HP Business Service Management

For the Windows and Linux operating systems

Software Version: 9.23

Recording Mobile Apps for BPM - Best Practices

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Chapter 1: Introduction

Business Process Monitor (BPM) runs scripts that are recorded by Virtual User Generator (VuGen). This document provides best practices for using VuGen to record mobile native applications for BPM. The document provides general best practices, as well as explanations about a number of emulators. The document also provides a brief description of how to record scripts using the Mobile True client protocol.

A mobile app (HTTP/HTML) is a protocol that enables you to develop scripts using mobile devices or device emulators that communicate with servers over HTTP. You can record network traffic to a capture file (PCAP file) and create a VuGen script, or you can use a mobile emulator on your VuGen machine to develop scripts.

Mobile emulators are available for free on the web. You must install the correct emulator version that is supported by your application, and meet the system requirements for each emulator software you use.

Note:

- This documented in intended for VuGen experts who are recording scripts for BPM.

- For an overview of using HP LoadRunner for mobile performance testing, see http://h30499.www3.hp.com/t5/HP-LoadRunner-and-Performance/Who-s-up-for-some-mobile-performance-testing/ba-p/5974699.

Chapter 2: Choosing a Mobile Monitoring Solution

In order to monitor a mobile application, you need to first answer the following questions:

1. Is it a technology-based application using HTML or HTTP (mobile web browser)?

2. Is the software installed on the machine locally (native application), or can you browse using browsing software such as IE, Firefox, or Safari?

If the application does **not** support HTML or HTTP, you need to use real-device monitoring like the Perfecto integration.

If the application **supports** HTML or HTTP, you need to decide what is important to you in your application monitoring:

- Do you want to bounce your application via wireless carrier (real wireless carrier network monitoring)?

- Do you only want to monitor your application backend, no matter which network you use (proactive backend-side monitoring)?

- Is it important to you to simulate client activity over a specific device (real-device user monitoring)?

Mobile Monitoring Options

The following tables can help you choose the best solution to your mobile monitoring:

- "Monitoring Solutions" on the next page

- "Application Types" on the next page

- "Protocols" on page 9

- "Native Mobile Apps - Recording Methods" on page 9

Monitoring Solutions

Monitoring Solution	Protocols	BPM installation
Real wireless carrier network monitoring	• Mobile TruClient • Mobile App (HTTP/HTML) • Mobile PerfectoMobile Integration	Add to the BPM machine a 3G card to emulate real carrier network connection (except for Perfecto integration).
Proactive backend-side monitoring	• Mobile TruClient • Mobile App (HTTP/HTML)	No need to add 3G card.
Real-device user monitoring	Mobile PerfectoMobile Integration	No need to add 3G card.

Application Types

Application Type	Protocols	Comments
Native	Mobile App (HTTP/HTML) Mobile PerfectoMobile Integration	See "Native Mobile Apps - Recording Methods" on the next page for more details.
Web Browser	Mobile TruClient Mobile App (HTTP/HTML)	TruClient works with Firefox browser API , and will soon work with IE.

Protocols

| Protocols	Methods	Comments
Mobile TruClient	• Web browser based protocol. • Recording using VugGen using a local PC Firefox/IE browser.	No need for 3G connectionor mobile device, or mobile emulators.
Mobile App (HTTP/HTML)	Supports both web browser, and native: • For web browser recording see above Mobile TruClient comments. • For Native recording, see "Native Mobile Apps - Recording Methods" below.	The script is simply an HTTP/Web regular script emulating a specific UserAgent (Device). For SSL applications, either use the Android emulator recording method (which avoids certificate imports), or get the certificate from the application admin, and import it to VuGen to enable decryption.
Mobile PerfectoMobile Integration	This can be done either using a QTP script, or using a VuGen template.	VuGen templates save you the QTP integration, but you must open BPM to the Perfecto open API interface.

Native Mobile Apps - Recording Methods

Scenario	If...	Then...
Proxy Recording	• The mobile device can be connected to the same network as the VuGen machine, and; • The app allows proxy configuration	You can configure your mobile app to use VuGen proxy to record the traffic.

| Server-Side Recording	• You don't want (or can't) record from the actual device, and; • The device, server, and VuGen machine are in the same network, and; • You only need to record on one server	Install VuGen's Mobile Sniffer Agent on the server. You can then use the protocol's 'Record and Analyze Traffic' feature, which will use the agent to record the traffic. Note that no 3G is required for recording.
Script from Network Capture	You already have a network capture file, such as WireShark's 'pcap' file	Use the protocol's 'Analyze Traffic' feature to turn it into a script.
Device Emulator Recording	• You don't want (or can't) record from the actual device, and; • The mobile OS is Android, and; • You have a device emulator available	Record from the emulator by using the protocol's 'Emulator Recording' feature. Note that no 3G is required for recording.
On-Device Recording	Your Android device is rooted (to allow access to the device's system)	You can install the LoadRunner Mobile Recorder on the device, and use it to record the traffic as a standard 'pcap' file. You can then open the file on your VuGen machine to create a script.

Chapter 3: Android

Installing the SDK

1. Download and install the Android SDK from the following location:
   http://developer.android.com/sdk/index.html.

2. Start the SDK Manager.

3. Install the relevant APIs and Android platform tools.
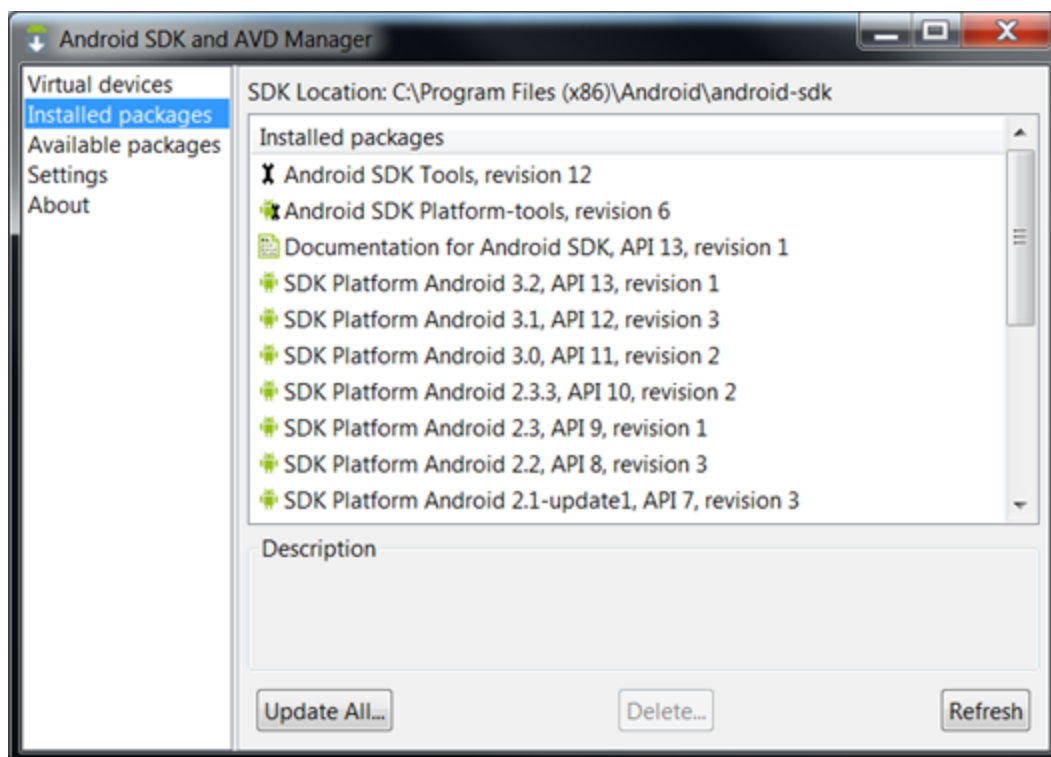
4. If the SDK Manager fails to retrieve the list of available tools, check your Internet proxy
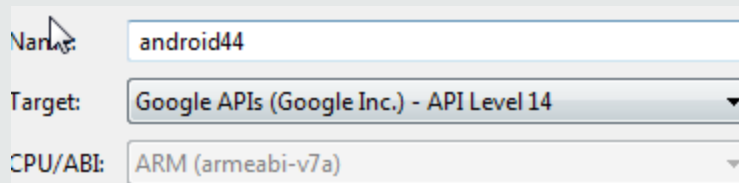   settings under the **Settings** tab and click **Refresh**.
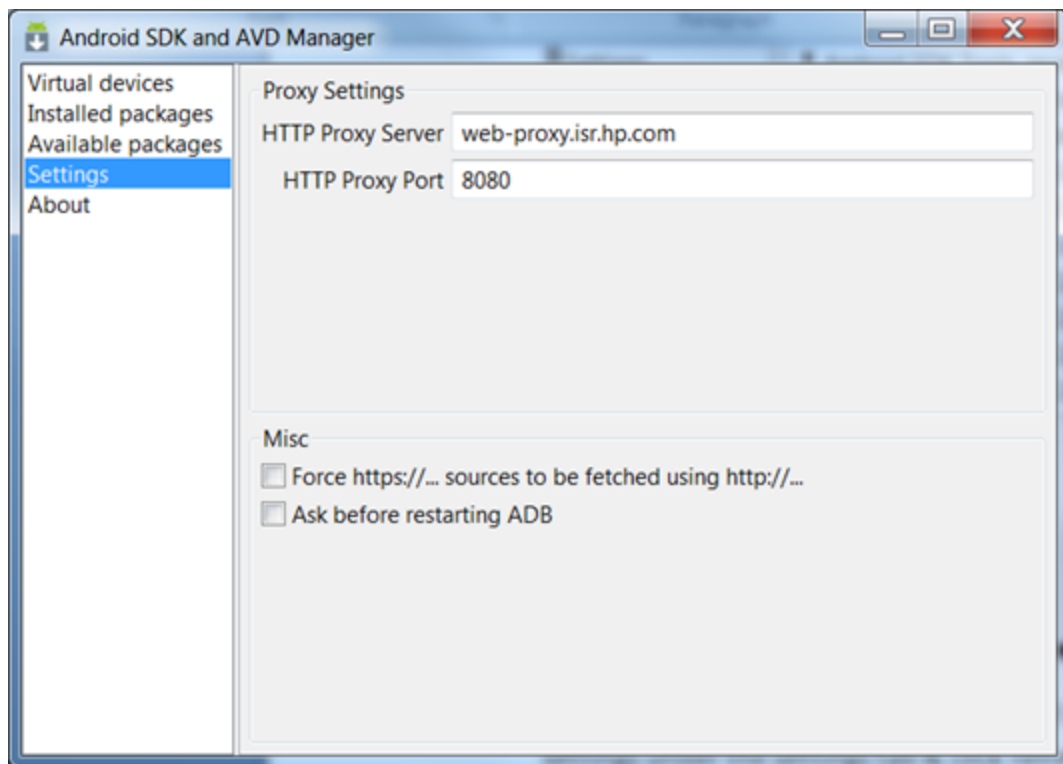
Creating and Running an Android Virtual Device (AVD)

To create an Android Virtual Device:

1. Open a command line and navigate to <ANDROID_SDK>\tools, where <ANDROID_SDK> is the path where you installed the Android SDK.

2. Use **android list targets** to view the list of available APIs and their IDs.

3. Create a new virtual device using the command : **android create avd –n <avd_name> –t <target_id>**, where:

   ▪ <target_id> is the number taken from the target list

   ▪ <avd_name> is the desired virtual machine name

   Note:

- In Android 4.0 the AVD Manager is located in the Tools directory.

- Ensure you select a device with Google APIs.

To run an Android Virtual Device:

1. Open a command line and navigate to <ANDROID_SDK>\tools, where <ANDROID_SDK> is the path where you installed the Android SDK.

2. Run the command **emulator @<avd_name>**, where <avd_name> is the name you used when creating the AVD.

Configuring a Proxy on the Android Network

1. Run the AVD as described in "Creating and Running an Android Virtual Device (AVD)" on the previous page.

2. On the HOME screen, click **Menu**.

3. Select **Settings > Wireless & Networks > Mobile Networks > Access Point Names – Telkila**.

4. Enter your proxy address in the **Proxy** field.

5. Enter the port number in the **Port** field.
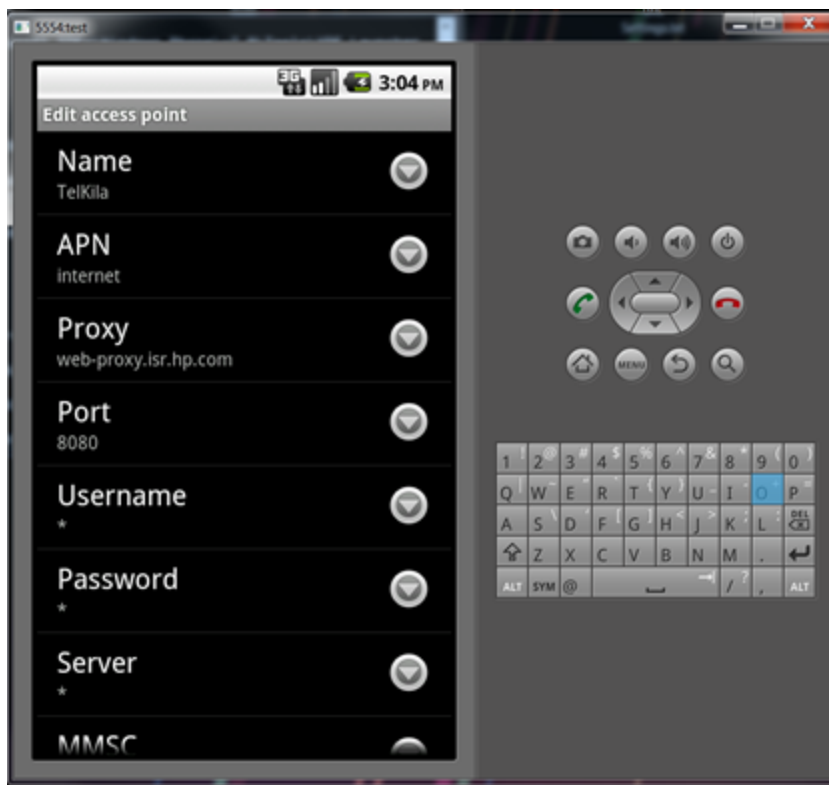
Installing an Application on the Android Emulator

1. Open the AVD.

2. Open a command line and navigate to <ANDROID_SDK>\tools, where <ANDROID_SDK> is the path where you installed the Android SDK.

3. Run the command **adb install <$APK>**, where <$APK> is the name of the apk file.

Note the following:

- Ensure you create a device that includes the Google Inc. API.

- If the proxy URL does not work, try using the proxy IP.

- Android does not support PAC proxy URLs. You must specify the exact proxy name or IP.

Recording a Mobile Native Application

1. Open VuGen and create a new virtual user (**File > New**).

2. Select **Mobile App (HTTP/HTML)**, and click **Start Recording**.

3. Select **Record Emulator** and configure the following parameters:

   ■ **Emulator to record**: Set the path to the emulator.exe file in the Android SDK folder.

   ■ **Command line**: Add any command line arguments that are required to run the emulator (for example, @avd_name,).

   ■ **Working directory**: Set the path to the directory in which the emulator.exe is located (typically ANDROID_SDK_FOLDER\tools).

4. Click **Finish.**

5. The Android emulator starts. Open your native app and perform the actions you want to record.

6. When you have recorded all the actions, go to VuGen and click **Stop**.

7. Select **File > Zip operations > Export to zip file**. We recommend you choose the **Runtime files** option for a smaller script size.

8. Enter a name for the script and click **OK**.

9. Click **OK** again.

The script is now ready to run on Business Process Monitor (BPM).

> **Tip:**
>
> ● **Computer resources**: Ensure you have enough computer memory when recording.
>
> ● **Slow start up**: Usually, the emulator start up is very slow and can take several minutes.
>
> ● **Text check**: Document the relevant text checks during recording. A good way to do this is to use the Inset comments feature.

Recording a Secure/SSL Native Application

1. Add **sdcard** to the android emulator:

   a. Open the Android emulator installation directory and run **AVD Manager.exe**.

   b. Select the Android 4.0 emulator, and choose **Edit**.

   c. Choose **sd card with 10 MB** (you can make this any size), and choose **Edit AVD** to save.

2. Copy the VuGen certificate to the sdcard:

   a. Start the Android emulator, and wait for the emulator to load.

   b. Select <android emulator installation directory>\tools\ddms.bat.
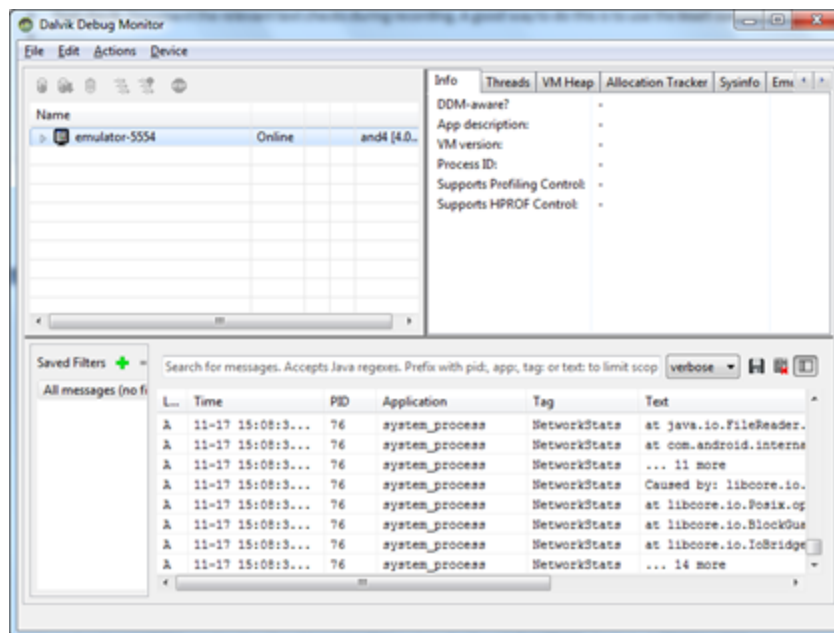
   c. Select the Android emulator > **Device > File explorer**.

   d. Browse to "/mnt/sdcard" directory > **Push file onto device** (icon with right arrow).
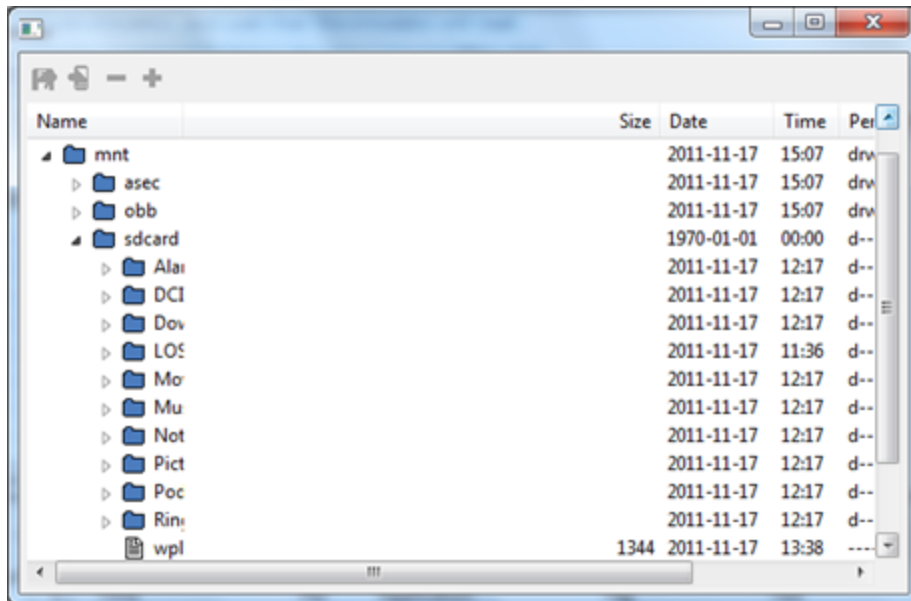
e. Choose the certificate: C:\Program Files\Hp\LoadRunner\bin\certs**wplusCAOnly_
    Expiration_2020.crt**, and make sure it is copied to the sdcard (you should see it under
    /mnt/sdcard/wplusCAOnly_Expiration_2020.crt).

f. In the Android 4.0 emulator, select **Menu > System Settings > Security > Install from
    sdcard (install certificates from sdcard) > wplusCAOnly_Expiration_2020.crt > OK**.
    (Note that you may be asked to add a PIN code.)
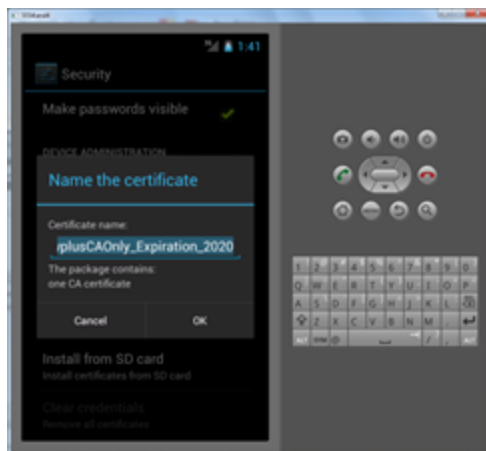
g. To verify the certificate is installed, in the Android 4.0 emulator select **Menu > System
    Settings > Security > Trusted Credentials > User**. You should see **Mercury Interactive
    Corp Winsock Plus Protocol Interceptor**.
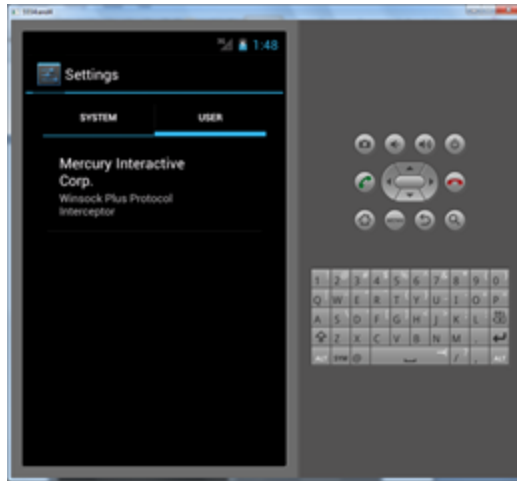
Recording a PCAP File on an Android Mobile Device

Prerequisites: You must have an Android-based mobile device with **root** permissions.

To record a PCAP file:

1. From the Android Market, download the **Shark** app.

2. Open the **Shark** app and start recording.

Troubleshooting

Problem: The emulator does not load through VuGen.

Solution:

- Check the command line arguments are correct.

- Make sure to change the path for the Android emulator so that each folder name is no longer than 8 characters (for example, program files (x86)**progra~2**).

Problem: There is no Internet connection from the emulator.

Solution: Check the proxy settings in **Home Screen > Menu > Settings > Wireless & networks > Mobile networks > Access Points Names > Telkila > Proxy**.

Problem: The emulator does not record the application through VuGen.

Solution: If your application is using HTTPS/Secure protocol, see "Recording a Mobile Native Application" on page 15.

Problem: When you try recording in VuGen you receive an application login failure, but when you launch the application using AVD Manager or a command line, you can log in successfully.

Solution: SSL communication failure; try the following procedure: "Recording a Mobile Native Application" on page 15.

Chapter 4: iPhone

Setting up an Ad Hoc Connection on a Windows Working Station

1. Make sure the wireless adapter is enabled.

2. Select **Network and sharing center > Tasks** and click **Manage wireless networks**.

3. Click **Add**.

4. Select **Create an ad hoc network** and click **Next**.

5. Enter a network name and configure the encryption type and password.

6. Click **Turn on Internet Connection sharing**.

7. Click **Close**.

8. Connect your mobile device to the new ad hoc connection.

Recording Using an Ad Hoc Connection

1. Create an ad hoc connection on your PC as described in "Setting up an Ad Hoc Connection on a Windows Working Station" above, and connect your mobile device to the network.

2. Open VuGen.

3. Select **Mobile App (HTTP/HTML)**.

4. Click **Start Recording**.

5. Select the first option: **Record and analyze traffic**.

6. Ensure the host URL and port are correct.

7. Click **Connect**.

8. Select the correct network interface from the **Record network interface** combo box.

9. Click **Start Recording**.

10. Perform all the actions you want to record on your mobile device.

11. Click **Stop Recording**.

12. Save the recorded pcap file.

13. Click **Next**.

14. Select whether to filter by server side or client side, and select the IP by which to filter.

15. Click **Finish**.

16. Select **File > Zip operations > Export to zip file**. We recommend you choose the **Runtime files** option for a smaller script size.

17. Enter a name for the script and click **OK**.

18. Click **OK** again.

The script is now ready to run on BPM.

Chapter 5: Windows Phone 7

Installing the Emulator

1. Download the Windows Phone 7 development kit from the following link:
   http://www.microsoft.com/download/en/details.aspx?id=13890.

2. Follow the on-screen instructions to install.

3. If you need to configure a proxy, see http://msdn.microsoft.com/en-us/library/ff754351
   (v=vs.92).aspx#BKMK_ConfigProxy.

Running the Emulator

To run the emulator, perform one of the following:

• From the Windows Phone Developer Tools menu, select **Windows Phone 7 Emulator**.

OR

• From a command line:

1. Navigate to where you installed the development kit (default is **C:\Program Files (x86)
   \Microsoft SDKs**).

2. Navigate to the folder **\Windows Phone\v7.0\Tools\XDE Launcher**.

3. Run the command **XdeLauncher "Windows Phone 7" "Windows Phone 7 Emulator"**.

Recording a Native Mobile Application with VuGen

1. Open VuGen and create a new virtual user (**File > New**).

2. Select **Mobile App (HTTP/HTML)**, and click **Start Recording**.

3. Select **Record Emulator** and configure the following parameters:

   ▪ **Emulator to record**: Set the path to the **xdeLauncher.exe** file in the windows SDK folder

   ▪ **Command line**: Add any command line arguments that are required to run the emulator.
     Default settings are: "Windows Phone 7" "Windows Phone 7 Emulator"

   ▪ **Working directory**: Set the path to the directory in whcih the **xdeLauncher.exe** is located.
     The default path is: C:\Program Files (x86)\Microsoft SDKs\Windows
     Phone\v7.0\Tools\XDE Launcher\.

4. Click **Finish.**

5. The Windows Phone 7 starts. Open your native app and perform the actions you want to record.

6. When you have recorded all the actions, go to VuGen and click **Stop**.

7. Select **File > Zip operations > Export to zip file**. We recommend you choose the **Runtime files** option for a smaller script size.

8. Enter a name for the script and click **OK**.

9. Click **OK** again.

The script is now ready to run on BPM.

Chapter 6: Blackberry

Installing the BlackBerry Emulator

1. Access the following link and select the phone model you want to emulate:

   http://us.blackberry.com/developers/resources/simulators.jsp.

2. Follow the on-screen instructions to install.

Recording a Native Mobile Application with VuGen

1. Open VuGen and create a new virtual user (**File > New**).

2. Select **Mobile App (HTTP/HTML)**, and click **Start Recording**.

3. Select **Record Emulator** and configure the following parameters:

   - **Emulator to record**: Set the path to the emulator executable file in the BlackBerry emulator directory (for 9800, the default path is **C:\Program Files (x86)\Research In Motion\BlackBerry Smartphone Simulators 6.0.0\6.0.0.534 (9800)\9800.bat**).

   - **Command line**: Add any command line arguments that are required to run the emulator (for 9800 there are no required arguments).

   - **Working directory**: Set the path to the directory in which the **xdeLauncher.exe** is located. The default path for 9800 is **C:\Program Files (x86)\Research In Motion\BlackBerry Smartphone Simulators 6.0.0\6.0.0.534 (9800)**.

4. Click **Finish.**

5. The BlackBerry emulator starts. Open your native app and perform the actions you want to record.

6. When you have recorded all the actions, go to VuGen and click **Stop**.

7. Select **File > Zip operations > Export to zip file**. We recommend you choose the **Runtime files** option for a smaller script size.

8. Enter a name for the script and click **OK**.

9. Click **OK** again.

The script is now ready to run on BPM.

Chapter 7: WebOS

Recording a Native Mobile Application with VuGen

Prerequisites:

- VuGen

- WebOS emulator with Internet access

- Oracle VirtualBox

To record a native mobile application:

1. Open VuGen and create a new virtual user (**File > New**).

2. Select **Mobile App (HTTP/HTML)**, and click **Start Recording**.

3. Select **Record Emulator** and configure the following parameters:

   - **Emulator to record**: Set the path to the emulator executable file in the BlackBerry emulator directory (the default path is **C:\Program Files (x86)\HP webOS\SDK\bin\palm-emulator.bat**).

   - **Command line**: Add any command line arguments that are required to run the emulator (for WebOS there are no required arguments).

   - **Working directory**: Set the path to the directory in which the **xdeLauncher.exe** is located. The default path for WebOS is **C:\Program Files (x86)\HP webOS\SDK\bin**.

4. Click **Finish.**

5. The WebOS emulator starts. Open your native app and perform the actions you want to record.

6. When you have recorded all the actions, go to VuGen and click **Stop**.

7. Select **File > Zip operations > Export to zip file**. We recommend you choose the **Runtime files** option for a smaller script size.

8. Enter a name for the script and click **OK**.

9. Click **OK** again.

The script is now ready to run on BPM.

Chapter 8: Creating a Script from a PCAP File

Creating PCAP on the server side:

- When your application is in testing mode, you can install a sniffer on the application's server machine and capture the entire traffic between the server and different clients.

- By filtering a different mobile device IP each time, you can create different pcaps for each mobile device.

Creating PCAP on the client side

- You can install sniffers on different mobile devices machines and then capture the traffic between the mobile device and the server.

- Once a pcap file is ready,use the following instructions to create a VuGen script from pcap.

How to Create a Script from a PCAP File

1. Open VuGen and select **Mobile App (HTTP/HTML)**.

2. Click **Start Recording**.

3. Select **Analyze traffic**.

4. Browse to where you saved your pcap file and select it.

5. Select whether to filter by server side or client side, and select the IP by which to filter.

6. Click **Finish**.

7. Select **File > Zip operations > Export to zip file**. We recommend you choose the **Runtime files** option for a smaller script size.

8. Enter a name for the script and click **OK**.

9. Click **OK** again.

The script is now ready to run on BPM.

> **Tip:** Use one pcap file per transaction, and then copy it to one script according to the flow you want to measure.

Chapter 9: TruClient

Recording Mobile TruClient with VuGen

Prerequisites:

- VuGen

- Proxy IP/URL (if you are using a proxy)

To record:

1. Open VuGen and create a new virtual user (**File > New**).

2. Select **Mobile 'TruClient'**, and click **Develop Script**.

3. If you are using a proxy, ensure you also set it in the **Recording Options**:

    a. In VuGen, select **Tools > TruClient General Settings**.

    b. Add the proxy settings to the **Automatic Proxy Configuration**.

4. Select a mobile device from the list.

5. Change the resolution, if necessary.

6. Click **OK**.

7. The browser loads. Use it to perform the actions you want to record.

8. Click **Stop**.

9. Select **File > Zip operations > Export to zip file**. We recommend you choose the **Runtime files** option for a smaller script size.

10. Enter a name for the script and click **OK**.

11. Click **OK** again.

The script is now ready to run on BPM.

For more information, refer to **Virtual User Generator > Help > Mobile Documentation**.

Chapter 10: Proxy Recording

In LoadRunner v11.52, a new proxy recording mode was provided. This feature provides a new approach for users to record web applications. It does not require installing any client on mobile devices, so it is particularly suitable for recording mobile applications. It can also be used for desktop operating systems on which VuGen cannot be installed, such as Linux, Mac OS, and so on.

For more details, see:

http://h30499.www3.hp.com/t5/HP-LoadRunner-and-Performance/Use-Proxy-Recording-in-LoadRunner-11-52-for-Mobile-Applications/ba-p/6152483.

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