

DevOps, 12-Factor, and Platform Engineering

Prepared for

CONF42



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Justin has over 20 years of experience working in various software roles including JEE work. He is an outspoken free software evangelist, delivering enterprise solutions, technical leadership, various publications and community education on databases, architectures, and integration projects.

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DeyOpsDays '09

**“It’s no longer the big beating the small,
but the fast beating the slow.”**

Eric Pearson, CIO, InterContinental Hotels Group

The Ancient Business Wisdom

...Of the 70s and 80s

Includes
Eli Goldratt's,
"Standing on the
Shoulders
of Giants."

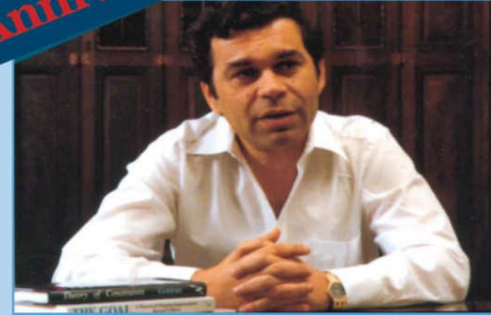
Eliyahu M. Goldratt and Jeff Cox
THE GOAL
A PROCESS OF ONGOING IMPROVEMENT
30th Anniversary Edition

Eli Goldratt has been described by *Fortune* as a "guru to industry" and by *Business Week* as a "genius". His book, *The Goal*, is a gripping fastpaced business novel.

"Goal readers are now doing the best work of their lives."
Success Magazine

"A factory may be an unlikely setting for a novel, but the book has been wildly effective..."
Tom Peters

Required reading for Amazon's management.



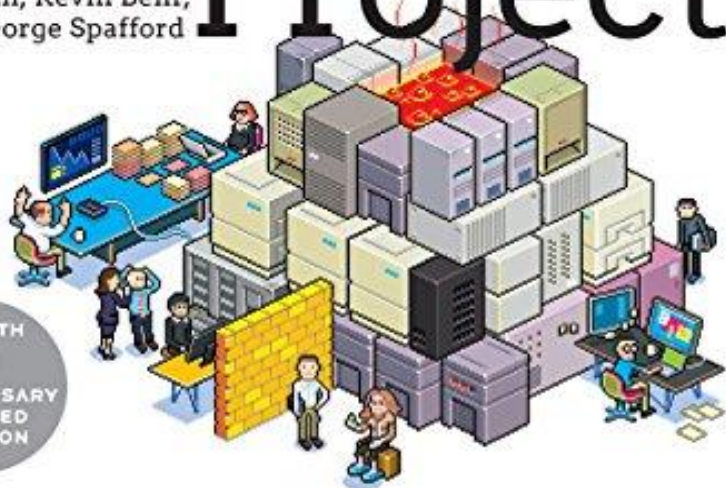
THE BEST-SELLING BUSINESS
NOVEL THAT INTRODUCED THE
**THEORY OF
CONSTRAINTS**
AND CHANGED HOW
AMERICA DOES BUSINESS

**OVER 6 MILLION
COPIES SOLD!**

A Novel About IT,
DevOps, and Helping
Your Business Win

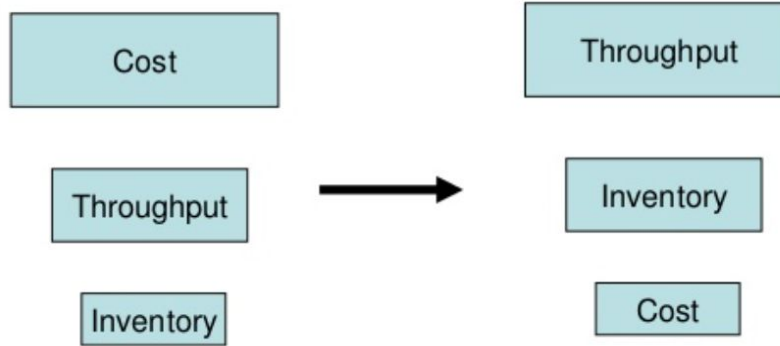
The Phoenix Project

Gene Kim, Kevin Behr,
and George Spafford



5TH
ANNIVERSARY
LIMITED
EDITION

Change in Focus
from the “cost world” to the “throughput world”



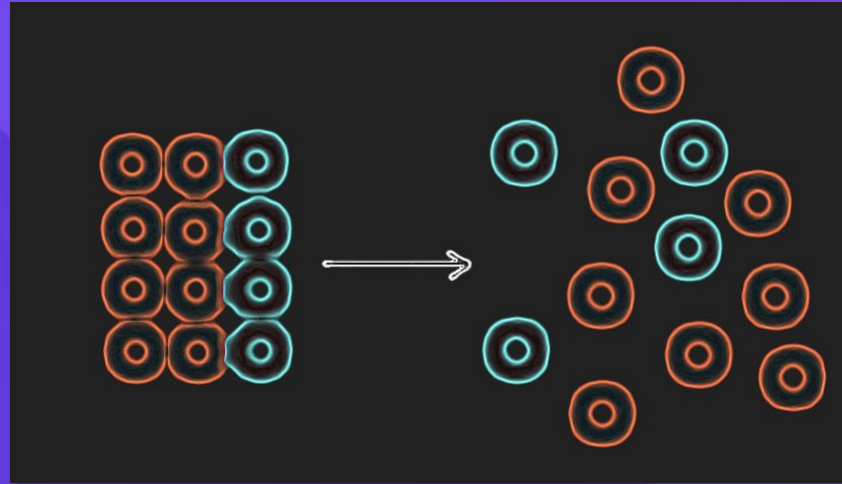
Cost = Organizational Cost

Inventory = Code

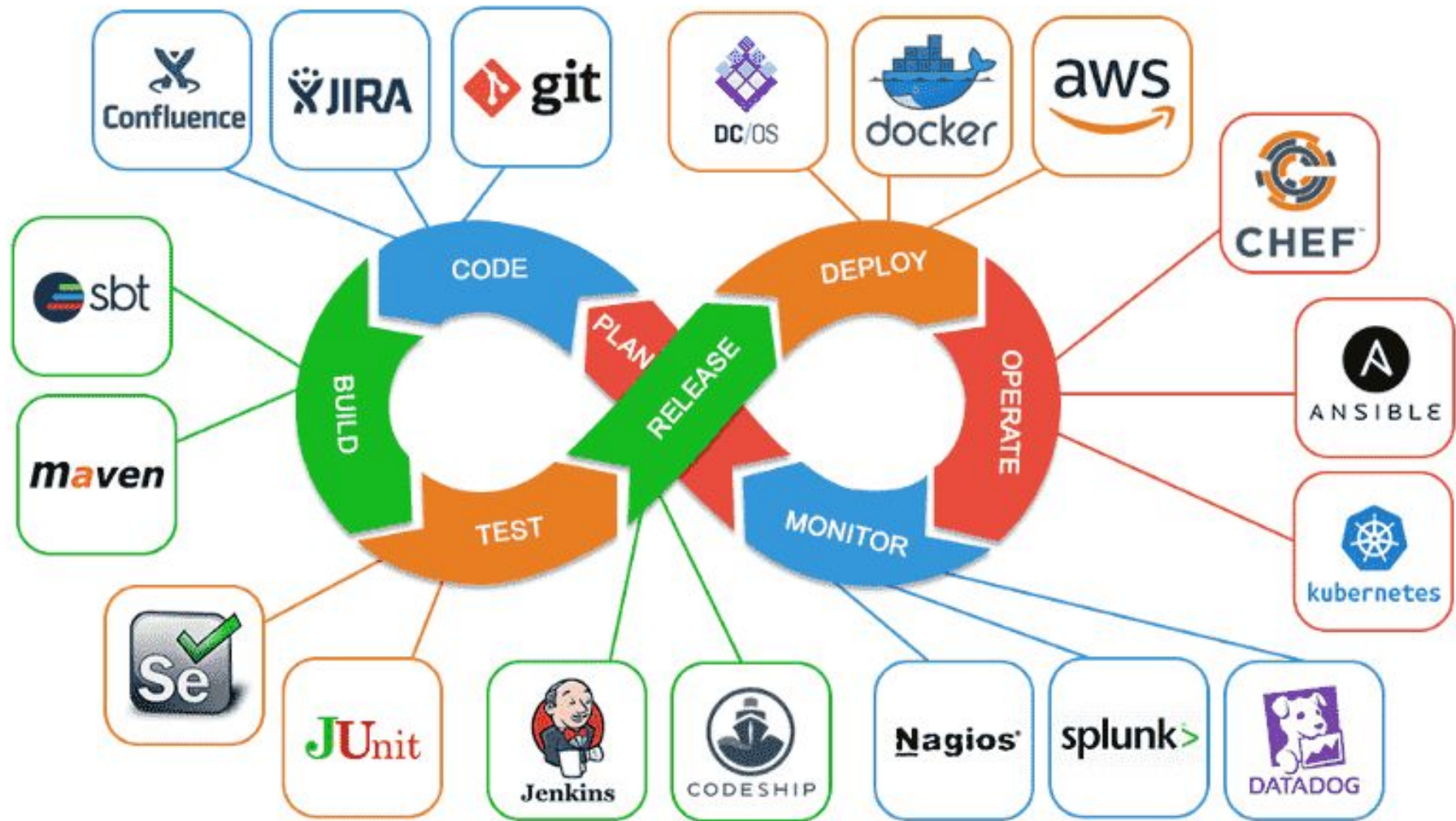
Throughput = Money

The only initiatives that will positively impact long-term performance are ones which **increase throughput while simultaneously decreasing cost.**

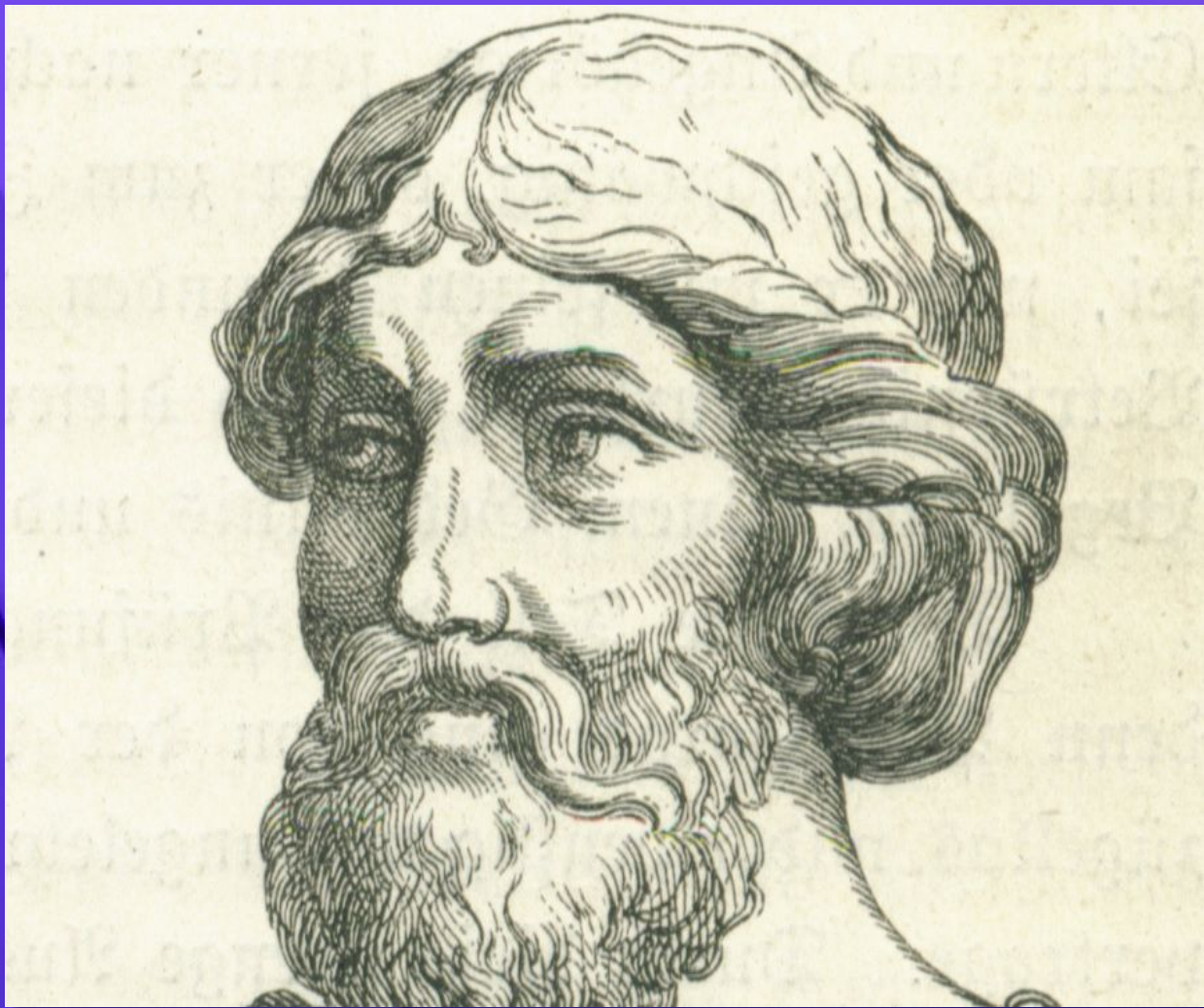
It doesn't really matter what you improve as long as you are constantly improving something, because...



...entropy denotes that if you aren't doing anything, you're always getting worse. Feedback is key to improvement...



Frictionless: Why Free Software?





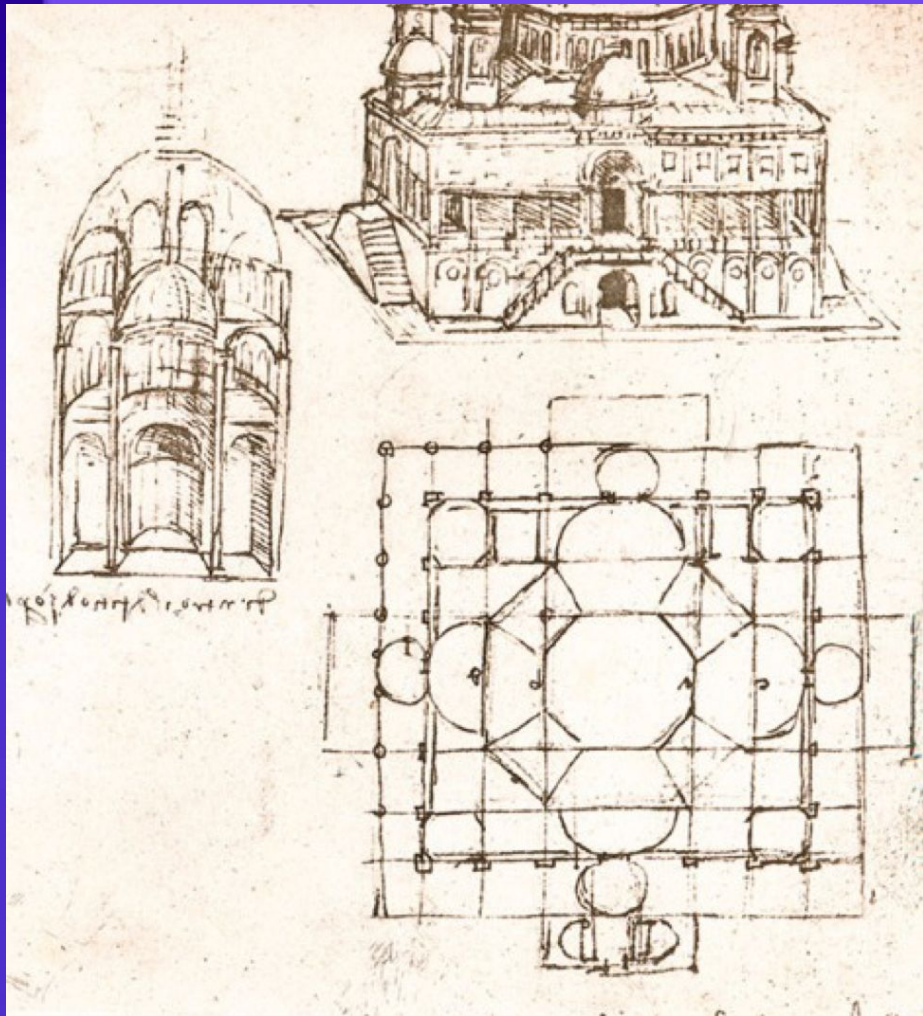
PHILOSOPHIÆ
NATURALIS
PRINCIPIA
MATHEMATICA.

Autore *J*S. NEWTON, *Trin. Coll. Cantab. Soc. Matheseos*
Professore *Lucafiano*, & Societatis Regalis Sodali.

IMPRIMATUR.
S. PEPY S, *Reg. Soc. PRÆSES.*
Julii 5. 1686.

LONDINI,

Jussu Societatis Regiæ ac Typis *Josephi Streater.* Prostat apud
plures Bibliopolas. *Anno MDCLXXXVII.*



The Florentine Bottega

Open communities at work!





CNCF Cloud Native Interactive Landscape

The cloud native landscape (png, pdf), serverless landscape (png, pdf), and member landscape (png, pdf) are dynamically generated below. Please open a pull request to correct any issues. Greyed logos are not open source. Last Updated: 2022-11-07T16:

You are viewing 1,179 cards with a total of 3,415,658 stars, market cap of \$18.9T and funding of \$54.4B.

Landscape

Card Mode

Members

Serverless

Wasm

Database

Streaming & Messaging

Application Definition & Image Build

Continuous Integration & Delivery

App Definition and Development

This section displays a grid of project cards categorized into four main areas: Database, Streaming & Messaging, Application Definition & Image Build, and Continuous Integration & Delivery. Each card features a logo, the project name, and its status (e.g., CNCF Graduated, CNCF Incubating). The Database category includes projects like KV, Vitess, and Cockroach Labs. Streaming & Messaging includes cloudevents, NATS, and Kafka. Application Definition & Image Build includes Helm, Backstage, and KubeVirt. Continuous Integration & Delivery includes Argo, Flux, and Keptn. The grid is organized into columns and rows, with some cards having additional information like star counts or funding details.

Orchestration & Management

Scheduling & Orchestration

Coordination & Service Discovery

Remote Procedure Call

Service Proxy

API Gateway

Service Mesh

This section displays a grid of project cards categorized into six main areas: Scheduling & Orchestration, Coordination & Service Discovery, Remote Procedure Call, Service Proxy, API Gateway, and Service Mesh. Each card features a logo, the project name, and its status. Scheduling & Orchestration includes Kubernetes, Crossplane, and Volcano. Coordination & Service Discovery includes CoreDNS and etcd. Remote Procedure Call includes gRPC and TARS. Service Proxy includes Envoy and Contour. API Gateway includes Emissary Ingress and Traefik. Service Mesh includes Linkerd and Istio. The grid is organized into columns and rows, with some cards having additional information like star counts or funding details.

Cloud Native Storage

Container Runtime

Cloud Native Network

This section displays a horizontal row of project cards categorized into three main areas: Cloud Native Storage, Container Runtime, and Cloud Native Network. Each card features a logo and the project name. Cloud Native Storage includes projects like Arrikto and MinIO. Container Runtime includes projects like Kata Containers and Lima. Cloud Native Network includes projects like Cilium and Weave. The row is organized into columns.

Ultra-Portable: How has this changed software?



THE TWELVE-FACTOR APP

INTRODUCTION

In the modern era, software is commonly delivered as a service: called *web apps*, or *software-as-a-service*. The twelve-factor app is a methodology for building software-as-a-service apps that:

- Use **declarative** formats for setup automation, to minimize time and cost for new developers joining the project;
- Have a **clean contract** with the underlying operating system, offering **maximum portability** between execution environments;
- Are suitable for **deployment** on modern **cloud platforms**, obviating the need for servers and systems administration;
- **Minimize divergence** between development and production, enabling **continuous deployment** for maximum agility;
- And can **scale up** without significant changes to tooling, architecture, or development practices.

The twelve-factor methodology can be applied to apps written in any programming language, and which use any combination of backing services (database, queue, memory cache, etc).

The 12 Factors Lead to Portable Design

I. Codebase

One codebase tracked in revision control, many deploys

II. Dependencies

Explicitly declare and isolate dependencies

III. Config

Store config in the environment

IV. Backing services

Treat backing services as attached resources

V. Build, release, run

Strictly separate build and run stages

VI. Processes

Execute the app as one or more stateless processes

VII. Port binding

Export services via port binding

VIII. Concurrency

Scale out via the process model

IX. Disposability

Maximize robustness with fast startup and graceful shutdown

X. Dev/prod parity

Keep development, staging, and production as similar as possible

XI. Logs

Treat logs as event streams

XII. Admin processes

Run admin/management tasks as one-off processes



Freedom and Portability

Freedom and Portability
+
Complexity and Disorganization

The State of the Art

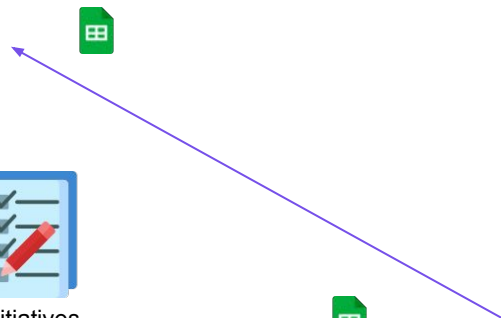
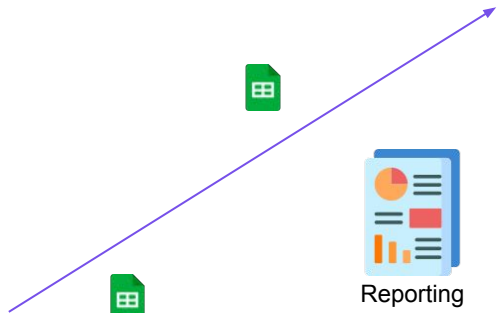
Engineering Leader



Reporting



Initiatives



Engineering Manager



Monolith Miniservice



Monolith Monolith Miniservice



Engineering Manager



Miniservice Miniservice



Monolith Microservice Monolith



Engineering Manager



Microservice Microservice



Microservice Microservice Microservice



State of the Art Service Catalog										
A	B	C	D	E	F	G	H	I	J	K
Service Name	Endpoint URL Path	Slack Channel	GitHub Repo	Production Status	Deployment Frequency	Owner	Troubleshooting Channel	Last Updated	Service Description	
Promotion API	/promotions	#promotion-api	https://github.com/org/promotion-service	Running	Daily	Emily Davis	#troubleshooting-promotion-api	03-12-2023	Manages and applies prom	
Order Tracking API	/order-tracking	#order-tracking-api	https://github.com/org/order-tracking-service	Maintenance	Weekly	Jack Johnson	#troubleshooting-order-tracking-api	02-15-2023	Tracks and updates order	
Discount API	/discounts	#discount-api	https://github.com/org/discount-service	Down	As needed	Tim Smith	#troubleshooting-discount-api	01-28-2023	Applies and manages disc	
Feedback API	/feedback	#feedback-api	https://github.com/org/feedback-service	Running	Continuous	Sarah Johnson	#troubleshooting-feedback-api	04-21-2023	Analyzes and summarizes	
Reporting API	/reporting	#reporting-api	https://github.com/org/reporting-service	Pre-prod	Monthly	Kevin Brown	#troubleshooting-reporting-api	05-14-2023	Generates and serves rep	
Analytics API	/analytics	#analytics-api	https://github.com/org/analytics-service	Deployed	Quarterly	Lisa Davis	#troubleshooting-analytics-api	03-24-2023	Performs advanced data a	
Customer Support API	/customer-support	#customer-support-api	https://github.com/org/customer-support-service	Running	24/7	Alex Johnson	#troubleshooting-customer-support-api	06-19-2023	Handles customer support	
Ticketing API	/tickets	#ticketing-api	https://github.com/org/ticketing-service	Pre-prod	Fortnightly	Jane Davis	#troubleshooting-ticketing-api	05-31-2023	Manages and assigns tick	
Chatbot API	/chatbot	#chatbot-api	https://github.com/org/chatbot-service	Deployed	Daily	Mark Johnson	#troubleshooting-chatbot-api	07-08-2023	Handles chatbot interacti	
Feedback Analysis API	/feedback-analysis	#feedback-analysis-api	https://github.com/org/feedback-analysis-service	Running	Weekly	Sarah Johnson	#troubleshooting-feedback-analysis-api	04-30-2023	Analyzes and summarizes	
Order Management API	/order-management	#order-management-api	https://github.com/org/order-management-service	Pre-prod	Monthly	Jack Johnson	#troubleshooting-order-management-api	02-21-2023	Manages and processes o	
Inventory Management API	/inventory-management	#inventory-management-api	https://github.com/org/inventory-management-service	Running	Continuous	Tim Smith	#troubleshooting-inventory-management-api	01-29-2023	Manages and updates inve	
Payment API	/payments	#payments-api	https://github.com/org/payment-service	Deployed	Quarterly	Kevin Brown	#troubleshooting-payments-api	03-18-2023	Processes and manages p	
Shipping API	/shipping	#shipping-api	https://github.com/org/shipping-service	Maintenance	Weekly	Lisa Davis	#troubleshooting-shipping-api	04-12-2023	Manages and tracks shipp	
User Authentication API	/user-authentication	#user-authentication-api	https://github.com/org/user-authentication-service	Deployed	Daily	Alex Johnson	#troubleshooting-user-authentication-api	06-23-2023	Manages user authenticati	
Email API	/email	#email-api	https://github.com/org/email-service	Running	Fortnightly	Jane Davis	#troubleshooting-email-api	05-16-2023	Sends and manages email	
Notifications API	/notifications	#notifications-api	https://github.com/org/notifications-service	Running	Continuous	Sarah Johnson	#troubleshooting-notifications-api	04-28-2023	Manages and sends notific	
Products API	/products	#products-api	https://github.com/org/products-service	Pre-prod	Monthly	Kevin Brown	#troubleshooting-products-api	03-25-2023	Manages and displays pro	
Categories API	/categories	#categories-api	https://github.com/org/categories-service	Deployed	Weekly	Lisa Davis	#troubleshooting-categories-api	04-19-2023	Manages and organizes pr	
Brands API	/brands-api	#brands-api	https://github.com/org/brands-service	Running	Continuous	Tim Smith	#troubleshooting-brands-api	01-27-2023	Manages and displays bra	
Prices API	/prices	#prices-api	https://github.com/org/prices-service	Running	Daily	Alex Johnson	#troubleshooting-prices-api	06-27-2023	Manages and displays pro	
Reviews API	/reviews	#reviews-api	https://github.com/org/reviews-service	Deployed	Weekly	Sarah Johnson	#troubleshooting-reviews-api	04-30-2023	Manages and displays pro	
Coupons API	/coupons	#coupons-api	https://github.com/org/coupons-service	Running	Monthly	Kevin Brown	#troubleshooting-coupons-api	03-21-2023	Manages and applies coup	
Discounts API	/discounts	#discounts-api	https://github.com/org/discounts-service	Running	Continuous	Lisa Davis	#troubleshooting-discounts-api	04-16-2023	Applies and manages disc	
Shipping Zones API	/shipping-zones	#shipping-zones-api	https://github.com/org/shipping-zones-service	Running	Weekly	Tim Smith	#troubleshooting-shipping-zones-api	01-31-2023	Manages shipping zones	
Discount Codes API	/discount-codes	#discount-codes-api	https://github.com/org/discount-codes-service	Running	Daily	Sarah Johnson	#troubleshooting-discount-codes-api	04-25-2023	Manages and applies disc	
Order History API	/order-history	#order-history-api	https://github.com/org/order-history-service	Running	Continuous	Kevin Brown	#troubleshooting-order-history-api	03-28-2023	Manages and displays ord	
Product Images API	/product-images	#product-images-api	https://github.com/org/product-images-service	Running	Weekly	Lisa Davis	#troubleshooting-product-images-api	04-20-2023	Manages and displays pro	
Order Details API	/order-details	#order-details-api	https://github.com/org/order-details-service	Running	Continuous	Tim Smith	#troubleshooting-order-details-api	01-30-2023	Manages and displays ord	
User Profile API	/user-profile	#user-profile-api	https://github.com/org/user-profile-service	Running	Weekly	Sarah Johnson	#troubleshooting-user-profile-api	04-23-2023	Manages and displays use	
Cart API	/cart	#cart-api	https://github.com/org/cart-service	Running	Daily	Kevin Brown	#troubleshooting-cart-api	03-23-2023	Manages and displays shc	
Addresses API	/addresses	#addresses-api	https://github.com/org/addresses-service	Running	Weekly	Lisa Davis	#troubleshooting-addresses-api	04-17-2023	Manages and displays adc	
Payment API	/payment	#payment-api	https://github.com/org/payment-service	Running	Continuous	Tim Smith	#troubleshooting-payment-api	01-29-2023	Manages and processes p	
Shipping API	/shipping	#shipping-api	https://github.com/org/shipping-service	Running	Weekly	Sarah Johnson	#troubleshooting-shipping-api	04-26-2023	Manages and processes s	
Wishlist API	/wishlist	#wishlist-api	https://github.com/org/wishlist-service	Running	Daily	Kevin Brown	#troubleshooting-wishlist-api	03-26-2023	Manages and displays wis	
Search API	/search	#search-api	https://github.com/org/search-service	Running	Continuous	Lisa Davis	#troubleshooting-search-api	04-21-2023	Manages and processes s	
Orders API	/orders	#orders-api	https://github.com/org/orders-service	Running	Weekly	Tim Smith	#troubleshooting-orders-api	01-28-2023	Manages and processes o	
User Orders API	/user-orders	#user-orders-api	https://github.com/org/user-orders-service	Running	Daily	Sarah Johnson	#troubleshooting-user-orders-api	04-24-2023	Manages and displays use	



8 A

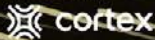
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IDPCON

Convene - 117 West 46th Street, New York, NY

Thursday, October 24, 2024

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