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Exported Sep 09, 2020 at 12:58 PM

HL7 FHIR eReferral Workstream

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Added by Tim Berezny • Updated Jun 11, 2018 at 10:05 PM

/DocumentReference

40% EARLY DRAFT

Overview:

Referrals often need additional documents attached. The DocumentReference resource acts as a wrapper around an attachment (.PDF, .TIFF, etc...) to provide attachment meta-data and reference or hold the attachment itself.

The mechanism for sharing documents is designed around simple document sharing between systems, similar to the way that a document might be emailed to another party, with some minor meta-data enhancements. The document sharing methodology is *not* designed around deep integration of specialized clinical document repositories which have strong functionality around document authentication, authorship, custodians, etc...

Links:

- Resource: DocumentReference
- Data Type: Attachment

Relevant chat.fhir.org Threads

- DocumentReference vs. Composition - It is recommended to use DocumentReference instead of Composition for attachments such as PDFs (Composition is meant for FHIR documents)
- Bidirectional Resource Referencing - no reply yet

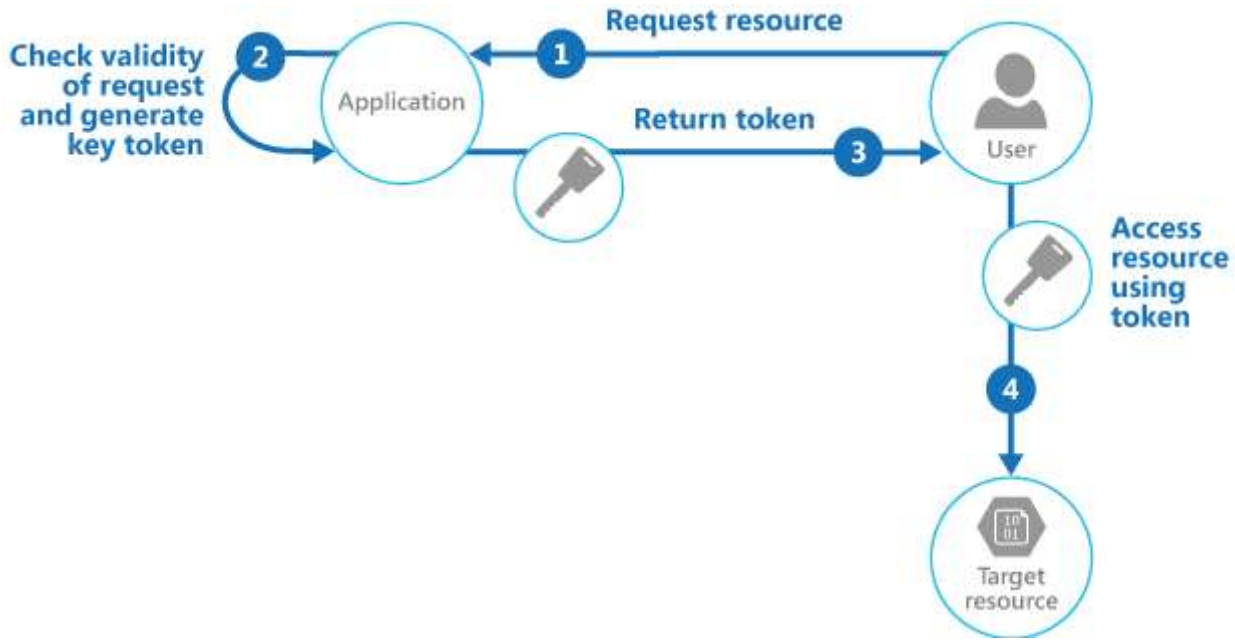
Usage

DocumentReference is used in the following scenarios & messages:

1. When submitting a new ServiceRequest (via ServiceRequest.supportingInfo)
2. As an attachment to a communication (via Communicatoin.payload.content[x]). In this case, this DocumentReference should **not** be attached by the referral target to ServiceRequest.supportingInfo, it is only connected via the Communication.
3. As a part of any post-submitted message that includes a ServiceRequest resource with attachments (via ServiceRequest.supportingInfo).
4. In response to a "Request for Information" process (process TBD)

Important Decisions & Rationale:

- Allow attachments as inline or references.
  - **referenced url (preferred)** *(content.attachment.url)*: To enable strong transmission performance and scalability, reference files externally. The recipient application would then be responsible to GET the attachment asynchronously. A valet-key pattern is used to reference the attachment.
    When possible, it is preferred to use the referenced url method instead of inline method, to support future scalability and performance.
  - **inline Base64** (*content.attachment.data)*: Including Base64 documents inline is the simplest, but less reliable method to send attachments. This should be used only for smaller attachments (implementer level decision) to avoid network and transmission timeout issues.
    This method should only be applied when referenced url is not a realistic option.
- **Valet-key pattern**: A valet-key pattern should be used for attachments referenced via url. It allows systems to issue a *temporarily authenticated link for a specific document* that the recipient can use to GET the attachment. This pattern simplifies access and authentication processes between eReferral systems. Learn more about valet-key patterns here. TODO: Detailed notes about implementing this pattern are included at the bottom of this page.



Valet Key Pattern (https://docs.microsoft.com/en-us/azure/architecture/patterns/valet-key)

- **The sender is responsible for hosting referenced attachments:** There is no expectation of a centralized document storage repository service to be provided, the sender is responsible for arranging to host referenced files. However, this model does enable central repositories that follow the valet-key pattern, if this is a future use case.
- **DocumentReference.type is optional, supports full LOINC code value set**: However, due to the length and complexity of the value set, some recommended values are suggested in the specification.

- **DocumentReference.category is not used** because it essentially duplicates the DocumentReference.type element.
- **Use DocumentReference instead of Composition** to manage attachments. The Composition resource is designed for FHIR documents, not attachments such as PDFs.
- **Restrict to ONE document per DocumentReference** (*.content as 1..1 instead of 1..**): It is impractical to enable multiple attachments (.content) per DocumentReference, since Identifiers are associated with at the DocumentReference level which would imply that one Identifier could be shared across
- **Don't use masterIdentifier**: Documents can be included when submitting an initial ServiceRequest by the referral source or can be added after by the referral target. This makes the meaning of masterIdentifier muddy, so exclude from the profile.

Resource Profile - DocumentReference

- **DocumentReference**
  - ~~**masterIdentifier [0..1] (Identifier)**: The *source* (filler) system identifier (version specific)~~
  - **identifier [0..*] (Identifier):** General identifiers
  - **status [1..1] (code):** √ current | √ superseded | √ entered-in-error (=current in most cases)
  - ~~**docStatus [0..1] (code):** preliminary | final | appended | amended | entered-in-error~~
  - **type [0..1] (CodeableConcept):** The type of document - uses LOINC document Type valueset. A simpler subset is suggested for implementers, but the full valueset is supported.
  - ~~**category [0..*](CodeableConcept):** Categorization of the document (duplicates "type" functionality)~~
  - ~~**subject [0..1] (Reference):** who/what is the subject of the document~~
  - **date [0..1] (instant):** The date the document was put into the recipient (RMS Target) system
  - **author [0..*] (Reference):** The PractitionerRole of the user that updated the document. ?Is this a realistic expectation given the functionality of existing systems on the market?
  - ~~**authenticator [0..1] (Reference):** who/what authenticated the document~~
  - ~~**custodian [0..1] (Reference):** Organization which maintains the document~~
  - ~~**relatesTo [0..*] :** Relationships with other documents~~
    - ~~**relatesTo.code [1..1] (code):** replaces | transofrms | signs | appends~~
    - ~~**relatesTo.target [1..1] (Reference):** Target of the relationships~~
  - ~~**description:** Human readable description~~
  - ~~**securityLabel:** Document Security Tags~~
  - **content [1..*1]:** Document Referenced
    - **.attachment.url:** Null if not authenticated, URL + Access token if authenticated
    - ~~**.format [0..1] (Coding):** Fomat/Content rules for the document~~

- ~~**context [0..1] (BackboneElement) -** Clinical context of the document~~

DataType: Attachment

- **Attachment**
  - **contentType [0..1] (code):** Mime Type of the content (e.g., PDF)
  - **language [0..1] (code):** Human language of the content (not expected to be used)
  - **data [0..1] (base64binary):** Data inline, Base64ed (used for INLINE method instead of url)
  - **url [0..1] (url):** Url where the data can be found (used for REFERENCE method instead of .data)
  - **size [0..1] (unsignedInt):** Number of bytes of content (if URL provided)
  - **hash [0..1] (base64bindary):** Hash of the data (sha-1, base64ed) (if URL provided, used for validating that data at a referenced URL has not changed and is the intended document)
  - **title [0..1] (string):** label to display in place of data
  - **create [0..1] (dateTime):** Date attachment was first created

Suggested Values for DocumentReference.type

The type of attachment (e.g., referral note, discharge note, etc...) in the DocumentReference can be specified with DocuentReference.type. The LOINC document type value set for this is incredibly large at > 1000 entries, which can be overwhelming. Also, some of these entries could be considered duplicate depending on the context (e.g., While any value in the value set can be used, this guide seeks to provide some helpful guidance to simplify the implementation of these codes. This guide breaks out some recommended values to general cases and common specific cases.

Note that the usage of DocumentReference.type is optional.

Common General Codes - These codes cover most use cases in a general manner. Use these codes as a starting point.

- 57133-1 Referral note <-- Use as "default" code for eReferrals.
- 51848-0 Assessment note
- 59284-0 Patient Consent
- 11488-4 Consult note
- 34109-9 Note
- 68607-1 Progress letter
- 18842-5 Discharge summary
- 11503-0 Medical records
- 46209-3 Provider orders (a.k.a., "medical orders")
- 11502-2 Laboratory report

- 70004-7 Diagnostic study note
- 56445-0 Medication summary Document

Common Workflow Specific Codes

- 64298-3 Power of attorney
- 47048-4 Diagnostic interventional study report Interventional radiology
- 18748-4 Diagnostic imaging study
- 51851-4 Administrative note
- 34117-2 History and physical note
- 51852-2 Letter
- 56447-6 Plan of care note
- 34895-3 Education note
- 64299-1 Legal document
- 74213-0 Discharge instructions
- 68608-9 Summary note
- 60591-5 Patient summary Document
- 67796-3 EMS patient care report - version 3.1 Document NEMSIS
- InterRAI
  - 74188-4 InterRAI Acute Care (AC) Hospital Document
  - 74194-2 InterRAI Community Health Assessment (CHA) Document
  - 74197-5 InterRAI Contact Assessment (CA) Document
  - 74187-6 InterRAI Emergency Screener for Psychiatry (ESP) Document
  - 74196-7 InterRAI Home Care (HC) Document
  - 74195-9 InterRAI Long Term Care Facility (LTCF) Document
  - 74189-2 InterRAI Palliative Care (PC) Document
- Discipline Specific Notes
  - 34786-4 Mental health Note
  - 34746-8 Nurse Note
  - 34801-1 Nutrition and dietetics Note
  - 28578-3 Occupational therapy Note
  - 51855-5 Patient Note
  - 28579-1 Physical therapy Note
  - 68834-1 Primary care Note
  - 28653-4 Social work Note
  - 28571-8 Speech-language pathology Note
  - 47042-7 Counseling note
  - 47043-5 Group counseling note

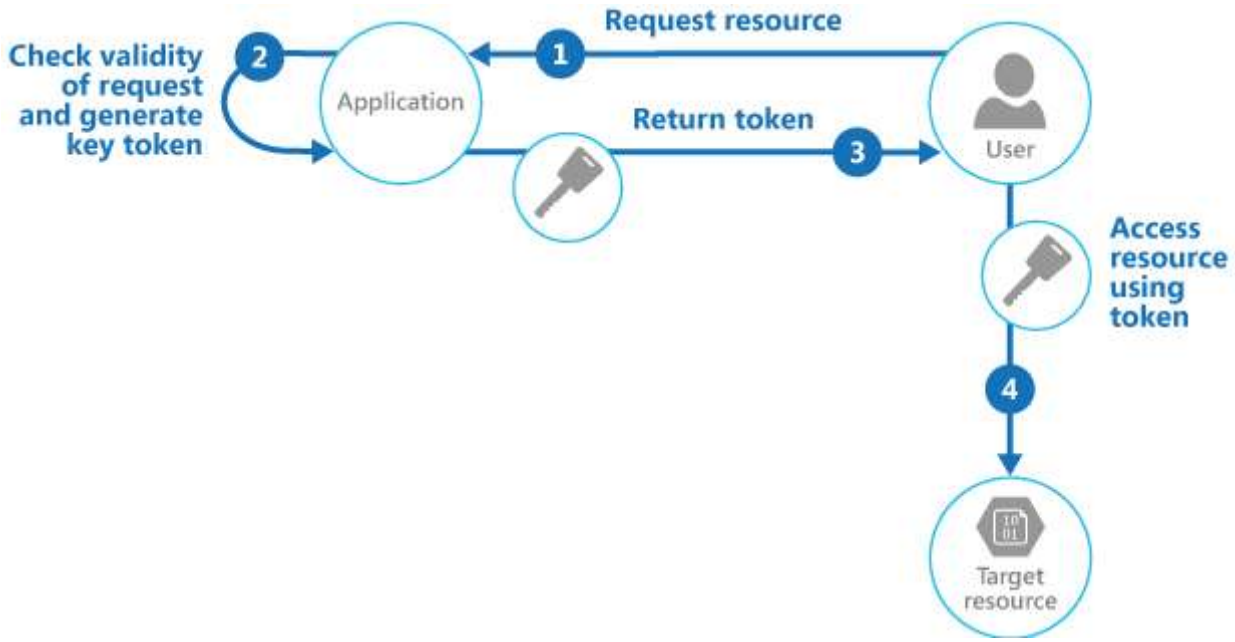
- 46210-1 Case manager Note
- 68629-5 Allergy and immunology Note

- Physician Actions
  - 57829-4 Prescription for medical equipment or product Document
  - 57833-6 Prescription for medication Document
  - 34847-4 Surgery Consult note

Valet Key Pattern

Things to cover...

- Token expiry time
- more...



Valet Key Pattern (https://docs.microsoft.com/en-us/azure/architecture/patterns/valet-key)

Sample Code

The following sample code (with inline/reference modifications) should be able to be accepted by any system compliant with this guide. Note that both inline (content.data) and reference (content.url) are included in this paylaod normally only one would be included. When both are included, use the inline data (content.data).

```
{
  "id": "12345",
```

```
      "resourceType": "DocumentReference",
      "identifier": [
        {
          "type": {
            "coding": [
              {
                "code": "PLAC",
                "display": "Placer Identifier"
              }
            ],
            "text": "Placer Identifier"
          },
          "value": "ReferralSourceSystemX-16907",
          "assigner": {
            "display": "ReferralSourceSystemX"
          }
        },
        {
          "type": {
            "coding": [
              {
                "code": "FILL",
                "display": "Filler Identifier"
              }
            ],
            "text": "Filler Identifier"
          },
          "value": "ReferralTargetSystemY-39223",
          "assigner": {
            "display": "ReferralTargetSystemY"
          }
        }
      ],
      "status": "current",
      "type": {
        "coding": [
          {
            "code": "57133-1",
            "display": "Referral note"
          }
        ],
        "text": "Referral note"
      },
      "date": "2019-07-09T19:06:47.478+00:00",
      "content": [
        {
          "attachment": {
            "contentType": "text/plain",
            "language": "en",
            "data": "SGVsbG8gV29ybGQh",
            "url": "https://www.samplevaletkey.com/aGVsbG8gd29ybGQh",
```

```
          "size": "16",
          "hash": "2EF7BDE608CE5404E97D5F042F95F89F1C232871",
          "title": "helloworld.txt",
          "creation": "2019-07-09T19:06:47.478+00:00"
        }
      }
    ]
  }
```


Comments & Events

Fariba Behzadi, Standards specialist
I have reviewed the `class` domain for Document Reference Profile and here is my comment and recommendation:
eHealth Standards Comments
This LOINC Value set contains all different kinds of reports which are not related to Referral. Referral is not done only for procedures, So`Reson for Referral` should be the problem/condition list which, patient is Referred for.
eHealth Standards Recommendation
We recommend use of :
http://hl7.org/fhir/ValueSet/conditioncode Which all the terms are mapped to SNOMED CT
Jun 22, 2018 at 3:07 PM · Notified 1 person

Tim Berezny, CTO Caredove, Chair FHIR eReferral Specification Working Group
We've discussed previously the idea of a temporary spot to hold files so that they don't have to be included in payloads.

Here is an interesting approach to structuring the URL for that that I found in another application. Its timeout lasted just a few minutes before expiry. Note, i've put newline between parameters for visual clarity:

https://asana-user-private-us-east-1.s3.amazonaws.com/assets/125356833567/1110911528011964/108a13b04d34343897ccd20345d81f23

?**AWSAccessKeyId**=ASIAV34L4ZY4GQYPVLFL

&**Expires**=1554133856

&**Signature**=Hg7JjP8Lb%2FNSmuierkW%2F6tWh9eQ%3D

&**x-amz-security-token**=
AgoJb3JpZ2luX2VjENj%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3
QtMSJIMEYCIQDJCVvZsMGeBWDfYV3GFUVouefunw4EmWUz2XuQFot7XAIhAJlCLe
NpuyLX70pl9soJRlKBgRKWEL2csLlapgC55htvKuMDCJH%2F%2F%2F%2F%2F%2F%
2F%2F%2F%2FwEQABoMNDAzNDgzNDQ2ODQwIgw8DHWFYhIL37D%2Bk7gqtwO4
ViWpUvm21BREWxgne6pG4tvUrzxH5qf4lx54JeayvGaVwORfVfi9IfvK5iFJdYJ7%2F47ci
oi6GxOjmNqxUrUSM1HwBIYhrfg%2BpJx0a5LgYZ10EzHvESporZu89M%2BTZvuHDpfA
%2FK%2BUlKGdKpgOOrGNG4GsTFAoNnATFQ%2B8uKG06ZQpHuE86qMleSScx0e%
2FFODp8Vg%2BGZsuwKLzO9tUMPE0aRQa%2B4SvCOVox4%2F3q4FNVorExCY4xpH
s0rkA2XPHs%2FyUzgcHBEdn0FtuuJYTLCgb8ReaZUTIkKXawbCZRyLoscug5NhwABA
ujUWtaBuvFViTTDcPr0uBYxNHeFk9P%2B7qOXB3FyoMPPVjyazTWKeneWzNoChkh0
KCtANs0FMlZuXeiNrx7UB39fj9FVYtRR82wHQIIFQGHKIh1ZHNbg8aRk9Pn%2BXo1iVE
oF5xhVMQcANj5txyH0%2F1xWPvhjYOjsHYrF1vxGkh1OOspJVxdhGnnIIxgYCjwoK6AA
GH3FmLz8%2BJ3nSGXomAPT3rGA2Q72361kMed3Ax%2BKaPEjO6ul9dhBVN7IhfU04
sSRde1WfzxYK15NzCCLq%2FMOHiiOUFOrMBR%2FTTzLVDVxqhji2BSeYvj4GhGybiM
zGqtN48weaIvN2sZ0CC9ikRQFEEy%2BMshhErz0vnMkDZJldN6IkGuzCj9ya0xLjyuBO9
qgTCldByFXFlApGLP1Gg3lnAMOlfwWOWmolV%2FAVZQco5C0UlnfalLk13l6CVbFgAN
JQkRmtZlamc0W66yrQ6nPrr4yQKOVb8qG8Hf7wmMgcNCPV%2B20d6iQmcv%2BUDQ
Car

Apr 01, 2019 at 12:03 PM · Notified 91 people

Ted Jin, Architect 2, Integration and Solutions Architecture
Is it expected that the URL can also be pointing to relevant provincial assets if a patient's EHR or PHR records (e.g., discharge summary, DI report, and lab results, etc.) need to be included in the referral? If an RMS Source system is considered the source of truth, can it permanently keep the files referenced in the referral and make them electronically available to the recipient?

Apr 01, 2019 at 5:37 PM · Notified 91 people

Tim Berezny, CTO Caredove, Chair FHIR eReferral Specification Working Group
Very good question. I think that's probably a fair assumption. Practically speaking, it's a bit more difficult to pull off than transmitting documents, as it requires more "registration" across systems. My initial gut feeling is that both approaches should be fully thought through as supported.

Apr 02, 2019 at 9:25 AM · Notified 91 people

Ted Jin, Architect 2, Integration and Solutions Architecture
Do you think Blockchain/DLT can possibly be used in this case to help manage system identities and document access in a de-centralized fashion?

Apr 02, 2019 at 9:43 AM · Notified 91 people

Geoff Ramsay, Solution Architect
Hi Folks! Ted,

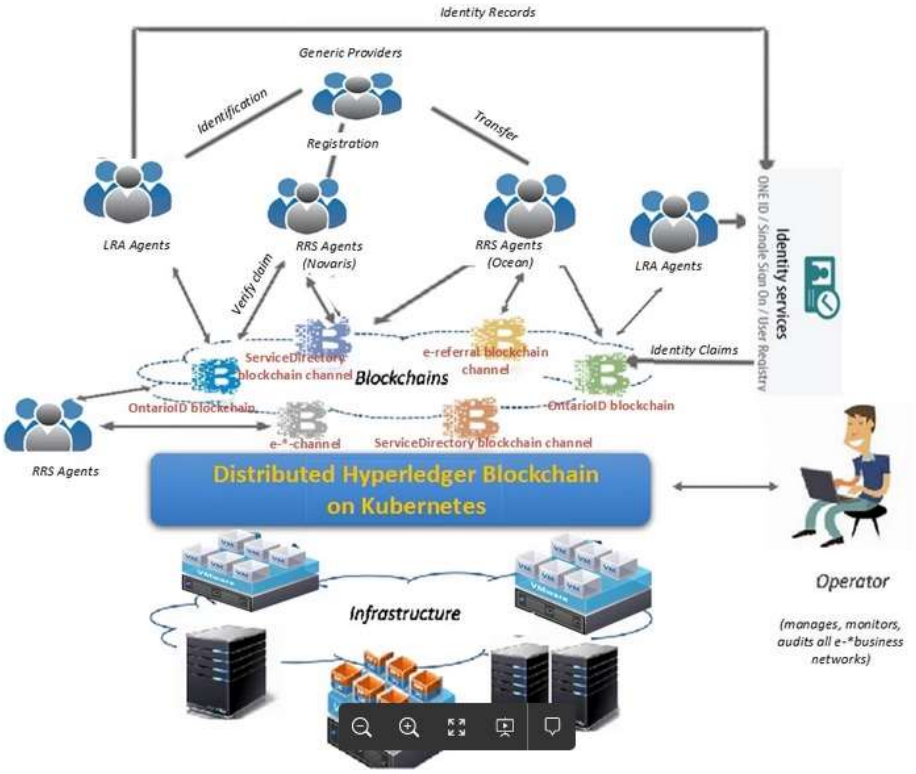
Want to note that it's usually the access keys in the URI parameter that has a time-to-live. The resource often hangs around after the shared key expires.
(apologies if that was obvious)

Microsoft does a good job of documenting this pattern:
https://docs.microsoft.com/en-us/azure/architecture/patterns/valet-key
Apr 04, 2019 at 4:13 PM · Notified 92 people

Ted Jin, Architect 2, Integration and Solutions Architecture
I don't disagree with the pattern itself. Just wanted to explore some possibilities as to how BC technologies can play a role here enabling easy resource sharing. My apologies if my question wasn't clear.
Apr 04, 2019 at 4:36 PM · Notified 92 people

Branko Koprivica, Architect 2
As I mentioned in one of my earlier posts, many of the (system) use cases that are necessary with the classical approach are not necessary with the block chain. For example, a classical approach of sharing data in a distributed fashion involves uploading data to a repository and then the recipient gets it from there i.e. it is a two-step process. With block chain, duplication is circumvented and data are replicated to all participants in real-time through distributed ledger technology and secured via private key cryptography.
The solution I proposed back in December was to leverage the existing LRA/ONEID assets in provisioning identities on the Blockchain (can be private or public chain). With this option, there would be two block chains comprising the solution: identity chain and (multi-channel) e-* chain.
Identity chain can be private or public the main difference being the level of sovereignty that is required (with public chain, the identity stays with the identity recipient forever and cannot ever be revoked by any organization; in contrast, with a chain such as HLF or Sovrin, the identity can be revoked by the organization that is in charge of the consortium).
Identity chain would be leveraged in all use cases of all e-* initiatives. e-* chain, if realized through HLF Fabric, would be comprised of multiple channels, one per e-* initiative e.g. eReferral, eShift, etc. Both identity and e-* chain can be either private or public. This depends on a particular e-* initiative and its throughput requirements (HLF has much higher throughput than Ethereum, for example). The option of using HLF with LRA/ONEID for identity chain is based on leveraging the existing LRA agents network and ONEID identity provisioning system: a client would enter LRA office with supporting identifying documents and leave the office with the digital identity provisioned on both the client's personal device and either public Blockchain or private eHO managed distributed identity block chain where the client's public key based digital global ID would

be registered during ONEID provisioning. This global digital ID would be derived from the public key generated within the client's smart device. The provisioning of OntarioID/EhoID would leverage the current ONE ID provisioning flows the difference being that the target system in this case would be (private or public) identity block chain and not the centralized database, AD and other downstream systems. ONE ID / LRA, upon getting the public key from the smart device and validating identifying documents, would associate the public key with the (provisioned) identity (1-to-1 mapping between the public key and OntarioID/EhoID). This association would serve as an identity attestation and would be digitally signed by the identity authority (e.g. eHO in case of HLF based private Blockchain) or authorities (e.g. MOHLTC for health cards, MTO for driver's licenses, Passport office for passports etc. in case a public Blockchain is used). The client would leave LRA office with the digital identity securely stored on his/her smart personal device (digital wallet). The client, who is the only private key holder for this identity, subsequently visits various offices that participate in various channels of e-* block chain e.g. service directory etc. The first use case in every such scenario is validation of the client's identity claim via the private key kept in the client's smart device. Once the identity is verified, the client and agent can transact via other e-* block chain channels. Every such transaction that creates data would result in the hash of the data being stored on the block chain. The (PI/PHI) data itself would reside off-chain. This data would also contain the hash of the URL endpoint serving as a FHIR data pointer for the resource (e.g. eReferral). If eReferral is deployed on a public Blockchain, there would be additional keys for signing the shared content to ensure tamper-proof sharing (this extra step would not be needed if private Blockchain is used). The referrer who is sending data to a referee would first sign the data pointer with the private signing key producing the hash. The referee's public key, which is also available on the Blockchain, would then be used to encrypt this hash and deploy it in the smart contract for exclusive access. The referee, via the system interfacing the Blockchain or via web intermediary, would get a notification in the form of a list of eReferrals requiring the referee's attention. Upon clicking on the specific eReferral, the referee's private encryption key would be used to decrypt the signed data pointer within the smart contract followed by the verification of data (by using the referrer's public encryption key available on the blockchain). The main benefit of the public Blockchain for eReferral is that the infrastructure is already available and it is "pay as you go"; in contrast, private Blockchain requires upfront investments in the infrastructure. But although there is a cost associated with transacting over the public Blockchain, by keeping only the hashes of data on-chain, the costs would not be excessive.



blockchain.jpg 103 KB • Download

Apr 15, 2019 at 1:12 PM · Notified 92 people

Alfred Wong, VP of Engineering, Think Research
Just adding my two cents here around using Blockchain for eReferrals.

What you have stated all sounds technically feasible but I think there are a couple of questions I have about this approach and if you can help clarify this for me that would be great.

- A lot of the assets you are stating are Ontario specific (OneID). How does other provinces in Canada provision their identities?
- Who would manage this public / private Blockchain?
- How would other provinces who don't have the infrastructure like BC / Ontario to get up and running to implement this?
- From a privacy and security perspective, how does one enforce the distribution of all the data stays within Canada or the jurisdiction the PHI should stay in?
- Further that question, if the PHI is replicated to all of the other nodes how does one expunge that data from all of the nodes if requested by the patient.

I feel using blockchain for PHI specific workflows requires more thought but maybe you can help educate me on how this can be done.

I think there is merit to use blockchain but I guess how and in what domain does it make sense.
Apr 15, 2019 at 6:05 PM · Notified 92 people

Branko Koprivica, Architect 2
The essence of Blockchain pattern is that there is no intermediary. It is true that private/permissioned blockchains are managed, that's why they are called private. There are Pros and Cons re private vs public and I mentioned some.
Regarding the scope, public blockchains are available globally. Sovrin, which is based on (private) HLF permissioned Blockchain technology, also built its own global Sovrin network through which one can get his/her Sovrin ID provisioned. But that ID can be revoked i.e. it is not a true sovereign identity like the one you get via public Blockchain and which I explained how it works. Now, the reason I mentioned only OntarioID and not CanadaID is because the approach would be phased: in the 1st phase, LRA network, which is only available in Ontario (but probably other provinces have something similar) and associated provisioning engine based on ONEID systems would be **leveraged** (no need to start from scratch, business processes exist, provisioning workflows could be reused and slightly changed to accommodate parties that are in scope e.g. only generic providers, or both generic providers and eReferral registrants, etc.).

The main benefits of the public Blockchain is that: we do not have to manage it; we do not have to pay for the infrastructure; we do not have to install the ledger layer (like we would have to with HLF; with v1.1 it was a rocket science to install it, now in v1.4 it is probably easier, but for anything non-trivial you want to install it on Kubernetes, or in the cloud, you need specialized resources and ... you get the picture); you can start developing the prototype today, literally, as every public chain has test networks available to consumers for building prototypes and apps; as you transact through the public chain you **pay-as-you-go** i.e. a payment model can be devised so that it makes sense for all participants; the data on-chain are only hashes of the data i.e. a minimal footprint (= minimal cost; bigger the data costlier the mining services); you do not have to worry about monitoring/control, backups/restored, BCP/DRs etc.

Re other provinces, public Blockchain is available globally i.e. not only in Canada. re private Blockchain both Ontario and other provinces would have to build a consortium (HLF term). This consortium could only have Ontario organizations in the beginning, but later on other organizations from Ontario and other provinces would join the consortium (as you can already see, it would require a lot of organizational and other effort = cost). Privacy and security I already addressed in the previous post (encryption private keys + signing private keys for public Blockchain). Only the hash of data would reside on-chain (this data, by the way, would not necessarily be PHI data but rather the URL endpoints where FHIR resources reside; for identity Blockchain, this would be a public key or global ID derived from it - private key will never leave the vault of the owner's personal device

nor will have access to any type of network including Bluetooth, WI-FI, etc). If you compare TLS/HTTPS, which is used to protect data in-flight of classical systems and Keccak (the winner of SHA-3 competition and already standardized for mobile telephony and NIST FIPS 202 and SP 800-185 standards), you'll see that TLS still suffers from vulnerabilities such as re-negotiation attacks (was exploited in 2009 in MIM attack), BEAST attack in 2011 (only for TLS 1.0, TLS 1.3 is more secure), timing attack from 2013, Logjam attack, Heartbleed in 2012, Drown attack on SSL 2.0 on session keys, and the latest Unholy PAC attack from 2016. Here is the current comparison of crypto algorithms: https://cryptography.gmu.edu/athena/papers/GMU_DATE_2015_poster.pdf Conclusions: multi-keccak outperforms multi-AES by a factor of 4 on average across all functions; Keccak's Keyak version achieves a TP of 23.2 Gbps; dedicated Keyak outperforms AES-GCM by a factor of 6 on average across all devices; Keccak is more flexible than AES.

I.e. there is nothing you gain if you decide to transfer (PHI) data via TLS with the classical approach vs using Keccak/Keyak SHA-3 within a public Blockchain (if the hash of PHI data is on-chain; but as I mentioned above, it is not necessarily true), on the contrary. But even if that is not sufficient to convince someone, you can always decide to use the hash of FHIR Provenance resource instead of FHIR resource itself as the PROV resource is non-PI/PHI.

Apr 16, 2019 at 12:19 PM · Notified 92 people

Matt Atwood

Attaching my rough notes regarding regarding the DocumentReference based on the discussions up to this point.

DocumentReferenceResourceNotes.docx 98.2 KB • Do…

Jun 03, 2019 at 10:46 AM · Notified 92 people

Tim Berezny, CTO Caredove, Chair FHIR eReferral Specification Working Group

I've reviewed the entire **DocumentReference.type** **valuesSet** **,** and come up with a proposed small subset:

57133-1 Referral note

51848-0 Assessment note
59284-0 Patient Consent
11488-4 Consult note
18842-5 Discharge summary
34109-9 Note
68607-1 Progress letter
28574-2 Discharge note
11503-0 Medical records
46209-3 Provider orders

There are a bunch more I considered and have noted in the document body for DocuemenReference in Basecamp.
Jun 27, 2019 at 10:38 AM · Notified 92 people

Tim Berezny, CTO Caredove, Chair FHIR eReferral Specification Working Group
Novari, HSSO specifically, looking for feedback on the document type list proposed.
Jun 27, 2019 at 11:30 AM · Notified 92 people

MA

Matt Atwood
Aside from the already mentioned, I would add:

34847-4 Surgery Consult note
51855-5 Patient Note
Jul 02, 2019 at 3:54 PM · Notified 89 people

IM

ion moraru
Here are the ones that I think will be useful to include:
68629-5 Allergy and immunology Note
51848-0 Assessment note
11488-4 Consult note
18842-5 Discharge summary
67796-3 EMS patient care report - version 3.1 Document NEMSIS
74188-4 InterRAI Acute Care (AC) Hospital Document
74194-2 InterRAI Community Health Assessment (CHA) Document
74197-5 InterRAI Contact Assessment (CA) Document
74187-6 InterRAI Emergency Screener for Psychiatry (ESP) Document
74196-7 InterRAI Home Care (HC) Document
74195-9 InterRAI Long Term Care Facility (LTCF) Document
74189-2 InterRAI Palliative Care (PC) Document
11502-2 Laboratory report
11503-0 Medical records
56445-0 Medication summary Document

34786-4 Mental health Note
34746-8 Nurse Note
34801-1 Nutrition and dietetics Note
28578-3 Occupational therapy Note
59284-0 Patient Consent
51855-5 Patient Note
28579-1 Physical therapy Note
56447-6 Plan of care note
64298-3 Power of attorney
57829-4 Prescription for medical equipment or product Document
57833-6 Prescription for medication Document
68834-1 Primary care Note
68607-1 Progress letter
46209-3 Provider orders
57133-1 Referral note
28653-4 Social work Note
28571-8 Speech-language pathology Note
34847-4 Surgery Consult note

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FB **Fariba Behzadi,** Standards specialist

Below is the value set specific to Referral notes:

57133-1 | Referral note
87250-7 | Addiction medicine Referral note
77432-3 | Allergy and immunology Referral note
77405-9 | Anesthesiology Referral note
77427-3 | Audiology Referral note
80577-0 | Cardiac surgery Referral note
57170-3 | Cardiology Referral note
78501-4 | Cardiopulmonary Referral note
85226-9 | Case manager Referral note
78330-8 | Clinical genetics Referral note
78329-0 | Colon and rectal surgery Referral note
80419-5 | Community health care Referral note
57178-6 | Critical care medicine Referral note
57134-9 | Dentistry Referral note
57135-6 | Dermatology Referral note
57136-4 | Diabetology Referral note
57137-2 | Endocrinology Referral note
78332-4 | Family medicine Referral note
69438-0 | Forensic medicine Referral note

57138-0 | Gastroenterology Referral note
57139-8 | General medicine Referral note
57171-1 | Geriatric medicine Referral note
89225-7 | Gynecology Referral note
57172-9 | Hematology+Medical oncology Referral note
86664-0 | HIV Referral note
57141-4 | Infectious disease Referral note
57142-2 | Kinesiotherapy Referral note
57143-0 | Mental health Referral note
78331-6 | Multi-specialty program Referral note
78483-5 | Neonatal perinatal medicine Referral note
57144-8 | Nephrology Referral note
57146-3 | Neurological surgery Referral note
57145-5 | Neurology Referral note
84271-6 | Nurse Referral note
78484-3 | Nurse practitioner Referral note
57173-7 | Nutrition and dietetics Referral note
89234-9 | Obstetrics Referral note
57179-4 | Obstetrics and Gynecology Referral note
57147-1 | Occupational medicine Referral note
57148-9 | Occupational therapy Referral note
57149-7 | Oncology Referral note
57150-5 | Ophthalmology Referral note
57151-3 | Optometry Referral note
57174-5 | Oral and Maxillofacial Surgery Referral note
57175-2 | Orthopaedic surgery Referral note
57176-0 | Otolaryngology Referral note
78672-3 | Pain medicine Referral note
78676-4 | Palliative care Referral note
78675-6 | Pastoral care Referral note
78673-1 | Pediatric surgery Referral note
78670-7 | Pediatrics Referral note
57152-1 | Pharmacology Referral note
57153-9 | Physical medicine and rehab Referral note
57154-7 | Physical therapy Referral note
83797-1 | Physician Referral note
57155-4 | Plastic surgery Referral note
57156-2 | Podiatry Referral note
78671-5 | Primary care Referral note
57157-0 | Psychiatry Referral note
57158-8 | Psychology Referral note
78674-9 | Public health Referral note
57177-8 | Pulmonary Referral note
57159-6 | Radiation oncology Referral note

57160-4 | Recreational therapy Referral note
82358-3 | Reproductive endocrinology and infertility Referral note
57162-0 | Respiratory therapy Referral note
57163-8 | Rheumatology Referral note
57164-6 | Social worker Referral note
57165-3 | Speech-language pathology Referral note
78700-2 | Sports medicine Referral note
57166-1 | Surgery Referral note
80806-3 | Surgical oncology Referral note
57167-9 | Cardiothoracic surgery Referral note
78677-2 | Transplant surgery Referral note
57168-7 | Urology Referral note
57169-5 | Vascular surgery Referral note
85199-8 | Long term care facility Referral note
84259-1 | Nurse Long term care facility Referral note
84287-2 | Nutrition and dietetics Long term care facility Referral note
83971-2 | Social worker Long term care facility Referral note
84031-4 | Team Long term care facility Referral note
85205-3 | Patient's home Referral note
83964-7 | Social worker Patient's home Referral note

Please review and let me know what other general document report or note we need (or tell me the business information of the report) I can add it to the value set as I need to make sure we are using the correct LOINC ontology and the document type.
Jul 03, 2019 at 11:37 AM · Notified 89 people

PF

Phil Forestall
Hi Fariba,
Per our discussion I'd like to suggest adding the following LOINC Ontology document types (in addition to the Referral note you've already given). Some have already been covered previously. As discussed I'll let you look up the LOINC numbers:

- Assessment Note (many subtypes of assessment come to mind: health assessment, behavioural assessment, smoking assessment, etc.)
- Release of Information Consent
- Consultation Note and the associated confirmatory note types

Potential Provider List does not seem to be in the Ontology but it was also thought relevant in the Provincial Reference Model for eReferral a few years back.
Finally, Assessments may not be complete without the many attachments which run the gamut of clinical document types: protocols, lab results, medication sheets, discharge summaries, pathology reports, etc. I don't know if individual clinical document types that will be attached to referral documents must be cited specifically; if so it will be long list. Available to discuss.

Jul 03, 2019 at 4:07 PM · Notified 89 people

ion moraru
Hi Fariba,

From my perspective the documents exchanged as part of the referral workflow are not limited to “referral note” types.
They need to cover a broader spectrum, i.e. various specialized assessment documents and consult notes available in different EMRs as that specific type.
Another example, Primary Care referrals may include prescription orders and nursing directives – these are very specialized document types that are insufficiently described by something like “Physician referral note”.
When received in the target EMR these documents have to be sufficiently described, in terms of both source (Primary Care) and purpose (prescription), in order to be part of the Patient file.
Jul 05, 2019 at 1:09 PM · Notified 89 people

Fariba Behzadi, Standards specialist
Hi Ion,
I agree with you, that `referral workflow are not limited to “referral note” types` that's why I asked for any other required clinical document type. Thank you for the value set I will put together a value set with all the Referral and general report types, and will make sure we are using the correct LOINC Ontology for codes.

Can you just clarify that, these additional clinical document types can be attached to referral form?
Jul 05, 2019 at 1:59 PM · Notified 89 people

Tim Berezny, CTO Caredove, Chair FHIR eReferral Specification Working Group
Note that a hash is available for the attachment. I'm pondering if we should make using this hash standard when sending attachments via a reference URL to ensure that the data hasn't changed. Thoughts?

From https://www.hl7.org/fhir/datatypes.html#Attachment:
"The hash is included so that applications can verify that the content returned by the URL has not changed. The hash and size relate to the data before it is represented in base64 form. The hash is not intended to support digital signatures. Where protection against malicious threats a digital signature should be considered, see Provenance.signaturefor mechanism to protect a resource with a digital signature."
Jul 09, 2019 at 2:33 PM · Notified 89 people

Harsh Sharma, Senior Advisor / SME
Hi Tim,
Sorry I am new to this forum.

I agree with you. If its used for DICOM, then we can use it for other attachment types as well. I guess we can use this method for referencing attachments.

Thanks
Harsh
Jul 09, 2019 at 2:47 PM · Notified 89 people

Ted Jin, Architect 2, Integration and Solutions Architecture
I think passing the content hash along with the document URL, version number, etc. is a feasible option. All the parties can trust that they are referring to the same version.

Ted
Jul 09, 2019 at 2:47 PM · Notified 89 people

Tim Berezny, CTO Caredove, Chair FHIR eReferral Specification Working Group
Ok I've included the hash.

I've added some sample code for a DocumentReference resource at the bottom of the page /DocumentReference - HL7 FHIR eReferral Workstream.

I struggled a fair bit with the identifier/masterIdentifer elements. Previously we had an extended discussion about how to use "MasterIdentifier" and "Identifier". At the time we decided to keep MasterIdentifier, but after some pondering, this seems entirely unhelpful to me, as a document could get added on to a ServiceRequest at the source or target system side. This really muddies what the meaning of MasterIdentifier is in a referral flow.

Instead, i've removed MasterIdentifier and created two entries in the "identifier" element; one of type=Placer (i.e., from the Referral Source System) and another of type=Filler (i.e., from the Referral Target System). Since documents are going to be duplicated between source and target systems, each system is responsible for adding in their respective system identifier.

... to be completely honest I'm not 100% sure that these identifiers need to be included at all, I'm open to scrapping the placer/filler concept entirely and just leaving "identifier" to be used for more established document identifiers (i.e., a lab req id or a drivers licence ID if a photo is sent as an attachment, etc...).

I haven't included any "system" for this placer/filler concept, I just used the type field.

I look forward to feedback from somebody who is more expert in FHIR identifiers than myself on this.

Jul 09, 2019 at 4:37 PM · Notified 89 people

Tim Berezny, CTO Caredove, Chair FHIR eReferral Specification Working Group

Also, please review the newly added sample payload and provide your thoughts/feedback!

Jul 09, 2019 at 4:37 PM · Notified 89 people

Tim Berezny, CTO Caredove, Chair FHIR eReferral Specification Working Group

Comments from call to consider:

- Consider using MasterIdentifer, no matter it's source (e.g., lab is a 3rd party) <-- but still may be just too complicated. Alt. Create identifier of type = Master. Alt. Do nothing.
- Consider using namespace for every system that can hold a document.
- What to do with non placer/fillers?
- More discussion required: versioning <-- is MasterIdentifier useful for this?

GR !!

Jul 23, 2019 at 11:35 AM · Notified 89 people

TJ

Ted Jin, Architect 2, Integration and Solutions Architecture

I am not sure of the concept of master identifier. However, I think including version specific identifier in DocumentReference may easily enable distinguishing and referencing versions between the source and the target systems, especially in the scenario where these systems use a third party/Dropbox like system to share documents.

Sep 06, 2019 at 11:10 AM · Notified 89 people

GR

Geoff Ramsay, Solution Architect

Hi Folks!

I put together a quick sample with a Shared Access Signature / Signed URL.
It just links to a pdf of the Think Research logo, but if you've been struggling to conceptualize this, it may help.

The pdf file is hosted on a private storage container in public cloud. The storage service validates access using a key embedded in the query parameters.

This particular Key expires in 7 days. In practice, we'd likely be using much shorter time periods.

If you're looking at this after a week, give me a quick ping and we can generate other samples.

doc_ref_w_SAS.json 1.32 KB • Download

Sep 18, 2019 at 11:48 AM · Notified 89 people