



JOHN DEERE

NOTHING RUNS LIKE A DEERE

Machine And JDLink™ API Overview

Kevin Seidl
Senior Product Manager

DEVELOP WITH
DEERE
2020



Agenda

Tuesday, February 4, 2020

- Machine APIs
 - High level overview of the API options for machine data
 - Real world examples of the data these APIs provide
 - Introduction to the Developer.Deere.com documentation for machine APIs
- MyJohnDeere API vs JDLink™ Machine Data API

Machine APIs

DEVELOP WITH
DEERE
2020

NOTHING RUNS LIKE A DEERE



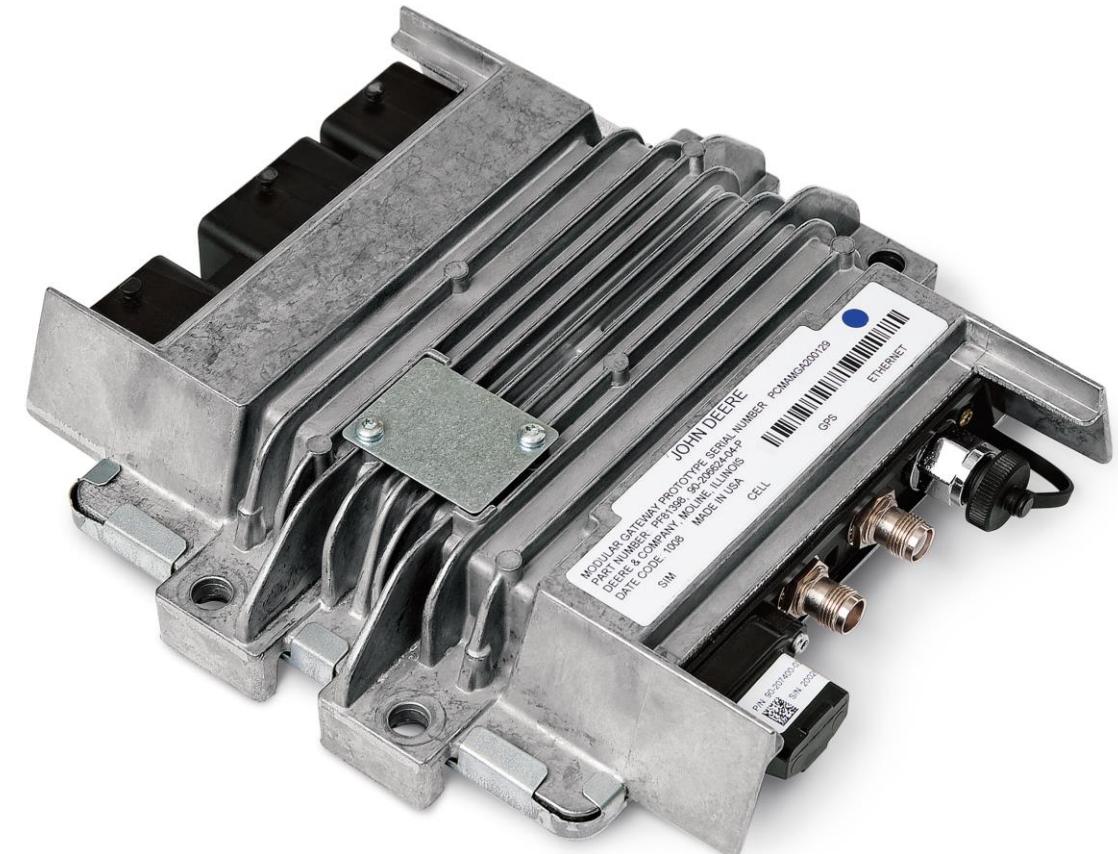
JOHN DEERE

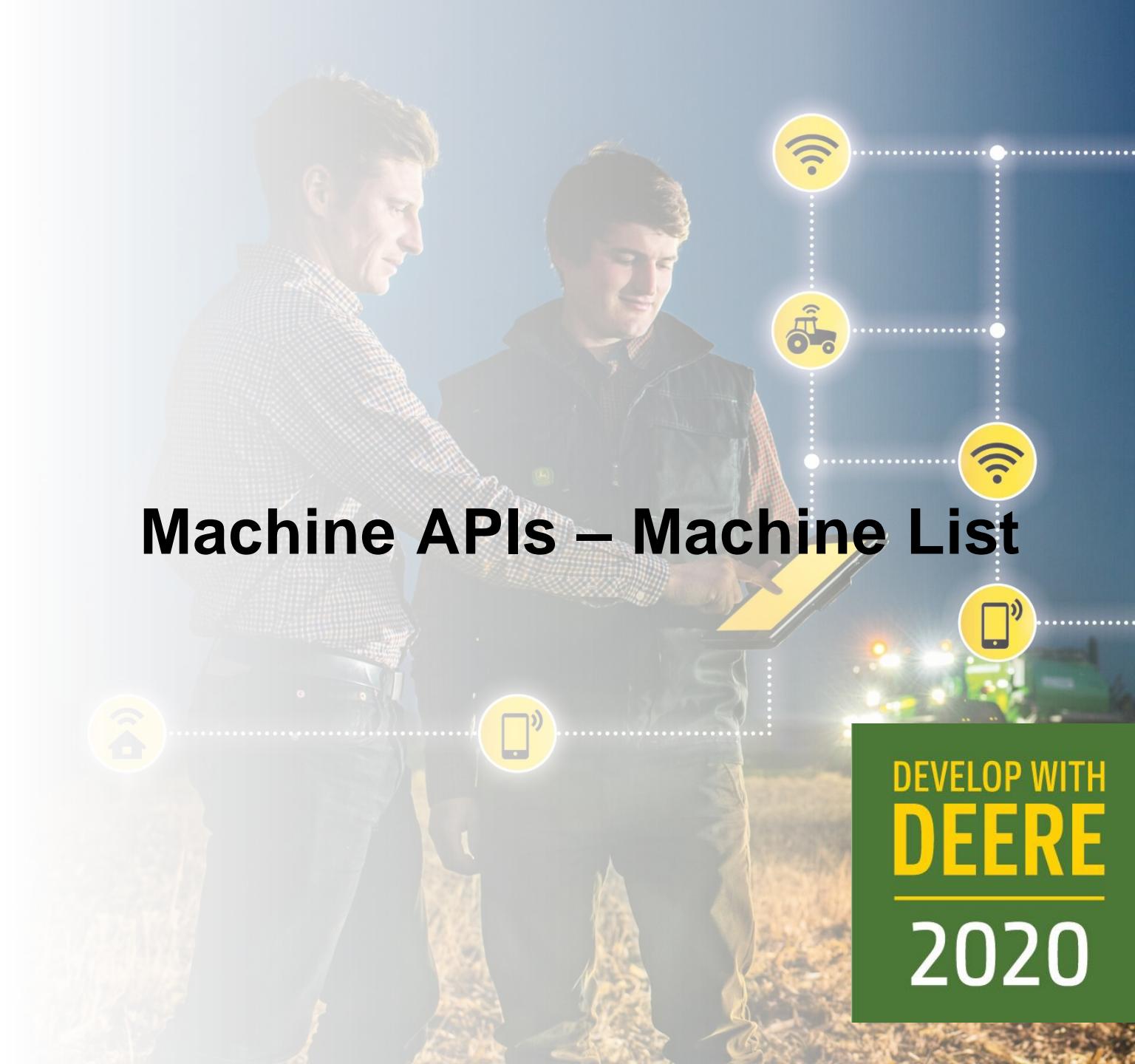
Machine APIs

- Machine List
- Location
- Engine Hours
- Notifications

JDLink™ – Enabling Technology

- Telematics Gateway to transfer data between cloud and machine (4G LTE)
- Eliminates the need for an USB device
- Captures machine data
- Enables data streaming
- Enables live connection
 - Remote Display Access
 - Adjustment of machine settings
 - Service packages from dealers
 - Real-time data
- Retrofit for non-Deere machines





Machine APIs – Machine List

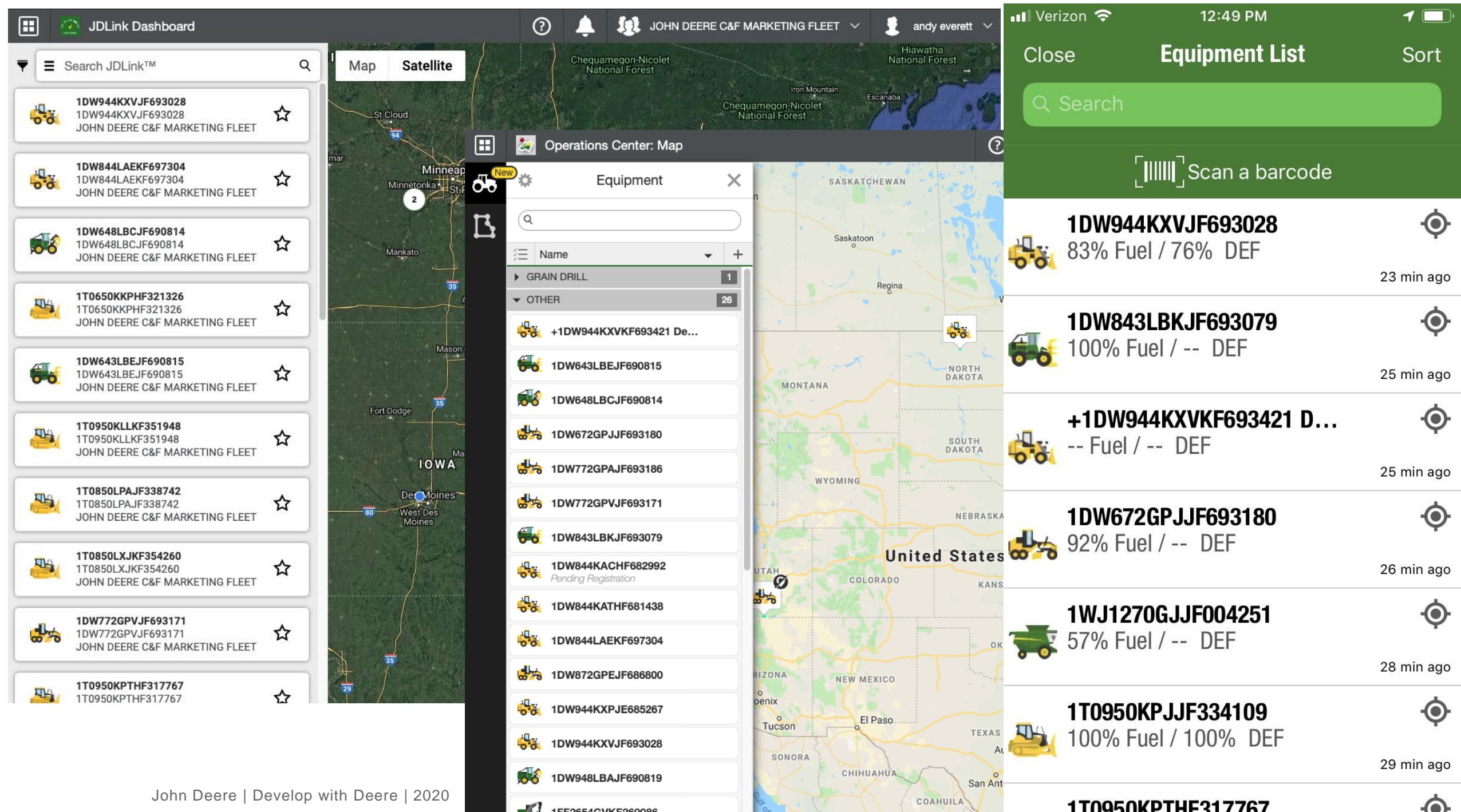
DEVELOP WITH
DEERE
2020



NOTHING RUNS LIKE A DEERE

Machine API – Machine List

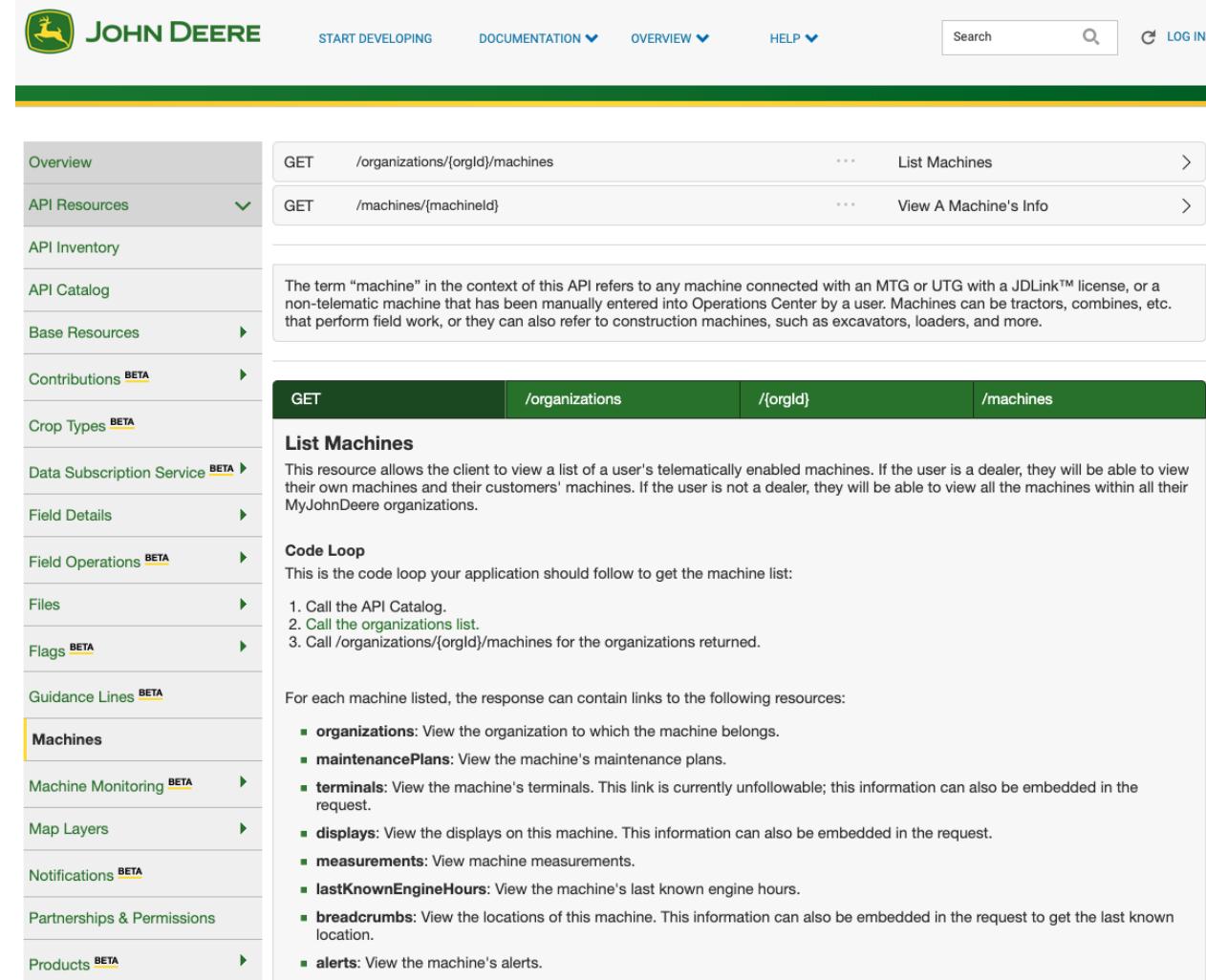
- List of all machines



Machine API – Machine List

Example API response (<https://partnerapi.deere.com/platform/machines>)

```
"values": [
{
  "@type": "Machine",
  "visualizationCategory": "spinnerSpreader",
  "machineCategories": {
    "@type": "MachineCategories",
    "machineCategories": [
      {
        "@type": "MachineCategory",
        "name": "JOHN DEERE",
        "id": "1",
        "type": "Make"
      },
      {
        "@type": "MachineCategory",
        "name": "F4365",
        "id": "4141162",
        "type": "Model"
      },
      {
        "@type": "MachineCategory",
        "name": "Nutrient Application",
        "id": "4280867",
        "type": "Type"
      },
      {
        "@type": "MachineCategory",
        "name": "N 47110",
        "type": "DMC"
      }
    ],
  }
},
```



The screenshot shows the John Deere API documentation page. At the top, there's a navigation bar with the John Deere logo, search bar, and login link. Below the navigation, a sidebar lists various API categories like Overview, API Resources, API Inventory, API Catalog, etc. The main content area is focused on the 'List Machines' endpoint, which is described as a GET request to `/organizations/{orgId}/machines`. It includes a detailed description of what a 'machine' refers to in this context, mentioning tractors, combines, etc. Below this, there's a 'Code Loop' section with steps 1-3 for getting the machine list, and a 'For each machine listed...' section with a bulleted list of resources like organizations, maintenancePlans, terminals, displays, measurements, lastKnownEngineHours, breadcrumbs, and alerts.

JOHN DEERE

START DEVELOPING DOCUMENTATION ▾ OVERVIEW ▾ HELP ▾

Search LOG IN

Overview

API Resources

API Inventory

API Catalog

Base Resources

Contributions BETA

Crop Types BETA

Data Subscription Service BETA

Field Details

Field Operations BETA

Files

Flags BETA

Guidance Lines BETA

Machines

Machine Monitoring BETA

Map Layers

Notifications BETA

Partnerships & Permissions

Products BETA

GET /organizations/{orgId}/machines ... List Machines >

GET /machines/{machineId} ... View A Machine's Info >

The term "machine" in the context of this API refers to any machine connected with an MTG or UTG with a JDLink™ license, or a non-telematic machine that has been manually entered into Operations Center by a user. Machines can be tractors, combines, etc. that perform field work, or they can also refer to construction machines, such as excavators, loaders, and more.

GET /organizations/{orgId}/machines /machines

List Machines

This resource allows the client to view a list of a user's telematically enabled machines. If the user is a dealer, they will be able to view their own machines and their customers' machines. If the user is not a dealer, they will be able to view all the machines within all their MyJohnDeere organizations.

Code Loop

This is the code loop your application should follow to get the machine list:

1. Call the API Catalog.
2. Call the organizations list.
3. Call `/organizations/{orgId}/machines` for the organizations returned.

For each machine listed, the response can contain links to the following resources:

- **organizations**: View the organization to which the machine belongs.
- **maintenancePlans**: View the machine's maintenance plans.
- **terminals**: View the machine's terminals. This link is currently unollowable; this information can also be embedded in the request.
- **displays**: View the displays on this machine. This information can also be embedded in the request.
- **measurements**: View machine measurements.
- **lastKnownEngineHours**: View the machine's last known engine hours.
- **breadcrumbs**: View the locations of this machine. This information can also be embedded in the request to get the last known location.
- **alerts**: View the machine's alerts.



Machine APIs – Location

DEVELOP WITH
DEERE
2020



 JOHN DEERE

NOTHING RUNS LIKE A DEERE

Machine API – Location

- Where a machine is located in the world at a point in time

JDLink Dashboard

Search JDLink™

Map Satellite

1DW944KXVJF693028
1DW944KXVJF693028
JOHN DEERE C&F MARKETING FLEET

1DW844LAEKF697304
1DW844LAEKF697304
JOHN DEERE C&F MARKETING FLEET

1DW648LBCJF690814
1DW648LBCJF690814
JOHN DEERE C&F MARKETING FLEET

1T0650KKPHF321326
1T0650KKPHF321326
JOHN DEERE C&F MARKETING FLEET

1DW643LBEJF690815
1DW643LBEJF690815
JOHN DEERE C&F MARKETING FLEET

1T0950KLLKF351948
1T0950KLLKF351948
JOHN DEERE C&F MARKETING FLEET

1T0850LPAJF338742
1T0850LPAJF338742
JOHN DEERE C&F MARKETING FLEET

1T0850LXJKF354260
1T0850LXJKF354260
JOHN DEERE C&F MARKETING FLEET

1DW772GPVJF693171
1DW772GPVJF693171
JOHN DEERE C&F MARKETING FLEET

1T0950KPTHF317767
1T0950KPTHF317767
JOHN DEERE C&F MARKETING FLEET

Machine Analyzer

View Edit Views

C&F Performance

Group by Machine Organization

Date Range This Year 01/01/2019 09/12/2019

304

Machine Type

4wd Loader

- 844K-III AGGREGATE ...
- 844L AGGREGATE ...
- 1DW844LAEKF6... (selected)
- 944K

- Crawler Dozer
- Forestry Swing Machine

Map

Minneapolis St. Paul Eau Claire Rochester Oshkosh Madison Rockford Naperville Peoria Cedar Rapids Iowa City Kansas City Columbia Springfield Evansville St. Louis Mark Twain National Forest Green Bay Milwaukee Chicago

1DW844LAEKF697304
1DW844LAEKF697304
JOHN DEERE C&F MARKETING FLEET

andy everett

1DW844LAEKF697304
1DW844LAEKF697304
JOHN DEERE C&F MARKETING FLEET

Map Data Terms of Use as of 09/12/2019

Alerts

85% Fuel

JDLink Dashboard View more machine details

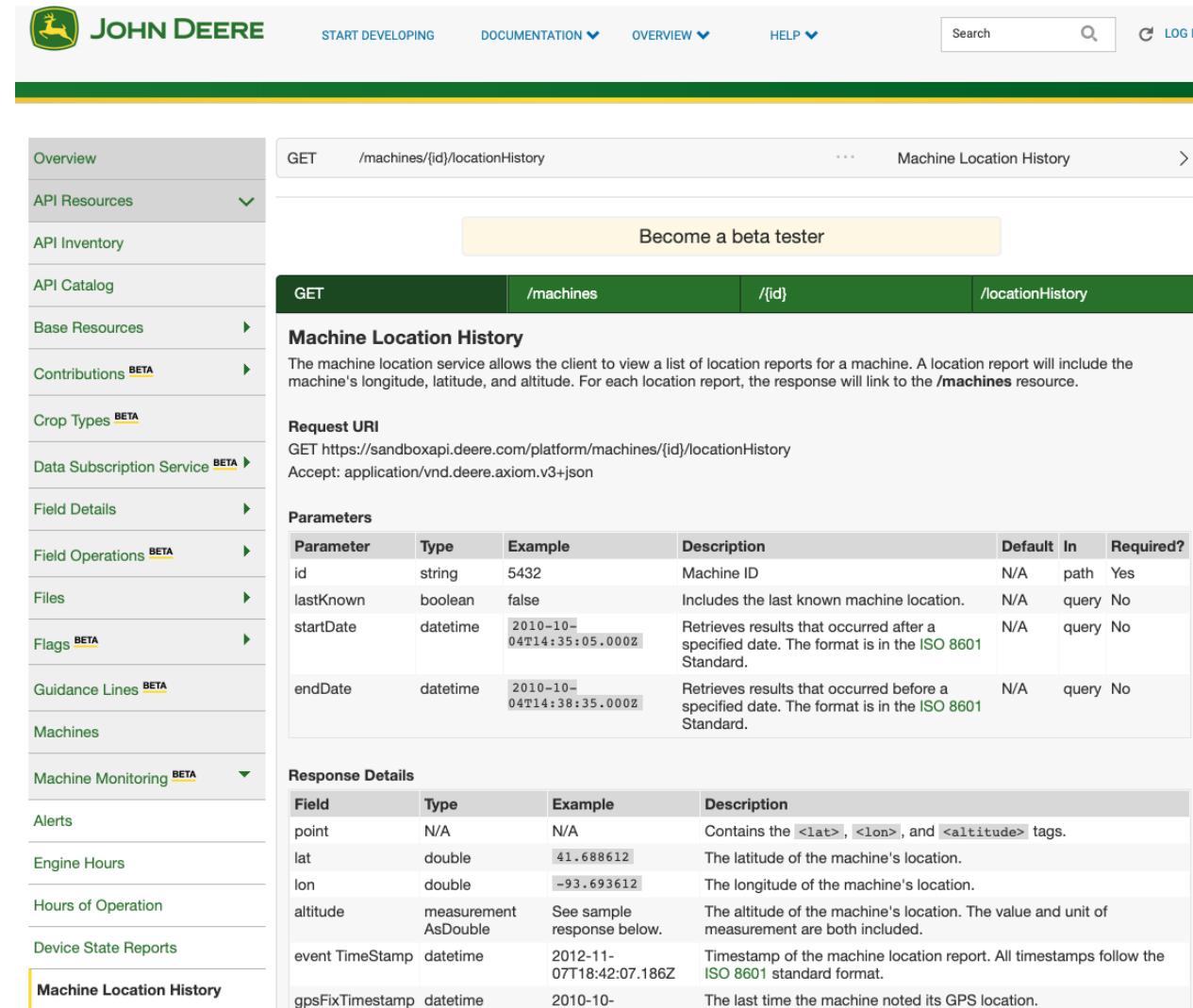
Maintenance Manager View and setup maintenance plans

Terminal

Machine API – Location

Example api response (<https://partnerapi.deere.com/platform/machines/321654/locationHistory>)

```
"values": [
  {
    "@type": "ReportedLocation",
    "point": {
      "@type": "Point",
      "lat": 42.973833,
      "lon": -86.070722
    },
    "eventTimestamp": "2019-09-12T05:31:05.000Z",
    "gpsFixTimestamp": "2019-09-12T05:30:59.000Z",
    "links": [
      {
        "@type": "Link",
        "rel": "machine",
        "uri": "https://partnerapi.deere.com/platform/machines/296544"
      }
    ],
    {
      "@type": "ReportedLocation",
      "point": {
        "@type": "Point",
        "lat": 42.973833,
        "lon": -86.070725
      },
      "eventTimestamp": "2019-09-11T17:32:49.000Z",
      "gpsFixTimestamp": "2019-09-11T10:35:25.000Z",
    }
  ]
},
```



The screenshot shows the John Deere API documentation interface. At the top, there's a navigation bar with the John Deere logo, search bar, and login link. The main content area has a sidebar on the left with links like Overview, API Resources, API Inventory, API Catalog, Base Resources, Contributions (BETA), Crop Types (BETA), Data Subscription Service (BETA), Field Details, Field Operations (BETA), Files, Flags (BETA), Guidance Lines (BETA), Machines, Machine Monitoring (BETA), Alerts, Engine Hours, Hours of Operation, Device State Reports, and Machine Location History (which is highlighted). The main panel shows a GET request for /machines/{id}/locationHistory. It includes a 'Become a beta tester' button, a detailed description of the machine location service, the request URI (GET https://sandboxapi.deere.com/platform/machines/{id}/locationHistory), parameters (id, lastKnown, startDate, endDate), and response details (point, lat, lon, altitude, eventTimeStamp, gpsFixTimestamp).

Overview

API Resources

API Inventory

API Catalog

Base Resources

Contributions BETA

Crop Types BETA

Data Subscription Service BETA

Field Details

Field Operations BETA

Files

Flags BETA

Guidance Lines BETA

Machines

Machine Monitoring BETA

Alerts

Engine Hours

Hours of Operation

Device State Reports

Machine Location History

GET /machines/{id}/locationHistory

... Machine Location History >

Become a beta tester

Machine Location History

The machine location service allows the client to view a list of location reports for a machine. A location report will include the machine's longitude, latitude, and altitude. For each location report, the response will link to the /machines resource.

Request URI

GET https://sandboxapi.deere.com/platform/machines/{id}/locationHistory

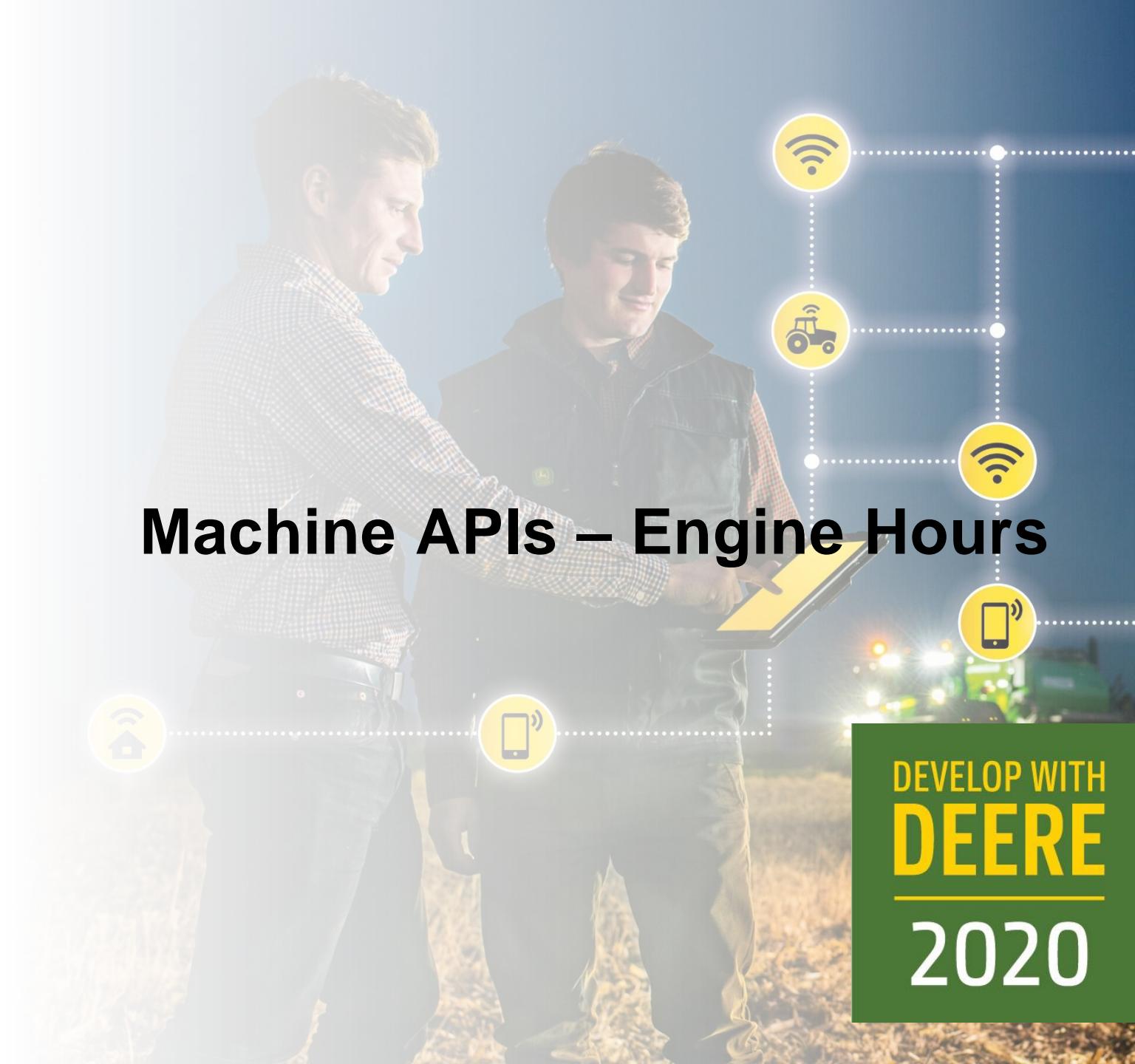
Accept: application/vnd.deere.axiom.v3+json

Parameters

Parameter	Type	Example	Description	Default	In	Required?
id	string	5432	Machine ID	N/A	path	Yes
lastKnown	boolean	false	Includes the last known machine location.	N/A	query	No
startDate	datetime	2010-10-04T14:35:05.000Z	Retrieves results that occurred after a specified date. The format is in the ISO 8601 Standard.	N/A	query	No
endDate	datetime	2010-10-04T14:38:35.000Z	Retrieves results that occurred before a specified date. The format is in the ISO 8601 Standard.	N/A	query	No

Response Details

Field	Type	Example	Description
point	N/A	N/A	Contains the <lat>, <lon>, and <altitude> tags.
lat	double	41.688612	The latitude of the machine's location.
lon	double	-93.693612	The longitude of the machine's location.
altitude	measurement AsDouble	See sample response below.	The altitude of the machine's location. The value and unit of measurement are both included.
eventTimeStamp	datetime	2012-11-07T18:42:07.186Z	Timestamp of the machine location report. All timestamps follow the ISO 8601 standard format.
gpsFixTimestamp	datetime	2010-10-	The last time the machine noted its GPS location.



Machine APIs – Engine Hours

DEVELOP WITH
DEERE
2020



 JOHN DEERE

NOTHING RUNS LIKE A DEERE

Machine API – Engine Hours

- The number of hours that the engine has been running



Search JDLink™

1DW648LBCJF690814
1DW648LBCJF690814
JOHN DEERE C&F MARKETING FLEET

1T0650KKPHF321326
1T0650KKPHF321326
JOHN DEERE C&F MARKETING FLEET

1DW643LBEJF690815
1DW643LBEJF690815
JOHN DEERE C&F MARKETING FLEET

1T0950KLLKF351948
1T0950KLLKF351948
JOHN DEERE C&F MARKETING FLEET

1T0850LPAJF338742
1T0850LPAJF338742
JOHN DEERE C&F MARKETING FLEET

1T0850LXJKF354260
1T0850LXJKF354260
JOHN DEERE C&F MARKETING FLEET

1DW772GPVJF693171
1DW772GPVJF693171
JOHN DEERE C&F MARKETING FLEET

1T0950KPTHF317767
1T0950KPTHF317767
JOHN DEERE C&F MARKETING FLEET

1DW844LAEKF697304
1DW844LAEKF697304
JOHN DEERE C&F MARKETING FLEET...
September 12, 2019 12:26 PM

Other

Aug 14, 2019 to Sep 12, 2019

as of September 12, 2019 12:26 PM
Machine Details

4 Alerts



36.75
Engine Hours



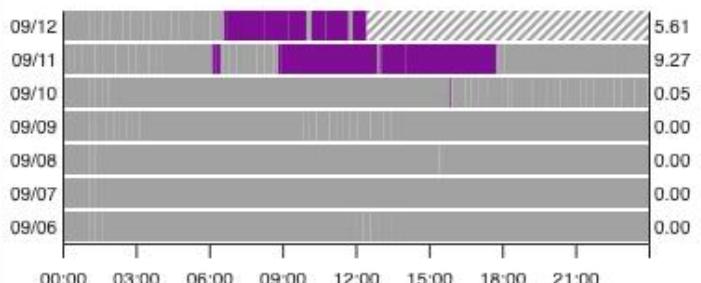
85%
Fuel

September 6, 2019 - September 12, 2019

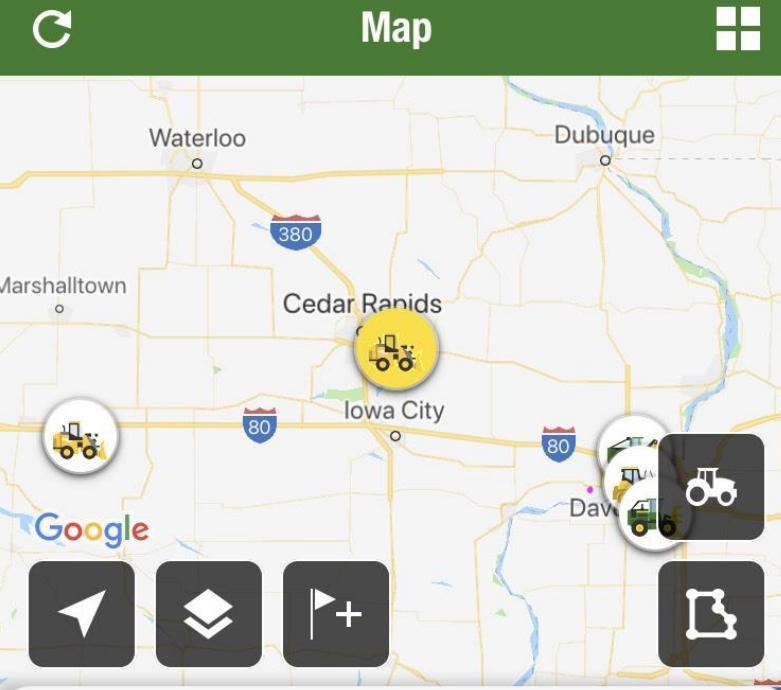
Machine Hours of Operation

14.93

Period Engine Hours



Show All



1DW844LAEKF697304



74%



68%



37 Hrs.

--

--

--

Idle

Working

Transport

LAST UPDATED 1 HR AGO



Machine API – Engine Hours

Example api response (<https://partnerapi.deere.com/platform/machines/321654/engineHours>)

```
"values": [
{
  "@type": "EngineHours",
  "reading": {
    "@type": "measurementAsDouble",
    "valueAsDouble": 36.75,
    "unit": "Hours"
  },
  "reportTime": "2019-09-12T09:55:05.000Z",
  "links": [
    {
      "@type": "Link",
      "rel": "machine",
      "uri": "https://partnerapi.deere.com/platform/machines/411754"
    }
  ]
}
```

The screenshot shows the John Deere API documentation interface. At the top, there's a navigation bar with the John Deere logo, search bar, and login link. On the left, a sidebar lists various API categories like Overview, API Resources, API Inventory, API Catalog, Base Resources, Contributions, Crop Types, Data Subscription Service, Field Details, Field Operations, Files, Flags, Guidance Lines, Machines, Machine Monitoring, Alerts, Engine Hours (which is highlighted in yellow), Hours of Operation, Device State Reports, and Machine Location History.

The main content area has a header for the 'Engine Hours' endpoint:

GET	/machines/{id}/engineHours	... Engine Hours
-----	----------------------------	------------------

Below the header, there's a button labeled 'Become a beta tester'. The 'Request URI' section shows the URL and accept header:

Request URI
GET <https://sandboxapi.deere.com/platform/machines/{id}/engineHours>
Accept: application/vnd.deere.axiom.v3+json

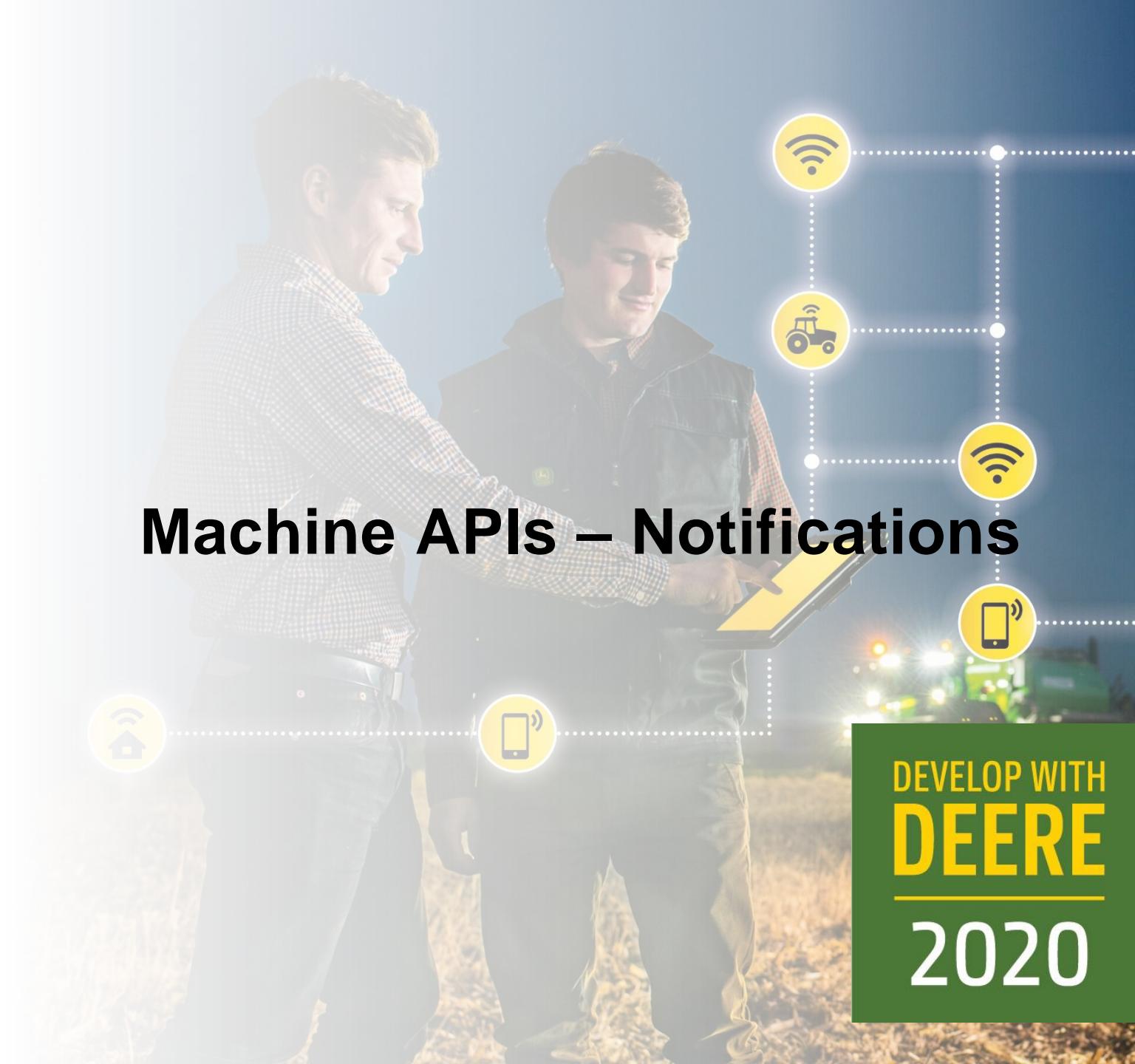
The 'Parameters' table defines the required parameters:

Parameter	Type	Example	Description	Default	In	Required?
id	string	5432	Machine ID.	N/A	path	Yes
startDate	datetime	2015-02-03T9:00:00.000Z	Start date & time.	N/A	query	No
endDate	datetime	2015-02-03T10:42:24.282Z	End date & time.	N/A	query	No
lastKnown	boolean	true	If true, returned only the last known engine hour reading. startDate and endDate are ignored.	false	query	No

The 'Response Details' table shows the fields and their descriptions:

Field	Type	Example	Description
reading	measurementAsDouble	<valueAsDouble> 523.5166666666667</valueAsDouble>	The number of hours the engine has been running.
reportTime	datetime	2010-10-04T14:35:05.000Z	Timestamp at which the report was created.
source ¹	string	CI	Device which collected the data.

A note at the bottom states: 'Please Note: This API does not support eTags.'



Machine APIs – Notifications

DEVELOP WITH
DEERE
2020



 JOHN DEERE

NOTHING RUNS LIKE A DEERE

Machine API – Notifications

- DTCs and other messages related to a machine



Search JDLink™

1DW944KXPJE685267
1DW944KXPJE685267
JOHN DEERE C&F MARKETING FLEET

1WJ1270GJJF004251
1WJ1270GJJF004251
JOHN DEERE C&F MARKETING FLEET

1T01050PPGF001250
1T01050PPGF001250
JOHN DEERE C&F MARKETING FLEET

1DW948LBAJF690819
1DW948LBAJF690819
JOHN DEERE C&F MARKETING FLEET

1DW843LBKJF693079
1DW843LBKJF693079
JOHN DEERE C&F MARKETING FLEET

1FF2654GVKF260086
1FF2654GVKF260086
JOHN DEERE C&F MARKETING FLEET

1DW672GPJJF693180
1DW672GPJJF693180
JOHN DEERE C&F MARKETING FLEET

1WJ1510GLJF003952
1WJ1510GLJF003952

137/137

YELLOW TCU 523952.31 Traction control disabled. - Cycle park brake to re-enable.
August 23, 2019 7:35 AM

YELLOW TCU 523952.31 Traction control disabled. - Cycle park brake to re-enable.
August 23, 2019 7:08 AM

YELLOW TCU 523952.31 Traction control disabled. - Cycle park brake to re-enable.
August 23, 2019 6:53 AM

YELLOW TCU 523952.31 Traction control disabled. - Cycle park brake to re-enable.
August 21, 2019 1:49 PM

YELLOW TCU 523952.31 Traction control disabled. - Cycle park brake to re-enable.
August 19, 2019 8:52 PM

YELLOW TCU 523952.31 Traction control disabled. - Cycle park brake to re-enable.
August 17, 2019 5:13 PM

Low Fuel
September 11, 2019 11:07 PM

Low Fuel
September 11, 2019 12:53 PM

Map

Today

Dubuque - Movement

1DW772GPAJF693186 Sep 12, 2019 10:50 AM

Dubuque - Movement

1DW672GPJJF693180 Sep 12, 2019 09:20 AM

Dubuque - Engine Started

1DW672GPJJF693180 Sep 12, 2019 09:07 AM

Sep 11, 2019

Low Fuel 1DW944KXPJE685267 Sep 11, 2019 11:07 PM

Dubuque - Movement

1DW772GPAJF693186 Sep 11, 2019 05:31 PM

INFO ECU 001569.31 Engine derated. - Engine power limited.

1DW843LBKJF693079 Sep 11, 2019 03:33 PM



Machine API – Notifications

Example api response (<https://partnerapi.deere.com/platform/notificationEvents>)

```
"values": [
{
  "@type": "GroupedNotifications",
  "geometries": "[{\\"type\\": \"Point\", \\"coordinates\\": [-90.1805376, 41.4475633]}]",
  "title": "Andy Fence - Enter",
  "text": "This machine entered the defined Geofence boundaries. \\r\\n\\r\\n **GEOFENCE ALERT** LOCATION AT THE TIME OF ALERT** \\r\\n41.4475633, -90.1805376",
  "severity": "HIGH",
  "sourceEvent": "803-99019292",
  "eventType": "CURFENCE_ALERT",
  "minimizedNotifications": [
    {
      "@type": "MinimizedNotification",
      "additionalDetails": [
        {
          "@type": "AdditionalDetail",
          "name": "targetResourceName",
          "value": "Mikes 9rx"
        },
        {
          "@type": "AdditionalDetail",
          "name": "latitude",
          "value": "41.4475633"
        },
        {
          "@type": "AdditionalDetail",
          "name": "longitude",
          "value": "-90.1805376"
        }
      ]
    }
  ]
}
```

The screenshot shows the John Deere Partner API documentation page. At the top, there's a navigation bar with the John Deere logo, search bar, and login link. The main content area has a sidebar on the left with various API categories like Overview, API Resources, API Inventory, API Catalog, Base Resources, Contributions (BETA), Crop Types, Data Subscription Service, Field Details, Field Operations (BETA), Files, Flags (BETA), Guidance Lines, Machines, Machine Monitoring (BETA), Map Layers, Notifications (BETA), Partnerships & Permissions, Products (BETA), and Request Rate Access. The Notifications (BETA) section is currently selected. The main panel shows the `/notificationEvents` endpoint with methods: POST, DELETE, GET, and another GET for organization notifications. Below this is a 'Create Notification Event' section with a 'Request URI' table and a 'Request Details' table. A large yellow button at the bottom says 'Become a beta tester'.

POST /notificationEvents

Create Notification Event

This resource creates an event that Operations Center will use to generate notifications. These notifications will be received by anyone who is subscribed to your services. Each notification event will include a link to `source`, which will define the event.

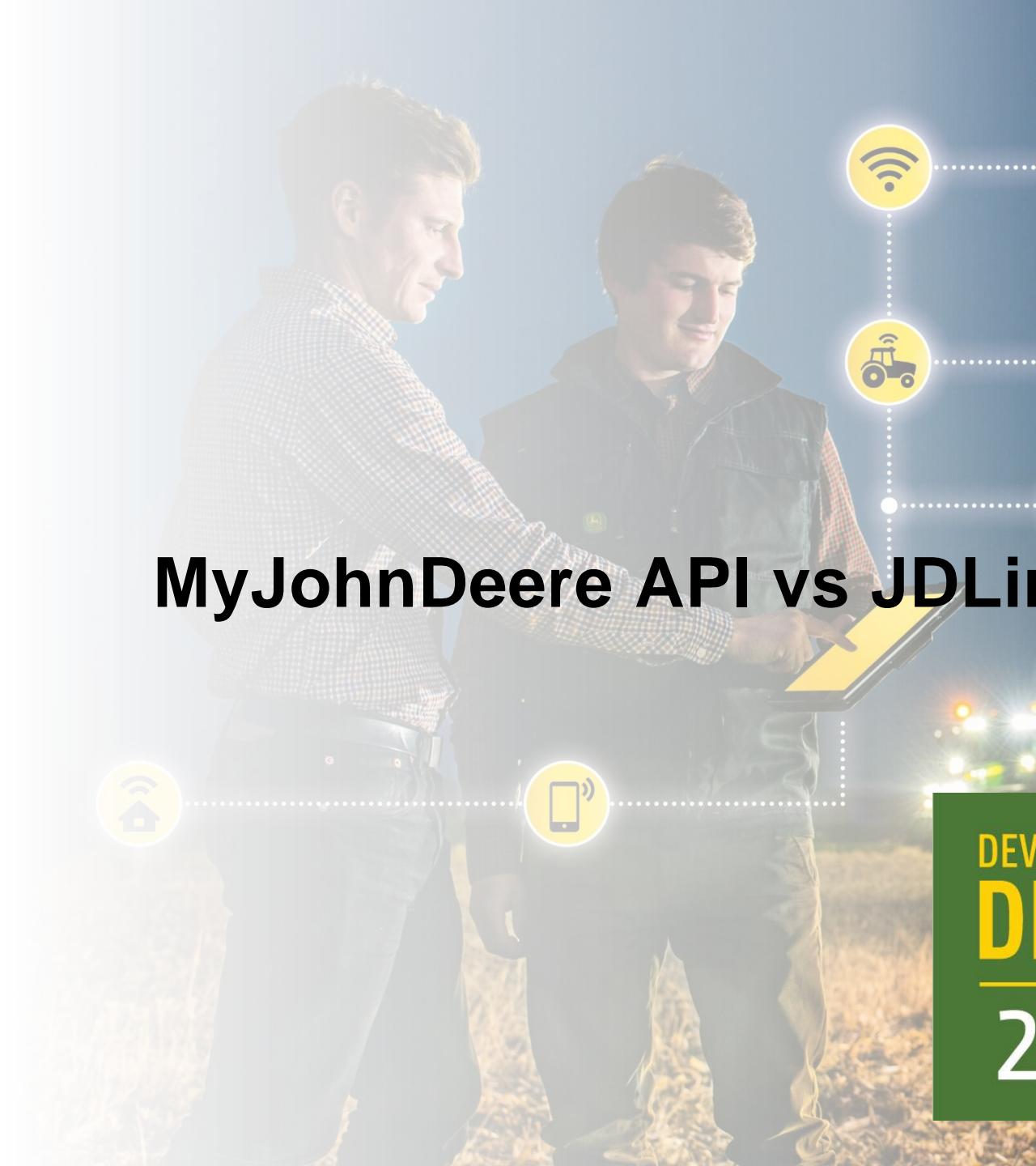
Request URI

POST <https://sandboxapi.deere.com/platform/notificationEvents>
Accept: application/vnd.deere.axiom.v3+json
Content-Type: application/vnd.deere.axiom.v3+json

Request Details

Field	Type	Example	Description
title	string	Some Title	Event title.
text	string	Detailed event text.	Event description.
severity ¹	string	HIGH	Event severity.
eventType ²	string	PEST	Event type.
additionalDetails	---	See sample request below.	More event details.
timeRange	---	See sample request below.	Time range of the event. Includes startDate and endDate.
eventAssociation	---	See sample request below.	Instructions on how to associate the resulting Notifications with resources.

Target Resource Event Association



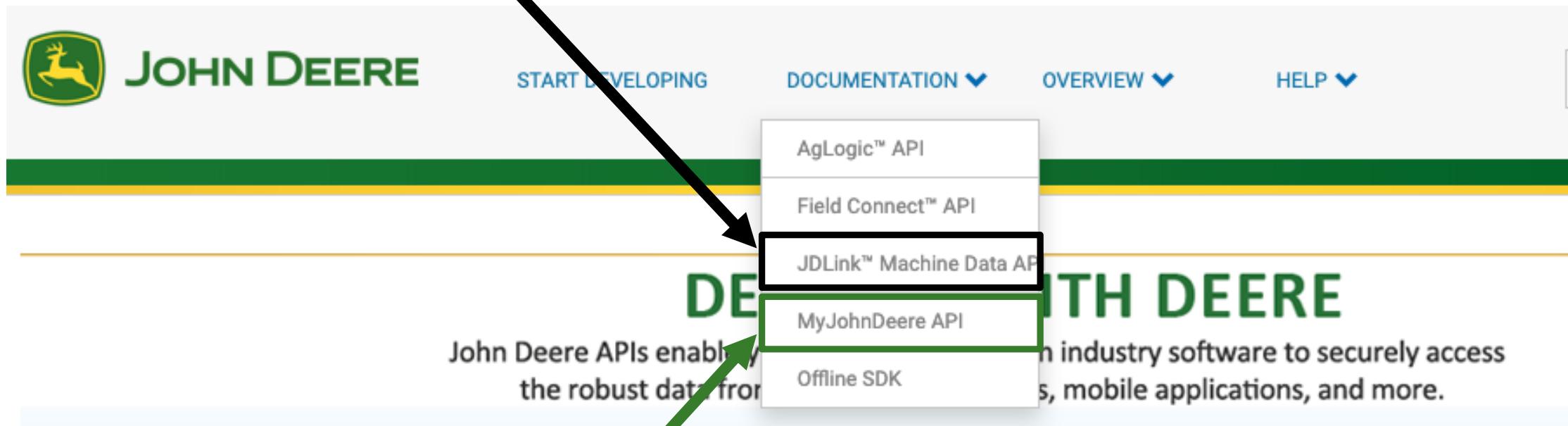
MyJohnDeere API vs JDLink™ Machine Data API

DEVELOP WITH
DEERE
2020



MyJohnDeere API vs JDLink™ Machine Data API

MyJohnDeere API



JDLink™ Machine Data API

MyJohnDeere API vs JDLink™ Machine Data API

	MyJohnDeere API	JDLink™ Machine Data API	Comments
Specification	John Deere Created	ISO 15143-3 Spec (AEMP 2)	MyJohnDeere has far more future flexibility, as it isn't tied to a slow moving ISO spec
Format	JSON	XML	
Data Access	Staff Member or Partnerships	Staff Member Only	JDLink™ API data accessibility may be hard to scale
Interaction	Multiple calls to retrieve all data	Single call to get most machine data	
Historical support	Full History Available	Not Available	JDLink™ only supports latest known information
Machine Alerts / DTCs	Available	Not Available	
Data	Flexible	Fixed	

Q&A / Feedback

DEVELOP WITH
DEERE
2020

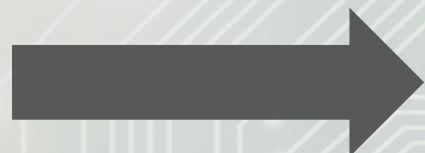
NOTHING RUNS LIKE A DEERE

How'd we do? How valuable was this session to you?

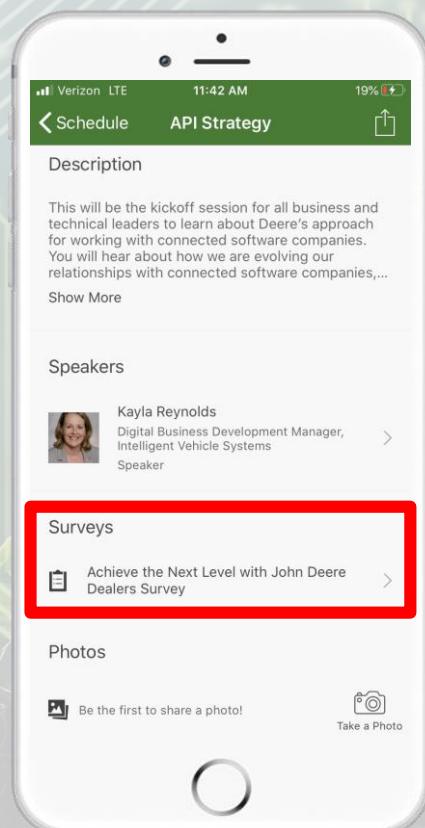


JOHN DEERE

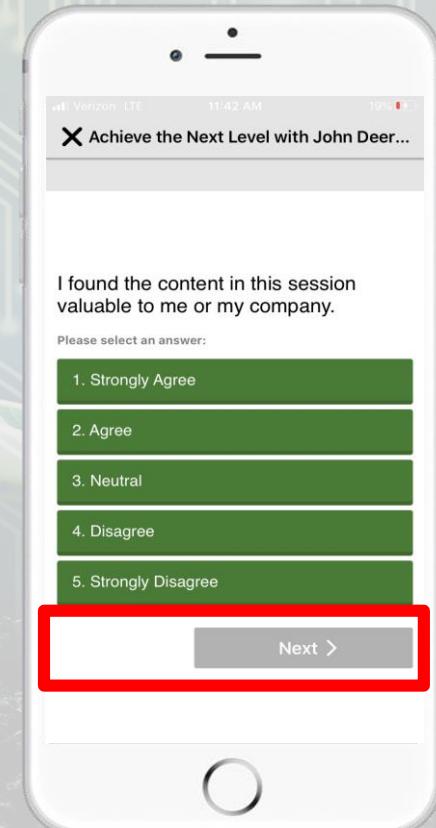
Please let us know by completing
a short survey in the app



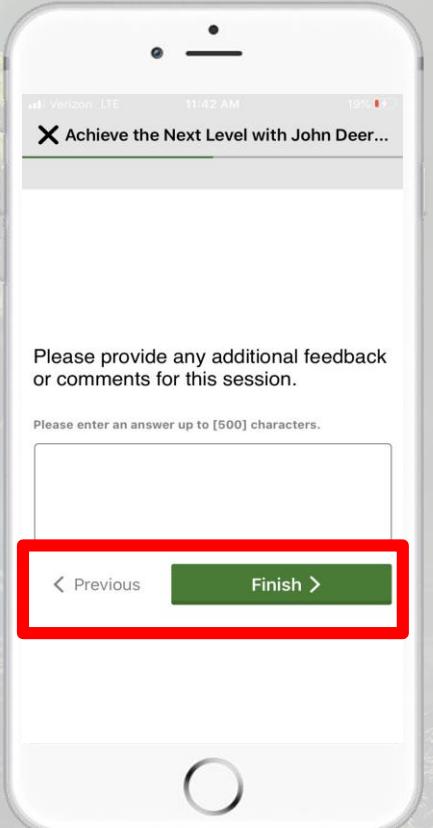
Slide to home screen to reveal menu



Select your session



Scroll down and select survey





JOHN DEERE