



Pagoda image © Susanne Henkel

The Automotive Pagoda

Vector Cloud SaaS Services

Agenda

► **Foundation**

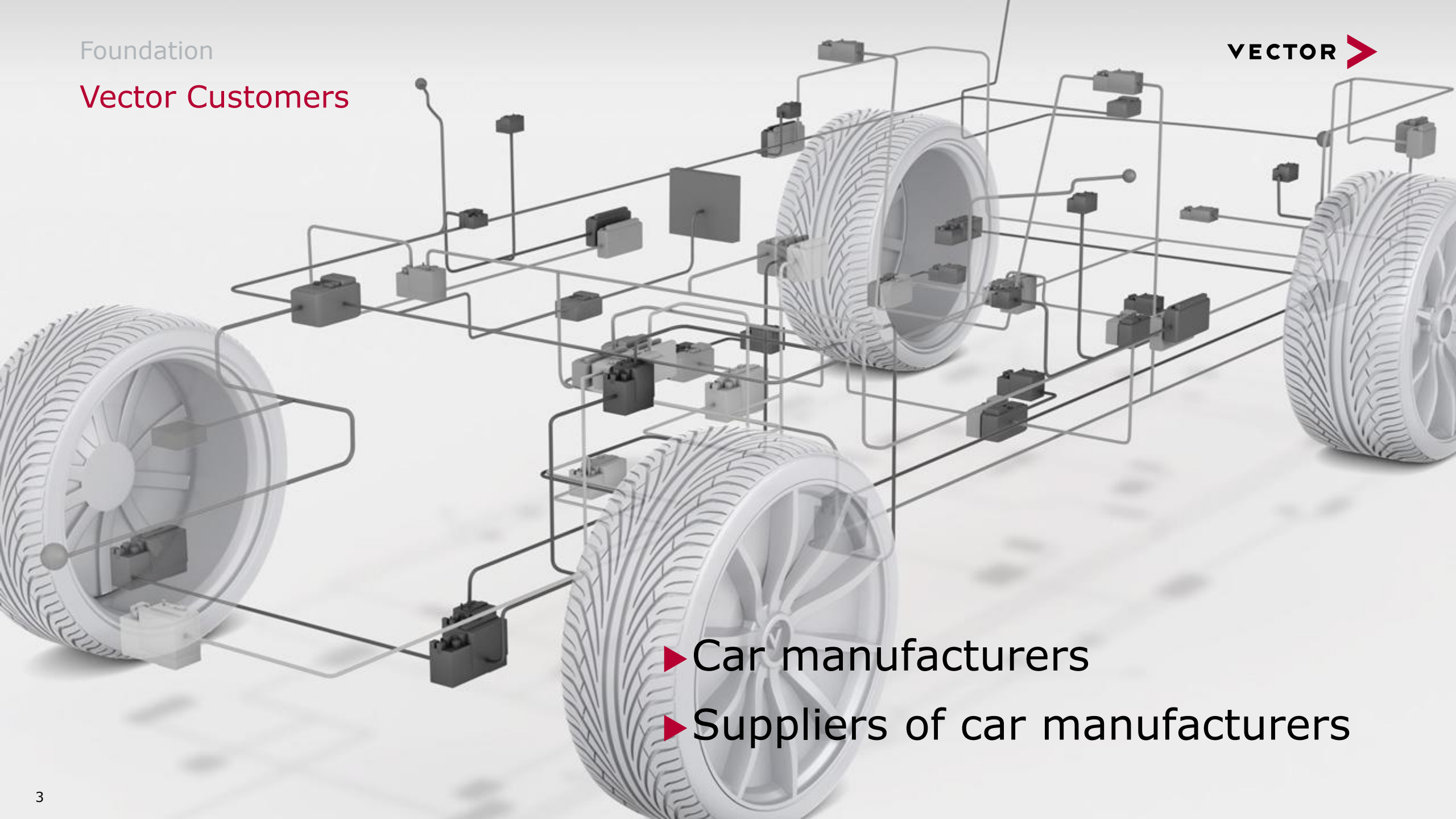
Multi-Story Building

Architecture

Choosing Material

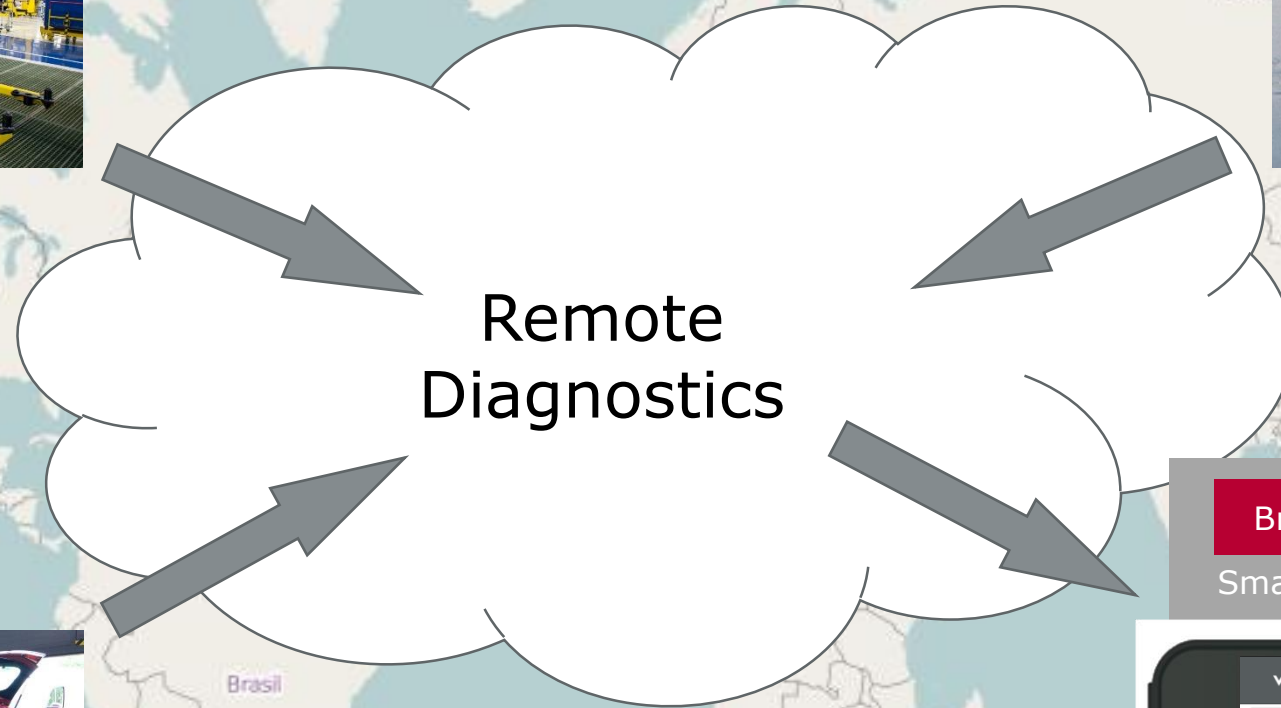
Conclusions



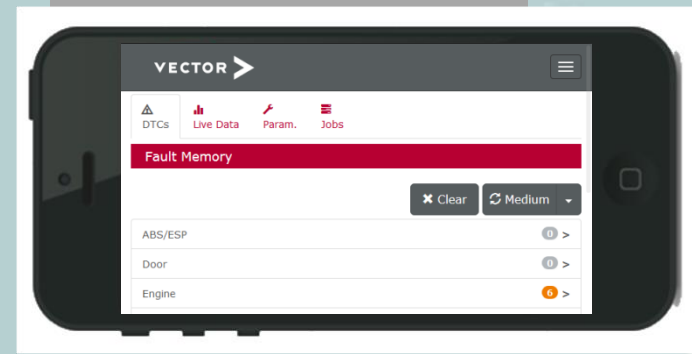


- ▶ Car manufacturers
- ▶ Suppliers of car manufacturers

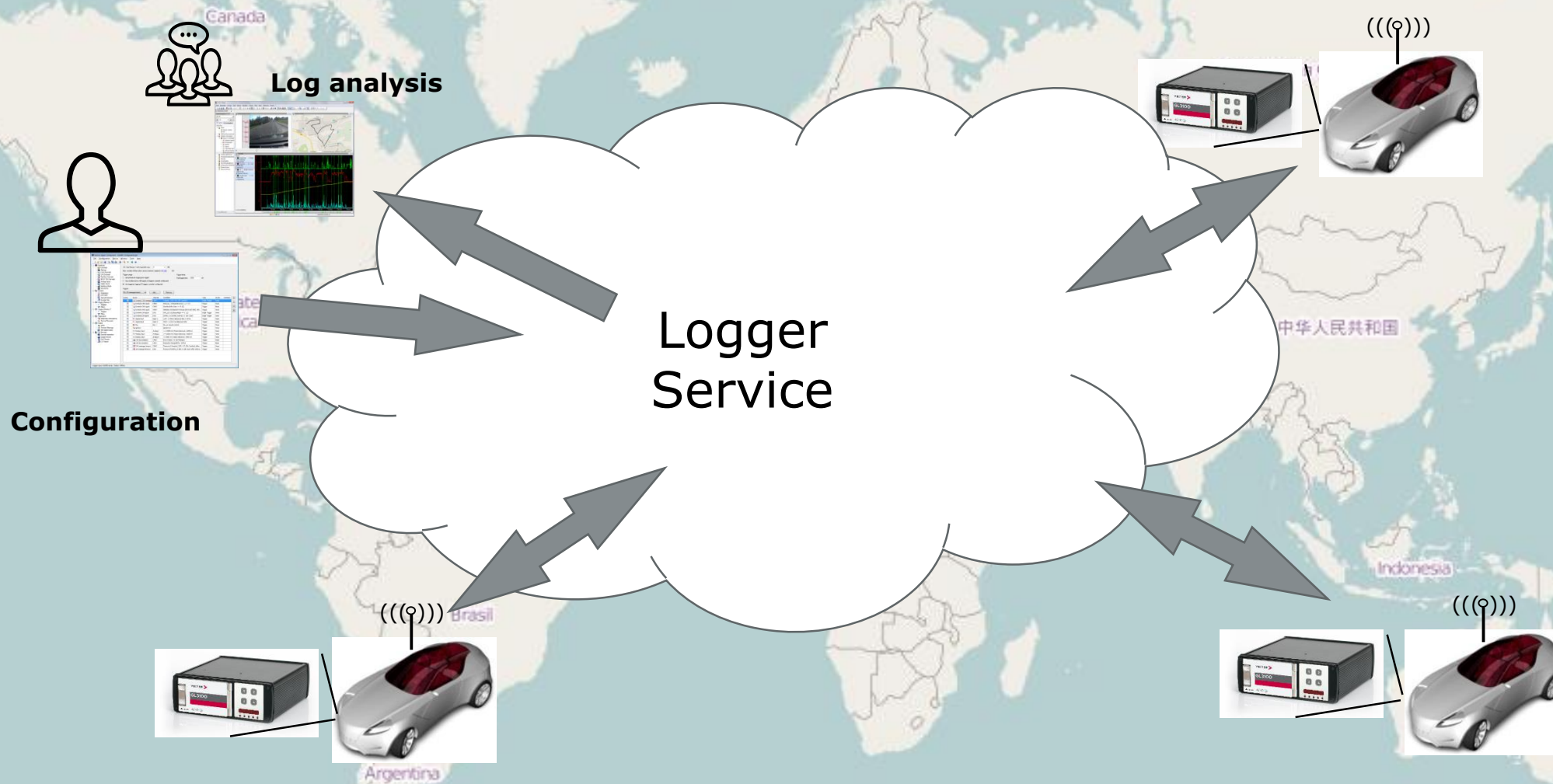
Example 1



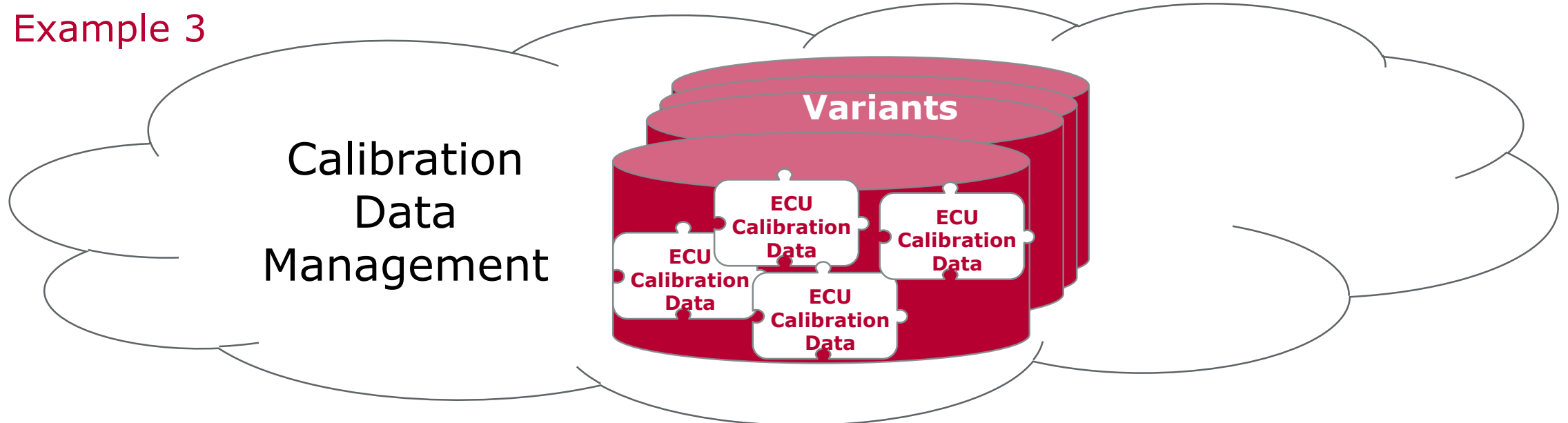
Browser / Web App
Smartphone, Tablet, PC



Example 2



Example 3



Calibration for all EU vehicles



Emissions

Calibration for all 2l engines



Consumption

Calibration for all 4WD



Performance

Multi-Story Building

Service Category



SaaS

Middleware

IaaS

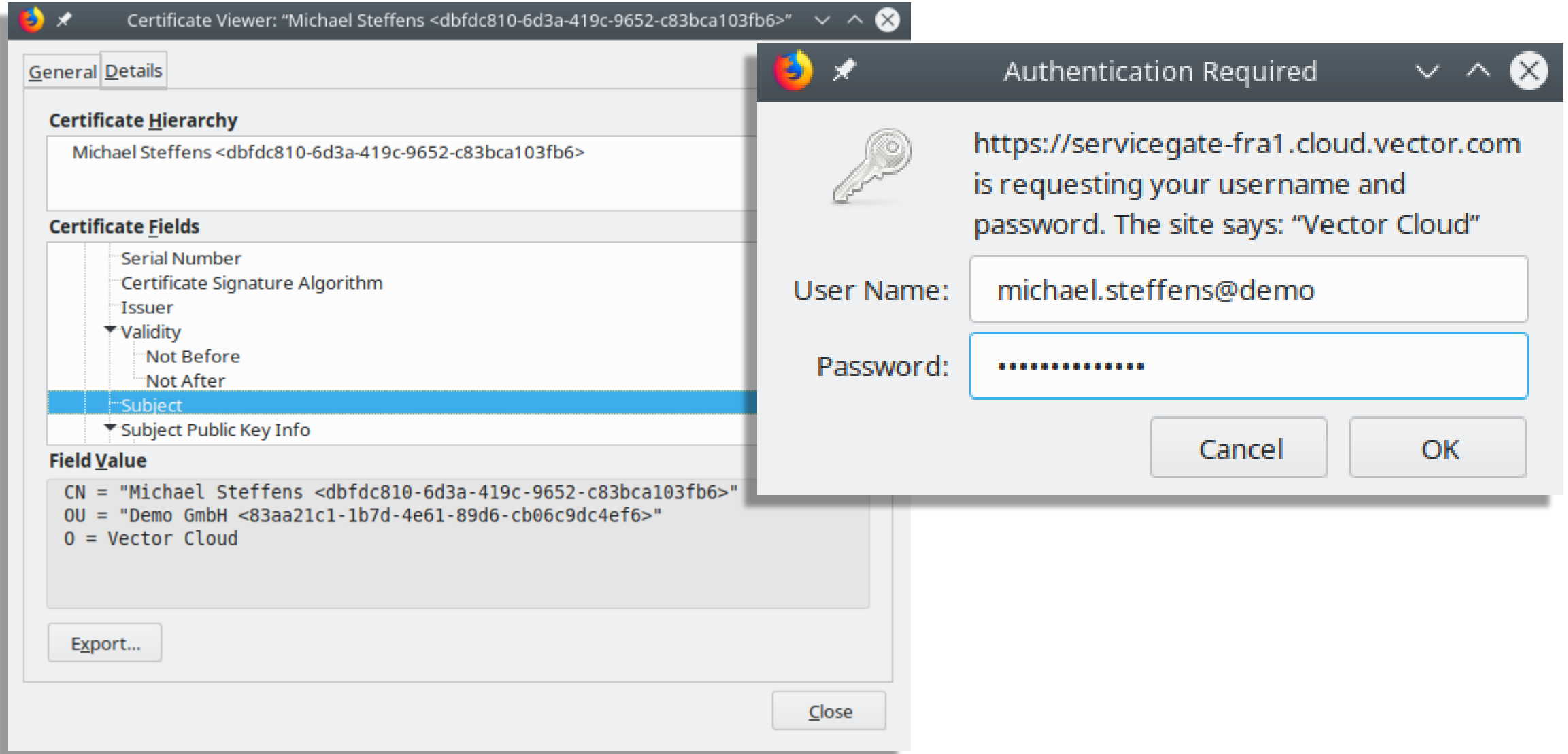
Cloud Services for Use with Vector Products

- ▶ Target mainly programmatic clients
 - > PC apps extending their functionality using cloud APIs
 - > Devices mounted in cars
- ▶ Legacy and new applications
- ▶ Offer customers option to use services
 - > either in a public environment run by Vector, connected via Internet
 - > or on customer premises
- ▶ Mitigate risks specific to cloud operations

Security and Tenant Separation

- ▶ As a customer, I want to have my data protected against unauthorized access
 - > Authentication
 - > Encryption
- ▶ As a customer, I don't want competitors to see that I have subscribed to a service at all
 - > SaaS frontend should not expose any means to guess and probe other tenants

Tenant Addressed by Credentials




The image shows two overlapping windows. The background window is 'Certificate Viewer' for a certificate issued to Michael Steffens. The foreground window is an 'Authentication Required' dialog box from a browser.

Certificate Viewer: "Michael Steffens <dbfdc810-6d3a-419c-9652-c83bca103fb6>"

- General** | Details
- Certificate Hierarchy**
 - Michael Steffens <dbfdc810-6d3a-419c-9652-c83bca103fb6>
- Certificate Fields**
 - Serial Number
 - Certificate Signature Algorithm
 - Issuer
 - Validity
 - Not Before
 - Not After
 - Subject**
 - Subject Public Key Info
- Field Value**
 - CN = "Michael Steffens <dbfdc810-6d3a-419c-9652-c83bca103fb6>"
 - OU = "Demo GmbH <83aa21c1-1b7d-4e61-89d6-cb06c9dc4ef6>"
 - O = Vector Cloud
- Export...
- Close

Authentication Required

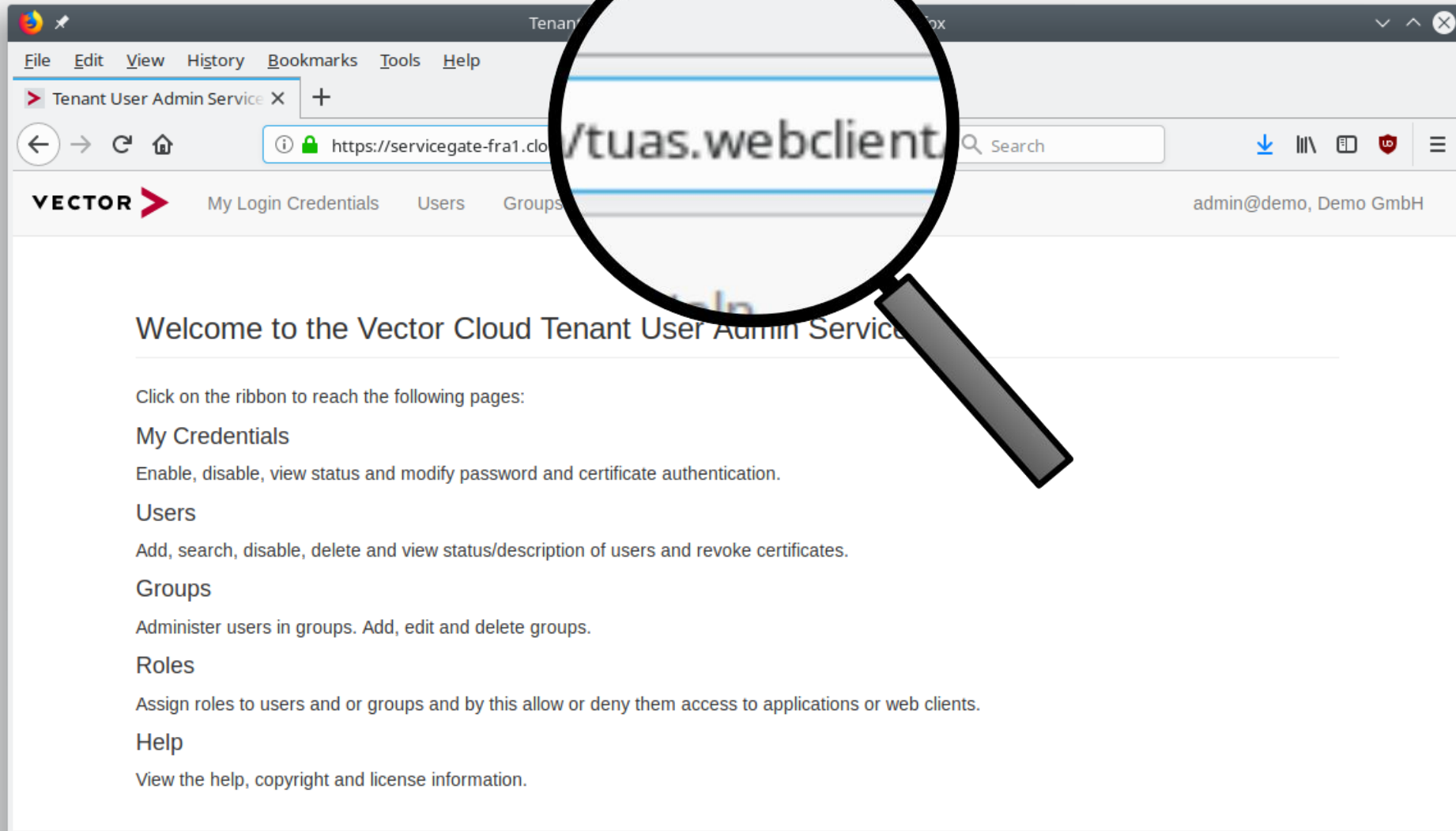
 https://servicegate-fra1.cloud.vector.com is requesting your username and password. The site says: "Vector Cloud"

User Name:

Password:

Cancel OK

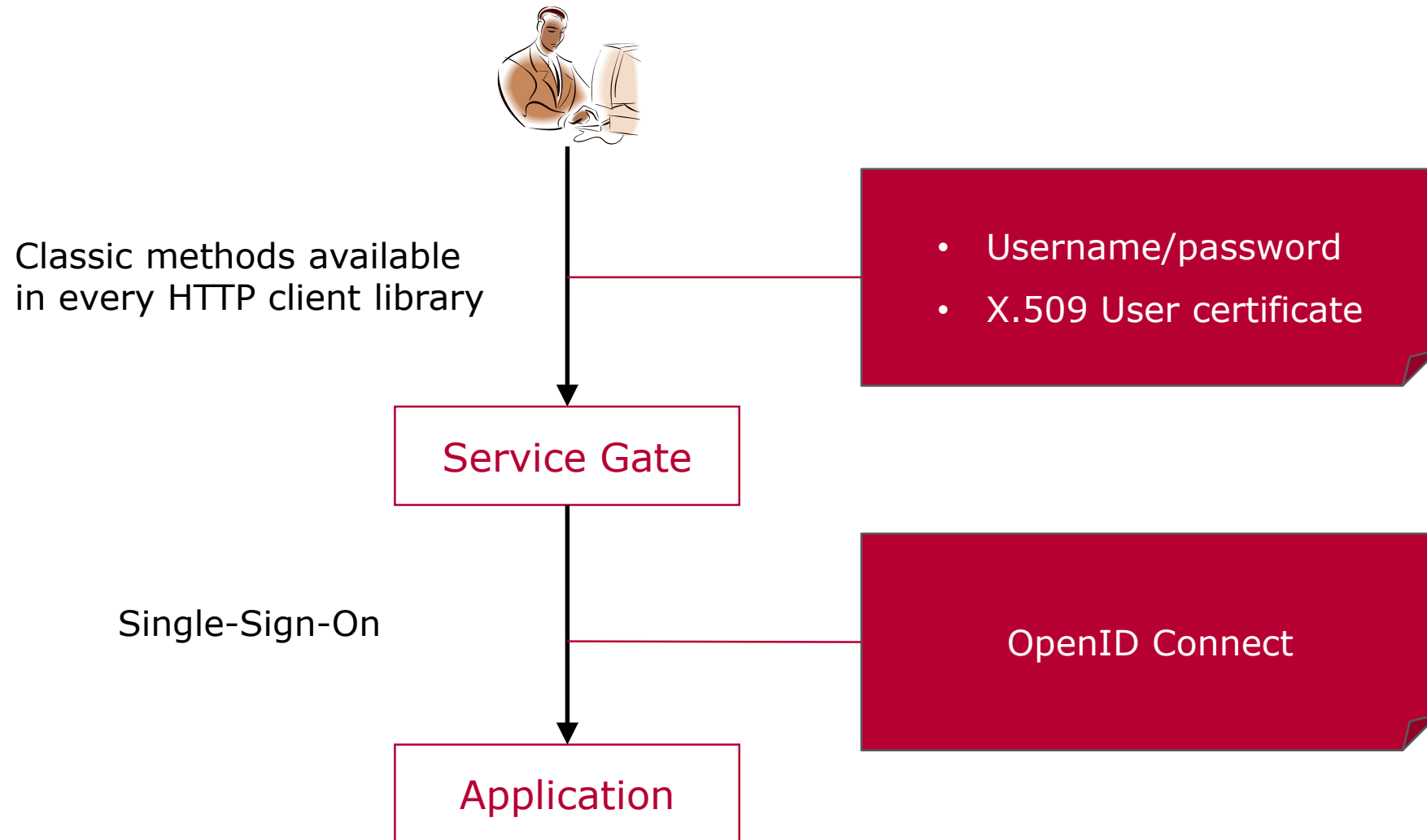
Service Addressed by URI Element



Programmatic Authentication: Client Side

- ▶ Offer authentication methods available in all client libraries
 - > Basic authentication
 - > X.509 client certificates
- ▶ Method at discretion of the client

Programmatic Authentication: Server Side



Internal Use of SSO

▶ Access tokens

- > used to forward authorization claims to servers
- > can be forwarded along service chains
- > are cached

Application Development Distributed across Product Departments

- ▶ Framework has to be
 - > generic
 - > adaptive
 - > covering common needs, such as identity and access management

Out-of-the-box

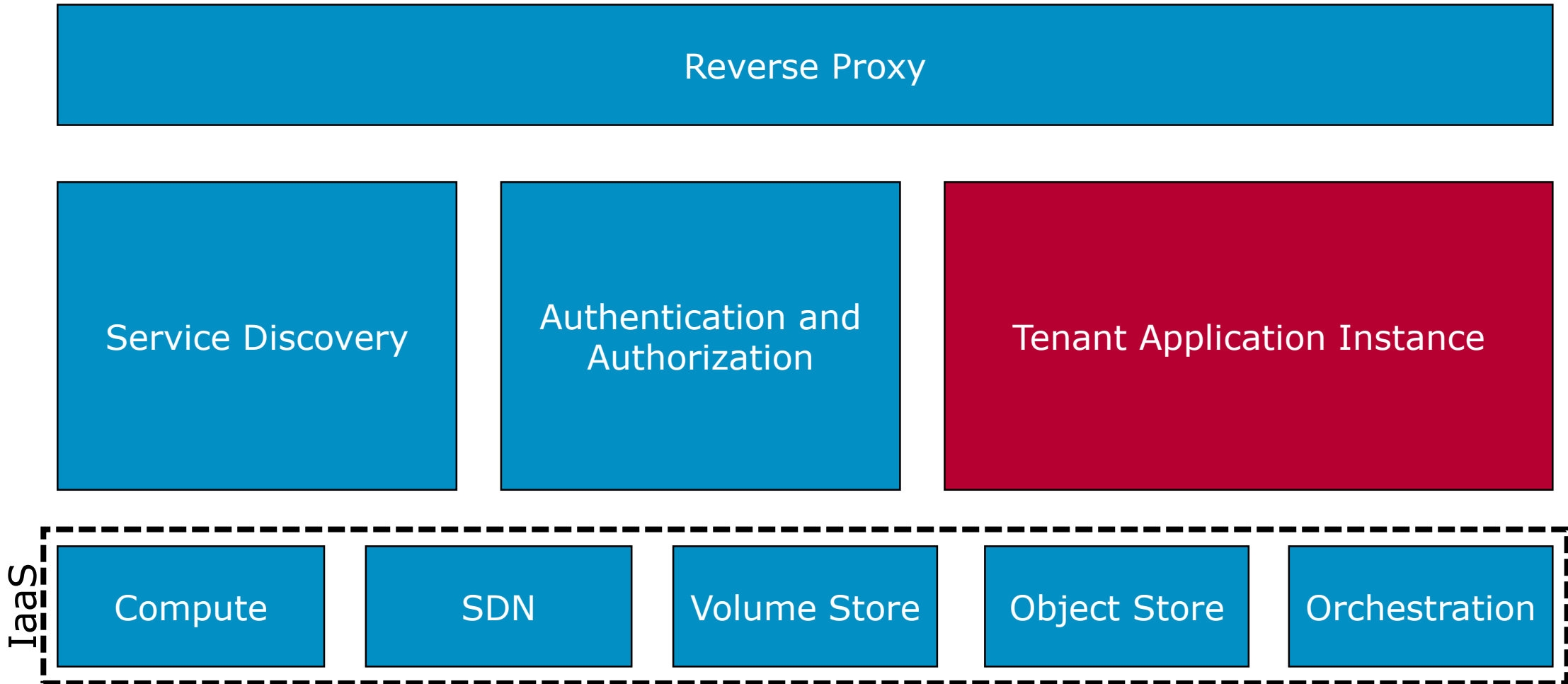
- ▶ Global presence, low latency
- ▶ Scale up, scale down
- ▶ No facilities and IT operated by Vector

Carving a Front Door

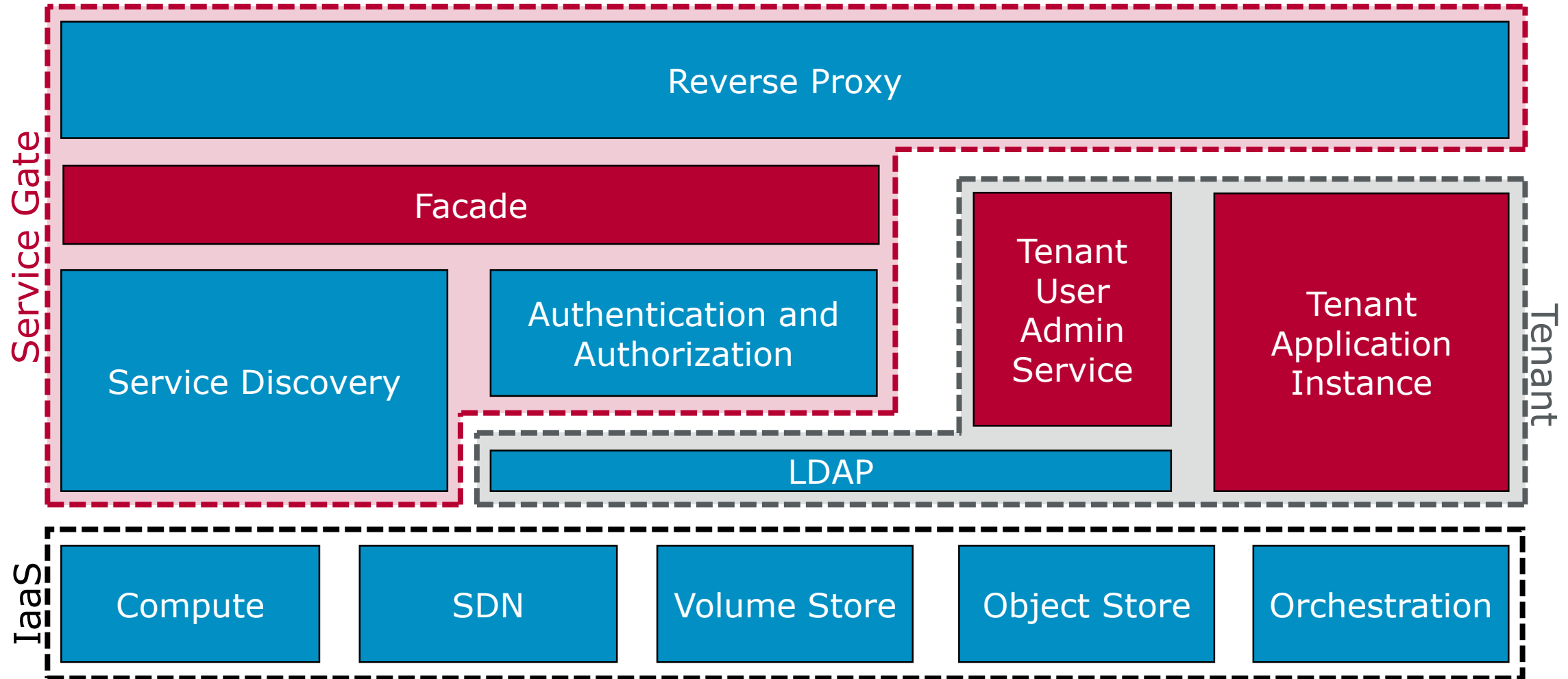


Image © Dr. Michael Steffens

Carving a Front Door



Refinement and Vector Artifacts



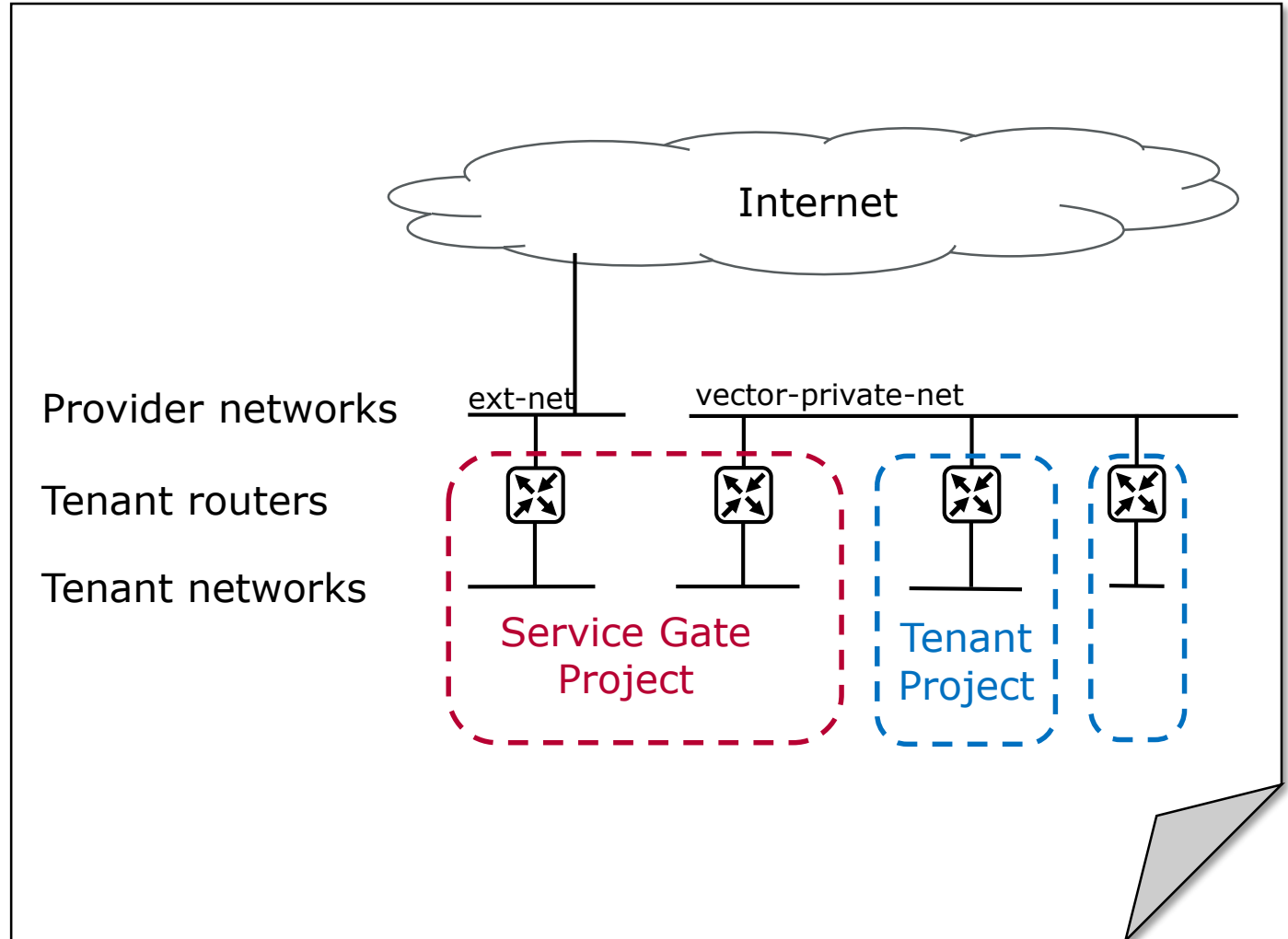
Choosing Material
Building Blocks



Images © Dr. Michael Steffens

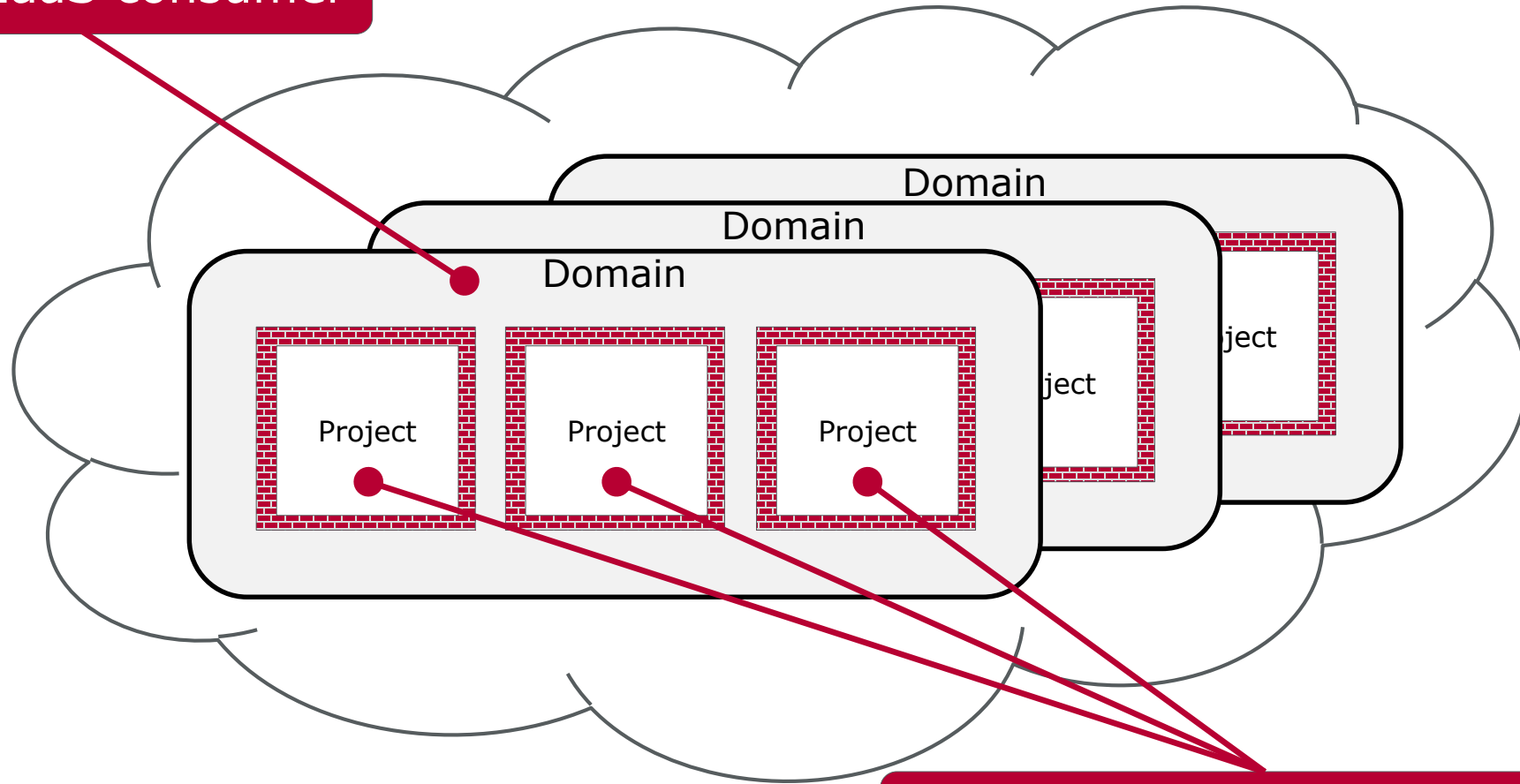
 **openstack.** Neutron

- ▶ Explicit model
- ▶ Project networks, subnets, routers, IP ranges, load balancers, security groups
- ▶ No hidden routes
- ▶ VM can have ports in different networks
- ▶ Private provider networks as Vector backbones spanning projects



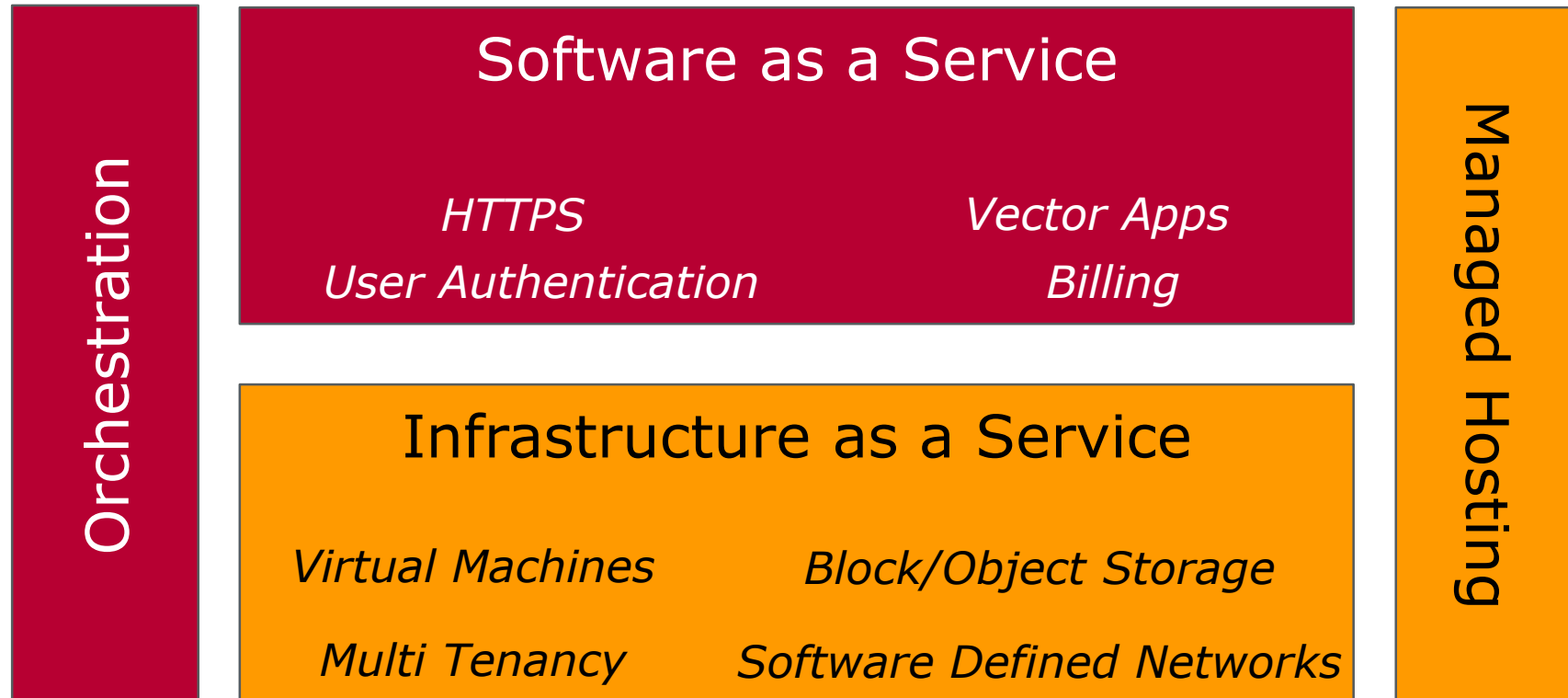
 **openstack**. Keystone V3: Stacked Tenancy

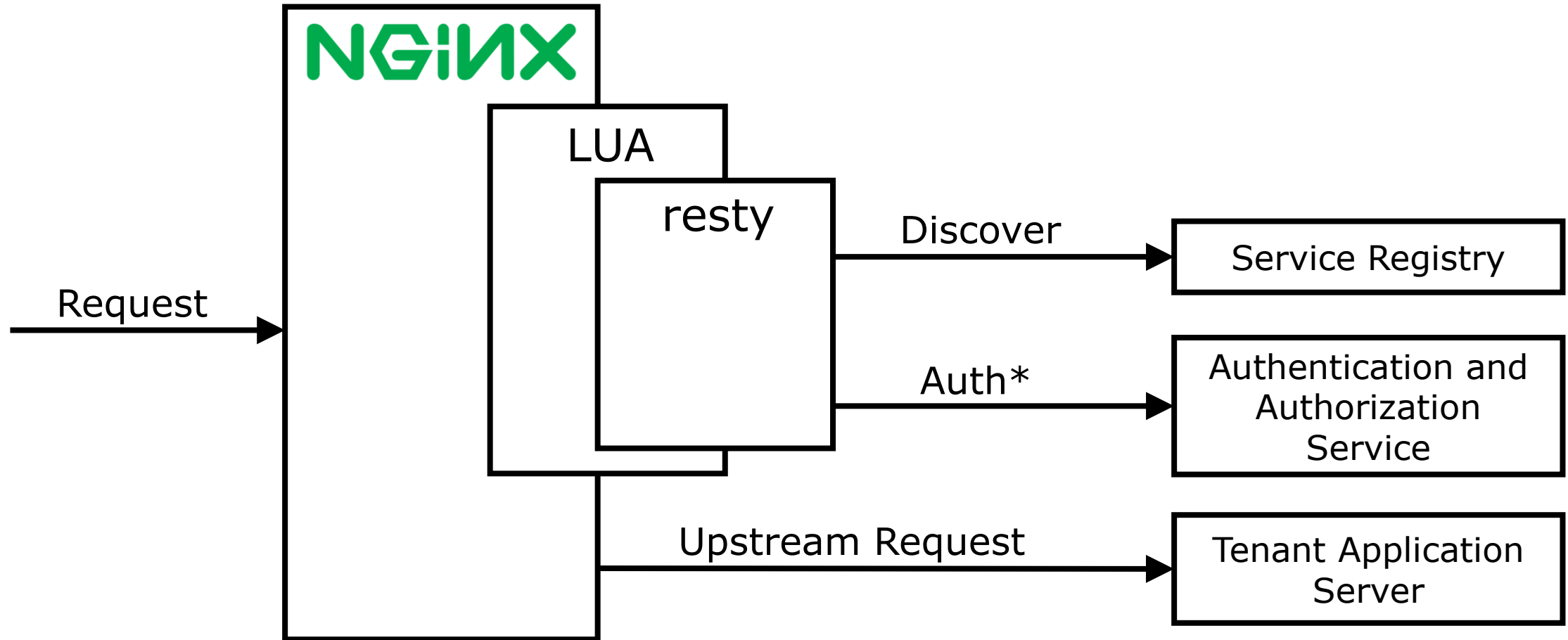
Vector as IaaS consumer



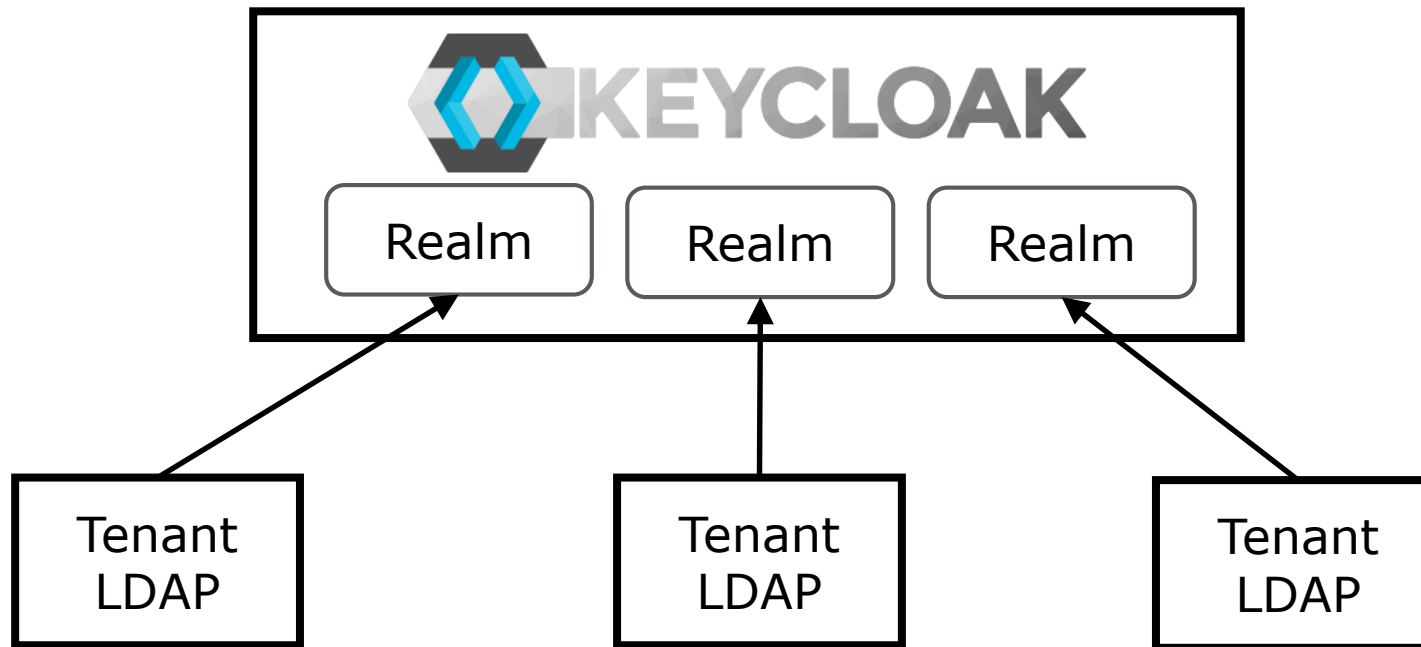
Vector Cloud SaaS customers

VECTOR >

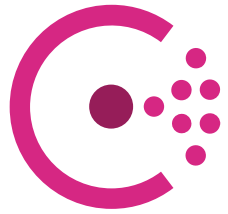




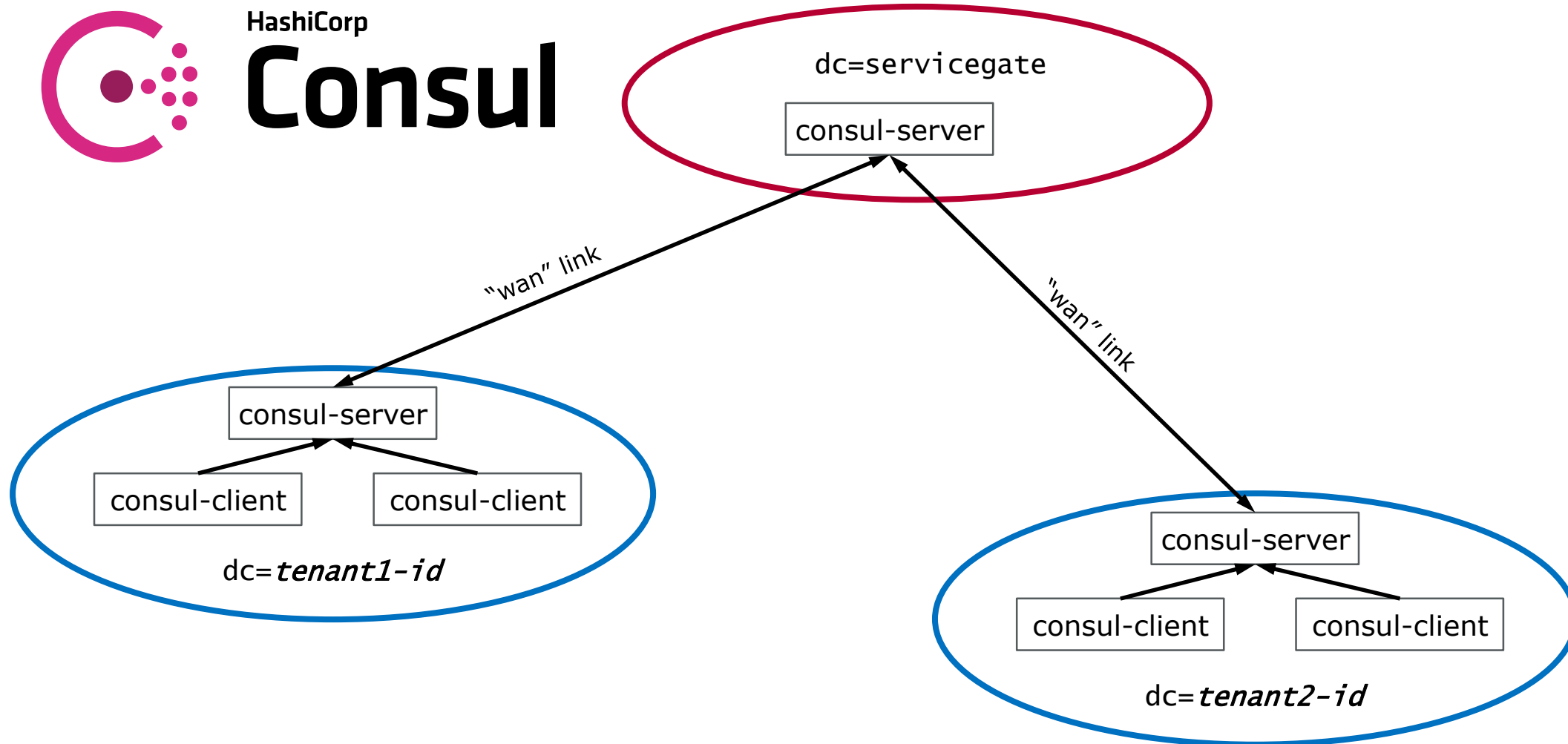
Identity and Access Management, User Federation



Service Registry

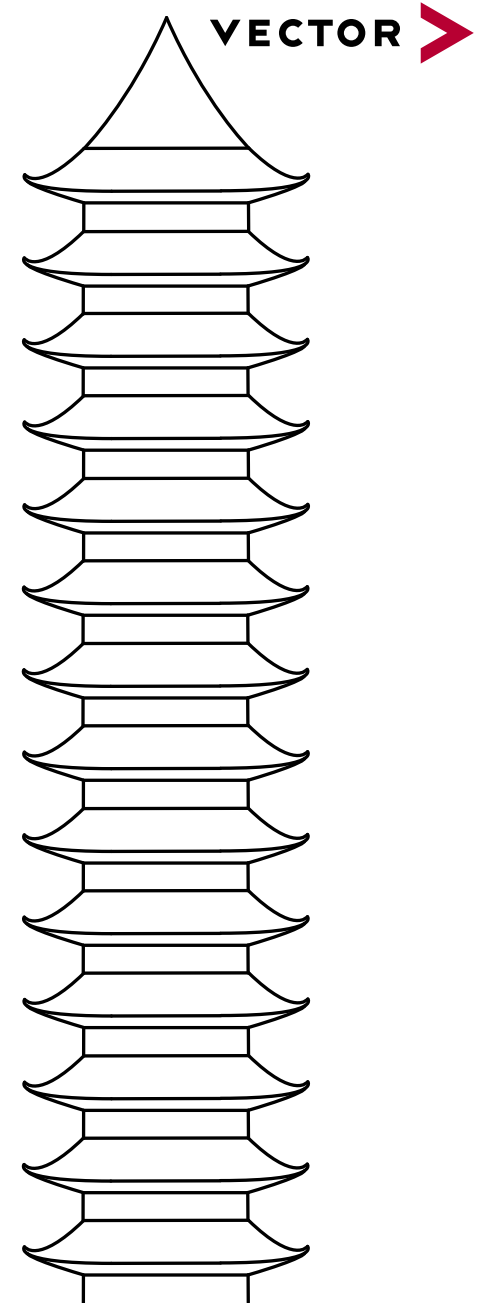


HashiCorp
Consul



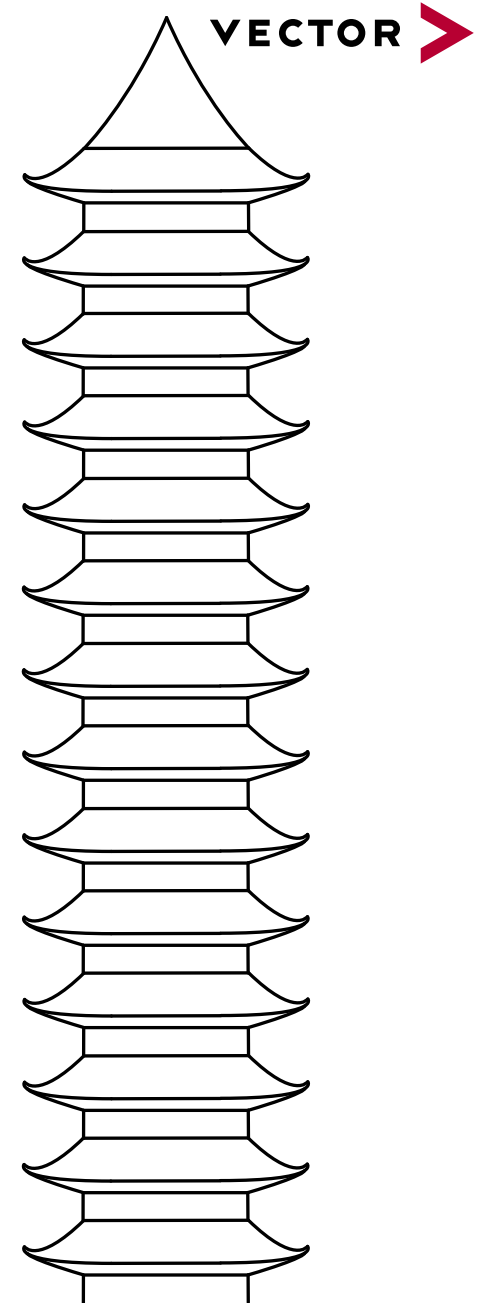
Success Stories

- ▶ Vector Cloud, as presented here, is in production since late 2016
 - > Points of presence in Europe, America and Asia
 - > Central infrastructure for orchestration, provisioning and logging
- ▶ Offer is very well received by customers in a risk averse and competitive industry
- ▶ Seamlessly adopted legacy IT server applications
- ▶ Globally interconnected private provider networks at least a year ahead in public IaaS market



Room for Growth

- ▶ Strict mapping of tenants to projects, however, imposing issues for scale-down
 - > Solved by more sophisticated use of Consul ACL allowing multi-tenant instances, consuming fewer virtual resources
- ▶ Container backend and Kubernetes considered for
 - > scale-out
 - > adapt the new mainstream of deployment
- ▶ Cloud API for test and simulation
- ▶ MQTT
- ▶ DBaaS



For more information about Vector
and our products please visit

www.vector.com

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