

FSA Integration Partner

United States Department of Education

Federal Student Aid



ITA Production Operations Goals Report I

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Table of Contents

1	Introduction	2
1.1	ITA Overview	2
1.2	Executive Summary	2
1.3	FSA Applications	3
1.4	ITA Products.....	6
2	Maintenance Services.....	8
2.1	Availability	8
2.2	Pager Support.....	8
3	Issue Troubleshooting and Resolution	9
3.1	Issue Matrix.....	9
3.2	Issue Resolution Log.....	10
3.3	Outstanding Issues	19
APPENDIX A – ITA PRODUCTION ENVIRONMENT DIAGRAMS		
APPENDIX B – ITA OPERATIONS SUPPORT SCHEDULE (DEC 2002)		
APPENDIX C - ITA ORGANIZATIONAL CHART		



1 Introduction

1.1 ITA Overview

The Integrated Technical Architecture (ITA) provides a standardized, reusable infrastructure for enabling business capabilities within the FSA application community. The long-term vision of the ITA team is to provide an integrated, enterprise-wide technical architecture that will enable FSA to reduce the number of custom-built applications that are difficult and costly to update and maintain.

1.2 Executive Summary

The ITA Production Operations Goals Report I (January 8, 2003) documents the maintenance services provided by the ITA team between November 1-December 31, 2002. These maintenance services were provided to FSA applications using ITA products hosted in the ITA production environment. The following is a brief overview of the contents of each section of this report:

Section 1 Introduction:

- Provides an overview of the contents of this report.
- Describes FSA applications maintained in the ITA production environment and identifies the ITA products being maintained.
- Provides an overview of the products that ITA supports as outlined in the Service Level Agreements (SLAs) between ITA and each FSA application using the ITA production environment.

Section 2 Maintenance Services:

- Summarizes ITA availability for maintenance services.
- Provides a brief summary of pages and calls, and includes the total number of incidents.

Section 3 Issue Troubleshooting and Resolution:

- Provides an overview of the Issues section of this document.
- Summarizes production issues that were identified and resolved between November 1 and December 31, 2002.
- Summarizes any outstanding production support issues.



1.3 FSA Applications

This section provides an overview of FSA applications hosted in the ITA production environment. The ITA team provides the following maintenance services to these applications:

- Environment maintenance.
- Upgrades and patches as needed.
- Change request processing.

1.3.1 eCampus Based

The intent of the project is to modernize the existing CB application architecture; migrating from the current platform (COBOL, IBM Mainframe, VSAM data store) to a relational database platform (Oracle), developing a web-based user interface (WebSphere), along with additional software functionality enhancements. This modernized solution is named eCB (electronic Campus Based). The main objective of the modernization effort is to offer institutions and CB staff an integrated and intuitive solution that increases access to information and self-service capabilities supporting FSA's strategic goals.

The eCampus Based application receives support for WebSphere Application Server, IBM HTTP Server, and Network Dispatcher.

1.3.2 Exit Counseling

Exit Counseling is the process students go through prior to graduation, and it is the beginning of the repayment phase of the financial aid process. The Exit Counseling application utilizes WebSphere and MQSeries to access the National Student Loan Data System (NSLDS) mainframe to retrieve appropriate loan information.

ITA provides WebSphere Application Server and IBM HTTP Server product support to the Exit Counseling application.

1.3.3 Free Application for Federal Student Aid on the Web (FAFSA on the Web)

The FAFSA on the Web application is used by college students and schools to submit financial aid applications to FSA via the Internet.

ITA provides FAFSA on the Web with support for WebSphere Application Server, IBM HTTP Server, and Network Dispatcher.

1.3.4 Financial Partners Data Mart (FP Data Mart)

The FP Data Mart initiative provides initial Risk Management, Customer Relationship Management, Compliance Management, and Portfolio Management functionality related to the thirty-six Guaranty Agencies and the approximately four thousand lenders.

FP Data Mart receives ITA support for the Informatica product.



1.3.5 FSA Computer-Based Orientation to Aid Concepts and How-to's (FSA COACH)

FSA COACH is a comprehensive introductory course on school requirements for administering post-secondary student financial aid programs.

ITA provides Network Dispatcher and IBM HTTP Server product support to the FSA COACH application.

1.3.6 FSANet

FSANet is an internal portal for FSA employees. It provides general information about FSA, FSA Channels, and the Department of Education. The portal also houses information about FSA standards.

ITA provides WebSphere Application Server, IBM HTTP Server, and Network Dispatcher product support to the FSANet Application.

1.3.7 Information for Financial Aid Professionals (IFAP)

The IFAP website is an electronic library for financial aid professionals containing publications, regulations, and guidance regarding the administration of Title IV Federal Student Aid Programs.

IFAP receives ITA support for WebSphere Application Server, IBM HTTP Server, and Network Dispatcher.

1.3.8 Lender Reporting System (LaRS)

LaRS is part of the Financial Management System phase IV project. LaRS is an Oracle Financials based application that improves the reliability of lender billing data through a redesigned loan payment process.

ITA provides Network Dispatcher product support to the LaRS application.

1.3.9 Ombudsman Redesign

The Ombudsman website contains information and resources about FSA Ombudsman. The site contains searchable content and links to quickly retrieve information.

ITA provides WebSphere Application Server, IBM HTTP Server, and Network Dispatcher product support.

1.3.10 Program Guidance

The Program Guidance application provides a central location for resources needed by the Program Development Division within FSA. The application provides documents and profiles to identify relevant information quickly for members of this division.

ITA provides WebSphere Application Server, IBM HTTP Server, and Network Dispatcher product support.



1.3.11 Schools Portal

The Schools Portal is a homepage for school-specific information with links, headlines, and calendar functions frequented by the schools. The site is customizable and can store bookmarks.

ITA provides WebSphere Application Server, IBM HTTP Server, Interwoven, Autonomy, and Network Dispatcher product support.

1.3.12 Students & Financial Partners Portal

Portals were developed for the Students and Financial Partners channels to provide a central location for information needed by students and financial partners.

ITA provides WebSphere Application Server, IBM HTTP Server, Interwoven, Autonomy, and Network Dispatcher product support.

1.3.13 Table of FSA Application Release Numbers

The table below presents the release numbers of the FSA applications supported by the ITA team in the production environment.

Application	Current Release Number
eCampus Based	3.0
Exit Counseling	-
FAFSA on the Web	7.0
FP DataMart	2.0
FSA COACH	1.0
FSANet	2.0
IFAP	2.0
LaRS	4.11
Ombudsman	-
Program Guidance	1.0
Schools Portal	2.0
Students & Financial Partners Portal	Students – 1.1 FP – 2.0



1.4 ITA Products

This section provides an overview of ITA products used by FSA applications hosted in the ITA production environment.

1.4.1 IBM HTTP Server

IBM's web serving offering is based upon the Apache web server. The implementation that IBM has custom tailored allows for tight integration into the IBM WebSphere applications and other IBM products. It allows for the serving of multiple web documents, while providing necessary application interaction.

1.4.2 IBM WebSphere Application Server

The IBM WebSphere Application Server manages, deploys, programs, and integrates development like IBM's WebSphere. It makes use of Java technology compatibility for most web application offerings. One of its most useful features is that it is a highly configurable solution for a small offering or a large enterprise. It is the middleware between the HTTP servers and the databases.

1.4.3 Network Dispatcher

This IBM product is an integrated portion of the IBM Edge Server. Network Dispatcher provides load balancing. It administers the resource balancing between clusters of web servers and application servers. It is one of many components within the network architecture that allows for high availability.

1.4.4 Interwoven TeamSite

As the flagship product of the Interwoven Platform, TeamSite enables content contribution, collaboration, and management across the enterprise. It provides the necessary components to streamline business processes, integrate currently used productivity tools, and accelerate all eBusiness initiatives.

1.4.5 Informatica

Informatica is a mainframe data tool that converts mainframe data for Oracle so MicroStrategy can generate reports.

1.4.6 Autonomy

Through the use of Autonomy the entire Internet offering is easily parsed into a searchable resource. Users can seamlessly search for content throughout enterprise offered information. It does this through its connectors that combine varying forms of resources (databases, html pages, e-mails, etc.) into one easily accessible resource.



1.4.7 Viador/JRun

Viador software acts as a filter for enterprise information to enable delivery to employees, customers, or any other group in need of focused information. This package is highly scalable for any implementation and more importantly is built on a flexible architecture that adapts to any project.

Viador runs on top of the JRun application server. Jrun is an offering from Macromedia that provides a fast, affordable, and reliable solution for Java application delivery.

1.4.8 Microstrategy

This product provides reporting, analysis, and information delivery capabilities.

1.4.9 Table of ITA Product Software Versions

The table below presents the version(s) of the software products installed in the ITA production environment.

Software Product	Current Version
IBM HTTP Server (IHS)	v1.3.12
WebSphere Application Server (WAS)	v3.5.6 (HP machines) v3.5.5 (SUN machines)
eNetwork Dispatcher	V4.0.2.25
Interwoven TeamSite	v5.0.1
Informatica	v5.1.2
Autonomy	v3.1.13.2
Viador	-
JRun	-
Microstrategy	v7i
Solaris	v2.6



2 Maintenance Services

2.1 Availability

The ITA team offers continuous tier two support in the maintenance escalation process. ITA provides support twenty-four hours a day, seven days a week. This level of support helps ITA ensure a high level of service as outlined in the Service Level Agreements (SLAs) with each application team.

Target Availability: 100% (24/7 production support)

Actual Availability: Please refer to the IT Services Report issued by Ernest Sheffield at Lin.Sheffield@ed.gov.

2.2 Pager Support

The ITA team provides non-business hour support through pager support. The ITA team has escalation procedures to ensure that support for production issues is readily available. During business hours the ITA team answers an average of 15 calls per day. During non-business hours the ITA team answers 4 pages per week. Additionally, the ITA team has been participating in weekly production issue status calls. The incidents (production issues) that have been captured thus far include those that are logged in the change request tool that are described in Section 3.2. At this point, sixteen of the seventeen production issues have been resolved and one remains outstanding with a resolution date targeted for January 15, 2003.



3 Issue Troubleshooting and Resolution

3.1 Issue Matrix

The issue log included in Section 3.2 of this document provides detailed issue troubleshooting and resolution information for production environment issues addressed between November 1, 2002 and December 31, 2002. The matrix is organized chronologically by application name.

This matrix consists of the following categories:

- Date Opened: Provides the date the issue was opened.
- Application: Provides the name of the application.
- Description: Provides a description of the issue.
- Resolution: Summarizes steps taken by the ITA team to resolve an issue.
- Priority: Provides the issue's level of priority (high, medium, low).
- Issue Status: Indicates the issue's status (open, closed).
- Issue Resolution/Target Date: Provides the issue's resolution date or target date.

Some issues span a greater time period and closure may not have been possible before the deadline of this report.



3.2 Issue Resolution Log

Date Opened	Application	Description	Resolution	Priority	Issue Status	Issue Resolution/ Target Date
08/01/02	FAFSA	<p>WebSphere is recreating the Session table in the session database when it restarts under a heavy load. This issue has been observed three times in the production environment.</p> <p>This issue appeared on February 28, 2002 when Operations tried to restart several WebSphere clones. During this restart it was discovered that if WebSphere receives the wrong status information from the session database, it can potentially drop the session database while using the session database.</p>	<p>The ITA team implemented an “efix” provided by IBM in March 2002 for WebSphere v3.5.5 in the FAFSA 6.0 production environment. The “efix” prevents the runtime code from dropping the Session table and provides information as to why WebSphere is receiving invalid status.</p> <p>IBM also provided a second “efix” in March 2002 for WebSphere v3.5.6. The FAFSA 7.0 environment runs on WAS v3.5.6, so this second “efix” was continually tested over the summer and into the fall. In addition, the “efix” was tested during FAFSA 7.0 performance testing in October and November 2002. The “efix” was tested successfully during the FAFSA 7.0 performance test proving that WebSphere will not drop or attempt to recreate the Session table.</p>	Medium	Closed	11/05/02

Note: Issues with the date opened 08/01/02 were outstanding issues described in deliverable *69.2.1h Technical Architecture Application Maintenance Services Report (September 2002).doc*. These issues are included in this report (Nov/Dec 2002) because they were ongoing during October, November, and/or December 2002.



Date Opened	Application	Description	Resolution	Priority	Issue Status	Issue Resolution/ Target Date
08/01/02	FAFSA	<p>Operations reported that the FAFSA WebSphere configuration takes a long time to initialize if all servers are rebooted together. (1 of 3)</p> <p>Issue 1: JSP's slow to compile.</p> <p>At startup, WebSphere compiles all JSP's in its document root. Since the FAFSA environment utilizes multiple clones, all of the clones are attempting to compile the same JSP files on the same system, at the same time. This requires a large amount of processing power and slows down the startup of the application.</p>	<p>Upon IBM's recommendation, the ITA team instituted WebSphere's JSP precompiler functionality. The precompiler compiles all JSP files before the application is restarted. This removes the need for a Web Application to compile JSP's on startup, thus lowering initialization times for servers on startup.</p>	Medium	Closed	12/29/02
08/01/02	FAFSA	<p>Operations reported that the FAFSA WebSphere configuration takes a long time to initialize if all servers are rebooted together. (2 of 3)</p> <p>Issue 2: Servlet Initialization.</p> <p>WebSphere was not configured to initialize servlets on startup. As a result, a servlet was started when it was first accessed by a user. Because the user was starting the servlet, this required the user to wait for initialization. The wait time for the servlet to startup is outside the designated limit for an acceptable response time for the FAFSA application.</p>	<p>The ITA team set all FAFSA servlets to initialize at startup rather than at first access. By initializing all servlets at startup, a user will access the application directly with no additional wait time.</p>	Medium	Closed	12/29/02



Date Opened	Application	Description	Resolution	Priority	Issue Status	Issue Resolution/ Target Date
08/01/02	FAFSA	<p>Operations reported that the FAFSA WebSphere configuration takes a long time to initialize if all servers are rebooted together. (3 of 3)</p> <p>Issue 3: Large number of clones resulting in too many database requests.</p> <p>The FAFSA 6.0 environment had upwards of 50 clones. During startup, all of the clones tried to access the Admin database at the same time. This immensely slowed the response time of the Admin database resulting in a slow WebSphere response time for initialization.</p>	The FAFSA 7.0 environment was configured with 18 clones. The reduction in the number of clones has reduced server space and will also reduce the number of requests to the Admin database during startup. As a result, initialization time has been reduced.	Medium	Closed	12/29/02
08/01/02	FAFSA	The FAFSA demo production environment was originally housed on HPL2 and HPL3 in the FAFSA development environment. The requirements for this application mandated it be installed in a production environment, so the demo production environment moved to different servers. In addition, a decision was made to move the environment to SUN servers.	The ITA team ported the demo production environment from the HP development servers to the SUN production servers. The FAFSA demo production environment was installed on the ITA SUN production environment on 11/25/02.	Medium	Closed	11/25/02
08/01/02	FAFSA	When the session database goes down for the FAFSA application, WebSphere continues to send requests, without stopping, to the database server to attempt updates to sessions and create new sessions.	IBM has provided an "efix" to limit the number of tries to connect to the session database to three before it stops attempting to connect. This "efix" is included in WebSphere v3.5.6. The FAFSA environments were upgraded to the new version and the issue has been resolved. In addition, another solution was provided by creating a database architecture with high availability.	Medium	Closed	11/07/02



Date Opened	Application	Description	Resolution	Priority	Issue Status	Issue Resolution/ Target Date
08/01/02	FAFSA	An issue has been identified with Network Dispatcher. When the backup server restarts while the primary is running, an incorrect MAC address is put to the firewall and it hangs there until the routing table is refreshed.	<p>The ITA team upgraded Network Dispatcher from v3.6.1.11 to v4.0.2.25 on 11/17/02. Version 3 provided marginal support for Quad Port Ethernet. Network Dispatcher v4.0.2.25 run son Sun 2.8 and provides better support for Quad Port Ethernet than version 3.</p> <p>Quad Port Ethernet is designed so one hardware address is used to access four different ports, whereas before one hardware address could only access one port. In ND 4.0 having multiple ports no longer causes a server to throw an incorrect MAC address. As a result, the issue has been resolved.</p>	Medium	Closed	11/17/02
11/18/02	FAFSA 6.0	<p>Old eSAR links sent out in system-generated email messages need to be updated. There is currently an email that is sent out to a user's application with a link to the previous year's Web Application. A new HTML page needs to be added to redirect users to the correct Web Application.</p> <p>For performance and security reasons, the FAFSA application links were rebranded from FOTW23WebApp to FAFSAWebApp. As a result, the old eSAR links are not working and need to be changed.</p>	<p>The ITA team added the /FOTW23WebApp/sar/ directory to the /www/fotw/htdocs/ directory on all FAFSA web servers. Within that directory a file named 'a' was added that will redirect users to the updated eSAR servlet and the correct Web Application location. The ITA team also adjusted the IHS configuration to account for the changes. This will fix all backwards compatibility with any email sent under FAFSA 6.0.</p>	High	Closed	11/19/02



Date Opened	Application	Description	Resolution	Priority	Issue Status	Issue Resolution/ Target Date
11/26/02	FAFSA 7.0	<p>CSC requested a cycle of the FAFSA application servers.</p> <p>One of the production Application Servers was pulled out of production to be used in the ITA performance test environment. In the performance test environment, the server received an updated level of code. After a successful performance test, the original production release code was moved back on to the server and the server was moved back into the production environment. However, WebSphere did not fully compile the original production code, causing some of the performance test code to be accessed.</p>	<p>After noticing an outdated file, the ITA team requested that WebSphere be recycled to compile all the JSP files on the machine. First, the timestamps were updated for each JSP file, forcing a recompile. To ensure a full change occurred back to the original production code, the Application Server was restarted and the problem was resolved.</p>	High	Closed	11/27/02



Date Opened	Application	Description	Resolution	Priority	Issue Status	Issue Resolution/ Target Date
12/09/02	FAFSA 7.0	<p>The FAFSA 7.0 application functionality was provided in a Beta format to a subset of all users. As a result, the ITA team and NCS implemented a password and security framework to grant access to the Beta version. In addition, the framework prevented the general population from accessing this functionality.</p> <p>The FAFSA0304 servlet is part of the Beta code that won't be released until January 1, 2003. In order to prevent users from submitting applications after the Beta period ends on Friday, Dec. 13, the FAFSA0304 servlet needs to be disabled and the userID's and passwords removed.</p>	<p>After the Beta test was completed, the ITA team disabled access in IHS to FAFSA0304 servlet. In addition, the userID's and passwords were removed from the system, preventing any user from accessing the Beta code.</p>	Medium	Closed	12/15/02



Date Opened	Application	Description	Resolution	Priority	Issue Status	Issue Resolution/ Target Date
12/16/02	FAFSA 7.0	<p>As per NCS requests, ITA provided a general error page through an IHS configuration for all applications. During the re-basing of code from FAFSA 6.0 to FAFSA 7.0, the location of the error file changed. The IHS configuration needs to be updated to reflect this change.</p> <p>Currently, the IHS configuration for FAFSA is pointing to the incorrect general error page on HPN14. The incorrect page is /www/fotw/htdocs/fotw0203/gerrdb.htm.</p> <p>It should be pointing to /www/fotw/htdocs/gerrdb.htm.</p>	<p>The IHS configuration for FAFSA was changed on HPN14 to point to the general error page located at /www/fotw/htdocs/gerrdb.htm. This change was also instituted on all FAFSA IHS servers to reflect the change in the code.</p>	Medium	Closed	12/22/02
12/11/02	FAFSA 7.0	<p>During an ITA test of FAFSA 7.0, OpenDeploy did not startup properly upon a server reboot. After contacting Interwoven support, the ITA team became aware that this is a known issue on HP-UX 11 systems, and OpenDeploy will not startup properly after system reboots.</p>	<p>After repeated inquiries to Interwoven about a solution, it became known that it has no plan to fix this issue in the current version of Interwoven, but a fix will be in a later unreleased version.</p> <p>As a result, the ITA team custom coded a script on all FAFSA web servers to check if OpenDeploy is running. The script runs two hours after the scheduled reboot time every night. If OpenDeploy is not running after the reboot, the script will start OpenDeploy. Otherwise, OpenDeploy will function as normal.</p>	Medium	Closed	12/22/02



Date Opened	Application	Description	Resolution	Priority	Issue Status	Issue Resolution/ Target Date
12/19/02	FAFSA	<p>There is a pair of servers hosting both the FAFSA and PIN applications. This is the first set of FAFSA servers to share an environment with another application. During the testing phase of production, the PIN application using SSL was found to be serving some FAFSA documents.</p> <p>After further inspection, it became apparent there was a mistake in the PIN portion of the IHS configuration file.</p>	<p>The ITA team identified the mistake in the IHS configuration file. In the PIN SSL configuration, the PIN document root properties were set as the FAFSA document root properties. The ITA team changed the incorrect PIN properties to the correct properties, which fixed the problem. NCS approved the change.</p>	Medium	Closed	12/19/02
11/08/02	FSANet	<p>The FSANet search functionality was not working due to a syntax error in the WebSphere configuration.</p> <p>During the normal Sunday maintenance window, CSC updated the FSANet classpath directive to reflect changes made in the application. During the course of the change, a comma was erroneously placed at end of the file name for Autonomy configurations. This caused the FSANET application to look for 'autonomy.properties,' a valid file name, instead of 'autonomy.properties' the actual file.</p>	<p>Given the nature of the associated logs, the character was difficult to spot, but upon close inspection, the ITA team discovered the error. The ITA team worked with CSC to remove the comma and restart the FSANet application. With the proper file name configured, FSANet successfully contacted the Autonomy database and the search functionality was returned.</p>	Medium	Closed	11/08/02



Date Opened	Application	Description	Resolution	Priority	Issue Status	Issue Resolution/ Target Date
11/13/02	IFAP	<p>The IFAP team added a summary field to the Interwoven template. As a result, the IFAP team requested the ITA team update the Interwoven Template DD file to reflect the change. The Template DD file contains the mapping of fields from the Interwoven template to the Oracle database.</p> <p>The IFAP team requested the addition of a Summary column to the Interwoven Template DD file in order to access the database from the Summary field on the IFAP/FAFSA/datacapture.cfg file of Interwoven.</p>	<p>The ITA team added the Summary mapping to Interwoven Template DD file. This successfully mapped the Interwoven template to the Oracle database, which now allows IFAP to store summary information.</p>	Medium	Closed	11/13/02
12/05/02	Program Guidance	<p>Recompiling updated include files is a complex task. Due to the nature of compiling dynamic files within WebSphere, it is not always clear or consistent how Application Servers, regardless of make or version, perform the recompilation.</p> <p>During the Program Guidance production release, the Program Guidance team updated an include file used for document download. WebSphere did not mark this file as new and therefore did not compile to the new version of the JSP.</p>	<p>In order to force a recompile, the ITA team deleted all the temporary files generated by WebSphere. WebSphere was then restarted, recompiling all files including the updated include file. The new version was picked up and the issue was resolved.</p>	Medium	Closed	12/15/02



3.3 Outstanding Issues

Date Opened	Application	Description	Resolution	Priority	Issue Status	Issue Resolution/ Target Date
08/01/02	FAFSA	<p>Web server processes are failing to respond to requests from IHS and causing a single CPU to peak at 100% utilization. The application is not impacted, but the server performance skewed WAS.</p> <p>This has been an ongoing problem. IBM has recommended an upgrade to IHS, but this must be tested throughout each environment. As a temporary solution, the process that is hanging the CPU is 'killed' so that performance resumes normally. A schedule to upgrade the version of IHS will be presented. This upgrade must be executed and tested in each environment before it can be moved into production.</p>	<p>This problem was identified in FAFSA 6.0, so IBM provided the ITA team with the updated SSL GS kit 4.0.2.267. Once this update was added to the production environment, the problem was stopped in production. With this fix, the problem will not happen in production unless a server hits 100% CPU utilization.</p> <p>However, the problem has been duplicated in the performance test environment when a web server was pushed to 100% CPU utilization. As a result, IBM recently provided another fix that is being tested in the performance test environment. The ITA team is currently testing the new patch to see if it corrects the problem at 100% utilization.</p>	Low	Open	01/15/03