



ClickOps is Dead: Refactoring existing Azure environments with GitOps, Bicep, and AI

David Pazdera

ClickOps – seasoned veteran

- manual GUI-based configuration and management of infrastructure and services
- heterogeneous environments with dozen vendors and technology providers



GitOps – young challenger

- declarative infra/app state stored in Git with automated reconciliation
- idempotent DSLs
- push-based vs. pull-based GitOps

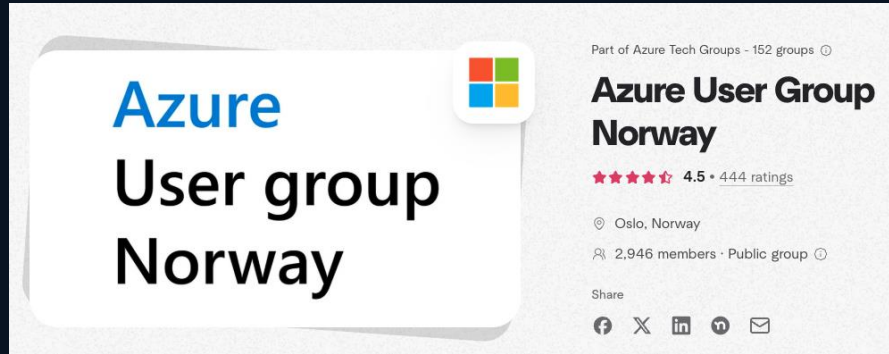


Who is this guy?

- cloud solution architect @ **CEΘAL**
- co-organizer of AUGN and IaC UG Oslo
- GitHub | LinkedIn | Sessionize | SpeakerDeck | X : [pazdedav](#) handle
- blog: [azurescholar.cloud](#)



Join our communities



Azure
User group
Norway

Part of Azure Tech Groups - 152 groups

Azure User Group Norway

★★★★☆ 4.5 • 444 ratings

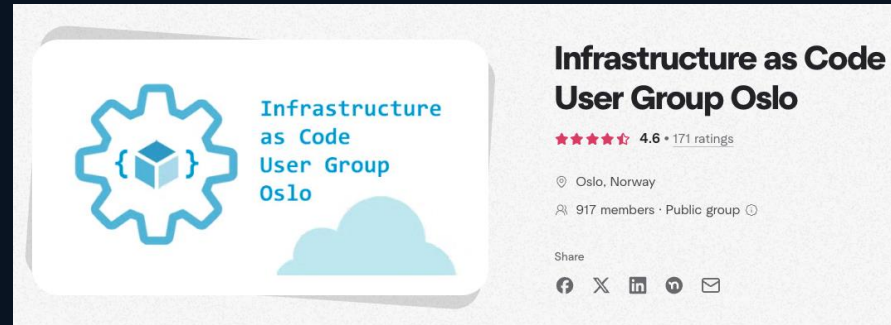
Oslo, Norway

2,946 members · Public group

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Infrastructure as Code User Group Oslo

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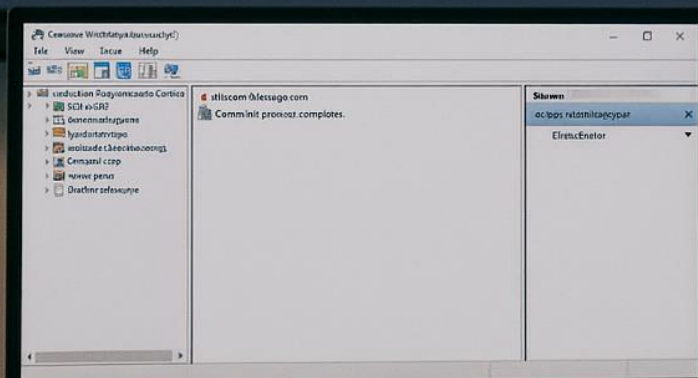
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“Change happens when the pain of staying the same is greater than the pain of change.”

Tony Robbins



Pain of staying the same

What's wrong with ClickOps?

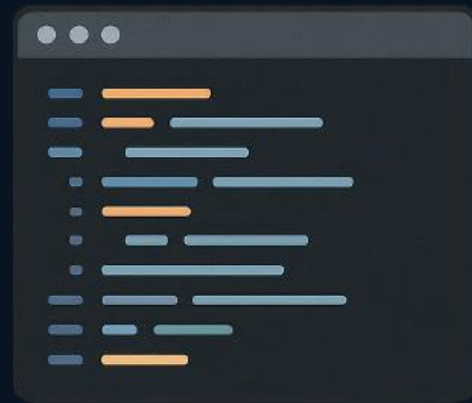
- hard to track and rollback changes
- human error and configuration drift
- snowflake environments
- increased compliance & security risk



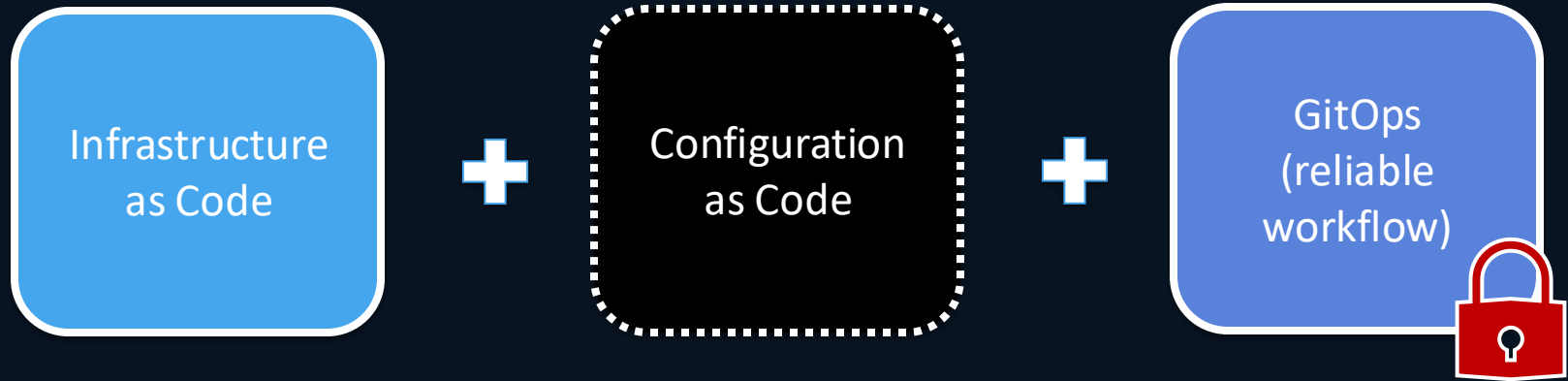
Pain of change

Why is IaC and GitOps hard to adopt?

- steep learning curve and cultural change
- new set of tools and platforms
- different processes and 'way of working'
- *"We have a dedicated IaC team"* idea



Desired state



THEY CAN'T CLICKOPS IN PROD

IF THEY DON'T HAVE PERMISSIONS

imgflip.com

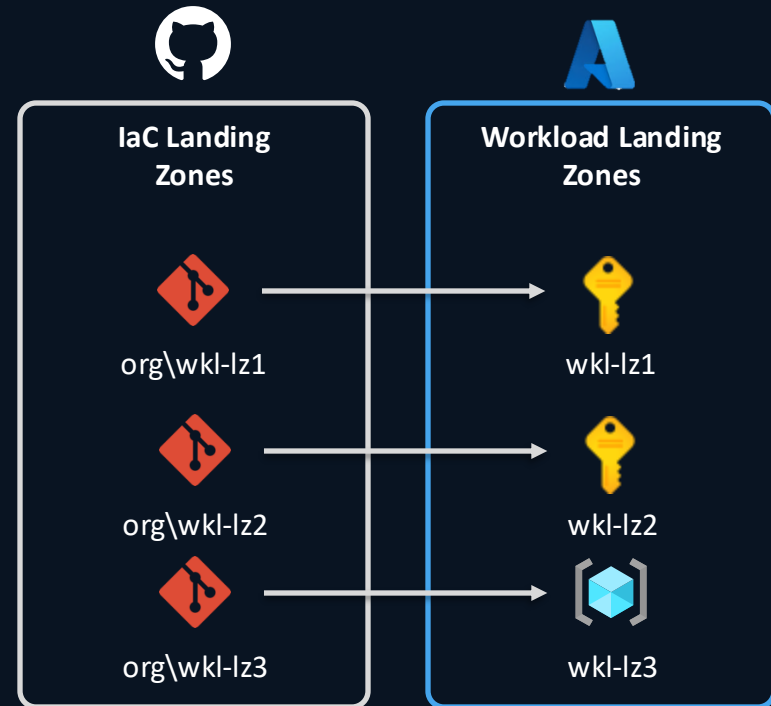
Brownfield migration – no magic button

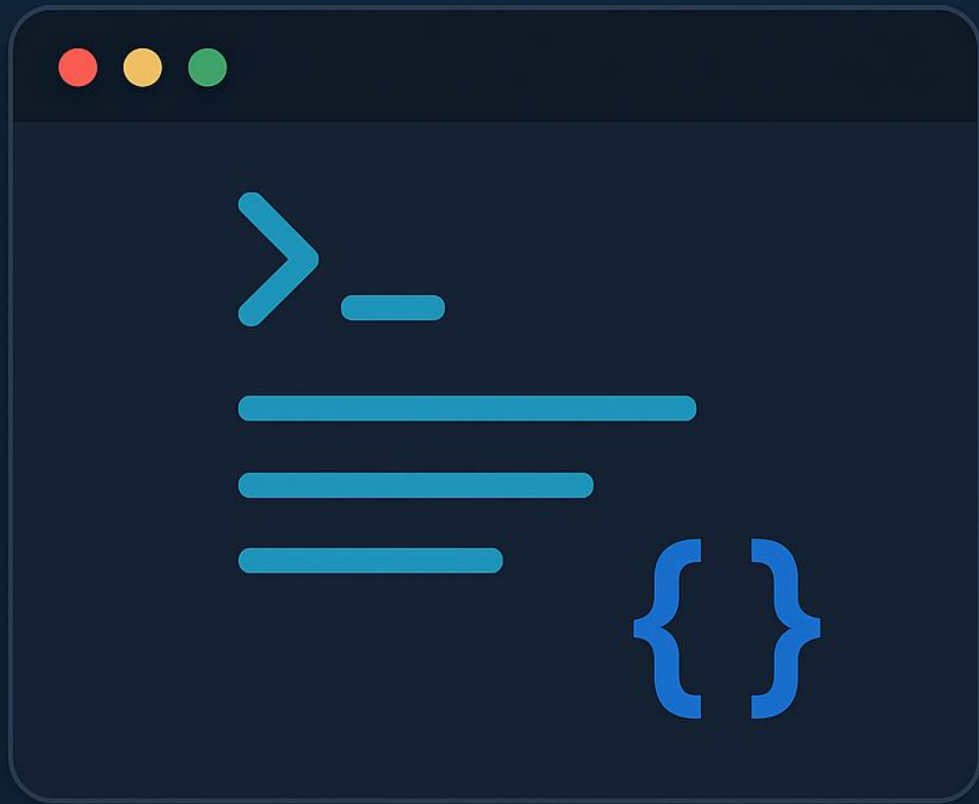
- official guidance – only ARM to Bicep
- bulk-import tool – only for Terraform
 - aztfexport + VS Code extension for TF
 - `import {}` blocks + Terraform Search in HCP Terraform
- multi-stage process



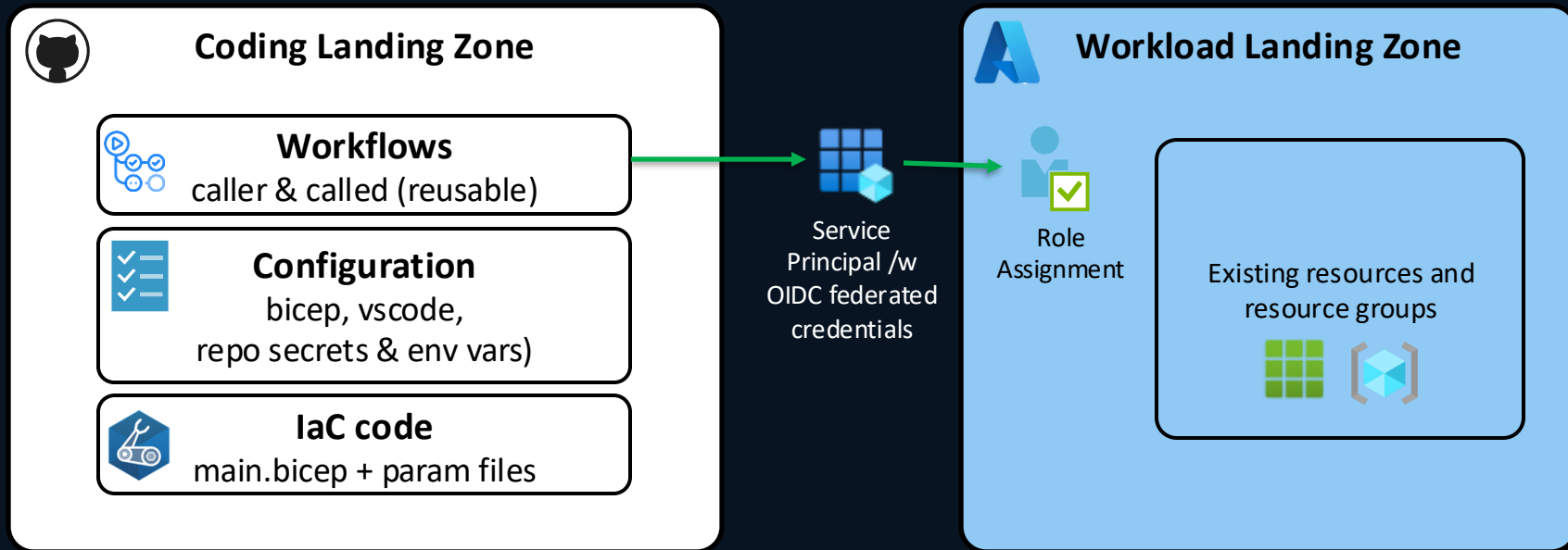
Step 1 - Discovery and scoping

- inventory of resources and dependencies
- define LZ boundary and map repos & environments
- controlled vs. uncontrolled environments
- clear 'demarcation line' between GitOps and ClickOps 'zones'

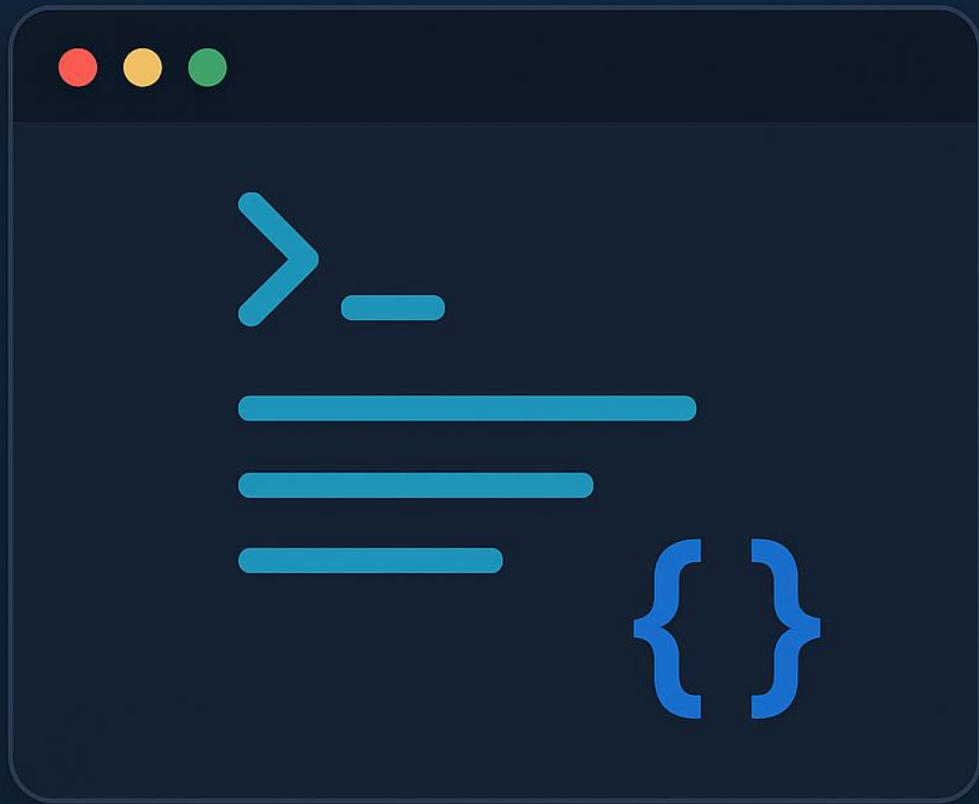




Reusable foundation

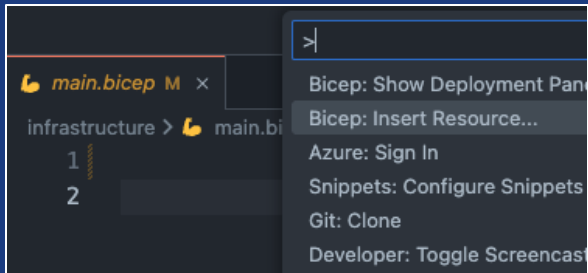


generated from *repository template*



Step 2 – Export resources

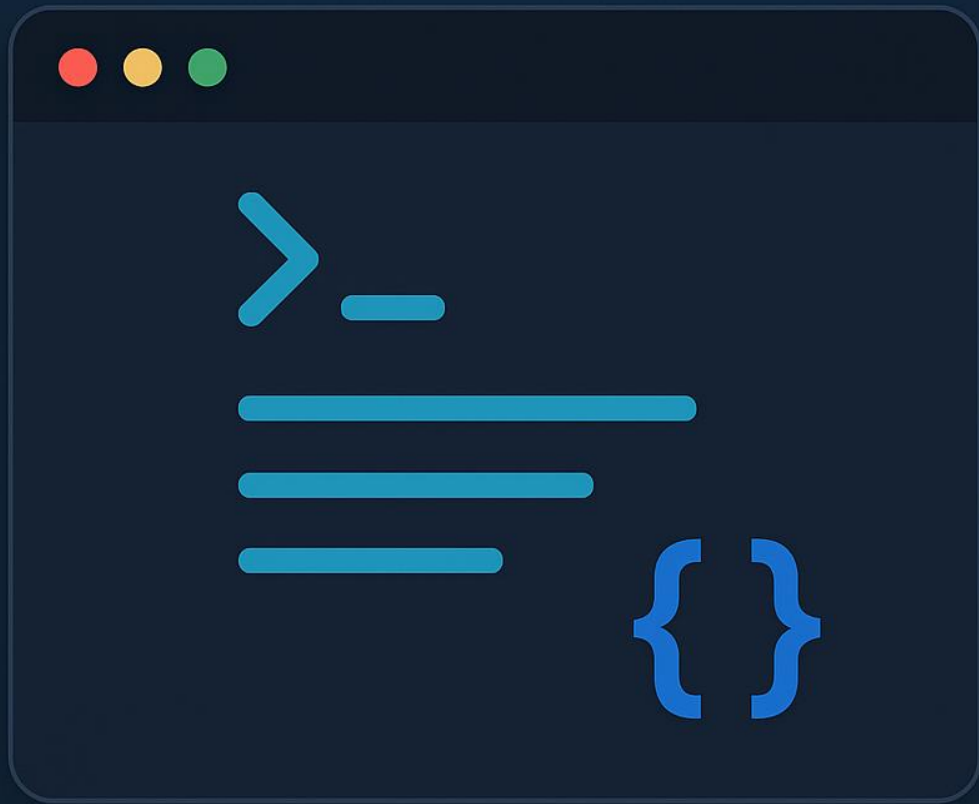
Gradual import of resources



Bulk Export

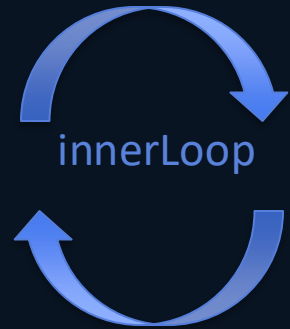
Limits

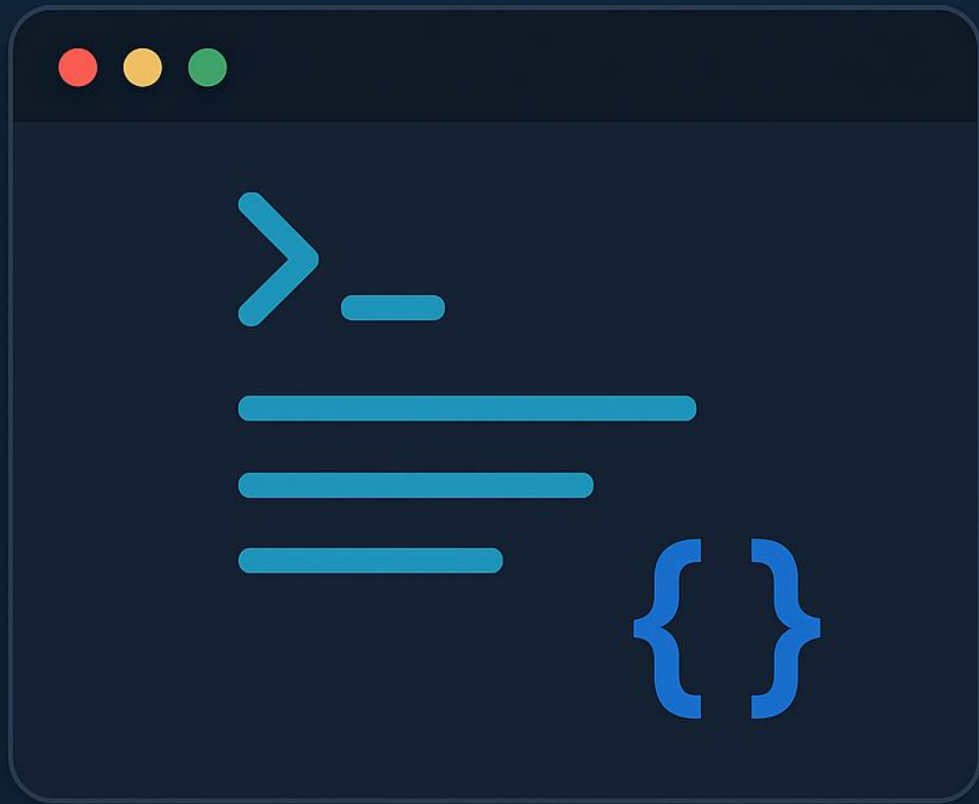
- Max 200 resources per export
- Missing secrets/passwords
- Often outdated API versions
- No guaranteed for deployable code



Step 3 – Refactor and test your code

- ✓ current API versions for resources
- ✓ linter suggestions (e.g., hardcoded secrets)
- ✓ revise parameters, variables, and symbolic names
- ✓ review child and extension resources
- ✓ modularize, reuse custom types
- ✓ add comments, descriptions, decorators (documentation as code)





Gen AI for the rescue



GitHub Copilot

GitHub Copilot Chat

Azure MCP Server

GitHub Copilot for Azure

Bicep (incl. MCP Server)

GitHub Copilot

license

(Free, Pro, Pro+, Business, Ent.)

Agent mode

(Ask, Edit, Agent)

Model

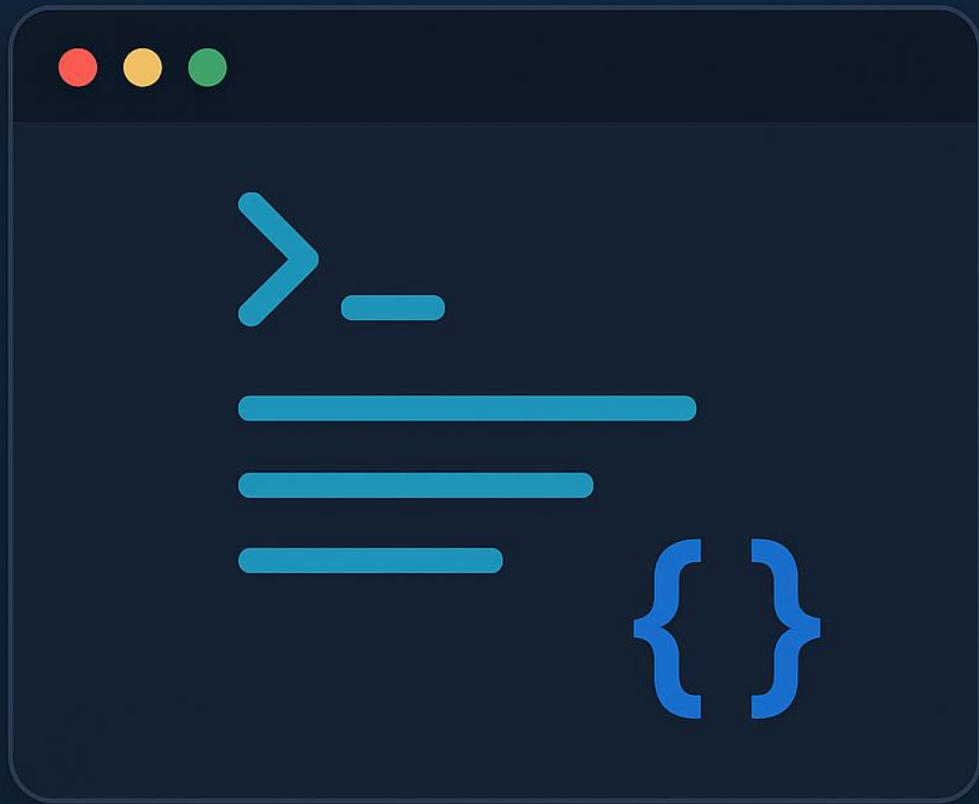
(GPT4.1, Sonnet 4)

custom instructions

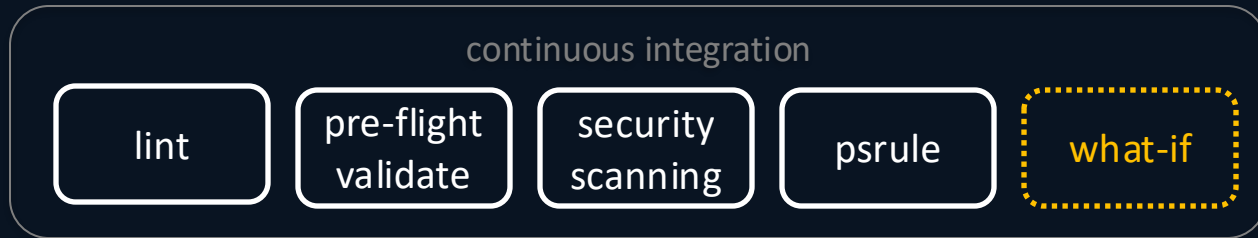
prompts

custom chat modes

and agents

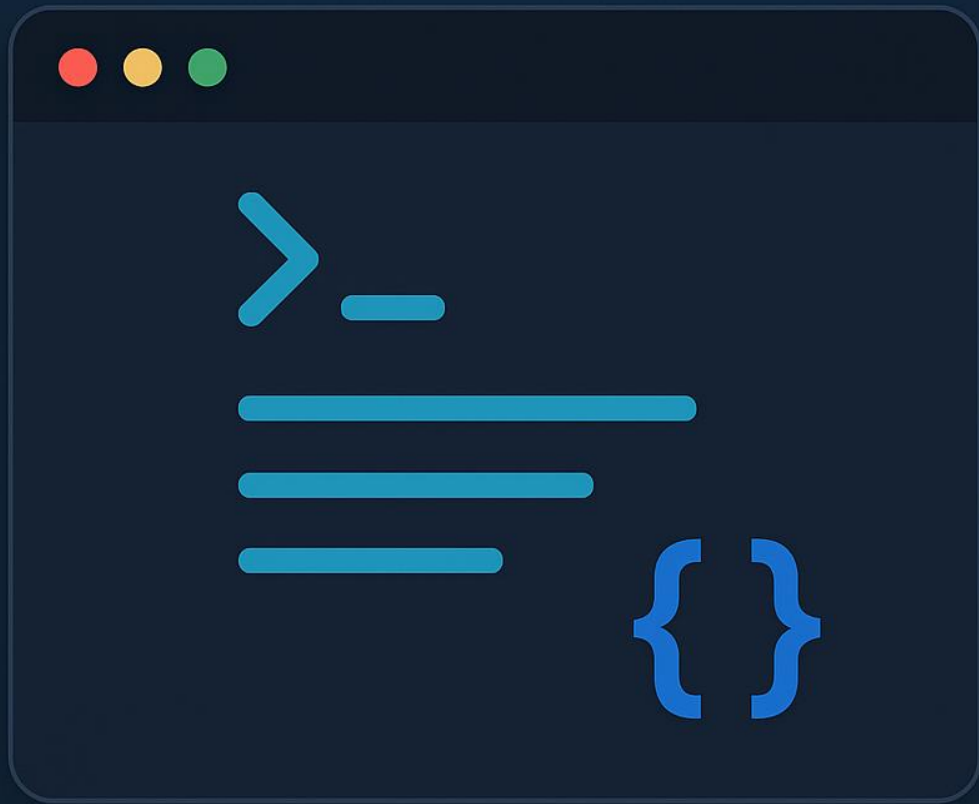


Step 4 – Deploy with GitOps workflow



pull request





Step 5 – Lock the environment



repository
visibility

roles &
permissions

enterprise
policies

branch protection
(RuleSets)

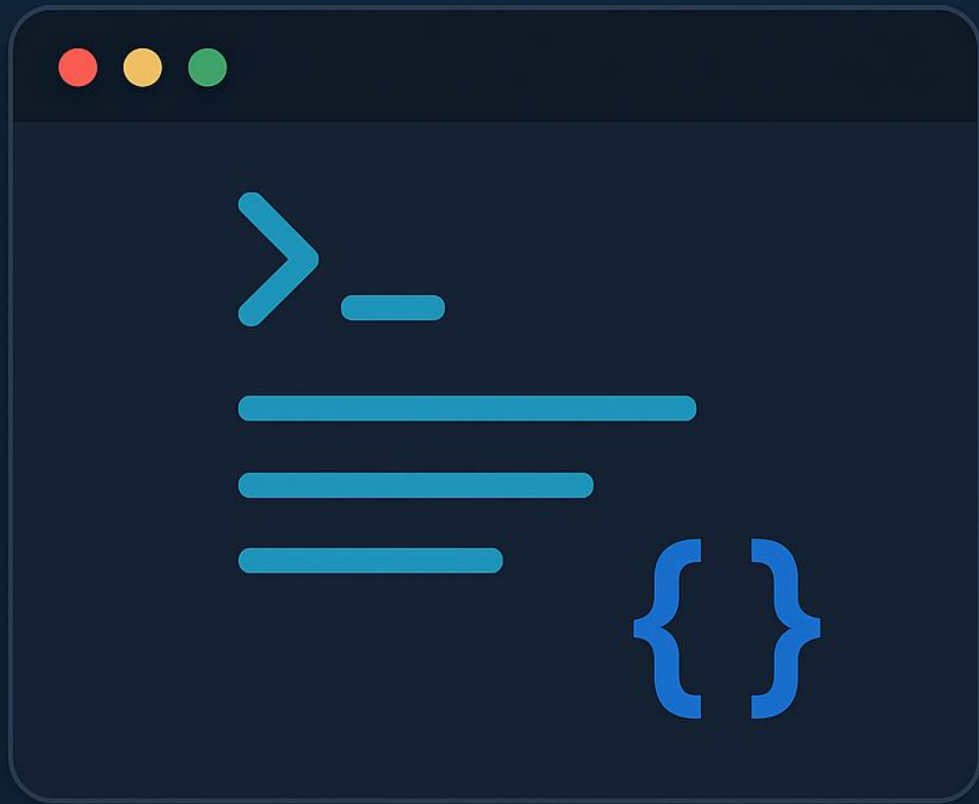


RBAC (Owner)
to workflows

PIM eligibility for humans
– emergency access

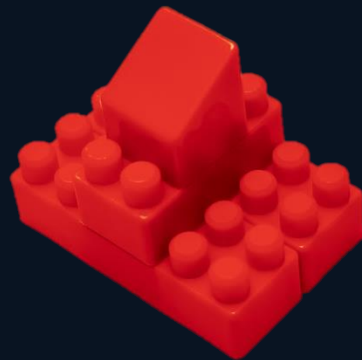
deployment stacks with
deny settings





Lessons learned

- export / decompile \neq production code
- adopt in slices (by RG, LZ, domain) and lock what you adopt
- use reliable modules (AVM)
- skilling & organizational readiness for GitOps-based cloud operations
- inconsistent RP APIs & what-if 'noise'



Resources

- My Demo GitHub Repository
 - <https://github.com/pazdedav/nic2025-gitops>
- az-bootstrap from (Stu Mace, MVP)
 - <https://github.com/kewalaka/az-bootstrap>
- Awesome AZD (AZ Developer CLI library)
 - <https://azure.github.io/awesome-azd/>
- John Lokerse's Blog (Azure MVP)
 - <https://johnlokerse.dev>

I AM

INEVITABLE

