# FHIR Powered Healthcare

Introduction

Contoso Healthcare is implementing FHIR (Fast Healthcare Interoperability Resources) to exchange data rapidly and securely in the HL7 FHIR standard format with a single, simplified data management solution for protected health information (PHI). FHIR service in the Azure Health Data Services platform is a fully managed, enterprise-grade FHIR Server in the cloud lets you quickly connect existing data sources, such as electronic health record systems and research databases. Create new opportunities with analytics, machine learning, and actionable intelligence across your health data.

Your team's assistance is needed to implement the following scenarios:

- Ingest and process patient record in HL7 FHIR Bundle or legacy formats from EHR systems into a common FHIR-based standard format, and persist them into a FHIR compliant store to facilitate health data interoperability.
- Securely connect and search FHIR patient data stored in a FHIR Server through a patient lookup web app to enhance patient engagement.
- Extract FHIR data via FHIR Analytics pipeline for data exploration in Synapse Studio/SSMS/PowerBI and perform downstream transformation against raw health data stored in Parquet format.
- Export de-identified FHIR data and store in staging Data Lake storage for downstream processing.
- Ingest, transform, correlate and persist medical IoT device data in FHIR using the MedTech service in Azure Health Data Services to facilitate discovery of clinical insights and a patient's health and wellness.
- Load and search imaging data using the DICOM service in Azure Health Data Services to integrate clinical and imaging data for many healthcare scenarios including: creating cohorts for research, provide longitudinal view of a patient during diagnosis, finding outcomes of similar patients to plan treatment options, etc.

You will implement a collection of Microsoft Health reference architectures using the **Azure Health Data Services** platform that best fit Contoso Healthcare requirements. Below is the holistic conceptual end-to-end Microsoft Health Architectures for the FHIR ecosystem.
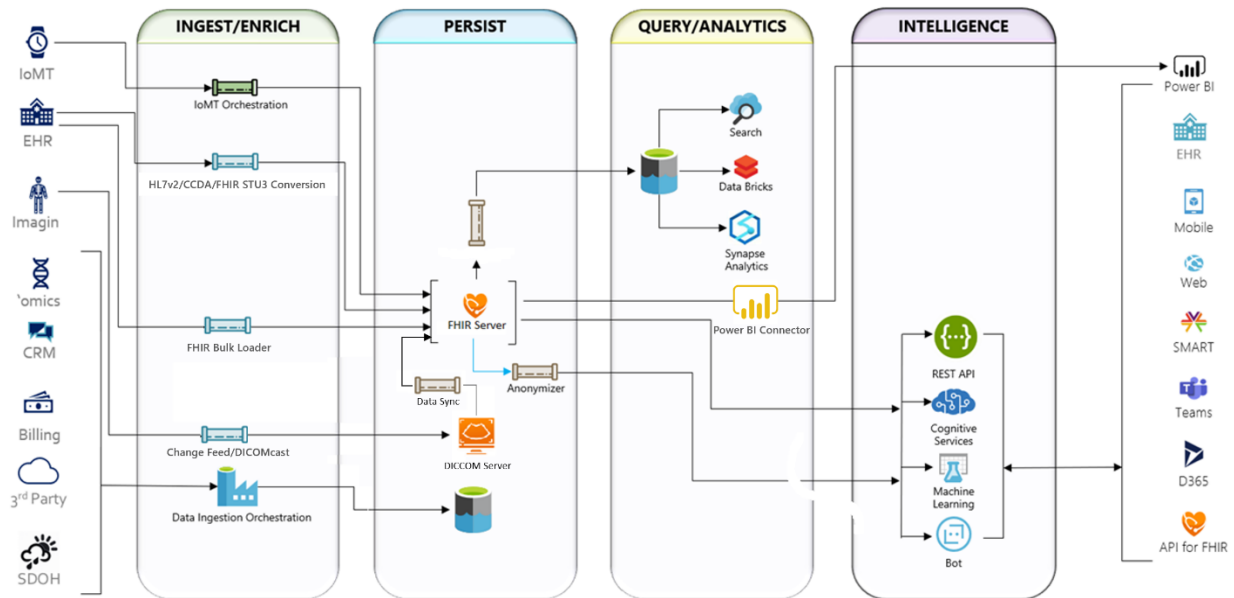
Duration

3 Days

Learning Objectives

This hack will help you:

1. Deploy FHIR service in Azure Health Data Services platform and persist generated synthetic FHIR data into it.
2. Convert and Load HL7v2 messages and C-CDA clinical data into FHIR Service.
3. Develop JavaScript SPA (Single Page App) to search and view FHIR patient data.
4. Transform and explore FHIR data for secondary use analytics.
5. Export and anonymize FHIR data for downstream processing.
6. Ingest, transform and load medical IoT device data into FHIR using MedTech service.
7. Ingest, search and retrieve imaging data persisted in the DICOM service.

Challenges
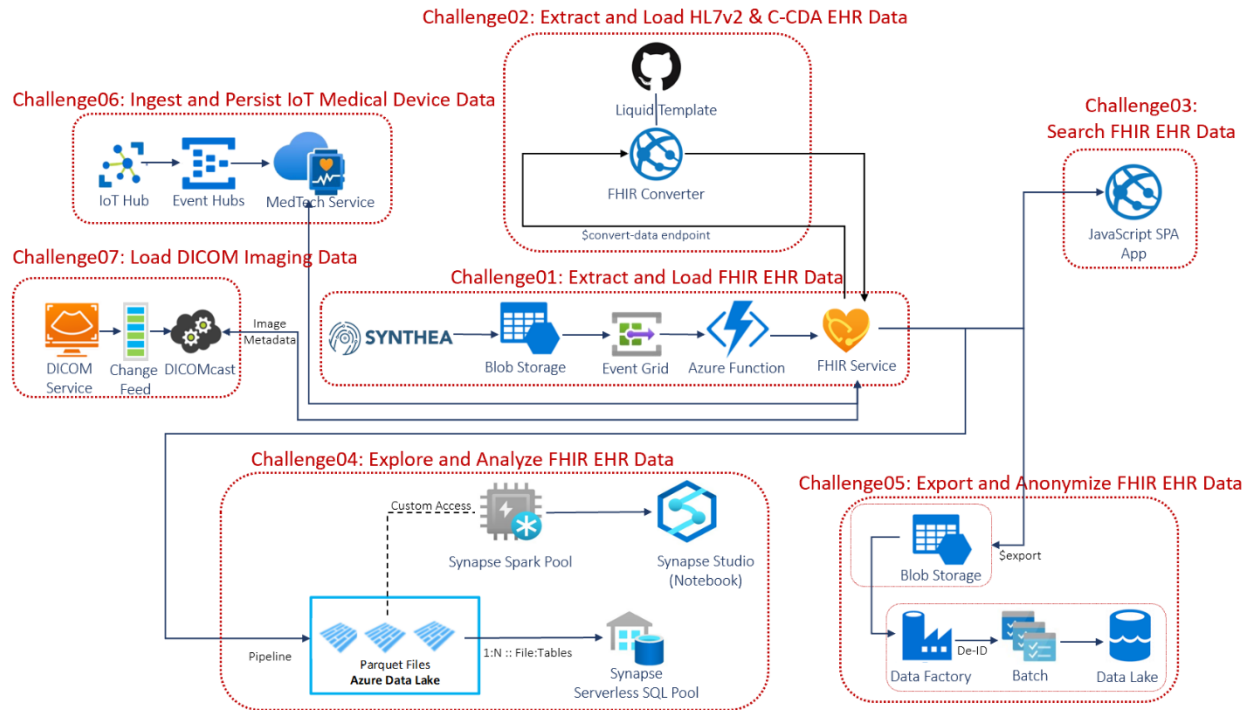
These challenges must be completed in order:

- Challenge 0: Pre-requisites - Ready, Set, GO!
- Challenge 1: Extract and Load FHIR EHR Data

These challenges can be completed in any order:

- Challenge 2: Extract and Load HL7v2 & C-CDA EHR Data
- Challenge 3: Search FHIR EHR Data
- Challenge 4: Explore and Analyze FHIR EHR Data
- Challenge 5: Export and Anonymize FHIR EHR Data
- Challenge 6: Ingest and Persist IoT Medical Device Data
- Challenge 7: Load DICOM Imaging Data