CSCI 4140 – Tutorial 9 Remote debugging on Android or iOS devices Matt YIU, Man Tung (<u>mtyiu@cse</u>) SHB 118 Office Hour: Tuesday, 3-5 pm

2015.03.19

Prepared by Matt YIU, Man Tung

Outline

- Why remote debugging?
- Requirements
- Remote debugging on Android
- Remote debugging on iOS

Why remote debugging?

- Mobile web development is becoming more popular
 - "The way your web content behaves on mobile can be dramatically different from the desktop experience" (from https://developer.chrome.com/devtools/docs/remote-debugging)



Sidetrack: Designing for mobile devices

- Differences for designing for mobile devices:
 - Working with small screens
 - Solved by responsive web design
 - Working with touch screens
 - Solved by using DOM Touch events (<u>https://developer.mozilla.org/en-US/docs/Web/Guide/Events/Touch_events</u>)
 - Optimizing images
 - Also solved by responsive web design
 - Use images with retina screen support (keyword: @2x)
 - Mobile APIs
 - Introduced by HTML5
 - New possibilities offered by mobile devices, such as orientation and geolocation

Ref.: https://developer.mozilla.org/en-US/docs/Web/Guide/Mobile

Why remote debugging?

- Mobile web development is becoming more popular
- For desktop, we have the developer tools for debugging
- For mobile devices, how can we debug our webpages?
- Remote debugging addresses the need!
 - With remote debugging, you can debug live content on your mobile device from your development machine!



Requirements

- For Android users, you need:
 - Chrome 32 or later installed on your development machine (Mac/Windows/Linux)
 - A USB cable to connect your Android device
 - Chrome for Android installed on your Android 4.4+ device
- For **iOS** users, you need:
 - Safari on your development machine (Mac only)
 - A USB cable to connect your iOS device
 - Safari and iOS 6 or later on your iOS device
- For those do not have an Android or iOS device:
 - Use emulator for <u>Android</u> (Mac/Windows/Linux) or <u>iOS</u> (Xcode on Mac)

Debugging Firefox for Android is also possible. But, we will skip it because of the time limit...



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Setting up your Android device





Setting up your Android device

• <u>Step 1</u>: Enable USB debugging

– Select "Settings > Developer options"

If you cannot find the options...

- It is because the developer options are hidden by default on Android 4.2 and later
- To enable the developer options,
 - select "Settings > About
 phone/tablet" and tap "Build
 number" 7 times

System updates
Status Status of the battery, network, and other information
Legal information
Regulatory information
Send feedback about this device
Model number Nexus 7
Android version 5.0.2
Kernel version 3.4.0-g154bef4 android-build@vpbs1.mtv.corp.google.com #1 Thu Nov 20 22:16:57 UTC 2014
Build number LRX22G Tap 7 times!

About tablet

Mobile

Setting up your Android device

- <u>Step 2</u>: In **Developer options**, select the **USB debugging** checkbox
 - An alert prompts you to allow USB debugging. Tap OK

← Developer options	۹	
On		
Take bug report		
Desktop backup password Desktop full backups aren't currently protected		Allow USB debugging?
Stay awake Screen will never sleep while charging	•	USB debugging is intended for development purposes only. Use it to copy data between your computer and your device, install apps on your device without notification, and read log data.
Enable Bluetooth HCI snoop log Capture all bluetooth HCI packets in a file		CANCEL OK
Process Stats Geeky stats about running processes		
Debugging	Select this	
USB debugging Debug mode when USB is connected		

Setting up your Android device

- <u>Step 3</u>: Connect the device to your development machine using a USB cable
 - Install the appropriate USB driver for your device for Windows
 - See <u>OEM USB Drivers</u> on the Android Developers' site



Desktop

Discovering devices in Chrome

- After setting up remote debugging on Android, discover your device on your desktop Chrome browser
- <u>Step 1</u>: Navigate to "chrome://inspect" and confirm that
 Discover USB devices is checked
 - Alternatively, you can select Chrome menu > More tools > Inspect
 Devices

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DevTools	Devices		
Devices	✓ Discover USB devices Port forwarding		
Pages	Nexus 7 #07B9A703		
Extensions			
Apps			
Shared workers			



Discovering devices in Chrome

- <u>Step 2</u>: On your Android device, an alert prompts you to allow USB debugging from your computer. Tap OK
 - The message USB debugging connected displays in the device's notification drawer

Allow USB debug	gging?
The computer's RSA 9F:39:97:33:BF:DC:E2 Always allow from the	key fingerprint is: 2:D4:03:D3:46:34:93:56:E7:4D his computer
To skip this alert in the future, check Always allow from this computer .	CANCEL OK



Discovering devices in Chrome

- Step 3: On your computer, the **chome://inspect** page displays every connected device, together with its open tabs and debug-enabled WebViews
 - Consult the <u>Troubleshooting</u> section if you cannot see them

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Desktop

Debugging remote browser tabs

- Now you are ready to launch **DevTools** and debug your **remote** browser tabs
- Click **inspect** below the browser tab you want to debug

Discover USB devices Port forwarding	g
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CSCI 4140: Open-Source Software Pro	oject Development - Tutorial Resource Page http://mtyiu.github.io/csci4140-sprin
inspect locus tab reload close	

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Debugging remote browser tabs

- A new instance of **Chrome DevTools** launches on the computer
 - The usage of this DevTools is the same as that of the one for desktop

	Developer Tools - mtyiu.github.io/csci4140-spring15	5/	
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Debugging tips

- Use F5 (or Cmd+R on Mac) to reload a remote page from the DevTools window
- Keep the device on a cellular network and use the Network panel to view the network waterfall under actual mobile conditions
- Use the Timeline panel to analyze rendering and CPU usage
- If you're running a local web server, use <u>port forwarding</u> or <u>virtual host mapping</u> to access the site on your device

References

- The instructions are mostly *copied* from <u>https://developer.chrome.com/devtools/docs/remote-</u> <u>debugging</u>
 - Content available under the <u>CC-By 3.0 license</u>

Will be skipped

Remote debugging on Android

In case there are some Firefox fans...

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Prerequisites

- A desktop computer with Firefox 36+ installed
- An Android device with Firefox for Android 35+ installed
- A USB cable to connect the two devices



Setting up your Android device

- <u>Step 1</u>: Again, you need to enable USB debugging on your Android device
- Please follow pp. 8-11 to enable USB debugging



Mobile

Setting up your Android device

- <u>Step 2</u>: Enable remote debugging in Firefox for Android
- Open the browser and open its menu, select Settings > Developer tools. Check the "Remote debugging" box.

Sync Sync your tabs, bookmarks, passwords, history		
Customize Home, search, tabs, import	Developer tools	
Display		
Text, title bar, full-screen browsing	Paint flashing	
Privacy		
Control passwords, cookies, tracking, data	Remote debugging	
Language		
Change the language of your browser		Learn more >
Mozilla		
About Firefox, FAQs, data choices		

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Configuring Firefox on Desktop

- You desktop Firefox needs to have the ADB Helper add-on, version 0.7.1 or higher
- It will be installed automatically the first time you open the WebIDE
- To open WebIDE, click the menu button > Developer > WebIDE

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New Window New Private Save Page	Network THQ
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Sign in to Sync	
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Desktop

Configuring Firefox on Desktop

 To verify that ADB Helper is installed, navigate to "about: addons" and select the "Extension" tab

Add-ons Manager	× + GSS
📥 Get Add-ons	ADB Helper 0.7.4 An addon to ease connecting to Firefox OS devices. More
Extensions	Adobe Acrobat - Create PDF is incompatible with Firefox 36.0.1. Adobe Acrobat - Create PDF 1.1 (disabled) Converts a web page to PDF More
Appearance	

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Connecting devices in Firefox

 <u>Step 1</u>: In WebIDE, click "Select Runtime" and select the Android device you want to debug

	Firefox WebIDE	
🖕 Open App ∨		Select Runtime
		USB DEVICES
		Firefox on Android (Nexus 7)
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		Install Simulator
		OTHER
		Remote Runtime
		Runtime Info
		Permissions Table
		Device Preferences
		Screenshot
		Disconnect
_		

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Mobile

Connecting devices in Firefox

 <u>Step 2</u>: On your Android device, an alert prompts you to allow USB debugging from your computer. Tap OK

Incoming Connection

An incoming request to permit remote debugging connection was detected. A remote client can take complete control over your browser! Allow connection?

Disable	Cancel	ок	



Debugging remote browser tabs

- Now you are ready to launch Firefox Developer Tools and debug your remote browser tabs
- In the WebIDE, click "Main Process" and select the remote tab that you want to debug

O New App		
N 🖕 Open Packaged App		
Open Hosted App		
MY PROJECTS		
RUNTIME APPS		
Main Process		
TABS		
mtyiu.github.io: CSCI 4140: Open-Sour	rce Software Proje	

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Debugging remote browser tabs

 The Firefox Developer Tools will open up and you can start debugging!

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References

 The instructions are mostly adapted from <u>https://developer.mozilla.org/en-</u> <u>US/docs/Tools/Remote Debugging/Debugging Firefox for An</u> <u>droid with WebIDE</u>



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Mobile

Setting up your iOS device

- Enable Web Inspector
 - Go to the Settings app and choose "Safari > Advanced"
 - Toggle on the Web Inspector switch

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Advances

Desktop

Setting up Safari on Mac

- Enable Develop menu
 - In desktop Safari, go to "Safari > Preferences..." menu
 - Select the Advanced tab
 - Select the "Show Develop menu in menu bar" checkbox

• •	About Safari Safari Extensions		0	General Iabs Auto-III Passwords Search Security Privacy Notifications Extensions Advanced
	Preferences Clear History and Websi	₩, te Data…	Discuss.co	Accessibility: Never use font sizes smaller than 9 V Press Tab to highlight each item on a webpage
	Services	•		Bonjour: Include Bonjour in the Bookmarks menu
	Hide Safari Hide Others Show All	H# H#J		Internet plug-ins: Stop plug-ins to save power Plug-ins start automatically on one website Details
	Quit Safari %Q			Style sheet: None Selected
				Default encoding: Unicode (UTF-8)
				Proxies: Change Settings
				Show Develop menu in menu bar

Discovering devices in Safari

- Connect the device to your development machine using a USB cable
- To begin inspecting, simply enter the URL of the page you want to inspect on the device
- At the same time, open Safari on Mac

Desktop

Debugging remote browser tabs

Choose the site from the "Develop" menu in Safari

Matt's MacBook Pro		mtviu.github.io -	- csci4140-spring15	
Connect Web Inspector	て企業			
Show Error Console	⊂ #C			

Debugging remote browser tabs

 Safari's Web Inspector will open up and you can start remote debugging!

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Remote debugging for other browsers

- You may find some useful information on:
 - <u>http://developer.telerik.com/featured/a-concise-guide-to-remote-debugging-on-ios-android-and-windows-phone/</u>
 - <u>http://stackoverflow.com/questions/11262236/ios-remote-debugging</u>
- Disclaimer: I didn't try the tools listed on these pages I
- Good luck to your assignment and project (if you are using the mobile browser as the controller)!

– End –