

Tridium N4 开发环境设置

JavaScript 开发环境篇

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本文将教你如何设置 N4 的 Javascript 开发环境。

本文信息源自 docDeveloper.pdf 第 77 页起 Building JavaScript Applications for Niagara 章节，以及自己的一些摸索，希望能对各位同行能有所助益。

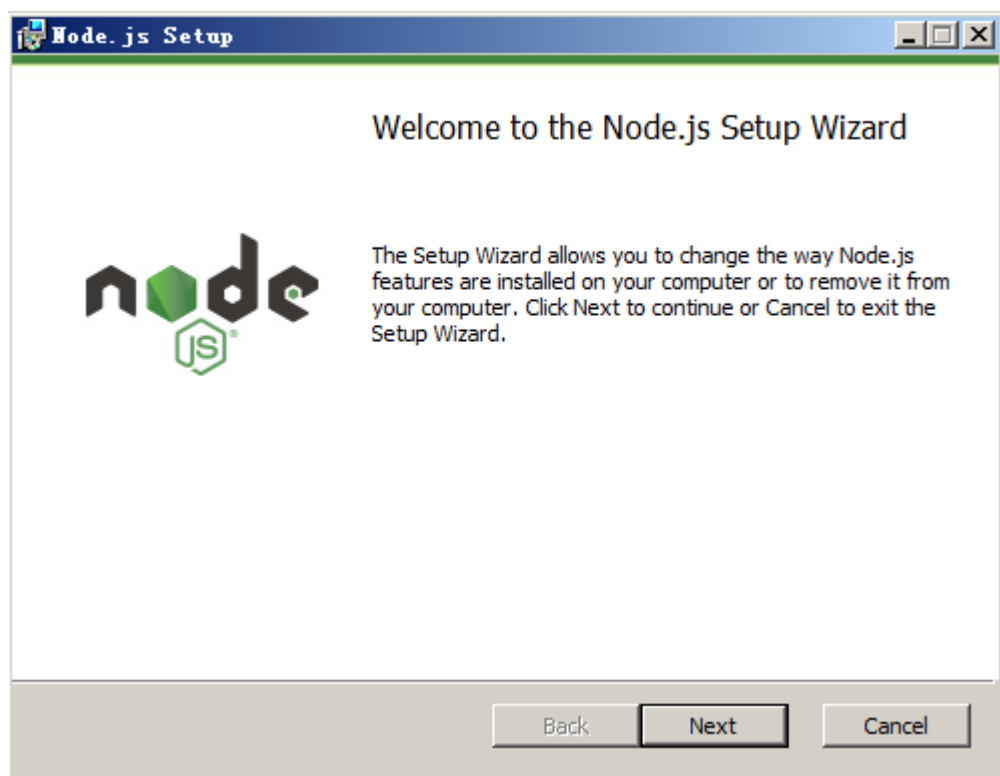
首先还是要感谢 docDeveloper.pdf，还要感谢 google 翻译。

其次，这个开发环境的安装需要访问外国网站，建议翻墙，要不有的步骤根本过不去。

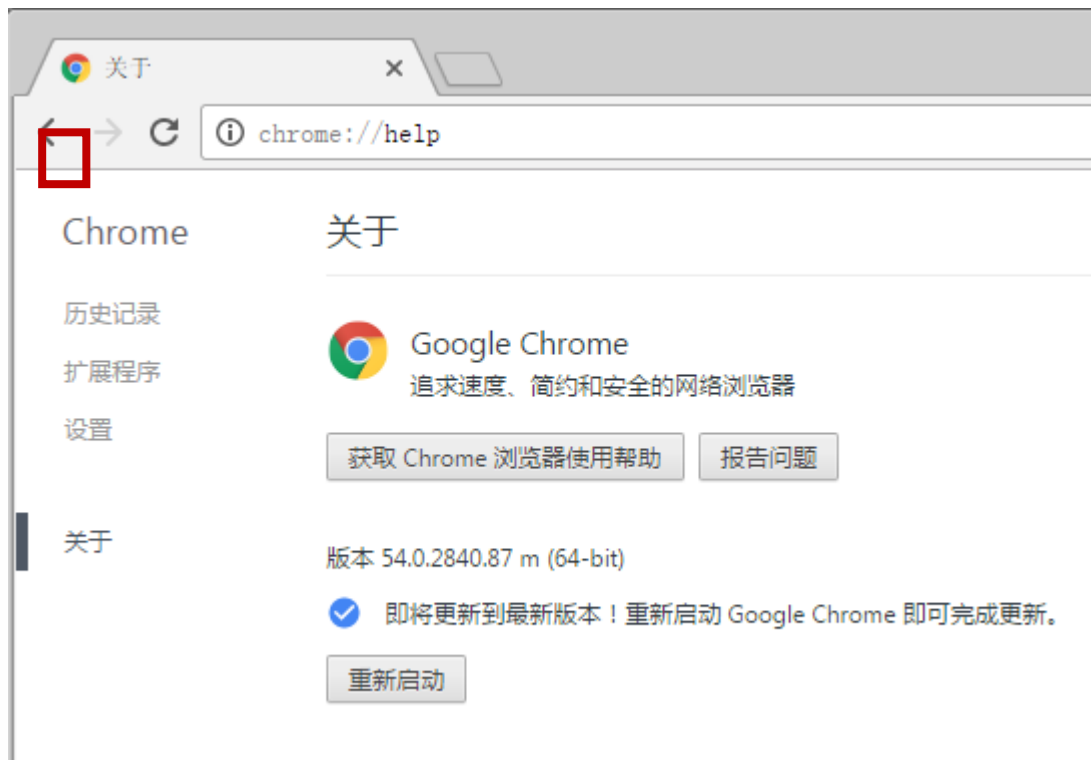
本文承接上一篇基础开发篇文章之后，没看过的可参考：<http://www.niagara-china.com/forum.php?mod=viewthread&tid=3378&extra=page%3D1>

好了，接下来上正文：

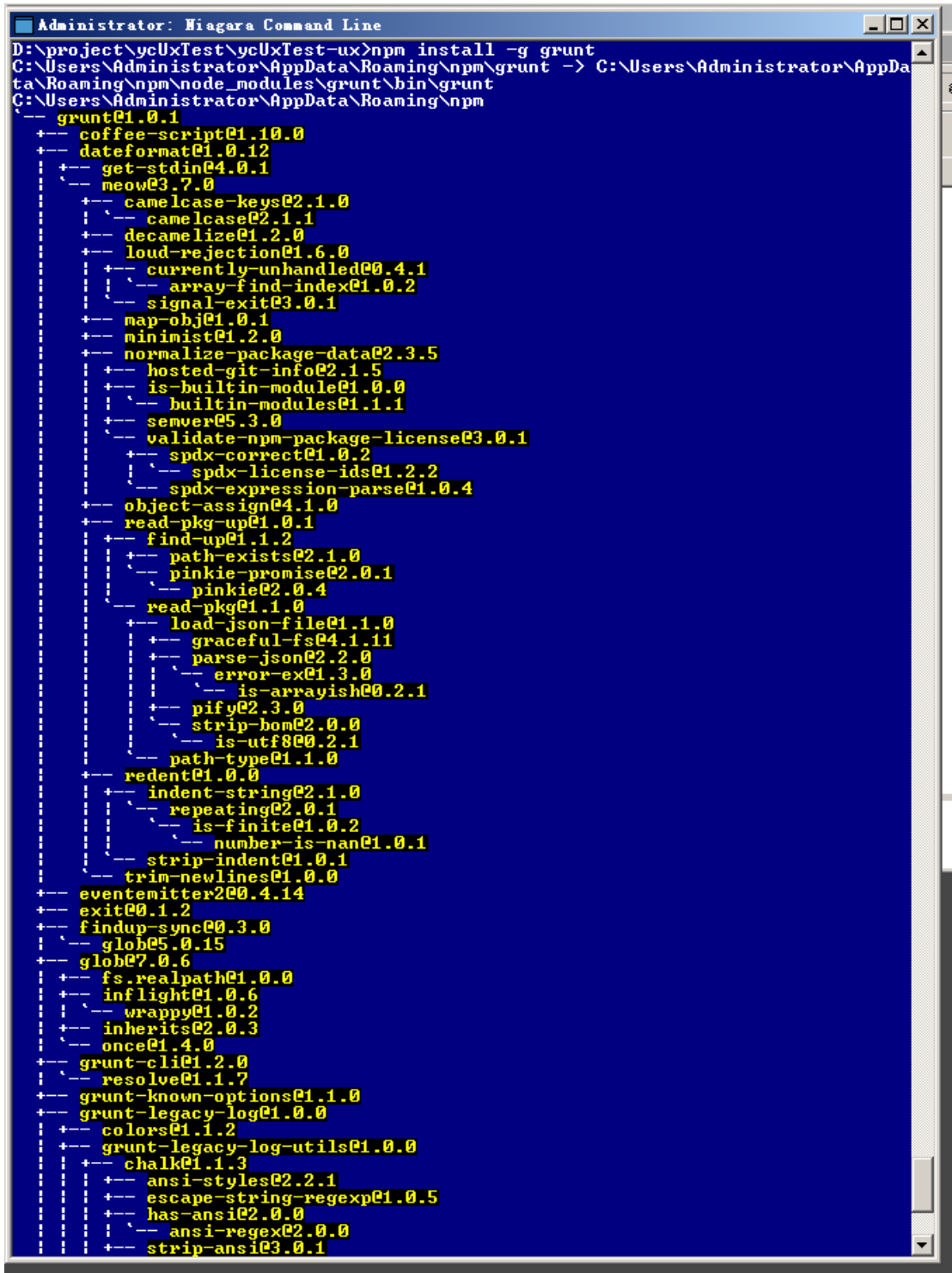
1. 安装 Node.js，参考 nodejs.org



2. 安装 Chrome 浏览器，可选：

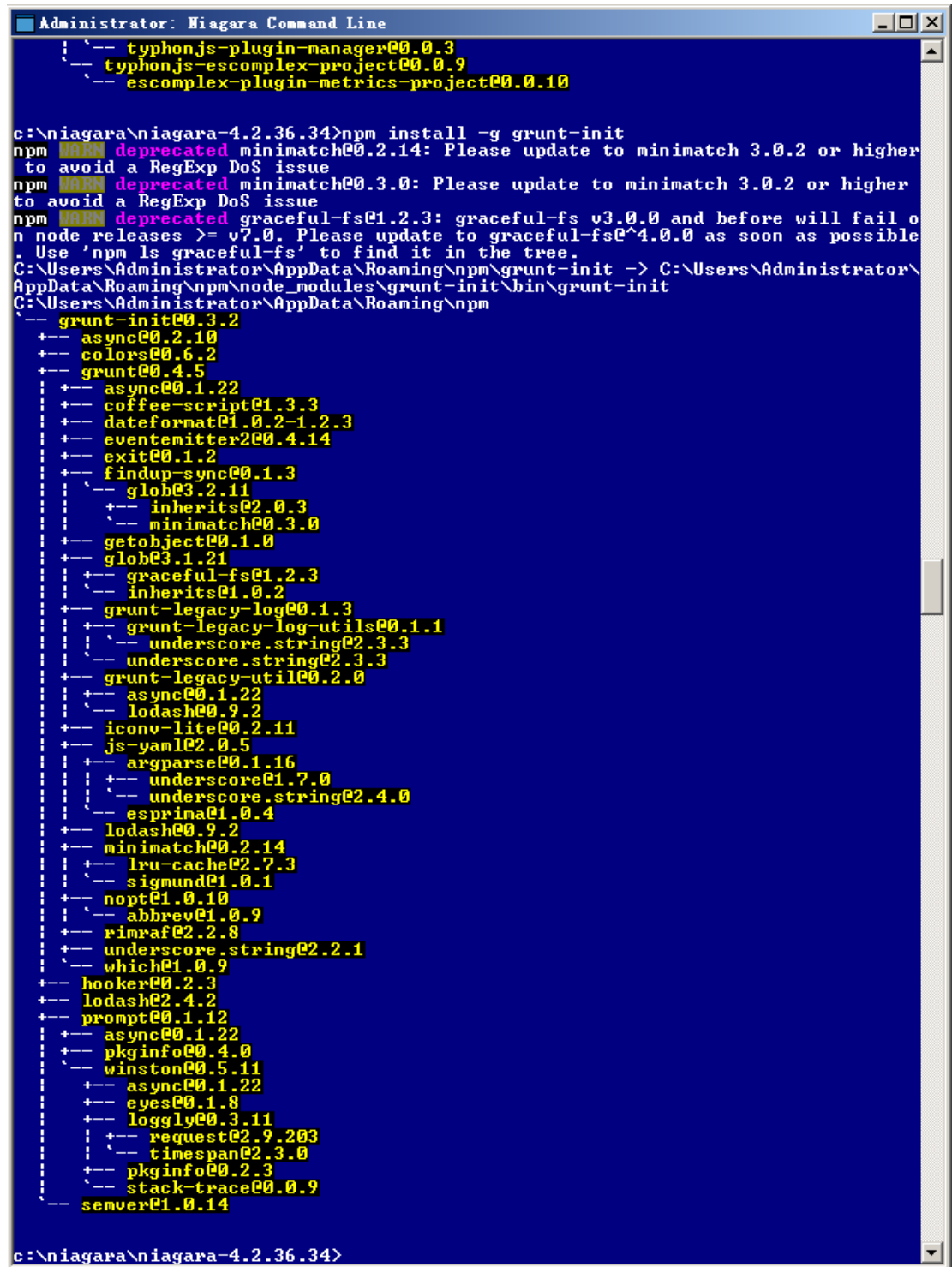


3. 安装 grunt, 运行 Niagara 目录下 bin 目录下的 console.exe 命令, 开控制台, 运行 npm install -g grunt 命令, 建议翻墙。



```
Administrator: Niagara Command Line
D:\project\ycUxTest\ycUxTest-ux>npm install -g grunt
C:\Users\Administrator\AppData\Roaming\npm\grunt -> C:\Users\Administrator\AppData\Roaming\npm\node_modules\grunt\bin\grunt
C:\Users\Administrator\AppData\Roaming\npm
-- grunt@1.0.1
+-- coffee-script@1.10.0
+-- dateformat@1.0.12
+-- get-stdin@4.0.1
+-- meow@3.7.0
+-- camelcase-keys@2.1.0
+-- camelcase@2.1.1
+-- decamelize@1.2.0
+-- loud-rejection@1.6.0
+-- currently-unhandled@0.4.1
+-- array-find-index@1.0.2
+-- signal-exit@3.0.1
+-- map-obj@1.0.1
+-- minimist@1.2.0
+-- normalize-package-data@2.3.5
+-- hosted-git-info@2.1.5
+-- is-builtin-module@1.0.0
+-- builtin-modules@1.1.1
+-- semver@5.3.0
+-- validate-npm-package-license@3.0.1
+-- spdx-correct@1.0.2
+-- spdx-license-ids@1.2.2
+-- spdx-expression-parse@1.0.4
+-- object-assign@4.1.0
+-- read-pkg-up@1.0.1
+-- find-up@1.1.2
+-- path-exists@2.1.0
+-- pinkie-promise@2.0.1
+-- pinkie@2.0.4
+-- read-pkg@1.1.0
+-- load-json-file@1.1.0
+-- graceful-fs@4.1.11
+-- parse-json@2.2.0
+-- error-ex@1.3.0
+-- is-arrayish@0.2.1
+-- pify@2.3.0
+-- strip-bom@2.0.0
+-- is-utf8@0.2.1
+-- path-type@1.1.0
+-- redent@1.0.0
+-- indent-string@2.1.0
+-- repeating@2.0.1
+-- is-finite@1.0.2
+-- number-is-nan@1.0.1
+-- strip-indent@1.0.1
+-- trim-newlines@1.0.0
+-- eventemitter2@0.4.14
+-- exit@0.1.2
+-- findup-sync@0.3.0
+-- glob@5.0.15
+-- glob@7.0.6
+-- fs.realpath@1.0.0
+-- inflight@1.0.6
+-- wrappy@1.0.2
+-- inherits@2.0.3
+-- once@1.4.0
+-- grunt-cli@1.2.0
+-- resolve@1.1.7
+-- grunt-known-options@1.1.0
+-- grunt-legacy-log@1.0.0
+-- colors@1.1.2
+-- grunt-legacy-log-utils@1.0.0
+-- chalk@1.1.3
+-- ansi-styles@2.2.1
+-- escape-string-regexp@1.0.5
+-- has-ansi@2.0.0
+-- ansi-regex@2.0.0
+-- strip-ansi@3.0.1
```

4. 安装 grunt-init, 刚才的控制台中直接运行命令 `npm install -g grunt-init`



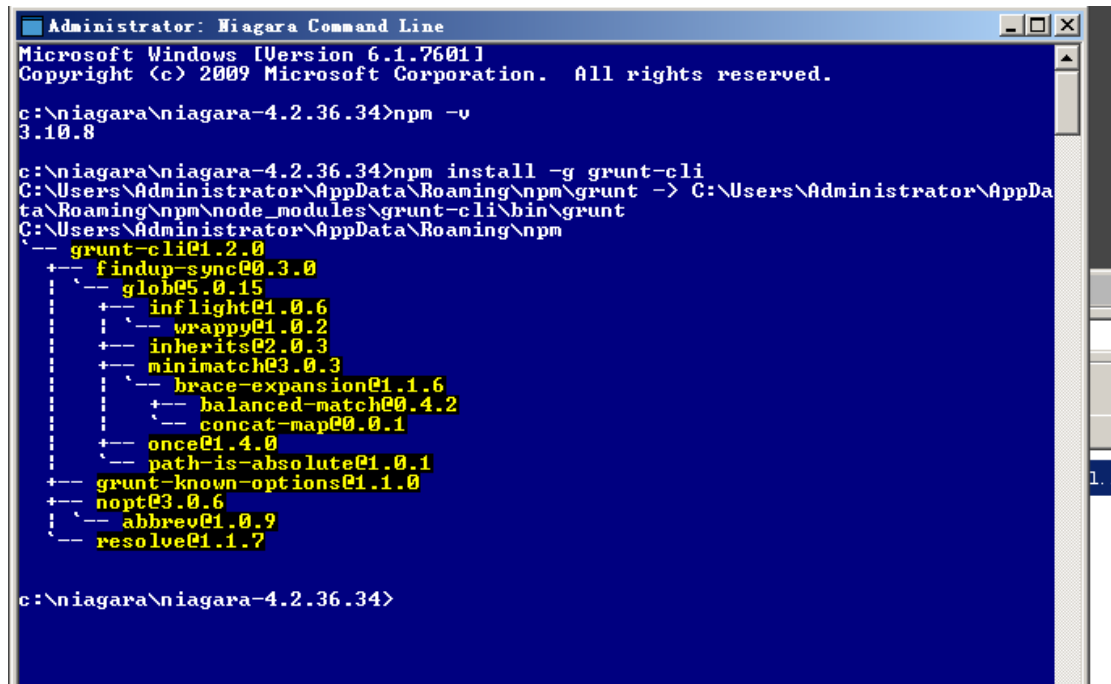
```
Administrator: Niagara Command Line

-- typhonjs-plugin-manager@0.0.3
-- typhonjs-escomplex-project@0.0.9
-- escomplex-plugin-metrics-project@0.0.10

c:\niagara\niagara-4.2.36.34>npm install -g grunt-init
npm WARN deprecated minimatch@0.2.14: Please update to minimatch 3.0.2 or higher
to avoid a RegExp DoS issue
npm WARN deprecated minimatch@0.3.0: Please update to minimatch 3.0.2 or higher
to avoid a RegExp DoS issue
npm WARN deprecated graceful-fs@1.2.3: graceful-fs v3.0.0 and before will fail o
n node releases >= v7.0. Please update to graceful-fs@^4.0.0 as soon as possible
. Use 'npm ls graceful-fs' to find it in the tree.
C:\Users\Administrator\AppData\Roaming\npm\grunt-init -> C:\Users\Administrator\
AppData\Roaming\npm\node_modules\grunt-init\bin\grunt-init
C:\Users\Administrator\AppData\Roaming\npm
-- grunt-init@0.3.2
+-- async@0.2.10
+-- colors@0.6.2
+-- grunt@0.4.5
|   +-- async@0.1.22
|   +-- coffee-script@1.3.3
|   +-- dateformat@1.0.2-1.2.3
|   +-- eventemitter2@0.4.14
|   +-- exit@1.2
|   +-- findup-sync@0.1.3
|   |   -- glob@3.2.11
|   |   +-- inherits@2.0.3
|   |   -- minimatch@0.3.0
|   +-- getobject@0.1.0
|   +-- glob@3.1.21
|   |   -- graceful-fs@1.2.3
|   |   -- inherits@1.0.2
|   +-- grunt-legacy-log@0.1.3
|   +-- grunt-legacy-log-utils@0.1.1
|   |   -- underscore.string@2.3.3
|   |   -- underscore.string@2.3.3
|   +-- grunt-legacy-util@0.2.0
|   +-- async@0.1.22
|   +-- lodash@0.9.2
|   +-- iconv-lite@0.2.11
|   +-- js-yaml@2.0.5
|   +-- argparse@0.1.16
|   |   -- underscore@1.7.0
|   |   -- underscore.string@2.4.0
|   -- esprima@1.0.4
|   -- lodash@0.9.2
|   -- minimatch@0.2.14
|   +-- lru-cache@2.7.3
|   -- sigmund@1.0.1
|   -- nopt@1.0.10
|   |   -- abbrev@1.0.9
|   +-- rimraf@2.2.8
|   +-- underscore.string@2.2.1
|   -- which@1.0.9
+-- hooker@0.2.3
+-- lodash@2.4.2
+-- prompt@0.1.12
|   +-- async@0.1.22
|   +-- pkginfo@0.4.0
|   -- winston@0.5.11
|   +-- async@0.1.22
|   +-- eyes@0.1.8
|   +-- loggly@0.3.11
|   |   -- request@2.9.203
|   |   -- timespan@2.3.0
|   +-- pkginfo@0.2.3
|   -- stack-trace@0.0.9
-- semver@1.0.14

c:\niagara\niagara-4.2.36.34>
```

5. 安装 grunt-cli, 刚才的控制台中直接运行命令 `npm install -g grunt-cli`。



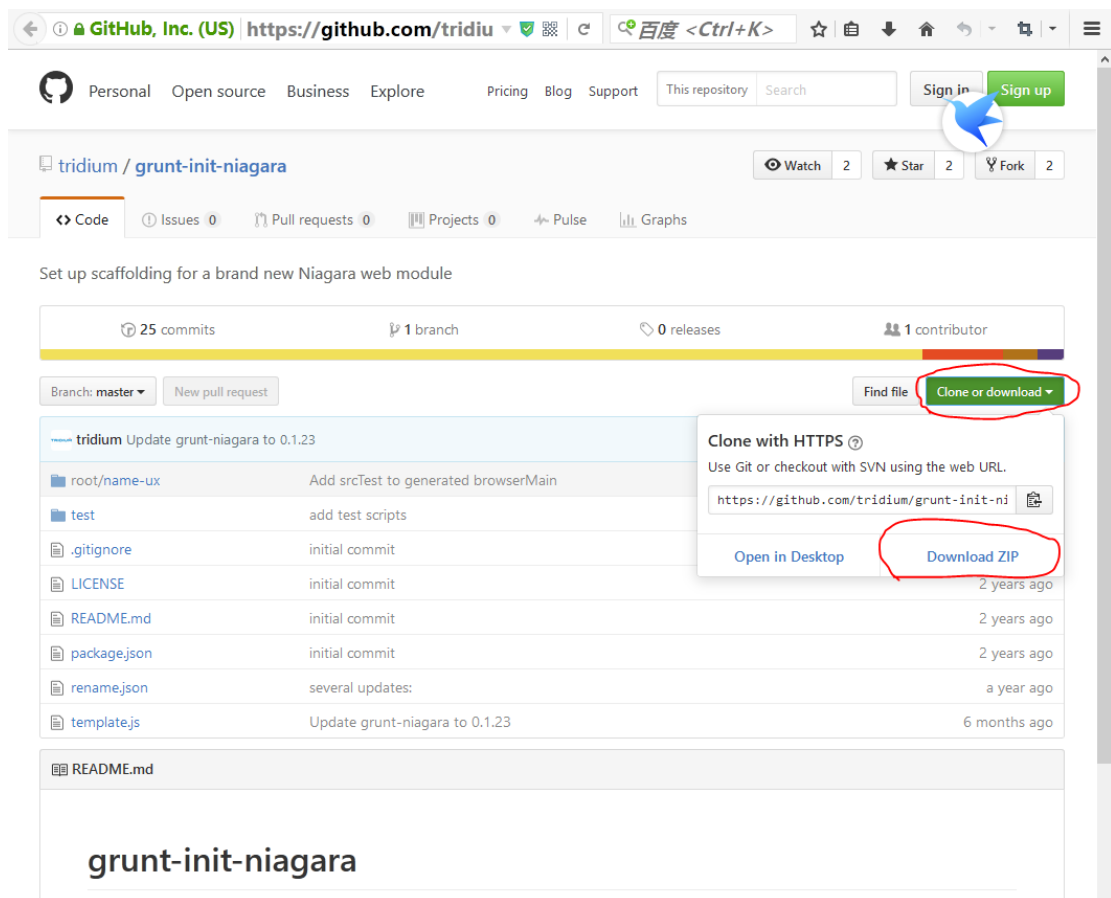
```
Administrator: Niagara Command Line
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

c:\niagara\niagara-4.2.36.34>npm -v
3.10.8

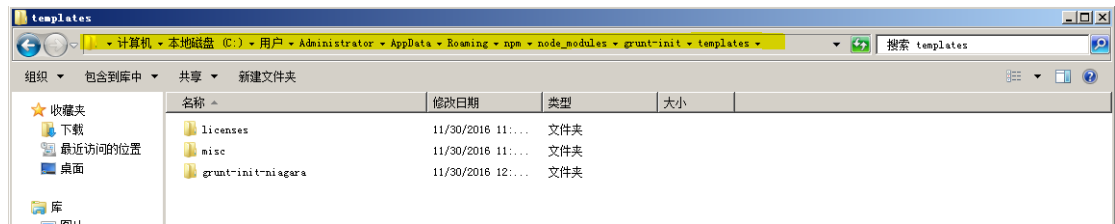
c:\niagara\niagara-4.2.36.34>npm install -g grunt-cli
C:\Users\Administrator\AppData\Roaming\npm\grunt -> C:\Users\Administrator\AppData\Roaming\npm\node_modules\grunt-cli\bin\grunt
C:\Users\Administrator\AppData\Roaming\npm\node_modules\grunt-cli\bin\grunt
-- grunt-cli@1.2.0
+-- findup-sync@0.3.0
+-- glob@5.0.15
+-- inflight@1.0.6
+-- wrappy@1.0.2
+-- inherits@2.0.3
+-- minimatch@3.0.3
+-- brace-expansion@1.1.6
+-- balanced-match@0.4.2
+-- concat-map@0.0.1
+-- once@1.4.0
+-- path-is-absolute@1.0.1
+-- grunt-known-options@1.1.0
+-- nopt@3.0.6
+-- abbrev@1.0.9
+-- resolve@1.1.7

c:\niagara\niagara-4.2.36.34>
```

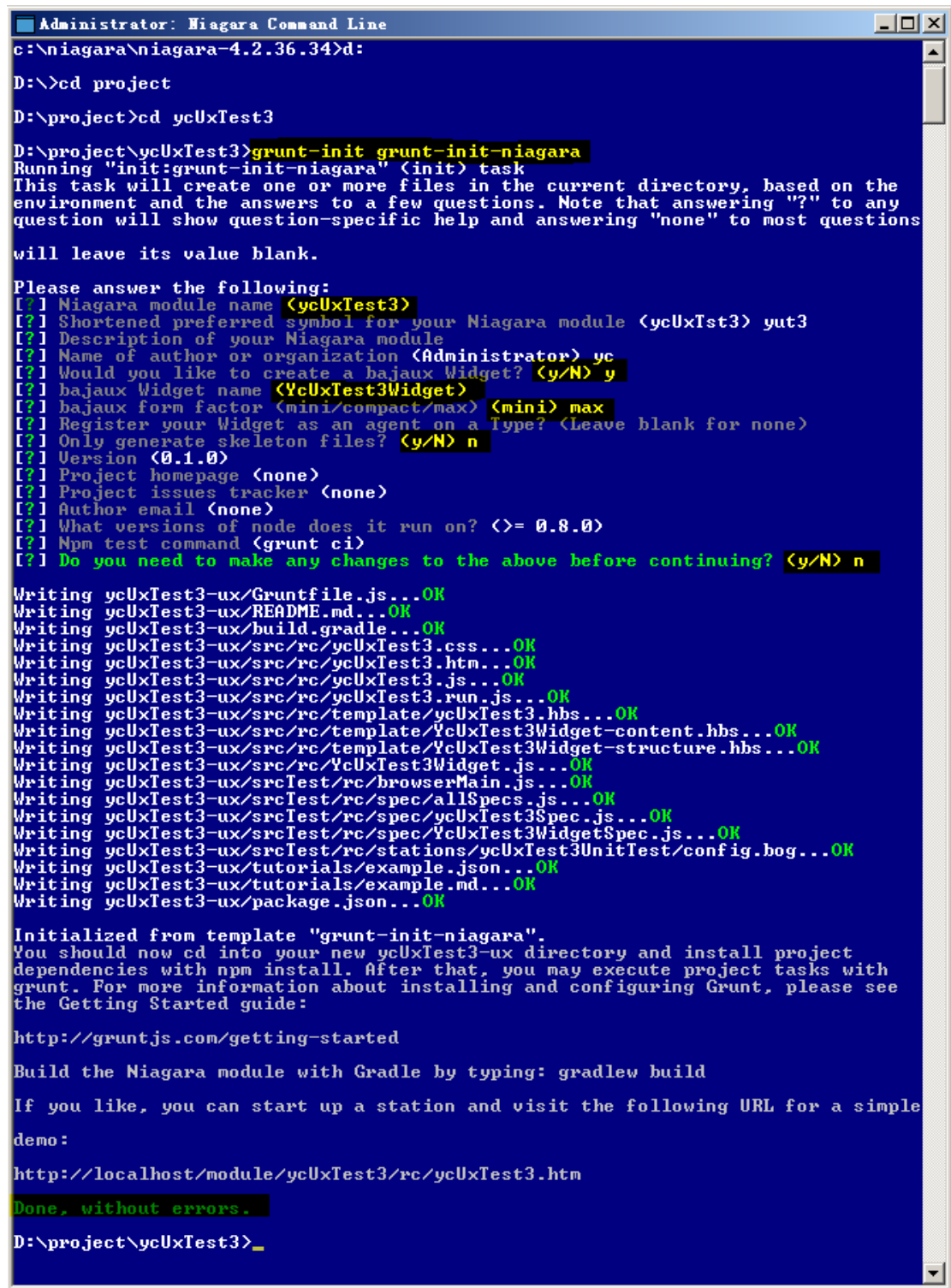
6. 下载 grunt-init-niagara, 参考网址:
<https://github.com/tridium/grunt-init-niagara>



7. 将下载好的 grunt-init-niagara 模板考入 grunt-init 的模板文件夹下，具体在：系统用户文件夹/AppData/Roaming/npm/node_modules/grunt-init/templates 下。



8. 运行 grunt-init-niagara 模板：建立项目文件夹，然后在刚才的控制台中进入这个项目文件，运行命令 `grunt-init grunt-init-niagara`，这时开始建立工程，模板会问你一些问题，如图所示，直接按回车则表示同意白字所示默认答案。



```
Administrator: Niagara Command Line
c:\niagara\niagara-4.2.36.34>d:
D:\>cd project
D:\project>cd ycUxTest3
D:\project\ycUxTest3>grunt-init grunt-init-niagara
Running "init:grunt-init-niagara" (init) task
This task will create one or more files in the current directory, based on the
environment and the answers to a few questions. Note that answering "?" to any
question will show question-specific help and answering "none" to most questions
will leave its value blank.

Please answer the following:
[?] Niagara module name (ycUxTest3)
[?] Shortened preferred symbol for your Niagara module (ycUxTest3) yut3
[?] Description of your Niagara module
[?] Name of author or organization (Administrator) yc
[?] Would you like to create a bajaux Widget? (y/N) y
[?] bajaux Widget name (YcUxTest3Widget)
[?] bajaux form factor (mini/compact/max) (mini) max
[?] Register your Widget as an agent on a Type? (Leave blank for none)
[?] Only generate skeleton files? (y/N) n
[?] Version (0.1.0)
[?] Project homepage (none)
[?] Project issues tracker (none)
[?] Author email (none)
[?] What versions of node does it run on? (>= 0.8.0)
[?] Npm test command (grunt ci)
[?] Do you need to make any changes to the above before continuing? (y/N) n

Writing ycUxTest3-ux/Gruntfile.js...OK
Writing ycUxTest3-ux/README.md...OK
Writing ycUxTest3-ux/build.gradle...OK
Writing ycUxTest3-ux/src/rc/ycUxTest3.css...OK
Writing ycUxTest3-ux/src/rc/ycUxTest3.htm...OK
Writing ycUxTest3-ux/src/rc/ycUxTest3.js...OK
Writing ycUxTest3-ux/src/rc/ycUxTest3.run.js...OK
Writing ycUxTest3-ux/src/rc/template/ycUxTest3.hbs...OK
Writing ycUxTest3-ux/src/rc/template/YcUxTest3Widget-content.hbs...OK
Writing ycUxTest3-ux/src/rc/template/YcUxTest3Widget-structure.hbs...OK
Writing ycUxTest3-ux/src/rc/YcUxTest3Widget.js...OK
Writing ycUxTest3-ux/srcTest/rc/browserMain.js...OK
Writing ycUxTest3-ux/srcTest/rc/spec/allSpecs.js...OK
Writing ycUxTest3-ux/srcTest/rc/spec/ycUxTest3Spec.js...OK
Writing ycUxTest3-ux/srcTest/rc/spec/YcUxTest3WidgetSpec.js...OK
Writing ycUxTest3-ux/srcTest/rc/stations/ycUxTest3UnitTest/config.bog...OK
Writing ycUxTest3-ux/tutorials/example.json...OK
Writing ycUxTest3-ux/tutorials/example.md...OK
Writing ycUxTest3-ux/package.json...OK

Initialized from template "grunt-init-niagara".
You should now cd into your new ycUxTest3-ux directory and install project
dependencies with npm install. After that, you may execute project tasks with
grunt. For more information about installing and configuring Grunt, please see
the Getting Started guide:

http://gruntjs.com/getting-started

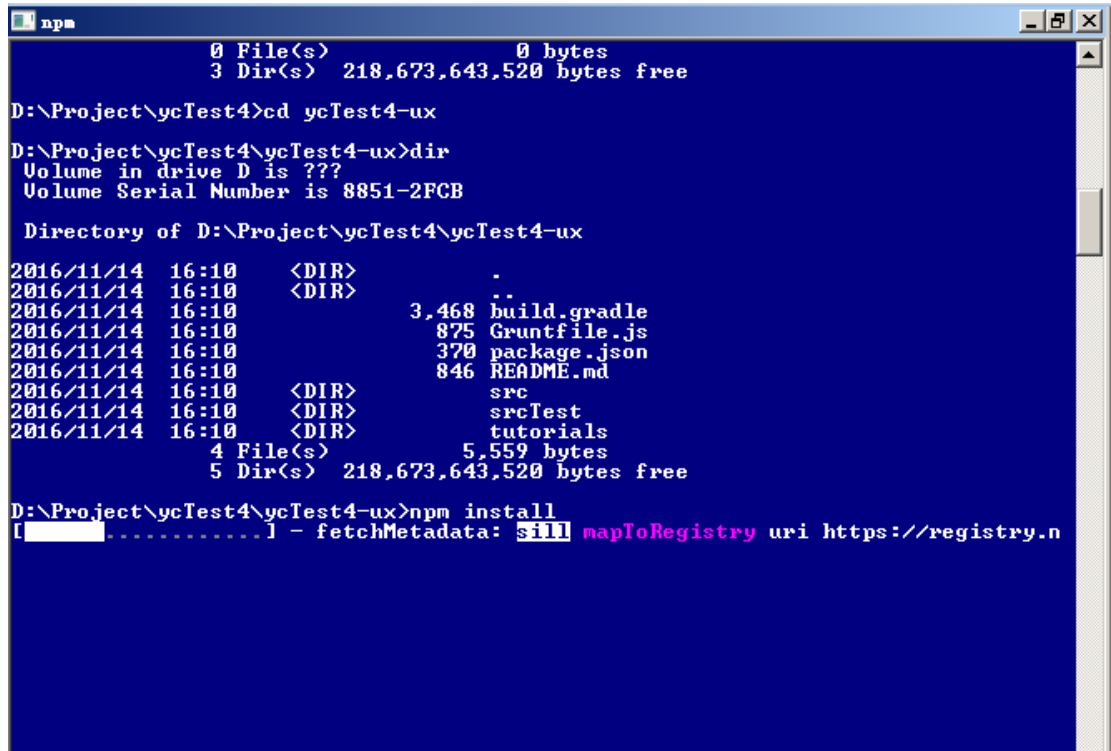
Build the Niagara module with Gradle by typing: gradlew build

If you like, you can start up a station and visit the following URL for a simple
demo:

http://localhost/module/ycUxTest3/rc/ycUxTest3.htm

Done, without errors.
D:\project\ycUxTest3>
```

9. 进入 grunt-init-niagara 模板建立的项目文件夹中，看到有 build.gradle 等文件，运行 npm install 命令，安装另外一些必须的 grunt 模块，此处无翻墙会卡住，必须翻墙。



```
0 File(s)          0 bytes
3 Dir(s)  218,673,643,520 bytes free

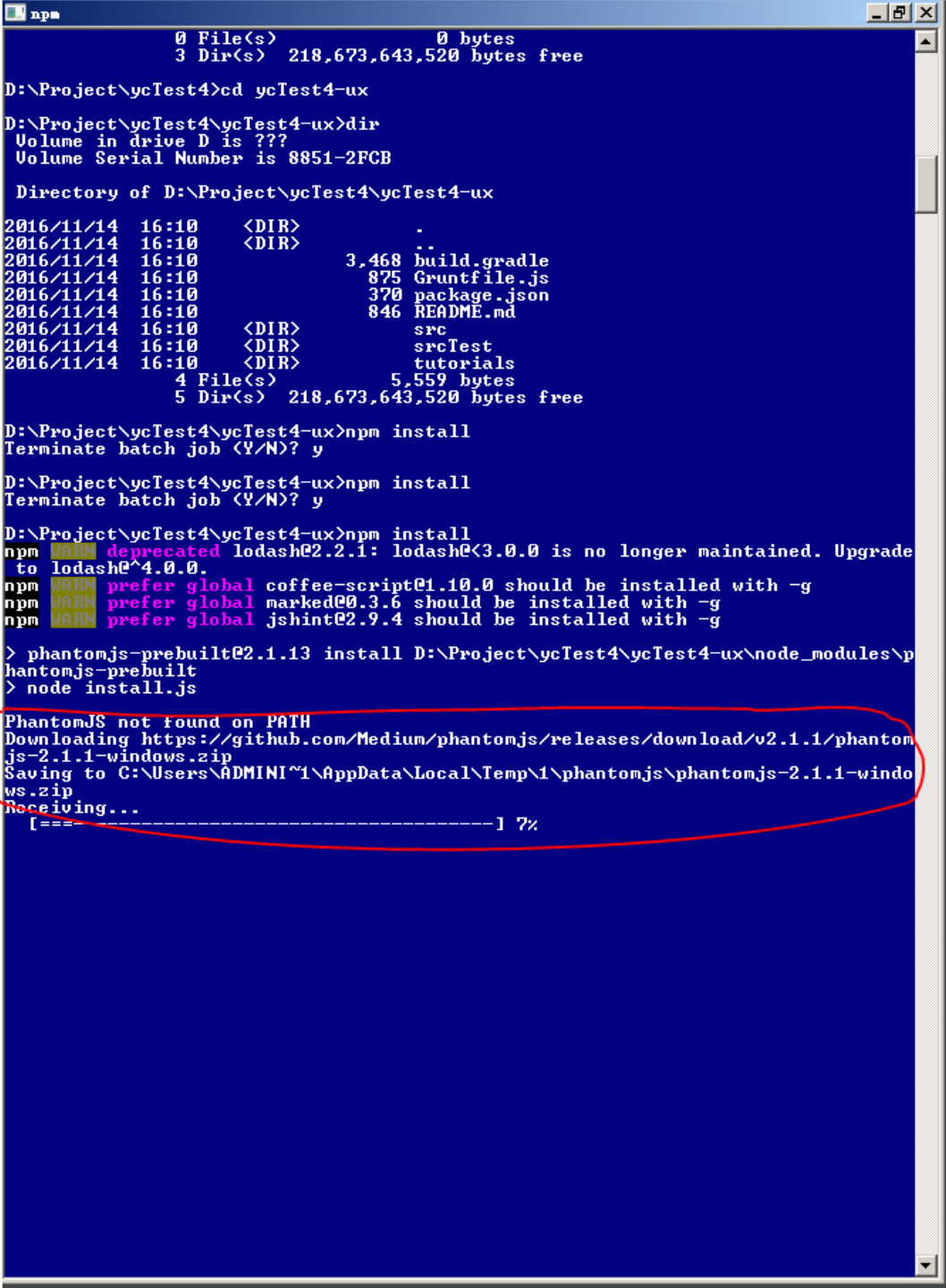
D:\Project\ycTest4>cd ycTest4-ux
D:\Project\ycTest4\ycTest4-ux>dir
Volume in drive D is ???
Volume Serial Number is 8851-2FCB

Directory of D:\Project\ycTest4\ycTest4-ux

2016/11/14  16:10    <DIR>          .
2016/11/14  16:10    <DIR>          ..
2016/11/14  16:10                3,468 build.gradle
2016/11/14  16:10                875 Gruntfile.js
2016/11/14  16:10                370 package.json
2016/11/14  16:10                846 README.md
2016/11/14  16:10    <DIR>          src
2016/11/14  16:10    <DIR>          srcTest
2016/11/14  16:10    <DIR>          tutorials
                4 File(s)          5,559 bytes
                5 Dir(s)  218,673,643,520 bytes free

D:\Project\ycTest4\ycTest4-ux>npm install
[ ] ..... - fetchMetadata: fail mapToRegistry uri https://registry.n
```


10. 安装过程中会提示安装 phantomjs, 这里不想麻烦的就只能慢慢等下载完, 也可以记录下它提示的下载地址和准备放到的目录, 然后点 Ctrl + C 退出安装进程, 然后用下载工具下载 phantomjs 的 ZIP, 然后放到它准备放到的目录里, 然后重新运行 npm install



```
0 File(s)          0 bytes
3 Dir(s)  218,673,643,520 bytes free

D:\Project\ycTest4>cd ycTest4-ux

D:\Project\ycTest4\ycTest4-ux>dir
Volume in drive D is ???
Volume Serial Number is 8851-2FCB

Directory of D:\Project\ycTest4\ycTest4-ux

2016/11/14  16:10    <DIR>          .
2016/11/14  16:10    <DIR>          ..
2016/11/14  16:10                3,468 build.gradle
2016/11/14  16:10                875 Gruntfile.js
2016/11/14  16:10                370 package.json
2016/11/14  16:10                846 README.md
2016/11/14  16:10    <DIR>          src
2016/11/14  16:10    <DIR>          srcTest
2016/11/14  16:10    <DIR>          tutorials
                4 File(s)          5,559 bytes
                5 Dir(s)  218,673,643,520 bytes free

D:\Project\ycTest4\ycTest4-ux>npm install
Terminate batch job (Y/N)? y

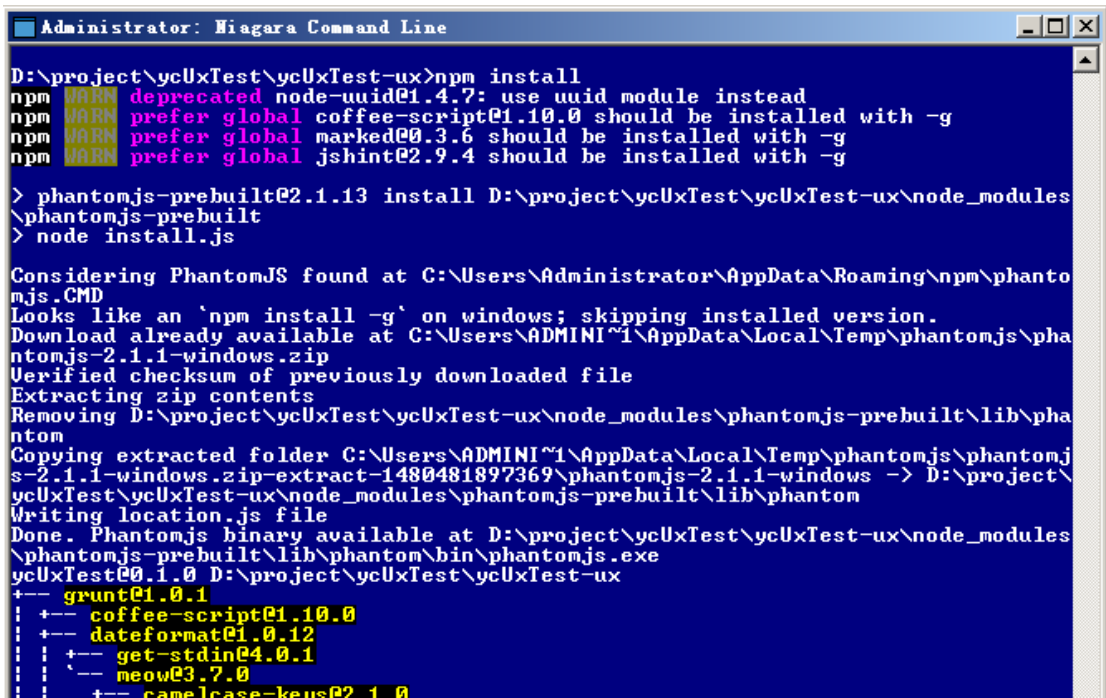
D:\Project\ycTest4\ycTest4-ux>npm install
Terminate batch job (Y/N)? y

D:\Project\ycTest4\ycTest4-ux>npm install
npm WARN deprecated lodash@2.2.1: lodash@<3.0.0 is no longer maintained. Upgrade
to lodash@4.0.0.
npm WARN prefer global coffee-script@1.10.0 should be installed with -g
npm WARN prefer global marked@0.3.6 should be installed with -g
npm WARN prefer global jshint@2.9.4 should be installed with -g

> phantomjs-prebuilt@2.1.13 install D:\Project\ycTest4\ycTest4-ux\node_modules\p
hantomjs-prebuilt
> node install.js

PhantomJS not found on PATH
Downloading https://github.com/Medium/phantomjs/releases/download/v2.1.1/phantom
js-2.1.1-windows.zip
Saving to C:\Users\ADMINI~1\AppData\Local\Temp\1\phantomjs\phantomjs-2.1.1-windo
ws.zip
Receiving...
[====] 7%
```

11. 全部安装完



```
Administrator: Niagara Command Line

D:\project\ycUxTest\ycUxTest-ux>npm install
npm WARN deprecated node-uuid@1.4.7: use uuid module instead
npm WARN prefer global coffee-script@1.10.0 should be installed with -g
npm WARN prefer global marked@0.3.6 should be installed with -g
npm WARN prefer global jshint@2.9.4 should be installed with -g

> phantomjs-prebuilt@2.1.13 install D:\project\ycUxTest\ycUxTest-ux\node_modules\phantomjs-prebuilt
> node install.js

Considering PhantomJS found at C:\Users\Administrator\AppData\Roaming\npm\phantomjs.CMD
Looks like an 'npm install -g' on windows; skipping installed version.
Download already available at C:\Users\ADMINI~1\AppData\Local\Temp\phantomjs\phantomjs-2.1.1-windows.zip
Verified checksum of previously downloaded file
Extracting zip contents
Removing D:\project\ycUxTest\ycUxTest-ux\node_modules\phantomjs-prebuilt\lib\phantom
Copying extracted folder C:\Users\ADMINI~1\AppData\Local\Temp\phantomjs\phantomjs-2.1.1-windows.zip-extract-1480481897369\phantomjs-2.1.1-windows -> D:\project\ycUxTest\ycUxTest-ux\node_modules\phantomjs-prebuilt\lib\phantom
Writing location.js file
Done. Phantomjs binary available at D:\project\ycUxTest\ycUxTest-ux\node_modules\phantomjs-prebuilt\lib\phantom\bin\phantomjs.exe
ycUxTest@0.1.0 D:\project\ycUxTest\ycUxTest-ux
+-- grunt@1.0.1
| +-- coffee-script@1.10.0
| +-- dateformat@1.0.12
| +-- get-stdin@4.0.1
| +-- meow@3.7.0
| +-- camelcase-keys@2.1.0
```

12. 友情提示：这时在你的项目文件夹中，会多出来一个/ node_modules 文件夹，这里面就是刚才下载安装的那一大堆东西，以后你每新建一个项目用 grunt-init 的 grunt-init-niagara 模板初始化你的项目后，运行 npm install 都会重新下载这一堆东西的最新版，如果你想避免这个下载的麻烦也可以，把这/ node_modules 文件夹拷贝下来，然后在新建一个项目用 grunt-init 的 grunt-init-niagara 模板初始化你的项目后把这个文件夹拷到你新项目文件夹的同样位置，然后不用再运行 npm install 就可以了，这时直接运行后续的 grunt ci 命令就可以测试了，当然这样做也有代价，就是不能保证每次项目里的这些 grunt 部件都是最新版本

13. 运行 grunt ci, 如果参数合适, 则会提示绿字的 SUCCESS

```
Administrator: Niagara Command Line
!  -- throttleit@1.0.0
+-- requirejs@2.3.2
+-- semver@5.3.0
+-- strip-ansi@3.0.1
!  -- ansi-regex@2.0.0
+-- temporary@0.0.8
+-- package@1.0.1

npm WARN optional Skipping failed optional dependency /chokidar/fsevents:
npm WARN notsup Not compatible with your operating system or architecture: fsevents@1.0.15
npm WARN ycTest4@1.0.0 No repository field.
npm WARN ycTest4@1.0.0 No license field.

D:\Project\ycTest4\ycTest4-ux>grunt ci
Running "jshint:ci" (jshint) task
>> Report "C:\Users\Administrator\Niagara4.1\reports\testng\junitreports\ycTest4-jshint.xml" created.

Running "karma:ci" (karma) task
Running tests in Karma.
[2016-11-14 16:47:58.425] [DEBUG] config - No config file specified.
starting up station ycTest4...
Copying test station from: ./srcTest/rc/stations/ycTest4UnitTest
to: C:\Users\Administrator\Niagara4.1\stations\ycTest4

D:\Project\ycTest4\ycTest4-ux>grunt ci
Running "jshint:ci" (jshint) task
>> Report "C:\Users\Administrator\Niagara4.1\reports\testng\junitreports\ycTest4-jshint.xml" created.

Running "karma:ci" (karma) task
Running tests in Karma.
[2016-06-01 16:50:49.118] [DEBUG] config - No config file specified.
starting up station ycTest4...
Copying test station from: ./srcTest/rc/stations/ycTest4UnitTest
to: C:\Users\Administrator\Niagara4.1\stations\ycTest4

starting up Niagara test server...
File at C:\Users\Administrator\Niagara4.1\etc\moduledev.properties could not be loaded. No moduledev resolution will occur.
niagara-test-server is starting HTTP listener: host 127.0.0.1, port 9090
niagara-test-server started successfully.
starting up Karma server...
01 06 2016 16:50:59.234:INFO [karma]: Karma v1.2.0 server started at http://localhost:9876/_karma/
01 06 2016 16:50:59.237:INFO [launcher]: Launching browser PhantomJS with unlimited concurrency
01 06 2016 16:50:59.246:INFO [launcher]: Starting browser PhantomJS
01 06 2016 16:51:00.967:INFO [PhantomJS 2.1.1 (Windows 7 0.0.0)]: Connected on socket /#i9KPN_kosdML7HEgAAAA with id 70521929
PhantomJS 2.1.1 (Windows 7 0.0.0) ERROR: 'There is no timestamp for /niagara-test-server/karmaUtils.js!'

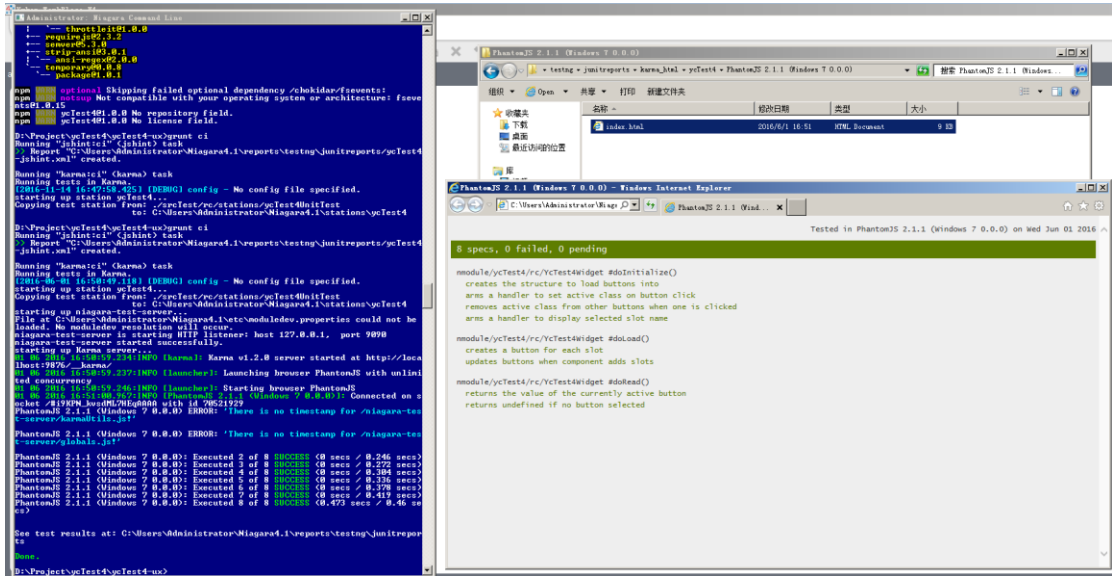
PhantomJS 2.1.1 (Windows 7 0.0.0) ERROR: 'There is no timestamp for /niagara-test-server/globals.js!'

PhantomJS 2.1.1 (Windows 7 0.0.0): Executed 2 of 8 SUCCESS (0 secs / 0.246 secs)
PhantomJS 2.1.1 (Windows 7 0.0.0): Executed 3 of 8 SUCCESS (0 secs / 0.272 secs)
PhantomJS 2.1.1 (Windows 7 0.0.0): Executed 4 of 8 SUCCESS (0 secs / 0.304 secs)
PhantomJS 2.1.1 (Windows 7 0.0.0): Executed 5 of 8 SUCCESS (0 secs / 0.336 secs)
PhantomJS 2.1.1 (Windows 7 0.0.0): Executed 6 of 8 SUCCESS (0 secs / 0.378 secs)
PhantomJS 2.1.1 (Windows 7 0.0.0): Executed 7 of 8 SUCCESS (0 secs / 0.419 secs)
PhantomJS 2.1.1 (Windows 7 0.0.0): Executed 8 of 8 SUCCESS (0.473 secs / 0.46 secs)

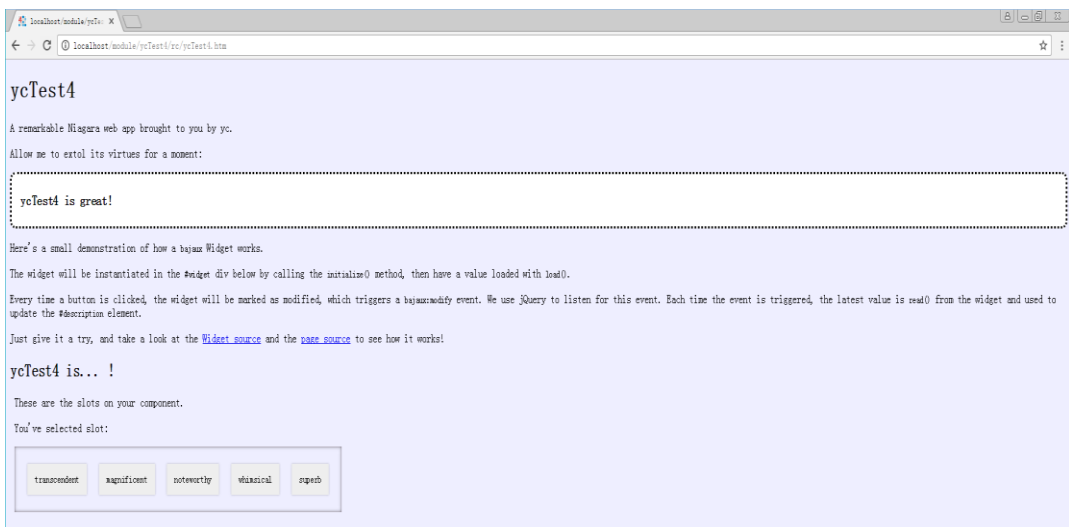
See test results at: C:\Users\Administrator\Niagara4.1\reports\testng\junitreports
Done.

D:\Project\ycTest4\ycTest4-ux>
```

14. 测试的网页结果报告在上图所示最后一个红框标出来的路径下。



15. 测试也会生成一个测试站点，可在 N4 的工作台里的 stations copier 里把这个站点拷进去运行。
16. 可在这个站点运行后，通过网址 localhost/module/模块名/rc/模块名.htm 访问模板自动生成的实例网页。



17. 关于官方文档中的一些个人提示：
- a) docDeveloper.pdf 84 到 85 页里的 BMyWebModuleWidget 的代码是不全的，需补上其 NiagaraType 的各个函数及这个类的构造函数。
 - b) **必须保证 TYPE 相关语句在程序最下方**，否则模块运行会出错，这个不知道算不算 BUG，困扰了我 3 天才找到，有兴趣的同学可以验证一下。

c) 实例代码如下:

```
/**
 * Created by Administrator on 2016/6/1.
 */
@NiagaraType(agent = @AgentOn(types =
{"kitControl:Ramp", "ycTest:YcTestComponent"}))

public class BYcTestWidget
    extends BSingleton
    implements BIJavaScript, BFormFactorMax {

    private BYcTestWidget() {}
    public static final BYcTestWidget INSTANCE = new BYcTestWidget();

    @Override
    public JsInfo getJsInfo(Context cx) { return jsInfo; }

    private static final JsInfo jsInfo =
        JsInfo.make(BOrd.make("module://ycTest/rc/YcTestWidget.js"));

    /*+ ----- BEGIN BAJA AUTO GENERATED CODE ----- +*/
    /*@ $com.zs.ycTest.ux.BYcTestWidget(1073681349)1.0$ @*/
    /* Generated Wed Jun 01 16:43:55 CST 2016 by Slot-o-Matic (c) Tridium, Inc.
    2012 */

    //////////////////////////////////////
    // Type
    //////////////////////////////////////

    @Override
    public Type getType() { return TYPE; }
    public static final Type TYPE = Sys.loadType(BYcTestWidget.class);

    /*+ ----- END BAJA AUTO GENERATED CODE ----- +*/

}
```

这几句必须保证
在代码最下方

18. 如上所示, N4 的 Javascript 开发环境设置已完毕, 当然我也不确定是不是完全, 文档中还提到要开 N4 的 dev 模式, 可是我试过后也没法确定我试的到底对不对, 所以没在本文中列出, 如有高手知道请指正。