LVX VERITAS VIRTVS

Institute for the Wireless Internet of Things

at Northeastern University

Colosseum First-time Users

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NSF

Platforms for Advanced Wireless Research

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COLOSSEUM at Northeastern University

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.

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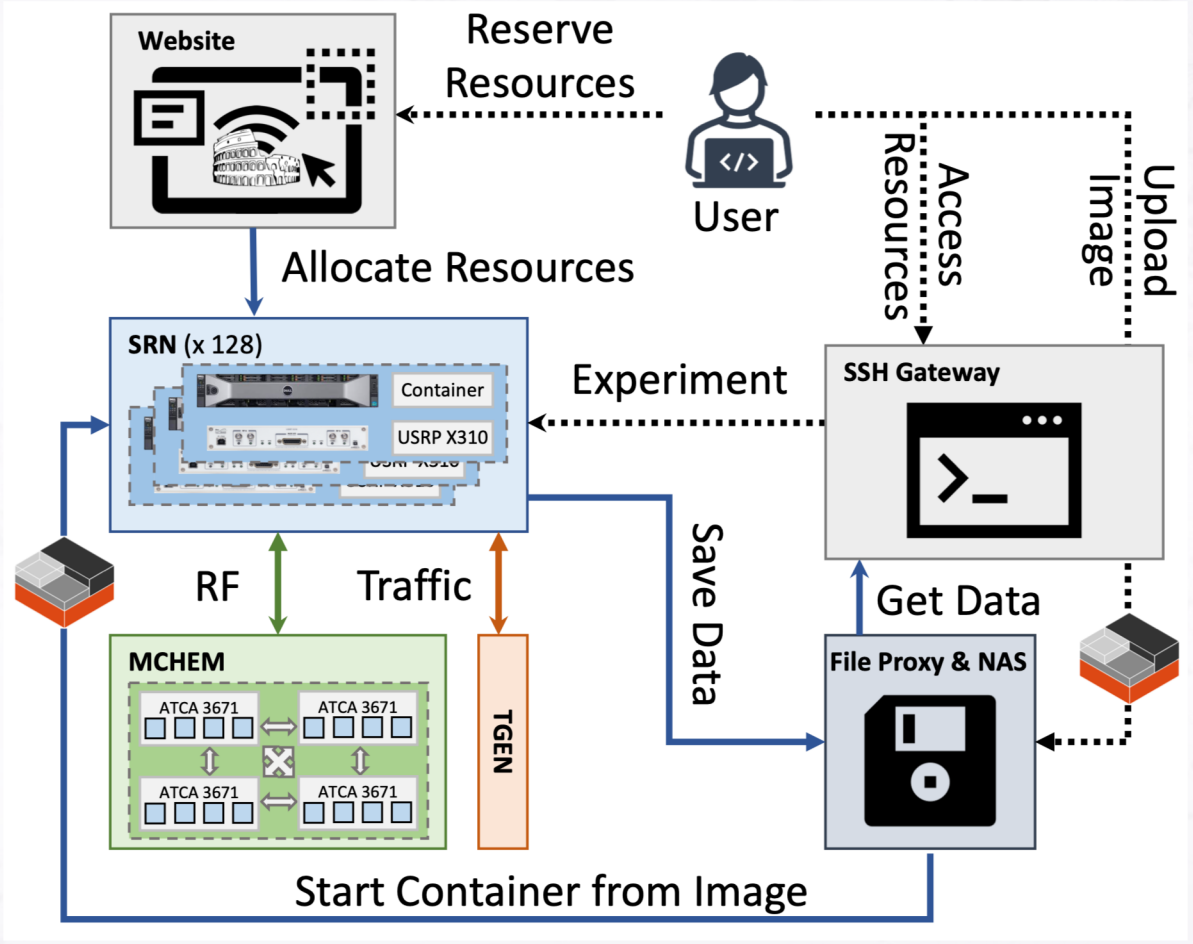
Colosseum Access Components

- **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



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SSH Setup (Linux/MAC)

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

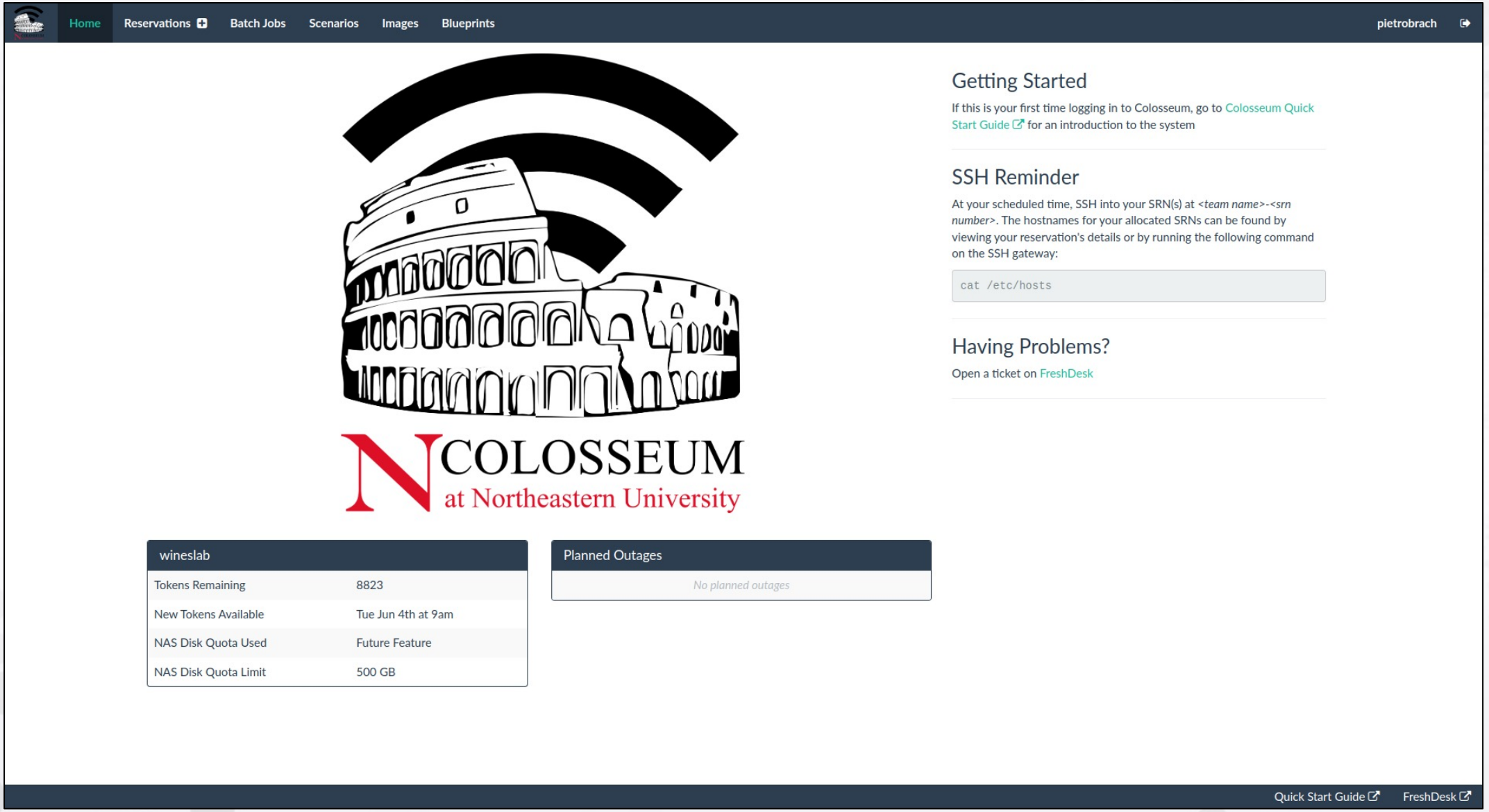
```
# SSH Gateway
Host colosseum-gw
    Hostname gw.colosseum.net
    User <your-colosseum-user-name>
    IdentityFile <path-to-private-key-on-your-
local-machine>


# 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


Home
Reservations
Batch Jobs
Scenarios
Images
Blueprints
pietrobrach
COLOSSEUM
at Northeastern University
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

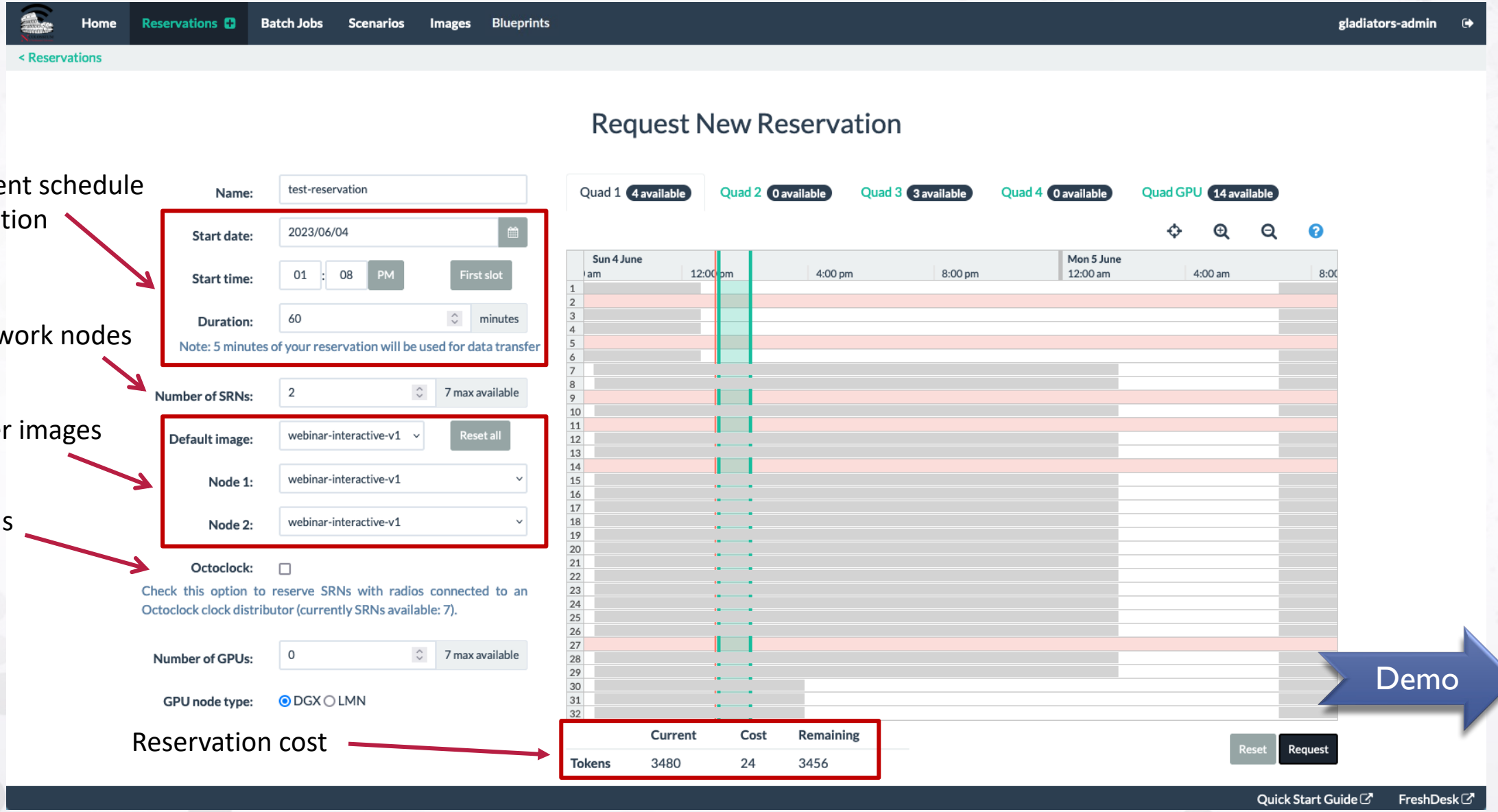
Reservation Modes

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

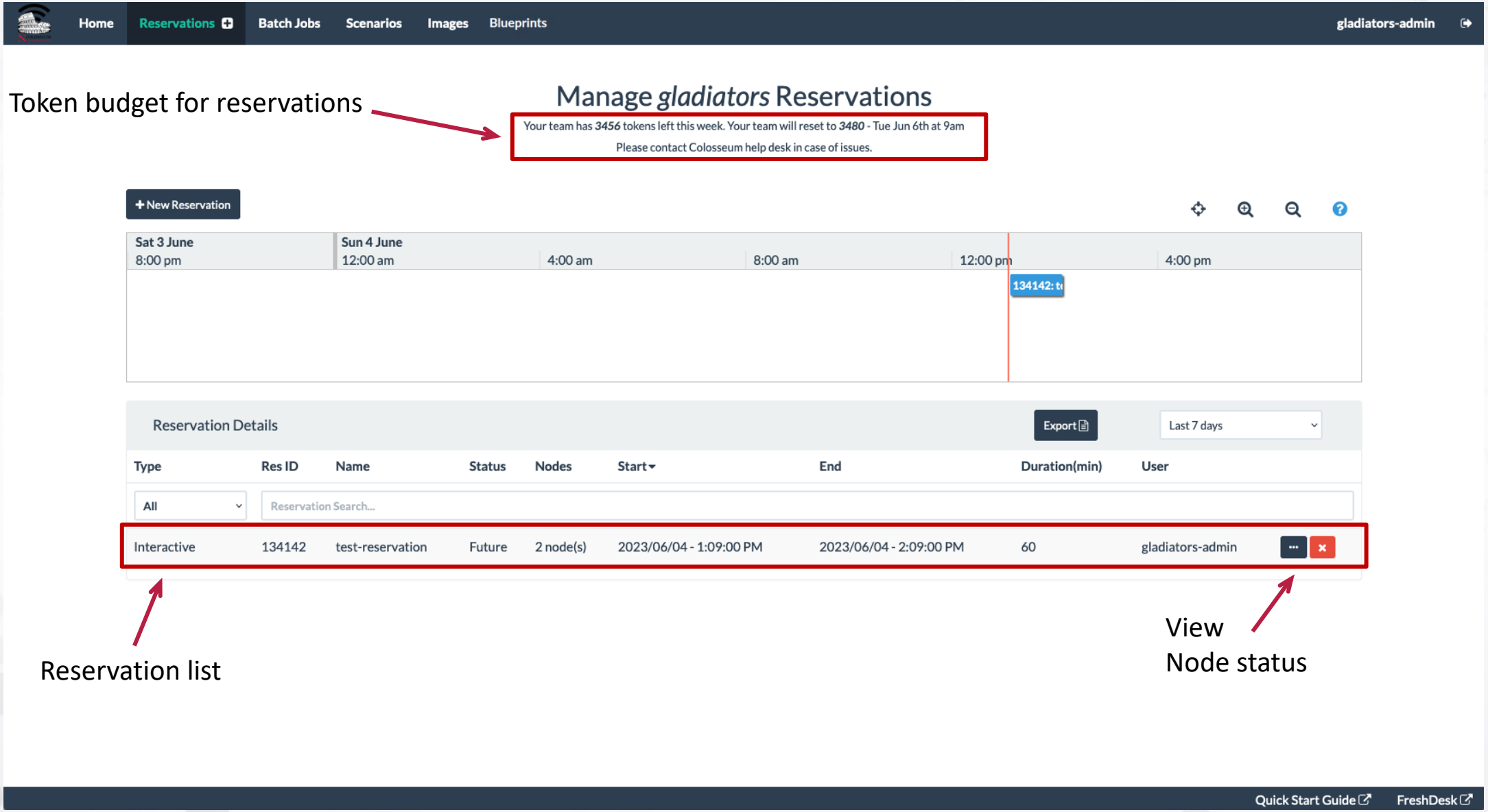
Interactive Mode	
Pros	**Cons**
Can verify status of MCHEM and TGEN before running experiment	Experiment must be run in real time and require user input to instantiate RF and TG scenarios.
Allows to debug programs on-the-fly	CLI mode uses more tokens per experiment than batch mode

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

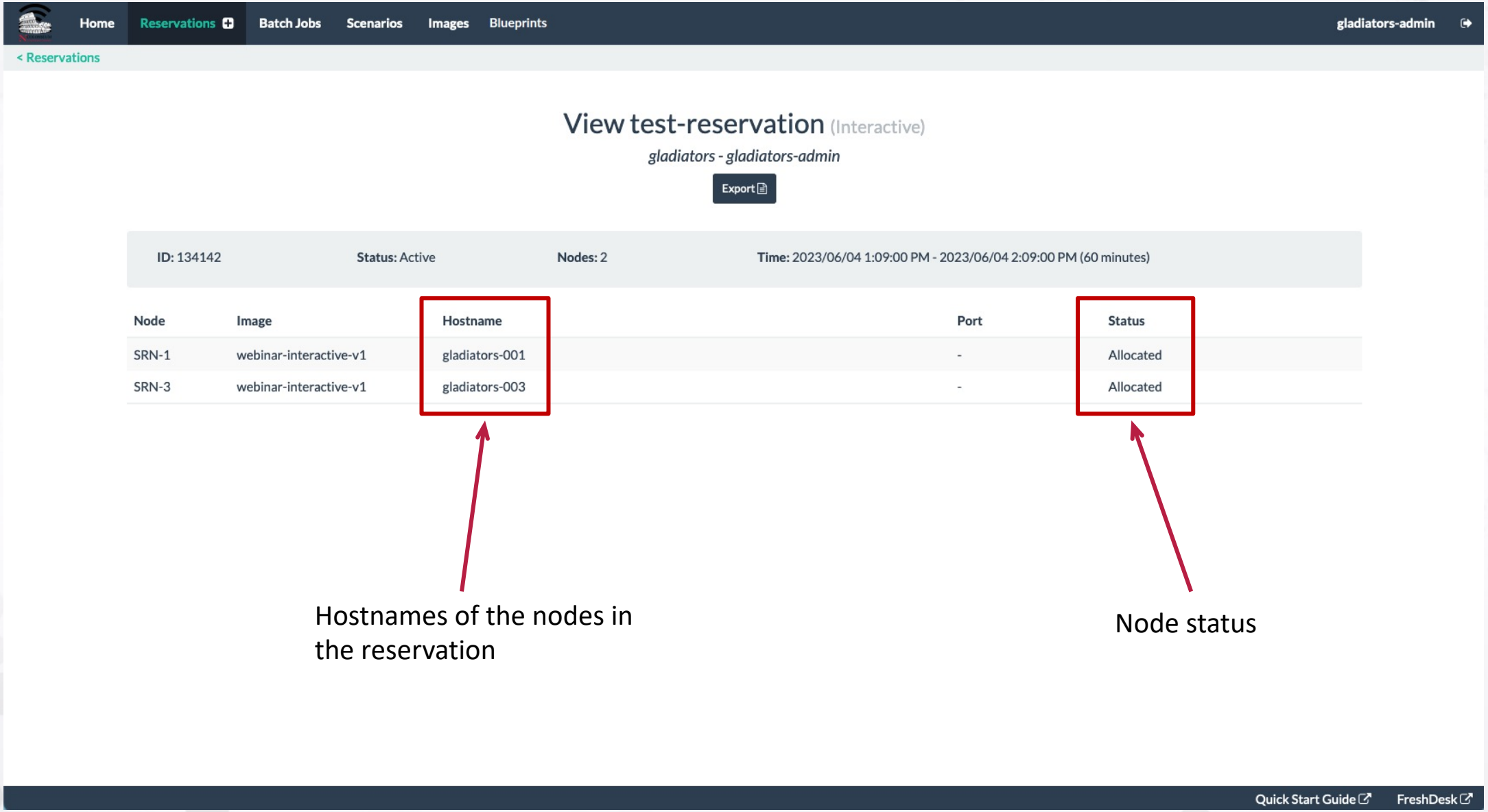
Start an Interactive Reservation



View Existing Reservations

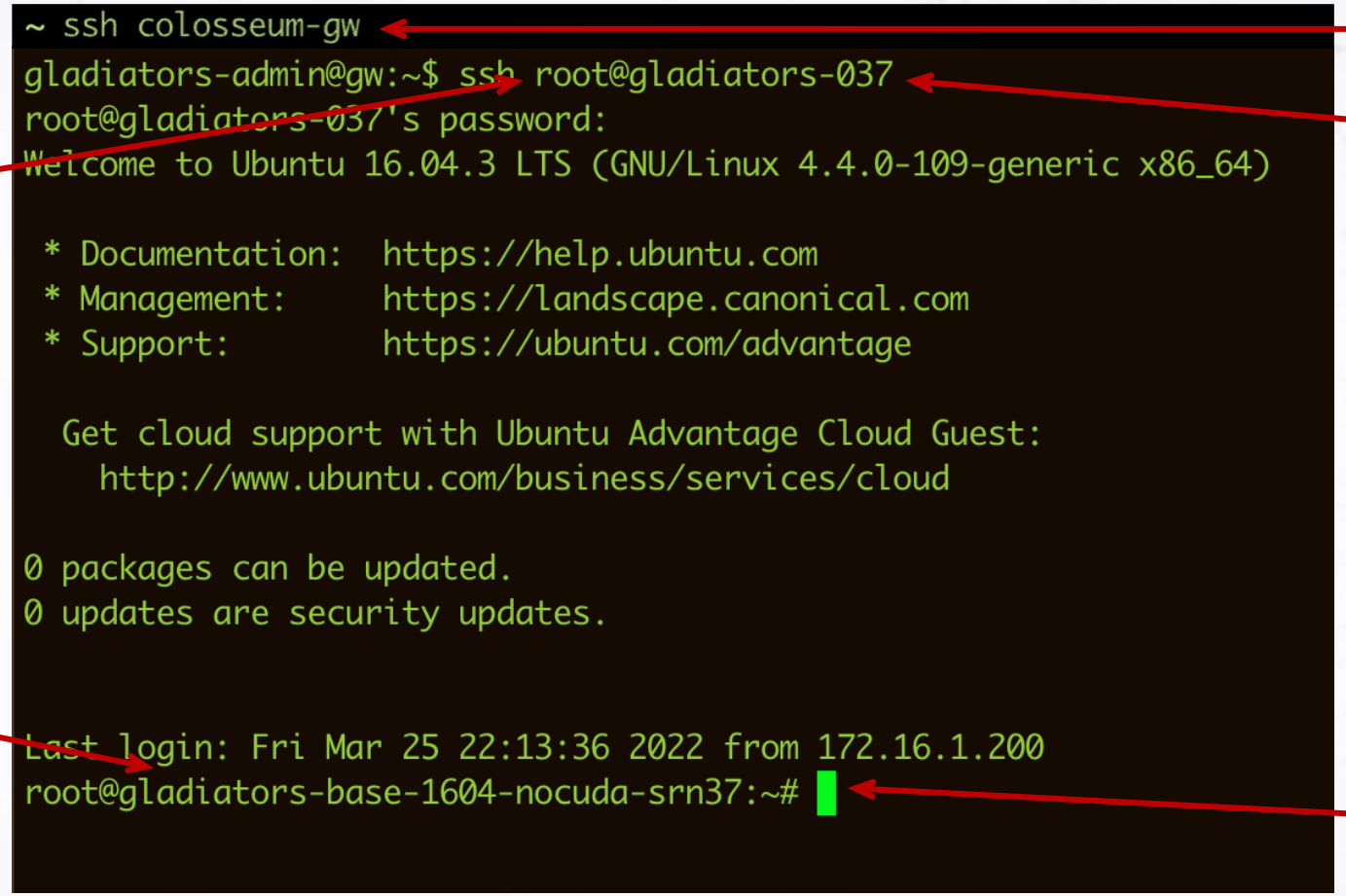


View Reservation Details



Login to an SRN

- Option 1:



Access Gateway

Node hostname

Access as root from gateway

Container name

Successfully logged-in!

- Option 2:

Node hostname

From your pc (need ssh config)

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colosseumcli

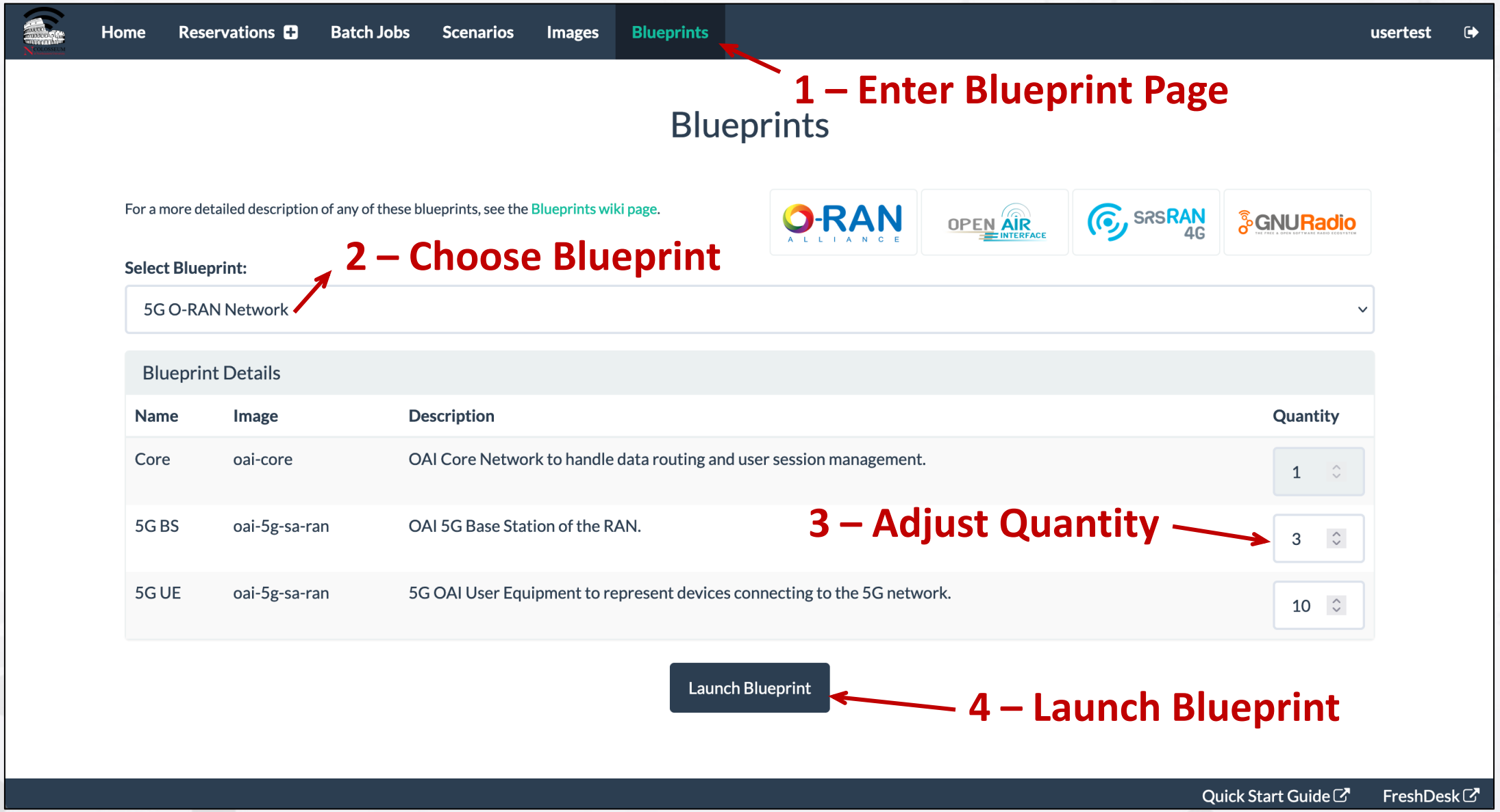
- **colosseumcli** is a Command Line Interface to interact with the Colosseum environment:
  - **Scenarios** – *colosseumcli rf …*
    - Start a scenario: *colosseumcli rf start 1009 –c*
    - Stop a scenario: *colosseumcli rf stop*
  - **Traffics** – *colosseumcli tg …*
    - Start a traffic scenario: *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



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

```
{
"BatchName": "My Test Batch",
"Duration": 300,
"RFScenario": 6742,
"TrafficScenario": 1,
"NodeData": [
  {
    "RFNode_ID"       : 1,
    "ImageName"       : "modem-image-v1",
    "ModemConfig"     : "modem_config_file_1",
    "isGateway"       : true,
    "TrafficNode_ID"  : 1,
    "node_type"       : "competitor"
  },
  {
    "RFNode_ID"       : 2,
    "ImageName"       : "modem-image-v1",
    "ModemConfig"     : "modem_config_file_2",
    "isGateway"       : false,
    "TrafficNode_ID"  : 2,
    "node_type"       : "competitor"
  }
]
}
```

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

```
{
  "BatchName": "My Test Batch",
  "Duration": 300,
  "RFScenario": 6742,
  "TrafficScenario": 1,
  "NodeData": [
    {
      "RFNode_ID"       : 1,
      "ImageName"       : "modem-image-v1",
      "ModemConfig"     : "modem_config_file_1",
      "isGateway"       : true,
      "TrafficNode_ID"  : 1,
      "node_type"       : "competitor"
    },
    {
      "RFNode_ID"       : 2,
      "ImageName"       : "modem-image-v1",
      "ModemConfig"     : "modem_config_file_2",
      "isGateway"       : false,
      "TrafficNode_ID"  : 2,
      "node_type"       : "competitor"
    }
  ]
}
```

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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