Cisco Nexus Dashboard Connector for HashiCorp Terraform

Increase productivity, reduce human error, and create self-service infrastructure and networks using Terraform Cloud and the Cisco® data center networking product portfolio.

Looking for a way to cut down on costs, ensure higher uptime, and implement more cloud-native network automation? Cisco's partnership with HashiCorp, the Terraform resources developed for Cisco Nexus® Dashboard and the data center product portfolio, and the Cisco Nexus Dashboard Connector for HashiCorp Terraform are the answer.

Nexus Dashboard Connector for HashiCorp Terraform benefits

- **Main Value Prop:** Terraform Cloud for Business with the Nexus Dashboard Connector for HashiCorp Terraform is a turnkey automation platform for network operators, who typically struggle to develop DevOps practices.

- **Cloud Agent Management:** Offload Terraform Cloud Agent container life-cycle management for Nexus Dashboard.

- **Cloud Agent Positioning:** Provide Network Operations an easy landing spot for the Terraform Cloud Agent.

- **Single Automation Point:** Helps position Nexus Dashboard as a platform for automation for all Cisco products with a Terraform provider.

Overview

Networks are becoming ever more distributed and complex as customers increasingly deploy multi-cloud architectures. To address some of the challenges of multi-cloud networking, Cisco has partnered with HashiCorp to deliver Cisco providers for Terraform. These joint solutions combine the power of Terraform, the provisioning tool for building, changing, and versioning infrastructure safely and efficiently, with the power of Cisco's data center portfolio.

Our joint solutions enable Cisco customers to build automation routines and true Infrastructure-as-Code practices; provide efficient, cloud-like, automated operating models and DevOps

methodologies for Cisco on-premises solutions; and help differentiate Cisco's portfolio. For example, Cisco ACI® is the only hardware- plus-software data center fabric with a [Supported Terraform Provider](#) in the industry.

Most recently, Cisco has launched the [Nexus Dashboard Connector for Terraform](#). This solution adds the ability to manage the HashiCorp Terraform Cloud Agent's lifecycle directly from Nexus Dashboard.
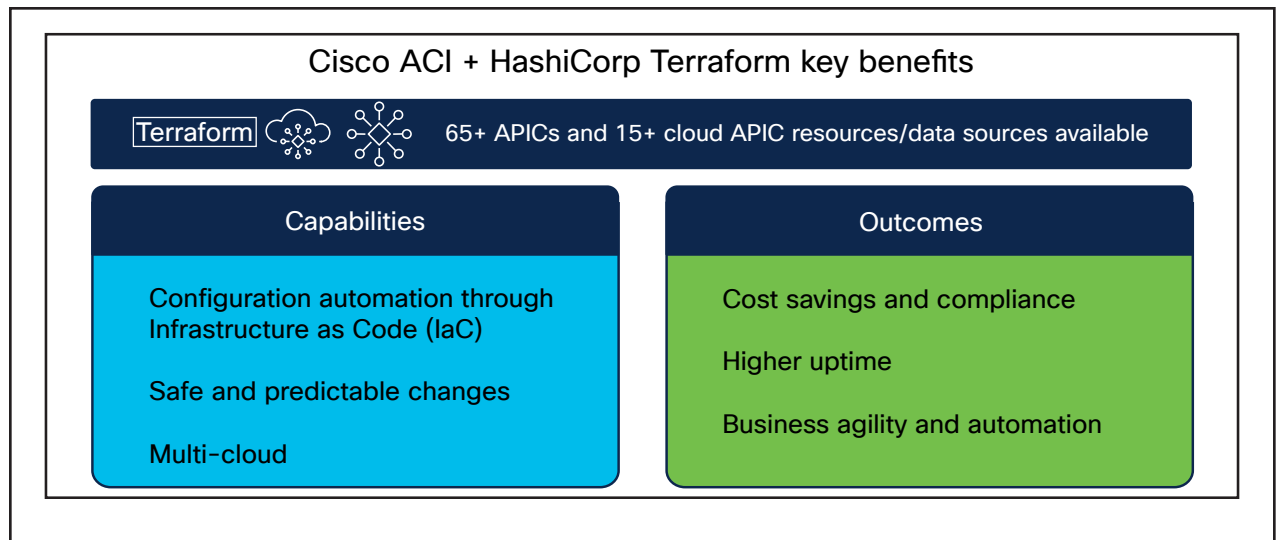
Cisco ACI + HashiCorp Terraform key benefits

Terraform — 65+ APICs and 15+ cloud APIC resources/data sources available

Capabilities
- Configuration automation through Infrastructure as Code (IaC)
- Safe and predictable changes
- Multi-cloud

Outcomes
- Cost savings and compliance
- Higher uptime
- Business agility and automation

Figure 1.   Key benefits of Cisco plus Terraform Cloud solution

Automation and Self-service networking solutions

It's tedious and time-consuming to deploy and make changes to both networks and applications. Two stats jump out in particular:

1. According to a recent ESG Research Report, **65%** of network professionals state that modifying or implementing network changes are manual processes.

2. Similarly, in a recent ZK Research Report, **75%** of companies surveyed said they take days or even weeks to complete networking tasks.

As business needs demand faster responses, customers are embracing the DevOps model to accelerate application deployment and achieve higher efficiency in operating their data centers as well as public-cloud deployments.

Furthermore, the business needs of customers can extend beyond having infrastructure respond faster: they may also require considerations pertaining to performance, cost, resilience, and security. This has led to customers adopting multi-cloud architectures. Multi-cloud architectures require network connectivity between application workloads running in different environments.

How it works

Integrated Solution Components

- Cisco Nexus Dashboard

- Terraform Cloud for Business (including Terraform Cloud Agent)

- The Nexus Dashboard Connector for HashiCorp Terraform

Cisco Nexus Dashboard Overview and key capabilities

- Nexus Dashboard is a platform designed to help customers automate and operate their data center and cloud networks. It enables users to streamline and rapidly change, scale, troubleshoot, and ensure the operation of their networks.

- **Unify operations:** Avoid managing and monitoring individual devices, fabrics, and clouds independently by consolidating a powerful and consistent operational model under a single pane of glass.

- **Accelerate innovation:** Make the most out of built-in and Infrastructure-as-Code (IaC) network automation to deliver connectivity faster to your switches (through Nexus Dashboard Fabric Controller), across fabrics (through Nexus Dashboard Orchestrator), or even across clouds.

- **Minimize downtime:** Leverage Cisco Nexus Dashboard Insights to increase visibility and identify potential issues and recommendations to fix them, gathering years of experience under a single network-operations platform.

- **Increase environmental sustainability:** Learn your network's impact on KWh, cost, and CO2 emissions through Cisco Nexus Dashboard Insights sustainability reports.

- **Ensure business compliance:** Reduce time spent on release notes and guidelines by getting embedded software recommendations to keep your networks running under support and following your own configuration and communication rules.

How Terraform Cloud for business and the Terraform Cloud agent work

▪ **Terraform Cloud for Business (TFCB):** TFCB is a turnkey Software as a Service (SaaS) platform to host Terraform automation routines, complete with security, compliance, collaboration, governance, and Continuous Integration and Continuous Delivery (CI/CD) pipeline capabilities.

▪ **Terraform Cloud Agent:** For TFCB to configure on-prem automation endpoints, typically those located behind a corporate firewall, the Terraform Cloud Agent is

required. The Terraform Cloud Agent is distributed in a container form factor and needs to run within the on-prem environment as a container.

▪ **Relationship between TCFB and the TF Cloud Agent:** The Terraform Cloud Agent polls TFCB for automation jobs. Users configure automation jobs using the Terraform Cloud for Business SaaS platform. If those automation jobs target on-prem systems, the Terraform Cloud Agent will find them and run the job against the on-prem target securely.

What is the Nexus Dashboard Connector for HashiCorp Terraform?

· It is a third-party connector running on Nexus Dashboard.

· The Connector is currently available as a free download from the Cisco Data Center (DC) App Center.

· The Connector acts as a hosting spot and lifecycle manager for the Terraform Cloud Agent.

Use cases

Table 1.   Use cases

Key use case	Use case description
Cloud-Native Network Automation (Infrastructure as Code [IaC] for operators)	· Network operators can take advantage of Terraform's ability to express Infrastructure as Code (IaC) in a simple, human-readable language called HashiCorp Configuration Language (HCL). · Network operators can manage infrastructure in a file or set of files. · Cisco and HashiCorp have worked together to deliver numerous providers for Terraform that cover the Cisco Data Center portfolio. · Providers are publicly available and enable Terraform users to leverage a unified set of resources to deliver a plethora of new cloud-native functions, from Software-Defined Networking (SDN) overlay extension in the cloud to Kubernetes Federation, including GitOps, DevSecOps, etc.

CISCO

The bridge to possible

Key use case	Use case description
Cisco DevNet's Providers for Terraform Resources as a Route to Developer Community	• Cisco DevNet offers free code samples and workflows for customers to use, CI/CD pipelines to push infrastructure changes to either the on-premises data center or the cloud, or showing a complete Virtual Private Cloud (VPC) or Administrative Zone (AZ) standup to a cloud-based ACI fabric through a full, declarative workflow. • DevNet offers a full journey to customers from a given starting point all the way to the construction of a composable infrastructure in the cloud using the industry-leading data-center-networking solution (Cisco ACI), and does so using Cisco products and/or open-source tooling to build these workflows (Terraform, GitLab, etc.). • Cisco DevNet's half-million developers share code, and its strong community and wide reach give customers an unparalleled "learn before you deploy" experience. • Other compelling features include free DevNet express training, social media outreach, webinars, and easy accessibility to DevNet subject-matter experts to get their recommendations to attain success.
GitOps-CI/CD Pipelines	• GitOps control Continuous Integration/Continuous Development (CI/CD) pipelines providea single source of truth, where application and infrastructure components can be rolled back or updated using standard Git operations. This helps create a universal approach to operations in complex environments with many containers and immutable infrastructures. • Cisco's portfolio amplifies GitOps and CI/CD pipelines by providing a software model that can rapidly adapt to automation-framework evolution, ensuring that our customers can rely on a robust, flexible, and extensible network and security API that can support bleeding-edge automation and cloud-native use cases, such as Kubernetes operators, application-level visibility, and multi-cloud security. • Terraform Cloud integrates with version control systems, allowing operators to provision and change their infrastructure with the simple merge of a pull request.

The bridge to possible

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The Cisco Advantage

As the worldwide leader in IT, networking, and cybersecurity solutions, Cisco has the power to help companies of all sizes transform how they connect, communicate, and secure their information. Cisco Application Centric Infrastructure, the industry-leading SDN solution, facilitates application agility and data center automation. Working with HashiCorp, the leader in infrastructure automation for multi-cloud environments, Cisco has created a joint solution that automates networking infrastructure provisioning, dramatically increasing DevOps productivity, minimizing risks by practically eliminating human error, and accelerating overall DevOps lifecycles.

For more information

- **Nexus Dashboard**
- **HashiCorp**
- **Nexus Dashboard Connector for Terraform**