Interop-a-thon

June 16, 2022
8:00 am MDT - 12:00 pm MDT

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Overview

Cardea is world's only complete, decentralized, easy-to-integrate, open-source ecosystem for verifying health data that preserves patient privacy.

To drive interoperability among the organizations adopting the underlying technology, Cardea hosted the third four-hour virtual Interoperability event on June 16, 2022. (the first was held September 9, 2021 and the second was held March 17, 2022)

The maintainers of Cardea stood up a test environment including an Issuer, Mobile, Mediator, Government, and Verifier Agents in an "atomic testing" environment for participants to test individual components against.

Goals

Drive interoperability! Interoperability is the key to decentralized identity's growth into a network of networks. This event tested Hyperledger Indy based projects; future interop-athons will cover other signature styles.

Participants had the opportunity to:

- Make a connection between agents using DIDComm V1 or Out of Band connections.
- Test any agent, or combination of agents, that support DIDComm
- Test basic messaging protocol (any pairing of Enterprise agents and holder agents)
- Test Q&A protocol
- Present self-attested demographic data (Anoncreds support required, other signature styles in future interop-a-thons)

Participants are also welcome to test solutions against components of the Cardea reference implementation including:

- Machine Readable Governance
- Cardea credential flow
- Medical release credential
- Lab result credential
- Trusted Traveler credential

The indicio Indicio TestNet was provided, but other decentralized networks were welcome as well

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By the numbers

- Received 10 unique organization participant registrations *(-2 from previous event)*
- ~15 interop-athon participants *(+2 from previous event)*
- Projects brought a variety of solutions to issue, verify, and hold verifiable credentials, using a reference implementation provided by Cardea
- The default network was Indicio TestNet.
- Each project had the opportunity to test against the Cardea reference implementation and against as many other participants as possible.
- In total, 10 tests were conducted. *(-2 from previous event)*

Registered Participants

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- Silibrain*
- Privatyze*
- komuny.org*
- Liquid Avatar
- CGI*
- SITA
- Province of BC
- BYU
- Procivis AG
- IBM
- Afri Automations

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* = did not participate

Testing

- Indicio set up a reference implementation including:
  - Cardea Issuers
  - Cardea Mediator
  - Cardea Mobile wallet
  - Cardea Verifier
  - Out Of Band Invitations
  - Machine Readable Governance
- Using Zoom breakout rooms, each participant had the opportunity to begin the day testing against the Cardea reference implementation.
- Participants also had the chance to meet in pairs to test against one another, with an Indicio trained staff member to facilitate.

Workflow

Out-of-Band Invitations

- The Lab enterprise agents can be used to display a QR code based on an out-of-band invitation URL. This is done by clicking on the “Display OOB” button on the home page. You can copy the invitation URL from the Console Log tab of your browser’s dev tools if you need it instead of the QR code.
- The invited agent scans the QR code or copies and pastes the invitation URL into a form field and accepts the invitation. (NOTE: For Cardea, only the enterprise agents support OOB at the moment. The Liquid Avatar mobile app is the only one we know of that supports OOB invitations)
- Either the connection process proceeds and a connection is formed (using the connections v. 1.0 protocol as the handshake protocol; you should see an active connection in the list of contacts) or error messages should appear in the enterprise agent logs.

Workflow

Basic Messaging

- Make sure you are connected to another agent.
- Open the contact in your list of contacts
- For an enterprise agent, click the “Send Basic Message” button. The message should appear on the mobile device or in the other enterprise agent’s logs.
- For a mobile agent, send a basic message. It should appear on the other mobile device or in the enterprise agent’s logs.

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Workflow

Presentation Request (Self Attested Demographic Data in Anoncreds Format) OR Edit Contact Button
The purpose of this workflow is to collect demographic information about the patient.

- Option 1:
  - Open the connection from your list of connections
  - Click the “Request Demographics” button
  - The connected agent will receive a proof request with a list of attributes without specifying a schema. This means the connected agent can respond with either a self-attested presentation in Anoncreds format or with a compatible credential (such as a medical release credential)
  - When the connected agent sends the presentation, the patient’s (connection’s) demographic details will be updated
- Option 2:
  - Open the connection from your list of connections
  - Click the “Edit” button in the top right corner
  - Fill in any details you want (even just garbage)
  - Click “Submit”. The connection’s demographic details should be updated

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Workflow

Issuance (Medical Release)
Make sure your enterprise agent is connected to another agent
Make sure your connection has demographic information about the patient

- Click the “Issue Medical Release” button
- Fill out the Medical Release form
- Click “Submit”
- The connected agent should receive a medical release credential offer

Presentation Request (Medical Release)
Make sure your enterprise agent is connected to another agent

- Click the “Request Medical Release” button
- If the connected agent has a medical release, it can choose to reject the request or send a presentation. A presentation will be shown in the enterprise logs.

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Workflow

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Issuance (Health Credential)

Use the Lab Enterprise Agent to display an invitation

- Holder Agent connects using the invitation
- If the connected agent doesn't yet have demographic information, the person running the Lab Enterprise Agent should manually fill in the contact's details.
    - Go to the contacts page
    - Select the appropriate contact
    - Click "Edit" in the top right corner
    - Enter/update the contact's information
- Once the Holder Agent's information has been entered, click on "Issue Lab Result Credential"
- Fill in whatever fields you would like. Only two are required to pass the health verification requirements.
    - You must select a "Lab Specimen Collected Date" that is no more than 3 days before your travel date. Usually selecting today's date and planning to travel tomorrow or the day after works quite well.
    - The "Lab Result" must be "Negative"
    - Click Submit when you are done
    - Click "Accept" on the Holder Agent.

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Workflow

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Trusted Traveler Issuance

1. Government Enterprise Agent displays an invitation
2. Holder Agent connects using the invitation
3. Government Enterprise Agent requests identity information using the present-proof v. 1 protocol.
4. Either:
    a. Holder Agent responds with a self-attested identity proof
        i. NOTE: If you get stuck while entering information on the Cardea or SITA holder, check to make sure that you've changed the date of birth to a non-default value.
    b. OR Lab Enterprise Agent manually edits the contact's info to contain the identity information
5. Government Enterprise Agent requests presentation of a lab_result credential (other options were disabled for this Interopathon to keep things simpler).
6. Holder Agent responds with a lab_result credential if it has one
7. Government Enterprise Agent verifies the credential cryptographically and validates the following attributes (if you are trying to demonstrate a particular use case, you can validate more):
    a. lab_result must be "Negative"
    b. lab_specimen_collected_date must be a Unix timestamp less than 3 days ago
8. **For machine readable governance**, the Government Enterprise Agent makes sure the lab_result credential was issued by a trusted lab issuer. If it was not, the Government Enterprise Agent sends a basic message to the Holder Agent that states that the credential was not issued by a trusted issuer.
9. Government Enterprise Agent issues a trusted_traveler credential to the Holder Agent
    a. If the credential offer does not arrive, sometimes closing and re-opening the holder app establishes a better connection with the mediator and allows a new credential offer to get through.

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Workflow

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Trusted Traveler Verification

1. Verifier Agent displays an invitation
2. Holder Agent connects using the invitation
3. Verifier Agent requests presentation of a trusted_traveler credential
4. Holder Agent responds with its trusted_traveler
5. Verifier Agent displays “Approved” or “Not Approved” depending on the result of the cryptographic verification
6. **For machine readable governance**, if the trusted_traveler was not issued by a trusted government issuer, the Enterprise Verifier Agent sends a basic message to the Holder Agent that states that the credential was not issued by a trusted issuer.

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Success

- Atomic testing was a success!
  - Allowed for better testing to occur
- Nice to test connections, credentials, and learning what features are being used.
- Good job getting diversity of new orgs participating/observing.
- Enjoy format with breakout rooms and 1:1
- No zoom bombing! :)

Lessons Learned

- Video recording of setup of Cardea environment (both mobile and enterprise) with link to repos
- Open servers as early as possible
- Keep servers open post interopathon for continued testing/fixes
- Full-workflow can be disrupted by atomic tests.
- Invite Mobile Team engineers so they are on hand to debug through the mobile interface
- Participants bring at least one agent pre-configured in debug mode.
- Have a good internet connection
- Versions of software tested more clearly (“I’m using ACA-Py v0.7.1”)
- Specify the network used as a default.
- Publish interop profile in a publicly accessible location
- Identify which communication channels are successful to communicate with participants

Next Interop-a-thon (internal suggestions)

- Early versus late (or stay whole time) or a second session at Asian timezone
- Automate calendar invites
- Look at Aries Interop-a-thon (second half of Aug)
- Re-focus onto health tech
- Host manually block video
- Remind to record
- Good internet connections a must
- Continue room scribes
- Sep/Oct (4-6 months cadence) slightly longer between events.
- UI/UX and terminology focus (separate or included)

Recordings and Notes Repo

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Complete repository of testing notes and recordings can be found HERE.

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Code

- Cardea github https://github.com/thecardeaproject
- Agent URLs:
  - **Mobile Holder:** https://github.com/thecardeaproject/cardea-mobile-holder/releases/tag/1.1.0
  - **Health Issuer**: https://lab.cardea.indiciotech.io/
  - **Travel Issuer**: https://government.cardea.indiciotech.io/
    - Note: For the purposes of this test, a holder must send a message so the connection status is considered active. If the holder doesn't send demographics, the user must also edit the demographics before sending.
  - **Enterprise Verifier:** https://restaurant.cardea.indiciotech.io/
  - **Mobile Verifier:** https://github.com/thecardeaproject/cardea-mobile-verifier/releases/tag/1.0.2
- Cardea Schemas: https://github.com/thecardeaproject/cardea/tree/main/schemas

(*Interop profile: which protocols we'll be using + rfc references)