

NETSCOUT Performance Management Solutions for Cisco ACI SDN in Government Deployments



Global government agencies have adopted Cisco® Application Centric Infrastructure (ACI) Software-Defined Networking (SDN) technology to reduce the cost, complexity, and performance challenges associated with managing traditional wide-area network (WAN) solutions in distributed operations environments. In the Federal Government, the General Services Administration (GSA) encouraged agencies to adopt SDN as part of the Enterprise Infrastructure Solutions (EIS) contract, including a deadline extension to 2024 for most agencies and 2026 for the departments of Justice and Homeland Security that provides more planning and transition time to do so.

From a network management standpoint, migrating to Cisco ACI in agency operations environments offers a holistic architecture that provides centralized automation and policy-driven application profiles, delivering software flexibility with the scalability of hardware performance.

Additional benefits include:

- Centralized policy management and Cisco Application Policy Infrastructure Controller (APIC).

- Open ecosystem of network, storage, management, and orchestration vendors.
- Simplicity delivered through use of non-designated paths/flows (i.e., best-path method), Layer 2 routing, and a multiple-paths, multiple-devices approach.
- Use of Cisco Nexus data center switches, which support highly scalable data center fabric deployments.

However, for government IT teams (as well as contractors) tasked with successfully deploying and managing these Cisco ACI investments, there are associated complexities and service edges, or boundaries, that make it challenging to pinpoint the source of a network or application performance problem in SDN environments.

As a result, IT teams frequently need to introduce additional observability to analyze performance in these new Cisco ACI environments and coordinate real-time monitoring to deliver evidence to government agency leadership teams that business service delivery is operating at appropriate levels before, during, and after the SDN migration.

Additionally, since Cisco ACI deployments are often introduced concurrently with other digital transformation initiatives involving cloud migrations (e.g., AWS GovCloud, Google Cloud, IBM Cloud for Government, Microsoft Azure® Government, Oracle Government Cloud, or Cloud.Gov), and VMware virtualization transitions, there is a further expansion of the range of service edges that IT operations need to visualize to manage service delivery. Emerging issues that may impact their employee and/or constituent user experience must be confidently investigated to pinpoint where in this complex path the disruption is occurring for rapid resolution.

Our Approach

With NETSCOUT®, government IT teams are equipped to provide observability into Cisco ACI deployments in the following manner:

- Monitoring data center operations at a “top of rack” perspective, including aggregation, border leaf, multi-spine, and multi-leaf layers.
- Monitoring in the fabric, factoring leaf-to-leaf/ leaf-to-border, Virtual Extensible LAN (VXLAN) tunnel parsing, multi-spine, and multi-leaf.
- Monitoring ACI SPAN, including multi-node tenant and endpoint group (EPG) capture, and automatic adjustment if EP moves.
- Undertaking complex monitoring, including end-through-end service management and visualization into, for example, client communities, Citrix servers, application servers, database servers, etc.

In this fashion, NETSCOUT closes visibility gaps, which enables government IT teams to maintain high quality and business continuity throughout Cisco ACI transformation. The benefits include:

- **Assuring real-time performance**, with visibility into applications and user experience, while enabling IT teams to validate properly implemented security controls.

- **Visualizing application dependencies in the Cisco ACI environment**, providing IT teams with the means to understand an app and baseline its performance.
- **Assessing quality of user experience** throughout the Cisco ACI SDN, as well as broader government environments.
- **Lowering mean time to repair (MTTR) time frames**, with faster resolution of application and network issues provided by visibility into both north-south traffic flowing in-and-out of the data center and east-west traffic within the data center.

Our Solution

NETSCOUT's nGenius® Enterprise Performance Management is being adopted by government agencies to migrate their networks to Cisco ACI SDN and visualize post-transition application performance. In assisting government IT teams, NETSCOUT leverages our "Visibility Without Borders" approach, patented smart data technology, and nGenius® smart analytics to provide an end-through-end solution for real-time monitoring of SDN deployments.

The nGeniusONE solution delivers unrivaled "single pane of glass" visibility into business services and provides contextual workflows to speed problem resolution. Through overarching views into the performance of applications and user experience, nGeniusONE exposes underlying service dependencies that help IT teams effectively manage health, availability, security, and user experience issues across Cisco ACI deployments.

Provided as patented technology in our InfiniStreamNG® (ISNG) software and hardware appliances and vSTREAM® virtual appliances, NETSCOUT Adaptive Service Intelligence® (ASI) technology takes packet analysis beyond traditional data centers and north-south traffic into virtualized environments to provide deep insights into east-west traffic. Regardless of deployment location, ISNG and vSTREAM technology with ASI generates NETSCOUT smart data in real-time from network packet traffic across government environments. ISNG software

and hardware appliances are designed for deployment in any environment, ranging from business edges where clients connect, disaster recovery locations, colocation data centers (colos), and onto the data center core. In addressing scalability and monitoring needs in very large agency environments, multiple ISNG software and hardware appliances can be deployed to provide virtually unlimited scalability.

With ASI-generated smart data as the foundation for vSTREAM virtual appliances for cloud services and virtual (e.g., VMware NSX-V and NSX-T) environments, ISNG software and hardware appliances can be deployed in tandem with vSTREAM. Our nGeniusONE analytics consume this smart data to provide real-time views that scale across Cisco ACI SDN deployments operating alongside hybrid cloud, virtual, and legacy data center environments for supreme user experience.

Given the complexity of transformed Cisco ACI network environments, both our nGenius® Packet Flow Switch (PFS) 7000 series and 5000 series packet brokers support high-speed 100GB network segments by distributing wire traffic from network links in Cisco ACI deployments to downstream monitoring and security tools, including our ISNG appliances. NETSCOUT continues its strategy of providing cost-effective alternatives by offering the nGenius PFS packet brokers in either appliance or Packet Flow Operation Software (PFOS) solutions.

NETSCOUT's nGenius Enterprise Performance Management provides the end-through-end visibility required to manage government user experience across client, network, cloud, and data center service edges that is required by IT operations for monitoring and assuring high-quality performance for their transformed government environments. As part of nGenius Enterprise Performance Management, new capabilities have been introduced for nGeniusONE. These enhancements enable nGeniusONE to deliver packet-based performance monitoring and can be combined with synthetic testing for assuring user experience from business edges.

Our Value to Government Agencies

NETSCOUT performance management solutions offer the following benefits to government agencies around the world that are deploying Cisco ACI SDN:

- Provide observability into numerous Cisco ACI deployment scenarios, with nGeniusONE providing real-time Service Dashboard snapshots and Service Monitoring into Cisco ACI performance, alongside VMware, Citrix VDI, Webservices, Oracle database, and hybrid cloud services, for example.
- Improve observability into modern data center environments required for real-time monitoring of Cisco ACI, as well as VMware and cloud services.
- Deliver "before-and-after" views into application dependencies, user experience, and real-time network performance to assure business continuity was not adversely impacted by the Cisco ACI transformation, enabling success before, during, and after migrations.
- Equip IT operations with contextual drill-downs from top-level nGeniusONE Service Dashboard and Service Monitor views to on-board forensic analysis required for deep-dive troubleshooting into Cisco ACI issues (e.g., routing back to the data center core) and MTTR cycles.
- Ensure user experience for government employees, contractors, and constituents meets high-quality standards, with observability for rapid troubleshooting and resolution of problems in these complex networking environments.
- Optimize uptime and minimize downtime associated by reducing network disruptions.



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