Sietch
hardware database system

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Aug 6 2020
FD Technical Board Meeting

Sietch is a tool designed to

easily and flexibly track components and tests in the APA or elsewhere.

It's a **web application.** Built to work well on mobile as well as desktop.

You can start playing with it now!

Development server http://dev.sietch.xyz
"Production server" https://sietch.xyz
(No data yet)

Technical details: Connects uses MongoDB database backend. Based on open source platform: Node.js, FormIO.js, Express, Passport. Runs in OSX or any Linux. Uses auth0.com for authentication and user management. Hosted on my own VM at Otterbein for now. Backed up daily.

What is it?

Every object has a unique
"serial" number in the
database (a UUID),
represented by a QR code:

If

https://sietch.xyz/71d9bdc0-ca93-11ea-bcd9-1f445262d4f0
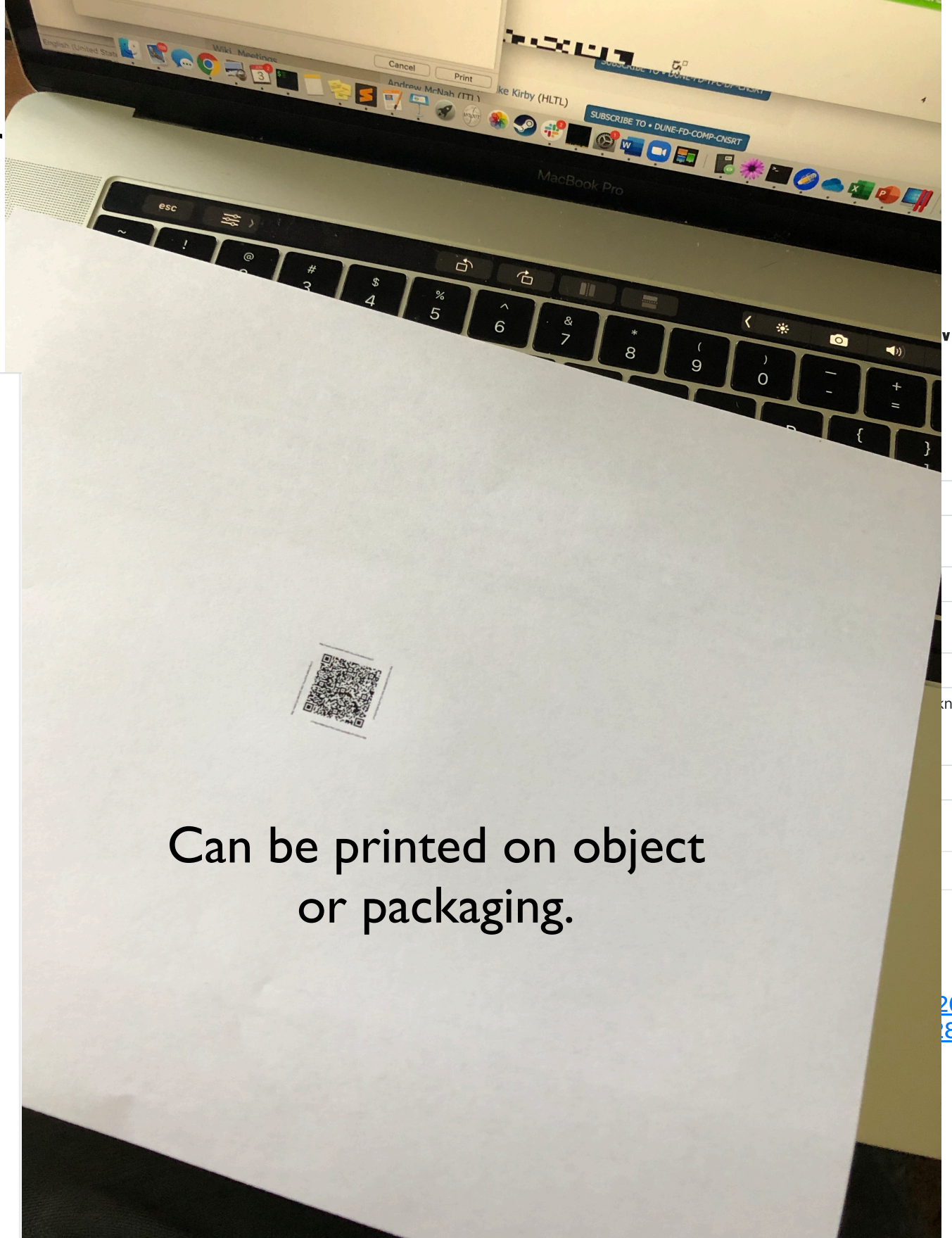
protoAPA US APA 004

Can be printed on object
or packaging.

Basic concepts

Every object has a unique "serial" number in the database (a UUID), represented by a QR code:

If you scan this code, you get the "traveller" for this document:

https://sietch.xyz/71d9bdc0-ca93-11ea-bcd9-1f445262d4f0
protoAPA US APA 004

Protodune APA: protoAPA US APA 004

Edit this component
Component UUID
71d9bdc0-ca93-11ea-bcd9-1f445262d4f0

Version 1
edited by Nathaniel Tagg's script on July 20th 2020, 2:15:20 pm

History

Effective as of
July 20th 2020, 2:15:20 pm (16 days ago)

Name	protoAPA US APA 004
A P A I D	US APA 004
Frame Serial Number	004
Head S N	5-01-01 12:00 AM
Center S N	6-01-01 12:00 AM
Side 1 S N	7-01-01 12:00 AM
Side 2 S N	7-01-01 12:00 AM

Protodune I SP APA 4
Translated from Jason Laffin's DB

Basic concepts

When you enter data about any component, it is automatically:

- associated with that component's UUID number
- tagged with your user ID and email
- timestamped (and optionally GPS stamped)
- entered into the permanent database

Example form for data entry

Schema are flexible!
They can change fluidly without affecting DB behavior.

Data entry

Wire Board U Layer Head Right

Component UUID ❓

| dbefefb95-4e81-11ea-a536-dfbbc418ecc2 | link |

All units in mm. Tolerances all ±0.1 mm.

Step 1: Overall dimensions

Overall Width ❓ *

Nominal 164.7±0.1

Overall Length ❓ *

Nominal 229.6±0.1

Thickness	Left side	Right side
Board Thickness	*Nominal 4.76±0.1*	*Nominal 4.76±0.1*
Tongue Thickness	*Nominal 4.56±0.1 mm*	*Nominal 4.56±0.1*
Board Thickness - Tongue Thickness (calculated)	*min 0.1*	*min 0.1*

Step 2: Visual checks

Silkscreen is OK
◯ Pass
◯ Fail

☐ Right Side Cut Corner Vertical ❓
Nominal 9.00 mm
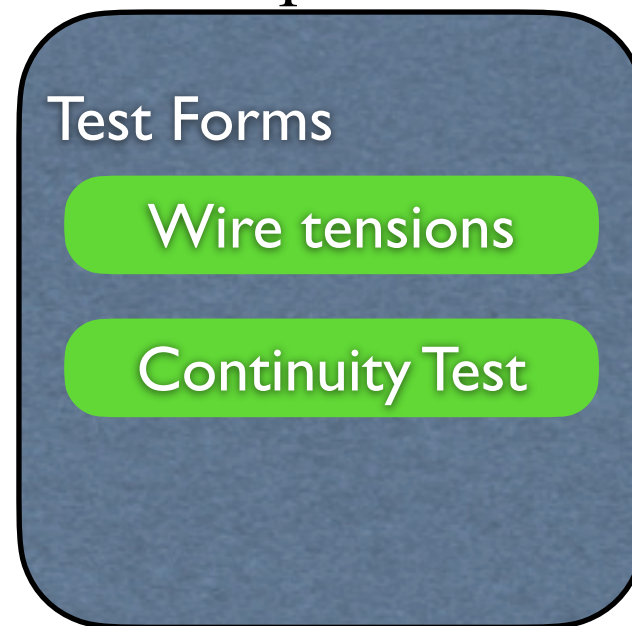
☐ Right Side Cut Corner Horizontal ❓
Nominal 8.80 mm

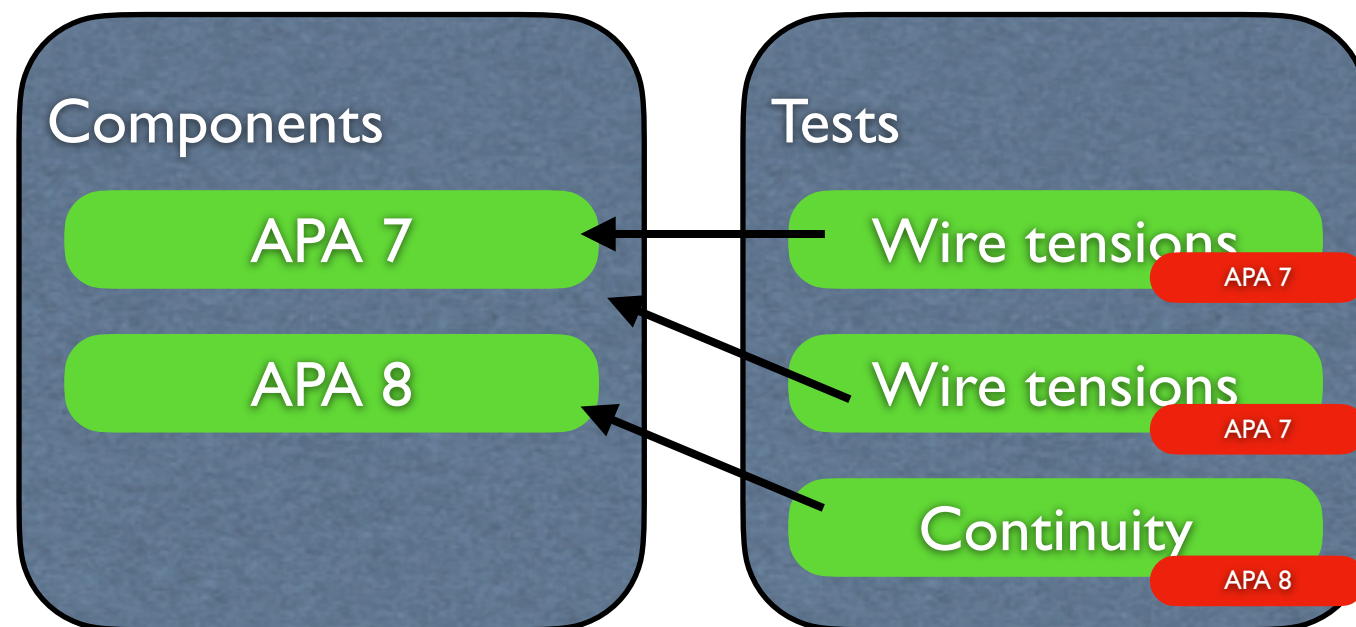☐ Notch - Vertical ❓
Nominal 9.00 mm

☐ Notch - Horizontal ❓

Components:
Physical objects

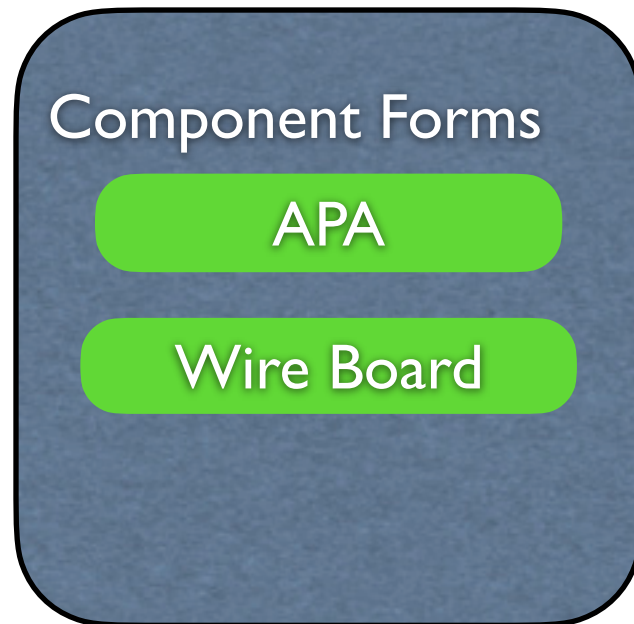Tests:
Things done to components

Component Forms
- APA
- Wire Board

Test Forms
- Wire tensions
- Continuity Test
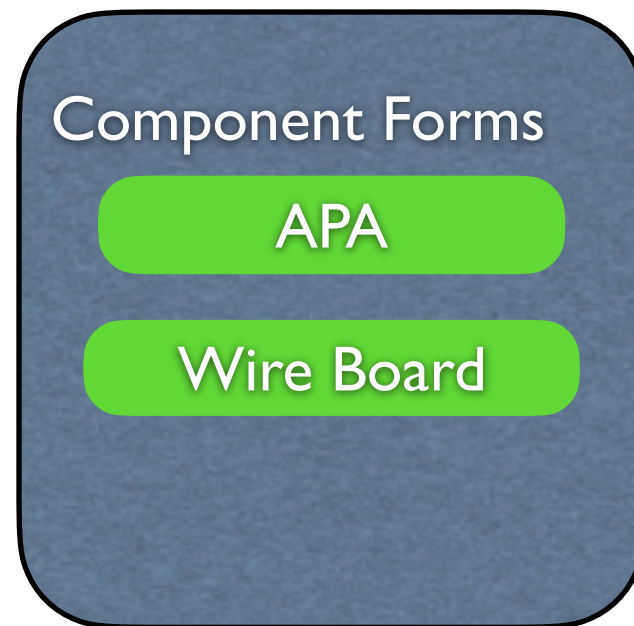
Forms describe how data is entered, edited by system experts.

Components
- APA 7
- APA 8

Tests
- Wire tensions — APA 7
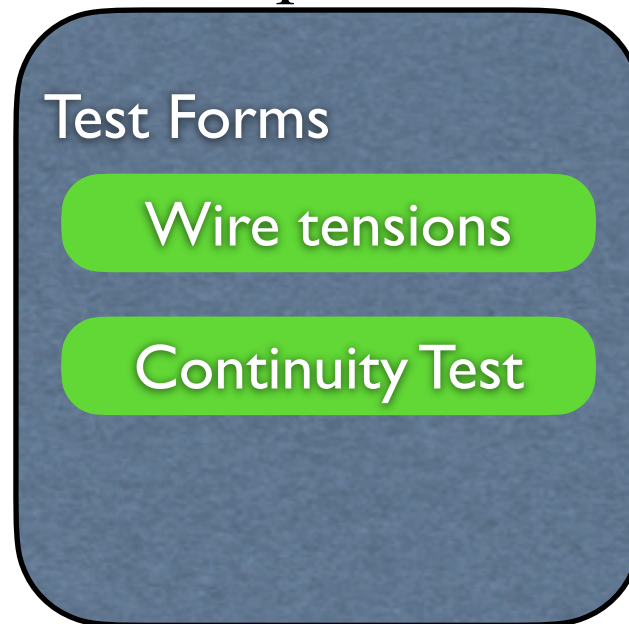- Wire tensions — APA 7
- Continuity — APA 8

Each test is connected to a component. Each component can be tested more than once.
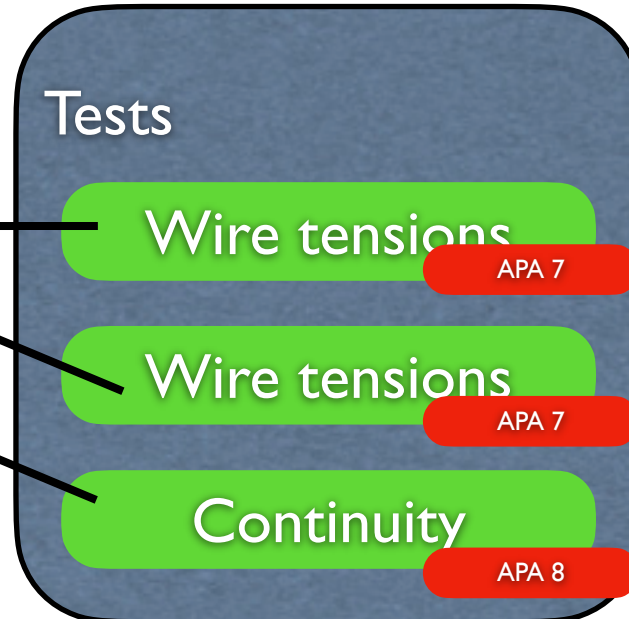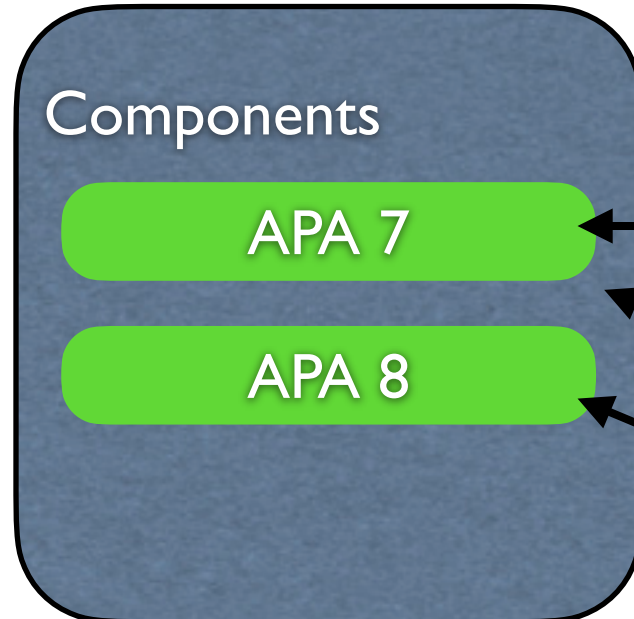
Database "Collections" (tables)
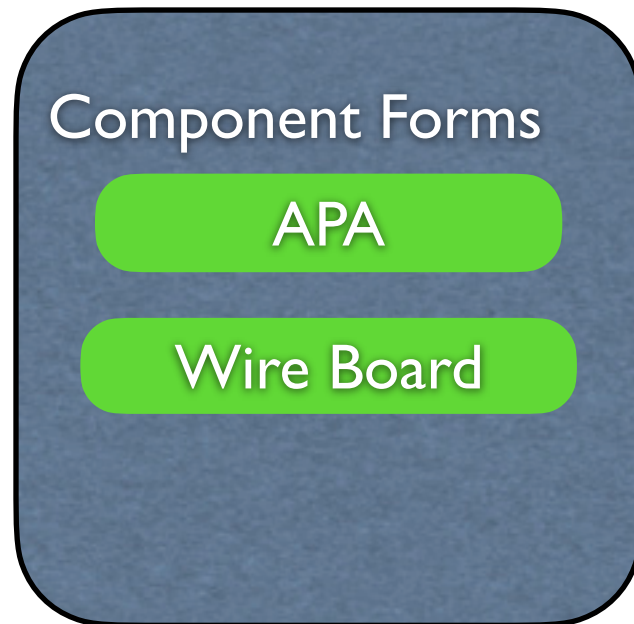
Components:
Physical objects

Tests:
Things done to components

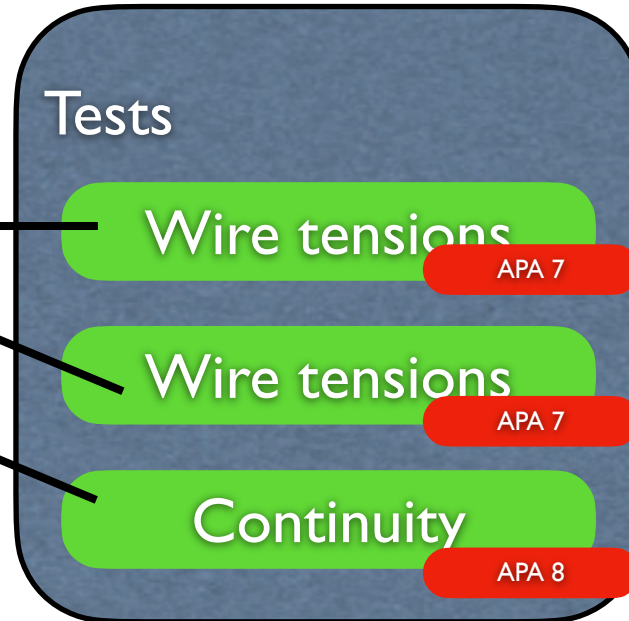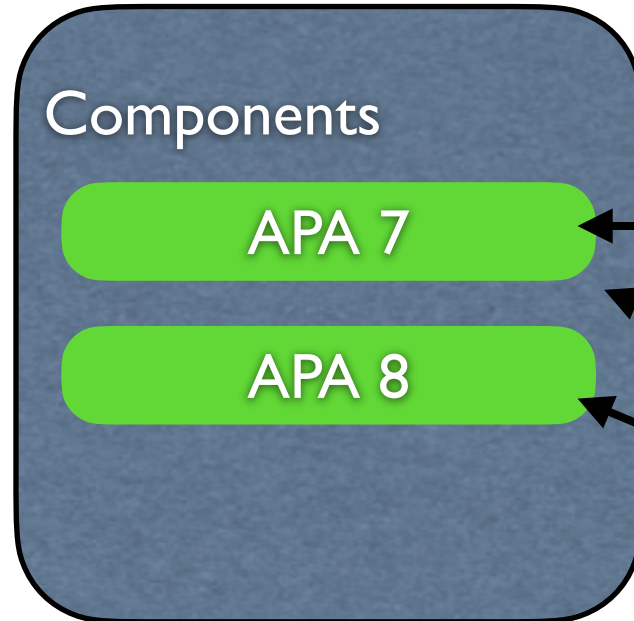**Jobs:**
Things done, not referenced to specific component

Component Forms
- APA
- Wire Board

Test Forms
- Wire tensions
- Continuity Test

Job Forms
- Shipment unpacking

Components
- APA 7
- APA 8

Tests
- Wire tensions — APA 7
- Wire tensions — APA 7
- Continuity — APA 8

Jobs
- Shipment unpacked on Monday

can then be used to create components and tests via user-specified algorithms

Database "Collections" (tables)

Components:
Physical objects

Tests:
Things done to components

Jobs:
Things done, not referenced to specific component

Component Forms
- APA
- Wire Board

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Job Forms
- Shipment unpacking

Components
- APA 7
- APA 8

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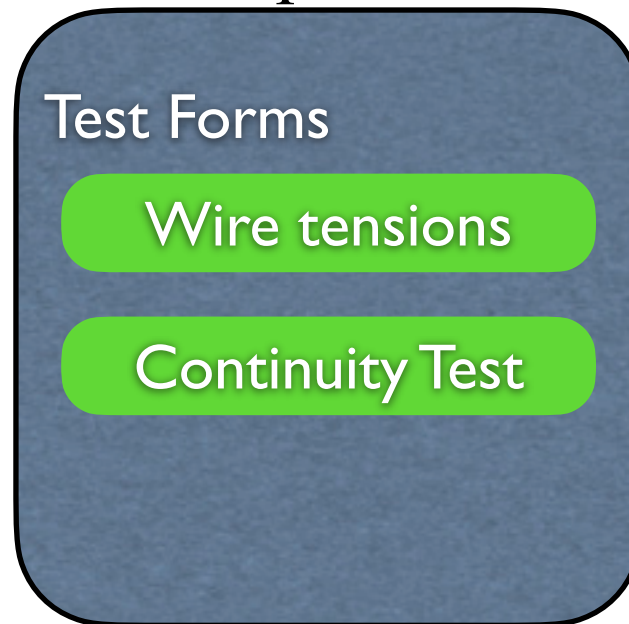
Jobs
- Shipment unpacked on Monday

can then be used to create components and tests via user-specified algorithms

Database "Collections" (tables)

Use cases I've had in mind:

- QA/QC data (e.g. wire tensions) that might be relevant to later physics analysis

- Virtual "traveller" documents

- Tracking component relationships (which cards built into which APA)

- Inventory tracking

- Checklists

Design philosophies

Designed to be used by people on the ground.

Make it easy as possible to get data in.

Flexible schemas - allow easy changes as things evolve

Never delete anything. All objects are either versioned or immutable.

Rapid development - we need this yesterday.

1. **Alice logs in**

2. Creates a new Widget component in Sietch

3. Enters the Widget serial number 14

4. Prints off the QR code, affixes it to the packagi

5. Bob logs in

6. Bob scans QR code (or types the first few chara
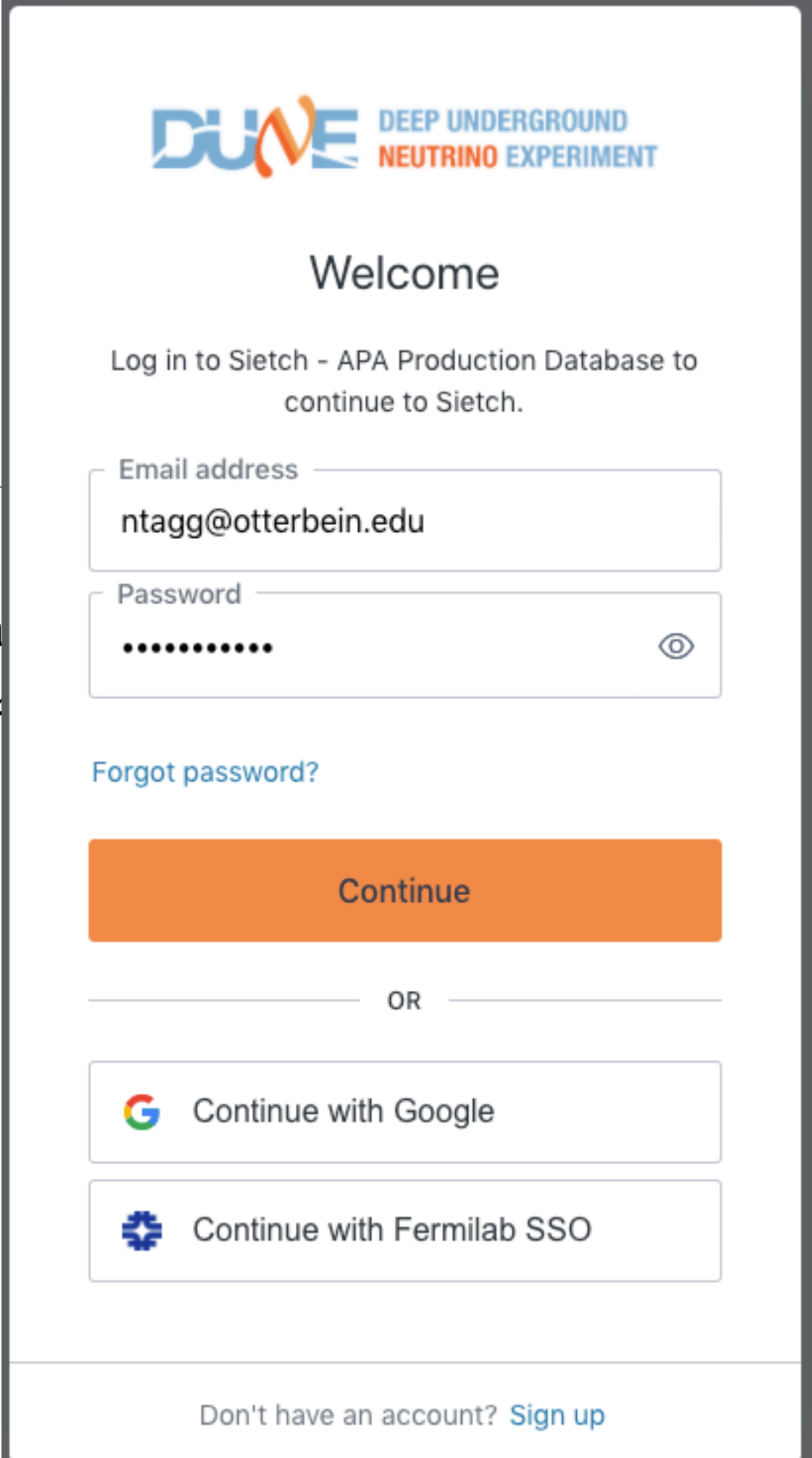
7. Bob starts a 'Widget integrity test' for widget 14

8. Bob enters the test results, submits.

9. Widget fails, so Charlie fixes widget

10. Bob redoes test, succeeds

How it would get used

1. Alice logs in
2. **Creates a new Widget component in Sietch**
3. Enters the Widget serial number 14
4. Prints off the QR code, affixes it to the packaging of the Widget
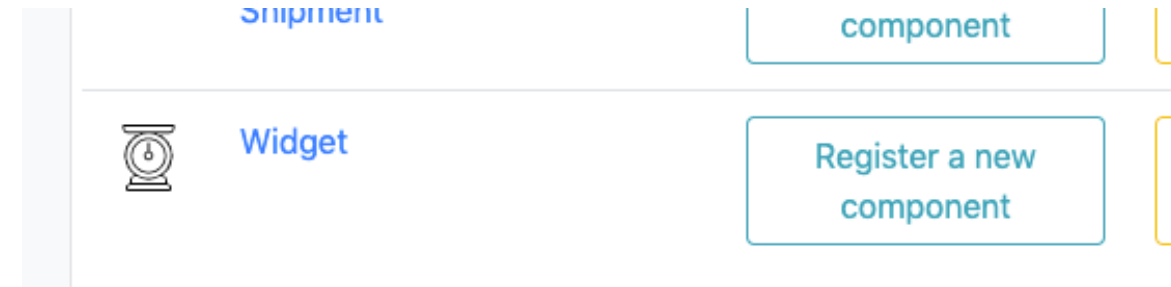5. Bob logs in
6. Bob scans QR code (or types the first few characters of the UUID)
7. Bob starts a 'Widget integrity test' for widget 14
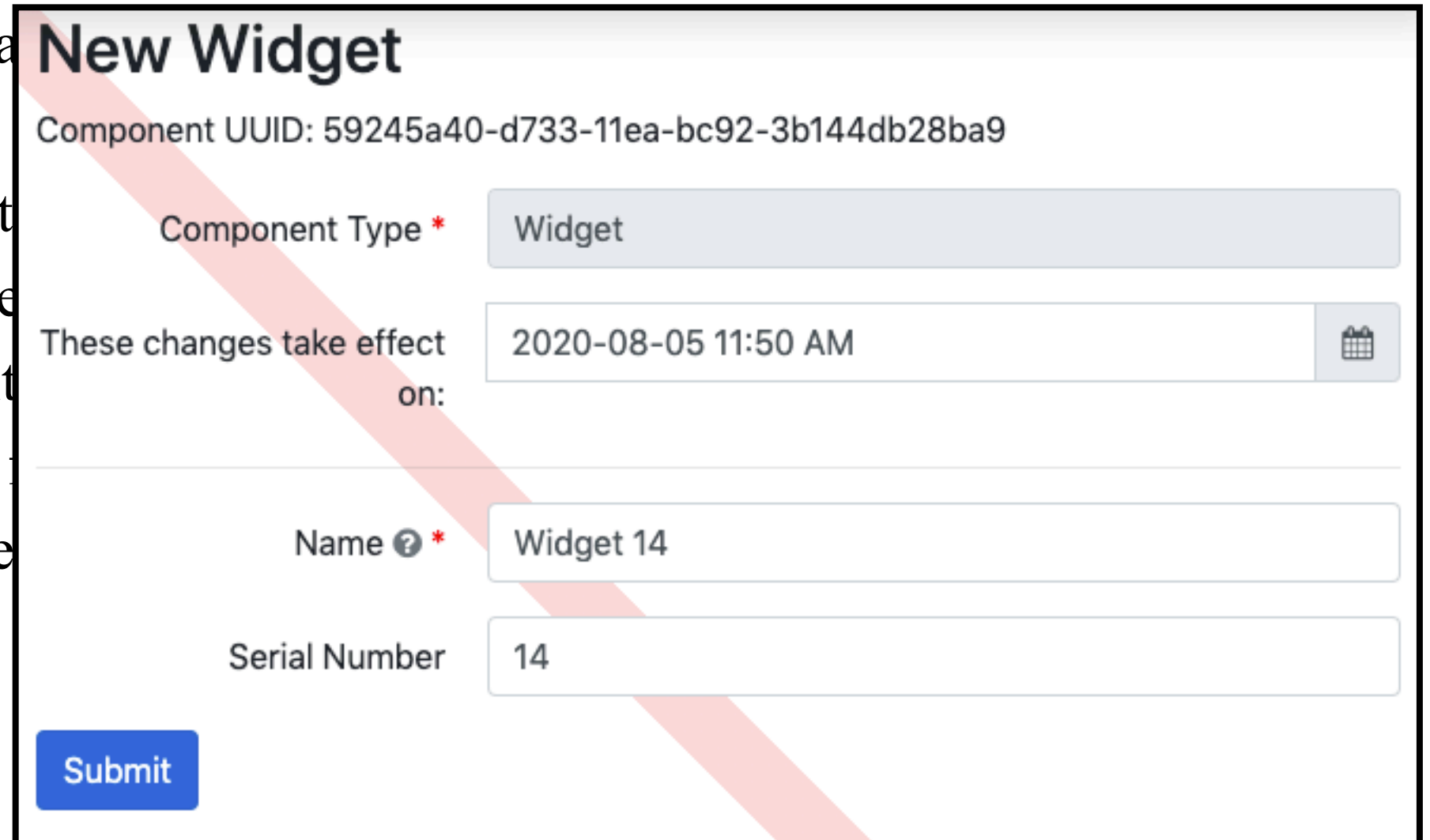8. Bob enters the test results, submits.
9. Widget fails, so Charlie fixes widget
10. Bob redoes test, succeeds

Shipment

Widget

component

Register a new
component

How it would get used

1. Alice logs in

2. Creates a new Widget component in Sietch

3. **Enters the Widget serial number 14**

4. Prints off the QR code, a

5. Bob logs in

6. Bob scans QR code (or t

7. Bob starts a 'Widget int

8. Bob enters the test result

9. Widget fails, so Charlie

10. Bob redoes test, succee

New Widget

Component UUID: 59245a40-d733-11ea-bc92-3b144db28ba9

| Component Type * | Widget |

| These changes take effect on: | 2020-08-05 11:50 AM |

| Name ❓ * | Widget 14 |

| Serial Number | 14 |

Submit

How it would get used

1.Alice logs in

2.Creates a new Widget component in Sietch

3.Enters the Widget serial number 14

4.Prints off the QR code, affixes it to the packaging of the Widget

5.Bob logs in

6.Bob scans QR code (or types the first few characters of the UUID)

This form has auto-complete - just start typing a component UUID to get started,

click on the camera icon to take a picture of the QR code.

Component UUID ❓ *

592_____-____-____-____-_____ ⊙ 📷

59245a40-d733-11ea-bc92-3b144db28ba9 Widget 14

How it would get used

7.Bob starts a 'Widget integrity test' for widget 14

How it would get used

1. Alice logs in
2. Creates a new Widget compo
3. Enters the Widget serial num
4. Prints off the QR code, affixe
5. Bob logs in
6. Bob scans QR code (or types the first few characters of the UUID)
7. Bob starts a 'Widget integrity test' for widget 14
8. **Bob enters the test results, submits.**
9. Widget fails, so Bob fixes widget
10. Bob redoes test, submits again.

Does it Blend?

Did it blend?   Yes   × ▾

Number of bits   134

Above tolerance. Nominal 100±20

Save Draft

Submit

How it would get used

1. Alice logs in
2. Creates a new Widget component in Sietch
3. Enters the Widget serial number 14
4. Prints off the QR code, affixes it to the packaging of the Widget
5. Bob logs in
6. Bob scans QR code (or types the first few characters of the UUID)
7. Bob starts a 'Widget integrity test' for widget 14
8. Bob enters the test results, submits.
9. Widget fails, so Bob fixes widget
10. Bob redoes test, submits again.

How it would get used

1. Alice logs in
2. Creates a new Wid[get]
3. Enters the Widget
4. Prints off the QR [code]
5. Bob logs in
6. Bob scans QR cod[e]
7. Bob starts a 'Widg[et]
8. Bob enters the test
9. Widget fails, so B[ob]
10. Bob redoes test, [s]

⚖ Widget: Widget 14

Edit this component

Component UUID
59245a40-d733-11ea-bc92-3b144db28ba9

Version 1
edited by ntagg@otterbein.edu on August 5th 2020, 3:51:34 pm

History

Effective as of
August 5th 2020, 3:51:34 pm (40 minutes ago)

Name ❓ * — Widget 14

Serial Number — 14

Raw JSON Document
Printable labels for this component

Testing History:

- Does it Blend? (on Aug 05 2020 by ntagg@otterbein.edu)
- Does it Blend? (on Aug 05 2020 by ntagg@otterbein.edu)
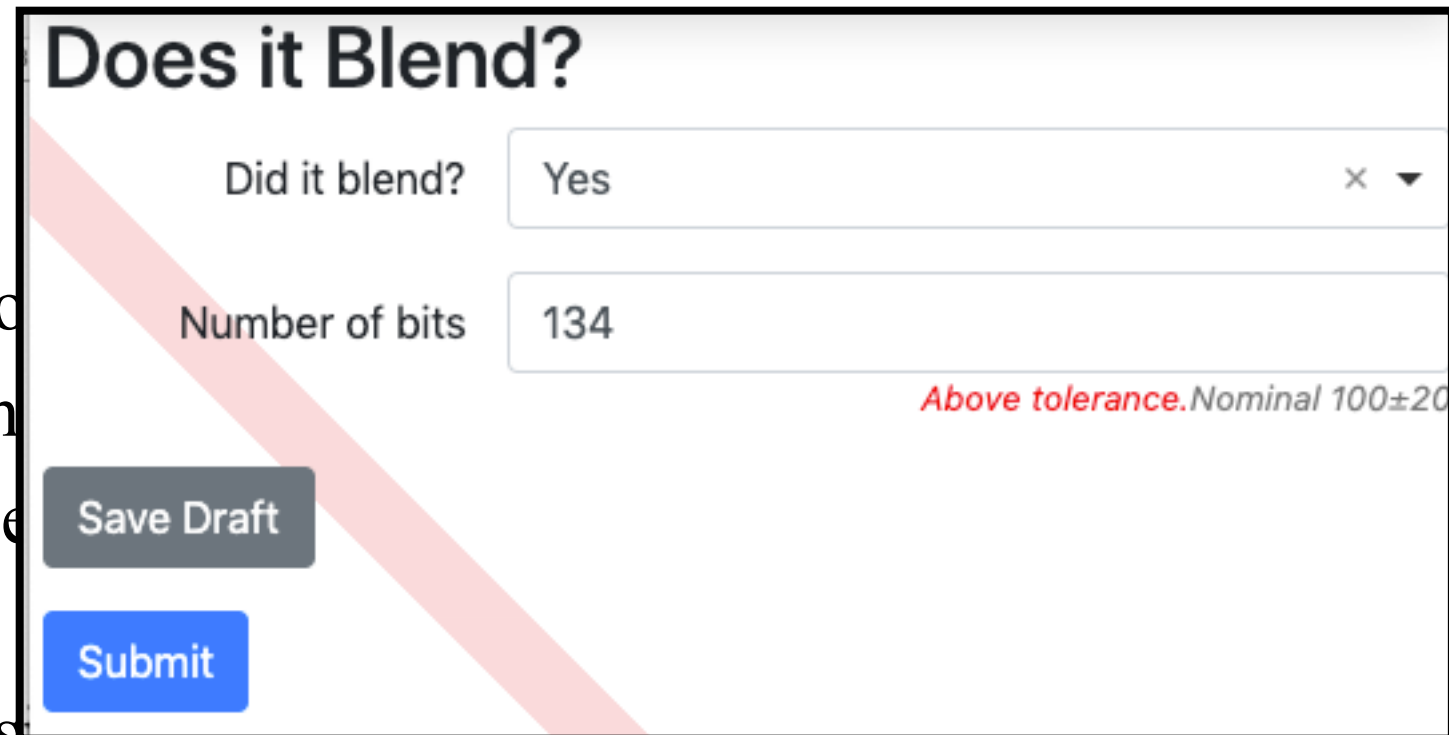
Run a test on this component

🗑 Does it Blend?

Prototype APA Gwind

How it would get used

Features

**File storage.
Image storage.
Can take picture
with mobile device.**

Location tagging

New! Search engine
in place

Coming soon:
Track component
connections

Custom views for
array data

Automatic
specification
warnings

Inventory

Where is it

Picture upload

☁ Drop files to attach, 📷 Use Camera, or browse

GeoTag

Set to current location (cached...)

Wed Aug 05 2020 12:36:07 GMT-0400 (Eastern Daylight Time)

Save Draft

Submit

File storage.
Image storage.
Can take picture
with mobile device.

Location tagging

**New! Search engine
in place**

Coming soon:
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Features
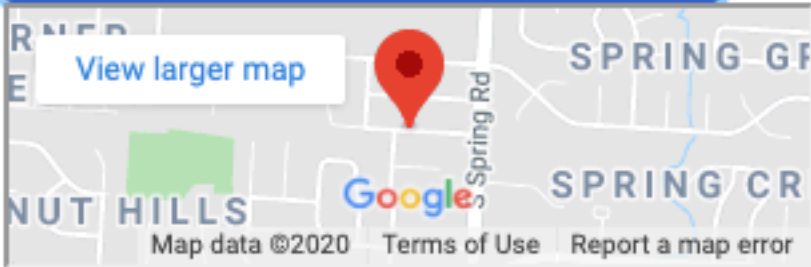
Advanced Search

Select type of record

Component ⌄

Select type or form

Widget ⌄

Text search:

Inserted or modified after

\<Beginning of time\> 📅 ✕

Inserted or modified before

\<End of time\> 📅 ✕

Specific data. Exact match only.

Name ❓ * example: apa 10

Serial
Number

File storage.
Image storage.
Can take picture
with mobile device.

Location tagging

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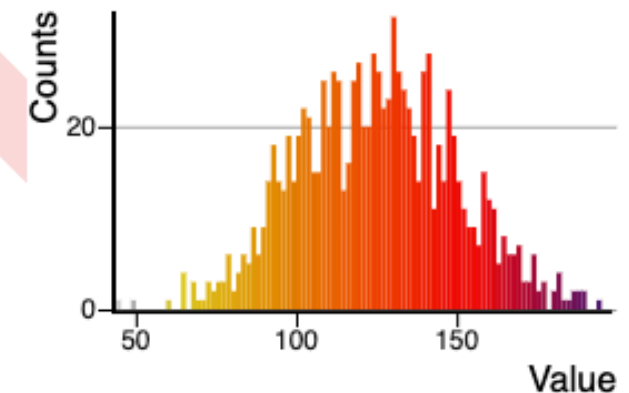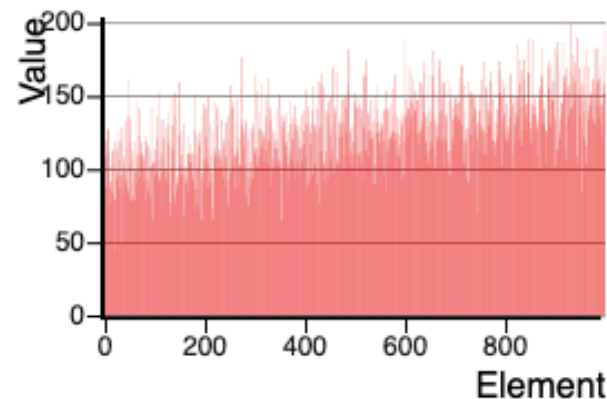User management system. does
NOT require FNAL ID, but can
use it.

Documented API for scripts or other
applications to upload test results
programmatically

Array Data

88.5649019085352,86.65968456616324,119.48473504839957,107.59896315515108,109.6240

Show Info

Data length: 1000
Min: 43.86
Max: 199.85
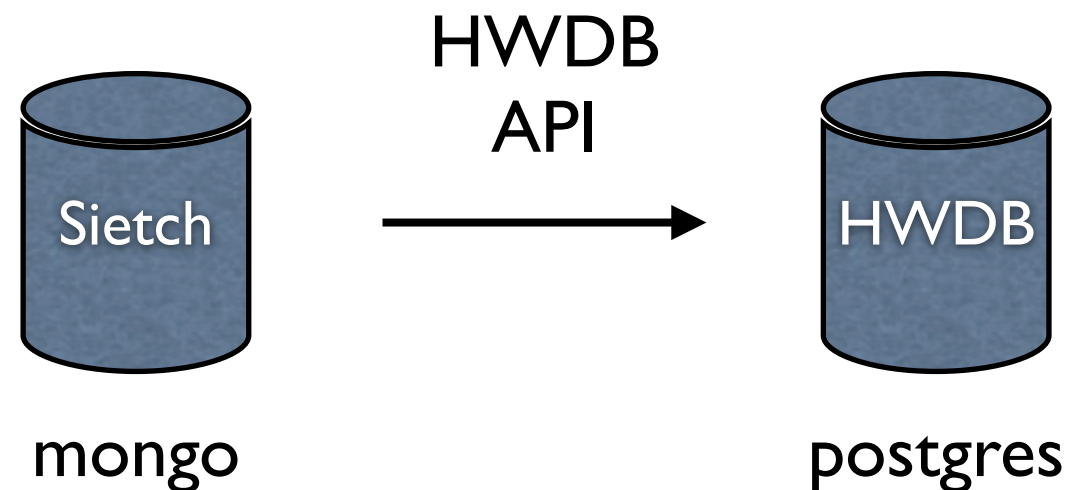Mean: 124.91
RMS: 24.51

Number of bits   134

Above tolerance. Nominal 100±20

Features

HWDB is the fully sanctioned long-term solution for storing this sort of data.

Sietch uses MongoDB, which Fermilab won't support.

Working model: Sietch exports it's data to HWDB for long-term storage.

HWDB
API

Sietch → HWDB

mongo   postgres

Sietch is ready for real-world testing,
(APA Steel, APA wire boards are moving to this soon)

HWDB is still under construction

Long-term