Proposal for Demonstrating at California Connects 2014

Use this template to communicate critical information for each demonstration proposed for the **2014 California Connects Interoperability Exhibition**, to be held at the *Connecting California to Improve Patient Care in 2014* conference sponsored by Redwood MedNet.

Prospective participants in California Connects 2014 must complete a proposal following this template for each proposed demonstration, and submit it for approval to the California Connects Steering Committee via email c/o Karen Boruff at karen.boruff@ca-hie.org. Please see the California Connects 2014 page at http://www.ca-hie.org/projects/california-connects-2014 for more information. Direct any questions to Karen Boruff at karen.boruff@ca-hie.org or Rim Cothren at robert.cothren@ca-hie.org.

1. Demonstration Synopsis

Please provide a title for your demonstration and a brief description of the demonstration. Try to limit the description to no more than 100 words. The title and description will appear on our web site in advance of the Exhibition to attract meeting participants to your demonstration.

CTEN Trust Bundles and Federated Directory Services

The CTEN provides a lightweight infrastructure that facilitates health information exchange statewide among otherwise unaffiliated HIOs using emerging national standards. The growth of new community and enterprise HIE capabilities makes it increasingly important that potential exchange partners have a secure and scalable means to discover addresses and service endpoints, authenticate gateways, and be assured of compliance with acceptable practices regarding health information exchange. Demonstrations that use CTEN services will illustrate how published Trust Bundles enable authentication of exchange services that comply with consensus policies, and how federated Directory Services enable discovery of Direct addresses and Exchange endpoints.

2. Demonstration User Story

Please provide a user story describing the demonstration, with specific emphasis on its clinical relevance. Be specific, illustrating how you will weave the technology you are demonstrating into real clinical flow.

The CTEN provides services that are components in other *California Connects* demonstrations of exchange among unaffiliated organizations. User stories for these demonstrations vary. However, the following illustrates how CTEN might be used to enable Direct secure messaging and query-based exchange.

A PCP wishes to refer a patient to a specialist outside of the community, and therefore to a provider not served by the community HIO. Rather than send the patient with printed records, the PCP wishes to send structured data, including a care summary, to the specialist before the patient visit using Direct.

The PCP queries the federated CTEN Directory Services for the specialist by searching for an individual by the last name and includes the specialty to narrow the search. From the names returned, the PCP verifies that one is associated with the expected clinic, and retrieves the Direct address for the specialist at that location. The PCP then collects the relevant clinical data, attaches it to a Direct message with a personal note describing the reason for the referral, and sends the message.

The referring specialist replies to the original Direct message with an encounter note, and a note to the PCP that the patient has been referred for imaging at the local radiology clinic. The PCP wishes to retrieve the radiology report. The PCP queries the federated CTEN Directory Services for the name of the radiology clinic, requesting the service address(es) for Exchange query/retrieve services (Patient Discovery, Query for Documents, and Retrieve Documents). Locating this information and noting the HIO that provides these services, the PCP queries the Exchange gateway at the HIO for the radiology report for the patient in question by querying for a patient match and for documents matching that patient, and then retrieving the radiology report with the appropriate date. The radiology report is supplied as a PDF document.

All exchange partners – that is, the HISPs and HIOs used by the PCP, the specialist, and the radiology clinic – are participants in the CTEN. They have therefore voluntarily agreed to comply with consensus policies regarding the exchange of information, submitted digital certificates to be included in the CTEN Trust Bundles, and retrieved and installed the Trust Bundles to enable inter-HIO exchange without any action or effort on the part of the PCP, specialist, or radiologist.

3. Goals and Objectives of the Demonstration

Please provide a brief description of the goals and objectives of the demonstration, emphasizing what you expect your audience to learn. Be sure to indicate how your demonstration aligns with the objectives and guidelines found in the California Connects Demonstration Charter at http://www.ca-hie.org/projects/california-connects-2014/charter.

The use of CTEN services in other *California Connects* demonstrations will show:

1. How CTEN Trust Bundles provide a scalable means of establishing trust among participating Direct HISPs without the need to exchange trust anchors;
2. How CTEN Trust Bundles provide a flexible means of establishing trust among participating Exchange gateways without a centralized certificate authority;
3. How the federated CTEN Directory Services architecture facilitates simple Exchange service or Direct address discovery, while avoiding a centralized, statewide directory;
4. How Directory Services can extend beyond simple Direct address discovery to support other means of exchange and other use cases; and
5. How Trust Bundles and Directory Services allow providers to exchange easily across organizational boundaries.

While CTEN services are compatible with other national initiatives, they enable a more complete set of exchange transactions than DirectTrust, Healtheway's eHealth Exchange, or the National Association for Trusted Exchange (NATE).

4. Participant Information

Please list information about the primary organization and any supporting organizations and/or sponsors for the demonstration. The primary organization will be responsible for creating, testing, and showcasing the demonstration. Supporting organizations might be collaborating to demonstrate the user story or otherwise deserve recognition. A sponsor may be funding or otherwise providing resources for the development of the demonstration.

4.1. Primary Organization

Name of the organization California Association of Health Information Exchanges

Role in the demonstration Providing CTEN services that enable inter-organizational exchange

4.2. Supporting Organization(s)

Name of the organization Transitional CTEN participants, including RAIN Live Oak, Santa Cruz HIE, OCPRHIO, and SD Health Connect

Role in the demonstration All supporting organizations are providing local directory services and directory information. RAIN Live Oak is illustrating exchange via Direct secure messaging using CTEN services.

4.3. Demonstration Sponsor(s)

Name of the organization _____

Role in the demonstration _____

5. Technical Information

5.1. Business Workflow

Please provide a description of the business workflow for the user story, showing the various actors and systems involved in the health information exchange. A diagram may be used.

The CTEN services utilize a collection of workflows to establish trust among CTEN participants and support address and service endpoint discovery.

Workflow for secure message exchange via Direct:

1. Each Direct HISP participating in CTEN must request and install the CTEN Trust Bundle for the Direct transaction pattern.
2. The provider must discover the Direct address of the intended message recipient, compose the message, and send it.

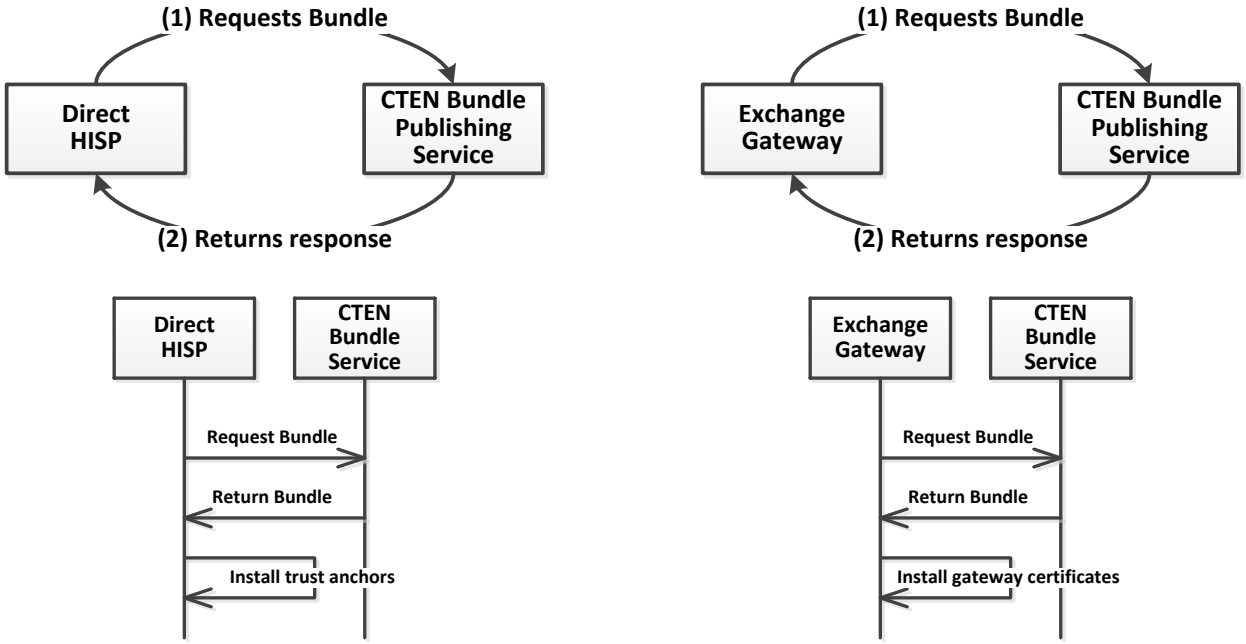
Workflow for query-based exchange via Exchange specifications:

1. Each HIO operating an Exchange gateway and participating in CTEN must request and install the CTEN Trust Bundle for the Exchange query/response transaction pattern.
2. The provider must discover HIO that provides Exchange services for the provider (an individual or organization, such as a radiology clinic), compose the query, and retrieve documents that match query parameters.

The following describes the workflows in more detail.

Retrieving a published CTEN Trust Bundle:

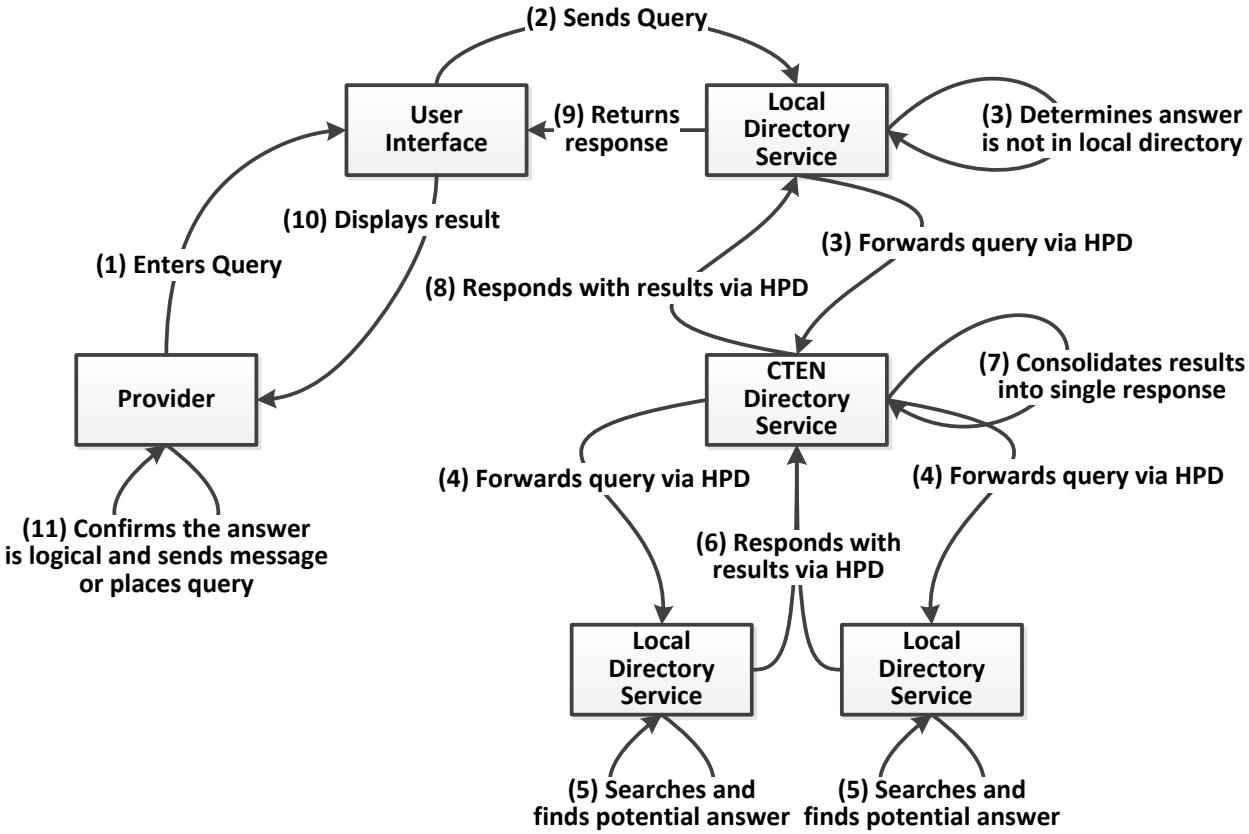
The workflow for retrieving and installing a trust bundle is very simple, and illustrated in the following data flow and process diagrams. The process for Direct and Exchange transactions patterns is effectively identical.



For most Direct HISPs and HIOs, requests for trust bundles are automated and the trust stores are updated regularly – perhaps once a day, once ever few days, or once a week. It may also be updated manually.

Discovering Direct addresses and Exchange endpoints:

The data flow for the federated lookup of Direct addresses and Exchange endpoints is the same for both the Direct and Exchange transactions patterns, and is illustrated below.



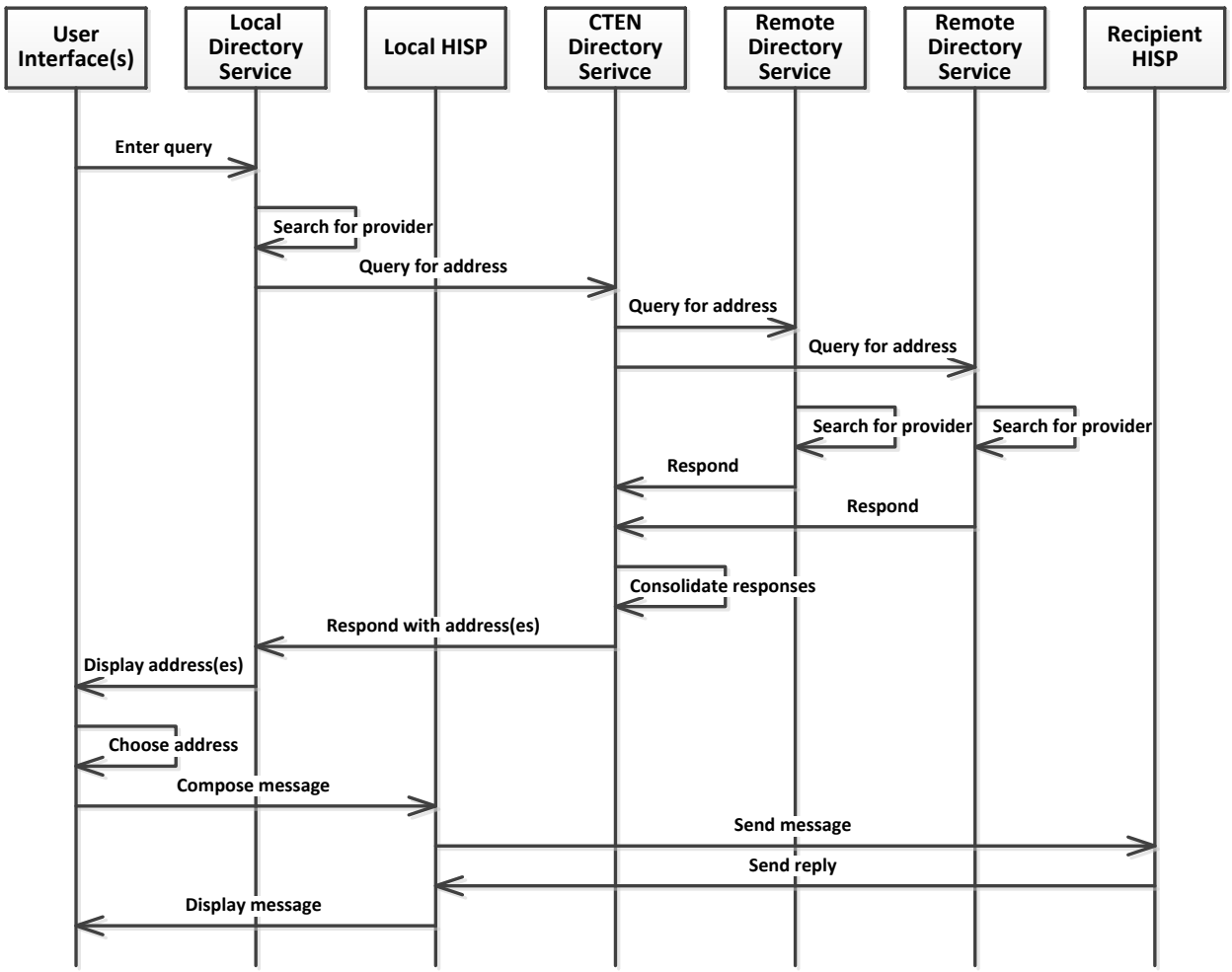
For the example user story:

1. For Direct, the Provider most often enters information about an individual into their Direct messaging portal or EHR that supports Direct and directory lookups in step (1). The response displayed in step (10) is most often one or more Direct addresses with demographic information that may help the Provider identify the correct recipient. Step (11) involves composing and sending a Direct message to the selected recipient.
2. For query-based Exchange, the Provider most often enters information about an individual or organization holding records that the Provider wishes to retrieve into their HIE portal or EHR in step (1). The response returned and displayed in step (10) is most often information about the individual or clinic to aid the Provider in confirming the match, and the HIO that operates the Exchange gateway to query. Step (11) involves composing the query and specifying the HIO gateway to be queried.

Portions of the discovery process for Exchange may be automated or hidden from the Provider.

Federated lookup of the Direct address of a provider, followed by Direct secure messaging and a reply to that message:

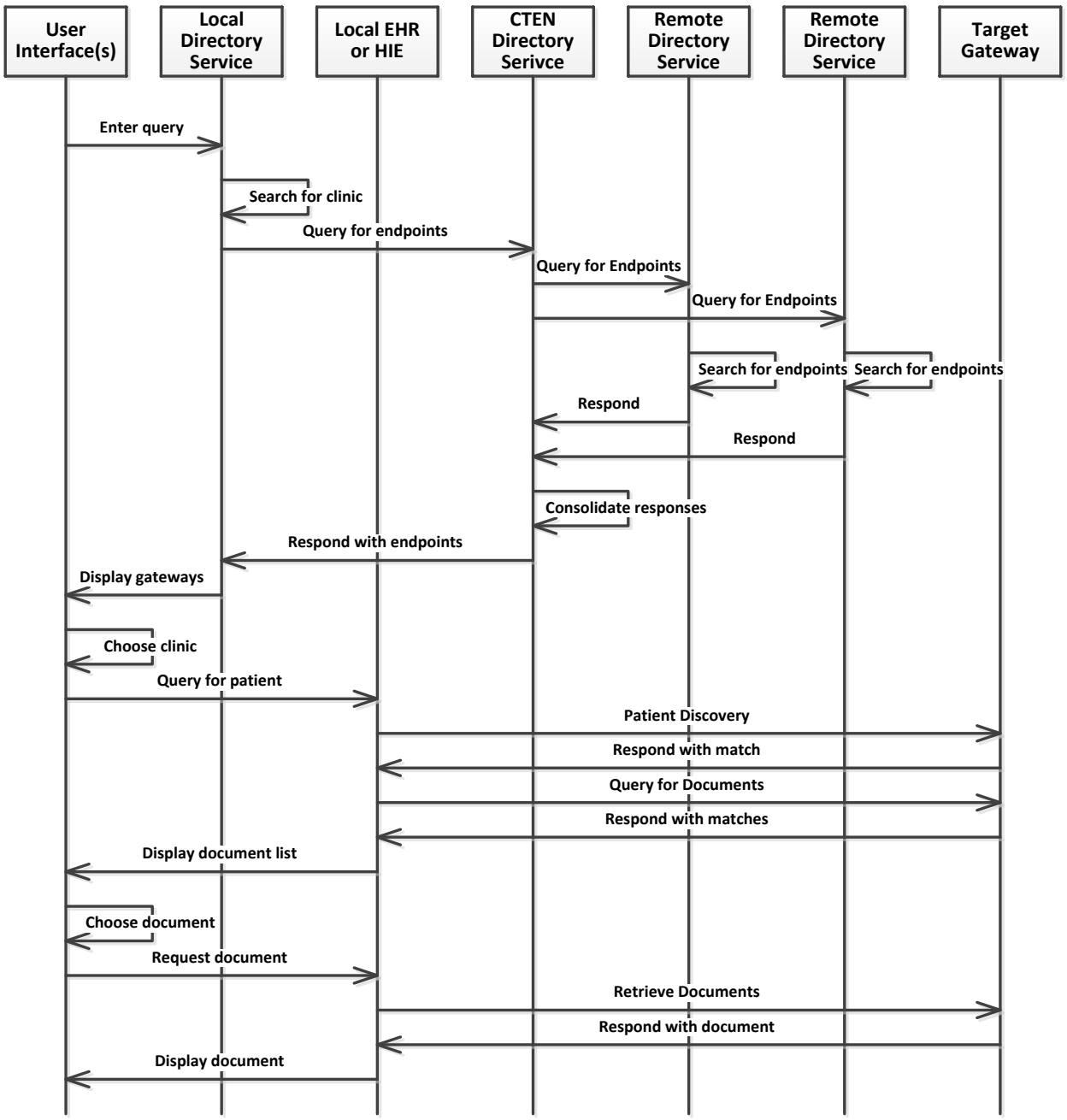
The following process diagram illustrates the full lifecycle of a Direct message, from discovery of the Direct address to a two-way exchange of messages.



Details of the specific workflow for Direct messaging are omitted for clarity.

Federated lookup of the Patient Discovery, Query for Documents, and Retrieve Documents service endpoints for an organization, followed by query/response document retrieval:

The following process diagram illustrates the full lifecycle of query-based document retrieval, from discovery of the Exchange service endpoints to document retrieval.



While the HIO placing the query requires all three Exchange service endpoints, they may be hidden from the Provider, displaying only the HIOs or gateways that might be queried. Specifics of the workflow for query-based exchange may vary.

5.2. Technical Standards

Please provide a brief discussion of the technical transport and content standards used in the demonstration. Include security, authentication and authorization standards as necessary. Please review http://www.ca-hie.org/projects/california-connects-2014/charter for the technical priorities for California Connects 2014.

CTEN services illustrate the use of:

- *Implementation Guide for Direct Project Trust Bundle Distribution v1.0* to publish trust bundles; and
- *IHE IT Infrastructure Framework Supplement, Healthcare Provider Directory (HPD) Trial Implementation Rev 1.4*, and *Statewide Send and Receive Patient Record Exchange Technical Specification Appendix, HPDPlus RDB Implementation Guide v1.1* for federated directory services.

Directory services implement mutual TLS for security.

CTEN services that support Direct are compatible with trust bundles published by DirectTrust and by NATE, as well as NATE guidance for provider directories.

CTEN services that support query-based exchange via Exchange specifications are compatible with the eHealth Exchange web services registry and digital certificates issued by the eHealth Exchange certificate authority.

6. Maturity of the Demonstrated Technologies

Please describe the maturity of the technologies highlighted in your demonstration, and when they might be available for use, and what barriers there are to reducing them to practice, if any. Technologies in the demonstration might be emerging and experimental, under development and soon to be available, or commercially available now.

The services, as demonstrated, were the subject of a pilot implementation during 2013 under CHeQ and sponsored by ONC's State HIE Cooperative Agreement Program. They are in limited production today. There are ongoing discussions that may make modifications, some of them significant, to the underlying standards that may require migration of the limited production services before more extensive roll-out.