

Arista CI Pipeline

Network operations teams are increasingly driven to increase agility and make their infrastructure more “cloud-like” through improving their operating model. One of the core foundations for providing a more modern operating model for networks is adopting a DevOps approach to network changes. This includes practices such as Continuous Integration (CI) and Continuous Delivery (CD) to automate workflows from building configurations, to testing them both before and after deployment. With proper automation and testing, it is possible for teams to deliver faster and more reliable changes and begin offering Network as a Service capabilities to users. However, many network operations teams face challenges when attempting to incorporate CI into their workflows due to the complexity of the tools, lack of expertise, and an overwhelming number of tool choices.

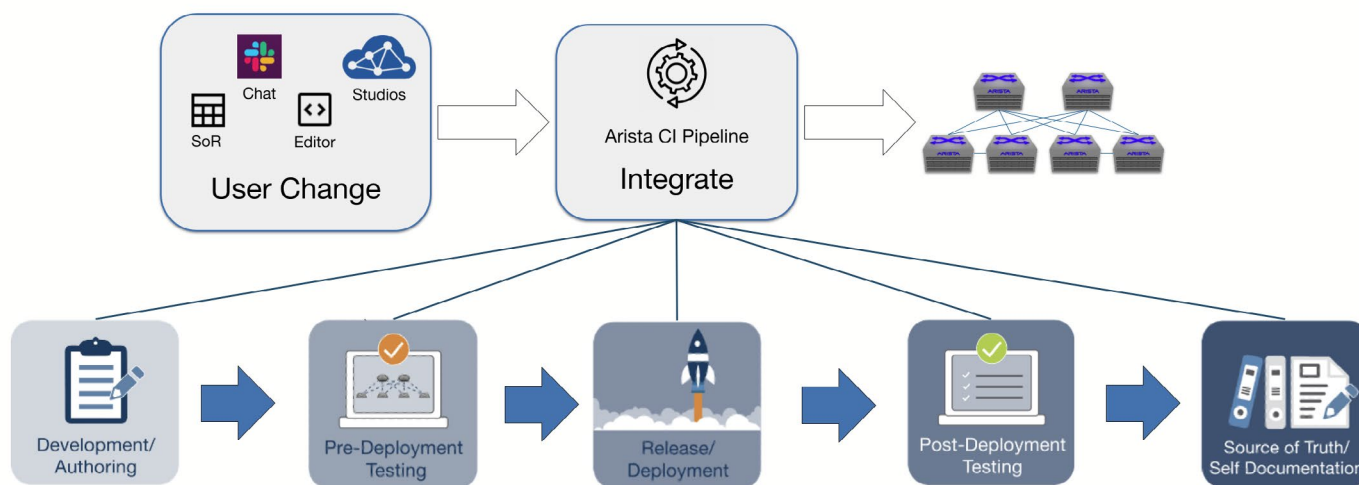
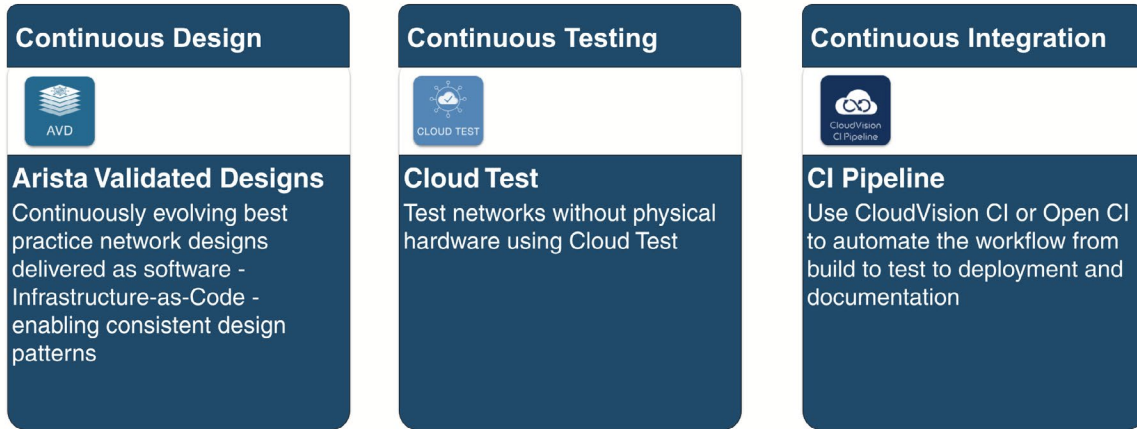


Figure 1: Improved operating model with Continuous Integration and Delivery

The Arista CI Pipeline provides an advanced CI environment for managing networks. It is a complete solution for design, test, and integration of network operations consisting of:

- Arista Validated Designs (AVD) - Network reference designs as Code
- Cloud Test - Virtualized network environments for testing
- CloudVision CI - A CI Pipeline workflow built for turnkey network operations



Bringing Modern Software Development and DevOps Operating Models to Network Infrastructure

Figure 2: Arista CI Pipeline

Arista Validated Designs (AVD)

Arista Validated Designs (AVD) serve as the design and templating system for CloudVision CI. AVD provides an abstracted data model for network design, allowing the network administrator to define their desired network state for the overall network, rather than on a per-device basis. These models can then be rendered into the actual device configurations to be deployed. CloudVision AVD Studios provide the functionality of AVD, wholly within CloudVision, and is designed to work within the CloudVision CI Pipeline for automation.

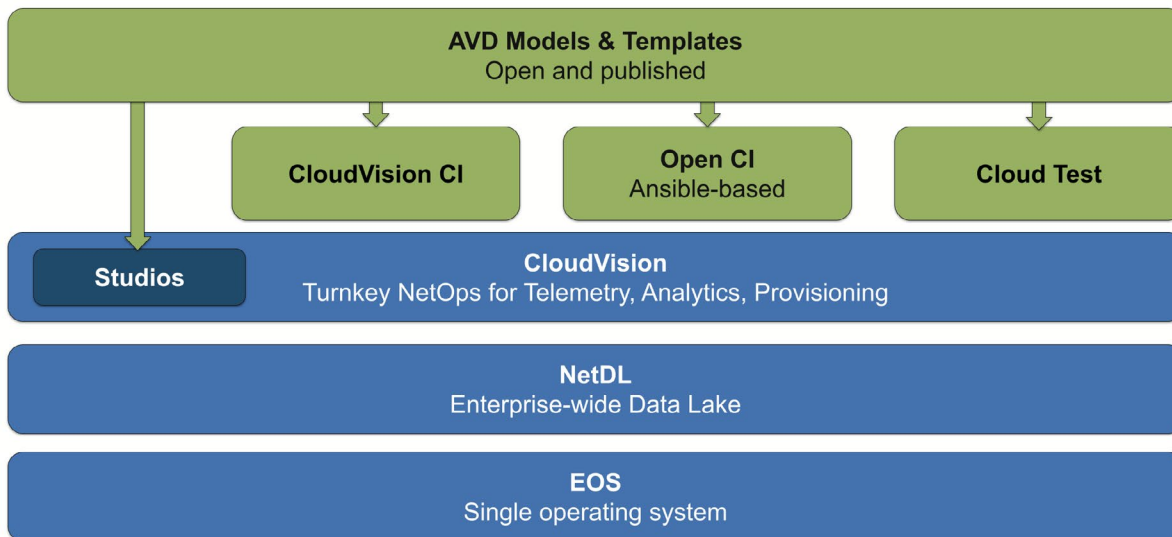


Figure 3: Arista Validated Design Models & Templates

Cloud Test

Cloud Test is a managed virtual environment offering that scales to large topologies leveraging the same EOS and CloudVision software images as is deployed on physical devices. It can serve as a sandbox for testing out changes, a way to certify code versions, or even as a training tool. The virtual network is built using the same EOS and CloudVision software as is used on production systems.

CloudVision CI

The CloudVision CI can be used as a standalone CI/CD environment, or provides features that can be leveraged with external systems and externally driven workflows. By using CloudVision and NetDL, users are able to easily customize how their workflows are driven, while taking advantage of having access to all the information stored in NetDL for automation. In addition, the data and tools provided are catered specifically to the needs of network automation.

Integration with NetDL

Proper monitoring and telemetry is essential for DevOps workflows to validate and build automated changes. The Arista CI Pipeline is built upon EOS NetDL, a robust, time-series database well suited to this task. NetDL will be enhanced with information relevant to a CI workflow, and can serve as a Source of Truth for changes. The data in NetDL can be used to validate network behavior, provide reports, and used to design future changes.

Solution Highlights

- Complete solution for Network CI/CD
- Enhanced change control workflow with pre/post validation stages.
- Built upon Arista Validated Designs, NetDL, and CloudVision.
- Testing and Documentation for reporting and historical reference.
- Integration with external sources of truth such as IPAM and DCIM systems.

Solution Features

Model-based Build Configuration

As part of the Arista CI Pipeline, AVD provides open and extensible fabric-wide data models. The data models focus on reducing user input while providing the flexibility to tune configuration when required. Support for various topologies is supported, whether building a data center, campus or WAN.

Enhanced Pre Deployment Validation Workflow

A critical part of any CI/CD workflow is the ability to provide tests and validation throughout the pipeline. For a network CI/CD pipeline, this includes validation of the model inputs, pre-validation tests on the proposed configurations. Cloud Test can be used to create a virtual sandbox to test changes before they are pushed into production. It also serves as a tool to evaluate network designs prior to deployment of new hardware.

Enhanced Post Deployment Validation Workflow

After changes have been deployed, the Arista CI Pipeline has the ability to run post-validation tests on the executed changes through CloudVision CI, and display or take actions on the results. This gives operators confidence that the proposed changes have the desired effect, as well as ensuring that the changes did not inadvertently affect other areas of the network. The AVD framework automatically builds a suite of post-validation tests for use in the CloudVision CI Pipeline, and additional tests can be added by the operators. These additional tests can include integration with third party testing tools. As part of a CI Pipeline, the execution of the tests are automatic, and enforced every time a change is made.

Automatic Documentation and Test

When using the Arista CI Pipeline, documentation and tests are automatically generated for the changes. This keeps documentation up-to-date and provides a starting point for validation tests without burdening the network operator. The documentation and test results can be viewed in CloudVision Dashboards or as Markdown.

IPAM / Source of Truth Integration

The Arista CI Pipeline includes integrations with IPAM and other sources of truth for easy inclusion into the templates and network designs built by AVD and CloudVision Studios.

Summary

The Arista CI Pipeline provides a complete solution for network DevOps by automating the design, documentation, deployment and testing of network changes. Through this automation, users take advantage of improved agility, reliability, and reduced OpEx that come with a modernized network operating model.

Santa Clara—Corporate Headquarters

5453 Great America Parkway,
Santa Clara, CA 95054

Phone: +1-408-547-5500

Fax: +1-408-538-8920

Email: info@arista.com

Ireland—International Headquarters

3130 Atlantic Avenue
Westpark Business Campus
Shannon, Co. Clare
Ireland

Vancouver—R&D Office

9200 Glenlyon Pkwy, Unit 300
Burnaby, British Columbia
Canada V5J 5J8

India—R&D Office

Global Tech Park, Tower A, 11th Floor
Marathahalli Outer Ring Road
Devarabeesanahalli Village, Varthur Hobli
Bangalore, India 560103

Singapore—APAC Administrative Office

9 Temasek Boulevard
#29-01, Suntec Tower Two
Singapore 038989



Copyright © 2022 Arista Networks, Inc. All rights reserved. CloudVision, and EOS are registered trademarks and Arista Networks is a trademark of Arista Networks, Inc. All other company names are trademarks of their respective holders. Information in this document is subject to change without notice. Certain features may not yet be available. Arista Networks, Inc. assumes no responsibility for any errors that may appear in this document. November 3, 2022