



Governance in Complex Cyber-Infrastructures

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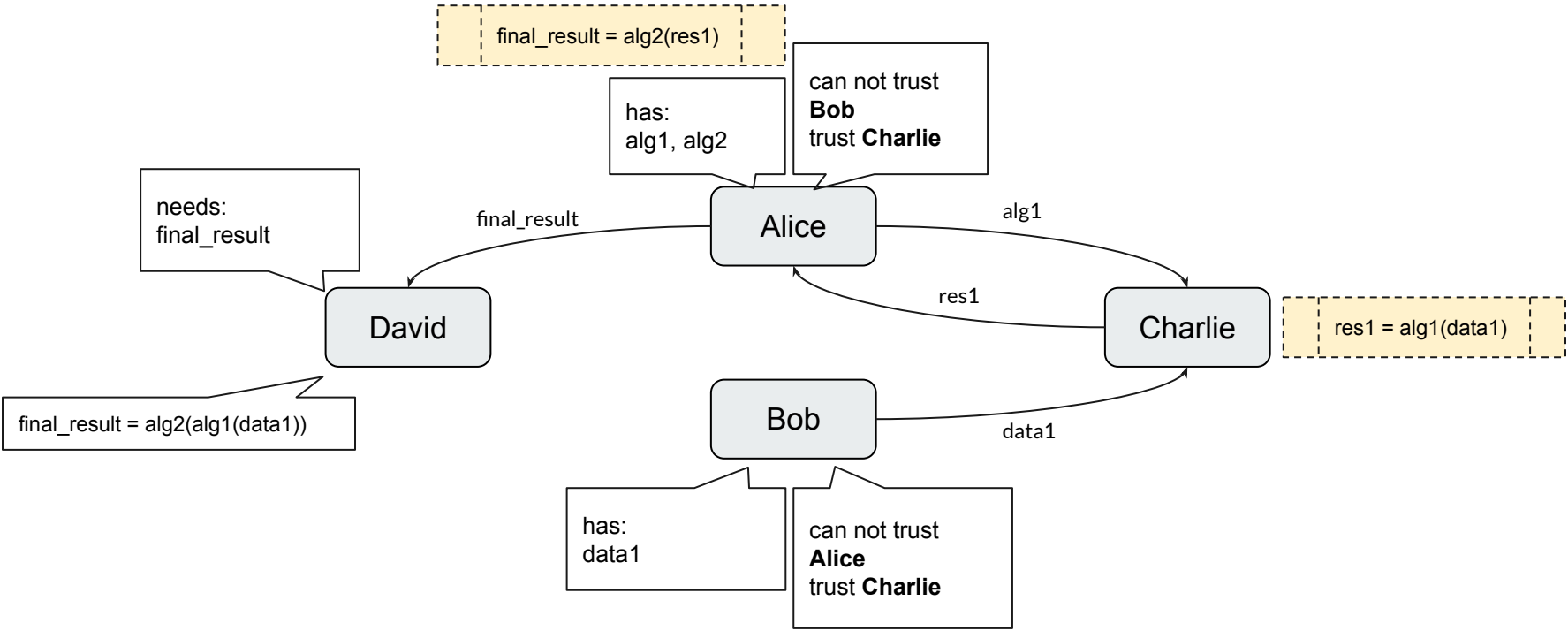
DL4LD meeting
Nov 30, 2022



Part 1: The context.

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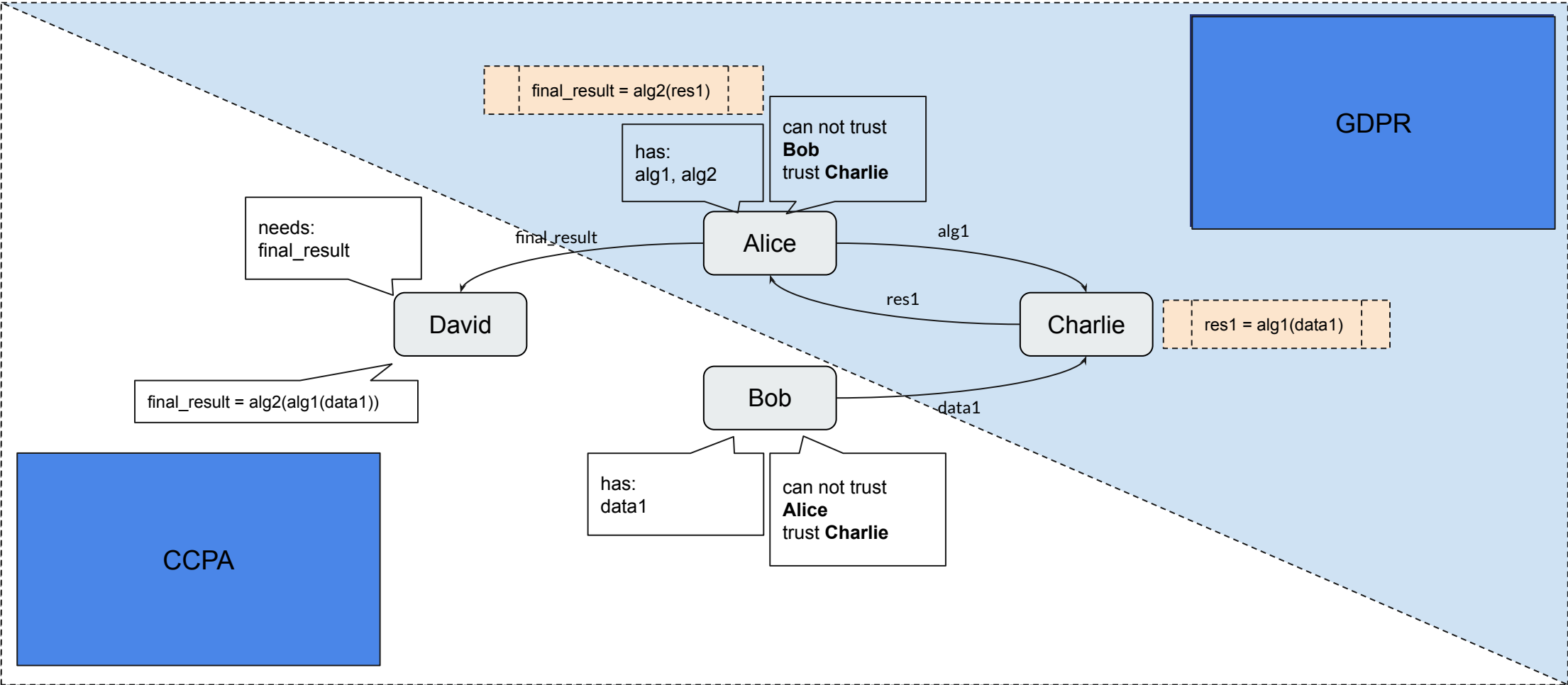
A Data-Sharing Scenario



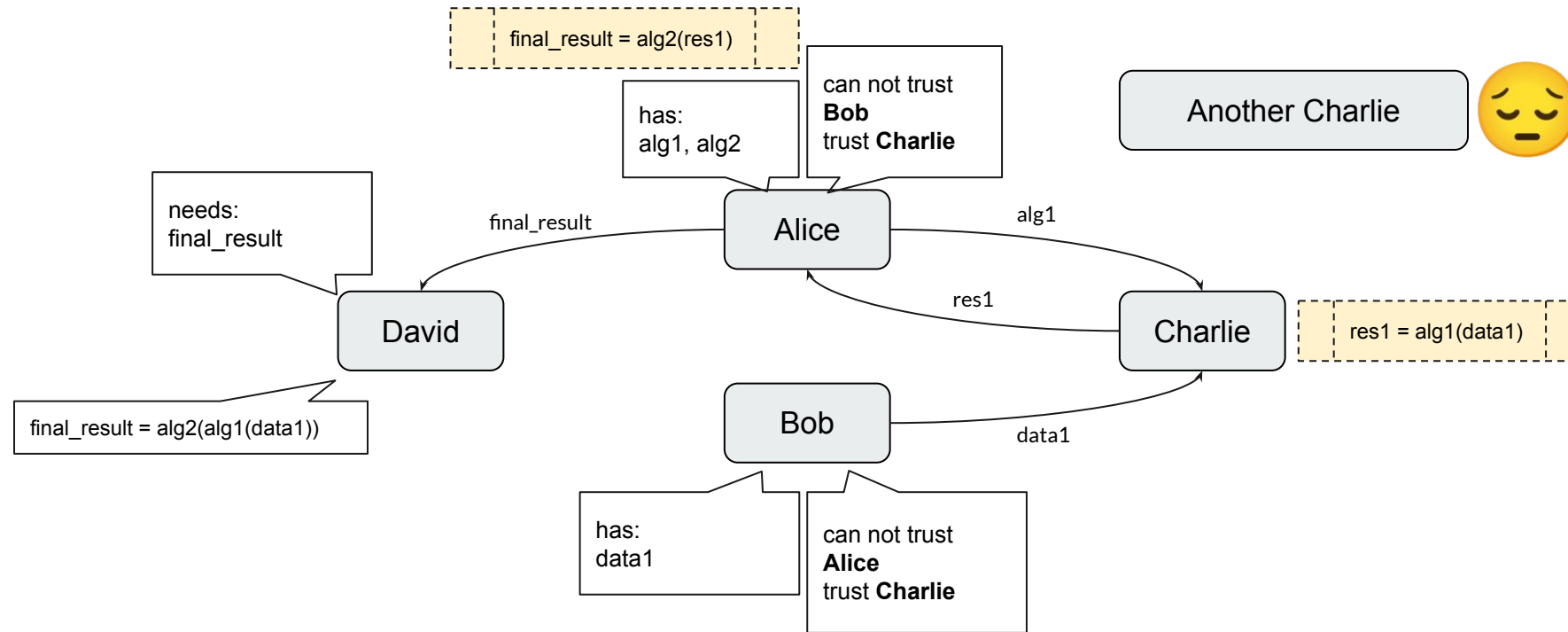
Part 1.b: Complications.

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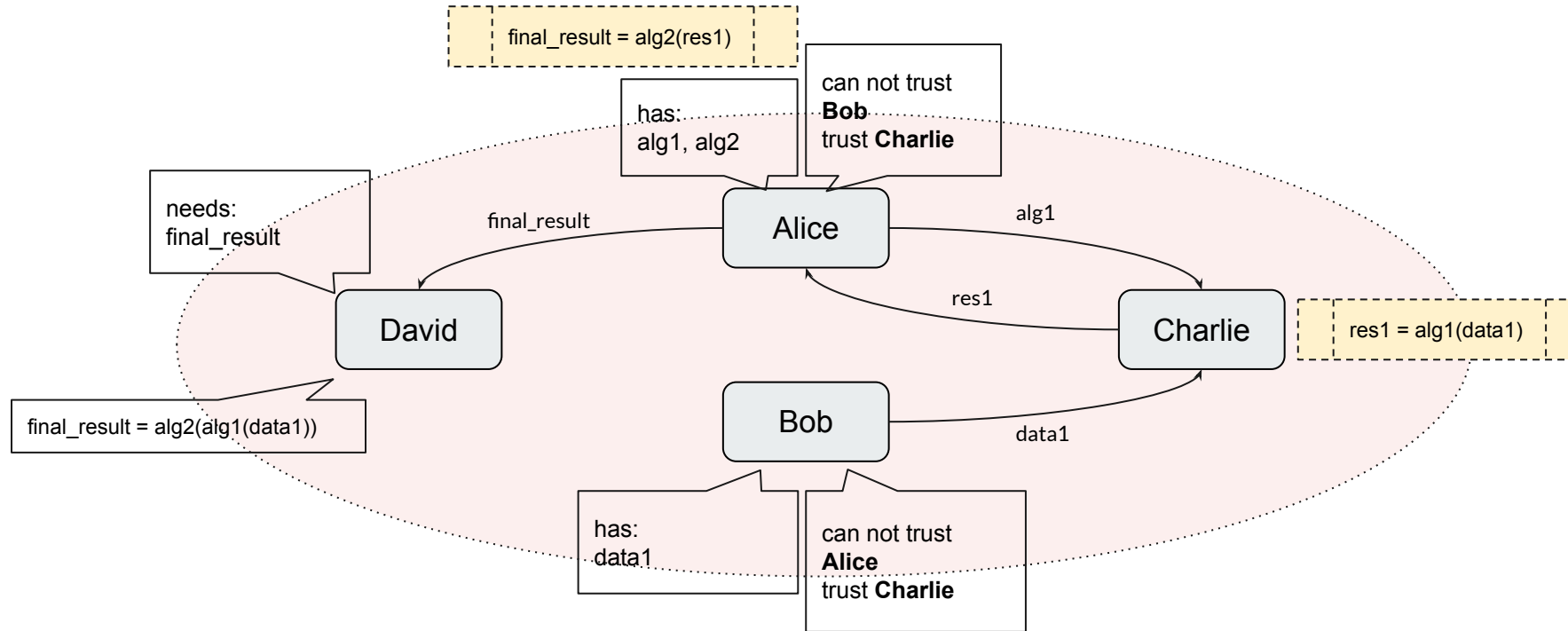
Jurisdiction



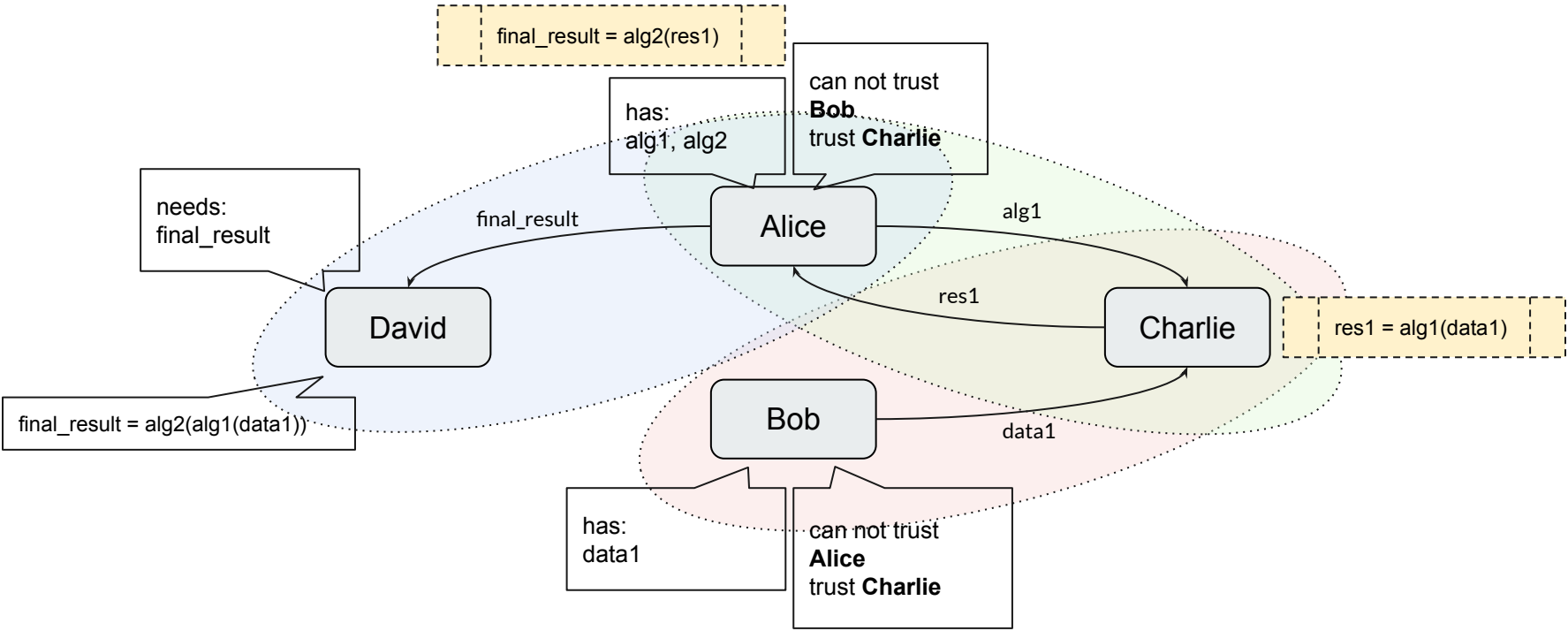
Decision-Making



Concrete vs. Partial Planning/Delegation



Concrete vs. Partial Planning/Delegation



How realistic are these issues?

This is all actually happening.

Lesson 1: Data mobility can get complicated.

Part 2: Modelling the system.

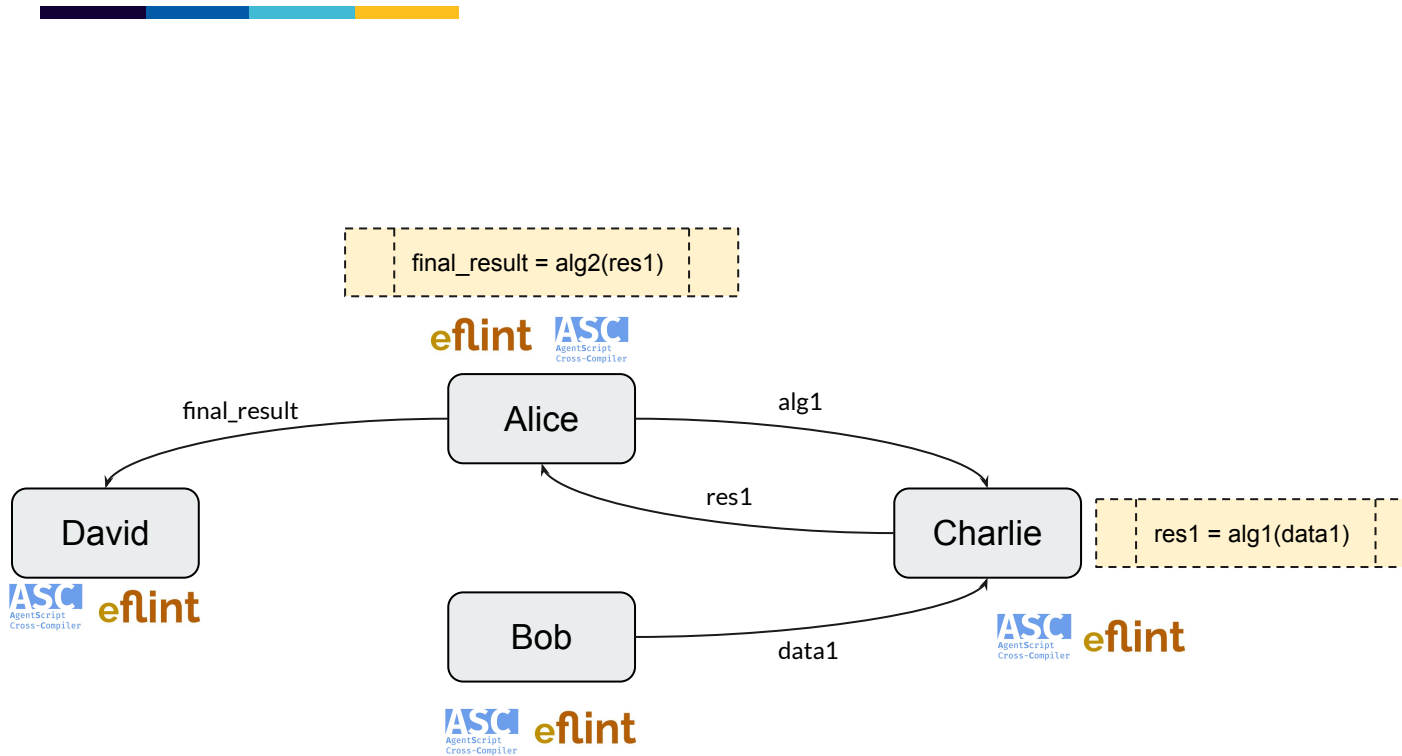
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Modelling the System

- Model the system as a Multi-Agent System
 - Both Software and Social actors



Modelling the data-market



```

Act send_data
  Actor source Recipient target
  Related to data
  Terminates to_send_data()

Act compute
  Actor source Recipient target
  Related to input, algorithm, reference
  Terminates to_compute()

Duty to_send_data
  Holder source Claimant target
  Related to data

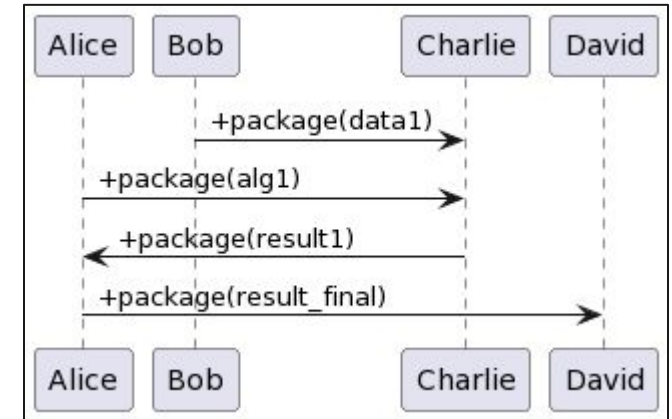
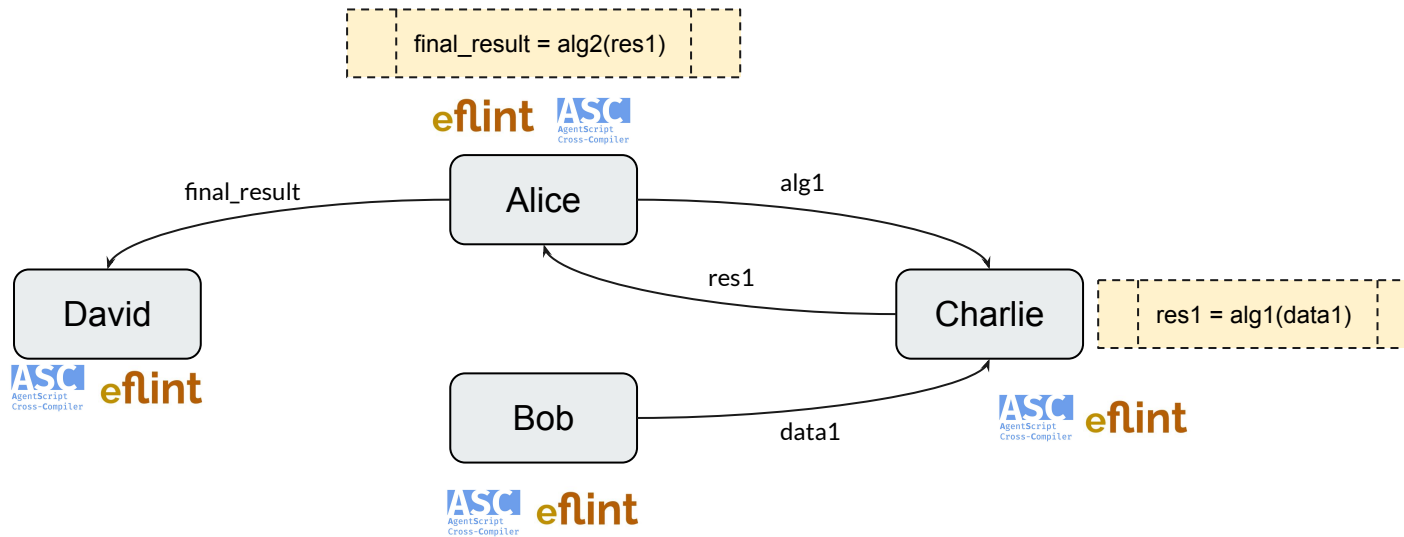
Duty to_compute
  Holder source Claimant target
  Related to input, algorithm, reference

Event init_contract
  
```

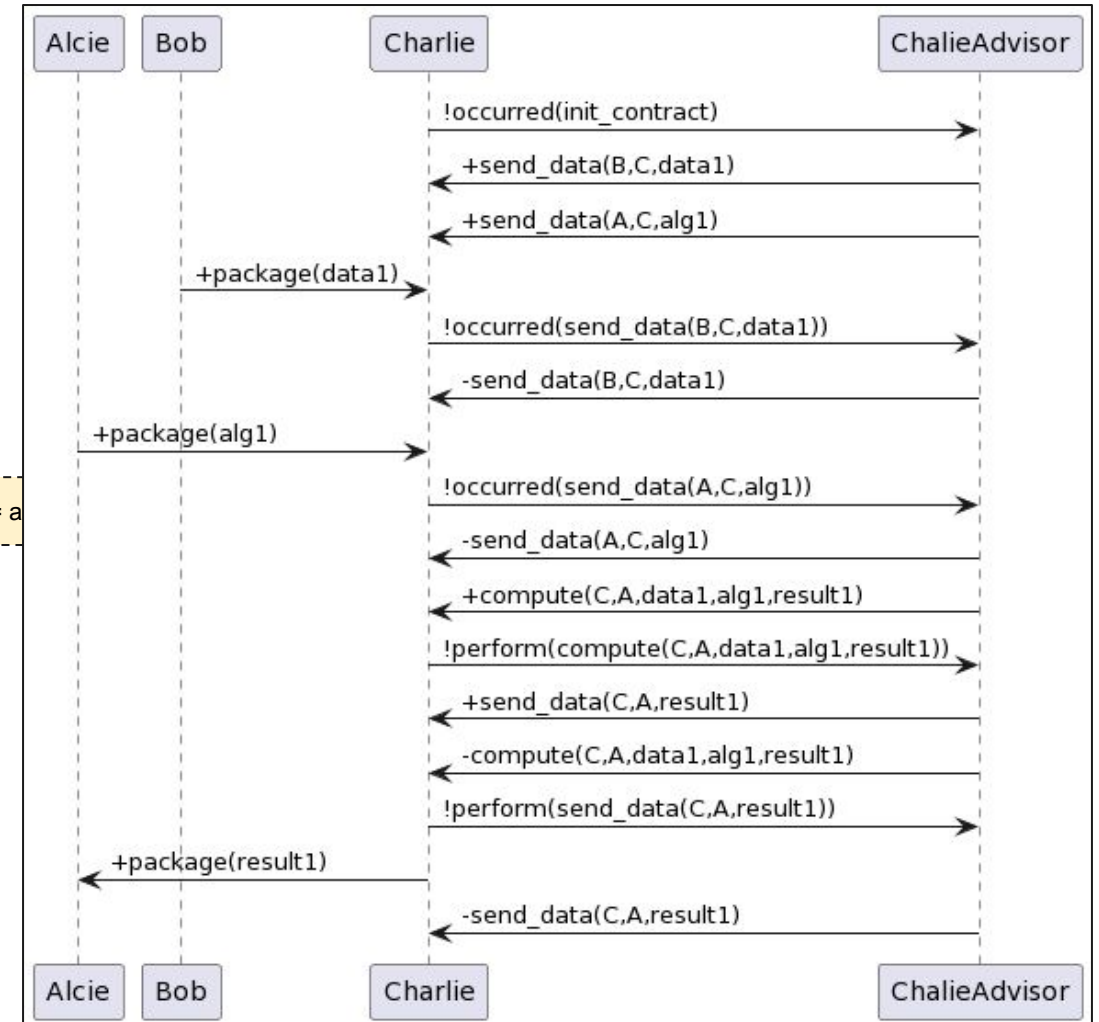
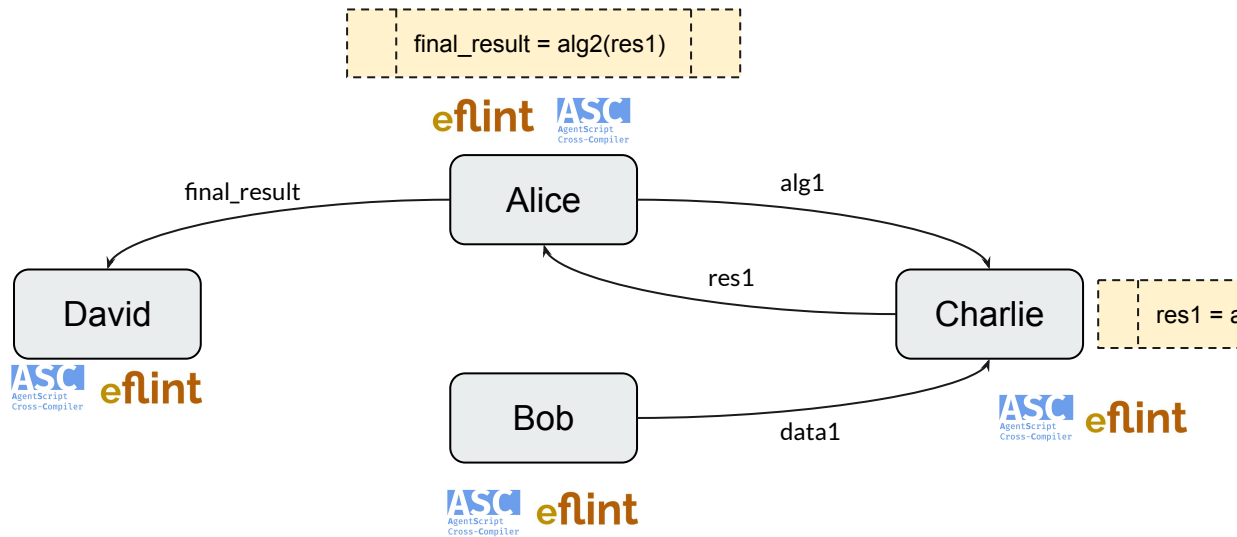
```

1  +!init(Advisor) => !inform_advisor(event, init_contract).
2
3  +!send_data(Target,Data) =>
4      #tell(Target,package(Data));
5      !inform_advisor(act,send_data(Self,Target,Data)).
6
7  +package(Data) =>
8      !inform_advisor(Act,send_data(Source,Self,Data)).
9
10 +send_data(S,T,D) : Self == S =>
11     #println("Duty created: " + send_data(S,T,D)).
12     !send_data(T,D).
13
14 +send_data(S,T,D) =>
15     #println("Duty created: " + send_data(S,T,D)).
16
17 -send_data(S,T,D) =>
18     #println("Duty terminated: " + send_data(S,T,D)).
  
```

Design artifacts



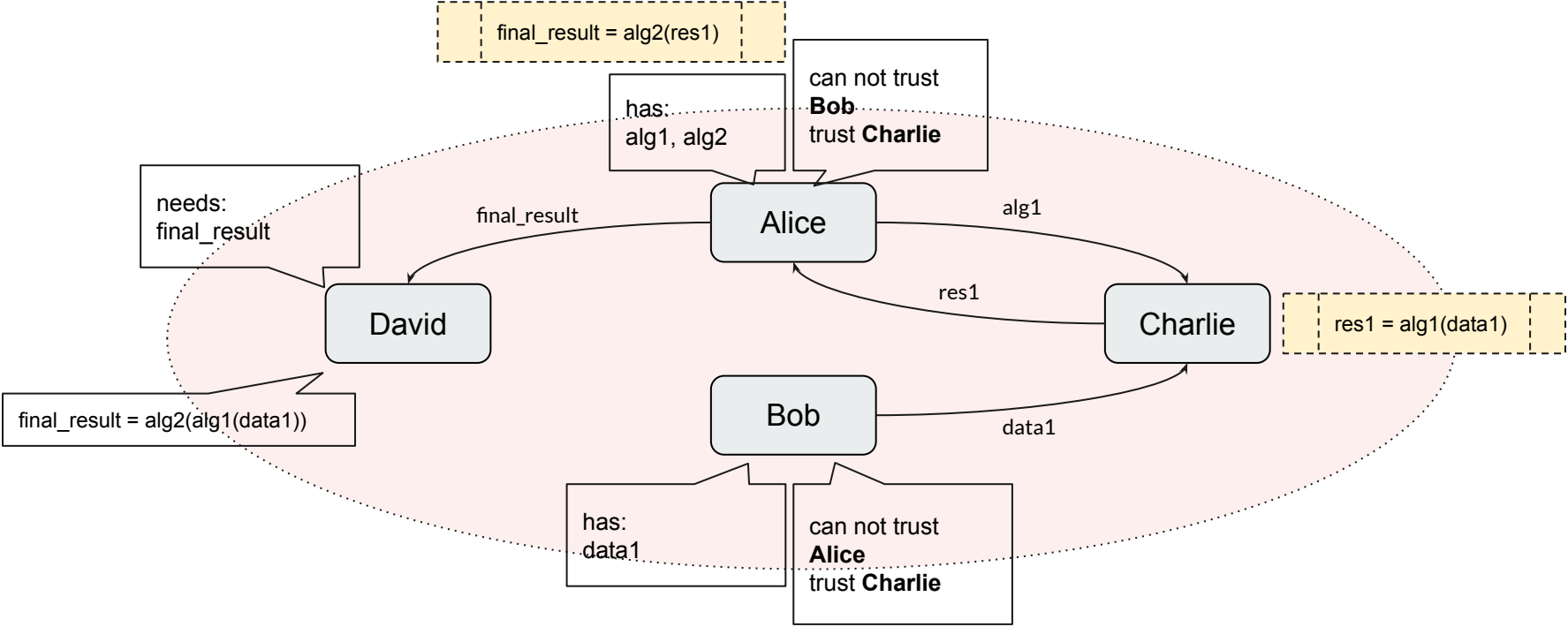
Policy making artifacts



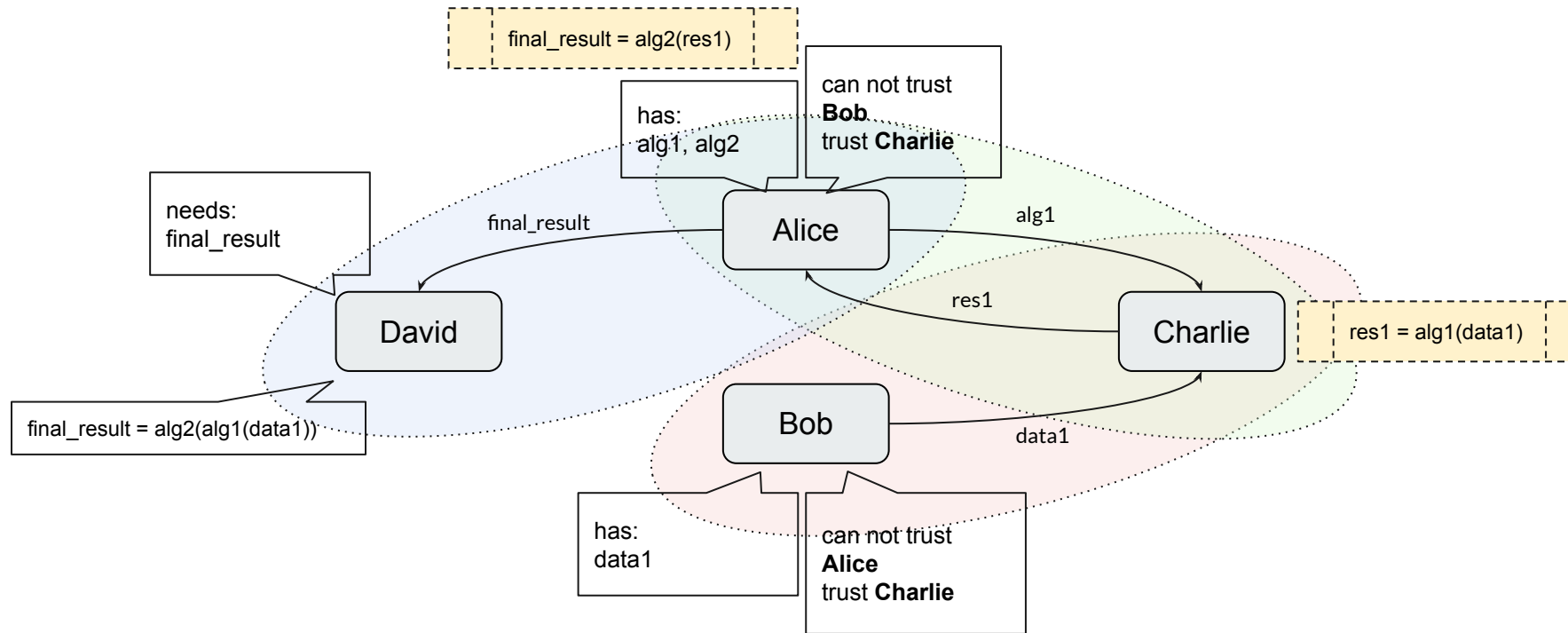
Part 2.b: Modelling Complications.

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Concrete Planning



Partial Planning/Delegation

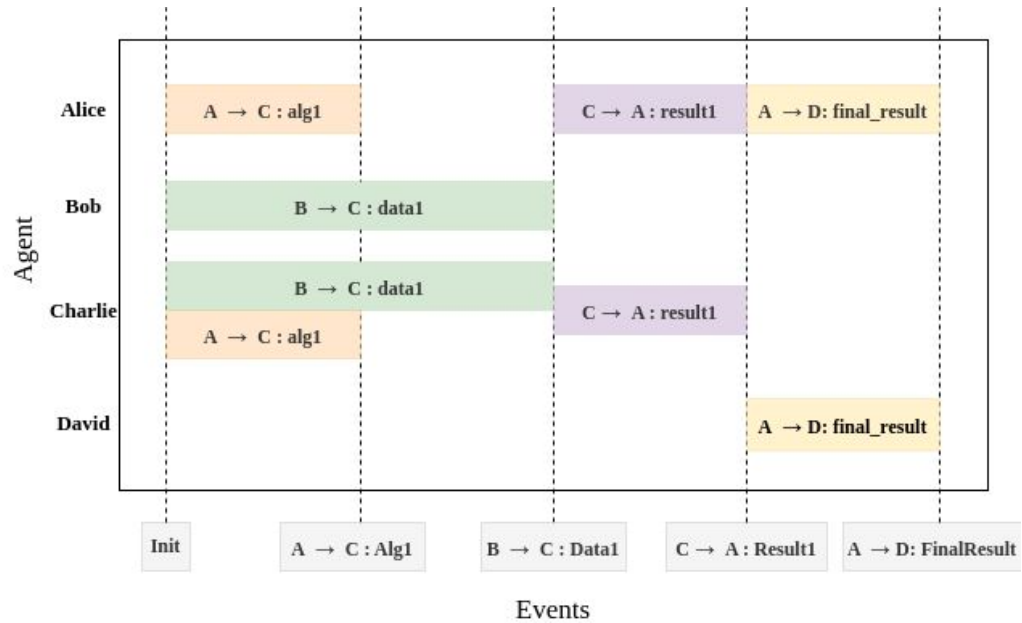


Duty life-cycles



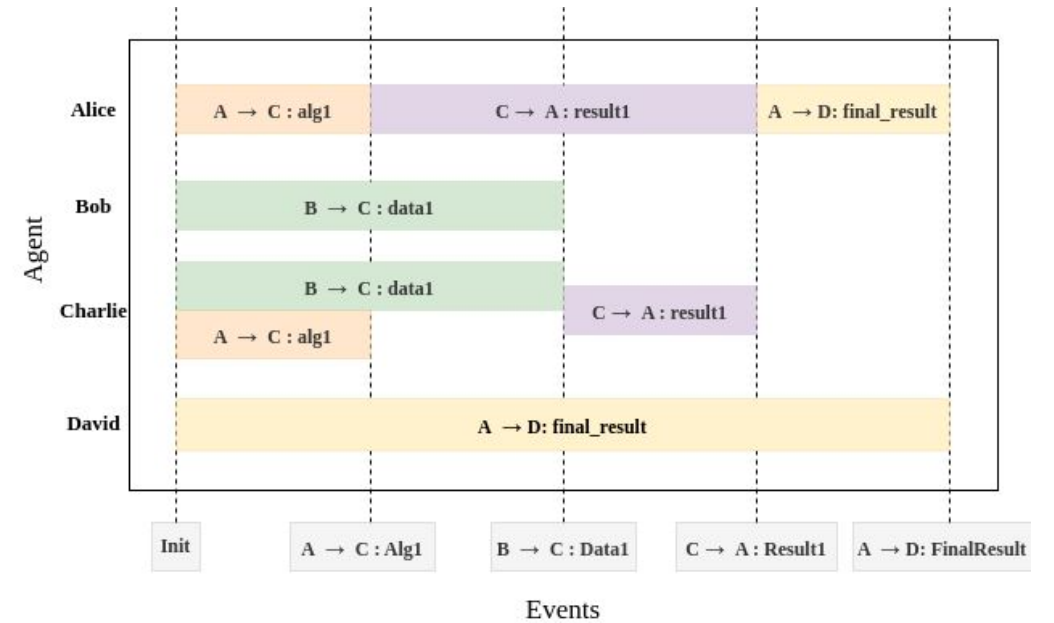
Full planned scenario

Complete monitoring



Partial planning

Ad-hoc monitoring



Lesson 1: Data mobility can get complicated

Lesson 2: The problem can and should be broken down

Part 3: Real World?

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Current Situation?



Which stage of system/policy to aim for?



Design

Development

Deployment

What would be more effective?



Training

Tools
/
Methodologies

Services

Who to aim for?



Lawyers and Law scholars

Software Engineers

Who to aim for?



Lawyers and Law scholars

Software Engineers

DevOps

Lesson 1: Data mobility can get complicated

Lesson 2: The problem can and should be broken down

**Lesson 3: It's a multi-dimensional
issue and can be addressed with
different approaches**

To sum it up

- **Lesson 1: Data mobility can get complicated**
- **Lesson 2: The problem can and should be broken down**
- **Lesson 3: It's a multi-dimensional issue and can be addressed with different approaches**
 - **From legal and SE perspective**
 - **Design, Development, and deployment**
 - **Training, Tools/Methodologies and Services**



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