
DevNation
Connect Public and Private Clusters in a Secured Application Layer with Skupper
June 29th 2023
Red Hat Developer
Noe Luaces

About Skupper

It is a layer 7 (HTTP, DNS) service interconnect

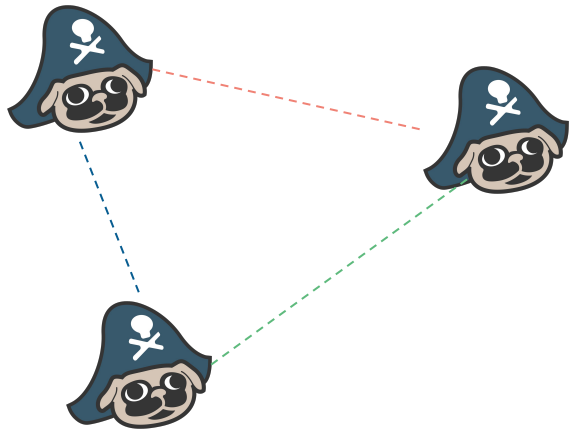
Allows hybrid cloud communication across different providers (AWS, GKE, AKS…) with no VPNs or special firewall rules

Creates Virtual Application Networks (VAN) by managing routers that allow secure connections between Skupper sites

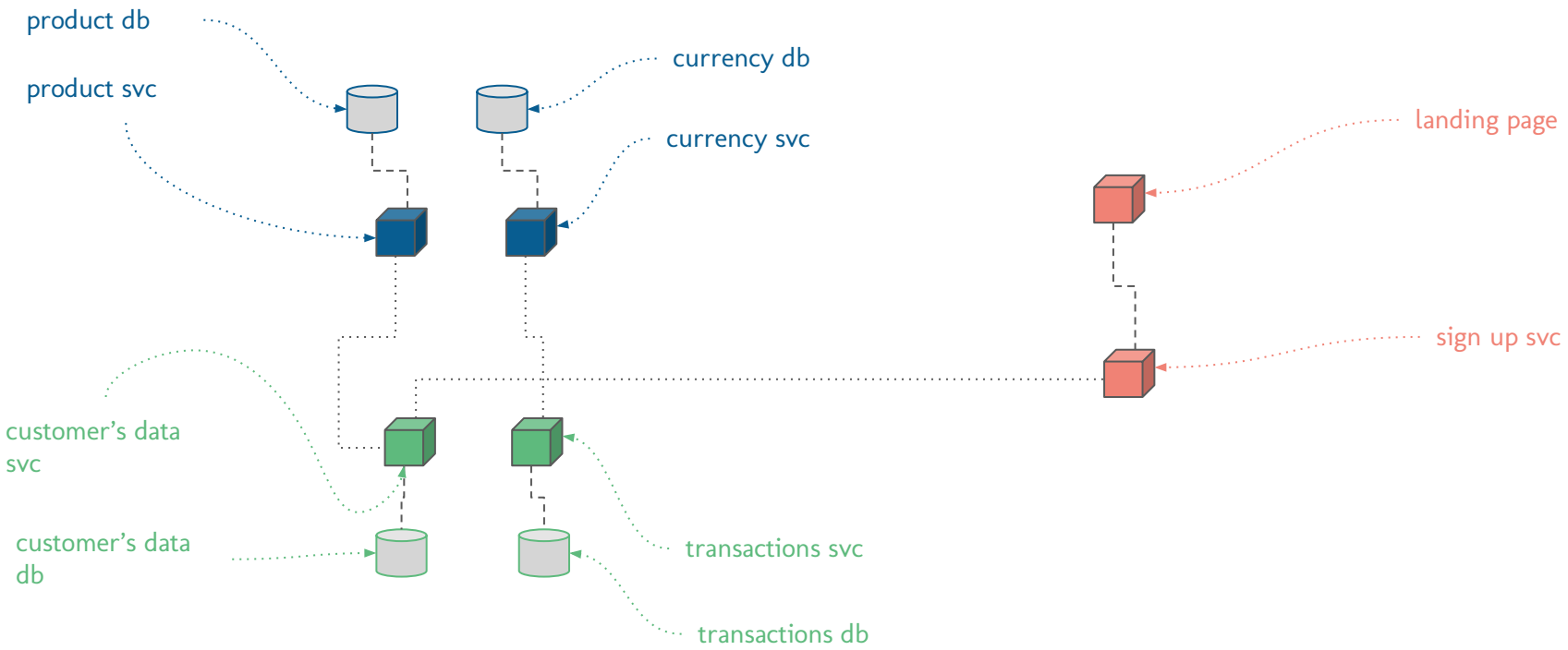
About the Skupper Router

The Skupper control plane manage skupper routers that use layer 7 addressing and routing to connect services

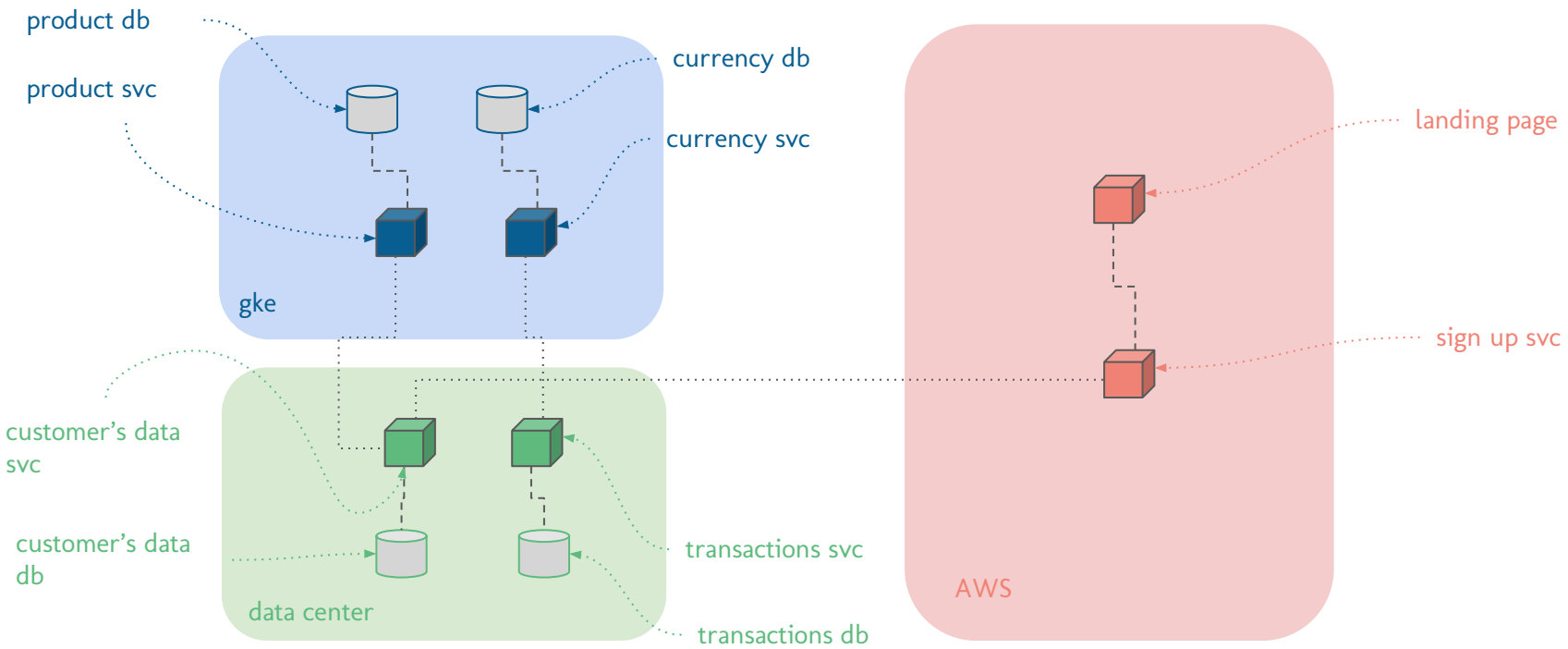
Skupper uses redundant network paths and smart routing to provide high availability



Basic use case



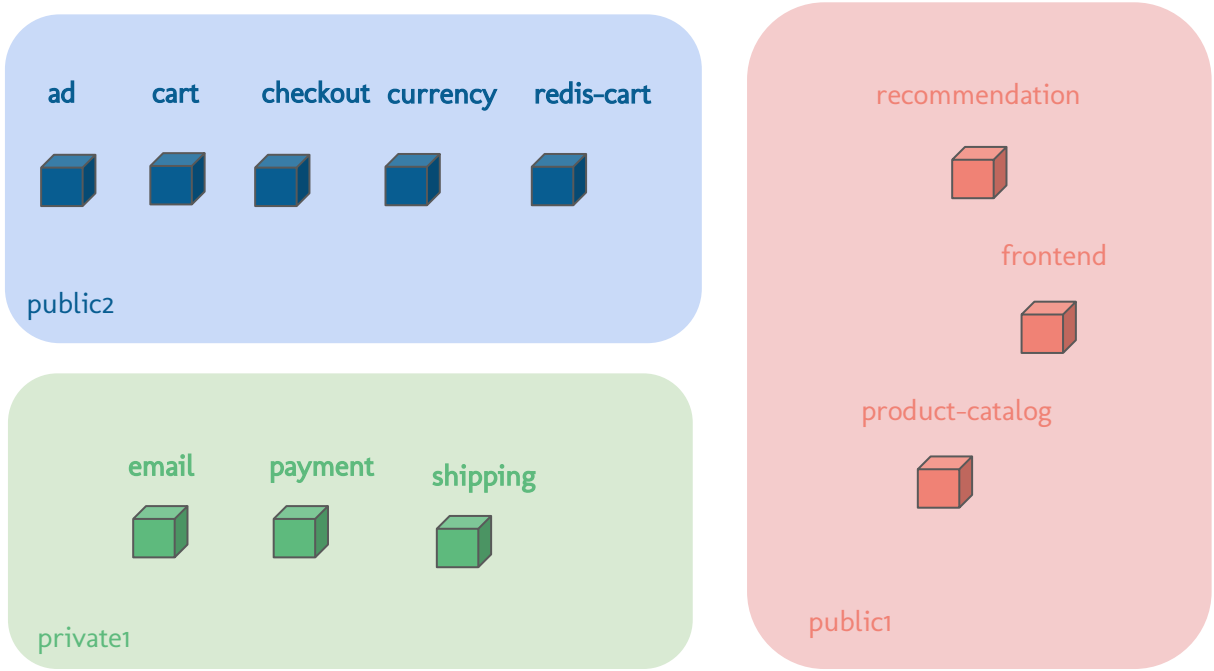
Basic use case



Agenda

1. Install Skupper in clusters
2. Install Skupper with the console
3. Create tokens
4. Create the links to establish the VAN
5. Look at the links' status
6. Exposing services through Skupper
7. Look at the status
8. Look at the console
9. Check the result of the demo
10. Revoke the access to one of the sites
11. Debug events
12. Debug events in Kubernetes

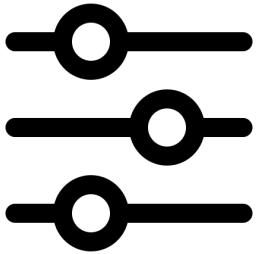
Starting point



Installing Skupper

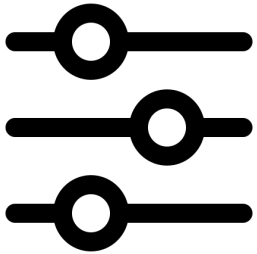
Skupper deploys a router and a service controller in a particular namespace inside a cluster

Some features of these pods can be customized (CPU, memory…)



Installing Skupper with the console

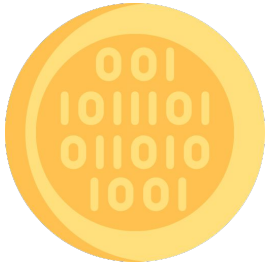
By default, the console is not installed, we can choose the type of authentication: unsecured, internal (using our own credentials or using ones generated by skupper)



Create the tokens

Create tokens implies generating yaml files with the target site certificates.

This tokens expire after a short period of time and can be revoked and by default they are single use.

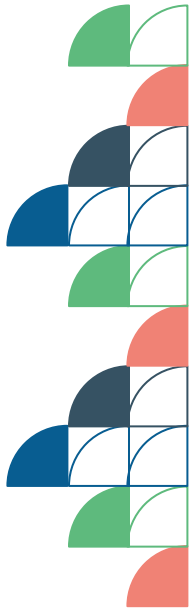


Create the links

A link establishes a bidirectional communication between routers of differents sites that is encrypted with mutual TLS.

Link status

When the links are created if the status is connected, the data flow communication between routers and the service synchronization are possible

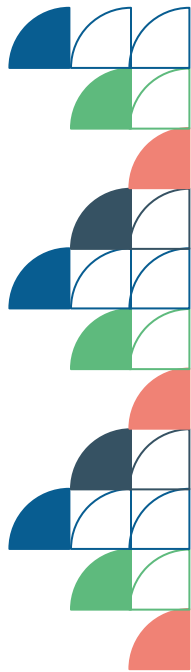


Expose services through Skupper

Exposing service through Skupper creates a service resource in Kubernetes.

The Skupper control plane replicates that service in other skupper sites.

This service synchronization across sites in the VAN makes the exposed service local to the rest of services.



Show Skupper status

Generic information about the VAN:

Sites connected directly or indirectly

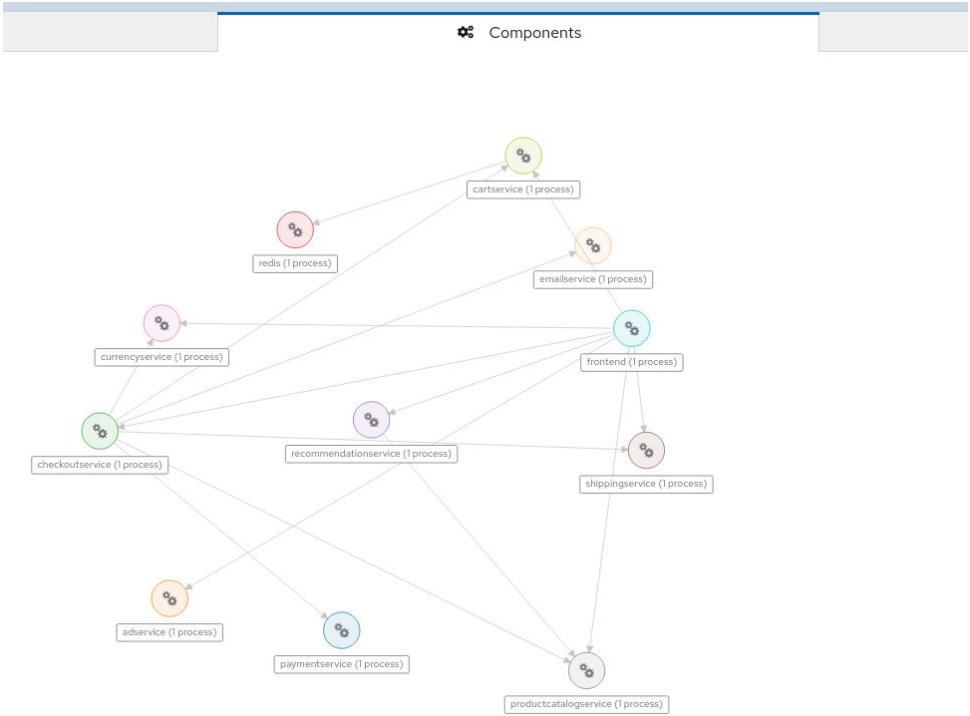
number of services exposed

console URL if applicable

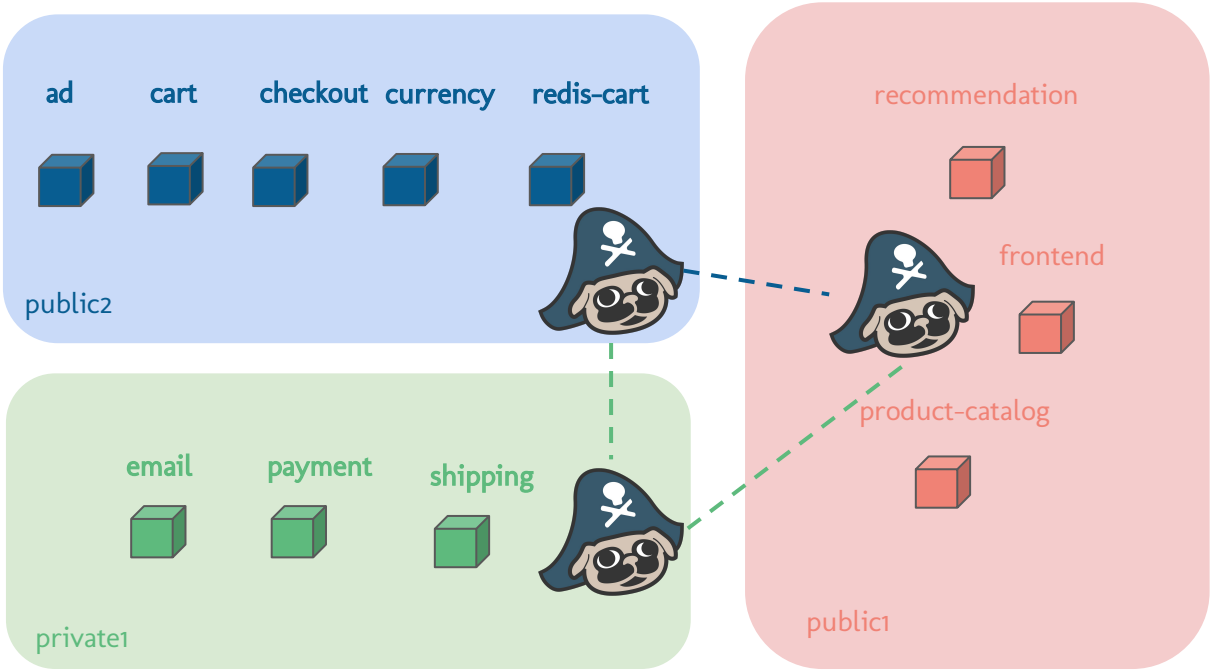
Show the console

Visual information about de topology of the VAN

Observability of the data flow within processes



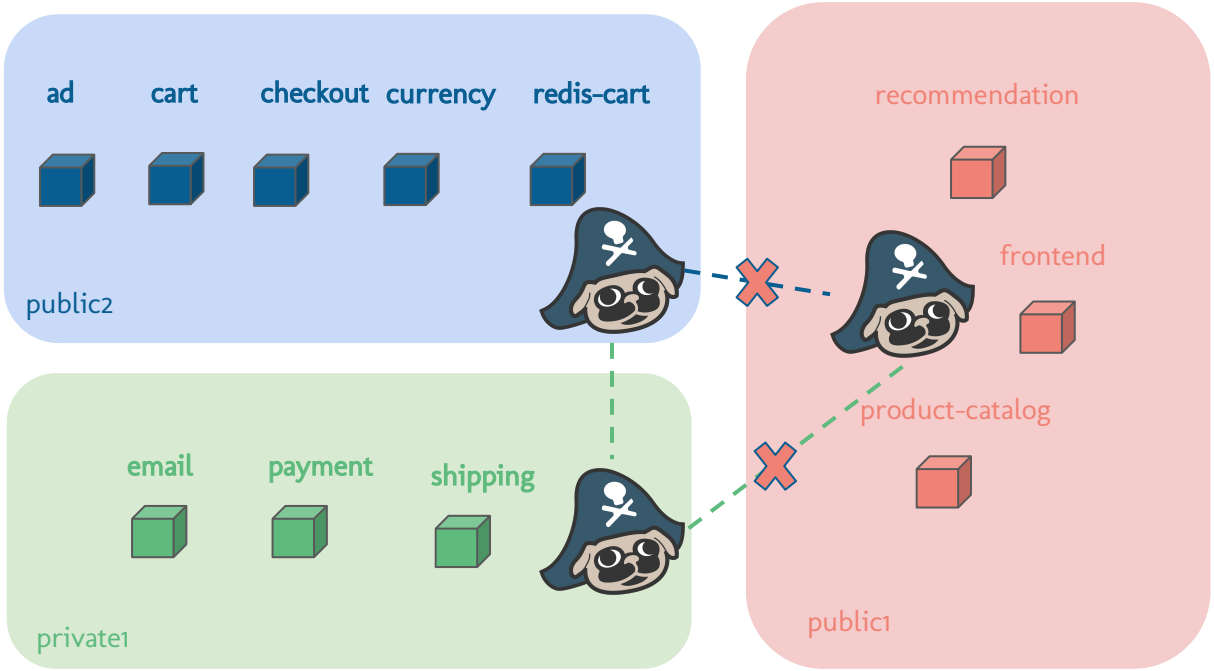
Result of the demo



Revoke access

Current links get disconnected

CA created to sign certificates for the links gets regenerated.



Debug events

Control plane events are actions that happen in Skupper and can help to debug potential issues with the VAN

Debug events in kubernetes

Skupper sends events of the resources that have been created in Kubernetes.

It is available by default, but it can be disabled

Takeaways

With Skupper, your application can span multiple cloud providers, data centers and regions

No VPNs are required because the connection between routers is secured with mutual TLS

There are several ways to check the status and topology of the VAN.

github.com/nluaces/devnation23

skupper.io

https://groups.google.com/g/skupper

version: 1.4.1