Moving to Cloud Run?

Leave your Kubernetes Luggage Behind

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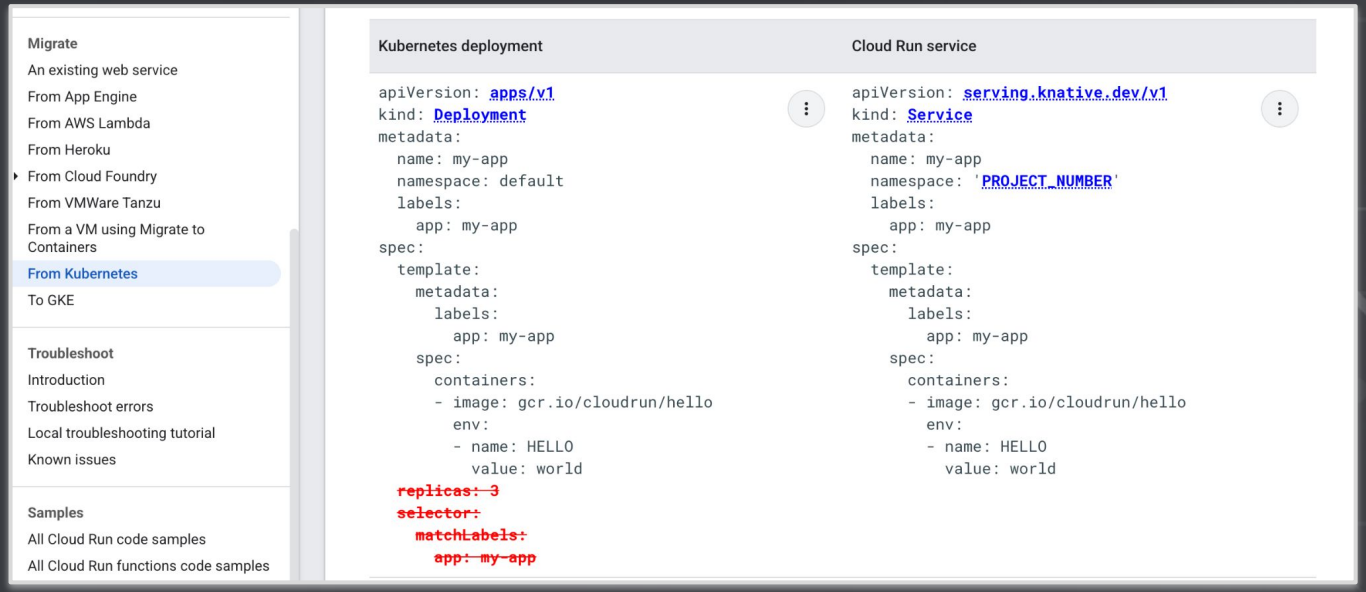
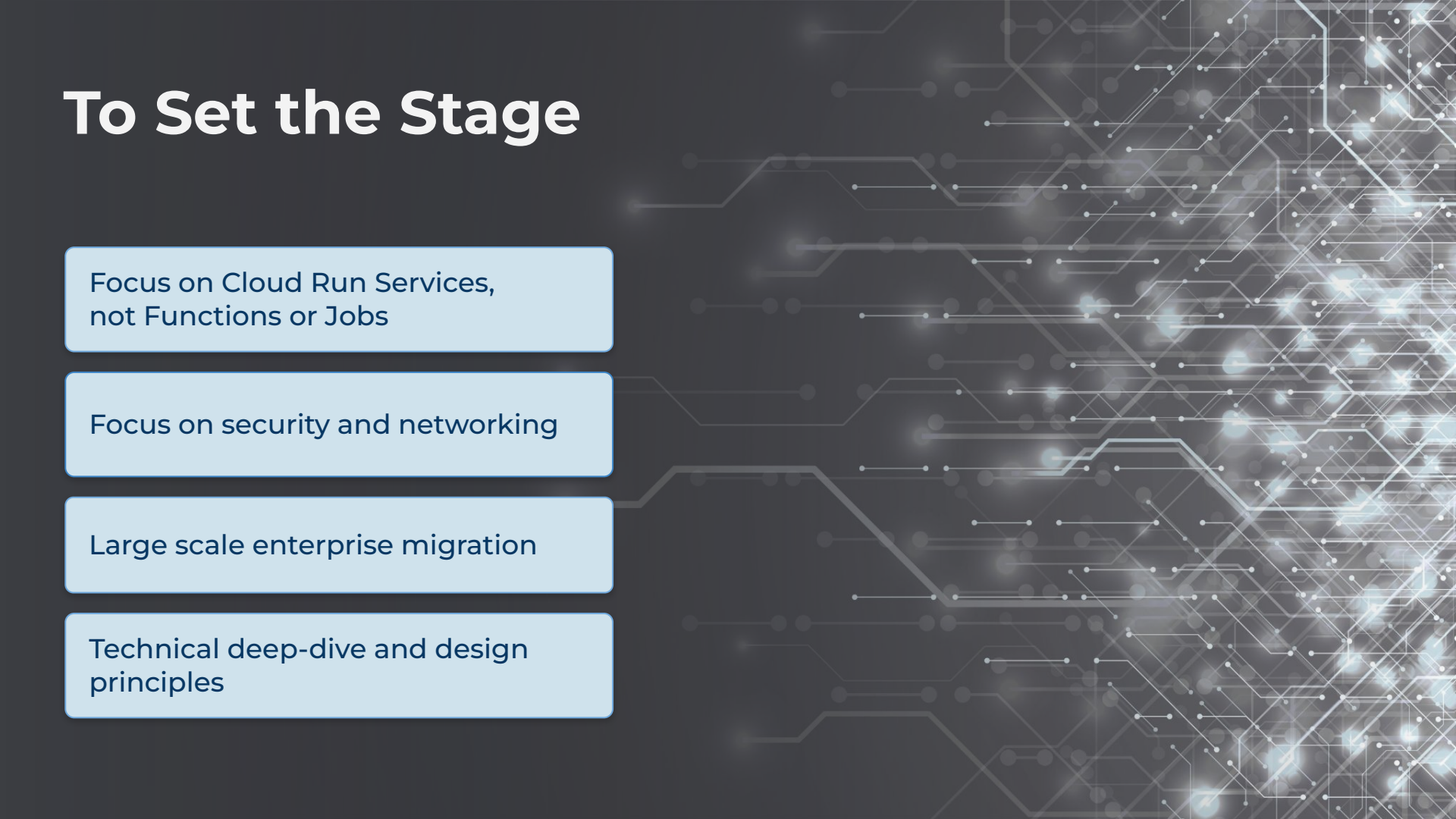
There is a Page for That!

https://cloud.google.com/run/docs/migrate/from-kubernetes

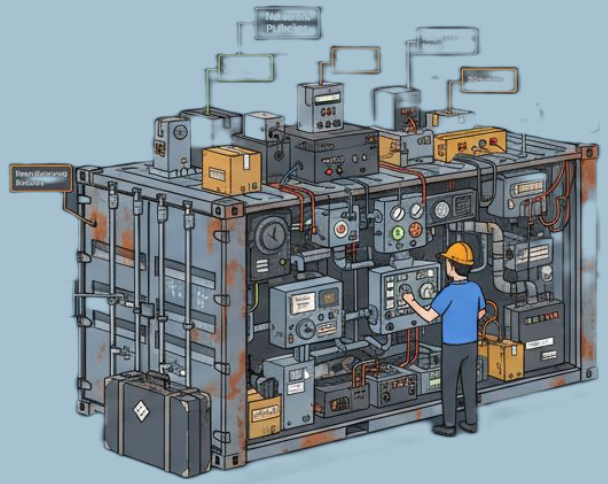


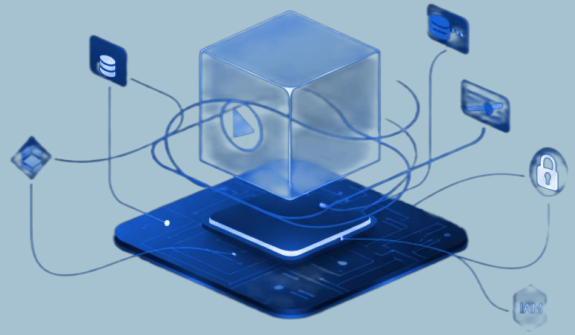
To Set the Stage

- Focus on Cloud Run Services, not Functions or Jobs
- Focus on security and networking
- Large scale enterprise migration
- Technical deep-dive and design principles



Why Cloud Run

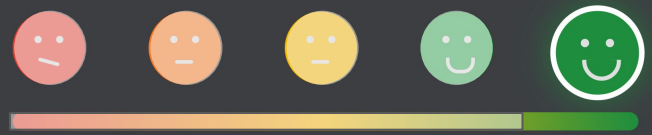




Container as a Service (CaaS)

Platform as a Service (PaaS)

Developer Experience



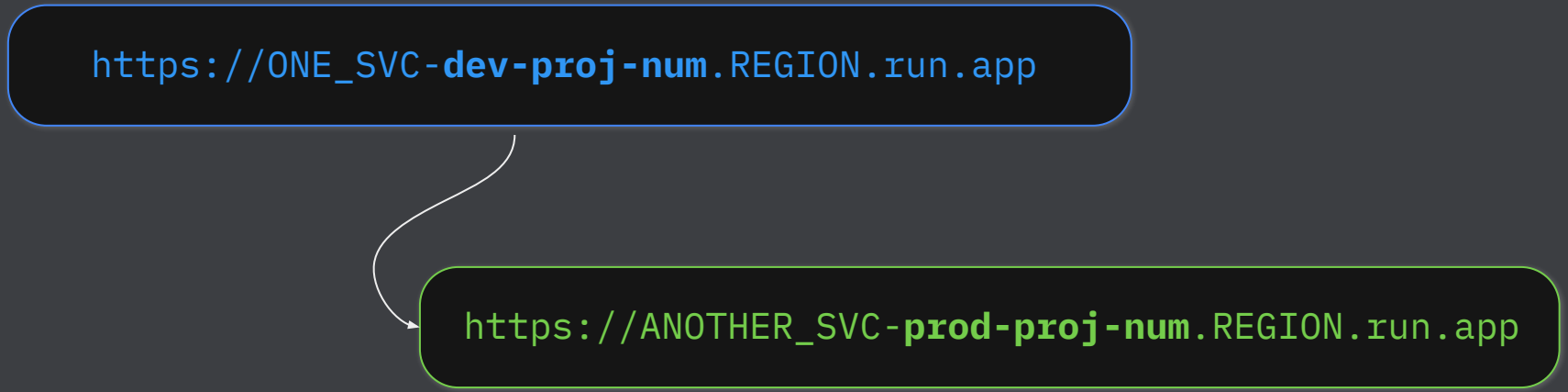
“Devs love it - drop an image, get the URL back”

“I don’t know... just feels more managed”

```
$ gcloud run deploy <SVC_NAME> \
    --image <IMAGE>            \
    --region <REGION>
```

```
https://SVC_NAME-PROJ_NUM.REGION.run.app
```

No Network Environment Segregation



Default .run.app URL

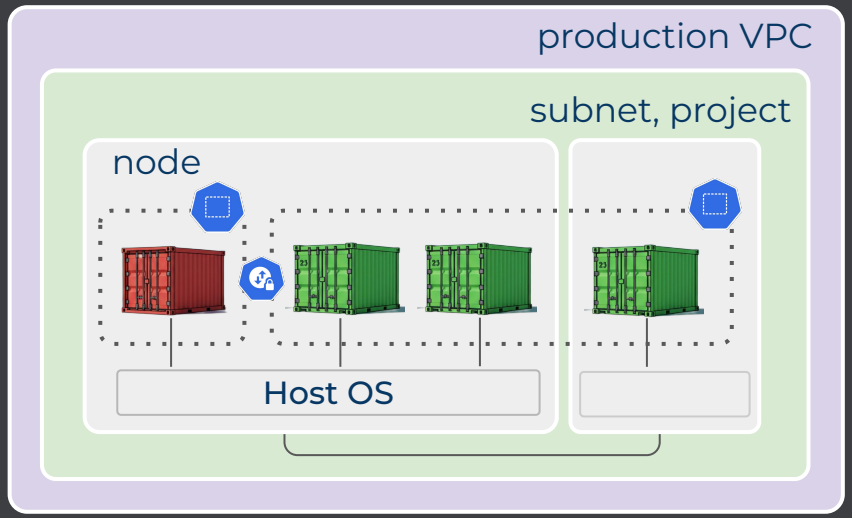
```
$ dig <SVC>.run.app

<SVC>.run.app. CNAME v2.run.app.

v2.run.app.   ... A    34.143.75.2
v2.run.app.   ... A    34.143.72.2
v2.run.app.   ... A    34.143.76.2
v2.run.app.   ... A    34.143.78.2
...
```

IP ranges that Google makes available to users on the internet

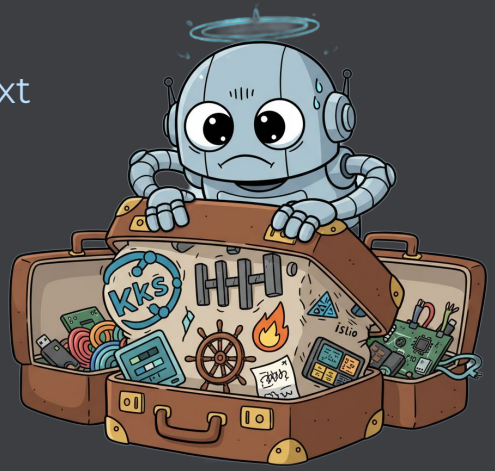
```
…
    "ipv4Prefix": "34.32.0.0/11"
  }, {
    "ipv4Prefix": "34.64.0.0/10"
  }, {
    "ipv4Prefix": "34.128.0.0/10"
  },
```

… many, many huge ranges

Kubernetes



- Namespaces
- Network policies
- Nodes
- RBAC
- Security Context
- Service Mesh
- OPA Policies
- ...



non-production VPC

GKE GKE

GKE

Deployment

Namespace

Network Policies

Cloud Run

Service

Network Tags?

Subnet?

Project?

Labels?

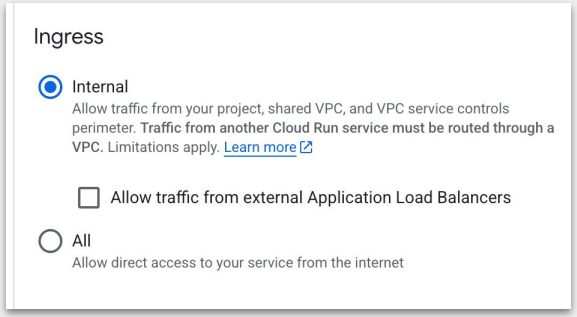
I'm Feeling Lucky

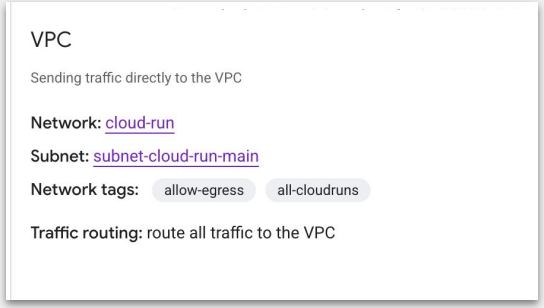
Exercise: Translate Netpols to Firewalls

Even with Internal Ingress

✅ Service Accounts, Network Tags

❌ IPs - ephemeral





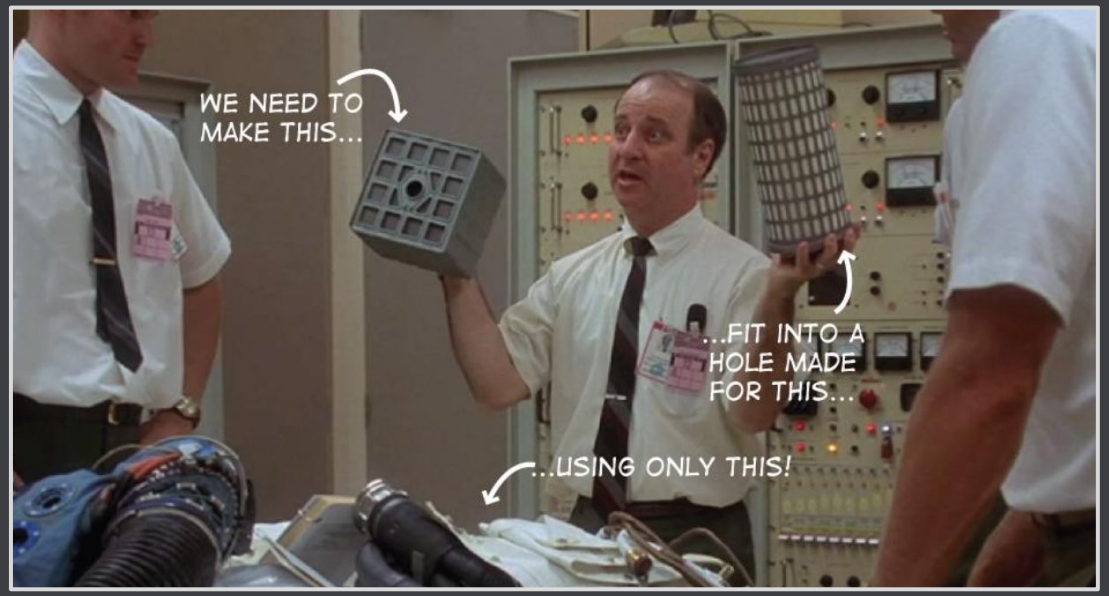
Even if we could...

The following limits apply to firewall rules:

Item	Limit	Notes
Maximum number of source secure tags per ingress firewall policy rule	256	Applicable only to ingress firewall policy rule—the maximum number of secure tags that you can use as source tags in the firewall rule. This limit cannot be increased.
Maximum number of target secure tags per firewall policy rule	256	Applicable only to firewall policy rule—the maximum number of secure tags that you can use as target tags in the firewall rule. This limit cannot be increased.
Maximum number of source network tags per ingress VPC firewall rule	30	Applicable only to ingress VPC firewall rules—the maximum number of network tags that you can use as source tags in the firewall rule. This limit cannot be increased.
Maximum number of target network tags per VPC firewall rule	70	Applicable only to VPC firewall rules—the maximum number of network tags that you can use as target tags in the firewall rule. This limit cannot be increased.
Maximum number of source service accounts per ingress VPC firewall rule	10	Applicable only to ingress VPC firewall rules—the maximum number of service accounts that you can use as sources in the firewall rule. This limit cannot be increased.
Maximum number of target service accounts per firewall rule	10	The maximum number of service accounts that you can use as targets in a VPC firewall rule or rule in a firewall policy. This limit cannot be increased.

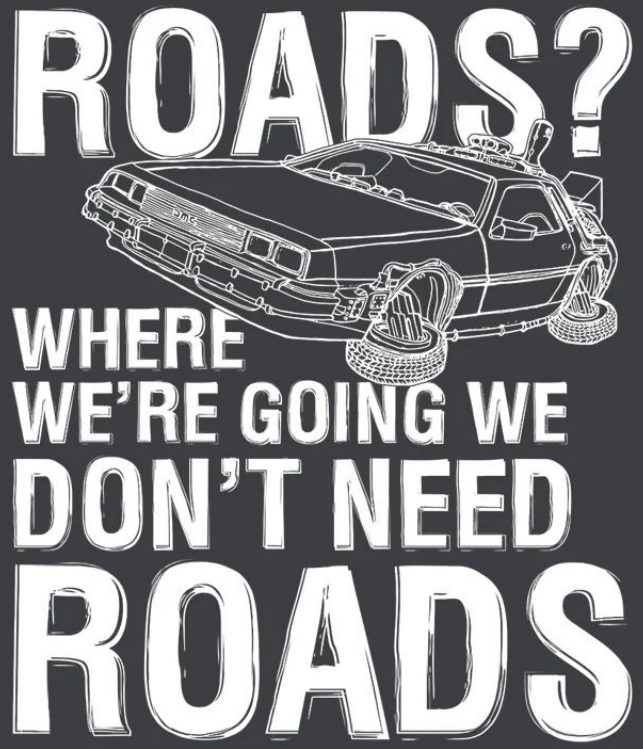
- Hard limits due to performance impact
- IP-based policies: CIDR only
- No Ingress
- Permission on shared VPC
- Complex at scale

Square Pegs in Round Holes



Granular firewalls:

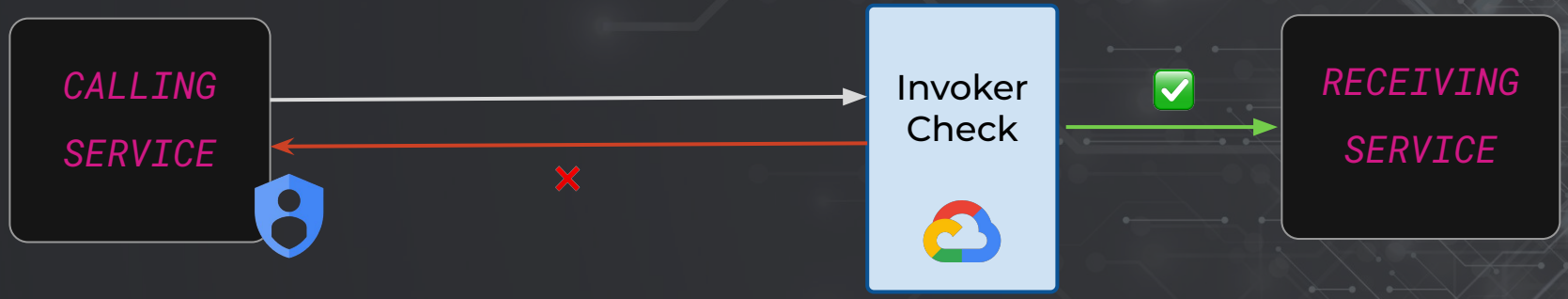
Don’t do it unless lives depend on it



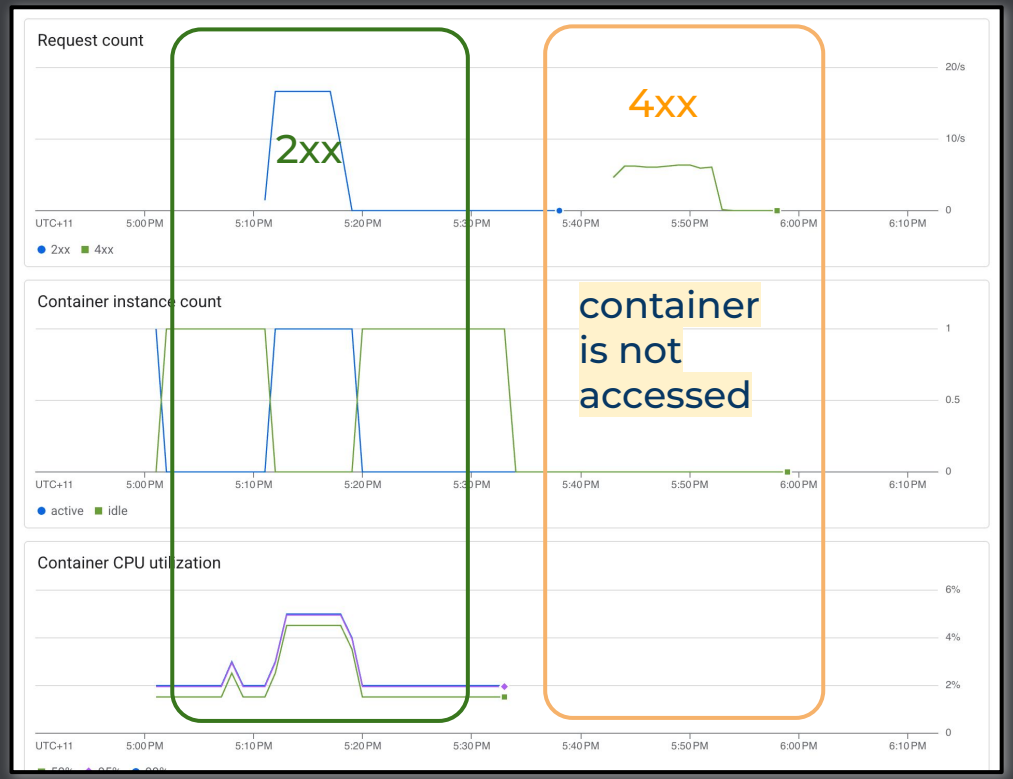
We need **Identity**

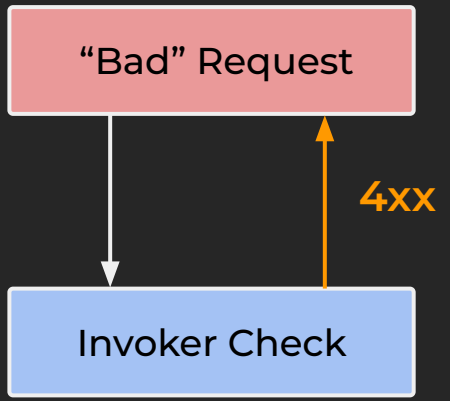
Invoker Check

```
$ gcloud run services add-iam-policy-binding RECEIVING_SERVICE \
    --member='serviceAccount:CALLING_SERVICE_IDENTITY'          \
    --role='roles/run.invoker'
```



Invoker Check





What We've Learned so Far

Cloud Run ingress can't be secured with network firewall

"Reaching the service" (network)
!=
"Accessing the container" (application)

Are we on the right path?

Security Design Principles

Zero Trust

Adopt "never trust, always verify". Every single request must be authenticated and authorized, regardless of its origin.

Identity as the New Perimeter

Shift focus from "where" a request comes from (network location) to "who" is making it (verifiable identity).

- Identity Aware Proxy (IAP)
- Secure Web Proxy (SWP)

Defence in Depth

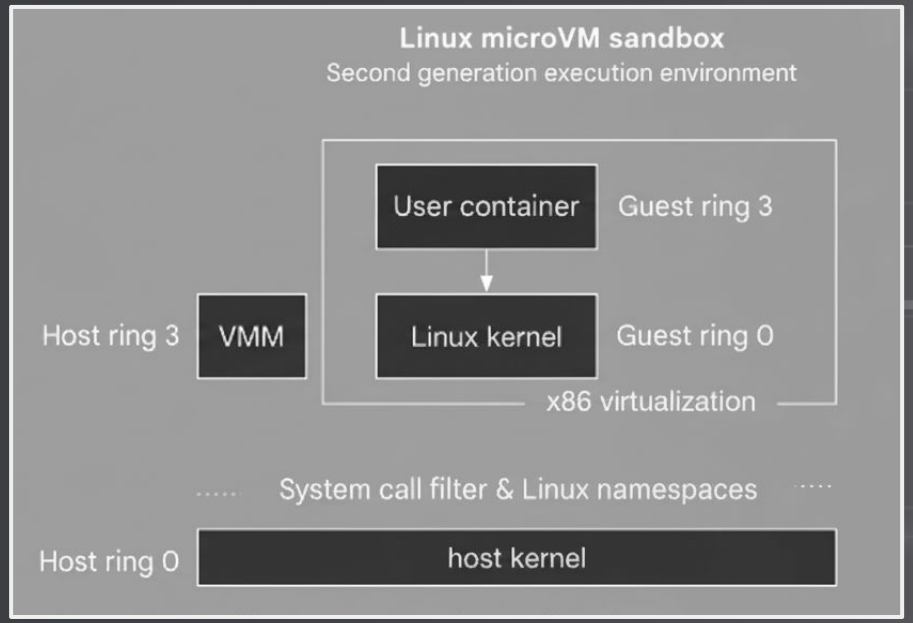
Establish multiple, independent layers of security controls. Secure the code, edge, runtime, service boundary.

- Org Policy
- VPC-SC
- Cloud Armor
- . . .

Kubernetes is ~~Complicated~~ Amazing

- Supports implementation of **the above principles**
- While achieving the main goal - **orchestration**
- Multi tenanted workloads on **shared infra**
- Same platform to run clusters of 180,000 nodes or on a tiny IoT device
- Cloud Run is built on Borg (k8s predecessor)

Execution Environment



Each container in Linux microVM. Two layers of sandboxing

Syscall filtering

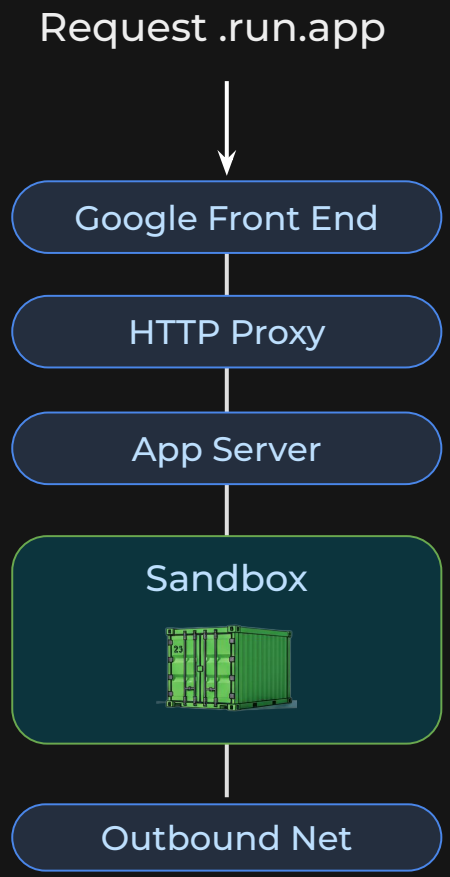
No shared node to escape to

Blast radius is contained to a single, ephemeral request

Ingress Infrastructure

- Connections are always terminated before reaching container
- GFE mitigates DDoS and other network attacks

```
< HTTP/1.1 403 Forbidden
< date: Mon, 13 Oct 2025 09:41:43 GMT
< server: Google Frontend
```



Externally Facing Services

Custom domain

External ALB

Cloud Armor

Disable default `.run.app`

Control DNS name

Use with custom domain

SSL Policy and Certificates

WAF at the edge of Google network

OWASP Top 10

Bot control

Demo

GKE

Cloud Run

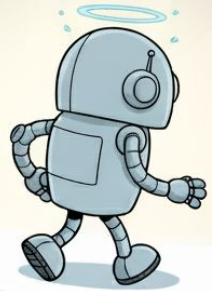
So how do we translate?

We don't!

Migration

```
for_each
concept(A) → concept(B)
```

- Target platform discovery
- System design principles
- Requirements



Let’s Connect!

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