

Cisco® Active Network Abstraction

# Visibility and Control for Carrier-Grade Networks

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# New Services, New Challenges

The market landscape for service providers has never been more competitive or complex. Customers' insatiable appetite for rich and varied content is putting a growing strain on service providers' networks and the operators that manage them.

Carriers must simultaneously evolve and consolidate their networks so they can deliver the exploding variety of services and massive amounts of information that consumers demand at home, on their mobile devices, and in their businesses.

As they build out their next-generation networks, service providers want to make use of ongoing product innovation and technology advances for higher capacity, faster, and more flexible network environments.

But, these environments are often too large and too complex for first-level operators to manage on their own. The intricacies of disparate management systems and data coming from multiple sources require a solid command of the network that only highly experienced, and high-paid, network engineers have. And, while next-generation, consolidated networks can simplify normal operations, degradations, outages, or service provisioning errors can overwhelm manual operations processes or procedures that rely on numerous, disparate management systems.

These circumstances not only increase a carrier's costs—they also heighten the risk of expensive service outages, pull network engineers away from other duties, and make operators less productive.

## A Simple Approach to Complex Problems

To boost efficiency in network operation and assurance, service providers need to equip network operations center (NOC) operators with a truly universal management suite that strips away complexity to give operators just the information they need to know. The ideal solution would automate the most time-consuming tasks, allow first-level operators to see and control the service operations lifecycle, and make it easier to deploy new technologies and resolve faults faster.



# A New Approach is Needed



This increasingly large and complex environment means service providers have to rely more heavily on manual labor and the expertise of highly paid staff just to keep their networks up and running.

When carriers use multiple, disparate systems, operators and engineers have to spend significantly more time manually retrieving and interpreting information. It's a time-consuming process that leaves the door open for human error, which could cause a carrier's network to stay in a degraded state for a longer period of time.

The inadequacy of multiple, disparate solutions becomes even more apparent when a problem occurs in the network. Without a converged and interpreted view of the network, finding the root cause of an alert can be a labor-intensive process that translates to outages that last hours instead of minutes, costing the service provider millions of dollars.

NOC staff must also fill the gap created by the shortcomings of disparate systems with their own knowledge of the network and the services it supports. But, this information is often trapped in the minds and experiences of seasoned network engineers, who have tasks of their own that they need to complete.

Some carriers recognize the need for a unified approach and turn to custom-developed network management tools for a cohesive solution. Besides being inherently expensive to build, maintain, and evolve with the network, these solutions won't help service providers control costs if they don't offer a level of automation that empowers staff with the information they need to be more efficient, make better decisions, and improve performance. They're also not truly universal management tools if they're not actually normalizing the differences between systems. Many solutions appear to offer consolidation of management information. But by simply combining systems and layering a new interface on top, they still leave network operations to contend with disjointed, raw, and inconsistent data.

Lastly, network managers can't fully optimize their Cisco® environments with custom-developed tools because these tools are often built to general networking standards and do not evolve along with Cisco elements.

Clearly, a new approach is needed.

# A Completely Simple Solution

Next-generation networks need a next-generation management solution. **Cisco Active Network Abstraction (ANA)** is a carrier-class, end-to-end manager built for ultimate efficiency.

Cisco's comprehensive management system provides deep visibility into networks and consolidates network data into actionable information despite the differences among devices, giving the operator a clear picture of the network and the services it supports. Cisco ANA helps assure service levels and speeds up troubleshooting with fault analysis, alarm correlation capabilities, and diagnostic tools. With Cisco ANA, operators can reduce the mean time to repair for service problems and thus decrease the effects of outages and reduce the average operations expense spent on resolving trouble tickets.

Cisco ANA also accelerates technology and service introduction and reduces the day-to-day cost of manual-process error by supporting automated software image upgrades, configuration management, third-party product integration, and monitoring of the latest device versions and services.

By automating the service provider's most complex operations, Cisco ANA puts control of the network back in the hands of capable first-level operators and frees up network engineers to focus on network planning, optimization, and other strategic tasks. Restoring this balance means service providers can innovate and support ever-growing and increasingly varying services for more customers without dramatically increasing their costs.

Carriers can also easily customize ANA with built-in tools or engage the help of consultants through the Cisco Partner program and Cisco Advanced Services support.

## Delivering Value Throughout the Network Lifecycle

Cisco's Active Network Abstraction increases efficiency by allowing operators to discover new elements automatically, manage them easily, restore configurations simply, diagnose problems more quickly and optimize networks for better performance.



### Discover and Detect

Information on Demand



### Manage and Control

Agility for Lifelong Support



### Diagnose and Repair

Find and Fix... Fast



### Change and Configure

The Ultimate Backup Plan



### Analyze and Act

Actionable Information  
for Peak Performance

# Discover and Detect:

## Information on Demand

Cisco ANA helps carriers guarantee service quality by giving them a clear and current picture of their networks. The cohesive visual experience allows them to deep dive into network details. For instance, an operator can trace alerts back through the network to see the specific root cause of a problem. And they can rely on Cisco ANA's network maps to reflect the latest state and configuration of network elements, connections, and virtual circuits.

ANA provides a piercing level of visibility into Cisco devices and can support third-party elements as well. With a richer view of every element, operators can better ensure a more stable and efficient network and, in turn, protect the service provider's revenue source.



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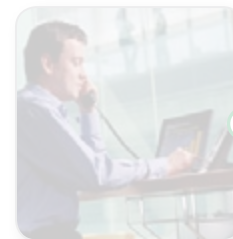
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# Manage and Control:

## Agility for Lifelong Support

Carriers need their complex networks to be more agile, so they can help ensure service levels in a constantly changing environment. In order for networks to function efficiently and continuously, service providers must have an intelligent system that will rapidly support new and updated devices.

ANA virtual network element technology recognizes and communicates with devices as they move through the service operation lifecycle so carriers can maximize their investment in the network.

This technology keeps both Cisco and third-party devices compatible with ANA by swiftly upgrading virtual network element drivers independently, without requiring ANA software upgrades.

Bottom line, ANA virtual network technology makes managing networks easier so operators can concentrate on optimizing service.



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# Diagnose and Repair:

## Find and Fix... Fast

Despite operators' best efforts, they will face faults and alarms that will need to be analyzed and solved quickly to avoid costly service interruptions. By distilling massive amounts of information and automatically finding the root cause of the problem, Cisco ANA can help eliminate event storms and the waterfall of alerts that come with them. Plus, it archives alerts to create a history of events and their resolutions.

Beyond alarms and showing physical connections, Cisco ANA graphically represents even the most complex virtual connections. With virtual connection topologies at their fingertips, operators can verify, assess the impact on, or troubleshoot network services in a fraction of the time it would take to dig for static images of virtual circuit diagrams or manually trace a complex Ethernet virtual connection from the device configuration data.

With Cisco ANA's unique combination of fault analysis, root-cause event identification, and topology-guided troubleshooting, carriers can expect shorter interruptions for customers, greater efficiency for staff, and overall cost savings for the business.



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# Change and Configure:

## The Ultimate Backup Plan

Sometimes it's easier to simply roll back changes to the network and restore service instead of wasting valuable time trying to fix the problem. Cisco ANA is one of the few network management systems that captures configuration baselines so operators can quickly return elements to a stable state.

The Change and Configuration Management feature also automatically detects any upgrades or changes made directly to a device outside of ANA. If a problem is identified, the operator can easily restore the network to exactly the way it was.



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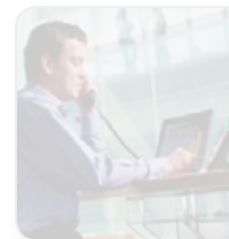
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# Analyze and Act:

## Actionable Information for Peak Performance

Beyond resolving problems when they occur, operators must proactively analyze network performance and anticipate service issues well before they arise. Carriers can do this and more with Cisco Prime™ Performance Manager. Cisco Prime Performance Manager is an easy-to-deploy, easy-to-use application that gathers raw operational data from next-generation networks and converts it into actionable information about a system's performance. With this information, service providers can identify potential problems before they affect users. This scalable solution works with both Cisco and third-party devices and comes with a set of reports that an operator can run to get detailed performance information.

### Cisco Prime Performance Manager in Action

It's Friday evening. A family is spending a night together streaming a movie on their TV when they notice the picture start to pixelate during a dramatic scene. The frustrated father reaches for the phone and calls his service provider.

Back at the network operations center, an operator receives a notice that the service is degrading. He can see they aren't meeting their service-level agreements with customers. Using Cisco ANA and Cisco Prime Performance Manager, the operator identifies the problem and applies a fix before it gets any worse.

A few minutes later, the family is back to enjoying their movie together with a crystal clear picture.



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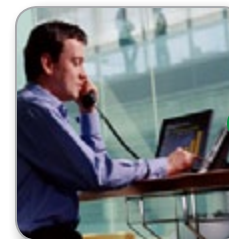
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# Investing in Unhindered Growth

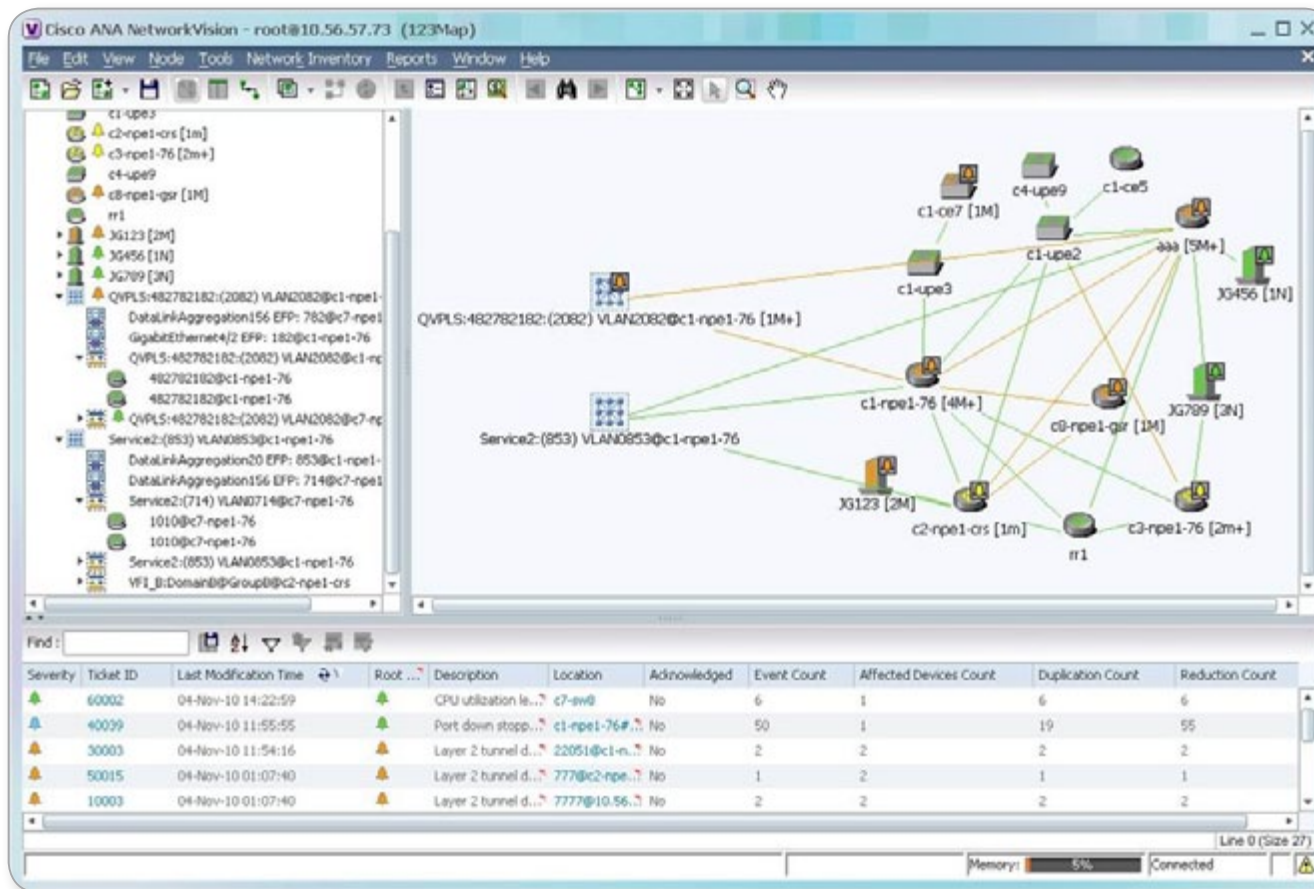


In 2002, a large telecommunications company could manage its network of fewer than 100 devices with open source and in-house tools. As that company was upgrading its next-generation network with Cisco equipment, the carrier realized that it needed a more complete and integrated approach.

Its network had grown to more than 300 high-capacity and feature-rich devices, and managing them and the services they provided was becoming unwieldy. By implementing Cisco ANA, the service provider was able to integrate multiple interfaces and add new devices quickly. Moreover, the carrier could easily track detailed inventory information for these devices and trace services through a graphical representation of the network.

Root-cause analysis and alarm correlation features made it easier to fix problems with less stress for operators and with significantly less downtime. Now, not only is the service provider looking to expand its relationship with Cisco by adding more functionality to Cisco ANA, it's developing some of its own tools to extend and adapt Cisco ANA to its unique operations needs.

# The Next Generation in Visibility and Control



Cisco ANA provides comprehensive and at-a-glance views into next-generation IP network infrastructures, facilitating more complete and effective element and fault management and increased network service assurance.

The Navigation Pane lists elements in alphabetical order so the NOC operator can easily find, select, and look at them on the network map.

The Topology Pane allows the operator to see the various types of physical, virtual, or protocol-related connections between the network elements and the services they control. ANA allows zooming in and out for ultimate viewing flexibility.

The “Ticket” Pane helps operators focus on root-cause alarms of interest by showing only the alarms that correspond to the area of the network shown on the map. Starting from a displayed root-cause alarm, operators can drill into the correlated symptomatic, redundant, and duplicate events or easily navigate to an affected device or interface for further troubleshooting.

# A Truly Comprehensive Solution

Cisco Active Network Abstraction, especially when combined with Cisco Prime Performance Manager, is the only truly comprehensive network management solution that gives service providers the ability to discover new devices, manage them easily, diagnose problems quickly, and restore network configurations. Moreover, Cisco Prime Performance Manager works seamlessly with ANA to optimize networks for better performance. Find out more about how Cisco can help you meet your service-level commitments, compete in an ever-changing environment, and reduce operating costs.

## More information about Cisco ANA:

<http://www.cisco.com/go/ana>

Cisco Advanced Services offers a broad range of services to help ensure that each Cisco ANA deployment is as smooth as possible.

[http://www.cisco.com/en/US/products/svcs/ps2961/serv\\_category\\_home.html](http://www.cisco.com/en/US/products/svcs/ps2961/serv_category_home.html)

## Cisco ANA Tech Center developer support:

The Cisco ANA Tech Center is an online community resource for integration and customization engineers who use Cisco ANA's APIs.

<http://developer.cisco.com/web/ana/home>

## More information about Cisco Prime Performance Manager:

<http://www.cisco.com/go/performance>