Harrison Grant Totty

DEVOPS ENGINEER · SOFTWARE PROGRAMMER

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Summary

Current lead DevOps Engineer and systems architect for the Web Systems group at Wolfram Research. Highly experienced at implementing custom infrastructure solutions within bare-metal/on-premise environments. Thrives in seeking solutions within domains not yet encompassed by popular technologies or industry standards.

Education

Tallahassee Community College   *Tallahassee, FL*

ASSOCIATE OF SCIENCE   *Jan 2015 - Jan 2016*

- Graduated honors with 4.0 GPA.

University of West Florida   *Pensacola, FL*

PHYSICS   *Aug 2011 - Jul 2014*

Skills

CI/CD	Jenkins Pipelines (Declarative & Scripted Syntax)
Cluster Orchestration	Helm, Bare-Metal Kubernetes (k8s & k3s)
Configuration Management	Ansible, Puppet, Salt
Container Runtimes & Virtualization	containerd, Docker
Data Languages	INI, JSON, TOML, XML, YAML
Data Science	Jupyter Lab/Notebooks, Mathematica, matplotlib, plotly, sympy
GNU/Linux Distributions	Arch Linux, Debian (Ubuntu), Gentoo, RHEL (CentOS), Void Linux
High Availability	HAProxy, keepalived
Markup Languages	LaTeX, Markdown, Org
Networking Fundamentals	ARP, CIDR, Mikrotik RouterOS, Ubiquity Unify Controller, VLAN
Programming Languages	C/C++, C# .NET, Emacs Lisp, groovy, Perl, Python, Rust, Shell Languages, Wolfram (Mathematica)
Project Management	GitHub Issues/Projects, GitLab Issues, JIRA
Repository Hosting	Bitbucket, GitHub, GitLab
Secrets Management	Hashicorp Vault
Templating Languages	Cheetah, Embedded Ruby, Jinja, Liquid
Text Editors	GitHub Atom, GNU Emacs, nano, vi/vim, Visual Studio Code
Version Control Systems	cvs, git
Web Servers	NGINX, Apache Tomcat

Work Experience

Wolfram Research, Inc.   *Champaign, IL*

DEVOPS ENGINEER   *Apr 2018 - Present*

- Streamlined disaster recovery of Wolfram Cloud user data with end-to-end encrypted backups via ○ backuputil.
- Provisioned bare-metal Kubernetes environments for Wolfram|Alpha utilizing Kubespray, Helm, Rook-Ceph, and Velero.
- Incorporated Hashicorp Vault for secrets management of Kubernetes CI/CD pipelines.
- Implemented infrastructure as code (IaC) standards for on-premises environments by leveraging ○ Puppet and ○ Cobbler.

WEB SYSTEMS ADMINISTRATOR   *Dec 2016 - Apr 2018*

- Developed a ○ templating engine for Apache HTTP Server configurations.
- Collaborated custom log data analysis and reports for Wolfram Cloud in Python and Mathematica.
- Designed Salt configurations for managing internal infrastructure.
- Developed backend code for the Wolfram Cloud Platform in Java.

WEB SYSTEMS INTERN   *Sep 2016 - Dec 2016*

- Implemented new Wolfram kernel features in C/C++.
- Developed a containerized RPM build environment hosted in Apache Marathon/Mesos.

Wolfram Research, Inc.
WOLFRAM SUMMER SCHOOL STUDENT

Boston, MA

Jun 2016 - Jul 2016

- Invited to Bentley University for three weeks to conduct research on various machine learning analogues.
- Participated in Wikipedia article authoring meetup at MIT.
- Completed final project on feed-forward neural networks using Boolean networks.

Tallahassee Community College
MATHEMATICS AND TECHNOLOGY TUTOR

Tallahassee, FL

May 2016 - Aug 2016

- Provided tutoring in topics such as Ordinary Differential Equations and introductory programming courses.

Radio Shack
SALES ASSOCIATE

Pensacola, FL

Jul 2013 - Mar 2015

- Provided customer service and support for a variety of mobile devices, DIY components, and more.

University of West Florida
STUDENT SSE SYSTEM ADMINISTRATOR

Pensacola, FL

Jan 2014 - Aug 2014

- Provided general systems administration for the faculty of the School of Science and Engineering.

RESNET TECHNICIAN

Feb 2012 - Aug 2013

- Supported the technical needs of dorm students.

Projects

Web Systems Infrastructure Rearchitecture
A PROJECT TO MODERNIZE ALL ON-PREMESIS USER-FACING INFRASTRUCTURE

Wolfram Research, Inc.

Mar 2020 -

- Leveraged Cobbler for systems provisioning and Puppet for configuration management.
- Targeted CentOS 8.2 (up from CentOS 6.8 and 5.5) for new machines, while still integrating with older environments.
- Implemented infrastructure-as-code standards.
- Developed more than 20 Puppet modules, each with a high degree of parameterization.

prov
A PYTHON SCRIPT TO MODIFY COBBLER ITEM SPECIFICATIONS IN A TERRAFORM-LIKE DECLARATIVE WAY

Wolfram Research, Inc.

Mar 2020 - May 2020

- Leverages Cobbler's XMLRPC API to synchronize YAML-based item specifications.
- Shows Terraform-like client-server differences prior or during application.
- Supports backwards-compatibility with Cobbler servers older than version 3.
- Synchronizes data items (such as profiles and systems) as well as files (such as snippets).

Personal Finance Analytics Platform
A PYTHON LIBRARY FOR CATEGORIZING AND ANALYZING BANK TRANSACTIONS

Personal Project

Mar 2020 -

- Categorizes transactions based on a home-made library of regular expressions.
- Leverages sklearn to perform predictive regression on financial trends.
- Provides a wrapper around plotly for graphical analysis.

grav
A GRAVITATIONAL N-BODY SIMULATION PROGRAM WRITTEN IN RUST

Personal Project

Nov 2019 - Dec 2019

- Leverages an entity-component-systems (ECS) simulation backend.
- Simulation data post-processed via Jupyter notebook.
- Custom 3D vector and physical laws implementation.

CV & Resume
(THIS DOCUMENT)

Personal Project

May 2019 -

- Built from Jinja2-templated LaTeX documents via "tmpl".
- Raw data present in YAML format.

tmpl
A GENERAL-PURPOSE TEMPLATING SYSTEM

Personal Project

May 2019 - Jun 2019

- A general-purpose Jinja2/YAML templating system based on "mkconf" and "mkdot".
- Utilized in the generation of this CV/Resume.
- Supports runtime-loaded Python extensions to the templating system.
- Capable of handling raw Jinja2 content piped directly to STDIN.

backuputil
A PYTHON WRAPPER SCRIPT AROUND THE BORG BACKUP UTILITY.

Wolfram Research, Inc.

Jan 2019 - Apr 2020

- Extends and generalizes the functionality of Borg.
- Allows multiple "back-up tasks" to be specified in a single configuration file.
- Used to back-up large volumes of data internally at Wolfram Research.
- Supports sending email reports on script completion or detection of issues.

⭘ Remote Execution Framework

Personal Project

An easy remote command execution utility

Nov 2018 - Apr 2019

- Written in Python3 as a lightweight alternative to frameworks such as Fabric and Ansible.
- Automatically formats output depending on whether a TTY is present.
- Capable of running both arbitrary commands and defined tasks.
- Includes interactive console mode.

⭘ mkdot

Personal Project

The handy dotfile templating system

Oct 2018 - Dec 2018

- Based on "mkconf" project, but specialized for the generation of dotfiles.

⭘ mkconf

Wolfram Research, Inc.

An Apache Web Server configuration templating engine

Aug 2018 - Sep 2018

- Generates Apache Web Server configurations from Jinja2 templates and YAML configuration files.
- Replaced older in-house utility written in Perl.
- Validates directives after generating configuration files.
- Capable of backing-up previous configurations and reverting changes.

⭘ Simplex Universe

Personal Project

An abstract n-dimensional n-body simulation program written in C# .NET

Aug 2013 - Dec 2014

- Custom CPU-based 3D rendering engine and graphical library.
- Dynamic C# scripting support
- Abstraction over spacial dimensionality and physical laws.
- Implemented Newtonian gravitational, classical electrostatic, and classical electrodynamic laws.
- Real-time simulation parameter tweaking and simulation object property inspection.
- Support for toroidal, infinite, and perfectly elastic/inelastic boundary conditions.