



QUALYS SECURITY CONFERENCE 2018

# Policy Compliance & Security Configuration Assessment

Automate the Assessment of Technical Controls & Mandate-based Security Requirements

# Compliance Challenges

Continuing Expansion of Industry & Regulatory Mandates

Ensuring Coverage of Technical & Non-Technical Controls

Maintaining Visibility Across Silos

Due Diligence Beyond Regulated Environment



# Necessities to Support Digital Transformation:

Complete Visibility across Business Units, Technologies, and Environments

Simplified Processes, So they can focus on improving security rather than running products

Flexibility options for capturing required compliance data

Support for emerging technologies and capabilities

# Necessities to Support Digital Transformation:

Tight integration across security technologies to support complex mandates and audit requirements

Automation and process integration to support DevSecOps

Comprehensive reporting against regulations, mandates & audit objectives

## Use Case:

# FedRAMP/NIST Compliance via unified security program

Customer: Cloud-based Infrastructure solution Provider

Digital Transformation underway  
FedRAMP certification driving compliance unification  
Leveraging NIST for control objectives company wide



## Goals:

Address FedRAMP compliance as a bi-product of good cybersecurity practices  
Consolidated cybersecurity dashboard based on the NIST objectives



## Requires:

Security Vendor Consolidation  
Integrated Solutions  
Strong Regulatory Content  
End-End mandate reporting  
Breadth & Depth of Coverage

NIST Control	NIST Control Objective	Qualys Applications
CM	Information System Component Inventory	AI SYN
CM	Inventory of Authorized and Unauthorized Software	AI SYN VM PC
CM	Secure Configuration for Hardware and Software	TP
RA-5	Continuous Vulnerability Assessment & Remediation	VM PC TP CM
AC, IA	Controlled Used of Administrative Privileges	PC
AU	Maintenance, Monitoring and Analysis of Audit Logs	PC FIM
AC	Email and Web Browser Protection	VM PC SAQ
SI-4	Malware Defense	PC IOC WAS WAF FIM
CM, SA	Limitation and Control of Network Ports	VM PC CM WAF
CP	Data Recovery Capability	PC SAQ
CM, RA	Secure Configurations for Network Devices	VM PC

NIST Control	NIST Control Objective	Qualys Applications
AC, SI	Boundary Defense	VM PC CS WAS WAF
AU	Maintenance, Monitoring, and Analysis of Audit Logs	PC FIM
AC, IA	Controlled Access Based on the Need to Know	PC CS
AC-17, AC-18	Wireless Access Control	VM
AC, IA	Account Monitoring and Control	PC SAQ
AT	Security Skills Assessment and Appropriate Training to Fill Gaps	SAQ
RA, CM	Vendor Controls Assessment	IOC CS WAS WAF
IR	Incident Response and Management	PC IOC FIM
CA	Penetration Tests and Red Team Exercises	VM TP IOC

# They started with critical requirements for Quick Wins...

1. Inventory Your Systems  
2. Inventory and Restrict Software    
3. Secure Configurations   
4. Continuous Vulnerability Management    
5. Review Rights & Permissions 
6. Definition, Automated Evaluation & Review of Processes 



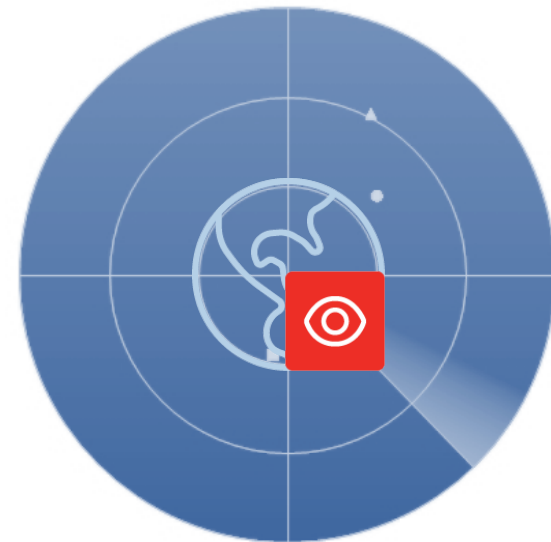
# Complete Visibility

Assessment for Out-of-band Configurations

Expanded UDC Support

- Agent Support for OS UDC's
- Database UDC
- Windows File Content
- Command UDC

PC Dashboard



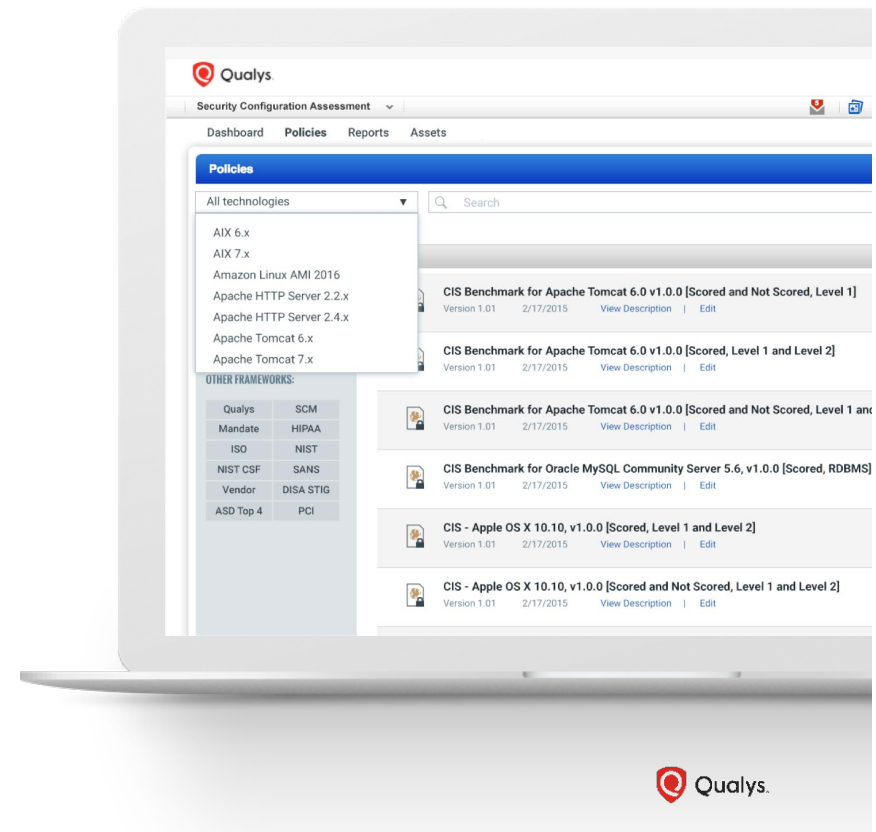
# Assess ALL your assets against CIS

With Qualys Security Configuration Assessment

## Security Configuration Assessment

Lightweight add-on to VM  
Broad platform coverage  
Accurate controls & content  
Simple assessment workflow  
Scan remotely or via agent  
Powered by the Qualys Cloud Platform

*Support for NIST Reporting coming soon!*



# Broad Technology & Control Coverage to support Emerging Technologies & Digital Transformation

Network Devices  
Applications  
Operating Systems

Emerging Technologies

Containers  
Cloud Security

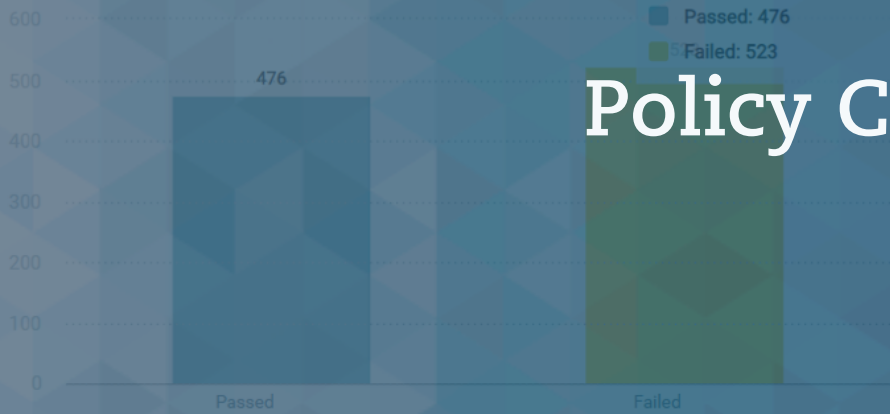
Qualys Platform Security Report  
Security Gap Assessment



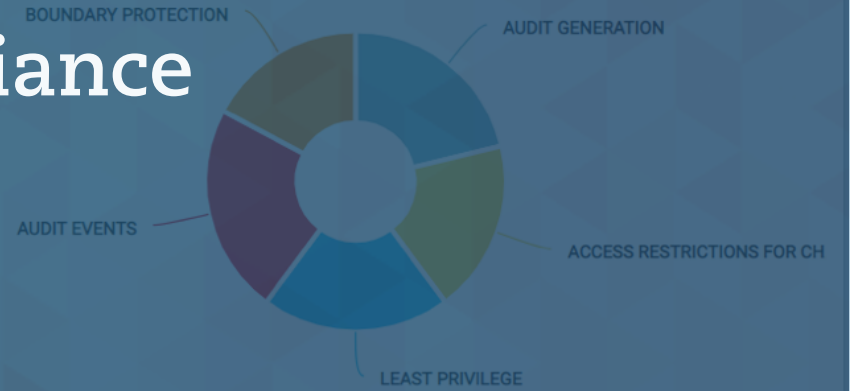
Demo

PC

### CONTROL STATUS FOR NIST RELATED CONTROLS



### TOP FAILING NIST CATEGORIES



# Policy Compliance

### FAILING CONTROL COUNT BY NIST CONTROL ID



# Database UDC

Initial Support: MSSQL,  
Oracle, MongoDB

Define DB Query (read  
only), Customizable by DB  
Version

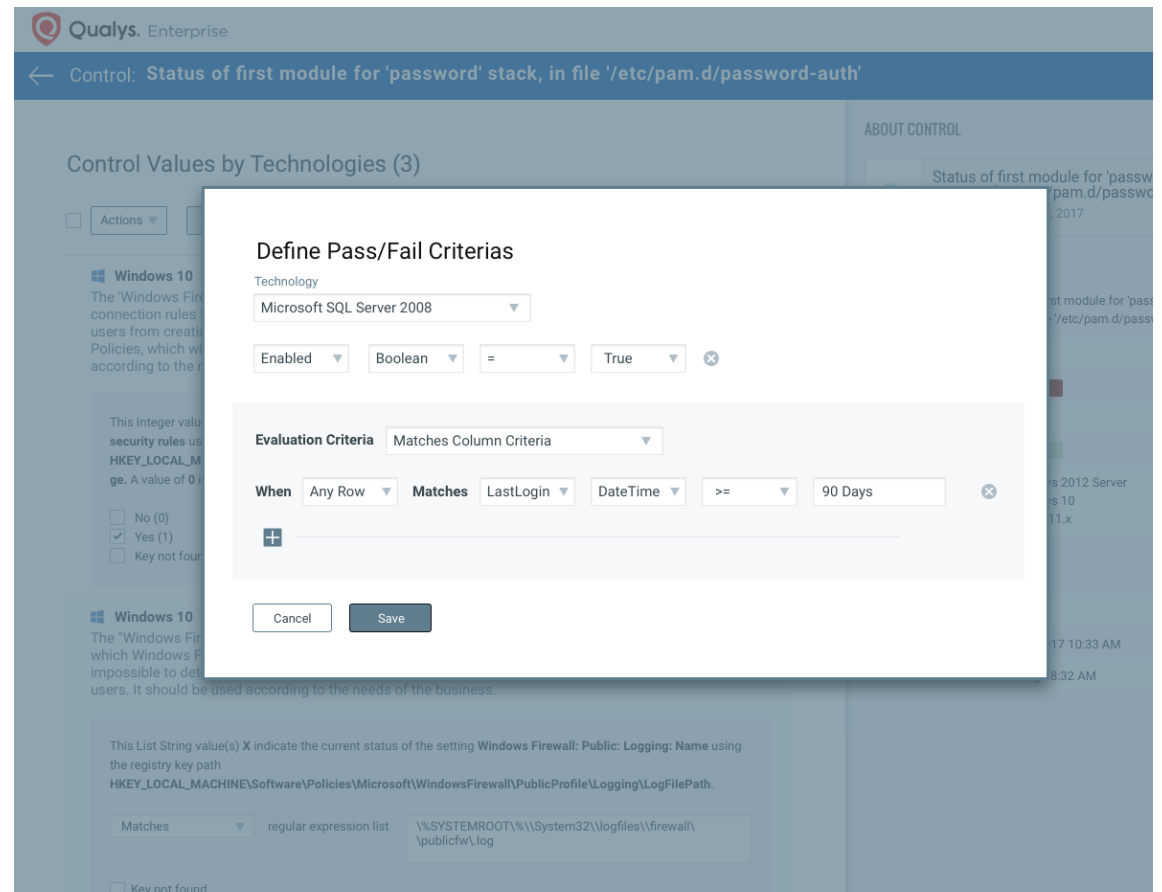
Set a query to return tabular  
data to evaluate (which can  
include evidence)

The screenshot shows the 'Database UDC' configuration page in the Qualys Enterprise interface. The page is titled 'Database UDC' and has a blue header. On the left, there is a sidebar with a 'STEPS 1/3' indicator and four steps: 1. General Information, 2. Technologies, 3. Scan Options, and 4. References. The main content area is titled 'Technology' and includes the instruction 'Select the technology and add the default control properties.' Below this, there is a 'Technology Family' dropdown menu with 'Oracle' selected. Underneath, there is a 'Default Control Properties' section with three text areas: 'Rationale' containing 'Accounts not logged in in last 90 days should be expired', 'Remediation' containing 'In User Management application, set Automated Account Expiration should be set to 90 days', and 'SQL Statement' containing 'SELECT UserID, UserName, Role, LastLogin, AccountEnabled from UserTable'. At the bottom right, there are 'Cancel' and 'Save' buttons.

# Then, Configure Pass/Fail Criteria

Define a Post-Filter, Then Evaluate based on:

- Empty Result Set
- Row Count Threshold
- Always Pass/Fail (for data gathering)
- Match Column Criteria



# Simplifying Processes

Expanded Library Content

Instance Discovery & Controls

Migration to New UI – Up First:

- PC Dashboard
- Policy & Control Library
- Reporting

Mandate-based Policy Configurator

Leverage Asset Inventory for Asset Lifecycle Management



# Mandate Policy Configurator

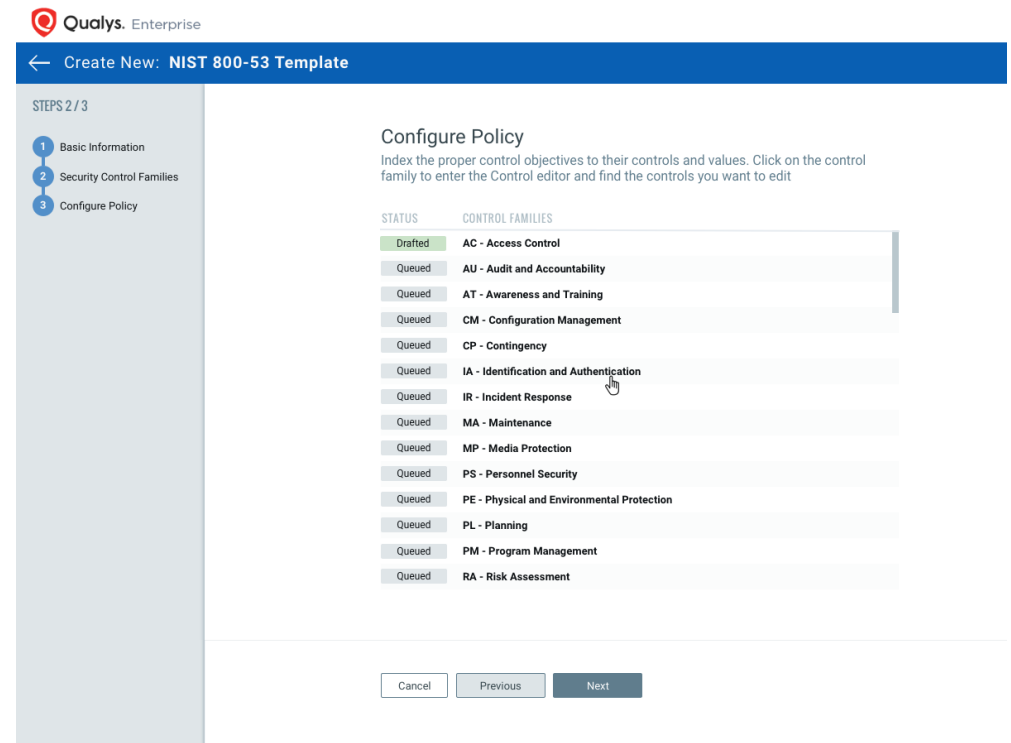
More Granular, Customizable Control Objectives

Custom & Library Mandates

Generate Policies from Mandate

Mandate-specific Reports

Gap Analysis Reports





STEPS 1 / 3

- 1 Basic Information
- 2 Security Control Families
- 3 Configure Policy

## Basic Information

Name and select the mandate for this template.

TITLE:

MANDATE:

Security Controls and Assessment Procedures for Federal Information Systems and Organizations

DESCRIPTION:

Cancel

Previous

Next

STEPS 2 / 3

- 1 Basic Information
- 2 Security Control Families
- 3 Configure Policy

## Security Control Families

Select all or just the security controls families you want to configure in this template.

CONTROL FAMILIES:

Select Families  Minimum Security Controls

BUILD LIST OF CONTROL FAMILIES:

There are no security control families selected, yet.  
Here is where you'll see the control families for this template.

Cancel

Previous

Next

STEPS 2 / 3

- 1 Basic Information
- 2 Security Control Families
- 3 Configure Policy

## Security Control Families

Select all or just the security controls families you want to configure in this template.

CONTROL FAMILIES:

Select Families  Minimum Security Controls

BUILD LIST OF CONTROL FAMILIES:

Search...

Select all (14 families)

AC - Access Control

AU - Audit and Accountability

AT - Awareness and Training

CM - Configuration Management

CP - Contingency

IA - Identification and Authentication

OK

STEPS 2 / 3

- 1 Basic Information
- 2 Security Control Families
- 3 Configure Policy

## Security Control Families

Select all or just the security controls families you want to configure in this template.

CONTROL FAMILIES:

- Select Families  Minimum Security Controls

BUILD LIST OF CONTROL FAMILIES:

10 CONTROL FAMILIES

[Remove all](#)

- AC - Access Control
- AU - Audit and Accountability
- AT - Awareness and Training
- CM - Configuration Management
- CP - Contingency
- IA - Identification and Authentication

STEPS 2 / 3

- 1 Basic Information
- 2 Security Control Families
- 3 Configure Policy

## Configure Policy

Index the proper control objectives to their controls and values. Click on the control family to enter the Control editor and find the controls you want to edit

STATUS	CONTROL FAMILIES
Drafted	AC - Access Control
Queued	AU - Audit and Accountability
Queued	AT - Awareness and Training
Queued	CM - Configuration Management
Queued	CP - Contingency
Queued	IA - Identification and Authentication
Queued	IR - Incident Response
Queued	MA - Maintenance
Queued	MP - Media Protection
Queued	PS - Personnel Security
Queued	PE - Physical and Environmental Protection
Queued	PL - Planning
Queued	PM - Program Management
Queued	RA - Risk Assessment

Objective: IA - Identification and Authentication

Cancel Done

Search Options

Search...

11

Total Control Objectives

Actions



MINIMUM SECURITY CONTROLS

High 3.01K  
Moderate 982  
Low 89

PRIORITY

P0 - Priority Level 0 3.01K  
P1 - Priority Level 1 982  
P2 - Priority Level 2 89  
P3 - Priority Level 3 89

TECHNOLOGY

Windows 2012 Server 25  
Windows Server 2012 R2 16  
Debian GNU/Linux 9.x 5  
Docker 1.x 23  
F5 BIG-IP 11.x 15  
10 more

NAME	PRIORITY	SECTIONS	CONTROLS
<input type="checkbox"/> <span>IA-5 Authenticator Management</span> The organization manages information system authenticators by: a. Verifying, as part of the initial authenticator distribution, the identity of the individual, group, role, or device receiving the authenticator;	P1	15	384
<input type="checkbox"/> <span>IA-5(1) Authenticator Management   Password-Based Authentication</span>		6	242
<input type="checkbox"/> <span>IA-5(2) Authenticator Management   PKI-Based Authentication</span>		4	48
<input type="checkbox"/> <span>IA-5(3) Authenticator Management   In-Person or Trusted Third=Party Registration</span>			1
<input type="checkbox"/> <span>IA-5(4) Authenticator Management   Automated Support for Password Strength Determination</span>			31
<input type="checkbox"/> <span>IA-5(5) Authenticator Management   Change Authenticators Prior to Delivery</span>			1
<input type="checkbox"/> <span>IA-5(6) Authenticator Management   Protection of Authenticators</span>			8
<input type="checkbox"/> <span>IA-5(7) Authenticator Management   No Embedded Unencrypted Static Authenticators</span>			4
<input type="checkbox"/> <span>IA-5(8) Authenticator Management   Multiple Information System Accounts</span>			0

Objective: IA - Identification and Authentication

Cancel Done

Search Options

Search...

11

Total Control Objectives

Actions

Refresh Download Settings

MINIMUM SECURITY CONTROLS

High	3.01K
Moderate	982
Low	89

PRIORITY

P0 - Priority Level 0	3.01K
P1 - Priority Level 1	982
P2 - Priority Level 2	89
P3 - Priority Level 3	89

TECHNOLOGY

Windows 2012 Server	25
Windows Server 2012 R2	16
Debian GNU/Linux 9.x	5
Docker 1.x	23
F5 BIG-IP 11.x	15
10 more	

NAME	PRIORITY	SECTIONS	CONTROLS
<input type="checkbox"/> <input type="checkbox"/> <b>IA-5 Authenticator Management</b> The organization manages information system authenticators by: a. Verifying, as part of the initial authenticator distribution, the identity of the individual, group, role, or device receiving the authenticator; ...	P1	15	384
<input type="checkbox"/> <b>IA-5(1) Authenticator Management   Password-Based Authentication</b>		6	242
<b>The information system, for password-based authentication:</b>			
<input checked="" type="checkbox"/> <b>IA-5 (1)(a)</b> <input type="checkbox"/> Enforces minimum password complexity of [Assignment: organization-defined requirements for case sensitivity, number of characters, mix of upper-case letters, lower-case letters, numbers, and special characters, including minimum requirements for each type];			36
<b>IA-5 (1)(b)</b> Enforces at least the following number of changed characters when new passwords are created: [Assignment: organization-defined number]			11
<b>IA-5 (1)(c)</b> Stores and transmits only cryptographically-protected passwords;			27
<b>IA-5 (1)(d)</b> Enforces password minimum and maximum lifetime restrictions of [Assignment: organization-defined numbers for lifetime minimum			63

← Controls: NIST 800-53 for Windows

Search Options ▾

Search...

36

Controls

Actions ▾



CID	STATEMENT / TECHNOLOGIES	TYPE	CATEGORY	BASELINE
3376	<b>Status of the 'Maximum Password Age' setting (expiration)</b> Windows 2012 Server, Windows Server 2012 R2, Solaris 11.x	CIS	IA-5 (1)(a)	HIGH
10734	<b>Status of the 'number of days before a [Prompt user] password expiration warning prompt is displayed at login' for 'users with a password' setting</b> Ubuntu 11.x, Windows 2000 Active Directory, Docker 1.x	DISA	IA-5 (1)(a)	MODERATE
10965	<b>Status of first module for 'password' stack, in file '/etc/pam.d/password-auth'</b> Windows 2012 Server, Windows Server 2012 R2, Solaris 11.x	CIS	IA-5 (1)(a)	HIGH
11468	<b>Status of the 'try_first_pass' setting for pam_cracklib.so module in PAM configuration file '/etc/pam.d/common-password'</b> Docker 1.x, Windows 2012 Server	Qualys	IA-5 (1)(a)	HIGH
11524	<b>Status of 'fail_interval' setting in the file '/etc/pam.d/password-auth'</b> Windows 2012 Server	CIS	IA-5 (1)(a)	HIGH
10911	<b>Status of 'turn off certificate revocation list (CRL) checking at the Key Distribution</b> Windows 2012 Server, Windows Server 2012 R2	DISA	IA-5 (1)(a)	HIGH

IMPACT BASELINE

HIGH	3.01K
MODERATE	982
LOW	89

TYPE

ANSSI	3.01K
Qualys	982
CIS	89
DISA	89

TECHNOLOGY

Windows 2012 Server	25
Windows Server 2012 R2	16
Debian GNU/Linux 9.x	5
Docker 1.x	23
F5 BIG-IP 11.x	15

10 more



## Control Values by Technologies (3)

Actions ▾ Technology: All  ▾

### Windows 10

The 'Windows Firewall: Apply local connection security rules (Domain)' setting enables domain-based connection rules that govern IPSec connections. As this setting enables or restricts local administrative users from creating such local connection rules, in addition to the connection security rules in Group Policies, which will increase the exposure of the system to remote attacks, this should be configured according to the needs of the business.

This Integer value **X** indicates the current status of the setting **Windows Firewall: Domain: Apply local connection security rules** using the registry key path **HKEY\_LOCAL\_MACHINE\Software\Policies\Microsoft\WindowsFirewall\DomainProfile\AllowLocalIPsecPolicyMerge**. A value of **0** indicates the setting is set to **No**, A value of **1** indicates the setting is set to **Yes**.

- No (0)
- Yes (1)
- Key not found

### Windows 10

The "Windows Firewall: Public: Logging: Name" setting is used to specify the path and name of the file in which Windows Firewall will write its log information. If events are not recorded it may be difficult or impossible to determine the root cause of system problems or the unauthorized activities of malicious users. It should be used according to the needs of the business.

### ABOUT CONTROL



Status of first module for 'password' stack, in file '/etc/pam.d/password-auth'  
Last modified: Apr 12, 2017

#### Identification

Statement: Status of first module for 'password' stack, in file '/etc/pam.d/password-auth'

CID: 10965

Baseline: HIGH

Reference: 17.15.2.1

Status: Active

Technologies:  Windows 2012 Server  
 Windows 10  
 Solaris 11.x

#### Activity

Last User Login: .\KCtech

Created on: March 1, 2017 10:33 AM

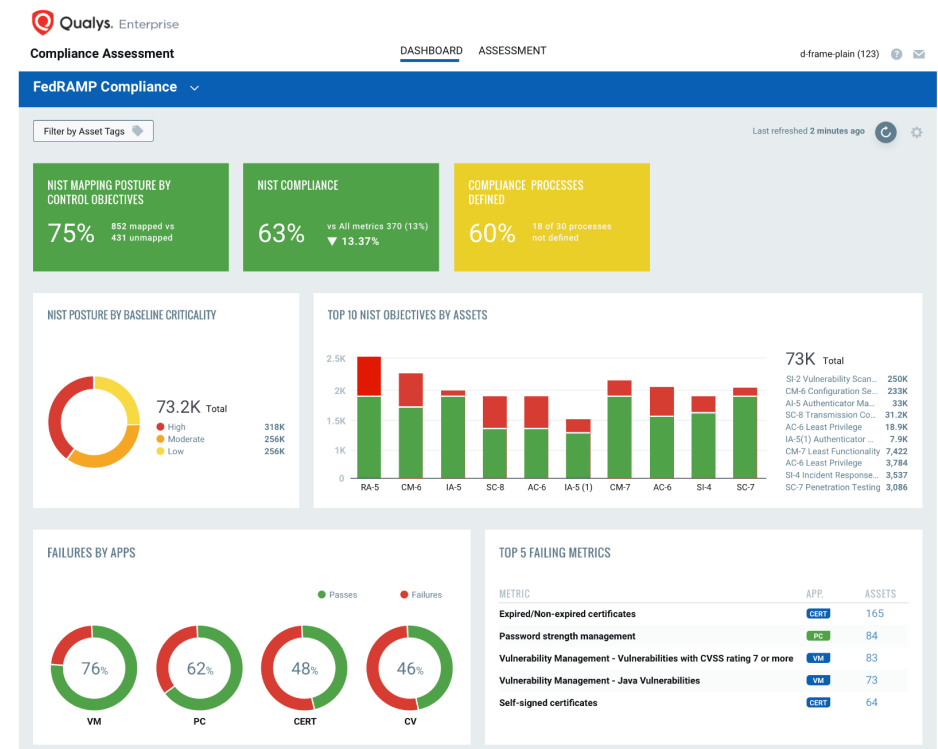
Last Modified on: 8 Mins ago 8:32 AM

# Integration Across the Platform: Unified Compliance Assessment

Out of the box Library of Metrics  
SAQ Self-Assessments  
Vendor Risk Violations  
VM & PC Remediation SLA Failures

Customizable! Map back to Control  
Objectives & Custom Mandates

Result: Single Pane of Glass for  
Reporting Metrics & Compliance  
Violation Tracking across the platform!



# Defining Metrics & Mappings

Leverages new Alerting feature as exposed in apps

Define ANY QQL Query

Action is Log a Compliance Metric

Metrics are then mapped to Control Objectives, which are cross-mapped to regulations

```
vulnerabilities.vulnerability.severity:"5" and vulnerabilities.vulnerability.patchAvailable:"true" and vulnerabilities.firstFound > now-90d
```

Qualys

← Create New: Rule

**Rule Details**  
Something about what the user will need to know about the fields below.

**Rule Information**  
Something about what the user will need to know about the fields below.

Action Name

Description OPTIONAL

**Alert Query**  
Something about what the user will need to know about the fields below.

Sample Queries

**Trigger Criteria**

# Security Metric Examples

High Severity Vulnerabilities/  
Patching

FIM Incident Review Expired

Cloud Security Configuration  
Issues

Expired or Self-Signed  
Certificates

Vendor Risk – Failure to Respond

Procedural Control Gap  
Identified

**Qualys. Enterprise**  
Vulnerability Management

DASHBOARD SEARCH SCANS **REPORTS** ASSETS KNOWLEDGEBASE USER g-frame-standard (123)

**Reports** | Reports | Schedules | Templates | Risk Analysis | Search Lists | **Compliance** | Setup

942 Metrics

SEVERITY	Count
Severity 5	471
Severity 4	251
Severity 3	76
Severity 2	44
Severity 1	32

METRIC	NIST ID	QID	VULNERABILITY	SEVERITY	ASSETS
Vulnerability Management - Vulnerabilities with CVSS rating 7 or more	RA-5	371248	HPE Intelligent Management Center (IMC) Multiple Vulnerabilities (HPESBHF037...	■■■■■	120
Vulnerability Management - Java Vulnerabilities	RA-5	371090	Java Debug Wire Protocol Remote Code Execution Vulnerability	■■■■■	132
Vulnerability Management - Java Vulnerabilities	RA-5	371265	Oracle Java SE Critical Patch Update - October 2018	■■■■■	508
Vulnerability Management - End of Life technologies	RA-5	370573	EOL/Obsolete Software: Apache Struts 1 Detected	■■■■■	70
Vulnerability Management - End of Life technologies	RA-5	105759	EOL/Obsolete Software: Microsoft Visual Studio 2008 Detected	■■■■■	76
Vulnerability Management - End of Life technologies	RA-5	105757	EOL/Obsolete Software: pfSense Version 2.2.x Detected	■■■■■	44
Vulnerability Management - End of Life technologies	RA-5	105753	EOL/Obsolete Operating System: Microsoft Windows 10 Version 1607 Detected	■■■■■	350
Vulnerability Management - Java Vulnerabilities	RA-5	22002	Oracle Database Server Java VM Remote Code Execution Vulnerability	■■■■■	55
Vulnerability Management - Java Vulnerabilities	RA-5	371035	Apache Cassandra Arbitrary Java Code	■■■■■	20

Reports

- Reports
- Schedules
- Templates
- Risk Analysis
- Search Lists
- Compliance**
- Setup

Demo

PC

942  
Metrics

Search

Actions

SEVERITY

Severity 5	471
Severity 4	251
Severity 3	76
Severity 2	44
Severity 1	32

METRIC	RISK ID	OID	VULNERABILITY	SEVERITY	ASSETS
Vulnerability Management - Vulnerabilities with CVSS rating 7 or more	RA-5	371090	HPE Intelligent Management Center (IMC) Vulnerabilities (HPESBHF037...	■■■■■	120
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# Policy Compliance



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# File Integrity Monitoring

Log and track file changes across global IT systems.

# Validating Integrity

Why do organizations need File Integrity Monitoring solutions?

- Change control enforcement
- Compliance & audit requirements
- Explicit mandates like PCI
- Security best practices
- Compromise detection



## Use Case:

# File Integrity Monitoring for PCI

## Customer: Retail

Distributed network environment that benefits from cloud-based model  
20k+ Windows systems  
Large Linux back end infrastructure on-prem and in the cloud

## Goals:

Monitor for change control enforcement  
PCI auditor requirements

## Requires:

Scalable, cloud-based solution  
Hands-off management of distributed agents  
VM+PC+FIM at the Point of Sale  
Broad Linux platform support



# What Are Customers Monitoring?

Critical Operating System Binaries

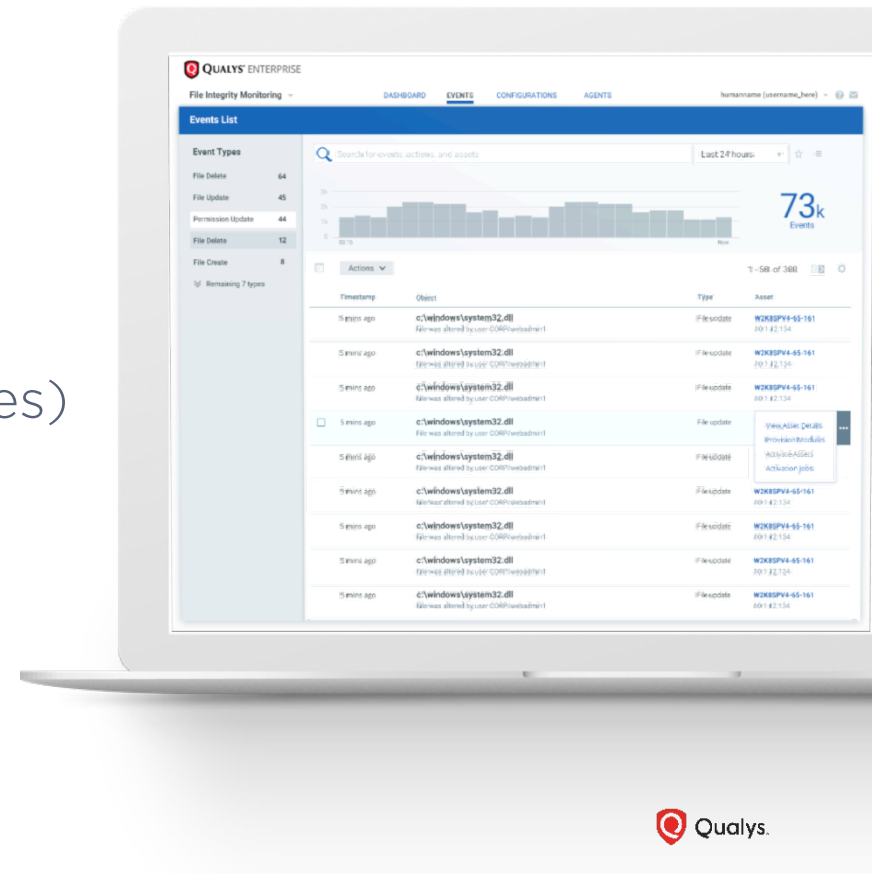
OS and Application Configuration Files

Content, such as Web source

Permissions (such as on Database Stores)

Security Data (Logs, Folder Audit Settings)

User & Authentication Configurations



# FIM Challenges

Deciding what depth to monitor

Tuning out noise, but not missing important events

Scalability of legacy solutions

Meeting auditor event review requirements

# Improvements since GA

Event Review & Incident Management Workflow

Library Content Improvements

AuditD Compatible Windows Agent (2.1.x)

Windows Feature Expansion & Updated Driver (2.1.x)

Several back-end releases for operational improvements & feature support

# Focus for 2019

Simplest tuning in the industry!

Secondary Event Filtering and Automated Correlation

API access to data

Rule-based Alerting

Reporting

Expanded data collection & whitelisting features

Expanded Platform Support

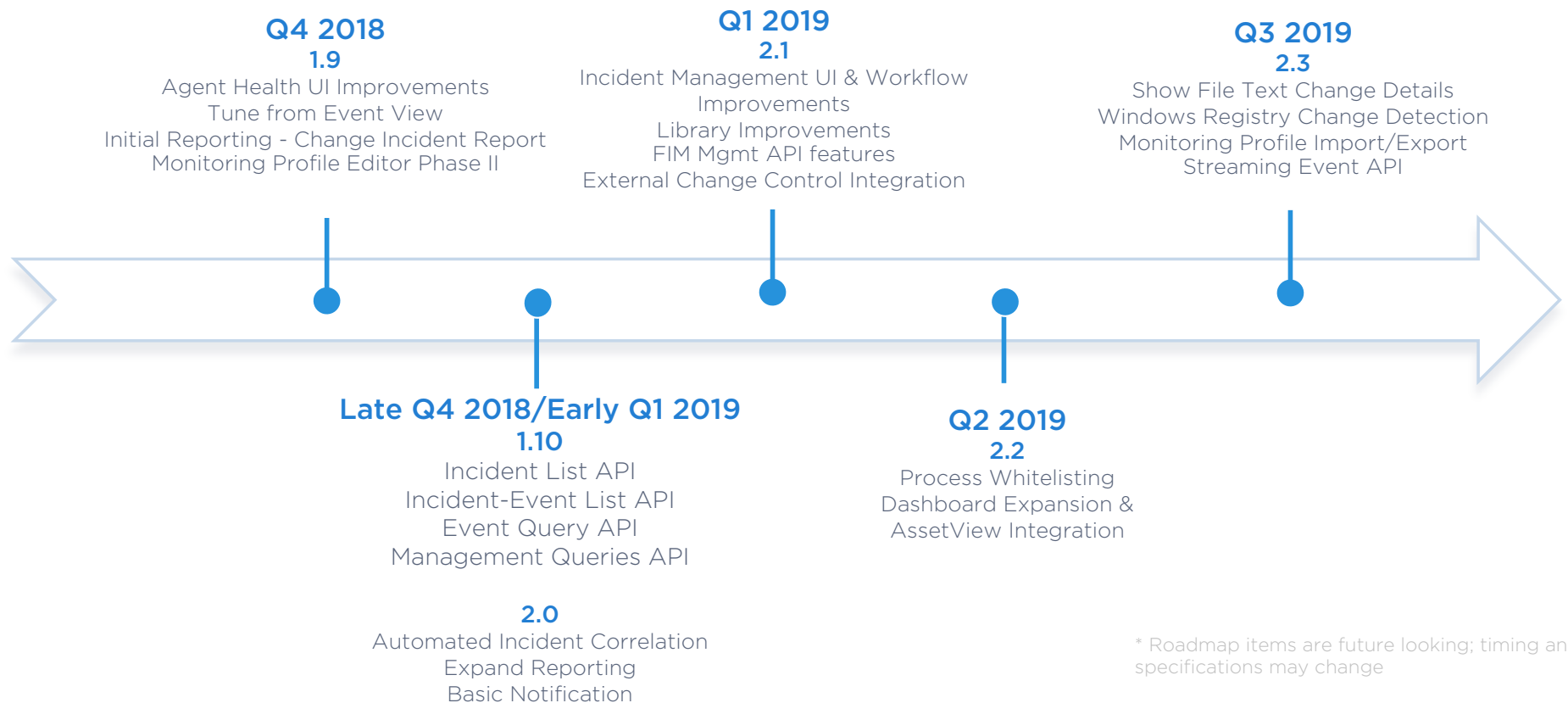


Demo



# Policy Compliance

# FIM Feature Roadmap





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# Thank You

**Tim White**  
twhite@qualys.com