



Rewriting a Plugin Architecture 3 Times to Harness the API Economy

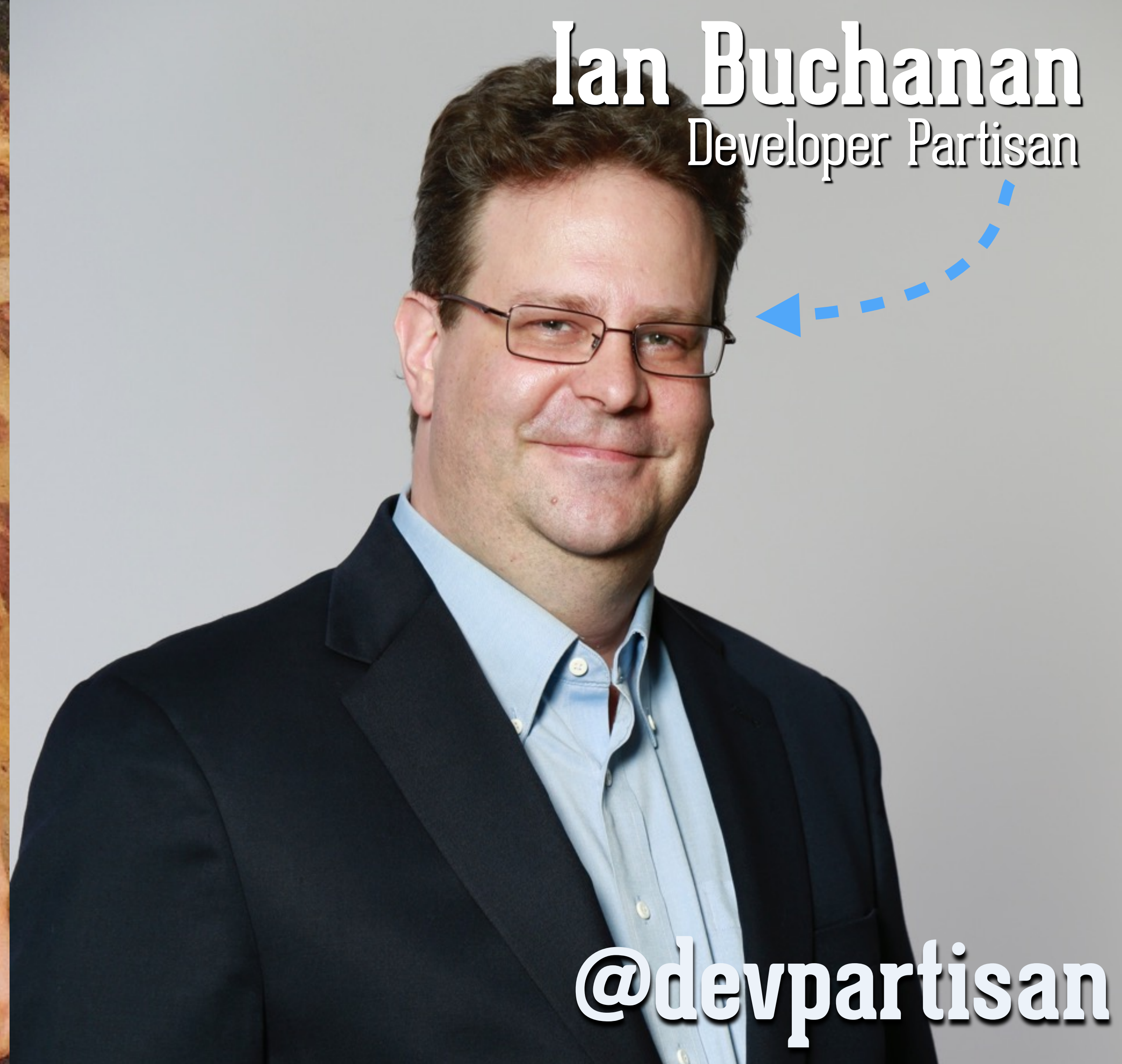


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Developer Provocateur



@kannonboy

Ian Buchanan
Developer Partisan



@devpartisan

A couple of Atlassians who are passionate about plugins

API Economy

Economy



\$50,000,000

***Paid to ISVs to date.**



15,000,000 paying
users

*2011. <http://techcrunch.com/2012/04/24/facebook-revenue-share-apps/>

The Salesforce logo, which consists of a blue cloud shape with the word "salesforce" written in white lowercase letters inside it.

salesforce

\$1,000,000,000

*Paid to ISVs in 2013. <http://www.partner-path.com/2013/12/salesforce-partner-ecosystem/>

REST?

OAuth?



Blue logos?

~~SP1 API~~
Economy

API

Application
Programming
Interface



SPI

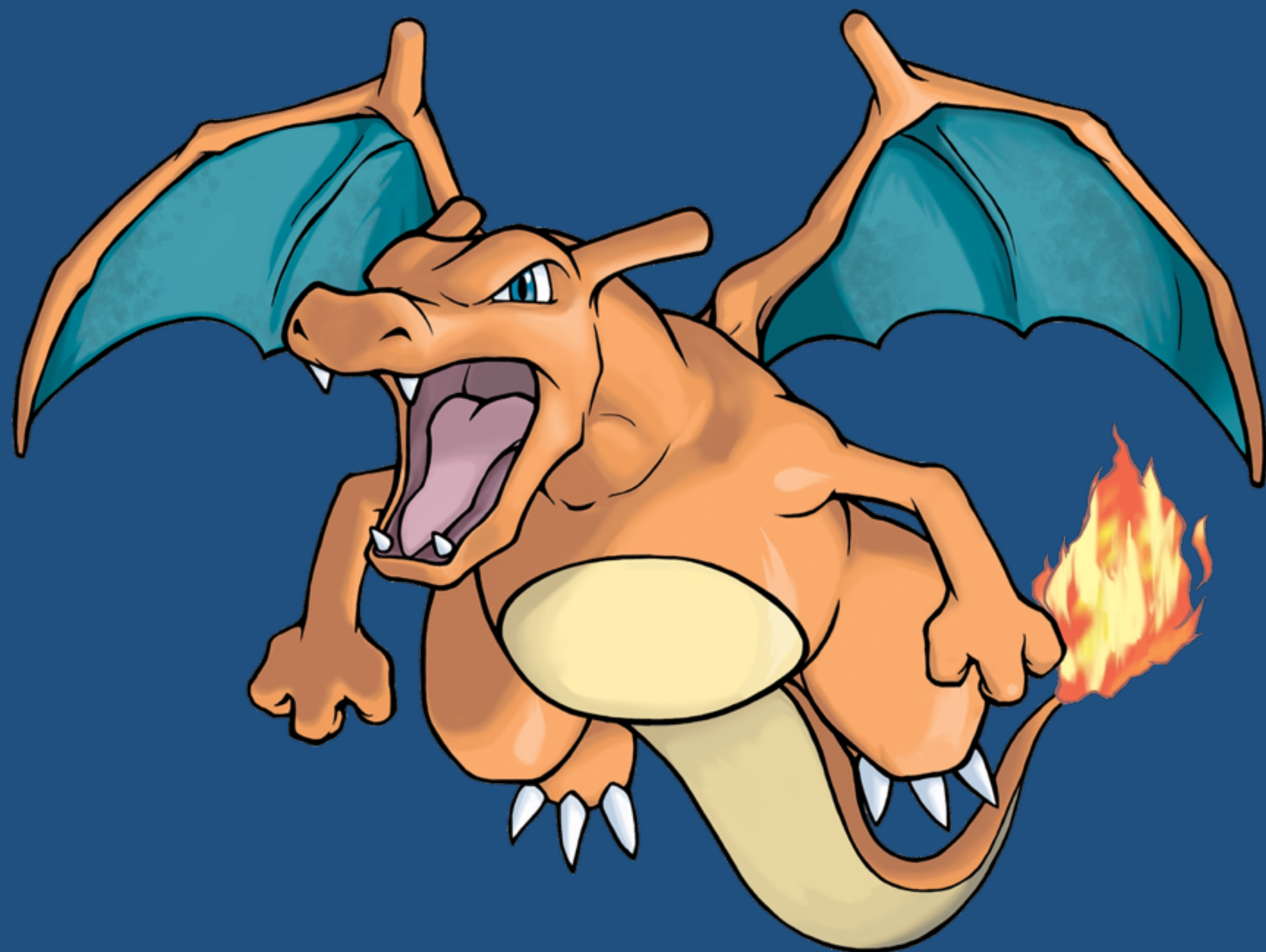
Service
Provider
Interface



Atlassian Plugins (2004)



P2
(2008)



Atlassian Connect (2014)











Atlassian Plugins (2004)







Open(-ish) Source [2001]

Why it's awesome!

-  Customers can “scratch their own itch”
-  Atlassian devs can focus on the 90%
-  Customization == stickier product
-  Devs who customize, evangelize



Why it sucks..

-  Massive barrier to upgrade
-  Pain to build the entire product
-  Poor plugin UX == poor product perception
-  Developer support load






Atlassian Plugins (2004)

Filter: [View](#) [Edit](#) [New](#) [Manage](#)

You are currently using a new, unsaved search.

☐ **Save** it as a filter

<< View & Hide | View >>

Project: 
Selection automatically reloads page

Project Components

(only available if there is a single project selected)

Fix For:

- Any
- No Fix Version
- Unreleased Versions

In Components:

- Any
- No Component
- App-Browser

Matches: Any
Versions: No Version
Unreleased Versions

Text Search

Query:

Query Fields: ☒ Summary ☒ Description
☐ Comments ☐ Environment

Issue Attributes

Issue Type: Any
Standard Issue Types
- Bug

Reported By: Any User

Issue Navigator

















Displaying issues 1 to 11 of 11 matching issues.

Current View:

Browser | [Printable](#) | [Excel](#) | [XML](#) | [Full Content](#) 

Bulk Change: all 11 issue(s)

- **Configure** your Issue Navigator

T	Key	Summary	Assignee	Reporter	Pr	Status	Res	Created	Updated	Due
	IRI-379	data app event logging sometimes not in the same order of execution	Unassigned	Julie Wong		 Closed		31/Dec/04	17/Jan/05	
	IRI-354	You can't deselect a connection type in the dataApp form	Leslie Pound	Leslie Pound		 Closed	Fixed	13/Dec/04	17/Jan/05	
	IRI-345	CALO Desktop Installer--needs gdiplus.dll	Steve Hardt	Mark Gondek		 Closed	Fixed	09/Dec/04	17/Jan/05	
	IRI-267	Make viewable history smaller	Unassigned	Leslie Pound		 Closed		03/Nov/04	17/Jan/05	
	IRI-191	Does not store password at login	Unassigned	Leslie Pound		 Closed		19/Oct/04	17/Jan/05	
	IRI-180	Setting an event to recur doesn't work	Colin Evans	Talia Shaham		 Closed		14/Oct/04	18/Jan/05	
	IRI-90	Calo/Iris chat while another app is active	Adam Cheyer	Steve Hardt		 Closed	Fixed	01/Sep/04	17/Jan/05	
	IRI-11	Contacts: 'Group' -> 'Team'	Richard Giuli	Adam Cheyer		 Closed	Fixed	19/Mar/04	17/Jan/05	
	IRI-10	Sort Global Relations	Adam Cheyer	Adam Cheyer		 Closed	Fixed	17/Mar/04	17/Jan/05	
	IRI-8	GROUP -> TEAM	Jack Park	Adam Cheyer		 Closed	Fixed	17/Mar/04	17/Jan/05	
	IRI-2	Contacts detail page: 'Close' button doesn't work	Richard Giuli	Adam Cheyer		 Closed	Fixed	17/Mar/04	17/Jan/05	

JIRA 3.0

How?

Wherever there is a collection of type FOO, let the end user inject their own implementations of FOO.



“Web fragments”



JIRA BUG TRACKER User: Colin Evans [History](#) | [Filters](#) | [Profile](#) | [Log Out](#)

[HOME](#) [BROWSE PROJECT](#) [FIND ISSUES](#) [CREATE NEW ISSUE](#) **[ADMINISTRATION](#)** QUICK SEARCH:

Filter: [View](#) [Edit](#) [New](#) [Manage](#)

You are currently using a new, unsaved search.
☐ [Save](#) it as a filter

<< View & Hide View >>

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Project Components
 (only available if there is a single project selected)

Fix For:
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 Unreleased Versions

In Components:
 No Component
 App-Browser

Issue Navigator

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	IRI-345	CALO Desktop Installer--needs gdiplus.dll	Steve Hardt	Mark Gondek		Closed	Fixed	09/Dec/04	17/Jan/05	
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	IRI-180	Setting an event to recur doesn't work	Colin Evans	Talia Shaham		Closed		14/Oct/04	18/Jan/05	

```
<ul>
```

```
<li><a href="/dashboard.jspa">Home</a></li>
```

```
<li><a href="/project.jspa">Browse Project</a></li>
```

```
<!-- ... -->
```

```
<li><a href="/admin.jspa">Administration</a></li>
```

```
</ul>
```



```
interface WebItem {  
    class FooWebLink implements WebItem {  
        String getHref();  
        public String getHref() {  
            String getText();  
            return "http://foo.com";  
        }  
  
        public String getText() {  
            return "Foo";  
        }  
    }  
}
```



PluginAccessor

```
List<WebItem> getModules ()
```



```
<ul>
  <li><a href="/dashboard.jspa">Home</a></li>
  <li><a href="/project.jspa">Browse Project</a></li>
  <!-- ... -->
  <li><a href="/admin.jspa">Administration</a></li>
</ul>
<% for (WebItem wi : pluginAccessor.getModules()) { %>
  <li>
    <a href="<% wi.getHref() %>">
      <% wi.getText() %>
    </a>
  </li>
<% } %>
```





Plugins promote abstraction and enforce modular architecture!



JIRA

Dashboards

Projects

Issues

Capture

Agile


Create

Search

?

⚙

👤

SourceTree For Mac / SRCTREE-1934

Sign commit with GPG key when using Git Flow

Edit

Comment

Assign

More

Needs Verification

Verify Issue Exists

Workflow

🔗

Export

Details

People

Type:

Improvement

Status:

OPEN

Priority:

Minor

(View Workflow)

Affects Version/s:

1.7.4

Resolution:

Unresolved

Component/s:

Git


Fix Version/s:

2.0.0

Labels:

None

Assignee:

Kieran Senior [Atlassian]

Assign to me

Reporter:

Two plugins
looks great!

3+ plugins.. not
so hot.

JIRA

Dashboards

Projects

Issues

Capture

Agile

Foo

Bar

SeBaz


Foo

Bar

Baz

⚙

👤

SourceTree For Mac / SRCTREE-1934

Sign commit with GPG key when using Git Flow

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Resolution:

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Component/s:

Git


Fix Version/s:

2.0.0

Labels:

None

Assignee:

Kieran Senior [Atlassian]

Assign to me

Reporter:





Every (pluggable) collection is now potentially infinitely large.



PluginAccessor

```
List<Type> getType()
List<Type> getTypes()
```



```
public void transitionIssue(Issue issue, Transition tn) {  
  
    // update issue state  
    // ..  
  
    // send email to watchers  
    for (User watcher : issue.getWatchers()) {  
        issue.emailTo(watcher);  
    }  
  
}
```



```
public void transitionIssue(Issue issue, Transition tn) {  
    // update issue state  
    // ..  
}  
  
public static interface PostFn {  
    void onTransition(Issue issue);  
}  
  
public class EmailFn implements PostFn {  
    public void onTransition(issue) {  
        for (User watcher : issue.getWatchers()) {  
            issue.emailTo(watcher);  
        }  
    }  
}
```




```
public void transitionIssue(Issue issue, Transition tn) {  
    // update issue state  
    // ..  
    // trigger post functions  
    for (PostFn fn : pluginAccessor.get(PostFn.class)) {  
        fn.onTransition(issue);  
    }  
}
```

```
public class EmailFn implements PostFn {  
    public void onTransition(issue) {  
        for (User watcher : issue.getWatchers()) {  
            issue.emailTo(watcher);  
        }  
    }  
}
```





Adding a new “plugin point” is easy if you already have good abstraction!





You SHOULD make “pluginizing” a feature as simple & quick as possible. Otherwise if there’s a crunch for time, it won’t happen.




```
for (PostFn fn : pluginAccessor.get(PostFn.class)) {  
    fn.onTransition(issue);  
}
```

StackOverflowError

ArithmeticException

OutOfMemoryError

ClassNotFoundException

ClassCastException

```
while (true) {}
```





Murphy's law:
If a plugin can fail, it will.
Horrifically.



Code defensively

```
for (PostFn fn : pluginAccessor.get(PostFn.class)) {  
    log.debug("Invoking " + fn);  
    try {  
        fn.onTransition(issue);  
    } catch (Exception e) {  
        log.error("Plugin post-function failed", e);  
    }  
}
```





Corollary:

**If an API is public, it will be used.
Often *incorrectly*.**



Show them the way

```
/**
 * @param list a non-null, non-empty list
 */
public void publicApiMethod(List<?> list)
    if (list == null) throw new NullPointerException(
        "list must not be null"
    );
    if (list.isEmpty()) throw new IllegalArgumentException(
        "list must not be empty"
    );
    ..
}
```



Backend

- Custom fields
- JQL functions
- Workflows (post-functions, conditions)
- Servlets
- Filters
- Event listeners

generic



Atlassian Plugins

Source (BSD 3-clause licensed)

<https://bitbucket.org/atlassian/atlassian-plugins>



Embedding Guide

<http://bit.ly/embedding-plugins>



How it works (1 of 3)

- **Host application exposes some “plugin point” interfaces**

```
public static interface PostFn {  
    void onTransition(Issue issue);  
}
```

- **Plugin developer provides concrete implementations**

```
public class EmailFn implements PostFn {  
    // send email to watchers  
    for (User watcher : issue.getWatchers()) {  
        issue.emailTo(watcher);  
    }  
}
```



How it works (2 of 3)

- **Plugin developer adds an XML descriptor (remember it's 2004)**

```
<post-function class="com.foo.EmailFn" weight="10" />
```

- **Developer packages up the class and XML in a JAR and puts it on the classpath**

```
atlassian-jira/WEB-INF/lib/my-cool-plugin-1.0.jar/
```

```
atlassian-plugin.xml
```

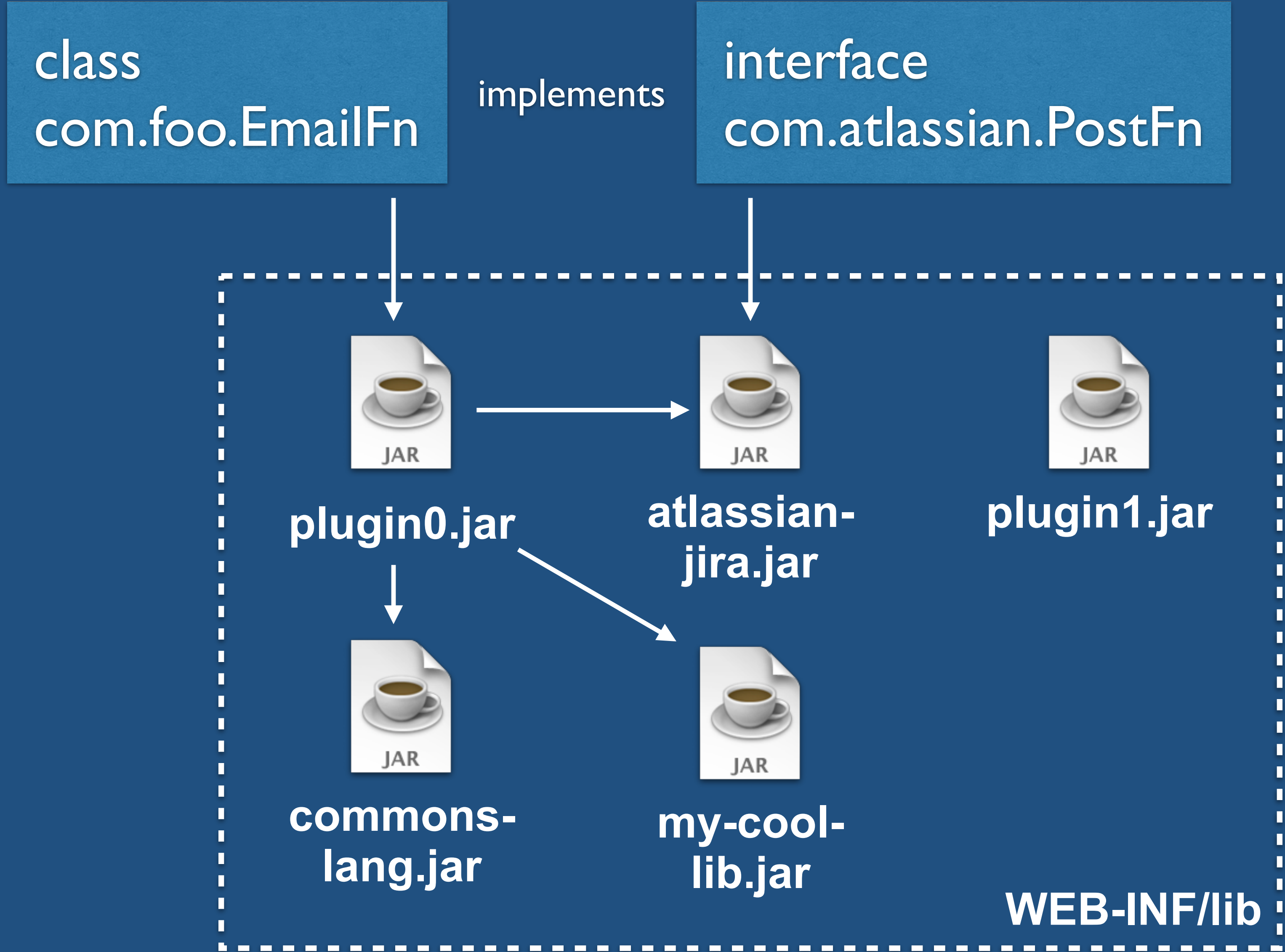
```
com/foo/EmailFn.class
```



How it works (3 of 3)

- On startup, plugin system parses the XML and instantiates classes with Spring DI
- The `PluginAccessor` is injected into other components and used to look up modules.
- Because the class path is static, the `PluginAccessor` caches plugins very aggressively.





Why it's awesome!

 Easier customization by end-users

 Smoother upgrades

 Improved customization UX

 Architectural benefits

 Simple to implement



Why it sucks..



Shared classpath



No API delineation



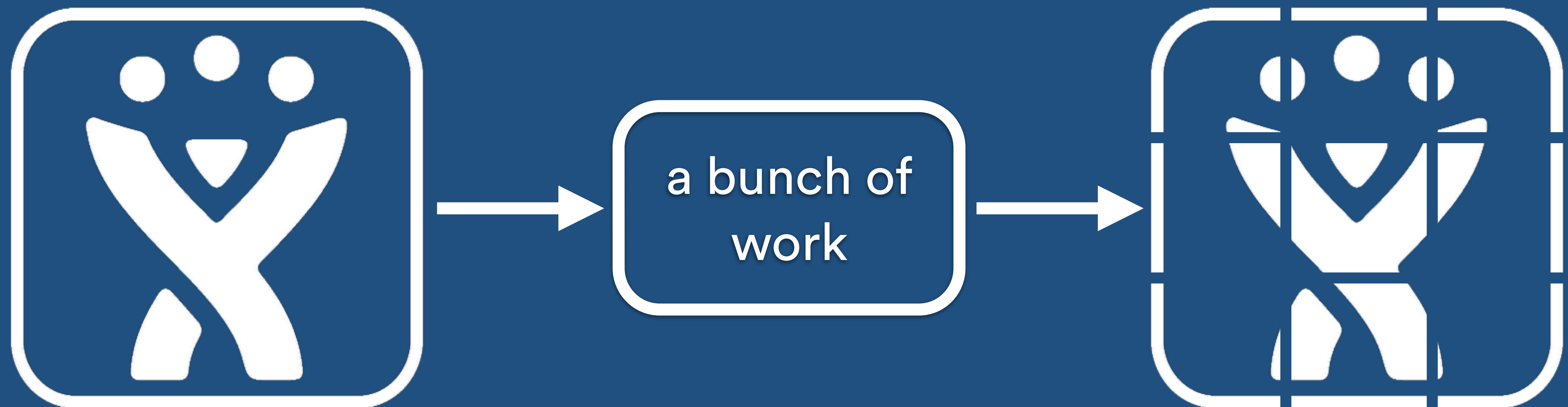
Need to restart to install plugins



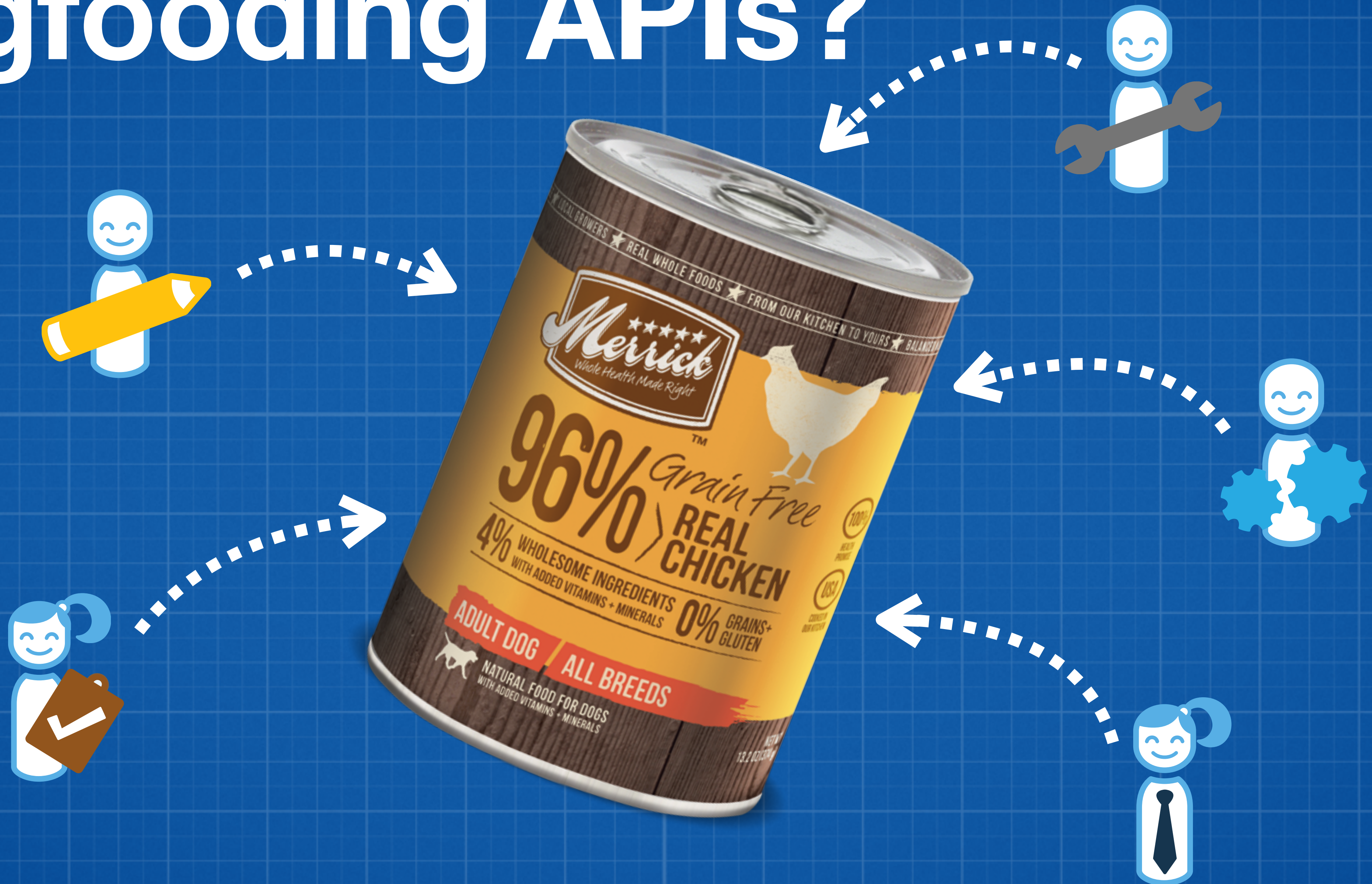
Totally bespoke, non-standard



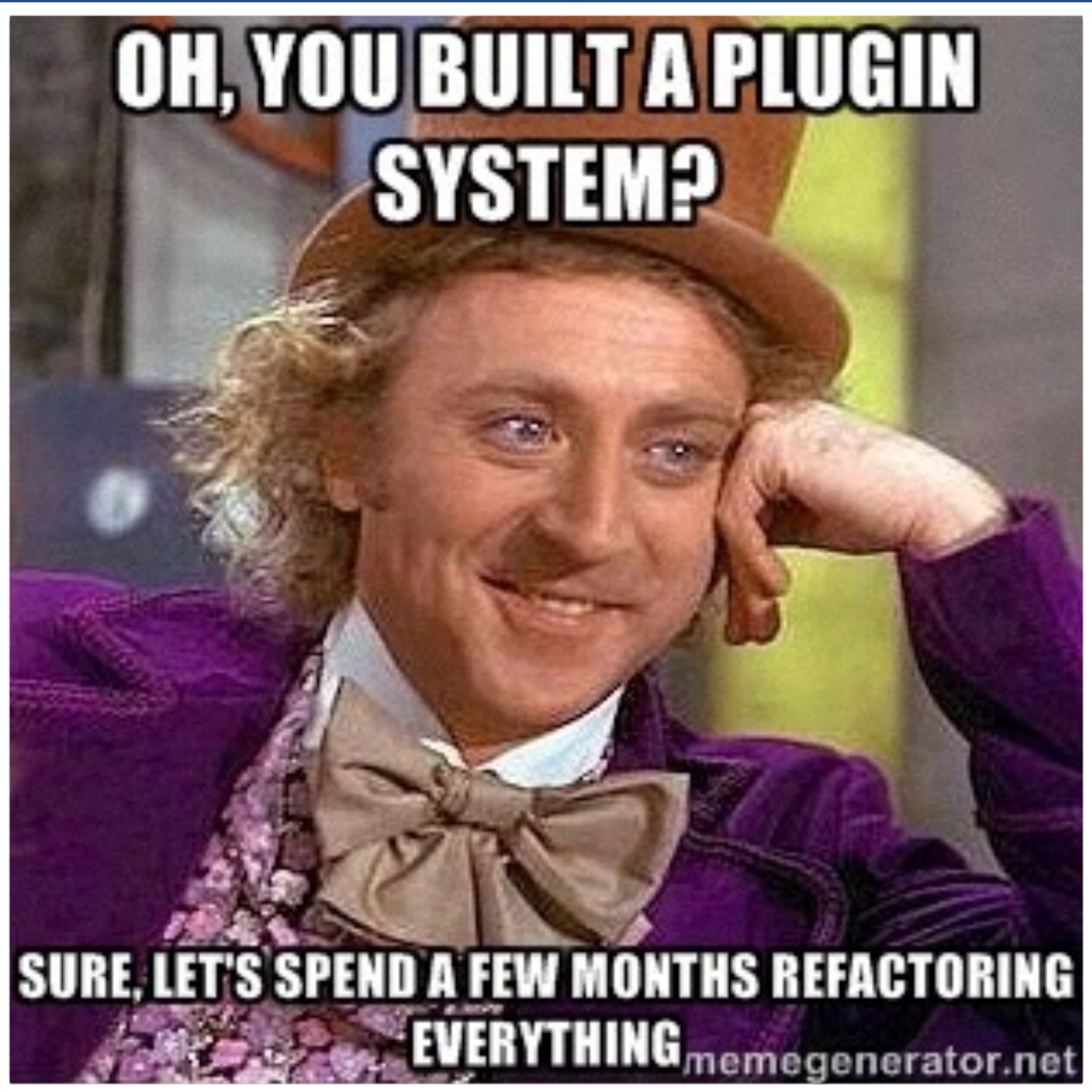
Re-architecting as plugins



Dogfooding APIs?



product
manager



“PM friendly” benefits!



Release plugins out of band



Ship “dark features”



Customers can turn stuff off



Release paid plugins (\$\$\$)



Architecture == velocity





Make sure your plugin system works.

Nothing turns off a plugin developer like
a broken API or an unstable platform.





P2
(2008)



P2
(2008)

Why plugins suck..



Shared classpath



No API delineation



Need to restart to install plugins

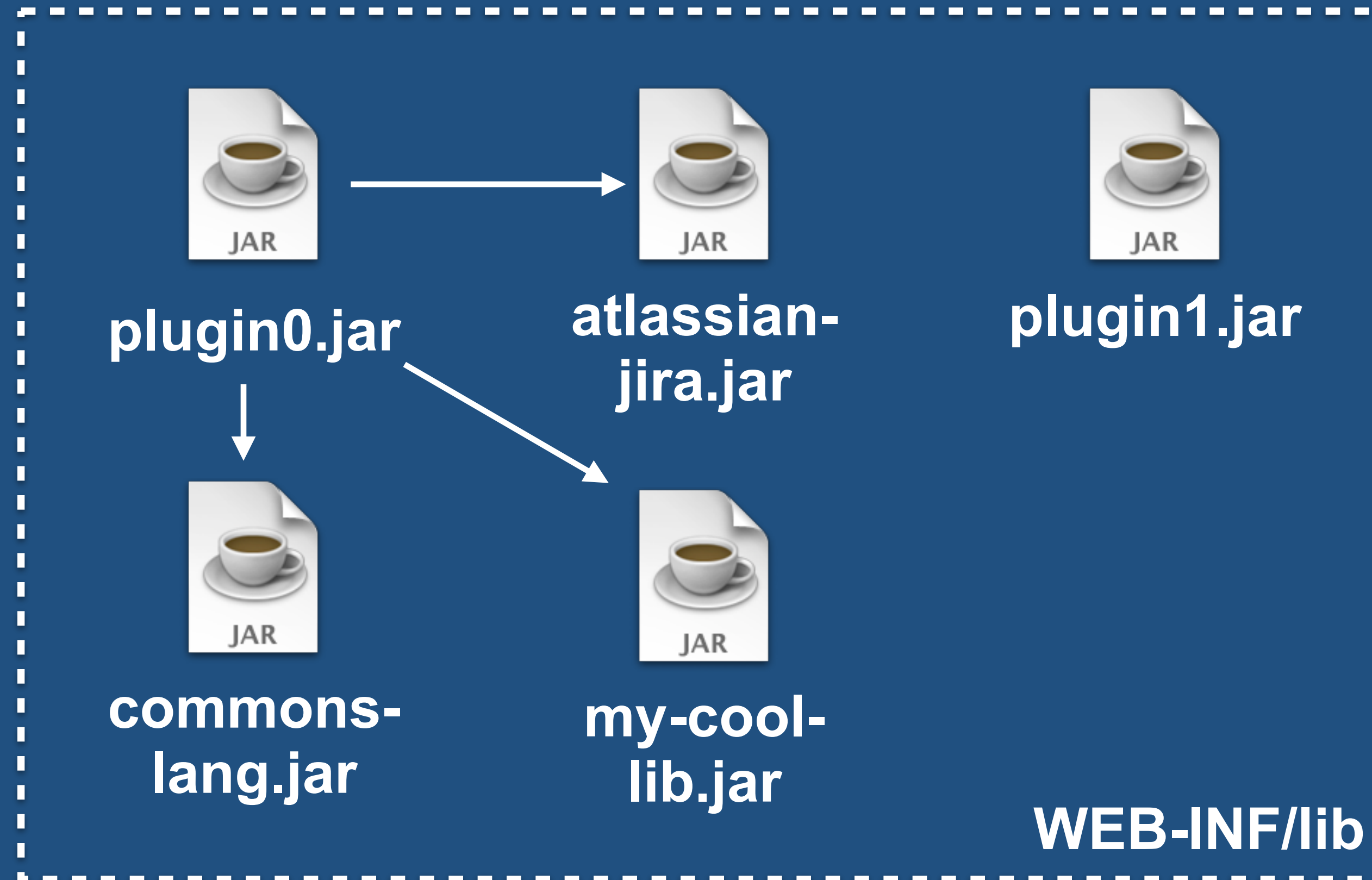


Totally bespoke, non-standard





OSGi





my-cool-lib.jar



commons-lang-3.3.jar

Import-Package:
com.atlassian.jira;version="5.0",
Export-Package:
org.apache;version="3.3"

MANIFEST.MF

plugin0.jar



atlassian-jira.jar



commons-lang-3.1.jar

Export-Package:
com.atlassian.jira;version="5.0",
org.apache;version="3.1",
...

MANIFEST.MF

WEB-INF/lib



Import-Package:
org.apache;version="3.3"

MANIFEST.MF

plugin1.jar



Why it sucks..



~~Shared classpath~~



~~No API delineation~~



~~Need to restart to install plugins~~



~~Totally bespoke, non-standard~~



Why it sucks..



OSGi is pretty
complicated




```
Terminal — less — 71x39
Manifest-Version: 1.0
Export-Package: com.pyxis.greenhopper.charts.report;uses="com.atlassian.jira.issue";version="6.3.13.1",com.pyxis.greenhopper.charts.renderer;uses="com.pyxis.greenhopper.charts.context,org.jfree.chart,org.jfree.chart.labels,org.jfree.ui,org.jfree.chart.annotations,org.jfree.chart.axis,org.jfree.chart.plot,com.pyxis.burndown,com.pyxis.greenhopper.charts,org.jfree.data.category,com.atlassian.jira.charts.jfreechart.util,org.jfree.chart.renderer.category,com.pyxis.greenhopper.jira.util,org.jfree.chart.renderer.xy,org.jfree.data.xy";version="6.3.13.1",com.pyxis.greenhopper.jira.customfields;uses="com.atlassian.jira.issue.search.managers,com.atlassian.jira.jql.operand,com.atlassian.jira.util,com.atlassian.jira.issue.customfields.converters,com.atlassian.jira.web,com.atlassian.jira.issue.customfields.searchers.transformer,com.atlassian.jira.issue.customfields.searchers,org.apache.log4j,com.pyxis.greenhopper.jira.util,com.atlassian.crowd.embedded.api,com.atlassian.jira.event.issue,com.atlassian.jira.issue,com.atlassian.jira.project,com.atlassian.jira.project.version,org.ofbiz.core.entity,com.pyxis.greenhopper.jira.listeners,com.atlassian.jira.issue.customfields.persistence,com.atlassian.jira.issue.customfields.manager,com.atlassian.jira.issue.customfields.impl,com.atlassian.jira.issue.fields,com.atlassian.jira.security,com.atlassian.jira.issue.fields.rest.json.beans,com.atlassian.jira.issue.fields.util,com.atlassian.jira,com.atlassian.jira.issue.search.searchers.transformer,com.atlassian.jira.jql.validator,com.atlassian.jira.jql.resolver,com.atlassian.jira.jql.context";version="6.3.13.1",com.pyxis.greenhopper.jira.util.collector;uses="org.apache.lucene.document,org.apache.lucene.search,com.atlassian.jira.issue.statistics.util,com.atlassian.jira.issue,com.pyxis.greenhopper.jira.configurations.taskboard,com.pyxis.greenhopper.jira.boards,com.pyxis.greenhopper.jira.util,com.atlassian.jira.project,com.pyxis.greenhopper.jira.boards.context,com.atlassian.jira,com.atlassian.jira.issue.issue,com.atlassian.jira.config,com.pyxis.greenhopper.jira.boards.stats,com.atlassian.greenhopper.model.stats,org.apache.log4j";version="6.3.13.1",com.pyxis.greenhopper.jira.conditions;uses="com.atlassian.jira.plugin.webfragment.model,com.atlassian.jira.plugin.webfragment.conditions,com.atlassian.greenhopper.upgrade,org.springframework.beans.factory.annotation,com.atlassian.crowd.embedded.api,com.atlassian.extras.common,com.pyxis.greenhopper.jira.license,com.atlassian.greenhopper.service.analytics,com.atlassian.greenhopper.service.conf
MANIFEST.MF
```

JIRA Agile's MANIFEST.MF

175Kb of text



P1

```
<post-function class="com.foo.EmailFn"  
weight="10" />
```

+

```
public class EmailFn implements PostFn {...}
```

=

a working plugin

P2

```
<post-function class="com.foo.EmailFn"  
weight="10" />
```

+

```
public class EmailFn implements PostFn {...}
```

+

```
Import-Package:  
com.atlassian.jira;version="5.0",  
Export-Package:  
org.apache;version="3.3"
```

+

```
<component>
```

```
..
```

```
</component>
```

=

a working plugin
... maybe



Abstracting OSGi (and a few other things..)

```
/**
 * Gets the default list of transform stages performed by the transformer. Clients wishing to add stages to the
 * transformation process should use this list as a template rather than creating their own from scratch.
 */
public static ArrayList<TransformStage> getDefaultTransformStages()
{
    return new ArrayList<TransformStage>(Arrays.asList(
        new AddBundleOverridesStage(),
        new ScanInnerJarsStage(),
        new ComponentImportSpringStage(),
        new ComponentSpringStage(),
        new ScanDescriptorForHostClassesStage(),
        new ModuleTypeSpringStage(),
        new HostComponentSpringStage(),
        new GenerateManifestStage()

    ));
}
```



Pros

- **Less upgrade pain**
- **Easy onboarding for new users**

Cons

- **Startup time**
- **Leaky abstraction**
- **Non-standard use of standard tech**
- **Proxies all the way down**
- **Complexities**





**Was it
worth it?**

Probably.





**Supporting
your ecosystem**



Find, try, and buy add-ons for Atlassian products

Search add-ons

Search

FILTER ADD-ONS BY PRODUCT

JIRA

CONFLUENCE

DEV TOOLS

Top selling for JIRA

[See more »](#)



 **ZEPHYR**



Good for devs!

 Paint-by-numbers marketing

 Pricing & licensing APIs

 Feedback

 Tracking & analytics



Good for customers!

 Central authority for add-ons

 Less fragmented UX

 Ratings & reviews

 Unified billing





Focus shifts from user to
vendor customization





**Building a marketplace is
non-trivial**



Stash Docs 3.7.1

Developer documentation for extending Stash through plugins or our remote APIs



Highlights

[Creating a Stash plugin](#)
[Stash plugin video tutorial](#)
[Open source Stash plugins...](#)



Plugin types

[Hosting Application Events](#)
[Global Hooks](#)
[Repository Hooks](#)
[Global Merge conditions](#)
[Repository Merge conditions](#)
[Adding commit metadata](#)



REST APIs

[Stash Core REST API](#)
[Audit REST API](#)
[Build Integration REST API](#)
[JIRA Integration REST API](#)
[SSH REST API](#)
[Branch Permissions REST API](#)
[Branch Utils REST API](#)
[Comment Likes REST API](#)



Reference

[API Changes in Stash 3.7](#) NEW
[Java API](#)
[JavaScript API](#)
[Web UI API](#)
[Plugin Module Types](#)
[Tutorials and Examples](#)

Got Feedback?

Tim's top tip for dev docs



Keep your documentation as close to the code as possible.



Bind the code..

```
* @response.representation.401.example {@link com.atlassian.stash.rest.data.RestErrors#EXAMPLE}
* @response.representation.401.doc The currently authenticated user has insufficient permissions to view the
* specified pull request.
*
* @response.representation.404.mediaType application/json
* @response.representation.404.qname errors
* @response.representation.404.example {@link com.atlassian.stash.rest.data.RestErrors#EXAMPLE}
* @response.representation.404.doc The specified repository or pull request does not exist.
*/
@GET
public Response getPullRequests(@Context Repository repository,
                                @QueryParam("direction") @DefaultValue("incoming") String direction,
                                @QueryParam("at") String at,
                                @QueryParam("state") String state,
                                @QueryParam("order") String order,
                                @QueryParam("withAttributes") @DefaultValue("true") Boolean withAttributes,
                                @QueryParam("withProperties") @DefaultValue("true") Boolean withProperties,
                                @Context PageRequest pageRequest) {
    PullRequestDirection prDirection = toDirection(direction);
    PullRequestState prState = toPullRequestState(state);
    PullRequestOrder resultOrder = fromString(order, getDefaultOrderForState(prState));

    return ResponseFactory.ok(
        new RestPage<>(pullRequestService.
```



..to the docs!

GET

/rest/api/1.0/projects/{projectKey}/repos/{repositorySlug}/pull-requests?direction&at&state&order&withAttributes&withProperties

This is a [paged API](#). This API can also be invoked via a [user-centric URL](#) when addressing repositories in personal projects.

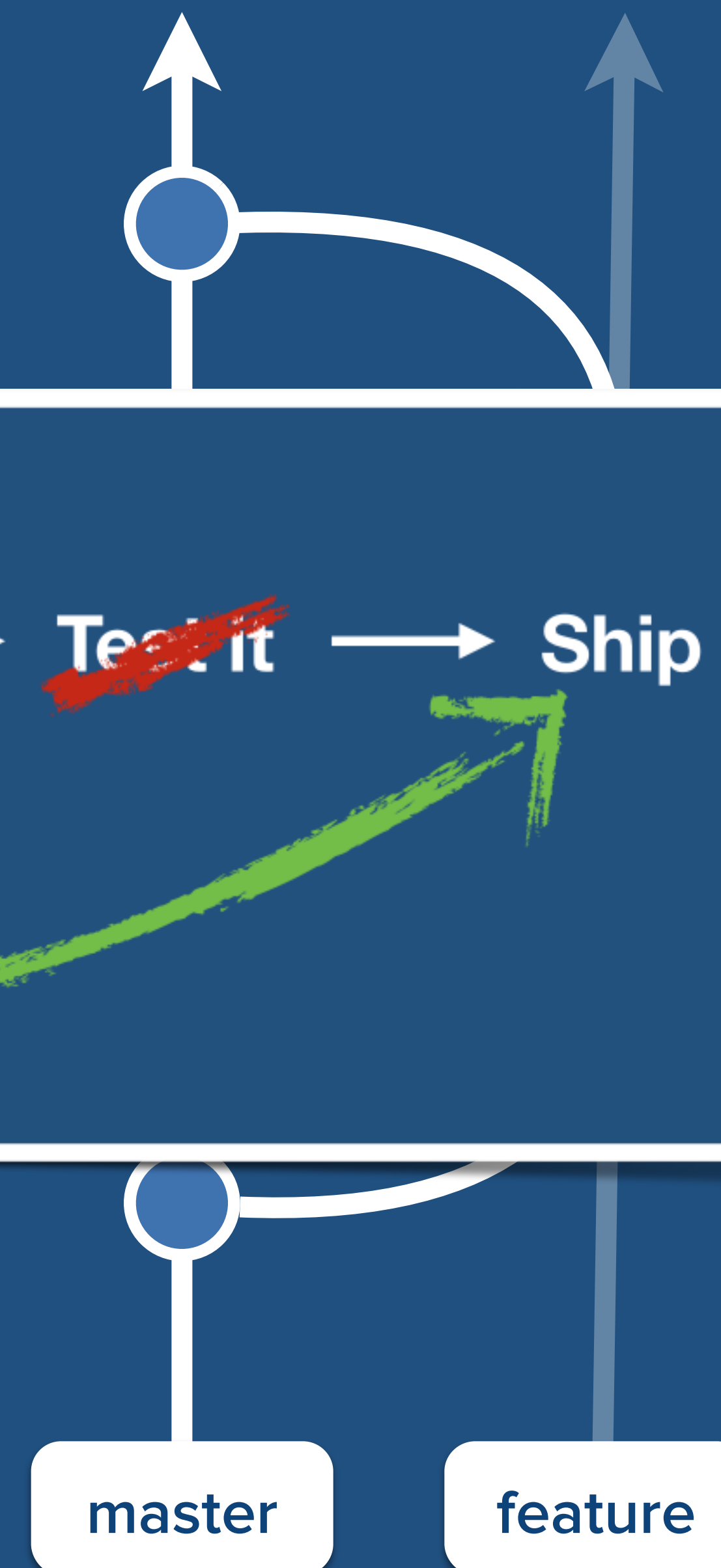
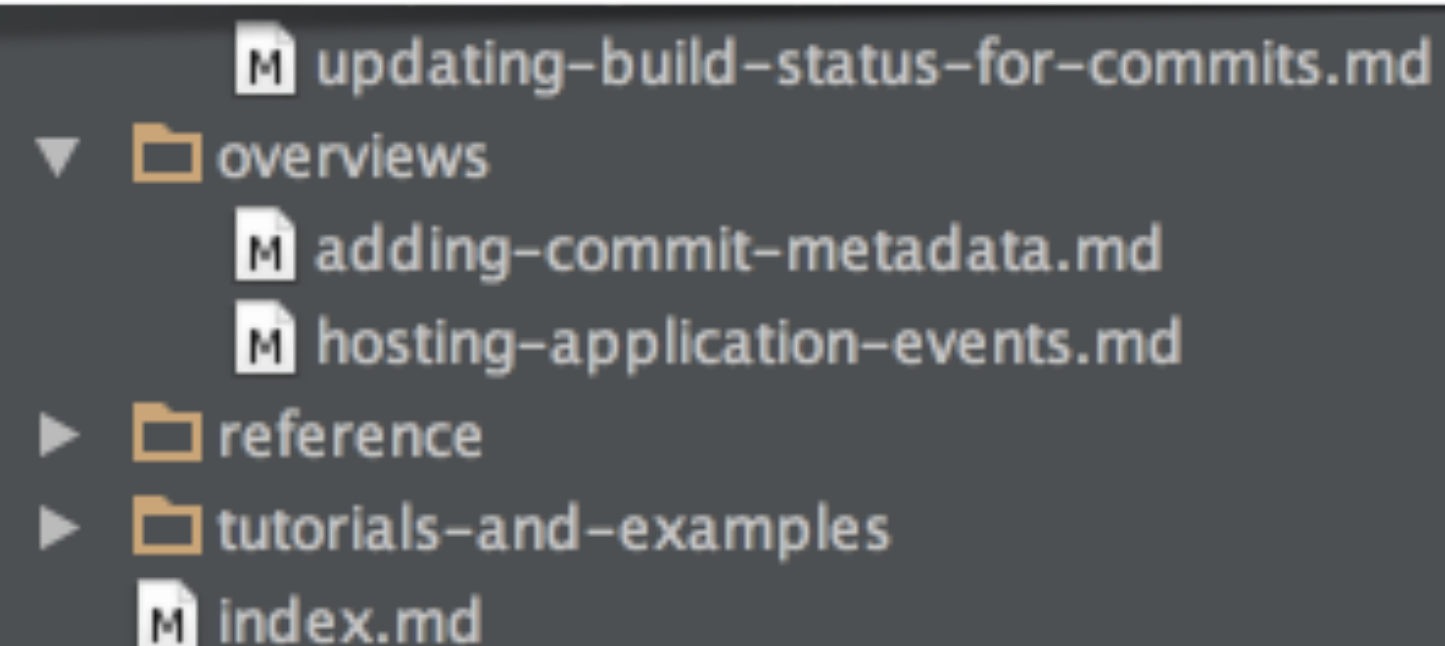
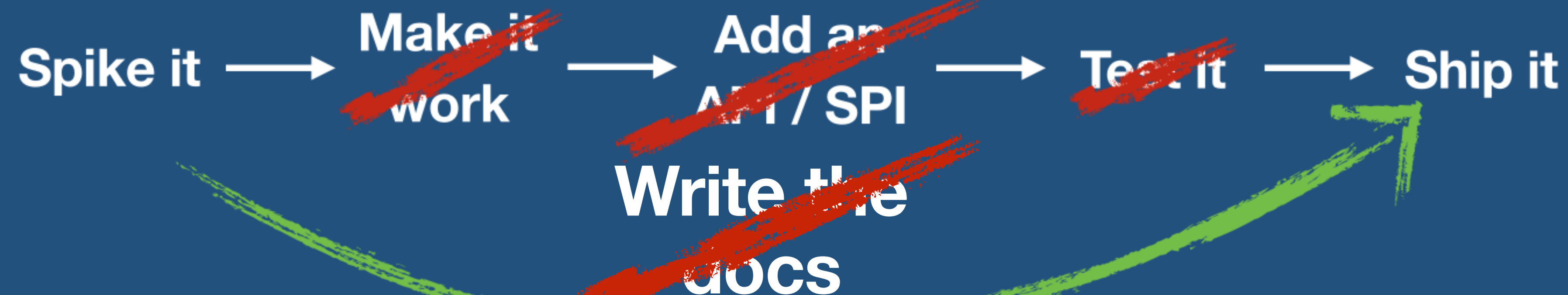
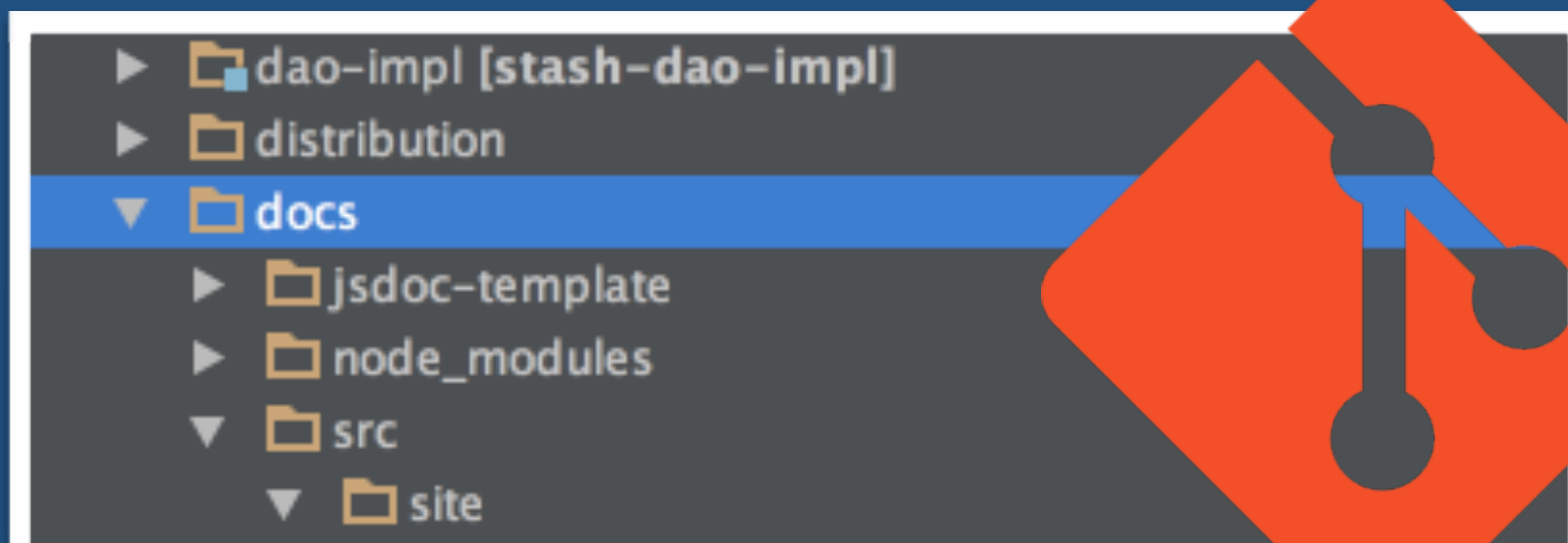
Retrieve a page of pull requests to or from the specified repository.

The authenticated user must have **REPO_READ** permission for the specified repository to call this resource.

request query parameters

parameter	value	description
direction	string Default: incoming	(optional, defaults to INCOMING) the direction relative to the specified repository. Either INCOMING or OUTGOING .
at	string	(optional) a <i>fully-qualified</i> branch ID to find pull requests to or from, such as {@code refs/heads/master}
state	string	(optional, defaults to OPEN). Supply ALL to return pull request in any state. If a state is supplied only pull requests in the specified state will be returned. Either OPEN , DECLINED or MERGED .
order	string	(optional) the order to return pull requests in, either OLDEST (as in: "oldest first") or NEWEST .
withAttributes	boolean Default: true	(optional) defaults to true, whether to return additional pull request attributes
withProperties	boolean Default: true	(optional) defaults to true, whether to return additional pull request properties





Code talks!



Make sure you have a simple process for open sourcing *and* liberally licensing example add-ons.





Meta-Developer Tools

SDK

- 😄 Fully automate plugin ALM
- 😄 Spin up products in “developer mode”
- 😄 Tight development loop
- 😄 Provide realistic test data
- 😄 Dogfood it!

FREE

/stash/projects

Stash

Projects






Repositories ▾

Find a repository... 🔍

ⓘ ⚙️ 📄 👤 ▾


Projects

Create project

Project	Key	Description
 Games	GAM	Contains HTML5 games.
 JIRA	JIRA	The JIRA project.
 Nexus	NEXUS	Sonatype Nexus
 Salesforce	SF	Internal Salesforce customization and development.
 Stash	STASH	The Atlassian Stash project


Getting started

All the information you need to get started in Stash.




Branching and forking

Learn about Git workflows for Enterprise teams.



API

Customize Stash via the API and plugin framework.



Git repository management for enterprise teams powered by Atlassian Stash

Atlassian Stash v3.4.0 · Documentation · Contact Support · Request a feature · About · Contact Atlassian



/stash/rest/api/1.0/projects

Stash

Projects






Repositories ▾

Find a repository... 🔍

ⓘ ⚙️ 📄 👤 ▾


Projects

Create project

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/stash/rest/api/1.0/projects

```
{
  size: 25,
  limit: 25,
  isLastPage: false,
  - values: [
    - {
      key: "ACE",
      id: 1383,
      name: "ACE",
      description: "Atlassian Communications Engine",
      public: false,
      type: "NORMAL",
      - link: {
        url: "/projects/ACE",
        rel: "self"
      },
      - links: {
        - self: [
          - {
            href: "https://stash.atlassian.com/projects/ACE"
          }
        ]
      }
    },
    - {
      key: "ATLASSIAN",
      id: 22,
      name: "atlassian",
      description: "Location for repositories being mirrored from bitbucket's atlassian account. Nothin in here should ever be pushed to!",
      public: false,
      type: "NORMAL",
      - link: {
        url: "/projects/ATLASSIAN",
        rel: "self"
      },
    },
  ]
}
```

[+ - View source](#)

/stash/projects

Stash

Projects






Repositories ▾

Find a repository... 🔍

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/stash/projects?web.panels&web.items

Stash

Projects






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/stash/projects?web.panels&web.items

Web Panel: stash.notification.banner.header
Context Items: request, principal

≡

Stash

Web Panel: header.global.primary
Context Items: request, principal

Web Item: header.global.primary.logo

Find a repository...

Projects

More

Web Panel: header.global.secondary.search
Context Items: request, principal

?

⚙

📄






Web Item: header.global.secondary

Projects

Create project


Web Item: stash.project.list.actions

Web Panel: stash.web.project.list.banner
Context Items: request, principal, projectPage

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Web Panel: stash.notification.banner.footer
Context Items: request, principal

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Web Panel: stash.web.footer
Context Items: request, principal

Developer Mode



Trim out dev speed killers (websudo, etc)



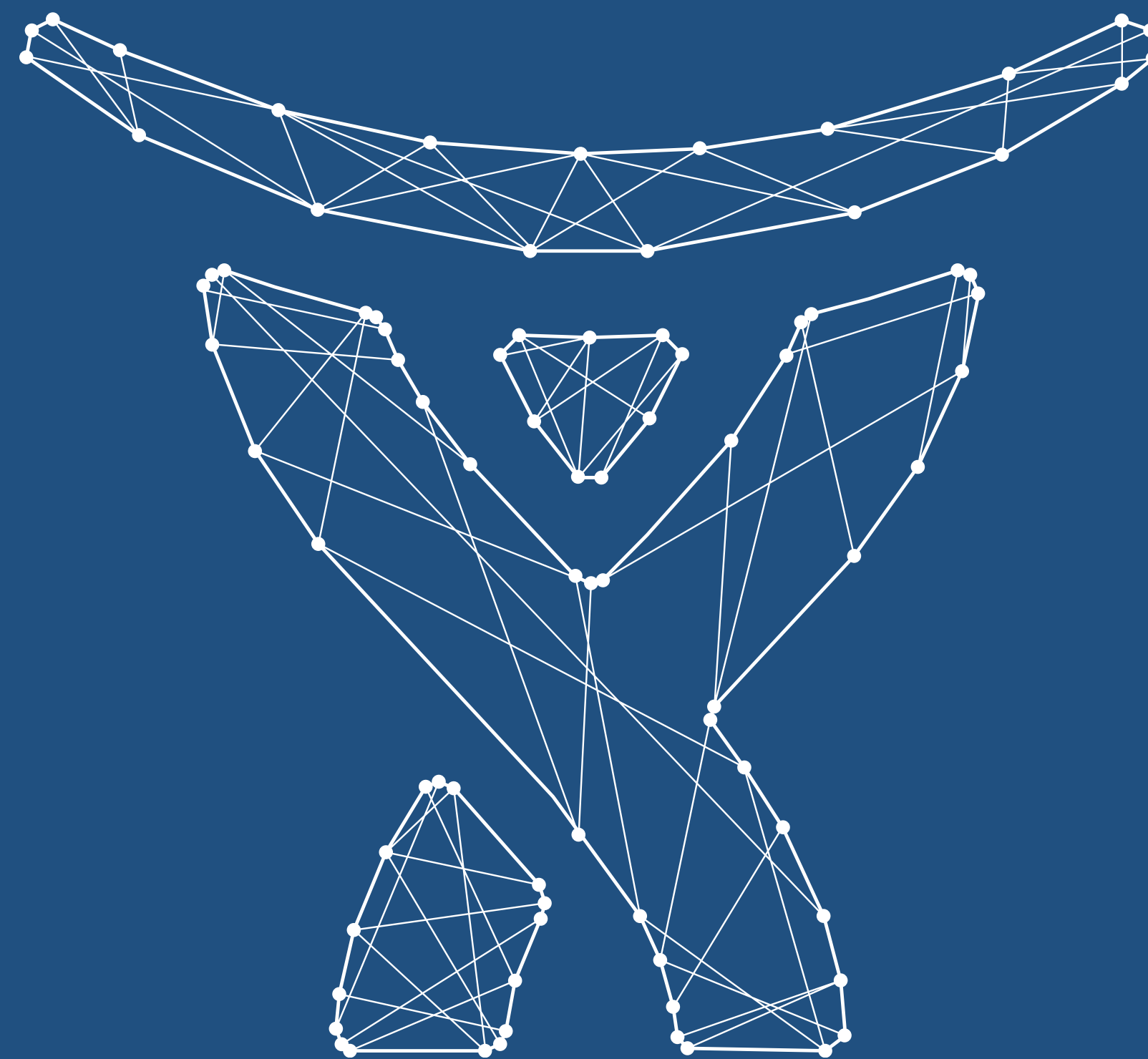
Expose logs & debug info



Add in custom “dev mode” plugins



Release your own *internal*
productivity tools



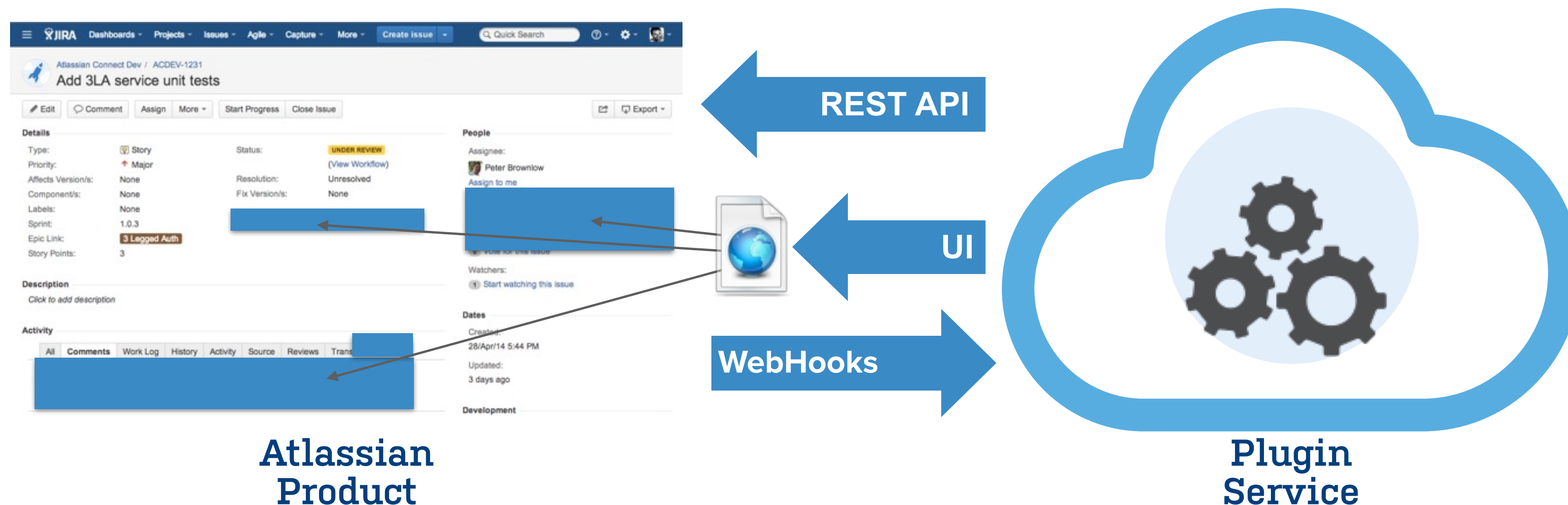
Atlassian Connect (2014)







What is Atlassian Connect?

Remote ~~Plugins~~ Add-ons

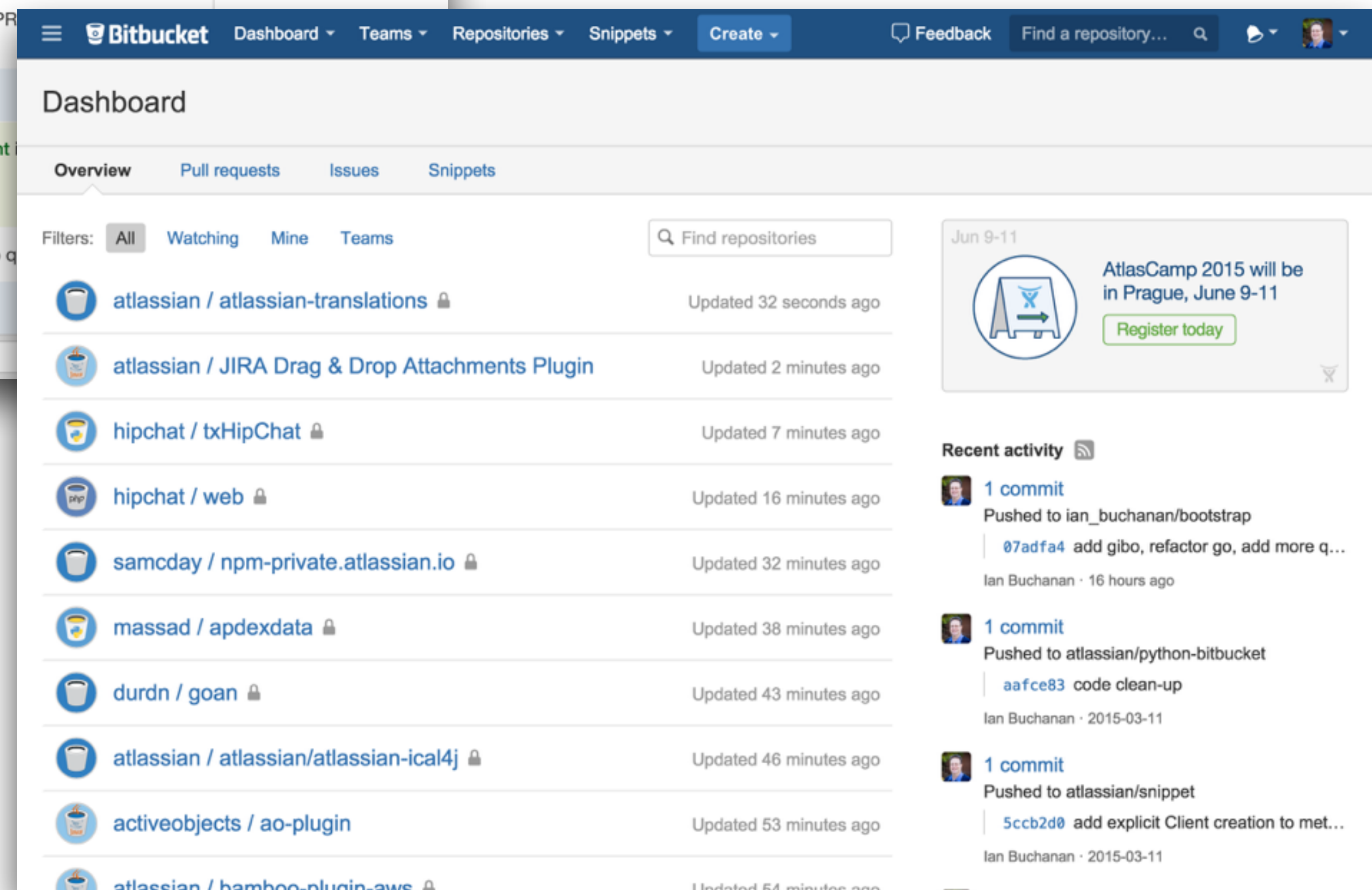
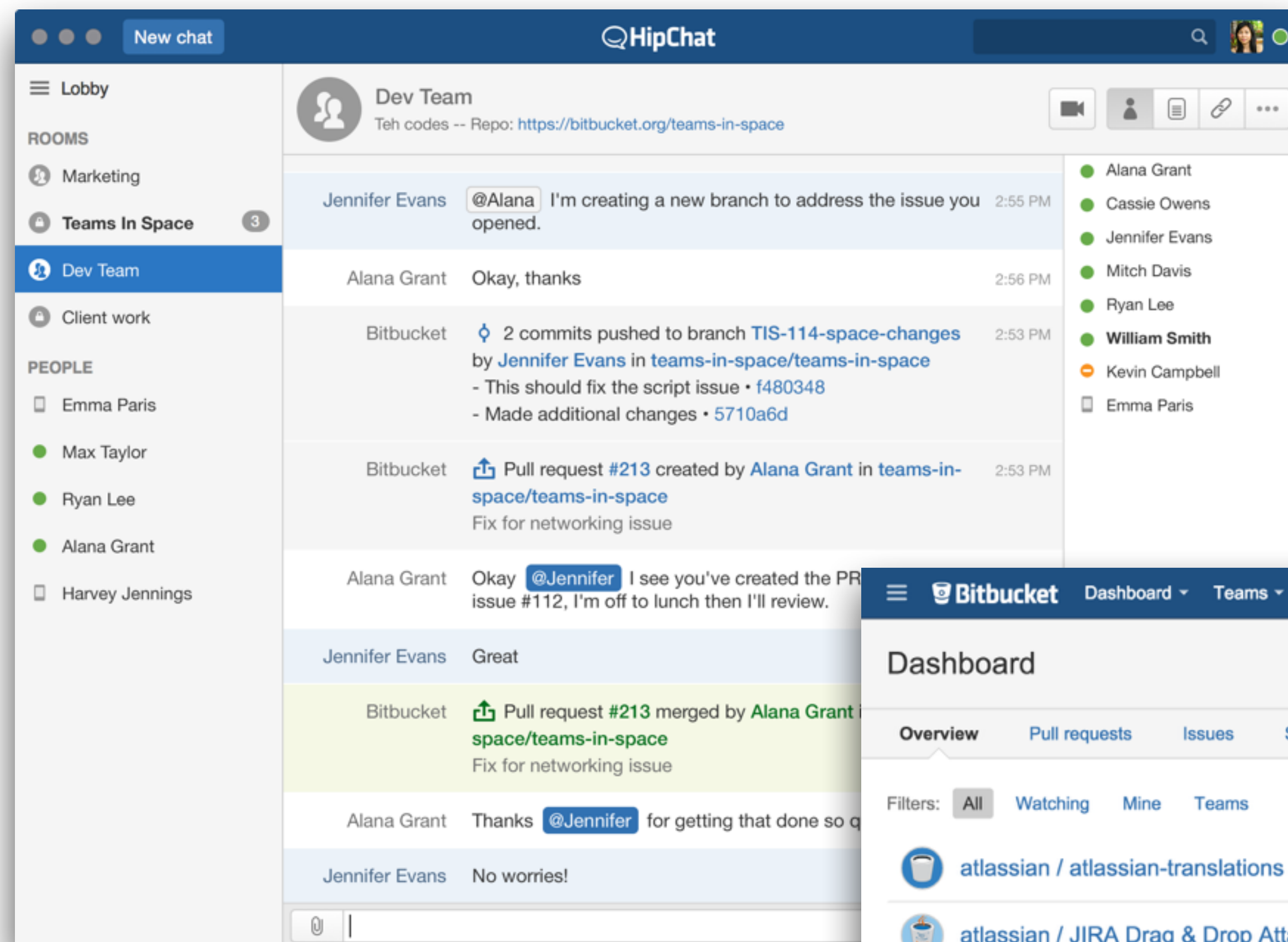
- Drive the product via its REST API
- Receive notifications from the product via WebHooks
- Inject content into the product UI via iframes



Why?

-  Atlassian Cloud (SaaS)
-  Run 3rd party code out-of-process
-  Improved customization UX (yet again)
-  Architectural benefits





Building up

- Connect is a new layer on top of the older plugin model.
- Same Marketplace serves up Connect plugins.
- Same plugins still available in the Marketplace.
- Same REST APIs still available for both Server and Cloud.
- Connect adds a new mode of integration.



<http://housebeauty.net/dressy-modern-townhouse-design-with-rooftop-garden-and-glass-walls/eye-catching-green-roofed-penthouse-apartment-rooftop-garden-with-deck-surrounded-by-glass-balustrades/#image-1>

How?

remember web fragments

**Wherever a module is called,
let a third-party inject a new feature.**



Test / TEST-2

Test issue!

Edit

Comment

Assign

More

Start Progress

Resolve Issue

Workflow

Description

This is a test

com.atlassian.jira.issue.vote.DefaultVoteManager.hasVoted yeah!

Hercules Report

Description

Creating a sub-task throws a NullPointerException and the issue cannot be created

Activity

All

Comments

History

Activity

Hercules

Commits

Item

Last Scanned At

Suggestions Found

AC WebPanel

AC IssueTab

Test / TEST-2

Test issue!

Edit

Comment

Assign

More

Start Progress

Resolve Issue

Workflow

Activity

All

Comments

History

Activity

Hercules

Commits

Item	Last Scanned At	Suggestions Found
Archive 3.zip (/sac-sample.log)	02/Sep/13 10:25 AM	18
sac-sample.log	02/Sep/13 10:25 AM	18
Description	02/Sep/13 10:24 AM	1

Comment



How to author a Connect Plugin

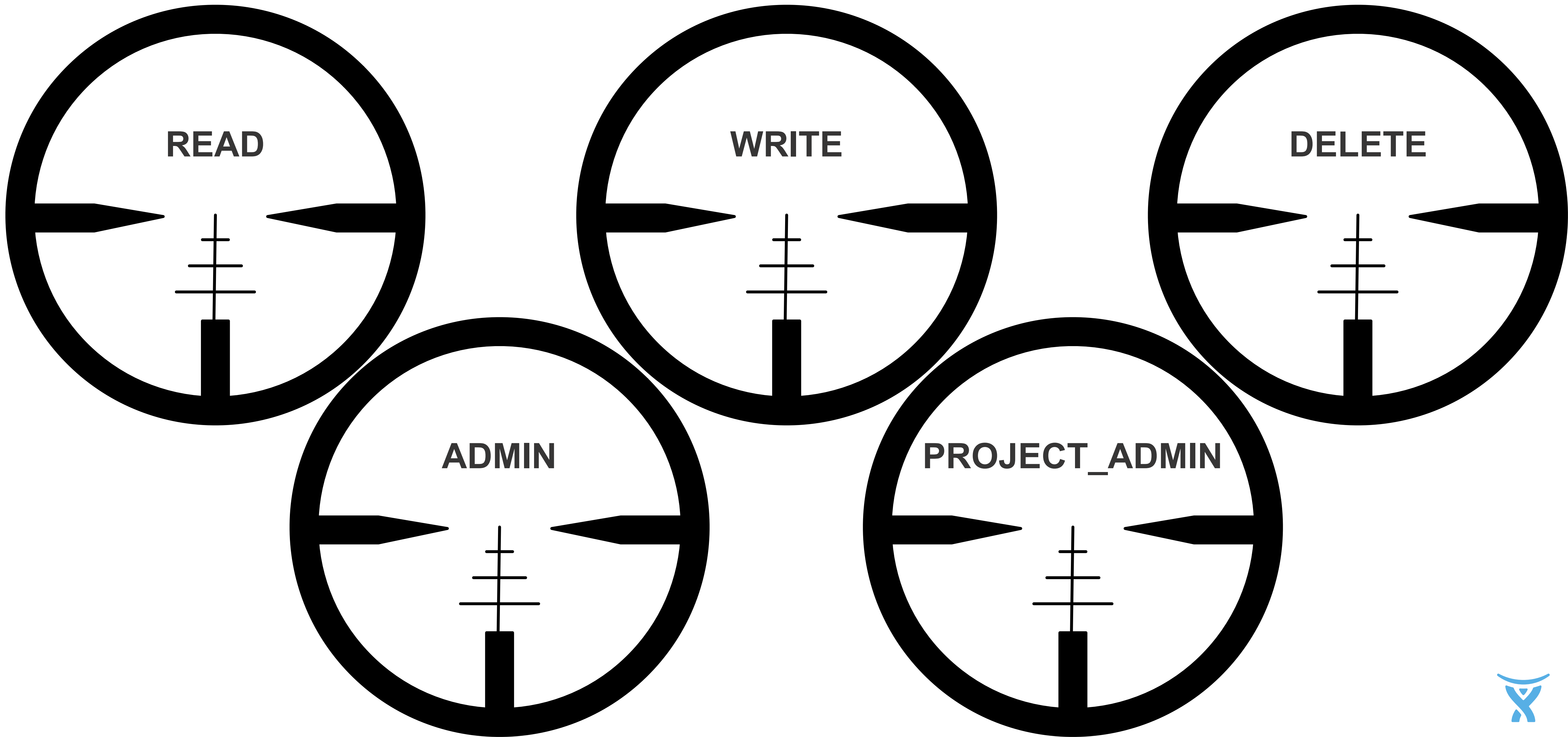
- Declare plugin with a descriptor.
- Extend the Atlassian application UI with modules.
- Request appropriate scopes.
- Recognize the user.
- Call the Atlassian application's REST API.
- Respond to the Atlassian application's webhooks.
- Register on the Atlassian Marketplace.
- Respect plugin licensing.



```
"name": "Hello World", "description": "...",  
"key": "com.example.myaddon", "apiVersion": 1,  
"baseUrl": "http://example.com/myaddon", ← where it is hosted  
"modules": { ← which modules it uses  
  "generalPages": [{  
    "name": { "value": "Greeting" }, "key": "hello-world",  
    "location": "system.top.navigation.bar",  
    "url": "/helloworld.html"  
  }]  
},  
"scopes": [ "read", "write" ], ← which scopes it needs  
"authentication": { "type": "jwt" }, ← recognize the user  
"lifecycle": { "installed": "/add-on-installed-callback" }
```



Example Scopes for JIRA



Recognizing the user with JWT

```
GET /myaddon?jwt=<jwt-token> http/1.1
```

```
POST /jira/rest/api/2/issue/AC-1/attachments http/1.1
```

```
Authorization: JWT <jwt-token>
```



Example REST API for Confluence

- URLs for resources
- HTTP verbs
- Parameters filter collections
- JSON data
- HAL(ish) links (newer APIs)

Confluence Spaces

Search ☒ Show only public APIs

api/content/{id}/child **PUBLIC**

GET

Returns a map of the direct children of a piece of Content. Content can have multiple types of children, such as Comments and Attachments. The {@link ContentType}(s) of the children returned is specified by the "expand" query parameter. If no types are included in the expand parameter, the map returned will just list the child types that are available. Example request URI(s):

- <http://example.com/rest/api/content/1234/child>
- <http://example.com/rest/api/content/1234/child?expand=page.body.VIEW>
- <http://example.com/rest/api/content/1234/child?expand=page&start=20>

Request Options

Parameter	Value	Type	Style	Description
id*	<input type="text"/>	string	template	a string
expand	<input type="text"/>	string	query	a comma
parentVersion	<input type="text"/>	int	query	an int for

Send

Example JIRA WebHooks



- HTTP callback to a URL
- Filtered by JQL
- When specific event occurs

```
"modules": {  
  "webhooks": [{  
    "event": "jira:issue_created",  
    "url": "/issue-created"  
  }]  
}
```

Name*

URL*

Exclude details ☐ Exclude issue details from the POST to URL

JQL ☒ *All issues*

[Syntax help](#)

JQL Filter for issue events that would trigger the webhook.


Events ☐ All issue events

- ☐ Issue Created
- ☐ Issue Deleted
- ☐ Issue Updated
- ☐ Worklog Updated
- ☐ Version Released
- ☐ Version Unreleased
- ☐ Version Created
- ☐ Version Moved
- ☐ Version Updated

[Cancel](#)

Register on the Atlassian Marketplace

- **Find:** in context catalog of add-ons
- **Try:** manage leads
- **Buy:** manage sales and licensing



Search add-ons...

Create add-on

Get started

Provide details

Add highlights & images

Version information

Final steps

Tell us about your add-on.

Vendor*

Register your organization and contact details.

Add-on visibility

Public

Public add-ons are listed on the Atlassian Marketplace and are subject to our approval process. Public add-ons can have any combination of public and private versions. If you change your add-on to private, all versions become private.

Private can only have private versions accessible by you or those you grant access tokens. You can change the visibility to public at any time to list new public or private versions.

Upload your add-on*

☒ Upload your add-on artifact (.jar, .obr, or .jwb).

☐ Provide a URL to your artifact (.jar, .obr, .jwb, Atlassian Connect .xml or JSON descriptor)

☐ My add-on isn't directly installable

Add-on file*

Select File

Next

Developer Tools for Atlassian Connect

- Vagrant Box for local development
- JSON descriptor validator
- JWT decoder
- Marketplace wizard to create a Connect listing
- Access Token model for private plugins
- Webhook Inspector

Atlassian Connect

Documentation

Introduction

Getting started

Tutorial: JIRA activity

Tutorial: Confluence Gardener **NEW!**

Connect cookbook

CORE CONCEPTS

Security

Authentication

Understanding JWT

Conditions

Context parameters

Styling add-ons with AUI

Licensing

Cloud development

Hosted data storage **NEW!**

DEVELOPING AND DEPLOYING

Developing locally

What is Atlassian Connect?

You can use the Atlassian Connect framework to build add-ons for Atlassian products like Jira, Confluence, or HipChat. An add-on could be an integration with another existing application, or even a new product that runs within the Atlassian application. To learn how, [check out the HipChat add-on documentation](#).

What is an Atlassian Connect add-on?

Simply understood, Atlassian Connect add-ons are web applications that run over HTTP and can be written with any programming language and web framework.

Fundamentally, Atlassian Connect add-ons have three major capabilities:

1. Insert content in [certain defined places](#) in the Atlassian application.
2. Make calls to the Atlassian application's [REST API](#).
3. Listen and respond to [WebHooks](#) fired by the Atlassian application.

What does an Atlassian Connect add-on descriptor do?

- **Declare itself with a descriptor.** The [add-on descriptor](#) is a JSON file that describes the add-on. In the descriptor, an add-on declares where it will run and which scopes it will need.

Pros






- Code in any language
- Use any build & dev tools
- Use anything: databases, search indexes, caching services, etc

Cons

- Host and scale a service
- No automated devloop (P2 SDK)
- Provide everything: databases, search indexes, caching services, etc







Why it's awesome!

-  BYOS (Bring your own stack)
-  More services, than products
-  Sandboxing
-  UI Design
-  Aligned with microservice thinking



Why it sucks..

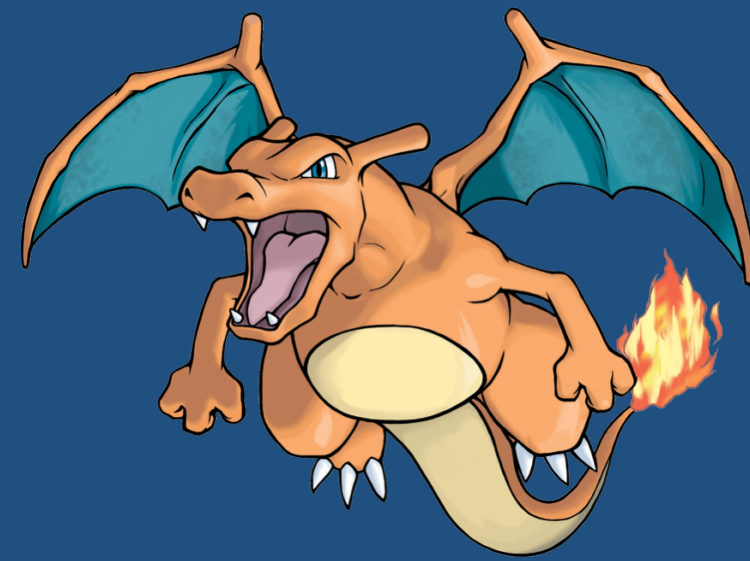
-  More interfaces must be stable
-  More developer tools, not just docs
-  Harder to create concrete examples
-  Complex to troubleshoot



Remember

SPIs?





AC



P2



P1



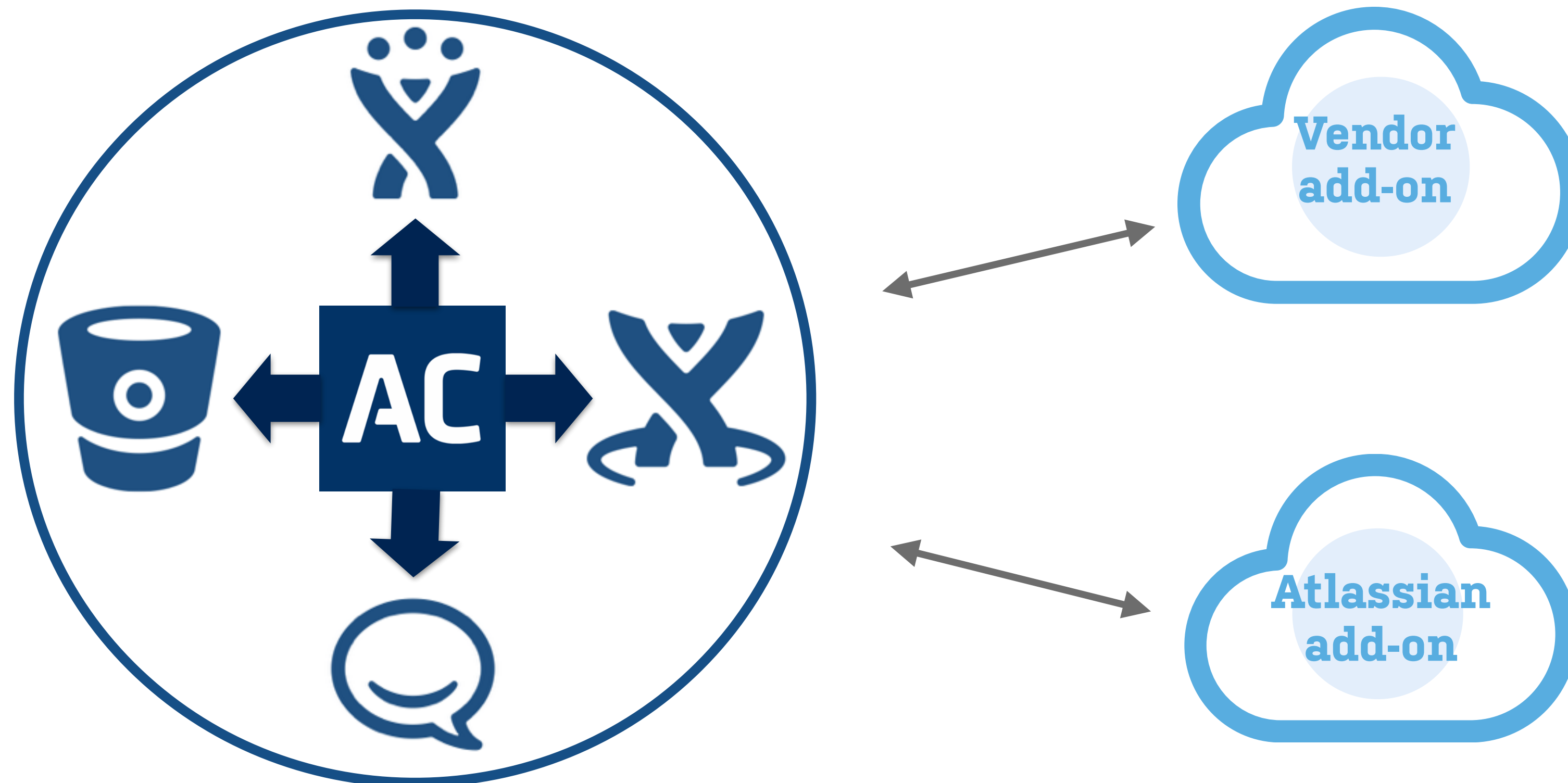
open(ish) source



What's Next?

Consolidate and expand

- Extend Bitbucket and HipChat
- Build integrations between Atlassian applications
- Build complex vertical apps: powered by Atlassian



Questions?

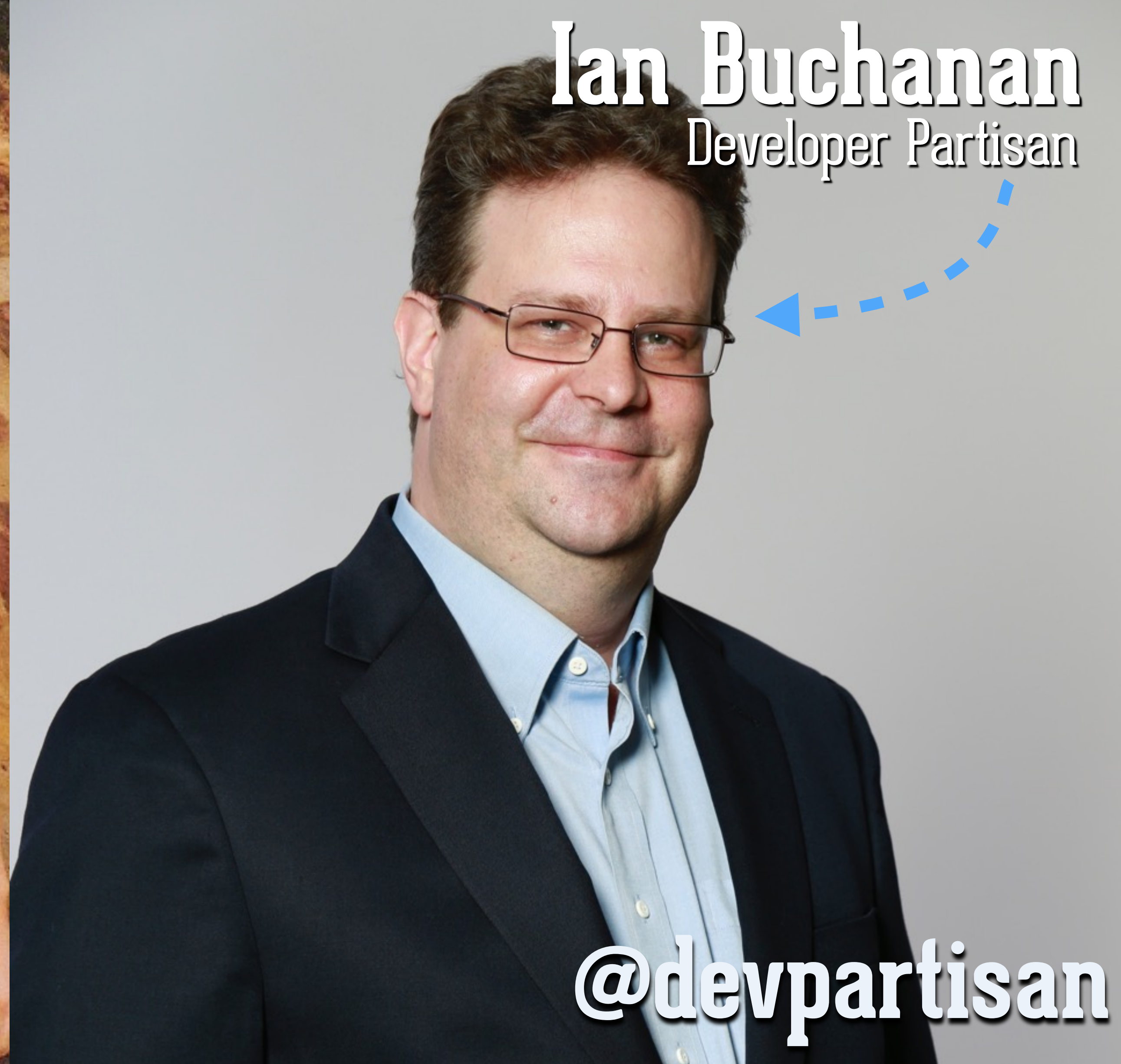


Tim Pettersen
Developer Provocateur



@kannonboy

Ian Buchanan
Developer Partisan



@devpartisan

A couple of Atlassians who are passionate about plugins