

HomeKit, Weave oder Eclipse SmartHome?

Best Practices für erfolgreiche Smart-Home-Projekte

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- › Software-Architektur
- › Modularisierung
- › Konnektivität
- › Interoperabilität
- › Regeln/Automation
- › User Interfaces
- › Systemtest/Wartung



Applications (Verticals)

Personal Devices Wearable Computing: pebble, cookoo, rocon, ALUMATE, i'm, JIDEYE, GLASS, RINGLY, striiv, APX, MOTA, OptiSense, M, wearable intelligence, VUZIX Fitness: GARMIN, Nike, senSonia, amigo, iFIT, JAWBONE, HISFIT, VALEN, BELL, BASIS, fitbit, tomTom, ATOM, LifeBEAM, wahoo Health: LUMO, narrowear, vesse, kinsa, HAPIfork, soundhawk, SPIRE, Withings, QUANTUS, Lively, SCARAD, DENSE, mc10, blueantony, hello, AliveCar, iHealth, MyVital, remee, acion, corventis, TELGATE Family: FILIP, Sprouting, ovuline, AmberAlert, greatcall, Good Night Lamp, monbaby, OWLET, Secur, BELLABEAT, mimo, Glow, pocketfinder	Lifestyle Sports: Brain Sentry, BIKESPIKE, SO, biometrics, ZEPP, InfoMotion, swingbyte, HAMMERHEAD Cooking: Smart Die Scale, ANOVA, drop, blossom, iDevices, THE ORANGE CHEF CO., partry, nomiku Pets: Whistle, PetPace, pintofeed, PetHub, etagg, BISTRO, hoytag, PetPark, PetChatz, Petcube, tractive, Petriest, gibi, Pebzillo Toys: KAROTZ, UBOOLY, MAKIES, atoms, seebo Music/Arty Video: ROLI, CATCH, GoPro, Narrative Garden: plantlink, BITPONICS, rachio, EDYN, Greenbox, Koubachi	Connected Home Automation: Quirky, Radiator Labs, netatmo, LEVITON, SmartThings, Ubi, nest, LIFX, gecko, LUMI, CRESTRON, smarthome, LUTRON, ecobee, Advanced.umenis, vivint, SAVANT, vera, INSTEON, CHAMBERLAN, PRO, LIGHTS, somfy. Monitoring: lapka, sense, birdi, BlueMaestro, SUPERMECHANICAL, leo, knot, CUBESENSORS, tado, ambient Security: HomeMonitor, canary, ring, dropcam, butterflye, Lockitron, August, SCHLAGE, RAVEN, Kwikset, globosense, GENIE, UNKEY, OP LINK, GOJI, scout, SmartAlarm, KeyPro, SmartSafe Tracker: Chipolo, Linquet, locca!, TrackR Hub: Homey, revolv, NINJABLOCKS, Control, Lowe's, zonoff, STAPLES, NEXIA, muzzley, wink	Industries Retail: Proximity, SWIPE, bytelight, euclid, KNOX, BONI, mahana, GIMBAL, PERCH, P, bruck stream Payment Loyalty: Square, shopify, PayPal, ACS, Verifone, LevelUp, belly, payleven, coin Healthcare: VISI, Senseonics, STANLEY, VITALITY, MedMinder, CENTRAK, Intellig, Sotera, Rhyth Automotive: Zobie, navdy, DELPHI, dash, wavelink, iBeam, kisi, Johnson Controls, Trimble, Robin, Schneider Electric, adapt-N, Ag Leader Infra-structure: wavelink, iBeam, kisi, Johnson Controls, Trimble, Robin, Schneider Electric	Industrial Internet Robotics: Double Robotics, ALDEBARAN, ROBOTEX, EMPIRE, iRobot, ABB, LIQUID ROBOTICS, jibo, XENEX, KUKA Drones/Aerospace: 3DR, KM, Airware, SKYCATCH, spire, Parrot, Skybotix, DJI Green-tech: BigBelly, enlightened, Smart, enevo, compology, AMPY 3D Scan/Print: MakerBot, Stratasys, HOREL 3D, FUEL3D, RepRap, Ultimaker, Solidoodle Smart Grid: GRIDNET, e-on, SilverSpring, Itron, Trilliant Asset Tracking: asap, vloc, MESH SYSTEMS, Bosch, COLSON, Impiny, CUBIC, Applivity
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Platforms & Enablement (Horizontals)

Connectivity/Dev Platforms spark, kynetx, pinoccio, ioBridge, electric Imp, Ayla Networks, EUROTECH, resin.io, Symplic, TESSEL, bluecity	Software/Data Platforms EXOSITE, iconrol, thingsquare, carriers, Keen IO, SeeControl, Lhings, ConnectHO, NewAer, BERG, Axeda, Yaler.net, RacoWireless, SpaceCurve, FITT, greenWAVE, DNK, X, CoopioPower, IOTA, thingful, CANDI, bugsworm, TempoIQ, evercam.io, covisint, Jasper, Grovetronics, ETHERIOS, PubNub, NFURA, SensorCloud, xively	Open Source Platforms webinos, AllJoyn, openHAB, nimbits.com, OPEN INTERCONNECT, KPA, ThingSpeak, GRID2HOME	Sensor Networks SAFECAST, placemeter, Motionloft	Personal Interfaces NeuroSky, Raykon, wit.ai, LEAP, gestigon, speech, TALKCLASS, WINTUINE, api.ai, EMOTIV, Malaya, Reemo, Oculus	Security inside, SafeNet, utimaco, escript, gemalto, BASTILLE NETWORKS, MOCANA	Corporates amazon, hp, LG, intel, htc, PHILIPS, IBM, SAMSUNG, Google, WIND RIVER, MOTOROLA, belkin, DELL, BOSCH, NATIONAL INSTRUMENTS, ARM, LogMeIn, Microsoft, Honeywell, SONY, Atmel, SIEMENS, QUALCOMM, CISCO, TOSHIBA, SHARP
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Building Blocks

Protocols Bluetooth, Weaved, MQTT, NFC, RuBee, WiFi, ZigBee, oMA, WAVE, enModus, HART, MIWI, M-Bus, 2G, 3G, 4G, LTE, CoAP, 6LoWPAN, LWM2M, BitXmI	M2M Net wrks Helium, SIGFOX, KORE, stream, aeris, MACHEN, M2M	Portable WiFi Open Garden, GOODSPEED, BRCK, Karma	Telecom at&t, boostmobile, Verizon, T-Mobile, Telefonica, VimpelCom, Sprint, US Cellular, Vodafone, airtel	M2M pallick, PROCOM, Laird, WICED, QuSmart, Wireless, seed, arkessa, ecAnsis, GainSpan, Watson, Telit, SIEMENS			
Cloud Google Cloud Platform, amazon web services, redhat, ORACLE CLOUD, Microsoft Azure	Mobile iOS, Android, Windows Phone, BlackBerry	Processors/Sensors WEIO, mCube, Beagleboard.org, ESP8265, ESP32, Raspberry Pi, Arduino, MEMS, Freescale	Parts/Kits Makey Makey, SAM, littleBits, TrakerForge, Wonders	Services MY MINI FACTORY, dragon, makexyz, sculpteo, CIRCUI	Incubators Highway 1, LEMNOS Labs, WEARABLE WORLD, R/GA Accelerator, TechStars	Funding KICKSTARTER, indiegogo, MedStart	Distribution GANDST, angelcam

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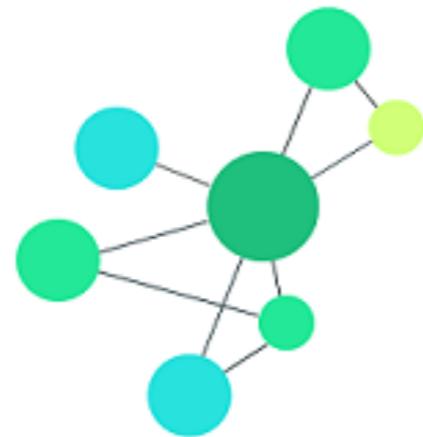


HomeKit

Google  eave



ALLSEEN ALLIANCE



OPEN
INTERCONNECT
CONSORTIUMSM















OSGi Container

JVM

OS

90.000+ LOC | 258 Forks | 57 Contributors

February 13, 2016 – March 13, 2016

Period: 1 month ▾

Overview



79 Active Pull Requests



81 Active Issues

 **72**
Merged Pull Requests

 **7**
Proposed Pull Requests

 **47**
Closed Issues

 **34**
New Issues

Jan 5, 2014 – Mar 13, 2016

Contributions: **Commits** ▾

Contributions to master, excluding merge commits



Umgesetzte Projekte

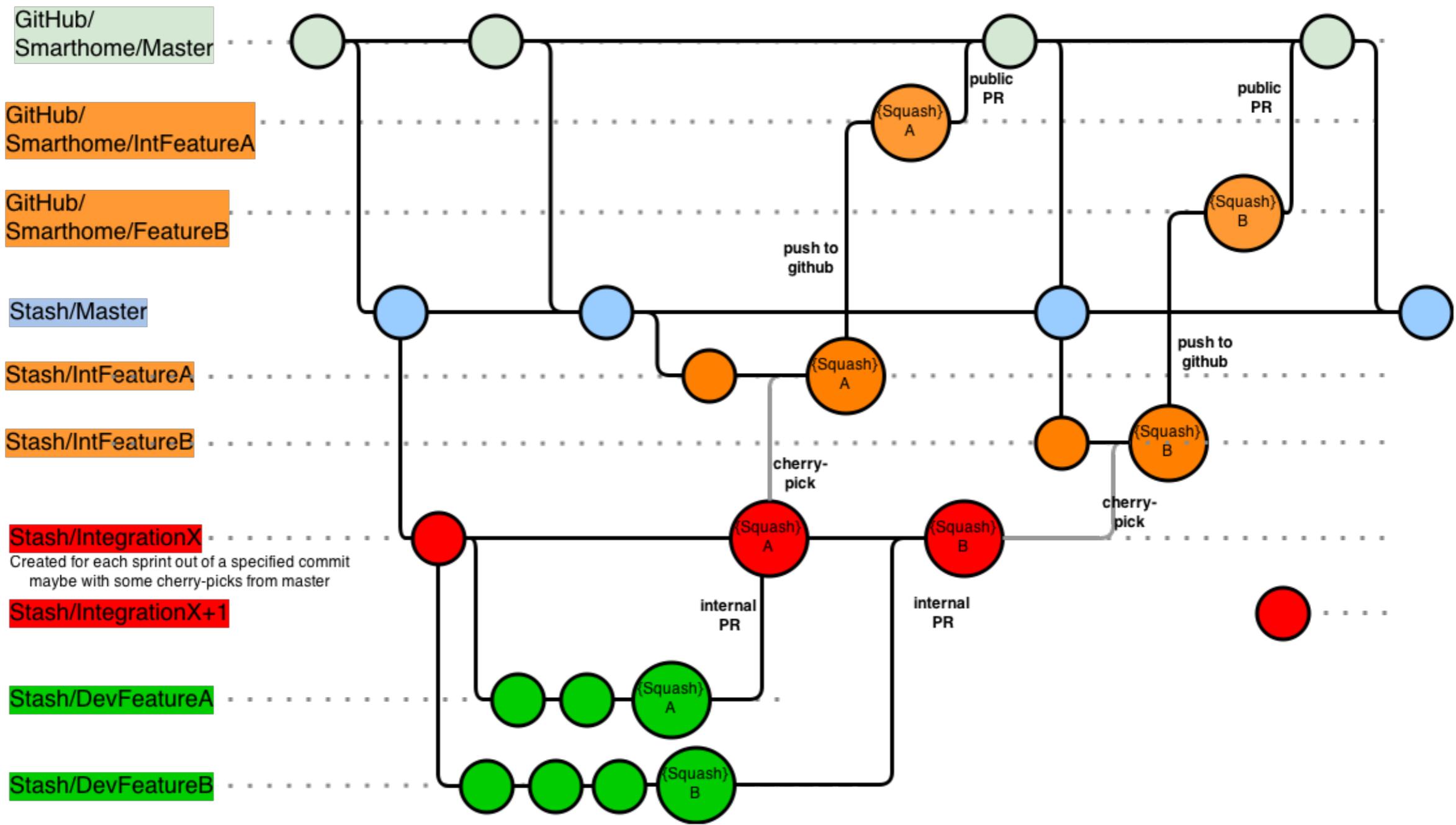
- › Smarthome-Lösung mit Fokus “Energie”
- › Konfigurationsbrücke zwischen Gebäude-Steuerungsbus und Eclipse Smarthome
- › Prototypische Smarthome-Lösung für die Vernetzung aller Konsortialpartner
- › ...

Lessons Learned 1

- › oomph Setup Datei erstellen
- › P2 Repository Proxy einsetzen
- › P2 Repository Mirror erstellen (optional)
- › Apache Karaf Features für Distribution

Lessons Learned 2

- › fehlende Features identifizieren, den “Schichten” zuordnen, Lösung formulieren, Github Issue anlegen, Lösung diskutieren
- › eigene “Solution” statt openHAB aufbohren
- › Rolle “ESH Community Manager” besetzen
- › Entwicklungs-“Flow” dokumentieren



Frontend

Muss nur geil sein.

Frontend

- › Wo fange ich an?
- › Welche Möglichkeiten habe ich?
- › Welche Technologie soll ich nutzen?

Wo fange ich an?

- › Neues UI-Bundle anlegen
- › `extensions/ui/com.innoq.esh.ui.my`
- › `pom.xml` erweitern
- › Bundle = Projekt, also importieren

Wo fange ich an?

- › `.launch`-Datei editieren, UI anhaken und AutoStart aktivieren
- › `httpService` injecten lassen
(`OSGI-INF/*.xml`)
- › Servlet in URI-Pfad einhängen

Oder man kopiert
einfach ein
vorhandenes UI ...

Vorhandene UIs

- › **PaperUI** - Setup Things, Rules, ...
- › **BasicUI** - User
- › **ClassicUI** - Oldie
- › **Apps** - Nativ Android + iOS
- › **YourFancyUI**

 Setup Wizard Configuration

Bindings

Services

Groups

Things

 Extensions Preferences

Paper UI

**Local Time** ONLINENTP Server
ntp:ntp:local**FRITZ!Box** OFFLINEFRITZ!Box
avmfritz:fritzbox:96916a2f**FRITZ!Box** OFFLINEFRITZ!Box
avmfritz:fritzbox:c1cfdaf8**Zone Player** ONLINEZone Player
sonos:zoneplayer:0cfc7d8e**WeMo Insight Switch** OFFLINEWeMo Insight Switch
wemo:insight:3ecfb735**Wetterinformation** ONLINEWetterinformation
vahooweather:weather:487c2ba5



Widget Overview

Binary Widgets



Toggle Switch



Button Switch

ON

Discrete Widgets



Scene Selection



Scene

READING

DINNER

TV



Temperature



Percent-based Widgets



Dimmer



RGB Light



Roller Shutter



Blinds



Map/Location

BasicUI

Binary Widgets

Toggle Switch

Button Switch On

Discrete Widgets

 **Scene Selection** >

 **Scene**

 **Temperature** 20.0 °C

Percent-based Widgets

 **Dimmer** 51 %

 **RGB Light** 

 **Roller Shutter**

 **Blinds** 100 %

Map/Location

ClassicUI



- ▼ > org.eclipse.smarthome.ui.iotcon2016 [smarthome master ↓22]
 - ▶ JRE System Library [JavaSE-1.7]
 - ▶ Plug-in Dependencies
 - ▶ src/main/java
 - ▶ about_files
 - ▶ META-INF
 - node_modules
 - ▶ OSGI-INF
 - ▶ src
 - target



- ▼ web-src
 - ▶ css
 - fonts
 - ▶ img
 - ▶ js
 - index.html

- about.html
- build.properties

- gulpfile.js
- package.json

- pom.xml

Wie kommt der moderne
 auf meinen Build-
Server?

```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns="http://maven.apache.org/POM/4.0.0"
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/maven-v4_0_0.xsd">

  <modelVersion>4.0.0</modelVersion>

  <parent>
    <groupId>org.eclipse.smarthome.extension.ui</groupId>
    <artifactId>pom</artifactId>
    <version>0.8.0-SNAPSHOT</version>
  </parent>

  <properties>
    <bundle.symbolicName>org.eclipse.smarthome.ui.paper</bundle.symbolicName>
    <bundle.namespace>org.eclipse.smarthome.ui.paper</bundle.namespace>
  </properties>

  <artifactId>org.eclipse.smarthome.ui.iotcon2016</artifactId>

  <name>IoTcon 2016 UI</name>
  <packaging>eclipse-plugin</packaging>

  <build>
    <plugins>
      <plugin>
        <groupId>com.github.eirslett</groupId>
        <artifactId>frontend-maven-plugin</artifactId>
        <version>0.0.27</version>

        <executions>
          <execution>
            <id>Install node and npm</id>
            <goals>
              <goal>install-node-and-npm</goal>
            </goals>
            <!-- optional: default phase is "generate-resources" -->
            <phase>generate-resources</phase>
            <configuration>
              <nodeVersion>v5.4.0</nodeVersion>
              <npmVersion>3.3.12</npmVersion>
              <nodeDownloadRoot>http://nodejs.org/dist/</nodeDownloadRoot>
              <npmDownloadRoot>http://registry.npmjs.org/npm/-/</npmDownloadRoot>
            </configuration>
          </execution>

          <!-- Default execution argument is 'install' -->

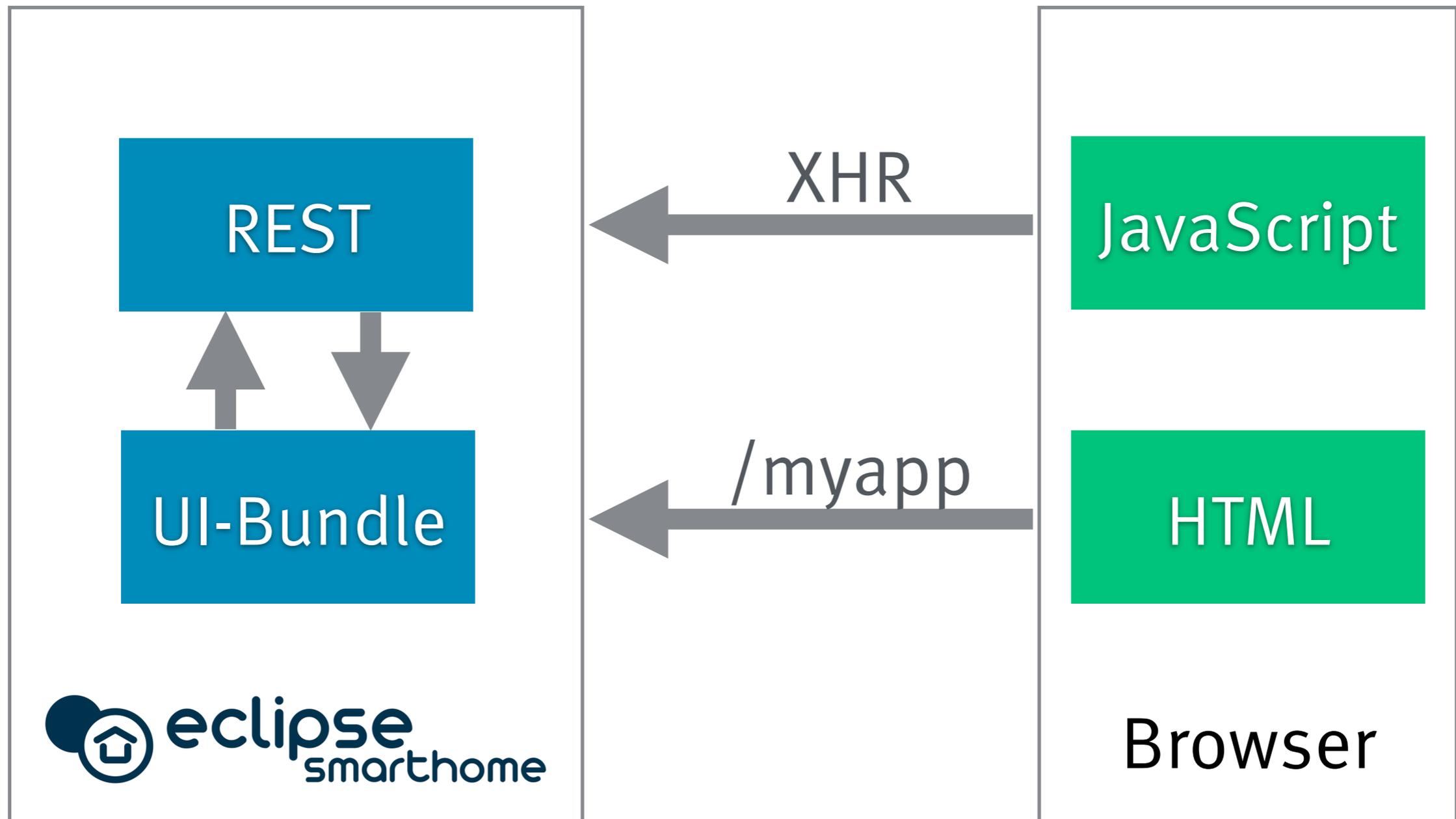
          <execution>
            <id>npm install</id>
            <goals>
              <goal>npm</goal>
            </goals>
          </execution>

          <execution>
            <id>gulp build</id>
            <goals>
              <goal>gulp</goal>
            </goals>
            <configuration>
              <arguments>build</arguments>
            </configuration>
          </execution>
        </executions>
      </plugin>
    </plugins>
  </build>
</project>
```

Welche Technologie?

- › Wer ruft mich auf? Mobile/Tablet/Desktop
- › Was kann die Hardware?
- › Was kann und möchte das Team?
- › Standards! ES2015 + Babel

UI Kommunikation



Lessons Learned 1

- › Caching header und GZip nutzen!
Servlets sind von Haus aus doof.
- › Assets mit Hash + Expires (∞)
- › Web Manifest generieren
- › `disableHtmlCache` in
`ESH-INF/config/config.xml`

Lessons Learned 2

- › UI-Bundles aus dem Workspace im Eclipse-Launcher wählen
- › Bei Transpilern einen Proxy für **/rest** verwenden (http-proxy-middleware, WebPack)
- › Evtl. generierte Dateien mit Einchecken

Lessons Learned 3

- › UI-Bundles aus dem Workspace im Eclipse-Launcher wählen
- › Bei Transpilern einen Proxy für **/rest** verwenden (http-proxy-middleware, WebPack)
- › Evtl. generierte Dateien mit Einchecken

Lessons Learned 4

- › Welche Persistenz benötigt meine UI?
 - › Sorting: Sitemaps verwenden
- › Protokoll-Entwicklung: Netty FTW!
- › Swagger/Postman nutzen!



openHAB REST API

bindings

Show/Hide | List Operations | Expand Operations

channel-types

Show/Hide | List Operations | Expand Operations

config-descriptions

Show/Hide | List Operations | Expand Operations

discovery

Show/Hide | List Operations | Expand Operations

extensions

Show/Hide | List Operations | Expand Operations

inbox

Show/Hide | List Operations | Expand Operations

items

Show/Hide | List Operations | Expand Operations

links

Show/Hide | List Operations | Expand Operations

persistence

Show/Hide | List Operations | Expand Operations

services

Show/Hide | List Operations | Expand Operations

sitemaps

Show/Hide | List Operations | Expand Operations

thing-types

Show/Hide | List Operations | Expand Operations

things

Show/Hide | List Operations | Expand Operations

uuid

Show/Hide | List Operations | Expand Operations



The image shows the Postman API client interface. The top navigation bar includes 'Runner', 'Import', 'Builder', and 'Team Library'. The main workspace is divided into a left sidebar and a right main area. The sidebar shows a 'Collections' view with a tree structure of API endpoints under 'openHAB REST API'. The main area displays a REST client request for 'Get all available items.' with a GET method and a URL containing query parameters. The 'Authorization' tab is selected, showing 'No Auth'.

Runner Import + Builder Team Library

Search localhost

History Collections

All Me Team

openHAB REST API 49 requests

- bindings
- channel-types
- config-descriptions
- discovery
- inbox
- items
- GET Get all available items.**
- PUT Adds a new member to a gr...
- DEL Removes an existing memb...
- GET Gets a single item.
- PUT Adds a new item to the regi...
- POST Sends a command to an item.
- DEL Removes an item from the r...
- GET Gets the state of an item.
- PUT Updates the state of an item.
- PUT Adds a tag to an item.
- DEL Removes a tag from an item.
- links
- services
- sitemaps
- thing-types
- things
- uuid

Get all available items. +

localhost

GET http://rest/items?type={{type}}&tags={{tags}}&recursive={{recursive}} Params Send Save

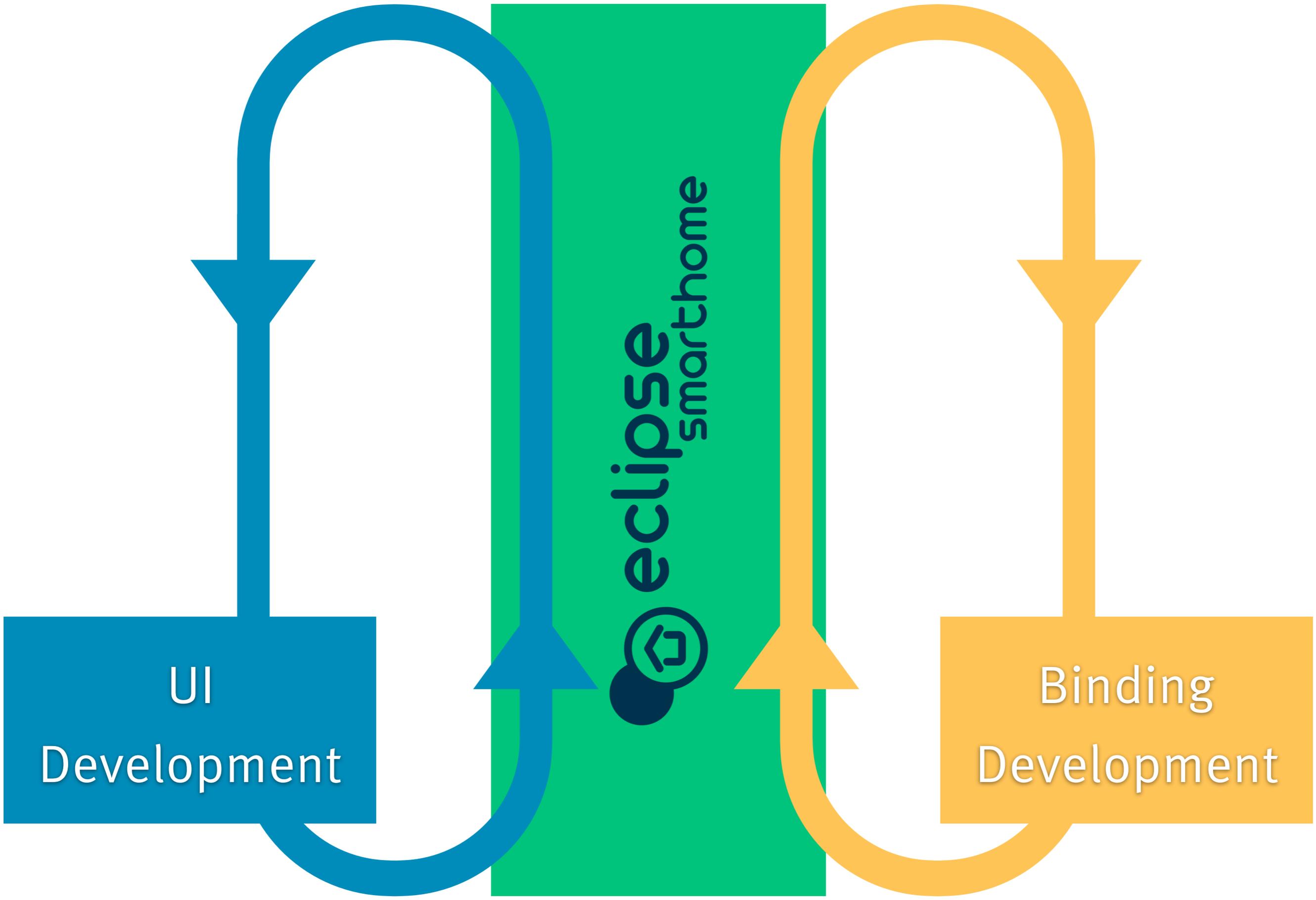
Authorization Headers (1) Body Pre-request Script Tests Generate Code

Type No Auth

Postman

Lessons Learned 4

- › Welche Persistenz benötigt meine UI?
 - › Sorting: Sitemaps verwenden
- › Protokoll-Entwicklung: Netty FTW!
- › Swagger/Postman nutzen!



UI
Development

 eclipse
smarthome

Binding
Development



WE WANT YOU!

Vielen Dank!

innoQ

