

C4G BLIS V3.8 DEPLOYMENT GUIDE










This document details the steps for deployment of C4G BLIS V3.8 in the digital Ocean account.

Assumption: The user has a digital ocean account with a project already set up. A domain is registered for the application as well.

STEP 1 : Chose a region (preferably closer to the country location)

infrastructure.







Choose Region

 New York	 San Francisco	 Amsterdam
 Singapore	 London	 Frankfurt
 Toronto	 Bangalore	 Sydney

STEP 2 : Choose an Image (Select Ubuntu)

Choose an image

OS Marketplace Custom images

 Ubuntu	 Fedora	 Debian	 CentOS	 AlmaLinux	 Rocky Linux
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Version

22.10 x64 ▼

STEP 3: Choose droplet type (Select Basic)

Choose Size

Need help picking a plan? [Help me choose](#)

Droplet Type

SHARED CPU	DEDICATED CPU			
<div>Basic</div> <div>(Currently selected)</div>	General Purpose	CPU-Optimized	Memory-Optimized	Storage-Optimized

Basic virtual machines with a mix of memory and compute resources. Best for small projects that can handle variable levels of CPU performance, like blogs, web apps and dev/test environments.

STEP 4: Choose CPU option

CPU options

☒ Regular
Disk type: SSD

☐ Premium Intel
Disk: NVMe SSD

☐ Premium AMD
Disk: NVMe SSD

<div>\$6/mo</div> <div>\$0.009/hour</div> <div>1 GB / 1 CPU</div> <div>25 GB SSD Disk</div> <div>1000 GB transfer</div>	<div>\$12/mo</div> <div>\$0.018/hour</div> <div>2 GB / 1 CPU</div> <div>50 GB SSD Disk</div> <div>2 TB transfer</div>	<div>\$18/mo</div> <div>\$0.027/hour</div> <div>2 GB / 2 CPUs</div> <div>60 GB SSD Disk</div> <div>3 TB transfer</div>	<div>\$24/mo</div> <div>\$0.036/hour</div> <div>4 GB / 2 CPUs</div> <div>80 GB SSD Disk</div> <div>4 TB transfer</div>	<div>\$48/mo</div> <div>\$0.071/hour</div> <div>8 GB / 4 CPUs</div> <div>160 GB SSD Disk</div> <div>5 TB transfer</div>	<div>\$96/mo</div> <div>\$0.143/hour</div> <div>16 GB / 8 CPUs</div> <div>320 GB SSD Disk</div> <div>6 TB transfer</div>
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STEP 5: Choose the Method to access the console

Choose Authentication Method ?

☐ SSH Key
Connect to your Droplet with an SSH key pair


☒ Password
Connect to your Droplet as the "root" user via password

Create root password *

Type your password...

PASSWORD REQUIREMENTS

STEP 6: Review the finalize details

Quantity Deploy multiple Droplets with the same configuration.	Hostname Give your Droplets an identifying name you will remember them by.
<div> <div>—</div> <div>1 Droplet</div> <div>+</div> </div>	<input type="text" value="ubuntu-s-1vcpu-1gb-ams2-01"/>
Tags <input type="text" value="Type tags here"/>	
Project <div>  first-project </div>	

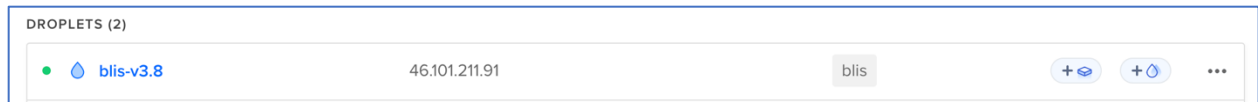
STEP 7: Good practice to add tag as shown below

Finalize Details	
Quantity Deploy multiple Droplets with the same configuration.	Hostname Give your Droplets an identifying name you will remember them by.
<div> <div>—</div> <div>1 Droplet</div> <div>+</div> </div>	<input type="text" value="BLISV3.8-Ubuntu"/>
Tags <div> <input type="text" value="BLIS"/> <input type="text" value="Type tags here"/> </div>	
Project	

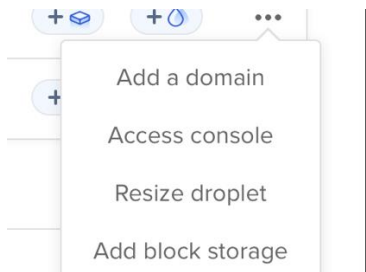
STEP 8: Create Droplet by pressing the blue button at the end

CREATE VIA COMMAND LINE	<div>Create Droplet</div>
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STEP 8: Droplet creation might take a few minutes. You should be able to see the provisioned droplet in the home page under Droplets like shown below



STEP 9: Review the menu by clicking the dots at the end of the droplet. Chose Access Console and login with root and the password you selected. Or use the SSH method to login



STEP 10: Console view

```
cloud.digitalocean.com
Welcome to Ubuntu 22.10 (GNU/Linux 5.19.0-23-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Sun Feb 26 00:24:40 UTC 2023

System load: 0.64404296875   Users logged in: 0
Usage of /: 6.8% of 24.06GB   IPv4 address for eth0: 46.101.211.91
Memory usage: 19%           IPv4 address for eth0: 10.19.0.5
Swap usage: 0%              IPv4 address for eth1: 10.114.0.2
Processes: 94

0 updates can be applied immediately.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

root@blis-v3:~#
```

STEP 11: next steps are to set up the Linux machine. Run the following command:

```
curl https://raw.githubusercontent.com/C4G/BLIS/master/docker/bootstrap.sh |  
bash
```

STEP 12: Run the commands for update and installing docker compose. **Please check if Docker compose is already set up. If it is set up you can skip this step.**

```
sudo curl -L  
"https://github.com/docker/compose/releases/download/1.29.2/docker-compose-  
$(uname -s)-$(uname -m)" -o /usr/local/bin/docker-compose
```

```
root@blis-v3:~# sudo curl -L "https://github.com/docker/compose/releases/download/1.29.2/docker-c  
s)-$(uname -m)" -o /usr/local/bin/docker-compose  
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current  
                                 Dload  Upload   Total   Spent    Left   Speed  
  0     0    0     0    0     0      0      0  --:--:-- --:--:-- --:--:--    0  
100 12.1M 100 12.1M    0     0 47.8M      0  --:--:-- --:--:-- --:--:-- 47.8M  
root@blis-v3:~#
```

STEP 13: Provide permission to run docker compose.

```
chmod +x /usr/local/bin/docker-compose
```

STEP 14: Now we are ready to install BLIS solution. Run command below to pull down the git release version

```
git clone https://github.com/C4G/BLIS.git
```

```
root@blis-v3:~# git clone https://github.com/C4G/BLIS.git  
Cloning into 'BLIS'...  
remote: Enumerating objects: 12731, done.  
remote: Counting objects: 100% (840/840), done.  
remote: Compressing objects: 100% (429/429), done.  
remote: Total 12731 (delta 411), reused 757 (delta 385), pack-reused 11891  
Receiving objects: 100% (12731/12731), 116.42 MiB | 17.58 MiB/s, done.  
Resolving deltas: 100% (5865/5865), done.  
root@blis-v3:~#
```

STEP 15: change directory to docker folder and run docker compose to bring the containers up

```
cd BLIS/docker  
docker-compose up -d
```

```

root@blis-v3:~/BLIS/docker# docker-compose up -d
Creating network "docker_default" with the default driver
Creating volume "docker_blis-data" with default driver
Creating volume "docker_blis-files" with default driver
Creating volume "docker_blis-apache2" with default driver
Creating volume "docker_blis-letsencrypt" with default driver
Pulling db (mysql:5.7)...
5.7: Pulling from library/mysql
e048d0a38742: Pull complete
c7847c8a41cb: Pull complete
351a550f260d: Pull complete
8ce196d9d34f: Pull complete
17febb6f2030: Pull complete
d4e426841fb4: Pull complete
fda41038b9f8: Pull complete
f47aac56b41b: Pull complete
a4a90c369737: Pull complete
97091252395b: Pull complete
84fac29d61e9: Pull complete
Digest: sha256:8cf035b14977b26f4a47d98e85949a7dd35e641f88fc24aa4b466b36beecf9d6
Status: Downloaded newer image for mysql:5.7
Pulling app (ghcr.io/c4g/blis:latest)...
latest: Pulling from c4g/blis
bdec8b63443a: Pull complete
26372d544197: Pull complete
5bfd1a80ce62: Pull complete
357f2a7fa360: Pull complete
b29324bfa7b7: Pull complete
5ba5441dca37: Pull complete
0b1fc1415be8: Pull complete
c1d491f3b904: Pull complete
bd15de8d8797: Pull complete
b664430e5920: Pull complete
de287c25c4d9: Pull complete
02646b0fa301: Pull complete
2815e62f249a: Pull complete
Digest: sha256:145d94fe78d0498b2cale5edff3c1411932b547e01272333b8479c991a0e2281
Status: Downloaded newer image for ghcr.io/c4g/blis:latest
Creating docker_db_1 ... done
Creating docker_app_1 ... done
root@blis-v3:~/BLIS/docker#

```

STEP 16: BLIS should be up. Identify the IP address from the console like the one below
Bring up the application on the browser. [http://\[your droplet IP address\]/](http://[your droplet IP address]/)

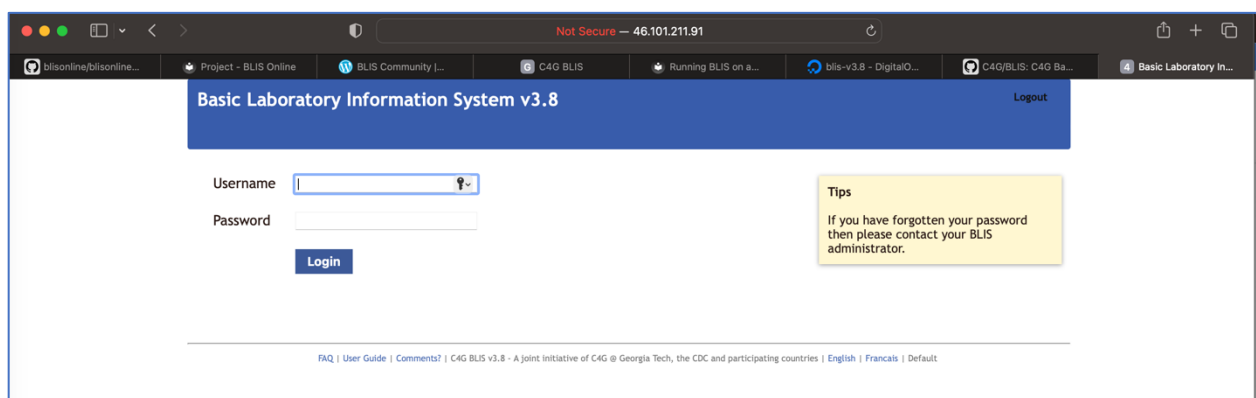


ipv4: 46.101.211.91

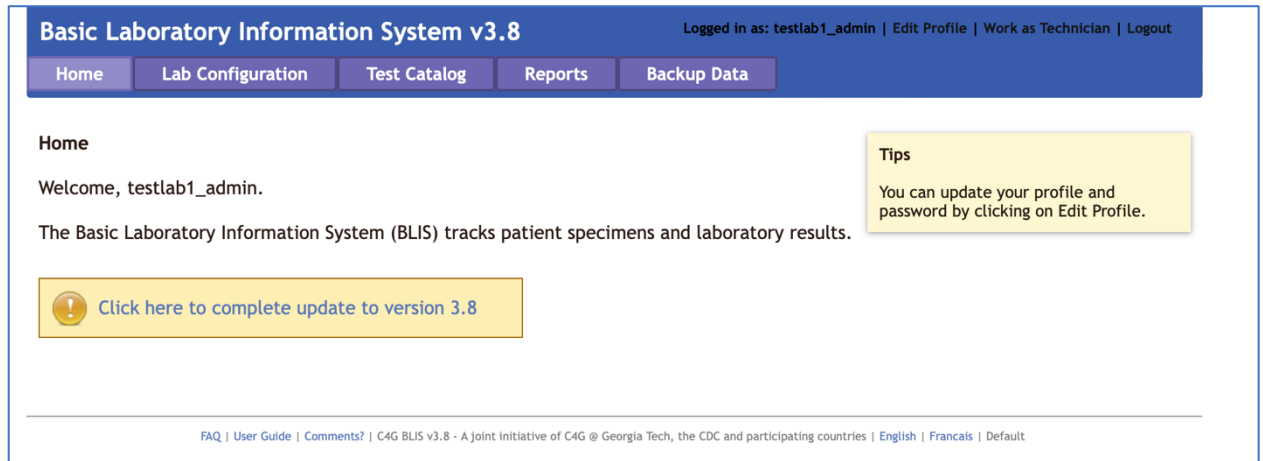
ipv6: [Enable now](#)

Private IP: 10.114.0.2

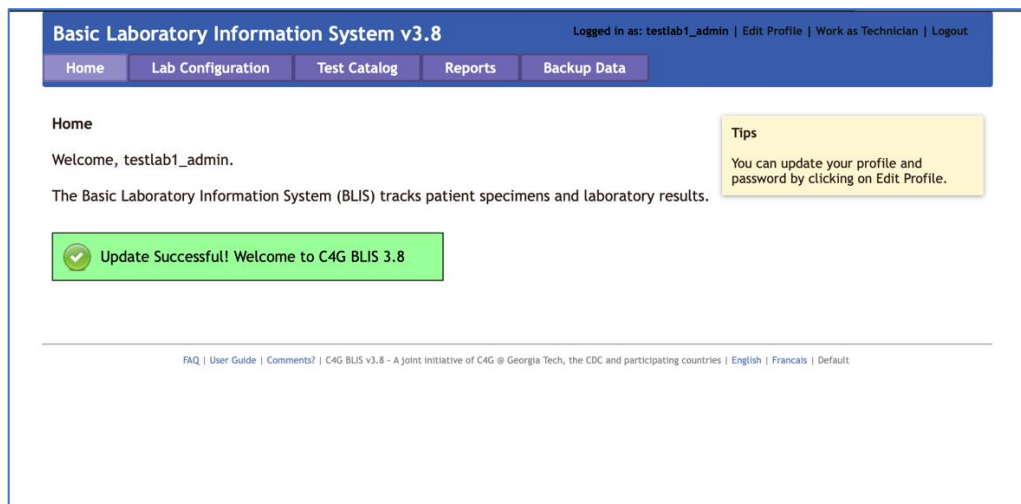
Reserved IP: [Enable now](#)



STEP 17: Please login using the credentials: testlab1_admin/admin123 (as admin) or testlab1_tech1, testlab1_tech2/tech123 (as lab technician).



STEP 18: Once logged in, you should see the ‘click here to complete update to version 3.8’ button on the screen. Please click to update to the latest version.



STEP 19: Update to https for the server URL by adding the certificate. For this step, there should be a **domain registered**. Use the following link to attach the domain to the droplet IP address. <https://docs.digitalocean.com/products/networking/dns/quickstart/>

After your domain is pointing to your BLIS host IP address

You will need to add the BLIS_SERVER_NAME to the **docker-compose.yml** configuration: Open the file in the cd BLIS/docker file and update the variable after removing the comment.

```
#####
# This file is an example docker-compose file for deploying BLIS to a cloud provider
#
services:
  app:
    # This image is automatically built and pushed from the GitHub action in .github/workflows/ folder
    image: ghcr.io/cig/blis:latest
    # build: ...
    environment:
      DB_HOST: 'db'
      DB_PORT: '3306'
      DB_USER: 'root'
      DB_PASS: 'blis123'
      # BLIS_SERVER_NAME: '[YOUR DOMAIN HERE]'
    depends_on:
      - db
    volumes:
      - blis-files:/var/www/blis/files
      - blis-apache2:/etc/apache2/sites-available
      - blis-letsencrypt:/etc/letsencrypt
    ports:
      - "80:80"
      - "443:443"
  db:
    image: mysql:5.7
    command: --default-authentication-plugin=mysql_native_password --innodb-strict-mode=OFF --sql-mode=""
    restart: unless-stopped
    volumes:
      - blis-data:/var/lib/mysql
      - type: bind
        source: ./database
        target: /docker-entrypoint-initdb.d
    environment:
      MYSQL_ROOT_PASSWORD: blis123
volumes:
  blis-data:
  blis-files:
  blis-apache2:
  blis-letsencrypt:
```

STEP 20: Then, (re)start BLIS:

if BLIS is running

\$ docker-compose down

bring the database container up first and daemonize it

\$ docker-compose up -d db

bring the app container up alone, synchronously, so we can see the output

\$ docker-compose up app

Make sure there are no errors in the output. The container will attempt to read the value of BLIS_SERVER_NAME and set the appropriate ServerName directive in the Apache2 web server configuration and a message will say that it is successful.

Assuming it is successful, you can quit with Ctrl-C and restart as a background process (docker-compose up -d app).

STEP 21:

In a separate terminal window, while BLIS is running, run the script:

docker-compose exec app get-https-cert.sh

This will verify the environment configuration seems correct and execute the certificate tool for you! Answer the questions about the domain to the best of your knowledge.

Once the domain is verified and the certificate installed, you can visit your BLIS instance with an <https://> URL and hopefully it just works!

This completes the installation. Thank you!!!

SMOKE TEST

(LOGIN TO THE APP AND RUN THE FOLLOWING TEST FOR VALIDATION)

Workflow Test

- Workflow1: [Register Specimen] [admin login]
 - In Manager Mode:
 - Update specimen and test visibility in lab configuration
 - Add new specimen/test types
 - In Technician Mode:
 - Register a new patient
 - Register a new specimen type
 - Switch to the Results tab
 - Navigate to Single Specimen Results
 - search the patient's name
 - enter the results
 - Navigate to Verify Results
 - Verify the results entered
 - In Manager Mode:
 - Switch to Reports tab
 - Navigate to Patient Report
 - Search for the patient
 - Generate the report
 - Navigate to Daily Log

- Generate daily logs

Specimen Type Test

Please follow the steps below to enable tests for a specimen type:

First, go to the Lab Configuration page and enable the specimens and tests that should be visible:

Basic Laboratory Information System v3.8 Logged in as: testlab1_admin | Edit Profile | Work as Technician | Logout

Home Lab Configuration Test Catalog Reports Backup Data

Summary Tests Specimen/Test Types Target TAT Results Interpretation Search Reports Results Sites Inventory Barcode Settings Billing User Accounts Registration Fields Doctor Registration Fields Modify Language Setup Local Network BLIS Online External Interface Revert To Backup

Page Help

Specimen/Test Types

Specimen Types Hide

Specimen Types		
<input type="checkbox"/> Aspirate	<input type="checkbox"/> CSF	<input type="checkbox"/> Dried Blood Spot
<input type="checkbox"/> Nasal Swab	<input type="checkbox"/> Plasma	<input type="checkbox"/> Plasma EDTA
<input type="checkbox"/> Rectal Swab	<input type="checkbox"/> Semen	<input checked="" type="checkbox"/> Serum
<input type="checkbox"/> SKIN	<input type="checkbox"/> Sputum	<input checked="" type="checkbox"/> Stool
<input type="checkbox"/> Throat Swab	<input type="checkbox"/> U/S	<input checked="" type="checkbox"/> Urine
<input type="checkbox"/> V/S	<input checked="" type="checkbox"/> Whole Blood	

Test Types Hide

Test Types		
<input checked="" type="checkbox"/> AFB	<input type="checkbox"/> Alb	<input checked="" type="checkbox"/> Alkaline Phosphatase
<input checked="" type="checkbox"/> ALT/SGPT	<input checked="" type="checkbox"/> Amylase	<input checked="" type="checkbox"/> ASLO
<input type="checkbox"/> ASOT (Streptococcal)	<input checked="" type="checkbox"/> AST/SGOT	<input type="checkbox"/> Bleeding Time (BT)
<input type="checkbox"/> Blood filaria	<input type="checkbox"/> Blood Type (ABO/Rh)	<input type="checkbox"/> Blood Urea Nitrogen
<input type="checkbox"/> C-Reactive Protein	<input type="checkbox"/> Calcium	<input type="checkbox"/> CD4
<input type="checkbox"/> Chlamydia	<input type="checkbox"/> Chloride	<input type="checkbox"/> Clotting Time (CT)
<input type="checkbox"/> CO2 Bicarbonate	<input type="checkbox"/> Conjugated/Direct Bilirubin	<input type="checkbox"/> Creatine Kinase
<input type="checkbox"/> Creatinine	<input type="checkbox"/> CSF	<input type="checkbox"/> Culture

Then, go to Test Catalog tab and edit the required specimen:

Basic Laboratory Information System v3.8 Logged in as: testlab1_admin | Edit Profile | Work as Technician | Logout

Home Lab Configuration Test Catalog Reports Backup Data

Specimen Types Test Types

Page Help

Specimen Types | Add New

1.	Aspirate	Edit
2.	CSF	Edit
3.	Dried Blood Spot	Edit
4.	Nasal Swab	Edit
5.	Plasma	Edit
6.	Plasma EDTA	Edit
7.	Rectal Swab	Edit
8.	Semen	Edit
9.	Serum	Edit
10.	SKIN	Edit
11.	Sputum	Edit
12.	Stool	Edit

Enable the tests that needed to be mapped for this specimen:

Basic Laboratory Information System v3.8

Logged in as: testlab1_admin | Edit Profile | Work as Technician | Logout

Home

Lab Configuration

Test Catalog

Reports

Backup Data

Edit Specimen Type | Cancel

Name

Stool

Description

-

Compatible Tests

Stool Analysis

Name *

Stool

Description

Compatible Tests * [?]

☒ AFB

☐ Alb

☒ Alkaline Phosphatase

☒ ALT/SGPT

☐ Amylase

☒ ASLO

☐ ASOT (Streptococcal)

☐ AST/SGOT

☐ Bleeding Time (BT)

☐ Blood filaria

☐ Blood Type (ABO/Rh)

☐ Blood Urea Nitrogen

☐ C-Reactive Protein

☐ Calcium

☐ CD4

☐ Chlamydia

☐ Chloride

☐ Clotting Time (CT)

☐ CO2 Bicarbonate

☐ Conjugated/Direct Bilirubin

☐ Creatine Kinase

☐ Creatinine

☐ CSF

☐ Culture

☐ Cytobacteriologic Examination of

☐ Erythrocyte Sedimentation

☐ Examen

Now you can see the tests:

Basic Laboratory Information System v3.8

Logged in as: testlab1_admin | Edit Profile | Work as Manager | Logout

Home

Registration

Results

Search

Inventory

Backup Data

Page Help

Specimen Registration | Accession No. 20230208-2 | Cancel

Patient Number *

2

Specimen Type *

Stool

Tests *

☐ AFB

☐ Alkaline Phosphatase

☐ ALT/SGPT

☐ ASLO

☐ Stool Analysis

Lab Receipt Date *

08

02

2023

(dd)

(mm)

(yyyy)

Physician

Dr.

Enter physician's name

Name

Wert

Gender

M

Age

34 Years

Date of Birth

1989-02-08 (approximate)

* Mandatory Field

Smoke Test is concluded.