

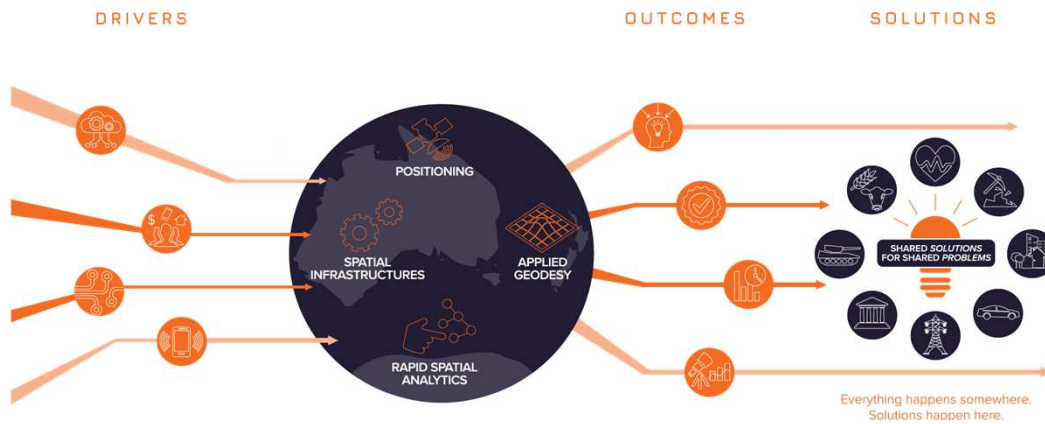
# SKI TECHNICAL ARCHITECTURE

Dr Ivana Ivánová  
Senior Lecturer/Research Fellow  
Curtin University



FRONTIERSI.COM.AU

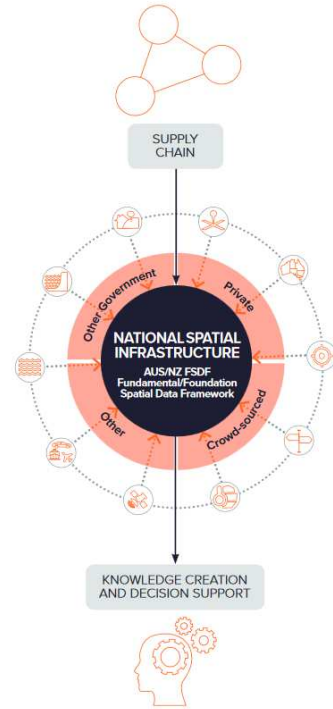
## FrontierSI (former CRCSI)



# FrontierSI (former CRCSI)

Spatial Infrastructures program (ANZSI) aims at building an infrastructure, which will, for example:

- assist people as they select a place to live,
- inform planners as they design new suburbs,
- aid emergency services personnel as they respond to life threatening situations and
- safely guide autonomous vehicles as they navigate our streets.



3 SKI Architecture

## What can we do with current SDIs?

4 SKI Architecture



## Q: Where is the closest POI?

- Call a friend and ask them which SDI catalogue to use?
  - Search in the catalogue,
  - Study what's available,
  - Access and use data,
- OR
- Go to provider's website, register, access data,
  - Download and use data

The screenshot shows the data.wa.gov.au website. The main heading is 'Medium Scale Topo Points of Interest (Point) (LGATE-135)'. Below this, there is a section for 'Data and Resources' with several items: 'Data dictionary and dataset metadata', 'End User License Agreement', 'Web Mapping Service', 'Web Feature Service', and 'Esrri Feature Service'. Each item has an 'Explore' button. The page also features a sidebar for the 'Landgate' organization and a search bar at the top.

There should be better ways to do this today!

Direct your apps to SKI!

7 SKI Architecture FRONTIER S I >

### Spatial Knowledge Infrastructure

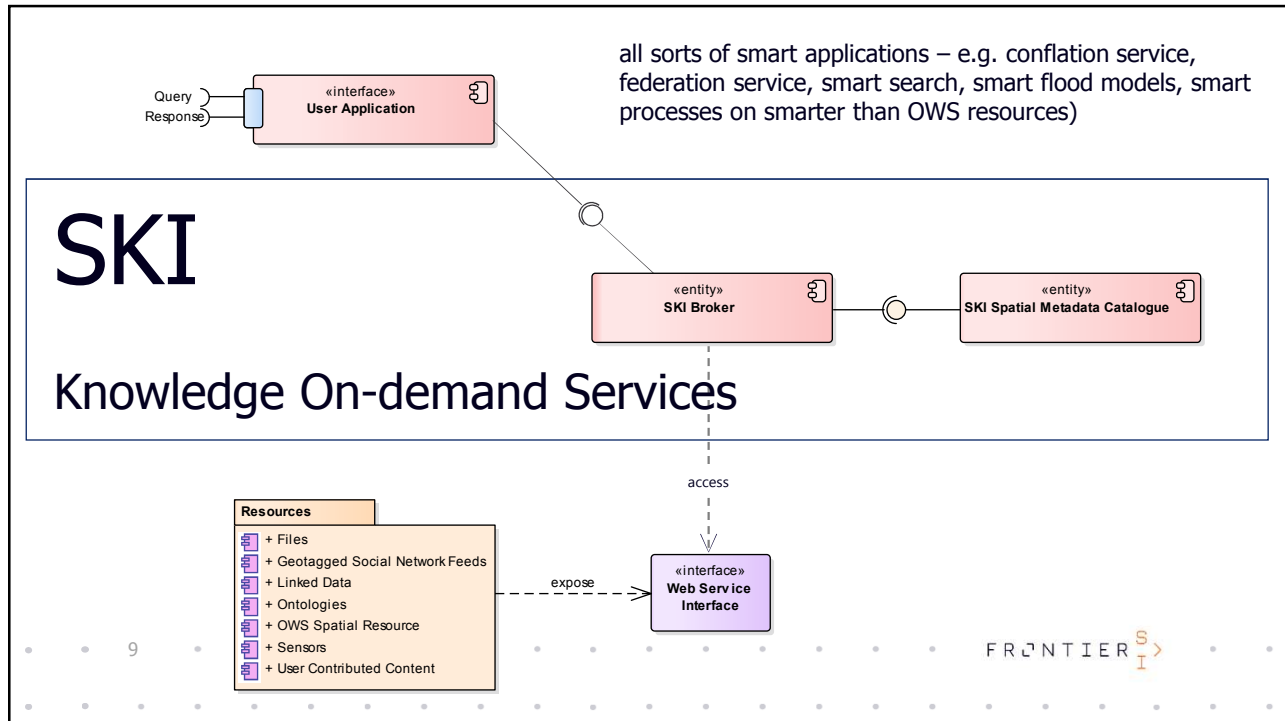
“a network of data analytics, expertise and policies that **assist** people, whether individually or in collaboration, to integrate in real-time spatial knowledge into everyday decision-making and problem solving.”

Towards a Spatial Knowledge Infrastructure  
White Paper  
March 2017

Information Knowledge

Australia and New Zealand  
Cooperative Research Centre  
for Spatial Information (CRCSI)

8 SKI Architecture



## Main components of SKI

### SKI Broker

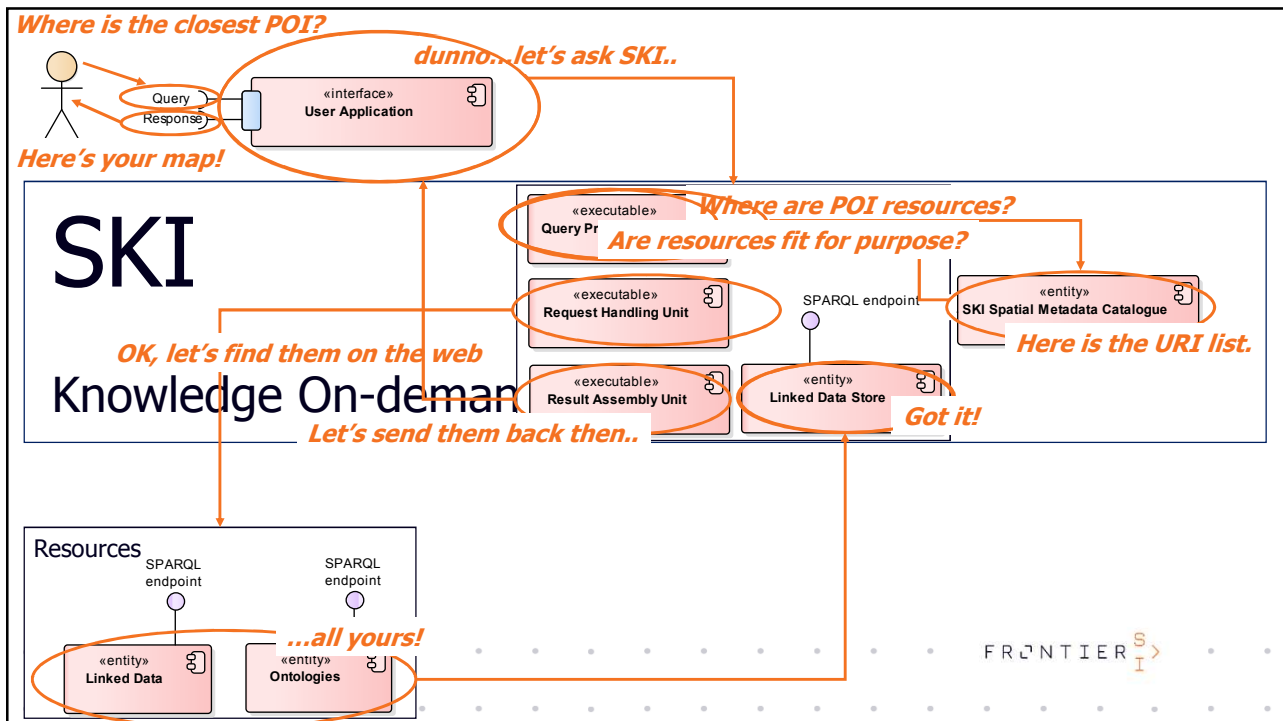
- Mediator between resources and application;
- Analyses and processes user queries;
- Explores curated resources in SKI Spatial Metadata Catalogue;
- Redirects requests to resources;
- Retrieves, assembles and returns response to the app;

### SKI Spatial Metadata Catalogue


- Stores information about spatial resources, i.e. Metadata

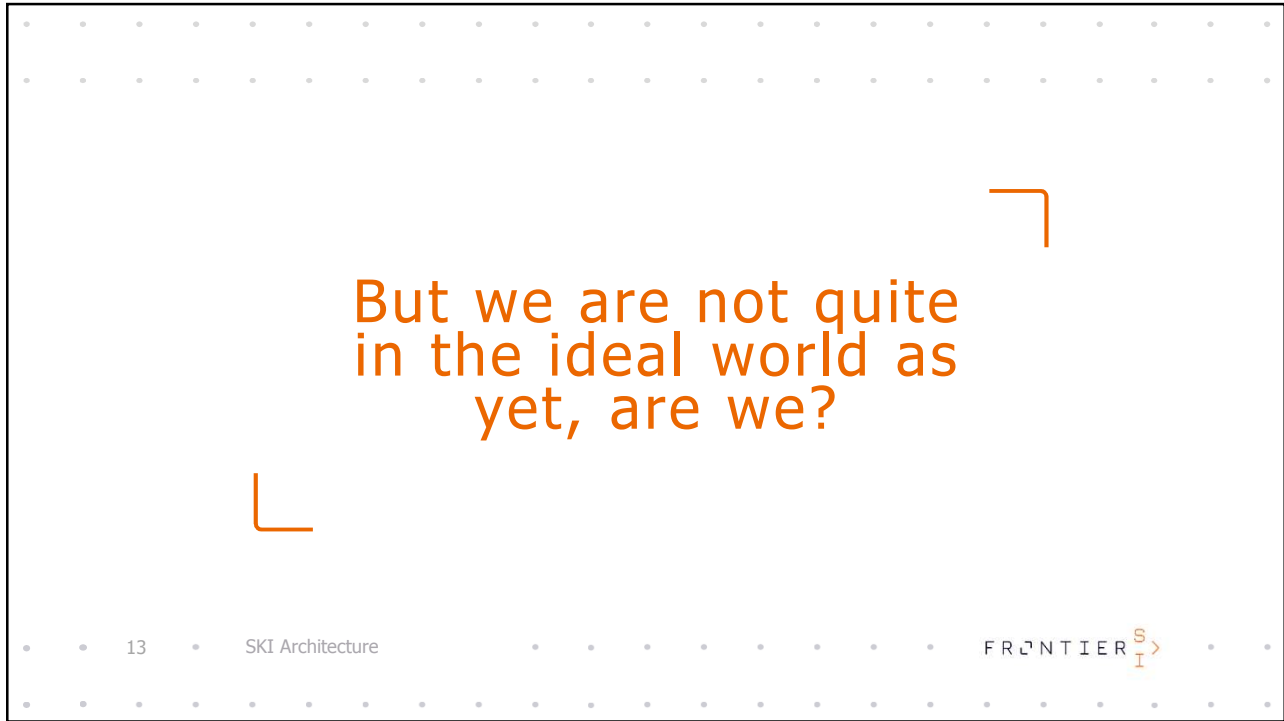
How apps use SKI in ideal world?

11 SKI Architecture FRONTIER




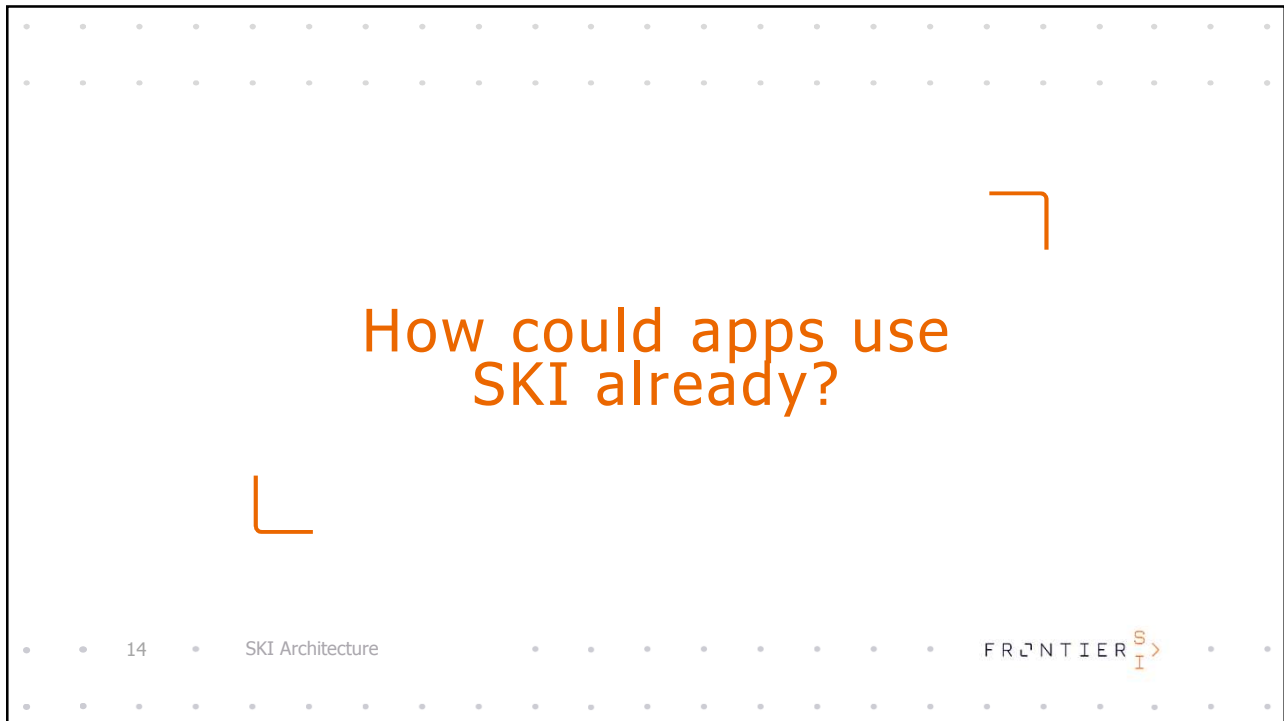
But we are not quite  
in the ideal world as  
yet, are we?

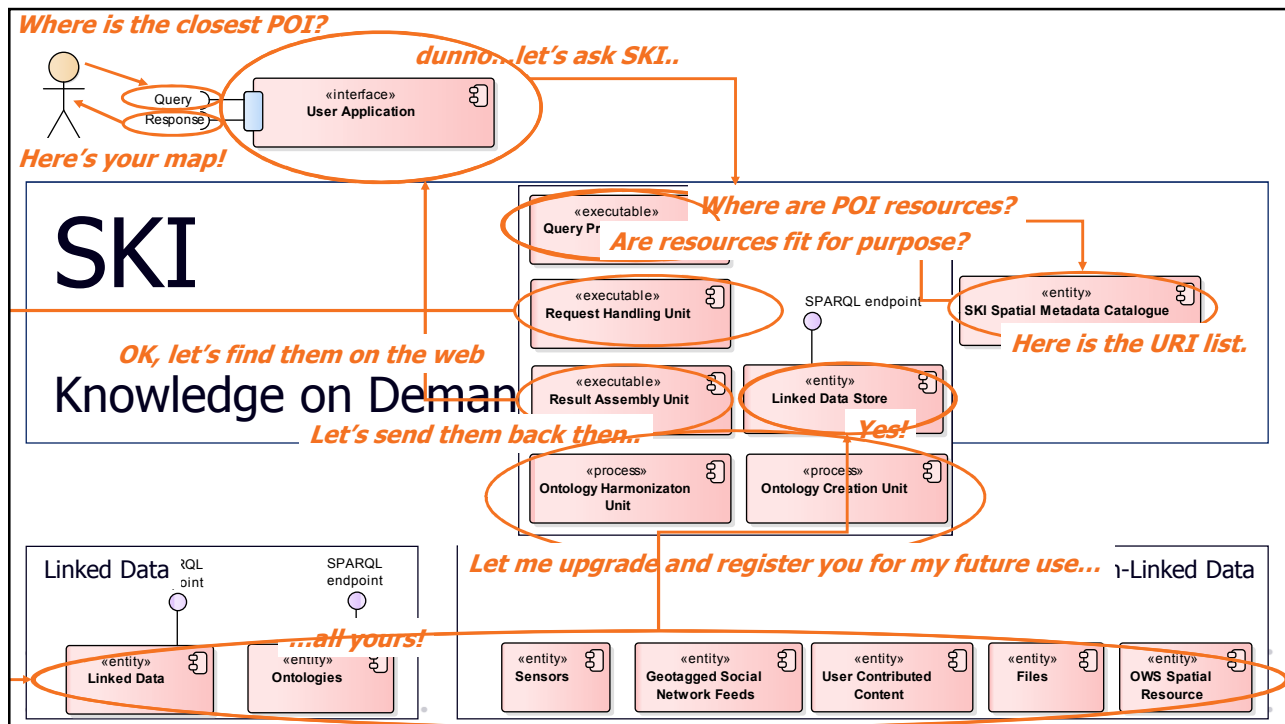
13 • SKI Architecture • FRONTIER 



How could apps use  
SKI already?

14 • SKI Architecture • FRONTIER 





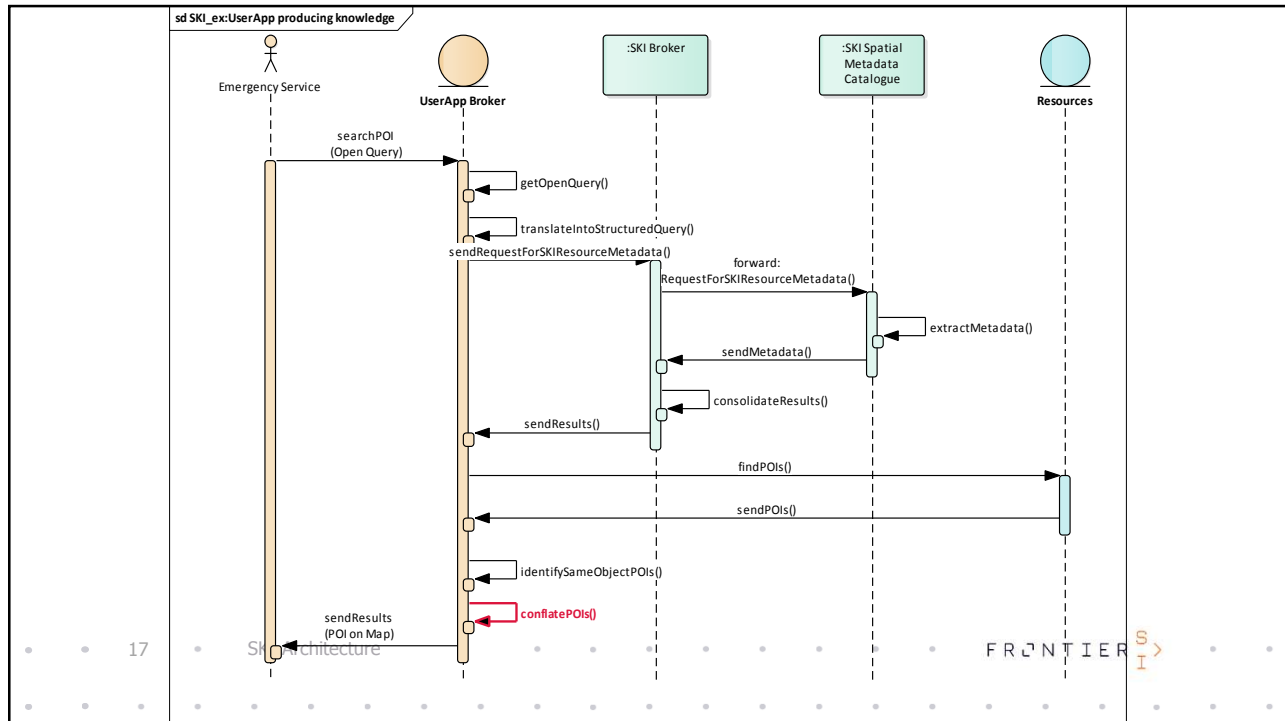
Who should be smart?

The app?

FRONTIER

16 SKI Architecture

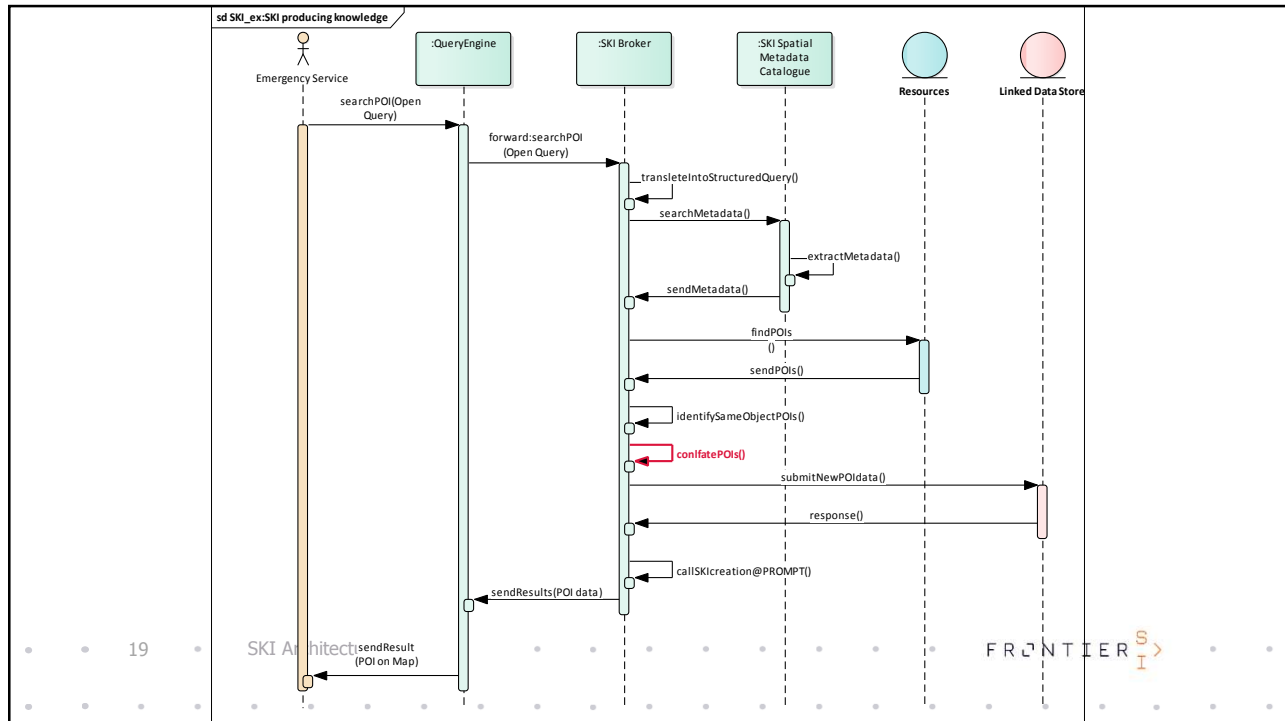




Who should be smart?

The SKI?

18 SKI Architecture FRONTIER



Let SKI governance decide...

SKI Architecture

FRONTIER

But what to do with SDIs?

21 SKI Architecture FRONTIER S I >

Expose them to the web: produce LINKED METADATA

22 SKI Architecture FRONTIER S I >

## Expose metadata to the web

The screenshot shows the 'data.wa.gov.au' website. The main content area displays the dataset 'Medium Scale Topo Points of Interest (Point) (LGATE-135)'. On the right, there are 'Data and Resources' with buttons for 'Explore' for items like 'Data dictionary and dataset metadata', 'End User License Agreement', 'Web Mapping Service', 'Web Feature Service', and 'Eri Feature Service'. A red circle highlights the 'RDF' and 'JSON' options. On the left, a red box highlights the metadata content, which includes a large block of XML/JSON metadata.

The screenshot shows the 'INSPIRE in Practice' website. The main content area is titled 'GeoDCAT-AP API'. It includes an overview, general info, and a contributor section for Andrea PEREGO. A table at the bottom provides details about the resource abstract and type. A red box highlights the table content.

<b>Resource abstract (M)</b> *Abstract describing the dataset (M)	dct:description (M)	- (dcate:Dataset (M), dcat:Catalog (M))	rdf:PlainLiteral
<b>Resource type (M)</b> *not in ISO19115 core	rdf:type (M) (see also binding for GeoDCAT-AP Extended)	- (dcate:Dataset (M), dcat:Catalog (M))	rdfs:Class (values dcat:Dataset dcat:Catalog)

...and 'teach' your stakeholders to expose their resources to the web

25

SKI Architecture

FRONTIER S  
I >

## Geoscience Australia

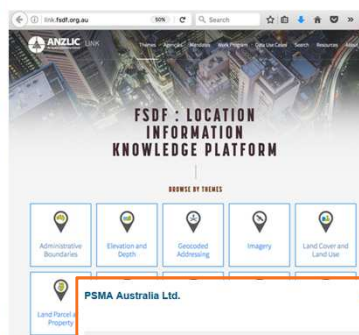
Geoscience Australia's Sample Register delivers metadata for physical samples stored in its repositories - internal databases. Multiple 'views' and 'formats' of samples' metadata is available, including the [Dublin Core Metadata Initiative represented in RDF](#) general purpose metadata, more specialised metadata according to more sample specialised schema, such as the W3C's [Spatial Data on the Web's SOSA ontology](#).

The full catalogue (register) of all samples is available at <http://pid.geoscience.gov.au/sample/> and W3C [Data on the Web Best Practices](#) are followed to allow for navigating through 2M samples.

- Samples index: <http://pid.geoscience.gov.au/sample/>
- Sample AU239's landing page (HTML): <http://pid.geoscience.gov.au/sample/AU239/>
- Sample AU239's Dublin Core metadata (HTML): <http://pid.geoscience.gov.au/sample/AU239/dublin-core/>
- Sample AU239's Dublin Core metadata (RDF): <http://pid.geoscience.gov.au/sample/AU239/dublin-core.turtle>
- Sample AU239's metadata in SOSA (RDF): <http://pid.geoscience.gov.au/sample/AU239/sosa.turtle>

<http://linked.data.gov.au>

## FSDf's LINK ontology



The LINK is the Australian Government's Foundational Spatial Data Framework initiative's online database of input data, agencies and so on that contribute to its themed datasets.

The LINK is presented online via a Content Management System (CMS) that makes all of its contents available via dynamic web pages draws from a relational database. That database's structure has been designed in accordance with

the LINK's OWL ontology:

- LINK ontology

## G-NAF - as a Register of Registers

### About

This is a Register view of the Linked Data API delivering data from the G-NAF, the Geocoded National Address File.

Here you see a 'Register of Registers', each of which contains classes of item from the Linked Data representation of G-NAF content.

### Register

- Address Register
  - An Address - example, GAACT714845933
- Street Locality Register - the list of all Addresses, paged
  - A Street Locality - example, NSW2856338
- Locality Register - the list of all Localities, paged
  - A Locality - example, 198023 (Argoon, Queensland)

Thank you!

[ivana.ivanova@curtin.edu.au](mailto:ivana.ivanova@curtin.edu.au)

FRONTIER S  
I >

FRONTIERSI.COM.AU