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You make **possible**

# NetDevOps: Application-to-Network

## Automated & Programmable Performance Insights

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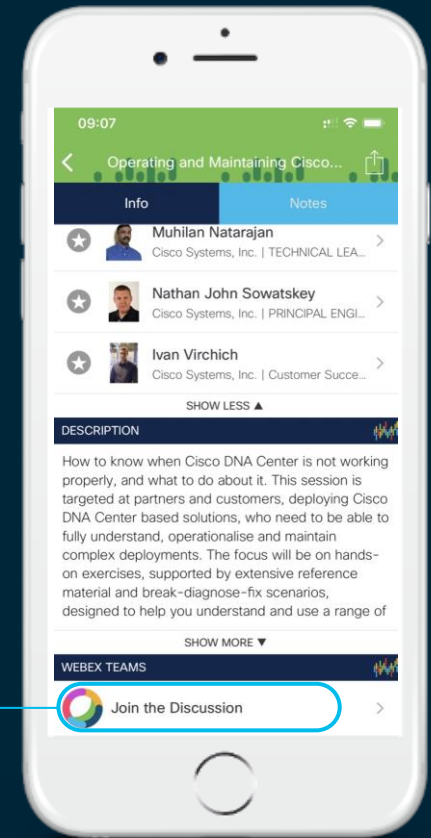@kshah_us

DEVNET-2204

Barcelona | January 27-31, 2020

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with the speaker after the session

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# Session Objectives

- Introduce Application Performance Monitoring with AppDynamics

- Introduce How Central Nervous System Can be built with Insights from App & Network together for better business outcomes

- Provide examples of how correlated Insights can be used to solve network issues or to program the underlying infrastructure for resource planning & better user experience

# Agenda

- Objective

- Application Performance Monitoring Introduction & Demo

- Central Nervous System of IT Operations with AppDynamics

- Case Study: NetDevOps with AppD & Viptela SD-WAN

- Summary, Q &A

- Resources

# Application & Business Performance Monitoring with AppDynamics

All your
customers
are
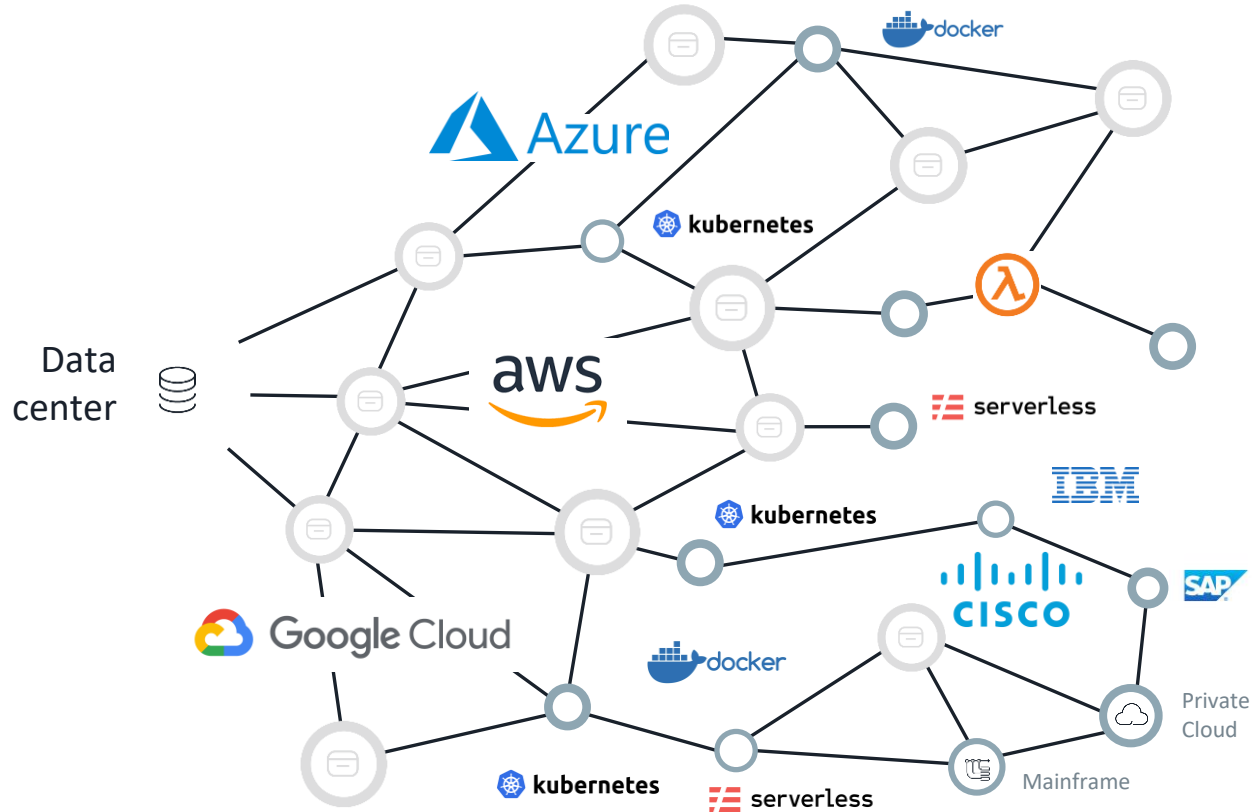building software

User want speed and simplicity

62%
Say their expectations are increasing

Digital leaders have set a high bar

# And IT's even more complex now

# You Need to Keep Pace with Your Customers!
## Every Business is a Software Business

*Do you know what our busiest bank branch is in the UK? It's our mobile app on the 7:15 am train to Paddington.*
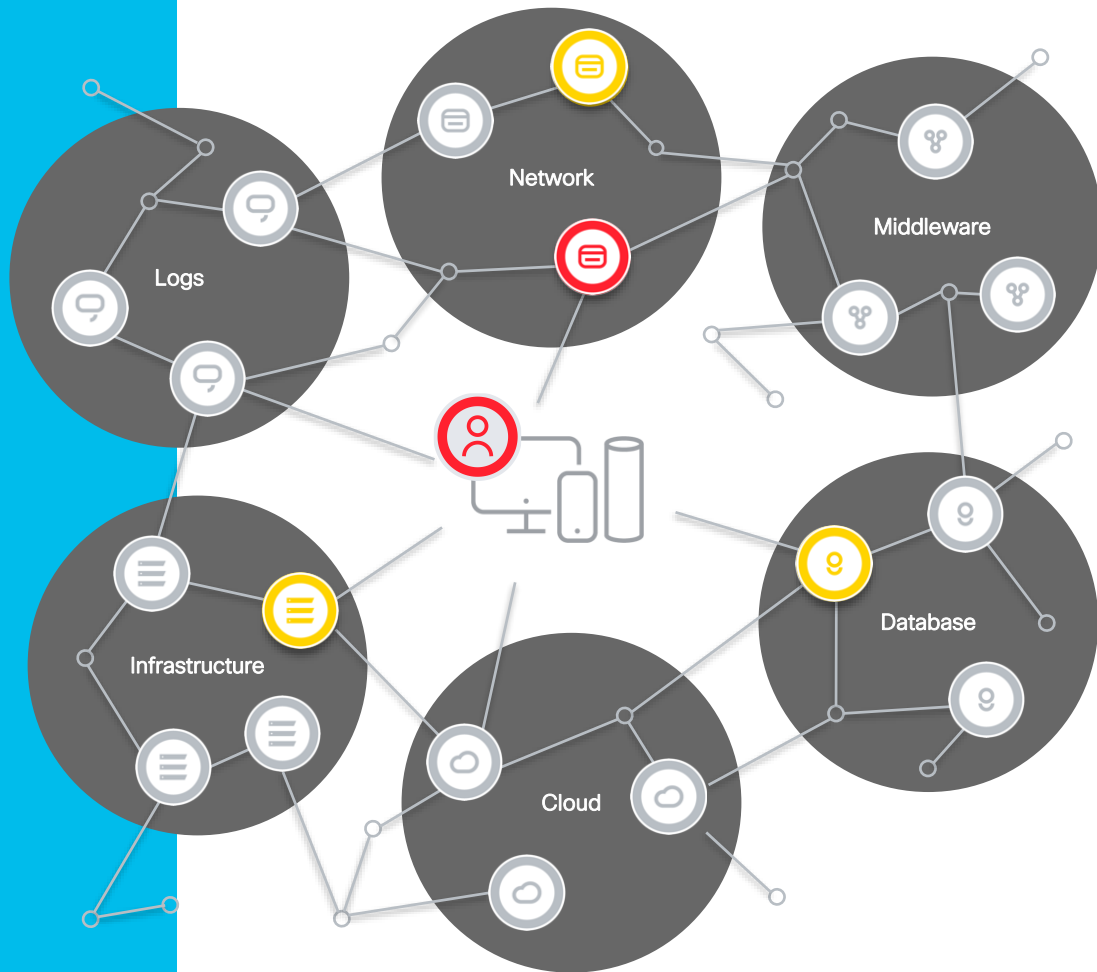
**RBS**

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# Traditional Siloed Tools Solve Siloed Problems

Siloed problems are identified by individual monitoring tools
*'Finding the red'*

Multiple minor issues when combined may contribute to poor user experience

Siloed tools struggle to identify these issues
*'Finding the yellow'*



Network

Middleware

Logs

Infrastructure

Cloud

Database

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# Application Intelligence with AppDynamics

*Move Fast, Follow Everything & Focus on What Matters Most*

| Visibility | Insight | Action |
|---|---|---|
| Automated Discovery & Dynamic Baselines for Production Applications *Every User, Every Transaction, Near Real Time* | Live Customer Journeys for every Business Transaction | Proactive Alert on Realtime Business Metric |
| | Automatically Collected, Fully Correlated Business Context of anomalies, trends & patterns | Programmable Actions to adjust resource allocation |
| | | User Impact Analysis due to new code deploy |

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# AppDynamics Production Architecture

**Application Intelligence Platform**

- SaaS/On-Prem Controller
- User Interface & Reporting
- Correlated transaction view
- No code changes required*
- <Low overhead in production

One-Way HTTP/S

One-Way HTTP/S

One-Way HTTP/S

Remote JDBC

**End User Agent**
Browser / Mobile / IoT

**Application Agent**
Java .NET. PHP Node.js C++ Python Go Extensions SAP

**Server Agent**
OS/Containers/Clusters

**Database**
SQL/NO-SQL/CLOUD

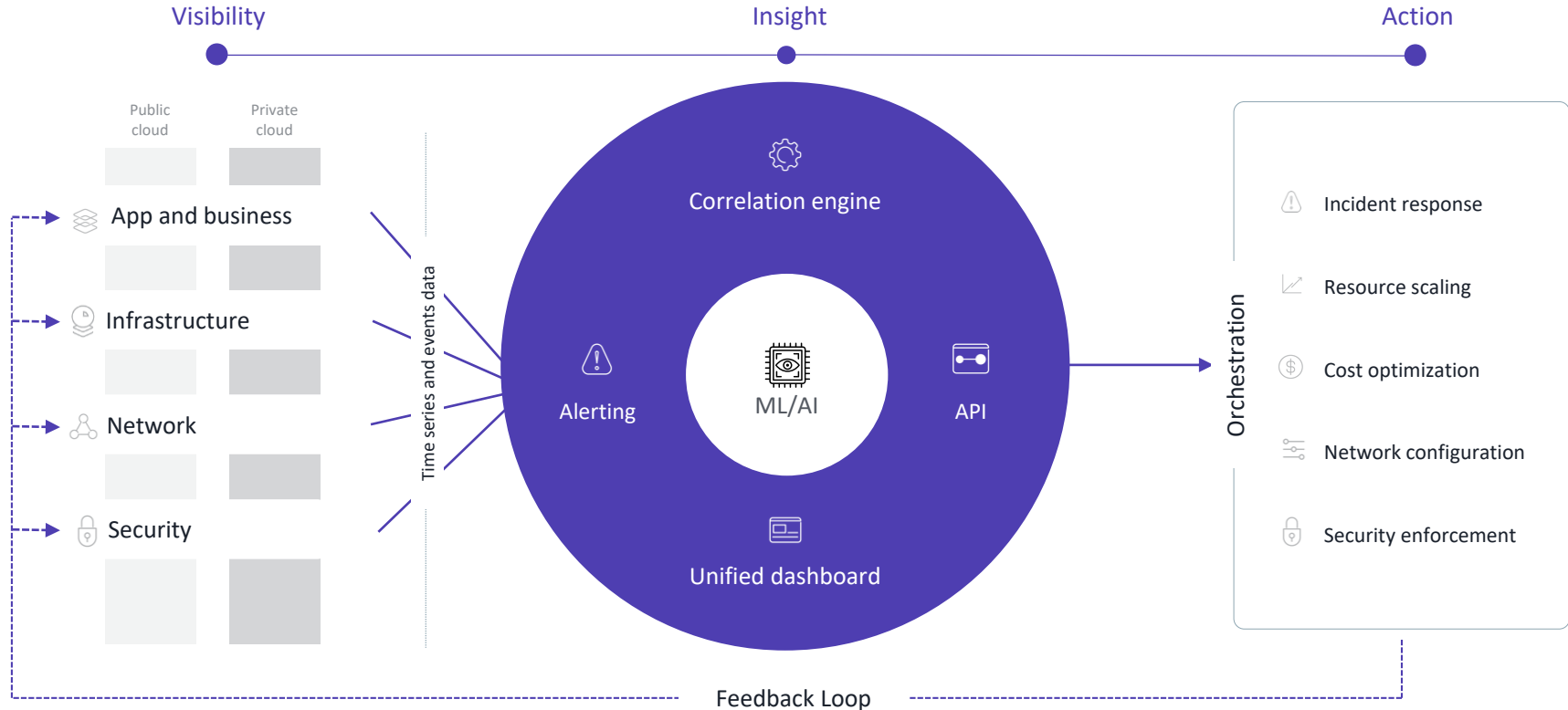*Exceptions apply

# AppDynamics Demo

# The Central Nervous System of IT Operations

# The Central Nervous System for IT Operations

**Visibility**

**Insight**

**Action**

Public cloud

Private cloud

App and business

Infrastructure

Network

Security

Time series and events data

Correlation engine

ML/AI

Alerting

API

Unified dashboard

Orchestration

Incident response

Resource scaling

Cost optimization

Network configuration

Security enforcement

Feedback Loop

# Three Scenarios Discussed

**Data Center**: Application & Network visibility via Integration with Application Centric Infrastructure (ACI)

**Multi-Cloud:** Application Resource Management (ARM) including Compute, Storage etc. in private or public clouds
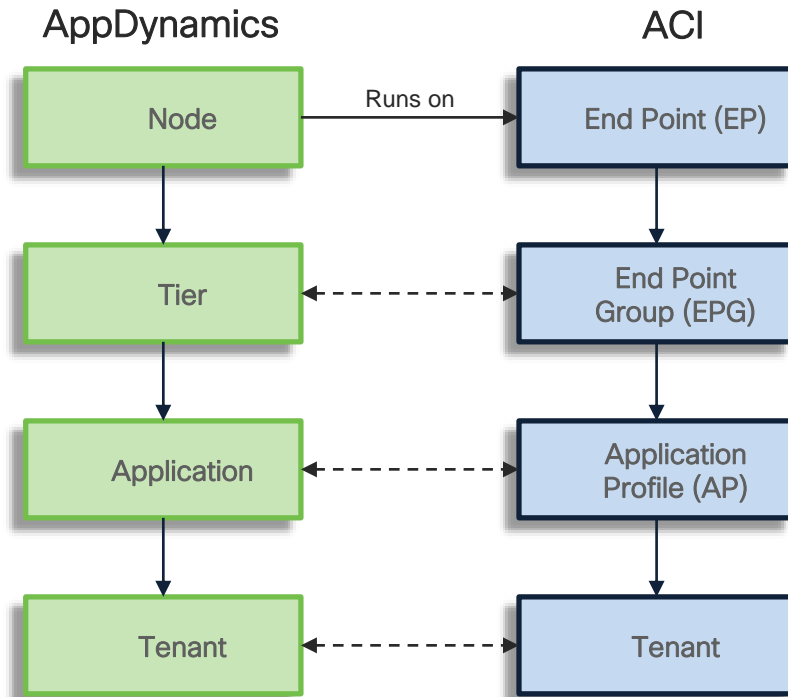
**SD-WAN:** Granular Application Awareness drives better End User Experience across SD-WAN

# Application & Network Visibility with ACI & AppDynamics

# Tie application context to your network w/ACI*



**Connecting Application & Network Data Models**

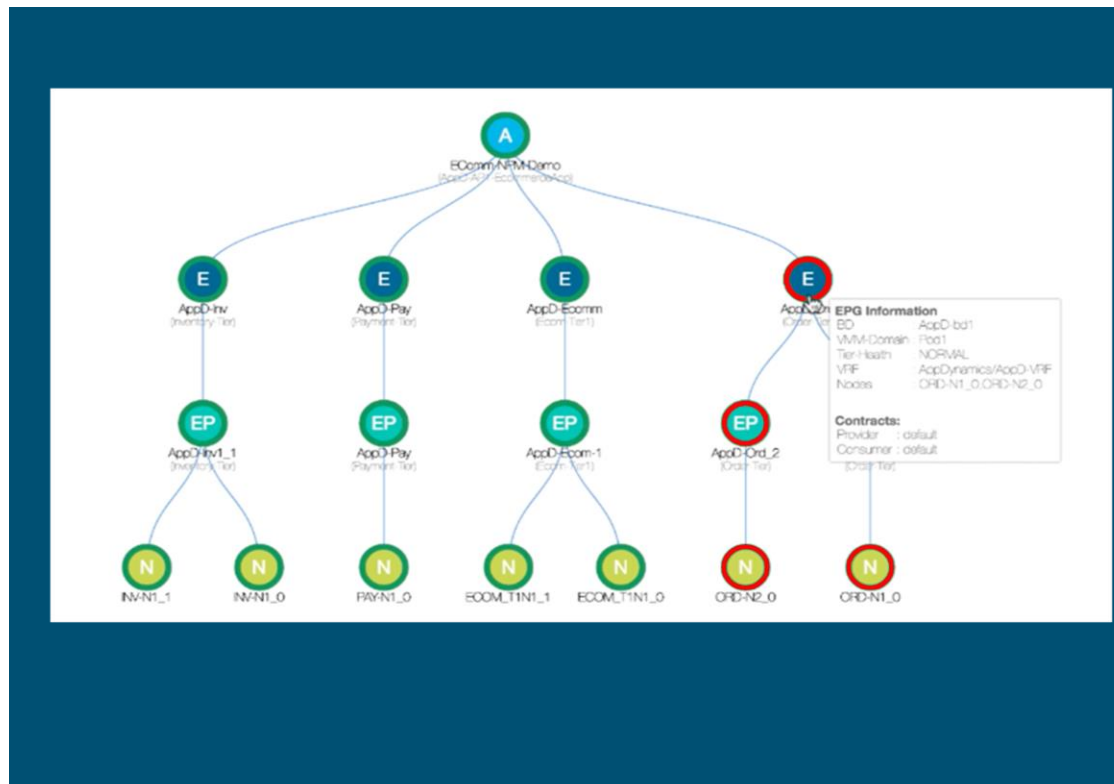| AppDynamics | | ACI |
|---|---|---|
| Node | Runs on → | End Point (EP) |
| Tier | ← | End Point Group (EPG) |
| Application | ← | Application Profile (AP) |
| Tenant | ← | Tenant |

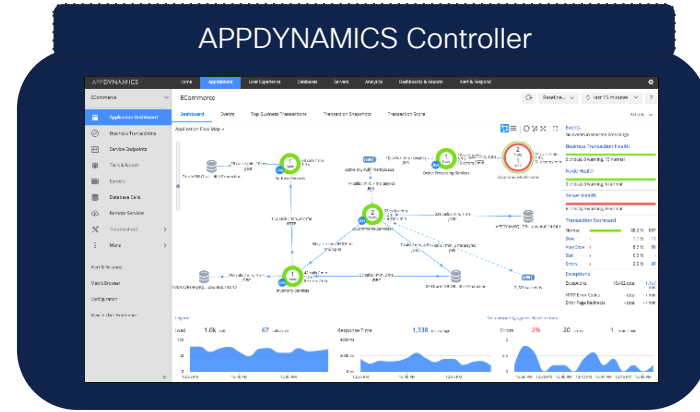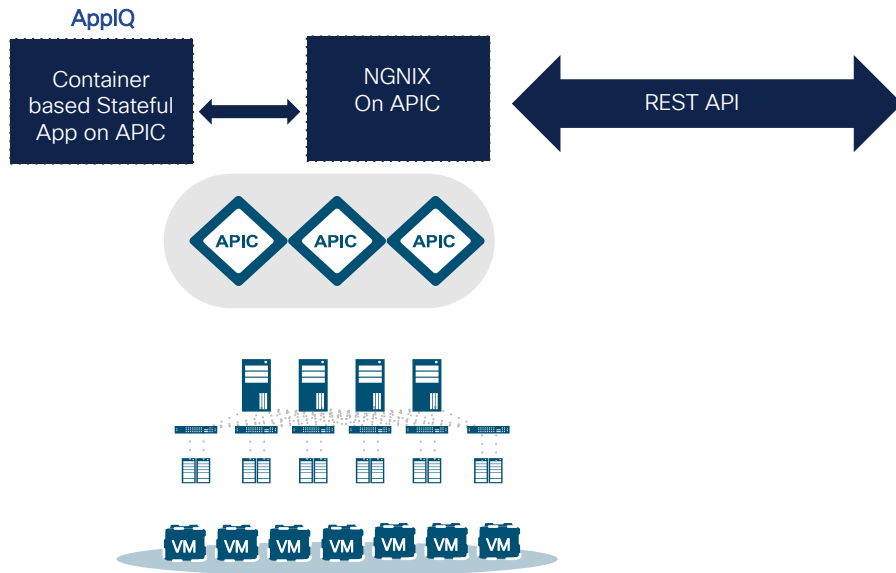ACI--Application Centric Infrastructure

# AppDynamics and ACI Integration Use Cases

Bring application context
to the network

- Faster root cause identification
  and remediation

- Reduce risk of unexpected app
  outages regardless of network
  location

- Better collaboration across
  network  and application teams

# Integration Architecture



ApplQ

Container based Stateful App on APIC

NGNIX On APIC

REST API

APPDYNAMICS Controller

APIC   APIC   APIC

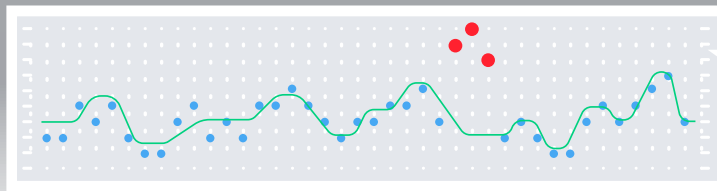# Application Resource Management with CWOM & AppDynamics

# How do you connect the application outcomes with infrastructure design?

–

Customer experience is constantly impacted by workload placement and capacity
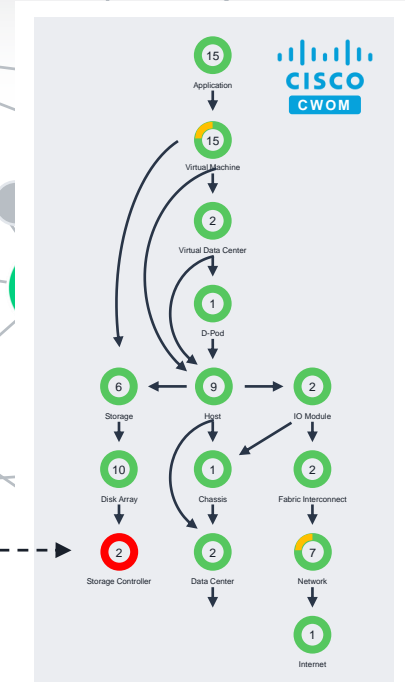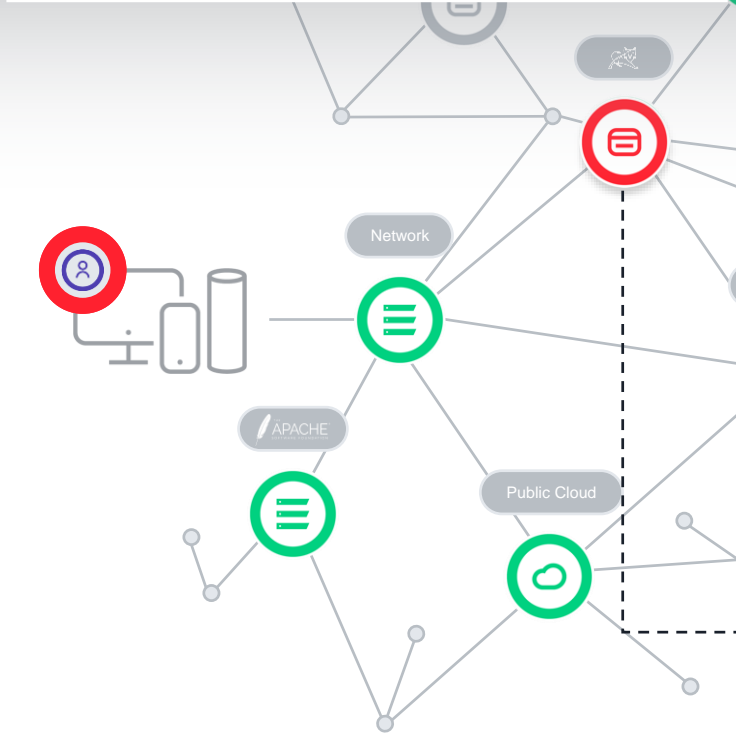
Virtualization
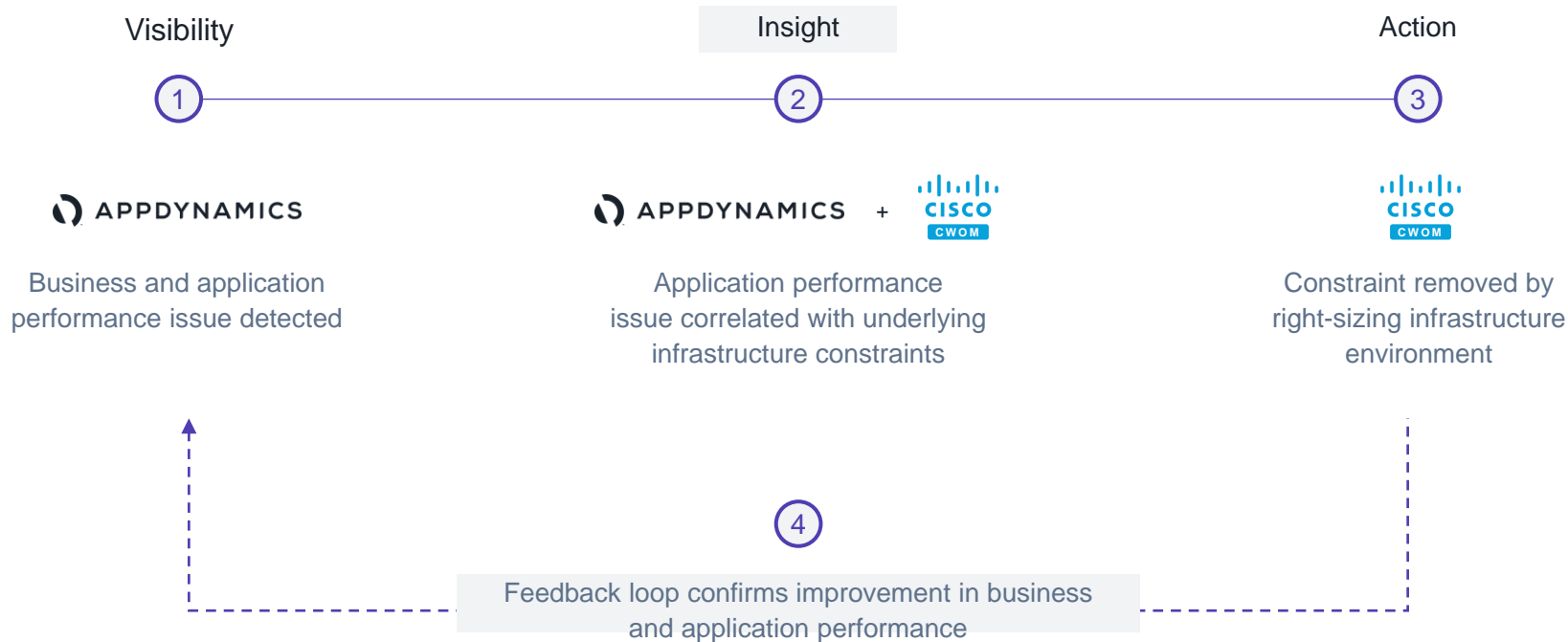
Multi-Cloud

Elastic Containers



## TRANSACTION SCORECARD

| Normal | | 65.4% 0.3m |
|--------|--|------------|
| Slow | | 34.0% 168.7k |
| Very Slow | | 0.5% 2.7k |
| Stalls | | 0.0% 63 |
| Errors | | 0.0% 140 |

# Application Intelligent Provisioning

Challenge: Scaling infrastructure to meet resource demands is manual, slow and complex

| Visibility | Insight | Action |
|---|---|---|

**1** ——————— **2** ——————— **3**

**APPDYNAMICS**

**APPDYNAMICS** + **CISCO CWOM**

**CISCO CWOM**

Business and application performance issue detected

Application performance issue correlated with underlying infrastructure constraints

Constraint removed by right-sizing infrastructure environment

**4**

Feedback loop confirms improvement in business and application performance

APPDYNAMICS + CISCO CWOM

# Application Intelligent Provisioning

## Challenge: Scaling infrastructure to meet resource demands is manual, slow and complex

Visibility

Insight

Action



- Identify slow application response time

- Measure business impact to performance degradation

# Application Intelligent Provisioning

## Challenge: Scaling infrastructure to meet resource demands is manual, slow and complex

Visibility

Insight

Action



Know exactly why the resource is constrained
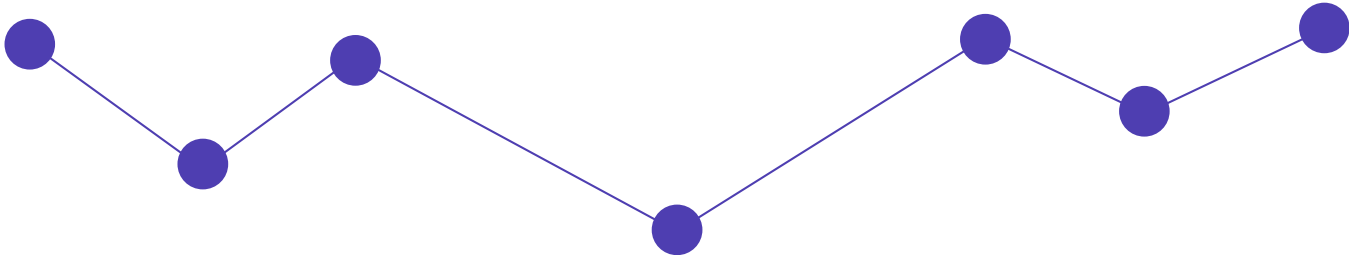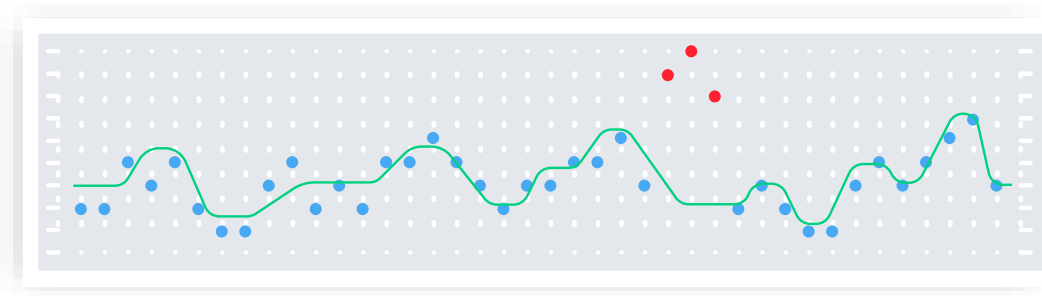
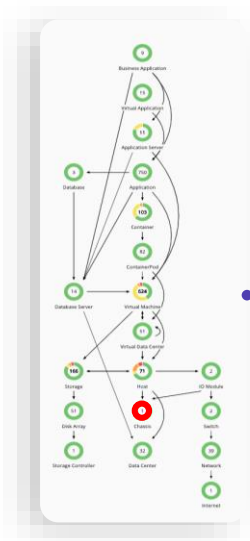Know the right action to take

# Application Intelligent Provisioning
## Challenge: Scaling infrastructure to meet resource demands is manual, slow and complex

Visibility

Insight

Action

Over
Capacity

SERVER CAPACITY

Move    Reconfigure    Start

Underutilized
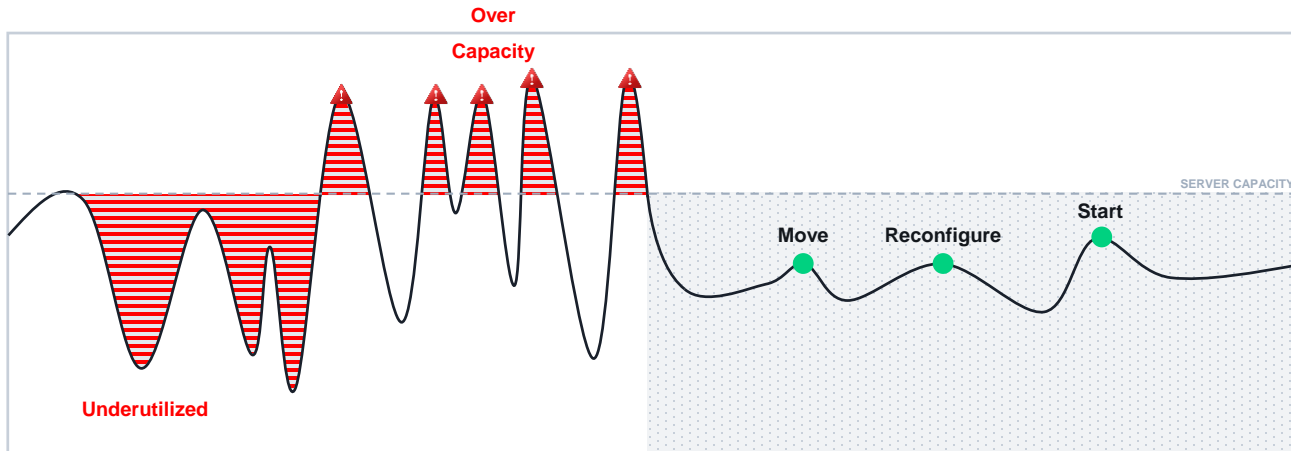
Automate workload placement and sizing to guarantee customer experience

# CWOM and AppDynamics Together

## CIO

Accelerate cloud migration through analysis of compute and storage costs.

Increase utilization of existing infrastructure resources
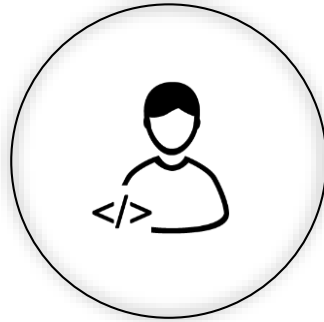
## App Ops

Ensure applications have sufficient resources to function as workload demand increases

## IT Ops

Optimize investment in infrastructure by avoiding overprovision of infrastructure resources

Increased productivity through automation of provisioning actions

# AppDynamics CWOM Demo

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# NetDevOps: AppD with SD-WAN bringing premium customer experiences

*Together with*

Fyllon G. Papadopoulos
Master Architect | Intelligent Networking | SDN & NFV
Verizon Enterprise Solutions

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# Premium Customer Experiences Using App Aware Policy to program SD-WAN Network

**APPDYNAMICS**

Real-Time Performance/Business Data

App                    App Code

Cisco Viptela SD-WAN

Dynamic Policies, Cloud First Management

Browser & Mobile RUM

Apps
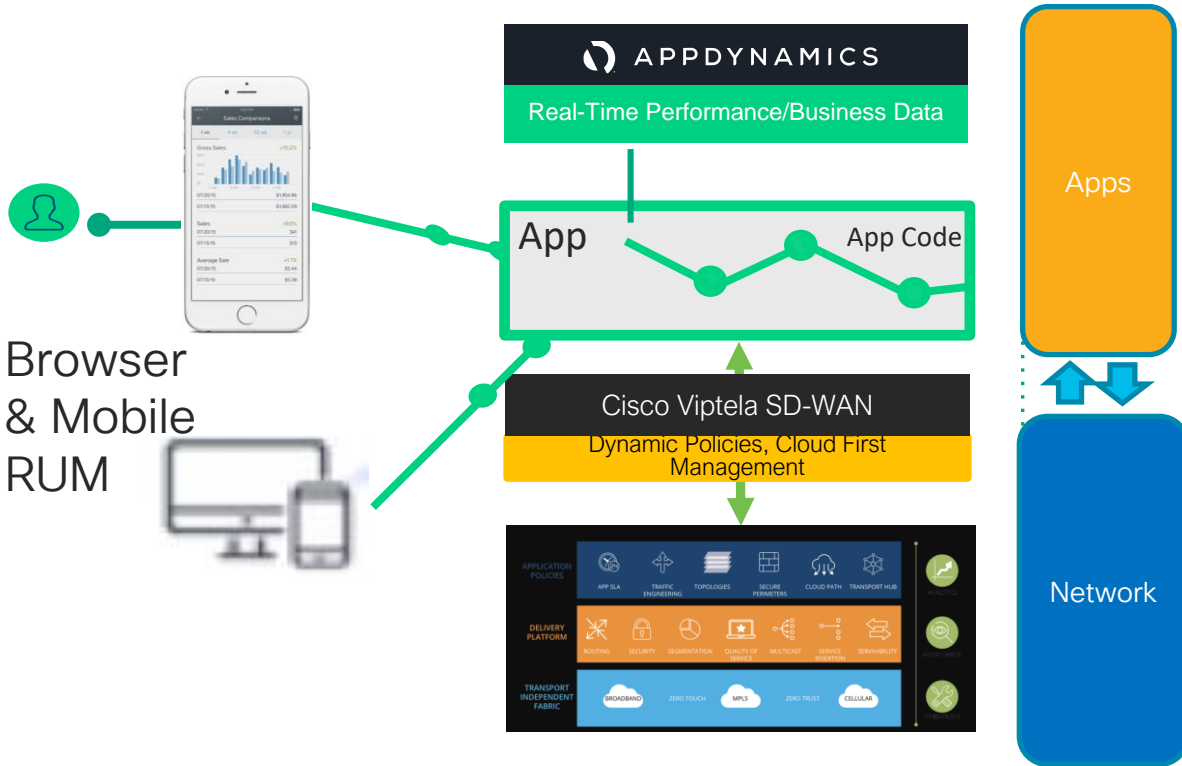
Network

✓ **Improved Customer experience for Critical Applications & Business Transactions**

✓ **End2End Visibility = Better Understanding of Application Health**

\* Current POC Scope

# Automated & Programmable App + Network Service Delivery

## *AppDynamics*
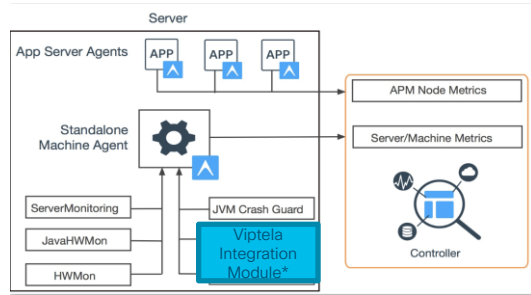


**Dynamic API based Action on SD-WAN**
*Route via MPLS vs. Business Internet, Color Traffic with Higher QoS etc.*



vManage

Viptela SD-WAN
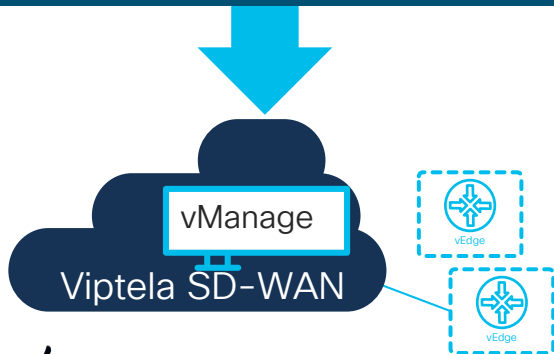
## End User Response Time Trend for Fleet Inc/Branch 22



Improved User Experience results from using Premium Service for App & BT

# NetDevOps Case Study: AppDynamics working with Viptela SD-WAN

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# What will your journey to secure, agile networking be?

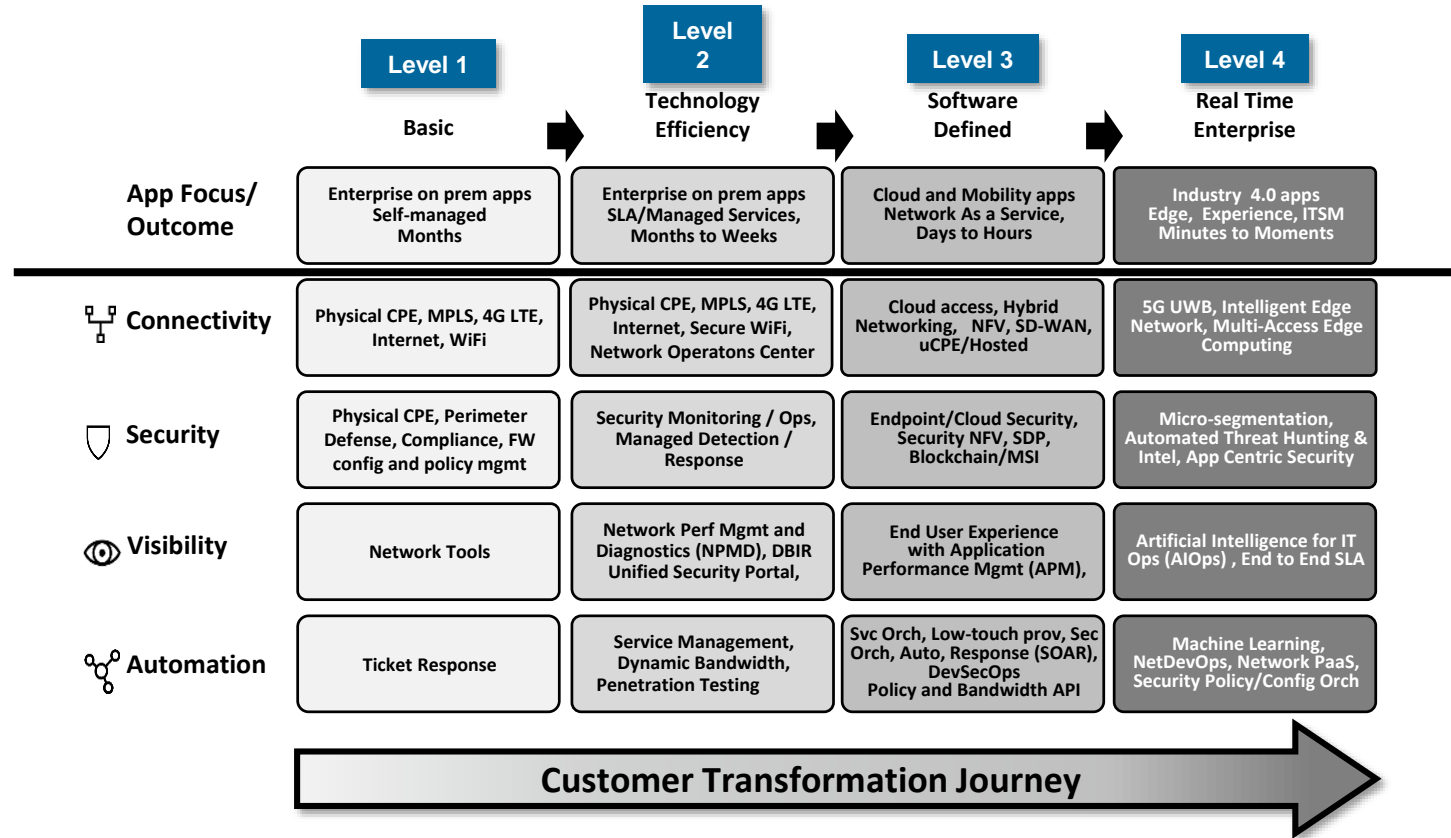| | Level 1 Basic | Level 2 Technology Efficiency | Level 3 Software Defined | Level 4 Real Time Enterprise |
|---|---|---|---|---|
| **App Focus/ Outcome** | Enterprise on prem apps Self-managed Months | Enterprise on prem apps SLA/Managed Services, Months to Weeks | Cloud and Mobility apps Network As a Service, Days to Hours | Industry 4.0 apps Edge, Experience, ITSM Minutes to Moments |
| **Connectivity** | Physical CPE, MPLS, 4G LTE, Internet, WiFi | Physical CPE, MPLS, 4G LTE, Internet, Secure WiFi, Network Operatons Center | Cloud access, Hybrid Networking, NFV, SD-WAN, uCPE/Hosted | 5G UWB, Intelligent Edge Network, Multi-Access Edge Computing |
| **Security** | Physical CPE, Perimeter Defense, Compliance, FW config and policy mgmt | Security Monitoring / Ops, Managed Detection / Response | Endpoint/Cloud Security, Security NFV, SDP, Blockchain/MSI | Micro-segmentation, Automated Threat Hunting & Intel, App Centric Security |
| **Visibility** | Network Tools | Network Perf Mgmt and Diagnostics (NPMD), DBIR Unified Security Portal, | End User Experience with Application Performance Mgmt (APM), | Artificial Intelligence for IT Ops (AIOps), End to End SLA |
| **Automation** | Ticket Response | Service Management, Dynamic Bandwidth, Penetration Testing | Svc Orch, Low-touch prov, Sec Orch, Auto, Response (SOAR), DevSecOps Policy and Bandwidth API | Machine Learning, NetDevOps, Network PaaS, Security Policy/Config Orch |

**Customer Transformation Journey** →

NetDevOps AppD & Verizon Demo (Video)

# Intelligent & programmable networks to drive agility.



SD-WAN Router

Corporate/Branch HQ

MPLS
Secure Internet
Public Internet

Customer Network

SD-WAN Controller

MPLS
Secure Internet
Public Internet

Customer Data Center

Dynamic bandwidth Mgmt.

| Context-based routing | **Application Context** Data routing based on Application | **User Context** Data routing based on user specific data | **Transaction Context** Data routing based on priority of transaction |
|---|---|---|---|
| Network Programmability | Manual Bandwidth Management | Automated, Dynamic Bandwidth Management | |

SDN 1.0

VZ SDN 2.0

# Thank You.

*Think of what*

*we can do*

*for **your** business!*

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# Summary and Q&A

# Summary

➤ AppDynamics provides deep application & Business visibility in near real time

➤ AppDynamics working with other products can provide a true multi-domain visibility & troubleshooting solution

➤ The solutions provide a mechanism to drive your NetDevOps via API & custom code integration

# References

➢ [AppDynamics ACI Integration Documentation](https://docs.appdynamics.com/pages/viewpage.action?pageId=45510337)
https://docs.appdynamics.com/pages/viewpage.action?pageId=45510337

➢ AppDynamics Extensions Library (aka Exchange)
https://www.appdynamics.com/community/exchange/

➢ AppDynamics APIs
https://docs.appdynamics.com/display/PRO45/AppDynamics+APIs

➢ GitHub Repo for AppDynamics
https://github.com/appdynamics

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