

Registry - Data Pull

Version 2.2

Effective Date : February 8, 2021

This document is intended for informational purposes only. The information contained herein is confidential and privileged and may not be shared with any third party without the prior written consent of FIGmd, Inc.

Notice of Copyright, Confidentiality and Disclaimer

Copyright © 2021 FIGMD, Inc. All Rights Reserved.

FIGMD, Inc. ("FIGmd"), hereby states that the contents of this document are proprietary and Confidential to FIGmd and that this document is governed by the copyright laws of the United States of America and other countries. It may not be reproduced, distributed, saved, stored or altered, in whole or in part, using any means, process or apparatus without the expressed written consent of FIGmd.

All trademarks, logos, graphics and other material included in this document are the property of their respective owners.

Disclaimer

FIGmd provides all material and information in this document on an "as-is" basis and disclaims all warranties and conditions with regard to this information, including all implied warranties and conditions of merchantability, fitness for any particular purpose, title and non-infringement. The document and its contents are subject to change without notice and, as such, do not imply responsibility on the part of FIGmd for any inaccuracy contained herein. In no event and under no circumstances can FIGmd accept responsibility for errors or omissions or be held liable for any kind of damage resulting from the use, performance, connection with or the application of the information contained in this document.

Environment

FIGmd is committed to the conservation of natural resources and reducing its overall burden on the environment. Please consider the environment before printing this document.

Document Information

Document Owner	FIGmd Operations Team
-----------------------	-----------------------

Current Version - 2.2

Details Of Current Revision	Review Type	Reviewed By	Review Date (Month DD, YYYY)
Annual Updates	Technical SME	Chintan Gandhi	January 15, 2020
	Final Approver	Narendra Shaligram, Abhijit Mane	August 13, 2020

Revision History

Author Name	Version	Details Of Revision	Approved By	Approval Date (Month DD, YYYY)
Hrushikesh Bhosle	1.0	Hosting provider updates	Narendra Shaligram	March 1, 2019
Hrushikesh Bhosle	2.0	Annual Updates	Narendra Shaligram, Siddhi Baralay	January 23, 2020
Hrushikesh Bhosle	2.1	Minor Updates	Narendra Shaligram, Siddhi Baralay	Jul 06, 2020

Table of Contents

1. General Information	5
1.1. Document Conventions	5
1.2. Acronyms	5
2. Data Extraction	6
2.1. Overview	6
2.2. Prerequisite for Data Extraction using Data Pull	6
3. Data Extraction Procedure	6
3.1. End-to-End Data Flow	7
3.1.1. Practice Environment	8
3.1.1.1. FIGmd Enterprise Connector (FEC)	9
3.1.1.2. Practice Systems	9
3.1.2. Registry Environment	10
3.1.2.1. FIGmd Enterprise Connector (FEC) Management Server	11
3.1.2.2. Clinical Data Upload Server (CDUS)	11
3.1.2.3. Clinical Data Repository	12
3.1.2.4. Data Marts	12
3.1.2.5. Registry Dashboard	13
3.1.3. FEC Installation	13
4. FAQs	14
4.1. About FEC	14
4.2. Registry Dashboard	15

1. GENERAL INFORMATION

1.1. Document Conventions

Callouts

- Alpha-numerical callouts in the images represent processes.
- The callout prefixed by (Figure 1)
 - **P** denotes the practice side component and the number indicates the sequence of the pull process.
 - **R** denotes the registry side component and the number indicates the sequence of the pull process.

Hyperlinks

- Hyperlinks have been used in the document to easily reference detailed explanations related to a specific topic placed at some other location within the document.

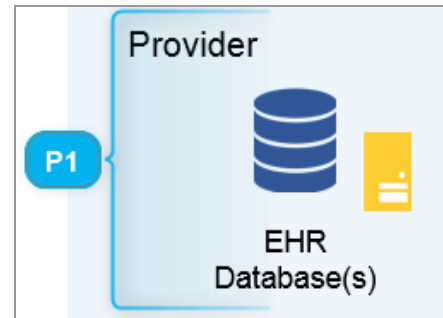


Figure 1: Alphanumeric Callouts

1.2. Acronyms

Acronyms	Description
CCDA	Consolidated Clinical Document Architecture
CDR	Clinical Data Repository
CDUS	Clinical Data Upload Server
DD	Data Dictionary
EHR	Electronic Health Record
FEC	FIGmd Enterprise Connector
GCP	Google Cloud Platform
GCS	Google Cloud Storage
LIS	Laboratory Information System
PMS	Practice Management System
RCM	Revenue Cycle Management

2. DATA EXTRACTION

2.1. Overview

FIGmd retrieves data from the client's EMR either by Data Pull or Data Push method of extraction.

For Data Pull, **FIGmd's patent-pending** data extraction software - the **FIGmd Enterprise Connector (FEC)** is installed on a workstation. The registry reporting process is fully managed by FIGmd and presents minimal impact to the practice with optimum results. In this process, the least effort is required from the practice's technical staff or the EHR vendor.

2.2. Prerequisite for Data Extraction using Data Pull

- Microsoft® Windows Operating System (O/S) with Microsoft® .NET 4.0 framework installed.

3. DATA EXTRACTION PROCEDURE

In the **Data Pull** method of data extraction, the FEC is installed on a computer that has access/connectivity to the EHR database (or a current copy).

A **read-only** user account is required for the FEC to directly access the EHR database. Once mapping to the appropriate fields is completed, the FEC performs a Data Pull at predefined intervals and submits the data to the registry.

The **Data Pull** environment is divided into

1. [Practice Environment](#)

The **Practice** environment comprises of

- [FIGmd Enterprise Connector \(FEC\)](#)
- [Practice EHR server](#)

2. [Registry Environment](#)

The **Registry** environment comprises of

- [FIGmd Enterprise Connector Management Server](#)
- [Clinical Data Upload Server](#)
- [Clinical Data Repository](#)
- [Data Marts](#)
- [Registry Dashboard](#)

Note:

Depending on the data received from the **EHR**, **FIGmd** may need to integrate with the **Practice Management System (PMS)** for any missing data.

3.1. End-to-End Data Flow

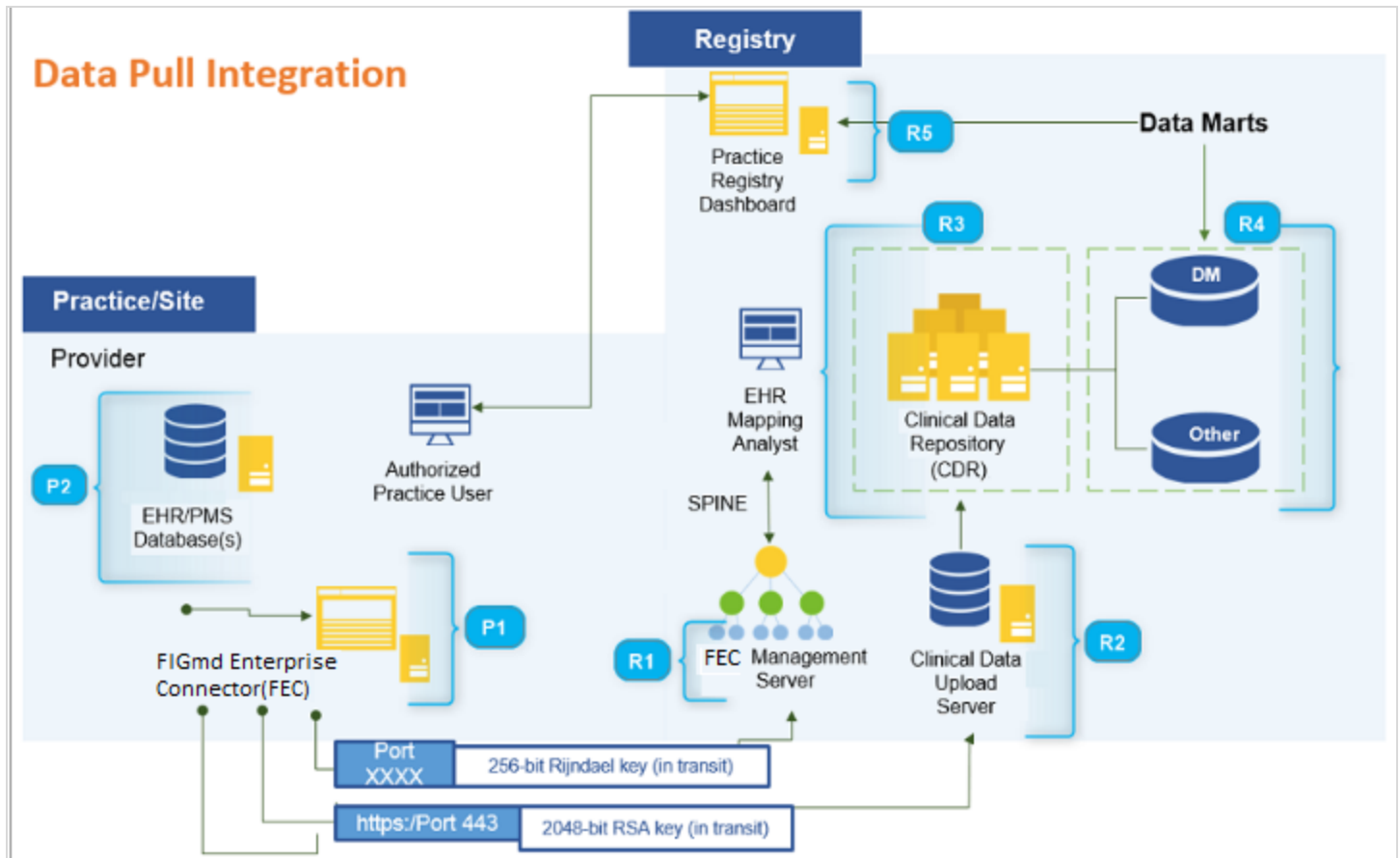


Figure 2: Data Pull Data Flow

Practice Environment	
P1	FIGmd Enterprise Connector
P2	Practice Systems (EHR, PMS, RCM, LIS)
Registry Environment	
R1	FEC Management Server
R2	Clinical Data Upload Server
R3	Clinical Data Repository
R4	Data Marts
R5	Registry Dashboard

3.1.1. Practice Environment

The practice environment comprises of:

- P1- [FIGmd Enterprise Connector](#)
- P2- [Practice Systems](#)

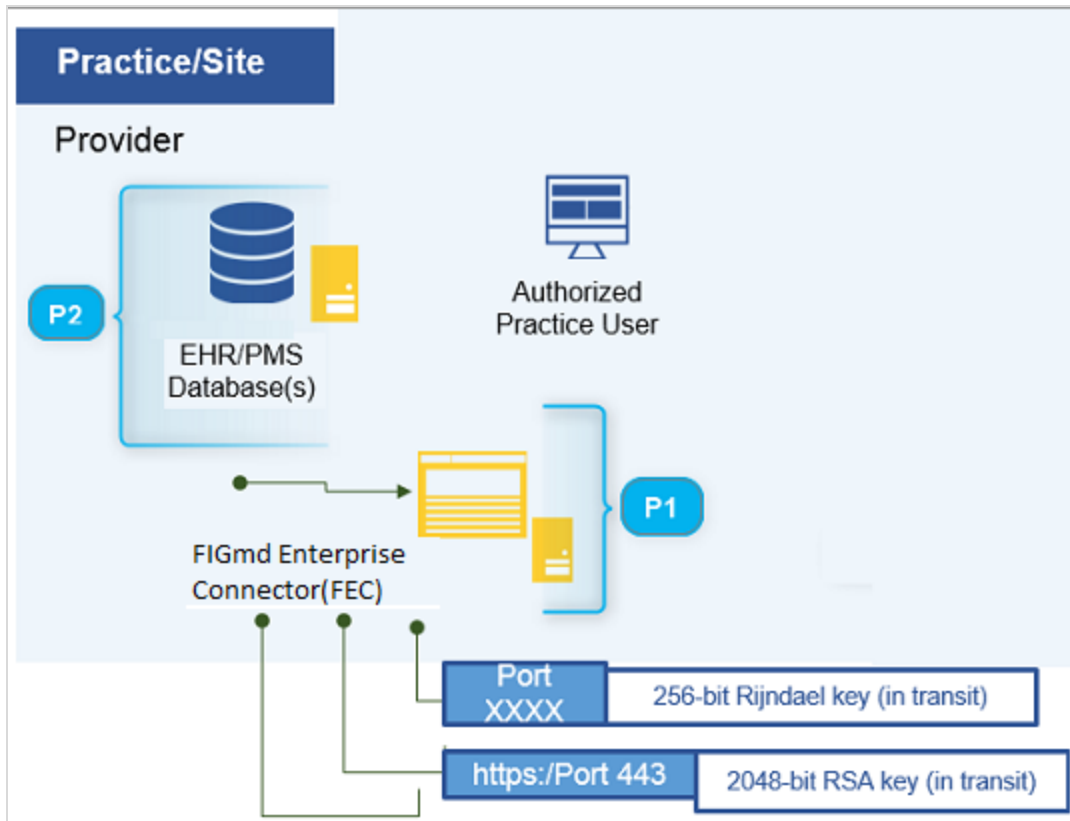


Figure 3: Data Pull at Practice Environment

3.1.1.1. FIGmd Enterprise Connector (FEC)

The FEC (Figure 4)

- Serves as a link between the **registry** and the **practice**.
- Transmits data from the **practice EHR** server to the **Clinical Data Upload** server at **FIGmd** via a secure port.
- Initiates data mapping immediately after the installation.
- Performs data pull on the **EHR** server once the required field mapping is completed.

Technical Specifications

- Microsoft Windows operating system with Microsoft.Net 4.0 framework needs to be installed.
- A **read-only** user account is needed to access the EHR database.

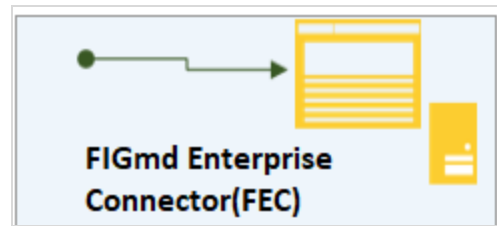


Figure 4: FEC

[Back to the End-to-End Data Flow](#)

[Back to Practice Environment](#)

3.1.1.2. Practice Systems

Practice EHR/PM system holds the patient's clinical data (Figure 5).

Prerequisites

The practice EHR can be:

- **EHR** and/or a **billing database** (PM System).
- A computer system at the **practice** side that stores patient's clinical encounter details.

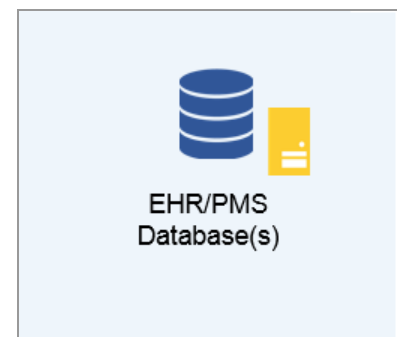


Figure 5: EHR

[Back to the End-to-End Data Flow](#)

[Back to Practice Environment](#)

3.1.2. Registry Environment

The registry environment comprises of:

- R1. [FEC Management Server](#)
- R2. [Clinical Data Upload Server](#)
- R3. [Clinical Data Repository](#)
- R4. [Data Marts](#)
- R5. [Registry Dashboard](#)

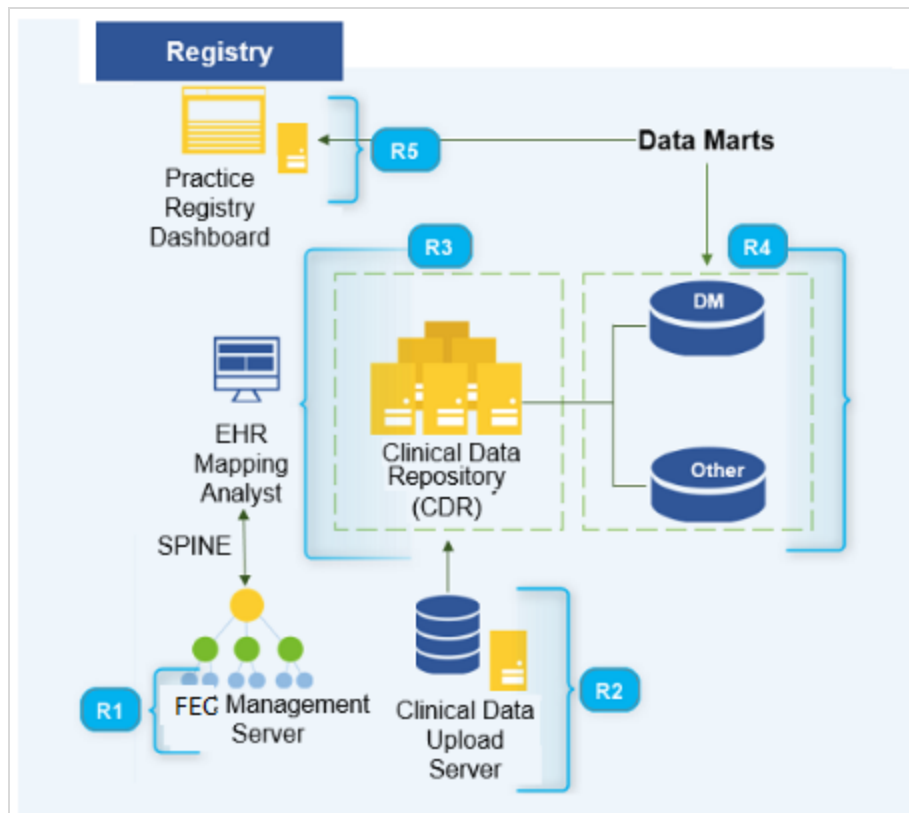


Figure 6: Data Pull in Registry Environment

3.1.2.1. FIGmd Enterprise Connector (FEC) Management Server

Purpose

The **FIGmd Enterprise Connector (FEC) Management Server** (Figure 7),

- Handles the FEC installed at the practice side.
- Acts as a proxy to FEC.
- Initiates a session on this connection for data extraction from **practice EHR**.

Prerequisites

- A connection between **FEC** and **FEC Management Server** is established after the FEC is installed.
- It securely connects to the port using a 256 bit Rijndael encryption key.

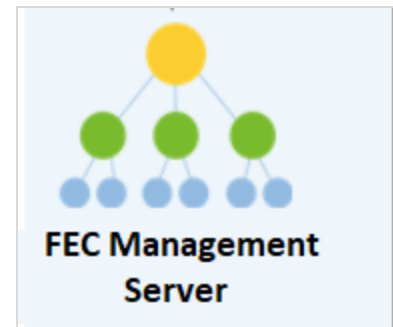


Figure 7: FEC Management Server

[Back to the End-to-End Data Flow](#)

[Back to Registry Environment](#)

3.1.2.2. Clinical Data Upload Server (CDUS)

The **practice FEC** accesses **CDUS** to transmit the de-identified clinical data that is reported to the registry (Figure 8).

A scheduled job pushes the encrypted data from the **practice EHR** to the **CDUS** hosted on the **GCP** that resides out of the practice IT system.

The data is stored in a **CCD compliant format** in two file types:

- Demographic data file.
- Clinical data file.

Purpose

CDUS in FIGmd environment:

- Uploads/transmits all the data related to a patient visit to the **Clinical Data Repository (CDR)**.
 - CDUS upload sessions can only be initiated at the practice side and not from the registry data center.
- Uploads the patient details into the **Registry Data Center**.

Prerequisites

- The CDUS is hosted on a cloud environment outside the practice IT system.
- The upload takes place via https: port 443 using a 2048-bit RSA encryption key.

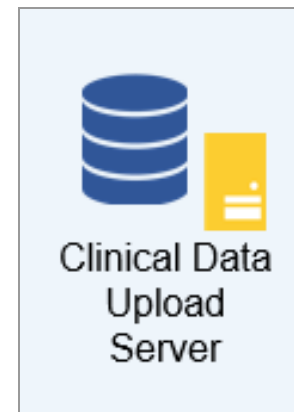


Figure 8: CDU Server

[Back to the End-to-End Data Flow](#)

[Back to Registry Environment](#)

3.1.2.3. Clinical Data Repository

The **Clinical Data Repository** (CDR) stores data uploaded through the **Clinical Data Upload** (CDU) server (Figure 9).

Purpose

- It processes the structured data collected by FEC and removes the duplicate and redundant data. The data processing involves:
 - Data Mapping
 - Data Validation
 - Data Cleaning
 - Data Loading
- Stores the data in a normalized CDR format.

Prerequisites

- CDR is stored on Google Cloud Storage (GCS) bucket. By default, data is encrypted using Google managed keys.



Figure 9: CDR

[Back to the End-to-End Data Flow](#)

[Back to Registry Environment](#)

3.1.2.4. Data Marts

Data from the **CDR** is converted into FIGmd specific database format called **Data Marts** (Figure 10).

- Support practice requirements such as quality measure calculations.
- Are displayed on the practice dashboard for review.

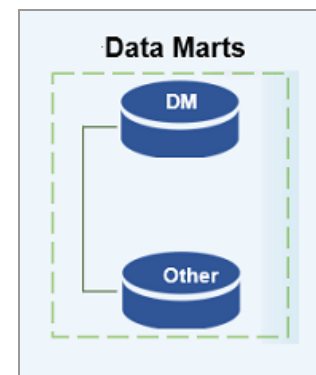


Figure 10: Data Marts

[Back to the End-to-End Data Flow](#)

[Back to Registry Environment](#)

3.1.2.5. Registry Dashboard

The dashboard displays measure-specific data (Figure 11).

It supports:

- View measure details.
- Export measure details in the required format (PDF, .CSV, and .XLS format).
- View and analyze the performance trend of measures against the registry benchmark and registry average.
- Generate reports.
- Raise tickets through the service desk.

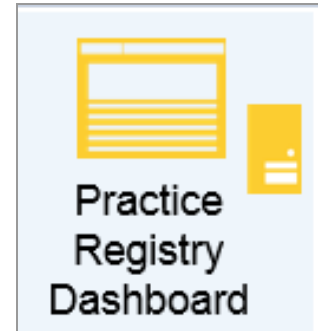


Figure 11: Practice Registry Dashboard

[Back to the End-to-End Data Flow](#)
[Back to Registry Environment](#)

3.1.3. FEC Installation

FIGmd sends **FEC** installation link via email to the authorized IT personnel. The authorized IT personnel will use a local admin account while installing the FEC in the practice environment.

Follow the below steps to install FEC:

Role of IT Personnel:

1. Click the installation link in the email **OR**
Copy the FIGmd FEC installation link to a browser and run it. A zip file containing the FEC setup gets downloaded.
2. Right-click **Setup.exe** and click **“Run as administrator”**.
3. Enter the **registration key** emailed with the installation link in the displayed field.
4. Select the server to install the FEC¹.
5. Configure FEC to extract patient data from EHR (Refer notes to the right).

Prerequisites

- Microsoft .NET Framework 4.0 or later
- Server Windows 2008 and above
- Microsoft Access 2010
- **Read-Only** account for the FEC to access the practice EHR database.

Role of FIGmd Mapping Team:

1. FIGmd ETL team will interface with practice EHR database via FEC using SPINE to create a map for the respective practice. The team may ask for the assistance of the IT personnel in the final mapping process.

Notes:

- The extracted data is temporarily stored in an encrypted compressed format.
- A scheduled job then pushes the data to the FIGmd database hosted on the Google Cloud Platform (GCP).
- The extracted data is then processed in the registry CDR warehouse.

Notes:

- To extract the missing data if any, FIGmd’s FEC may need to integrate with the Practice Management System (PMS).

¹ FEC is installed as an add-on service.

4. FAQs

4.1. About FEC

1. Who installs the FEC?

The participant practice/group admin installs the FEC. FIGmd technical support team may assist as required.

2. Where is the FEC installed?

The FEC is installed on a machine (typically within the practice network) that has access/connectivity to the practice EHR database.

3. Who can access the FEC?

Practice/Group IT admin and FIGmd staff can access FEC for troubleshooting.

4. What does the FEC connect with?

The FEC connects to the EHR database having a read-only account.

5. Does the FEC have access to PHI?

Yes, FEC has access to PHI.

6. Does the FIGmd FEC store PHI?

No, the FEC does not permanently store PHI, the registry stores the PHI. The data extracted by FEC is temporarily stored in a compressed and encrypted format, on the local file system. Once securely uploaded to the CDUS, the extracted data is permanently deleted from the local file system.

7. What are the outgoing connections from the FEC?

The only outgoing connection from the FEC is from GCP to the CDUS.

8. What are the hardware requirements for installation of the FEC?

The minimum specifications for the computer (or virtual machine) running the FIGmd Enterprise Connector (FEC) service are:

- Processor: 4 vCPU.
- Memory: 8 GB *
- Hard Drive: 50 GB of free space expandable to 200 GB
- Operating System: Microsoft Windows
- Microsoft .NET 4.0 framework
- Broadband Internet Access

* Up to 8 GB (Giga Bytes) of memory is required only during scheduled data extraction and upload jobs.

On an average 700-800 MB (Mega Bytes) of memory will be used while the service is idle.

This configuration will accommodate the majority of large sites. However, additional resources may be required.

4.2. Registry Dashboard

1. Where is the registry dashboard hosted?

The registry dashboard is hosted on the Google Cloud Platform.

2. Who deploys the registry dashboard portal?

The FIGmd delivery team deploys the registry dashboard.

3. Who can access the registry dashboard?

Practice Admin, Practice clinician can access the registry dashboard.

4. Does the registry dashboard display PHI?

Yes, the registry dashboard displays PHI.

5. What are the hardware requirements for registry dashboard deployment?

Following browsers are compatible with registry dashboard deployment:

Browser	Version
Chrome	65 and above
Safari	11 and above
Mozilla Firefox	60 and above
Internet Explorer	11 and above