

***SFA Modernization Partner***  
**United States Department of Education**  
**Student Financial Assistance**



**Technical Architecture Services Report**  
**3Q01**

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## 1 Introduction

### 1.1 Summary

The *Technical Architecture Services Report: Third Quarter of 2001* summarizes the Integrated Technical Architecture (ITA) team's tasks related to implementing Task Order 46 during the third quarter of 2001. Task Order 46 provides support and enhancements for SFA's ITA. The ITA provides a standardized, reusable infrastructure for enabling business capabilities within the SFA application community. The long-term vision of the ITA is to provide an integrated, enterprise-wide technical architecture that will enable SFA to reduce the number of custom-built applications that are difficult to update and maintain.

The ITA team's tasks fall into the following categories:

- Core ITA Support – Provides a standard development architecture/procedures for SFA application teams.
- Technical Architecture Support – Provides infrastructure and application architecture expertise to SFA application teams.
- Roll Out Support – Build out of environments (development, test, staging, and production) and system upgrades for SFA application teams.
- Product Specialist Support – Provides support for specific software products used in SFA.
- Reusable Common Services (RCS) - Provides a set of reusable basic application services based on open-source technology and Java 2 Enterprise Edition (J2EE).

The rest of the report provides a description of the ITA team's tasks performed within these categories during the third quarter of 2001.



## 2 Support Areas

During the third quarter of 2001, the ITA team provided technical support to SFA in the following areas:

- Core ITA Support
- Technical Architecture Support
- Roll Out Support
- Product Specialist Support

The following sections describe the specific tasks the ITA team performed in these support areas.

### 2.1 Core ITA Support

#### 2.1.1 Deliverables

The ITA team wrote the following deliverables:

- The ITA Quarterly Report
- ITA Best Practices Guide
- ITA RCS Build and Test Report

#### 2.1.2 Configuration Management

The SFA Modernization Partner was looking to utilize tools for use in configuration management and bug and issue tracking. The ITA team selected and implemented Rational ClearCase for its configuration management system. ClearCase manages multiple variants of evolving software systems, tracks which versions were used in software builds, performs builds of individual programs or entire releases according to user-defined version specifications, and enforces site-specific development policies.

#### 2.1.3 Build Management

Rational ClearCase and ANT are used for release management. ANT is a Java-based build tool used for RCS Build Management. ANT is an open-source project from the Jakarta Project. It is a powerful scripting tool that lets developers execute build processes around code requirements using predefined tasks. A defined build process ensures that the software in the development project is built in the exact same manner each time a build is executed. As the build process becomes more complex it becomes increasingly necessary to achieve such consistency. ANT is a platform-independent scripting tool that lets developers construct build scripts using a large number of built-in tasks with minimal customization.



#### **2.1.4 Problem Management**

ClearQuest is the defect-tracking tool within the Rational Suite. The SFA Modernization Partner project is utilizing ClearQuest as a request, issue, and action-item tracking database. The interface to ClearQuest is available on the web, so any user is capable of logging on and submitting a request/issue/action-item. The databases can be administered from the Aerospace building, so user IDs will be controlled by a designated contact. All enhancement requests will be documented and assigned an estimated level of effort to decide whether the change can be implemented. The schema for the database can be used to create databases for specific projects to track bug defects and any other requests. ClearQuest also has the capability of email notification when a person is assigned to a task.

#### **2.1.5 Requirement Management**

The ITA team built Rational Requisite Pro as a requirement management tool for the Common Origination and Disbursement (COD) team.

#### **2.1.6 ITA Web Site**

The Intranet Web site contains information and documentation about the Integrated Technical Architecture (ITA) team, environments, reusable common services, and best practices.

### **2.2 Technical Architecture Support**

#### **2.2.1 Technical Architecture Review**

The ITA team performed the following:

- Reviewed FAFSA 6.0 architecture and provided FAFSA with WebSphere best practices.
- Reviewed design of EIP application and provided input with regards to the rollout of the Reusable Common Services.

#### **2.2.2 Technical Support**

The ITA team provided technical support and change requests for the FAFSA, CBS, and EAI software applications. Examples of this type of support include restarting servers, updating configurations, adding new configurations, and debugging problematic application code.

#### **2.2.3 COD/ XML**

COD team required the ITA team's expertise in XML to provide assistance in the completion of the XML Schema design for the Common Record. This included edits to satisfy the reviews and feedback of the larger student aid community, including PESC (Postsecondary Electronic Standards Council) and FFEL (Federal Family Education Loan) lenders. The ITA team also worked with the COD team on the detailed requirements gathering, design walkthroughs, and development of business data transformations (XML to/from Flatfile) functionality in Java.



## **2.3 Roll Out Support**

### **2.3.1 ITA Environments**

The ITA team built the following environments on WebSphere Application Server, IBM HTTP Server, and Oracle database:

- The development environment on HP for FAFSA 6.0 on the Web
- The test environment on HP for FAFSA 6.0 on the Web
- The stage environment on HP for FAFSA 6.0 on the Web
- The performance test environment on HP for FAFSA 6.0 on the Web
- The WebSphere 3.5 development and stage environment for IFAP and Intranet
- The WebSphere 3.5 upgrade for IFAP and Intranet on Production
- The test environment for CBS
- The performance test environment for CBS
- The production environment for CBS

In addition, the ITA team:

- Installed Digital certificates for CBS secure site (SSL)
- Implemented application server failover strategy in production for COD using WebSphere modeling and cloning technology
- Established location and availability of the COD prototype

## **2.4 Product Specialist Support**

### **2.4.1 WebSphere Application Server on HP Testing**

The ITA team successfully built, configured, and tested WebSphere 3.5 on the HP Platform. Tests were completed for two environment configurations including IBM HTTP Sever on Sun to WebSphere Application Server on HP and IBM HTTP Server on HP to WebSphere Application Server on HP. Test scripts were executed on both environment configurations and the actual test results matched the expected results in all cases, thereby validating WebSphere 3.5 on the HP platform.

### **2.4.2 SFA Application Team Support**

The ITA team assisted CBS in performance testing. The ITA team used IBM's WebSphere Resource Analyzer tool to monitor CBS performance during the test. The ITA team analyzed the data and provided a performance report to CBS.

The ITA team also provided assistance to the FAFSA team with the following activities:

- Reviewed and provided input to the FAFSA 6.0 Performance Plan
- Tuned servers for optimal performance



- Monitored the Performance Test using WebSphere Resource Analyzer
- Conducted FAFSA 5.x application design and code review and provided feedback based on ITA best practices.
- Assisted with performance test of FAFSA 5.x
- Lead the capacity planning effort for FAFSA 6.0

### **2.4.3 Interwoven**

#### **2.4.3.1 JSP deployment in Interwoven**

Until now TeamSite has been used to editing and pushing only static content. The ITA team has configured TeamSite 5.0.1 to be capable of pushing IFAP JSP files to development and production. The team worked closely with the Operations team to define requirements and establish work areas for the developers. TeamSite can now be utilized to make changes to JSP files and push them to development, testing, and production regions without requiring telnet access to all affected servers. The Operations team will be utilizing editions to deploy updated content to the IFAP application. By utilizing editions, old versions of code can be recovered and only updated files will be pushed, rather than the entire directory structure of code. This change allows the Operations team to fix any production errors efficiently and effectively.

#### **2.4.4 Interwoven Upgrade**

As part of ITA Release 2.0, the team is investigating options for upgrading products. Interwoven users have documented several items that require attention to the product. To accommodate many of these items, an upgrade to Interwoven 5.0.1 from version 4.2.1 was done. The upgrade provides a new user interface that is more web-orientated and provides the functionality of supporting rich text format fields in the templates. This will allow the users to create more appealing web pages for the content of IFAP. The upgrade will also provide more functionality for applications looking at coming into the ITA.

## **2.5 ITA Reusable Common Services**

The ITA team has completed the design, development, testing, and performance analysis of the reusable common services. The ITA team used JUnit to automate the testing of each RCS framework. The ITA team used JProbe to do the performance analysis and wrote a performance report for all six of the common services. The common services for this release include:

- Logging
- Exception Handling
- E-mail
- Persistence
- Component Factory
- Search



The testing and performance analysis results for the RCS can be found in the ITA RCS Build and Test report document.

### **2.5.1 ITA Common Services – SFA Application Rollout**

The following SFA application teams have either successfully implemented RCS or are considering the use of RCS frameworks:

- CBS – Email framework (under consideration)
- FASFA – Logging and Exception Handling frameworks (in production)
- EIP – Logging, Exception handling, Persistence, and Search frameworks (in development)
- IFAP – Search framework (in production)
- COD – Exception Handling (under consideration)
- PGD – Search framework (under consideration)