

# Digital Twins Deployment Platform

A platform to install, deploy, use and monitor  
Digital Twins

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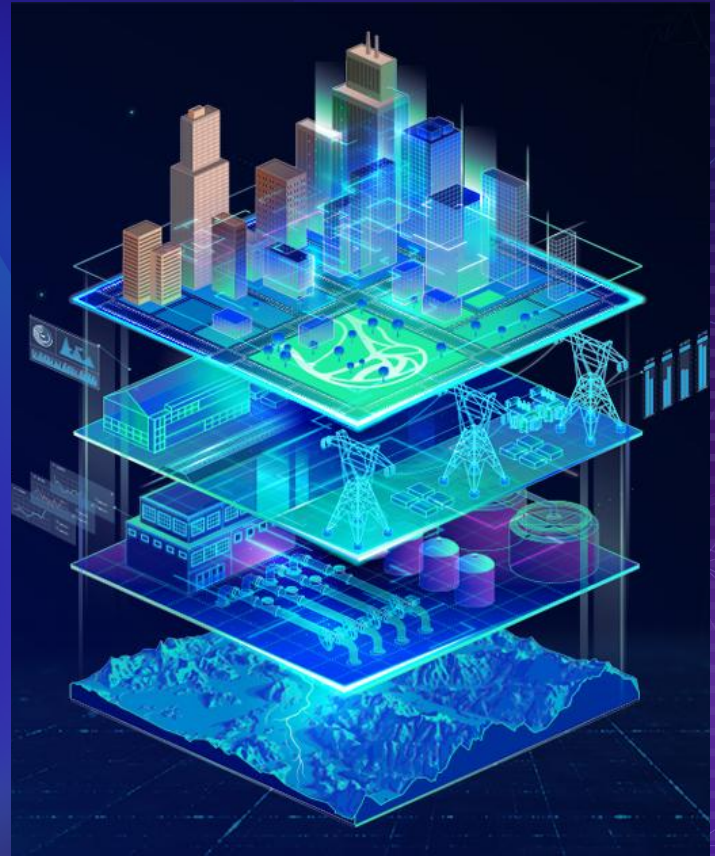
# Introduction

# What is a Digital Twin?

A digital twin refers to a virtual representation of a physical object, system, or process.

It is a digital counterpart that mirrors the real-world entity and is typically created using data collected from sensors, IoT devices, and other sources.

The idea is to have a dynamic, real-time representation that can be used for analysis, monitoring, and simulation.



# Digital Twin Requirements



Data  
Integration



Real-time  
Monitoring



Simulation &  
Analysis



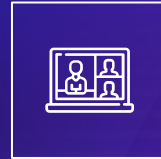
Interconnectivity



Security



Scalability



User Interface  
& Experience



Lifecycle  
Management

# Digital Twin Challenges

## Data Quality and Availability

Ensuring the quality, accuracy, and availability of data from diverse sources can be challenging, impacting the reliability of the digital twin.

## Interoperability

Achieving seamless interoperability with existing systems and platforms can be complex, especially in environments with diverse technologies.

## Security Concerns

Managing security risks, including the protection of sensitive data and prevention of cyber threats, poses an ongoing challenge.

## Scalability Issues

Ensuring that the digital twin remains scalable as the physical system grows in complexity or size.

## Standardization

The lack of standardized protocols and formats for digital twin implementation can hinder interoperability and collaboration.

```
54 //it became hidden?
55 t.is(':visible') {
56 //it became hidden
57 t.appeared = false;
58 return;
59 }
60 //is the element inside the visible window?
61 var a = w.scrollLeft();
62 var b = w.scrollTop();
63 var o = t.offset();
64 var x = o.left;
65 var y = o.top;
66
67 var ax = settings.accX;
68 var ay = settings.accY;
69 var th = t.height();
70 var wh = w.height();
71 var tw = t.width();
72 var ww = w.width();
73
74 if (y + th + ay >= b &&
75     y <= b + wh + ay &&
76     x + tw + ax >= a &&
77     x <= a + ww + ax) {
78     //trigger the custom event
79     if (!t.appeared) t.trigger('appear', settings.data);
80 } else {
81     //it scrolled out of view
82     t.appeared = false;
83 }
84 };
85
86 //create a modified fn with some additional logic
87 var modifiedFn = function() {
88     //mark the element as visible
89     t.appeared = true;
90
91     //is this supposed to happen only once?
92     if (settings.one) {
93         //remove the check
94         w.unbind('scroll', check);
95         var i = $.inArray(check, $.fn.appear.checks);
96         if (i >= 0) $.fn.appear.checks.splice(i, 1);
97     }
98
99     //pass the original fn
100     (fn)(arguments);
101 }
```

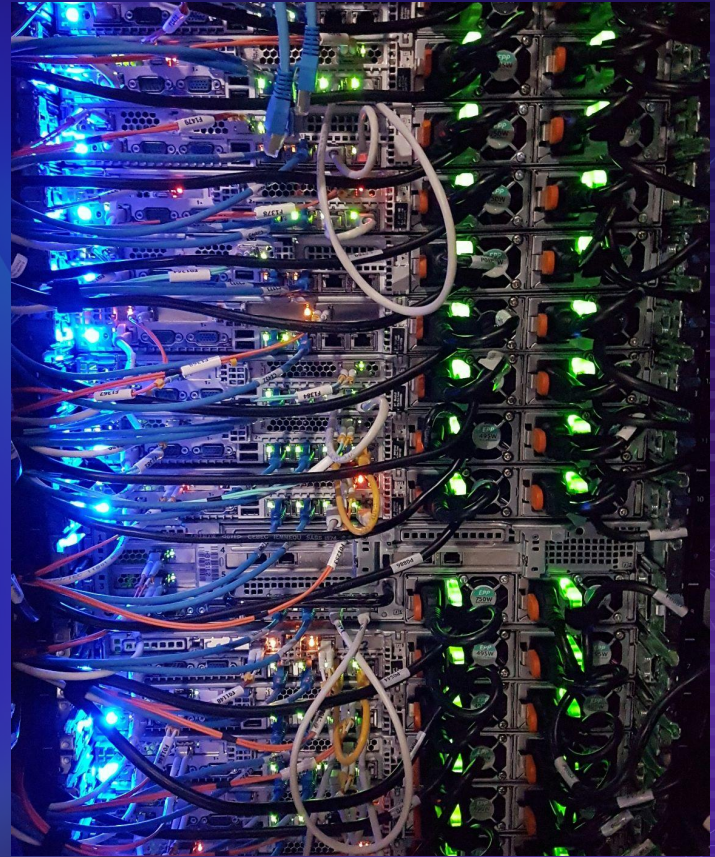
## 02

# Project Overview

# Project Overview

Our Digital Twin Integration and Deployment Platform is a solution designed to streamline the deployment and integration of digital twins across various research projects.

This platform acts as a robust infrastructure that enables organizations to create, manage, and leverage digital twins for enhanced operational insights, predictive analytics, and overall efficiency improvements.



# Technology Stack

## Infra



## Development



django



NEXT.js

## Tools



## Deployment



CI/CD



NGINX

## Monitoring



Grafana

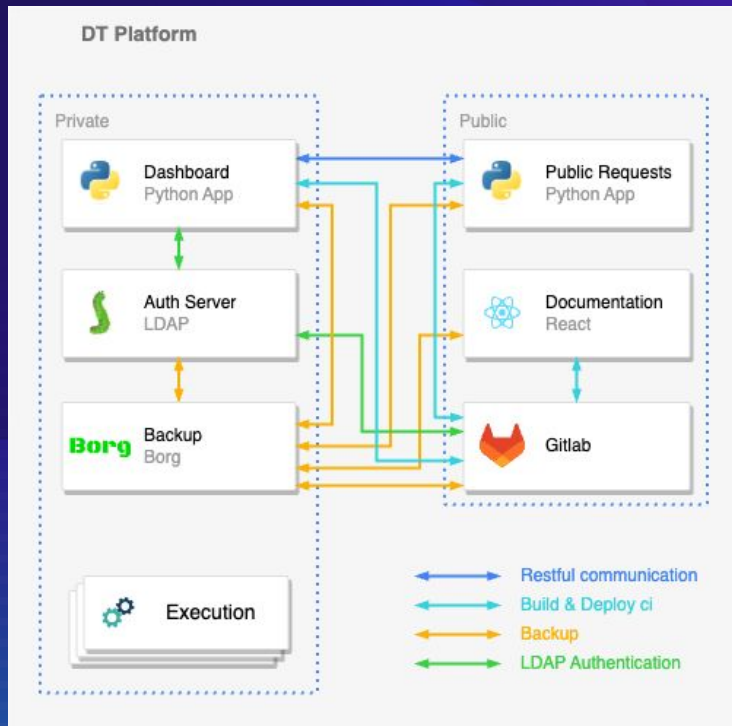




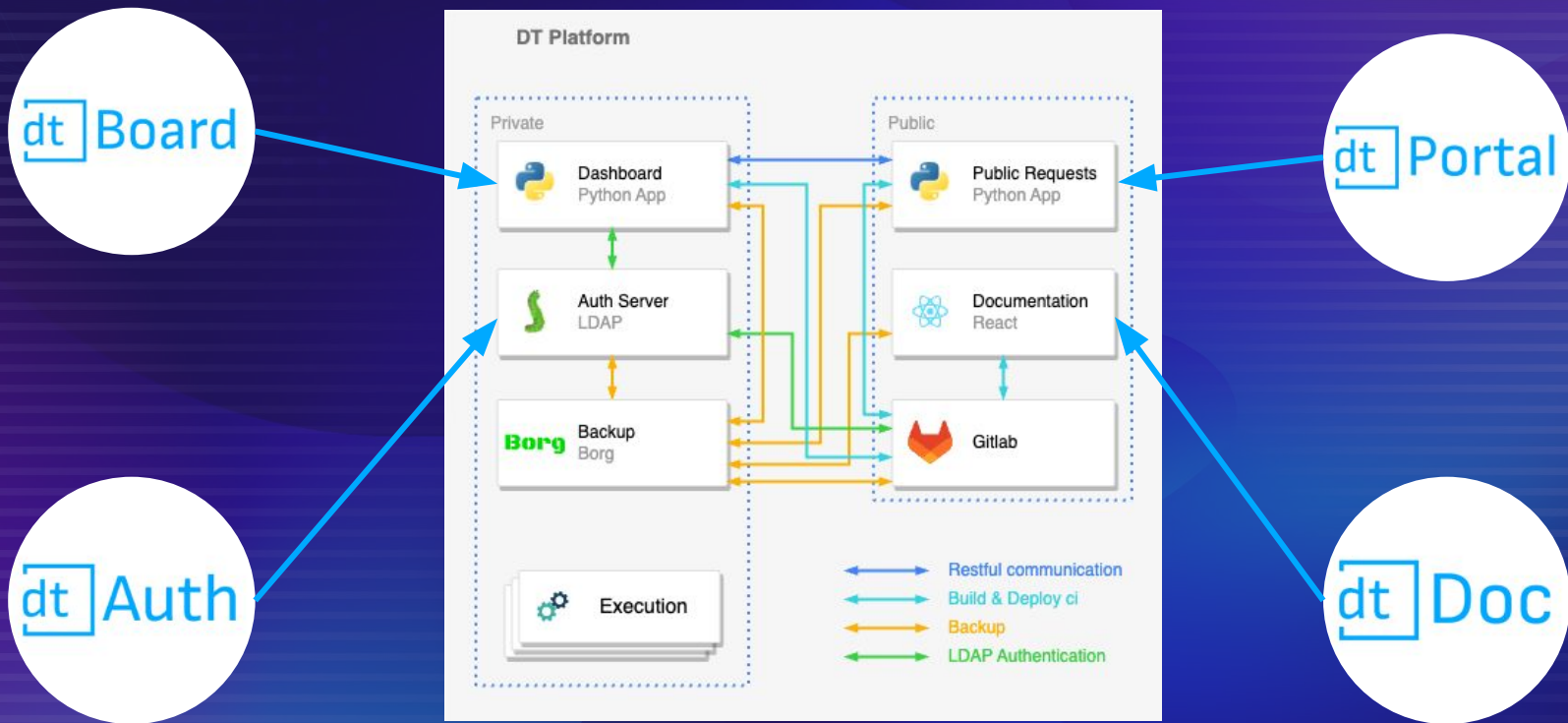
03

# Project Architecture

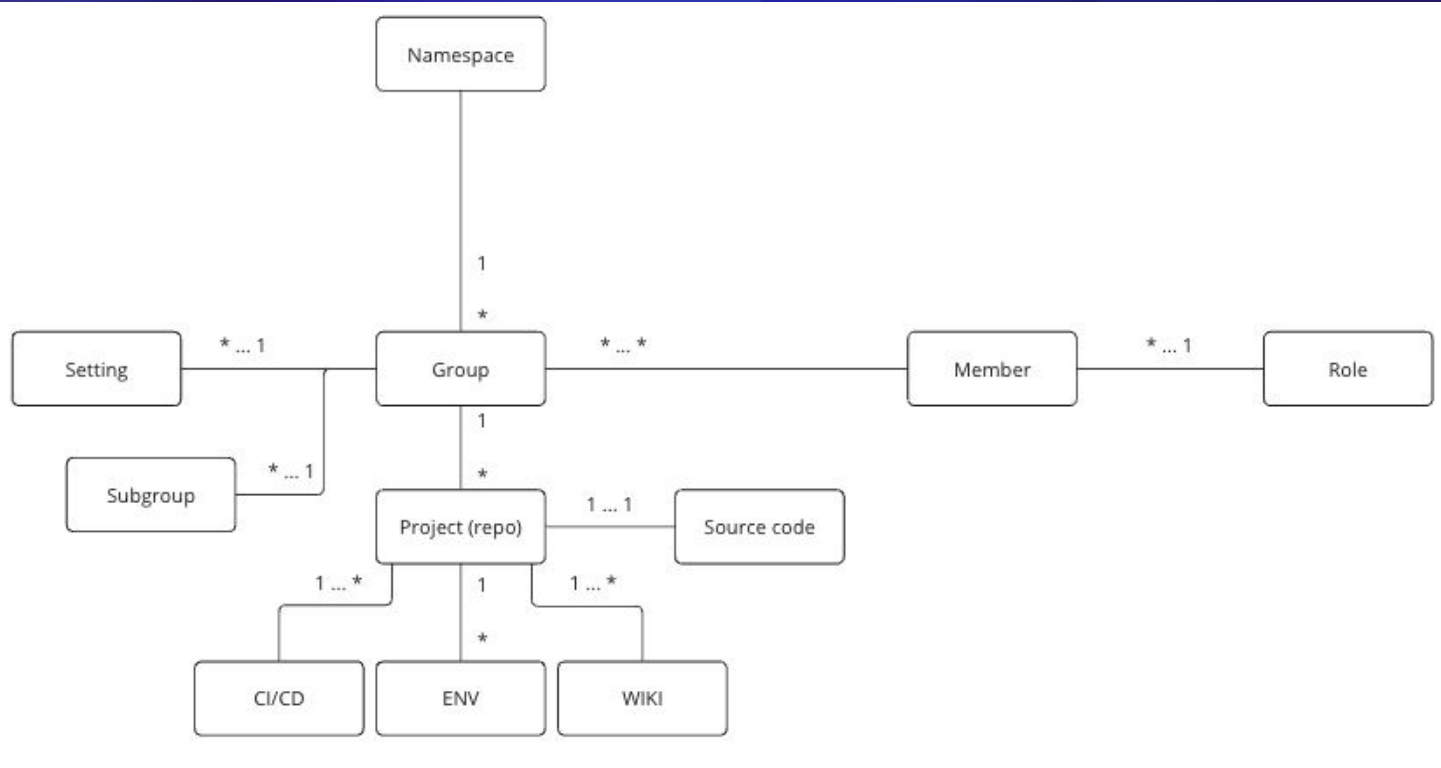
# Architecture Overview



# Architecture Overview



# GitLab Integration

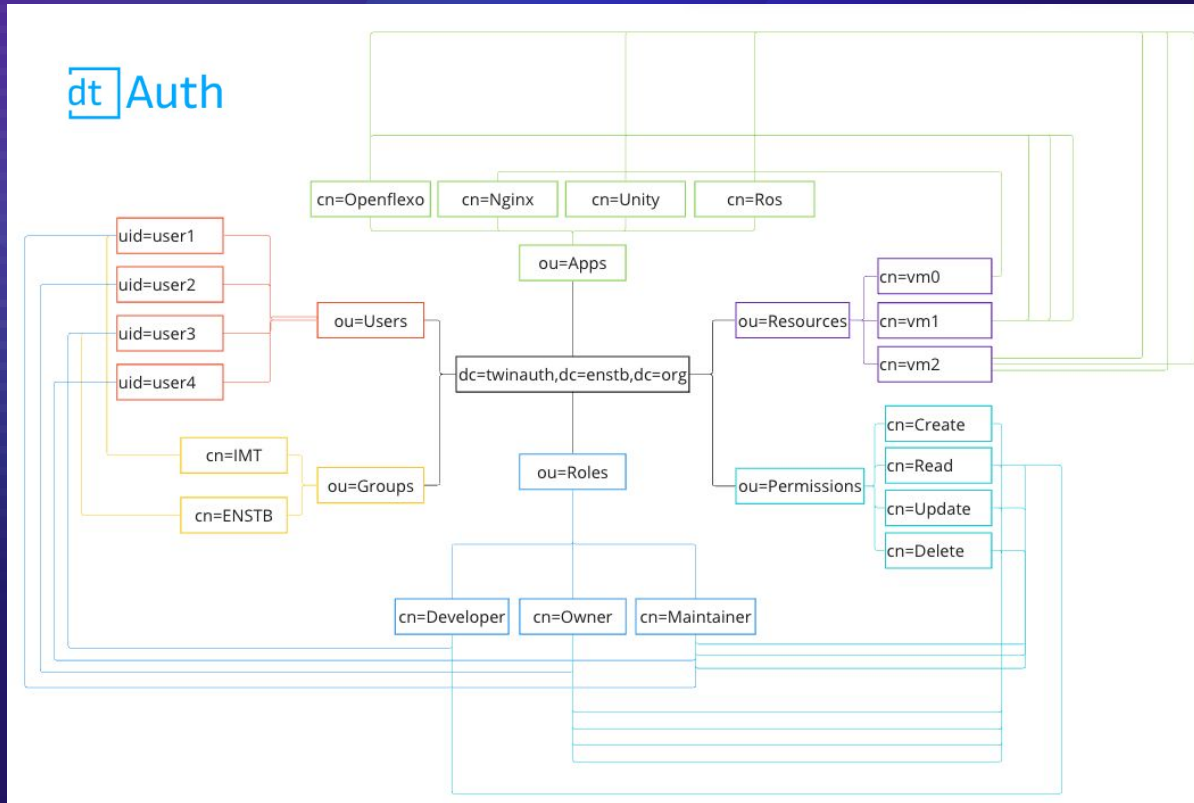


# GitLab Integration

The screenshot displays the GitLab web interface for the 'dt-workspace' group. The interface is organized into several sections:

- Header:** Shows the group name 'dt-workspace' and navigation options like 'New subgroup' and 'New project'.
- Subgroups and projects:** A list of subgroups and projects, each with its own set of statistics (stars, forks, issues) and a '1 month ago' timestamp.
- Subgroups:**
  - DigitalTwins:** Contains subgroups 'DTfischertechnik', 'Templates', and 'TwinCoBot'.
  - DT-Core:** Contains projects 'dt-auth', 'dt-board', 'dt-doc', and 'dt-portal'.
  - Members:** Contains subgroups 'ENSTB' and 'IMT'.
  - Tools:** Contains projects 'Blender', 'NodeRed', and 'Ros'.
- Left Sidebar:** Contains navigation options such as 'Pinned', 'Issues', 'Merge requests', 'Manage', 'Plan', 'Code', 'Build', 'Deploy', 'Operate', and 'Settings'.
- Bottom:** Includes 'Help' and 'Admin Area' links.

# LDAP Authentication Server

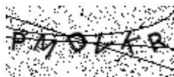


# dtPortal

dtPortal

## Register

Already have an account? [Log in](#)



Register

Welcome to dtPortal

Unlock the Power of Your Digital Twins.



# dtPortal

dt Portal

Overview

Requests

New Request



## Requests

+ Add

#	USER	TITLE	CONTENT	STATUS	DATE
1	i22benam	Resource Allocation Dashboard	Hello Team, I propose the addition of a resource allocation dashboard to the platform. This dashboard would provide an overview of resource utilization across all deployed instances, allowing users to identify potential bottlenecks and optimize resource allocation. Including visualizations such as charts and graphs would enhance data interpretation. I'm open to discussing the details and potential implementation of this feature. Regards	Created	12/12/2023 14:12:88
2	i22benam	Alert System	Implement alerts for immediate notification of critical thresholds.	In progress	12/12/2023 14:12:47
3	i22benam	Enhanced Deployment Workflow	Dear Team, I would like to suggest an enhancement to the deployment workflow. Currently, the process involves several steps, and I believe streamlining it would improve overall efficiency. Specifically, integrating a guided deployment wizard with step-by-step instructions and validation checks would make the process more user-friendly. This could significantly benefit users, especially those new to the platform. Looking forward to discussing this proposal further. Best regards,	Finished	12/12/2023 14:12:46
4	i22benam	Scheduled Instance Backups	Hi Team, I've noticed a need for a scheduled instance backup feature. This would allow users to automate regular backups of their digital twin instances, providing a safety net in case of unexpected issues or failures. I'd love to hear your thoughts on incorporating this into our platform. Thanks,	Refused	12/12/2023 14:12:74

Rows per page: 5 ▾ 1-4 of 4 < >

# dtBoard

The screenshot displays the dtBoard interface. On the left is a sidebar with navigation options: GITLAB (Groups, Projects, Users), PUBLIC REQUESTS (Requests), and REMOTE HOST MANAGEMENT (Runner [DEV], Runner 1, Runner 2). At the bottom of the sidebar are two buttons: 'Sync DB/LDAP' and 'Sync Gitlab/LDAP'. The main content area has a blue header with a menu icon, a user profile 'Hi, ibenamer', and a breadcrumb 'Dashboard / List requests'. Below the header is a 'Requests' section with a 'Public Requests List' title. A search bar and a 'Show 10 entries' dropdown are present. The table below has columns for #, User, Status, Title, Content, Created at, and Action. It lists four requests with statuses: Created, In progress, Finished, and Refused. At the bottom, it shows 'Showing 1 to 4 of 4 entries' and navigation links for 'Previous', '1', and 'Next'.

dt Board

Hi, ibenamer

Dashboard / List requests

## Requests

### Public Requests List

Show 10 entries Search:

#	User	Status	Title	Content	Created at	Action
1	i22benam	Created	Resource Allocation Dashboard	Hello Team, I propose the addition of a resource allocation dashboard to the platform. This dashboard would provide an overview of resource utilization across all deployed instances, allowing users to identify potential bottlenecks and optimize resource allocation. Including visualizations such as charts and graphs would enhance data interpretation. I'm open to discussing the details and potential implementation of this feature. Regards	2024-01-16T09:43:47.684477+01:00	Action
2	i22benam	In progress	Alert System	Implement alerts for immediate notification of critical thresholds.	2024-01-16T09:44:02.480634+01:00	Action
3	i22benam	Finished	Enhanced Deployment Workflow	Dear Team, I would like to suggest an enhancement to the deployment workflow. Currently, the process involves several steps, and I believe streamlining it would improve overall efficiency. Specifically, integrating a guided deployment wizard with step-by-step instructions and validation checks would make the process more user-friendly. This could significantly benefit users, especially those new to the platform. Looking forward to discussing this proposal further. Best regards,	2024-01-16T09:44:17.379096+01:00	Action
4	i22benam	Refused	Scheduled Instance Backups	Hi Team, I've noticed a need for a scheduled instance backup feature. This would allow users to automate regular backups of their digital twin instances, providing a safety net in case of unexpected issues or failures. I'd love to hear your thoughts on incorporating this into our platform. Thanks,	2024-01-16T09:44:29.258487+01:00	Action

Showing 1 to 4 of 4 entries Previous 1 Next

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# dtBoard

The screenshot displays the dtBoard interface for managing groups. The left sidebar contains navigation menus for GITLAB, PUBLIC REQUESTS, and REMOTE HOST MANAGEMENT. The main content area shows the 'Groups List' page with a search bar and an 'Add new Group' button. A table lists various groups with their details.

#	Name	Visibility	Path	Created at	Action
4	dt-workspace	public	dt-workspace	2023-11-14T09:26:16.594Z	Action
5	Members	internal	dt-workspace/members	2023-11-14T10:03:44.566Z	Action
6	ENSTB	private	dt-workspace/members/enstb	2023-11-14T10:03:57.962Z	Action
7	IMT	private	dt-workspace/members/imt	2023-11-14T10:04:15.393Z	Action
8	DigitalTwins	internal	dt-workspace/digitaltwins	2023-11-14T10:04:35.925Z	Action
9	DTfischertechnik	private	dt-workspace/digitaltwins/dtfischertechnik	2023-11-14T10:04:42.213Z	Action
10	TwinCoBot	private	dt-workspace/digitaltwins/twincobot	2023-11-14T10:04:55.091Z	Action
12	Tools	internal	dt-workspace/tools	2023-11-14T10:13:38.877Z	Action
25	DT-Core	private	dt-workspace/dt-core	2023-11-28T14:22:47.700Z	Action
48	Templates	internal	dt-workspace/digitaltwins/templates	2024-01-12T11:49:27.269Z	Action

# dtBoard

**dt Board**

Hi, ibenamer

## Remote Host Management

Dashboard / List images

### Images List

Show  entries Search:

#	Created	Repo Tags	Size	Shared Size	Virtual Size
31d1d6e16394	2021-02-19 13:09:16	osixia/openldap.latest	256.69 MB	-0.00 MB	256.69 MB
735833aaae8e	2023-08-31 13:02:30	ldapaccountmanager/lam-3.4	388.83 MB	-0.00 MB	388.83 MB
d2c94e258dcb	2023-05-02 16:49:27	hello-world.latest	0.01 MB	-0.00 MB	0.01 MB

Showing 1 to 3 of 3 entries Previous **1** Next

[Sync DB/LDAP](#)

[Sync Gitlab/LDAP](#)

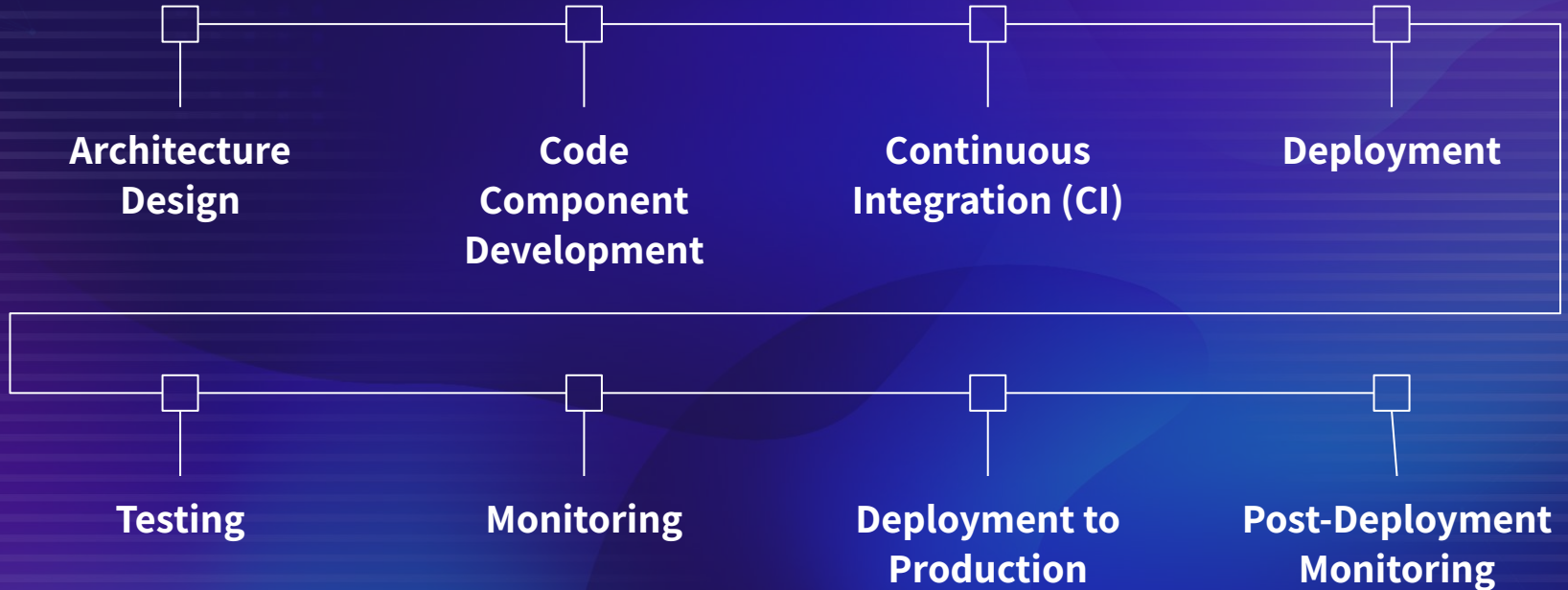
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04

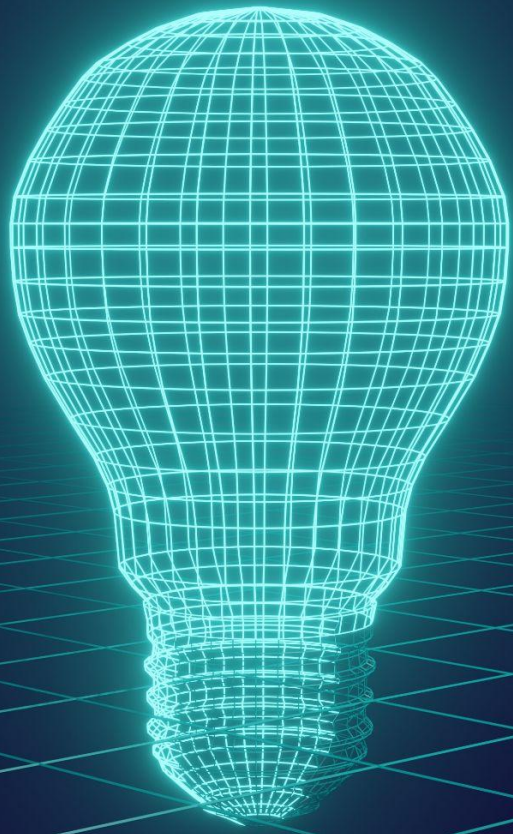
# The Development Process

# The development process





# 05 Demo



06

**Conclusion**



# Thanks !

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