Cisco Analytics: Accelerate Network Optimization with Visualization

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Agenda

- Big Data and Analytics to Meet Changing Customer Expectations
- Why Apply Analytics to Networks?
- Analytics for Network Deployment and Optimization
Does Your Network Deliver Services and Insights Fast Enough?

- Ever-present connectivity and cloud services are setting customer expectations for all types of services
- There’s a greater need for immediacy, quality, and consistency in networked customer services
- Is your network delivering services with the speed, quality, and consistency customers want?
Cisco Analytics: Network-Leveraged Insights

- Network data- and metadata-enriched analytics for common vertical use cases
- Data and decision science services for unique use cases

Cisco Analytics

- Retail: Store operations and customer service
- Service Providers: Customer service and operational efficiency
- Collaboration: Organizational effectiveness, collaborative selling
- Contact Centers: Personalized contact center service
- Networks: Network resilience and service agility

Data and Decision Science Services

- Cisco Data Virtualization
- Cisco Prime Real-Time Analytics
- Cisco Decision Science
- Cisco Intellectual Capital
Why Do Big Data and Analytics Matter?

- Companies are turning to Decision Science based on Big Data to improve network resilience and service agility.
- Sources of Big Data include network data sets like syslog and configuration files.
- Big Data analytical tools accelerate:
  - Cleansing, enriching and analysis of data
  - Retrieval, search, integration, visualization
## Analytics Reveal Hidden Patterns Impacting Network Deployment and Optimization

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<th>Analytics</th>
<th>Insight</th>
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<tr>
<td>Correlate service call data with device configurations</td>
<td>Discover devices that cause excessive service calls</td>
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<td>Correlate historical data on device deployment with incident histories</td>
<td>• Trends improving or not?</td>
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<td>• Deploying devices correctly for the required service(s)?</td>
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<td>Cluster devices in similar network roles and compare deployment postures</td>
<td>Pinpoint outliers: non-standard configurations, software versions, and feature sets</td>
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<td>Correlate device data with EoX, PSIRT, field notice bulletins, and customer configurations</td>
<td>Find devices out of compliance with standards and best practices</td>
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What does this look like in the real world?
Analytics -- A Different Technical Experience …..

Conventional

- Enablement → Validation → Troubleshooting
- Heavily utilize CLIs on Cisco devices
- Feature release roadmap for future planning

Analytics Experience

- Automated or manual data collection
- Data processing in the backup
- Data interpretation to gain the insight

What can you do on your network and how to do it?

What can you learn from your network?

What should you do on your network?
Analytics – Enables a New Way to Measure Networks

Network Deployment Measurement via **Consistency**, **Complexity**, and **Disruption** Indexes

Network Health Measurement via Network **Performance** Index

**Trend** indication, **Peer** Comparison, and **Industry** Benchmarking
Analytics -- Network Deployment KPIs:

Network Disruption Index

- **A measure of a severity of network disruption**
- **Data Source:** Cisco Service Request Data Base
- **Algorithm derived from**
  - Service request severity
  - Time to resolution
  - Escalation level
  - Outages
- **Benchmark against yourself, peers, and industry with trend report**
- **KPI granularity:**
  - Network vs. HW/SW/Operations
- **Between 1 - 10**

Network Consistency Index

- **A measure of how devices performing similar functions are similarly deployed**
- **Data Source:** Customer Network Data
- **Algorithm derived from**
  - Device HW choices
  - Device software choices
  - Technology configurations
- **Benchmark against yourself**
- **KPI granularity:**
  - Network vs. Families/Roles
- **Between 1 – 1000**

Network Complexity Index

- **A measure of number of features enabled with different complexity weights**
- **Data Source:** Customer Network Data
- **Algorithm derived from:**
  - Features enabled
  - Feature complexity weight by domain experts in Cisco
- **Indication of network technology enablement**
- **KPI granularity:**
  - Network vs. Families/Roles
- **Between 1 – 1000**
If you have a highly complex network, what are the expectations on Consistency and Disruption Indexes?

If your network is not stable at the level your business requires, what may you see from your consistency and complexity indexes?

If your network consistency is improved by recent SW consolidation, what may you also experience from your network disruption and complexity indexes?
Analytics → Network Health KPI:

Data Source: Customer Network Data

Algorithm derived from:
- Network exceptions
- Cisco best practice

A Measure of how well your network scores against Cisco Best Practices

- Tracks the progress of business critical deliverables – Compliance, Risk and Problem Management
- Benchmark against yourself
- Scored between 0 – 100

Network Performance Index

Analytics

Customer Network Data

Algorithm derived from:
- Network exceptions
- Cisco best practice

A Measure of how well your network scores against Cisco Best Practices

Network Performance Index

Compliance Management
- CONFIG BP
- CUSTOM CNFG
- SW COMP

Risk Management
- PSIRT
- HW Field Notice
- HW EoX

Problem Management
- SYSLOG
- AUDIT
Analytics – What Beyond KPIs ….

Use HISTORY to predict FUTURE
( Disruption Trend Analysis)

Compare NOW with PAST
(Consistency Change Management)

Position yourself in competition
( Disruption Peer Comparison & Industry Benchmark )
Which KPI uses Cisco Service Request as data source?
Which KPIs use Customer Network Data as data source?

Data Process
(Validation, Analyze)

Data Collection

Cisco Data Center

Business User

Report
End-to-End Security

Collector on Customer Network:
- Hardened
- No root access
- Password policy enforcement

Transport to Cisco Data Center:
- AES 128-bit data encryption, and HTTPS or SSL connection
- Sensitive credentials removed before transport

Cisco Data Center:
- Only accepts connections from registered systems
- Secure Cisco IT lock-and-key facility

Network Analytics Portal
- Cisco.com credentials
- User can see only their data
Any Questions?
Analytics – Network Deployment Use Case:

Your network is dynamic on technology, size, HW, etc.

Minimizing network disruption is time & resource consuming

Communication challenges on the progress and priority

Need a multi-dimension approach to analyze my entire network

Need an automated way to pinpoint and prevent problems

Need a simple but powerful report to management team
Solution – Cisco Analytics for Network Deployment

- Enable Data Collection
- Gain analytics portal access
- **Periodical** network deployment analytics exercise
  1. Get disruption index and **trend**
  2. Get disruption peer comparison
  3. Get Consistency and Complexity Scores
  4. Identify Consistency outliers
  5. **Prioritize** top outliers
  6. Fix top outliers on SW and configuration
  7. Generate report
- Aggregate report and **track** the change activities

**Learn from your network about what needs to be done first and apply your knowledge to deliver**
Step 1: Get Network Disruption Index

- Highs and lows indicate network instability
- Allows you to select the most disruptive hardware and SW by product families

- Granularity further classifies the hardware, software and operational disruption percentage
Step 2: Get Incident Benchmarking

- Provides insights about peer and industry network stability
Step 3: Getting consistency and Complexity Indexes

- Higher consistency score means better consistency
- Low complexity score means less complex network
Step 4: Finding Inconsistent Devices (Outliers)

- Drill down displays outliers within specific groups of devices or functional roles
- Product family view also available for roles
- Score also determines focus area
Step 5: Prioritize the Top Device Outliers

- Further drill-down displays the actual device outlier(s)
- Provides ability to find out if it's hardware, software or feature outliers
Step 6-1: How to fix these outliers? – Software

Device details view provides insight into next steps and possible remediation.

Software analysis recommends a different image than the one currently deployed.
Step 6-2: How do I fix these outliers? – Features

Provides insights about feature change
Change Analysis and Tracking

Historical change analysis allows you to detect any network changes and control risk.

Provides complete visibility of hardware, software and feature changes.

See the impact to consistency of any change.
Change Analysis and Tracking – Feature Changes

75 feature changes on 186 devices between July’12 and Feb’13

Shows the exact breakdown by feature

Feature changes have negative impact on feature consistency

Impacts overall network consistency
Analytics – Network Deployment Customer Story

Telecom Giant Revitalizes Network Using Cisco Network Analytics

Situation

- Leading telecom in U.S. with 45 million+ customers
- IP network supports 12K+ businesses
- Diverse customer base causes fragmentation in network devices and software versions
- Complexity and instability in networks hinder business operations

Goal

Standardize software versions across all Cisco GSRs and stabilize configurations in the network

Benefits

- +13% Customer Satisfaction
- +12.5% Network Consistency
- -62% Network Disruption
- Enhanced Operational Productivity and Quality
Any Questions?
How do I identify network exceptions automatically:
- Devices with non-recommended configurations or software release,
- EoX devices,
- Devices with PSIRTs

Based on these network exceptions, how do I rate my network?

How do I prioritize and fix these issues and report to my management?
Solution – Cisco Network Performance Analytics

- Enable data collection
- Gain analytics portal access
- Periodical network health analytics exercise:
  1. Get NPI score
  2. Identify network exceptions
  3. Filter network exceptions
  4. Prioritize and create project
  5. Remediate
  6. Report capability (executive dashboard)
- Measures and tracks risk and compliance over time
Step 1: Get Network Health Index (NPI)

- All published device exceptions (the ones you care about most)
- Exceptions are weighed
- Deliverable weight impacts your score
- Device importance impacts your score
- Attributes impact score
- Trend allows you to monitor the progress

This is your score and not a generic algorithm
Step 2: Viewing all network exceptions
(Network Improvement Plan)

- Shows all network exceptions – source, impacted device, history, status and more
Step 3: Filtering Exceptions Based on Business Need

- Several Exception filtering options
  - Network element criticality
  - Exception priority
  - Deliverable priority
  - Key Performance Indicators
  - Exception Attribute priority
  - Hostnames, IP, OS and more
Step 4: Prioritize, Create, and Assign Projects

First filter your critical exceptions

Create and assign projects

Export available for reporting
As exceptions are resolved, NPI scores improve
Step 6: Metrics and Reporting – Impact on Network Health

(Executive Dashboard)

- Computed score from all network exceptions against Cisco Best Practices
- Scores between 0-100
- Measures and tracks the progress of business critical deliverables – Compliance, Risk and Problem Management

One look at the Executive Dashboard and you instantly know how well your network scores against Cisco Best Practices
Any Questions?
Key Takeaways

- Customer use of mobility, social media, video, telemetry, and cloud services increases demands on your networks

- Network Analytics – Learn from your network and prioritize your network optimization activities

- Cisco’s visualization analytics deliver faster insights than scripts/spreadsheets:
  - Lower your operational costs by improving network consistency and tracking network changes
  - Reduce network downtime and optimize policy and best practice compliance
  - Minimize network disruptions and gain competitive edge against peers

“When you think of network optimization, think Cisco Analytics”