



Institute for the Wireless Internet of Things

at Northeastern University

Colosseum First-time Users

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MITRE



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Colosseum Credentials

When an account is created, **2 pairs** of credentials are sent (check SPAM!):

1. **Freshdesk** Credentials:

- Access guides.
- Open Tickets.



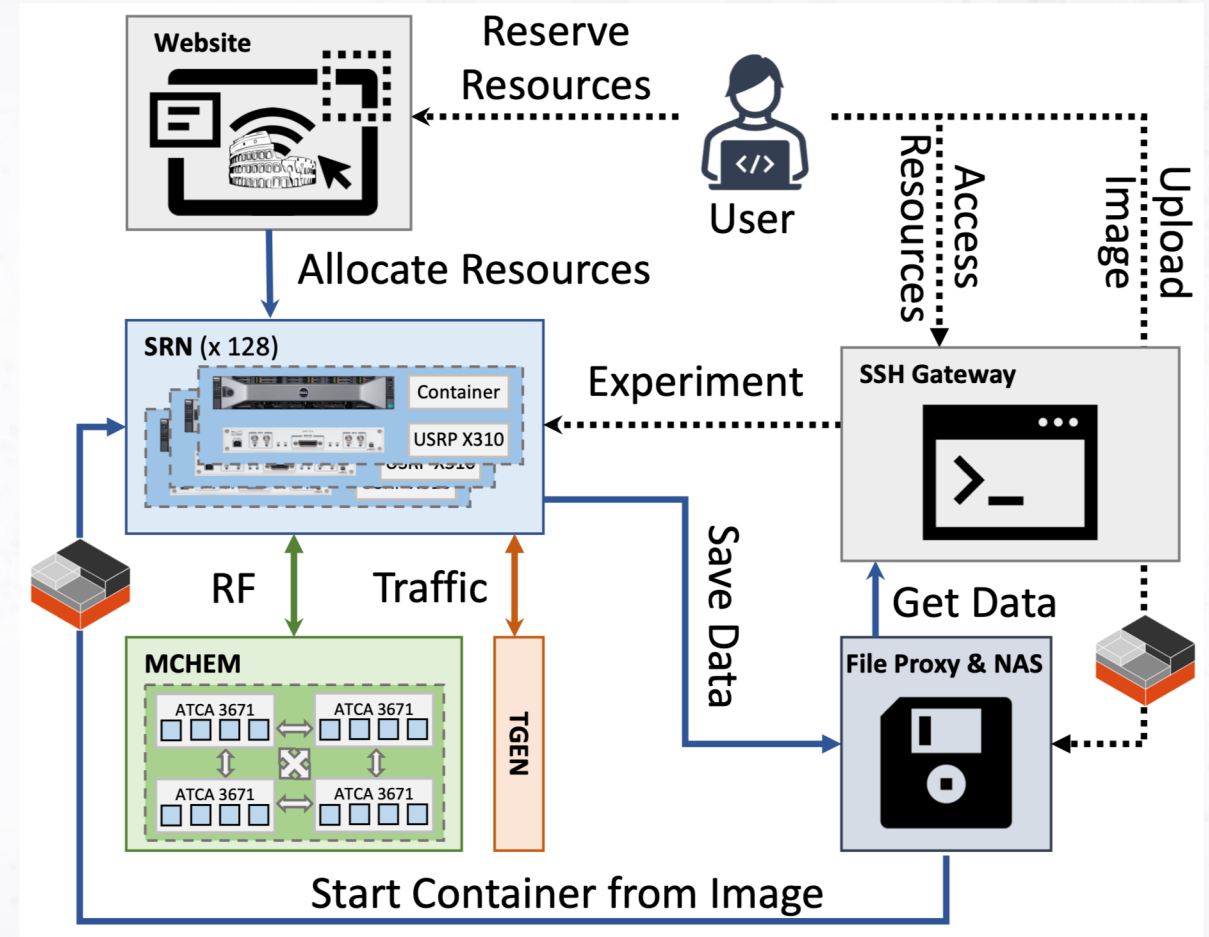
2. **Colosseum** Credentials:

- Access Colosseum Experiment website.
- SSH in the Colosseum environment.



Colosseum Access Components

- **SSH gateway**
 - Allows users to access to the system
 - Allows users to log into the SRNs
- **File-proxy:**
 - Allows users to upload/download container images and configuration files
 - Allows users to retrieve experiment data



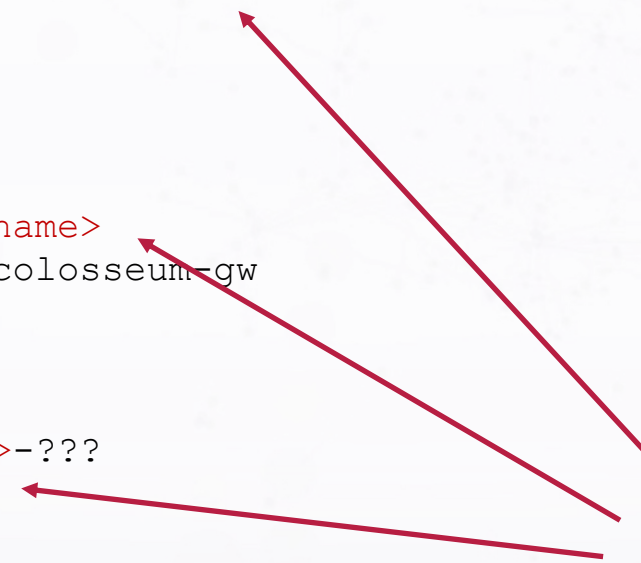
SSH Setup (Linux/MAC)

Add the following to SSH config file: ~/.ssh/config

```
# SSH Gateway
Host colosseum-gw
    Hostname gw.colosseum.net
    User <your-colosseum-user-name>
    IdentityFile <path-to-private-key-on-your-
local-machine>

# File Proxy Server
Host file-proxy
    User <your-colosseum-user-name>
    ProxyCommand ssh -W %h:%p colosseum-gw

# SRNs (User Container)
Host <your-colosseum-team-name>-???
    User root
    StrictHostKeyChecking no
    UserKnownHostsFile=/dev/null
    ProxyCommand ssh -W %h:%p colosseum-gw
```



```
# SSH Gateway
Host colosseum-gw
    Hostname gw.colosseum.net
    User <your-colosseum-user-name>
    IdentityFile <path-to-private-key-on-your-local-machine>


# File Proxy Server
Host file-proxy
    User <your-colosseum-user-name>
    ProxyCommand ssh -W %h:%p colosseum-gw

# SRNs (User Container)
Host <your-colosseum-team-name>-???
    User root
    StrictHostKeyChecking no
    UserKnownHostsFile=/dev/null
    ProxyCommand ssh -W %h:%p colosseum-gw
```

Replace these!

Note: Users need to copy their public key in the Colosseum portal

Home page



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Getting Started

If this is your first time logging in to Colosseum, go to [Colosseum Quick Start Guide](#) for an introduction to the system

SSH Reminder

At your scheduled time, SSH into your SRN(s) at `<team name>-<srn number>`. The hostnames for your allocated SRNs can be found by viewing your reservation's details or by running the following command on the SSH gateway:

```
cat /etc/hosts
```

Having Problems?

Open a ticket on [FreshDesk](#)

wineslab	
Tokens Remaining	8823
New Tokens Available	Tue Jun 4th at 9am
NAS Disk Quota Used	Future Feature
NAS Disk Quota Limit	500 GB

Planned Outages
No planned outages

[Quick Start Guide](#) [FreshDesk](#)

Reservation Modes

- **Interactive**: control Colosseum resources through the command line interface
- **Batch**: automatically perform (preconfigured) experiments on Colosseum

Interactive Mode	
Pros	Cons
Can verify status of MCHEM and TGEN before running experiment	Experiment must be run in real time and require user input to instantiate RF and TG scenarios.
Allows to debug programs on-the-fly	CLI mode uses more tokens per experiment than batch mode

Batch Mode	
Pros	Cons
Can be scheduled to run at a given time, without requiring specific user input during experiment runtime	The container cannot be accessed by the user
Automatically perform experiments and large data-collection campaigns	Takes a longer setup time

Start an Interactive Reservation

Experiment schedule and duration

of network nodes

Container images

Options

Reservation cost

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Reservations

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gladiators-admin

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Request New Reservation

Name: test-reservation

Start date: 2023/06/04

Start time: 01 : 08 PM First slot

Duration: 60 minutes

Note: 5 minutes of your reservation will be used for data transfer

Number of SRNs: 2 7 max available

Default image: webinar-interactive-v1 Reset all

Node 1: webinar-interactive-v1

Node 2: webinar-interactive-v1

Octoclock: ☐

Check this option to reserve SRNs with radios connected to an Octoclock clock distributor (currently SRNs available: 7).

Number of GPUs: 0 7 max available

GPU node type: ☒ DGX ☐ LMN

Quad 1 4 available

Quad 2 0 available

Quad 3 3 available

Quad 4 0 available

Quad GPU 14 available

Sun 4 June

Mon 5 June

12:00 am 12:00 pm 4:00 pm 8:00 pm 12:00 am 4:00 am 8:00 pm

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32


	Current	Cost	Remaining
Tokens	3480	24	3456

Reset

Request

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View Existing Reservations



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Token budget for reservations

Manage *gladiators* Reservations

Your team has 3456 tokens left this week. Your team will reset to 3480 - Tue Jun 6th at 9am
Please contact Colosseum help desk in case of issues.

+ New Reservation

Sat 3 June
8:00 pm

Sun 4 June
12:00 am

4:00 am

8:00 am

12:00 pm

4:00 pm

134142: ti

Reservation Details

Export

Last 7 days

Type	Res ID	Name	Status	Nodes	Start	End	Duration(min)	User
All	Reservation Search...							
Interactive	134142	test-reservation	Future	2 node(s)	2023/06/04 - 1:09:00 PM	2023/06/04 - 2:09:00 PM	60	gladiators-admin

Reservation list


View Node status

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FreshDesk

View Reservation Details



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gladiators-admin

< Reservations

View test-reservation (Interactive)
gladiators - gladiators-admin

Export

ID: 134142Status: ActiveNodes: 2Time: 2023/06/04 1:09:00 PM - 2023/06/04 2:09:00 PM (60 minutes)

Node	Image	Hostname	Port	Status
SRN-1	webinar-interactive-v1	gladiators-001	-	Allocated
SRN-3	webinar-interactive-v1	gladiators-003	-	Allocated

Hostnames of the nodes in the reservation

Node status

Quick Start Guide

FreshDesk

Login to an SRN

- Option 1:

Access as root
from gateway

```
~ ssh colosseum-gw  
gladiators-admin@gw:~$ ssh root@gladiators-037  
root@gladiators-037's password:  
Welcome to Ubuntu 16.04.3 LTS (GNU/Linux 4.4.0-109-generic x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:        https://ubuntu.com/advantage  
  
Get cloud support with Ubuntu Advantage Cloud Guest:  
http://www.ubuntu.com/business/services/cloud  
  
0 packages can be updated.  
0 updates are security updates.  
  
Last login: Fri Mar 25 22:13:36 2022 from 172.16.1.200  
root@gladiators-base-1604-nocuda-srn37:~#
```

Access
Gateway

Node hostname

Successfully
logged-in!

Container name

- Option 2:

From your pc
(need ssh config)

```
~ ssh gladiators-035
```

Node hostname

colosseumcli


- **colosseumcli** is a Command Line Interface to interact with the Colosseum environment:
 - **Scenarios** – *colosseumcli rf ...*
 - Start a scenario: *colosseumcli rf start 1009 -c*
 - Stop a scenario: *colosseumcli rf stop*
 - **Traffics** – *colosseumcli tg ...*
 - Start a traffic scenario: *colosseumcli tg start 100090*
 - Stop a traffic scenario: *colosseumcli tg stop*
 - **Images** – *colosseumcli ...*
 - Image snapshot: *colosseumcli snapshot image-test*

Blueprints


What are Blueprints

- Blueprints are predefined info to pre-fill the "Create New Reservation"
- Blueprints simplify the manual selection of nodes and images.
- Blueprints are identical for all users.
- Only images from the "common" section are utilized.

How to Use Blueprints



Home


Reservations 

Batch Jobs

Scenarios

Images





Blueprints

usertest 

1 – Enter Blueprint Page

Blueprints

For a more detailed description of any of these blueprints, see the [Blueprints wiki page](#).



Select Blueprint:

2 – Choose Blueprint

5G O-RAN Network


Blueprint Details


Name	Image	Description	Quantity
Core	oai-core	OAI Core Network to handle data routing and user session management.	1
5G BS	oai-5g-sa-ran	OAI 5G Base Station of the RAN.	3
5G UE	oai-5g-sa-ran	5G OAI User Equipment to represent devices connecting to the 5G network.	10

3 – Adjust Quantity

Launch Blueprint

4 – Launch Blueprint

Quick Start Guide 

FreshDesk 

Batch Jobs

Batch Mode

- Radio applications and scenarios are controlled automatically by Colosseum
- Containers need to be preconfigured to use the Radio API which will allow Colosseum to control the radio applications
- Containers **do not** have access to the teams' network storage folders
- Containers **are not** accessible by SSH
- Batch jobs are inserted in a queue and run when resources are available

Batch Mode

Set-up through configurations files:

- Batch configuration file:
 - Tells Colosseum how to run the experiment
 - Must be saved to the network storage on the File Proxy at </share/nas/teamname/batch/>
- Modem configuration file(s):
 - Passes any additional parameters to the container
 - Parameters need to be handled by user code
 - Must be saved to the network storage on the File Proxy at </share/nas/teamname/config/>

Batch Configuration File

- Name of batch experiment
- Duration of batch experiment
- RF Scenario to run
- Traffic scenario to run
- Mapping of SRNs to nodes in the scenarios

```
1  {
2    "BatchName": "My Test Batch",
3    "Duration": 300,
4    "RFScenario": 6742,
5    "TrafficScenario": 1,
6    "NodeData": [
7      {
8        "RFNode_ID"      : 1,
9        "ImageName"      : "modem-image-v1",
10       "ModemConfig"     : "modem_config_file_1",
11       "isGateway"       : true,
12       "TrafficNode_ID"  : 1,
13       "node_type"       : "competitor"
14     },
15     {
16       "RFNode_ID"      : 2,
17       "ImageName"      : "modem-image-v1",
18       "ModemConfig"     : "modem_config_file_2",
19       "isGateway"       : false,
20       "TrafficNode_ID"  : 2,
21       "node_type"       : "competitor"
22     }
23   ]
24 }
```

Batch Configuration File, cont'd

Mapping of SRNs to nodes in the scenarios:

- **RFNode_ID**: Node in the RF scenario the SRN should be mapped to
- **ImageName**: Container image to load on the SRN
- **ModemConfig**: The location of the modem config file to load

```
1  {
2    "BatchName": "My Test Batch",
3    "Duration": 300,
4    "RFScenario": 6742,
5    "TrafficScenario": 1,
6    "NodeData": [
7      {
8        "RFNode_ID"      : 1,
9        "ImageName"      : "modem-image-v1",
10       "ModemConfig"     : "modem_config_file_1",
11       "isGateway"       : true,
12       "TrafficNode_ID"  : 1,
13       "node_type"       : "competitor"
14     },
15     {
16       "RFNode_ID"      : 2,
17       "ImageName"      : "modem-image-v1",
18       "ModemConfig"     : "modem_config_file_2",
19       "isGateway"       : false,
20       "TrafficNode_ID"  : 2,
21       "node_type"       : "competitor"
22     }
23   ]
24 }
```

Three red arrows originate from the text on the left and point to specific fields in the JSON on the right. The first arrow points from 'RFNode_ID' to the value 1 in the first node object. The second arrow points from 'ImageName' to the value 'modem-image-v1' in the first node object. The third arrow points from 'ModemConfig' to the value 'modem_config_file_1' in the first node object.

Links to Colosseum Resources and Documentations

- Young Gladiator GitHub Page
 - <https://github.com/colosseum-wiot/colosseum-school-2024>
- Colosseum Home Page
 - <https://northeastern.edu/colosseum>
- Colosseum Experiment Portal
 - <https://experiments.colosseum.net>
- Freshdesk Users Support
 - Knowledge Base: <https://colosseumneu.freshdesk.com/support/solutions>
 - Helpdesk: <https://colosseumneu.freshdesk.com/support/tickets>
- Colosseum Users Google Group
 - <https://groups.google.com/g/colosseum-users>
- Ready-to-use VM for Windows Users
 - <https://tinyurl.com/ajm64wuc>



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Thank You!



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