



Rezare Systems

DataLinker

User Guide v1.6





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1. Introduction

This document guides DataLinker users through the initial registration process. Technical information about how system registration and farmer permissions are obtained, and how data transfer is executed, can be found in the Technical Specification found in [github](#).

About DataLinker

DataLinker is a service to facilitate the transfer of farm data between organisations, with farmer authorisation. Organisations storing farm data can register their services as a data provider, a data consumer or as both.

DataLinker creates data schema which describe the type and format of specified data sets and the means for requesting and delivering that data. Data fields and their meanings conform to the Farm Data Standards data dictionaries¹.

DataLinker provides a standard licence agreement template, with a range of standard but optional clauses so that users can construct their own data sharing licence agreements.

At registration, data providers identify what data schema will be provided. They select the licence terms and conditions that will apply in the data sharing Agreement. Data consumers do the same – they register the data schema they wish to receive and the licence terms they are willing to accept.

Data Consumers are provided with endpoint details for data providers where there is a match of both schema and licence terms, and a Licence Agreement can be executed.

Definitions

Account - Refers to the access to DataLinker web services for a legitimate organisation.

Consumer - An application registered to receive data.

Licence Agreement – A legal agreement describing the terms and conditions for the transfer of data between two parties (organisations).

Provider – A service registered to provide data.

Schema – Describes the type and format of specified data sets and the means for requesting and delivering that data.

¹ See <http://www.farmdatastandards.org.nz/> for more information.



2. Register Your Organisation

Select the 'Register' icon at www.datalinker.org.nz or go to <https://www.datalinker.org/app/Account/Create#>

2.1 - Description

Enter your personal and organisation contact details on the Description page to register a person as a user against the organisation.

2.2 – Terms of Service

Read through the DataLinker Terms of Use document and tick the required boxes when complete.

2.3 Submit Registration

An email confirmation message will be sent to the registered email address. Click the link provided to confirm the registration and account settings and to create a password. Your password must be a minimum of six characters, and must include 1 uppercase alpha, 1 lowercase alpha, 1 number and 1 symbol.

2.4 – Password Setup

Log in with your username and password using the link provided. Once you have logged in you will notice the notification below stating that a legal officer ('authorised signatory') must be registered before the account will be activated.

The screenshot shows the DataLinker user interface. At the top left, there is a black button labeled 'inactive'. At the top right, there is a green button labeled '+ Add Colleague'. Below these, a notification box with a warning icon states: 'You must register a Legal Officer before an account will be activated. Data Linker requires a Legal Officer for the organisation to approve licence terms as these will lead to a legally binding data sharing agreement. You may register yourself as a Legal Officer by updating your profile, or Add Colleague to set up another user as the Legal Officer.' Below the notification, there are two main sections. The left section is titled 'Services and Applications Requiring Approval' and contains the text 'No services requiring legal approval'. The right section is titled 'Active members' and contains the text 'Test'. At the bottom left, there is a section titled 'Applications and Services' with a '+ Add' button and the text 'No services or applications'. At the bottom right, there is a 'Need help?' link and a 'User guide (download)' link.

2.5 Register a Legal Officer / Authorised Signatory

DataLinker requires that an authorised signatory (Legal Officer) for the organisation approves licence terms as these will lead to a legally binding data sharing agreement. You must register a Legal Officer before the account will be activated. A user may register themselves as a Legal Officer through their own profile settings, or use the 'Add Colleague' button to set up another user as the Legal Officer.



2.6 DataLinker Verification

Once the Legal Officer has been selected, DataLinker will manually verify the organisation's registration and the assignment of a Legal Officer. Once verified, the account will be activated, and an email confirmation will be sent to the user. This can take up to 3 working days.

3. Register as a Data Consumer

Complete this process if your service will RECEIVE data. Go to section 4 if your service will PROVIDE data. Note that a service may be both a Provider and Consumer.

Register a Consumer Application

3.1 – Add Consumer Application

Once the account has been activated, select 'Add' in the Applications and Services section and select 'Consumer Application'.

3.2 – Application Description

Enter an Application Name and a description of this service. These will appear to other DataLinker users, and to farmer clients.

N.B. The option to check the application as an industry good allows the transfer of aggregated data from Provider to Consumer. Only tick this box if you only want the application to receive aggregated data for an Industry Good service. See section 3 of the [Data Agreement] for more details on aggregated schema as an industry good service.

The screenshot shows the 'Create New Application' form with a dark blue header bar containing the title and a close icon. On the left, there are three tabs: 'Description' (highlighted in green), 'Origin FQND', and 'Summary'. The main form area has two input fields: 'Application Name' with the value 'Cattle Data' and 'Description' with the value 'Data on cattle for research'. Below these is a checkbox labeled 'Register this application as industry good.' which is currently unchecked. At the bottom right are 'Back' and 'Next' buttons.

3.3 – Host Domain Name

Provide the host domain name (URL) that DataLinker will use to authenticate your application. Click next and select 'Save' in the Summary page to complete the application.

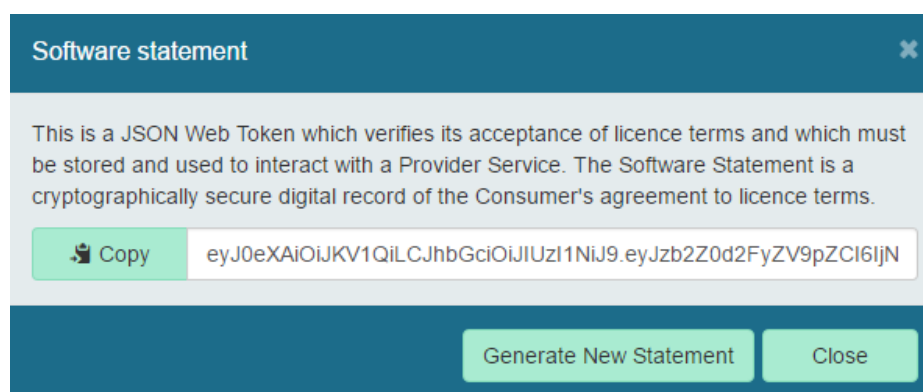
The screenshot shows the 'Create New Application' form with the 'Origin FQND' tab highlighted in green. The 'Description' tab is also visible. The main form area has a text box labeled 'Hosts:' with the value 'Fully qualified dor'. Above this text box is a detailed instruction: 'Enter the Fully Qualified Domain Names for the hosts from which API queries to DataLinker will originate. Use a space or comma between each host. Each host will be allocated its own access token to authenticate to the DataLinker API.' At the bottom right are 'Back' and 'Next' buttons.

3.4 – Software statement

Once saved, the data schema page will load and you can generate a Software Statement using the 'Software statement' icon. The statement will appear as shown in the below image. The details of the statement are explained below.

A new software statement has been generated to reflect your changed schema and licence terms, and your organisation's previous software statement has expired. (The software statement is used in the Dynamic Client Registration request to validate that you have accepted a Provider's licence terms.)

If your system automatically requests a software statement from DataLinker, then you do not have to take any further action. If your system has stored the previous statement, then you must update this with the new software statement which can be viewed and copied from the application details page.



Register Data Schema

3.5 – Data Schema

Select the data schema you wish to receive by clicking 'Manage Licences' to complete the licence terms for each schema. See the DataLinker website to learn more about [data schema](#).

3.6 – Licence Terms

Select the licence terms which your organisation agrees to. You must select at least one term per section, and you may select multiple terms within a section. (DataLinker recommends that you have already viewed the licence terms online, consulted with your Legal Officer, and know exactly which terms your organisation will accept.) Select 'Check Providers' to continue.

See the DataLinker website to learn more about [Licence Agreements](#)

Use
<input checked="" type="checkbox"/> May use the Data and any Derived Data solely for the purposes of providing products or services which are from time to time offered by the Consumer to the Primary Producer to whom the Data relates.
<input type="checkbox"/> May use the Data and any Derived Data solely for the purposes of providing products or services which are from time to time offered by the Consumer to the Primary Producer to whom the Data relates. The Consumer must not aggregate the Data or any Derived Data with any other data for use in services offered to the Consumer's wider customer base.
<input type="checkbox"/> May use the Data and any Derived Data or Aggregated Data for any purpose.
<input type="checkbox"/> May use the Data solely for the purposes of research the outcome of which is intended to be of benefit to the New Zealand primary sector.
<input type="checkbox"/> Data usage must be attributed to <input type="text"/>
Use (Optional)
<input type="checkbox"/> The Consumer may only publish or disclose the Data in a form which prevents identification of the Primary Producer to whom the Data relates.
Attribution
<input checked="" type="checkbox"/> Must acknowledge to the Consumer's customers who receive products or services which incorporate or are based on the Data that the Consumer received the Data from the Provider. The acknowledgement must be made on the Consumer's website or application such that the Primary Producer would reasonably view this in the following form Data is sourced directly from [Provider] with permission.
<input type="checkbox"/> Must acknowledge in any publication by the Consumer which incorporates or is based on the Data that the Consumer received the Data from the Provider. ("Publication" includes the posting of information on the Consumer's website). The acknowledgement must be in the following form "Data is sourced directly from [Provider] with permission".
<input type="checkbox"/> Must acknowledge in any publication by the Consumer which incorporates or is based on the Data that the Consumer received the Data from the Provider. ("Publication" includes the posting of information on the Consumer's website). The acknowledgement must be in the following form "Data is sourced directly from [Provider] with permission". Must acknowledge to the Consumer's customers who receive products or services which incorporate or are based on the Data that the Consumer received the Data from the Provider. The acknowledgement must be made on the Consumer's website or application such that the Primary Producer would reasonably view this in the following form Data is sourced directly from [Provider] with permission.
<input type="checkbox"/> Must not disclose to the Consumer's customers that the Consumer received the Data from the Provider.
→ Check Providers

3.7 - Summary

DataLinker will show you if there are matching data providers for this schema, on these licence terms (i.e. "Is there anyone who will supply this data to me on the terms that I will accept?") On this page, DataLinker returns a table showing which providers are registered against that schema, and where your licence terms match. In the example below, Beef + Lamb Genetics will be a Provider for this schema as its licence terms match those selected by the Consumer. DataLinker will show all Providers registered for each schema, and will show which licence terms match a Consumer's selections.

Organization	Attribution	Payment	Is Match
Beef + Lamb NZ Genetics	Yes. ✓	No ✓	Match
			Save

3.8 – Completing Licence

To change your licence selections, you can go back to the previous page. If you are satisfied with your licence selections, click 'Save'.

3.9 – Send Licence Selection for Legal Approval

Send saved selections for legal approval by clicking 'Send to legal'. This sends an email to your Legal Officer, requesting approval of these licence terms. DataLinker shows the status of that schema

selection as 'Pending Approval', as below. Note that you can select 'Retract' to withdraw the licence terms at any stage, or select 'Add new terms' to change the licence terms.

Repeat this process for all schema you wish to receive.

Created At	Status					
14/07/2016 10:20:36 p.m.	PendingApproval	Retract	Download	To draft	Send to legal	Publish

3.10 - Legal Approval received

Once approved by the Legal Officer, DataLinker changes the status against the schema to 'Ready to Publish' as below. To complete the agreement, select 'Publish'. This activates your registration of this schema, and your application receives matching provider details in order to execute licence agreements and initiate a data transfer process.

Created At	Status					
14/07/2016 10:20:36 p.m.	ReadyToPublish	Retract	Download	To draft	Send to legal	Publish

Download the licence terms at any time by clicking on 'Download'. Once published, the schema status will update to 'Published' as below.

Created At	Status					
14/07/2016 10:20:36 p.m.	Published	Retract	Download	To draft	Send to legal	Publish

3.11 – Software statement

Once saved, DataLinker updates the Software Statement² used in a Dynamic Client Registration request, and your previous Software Statement expires.

If your system automatically requests a software statement from DataLinker before each Dynamic Client registration request, then you do not have to take any further action. If your system **has stored** the previous statement, then you must update this with the new software statement which can be viewed and copied from your Consumer Service page.

Software statement

This is a JSON Web Token which verifies its acceptance of licence terms and which must be stored and used to interact with a Provider Service. The Software Statement is a cryptographically secure digital record of the Consumer's agreement to licence terms.

Copy
eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJzb2Z0d2FyZV9pZCI6IjN

Generate New Statement
Close

² The Software Statement is a digitally signed record of your acceptance of licence terms against a schema, and is used to validate your agreement to licence terms with a Provider.



Retract Data Schema (Withdraw - No New Agreements can be Executed)

3.12 – Remove Schema

A Published schema can be retracted, so that no new data agreements will be executed under those terms. Select 'Retract' on the relevant data schema page to retract. A retracted schema cannot be republished, but a new schema registration can begin.

NB: Existing data sharing Licence Agreements that were executed while this schema was published will remain in place. (DataLinker is not a party to these agreements and cannot terminate them - it simply facilitates the negotiation and execution of these agreements. A data sharing agreement can only be terminated via the business processes described in the Licence Agreement.)

4. Register as a Data Provider

Complete this process if your service will PROVIDE data. Go to section 3 if your service will RECEIVE data. Note that a service may be both a Provider and Consumer.

Register a Provider Service

4.1 – Add Provider

Select the Add button in the Applications and Services section, and select 'Provider Service'.

4.2 - Service Description

Enter a Service Name and a description of this service as below. These appear to other DataLinker users, and to farmer clients.

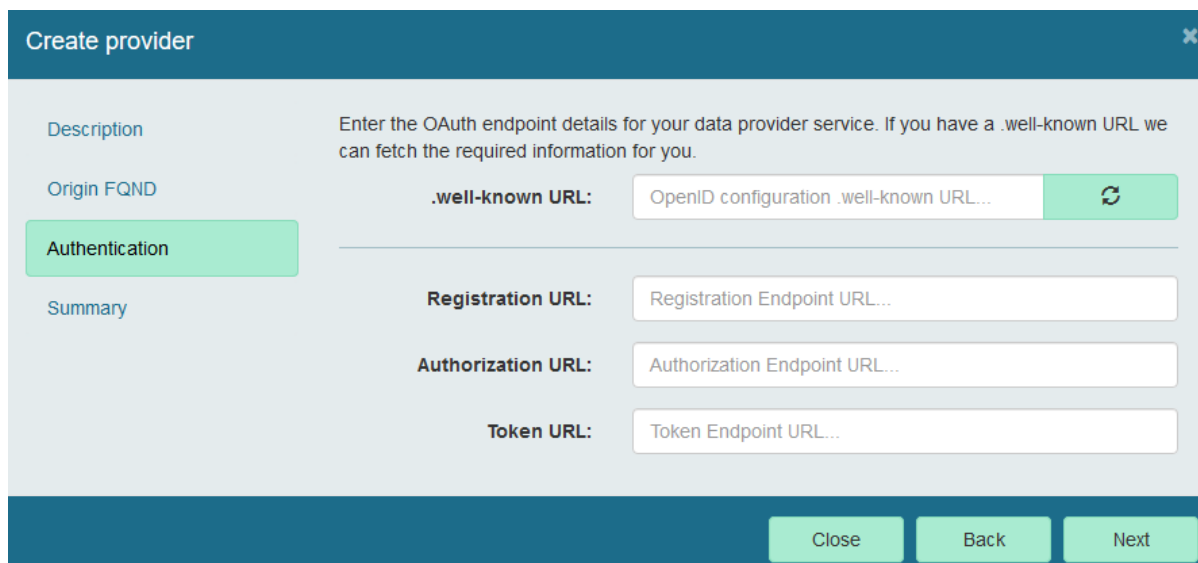
The screenshot shows a web form titled 'Create New Service'. On the left is a sidebar with four options: 'Description' (highlighted in green), 'Origin FQND', 'Authentication', and 'Summary'. The main area has two input fields: 'Service Name' with the text 'Deer Data Schema 1999 to 2015' and 'Description:' with the text 'Data schema of deer flock from 1999 to 2015'. At the bottom right of the form are two buttons: 'Back' and 'Next'.

4.3 – Host Domain Name

Provide the host domain name (URL) that DataLinker will use to authenticate your service.

4.4 - Authentication

Enter the endpoint URL addresses and JSON Web Key Set (JWKS) that consumer applications use to access your service. Select 'Save' in the Summary page to complete the application.




Create provider

Description: Enter the OAuth endpoint details for your data provider service. If you have a .well-known URL we can fetch the required information for you.

Origin FQND

Authentication

Summary

.well-known URL: OpenID configuration .well-known URL... 

Registration URL: Registration Endpoint URL...

Authorization URL: Authorization Endpoint URL...

Token URL: Token Endpoint URL...

Close Back Next

4.5 – Edit Information

Once saved, update the information at any time by selecting 'Edit' in the Authentication Details section.

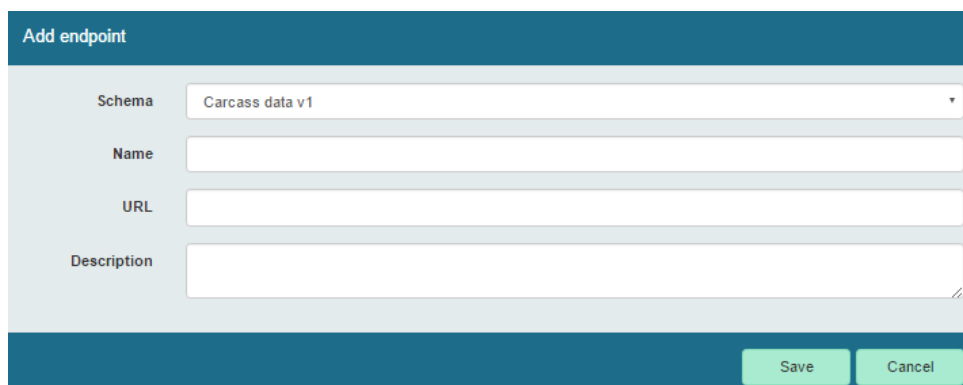
4.6 – Data Schema Endpoints

Add data schema endpoints by clicking on 'Add' in the Data Schema Endpoints section.

NB: Only add schema when there is an API in place which confirms to the required data standards.

4.7 – New Provider Endpoint

Select the schema to be provided and add the Name, URL, and Description, and select 'Create'. The name and description fields can be used to explicitly describe the data that will be provided.



Add endpoint

Schema: Carcass data v1

Name:

URL:

Description:

Save Cancel

4.8 – Licence Terms



After creating the endpoint, enter the licence terms. You can also go to the licence terms page by selecting 'Manage Licences' highlighted below.

Data Schema Endpoints		+ Add
Name	Schema	
schema 2015-16 ?	Core Animal Schema - v0.5	Manage Licenses
Deer data schema 1999-2015 ?	Core Animal Schema - v0.5	Manage Licenses
Deer data schema 1999-2016 ?	Core Animal Schema - v0.5	Manage Licenses

4.9 – Licence Terms

Select the licence terms under which your organisation will provide this data (and to which data consumers must agree). You may only select one term per section. (DataLinker recommends that you have already viewed the licence terms online, consulted with your Legal Officer, and know exactly which terms your organisation will offer.)

Click 'Save' to continue.

4.10 – Send Licence Selection

Send the saved selections for Legal Approval by clicking 'Send to legal'. This sends an email to your Legal Officer, requesting approval of these licence terms. DataLinker shows the status of that schema selection as 'Pending Approval', as below. Note that you can select 'Retract' to withdraw the licence terms at any stage, or select 'Add new terms' to change the licence terms.

Repeat this process for all schema you wish to receive.

Created At	Status					
14/07/2016 10:20:36 p.m.	PendingApproval	Retract	Download	To draft	Send to legal	Publish

4.11 - Legal Approval received

Once approved by the legal officer, DataLinker changes the status against the schema to 'Ready to Publish' as below. To complete the agreement, select 'Publish'. This activates your registration of this schema, and your service may receive Dynamic Client Registration³ requests from Consumer applications to execute licence agreements and initiate a data transfer process.

Created At	Status					
14/07/2016 10:20:36 p.m.	ReadyToPublish	Retract	Download	To draft	Send to legal	Publish

Download the licence terms at any time by clicking on 'Download'. Once published, the schema status will update to 'Published' as below.

Created At	Status					
14/07/2016 10:20:36 p.m.	Published	Retract	Download	To draft	Send to legal	Publish

³ Refer Technical Specification in [github](#)



The schema is now available for consumer applications to select and initiate data sharing with your service.

[Retract Data Schema \(Withdraw - No New Agreements can be Executed\)](#)

4.12 – Remove Schema

A Published schema can be retracted, so that no new data agreements will be executed under those terms. Select 'Retract' on the relevant data schema page to retract. A retracted schema cannot be republished, but a new schema registration can begin.

NB: *Existing data sharing Licence Agreements that were executed while this schema was published will remain in place. (DataLinker is not a party to these agreements and cannot terminate them - it simply facilitates the negotiation and execution of these agreements. A data sharing agreement can only be terminated via the business processes described in the Licence Agreement.)*

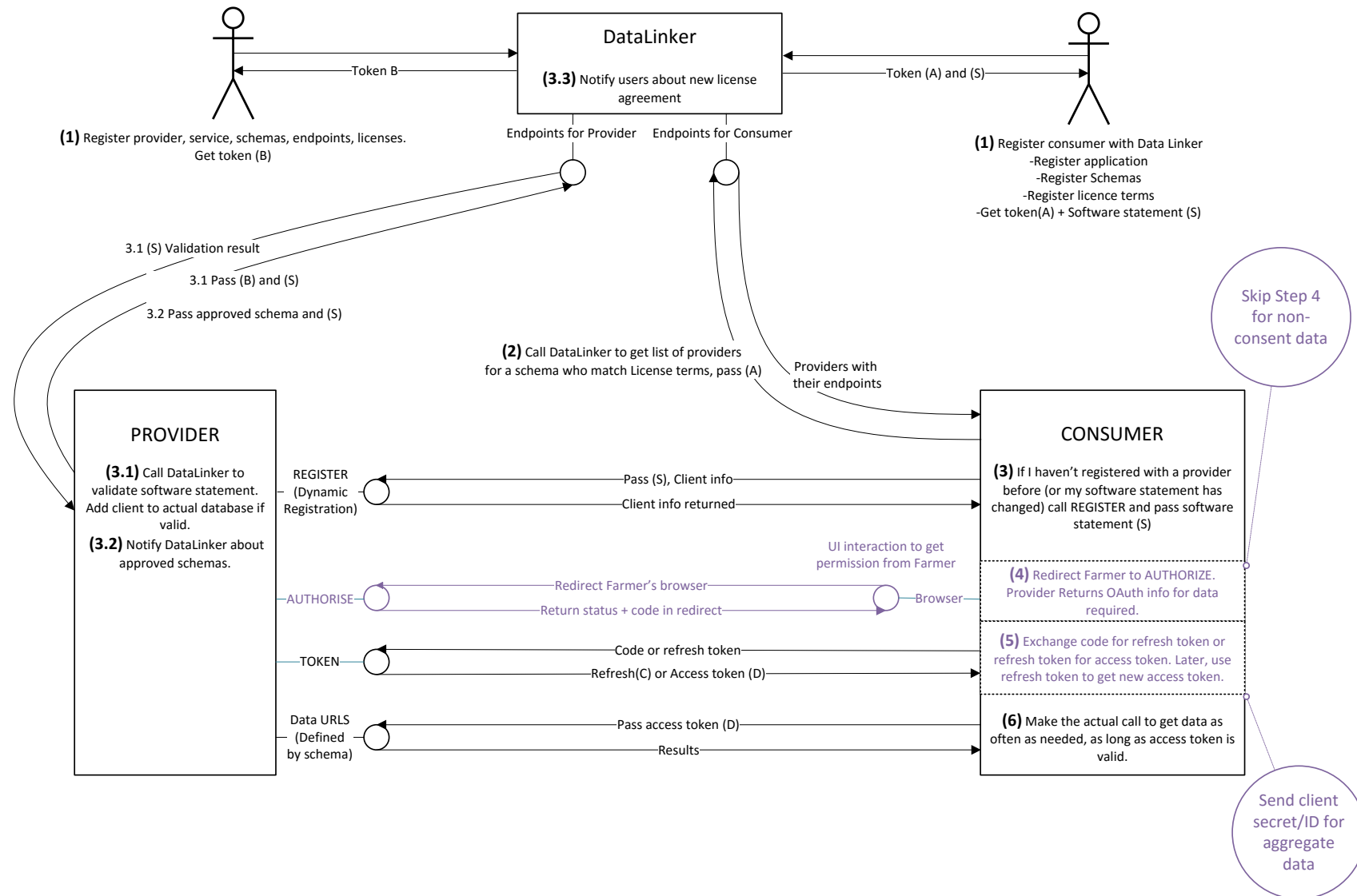


5. DataLinker Implementation

The diagram below illustrates the process from registration to data transfer. Each step is marked and technical detail is described in subsequent sections.

DataLinker also provides additional reference resources to support client implementations:

- [Client Implementation Example User Stories](#)
- [Example Consumer and Provider implementation code written in dot.net](#)
- [Registration User GUI](#)



6. Consumer Implementation

Implementation Steps

6.1 - Consumer Queries DataLinker for Provider Matches

The Consumer queries Data Linker to discover which services provide data for the schema(s) they are interested in, and matching the licence terms they will accept.

Each Consumer chooses when to initiate that call to the Data Linker Consumer API and must supply their DataLinker access token with that request.

Data Linker returns all API endpoints for matching Provider Services. Data Linker recommends that the Consumer stores these endpoints and refreshes the list from time to time to pick up new or modified Providers, rather than with every end-user interaction.

6.2 - Consumer Registers as a Client with Provider

OAuth2.0 requires that there is only one access method per client registration. Consumers that use both a Consent Schema and a No Consent schema (which are different access methods) with the same Provider must register a new client for each access type.

6.3 - First Dynamic Client Registration

The Consumer must initiate a Dynamic Client Registration process with a Provider. The timing of that registration is at the Consumer's discretion:

- Initiate registration when endpoints are received from Data Linker; OR
- Initiate registration the first time a farmer selects that Provider; OR
- Initiate registration every time a farmer selects a Provider; OR
- Initiate registration with each data request

The Consumer calls the Provider's REGISTER API. The Client Registration request must include the Consumer's Client Metadata⁴, its Software Statement and the scope(s) (data schema) for which it is requesting access.

6.4 - Second Dynamic Client Registration with Same Provider

When a Consumer chooses a data schema with a different consent requirement than that already registered with a Provider, a second Dynamic Client Registration must be initiated with appropriate grant type.

6.5 - Consumer redirects Farmer to Provider API

A Provider AUTHORISE API is supplied to the Consumer when it queries DataLinker for provider matches (Step 2). When a Farmer selects a Provider (from the Consumer's prompt), the Consumer redirects the farmer to the Provider's AUTHORISE API

⁴ RFC on the IETF - <https://tools.ietf.org/html/rfc7591#section-2>

6.6 – Consumer authorizes with Provider API

Farmer Consent Method

The Consumer sends the Authorisation code to the Provider TOKEN API and is issued a Refresh Token. The Refresh token is used to request an Access Token for querying the Provider DATA API. An Access Token has a very short expiry time, so the Refresh Token will be used to request an Access Token prior to each data request.

No Farmer Consent Method

The Consumer authorises with Provider by sending client id and client secret to the Provider TOKEN API. On successful authorization Access Token for querying the Provider DATA API will be returned.

6.7 - Consumer Requests and Receives Data from Provider

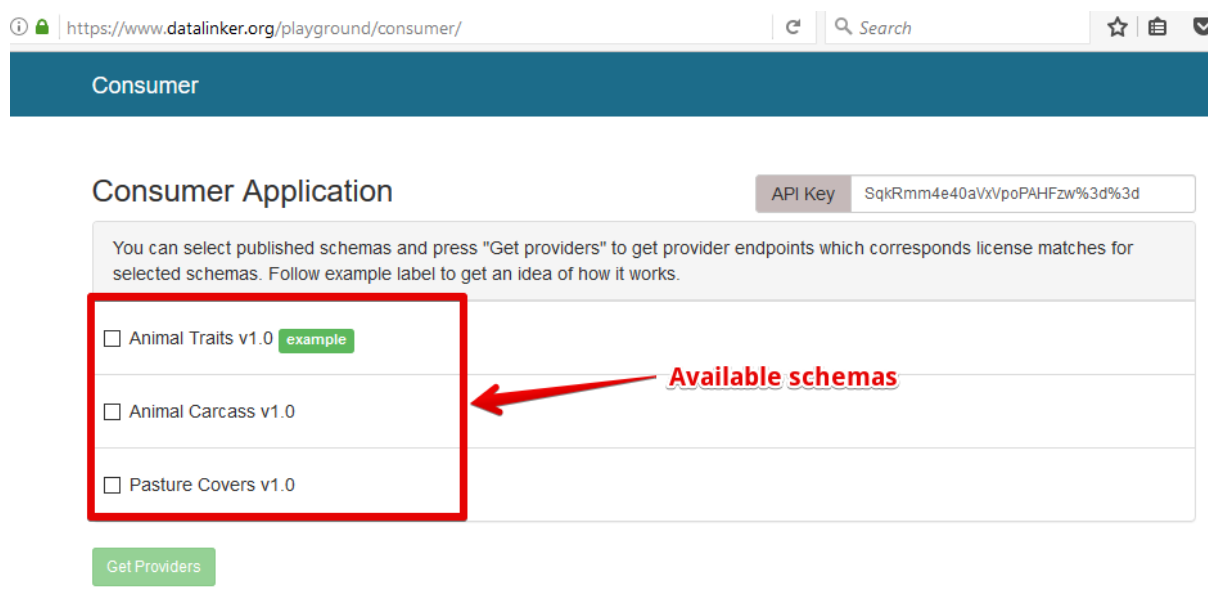
The Provider DATA API for each schema will comply with the schema format.

The Consumer call to the DATA API will comply with the schema format and will pass the Farmer access token.

Implementation Example

6.8 – Query DataLinker API

When the home page has loaded, query the DataLinker API to get and display all available schemas as shown below.



The screenshot shows the DataLinker API playground consumer interface. At the top, the URL is <https://www.datalinker.org/playground/consumer/>. Below the URL bar, there is a dark blue header with the word "Consumer". The main content area is titled "Consumer Application" and features an "API Key" field with the value "SqkRmm4e40aVxVpoPAHFzw%3d%3d". Below this, a text box explains: "You can select published schemas and press 'Get providers' to get provider endpoints which corresponds license matches for selected schemas. Follow example label to get an idea of how it works." A table lists three schemas: "Animal Traits v1.0" (with a green "example" label), "Animal Carcass v1.0", and "Pasture Covers v1.0". A red box highlights the first three rows of the table, and a red arrow points to it with the text "Available schemas". At the bottom of the table is a green "Get Providers" button.

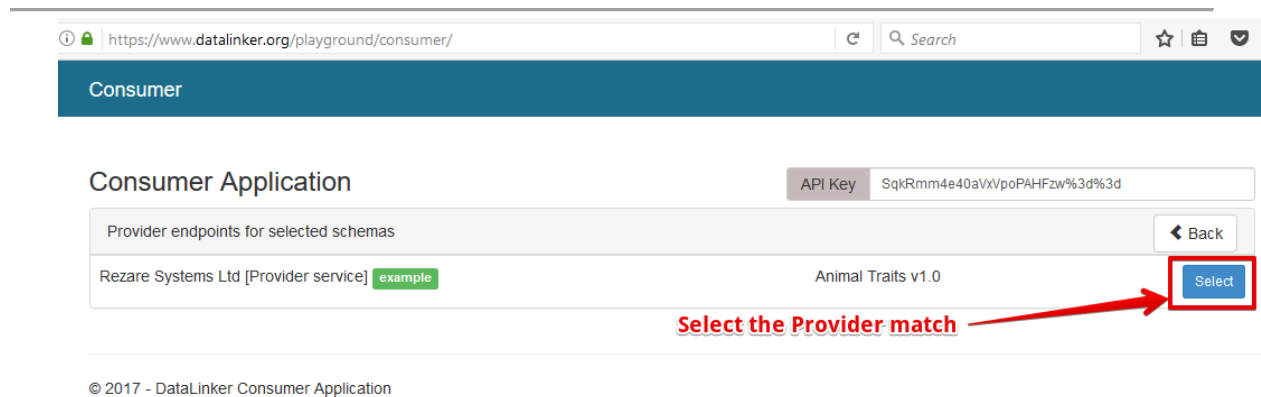
Schema
<input type="checkbox"/> Animal Traits v1.0 example
<input type="checkbox"/> Animal Carcass v1.0
<input type="checkbox"/> Pasture Covers v1.0

[Available schemas](#)

[Get Providers](#)

6.9 – Get Providers

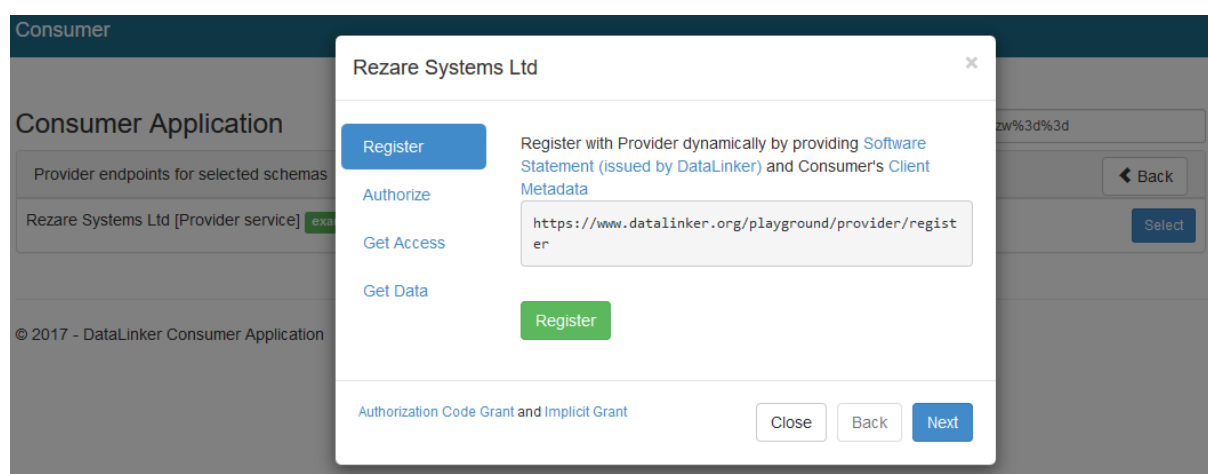
By selecting a schema and clicking on 'Get Providers', you will see a list of providers that match the legally approved licenses of your application in DataLinker as shown below:



6.10 – Provider Details

By clicking on the Provider, you will be taken to the Provider details page as shown below. On the Provider details page you will be able to perform all requests to the Provider via the below buttons:

- Register – Queries DataLinker to get software statement, queries dynamic client registration endpoint
- Authorize – Queries OAuth authorize endpoint OAuth endpoints
- Get Refresh, Access tokens – Queries OAuth token endpoint OAuth endpoints
- Get Data – Queries data endpoint for the schema (Endpoint details such as query parameters and others will be present in the schema file)
- Revoke Refresh/Access token – Queries OAuth revocation endpoint.



7 Provider Implementation

Provider Checks Consumer Software Statement

7.1 - Send Validation request

A Provider may choose to validate a Consumer's Client registration request with Data Linker:

- upon first request from that Consumer only; OR
- every time a Consumer registration request is received.

7.2 – API call

The Provider calls the DataLinker Provider API, with the Consumer software statement and the scopes (schema) it wishes to validate.

The Data Linker response returns if:

- the Consumer is a valid DataLinker user;
- the software statement is authentic;
- the Consumer has accepted the Provider licence terms for each of the Provider's scopes.

The Provider processes the list of schema results to compare the list to the scopes requested by the Consumer. This allows the Provider to apply additional checks: for instance, if a Consumer request includes access to a scope that has already been granted, the Provider may choose not to assess the Consumer acceptance of terms for that scope, as the parties have already agreed terms.

Provider Accepts Client Registration

a) The Provider REGISTER API returns to the Consumer a client secret, unique client id and other information in compliance with Dynamic Client Registration. A Provider may choose to issue an expiry date with that secret, but should note the terms of the Licence agreement in respect of agreed access to data.

b) The Provider stores the client secret and scopes for which that Consumer has agreed licence terms.

c) The Provider sends DataLinker notification of Client Registration accepted.

7.3 - Provider declines Client Registration

The Provider REGISTER API returns the error response described in [RFC7591](#), error responses.

7.4 - Consumer Software Statement Changes

A Consumer's software statement will change if new schema and licence selections are made, but this does not alter Licence Agreements executed under old software statements. If a Provider has previously accepted a Client registration for a Consumer, but subsequently receives an 'invalid' response from DataLinker, it is recommended that the Provider initiate a business process to check the terms of the existing Licence Agreement with that Consumer.

7.5 Expire Client Secret

If a Licence Agreement is terminated through normal business process, the Provider will expire the Consumer's client secret in order to deny access to data.

7.6 - Provider AUTHORISE API

A Provider AUTHORISE API is supplied to the Consumer when it queries DataLinker for provider matches. When a Farmer selects a Provider (from the Consumer's prompt), the Consumer redirects the farmer to the Provider's AUTHORISE API.

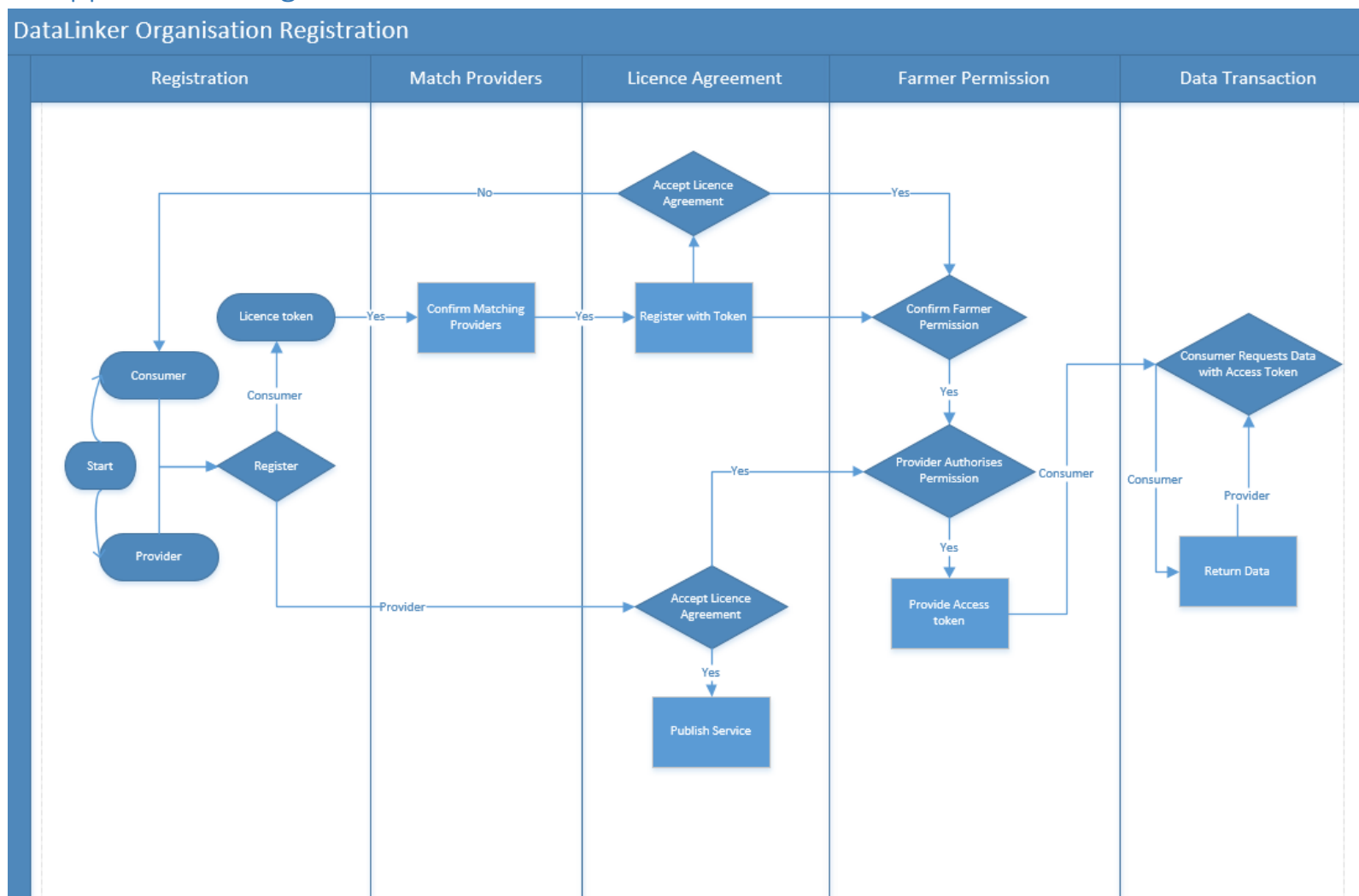
The Provider AUTHORISE API must:

- ensure that the Farmer provides their Provider login credentials; AND
- get clear permission from the Farmer to transfer specified schema data to the Consumer. E.g [Consumer] is requesting access to your [schema] data. Do you grant permission for us to share [schema] data directly with [consumer]? YES / NO

If Farmer permission is granted, authorisation information will be sent to the Consumer.

The Provider's authentication service stores authorisation records, and it is recommended that it enables a 'Manage Permissions' menu on its user profile. Users (Farmers) can check what permissions are in place and revoke permission from this site. If permission is revoked, the Provider expires the access token.

Appendix A - Registration Flow Chart



Appendix B – Implementation Flow Chart

