its 4,600 officers and staff. Coupled with courses offered to other law enforcement agencies, classroom space was becoming scarce, and on any given day, it was not uncommon to find the Training Bureau's 12 classrooms filled. In the existing system, officers were marked "unavailable" while at an on-site training, and thus, unable to respond in the event of an emergency. The department was looking for a way to increase the flexibility of its training program and allow officers to attend training sessions while remaining available to respond to an incident. The department also needed to find a way to quickly deliver courses based on emergency response-related government mandates.

To initiate its online training function, the Training Bureau turned to Macromedia Breeze and the Macromedia Flash Platform. The first course created was "Introduction to the Incident Command System (ICS)", to help address the requirements for a state-based, standardized system for coordinating emergency management efforts in compliance with the Department of Homeland Security's (DHS) National Incident Management System (NIMS) mandate. The in-depth and lengthy course provided the foundation for higher-level ICS training; described the system's history, features, principles and organizational structure; and expanded on the relationship between ICS and the NIMS.

With Breeze, the Training Bureau was able to transform original ICS learning materials (including more than 100 pages of learning content) into a highly engaging online training course everyone in the department can access instantly at www.mdpdtraining.com. The new, web-based training program integrates 27 instructional videos, the department's own digital photography, and narrated multimedia courses using Microsoft® PowerPoint® presentations. Additionally, with Breeze, the department was able to easily incorporate video with critical, timely content from DHS into the online course. Miami-Dade estimates that over 3,000 officers will be certified on the I-100 course within its first 90 days.

Miami-Dade has realized many benefits from the Flash platform, including:

- Multiple media formats supported, including video, audio and still
- Instant, available access of rich media for training from any location, over any bandwidth
- Courses, content and student results information that integrate easily with other enterprise systems to support professional development and HR needs

U.S. Naval Air Systems Command (NAVAIR)

NAVAIR maintains the operational forces of the Navy in a state of battle readiness. In the past, NAVAIR had focused on developing, testing, and delivery of the Navy/Marine Corps Team's aircraft and weapons systems; today the priority is to facilitate Network Centric Warfare through an integrated striking force that extends the power, reach, and precision of U.S. naval forces.

The NAVAIR Career Development Office (CDO) was tasked with providing on-demand, standardized computer-based training to the NAVAIR community of 30,000 employees worldwide. This solution needed to integrate with the office's existing learning management system and provide consistency in presentation, delivery, and distribution. NAVAIR chose Macromedia Breeze and the Macromedia Flash Platform.

The Flash Platform is widely leveraged in the U.S. Navy—the Flash Player is approved on the NMCI Gold Disk. This means that every person in the organization is able to easily access any training content delivered on the Platform.

NAVAIR took advantage of the XML application programming interface (API) that Macromedia Breeze provides to integrate its new learning solution with the CDO's existing LMS technology and the corresponding website that's built on Macromedia ColdFusion MX software. The end result is a highly efficient, standardized training system that has seen nearly instant user adoption worldwide—and is growing at 10% every month. More than 30,000 Breeze sessions, available over a variety of bandwidths, have been completed to date, adding up to more than 11,000 successfully completed courses.

- Integrates seamlessly with existing LMS
- Single sign-on capability
- Consistent, rich media content available on demand to personnel anywhere
- NMCI-approved technology

Communication and collaboration

The next-generation federal enterprise architecture will allow engineers, technicians, and warfighters to exchange information and collaborate - wherever they are located - by broadening access to run-time system activities, centralized data repositories, and real-time collaborative communication tools. Device-independent capabilities will enable development and operation teams to transfer data and maintain constant communication in critical and non-critical situations.

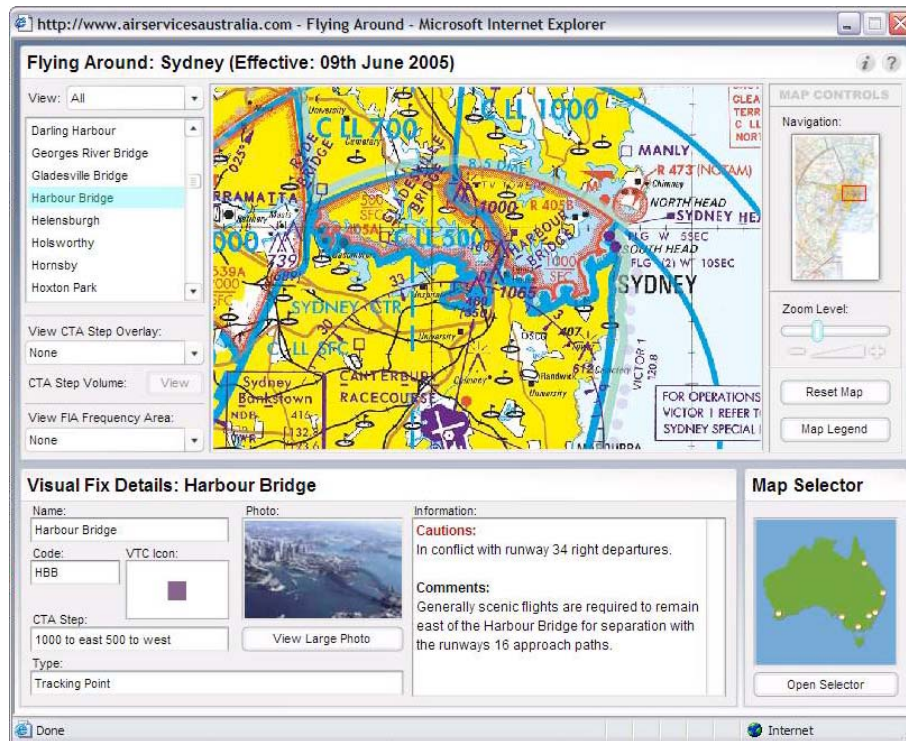
A key benefit of the Flash Platform is the ability to provide communication and collaboration capabilities across multiple devices in a consistent manner, reducing both the development time required for the functionality and the operational ramp-up time for the personnel. Regardless of what device is being used, the interface and functionality remain the same, delivering true cross-device capabilities. Leveraging standards such as VoIP and advanced compression algorithms, true multimedia collaboration and information sharing is supported. The following two examples demonstrate how the Flash Platform enables both technical and non-technical teams to more easily and quickly work together.

Airservices Australia

Airservices Australia—a government-owned corporation that provides air traffic control management and related airside services to the aviation industry—manages over 11% of the world's airspace, and handles air traffic operations for more than three million domestic and international flights a year.

As the aviation industry in Australia grows, too often, General Aviation pilots were straying into controlled airspace, greatly increasing the chance of a serious incident occurring. Airservices Australia wanted an interactive and visual website that provided pilots with information on how to operate flights in a safe and effective manner, thus reducing the likelihood of a violation of controlled airspace. Because controlled airspaces and geography are continuously changing, Airservices Australia must update the maps and information on the site every six months. Airservices Australia required a solution that was easy to maintain and modify, would work across multiple platforms, and supported different internet connection speeds and varying user skill levels.

Leveraging the Macromedia Flash Platform, along with Macromedia Flash, Macromedia Dreamweaver, Macromedia Fireworks, and Macromedia FreeHand, Airservices Australia created its *Flying Around* website (www.airservices.gov.au/pilotcentre/training/flyingaround/default.asp). *Flying Around*, has been designed to give pilots 'just-in-time' information about a specific area and the ways to operate flight in a safe, effective manner - reducing the likelihood of being involved in a violation of controlled airspace. The site provides interactive charts, aerial photos showing new geography of the landscape, specific information about the airspace around major Australian cities, and controller tips about hazards in areas surrounding this controlled airspace. Airservices Australia found that through the use of automation and scripting inside Macromedia Fireworks and Macromedia Flash, repetitive tasks were simplified and workloads were greatly reduced.



Macromedia's product set allows Airservices Australia to provide an interactive website that delivers realistic experiences for rich content, applications, and communications across browsers, operating systems, and devices. Key benefits of the Flash Platform for Airservices Australia include:

- Significant application adoption, resulting in 25% reduction in the number of violation-of-controlled-airspace occurrences
- Scripting automates many repetitive tasks, reducing the workload and making modifications easier
- New features such as video or animation can easily be added
- Base application can be retooled to display any information based on spatial relations (i.e. using maps or diagrams)

U.S. Department of Defense - Uniformed Services University of the Health Sciences

The Uniformed Services University of the Health Sciences is the nation's federal health sciences university and is committed to excellence in military medicine and public health during peace and war. As headline news of biological warfare, chemical attacks, and possible nuclear threats has pushed its way into the attention of U.S. citizens and businesses, healthcare leaders in the armed services, in private corporations, and at medical facilities knew they needed immediate, up-to-date information on medical diagnosis and treatments of these weapons of mass destruction (WMD).

The Department of Defense's Uniformed Services University, The Henry Jackson Foundation for the Advancement of Military Medicine, and Lippincott Williams & Wilkins—a medical publisher—joined forces with Medantic Technology—an e-learning company—to create the nation's first certified online course for training healthcare professionals on how to diagnose and treat victims of WMD.

Medantic chose the Macromedia Flash Platform, developing in Macromedia Flash and Cold Fusion to create an e-learning platform that allowed the country's leading WMD experts to rapidly, and remotely, create a comprehensive course for a broad learner culture with differing information needs and diverse learning styles.

The “Weapons of Mass Destruction” course demonstrates real-life scenarios in clinics and hospitals through virtual patient scenarios complete with multimedia presentation of illnesses, interactive patient diagnosis, testing, and management, and learner assessment. Using the Flash Player, courses were repurposed for handheld devices to offer the most flexibility to learners.

The course combines two effective multimedia teaching methods—lectures for demonstration and interactive case simulations for practice—to improve learners' knowledge retention. Medantic Technology's online learning management system (LMS) provides user-controllable course sequences, performance tracking, and matches results with certification criteria.

“Macromedia Flash allows us to animate molecular, biological, and physiological events that would normally take hundreds of pages of text to describe in totality. In our low bandwidth application, we can make clinical e-learning memorable, compelling, and dynamic.”

Jay Darji, Vice President of e-learning for Medantic Technology

Benefits

- Improved quality and quantity of visual content helps students better engage with course content
- Courseware takes advantage of subject matter experts from around the world
- The rapid development environment allows developers to meet just-in-time market demands
- Support for video makes it easy to increase the visual impact of the site
- By leveraging the Flash Player, courses were repurposed for handheld devices

Conclusions

Governments worldwide are striving to increase efficiencies, lower costs, and improve interactions with citizens and between agencies, and must do so in an increasingly digital environment in which the web, desktop applications, telephony, and mobile devices are converging. In a world in which interactions—whether in the office, the training center, the battle theatre, the military base, or the patrol car—are increasingly digital, government agencies must transition mission-critical legacy applications to support today’s technology and standards, while avoiding the need to repeat this process of technology transformation a few years down the road.

As the notion of the “enterprise” breaks through the physical boundaries of office buildings, information must be available when the user needs it, how the user needs it, and where the user needs it, whether that be the extension of enterprise-level information within a civilian agency, or the enablement of C4I (Command, Control, Communications, Computers, and Intelligence) within military and space agencies. To support this goal, government agencies need a technology foundation that supports the rapid and accurate development, integration, analysis, and deployment of rich information in a highly fluid, mobile environment across a spectrum of hardware and software platforms and devices.

The Macromedia Flash Platform provides a next-generation, cross-platform, and device-independent delivery system that delivers superior digital experiences to enable information superiority, cost-effective training, and real-time collaboration. By delivering many technical advantages over existing technologies for enabling federal enterprise architectures—including an easy reach forward to multiple-device, light-footprint environments—the Flash Platform helps agencies transform their operations and capabilities and enable their workforce and constituents to realize the degrees of freedom needed to drive the business of government.

Appendix A–Application Platform Evaluation Checklist

Does/is the platform:	Macromedia Flash Platform	Company A	Company B
Offer OS and browser independence?	Macromedia Flash Platform and solutions are agnostic to the underlying application server and OS, so they remain relevant no matter which infrastructure choices an agency makes		
Offer cross-platform device support?	Allows an agency to reach multiple clients—such as the desktop, PDAs, mobile phones - without having to install a separate client on each end user device		
Help agencies reach a wide audience?	The Flash Player is deployed on more than 98% of all computers worldwide as well as on a majority of mobile and electronic devices		
Supported by a robust, active developer’s community?	More than a million designers and developers work with the Flash Platform today—including the top 50 Department of Defense (DOD) system integrators		
Widely adopted in the commercial sector?	The Flash Platform is used across a wide range of industries including financial services, telecommunications, education, and government		
Ensure security and privacy of user and agency data?	Flash Platform technologies leverage existing security tools and approaches that are already in place		
Offer easy deployment and maintenance?	The Flash Platform integrates seamlessly into an agency’s existing architecture at the browser level through a plug-in and at the presentation tier through Flex software or a static HTML solution with script and Flash		
Poised for long-term stability and growth?	Numerous industry heavyweights such as SAP, HP, Nokia, Samsung already build on the Flash Platform		

Appendix B—Flash Platform Standards

Server-side standards	<ul style="list-style-type: none"> • Runs on all popular operating systems and on multiple platforms, including Macintosh, Windows, Solaris, and Unix, and Java application servers such as IBM WebSphere, BEA WebLogic Server, Macromedia JRun, Apache Tomcat, Oracle 10g, SAP NetWeaver, and Fujitsu Interstage 6
Network standards	<ul style="list-style-type: none"> • Networking uses native HTTP/HTTPS protocols • Enables backend connectivity using SOAP-based web services, XML over HTTP, and remote method invocation into Java objects • Uses automatic detection of the client's bandwidth connection to adjust video streams accordingly
Security standards	<ul style="list-style-type: none"> • Based on proven and accepted security standards such as SSL and HTTPS for data transport • Integrates with standard protocols for authentication, such as LDAP and other directory services • Takes advantage of the common security technologies available in web technologies, such as the transparent authentication handling by browsers and cryptographic standards such as x509 certificates • Uses SSL, native encryption, and the security on the operating system to minimize wireless security concerns
Client-side standards	<ul style="list-style-type: none"> • Programming language, ActionScript, is an ECMAScript language • Media formats include JPEG images, MP3 audio, and H.263 video • Data integration supports XML and SOAP web services • Installed on more than 98% of all Internet-enabled PCs and a wide variety of other electronic devices
Application standards	<ul style="list-style-type: none"> • Supports industry standards such as SCORM and AICC

For More Information

For more information about how the Flash Platform could benefit your agency, you can contact a North American sales representative at 1-888-649-2990 (US and Canada) or find a specific North American government account manager at <http://www.macromedia.com/resources/government/contact/>. For contact information outside of North America, please visit www.macromedia.com/international/buy/numbers.html.

If you have further questions about the Flash Platform and Macromedia Government, please contact government@macromedia.com Or, use any of the following links:

- For more information about the Flash Platform, visit www.macromedia.com/platform
- For more information about Macromedia Government, visit <http://www.macromedia.com/resources/government/>
- For more information about the Flash Player, visit www.macromedia.com/software/flashplayer/
- For more information about the Flash authoring tool, visit www.macromedia.com/software/flash/
- For more information about Flex Builder, visit www.macromedia.com/software/flex/flexbuilder/
- For more information about the Flex Presentation Server, visit www.macromedia.com/software/flex/
- For more information about Flash Media Server, visit www.macromedia.com/software/flashcom/
- For more information about Flash Video Streaming Services, visit www.macromedia.com/software/flashcom/fvss/
- For more information about Breeze, visit www.macromedia.com/software/breeze/
- For more information about Macromedia Security, visit www.macromedia.com/resources/security

Resources

129th Rescue Wing of the U.S. Air National Guard case study

http://www.macromedia.com/cfusion/showcase/index.cfm?event=casestudydetail&casestudyid=86831&loc=en_us

Airservices Australia case study

<http://macromedia.breezecentral.com/airservices/>

Colorado Public Employees Retirement Association case study

http://www.macromedia.com/cfusion/showcase/index.cfm?event=casestudydetail&casestudyid=87860&loc=en_us

Miami-Dade Police Department case study

http://www.macromedia.com/cfusion/showcase/index.cfm?event=casestudydetail&casestudyid=89390&loc=en_us

U.S. Department of Defense - Uniformed Services University of the Health Sciences case study

http://www.macromedia.com/cfusion/showcase/index.cfm?event=casestudydetail&casestudyid=2781&loc=en_us

U.S. Naval Air Systems Command (NAVAIR) case study

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