Department of Veterans Affairs

Enterprise Health Management Platform (eHMP)
Integration and Transition Support (ITS)

Application Development Kit (ADK) Windows Workstation Installation Guide

January 2016

Version 0.2

Revision History

Date	Revision	Description	Author
01/28/2016	0.2	Technical Writer review	J. Owczarzak
01/27/2016	0.2	Technical Updates	L. Brown H. Lemieux
01/11/2016	0.1	Initial Technical Writer review	J. Owczarzak
01/07/2016	0.1	Initial Draft	C. Ruiz E. Crean

Table of Contents

1. Configuring an ADK Windows Workstation

This document outlines the necessary steps to install and configure an Application Development Kit (ADK) Windows Workstation. The process requires installing several Commercial-Off-the-Shelf (COTS) applications, cloning and building the Enterprise Health Management Platform (eHMP) adk and ehmp-ui source, and installing and configuring an Apache Web Server.

2. Installation of COTS

2.1. Installing the Java Development Kit

Perform the following procedure to install JDK:

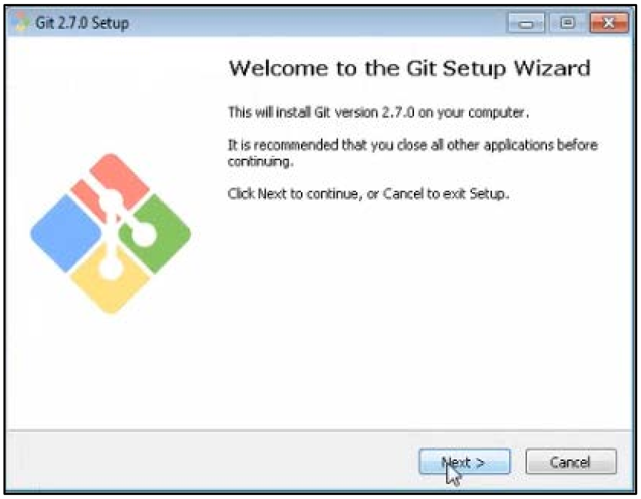
1. Download the Java SE Development Kit 8u66 software from Oracle: http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html

2. It is recommended to install in the default location: "C:\Program Files\Java\jdk1.8.0_66" (default).

2.2. Installing Git

Git is required to set up the local repository and to check out source codes from the Git repository. Perform the following procedure to install Git:

1. Download most recent version of Git at: http://git-scm.com/downloads
2. From Windows Explorer, run the Git executable file to run the Git Setup Wizard.
3. On the "Welcome to the Git Setup Wizard" screen, click **Next>**.



Welcome to the Git Setup Wizard

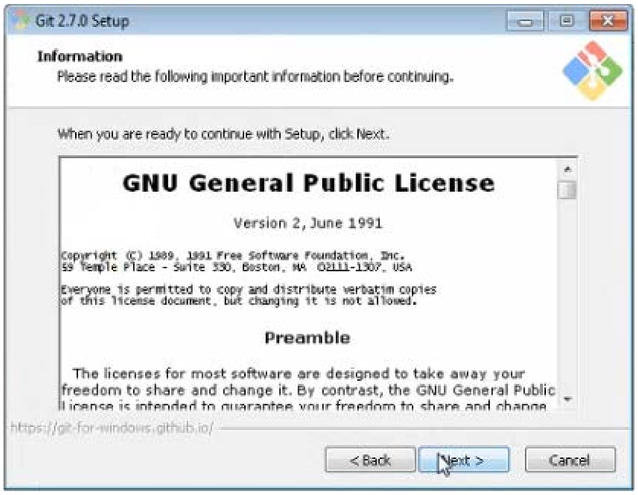
This will install Git version 2.7.0 on your computer.

It is recommended that you close all other applications before continuing.

Click Next to continue, or Cancel to exit Setup.

Figure 1: Git Installation Welcome Screen

4. On the "Information" screen, click **Next>** to accept the GNU General License and continue.



Information

Please read the following important information before continuing.

When you are ready to continue with Setup, click Next.

GNU General Public License

Version 2, June 1991

Copyright (C) 1989, 1991 Free Software Foundation, Inc.
59 Temple Place - Suite 330, Boston, MA 02111-1307, USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

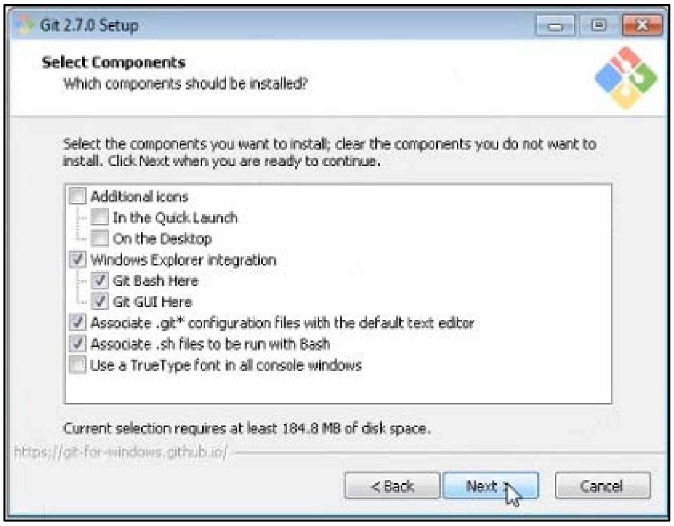
Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change

https://git-for-windows.github.io/

Figure 2: License Information

5. On the “Select Components” screen, leave the default checkboxes checked and click **Next>**.



Select Components

Which components should be installed?

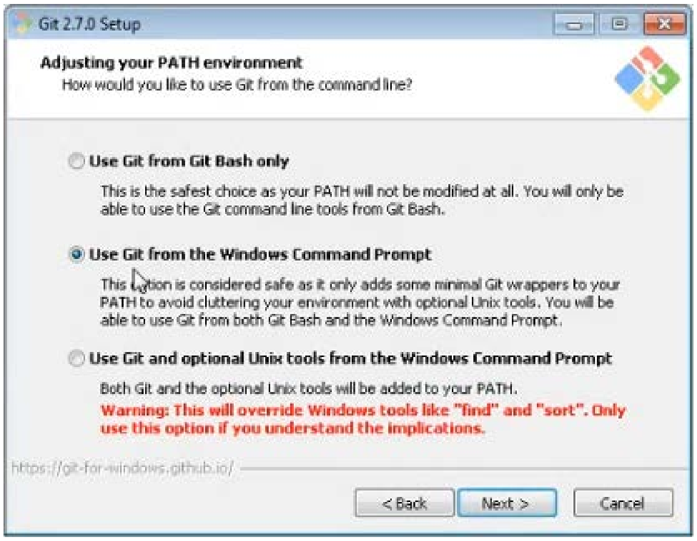
Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.

- □ Additional icons
  - □ In the Quick Launch
  - □ On the Desktop
- ☑ Windows Explorer integration
  - ☑ Git Bash Here
  - ☑ Git GUI Here
- ☑ Associate .git* configuration files with the default text editor
- ☑ Associate .sh files to be run with Bash
- □ Use a TrueType font in all console windows

Current selection requires at least 184.8 MB of disk space.

Figure 3: Select Components

6. On the “Adjusting your PATH environment” screen, select the “Use Git from the Windows Command Prompt” radio button. This variable must be selected to run scripts during the building on eHMP components.
7. Click **Next>**.



Adjusting your PATH environment

How would you like to use Git from the command line?

○ **Use Git from Git Bash only**

This is the safest choice as your PATH will not be modified at all. You will only be able to use the Git command line tools from Git Bash.

● **Use Git from the Windows Command Prompt**

This option is considered safe as it only adds some minimal Git wrappers to your PATH to avoid cluttering your environment with optional Unix tools. You will be able to use Git from both Git Bash and the Windows Command Prompt.

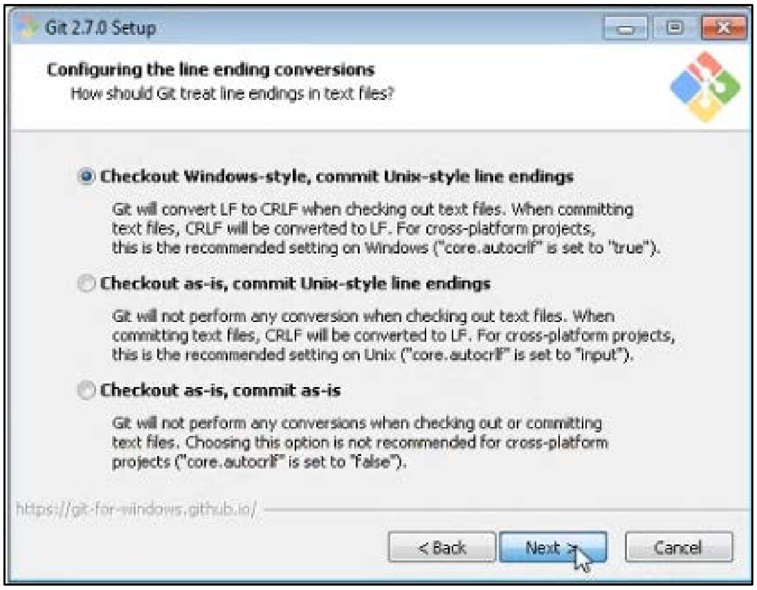
○ **Use Git and optional Unix tools from the Windows Command Prompt**

Both Git and the optional Unix tools will be added to your PATH.

Warning: This will override Windows tools like "find" and "sort". Only use this option if you understand the implications.

Figure 4: Adjusting your PATH environment

8. On the “Configuring the line ending conversions” screen. Select the “Checkout Windows-style, commit Unix-style line endings” radio button and click **Next>**.



Configuring the line ending conversions
How should Git treat line endings in text files?

● **Checkout Windows-style, commit Unix-style line endings**

Git will convert LF to CRLF when checking out text files. When committing text files, CRLF will be converted to LF. For cross-platform projects, this is the recommended setting on Windows ("core.autocrlf" is set to "true").

○ **Checkout as-is, commit Unix-style line endings**

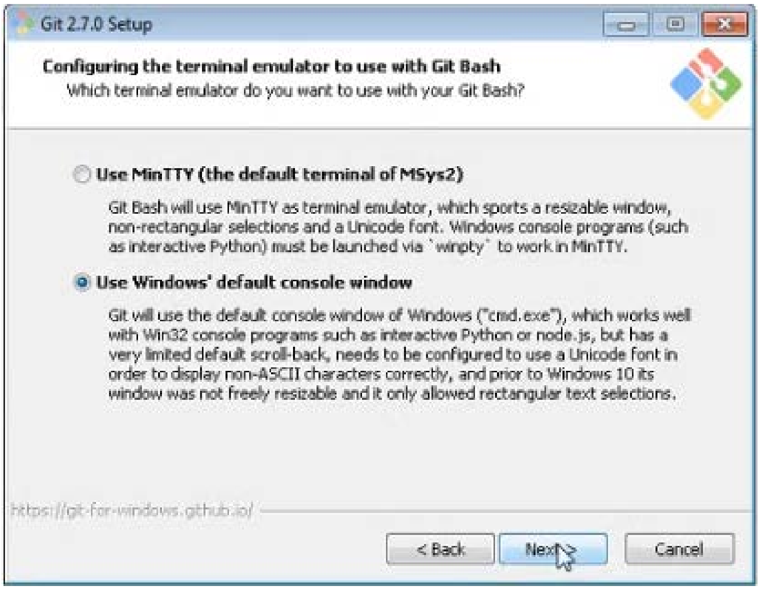
Git will not perform any conversion when checking out text files. When committing text files, CRLF will be converted to LF. For cross-platform projects, this is the recommended setting on Unix ("core.autocrlf" is set to "input").

○ **Checkout as-is, commit as-is**

Git will not perform any conversions when checking out or committing text files. Choosing this option is not recommended for cross-platform projects ("core.autocrlf" is set to "false").

Figure 5: Configuring the line ending conversions

9. On the “Configuring the terminal emulator to use with Git Bash” screen, select the “Use Windows’ default console window” radio button and click **Next>**.



Configuring the terminal emulator to use with Git Bash
Which terminal emulator do you want to use with your Git Bash?

○ **Use MinTTY (the default terminal of MSys2)**

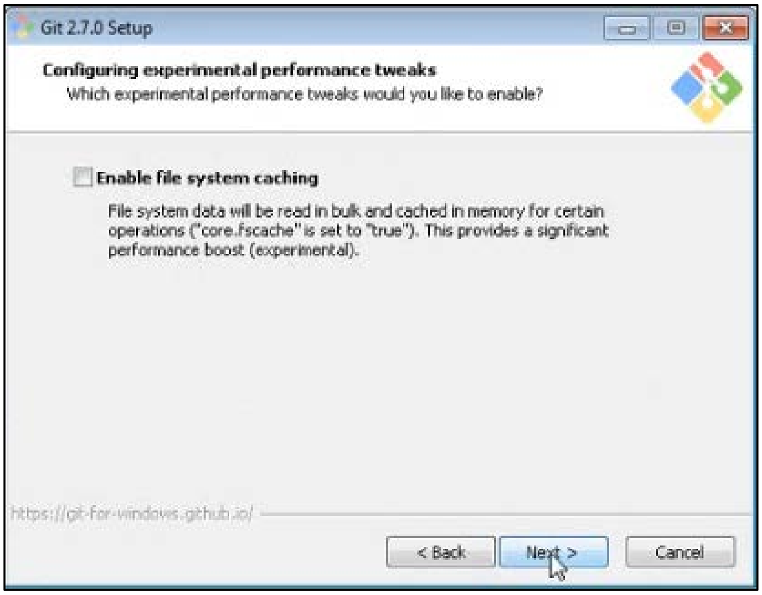
Git Bash will use MinTTY as terminal emulator, which sports a resizable window, non-rectangular selections and a Unicode font. Windows console programs (such as interactive Python) must be launched via `winpty` to work in MinTTY.

● **Use Windows' default console window**

Git will use the default console window of Windows ("cmd.exe"), which works well with Win32 console programs such as interactive Python or node.js, but has a very limited default scroll-back, needs to be configured to use a Unicode font in order to display non-ASCII characters correctly, and prior to Windows 10 its window was not freely resizable and it only allowed rectangular text selections.

Figure 6: Configuring the terminal emulator to use with Git Bash

10. On the “Configuring experimental performance tweaks” screen, click **Next>** to begin the installation.



Git 2.7.0 Setup

Configuring experimental performance tweaks

Which experimental performance tweaks would you like to enable?

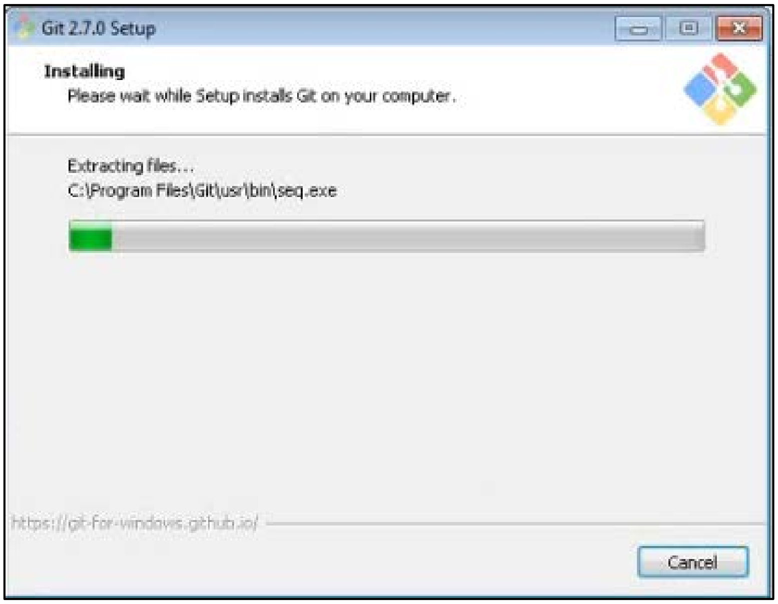
□ **Enable file system caching**

File system data will be read in bulk and cached in memory for certain operations ("core.fscache" is set to "true"). This provides a significant performance boost (experimental).

https://git-for-windows.github.io/

Figure 7: Configuring experimental performance tweaks

The “Installing” screen displays while the installation is in progress.



Git 2.7.0 Setup

Installing

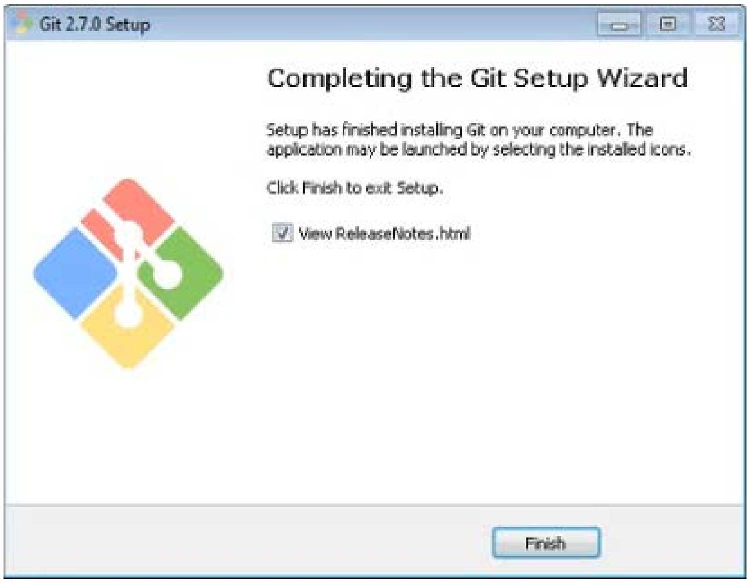
Please wait while Setup installs Git on your computer.

Extracting files...
C:\Program Files\Git\usr\bin\seq.exe

https://git-for-windows.github.io/

Figure 8: Installation in Progress

11. On the “Completing the Git Setup Wizard” screen, click **Finish** to complete the installation.



Completing the Git Setup Wizard

Setup has finished installing Git on your computer. The application may be launched by selecting the installed icons.

Click Finish to exit Setup.

☑ View ReleaseNotes.html

Figure 9: Completing the Git Setup Wizard

More information on Git is available at: https://msysgit.github.io/

2.3. Configuring Git

Optional configuration is available to developers to allow code to be annotated with the developer’s name and email address. The name is not the username used for authentication.

To configure name and email address, from the Command Prompt or Git Bash, run the commands separately for each. In the following examples, “John Doe” and “Johndoe@example.com” are examples to be replaced with the developer’s name and email address:

- `git config --global user.John Doe`
- `git config --global user.email johndoe@example.com`

2.4. Setting Up eHMP Frontend Development Environment

The eHMP system uses the following for the frontend project build and deployment processes:

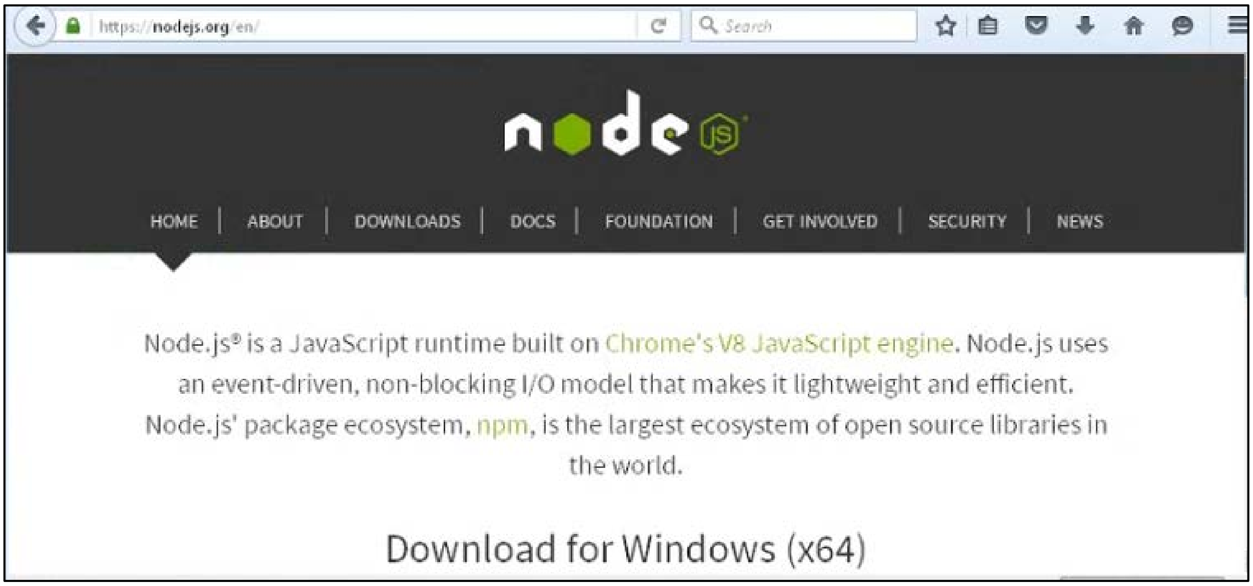
- Node.js
- Grunt (task runner)
- Node Package Manager (NPM)/Bower
- Ruby
- Sass
- Compass
- Gradle

The following sections describe the installation of the required items.

2.4.1. Installing Node.js

Node.js is a prerequisite to installing Grunt. Perform the following procedure to install Node.js:

1. Go to the Node.js website at: http://nodejs.org/.

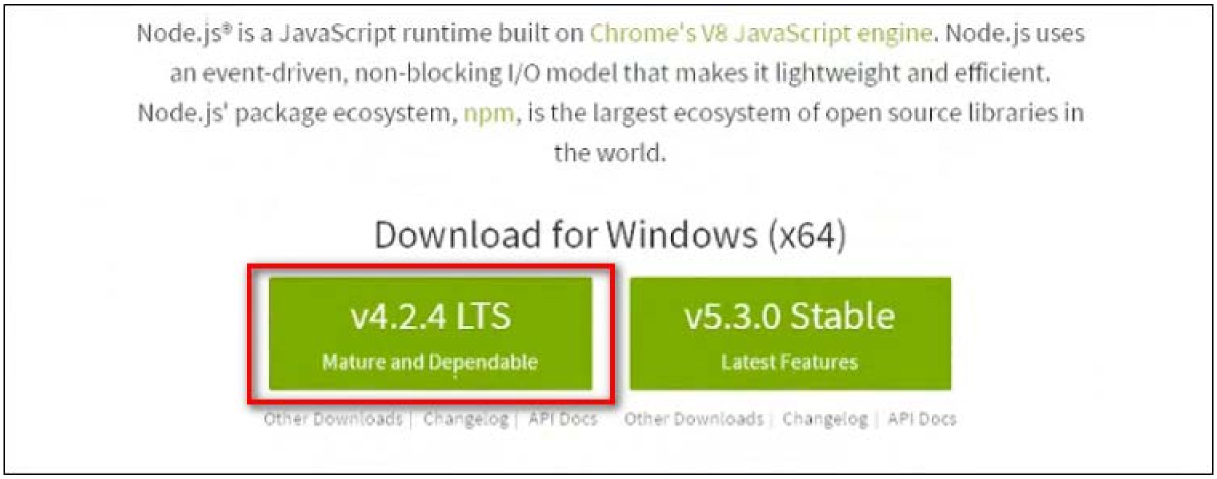


https://nodejs.org/en/

Node.js® is a JavaScript runtime built on Chrome's V8 JavaScript engine. Node.js uses an event-driven, non-blocking I/O model that makes it lightweight and efficient. Node.js' package ecosystem, npm, is the largest ecosystem of open source libraries in the world.

Figure 10: Node.js Website

2. Download Node.js version 4.2.4 LTS (Mature and Dependable).



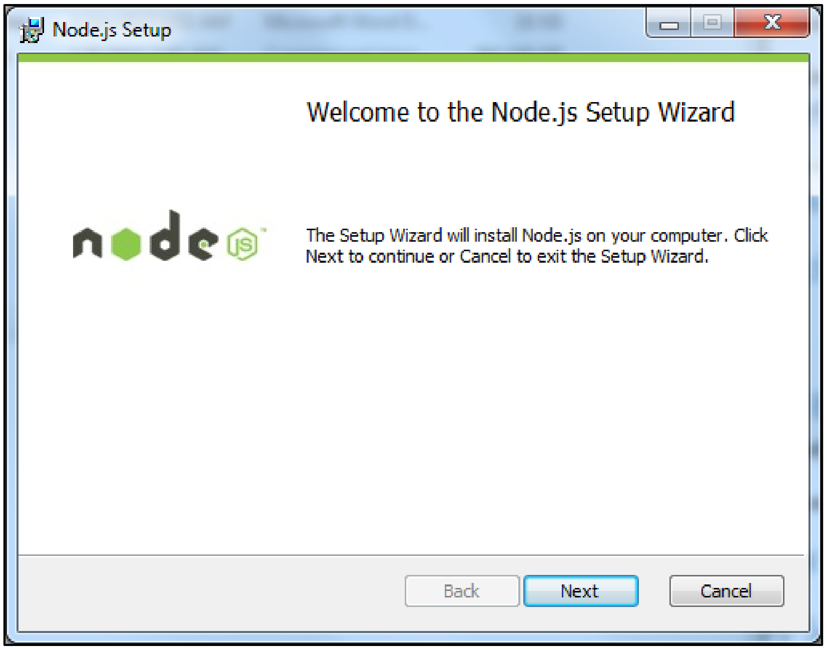
Node.js® is a JavaScript runtime built on Chrome's V8 JavaScript engine. Node.js uses an event-driven, non-blocking I/O model that makes it lightweight and efficient. Node.js' package ecosystem, npm, is the largest ecosystem of open source libraries in the world.

Download for Windows (x64)

v4.2.4 LTS
Mature and Dependable
v5.3.0 Stable
Latest Features
Other Downloads | Changelog | API Docs
Other Downloads | Changelog | API Docs

Figure 11: Node.js Version

3. From Windows Explorer, run the executable file to start the Node.js Setup Wizard.
4. On the "Welcome to the Node.js Setup Wizard" screen, click **Next**.

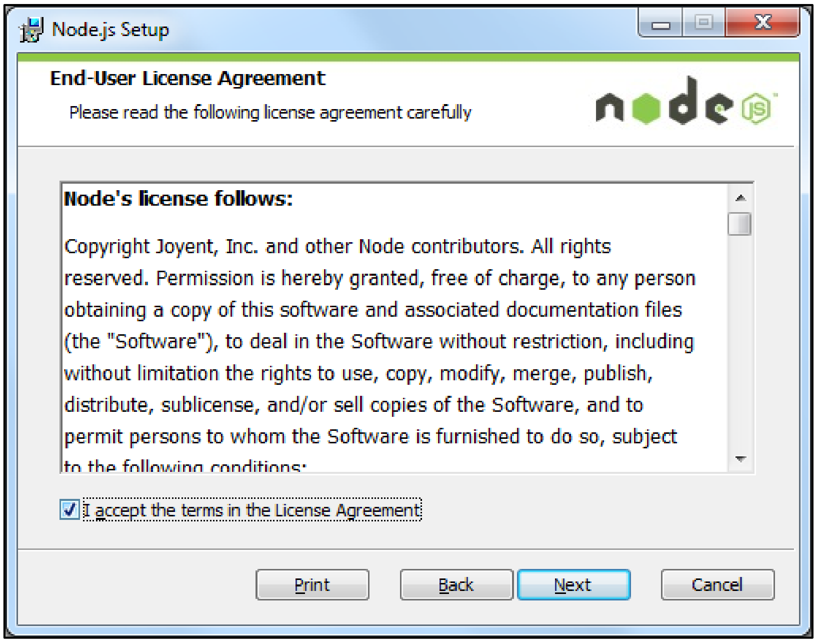


Welcome to the Node.js Setup Wizard

The Setup Wizard will install Node.js on your computer. Click Next to continue or Cancel to exit the Setup Wizard.

Figure 12: Node.js Setup Wizard Welcome

5. On the “End-User License Agreement” screen, select the “I accept the terms in the License Agreement” checkbox and click **Next**.



End-User License Agreement

Please read the following license agreement carefully

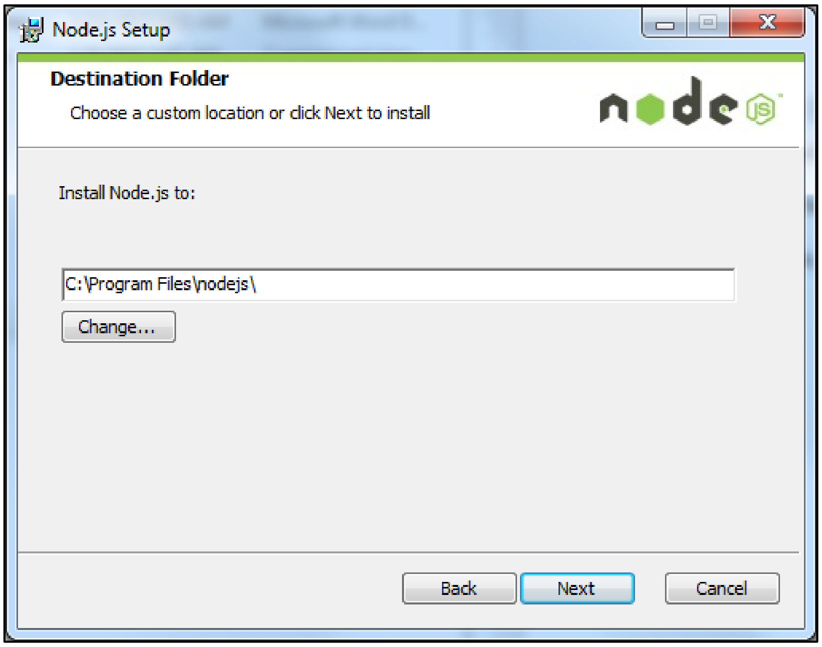
Node's license follows:

Copyright Joyent, Inc. and other Node contributors. All rights reserved. Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

☑ I accept the terms in the License Agreement

Figure 13: End-User License Agreement

6. On the “Destination Folder” screen, select the desired program destination and click **Next**.



Destination Folder

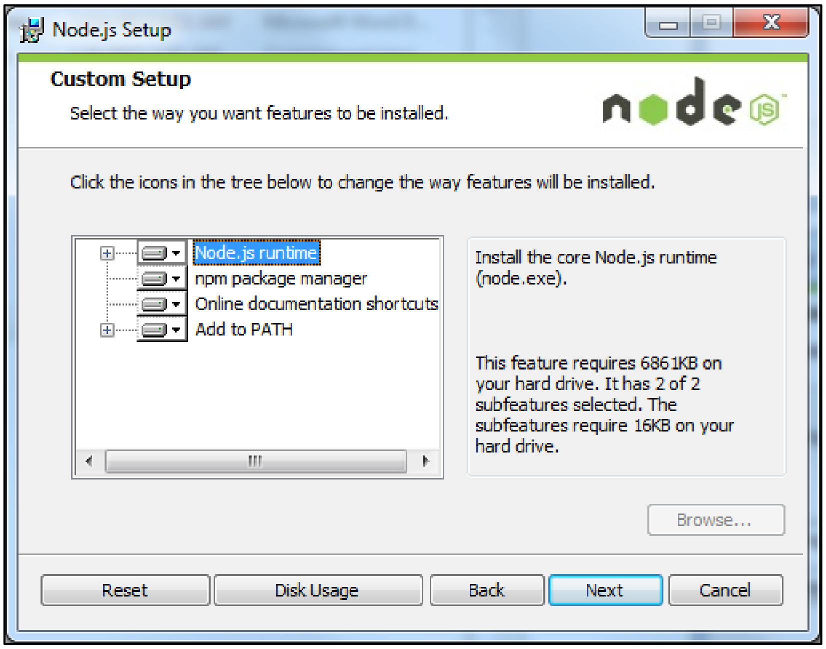
Choose a custom location or click Next to install

Install Node.js to:

C:\Program Files\nodejs\

Figure 14: Destination Folder

7. On the “Custom Setup” screen, click **Next**.



Node.js Setup

Custom Setup

Select the way you want features to be installed.

Click the icons in the tree below to change the way features will be installed.

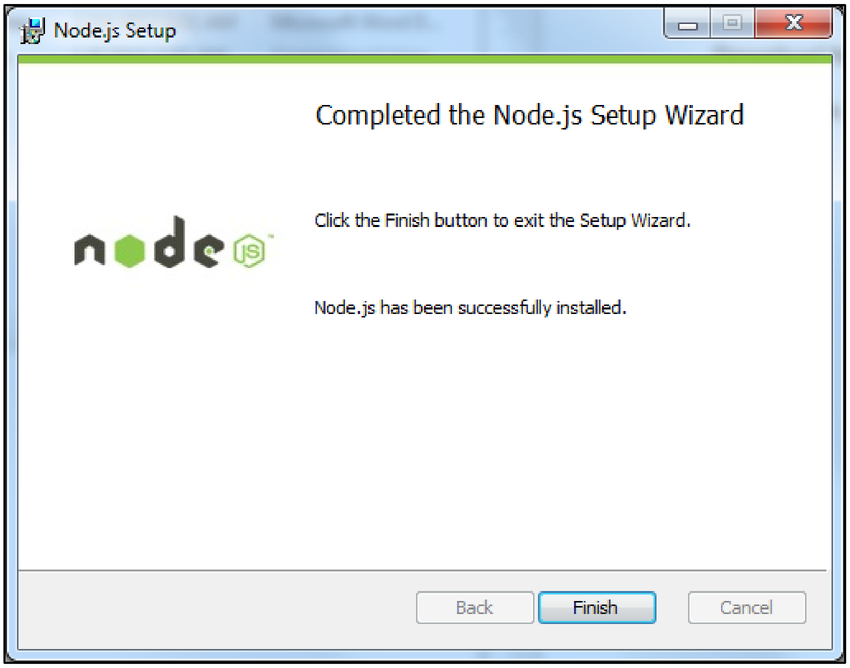
- Node.js runtime
- npm package manager
- Online documentation shortcuts
- Add to PATH

Install the core Node.js runtime (node.exe).

This feature requires 6861KB on your hard drive. It has 2 of 2 subfeatures selected. The subfeatures require 16KB on your hard drive.

Figure 15: Custom Setup

8. On the “Completed the Node.js Setup Wizard” screen, click **Finish** to complete the installation.



Node.js Setup

Completed the Node.js Setup Wizard

Click the Finish button to exit the Setup Wizard.

Node.js has been successfully installed.

Figure 16: Installation Completed

2.4.2. Checking Node.js Post Installation

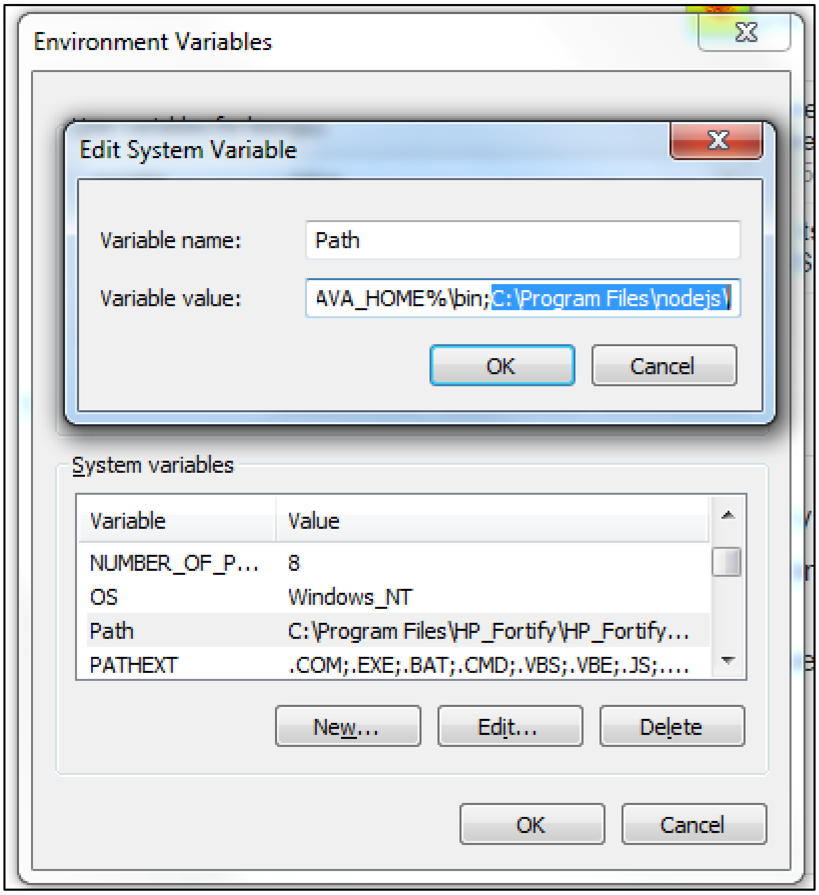
Perform the following procedure to verify that npm, from Node.js, is accessible from any directory by checking the npm version.

1. If the Command Prompt is open, close it and reopen it.
2. In Command Prompt, navigate to any directory other than your node.js path and run: `npm -v`
3. Verify that the command line returns the npm version. This verifies that it is accessible.

If command line returns the npm version, the installation is complete. Proceed to the next section.

If an error displays stating that “npm is not recognized as an internal or external command…”, continue to step 4.

4. Check that the <installation path>\nodejs path is added to your environment variable.



Variable name: Path

Variable value: AVA_HOME%\bin;C:\Program Files\nodejs\

Variable	Value
NUMBER_OF_P...	8
OS	Windows_NT
Path	C:\Program Files\HP_Fortify\HP_Fortify...
PATHEXT	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;....

Figure 17: Environment Variable Installation Path

5. Restart Command Prompt and run the `npm -v` command again.
6. If it still doesn’t work, restart the computer and run the command one more time.

2.4.3. Installing Grunt

Grunt automates frontend development tasks. A typical project would include a Gruntfile.js as shown in the following structure shown in Figure 19 that defines such tasks.

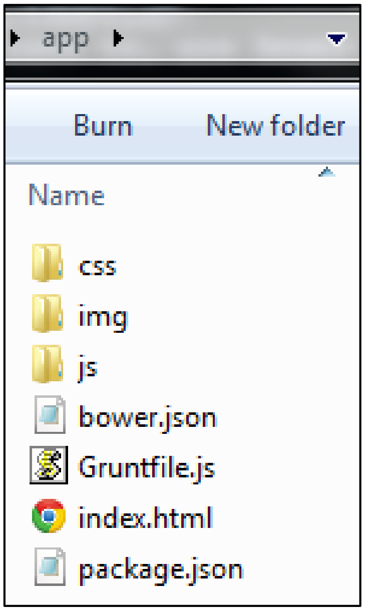
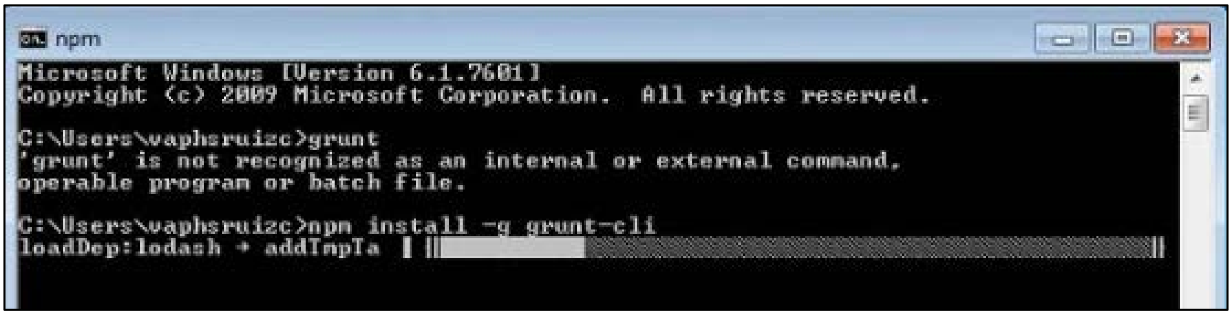


Figure 18: Grunt Structure

Grunt is typical installed at a project level, but you should install the Grunt command line interface globally by including the “-g” variable”. This allows Grunt commands to be run from anywhere during development.
To install Grunt, from the Command Prompt, run the `npm install -g grunt-cli` command.



```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\Users\vaphsruizc>grunt
'grunt' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\vaphsruizc>npm install -g grunt-cli
loadDep:lodash → addTmpTa
```

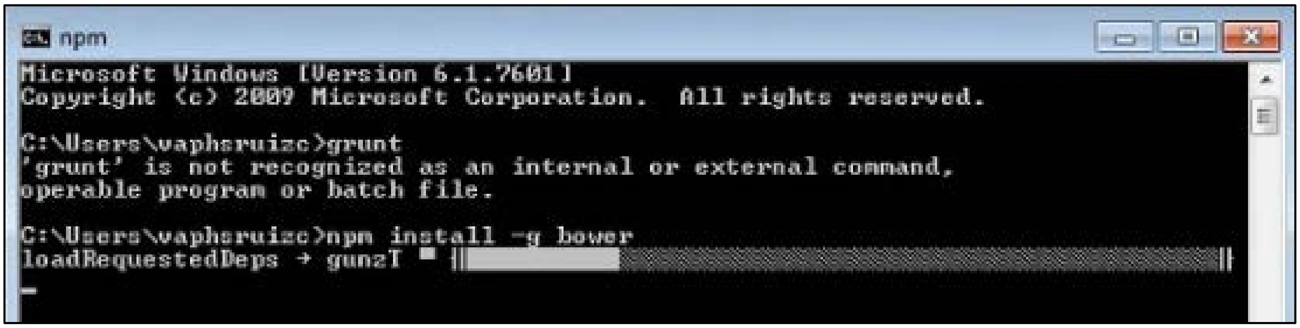
Figure 19: Grunt Install Command and Installation in Progress

2.4.4. Installing Bower

Bower is the package management tool used for frontend development. It automatically downloads all necessary external Java Script (JS) libs as listed in the bower.json file.

To install Bower, from the Command Prompt, run the following commands:

- `npm install -g bower`
- `npm install -g bower-installer`



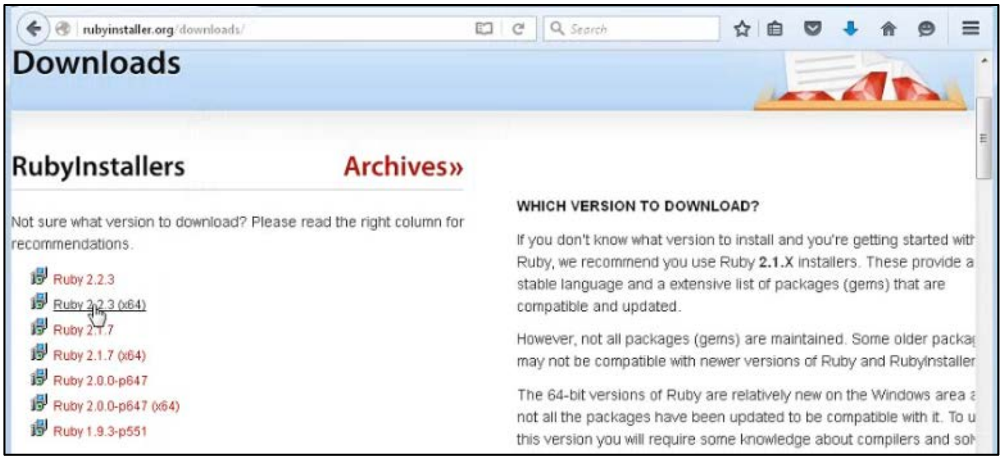
```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\Users\vaphsruizc>grunt
'grunt' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\vaphsruizc>npm install -g bower
loadRequestedDeps → gunzT
_
```

Figure 20: Bower Install Command and Installation in Progress

2.4.5. Installing Ruby

Ruby is required since the ADK uses Sass. Perform the following procedure to install Ruby:

1. Got to the Ruby website at http://rubyinstaller.org/downloads/ and download Ruby 2.2.3.



Downloads

RubyInstallers

Archives»

Not sure what version to download? Please read the right column for recommendations.

- Ruby 2.2.3
- Ruby 2.2.3 (x64)
- Ruby 2.1.7
- Ruby 2.1.7 (x64)
- Ruby 2.0.0-p647
- Ruby 2.0.0-p647 (x64)
- Ruby 1.9.3-p551

WHICH VERSION TO DOWNLOAD?

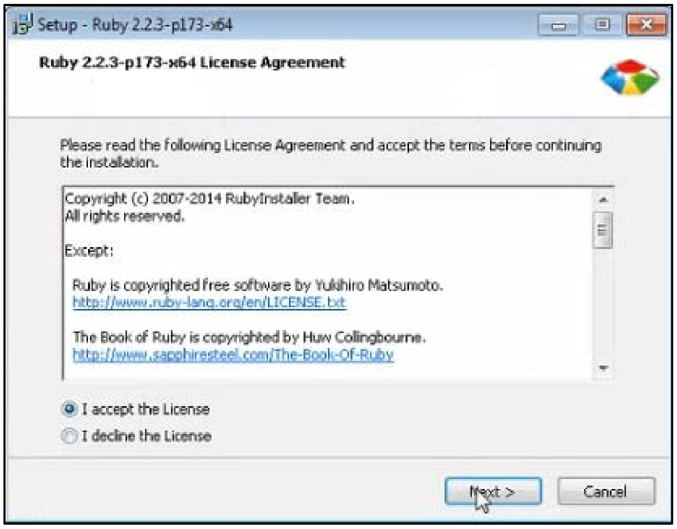
If you don't know what version to install and you're getting started wit Ruby, we recommend you use Ruby **2.1.X** installers. These provide a stable language and a extensive list of packages (gems) that are compatible and updated.

However, not all packages (gems) are maintained. Some older packa may not be compatible with newer versions of Ruby and RubyInstaller

The 64-bit versions of Ruby are relatively new on the Windows area not all the packages have been updated to be compatible with it. To u this version you will require some knowledge about compilers and so

Figure 21: Ruby Website

2. Run the executable file to start the Ruby Setup.
3. On the License agreement screen, accept the license and click **Next>**.



Setup - Ruby 2.2.3-p173-x64

Ruby 2.2.3-p173-x64 License Agreement

Please read the following License Agreement and accept the terms before continuing the installation.

Copyright (c) 2007-2014 RubyInstaller Team.
All rights reserved.

Except:

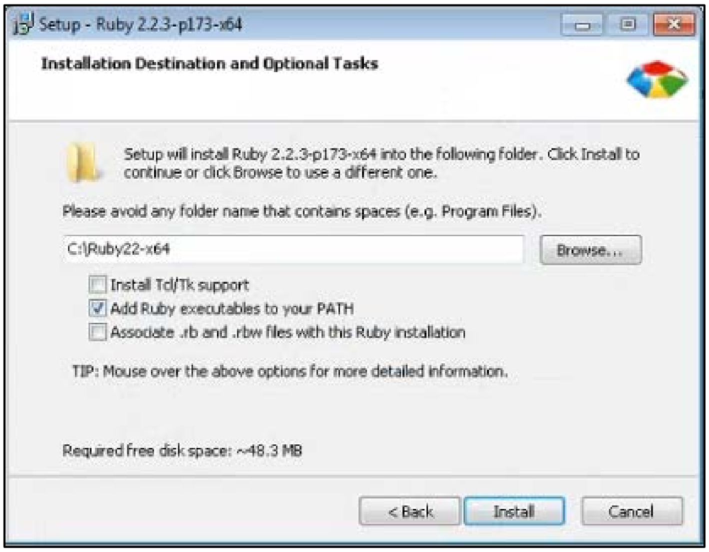
Ruby is copyrighted free software by Yukihiro Matsumoto.
http://www.ruby-lang.org/en/LICENSE.txt

The Book of Ruby is copyrighted by Huw Collingbourne.
http://www.sapphiresteel.com/The-Book-Of-Ruby

● I accept the License
○ I decline the License

Figure 22: License Agreement

4. On the “Installation Destination and Optional Tasks” screen, select the “Add Ruby executables to your PATH” checkbox and click **Install** to begin the installation.



Setup - Ruby 2.2.3-p173-x64

Installation Destination and Optional Tasks

Setup will install Ruby 2.2.3-p173-x64 into the following folder. Click Install to continue or click Browse to use a different one.

Please avoid any folder name that contains spaces (e.g. Program Files).

C:\Ruby22-x64

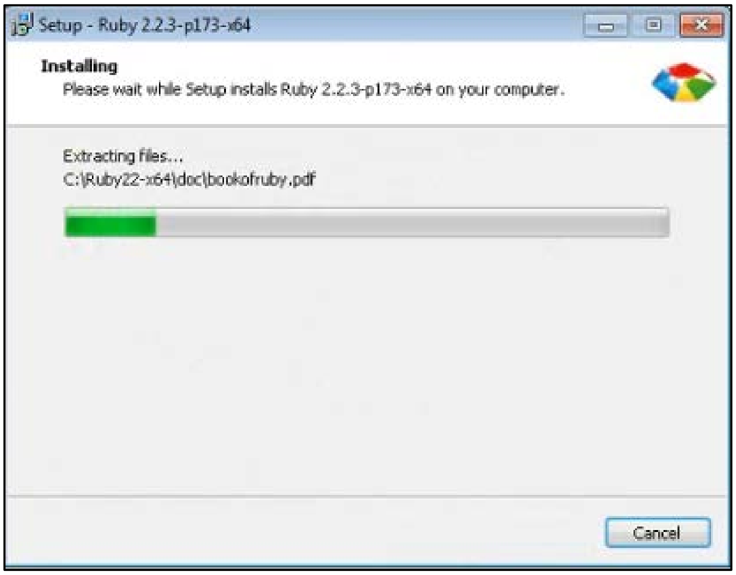
□ Install Tcl/Tk support
☑ Add Ruby executables to your PATH
□ Associate .rb and .rbw files with this Ruby installation

TIP: Mouse over the above options for more detailed information.

Required free disk space: ~48.3 MB

Figure 23: Installation Destination and Optional Tasks

The “Installing” screen displays showing installation progress.



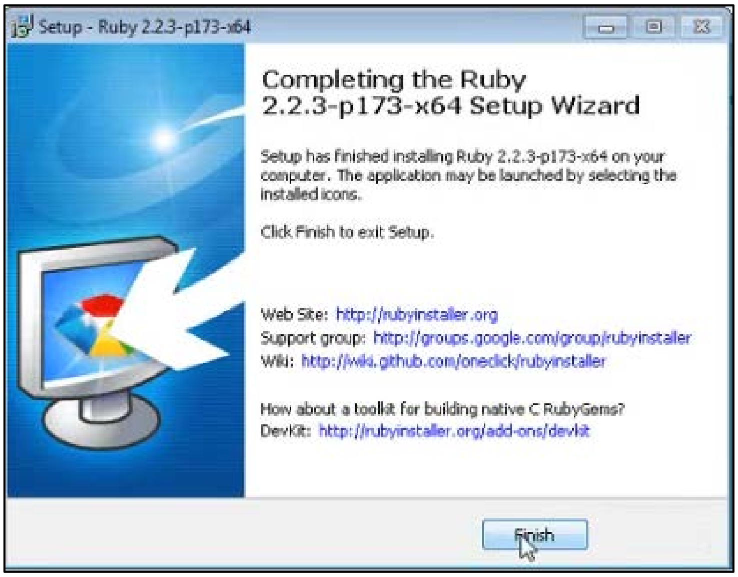
Installing

Please wait while Setup installs Ruby 2.2.3-p173-x64 on your computer.

Extracting files...
C:\Ruby22-x64\doc\bookofruby.pdf

Figure 24: Installation in Progress

5. On the Completing the Setup Wizard screen, click **Finish** to complete the installation.



Completing the Ruby 2.2.3-p173-x64 Setup Wizard

Setup has finished installing Ruby 2.2.3-p173-x64 on your computer. The application may be launched by selecting the installed icons.

Click Finish to exit Setup.

Web Site: http://rubyinstaller.org
Support group: http://groups.google.com/group/rubyinstaller
Wiki: http://wiki.github.com/oneclick/rubyinstaller

How about a toolkit for building native C RubyGems?
DevKit: http://rubyinstaller.org/add-ons/devkit

Figure 25: Completing the Installation

6. To verify the successful Ruby installation, from the Command Prompt, run:

```
ruby -v
```

7. . If the Ruby version is returned (e.g., ruby 2.2.3p173), Ruby is successfully installed.

2.4.6. Installing Sass and Compass

Compass is a "helper" lib for Sass. Perform the following procedure to install Sass and Compass:

1. Start a command prompt with Ruby from the Windows **Start** menu:
   - Windows 7 – Select **Start Command Prompt with Ruby**
   - Windows 8 – Search for "Start Command Prompt with Ruby"
2. From the Ruby Command Prompt, run the following commands:

   ```
   gem install sass
   ```

   When Sass installation is finished, run:

   ```
   gem install compass
   ```

   Finally, run:

   ```
   gem install breakpoint
   ```

2.4.7. Installing Gradle

Gradle requires a Java JDK or Java Runtime Environment (JRE) to be installed. Perform the following procedure to install Gradle:

1. Download Gradle from the Gradle website at: http://www.gradle.org/downloads.
2. The Gradle distribution comes packaged as a ZIP. Unzip the distribution to the desired directory.
3. The Gradle distribution comes packaged as a ZIP and must be unzipped to install. It is recommended to unzip to the C:\Program Files\gradle-2.10directory
4. For running Gradle, add the path to the Gradle executables to your "PATH" Environment Variable. This should be sufficient to run Gradle.
5. To set the environment variable:
   a. Right-Click **My Computer**.
   b. Select **Properties**.
   c. Select **Advanced system settings**.
   d. Click the **Environment Variables…** button.
   e. Add the path to the Gradle executables to the PATH directory.
   f. Select the PATH variable and click the **Edit…** button.
   g. Append the Gradle path to the existing value ;C:\Program Files\gradle-2.10\bin
6. To verify that Gradle is successfully installed, from the Command Prompt, run: `gradle -v` and verify that the return displayed matches the distribution that was downloaded.

3. Building ADK Deployment Artifacts in Windows

Create a directory for installation of the code. This example uses “C:\ehmp” throughout the instructions. Download the following repositories into c:\ehmp\projects:

- https://github.com/VHAINNOVATIONS/adk
- https://github.com/VHAINNOVATIONS/ehmp-ui

To do this, open a prompt window and download the ‘dev’ branch for each respective repository.

```
cd C:\ehmp\projects
git clone –b dev https://github.com/VHAINNOVATIONS/adk.git
git clone –b dev https://github.com/VHAINNOVATIONS/ehmp-ui.git
```

The adk repository includes the Applet Development Kit (ADK), a Backbone.js/Marionette framework for writing eHMP applets. The ehmp-ui repository includes the applets, layouts and screens developed using the ADK.

1. Modify build.gradle in ADK. The build.gradle scripts need modification to run standalone in Windows. Inside the ADK project, change the following in build.gradle that is located in ../product/production folder:

```
 task installNpm (type: Exec) {
   //commandLine "npm", "install"
   commandLine "cmd", "/c", "npm", "install"
   workingDir "."
}
task installBower (type: Exec ){
    //commandLine "bower-installer", "-p", "-r"
 commandLine "cmd", "/c", "bower-installer", "-p", "-r"
}
```

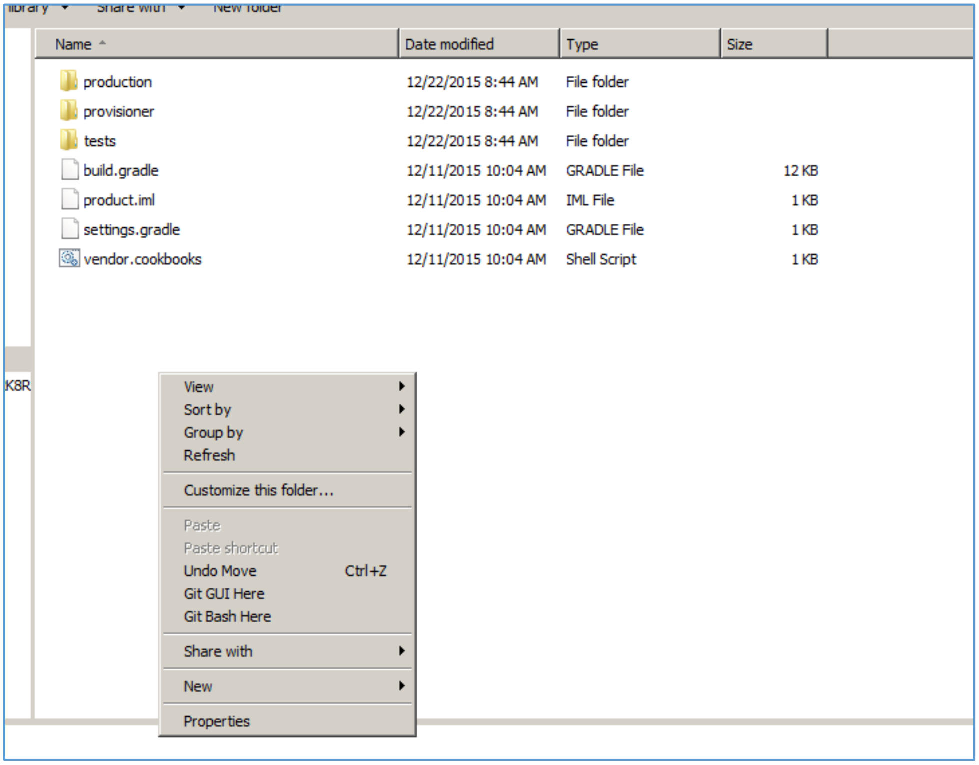
2. Modify the build.gradle script in ehmp-ui. Inside the ehmp-ui project, change the following in the build.gradle that is located in ../product/production folder:

```
task installNpm (type: Exec) {
  //commandLine "npm", "install"
  commandLine "cmd", "/c", "npm", "install"
  workingDir "."
}
```

3. Inside the ehmp-ui project, add the following line (highlighted in yellow) to the build[A1].gradle located in ../product folder:

```
…
  ext.set('artifactId','ehmp-ui')
  ext.set('repoVersion', getRepoVersion())
  ext.set('branchName', getCurrentBranchName())
  ext.set('currentCommitHash', getCurrentCommitHash())

  ext.set('commitCountDir', projectDir)

  ext.set('repoCommitCount', '0.0.0.0')
```

4. With explorer, navigate to /product folder of the adk source. Right-click folder contents and select “Git Bash Here” to open console. Both Linux (limited) and Windows commands can work in this console. Run:
   ```
   export WORKSPACE=<path to your ehmp projects folder>
   example: export WORKSPACE=”C:\ehmp\projects”
   ```
   and then run:
   ```
   gradle clean test grunt_deploy
   ```
   Build Artifact Location: adk/product/production/build/adk.tgz



Name	Date modified	Type	Size
production	12/22/2015 8:44 AM	File folder	
provisioner	12/22/2015 8:44 AM	File folder	
tests	12/22/2015 8:44 AM	File folder	
build.gradle	12/11/2015 10:04 AM	GRADLE File	12 KB
product.iml	12/11/2015 10:04 AM	IML File	1 KB
settings.gradle	12/11/2015 10:04 AM	GRADLE File	1 KB
vendor.cookbooks	12/11/2015 10:04 AM	Shell Script	1 KB

Figure 26: Right-click to ‘Git Bash Here’ Selection

5. Create directory c:\ehmp\home.

6. Copy the adk.tgz here and extract the contents.
   ```
   example: tar -zxvf adk.tgz
   ```

7. With explorer, navigate to /product folder of the ehmp-ui source.

8. Right-click folder contents and select “Git Bash Here” to open console. Both Linux (limited) and Windows commands can work in this console. Run:
   ```
   export WORKSPACE=<path to your ehmp projects folder>
   example: export WORKSPACE=”C:\ehmp\projects”
   ```
   and then run:

```
gradle clean test zipEhmpuiApp
```

Build Artifact Location: ehmp-ui/product/build/ehmp-ui-x.x.x.zip

9. Create directory c:\ehmp\home\app.
10. Copy the ehmp-ui-x.x.x.zip here and extract contents.
    `example: unzip ehmp-ui-x.x.x.zip`

This completes setup, build, and installation of the ADK and ehmp-ui source.

4. APACHE Server Configuration in Windows

Perform the following procedure to configure an Apache server on your localhost to run the ADK client:

1. Download and install Apache 2.2.25 with ssl from: https://archive.apache.org/dist/httpd/binaries/win32/
2. Ensure Network Domain and Server is “localhost”. Administrator's Email Address can be set to any value. After clicking **next**, select the “typical” installation type.
3. After installation, open the permissions on the Apache install directory tree.
4. Add "C:\Program Files (x86)\Apache Software Foundation\Apache2.2\bin" to path environment variable.
5. Open a terminal and run the following commands:
    1. `cd "C:\Program Files (x86)\Apache Software Foundation\Apache2.2\conf"`
    2. `set OPENSSL_CONF="C:\Program Files (x86)\Apache Software Foundation\Apache2.2\conf\openssl.conf"`
    3. `openssl req -new -x509 -days 365 -sha1 -newkey rsa:2048 -nodes -keyout server.key -out server.crt -config "C:\Program Files (x86)\Apache Software Foundation\Apache2.2\conf\openssl.cnf"`
6. Edit the following file; you may need to open your editor in Administrator mode:
    “C:\Program Files (x86)\Apache Software Foundation\Apache2.2\conf\httpd.conf”

    The contents of the file should be as follows. Pay special attention to these settings:

    a. Verify the server root path is correct.

    b. Add ‘Listen 443’

    c. Ensure the content of the <VirtualHost> element matches this example (this is the last element shown below).

```
#
# This is the main Apache HTTP server configuration file.  It contains the
# configuration directives that give the server its instructions.
# See <URL:http://httpd.apache.org/docs/2.2> for detailed information.
# In particular, see
# <URL:http://httpd.apache.org/docs/2.2/mod/directives.html>
# for a discussion of each configuration directive.
#
# Do NOT simply read the instructions in here without understanding
# what they do.  They're here only as hints or reminders.  If you are unsure
# consult the online docs. You have been warned.
#
# Configuration and logfile names: If the filenames you specify for many
# of the server's control files begin with "/" (or "drive:/" for Win32), the
# server will use that explicit path.  If the filenames do *not* begin
# with "/", the value of ServerRoot is prepended -- so 'log/access_log'
# with ServerRoot set to '/www' will be interpreted by the
# server as '/www/log/access_log', where as '/log/access_log' will be
# interpreted as '/log/access_log'.
#
# NOTE: Where filenames are specified, you must use forward slashes
# instead of backslashes (e.g., "c:/apache" instead of "c:\apache").
# If a drive letter is omitted, the drive on which httpd.exe is located
# will be used by default.  It is recommended that you always supply
# an explicit drive letter in absolute paths to avoid confusion.

#
# ServerRoot: The top of the directory tree under which the server's
# configuration, error, and log files are kept.
#
# Do not add a slash at the end of the directory path.  If you point
# ServerRoot at a non-local disk, be sure to point the LockFile directive
# at a local disk.  If you wish to share the same ServerRoot for multiple
# httpd daemons, you will need to change at least LockFile and PidFile.
#
ServerRoot "C:/Program Files (x86)/Apache Software Foundation/Apache2.2"

#
# Listen: Allows you to bind Apache to specific IP addresses and/or
# ports, instead of the default. See also the <VirtualHost>
# directive.
#
# Change this to Listen on specific IP addresses as shown below to
# prevent Apache from glomming onto all bound IP addresses.
#
#Listen 12.34.56.78:80
Listen 80
Listen 8888
Listen 443

#
# Dynamic Shared Object (DSO) Support
#
# To be able to use the functionality of a module which was built as a DSO you
# have to place corresponding `LoadModule' lines at this location so the
# directives contained in it are actually available _before_ they are used.
# Statically compiled modules (those listed by `httpd -l') do not need
# to be loaded here.
#
# Example:
# LoadModule foo_module modules/mod_foo.so
#
LoadModule actions_module modules/mod_actions.so
LoadModule alias_module modules/mod_alias.so
LoadModule asis_module modules/mod_asis.so
LoadModule auth_basic_module modules/mod_auth_basic.so
#LoadModule auth_digest_module modules/mod_auth_digest.so
#LoadModule authn_alias_module modules/mod_authn_alias.so
#LoadModule authn_anon_module modules/mod_authn_anon.so
#LoadModule authn_dbd_module modules/mod_authn_dbd.so
#LoadModule authn_dbm_module modules/mod_authn_dbm.so
LoadModule authn_default_module modules/mod_authn_default.so
LoadModule authn_file_module modules/mod_authn_file.so
#LoadModule authnz_ldap_module modules/mod_authnz_ldap.so
#LoadModule authz_dbm_module modules/mod_authz_dbm.so
LoadModule authz_default_module modules/mod_authz_default.so
LoadModule authz_groupfile_module modules/mod_authz_groupfile.so
LoadModule authz_host_module modules/mod_authz_host.so
#LoadModule authz_owner_module modules/mod_authz_owner.so
LoadModule authz_user_module modules/mod_authz_user.so
LoadModule autoindex_module modules/mod_autoindex.so
#LoadModule cache_module modules/mod_cache.so
#LoadModule cern_meta_module modules/mod_cern_meta.so
LoadModule cgi_module modules/mod_cgi.so
#LoadModule charset_lite_module modules/mod_charset_lite.so
```

```
#LoadModule dav_module modules/mod_dav.so
#LoadModule dav_fs_module modules/mod_dav_fs.so
#LoadModule dav_lock_module modules/mod_dav_lock.so
#LoadModule dbd_module modules/mod_dbd.so
#LoadModule deflate_module modules/mod_deflate.so
LoadModule dir_module modules/mod_dir.so
#LoadModule disk_cache_module modules/mod_disk_cache.so
#LoadModule dumpio_module modules/mod_dumpio.so
LoadModule env_module modules/mod_env.so
#LoadModule expires_module modules/mod_expires.so
#LoadModule ext_filter_module modules/mod_ext_filter.so
#LoadModule file_cache_module modules/mod_file_cache.so
#LoadModule filter_module modules/mod_filter.so
#LoadModule headers_module modules/mod_headers.so
#LoadModule ident_module modules/mod_ident.so
#LoadModule imagemap_module modules/mod_imagemap.so
LoadModule include_module modules/mod_include.so
#LoadModule info_module modules/mod_info.so
LoadModule isapi_module modules/mod_isapi.so
#LoadModule ldap_module modules/mod_ldap.so
#LoadModule logio_module modules/mod_logio.so
LoadModule log_config_module modules/mod_log_config.so
#LoadModule log_forensic_module modules/mod_log_forensic.so
#LoadModule mem_cache_module modules/mod_mem_cache.so
LoadModule mime_module modules/mod_mime.so
#LoadModule mime_magic_module modules/mod_mime_magic.so
LoadModule negotiation_module modules/mod_negotiation.so
LoadModule proxy_module modules/mod_proxy.so
#LoadModule proxy_ajp_module modules/mod_proxy_ajp.so
#LoadModule proxy_balancer_module modules/mod_proxy_balancer.so
LoadModule proxy_connect_module modules/mod_proxy_connect.so
#LoadModule proxy_ftp_module modules/mod_proxy_ftp.so
LoadModule proxy_http_module modules/mod_proxy_http.so
#LoadModule proxy_scgi_module modules/mod_proxy_scgi.so
#LoadModule reqtimeout_module modules/mod_reqtimeout.so
#LoadModule rewrite_module modules/mod_rewrite.so
LoadModule setenvif_module modules/mod_setenvif.so
#LoadModule speling_module modules/mod_speling.so
#HPE
LoadModule ssl_module modules/mod_ssl.so
#LoadModule status_module modules/mod_status.so
#LoadModule substitute_module modules/mod_substitute.so
#LoadModule unique_id_module modules/mod_unique_id.so
#LoadModule userdir_module modules/mod_userdir.so
#LoadModule usertrack_module modules/mod_usertrack.so
#LoadModule version_module modules/mod_version.so
LoadModule vhost_alias_module modules/mod_vhost_alias.so

<IfModule !mpm_netware_module>
<IfModule !mpm_winnt_module>
#
# If you wish httpd to run as a different user or group, you must run
# httpd as root initially and it will switch.
#
# User/Group: The name (or #number) of the user/group to run httpd as.
# It is usually good practice to create a dedicated user and group for
# running httpd, as with most system services.
#
User daemon
Group daemon

</IfModule>
</IfModule>

# 'Main' server configuration
#
# The directives in this section set up the values used by the 'main'
# server, which responds to any requests that aren't handled by a
# <VirtualHost> definition.  These values also provide defaults for
# any <VirtualHost> containers you may define later in the file.
#
```

```
# All of these directives may appear inside <VirtualHost> containers,
# in which case these default settings will be overridden for the
# virtual host being defined.
#

#
# ServerAdmin: Your address, where problems with the server should be
# e-mailed.  This address appears on some server-generated pages, such
# as error documents.  e.g. admin@your-domain.com
#
ServerAdmin admin@testehmp.localdomain

#
# ServerName gives the name and port that the server uses to identify itself.
# This can often be determined automatically, but we recommend you specify
# it explicitly to prevent problems during startup.
#
# If your host doesn't have a registered DNS name, enter its IP address here.
#
#ServerName testehmp.localdomain:80

#
# DocumentRoot: The directory out of which you will serve your
# documents. By default, all requests are taken from this directory, but
# symbolic links and aliases may be used to point to other locations.
#
DocumentRoot "C:/Program Files (x86)/Apache Software Foundation/Apache2.2/htdocs"

#
# Each directory to which Apache has access can be configured with respect
# to which services and features are allowed and/or disabled in that
# directory (and its subdirectories).
#
# First, we configure the "default" to be a very restrictive set of
# features.
#
<Directory />
    Options FollowSymLinks
    AllowOverride None
    Order deny,allow
    Deny from all
</Directory>

#
# Note that from this point forward you must specifically allow
# particular features to be enabled - so if something's not working as
# you might expect, make sure that you have specifically enabled it
# below.
#

#
# This should be changed to whatever you set DocumentRoot to.
#
<Directory "C:/Program Files (x86)/Apache Software Foundation/Apache2.2/htdocs">
    #
    # Possible values for the Options directive are "None", "All",
    # or any combination of:
    #   Indexes Includes FollowSymLinks SymLinksifOwnerMatch ExecCGI MultiViews
    #
    # Note that "MultiViews" must be named *explicitly* --- "Options All"
    # doesn't give it to you.
    #
    # The Options directive is both complicated and important.  Please see
    # http://httpd.apache.org/docs/2.2/mod/core.html#options
    # for more information.
    #
    Options Indexes FollowSymLinks

    #
    # AllowOverride controls what directives may be placed in .htaccess files.
    # It can be "All", "None", or any combination of the keywords:
```

```
    #   Options FileInfo AuthConfig Limit
    #
    AllowOverride None

    #
    # Controls who can get stuff from this server.
    #
    Order allow,deny
    Allow from all

</Directory>

#
# DirectoryIndex: sets the file that Apache will serve if a directory
# is requested.
#
<IfModule dir_module>
    DirectoryIndex index.html
</IfModule>

#
# The following lines prevent .htaccess and .htpasswd files from being
# viewed by Web clients.
#
<FilesMatch "^\.ht">
    Order allow,deny
    Deny from all
    Satisfy All
</FilesMatch>

#
# ErrorLog: The location of the error log file.
# If you do not specify an ErrorLog directive within a <VirtualHost>
# container, error messages relating to that virtual host will be
# logged here.  If you *do* define an error logfile for a <VirtualHost>
# container, that host's errors will be logged there and not here.
#
ErrorLog "logs/error.log"

#
# LogLevel: Control the number of messages logged to the error_log.
# Possible values include: debug, info, notice, warn, error, crit,
# alert, emerg.
#
LogLevel warn

<IfModule log_config_module>
    #
    # The following directives define some format nicknames for use with
    # a CustomLog directive (see below).
    #
    LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\"" combined
    LogFormat "%h %l %u %t \"%r\" %>s %b" common

    <IfModule logio_module>
      # You need to enable mod_logio.c to use %I and %O
      LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\" %I %O" combinedio
    </IfModule>

    #
    # The location and format of the access logfile (Common Logfile Format).
    # If you do not define any access logfiles within a <VirtualHost>
    # container, they will be logged here.  Contrariwise, if you *do*
    # define per-<VirtualHost> access logfiles, transactions will be
    # logged therein and *not* in this file.
    #
    CustomLog "logs/access.log" common

    #
    # If you prefer a logfile with access, agent, and referer information
    # (Combined Logfile Format) you can use the following directive.
    #
    #CustomLog "logs/access.log" combined
</IfModule>

<IfModule alias_module>
    #
    # Redirect: Allows you to tell clients about documents that used to
    # exist in your server's namespace, but do not anymore. The client
    # will make a new request for the document at its new location.
    # Example:
    # Redirect permanent /foo http://testehmp.localdomain/bar

    #
    # Alias: Maps web paths into filesystem paths and is used to
    # access content that does not live under the DocumentRoot.
    # Example:
    # Alias /webpath /full/filesystem/path
    #
    # If you include a trailing / on /webpath then the server will
    # require it to be present in the URL.  You will also likely
    # need to provide a <Directory> section to allow access to
    # the filesystem path.

    #
    # ScriptAlias: This controls which directories contain server scripts.
    # ScriptAliases are essentially the same as Aliases, except that
    # documents in the target directory are treated as applications and
    # run by the server when requested rather than as documents sent to the
    # client.  The same rules about trailing "/" apply to ScriptAlias
    # directives as to Alias.
    #
    ScriptAlias /cgi-bin/ "C:/Program Files (x86)/Apache Software Foundation/Apache2.2/cgi-bin/"

</IfModule>

<IfModule cgid_module>
    #
    # ScriptSock: On threaded servers, designate the path to the UNIX
    # socket used to communicate with the CGI daemon of mod_cgid.
    #
    #Scriptsock logs/cgisock
</IfModule>

#
# "C:/Program Files (x86)/Apache Software Foundation/Apache2.2/cgi-bin" should be changed to
whatever your ScriptAliased
# CGI directory exists, if you have that configured.
#
<Directory "C:/Program Files (x86)/Apache Software Foundation/Apache2.2/cgi-bin">
    AllowOverride None
    Options None
    Order allow,deny
    Allow from all
</Directory>

#
# DefaultType: the default MIME type the server will use for a document
# if it cannot otherwise determine one, such as from filename extensions.
# If your server contains mostly text or HTML documents, "text/plain" is
# a good value.  If most of your content is binary, such as applications
# or images, you may want to use "application/octet-stream" instead to
# keep browsers from trying to display binary files as though they are
# text.
#
DefaultType text/plain

<IfModule mime_module>
    #
    # TypesConfig points to the file containing the list of mappings from
    # filename extension to MIME-type.
    #
    TypesConfig conf/mime.types

    #
    # AddType allows you to add to or override the MIME configuration
    # file specified in TypesConfig for specific file types.
    #
    #AddType application/x-gzip .tgz
    #
    # AddEncoding allows you to have certain browsers uncompress
    # information on the fly. Note: Not all browsers support this.
    #
    #AddEncoding x-compress .Z
    #AddEncoding x-gzip .gz .tgz
    #
    # If the AddEncoding directives above are commented-out, then you
    # probably should define those extensions to indicate media types:
    #
    AddType application/x-compress .Z
    AddType application/x-gzip .gz .tgz

    #
    # AddHandler allows you to map certain file extensions to "handlers":
    # actions unrelated to filetype. These can be either built into the server
    # or added with the Action directive (see below)
    #
    # To use CGI scripts outside of ScriptAliased directories:
    # (You will also need to add "ExecCGI" to the "Options" directive.)
    #
    #AddHandler cgi-script .cgi

    # For type maps (negotiated resources):
    #AddHandler type-map var

    #
    # Filters allow you to process content before it is sent to the client.
    #
    # To parse .shtml files for server-side includes (SSI):
    # (You will also need to add "Includes" to the "Options" directive.)
    #
    #AddType text/html .shtml
    #AddOutputFilter INCLUDES .shtml
</IfModule>

#
# The mod_mime_magic module allows the server to use various hints from the
# contents of the file itself to determine its type.  The MIMEMagicFile
# directive tells the module where the hint definitions are located.
#
#MIMEMagicFile conf/magic

#
# Customizable error responses come in three flavors:
# 1) plain text 2) local redirects 3) external redirects
#
# Some examples:
#ErrorDocument 500 "The server made a boo boo."
#ErrorDocument 404 /missing.html
#ErrorDocument 404 "/cgi-bin/missing_handler.pl"
#ErrorDocument 402 http://testehmp.localdomain/subscription_info.html
#

#
# MaxRanges: Maximum number of Ranges in a request before
# returning the entire resource, or one of the special
# values 'default', 'none' or 'unlimited'.
# Default setting is to accept 200 Ranges.
#MaxRanges unlimited

#
# EnableMMAP and EnableSendfile: On systems that support it,
# memory-mapping or the sendfile syscall is used to deliver
# files.  This usually improves server performance, but must
# be turned off when serving from networked-mounted
# filesystems or if support for these functions is otherwise
# broken on your system.
#
#EnableMMAP off
#EnableSendfile off

# Supplemental configuration
#
# The configuration files in the conf/extra/ directory can be
# included to add extra features or to modify the default configuration of
# the server, or you may simply copy their contents here and change as
# necessary.

# Server-pool management (MPM specific)
#Include conf/extra/httpd-mpm.conf

# Multi-language error messages
#Include conf/extra/httpd-multilang-errordoc.conf

# Fancy directory listings
#Include conf/extra/httpd-autoindex.conf

# Language settings
#Include conf/extra/httpd-languages.conf

# User home directories
#Include conf/extra/httpd-userdir.conf

# Real-time info on requests and configuration
#Include conf/extra/httpd-info.conf

# Virtual hosts
#Include conf/extra/httpd-vhosts.conf

# Local access to the Apache HTTP Server Manual
#Include conf/extra/httpd-manual.conf

# Distributed authoring and versioning (WebDAV)
#Include conf/extra/httpd-dav.conf

# Various default settings
#Include conf/extra/httpd-default.conf

# Secure (SSL/TLS) connections
# HPE causes error when active won't start and error detail is not reported in log
#Include conf/extra/httpd-ssl.conf

#
# Note: The following must must be present to support
#       starting without SSL on platforms with no /dev/random equivalent
#       but a statically compiled-in mod_ssl.
#
<IfModule ssl_module>
SSLRandomSeed startup builtin
SSLRandomSeed connect builtin
</IfModule>

NameVirtualHost *:443
<VirtualHost *:443>
 ServerName localhost
 ServerAlias localhost
 DocumentRoot c:/ehmp/home
  <Directory "c:/ehmp/home">
    Options Indexes MultiViews
    AllowOverride None
    Order allow,deny
    Allow from all
  </Directory>
   <filesMatch "\.(html|htm|js|css)$">
```

```
          FileETag None
          <ifModule mod_headers.c>
             Header unset ETag
             Header set Cache-Control "max-age=0, no-cache, no-store, must-revalidate"
            Header set Pragma "no-cache"
             Header set Expires "Wed, 11 Jan 1984 05:00:00 GMT"
          </ifModule>
  </filesMatch>

  SSLEngine on

  SSLCertificateFile "C:/Program Files (x86)/Apache Software
Foundation/Apache2.2/conf/server.crt"

  SSLCertificateKeyFile "C:/Program Files (x86)/Apache Software
Foundation/Apache2.2/conf/server.key"

  ProxyRequests Off
  ProxyPreserveHost On
  SSLProxyEngine on
  SSLProxyProtocol -all +SSLv3

  ProxyPass /resource https://ehmp.vaftl.us/resource
  ProxyPassReverse /resource https://ehmp.vaftl.us/resource



  EnableSendfile Off
</VirtualHost>
```

7. Restart Apache.

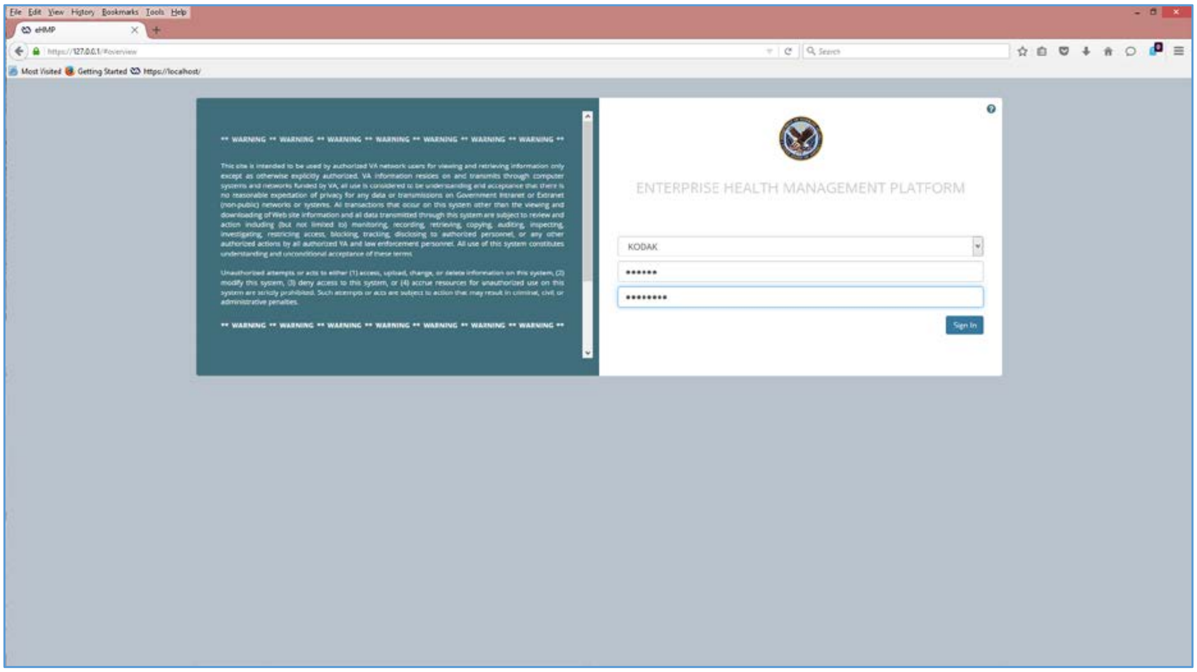
5. Running the eHMP Application in Windows

At this point, you should be able to test and develop applets locally.

1. Navigate to https://localhost to display the eHMP login screen.

NOTE: If using Chrome, https://localhost should work. If using Firefox, https://127.0.0.1 may be needed.

2. To login: Site is KODAK
   Username: mx1234
   Password: mx1234!!


File Edit View History Bookmarks Tools Help
eHMP
https://127.0.0.1/#overview
Search
Most Visited
Getting Started
https://localhost/
ENTERPRISE HEALTH MANAGEMENT PLATFORM
Sign In

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Unauthorized attempts or acts to either (1) access, upload, change, or delete information on this system, (2) modify this system, (3) deny access to this system, or (4) accrue resources for unauthorized use on this system are strictly prohibited. Such attempts or acts are subject to action that may result in criminal, civil or administrative penalties.

** WARNING ** WARNING ** WARNING ** WARNING ** WARNING ** WARNING ** WARNING **

KODAK
••••••
••••••••

Figure 19: eHMP Login Screen

3. Upon successful login, the My Workspace tab displays.

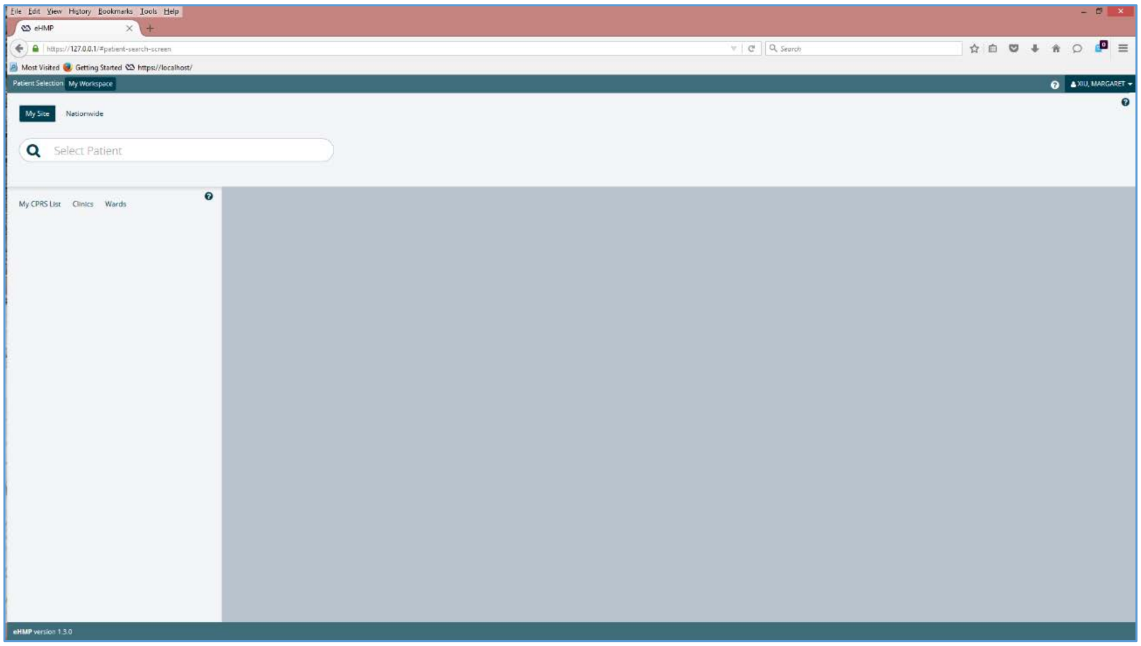
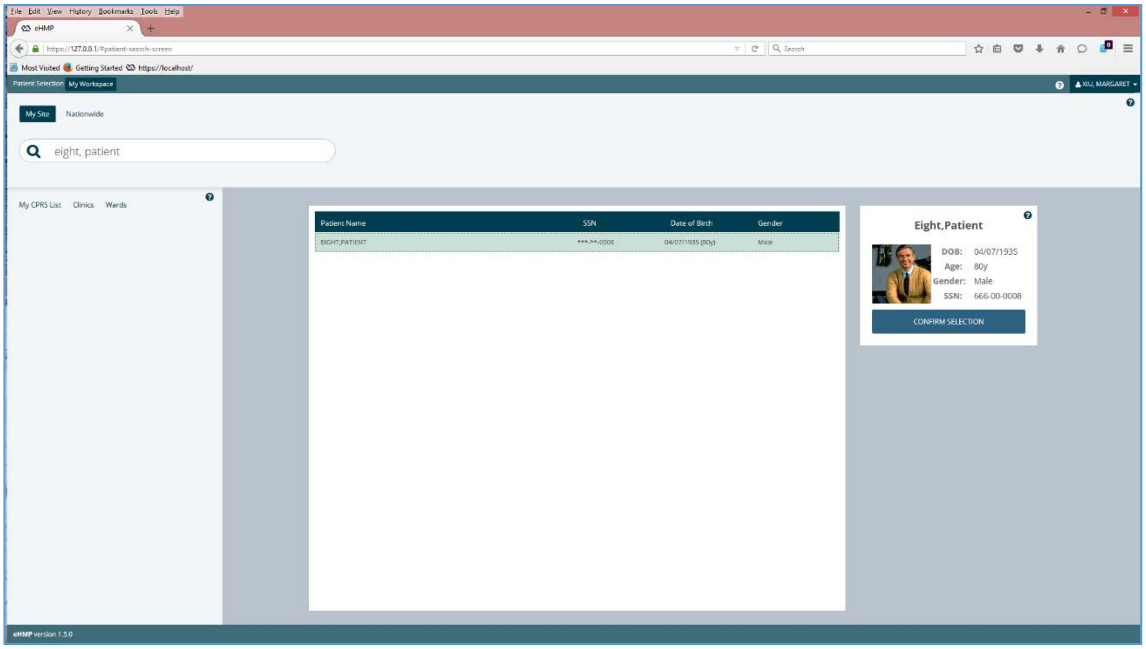


Figure 20: My Workspace Tab

4. To continue, search and select a patient. A good patient to begin with for testing is ‘eight, patient’.



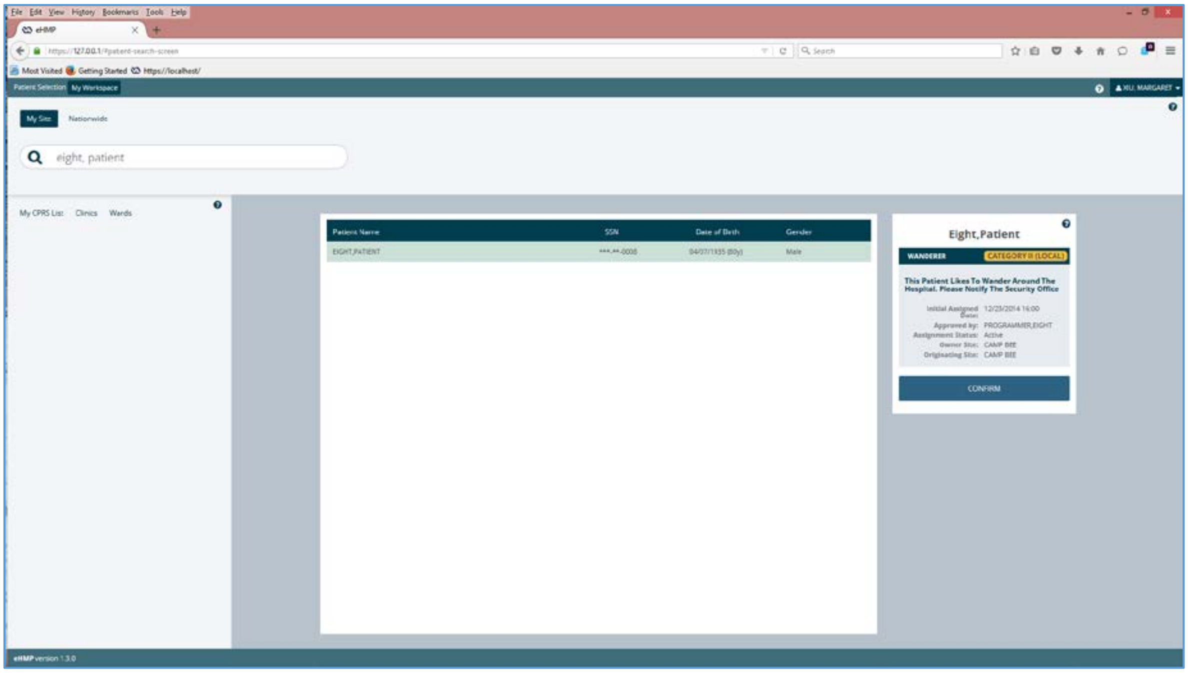
Patient Name	SSN	Date of Birth	Gender
EIGHT,PATIENT	***-**-0008	04/07/1935 (80y)	Male

Eight,Patient

DOB: 04/07/1935
Age: 80y
Gender: Male
SSN: 666-00-0008

Figure 31: Patient Search

5. Confirm the patient selection on the right hand side of the screen and also confirm any notices that may appear.


File Edit View History Bookmarks Tools Help
eHMP
https://127.0.0.1/#patient-search-screen
Search
Most Visited Getting Started https://localhost/
Patient Selection My Workspace
XIU, MARGARET
My Site Nationwide
eight, patient
My CPRS List Clinics Wards
eHMP version 1.3.0

Patient Name	SSN	Date of Birth	Gender
EIGHT,PATIENT	***-**-0008	04/07/1935 (80y)	Male

Eight,Patient

WANDERER CATEGORY II (LOCAL)

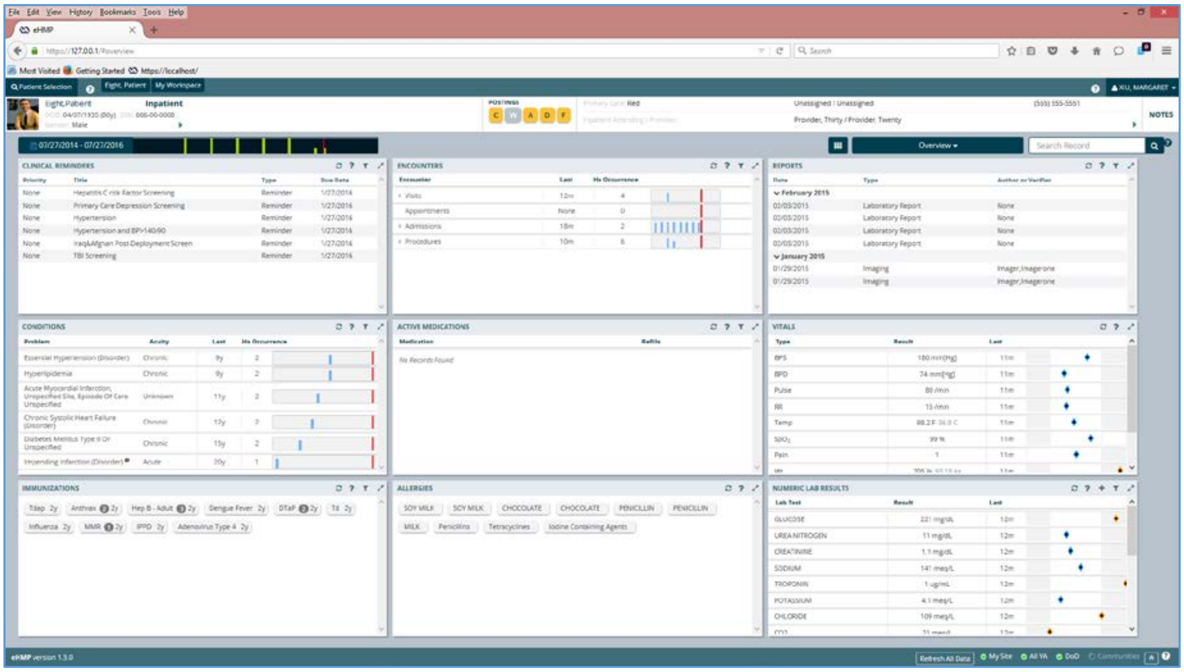
This Patient Likes To Wander Around The Hospital. Please Notify The Security Office

Initial Assigned Date: 12/23/2014 16:00
Approved by: PROGRAMMER,EIGHT
Assignment Status: Active
Owner Site: CAMP BEE
Originating Site: CAMP BEE

CONFIRM

Figure 32: Notice Confirmation

6. Upon successful patient selection, you should see the overview workspace.



CLINICAL REMINDERS

Priority	Title	Type	Due Date
None	Hepatitis C risk Factor Screening	Reminder	1/27/2016
None	Primary Care Depression Screening	Reminder	1/27/2016
None	Hypertension	Reminder	1/27/2016
None	Hypertension and BP>140/90	Reminder	1/27/2016
None	Iraq&Afghan Post-Deployment Screen	Reminder	1/27/2016
None	TBI Screening	Reminder	1/27/2016

ENCOUNTERS

Encounter	Last	Hx Occurrence
Visits	12m	4
Appointments	None	0
Admissions	18m	2
Procedures	10m	6

REPORTS

Date	Type	Author or Verifier
February 2015		
02/03/2015	Laboratory Report	None
02/03/2015	Laboratory Report	None
02/03/2015	Laboratory Report	None
02/03/2015	Laboratory Report	None
January 2015		
01/29/2015	Imaging	Imager,Imagerone
01/29/2015	Imaging	Imager,Imagerone

CONDITIONS

Problem	Acuity	Last	Hx Occurrence
Essential Hypertension (Disorder)	Chronic	9y	2
Hyperlipidemia	Chronic	9y	2
Acute Myocardial Infarction, Unspecified Site, Episode Of Care Unspecified	Unknown	11y	2
Chronic Systolic Heart Failure (Disorder)	Chronic	13y	2
Diabetes Mellitus Type II Or Unspecified	Chronic	15y	2
Impending Infarction (Disorder)	Acute	20y	1

ACTIVE MEDICATIONS

Medication	Refills
No Records Found	

VITALS

Type	Result	Last
BPS	180 mm[Hg]	11m
BPD	74 mm[Hg]	11m
Pulse	80 /min	11m
RR	15 /min	11m
Temp	98.2 F 36.8 C	11m
SpO₂	99 %	11m
Pain	1	11m

IMMUNIZATIONS

Tdap 2y · Anthrax 2 2y · Hep B - Adult 3 2y · Dengue Fever 2y · DTaP 2 2y · Td 2y · Influenza 2y · MMR 1 2y · PPD 2y · Adenovirus Type 4 2y

ALLERGIES

SOY MILK · SOY MILK · CHOCOLATE · CHOCOLATE · PENICILLIN · PENICILLIN · MILK · Penicillins · Tetracyclines · Iodine Containing Agents

NUMERIC LAB RESULTS

Lab Test	Result	Last
GLUCOSE	221 mg/dL	12m
UREA NITROGEN	11 mg/dL	12m
CREATININE	1.1 mg/dL	12m
SODIUM	141 meq/L	12m
TROPONIN	1 ug/mL	12m
POTASSIUM	4.1 meq/L	12m
CHLORIDE	109 meq/L	12m

Figure 33: Overview Workspace