

Smart Home Lab Virtual Machine Installation - 2/24/2011

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Introduction

This document describes how to install the environment used in the ISU smart home lab (SHL) for developing and executing smart home services and applications. Any questions or problems should be directed towards the author of this document, Ryan Babbitt, at rbabbitt@iastate.edu.

The installation process is fairly simple and makes use of the concepts of virtualization and virtual machines to provide a virtual copy of the lab environment. *Virtualization* is a technique in which system, the *host operating system*, has special software that can provide containers, or *virtual machines*, for other systems, called *guest operating systems*, to run. The host provides a software API that mimics the hardware API to each guest system, such that each guest operating system executes as though it is communicating with the host's actual hardware. The guest's virtual hardware (e.g. CPU, memory, I/O devices) is actually made up of processes/threads running on the host machine, and the state of the virtual machine (i.e. its CPU registers, device registers, memory contents, and hard disk) are stored in the host's memory. Each guest system is isolated and independent from other guest systems as well as from the host system, making virtual machines a very safe way of testing software.

The virtualization software that we are using is VMWare Server 2.0 [1][2]. The installation of the virtual lab environment requires three steps: 1) installing the VMWare server on your local machine and 2) creating a virtual machine on which to do the development, and 3) executing the virtual machine.

1. Install VMWare Server 2.0 on host machine (requires admin account)

-Download VMWare Server 2.0 (<http://www.vmware.com/products/server/>). Create a VMWare account to obtain a license key required. It will be sent in the reply email.

-Install VMWare Server 2.0. You may leave all options default. Take note of the directory that will contain virtual machine images. By default, this is C:\Virtual Machines, and make sure the drive has enough free space to store the lab's virtual machine. It is approximately 8+ GB.

-Note that the default port for accepting secure communications is 8333. Add Firewall rule to allow connections over port 8333 (Control Panel → Windows Firewall).

-After installation, an icon should be installed on the desktop for the server application.

-By default all Administrator accounts can log into the Server.

2. Install the SHL virtual machine in VMWare Server

- Copy the provided virtual machine image directory (vm-dev-j) into declared the virtual machine directory (usually C:\Virtual Machines)

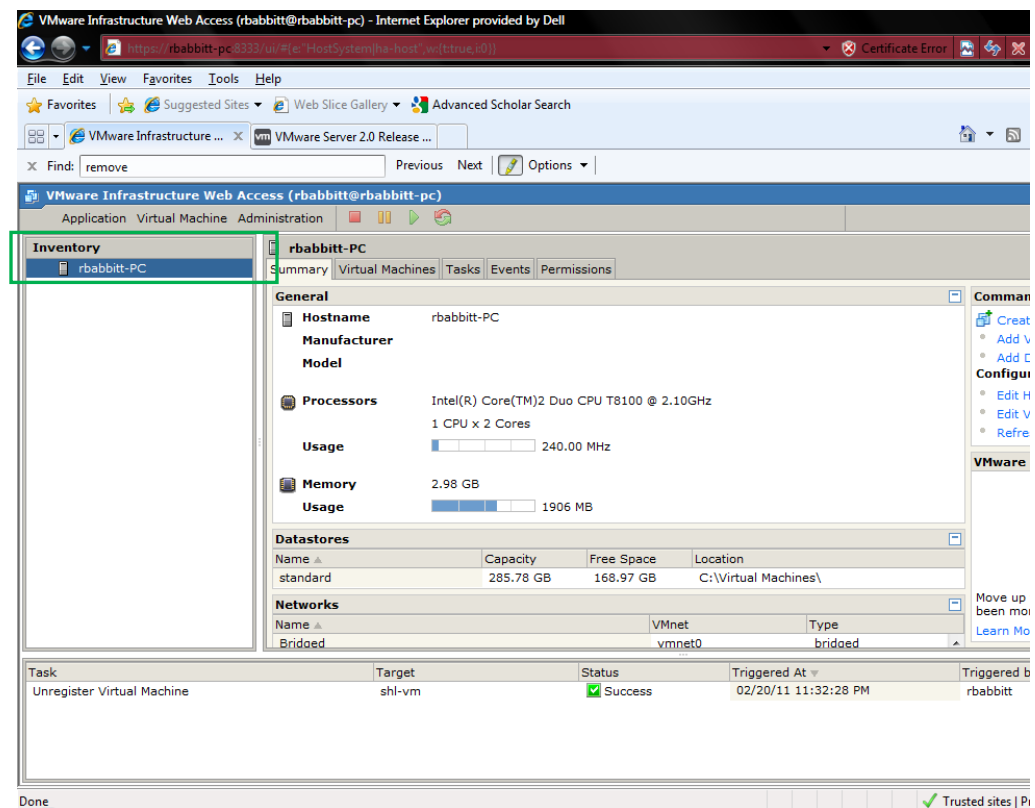
- Login to local VMWare Server Infrastructure Web Access using the newly created desktop icon or entering <https://localhost:8333/ui/> in a browser. Accept the invalid security certificate.

- Install remote console browser plug-in if prompted to do so. This enables you to connect to any VMware Server to manage and execute its virtual machines (if you have the proper credentials)

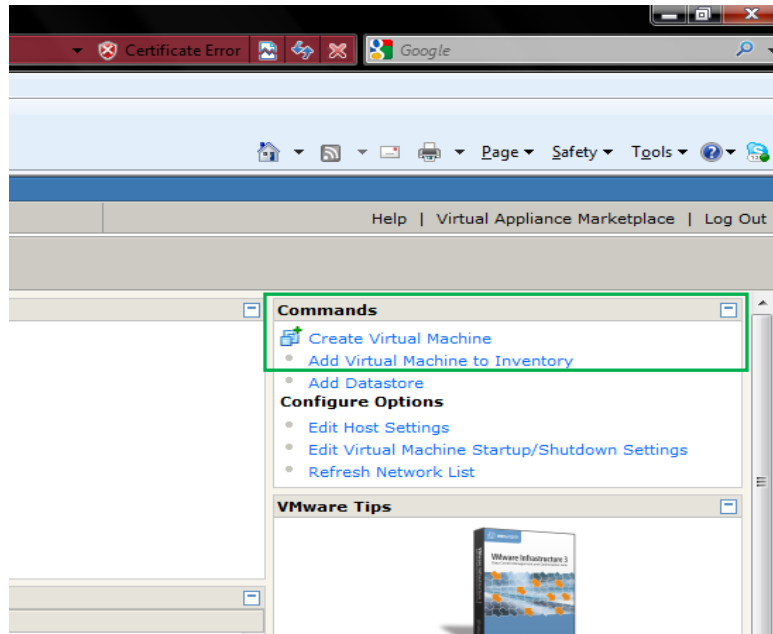
-Also, if prompted to do so, add **localhost** as a trusted site to disable the protected mode of your browser (e.g. IE8 Tools → Internet Options → Security → Trusted Sites → Sites)

-Add the existing SHL virtual machine to the VMServer inventory

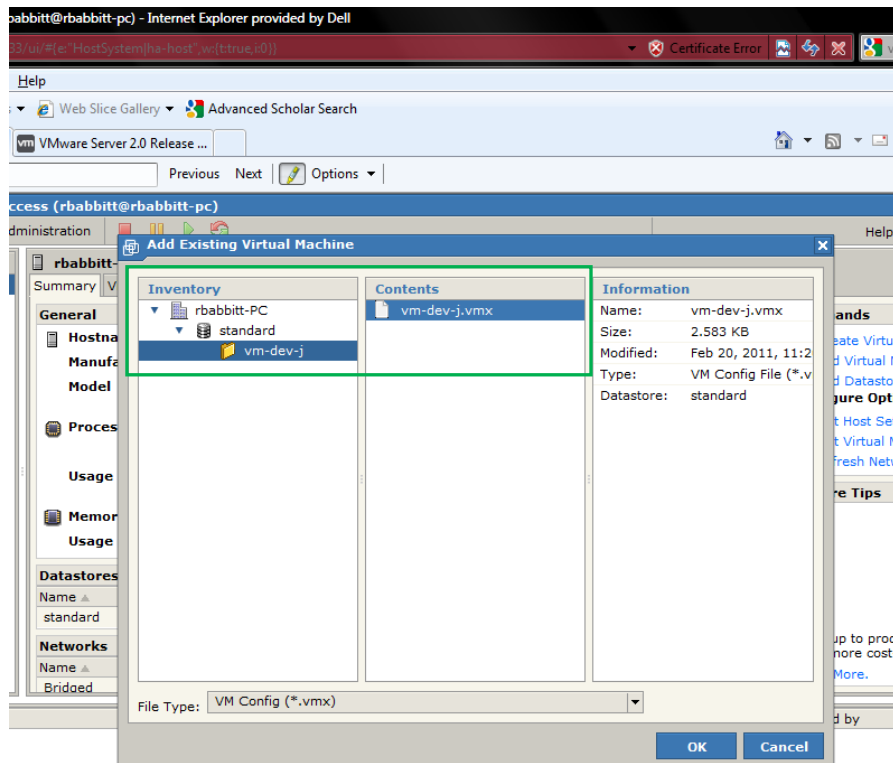
i) On the left side of the page there is an **Inventory** pane. Select your host machine in the Inventory pane.



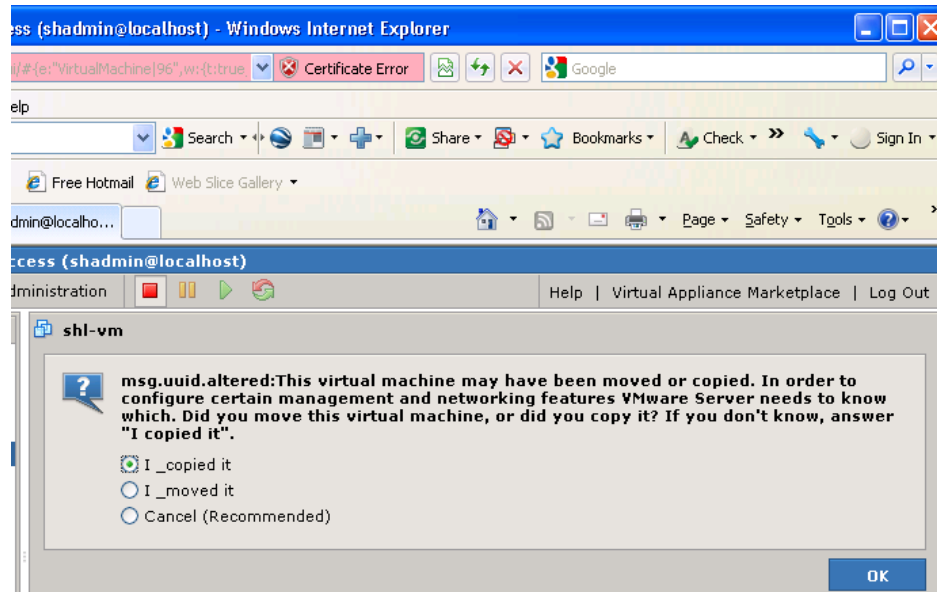
ii) On the right side of the page there is a **Commands** pane. Select Commands -> 'Add Virtual Machine to Inventory'. This brings up a new 'Add Existing Virtual Machine' window.



iii) In the new window, select Host -> Standard -> vm-dev-j in the Inventory Pane and **vm-dev-j.vmx** in the **Contents** pane.



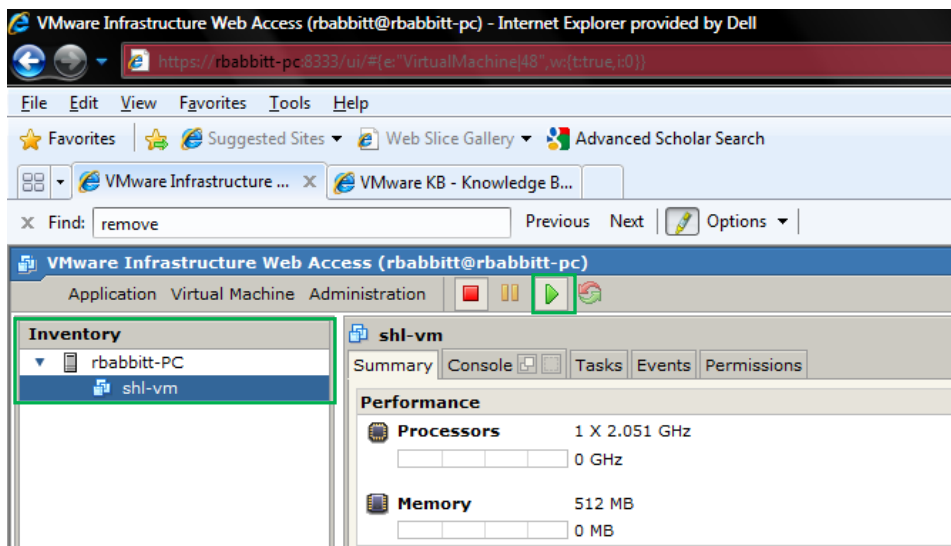
iv) When prompted to do so, indicate that the virtual machine was **copied**



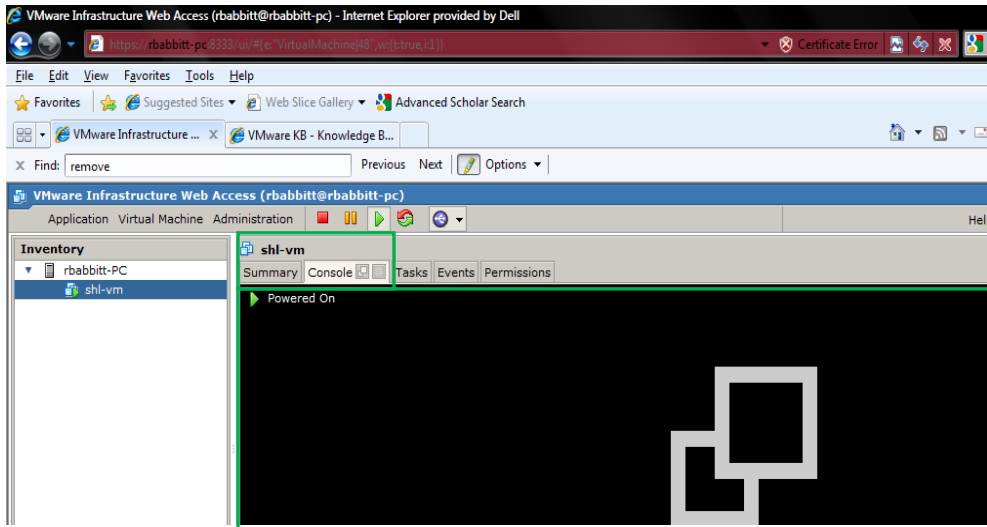
v) Click 'OK' to load the virtual machine.

3. Run the Virtual Machine

- Select the newly added **shl-vm** virtual machine in the **Inventory** pane and click the green "play" icon in the top middle of the page



- With **shl-vm** still selected in the **Inventory** pane, click on the **Console** tab in the middle of the page.



- As directed, click anywhere in the black window exposed by the **Console** tab to connect to the **shl-vm** virtual machine. After a few seconds, you should see a new window containing a booting Windows XP virtual machine. It may take a few seconds (minutes) for the machine to boot and the status bar may hang during this process.

-Maximize the new window for a full screen view of the virtual machine.

- The virtual machine has been configured with a user account with administrator privileges named **smarthome** has already been created for you. Its password is also **smarthome**.

- Brows the **Smart Home Programming Manual**, located on the left-side of the desktop, and complete the exercises in parts 4 and 5.

References

[1] VMWare Server 2.0 homepage - <https://vmware.com/products/server/>

[2] VMWare Server user guide - <http://www.vmware.com/pdf/vmserver2.pdf>