ABLE CARE

Able Connect: Partner Integration

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Integration with the Able Platform enables partners to acquire and integrate clinically validated grip and gait measurement data in your workflows. Depending upon your integration requirements, this can be provided through automatic, real-time, push, pull, or batch-based data synchronization.

Additional insights complement standard grip and gait measurements including normative values and cut-offs highlighting *position* within a certain demographic (e.g. age and gender) or associated risk levels, for example, falls. A significant body of research demonstrates high measurement quality e.g. reliability, accuracy, sensitivity, and robustness, especially when compared to publicly available datasets and existing gold-standard measurement tools.

This document outlines the integration process for connecting external partner systems with our multi-tenant assessment platform. The integration leverages organization-based multi-tenancy with secure data synchronization capabilities.

> This document is intended for technical staff and engineers responsible for integrating the Able Platform multi-tenant assessment platform with your partner system.

1 Overview

The Able Platform comprises the following components that can be packaged together based on your requirements:

- **GripAble Sensor** - our custom sensor that combines sensitive force sensing with dynamic motion tracking enabling comprehensive hand function measurement during assessment and training activities. Measurement data is captured at 50 Hz and streamed over BLE in real-time.
- **Able Mobile App** - our simple app that enables carers and healthcare professionals to quickly log in, connect a GripAble sensor and record a grip or gait measurement against an individual in their org or facility. The app can run on Android and iOS devices including smartphones and tablets.
- **Able Portal** - our simple web portal that enables carers or healthcare professionals to perform key administration tasks such as user onboarding, configure test parameters, access cohort-level data insights, etc.
- **Integration Portal** - a separate admin portal that enables a partner to setup, manage and test integrations with between the Able Platform and their system using our Connect APIs, Webhooks and API keys.
- **Able Backend** - our APIs based on OpenAPI and gRPC specs allow direct integration between our secure and regionalized backend services, and your system(s). This promotes interoperability by, for example, simplifying user onboarding, ensuring a common set of user identifiers and automatically pulling test and sensor data into your system(s), etc.
- **Partner System** - is an external system or service that connects with our Able Backend platform to synchronize data such as individual records and measurement results. The partners leverage APIs to actively interact with our platform or web-hooks and batch-exports to passively receive updated information.

2 Solution

2.1 Domain data

Our central entity is the `Individual` which models a patient, a resident in a care facility, etc. that takes grip and gait measurements using a Gripable Sensor. This entity captures relevant information about the person such as birthdate, dominant hand, height, etc. The `Individual` can be optionally assigned to a healthcare professional (`Provider`), which is a specialized user account within an `Organization` . From a data management perspective, the `Organizatin` is the tenancy-key in our shared-database tenancy model. The organization identifier is used to logically partition the data and remove any risk of cross-organization data sharing. An `Organization` manages `Individuals` across multiple care-homes (`Facilities`), but an `Individual` can only belong to a single `Facility` at any one time. `Measurements` , such as Single Maximum Grip Test, or different Gait tests (e.g. chair stand, gait speed or timed-up-and-go) are captured through the Able Assess mobile app and stored against the `Individual` . The individual can view these measurements directly (if an email address was provided during enrollment) or via the `Provider` they are assigned to.

2.2 Access control

Access to data within an `Organization` is granted depending on the user's type. Our system has three `User` types:

- `Individual` manages and has access to their own data only.
- `Provider` is a carer or healthcare professional that manages patients at the `Organization` or `Facility` level.
- `Integrator` is a back-office user who can setup and manage an organization's Connect APIs, webhooks and API keys for partner integration.

> `Users` associated with an `Organization` only have access to that organization's data.
>
> An `Organization` does not need to have any `Facilities`

2.3 **Authentication**

Users of the mobile app and web portal authenticate themselves with email and a one-time-password (OTP) combination.

API clients authenticate by means of API Keys which will be generated and accessed by an `Integrator` via the Integrations portal.

> If the partner requires alternative or additional authentication methods, including multifactor authentication (MFA), SSO, PIN — contact the Able Care team to discuss options

2.3.1 Authentication flows and measurements

There are two ways in which individuals can record measurements:

- Users of type `Individual` log into their account and take measurements.
- Users of type `Provider` log into their account, select the `Individual` that is taking the measurement and then record the measurements against the selected `Individual`.

In both cases the measurement data for the Individual will be associated with the `Facility` and `Organization` they are assigned to.

2.4 Operation modes

The Able Platform supports two key operation modes:

2.4.1 Supervised operation

During supervised mode, a healthcare `Provider` will guide a cohort of individuals during measurements. This is mostly used in care homes, medical facilities, etc. where measurements are a scheduled and recurring activity.

Key assumptions include:

- Multiple host devices - implying one or more devices (smartphones, tablets, iOS/Android)
- Multiple sensors - implying one or more GripAble Sensors
- Multiple `Individuals` - interchangeably taking grip measurements
- Multiple `Providers` - interchangeably supervising `Individuals`

> Given this setup, it is expected that at any point in time, an `Individual` could record measurements across multiple host devices, sensors, and `Providers` within a single `Facility` or `Organization`.

2.4.2 Unsupervised operation

In unsupervised mode, the measurements will be self-administered, from the comfort of one's home.

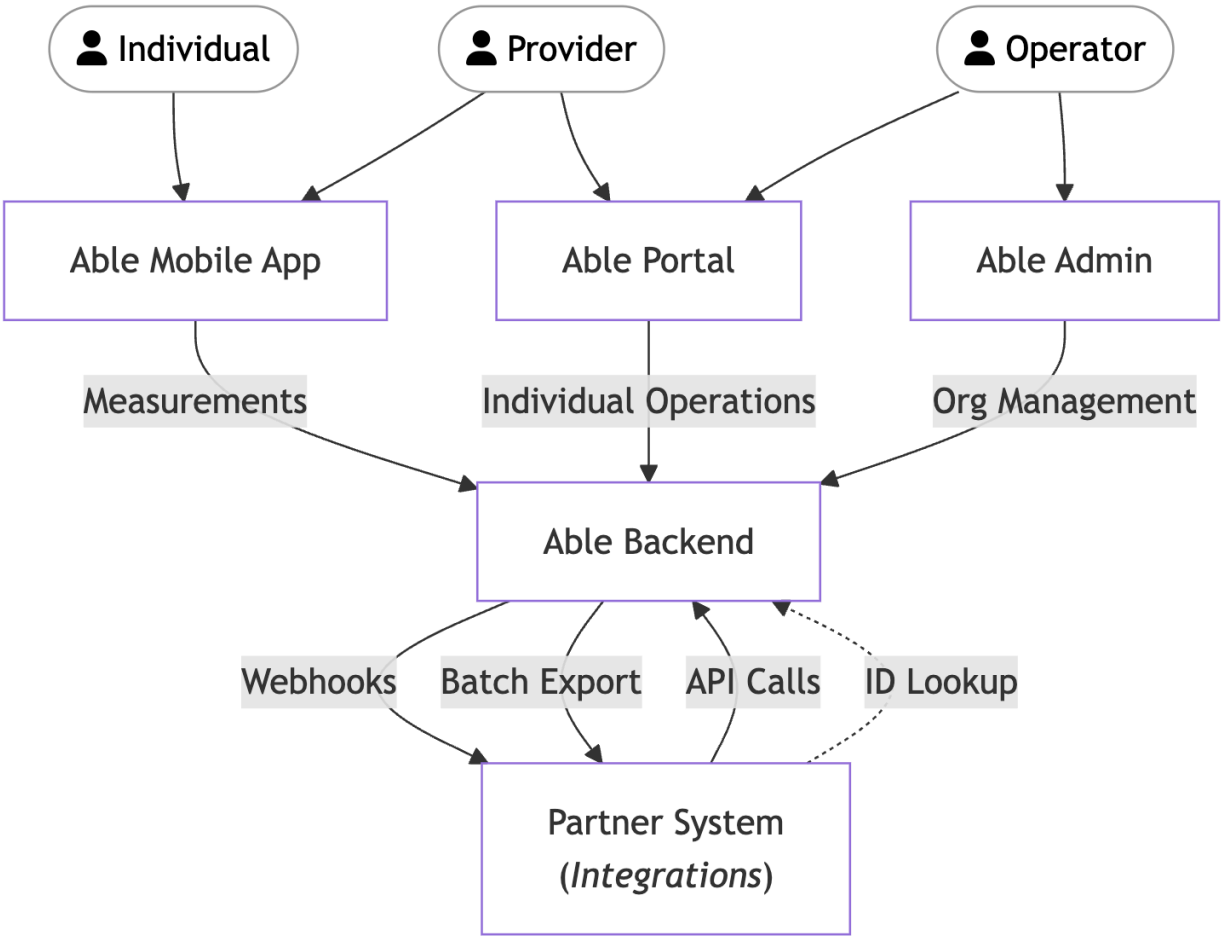
Key assumptions include:

- Single host device
- Single sensor
- Single individual/user

> The data of `Individual` that belongs to an `Organization` will be available to `Providers` of the `Organization`.

3 Integration Architecture

Integration is configured at the `Organization` level. An `Organization` can choose to integrate with a `Partner` in which case updates to the organization's data will be sent to (or synchronized with) the partner approved by the `Organization`.
To enable integration, all data that *belongs to* an `Organization` including `Individual`, `Facility` and `Measurement`, and will be identified as such. This enables single-database multi-tenancy based on the `Organization` and makes organization-based data synchronization possible based on webhooks, queues or other synchronization APIs.



1 Overview of how the Able Platform integrates with Partner Systems

3.1 Multi-Tenancy Model

- **Organization-based filtering**: All data records are tied to the specific organization they belong.
- **Isolated queries**: All data access is automatically filtered by organization context.

- **Secure boundaries**: Each organization's data remains isolated

3.2 User Management

3.2.1 Enrollment

We have simple and easy enrollment procedures that works across all operating modes:

1. An `Organisation` will be created by Able Care following contractual approval.
2. An `Integrator` account will be created by Able Care and securely provided to the Partner.
3. The `Integrator` will be able to log into the Integrations portal to manage Webhooks and API keys.
4. `Individuals` existing in the Partner System can be enrolled into our system through our Connect APIs or details of existing users can be retrieved (see "Matching Individuals" below).
5. Providers can log into the Able Mobile App or Able Portal, create `Individuals` and take measurements against that `Individual`.

> Additionally, we can preload your provider and individuals' data in bulk into our system to reduce manual work — contact the Able Care team to discuss this as an option
>
> We've built the system so that your individual identifiers need only be unique to your group of individuals.

3.2.2 Matching Individuals

The most critical point of data integration is that the same identifier be used for an individual taking multiple measurements over time. Individuals represent the core entity being assessed and have the following:

- Demographic information: data points like date of birth, handedness, height, etc., which are used for evaluating and scoring measurements for the individual.
- Authentication capability: individuals can authenticate to take measurements as described in “Authentication flows and measurements”.
- Identifiers to map and identify the individual to external partner systems.

> There is one primary option to match the Individual between the Able Care platform and an integration partners system:

Internal ID: read-only internal identifier (UUID) of the individual in the Able Care platform. When using the Connect API for creating Individuals, the integration partner will receive the Individual ID in the API response. If the Individual was manually created via the Provider account then a semantic listing of Individuals filterable by Organisation, Facility, or Provider can be retrieved through the Connect APIs.

Sensor ID matching: in cases where a sensor is assigned to a specific `Individual` (i.e. at their home), the individual matching can be done by keeping track of inventory. However, this is only recommended to support specific edge cases where the option provided above is not possible.

4 Integration Approaches

4.1 Individual Matching Strategies

The identifiers associated with the `Individual` entity will differ between the two systems. We recommend tracking the Able Care Platform identifiers within the Partner System.

4.1.1 Internal ID Tracking

- Capture the Able Care Platform's Internal ID in API responses.
- Store this ID within the partner's external system.
- Eliminates need to share potentially sensitive identifiers from integration partner's systems.

4.2 Dataflow

4.2.1 Real-time Synchronization

These are **continuous data flows** that ensures external systems stay current with the latest changes in the data:

1. **Webhooks for immediate updates**: Receive notifications for each measurement update
2. **Event-driven architecture**: Triggered by specific actions (measurements completed, results calculated)

4.2.2 Batch Synchronization

These are **periodic bulk exports** scheduled data transfers at defined intervals:

1. **Webhook-based batching**: Accumulated updates sent in batches - contact the Able Care team to discuss this as an option
2. **Data upload integration**: Direct file-based transfers for large datasets

4.3 Partner Connect API

The Partner Connect API is the primary integration surface for actively exchanging data between your system and the Able platform.

- **API Endpoints**: The Connect API currently provides endpoints to manage core entities:
  - `/api/connect/v1/individuals/` : Manage `Individual` records (List, Create, Retrieve, Update).

    - `/api/connect/v1/facilities/`: Manage `Facility` records (List, Create, Retrieve, Update).
- **OpenAPI Schema**: The exact resources, operations, scopes, and data contracts are defined in the live OpenAPI schema at `/api/connect/v1/schema/`. We encourage generating API clients directly from this schema.
- **Authentication**: Requests must be authenticated using the custom HTTP header: `Able-Api-Key: <your-secret>`.
- **Key Management**: API keys and their lifecycles are provisioned and managed by an `Integrator` via the Integrations portal at `/api-keys/`.
- **Authorization**: Operations are specifically protected by explicit scopes assigned to the API key at creation. Current valid scopes include `individuals:read`, `individuals:write`, `facilities:read`, `facilities:write`, `measurements:read`, `measurements:write`, `screenings:read`, and `screenings:write`. The required scopes for any given endpoint are documented in the OpenAPI schema.

5 Additional Considerations

5.1 Security

- **Organization isolation**: Data access automatically scoped to correct organization
- **Secure matching**: Choose appropriate individual matching strategy based on security requirements
- **API authentication**: All endpoints require proper authentication
- **Data encryption**: The data is encrypted at-rest as well as in-transit

5.2 Technical

- **Connect APIs**: Specific data is exposed via RESTful APIs.
- **Webhook Support**: For real-time and batch synchronization
- **Data Format**: JSON-based data exchange
- **Error Handling**: API calls that result in errors will include `error_code` and `message` fields in the JSON response. The caller should apply a recovery mechanism, like retrying with a backoff algorithm.