

SFA Modernization Partner



United States Department of Education Student Financial Assistance

Architecture Release Plan

Task Order # 4

Deliverable # 4.1.4

February, 2000



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- **Introduction**
- Approach
- Integration Architecture Release
- Internet Architecture Release
- Data Warehouse Architecture Release
- Assumptions

The “Architecture Release Plan” describes the technology components, estimated delivery schedules and magnitude of cost



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- The objective of Release 1.0 is to “*Design & Build the technical services, infrastructure, and components required to enable the development of business applications*”
- The “Architecture Release Plan” delivery schedule is based on timelines described in the Capability Release Plan v1.0.
- The “Architecture Release Plan” is comprised of the following sections:
 - Release Description & Scope - “*what do I get with release 1.0*”
 - Architecture Component Description - “*what technology services will I get*”
 - Architecture Delivery Schedule - “*when will it be in place to support the business*”
 - Cost & Assumptions - “*how much will it cost & what is it based on*”
- ➡ **Each Architecture (Integration, Data Warehouse, Internet) utilizes this framework**



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- Introduction

- **Approach**

- Integration Architecture Release

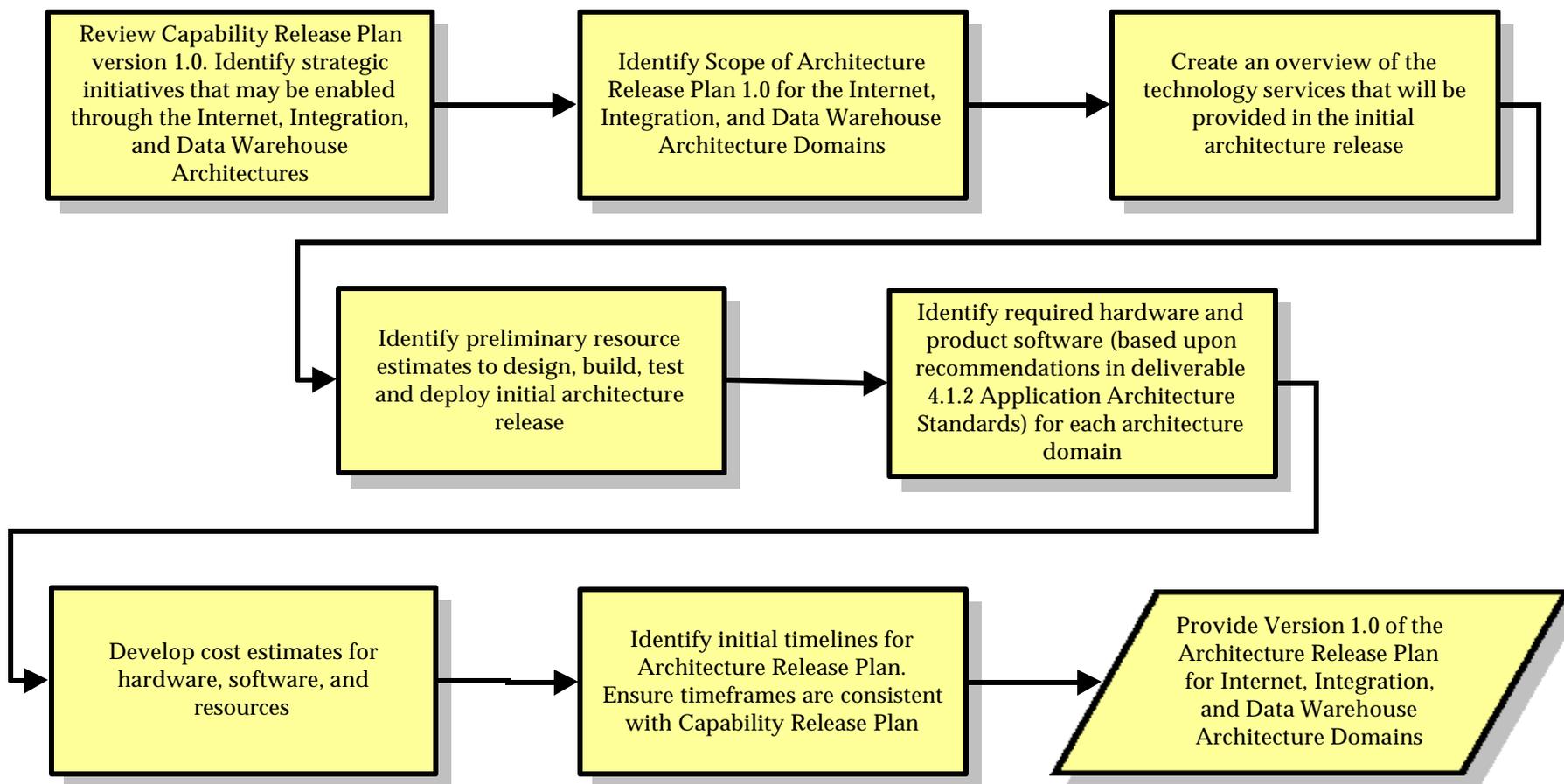
- Internet Architecture Release

- Data Warehouse Architecture Release

- Assumptions



The following diagram outlines the approach followed for Deliverable # 4.1.4: “Architecture Release Plan”





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- Internet Architecture Release
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Release Description & Scope - The Integration Architecture Release 1.0 is targeted to enable the following Capability Release Plan initiatives



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- Web Portal Prototype
- Web Portal For Customers
- Enhanced Aid Origination & Funds Disbursement
- FMS (Financial Management System)
- Direct Loan Servicing Reengineering

Note: See Capability Release Plan v1.0 for further details on capability initiatives

Release Description & Scope (continued) - The first release is comprised of six major job streams



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1. Legacy System & Network Analysis – Perform up-front analysis of existing systems

- Coordinate existing system access/privileges with contractors & system owners
- Validate existing systems software versions
- Confirm status of existing environment Development Architecture
- Analyze network bandwidth capacity capability

2. Hardware/Software Procurement – Acquire all of the necessary hardware/software for implementation of Release 1.0 of the Integration Architecture

- Participate in vendor alliance management
- Coordinate with contract managers
- Manage entire procurement process

3. Initial Installation & Configuration – This phase is dependent on the “Hardware/Software Procurement” phase and can only start after all required hardware and integration software (STC e*Gate) is on hand

- Install and configure core STC product
- Develop and configure the initial set of required connections for the first release
- Validate STC software is correctly configured and functions properly within the SFA environment

Release Description & Scope (continued) - The following two phases make up the Delivery Phase of Release 1.0



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- 4. *Design & Prototype Technical Architecture*** – Design & Prototype technical architecture interface patterns & interfaces to core technology components (i.e., Oracle, CICS, ODBC, CORBA v2.3)
- Assure that the “Communication Middleware” services are implemented properly and functional within the existing technical environment
 - Address connectivity and interoperability with the recommended Internet/Web Portal Architecture (based on a Java object model J2EE)
 - Prototype connectivity & accessibility to legacy system resources
 - Design Technical Architecture & Standards
 - Scope pilot of initial business capability
- 5. *Build & Test Technical Architecture*** - Technical architecture services must be complete before implementation of business applications (applications that enable a business capability)
- Development Architecture
 - Execution Architecture
 - Operation architectures
 - Physical Network

Release Description & Scope (continued) - The final phase is where the Integration Architecture is customized for a given business capability



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6. ***Pilot Initial Business Capability*** - Conduct a pilot implementation for initial business capability (one of the five Capability Release Plan initiatives).
- Customize “Transformation & Formatting” and “Business Process Management” services based on initial business capability’s requirements
 - Work with business community to facilitate application development of adapters and implementation of business rules
 - Identify organizational requirements of the development, execution, and operations environments
 - Roll-out initial business capability to a select user community for validation of technical and functional capabilities

Architecture Components Description - Release 1.0 of the Integration Architecture will deliver the following technical services to enable business capabilities



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Technical Services	<i>Web Portals</i>	<i>Aid Origination & Funds Disbursement</i>	<i>FMS</i>	<i>Direct Loan Servicing Reengineering</i>
■ View Layer Services (Development & Operations)	✓	✓	✓	✓
■ Control Layer Services (Communications Middleware)	✓	✓	✓	✓
■ Business Rules/Data Processing Layer (Transformation & Formatting)	✓	✓	✓	✓
■ Collaboration Technical Services (Business Process Management)		✓		✓
■ Oracle Connector/Adapters	✓	✓	✓	✓
■ ODBC Connector - for DB2		✓		✓
■ Batch/FTP Connectors		✓	✓	✓
■ CICS Connectors		✓		✓
■ CORBA Connectors - v2.3 IDL	✓			

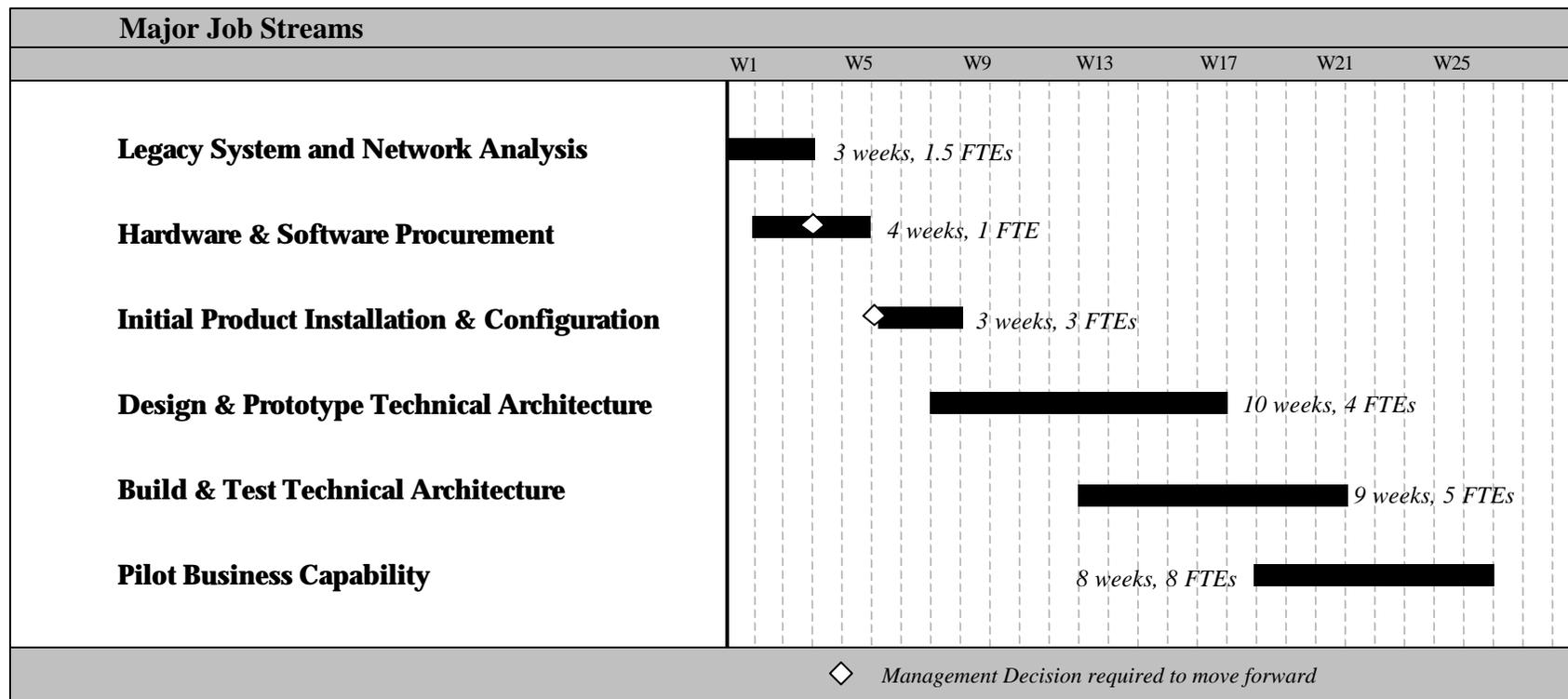
Note: Refer to Deliverable #4.1.2 for detailed explanation/definition of services

Architecture Delivery Schedule -The estimated timelines and resources were identified by project phase



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Estimated Time Lines & Resources

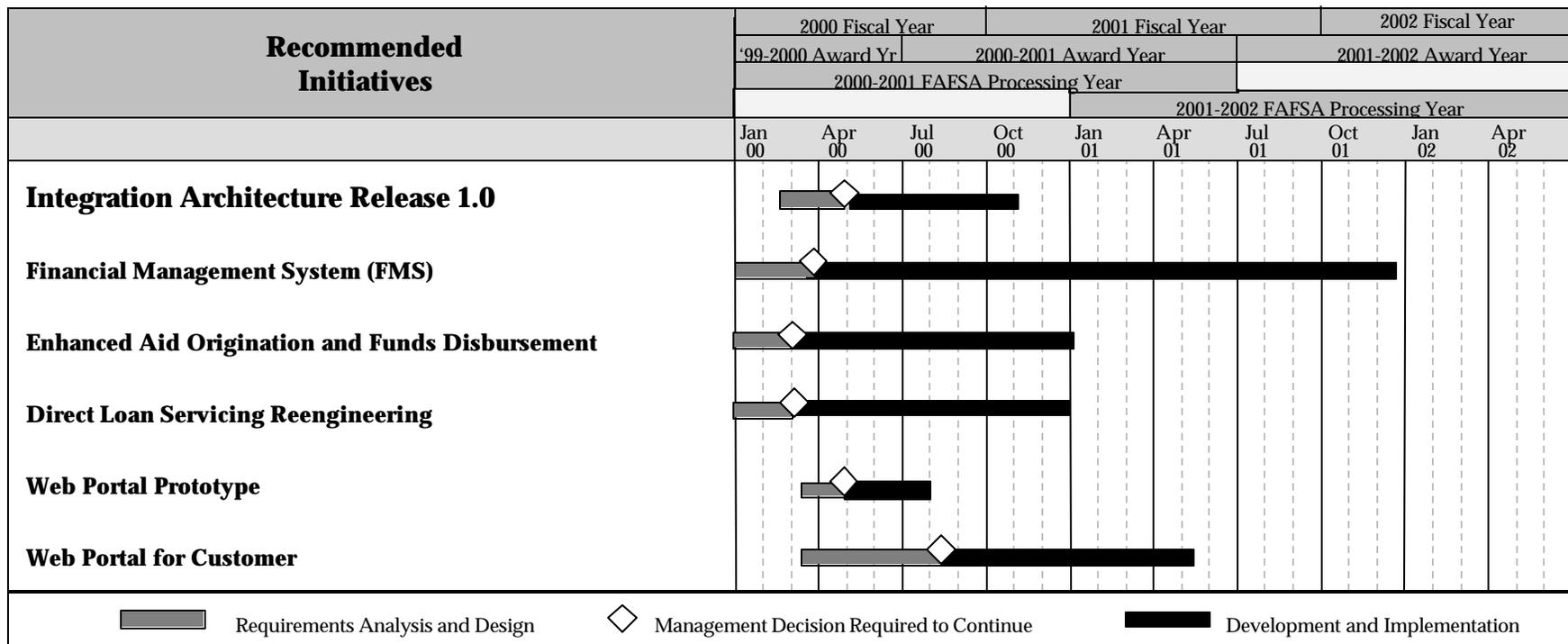


Architecture Delivery Schedule (continued) - is based on the Capability Release Plan v1.0. The objective is to design, pilot and build selected architecture components required to support application capabilities



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Estimated Delivery Schedule



Cost - Release 1.0 was priced based on three (3) cost factors a) product cost b) hardware requirements and c) labor fees



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Estimated Hardware Costs

	<u>Low</u>	<u>High</u>
EAI Development Server	\$65,000	\$75,000
EAI Production Server	\$125,000	\$250,000
Development/Operations Workstations (8)	<u>\$20,000</u>	<u>\$40,000</u>
<i>Total</i>	<i>\$210,000</i>	<i>\$365,000</i>

IBM MQ Series Integrator Component Costs

	<u>Low</u>	<u>High</u>
Adapters (4)	\$40,000	\$120,000
CPUs (2 or 4)	\$100,000	\$200,000
Mainframe MQ Series Queue Managers (Annual Lease)	\$36,000	\$72,000
Unix MQ Series Queue Managers (Purchase)	<u>\$10,000</u>	<u>\$24,000</u>
<i>Total</i>	<i>\$186,000</i>	<i>\$416,000</i>

Estimated Labor Costs

	<u>Low</u>	<u>High</u>
Integration Architecture Labor	<u>\$800,000</u>	<u>\$1,200,000</u>
<i>Total</i>	<i>\$800,000</i>	<i>\$1,200,000</i>

Overall Estimated Costs

	<u>Low</u>	<u>High</u>
<i>Total</i>	<i>\$1,196,000</i>	<i>\$1,983,000</i>



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Release Description & Scope - The Internet Architecture Release 1.0 is targeted to enable the following Business Capabilities



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- Web Portal prototype
- Web Portal For Customers
- Enhanced Aid Origination & Funds Disbursement*
- Enhanced Electronic FAFSA

**Aid origination supported by initial architecture; funds disbursement would be built on top of the Internet Architecture*

Release Description & Scope - Release 1.0 of the Internet Architecture is comprised of four major job streams



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- 1 **Initial Product Installation & Configuration** - Install, configure & test installation and configuration of core Internet Architecture component products
 - Install and configure Internet Architecture components
 - Install and configure Portal products/components
 - Validate that all components are installed and function correctly

- 2 **Design & Prototype Technical Architecture** - This effort will focus on assuring that base internet technical services are properly implemented and technically sound (functional) within the existing environment and network topology. This work stream will also address connectivity and interoperability with the communication middleware services of the Integration Architecture
 - Interoperability of Internet Architecture components & services
 - Interoperability between Internet Architecture and Integration Architecture

Release Description & Scope (continued) - The final two phases will build the infrastructure for the Internet Architecture and enable a given business capability



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- 3 ***Build & Test Technical Architecture*** - Build & test the development, execution, and operation environments for the Internet Architecture
 - Development Architecture
 - Execution Architecture
 - Operation architectures
 - Physical Network

- 4 ***Pilot Initial Business Capability*** - Conduct a pilot implementation for initial business capability (one of the four Capability Release Plan initiatives)
 - Customize personalized, dynamic Internet Architecture functionality based on initial business capability's requirements.
 - Identify organizational requirements of the development, execution, and operations environments.
 - Roll-out initial business capability to a select user community for validation of technical and functional capabilities.

Architecture Components Description - Release 1.0 of the Internet Architecture will deliver the following technical services



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Technical Services	Web Portal Prototype	Web Portal for Customers	Aid Origination & Funds Disbursement	Enhanced Electronic FAFSA
Core Architecture Components				
■ Web Server, Directory Server, & Certificate Server	✓	✓	✓	✓
■ Application Server	✓	✓	✓	✓
■ Database Server	✓	✓	✓	✓
■ Core Software	✓	✓	✓	✓
■ Content Management Software	✓	✓	✓	✓
■ Search Software	✓	✓	✓	✓
■ Firewall for Certificate Server	✓	✓	✓	✓
Core Architecture Services				
■ Extensibility & Integration	✓	✓	✓	✓
■ Personalization	✓	✓	✓	✓
■ Content Management	✓	✓	✓	✓
■ Security/Single Sign-on	✓	✓	✓	✓
■ Intelligent Search	✓	✓	✓	✓
■ Chat & Discussion Boards	✓	✓	✓	✓

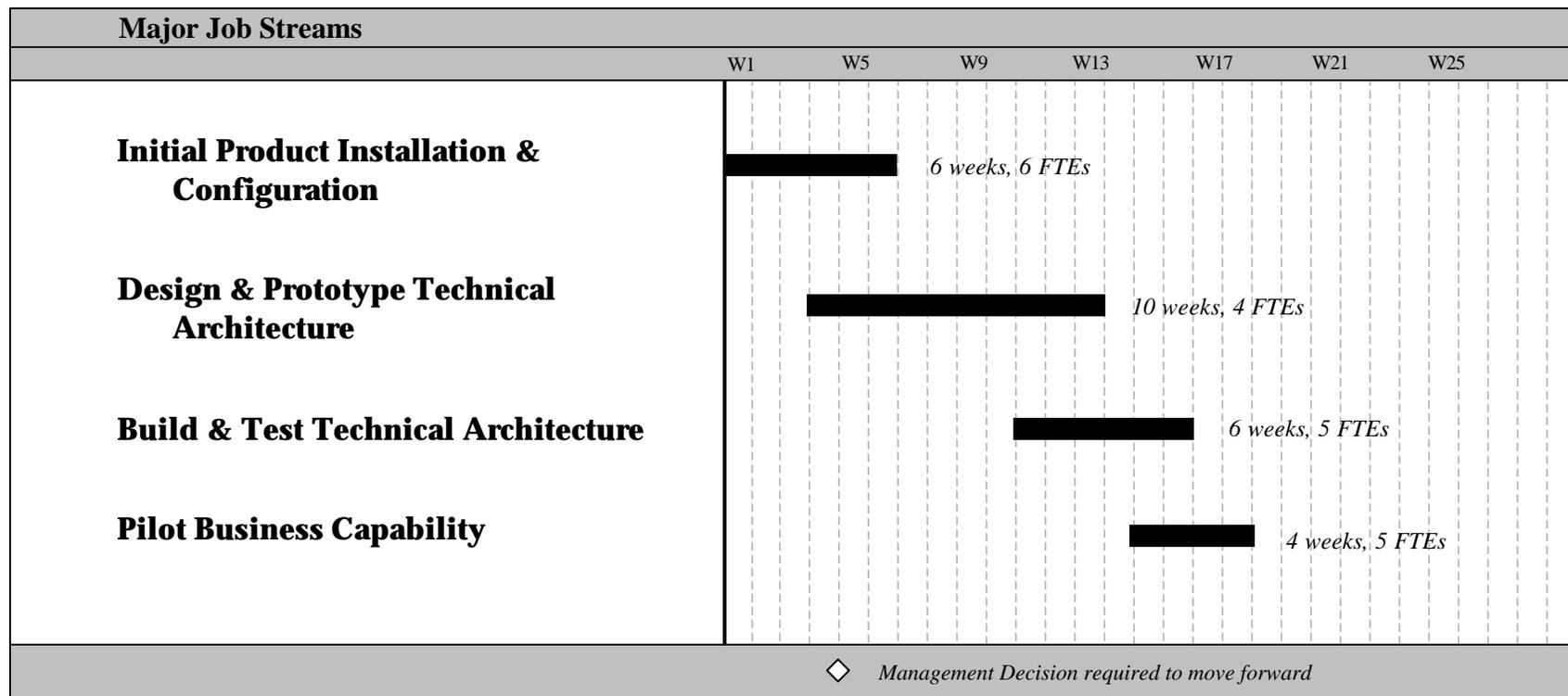
Note: Refer to Deliverable #4.1.2 for detailed explanation/definition of services

Architecture Delivery Schedule -The estimated timelines and resources were identified by project phase



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Estimated Time Lines & Resources

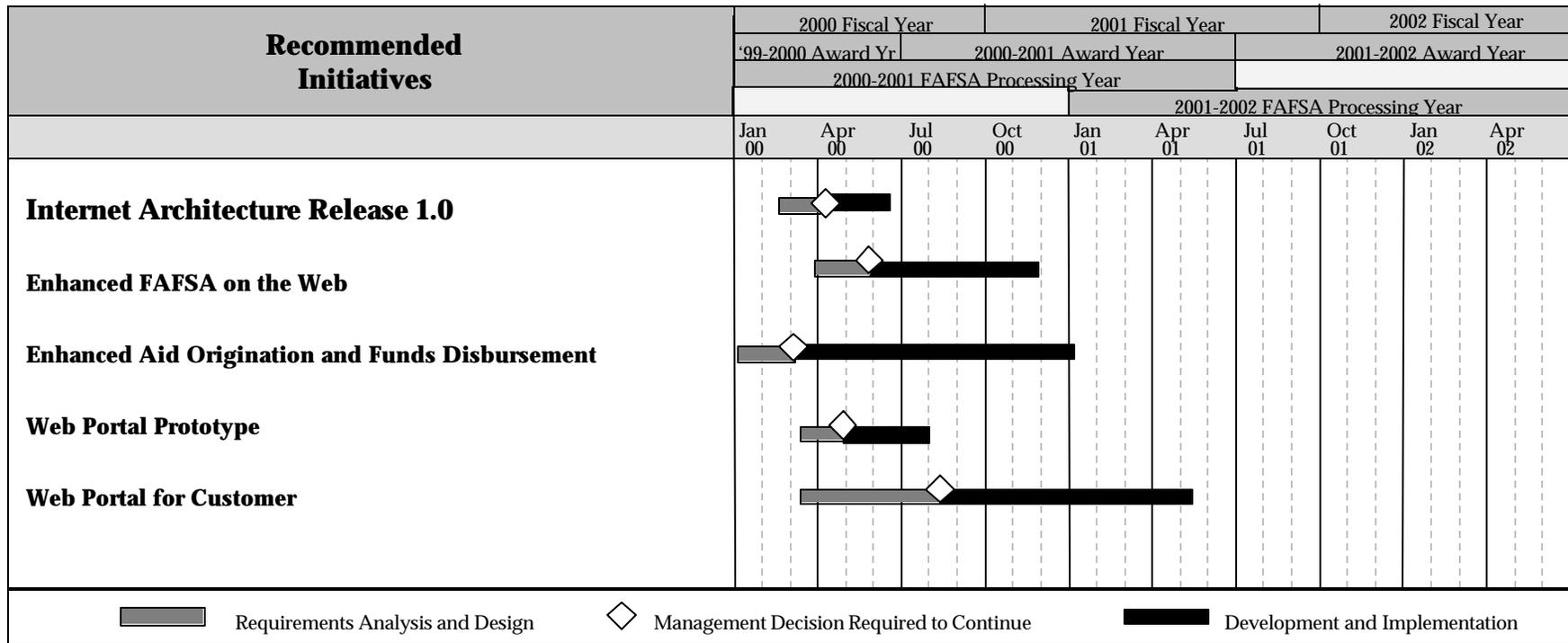


Architecture Delivery Schedule (continued) - is based and driven by the Capability Release Plan v1.0. The objective is to design, pilot and build selected architecture components required to support application capabilities



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Estimated Delivery Schedule



Cost - Release 1.0 was priced based on three (3) cost factors a) product cost b) hardware requirements and c) labor fees



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Estimated Hardware Costs

Development/Production Servers

Total

Low

\$700,000

\$700,000

High

\$800,000

\$800,000

Portal Component Costs

Web Server

Application Server

Directory Server

Certificate Server

Firewall for Certificate Server

Viador e-Portal Suite

Interwoven TeamSite/OD

Autonomy Knowledge Suite

Total

Low

\$ 20,000

\$ 70,000

\$ 14,000

\$ 2,000

\$ 15,000

\$ 84,000

\$140,000

\$265,000

\$610,000

High

\$ 30,000

\$140,000

\$350,000

\$ 3,000

\$ 15,000

\$200,000

\$175,000

\$325,000

\$1,238,000

Estimated Labor Costs

Internet Architecture Labor

Total

Low

\$750,000

\$750,000

High

\$1,000,000

\$1,000,000

Overall Estimated Costs

Total

Low

\$2,060,000

High

\$3,038,000



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- **Data Warehouse Architecture Release**

- Assumptions



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Release Description & Scope - The Data Warehouse Architecture Release 1.0 is targeted to enable the following Capability Release Plan initiatives

- EIS (Enterprise Information System)/MIS Reporting
- FMS (Financial Management System)
- Direct Loan Servicing (Reengineering)
- Loan Repayment
- CRM (Customer Relationship Management)
- Performance Measurement Analysis & Design

Release Description & Scope - The first release is comprised of six major job streams



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1. **Legacy System Analysis** - Perform up-front analysis of existing systems
 - Coordinate with contractors to gain access / privileges to SFA systems
 - Gather information on software versions
 - Develop delivery options for data warehousing capabilities
2. **Hardware / Software Procurement** - Acquire all of the necessary hardware/software for implementation of Release 1.0 of the Data Warehouse Architecture
 - Assist in the procurement process (vendor alliance, sizing, negotiations)
 - Coordinate with contract managers
 - Manage entire procurement process
3. **Initial Product Installation & Configuration** - This phase is dependent on the “Hardware/Software Procurement” phase and can only start after all required hardware and data warehouse software is on hand
 - Install and configure Informatica (ETL) and MicroStrategy (ROLAP)
 - Test products to understand optimal configurations for SFA

Release Description & Scope - The prototype and pilot phases will customize the Data Warehouse Architecture for a given business capability



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4. **Design & Prototype Technical Architecture** - Design and prototype the technical architecture related to data warehousing, the with the following objectives:
 - End-to-end interconnectivity between data warehousing components
 - Address potential design issues related to throughput and scalability
 - Interconnectivity with middleware and internet architectures / tools

5. **Pilot Business Capability** - Conduct a pilot implementation for an initial business capability
 - Identify business capability to use for pilot, working with the capabilities team
 - Extract and transform data from transactional system for one of the capabilities identified. Generate metadata in the process.
 - Design a pilot target data warehouse or mart, and load data
 - Design front-end ROLAP application to include some queries and reports
 - Gather/document feedback

Release Description & Scope - The objective of the final phase is to build the right technical architecture needed to enable business capabilities



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6. **Build & Test Technical Architecture** - Architecture must be in place prior to application development efforts
- Development architecture
 - Execution architecture
 - Operations architecture

Architecture Components Description - Release 1.0 of the data warehouse will deliver the following core technical services & application specific components



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Technical Services	<i>EIS</i>	<i>FMS</i>	<i>Direct Loan Service</i>	<i>Loan Repayment</i>	<i>CRM</i>	<i>Perf Measure</i>
■ Data Warehouse Architecture Services	✓	✓	✓	✓	✓	✓
■ Population Architecture Services	✓	✓	✓	✓	✓	✓
■ Metadata Services and Management	✓	✓	✓	✓	✓	✓
■ End-user Access Services	✓	✓	✓	✓	✓	✓

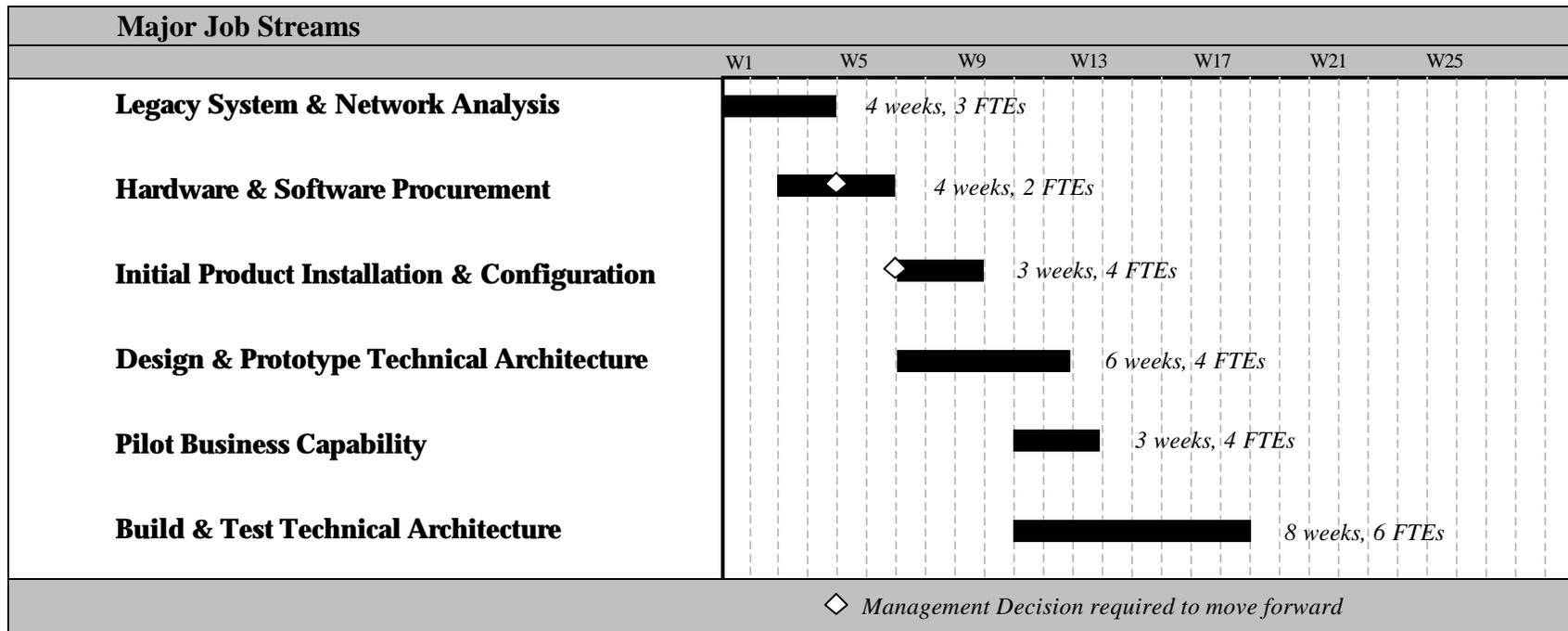
Note: Refer to deliverable 4.1.2 for description of Core Architecture Services

Architecture Delivery Schedule -The estimated timelines and resources were identified by project phase



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Estimated Time Lines & Resources

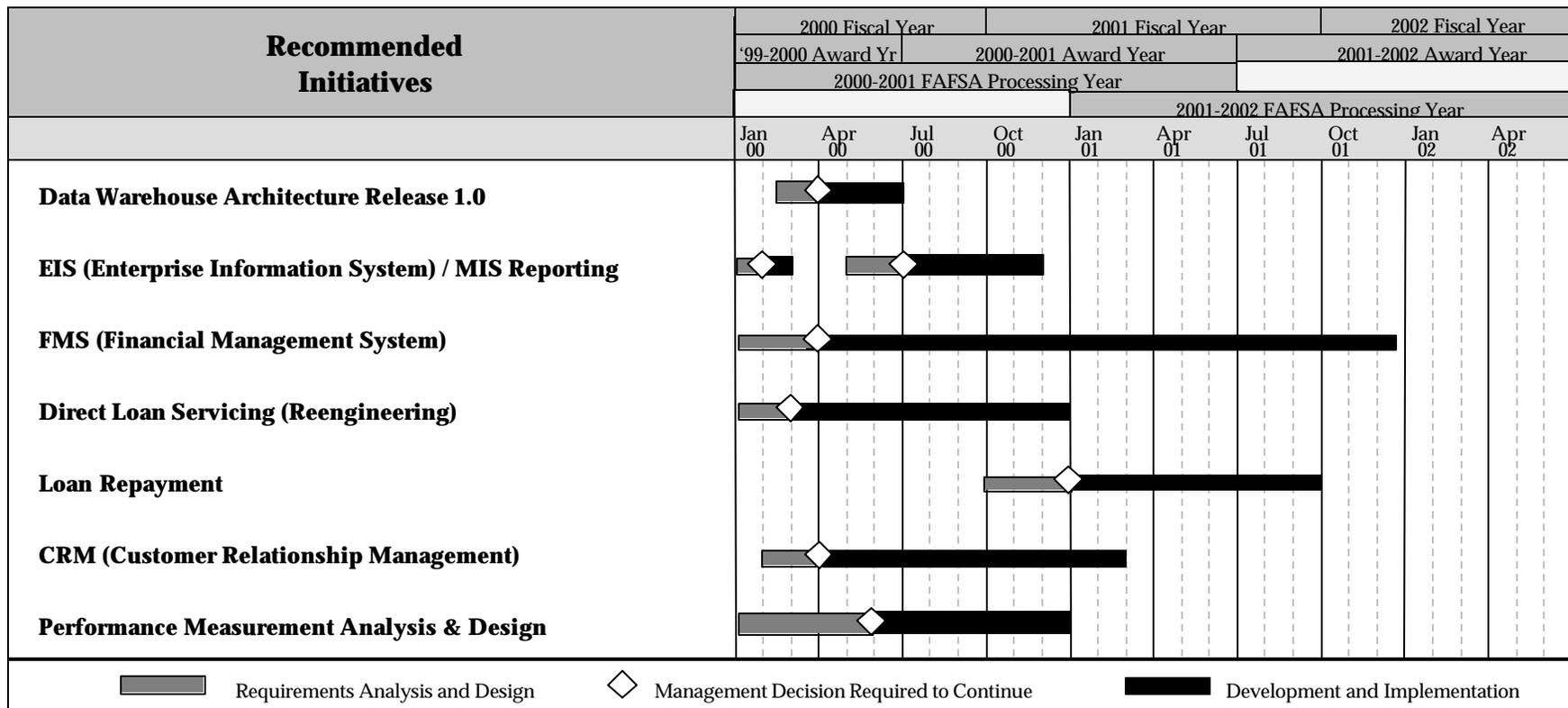


Architecture Delivery Schedule (continued) - is based and driven by the Capability Release Plan v1.0. The objective is to design, pilot and build selected architecture components required to support application capabilities



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Estimated Delivery Schedule



Cost - Release 1.0 was priced based on three (3) cost factors a) product cost b) hardware requirements and c) labor fees



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Estimated Hardware Costs

	<u>Low</u>	<u>High</u>
Data Warehouse Development Server	\$65,000	\$75,000
Data Warehouse Production ROLAP Server	shared w/ Pop. Arch.	\$250,000
Data Warehouse Population Architecture Server	<u>\$125,000</u>	<u>\$175,000</u>
<i>Hardware Total</i>	<i>\$190,000</i>	<i>\$500,000</i>

Informatica Component Costs

	<u>Low</u>	<u>High</u>
1 CPU	\$80,000	---
Unlimited CPUs	---	\$135,000
Unlimited Sources & Targets	---	\$80,000
Plug-in for Power Designer	\$7,500	\$7,500
On-Site Training (3 days) and Support (10 days)	<u>\$29,500</u>	<u>\$29,500</u>
<i>Informatica Total</i>	<i>\$117,000</i>	<i>\$252,000</i>

Estimated Labor Costs

	<u>Low</u>	<u>High</u>
Data Warehouse Architecture Services	<u>\$600,000</u>	<u>\$800,000</u>
<i>Total</i>	<i>\$600,000</i>	<i>\$800,000</i>

Cost (continued) - Product Costs for Release 1.0 of the Data Warehouse include components from both Informatica and MicroStrategy



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<u>MicroStrategy Component Costs</u>	<u>Low</u>	<u>High</u>
<u>Server Components</u>		
Intelligent Server	\$58,500	\$58,500
Web Server	\$31,500	\$31,500
Broadcaster Server	\$31,500	\$31,500
Developer's Bundle	\$0	\$31,500
Architect	\$6,750	\$6,750
InfoCenter	\$31,500	\$31,500
 <u>End-User Components</u>		
MS Agent	\$2,670	\$4,350
Broadcaster	\$5,500	\$26,500
Web PE	\$13,800	\$43,500
 Consulting	 \$17,640	 \$24,960
Annual Support (18% of software)	\$32,710	\$47,808
<i>MicroStrategy Total</i>	<i>\$232,070</i>	<i>\$338,368</i>
 <u>Overall Estimated Costs</u>		
<i>Total</i>	<u>Low</u> <i>\$1,139,070</i>	<u>High</u> <i>\$1,890,368</i>



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- **Assumptions**

Assumptions - have been made which drive schedules and pricing (cost). Modification can potentially impact this release plan. Therefore, all revisions need to be reviewed prior to finalization



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- Release 1.0 will be implemented and positioned to support business capability development within a five-to-six month period after “Go” decision is made
- Development and configuration of the technical architecture needs to start three to four months prior to the development of any business capability
- Release 1.0 assumes that the existing systems have a development environment that can be utilized for testing, prototyping connectivity, and accessibility. This will be confirmed during the Legacy System & Network Analysis phase of the release plan.
- Adjustments to the Capability Release Plan could potentially impact the Technology Architecture release
- The required rights and access to existing legacy systems will be provided
- No data conversion will need to take place during Release 1.0 of the Integration Architecture