

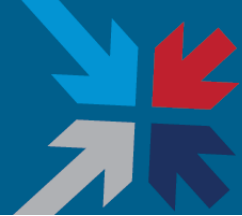
The Direct Project Implementers Workgroup:

Implementation Guide for Expressing Context in Direct Messaging

November 13, 2018
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CTO, EMR Direct



We're all quite familiar with Direct Messaging...



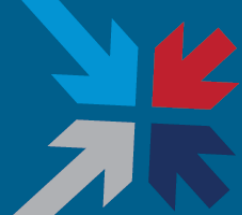
The Direct Project specifies a simple, secure, scalable, standards-based *transportation mechanism* that enables participants to send encrypted health information directly to known, trusted recipients over the Internet.



b.wells@direct.aclinic.org

h.elthie@direct.ahospital.org

- » **Simple.** Connects healthcare stakeholders through universal addressing using simple *push* of information.
- » **Secure.** Users can easily verify messages are complete and not tampered with en route.
- » **Scalable.** Enables Internet scale with no need for one-off agreements (federated agreements instead), point-to-point connections, or centralized data storage.
- » **Standards-based.** Built on well-established Internet standards, commonly used for secure e-mail communication; i.e., SMTP for transport, S/MIME & X.509 certificates for encryption and integrity protection
- » **Identity Assurance.** When a use case requires it, Direct is capable of providing this, too.



Nationwide Direct infrastructure is established

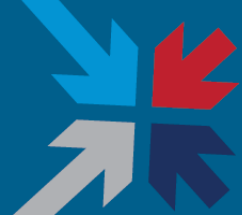
- Over 1.4 million production Direct endpoints are live today

Connected users want to use Direct for more than just TOCs:

- Improved care coordination
- More complete healthcare records
- Automated transaction processing
- Leveraging existing trust framework to authorize transactions beyond the CCDA

Benefits of further enhancing interoperability:

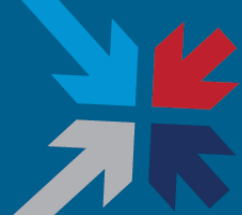
- Predictive analytics, population health, clinical research, telemedicine, and more



Some systems only capable of CCDA send/receive

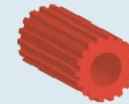
- 2015 Edition certification will expand to include text, PDF, and XDM (at a minimum)
- Messages containing PDFs don't have a standardized way to include patient context
- Same true for JPGs and many other content types
- XD* not universally supported
- Workflow cannot always be determined from payload type
- Not all CCDAs are for Transitions of Care

Goals of Expressing Context in Direct



- » **Extending Direct use cases beyond Transitions of Care**
- » **Leveraging Direct Networks to encapsulate HL7 and other transactions**
- » **Explaining why a message is sent & what response is expected**
- » **Ability to tag non-CCDA attachments (PDFs, images) with patient information**
- » **Make Context information accessible even to applications that are not Context IG-aware**

Not unlike a modernized cover sheet for a fax, so recipient knows why they are receiving a payload, what to do with it, and what response is expected



Services



Standards

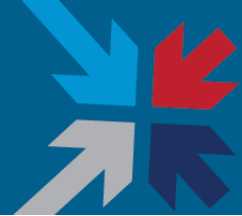


Policies



Trust Fabric

What can we do with context?



» Transaction Type

- to identify the role of the message sender in the transaction sequence
Appointment request

type-element = “type:” category “/” action

category = “laboratory”/ “radiology”

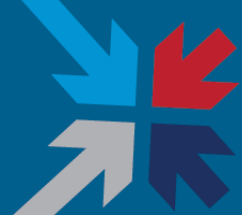
 / “pharmacy” / “referral” / “general” / “error”

action = “order”/ “report” / “result” / “request”

 / “response” / “notification”

Example: type: radiology/report

What can we do with context?



» Patient Identifiers

- to identify the patient identifier in a sender's local context
- Recipients echo this information back in responses and optionally add their own patient identifiers

patient-id-element = "patient-id:" pid-instance *(";" pid-instance)

pid-instance = pid-context ":" local-patient-id

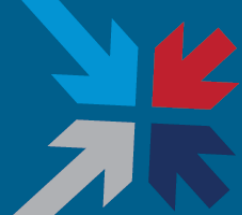
pid-context = <Assigning Authority Domain ID or standardized UUID constructed from Direct addresss or domain>

local-patient-id = <printable ASCII characters other than whitespace and ";">

Example:

```
patient-id: 2.16.840.1.113883.19.999999:123456;  
          2.16.840.1.113883.19.888888:75774
```

What can we do with context?



» Patient Matching Attributes

- included to facilitate patient matching by the recipient

patient-data-element = “patient:” patient-attribute *(“;” patient-attribute)

patient-attribute = patient-parameter “=” patient-parameter-value

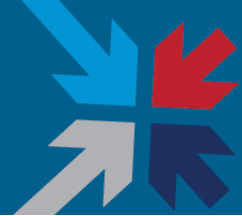
patient-parameter = “givenName” / “surname” / “middleName”
/ “dateOfBirth” / “gender” / “socialSecurityNumber”
/ “telephoneNumber” / “streetAddress” / “localityName”
/ “stateOrProvinceName” / “postalCode” / “country”
/ “directAddress”

patient-parameter-value = <depends on patient-parameter...>

Example:

patient: givenName=John; surname=Doe; dateOfBirth=1961-12-31

What can we do with context?



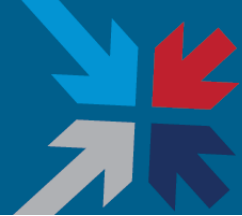
» Purpose of Use

- When a message sender requests the disclosure of healthcare information from the recipient, the purpose-element identifies the purpose for which the sender will use the disclosed information.
- Policy engines determine transaction response

purpose-element = “purpose:” purpose-name

purpose name = “treatment” / “payment” / “operations”
/ “emergency” / “research”

Example: purpose: research



» Example context attachment

- Human-readable (if receiving system not context-aware)
- version refers to IG version
- Id refers to a transactional identifier established by the original sender, echoed back in responses

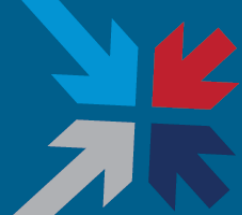
version: 1.1

id: 2ba8a9a1-0f59-4688-b818-67930ae26979

patient-id: 2.16.840.1.113883.19.999999:123456

type: radiology/report

patient: givenName=John; middleName=Jacob; surname=Doe;
dateOfBirth=1961-12-31; gender=M; postalCode=12345



» Example context attachment

Date: Wed, 31 May 2017 18:32:15 -0700 (PDT)
From: test@direct.phimail-dev.com
To: another@direct.example.com
Message-ID: <0000015c-6148-1d24-9687-50a0730f8b21.test@direct.phimail-dev.com>
Subject: Context Example 1
MIME-Version: 1.0
Content-Type: multipart/mixed;
 boundary="-----=_Part_14_125690771.1496280735009"
[X-Direct-Context: <0000015c-6148-1bc5-960f-cf885d5b8df1@direct.phimail-dev.com>](mailto:0000015c-6148-1bc5-960f-cf885d5b8df1@direct.phimail-dev.com)

-----=_Part_14_125690771.1496280735009
Content-Type: text/plain; charset="us-ascii"
Content-Transfer-Encoding: quoted-printable

This is the main message content. A PDF radiology report is attached.

Adding Context to a Direct Message (2 of 3)

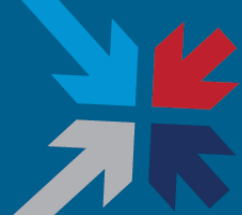


» Example context attachment (continued)

```
-----=_Part_14_125690771.1496280735009  
Content-Type: text/plain; charset="us-ascii"  
Content-Transfer-Encoding: quoted-printable  
Content-ID: <0000015c-6148-1bc5-960f-cf885d5b8df1@direct.phimail-dev.com>  
Content-Disposition: attachment; filename=metadata.txt
```

```
version: 1.1  
id: 2ba8a9a1-0f59-4688-b818-67930ae26979  
patient-id: 2.16.840.1.113883.19.999999:123456  
type: radiology/report  
patient: givenName=3DJohn; middleName=3DJacob; surname=3DDoe; dateOfBirth=  
=3D1961-12-31; gender=3DM; postalCode=3D12345
```

```
-----=_Part_14_125690771.1496280735009
```



» Example context attachment (continued)

-----=_Part_14_125690771.1496280735009

Content-Type: application/pdf

Content-Transfer-Encoding: base64

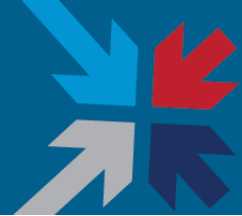
Content-Disposition: attachment; filename="report.pdf"

JVBERi0xLjUNCiW1tbW1DQoxIDAgb2JqDQo8PC9UeXBIL0NhdGFsb2cvUGFnZXMgMiAwIFlvTGFu
Zyhlbi1VUykgL1N0cnVjdFRyZWVSb290IDggMCBSL01hcmtJbmZvPDwvTWFya2VkiHRydWU+Pj4+
[.....bulk of Base64 encoded PDF file redacted for brevity.....]

Pj4NCnNOYXJ0eHJlZg0KMTQ3MDc4DQoIJUVPRg==

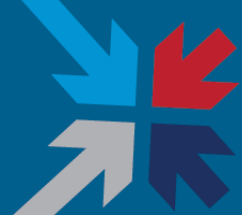
-----=_Part_14_125690771.1496280735009--

Where do we go from here?



- » Implementation—approximately 4 known prototypes in the field
- » Exchanging messages in a test environment
- » Connect-a-thon geared toward a specific use case:
 - Radiology report
 - Encapsulated HL7 transactions (HL7 v2 and FHIR)
- » Community feedback
- » Update from “Draft for Trial Use” status to final IG

Direct + Context = A variety of transaction types enabled via a single HISP connection



PM integration Routing ACO integration Inter-Enterprise Messaging

Billing/Claims E-Prescribing Sensor Gateway

Medication Adherence Patient-Centric Nurse Call On-Call Scheduling

Telemedicine **Order Entry** Secure Texting Pager Replacement

Care Coordination Patient Engagement Population Health

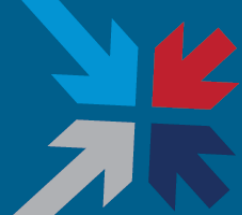
Home Health Referrals Second Opinions Remote ICU Remote Monitoring

Patient Education **Public Health Reporting**

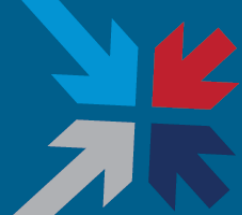
Rounding Nurse/Physician Appointment Scheduling

Secure Messaging

Context IG References



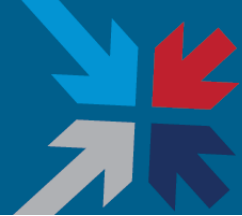
- » Direct Project Implementation Guide for Expressing Context in Direct
<http://wiki.directproject.org/File/view/Implementation%2BGuide%2Bfor%2BExpressing%2BContext%2Bin%2BDirect%2BMessaging%2Bv1.1.pdf>



Questions?

LCMaas@emrdirect.com

Additional Direct Project References



- » Direct Project Wiki
<http://wiki.directproject.org>
- » Direct Project Reference Implementation Workgroup – Java and C# open source software implementations of Direct Project specifications
<http://wiki.directproject.org/Reference+Implementation+Workgroup>
- » *Applicability Statement for Secure Health Transport* – the normative specification defining Direct transport
<http://wiki.directproject.org/Applicability+Statement+for+Secure+Health+Transport>
- » *XDR and XDM for Direct Messaging* – the normative specification defining conversion between Direct and IHE XDR (optional for STAs and HISPs)
<http://wiki.directproject.org/XDR+and+XDM+for+Direct+Messaging>

Beyond the Applicability Statement: Useful Implementation Guides



- » *XDR and XDM for Direct Messaging v1.0* – defines standard conversions between Direct and IHE XDR, enabling STAs to serve XDR edge clients
<http://wiki.directproject.org/XDR+and+XDM+for+Direct+Messaging>
- » *Implementation Guide for Delivery Notification in Direct v1.0* – defines standard positive and negative delivery notifications, enabling assurance of quality of service
<http://wiki.directproject.org/file/view/Implementation+Guide+for+Delivery+Notification+in+Direct+v1.0.pdf>
- » *Implementation Guide for Direct Project Trust Bundle Distribution v1.0* – provides guidance on the packaging and distribution of trust anchors to facilitate scalable trust between STAs
<http://wiki.directproject.org/file/view/Implementation+Guide+for+Direct+Project+Trust+Bundle+Distribution+v1.0.pdf>
- » *Implementation Guide for Direct Edge Protocols v1.1* – provides guidance for standard mechanisms connecting STAs and edge clients
<http://wiki.directproject.org/file/view/Implementation+Guide+for+Direct+Edge+Protocols+v1.1.pdf>

Supplemental slide: Direct end-to-end

