
# Arizona Medical Information Exchange AMIE

## AMIE/Initiate Integration Technical Solution

**May 1st, 2009**

## Document Revision History

| Date | Revisions | Version | Author |
|---|---|---|---|
| 05/05/2009 | Draft | 1.0 | Lupita Figueroa, System Analyst/AHCCCS |
| | | | |

# 1. Introduction

This document is intended to describe two proposed technical solutions for integrating the Initiate patient system within the AMIE current architecture. Until now AMIE has relied on their home grown Master Patient Index (MPI) for matching and linking patient records from disparate source systems in order to satisfy the core AMIE use case of a federated medical information exchange. The objectives of the AMIE/Initiate integration are as follows:

- Demonstrate AMIE interoperability with Initiate Master Patient Index services.
- Evaluate the Initiate MPI product for potential future use within the AMIE architecture.
- Explore and analyze which of the two Initiate/AMIE integration solutions is the best for meeting current and future AMIE requirements.
- Validate Initiate's adherence to CCHIT certification criteria for MPI services.

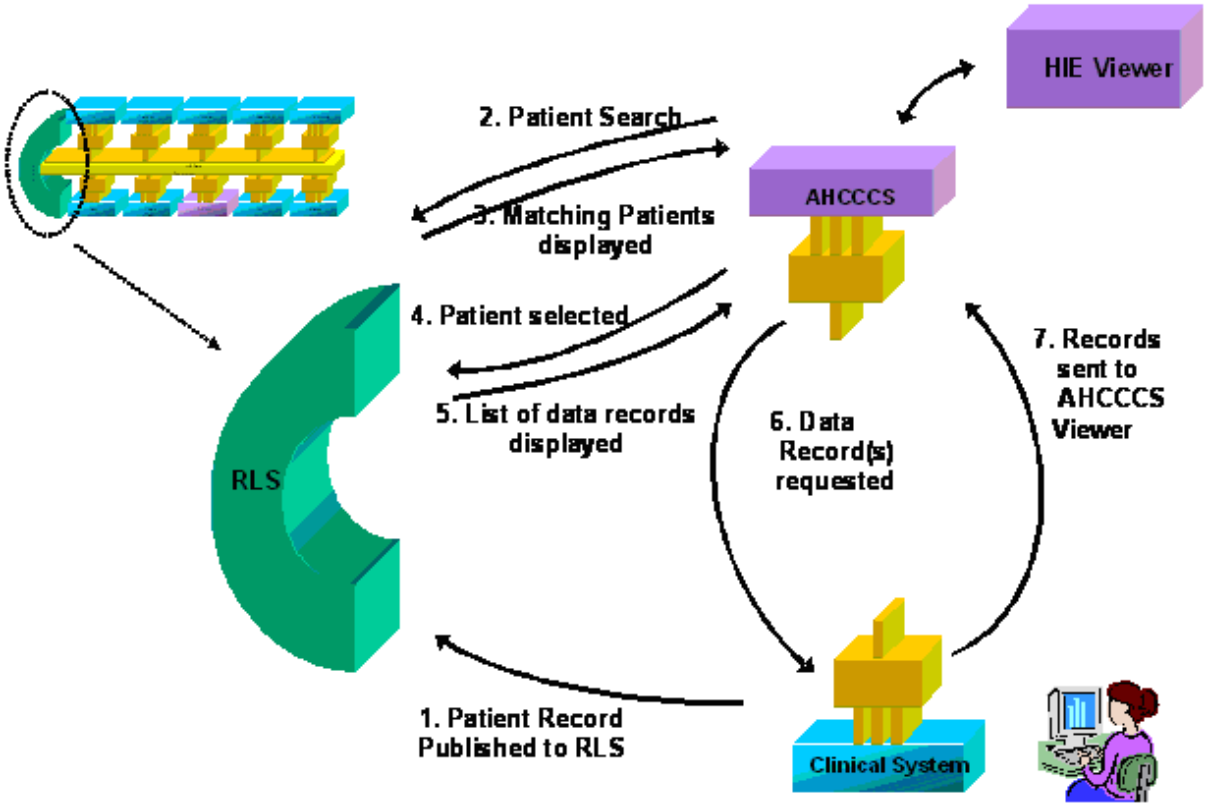
## Background

Arizona Medical Information Exchange (AMIE) uses a combination of open source software applications, internally developed software and off the shelf products. AMIE committed to meet standards established by the Office of the National Coordinator for Health Information Technology (ONCHIT), the Medicaid Information Technology Architecture (MITA), the Arizona statewide technology standards, AHCCCS standards, as well as industry standards for data exchange (such as HL7,LOINC, CDA), and technical standards common to web technologies and internet connectivity. AHCCCS intends the system to be able to meet the certification by the Certification Commission for Healthcare Information Technology (CCHIT). The base technology for the Utility is Microsoft Windows, .NET and C#.

The diagram above depicts the core use case supported by AMIE

1. All Data Providers publish notification of the existence of available patient records from the local data source to the central registry (Record Locator Service or RLS) following service delivery. Patient demographics, a record metadata and the source system ID are logged, specifying the location of each record. At the point of care, these records are made available through the web-based Viewer application.
2. The Provider accesses the Viewer and searches for a Patient using valid criteria.
3. The viewer queries the RLS and returns Patient records matching entered criteria to the screen for review by the Provider. Currently, we are using a deterministic matching algorithm.
4. The Provider selects the appropriate Patient.
5. The Viewer then queries the RLS and displays a list of available Records for the selected Patient, such as Medication History, Lab Results, and/or Discharge Summaries. All of this is formatted as CDA documents.
6. The Provider selects one or more records for viewing purposes.
7. The Viewer acquires the address (record location) from the central registry (RLS – see step 1).
8. The Record data is retrieved directly from the Data Provider on peer-to-peer basis.

AMIE Core Use Case




## Success Criteria

- Ability for Initiate to replace AMIE MPI component without loosing current capabilities.
- Ability for Initiate to replace AMIE MPI and Record Locator Service components without loosing current capabilities.
- Ability for Initiate to interface with the AMIE gateway.
- Ability for Initiate to outperform current AMIE MPI matching/linking algorithm in terms of speed and accuracy.
- Ability for Initiate to receive automatic patient demographics feeds from AHCCCS and use this information to link patient records in the MPI to their appropriate AHCCCS ID.

## Out of Scope

- Ability to synchronize patient demographics data between AMIE MPI and Initiate MPI

## Assumptions and Constraints

- Initiate will provide web service based interface for feeding patient demographic information in the Master Patient Index (MPI)
- Initiate has the capability to replace the Record Locator Service (RLS) and/or the AMIE MPI.
- There will be no interaction between the AMIE MPI and Initiate MPI.

## Required Initiate Components

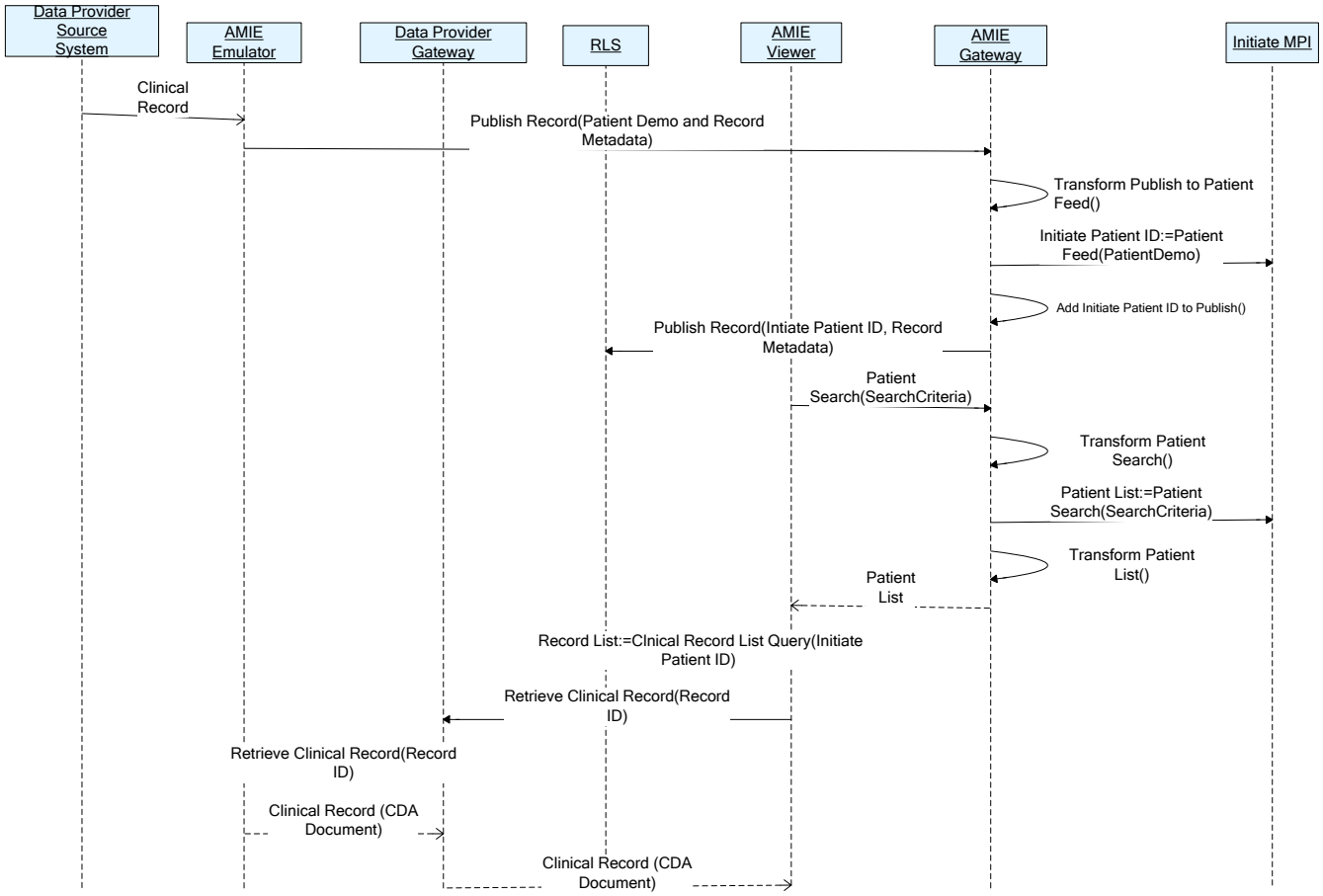
- Initiate Master Data Service & Master Data Engine
- Initiate Patient Data Hub
- Initiate HL7 Query Broker
- Initiate Inspector (for visualization of linkages, not for data resolution)
- Initiate Workbench (for configuration understanding)

# 2. Use Cases

AHCCCS would like to implement two integration solutions in a phased approach. This will assist AMIE in evaluating the capabilities of the Initiate product and ensure that the best approach is taken in the future. The sequence diagrams represent the two scenarios that will be supported by the Phase I and Phase II integration efforts.

## Use Case for Phase I

This use case scenario will be implemented during phase I of the Initiate/AMIE integration effort. In this use case, Initiate integrates with AMIE by replacing the home grown AMIE MPI and interfacing directly with the AMIE Gateway. Note that the RLS will not be replaced during the phase I of this implementation.

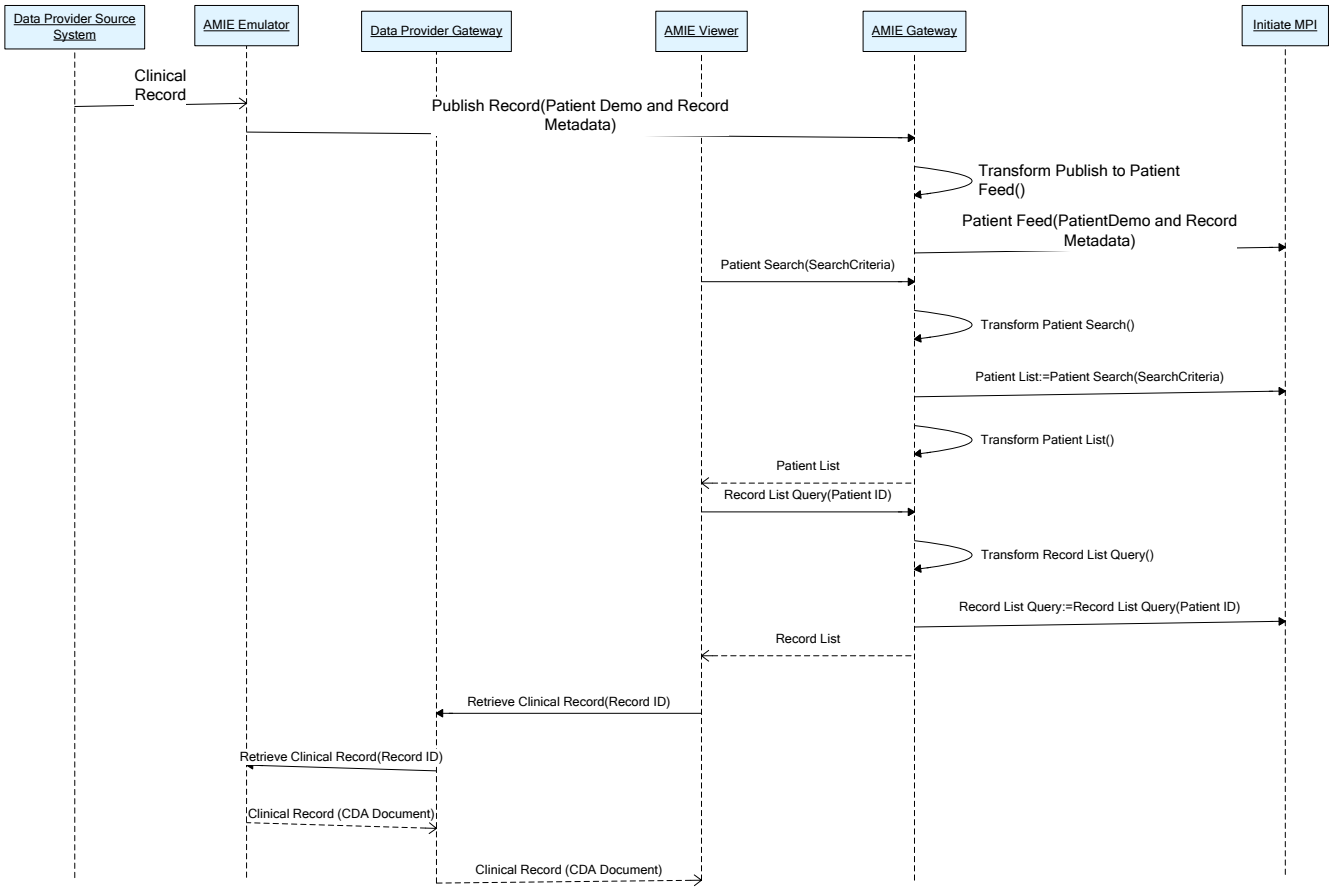



1. Data provider source system sends clinical record to AMIE Emulator
2. Emulator sends publish message to AMIE Gateway containing patient demographic information and record metadata (record type, record date, and record description).
3. AMIE Gateway transforms the current AMIE supported publish message into a standardized patient feed message supported by Initiate. The patient feed message must contain all patient demographics supplied within AMIE publish message.
4. AMIE Gateway sends patient feed message containing patient demographics to Initiate.
5. Viewer sends patient search message to AMIE gateway
6. AMIE gateway transforms the patient search message into a standardized format supported by Initiate. Initiate will utilize the HL7 Query Broker component to consume the PDQ request

7. AMIE gateway sends patient search message to Initiate. Initiate returns a patient list containing a set of patients that matched the search criteria with associated patient demographics, including local source information and identifiers
8. AMIE gateway transforms the patient list into the AMIE supported format and sends it to viewer.
9. AMIE Viewer sends record list query for all user selected patients to RLS. This query contains the local source IDs for selected patients.
10. RLS searches for records based on the local source IDs received. RLS returns a list of available clinical records for each of the patients to Viewer.
11. Viewer sends a retrieve record message for all user selected records to each of the data provider gateways serving the Emulators/source systems where the records reside.
12. Data provider gateways serve the retrieve record request message by routing it to the Emulator/source system.
13. Emulators/source systems return requested records in CDA format to the Viewer for display.

## Use Case for Phase II

This use case scenario will be implemented during phase II of the Initiate/AMIE integration effort. In this use case, Initiate integrates with AMIE by replacing both the home grown AMIE MPI and RLS by interfacing directly with the AMIE Gateway.




1. Data provider source system sends clinical record to AMIE Emulator
2. Emulator sends publish message to the AMIE Gateway containing patient demographic information and record metadata (record type, record date and record description).
3. AMIE Gateway transforms the currently AMIE supported publish message into a standardized patient feed message supported by Initiate. The patient feed message must contain all information supplied in the AMIE supported publish message, such as patient demographics and record metadata.

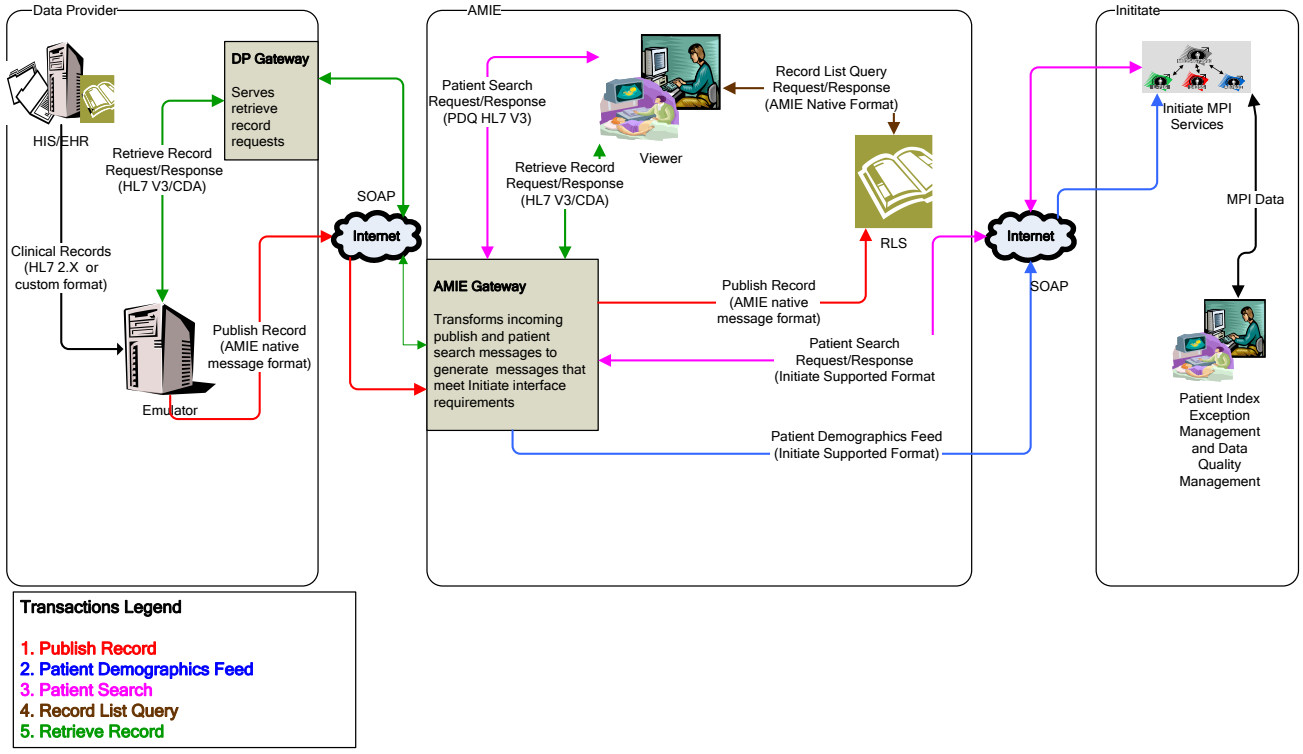
4. AMIE Gateway sends patient feed message with patient demographics and record metadata to Initiate.
5. Viewer sends patient search message to AMIE gateway
6. AMIE gateway transforms the patient search message into a standardized format supported by Initiate. Initiate will utilize the HL7 Query Broker component to consume the PDQ request
7. AMIE gateway sends transformed patient search message to Initiate HL7 Query Broker
8. Initiate returns a patient list containing a set of patients that matched the search criteria and associated patient demographics, including sources & MRNs.
9. AMIE gateway transforms the patient list into an AMIE supported format.
10. AMIE Viewer sends query for clinical records to AMIE Gateway containing for all patients returned in the patient list.
11. AMIE Gateway transforms available record list query into a format supported by Initiate.
12. AMIE Gateway sends record list query to Initiate and Initiate returns a list of available clinical records for the patients to the viewer.
13. Viewer sends a retrieve record message for all user selected records to each of the data provider gateways serving the Emulator/source system where the records reside.
14. Data provider gateways serve retrieve record request message by routing it to the Emulator/source system.
15. Emulators/source systems return requested records in CDA format to viewer for display.

# 3. Proposed Technical Solutions for AMIE/Initiate Integration

The diagrams below represent the data flows for the two solutions proposed solutions.

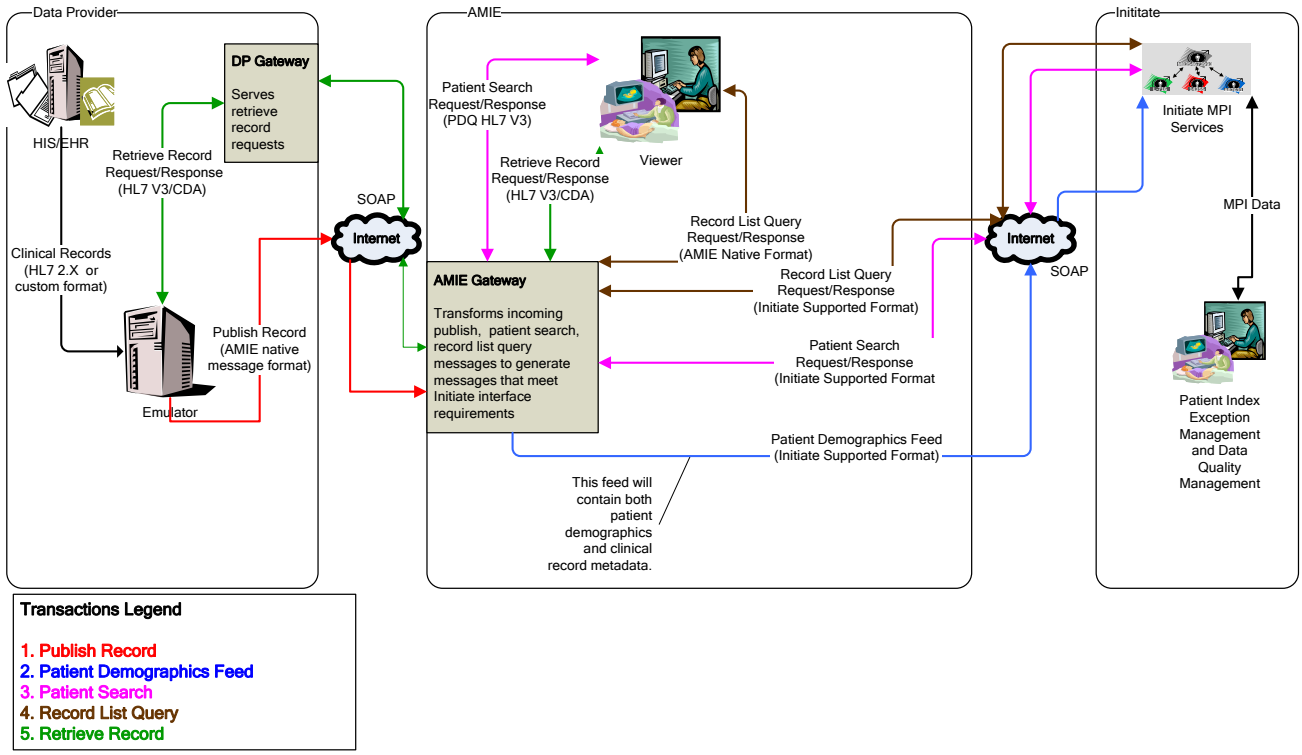
## Proposed Technical Solution (Phase I)

During the phase I of the AMIE/Initiate integration effort, AMIE will aim to replace the current AMIE MPI with the Initiate MPI, while keeping the Record Locator Service component as part of the AMIE architecture. This will require that the AMIE Gateway be modified to transform the current publish and patient search messages to meet Initiate interface requirements.

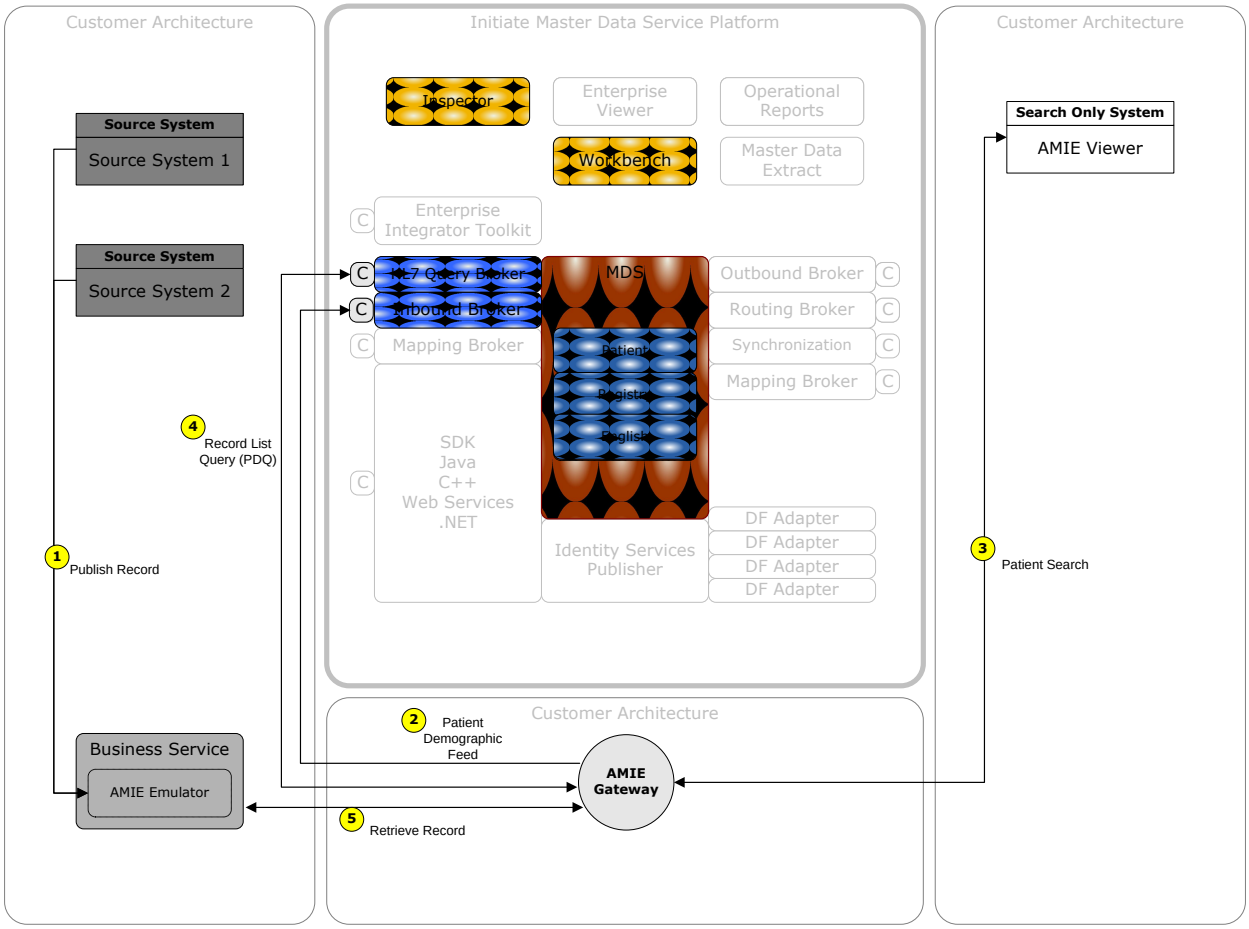


## Proposed Technical Solution (Phase II)

During the phase II of the AMIE/Initiate integration effort, AMIE will aim to replace both the AMIE MPI and Record Locator Service (RLS) with the Initiate MPI. This will require that the AMIE Gateway be modified to transform the current publish, patient search, and record list query messages to meet Initiate interface requirements.



## Initiate Solution Architecture




# Appendix A: Glossary

| | |
|---|---|
| AHCCCS | Arizona Health Care Cost Containment System (AHCCCS) is the state agency who oversees the administration of the Medicaid program. |
| AHCCCS ID | The identification number assigned to Medicaid members by AHCCCS. The number is a unique identifier for each Medicaid |

| | |
|---|---|
| | member. |
| Data provider | A person or organization who is contracted with AHCCCS to exchange data (either retrieve or submit data) utilizing the Health Information Exchange. |
| Health Information Exchange (HIE): | A multi-stakeholder entity that enables the movement of health-related data within state, regional, or non-jurisdictional participant groups. |
| HIPAA | Health Insurance Portability and Accountability Act (HIPAA) is the law passed by the U.S. Congress in 1996 (Public Law 104-191) that included provisions that required Health and Human Services (HHS) to adopt national standards for electronic healthcare. HIPAA includes provisions that require that doctors, hospitals and others protect the privacy of patients' health care information. |
| Record Locator Service (RLS) | An information service that locates patient clinical records, such as discharge summaries, lab results, and medication history across disparate systems given a set of criteria, such as patient demographics or ID numbers. |
| Viewer | AHCCCS web-browser based application designed to allow users to search for specific patient related data, and view a single non-aggregate record through the AHCCCS HIE. |