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UNLEASH THE POWER OF LIMITLESS CONNECTIVITY
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Operational Transformation

Strategies for Continuous Deployment at Scale at the Network Edge: a.k.a. The Pursuit of the Zero-Downtime Headend

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2021 Fall Technical Forum
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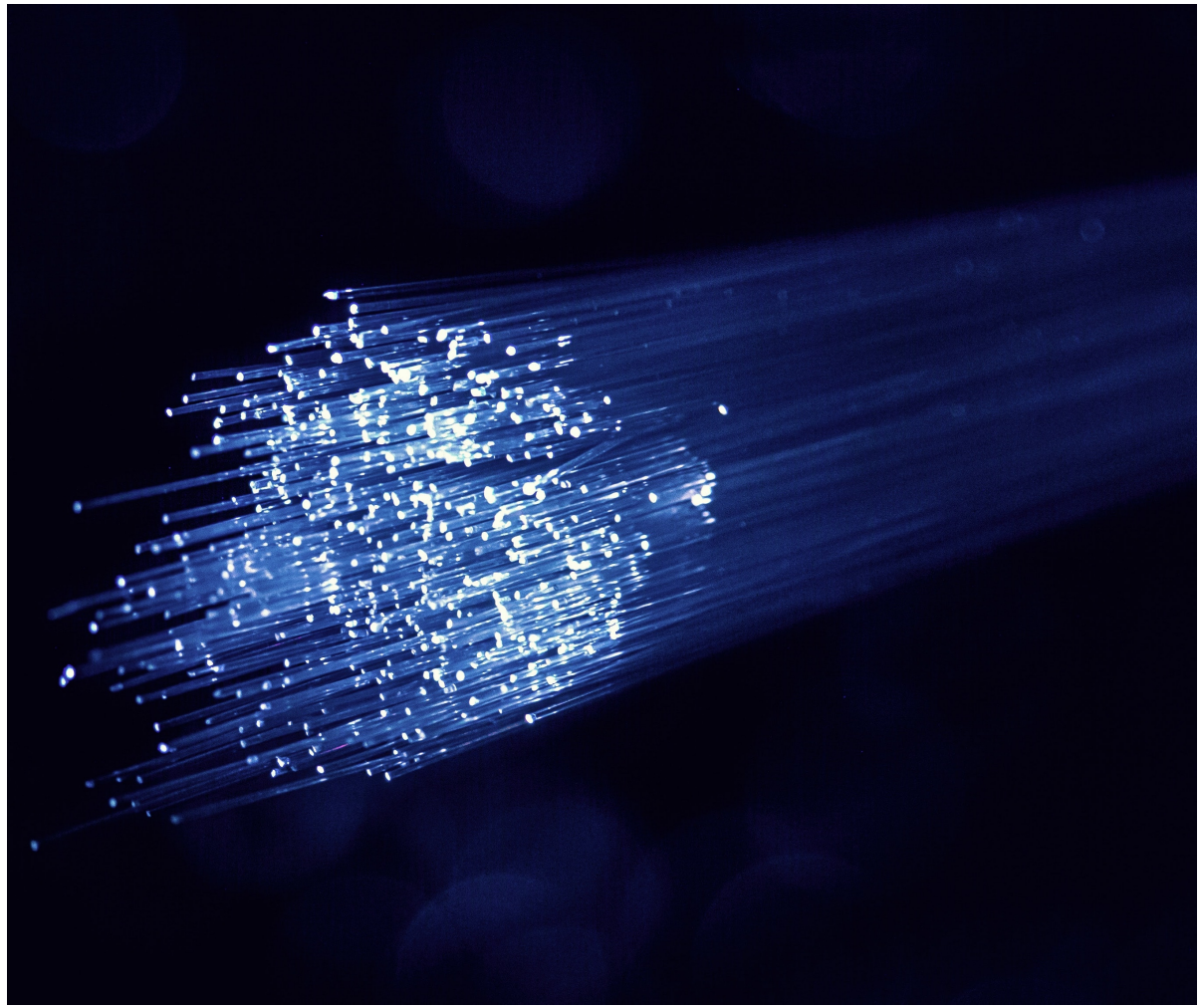
What is it?

- ”Edge of the network” constantly changing
- Microwave, Coaxial tree-and-branch, modern HFC
- Moving closer to consumers
- Where optical signals hand off to RF or the output of set-top box
- Depends who you ask!



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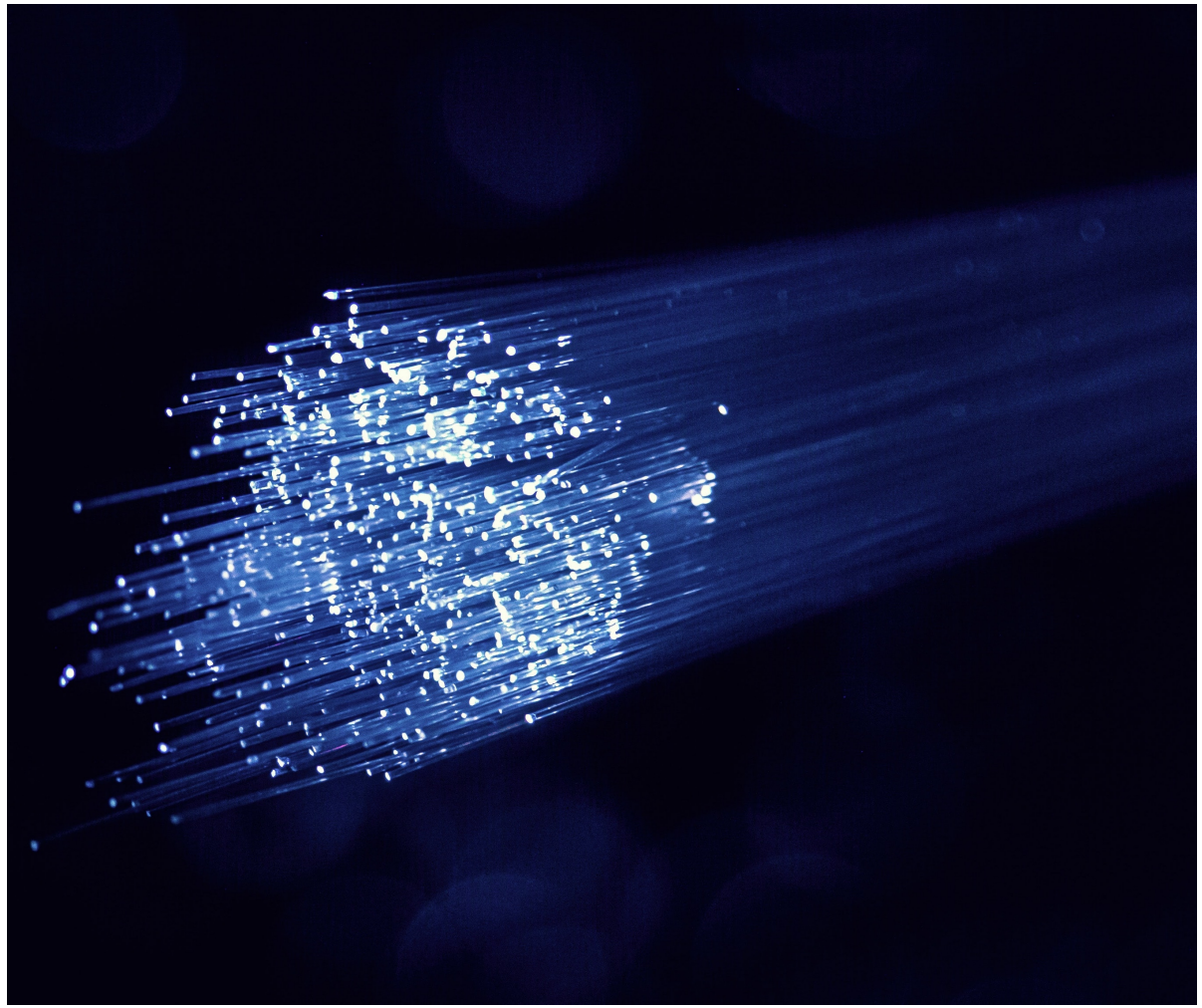
Our Focus

- Focus on the headend, CMTS
- CMTS devices transformed into vCMTSs
- Network edges must always be healthy and ready for anything
- Big focus on CI/CD



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Continuous Integration / Continuous Deployment

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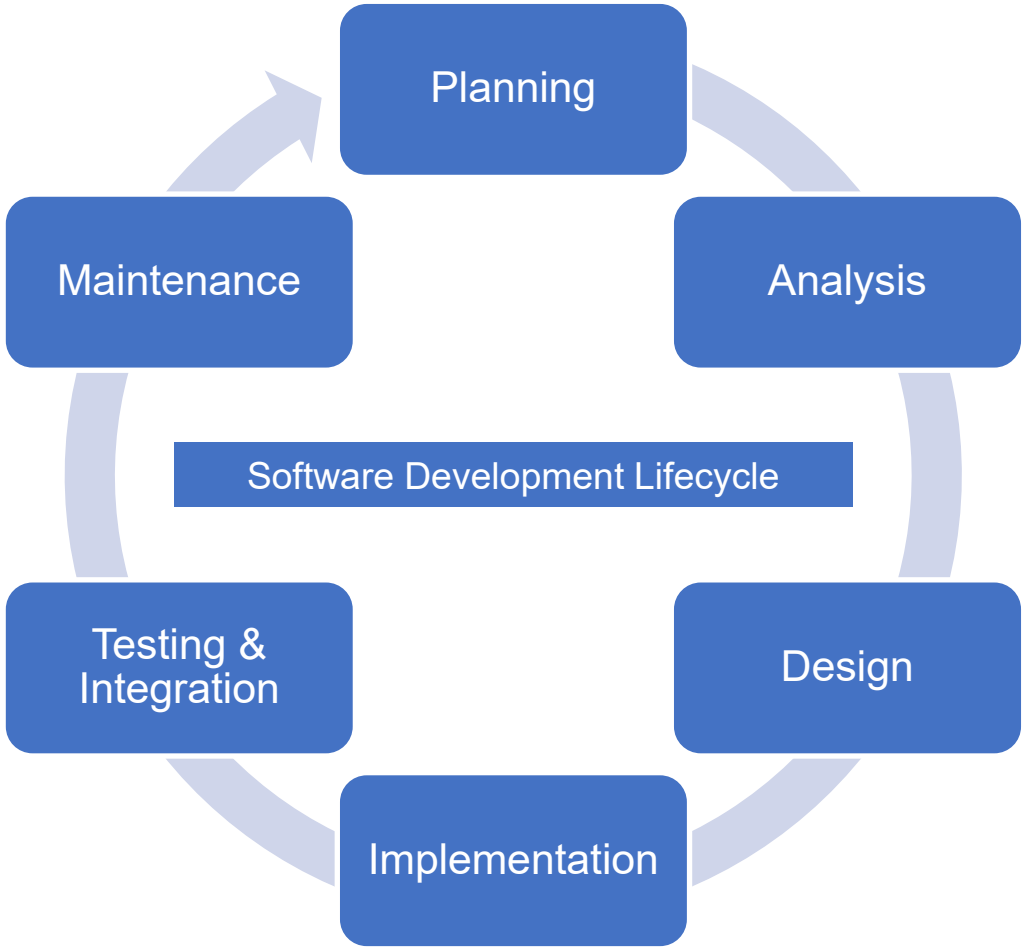
Benefits of CI/CD

- Make changes quickly and safely
- Zero downtime
- Huge industry support around tooling, best practices
- Encouraged to “fail fast”
- Agile, Devops, SDLC



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The CI/CD Journey at Comcast

- Multiple teams already leveraging different platforms
- Unite internal community under one platform
- Architecture Guild and Architecture Design Record
- Ever evolving, community driven language of best practices

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CNCF Cloud Native Landscape

2019-02-05T00:24:26Z b39159e

See the interactive landscape at l.cncf.io

Greyed logos are not open source

App Definition and Development

Database

CNCF Incubating: Vitess

Streaming & Messaging

CNCF Incubating: NATS

Application Definition & Image Build

CNCF Incubating: HELM

Continuous Integration & Delivery

Orchestration & Management

Scheduling & Orchestration

CNCF Graduated: kubernetes

CNCF Incubating: Nomad

Coordination & Service Discovery

CNCF Graduated: CoreDNS

CNCF Incubating: etcd

CNCF Incubating: Consul

Remote Procedure Call

CNCF Incubating: GRPC

Service Proxy

CNCF Graduated: envoy

API Gateway

Service Mesh

CNCF Incubating: LINKERD

Runtime

Cloud-Native Storage

CNCF Incubating: ROOK

Container Runtime

CNCF Incubating: container d

CNCF Incubating: rkt

Cloud-Native Network

CNCF Incubating: CNI

Provisioning

Automation & Configuration

Container Registry

CNCF Incubating: HARBOR

Security & Compliance

CNCF Incubating: Notary

CNCF Incubating: TUF

Key Management

Cloud

Public

Platform

Certified Kubernetes - Distribution

Certified Kubernetes - Hosted

Certified Kubernetes - Installer

PaaS/Container Service

Observability and Analysis

Monitoring

CNCF Graduated: Prometheus

Logging

CNCF Incubating: fluentd

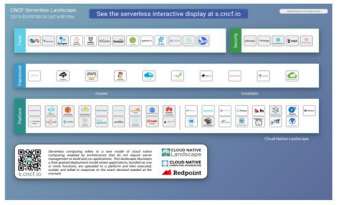
Tracing

CNCF Incubating: JAEGER

CNCF Incubating: OPENTRACING

Chaos Engineering

Serverless



This landscape is intended as a map through the previously uncharted terrain of cloud native technologies. There are many routes to deploying a cloud native application, with CNCF Projects representing a particularly well-traveled path

l.cncf.io

CLOUD NATIVE COMPUTING FOUNDATION

CLOUD NATIVE Landscape

Redpoint Amplify PARTNERS

Special

Kubernetes Certified Service Provider

Kubernetes Training Partner

Single Platform Focus

- Unified platform agreed upon
- Separate, individual team responsible for maintenance and upkeep
- Community assisted onboarding and troubleshooting

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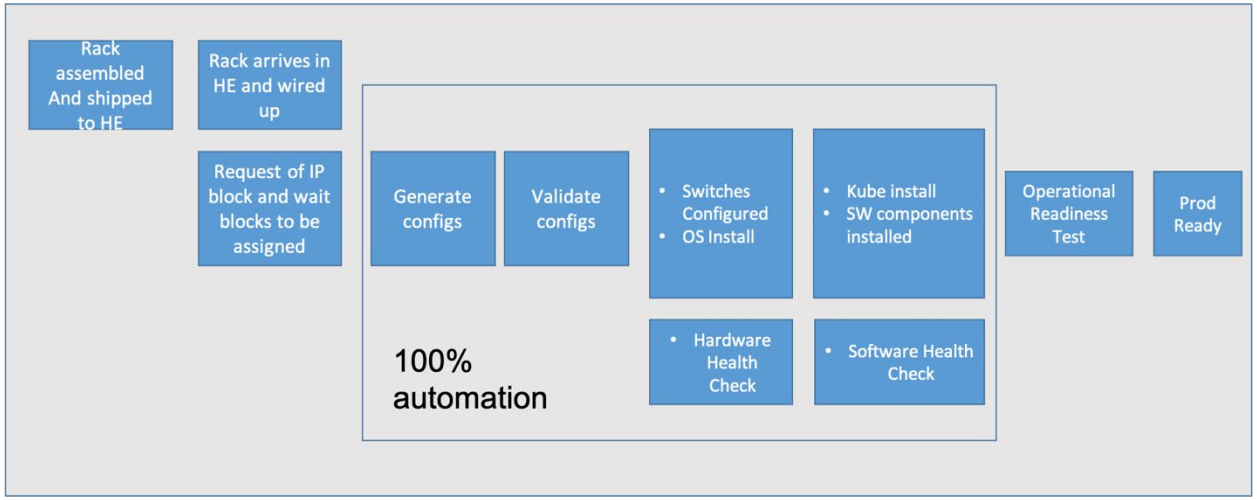
CI/CD Driving Improvements

- vCMTS patches and updates handled via CI/CD
- Changes that previously required a technician in the field
- Changes pushed out to over 10K devices
- Push button deployment



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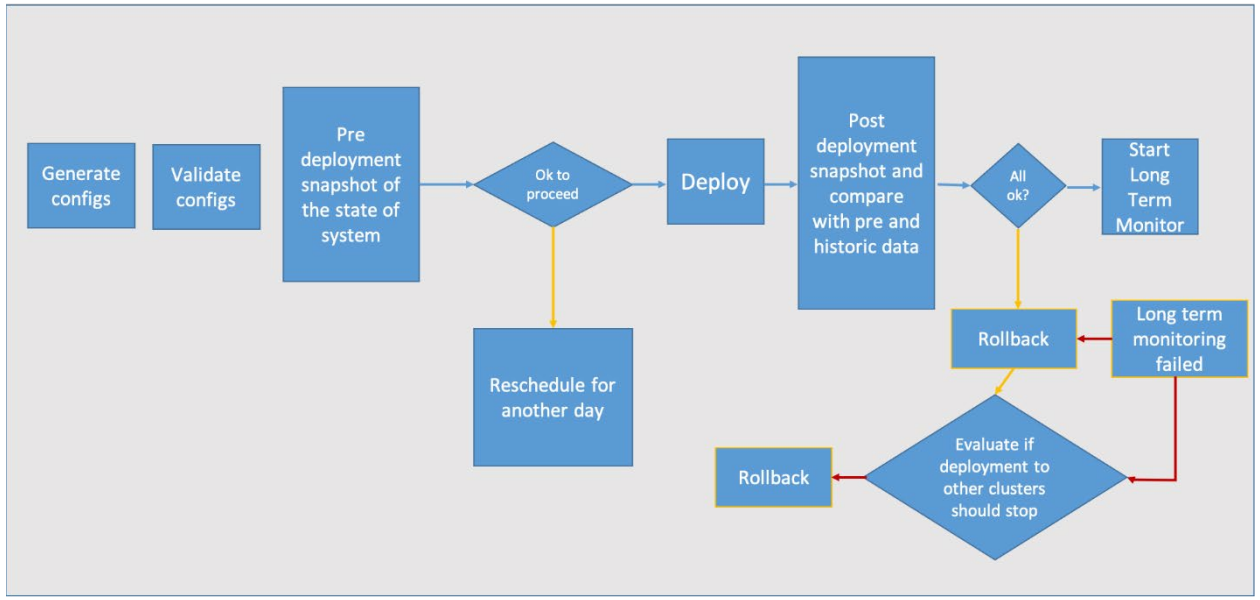
CI/CD Driving Improvements

- Prior mistakes to human error eliminated
- Changes that took days completed in a few hours
- Rolling back changes can be done in minutes in some scenarios
- In some cases, opt to rebuild software vs debug and fix



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Thank You!

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