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Resolving Network Faults Faster through Automating Entire Fault Management Process.

Automated Fault Management

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BRKOPS-2100

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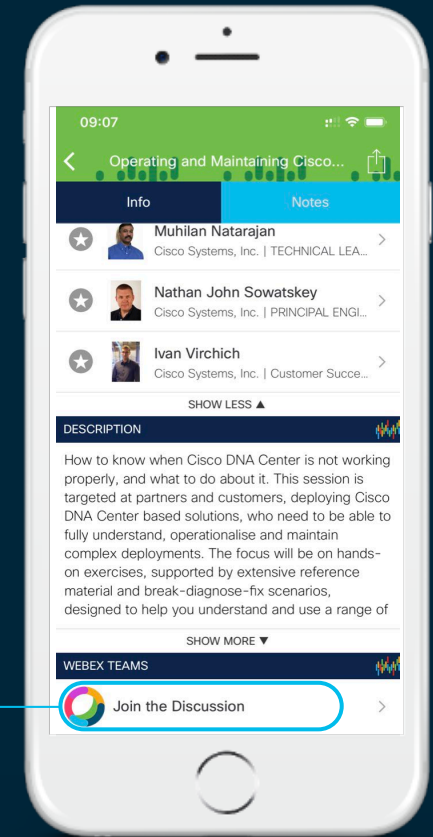
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Business Critical Services: The Next Generation of Optimization Services

Cisco Business Critical Services: New Capabilities



Analytics

- Trending, anomaly detection, KPI management, and preemptive and predictive recommendations
- Near real-time reporting via online portal

Outcome:
Informed decisions



Automation

- Automated fault management: detection, collection, reporting, and notification
- Solution Validation automation and network replication
- Automated software upgrades and large scale configuration changes
- PCI, HIPAA, SOX, ISO, and other compliance audits

Outcome:
Lower complexity



Compliance and Remediation



Security

- Threat Management: Incident response, threat hunting, and vulnerability assessments
- Strategy & Planning: Segmentation design, program maturity, and architecture assessments

Outcome:
Threat protection

Where am I now ? Where I want to reach.



How to identify critical faults quickly?

What issues to prioritize?

How to get faults resolved quickly?

How to Improve Uptime and Performance?

I can fix problems faster.

I can work on high complex and meaningful issues.

I have time to learn new technologies.

Agenda

- Business Problem
- What is AFM
- Solution Architecture
- Dashboard and Demo
- Case Study
- Transition from Expert system to Machine Learning
- Conclusion

Key Message of the Session



Real time Fault monitoring and Log Collection



Improve Uptime and Performance



Automated Service Request Creation and alert notification



Reduce Time to Resolution

Fault Detection – Why does it matter?



Challenges

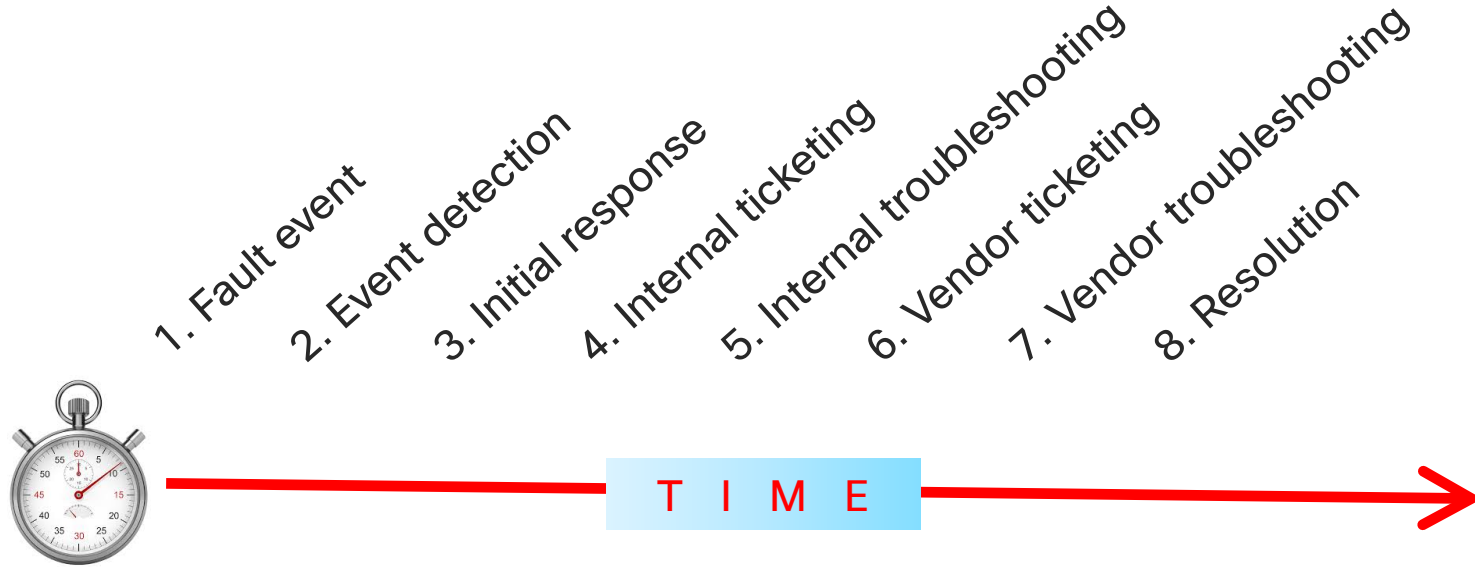
- Problem resolution duration
- Time of engagement
- Prevent outages
- Recommendation availability
- Time taken to gather data



Outcomes

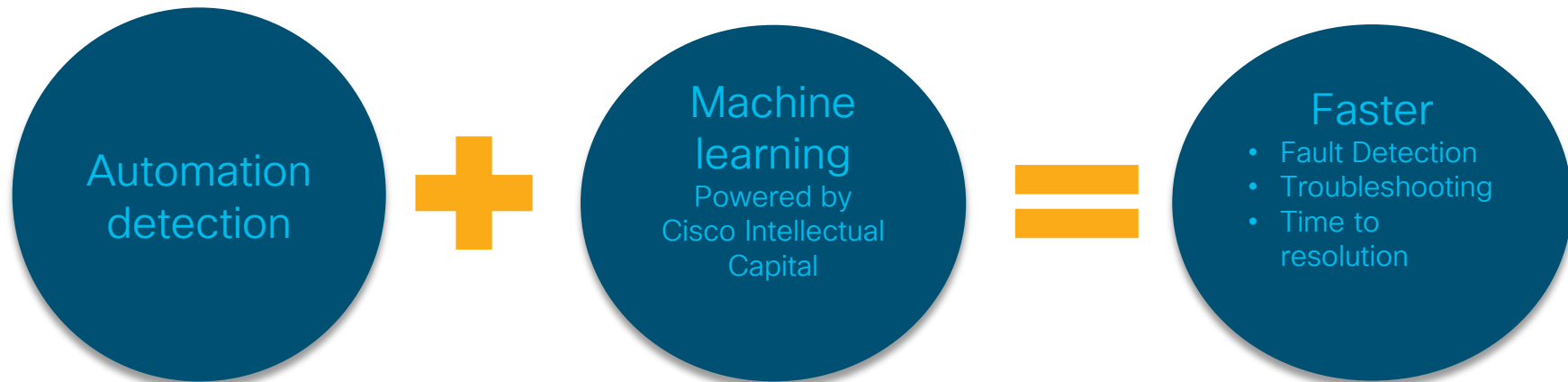
- Improve time to resolution
- Jump start troubleshooting
- Provide Remediation notifications
- Automated collection of data.

Fault Management Timeline



How can the ENTIRE process improve?

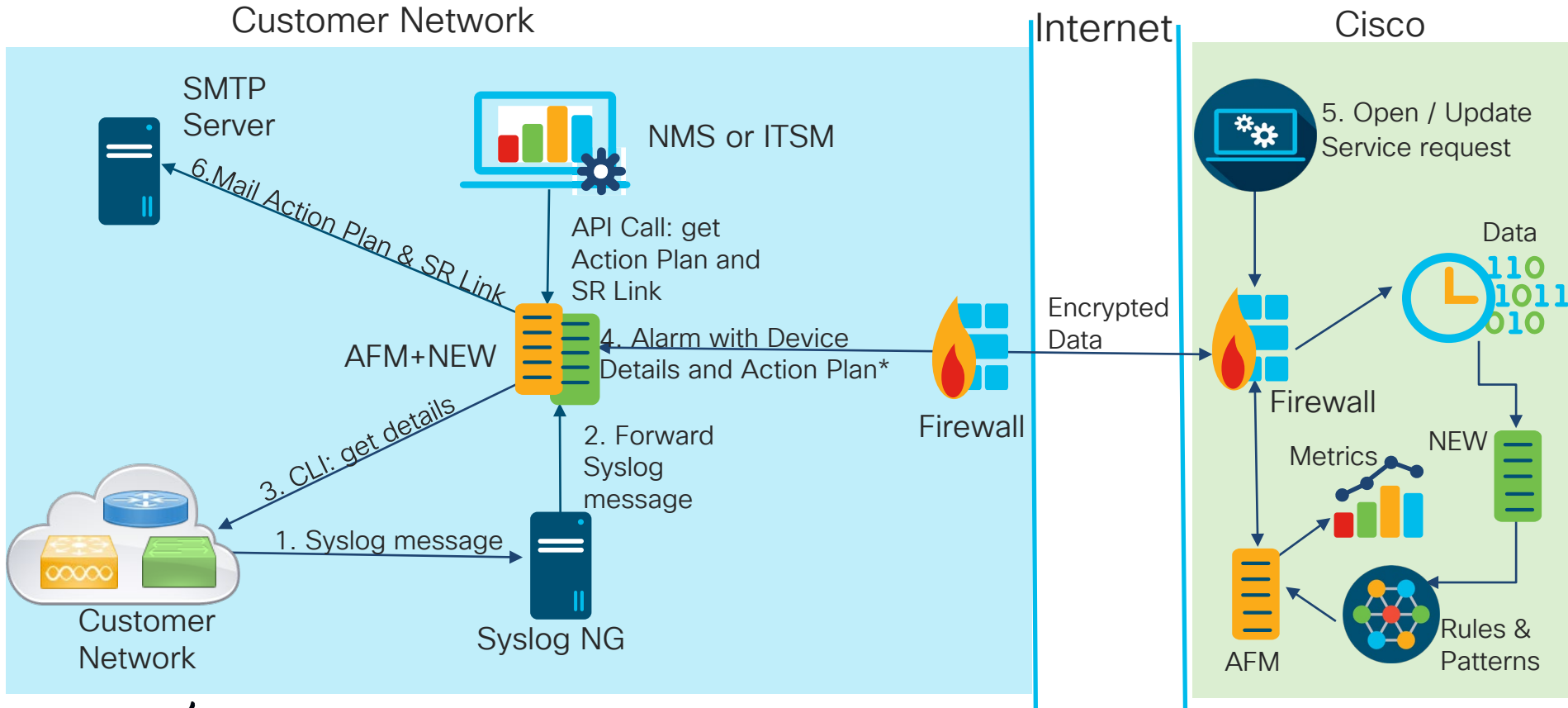
What is Automated Fault Management?



Combines automation detection and machine learning, powered by Cisco intellectual capital to speed fault detection, troubleshooting and resolution times

AFM Architecture

Automated Fault Management Architecture





Dashboard and Demo

Case Study

Case Study – Major Service Provider

Problem

High network outage costs due to:

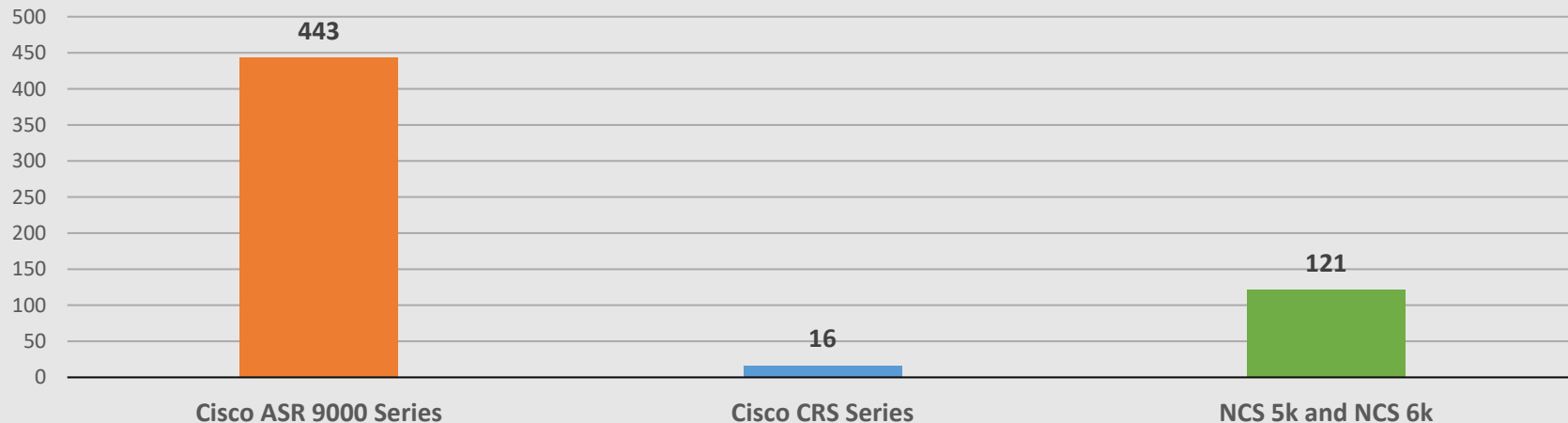
- Time to detect
- Time to diagnose and remediate
- Technical Resource costs

Solution

- Near real time automated outage detection
- Automated collection of detailed failure data
- Cisco Intellectual Capital supplied remediation steps
- Automated support case creation and problem notification

Major Service Provider AFM Statistics

580 TAC cases created b/w Aug'18 - Sep'19



Enabled outcome

- Approximately \$8 million in outage reduction savings over a period of 12 month with ~2100 devices enrolled
- Outage detection time reduced by 75%. Went from 30 - 60 minutes to < 10 minutes.
- Remediation is often similarly shortened for 30 - 60 minutes to < 10 minutes for an average 40 to 100 minutes saved per incident.

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*“\$8 million outage reduction
saving over 12 months”*

*“Outage detection times
reduced by 75%.”*

Major Service Provider

Transition from Expert system to Machine Learning

Expert System vs Machine Learning Model



Expert System

- Proactive processes
- When I see X, I need to do Y.
- When I see X, I need to do Y or Z based on some factor.



ML Models

- Predictive processes
- What events led to X?
- Can I predict X will happen?
- Can I identify noise events?
- Can I learn when we see X, we do Y or Z?



Predictive Model

Syslog Analysis

Selected Customer: /
TEST

Modeling 2.1

Maintenance Window Events

Noise Events

Patterns by Status

Approved Patterns

Rejected Patterns

Pending Patterns

SR derived Target Events



Network Early Warning

Welcome, Rohit Bhagat



SR Target Events

Service Requests Mined Target Events

Product Family

--Select--

Sele...	Target Event	Status	Severity	Open ...	Updated By
<input type="checkbox"/> All	<input type="text" value="Search"/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value="Search"/>
<input type="checkbox"/>	PLATFORM-PFM-0-CARD_RESET_REQ:pfm_dev_sm_perform_recovery_action ...	PENDING	0	59	✓ ✕
<input type="checkbox"/>	PLATFORM-NP-0-NON_RECOVERABLE_SOFT_ERROR:set prn_server_ty %HEX ...	PENDING	0	36	✓ ✕
<input type="checkbox"/>	PLATFORM-NP-0-LC_RELOAD:%other had %XXX fast resets within an hour initiat...	PENDING	0	14	✓ ✕
<input type="checkbox"/>	PLATFORM-DIAGS-0-LC_NP_LOOPBACK_FAILED_TX_PATH:set online_diag_lc ...	PENDING	0	13	✓ ✕

Syslog Analysis

Selected Customer: /
TEST

Modeling 2.1

Maintenance Window Events

Noise Events

Patterns by Status

Approved Patterns

Rejected Patterns

Pending Patterns



Network Early Warning

Welcome, Rohit Bhagat

Pattern Details :

Target Event

%PLATFORM-PFM-0-CARD_RESET_REQ:pfm_dev_sm_perform_recovery_action card reset requested by process id %HEX prn_server_ty fault sev %XXX target node %other compid %MEM_SHORT_ADDRESS device handle %HEX condid %XXX fault reason persistent initialization failure

Product Family

Cisco ASR 9000 Series Aggregation Services Routers

Pattern

%OS-SYSMGR-2-REBOOT:reboot required process prn_server_ty reason maximum restart attempts exceeded for prn_server_ty
%PLATFORM-ENVMON-4-CBC_WDOG_EXCEED_THRESHOLD:cbc on node %other has not seen watchdog toggle in at least %TIME_UNIT
%PLATFORM-NP-0-INIT_ERR:in spite of %XXX cold restarts np init unsuccessful...exiting!!
%PLATFORM-SHELFMGR-6-NODE_STATE_CHANGE:%other %other state bringdown
%PLATFORM-SHELFMGR-6-NODE_STATE_CHANGE:%other %other state rommon

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Customer Benefits

- ✓ Leverages library of signatures
- ✓ Better Correlation
- ✓ Delivers remediation plan
- ✓ Improves Uptime
- ✓ Reduce lost revenue
- ✓ Ultimately reduced Mean Time To Resolve (MTTR)



Key Message of the Session



Real time Fault monitoring and Log Collection



Improve Uptime and Performance



Automated Service Request Creation and alert notification



Reduce Time to Resolution

References

Optimization Services:

- <https://www.cisco.com/c/en/us/services/optimization.html#~benefits>

BCS Services:

- <https://discover.cisco.com/en/us/services/guide/businesscriticalservices>

AFM :

- <https://www.cisco.com/c/dam/en/us/services/collateral/services/bcs-afm-aag.pdf>

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