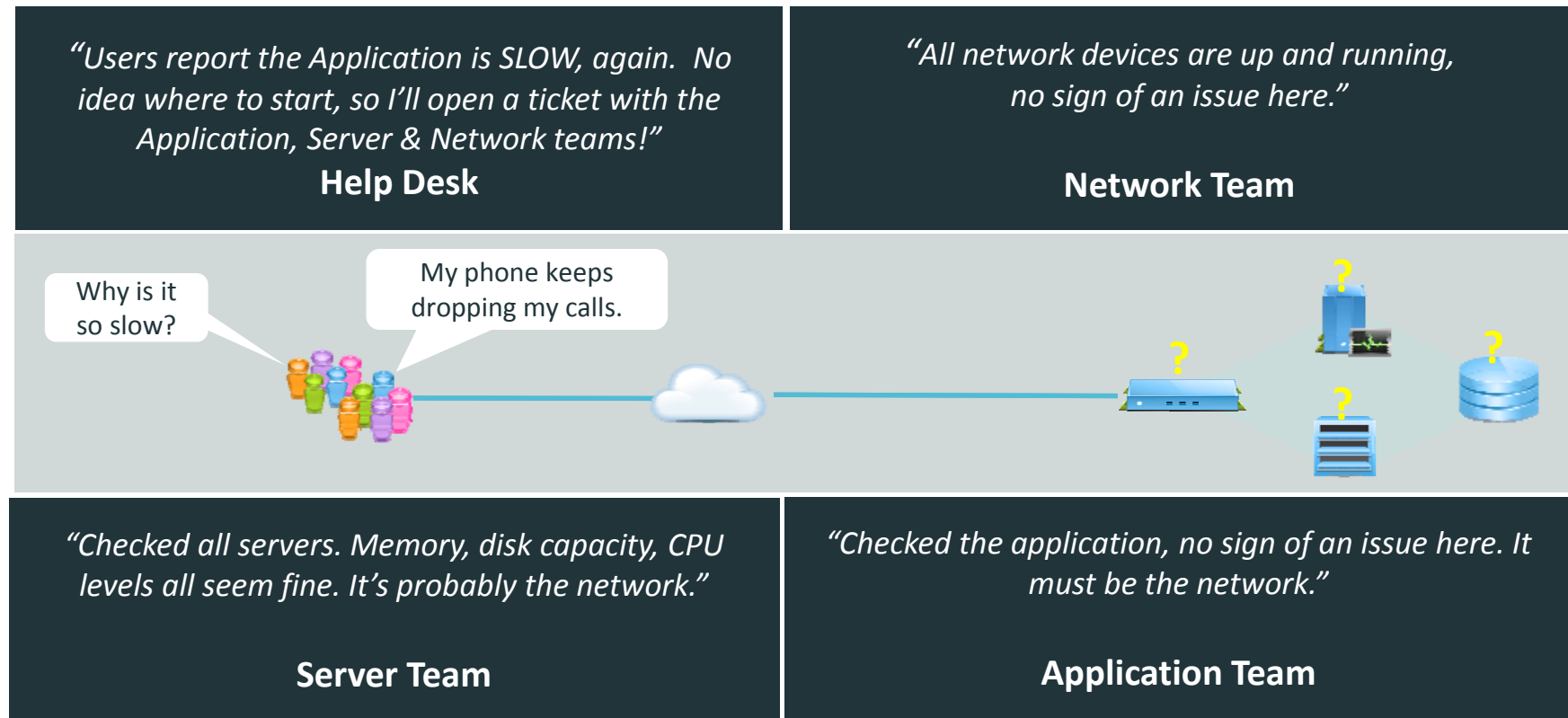# EM DevXchange
UIM / NFA / ADA:
Application-aware Network Monitoring

Tyler Peterson, Senior Principal Product Manager

12th May 2016
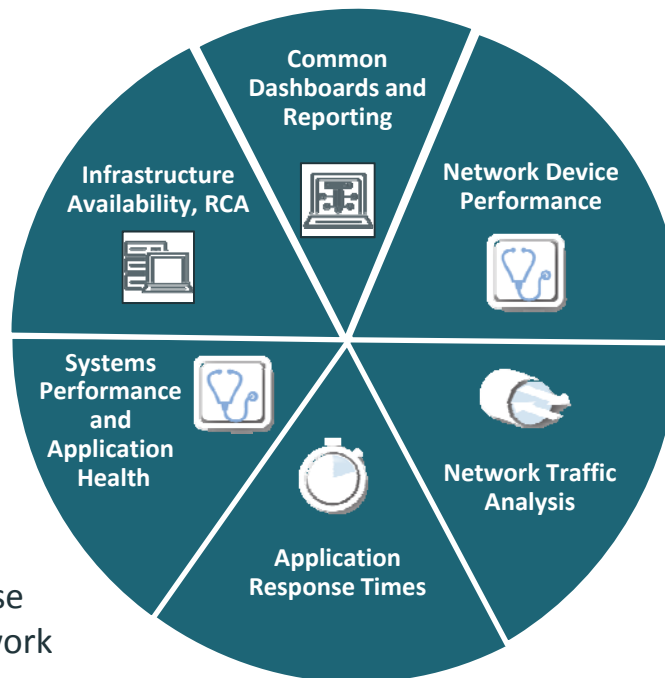
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Today: Organizational Silos and Fragmented Views

"Users report the Application is SLOW, again. No idea where to start, so I'll open a ticket with the Application, Server & Network teams!"
Help Desk

"All network devices are up and running, no sign of an issue here."
Network Team

Why is it so slow?

My phone keeps dropping my calls.

"Checked all servers. Memory, disk capacity, CPU levels all seem fine. It's probably the network."
Server Team

"Checked the application, no sign of an issue here. It must be the network."
Application Team

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Application-Aware Network Monitoring

## When Application Performance is Business Performance

- Ensure high performance and continuous availability with advanced root cause analysis and event correlation

- Visibility into system performance, i.e. CPU, disk, memory, response, etc.

- Visibility into application performance, i.e. Exchange, Citrix, SAP, Java, databases, etc.

- Visibility into application response time to gauge how well the network delivers services to end users

Common Dashboards and Reporting

Infrastructure Availability, RCA

Network Device Performance

Systems Performance and Application Health

Application Response Times

Network Traffic Analysis

- Centralized view of infrastructure health and performance

- Visibility into network performance through SNMP collection

- Visibility into network traffic composition, behavior, utilization and the impact on application performance

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Network Device Performance

Visibility into the impact of network device performance on application delivery

Network Device Performance
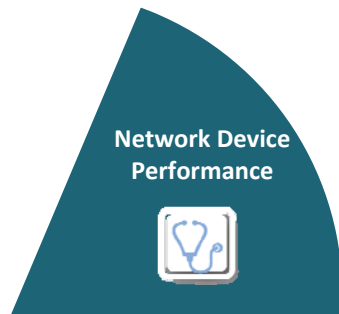
CA Performance Management
For web-scale networks

CA Unified Infrastructure Management
For growth-oriented enterprises

CA Unified Communications Monitor
For voice and video systems monitoring

- What is the health of your network devices?

- How are my devices performing compared to baseline?

- Which interfaces are experiencing high utilization, errors, discards, and other thresholds impacting application delivery?

- How are my QoS queues performing and are they right-sized for my environment?

- How are my network-based synthetic tests performing (IPSLA/Juniper RPM)?

- Why are some voice calls experiencing issues?

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Network Traffic Analysis

Visibility into the impact of application traffic on network resources

CA Network Flow Analysis

Network Traffic Analysis
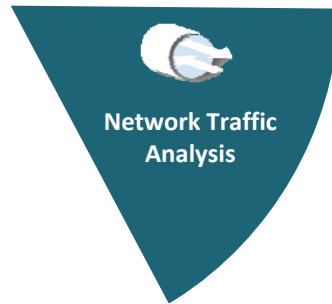
- What are all of the applications running on the network?

- Which applications and hosts are consuming the most bandwidth?

- When do applications consume too much bandwidth?

- Is more bandwidth really going to resolve performance problems?

- How much link capacity is needed in the future?

CA Network Flow Analysis

100% visibility into network traffic and behavior
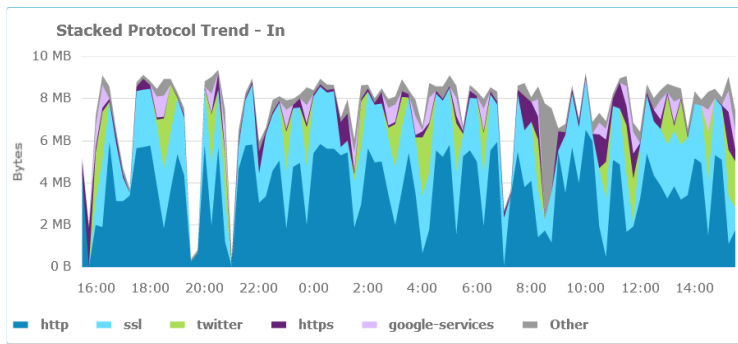
- Visibility into how the network is being used – users, destinations, prioritization

- Single, data center-based collection point

- Accurate historical, real-time and projective capacity account

- Cisco IVT certified for AVC (Application Visibility and Control) enabled devices for rich accounting, classification and reporting of applications

Application Response Time

Visibility into network latency's impact on end user experience

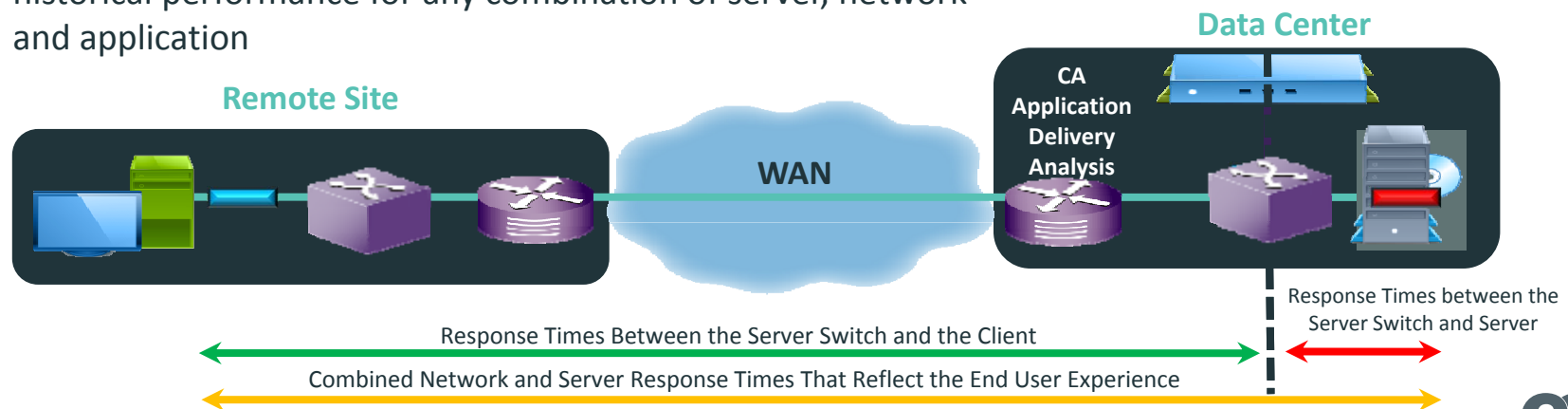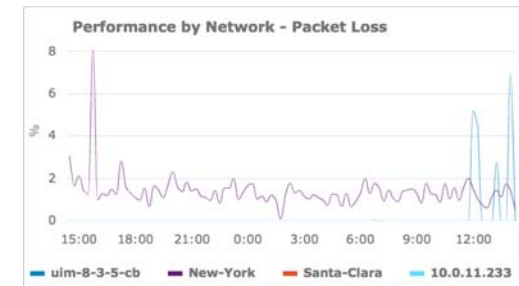**CA Application Delivery Analysis**

Application
Response Times
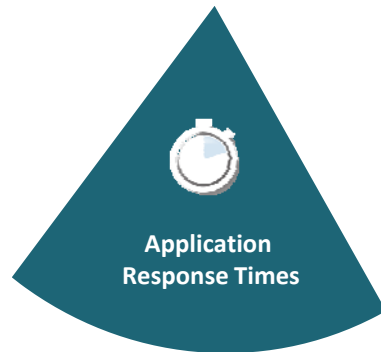
- Is it a network, server or application problem?

- How do I quickly prove that the network is not the cause for poor application performance?

- When did the problem begin and how long has it lasted?

- How many users were impacted?

- Did application response time dramatically improve after QoS routing policies were updated?

- How has WAN optimization improved application performance?

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CA Application Delivery Analysis

Visibility into how well the network is delivering applications

- Provides end-to-end response time broken down to server, network and application domains with support for WAN-optimized networks

- Automated investigation (on-schedule or on-demand) to gather key performance measurements for root cause determination

- Validate the impact of change by comparing current versus historical performance for any combination of server, network and application

Performance by Network - Packet Loss

uim-8-3-5-cb — New-York — Santa-Clara — 10.0.11.233

Data Center

Remote Site

WAN

CA Application Delivery Analysis

Response Times between the Server Switch and Server

Response Times Between the Server Switch and the Client

Combined Network and Server Response Times That Reflect the End User Experience

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Systems Performance and Application Health

Visibility into server and application health's impact on end user experience

**CA Unified Infrastructure Management**

Systems
Performance
and
Application
Health

- Is it a problem with the server or the application?

- How do I quickly prove that the server is not the cause for poor application performance?

- How are system performance metrics, such as CPU, disk, and memory, impacting application performance?

- How is the virtualization infrastructure impacting performance?

- How is the database and specific queries impacting application performance?

Infrastructure Availability, Root Cause Analysis

CA Spectrum

Infrastructure
Availability, RCA
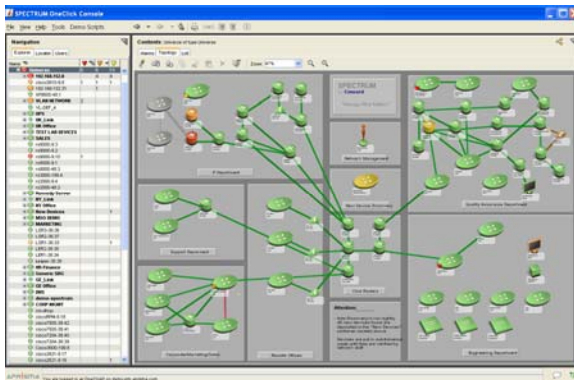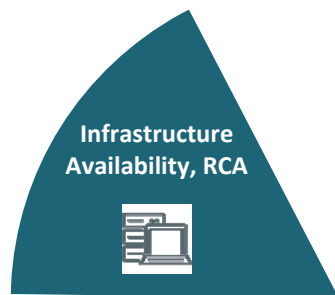
- Is the infrastructure up and running?

- How are my business services functioning? (Not just the underlying infrastructure.)

- How can I automate device discovery and creation of relationships between different infrastructure entities?

- How do I speed up issue detection and remediation by pin pointing the root cause of problems?

- How can I be proactive change management to enable improved visibility and control for my system administrators?

- What configuration change resulted into a problem on a device?

- How do I ensure one tool provides comprehensive visibility across physical, virtual, cloud and SDN environments?

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Common Dashboards and Reporting

Unified view into infrastructure health and performance

Common Dashboards and Reporting

CA Unified Infrastructure Management

- What is the overall health and performance picture of the infrastructure?

- Which applications are consuming the most resources across the enterprise?

- What is the volume for global operations?

- Does the data center have the capacity to handle more servers?

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CA Unified Infrastructure Management
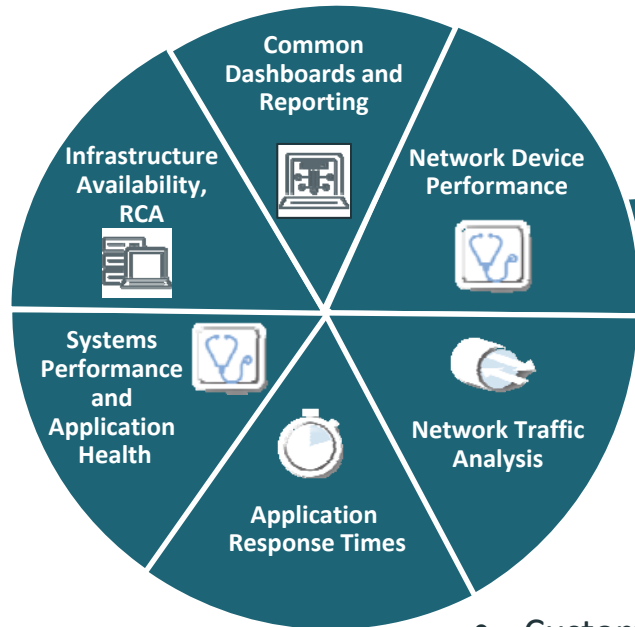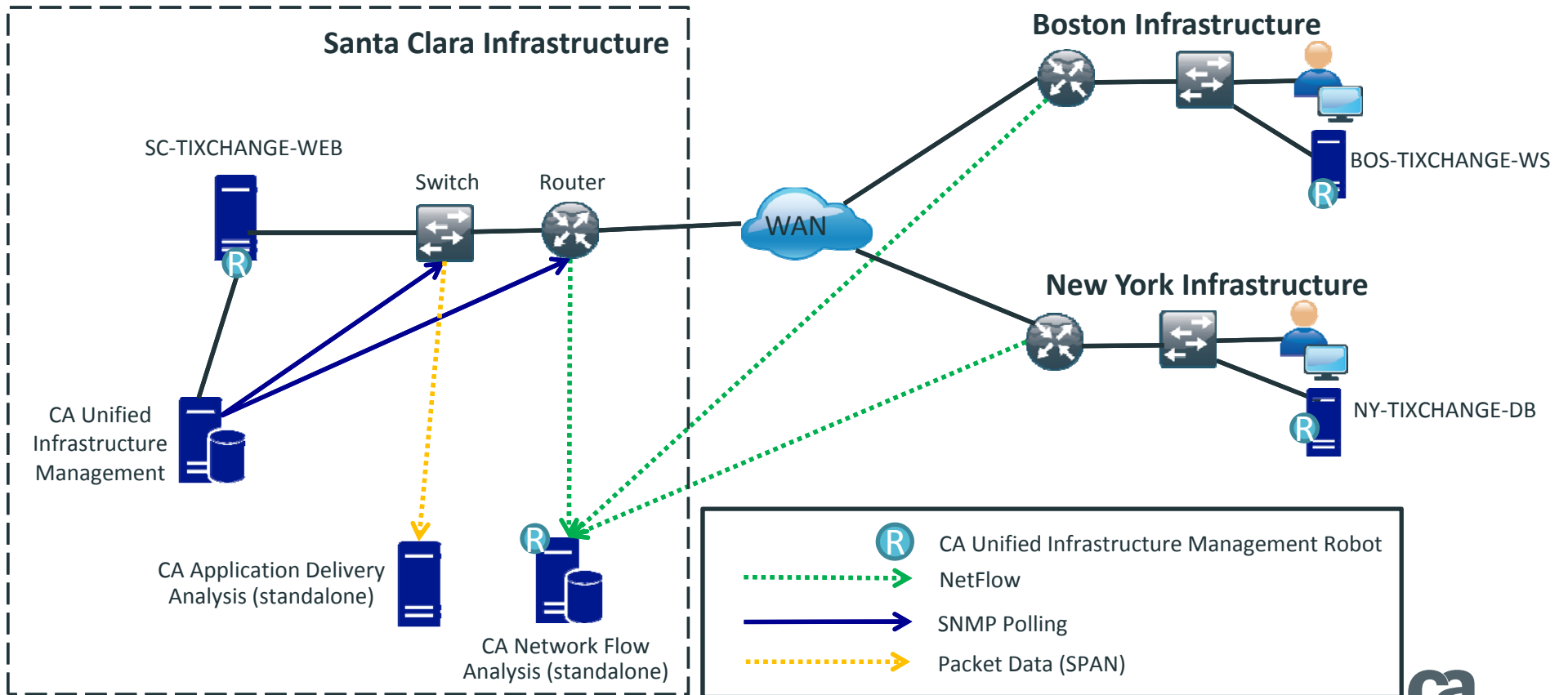

Unified Management Portal

- Customizable, role-based access and reporting
- Web console with top-down and drill-down navigation
- Single interface for problem discovery down to root cause
- Correlated key metrics for infrastructure planning and decision support
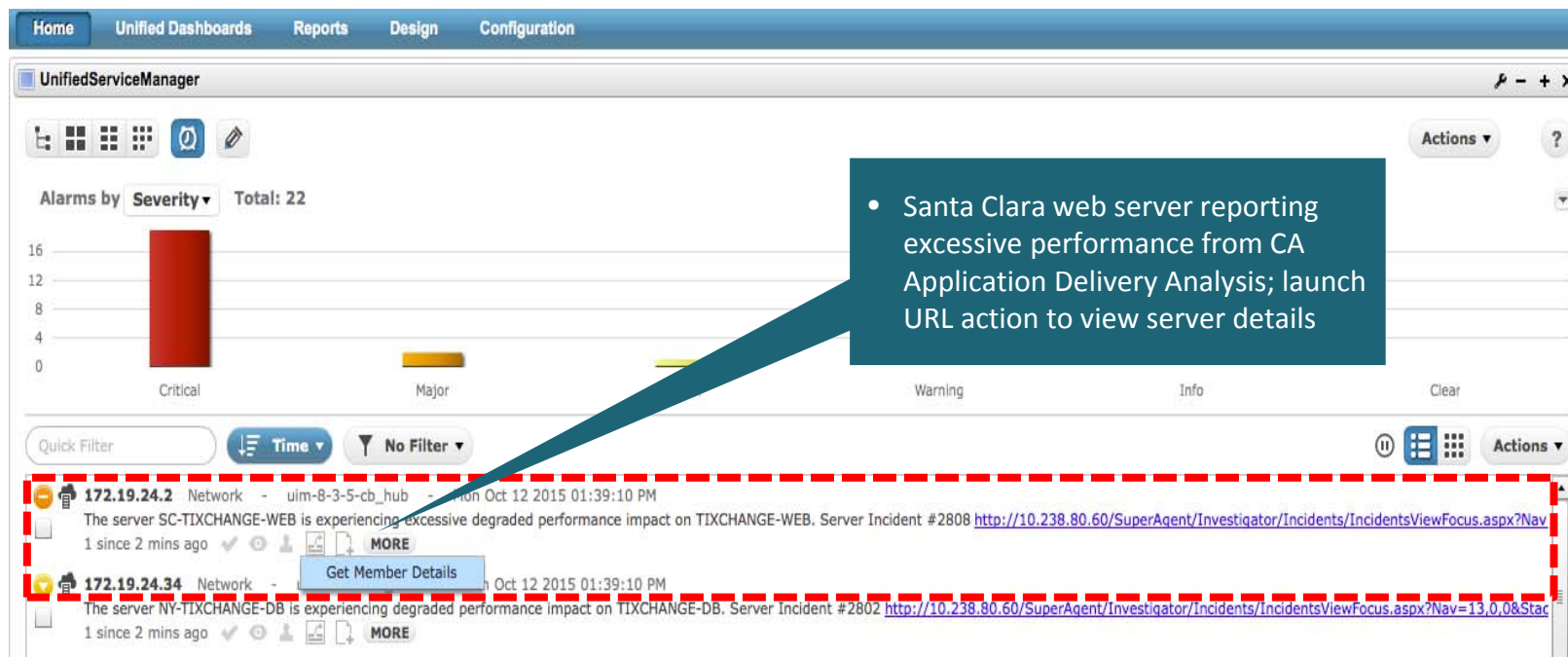- Third-party data integration

Application-Aware Network Monitoring
Use Case: Application Delivery

Use Case Environment

Santa Clara Infrastructure

SC-TIXCHANGE-WEB

Switch

Router

CA Unified Infrastructure Management

CA Application Delivery Analysis (standalone)

CA Network Flow Analysis (standalone)

WAN

Boston Infrastructure

BOS-TIXCHANGE-WS

New York Infrastructure

NY-TIXCHANGE-DB

R — CA Unified Infrastructure Management Robot
····· NetFlow
——— SNMP Polling
····· Packet Data (SPAN)

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Unified Service Manager Alarm View

- Santa Clara web server reporting excessive performance from CA Application Delivery Analysis; launch URL action to view server details
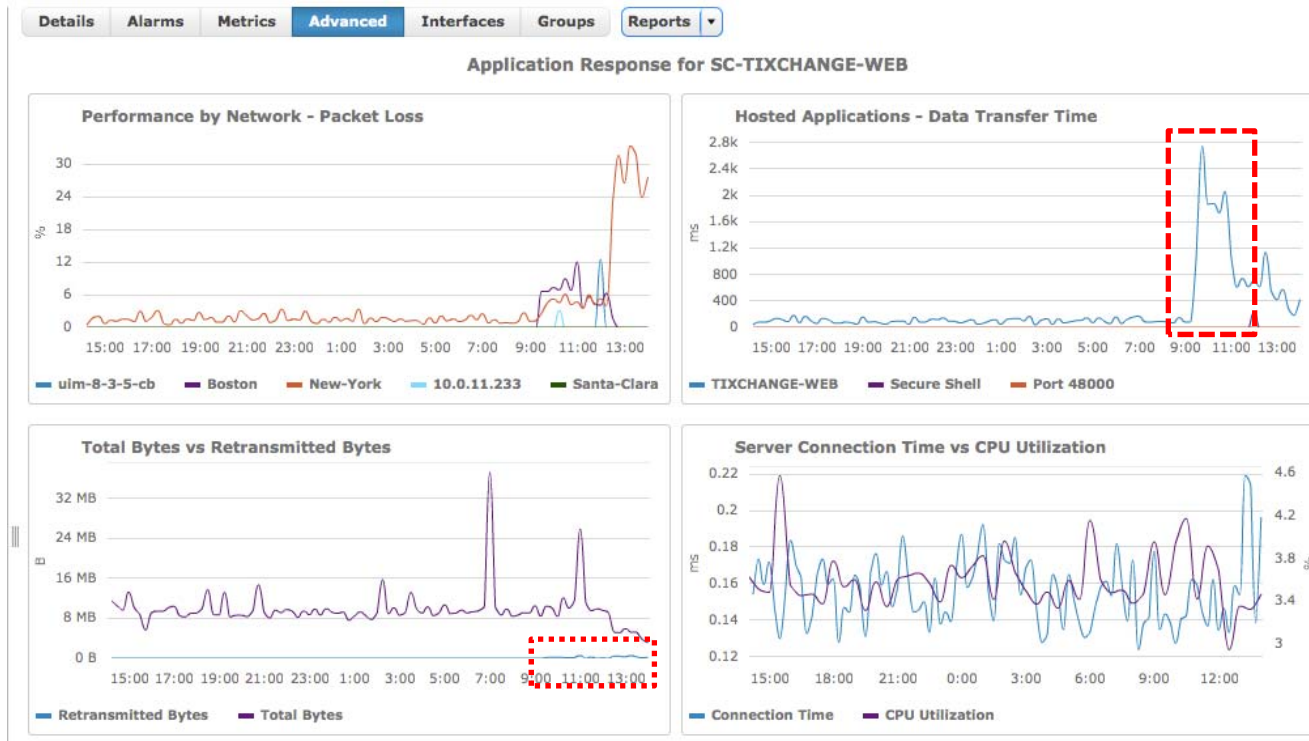
Server Details Page
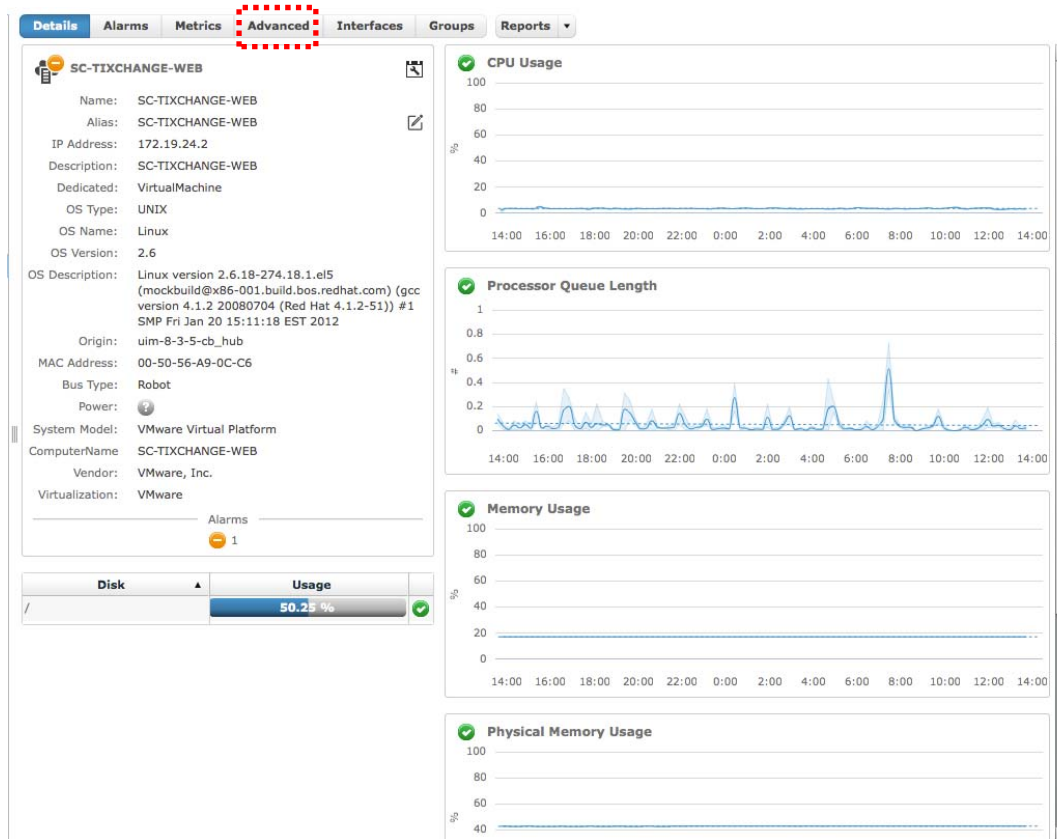
- Server details shows key system KPIs trended over last 24 hours

- Click Advanced tab to view CA Application Delivery Analysis metrics for the selected server

CA Application Delivery Analysis Data

Santa Clara web server

- New York location shows high packet loss
- Web application showing data transfer time of **2.5 seconds**

- Low amount of retransmitted bytes
- Server connection time and CPU normal

Additional App Delivery KPIs for Santa Clara Web Server

Downstream Dependencies

Server	Port	SCT	SRT	OBS
NY-TIXCHANGE-DB	3306	0.00 ms	407.00 ms	298,902
uim-8-3-5-cb	48000	0.00 ms	0.00 ms	14,957
BOS-TIXCHANGE-WS	8080	2.48 secs	4.10 secs	8,672

Server Response Time
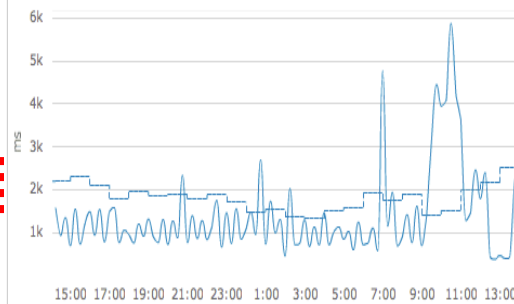
Incidents

ID	Application	Severity	Started On	Duration
1002808	TIXCHANGE-WEB	Excessive	10/12/15 10:05:00 AM	4.00 hrs

Total Sessions vs Refused Sessions

- Total Sessions   - Refused Sessions
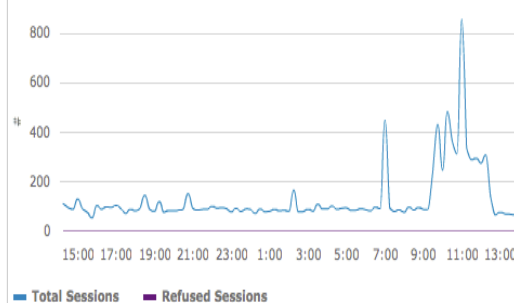
- Downstream dependencies show connection to Boston WS is taking **4 seconds** to respond
- SRT for web server showing 5+ seconds, indicating further evidence that issue is with Boston web service layer
- Drill to Boston web service server

- Incidents reflect CA Application Delivery Analysis thresholds being exceeded
- Web server is not refusing any sessions

CA Application Delivery Analysis Data

Boston server providing web services for Santa Clara web server
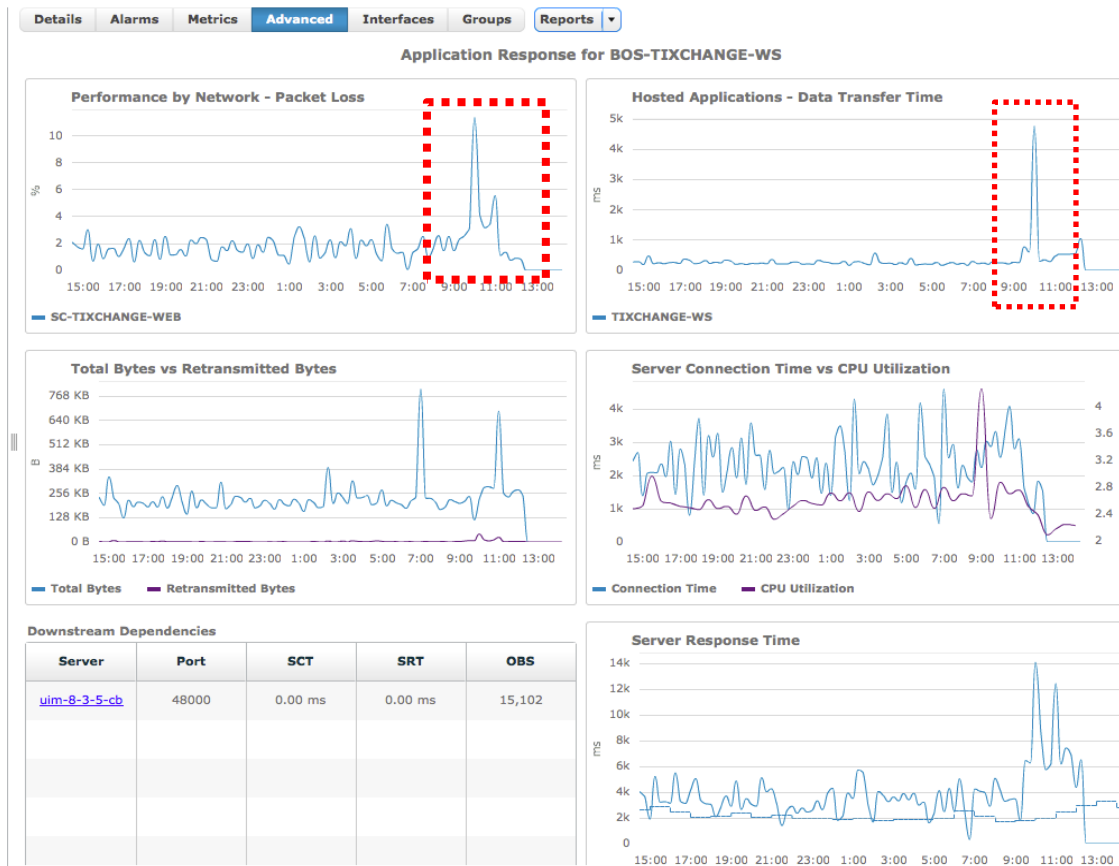
- Boston web services layer shows high packet Loss from Santa Clara web server and high data transfer time from Boston web services server

- Issue pointing to network (high packet loss and high response time between Santa Clara and Boston
- Let's look at the Boston router to further investigate the problem

Flow and SNMP Data from Boston Site Router
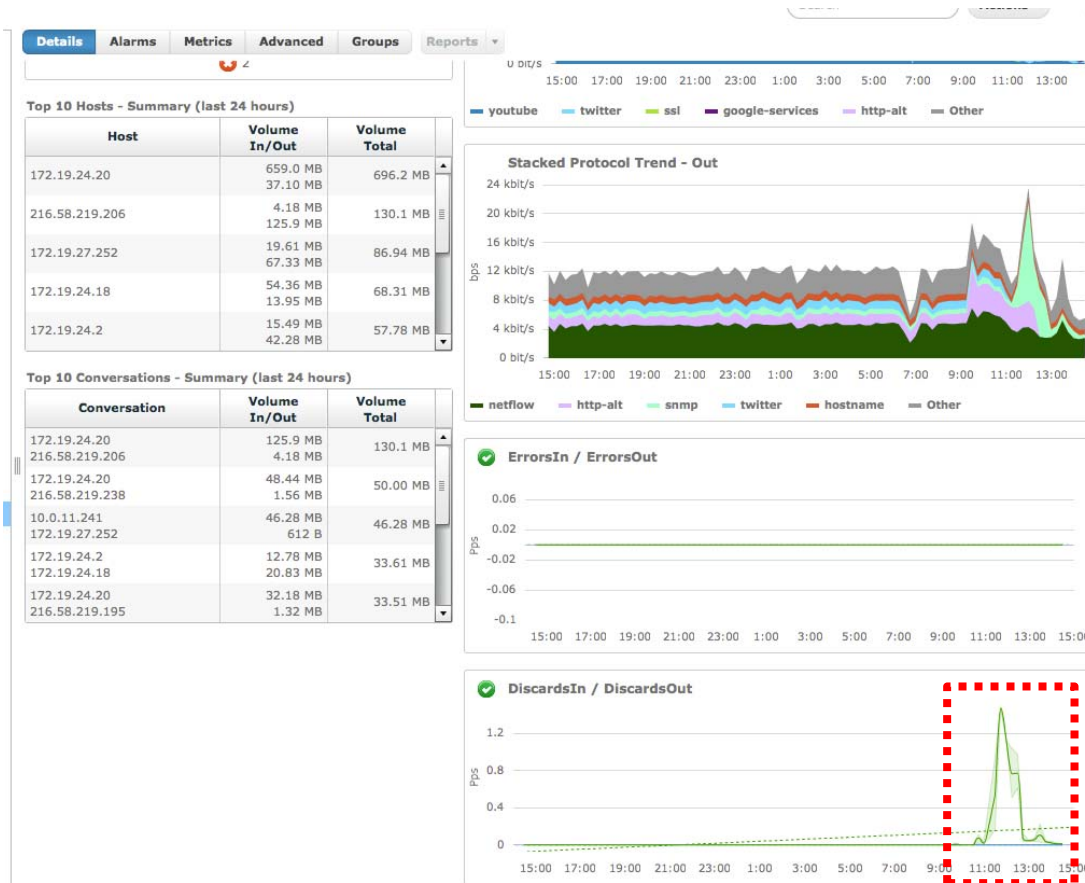
- Flow and SNMP data do not show high utilization, however it does show spike in traffic that is discarded

Boston Site Router – CBQoS Stats

- Further drill down into SNMP data shows business critical queue is dropping traffic, causing packet loss and performance problems for any apps hosted or being accessed by the Boston site
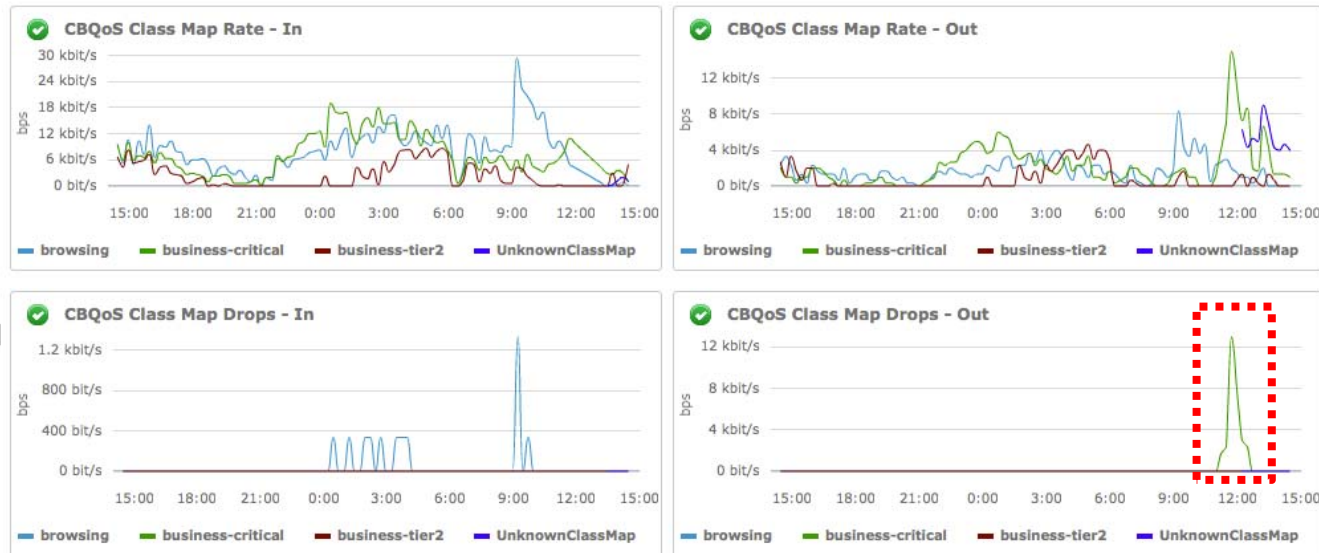
Top Host Per ToS – Summary (last 24 hours)

ToS	Host	Volume In/Out	Volume Total
EF (DSCP46)	172.19.24.20	278.2 MB 13.03 MB	291.2 MB
CS3 (DSCP24)	172.19.24.20	199.7 MB 10.95 MB	210.7 MB
AF21 (DSCP18)	172.19.24.20	136.6 MB 13.00 MB	149.6 MB
Default Traffic	172.19.27.252	524.1 KB 46.60 MB	47.11 MB

Top Conversation Per ToS – Summary (last 24 hours)

ToS	Conversation	Volume In/Out	Volume Total
EF (DSCP46)	172.19.24.20 216.58.219.206	126.0 MB 4.20 MB	130.2 MB
CS3 (DSCP24)	172.19.24.20 216.58.219.195	32.04 MB 1.33 MB	33.38 MB
AF21 (DSCP18)	108.174.10.10 172.19.24.20	2.01 MB 13.21 MB	15.22 MB
Default Traffic	10.0.11.241 172.19.27.252	46.28 MB 0 B	46.28 MB

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Use Case Summary

- Santa Clara Web Server experienced excessive performance alarm

- Operator drills to Santa Clara web server details page to view system resource performance

- Operator views the advanced tab to view CA Application Delivery Analysis metrics, which reveal slow performance when accessing Boston web services layer

- Viewing Boston web services layer, CA Application Delivery Analysis metrics reveal high packet loss between Santa Clara and Boston

- Flow and SNMP data do not show utilization issues, however the router is showing high discards

- Further router investigation shows business critical QoS queue is dropping traffic

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Always In Title Case;
2 Lines Preferred

Subtitle or presenter name [sentence or
title case as needed Calibri 18 pt]

Insert Date Here

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   - To use the white background, place the cursor after the light title slide
   - To use the dark background, place the cursor after the dark title slide

4. Right-click and choose 'Use Destination Theme' (to use the correct formatting from this template)

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6. Save your work
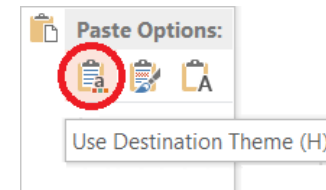
Sample Slides

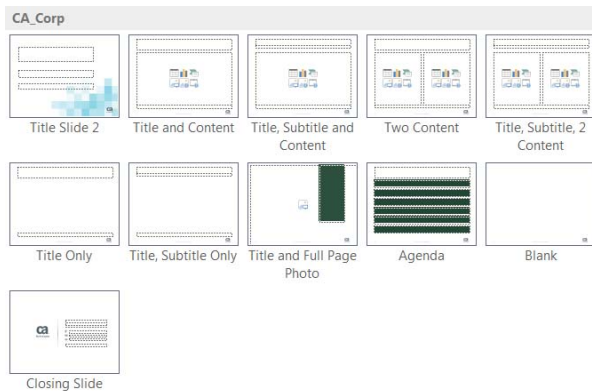# Understanding the Master Slides

White vs. Dark Backgrounds

CA_Corp

Title Slide 2 | Title and Content | Title, Subtitle and Content | Two Content | Title, Subtitle, 2 Content

Title Only | Title, Subtitle Only | Title and Full Page Photo | Agenda | Blank

Closing Slide

CA_Event

Title Slide | Title and Content | Title, Subtitle and Content | Two Content | Title, Subtitle, 2 Content

Title Only | Title, Subtitle Only | Title and Full Page Photo | Agenda | Blank

Closing Slide

Corp and Event Divider

Divider Slide | Divider Slide 2

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White background is to be used in the majority of situations, particularly for internal use and when printing is expected.

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Dark background is to be used for event situations where lighting in the room is low and the white background is too bright.
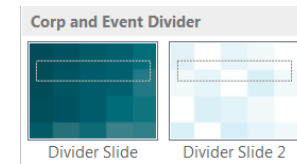
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TITLE SLIDE SUBTITLE
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SLIDE HEADLINE
Calibri Regular | 28 pt | Max 2 Lines | Max Character: 90

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TEXT [HEADLINES, SUBHEADLINES, BODY COPY] APPEARS IN:

Dark Blue
R: 34 G: 70 B: 94

White
R: 255 G: 255 B: 255

Dark Gray
R: 88 G: 103 B: 109

Digital/Dark Background
R: 46 G: 68 B: 75

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Cool Gray
R: 208 G: 216 B: 216

Light Blue
R: 83 G: 187 B: 212

Light Green
R: 87 G: 193 B: 180

Yellow
R: 255 G: 201 B: 28

Light Purple
R: 189 G: 102 B: 169

Dark Green
R: 6 G: 63 B: 52

Maroon
R: 109 G: 4 B: 4

Purple
R: 59 G: 34 B: 86

The light colors should be used minimally compared to the Blue and Gray.

The color palette has been programmed into the corporate template.
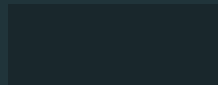
Event Template Color Guideline

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Dark Blue Green
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Dark Blue Green
R: 25 G: 39 B: 44

Light Blue
R: 83 G: 187 B: 212

Light Green
R: 87 G: 193 B: 180

Yellow
R: 255 G: 201 B: 28

Light Purple
R: 189 G: 102 B: 169

White
R: 255 G: 255 B: 255
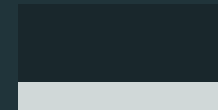
Cool Gray
R: 208 G: 216 B: 216

Dark Gray
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Agenda

1	**TITLE OF SECTION ONE**

2	**TITLE OF SECTION TWO**

3	**TITLE OF SECTION THREE**

4	**TITLE OF SECTION FOUR**

5	**TITLE OF SECTION FIVE**

6	**TITLE OF SECTION SIX**

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Agenda

1 **TITLE OF SECTION ONE**

2 **TITLE OF SECTION TWO**

3 **TITLE OF SECTION THREE**

4 **TITLE OF SECTION FOUR**

5 **TITLE OF SECTION FIVE**

6 **TITLE OF SECTION SIX**

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Title – Title Case, Calibri 28 pt
2 Lines Max

- Bullet 1, Calibri regular 24 pt
  - Sub-bullet, Calibri regular 20 pt
    - Sub-sub-Bullet, Calibri regular 18 pt
      - Sub-sub-sub Bullet, Calibri regular 16 pt
        - Sub-sub-sub-sub Bullet, Calibri regular 14 pt

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Example Table

TITLE	TITLE	TITLE	TITLE	TITLE	TITLE	TITLE
Description Here	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Description Here	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
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TOTAL						**XXXX**

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Example Table

TITLE	TITLE	TITLE	TITLE	TITLE	TITLE	TITLE
Description Here	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
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TOTAL						XXXX

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Example Pie Chart

The [sidebar text] is sentence case and top aligns with the [chart] when used next to a chart.

Chart Title

■ 1st Qtr ■ 2nd Qtr ■ 3rd Qtr ■ 4th Qtr

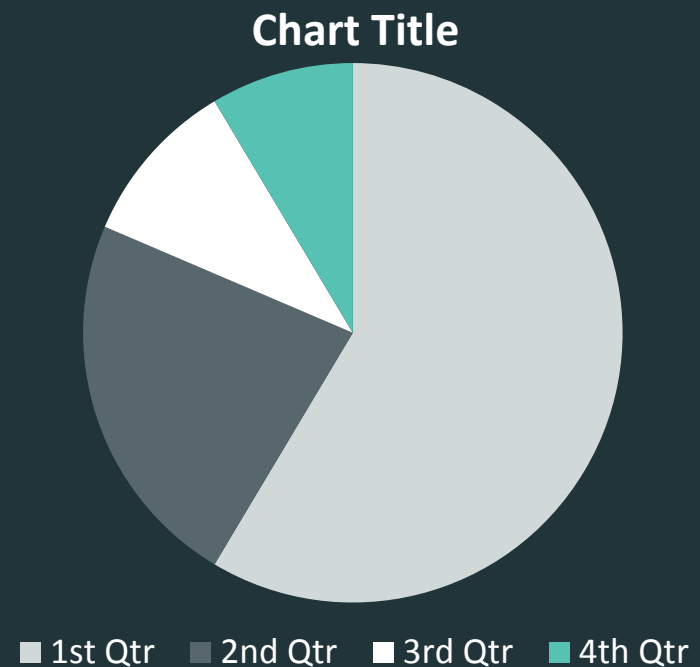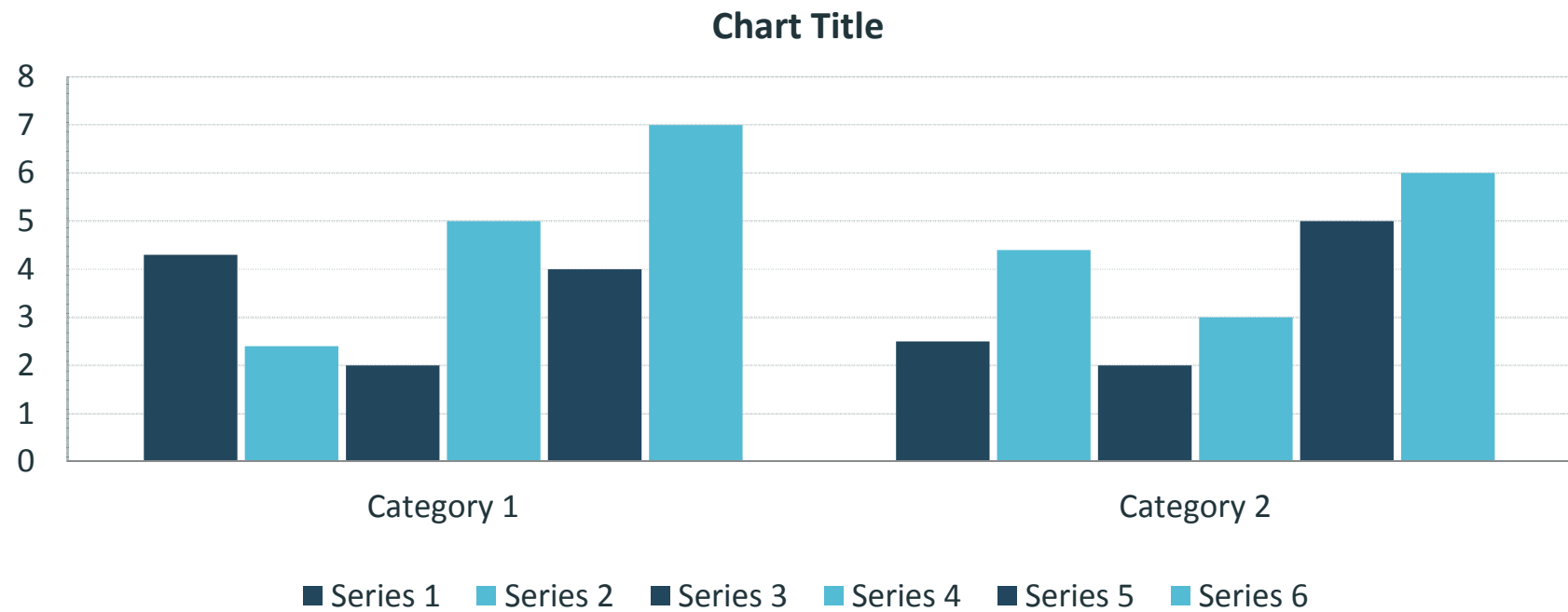# Example Pie Chart

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Chart Title

- 1st Qtr
- 2nd Qtr
- 3rd Qtr
- 4th Qtr

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Example Column Chart

Chart Title

Example Column Chart

Chart Title

Example Timeline

TITLE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Description Here	Label arrow											
Description Here		Label arrow										
Description Here				Label arrow								
Description Here		Label arrow										
Description Here	Label arrow											
Description Here					Label arrow							

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Example Timeline

TITLE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
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Description Here		Label arrow										
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Description Here	Label arrow											
Description Here						Label arrow						

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