Liferay®

Learning Paths - Level 01

Headless APIs

#LIFERAY**ENABLEMENT**

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Some features may not be available in earlier releases.

Session Breakdown

05 min	01	Introduction + Session Scope
05 min	02	Security and Authorization
10 min	03	Headless APIs in Action
05 min	04	Importing Legacy Web Content
10 min	05	Importing Products

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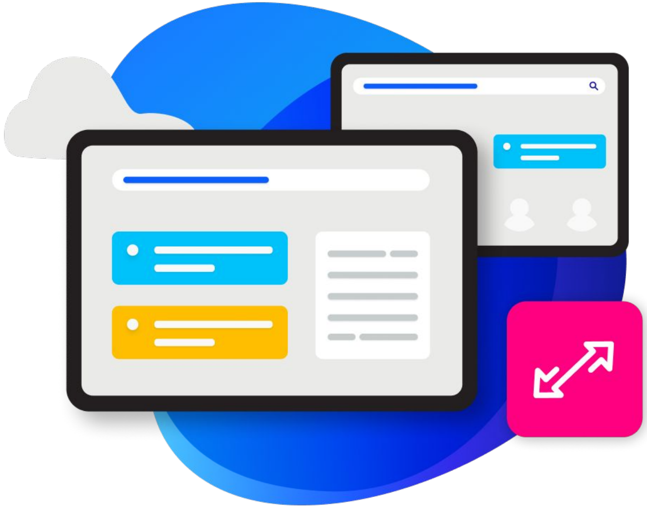
Part 01

Introduction and Session Scope

What are Headless APIs and why are they important?

Introduction to Headless APIs

- Suite of APIs that allow RESTful interaction with Liferay DXP resources
- Promotes decoupling of systems
- Build a UI with any framework while leveraging back-end services
- Easy to consume specification
- Connect securely
- Works naturally with messaging architectures



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What we are planning to cover in this session

Session Scope

- Maximize enterprise and legacy systems
- Cover ways to keep data secure
- Focus on out-of-the-box features and capabilities
- Focus on a handful of APIs that represent the diversity of content that is required
- Determining when Headless APIs are the best fit
- Share an example of importing legacy content into Liferay via the Headless APIs

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Measuring Success

Clarity’s Critical Success Factors

1. Non-technical participation

✓ 2. Simplified maintenance (and evolution)

✓ 3. Future proofed and flexible

4. Increase engagement and user experience through personalization

5. Risk mitigation with better governance

✓ 6. Lower investment / total cost of ownership

Part 02

Security and Authorization

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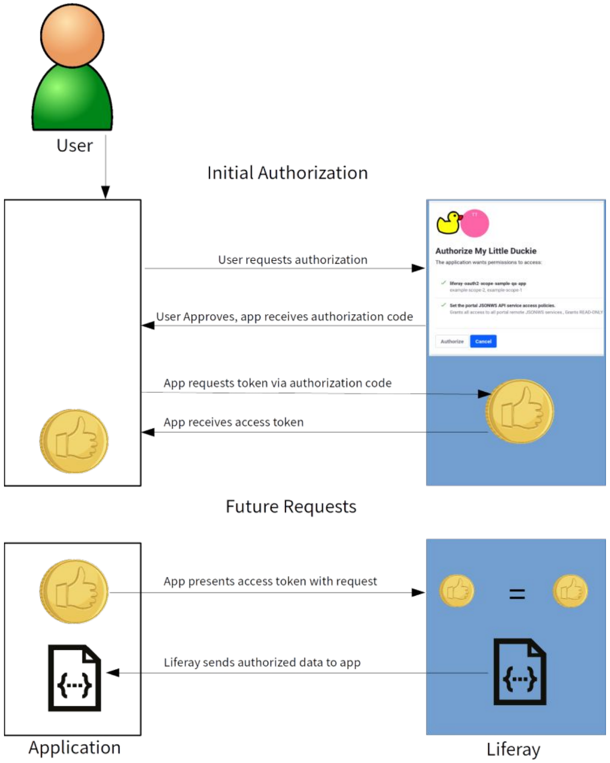
Security and Authorization

Authorization Approaches

- Basic Authorization (during Development only) and OAuth 2.0 (Production)
- Liferay SaaS => OAuth 2.0
- Initial Authorization:
    - User requests authorization
    - App receives authorization code
    - App requests token via the authorization code
    - App receives access token
- Future Requests:
    - App presents access token with request
    - Liferay sends authorized data to app


User
Initial Authorization
User requests authorization
User Approves, app receives authorization code
App requests token via authorization code
App receives access token
Future Requests
App presents access token with request
=
Liferay sends authorized data to app
Application
Liferay
Authorize
Cancel

Authorize My Little Duckie

The application wants permissions to access:

✓ liferay-oauth2-scope-sample-qa-app
example-scope-2, example-scope-1

✓ Set the portal JSONWS API service access policies.
Grants all access to all portal remote JSONWS services., Grants READ-ONLY

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Security and Authorization

Enabling OAuth 2.0 in Liferay

- To enable OAuth2:
  - Create OAuth2 application
  - Define scopes
  - Authorize account access using OAuth2
- Use OAuth2 in client applications to authorize users via access token

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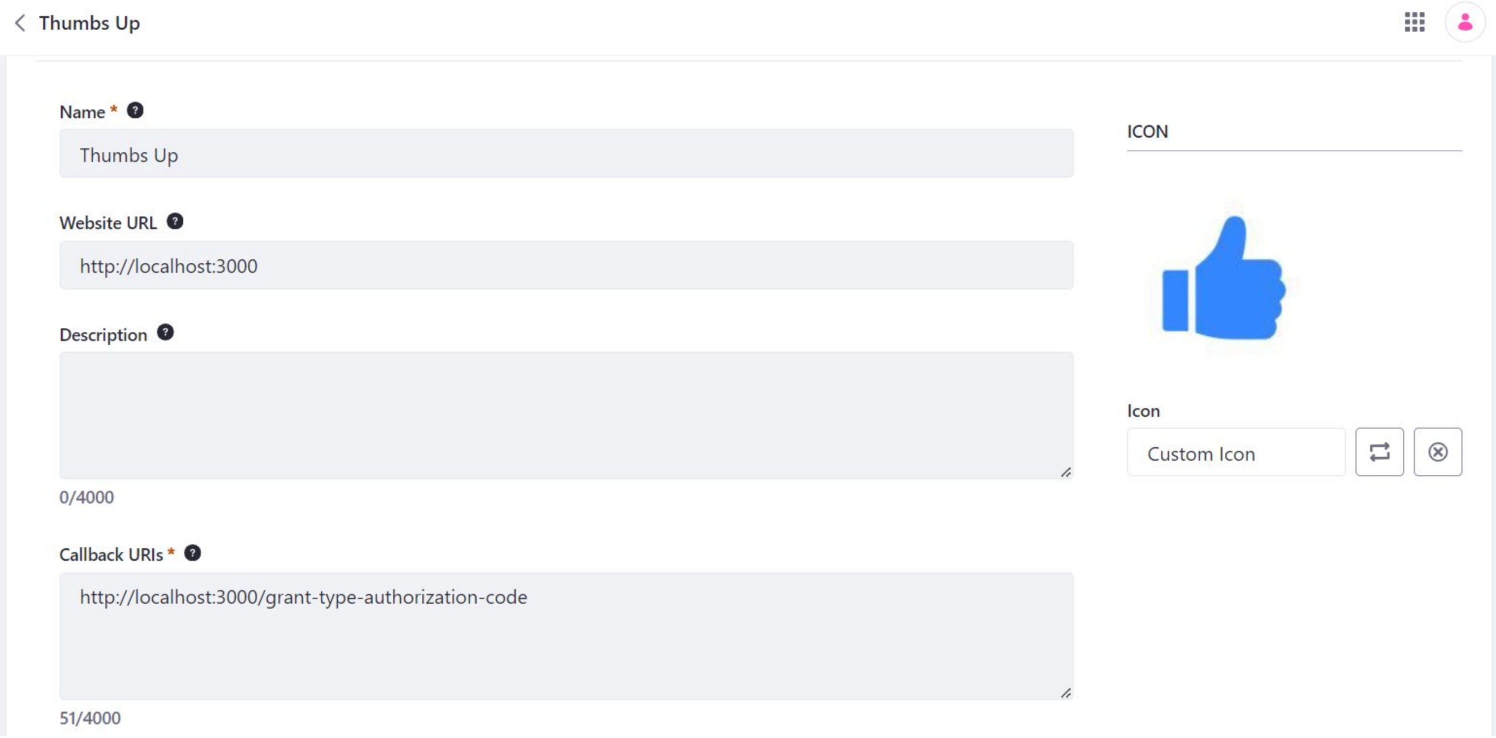
Creating an OAuth2 Application



Name *	Thumbs Up
Website URL	http://localhost:3000
Description	
	0/4000
Callback URIs *	http://localhost:3000/grant-type-authorization-code
	51/4000

ICON

Icon: Custom Icon

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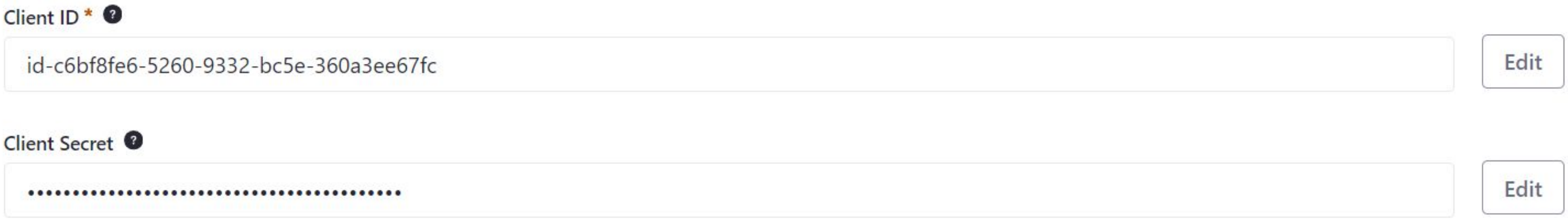
Security and Authorization

Client Access Token



Client ID * ?

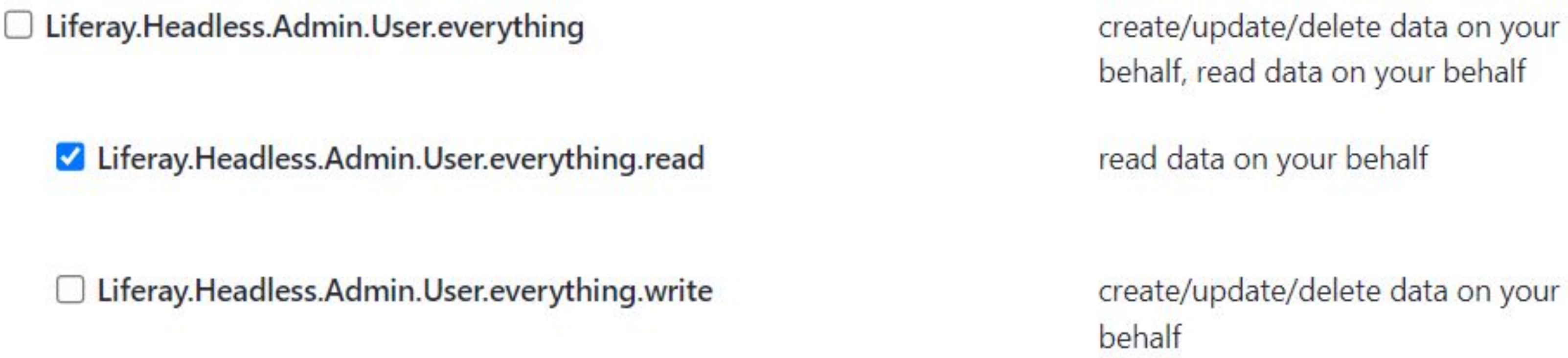
id-c6bf8fe6-5260-9332-bc5e-360a3ee67fc

Client Secret ?

••

Security and Authorization

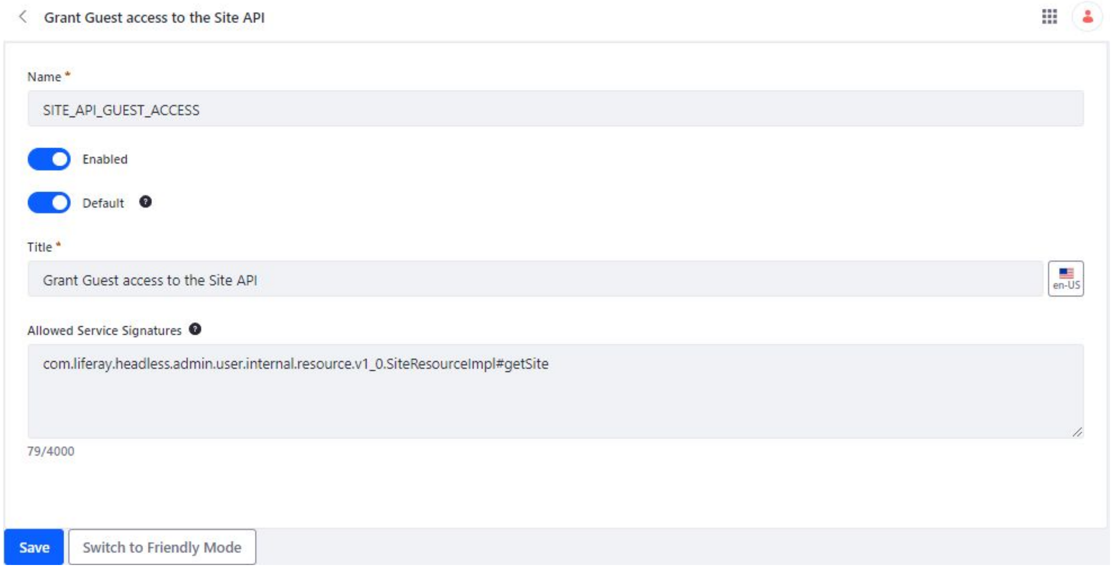
Authorizing Scopes



☐ Liferay.Headless.Admin.User.everything	create/update/delete data on your behalf, read data on your behalf
☑ Liferay.Headless.Admin.User.everything.read	read data on your behalf
☐ Liferay.Headless.Admin.User.everything.write	create/update/delete data on your behalf

Guest Access for APIs

- By default, Liferay DXP requires authentication to access APIs
- Use Service Access Policies to define API access for Guest users
- Specify method signature to allow Guest access in the Allowed Service Signatures



Grant Guest access to the Site API

Name *

SITE_API_GUEST_ACCESS

Enabled

Default

Title *

Grant Guest access to the Site API

Allowed Service Signatures

```
com.liferay.headless.admin.user.internal.resource.v1_0.SiteResourceImpl#getSite
```

79/4000

Part 03

Headless APIs in Action

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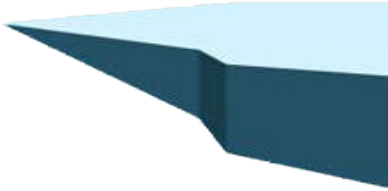
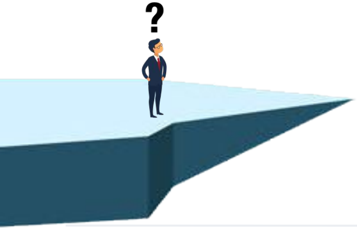
When are Headless APIs the best option?

When to use Headless APIs

- Provide services for many of Liferay’s key functions (Site Building, Content Authoring and Management, Users and Permissions, etc.)
- Building custom mobile applications
- Building custom web applications
- Building custom client extensions to interact with Liferay DXP
- Creating automated processes (batch jobs, triggering workflows)
- Requirement for interacting with Liferay DXP from external systems, such as Salesforce or SAP

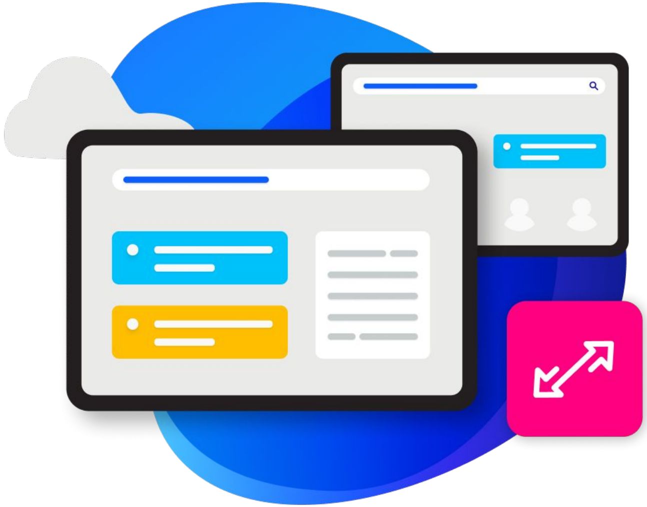




Headless APIs in Action

Connecting to Headless APIs

- curl commands
- Liferay's API Explorer
- Postman
- Any other platform tools that provide capability to test REST services



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Connecting to Liferay DXP - Using curl

CURL commands

Client URL (cURL) is a command line tool for transferring data using various network protocols.

Calling a Service using Basic Auth (During Development only):

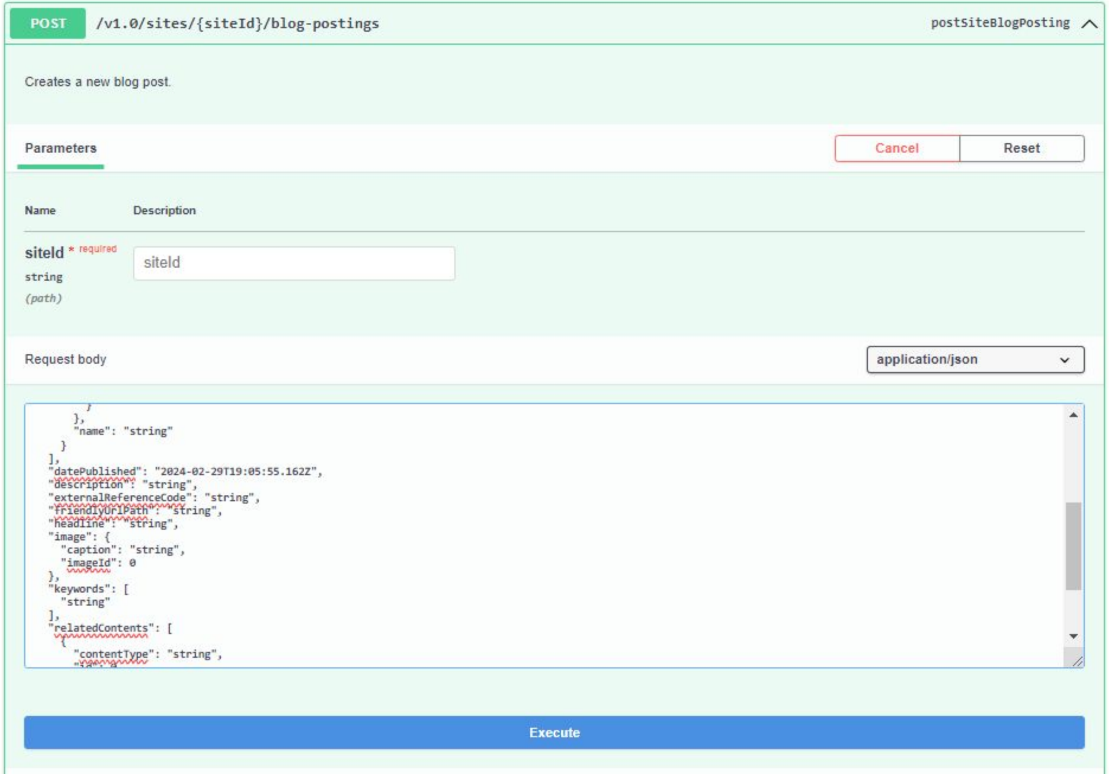
```
curl "http://localhost:8080/o/headless-delivery/v1.0/sites/20122/blog-postings/" -u 'test@liferay.com:learn'
```

Calling a Service using OAuth2:

```
curl -H "Authorization: Bearer d5571ff781dc555415c478872f0755c773fa159"
http://localhost:8080/o/headless-delivery/v1.0/sites/20122/blog-postings
```

API Explorer Request

- Accessible via web browser:
- [server]:[port]/o/api
- Request body (JSON/XML)
- Required Input Parameters
- POST Blog Posting for Site



POST /v1.0/sites/{siteId}/blog-postings postSiteBlogPosting

Creates a new blog post.

Parameters

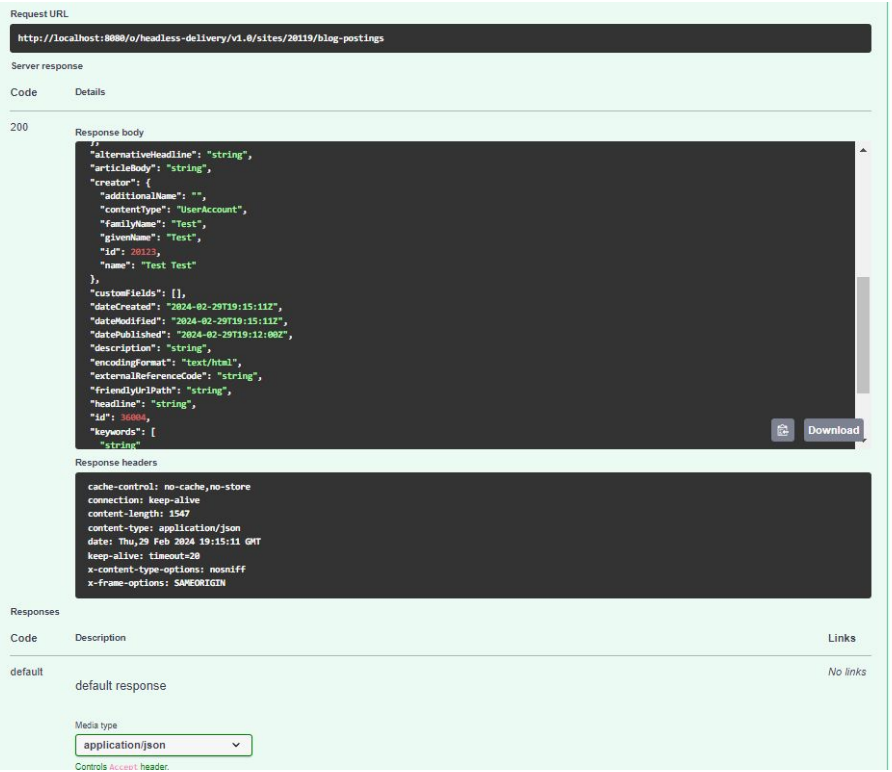
Name	Description
siteId * required string *(path)*	siteId

Request body application/json

```
      }
    },
    "name": "string"
  }
],
"datePublished": "2024-02-29T19:05:55.162Z",
"description": "string",
"externalReferenceCode": "string",
"friendlyUrlPath": "string",
"headline": "string",
"image": {
  "caption": "string",
  "imageId": 0
},
"keywords": [
  "string"
],
"relatedContents": [
  {
    "contentType": "string",
```

API Explorer Response

- Accessible via web browser:
- [server]:[port]/o/api
- Sample response (JSON/XML)
- Response Code and Body
- GET Blog Postings for Site



Request URL

```
http://localhost:8080/o/headless-delivery/v1.0/sites/20119/blog-postings
```

Server response

Code Details

200

Response body

```
  },
  "alternativeHeadline": "string",
  "articleBody": "string",
  "creator": {
    "additionalName": "",
    "contentType": "UserAccount",
    "familyName": "Test",
    "givenName": "Test",
    "id": 20123,
    "name": "Test Test"
  },
  "customFields": [],
  "dateCreated": "2024-02-29T19:15:11Z",
  "dateModified": "2024-02-29T19:15:11Z",
  "datePublished": "2024-02-29T19:12:00Z",
  "description": "string",
  "encodingFormat": "text/html",
  "externalReferenceCode": "string",
  "friendlyUrlPath": "string",
  "headline": "string",
  "id": 36004,
  "keywords": [
    "string"
```

Response headers

```
cache-control: no-cache,no-store
connection: keep-alive
content-length: 1547
content-type: application/json
date: Thu,29 Feb 2024 19:15:11 GMT
keep-alive: timeout=20
x-content-type-options: nosniff
x-frame-options: SAMEORIGIN
```

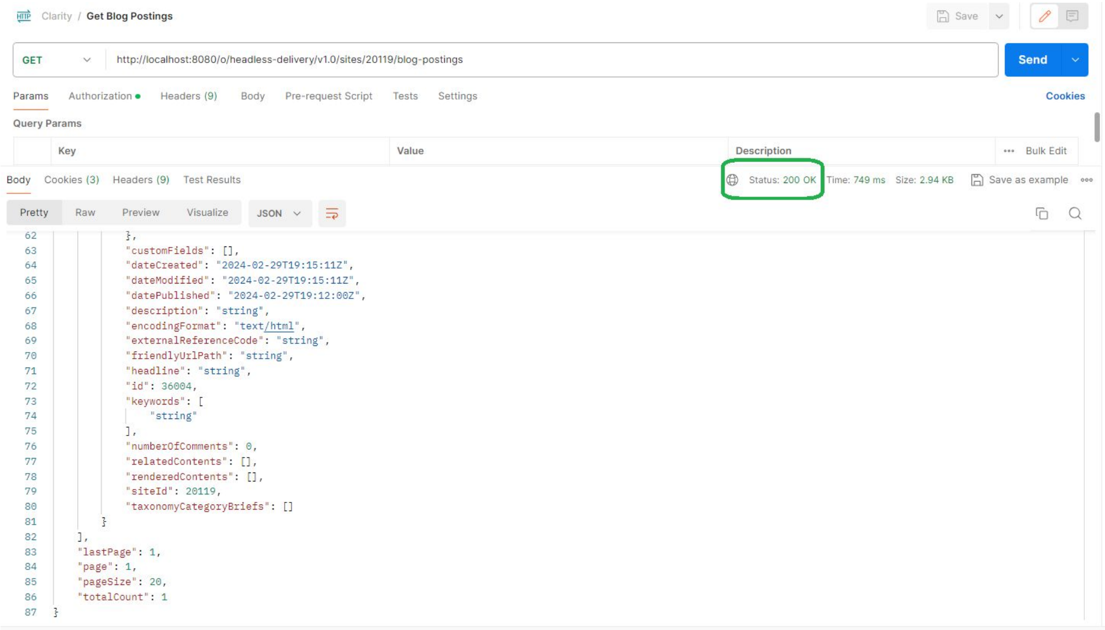
Responses

Code	Description	Links
default	default response Media type application/json Controls Accept header.	No links

Connecting to Liferay DXP - Using Postman

Postman

- Accessible via web browser:
- postman.com
- Create new workspace
- Add new request
- GET Blog Postings for Sit



http://localhost:8080/o/headless-delivery/v1.0/sites/20119/blog-postings

```
            },
            "customFields": [],
            "dateCreated": "2024-02-29T19:15:11Z",
            "dateModified": "2024-02-29T19:15:11Z",
            "datePublished": "2024-02-29T19:12:00Z",
            "description": "string",
            "encodingFormat": "text/html",
            "externalReferenceCode": "string",
            "friendlyUrlPath": "string",
            "headline": "string",
            "id": 36004,
            "keywords": [
                "string"
            ],
            "numberOfComments": 0,
            "relatedContents": [],
            "renderedContents": [],
            "siteId": 20119,
            "taxonomyCategoryBriefs": []
        }
    ],
    "lastPage": 1,
    "page": 1,
    "pageSize": 20,
    "totalCount": 1
}
```

Demo – Configuring an OAuth 2.0 Application with Postman

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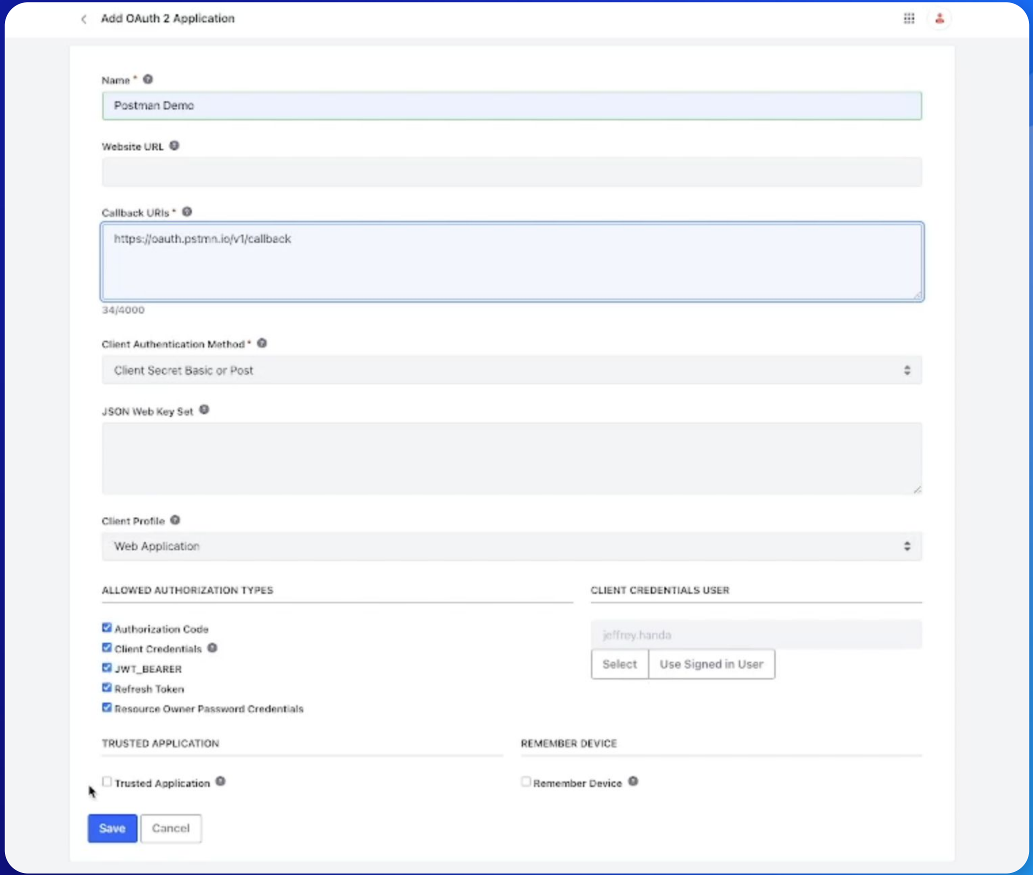

Name *
Postman Demo

Website URL

Callback URIs *
https://oauth.pstmn.io/v1/callback
34/4000

Client Authentication Method *
Client Secret Basic or Post

JSON Web Key Set

Client Profile
Web Application

ALLOWED AUTHORIZATION TYPES

☑ Authorization Code
☑ Client Credentials
☑ JWT_BEARER
☑ Refresh Token
☑ Resource Owner Password Credentials

CLIENT CREDENTIALS USER

jeffrey.handa

TRUSTED APPLICATION

□ Trusted Application

REMEMBER DEVICE

□ Remember Device

Part 04

Creating Headless APIs

Liferay Deployment Options

Offering Comparison

Feature	Liferay SaaS	Liferay PaaS	Liferay Self-Hosted
Liferay DXP	✓	✓	✓
Customization via Client Extensions	✓	✓	✓
Customization via OSGi	X	✓	✓
Cloud Infrastructure	✓	✓	On-Premise or Customer’s Cloud
SDLC / DevOps Management Tools	X	✓	X
Tenancy	✓ Multi-tenant	✓ Single Tenant	✓ Single Tenant
Infrastructure Management	✓	✓	X
Liferay DXP Upgrades & Patches	✓	X	X
Platform Managed Services	✓	Partner or Customer	Partner or Customer

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Headless APIs in Action

REST Builder vs. API Builder

- REST Builder
- Create -api and -impl projects for the service
- Use configuration files to define the schema and API methods to expose from the service
- Run *buildREST* Gradle task
- REST Builder populates the projects with scaffolding code
- Add implementation logic
- Deploy and test via API Explorer

- API Builder
- Access API Builder application via Control Panel
- Click the + button to add a new custom API
- Edit the new custom API and add endpoints
- Specify Retrieve Type, Scope, Path, Description, Schema
- Apply filtering or sorting to the endpoint
- Create the endpoints
- Test via API Explorer

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Headless APIs in Action

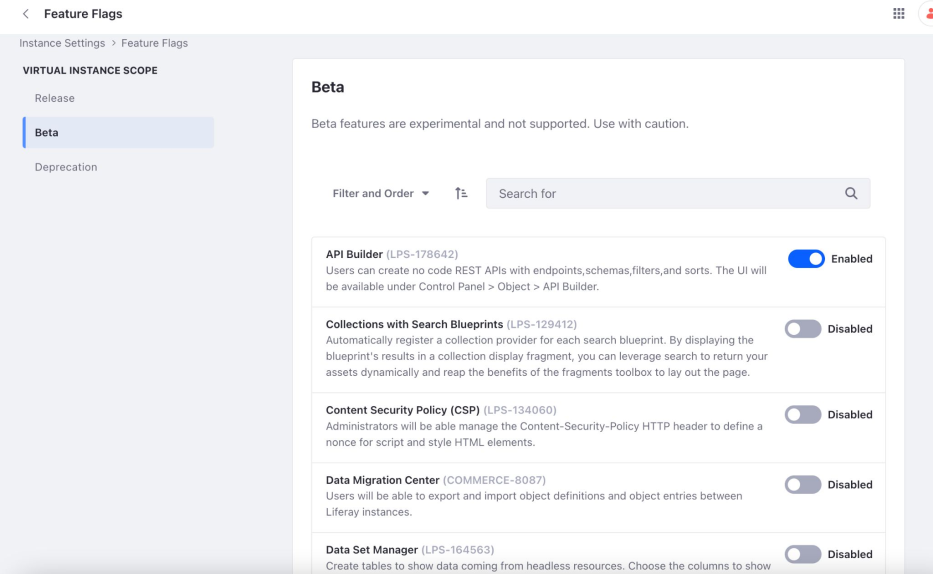
Feature Flags

- Some headless capabilities may be hidden behind feature flags
- Feature flag types:
  - Beta feature flags - May be deprecated after a limited time period or converted into a release feature
  - Release feature flags - fully functional and supported
  - Dev feature flags - features still in active development
- NEVER:
  - Use Beta features in Production
  - Use Dev features in a Customer environment

Headless APIs in Action

Enabling Beta Feature Flags

- Experimental features or capabilities that may require careful consideration before usage
- May be deprecated after a limited time period or converted into a release feature
- Give feedback on beta features through Liferay’s Community Slack!



Feature Flags

Instance Settings > Feature Flags

VIRTUAL INSTANCE SCOPE

Release

Beta

Deprecation

Beta

Beta features are experimental and not supported. Use with caution.

Filter and Order

Search for

API Builder (LPS-178642) — Enabled
Users can create no code REST APIs with endpoints,schemas,filters,and sorts. The UI will be available under Control Panel > Object > API Builder.

Collections with Search Blueprints (LPS-129412) — Disabled
Automatically register a collection provider for each search blueprint. By displaying the blueprint's results in a collection display fragment, you can leverage search to return your assets dynamically and reap the benefits of the fragments toolbox to lay out the page.

Content Security Policy (CSP) (LPS-134060) — Disabled
Administrators will be able manage the Content-Security-Policy HTTP header to define a nonce for script and style HTML elements.

Data Migration Center (COMMERCE-8087) — Disabled
Users will be able to export and import object definitions and object entries between Liferay instances.

Data Set Manager (LPS-164563) — Disabled
Create tables to show data coming from headless resources. Choose the columns to show

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Part 05

Importing Legacy Web Content

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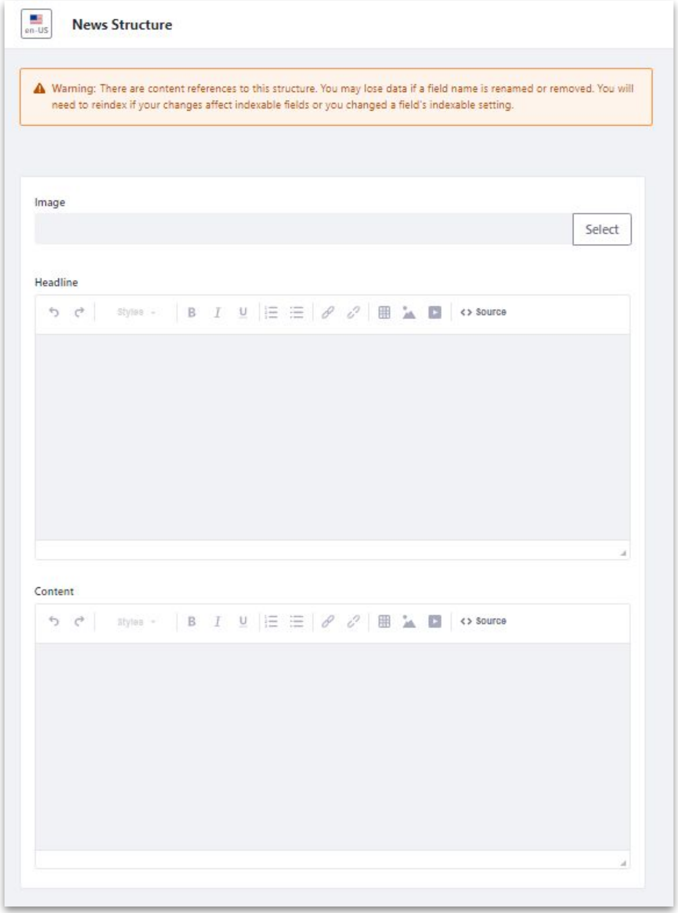
Structured Content

- Web Content Articles will have a custom Structure called News Structure
- Contains:
  - Image
  - Headline
  - Content
- Structure ID will be referenced as input parameter
- Warning indicates possible reindex required or data loss could occur for existing web content referencing the structure

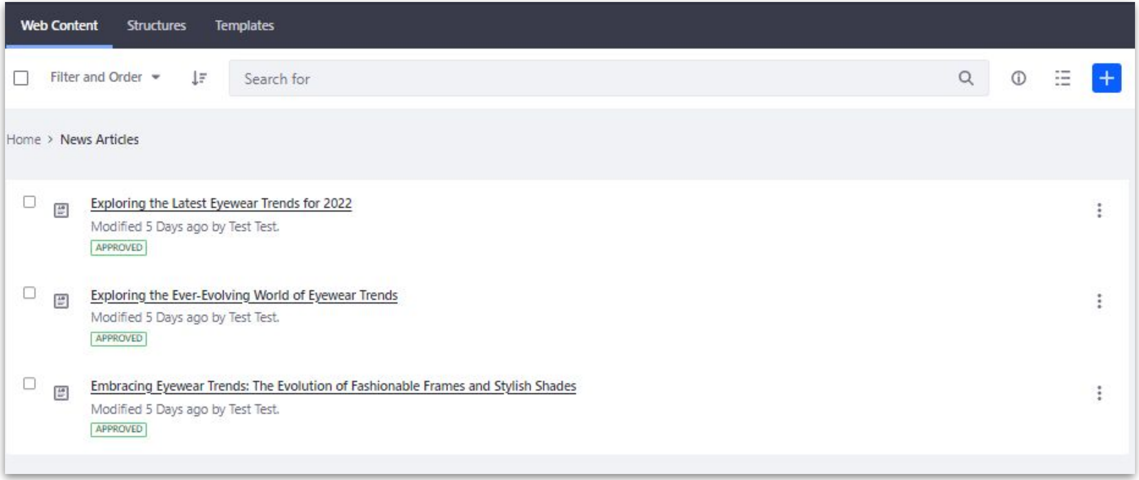


News Structure

Warning: There are content references to this structure. You may lose data if a field name is renamed or removed. You will need to reindex if your changes affect indexable fields or you changed a field's indexable setting.

Target Folder Location

- Web Content will contain a folder called News Articles
- Contain any Web Content Articles related to news of past or future trends
- Structured Content Folder ID will be referenced as input parameter



Exploring the Latest Eyewear Trends for 2022
Modified 5 Days ago by Test Test.
APPROVED

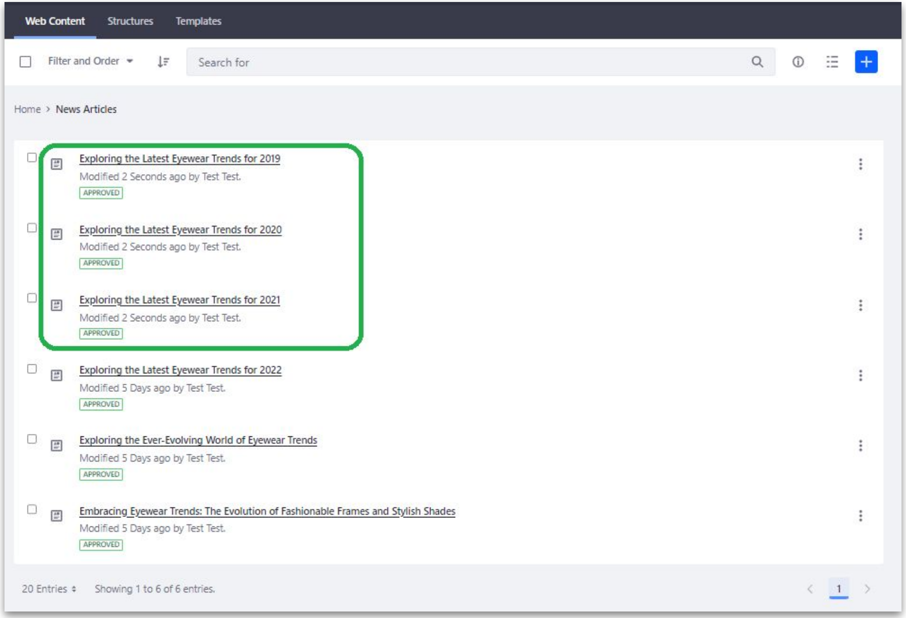
Exploring the Ever-Evolving World of Eyewear Trends
Modified 5 Days ago by Test Test.
APPROVED

Embracing Eyewear Trends: The Evolution of Fashionable Frames and Stylish Shades
Modified 5 Days ago by Test Test.
APPROVED

Importing Legacy Web Content

Import Web Articles

- Requirement: Make archived web articles for eyewear trends for 2021, 2020, 2019 available in Liferay
- Use Batch API: http://<server>:<ipaddress>/o/headless-delivery/v1.0/sites/<site-id>/structured-contents/batch



Exploring the Latest Eyewear Trends for 2019
Modified 2 Seconds ago by Test Test.
APPROVED

Exploring the Latest Eyewear Trends for 2020
Modified 2 Seconds ago by Test Test.
APPROVED

Exploring the Latest Eyewear Trends for 2021
Modified 2 Seconds ago by Test Test.
APPROVED

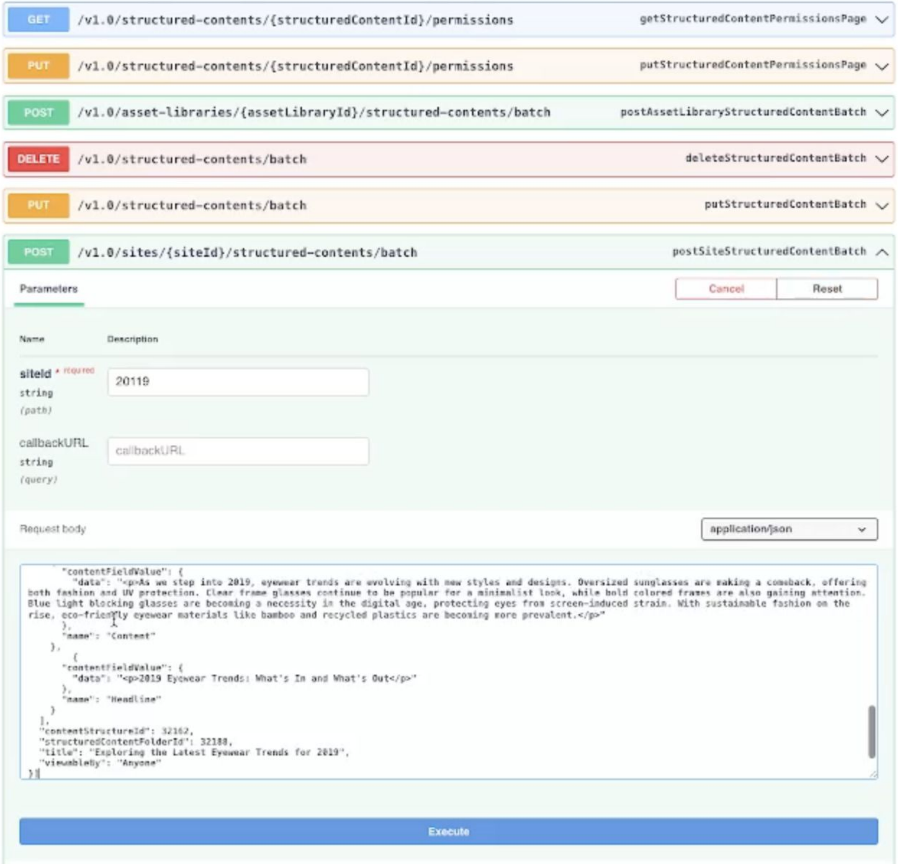
Exploring the Latest Eyewear Trends for 2022
Modified 5 Days ago by Test Test.
APPROVED

Exploring the Ever-Evolving World of Eyewear Trends
Modified 5 Days ago by Test Test.
APPROVED

Embracing Eyewear Trends: The Evolution of Fashionable Frames and Stylish Shades
Modified 5 Days ago by Test Test.
APPROVED

20 Entries Showing 1 to 6 of 6 entries. 1

Demo – Importing Legacy Content



GET /v1.0/structured-contents/{structuredContentId}/permissions getStructuredContentPermissionsPage

PUT /v1.0/structured-contents/{structuredContentId}/permissions putStructuredContentPermissionsPage

POST /v1.0/asset-libraries/{assetLibraryId}/structured-contents/batch postAssetLibraryStructuredContentBatch

DELETE /v1.0/structured-contents/batch deleteStructuredContentBatch

PUT /v1.0/structured-contents/batch putStructuredContentBatch

POST /v1.0/sites/{siteId}/structured-contents/batch postSiteStructuredContentBatch

Name	Description
siteId * required string *(path)*	20119
callbackURL string *(query)*	callbackURL

Request body: application/json

```
        "contentFieldValue": {
          "data": "<p>As we step into 2019, eyewear trends are evolving with new styles and designs. Oversized sunglasses are making a comeback, offering both fashion and UV protection. Clear frame glasses continue to be popular for a minimalist look, while bold colored frames are also gaining attention. Blue light blocking glasses are becoming a necessity in the digital age, protecting eyes from screen-induced strain. With sustainable fashion on the rise, eco-friendly eyewear materials like bamboo and recycled plastics are becoming more prevalent.</p>"
        },
        "name": "Content"
      },
        {
        "contentFieldValue": {
          "data": "<p>2019 Eyewear Trends: What's In and What's Out</p>"
        },
        "name": "Headline"
      }
    ],
    "contentStructureId": 32162,
    "structuredContentFolderId": 32188,
    "title": "Exploring the Latest Eyewear Trends for 2019",
    "viewableBy": "Anyone"
}
```

Part 06

Importing Products

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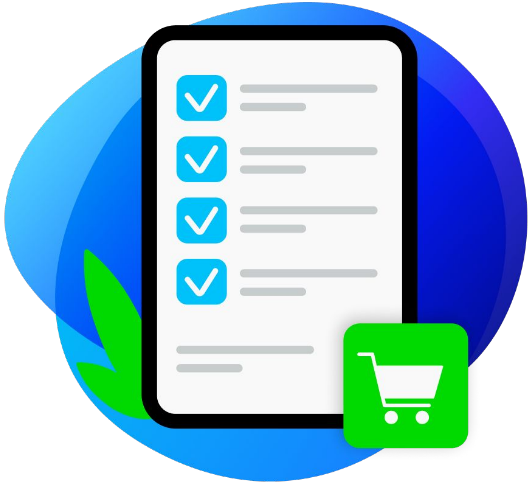
Importing Products

Liferay Commerce

- Leverage Liferay Commerce to build a digital storefront
- Use product catalogs for eyewear products grouped by related features
- Manage product inventory and distribute products globally
- Migrate existing products to Liferay using Commerce APIs



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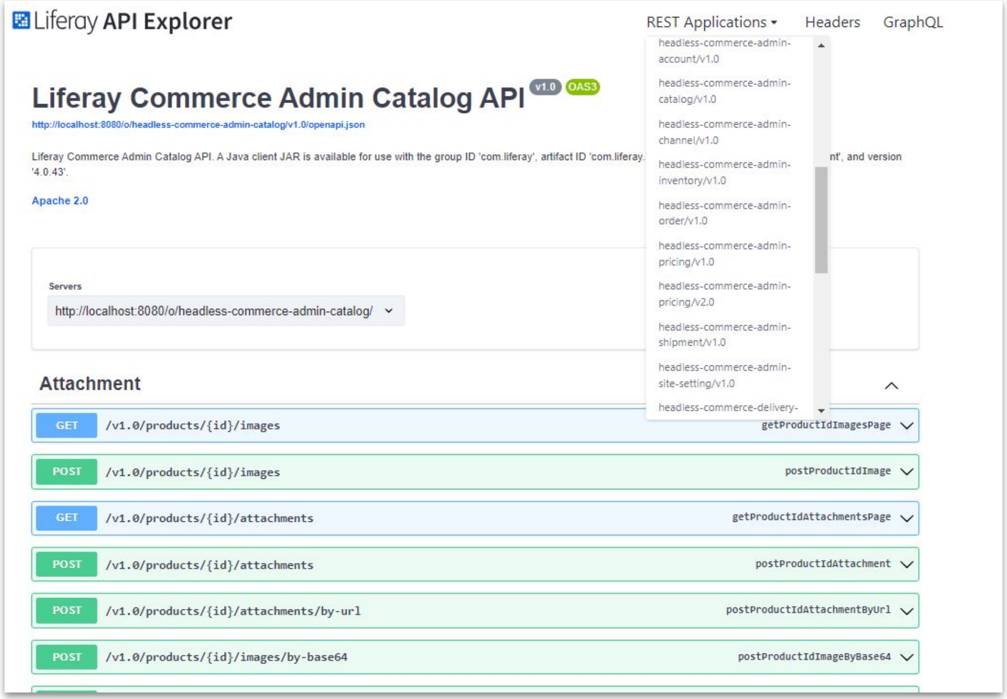
Importing Products

Liferay Commerce APIs


Liferay API Explorer
REST Applications ▾
Headers
GraphQL
headless-commerce-admin-account/v1.0
headless-commerce-admin-catalog/v1.0
headless-commerce-admin-channel/v1.0
headless-commerce-admin-inventory/v1.0
headless-commerce-admin-order/v1.0
headless-commerce-admin-pricing/v1.0
headless-commerce-admin-pricing/v2.0
headless-commerce-admin-shipment/v1.0
headless-commerce-admin-site-setting/v1.0
headless-commerce-delivery-
v1.0
OAS3
Servers

Liferay Commerce Admin Catalog API

http://localhost:8080/o/headless-commerce-admin-catalog/v1.0/openapi.json

Liferay Commerce Admin Catalog API. A Java client JAR is available for use with the group ID 'com.liferay', artifact ID 'com.liferay. nt', and version '4.0.43'.

Apache 2.0

http://localhost:8080/o/headless-commerce-admin-catalog/

Attachment

GET	/v1.0/products/{id}/images	getProductIdImagesPage
POST	/v1.0/products/{id}/images	postProductIdImage
GET	/v1.0/products/{id}/attachments	getProductIdAttachmentsPage
POST	/v1.0/products/{id}/attachments	postProductIdAttachment
POST	/v1.0/products/{id}/attachments/by-url	postProductIdAttachmentByUrl
POST	/v1.0/products/{id}/images/by-base64	postProductIdImageByBase64

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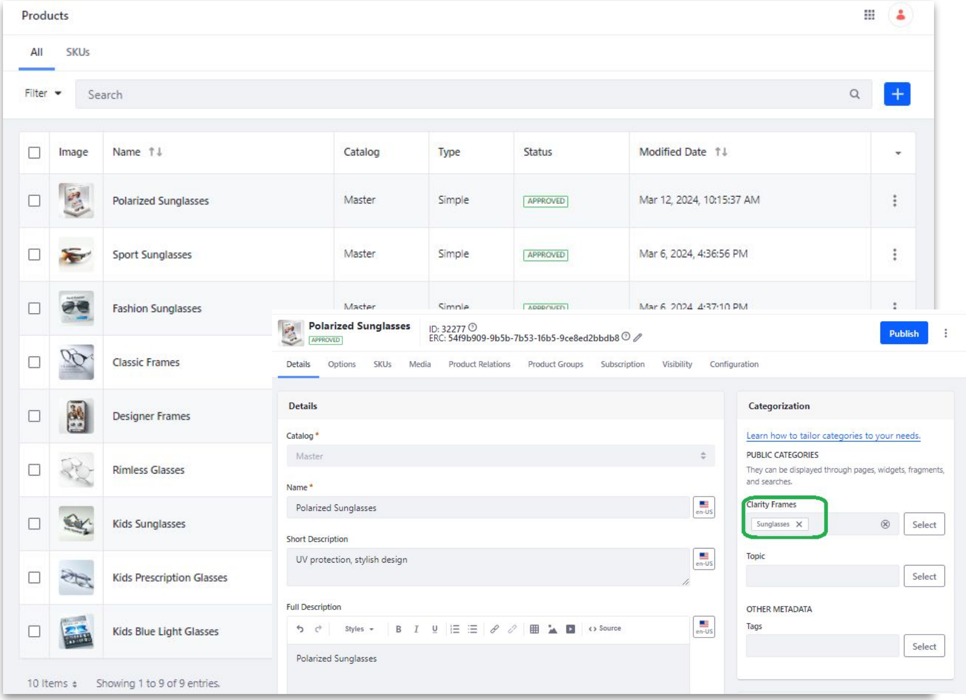
Importing Products

Clarity Products

- Clarity has a list of eyewear products that are available on their website
- Categorized into 2 categories:
  - Sunglasses
  - Prescription Glasses



Products

All SKUs

Filter Search

□	Image	Name	Catalog	Type	Status	Modified Date
□		Polarized Sunglasses	Master	Simple	APPROVED	Mar 12, 2024, 10:15:37 AM
□		Sport Sunglasses	Master	Simple	APPROVED	Mar 6, 2024, 4:36:56 PM
□		Fashion Sunglasses	Master	Simple	APPROVED	Mar 6, 2024, 4:37:10 PM
□		Classic Frames				
□		Designer Frames				
□		Rimless Glasses				
□		Kids Sunglasses				
□		Kids Prescription Glasses				
□		Kids Blue Light Glasses				

10 Items Showing 1 to 9 of 9 entries.

Polarized Sunglasses APPROVED

ID: 32277

ERC: 54f9b909-9b5b-7b53-16b5-9ce8ed2bbdb8

Publish

Details Options SKUs Media Product Relations Product Groups Subscription Visibility Configuration

Details

Catalog *: Master

Name *: Polarized Sunglasses

Short Description: UV protection, stylish design

Full Description: Polarized Sunglasses

Categorization

Learn how to tailor categories to your needs.

PUBLIC CATEGORIES

They can be displayed through pages, widgets, fragments, and searches.

Clarity Frames: Sunglasses

Topic

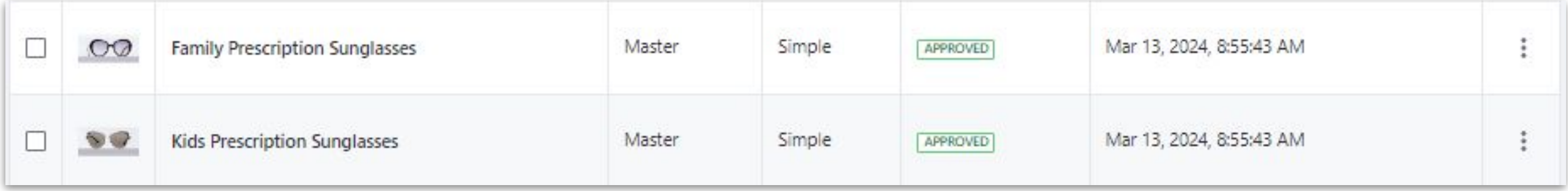
OTHER METADATA

Tags

Importing Products

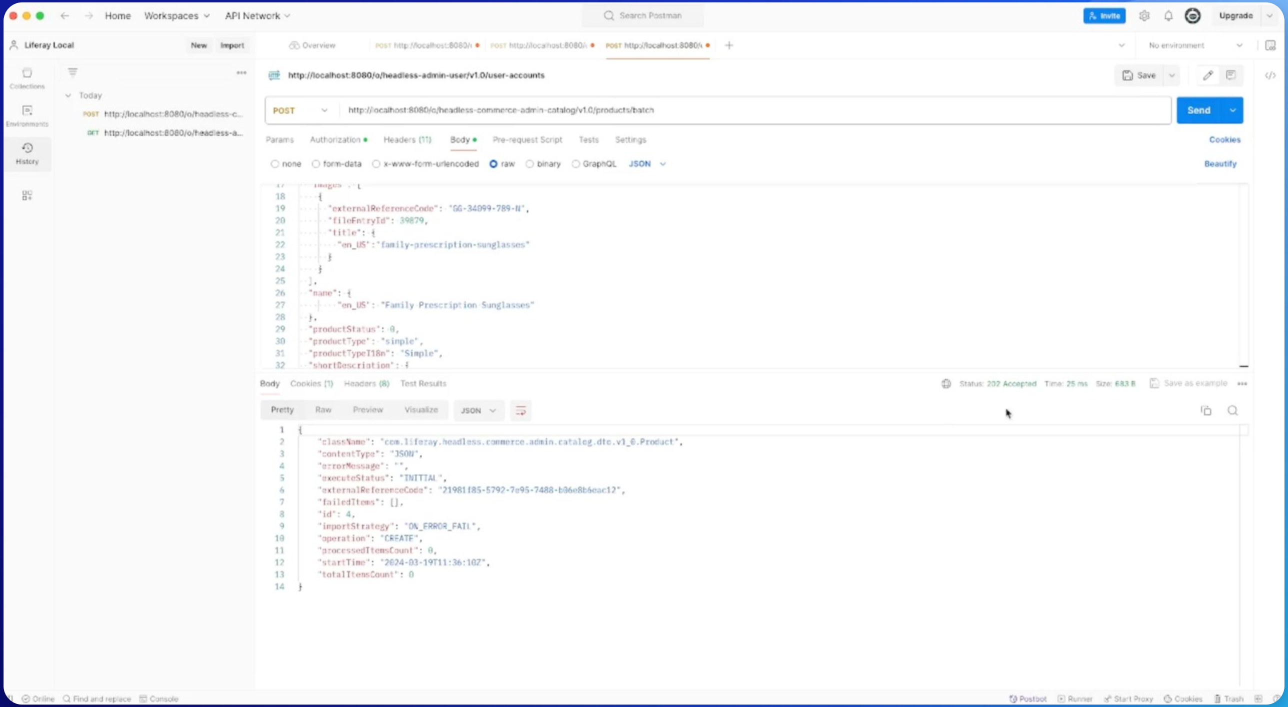
DEMO: Import Products

- Requirement: Import a new line of prescription sunglasses products for global distribution
- Use Commerce Batch API: http://<server>:<ipaddress>/o/headless-commerce-admin-catalog/v1.0/products/batch
- Associate products with categories, images and SKUs at time of creation



□		Family Prescription Sunglasses	Master	Simple	APPROVED	Mar 13, 2024, 8:55:43 AM	⋮
□		Kids Prescription Sunglasses	Master	Simple	APPROVED	Mar 13, 2024, 8:55:43 AM	⋮

Demo – Importing Products



http://localhost:8080/o/headless-admin-user/v1.0/user-accounts

POST http://localhost:8080/o/headless-commerce-admin-catalog/v1.0/products/batch

○ none ○ form-data ○ x-www-form-urlencoded ● raw ○ binary ○ GraphQL JSON

```
"images": [
    {
        "externalReferenceCode": "GG-34099-789-N",
        "fileEntryId": 39879,
        "title": {
            "en_US":"family-prescription-sunglasses"
        }
    }
],
"name": {
        "en_US": "Family Prescription Sunglasses"
},
"productStatus": 0,
"productType": "simple",
"productTypeI18n": "Simple",
"shortDescription": {
```

Body Cookies (1) Headers (8) Test Results

Status: 202 Accepted Time: 25 ms Size: 683 B

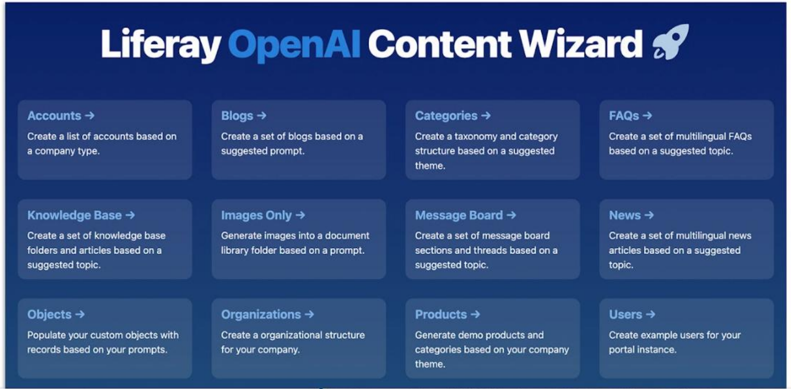
JSON

```
{
    "className": "com.liferay.headless.commerce.admin.catalog.dto.v1_0.Product",
    "contentType": "JSON",
    "errorMessage": "",
    "executeStatus": "INITIAL",
    "externalReferenceCode": "21981f85-5792-7e95-7488-b06e8b6eac12",
    "failedItems": [],
    "id": 4,
    "importStrategy": "ON_ERROR_FAIL",
    "operation": "CREATE",
    "processedItemsCount": 0,
    "startTime": "2024-03-19T11:36:10Z",
    "totalItemsCount": 0
}
```

Importing Products

OpenAI Content Wizard

- Simple Product Generator interface for creating initial example content
- Enter an OpenAI prompt and receive product details
- Pass OpenAI-generated product details to Liferay’s Headless endpoints
- Generate over a dozen content types in Liferay
- Tool available on Github!



Liferay OpenAI Content Wizard

Accounts → Create a list of accounts based on a company type.

Blogs → Create a set of blogs based on a suggested prompt.

Categories → Create a taxonomy and category structure based on a suggested theme.

FAQs → Create a set of multilingual FAQs based on a suggested topic.

Knowledge Base → Create a set of knowledge base folders and articles based on a suggested topic.

Images Only → Generate images into a document library folder based on a prompt.

Message Board → Create a set of message board sections and threads based on a suggested topic.

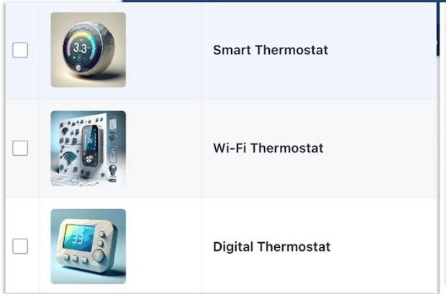
News → Create a set of multilingual news articles based on a suggested topic.

Objects → Populate your custom objects with records based on your prompts.

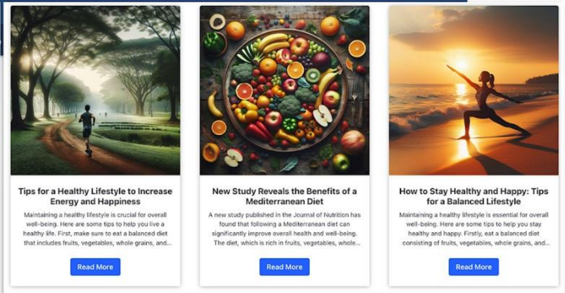
Organizations → Create a organizational structure for your company.

Products → Generate demo products and categories based on your company theme.

Users → Create example users for your portal instance.



□		Smart Thermostat
□		Wi-Fi Thermostat
□		Digital Thermostat



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Liferay

Liferay: Seamless integration, boundless possibilities. Harness the power of headless APIs.

Thank you