

Manage IX RS from Git!

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Introduction

Working at Global backbone operator & datacenter provider - Hurricane Electric and based in Haryana, India. Spend lot of time in looking at BGP routing tables, traceroutes across the ocean, interesting patterns & tooling around those patterns.

Besides routing I got lot of interest in DNS, root DNS servers, network automation & virtualization.

Also a dad since Sept 2021! ;-)



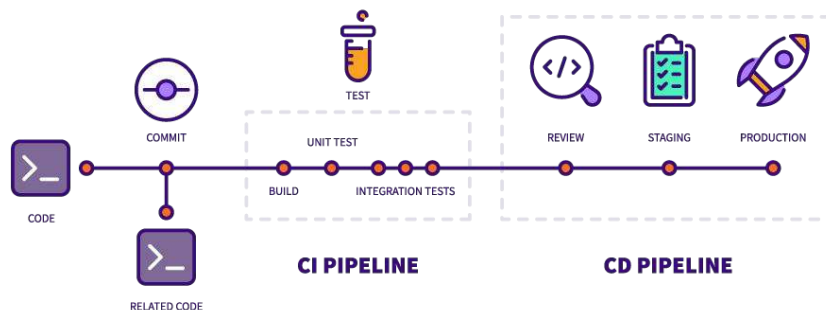
Introduction to Git & CI/CD Pipelines

Basic idea of Git

- Allows versioning of code, making it possible for teams to work together
- Allows creating “branches” from code to try/test different things & merge branches
- Allows working locally and pushes changes to centrally hosted Git repo to be shared
- Makes complicated software development easier. Earlier tools with similar features Git, CVS, SVN etc

What is CI/CD

- Continuous Integration (CI)
- Continuous Delivery (CD)
- Continuous Deployment (CD)



Term comes from Gitlab ecosystem but concept is also used across various hosted Git options (e.g Github actions in Github)

Image source: [Gitlab](#)

Continuous Integration (CI)

- Actions happen when code is pushed to Git
- Can run tests & allow commit only if certain tests are passed
- Helps in adding checks & balance in code development

Continuous Delivery (CD) & Continuous Deployment (CD)

- Allow build, test and deployment of application upon Git commits
- All of it can be automated or manual or a mix of it depending on the need
- Typical use case: Code is pushed, test environment is built, code is compiled, deployed & test scripts run. Upon confirmation, it can be pushed to production environment

Why manage IX Route Server via Gitlab?

- Makes deployment easier for dev as well as prod infrastructure
- Makes initial setup as well as long term management of IX peers easier
- Automated config generation = low chances of mistakes
- Support IRR & RPKI based filtering
- Abstract the IX management via Git or even a REST API call to integrate with other tools
- Make use of existing good tool like arouteserver for generating config

So what's the end goal here?

A simple clients.yml

- clients.yml to keep details of IXP RS clients
- Push of updates on that results in Gitlab CI/CD pipeline to run checks & deploy it on production infrastructure

```
clients.yml 197 bytes
1 clients:
2 - asn: 15169 # Google
3   ip:
4     - 172.16.0.2
5     - 2001:db8::2
6
7 - asn: 4775 # Globe
8   ip:
9     - 172.16.0.3
10    - 2001:db8::3
11
12 - asn: 6939 # Hurricane Electric
13   ip:
14     - 172.16.0.4
15     - 2001:db8::4
16
```

Introduction to Arouteserver

- Open source tool to generate route server configuration written in python
- Supports BIRD and Openbgpd
- Supports filtering based on route objects
- Supports filtering based on RPKI ROAs
- Includes a dozen of built-in “good to have” filter rules
- Supports BGP communities and information based on that

Challenges with arouteserver

- Needs light Linux administration skills
- Need admin to take a few steps - update clients.yml, trigger new config build, push new config build to route server, load config etc
- Lack of easy to view “logs” of what happened during a specific run
- Automating config builds for BGP filter updates

Live demo for Arouteserver via CI/CD pipelines...

Possible checks and automation use cases

- Push code to dev-route servers, validate output and only then proceed with automated production push
- Generate and publish list of members online by reading clients.yml
- Automated mail to mailing list for new peer addition
- Enable config rollback via REST API which can be called by NMS if IX traffic goes below certain threshold
- Inform to team email, slack, Telegram, Google Chat about updates via pipeline

(Anything else as you see fitting your use case!)

Important links

- Sample project (clone, tweak & use!) - <https://gitlab.com/anuragbhatia/ixp-via-gitlab-demo>
- Arouteserver - <https://github.com/pierky/arouteserver>
- Gitlab CI/CD Pipelines documentation - <https://docs.gitlab.com/ee/ci/>

Questions/Feedback/Suggestions?

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