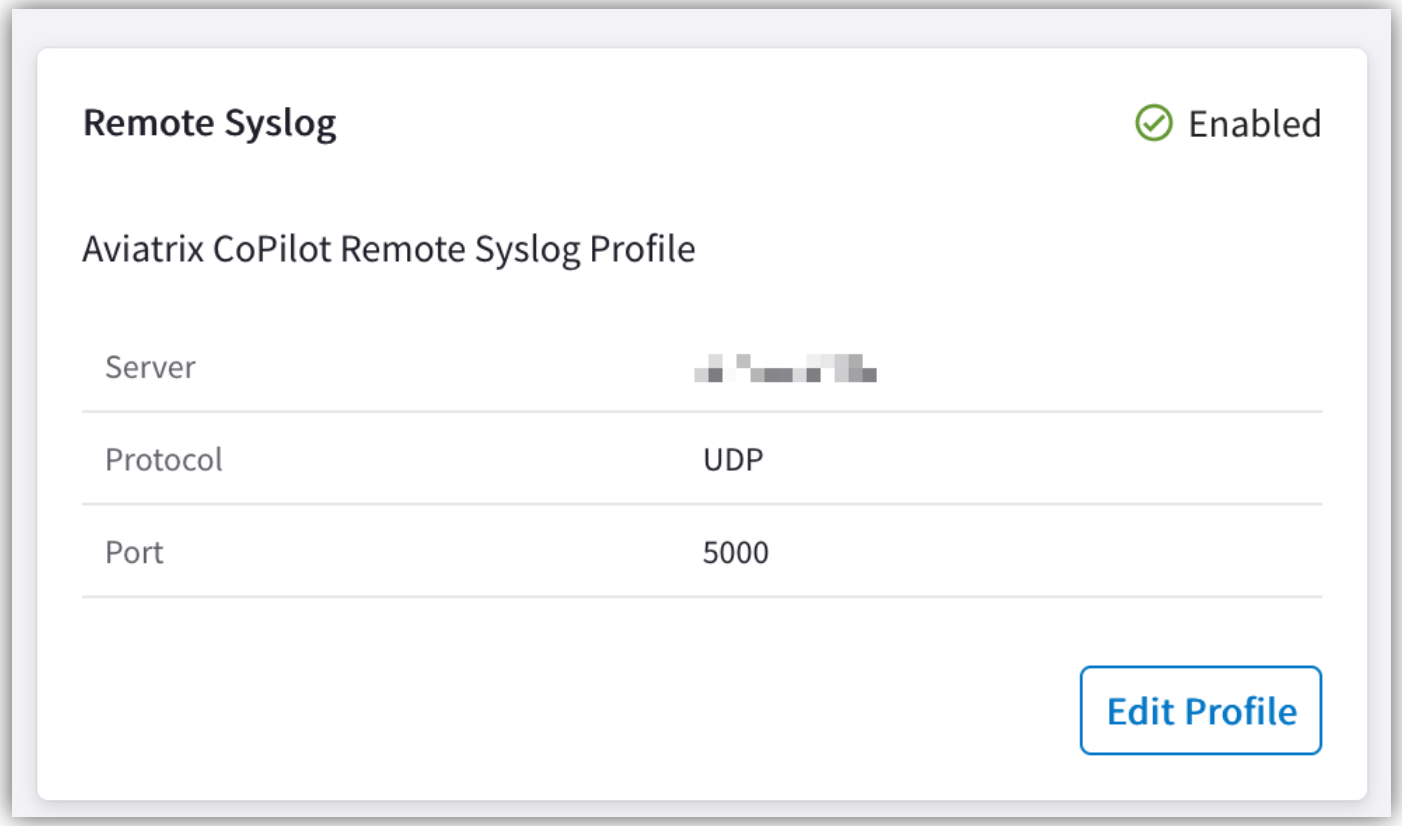
Operational Best Practices

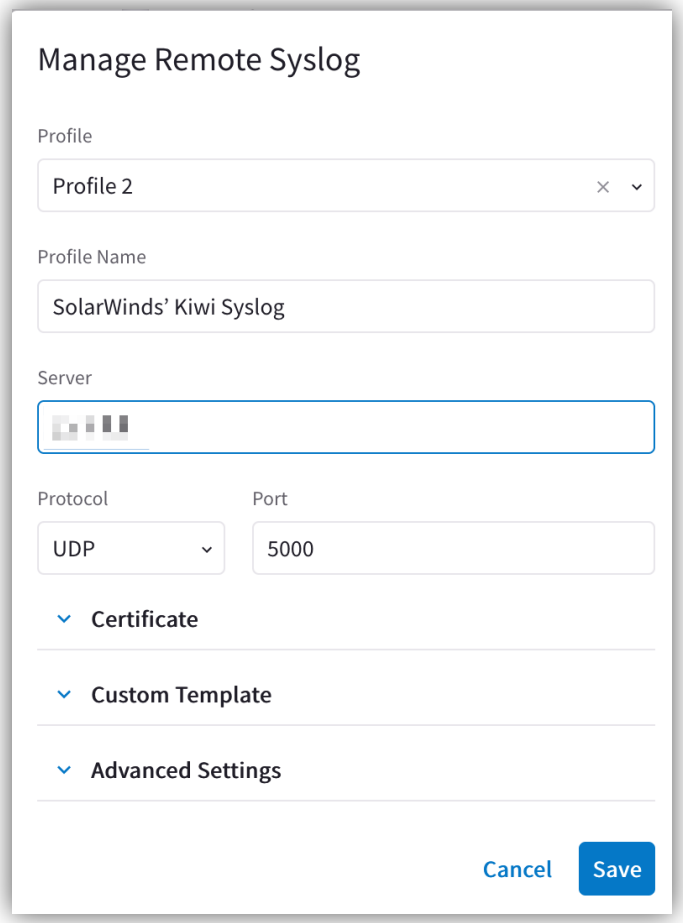
ACE Solutions Architecture Team

CoPilot Remote Syslog

- The Syslog server is by default the CoPilot.
  - When you deploy the CoPilot, automatically the Controller will open the port UDP **5000** (Syslog) on the Security Group attached to the CoPilot instance.
  - Aviatrix CoPilot Remote Syslog Profile is set to use the Profile **9.**

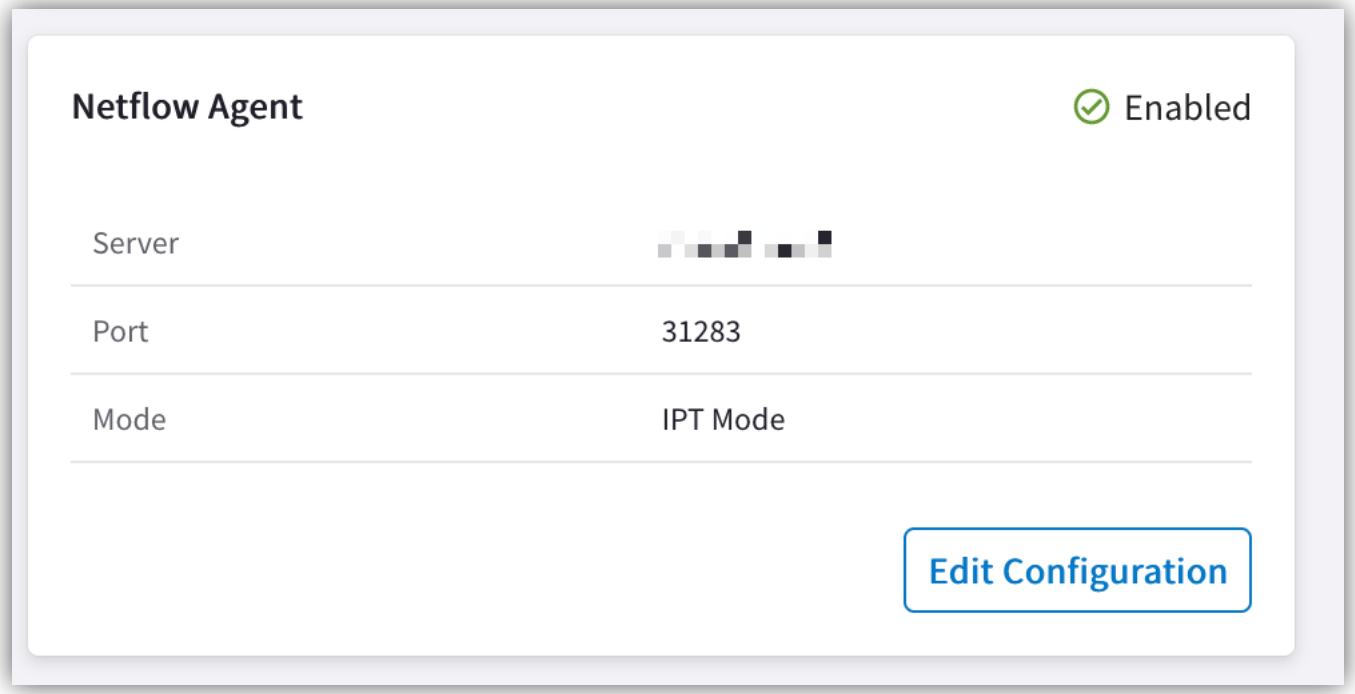


- In the **CoPilot > Settings > Configuration > Logging Services** page, you can configure the forwarding of logs from the Aviatrix platform to the log servers of well known log management systems.

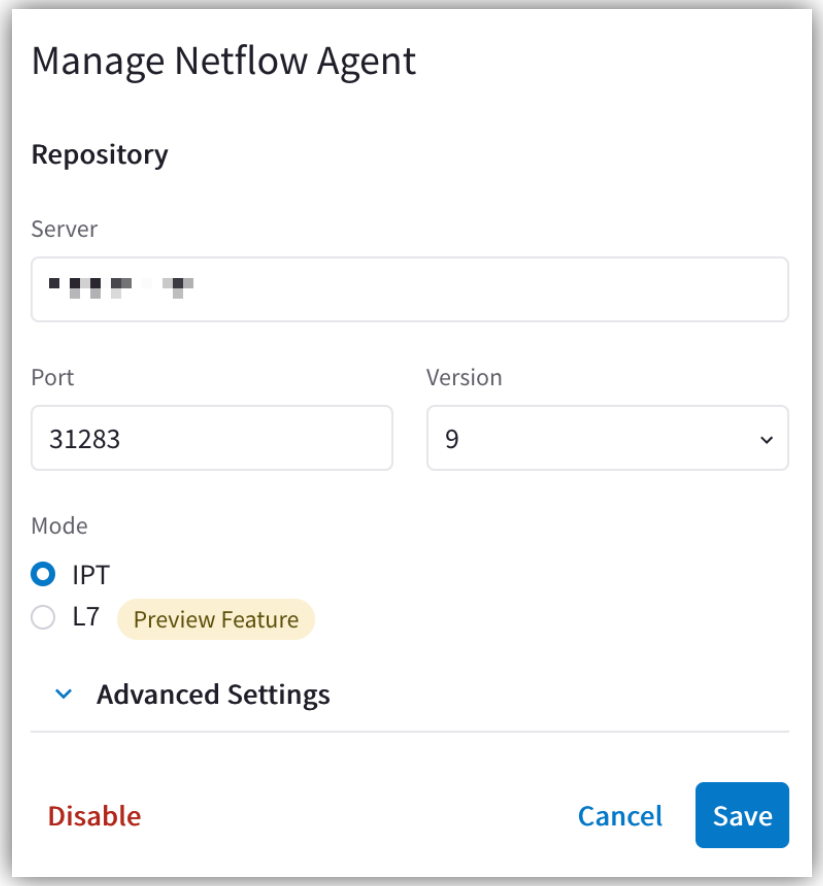


CoPilot NetFlow

- The NetFlow collector is by default the CoPilot.
  - When you deploy the CoPilot, automatically the Controller will open the port UDP **31283** (NetFlow) on the Security Group attached to the CoPilot instance.
  - All the Aviatrix Gateways will send NetFlow data to the CoPilot.
  - As a consequence, FlowIQ feature in Aviatrix CoPilot will start to process the NetFlow information received by the Gateways.

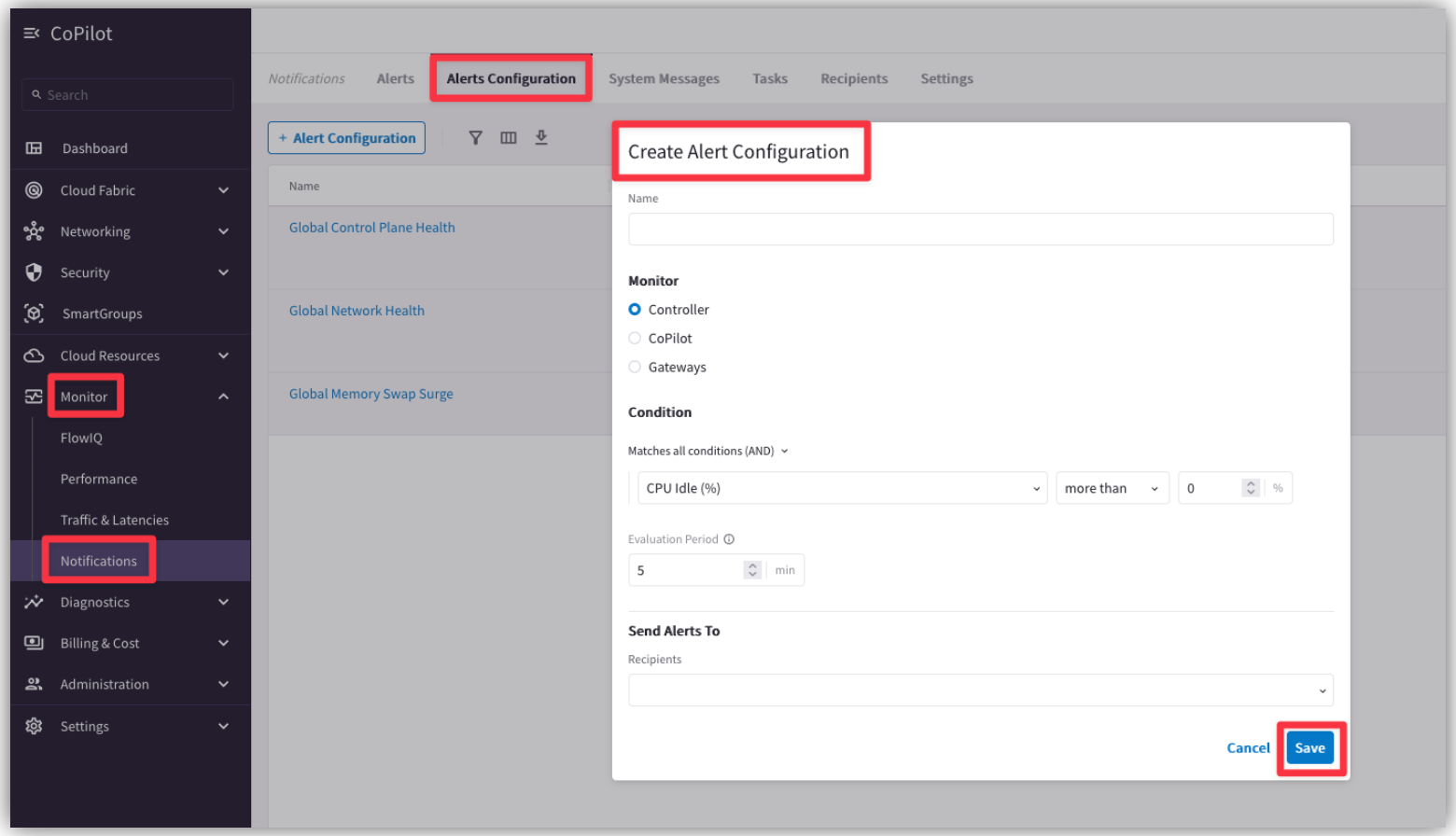


- In the **CoPilot > Settings > Configuration > Logging Services** page, you can configure the forwarding of the NetFlow Data from the Aviatrix platform to your designated service point.



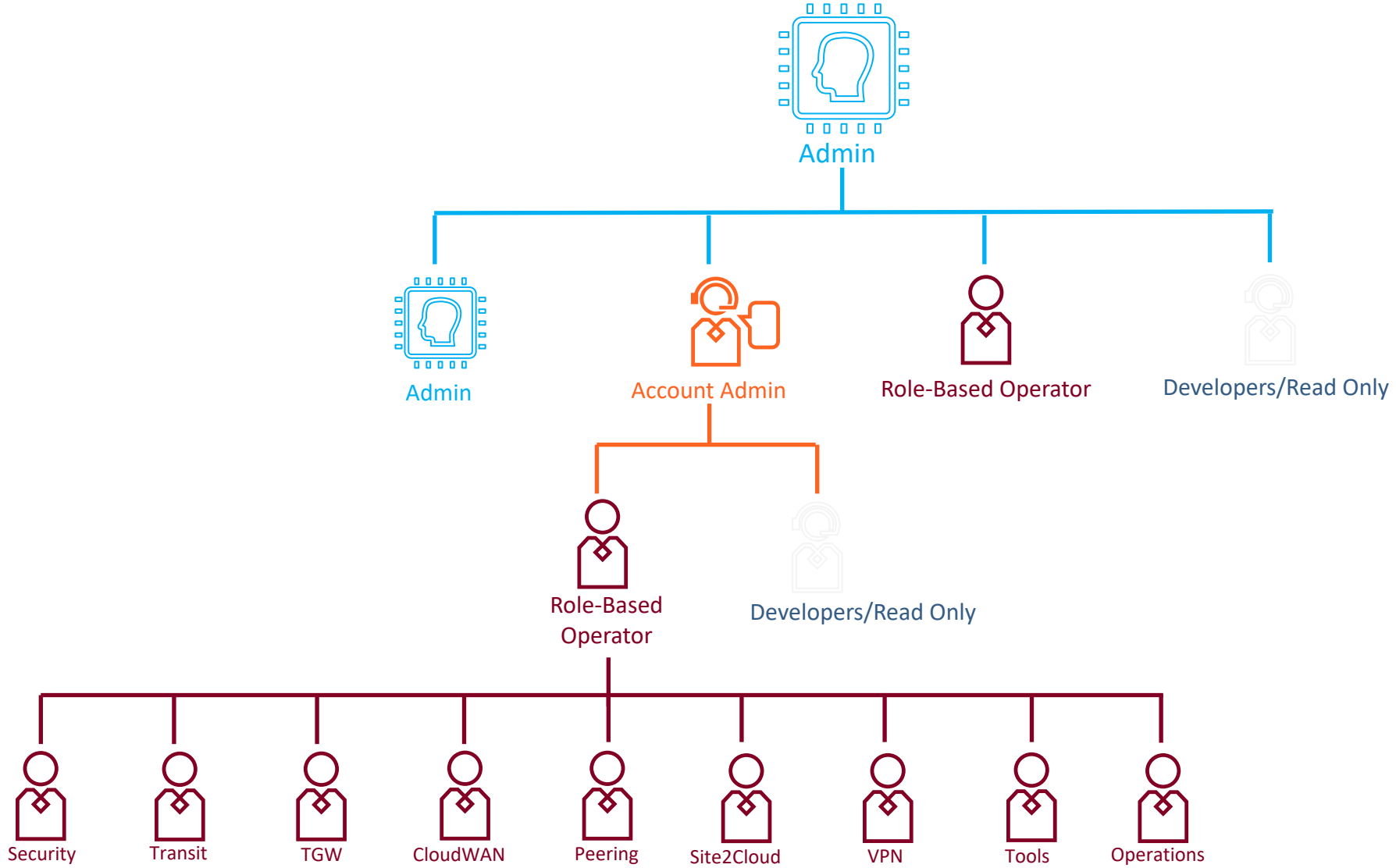
CoPilot Alerts Configuration

1. Webhooks Integrations work with any 3rd party integration (Slack, PagerDuty, ServiceNow, etc.)
2. Add webhook endpoints (can send payload as JSON or text)
3. Provide custom tags in the payload to classify triggered events and further integrate into your systems
4. Get alerted via webhook and email for the same alert



Role-Based Access Control (RBAC)

RBAC: Role-Based Access Control



Authentication Phase

- Users can be authenticated:
  - **Locally** on the Aviatrix Controller
    - Onboard Users (Admin, Operators, Developers, Read-Only)
    - Allowed to reset their password
  - Using **SAML IDP**
    - Onboard Users (Admin, Operators, Developers, Read-Only)
    - Other functionality depends on IDP

onelogin okta

DUO Azure Active Directory

Ping Identity. G Suite

AWS SSO

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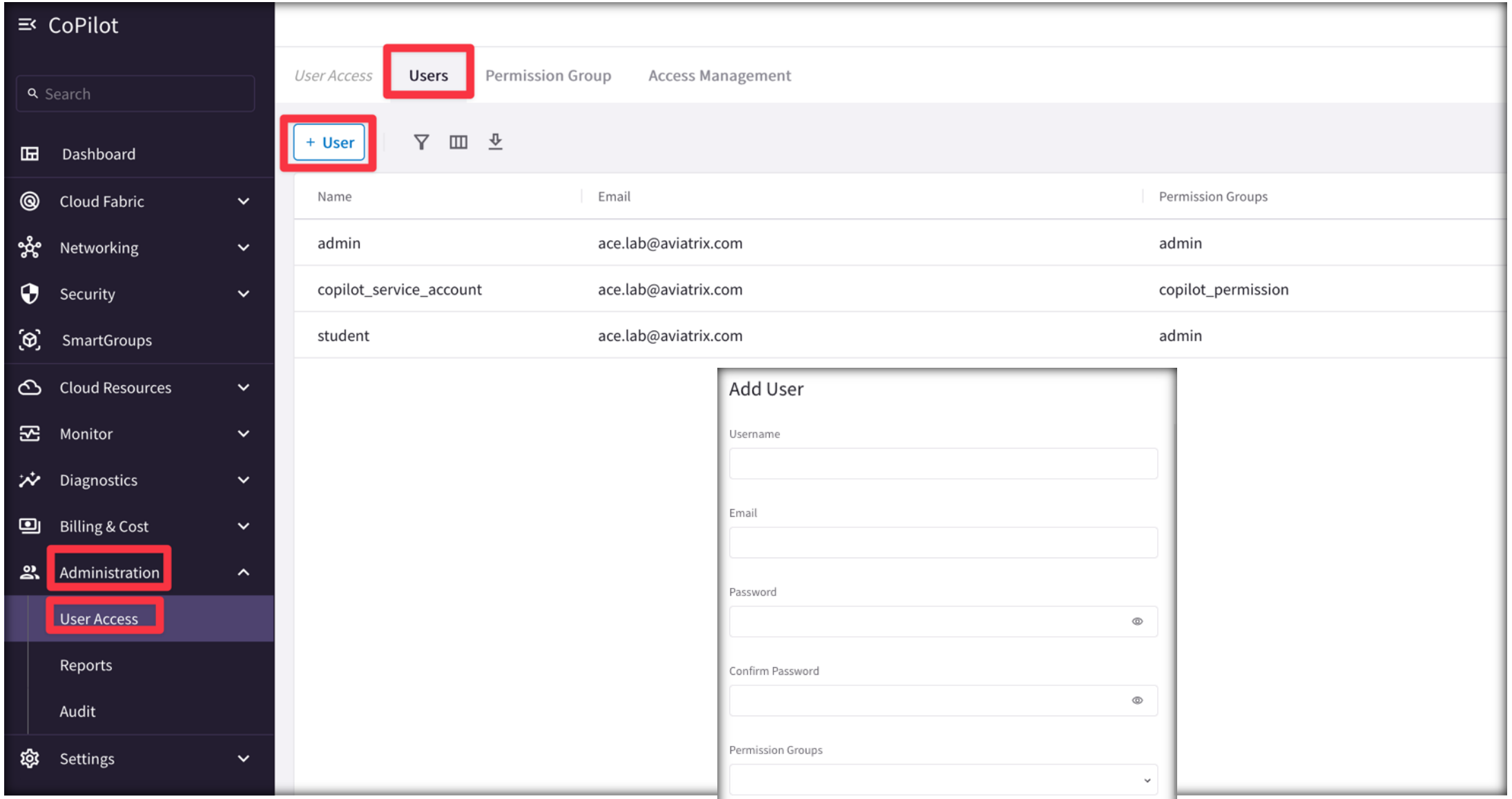
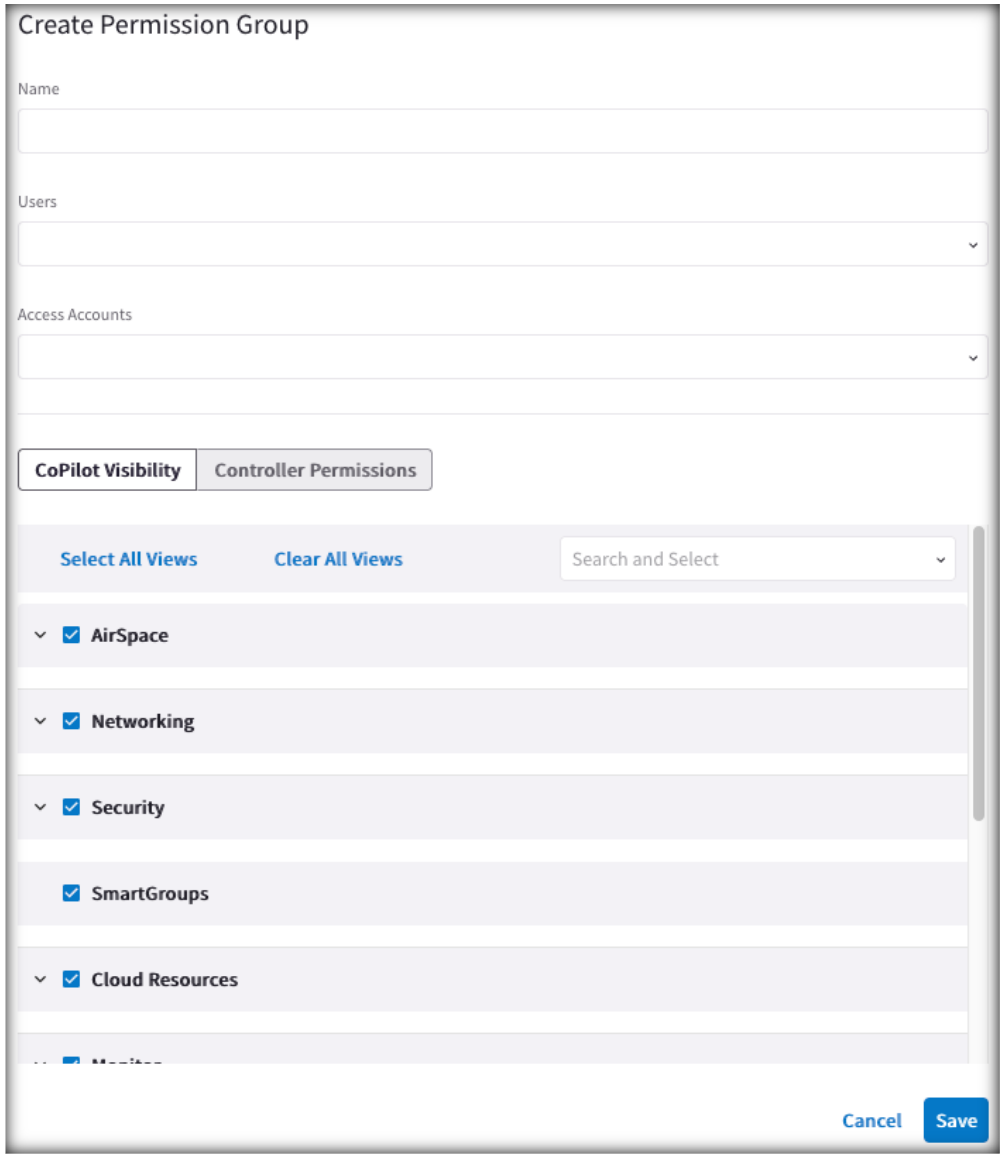
Delinea
Defining the boundaries of access

User Access- CoPilot

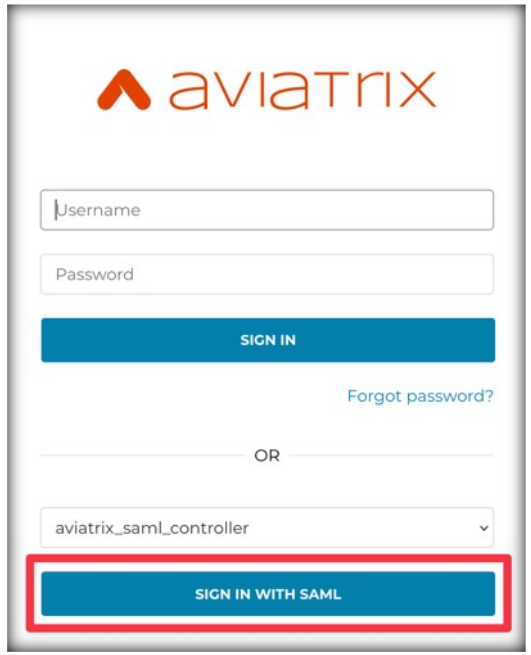


Permission Sets – CoPilot/Controller



RBAC Example – Okta

RBAC User : saad-developer@aviatrix.com	read_only
RBAC User : saad@aviatrix.com	Super-Users
	Account-Admin
RBAC User : saad_A-B@aviatrix.com	Account Admins (A&B)
	Account Admins (C&D)
RBAC User : saad-security@aviatrix.com	Security-Users



RBAC-User	Permissions
saad-developer	Read Only
saad	Super User (Admin)
saad_A-B	Account Admin for Accounts A&B Only
saad-security	Security User

Admin/Super-Users
Saad

Account Admins
Saad-A&B

Security-Users
Saad-Security

Developers/Read Only
Saad-Developer

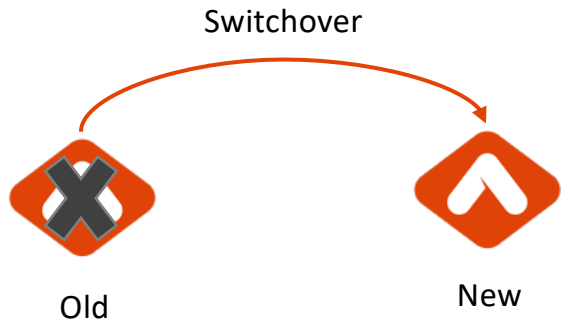
Aviatrix Controller High Availability (HA)

Aviatrix Controller High Availability (HA)

- Very important: Controller is not in the data path
- If Controller is down → Data Plane still functions
- Your cloud network is still up and running
- Do not compare on-prem to cloud
  - Hardware devices cannot be replaced / software is more flexible
  - Cloud operating models are different
  - Cloud processes are different
  - We need a fresh and different look to solve

Aviatrix Controller HA Process

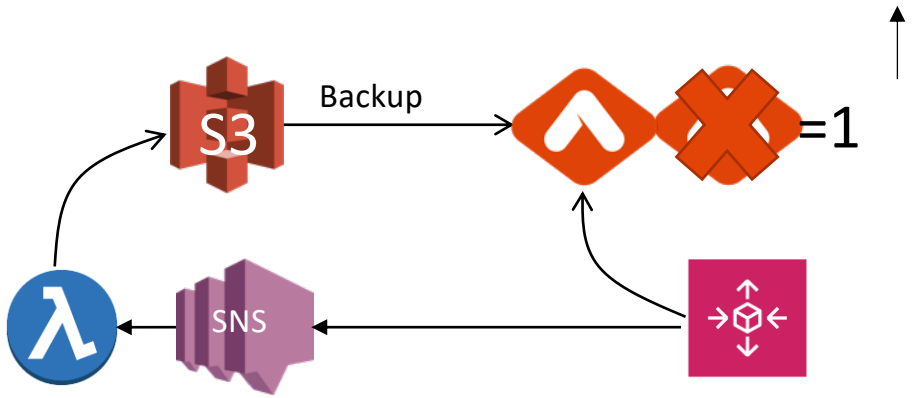
- Takes minutes to switch over to new controller
  - Depends on factors such as AWS latency, instance type, size of the DB, etc.
- Previous controller is terminated
- All existing configuration is restored
- New Private IP is assigned (new AZ)
- New controller stays at the same version as previous



https://docs.aviatrix.com/HowTos/controller_ha.html
https://github.com/AviatrixSystems/Controller-HA-for-AWS/

Aviatrix Controller HA Process

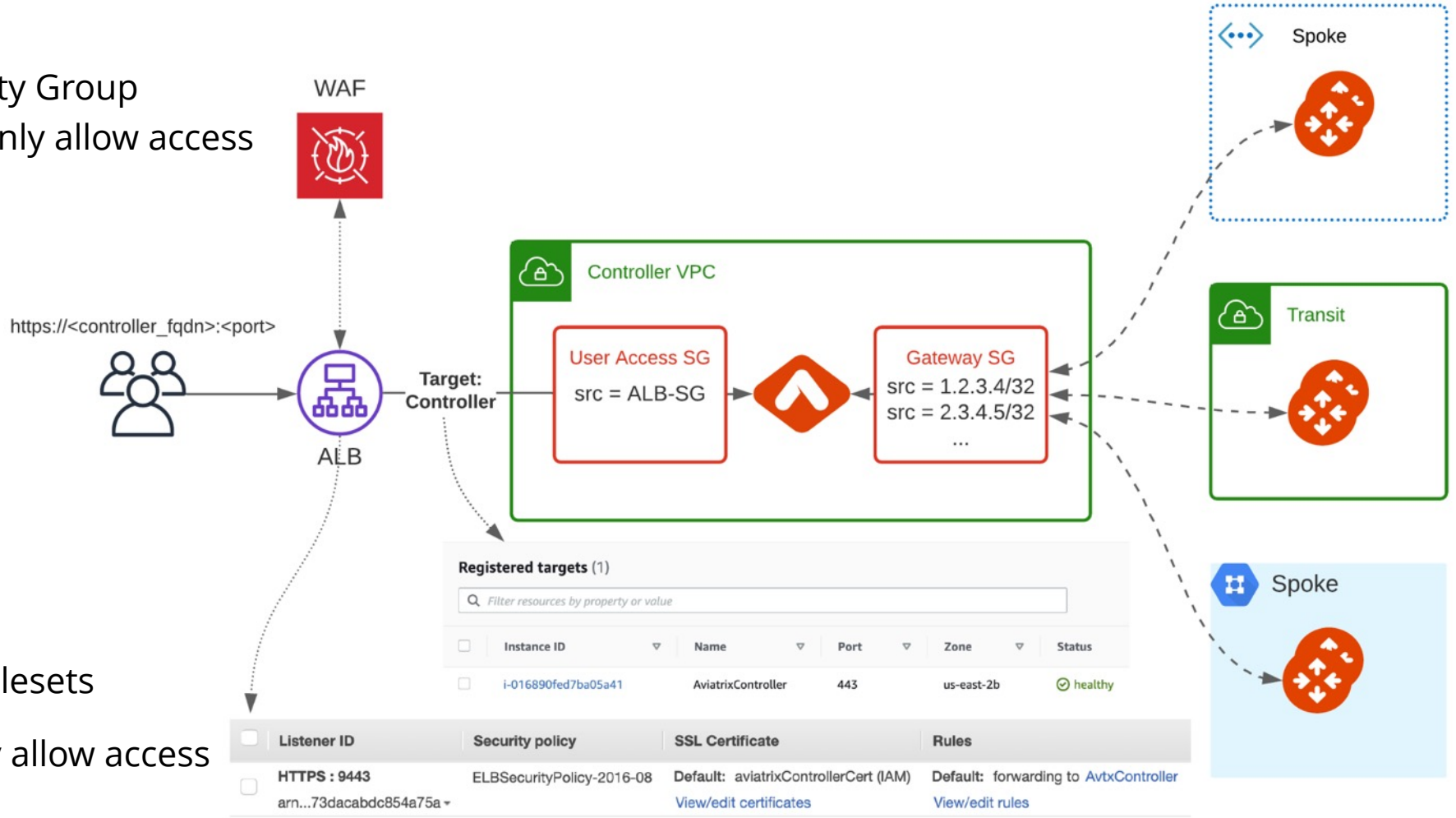
- Aviatrix Controller HA operates by relying on an AWS Auto Scaling Group
- The Auto Scaling Group has a desired capacity of 1
- If the Controller EC2 instance is stopped or terminated, it will be automatically re-deployed by the Auto Scaling Group
- An AWS Lambda script is notified via SNS when new instances are launched by the Auto Scaling Group
- This script handles configuration restore using the most recent Controller backup file, stored in S3



Securing Aviatrix Controller with Application Load Balancer

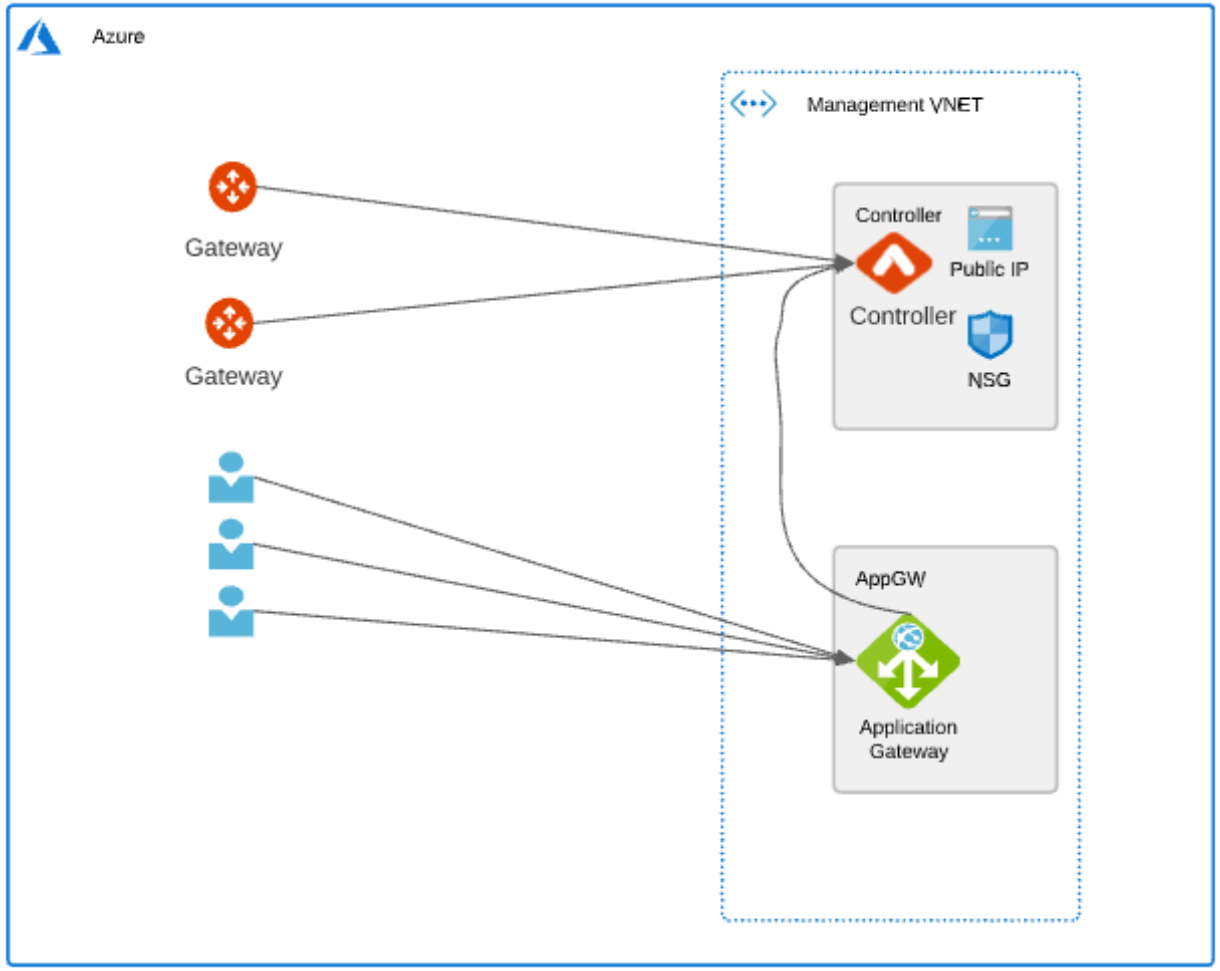
Applies to any cloud

- Confirm that the Controller Security Group Management is NOT disabled to only allow access to the Controller EIP from Aviatrix Gateways
- Create a new internet facing ALB
- Modify main Controller Security Group to only allow access from the ALB Security Group
- Enable WAF on the ALB with AWS Managed Rules
- Adjust ALB idle timeout, modify rulesets
- Modify ALB Security Group to only allow access from the admin user IP



Azure

- Use WAF with Azure Managed rules on Application Gateway to limit usual web hacks/attacks against Controller
- Only allow user access from the Application Gateway subnet to Controller on port 443 (Controller Security Groups management feature is a pre-requisite for gateway communication to Controller)
- Allow configuring user access on non-standard HTTPS listener port
- Terminate SSL connection on Application Gateway to leverage cloud native certificate management and WAF capability to inspect and log requests
- L7 health-check on the Controller



Gateway and Controller Sizing

Controller Sizing

- Controller uses multiple cores to handle the API query load generated by CoPilot → **Minimum 4 core instance**

- Resizing:
  - If you do not use User VPN
    - Stopping the controller to resize does not impact the data traffic
    - Always good practice to backup controller before performing upgrade
  - If you use User VPN
    - No impact to connected users, but new connections could not be established during the stop and resize

- Maintenance Windows for resizing usually do not require more than 15 minutes

Gateway Sizing

- Gateway selection affects expected throughput
- If you decide to enable **High Performance Encryption**
  - Use Jumbo MTU and to verify MTU along the path
    - Go to TROUBLESHOOT > Diagnostics > Network
    - Select a gateway and destination IP address, click **Trace Path**
    - It will display MTU of the devices along the path

- **Secure Egress**
  - T2.micro is not adequate, for instance
  - But test it out and adjust accordingly based on CSP quotas*
    - *CSPs have quotas on PPS, but often do not publish them

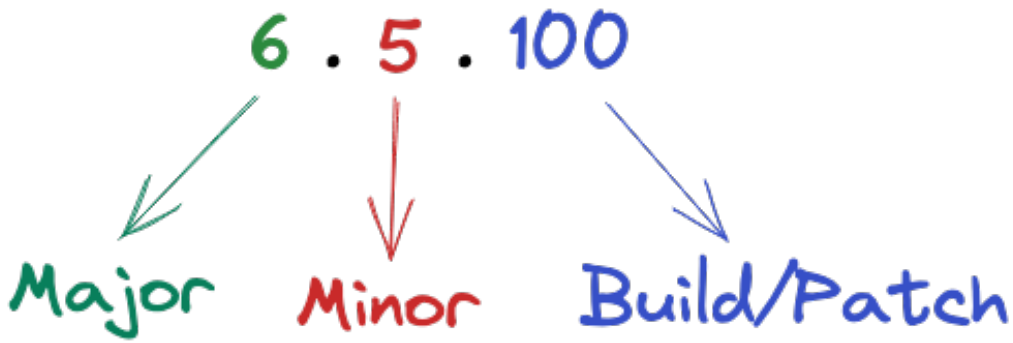
Gateway and Controller Upgrading & Updating

Types of Upgrades and Updates

- Software Upgrade
  - Replaces relevant Platform (i.e., Controller) and **selected** Gateway packages, configuration files, and binaries to Target version
  - Part of regular maintenance operations
  - Hitless
- Image Upgrade
  - Replaces **selected** Gateway cloud image (AMI, VHD, etc.) to the newer version
  - Doesn't change Aviatrix software version
  - Less frequent
  - Incurs traffic disruption
- Security Patches
  - Released when security updates to underlying software components become available.
  - Most security patches are hitless (review the release notes)
- Software Patches
  - Released to address compatibility issues when they arise (if you are using any applications or configurations affected by the patch.
  - Most software patches are hitless (review the release notes)

Terminology

- Software Major, Minor, Build Release
  - Numbering convention
    - Example: Aviatrix Release 6.5.100



Supported Upgrade Paths

- Upgrading Builds (within same minor release)
  - You automatically get the latest build and cannot select the build number.
  - Process might skip over previously released build numbers.

- Upgrading Minor Release Version (within same major release)
  - You must upgrade each minor release sequentially.

- Upgrading Major Release Version
  - You must upgrade each major release sequentially.

Software Rollback

- Software roll back to Gateway software previous version
- Previous version may or may not be the latest patch/build version available
- Replaces the entire Gateway (image + software) → expect brief disruption
- Gateway Image version may automatically be downgraded if required
- Does not apply to Controller

Upgrade Scenarios

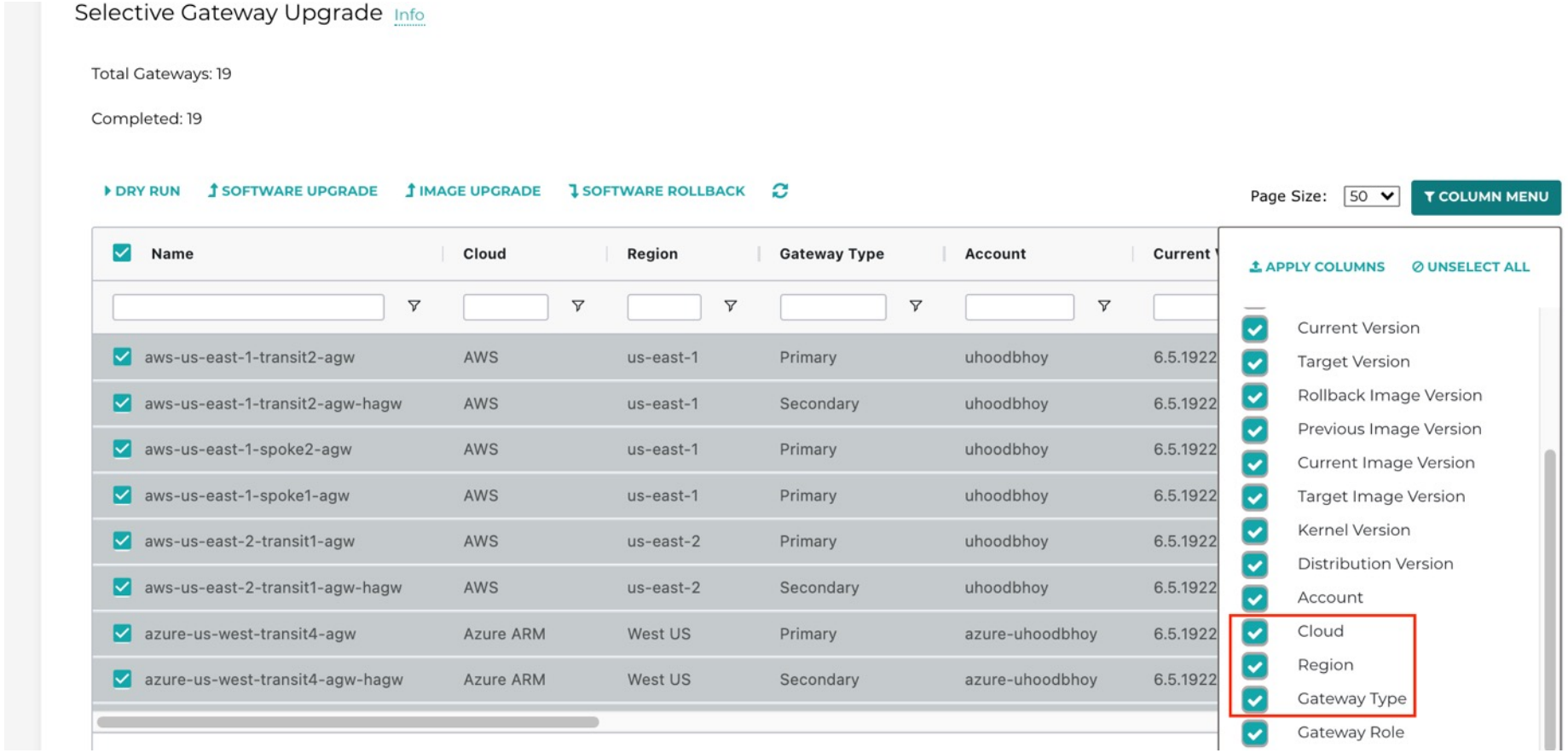
- At any point in time, the Controller supports 2 unique Gateway software versions :
  - **Target Version:** same version as the Controller
  - **Previous:** previous version of the Controller
- Example of supported scenario
  - Upgrade the Controller from 6.5 to 6.5.100
  - Upgrade a group of Gateways to 6.5.100
  - Remaining Gateways run 6.5

- Example of unsupported scenario
  - Upgrade the Controller from 6.5 to 6.5.100
  - Upgrade a group of Gateways to 6.5.100
  - Remaining Gateways run 6.5
  - Upgrade the Controller to 6.5.200
    - Not supported: All Gateways must be upgraded to 6.5.100 before upgrading the Controller to 6.5.200

Common Scenario – Rolling Upgrades

Upgrade all Secondary Gateways in a particular CSP region

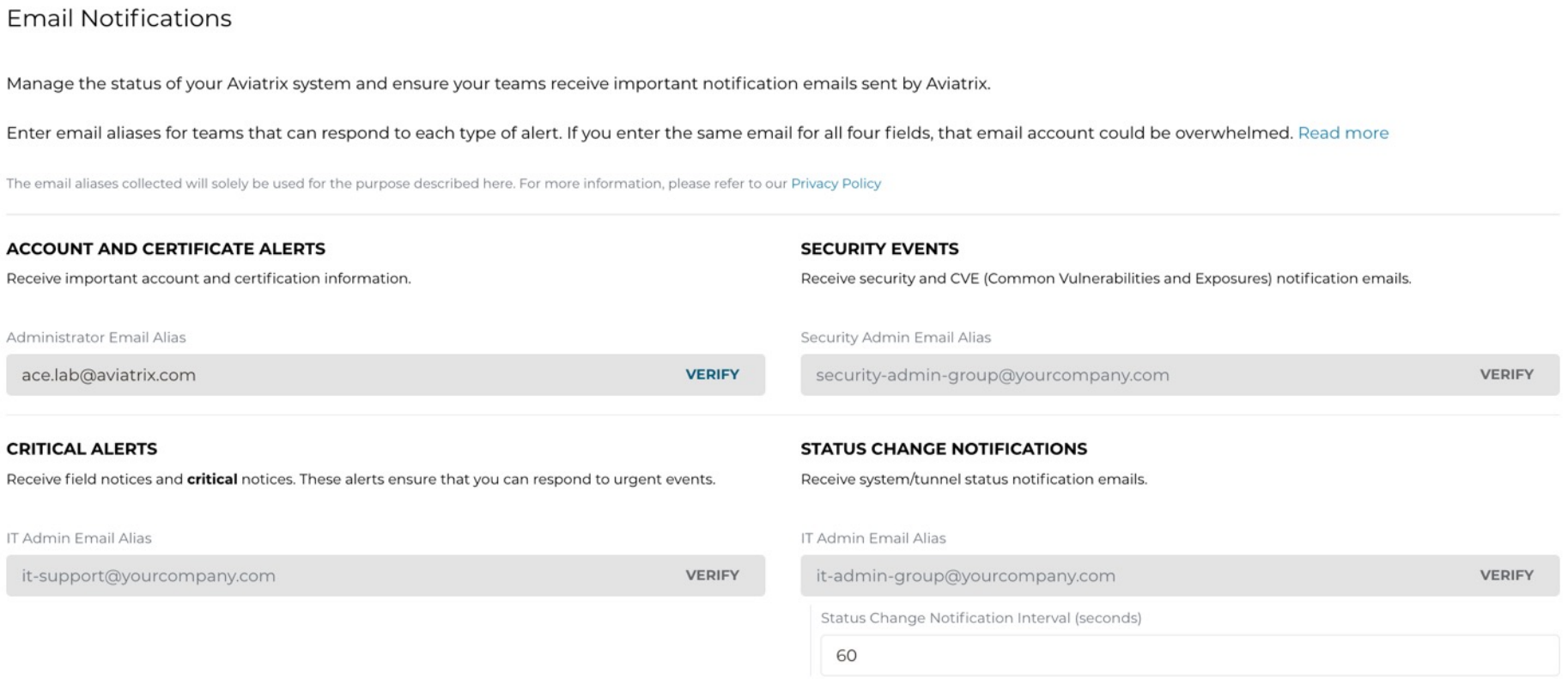
- Upgrade of the Controller has been performed
- Use the Gateway Selective Upgrade capability
  - Add CSP filter
  - Add region filter
  - Add Gateway Type filter
- Optionally perform a dry run upgrade of the selected Gateways



Support Resources

Support Portal

- Aviatrix customers may visit Support portal – https://support.aviatrix.com to access:
  - Knowledge Base with videos
  - Documentation
  - Community
  - History of tickets
  - CSP outage tracker
- Sign up for Email Notifications from Controller



Next:

Distributed Cloud Firewall