FSA Integration Partner

United States Department of Education

Federal Student Aid

EAI Production Architecture
Performance Report I

Task Order #117

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1 Introduction

1.1 Summary

The purpose of this report is to document the EAI Production Architecture Performance metrics for services performed in support of Task Order 117, EAI Release 4.0 during the period of September 27, 2002 through December 20, 2002.

Task Order 117 provides for operational support and maintenance of the EAI architecture and infrastructure. The EAI Core Operations personnel provide 24 hrs x 365 days a year support of the EAI Production Architecture. In the event of any EAI related production incident or alert, EAI Operations is engaged to troubleshoot and restore the operability of the system.

The EAI Production Architecture Performance Report is summarized in the following sections:

- ***Section 2:*** *EAI Architecture Availability* - Provides a summary of the EAI Production Architecture availability and major support events.
- ***Section 3:*** *EAI Operations Support Summary* – Provides a summary of support pages and file transfer failures addressed.
- ***Appendix A:*** *EAI Issues Summary* - Documents the EAI Operations related issues that opened or closed during the reporting period.
- ***Appendix B:*** *EAI Operations Metrics – October 2002*
- ***Appendix C:*** *EAI Operations Metrics – November 2002*
- ***Appendix D:*** *EAI Operations Metrics – December 2002*
- ***Appendix E:*** *Software Installation Report* – Documents the software installed in the EAI environments.
- ***Appendix F:*** *EAI Architecture Availability Summary* – Documents the availability for the EAI Architecture components.

2 EAI Production Architecture Availability

The availability, or up time, of the EAI Production Architecture is a high level metric used to determine the overall health and stability of the architecture. The EAI Team works in conjunction with its data center counterparts to ensure the highest availability possible outside the normal, defined server maintenance windows.

2.1 Availability

The EAI Team operates with the informal availability target of 100%. This represents the ideal availability.

To provide a more accurate picture of the EAI Architecture availability, it is necessary to calculate the availability for each component (i.e., application interface, EAI server). This compared to a cumulative availability of all components in which the availability metric would not represent the accurate up time if applied to all components.

The key inputs for calculating the interface availability are based on:

- *FSA Server Maintenance Schedule*
- *Root Cause Analysis (RCA) documentation* - A RCA document is created for each major system event or outage and is the result of a System Restoration Team (SRT) being assembled by a Virtual Data Center (VDC) Availability manager in response to a Production outage or issue. Detailed information pertaining to each outage or issue is contained within each of these documents including total time of the outage or degradation of service.

2.1.1 Calculation

The architecture availability for each component is a simple calculation using the following variables:

$Total_H$ - Total Number of hours in Period
$Total_{MW}$ - Total Number of Scheduled Maintenance Window hours in Period
$Total_O$ - Total Number of Outage hours in Period

The calculation is a follows:

$$\frac{(Total_H - Total_{MW}) - Total_O}{(Total_H - Total_{MW})} * 100 = \% \text{ Availability}$$

To demonstrate the calculation, a sample interface availability is calculated for the period from September 27th through December 31st, with the cumulative, non-maintenance window outages equaling 5 hours.

E.g.

$$\frac{(2304 - 84) - 5}{(2304 - 84)} * 100 = 99.7 \% \text{ Availability}$$

The breakdown of each calculation for each variable:

- Total Number of hours ($Total_H$) in Period:

$Total_H$ = (Period End Date - Period Begin Date) * 24
= (12/31/02 - 9/27/02) * 24
= (96) * 24
$Total_H$ **= 2304 hours**

- Total Number of Scheduled Maintenance Window hours ($Total_{MW}$) in Period:

$Total_{MW}$ = Number of Sundays in Period * 6 hours
= 14 * 6
$Total_{MW}$ = **84 hours**

- Total Number of Outage hours ($Total_O$) in Period:

$Total_O$ = Sum of all outage hours
$Total_O$ = **5 hours**

2.1.2 Component Availability

The following table summarizes the EAI Production Architecture component availability.

Period = September 27, 2002 through December 31, 2002
$Total_H$ = **2304 hours**

Note: All application interfaces have a dependency on the EAI Bus and therefore any EAI Bus service outage impacts all components. The EAI Bus supports transport of transactional data and files between Trading Partner applications. The clustering of the EAI Bus servers allows fail over of all transactional data to the non-affected server. Due to software configuration constraints, file transfers are routed through either of the EAI Bus servers (SU35E3 or SU35E14). The Trading Partner application is configured to transfer files using either SU35E3 or SU35E14. There is no fail over to the other server in the event of a MQ Series outage. If a server experiences an outage, all Trading Partner file transfers configured for that affected server will be queued up until the issue is resolved. Once restored, the messages will be transferred normally. Therefore, the availability of all components will be affected for the length of the service outage for SU35E3 or SU35E14.

Refer to ***Appendix F*** – *EAI Architecture Availability Summary* for a detailed summary of the availability of the architecture components.

2.2 Major Production Events

Production events are defined as system affecting occurrences ranging in severity from Degradation of Service to a Service Outage. The following tables summarize the major events encountered in the EAI Production Architecture for this reporting period.

Date	9/15/2002
RCA Description	TSYS is not able for transfer files
Interfaces Affected	COD
Level of Impact	Service Outage – All bulk file transfers via Data Integrator Degradation of Service - All real-time transactions automatically routed to clustered EAI server (SU35E14).
Length of event	4 hours 26 minutes

Date	10/14/2002
RCA Description	MQ Manager on LOWeb HPL13 did not start after scheduled reboot
Interfaces Affected	LO Web
Level of Impact	Service Outage – All transactions were queued up until the MQ Series queue manager was started properly.
Length of event	3 hours 57 minutes

Date	11/6/2002
RCA Description	MQ Series was down on EAI server SU35E14.
Interfaces Affected	N/A
Level of Impact	Degradation of Service. All transactions automatically routed to clustered server (SU35E3).
Length of event	1 hour 18 minutes

Date	11/22/2002
RCA Description	HPV2 Failure and Failed over to HPV1
Interfaces Affected	FMS
Level of Impact	Service Outage - Service Guard configuration did not restore the FMS Adapter. The interface was restored once the server was recovered to HPV2. Outage lasted from Friday to Sunday. Minimal message traffic impacted.
Length of event	55 hours

Date	11/28/2002 (Thanksgiving)
RCA Description	MQSeries on SU35E3 hung
Interfaces Affected	N/A
Level of Impact	Service Outage - Some bulk file transfers via Data Integrator were queued until MQ Series was restarted. Minimal message traffic queued due to holiday. Degradation of Service - All real-time transactions automatically routed to clustered EAI server (SU35E14).
Length of event	9 hours

Date	12/5/2002
Description	MQ Series Hung on SU35E14
Interfaces Affected	N/A
Level of Impact	Service Outage – Some bulk file transfers via Data Integrator were queued until MQ Series was restarted. No data in queues Degradation of Service. All transactions automatically routed to clustered server (SU35E3).
Length of event	2 hours

Date	12/14/2002
RCA Description	MQSeries on SU35E3 hung
Interfaces Affected	N/A
Level of Impact	Service Outage – Some bulk file transfers via Data Integrator were queued until MQ Series was restarted. No data in queues Degradation of Service - All real-time transactions automatically routed to clustered EAI server (SU35E14).
Length of event	1 hour 57 minutes

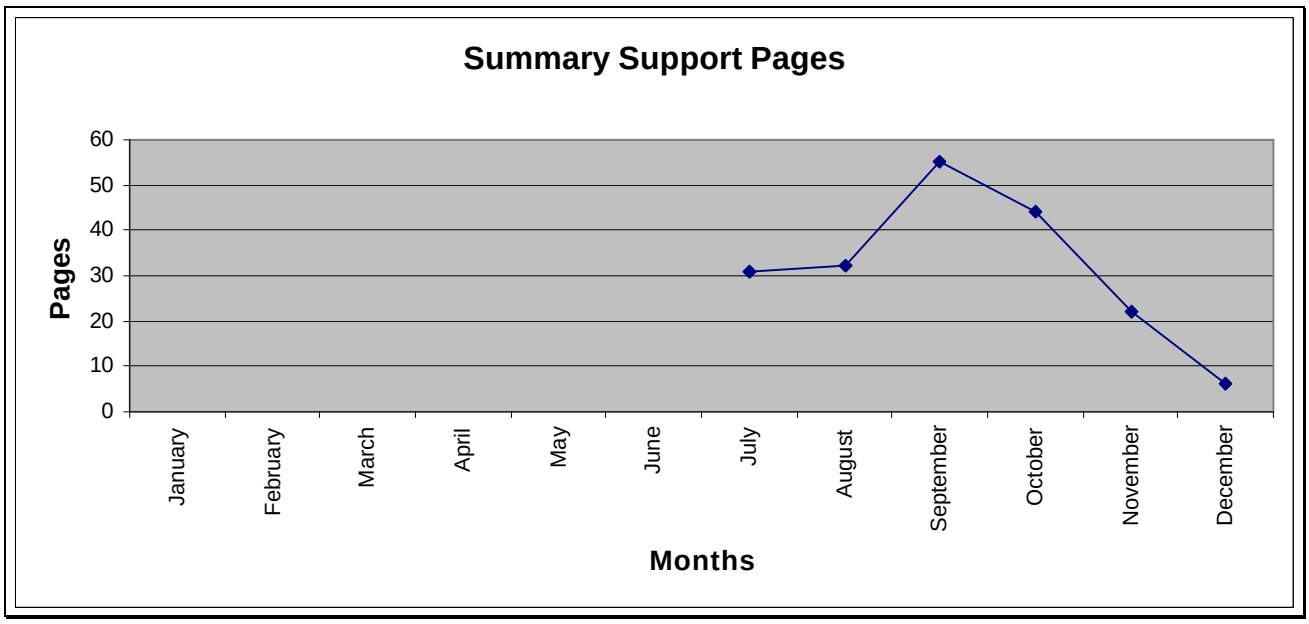
Date	12/20/2002
RCA Description	Disk failure on SU35E14 caused server to panic
Interfaces Affected	N/A
Level of Impact	Service Outage – Some bulk file transfers via Data Integrator were queued until MQ Series was restarted. No data in queues Degradation of Service - All real-time transactions automatically routed to clustered EAI server (SU35E14).
Length of event	10 hour 42 minutes

3 Support Summary

The EAI team provides support that can be categorized in three general areas: Production support pages, file transfer failure inquiries, and ad hoc message delivery research or confirmation requests. Daily metrics are currently collected for the support pages and file transfer failure requests, as this constitutes the greater percentage of the support requests.

3.1 Support Pages

The following chart summarizes the support pages for this reporting period. Since September, the number of support pages has steadily decreased and is on a downward trend. This is the expected trend as the EAI Production Architecture matures and interface anomalies are identified. As new application interfaces and releases are introduced to the Production environment, the expected number of support pages is anticipated to increase until the interface or release matures. FAFSA 7.0 was released to production on January 1, 2003 and as a result the number of FAFSA related support pages is expected to increase in January and February 2003.



To provide greater insight to the areas of the architecture that have recurring errors or problems, we have implemented a mechanism to provide detailed MQ Series metrics. The MQ Series monitoring software (MQMON) sends an email for every MQ Series alert to the EAI Operations Support mailbox. The alert information contained in the email will enable more detailed analysis of pages (i.e., page time distributions, alerts by Queue Manager, alert type breakdown, etc). Unfortunately, these are not available for this reporting period, but will be incorporated in the next report - EAI Production Architecture Performance Report II.

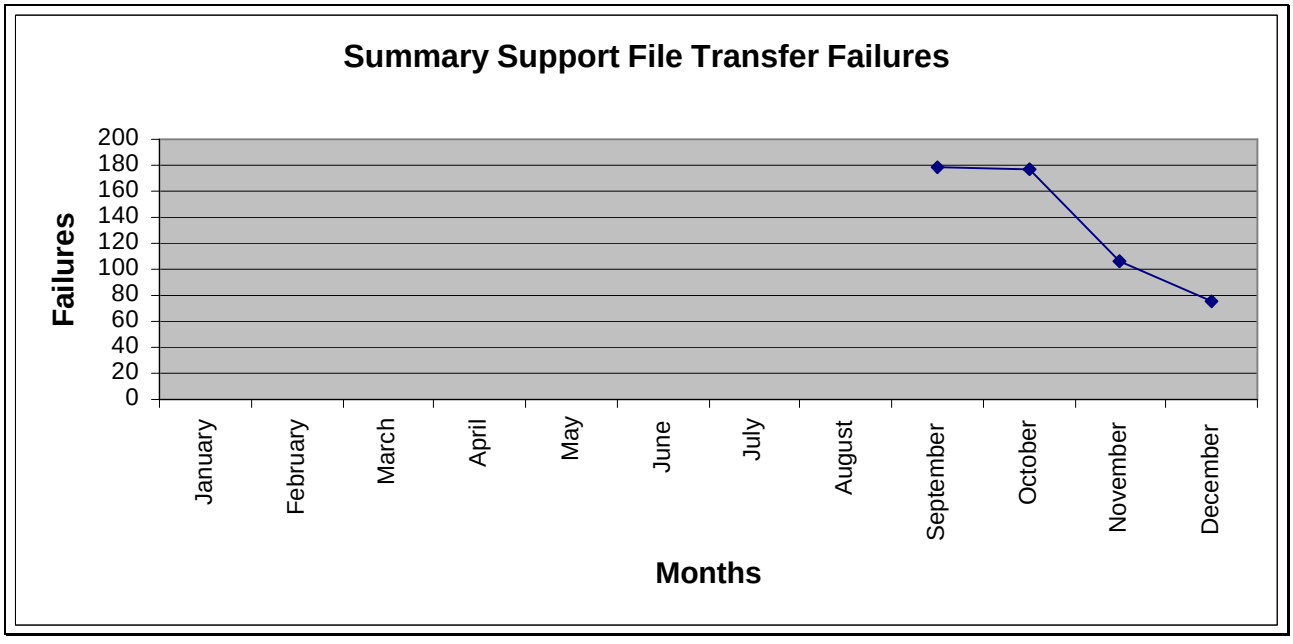
3.1.1 Pager Response Time

The EAI Team target for pager response is immediate. Upon a page or call for a Production support issue, the EAI team currently responds immediately to all support pages and calls.

The collection of pager response times is a metric that was defined for this report before a mechanism was implemented to record and track these times. Therefore no metrics are available for this period. The EAI team is implementing a process to use the time stamps from forwarded pager messages to the EAI Operations Support mailbox. Comparisons of the page timestamp to that of the email will be used derive pager response times. This metric data and will be included in the next report - EAI Production Architecture Performance Report II.

3.2 File Transfer Failures

The bulk of the application interfaces consist of file transfers over Data Integrator. As expected, there are file transfers that occur. The EAI Team provides the research and analysis into the cause of the file transfer failures. Frequently the files are not in the correct format or layout. This root cause information is communicated to Customer Service or the requestor so that the file maybe fixed and re-sent. In addition the team provides support for file resend requests.



3.3 Adhoc Requests

The EAI Team provides support for adhoc requests. These requests vary in complexity from the simple status or configuration questions to creation of environments and extracurricular testing support. Due to the varied nature, frequency, and source (email, phone, verbal) of the requests, a mechanism has not been implemented to track the time spent on these types of requests, therefore no metrics are available. We will look into a process to collect adhoc request data for the next report - EAI Production Architecture Performance Report II.