# Mattias **Cockburn**

DevOps Engineer · Teacher

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## Summary

Enthusiastic nerd that loves Linux and all the freedom that comes with it, is obsessed with automation and enjoys working with config management systems and APIs to glue systems together in order to create awesome infrastructure and processes that people can rely on. Loves to learn about new technologies and tools and likes to spread the knowledge about them.

## Skills

### Technology

#### Operating Systems

The things that make the computer go beep

- Linux:
  - RHEL/CentOS 5-9
  - SUSE Linux Enterprise 10-15, openSUSE (since 2011)
  - Debian GNU/Linux 3+
  - Ubuntu Linux 4.04+
  - Archlinux (since 2007)
  - NixOS (2022)
- Microsoft Windows: XP-11, Server 2003-2019

#### Virtualization/Containerization

Because computers can run inside of computers

- podman, Docker, LXD, lxc
- libvirt: KVM/Xen
- VMWare vSphere
- Kubernetes

#### Tools

Things used to manage other things

- Configuration Management/IaC/Gitops:
  - Terraform
  - ArgoCD
  - Flux
  - Helm
  - Puppet
  - Salt
  - Ansible
- Systems- and Patchmanagement:
  - RedHat Satellite 6/Katello
  - Spacewalk/uyuni/SUSE Manager
- CI/CD:
  - Gitlab CI
  - Github Actions
  - Azure Pipelines
  - Jenkins
  - Open Build Service (Package building for RPM/deb, Images)
  - packer
  - vagrant

#### Programming

Different tongues that translate to ones and zeroes

- Bash
- Python
- Golang
- Perl (i can read/hack it if i must)

### Languages

In addition to having German as mother tongue i am also able to speak English proficiently as well as having a basic understanding of Spanish (B2)

### Personal

- Attention to detail
- Responsible and well organised
- Able to work autonomously or in a team environment
- Flexible and adaptable
- Hard working and fast learning

# Work Experience

## Key projects

### Development of a complete management platform for Edge computing use-cases

Cloud provider

- Development of a (successful) MVP of a SaaS management platform for Edge devices based on Kubernetes and Talos.
- Technologies/Providers used: Talos, Kubernetes, kubebuilder, flux, chisel, Microsoft Azure, STACKIT, helm, kustomize, golang

### Implementation, Deployment and Maintenance of central Kubernetes platform services

Food production/Retail

- Implementation of the main Kubernetes-based deployment platform for use-cases related to the shop/production floors (Edge computing). Development of custom tools and pipelines to streamline maintenance of different tenants/deployments. Active development of the future architecture of all relevant components used in the setup.
- Technologies/Providers used: Kubernetes, ArgoCD, Teleport, Microsoft Azure, STACKIT, helm, Python, golang

### Deployment and Configuration System for lab systems hosted in the cloud

Automobile manufacturer

- Implementation of a highly automated deployment of Foreman, Salt and aptly in AWS. Extensive use of terraform to provision all required resources following a versioned recipe, implementing strict security policies as demanded by the customer.
- Technologies/Providers used: Amazon AWS, terraform, Foreman, Salt, Python, aptly, bash, openvpn

### Implementation of a secure and fully-managed Ubuntu Linux client

Software manufacturer

- Implementation of a fully automated deployment pipeline as well as a complete management stack for Ubuntu-based Laptops destined for Software developers. Security mechanisms like Linux Full Disk Encryption with LUKS, always-on management VPN tunnel to access the central infrastructure hosted in the Azure cloud and storage of secrets like VPN certificates in the Laptops' TPM chip were implemented.
- Technologies used: Microsoft Azure, openvpn, TPM 2 Software Stack, Salt, Python, openssl, bash

### Migration of a complex legacy configuration management system to Salt

Automobile manufacturer

- Complete re-implementation of the internal configuration management system (formerly scVenus) in Salt. Migration of the heaviliy customized/grown infrastructure scripting
- Technologies used: Salt, Python, SLES 12/15, Ubuntu 20.04

### Complete reimplementation of the internal deployment and configuration management infrastructure

Telematics solution provider

- Complete re-implementation of the internal deployment and configuration management system based on Foreman (Deployment, Visualization), Spacewalk (Patchmanagement) and Puppet/Ansible (Configuration management, Deployment)
- Implementation of a completely unattend deployment process, including automatic integration into the internal monitoring system as well as inventory management (Kickstart/AutoYaST)
- Migration of old Puppet code (2.x) to a new architecture featuring Puppet 5 and hiera for configuration data storage. Refactoring of old code to new development paradigms. Implementation of a CI pipeline for new Puppet code with automated syntax and lint tests as well as deployment via r10k (Puppet control repository)
- Implementation of several python-based tools to further automate different administration processes like system upgrades (SLES service packs with Spacewalk) and configuration of specialized internal applications. Revamp of pre-exisiting Ansible playbooks used for the deployment of several key applications
- Integration of the aforementioned deployment infrastructure into a ticket workflow based on Jira where developers/testers may request custom system builds which will be automatically deployed once a request is validated
- Infrastructure landscape: hundreds of systems in several internal networks as well as public facing systems
- Technologies used: SUSE Linux Enterprise Server 11/12, CentOS 7.x, Ubuntu Linux 14.04/16.04, Puppet 5.x, Ansible, Foreman 1.17, Spacewalk 2.8, AutoYaST, Python 2/3, bash, Ruby, Atlassian Jira, Atlassian Bitbucket, Mattermost, Icinga 2, ISC Bind 9, ISC dhcpd

### Implementation of a streamlined automatic deployment solution for RHEL/CentOS 7 and Windows Server 2012 R2/2016

Retail chain

- Creation of a completely new deployment platform based on the autoinstallation frameworks of Windows Server 2012 R2/2016 (unattend.xml/Windows PE) and RedHat Enterprise Linux/CentOS (Kickstart) based on Katello/Foreman for completely unattend provisioning.
- Windows Deployment was done using a custom Windows PE image, bypassing the regular installation mechanism to better automate the deployment process and for tighter integration into Foreman and its feature set.
- Development of a Foreman smart-proxy plugin (Ruby) in order to orchestrate DHCP/DNS infrastructure (Bluecat DHCP/DNS Server/IPAM)
- Seemless installation of new bare metal as well as virtual machines hosted on VMWare vSphere.
- Integration with the deployed CMDB system i-doit (Automatic creation of records and updating of parameters as well as decomissioning)
- Automatic configuration of both platforms with the help of Puppet 4.x/5.x, including automatic Active Directory Joins and basic application deployment (chocolatey on Windows). Automatic integration with patch management systems (Katello for RHEL/CentOS) and WSUS for Windows Server platforms.
- Infrastructure landscape: several hundred to thousand machines with a multitude of different networks and DMZs
- Technologies used: Puppet 4.x/5.x, Foreman 1.13-1.15, Katello 3.x, Ruby 2.1, Python 3, Kickstart, Windows PE scripting, Windows MDT, chocolatey, RHEL/CentOS 7.x, Windows Server 2012 R2/2016, Bluecat IPAM,DHCP/DNS Server, bash

### Implementation of an automated patch process for RHEL 5-7 machines with complete audit/backlog

Financial services provider

- Being bound to security standards like PCI-DSS my company was approached by a german fincial service provider to help automate their patch procedures.
- Several tools had to be integrated/orchestrated: RedHat Satellite 5.x (Patch management tool), Atlassian Jira (ticketing system/audit), National Vulnerability Database (nvd.nist.gov).
- Creation of a bridge to nvd.nist.gov in order to better classify security patches from RedHat against the CVSS base score of the NVD because of PCI-DSS requirements
- Development of a bridge from Satellite into the ticketing system. The bridge automatically opens new tickets with specified subtasks (as demanded by the customer). The bridge automatically keeps track of the patching process, updates tickets as systems are getting patched and automatically closes each specific ticket as soon as patching a specific vulnerability is completed.
- Additionally an easy to use text-mode frontend had to be created for the systems engineer to initiate the patching itself.
- Upon conpletion of this project the overall time needed to manage the monthly patching process was reduced from roughly 2-3 days to around 5 minutes.
- Technologies used: RedHat Satellite 5.x and its APIs, Python 2.7, Atlassian Jira APIs, nvd.nist.gov XML-dumps, bash

### Implementation of an automatic deployment system for Windows 7 and technical training resources based on Linux/Bittorrent

Provider of technical trainings

- The training provider i worked at needed a better process to deploy the training materials/virtual machines and configuration needed for new courses. As there are different courses with their own requirements each week, every workstation needed to be deployed at least once a week.
- To work around the limitations of Windows and its deployment process a new (at the time) feature of Windows was used: Direct booting of WMI-Files
- With the help of a custom Linux live system booted via PXE, a new Windows Image will deployed to the machine
- The live system obtains a list of needed resources for the next course from a central application (developed in PHP)
- Then the relevant courseware (with peer2peer download via bittorrent) is copied to the local machine. The usage of bittorrent is critical here because several Microsoft technical courses are huge in terms of filesize (VM Images, Setups, ISO Files)
- After the first boot, several VBScript and Powershell based scripts configure the machine in order to support the next weeks course. Group policies handle the generic configuration of the machines.
- Technologies used: Debian preseed/liveiso tools, bash, aria2c/bittorrent, Windows WMI Image format, VBS, Powershell, Active Directory Group Policies, PHP

## Work history

### ImpressSol GmbH

*Remote, Germany*

DevOps/CloudOps Engineer

*April 2023 - Present*

- Creating highly automated infrastructure and implementing complex processes for our clients
- Typical technologies used in projects:
  - OS: Linux Distros of all kinds
  - Kubernetes and many tools from the CNCF landscape
  - ArgoCD, flux, helm, kustomize, timoni
  - Python, Bash, golang
  - Github/Github Actions, Gitlab and others
  - Prometheus/Grafana, ELK Stack

### Mercedes-Benz Tech Innovation

*Stuttgart, Germany*

DevOps Engineer

*March 2022 - March 2023*

- Supporting internal developers in deploying and running different projects in the internal Kubernetes infrastructure
- Automation of said deployments via Github Action pipelines and ArgoCD and central management of secrets via ‘bitnami/sealed-secrets‘
- Automation of common administration tasks using Python APIs of the aforementioned applications
- Typical technologies used in projects:
  - OS: Ubuntu Linux 20.04/22.04
  - Kubernetes, Bitnami sealed-secrets
  - ArgoCD, argocd-image-updater, helm
  - Docker/podman
  - Python, Bash
  - Github/Github Actions
  - Prometheus/Grafana, ELK Stack
  - Atlassian Stack (Jira/Confluence)

### B1 Systems GmbH

*Vohburg, Germany*

Solution Architect

*May 2011 - Dec. 2021*

- Delivering solutions for infrastructure automation and ease of administration in a variety of companies ranging from banks/insurance companies to automobile manufacturers, digital media agencies and software vendors
- Conducting trainings in the field of configuration management and systems management technologies
- Giving talks about those topics at various conferences as well as writing articles in highly respected german subject literature
- Typical technologies used in projects:
  - OS: RedHat Enterprise Linux 5-7 (including Kickstart), SUSE Linux Enterprise 11+ (with AutoYaST), Debian/Ubuntu Linux (with preseed), some Windows Server 2012-2016, Windows 7-10
  - Puppet (with PuppetDB, hiera, r10k, rspec-puppet, beaker/testkitchen), Ansible (with ansible-vault, dynamic inventories), Chef, Salt
  - Docker (Machine, Compose, Swarm)
  - Python 2/3, Ruby, bash
  - RedHat Satellite/Spacewalk/SUSE Manager
  - Nagios, Icinga(1/2)
  - vagrant, packer, libvirt/KVM/Xen/VMWare
  - openvpn, iptables, Squid
  - Samba, NFS, ownCloud
  - Git, Gitlab, Github
  - Jenkins, Gitlab CI

### signet GmbH

*Kassel, Germany*

System Administrator & Teacher

*Oct. 2005 - Apr. 2011*

- Managing the whole IT infrastructure of the Office/Backoffice as well as training delivery.
- Implementing Microsoft (Windows Server/Office/Exchange) and Linux-based solutions (Routing/Firewall/Fileserver/Backup/Monitoring) in-house and at customer sites.
- Management of training delivery hardware and server systems (+150 Nodes).
- Conducting trainings in the fields of Linux and general System administration.
- Enduser support for Windows XP-7 as well as the MS Office Suite (2003-2007)
- Typical technologies used in projects:
  - Windows XP-7, Windows Server 2003-2008 R2, Debian Linux 5+, CentOS 5/6
  - Active Directory, Group Policies
  - IPCop, openvpn, Squid, Samba, Nagios, Bittorrent, Clonezilla
  - bash, PHP, Perl, VBScript, Powershell

## Talks

### ContinuousLifecycle 2016

*Mannheim, Germany*

Presenter: Systemsmanagement with Puppet and Foreman

*Sept. 2016*

- Talked about how Foreman and Puppet can be used to provide a completely unattended way to deploy and configure systems in highly complex landscapes

### Committerconf 2015

*Essen, Germany*

Presenter: Deployment of Multi-Tier Applications with Docker

*Nov. 2015*

- Introduced docker-machine, docker-compose and docker-swarm and how they can be used to deploy multi-tier applications in a private Swarm cluster

### SUSECon 2015

*Amsterdam, Holland*

Presenter: Implementation of a SUSE-based deployment solution with SUSE Manager at Apollo-Optik

*Nov. 2015*

- Introduced the B1 developed solution used to automate the whole deployment process of new branch servers used by Apollo Optik, a large German-based retail chain selling glasses and related accessories.

### LinuxCon Europe 2014

*Düsseldorf, Germany*

Presenter: Continuous Integration with Docker and Jenkins

*Oct. 2014*

- Introduced technologies/techniques that can be used to build a CI/CD pipeline based on Docker and Jenkins

### LinuxTag 2014

*Berlin, Germany*

Presenter: Creating a dynamic software deployment solution using free/libre software

*May 2014*

- Introduced how freely available software components like Gitlab, Open Build Service, Jenkins, Spacewalk and Puppet/Ansible can be used to create a proper software delivery pipeline

## Publications

### Create virtual machines with a grain of salt

*B1 Systems Blog*

Writer

*September 2020*

- Described how Salt in custom Python code in order to create a complex deployment pipeline for Hypervisors and virtual machines: `https://blog.b1-systems.de/create-virtual-machines-grain-salt`

### From Docker to podman: On the why and how

*B1 Systems Blog*

Writer

*August 2020*

- Wrote about my personal journey on migrating a common internal use case at B1 from Docker to podman and about some advantages podman has over Docker in the given scenario: `https://blog.b1-systems.de/docker-podman-why-and-how`

### Multi-Tier Applications with Docker Compose, Machine and Swarm

*heise Developer*

Writer

*Nov. 2015*

- Described docker and associated technologies and how they can be used to deploy a multi-component application based on containers inside a cluster of machines at several stages

### Harbour Worker - DevOps-Trend Docker

*LinuxMagazin*

Writer

*Sept. 2014*

- Introduced the new and exciting features of Docker 1.0 and how they can be used.

### Stack more intelligently

*LinuxMagazin*

Writer

*Sept. 2014*

- Introduced docker-compose and showed its usage with different multi-container applications

### Order on the construction site - comfortable systems management with Foreman and Puppet

*heise iX*

Writer

*Dec. 2013*

- Described how Foreman and Puppet can be used to create a highly automated deployment and systems management solution for the modern Enterprise

## Education

### Industrie und Handelskammer (Chamber of Industry and Commerce)

*Kassel, Germany*

Apprenticeship: Information Technology Systems Engineer/Systems integration

*2009*

### Max-Eyth-Schule

*Kassel, Germany*

General university entrance qualification (information technology)

*2005*