



April 2023

Architecting SaaS Solutions

Matheus Monteiro

Solutions Architect

DISCLAIMER

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Not for Distribution.*

Matheus Monteiro

From Recife, Brazil

BEng. Computer Engineering

MsC. Computer Science - Cloud Computing

PhD Candidate - Computer Science -

Cloud Applications Development

Liferay 5+ years (From Support to Cloud Team)



Setting the Audience

Setting the Audience

This presentation will not go deeper in any particular functionality

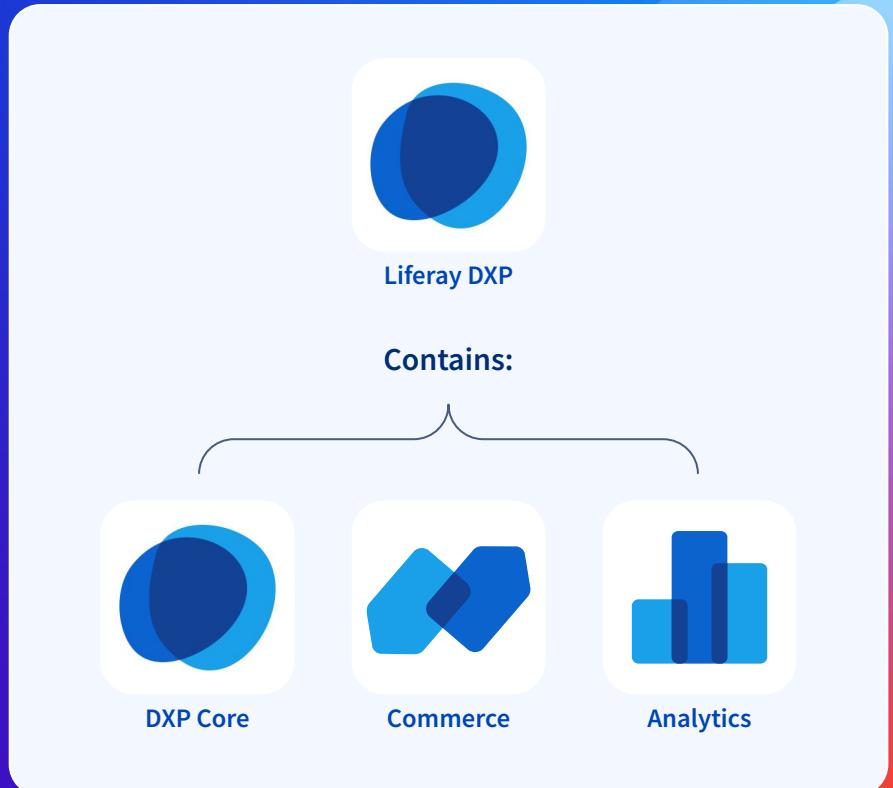
Product, Engineering and Cloud teams are committed to help the partners!

We are in a new horizont. It is necessary to embrace change

Most common custom cases will be addressed.

Liferay's Product

- Our *product* is Liferay DXP
- Three main capability sets:
Digital Experience Platform core, Commerce, Analytics
- All-inclusive pricing



Supporting Every Deployment Approach

Liferay's Product Offerings

SaaS

Liferay
Experience Cloud

PaaS

Liferay
Experience Cloud
Self-Managed

Software

DXP
Self-Hosted

All deployment options are **possible**,
but our approach is **SaaS First**

Liferay DXP - Self-Hosted

With Liferay DXP Self-Hosted, Liferay provides **just** the DXP software itself - the Customer is responsible for **everything else**.



Liferay DXP



Liferay DXP - Self-Hosted

With Liferay DXP Self-Hosted, Liferay provides **just** the DXP software itself - the Customer is responsible for **everything else**.

Customers can **deploy** DXP Self-Hosted **where they wish** - in public cloud, private cloud, in their own data-center.

RESPONSIBILITIES

Liferay

- Products
- Subscription (Support, Warranty, Indemnity, etc.)

Customer

Low-value:

- Infrastructure
- Platform Software - DB, Search, etc.
- Architecture - Scaling, Load Balancing, etc.
- Upgrades
- Updates, Patches, Security Hotfixes
- Software Troubleshooting

High-value:

- Application Delivery
(aka Solving Business Problems)





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Liferay Experience Cloud

Self-Managed

With **Liferay's PaaS** offering, Liferay provides the **DXP**, the **Infrastructure**, and the **Platform Services**, but the Customer is still responsible for **most other activities**.

This was previously known as **DXP Cloud**.

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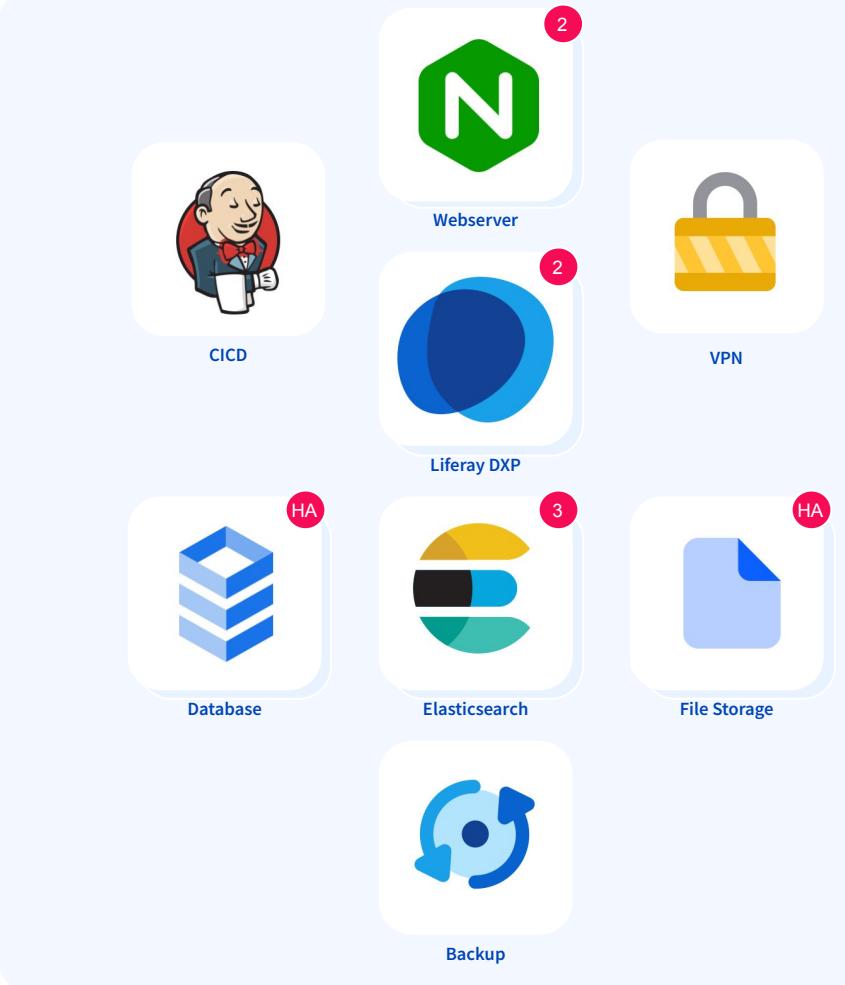


Liferay Experience Cloud

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Internet

Private Network



Web Server
Nginx



Liferay DXP
Liferay



VPN
OpenVPN /
IPSec



Search
Elasticsearch



Database
MySQL



File System
—





DXP Cloud

acme

prd



Builds

Deployments



?

[Overview](#)[Services](#)[Network](#)[Activities](#)[Logs](#)[Monitoring](#)[Backups](#)[Team](#)[Settings](#)

Overview

Services



backup

liferaycloud/service-backup:0.0.4

Running



database

liferaycloud/service-database:0.0.3

Running



liferay

liferaycloud/service-liferay-dxp:7.1.0-ga1-3.0

Running



search

liferaycloud/service-elasticsearch:6.1.4-1.2

Running



webserver

liferaycloud/service-nginx:1.14.0-1.4

Running

[Go to services page](#)

Alerts



The liferay service exceeded 90% of its allocated Memory.

30 min ago



The database service exceeded 90% of its allocated Memory.

2 hours ago



The database service exceeded 90% of its allocated CPU.

4 hours ago

[Go to alerts page](#)

Latest deployment



30 min ago

[Add new form page](#)[See previous deployments](#)

Activities

[Deployments](#)[General](#)

Auto scaling disabled for liferay

a min ago



Downscaled from 8 to 6 instances for liferay

a min ago



Scaled from 7 to 8 instances for liferay

1 hour ago



Scaled from 6 to 7 instances for liferay

1 hour ago



Scaled from 5 to 6 instances for liferay

2 hours ago



Auto scaling enabled for liferay

2 hours ago

Liferay Experience Cloud

SaaS

Liferay Experience Cloud is **Liferay's SaaS** offering. With Liferay Experience Cloud the Customer can **focus on what really matters** - creating and launching their business applications.

Remember: it's still Liferay DXP - it's not a turnkey application.

RESPONSIBILITIES

Liferay

- Products
- Subscription (Support, Warranty, Indemnity, etc.)
- Infrastructure
- Platform Software - DB, Search, etc.
- Architecture - Scaling, Load Balancing, etc.
- Upgrades
- Updates, Patches, Security Hotfixes
- Software Troubleshooting

Customer

High-value:

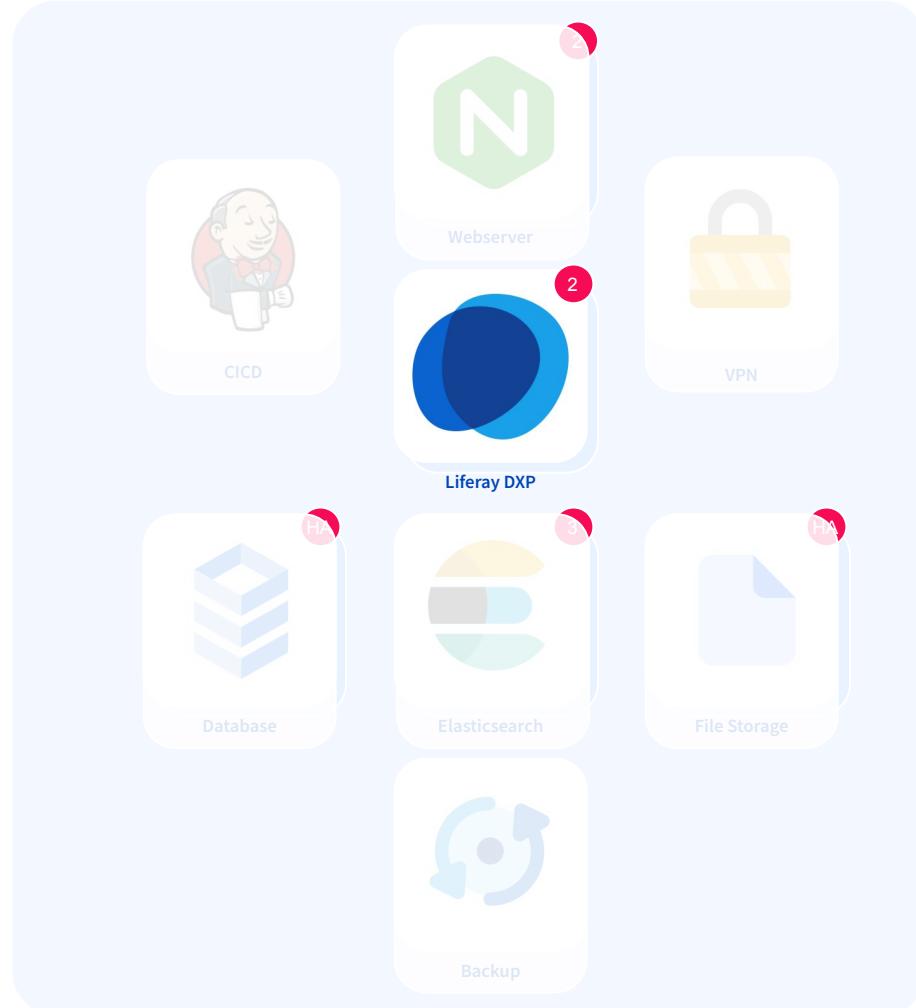
- Application Delivery
(aka Solving Business Problems)



Liferay Experience Cloud

SaaS

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SaaS

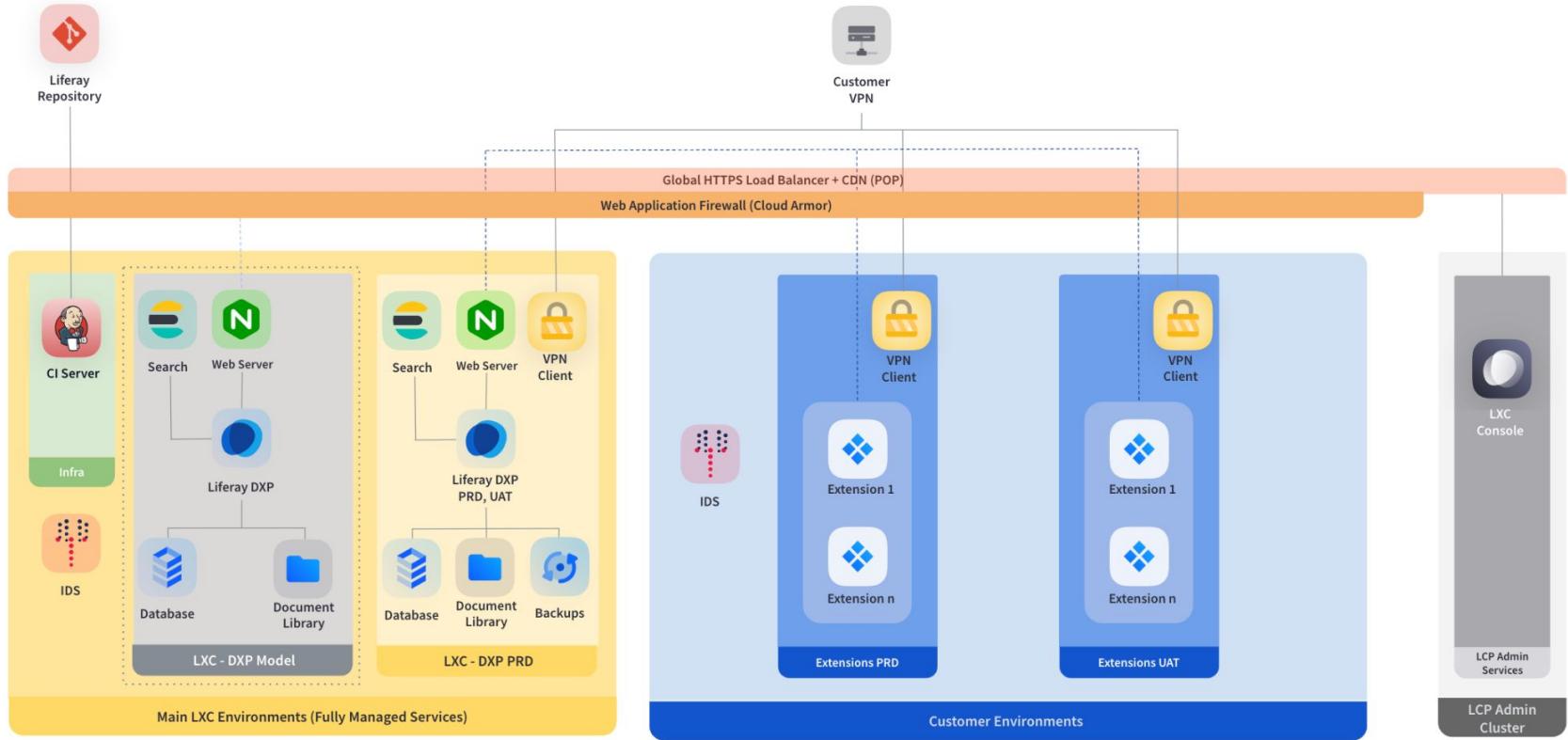
Liferay Experience Cloud - Customer Perspective

The screenshot shows the Liferay Experience Cloud interface. On the left, there's a sidebar with navigation links like 'Beryl Intranet', 'TOUCHPOINTS', 'PEOPLE', 'OPTIMIZE', and 'AS'. The main area displays a 'Client Extensions' dashboard with a table listing four services:

Service	Description	Endpoints	Status
liferaydotcomglobaljs	liferay/caddy:latest	liferaydotcomglobaljs-exte5a2learn-extua...	Ready
liferaylearncron	liferay/jdk11-jdk8:latest	No endpoints	Ready
liferaylearnddmimporter	adoptopenjdk/openjdk11:jre-11.0.14.1_1	No endpoints	Ready
liferaylearnglobaljs	liferay/caddy:latest	liferaylearnglobaljs-exte5a2learn-extua...	Ready

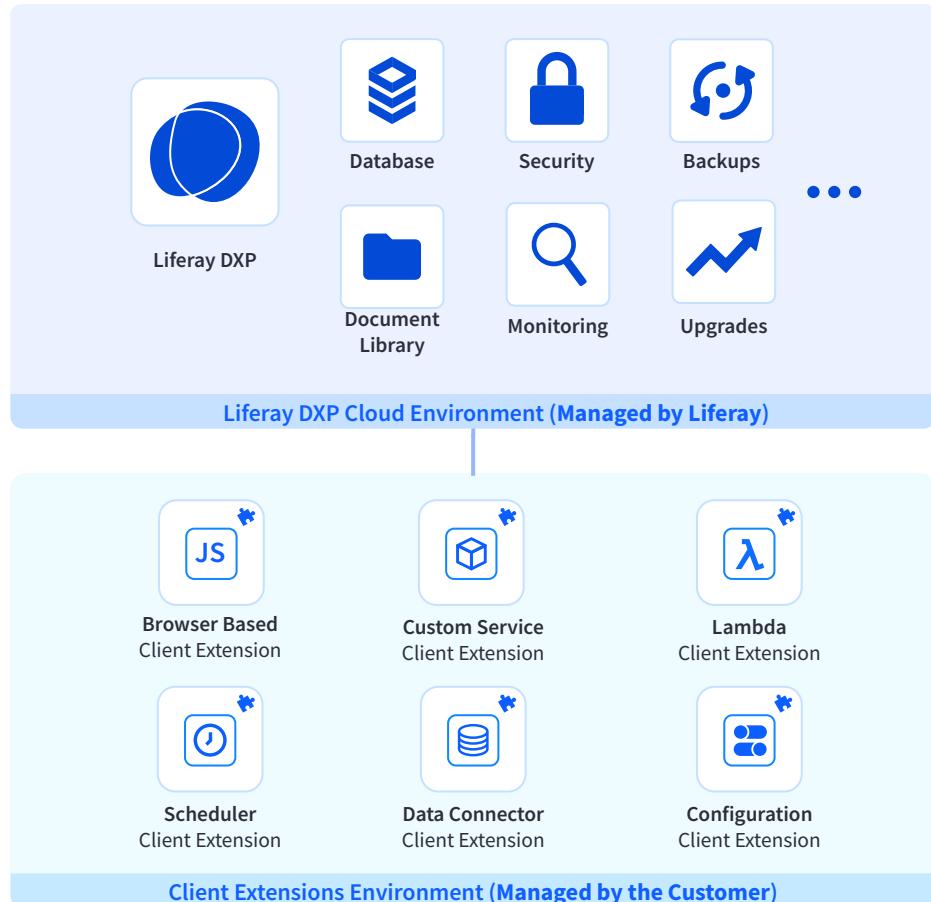


Liferay Experience Cloud (SaaS) Architecture



SaaS Architecture

- Feature
 - DXP-as-a-Service
- **Benefits:**
 - Managed by Liferay
 - DXP Upgrades on your behalf
 - Monitor Application Uptime
 - Security Scan



- Feature
 - Cloud Tooling
- **Benefits:**
 - Managed by customers
 - Customize without compromise (no changes to core).
 - 60% maturity
 - Currently only available for LXC SaaS
 - Full control of Client Extension's SDLC
 - Manage and Monitor your Client Extensions

Liferay Experience Cloud (SaaS) concept

Liferay's flexible DXP-as-a-Service offering
to create, launch, and optimize **tailored
solutions** with the agility and **convenience
of SaaS**

Remember...

Liferay Experience Cloud (SaaS) is a Deployment Strategy. **Liferay DXP 7.4 is the product.**

Liferay Experience Cloud (SaaS)



**OOTB DXP
Capabilities**



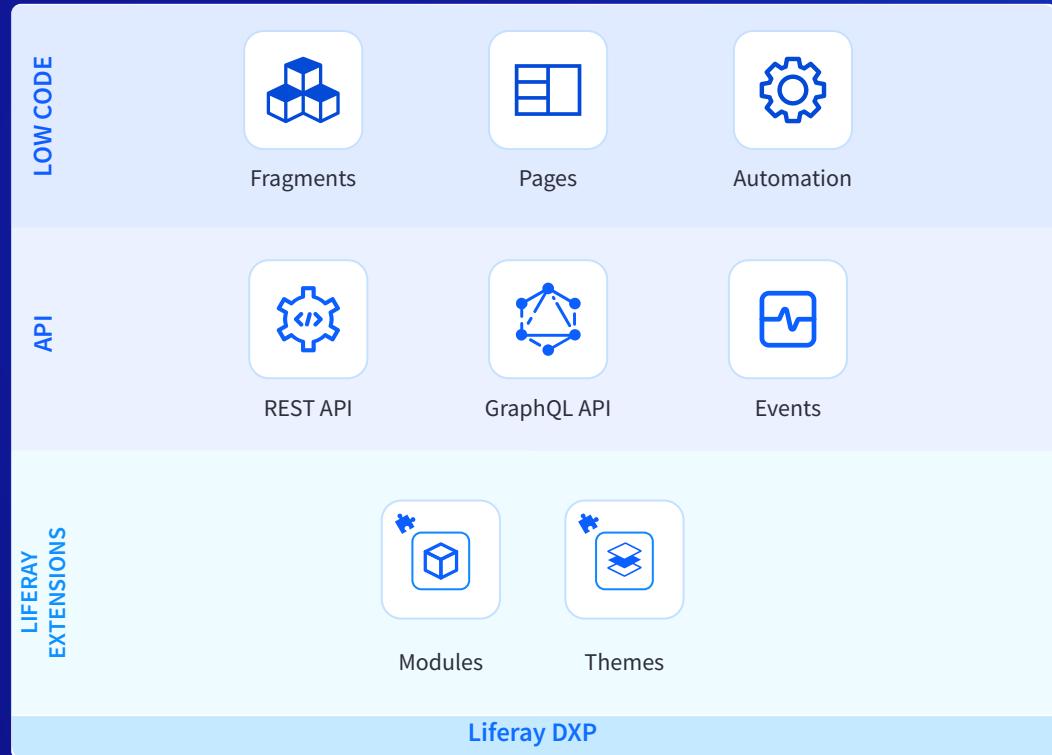
**Modern
Extensions**

Pre-7.4 way of Extending Liferay

Modules and **themes** let you add functionality and style your sites.

However..

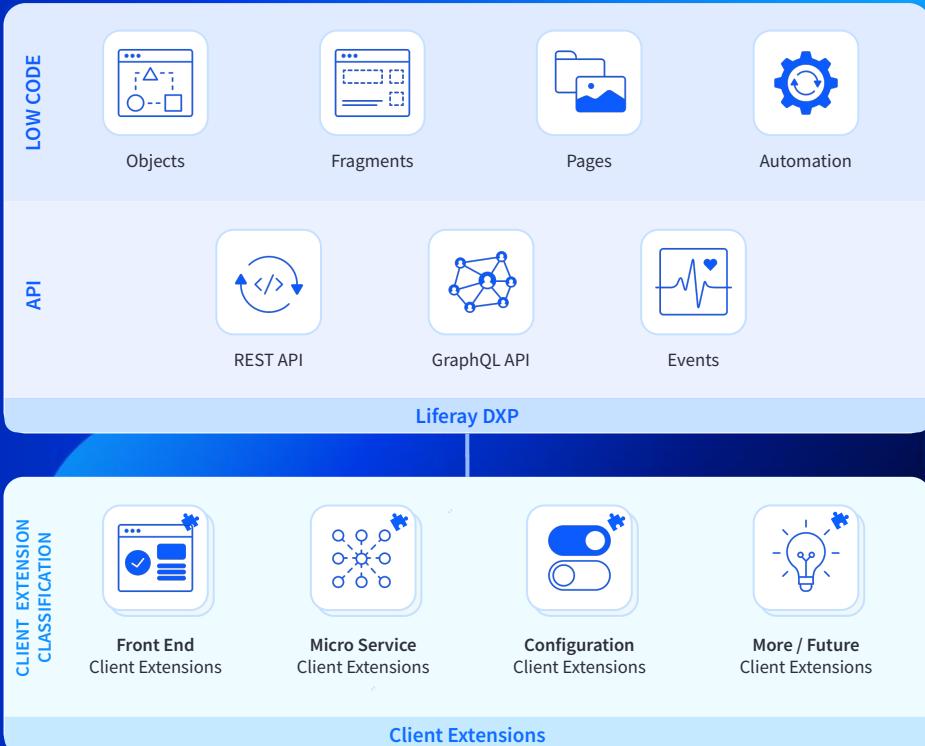
- Upgrades are almost always hard
- Customizations are static



Extending Liferay

Provides the **key customization** capabilities needed to meet highly specific **business requirements**, **without modifying** Liferay

- Improves TCO
- Required for:
 - Liferay Experience Cloud (SaaS)
- Recommended for:
 - Liferay Experience Cloud SM
 - DXP SH



What should you know to use LXC in terms of...



**OOTB DXP
Capabilities**

What Changed in DXP 7.4

	Availability	Note
App Builder, App Builder Workflow	<i>Removed</i>	Replaced by Liferay Objects.
Google Login/SSO	<i>Removed</i>	Deprecated in 7.2. It is replaced by other solutions, including SAML, OpenID Connect, and Token-based SSO.
Commerce Account Widget	<i>Removed</i>	Replaced by the DXP/Portal Accounts Widget
Dynamic Data List	<i>Bundled</i>	Deprecated in 7.3. It is replaced by Liferay Objects.
EXT Plugins support	<i>Removed</i>	Replaced by configuration settings and standard extension points.
Image Editor (Soy-based)	<i>Removed</i>	Replaced by a React-based image editor.

What Changed in DXP 7.4

	Availability	Note
SOAP Web Services	<i>Removed</i>	Replaced by JSON web services, REST services, and GraphQL services.
NTLM	<i>Archived</i>	Deprecated in 7.2. It is replaced by Kerberos. If you're using NTLM to authenticate Microsoft Windows™ accounts with , switch to using Kerberos.
Kaleo Forms	<i>Maintenance Mode</i>	To be replaced by business processes for Liferay Objects.
Solr Connector	<i>Maintenance Mode</i>	Use Elasticsearch if possible

More info can be found:

- [Maintenance Mode and Deprecation doc](#)
- [7.4 Breaking Changes](#)
- [Default Setting Changes in 7.4](#)



Tools > Fragments

One Info Banner (Copy)

Kit de herramientas de fragmentos | 32

Código Configuración

HTML

```
1 <div class="fragment_536846">
2   <div class="sc_section oib-banner text-white text-break" c>
3     <div class="sc_section_overlay" style=" padding:40px;">
4       <div class="sc_section_content ">
5         <lfr-editable id="01-button-oib" type="link">
6           <a href="">
7             class="sc_button sc_button_square sc_button">
8           </lfr-editable>
9             <h1 class="sc_title sc_title_regular oib-h1">
10               <lfr-editable id="01-title-oib" type="rich">
11                 </h1>
12               </div>
13             </div>
14           </div>
15         </div>
```

CSS

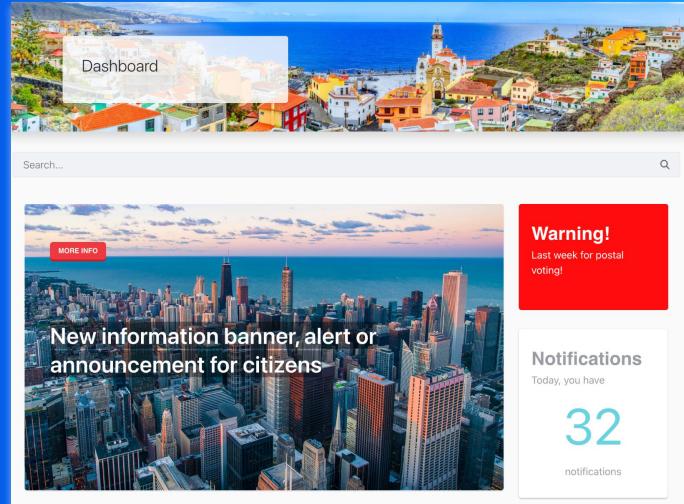
```
1 .fragment_536846 {}>
2 .oib-banner {
3   background-image: url("data:image/png;base64,iVBORw0KGgoA");
4   background-position: center;
5   background-size: cover;
6   border-radius: 4px;
7   box-shadow: 1px 2px #e8eaec;
8 }
9
10 .oib-button {
11   color: #ffffff;
12   background-color: #ee3940;
13   box-shadow: 0 3px rgb(208,27,34);
14 }
15
```

JavaScript

```
function(fragmentElement, configuration) {
```

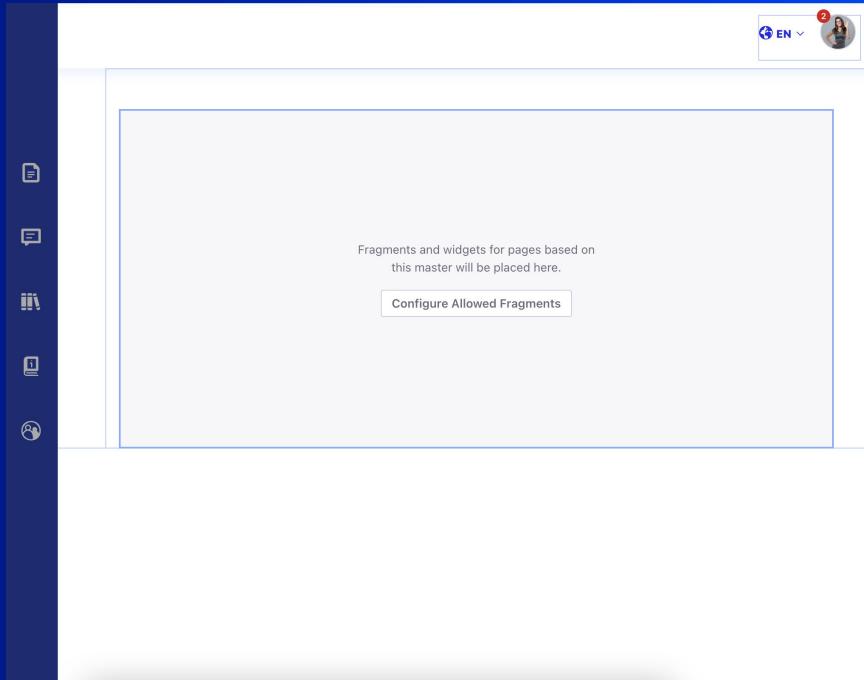
MORE INFO

New banner information, alert or announcement for citizens



Tools > Web Tools

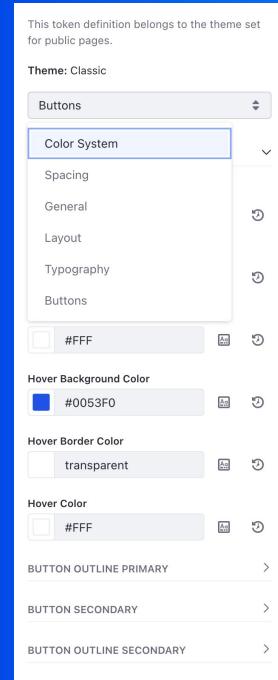
Master Pages



Fragments and widgets for pages based on this master will be placed here.

Configure Allowed Fragments

Style Books



This token definition belongs to the theme set for public pages.

Theme: Classic

Buttons

Color System

Spacing

General

Layout

Typography

Buttons

#FFF

Hover Background Color #0053F0

Hover Border Color transparent

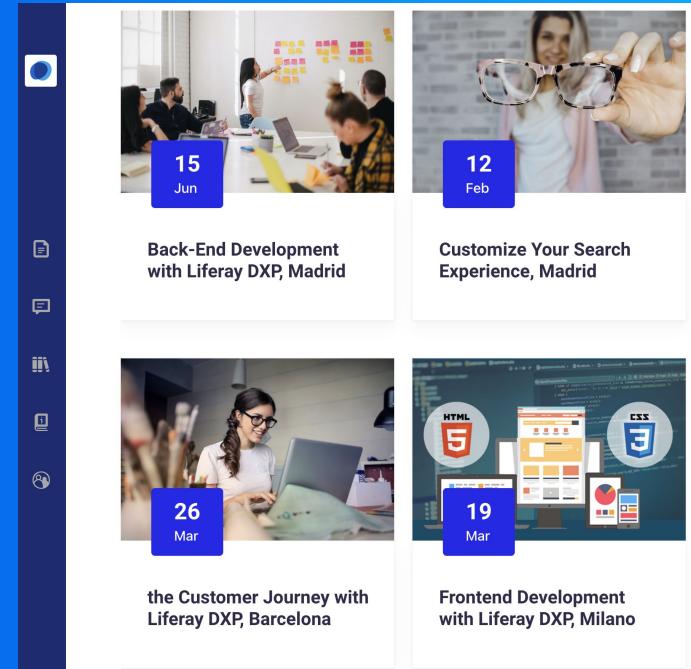
Hover Color #FFF

BUTTON OUTLINE PRIMARY

BUTTON SECONDARY

BUTTON OUTLINE SECONDARY

Collections



15 Jun Back-End Development with Liferay DXP, Madrid

12 Feb Customize Your Search Experience, Madrid

26 Mar the Customer Journey with Liferay DXP, Barcelona

19 Mar Frontend Development with Liferay DXP, Milano

Objects Entries

Tools > Objects

Fields Definitions

ATTENDEE

First *	Jane	Last *	Smith
email *	jsmith@liferay.com	Telephone	432617289
company *	Liferay	Job title *	Sr Sales Engineer
Event	Product Design Bootcamp Info		

Save **Cancel**

Event Registrations

ID	Company	Email	First	Job title	Last	Telephone	Status	Author	⋮
54468	Liferay	jsmith@liferay.com	Jane	Sr Sales Engineer	Smith	432617289	APPROVED	William Williams	⋮
54470	Liferay	sanderson@liferay.com	Sophia	Support	Anderson	456378290	APPROVED	William Williams	⋮
54472	Animals	kerry@testing.com	Katy	HR	Dog	987604983	APPROVED	William Williams	⋮
54474	M&Ms	arambo@think.com	Aurelio	Director	Rambo	0	APPROVED	William Williams	⋮

20 items ◀ Showing 1 to 4 of 4 ▶ 1 >

Permissions

Site Procedure Reviewer

Event Registrations

<input type="checkbox"/> Action
<input type="checkbox"/> Access in Site and Asset Library Administration
<input type="checkbox"/> Add to Page
<input type="checkbox"/> Configuration
<input type="checkbox"/> Permissions
<input type="checkbox"/> Preferences
<input type="checkbox"/> View

Event Registrations

<input type="checkbox"/> Action
<input type="checkbox"/> Add Object Entry
<input type="checkbox"/> Permissions

Event Registration

<input type="checkbox"/> Action
<input type="checkbox"/> Add Object Entry
<input type="checkbox"/> Permissions

APIs Generations

Liferay API Explorer

Object

<http://localhost:8080/o/ceventregistrations/openapi.json>

EventRegistration

- DELETE** /scopes/{scopeKey}/by-external-reference-code/{externalReferenceCode} deleteScopeKeyByExternalReferenceCode ✓
- GET** /scopes/{scopeKey}/by-external-reference-code/{externalReferenceCode} getScopeKeyByExternalReferenceCode ✓
- PUT** /scopes/{scopeKey}/by-external-reference-code/{externalReferenceCode} putScopeKeyByExternalReferenceCode ✓
- GET** /scopes/{scopeKey} getScopeKeyPage ✓
- POST** /scopes/{scopeKey} postScopeKey ✓
- DELETE** /{eventRegistrationId} deleteEventRegistration ✓
- GET** /{eventRegistrationId} getEventRegistration ✓
- PATCH** /{eventRegistrationId} patchEventRegistration ✓
- PUT** /{eventRegistrationId} putEventRegistration ✓

Tools > Objects

Integration with Forms

Sign up for a specific event!

* Indicates Required Fields

First name *	Last name *
<input type="text"/>	<input type="text"/>
Email *	
<input type="text"/>	<input type="text"/>
Job title *	Telephone
<input type="text"/>	<input type="text"/>
Company *	
<input type="text"/>	<input type="text"/>

Select Form

Widgets Integrations

Event Registration

William

Attendee details



Event	Project Manager Certification Info		
First name	Katy	Last name	Dog
Job title	HR	Company	Liferay
Email	kerry@testing.com	Telephone	987604983



Dashboard Data Objects

Search

Data Source

ID ↑↓	Label	Value ↑↓	Status ↑↓	Author ↑↓
52613	North	400	APPROVED	William Williams
52615	North West	400	APPROVED	William Williams
52617	North East			
52619	Center			
52621	South			
52623	South West			
52625	South East			

20 items ↓ Showing 1 to 7 of 7

Impactful Data from Specific Areas

Specific data for each area



FusionCharts Trial

Traffic Tickets

Business Logic

ID ↑↓	Car Registration Number ↑↓	Reason for Traffic Violation ↑↓	Amount ↑↓	Discount for Prepayment ↑↓	Traffic Violation Address ↑↓
161282	4536hjk	Speed	100	10	280 Castellana Street, 28046 Madrid
167416	1234opt	Traffic Light	500	5	280 Castellana Street, 28046 Madrid

20 items ↓ Showing 1 to 2 of 2

Reservations center

Search

Data Manipulation

ID ↑↓	Author	Room	Date	Time
186232	William Williams	Business School	Coordination activities room	Feb 2, 2023
162572	William Williams	Foundation Vocational Training Center	Library	Dec 15, 2022
158503	William Williams	Fundación Centro de Formación Profesional	Aula de actividades de coordinación	Dec 15, 2022
150306	Sophia Smith	Foundation Vocational Training Center	Classroom orientation	Nov 23, 2022
149672	William Williams	Foundation Vocational Training Center	Staff room	Nov 25, 2022
145357	William Williams	Foundation Vocational Training Center	Classroom orientation	Oct 28, 2022
117805	Sophia Smith	Foundation Vocational Training Center	Classroom orientation	Oct 28, 2022
117797	William Williams	Foundation Vocational Training Center	Classroom orientation	Oct 28, 2022
110997	William Williams	Foundation Vocational Training Center	Classroom orientation	Oct 28, 2022
108554	Sophia Smith	Business School	Classroom orientation	Oct 28, 2022
108545	William Williams	Foundation Vocational Training Center	Classroom orientation	Oct 28, 2022

20 items ↓ Showing 1 to 11 of 11

Meeting room reservation

Date

/ /

Select time

Choose an Option

Select num. of hours

Choose an Option

Make a reservation

1 Traffic Ticket Data

Please, look for a traffic ticket providing the registration number of your vehicle and Traffic Ticket registration number

Traffic Ticket Registration Number*

Vehicle Registration Number*

CONTINUE

2 Traffic Ticket Information Confirmation

3 Payment

4 Payment Confirmation

5 Receipt
Final step

Tools > Search

The image shows a panoramic view of a vibrant coastal town, likely in Spain, with its characteristic red-tiled roofs and pastel-colored houses built into a steep hillside. The town is situated on the edge of a deep blue sea. In the foreground, there's a white rectangular overlay containing the word "Dashboard". Below this, the word "services" is typed into a search bar, which also features a magnifying glass icon.



Welcome, William Williams

Dashboard

Profile

Tickets

My Tickets

My Wishes

Announcements

Alerts & Information

My Services

FAQs

Documents & More

City Map

COVID-19

Search

Go Back Literacy City

Category

Search...

SITE

Citizen Site (175)
Centers (24)
Literacy City (7)
Masterclasses (1)
Site Based Ch
Template Literacy City (1)

TYPE

Document (70)
Documents Folder (9)
File (16)
Page (26)
User (7)
Web Content Article (5)
Web Content Folder (21)

199 Results for

Foundation Vocational Training Center
Web Content Article - By William Williams On May 6, 2022 8:02 AM
Nulla sapien erat, venenatis nec id eleifend, lacreet interdum libero. Aenean et risus suscipit, elementum turpis id, varius velit. Integer turpis nibh. Uttrices vivante neque lectus, maximus...
CENTRO EDUCATIVO | Asociet EDUCATIONAL CENTER Educational topic: SOCIAL AND CULTURAL CENTERS
Place: CITY AREA A

Business School
Web Content Article - By William Williams On May 6, 2022 10:01 AM
Nulla sapien erat, venenatis nec id eleifend, lacreet interdum libero. Aenean et risus suscipit, elementum turpis id, varius velit. Integer turpis nibh. Uttrices vivante neque lectus, maximus...
CENTRO EDUCATIVO | Asociet EDUCATIONAL CENTER Educational topic: EDUCATIONAL CENTERS AND STUDENT RESIDENCE Place: CITY AREA E

Coordination activities room
Web Content Article - By William Williams On May 6, 2022 11:03 AM
Main description coordination activities room

Audiovisual facilities
Web Content Article - By William Williams On May 6, 2022 11:03 AM
Descripción aula de actividades de coordinación

Business & self-employment	
Register a business	Report a paid sick leave violation
Cars, parking & transportation	
Pay or dispute a ticket	Report predatory towing



Liferay City

NEWS EVENTS DOCUMENTS ABOUT EDUCATION

liferay

SITE

[Liferay City \(12\)](#) [Citizen Site \(10\)](#)

TYPE

Blog Entry (2)
 Document (7)
 Page (9)
 Web Content Article (4)

CATEGORY

Tourism (1)
 Procedures (1)
Trees, parks & the environment (1)

TAG

about (2)
 english (1)

liferay

22 Results for liferay

Welcome
Page - By William Williams On Jan 13, 2022 4:41 PM
Air Quality Access to real-time data and historical data, daily reports, schedules, graphs, and historical data, daily reports, schedules,...

Events
Page - By Admin Istrator On Jan 13, 2022 4:03 PM
Recommended Events NOV 15, 2021 11:43:23 AM Prevent 75% of visitors from google ana...

New
Page - By Admin Istrator On Jan 13, 2022 4:03 PM
News People Select Show More NOV 15, 2021 11:43:23 AM Prevent 75% of visitors from ge...

Template
Page - By William Williams On Jun 7, 2022 2:30 PM
Thought Leadership **Liferay** City Come to

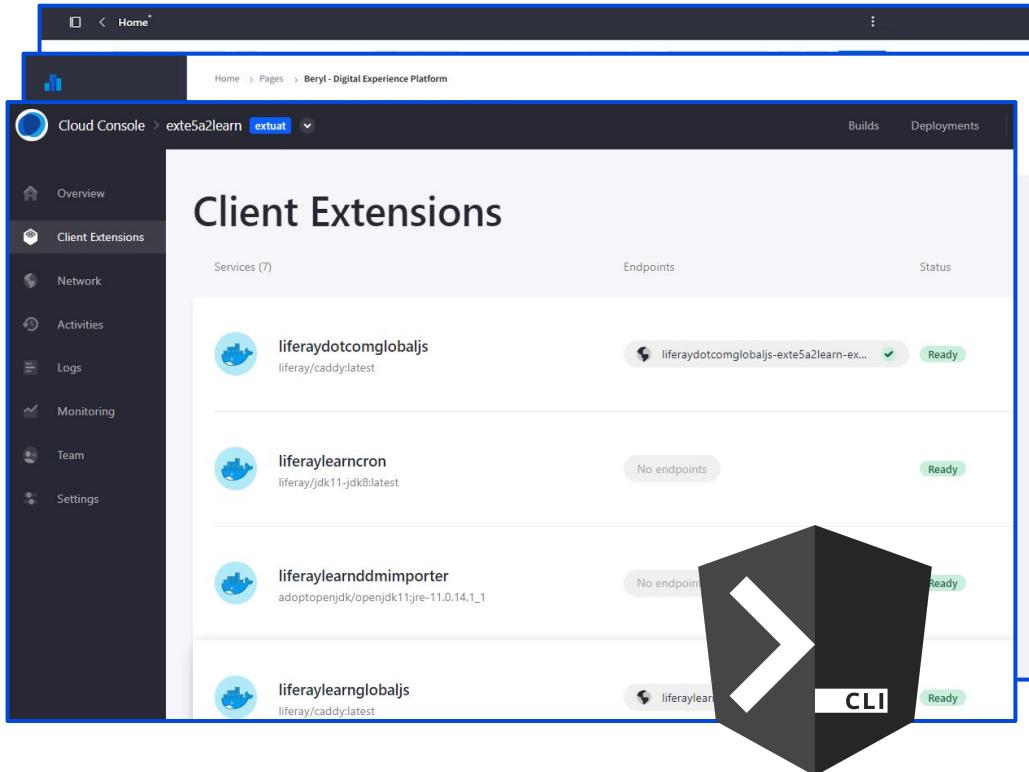
Search
Page - By William Williams On Jan 20, 2022 9:39 AM
Liferay...Site Based On Template **Liferay**

What should you know to use Liferay Experience Cloud in terms of...



Modern
Extensions

What do you get with LXC and what's the experience like?



The screenshot shows the Liferay Cloud Console interface. On the left is a sidebar with icons for Overview, Client Extensions (selected), Network, Activities, Logs, Monitoring, Team, and Settings. The main area is titled "Client Extensions" and displays a table of services:

Services (7)	Endpoints	Status
liferaydotcomglobaljs liferay/caddy:latest	liferaydotcomglobaljs-exte5a2learn-ex... ✓ Ready	
liferaylearncron liferay/jdk11-jdk8:latest	No endpoints	Ready
liferaylearnddimporter adoptopenjdk/openjdk11:jre-11.0.14.1_1	No endpoints	Ready
liferaylearnglobaljs liferay/caddy:latest	liferaylearnglobaljs-exte5a2learn-ex... ✓ Ready	
liferaylearncron liferay/jdk11-jdk8:latest	No endpoints	Ready
liferaylearnddimporter adoptopenjdk/openjdk11:jre-11.0.14.1_1	No endpoints	Ready

A large, dark gray hexagonal icon with a white right-pointing arrow and the letters "CLI" is positioned in front of the table.



Liferay DXP PRD, UAT



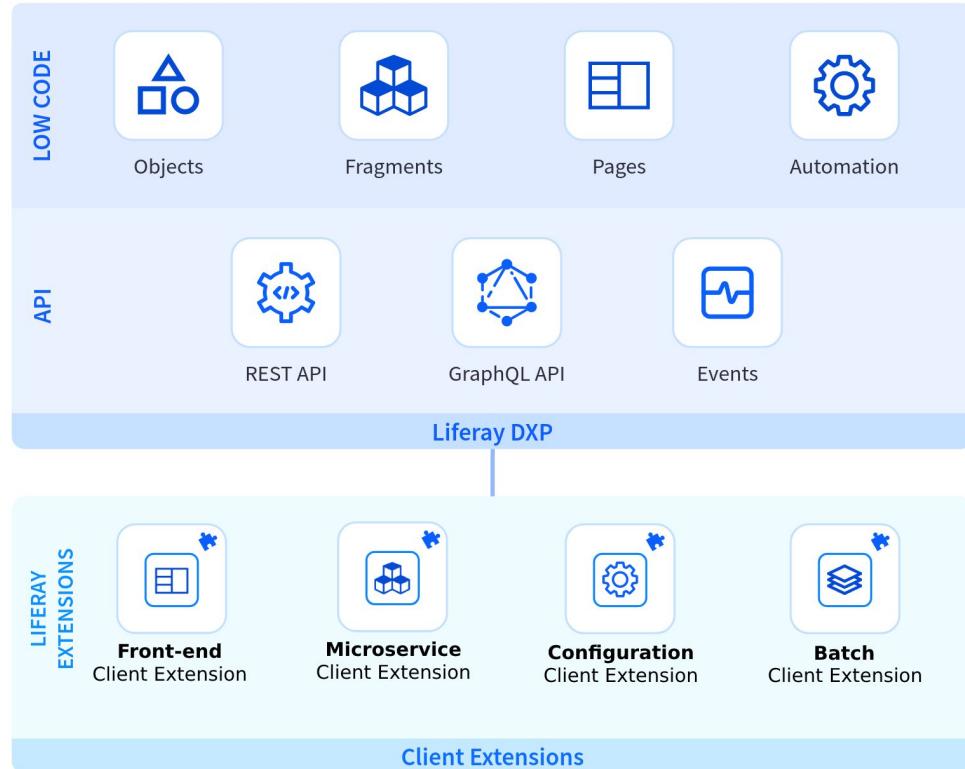
Analytics



Client Extensions PRD, UAT



DevOps Tools



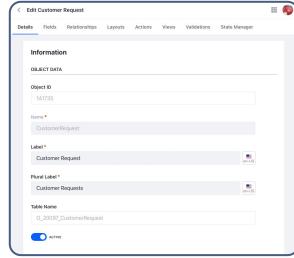
Liferay Client Extensions types

- **Frontend client extensions**: Front-end client extensions augment your pages and integrate new functionality. Available types include CSS, JavaScript, Theme CSS, Theme JS, Theme Favicon, Custom Element, and IFrame.
- **Microservice client extensions**: Define microservice client extensions to run your own code in response to events in your Liferay instance. How you implement the code is up to you: use the patterns and technologies you like. Microservice client extensions are hosted outside of Liferay.
- **Configuration client extension**: Liferay instance configurations are deployable with client extensions. For example, you can deploy OAuth2 authentication profiles as configuration client extensions, enabling your other client extensions that require authentication.
- **Batch client extensions**: Similar to a Microservice client extensions but is executed according to a schedule or a single-shot.



Configuration as Code

1. A Liferay-based solution can be customized using the Low Code admin UI.



DEV

2. The Low Code configuration can be exported as JSON for a developer to further modify. In a rapid development phase, DEV can be set up to immediately reflect config changes made in code.



```
liferay低代码平台上的命令行界面显示了blade命令的使用，包括blade create和blade client-extensions命令。命令行显示了blade版本、逆向搜索结果以及如何使用blade create命令来创建新的blade客户端扩展。
```

Developer Workspace

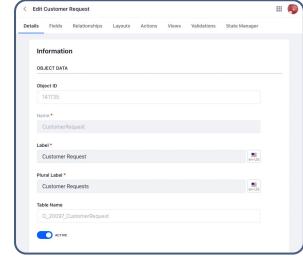
4a. Configuration as code in the repo can be used to make a single large update to DEV...

3. In code form, you can easily commit the configuration to a repository.

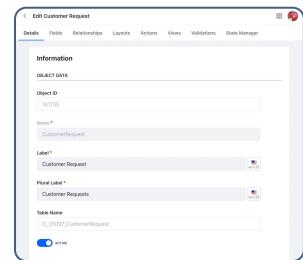


Source Code Repo

4b. Or be pushed (with Extensions code) to other environments.



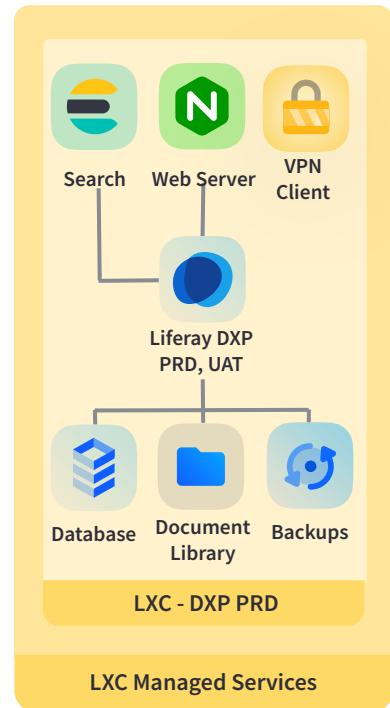
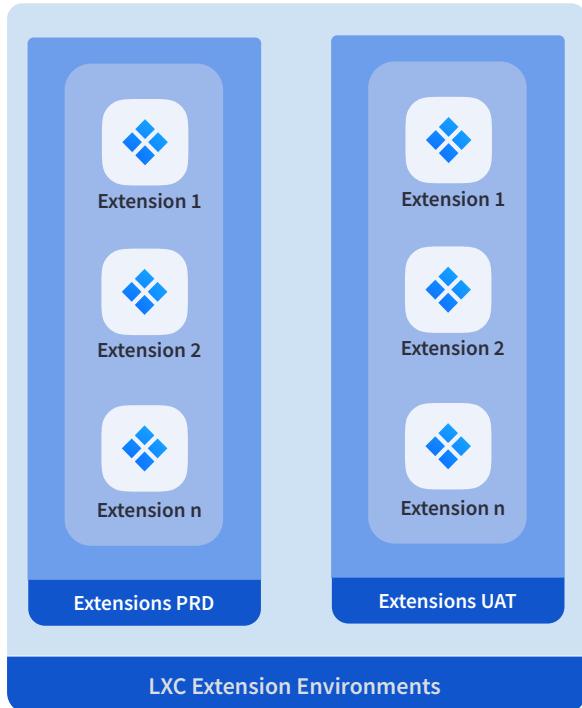
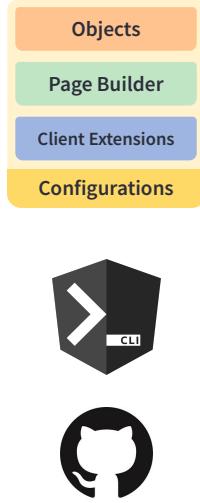
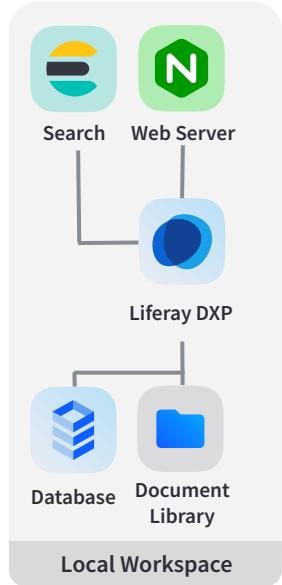
UAT



PROD



Architecture



Setting up local development environment

1 **Install docker**

2 **Install JAVA and gradle**

3 **Install LCP CLI**

Configuring Client Extensions

Client extensions are defined in `client-extension.yaml` files containing these properties:

- `name`: Enter the name as it appears in the Liferay UI. If it's not configurable in the UI, the name value is not used.
- `type`: Set the client extension's type (e.g., `globalCSS`). The type determines how Liferay handles the client extension when it is deployed.
- `dxp.lxc.liferay.com.virtualInstanceId`: Enter the ID of the virtual instance to deploy to.

Each client extension project lives in a folder inside of the workspace's `client-extensions/` folder. The project contains a single `client-extension.yaml` file, which defines one or more client extensions. For example, [the iframe-2 project's](#) `client-extension.yaml` defines three `iframe` client extensions: `Baseball`, `Football`, and `Hockey`.

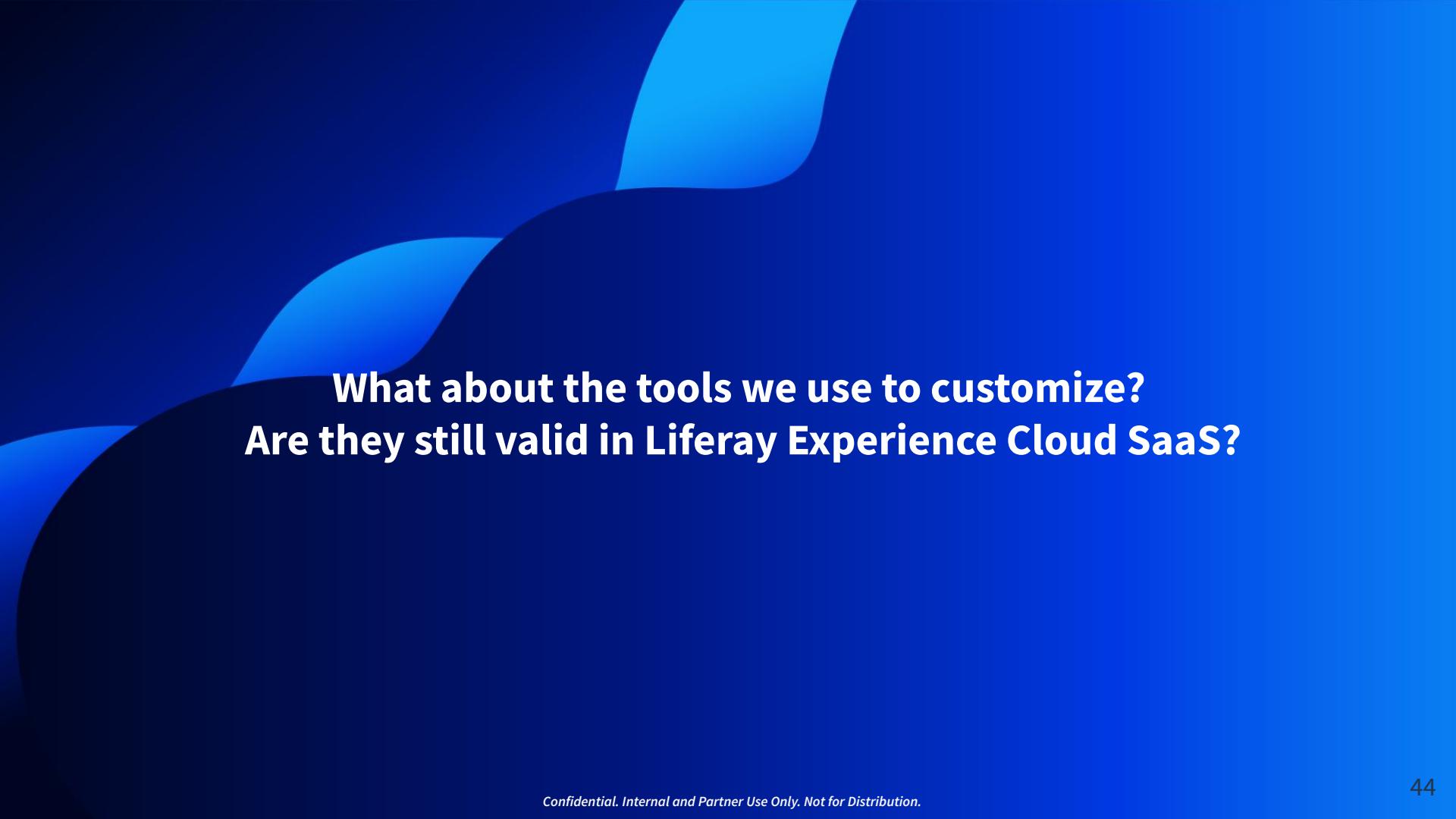
Additional Source Files

The client extension's source files are in the project's `src/` folder by default. You can specify additional files to include in the built archive using an `assemble` block in the `client-extensions.yaml` file:

```
assemble:  
  - from: assets  
    include: "**/*"  
    into: static
```

The assemble block has these properties:

- `from`: Set a folder in your client extension project that houses the additional resources. When you build the client extension, these resources are included in the `.zip` file. You can use multiple `from` definitions in the `assemble` block, with each containing an `into` property.
- `include`: Enter a single file or glob syntax to find the desired files in the `from` directory.
- `into`: Specify where to include the additional resources in the built `.zip` file. For example, the source files for many front-end client extensions (like JavaScript or CSS client extensions) must be in the `static` directory so that Liferay can serve them as static resources for your site



**What about the tools we use to customize?
Are they still valid in Liferay Experience Cloud SaaS?**

Customer Requirement 1

"Matheus is the name of a Liferay user and He can create Contents. If my users search for "Matheus", I don't want the contents created by Matheus to appear in the results, only the ones who really contains the word "Matheus" in its fields".



Possible Solution 1

- They don't want to index the "author" field of the Web Contents.
- We can use **Index No Processors**.



SaaS Solution 1 - Use Search BluePrints

Friendly UI for building fully custom search behaviors via reusable “Blueprints”

- Visual query builder
- Boost, filter, hide, and match results on any indexed property
- Context-aware
- Predictive search

The screenshot shows a user interface for managing search blueprints. At the top, a header reads "Edit Blueprint" with a subtitle "Optimize for Knowledge Management and Discovery" and a description: "A Blueprint with custom clauses for content driven sites. Emphasizes content qualities like freshness, length and updates in calculating relevance....". Below the header are "Preview", "Cancel", and "Save" buttons.

The main area is divided into two sections: "Query Builder" and "Settings".

Query Builder:

- Boost Contents in a Category for a Period of Time:** This section is active, indicated by a blue toggle switch. It includes fields for "Asset Category" (set to 83475), "Create Date: From" (12/17/2020), "Create Date: To" (02/03/2021), and a "Boost" value of 1.
- Text Match Over Multiple Fields:** This section is also active. It includes a table for "Fields" with four rows: "Title" (User's Language, weight 2), "Content" (User's Language, weight 1), "Description" (User's Language, weight 1), and "Name" (User's Language, weight 1). It also includes "Operator" (set to OR), "Match Type" (Best Fields), "Fuzziness" (Auto), and a "Boost" value of 1.

Preview: On the right, there is a "Preview" panel with a search bar, a "Refresh" button, and a message: "Try a search to see how your Blueprint influences your search results."



SaaS Solution 1 - Use Search BluePrints

- [Official doc](#)
- #help-search slack channel

Customer Requirement 2

"Lifebank is a company that needs to update some internal system specifications everytime a new Liferay user is created. Their internal system has an API for that".



Possible Solution 2

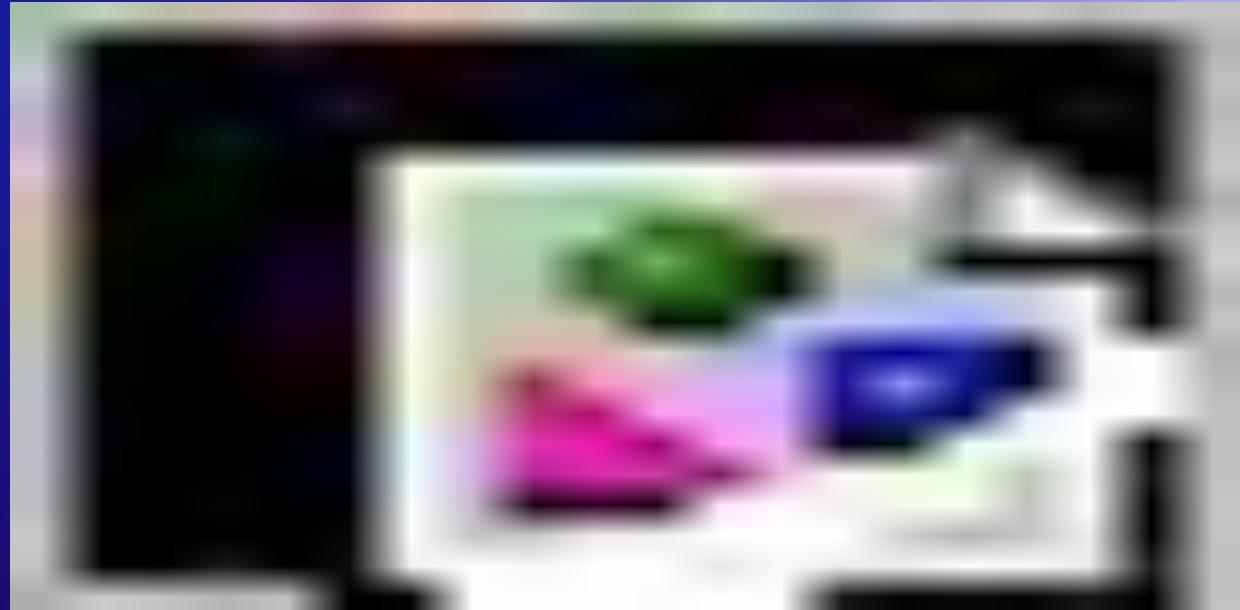
- Very easy: Is is clearly a "OnAfterCreate" event.
- Let's use ~~Model listeners~~.



SaaS Solution 2 - Object Actions

Object actions define custom business logic that you can run manually or automatically for object entry events

- Define "on after" or "standalone" events (missing "onBefore").
- Send a notification, update or add an object entry, Deliver a payload to a URL



SaaS Solution 2 - Object Actions

- [Official doc](#)
- #help-objects slack channel

Customer Requirement 3

"There is no advanced use case for that: The customer needs an impressive look and feel compatible with their Design material".



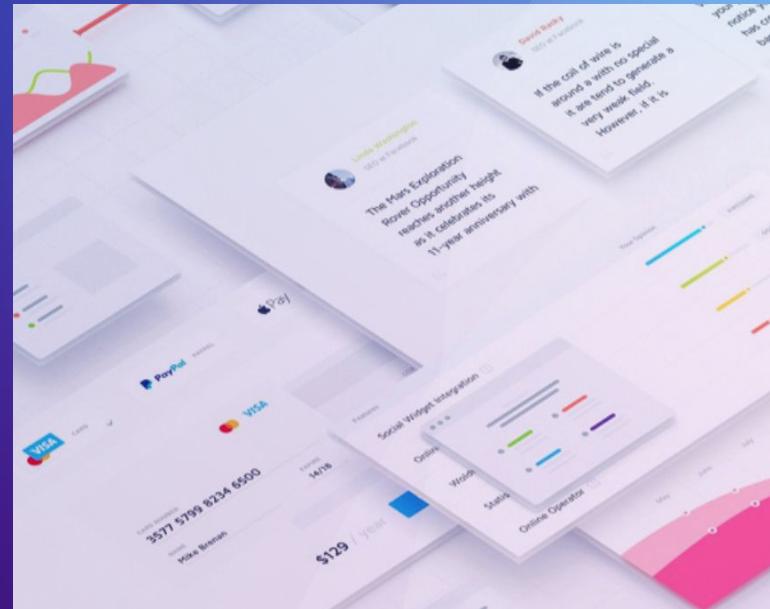
Possible Solution 3

- Obviously: Times



SaaS Solution 3 - Themeless styling extension capabilities

- Users are able to add CSS, JS and the necessary Design Resources to a site or page without the need to modify the Theme.
- There is no need to access the Theme to modify styles of a site or page.
- The Page or Site look & feel does not break when replacing the OOTB styles provided by Clay.



SaaS Solution 3.1 - CSS Client Extensions

Extend the CSS of a page, Master or Layout Set from Page Configuration without Theme deployment with CSS Client Extensions

- CSS extensions can be applied to Layout sets, Master pages and pages/page templates, and they work hierarchically, meaning that pages could inherit extensions applied in their Master pages, and also load their own ones.
- CSS extensions can be created from the Remote Apps UI, or from the Liferay Workspace.

The screenshot illustrates the process of creating and applying CSS Client Extensions in the Liferay Workspace.

Top Panel: Shows the configuration dialog for a new CSS Extension named "my CSS Extension". It includes fields for "Source Code URL" (set to "https://www.mywebsite.com/css") and "CSS EXTENSIONS" (with two entries: "My CSS extension 1" and "My CSS Extension 2"). Buttons for "Publish" and "Cancel" are at the bottom.

Bottom Panel: Shows the "GovUK Landing Page" in the Liferay Workspace. A modal dialog is open asking "Which types of waste do you transport?". The sidebar on the right displays the "Fragments and Widgets" section, which includes a "LAYOUT ELEMENTS" category with options like Container, Grid, and a "BASIC COMPONENTS" category listing various UI components such as Button, Cell, Dropdown, External Video, HTML, Heading, Image, Paragraph, Separator, Social, Space, and Tab.

SaaS Solution 3.2 - JS Client Extensions

Extend the Javascript of a page, Master or Layout Set from Page Configuration without Theme deployment with JS Client Extensions

- Users can now create and apply Javascript extensions, to extend the behavior of their pages without the need to add Javascript to the Theme and redeploy. It is available through a new configuration option, enabled in the Page Design Options section.
- Users can decide if the Javascript extensions are added to either the page <head> or the page bottom.

JAVASCRIPT EXTENSIONS			
Add JavaScript Extensions		Inherited	Load
Order	Name		
PAGE HEAD JS EXTENSIONS			
1	My Javascript extension 2	From Master	default
2	My JAvascript Extension 3	-	default
PAGE BOTTOM JS EXTENSIONS			
3	My Javascript Extension	From Master	default
4	My Javascript Extension 4	-	default

SaaS Solution 3.3 - Theme CSS Client Extension

Modify Theme CSS of Pages, Masters or Layout Sets, without the need to redeploy the Theme.

- Users can now add or modify the Theme CSS their pages, Masters or Layout sets
- A new Client Extension type, called Theme CSS, is now available.
- Theme CSS Client Extensions can be created from Remote Apps, or from the Liferay Workspace, and they allow users to provide the Clay CSS and Main CSS files that are resulting from their own Themes build, so that they can be connected to their pages without the need to redeploy the Themes.
- This Client Extension type can be applied to Layout sets, Master pages and pages, and pages can inherit the Theme CSS Client Extensions from either the associated Layout set or the Master Page.

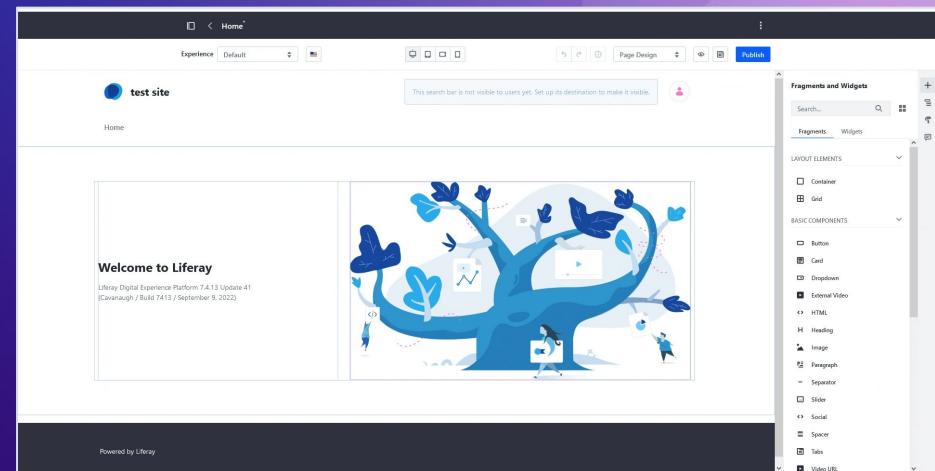
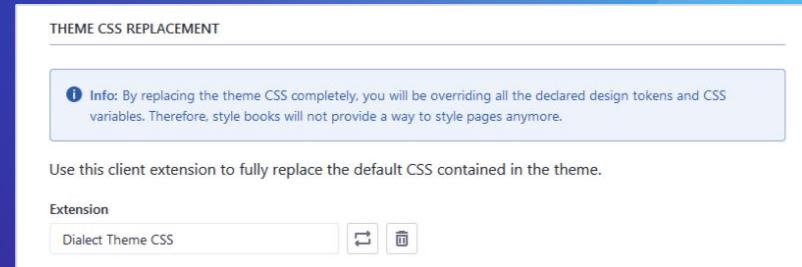
THEME CSS REPLACEMENT

Info: By replacing the theme CSS completely, you will be overriding all the declared design tokens and CSS variables. Therefore, style books will not provide a way to style pages anymore.

Use this client extension to fully replace the default CSS contained in the theme.

Extension

Dialect Theme CSS



SaaS Solution 3 - Themeless styling extension capabilities

- Confluence Page
- [Jira Ticket](#)
- #t-dxp-echo slack channel

Customer Requirement 4

"I need a template to print, besides other things, my Blog Posts Titles".



Possible Solutions 4

- It does not seem to be difficult: We can use **Freemarker Template**.
- We can ~~simply~~ build more things using **Service Locator**.



SaaS Solution 4 - Headless resources for templates

Template developers will be able to leverage the headless resources in their templates (widget templates, information templates...) through the restClient object.

- The argument is the relative URL to the desired endpoint (including any parameters). It can be copied from API Explorer.

Responses

Curl

```
curl -X 'GET' \
  'http://localhost:8080/o/headless-delivery/v1.0/sites/20121/blog-postings' \
  -H 'accept: application/json' \
  -H 'x-csrf-token: UDx03lre'
```

Request URL

```
http://localhost:8080/o/headless-delivery/v1.0/sites/20121/blog-postings
```

```
<#assign  
  
blogPostings =  
restClient.get("/headless-delivery/v1.0/sites/${groupId}/blog-postings").items  
/>  
  
<#list blogPostings as blogPosting>  
    <h1>${blogPosting.headline}</h1>  
</#list>
```



SaaS Solution 4 - Object Actions

- [Confluence Page](#)
- [PoC](#)



Customer Requirement 5

"I want to show all of the articles in a page that match an specific filter. This widget will appear in a variety of pages and the filter can be changed in time".



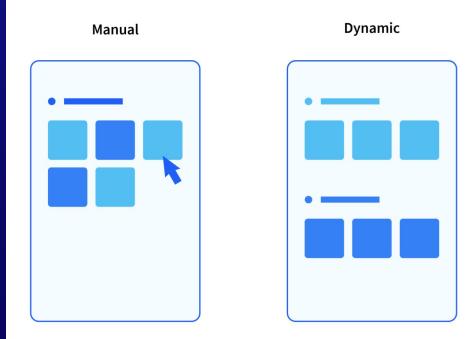
GS Possible Solutions 5

- We don't like the "Filter can be changed" part
but we will recommend Association Publisher.



SaaS Solution 5 - Collections

Collections are sets of content items that you can use to group and filter information. Collections can include many different types of content or just one specific type of content. You can then display them on a collection page, which you can present in your desired format using page fragments.



A screenshot of a SaaS solution interface titled 'Sports'. The top navigation bar includes 'Experience', 'Default', a language dropdown set to 'en-US', and a 'Sports' tab. On the right side, there's a toolbar with icons for 'Section', 'Grid', 'Container', 'Basic Components' (with sub-options like 'Heading', 'Paragraph', 'Image', etc.), and 'Content Display' (with sub-options like 'Content Display', 'Content Flags', and 'Content Ratings'). The main content area shows a search bar with filters: 'Sports' (3 Selected), 'People' (1 Selected), and 'Winner'. Below the filters, a message states '21 results for Sports: 3 selected : Williams : "Winner"'. Two news cards are displayed: 'FOOTBALL' with the headline 'Messi says goodbye in Paris and PSG unlocks the operation' and 'CHAMPIONS' with the headline 'Neymar on target as PSG overcome Dortmund'. Both cards are attributed to 'David Aragonés'.

SaaS Solution 5 - Collections

- [Official doc](#)
- #t-search-fragments-collections slack channel

Customer Requirement 6

"I want to test every new feature in a low level environment (e.g. UAT) before pushing them to Production".



Possible Solutions 6

- Can we offer Staging ?
- What about Publications? That would bring all their Objects Data and Definition, right?



SaaS Solution 6 - Batch Client Extension

Client Extension to move Data Definitions

```
        },
        "name": "Sample",
        "objectActions": [
            {
                "active": true,
                "conditionExpression": "",
                "description": "",
                "errorMessage": {
                },
                "label": {
                    "en_US": "Sample Update 1"
                },
                "name": "SampleUpdate1",
                "objectActionExecutorKey": "function#sample-object-action-1",
                "objectActionTriggerKey": "onAfterUpdate",
                "parameters": {
                },
                "status": {
                    "code": 0,
                    "label": "never-ran",
                    "label_i18n": "Never Ran"
                }
            },
            {
            }
        ]
    }
```

SaaS Solution 6 - Batch Client Extension

- PoC
- #lxc-client-extensions
- p-lxc

Customer Requirement 7

"I want to add my Settings in a repository and promote these settings from UAT/PRD".



Possible Solutions 7

- .config files in the /osgi/configs folder.



SaaS Solution 7 - Client Extension

Client Extension can do the trick



**System Settings are NOT allowed to be changed!
Only Instance Settings.**

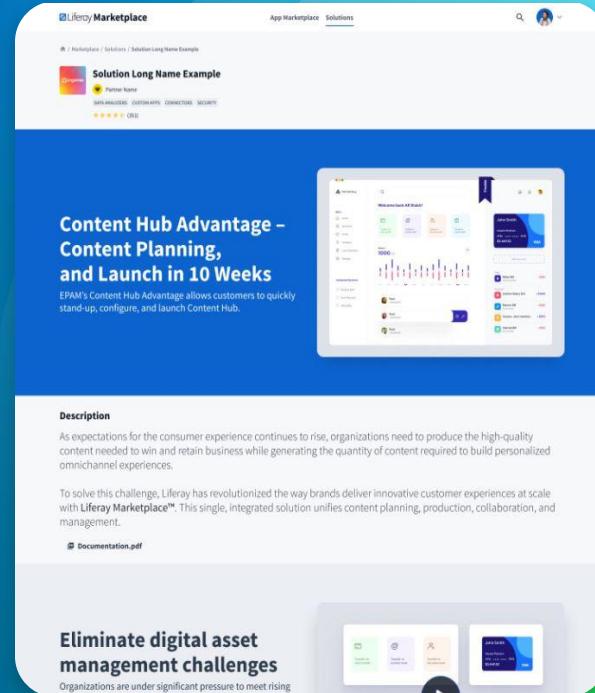
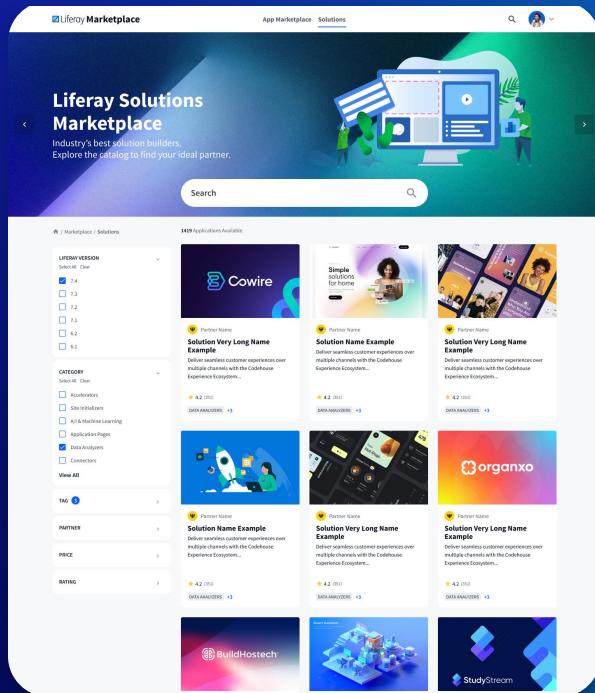
The screenshot shows the 'Instance Settings' interface with a search bar at the top. Below it is a 'SECURITY' section containing icons for API Authentication, LDAP, Login, Multi-Factor Authentication, OAuth 2, Security Tools, and SSO. The main area is divided into several sections: 'CONTENT AND DATA' (Announcements, Assets, Blogs, Breadcrumbs, Click to Chat, Comments, Community Tools, Data Providers, Digital Signature, Display Content, Documents and Media, Dynamic Data Mapping, Forms, Icons Admin, Knowledge Base, Message Boards, Navigation, Page Fragments, Pages, RSS, Segments, Sharing, Translation, User Activity, Web Content, Wiki), 'OTHER' (Batch Engine, Channel, Custom Dialogs, Tax), and a bottom row of icons.

SaaS Solution 7 - Client Extension

- #lxc-client-extensions
- p-lxc

Besides everything already mentioned, there is also a lot more to come...

- Market Place 2.0



App Marketplace

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842 Applications Available

LIFERAY VERSION

[Select All](#) [Clear](#)**Blue Transport**

Blue Inc.

This app integrates Liferay DXP with

**Chameleon Intranet**

Entry

This app integrates Liferay DXP with

**Azure Payment**

Azure Enterprise

This app integrates Liferay DXP with

Liferay Marketplace

Apps

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Dashboard

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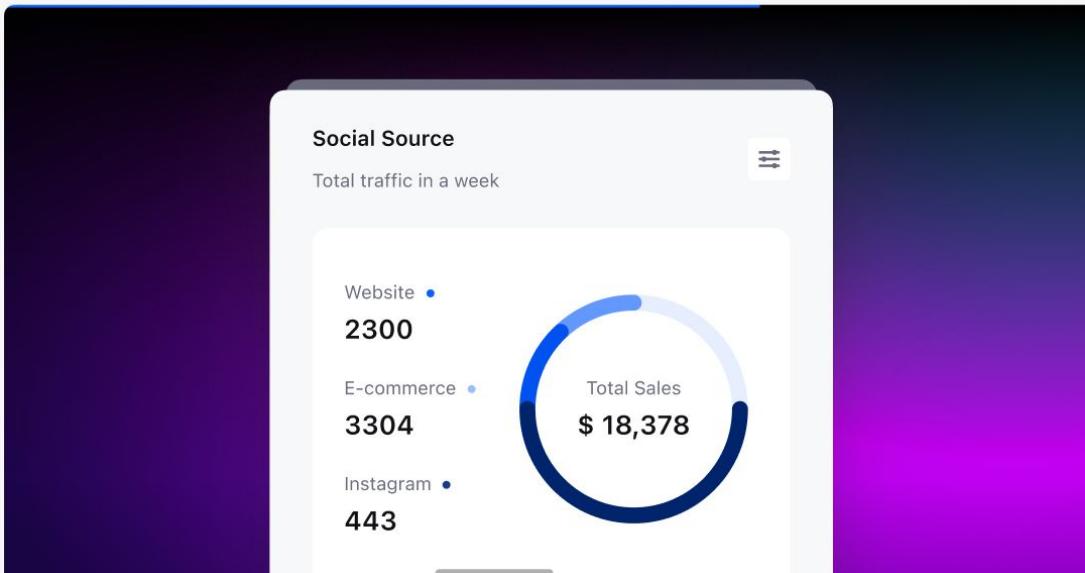
A&Co Data Viz

Data Modeling and Business Logic

Analytics and Optimization

[Install App](#)

15-days trial or \$ 79.99 USD one-time payment



DEVELOPER

Acme Co

PUBLISHED DATE

Oct 22 2022

VERSION

1.0.0

SUPPORTED VERSIONS

DXP 7.4



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Choose app payment method and edit purchasing details

15-days Trial

Try now. Pay later

One-time Payment

Pay now. Use it indefinitely

**A&Co Data Viz**

v1.0.0 by Acme Co. App purchase

Price

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Purchasing as



Don Matsumae (you)

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h3v3

LXC

Extensions

DXP Access

exth3v3 2 environments

h3v3extprd 3 Extensions Latest deployment 13 1w ago Ready

h3v3extuat 5 Extensions Latest deployment 27 1d ago Ready

Production webserver-lxch3v3-h3v3prd...

Testing webserver-lxch3v3-h3v3uat...

Apps

apph3v3acmeflows v1.3 2 environments

h3v3appprd 3 Extensions Latest deployment 24 1w ago Ready

h3v3appuat 3 Extensions Latest deployment 56 1w ago Ready

[Back](#)

Install marketplace app

Order ID

Provide the [order ID](#) of the app you want to install on project h3v3

App Order ID

Install App

[Back](#)

Install marketplace app

Order ID

Provide the [order ID](#) of the app you want to install on project h3v3

App Order ID

345678903

[Clear](#)**A&Co Data Viz** v1.0.0

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By clicking on the button "Install App" below, I confirm that I have read and agree to the Liferay [privacy policy](#) and [terms](#)

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Installing an app may take a few minutes to complete. Why?

h3v3

LXC

New App

Extensions

DXP Access



exth3v3

2 environments

h3v3extprd

3 Extensions

Latest deployment

13

1w ago

Ready



h3v3extuat

5 Extensions

Latest deployment

27

1d ago

Ready



Apps



apph3v3acodataviz

v1.0.0

2 environments

h3v3appprd

2 Extensions

Latest deployment

1

a min ago

Ready



h3v3appuat

2 Extensions

Latest deployment

1

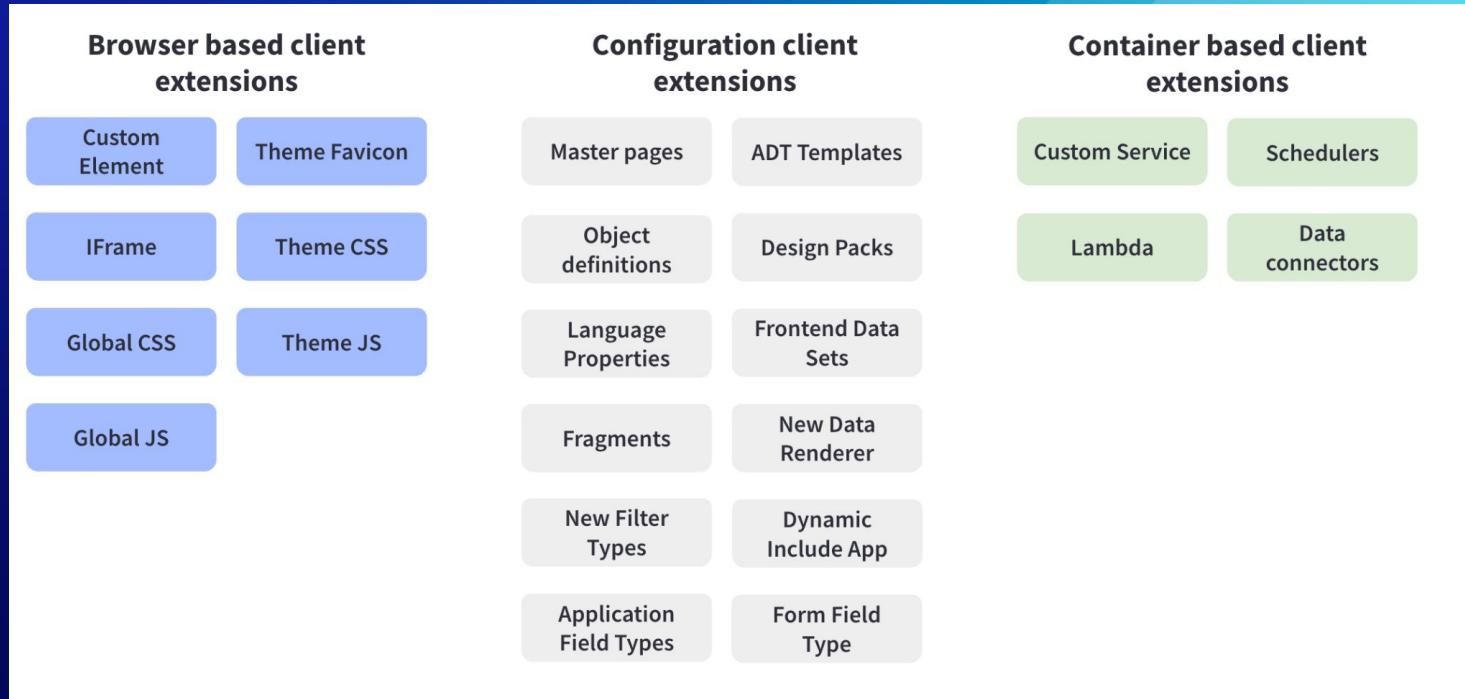
a min ago

Ready



Besides everything already mentioned, there is also a lot more to come...

- New client Extensions



Questions?



Thank You