FEDERAL STUDENT AID

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EAI Implementation Workshop
Appendices

14 May, 2002
1:30-4:00 PM
Room 221 BC
Dial-In: (877) 714-4281
Meeting ID: 4057

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Agenda

Part I: Overview of EAI & Intro To EAI Concepts

- Overview of EAI
- Intro to EAI Concepts
- Break

Part II: Products & Architecture

- Products
- Overview of the EAI Architecture
- Questions & Answers

Appendices

Appendices

Appendix A

-MQSeries Scenerios

Appendix B

-Building an Interface

Appendix C

-Training Resources

Appendix D

-Security

Appendix E

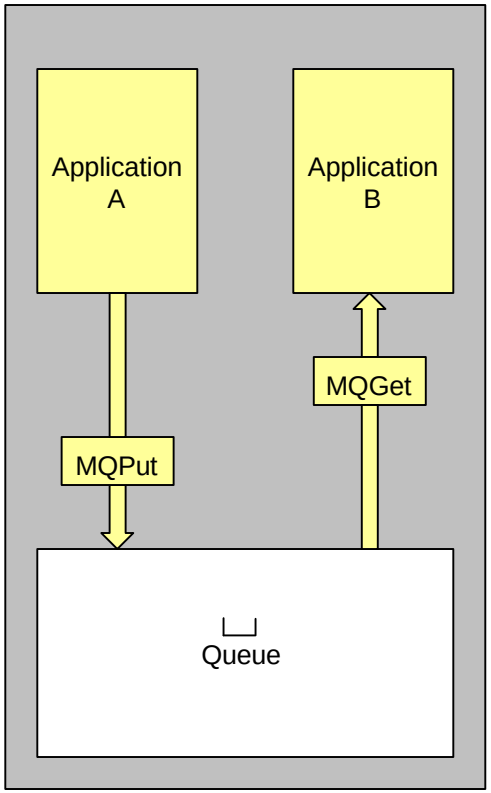
-Performance Test Results

Appendix A: MQSeries Scenerios

1 - MQSeries Communicates Through Queues

Note:

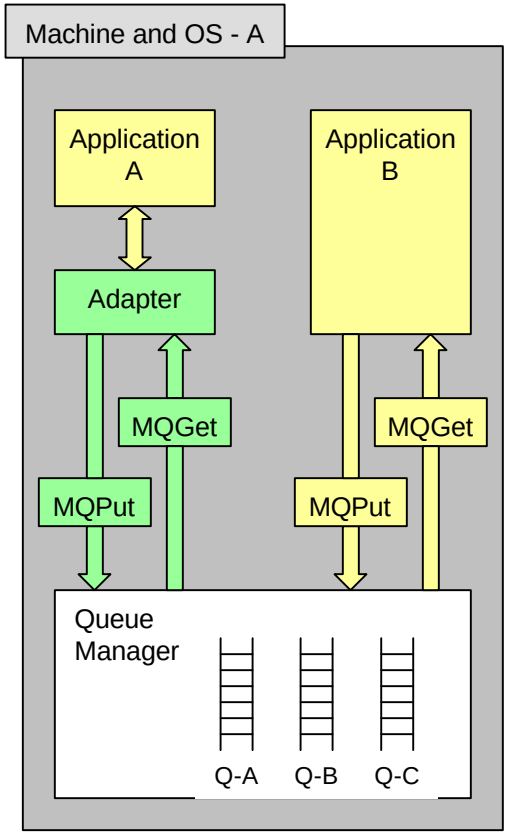
Slides #4-8 illustrate EAI concepts. Slide #4 shows an oversimplified relationship between two applications. Slides #5-8 incrementally become more complex to illustrate how messaging works.



Concepts:

- **Communicate through a Queue**
- **Decouples the Applications**
- **Applications use Puts and Gets**

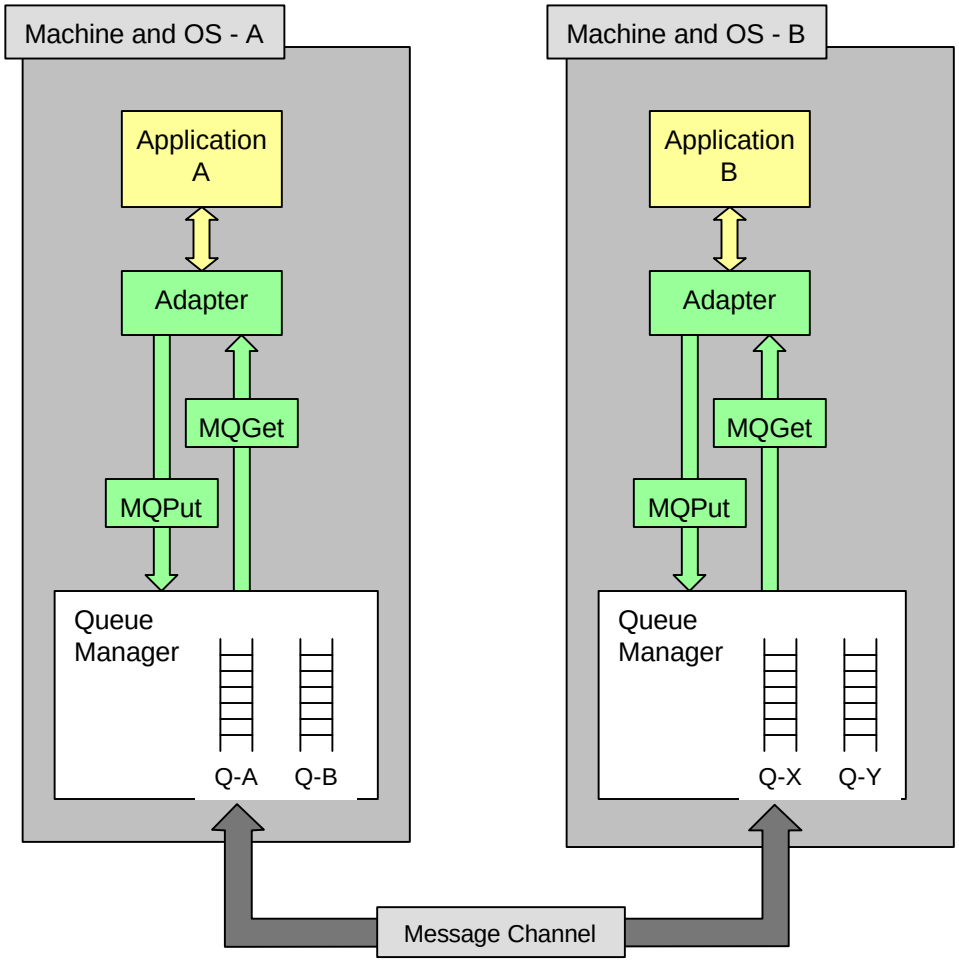
2 - Queue Managers and Adapters



Concepts:

- **Adapters for COTS Software**
- **Queue Manager**
- **Gets and Puts go both ways**

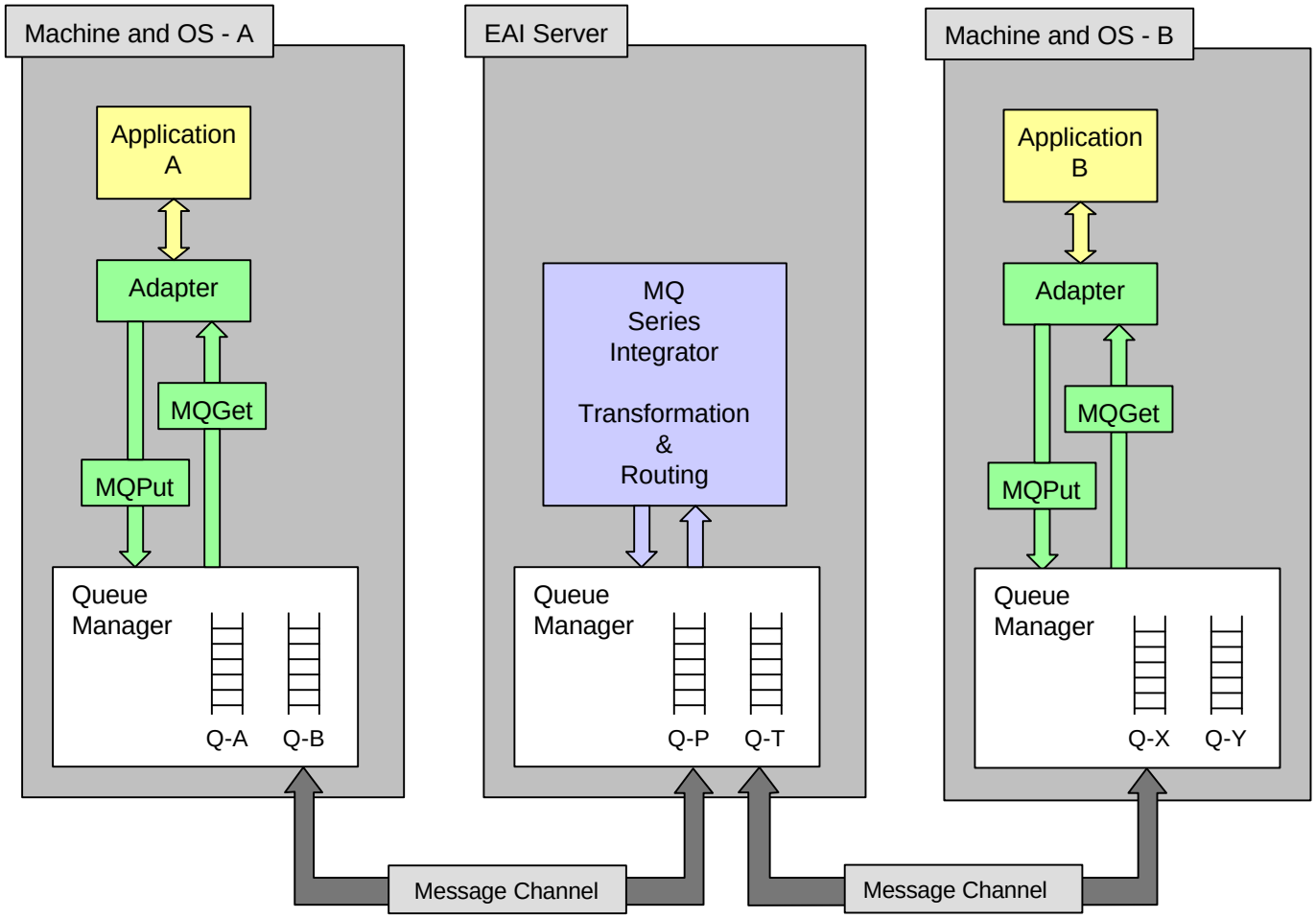
3 - The Queues can be on Different Machines



Concepts:

- **Different Physical Machines**
- **Different Machine Architectures**

4 - An EAI Bus Server Provides a Hub

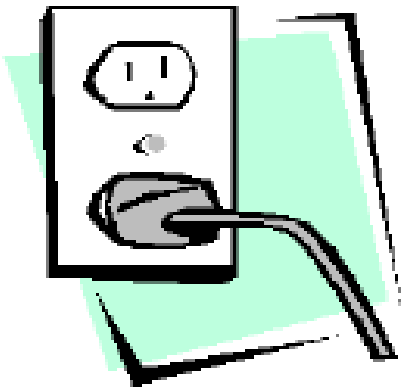


Concepts:

- **Central Communications Point**
- **Routing and Transformation**

Appendix B: Building an Interface

Building an EAI Interface



- **EAI provides services to application teams.**
- **The EAI Core Team implements the EAI products on the target system platforms and validates the ability to process system functionality.**
- **Application development teams plug into these services and develop application interfaces.**

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Services provided to Application teams by EAI Core Support are comprehensive. They include:

EAI Core Services Support

Business Integration Design

- How can applications integrate with the Enterprise Solution?
- What are Application/ Trading Partner business needs?
- If data transformation is necessary, what are Application/ Trading Partner data specifications?

Architecture Design

- Determine application needs: Online &/or Batch
- Assess application needs
- Propose EAI Solution

System Installation/ Admin

- Install EAI Products
- Configure EAI Products
- Administer EAI products

Interface Development

- Install MQ SW
- Configure MQ SW & Verify
- Build Application Interfaces with or without application team assistance
- SME support during application testing

Performance Testing

- Measure message response time
- Analyze Data Through-put rates

Operations Support and Maintenance

- EAI SME Support
- EAI Architect ure Upgrades /Patches

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Building an EAI Interface Is a Joint Effort

Task	*EAI Team Responsibility*	*Application Team Responsibility*
Identify target machine	Support	Primary
Assess Target Machine (HW Capacity, OS Versions, etc.)	Primary	Primary
Install MQ Software (MQ Series, Data Integrator, MQMon)	Primary	Support
Configure MQ Software and Verify (May include building an interface for test purposes)	Primary	Support
Identify Application Interface Functions (Define functional requirements, formats, layouts, Prepare Interface Control Document)	Support	Primary
Build Application Interfaces	Support	Primary
Test Interfaces	Support	Primary
Migrate Into Production	Primary for Infrastructure	Primary for Application Interface

Two types of costs are involved in building an interface: Development, and Operations & Maintenance.

	Development		Operations & Maintenance	
What is it for?	MQ Capability	Application Interface	System Operations and Maintenance	EAI Maintenance
Who will perform the work?	Core Team	Core Team & Application Team	VDC	Core Team
Who will bear the cost?	CIO	Dev App Team	Business Channel (Allocated by usage assessments)	

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EAI Key Points of Contact:

System/Initiative	EAI HPT Lead
▪ eServicing ▪ DMCS Replacement ▪ CSID & PEPS Replacement, ▪ Financial Partners Data Mart ▪ FARS Retirement ▪ Enterprise Data Warehouse ▪ NSLDS Re-engineering	Eric Suzuki Eric.N.Suzuki@accenture.com (202) 962-0743
▪ e-Campus Based ▪ FAFSA on the Web ▪ SFA Portal ▪ Single Sign On & Security	Julian Ackert Julian.Ackert@accenture.com (202) 962-0734
▪ Consistent Answers ▪ Business Integration	Bruce Kingsley Bruce.Kingsley@accenture.com (202) 962-0793
▪ FMS	Lauren Brett lgbrett@rsgltd.com (202) 962-0733
▪ LO Web	Barnet Malkin barnet@bitsmart.com (202) 962-0645
▪ COD	Scott Gray sgray@rsgltd.com (202) 962-0795

Appendix C: Training Resources

Training

Main resource for introductory information on MQ Series

http://www-3.ibm.com/software/ts/mqseries/

Listing of Educational centers offering MQ Series Courses in the Washington, DC area:

http://www-3.ibm.com/services/learning/lsweb/educationcenters/southern.html

Listing of all MQ Series courses:

http://www-3.ibm.com/servlet/com.ibm.ls.lsow.servlets.SearchByChapterServlet?CATALOG_ID=6&CHAPTER_ID=31

CDROM courses that would give a developer a good understanding of MQ Series

MQSeries Technical Intro (MQ82C)

MQSeries System Administration (MQ84C)

MQSeries Java Programming - Basic (MQ85C)

Developer Forum for MQ Series

http://www.mqseries.net

http://www.messageq.com/forums

Appendix D: Security

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EAI Security Context

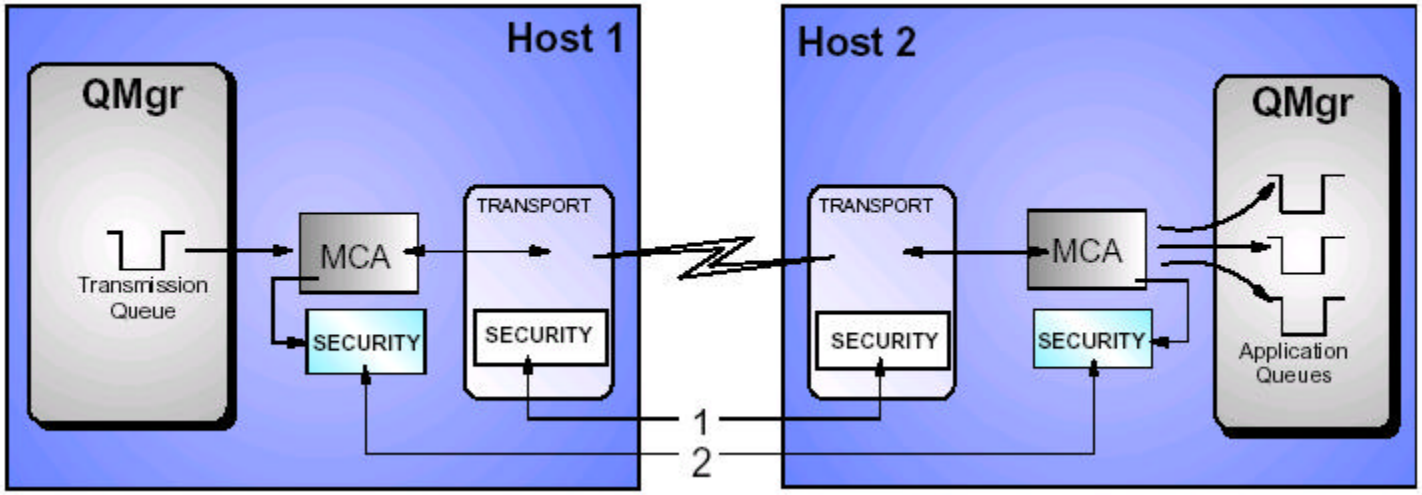
EAI Operates within the context of the FSA Infrastructure supporting FSA Applications

Layer	Example	Developer Access	Application User Access	Physical Access
Application Software supporting a business function	COD, CPS, DLSS, DLCS, DMCS, NSLDS, PEPS	Limited Group of Developers through FSA Security Officer	UserID Controlled by FSA Security Officer	Controlled Access to Developer Facilities
EAI Architecture Common Capabilities used by Applications	IBM MQSeries, MQ System Integrator, Data Integrator	Limited Group of Developers through FSA EAI Security Officer	Queue Manager to Queue Manager through Applications	Via Physical Network Controlled by VDC
Infrastructure Platforms for Architecture and Applications	Servers, O/S, Network, Routers, Firewall	Physical Access Required	Limited Production Access via Applications	Port Restrictions, Firewalls, Router Encryption

EAI Security needs to addresses the two areas of 1) Developer Access, and 2) Access of Queue Mangers to Other Queue Managers

Queue Manager Access Control

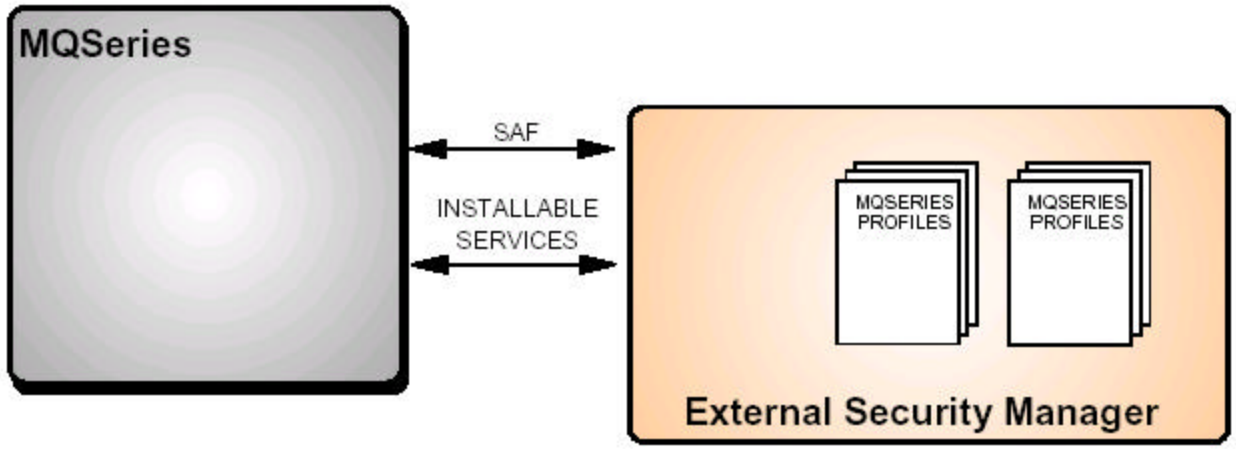
Message Channel Agents Ensure Queue Managers are on Expected Servers



- MQSeries Message Channel Agent (MCA) enables the authentication process to be carried out
- MCA will accept data from authorized servers only (based on ACL-Access Control list

MQSeries Developer Access Control

Developer Access is Controlled through Normal Access Procedures



Complete access control facilities for MQSeries using external security manager:

- FSA Access control is configured at the “group” level on Unix platforms
- FSA Access control is configured at the MQ object level on OS/390

Appendix E: Performance Test Results

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EAI - FMS Performance Test Results

Interface	Objective	Test	Results
FMS - COD	Measure the rate at which the EAI Bus handles FMS - COD Transactions	370 transactions were monitored from their availability on the Bus until they were committed to the FMS database.	Transactions where available to FMS in 166 seconds. (2 messages per second)
		278 transactions were monitored from the time they are available in the FMS database until they land on a queue destined for COD	Transactions where available to be sent to COD in 84 seconds. (3 messages per second)
eCB - FMS	Measure the rate at which the interface processes eCB UTCL file	A UTCL file with 1945 detailed records was monitored from it's availability on the Bus until it was committed to the FMS database.	File was available to FMS in 22 minutes. (1.5 records per second)
		A UTCL file with 325 detailed records was monitored from it's availability on the Bus until it was committed to the FMS database.	File was available to FMS in 3 minutes (1.8 records per second)

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EAI Performance Test Results

Interface	Objective	Test	Results
PEPS - EAI	Measure time to transfer School File (127 MB) from PEPS to EAI Bus	Transfer file using FTP	Transfer took 2 hrs, 21 min, 28 sec
		Transfer file using EAI	Transfer took 6 min, 10 sec
DLSS - CMDM	Measure the transfer rate of very large monthly demographic file from DLSS to CMDM	Transfer the file using FTP	Transfer took 13 hours
		Transfer the file using EAI	Transfer took 2.5 hours
P-Note Data from LOWEB	Measure the response time for a request for P-Note Data	Several thousand requests for P-Note data were made from the WebSphere server, through the EAI Bus Server, to the LOWEB Server.	Average response time was 1.2 sec
SAIG - COD	Assess SAIG ability to process 6,000 sends within one hour	Simulated 6,000 sends in a very short period of time	All transactions were processed within 30 minutes.

COD - XML File Conversion Performance

Test files of 20MB, 160MB and 500MB were processed to obtain an understanding of the performance characteristics of the processor as it operated on the BUS (Sun E3500, 4 4OO MHz processors, 4 GB RAM). Testing showed that there was no performance degradation of the processor as the file size grew.

The processor was able to convert a 20 MB file (4300-6500 transactions) in 60-90 seconds, (depending on file type). Results of the tests have been compared to average and max daily volume statistics to obtain an estimate of total processing time.

File Type	Average # of daily transactions	Average day processing time	Maximum # of daily transactions	Maximum day processing time
Output Common Record	200MB	10 min.	600MB	60 min
Legacy Pell Origination Ack.	30,000	7.5 min.	125,000	31.5 min.
Legacy Pell Disbursement. Ack.	45,000	10 min	175,000	38 min.
Legacy DL Origination Ack.	10,000	3 min.	50,000	15 min.
Legacy DL Disbursement Ack.	14,000	4 min.	115,000	33 min.
System Generated Responses	40,000	8 min.	175,000	32 min.

COD - File Transfer Performance

The tests were conducted from the host system of the trading partner, over MQ/DI, through the BUS. An average and a maximum file size is used, to obtain data on operation under average and heavy loads.

File Type	Frequency	Avg. File Size	Average Time	Max. File Size	Max Time
CPS Abbreviated Applicant File	1 time/day	16MB	10 sec.	50MB	30 sec.
CPS Pell Institution Universe	1 time/day	2.75MB	<5 sec.	2.75MB	<5 sec.
CPS Recipient Record	4 times/year	275MB	3 min.	1.165GB	12 min.
DLSS Daily Batch - Submit	1 time/day	7MB	<5 sec.	50MB	30 sec.
DLSS Daily Batch - Response	1 time/day	100MB	1 min.	200MB	2 min.
DLSS Disbursement Confirmation	1 time/week	24MB	15 sec.	50MB	30 sec.
NSLDS Pell Recipient Info	1 time/day	13.2MB	10 sec.	34MB	15 sec.
NSLDS Pell Recipient Info Response	1 time/day	0.23MB	5 sec.	0.62MB	5 sec.
PEPS Full Refresh Feed	As needed	70MB	40 sec.	100MB	1 min.
PEPS Processed Delta Feed	1 time/day	700KB	<5 sec.	100MB	1 min.
SAIG School Destination Info	1 time/day	10MB	<5 sec.	20MB	10 sec.
SAIG Reports	TBD	111MB	1 min.	2000MB	20 min.