Mozilla Addon Builder
Definition of the Package Building System

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This document is written in LaTeX [1]

If in doubts, please take a look at the accompanied document:
`http://github.com/zalun/FlightDeck/raw/master/Docs/Addon%20Builder%20-%20Build%20System.pdf`.

1 Syntax

1.1 Objects

`x`, `y`, `z` — *represents* `[a..z]`
`m`, `n` — *represents* `[0..9]+`

`Ux` is the specific User (identified by *UserName*)

`Px` is the specific Package (identified by *PackageName*)
It should always be used within its `type` context as `Lx` — Library or `Ax` — Addon
Every Package has associated PackageRevision[2] (identified by a triplet `Ux:Py.n` *User/Package/RevisionNumber*)

`Mx` is the Module[3] (identified by a triplet *User/PackageRevision/ModuleName*)

1.2 Object identification — revision numbers and HEAD

`Ux:Py.n` defines revision of the Package.
`Ua:La.1` — First revision of Library `La` saved by `Ua`.

`Ux:Py.n:Mz` defines Module inside the revision of the Package.
`Ua:La.1:Ma` — Module `Ma` inside the first revision of Library `La` saved by `Ua`.

`Px` $\Longrightarrow$ `Uy:Px.n` is the HEAD revision of the Package
`La` $\Longrightarrow$ `Ua:La.1` — `La`'s HEAD points to the first revision of Library `La` saved by `Ua`.

`Ux:Py.n` $\supset$ {`Ux:Py.m:Mz, ...`} Modules inside the Package revision.
`Ua:La.2` $\supset$ {`Ua:La.1:Ma, Ub:La.2:Mb`} — Second revision of Library `La` saved by `Ua` contains `Ma` saved by `Ua` in his `La`'s first revision and `Mb` saved by `Ub` in his second `La`'s revision.

[1] For quick doc please follow to `http://web.mit.edu/olh/Latex/ess:Latex.html`, All used symbols may be found here: `http://www.artofproblemsolving.com/Wiki/index.php/LaTeX:Symbols`

[2] Please bare in mind that PackageVersion is just metadata, a field of PackageRevision object used only in exported `XPI`. It will no longer be used for data identification.

[3] The only revision is the PackageRevision. It is similar concept to *git*'s commits. For every saved Module change, a new PackageRevision is created.

2 Building Library

2.1 Starting point

`La` $\Longrightarrow$ `Ua:La.1` $\supset$ {`Ua:La.1:Ma`}

Package `La` is created by User `Ua`.
`La`'s HEAD is PackageRevision identified as `Ua:La.1`
It contains only one module - `Ma`
Following steps had to happen to achieve above status:

1. `Ua` creates a package `La`
   `La` $\Longrightarrow$ `Ua:La.0`
   `Ua:La.0` $\supset$ {}
2. `Ua` adds `Ma` to `La`
   `Ua:La.1` $\supset$ {`Ua:La.1:Ma`}
3. `Ua` sets the HEAD
   `La` $\Longrightarrow$ `Ua:La.1`

2.2 Scenario (1 Module, 2 Users, no dependencies)

`Ua` and `Ub` are working on `La`
`Ub` modified one module

1. `Ub` modifies `Ma`
   `Ub:La.0` $\supset$ {`Ua:La.1:Ma`} — automatic fork of `La`
   `Ub:La.1` $\supset$ {`Ub:La.1:Ma`}
2. `Ub` sends *request* to `La`'s creator (`Ua`) to upgrade `La` from `Ub:La.1`
3. `Ua` accepts the request by setting the HEAD to `Ub`'s version
   `La` $\Longrightarrow$ `Ub:La.1`
4. Result: `La` $\Longrightarrow$ `Ub:La.1` $\supset$ {`Ub:La.1:Ma`}

2.3 Scenario (2 Modules, 2 Users, no dependencies)

`Ua` and `Ub` are working on `La`
`Ua` created module `Mb`
`Ub` is working on `Mb`

1. `Ua` adds a new module `Mb` to `La`
   `Ua:La.2` $\supset$ {`Ua:La.1:Ma, Ua:La.2:Mb`}
2. `Ua` sets the HEAD
   `La` $\Longrightarrow$ `Ua:La.2`
3. `Ub` modifies `Mb`
   `Ub:La.0` $\supset$ {`Ua:La.1:Ma, Ua:La.2:Mb`} — automatic fork of `La`
   `Ub:La.1` $\supset$ {`Ua:La.1:Ma, Ub:La.1:Mb`}
4. `Ub` sends request to `Ua` to upgrade `La` from `Ub:La.1`
5. `Ua` modifies `Ma`
   `Ua:La.3` $\supset$ {`Ua:La.3:Ma, Ua:La.2:Mb`}

6. Ua acepts Ub's request
   Ua:La.4 $\supset$ {Ua:La.3:Ma, Ub:La.1:Mb}

7. Ua sets the HEAD
   La $\Longrightarrow$ Ua:La.4

8. Result: La -> Ua:La.4 $\supset$ {Ua:La.3:Ma, Ub:La.1:Mb}

2.4 Scenario (2 Modules, 2 Users, no dependencies)

Ua and Ub are working on La
Ub created module Mb

1. Ub adds a new module Mb to La
   Ub:La.0 $\supset$ {Ua:La.1:Ma} — automatic fork of La
   Ub:La.1 $\supset$ {Ua:La.1:Ma, Ua:La.1:Mb}

2. Ub modifies Mb
   Ub:La.2 $\supset$ {Ua:La.1:Ma, Ub:La.2:Mb}

3. Ub sends request to Ua to upgrade La from Ub:La.2

4. Ua modifies Ma
   Ua:La.2 $\supset$ {Ua:La.2:Ma}

5. Ua acepts Ub's request
   Ua:La.3 $\supset$ {Ua:La.2:Ma, Ub:La.2:Mb}

6. Ua sets the HEAD
   La $\Longrightarrow$ Ua:La.3

7. Result: La $\Longrightarrow$ Ua:La.3 $\supset$ {Ua:La.2:Ma, Ub:La.2:Mb}

2.5 Scenario with conflict (2 Modules, 2 Users, no dependencies)

Ua and Ub are working on La
Ua created module Mb
Ua and Ub are working on Mb
Conflict arises...

1. Ua adds a new module Mb to La
   Ua:La.2 $\supset$ {Ua:La.1:Ma, Ua:La.2:Mb}

2. Ua sets the HEAD
   La $\Longrightarrow$ Ua:La.2

3. Ub modifies Mb
   Ub:La.0 $\supset$ {Ua:La.1:Ma, Ua:La.2:Mb} — automatic fork of La
   Ub:La.1 $\supset$ {Ua:La.1:Ma, Ub:La.1:Mb}

4. Ua modifies Mb
   Ua:La.3 $\supset$ {Ua:La.1:Ma, Ua:La.2:Mb}

5. **CONFLICT**
   At the time we've got two versions of La.Mb which came out from the same version

6. `Ua` sets the HEAD
   `La` $\supset$ `Ua:La.3`

7. `Ub` receives info that his source is behind the HEAD
   `Ub:La.1:Mb` (and `Ub:La.1`) is marked as *conflicted*
   `Ub` can't send the update request

8. `Ub` manually solves conflict by editing the `Mb` and removing the *conflict flag*
   `Ub:La.2` $\supset$ {`Ua:La.1, Ub:La.2:Mb`}

9. `Ub` sends request to `Ua` to upgrade `La` from `Ub:La.2`

10. `Ua` acepts `Ub`'s request
    `Ua:La.4` $\supset$ {`Ua:La.3:Ma, Ub:La.2:Mb`}

11. `Ua` sets the HEAD
    `La` $\Longrightarrow$ `Ua:La.4`

12. Result: `La` $\Longrightarrow$ `Ua:La.4` $\supset$ {`Ua:La.3:Ma, Ub:La.2:Mb`}

Draft/Ideas

update Library if Library HEAD has been changed something should tell the User that an update is possible. It should then (on request) change the versions of all Modules which are not in conflict with updating Library. If
`Ua:La.1` $\supset$ {`Ua:La.1:Ma, Ub:La.2:Mb`} is a Library to be updated and
`La` $\Longrightarrow$ `Uc:La.3` $\supset$ {`Ub:La.1:Ma, Uc:La.3:Mb, Uc:La.1:Mc`} is current HEAD, then
`Ub:La.2:Mb` should be updated to `Uc:La.3:Mb` and `Uc:La.1:Mc` should be added.
User should receive a notification that `Ua:La.1:Ma` is not in sync with HEAD.

forking Consider forcing users to fork a Library before entering to edit mode (as in *github*)

To be continued...