Virtual Appliances: Releasing Without an Executable
Narayan D. Raum, Christopher P. Barnes, Dale Scheppler, Nicholas Skaggs, Christopher Haines, Stephen Williams, Yang Li, VIVO Collaboration

Background

Virtual Machines

Virtual machines are servers that run as guests on a single physical server, which acts as the host machine. Virtualization technology allows a single or multiple operating system instances to run on a single host while sharing physical resources such as CPU and RAM. There are many virtualization technologies available such as VMWare, XenServer, and VirtualBox. This poster demonstrates how Oracle VirtualBox, an open source virtualization application, is used to host the VIVO Virtual Appliance.

Virtual Appliances

When a virtual machine is first created on a host, it is much like buying a computer with all the physical hardware, but without an operating system installed. After a virtual machine is created, an operating system and other software packages must be installed for it to become useful. Virtual appliances are pre-packaged virtual machine images with the operating system and a set of pre-configured applications already installed. Virtual appliances are typically packaged as TAR or ZIP files that can be downloaded and imported into virtualization applications such as VirtualBox or VMWare. The purpose of a virtual appliance is to allow an end user to implement an integrated system of tools and applications without manually installing them. The VIVO virtual appliance is a great place for someone interested in the semantic web to start developing and testing in an environment with tools installed to do so.

Installation

1. Download Appliance from SourceForge
   1.6 GB, ~1 hour @ 500 kbs
2. Download and Install VirtualBox
   75 MB, ~2 minutes @ 500 kbs
3. Import the Appliance
   ~5 Minutes
4. Map Local Ports to Appliance Ports
   ~2 Minutes
5. Adjust MAC Address of Virtual NIC
   ~1 Minute
6. Start the Appliance
   ~1 Minute
7. Open VIVO Web Interface
   ~1 Minute
8. Login to Admin Interface
   ~1 Minute

Extending the Appliance

Marketing Version

A marketing version of the virtual appliance is also available on the VIVO SourceForge site. This version contains test data, which was loaded prior to creation of the appliance. This allows users to view and modify existing RDF data from the VIVO web application interfaces.

Securing the Appliance

Step-by-step instructions for securing the virtual appliance are also available on the VIVO SourceForge site. Since all administrative user names and passwords are publicly available, an appliance must be secured before moving it into a production environment.

Adding Tools

As tools become available, they can be easily downloaded directly to the appliance using the command line interface within VirtualBox. For example, the ingest package can be downloaded using the following command:

```
vivo:-# wget https://downloads.sourceforge.net/project/vivo/VIVO%20Harvester/ingest_0.4.1.tar.gz
```

Additional features, such as implementing Joseski as a SPARQL end point, can also be installed, configured and tested on the appliance. Additional procedures are available on the SourceForge site in the Files and Wiki sections.