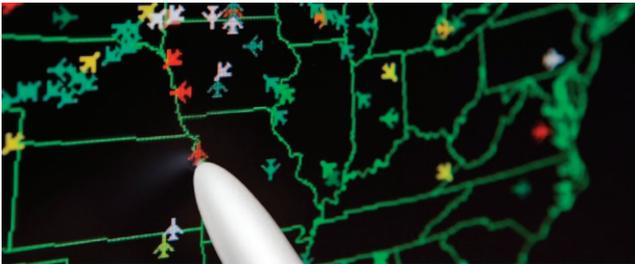


## technology opportunity

# Enterprise Middleware Solution

*Increases productivity and efficiency by enabling IT programs to share data*



NASA's Dryden Flight Research Center has developed an Enterprise Middleware solution that allows disparate information technology (IT) systems to be integrated into one seamless, efficient system. As software and database platforms continue to develop at an accelerated pace, legacy systems can be a drain on resources, requiring complex workarounds and major code modifications in order to share data. NASA's middleware offers an easy to use tool that integrates existing IT systems with new applications to help businesses become more agile, intelligent, and innovative.

## Benefits

- **Increases productivity:** Business users can access complex data at a single entry point to promote agile, intelligent business decisions.
- **Maximizes IT efficiency:** IT staff can leverage modern hardware and software architectures in concert with legacy systems.
- **Encourages agile growth:** Companies can readily adopt new IT systems and modify legacy systems without disrupting user access to data sources.
- **Reduces number of Web outages:** The need to schedule downtime for major code modifications to the legacy systems is significantly reduced.
- **Isolates interfaces:** IT staff can isolate custom code in the middleware allowing a common Application Program Interface (API) to be developed. If the custom code changes, the changes will be transparent to all systems using the API.
- **Enables common access:** IT staff can develop one common access user interface to multiple systems. Users can access one system to view and manage information from multiple systems.

## Applications

NASA's Enterprise Middleware solution is ideally suited for businesses with critical legacy systems that power day-to-day operations.

- **Banking** (i.e., customer accounts)
- **Air traffic control**
- **Energy distribution** (i.e., power grids)
- **Nuclear power plants**
- **Military defense installations**
- **Rail transportation**
- **Health care**
- **Insurance**

## Technology Details

### *How It Works*

NASA's Enterprise Middleware solution provides a single access point for numerous legacy systems to be integrated with new IT systems. The middleware system is composed of four tiers:

- **Service-Oriented Architecture (SOA) entry point gateway:** This is a single entry point for all transaction requests. The entry gateway authenticates and validates requests and routes XML messages to the appropriate queue. Once a request is sent, the entry gateway listens for the returned requests on the respective queue and submits results to the user.
- **Messaging service:** The messaging service stores all messages between the entry gateway layer and the Enterprise Middleware interface. It provides a secure wall surrounding the Enterprise Middleware orchestration layer, storing messages from the publisher and the subscriber.
- **Enterprise Middleware interface:** This represents the main intelligence of the entire SOA, processing each request in the form of a message, building the request, and intelligently routing to the respective business Web service. The orchestration layer determines the appropriate Web service to call, then sends the message to the Web service with an encryption key.
- **Business logic Web services:** This tier incorporates key encryption to ensure that the only communication possible is between the Enterprise Middleware and the respective Web service. It is configured to interface directly with the Enterprise Middleware when a message is received. This layer adheres to JSR-181 specification to ensure standardization on various platforms.

### *Why It Is Better*

NASA's Enterprise Middleware solution enables companies to stay agile and adopt new IT systems while still retaining comprehensive access to data stored in legacy systems. Built around XML, the Service-Oriented Architecture is loosely coupled and therefore highly flexible, which means legacy systems can be accessed in one central location without the need for any complex and time-consuming code changes. The product is also significantly less expensive than commercially available competitors. NASA's Enterprise Middleware can help businesses maximize existing IT infrastructure, increase efficiency, and create a more agile, flexible, growth-oriented IT environment.

## Commercial Opportunity

This technology is part of NASA's Innovative Partnerships Office, which seeks to transfer technology into and out of NASA to benefit the space program and U.S. industry. NASA invites companies to consider using this Enterprise Middleware Solution (DRC-010-040) for commercial applications.

### **For more information about this technology, please contact:**

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