



CIAB Remote Desktop System

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CIAB - "Cloud in a Box"

The file "**install-ciab.zip**" includes all of the installation Bash Scripts and associated files required to create an *LXD container based CIAB Remote Desktop System*.

CIAB will create 2 LXD containers:

- **ciab-cn1** - which will have an installer's choice of *Desktop Environment* installed in it
- **ciab-guac** - will have Guacamole, Tomcat9, PostgreSQL, and NGINX installed via Docker in *ciab-guac*. We create the LXD "**ciab-guac**" container with an command option to "**enable** container "**nesting**". This is why we are able to install Docker "*inside*" the LXD "**ciab-guac**" container

Once installation is complete you can access both Guacamole & the ciab-cn1 based Desktop using any HTML5 Web Browser.

We configure *Guacamole/NGINX* etc with a "**self-signed**" certificate to allow support for using HTTPS. This means the connection **from** a User **to** the Remote Desktop is **encrypted**.

Steps to Install CIAB Remote Desktop

- 1) Copy the **install-ciab.zip** to the (local/remote) (Cloud, VM, server etc) you want to create the CIAB System
- 2) Unzip **install-ciab.zip**
- 3) Execute **ciab-pre-install.sh**
- 4) Execute **install-ciab.sh**

NOTE: When **Step 4** completes...

- a) **both** of the CIAB LXD containers (**ciab-guac** and **ciab-cn1**) will have been *created*
- b) a **"working"** installation directory **/opt/ciab/** will have been created in *each* container
- c) additional configuration scripts specific to setting up software **specific** to the function of each LXD container
 - scripts to install Docker, Guacamole, Tomcat9, PostgreSQL, NGINX in the **ciab-guac** LXD container
 - scripts to install a Desktop Environment and a User Acct for the person doing the CIAB installation into the **ciab-cn1** container.

Setup & Configure the **ciab-cn1** container

- 1) Access the **ciab-cn1** container:

```
$ lxc exec ciab-cn1 bash
```

- 2) Create a User Account for yourself (**substitute your own UserID for "UserName" in the following steps**)

```
root@ciab-cn1:~# adduser UserName
```

Answer all the questions re Password etc.

- 3) Make your UserName Account both "sudo" and "adm" privileged

```
root@ciab-cn1:~# adduser UserName sudo
root@ciab-cn1:~# adduser UserName adm
```

- 4) Change the ownership of everything in /opt/ciab to UserName:UserName

```
root@ciab-cn1:~# chown -R UserName:UserName /opt/ciab
```

- 5) Make sure file permissions make sense for the installation

```
root@ciab-cn1:~# chmod -R 766 /opt/ciab/
```

- 6) change to the Install Directory

```
cd /opt/ciab
```

- 6.1) Become your UserName user

```
root@ciab-cn1:~# su UserName
UserName@ciab-cn1: ~$
```

NOTE:

CIAB installation scripts should be executed as a "normal" User ... **do not** use **sudo**.

The Scripts will prompt for you to enter your password when Sudo privileges are required!

6.2) **Begin the ciab-cn1 installation/setup** by executing:

```
UserName@ciab-cn1:/opt/ciab$ ./setup-ciab-cn1.sh
```

During the installation into the **ciab-cn1** container you will be presented with the following menu where you can choose which **Desktop Environment** you want to install:

```
Software selection
You can choose to install one or more of the following predefined collections of software.
Choose software to install:

[ ] Kubuntu live CD
[ ] Lubuntu live CD
[ ] Ubuntu Budgie live CD
[ ] Ubuntu live CD
[ ] Ubuntu MATE Live CD
[ ] Ubuntu Studio live DVD
[ ] Xubuntu live CD
[*] Ubuntu Cloud Image (instance)
[ ] DNS server
[ ] Kubuntu desktop
[ ] LAMP server
[ ] Lubuntu Desktop
[ ] Mail server
[ ] PostgreSQL database
[ ] Print server
[ ] Samba file server
[ ] Ubuntu Budgie desktop
[ ] Ubuntu desktop
[ ] Ubuntu desktop default languages
[ ] Ubuntu minimal desktop
[ ] Ubuntu minimal desktop default languages
[ ] Ubuntu MATE minimal
[ ] Ubuntu MATE desktop
[ ] Audio recording and editing suite
[ ] Ubuntu Studio desktop
[ ] Ubuntu Studio minimal DE installation
[ ] Large selection of font packages
[ ] 2D/3D creation and editing suite
[ ] Photograph touchup and editing suite
[ ] Publishing applications
[ ] Video creation and editing suite
[ ] Xubuntu minimal installation
[ ] Xubuntu desktop
[*] OpenSSH server
[*] Basic Ubuntu server

<Ok>
```

You should **pick just one** of the variety of **Desktop Environments** available

- Kubuntu (re KDE)
- Lubuntu (re LXDE)
- Ubuntu Budgie
- Ubuntu Gnome
- Ubuntu MATE
- Xubuntu (re XFCE)

NOTE: You can also select to install some of the other services listed as well... if you choose !

Setup & Configure the *ciab-guac* container

1) Access the *ciab-guac* container:

```
$ lxc exec ciab-guac bash
```

2) Create a User Account for yourself (substitute your own UserID for "UserName" in the following steps)

```
root@ciab-guac:~# adduser UserName
```

Answer all the questions re Password etc.

3) Make your UserName Account both "sudo" and "adm" privileged

```
root@ciab-guac:~# adduser UserName sudo
root@ciab-guac:~# adduser UserName adm
```

4) Change the ownership of everything in /opt/ciab to UserName:UserName

```
root@ciab-guac:~# chown -R UserName:UserName /opt/ciab
```

5) Make sure file permissions make sense for the installation

```
root@ciab-guac:~# chmod -R 766 /opt/ciab/
```

6) change to the Install Directory

```
cd /opt/ciab
```

6.1) Become your UserName user

```
root@ciab-guac:~# su UserName
UserName@ciab-guac: ~$
```

NOTE:

CIAB installation scripts should be executed as "normal" User ... **do not** use **sudo**. The Scripts will prompt for you to enter your password when required to use Sudo to do something!

6.2) **Begin the ciab-guac installation/setup** by executing:

```
UserName@ciab-guac:/opt/ciab$ ./setup-ciab-guac.sh
```

This will install Docker and Docker-compose into the *ciab-guac* LXD container,
Then Docker-Compose is used to to install/setup **the Dockerized Guacamole**, Tomcat9, PostgreSQL, NGINX for CIAB.

Post Installation

At this point you should exit back to the LXD **"Host"** and **restart** both **ciab-cn1** and **ciab-guac** so just type **"exit"** until you are back at your Server/VM's terminal Prompt.

Then execute:

```
$ lxc restart ciab-cn1
$ lxc restart ciab-guac
```

You can now use an HTML5 Web Browser to access Guacamole and configure a new **"Connection"** configuration for accessing **ciab-cn1**

You (the Admin) must first access Guacamole first to setup a Guacamole "connection" to ciab-cn1's using its IP address (10.x.x.x):

Point your web browser to:

```
HTTPS://ip_addr_of_Server-VM-Cloud-Instance
```

This HTTPS traffic will be sent to Port 443 (re HTTPS) on the *Server/VM/Cloud-Instance*.

CIAB forwards anything on the incoming to the Server/VM/Cloud-Instance on Port 443 to Port 443 on the **ciab-guac** Container. In **ciab-guac** NGINX is listening on Port 443 and will forward again that Traffic to Port 8443 for the Guacamole Daemon (**guacd**) to process.

First you will see the Guacamole Login Screen!

```
Enter guacadmin and guacadmin
```



You should see...

RECENT CONNECTIONS

guacadmin ▾

No recent connections.

ALL CONNECTIONS

Filter

Click on **"Guacadmin"** in the *upper right* of the screen and a *Drop Down Menu* will appear.

On that menu...

Click on **Settings**

You will see the Guacamole Configuration editor's Main Menu:

Click on **Connections**

SETTINGS

Active SessionsHistoryUsersGroupsConnectionsPreferences

Click or tap on a connection below to manage that connection. Depending on your access level, connections can b

New ConnectionNew Group

Filter

Configure a "new" Guacamole "Connection" for the ciab-cn1 Desktop Container.

Configure a "connection" for the **ciab-cn1** container running our CIAB Remote Desktop *using the following example*.

Make sure to substitute the IP of your **ciab-cn1** container (*_re 10.x.x.x something*) for the *Hostname* instead of the *"IP of ciab-cn1"* in the example.

EDIT CONNECTION

Name: CN1

Location: ROOT

Protocol: RDP ▾

CONCURRENCY LIMITS

Maximum number of connections:

Maximum number of connections per user:

LOAD BALANCING

Connection weight:

Use for failover only: ☐

GUACAMOLE PROXY PARAMETERS (GUACD)

Hostname:

Port:

Encryption:

PARAMETERS

Network

Hostname:

Port:

Authentication

Username:

Password:

Domain:

Security mode:

Disable authentication: ☐

Ignore server certificate: ☐

Remote Desktop Gateway

Hostname:

Port:

Username:

Password:

Domain:

Basic Settings

| | |
|------------------------|--|
| Initial program: | <input type="text"/> |
| Client name: | <input type="text"/> |
| Keyboard layout: | <div>US English (Qwerty) ▾</div> |
| Time zone: | <div>America ▾</div> <div>New York ▾</div> |
| Administrator console: | <input type="checkbox"/> |

Display

| | |
|-------------------|----------------------------------|
| Width: | <input type="text"/> |
| Height: | <input type="text"/> |
| Resolution (DPI): | <input type="text"/> |
| Color depth: | <div>True color (32-bit) ▾</div> |
| Resize method: | <div>▾</div> |
| Read-only: | <input type="checkbox"/> |

Clipboard

| | |
|--------------------------------------|--------------------------|
| Disable copying from remote desktop: | <input type="checkbox"/> |
| Disable pasting from client: | <input type="checkbox"/> |

Device Redirection

| | |
|----------------------------------|--|
| Support audio in console: | <input type="checkbox"/> |
| Disable audio: | <input type="checkbox"/> |
| Enable audio input (microphone): | <input type="checkbox"/> |
| Enable printing: | <input type="checkbox"/> |
| Redirected printer name: | <input type="text"/> |
| Enable drive: | <input checked="" type="checkbox"/> |
| Drive name: | <input type="text" value="ciab_drive"/> |
| Disable file download: | <input type="checkbox"/> |
| Disable file upload: | <input type="checkbox"/> |
| Drive path: | <input type="text" value="/home/\${GUAC_USERNAME}"/> |
| Automatically create drive: | <input checked="" type="checkbox"/> |
| Static channel names: | <input type="text" value="rdpdr"/> |

Performance

| | |
|------------------------------------|--------------------------|
| Enable wallpaper: | <input type="checkbox"/> |
| Enable theming: | <input type="checkbox"/> |
| Enable font smoothing (ClearType): | <input type="checkbox"/> |
| Enable full-window drag: | <input type="checkbox"/> |
| Enable desktop composition (Aero): | <input type="checkbox"/> |
| Enable menu animations: | <input type="checkbox"/> |
| Disable bitmap caching: | <input type="checkbox"/> |
| Disable off-screen caching: | <input type="checkbox"/> |
| Disable glyph caching: | <input type="checkbox"/> |

RemoteApp

| | |
|--------------------|----------------------|
| Program: | <input type="text"/> |
| Working directory: | <input type="text"/> |
| Parameters: | <input type="text"/> |

Preconnection PDU / Hyper-V

| | |
|-----------------------------|----------------------|
| RDP source ID: | <input type="text"/> |
| Preconnection BLOB (VM ID): | <input type="text"/> |

Load Balancing

| | |
|---------------------------|----------------------|
| Load balance info/cookie: | <input type="text"/> |
|---------------------------|----------------------|

Screen Recording

| | |
|--------------------------------------|--------------------------|
| Recording path: | <input type="text"/> |
| Recording name: | <input type="text"/> |
| Exclude graphics/streams: | <input type="checkbox"/> |
| Exclude mouse: | <input type="checkbox"/> |
| Include key events: | <input type="checkbox"/> |
| Automatically create recording path: | <input type="checkbox"/> |

SFTP

| | |
|------------------------------|--------------------------|
| Enable SFTP: | <input type="checkbox"/> |
| Hostname: | <input type="text"/> |
| Port: | <input type="text"/> |
| Public host key (Base64): | <input type="text"/> |
| Username: | <input type="text"/> |
| Password: | <input type="password"/> |
| Private key: | <input type="text"/> |
| Passphrase: | <input type="password"/> |
| File browser root directory: | <input type="text"/> |
| Default upload directory: | <input type="text"/> |
| SFTP keepalive interval: | <input type="text"/> |
| Disable file download: | <input type="checkbox"/> |
| Disable file upload: | <input type="checkbox"/> |

Wake-on-LAN (WoL)

| | |
|-----------------------------------|--------------------------|
| Send WoL packet: | <input type="checkbox"/> |
| MAC address of the remote host: | <input type="text"/> |
| Broadcast address for WoL packet: | <input type="text"/> |
| Host boot wait time: | <input type="text"/> |

[Save](#) [Clone](#) [Cancel](#) [Delete](#)

Remember to *Click Save* !

NOTE: the Use of "squirrely* braces in several of the above "fields".

the **`${GUAC_USERNAME}`** will allow Guacamole to pass the current User's Guacamole ID as the XRDP Login User ID.

the **`${GUAC_PASSWORD}`** will allow Guacamole to pass the current User's Guacamole Password as the XRDP Login User's Password

This helps automate login so the CIAB User only has to enter their Login UserID and Login Password once.

NOTE: In Guacamole-speak the above are called [Parameter Tokens](#)

Configure a "new" Guacamole "User" for CIAB.

From the Guacamole main menu Click on **Users** and create a NEW User *with the following example substituting your UserID on the **ciab-cn1** container as the **UserName**;*_ in place of the examples "YourID".

EDIT USER

guacadmin

Username:

YourID

Password:

Re-enter Password:

PROFILE

Full name:

your name

Email address:

Organization:

Role:

ACCOUNT RESTRICTIONS

Login disabled:

☐

Password expired:

☐

Allow access after:

-- : -- --

Do not allow access after:

-- : -- --

Enable account after:

mm / dd / yyyy

Disable account after:

mm / dd / yyyy

User time zone:

PERMISSIONS

Administer system:

☒

Create new users:

☒

Create new user groups:

☒

Create new connections:

☒

Create new connection groups:

☒

Create new sharing profiles:

☒

Change own password:

☒

CONNECTIONS

Filter

Current Connections

All Connections

CN1

Save

Cancel

Remember to **Click Save !**

IMPORTANT NOTE

When creating **YOUR** Guacamole User ID...

Remember to check **ALL** of the **Permissions** so that you will have Guacamole Admin capabilities in the future.

Other future Users you create usually only have 1 or 2 of these checked !



Time to Rock & Roll

Logout of Guacamole by again **Clicking on Guacadmin** in the *upper right* and selecting **Logoff**

Then log back in using your new CIAB **User ID** and **_Password_**



Troubleshooting Tips

1) RDP uses Port 3389 so make sure that Port is open on the LXD **ciab-cn1** container.

Make sure that Ports 443 are Open on the LXD Host and in the LXD **ciab-guac** container to permit HTTPS access.

2) When you access your ciab-cn1 Desktop, if you have no audio then open a Terminal on that Desktop and do the following:

```
$ pulseaudio -k
```

This will kill & immediately restart the Pulseaudio Daemon for that UserID only. Audio should then work.

NOTE: the CIAB installation should have already added the above command to the system /etc/skel/.profile "skeleton" template file so all future users created in the ciab-cn1 Desktop system will automatically have this configured for them so audio will work on first login.*

References

Note: Each project has their own specific open source license



1) [Apache Guacamole](#) Apache Guacamole is a *clientless remote desktop gateway*.

It's called *clientless* because *no plugins or client software are required!*

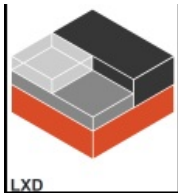
Thanks to HTML5, once Guacamole is installed, all you need to access your **CIAB Remote Desktop** is a web browser.



2) [boschkundendienst - Github Guacamole with Docker-Compose](#) Create a fully working Apache Guacamole (including Tomcat9, NGINX, PostgreSQL) instance using Docker (Docker-Compose).



3) [Pieces/Excerpts from "Easy install xRDP w Pulseaudio support on Ubuntu"](#)



4) [LXD - linux containers](#) LXD is a next generation System Container & Virtual Machine (VM) manager



LXD

r/LXD

5) [LXD Sub-Reddit - moderated by Brian Mullan](#)