# **C4G BLIS Documentation**

None

C4G BLIS

None

# Table of contents

1. C4G BLIS	3
2. Contributing	4
2.1 About the documentation	4
2.2 Making Local Changes	4
2.3 Deployment	4
3. Frequently Asked Questions	5
4. Developer documentation	9
4.1 C4G BLIS Developer Guide	9
4.2 Adding Localized Strings	17
4.3 Database & Backup Structure	19
4.4 Work in progress	20
5. User guide	21
5.1 Introduction	21
5.2 Getting Started	22
5.3 Running BLIS on a Cloud Provider	25
5.4 Migrating labs to Cloud	31
5.5 Director Overview	37
5.6 Manager Overview	40
5.7 Technician Overview	64
5.8 Glossary	72
5.9 Experimental: BLIS Cloud Command-Line Interface	73

# 1. C4G BLIS

C4G Basic Laboratory Information System is a collaboration between Computing-for-Good (C4G) at Georgia Tech, the Center for Disease Control (CDC), and participating PEPFAR countries.

- BLIS Home Page
- BLIS User Guide
- BLIS Developer Guide
- BLIS GitHub Repo

You may download a copy of this documentation at this link: C4G BLIS Documentation

# 2. Contributing

# 2.1 About the documentation

The documentation is generated by mkdocs and mkdocs-material using GitHub Actions. They use markdown for composition.

# 2.2 Making Local Changes

If you are using the devcontainer-based setup, you have everything you need. If you are running locally, and you have Python installed, you should run:

\$ pip install -r requirements.txt

Then you can run:

\$ mkdocs serve

To see your documentation changes locally.

# 2.3 Deployment

Deployment is handled by our GitHub Action, so once you make a pull request to the repository and it is merged, the documentation will be updated.

# 3. Frequently Asked Questions

#### 3.0.1 Q: I'm using BLIS for Windows and everytime I try to run the executable, it crashes! What's going on?

A: Ensure that the zipped files from the Runtime.zip are extracted directly into the BLIS directory. They should not remain in a Runtime folder.

#### 3.0.2 Q: I am trying out BLIS. How do I login?

A: Please login using the credentials: testlab1\_admin/admin123 (as admin) or testlab1\_tech1, testlab1\_tech2/tech123 (as lab technician).

# 3.0.3 Q: How do I look up a patient in our system?

A: Navigate to the Registration tab and search for the patient by name, number, or ID.

Basic La	boratory Infor	mation Sy	stem v3.8	Logged in as: testlab1_admin   Edit Profile   Work as Manager   Logout		
Home	Registration	Results	Search	Inventory	Backup Data	
Patient Lo	ok-up					Page Help

This page allows us to register new patients or lookup existing patients based on name, patient ID or number.

Patient Name	<ul> <li>Contains</li> </ul>	$\sim$		Search

#### 3.0.4 Q: How do I add a new patient?

A: To add a new patient, navigate to the Registration tab. Do not enter anything into the search bar and click 'Search'. You will see an option to add new patient appear. Click the link to proceed.

Basic La	boratory Infor	mation Sy	Logged in as: testla	Logged in as: testlab1_admin   Edit Profile   Work as Manager   Logout		
Home	Registration	Results	Search	Inventory	Backup Data	
						Page
Tips						
This page a Patient Lo	allows us to register ok-up	r new patients	or lookup exi	sting patients ba	sed on name, patie	nt ID or number.
Patient Nam	e 🗸 Contains 🗸	Jane Doe		Search		
			_			
No match	n found - Name Jane I	Doe				
lf not this i	name ' <mark>Jane Doe</mark> ' Ad	ld New Patient	»)			

| English | Francais | Default

#### 3.0.5 Q: How do I add a new Specimen to a patient?

A: After pulling open the patient's profile, click the 'Register New Specimen' hyperlink on the righthand side.

	oratory Infor							
Home	Registration	Results	Search	Inventory	Backup [	Data		
atient Prof	ile   « Back							
Name		Doe				Register New Specimen		
<u>Name</u> <u>Gender</u>	John M	Doe				- · ·		
Gender						Register New Specimen Update Profile		
<u>Gender</u> Age	M 55 Ye		mate)			- · ·		
	M 55 Ye	ars	mate)			Update Profile		

#### Test History

Type \$	Lab Receipt Date \$	Status ¢	٥	٥	Φ.	٥
Stool	22-03-2022	Completed	Details	Report	Delete	Print Barcode
Whole Blood	22-03-2022	Completed	Details	Report	Delete	Print Barcode
Whole Blood	22-03-2022	Removed	Details	Report	Retrieve	Print Barcode

#### 3.0.6 Q: How do I change the language of BLIS?

A: You can change the language to either the English or French version by clicking on the preferred language in the footer menu.

Basic La	boratory Infor	mation Sy	stem v3.8	Logged in as: testlab1_admin   Edit Profile   Work as Manager   Logout											
Home	Registration	Results	Search	Inventory	Backup Data										
Home						Tips									
Welcome, t	estlab1_admin.					You can update your profile and password by clicking on Edit Profile.									
The Basic L	aboratory Informat	ion System (B	LIS) tracks pat	tient specimens a	The Basic Laboratory Information System (BLIS) tracks patient specimens and laboratory results.										

BLIS has several language options to cater to a diverse community, and we're still working to implement our changes in all of them! Thank you for your patience.

3.0.7 Q: I'm logged in as an admin user but I want to work as a lab technician. How do I switch to the technician interface?

A: The Work as Technician option can be selected from the top right side of the header next to the logout button.

FAQ | User Guide | Comments? | C4G BLIS v3.8 - A joint initiative of C4G @ Georgia Tech, the CDC and participating cou

Basic La	boratory Informat	: pette_admin1   Edit Profile   Work as Technician   Jogout										
Home	Lab Configuration	Test Catalog	Reports	Backup Data								
Home					Tips							
Welcome, p	pette_admin1.				You can update your profile and							
The Basic L	aboratory Information Sy	stem (BLIS) tracks	patient specir	nens and laborator	y results.							

# 3.0.8 Q: What are the different lab tests that BLIS can be used for?

A: The lab tests that BLIS can be used for are configured by your administrator, so they vary from lab to lab. Check with you local administrator for more information.

### 3.0.9 Q: How do I add new BLIS users to the system?

A: An administrator can add new users. The types of users can also be configured. To add a new user, you must be logged in as an administrator. Go the the *Lab Configuration* tab and select the User Accounts option (from this page you can also add new user types, e.g. technicians or administrators. Click on *Add New Account* and fill out the form that pops up to add a new user. Be sure to click the Add button, not Close at the bottom of the form. permissions.

Basic Lal	ooratory	Inform	ation System v3	Logged in as:	: pette_admin1	Edit Profile	e   Work as Technician   Lo	
Home	Lab Conf	figuration	Test Catalog	Reports	Backup Data			
Summa	ary							Page Help
Tests		User Ac	counts Add New Aco	count				
Search								
Report	s	#	Username	Туре				
Results	5	1.	pette_admin1	Lab Ma	nager	Edit	Delete	
Sites		2.	sidney	Lab Teo	chnician	Edit	Delete	
Invento	ory	User Ty	pes   Add New User T	уре				
Barcod	le Settings	Level	Туре		Default			
Billing		1.	Lab Technician		Yes	Edit	Delete	
User A	ccounts	2.	Lab Manager		No	Edit	Delete	

# New Lab User

* Mandatory Field Username *				]	
Temp Password *				]	
Type *	LIS_TECH_RO		~		
Writeable Options	Patient Registration	Test Results	Sea	rch Invento	Backup Data
*	Y	Υ	Υ	Y	Y
Name				]	
Email				]	
Phone No.					
Language Display Name at Results Entry?	Default		~	,	
(	Add				
					CLOSE 🗙

# 4. Developer documentation

# 4.1 C4G BLIS Developer Guide

C4G Basic Laboratory Information System is a collaboration between Computing-for-Good (C4G) at Georgia Tech, the CDC, and participating PEPFAR countries. This doc will works as a supplement to <code>BLIS\_User\_Guide.pdf</code>, mainly to help developers quick ramp up on this repo and list out tips when contribute to this project.

- C4G BLIS Developer Guide
- Welcome
- Set up the dev envs
- Tools
- Test the envs
- Smoke tests
- Running environment
- Running on devcontainer
- Running on Windows
- Code directory and organization
- Developer tools directories
- Docker related
- Github related
- Composer Related
- Source code directories
- Backup Data and Cloud Backup
- UI changes
- Deployment
- Deployment video

# 4.1.1 Welcome

So welcome to this project! In this guide, we are going to go through the recommended tools, workflows and debug tips.

### 4.1.2 Set up the dev envs

#### Tools

1. git Depending on your computer OS, there will be different step to setup git. You can refer to the official manual for git installation.

#### thps on install git

On Windows, installing command-line tools can be done with a Windows package manager such as Scoop. On MacOS or Linux systems, installing tools can be done with package manager brew.

- 1. VScode For IDE, we recommended using VSCode, which is a lightweight, opensource IDE. VSCode-Extension recommended to install:
- Remote-Containers
- Remote-WSL
- Docker
- Docker-compose
- 2. Docker We will need Docker as the major tool in the development cycle.

With the Docker application running, after installing the Remote-Containers and related extensions, we will be able to start the devcontainer which has been setup under /root/.devcontainer directory.

# What's devcontainer and why do we use it here?

Devcontainers are a feature of Visual Studio Code that allow you to specify your development environment as a Docker container develop inside of it as if you were running the tools on your computer directly.

The c4g-blis-spr22/BLIS repository has a .devcontainer configuration already specified, so you can develop BLIS on any computer that can run Docker and Visual Studio Code.

#### Test the envs

A quick way to test the dependencies installed correctly is: 1. Clone the BLIS repository to your computer:

\$ git clone https://github.com/C4G/BLIS.git

4.1.2 Set up the dev envs

- 1. Open the folder in Visual Studio Code
- 2. A pop-up that says something like "This folder contains a devcontainer configuration" will appear. Click the button to open the folder in a container.
- 3. If that does not appear, open the command palette (Ctrl-Shift-P or Cmd-Shift-P) and find "Open folder in container" and select the BLIS folder.

D	>remote	
>	Remote-Containers: Rebuild and Reopen in Container	recently used
ŧ	Remote-Containers: Open Folder in Container	ર્ફેટ્રેટ
1	Remote: Install Remote Development Extensions	

4. Once the container is started, the ports should forward automatically. You can see apache2 running if you click the "Ports" tab on the bottom (if the bottom panel is not open, use Ctrl-` (backtick) to open it)

In this plot, you can see the terminal output, where the apache servers starts.

•••		cocker-compose ym wonspace [Dev Comaner]	
Ð	EXPLORER ····	🐄 script_elems.php 👒 search_p_dyn.php 👒 lab_config_home.php 🛶 docker-compose.yml × 👒 delete_patient.php	> ↔ (>) []] …
_	~ WORKSPACE [DEV CONTAINER] 口口の	.devcontainer > 🗇 docker-compose yml	
Q	✓ .devcontainer	7 context: ""	Seguriter
	{} devcontainer.ison	8 # Overrides default command so things don't shut down after the process ends.	Carrier Carrows and Carrows
0	docker-compose.yml	9 command: sleep infinity	
<b>2</b> 3	✓ Dockerfile	10 # Runs app on the same network as the database container,	
	> .github	11 # allows "forwardPorts" in devcontainer.json function.	
à	> bin	12 network_mode: service:db	
	> docker	$13 \lor  $ depends_on: 14   - db	
в		14   - 00 15 \volumes:	
	> files	16/workspace:cached Mitchell Rysavy, 3 weeks ago • Disable innodb strict mode	
	✓ htdocs	17	
Lo	> ajax	18 # Use "forwardPorts" in ***devcontainer.json** to forward an app port locally.	
	> api	19 # (Adding the "ports" property to this file will not forward from a Codespace.)	
	> assets		
	> barcode	21 v db: 22   image: mysql:5.7	
, and a	> billing	<pre>22 image: mysqList; 23 command:default-authentication-plugin=mysgL native_passwordinnodb-strict-mode=OFFsgL-mode=""</pre>	
	> BLISInterfaceClient	24 restart: unless-stopped	
	> catalog	25 V volumes:	
	✓ config	26   - blis-data:/var/lib/mysql	
	majax_multi.php	27 V - type: bind	
	efield edit.php	28 source: ./docker/database 29 target: /docker-entrypoint-initdb.d	
	erield_new.php	29     target: /docker-entrypoint-initdb.d 30 ∨ environment:	
	in oneid_new.php	31 MYSQL ROT PASSWORD: blis123	
	grouped_report_config.php	32	
	<pre>m glouped_leper_eoning.php</pre>	22 ·····alument	
	<pre>m lab_config_add.php</pre>	PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS 1 GITLENS	$+ \cdot \cdot \cdot \times$
	<pre>m lab_config_addd.php m lab_config_addd.php</pre>		> bash
	<pre>m lab_config_home.php</pre>	Running the postAttachCommand from devcontainer.json	Configuring
		[9481 ms] Start: Run in container: /bin/sh -c sudo service apache2 start	
	🐏 lab_config_new.php	* Starting Apache httpd web server apache2 AH00558: apache2: Could not reliably determine the serve r's fully qualified domain name, using 172.18.0.2. Set the 'ServerName' directive globally to suppress this message	
	🐏 lab_config_status.php	*	
	🐄 lab_configs.php	Done. Press any key to close the terminal.	
8	≣ offline.txt		
	🐄 redirect.php		
22	OUTLINE		
	> TIMELINE		
_ ≻ De	Container \$? leemingee/developer-doc*+ 🗇 🛞 0 🖄	0 № 1 ¢ Mitchell Rysavy, 3 weeks ago Ln 16, Col 29 Spaces: 2 UTF-8 LF	Compose 🕅 🗘

In this plot, you can see the port, click the little earth button and then it will take you to the local hosted BLIS instance.

PRO	BLEMS OUTPUT	DEBUG CO	NSOLE TERMINAL	PORTS	GITLENS		~ ×
	Port		Local Address	$\frown$	Running Process	Origin	
•	apache2 (80)	$\oslash \times$	localhost:55831	fi 🌐 🗔	Process information unavailable	Remote - Containers	
	Add Port						

- 5. You can then browse BLIS in your normal browser by visiting http://localhost:80 (substituting 80 for another port, depending on what port VS Code has mapped to apache2.)
- 6. Log into the BLIS and start your exploration.

Read the data structures site for (username, password) pairs, as well as data structures stored in database before diving in

#### Smoke tests

If you want to run smoke tests on BLIS you can find them in the smoke\_tests folder on the C4G BLIS Github. Below are the tests that are implemented and instructions for running the smoke tests.

Tests 1. Login

- 1. Specimen test
- 2. Registering a patient
- 3. Registering a specimen

Running Instructions 1. You will need python 3 installed, the latest is preferred

- 1. You will need to pip install selenium, if pip is not on your command line you can do python -m pip install selenium
- 2. Create a folder called test or something of that variety to extract your smoke test zip file to
- 3. Extract the zip to that folder
- 4. Ensure you have Firefox installed on the local machine, you will need to also get the gecko driver
- 5. Get the gecko driver from here for your platform you are running the tests on https://github.com/mozilla/geckodriver/releases
- 6. Put the gecko driver into the folder where your tests are running
- 7. Either run BLIS locally or have it installed on digital ocean
- 8. Get the address for your BLIS installation, this is what you put in the address bar in your browser to access BLIS
- 9. Edit the BLIS\_URL in test.py with your address from step 9, so if your address was http://172.24.80.1:4001 that line should now be blis\_url = "http://172.24.80.1:4001"
- 10. Open up command prompt or terminal
- 11. Navigate to the directory with cd
- 12. Run python main.py in your terminal or command prompt
- 13. The testing platform will run and will report back if any tests failed and with any errors or if all the tests ran successfully

#### 4.1.3 Running environment

#### Running on devcontainer

You can see more details on the Test the envs section.

#### **Running on Windows**

Aside by running BLIS on devcontainer, you can also try with running BLIS on Windows, where the BLIS was originally designed and developed on). This process will only require git to pull the code from github.

BLIS was originally developed to run on Windows using a discontinued project called Server2Go. This packages Apache2, MySQL, PHP, and Firefox together into a package that can be run all at once on a desktop computer.

#### Se Also

• Design and Implementation of a Basic Laboratory Information System for Resource-Limited Settings

Server2Go - Portable Web Server

This is the primary way that end-users are still using BLIS. You can still run BLIS this way to develop it.

	Arning
	These instructions are subject to change.
L. Cl	one the BLIS repository to your computer:

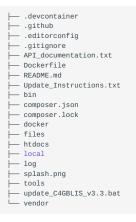
\$ git clone https://github.com/C4G/BLIS.git

- 2. Download the latest version of BLISRuntime.zip archive
- 3. Unzip BLISRuntime.zip into the BLIS repository directory
- 4. Run BLIS.exe

The bundled Firefox will start and you can use BLIS normally, or make changes to files in the htdocs/ directory.

#### 4.1.4 Code directory and organization

As you can see in the directory, there is the first level file tree directory. And in the following sections, we will cover the some of important file/directory for your faster & better understanding about the BLIS code organization.



#### s about file structure

The above tree structure can be generated via the tree command. For more details, read this doc.

#### **Developer tools directories**

DOCKER RELATED

 Dockerfile
 docker
 .devcontainer

The above files are mostly for development usage. As mentioned above, we use docker to containize the application and make it easily deployable in Linux platforms. .devcontainer contain the setup for docker setup locally when running in devcontainer; Dockerfile contains the details for pushing image to ghcr.io in the CI/CD stage (Also mentioned in the below **Github related** section). And docker/ directory contains the docker-compose file, bash files for deployment at Linux machine. More details can be seen in the Deployment section below.

GITHUB RELATED

 README.md
 files
 log

```
— .github
— splash.png
```

You will find mostly directory empty (As of April, 2022). And in the .github/ directory, there is a CI/CD step: releasing latest changes to the ghcr.io, thus we can easily deploy the latest changes when needed. You can see more details in release-docker.yml.

```
COMPOSER RELATED
```

```
├── composer.json
├── composer.lock
├── tools
└── vendor
```

Start from Version [TODO], we introduced *Composer* as the php package manager for BLIS. You will need to set it up before using it, see more details here. But this is not necessary till you want to make changes to the BLIS dependencies.

As for the composer.json and composer.lock file, you can refer to this documentation to understand how they work. composer.lock records the exact versions that are installed. So that you are in the same versions with your co-workers. And composer.json records the packages you specify and want to use in the project.

And the vendor directory is where the specified packages installed.

#### Source code directories

After going through the developer tools directories, you will find one few files/directories left.

And among those, the most important two directories are htdocs and local. The htdocs contains almost all the modules in BLIS. And local directory contains the localization versions' settings of phrases, tips, UI appearance. Due to the complexity of this section, few features will be focused for illustration, feel free to add your findings when working on some features.

BACKUP DATA AND CLOUD BACKUP

Cloud backup means you can specify the IP Address and then send backup to the BLIS instance hosted on that IP Address. (More details of UI can be found in User Guide -> Backup Data section).

This functionality mainly lives in ./htdocs/export. The latest changes mainly live in backupData.php and backupDataUI.php. We can refer to specific git commits for better understanding.

#### **UI CHANGES**

UI and tips have been refactored in the version [TODO], and we found out that the UI settings is reflected in both ./htdocs/ Language and local/lab\_id directory. Changes in ./htdocs don't necessary propogate to the local labs. So if you want to your changes to be reflected in both new labs and old existed labs, you will need to change the files in ./local/lab\_id accordlingly.

There may be some confusion on default, en, fr versions across the repo. TLDR is default is the version will be setup by your country directory when setting up the lab, and can be en or fr. To better understand this scenario, let's imagine we are going to change the tips for english version, then potentially, we will make 4 changes (2 for default and en, 2 for local\_lib and htdocs)

#### 4.1.5 Deployment

After you are satisfied with your new changes and want to deploy a newer version BLIS on cloud. In this doc, we will use DigitalOcean for the deployment platform as example. You will go through two main steps:

- 1. Push & merge your changes to github repo. Based on ./github/workflows/release-docker.yml, the newest change will reflect in the ghcr.io/C4G/blis:latest docker repo.
- 2. Use the docker image to deploy BLIS service as well as database service. An step-by-step detailed instruction can be seen in this site

# Deployment Video

Video showing how to deploy the BLIS cloud version, upgrade script and collected survey from the BLIS online team in Spring of 2023



**C**2024-05-03

# 4.2 Adding Localized Strings

If you are adding a new BLIS feature, or modifying the text that is on an existing feature, you probably want to add or change strings.

#### 4.2.1 Files & Directories

BLIS uses XML and PHP files to store strings. These are located in a few places.

```
[root]
   - htdocs/
     - Language/
      - default.xml
       - en.xml
      - fr.xml
      - default.php
      - en.php
      - fr.php
  - local/
    - langdata_[lab ID]/
      - default.xml
      - en.xml
      - fr.xml
      - default.php
      - en.php
      - fr.php
```

#### htdocs/Language Folder

The Language folder is the base template from which all labs are created. When a new lab is created, or a lab is updated, files from this folder are copied to the local/langdata\_ folder.

local/langdata\_[lab ID] Folder

The files in this folder are what is actually used to render the text on the pages that you visit in BLIS. These files are required conditionally depending on what your session's language is set to..

#### 4.2.2 How to Use Localized Strings

Because the logic for requiring the correct language file is handled in db\_lib.php, you must require it in your file if it is not already required (it probably already is.)

require\_once("../includes/db\_lib.php");

Once that is done, you can use the LangUtil class like so:

```
<?php
echo LangUtil::$generalTerms['NAME'];
?>
```

There are several "pages" of localized strings. These sections are organized in the XML file. You can set the current page ID and then use the pageTerms array.

```
<?php
LangUtil::setPageId("stocks");
echo LangUtil::$pageTerms["Reagents"];
?>
```

#### 4.2.3 How to Add or Change a String

It is important to keep the strings in BLIS consistent so we can make it easy to maintain these strings for future generations of contributors.

Here is the process for adding or changing a string:

- 1. In htdocs/Language/, for **each** en.xml, fr.xml, default.xml, add or change the string.
- a. Identify the correct page to place the string under (adding it to "general" is acceptable)
- b. Decide on a name for the string (like CMD\_EXIT, UPDATE\_PATIENT, etc.) and ensure it is not already taken
- c. Add a value for the string
- d. If you don't speak or understand French, judicious use of Google Translate or other services is reasonable. BLIS administrators will be able to change this value.
- 2. Run the update-lang.php utility. This will copy your changes to the corresponding PHP file.
- If you are using the BLIS devcontainer: You can run:

```
vscode@14ba082a42d1:/workspace$ php bin/update-lang.php htdocs/Language/en.xml
Generating PHP file: /workspace/htdocs/Language/en.php
From XML file: /workspace/htdocs/Language/en.xml
Calling: lang_xml2php("en", "/workspace/htdocs/Language/")
Calling: require_once("/workspace/htdocs/Language/en.php") to ensure valid PHP syntax...
```

• If you are on Windows: You can run:

```
C:\Users\c4g\BLIS>server\php\php.exe bin\update-lang.php htdocs\Language\en.xml

Generating PHP file: /workspace/htdocs/Language/en.php

From XML file: /workspace/htdocs/Language/en.xml

Calling: lang_xml2php("en", "/workspace/htdocs/Language/")

Calling: require_once("/workspace/htdocs/Language/en.php") to ensure valid PHP syntax...
```

• Copy all your changes from the htdocs/Language folder to the local/langdata\_ folders.

\$ cp htdocs/Language/en.\* local/langdata\_127/ \$ cp htdocs/Language/fr.\* local/langdata\_127/ \$ cp htdocs/Language/default.\* local/langdata\_127/

# Repeat for local/langdata\_12/, local/langdata\_revamp/
# These folders are distributed with BLIS as test labs.

# 4.3 Database & Backup Structure

Notes as I look into the database and structure of the databases, and the backups generated by the "export" function.

# 4.3.1 BLIS Default Users/passwords

Username	Password	Description
cameroon_dir	dir123	Director's view
testlab1_admin	admin123	Lab admin account
testlab1_tech1	tech123	Lab tech account
testlab1_tech2	tech123	Lab tech account

#### 4.3.2 Database Dumps

In the BLIS download from the website, the MySQL tables are prepopulated with a structure. It's not clear if this can be recreated exactly from the various SQL files available in the data/ directory. So I dumped the databases using DBeaver and here they are:

- blis\_12
- blis\_127
- blis\_revamp

I can use this to seed a container image of BLIS on Linux.

# 4.4 Work in progress

#### 4.4.1 Reference & Satellite Labs

#### Last updated by @mrysav

#### 4.4.2 Use Case: 1 reference lab, 2 satellite labs

- The reference lab admin can create accounts for satellite lab users.
- The reference lab technician can enter results into the reference lab and tag those results as belonging to satellite labs.
- The satellite labs can log in to the reference lab cloud BLIS and view results only for their labs.

```
sequenceDiagram
    participant A as Reference Lab BLIS Cloud
    participant B as Reference Lab Admin
    participant C as Reference Lab Technician
    participant D as Satellite Lab A
    participant E as Satellite Lab B
    B->>A: Creates Account for Satellite Lab A
    B->>A: Creates Account for Satellite Lab B
    D->>C: Send Specimen A for test
    E->>C: Send Specimen B for test
    C->>A: Log in as Reference Lab Technician and Enter Test Result for Specimen B
    D->>A: Log in as Satellite Account A
    A->>D: Can ONLY view result for Specimen A
    E->>A: Log in as Satellite Account B
    A->>E: Can ONLY view result for Specimen B
```

#### 4.4.3 Data Model (in progress)

```
classDiagram
BLISCloud <-- Lab
BLISCloud <-- UserAccountType
BLISCloud <-- UserAccount
UserAccountType <-- UserAccount
class BLISCloud {
    }
    class Lab {
        - Contains specimens and test results specific to a particular lab
    }
    class UserAccountType {
        - List of permissions
    }
    class UserAccount {
        - Has access to specific lab or labs
    }
</pre>
```



# 5. User guide

# 5.1 Introduction

The Basic Laboratory Information System (BLIS) is a freeware Web-based system that can be installed in a local, district, or national laboratory. It is a tool that can help to standardize data, which improves the ability to run useful reports and can both give a realistic picture of laboratory services and assist with staff and budget planning. With enough data, BLIS can be used to track disease prevalence over time.

# Reatures of BLIS

• One-time entry of each unique patient

• Standardization of data collected (allowable entries for specimen type, test type, patient data, reagents are set at MOH level and then entered consistently throughout a country)

- Customization to a country's needs
- Ability to track lab supplies such as test kits, reagents
- Ability to run reports as specified by a country
- Automatic alerting of data values that may be out of range(reference ranges and panic values are set at the regional or national level)
- Daily logs to be reviewed for data verification
- Simple data backup to a zipped file
- [NEW] BLIS running on a cloud provider
- [NEW] Manual data backup to a version of BLIS running on a remote server
- [NEW] Ability to view statistics for tests reported quantitatively. e.g., how many test results for calcium are in the range of 0.5 to 1
- [NEW] Ability to print results in bulk

As with any properly implemented electronic record system, BLIS may be found over time to improve data accuracy and reduce costs in laboratories.

#### Benefits seen in labs using BLIS

- Reduced burden for technicians, as results are available soon after testing
- Improved consistency of data entry
- Ability to view patient history and track samples
- Ability to aggregate data and analyze data patterns and trends at a regional or national level
- Printed patient records in place of handwritten records
- Printed daily logs that make the reports look like the paper forms used in the laboratory

# 5.2 Getting Started

There are three versions of BLIS that currently exist.

Firstly, **BLIS on Windows** was the original version developed for end-users. Stand-alone versions, updates, and packaged content are still publicly available on the C4G BLIS home page, accessible here.

Secondly, **BLIS on the Cloud** is a newly deployed version of BLIS that is capable of running on a Cloud Provider, and was originally intended to be used as an online backup database for aggregating country-wide data for analysis.

#### Estallation Instructions for BLIS on the Cloud

For instructions on installing BLIS on the Cloud, please see the article on Running BLIS on a Cloud Provider.

Thirdly, **BLIS in a Devcontainer** is an instantiation of BLIS that allows for developers to specify the development environment, and is intended to be used by developers only.

#### **R**stallation Instructions for BLIS in a Devcontainer

For instructions on installing **BLIS in a Devcontainer**, please see the Developer Documentation.

#### **BLIS For Windows**

BLIS was originally developed to run on Windows using a discontinued project called Server2Go. This packages Apache2, MySQL, PHP, and Firefox together into a package that can be run all at once on a desktop computer. BLIS on Windows is the primary way that end-users are using BLIS, but can and should be used by developers to test updates.

#### **O**riginal BLIS Windows Setup Instructions

These instructions are carried over from a previous version of the user guide. If you are setting up BLIS for the first time, you should ignore these.

If using a server and router, plug in the router first.

- Set up and turn on the server PC and its monitor.
- Navigate to the BLIS home page and select Download
- Save the files to a hard drive.
- Open the BLIS folder on the desktop and double click on BLIS.exe. Wait for a dialog box to appear on the screen. Choose Yes from the two options. The application will be installed automatically and the full login screen will appear.
- This completes installation for a single computer. For networked computers, we recommend setting a static IP address for the network.
- Ensure that the computer is on the network.
- Copy the file *BlisSetup.html* to the computer
- Double click *BlisSetup.html* to install BLIS on the networked computer.
- Wait for the login screen. If the full screen with username, password, and login does not appear, check the URL on the server and make sure they are the same.

INSTRUCTIONS FOR INSTALLATION

1. Navigate to the C4G BLIS home page.

2. Click on the **Download** tab in the top menu bar, then click **Download BLIS v3.8 Complete**.

3. Follow all instructions on the Download page.

#### Starting BLIS

- 1. Double-click on the BLIS.exe file.
- 2. A page requesting login information will appear. Enter in the user's login credentials.

Basic Labo	Basic Laboratory Information System v3.8							
Username Password	Login	Tips If you have forgotten your password then please contact your BLIS administrator.						
	FAQ   User Guide   Comments?   C4G BLIS v3.8 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countrie	s   English   Francais   Default						

#### Stopping BLIS

- 1. After the session is complete, click the **Logout** button in the top right pane of the screen.
- 2. A popup window will appear where the user can rate their experience with C4G BLIS and write any comments they may have. After entering any feedback, press the **Submit** button to fully logout. Alternatively, press **Skip** to logout immediately without providing any feedback. Press **CLOSE** to cease logging out.

Basic La	boratory Informat	3.8	Logged in	as: testlab1_ad	min   Edit Profile   Work as Technician   Logout	
Home	Lab Configuration	Test Catalog	Reports	Backup Data		
,	testlab1_admin. aboratory Information St FAQ   User Guide   Comr	<ul> <li>○ 1. Highly</li> <li>○ 2. Some</li> <li>③ 3. Neith</li> <li>○ 4. Unsat</li> <li>○ 5. Highly</li> </ul>	, satisfactory what satisfactor er satisfactory n	perience with BLIS y for unsatisfactory		Tips You can update your profile and password by clicking on Edit Profile.
		Submit	Skip	.1	CLOSE 🗙	

### 5.2.1 Overview of Roles in BLIS

There are three roles in BLIS.

Firstly, **Directors** (also referenced to as country directors) are a role held by a single individual at the management level of each country. The roles of Directors are to oversee many laboratories using BLIS, summarize data trends from uploaded patient data from across the country, and work with C4G developers to provide user feedback for future versions of BLIS.

Secondly, **Managers** (also referenced as admin users) are the managerial supervisors of laboratories. The roles of Managers are to maintain the user permissions to individual labs and alter individual lab configurations as needed.

Thirdly, Technicians are the majority of BLIS users. The role of Technicians is to enter in and verify patient data.

# 5.3 Running BLIS on a Cloud Provider

#### Running BLIS in the cloud is still a new process and there may be issues.

#### 5.3.1 Quick Version



If you are not using Ubuntu, or you want to install BLIS manually, follow the instructions below.

#### 5.3.2 Manual Instructions

#### **Creating a Droplet**

If you need additional help or feel like something is missing you may want to look at the Digital Ocean droplet documentation but below are instructions to get you running.

- 1. Signup for Digital Ocean and start creating a droplet
- 2. Choose a region (preferably closest to the country location)

Choose	Region
--------	--------

New York	San Francisco	Amsterdam
Singapore	🗱 London	Frankfurt
Toronto	Bangalore	Sydney

1. Select the latest LTS version of Ubuntu (20.04 LTS, 22.04 LTS, etc)

# Choose an image

•Ç	Ð	$\bigcirc$		<b>\$</b>	
				-	
Jbuntu	Fedora	Debian	CentOS	AlmaLinux	Rocky Linux
on					
0 x64		~			

#### 1. Select the basic droplet type

Choose Size			Need help pickin	g a plan? Help me choose 🖸
Droplet Type				
SHARED CPU		DEDICA	ATED CPU	
Basic (Currently selected)	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.

# 1. Choose the regular 6 a month or equivalent in your local currency CPU type

Regular     Disk type: SSD	0	Premium Intel Disk: NVMe SSD		nium AMD	
\$ 6/mo	\$ <b>12</b> /mo	\$ <b>18</b> /mo	\$ <b>24</b> /mo	\$ <b>48</b> /mo	\$ <b>96</b> /mo
\$0.009/hour	\$0.018/hour	\$0.027/hour	\$0.036/hour	\$0.071/hour	\$0.143/hour
1GB/1CPU	2 GB / 1 CPU	2 GB / 2 CPUs	4 GB / 2 CPUs	8 GB / 4 CPUs	16 GB / 8 CPUs
25 GB SSD Disk	50 GB SSD Disk	60 GB SSD Disk	80 GB SSD Disk	160 GB SSD Disk	320 GB SSD Disi
1000 GB transfer	2 TB transfer	3 TB transfer	4 TB transfer	5 TB transfer	6 TB transfer

1. Choose password for you authentication method, make sure to store this password somewhere.

Conn	Key ect to your Droplet with	an SSH key p	bair	•	Passwor Connect		plet as the	"root" us	er via passwor	rd
Create roo	t password *									
Type you	ir password		SQ.							
PASSWORD	REQUIREMENTS									
ize the do	etails		Hostname							
ize the do	etails iple Droplets with the sa	ame	Hostname Give your Droplets a	ın identify	ving name ;	vou will ren	ember the	em by.		
ize the do Quantity Deploy multi	etails iple Droplets with the sa	ıme +				/ou will ren	ember the	em by.		
ize the de Quantity Deploy multi configuration	etails iple Droplets with the se		Give your Droplets a			vou will ren	ember the	em by.		

# 1. Add BLIS to the Tags section

1.

Quantity			Hostname
Deploy mul configuration	tiple Droplets with the s on.	ame	Give your Droplets an identifying name you will remember them by.
-	1 Droplet	+	BLISV3.8-Ubuntu
Tags			
BUS TV	pe tags here		

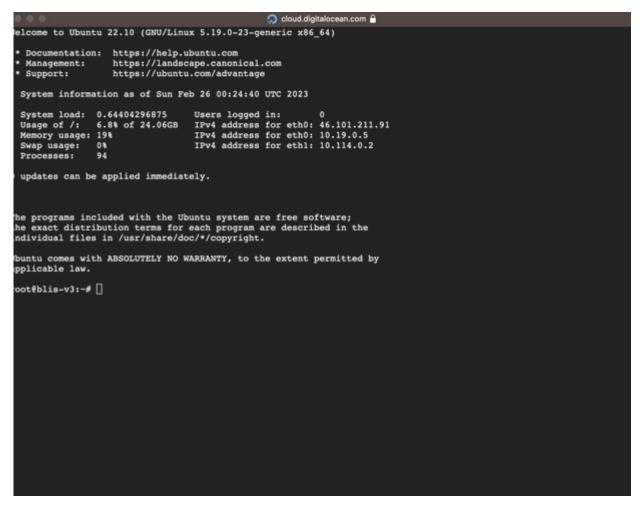
1. Create droplet by pressing the blue "Create Droplet" button, this may take a few minutes. Once it is complete it will be shown on the home page under droplets.



DROPLETS (2)					
• 💧 blis-v3.8	46.101.211.91	blis	+0	+0	

Installing Docker

1. To login to your droplet click on the three dots at the end of the droplet on the home page and choose "Access console" or use SSH to login. The login will be root and the password you created for your droplet earlier. The console will look something like this.



1. Run this to install docker

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

1. Check if docker-compose is installed. You can check this by running docker-compose if it is **not installed** you should see something like this

Command 'docker-compose' not for sudo apt install docker-compose the above run this command			If you see something like
<pre>sudo curl -L "https://github.com/docker/compose/release</pre>	s/download/1.29.2/docker-compose-\$(uname	-s)-\$(uname -m)" -o /usr/loc	al/bin/docker-compose
oun this command to allow decker compass to a			

1. Run this command to allow docker compose to run

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

Now you're ready to run BLIS!

#### Running BLIS

#### 1. Install python3-pip:

\$ sudo apt-get install -y python3-pip

#### 2. Install the BLIS Cloud CLI

\$ pip3 install git+https://github.com/C4G/blis-cloud-cli.git

#### 3. Ensure Docker is installed correctly:

blis docker status

#### You should get something like this:

root@ubuntu-s-1vcpu-1gb-nyc0-00:~# blis docker status Docker is accessible? Yes Docker Compose is installed? v2

4. Install BLIS:

blis install

These commands will set up two containers:

- 1. The app container: This contains all of the BLIS source code, as well as the Apache2 web server and PHP 5.6 runtime.
- 2. The db container: This contains the MySQL 5.7 database.

#### 5.3.3 Accessing BLIS

Now, BLIS should be running. You can access it by visiting a URL that looks like:

http://[your droplet IP add	ress]/			
blis-v3.8 in sfirst-project /	1 GB Memory / 25 GB Disk / FRA1	- Ubuntu 22.10 x64		
ipv4: 46.101.211.91	ipv6: Enable now	Private IP: 10.114.0.2	Reserved IP: Enable now	c

Substitute your droplet IP address above, you should have this from your console.

#### 5.3.4 Upgrading BLIS

When you want to upgrade BLIS, you can follow these commands to pull the latest version of the Docker image and restart the containers:

blis update

And that's it!

#### 5.3.5 Adding an HTTPS certificate to BLIS

By default, BLIS will only communicate over HTTP on port 80 (see docker/docker-compose.yml for the full port configuration.)

BLIS includes support for automatically retrieving and configuring a certificate from Let's Encrypt for communicating over HTTPS. However, you must already have a domain configured and pointing at the host you are running BLIS on. **This process is not included in this guide.** If you are using DigitalOcean, there is a guide you can use as a jumping-off point here.

#### After your domain is pointing to your BLIS host IP address

You will need to add the  ${\tt BLIS\_SERVER\_NAME}$  to the docker-compose.yml configuration:

```
services:
app:
    # This image is automatically built and pushed from the GitHub action in .github/workflows/ folder
    image: "ghcr.io/C4G/blis:latest"
    environment:
    DB_HOST: 'db'
    DB_PORT: '3306'
    DB_USER: '[blis database user here]'
    DB_PASS: '[blis database password here]'
    # Add or uncomment this line, and change the domain value to your own
    BLIS_SERVER_NAME: 'blis.mydomain.com'
```

#### 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, syncronously, 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).

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!

#### 5.3.6 Troubleshooting

1. There maybe a error when you call docker-compose API, the error will show similar to:

```
root@blis-test:~/BLIS/docker#docker-compose
-bash: /usr/local/bin/docker-compose: Permission denied
```

Using a chmod +x /usr/local/bin/docker-compose will help the work.

# 5.4 Migrating labs to Cloud

- 1. Upgrade your labs to version 3.8 from C4G BLIS web page.
- 2. Open your Firefox browser.
- 3. Set up BLIS on cloud if not already done. You can follow the Running BLIS on a Cloud Provider guide for instructions.
- 4. Go to the Digital Ocean hosted BLIS webpage. Example: http://142.93.49.10/login.php
- 5. Now either create encrypted or unencrytped backups using the steps below.

#### 5.4.1 Encrypted lab backup

1. Go to the url http://digital-ocean-blis-host/ajax/download\_key.php?role=dir to download the public key needed to encrypt the backup. Example: http://142.93.49.10/ajax/download\_key.php?role=dir

💩 Basic Laboratory Information Syster X 🔹 📦 New Tab X +		~	-	٥
C Q. 142.93.49.10/ajax/download_key.php?role=dir     A				
🚸 Getting Started 🗋 HDFC 🗋 Ubuntu 🗋 LeetCode 🗋 DSA, References 🗋 ML 🗋 Shopping 🗋 System, Design 🗋 Software Paradigms 🗋 Masters 🗋 @GATicch 🗋 DevOps - Tools and Fr. 🖶 TP-Link 🖶 The music of silence				۵
	Show all downloads			
<b>iii</b> Firefox				

- 2. Next, inorder to create an encrypted backup of the local lab:
- a. Navigate to the **Backup Data** tab.
- b. Upload the public key dowloaded in the previous step.

Basio	c Labo	oratory Informat	ion System v3	3.8	Logged in as:	onlLab_admin	Edit Profile   Work as Technician   Logout
Hom	ie	Lab Configuration	Test Catalog	Reports	Backup Data		
Backu		otion key: New key	~				
		Key alias: onl_dir		**			Tips
	Choose	e key file:	Browse	.]			Select the receiver who should be able
	Туре о	of backup:      General     General     Anonym	i Backup Nized Backup				to revert this backup. 'Current Lab' will create backups that can be reverted on
		Backup	nzeu buenup				this lab for current instance of BLIS. If the receiver you have selected does
					×		not exist in the system, you will be
							prompted to upload their public key. The public key can be obtained by
This PC →	Download	s > BLIS	5 V		د النظام الح	ancais   Default	contacting the receiver. Public Key is a . .blis file and can be obtained by lab
lder					- 🛄 📀		managers under the lab configuration ->
^ Name			Date modified	Туре	Size		Manage Backup Keys -> Download Public Key option.
	AB_dir_pub	key.blis	09-01-2023 11:21	BLIS File			
< <					<b>````</b>		
e name: LAI	B_dir_pubk	ey.blis		All Files (*.*)	<u> </u>		
				Open	Cancel .::		

c. Click on  ${\bf Backup}$  and save the .zip encrypted backup.

5.4.2 Unencrpyted lab backup

- 1. Navigate to the **Lab Configurations** tab.
- 2. In the left side panel, click Manage Backup Keys.
- 3. Click Disable Encrypted Backups.
- 4. Now, navigate to the **Backup Data** tab.
- 5. Click on  ${\bf Backup}$  and save the .zip encrypted backup.

5.4.3 Importing the backup onto cloud

1. Now the country Director can upload this lab's encrypted backup onto cloud:

- a. Login onto http://digital-ocean-blis-host/login.php as a Director.
- b. Navigate to Lab Configurations.
- c. Click on Import Lab Data and upload the encrypted lab backup.

Basic La	boratory Informat	Logged in as: cameroon_dir   Edit Profile   Logout			
Home	Lab Configurations	Lab Managers	Test Catalog	Report	ts
Back I Im	port Lab Data				
					Tips
lect back	up zip file Browse No fil	e selected.			Click on browse and select the backup file to import.
	ALL user account, speci				backup.
e very ca	reful with this option! Y	ou will lose access t	o ALL lab data otl	ner than what	at you are importing!
mport					
d					×
↑ 📑 ז	`his PC → Downloads → BLIS		✓ <sup>0</sup> , Sea		
New fol	der			<b>I</b> II <b>-</b> I	III (2)
Name		Date modified	Туре	Size	
🕌 blis_backu	ıp_20230109-190304_enc.zip	10-01-2023 00:33	Compressed (zipp	2,104 KB	
					ntries   English   Francais   Default
File	<u>n</u> ame: blis_backup_20230109-190	)304_enc.zip	~ All Files	(*.*)	
				en Ca	

d. Upon successfully importing the lab you will see something like this:

Basic La	boratory Informati	Logg	ed in as: cameroon_dir   Edit Profile   Logout			
Home	Lab Configurations	Lab Managers	Test Catalog	Reports		
< Back   In	nport Lab Data					Tips
Select back	kup zip file Browse blis_b	ackup_20230109-190304	_enc.zip			Click on browse and select the backup file to import.
	ALL user account, special reful with this option! You	/ 5				nporting!
Import						
💽 The	file was imported succes	sfully!				

FAQ | User Guide | Comments? | C4G BLIS v3.8 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francais | Default

# e. And in the **Lab Configuration** tab you would see:

Basi	c Laboratory Informati		Logged in as: cameroon_	_dir   Edit Profile   Logout		
Hom	ne Lab Configurations	Lab Managers	Test Catalog	Reports		
Lab C	onfigurations   Add New Lab	Import Lab Data   E	Oownload Public	Кеу		
Lab Ba	ackups					
#	Facility		Location	Lab Manager	Last Import Date	
1.	Lab Import on 2023-01-09 by came	roon_dir		admin_1	2023-01-09 19:03:33	Lab Status
Lab C	onfig Templates					
#	Facility		Location	Lab Manager		
1.	FONDATION SOCIALE SUISSE, HD P	ETTE	MAROUA	pette_admin1	Export Lab Config	uration

FAQ | User Guide | Comments? | C4G BLIS v3.8 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francais | Default

#### 2. The new admin created for the newly imported lab can login using the default credentials using C4G BLIS in the cloud.

# 5.5 Director Overview

The Director role allows a user to control some components at a country level. This is organized into tabs, as with the other interfaces.

### Lab Configurations

In the **Lab Configurations** tab, the Director can view lab backups that have been imported. A list of the different lab configurations is also displayed, along with links to export each of these lab configurations. This allows a Director to setup a lab configuration in advance and then export it for a new lab to import to streamline the process.

To setup a new lab configuration, click the button to add a new lab. This walks the user through four steps to setup site information, technicians, base configuration, and test types.

Basic La	boratory Informatio	Logged in a	s: cameroon_dir   E	dit Profile   Logout				
Home	Lab Configurations	Lab Manager	s Test Cat	alog	Reports			
New Lab C	onfiguration   Cancel							
	1: Site Informat	ion						
	Facility * Location * Country * Lab Manager *	Cameroon						
	🖙 Back							Next ⇒
	Step 1: Site Info	rmation	Step 2: Technicians		Step 3: Base Config		Step 4: Test Types	

It is possible to add Technicians during this setup process, but note that additional Technicians can be added later. During setup of the base configuration, an existing lab configuration can be selected from the dropdown menu to use as a base. During the next step, test can be imported from an existing facility by selecting it from the dropdown menu. As with the other steps, the configuration can be further customized later from the **Lab Configuration** tab when logged in and work as a Manager.

Clicking on the name of a facility takes the user to the **Lab Configuration** view, with all the same options available in the Manager view, plus three additional menu options: **General Settings**, **Change Manager**, **Delete Configuration**, and **Import Configuration**. For information on the other menu options and how they work, please go to the Manager Lab Configuration section. Each of the additional options are covered here.

The **General Settings** option allows the Director to change the name or location of a facility. Additionally, the user can populate the database with random data or clear randomly populated data. The **Change Manager** option is self-explanatory. This option allows the Director to select a user from the dropdown menu as the new Lab Manager. The **Delete Configuration** menu option should be used with caution. This allows the Director to delete an entire lab configuration. Please use this with caution!

## Arning

After a Lab Configuration is deleted, it cannot be recovered. Please take caution when proceeding with deleting a lab configuration.

Another functionality available on the **Lab Configuration** tab is importing lab backups. Lab Managers can perform backups and send the backups to the Director. To import a lab backup from the **Lab Configuration** tab, select **Import Lab Data**. Browse to find the zipped backup provided by the lab, and click the import button. A confirmation message will display indicating that the backup was successful or an error message if there is something wrong with the backup.

If the backup is encrypted, it can only be unencrypted with the correct key. If an encrypted backup is desired, first download the public key and share it with the lab. To do this, click the button to download a public key. It will get saved in the local computer's downloads folder by default. Send this file to the lab that is going to perform the backup. The Lab Manager can use the public key to export an encrypted backup from the Backup Data tab, and then share the zipped backup folder with the user, which can be imported as described above.

### Who else can edit Lab Configurations?

Lab Configurations can also be set by Lab Managers. Click here for more details.

#### Lab Managers

Under the **Lab Managers** tab, the Director can add, edit, or delete Lab Managers. Click **Edit** on an existing manager to change the name, email address, phone number, or language of a manager, or to reset the managers password.

### Note

Directors cannot edit/reset passwords for Technicians. Navigate to the **User Accounts** menu option in the **Lab Configurations** tab from the Manager view to edit/reset passwords for Technician accounts.

#### **Test Catalog**

The Test Catalog tab allows the Director to add country-wide specimens and tests.

#### Reports

The **Reports** tab allows the Director to build reports for some or all of the labs that are under the country's management. The aggregate reports work much as the aggegrate reports do within the Manager view, with two additional options to select a specific test and select which facilities should be included in the report. There is also a menu option to configure some of the aggregation settings (e.g. age ranges) for the reports.

#### EXPORT TO EXCEL

The process for exporting to and Excel spreadsheet is identical for the director as it is for a lab manager, however, the director can select which lab among those they have access to thatthey want to generate the report for.

onfiguration	ns 💦 Lab Mana	agers	Test Catalo	g	Reports						
35	Export to Ex	Export to Excel									
Aggregate	From	26 (de	02 - 2023 d) (mm)	(уууу)							
e	То	(de	(mm)	(уууу)			_				
:gate Report	Facility	Testlab1									
	Test Type	Hepatitis B Surface Antigen Hepatitis C Antibodies HGB HGB Electropherosis HIV DNA PCR HIV EIA HIV Monitoring Panel Press and hold the "Ctrl" key to select multiple tests.									
	Options	<ul> <li>✓ Include patient name</li> <li>✓ Include patient birth date</li> <li>✓ Include patient sex</li> </ul>									
		Export									

Q | User Guide | Comments? | C4G BLIS v3.9 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francai:

\$2024-05-03

# 5.6 Manager Overview

The manager interface allows the Manager to do the following:

- 1. Add, edit, and delete users
- 2. Change the laboratory configuration settings in the Lab Configuration tab in the top menu bar
- 3. Generate and print reports in the **Reports** tab in the top menu bar

### Manager Lab Configuration

The laboratory configuration can be changed by Managers or admin users of BLIS. Here, Lab Managers can change how reports are generated, what patient data is collected, as well as various other settings. In general, laboratory settings are usually initialized by the Country Director, but can be modified to suit individual labs' needs.

### SUMMARY

The **Summary** page displays information about the laboratory. Specific information includes the Facility Name, Location, Lab Manager, available Specimen Types, available Test Types, and Technician Accounts allocated to the specific laboratory.

Basic Laboratory	Information Sys	tem v3.8	Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logout			
Home Lab Con	figuration Test C	atalog Reports	Backup Data			
	1					
Summary			Page Help			
Tests	Summary					
Search						
Reports	Facility Name	Testlab1				
Results	Location	GT				
Sites	Lab Manager	testlab1_admin				
Inventory	Specimen Types	Aspirate CSF				
Barcode Settings		Dried Blood Spot Nasal Swab				
Billing		Plasma Plasma EDTA				
User Accounts		Rectal Swab Semen				
Registration Fields		Serum SKIN				
Doctor		Sputum Stool				
Registration Fields		Throat Swab U/S				
Modify Language		Urine V/S				
Setup Local Network		Whole Blood				
BLIS Online	Test Types	AFB Alb				
External Interface		Alkaline Phosphatase ALT/SGPT				
Revert To Backup		Amylase				
		ASLO ASOT (Streptococcal)				
Manage Backup Keys		AST/SGOT Bleeding Time (BT)				
Export		Blood filaria Blood Type (ABO/Rh)				
Configuration		Blood Urea Nitrogen C-Reactive Protein				
		Calcium				

#### TESTS

The **Tests** page has a drop down menu that opens up to reveal three different options: **Specimen/Test Types**, **Target TAT**, and **Results Interpretation**.

Specimen/Test Types

The **Specimen/Test Types** page allows the Lab Manager to set the specimen and test types as appropriate for their country. Click **Show** to reveal hidden panes and **Hide** to close the panes. Check the box for each specimen type collected or test done at this facility, and click **Submit** to save.

Basic La	boratory	Informat	ion System v3	Logged in as: te	Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logout			
Home	Lab Confi	iguration	Test Catalog	Reports	Backup Data			
Summ	arv					Page Help		
Tests		Specimen	/Test Types			Page netp		
-Spec Types	imen/Test	Specimen	Types Hide					
-Targe	t TAT	English	an Turner					
	-Results Interpretation		Specimen Types			Dried Blood Spot		
Search	h	□ Na	sal Swab	Plasma		Plasma EDTA		
Repor	ts	Re	ctal Swab	Semen		Serum		
Result	3	□ ѕк	IN	Sputum		Stool		
Sites		Th	roat Swab	□u/s		Urine		
Inven	tory	□v/	S	Whole	Blood			
Barco	de Settings							
Billing								
User A	Accounts	Test Types	Hide					
Regist	ration Fields	Test Ty						
Docto Regist	r ration Fields	AF	-		Alb	Alkaline Phosphatase		

#### Target TAT

The **Target TAT** page displays turnaround times for tests. To enter or change turnaround time, click **Edit**. The number and unit (such as "24 hours") change to a text field and a drop-down list. Enter the desired number and choose **Hours** or **Days**. When finished, click the **Submit** button to save changes, or **Cancel** to discard changes. These options are below the list.

sic Labor	atory Informa	tion System v3	3.8	Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logo				
ome L	ab Configuration	uration Test Catalog Reports		Backup Data				
Summary					Page Help	)		
Tests	Target T	AT   Edit						
-Specimen	/Test							
Types	Test Type	•		Turnar	ound Time			
-Target TA	T AFB	AFB			2 Days 0 Hours 0 Minutes			
-Results	Alb	Alb			1 Days 0 Hours 0 Minutes			
Interpreta	tion Alkaline P	Alkaline Phosphatase			1 Days 0 Hours 0 Minutes			
Search	ALT/SGPT			1 Days 0 Hours 0 Minutes				
Reports	Amylase	Amylase			1 Days 0 Hours 0 Minutes			
	ASLO			1 Days 0 Hours 0 Minutes				
Results	ASOT (Str	ASOT (Streptococcal)			1 Days 0 Hours 0 Minutes			
Sites	AST/SG0	г		1 Days	0 Hours 0 Minutes			
Inventory	Bleeding 1	Time (BT)		1 Days	0 Hours 0 Minutes			

**Results Interpretation** 

The **Results Interpretation** page allows the Lab Manager to specify the interpretation for multiple ranges of values for each test type. To view or edit an existing test's result, choose the test type from the drop-down list and click the **Search** button. The current interpretation appears. Edit using the text boxes.

To add a new range to the list, click the **Add Another** link and enter data in the text boxes. Click the **Submit** button to save changes, or **Cancel** to discard them.

Basic La	boratory Informat	ion System v3	.8	Logged in as: to	estlab1_admin   Edit Profile   Work as Technician   Logout
Home	Lab Configuration	Test Catalog	Reports	Backup Data	

Page Help

### « Back | Results Interpretation

Test Type	AFB	✓ Search
	AFB	
	Alb	
	Alkaline Phosphatase	
	ALT/SGPT	
	Amylase	
	ASLO	initiative of C4G @ Georgia Tech, the CDC and participating countries   English   Francais   Default
	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	~

#### SEARCH

The **Search** page allows the Lab Manager to configure what results are displayed for each patient when a search is executed. It also permits changing how many results are displayed on each page.

Basic La	boratory	Informat	ion System v3	.8	Logged in as: testlab1_admin	n   Edit Profile   Work as Technician   Logout			
Home	Lab Conf	iguration	Test Catalog	Reports	Backup Data				
Summ	ary					Page Help			
Tests		Configure Fields for search results							
Searc	h								
Repor	ts	Patien	t Number		Patient's Age				
Result	ts								
Sites		Number of	Results Per Page:	20 ~					
Inven	Inventory								
Barco	de Settings	Oublink							

#### REPORTS

The **Reports** page has a drop down menu that opens up to reveal seven different options: **Infection Report**, **Test/Specimen Grouped Reports**, **Daily Report Settings**, **Enable/Disable Test Reports**, **Test Report Configuration**, **Worksheet**, and **Order Patient Fields**.

# Which users can create reports?

Previous functionality of BLIS permitted Technicians to create reports. Currently, creating reports is a functionality only available to Managers and Directors.

#### Infection Report

The **Infection Report** page generates an aggregate report of laboratory test results for a particular period for one or all lab sections. The tests listed in the report are the ones checked to include on the **Specimen/Test Types** page. Click **Edit** to make changes to the details reported. When finished, click **Submit** button to save changes, **Preview** to view the report, or **Cancel** to discard changes.

lome Lab Conf		uration	Test Catalog	Reports	Backup Data	
ome			lest catalog	Reports	Dackup Data	
Summ	hary					Page Help
Tests		Informion	Report   Edit			
Searc		mection	Report   Edit			
Repor						
		Group	By Gender	Yes		
	ction Report		By Age	Yes		
	/Specimen ped Reports	Age Ra	ange (Years)	0-10 10-20	0 20-50 50-100	
-Daily	Report	FACSC	ount	CD4 0-150	0 1500-3000	
Settin				CD8 0-90		
	ole/Disable Reports			CD4/CD8	>1-	
	Report guration	ALT/S	GPT	0-1000 10	01-2000	
-Work	ksheet	Urine	Analysis	No range con	figuration required.	
-Orde Fields	er Patient	Stool	Analysis	No range cont	figuration required.	
Result	ts	Alkalin	e Phosphatase	0-1000		
Sites		<u> </u>				
Inven	tory	Amyla	se	0-1000		
Barco	de Settings	AST/S	GOT	0-1000		
Billing	g	HGB		0.5-25		
User /	Accounts			0.0 20		

Test/Specimen Grouped Reports

The **Test/Specimen Grouped Reports** page allows the Lab Manager to set the **Test Count (Grouped) Report** settings and the **Specimen Count (Grouped) Report** settings. Click **Edit** to change settings. When finished, click the **Submit** button to save changes, or **Cancel** to discard changes.

Basic La	Basic Laboratory Information System v3.8					Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logout			
Home	Lab Conf	iguration	Test Catalog	Reports	Backup Data				
Summ	ary					Page Help			
Tests		Test/Spec	imen Count Group	ed Reports	Cancel				
Search	h								
Repor	ts								
-Infec	tion Report	Group		Grouped) Repor	t Settings:				
	Specimen oed Reports	Section							
	Report	Group Gende		No					
Settin				No					
Test R	le/Disable Reports Report	Age Ra (Years)		4 - 9 - 39 39	9 - 14 14 - 44 44 - 49	19     19     24     24     29     29       49     54     54     59     59     -			
	guration	Counts	to O All registe						
-Work	sheet	Display Only completed tests Both completed and pending tests (separated by a slash)				by a dash)			
-Order Fields	r Patient					u by a stastij			
Result	s	Group Gende	By	unt (Grouped) I No	Report Settings:				
Sites		Group	By Age  () Yes ()	No					
Inven	tory	Age Ra (Years)	• L <u> </u>	4 - 9	9 - 14 14	- 19 19 - 24 24 - 29 29			
Barco	de Settings	(rears)	64 64	- 39 39	- 44 44 - 49	49 - 54 59 59 -			
Billing			Add Another	30					
User /	Accounts		Submit						
Regist	tration Fields								

Daily Report Settings

The **Daily Report Settings** page sets the layout of the **Patient Report**, **Daily Log - Specimens**, and **Daily Log - Patients**. Use the drop-down to select the report type, then click **Search**. Check or un-check boxes to show or hide patient, specimen, and test information. If desired, the Lab Manager can upload a .jpg logo file to appear on the report. When finished, click the **Submit** button to save changes, or **Cancel** to discard changes. These options are below the list.

Basic La	Basic Laboratory Information System v3.8					as: testlab1_admin	Edit Profile	Work as Technician   Logout
Home	Lab Conf	iguration	Test Catalog	Reports	Backup Data			
Summ	ary							Page Help
Tests		Test/Spec	imen Count Grouj	ed Reports	Cancel			
Search	h							
Repor	ts		/					
-Infec	tion Report	Group		Grouped) Repor	rt Settings:			
	Specimen ed Reports	Section		NO				
		Group Gende	·	No				
-Daily Settin	Report Igs	Group		No				
Test R	le/Disable leports Report	Age Ra (Years)		4 · 9 - 39 39 - +	9 - 14 14 - 44 44 - 49		24 24 54 59	- 29 29 59 -
	guration	Counts						
-Work	sheet	Display	Only com	pleted tests				
	r Patient		⊖ Both com	pleted and pen	ding tests (separat	ed by a slash)		
Fields			Specimen Co	unt (Grouped)	Report Settings:			
Result	s	Group Gende	/ eles C	No				
Sites		Group	By Age	No				
Inven	tory	Age Ra (Years)	- L <u>-</u>	4 9	9 - 14 14		24 24	- 29 29
Barco	de Settings	(rears)	- 34 34 64 64	- 39 39	- 44 - 49	49 - 54	54 - 59	- 59
Billing			Add Another	30				
User A	Accounts		Submit					
Regist	ration Fields							

Enable/Disable Test Results

The **Enable/Disable Test Results** page allows the Lab Manager to enable or disable specific tests. Items on the left side are disabled; move the test items to the right side to enable them. When finished, click the **Submit** button to save changes, or **Cancel** to discard changes.

Basic La	boratory	Informat	ion System v3	.8	Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logout			
Home	Lab Conf	figuration Test Catalog		Reports	Backup Data			
Summ Tests Search	-	Enable/Di	sable Test Reports			Page Help		
-Test/ Group -Daily Settin <b>-Enab</b>	tion Report Specimen ed Reports Report Igs Ie/Disable	AST/S Bleedir Blood f	ee (Streptococcal) GOT ng Time (BT)	<ul> <li>A</li> <li>A</li> <li>A</li> </ul>	Ikaline Phosphatase	< >		
-Test Config	Reports Report guration sheet			< : Submit				

#### Test Report Configuration

The **Test Report Configuration** page allows the Lab Manager to visualize the enabled test configurations. Use the drop-down to select the test type from the enabled test list, then click **Search**. Click **Edit** to edit the configuration of the reported test data. Check or un-check boxes to show or hide patient, specimen, and test information. When finished, click the **Submit** button to save changes, or **Cancel** to discard changes.

#### Worksheet

The **Worksheet** page allows the Lab Manager to create templates for gather patient data in the lab. In lab settings where data are not entered at the point of service, the data entry staff can enter the laboratory's patient information and ordered tests, then print the worksheet so that lab technicians can write test results and other data to be entered into BLIS.

Select the Lab Section and Test Type and click Search to edit the report format. To edit a custom report, click Edit to the right of the report. To create a new custom worksheet, click the Add Custom Worksheet link at the bottom of the list.

Basic La	boratory	Informa	tion System v3	.8	Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logout		
Home	Lab Conf	iguration	Test Catalog	Reports	Backup Data		
Summ	ary				P	age Help	
Tests		Workshe	et				
Search	h						
Repor	ts	Lab Sect	ion All	~			
-Infec	tion Report	Test Type		$\sim$			
	Specimen oed Reports		Search				
	Report	Custom V	Vorksheets Custom	Worksheets			
Settin	-	# N	lame				
	le/Disable Reports	1. 0	HEMISTRY WORKSHEET	-	Edit		
-Test	Report	2. S	EROLOGY WORKSHEET		Edit		
	guration	3. P	ARASITOLOGY WORKSH	EET	Edit		
-Worl	ksheet	4. B	ACTERIOLOGY WORKSH	IEET	Edit		
-Orde Fields	r Patient	5. A	ALARIA WORKSHEET		Edit		
Result	ts	Add Custor	n Worksheet »				

## RESULTS

The **Results** page allows the Lab Manager to edit the parameters displayed in the batch results page. Currently, the editable data is limited to Patient information.

Basic La	boratory	Informat	ion System v3	.8	Logged in as: t	estlab1_admin   Edit Profile   Work as Technician   Logout
Home	Lab Cont	figuration	Test Catalog	Reports	Backup Data	
Summ	ary			Page	Help	
Tests		Batch Res	ults Fields			
Search	h					
Repor	ts					
Result	ts	Patient				
Sites			tient ID tient Number			
Inven	tory	_	lditional ID			
Barco	de Settings	⊡ Ge				
Billing			e			
User A	Accounts	🗹 Da	te of Birth			
Regist	tration Fields	⊠ Na				
Docto Regist	or tration Fields		gistration Date			
Modif	y Language					

SITES

The **Sites** page allows the Lab Manager to add, modify, or remove specimen collection sites to the laboratory records. When first spawning a laboratory, only one site - the default site - will exist.

Additional information about the site can be provided in the textboxes - currently, BLIS supports adding in District and Region information. To add another site, click on the **Add Another** hyperlink at the top and fill in textbox with the new site name, then click **Submit**. To go back, click **Cancel**.

Basic La	boratory	Informat	ion System v3	.8	Logged in as:	testlab1_admin   Edit Profile   Work as Technician   Logout
Home	Lab Conf	iguration	Test Catalog	Reports	Backup Data	
Summ Tests Search Report Result	ary n ts		guration   Add And	Page	e Help	
	de Settings	Region:	Virginia	men 🖲 Yes 🔿	No	
	Accounts ration Fields	Submi	_			

#### INVENTORY

The **Inventory** page is a list of any existing reagents being tracked in BLIS. To add another, click the **Add Item** link above the list and input the name, unit of measurement associated with the reagent, and any miscellaneous remarks about the reagent. After pressing **Submit**, don't forget to add the item's stock. On the **Current Inventory** page, other features include **Log Stock Usage**, **Add Stock**, or **Edit Details**.

Basic Laboratory Information System v3.8						Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logout				
Home	Lab	Configuratio	n	Test Catalog		Reports	Ι	Backup I	Data	
										Page Help
Barcode S	can Sea	arch:		Search						
Add Item	Gener	ate Barcode	s   C	urrent Inventory	,					
Item	¢	Quantity\$	Unit	Update	¢	Add	¢	Edit	\$	
Drinking S	traws	0	100	Log Stock Usage		Add Stock	(	Edit Detail	ls	

BARCODE SETTINGS

The **Barcode Settings** page configures the settings for barcode formats. Click on the **Page Help** for more details. After changing the settings, click **Submit** to save any edits.

Basic La	boratory	Informati	on System v3	.8	Logged in as: t	estlab1_admin   Edit Profile   Work as Technician   Logout
Home	Lab Conf	iguration	Test Catalog	Reports	Backup Data	
Summ	ary		P	age Help		
Tests		Configure	Barcode Format	Settings		
Searc	h	Encoding	Format: code39 🔻			
Repor	ts	Barcode W				
Result	s	Barcode H				
Sites		Text Size:	11 ~			
Inven	tory					
Barco	de Settings	Submit				

### USER ACCOUNTS

The **User Accounts** page shows all the users with access to the system. Here, a Lab Manager can create new user accounts, edit account settings, delete accounts, and monitor account activity.

Click Add New Account to enter a new user.

sic Lal	ooratory	Informa	tion System v3	.8	Logged in as: to	estlab1_admin	Edit Profil	le   Work as Technician   Lo	gout
lome	Lab Confi	iguration	Test Catalog	Reports	Backup Data				
	1								
Summa	ary							Page Help	
Tests		User Acc	counts   Add New Acc	count					
Search		#	Username	Time					
Report	s			Туре					
Results	5	1.	testlab1_tech1		echnician	Edit	Delete		
Sites		2.	testlab1_tech2	Lab T	echnician	Edit	Delete		
Invento	ory	User Typ	oes   Add New User T	уре					
Barcod	le Settings	Level	Туре		Default				
Billing		1.	Lab Technician		Yes	Edit	Delete		
User A	ccounts	2.	Lab Manager		No	Edit	Delete		
Registr	ation Fields	3.	BLIS Super-admi	n	No	Edit	Delete		
Doctor	ation Fields	4.	Country Director		No	Edit	Delete		
		5.	Lab Receptionist	:	Yes	Edit	Delete		
Modify	Language	6.	Lab Receptionist	:	No	Edit	Delete		

Click **Edit** on a user to edit the user account details or to reset password. User Type dictates the access the user has in the system. **Reset Password** allows the Lab Manager or admin user to enter a new password for this user. Click the **Submit** button to save changes, or **Cancel** to discard.

To remove a user account, click the **Delete** link for that user. A confirmation box appears. Click **OK** to complete the deletion, or **Cancel** to keep that user's information.

Basic La	boratory Inforr	nation System v3	.8		Logged in as: to	estlab1_admi	in   Edit Profile   Work as Technician   Logout
Home	Lab Configuratio	n Test Catalog	Rep	orts	Backup Data		
Back  New	Lab User						Tips
Username		testlab1_tech1					Edit user account details or reset
Name		Testlab1 Tech1					password by entering a new one.
Email							
Phone No.							
Language		English	~				
Туре		LIS_TECH_RO	~				
Display Nar	me at Results Entry?	□ Yes					
Reset Passy	vord 🛛						
		Submit Cancel					

### REGISTRATION FIELDS

The **Registration Fields** page shows the configuration of the patient registration page. It allows the Lab Manager to create mandatory fields and hide the fields that are not used, per the country's protocols. It also allows for creation of certain custom fields for patient registration and new Specimen addition which may be needed by certain labs only.

Basic La	boratory	Informat	ion System v3.	8	Logged in as: t	estlab1_admin   Edit	Profile   Work as Technician   Logout
Home	Lab Conf	figuration	Test Catalog	Reports	Backup Data		
Summ	nary						Page Help
Tests		Registratio	on Fields   Edit				· ·
Searcl	h	<b>5</b>					
Repor	ts	Patient	s - Patient ID	In use (Manda	tory field) (allows du	iplicates)	
Result	ts	Patient	s - Additional ID	Not in use			
Sites		Patient	s - Patient Number	In use Reset	: Daily		
Invent	tory	Patient	s - Date of Birth	In use			
Barco	de Settings	Specim	ens - Specimen ID	Not in use			
Billing	g	Specim	ens - Comments	Not in use			
User A	Accounts		ens - Lab Receipt Date	e In use (Manda	itory field)		
Regist	tration	Specim	ens - Referred Out	Not in use			
Fields	S	· · ·	ens - Physician	In use			
Docto Regist	r tration Fields	Date Fo	ormat	d-m-Y			
_	y Language	Reorder Fi	elds				
Setup Netwo	Local ork	Neorder 11					
BLIS C	Online		elds - Specimens   A	dd New[?]			
Exter	nal Interface	No custom	fields exist				
Rever	t To Backup	Custom Fie	elds - Patients   Add	New [?]			
	ge Backup	#	Name		Туре		
Keys		1.	Date of Diagnosis		Date	Edit	

To customize fields, click **Edit** to make changes: check the box to display a field, uncheck to hide. Set fields as required. After editing, click **Update** button below the fields to save changes, Cancel to discard.

To create new fields, choose the **Add New** link for which to add, and enter field name and type. Click **Submit** button to save changes, **Cancel** to discard.

Also, the Lab Manager can customize the order of the registration fields for Patient and Specimen Registration forms.

DOCTOR REGISTRATION FIELDS

The **Registration Fields** page shows the configuration of the patient registration page. There is currently an issue opened to address the duplicity of the previous **Registration Fields** page.

#### MODIFY LANGUAGE

One of the features of BLIS is the ability to toggle between languages. The **Modify Language** page allows the Lab Manager to change the language for a few pages using this option. The pages are listed as a drop-down menu.

Basic La	boratory	Informati	on System v	3.8	Logged in as: t	estlab1_admin   Edit Profile   Work as Technician   Logout
Home	Lab Conf	figuration	Test Catalog	Reports	Backup Data	
Summa Tests Search Report Result Sites Invent Barcoo Billing User A Registr Doctor Registr	hary h ts ts tory de Settings de Settings de Settings de Settings de Settings	Figuration Modify Lan Language	guage	ategory Select Gener Page Login Home Main I Patier Patier Speci Speci Speci Resul Searc Patier Speci Lab C	t t ral Terms Header Footer Page	
Modify Setup Netwo				Test C	lanagers Page Catalog Page Reports Page	•

Select the language and category (type of page or section). Select **Search** button to view or edit the text. When finished, click **Submit** button to save changes, or **Cancel** to discard.

SETUP LOCAL NETWORK

The **Setup Local Page** is an instructional page on how to set up a local network for a hospital or laboratory. Please access it from BlisSetup.html in the main folder, then enter login credentials (username and password).

EXTERNAL INTERFACE

The **External Interface** Laboratory settings allows the Lab Manager to set up an interface with external devices or websites. The currently featured interface for alternative patient registration system is DHIMS 2. Others may be added upon request.

The **Interfaced Equipment** page allows the Lab Manager to select the equipment to be interfaced through BLISInterfaceClient. Configurations may be set in the *BLISInterfaceClient.ini* file.

Basic La	boratory	Informat	ion System v3	.8	Logged in as: te	stlab1_admin   Edit Profile   Work as Technician   Logout
Home	Lab Cont	figuration	Test Catalog	Reports	Backup Data	
Summ	ary				Page Help	
Tests		Select Equ	ipment to be inter	faced through	BLISInterfaceClient	
Search	n	-	~			
Report	ts	Mindray BS				
Result	s	ABX Pentra ABX MACRO	OS 60			
Sites		BT 3000 Plu Sysmex SX	500i			
Invent	ory	BD FACSCal Mindray BC	3600			
Barcoo	de Settings	Selectra Jur GeneXpert	lior			
Billing		ABX Pentra Sysmex XT				
User A	ccounts	Vitalex Flex				
Regist	ration Fields					

REVERT TO BACKUP

In case of system failure, the **Revert to Backup** page allows the Lab manager to revert to a previously backed-up copy of the data. Clicking the link presents the dates of the previous backups, click one to select which data set to load.

Basic La	Basic Laboratory Information System v3.8					Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logout			
Home	Lab Con	figuration	Test Catalog	Reports	Backup Data				
Summ	ary				Page Help				
Tests									
Searc	h								
Repor	ts	Backup Ve	rsion	No	ot Found				
Result	:S		nguage Settings? rrent version befor		Yes  No				
Sites		васкир си	rrent version befor		ubmit				
Invent	tory								
Barco	de Settings								

MANAGE BACKUP KEYS

The **Manage Backup Keys** page creates, manages, or deletes key pairs in order to encrypt laboratory backup data. Encrypting laboratory backup data with a unique key-pair ensures that only the personnel with the correct private key will be able to successfully decrypt the encrypted data with the correlated public key.

The home screen of the **Manage Backup Keys** page displays the list of currently active public keys. In the example image below, only one public key is available for use, with a key alias of "my\_pubkey".

Summary Tests Search	Disable E	Test Catalog	Reports	Backup Data		
Tests	Disable E					
Tests	Disable E					
	Disable E					Page Help
Search		ncrypted Backups	Download Public Key	Add Key Alias		
Reports	Key	Alias	Modified By	N	Nodified On	
Reports	my_p	oubkey	testlab1_admin	2022	-03-15 04:36:24	Delete
Results						
Sites						
Inventory						
Barcode Se	ings					

### **Disable Encrypted Backups**

Toggle this button to disable or enable encrypted backups. It is recommended to enable encrypted backups to protect private patient information.

Download Public Key

This button opens a popup window prompting the user to download a public key. This key should be saved onto the computer.

Basic La	Basic Laboratory Information System v3.8						gged in as: testlab1_admin   Edit Profile   Work as Technician   Logout		
Home	Lab Confi	iguration	Test Catal	og Rep	oorts	Backup Data			
Summa									
Tests		Disable E	ncrypted Backup	os Download	d Public Ke	ey Add Key Alias		Page Help	
Search Report		Add a n	ew Key Ali	as					
Results	s	Openii Ke	ng LAB_127_pu	bkey.blis			×		
Sites			nave chosen to	open					
Invent	ory		LAB_127_pub	-					
Barcoo	de Settings		which is a: blis from: http://lo		es)				
Billing		Wha	at should Firefo	x do with this	file?				
User A	ccounts	0	Open with	<u>B</u> rowse					
Regist	ration Fields		Save File						
Doctor Registr	r ration Fields		Do this <u>a</u> uto	matically for fi	iles like th	nis from now on.			
Modify	/ Language					OK	Canad		
Setup Netwo						OK	Cancel		
	alla a								

#### Add Key Alias

To add a new public key, click **Add Key Alias**. Fill free to enter in any key alias names here. We recommend entering in some identifying information that describes the origin of the public key. For example, if the public key was provided by the country director, the key alias name could be "country director pubkey".

To upload the public key, click **Browse** and use the File Upload navigational controls to select the desired public key (ending in a .blis file extension). After selecting the correct public key, click **Add** to add the public key to the list of currently active public keys, or **Cancel** to discard changes.

Basic La	boratory	Informati	ion System v	/3.8	Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logout		
Home	Lab Confi	guration Test Catalog Reports		Backup Data			
Summ	ary					Page Help	
Tests		Disable En	crypted Backups	Download Public K	ey Add Key Alias		
Search	h						
Repor	ts	Add a ne	ew Key Alias				
Result	ts	Key Alias:					
Sites		Public Key		Browse			
Inven	tory	Add	Cancel				
Barco	de Settings						
Billing							
User /	Accounts						
n							

EXPORT CONFIGURATION

The **Export Configuration** page exports all configuration settings to Microsoft Word. Clicking this link opens a new browser tab with a preview showing all preset and custom fields as well as report settings. The preview has three buttons at the top: Print, Export as Word document, and Close. Click the **Print** button to open the print dialog box; **Export as Word document** to create a file named **blisreport\_[date of report].doc**, which may be opened or saved, or **Close** to close this browser tab.

Print	Export as Word Document	Close This Page		
	y: Testlab1 - GT 21-04-2022			

### **Registration Fields**

Facility Name	Testlab1
Location	GT
Lab Manager	testlab1_admin
Specimen Types	Aspirate
	CSF
	Dried Blood Spot
	Nasal Swab
	Plasma
	Plasma EDTA
	Rectal Swab

0

### **Test Catalog**

The Test Catalog page allows the Manager to add or edit specimen or test types used in their laboratory.

Basic La	boratory Informat	testlab1_admin   Edit Profile   Work as Technician   Logout			
Home	Home Lab Configuration Test Catalog Reports				
Specimen T Test Types	Types				

SPECIMEN TYPE

The **Specimen Type** page allows for adding or editing specimen types used in the laboratory.

asic Labo	pratory Inf	ormati	ion System v3.	Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logo		
Home	Lab Configur	ation	Test Catalog	Reports	Backup Data	]
<b>pecimen Ty</b> pes		pecimen	Types   Add New		Page	Help
	1	۱.	Aspirate		Edit	
	2	2.	CSF		Edit	
	3	3.	Dried Blood Spot		Edit	
	4	4.	Nasal Swab		Edit	
	5	5.	Plasma		Edit	
	é	<b>5.</b>	Plasma EDTA		Edit	
	7	7.	Rectal Swab		Edit	

Click **Add New** to enter a new specimen type. Required fields are **Name**, which is a text box for entering the name of the specimen, and **Compatible Tests**, which allows the user to check the tests that can be performed using that specimen. **Ctrl-F** opens the Find function to search for a test. Another feature is a **Description** of the specimen type, which is optional.

To edit the information about a specimen type, find the editable specimen type and then click the **Edit** link in the far-right column.

Click **Submit** button to save changes, **Cancel** to discard.

Basic La	boratory l	nformati	on System v3.	Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logout				
Home	Lab Confi	guration	Test Catalog	Reports	Backup Data			
Edit Specir	nen Type   Ca	ancel						
Name		Aspirate						
Description		Aspirate Samp	ble					
Compatible	Tests ,	AFB						
Name * Descript	ion	Aspirate Aspirate San	ıple					
Compati	ble Tests * [?]	🗹 AFB			Alb		Alkaline Phosphatase	
		ALT/SG	т		Amylase		ASLO	
		🗆 ASOT (S	□ ASOT (Streptococcal)		□ AST/SGOT		Bleeding Time (BT)	
		□ Blood fi	laria		Blood Type (ABO/Rh)		Blood Urea Nitrogen	
		C-React	ive Protein		Calcium		CD4	
		Chlamy	dia		Chloride		Clotting Time (CT)	
		CO2 Bic	arbonate		Conjugated/Direct Biliru	ubin 🗆	Creatine Kinase	
		Creatini	ne		CSF		Culture	
		Cytobac Urine (CBE	teriologic Examinatic U)		) Erythrocyte Sedimentati SR)		examen teriologique	

TEST TYPE

The **Test Type** page allows for adding or editing test types used in the laboratory. It is controlled the same way as Specimen Types.

Basic La	boratory l	nformat	ion System v3	.8	Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logout		
Home	Lab Confi	guration	Test Catalog	Reports	Backup Data		
Specimen Test Types		Test Type	•s   Add New		Paş	ge Help	
		# Test	:		Lab Section		
		1. AFB			Bacteriology	Edit	
		2. Alb			parasitology	Edit	
		3. Alka	aline Phosphatase		Chemistry	Edit	
		4. ALT	/SGPT		Chemistry	Edit	
		5. Amy	lase		Chemistry	Edit	
		6. ASL	0		Serology	Edit	
		7. ASO	T (Streptococcal)		Serology	Edit	
		8. AST	/SGOT		Chemistry	Edit	

Click Add New to enter a new test type. Required fields are Name, which is a text box; Lab Section, a drop-down list that includes an option to add a new section; Measures, which are editable; and Compatible Specimens, which allows the user to check one or more specimens that can be used for this test.

Optional fields include **Description** (text box), **Clinical Data**, **Panel Test** (a check-box, checked for Yes), **Hide Patient's Name** (drop-down Yes/No), **Prevalence Threshold** (text box), and **Target TAT** (text box).

To edit the information about a test type, select the editable test type and then click the Edit link in the far-right column.

Click **Submit** button to save changes, or **Cancel** to discard.

Basic La	Basic Laboratory Information System v3.8						Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logout		
Home	Lab Configura	tion Test	Catalog	Reports	Backup I	Data			
Edit Test T	ype   Cancel								
Name			AFB					Tips	
Lab Section	I.		Bacteriology					To know more about a particular field select on the [?] next to the field name.	
Description			- A. (1997)						
Measures			AFB						
Compatible	Specimens		Aspirate						
Hide Patien	t Name in Report		No						
Prevalence	Threshold		70						
Target TAT			48						
Cost To Pat	ient		0.00 USD						
Name *		AFB							
Lab Sect	tion *	Bacteriology	~						
Descript	ion		,						
Clinical	Data [?]			\$					
Measure	s [?]	<u>Delete</u> <u>Name</u> *		Type *		Values	* <u>i</u>	Jnit /Default Value[?]	
		AFB		Alphanu	meric Values 🗸	·	/ P		
		Add Another »				Add Ano	ther »		

#### Reports

The Reports page is used to generate reports ranging from Daily Reports to Aggregate Reports.

Basic La	boratory Informat	ion System v3	Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logout		
Home	Lab Configuration	Test Catalog	Reports	Backup Data	
<ul> <li>Dail</li> <li>Aggregate</li> <li>Prev</li> <li>Cou</li> <li>Turr</li> <li>Infe</li> <li>Use</li> </ul>	ent Report y Log Reports /alence Rate				

### DAILY REPORTS

The **Daily Reports** should be generated each day for both the Patient Report and also Daily Log.

### Patient Report

The Patient Reports page generates reports for each searchable patient.

Search for the patient by Patient Name, Patient Number, or Patient ID and Lab Section to which the patients' specimen are registered against. Click the **Search** button to start search. Select the desired patient from the list if more than one patient matches the search criteria. Click **View Report** to see all data for that patient, or **Select Tests** to see tests ordered and the results for that patient.

Additionally, the user can edit the report to show activity within a date range, include pending tests for which results are not available, set printing information, set tests to print 1 per page, or export to Word using the controls at the top of the page.

Basic Laboratory Inform	estlab1_admin   Edit Profile   Work as Technician   Logout		
Home Lab Configuratio	n Test Catalog Reports	Backup Data	
Daily Reports <ul> <li>Patient Report</li> <li>Daily Log</li> </ul>	Patient Report          Patient Name       Contains		Tips Select Patient Name, Number or ID to retrieve patient's lab reports
Aggregate Reports Prevalence Rate Counts Turnaround Time Infection Report User Statistics Test Specific Reports	Lab Section	All Search	<b>↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓</b>

FAQ | User Guide | Comments? | C4G BLIS v3.8 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francais | Default

### Daily Log

The Daily Log creates a report of the day's activity.

Set the date range to reflect the log to print. The Lab Manager can run a report of the day's activity by patients seen (by clicking **Patient Records**), or by tests run (by clicking **Test Records**). If **Test Records** is selected, logs can be generated for one lab section or for one type of test. The default settings are test records, all sections, and all tests. The report opens in a new browser tab and has **Print** and **Export** controls at the top of the page.

Also patient barcodes for each patient with the number of specimens they have handed over can also be printed over a given a range of time by selecting the **Patient Barcode** option.

Basic La	boratory Inform	nation System	v3.8	Logged in as: testlab1_admin   Edit Profile   Work as Technician   Logout			
Home	Lab Configuratior	n Test Catalog	Reports	Backup Data			
Daily Para	+				Time		
Daily Reports <ul> <li>Patient Report</li> <li>Daily Log</li> </ul> Aggregate Reports		Daily Log			Tips Print all records handled on a given day.		
		From	(dd) (mm)	- 2022 (yyyy)	Frinc au records handled off a given day.		
			[] 21 - 04	- 2022			
Coun		То	(dd) (mm)	(7777)			
<ul> <li>Turnaround Time</li> <li>Infection Report</li> <li>User Statistics</li> <li>Test Specific Reports</li> </ul>		Records	<ul> <li>Test Records</li> <li>Patient Record</li> <li>Patient Barco</li> </ul>				
		Lab Section	All	~			
		Test	All	~			
			Submit				

FAQ | User Guide | Comments? | C4G BLIS v3.8 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francais | Default

#### AGGREGATE REPORTS

Aggregate Reports generates reports for specific data selected by the user. There are currently six types of reports to generate:

- 1. **Prevalence Rate** which opens an infection graph and prevalence rates. It gives the prevalence of a particular laboratory test result based on the number of testsdone and the results.
- 2. **Counts** which can open a specified kind of ungrouped or grouped, test/specimen/doctor statistics. It generates a report for a particular time period of the number of tests, specimens, or doctor statistics.
- 3. Turnaround Time which opens the average test-wise turnaround times for the lab test reports, either for all or specific tests.
- 4. **Infection Report** which opens an Infection Report for a specified laboratory. It generates reports of infections by patient age and gender.
- 5. User Statistics which displays user specific statistics and user activity logs.
- 6. Test Specific Reports which provides information on specific tests, and can be specified to an individual site.

EXPORT TO EXCEL

The Export to Excel feature allows the lab manager to export the results of tests across the whole lab for a given date range. The user can select to exclude patient data from the final report.

onfiguration	Test Cata	og Reports E	Backup Data						
	Export to Ex								
	From	(dd) (mm) (	уууу)						
2	То	(dd) (mm) (	уууу)						
e t	Facility	Testlab1							
ports	Test Type	Alkaline PhosphataseALT/SGPTAmylaseASLOAST/SGOTBleeding Time (BT)Blood Urea NitrogenPress and hold the "Ctrl" key to select multiple tests.							
	Options	<ul> <li>✓ Include patient name</li> <li>✓ Include patient birth</li> <li>✓ Include patient sex</li> </ul>							
		Export							

Q | User Guide | Comments? | C4G BLIS v3.9 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francai:

### Backup Data

The **Backup Data** feature was created for two reasons - to revert to a previously backed-up copy in cases of system failure, but also to create a backup file of the current laboratory patient data for uploading to a **BLIS on Cloud** version.

For example, one intended use of the second scenario would be to upload the current laboratory data to the director's instantiation of BLIS. A conglomeration of multiple labs' data would permit the director to visualize larger trends in the healthcare data across several laboratories. This would aid the director in understanding the needs of individual labs, and permit them to mobilize aid catered to the specific needs of each laboratories.

The below image is the default view of the **Backup Data** page.

Basic La	boratory Informat	ion System v3	.8	Logged in as: t	estlab1_admin   Edit Profile   Work as Technician   Logout
Home	Lab Configuration	Test Catalog	Reports	Backup Data	
Тур	ryption key: Current Lab ( e of backup: Genera @ Anonym Backup	l Backup nized Backup	ich, the CDC and partic	ipating countries   English   Fr	Tips         Please select the receiver who should be able to revert this backup from the drop-down list.         crancals   Default         Current Lab is the default key and will create backups that can be reverted on this lab for the current instance of BLIS.         If the receiver does not appear in the drop-down list, you will be prompted to upload a new public key, which is a .blis file and can be obtained by lab managers under the Lab Configuration > Manage Backup Keys > Download Public Key.

BACKUP DATA WITH PRE-EXISTING KEY

If a public key has already been registered to the personnel account through the **Lab Configuration** > **Manage Backup Keys** functionality, then the key should appear in the drop-down menu. In the image below, *my\_pubkey* is a pre-existing public key that had been previously registered. Please select the key from the drop-down menu.

Basic La	boratory Informat	estlab1_admin   Edit Profile   Work as Technician   Logout			
Home	Lab Configuration	Test Catalog	Reports	Backup Data	
Тур	Cryption key: Current Lab ( Current Lab ( my_pubkey New key Backup	default key)	rch, the CDC and partic	ipating countries   English   Fi	Tips         Please select the receiver who should be able to revert this backup from the drop-down list.         cancais   Default         Current Lab is the default key and will create backups that can be reverted on this lab for the current instance of BLIS.         If the receiver does not appear in the drop-down list, you will be prompted to upload a new public key, which is a .blis file and can be obtained by lab managers under the Lab Configuration > Manage Backup Keys > Download Public Key.

BACKUP DATA WITHOUT PRE-EXISTING KEY

If the desired public key has not already been registered to the account, then please select *New Key...* from the drop-down menu. Two new boxes should appear. Give the key a name (recommend either the lab name or lab ID), and click on the **Browse** button. Find the public key that was previously downloaded onto the user's computer and select it to upload.

Basic La	boratory Informat	admin   Edit Profile   Work as Technician   Logout			
Home	Lab Configuration	Test Catalog	Reports	Backup Data	
Cho Typ	Backup	Browse_ I Backup nized Backup	_	cipating countries   English   Francais   De	Tips         Please select the receiver who should be able to revert this backup from the drop-down list.         Current Lab is the default key and will create backups that can be reverted on this lab for the current instance of BLIS.         Matt         If the receiver does not appear in the drop-down list, you will be prompted to upload a new public key, which is a .blis file and can be obtained by lab managers under the Lab Configuration > Manage Backup Keys > Download Public Key.

After selecting the public key of choice, please choose the desired backup (General or Anonymized) and then click **Backup** to trigger the data backup. A new page should pop up, confirming that the backup was successful. Please click the **Download Zip** hyperlink to download the zipped file to the user's Desktop.



Backup was transferred to server http://localhost:80

\$2024-05-03

# 5.7 Technician Overview

The technician interface allows the Technician to do the following:

- 1. Register new patients and look up existing patients.
- 2. Add results for a patient based on the specimens provided.
- 3. Manage existing reagents currently being tracked in BLIS.

Users with Admin rights can click the Work as Manager link in the top right corner to switch to the Lab Manager view.

Users with only Technician rights can access their profile page by clicking **Edit Profile**. Users can edit their profile to add or change email, phone, and language. Click on the **Change Password** link to change the user's password.



### Registration

The **Registration** page allows the Technician to register new patients or lookup existing patients based on name, patient ID or number.

ADD NEW PATIENT

To add a new patient: Click the **Search** button without entering any search criteria. The **Add New Patient** link appears, illustrated in the red circle in the image below.

Basic La	boratory Infor	Logged in as: testlab1_tech1   Edit Profile   Logout				
Home	Registration	Results	Search	Inventory	Backup Data	
						Page Help
Patient Lo	ok-up					
This page a	Illows us to register	new patients	; or lookup ex	isting patients ba	sed on name, patie	ent ID or number.
Patient Name	e v Contains v			Search		
Add New P	atient »					

FAQ | User Guide | Comments? | C4G BLIS v3.8 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francais | Default

Also, if no results are found for the desired patient, an option to create a new patient will be presented and the searched name will automatically be filled into the new patient form. Click the link and wait for a dialog box to appear on the screen. Fill in the blank fields and check the appropriate elements. Elements with asterisks \* are mandatory.

Click on **Submit** to save, or **Cancel** to discard changes and return to patient look-up page.

Basic La	poratory Info	rmation Sy	Logged in as: testlab1_tech1   Edit Profile   Logout			
Home	Registration	Results	Search	In∨entory	Backup Data	
						Page Help
New Patien	<b>t</b>   « Back to Pati	ent Look-up				
Patient	ID * 123456				7	
Patient Number	1					
Name *	John Doe					
Gender	* 🖲 Male	⊖Female ○0t	her			
Age	Only one	of Age or Date o	o <mark>f Birth is requi</mark> Years	red for entry. ~		
Date of	Birth III (dd)	- 01 - 1901 (mm) (yyyy)				
Date of Diagnos		- 04 - 2022 (mm) (yyyy)				
Date of Registra		- 04 - 2022 (mm) (yyyy)				
	Submit	Cancel				

FAQ | User Guide | Comments? | C4G BLIS v3.8 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francais | Default

## PATIENT LOOK-UP

Once a patient has been registered, the Technician can use the **Registration** page to view or edit patient profiles. Additionally, a specimen the patient has provided for a particular test can also be registered.

Click on the drop-down list and select patient name, ID, or number. Type in the blank space the patient name, ID, or number. Enter all available patient information for the best search results.

Basic La	boratory Infor	mation Sys	stem v3.8		Logged in as: testla	b1_admin   Edit Profile   Work as Manager   Logout
Home	Registration	Results	Search	Inventory	Backup Data	

Page Help

### Patient Look-up

This page allows us to register new patients or lookup existing patients based on name, patient ID or number.

Patient Name 🗸	Contains 🗸	Aaron	Search				
Patient Number	Patient ID	Name	Gender				
-	72097	Aaron Acevedo	М	Register Specimen	View Profile	Delete Profile	Update Profile
-	47390	Aaron Berg	F	Register Specimen	View Profile	Delete Profile	Update Profile
-	98303	Aaron Gonzalez	F	Register Specimen	View Profile	Delete Profile	Update Profile
-	49342	Aaron Trujillo	м	Register Specimen	View Profile	Delete Profile	Update Profile

ADD OR EDIT A SPECIMEN RECORD

To add or edit a specimen record, first begin by finding the patient to whom the specimen belongs to. Then, click the **Register Specimen** link to the right of the patient name.

Home Registration Results Search Inventory Backup Data	

Page Help

### Patient Look-up

This page allows us to register new patients or lookup existing patients based on name, patient ID or number.

Patient Name 🗸	Contains 🗸	Aaron	Search				
Patient Number	Patient ID	Name	Gender				
-	72097	Aaron Acevedo	Μ	Register Specimen	View Profile	Delete Profile	Update Profile
-	47390	Aaron Berg	F	Register Specimen	View Profile	Delete Profile	Update Profile
-	98303	Aaron Gonzalez	F	Register Specimen	View Profile	Delete Profile	Update Profile
-	49342	Aaron Trujillo	Μ	Register Specimen	View Profile	Delete Profile	Update Profile

Fill in the blank fields and check the appropriate elements. Elements with asterisks \* are mandatory.

Basic La	boratory Infor	mation Sy	stem v3.8		Log	ged in as: testlab1_adn	nin   Edit Profile   Work as Manager   Logout	t
Home	Registration	Results	Search	Inventory	Bac	:kup Data		
Specimen I	Registration   Acce	ssion No. 2022	20507-2   Cano	cel			Page He	∍lp
						Name	Aaron Acevedo	
Patier Numb						<u>Gender</u>	м	
Numb	ber					Age	56 Years	
Speci Type		-S	elect-	~		Date of Birth	04-04-1966	
Tests	*	-Se	elect specimen	type first-				
Lab Recei Date		<b>i</b>	07 - 05 (dd) (mm)	- 2022 (yyyy)				
Physic	cian Dr.	► Er	nter physician's na	ame				
Add Anoth	er Specimen »			* Manda	atory Field	1		
Submit	Cancel							

Click on **Submit** to save, or **Cancel** to discard changes and return to patient look-up page. Click **Add Another Specimen** to add another specimen for this patient.

### Results

The **Results** page allows the Technician to see, evaluate, and verify results for collected specimens.

### SINGLE SPECIMEN RESULTS

This option allows the Technician to add results for a patient based on the specimens provided and Lab sections to which the specimen tests are registered. Click on the drop-down list and select patient name, ID, or number. Type in the field at least 2 characters to search.

Basic Laboratory Information System v3.8				Logged in as: testla	ab1_admin   Edit Profile   Work as Manager   Logou	
Home	Registration	Results	Search	Inventory	Backup Data	
Single Spec	cimen Results	Single Specim	en Results			
Batch Resu	lts	Patient Name	✓ Contains	~		]
Verify Resu	lts	Lab Section				
Worksheet		Lab Section	ALL	~		
Lab Sectior	n-wise Results	Search				

To add or edit a specimen record: Find the patient as above and then click the **Enter Results** link to the right of the patient name. Fill in the blank fields and check the appropriate elements.

Click on **Submit** to save, or **Cancel** to discard changes.

#### BATCH RESULTS

This option allows the Technician to add results for a particular Test Type.

Select a test for which to find results. Set a date range, then click Search. The results appear without patient names. Click on **Submit** to save, or **Cancel** to discard changes.

Basic La	boratory Info	ormation S	System v3.8	Logged in as: testla	b1_admin   Edit Profile   Work as Manager   Logout	
Home	Registration	Results	Search	Inventory	Backup Data	
Single Specimen Results		Batch Resu	lts			Tips
Batch Results		Test Type	Select one	~		If you cannot see any
Verify Resu	Verify Results		<b>10 - 08</b>	- 2021		information other than Test Name, Results and the Skip
Worksheet	Worksheet		(dd) (mm)	(уууу)		Option, please tell your administrator to configure it
Lab Section-wise Results		То	(dd) - 05	- 2022 (yyyy)		from Worksheet Configuration
			Search			

FAQ | User Guide | Comments? | C4G BLIS v3.8 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francais | Default

#### VERIFY RESULTS

This option allows the Technician to verify the result based on the test type. It shows the list of results for all patients whose results have not been verified. Here, results can be modified and entered prior to verifying.

Basic La	boratory Info	rmation Sy	vstem v3.8	Logged in as: testla	b1_admin   Edit Profile   Work as Manager   Logout	
Home	Registration	Results	Search	Inventory	Backup Data	
Batch Resu Verify Res Worksheet	ults	Verify Result Test Type [	s Select one	~	Search	<b>Tips</b> If you cannot see any information other than Test Name, Results and the Skip Option, please tell your administrator to configure it from Worksheet Configuration

FAQ | User Guide | Comments? | C4G BLIS v3.8 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francais | Default

Select a **Test Type** and click **Search**. All test results for that test appear. Look over the test results for accuracy. Edit the results as appropriate. When finished, click on **Verify**, or **Cancel** to discard changes. Choosing **Verify** opens a confirmation dialog box.

Click **OK** to mark results as verified, **Cancel** to discard changes.

#### WORKSHEET

This option generates a worksheet based on the Lab Section and Test Type. In lab settings where data are not entered at the point of service, the data entry staff enter patient information and the tests ordered, then print the worksheet so that lab

technicians can write test results and other data to be entered into BLIS. Custom worksheet which can be created by Admins using Lab Configuration > Tests > Reports > Worksheet.

Create a blank worksheet by choosing the **Keep Blank** option and specifying the number of rows needed. Click **Submit** to create the worksheet.

Basic La	poratory Info	ormation System	Logged in as: tes	stlab1_admin   Edit Profile   Work as Manager   Logout		
Home	Registration	Results S	earch	Inventory	Backup Data	
Single Specimen Results		Worksheet		Ting		
Batch Results		Lab Section	Serology	Tips If you cannot see any		
Verify Results		Test Type OR	-Not Foun	information other than Test Name, Results and the Skip		
Worksheet		Custom Worksheet	Option, please tell your administrator to configure it			
Lab Section-wise Results		Keep Blank?	○Yes	No	from Worksheet Configuration	
			Submit			

FAQ | User Guide | Comments? | C4G BLIS v3.8 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francais | Default

After generating the worksheet, click on a column heading to sort the table by that field. Other features include **Print** in portrait (default) or landscape view, **Export as a Word Document**, or **Close** the page. If **Export** is selected, the default option is to open the Word document. The document can be printed or saved from Word.

### Search

This page allows the Technician to search for a patient by name, number, or ID. Enter a partial name or ID (at least 2 characters) to generates a list of matches.

Basic La	boratory Infor	mation Sys	stem v3.8	Logged in as: testlab1_admin   Edit Profile   Work as Manager   Logout		
Home	Registration	Results	Search	Inventory	Backup Data	
						Page Help
Search						
Patient	Patient Name	Contains V			Search	

FAQ | User Guide | Comments? | C4G BLIS v3.8 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francais | Default

Click View Profile to view the patient's profile and test history.

From the test history section, click **Details** for specimen information. Then, choose **Get Report** for a specimen report; **Track Actions** to view a log of actions on that specimen, or **Enter Results** to enter the specimen analysis results. A report can be generated from the test history section on the profile page by clicking the **Report** link.

From the profile page, other features include can also Register New Specimen, Update Profile, or Print Patient Report.

### Inventory

CURRENT INVENTORY

This link displays the reagent quantities currently in stock. It is not editable. To edit the list, click Add Reagent.

Basic La	boratory Infor	mation Sy	stem v3.8	Logged in as: testlab1_admin   Edit Profile   Work as Manager   Logout		
Home	Registration	Results	Search	Inventory	Backup Data	
						Page Help
Barcode S	can Search:		Search			
Add Item	Generate Barcode	es   Current	t Inventory			
ltem \$	Quantity	¢ Unit ¢	Update	¢ Add ¢	Edit 🗢	

FAO | User Guide | Comments? | C4G BLIS v3.8 - A ioint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francais | Default

## ADD ITEM

Click **Add Item** to add a new item to the list. Update the stock as more reagents are acquired by adding the reagent name, quantity received, receiver name, and remarks.

Basic La	boratory Infor	mation Sy	stem v3.8	Logged in as: testlab1_	admin   Edit Profile   Work as Manager   Logout					
Home	Registration	Results	Search	Inventory	Backup Data					
« Back   Ad	« Back   Add New Item									
Item *						Tips				
Unit						Add new Item by completeing this form. Stocks can then be added for these				
Remarks						items. Item name is required. Entering units for the item is optional. As you				
			11			type letters in item name field, item with similar names are dispayed below.				
Submit Cancel										

FAQ | User Guide | Comments? | C4G BLIS v3.8 - A joint initiative of C4G 🖲 Georgia Tech, the CDC and participating countries | English | Francais | Default

Click **Submit** to save changes.

GENERATE BARCODES

Clicking **Generate Barcodes** allows the Technician to generate a unique barcode. To do so, enter text into the field on the page, and press **Generate**. After generating the barcode, print them by pressing the **Print** button.

Basic La	boratory Infor	mation Sy	stem v3.8	Logged in as: testla	Logged in as: testlab1_admin   Edit Profile   Work as Manager   Logout			
Home	Registration Results Search Inventory			Inventory	Backup Data	]		
Code: test tubes 50 ml Generate Print								
Remove		test tubes			I			

FAQ | User Guide | Comments? | C4G BLIS v3.8 - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries | English | Francais | Default

## Backup Data

The Backup Page is similarly designed to the Backup Data feature available for Lab Managers.

# see Also

The Backup Data functionality can be found in the Lab Manager section on Backup Data.

\$2024-05-03

# 5.8 Glossary

Admin - Designation for a user that has control over lab configuration settings. Also known as a Lab Manager.

Aggregate - Type of report that collects data over a period of time and presents it to the user.

Barcodes - Used in inventory management to create printable 'barcode' labels for reagents.

**Director** - Designation for a user that oversees many laboratories, typically at the country level. Manages lab configuration standardization.

Grouped Reports - Reports that cover multiple types of information.

Inventory - Interface for managing reagents and supplies.

Lab Configuration - Collection of customizable settings relating to the collection and storage of data.

Manager - Another name for an Admin user. Also known as a Lab Manager.

Patient - Entry for a ptient whose specimen tests are performed on.

Prevalence Rate - The percentage of rate occurrence of a particular result of tests.

Reagent - Term used in inventory control in BLIS. Denotes any physical supply that requires tracking in the inventory system.

**Registration** - The act of entering a patient into the BLIS program. Creates a unique patient entry that can be associated with specimens and tests.

**Reports** - Pages that collect metrics for various types of data. The scope of these reports varies from individual patients to entire groups of laboratories.

Results - The recorded outcome of tests performed on specimens.

**Specimen** - An entry representing a physical specimen or reading taken from a patient.

Specimen Type - Classification for different types of specimens.

Technician - A designation for a user who is tasked with entering data into BLIS.

Test - An entry representing a test or reading taken from a specimen.

Test Type - Classification for different types of tests.

Turnaround Time - A measurement of the time it takes to receive a result, once a specimen is collected.

User - Any person or entity that logs into the BLIS program.

Verify - An action performed on test entries that validates the results for further use.

**Worksheet** - Customizable, printable sheets for improving the speed at which information is recorded in a physical sense (i.e. not entered *directly* into the BLIS program.)

\$2024-05-03

# 5.9 Experimental: BLIS Cloud Command-Line Interface

The BLIS Cloud CLI is an experimental way to install and manage BLIS on cloud-based virtual machines.

### tool is in preview!

Unless you are comfortable debugging issues, you should instead use the article on Running BLIS on a Cloud Provider.

### 5.9.1 Installation

The tool is intended to be used on **Ubuntu** installations only. In order to install the tool, you must first install the prerequisites:

```
sudo apt-get update
sudo apt-get install -y python3-pip
echo "export PATH=\"\$HOME/.local/bin:\$PATH\"" | tee -a ~/.bashrc
Source ~/.bashrc
```

Then you can install the tool with:

```
pip3 install -U git+https://github.com/C4G/blis-cloud-cli.git
```

### 5.9.2 Usage

### Installing Docker

You can check the status of Docker with:

blis docker status

The tool will check to see if Docker is installed and configured correctly. If Docker is not installed, then you should run:

blis docker install

### Checking the status of BLIS

blis status

This command will check the status of BLIS: whether or not it is running, and if the system is supported.

### **BLIS Installation**

### blis install

This command will install the BLIS configuration file to ~/.blis/ and provision the database as a Docker container.

#### Starting BLIS

blis start

This command will start BLIS.

### **BLIS Update**

blis update

This command will update the container used by BLIS. If BLIS is running, it will stop and start BLIS as needed.

## Stopping BLIS

blis stop

This command will stop BLIS.

# Accessing log files

blis logs application blis logs database

These two log files are generated by the BLIS application. The application log is most useful for debugging issues.

blis logs apache2/error blis logs apache2/access

These two log files are generated by the Apache2 webserver. The apache2/error log contains PHP errors useful for debugging issues.

\$2024-05-03