EMR EHR Connectivity 2.0

Context Management – Business View

December 23, 2019

Document Version & Status: 1.0 – DFC (Draft for Comment)

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1. INTRODUCTION

1.1 Overview

Context Management allows an EMR to include a specific context when requesting information from other systems so that the information returned is relevant to the provided context. For example, requesting information from an EHR product or service with the context of the desired patient will return information only for that specific patient without the need for the EMR user to manually search for information pertaining to that patient. This allows for a more efficient and natural transition for the clinician when information is presented from different systems that leverage Context Management.

1.2 Context Management

Context Management defines a standard for an EMR to communicate to EHR services or viewlets in a way that allows the EMR to provide information that is specific to a given context. Examples of context that can be shared include patient, provider, or any other context, as long as it is defined and understood by all systems expected to retrieve or provide the context. This document defines EMR requirements for context management.

Context Management provides a streamlined and logical transition when presenting information from multiple systems. For example, a clinician reviewing a patient's medical profile may want to connect to another system (e.g., Digital Health Drug Repository / DHDR) to retrieve dispensed medication history for that same patient could seamlessly connect to and access DHDR (if the EMR Offering leverages Single Sign-On) information specific to the patient. While this can be accomplished by simply searching for information specific to the patient from the DHDR, each system may have different ways to perform queries for a specific patient. Context Management standardizes the method to request information for a specific patient to reduce or eliminate the need to develop a different query for each system, reducing development time and establishing a more standard approach.

1.3 Business Drivers

Health care providers can deliver enhanced patient care with streamlined access to information and the ability to coordinate with other care providers. Integrating EMR Offerings with provincial EHR services is one of the ways to help clinicians achieve this goal. Launching a website is one method by which EMR users access EHR services. EMR users want the website to be launched with information relevant specifically to the same patient as the active patient opened within their EMR system. For example, if the EMR user is looking at a patient record in their EMR and launches a viewlet; when the viewlet launches, information pertaining to the same patient is automatically (and seamlessly) presented in a browser window.

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2. SYSTEM VIEW

2.1 System Overview

There are conceptually four systems involved in context management from an EMR Offering.

1. **EMR Offering:** Point of service used by clinicians to access EHR services
2. **ONE Access Provider Gateway:** Orchestrates the identification, authentication of the EMR user and EMR Offering and their requests for authorizations to an EHR Service. It also provides information to the EMR Offering needed to interact with the viewlet and EHR service.
3. **Context Management System (CMS):** Receives context data from EMR Offerings and provides it to viewlets
4. **EHR Service or Context-Aware Viewlet**: The service that leverages and expects to receive context data.

2.2 High-Level Flow of Context Management

The diagram below provides an example of the workflow of an EMR user interacting with an EHR Service that leverages a viewlet that uses patient context sharing. This specific example is of the DHDR EHR Service that leverages the PCOI viewlet. The steps that pertain to patient context sharing in the diagram are:

a) **Step 2: Get OAuth2 token**: When attempting to connect to the EHR service (in this case DHDR EHR Service), the CMS URL is provided to inform the EMR Offering of the endpoint of where to set the patient context.
b) **Step 3: Put CMS context**: The EMR Offering saves the necessary patient context data for whom it is about to request information. It then
c) **Step 5: VFSPA launch:** The EMR Offering then initiates a call to the Context-Aware service (which is a viewlet or Virtual Framework Single-Page Application or VFSPA in this case). The viewlet serves the website to perform a specific function for the EHR service (e.g., the viewlet collects patient consent information).
d) **Steps 6 through 8:** The Context-Aware service retrieves the patient context data left by the EMR Offering to process it as needed. This is performed without direct EMR Offering interaction.

Note: There are additional steps described in this workflow that identify processes beyond patient context.

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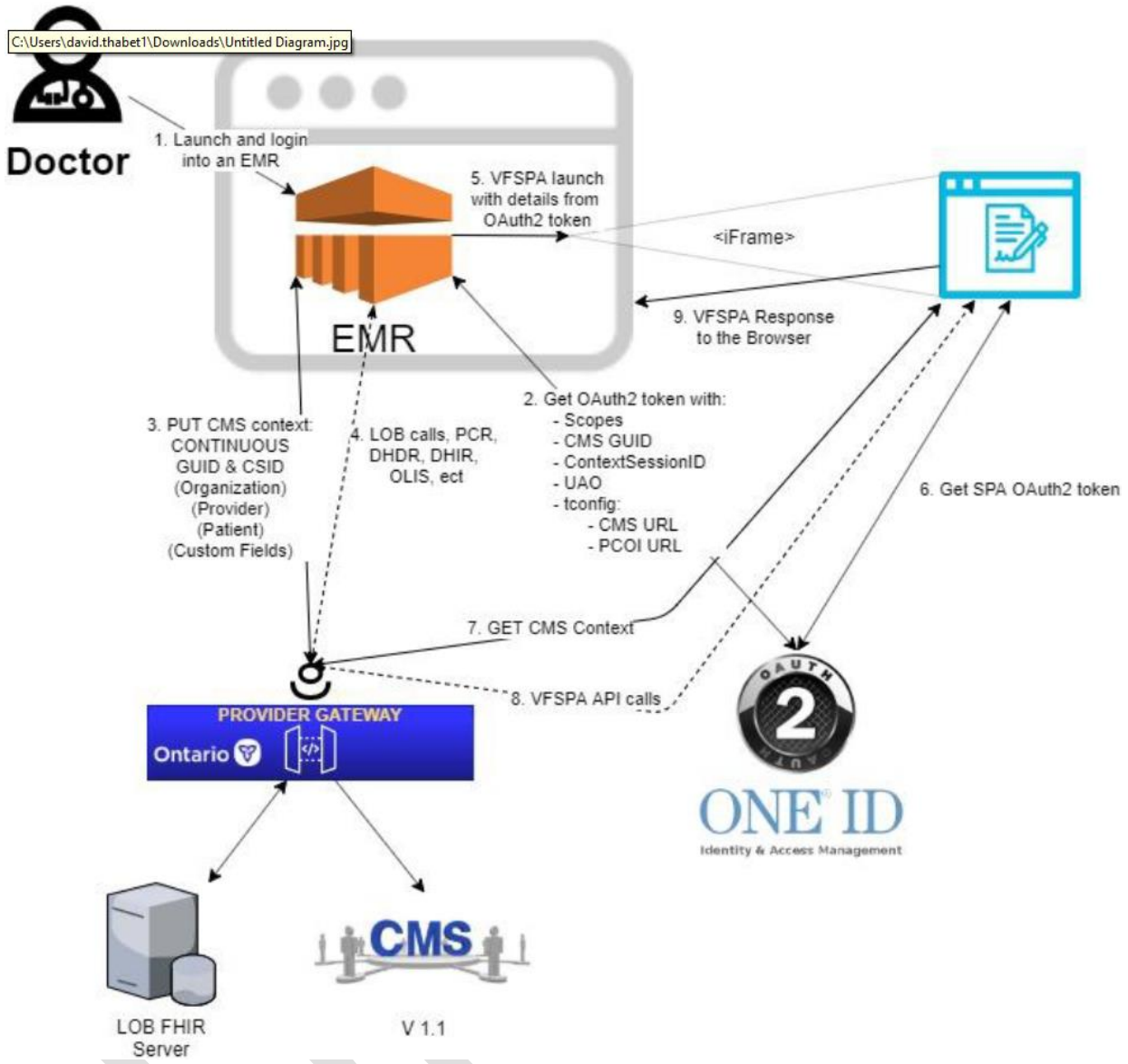

Figure 1 - High-level flow of EMR launching a viewlet service with patient context (Ontario Health, 2019)

2.3 Context Management Message Flow

The following sequence diagram depicts the message flow of an EMR Offering authenticating and connecting to and interacting with an EHR Service that leverages a viewlet that uses patient context. The boxed sections identify interactions specific to context management.

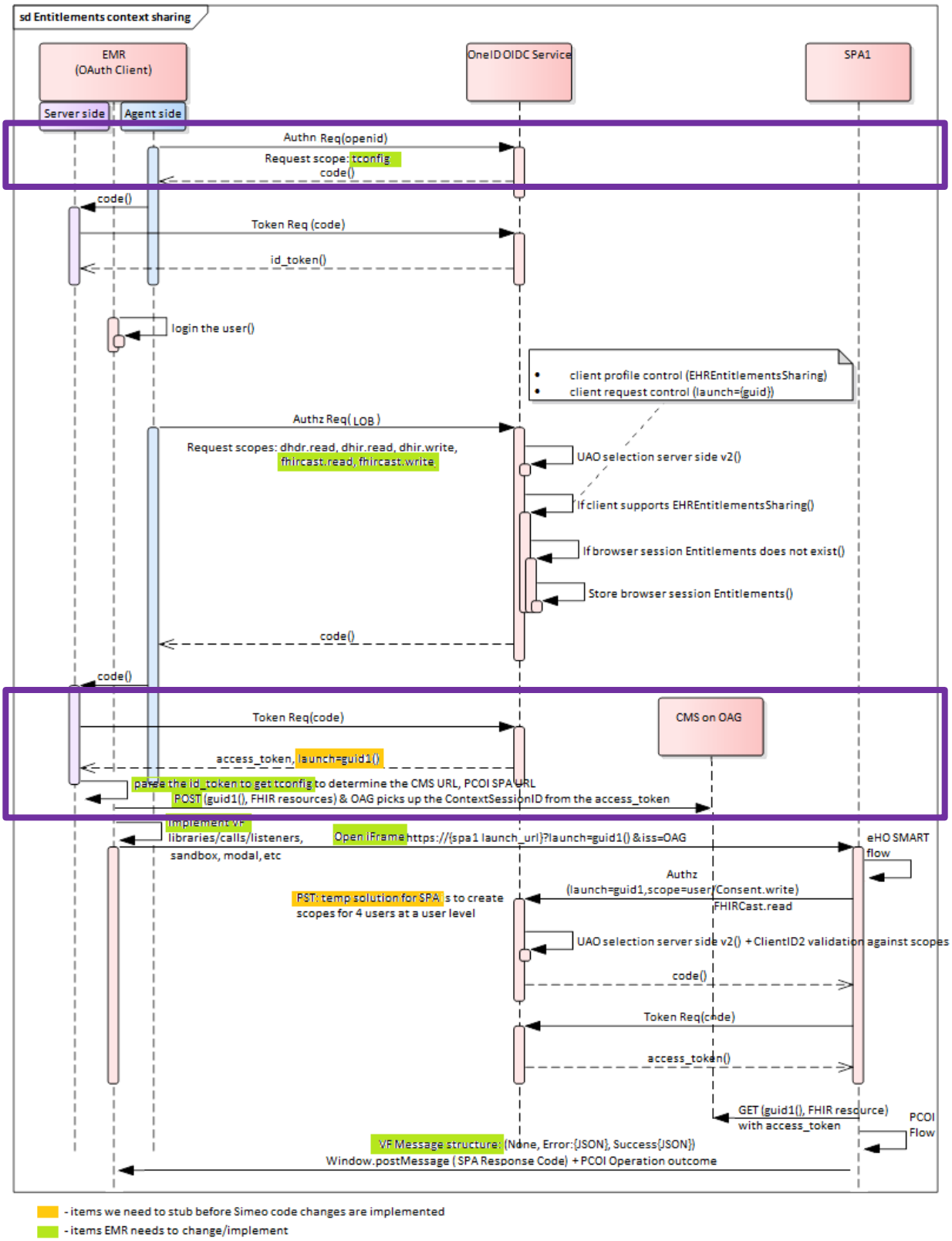

Figure 2 - Sequence diagram of EMR interacting with EHR service that leverages Patient Context (Ontario Health, 2019)

The diagram below assumes the EMR user has authenticated using their federated identity and the EMR system has extracted the ContextSessionID.

When an EMR user accesses a patient record within the EMR, then launches a viewlet while accessing an EHR service, the EMR Offering performs two main actions:

1. Sends patient context data (ContextSessionID and patient unique identifier) of the patient's record that the EMR user is viewing within their EMR.
2. Launches a web browser (i.e., iFrame, etc.) pointing to the viewlet.

The viewlet is redirected to the Federation ID Broker which validates to ensure the EMR user is authorized to access the Viewlet. Once the authorization is confirmed, the Federation ID Broker creates a new Federated SSO Token for the web browser to store and redirects the web browser to the Viewlet.

The Viewlet extracts the ContextSessionID from that new Federated SSO Token and uses it to query the CMS for the associated Patient ID. The Patient ID is returned to the Viewlet which it uses to determine if a record for the patient exists. If a patient record is found, the Viewlet presents it to the EMR user. If a patient record is not found, the Viewlet presents a patient search page to the EMR user.

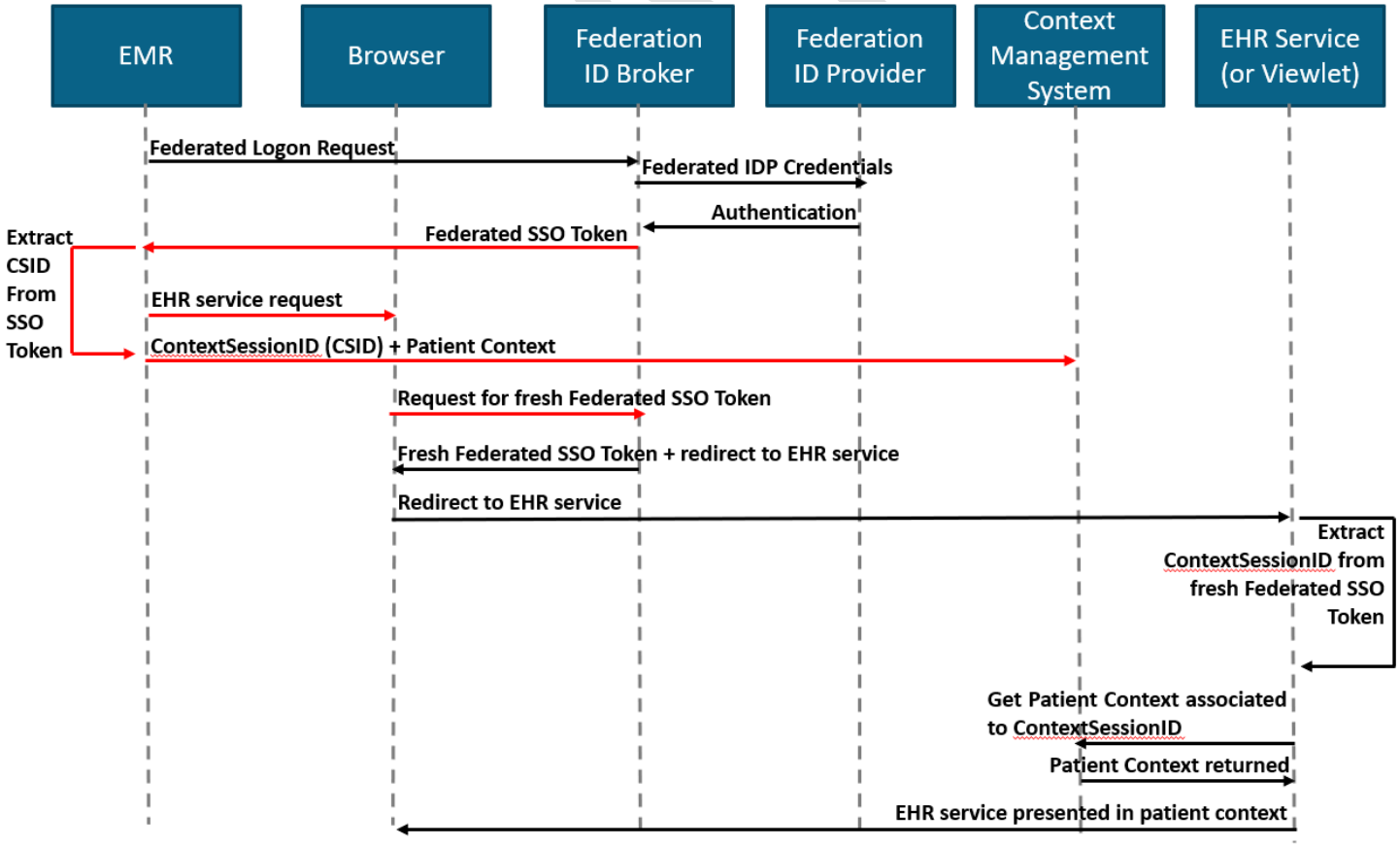

Figure 3 - Sequence diagram of EMR interaction with EHR service to pass patient context

3. DATA VIEW

3.1 Patient Context Parameters

The following section provides an example of patient context data sent from the EMR to the CMS. For the most up-to-date list, refer to https://simplifier.net/guide/OntarioContextManagement/ProfilesTransactions3.

ID	FIELD NAME	DATA TYPE	CARDINALITY	VALUE
1	contextSessionID	String	1..1	Populate with the ContextSessionID found in the SSO Federated Token
2	contextTopic	String	1..1	Fixed value "patientContext"
3	patientContext. Identifier1.type	String	1..1	Fixed value "**JHN**" (JHN = Jurisdictional Health Number)
4	patientContext. Identifier1.value	String	1..*	Identifier value pertaining to the patientContext.Identifier1.type (e.g., HCN value for JHN identifier type)
5	patientContext. Identifier1.system	String	1..1	The FHIR URI of the patient identifier assigning authority.
6	patientContext.birthDate	Date	0..1	Patient birth date in the format: YYYY-MM-DD (e.g., *2019-12-31*)
7	patientContext.gender	String	0..1	Accepted (case insensitive) values are: a) **male** b) **female** c) **unknown**

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4. APPENDIX A: GLOSSARY OF KEY TERMS AND DEFINITIONS

4.1 Acronyms and Abbreviations

This table identifies definitions for terms used within or that are relevant to this document.

ACRONYM	DEFINITION
CMS	Context Management System
DHDR	Digital Health Drug Repository
EHR	Electronic Health Record
EMR	Electronic Medical Record
FHIR	Fast Healthcare Interoperability Resources
HCN	Health card number
OAuth2	Open Authentication 2.0
PCOI	Patient Consent Override Interface
SAML	Security Assertion Markup Language
URI	Uniform Resource Identifier
URL	Uniform Resource Locator

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4.2 Definitions

The following are the terms and definitions used to describe the concepts used in this document.

TERM	DEFINITION
Context-Aware EHR Service	An EHR service that supports Context Management. **Note**: Not all EHR services support Context Management.
Context Response Wait Time	The amount of time (in seconds) that an EMR Offering MUST wait for a response back from any Context-Aware EHR Service. This time starts when the patientContext Topic is sent by the EMR Offering. This value is global, pertaining to all supported Context-Aware EHR Services.
EHR Service	A service hosted on the ONE Access Provider Gateway. An EHR Service may or may not supports Context Management. Each and every EHR Service will have its own unique target end-point within the EMR Offering.
Viewlet	A webpage or website that is a component of an EHR service used to fulfill a specific function or workflow for that EHR service. Some viewlets can be Context-Aware and leverage context sharing (e.g., PCOI).

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