Large scale dynamic web deployment for CERN, experience and outlook
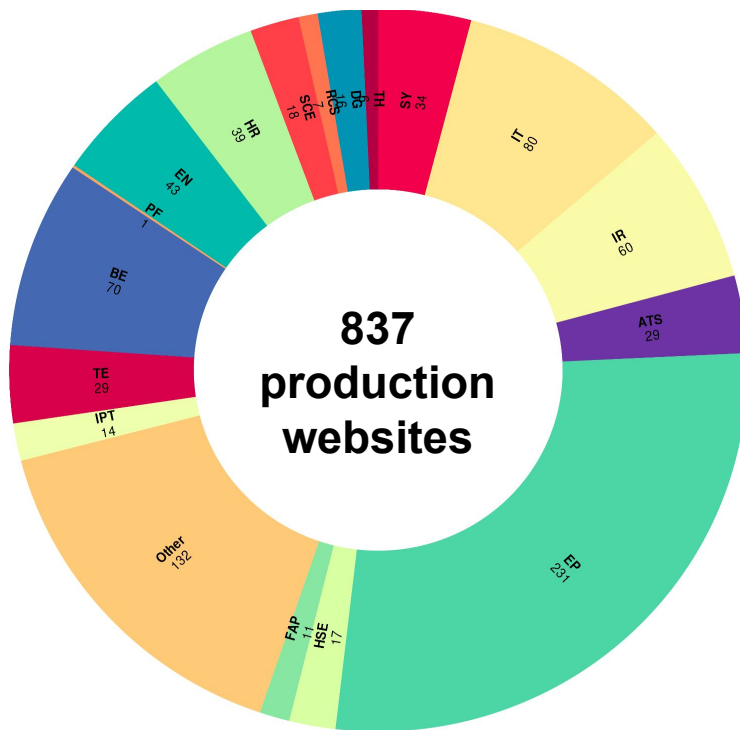
Joachim Valdemar Yde, Web Team

Rajula Vineet Reddy, Infrastructure Team
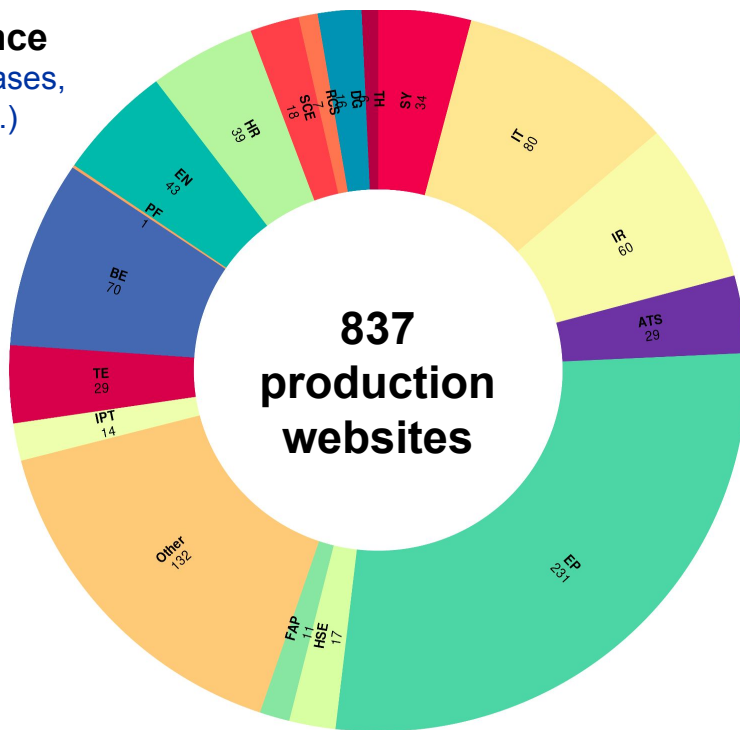
9 May 2023

CERN's Online Presence

837 production websites

CERN's Online Presence

Internal and external audience
(day-to-day operations, press releases,
announcements, collaboration, etc.)

837 production websites

SY 34 · IT 80 · IR 60 · ATS 29 · EP 231 · HSE 17 · FAP 11 · Other 132 · IPT 14 · TE 29 · BE 70 · PF 1 · EN 43 · HR 39 · SCE 18 · RCS 7 · DG 16 · TH

CERN's Online Presence

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837
production
websites

SY 34
IT 80
IR 60
ATS 29
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Other 132
IPT 14
TE 29
BE 70
PF 1
EN 43
HR 39
SCE 18
RCS 7
DG 16
TH 1
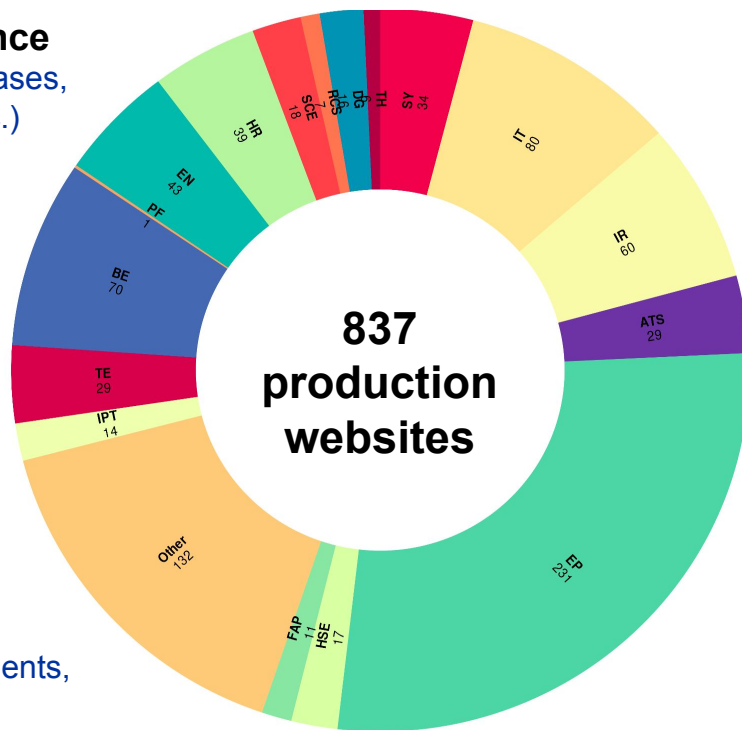
Different owners and users
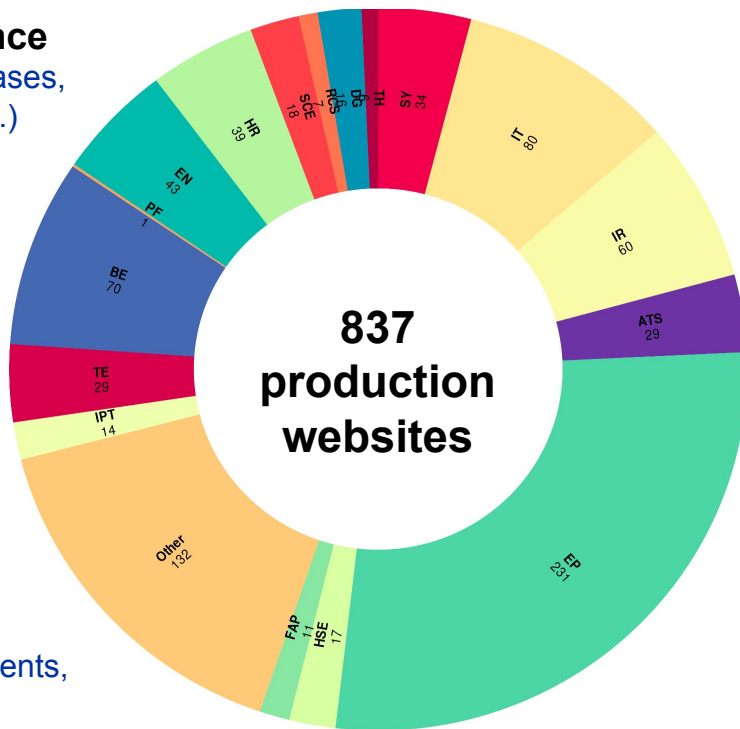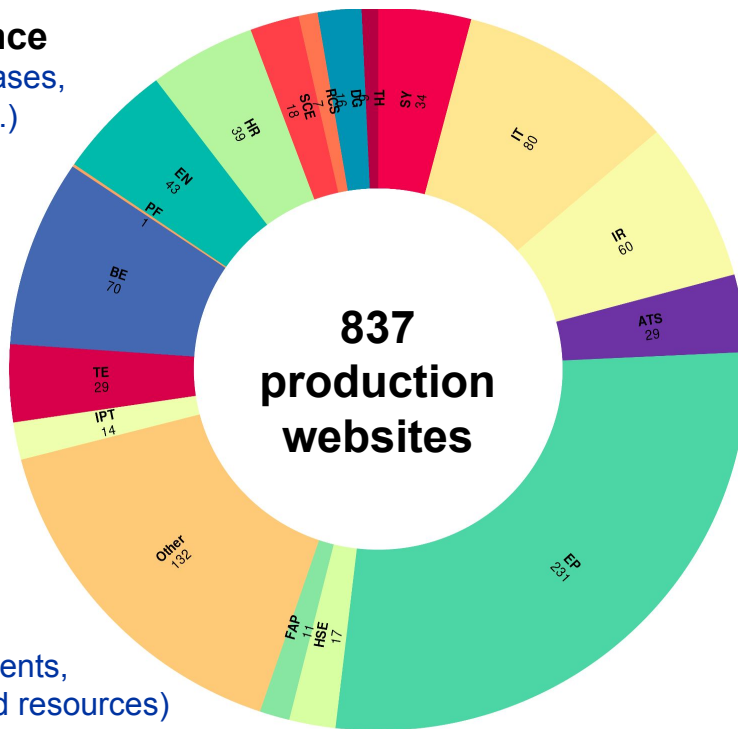(each website has unique requirements,
audience(s), traffic, and resources)

CERN's Online Presence

Internal and external audience
(day-to-day operations, press releases, announcements, collaboration, etc.)

Centralised infrastructure
(run latest versions, apply security patches, meet design and communication guidelines)

Different owners and users
(each website has unique requirements, audience(s), traffic, and resources)

837 production websites

SY 34
TH 1
DG 4
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EN 43
PF 1
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CERN's Online Presence

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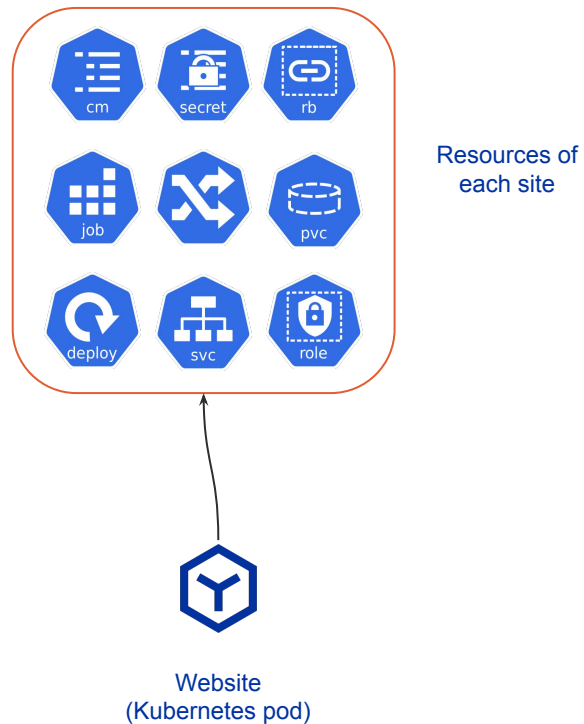(each website has unique requirements, audience(s), experience, traffic, and resources)

Standardised configuration
(provisioning, backups, service integrations, authentication, etc.)

837 production websites

IT 80
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IPT 14
TE 29
BE 70
PF 1
EN 43
HR 39
SCE 18
RCS 7
IdS 16
DG 1
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SY 34

Infrastructure Overview

Website
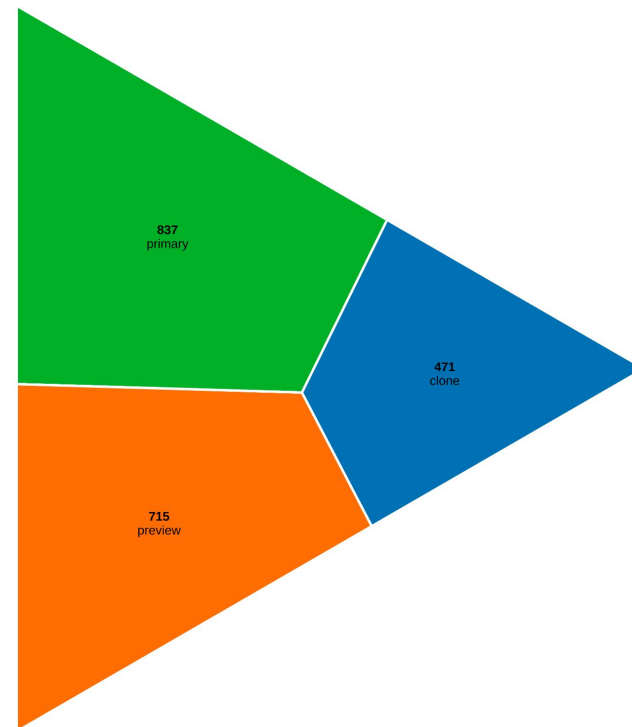(Kubernetes pod)

Infrastructure Overview

Resources of each site

Website
(Kubernetes pod)

Infrastructure Overview

Resources of each site

Website
(Kubernetes pod)

Content Management System Controllers

Infrastructure Overview

Resources of each site

cm secret rb
job pvc
deploy svc role

ns

Content
Management
System
Controllers

ns

Website
(Kubernetes pod)

Database integration

SSO integration
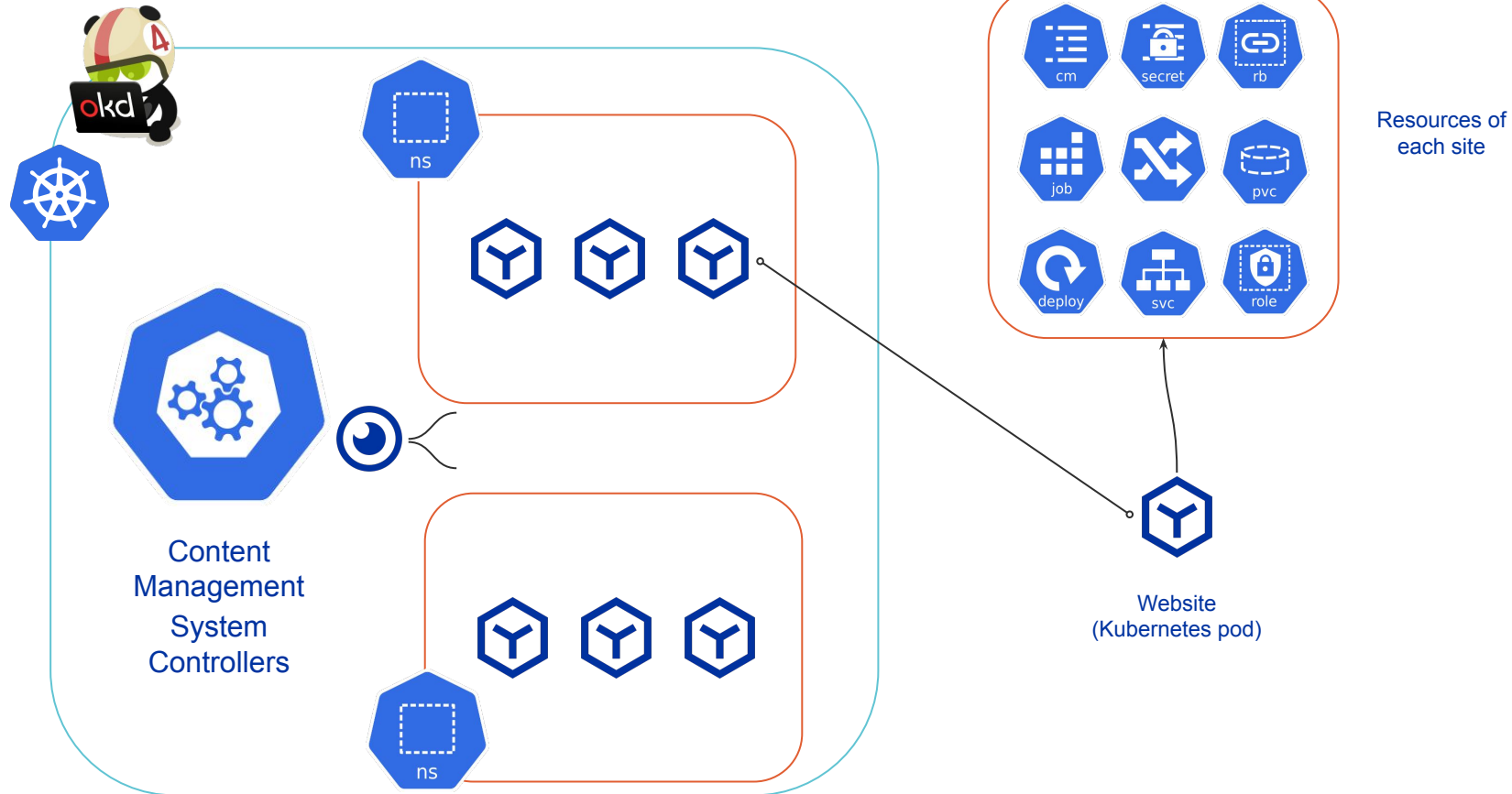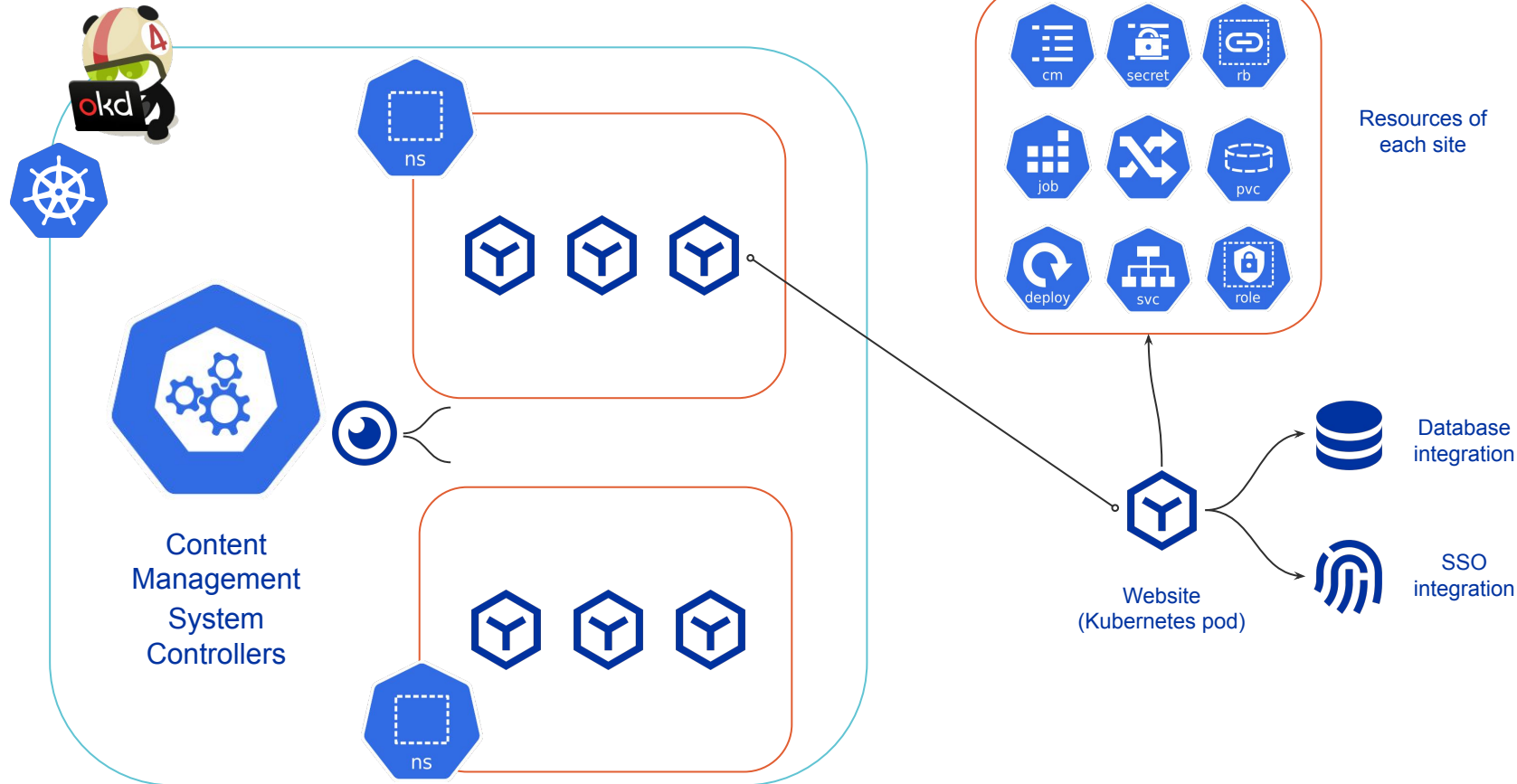
Infrastructure Snapshot
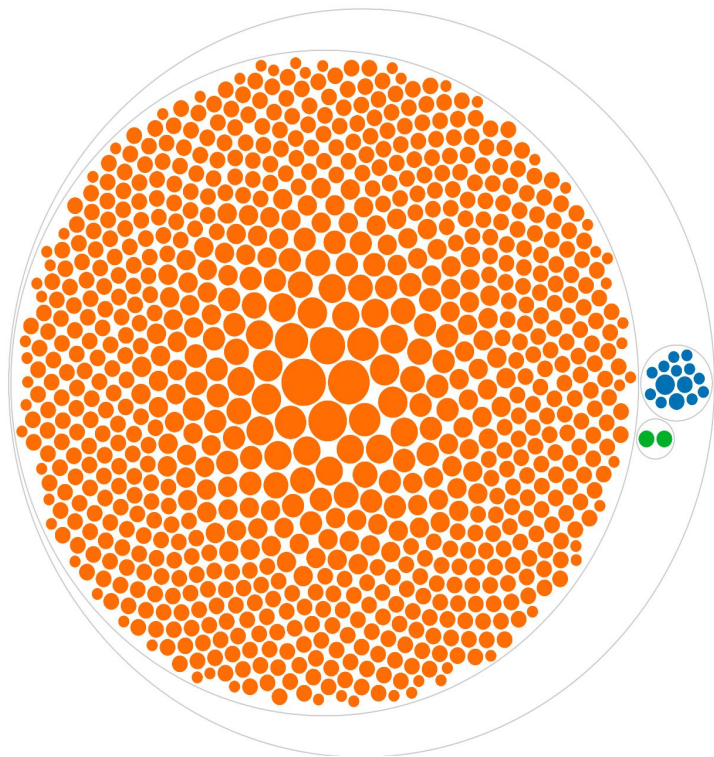
Quality of Service

Type of website

critical
standard
test

837
primary

471
clone

715
preview

CERN Custom Distribution

Upstream Core
Software (and
base modules)
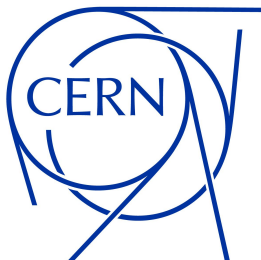
CERN Themes
& Profiles

Custom Scripts

- **Standardization**
- **Centralized development and bug fixes**
- **Ease of operations**
- **CERN design guidelines**
- **Installing extra modules**

Gitlab Repository: https://gitlab.cern.ch/drupal/paas/cern-drupal-distribution

Rolling out a New Release

New version available

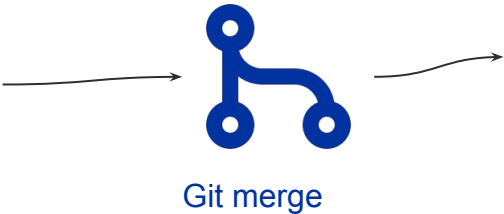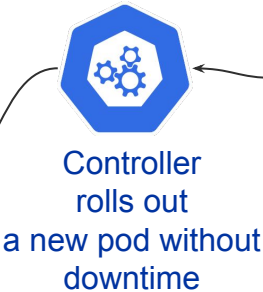Update the CERN distribution

CI build and testing

Rolling out a New Release
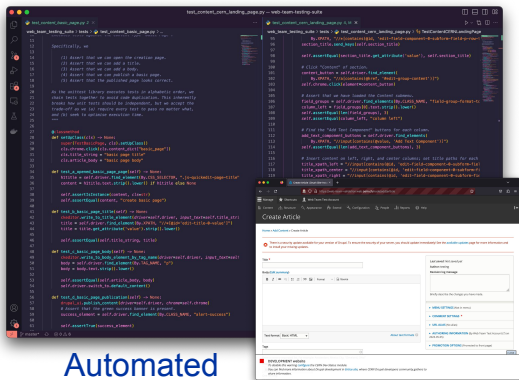
Automated
browser testing

Git merge

```yaml
apiVersion: drupal.webservices.cern.ch/v1alpha1
kind: SupportedDrupalVersions
metadata:
    name: supported-drupal-versions
spec:
  blacklist:
  - "v8.9-2"
  - "v9.4-1"
  defaultVersion: "v9.4-2"
status:
  versions:
  - name: "v9.4-2"
    releaseSpec:
      latest: "RELEASE-2023.04.08T15-43-35Z"
  - name: "v9.5-1"
    releaseSpec:
      latest: "RELEASE-20203.05.09T11-00-00Z"
```

Release tag

```yaml
apiVersion: drupal.webservices.cern.ch/v1alpha1
kind: DrupalSite
metadata:
  name: chep-2023
spec:
  siteUrl:
  - "chep-2023.webtest.cern.ch"
  version:
    name: "v9.5-1"
    releaseSpec: "RELEASE-20203.05.09T11-00-00Z"
  configuration:
    qosClass: "standard"
    databaseClass: "standard"
    diskSize: "1Gi"
```

Updating the CR

Controller
rolls out
a new pod without
downtime

pod

deploy

crd

Migration Campaigns

```yaml
apiVersion: drupal.webservices.cern.ch/v1alpha1
kind: DrupalSite
metadata:
  name: chep-2023-clone
spec:
  siteUrl:
  - "chep-2023-clone.webtest.cern.ch"
  version:
    name: "v9.5-1"
    releaseSpec: "RELEASE-2023.05.09T11-00-00Z"
  configuration:
    qosClass: "standard"
    databaseClass: "standard"
    diskSize: "1Gi"
    cloneFrom: "chep-old"
```
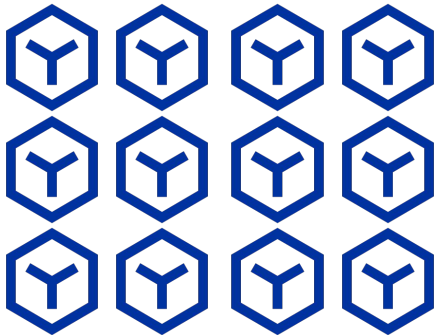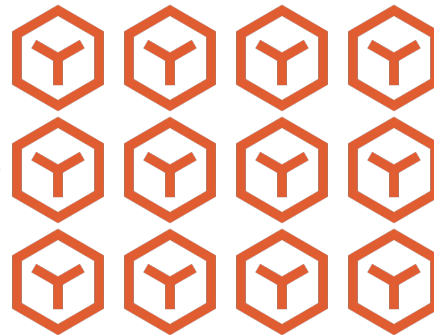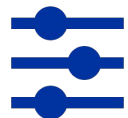
.web.cern.ch

.webtest.cern.ch

User Interface

Quality of Service

Extra Configuration

Cloning

Backups and Restores

Web Services Portal

Traffic

cylindricalonion.web.cern.ch (1.71%)
lhcathome.web.cern.ch (1.73%)
knowledgetransfer.web.cern.ch (1.94%)

procurement.web.cern.ch (2.03%)
careers-at-cern.web.cern.ch (2.13%)
teacher-programmes.web.cern.ch (2.14%)
fcc.web.cern.ch (2.16%)
design-guidelines.web.cern.ch (2.24%)
db-blog.web.cern.ch (2.85%)
ep-news.web.cern.ch (3.01%)
scoollab.web.cern.ch (3.05%)
cas.web.cern.ch (3.08%)
international-relations.web.cern.ch (3.17%)
hr.web.cern.ch (3.65%)
alice-collaboration.web.cern.ch (3.73%)

home.web.cern.ch (20.71%)

timeline.web.cern.ch (18.52%)

information-technology.web.cern.ch (4.93%)

admin-eguide.web.cern.ch (4.51%)

Top 25 sites ordered by unique IP visits in the last 30 days
Note: This is as of 04/05/2023 and does not include traffic to '.cern' domains

Special Events

Voir en français

The third run of the Large Hadron Collider has successfully started

A round of applause broke out in the CERN Control Centre on 5 July at 4.47 p.m. CEST when the Large Hadron Collider (LHC) detectors started recording high-energy collisions at the unprecedented energy of 13.6 TeV
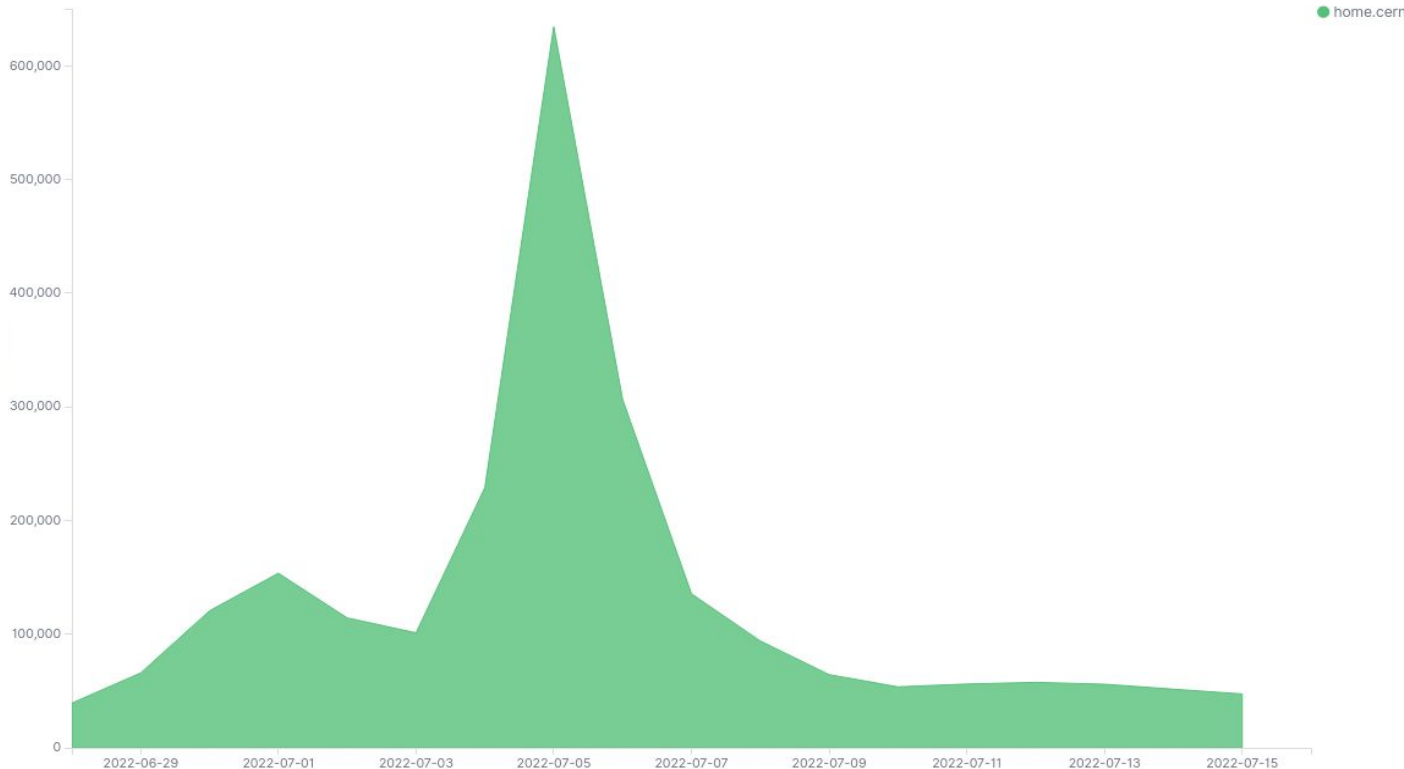
5 JULY, 2022

Celebrations at the CERN control centre (CCC) to mark the start of LHC Run 3 (Image: CERN)

A round of applause broke out in the CERN Control Centre on 5 July at 4.47 p.m. CEST when the Large Hadron

- Infra handled the traffic without any extra preparation
- While maintaining a response time under the SLA

● home.cern

Learnings

- **Upgrades are now automated and seamless**

- **Improved transparency through monitoring and alerts**

- **Users acclimatising to the new infrastructure took time**

    - Underestimated the technical debt imposed on users

    - End-user involvement should have been prioritised earlier

- **Heavy lifting done by the controller doing the operations**

- **Ability to adopt infrastructure to other Content Management Systems**

Thank you!

Questions?

References

- **CERN Drupal Distribution -**
  https://gitlab.cern.ch/drupal/paas/cern-drupal-distribution
- **Drupalsite Operator - https://gitlab.cern.ch/drupal/paas/drupalsite-operator/**
- **Past publications - https://drupal.docs.cern.ch/publications/**
- **Icons - https://remixicon.com**