APOS

Flashes of Insight:
SAP BusinessObjects Performance Analysis

Today's Session

Key Topics

TOPIC

- Report Performance
- BI System Performance
- BI System Monitoring

- Q&A – see webinar console

APOS

Today's Presenters

Peter Warren

Account Manager
APOS

Fred Walther

Senior Solution Consultant
APOS

Who is APOS?

- Formed in 1992
- Enabling BI platform management, administration, migration, governance and compliance
- Simplifying, automating, extending SAP BusinessObjects and SAP Analytics Cloud
- Strategic SDK development and consulting
- Hundreds of customers globally

SAP Partner

APOS
SAP BusinessObjects
Hybrid BI
SAP Analytics Cloud

HOUSEKEEPING

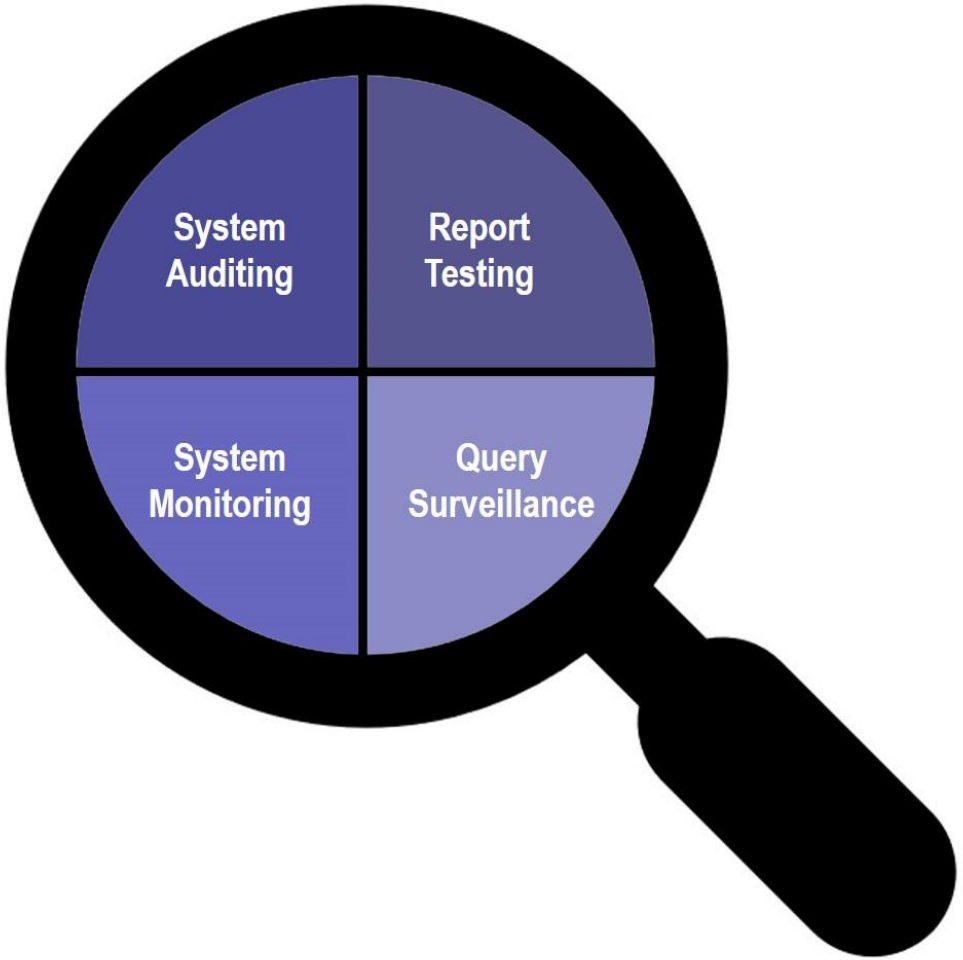
You will have access to the slides via email

You will get the recording within 24 hours

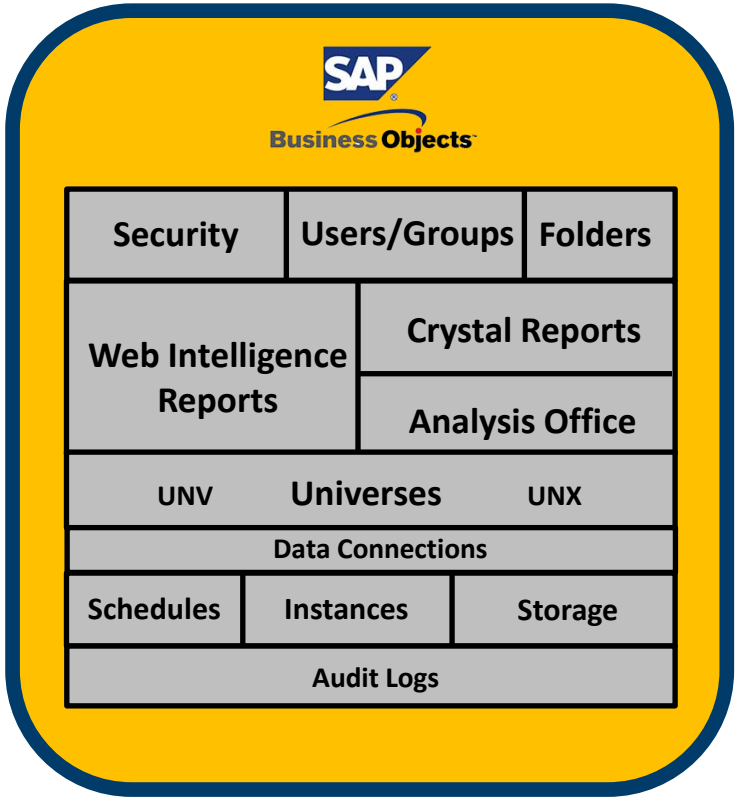
Tell us how we did in the survey

APOS Insight – Deep System Knowledge

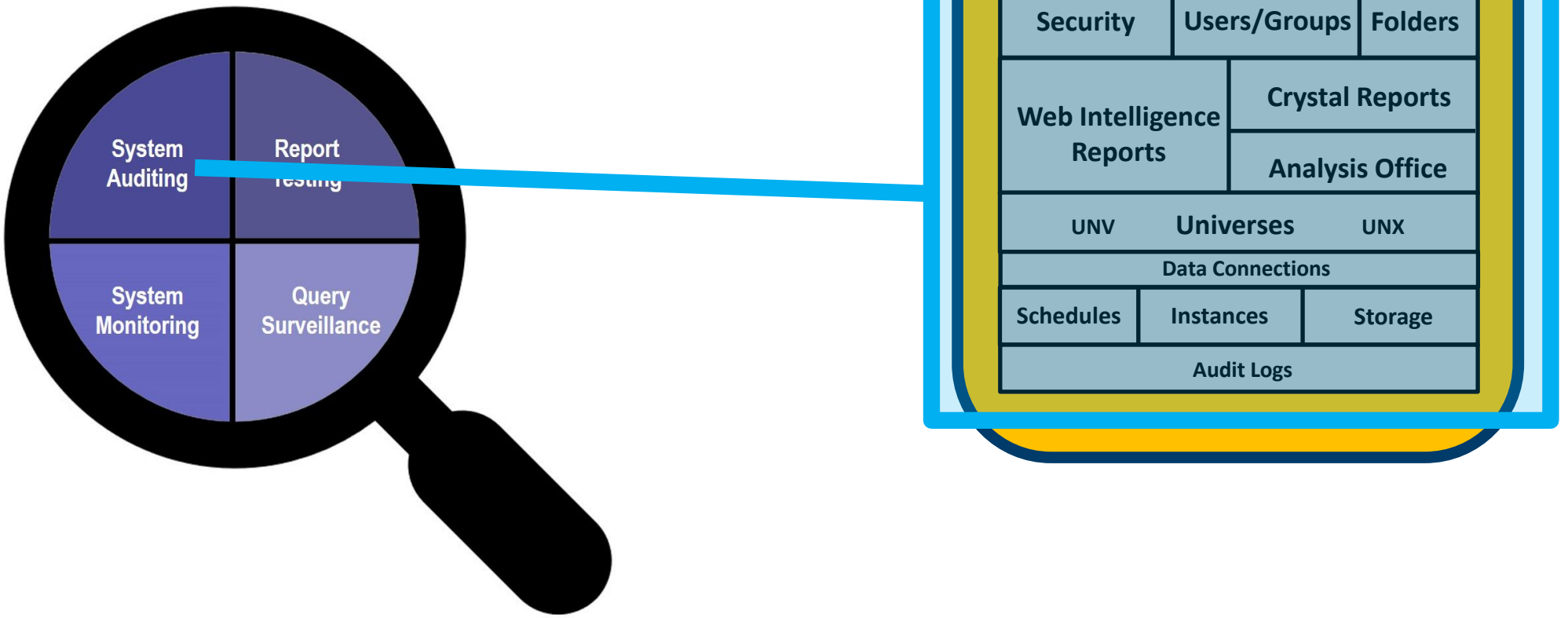
APOS Insight – Deep System Knowledge



APOS Insight



APOS Insight



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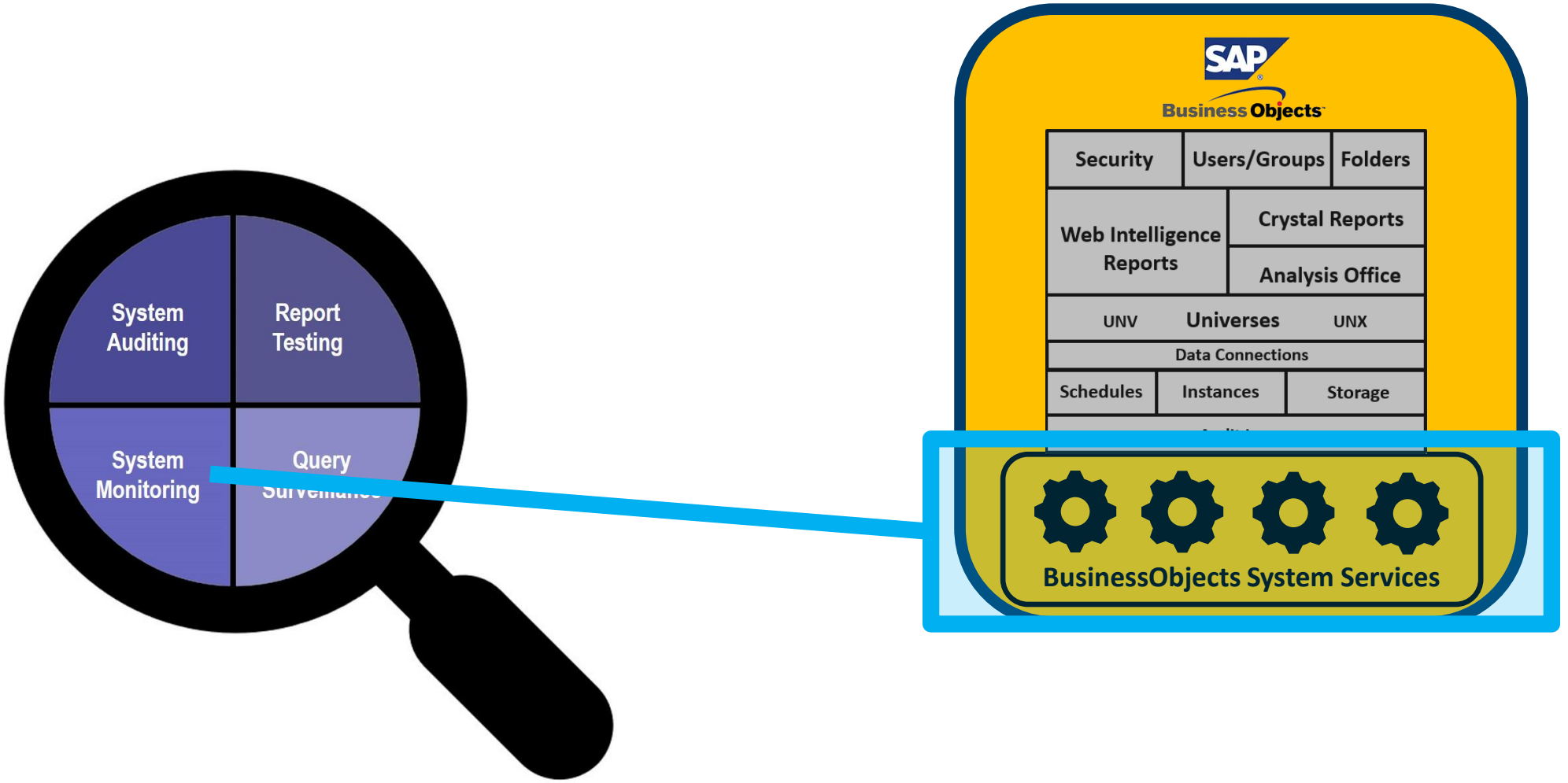

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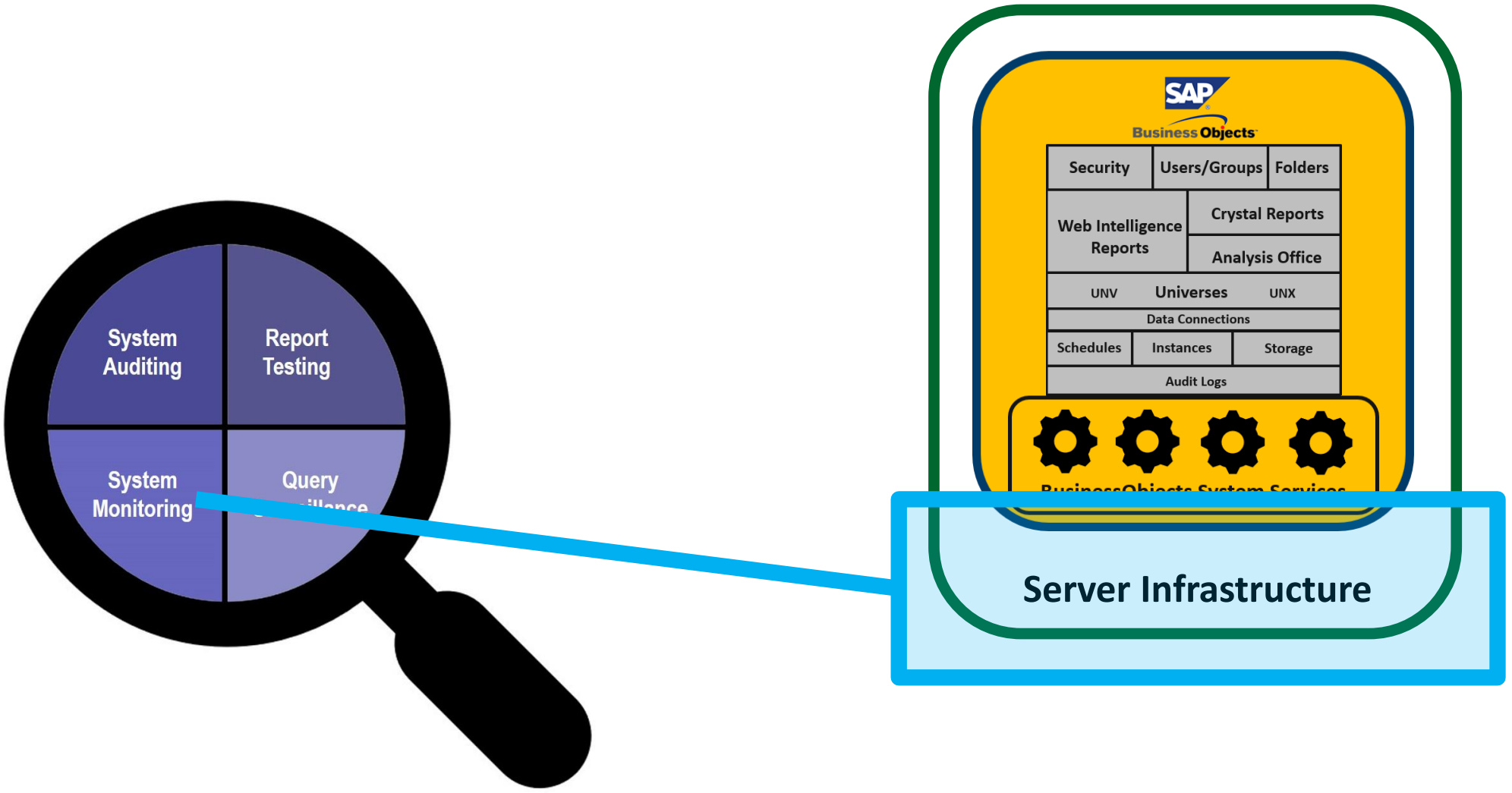

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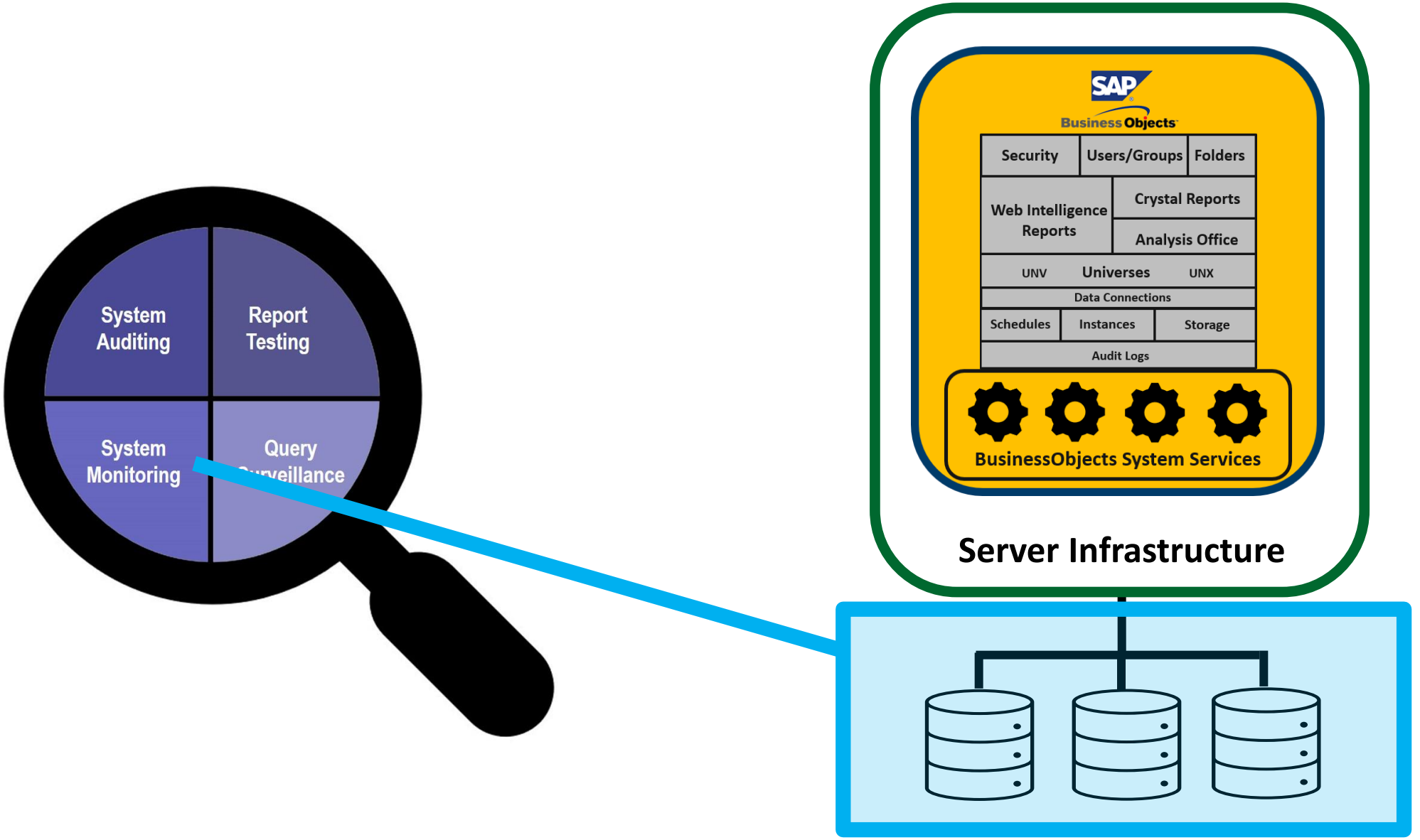
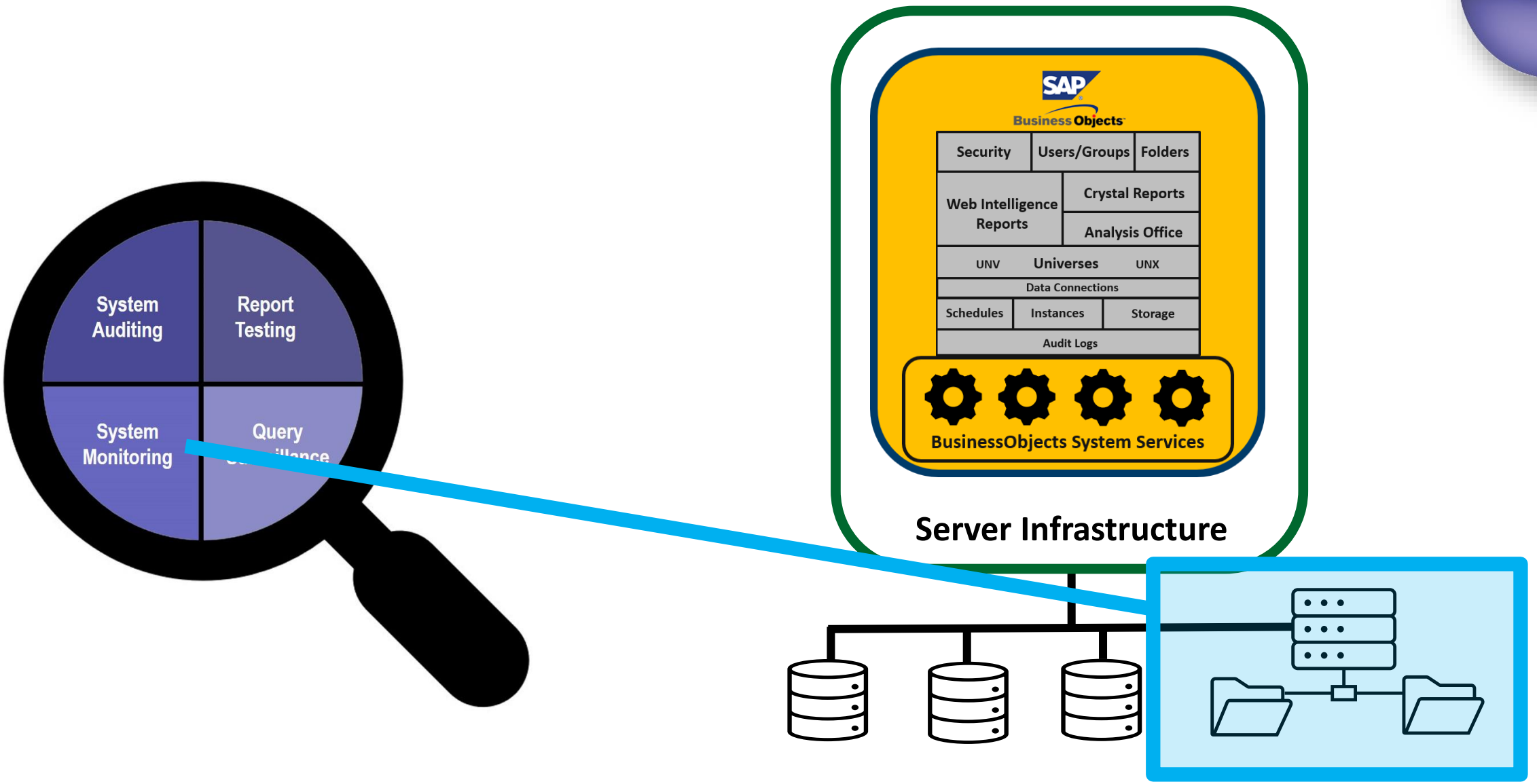


APOS Insight



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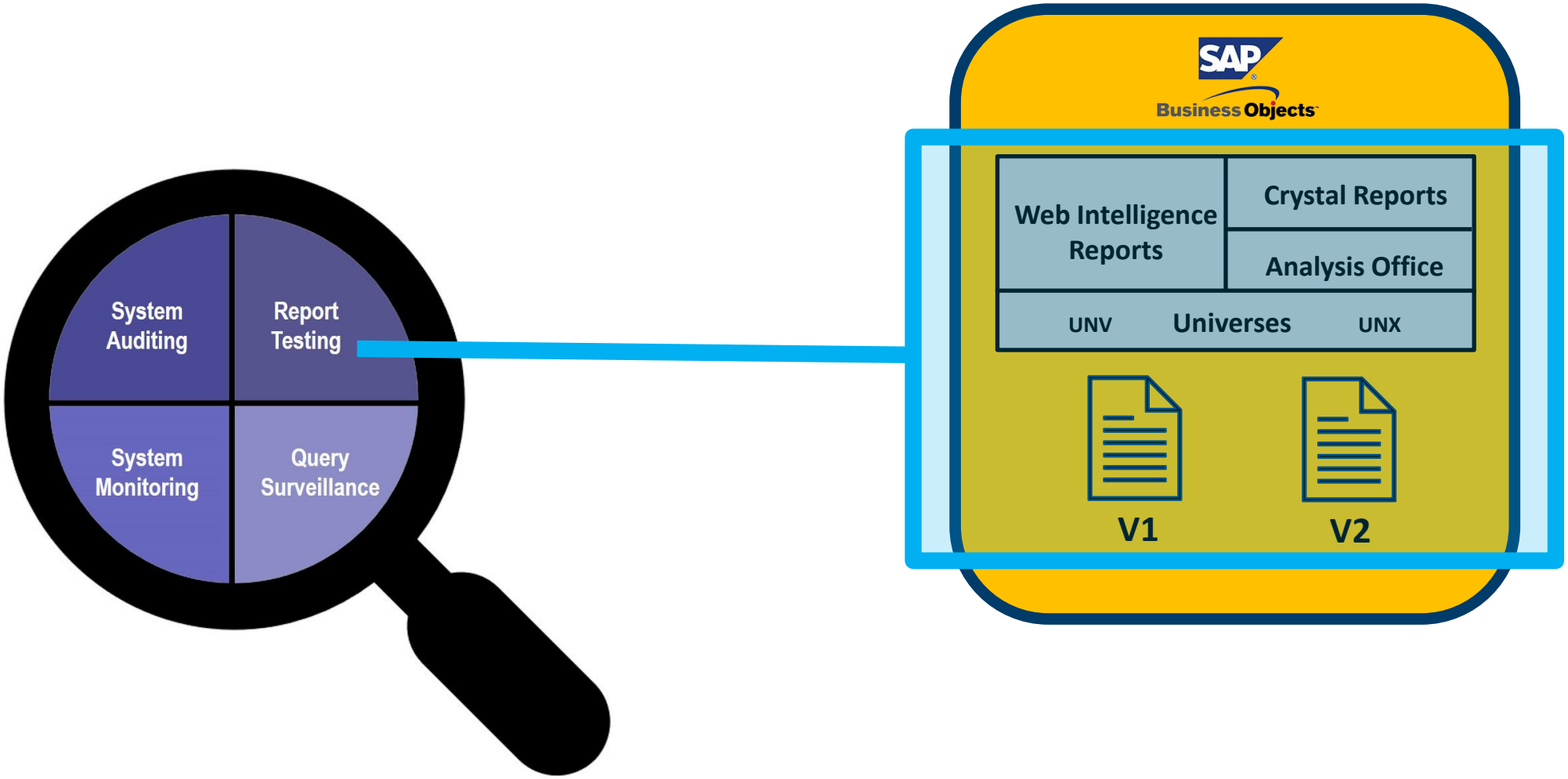
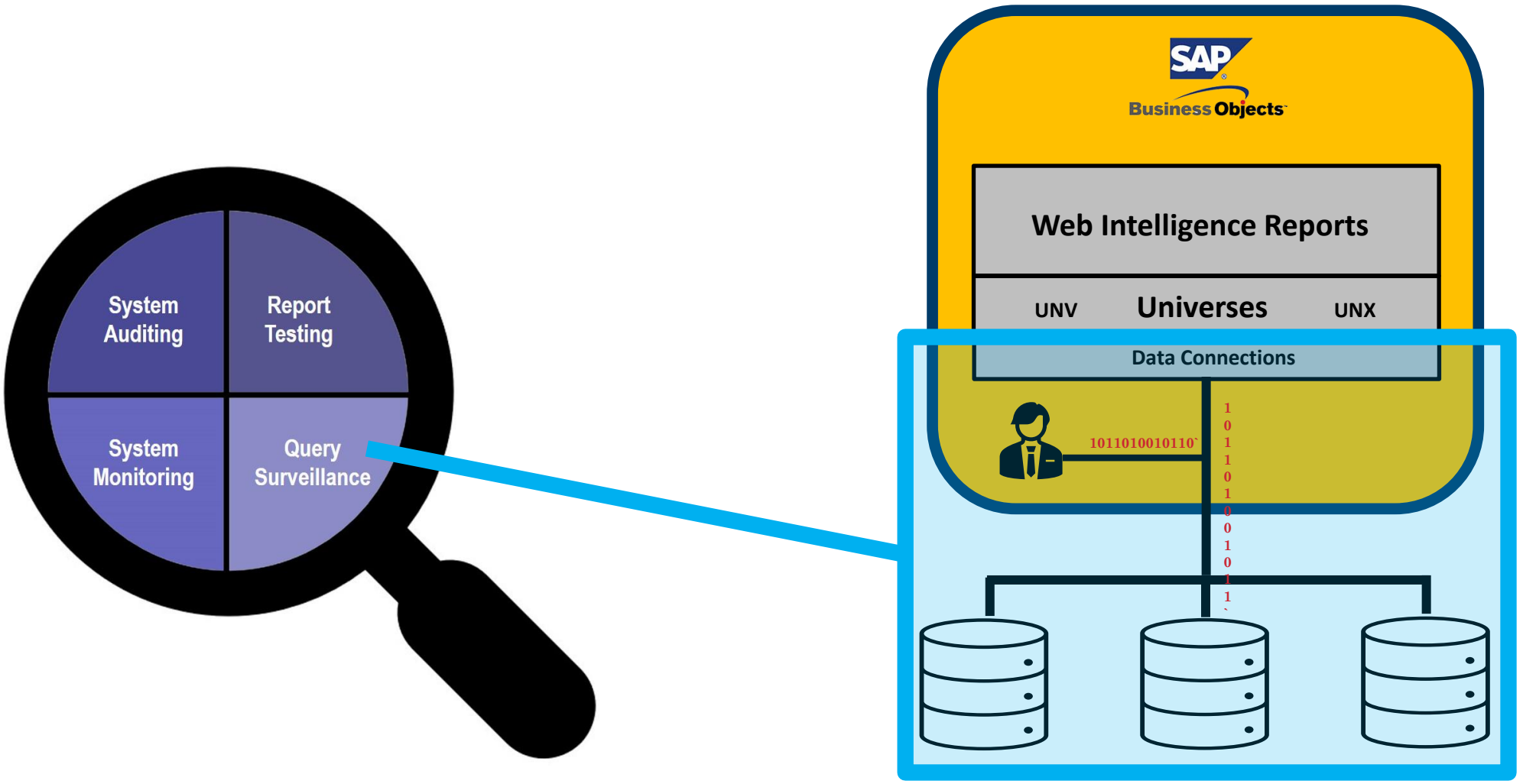
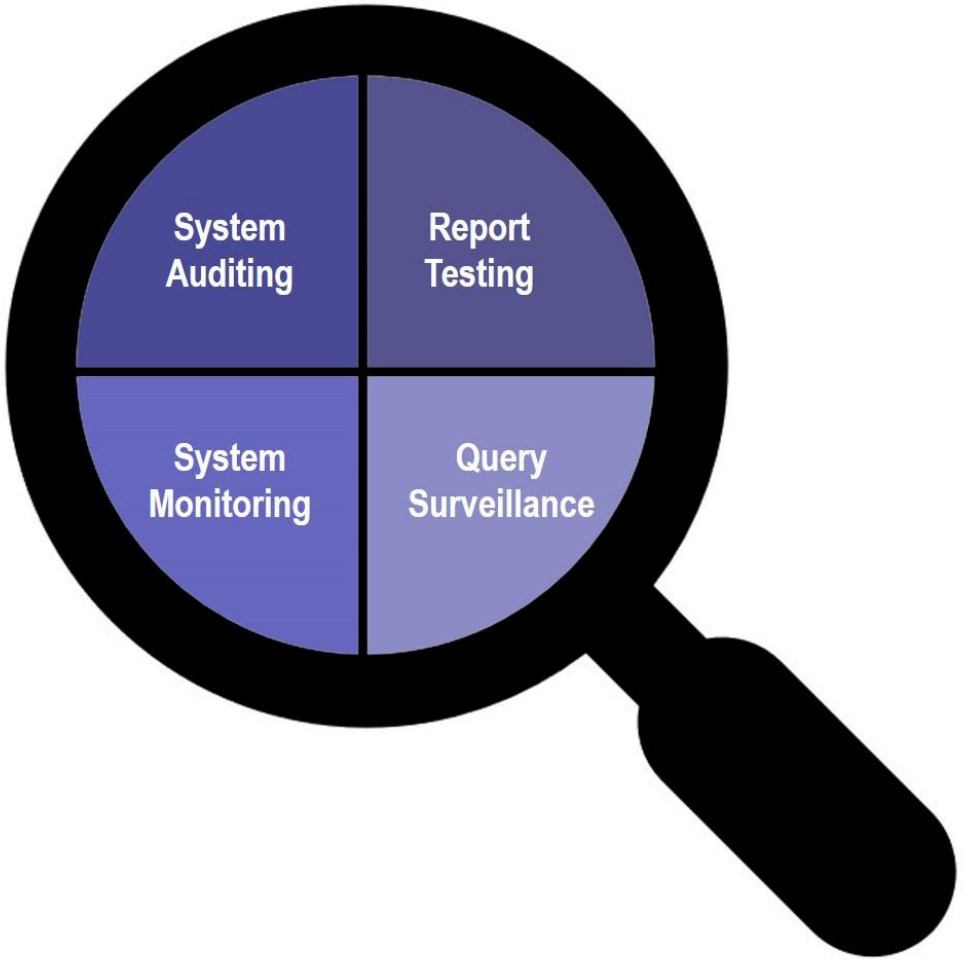


APOS Insight



Flashes of Insight – Performance Analysis



Fred Walther
Senior Solution Consultant
APOS

Flashes of Insight

- Report Performance
- BI System Performance
- BI System Monitoring

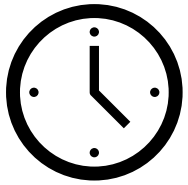
Flashes of Insight

Report Performance

- Compare instance runtimes
- Analyze query runtimes
- Analyze long running queries

Report Performance

Why Important?



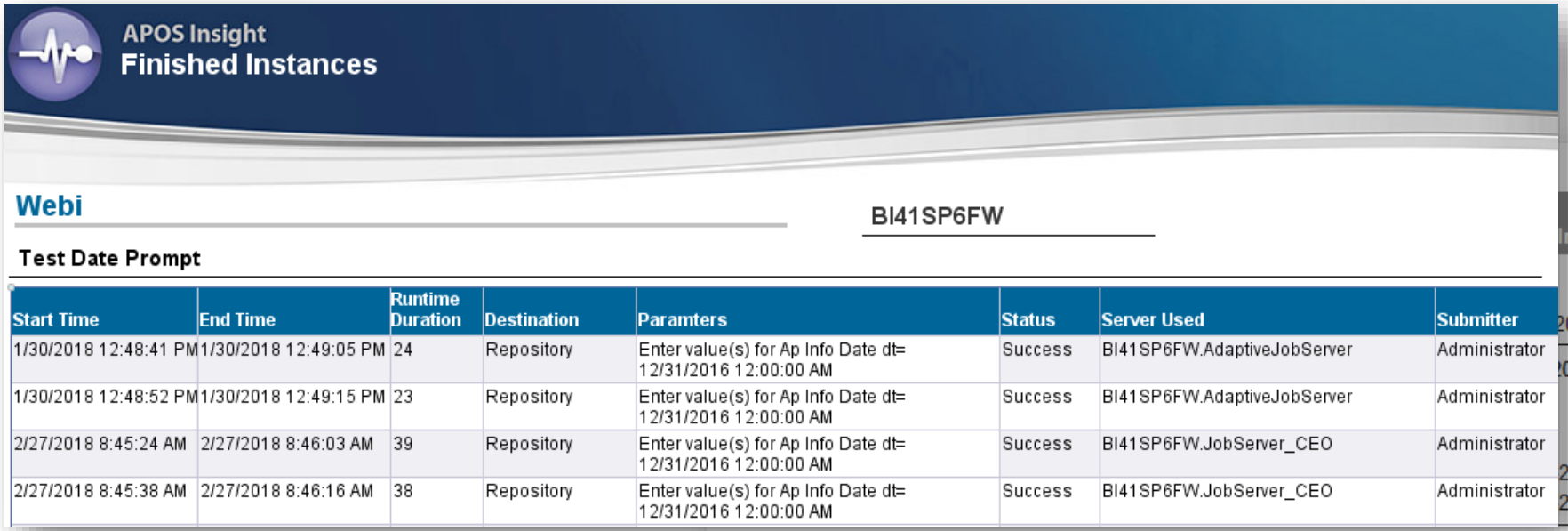
Report Performance

Report performance can be measured in a number of ways:

- How long does an instance take to run to successful completion?
- How long does a user have to wait for a report on demand?
- How long do report queries take to execute on the database server?

Report Performance

Instance Runtimes



APOS Insight
Finished Instances

Webi BI41SP6FW

Test Date Prompt

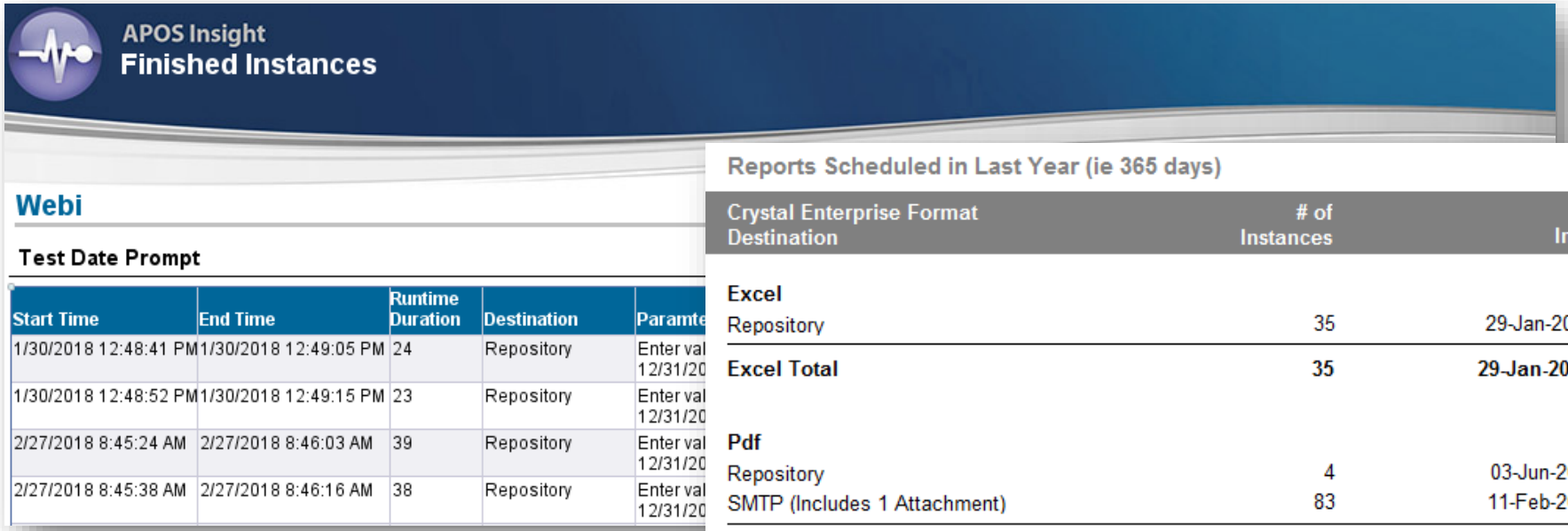
Start Time	End Time	Runtime Duration	Destination	Paramters	Status	Server Used	Submitter
1/30/2018 12:48:41 PM	1/30/2018 12:49:05 PM	24	Repository	Enter value(s) for Ap Info Date dt= 12/31/2016 12:00:00 AM	Success	BI41SP6FW.AdaptiveJobServer	Administrator
1/30/2018 12:48:52 PM	1/30/2018 12:49:15 PM	23	Repository	Enter value(s) for Ap Info Date dt= 12/31/2016 12:00:00 AM	Success	BI41SP6FW.AdaptiveJobServer	Administrator
2/27/2018 8:45:24 AM	2/27/2018 8:46:03 AM	39	Repository	Enter value(s) for Ap Info Date dt= 12/31/2016 12:00:00 AM	Success	BI41SP6FW.JobServer_CEO	Administrator
2/27/2018 8:45:38 AM	2/27/2018 8:46:16 AM	38	Repository	Enter value(s) for Ap Info Date dt= 12/31/2016 12:00:00 AM	Success	BI41SP6FW.JobServer_CEO	Administrator

		Latest Instance Date	Average Run-Time(Sec)
		2020 11:25 am	10
Pdf Total	**87**	**03-Jun-2021 2:26 pm**	**11**
		2021 2:26 pm	62
		2020 3:15 pm	8
Report			
Repository	46	12-Jul-2021 4:57 pm	60
Report Total	**46**	**12-Jul-2021 4:57 pm**	**60**
Webi			
Inbox (Copy)	43	13-Jul-2021 11:14 am	20
Repository	148,815	22-Jul-2021 3:44 pm	363
Webi Total	**148,858**	**22-Jul-2021 3:44 pm**	**363**

Instance performance can be analyzed over time

Report Performance

Instance Runtimes



APOS Insight
Finished Instances

Webi

Test Date Prompt

Start Time	End Time	Runtime Duration	Destination	Paramte
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2/27/2018 8:45:24 AM	2/27/2018 8:46:03 AM	39	Repository	Enter val 12/31/20
2/27/2018 8:45:38 AM	2/27/2018 8:46:16 AM	38	Repository	Enter val 12/31/20

Reports Scheduled in Last Year (ie 365 days)

Crystal Enterprise Format Destination	# of Instances	Latest Instance Date	Average Run-Time(Sec)
Excel			
Repository	35	29-Jan-2020 11:25 am	10
Excel Total	**35**	**29-Jan-2020 11:25 am**	**10**
Pdf			
Repository	4	03-Jun-2021 2:26 pm	62
SMTP (Includes 1 Attachment)	83	11-Feb-2020 3:15 pm	8
Pdf Total	**87**	**03-Jun-2021 2:26 pm**	**11**
Report			
Repository	46	12-Jul-2021 4:57 pm	60
Report Total	**46**	**12-Jul-2021 4:57 pm**	**60**
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Instance performance can be analyzed over time

Report Performance

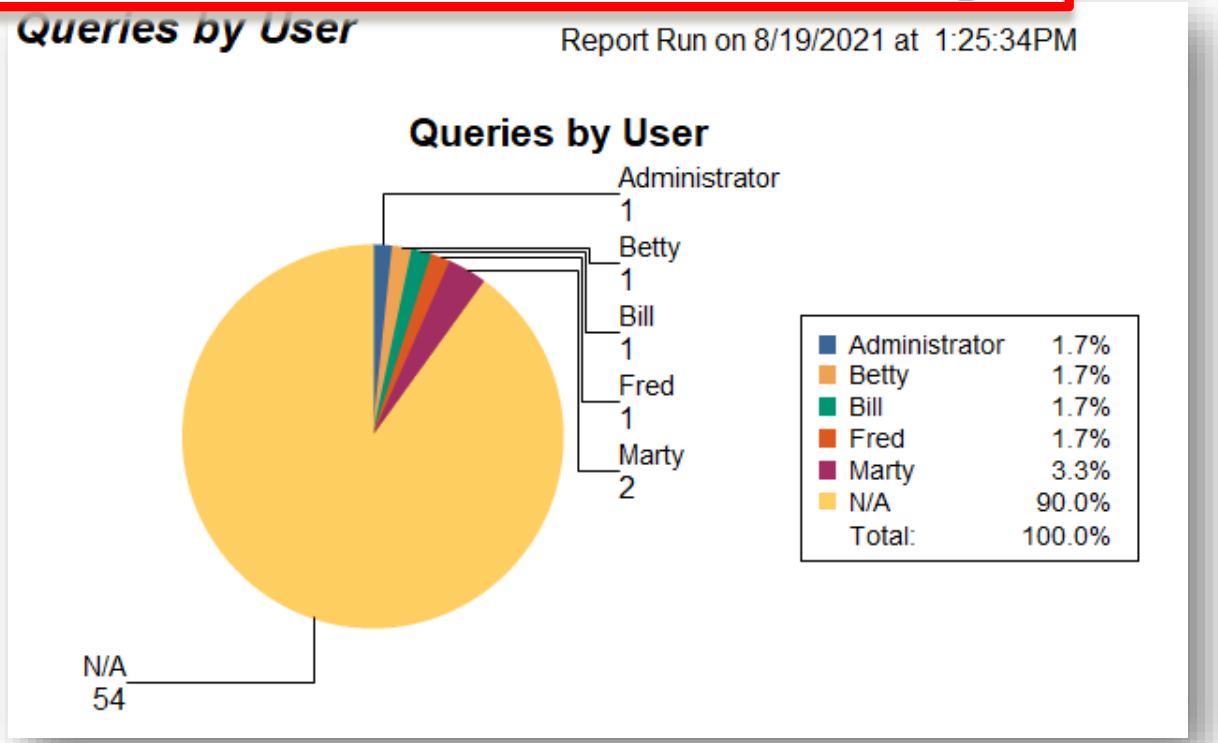
Query Runtimes

Capture query information as they are being executed

Report Queries Sorted by Duration Report Run on 8/19/

Query Duration (sec)	Query Date/Time	Document Name	Universe Name
4.41	08/18/2021 10:42		IDAC_Xtreme
4.20	08/18/2021 11:05	IDAX UNX Xtreme Products	IDAC_Xtreme
3.34	08/18/2021 11:11	Xtreme Sales IDAC	Xtreme_IDAC
2.48	08/18/2021 11:12	IDAX UNX Xtreme Products	IDAC_Xtreme
2.34	08/18/2021 11:12	Xtreme Sales IDAC	Xtreme_IDAC
2.30	08/18/2021 10:13	Xtreme Sales IDAC	Xtreme_IDAC

Queries by User Report Run on 8/19/2021 at 1:25:34PM



Report Performance

Query Runtimes

- Capture query information as they are being executed
- Analyze query runtimes by
  - Report
  - Universe
  - User

Report Queries Sorted by Duration

Report Run on 8/19/

Query Duration (sec)	Query Date/Time	Document Name	Universe Name
4.41	08/18/2021 10:42		IDAC_Xtreme
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Queries by User

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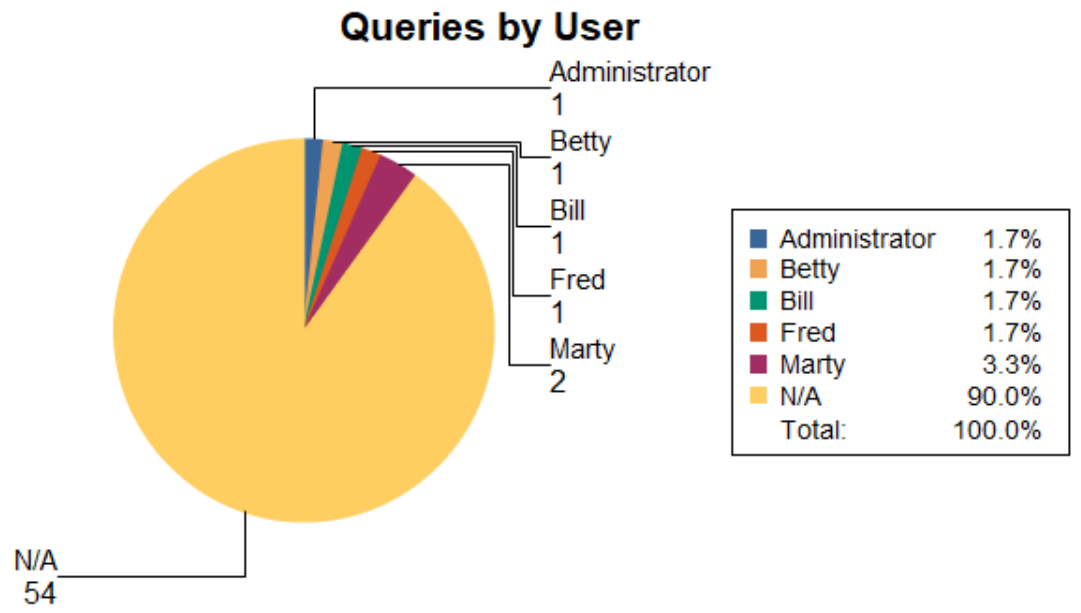


Report Performance

Quality of Query

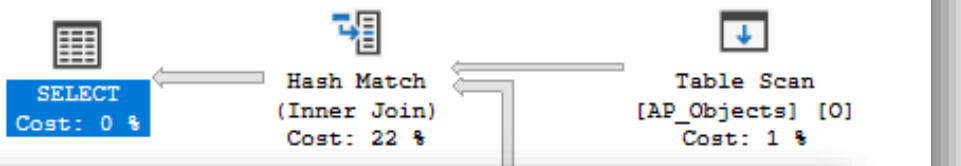
Report queries are captured in a database

```
1  Select CE.AP_StartTime, CE.AP_UserName, CE.AP_EventTy
2  , O.AP_Location, O.SI_OWNER
3  From AP_CommonEvents CE JOIN AP_Objects O
4      ON CE.AP_ObjectID = O.SI_CUID
5      AND CE.System_Name = O.System_Name
6  WHERE CE.System_Name='BI43FW' and CE.AP_StartTime >
```

100 %

Messages | Execution plan

```
Query 1: Query cost (relative to the batch): 100%
Select CE.AP_StartTime, CE.AP_UserName, CE.AP_EventTy
Missing Index (Impact 99.204): CREATE NONCLUSTERED IN
```



Query Analysis - Compare Ratio of Duration to Rows Read

Page 1 of

Report Run on 8/19/2021 at 1:33:59P

Report Name	Query Date	# of Rows Read	Query Duration(ms)	Ratio ms / Row
Universe: Northwind				
Northwind_Test	02/08/2016 18:26	91	2,140	23.52
Northwind_Test	02/08/2016 18:28	91	2,205	24.23
Northwind_Test	02/08/2016 18:29	91	2,127	23.37
Northwind_Test	02/08/2016 18:32	91	2,151	23.64
Northwind_Test	04/04/2016 10:14	91	2,212	24.31
Northwind_Test	09/20/2016 14:02	91	2,490	27.36
	09/20/2016 14:04	-1	2,043	-2,043.00
Northwind_Test	09/20/2016 16:11	91	2,444	26.86
Northwind_Test	09/20/2016 16:11	91	2,354	25.87
Northwind_Test	09/20/2016 16:13	91	2,351	25.84
Northwind_Test	09/20/2016 16:14	91	2,294	25.21

[CE]

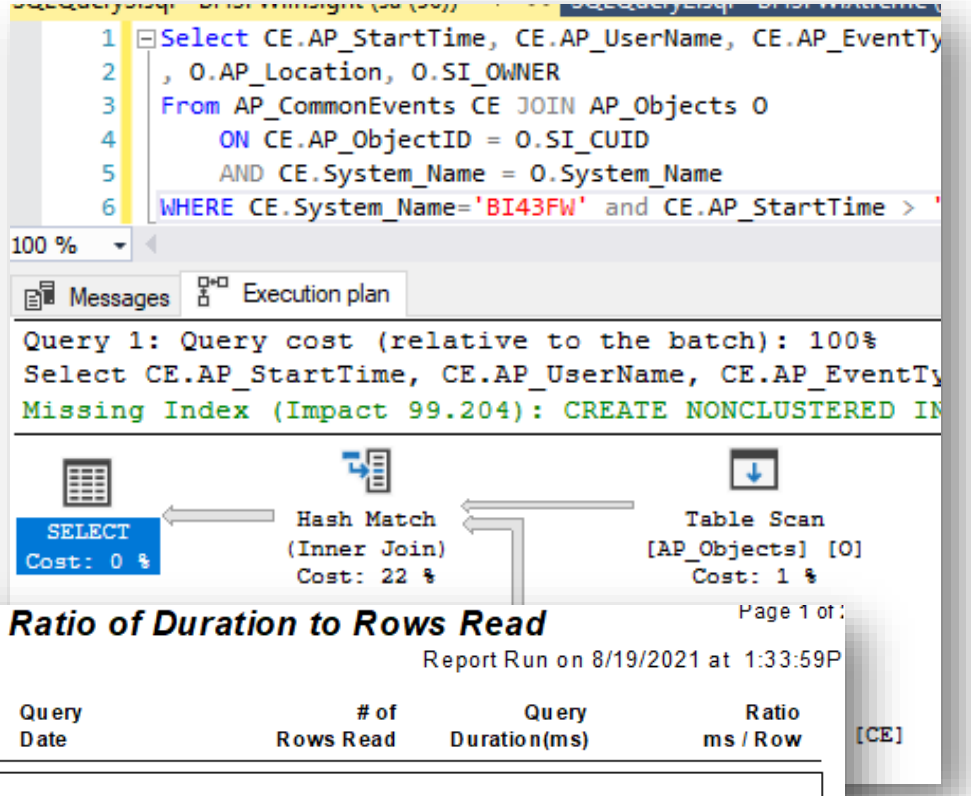
QryDateTime	BOE_User	Qry_Text	QryDuration	Qry_dbDuration	Qry_ReadDuration	Qry_RowsRead	DocumentName	UniverseName
2021-08-18 10:13:09.793	Marty	SELECT dbo.Customer.Country, dbo.OrdersDetail....	2304	0	2185	3684	Xtreme Sales_IDAC	Xtreme_IDAC
2021-08-18 10:42:12.670	Administrator	SELECT dbo.Customer.Country, dbo.Customer.Re...	4412	0	3258	3684		IDAC_Xtreme
2021-08-18 11:05:42.700	Marty	SELECT dbo.Customer.Country, dbo.Customer.Re...	4202	0	2972	3684	IDAX_UNX_Xtreme_Products	IDAC_Xtreme
2021-08-18 11:11:10.067	Bill	SELECT dbo.Customer.Country, dbo.OrdersDetail....	3340	0	3161	3684	Xtreme Sales_IDAC	Xtreme_IDAC
2021-08-18 11:12:11.593	Fred	SELECT dbo.Customer.Country, dbo.Customer.Re...	2482	0	2357	3684	IDAX_UNX_Xtreme_Products	IDAC_Xtreme
2021-08-18 11:12:48.250	Betty	SELECT dbo.Customer.Country, dbo.OrdersDetail....	2341	0	2218	3684	Xtreme Sales_IDAC	Xtreme_IDAC

Report Performance

Quality of Query

Report queries are captured in a database

Many different query metrics can be analyzed



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Northwind_Test	04/04/2016 10:14	91	2,212	24.31
Northwind_Test	09/20/2016 14:02	91	2,490	27.36
	09/20/2016 14:04	-1	2,043	-2,043.00
Northwind_Test	09/20/2016 16:11	91	2,444	26.86
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Northwind_Test	09/20/2016 16:13	91	2,351	25.84
Northwind_Test	09/20/2016 16:14	91	2,294	25.21
Northwind_Test	09/20/2016 16:40	91	2,443	26.85
			Average ms/Row	-147.16

QryDateTime	BOE_User	Qry_Text						UniverseName
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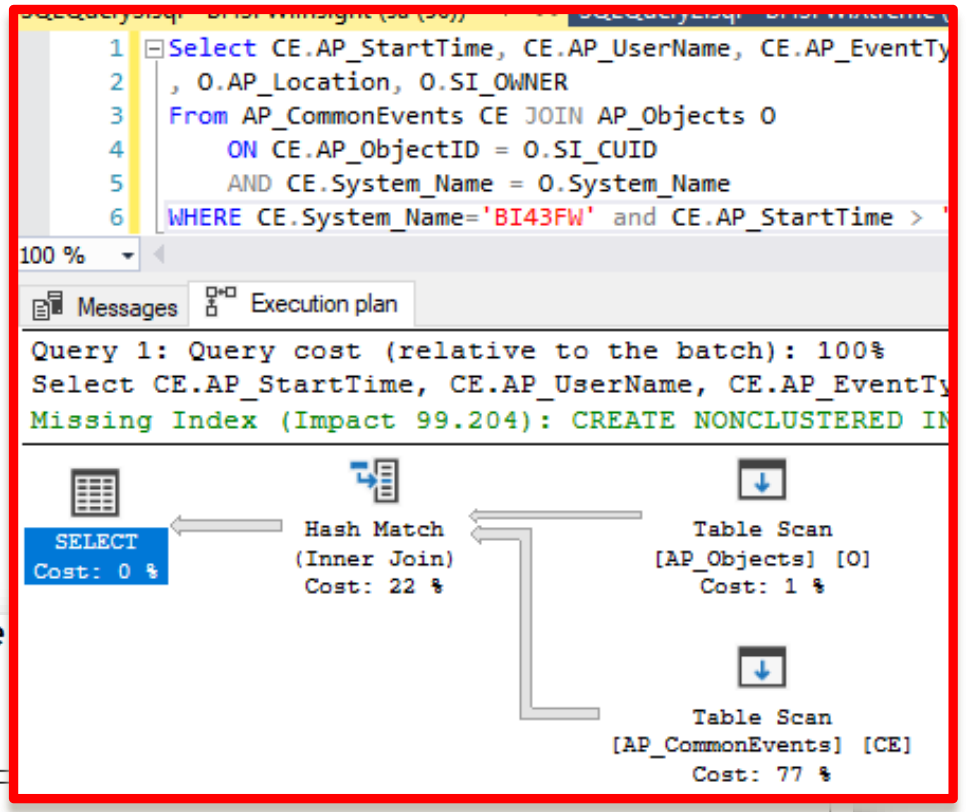
Report Performance

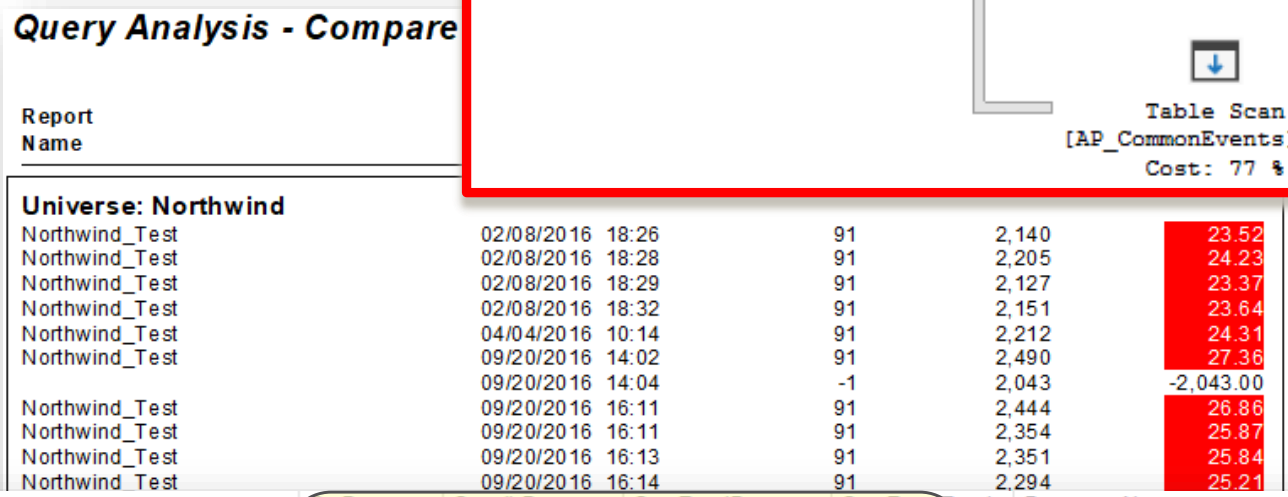
Quality of Query

Report queries are captured in a database

Many different query metrics can be analyzed

These queries can then be copied and analyzed by your DBA





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2021-08-18 11:12:48.250	Betty	SELECT dbo.Customer.Country, dbo.OrdersDetail....	2341	0	2218	3684	Xtreme Sales_IDAC	Xtreme_IDAC

Customer Success-Report Performance

Healthcare Organization in the US Northeast

- Use Insight to compare and analyze increase/decrease of report instances based on year

US Cancer Treatment Center

- Use Insight to analyze the average instance runtime

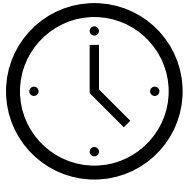
Flashes of Insight

BI System Performance

- BI service metrics
- OS performance for non-BI services
- Disk usage

BI System Performance

Why Important?



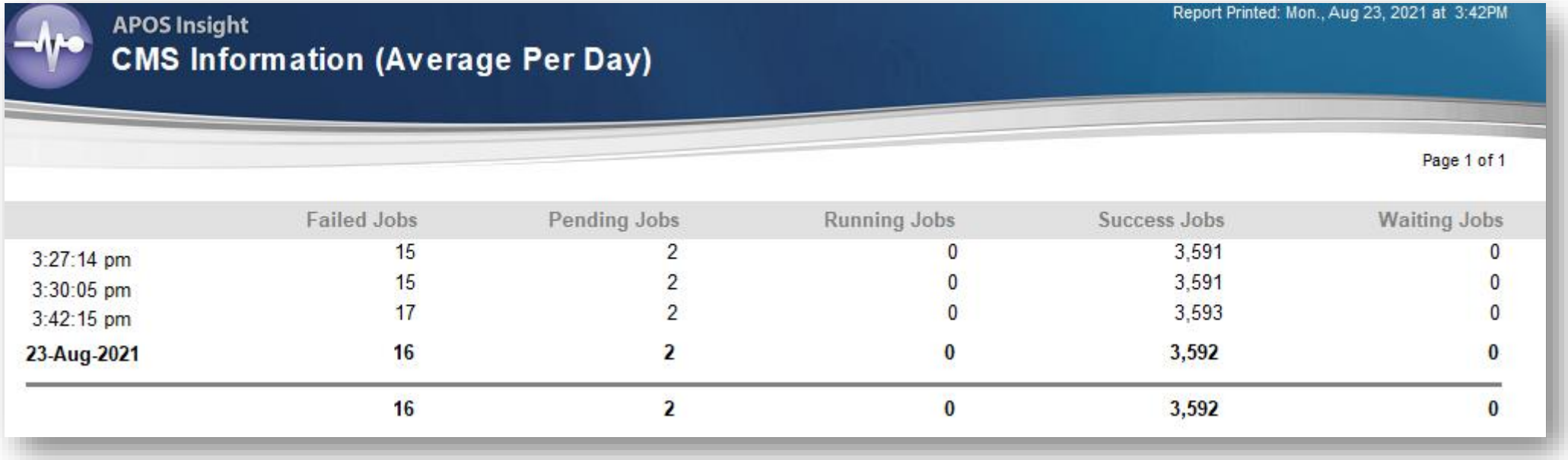
BI System Performance

The performance of BI system itself can be measured in a number of ways, but the performance of the Operating System environment must also be taken into consideration.

System performance can be measured in a number of ways

- Log-in time
- Number of reports processed
- Failed vs. successful reports
- System resources used by processes
- BI Sessions in use

BI System Performance



APOS Insight

CMS Information (Average Per Day)

Report Printed: Mon., Aug 23, 2021 at 3:42PM

Page 1 of 1

	Failed Jobs	Pending Jobs	Running Jobs	Success Jobs	Waiting Jobs
3:27:14 pm	15	2	0	3,591	0
3:30:05 pm	15	2	0	3,591	0
3:42:15 pm	17	2	0	3,593	0
23-Aug-2021	**16**	**2**	**0**	**3,592**	**0**
	16	**2**	**0**	**3,592**	**0**

Discover CMS metrics

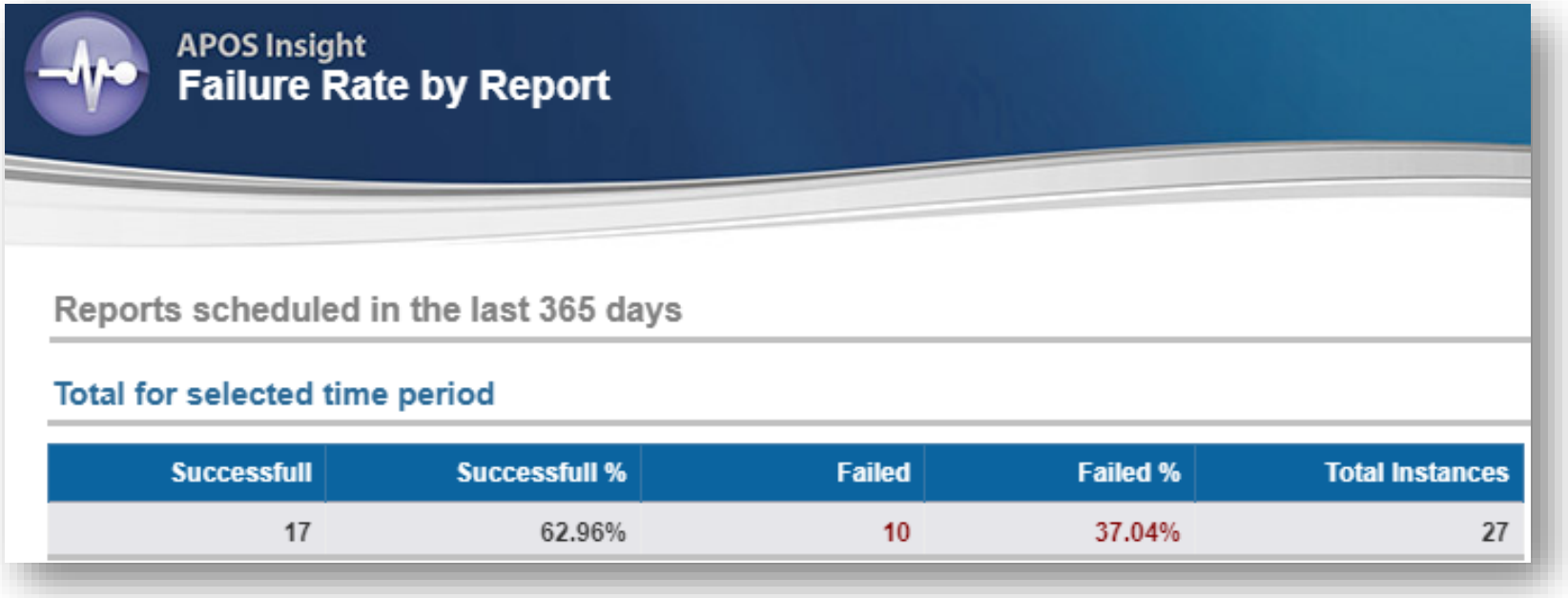
BI System Performance

BI Service Information

BI Service	Registered to CMS	Service Started Date-Time	Service Version	Disk Space Available (Bytes)
Adaptive Job Server	BI43FW:6400	2021/08/23 15:18:13	14.3.1.3701	16,247,783,424
Central Management Server	BI43FW:6400	2021/08/23 15:18:03	14.3.1.3701	16,247,791,616
Connection Server	BI43FW:6400	2021/08/23 15:18:13	14.3.1.3701 (4.1.0.0)	16,247,775,232
Crystal Reports 2020 Processing Server	BI43FW:6400	2021/08/23 15:18:12	14.3.1.3701	16,247,762,944
Crystal Reports 2020 Report Application Server	BI43FW:6400	2021/08/23 15:18:16	14.3.1.3701	16,247,492,608
Crystal Reports Cache Server	BI43FW:6400	2021/08/23 15:18:13	14.3.1.3701	16,247,779,328
Crystal Reports Processing Server	BI43FW:6400	2021/08/23 15:18:12	14.3.1.3701	16,247,771,136
Event Server	BI43FW:6400	2021/08/23 15:18:12	14.3.1.3701	16,247,488,512
Input File Repository Server	BI43FW:6400	2021/08/23 15:18:12	14.3.1.3701	16,247,787,520
Output File Repository Server	BI43FW:6400	2021/08/23 15:18:12	14.3.1.3701	16,247,488,512
Web Intelligence Processing Server	BI43FW:6400	2021/08/23 15:18:13	14.3.1.3701	16,247,767,040

Understand each service that makes up the BI system

BI System Performance



Successfull	Successfull %	Failed	Failed %	Total Instances
17	62.96%	10	37.04%	27

Discover how system performance may contribute to Report schedule failure.

BI System Performance

Select the processes you would like to log

CMS at BI41SP6FW (1), Number of Metrics Tracked: 0
ConnectionServer at BI41SP6FW (1), Number of Metrics Tracked: 0
ConnectionServer32 at BI41SP6FW (1), Number of Metrics Tracked: 0
crystalras at BI41SP6FW (1), Number of Metrics Tracked: 0
JobServer at BI41SP6FW (1), Number of Metrics Tracked: 0
spoolsv at BI41SP6FW (1), Number of Metrics Tracked: 0
tomcat7 at BI41SP6FW (1), Number of Me
WIReportServer at BI41SP6FW (1), Numb

AP_ProcessName	AP_MachineName	AP_WorkingSet64	AP_PeakWorkingSet64	AP_NonpagedSystemMemorySize64	AP_PagedMemorySize64	AP_PeakPagedMemorySize64
CMS	BI41SP6FW	1896308736	1898602496	3630920	1979637760	1984098304
ConnectionServer	BI41SP6FW	52170752	52715520	59848	26972160	28131328
ConnectionServer32	BI41SP6FW	55693312	55742464	77488	38260736	38326272
crystalras	BI41SP6FW	55095296	55918592	52416	35717120	36687872
JobServer	BI41SP6FW	26816512	27656192	24768	12574720	14180352
spoolsv	BI41SP6FW	19046400	19046400	29320	10227712	10342400
tomcat7	BI41SP6FW	1387855872	1396719616	41072	1608851456	1608884224
WIReportServer	BI41SP6FW	57655296	57700352	51448	46723072	49254400

Understand the system resources being consumed by the BI services, and the OS processes on the server where BI is installed.

Customer Success – BI System Performance

Multinational Retailer

- Use Insight to capture disk space usage to analyze performance

US Manufacturer

- Capture and compare resource usage and performance of the Tomcat Server

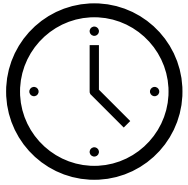
Flashes of Insight

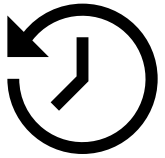
BI System Monitoring

- Monitor Schedule and Instance activity
- Monitor key resource metrics
- Monitor BI availability and performance

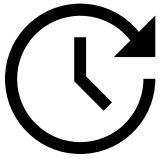
BI System Monitoring

Why Important?





Auditing = Past



Monitoring = Now

What's happening Now
Taking action Now

BI System Monitoring

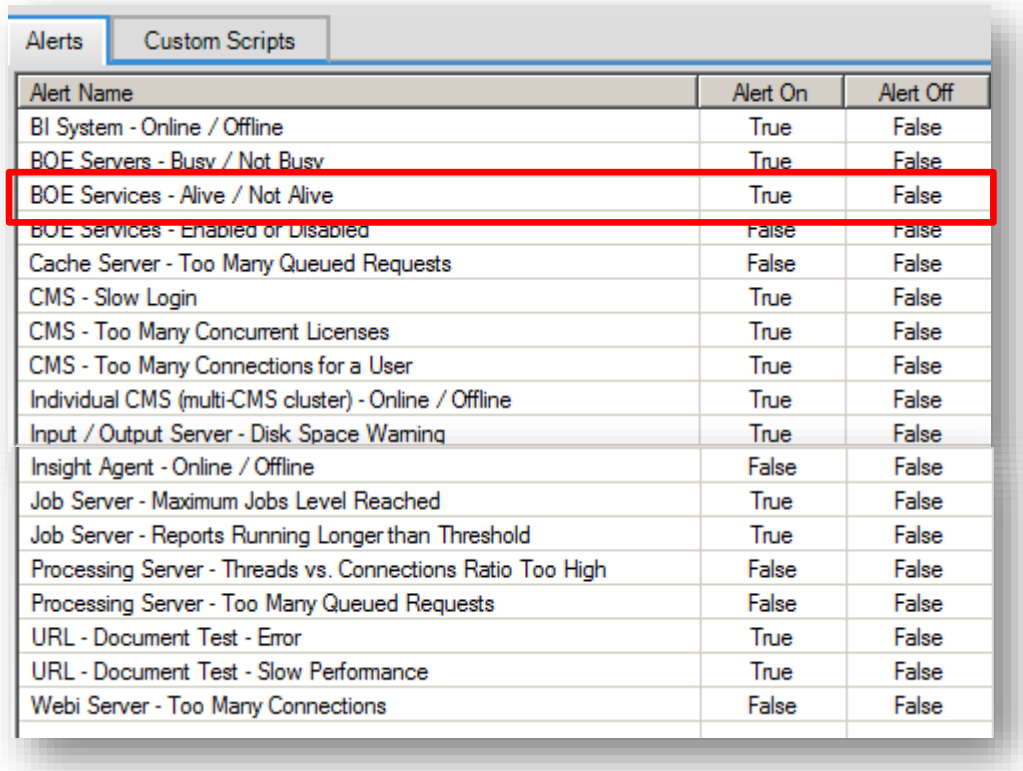
Monitoring your BI system can seem like a daunting task – but it doesn't have to be.

Once pertinent metrics have been measured, those metrics can be monitored, and alerts can be triggered when metrics are exceeded to notify and take action

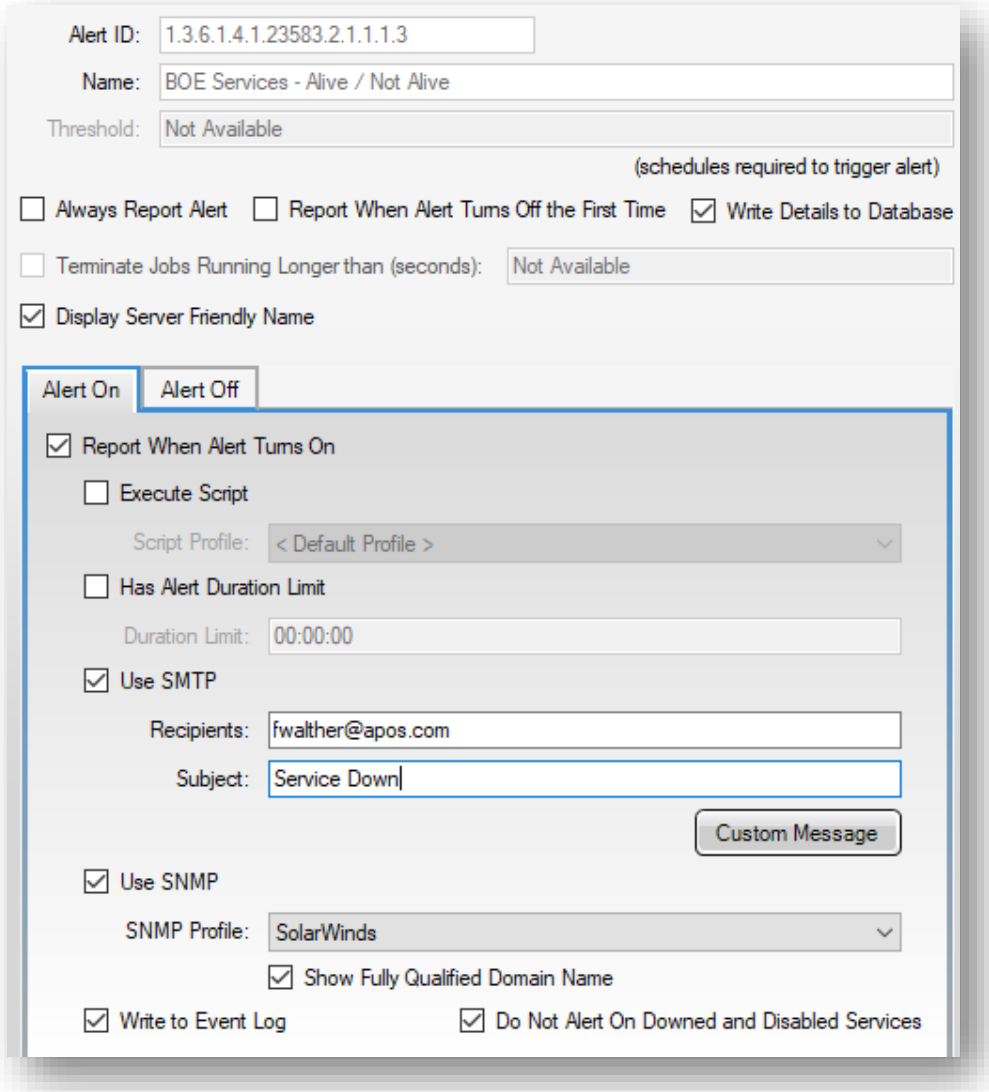
System monitoring can be accomplished in a number of ways

- Log-in time
- Run-time of scheduled reports
- Delayed schedules
- Execution Time of queries
- System KPIs
- Disk space usage

BI System Monitoring

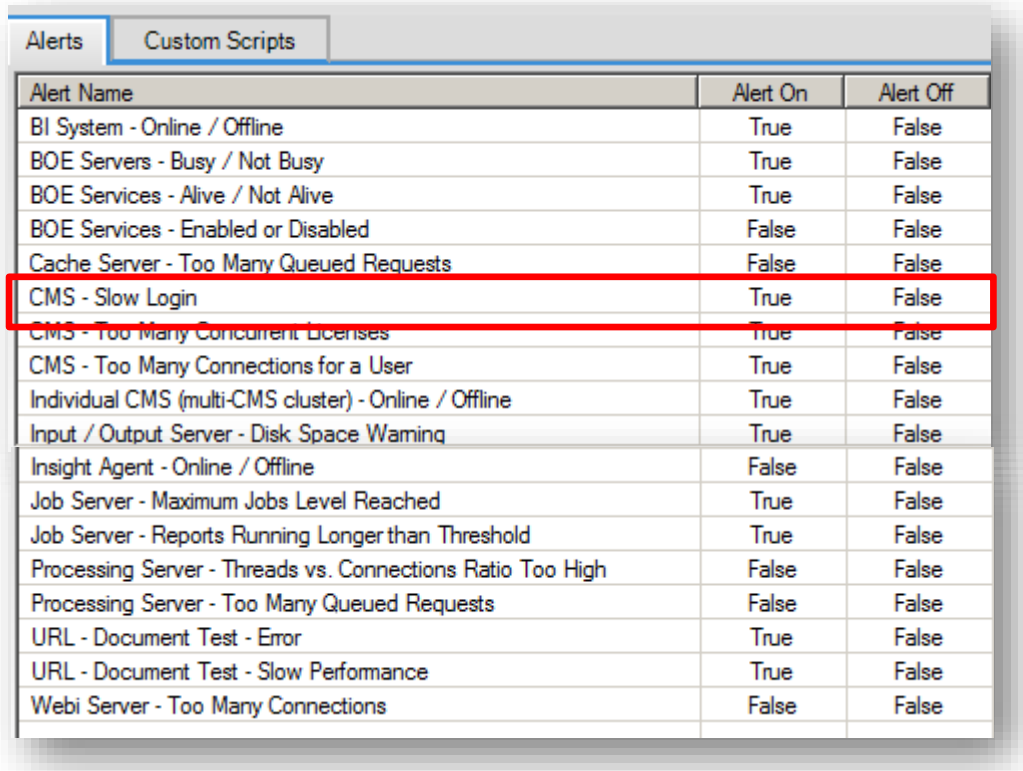


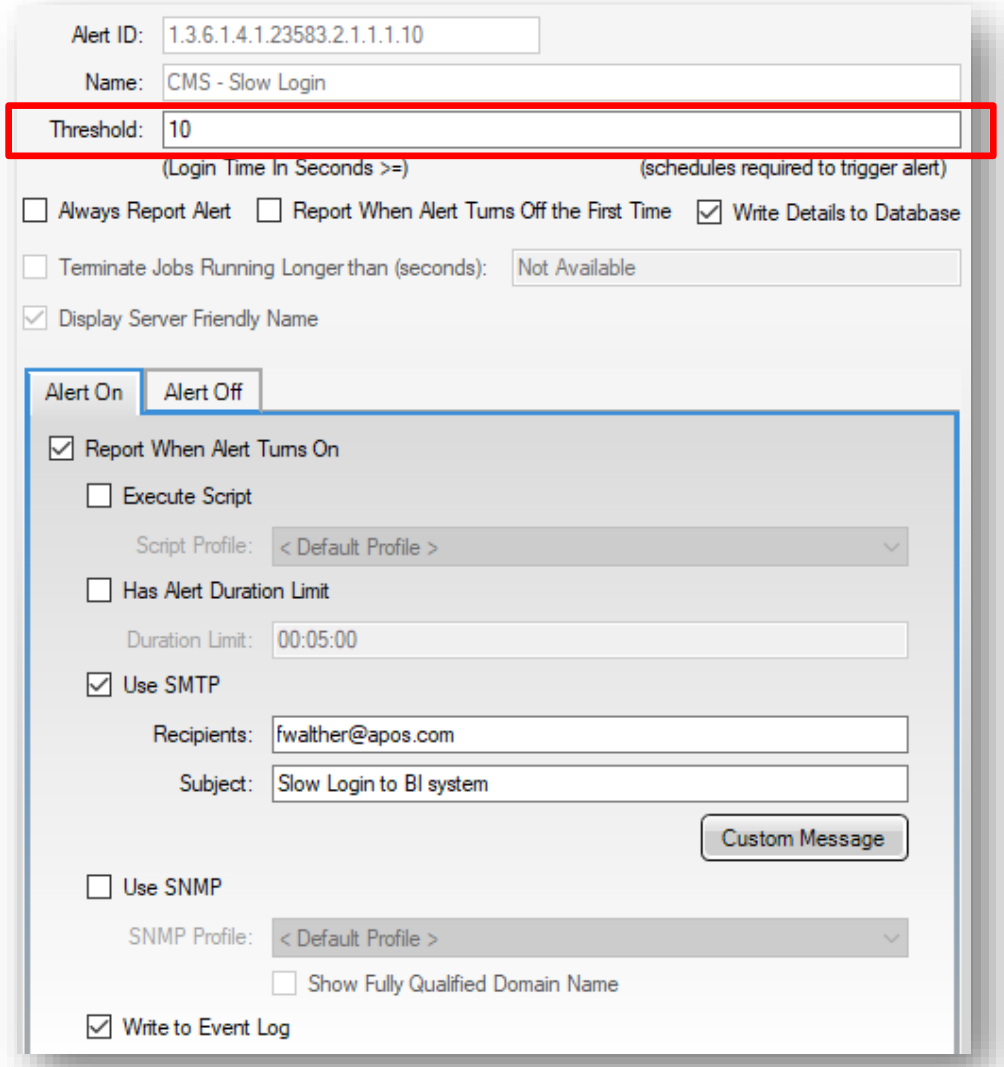
Alert Name	Alert On	Alert Off
BI System - Online / Offline	True	False
BOE Servers - Busy / Not Busy	True	False
BOE Services - Alive / Not Alive	True	False
BOE Services - Enabled or Disabled	False	False
Cache Server - Too Many Queued Requests	False	False
CMS - Slow Login	True	False
CMS - Too Many Concurrent Licenses	True	False
CMS - Too Many Connections for a User	True	False
Individual CMS (multi-CMS cluster) - Online / Offline	True	False
Input / Output Server - Disk Space Warning	True	False
Insight Agent - Online / Offline	False	False
Job Server - Maximum Jobs Level Reached	True	False
Job Server - Reports Running Longer than Threshold	True	False
Processing Server - Threads vs. Connections Ratio Too High	False	False
Processing Server - Too Many Queued Requests	False	False
URL - Document Test - Error	True	False
URL - Document Test - Slow Performance	True	False
Webi Server - Too Many Connections	False	False



Pertinent BI metrics can be monitored, and action taken when thresholds met or exceeded.

BI System Monitoring





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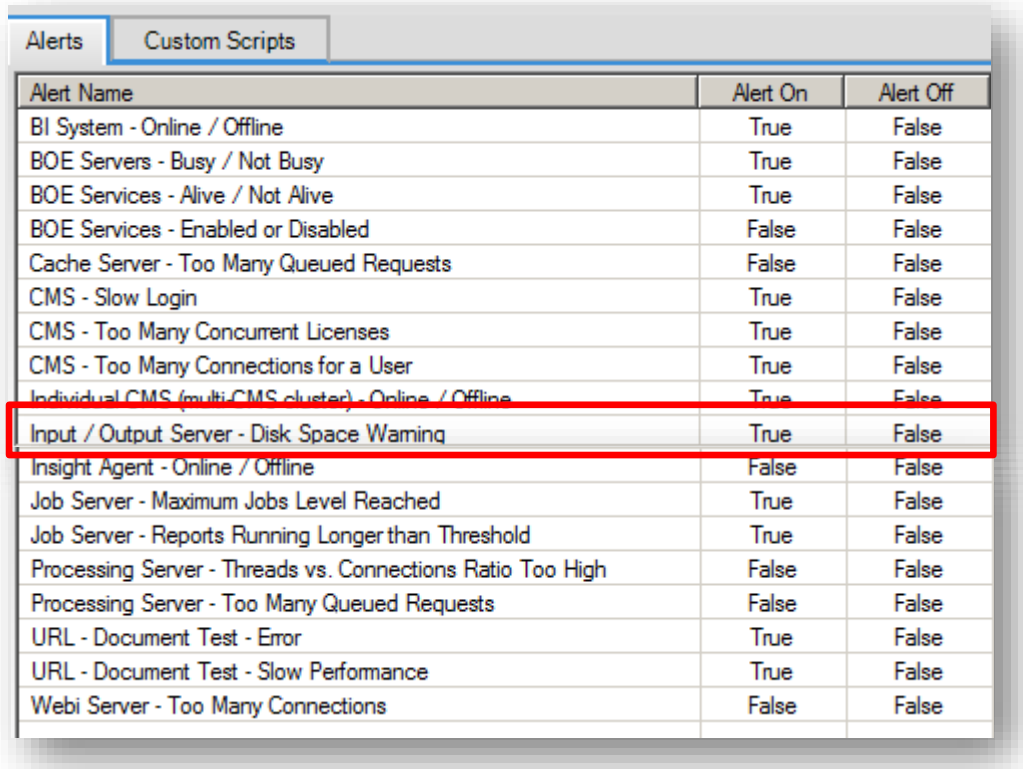
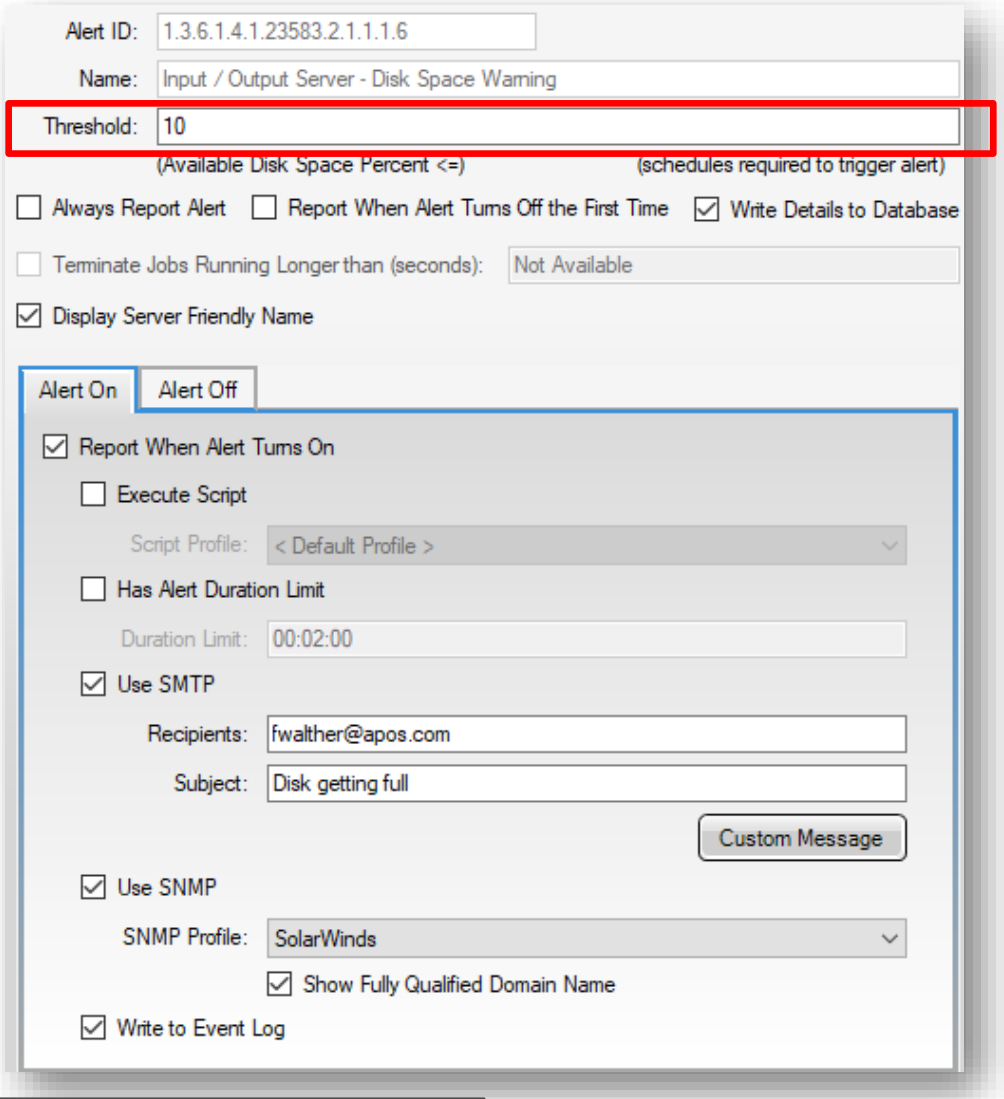
BI System Monitoring





Pertinent BI metrics can be monitored, and action taken when thresholds met or exceeded.

BI System Monitoring

Alerts | Custom Scripts

Alert Name	Alert On	Alert Off
BI System - Online / Offline	True	False
BOE Servers - Busy / Not Busy	True	False
BOE Services - Alive / Not Alive	True	False
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Cache Server - Too Many Queued Requests	False	False
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CMS - Too Many Concurrent Licenses	True	False
CMS - Too Many Connections for a User	True	False
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Input / Output Server - Disk Space Warning	True	False
Insight Agent - Online / Offline	False	False
Job Server - Maximum Jobs Level Reached	True	False
Job Server - Reports Running Longer than Threshold	True	False
Processing Server - Threads vs. Connections Ratio Too High	False	False
Processing Server - Too Many Queued Requests	False	False
URL - Document Test - Error	True	False
URL - Document Test - Slow Performance	True	False
Webi Server - Too Many Connections	False	False

Alert ID: 1.3.6.1.4.1.23583.2.1.1.16

Name: Job Server - Reports Running Longer than Threshold

Threshold: 120 (Max processing time - in seconds >=)

Minimum: 1 (schedules required to trigger alert)

☐ Always Report Alert ☐ Report When Alert Turns Off the First Time ☑ Write Details to Database

☑ Terminate Jobs Running Longer than (seconds): 600

☑ Display Server Friendly Name

Alert On | Alert Off

☑ Report When Alert Turns On

☐ Execute Script

Script Profile: < Default Profile >

☐ Has Alert Duration Limit

Duration Limit: 00:00:00

☑ Use SMTP

Recipients: fwalther@apos.com

Subject: Long Running Report

Custom Message

☐ Use SNMP

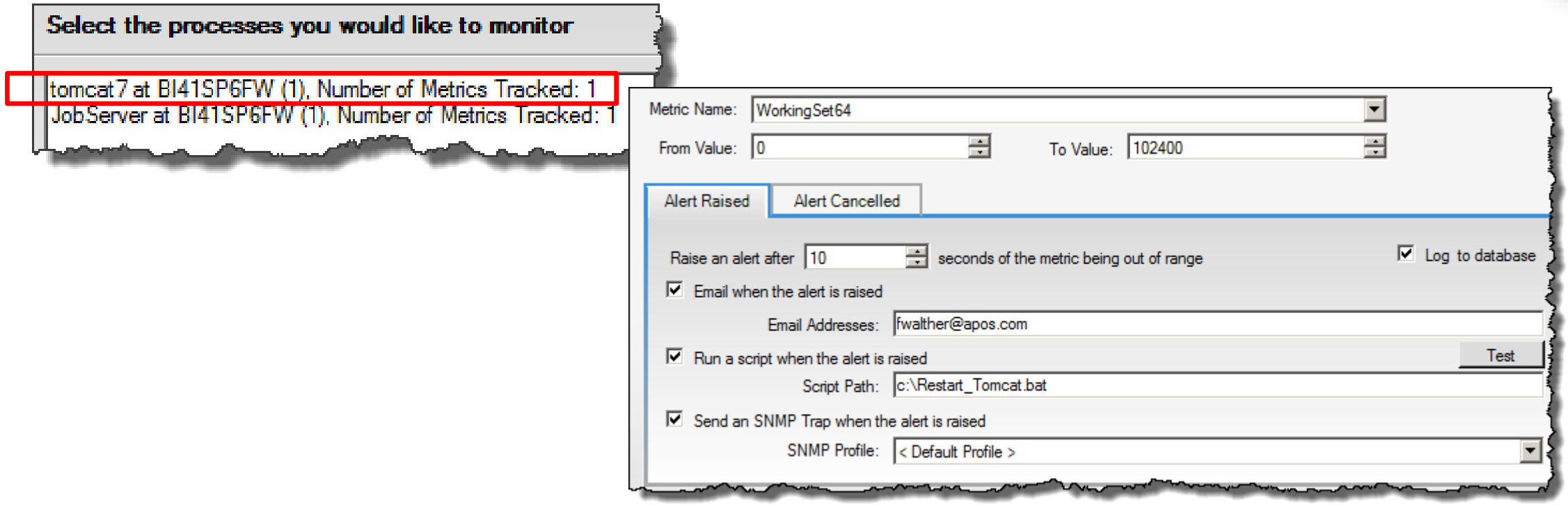
SNMP Profile: < Default Profile >

☐ Show Fully Qualified Domain Name

☑ Write to Event Log

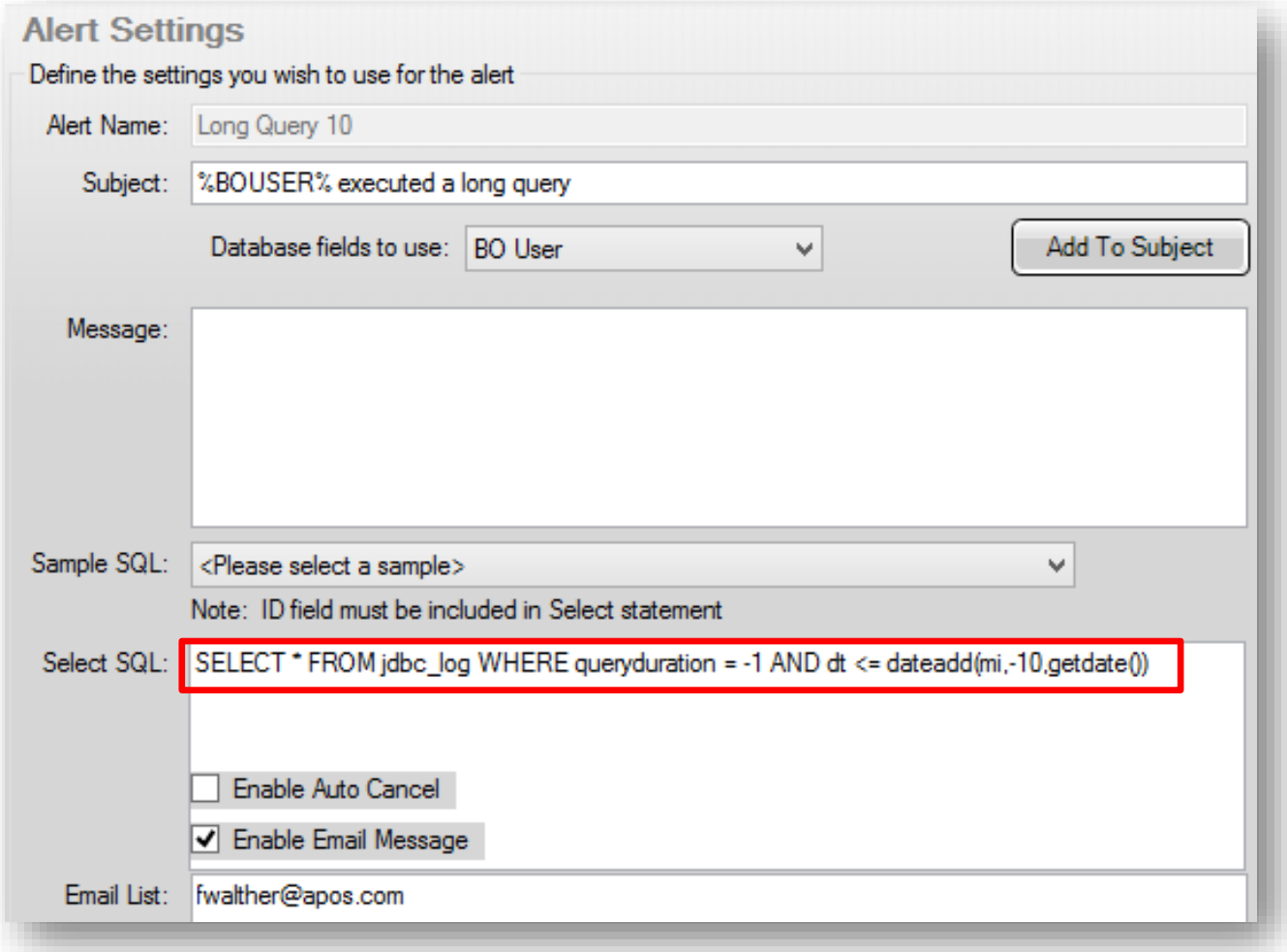
Pertinent BI metrics can be monitored, and action taken when thresholds met or exceeded.

BI System Monitoring



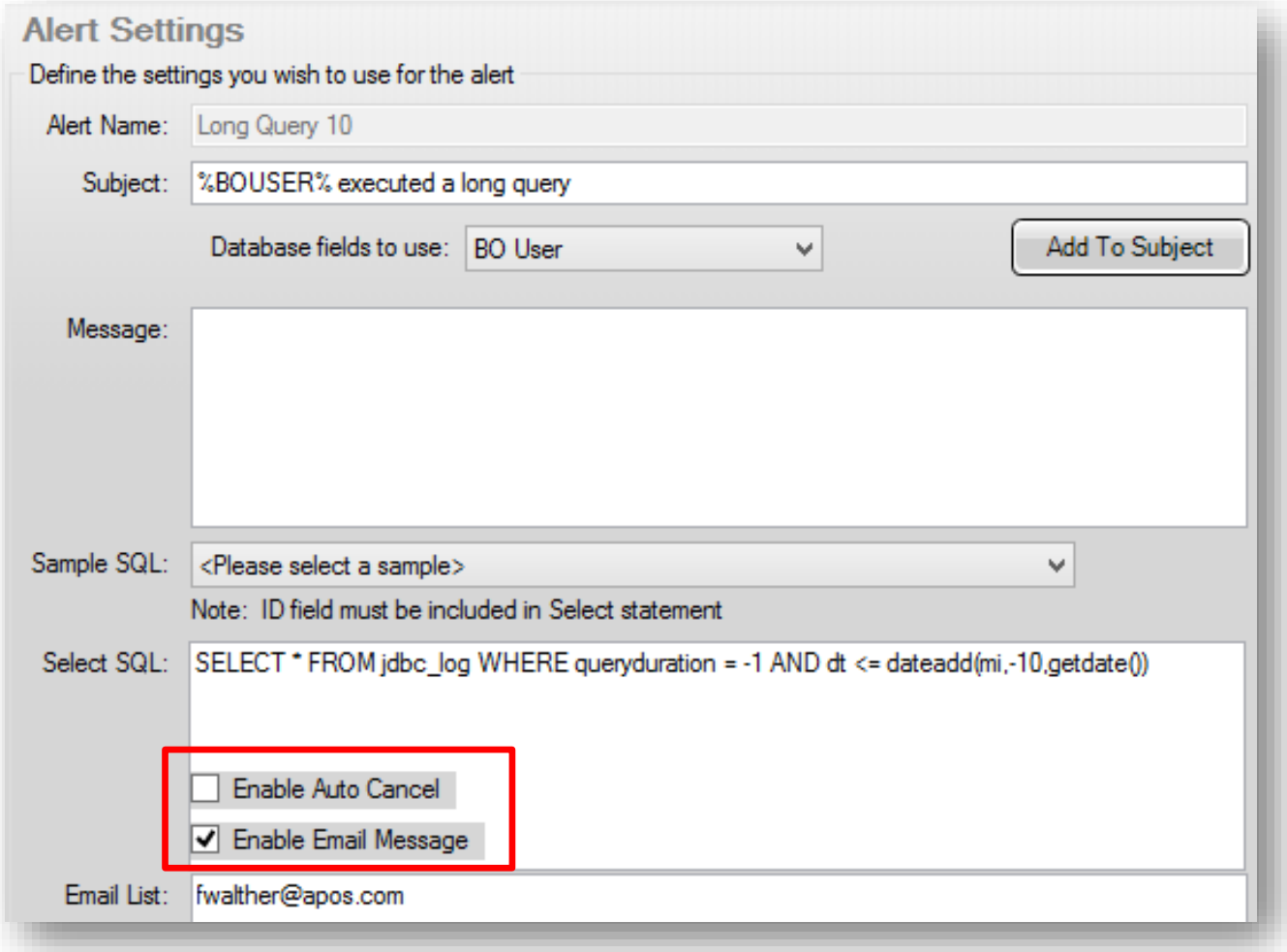
Monitor identified metrics, and take action when they are out of tolerance.

BI System Monitoring



Report Queries can be monitored, and corrective action can be taken when thresholds are exceeded.

BI System Monitoring



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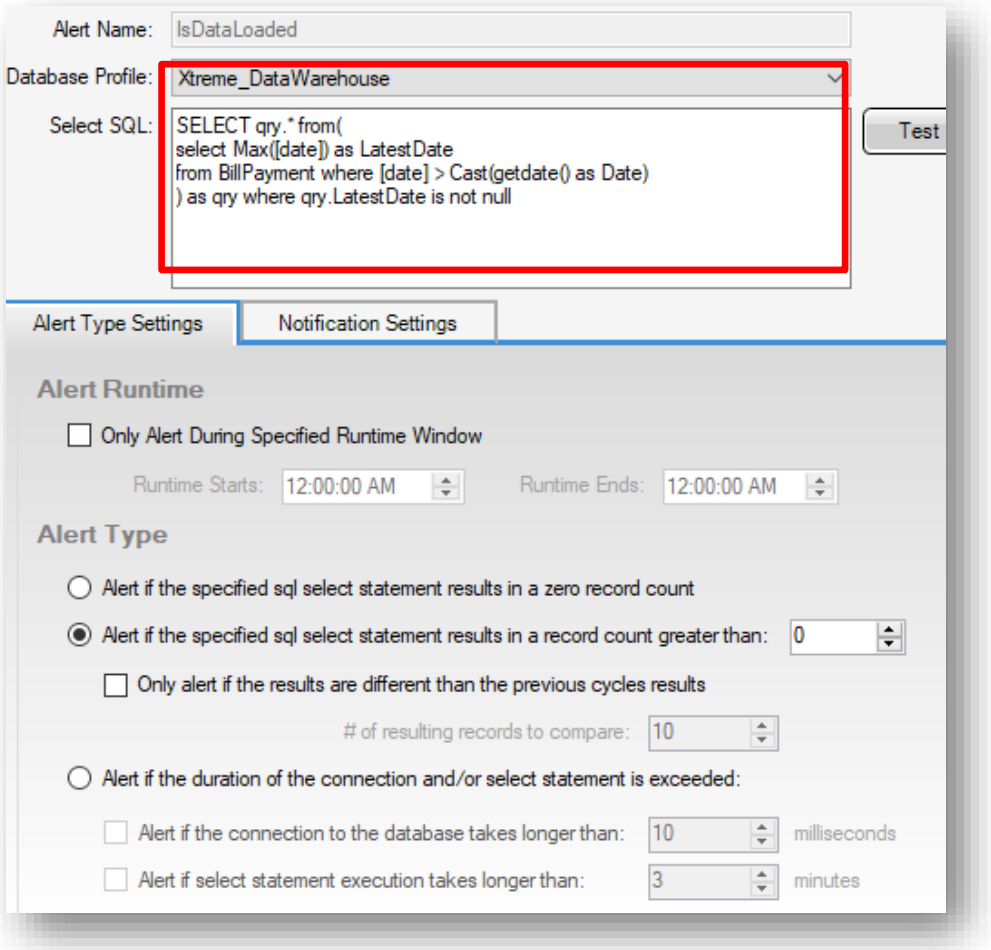
BI System Monitoring



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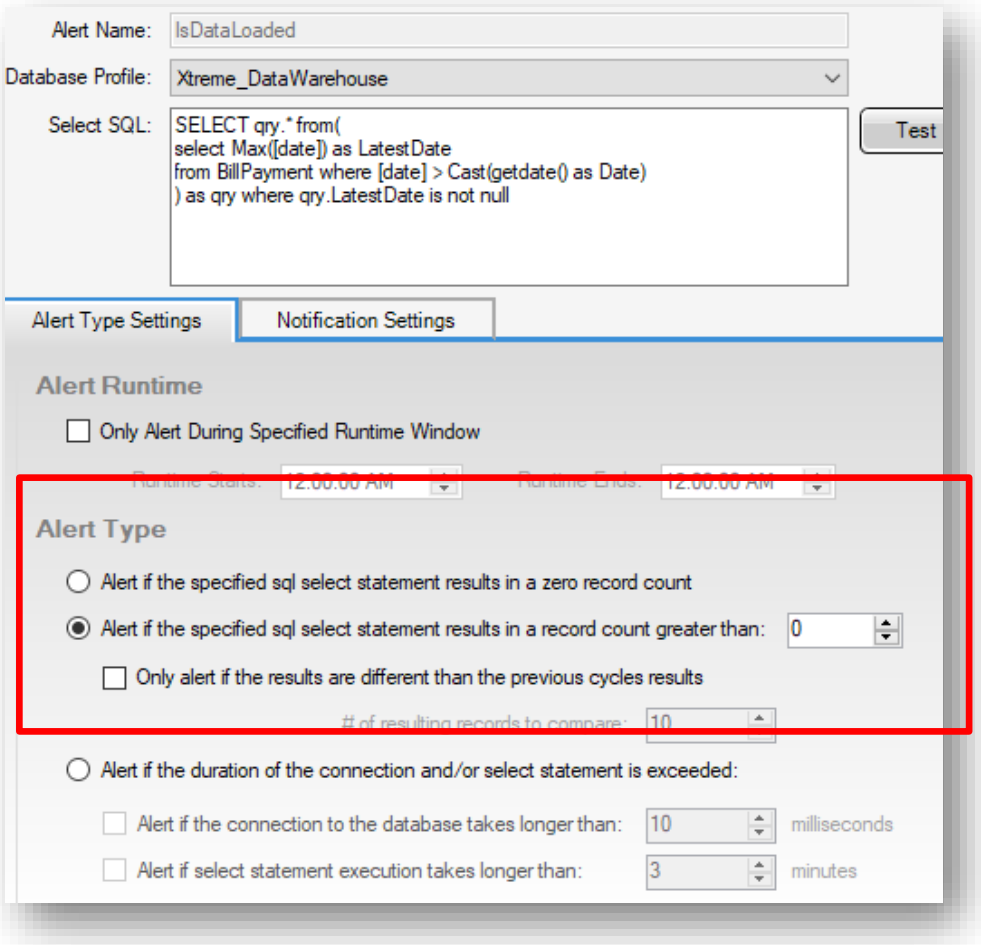
BI System Monitoring



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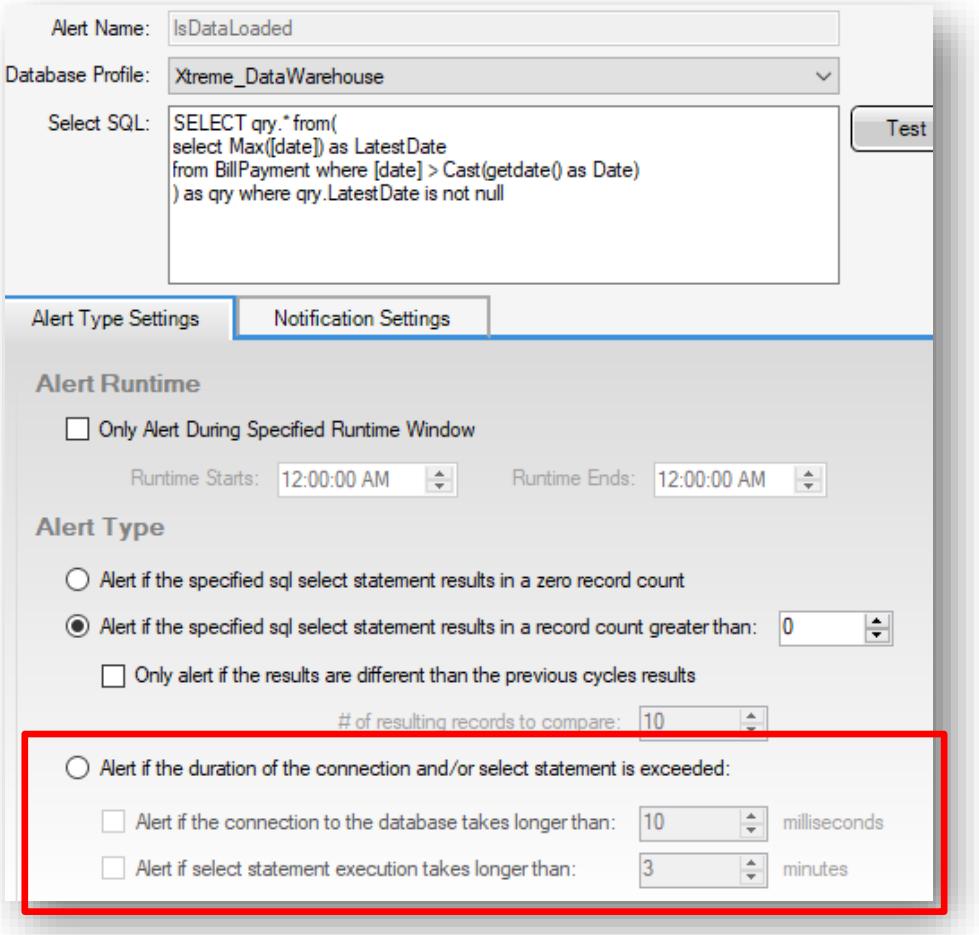

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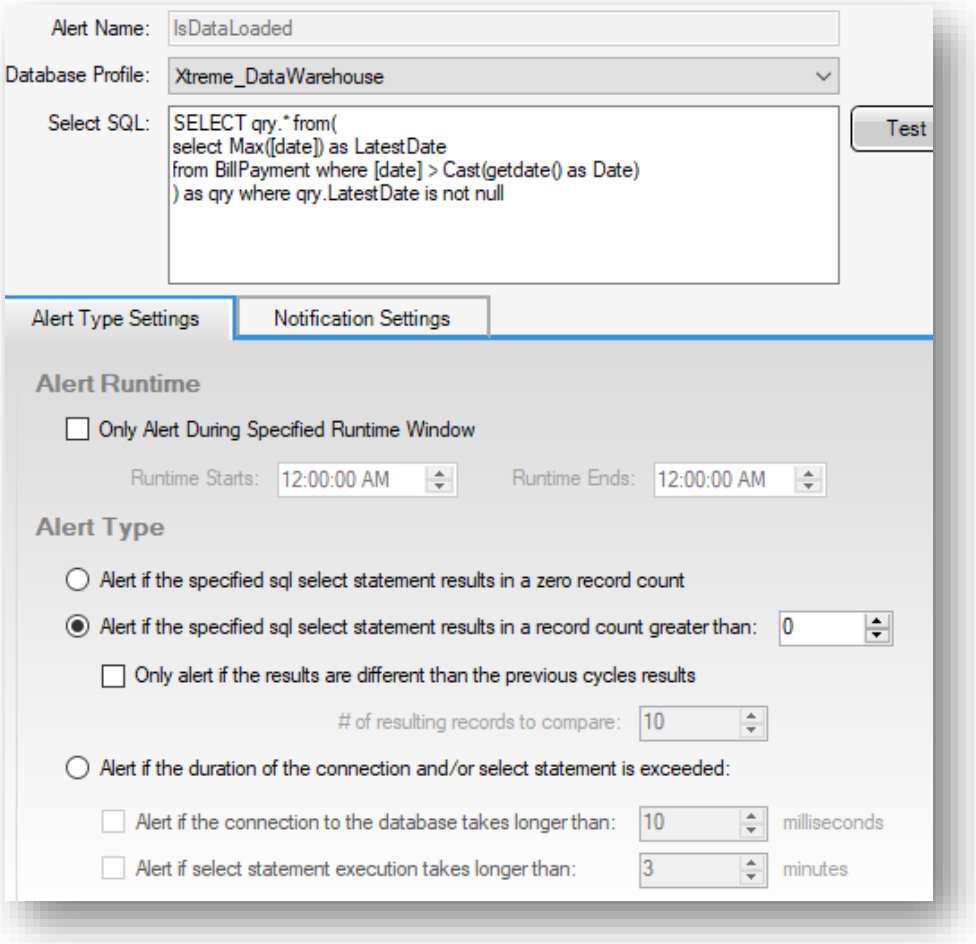
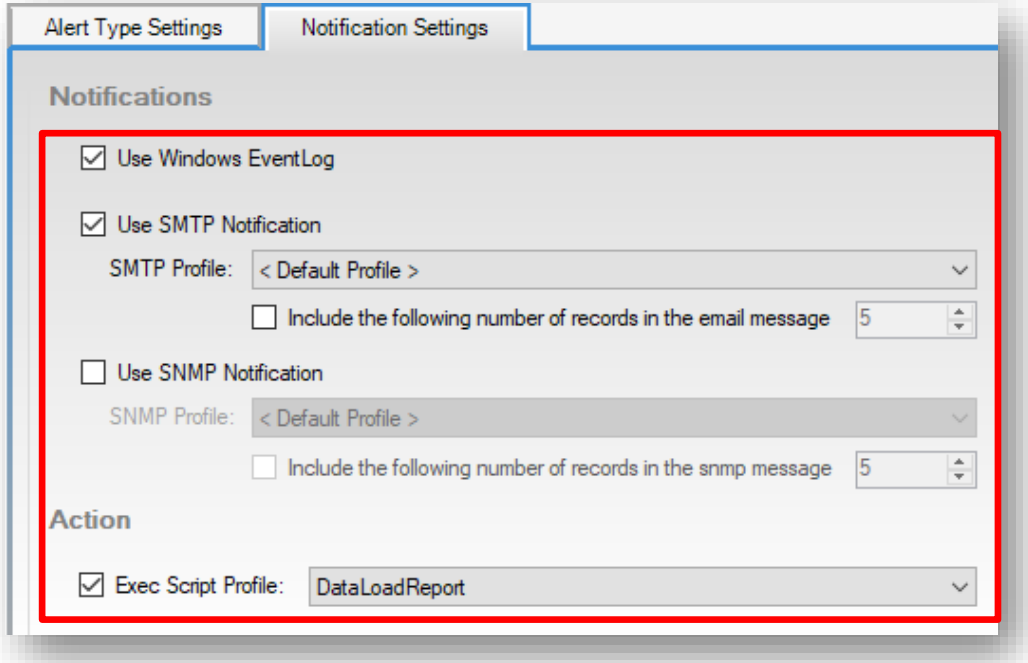
BI System Monitoring





Monitor identified metrics, and take action when they are out of tolerance.

Customer Success – BI System Monitoring

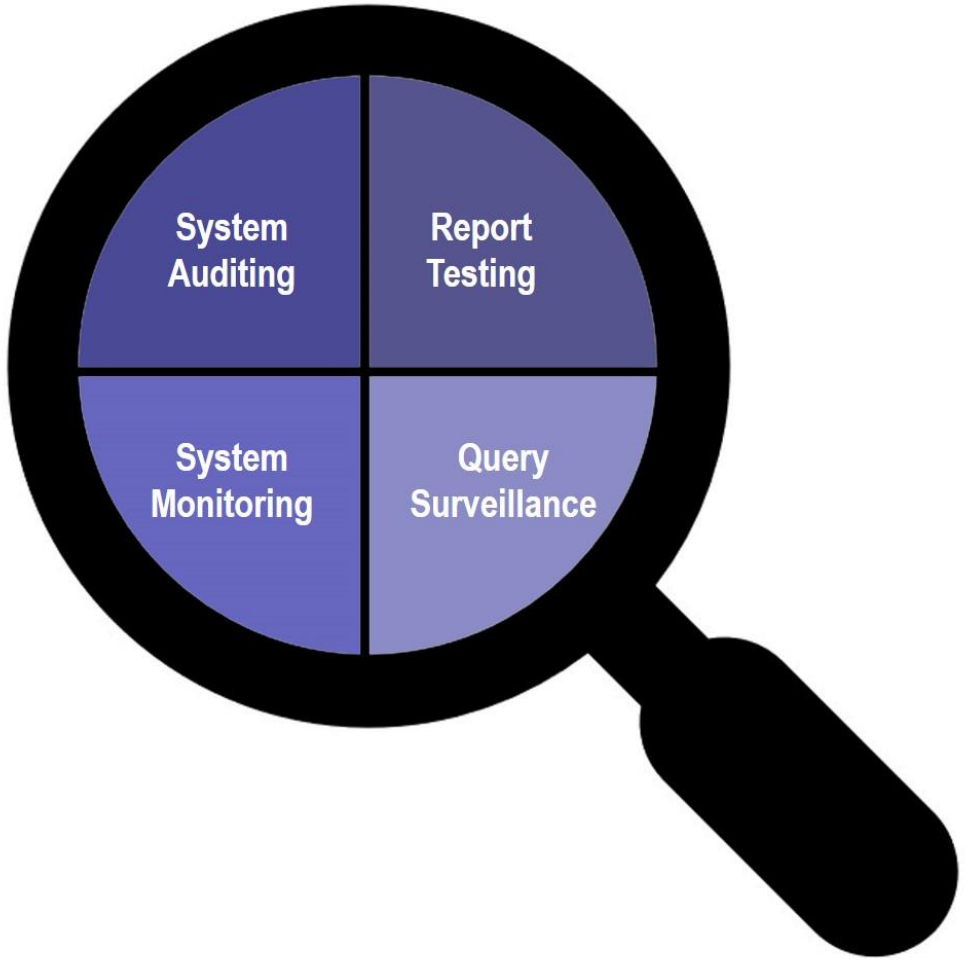
US University

- Use Insight to monitor Oracle Temp DB space and alert when usage is greater than 350 GB

Multinational Retailer

- Use Insight to monitor the Tomcat Server and alert when resources exceed a predetermined threshold

Flashes of Insight – Performance Analysis



APOS Solutions for SAP BusinessObjects

APOS Insight

BI System Auditing

- System Inventory
- Security Analysis
- System Usage Analysis
- Report Impact Analysis

BI Report Testing

- Automated Report Testing
- Regression Testing
- Validation of Report Data
- Report Performance Testing

BI System Monitoring

- Advanced System Monitoring
- Operating Environment Monitoring
- Database Monitoring
- Process Monitoring

BI Query Surveillance

- Real-time BI Query Monitoring
- Query Performance Alerting & Auditing
- Query Intervention; Remote Cancelling
- Sensitive Data Audit

APOS Administrator

Object Management

- Bulk Security Management
- Bulk Settings Management
- System Objects Promotion
- Connections Maintenance

Schedule Management

- High-volume schedule management
- Multiple schedule properties editing
- Grid scheduling interface
- Repeatable scheduling templates

Instance Management

- Manage entire instance inventory
- Granular instance search
- Stop, pause, release, reschedule
- Rapid recovery to failed schedules

Web Intelligence Migration

- Bulk conversion of Universes from UNV to UNX
- High-Volume Repoint Web Intelligence reports
- Success validation
- Controlled, project-based workflow

APOS Storage Center

- System Backup
- Content Archiving
- Content Versioning
- Selective Restoration
- Automated System Clean Up

APOS Publisher

- Systematic Content Delivery
- Advanced Document Bursting
- Enhanced Content Distribution
- Security and Encryption
- Statement Generation

APOS Solutions for SAP Analytics Cloud

APOS Live Data Gateway

- High-performance live data connectivity
- Virtualized, governed, self-service connectivity
- Connect to Relational databases
- Connect to OLAP data sources
- Connect to Cloud data environments
- Connect to SAP Application data

APOS Publisher for Cloud

- Automate secure information delivery
- Deliver timely information
- Create a flexible messaging environment
- Simplify administration
- Use multiple formats & destinations
- Burst stories with multiple filters
- Burst conditionally
- Collate stories
- Personalize PowerPoint bursting

APOS Insight for Cloud

Monitor – tracking & alerting for:

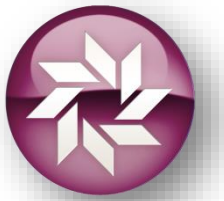
- SAC story performance
- System response measures

Validation automated comparisons across SAC versions of:

- SAC story data
- SAC story performance
- SAC story structure

Impact analysis – granular auditing of SAC story structure metadata

APOS Semantic Layer Migration



- Capture SAP BI Universe data connection and data modelling logic
- Project-based, wizard-driven interface
- Scan your SAP BI content for relevant data connections
- Harmonize SAP BI and HANA data modelling throughout Hybrid BI
- Translate SAP BusinessObjects modelling to SAP HANA Calculation Views
- Translate SAP BusinessObjects modelling to a unified semantic layer

Upcoming Events

High-Performance Analytics Connectivity to Cloud Data Sources - *Webinar*

September 29, 2021 –11 am EDT

Join this session to learn the great efficiency and performance benefits of direct, live connectivity from SAP Analytics Clou d to non-SAP data sources.

Topics:

- Leverage data assets from your cloud data environments, such as Snowflake, Azure and Google BigQuery
- Leverage data from relational sources such as SQL, Oracle and DB2
- Leverage OLAP sources such as Azure Analysis Services and Essbase
- Leverage data from your SAP applications such as SAP Ariba, Fieldglass, Concur and SuccessFactors

…and much more.

Register at www.apos.com

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QUESTIONS?

Please enter your questions in the Q&A panel.

APOS

Thank You!

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PHONE NUMBER

(+1) 519 894 2767

SAP Partner