

Cloudy with a chance of Simulation

ROSCon 2016

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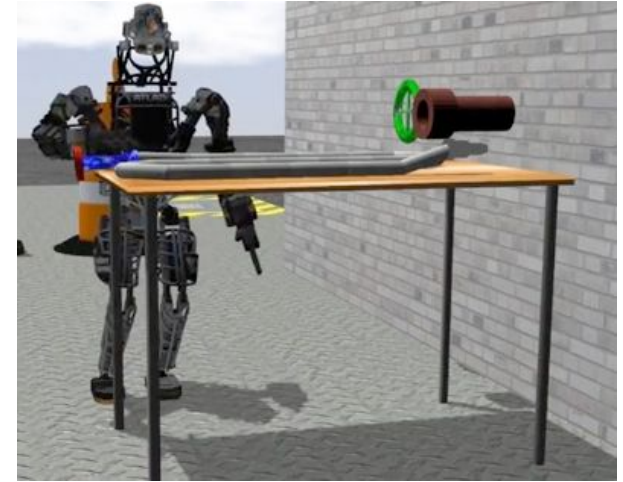
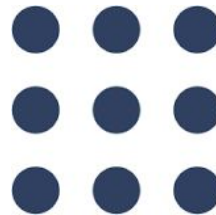
Simulation on the Cloud

DARPA Virtual Robotics Challenge

- Birth of CloudSim



Rich Hardware / Software
Resources available



Upcoming Projects

Space Robotics Challenge (SRC)
NASA



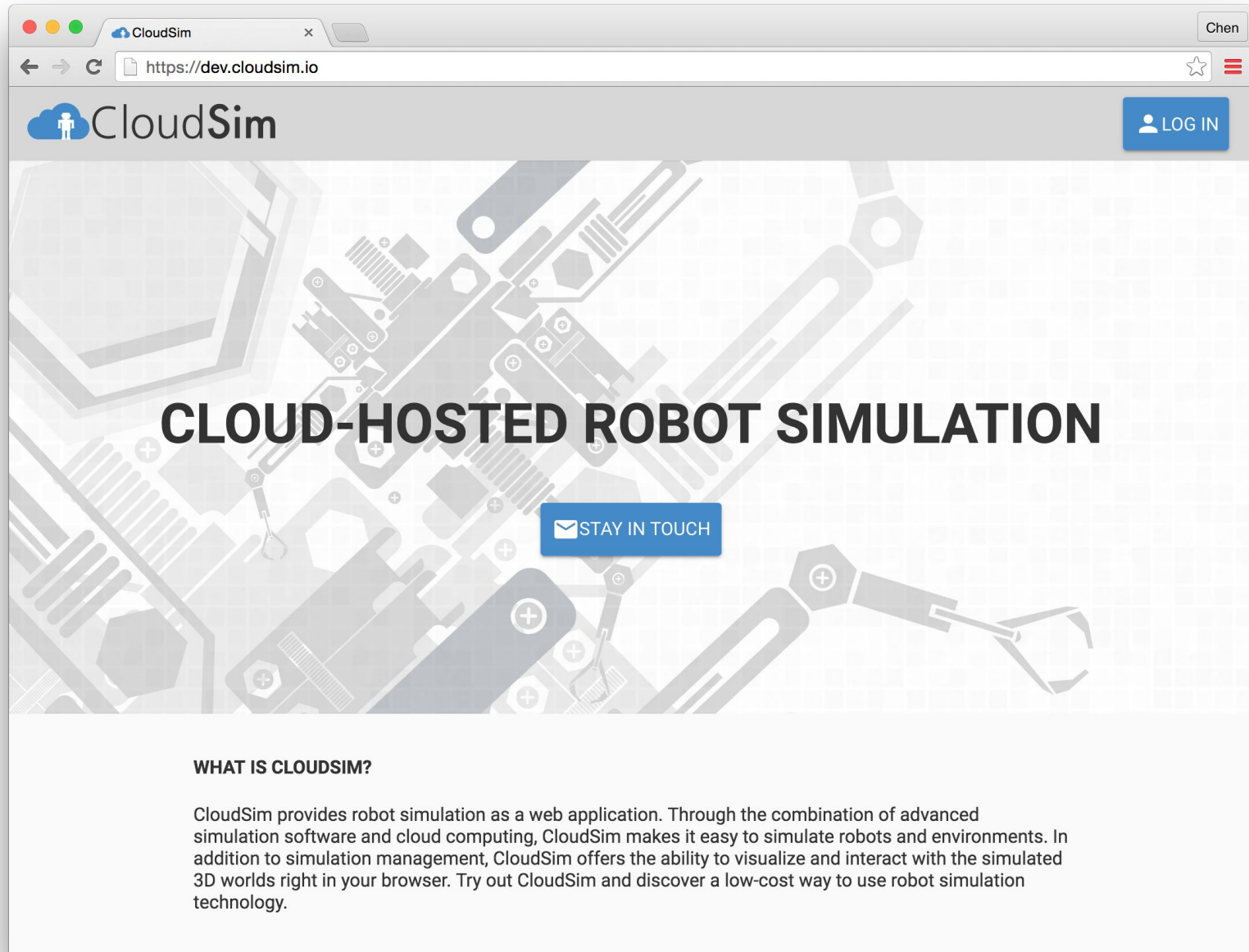
Agile Robotics for Industrial
Automation Competition (ARIAC)
NIST



ARIAC^{NIST}
Agile Robotics for Industrial
Automation Competition

Upcoming Swarm Competition
TBA

Cloudsim.io



Cloudsim.io - What's New?

Architectural Design

- Frontend: Web components
- Backend: Servers as micro-services

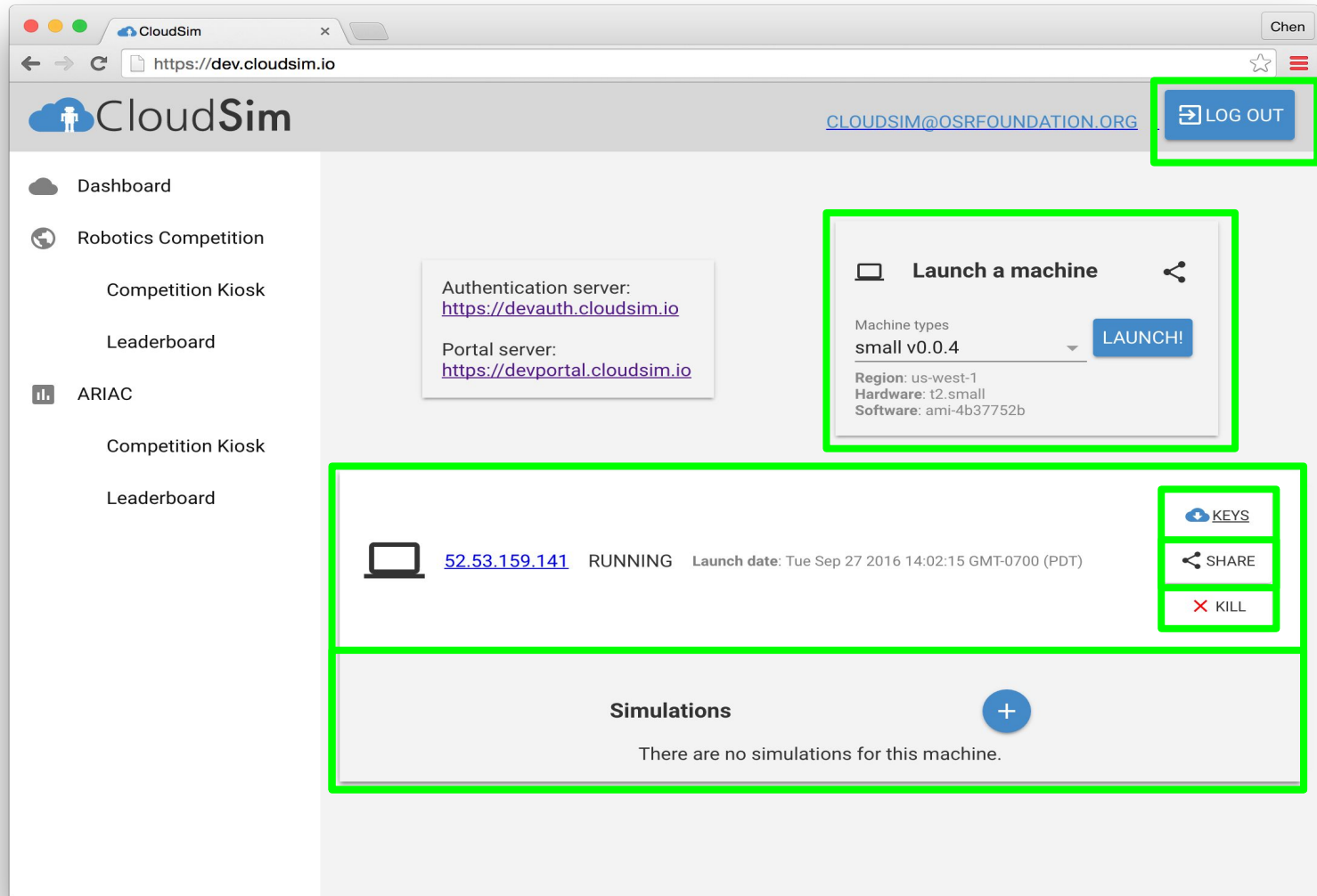
Flexible configuration of machine instances

Permissions / Resource Sharing

User software setup

Frontend: Cloudsim-Widgets

Web-app pieced together by web components



Cloudsim-Widgets

Web components talks directly to back-end

The screenshot shows the CloudSim web interface at <https://dev.cloudsim.io>. The interface includes a sidebar with navigation links: Dashboard, Robotics Competition, Competition Kiosk, Leaderboard, and ARIAC. The main content area features a 'Launch a machine' section with a dropdown menu for 'Machine types' (currently showing 'small v0.0.4') and a 'LAUNCH!' button. Below this, a table lists running machines, with one machine shown: IP [52.53.159.141](#), status 'RUNNING', and launch date 'Tue Sep 27 2016 14:02:15 GMT-0700 (PDT)'. To the right of the table are buttons for 'KEYS', 'SHARE', and 'KILL'. At the bottom, a 'Simulations' section indicates 'There are no simulations for this machine.' with a '+' button to add more. Annotations include a blue box around the 'LOG OUT' button in the top right, a blue box around the 'Launch a machine' section, a yellow box around the machine entry in the table, and a yellow box around the 'Simulations' section. Three server icons are overlaid: a light blue 'AUTH' server in the top right, a teal 'PORTAL' server in the center, and a brown 'SIM' server in the bottom right.

CloudSim

<https://dev.cloudsim.io>

CLOUDSIM@OSRFFOUNDATION.ORG

LOG OUT

Authentication server: <https://devauth.org>

Portal server: <https://devportal.org>

Launch a machine

Machine types: small v0.0.4

Region: us-west-1

Hardware: t2.small

Software: ami-4b37752b

LAUNCH!

52.53.159.141 RUNNING Launch date: Tue Sep 27 2016 14:02:15 GMT-0700 (PDT)

KEYS

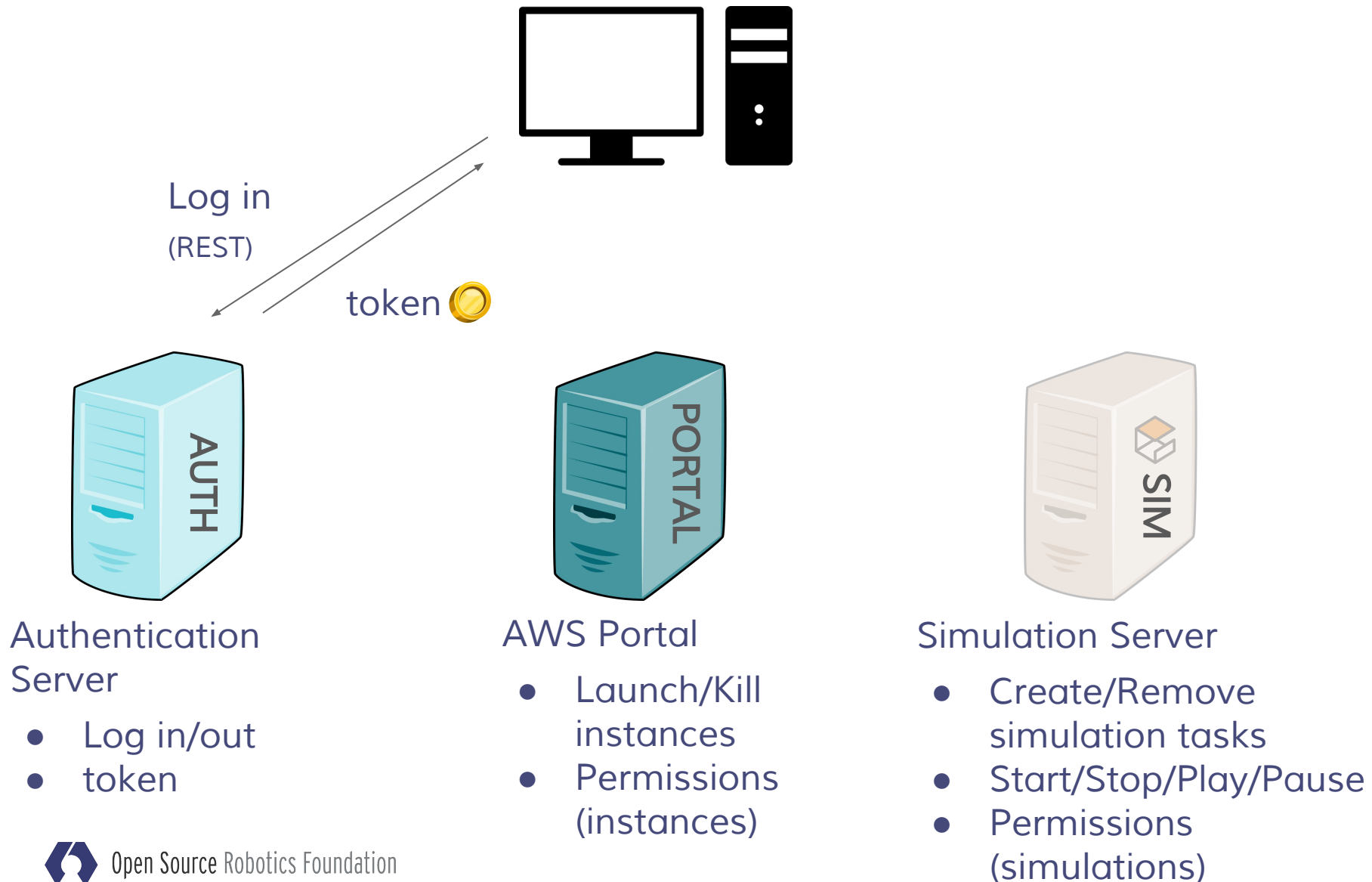
SHARE

KILL

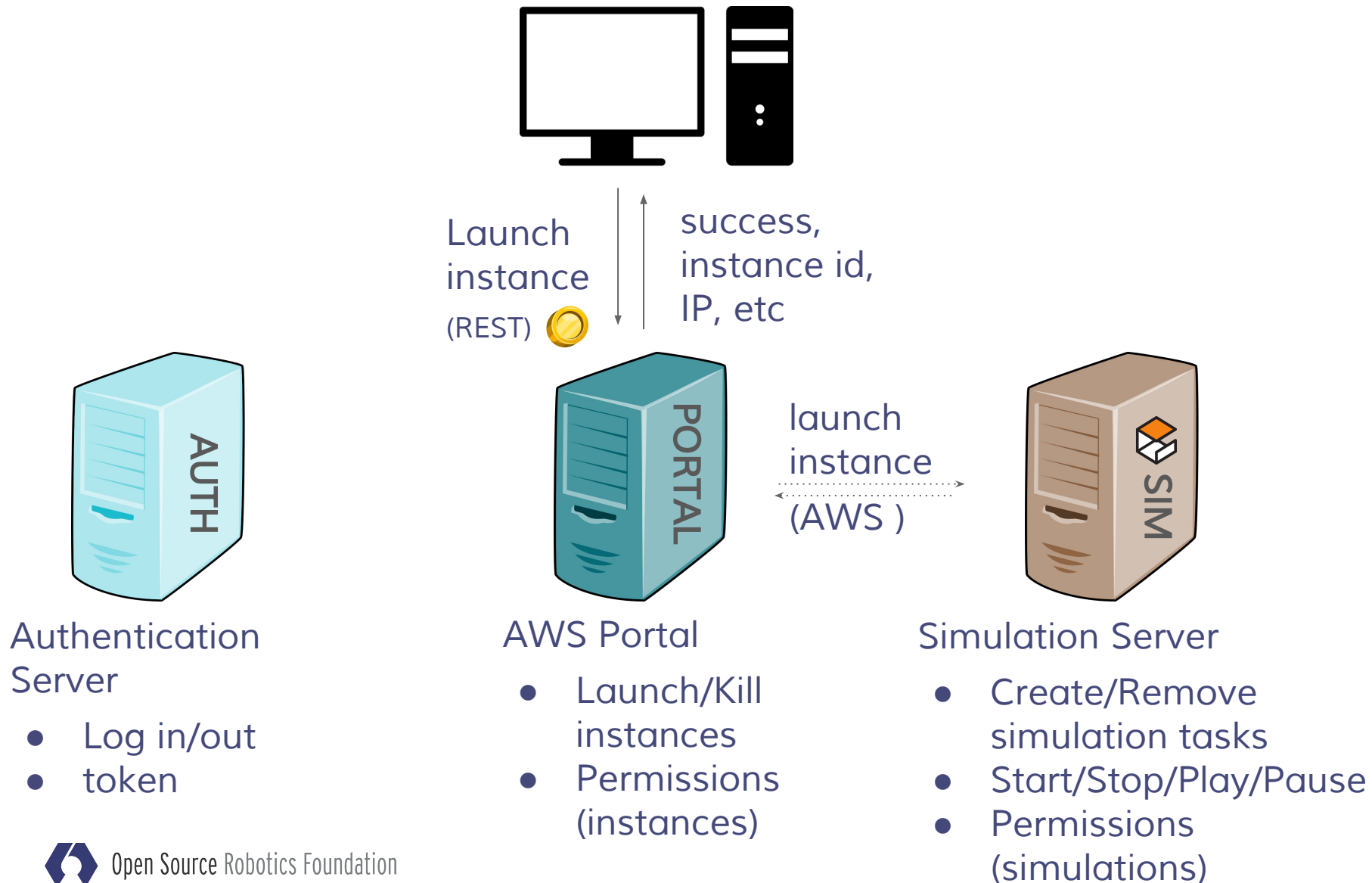
Simulations

There are no simulations for this machine.

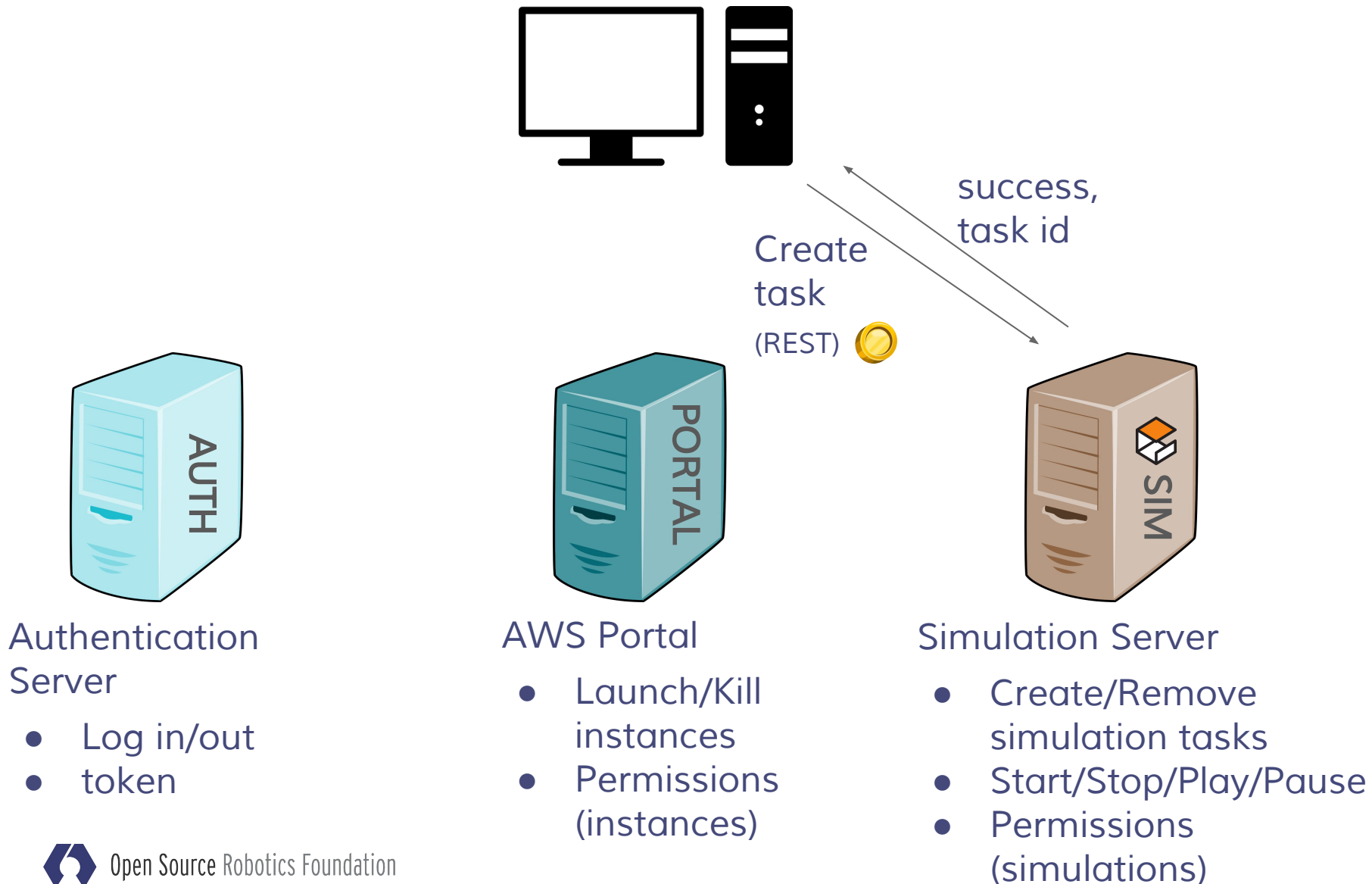
Authentication



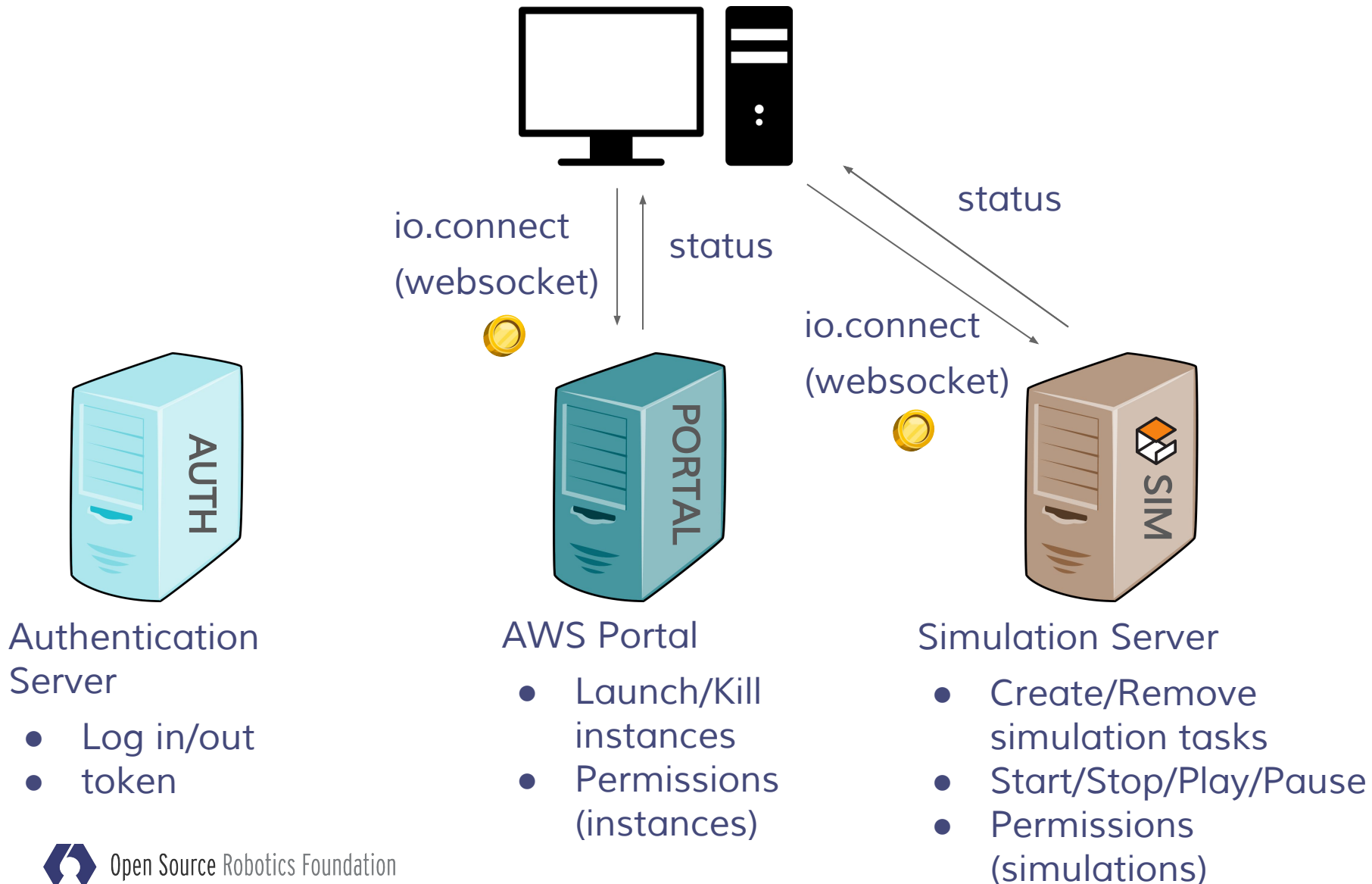
Back-end Servers



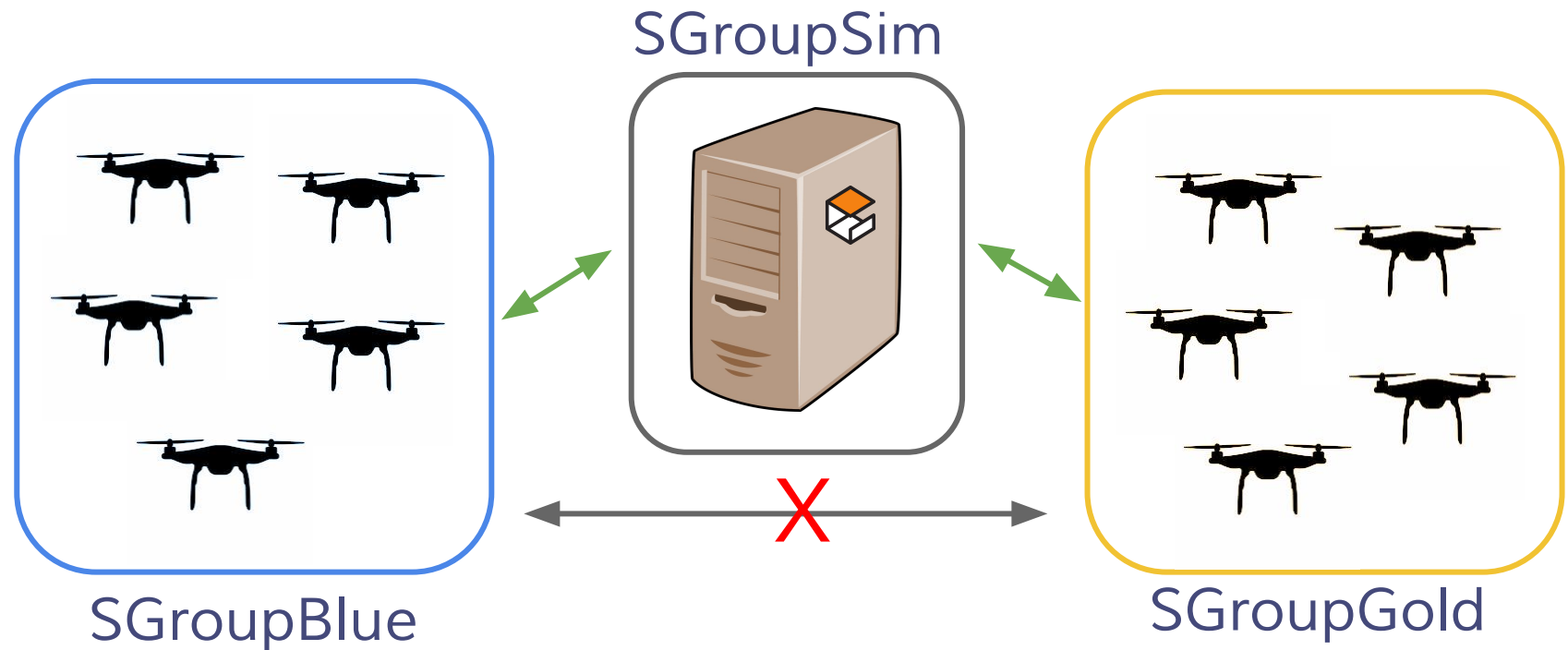
Back-end Servers



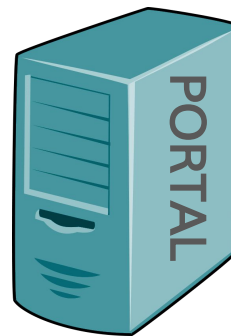
Back-end Servers



Security Groups: Swarm Competition Case Study

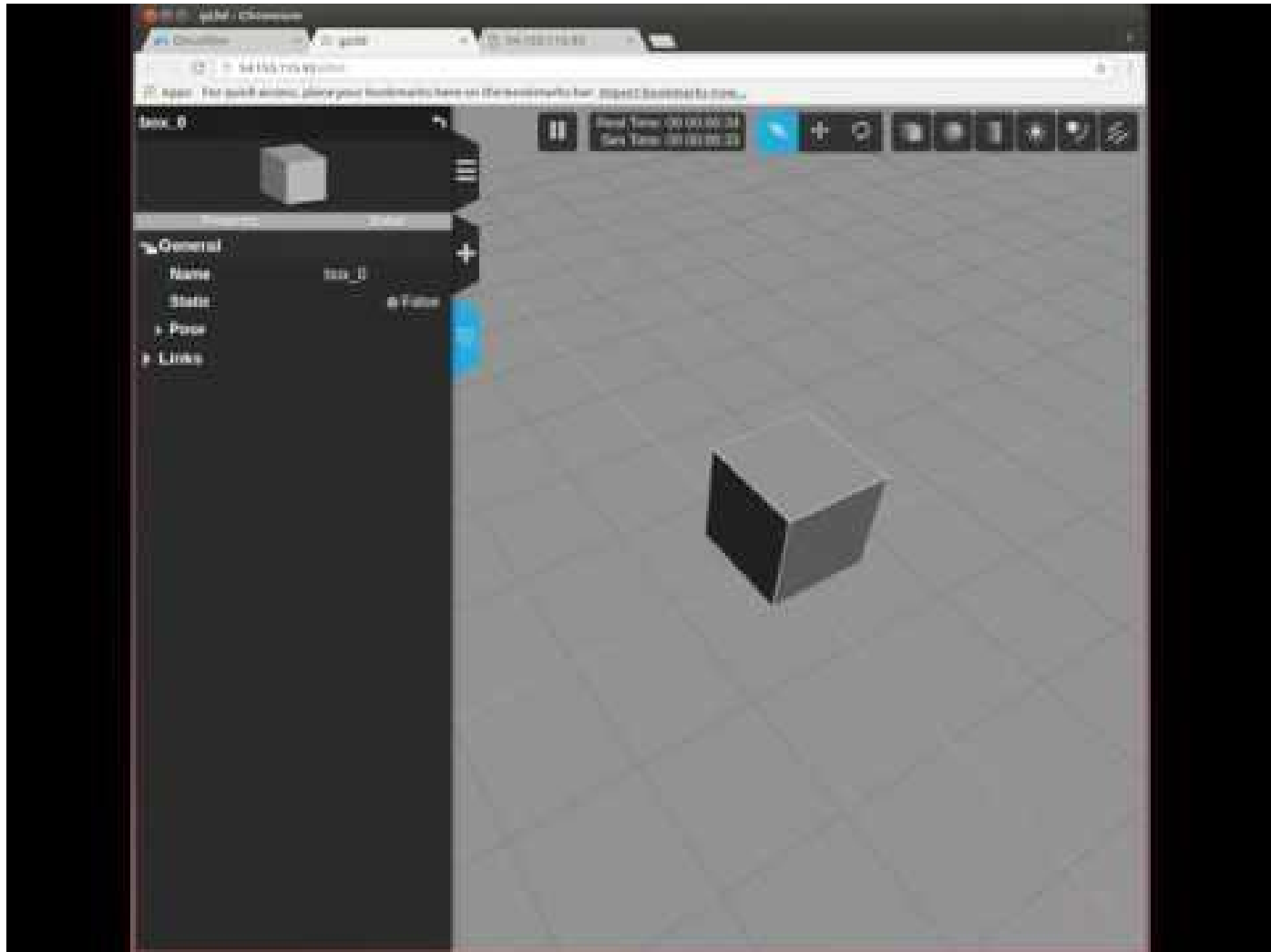


- Traffic Control managed by Portal



1. Create sgroup
name: SGroupGold
rules: type: inbound
src: sgroupsim
2. Launch instance
sgroup: SGroupGold

Demo / Video



Thank you - Questions?

Cloudsim developers:

Ian Chen, Louise Poubel, Hugo Boyer

Contributions:

Gazebo/ROS team @ OSRF

Mohamd Ayman (GSOC student for gazebojs / gzweb)

CloudSim Repo:

<https://bitbucket.org/osrf/cloudsim>

