



*“We Help  
Put America  
Through  
School”*

# **EAI Integration Workshop**

December 18, 2001

1:30-4:00 PM

Room 221 BC

Dial-In: ( 877) 714-2900

Meeting ID: 1025

# Agenda



**What is EAI?**

What are the benefits of EAI?

What products make up EAI?

How does MQSeries Work?

What is the EAI Architecture?

Sample EAI Interfaces

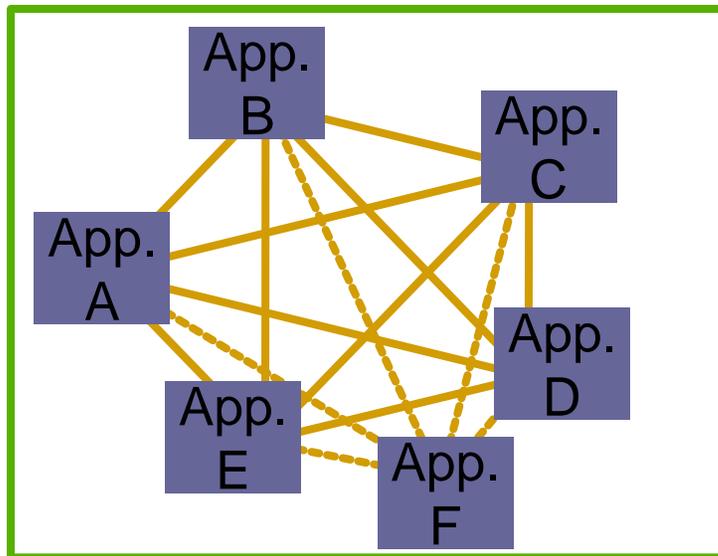
How do I build an EAI Interface?

How do I plan for EAI?

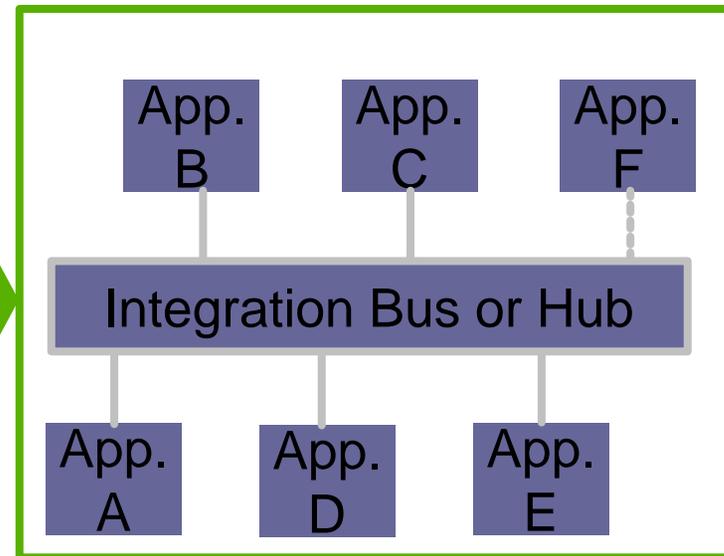
# EAI Enhances Tools and Technologies to Tie Applications Together.



## Custom, Point-to-Point



## Standard, Virtual Connections



**But in an improved, more flexible manner.**

## EAI is...



- The Enterprise Application Integration (EAI) system is part of the Enterprise Architecture for the SFA system as part of the Modernization Blueprint.
- EAI is a set of common technology services that enables the sharing of processes and data of disparate systems to support end-to-end business processes.
- The EAI architecture enables many “stovepipe” applications to exchange information via common, reusable methods and infrastructure.
- EAI provides the capability to integrate web-based applications, the Data Warehouse environment, COTS packages, and existing legacy systems within the SFA technical environment.

*Enterprise Application Integration is a set of technology services that enables the integration of disparate systems processes and data to support end-to-end business processes.*

# Several Technical Capabilities are Combined.



Area	Description	Product
Business Process Management	Business process-level integration & management	MQSeries Workflow
Application Connectivity	Pre-built adapters to packaged apps & custom adapter development kits	Adapters
Transformation & Formatting	Message & data transformation & formatting	MQSeries Integrator (MQSI)
Communications Middleware	Communications middleware & message routing	MQSeries

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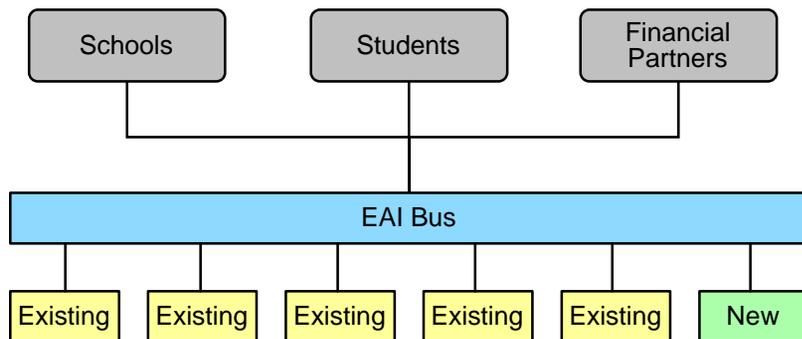
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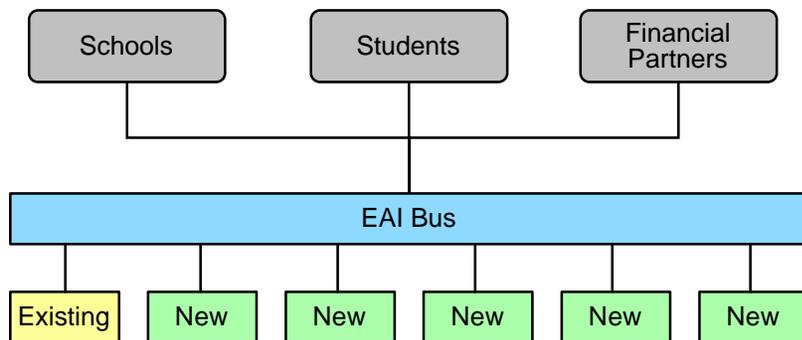


# SFA's Modernization Approach Alternatives

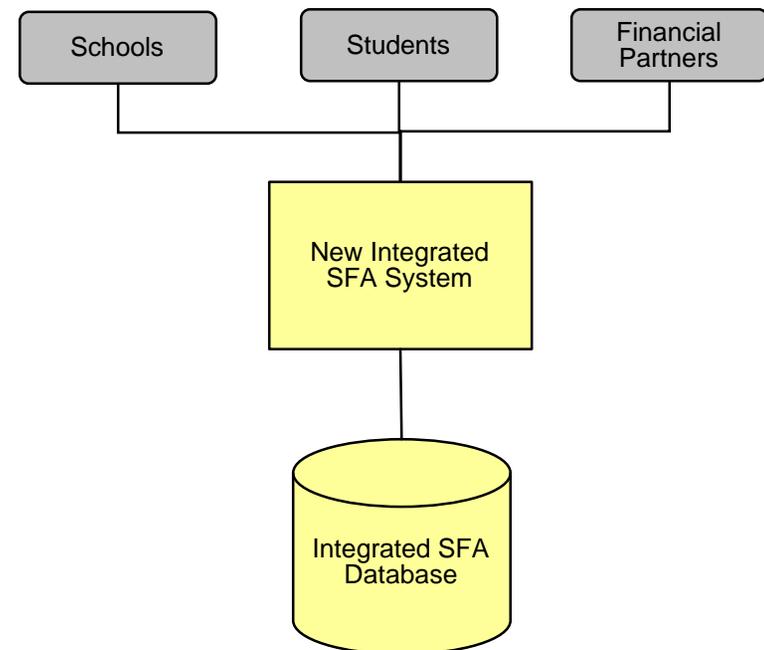
## Evolutionary Approach "Build a Little, Test a Little"



*Becomes*



## Monolithic Approach "Big Bang"



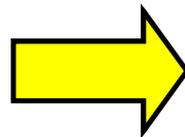
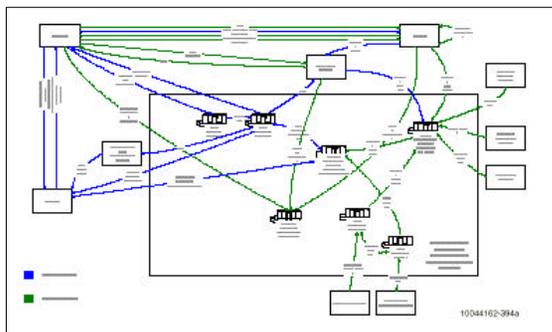


# Managing Many Interfaces

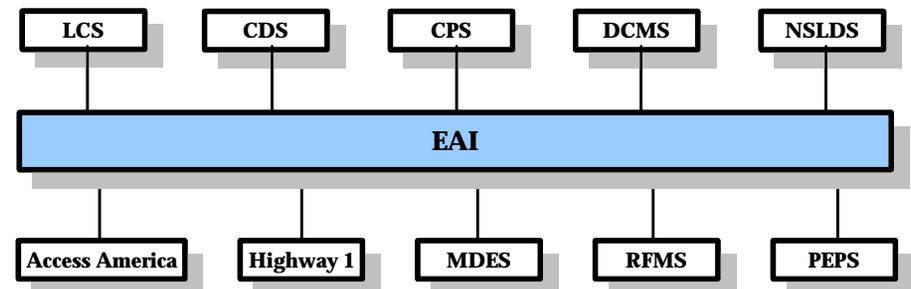
## Challenge:

Legacy systems hold valuable business functionality and data that cannot be easily updated or replaced with new technology. This information is currently housed in a number of “stovepipes” that currently interface with other systems through complex point-to-point interfaces.

**“As is”  
Existing Hairball**



**“To Be”  
Integrated Business Solutions**



# Benefits of EAI



- Integration development is cheaper
- Operating costs are lower
- Increased application development capacity
- Faster responsiveness to change
- Increased manageability and maintainability
- Improved access and distribution of information
- Visibility and control over transaction processing

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# The EAI Core Team installs, configures and administers selected EAI products.



Product	Service
<b>MQSeries</b>	Transport of messages between systems
<b>MQSI</b>	Transformation and formatting of messages between systems
<b>Data Integrator</b>	Large amount of data transportation
<b>AMI/JDK</b>	Transformation of data
<b>Other COTS EAI products</b>	Based on future needs.

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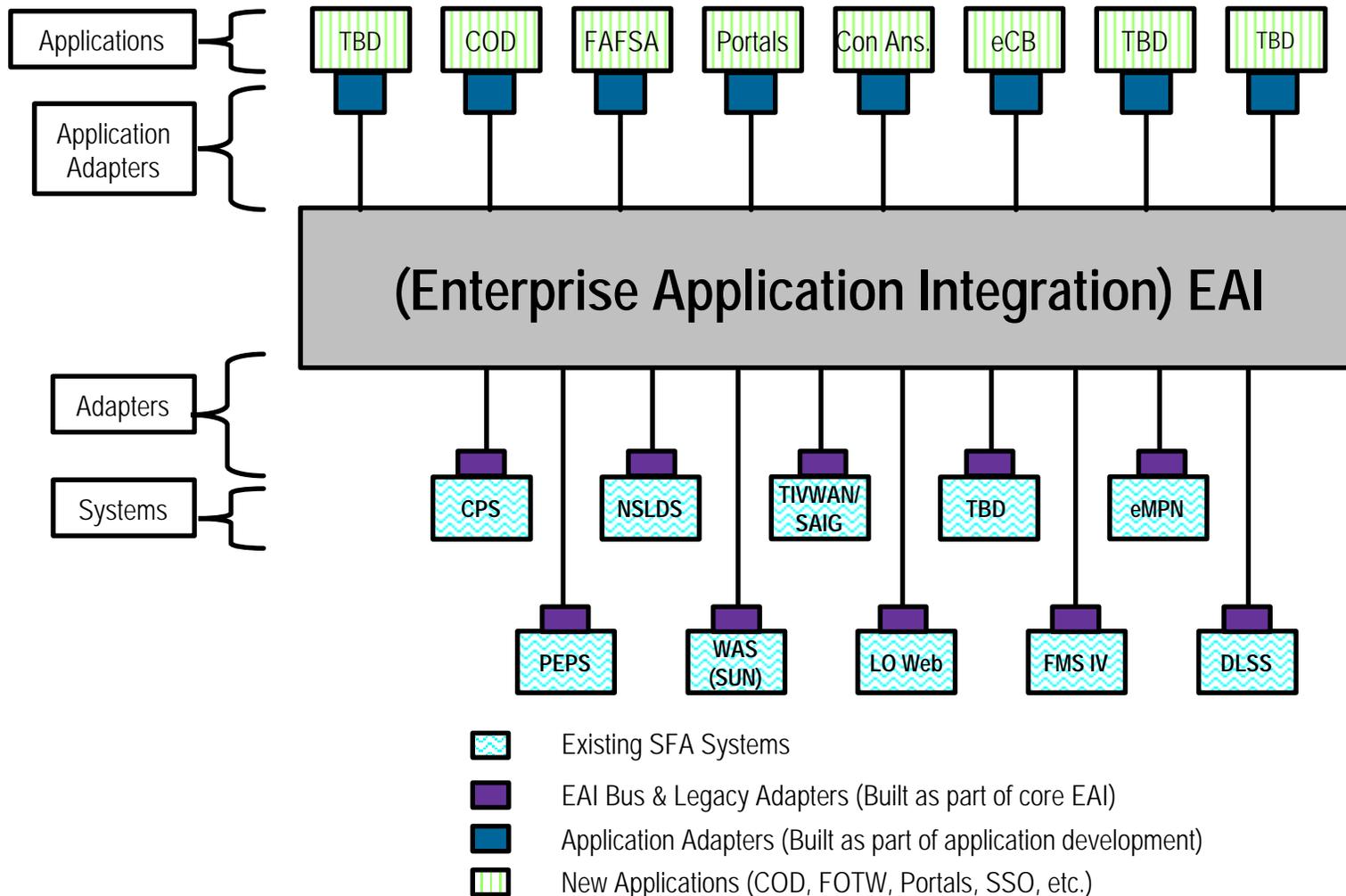
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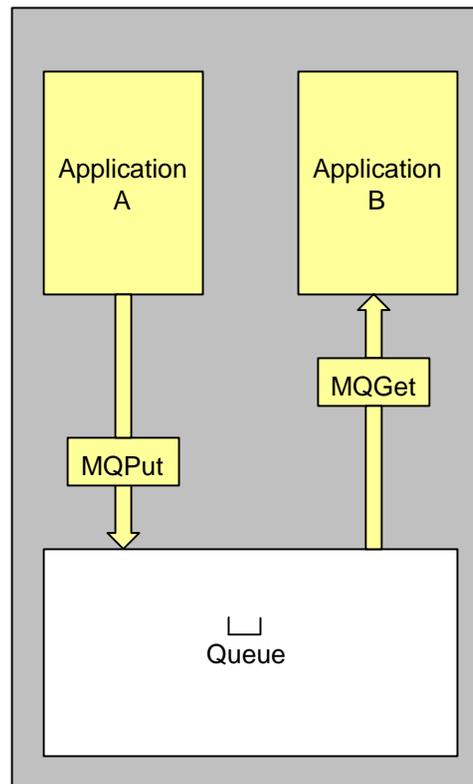


# Enterprise Application Integration Architecture





# 1 - MQSeries Communicates Through Queues

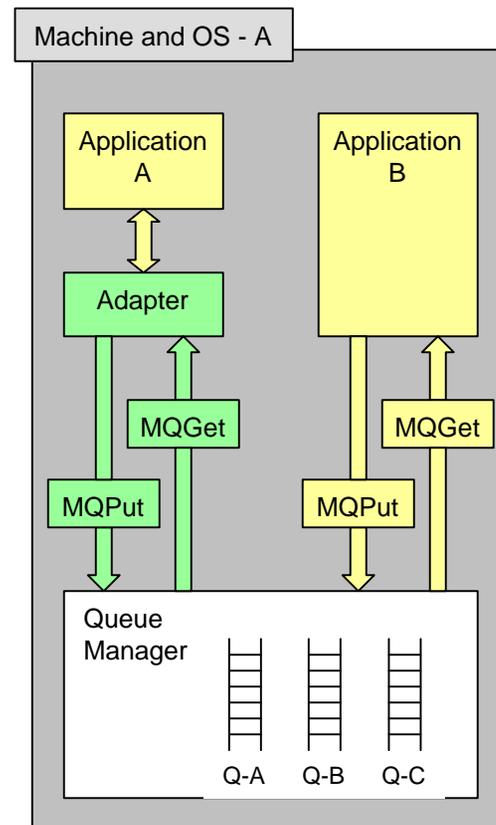


## Concepts:

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



## 2 - Queue Managers and Adapters

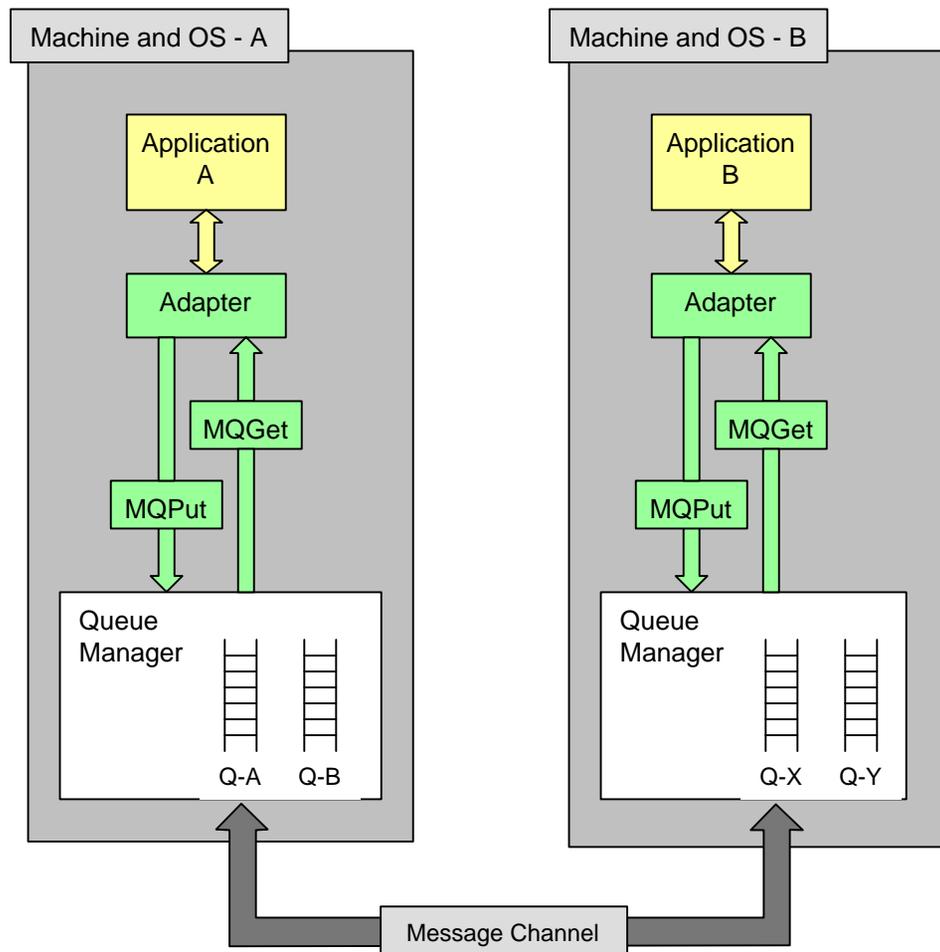


### Concepts:

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



### 3 - The Queues can be on Different Machines

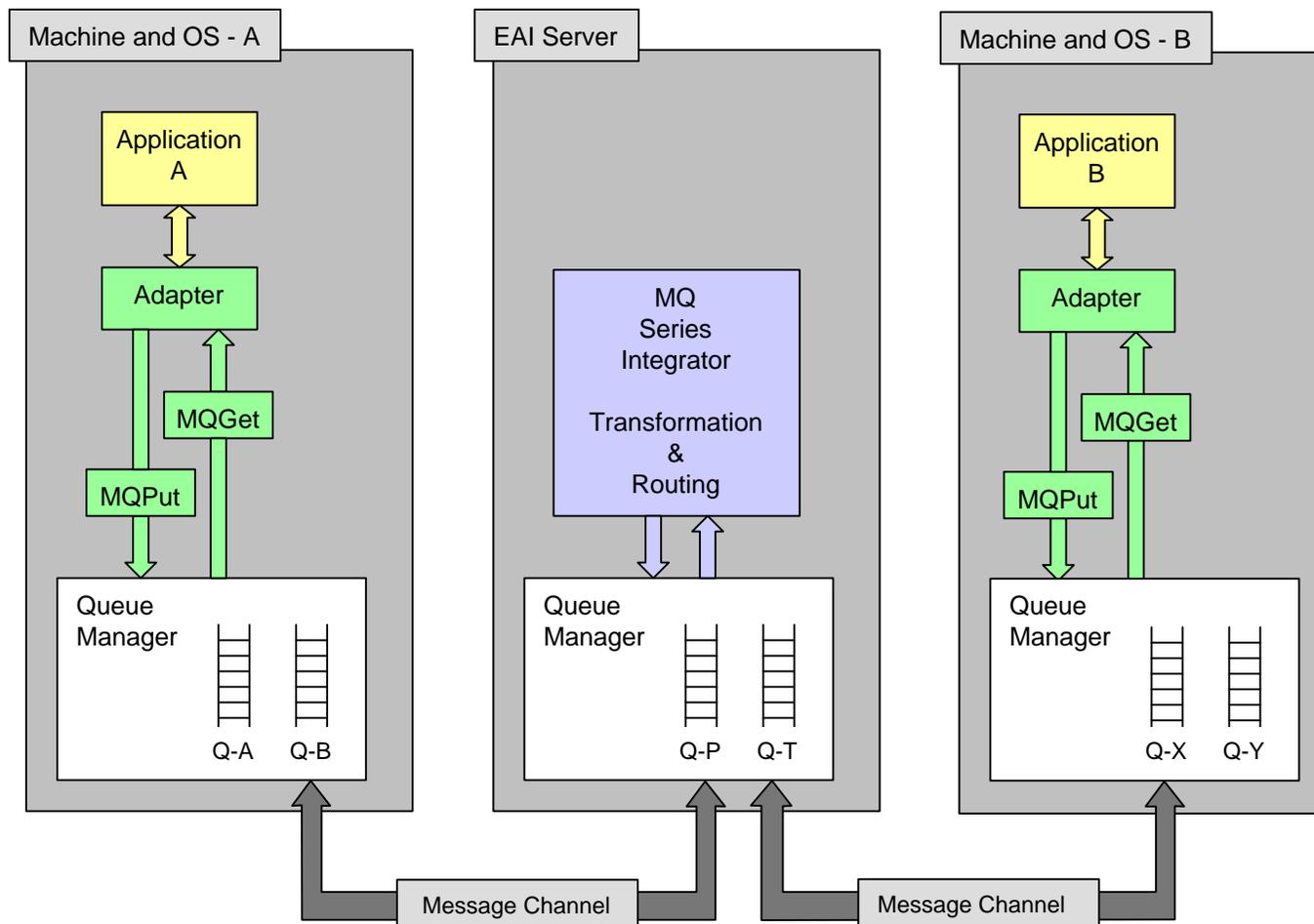


#### Concepts:

- Different Physical Machines
- Different Machine Architectures



# 4 - An EAI Bus Server Provides a Hub

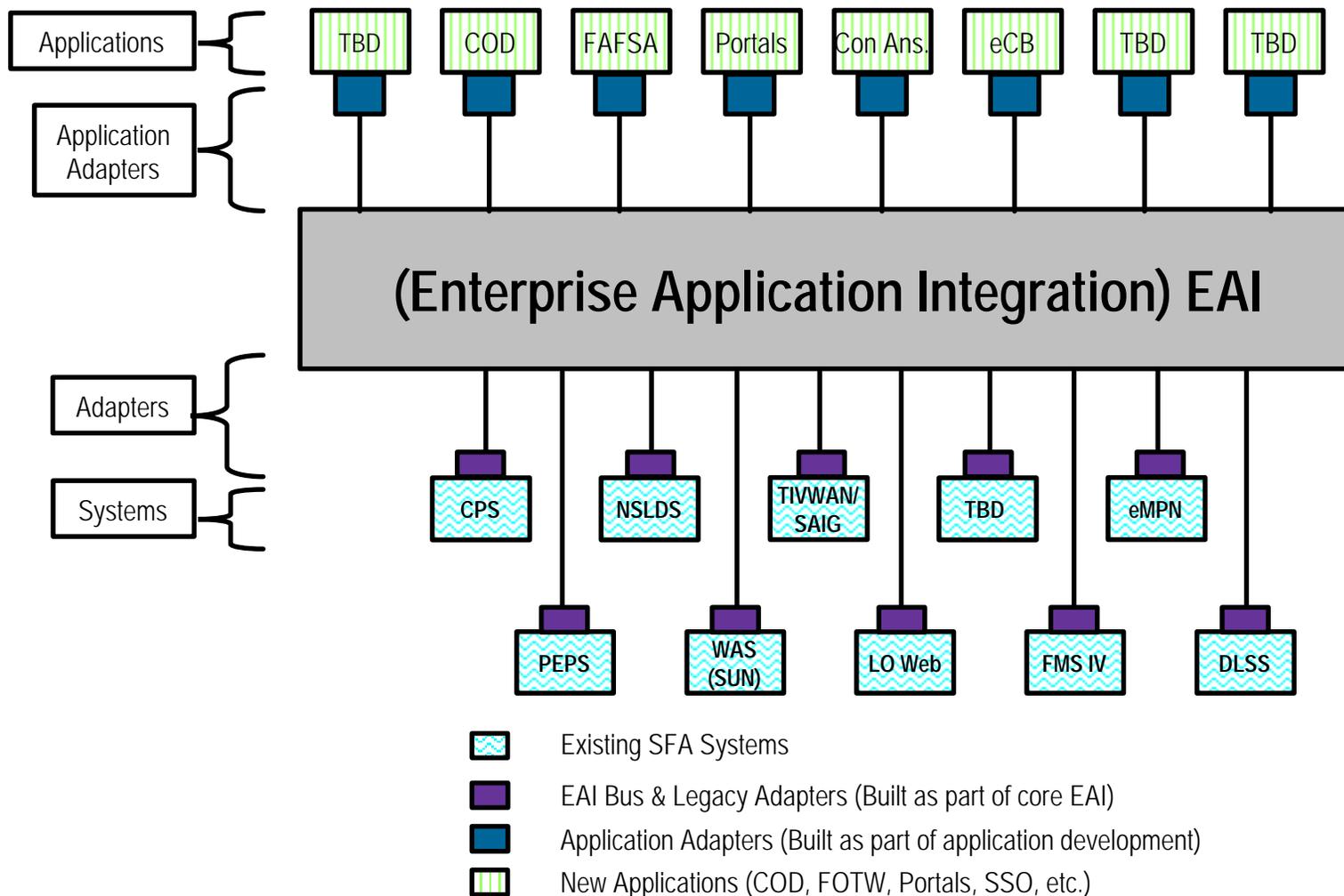


## Concepts:

- Central Communications Point
- Routing and Transformation



# Enterprise Application Integration Architecture



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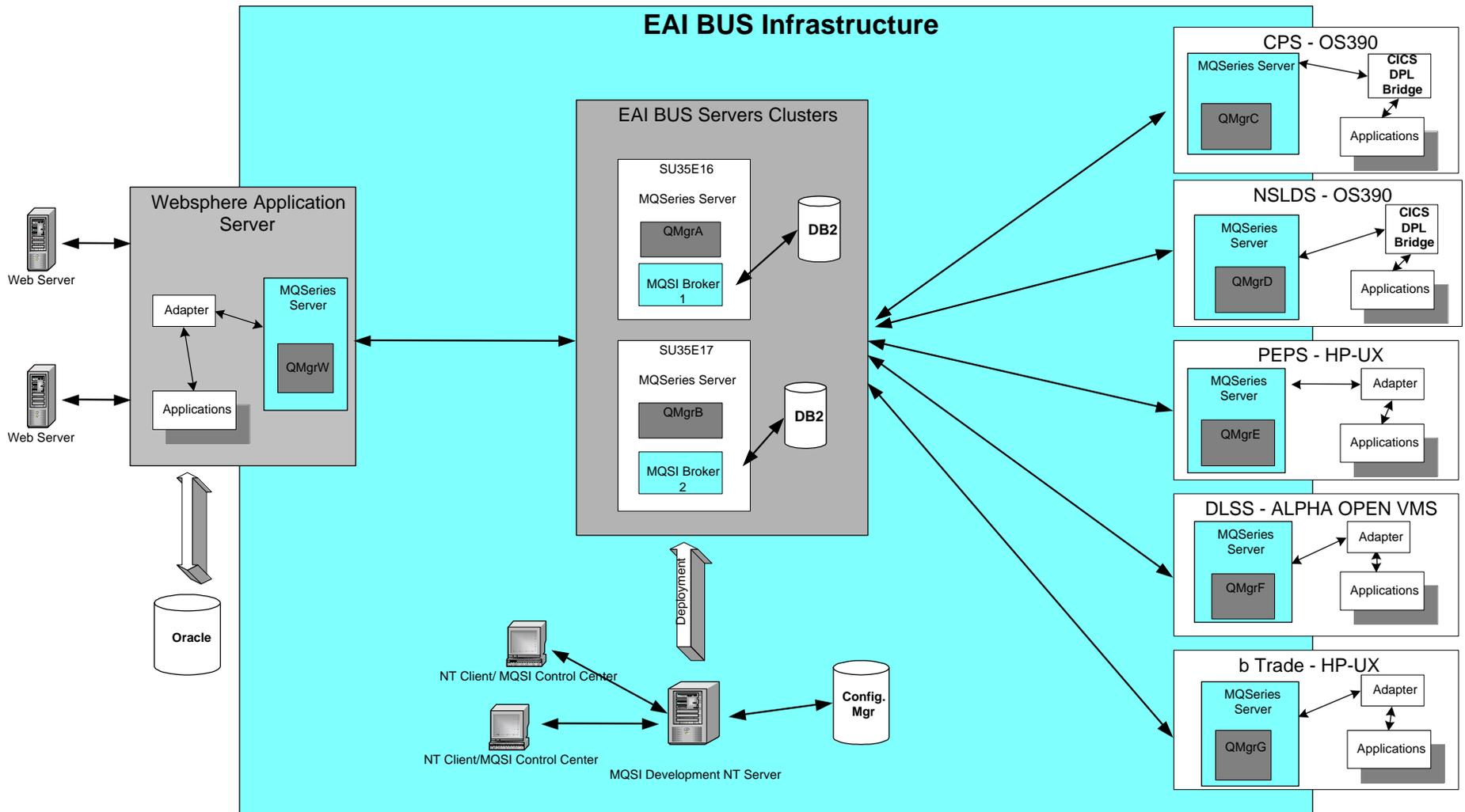
Sample EAI Interfaces

How do I build an EAI Interface?

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# Development Environment - EAI



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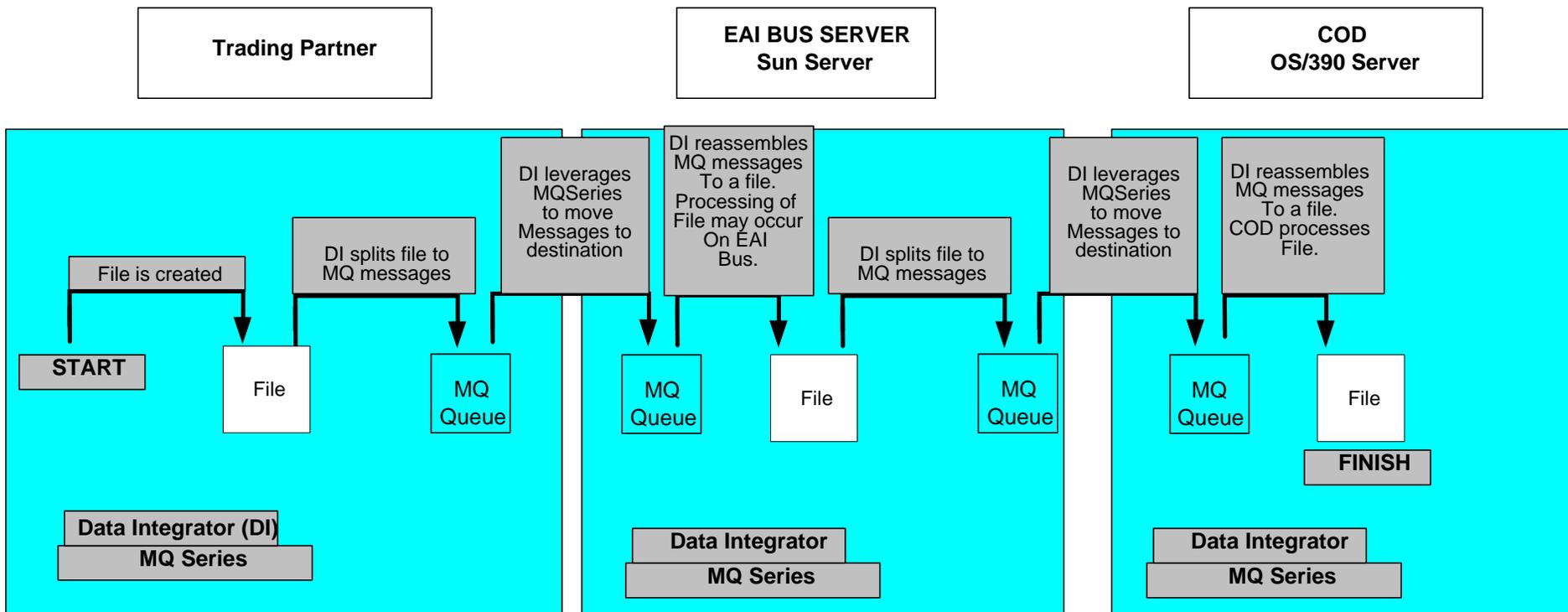
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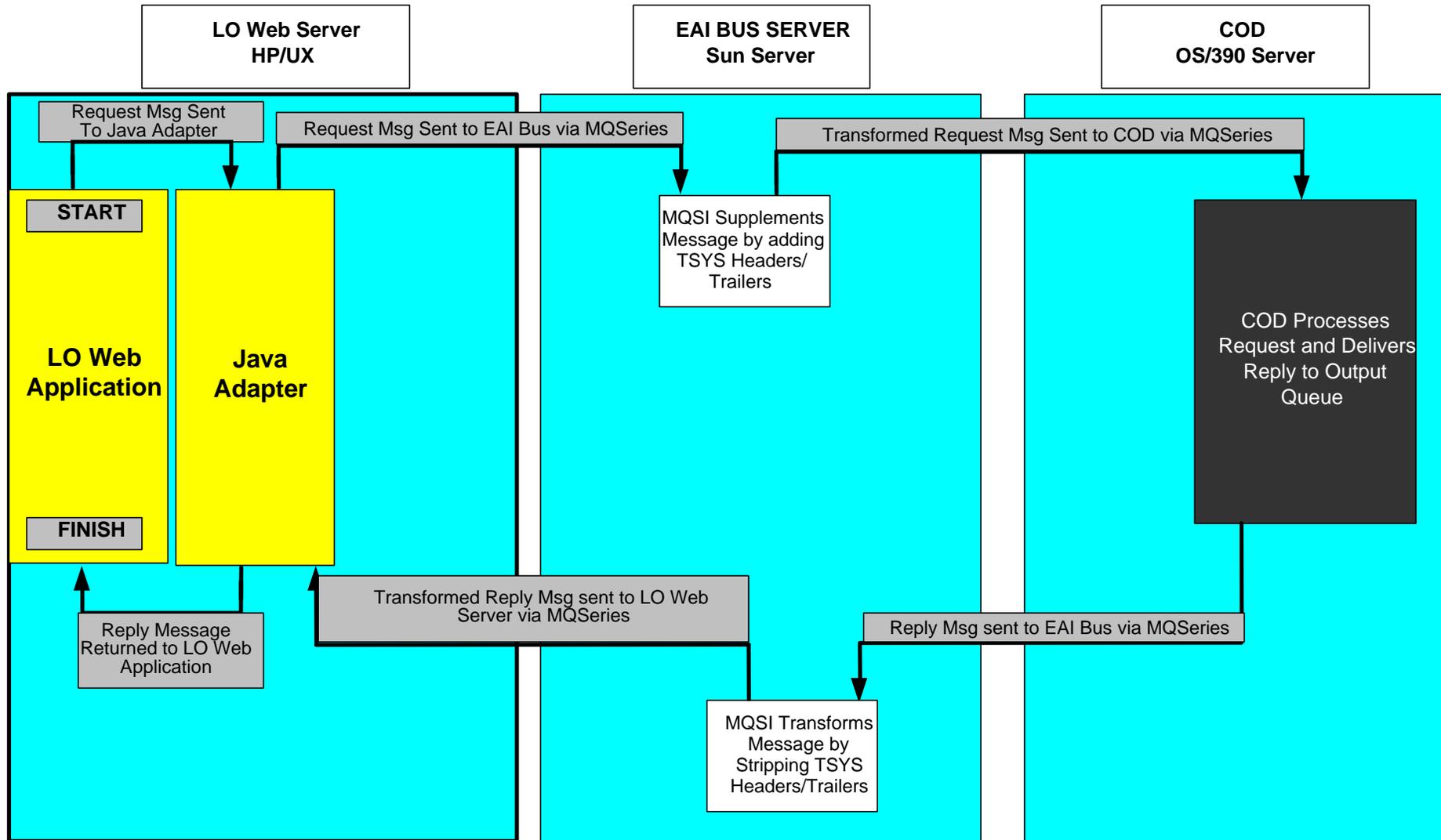
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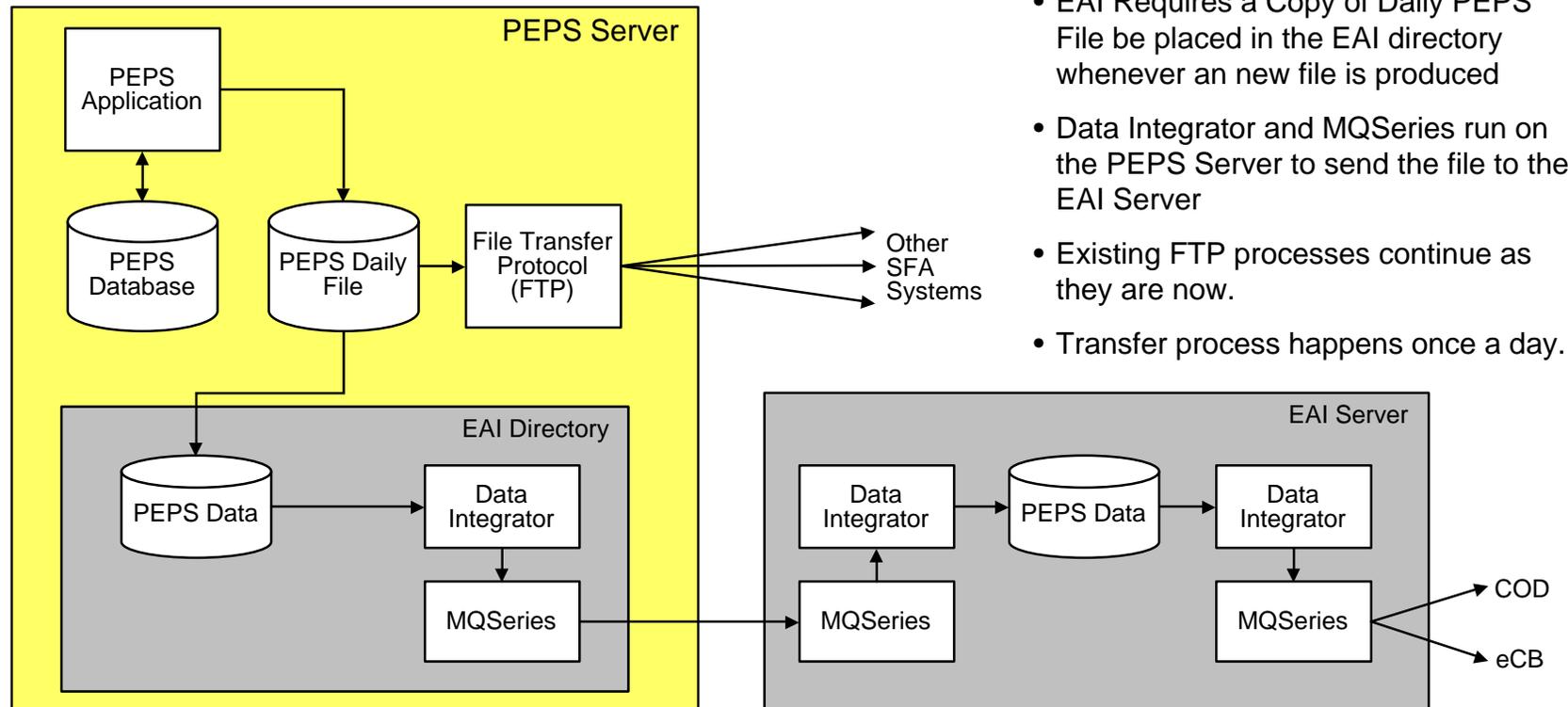
# Files are transferred from trading partners to COD through the services offered by the EAI architecture.



# Individual transactions are transported and transformed, if necessary, using the services provided by the EAI architecture.

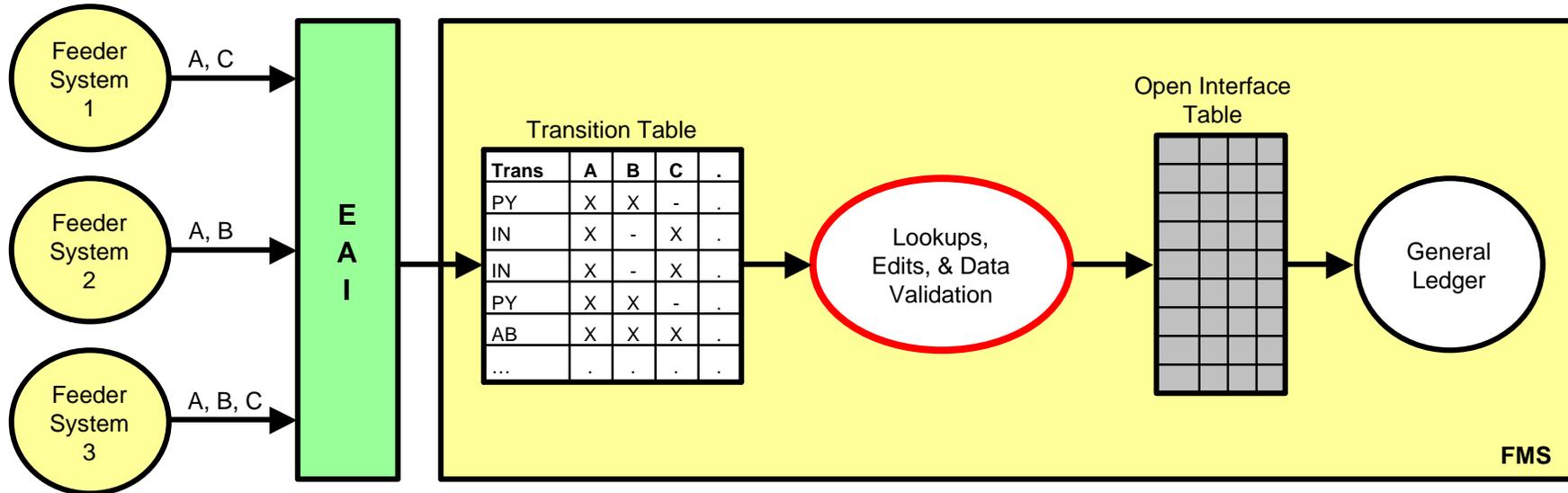


# The PEPS EAI Interface Minimizes the Impact on PEPS Resources



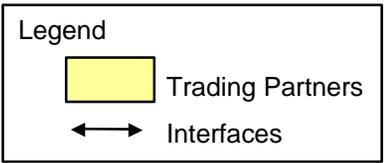
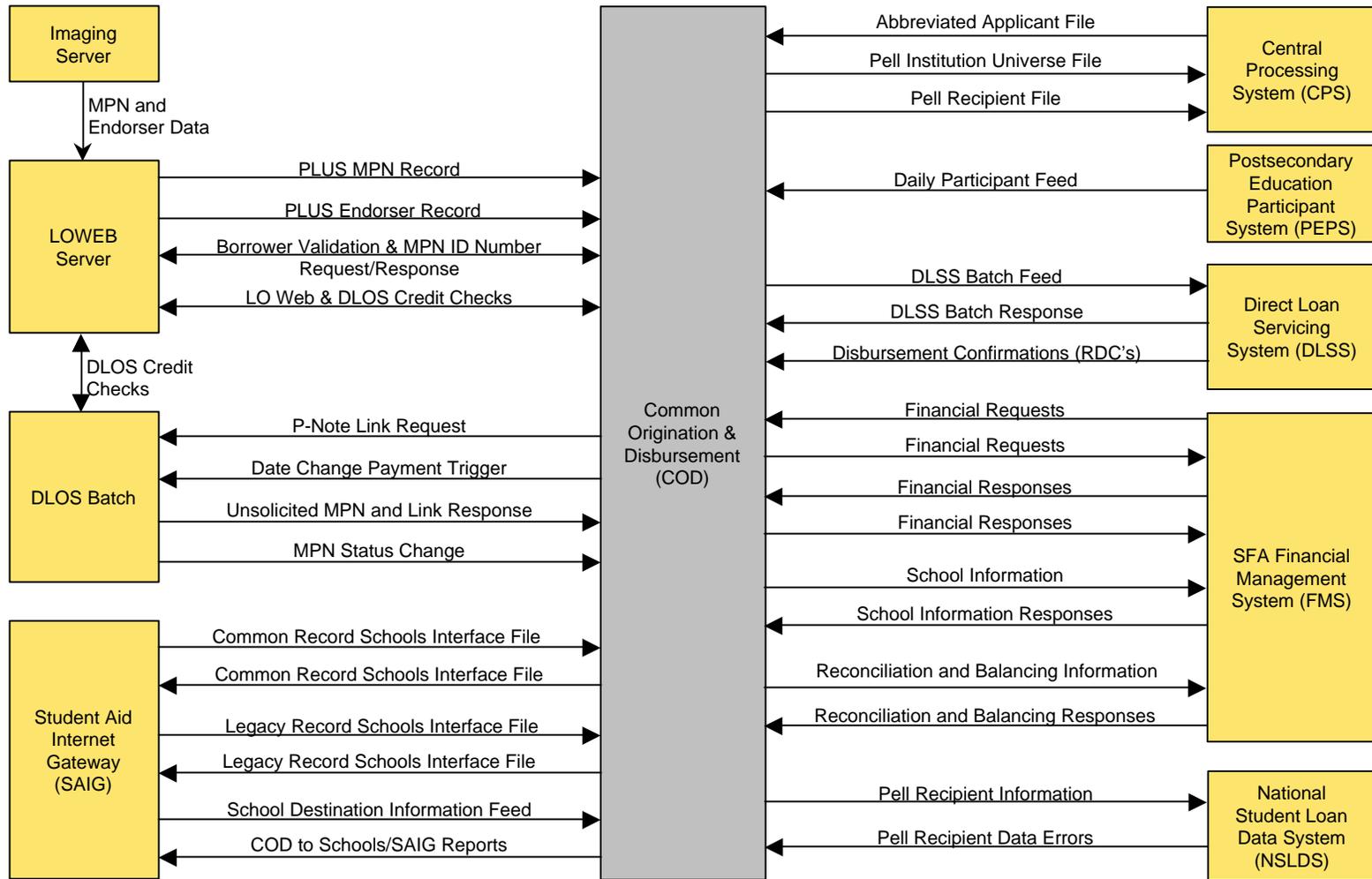
- EAI Requires a Directory and Workspace on PEPS Server
- EAI Requires a Copy of Daily PEPS File be placed in the EAI directory whenever a new file is produced
- Data Integrator and MQSeries run on the PEPS Server to send the file to the EAI Server
- Existing FTP processes continue as they are now.
- Transfer process happens once a day.

# The FMS - EAI Interface Approach Utilizes a Transition Table to Map Feeder System Data Elements Into FMS



Feeder Systems	EAI	Transition Table	Data Loading	OI Table	FMS Module
<ul style="list-style-type: none"> <li>• Provide data according to own format</li> <li>• Different systems may provide different data elements</li> </ul>	<ul style="list-style-type: none"> <li>• Routes data to appropriate Transition Table and Column</li> <li>• Converts data formats as necessary</li> <li>• Validates basic data formats</li> </ul>	<ul style="list-style-type: none"> <li>• Contains columns for all possible data elements</li> <li>• Source system is implied by the data</li> </ul>	<ul style="list-style-type: none"> <li>• Performs feeder specific processing</li> <li>• Performs table lookups</li> <li>• Performs data validation and edits</li> </ul>	<ul style="list-style-type: none"> <li>• Presents input data for Module processing</li> <li>• One Open Interface Table for each FMS Module</li> </ul>	<ul style="list-style-type: none"> <li>• One FMS Module each for General Ledger, Accounts Payable, Accounts Receivable</li> </ul>

# COD is composed of multiple interfaces with SFA's trading partners.



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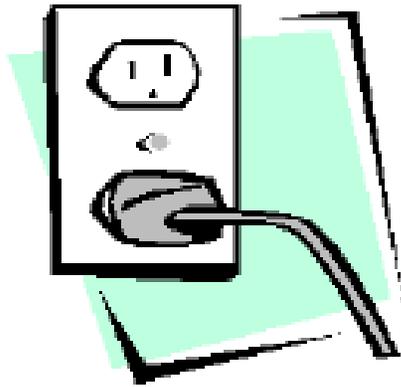
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## Building an EAI Interface



- **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.**

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



## EAI Core Services Support

Business Integration Design	Architecture Design	System Installation/ Admin	Interface Development	Performance Testing	Operations Support and Maintenance
<ul style="list-style-type: none"> <li>• How can applications integrate with the Enterprise Solution?</li> <li>• What are Application/ Trading Partner business needs?</li> <li>• If data transformation is necessary, what are Application/ Trading Partner data specifications?</li> </ul>	<ul style="list-style-type: none"> <li>• Determine application needs: Online &amp;/or Batch</li> <li>• Assess application needs</li> <li>• Propose EAI Solution</li> </ul>	<ul style="list-style-type: none"> <li>• Install EAI Products</li> <li>• Configure EAI Products</li> <li>• Administer EAI products</li> </ul>	<ul style="list-style-type: none"> <li>• Install MQ SW</li> <li>• Configure MQ SW &amp; Verify</li> <li>• Build Application Interfaces with or without application team assistance</li> <li>• SME support during application testing</li> </ul>	<ul style="list-style-type: none"> <li>• Measure message response time</li> <li>• Analyze Data Throughput rates</li> </ul>	<ul style="list-style-type: none"> <li>• EAI SME Support</li> <li>• EAI Architecture Upgrades /Patches</li> </ul>



# Building an EAI Interface Is a Joint Effort

<b><i>Task</i></b>	<b><i>EAI Team Responsibility</i></b>	<b><i>Application Team Responsibility</i></b>
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

**The EAI Core team has developed a sample work-plan to assist application teams.**



ID	Task Name	Predecessors
1	<b>Establish Contact with Application Team</b>	
4	<b>Gather Interface Requirements</b>	1
8	<b>Determine EAI Requirements</b>	4
13	<b>Propose Agreement of Work</b>	8
16	<b>Develop Application Workplan</b>	13
20	<b>Kickoff Application Design</b>	16
22	<b>Install and Configure MQSeries</b>	20
65	<b>Design Application Adapters/Components</b>	22
71	<b>Build Application Adapters/Components</b>	65
76	<b>Test Application Adapters/Components</b>	71
82	<b>Deploy to Production</b>	76
129	<b>Operations and Maintenance</b>	82

# The tasks outlined correspond to the sample work-plan.



<b>Task</b>	<b>EAI Team Responsibility</b>	<b>Application Team Responsibility</b>	<b>Work-plan</b>
Identify target machine	Support	Primary	22*
Assess Target Machine (HW Capacity, OS Versions, etc.)	Primary	Primary	22*
Install MQ Software (MQ Series, Data Integrator, MQMon)	Primary	Support	22*
Configure MQ Software and Verify (May include building an interface for test purposes)	Primary	Support	22*
Identify Application Interface Functions (Define functional requirements, formats, layouts, Prepare Interface Control Document)	Support	Primary	65*
Build Application Interfaces	Support	Primary	71*
Test Interfaces	Support	Primary	76*
Migrate Into Production	Primary for Infrastructure	Primary for Application Interface	82*

\*These numbers correspond to the ID numbers of tasks outlined in sample work plan.

# 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)	

**Operations and Maintenance Costs will vary based on usage.**



## **Cost Allocation:**

- **Ante (\$38, 200)\***
- **Usage**
  - **Volume of data**
  - **Frequency of Transactions**

\*Preliminary.

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# Guideline for Team Effort to Build an EAI Interface



<i>Task</i>	<i>Effort (Hrs)</i>		
	<i>Simple</i>	<i>Medium</i>	<i>Complex</i>
Identify target machine	2	4	8
Assess Target Machine (HW Capacity, OS Versions, etc.)	4	12	24
Install MQ Software (MQ Series, Data Integrator, MQMon)	24	24	24
Configure MQ Software and Verify (May include building an interface for test purposes)	24	60	120
Identify Application Interface Functions (Define functional requirements, formats, layouts, Prepare Interface Control Document)	40	120	320
Build Application Interfaces	16	48	120
Test Interfaces (functional and performance)	40	60	120
Migrate Into Production (including Ops Readiness Test)	40	60	80



# EAI Key Points of Contact:

System/Initiative	EAI HPT Lead
<ul style="list-style-type: none"> <li>▪ eServicing</li> <li>▪ DMCS Replacement</li> <li>▪ CSID &amp; PEPS Replacement,</li> <li>▪ Financial Partners Data Mart</li> <li>▪ FARS Retirement</li> <li>▪ Enterprise Data Warehouse</li> <li>▪ NSLDS Re-engineering</li> </ul>	<p><b>Eric Suzuki</b>  <a href="mailto:Eric.N.Suzuki@accenture.com">Eric.N.Suzuki@accenture.com</a>            (202) 962-0743</p>
<ul style="list-style-type: none"> <li>▪ e-Campus Based</li> <li>▪ FAFSA on the Web</li> <li>▪ SFA Portal</li> <li>▪ Single Sign On &amp; Security</li> </ul>	<p><b>Julian Ackert</b>  <a href="mailto:Julian.Ackert@accenture.com">Julian.Ackert@accenture.com</a>            (202) 962-0734</p>
<ul style="list-style-type: none"> <li>▪ Consistent Answers</li> <li>▪ Business Integration</li> </ul>	<p><b>Bruce Kingsley</b>  <a href="mailto:Bruce.Kingsley@accenture.com">Bruce.Kingsley@accenture.com</a>            (202) 962-0793</p>
<ul style="list-style-type: none"> <li>▪ FMS</li> </ul>	<p><b>Lauren Brett</b>  <a href="mailto:lgbrett@rsgltd.com">lgbrett@rsgltd.com</a>            (202) 962-0733</p>
<ul style="list-style-type: none"> <li>▪ LO Web</li> </ul>	<p><b>Barnet Malkin</b>  <a href="mailto:barnet@bitSMART.com">barnet@bitSMART.com</a>            (202) 962-0645</p>
<ul style="list-style-type: none"> <li>▪ COD</li> </ul>	<p><b>Scott Gray</b>  <a href="mailto:sgray@rsgltd.com">sgray@rsgltd.com</a>            (202) 962-0795</p>