

RED HAT
SUMMIT

BOSTON, MA
JUNE 23-26, 2015

SECURITY COMPLIANCE MADE EASY(ER): ENTERING THE SCAP RENAISSANCE

MOTIVATION

RHEL5 STIG (U.S. Military Baseline)

- 587 compliance items
- Many are manual

Avg Time to Configure & Verify Setting	# controls	Total Time <i>per RHEL instance</i>
1 minute	* 587	9.7 hours
3 minutes	* 587	29.4 hours
5 minutes	* 587	48.9 hours

branch: master

ansible-scap / provision.yml



openprivacy 14 days ago comments cleaned up

1 contributor

15 lines (12 sloc) | 0.303 kB

[Raw](#)[Blame](#)[History](#)

```
1  ---
2
3  - name: All machines get OpenSCAP scanner installed
4    hosts: all
5    sudo: true
6    roles:
7      - openscap
8    #    - harden -- Commented out for demo purposes only
9
10   - name: Install SCAP Security Content (SSG) and GovReady on 'dashboard'
11     hosts: dashboard
12     roles:
13       - scap-security-guide
14       - govready
```

... or a single LOC in kickstart

```
$ oscap xccdf eval \
--profile rht-ccp \
--remediate \
--report /root/scan-report.html \
/usr/share/xml/scap/content.xml
```

Compliance and Scoring

The target system did not satisfy conditions of 13 rules! Please review rule results and consider applying remediation.

Rule result breakdown



Failed rules by severity breakdown



Score

Scoring system	Score	Maximum	%
urn:xccdf:scoring:default	93.626541	100.000000	93.63%

OUR (*very ambitious*) AGENDA

1. What's the latest in the Security Automation space?
 - a. Government & Commercial Initiatives
 - b. Formal and Emerging SCAP Standards
2. What tools and content are available today?
 - a. For enumerating (known) software vulnerabilities
 - b. For assessing configuration
3. Use Case Story: Lockheed Martin
and the Centralized Super Computing Facility

LIVE DEMOS

1. Install & Review SCAP profiles in RHEL 7
2. Performing a Compliance Scan
3. System Remediation
4. Creating Custom (derived) Configuration Baselines with SCAP Workbench
5. RHEL 7 “Easy Button” Installations

SPEAKERS

Shawn Wells

Director, Innovation Programs

Developer, OpenSCAP Content

Red Hat



SPEAKERS

Jeff Blank
Technical Director,
OS and Applications Division
Information Assurance Directorate
National Security Agency



SPEAKERS

Sarah Storms
Josh Koontz
Engineering,
Lockheed Martin



COMPLIANCE BIG PICTURE: PRODUCTS AND SYSTEMS

SYSTEM VIEW

System Controls

Compliance Checklist

Report / Results

PRODUCT VIEW

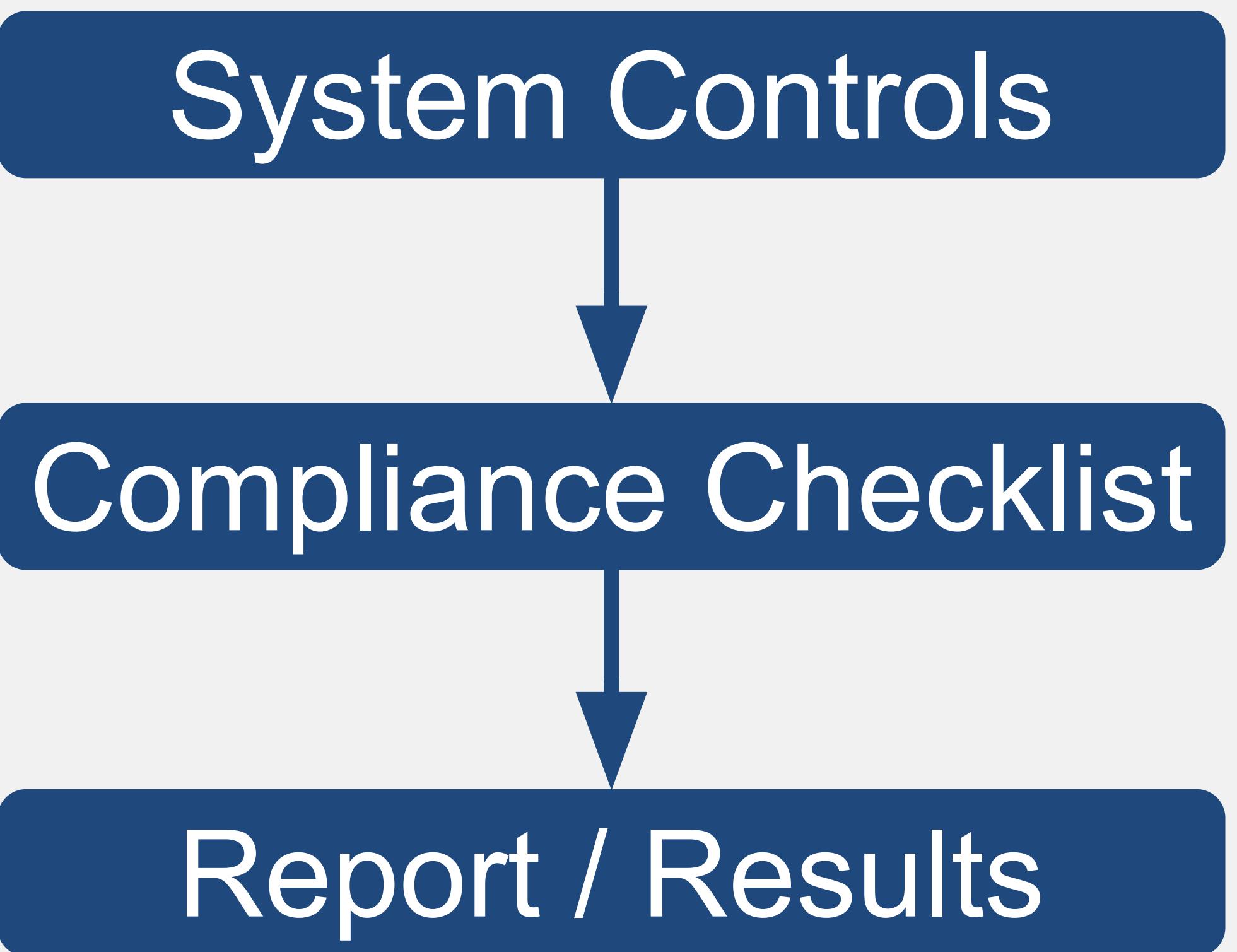
Product Mandates

Product Evaluations

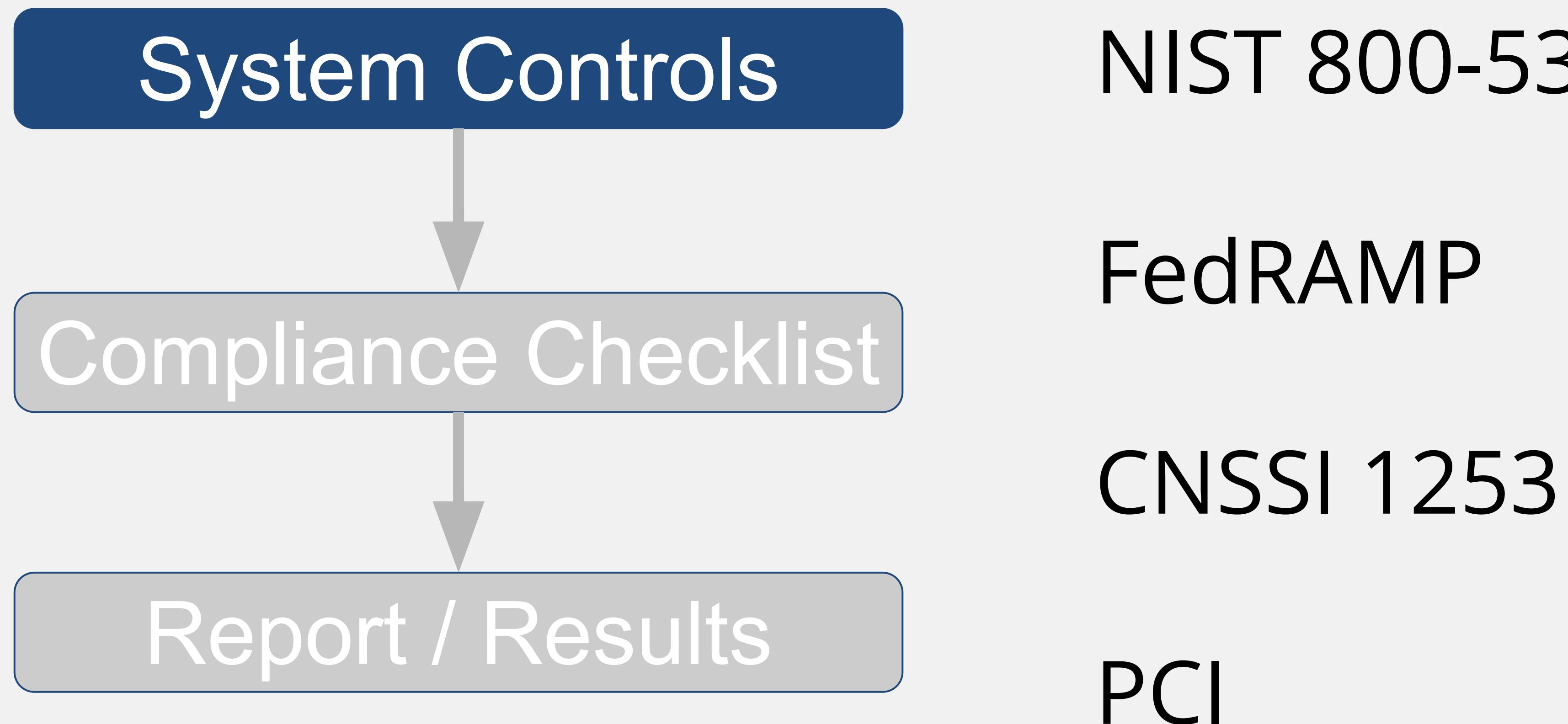
Certificates

ACCREDITATION

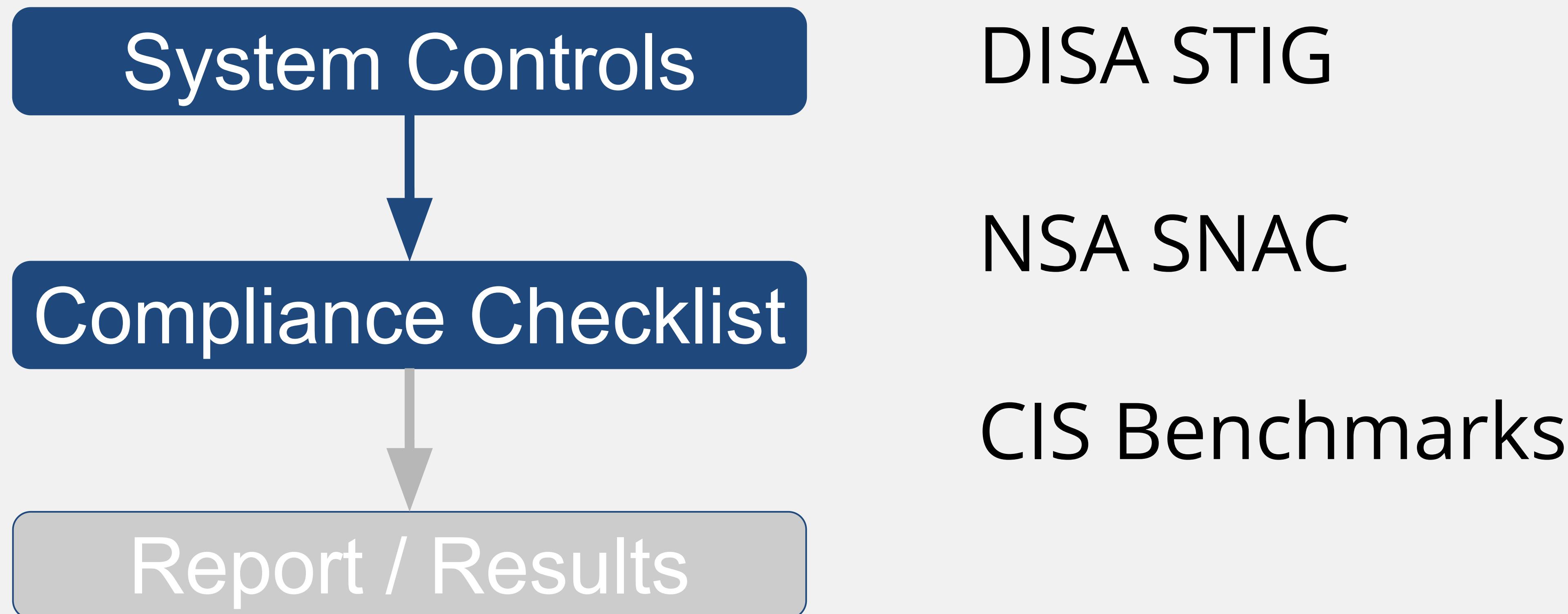
SYSTEM VIEW OF ACCREDITATION



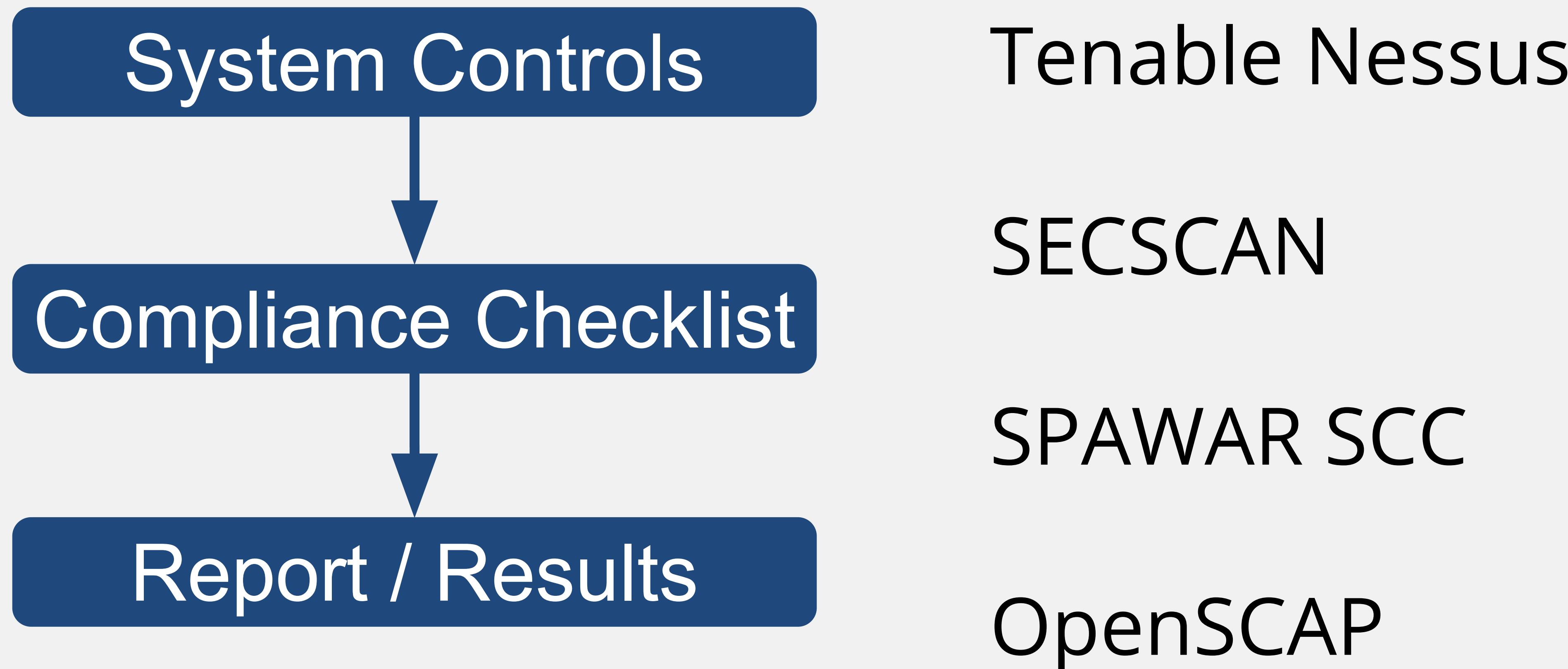
SYSTEM VIEW OF ACCREDITATION



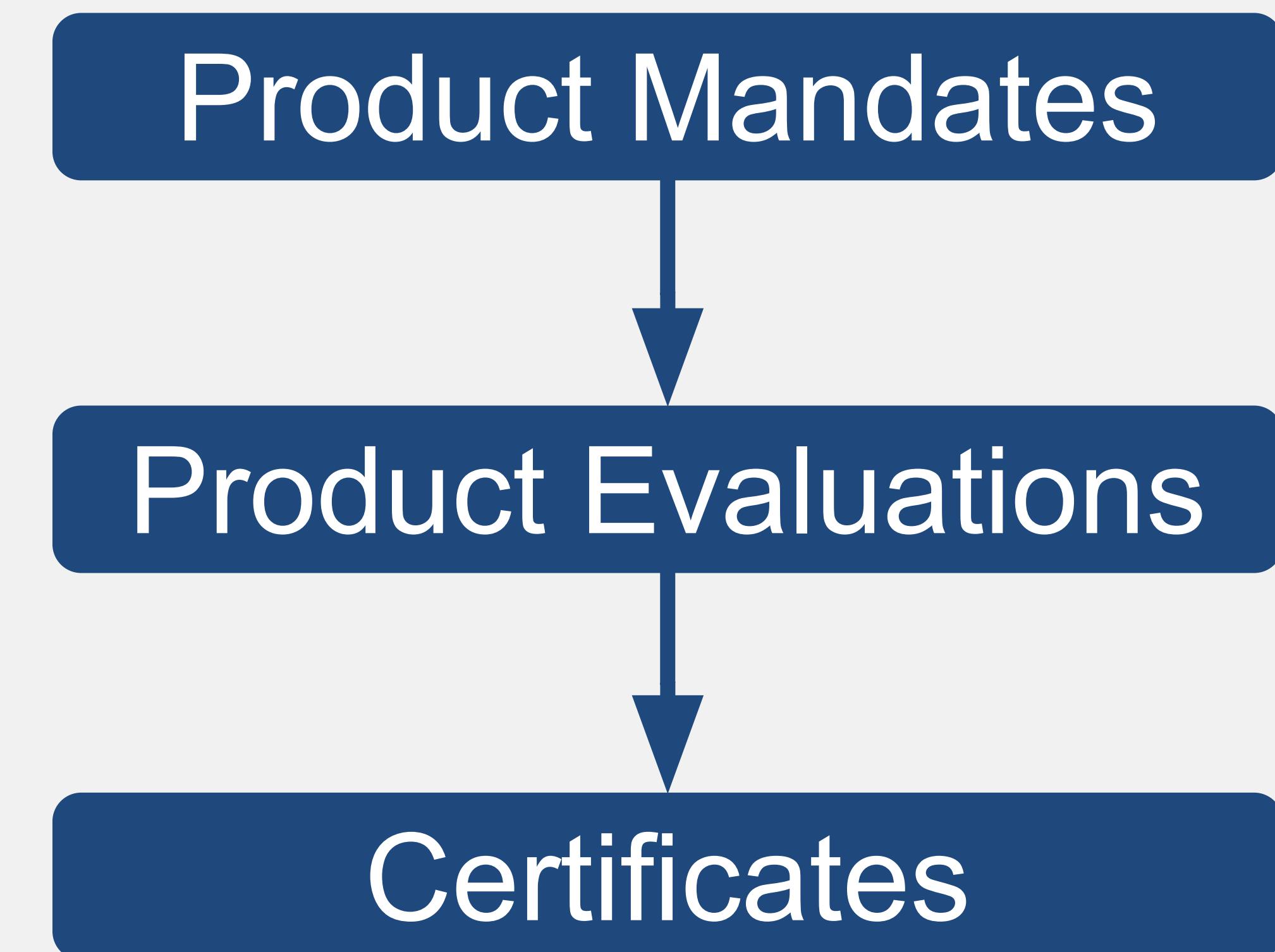
SYSTEM VIEW OF ACCREDITATION



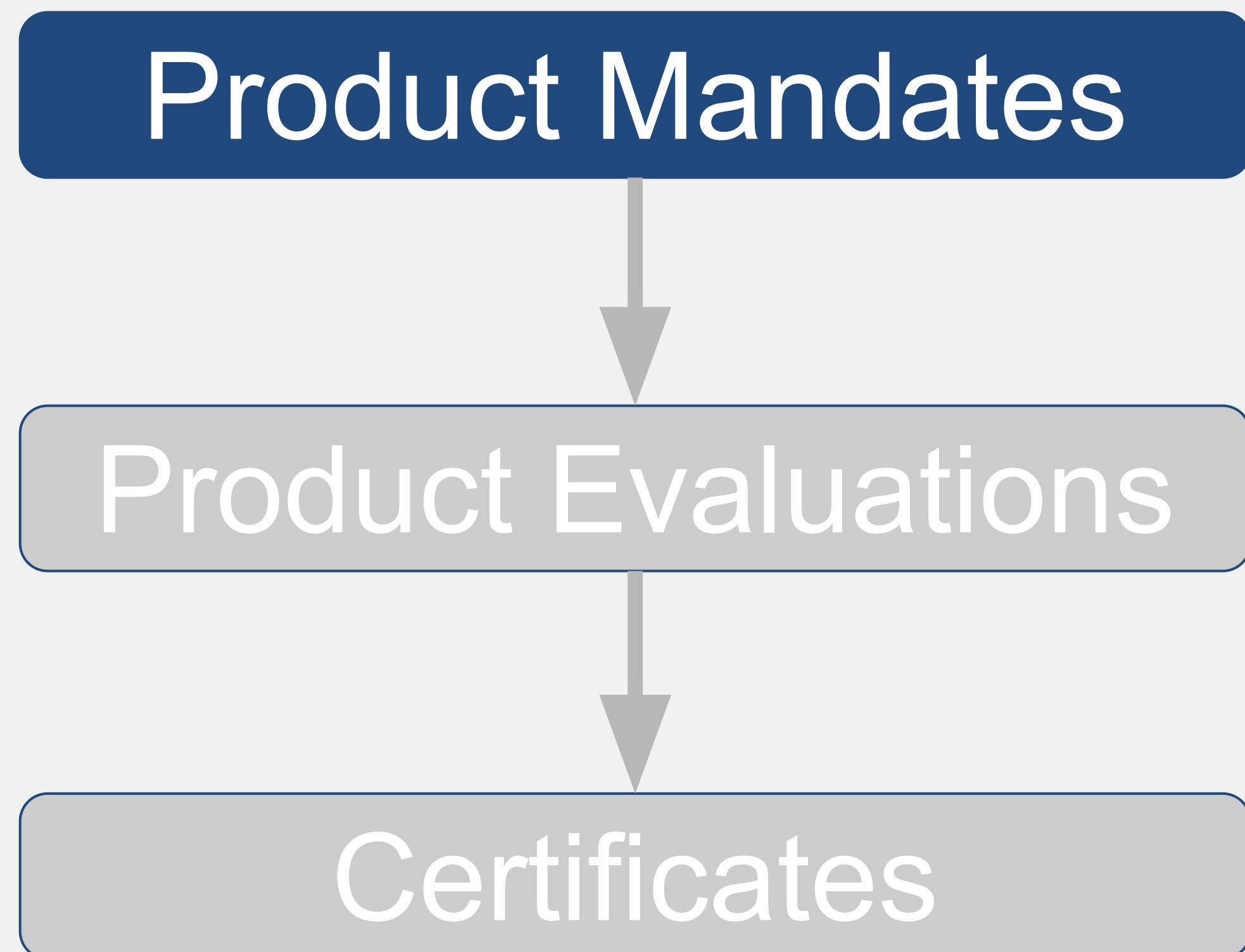
SYSTEM VIEW OF ACCREDITATION



PRODUCT VIEW OF ACCREDITATION



PRODUCT VIEW OF ACCREDITATION



Common Criteria

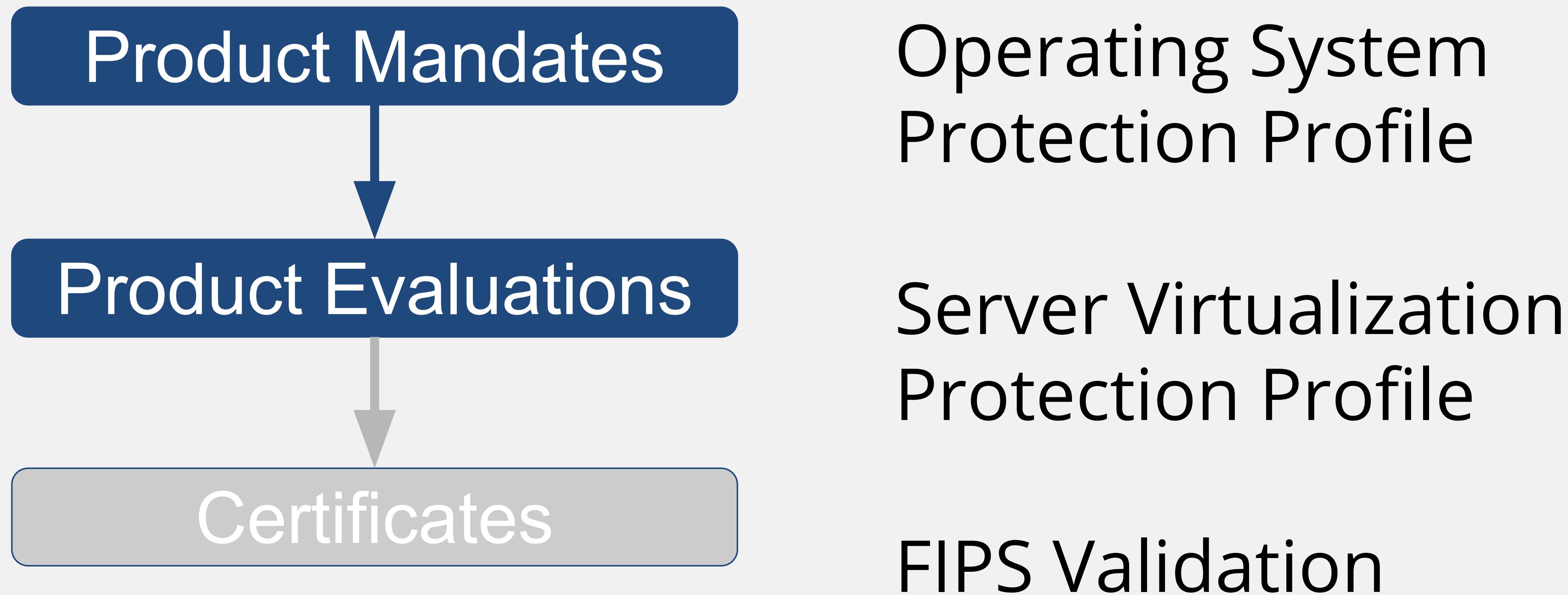
FIPS 140-2

.... wait... what's COMMON CRITERIA?

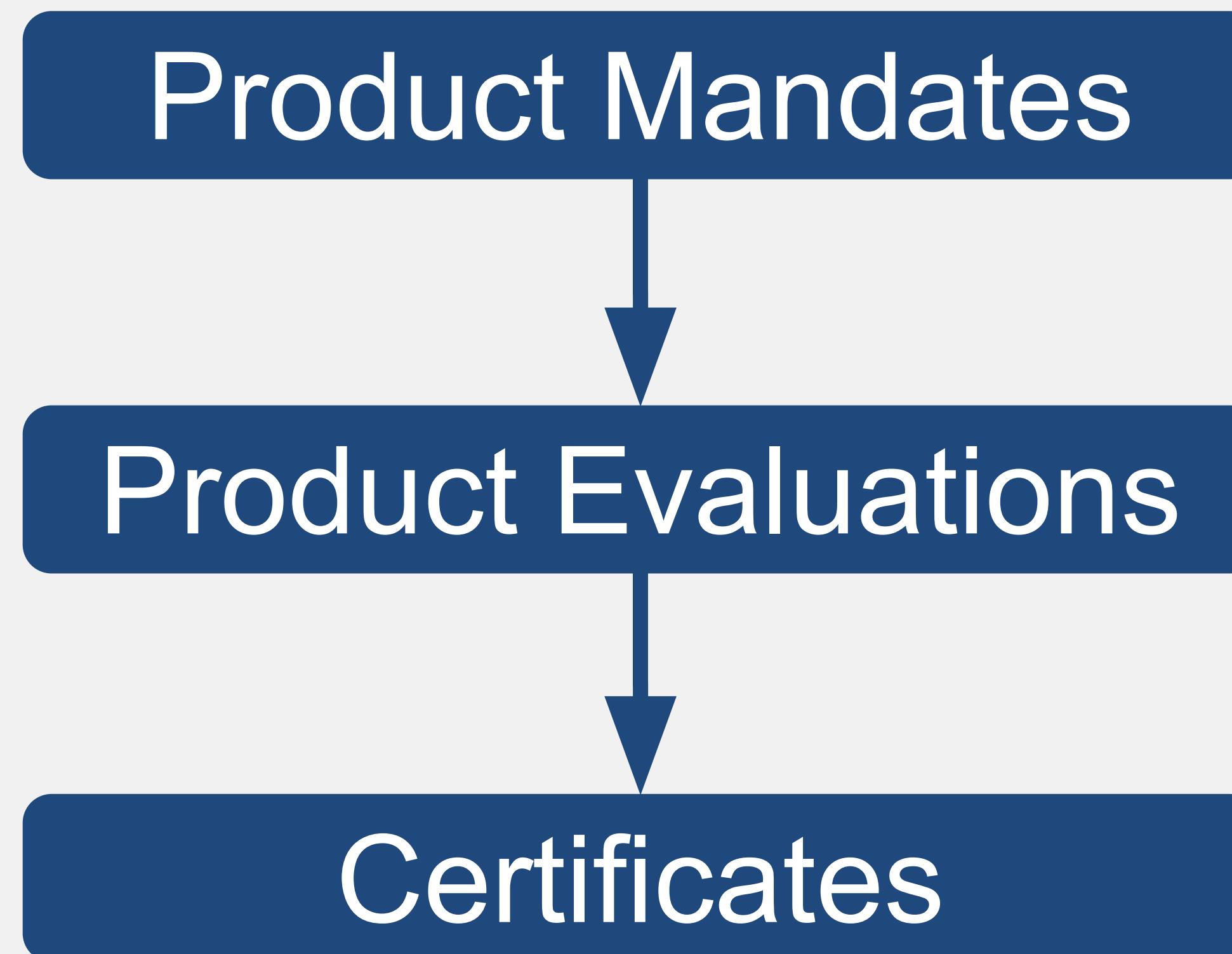
- international framework for specifying and testing security functional and assurance requirements in IT products
- through the use of Protection Profiles (PPs)
- vendors can then implement and/or make claims about the security attributes of their products, and testing laboratories can evaluate the products to determine if they actually meet the claims.



PRODUCT VIEW OF ACCREDITATION



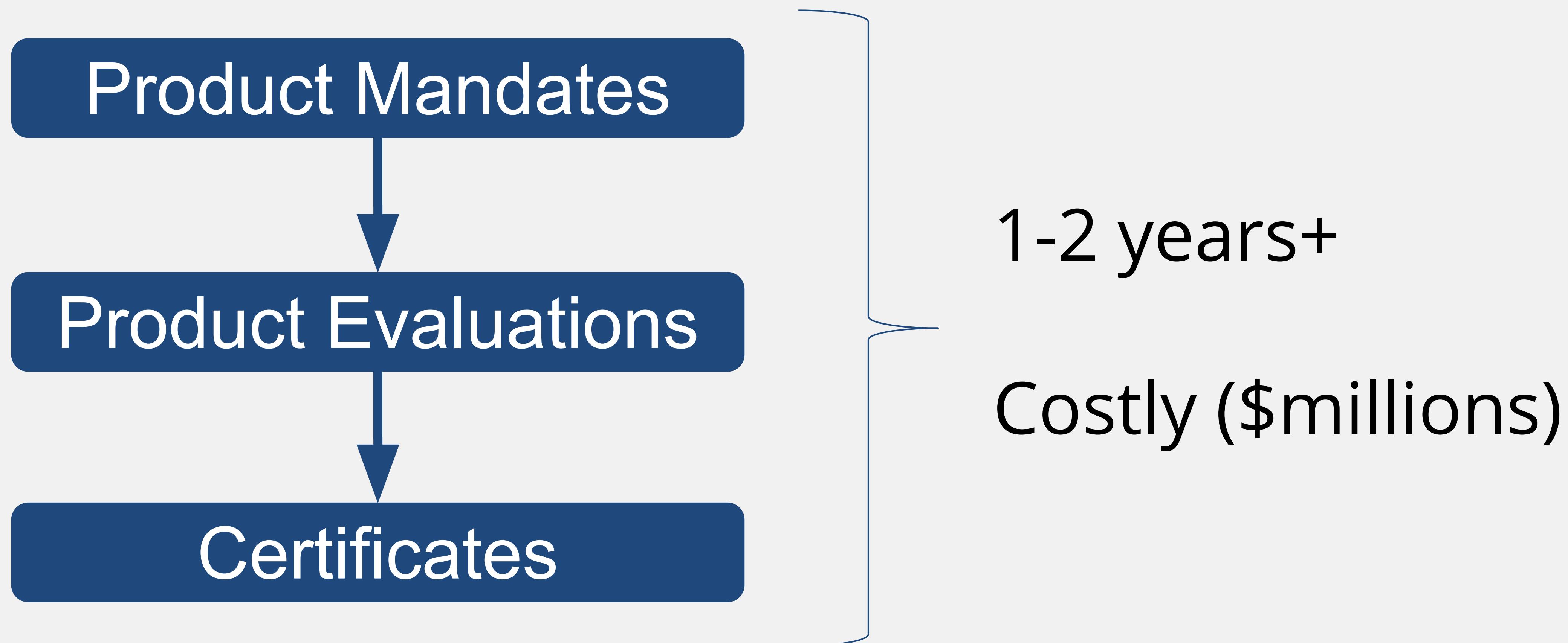
PRODUCT VIEW OF ACCREDITATION



NIAP Product Compliant
List

FIPS Crypto Module
Validation List

PRODUCT VIEW OF ACCREDITATION





SYSTEM VIEW

System Controls

Compliance Checklist

Report / Results

PRODUCT VIEW

Product Mandates

Product Evaluations

Certificates

ACCREDITATION

OPEN SOURCE CONFRONTS THE C&A CHALLENGE: PRODUCT CERTIFICATION

COMMON CRITERIA - REVAMPED

- Requirements specified in *Protection Profiles*
 - see <https://www.niap-ccevs.org>
 - development on <https://github.com/commoncriteriad>
 - revamped OS Protection Profile due this July
- Dramatically reduced evaluation time and cost
 - 90 days possible, 180 max
 - compliance checklist produced during evaluation (SCAP)
 - list of system controls provided for evaluated products

COMMON CRITERIA - REVAMPED

- DISA STIG creation through ~25 selectable “management functions”
- DoD specific values expressed in *DoD Annexes to Protection Profiles* (succeeding SRGs)
- Remember...
 - RHEL5 STIG: 587 rules
 - RHEL6 STIG: ~255
 - RHEL.future STIG: est. < 100

Management Function

configure minimum password length

configure minimum number of special characters in password

configure minimum number of numeric characters in password

configure minimum number of uppercase characters in password

configure minimum number of lowercase characters in password

enable/disable screen lock

configure screen lock inactivity timeout

configure remote connection inactivity timeout

OPEN SOURCE CONFRONTS THE C&A CHALLENGE: SYSTEM COMPLIANCE



OpenSCAP

Community created portfolio of tools and content
to assess systems for known vulnerabilities.

<https://github.com/OpenSCAP>

2008

First commit to OpenSCAP,
execution capability for SCAP on Linux

```
commit 768d2d13c7b95736738ce2a48db7f2e528c161fe
Author: Peter Vrabec <pvrabec@wrabco.englab.brq.redhat.com>
Date: Mon Nov 3 17:58:30 2008 +0100
```

Initial commit

2011

First commit to SCAP Security Guide,
hardening guidance + policy references
Colloquially, “SCAP Content”

```
commit 540a78f26191a69651a167d256b5af47fd3eb983
Author: Jeff Blank <blank@eclipse.ncsc.mil>
Date: Wed Jun 8 18:45:05 2011 -0400
```

added a README



SCAP
SECURITY GUIDE



WORKBENCH



Foreman
OpenSCAP



Ruby Gem
OpenSCAP



Puppet
OpenSCAP



SCAPtimony



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



GO✓READY



**WE DON'T ALWAYS
TEST OUR CODE**



**BUT WHEN WE DO,
IT'S LIVE AT SUMMIT**

DEMO #1: INSTALL, REVIEW PROFILES

Install OpenSCAP and SCAP Content

```
$ sudo yum install openscap-scanner scap-security-guide
```

What default profiles exist?

```
$ oscap info /usr/share/xml/scap/ssg/content/ssg-rhel7-xccdf.xml
```

....

Profiles:

pci-dss

rht-ccp

common

stig-rhel7-server-upstream

....

DEMO #2: REVIEW HARDENING GUIDES

Review manpage

```
$ man scap-security-guide
```

Review HTML guides

```
$ ls -l /usr/share/doc/scap-security-guide/rhel7-guide.html
```

DEMO #3: LOCAL SCAN, REVIEW RESULTS

Perform 1st Scan

```
$ sudo oscap xccdf eval --profile rht-ccp \  
--results /root/summit-results.html \  
--report /root/summit-report.xml \  
/usr/share/xml/scap/ssg/content/ssg-rhel7-xccdf.xml
```

Review Results

```
$ ${web_browser} /root/summit-results.html
```

DEMO #4: REMEDIATION

Generate remediation scripts from results

```
$ sudo oscap xccdf generate fix \  
--result-id xccdf_org.open-scap_testresult_rht-ccp \  
/root/summit-results.xml
```

Or, remediate automatically (*be careful - no “undo”!*)

```
$ sudo oscap xccdf eval --profile rht-ccp \  
--results /root/summit-results.xml \  
--report /root/summit-report.xml \  
--remediate \  
/usr/share/xml/scap/ssg/content/ssg-rhel7-xccdf.xml
```

DEMO #5: SCAP WORKBENCH

Download SCAP Workbench

```
$ sudo yum -y install scap-workbench
```

Much of this demo is live. For extra details, <https://open-scap.org>

DEMO #6: “Easy Button Installs”

Live Demo

- RHEL 7.2 Anaconda Plugin
- Sample kickstarts @

<https://github.com/OpenSCAP/scap-security-guide/tree/master/RHEL/6/kickstart/>

The screenshot shows the OpenSCAP interface with a blue header bar. In the top left, there are buttons for "Change content" and "Apply security policy" (which is set to "ON"). Below these is a dropdown menu labeled "Data stream: scap_org.open-scap_datastream_from_xccdf(ssg-rhel7-xccdf-1.2.xml)". On the far right of the header is a "Checklist:" button. The main content area has a heading "Choose profile below:". It lists several profiles:

- Default**: The default profile.
- PCI-DSS v3 Control Baseline for Red Hat Enterprise Linux 7**: This is a *draft* profile for PCI-DSS v3.
- Red Hat Corporate Profile for Certified Cloud Providers (RH CCP)**: This is a *draft* SCAP profile for Red Hat Certified Cloud Providers.
- Common Profile for General-Purpose Systems**: This profile contains items common to general-purpose desktop and server installations.
- Centralized Super Computing Facility**: Baseline for Cross Domain systems for U.S. Intelligence Community.

A large blue button at the bottom right of the content area is labeled "Select profile".

OpenSCAP IN ACTION

Lockheed's Use Case



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WHAT WE DO

The Centralized Super Computer Facility (CSCF) is an ICD 503 certified, cross-domain computing facility for U.S. Intelligence processing research and development.

ALGORITHM
PROESSING

MULTI-TENANT
DATA STORAGE

CROSS DOMAIN
DATA FUSION

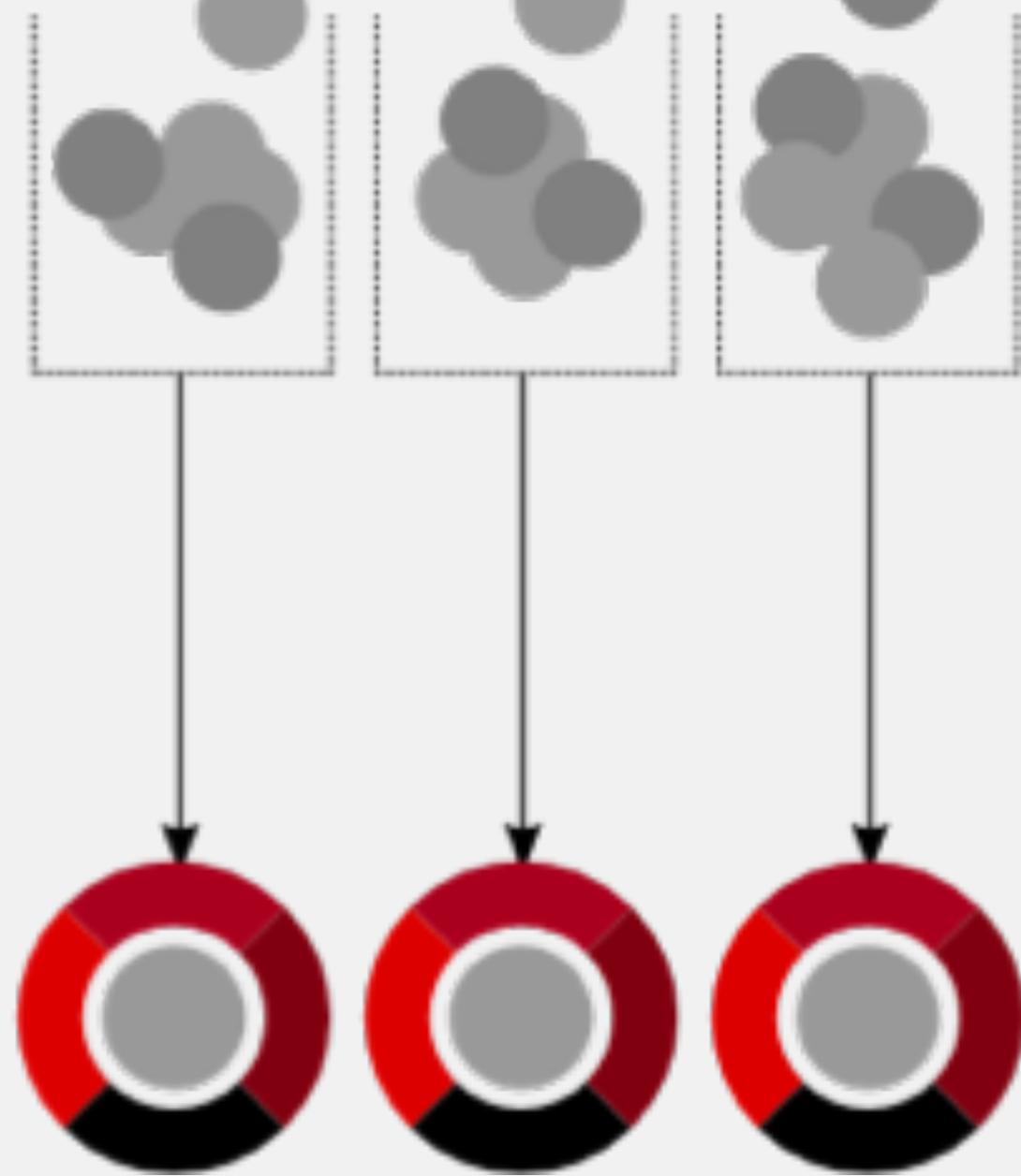
VIRTUALIZATION

CSCF BACKSTORY

- The CSCF program leverages MLS OS configurations for the last 20 years
 - Minimize hardware, licensing, OS configuration, manpower costs
 - Maximize flexibility, data fusion, system utilization
- MLS requires a full ecosystem to be truly useful
 - Certified products
 - OS configuration
 - Resource management
 - Direct and Network attached storage
 - Including long haul data sharing
 - System Monitoring including audit reduction
 - Databases

CONSUMER TO COLLABORATOR

100,000+
PROJECTS



PARTICIPATE
(upstream projects)



INTEGRATE
(community platforms)



STABILIZE
(supported products,
platforms, solutions)

CSCF participates in community-powered upstream projects, such as OpenSCAP and SELinux.

CSCF collaborates with Red Hat to integrate upstream projects into open, enterprise platforms.

<https://github.com/CSCF>

Lockheed commercializes these platforms, together with an ISV ecosystem, and pushes security accreditations.

MLS ECOSYSTEM

ECOSYSTEM PARTNERS

- LMC/CSCF
- Red Hat
- Altair
- Seagate
- Mellanox
- ViON
- Bay Microsystems
- SGI
- Cray
- Splunk
- Crunchy Data
- UNLV/NSCEE

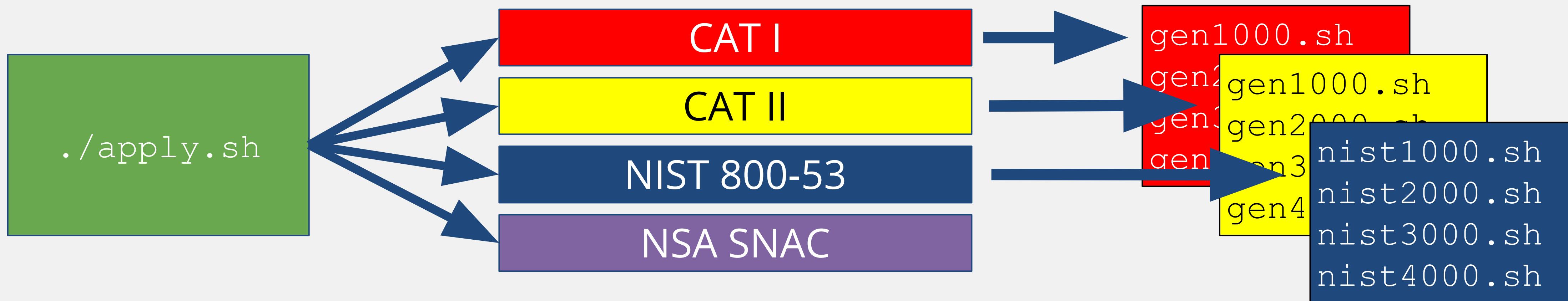


MLS Ecosystem Objective - Provide MLS capable versions of software capabilities integrated with the RHEL MLS configuration to solve complex system configuration and support problems

HARDENING: OLD METHOD

The hardening shell script served several purposes in hardening the system:

- Distributes “baseline” system configurations and policies for authentication, auditing, accounts, services;
- Modular code in folders and separate script allowed for adoption to meet changing system and security needs



C&A TESTING: OLD METHOD

Technical control testing is a subset of overall system controls

- SECSCN - Legacy system security scanner useful for DCID 6/3 testing. Isn't flexible enough to test most of ICD503 technical controls
- Bash script to manually test each control - System testers required a bash script to manually test each system control not checked by SECSCN
- Interactive tests - Tests that couldn't be automatically checked in a bash script or special test cases

Initially took **12+ months** from paperwork submittal until initial approval

HARDENING: NEAR FUTURE METHOD

Use OSCAP Anaconda Addon to specify CSCF-MLS profile during system build. Then apply custom configurations

- CSCF's SCAP profile distributes hardened system configurations and policies for authentication, auditing, accounts, services
- Apply custom configurations separately from security relevant changes

C&A: CURRENT & FUTURE METHOD

Current (**90 days** from submittal to approval) :

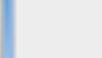
- SECSCN: still in use for familiarity
- NESSUS: vulnerability scan
- OpenSCAP: Configuration Compliance checklist
- Small set of interactive checks

Future (Targeting <30 days from submittal to approval):

- Drop SECSCN and NESSUS
- Fully utilize Anaconda-SCAP to provision directly into secure configuration

....DRAMATICALLY SIMPLIFIED

[Change content](#)

Apply security policy: **ON** 

Data stream: [scap_org.open-scap_datastream_from_xccdf_ssg-rhel7-xccdf-1.2.xml](#) 

Checklist:

Choose profile below:

Default

The default profile

PCI-DSS v3 Control Baseline for Red Hat Enterprise Linux 7

This is a *draft* profile for PCI-DSS v3

Red Hat Corporate Profile for Certified Cloud Providers (RH CCP)

This is a *draft* SCAP profile for Red Hat Certified Cloud Providers

Common Profile for General-Purpose Systems

This profile contains items common to general-purpose desktop and server installations.

Centralized Super Computing Facility

Baseline for Cross Domain systems for U.S. Intelligence Community

[Select profile](#)

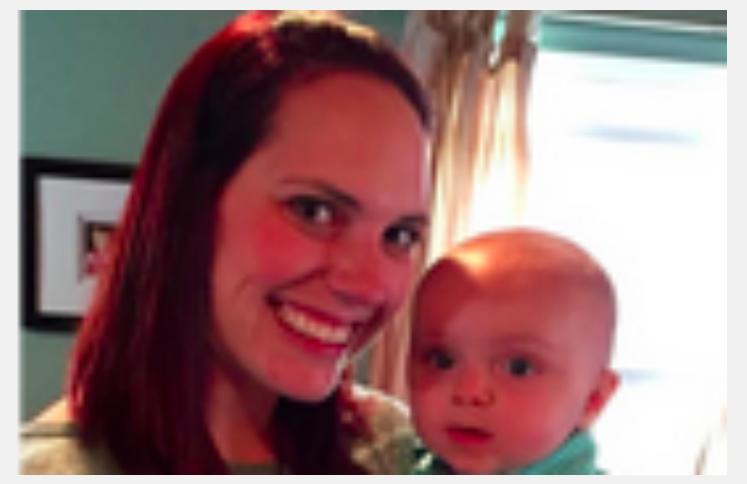
CONTACT INFO



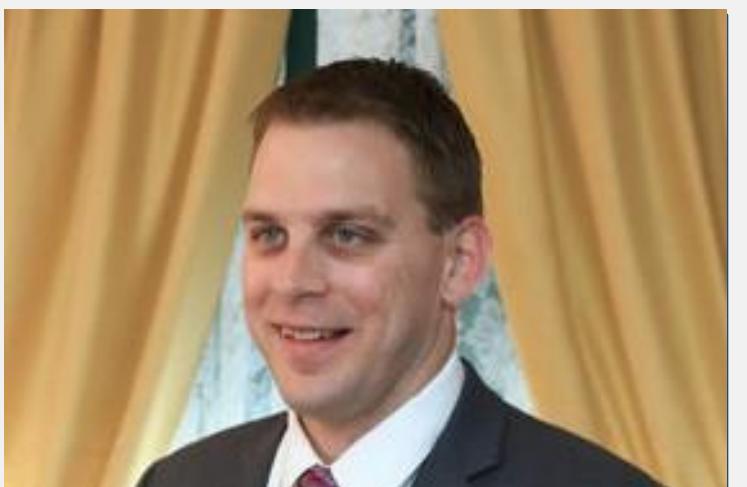
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