

An Automatic Internationalization and Localization Mechanism for Web Applications

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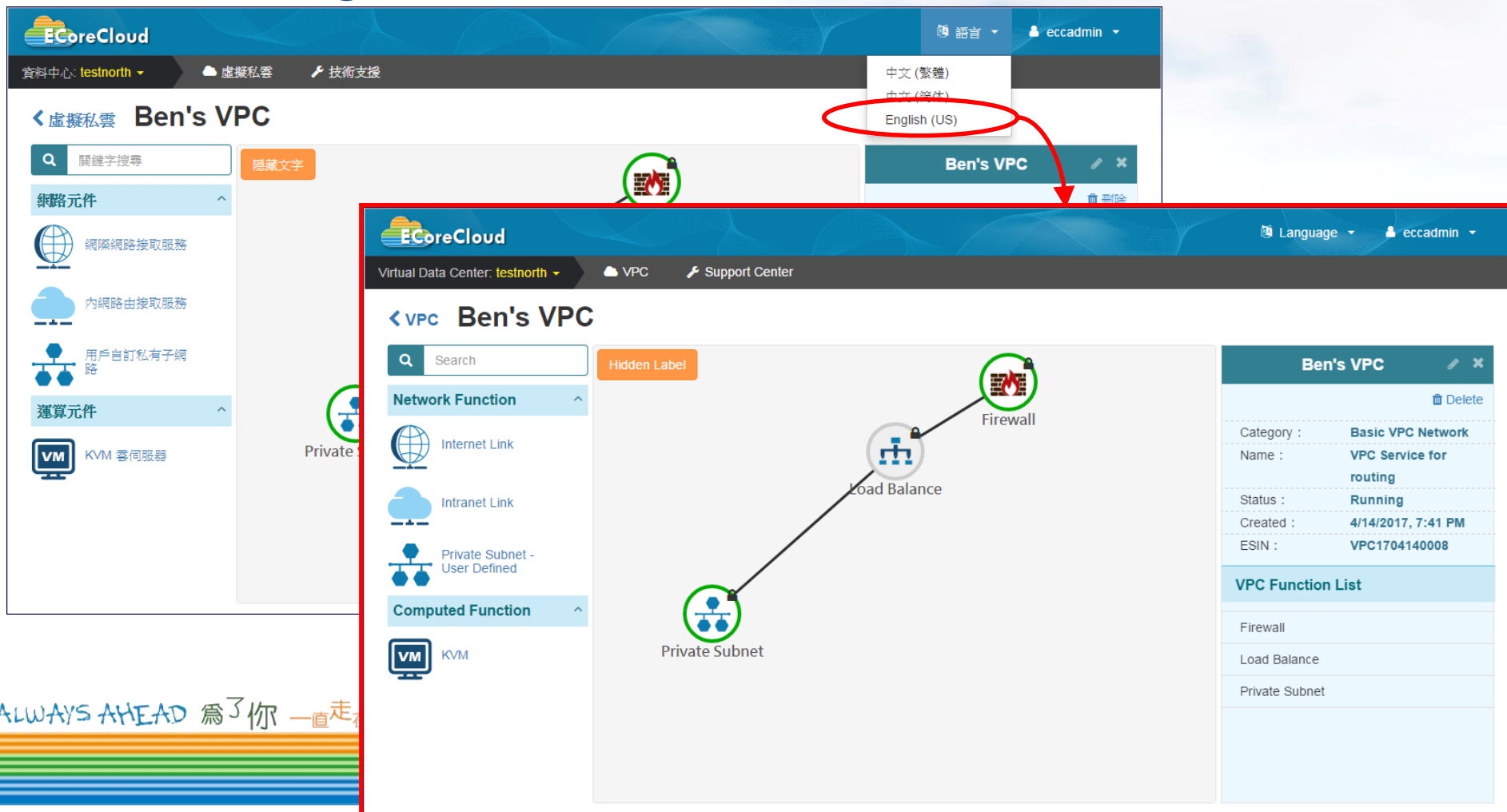
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Introduction

- ❖ Internationalization and localization are used for website globalization.



The image displays two overlapping screenshots of the ECoreCloud web interface to demonstrate internationalization and localization. The top screenshot shows the interface in Traditional Chinese, with the language dropdown menu open, highlighting 'English (US)' with a red circle and an arrow. The bottom screenshot shows the same interface after switching to English (US), with the language dropdown now labeled 'Language' and the content translated into English. The interface includes a sidebar with navigation links, a main content area with a network diagram, and a right-hand panel with VPC details and a function list.

Ben's VPC Details:

Ben's VPC	
Category :	Basic VPC Network
Name :	VPC Service for routing
Status :	Running
Created :	4/14/2017, 7:41 PM
ESIN :	VPC1704140008

VPC Function List

Firewall
Load Balance
Private Subnet

Problems

- ❖ Hard to find out where exist un-international characters
- ❖ Hard to manage translations in multiple locales
 - inconsistent translations
 - lack of keys, duplicated keys, out of order ...
- ❖ Hard to share translations among different web applications
 - trivial to transfer translations from one application to another
 - different locale formats for different applications



How to solve?

❖ Internalization

- Implement a plugin([eslint-plugin-i18n](#)) based on ESLint to find out non-abstracted string were.

❖ Localization

- Implement a web tool called [Keys-Translations Manager \(KTM\)](#) to manage all of the translations in different locales for multiple applications.

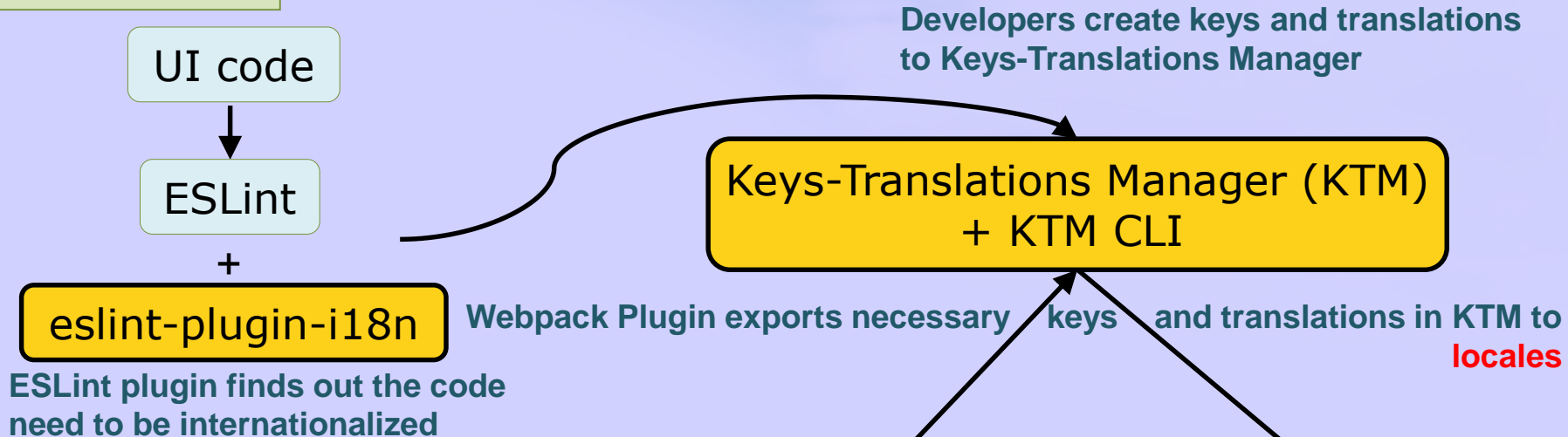
❖ Automation

- Implement Babel transpiler plugin ([babel-plugin-ktm](#))
- Implement Webpack module bundler plugin ([ktm-webpack-plugin](#))
- Use [Jenkins](#) to adopt CI/CD workflow

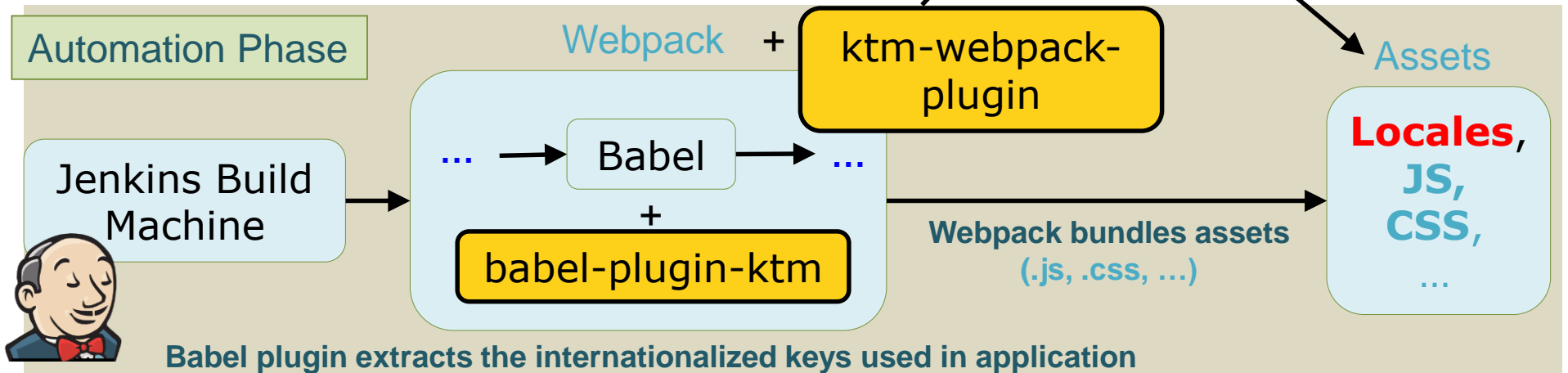


Automation Flowchart

Developer Phase



Automation Phase



means our implements.

Implementation: eslint-plugin-i18n



- ❖ This ESLint plugin lists all strings not internationalized in every single JavaScript file.

```
WARNING in ./up/views/queryForm/QueryFormList.react.js
```

```
D:\Git\ecc-ui\up\views\queryForm\QueryFormList.react.js
 207:13  warning  Using chinese characters: '套裝軟體'      i18n/no-chinese-character
 210:13  warning  Using chinese characters: '虛擬私雲服務' i18n/no-chinese-character
 213:13  warning  Using chinese characters: '虛擬機'       i18n/no-chinese-character
 271:125 warning  Using chinese characters: '未完成表單'   i18n/no-chinese-character
 273:128 warning  Using chinese characters: '近三天內完成表單' i18n/no-chinese-character
```

```
a 5 problems (0 errors, 5 warnings)
```

This means the JS file has 5
uninternationalized
strings at line 207, 210, 213, 271, and 273.

- The plugin can be found at <https://www.npmjs.com/package/eslint-plugin-i18n>
- This plugin also can discover Japanese and Korean characters.



Implementation: Keys-Translations Manager (KTM)

Keys-Translations Manager

download all locales for a specific application



































import

support various output formats

input

share translations to multiple applications

edit or delete specific translations

Actions	Apply to	Key	Description	* Locale / en-US	* Locale / zh-TW	* Locale / zh-CN
 	User Portal, Operation Portal	18n.product.offering.desc.oaLi...		OA Link	OA路由接取服務	OA路由接取服务
 	User Portal, Operation Portal	18n.product.offering.name.oaLi...		OA Link	OA路由接取服務	OA路由接取服务
 	User Portal	iam.organization.updateNode		Update organization node	編輯組織節點	编辑组织节点
 	User Portal	iam.organization.createNode		Create organization node	新增組織節點	新增组织节点
 	User Portal			組織名稱		组织名称
 	User Portal	iam.organization.code		Organization Code	組織代號	组织代号
 	User Portal	iam.organization.manage		Manage Organization	組織管理	组织管理
 	User Portal	iam.organization.title		Organization	組織	组织
 	User Portal	image.function.description		The image is a virtual har...	映像檔為一種虛擬硬碟備...	映像档为一种虚拟硬碟备...
 	User Portal	iam.authority.toast.removeFailed		Failed to delete {name} a...	{name} 刪除權限失敗	{name} 删除权限失败
 	User Portal	iam.authority.toast.removeing		Deleting {name} authorities	{name} 刪除權限中	{name} 删除权限中
 	User Portal	iam.authority.toast.removeSucc...		{name} authorities remov...	{name} 刪除權限成功	{name} 删除权限成功
 	User Portal	iam.authority.toast.updateSucc...		{name} authorities update...	{name} 編輯權限成功	{name} 编辑权限成功
 	User Portal	iam.authority.toast.updateing		Updating {name} authorities	{name} 編輯權限中	{name} 编辑权限中
 	User Portal	iam.authority.toast.updateFailed		Failed to update {name} a...	{name} 編輯權限失敗	{name} 编辑权限失败
 	User Portal	iam.authority.toast.createFailed		Failed to set {name} auth...	{name} 設定權限失敗	{name} 设置权限失败
 	User Portal	iam.authority.toast.createSucc...		{name} authorities set suc...	{name} 設定權限成功	{name} 设置权限成功

(*) Double-click the cell to edit. / Press Enter to commit.

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KTM - configuration



- ❖ Initiate various locales and applications as needed without altering the code.

```
module.exports = {  
  /**  
   * If you change the configurations,  
   * don't forget to rebuild the code (npm run build) and  
   * restart the server (npm run start).  
   */  
  server: {  
    hostname: 'localhost',  
    port: 3000  
  },  
  database: 'mongodb://localhost:27017/translationdb',  
  locales: ['en-US', 'zh-TW', 'zh-CN'],  
  applications: [ // make sure the ids are 'String' type  
    {id: 'up', name: 'User Portal'},  
    {id: 'op', name: 'Operation Portal'}  
  ],  
  enableNotifications: true  
};
```

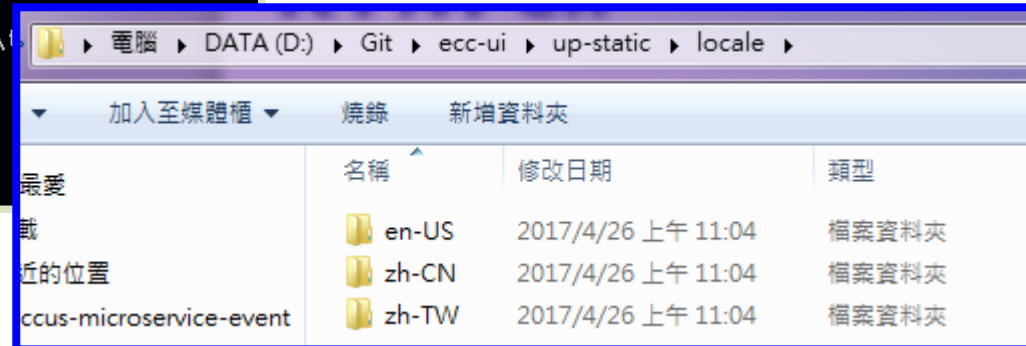
both locales and applications are configurable

- ❖ KTM can be found at <https://github.com/chejen/keys-translations-manager>

- With KTM CLI, export automation can be one of the stages of CI/CD.

```
D:\Git\ecc-ui>npm run ktm  
  
> ecc-ui@2.0.0 ktm D:\Git\ecc-ui  
> ktm export  
  
ktm [INFO] Found config at D:\Git\ecc-ui\.ktmrc  
ktm [INFO] Successfully output to op-static\locale\zh-TW\translation.json  
ktm [INFO] Successfully output to op-static\locale\zh-CN\translation.json  
ktm [INFO] Successfully output to op-static\locale\en-US\translation.json  
ktm [INFO] Successfully output to up-static\locale\en-US\translation.json  
ktm [INFO] Successfully output to up-static\locale\zh-TW\translation.json  
ktm [INFO] Successfully output to up-static\locale\zh-CN\translation.json  
ktm [INFO] Finished!  
  
D:\Git\ecc-ui>
```

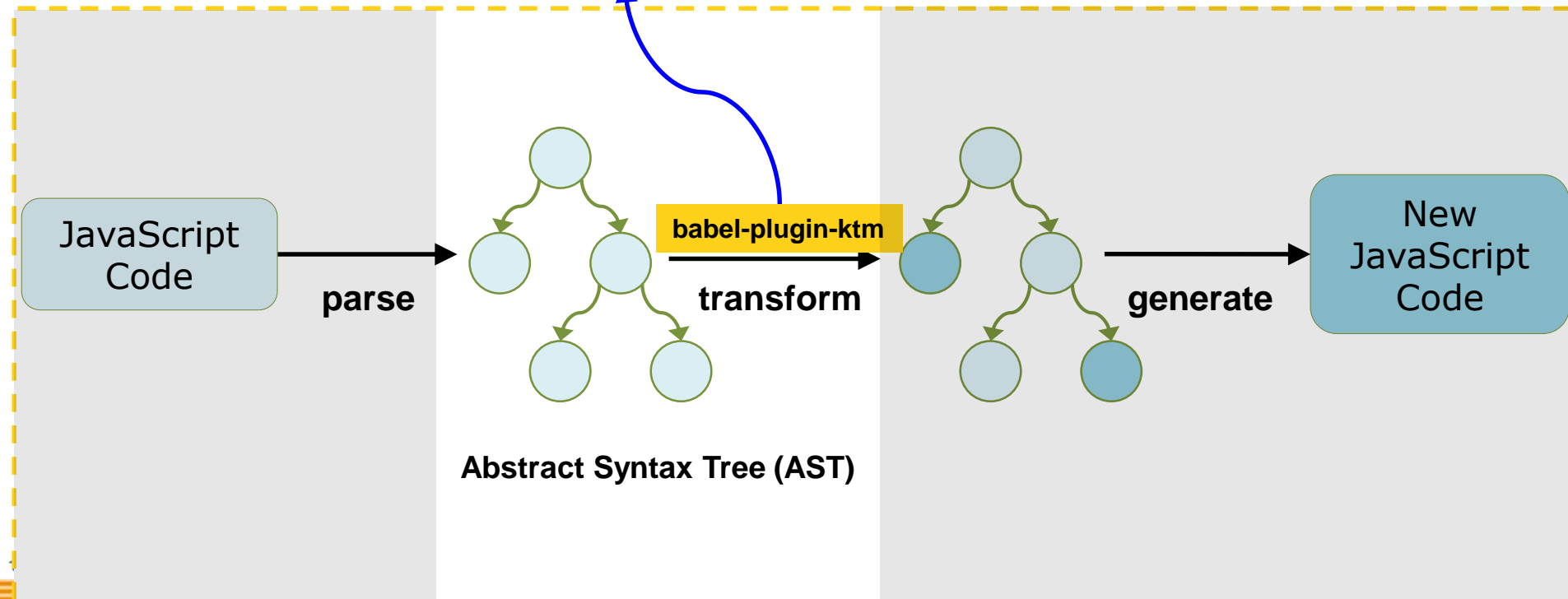
output



Implementation: babel-plugin-ktm

- ❖ With babel-plugin-ktm, the keys used throughout the application would be discovered.

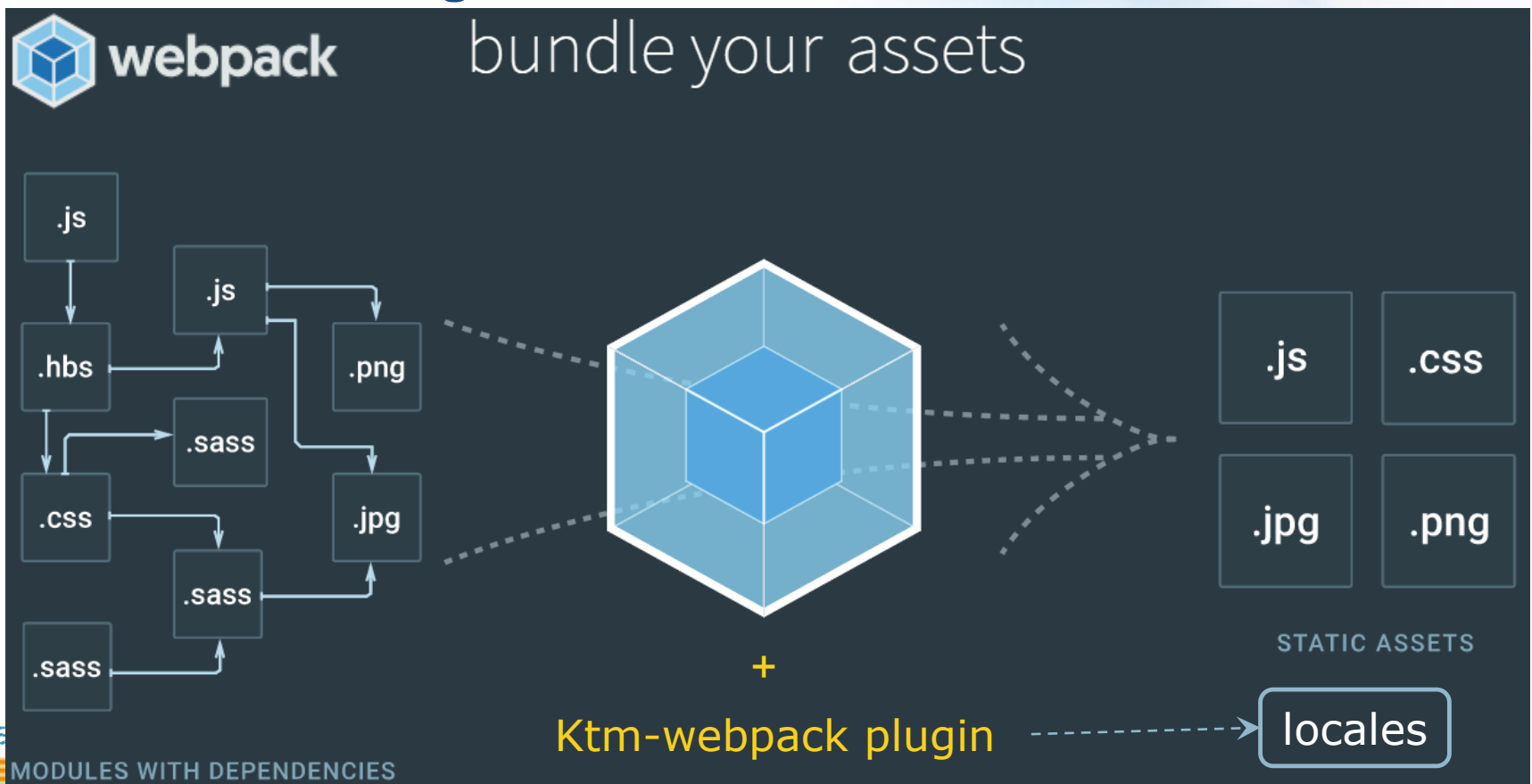
This plugin takes advantage of the AST generated by Babel to collect the internationalized keys in source code.



The way how Babel transpiles the code

Implementation: ktm-webpack-plugin

- ktm-webpack-plugin takes the keys extracted from babel-plugin-ktm, and retrieves their related translations from KTM, and then generates the final locales.



Source: <https://webpack.js.org>

❖ Conclusion

- We have designed and implemented a web application KTM and various tools, including a KTM CLI, a ESLint plugin, a Babel plugin and a Webpack plugin to facilitate i18n/l10n.
- With the aid of the tools, we have successfully reduced a lot of manual works and human errors. Also, our web development has become more efficient as a result of the automation.

❖ Future work

- Hope that we can do translation splitting in the future for better performance.

Thanks for your listening

Q & A

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