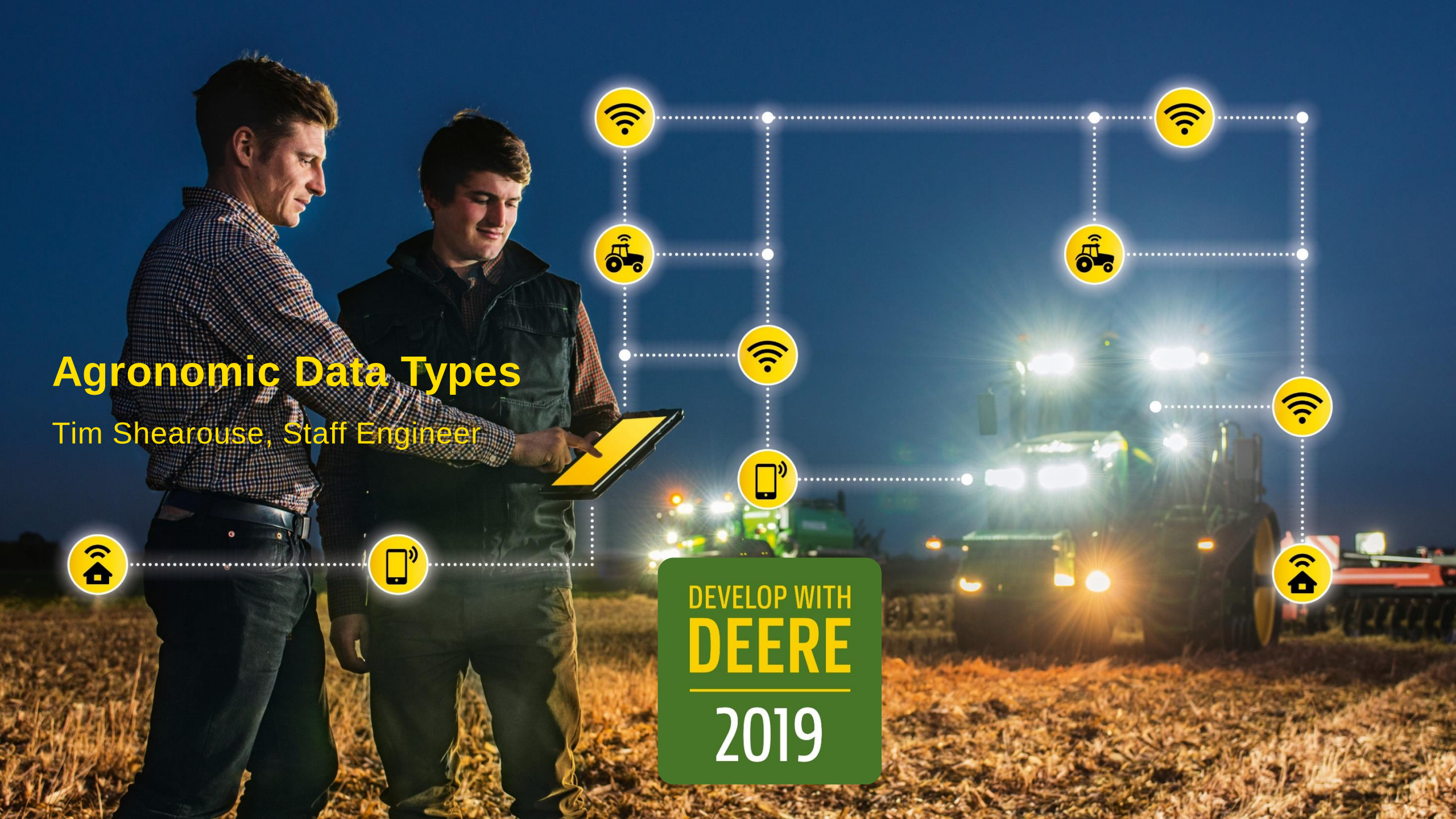
Agronomic Data Types
Tim Shearouse, Staff Engineer
DEVELOP WITH
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2019

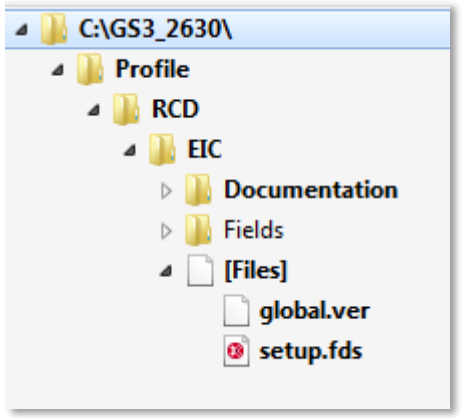
Agenda

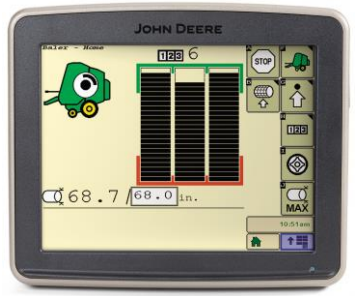
- Overview of terminology
- Learn what John Deere Operations Center supports
- Learn what each solution can do, along with pros and cons
  - ISOXML, ADAPT, and MyJohnDeere API’s
- Understand how to decide which solution to use
- Questions and Feedback

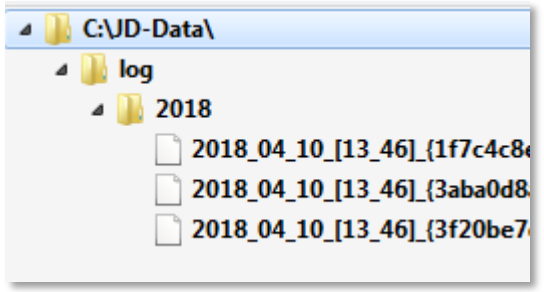
Definitions

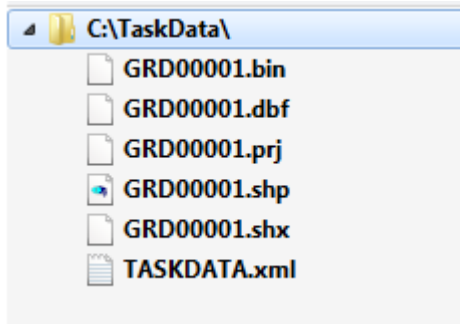
What is a datacard?

- Data … the way a display wants to see it
- Each display model has its own format
  - Defined folder structure
  - Defined file formats
- MyJohnDeere calls a zipped datacard a “file”









Delivery Methods

- **USB - Datacards**

  Requires transporting physical media

- **Cell Modem - Datacards**

  Requires cell connection

  Saves driving time

  - **Cell Modem - Data Streaming**

    Requires cell connection

    Granular pieces of data – No Datacards

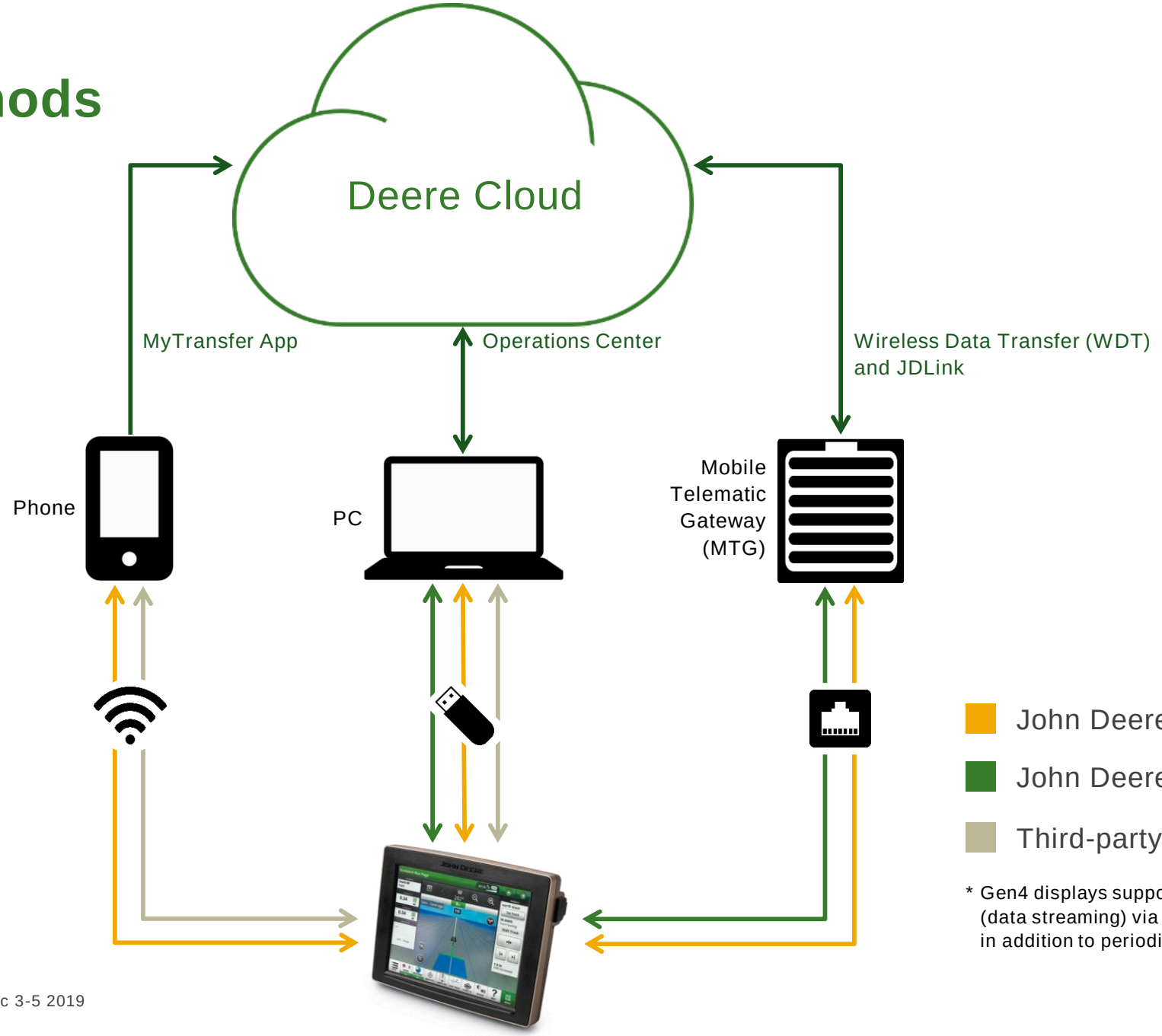
What does Operations Center Support?

Supported Data Types

…as of January 2020

	Setup	Documentation
Deere GS2 / GS3	✔	✔
Deere 4600 series	✔	✔
ESRI Shapefile	N/A	✔ (export)
ADAPT Datacard	✔	✔
ISOXML	Coming soon	
AgLeader	✔ (import)	✔ (import)
Raven	✔ (import)	✔ (import)
Trimble	✔ (import)	✔ (import)
Precision Planting	✔ (import)	✔ (import)

Delivery Methods



John Deere 2630

John Deere 4600*

Third-party displays

* Gen4 displays support entity sync (data streaming) via the MTG route in addition to periodic data transfers.


What can each solution do?
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NOTHING RUNS LIKE A DEERE

ISOXML

- Data standard: File structures and schemas
  - No supporting SDK‘s
  - You still need a delivery method
- Well-understood standard
- Supported on Deere‘s 2630 and Gen4 displays
- Limited scope
  - Cannot store all types of agronomic data
    - No support for soil data
    - PAIL for irrigation data

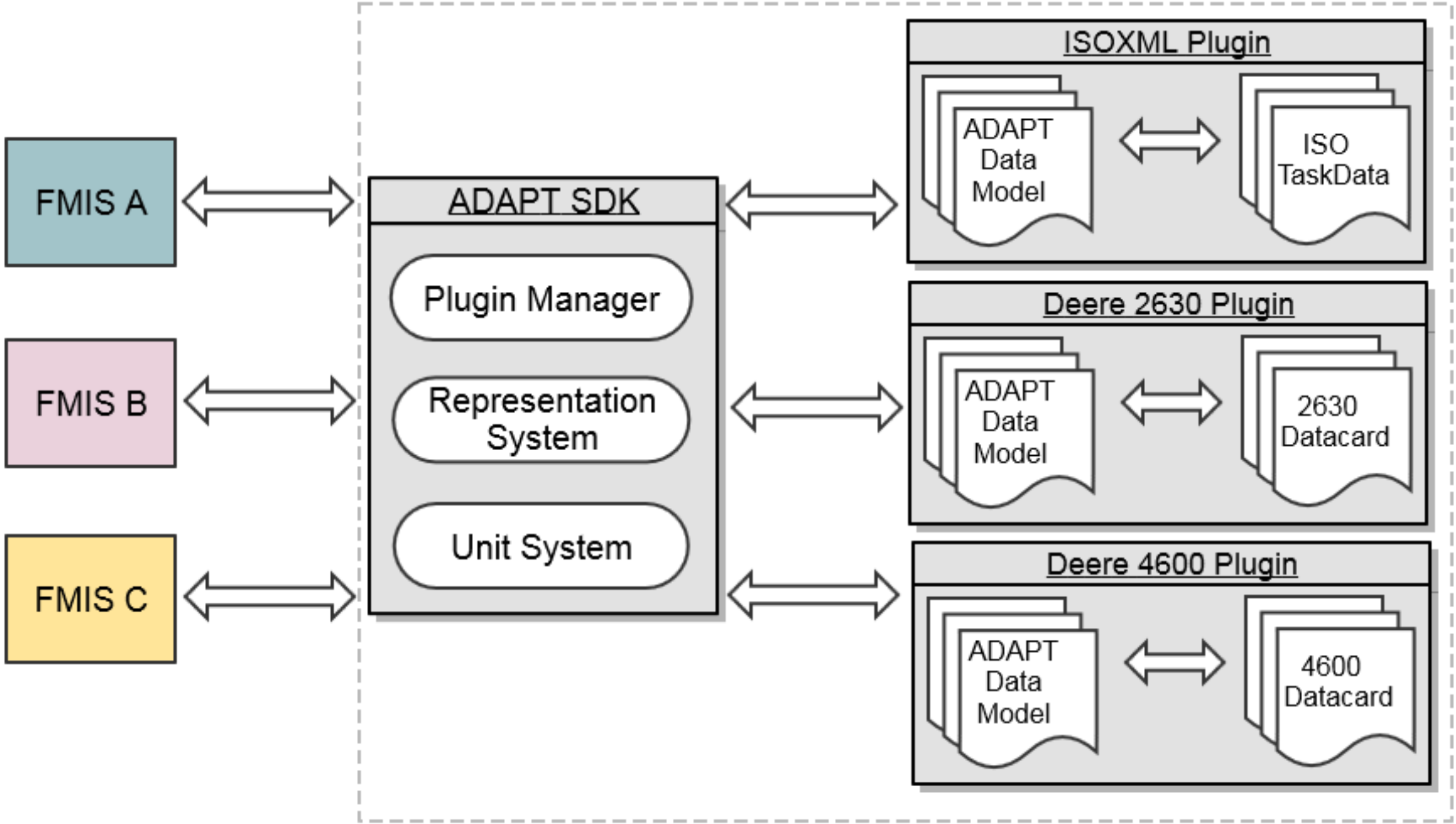
ADAPT

https://adaptframework.org/

https://github.com/adapt/

http://aggateway.org/

- SDK (Software Development Kit)
  - Set of libraries to abstract away the details of specific data formats
- Also a data standard
- Developed in collaboration with AgGateway and industry companies
- Converts data between various datacard formats and the ADAPT data model


FMIS A
FMIS B
FMIS C
ADAPT SDK
Plugin Manager
Representation System
Unit System
ISOXML Plugin
ADAPT Data Model
ISO TaskData
Deere 2630 Plugin
ADAPT Data Model
2630 Datacard
Deere 4600 Plugin
ADAPT Data Model
4600 Datacard

ADAPT

- ADAPT replaces EIC as Deere‘s offline SDK
- Feedback: ADAPT is easier to integrate than EIC
- You can run both in parallel if you need GS1 support

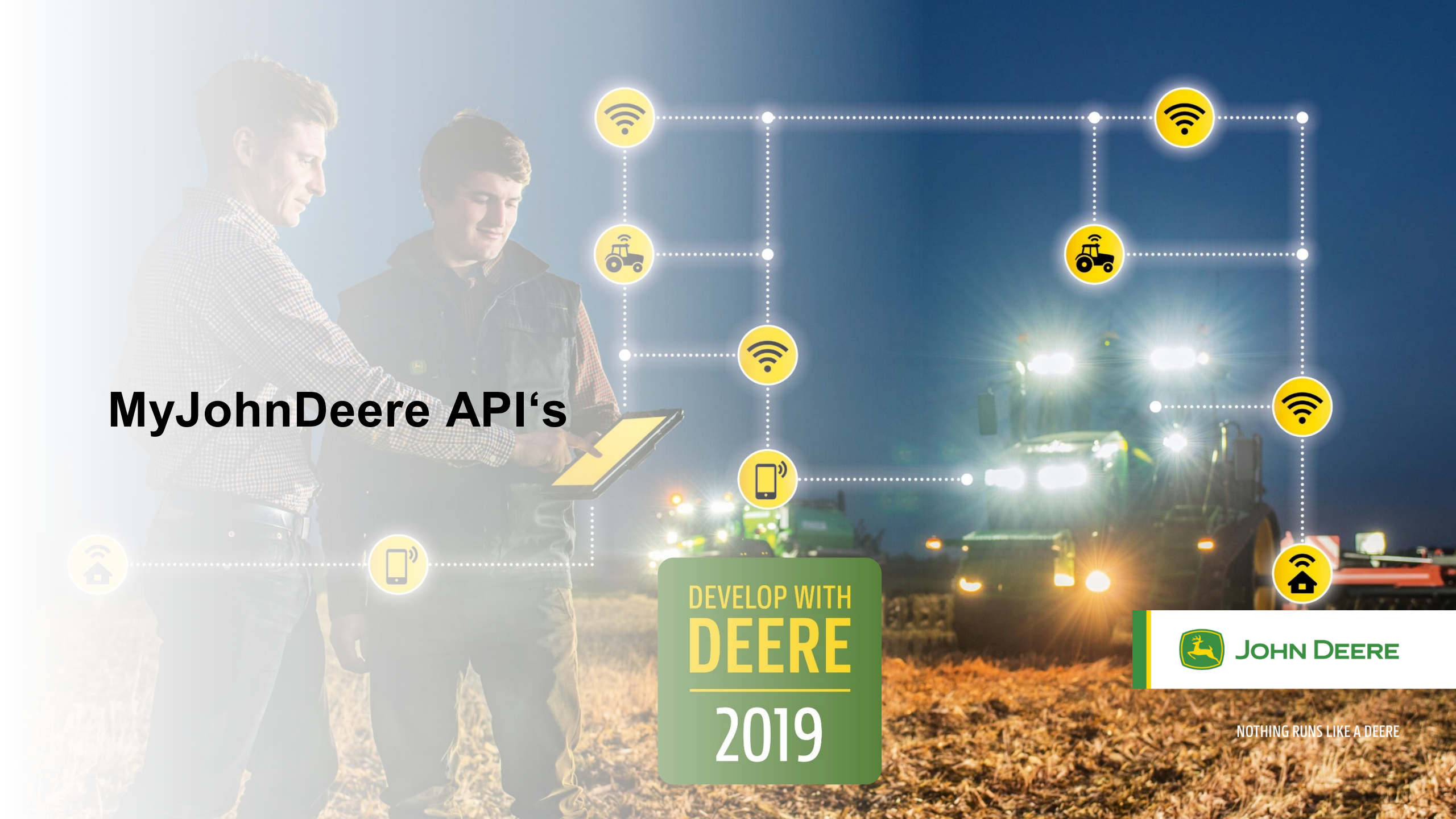
Documentation support by display model:

	GS1 Brownbox	GS2 2600	GS2 1800	GS3 2630	GS3 Command Center	GS4 Command Center	GS4 4600
EIC	✓	✓	✓	✓	✓	✗	✗
ADAPT	✗	✓	✓	✓	✓	✓	✓

ADAPT – Pros and Cons

- Requires .NET or Mono runtime
- Presents data as it sits on the datacard
  - You can apply custom algorithms to the raw data
  - Custom algorithms may not match John Deere Operations Center
- Expensive to process
- Supports all the data attributes EIC does
  - …plus multi-OEM support

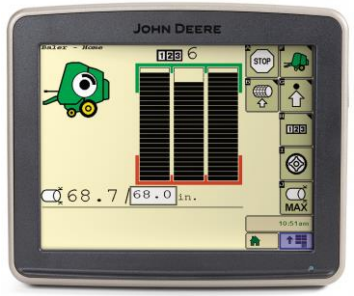
MyJohnDeere API‘s



MyJohnDeere API‘s – Multiple Ways To Integrate

- Use Files API to download datacards, use ADAPT to process them
- This gives you everything, but it’s expensive

GS3 2630



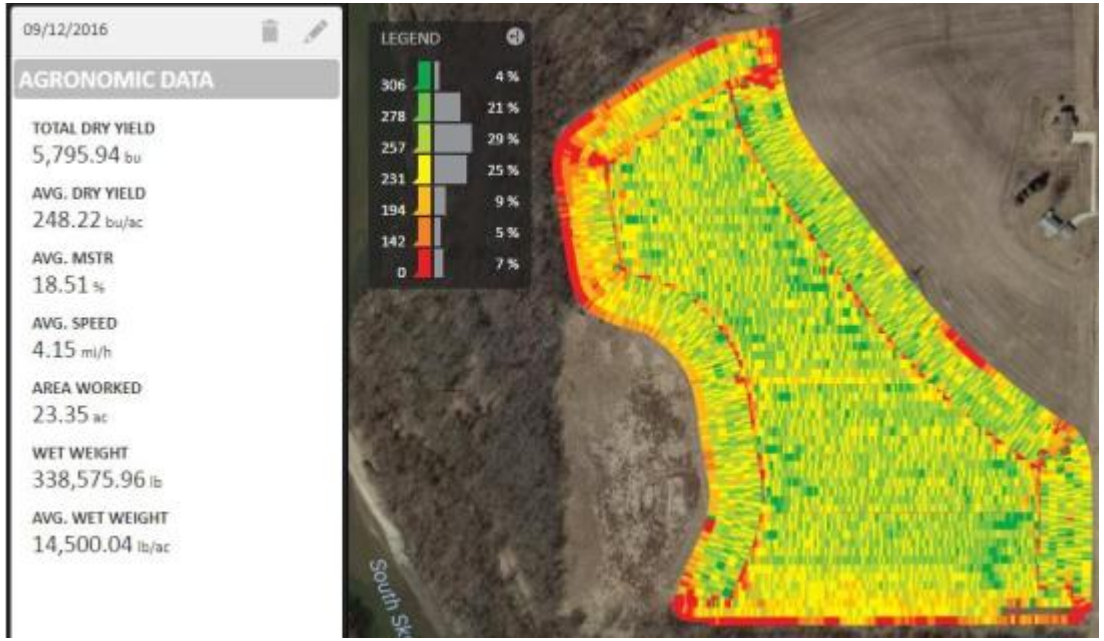
1 hz * 16 sections = 16 measurements per layer per second

GS4 4600

5 hz * 90 rows = 450 measurements per layer per second
…also, it records more layers

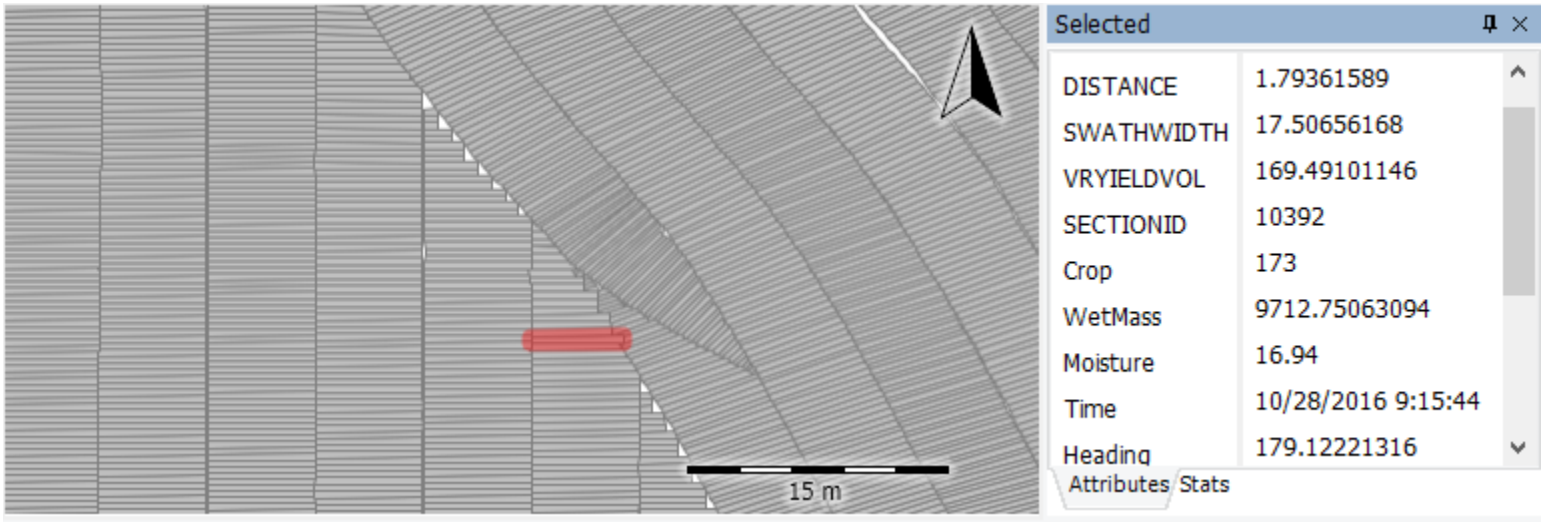
MyJohnDeere API‘s – Multiple Ways To Integrate

- Use multiple API’s to retrieve processed data
- Field Details: Fields, Boundaries, Flags, Guidance Lines
- Products: Crop Varieties, Chemicals, Tank Mixes
- Machines & Machine Monitoring
- FieldOperations: Maps, Totals, and Metadata
- See what’s available at developer.deere.com

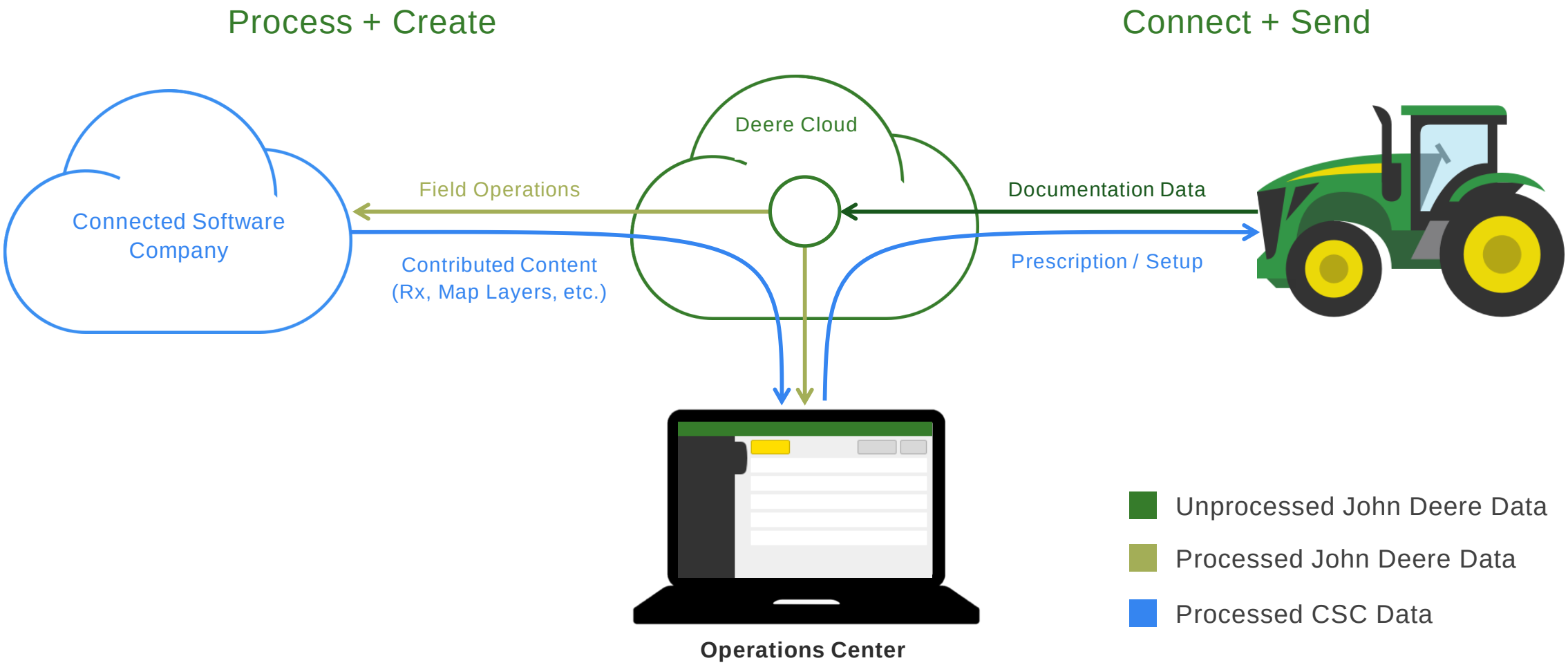


MyJohnDeere API‘s – Multiple Ways To Integrate

- Shapefile Export: Point-by-point data for a FieldOperation
- Matches what customers see in Operations Center
- Available in Point or Polygon shapes
- Available in multiple data resolutions



MyJohnDeere API‘s – Data Flow

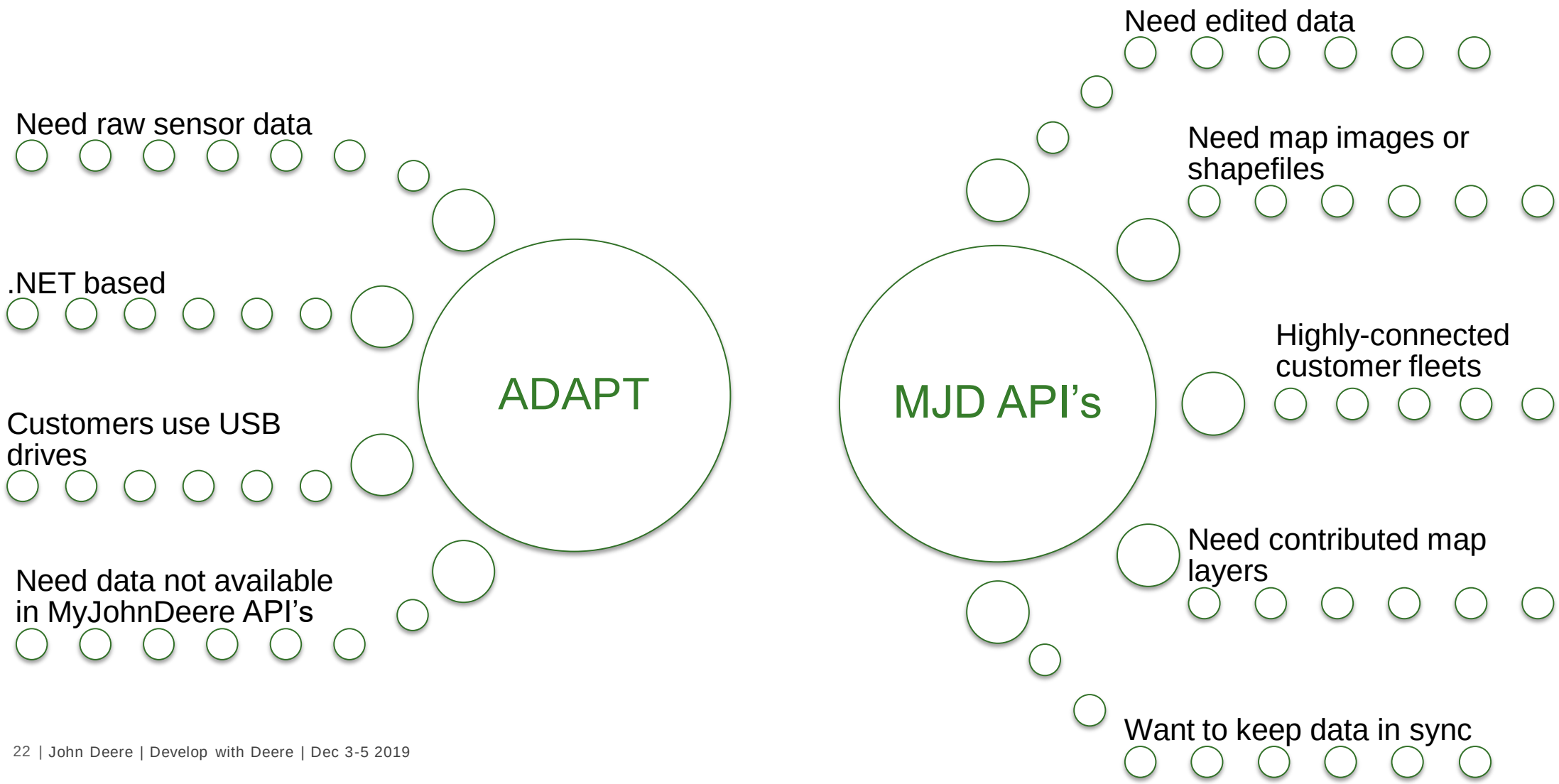


MyJohnDeere API‘s – Pros and Cons

- Language and platform agnostic
- Easier update process
  - No need to ship new binaries if the 4600 extends its data format
- Data consistency: Stay in sync
  - Data Subscription Service makes this easy and inexpensive
- Get all the data from one place
  - Field Operations can be spread across multiple files
  - Gen4 DataSync results in more files than ever
  - Users can share contributed data layers
- Not all data is available yet

Which Should You Use?

It Depends


Need raw sensor data
.NET based
Customers use USB drives
Need data not available in MyJohnDeere API's
ADAPT
MJD API's
Need edited data
Need map images or shapefiles
Highly-connected customer fleets
Need contributed map layers
Want to keep data in sync


Q&A / Feedback
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