



THE GLOBAL STANDARD  
FOR LIVESTOCK DATA

Network. Guidelines. Certification.

# Implementing the ICAR ADE standards

Webinar  
ICAR ADE WG

April 22nd 2020, 14.00 PM CEST, ICAR 'virtual room'

April 23rd 2020, 21.00 PM CEST, ICAR 'virtual room'

Version 1.0  
24-4-2020

# Content

14.00 Welcome & Introduction to the subject (Andrew Cooke, NZ)

14.10 ICAR-ADE defined messages (Erwin Speybroeck, BE)

14.20 Prototype of ADE API based on standard messages (Anton Hokkonen, Fi)

14.30 How to start using ADE messages in your data exchange (Arjan Lamers, NL)

14.40 Questions

15.00 eom



# Welcome and introduction

## Why:

- Common standards and guidelines make data interchange easier and more effective

## How:

- Modern, standards-based web technologies
- Open source, collaborative approach



# Audience and Scope

## Audience:

- Business decision makers
- Product owners and business analysts
- Software and data developers

## Scope:

- Individual animals (at least initially)
- Wider than milking bovines – all livestock covered by ICAR
- First the “data” standards – then the exchange



# Content – in version 1

## Version: ADE-1

- Animal
- Generic device
- Registration
- Arrivals
- Departures
- Deaths
- Embryos
- Semen straws
- Heats
- Mating
- Insemination
- Pregnancy check
- Abortion
- Parturition
- Lactation
- Test Day Result
- Milking Visit
- Drying Off
- Weight

# Content – in future

## Next versions

- Condition scores
- Conformation scores
- Breeding values
- Health diagnoses
- Health treatments (medicines, procedures)
- Groups



# Content – in future

Version: ADE-1

Detailed version numbering <major>.<minor>.<patch>

- Major version number – breaking changes only – infrequent
- Minor version number – new additions – regular cadence
- Patch – extremely minor corrections

# How to get started

<https://github.com/adewg/ICAR>

1

<> Code ! Issues 14 Pull requests 0 Actions Projects 0 Wiki Security Insights

2

<> Code ! Issues 14 Pull requests 0 Actions Projects 0 Wiki Security Insights

3

<> Code ! Issues 14 Pull requests 0 Actions Projects 0 Wiki Security Insights



# How to get started <https://github.com/adewg/ICAR>

📁 collections

← Arrays or lists of resources

📁 enums

← List values included in resources

📁 examples

← Example resources

📁 resources

← The main things to GET or update

📁 types

← Other data types included in resources

📁 url-schemes

← API methods to GET or update resources and collections



# ICAR ADE defined messages

**ADE-1-milk** Milk messages approved by the working group, waiting for a test



**ADE-1-other** Other messages approved by the working group, waiting for a test



**ADE-1-registration** Registration messages approved by the working group, waiting for a test



**ADE-1-reproduction** Reproduction messages approved by the working group, waiting for a test



# ICAR ADE defined messages

## ADE-1-registration Registration messages approved by the working group, waiting for a test



**GET** /locations/{location-scheme}/{location-id}/births Get the births for a certain location

**GET** /locations/{location-scheme}/{location-id}/deaths Get the deaths for a certain location

**GET** /locations/{location-scheme}/{location-id}/arrivals Get the arrivals for a certain location

**GET** /locations/{location-scheme}/{location-id}/departures Get the departures for a certain location

**GET** /locations/{location-scheme}/{location-id}/animals Get the animals for a certain location

# ICAR ADE defined messages

## ADE-1-reproduction Reproduction messages approved by the working group, waiting for a test



**GET** `/locations/{location-scheme}/{location-id}/pregnancy-checks` Get the pregnancy checks for a certain location

**GET** `/locations/{location-scheme}/{location-id}/heats` Get the heats for a certain location

**GET** `/locations/{location-scheme}/{location-id}/inseminations` Get the inseminations for a certain location

**GET** `/locations/{location-scheme}/{location-id}/drying-offs` Get the drying off for a certain location

**GET** `/locations/{location-scheme}/{location-id}/abortions` Get the abortion events for a certain location

**GET** `/locations/{location-scheme}/{location-id}/parturitions` Get the parturition events for a certain location

**GET** `/locations/{location-scheme}/{location-id}/mating-recommendations` Get the mating recommendations for a certain location

# ICAR ADE defined messages

## ADE-1-milk Milk messages approved by the working group, waiting for a test

**GET****/locations/{location-scheme}/{location-id}/milking-visits** Get the data for milking visits**GET****/locations/{location-scheme}/{location-id}/test-day-results** Get the data for test day results**GET****/locations/{location-scheme}/{location-id}/lactations** Get the data for lactations

# ICAR ADE defined messages

## ADE-1-other

Other messages approved by the working group, waiting for a test



GET

/locations/{location-scheme}/{location-id}/weights Get the weight data of animals

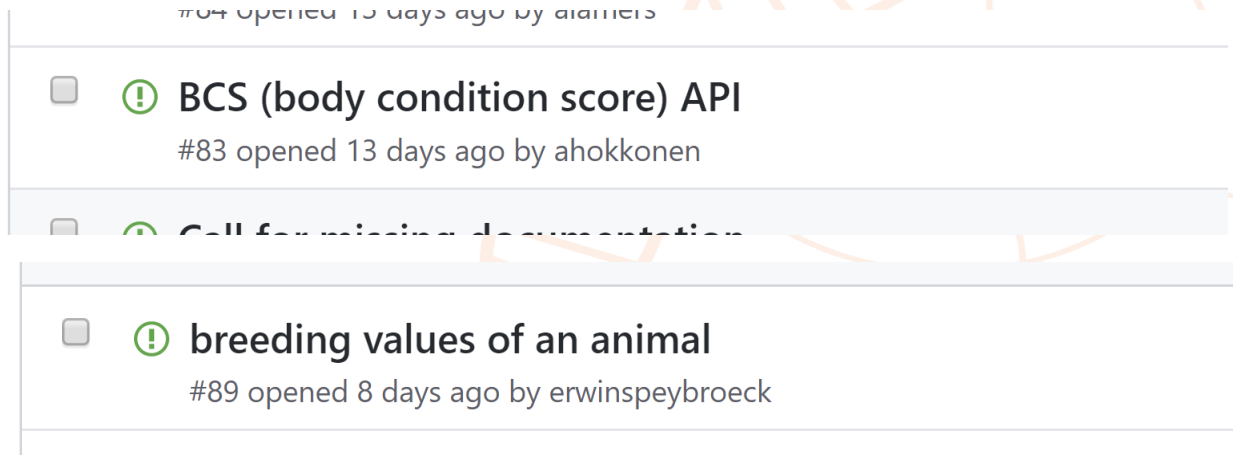
GET

/locations/{location-scheme}/{location-id}/devices Get the device data for a location

# ICAR ADE defined messages

## I Need other messages

- Take part in the ADE working group
- Bring in an issue with your request on <https://github.com/adewg/ICAR/issues>



# ICAR ADE defined messages - principles

- **Example**

<http://editor.swagger.io/?url=https://raw.githubusercontent.com/adewg/ICAR/master/url-schemes/exampleUrlScheme.json>

# Identification with *icarIdentifierType*

Generalised way of identifying:

- Animals
- Locations
- Trait labels
- Many other things

Two parts:

- scheme e.g. “nl.ubn” or “eu.animalld” or “org.gs1.gln”
- id A unique identifier within that scheme

<https://github.com/adewg/ICAR/blob/master/location-scheme.md>



# Observations – based on *icarEventCoreResource*

Record observations or actions for individual animals

## Required

- **id** (a unique id of the event, at least at location level)
- **animal** (identifier)
- **location** (identifier)
- **eventDateTime** (ISO date time, UTC format)

## Not required

- **traitlabel** (If event = formal trait, identifies the recording system and trait.)
- **responsible** (person object : event is carried out or authorised by a person)
- **contemporaryGroup** (contemporary group code that affects statistical analysis)

# Prototype ADE API/client based on ADE

- ICAR ADE standard code generation for server/client side
- several generic code generators available (codegen, openapi-generator, etc.)
- Web Service (.NET Web API)
  - endpoints
  - models and enums

<http://ade-api.azurewebsites.net/>
- Client SPA (Angular 8)
  - client models and enumeration types
  - data services
  - Data presentation

<http://ade-client.azurewebsites.net/>



# Tools – openapi-generator

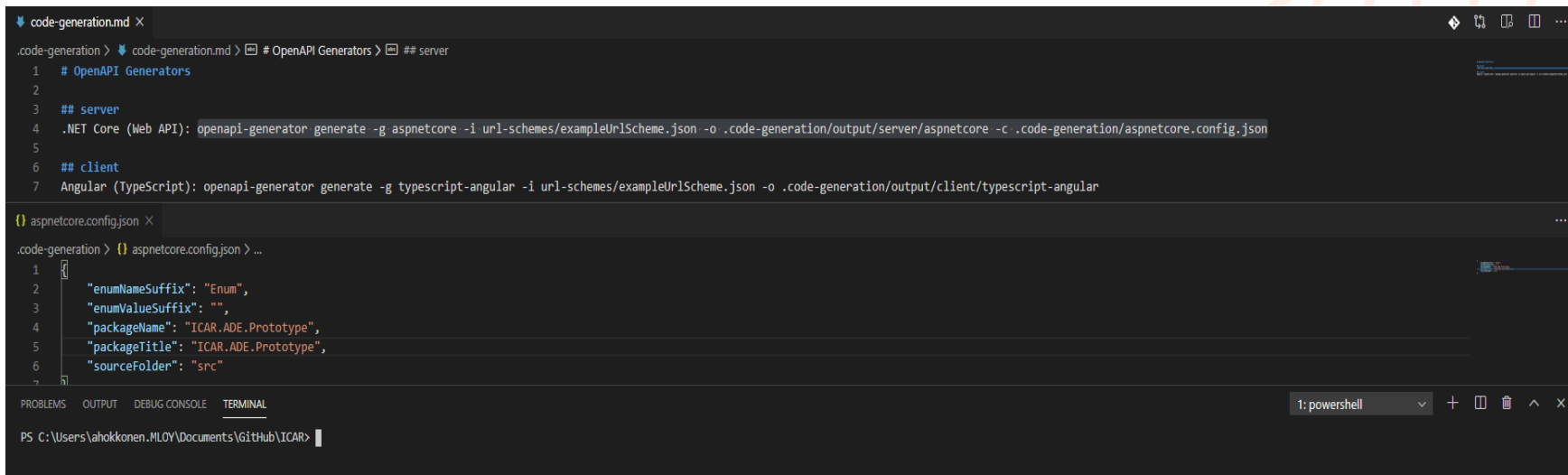
<https://github.com/OpenAPITools/openapi-generator>

|                              | Languages/Frameworks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| API clients                  | <b>ActionScript, Ada, Apex, Bash, C, C#</b> (.net 2.0, 3.5 or later, .NET Standard 1.3 - 2.0, .NET Core 2.0), <b>C++</b> (cpp-restsdk, Qt5, Tizen), <b>Clojure, Dart (1.x, 2.x), Elixir, Elm, Eiffel, Erlang, Go, Groovy, Haskell</b> (http-client, Servant), <b>Java</b> (Jersey1.x, Jersey2.x, OkHttp, Retrofit1.x, Retrofit2.x, Feign, RestTemplate, RESTEasy, Vertx, Google API Client Library for Java, Rest-assured, Spring 5 Web Client, MicroProfile Rest Client), <b>k6, Kotlin, Lua, Nim, Node.js/JavaScript</b> (ES5, ES6, AngularJS with Google Closure Compiler annotations, Flow types, Apollo GraphQL DataStore), <b>Objective-C, OCaml, Perl, PHP, PowerShell, Python, R, Ruby, Rust</b> (rust, rust-server), <b>Scala</b> (akka, http4s, scalaz, sttp, swagger-async-httpclient), <b>Swift</b> (2.x, 3.x, 4.x, 5.x), <b>Typescript</b> (AngularJS, Angular (2.x - 8.x), Aurelia, Axios, Fetch, Inversify, jQuery, Node, Rxjs) |
| Server stubs                 | <b>Ada, C#</b> (ASP.NET Core, NancyFx), <b>C++</b> (Pistache, Restbed, Qt5 QHTTPEngine), <b>Erlang, F#</b> (Giraffe), <b>Go</b> (net/http, Gin), <b>Haskell</b> (Servant), <b>Java</b> (MSF4J, Spring, Undertow, JAX-RS: CDI, CXF, Inflector, Jersey, RestEasy, Play Framework, <b>PKMST, Vert.x</b> ), <b>Kotlin</b> (Spring Boot, Ktor, Vertx), <b>PHP</b> (Laravel, Lumen, Slim, Silex, <b>Symfony, Zend Expressive</b> ), <b>Python</b> (Flask), <b>NodeJS, Ruby</b> (Sinatra, Rails5), <b>Rust</b> (rust-server), <b>Scala</b> (Akka, <b>Finch, Lagom, Play, Scalatra</b> )                                                                                                                                                                                                                                                                                                                                                               |
| API documentation generators | HTML, Confluence Wiki, Asciiidoc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Configuration files          | <b>Apache2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Others                       | GraphQL, JMeter, MySQL Schema, Protocol Buffer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |



# .NET Core API – stub service

- openapi-generator for "aspnetcore" used for API stub generation
- contains models, enums and default API endpoint definitions
- includes swagger docs and descriptions



The screenshot shows a Visual Studio Code editor with two files open: `code-generation.md` and `aspnetcore.config.json`.

**code-generation.md**

```
.code-generation > code-generation.md > # OpenAPI Generators ## server
1 # OpenAPI Generators
2
3 ## server
4 .NET Core (Web API): openapi-generator generate -g aspnetcore -i url-schemes/exampleUrlScheme.json -o .code-generation/output/server/aspnetcore -c .code-generation/aspnetcore.config.json
5
6 ## client
7 Angular (TypeScript): openapi-generator generate -g typescript-angular -i url-schemes/exampleUrlScheme.json -o .code-generation/output/client/typescript-angular
```

**aspnetcore.config.json**

```
.code-generation > {} aspnetcore.config.json > ...
1 {
2   "enumNameSuffix": "Enum",
3   "enumValueSuffix": "",
4   "packageName": "ICAR.ADE.Prototype",
5   "packageTitle": "ICAR.ADE.Prototype",
6   "sourceFolder": "src"
7 }
```

The bottom of the screenshot shows the **TERMINAL** tab with the command prompt:

```
PS C:\Users\lahokkonen.MLOV\Documents\GitHub\ICAR>
```

# How to start using ADE messages

- Demo based on JoinData
  - See <https://integration.join-data.net/api/docs#datahub-api>
- What will we demo?
  - Proposed URL scheme
  - Proposed Authentication (OAuth2)
  - Example data for a dummy Dutch farm



# Questions



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# Thank you

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