

Concurrent Presentation Session  
THE SKILLFUL USE OF xAPI, IN PRACTICE

# Challenges in Providing a Semi-Connected Learner Experience with xAPI

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Social: #ADLiFEST | WiFi: HILTON\_MEETING / Password: ADLiFEST

**iFEST**

# xAPI & Semi-connected Learners

Challenges in Providing a Semi-connected Learner Experience  
with the Experience API (xAPI)



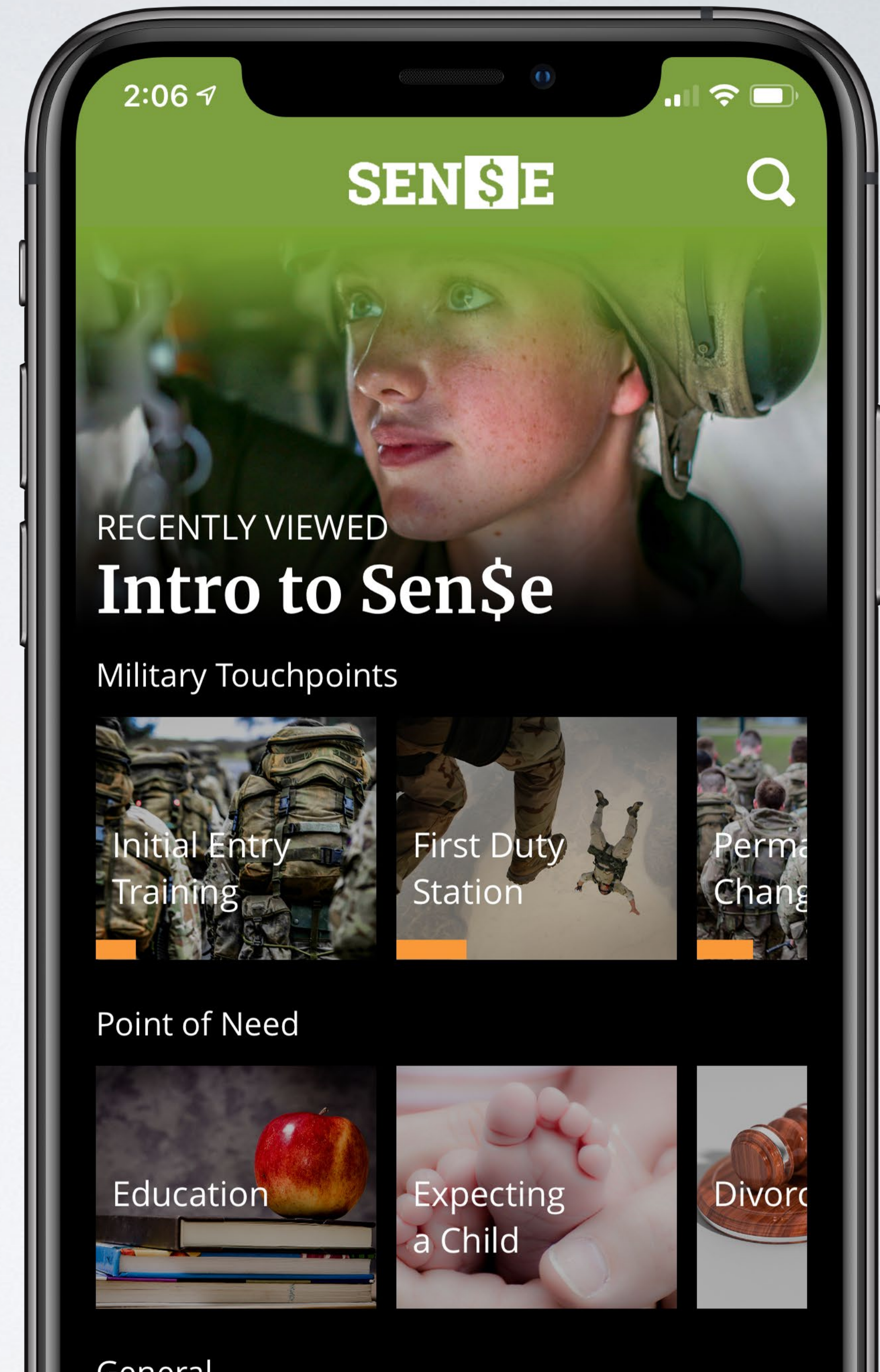
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# Sen\$e



2:06

SEN\$E



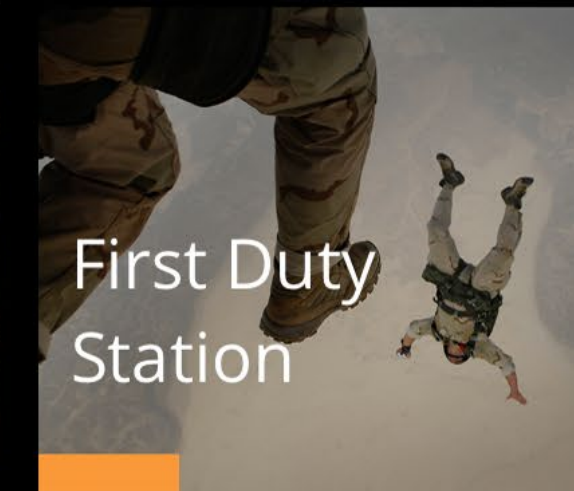
RECENTLY VIEWED

## Intro to Sen\$e

### Military Touchpoints



Initial Entry  
Training



First Duty  
Station



Perma  
Change

### Point of Need



Education



Expecting  
a Child



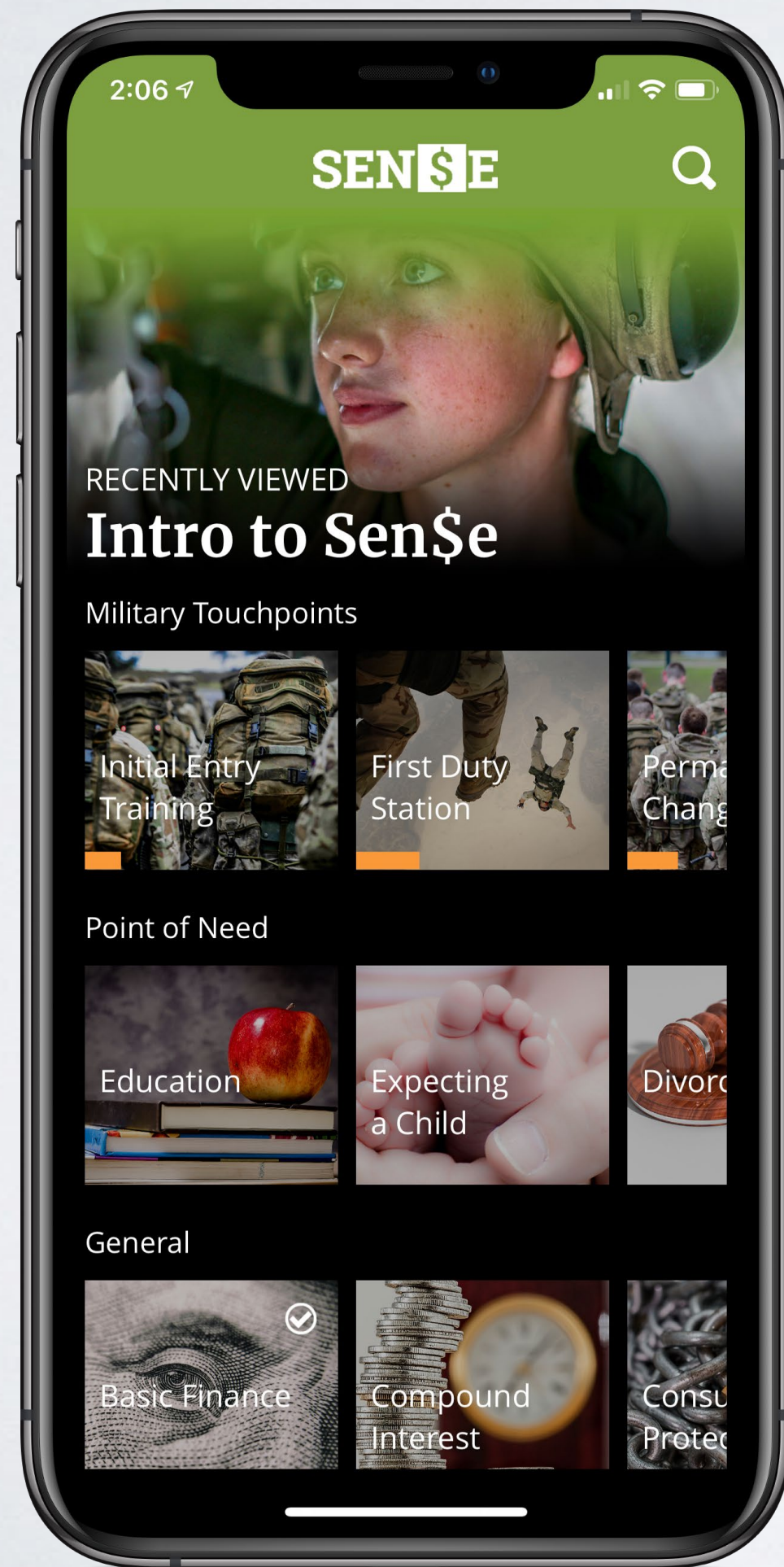
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### General



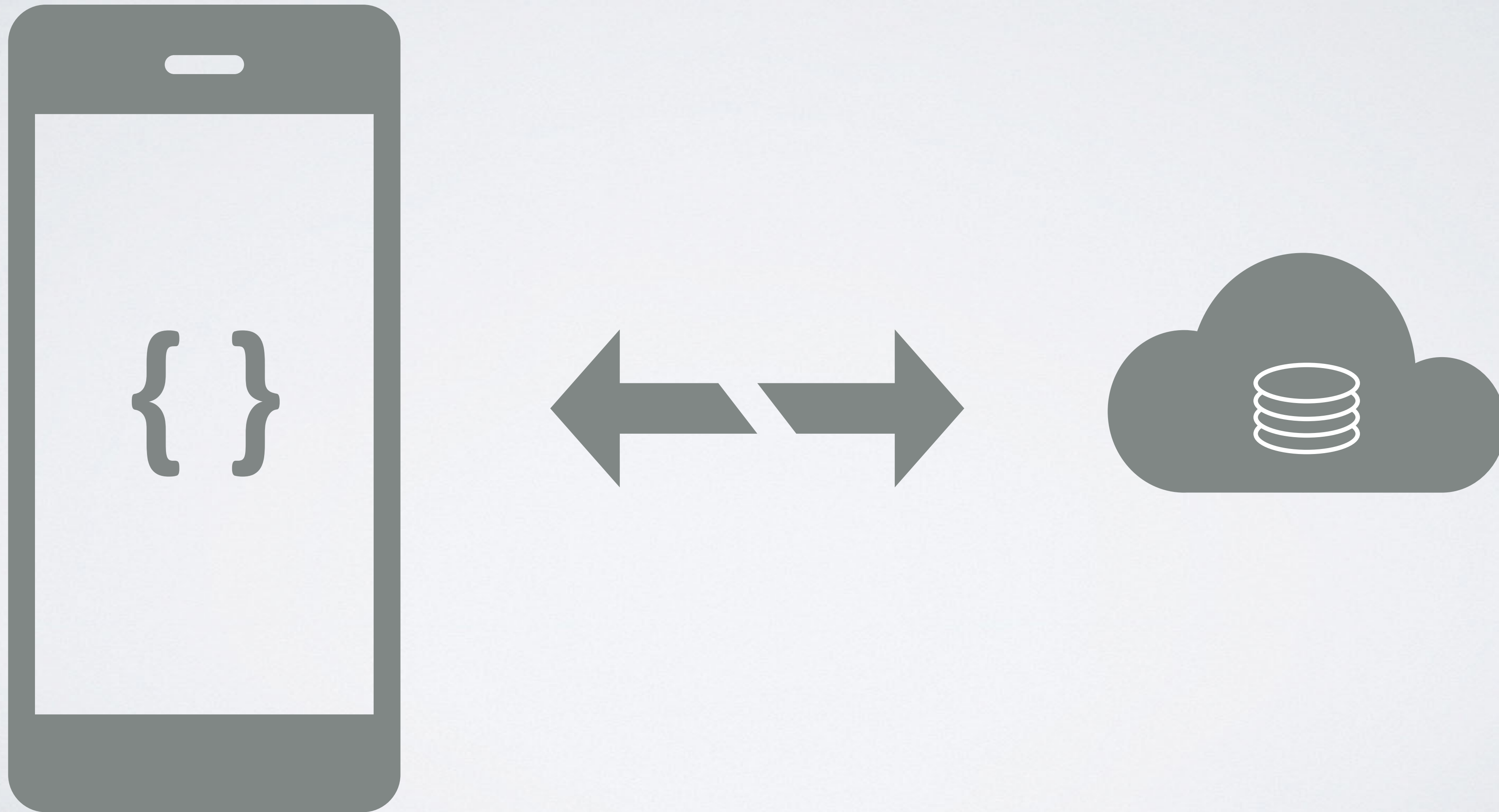
# Semi-connected

Sometimes I have an Internet access





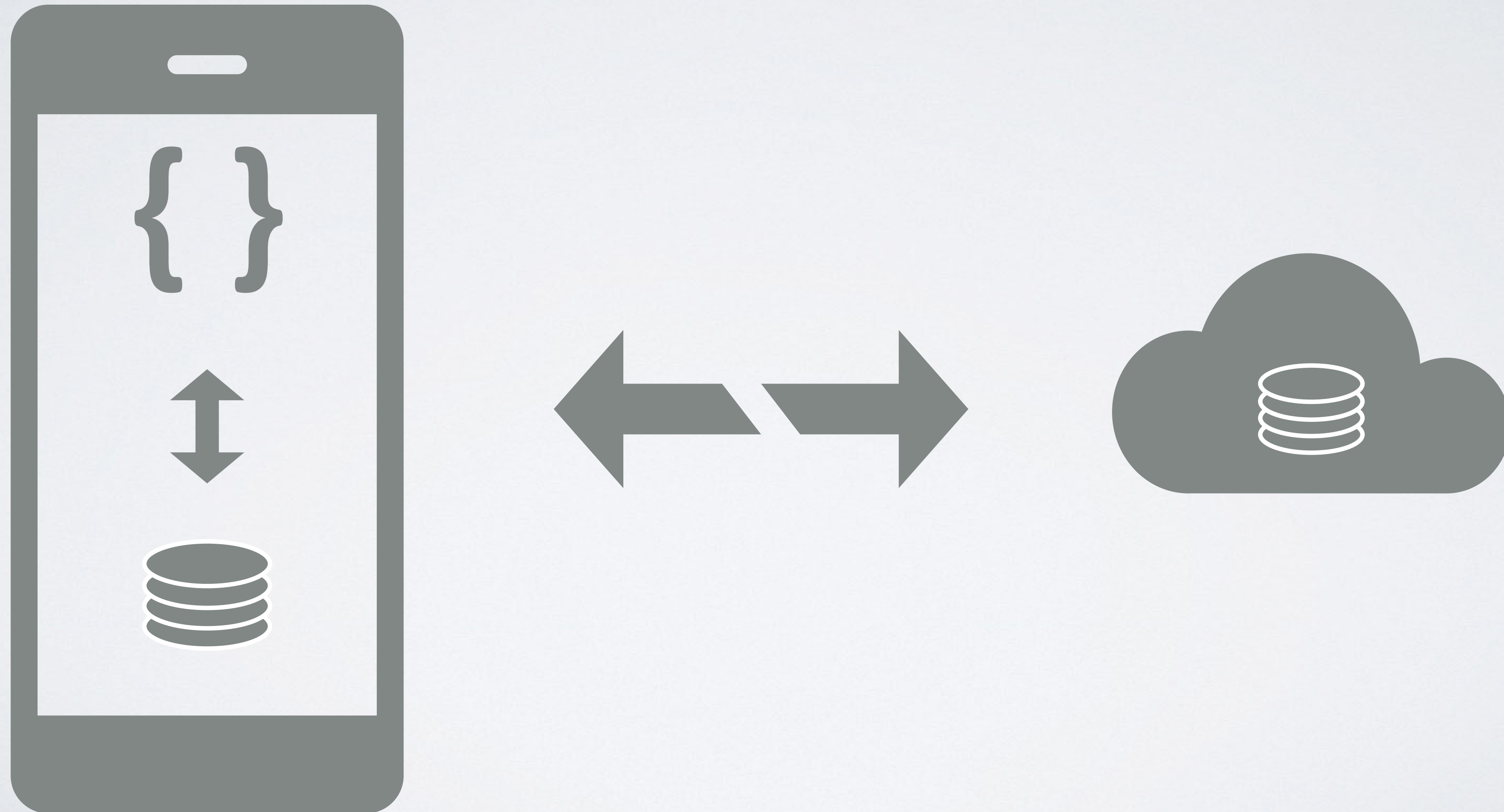
# Semi-connected



To maximize interoperability of services which create, gather, store and process information about learning experiences.

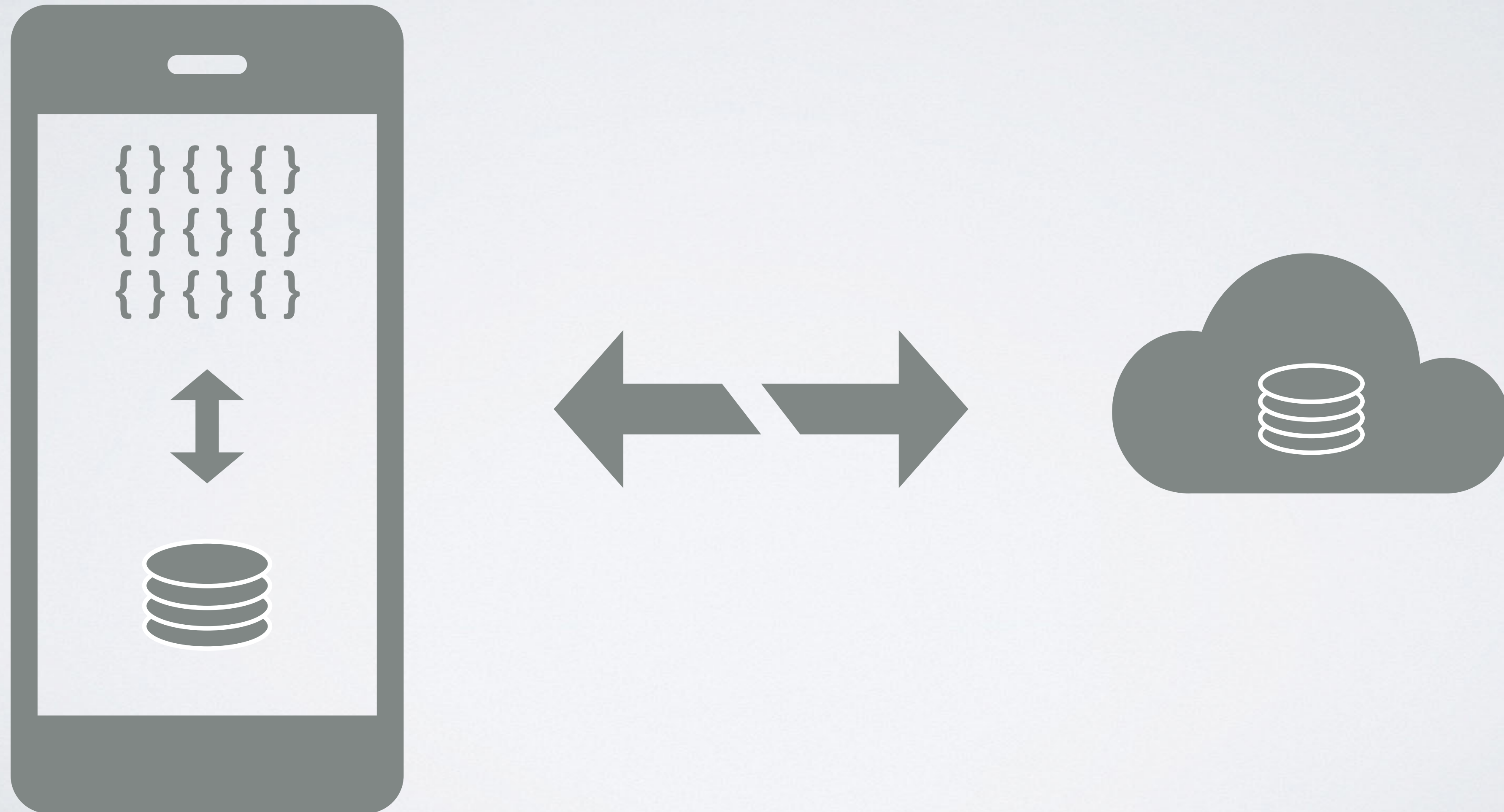


# Local LRS





# Local LRS





# Local LRS

- Worked great for statements—easily queued and batch
- Challenging for documents (e.g. activity state documents)

# Problems encountered

1. Unable to batch updates to document-based APIs
2. Disagreement on how to merge docs
3. Unhelpful concurrency controls



# 1. Unable to batch updates for documents

- The xAPI spec does not offer APIs for performing batch updates or retrievals of documents
- Requires sending multiple API requests to get back in sync
- Easily overrun API rate limits imposed by some LRS vendors

# 400

API requests per minute

---

8

courses

25

state updates / course

1

user

# 200

API requests



# 400

API requests per minute

---

8

courses

25

state updates / course

2

users

~~400~~  
API requests

Let's  
batch  
locally!

# 400

API requests per minute

---

8

courses

1

state update / course

2

users

 16

API requests



## 2. Disagreement on how to merge docs

```
{  
  "x" : "foo",  
  "y" : "bar"  
}  
  
+  
  
{  
  "x" : "bash",  
  "z" : "faz"  
}  
  
=  
  
{  
  "x" : "bash",  
  "y" : "bar",  
  "z" : "faz"  
}
```



## 2. Disagreement on how to merge docs

```
[  
  {  
    "id" : 1,  
    "done" : true  
  }  
]
```

+

```
[  
  {  
    "id" : 2,  
    "done" : true  
  }  
]
```

=

??



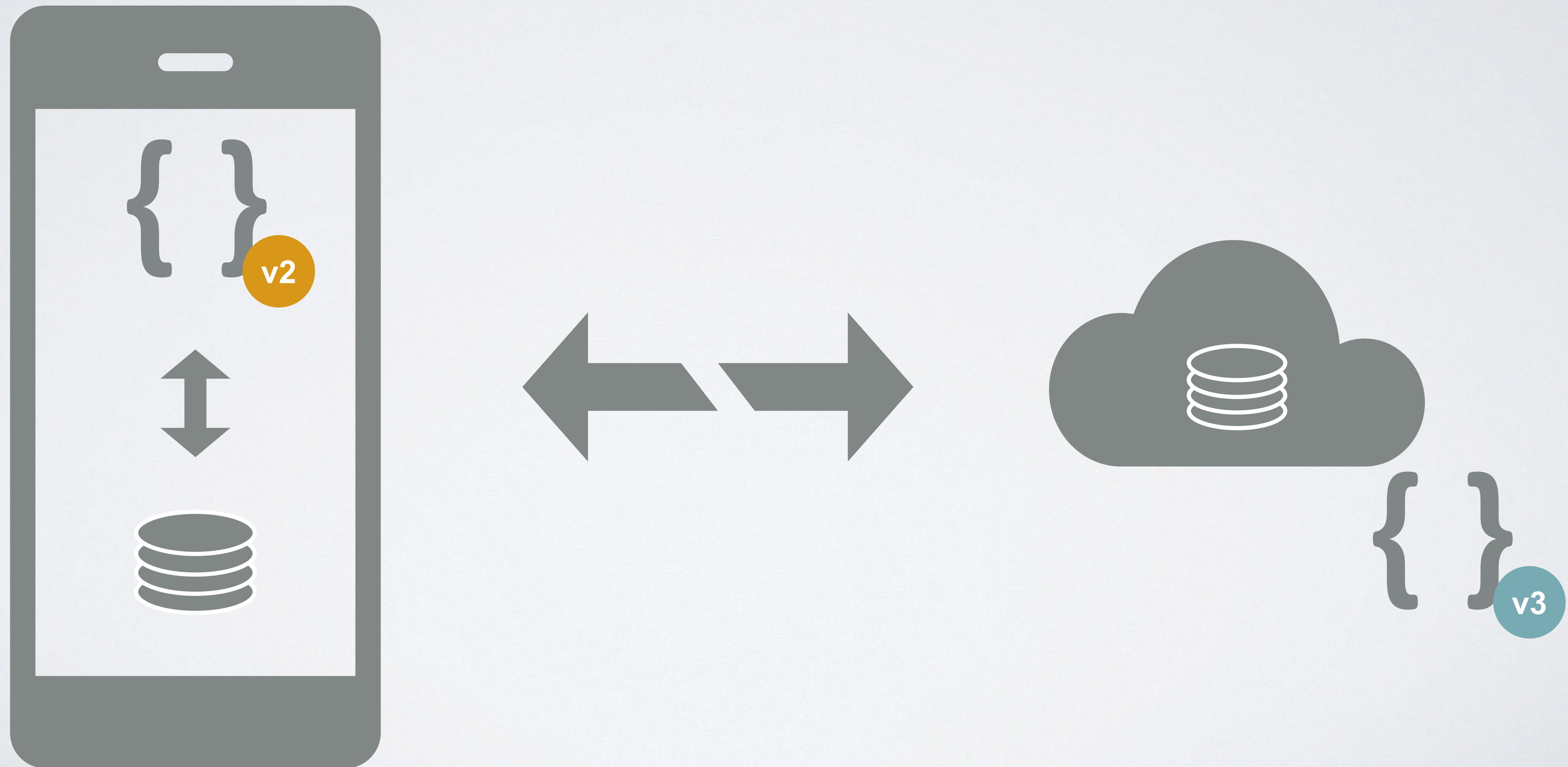
## 2. Disagreement on how to merge docs

```
[
  {
    "id" : 1,
    "done" : true
  }
] + [
  {
    "id" : 2,
    "done" : true
  }
] = [
  {
    "id" : 1,
    "done" : true
  },
  {
    "id" : 2,
    "done" : true
  }
]
```



# 3. Unhelpful concurrency controls

How do I know if my cache is up-to-date?



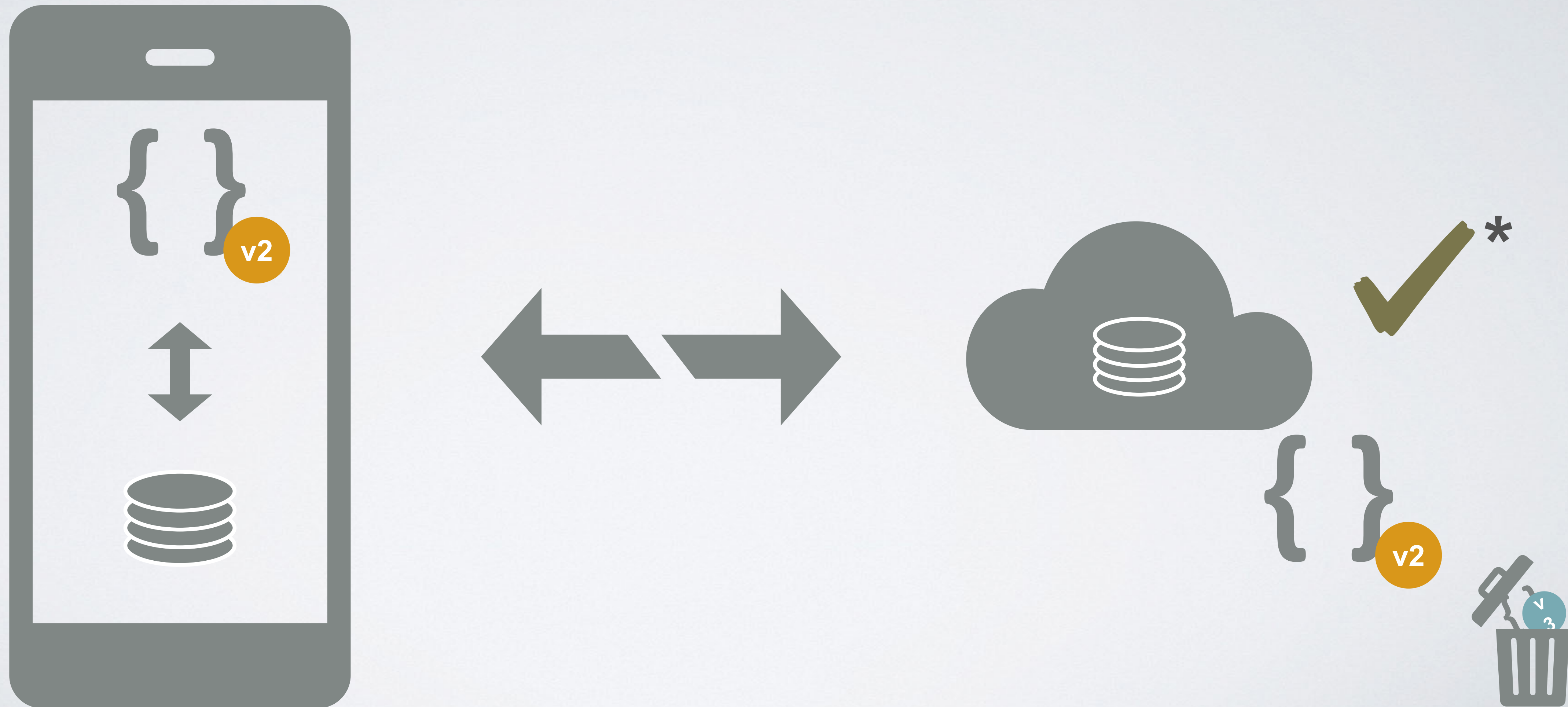


# 3. Unhelpful concurrency controls

- Unable to quickly check on the status of multiple documents
- Unable to check the status of a single document without downloading it

# 3. Unhelpful concurrency controls

Optimistically choose the device as source of truth





# Recommendations

1. Add API for batch retrieval or updating of documents
2. Clarify how to merge JSON arrays
3. Require the LRS to return 304 Not Modified if document is GET with If-None-Match
4. Require the LRS to provide a "collection" ETag for all document resources

# Questions?



# Thank you!

More about Float: [gowithfloat.com](http://gowithfloat.com)

More about xAPI: [xapi.com](http://xapi.com)

xAPI spec: [github.com/adlnet/xAPI-Spec](https://github.com/adlnet/xAPI-Spec)



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