NRELABS.IO

Learning Automation Without Barriers

with NRE Labs

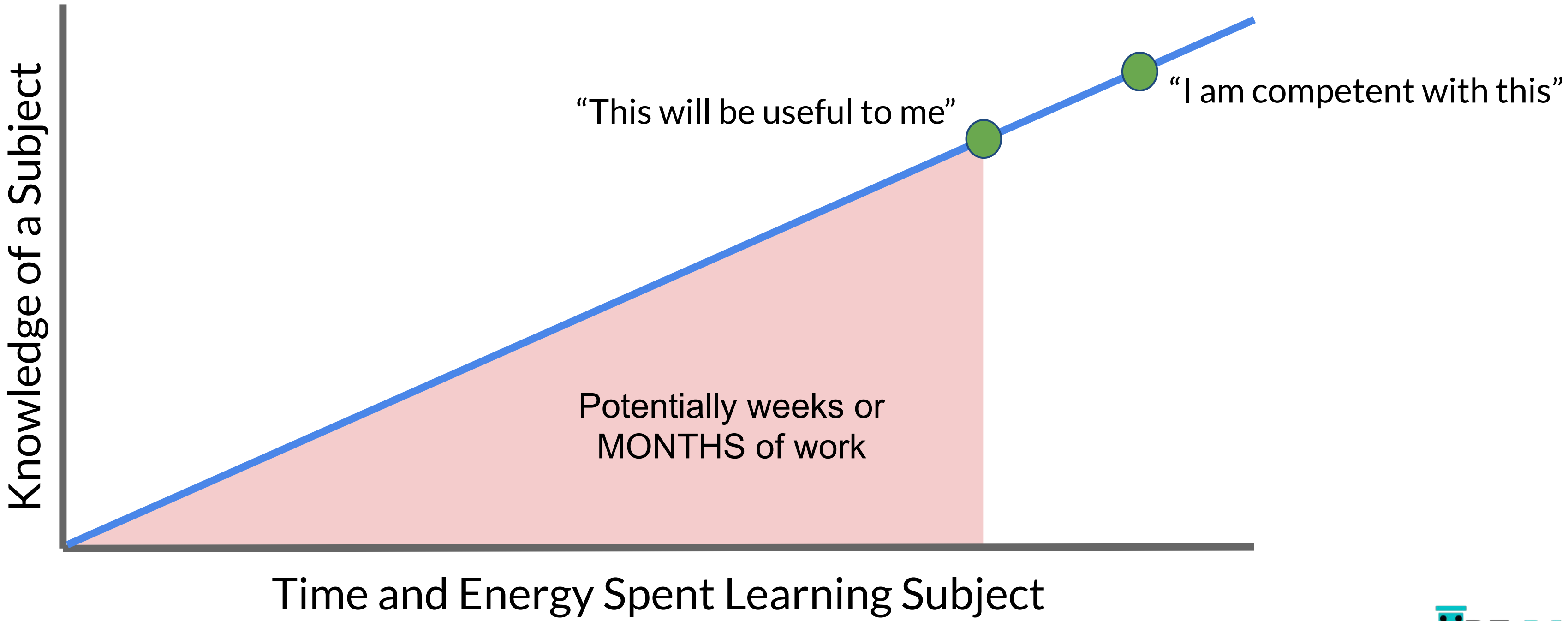
Agenda

1. The Automation Adoption Problem
2. What is NRE Labs?
3. How NRE Labs Can Help You
4. Contributing to NRE Labs

With automation, you have be an expert before you are allowed to be a beginner

(this is a problem)

Time Investment Minimum (TIM) - HIGH



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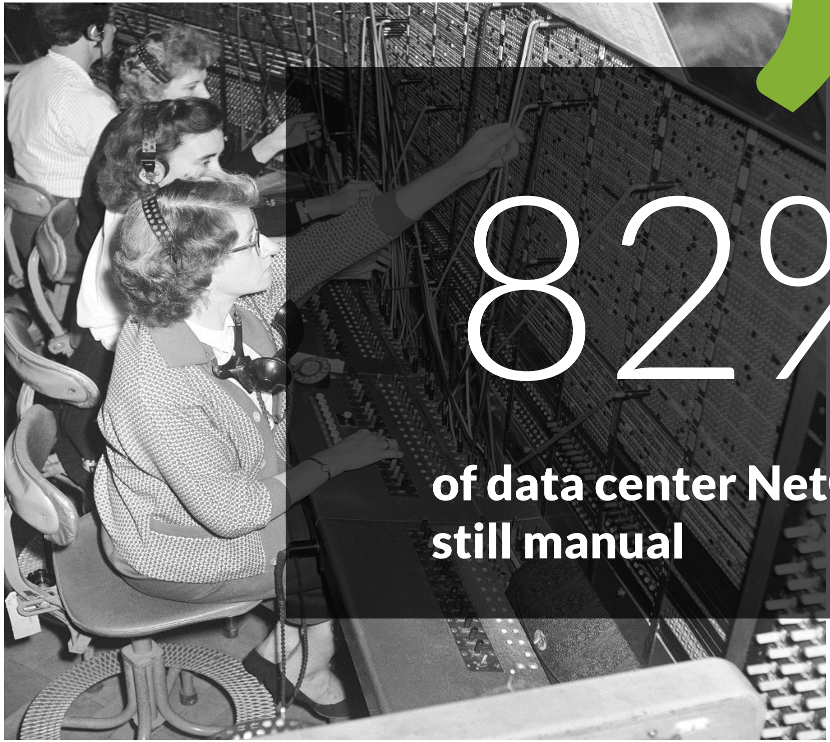
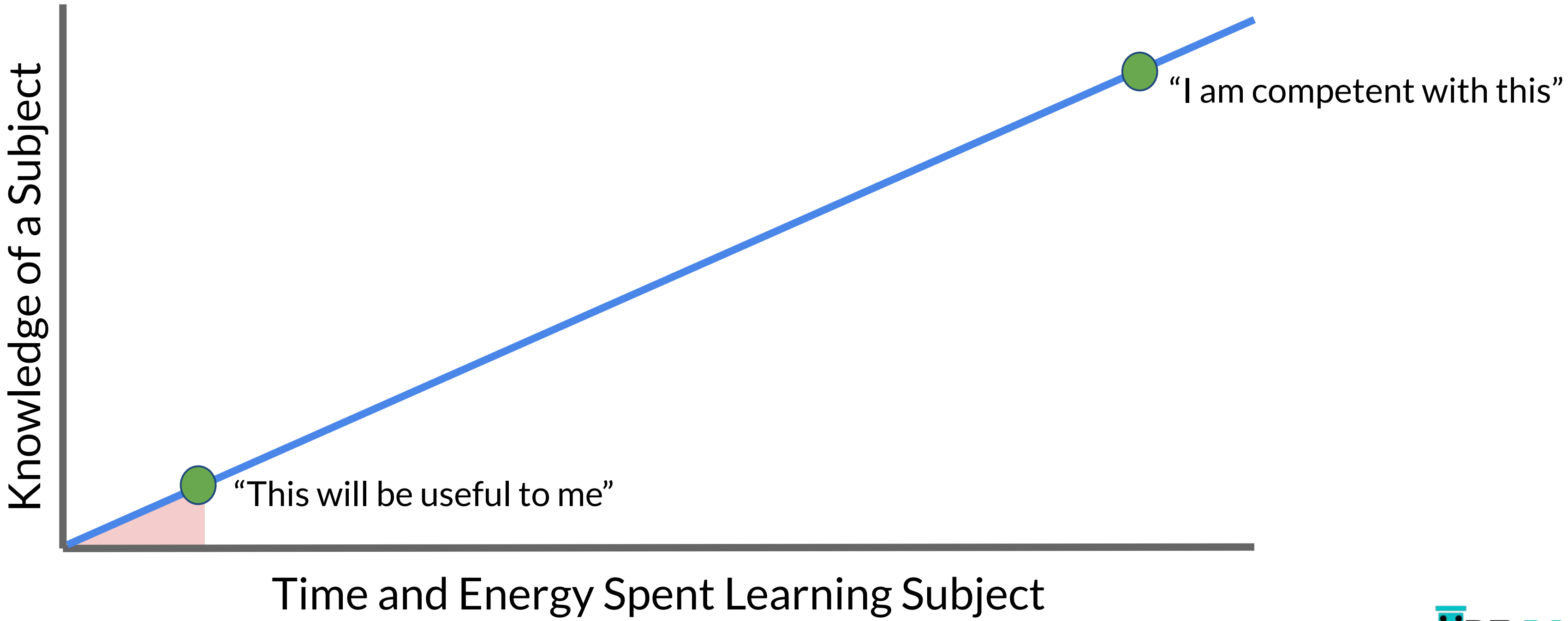


82%

of data center NetOps are still manual

Time Investment Minimum (TIM) - LOW



NRE LABS

NRE Labs

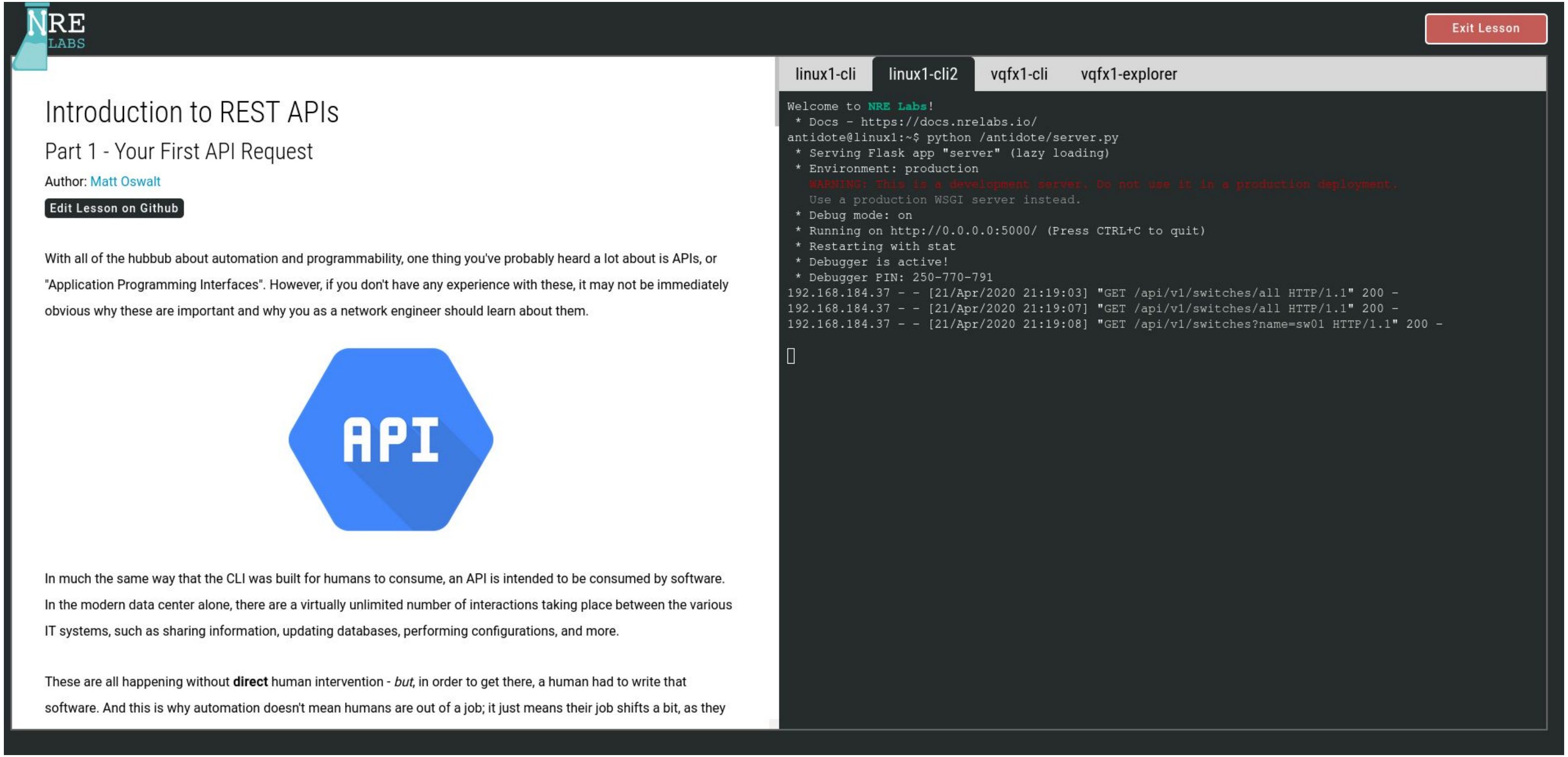
Community platform for learning and teaching automation and Network Reliability Engineering

- Totally browser-based
- Internet-accessible
- Free - no login, paywall or creepy trackers
- Vendor-neutral
- Open Source (curriculum too!)

Our Mission

To remove traditional barriers to learning new, advanced skill sets, and meaningfully enhance and edify infrastructure professionals around the world

Interactive, Browser-Based, On-Demand.



Introduction to REST APIs

Part 1 - Your First API Request

Author: Matt Oswalt

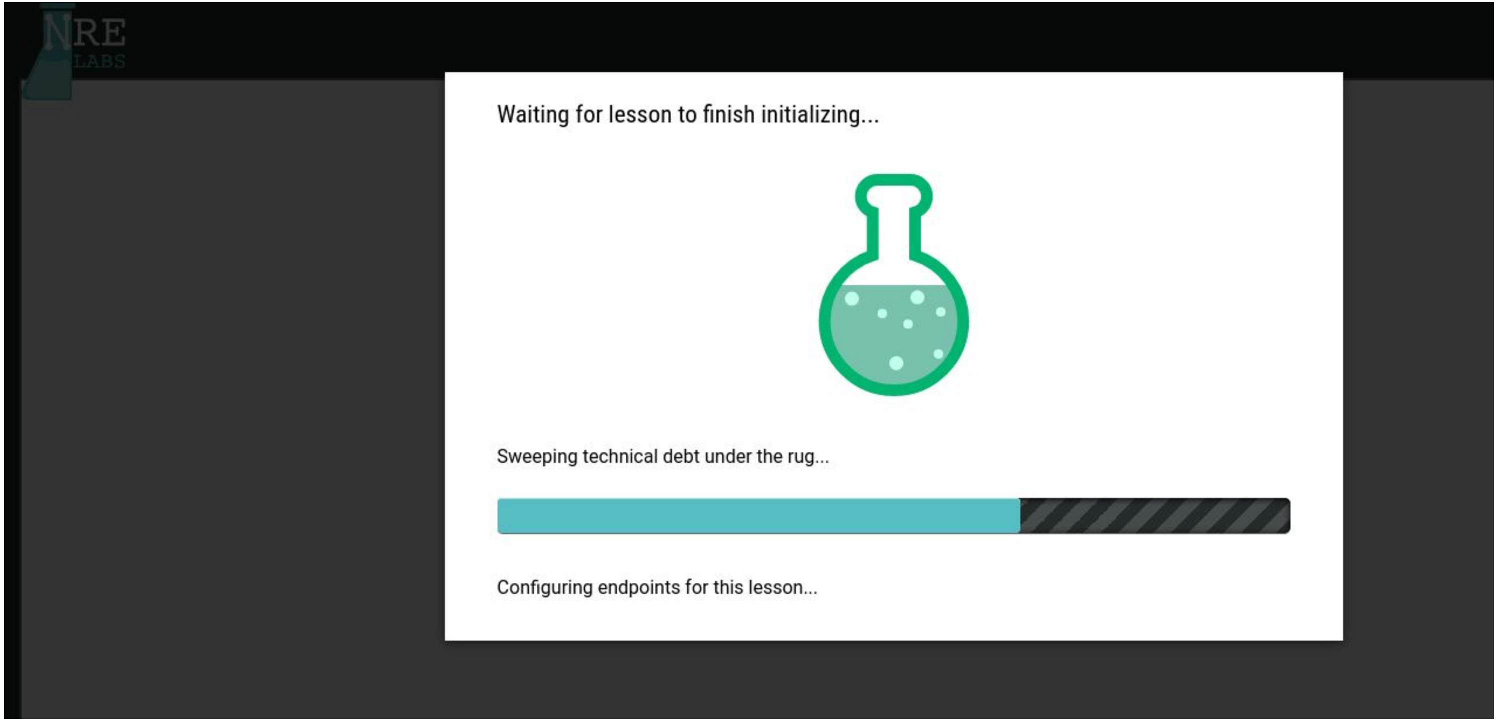
With all of the hubbub about automation and programmability, one thing you've probably heard a lot about is APIs, or "Application Programming Interfaces". However, if you don't have any experience with these, it may not be immediately obvious why these are important and why you as a network engineer should learn about them.

In much the same way that the CLI was built for humans to consume, an API is intended to be consumed by software. In the modern data center alone, there are a virtually unlimited number of interactions taking place between the various IT systems, such as sharing information, updating databases, performing configurations, and more.

These are all happening without **direct** human intervention - *but*, in order to get there, a human had to write that software. And this is why automation doesn't mean humans are out of a job; it just means their job shifts a bit, as they

```
Welcome to NRE Labs!
 * Docs - https://docs.nrelabs.io/
antidote@linux1:~$ python /antidote/server.py
 * Serving Flask app "server" (lazy loading)
 * Environment: production
   WARNING: This is a development server. Do not use it in a production deployment.
   Use a production WSGI server instead.
 * Debug mode: on
 * Running on http://0.0.0.0:5000/ (Press CTRL+C to quit)
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 250-770-791
192.168.184.37 - - [21/Apr/2020 21:19:03] "GET /api/v1/switches/all HTTP/1.1" 200 -
192.168.184.37 - - [21/Apr/2020 21:19:07] "GET /api/v1/switches/all HTTP/1.1" 200 -
192.168.184.37 - - [21/Apr/2020 21:19:08] "GET /api/v1/switches?name=sw01 HTTP/1.1" 200 -
```

Focus on the Topic

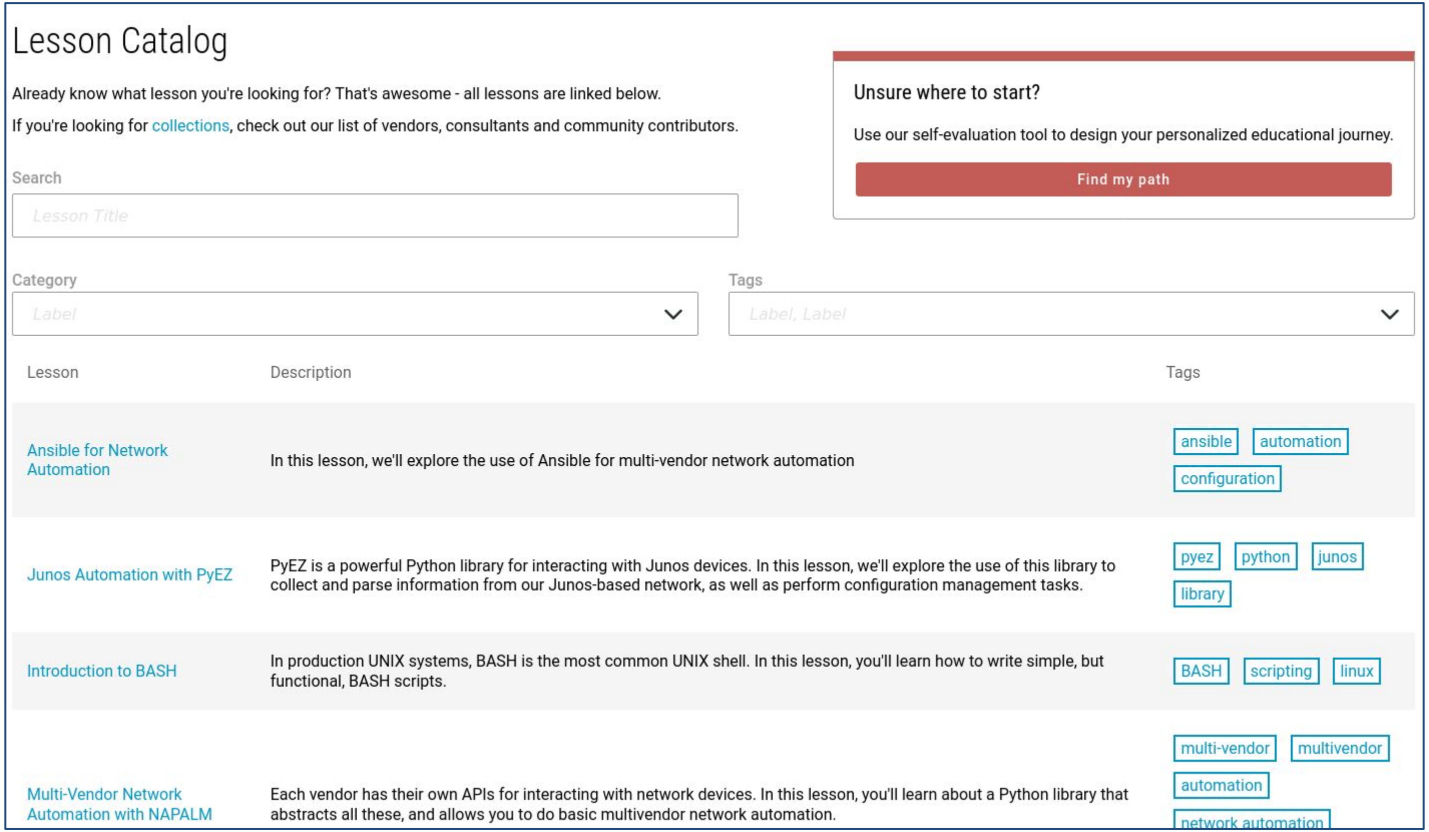


Waiting for lesson to finish initializing...

Sweeping technical debt under the rug...

Configuring endpoints for this lesson...

A Diverse and Growing Curriculum



Lesson Catalog

Already know what lesson you're looking for? That's awesome - all lessons are linked below.

If you're looking for collections, check out our list of vendors, consultants and community contributors.

Unsure where to start?

Use our self-evaluation tool to design your personalized educational journey.

Lesson	Description	Tags
Ansible for Network Automation	In this lesson, we'll explore the use of Ansible for multi-vendor network automation	ansible automation configuration
Junos Automation with PyEZ	PyEZ is a powerful Python library for interacting with Junos devices. In this lesson, we'll explore the use of this library to collect and parse information from our Junos-based network, as well as perform configuration management tasks.	pyez python junos library
Introduction to BASH	In production UNIX systems, BASH is the most common UNIX shell. In this lesson, you'll learn how to write simple, but functional, BASH scripts.	BASH scripting linux
Multi-Vendor Network Automation with NAPALM	Each vendor has their own APIs for interacting with network devices. In this lesson, you'll learn about a Python library that abstracts all these, and allows you to do basic multivendor network automation.	multi-vendor multivendor automation network automation

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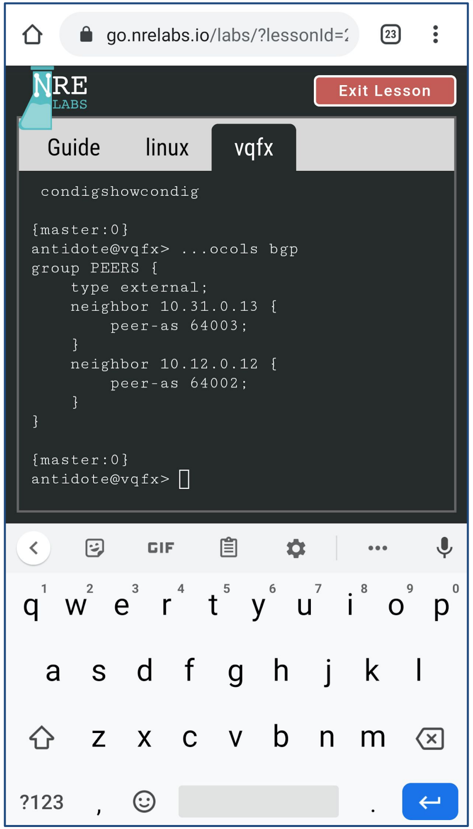
Junos On Your Phone!

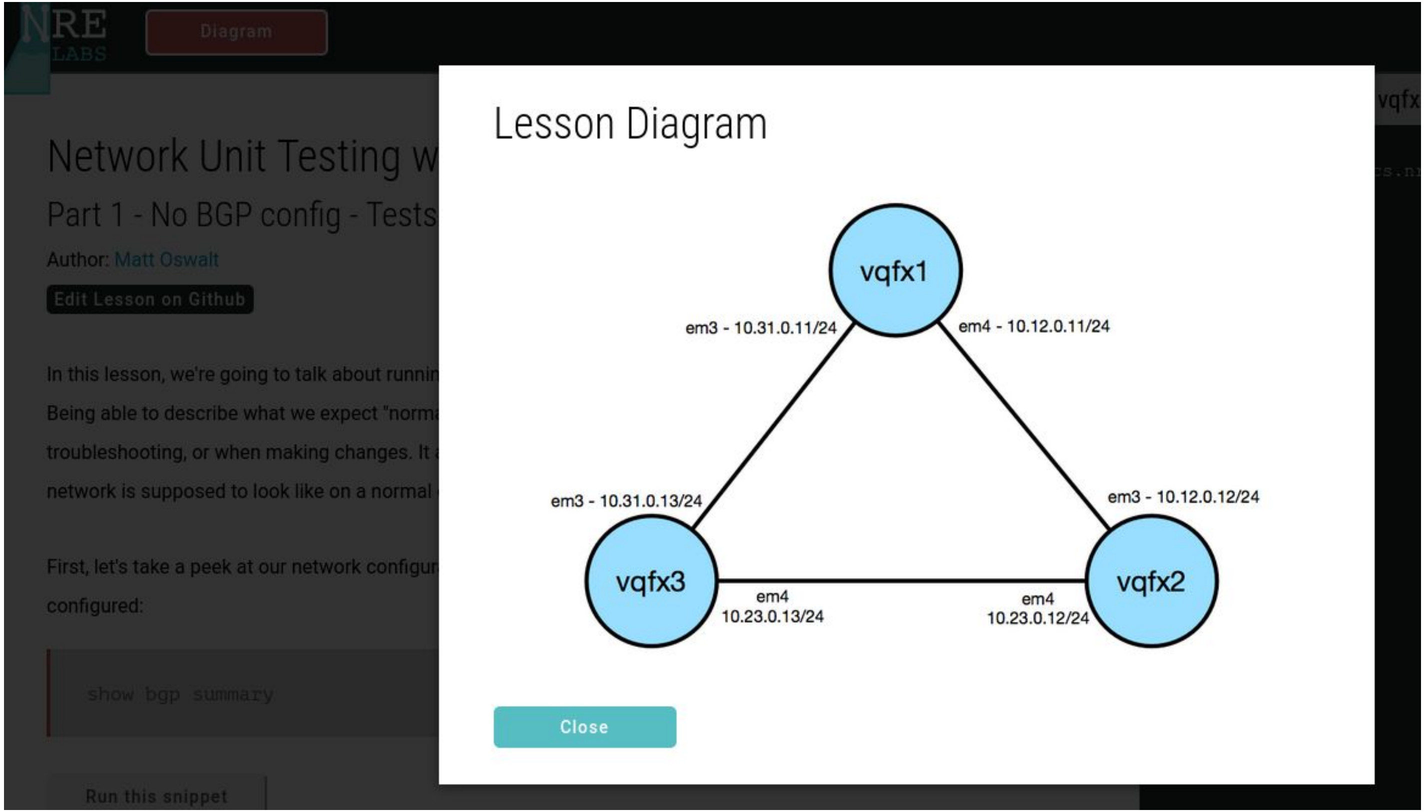


```
 condigshowcondig

{master:0}
antidote@vqfx> ...ocols bgp
group PEERS {
    type external;
    neighbor 10.31.0.13 {
        peer-as 64003;
    }
    neighbor 10.12.0.12 {
        peer-as 64002;
    }
}

{master:0}
antidote@vqfx> 
```

Pre-defined Topologies



Network Unit Testing w

Part 1 - No BGP config - Tests

Author: Matt Oswalt

In this lesson, we're going to talk about runnin

Being able to describe what we expect "norma

troubleshooting, or when making changes. It a

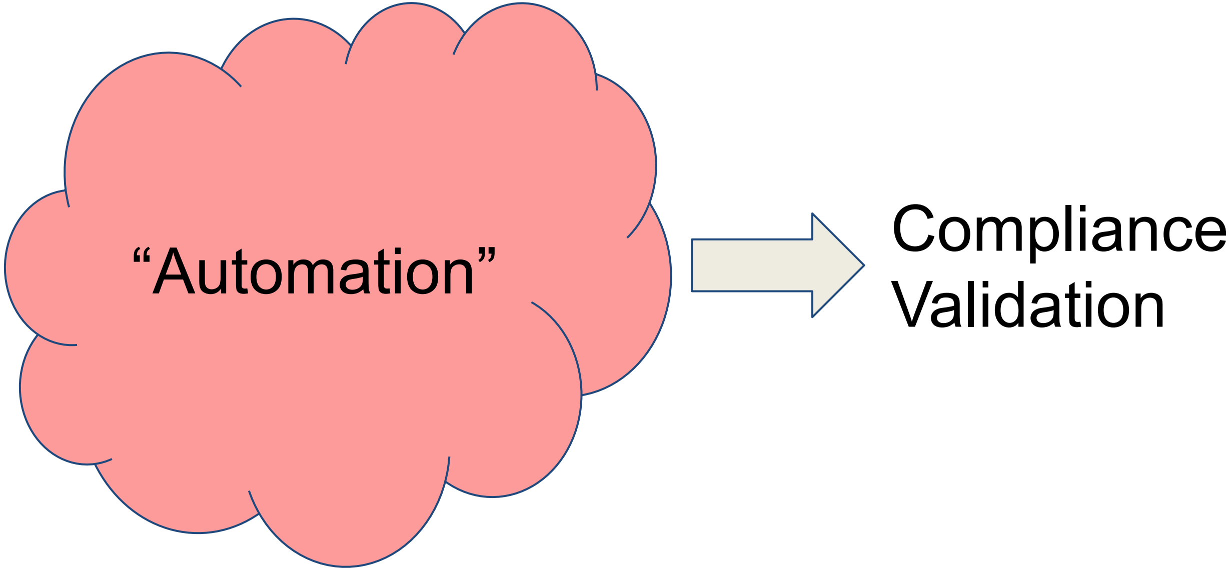
network is supposed to look like on a normal

First, let's take a peek at our network configur

configured:

```
show bgp summary
```

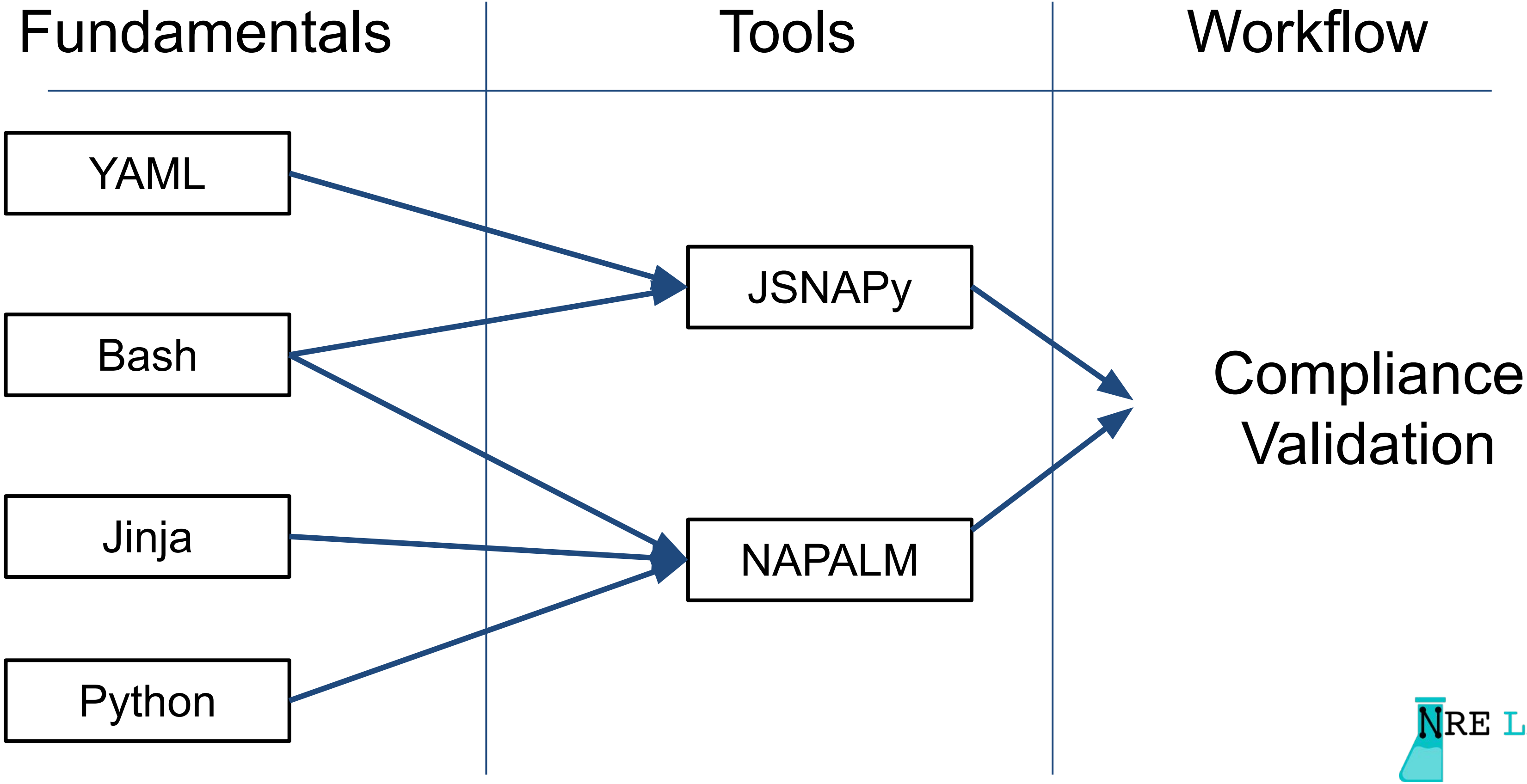
Lesson Diagram



“Automation”

Compliance Validation

Mapping Out Pre-Requisite Knowledge



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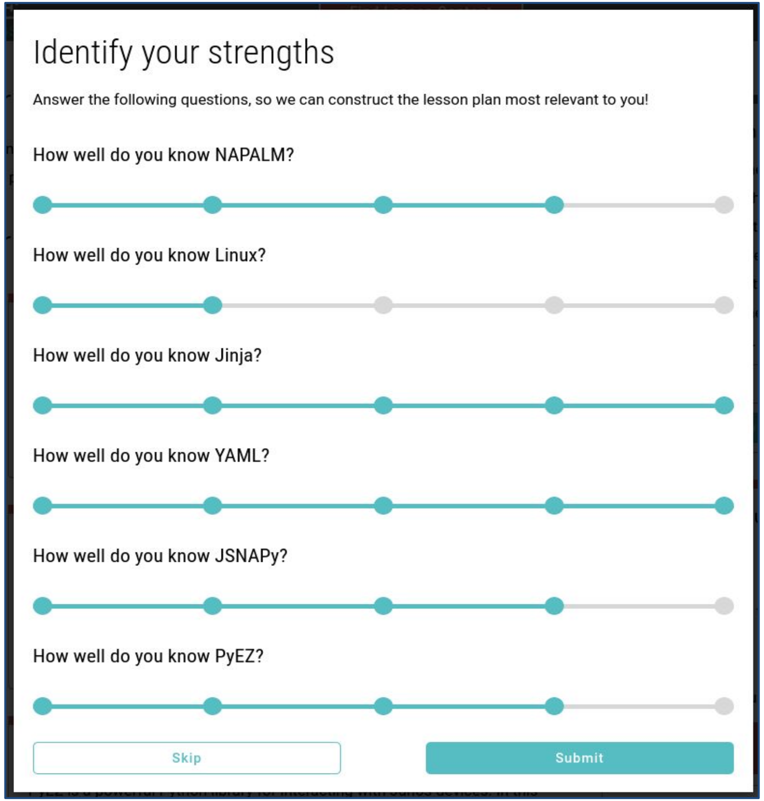
Course Advisor



Identify your strengths

Answer the following questions, so we can construct the lesson plan most relevant to you!

How well do you know NAPALM?

●—●—●—●—○

How well do you know Linux?

●—●—○—○—○

How well do you know Jinja?

●—●—●—●—●

How well do you know YAML?

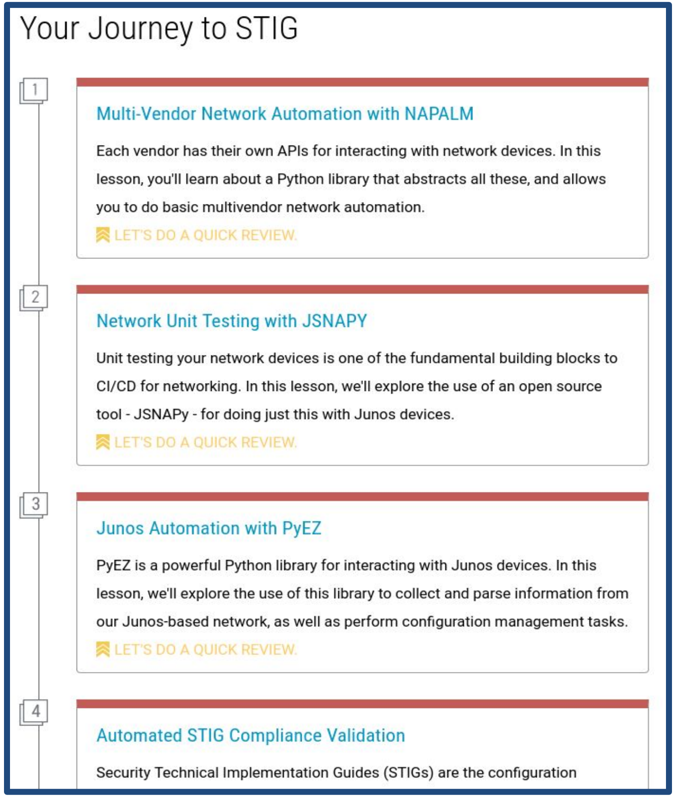
●—●—●—●—●

How well do you know JSNAPy?

●—●—●—●—○

How well do you know PyEZ?

●—●—●—●—○



Your Journey to STIG

1

Multi-Vendor Network Automation with NAPALM

Each vendor has their own APIs for interacting with network devices. In this lesson, you'll learn about a Python library that abstracts all these, and allows you to do basic multivendor network automation.

LET'S DO A QUICK REVIEW.

2

Network Unit Testing with JSNAPY

Unit testing your network devices is one of the fundamental building blocks to CI/CD for networking. In this lesson, we'll explore the use of an open source tool - JSNAPy - for doing just this with Junos devices.

LET'S DO A QUICK REVIEW.

3

Junos Automation with PyEZ

PyEZ is a powerful Python library for interacting with Junos devices. In this lesson, we'll explore the use of this library to collect and parse information from our Junos-based network, as well as perform configuration management tasks.

LET'S DO A QUICK REVIEW.

4

Automated STIG Compliance Validation

Security Technical Implementation Guides (STIGs) are the configuration

NRE LABS

NRE Labs IS

✓ Pre-defined, easy to consume lessons on automation and NRE principles

✓ An Open Source project and curriculum - open to all to contribute

✓ Vendor-Inclusive

NRE Labs is NOT

✓ Build-your-own topologies

✓ A fully-featured demo or PoC platform

✓ "Owned" by any one of the sponsoring organizations. This is a community project.

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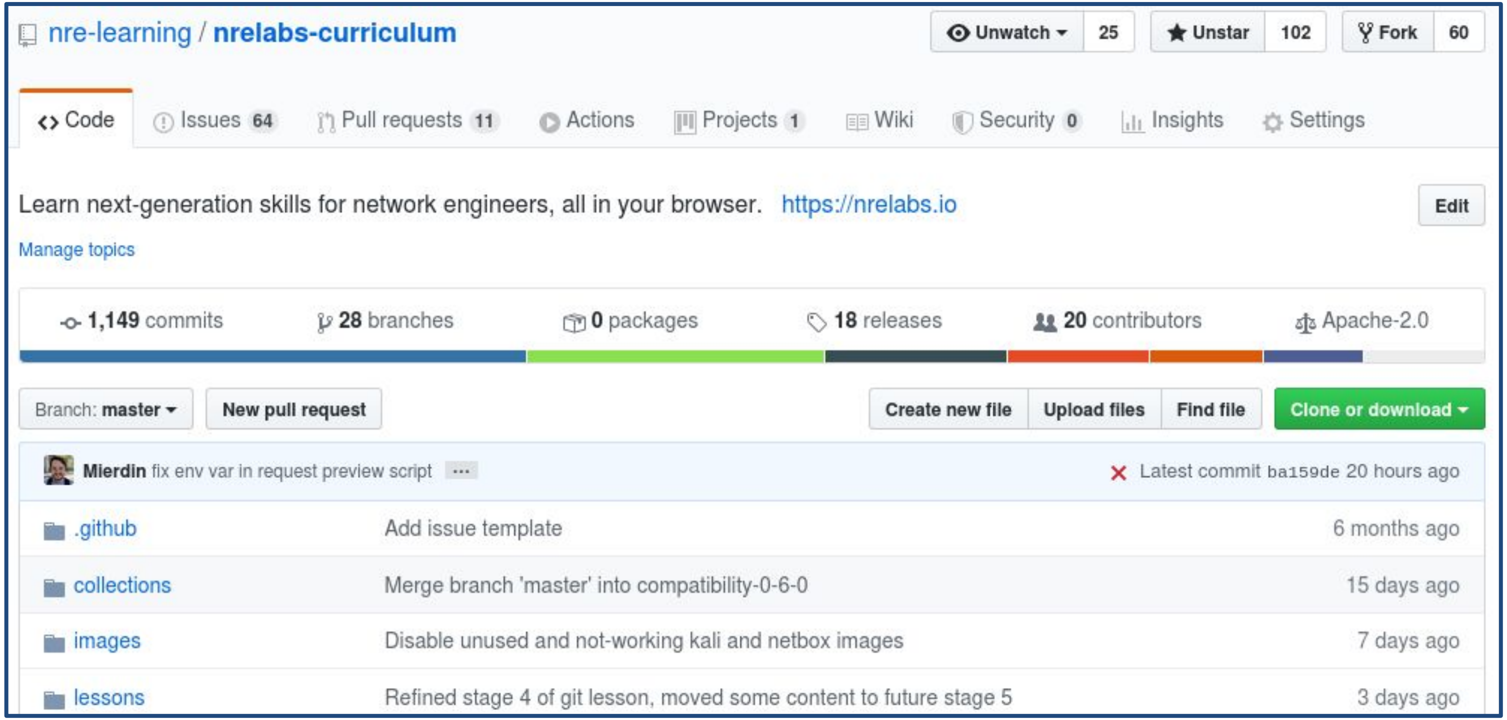
Contributing to NRE Labs



nre-learning / **nrelabs-curriculum**

Learn next-generation skills for network engineers, all in your browser. https://nrelabs.io

1,149 commits · 28 branches · 0 packages · 18 releases · 20 contributors · Apache-2.0

Mierdin fix env var in request preview script ··· Latest commit ba159de 20 hours ago

.github	Add issue template	6 months ago
collections	Merge branch 'master' into compatibility-0-6-0	15 days ago
images	Disable unused and not-working kali and netbox images	7 days ago
lessons	Refined stage 4 of git lesson, moved some content to future stage 5	3 days ago

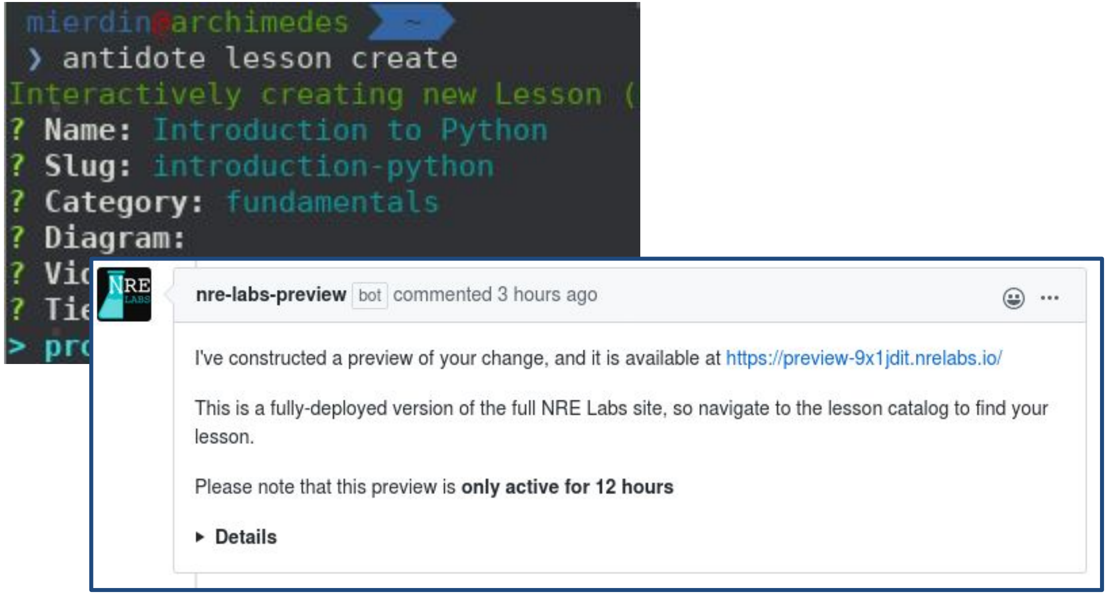
https://github.com/nre-learning/nrelabs-curriculum

NRE LABS

Contributing to NRE Labs

Start here - docs.nrelabs.io/creating-contributing/getting-started

1. Bootstrap new lesson
2. Open Pull Request
3. Iterate until finished
4. Review and merge



```
mierdin@archimedes  ~
❯ antidote lesson create
Interactively creating new Lesson (
? Name: Introduction to Python
? Slug: introduction-python
? Category: fundamentals
? Diagram:
? Vid
? Tie
> pr
```

nre-labs-preview bot commented 3 hours ago

I've constructed a preview of your change, and it is available at https://preview-9x1jdit.nrelabs.io/

This is a fully-deployed version of the full NRE Labs site, so navigate to the lesson catalog to find your lesson.

Please note that this preview is **only active for 12 hours**

▸ **Details**

Resources

Homepage - nrelabs.io

Forums - discuss.nrelabs.io

Docs - docs.nrelabs.io

Open Source - github.com/nre-learning

Twitter - @NRELabs

No Contribution Too Small!

- Use NRE Labs and open issues!
- Lesson Contributions - new or existing
- Platform enhancements/fixes

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Thank You!