Network Insights for Resources
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Cisco Network Insights for Resources (NIR) Application that monitors and records hardware and software telemetry data over time to identify Anomalies in the fabric and help automate troubleshooting, root-cause analysis, capacity planning and remediation. It helps infrastructure owners comply with SLAs required by their customers. The same NIR app works for both ACI/APIC and NXOS/DCNM platforms.

Product overview

NIR features for System and Operations resources include the following categories:

- Resource utilization: Provides visibility into operational, configuration, and hardware resource-utilization across the Cisco ACI fabric.
- Environmental: Provides visibility into usage patterns of hardware components, such as CPU, memory, fan speeds, and temperature.
- Event analytics: This is software telemetry that leverages audit logs and events and faults data from the Cisco ACI™ fabric.
- Statistics: This shows Interface and protocol statistics thereby exposing interface utilization and the protocol density per node. Flow Analytics (available with service engine appliance): This provides flow-based hardware telemetry to identify anomalies and characterize flows through the fabric. Latency and conditions like buffer drops can be quickly identified for select flows of interest.
- Event analytics (available for ACI modes): This function correlates Events with detected anomalies to greatly expedite troubleshooting.

NIR anomaly-detection provides great value, by observing many sources of near real-time data, such as resource utilization, software telemetry, hardware telemetry, and environmental data, then building relationship tables to identify deviations from baseline behavior and patterns in the Cisco Nexus fabric. NIR helps investigate root-cause issues so that the administrator can focus on remedial steps and thus minimize time spent detecting what went wrong as well as when, where, and why.
Features and benefits

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
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<tbody>
<tr>
<td>Event Analytics (ACI modes)</td>
<td>● Anomaly detection based on software telemetry data helps speedier root-cause analysis and remediation of control plane issues.</td>
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<td></td>
<td>● Assisted auditing and compliance checks using searchable historical data presented in time-series format.</td>
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<tr>
<td>Resource Utilization</td>
<td>Useful for capacity planning in two ways:</td>
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<td></td>
<td>● Fabric-wide visibility of resource utilization and historical trends.</td>
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<td></td>
<td>● Detection and highlighting of components exceeding capacity thresholds.</td>
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<tr>
<td>Environmental</td>
<td>● Useful in preventing outages by monitoring and reporting environmental anomalies. Leverages telemetry data from hardware sensors.</td>
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<tr>
<td>Flow Analytics (ACI with service engine appliance)</td>
<td>● Helps meet and improve Infrastructure uptime SLAs required by businesses.</td>
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<td></td>
<td>● Minimizes critical troubleshooting time through automated root-cause analysis of data plane anomalies, such as packet drops, latency, workload movements, routing issues, ACL drops, etc.</td>
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Prominent feature

**Event analytics**

Event analytics is tuned for control-plane events in the infrastructure. It performs the following:

- Data collection: configuration changes and control plane events and faults.
- Analytics: AI and ML (machine-learning) algorithms determine correlation between all changes, events, and faults.
- Anomaly detection: output of AI and ML algorithms (unexpected or downtime-causing events).

The Event Analytics dashboard displays faults, events, and audit logs in a time-series fashion. Clicking on these points in the history displays its historical state and detailed information.

**Resource utilization**


Resource utilization categorizes capacity utilization by the following:

- Operational resources: This displays the capacity of transient resources that are dynamic in nature and expected to change over short intervals. Examples are routes, MAC addresses, security TCAM, etc.
- Configuration resources: This displays the capacity utilization of resources that are dependent on configuration, such as number of VRFs, bridge domains, VLANs, EPGs, etc.
- Hardware resources: This display port and bandwidth-capacity utilization.

**Environmental**

Environmental provides anomaly-detection capabilities in hardware components such as CPU, memory, temperature, fan speed, etc. As with other screens, it highlights components exceeding thresholds and requiring administrator attention.
NIR flow analytics (Available with service engine appliance)

NIR App Version 2 offers Flow Analytics for ACI when used a service engine appliance. Flow Analytics is tuned for identifying data-plane anomalies in the network. The Flow Analytics dashboard attracts administrator attention on key indicators of infrastructure data plane health. By leveraging ML and AI algorithms, it automates many functions of root-cause analysis, thus minimizing downtime. Time-series data provides information on historical trends, specific patterns, and past issues and help the administrator to build a case for audit, compliance, and capacity planning or infrastructure assessment. The Flow Analytics dashboard provides a time-series based overview, as shown below, with a capability to drill down on specific functions by clicking on the graph.

Platform support

<table>
<thead>
<tr>
<th>NIR App function</th>
<th>Cisco Nexus® 9300/9700 EX series</th>
<th>Cisco Nexus 9300/9700 FX series</th>
<th>Cisco Nexus 9300/9700 FX2 series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource utilization</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Environmental</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Event analytics</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Flow analytics (Available for ACI with service engine appliance)</td>
<td>No**</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Target for future releases.

Licensing

The NIR App license is included as part of the Cisco ACI Premier license.

Customers who already have a Cisco ACI Essentials, or Advantage license can purchase an NIR App “add-on” license.

The NIR App license is a subscription-only Smart license. To learn more about Cisco ACI Smart Licensing, click [here](#). The number of NIR App add-on licenses required is equal to the sum of the leafs, the fixed spines, and/or the line cards for the modular spines in the Cisco ACI fabric.

The NIR App is currently available to download and use. Contact your Cisco Account team to learn future pricing and get additional details.

System requirements

The NIR App has the following dependencies:

Installation dependencies

NIR app can be installed on existing APIC or DCNM Controller for Resource Utilization, Environmental and Event Analytics functions. To use Flow Analytics, NIR app must be installed on a Services Engine appliance cluster which is targeted to ship along with General Availability of Flow Analytics functions. For DCNM installation with Flow Analytics, the NIR can use a UCS cluster – contact your Cisco Sales rep for specific requirements.

A cluster of three nodes is required.
Software dependencies

The NIR App is supported on Cisco ACI Release 4.0(3d) onwards or DCNM 11.2 onwards. There are no other software dependencies.

Ordering information

The NIR App is currently available to download from the Cisco DC App Center. Contact your Cisco Account team to learn future pricing and get additional details.

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