



Liferay  
**Boot Camp 2022**  
10<sup>th</sup> Anniversary

# Liferay Objects and low code development



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# Summary



Low code development approach



Tools



Demo



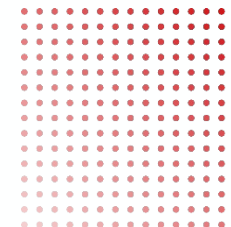
Advanced features



New Architectures



Roamap



# Low code development approach

Leveraging the new "Liferay Objects" feature to implement an alternative solution architecture for Liferay DXP, Portal and the Cloud





# Low code: old approach

- ✓ Dynamic Data Lists
- ✓ App Builder (Liferay 7.3)
- ✓ Forms

The screenshot displays the Liferay 7.3 App Builder interface. At the top, there are buttons for 'Share', 'Preview', 'Save', and 'Publish'. Below these, a language selector shows 'English (United States)'. The main canvas is titled 'Untitled Form' and contains a 'Page title' section with a description 'Add a short description for this page.' and a large dashed box with the text 'Drag fields from the sidebar to compose your form.' A 'New Page' button is located at the bottom of the canvas. On the right side, there is a 'Builder' sidebar with a search bar and two tabs: 'Fields' and 'Element Sets'. The 'Fields' tab is active, showing a list of field types: Paragraph, Text, Select from List, Single Selection, Multiple Selection, Grid, Date, Date and Time, Numeric, Boolean, and Image. Each field type has a small icon and a brief description.



# Liferay Objects

Real tables

Custom forms layouts

Custom List view

Deploy as portlet or use in fragments

Integrated with core frameworks


APIs


**Information**

**OBJECT DATA**

**Object ID**

**Name \***

**Label \***  
 

**Plural Label \***  
 

**Table Name**

☒ **ACTIVE**

**ENTRY DISPLAY**

**Title Field**

**SCOPE**

**Scope**

**Panel Category Key**

**DISPLAY**

☐ **HIDE WIDGET**

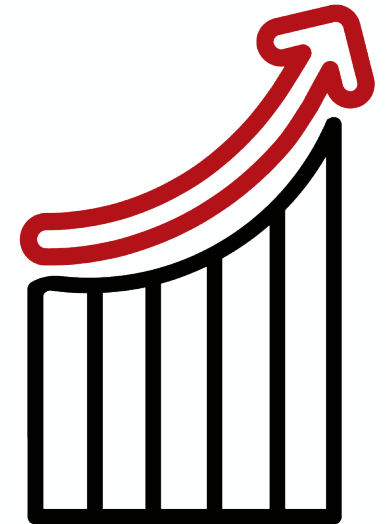
# Low code adoption

Gartner Forecasts Worldwide Low-Code Development Technologies Market to Grow 23% in 2021 ([Gartner 2021-02](#))

By 2025, 70% of new applications developed by organizations will use low-code or no-code technologies, up from less than 25% in 2020 ([Gartner 2021-11](#))

Business applications:

- Data centric
- Process centric





# Custom developments

Develop from scratch

- Best user experience

- Higher costs

Adapt existing features

- Good user experience

- Hidden costs...

Low code / configuration only

- Less freedom

- Fast development



# Hidden costs

Software maintenance

New requests

Scaling

Tuning

Security

Platform upgrades



# Challenges



Reliability



Scalability



Security



DXP tested and proven solutions

vs.



Custom developed solution

# Low code advantages



Lower development time (up to 90%)



Lower skill requirements (and less specialized)



Lower testing time



Lower maintenance costs



Easier platform upgrades



# Low code tools

Liferay Objects

Style Books

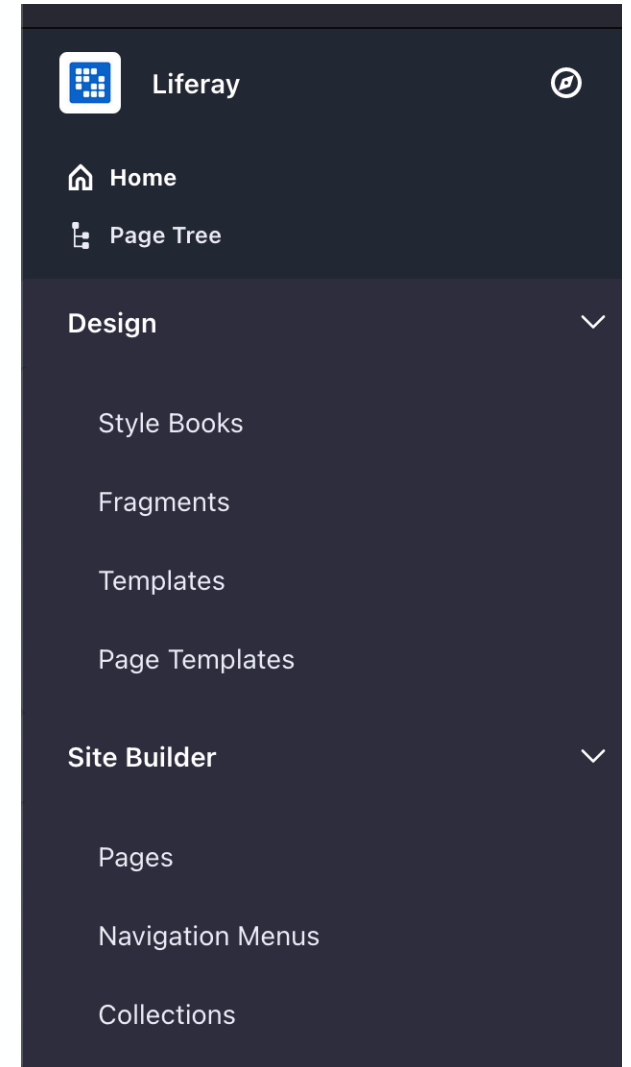
Fragments

Templates

Workflow

Language Override

...and more... ("Dynamic Data List", "Page Templates" ...and even the "Service Builder")



# Liferay objects in action



# Basic modeling steps

- ✓ Define list of values or "Picklists"
- ✓ Define object's fields
- ✓ Design the default layout (main form)
- ✓ Define a custom view (list)
- ✓ Publish



# Liferay Objects Features

- ✓ Fields
- ✓ Relationships (with other objects)
- ✓ Custom Layouts (input form)
- ✓ Custom Views (list)
- ✓ Custom Actions



# Integrations



Widget (portlet)



Permissions



Workflow



Search



Fragments (Info framework), Assets, Collections



# Integrations



Forms



Headless REST API (OpenAPI)



GraphQL





# Forms

## Settings

General

Personalization

Notifications

Submissions

☐ Require User Authentication

☐ Require CAPTCHA

☒ Save Answers Automatically

Select a Storage Type

Object

Select Object

Event

Cancel

Done



# OpenAPI

http://localhost:8080/o/api

Liferay API Explorer

REST Applications ▾ Headers GraphQL

Object v1.0 OAS3

<http://virtualhost1:8080/o/c/events/openapi.json>

Servers

http://virtualhost1:8080/o/c/events/ ▾

Event

DELETE

/scopes/{scopeKey}/by-external-reference-code/{externalReferenceCode}

deleteScopeScopeKeyByExternalReferenceCode

GET

/scopes/{scopeKey}/by-external-reference-code/{externalReferenceCode}

getScopeScopeKeyByExternalReferenceCode

PUT

/scopes/{scopeKey}/by-external-reference-code/{externalReferenceCode}

putScopeScopeKeyByExternalReferenceCode

GET

/scopes/{scopeKey}

getScopeScopeKeyPage

POST

/scopes/{scopeKey}

postScopeScopeKey

DELETE

/eventId

deleteEvent

# OpenAPI testing

string

(query)

pageSize

string

(query)

sort

string

(query)

pageSize

sort

Execute

Responses

Code	Description	Links
default	default response	No links

Media type

application/json

Controls Accept header.

[Example Value](#)
[Schema](#)

```

{
  "items": [
    {
      "actions": {
        "additionalProp1": {
          "additionalProp1": "string",
          "additionalProp2": "string",
          "additionalProp3": "string"
        }
      }
    }
  ]
}

```



# OpenAPI example

# Get all "Events" objects in scope...

```
curl -X 'GET' \  
  'http://localhost:8080/o/c/events/scopes/37937' \  
  -H 'accept: application/json' \  
  -H 'x-csrf-token: ...'
```

# or ...optionally with search and pagination


```
curl -X 'GET' \  
  'http://localhost:8080/o/c/events/scopes/37937?search=Bootcamp&page=0&pageSize=10' \  
  -H 'accept: application/json' \  
  -H 'x-csrf-token: ...'
```



# OpenAPI example

# Create an object

```
curl -X 'POST' \
  'http://localhost:8080/o/c/events/scopes/37937' \
  -H 'accept: application/json' \
  -H 'Content-Type: application/json' \
  -H 'x-csrf-token: ...' \
  -d '{
    "creator": {},
    "dateCreated": "2022-04-07T16:16:06.627Z",
    "dateModified": "2022-04-07T16:16:06.627Z",
    "id": 0,
    "status": {"label": "string", "label_i18n": "string"},
    "description": {},
    "endDate": "2022-04-07",
    "eventType": { "key": "inPerson", "name": "In Person"},
    "name": "Test from REST API",
    "r_organizer_userId": 0,
    "startDate": "2022-04-07",
    "venue": "unknown" }'
```


**Liferay API Explorer**
REST Applications ▾
Headers
Swagger

GraphiQL
▶
Prettify
Merge
Copy
History

```

1 {
2   c {
3     events (
4       scopeKey:"37937",
5       search:"Liferay"
6     ) {
7       totalCount,
8       items{
9         name,
10        startDate,
11        endDate,
12        eventType{name},
13        venue
14      }
15    }
16  }
17 }

```

```

{
  "data": {
    "c": {
      "events": {
        "totalCount": 1,
        "items": [
          {
            "name": "Liferay Bootcamp 2022",
            "startDate": "2022-05-11T00:00:00Z",
            "endDate": "2022-05-11T00:00:00Z",
            "eventType": {
              "name": "Online"
            },
            "venue": ""
          }
        ]
      }
    }
  }
}


```

< Schema
**C\_Event**
✕

No Description

**FIELDS**

- c\_eventId: Long
- creator: Creator
- dateCreated: Date
- dateModified: Date
- description: Map
- endDate: Date
- eventId: Long
- eventType: ListEntry
- externalReferenceCode: String
- name: String
- startDate: Date


**Liferay API Explorer**
REST Applications ▾
Headers
Swagger

**GraphQL**
▶
Prettify
Merge
Copy
History

```

1 mutation {
2   c {
3     createEvent(scopeKey: "37937",
4       Event: {
5         name: "2023 Worldwide devcon",
6         venue: "Moscone Center, San Francisco (CA)"
7       }) {
8         name
9       }
10  }
11 }
12

```

```

{
  "data": {
    "c": {
      "createEvent": {
        "name": "2023 Worldwide devcon"
      }
    }
  }
}

```

< Schema
**C\_Event**
✕

No Description

**FIELDS**

- c\_eventId: Long
- creator: Creator
- dateCreated: Date
- dateModified: Date
- description: Map
- endDate: Date
- eventId: Long
- eventType: ListEntry
- externalReferenceCode: String
- name: String
- startDate: Date
- status: String
- user: Map
- userId: Long
- venue: String



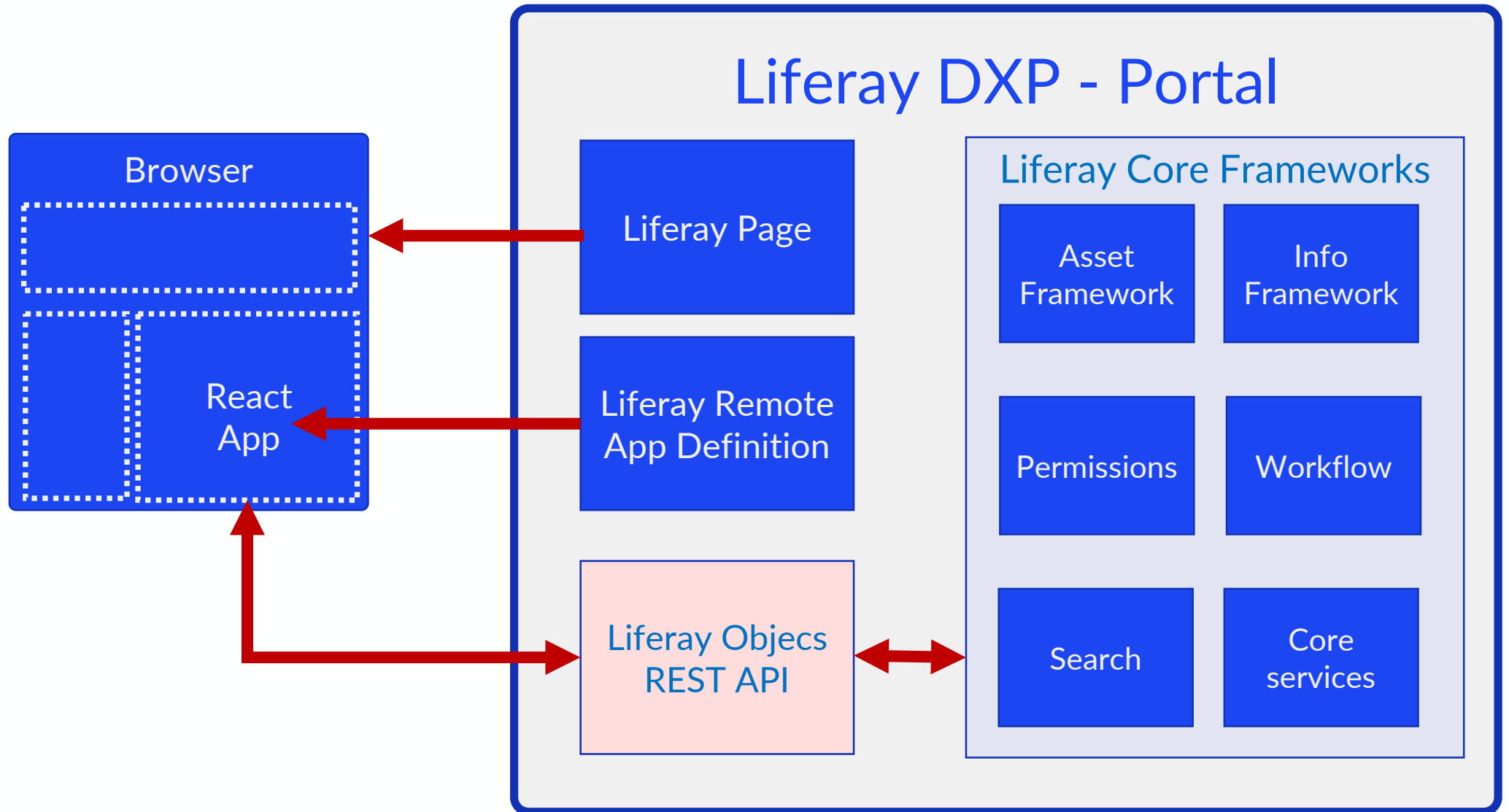
# GraphQL

```
curl 'http://localhost:8080/o/graphql' -X POST \  
  -u test@liferay.com:test \  
  -H 'accept: application/json' \  
  -H 'Content-Type: application/json' \  
  -d '{ "query": "{ c { events (scopeKey:\"37937\") { items{ name, startDate, endDate, eventType{name}, venue } } } }\"}'
```

```
{  
  "data": {  
    "c": {  
      "events": {  
        "items": [  
          {  
            "name": "Liferay Bootcamp 2022",  
            "startDate": "2022-05-11T00:00:00Z",  
            "endDate": "2022-05-11T00:00:00Z",  
            "eventType": {  
              "name": "Online"  
            },  
            "venue": ""  
          }  
        ]  
      }  
    }  
  }  
}
```



# Remote Apps



# Liferay Experience Cloud



Hardware



Networking



Services  
Stack



Log Management



Upgrades



High Availability



Clustering



Auto-scaling



VPN



Pen Tests



Security



Deployments



Backup

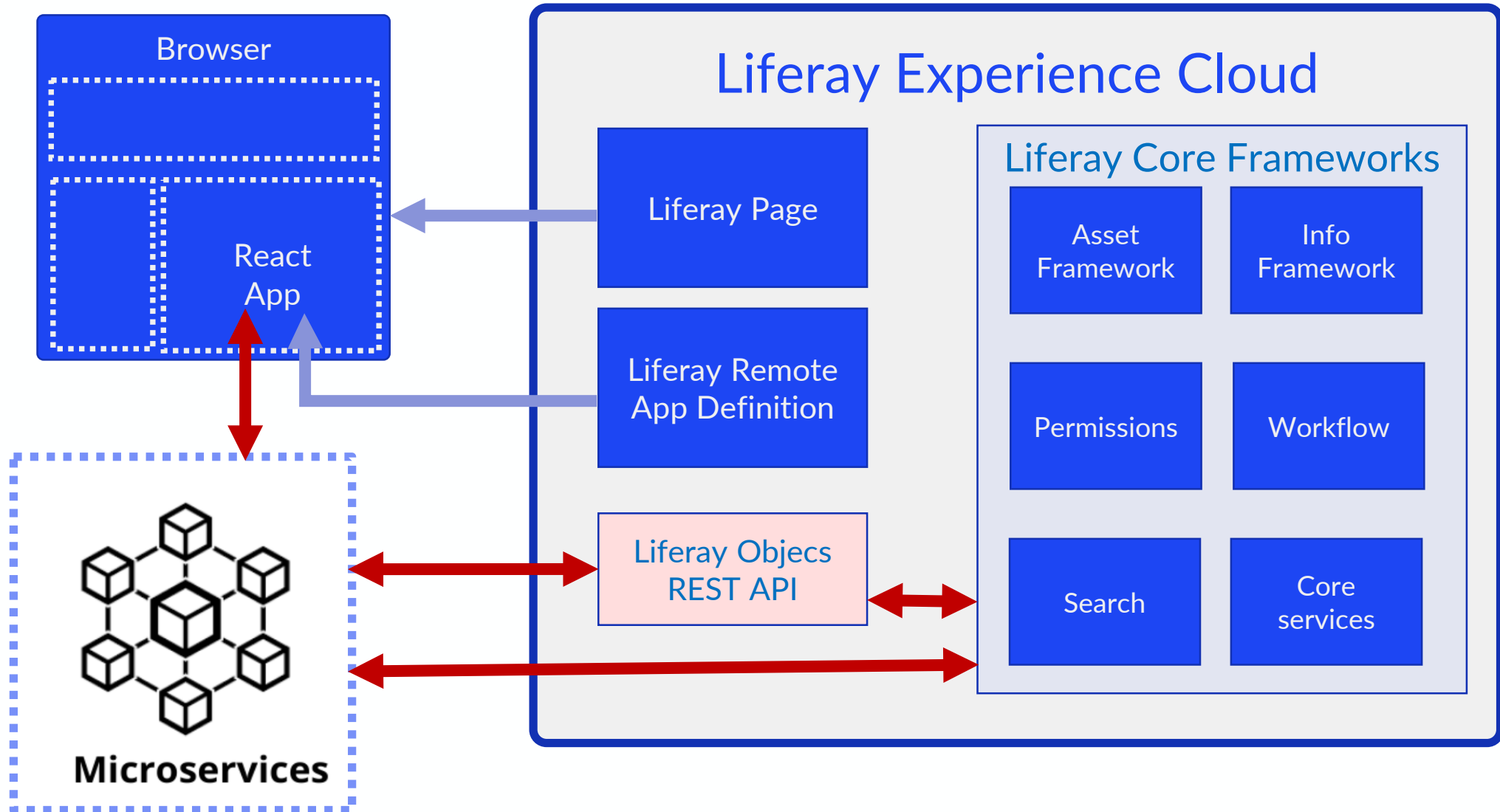


Access Control



Tuning

# Remote Apps + Microservices



# Current limitations

After "publishing"

- ❖ Cannot edit "scope"
- ❖ Cannot delete the object's definition
- ❖ Cannot change existing fields
- ❖ Can add new fields or relationships
  - ❖ main table: `o_<companyId>_<object_name>`
  - ❖ table with new fields: `o_<companyId>_<object_name>_x`



# One size doesn't fit all

Find the best choice for your use case

Find the right balance

Build faster the core (boring) features

Rely on proven patterns that are reliable and scale well

Spend more time on features that add more value to your solution

Let's spend our time creating a great User Experience!



# Roadmap

Liferay Objects: a quickly evolving project

Leverages the new weekly release cycle of Liferay 7.4

New field types:

- ✓ File attachments (7.4 GA19)
- ✓ Rich text fields (7.4 GA20)

Data validations

New frameworks (tags, categories, comments)

Data visibility rules (beyond permissions)

New actions (e. g. email notifications, groovy)



Contatti

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**Thank you 😊**