

# Unit #9

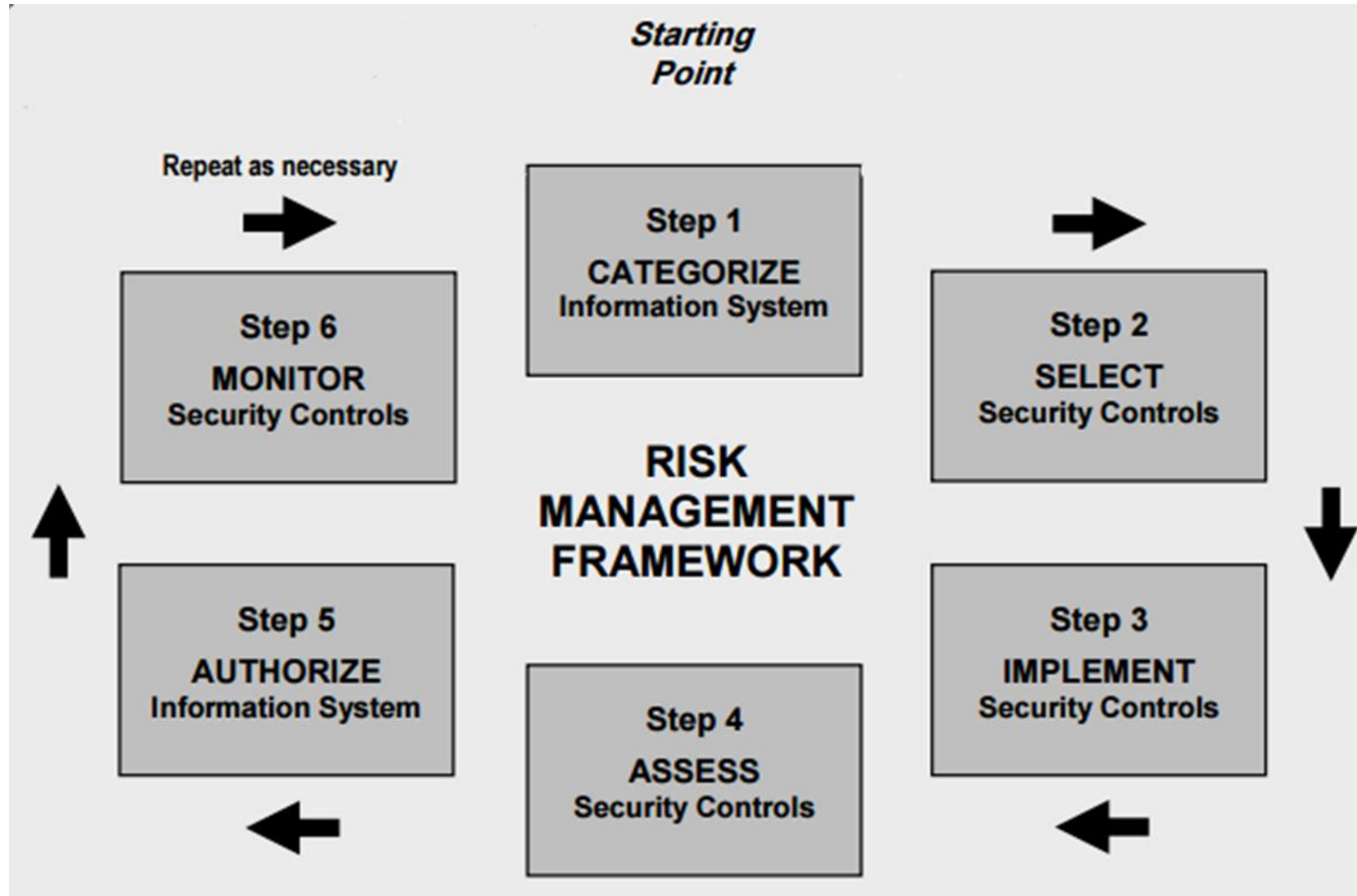
MIS5214

Host Hardening

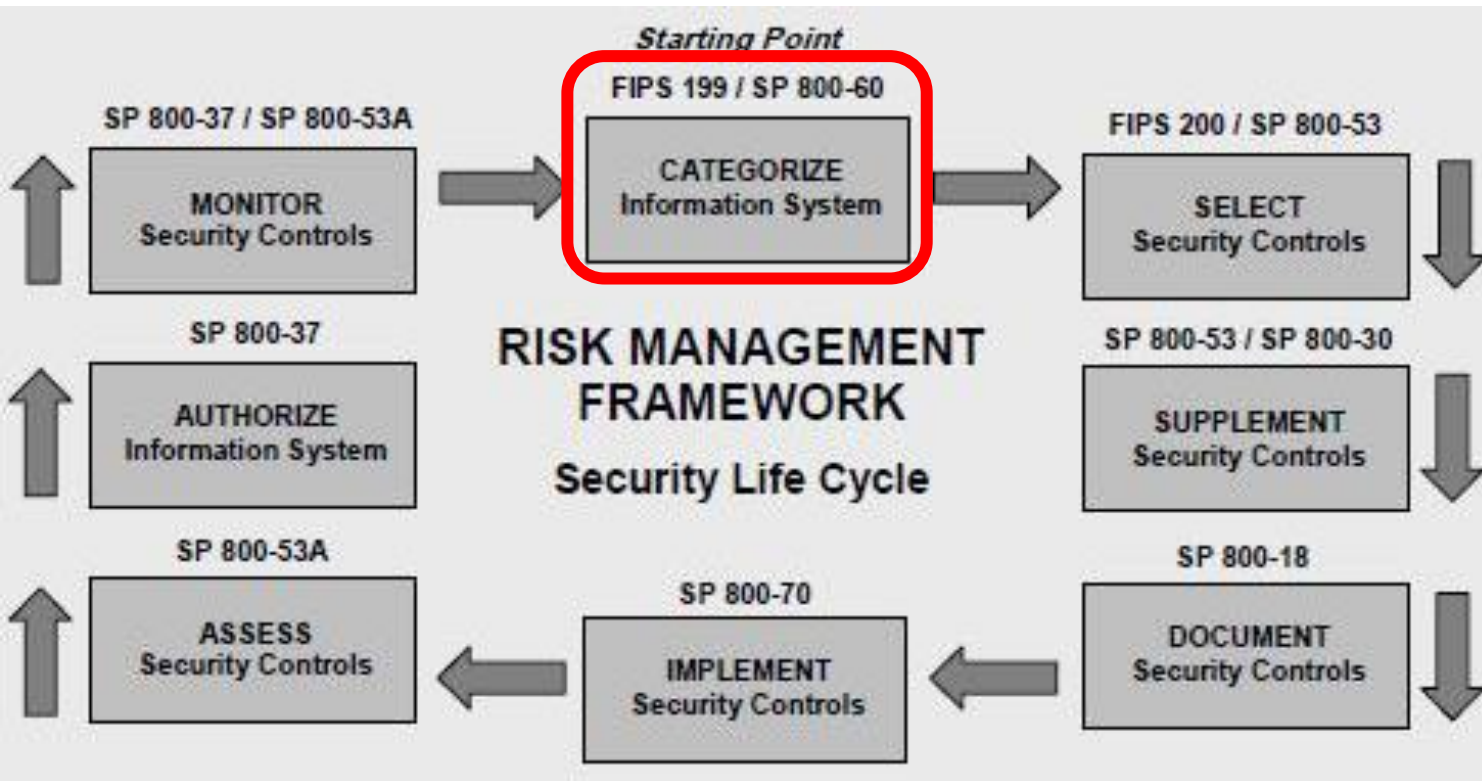
# Agenda

- Risk Management Framework – A quick review...
- Implementing controls – Host hardening...
  - Security configuration checklist (with STIG Viewer)
- SCAP - Security Content Automation Protocol
- System Security Plan's Section 13
  - Select 1 control family to fill out for your information system
- System Security Plan's Section 8
  - Information System Type
- Team Project - SSP draft development...

# NIST Risk Management Framework



# NIST Risk Management Framework



FIPS PUB 199

FEDERAL INFORMATION PROCESSING STANDARDS PUBLICATION

Standards for Security Categorization of Federal Information and Information Systems

NIST Special Publication 800-60 Volume I  
Revision 1

**NIST**  
National Institute of Standards and Technology  
U.S. Department of Commerce

Volume I:  
Guide for Mapping Types of Information and Information Systems to Security Categories

Kevin Stine  
Rich Kissel  
William C. Barker  
Jim Fahlsing  
Jessica Gulick

NIST Special Publication 800-60 Volume II  
Revision 1

**NIST**  
National Institute of Standards and Technology  
U.S. Department of Commerce

Volume II: Appendices to Guide for Mapping Types of Information and Information Systems to Security Categories

Kevin Stine  
Rich Kissel  
William C. Barker  
Annabelle Lee  
Jim Fahlsing

INFORMATION SECURITY

Computer Security Division  
Information Technology Laboratory  
National Institute of Standards and Technology  
Gaithersburg, MD 20899-8930

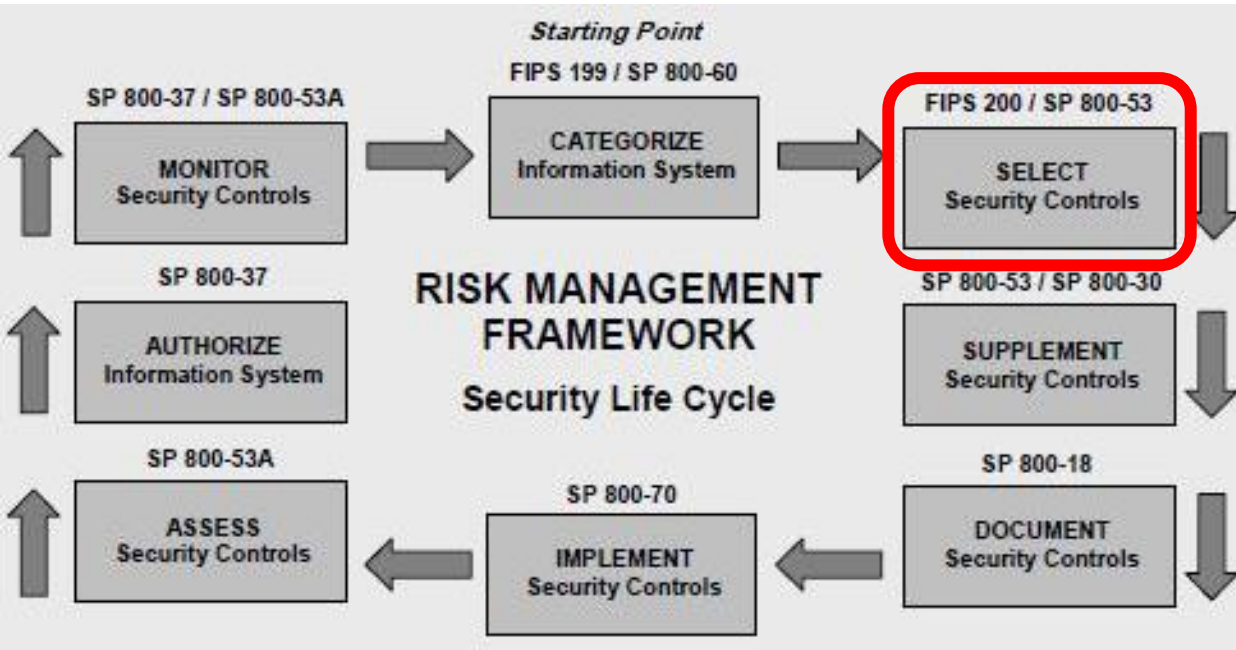
August 2008



U.S. DEPARTMENT OF COMMERCE  
Carlos M. Gutierrez, Secretary

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY  
James M. Turner, Deputy Director

# NIST Risk Management Framework



FIPS PUB 200

FEDERAL INFORMATION PROCESSING STANDARDS PUBLICATION

Minimum Security Requirements for Federal Information and Information Systems

NIST Special Publication 800-53  
Revision 5

## Security and Privacy Controls for Information Systems and Organizations

JOINT TASK FORCE

This publication is available free of charge from:  
<https://doi.org/10.6028/NIST.SP.800-53r5>

September 2020

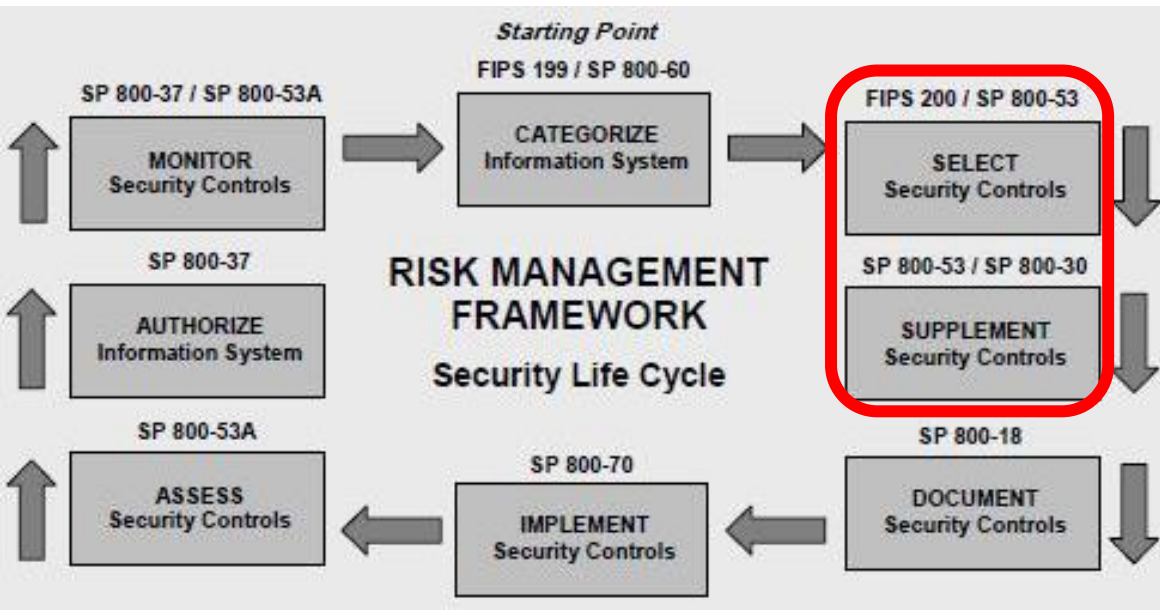
INCLUDES UPDATES AS OF 12-10-2020; SEE PAGE XVII



U.S. Department of Commerce  
Wilbur L. Ross, Jr., Secretary

National Institute of Standards and Technology  
Walter Copan, NIST Director and Under Secretary of Commerce for Standards and Technology

# NIST Risk Management Framework



NIST Special Publication 800-53  
Revision 5

## Security and Privacy Controls for Information Systems and Organizations

JOINT TASK FORCE


NIST Special Publication 800-63-3

## Digital Identity Guidelines

Paul A. Grassi  
Michael E. Garcia  
James L. Fenton

This publication is available free of charge from:  
<https://doi.org/10.6028/NIST.SP.800-53r5>

September 2020  
INCLUDES UPDATES AS OF 12-10-2020; SEE PAGE XVII



U.S. Department of Commerce  
Wilbur L. Ross, Jr., Secretary

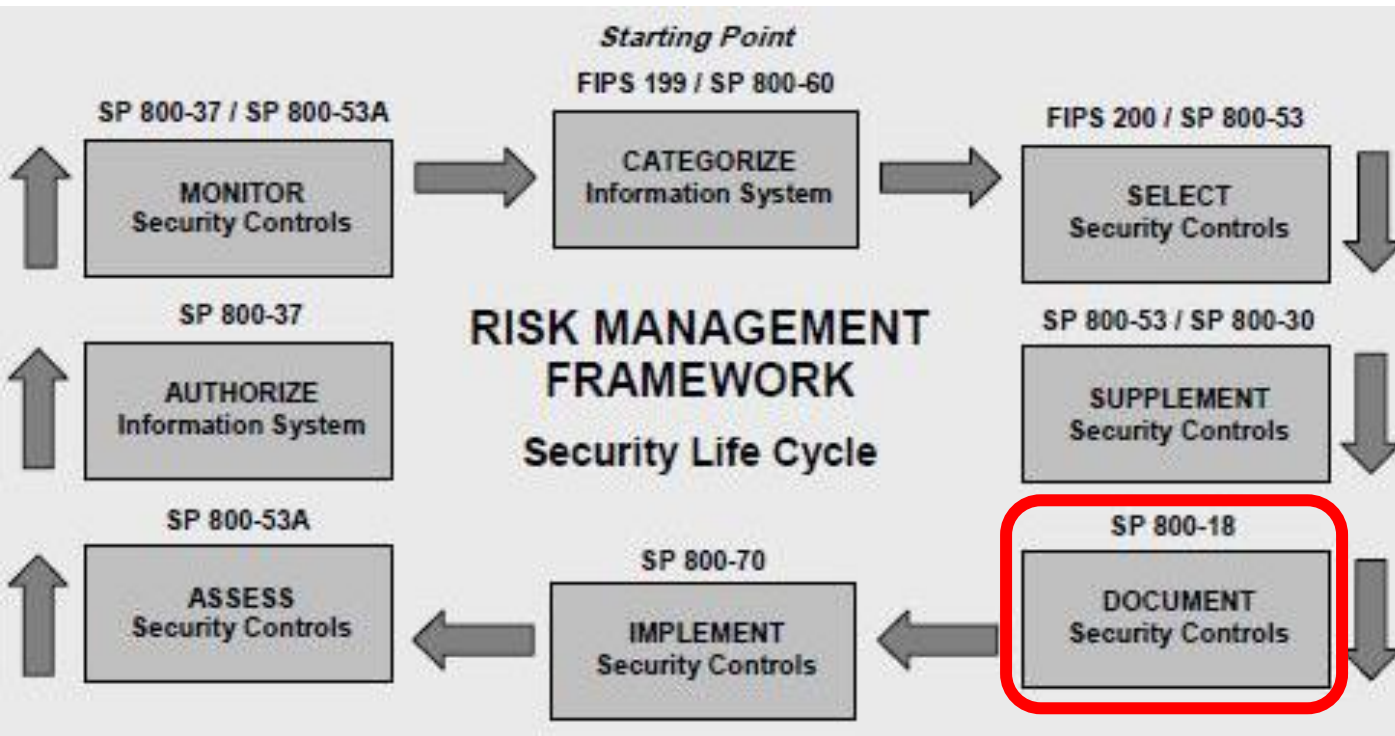
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**NIST**  
National Institute of Standards and Technology  
U.S. Department of Commerce



# NIST Risk Management Framework



NIST Special Publication 800-18  
Revision 1

Guide for Developing Security  
Plans for Federal Information  
Systems

**NIST**

National Institute of  
Standards and Technology  
Technology Administration  
U.S. Department of Commerce

Marianne Swanson  
Joan Hash  
Pauline Bowen

INFORMATION SECURITY

## FEDRAMP SYSTEM SECURITY PLAN (SSP) HIGH BASELINE TEMPLATE

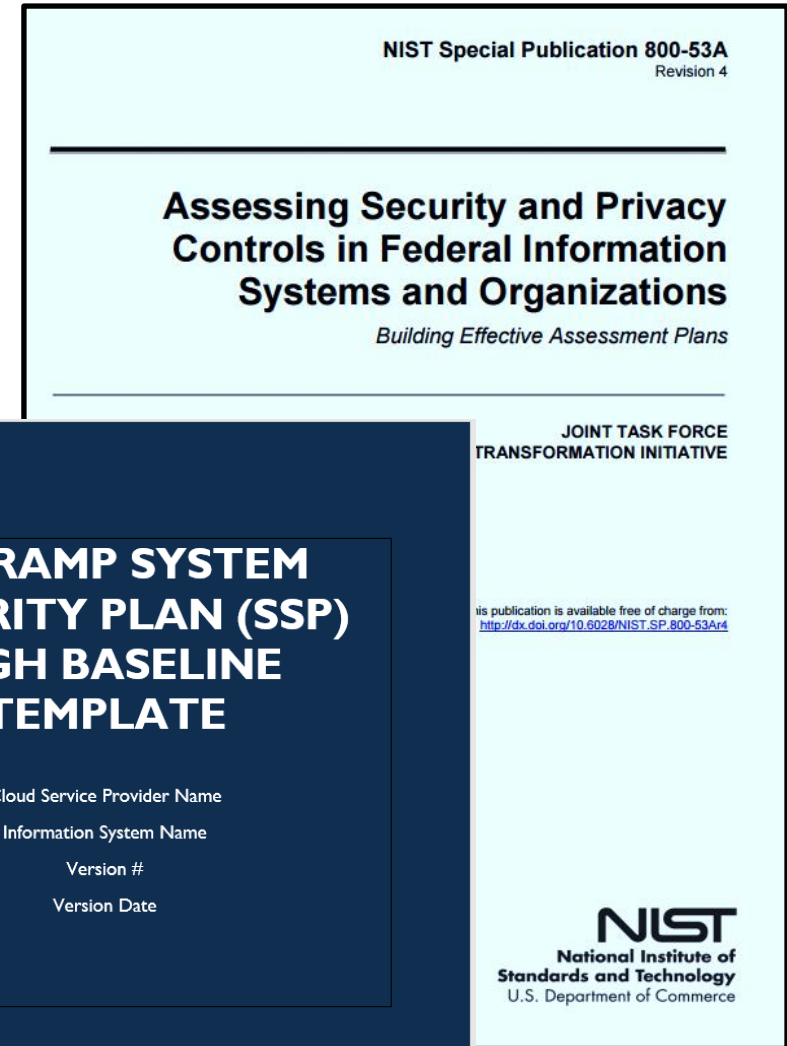
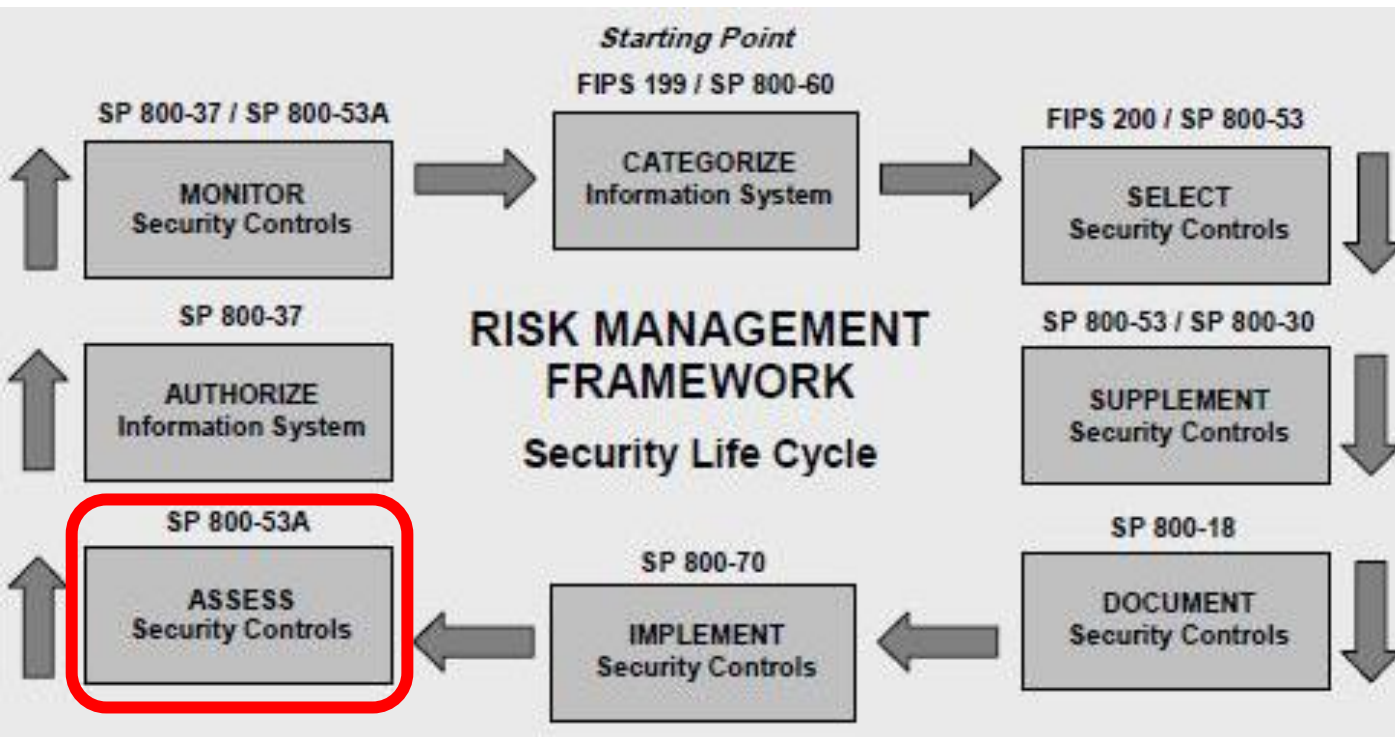
Cloud Service Provider Name  
Information System Name  
Version #  
Version Date



FedRAMP

CONTROLLED UNCLASSIFIED INFORMATION

# NIST Risk Management Framework





# Which controls aid in Host Hardening... ?

NIST Special Publication 800-18  
Revision 1

**NIST**  
National Institute of Standards and Technology  
Technology Administration  
U.S. Department of Commerce


Guide for Developing Security Plans for Federal Information Systems

Marianne Swanson  
Joan Hash  
Pauline Bowen

INFORMATION SECURITY

Computer Security Division  
Information Technology Laboratory  
National Institute of Standards and Technology  
Gaithersburg, MD 20899-8930

February 2006



U.S. Department of Commerce  
*Carlos M. Gutierrez, Secretary*

National Institute of Standards and Technology  
*William Jeffrey, Director*

CLASS	FAMILY	IDENTIFIER
Management	Risk Assessment	RA
Management	Planning	PL
Management	System and Services Acquisition	SA
Management	Certification, Accreditation, and Security Assessments	CA
Operational	Personnel Security	PS
Operational	Physical and Environmental Protection	PE
Operational	Contingency Planning	CP
Operational	Configuration Management	CM
Operational	Maintenance	MA
Operational	System and Information Integrity	SI
Operational	Media Protection	MP
Operational	Incident Response	IR
Operational	Awareness and Training	AT
Technical	Identification and Authentication	IA
Technical	Access Control	AC
Technical	Audit and Accountability	AU
Technical	System and Communications Protection	SC

**Table 2: Security Control Class, Family, and Identifier**

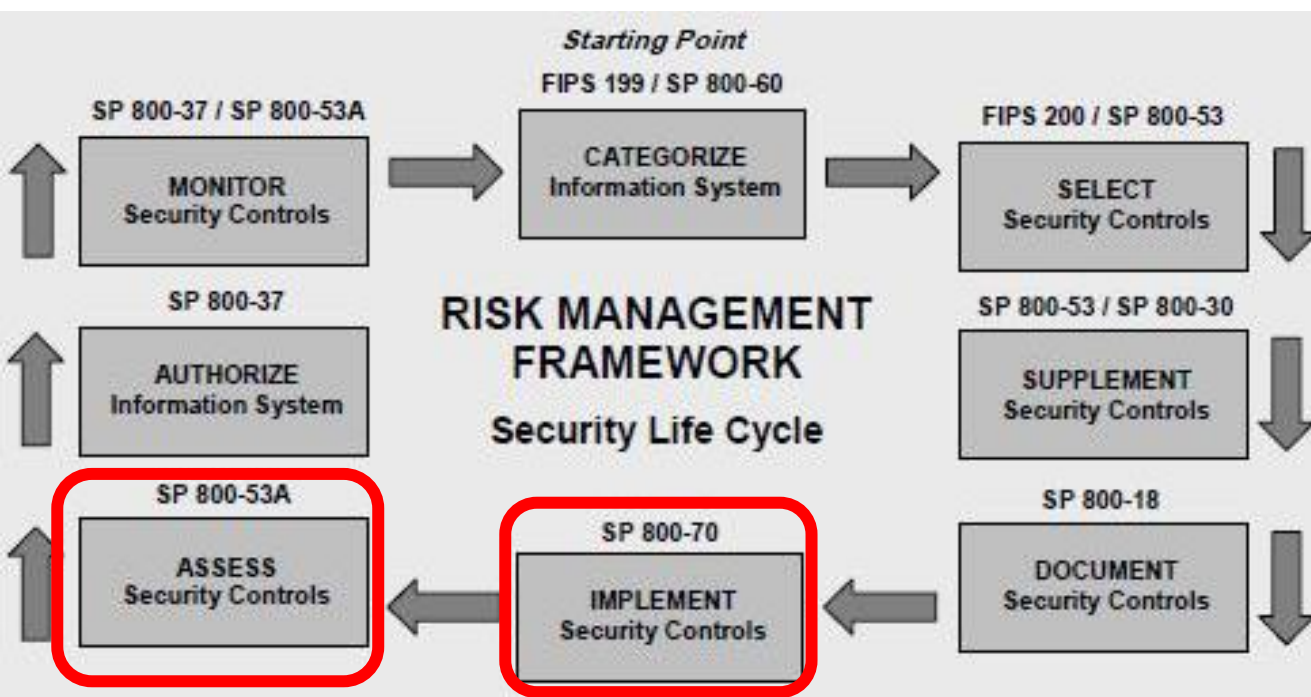
# Security and Privacy Controls for Federal Information Systems and Organizations

JOINT TASK FORCE  
TRANSFORMATION INITIATIVE

This publication is available free of charge from:  
<http://dx.doi.org/10.6028/NIST.SP.800-53r4>

CNTL NO.	CONTROL NAME	PRIORITY	INITIAL CONTROL BASELINES		
			LOW	MOD	HIGH
<b>Configuration Management</b>					
CM-1	Configuration Management Policy and Procedures	P1	CM-1	CM-1	CM-1
CM-2	Baseline Configuration	P1	CM-2	CM-2 (1) (3) (7)	CM-2 (1) (2) (3) (7)
CM-3	Configuration Change Control	P1	Not Selected	CM-3 (2)	CM-3 (1) (2)
CM-4	Security Impact Analysis	P2	CM-4	CM-4	CM-4 (1)
CM-5	Access Restrictions for Change	P1	Not Selected	CM-5	CM-5 (1) (2) (3)
CM-6	Configuration Settings	P1	CM-6	CM-6	CM-6 (1) (2)
CM-7	Least Functionality	P1	CM-7	CM-7 (1) (2) (4)	CM-7 (1) (2) (5)
CM-8	Information System Component Inventory	P1	CM-8	CM-8 (1) (3) (5)	CM-8 (1) (2) (3) (4) (5)
CM-9	Configuration Management Plan	P1	Not Selected	CM-9	CM-9
CM-10	Software Usage Restrictions	P2	CM-10	CM-10	CM-10
CM-11	User-Installed Software	P1	CM-11	CM-11	CM-11

<b>Risk Assessment</b>					
RA-1	Risk Assessment Policy and Procedures	P1	RA-1	RA-1	RA-1
RA-2	Security Categorization	P1	RA-2	RA-2	RA-2
RA-3	Risk Assessment	P1	RA-3	RA-3	RA-3
RA-4	<b>Withdrawn</b>	---	---	---	---
RA-5	Vulnerability Scanning	P1	RA-5	RA-5 (1) (2) (5)	RA-5 (1) (2) (4) (5)



A security configuration checklist is a document containing instructions or procedures for:

- Configuring an information technology (IT) product to an operational environment
- Verifying that the product has been configured properly
- Identifying unauthorized changes to the product

Checklists can help you:

- Minimize the attack surface
- Reduce vulnerabilities
- Lessen the impact of successful attacks
- Identify changes that might otherwise go undetected

NIST Special Publication 800-70  
Revision 4

## National Checklist Program for IT Products – Guidelines for Checklist Users and Developers

Stephen D. Quinn  
Murugiah Souppaya  
Melanie Cook  
Computer Security Division  
Information Technology Laboratory

Karen Scarfone  
Scarfone Cybersecurity  
Clifton, VA

This publication is available free of charge from:  
<https://doi.org/10.6028/NIST.SP.800-70r4>

February 2018



U.S. Department of Commerce  
Wilbur L. Ross, Jr., Secretary

National Institute of Standards and Technology  
Walter Copan, NIST Director and Under Secretary of Commerce for Standards and Technology

# Two types of checklists



- **Non-Automated**

- Designed to be used manually, such as written instructions that describe the steps an administrator should take to secure a system or to verify its security settings

- **Automated**

- Used through one or more tools that automatically alter or verify settings based on the contents of the checklist
- Many checklists are written in Extensible Markup Language (XML), and there are special tools that can use the contents of the XML files to check and alter system settings
  - Security Content Automation Protocol (SCAP) is a common example used to express checklist content in a standardized way that can be processed by tools that support SCAP

# Security Configuration Checklist

- There is no checklist that can make a system or product 100 percent secure
- Using checklists does not eliminate the need for ongoing security maintenance, such as patch installation
- Using checklists for hardening systems against software flaws (e.g., by applying patches and eliminating unnecessary functionality) and configuring systems securely will typically:
  - Reduce the number of ways in which systems can be attacked
  - Result in greater product security and protection from threats
  - Help verify the configuration of some types of security controls for system assessments

NIST Special Publication 800-70  
Revision 4

## National Checklist Program for IT Products – Guidelines for Checklist Users and Developers

Stephen D. Quinn  
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National Institute of Standards and Technology  
*Walter Copan, NIST Director and Under Secretary of Commerce for Standards and Technology*



# ISACA is a source of many audit control checklists



## AUDIT PROGRAM

### UNIX/LINUX Operating System Security Audit Program

Objective—The objective of the UNIX/LINUX Audit program is to provide management with an independent assessment relating to the effectiveness of configuration and security of the UNIX/LINUX operations systems...

**FREE to ISACA Members**  
**Not a Member? [Join Now](#)**



## AUDIT PROGRAM

### Windows Active Directory Audit Program

Objective—The Active Directory audit review will: Provide management with an evaluation of the Active Directory implementation and management security design effectiveness Provide management with an independent...

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## AUDIT PROGRAM

### Network Perimeter Security Audit Program

Objective—The objectives of the network perimeter security audit review are to: Provide management with an independent assessment relating to the effectiveness of the network perimeter security and its alignment with...

**FREE MEMBER PREVIEW**



## AUDIT PROGRAM

### Secure Shell Protocol (SSH) Audit Program

Objective—Provides enterprises with a means to assess the effectiveness of their use of the SSH protocol, including key management and applicable SSH controls. Scope—The use of the Secure Shell (SSH) protocol...

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The screenshot shows the ISACA website's search results page. The search query is 'Application audit checklist', resulting in 17 of 132 items. The results are filtered by 'English' language. The list includes various audit programs such as CIS Controls, UNIX/LINUX Operating System Security, Lotus Domino Server, z/OS Security, Windows Active Directory, Change Management, BYOD, Biometrics, IPv6 Security, Windows File Server, Social Media, IT Strategic, IT Tactical Management, IT Risk Management, and Cloud Computing Management. Each result includes a brief objective and a link to 'Join Now' or 'Free Member Preview'.



# UNIX/LINUX Operating System Security Audit Program

Audit Program

Digital materials can be accessed from the Downloaded Materials tab of your *MyISACA* account.

## UNIX/LINUX Operating System Security Audit/Assurance Program



Pages  
55

Date Published  
2009

Status  
Available

Language  
English

Format  
Digital

## UNIX/LINUX Operating System Security Audit/Assurance Program

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effectiveness











tions/functions

# Security Technical Implementation Guides

## Security Technical Implementation Guides (STIGs)

Show 10 entries

Search:

TITLE	SIZE	UPDATED
 Microsoft Windows Privileged Access Workstation (PAW) STIG - Ver 1, Rel 2	771.21 KB	26 Jul 2019
 Microsoft Windows Privileged Access Workstation (PAW) STIG Ver 1 - Release Memo	63.41 KB	30 Nov 2018
 Microsoft Windows Server 2012 and 2012 R2 DC STIG - Ver 2, Rel 19	988.31 KB	16 Jan 2020
 Microsoft Windows Server 2012 and 2012 R2 MS STIG - Ver 2, Rel 17	768.36 KB	31 Oct 2019
 Microsoft Windows Server 2012 STIG Release Memo - Ver 2	52.83 KB	12 Mar 2019
 Microsoft Windows Server 2016 STIG - Ver 1, Rel 10	925.68 KB	16 Jan 2020
 Microsoft Windows Server 2019 STIG - Ver 1, Rel 3	880.71 KB	16 Jan 2020
 Oracle Linux 5 STIG - Ver 1, Rel 13	500.65 KB	26 Jun 2019
 Oracle Linux 6 STIG - Ver 1, Rel 17	851.18 KB	31 Oct 2019
 Oracle Linux 7 STIG - Ver 1, Rel 1	1.41 MB	28 Feb 2020

### STIG TOPICS

- Operating Systems (59)
  - General Purpose OS (2)
  - Mac OS (2)
  - Mainframe (12)
  - UNIX/Linux (13)
  - Virtualization (10)
  - Windows (16)

### SECURITY TECHNICAL IMPLEMENTATION GUIDES (STIGS)

- SRG/STIGs Home
- Control Correlation Identifier (CCI)
- Document Library
- DoD Annex for NIAP Protection Profiles
- DoD Cloud Computing Security
- Frequently Asked Questions - FAQs
- Group Policy Objects
- Quarterly Release Schedule and Summary
- Security Content Automation Protocol (SCAP)
- SRG / STIG Library Compilations

### STIG UP

Group Have E Januar

Group F have be

Showing 21 to 30 of 59 entries

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STIG Explorer

STIGs

Filter on STIG name...

CK	Name
<input type="checkbox"/>	voice video Session management Security Requirements Guide
<input type="checkbox"/>	vRealize - Cassandra Security Technical Implementation Guide
<input type="checkbox"/>	Web Policy STIG
<input type="checkbox"/>	Web Server Security Requirements Guide
<input type="checkbox"/>	Windows 10 Security Technical Implementation Guide
<input checked="" type="checkbox"/>	Windows 10 Security Technical Implementation Guide
<input type="checkbox"/>	Windows 2008 Domain Controller Security Technical Implementation Guide
<input type="checkbox"/>	Windows 2008 Domain Controller Security Technical Implementation Guide
<input type="checkbox"/>	Windows 2008 Member Server Security Technical Implementation Guide
<input type="checkbox"/>	Windows 2008 Member Server Security Technical Implementation Guide
<input type="checkbox"/>	Windows 8/8.1 Security Technical Implementation Guide
<input type="checkbox"/>	Windows Firewall with Advanced Security Security Technical Implementation Guide
<input type="checkbox"/>	Windows PAW Security Technical Implementation Guide
<input type="checkbox"/>	Windows PAW Security Technical Implementation Guide

Profile: No Profile

Filter Panel

Must match:  All  Any

Keyword  Add

Inclusive (+) Filter  Exclusive (-) Filter

+ / -	Keyword	Filter
No content in table		

Remove Filter(s) Remove All Filters

Vul ID	Rule Name
V-63319	WN10-00-000005
V-63321	WN10-CC-000310
V-63323	WN10-00-000010
V-63325	WN10-CC-000315
V-63329	WN10-CC-000320
V-63333	WN10-CC-000325
V-63335	WN10-CC-000330
V-63337	WN10-00-000030
V-63339	WN10-CC-000335
V-63341	WN10-CC-000360
V-63343	WN10-00-000025
V-63345	WN10-00-000035
V-63347	WN10-CC-000345
V-63349	WN10-00-000040
V-63351	WN10-00-000045
V-63353	WN10-00-000050
V-63355	WN10-00-000055
V-63357	WN10-00-000060
V-63359	WN10-00-000065
V-63361	WN10-00-000070
V-63363	WN10-00-000075
V-63365	WN10-00-000080
V-63367	WN10-00-000085
V-63369	WN10-CC-000350
V-63371	WN10-00-000090
V-63373	WN10-00-000095
V-63375	WN10-CC-000355
V-63377	WN10-00-000100
V-63381	WN10-00-000105
V-63383	WN10-00-000110
V-63385	WN10-00-000115
V-63389	WN10-00-000120
V-63393	WN10-00-000130
V-63399	WN10-00-000135
V-63403	WN10-00-000140
V-63405	WN10-AC-000005
V-63409	WN10-AC-000010

Showing rule 14 out of 282

**Windows 10 Security Technical Implementation Guide :: Version 1, Release: 19 Benchmark Date: 25 Oct 2019****Vul ID:** V-63349 **Rule ID:** SV-77839r9\_rule **STIG ID:** WN10-00-000040**Severity:** CAT I **Classification:** Unclass**Group Title:** WN10-00-000040**Rule Title:** Windows 10 systems must be maintained at a supported servicing level.

**Discussion:** Windows 10 is maintained by Microsoft at servicing levels for specific periods of time to support Windows as a Service. Systems at unsupported servicing levels or releases will not receive security updates for new vulnerabilities which leaves them subject to exploitation.

New versions with feature updates are planned to be released on a semi-annual basis with an estimated support timeframe of 18 to 30 months depending on the release. Support for previously released versions has been extended for Enterprise editions.

A separate servicing branch intended for special purpose systems is the Long-Term Servicing Channel (LTSC, formerly Branch - LTSB) which will receive security updates for 10 years but excludes feature updates.

**Check Text:** Run "winver.exe".

If the "About Windows" dialog box does not display:

"Microsoft Windows Version 1703 (OS Build 15063.0)"

or greater, this is a finding.

Note: Microsoft has extended support for previous versions providing critical and important updates for Windows 10 Enterprise.

Microsoft scheduled end of support dates for current Semi-Annual Channel versions:

v1703 - 8 October 2019  
 v1709 - 14 April 2020  
 v1803 - 10 November 2020  
 v1809 - 13 April 2021  
 v1903 - 8 December 2020

No preview versions will be used in a production environment.

Special purpose systems using the Long-Term Servicing Branch\Channel (LTSC\B) may be at following versions which are not a finding

v1507 (Build 10240)  
 v1607 (Build 14393)  
 v1809 (Build 17763)

**Fix Text:** Update systems on the Semi-Annual Channel to "Microsoft Windows Version 1703 (OS Build 15063.0)" or greater.

It is recommended systems be upgraded to the most recently released version.

Special purpose systems using the Long-Term Servicing Branch\Channel (LTSC\B) may be at the following versions:

v1507 (Build 10240)  
 v1607 (Build 14393)  
 v1809 (Build 17763)

**References**



# Severity Category Code (CAT) Levels

The risk level associated with the information assurance (IA) security weakness and the urgency for a corrective action to be completed

- **CAT I Severity Code** is assigned to *findings* that allow primary security protections to be bypassed, allowing immediate access by unauthorized personnel or unauthorized assumption of super-user privileges
  - CAT I weaknesses **must be corrected** before an Authorization to Operate (ATO) is granted
- **CAT II Severity Code** is assigned to *findings* that have a potential to lead to unauthorized system access or activity.
  - CAT II findings **shall be corrected or satisfactorily mitigated** before an Authorization to Operate will be granted.
  - A system with a CAT II weakness can be granted an ATO only when there is clear evidence that the CAT II weakness can be corrected or satisfactorily mitigated within 180 days of the accreditation decision.
- **CAT III Severity Code** is assigned to *recommendations* that will improve IA posture but are **not required** for an authorization to operate



STIG Explorer

STIGs

Filter on STIG name...

CK	Name
<input type="checkbox"/>	voice video session management Security Requirements Guide
<input type="checkbox"/>	vRealize - Cassandra Security Technical Implementation Guide
<input type="checkbox"/>	Web Policy STIG
<input type="checkbox"/>	Web Server Security Requirements Guide
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<input type="checkbox"/>	Windows PAW Security Technical Implementation Guide
<input type="checkbox"/>	Windows PAW Security Technical Implementation Guide

Profile: No Profile

Filter Panel

Must match:  All  Any

Keyword

Filter  Exclusive (-) Filter

+ / -	Keyword	Filter
	Rule Title	
	STIG ID	
	Vulnerability ID	
	Rule ID	
	IA Control	
	CAT I	
	CAT II	
	CAT III	
	CCI	

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Showing rule 14 out of 282



STIG Explorer

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<input type="checkbox"/>	Web Policy STIG
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<input type="checkbox"/>	Windows PAW Security Technical Implementation Guide
<input type="checkbox"/>	Windows PAW Security Technical Implementation Guide

Profile: No Profile

Filter Panel

Must match:  All  Any

CAT I

Inclusive (+) Filter  Exclusive (-) Filter

+ / -	Keyword	Filter
+	CAT I	CAT I

Showing rule 4 out of 25



Vul ID	Rule Name
V-63319	WN10-00-000005
V-63321	WN10-CC-000310
V-63323	WN10-00-000010
V-63325	WN10-CC-000315
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V-63333	WN10-CC-000325
V-63335	WN10-CC-000330
V-63337	WN10-00-000030
V-63339	WN10-CC-000335
V-63341	WN10-CC-000360
V-63343	WN10-00-000025
V-63345	WN10-00-000035
V-63347	WN10-CC-000345
V-63349	WN10-00-000040
V-63351	WN10-00-000045
V-63353	WN10-00-000050
V-63355	WN10-00-000055
V-63357	WN10-00-000060
V-63359	WN10-00-000065
V-63361	WN10-00-000070
V-63363	WN10-00-000075
V-63365	WN10-00-000080
V-63367	WN10-00-000085
V-63369	WN10-CC-000350
V-63371	WN10-00-000090
V-63373	WN10-00-000095
V-63375	WN10-CC-000355
V-63377	WN10-00-000100
V-63381	WN10-00-000105
V-63383	WN10-00-000110
V-63385	WN10-00-000115

V-63403	WN10-00-000140
V-63405	WN10-AC-000005
V-63409	WN10-AC-000010

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V-63335	WN10-CC-000330
V-63347	WN10-CC-000345
V-63349	WN10-00-000040
V-63351	WN10-00-000045
V-63353	WN10-00-000050
V-63361	WN10-00-000070
V-63429	WN10-AC-000045
V-63651	WN10-CC-000155
V-63667	WN10-CC-000180
V-63671	WN10-CC-000185
V-63673	WN10-CC-000190
V-63739	WN10-SO-000140
V-63745	WN10-SO-000145
V-63749	WN10-SO-000150
V-63759	WN10-SO-000165
V-63797	WN10-SO-000195
V-63801	WN10-SO-000205
V-63847	WN10-UR-000015
V-63859	WN10-UR-000045
V-63869	WN10-UR-000065
V-68845	WN10-00-000145
V-68849	WN10-00-000150
V-78129	WN10-00-000240

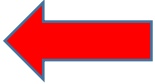
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V-63409	WN10-AC-000010





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or greater, this is a finding.

Note: Microsoft has extended support for previous versions providing critical and important updates for Windows 10 Enterprise.

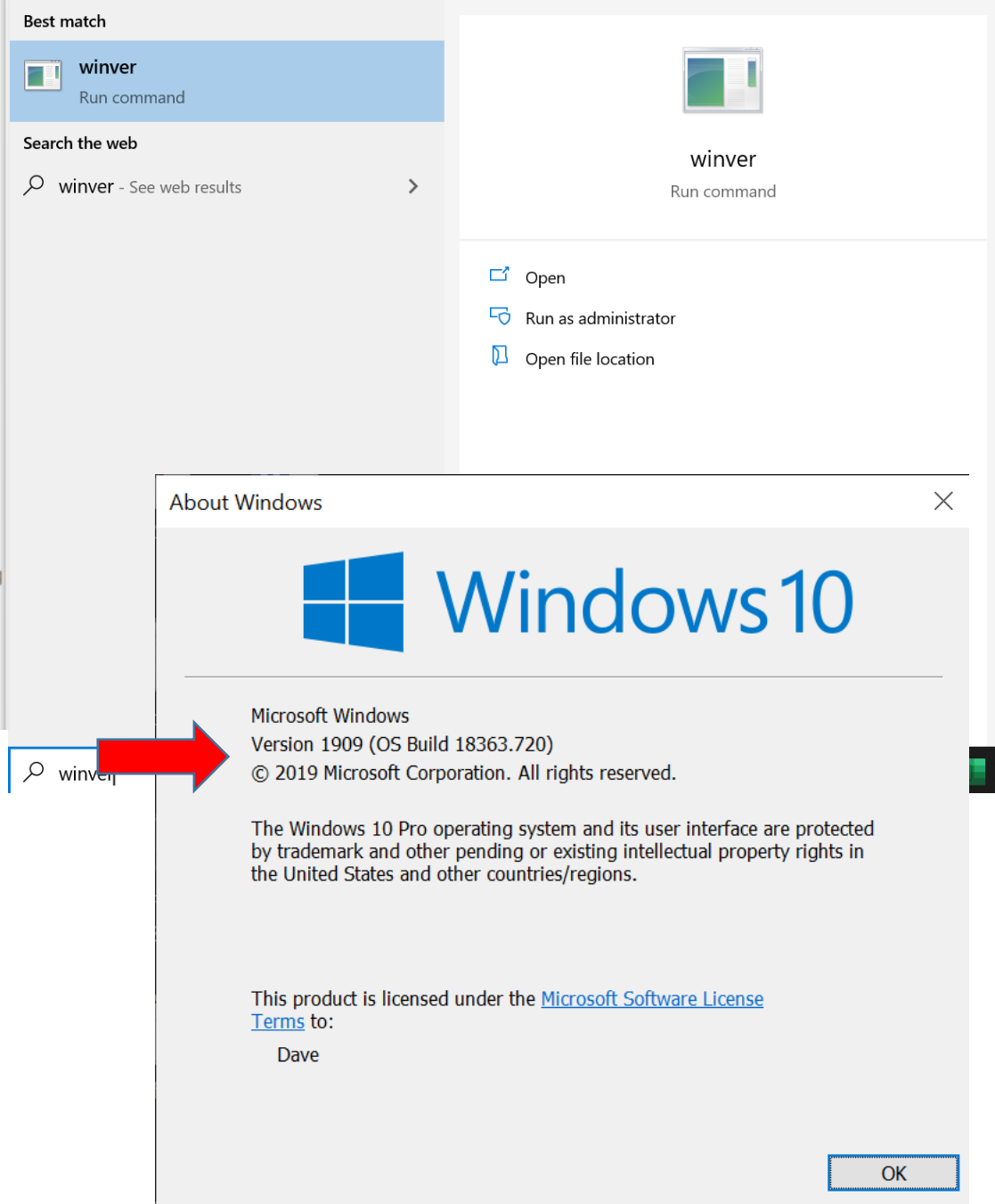
Microsoft scheduled end of support dates for current Semi-Annual Channel versions:

v1703 - 8 October 2019  
v1709 - 14 April 2020  
v1803 - 10 November 2020  
v1809 - 13 April 2021  
v1903 - 8 December 2020

No preview versions will be used in a production environment.

Special purpose systems using the Long-Term Servicing Branch\Channel (LTSC\B) may be at following versions which are not a finding

v1507 (Build 10240)  
v1607 (Build 14393)  
v1809 (Build 17763)



The image shows a Windows search interface with the query "winver". The search results are divided into "Best match" and "Search the web". The "Best match" section shows "winver" as a "Run command" with a small icon. The "Search the web" section shows "winver - See web results" with a magnifying glass icon and a right-pointing arrow. To the right of the search results is a larger window titled "winver" with a "Run command" label and three action buttons: "Open", "Run as administrator", and "Open file location".

Below the search results is the "About Windows" dialog box. It features the Windows logo and "Windows 10" text. The dialog box contains the following information:

- Microsoft Windows
- Version 1909 (OS Build 18363.720)
- © 2019 Microsoft Corporation. All rights reserved.
- The Windows 10 Pro operating system and its user interface are protected by trademark and other pending or existing intellectual property rights in the United States and other countries/regions.
- This product is licensed under the [Microsoft Software License Terms](#) to:  
Dave

An "OK" button is located at the bottom right of the dialog box. A red arrow points from the search results area to the "About Windows" dialog box.

STIG Explorer

▼ STIGs

Filter on STIG name...

CK	Name
<input type="checkbox"/>	z/OS ROSCOE for RACF STIG
<input type="checkbox"/>	z/OS ROSCOE for TSS STIG
<input type="checkbox"/>	z/OS SRRAUDIT for ACF2 STIG
<input type="checkbox"/>	z/OS SRRAUDIT for RACF STIG
<input type="checkbox"/>	z/OS SRRAUDIT for TSS STIG
<input type="checkbox"/>	z/OS TADz for ACF2 STIG
<input type="checkbox"/>	z/OS TADz for RACF STIG
<input type="checkbox"/>	z/OS TADz for TSS STIG
<input type="checkbox"/>	z/OS TDMF for ACF2 STIG
<input type="checkbox"/>	z/OS TDMF for RACF STIG
<input type="checkbox"/>	z/OS TDMF for TSS STIG
<input type="checkbox"/>	z/OS TSS STIG
<input type="checkbox"/>	z/OS VSS for RACF STIG
<input checked="" type="checkbox"/>	Windows 10 Security Technical Implementation Guide

Profile: No Profile

Vul ID	Rule Name
V-63325	WN10-CC-000315
V-63335	WN10-CC-000330
V-63347	WN10-CC-000345
V-63349	WN10-00-000040
V-63351	WN10-00-000045
V-63353	WN10-00-000050
V-63361	WN10-00-000070
V-63377	WN10-00-000100
V-63429	WN10-AC-000045
V-63651	WN10-CC-000155
V-63667	WN10-CC-000180
V-63671	WN10-CC-000185
V-63673	WN10-CC-000190
V-63739	WN10-SO-000140
V-63745	WN10-SO-000145
V-63749	WN10-SO-000150
V-63759	WN10-SO-000165
V-63797	WN10-SO-000195
V-63801	WN10-SO-000205
V-63847	WN10-UR-000015
V-63859	WN10-UR-000045
V-63869	WN10-UR-000065

**Windows 10 Security Technical Implementation Guide :: Version 1, Release: 19 Benchmark Date: 25 Oct 2019**

**Vul ID:** V-63349 **Rule ID:** SV-77839r9\_rule **STIG ID:** WN10-00-000040

**Severity:** CAT I **Classification:** Unclass

Systems at unsupported servicing levels or releases will not receive security updates for new vulnerabilities which leaves them subject to exploitation.

New versions with feature updates are planned to be released on a semi-annual basis with an estimated support timeframe of 18 to 36 months depending on the release. Support for previously released versions has been extended for Enterprise editions.

A separate servicing branch intended for special purpose systems is the Long-Term Servicing Channel (LTSC, formerly Branch - LTSB) which will receive security updates for 10 years but excludes feature updates.

**Check Text:** Run "winver.exe".

If the "About Windows" dialog box does not display:

"Microsoft Windows Version 1703 (OS Build 15063.0)"

or greater, this is a finding.

Note: Microsoft has extended support for previous versions providing critical and important updates for Windows 10 Enterprise.

Microsoft scheduled end of support dates for current Semi-Annual Channel versions:

- v1703 - 8 October 2019
- v1709 - 14 April 2020
- v1803 - 10 November 2020
- v1809 - 13 April 2021
- v1903 - 8 December 2020

No preview versions will be used in a production environment.

▼ Filter Panel

Must match:  All  Any

CAT I CAT I Add

Inclusive (+) Filter  Exclusive (-) Filter

+ / -	Keyword	Filter
+	CAT I	

Remove Filter(s) Remove All Filters

### References

**CCI:** CCI-000366: The organization implements the security configuration settings.

NIST SP 800-53 :: CM-6 b

NIST SP 800-53A :: CM-6.1 (iv)

NIST SP 800-53 Revision 4 :: CM-6 b

branch\Channel (LTSC\B) may be at following versions which are not a finding

"Microsoft Windows Version 1703 (OS Build 15063.0)" or greater.

ntly released version.

branch\Channel (LTSC\B) may be at the following versions:

v1607 (Build 14393)

v1809 (Build 17763)

### References

**CCI:** CCI-000366: The organization implements the security configuration settings.

NIST SP 800-53 :: CM-6 b

NIST SP 800-53A :: CM-6.1 (iv)

NIST SP 800-53 Revision 4 :: CM-6 b

## References

**CCI:** CCI-000366: The organization implements the security configuration settings.

NIST SP 800-53 :: CM-6 b

NIST SP 800-53A :: CM-6.1 (iv)

NIST SP 800-53 Revision 4 :: CM-6 b


NIST Special Publication 800-53  
Revision 5

# Security and Privacy Controls for Information Systems and Organizations

JOINT TASK FORCE

This publication is available free of charge from:  
<https://doi.org/10.6028/NIST.SP.800-53r5>

September 2020  
INCLUDES UPDATES AS OF 12-10-2020; SEE PAGE XVII



U.S. Department of Commerce  
Wilbur L. Ross, Jr., Secretary

National Institute of Standards and Technology  
Walter Copan, NIST Director and Under Secretary of Commerce for Standards and Technology

CM-6(1)	CONFIGURATION SETTINGS   AUTOMATED CENTRAL MANAGEMENT / APPLICATION / VERIFICATION	
	<b>ASSESSMENT OBJECTIVE:</b> <i>Determine if the organization:</i>	
CM-6(1)[1]	<i>defines information system components for which automated mechanisms are to be employed to:</i>	
	CM-6(1)[1][a]	<i>centrally manage configuration settings of such components;</i>
	CM-6(1)[1][b]	<i>apply configuration settings of such components;</i>
	CM-6(1)[1][c]	<i>verify configuration settings of such components;</i>
CM-6(1)[2]	<i>employs automated mechanisms to:</i>	
	CM-6(1)[2][a]	<i>centrally manage configuration settings for organization-defined information system components;</i>
	CM-6(1)[2][b]	<i>apply configuration settings for organization-defined information system components; and</i>
	CM-6(1)[2][c]	<i>verify configuration settings for organization-defined information system components.</i>
	<b>POTENTIAL ASSESSMENT METHODS AND OBJECTS:</b>	
	<b>Examine:</b> [SELECT FROM: Configuration management policy; procedures addressing configuration settings for the information system; configuration management plan; information system design documentation; information system configuration settings and associated documentation; security configuration checklists; change control records; information system audit records; other relevant documents or records].	
	<b>Interview:</b> [SELECT FROM: Organizational personnel with security configuration management responsibilities; organizational personnel with information security responsibilities; system/network administrators; system developers].	
	<b>Test:</b> [SELECT FROM: Organizational processes for managing configuration settings; automated mechanisms implemented to centrally manage, apply, and verify information system configuration settings].	



STIG Explorer

▼ STIGs

CK	Name
<input type="checkbox"/>	Red Hat Enterprise Linux 7 Security Technical Implem...
<input type="checkbox"/>	Windows Firewall with Advanced Security Security Te...
<input type="checkbox"/>	Windows 2008 Domain Controller Security Technical I...
<input type="checkbox"/>	Windows 2008 Member Server Security Technical Imp...
<input type="checkbox"/>	Windows Server 2008 R2 Domain Controller Security ...
<input type="checkbox"/>	Windows Server 2008 R2 Member Server Security Tec...
<input type="checkbox"/>	Windows Server 2012/2012 R2 Domain Controller Sec...
<input type="checkbox"/>	Windows Server 2012/2012 R2 Member Server Securi...
<input type="checkbox"/>	Windows Server 2016 Security Technical Implementat...
<input checked="" type="checkbox"/>	Windows 10 Security Technical Implementation Guide
<input type="checkbox"/>	Windows 7 Security Technical Implementation Guide
<input type="checkbox"/>	Windows 8/8.1 Security Technical Implementation Gu...
<input type="checkbox"/>	VMware ESXi Server 5.0 Security Technical Implement...

Profile: MAC-3\_Public

▼ Filter Panel

CAT I CAT I Add

Inclusive (+) Filter  Exclusive (-) Filter

+ / -	Keyword	Filter
+	CAT I	CAT I

Remove Filter(s) Remove All Filters

Vul ID	Rule Name
V-63337	WN10-00-000030
V-63349	WN10-00-000040
V-63351	WN10-00-000045
V-73811	WN10-00-000046
V-63353	WN10-00-000050
V-63361	WN10-00-000070
V-63377	WN10-00-000100
V-68845	WN10-00-000145
V-68849	WN10-00-000150
V-78129	WN10-00-000240
V-63429	WN10-AC-000045
V-63651	WN10-CC-000155
V-63667	WN10-CC-000180
V-63671	WN10-CC-000185
V-63673	WN10-CC-000190
V-63325	WN10-CC-000315
V-63335	WN10-CC-000330
V-63347	WN10-CC-000345
V-63739	WN10-SO-000140
V-63745	WN10-SO-000145
V-63749	WN10-SO-000150
V-63759	WN10-SO-000165
V-63797	WN10-SO-000195
V-63801	WN10-SO-000205
V-63847	WN10-UR-000015
V-63859	WN10-UR-000045
V-63869	WN10-UR-000065

**Windows 10 Security Technical Implementation Guide :: Release: 12 Benchmark Date: 26 Jan 2018**

**Vuln ID:** V-63337 **Rule ID:** SV-77827r1\_rule **STIG ID:** WN10-00-000030

**Severity:** CAT I **Check Reference:** M **Classification:** Unclass

**Group Title:** WN10-00-000030

**Rule Title:** Mobile systems must encrypt all disks to protect the confidentiality and integrity of all information at rest.

**Discussion:** If data at rest is unencrypted, it is vulnerable to disclosure. Even if the operating system enforces permissions on data access, an adversary can remove non-volatile memory and read it directly, thereby circumventing operating system controls. Encrypting the data ensures that confidentiality is protected even when the operating system is not running.

**Check Text:** Verify mobile systems employ DoD-approved full disk encryption.

If full disk encryption is not implemented, this is a finding.

If BitLocker is used, verify it is turned on for the operating system drive and any fixed data drives. Open "BitLocker Drive Encryption" from the Control Panel.

If the operating system drive or any fixed data drives have "Turn on BitLocker", this is a finding.

**Fix Text:** Install an approved DoD encryption package and enable full disk encryption on mobile systems.

BitLocker can be enabled in "BitLocker Drive Encryption" in the Control Panel.

---

**References**

---

**CCI:** CCI-001199: The information system protects the confidentiality and/or integrity of organization-defined information at rest.  
 NIST SP 800-53 :: SC-28  
 NIST SP 800-53A :: SC-28.1  
 NIST SP 800-53 Revision 4 :: SC-28

CCI-002475: The information system implements cryptographic mechanisms to prevent unauthorized modification of organization-defined information at rest on organization-defined information system components.  
 NIST SP 800-53 Revision 4 :: SC-28 (1)

CCI-002476: The information system implements cryptographic mechanisms to prevent unauthorized disclosure of organization-defined information at rest on organization-defined information system components.

**Group Title:** WN10-00-000030

**Rule Title:** Mobile systems must encrypt all disks to protect the confidentiality and integrity of all information at rest.

**Discussion:** If data at rest is unencrypted, it is vulnerable to disclosure. Even if the operating system enforces permissions on data access, an adversary can remove non-volatile memory and read it directly, thereby circumventing operating system controls. Encrypting the data ensures that confidentiality is protected even when the operating system is not running.

**Check Text:** Verify mobile systems employ DoD-approved full disk encryption.

If full disk encryption is not implemented, this is a finding.

If BitLocker is used, verify it is turned on for the operating system drive and any fixed data drives.  
Open "BitLocker Drive Encryption" from the Control Panel.

If the operating system drive or any fixed data drives have "Turn on BitLocker", this is a finding.

**Check Text:** Verify mobile systems employ DoD-approved full disk encryption.

**Fix**

BitLocker If full disk encryption is not implemented, this is a finding.

CC If BitLocker is used, verify it is turned on for the operating system drive and any fixed data drives.  
NI Open "BitLocker Drive Encryption" from the Control Panel.  
NI

CC If the operating system drive or any fixed data drives have "Turn on BitLocker", this is a finding.  
de

NI **Fix Text:** Install an approved DoD encryption package and enable full disk encryption on mobile systems.

CC BitLocker can be enabled in "BitLocker Drive Encryption" in the Control Panel.  
de



System and Security

Control Panel > System and Security >

- Control Panel Home
- System and Security**
- Network and Internet
- Hardware and Sound
- Programs
- User Accounts
- Appearance and Personalization
- Clock, Language, and Region
- Ease of Access

- Security and Maintenance**  
Review your computer's security  
Change User Account Control settings
- Windows Firewall**  
Check firewall status
- System**  
View amount of RAM and virtual memory  
Launch remote assistance
- Power Options**  
Change battery settings  
Change what the power buttons do
- File History**  
Save backup copies of your files
- Backup and Restore**  
Backup and Restore (Windows 7)
- BitLocker Drive Encryption**  
Manage BitLocker
- Storage Spaces**  
Manage Storage Spaces
- Work Folders**  
Manage Work Folders
- Administrative Tools**

BitLocker Drive Encryption

Control Panel > System and Security > BitLocker Drive Encryption

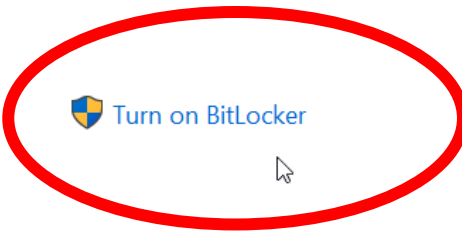
Control Panel Home

## BitLocker Drive Encryption

Help protect your files and folders from unauthorized access by protecting your drives with BitLocker.

### Operating system drive

Windows (C:) BitLocker off



Fixed data drives

Removable data drives - BitLocker To Go

Insert a removable USB flash drive to use BitLocker To Go.

BitLocker Drive Encryption  
Protect your PC using BitLocker Drive Encryption.

# Agenda

- ✓ Risk Management Framework – A quick review...
- ✓ Implementing controls – Host hardening...
  - ✓ Security configuration checklist (w/DISA STIG Viewer)
- SCAP - Security Content Automation Protocol
- System Security Plan's Section 13
  - Select 1 control family to fill out for your information system
- Team Project - SSP draft development...

# SCAP (Security Content Automation Protocol) *pronounced “ess-cap”*

**Purpose:** Used for continuously monitoring deployed computer systems and applications for detectable vulnerabilities and assure they incorporate security upgrades to software (“patches”) and deploy updates to configurations

SCAP based on a number of open standards, widely used to enumerate software flaws and configuration issues related to security

- The National Vulnerability Database (NVD) is the U.S. government content repository for SCAP
  - *Vendors can get their computer system configuration scanner product validated against SCAP, demonstrating that it will interoperate with other scanners and express the scan results in a standardized way*
- Validated tools for automating collection of assessment objects used in Examine, Inspect and Test activities

# Examine: SCAP (Security Content Automation Protocol) validated tools may be used to automate collection of assessment objects

## Common SCAP uses

- Security configuration verification
  - Compare settings in a checklist to a system's actual configuration
  - Verify configuration before deployment, audit/assess/monitor operational systems
  - Map individual settings to high-level requirements (requirements traceability)
  - Verifying patch installation and identifying missing patches
- Check systems for signs of compromise
  - Known characteristics of attacks, such as altered files or the presence of a malicious service

Frequently Asked Questions – FAQs

Group Policy Objects

Quarterly Release Schedule and Summary

SRG / STIG Library Compilations

SRG / STIG Mailing List

SRG/STIG Tools and Viewing Guidance

Sunset Products

Vendor STIG Development Process

Help

## SCAP 1.2 CONTENT

Show 10 entries

Search:

TITLE	SIZE	UPDATED
<a href="#">Adobe Acrobat Reader DC Classic Track STIG Benchmark - Ver 2, Rel 1</a>	10.95 KB	26 Oct 2020
<a href="#">Adobe Acrobat Reader DC Continuous Track STIG Benchmark - Ver 2, Rel 1</a>	10.79 KB	26 Jul 2021
<a href="#">Canonical Ubuntu 18.04 STIG Benchmark - Ver 2, Rel 5</a>	50.75 KB	24 Jan 2022
<a href="#">Canonical Ubuntu 20.04 LTS STIG Benchmark - Ver 1, Rel 1</a>	59.4 KB	24 Feb 2022
<a href="#">Google Chrome Current Windows STIG Benchmark - Ver 2, Rel 5</a>	24.1 KB	24 Jan 2022
<a href="#">Microsoft .Net Framework 4 STIG Benchmark - Ver 2, Rel 1</a>	8.44 KB	22 Jan 2021
<a href="#">Microsoft Edge STIG Benchmark - Ver 1, Rel 1</a>	24.23 KB	27 Oct 2021
<a href="#">Microsoft Windows 10 STIG Benchmark - Ver 2, Rel 3</a>	100.5 KB	18 Nov 2021
<a href="#">Microsoft Windows Defender Antivirus STIG Benchmark - Ver 2, Rel 2</a>	22.31 KB	18 Nov 2021
<a href="#">Microsoft Windows Firewall STIG Benchmark - Ver 2, Rel 1</a>	13.53 KB	18 Nov 2021

Showing 1 to 10 of 26 entries

Previous **1** 2 3 Next

## SCAP TOOLS

Show 10 entries

Search:

TITLE	SIZE	UPDATED
<a href="#">SCC 5.4.2 Checksum file</a>	7.56 KB	15 Sep 2021

# SCAP Audit Summary

Switch Dashboard

## SCAP Audit Summary - Top 25 Linux Compliance Failed Checks

Plugin ID	Name	Severity	Total
1003887	CCE-18031-5::ipsec_tools_package:USGCB-RHEL-5-Desktop_1.2.5.0:united_states_government_configurati...	High	1
10038...	CCE-17504-2::irda_tools_package:USGCB-RHEL-5-Desktop_1.2.5.0:united_states_government_configurati...	High	1
10038...	CCE-18200-6::talk_package:USGCB-RHEL-5-Desktop_1.2.5.0:united_states_government_configuration_ba...	High	1
10038...	CCE-17250-2::pam_ccreds_package:USGCB-RHEL-5-Desktop_1.2.5.0:united_states_government_configura...	High	1
10038...	CCE-17742-8::usgcb-rhel5desktop-rule-2.6.1.0:USGCB-RHEL-5-Desktop_1.2.5.0:united_states_government...	High	1
1003881	CCE-15018-5::postfix_network_listening:USGCB-RHEL-5-Desktop_1.2.5.0:united_states_government_config...	High	1
10038...	CCE-14068-1::postfix_package_installation:USGCB-RHEL-5-Desktop_1.2.5.0:united_states_government_co...	High	1
10038...	CCE-14495-6::sendmail_package_installation:USGCB-RHEL-5-Desktop_1.2.5.0:united_states_government...	High	1
1003878	CCE-14825-4::lsdn4k_utils_package:USGCB-RHEL-5-Desktop_1.2.5.0:united_states_government_configura...	High	1
10038...	CCE-14412-1::nodev_option_on_tmp:USGCB-RHEL-5-Desktop_1.2.5.0:united_states_government_configura...	High	1

Last Updated: 1 hour ago

## SCAP Audit Summary - Compliance Summary

	Systems	Passed	Manual Check	Failed
Windows	1	30%	3%	67%
Linux	1	39%	13%	47%

Last Updated: 1 hour ago

## SCAP Audit Summary - Network Summary

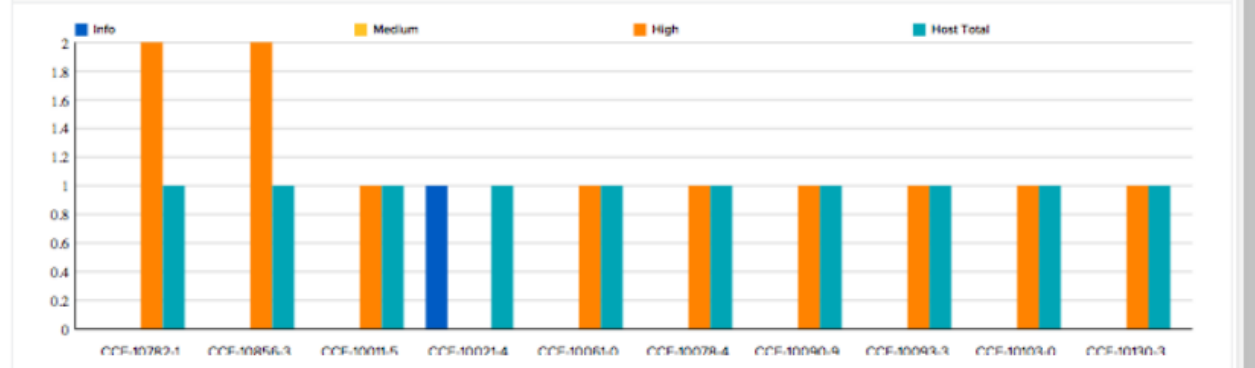
IP Address	Score	Info	Medium	High	Total
10.31.104.0/24	1811	80	7	179	266
172.26.48.0/24	1322	101	34	122	257

## SCAP Audit Summary - Top 25 Windows Compliance Failed Checks

Plugin ID	Name	Severity	T...
10046...	CCE-14830-4::SV-25139r1_rule:Windows_7_STIG_1:MAC-1_Public	High	1
10046...	CCE-14109-3::SV-25138r1_rule:Windows_7_STIG_1:MAC-1_Public	High	1
10046...	noCCE:The Enhanced Mitigation Experience Toolkit (EMET) must be installed on the system.VMS Target WL...	High	1
10046...	CCE-15041-7::SV-25143r1_rule:Windows_7_STIG_1:MAC-1_Public	High	1
10046...	CCE-10777-1::SV-25107r1_rule:Windows_7_STIG_1:MAC-1_Public	High	1
10046...	noCCE:The Enhanced Mitigation Experience Toolkit (EMET) system-wide Address Space Layout Randomizat...	High	1
10046...	noCCE:The Enhanced Mitigation Experience Toolkit (EMET) system-wide Data Execution Prevention (DEP) ...	High	1
1004641	noCCE:The Enhanced Mitigation Experience Toolkit (EMET) Default Protections for Popular Software is not e...	High	1
10046...	noCCE:The Enhanced Mitigation Experience Toolkit (EMET) Default Protections for Internet Explorer must b...	High	1
10046...	noCCE:Local administrator accounts must have their privileged token filtered to prevent elevated privileges ...	High	1

Last Updated: 1 hour ago

## SCAP Audit Summary - Top 10 CCE's



Last Updated: 1 hour ago



# SCAP Compliance Scan Results

Nessus Scans Policies admin

## Windows 7 SCAP Scan

CURRENT RESULTS: NOVEMBER 11, 2014 10:53:16

Configure Audit Trail Launch Export Filter Compliance

Scans > Hosts 1 Vulnerabilities 2 Compliance 270 History 1

Status	Plugin Name	Plugin Family	Count
FAILED	CCE-10021-4:Audit Policy Change	SCAP Windows Compliance Checks	1
FAILED	CCE-10059-4:Turn on Responder (RSPNDR) driver	SCAP Windows Compliance Checks	1
FAILED	CCE-10061-0:Turn off printing over HTTP	SCAP Windows Compliance Checks	1
FAILED	CCE-10090-9:Do not allow passwords to be saved	SCAP Windows Compliance Checks	1
FAILED	CCE-10103-0:Always prompt client for password upon connection	SCAP Windows Compliance Checks	1
FAILED	CCE-10137-8:Prevent Windows anytime upgrade from running	SCAP Windows Compliance Checks	1
FAILED	CCE-10140-2:Turn off Search Companion content file updates	SCAP Windows Compliance Checks	1
FAILED	CCE-10150-1:Fax Service	SCAP Windows Compliance Checks	1

### Scan Details

Name: Windows 7 SCAP Scan  
Folder: My Scans  
Status: Completed  
Policy: SCAP Compliance Audit  
Scanner: Local Scanner  
Targets: 172.26.48.75  
Start time: November 11, 2014 10:53:16  
End time: November 11, 2014 10:56:03  
Elapsed: 3 minutes

### Compliance

- Passed
- Warning
- Failed

# SCAP: Individual compliance check result for scanned host

The screenshot shows the Nessus interface for a Windows 7 SCAP scan. The top navigation bar includes the Nessus logo, 'Scans', 'Policies', and a user profile 'admin'. The main header displays 'Windows 7 SCAP Scan' with 'CURRENT RESULTS: NOVEMBER 11, 2014 10:53:16'. Action buttons for 'Configure', 'Audit Trail', 'Launch', and 'Export' are visible. A breadcrumb trail shows 'Scans > Hosts 1 > Vulnerabilities 2 > Compliance 270 > History 1'. The main content area features a red 'FAILED' badge and the title 'CCE-10103-0:Always prompt client for password upon connection'. The 'Description' section explains the policy and its application to Terminal Services. The 'Audit File' is 'Win7-510-1.2.7.1.zip'. The 'Policy Value' is 'xccdf\_gov.nist\_rule\_always\_prompt\_for\_password\_upon\_connection: PASSED'. The 'Output' section shows the command 'xccdf gov.nist rule always prompt for password upon connection: FAILED'. The 'Reference Information' section provides metadata such as 'UPDATED-DATE: 2012-02-24T10:00:00', 'RULE-ID: xccdf\_gov.nist\_benchmark\_USGCB-Windows-7:xccdf\_gov.nist\_profile\_united\_states\_government\_configuration\_baseline\_version\_1.2.3.1:xccdf\_gov.nist\_rule\_always\_prompt\_for\_password\_upon\_connection', 'GENERATED-DATE: 2012-02-24T10:00:00', 'SCAN-DATE: 2014-11-11T16:53:40', 'OVAL-DEF: oval:gov.nist.usgcb.windowsseven:def:275', 'CCE: CCE-10103-0', and 'SEVERITY: unknown'.

**Nessus** Scans Policies admin

## Windows 7 SCAP Scan

CURRENT RESULTS: NOVEMBER 11, 2014 10:53:16

Configure Audit Trail Launch Export

Scans > Hosts 1 > Vulnerabilities 2 > Compliance 270 > History 1

**FAILED** CCE-10103-0:Always prompt client for password upon connection

### Description

Always prompt client for password upon connection

The "Always Prompt Client for Password upon Connection" policy should be set correctly for Terminal Services.

### Audit File

Win7-510-1.2.7.1.zip

### Policy Value

xccdf\_gov.nist\_rule\_always\_prompt\_for\_password\_upon\_connection: PASSED

### Output

```
xccdf gov.nist rule always prompt for password upon connection: FAILED
```

### Reference Information

UPDATED-DATE: 2012-02-24T10:00:00  
RULE-ID: xccdf\_gov.nist\_benchmark\_USGCB-Windows-7:xccdf\_gov.nist\_profile\_united\_states\_government\_configuration\_baseline\_version\_1.2.3.1:xccdf\_gov.nist\_rule\_always\_prompt\_for\_password\_upon\_connection  
GENERATED-DATE: 2012-02-24T10:00:00  
SCAN-DATE: 2014-11-11T16:53:40  
OVAL-DEF: oval:gov.nist.usgcb.windowsseven:def:275  
CCE: CCE-10103-0  
SEVERITY: unknown

# SCAP (Security Content Automation Protocol) validated tools may be used to automate collection of assessment objects

- National Vulnerability Database (NVD): <https://nvd.nist.gov/>
- NVD SCAP Download: <http://nvd.nist.gov/download.cfm>
- National Checklist Program (NCP): <http://web.nvd.nist.gov/view/ncp/repository>
- NIST SP 800-126r3, The Technical Specification for SCAP
- NIST SP 800-70r4, National Checklist Program for IT Products
- More documentation and tools: <https://scap.nist.gov/revision/1.0/index.html>

NIST Special Publication 800-70  
Revision 4

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## National Checklist Program for IT Products – Guidelines for Checklist Users and Developers

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C O M P U T E R   S E C U R I T Y

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**NIST**  
National Institute of  
Standards and Technology  
U.S. Department of Commerce

# DISA STIG Tool

The screenshot shows the DISA STIG Viewer interface. On the left, a list of STIGs is displayed, with 'Windows 10 Security Technical Implementation Guide' selected. The main pane shows the details for rule 'WN10-00-000030', including its title, severity (CAT I), and a detailed description of the requirement for mobile systems to encrypt all disks. A 'References' section lists various standards like NIST SP 800-53 and CCI 002475.

+

# SCAP Tool

The screenshot displays the SecurityCenter SCAP Audit Summary dashboard. It features a 'Compliance Summary' table with columns for Systems, Passed, Manual Check, and Failed. Below this, a 'Network Summary' table shows audit results for IP addresses 10.31.104.0/24 and 172.26.48.0/24. On the right, there are two bar charts: 'Top 25 Windows Compliance Failed Checks' and 'Top 10 CCE's', both showing the severity of failed checks.

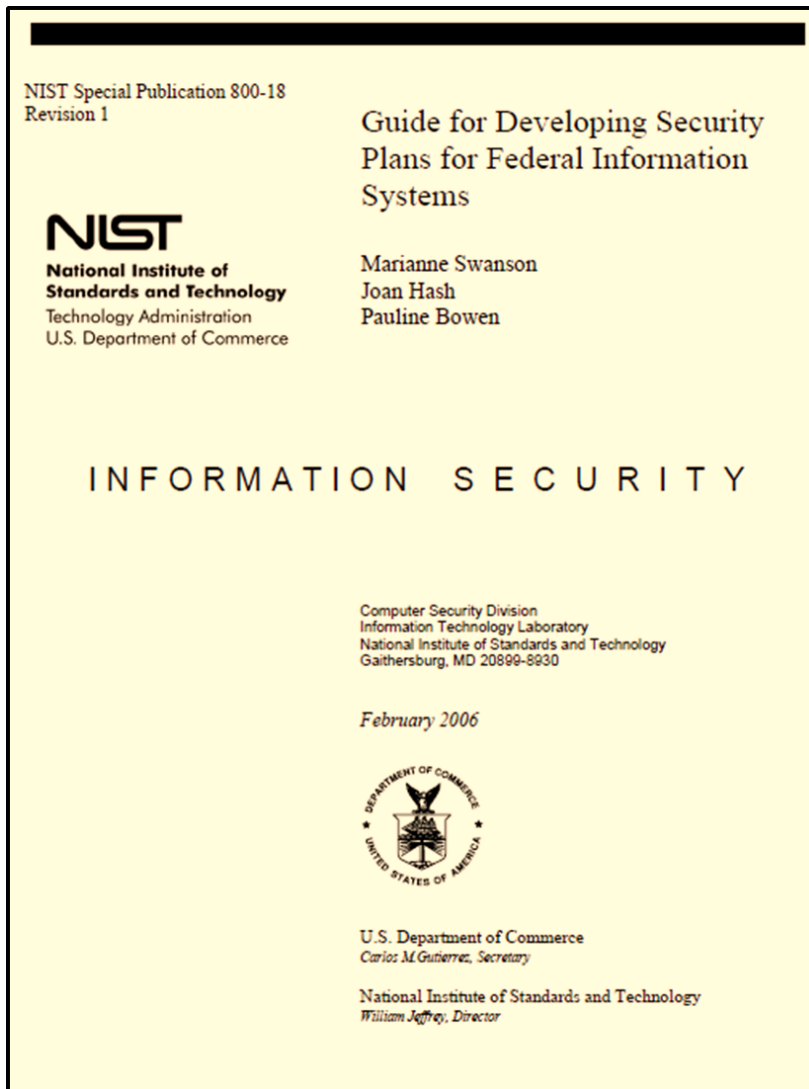
## SCAP Compliance Checker

The SCAP Compliance Checker is an automated compliance scanning tool that leverages the DISA Security Technical Implementation Guidelines (STIGs) and operating system (OS) specific baselines to analyze and report on the security configuration of an information system. The tool can be run locally on the host system to be scanned, or scans can be conducted across a network from any machine on the domain. In either scanning environment, the following requirement applies: The user conducting the scan must have administrative privileges on the machine to be scanned. If the machine is not hosting the tool, domain-level administrative privileges (or individual local administrator accounts) are required to remotely scan other systems on the network.

# Agenda

- ✓ Risk Management Framework – A quick review...
- ✓ Implementing controls – Host hardening...
  - ✓ Security configuration checklist (w/DISA STIG Viewer)
- ✓ SCAP - Security Content Automation Protocol
- System Security Plan's Section 13
  - **Select 1 technical control family or CM control family to fill out for your information system's SSP**
- Team Project - SSP draft development questions & answers...

# SSP's Technical Controls: Section 13




CLASS	FAMILY	IDENTIFIER
Management	Risk Assessment	RA
Management	Planning	PL
Management	System and Services Acquisition	SA
Management	Certification, Accreditation, and Security Assessments	CA
Operational	Personnel Security	PS
Operational	Physical and Environmental Protection	PE
Operational	Contingency Planning	CP
Operational	Configuration Management	CM
Operational	Maintenance	MA
Operational	System and Information Integrity	SI
Operational	Media Protection	MP
Operational	Incident Response	IR
Operational	Awareness and Training	AT
Technical	Identification and Authentication	IA
Technical	Access Control	AC
Technical	Audit and Accountability	AU
Technical	System and Communications Protection	SC

**Table 2: Security Control Class, Family, and Identifier**



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# Technical Controls

NIST Special Publication 800-18  
Revision 1

**NIST**  
National Institute of  
Standards and Technology  
Technology Administration  
U.S. Department of Commerce


Guide for Developing Security  
Plans for Federal Information  
Systems

Marianne Swanson  
Joan Hash  
Pauline Bowen

INFORMATION SECURITY


Computer Security Division  
Information Technology Laboratory  
National Institute of Standards and Technology  
Gaithersburg, MD 20899-8930

February 2006



U.S. Department of Commerce  
*Carlos M. Gutierrez, Secretary*

National Institute of Standards and Technology  
*William Jeffrey, Director*

CLASS	FAMILY	IDENTIFIER
Technical 	Identification and Authentication	IA
Technical	Access Control	AC
Technical	Audit and Accountability	AU
Technical	System and Communications Protection	SC

# Identification and Authentication (IA)

*Organizations must identify information system users, processes acting on behalf of users, or devices and authenticate (or verify) the identities of those users, processes, or devices, as a prerequisite to allowing access to organizational information systems.*

FIPS PUB 200

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FEDERAL INFORMATION PROCESSING STANDARDS PUBLICATION

## Minimum Security Requirements for Federal Information and Information Systems

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Computer Security Division  
Information Technology Laboratory  
National Institute of Standards and Technology  
Gaithersburg, MD 20899-8930

March 2006



U.S. DEPARTMENT OF COMMERCE  
Carlos M. Gutierrez, Secretary

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY  
William Jeffrey, Director

# Identification and Authentication (IA)

## Security and Privacy Controls for Information Systems and Organizations

JOINT TASK FORCE

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<https://doi.org/10.6028/NIST.SP.800-53r5>

September 2020  
INCLUDES UPDATES AS OF 12-10-2020; SEE PAGE XVII



U.S. Department of Commerce  
Wilbur L. Ross, Jr., Secretary

National Institute of Standards and Technology  
Walter Copan, NIST Director and Under Secretary of Commerce for Standards and Technology

CNTL NO.	CONTROL NAME	PRIORITY	INITIAL CONTROL BASELINES		
			LOW	MOD	HIGH
<b>Identification and Authentication</b>					
IA-1	Identification and Authentication Policy and Procedures	P1	IA-1	IA-1	IA-1
IA-2	Identification and Authentication (Organizational Users)	P1	IA-2 (1) (12)	IA-2 (1) (2) (3) (8) (11) (12)	IA-2 (1) (2) (3) (4) (8) (9) (11) (12)
IA-3	Device Identification and Authentication	P1	Not Selected	IA-3	IA-3
IA-4	Identifier Management	P1	IA-4	IA-4	IA-4
IA-5	Authenticator Management	P1	IA-5 (1) (11)	IA-5 (1) (2) (3) (11)	IA-5 (1) (2) (3) (11)
IA-6	Authenticator Feedback	P2	IA-6	IA-6	IA-6
IA-7	Cryptographic Module Authentication	P1	IA-7	IA-7	IA-7
IA-8	Identification and Authentication (Non-Organizational Users)	P1	IA-8 (1) (2) (3) (4)	IA-8 (1) (2) (3) (4)	IA-8 (1) (2) (3) (4)

# IA-1 Identification and Authentication Policy and Procedures

Control: The organization:

- a. Develops, documents, and disseminates to [**Assignment: organization-defined personnel or roles**]:
  1. An identification and authentication policy that addresses **purpose, scope, roles, responsibilities, management commitment, coordination among organizational entities, and compliance**; and
  2. **Procedures to facilitate the implementation of the identification and authentication policy and associated identification and authentication controls**; and
- b. Reviews and updates the current:
  - a. Identification and authentication policy [**Assignment: organization-defined frequency**]; and
  - b. Identification and authentication procedures [**Assignment: organization-defined frequency**].

IA-1		IDENTIFICATION AND AUTHENTICATION POLICY AND PROCEDURES	
<b>ASSESSMENT OBJECTIVE:</b>			
<i>Determine if the organization:</i>			
IA-1(a)(1)	IA-1(a)(1)[1]	<i>develops and documents an identification and authentication policy that addresses:</i>	
		IA-1(a)(1)[1][a]	<i>purpose;</i>
		IA-1(a)(1)[1][b]	<i>scope;</i>
		IA-1(a)(1)[1][c]	<i>roles;</i>
		IA-1(a)(1)[1][d]	<i>responsibilities;</i>
		IA-1(a)(1)[1][e]	<i>management commitment;</i>
		IA-1(a)(1)[1][f]	<i>coordination among organizational entities;</i>
		IA-1(a)(1)[1][g]	<i>compliance;</i>
	IA-1(a)(1)[2]	<i>defines personnel or roles to whom the identification and authentication policy is to be disseminated; and</i>	
IA-1(a)(1)[3]	<i>disseminates the identification and authentication policy to organization-defined personnel or roles;</i>		
IA-1(a)(2)	IA-1(a)(2)[1]	<i>develops and documents procedures to facilitate the implementation of the identification and authentication policy and associated identification and authentication controls;</i>	
	IA-1(a)(2)[2]	<i>defines personnel or roles to whom the procedures are to be disseminated;</i>	
	IA-1(a)(2)[3]	<i>disseminates the procedures to organization-defined personnel or roles;</i>	
IA-1(b)(1)	IA-1(b)(1)[1]	<i>defines the frequency to review and update the current identification and authentication policy;</i>	
	IA-1(b)(1)[2]	<i>reviews and updates the current identification and authentication policy with the organization-defined frequency; and</i>	
IA-1(b)(2)	IA-1(b)(2)[1]	<i>defines the frequency to review and update the current identification and authentication procedures; and</i>	
	IA-1(b)(2)[2]	<i>reviews and updates the current identification and authentication procedures with the organization-defined frequency.</i>	
<b>POTENTIAL ASSESSMENT METHODS AND OBJECTS:</b>			
<b>Examine:</b> [SELECT FROM: Identification and authentication policy and procedures; other relevant documents or records].			
<b>Interview:</b> [SELECT FROM: Organizational personnel with identification and authentication responsibilities; organizational personnel with information security responsibilities].			

NIST Special Publication 800-53A  
Revision 5

# Assessing Security and Privacy Controls in Information Systems and Organizations

JOINT TASK FORCE

This publication is available free of charge from:  
<https://doi.org/10.6028/NIST.SP.800-53Ar5>

January 2022



U.S. Department of Commerce  
Gina M. Raimondo, Secretary

National Institute of Standards and Technology  
James K. Olthoff, Performing the Non-Exclusive Functions and Duties of the Under Secretary of Commerce  
for Standards and Technology & Director, National Institute of Standards and Technology



# IA-1 Identification and Authentication Policy and Procedures



University of Wisconsin Superior	Identification and Authentication Policy and Procedures	
Department Name Technology Services	Policy # IT-IA1	Issue Date: March 16, 2016
Approved by:		

## 1. Purpose

The University of Wisconsin Superior fosters intellectual growth and career preparation within a liberal arts tradition that emphasizes individual attention, embodies respect for diverse cultures and multiple voices, and engages the community and region. This policy establishes the Identification and Authentication Policy and Procedures. This policy addresses the establishment of procedures for the effective implementation of selected security controls and control enhancements in the Identification and Authentication Policy and Procedures Family.

## 2. Scope

The scope of this policy is applicable to all Information Technology (IT) resources owned or operated by the University of Wisconsin Superior. Any information, not specifically identified as the property of other parties, that is transmitted or stored on University of Wisconsin Superior IT resources (including e-mail, messages and files) is the property of the University of Wisconsin Superior. All users (University of Wisconsin Superior employees, Students, contractors, vendors or others) of IT resources are responsible for adhering to this policy.

## 3. Data Classification

Authorization to access institutional data varies according to its sensitivity (the need for care or caution in handling). Access Controls will vary depending upon the following classifications:

### Level I: Low Sensitivity/Public Data:

Access to Level I institutional data is targeted for general public use and may be granted to any requester or may be published with no restrictions. Level I data is specifically defined as public in local, state, or federal law, or data whose original purpose was for public disclosure.

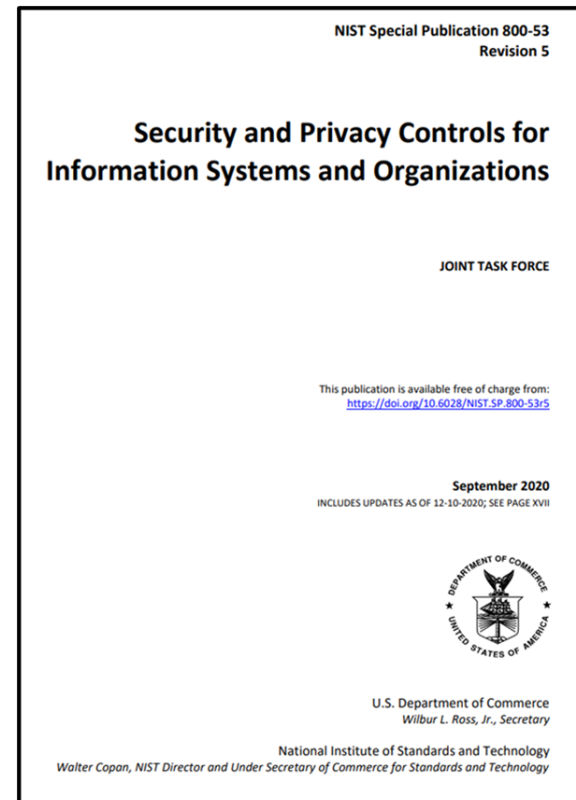
Examples of Level I (low sensitivity) institutional data:

- published "white pages" directory information
- maps
- university websites intended for public use
- course catalogs and schedules of classes (timetables)
- campus newspapers, magazines, or newsletters
- press releases
- campus brochures

### Level III: Moderate Sensitivity/Internal Data:

Access to Level III institutional data is authorized for all employees for business purposes unless restricted by a data steward. Access to data of this level is generally not available to parties outside the university community and must be requested from, and authorized by, the data steward who is responsible for the data.

# Identification and Authentication (IA)



**A-2** is a common control to all baselines

CNTL NO.	CONTROL NAME	PRIORITY	INITIAL CONTROL BASELINES		
			LOW	MOD	HIGH
<b>Identification and Authentication</b>					
IA-1	Identification and Authentication Policy and Procedures	P1	IA-1	IA-1	IA-1
IA-2	Identification and Authentication (Organizational Users)	P1	IA-2 (1) (12)	IA-2 (1) (2) (3) (8) (11) (12)	IA-2 (1) (2) (3) (4) (8) (9) (11) (12)
IA-3	Device Identification and Authentication	P1	Not Selected	IA-3	IA-3
IA-4	Identifier Management	P1	IA-4	IA-4	IA-4
IA-5	Authenticator Management	P1	IA-5 (1) (11)	IA-5 (1) (2) (3) (11)	IA-5 (1) (2) (3) (11)
IA-6	Authenticator Feedback	P2	IA-6	IA-6	IA-6
IA-7	Cryptographic Module Authentication	P1	IA-7	IA-7	IA-7
IA-8	Identification and Authentication (Non-Organizational Users)	P1	IA-8 (1) (2) (3) (4)	IA-8 (1) (2) (3) (4)	IA-8 (1) (2) (3) (4)

# IA-2 Identification and Authentication (Organizational Users)

**Control:** The information system uniquely identifies and authenticates organizational users (or processes acting on behalf of organizational users)

IA-2	IDENTIFICATION AND AUTHENTICATION (ORGANIZATIONAL USERS)
	<p data-bbox="715 582 1174 615"><b>ASSESSMENT OBJECTIVE:</b></p> <p data-bbox="715 644 2364 739"><i>Determine if the information system uniquely identifies and authenticates organizational users (or processes acting on behalf of organizational users).</i></p> <p data-bbox="715 782 1615 815"><b>POTENTIAL ASSESSMENT METHODS AND OBJECTS:</b></p> <p data-bbox="715 839 2321 1001"><b>Examine:</b> [SELECT FROM: Identification and authentication policy; procedures addressing user identification and authentication; information system design documentation; information system configuration settings and associated documentation; information system audit records; list of information system accounts; other relevant documents or records].</p> <p data-bbox="715 1025 2397 1186"><b>Interview:</b> [SELECT FROM: Organizational personnel with information system operations responsibilities; organizational personnel with information security responsibilities; system/network administrators; organizational personnel with account management responsibilities; system developers].</p> <p data-bbox="715 1210 2283 1325"><b>Test:</b> [SELECT FROM: Organizational processes for uniquely identifying and authenticating users; automated mechanisms supporting and/or implementing identification and authentication capability].</p>



# FEDRAMP SYSTEM SECURITY PLAN (SSP) HIGH BASELINE TEMPLATE

CSP Name | Information System Name

Version ##, Date

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- 1. INFORMATION SYSTEM NAME/TITLE..... 1
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  - 2.1. Information Types ..... 1
  - 2.2. Security Objectives Categorization (FIPS 199) ..... 3
  - 2.3. Digital Identity Determination..... 3

Impact Categories	Assurance Level		
	1	2	3
Inconvenience, distress or damage to standing or reputation	Low	Mod	High
Financial loss or agency liability	Low	Mod	High
Harm to agency programs or public interests	N/A	Low/Mod	High
Unauthorized release of sensitive information	N/A	Low/Mod	High
Personal Safety	N/A	Low	Mod/High
Civil or criminal violations	N/A	Low/Mod	High



Business Area	Business Area ID	Information Type	Inconvenience, distress or damage to standing or reputation	Financial loss or agency liability	Harm to agency programs or public interests	Unauthorized release of sensitive information	Personal Safety	Civil or criminal violations	IAL	AAL
Environmental Management	D.8	Pollution Prevention and Control	Low	Low	Low	Low	Low	Low	2	2
Public Goods Creation & Management	D.22	Public Resources, Facility and Infrastructure Management	Moderate	Low	Low	Moderate	Low	Low		
		Tenant Data	Moderate	Low	Low	Moderate	Low	Low		
Information & Technology Management	C.3.5.5	Information Security	Moderate	Low	Moderate	Moderate	Low	Low		
Information & Technology Management	C.3.5.6	Record Retention	Moderate	Low	Moderate	Moderate	Low	Low		
Information & Technology Management	C.3.5.7	Information Management	Moderate	Low	Moderate	Moderate	Low	Low		
Information & Technology Management	C.3.5	System and Network Monitoring	Moderate	Low	Moderate	Moderate	Low	Low		
		System Data	Moderate	Low	Moderate	Moderate	Low	Low		
			Moderate	Low	Moderate	Moderate	Low	Low		
		Assurance Level:	2	1	2	2	2	2		

### 2.3. Digital Identity Determination

The digital identity information may be found in Attachment 3, Digital Identity Worksheet.

Note: NIST SP 800-63-3, Digital Identity Guidelines, does not recognize the four Levels of Assurance model previously used by federal agencies and described in OMB M-04-04, instead requiring agencies to individually select levels of authentication being performed.

The digital identity level is

- Level 1: AAL1, IAL1, FAL1
- Level 2: AAL2, IAL2, FAL2
- Level 3: AAL3, IAL3, FAL3

### 2.3. Digital Identity Determination

The digital identity information may be found in Attachment 3, Digital Identity Worksheet.

Note: NIST SP 800-63-3, Digital Identity Guidelines, does not recognize the four Levels of Assurance model previously used by federal agencies and described in OMB M-04-04, instead requiring agencies to individually select levels of authentication being performed.

The digital identity level is

# IA-2 Identification and Authentication

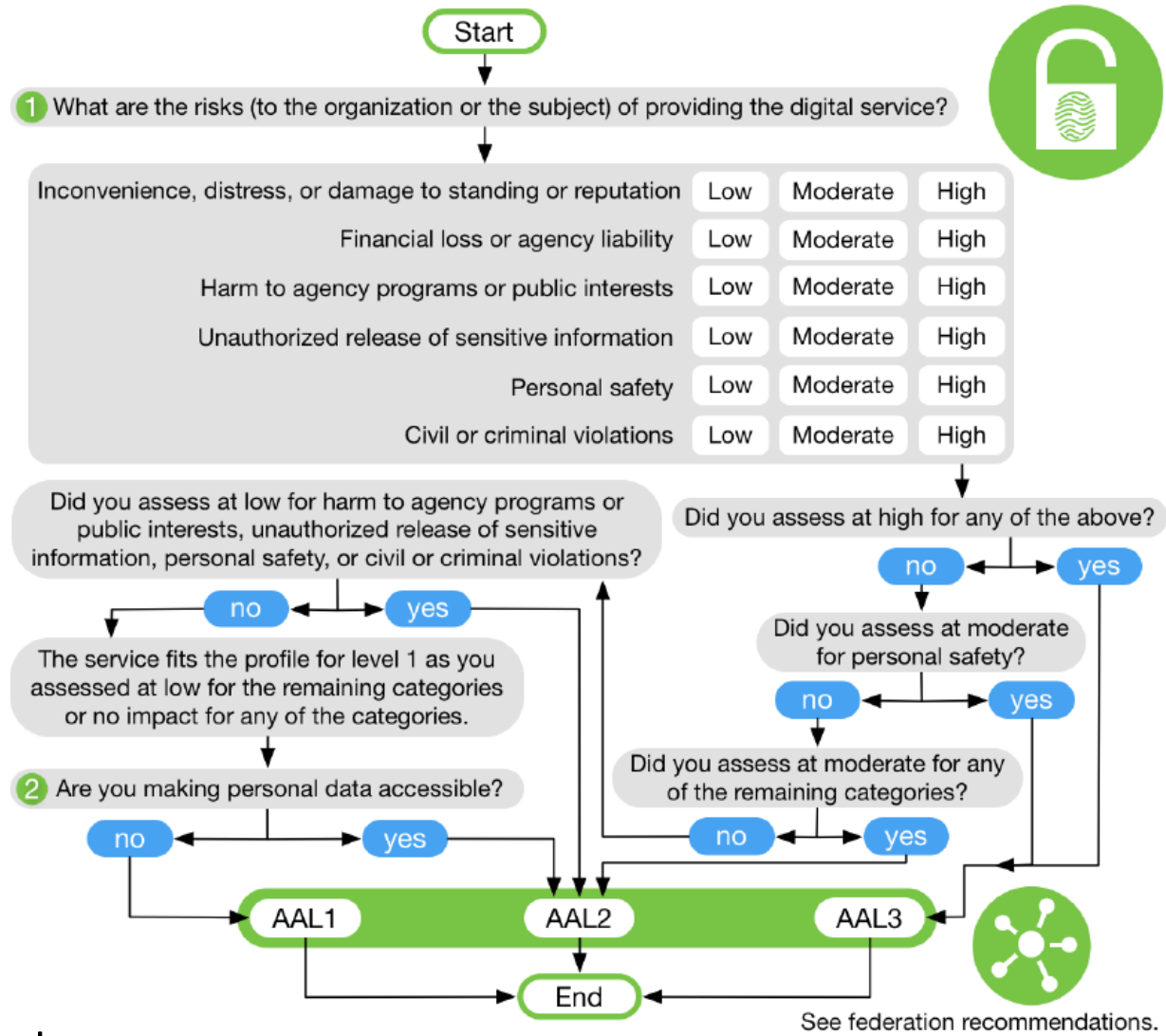
## Control Enhancement:

IA-2(1)	IDENTIFICATION AND AUTHENTICATION   <i>NETWORK ACCESS TO PRIVILEGED ACCOUNTS</i>
	<p data-bbox="537 434 1034 468"><b>ASSESSMENT OBJECTIVE:</b></p> <p data-bbox="537 496 2277 602"><i>Determine if the information system implements multifactor authentication for network access to privileged accounts.</i></p> <p data-bbox="537 648 1510 682"><b>POTENTIAL ASSESSMENT METHODS AND OBJECTS:</b></p> <p data-bbox="537 711 2262 888"><b>Examine:</b> [<i>SELECT FROM:</i> Identification and authentication policy; procedures addressing user identification and authentication; information system design documentation; information system configuration settings and associated documentation; information system audit records; list of information system accounts; other relevant documents or records].</p> <p data-bbox="537 908 2372 1042"><b>Interview:</b> [<i>SELECT FROM:</i> Organizational personnel with information system operations responsibilities; organizational personnel with account management responsibilities; organizational personnel with information security responsibilities; system/network administrators; system developers].</p> <p data-bbox="537 1062 2359 1145"><b>Test:</b> [<i>SELECT FROM:</i> Automated mechanisms supporting and/or implementing multifactor authentication capability].</p>



Requirement	AAL1	AAL2	AAL3
<b>Permitted Authenticator Types</b>	Memorized Secret; Look-Up Secret; Out-of-Band; SF OTP Device; MF OTP Device; SF Crypto Software; SF Crypto Device; MF Crypto Software; MF Crypto Device	MF OTP Device; MF Crypto Software; MF Crypto Device; or Memorized Secret plus: <ul style="list-style-type: none"> <li>Look-Up Secret</li> <li>Out-of-Band</li> <li>SF OTP Device</li> <li>SF Crypto Software</li> <li>SF Crypto Device</li> </ul>	MF Crypto Device; SF Crypto Device plus Memorized Secret; SF OTP Device plus MF Crypto Device or Software; SF OTP Device plus SF Crypto Software plus Memorized Secret
<b>FIPS 140 Verification</b>	Level 1 (Government agency verifiers)	Level 1 (Government agency authenticators and verifiers)	Level 2 overall (MF authenticators) Level 1 overall (verifiers and SF Crypto Devices) Level 3 physical security (all authenticators)
<b>Reauthentication</b>	30 days	12 hours or 30 minutes inactivity; MAY use one authentication factor	12 hours or 15 minutes inactivity; SHALL use both authentication factors
<b>Security Controls</b>	<a href="#">SP 800-53</a> Low Baseline (or equivalent)	<a href="#">SP 800-53</a> Moderate Baseline (or equivalent)	<a href="#">SP 800-53</a> High Baseline (or equivalent)
<b>MitM Resistance</b>	Required	Required	Required
<b>Verifier-Impersonation Resistance</b>	Not required	Not required	Required
<b>Verifier-Compromise Resistance</b>	Not required	Not required	Required
<b>Replay Resistance</b>	Not required	Not required	Required
<b>Authentication Intent</b>	Not required	Recommended	Required
<b>Records Retention Policy</b>	Required	Required	Required
<b>Privacy Controls</b>	Required	Required	Required

# Authenticator Assurance



AAL1 := 1 Factor

AAL2 := 2 Factors

AAL3 := 2 Factors: Hardware-based authenticator and an authenticator that provides verifier impersonation resistance

AAL = Authenticator Assurance Level

# Agenda

- ✓ NIST Risk Management Framework – A quick review...
- ✓ Implementing controls – Host hardening...
  - ✓ Security configuration checklist (w/DISA STIG Viewer)
- ✓ NIST 800-53Ar4 – How Controls are Assessed
- ✓ SCAP - Security Content Automation Protocol
- ✓ FedRAMP System Security Plan's Section 13 – A controls deep dive
  - ✓ Identity and Authentication – controls assessment questions
- **Team Project - SSP drafts...**

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## 8.1. Cloud Service Models

Information systems, particularly those based on cloud architecture models, are made up of different service layers. Below are some questions that help the system owner determine if their system is a cloud followed by specific questions to help the system owner determine the type of cloud.

Question (Yes/No)	Conclusion
Does the system use virtual machines?	A no response means that system is most likely not a cloud.
Does the system have the ability to expand its capacity to meet customer demand?	A no response means that the system is most likely not a cloud.
Does the system allow the consumer to build anything other than servers?	A no response means that the system is an IaaS. A yes response means that the system is either a PaaS or a SaaS.
Does the system offer the ability to create databases?	A yes response means that the system is a PaaS.
Does the system offer various developer toolkits and APIs?	A yes response means that the system is a PaaS.
Does the system offer only applications that are available by obtaining a login?	A yes response means that system is a SaaS. A no response means that the system is either a PaaS or an IaaS.

The layers of the Enter Information System Abbreviation defined in this SSP are indicated in Table 8-1. Service Layers Represented in this SSP that follows.

*Table 8-1. Service Layers Represented in this SSP*

Service Provider Architecture Layers		
<input type="checkbox"/>	Software as a Service (SaaS)	Major Application
<input type="checkbox"/>	Platform as a Service (PaaS)	Major Application
<input type="checkbox"/>	Infrastructure as a Service (IaaS)	General Support System
<input type="checkbox"/>	Other	Explain: <a href="#">Click here to enter text.</a>

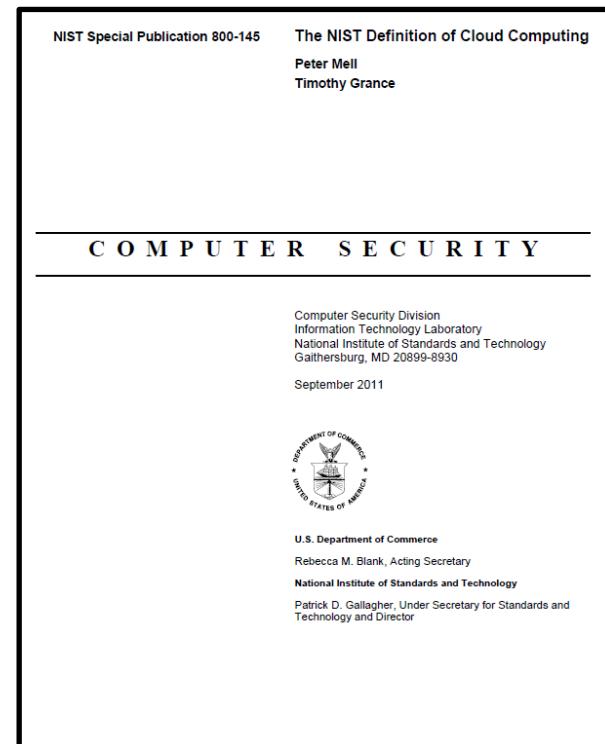
Note: Refer to NIST SP 800-145 for information on cloud computing architecture models.

## 8.2. Cloud Deployment Models

Information systems are made up of different deployment models. The deployment models of the Enter Information System Abbreviation that are defined in this SSP and are not leveraged by any other FedRAMP Authorizations, are indicated in Table 8-2. Cloud Deployment Model Represented in this SSP that follows.

*Table 8-2. Cloud Deployment Model Represented in this SSP*

Service Provider Cloud Deployment Model		
<input type="checkbox"/>	Public	Cloud services and infrastructure supporting multiple organizations and agency clients
<input type="checkbox"/>	Private	Cloud services and infrastructure dedicated to a specific organization/agency and no other clients
<input type="checkbox"/>	Government Only Community	Cloud services and infrastructure shared by several organizations/agencies with same policy and compliance considerations
<input type="checkbox"/>	Hybrid	Explain: (e.g., cloud services and infrastructure that provides private cloud for secured applications and data where required and public cloud for other applications and data) <a href="#">Click here to enter text.</a>



# Essential Characteristics of Cloud Computing

## 1. **On-demand self-service**

A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service provider

## 2. **Broad network access**

Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, tablets, laptops, and workstations)

## 3. **Resource pooling**

The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or datacenter). Examples of resources include storage, processing, memory, and network bandwidth

## 4. **Rapid elasticity**

Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly outward and inward commensurate with demand. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time

## 5. **Measured service**

Cloud systems automatically control and optimize resource use by leveraging a metering capability (typically done on pay-per-use or charge-per-use basis) at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service



# Cloud Service Models

## **Infrastructure as a Service (IaaS)**

- The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications
- The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications; and possibly limited control of select networking components (e.g., host firewalls)

## **Platform as a Service (PaaS)**

- The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider
- The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment

## **Software as a Service (SaaS)**

- The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface
- The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited userspecific application configuration settings

## 8.1. Cloud Service Models

Information systems, particularly those based on cloud architecture models, are made up of different service layers. Below are some questions that help the system owner determine if their system is a cloud followed by specific questions to help the system owner determine the type of cloud.

Question (Yes/No)	Conclusion
Does the system use virtual machines?	A no response means that system is most likely not a cloud.
Does the system have the ability to expand its capacity to meet customer demand?	A no response means that the system is most likely not a cloud.
Does the system allow the consumer to build anything other than servers?	A no response means that the system is an IaaS. A yes response means that the system is either a PaaS or a SaaS.
Does the system offer the ability to create databases?	A yes response means that the system is a PaaS.
Does the system offer various developer toolkits and APIs?	A yes response means that the system is a PaaS.
Does the system offer only applications that are available by obtaining a login?	A yes response means that system is a SaaS. A no response means that the system is either a PaaS or an IaaS.

The layers of the Enter Information System Abbreviation defined in this SSP are indicated in Table 8-1. Service Layers Represented in this SSP that follows.

*Table 8-1. Service Layers Represented in this SSP*

Service Provider Architecture Layers		
<input type="checkbox"/>	Software as a Service (SaaS)	Major Application
<input type="checkbox"/>	Platform as a Service (PaaS)	Major Application
<input type="checkbox"/>	Infrastructure as a Service (IaaS)	General Support System
<input type="checkbox"/>	Other	Explain: <a href="#">Click here to enter text.</a>

Note: Refer to NIST SP 800-145 for information on cloud computing architecture models.

# Cloud Deployment Models

## Private cloud

- The cloud infrastructure is provisioned for exclusive use by a single organization comprising multiple consumers (e.g., business units)
- It may be owned, managed, and operated by the organization, a third party, or some combination of them, and it may exist on or off premises

## Community cloud

- The cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns (e.g., mission, security requirements, policy, and compliance considerations)
- It may be owned, managed, and operated by one or more of the organizations in the community, a third party, or some combination of them, and it may exist on or off premises

## Public cloud

- The cloud infrastructure is provisioned for open use by the general public
- It may be owned, managed, and operated by a business, academic, or government organization, or some combination of them. It exists on the premises of the cloud provider

## Hybrid cloud

The cloud infrastructure is a composition of two or more distinct cloud infrastructures (private, community, or public) that remain unique entities, but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing between clouds)

## 8.2. Cloud Deployment Models

Information systems are made up of different deployment models. The deployment models of the Enter Information System Abbreviation that are defined in this SSP and are not leveraged by any other FedRAMP Authorizations, are indicated in Table 8-2. Cloud Deployment Model Represented in this SSP that follows.

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<input type="checkbox"/>	Hybrid	Explain: (e.g., cloud services and infrastructure that provides private cloud for secured applications and data where required and public cloud for other applications and data) <a href="#">Click here to enter text.</a>

# Agenda

- ✓ NIST Risk Management Framework – A quick review...
- ✓ Implementing controls – Host hardening...
  - ✓ Security configuration checklist (w/DISA STIG Viewer)
- ✓ NIST 800-53Ar4 – How Controls are Assessed
- ✓ SCAP - Security Content Automation Protocol
- ✓ FedRAMP System Security Plan's Section 13 – A controls deep dive
  - ✓ Identity and Authentication – controls assessment questions
- ✓ System Security Plan's Section 8
  - ✓ Information System Type
- Team Project - SSP drafts...

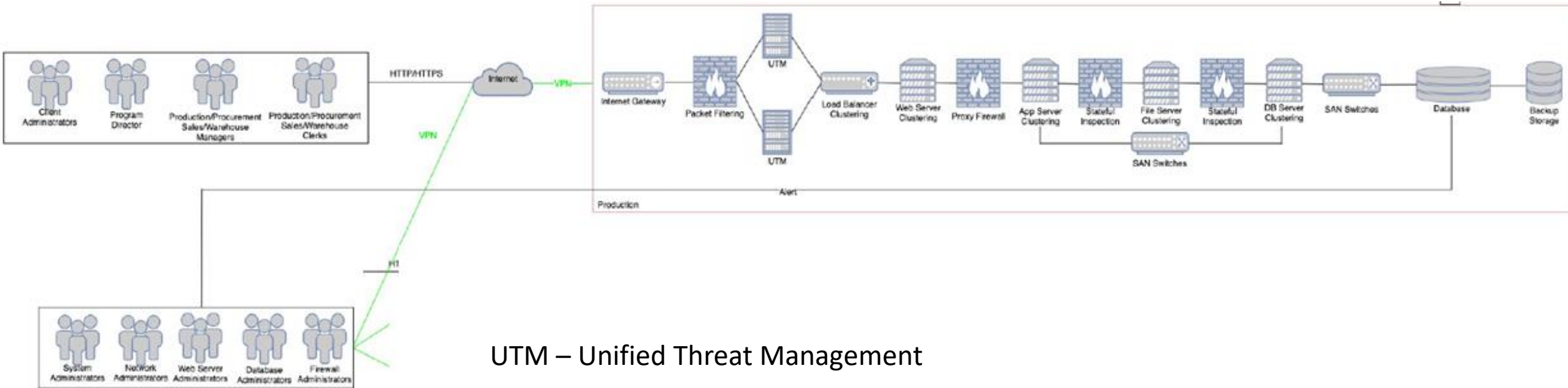


# Next Time We Meet 3/31 – Logical diagrams

Unit #	Team Project Schedule	Due
8	1 <sup>st</sup> Draft System Security Plan (SSP)	3/10
10	2 <sup>nd</sup> Draft SSP	3/31
11	3 <sup>rd</sup> Draft SSP	4/7
12	Presentation of Final Deliverables	4/14
13	Presentation of Final Deliverables	4/21

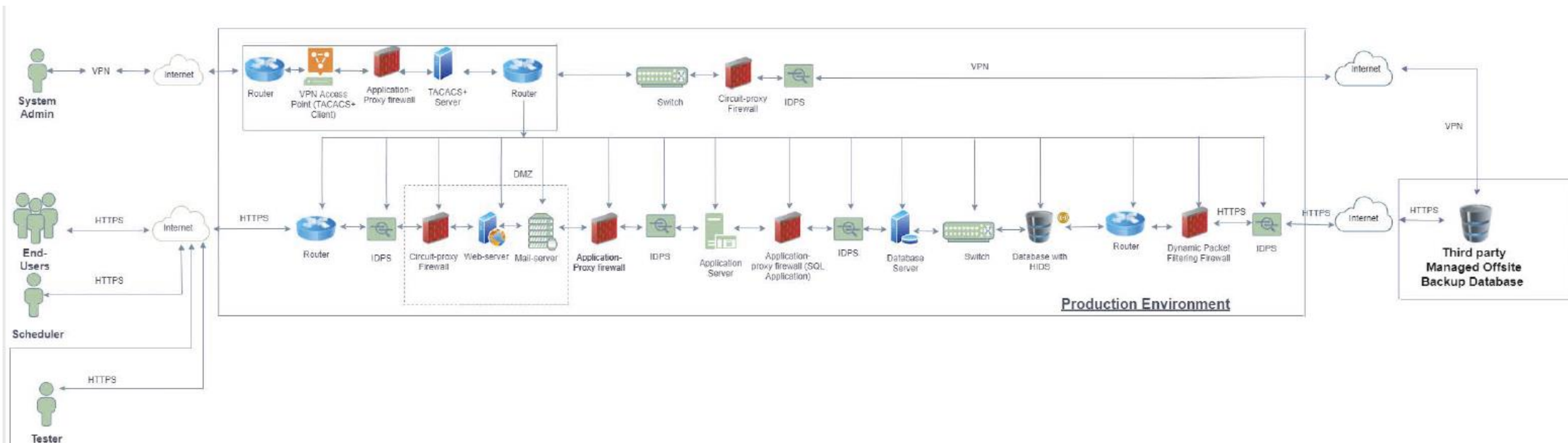
- Network diagram depicting locations and relationships among:
  - Servers
  - Security components
  - Internet
  - Users
  - Interconnected systems
- Boundary diagram - network diagram that also depicting boundaries and flow of data across interconnections that cross internal and external boundaries:
  - Security zones
  - Internal Interconnections to external systems
- Data flow (simplified) – a series of individual boundary diagrams that also depict data flowing to/from individual classes of users that enable seeing how their data packets are secured as they flow across the boundaries and through the logical network
  - End users
  - System administrators
  - Testers
  - Developers

# What can be improved in this architecture?



UTM – Unified Threat Management

# What can be improved in this architecture?



# Agenda

- ✓ NIST Risk Management Framework – A quick review...
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