proximus ict academy

Guacamole?

Contents

1. Introduction.

Guacamole (http://guac-dev.org) is an remote desktop gateway supporting commonly used protocols like VNC and RDP (and SSH).

What makes Guacamole extremely interesting in lab environments (and others) is the fact that it is completely clientless – no browser plugins or software agents are required – and will run on modern, HTML5 enabled web browsers.
Even better: it is completely free and open source software. Although the documentation is pretty extensive, commercial support is also available for those who need to run more critical setups and/or want to support the community.

2. Setup on CentOS 7.1 x64.

Setup Guacamole 0.9.8 on CentOS 7.1.x x64:

- Make sure that the machine is secured and hardened before proceeding with the Guacamole installation. In my case the system is able to get packages from the Internet or through a YUM-enabled, trusted, server.
- Guacamole requires a servlet container, often Tomcat (http://tomcat.apache.org/).
  Tomcat is an open source implementation of different Java-related technologies such as Java Servlet, needed by Guacamole.
  Set up Tomcat and its dependencies (e.g. Java, …):

- #yum install tomcat.
- (#yum install apache, if needed, to experiment further).
  - The installation will also create the "tomcat" user.
  - The important Tomcat files will be located by default in "/usr/share/tomcat".
  - TheTomcat configuration file is located in "/usr/share/tomcat/conf/tomcat.conf". No changes where made for this tutorial, but Java options and optimalizations could be applied down here.
- CentOS/RHEL 7 management of the Tomcat service:
  - #systemctl start tomcat.
  - #systemctl status tomcat.
  - #systemctl restart tomcat.
  - #systemctl stop tomcat.
- Enable services to be started on boot on the CentOS/RHEL 7 platform:
  - #systemctl enable tomcat.
  - #systemctl disable tomcat.

- Download all the required files from the Guacamole server:
  - "guacamole-client-0.9.8.tar.gz".
  - "guacamole-server-0.9.8.tar.gz".
- The Guacamole server, "guacd" is the core daemon process that is running in the background that will determine the remote support protocol that needs the be loaded and the arguments that need to be used.

  It needs to be build from source, so make sure that you have the proper development tools installed (C compiler – like "gcc" and co).

  It might be required on your setup to enable the EPEL servers:
  - #yum install epel-release.

  The required dependencies for building the guacamole-server:
  - Cairo (http://cairographics.org) – a 2D graphics library:
    - #yum install cairo-devel.
  - Libjpeg-turbo (http://libjpeg-turbo.virtualgl.org/) – JPEG image codec:
    - #yum install libjpeg-turbo-devel.
  - Libpng (http://www.libpng.org/pub/png/libpng.html) – PNG support:
    - #yum install libpng-devel.
  - OSSP UUID (http://www.ossp.org/pkg/lib/uuid/) – used for assigning UUIDs to each Guacamole connection:
    - #yum install uuid-devel
  - Note: most of the time you will need the development packages on CentOS 7.1.

  Optional dependencies I installed on my testhost:
  - FreeRDP (http://www.freerdp.com/) – RDP support:
    - #yum install freerdp-devel.
  - Pango (http://www.pango.org/) – needed for SSH/telnet text rendering:
    - #yum install pango-devel.
  - Libssh2 (http://www.libssh2.org/) – needed for SSH support:
    - #yum install libssh2-devel.
  - LibVNCServer (http://libvnc.github.io/) – needed for VNC support:
    - #yum install libvncserver-devel.

  Extract the "guacamole-server" tarball and run the configure script inside of the extracted directory:
  - $./configure --init-dir=/etc/init.d
    - Make sure that configure finds everything it needs and that you would like to have support for.
  - $make.
    - To start the compilation of the Guacamole server.

- #make install.
- #ldconfig.
  - Install the components and update the cache of installed libraries.

- To install the Guacamole client:
  - Make sure that you have Apache Maven installed:
    - #yum install maven.
  - Extract the Guacamole-client tarball and invoke Maven in this directory to build and package all required components, resulting in a single ".war" file that will contain the entire web application:
    - #mvn package.
  - Rename the "target/guacamole*.war" to "target/guacamole.war" and copy the "target/guacamole.war" file to "/var/lib/tomcat/webapps".

- Install some additional fonts for SSH connections, as the default fonts used on the CentOS core installation by Guacamole are not that easy on the eye:
  - #fc-list
    - This will list all the available fonts on the machine.
  - #yum search arial
  - #yum install liberation-sans-fonts.noarch.
- Launching the services:
  - #systemctl start tomcat.
  - #systemctl start guacd.

3. Example configuration.

In my basic test setup, my configuration file is created in the file "/usr/share/tomcat/.guacamole" – this is sufficient for smaller setups of Guacamole. For large setups, it might be recommended to deploy a backend database and to move the configuration file, but you will get the idea:

Example configuration file:

- *Italic information is my comment.*

```
<user-mapping> Start of the user configuration.
<authorize username="myuser" password="mypassword"> Configuration of a user and password.
<connection name="WIN 10 RDP"> Name of the first RDP connection.
<protocol>rdp</protocol> Protocol specification: rdp, ssh, vnc, telnet, ...
<param name="hostname">IP.IP.IP.IP</param> Machine to connect to.
<param name="server-layout">fr-fr-azerty</param> Specify a Azerty keyboard layout for RDP.
</connection>
<connection name="KALI LINUX VNC"> Secondary connection of the user.
<protocol>vnc</protocol> Running on the VNC protocol.
<param name="hostname">IP.IP.IP.IP</param> Machine to connect to.
<param name="port">5901</param> VNC port/display to connect to.
<param name="password">student</param> Optional configuration of VNC user name.
</connection>
<connection name="KALI LINUX SSH"> Third connection of the user.
<protocol>ssh</protocol> Remote protocol is SSH.
```

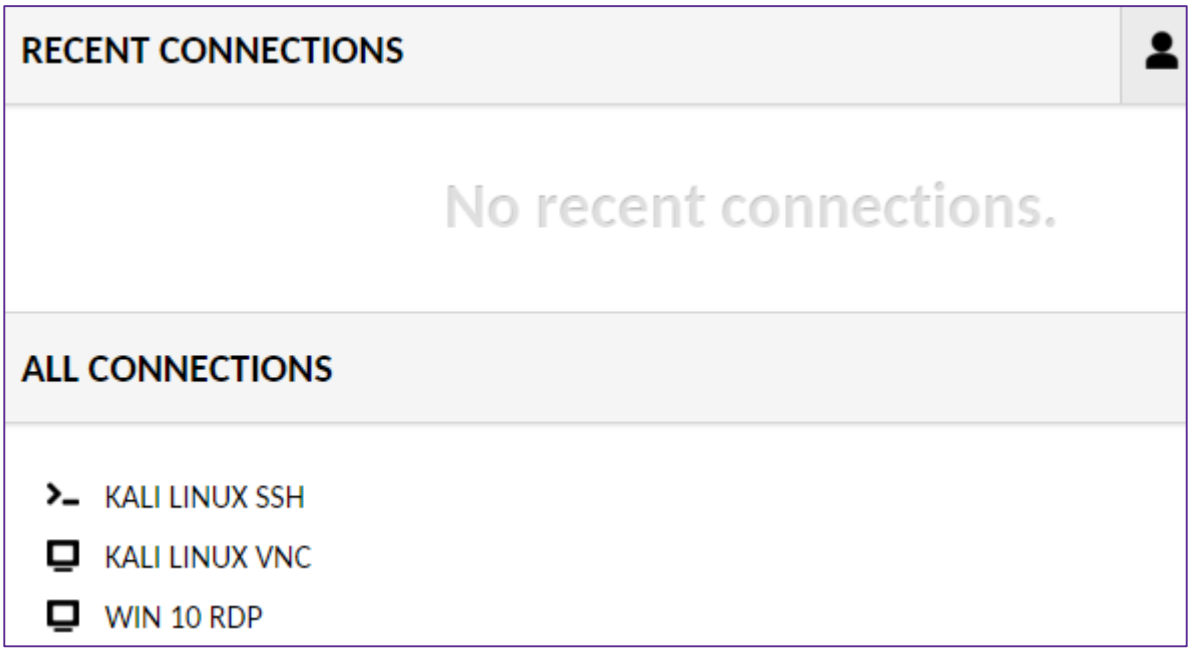
```
<param name="hostname">IP.IP.IP.IP</param> Machine to connect to.
<param name="font-name">Courier 10 Pitch</param> Font to use as provided by "fc-list".
<param name="font-size">12</param> Fon-size indication.
</connection>
</authorize>
</user-mapping>
```

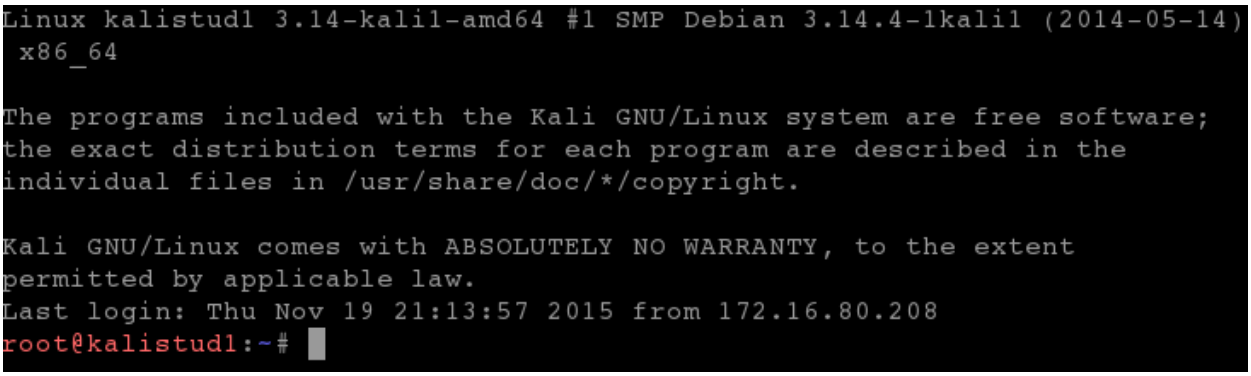
- For more configuration options: http://guac-dev.org/doc/gug/configuring-guacamole.html

4. Connecting to Guacamole:

By default, Guacamole will be running on http://server.ip.ip.ip:8080/guacamole. Log in with the configured user(s):

Select the connection(s) you would like to use:





5. Windows 10 remote desktops.

Connecting to Windows 10 remote desktops with RDP requires some changes (make sure that you know what you are doing). Change the following registry key on the Windows 10 RDP client: "[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Terminal Server\WinStations\RDP-Tcp] "SecurityLayer"=dword:00000001" (source: http://boreditguy.com/blog/?p=3784).