

# Apache Unomi: a Customer Data Platform ...

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**APACHECON** North America

Sept. 24-27, 2018



# Introduction

Co-founder &  
CTO of Jahia

20 years Web Dev  
experience

Apache Committer  
(Jackrabbit, Unomi)

Coder at heart  
(since I'm 7)

Co-chair OASIS  
Context Server TC

Very intested in  
User experiences



# What is a Customer Data Platform ?

- From Wikipedia: “Customer Data Platform (CDP) is a marketer-based management system. It creates a persistent, unified customer database that is accessible to other systems. Data is pulled from multiple sources, cleaned and combined to create a single customer profile. This structured data is then made available to other marketing systems. CDP provides real-time segmentation for personalized marketing.

CDP is currently a \$300 million industry and projected to reach \$1 billion by 2019”

# Why do I need one ?

- If you want to...
  - learn more about your visitors
  - deliver personalized experiences on your website or mobile app
  - make sure you comply with stricter regulations now in place (GDPR) or upcoming
  - be in control of your analytics and personalization (instead of giving away your data to others like Google Analytics)
  - avoid reinventing the wheel by building your own customer database, related hooks and segmentation

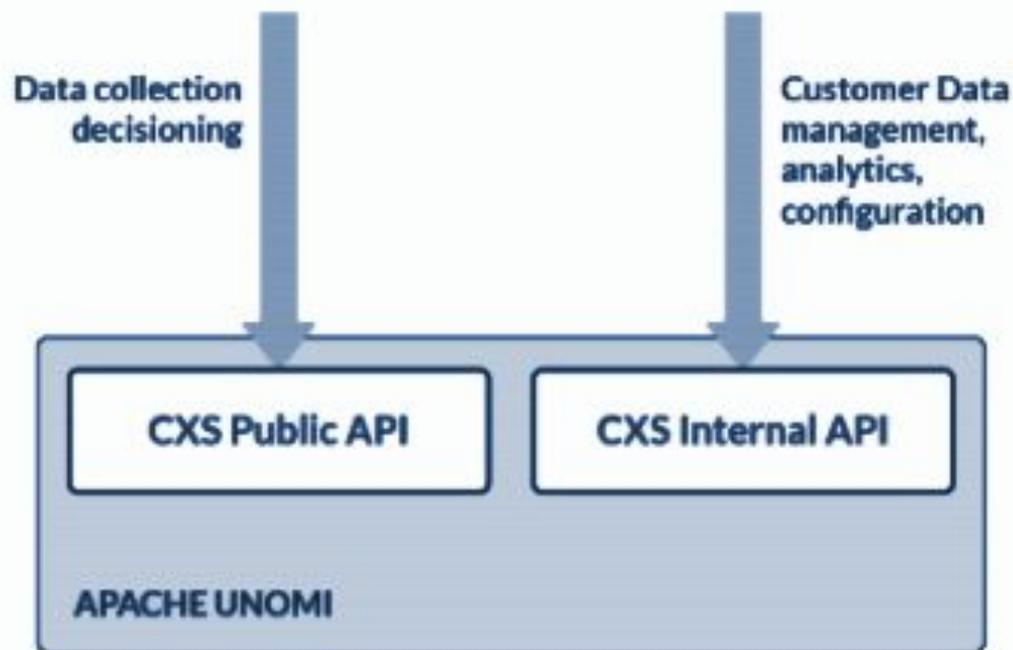
# What is Apache Unomi ?

- Apache Unomi is an open source CDP
- A Java platform based on a completely modular and highly scalable architecture
- Is the reference implementation of the ConteXt Server specification standard (CXS)
- Is event-based and uses Elasticsearch as a scalable backend for persistence and querying



# What is CXS ?

- The ConteXt Server Specification (to be renamed to CDP standard !)
- Being established at the OASIS Foundation
- Defines a standard to deliver personalized experiences
- Allow for interoperability and customer data exchanges

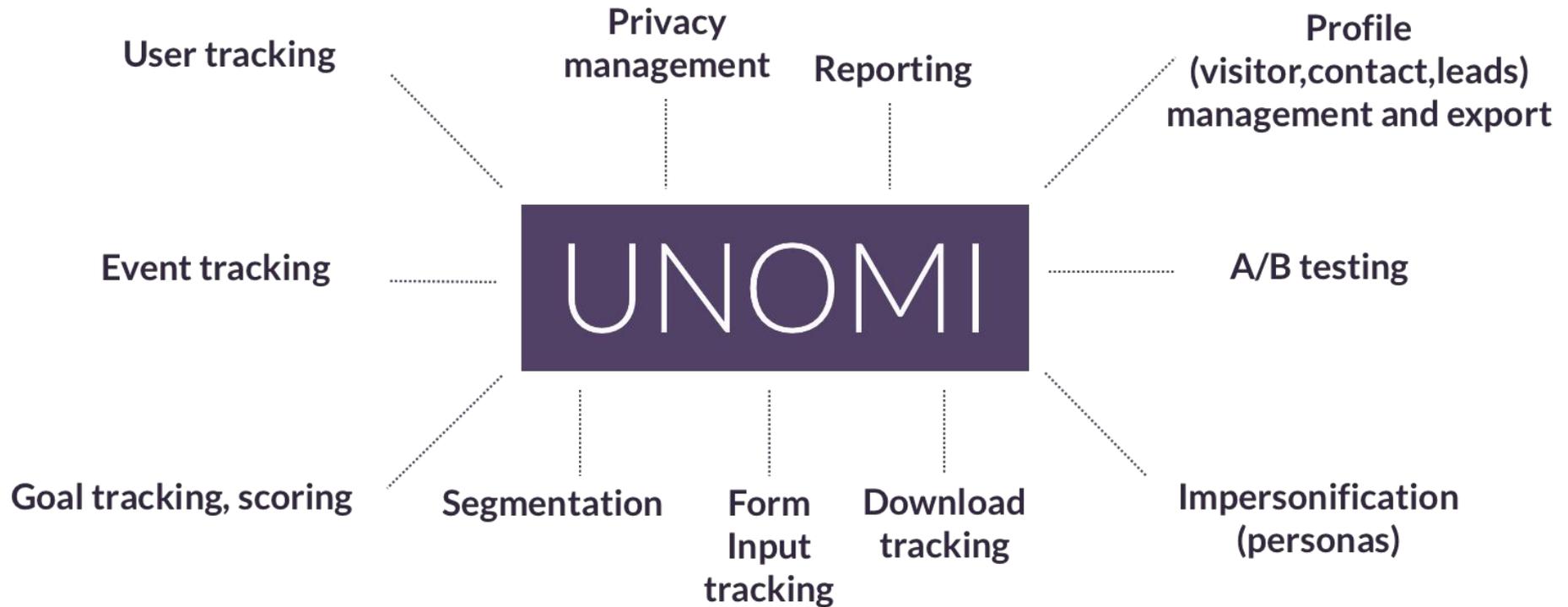


# Why was the project started at Apache ?

- No open source implementation existed !
- Apache is well recognized to provide platform solutions
- Apache is truly independant (eg. Github == Microsoft)
- Apache provides highly recognized and solid infrastructure
- Community is great, good things will automatically happen to the code



# Apache Unomi functionalities



# Why privacy is now critical !

- GDPR : A new EU directive that imposes strict conditions on dealing with customer data
- Fines are very expensive, up to 4% of annual company turnover or €20 million, whichever is higher !
- Consent for data usage is now explicitly required -> lots of ugly/buggy popups on web browsers, and most are not compliant !
- Users must be able to download their profiles or delete them !



# Unomi supports all that !

- Profile properties management
- Defines “personal identifiers” properties
- “Anonymize my profile” endpoint (erase any personal identifier)
- Consent management (get AND update)
- “Private browsing”
- Downloading profile

# Consent Management UI

The image shows a screenshot of a web application titled "Consent Manager". At the top, there is a blue header with the text "Consent Manager" and two icons: a refresh icon and a help icon. Below the header, there is a purple button labeled "CREATE NEW CONSENT TYPE".

The main content area displays a list of "Defined consent types":

- Weekly newsletter**  
(weeklyNewsletter)  
Allow us to send you weekly newsletter to keep you informed of our latest offers. We want use y anything else
- Tracking**  
(tracking)  
Allow us to track you to provide better personalized experiences
- Romain bugging**  
(romainBugging)  
Allows Romain to bug you all the time with questions

An "Edit consent type" modal is open, showing the details for the "Weekly newsletter" type. The modal includes a language dropdown set to "English".

**Edit consent type** (English)

Identifier\* weeklyNewsletter  
Display name\* Weekly newsletter (17 / 50)

Description  
Allow us to send you weekly newsletter to keep you informed of our latest offers. We want use your email address for anything else

HIDE OPTIONS

Activated

CANCEL OK

Consent definition (outside of Unomi's scope)

# Consent Management UI

Built on top of Unomi's Consent API

Privacy settings ×

---

Consents Other settings

---

YES  NO **Monthly newsletter subscription**  
Subscription to our monthly newsletter.

YES  NO **Personalization**  
To show you the best content and offers, we collect your browsing data.

---

End user user interface  
(updated through consent events)



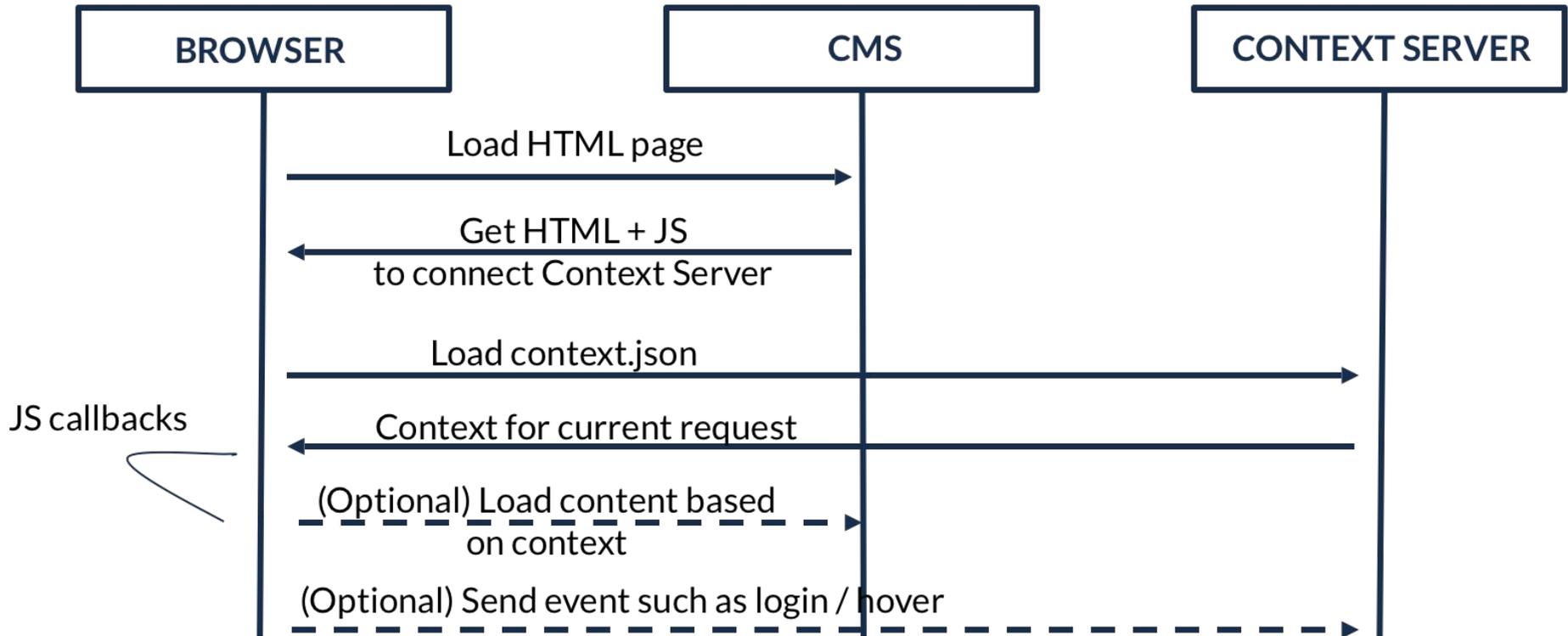
CLOSE

# Performance & scalability

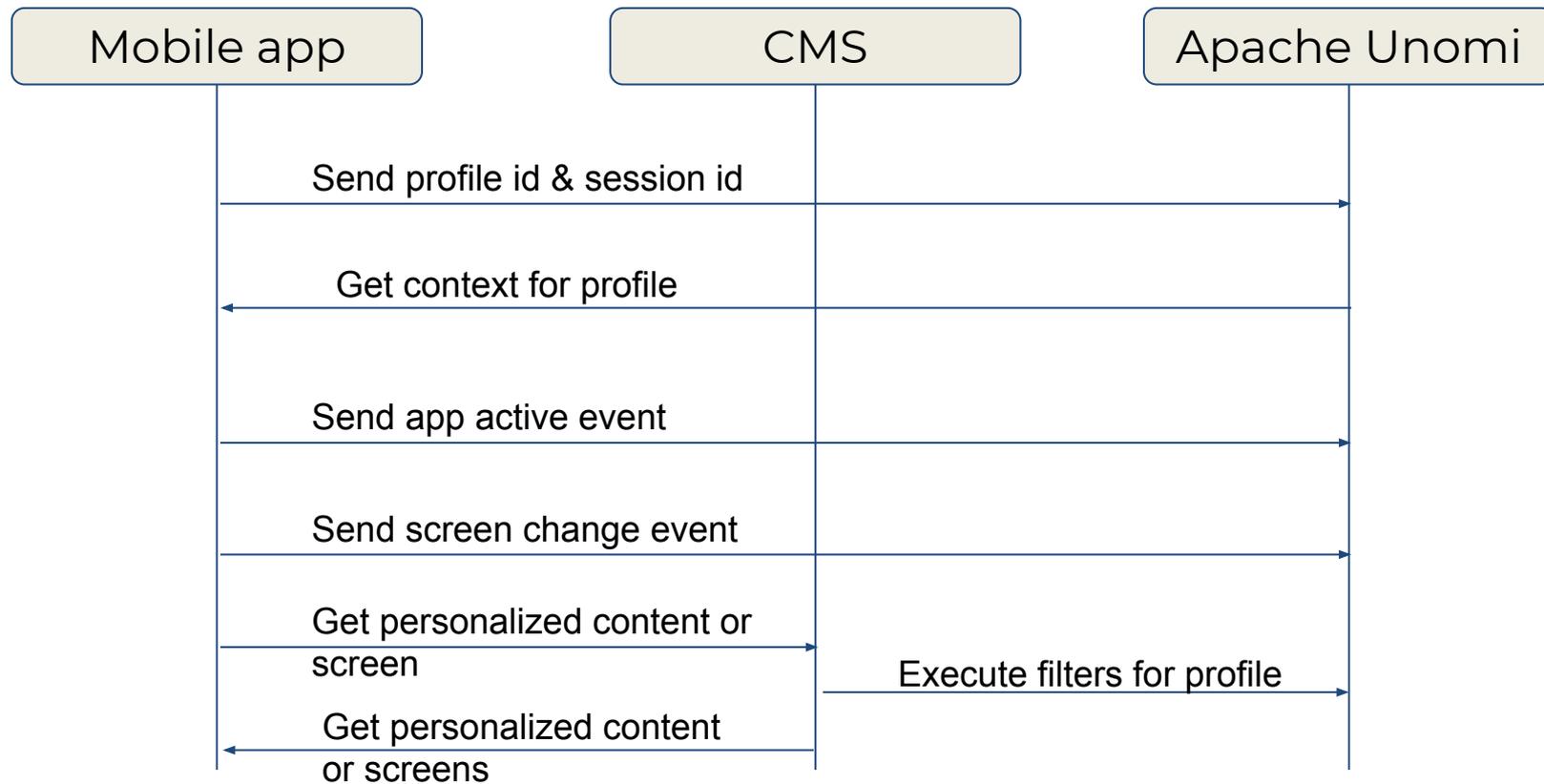
- At Jahia we test Apache Unomi on a weekly basis with over 5 million profiles
- Server is designed to be scalable
- Elasticsearch cluster allows growth to achieve proper scalability
- Known bottlenecks:
  - ingestion speed
  - rule processing
- Solutions:
  - Add more ES & Unomi nodes



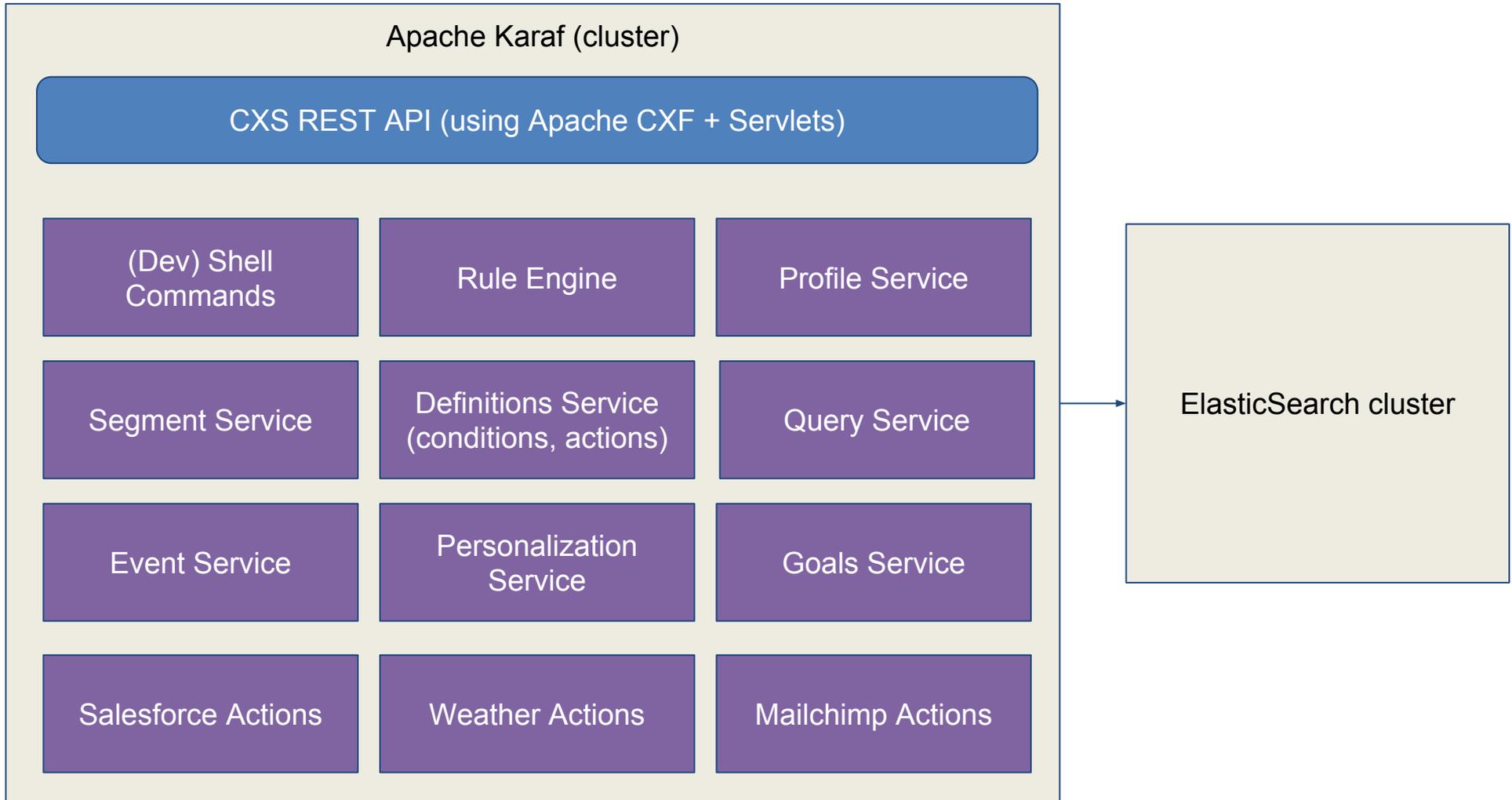
# Use case : web site tracking & personalization



# Use case : mobile app & personalization

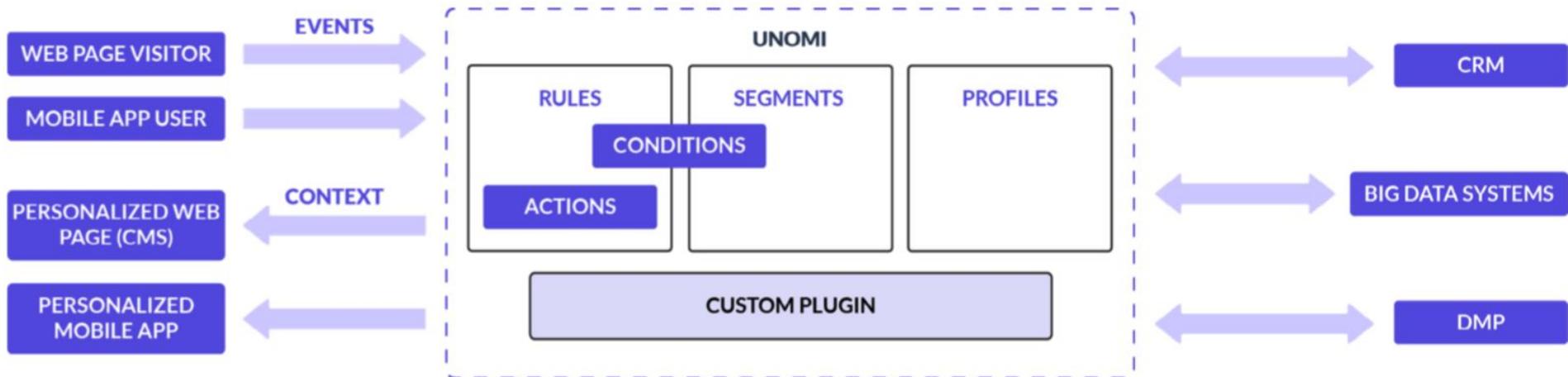


# Architecture



# Look Inside

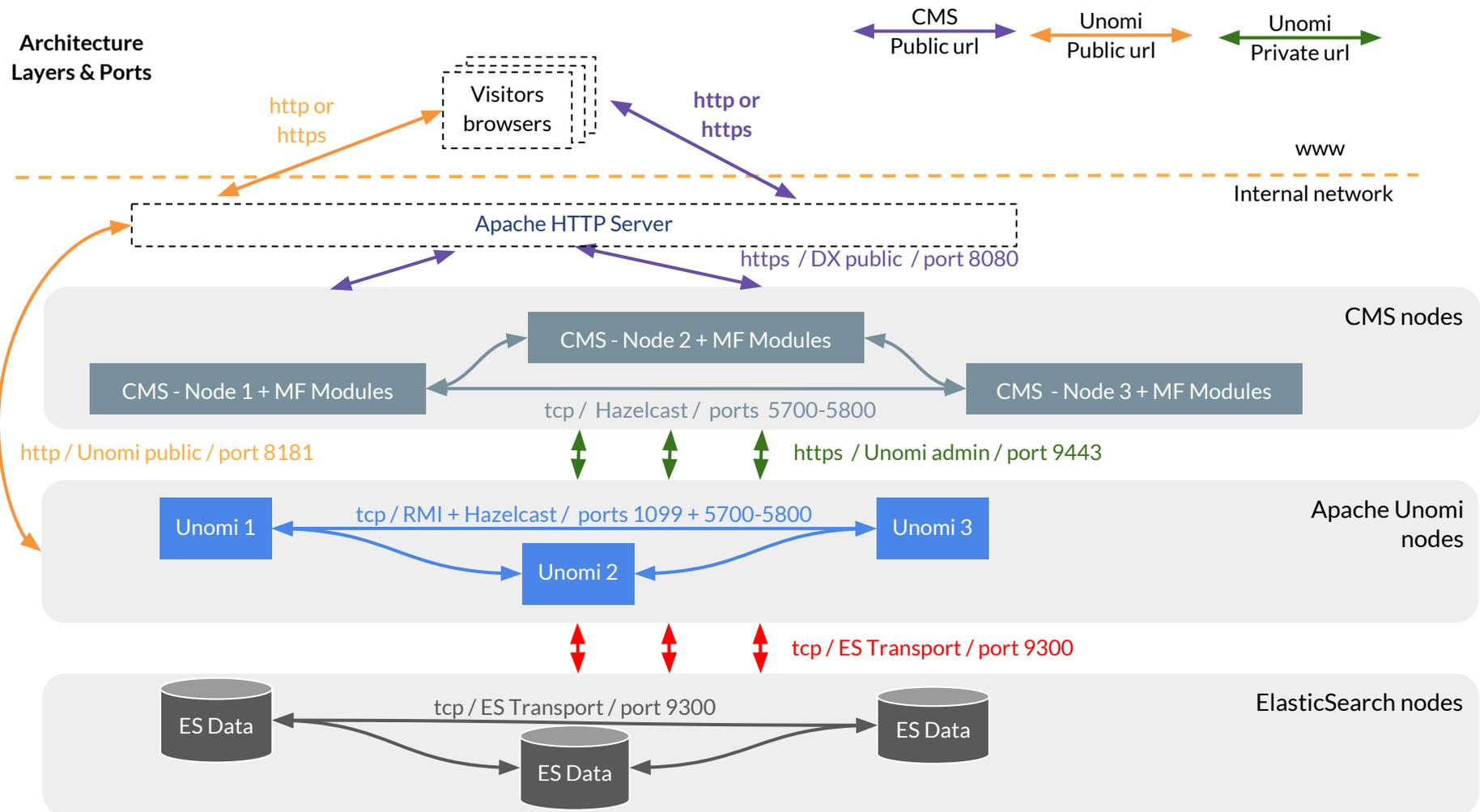
## Functional architecture



Custom plugins may:

- Implement rule conditions
- Implement rule actions
- Deploy rules
- Do anything an OSGi bundle may do (define new servlets, APIs, karaf shell commands...)

# Example deployments



# Profiles

- Generic properties
- Goals
- Segments
- Scores
- Consents

```
{
  "itemId" : "48563fd0-6319-4260-8dba-ae421beba26f",
  "itemType" : "profile",
  "version" : 91,
  "properties" : {
    "nbOfVisits" : 42,
    "pageViewCount" : {
      "digitall" : 7,
      "systemscope" : 7
    },
    "lastVisit" : "2018-09-25T09:23:33Z",
    "firstVisit" : "2018-02-10T17:15:25Z",
    "preferredLanguage" : "en",
    "previousVisit" : "2018-09-25T09:21:39Z",
    "j:email" : "shuber@apache.org",
    "emailNotificationsDisabled" : "false",
    "j:organization" : "Jahia",
    "j:firstName" : "Serge",
    "j:lastName" : "Huber",
    "j:nodename" : "root"
  },
  "systemProperties" : {
    "goals" : {
      "pageview_1519726765394StartReached" : "2018-09-25T09:23:33Z",
      "_gu4inatp1TargetReached" : "2018-04-04T13:57:18Z",
    },
    "mergeIdentifier" : "root"
  },
  "segments" : [ "over30", "male", "technology" ],
  "scores" : {
    "scoring_1" : 0,
    "scoring_0" : 0,
  },
  "mergedWith" : null,
  "consents" : {
    "digitall/tracking" : {
      "scope" : "digitall",
      "typeIdentifier" : "tracking",
      "status" : "GRANTED",
      "statusDate" : "2018-01-19T14:54:01Z",
      "revokeDate" : "2020-01-19T14:54:01Z"
    },
    "digitall/newsletter" : {
      "scope" : "digitall",
      "typeIdentifier" : "newsletter",
      "status" : "DENIED",
      "statusDate" : "2018-01-22T16:15:05Z",
      "revokeDate" : "2020-01-22T16:15:05Z"
    }
  }
}
```

# Segments

Defined as conditions on profiles:

Rich people over 30:

a profile has income > 200'000  
AND his age is over 30

An active visitor interested in technology:

a profile has read 10 pages with the tag "technology"  
AND he has created 10 session in the last 10 days

# Rule Engine

when

condition is true

then

actions are executed

in REAL-TIME !

# Rule Engine

when

    a page event occurs

then

    increment profile page count

# Rule Engine

when

a login event occurs

AND

it comes from a trusted third party

then

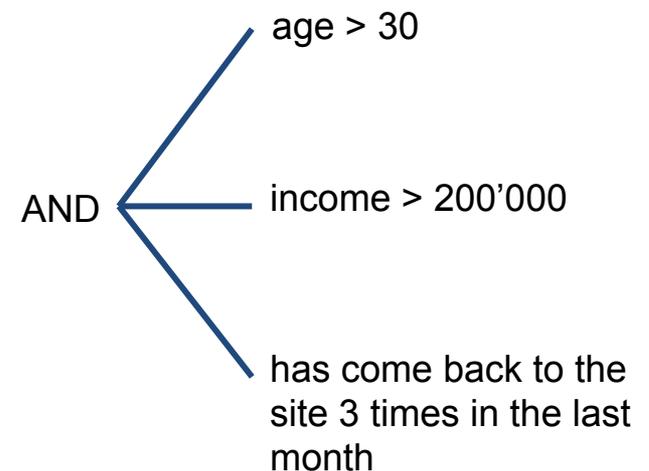
1. copy login account information into profile
2. merge with other pre-existing profiles
3. send updated profile to external system (CRM)

# Conditions

Organized as a tree

Condition types:

- boolean (and, or, not)
- on event/session/profile  
property values (equals, in list,  
etc...)
- on existence of previous events  
for a profile
- extensible, you can build your  
own !



# Actions

- executed when a rule condition is satisfied
- executed as a list of actions executed sequentially
- actions can:
  - update the current profile
  - push or pull data to a different system
  - be extended using plugins !

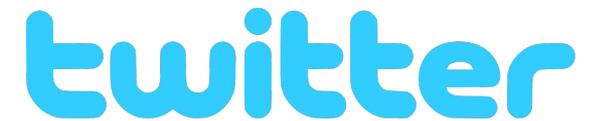
Action sequence example:

1. Retrieve data from form event and copy into profile
2. Update profile segments
3. Send updated profile to Salesforce account

# Integrations

Out of the box:

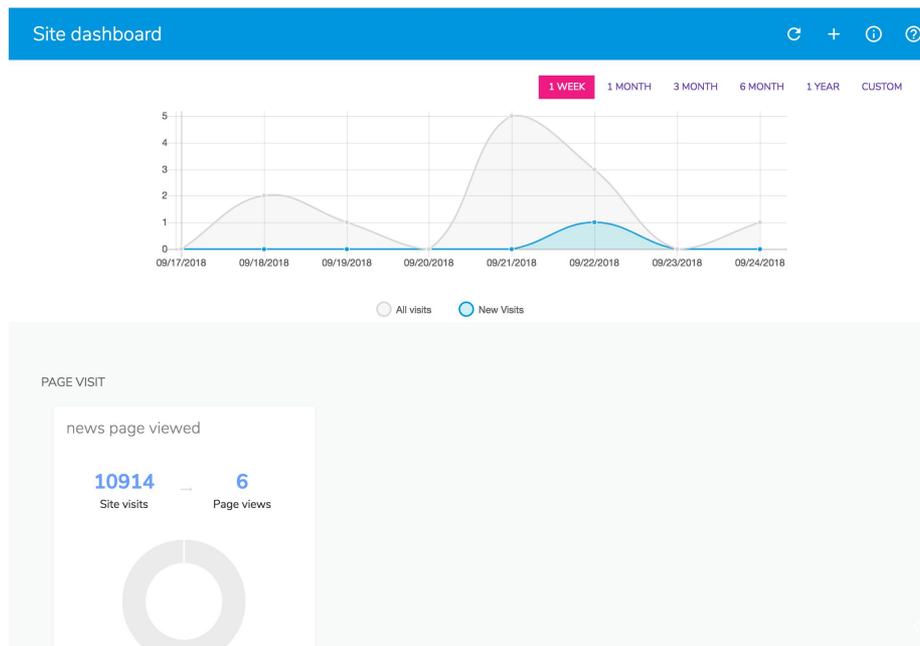
- Salesforce CRM integration
- Twitter sample
- Weather API (enrich session)
- Mailchimp (update lists)



Easy to build your own using  
custom actions and plug into rules !

# Jahia Marketing Factory

- Basically a UI built on top of Apache Unomi's REST API
- Uses AngularJS as a front-end framework
- Provides tight integration with the CMS



The screenshot shows the 'Visitor profile' form for 'Doutzen Ambrosio'. The form is divided into sections: 'Basic info' and 'Contact'. The 'Basic info' section includes fields for 'First name' (Doutzen), 'Last name' (Ambrosio), 'Nationality' (Russia), and 'Gender' (Male). The 'Contact' section includes fields for 'Email', 'Phone number', 'Address', and 'City'. The form also displays 'Last visit: FEBRUARY 28, 2018' and 'First visit: FEBRUARY 28, 2018'. There are 'Cancel' and 'Save' buttons at the bottom of the form.

# Others

- Building an advertisement server using Apache Unomi
- Evaluating Unomi to build personalization for a TV network's website

Are you using/interested in Apache Unomi ?  
Please let us know and reach out for help !

# Let's integrate now !

Let's add Apache Unomi to an existing website

-> let's use it for tracking

-> let's see how we can view events coming in

-> let's look at profile examples

-> let's use profile information to build personalization !

# Existing website



GET STARTED USE CASES DOWNLOAD DOCUMENTATION CONTRIBUTE COMMUNITY



## Apache Unomi: The Open Source Customer Data Platform

Apache Unomi is a Java Open Source customer data platform, a Java server designed to manage customers, leads and visitors data and help personalize customers experiences while also offering features to respect visitor privacy rules (such as GDPR)

Learn more

Download Unomi 1.3.0-incubating



## News

### Privacy (GPDR consent management) upcoming features in version 1.3

New to release 1.3 (currently in development, nearing completion) are features to manage visitor consents, in order to make it easier to comply with new privacy regulations such as the [GDPR](#) If you are interested in these new features, you must for the moment build the master branch from [source](#). A quick guide to these new features is also available [here](#).

# Add Javascript to send events to Apache Unomi

Unomi tracker is an extension of the open source Analytics.js tracking script

```
<script type="text/javascript">
  var unomiOption = {
    scope: 'unomiWebSite',
    url: 'http://localhost:8181'
  };
  window.unomiTracker||(window.unomiTracker={},function(){function e(e){for(unomiTracker.initialize({"Apache Unomi
r=n.shift(),t=r.shift();unomiTracker[t]&&unomiTracker[t].apply(unomiTracker,r)}}for(var
n=[],r=["trackSubmit","trackClick","trackLink","trackForm","initialize","pageview","identify","reset","group","track","read
length;t++){var i=r[t];window.unomiTracker[i]=function(e){return function(){var r=Array.prototype.slice.call(arguments)
r.unshift(e),n.push(r),window.unomiTracker}}(i)}unomiTracker.load=function(){var
n=document.createElement("script");n.type="text/javascript",n.async=!0,n.src=unomiOption.url+"/tracker/unomi-track
on(n){"function"==typeof e&&e(n)},!1):n.onreadystatechange=function(){"complete"!==this.readyState&&"loaded"!==t
r=document.getElementsByTagName("script")[0];r.parentNode.insertBefore(n,r)},document.addEventListener("DOM
</script>
```

# View events

unomi:event-tail

```
[karaf@root(>) unomi:event-tail
ID |Type |Session |Profile |Timestamp |Scope |Persi|
-----|-----|-----|-----|-----|-----|-----|
8196bf26-4ac8-4d9c-97ad-290e6a1bea8e|sessionCreated|7b5c0b0e-652d-319d-751b-4a8b55d82996|9337cf60-97d4-4116-93ff-dd94f5558ea8|Mon Sep 24 16:06:13 CEST 2018|unomiWebSite|true|
2920b669-709c-4a7e-a840-d1036f71842a|view|7b5c0b0e-652d-319d-751b-4a8b55d82996|9337cf60-97d4-4116-93ff-dd94f5558ea8|Mon Sep 24 16:06:13 CEST 2018|unomiWebSite|true|
2f4bb094-23da-47f2-b2a7-55a5d8257005|view|7b5c0b0e-652d-319d-751b-4a8b55d82996|9337cf60-97d4-4116-93ff-dd94f5558ea8|Mon Sep 24 16:06:17 CEST 2018|unomiWebSite|true|
2d756ca6-5c33-4c63-94af-3119a474cbd5|view|7b5c0b0e-652d-319d-751b-4a8b55d82996|9337cf60-97d4-4116-93ff-dd94f5558ea8|Mon Sep 24 16:06:18 CEST 2018|unomiWebSite|true|
e2278c39-23af-481c-af83-425994061edf|view|7b5c0b0e-652d-319d-751b-4a8b55d82996|9337cf60-97d4-4116-93ff-dd94f5558ea8|Mon Sep 24 16:06:19 CEST 2018|unomiWebSite|true|
2b416153-3071-4c0c-87d4-0765273deb0e|view|7b5c0b0e-652d-319d-751b-4a8b55d82996|9337cf60-97d4-4116-93ff-dd94f5558ea8|Mon Sep 24 16:06:33 CEST 2018|unomiWebSite|true|
615ec071-544b-42a1-b15c-07e18c536c7b|sessionCreated|58480ec6-a1d4-4c8b-b024-25c35a04041a|7bf96232-940f-45c9-bacc-1079a45c2056|Mon Sep 24 17:16:32 CEST 2018|digital1|true|
d53a411c-a73b-49ea-9d4c-ee9f98133fe2|view|58480ec6-a1d4-4c8b-b024-25c35a04041a|7bf96232-940f-45c9-bacc-1079a45c2056|Mon Sep 24 17:16:32 CEST 2018|digital1|true|
```

# View profiles

unomi:profile-view

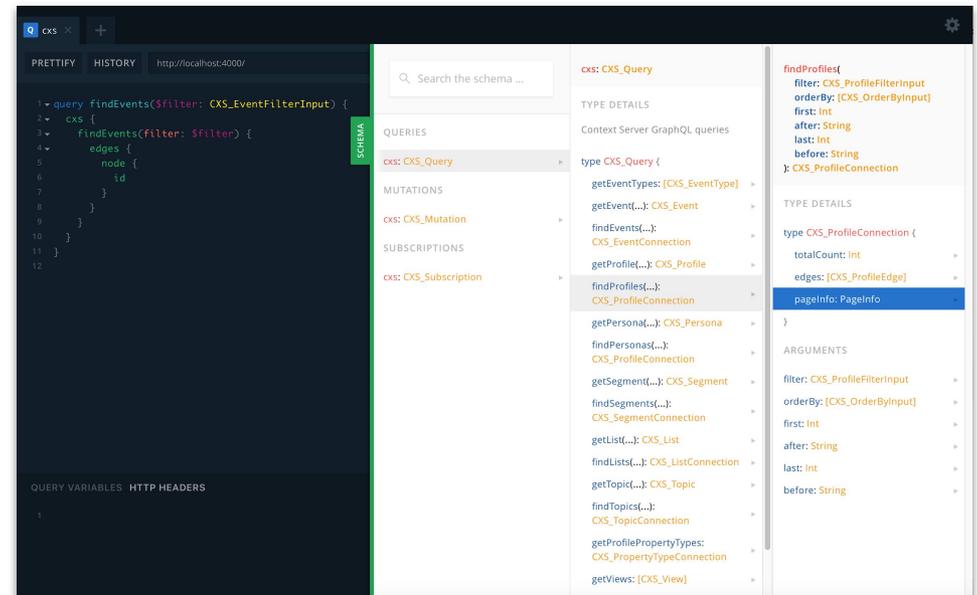
```
[karaf@root()]> unomi:profile-view 9691c29d-43cc-4821-97a9-1d004b537e65
{
  "itemId" : "9691c29d-43cc-4821-97a9-1d004b537e65",
  "itemType" : "profile",
  "version" : 1,
  "properties" : {
    "nbOfVisits" : 1,
    "pageViewCount" : {
      "unomiWebSite" : 1
    },
    "lastVisit" : "2018-09-24T14:02:52Z",
    "firstVisit" : "2018-09-24T14:02:52Z"
  },
  "systemProperties" : { },
  "segments" : [ ],
  "scores" : {
    "scoring_9" : 0,
    "scoring_8" : 0,
    "scoring_1" : 0,
    "scoring_0" : 0,
    "scoring_3" : 0,
    "scoring_2" : 0,
    "scoring_5" : 0,
    "scoring_4" : 0,
    "scoring_7" : 0,
    "scoring_6" : 0
  },
  "mergedWith" : null,
  "consents" : { }
}
```

# What's next for Apache Unomi ?

- Graduate to top level project !
- Improve scalability (Kafka integration)
- Implement final version of CXS spec
- Provide a web UI

# CXS GraphQL API

- CXS Specification switched from REST API to GraphQL API a year ago -> must implement the changes in Apache Unomi (uses REST API for the moment)
- GraphQL makes it easy to integrate with very different types of clients (web, mobile)
- Clients such as GraphiQL or GraphQL Playground make learning and testing GraphQL APIs easy and fun !



# New User Interface !

Jahia is considering contributing parts of the Marketing Factory web UI to Apache Unomi !

The screenshot displays the 'Manage dynamic segments' interface. At the top, it shows a back arrow and the title 'Manage dynamic segments'. Below this, the user is editing the 'Contacts' segment. The 'Segment name' is 'Contacts' and the 'Description' is 'You can customize the list below by editing the contacts segment.' Under the 'Options' section, the 'Enabled' and 'Shared' checkboxes are both checked. The 'Conditions' section contains two rules. The first rule is 'Property Email exists' with an 'AND' button below it. The second rule is 'Property name Phone number exists' with an 'AND' button below it. The interface is clean and modern, with a light gray background and clear labels.

# Our community

Don't be shy !

Use the communication channel you prefer

Mailing lists:

[users@unomi.apache.org](mailto:users@unomi.apache.org)

[dev@unomi.apache.org](mailto:dev@unomi.apache.org)

JIRA:

<https://issues.apache.org/jira/projects/UNOMI>

ASF Slack:

#unomi, <https://the-asf.slack.com/messages/CBP2Z98Q7>

# More resources

Website : <https://unomi.apache.org>

Github (mirror): <https://github.com/apache/incubator-unomi>

OASIS Context Server Technical Committee:

[https://www.oasis-open.org/committees/tc\\_home.php?wg\\_abbr=ev=CXS](https://www.oasis-open.org/committees/tc_home.php?wg_abbr=ev=CXS)

OASIS Context Server API on Github:

<https://github.com/sergehuber/contextserver-graphql-api>

# Questions

... and hopefully good answers

# Thanks

- Jean Baptiste for all the mentoring and dedication throughout the years
- Bertrand Delacretaz for helping and supporting the project
- All the contributors over the years !
- Some very active newcomers (thanks Francois Papon ! Hope they will be more soon!)
- The community of users !

# THANK YOU

- **SERGE HUBER**
- **@sergehuber**
- **[shuber@apache.org](mailto:shuber@apache.org)**
- **[shuber@jahia.com](mailto:shuber@jahia.com)**