

WELCOME TO THE MARCH 1, 2023

ISOAG MEETING



AGENDA	
Welcome/Opening Remarks	Tina Gaines/ VITA
Introduction to New Governance Director	Trey Stevens/VITA
Preparing for Post Quantum Cryptography	Andrew Sheedy & Dan McGinnis/Entrust
Knowbe4 Update	Tina Gaines/VITA
Knowbe4 Training Overview	Ruxandra Teodorescu/VDACS
Datapoints Review & Checklist	Erica Bland, Tina Gaines & Renea Dickerson/VITA
Upcoming Events Adjourn	Tina Gaines/VITA

PREPARING FOR POSTQUANTUM CRYPTOGRAPHY

Presenter: Andrew Sheedy

February 2023



AGENDA

- Introductions
- ▶ Entrust Company Profile
- ▶ Post Quantum Readiness
 - Post Quantum Landscape
 - Crypto Agility
 - Cryptographic Center of Excellence
 - Recommended Best Practices
- Questions







PEOPLE, PROCESS, TECHNOLOGY

Digital
transformation
accelerated by
efficiently securing
identity, transactions
and data



STRONG IDENTITIES

Verification, control
and fraud prevention
at low friction for
people and machines



SECURE PAYMENTS

Digitally onboard, issue and manage both physical and digital payment vehicles



TRUSTED INFRASTRUCTURE

Assured, agile and
Post Quantum ready
infrastructure across
enterprise and cloud



PEOPLE, PROCESS, TECHNOLOGY

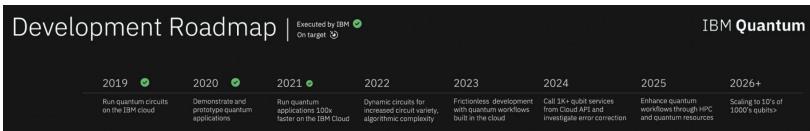




PQ PREPAREDNESS



SCALED QUANTUM COMPUTERS ARE ON THE HORIZON



Engineering

scale up

Error-corrected

quantum computer

Google Al Quantum hardware roadmap Physics derisked 2029 Year 54 10² 10³ 10⁴ 10⁵ 10⁶ Physical qubits

Tileable module

(Logical gate)

1 logical qubit

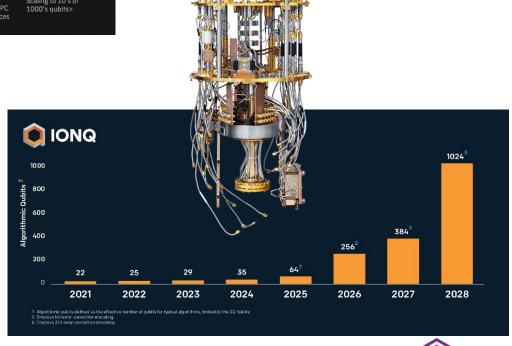
Beyond

classical

Logical qubit

prototype

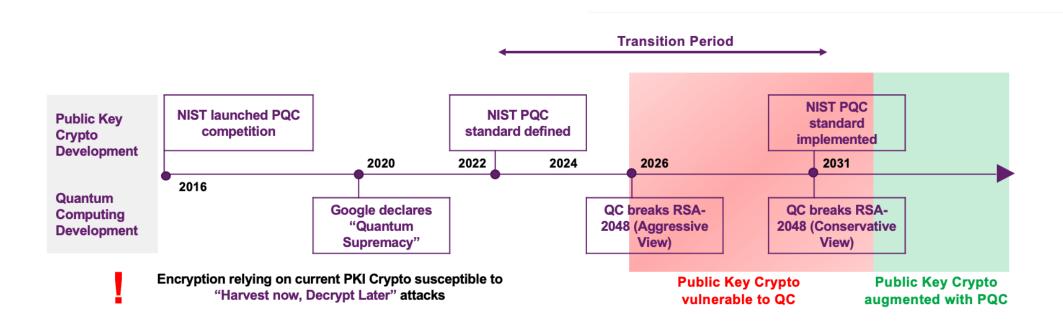
Rigetti Aspen-11





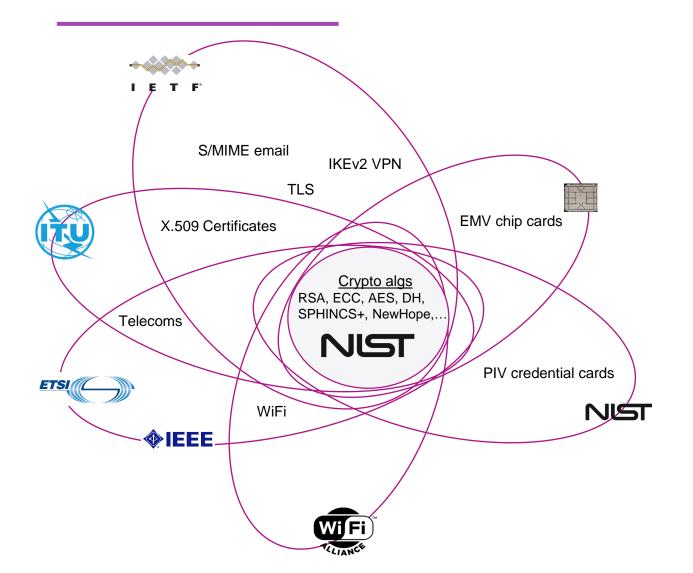
QUANTUM THREAT AND EXPECTED TIMELINE

- Quantum computers will be able to break <u>current</u> public key encryption
- Accurate crypto inventory & mitigation strategies are required
- ▶ Long term data needs to be protected not then, but now
- ▶ Failure to migrate leaves applications and data at risk of compromise.





FRAGMENTED COMMUNITY





- Standards bodies to adopt algorithms and update protocols/documentation
- ▶ PQC "ready" chips available around 2024-2025
- ➤ Certification audit/testing then follows so c.2025-2026 for release of assured products



NEW CRYPTOGRAPHIC STANDARDS RELEASED WITH TIMELINES (SEPTEMBER 2022)





Public-key

CRYSTALS-Dilithium CRYSTALS-Kyber

Symmetric-key

Advanced Encryption Standard (AES)
Secure Hash Algorithm (SHA)

Software and Firmware Updates

Xtended Merkle Signature Scheme (XMSS) Leighton-Micali Signature (LMS)



NATIONAL SECURITY AGENCY – TIMELINES

➤ Software and firmware signing: begin transitioning immediately, support and prefer CNSA 2.0 by 2025, and exclusively use CNSA 2.0 by 2030.



- **Web browsers/servers and cloud services:** support and prefer CNSA 2.0 by 2025, and exclusively1 use CNSA 2.0 by 2033.
- ➤ Traditional networking equipment (e.g., virtual private networks, routers): support and prefer CNSA 2.0 by 2026, and exclusively use CNSA 2.0 by 2030.
- ➤ Operating systems: support and prefer CNSA 2.0 by 2027, and exclusively use CNSA 2.0 by 2033.
- Niche equipment (e.g., constrained devices, large public-key infrastructure systems): support and prefer CNSA 2.0 by 2030, and exclusively use CNSA 2.0 by 2033.
- **Custom applications and legacy equipment:** update or replace by 2033.









OCTOBER 2021

PREPARING FOR POST-QUANTUM CRYPTOGRAPHY

Through our partnership with NIST, DHS created a roadmap for those organizations who should be taking action now to prepare for a transition to post-quantum cryptography. This guide will help organizations create effective plans to ensure the continued security of their essential data against the post-quantum threat and prepare for the transition to the new post-quantum cryptography standard when published by NIST.



Engagement with Standards Organizations

Organizations should direct their Chief Information Officers to increase their engagement with standards developing organizations for latest developments relating to necessary algorithm and dependent protocol changes.



Inventory of Critical Data

This information will inform future analysis by identifying what data may be at risk now and decrypted once a cryptographically relevant quantum computer is available.



Inventory of Cryptographic Technologies

Organizations should conduct an inventory of all the systems
using cryptographic technologies for any function to facilitate
a smooth transition in the future.



Identification of Internal Standards

Cybersecurity officials within organizations should identify acquisition, cybersecurity, and data security standards that will require updating to reflect post-quantum requirements.



Identification of Public Key Cryptography

From the inventory, organizations should identify where and
 for what purpose public key cryptography is being used and
 mark those systems as quantum vulnerable.



Prioritization of Systems for Replacement

Prioritizing one system over another for cryptographic transition is highly dependent on organization functions, goals, and needs. To supplement prioritization efforts, organizations should consider the following factors when evaluating a quantum vulnerable system:

- a. Is the system a high value asset based on organizational requirements?
- b. What is the system protecting (e.g. key stores, passwords, root keys, singing keys, personally identifiable information, sensitive personally identifiable information)?
- c. What other systems does the system communicate with?
- d. To what extent does the system share information with federal entities?
- e. To what extent does the system share information with other entities outside of your organization?
- f. Does the system support a critical infrastructure sector?
- g. How long does the data need to be protected?



Plan for Transition

Using the inventory and prioritization information, organizations should develop a plan for systems transitions upon publication of the new post-quantum cryptographic standard. Transition plans should consider creating cryptographic agility to facilitate future adjustments and enable flexibility in case of unexpected changes. Cybersecurity officials should provide guidance for creating transition plans.









2021-2023

Inventory and prioritize systems

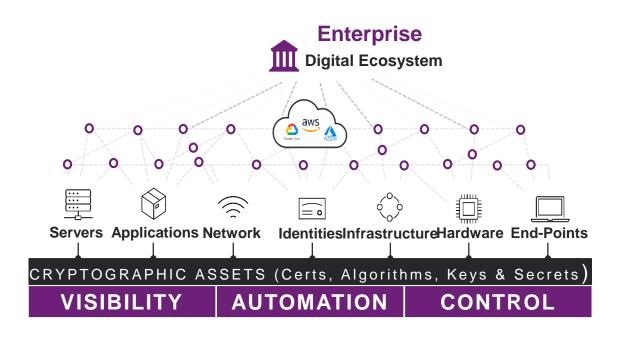
2024

NIST post-quantum cryptography standard published 2024-2030

Transition of systems to NIST post-quantum cryptography standard 2030

Cryptographically relevant quantum computer potentially available

MANAGEMENT OF CRYPTOGRAPHIC ASSETS



Problem Statements:

- PKI and crypto ARE critical infrastructure and expanding
- It is a false assumption that systems are "forever" secured with PKI/crypto
- Risks can be unknown because elements are not visible/managed
- Crypto resources are scarce and expensive
- Best practices are often inconvenient
- Procedures, Policies and platforms are not always robust or maintained
- Many organizations find out too late



POST QUANTUM PREPAREDNESS



Time to set up your PQ team to build your strategy

PQ Readiness needs accurate inventories, crypto agility and new technology

Meanwhile, crypto continues to proliferate in the landscape



NETWORK



ENDPOINTS



IOT



CI/CD

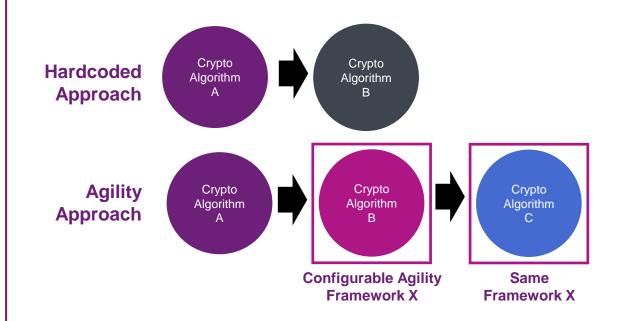


CRYPTO AGILITY AND HYBRID

WHAT IS CRYPTO AGILITY?

DEFINED:

The ability to reconfigure an application or system with a different cryptographic algorithm (or implementation).





THE CHALLENGE OF TRANSITION

Legacy Applications

- Cryptography baked into the application
- Multiple cryptographic dependencies
- Requires software rewrite
- Needs decomposition / modernization

Modern Applications

- Cryptography baked into the platform
- Inter-service communication often unsecured
- New zero trust requirements
- Complex management capabilities



BSI CALL FOR "HYBRID"

"A dual signature consists of two (or more) signatures on a common message. It may also be known as a hybrid signature or composite signature.

Solutions are FIPScompliant as long as one component is FIPS-compliant;

Ex {RSA + Dilithium}

- ▶ Hybrid modes provide protection until we have confidence in PQC:
 - Time between publication of NIST standards and full confidence.
 - Time between publication of new attack and patching.

Max data lifetime

Use RSA/ECC alone

Hybrid key exchange/encryption desired

Dual signatures are desired

Use PQ algorithms alone

RSA & ECC are broken by / quantum computers

Sufficient trust in PQ algorithms



PRE-QUANTUM APPROACHES FOR POST QUANTUM

Subject: "Joe" Issuer: JoeCorpCA PubKey: RSA2048 v3 Extns: - joe@corp.com ... SigAlg: RSA4096 Sig: 101111010100... SigAlg: RSA4096 Sig: 101111010100... SigAlg: SPHINCS+ Sig: 1101000001...

MULTI-CERT

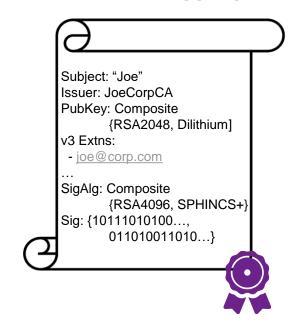
"HYBRID" CATALYST™ 1

IETF: draft-truskovsky-lamps-pg-hybrid-x509

Subject: "Joe"
Issuer: JoeCorpCA
PubKey: RSA2048
v3 Extns:
- joe@corp.com
- AltPubKey: Dilithium
- AltSigAlg: SPHINCS+
- AltSig: 01101001...
...
SigAlg: RSA4096
Sig: 10111010100...

COMPOSITE ²

IETF: draft-ounsworth-pq-composite-sigs



Entrust is working on standardizing this!



CRYPTOGRAPHIC CENTER OF EXCELLENCE

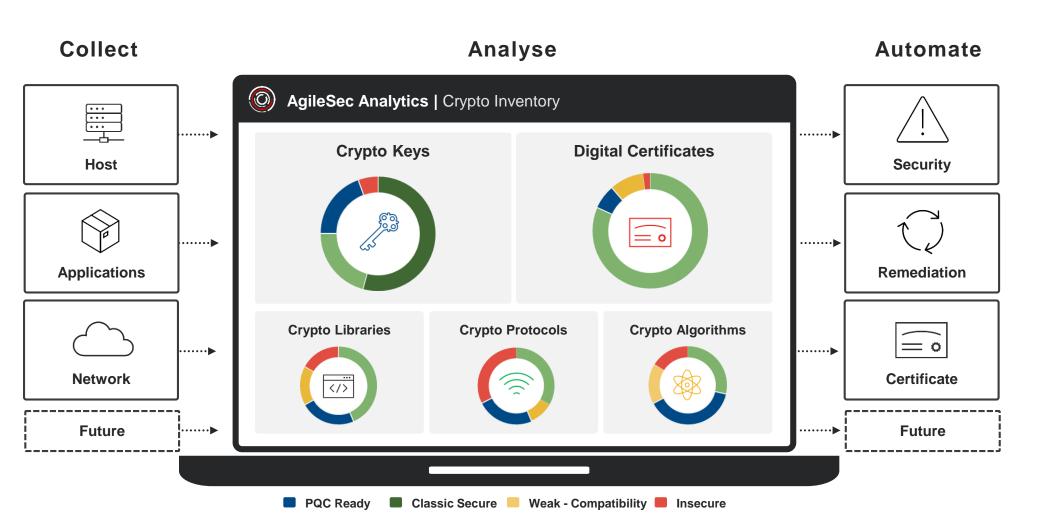
CRYPTOGRAPHIC CENTER OF EXCELLENCE

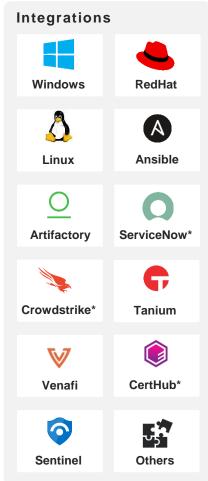
P

O

Cryptographic Center of Excellence EXPERT-BY-YOUR-SIDE VISIBILITY BEST PRACTICES PKI GOVERNANCE DESIGN & PKI HEALTH CHECK **CONSULTING IMPLEMENTATION** & PKI DISCOVERY **PQ MATURITY CRYPTO HEALTH CHECK CRYPTO GOVERNANCE ASSESSMENT CONSULTING ENTRUST**

CRYPTO INVENTORY | AUTOMATION

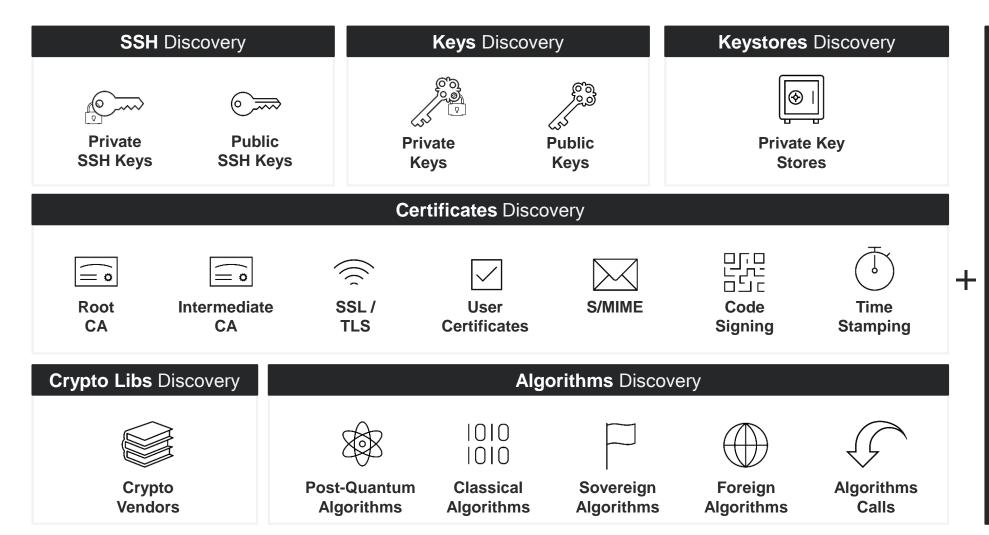




* In process



CRYPTO INVENTORY | COLLECTED OBJECTS







CRYPTO INVENTORY | USE-CASES



Detect secrets keys leaked into systems or applications before they are exploited.



Detect certificates hidden into systems or applications before they expire.



Detect Machine Identities generated outside of corporate process as soon as they appear.



Automate Crypto Compliance

oto -

CRYPTO INVENTORY

Verify compliance with Cryptographic standards, including NIST or internals.



Detect exploitable cryptographic vulnerabilities within infrastructure and systems.



Prepare for

CRYPTO INVENTORY

Plan transition to post-quantum cryptography by inventorying cryptographic objects.



POST QUANTUM MATURITY ASSESSMENT



- Maturity level assessed across:
 - Process, People & Technology
- Recommendations documented
- Roadmap mutually agreed and tracked



Unknown

- · Highly reactive
- Lack of ownership
- No centralized policy
- · No inventory of assets
- Silo and segmented organization
- No roadmap



Awareness

- Reactive
- Decentralized crypto; ad hoc tools
- Evaluates regulations and understands crypto landscape
- Risk mitigation plan in place, but lacks planning and visibility of critical issues



Management

- Moderately proactive
- · Policy established
- Crypto policy and staffing in place
- Exposed to vulnerabilities
- InfoSec oversight
- Backlog of issues and improvements
- Short-term vision



Optimization

- Proactive
- · Central policy widely enforced
- Crypto management and discovery tools
- · Cross functional team
- Modern, cloud-based technologies
- Lacks dedicated resources; competing priorities
- 3-year crypto roadmap



Excellence

- Highly proactive
- Centralized crypto centre established
- Full set of tools and best practices in place
- Board support
- Fast response to fix vulnerabilities and comply with new standards with Crypto Agility
- Manage investments in timely matter
- · Monitors emerging threats
- 5-year crypto roadmap



POST-QUANTUM READINESS

Timing Guidance to be prepared

Inventory 2022-2024

Build cryptographic inventory, policies, transition (BSI Hybrid?) plan, and start crypto-agile development strategy

Governance 2024-2027

Implement transition plan, crypto policies, and crypto-agile application development, and purge weak crypto

Operationalize 2027-2028

End of life non-Agile
applications, enforce strong
crypto policies for data, test and
vet new PQ algorithms,
transition to COE

PQ Readiness Solutions

Inventory & Control – Infosec Global AgileSec & Entrust Cert Hub

PQ Maturity Assessment, Health Checks & Discovery

Early Adopter: PKI and Cryptographic solutions

PQC Hybrid enabled Entrust solutions



THE STEPS TO QUANTUM SAFETY

Step 1:

Become excellent at Crypto Agility

Step 2:

Inventory your crypto assets & map to the data

Step 3:

Figure out your timeline to transition

Step 4:

Plan the migration



PEOPLE, PROCESS, TECHNOLOGY





THANK YOU

Visit entrust.com



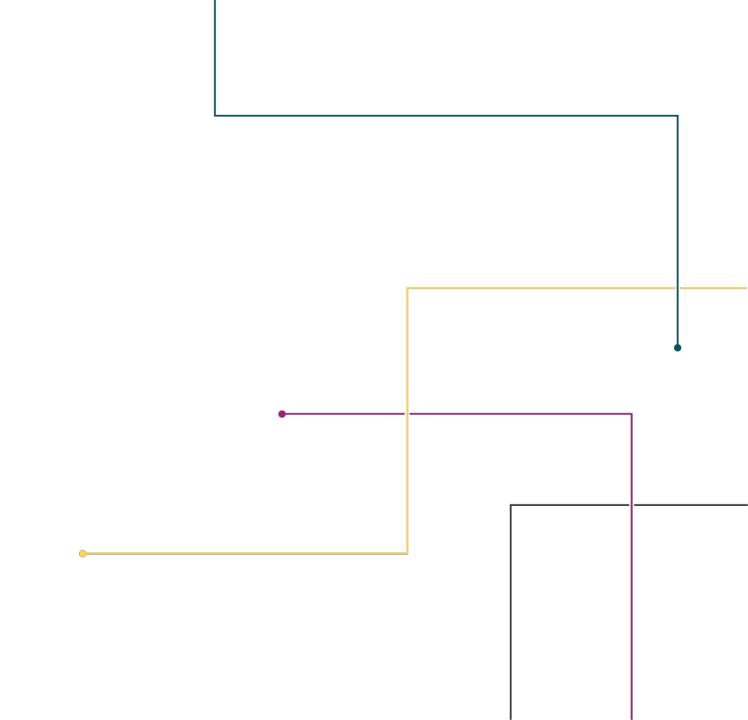


KNOWBE4 UPDATE

Tina Gaines

Security Awareness Training Manager

CSRM



What's the





- •
- Twenty three agencies that use KnowBe4 were moved under the VITA tenant with minimum issues the week of Jan. 30. In addition, three agencies that used other security awareness training solutions were moved and given access to their KnowBe4 console.
- What was requested from agencies during phase one:
 - > Current training solution and contract expiration date.
 - > Number of employees to include FTEs, wage and contractors.
 - > Name and email address of agency designated administrator(s).



-

- What VITA received the week of Feb. 20:
 - > Current training solution and contract expiration date.
 - Number of employees to include FTEs, wage and contractors.
 - > Name and email address of agency designated administrator(s).
- What VITA is working on:
 - Compiling the data we received from survey monkey into a spreadsheet as a centralized repository.
 - Working with KnowBe4 on agencies whose subscriptions are close to expiration so that there will not be
 a gap in console access for those agencies that are currently using the platform.
 - Preparing to grant KnowBe4 console access to those agencies who subscriptions are close to expiration
 and are using another training solution other than KnowBe4 starting the week of March 6. Agencies
 involved will be notified in advance.
 - Knowbe4 Training: VITA will begin scheduling training sessions with console admins in April.



•

- ➤ Phase One Those agencies who are currently subscribed to Knowbe4. This phase will take place the week of Jan. 30, 2023. Phase one included over 20 state and independent agencies, two higher ed agencies, the Governor's Office, and two agencies who did not use Knowbe4.
- ➤ Phase Two (Start Date week of March 6) Majority of the agencies not included in phase one. This phase is schedule to be completed by July 2023.
- ➤ Phase Three This phase will include agencies that might be a little more complex, challenging, or their subscription renewals expire later in the year or next year. This phase is scheduled for completion by December 2023.





Custom Content:

https://support.knowbe4.com/hc/en-us/articles/360047284433

KnowBe4 527 Crosswalk: https://www.vita.virginia.gov/policy--governance/policies-standards--guidelines

What type of reporting is available? https://support.knowbe4.com/hc/en-us/articles/360007952894

Will it be OKTA enabled? OKTA configurations: https://support.knowbe4.com/hc/en-us/articles/115013176407

Training Notifications:

https://support.knowbe4.com/hc/en-us/articles/115010848868

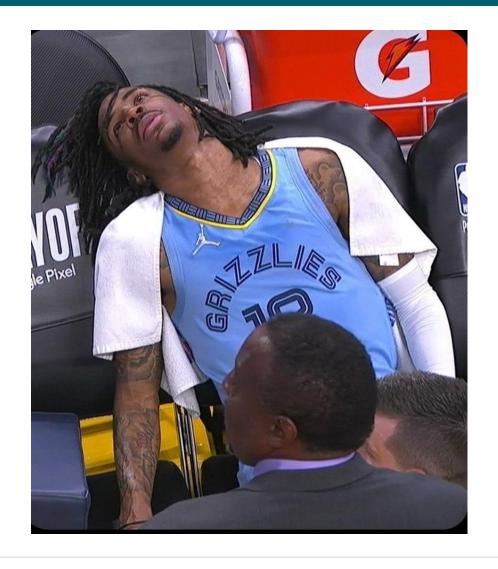
https://www.knowbe4.com/en/security-awareness-training-features/

Here is a link to a recorded version of the webinar so you can get a feel for it.

https://attendee.gotowebinar.com/recording/6413257131567872515









Ē

QUESTIONS







SECURITY AWARENESS TRAINING



KNOWBE4 AND THE AGENCY SECURITY AWARENESS TRAINING PROGRAM

Ruxandra Teodorescu

Agenda

- Account Settings
- Campaign Planning
- User Groups
- Campaign Settings
- Campaign Custom Notifications
- Policies Settings
- Training Status and Reports
- Challenges



Account Settings

Configure Single Sign On

Phased rollout

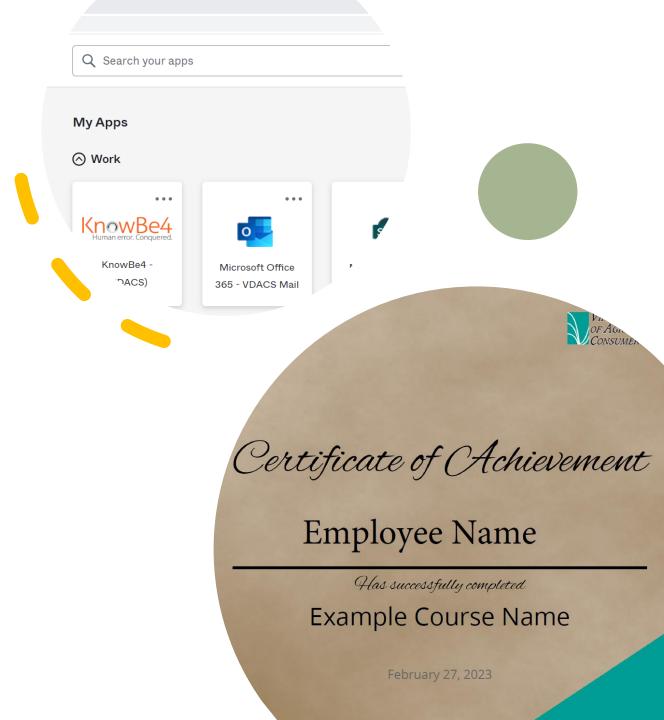
COV-AUTH Okta Application Integration

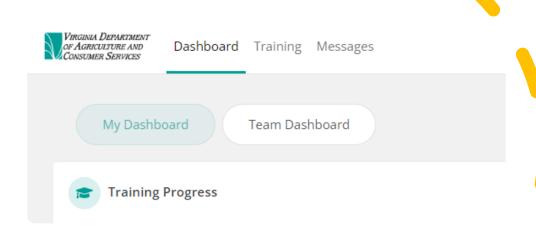
Branding

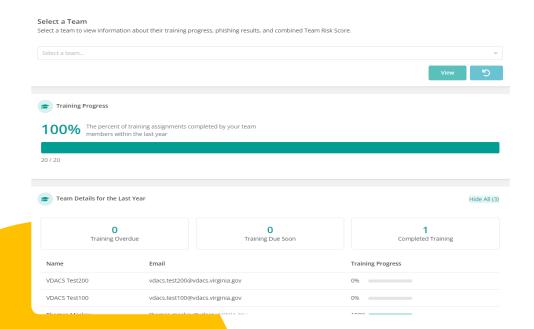
- Add a link to your agency logo size and format restrictions apply
- Set up a brand color (Hex value)
- Upload your branded certificate see the KnowBe4 knowledge base <u>article</u> for image specifications and templates.

Learner Experience

- Enable Learner Dashboard
- Enable Team Dashboard



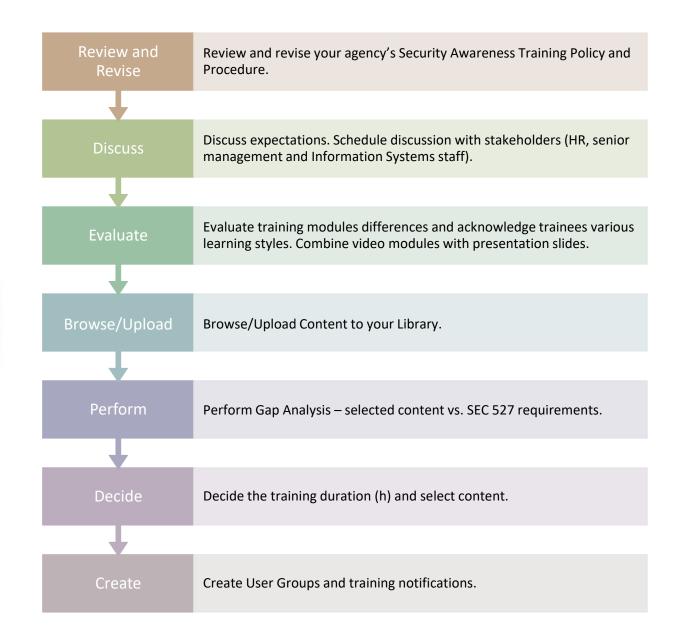




User Dashboard View

- Learner Experience
 - Enable Learner Dashboard
 - Training Progress Bar
 - Assignment Name
 - View Messages
 - Enable Team Dashboard
 - Limit User Information Shown: Disabled
 - Select a Team
 - Training Progress Bar
 - Team Details (training overdue, due soon)

Training Campaign Planning



Training Content

Option 1: browse Knowbe4 content and add it to Library

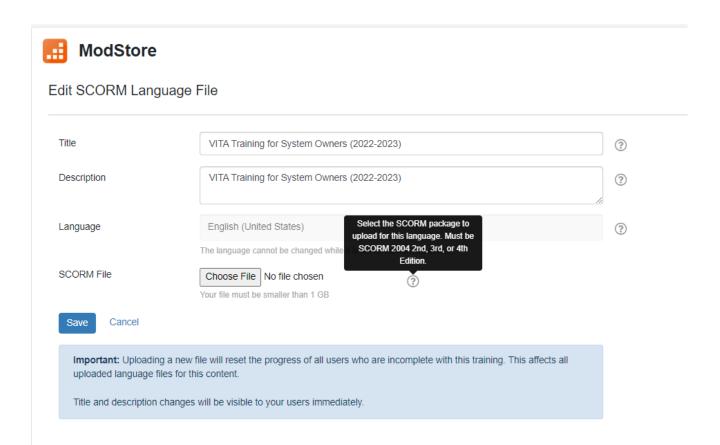
MODSTORE -> Browse -> Library

Option 2: add personalized content

 MODSTORE -> Uploaded Content (SCORM 2004 2nd, 3rd or 4th edition, video files)

Option 3: add documents and presentation slides as PDF files under the Policies section.

- TRAINING -> Policies (PDF, URL)
 - ✓ Non-Disclosure Agreements (NDAs)
 - ✓ Separation of Duties
 - ✓ Principle of Least Privilege Training



User Groups

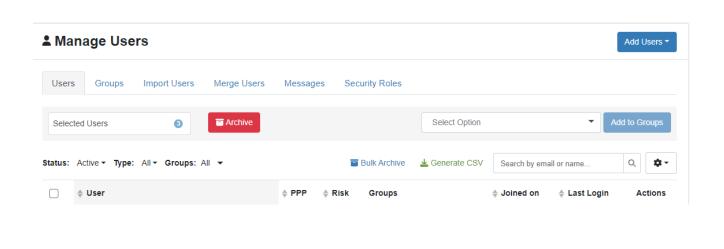
1. Manage Existent Users

2. CSV Import – predefined groups

- ✓ [Agency] Active Employee List
- ✓ [Agency] New-Hire List
- ✓ [Agency] System Administrators

3. SmartGroups – predefined criteria

- √ [Agency] New Employees
- ✓ [Agency] Terminations



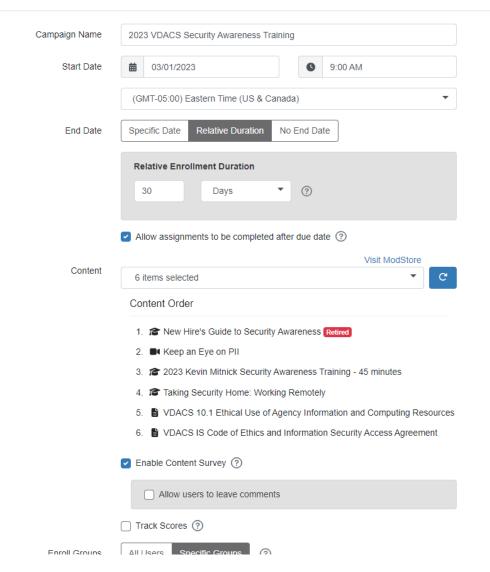


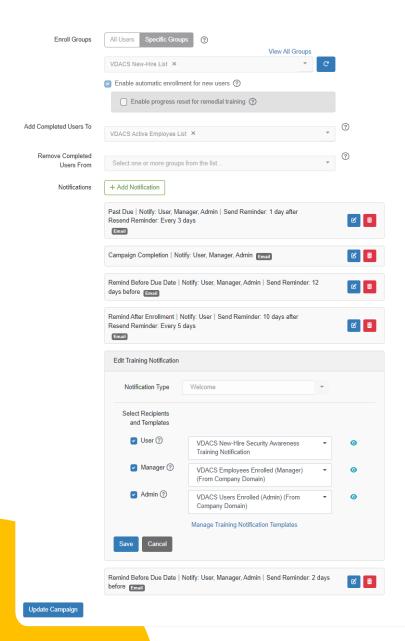
Campaign Settings

End Date:

- ☐ Specific Date used for the annual SAT campaign, needed for email notifications.
- Relative Duration new hire, other ongoing campaigns, if employees need to access their training certificates.
- ☐ No End Date optional content
- Allow assignments to be completed after due date. Use Past Due Notifications.
- **Enable** Content Survey
- Enable Track Scores

Create New Training Campaign





Campaign Notifications

- ☐ Select Specific Groups
- ☐ **Enable** automatic enrollment for new users (if needed)
- Add Completed Users To a selected group (if needed)
- ☐ Schedule Email Notifications
 - ✓ Welcome Emails
 - ✓ Remind after enrollment on-time
 - ✓ Remind after enrollment sent regularly at a specified interval
 - ✓ Remind before due date approx. 10-12 days
 - ✓ Remind before due date 2 days
 - ✓ Campaign Completion
 - ✓ Past Due

User Custom Notification Example

← Back To Training Notification Templates 2022 Role-based Training Notification - Enrollment Template Name 2022 Role-based Training Notification - Enrollment Leave this field blank to use the Subject field as the Template Name. Sender's Email Address Sender's Name itsecurity@vdacs.virginia.gov VDACS IT Security Subject Important: Mandatory VDACS Role-Based Training A - A - Styles - Format - Font - Size - 📾 🚌 🏴 Placeholder -VDACS Role-Based Training Enrollment Hello [[display_name]], The [[company_name]] (VDACS) uses the KnowBe4 platform to provide role-based security awareness training for employees that hold certain roles within the organization. You have been identified as being in one of the following roles: System Owner, Data Owner, or System Administrator. You have been enrolled in the [[TRAINING_CAMPAIGN]] which must be completed by [[training_campaign_end_at]]. If you do not currently hold any of the above roles and believe this was sent in error, please reach out to the VDACS IT Security team at itsecurity@vdacs.virginia.gov to let us know. You can access the KnowBe4 platform by clicking on the icon posted on the new VDACS Insite Information Systems page and using your employee email address to log in, or you can use the unique link below to begin your training. The training content can also be accessed from a mobile device. Please use Google Chrome when accessing the training from a computer: [[LOGIN_LINK]] We need to defend our organization against cyber crime, and security is a team effort. In order to meet the Commonwealth's IT security compliance requirements, it is important that you complete this training before the deadline. Please email VDACS IT Security if you have questions or need to report a suspicious activity. Thank you! VDACS IT Security itsecurity@vdacs.virginia.gov

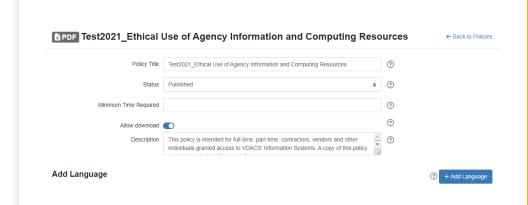
TRAINING USERS ASAP PHYSICAL TESTS + SECOND CHANCE MODSTORE REPORTS

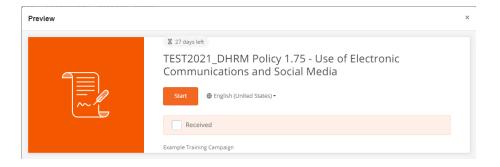
Manager Custom Notification Example

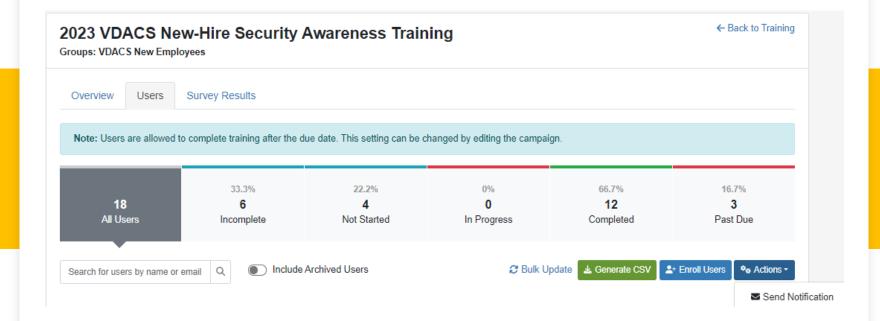
← Back To Training Notification Templates VDACS Employees Incomplete (Manager) (From Company Domain) - 2 days left Template Name VDACS Employees Incomplete (Manager) (From Company Domain) - 2 days left Leave this field blank to use the Subject field as the Template Name. Sender's Email Address Sender's Name do-not-reply@[[domain]] [[company_name]] Subject Reminder: Employees Mandatory Training - 2 days left This is a friendly reminder to ensure that employees complete the annual mandatory security awareness training. As of [[current_date_0]], [[user_list_count]] of your employees have not completed their assignment(s) as part of training campaign: [[training_campaign]] due in two days. User List: User Names Emails [[user_fullname_list]] [[user_email_list] VDACS IT Security itsecurity@vdacs.virginia.gov

TRAINING USERS ASAP PHYSICAL TESTS - SECOND CHANCE MODSTORE REPORTS

Policies Settings



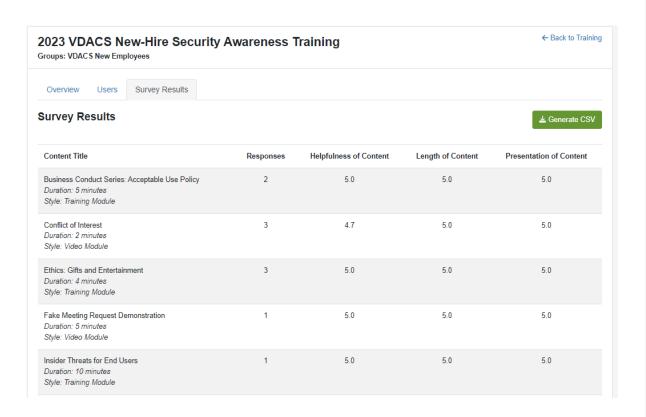




Training
Status
and
Reports

Survey Results

- You can use the results of your survey to keep informed on the type of content your users find the most engaging. Using training assignments that your users are more engaged with makes them more likely to finish their training on time.
- As an example, if you receive negative survey feedback regarding the length of the content you are assigning to users, you can adapt your training content selections based on this feedback for your next training campaign.



Challenges





ACCOUNT FOR NETWORK PERFORMANCE ISSUES FOR EMPLOYEES IN REMOTE LOCATIONS.

HARD TO DIFFERENTIATE BETWEEN TRAINING MODULES COMPLETED FROM ONE YEAR TO ANOTHER. CLOSE TRAINING CAMPAIGNS AS NEEDED



THANK YOU!



Ruxandra Teodorescu, CDPSE, CISA

VDACS Information Security Officer ruxandra.teodorescu@vdacs.virginia.gov

AGENCY DATA POINTS REMINDER

ARCHER SCORECARD

Agency score card metrics captured from Jan. 1 to Dec. 31 of each calendar year. The metrics listed below reset at the beginning of each calendar year in Archer:

- Current year percentage of risk finding updates received;
- Current year percentage of audit finding updates received;
- ISO certification.

Agency head approved audit and risk plans covering a three-year period are due annually.

Expiring audit or risk plans should be updated as soon as possible and submitted to the CSRM mailbox, commonwealthsecurity@vita.virginia.gov.

Scheduled audits and risk assessments should be submitted upon completion and agency head approval.

March 31 is the end of the first quarter. Please submit all quarterly updates due to the CSRM mailbox.



UPCOMING EVENTS



IS ORIENTATION



IS Orientation

06993b2934c3270491

Remote – WebEx

Date: March 29, 2023

Start time: 1:00 p.m.

End time: 3:00 p.m.

Instructors: Erica Bland, Renea Dickerson and Tina

Gaines

https://covaconf.webex.com/weblink/register/r97c7834e1e02a6





The next scheduled meeting for the IS Council:

March 22, 2023 (revised date)

12 p.m. – 1 p.m. (virtual)

If you would like an invite to the meeting, contact:

tina.gaines@vita.virginia.gov





Government Innovation Virginia
How Technology is Making Citizens Lives Better
Wednesday, April 12, 2023
Richmond, VA | 8:00 a.m.
Network Drink Reception at 5 p.m.

Location: TBA

Register at:

PSIS_2023_USA_Government-Innovation-VA.pdf (publicsectornetwork.com)

Speakers:

Bob Osmond (VITA), Zacc Allen (DOC), Ravi Padma (DVS), Mike Riggs (SCV), Peter Aiken (VCU) and more.....



ISO REMINDERS COMPLIANCE AND VERIFICATION SAT FORMS

The Compliance and Verification forms were due on Jan. 31, 2023.

The form maybe completed manually or in Archer by clicking on the "Verification and Compliance Tab under the Security Awareness Training Questionnaire for year 2022. If you do not see the tab, click on recalculate and it should appear.

If you have questions, contact

Tina.Gaines@vita.virginia.gov





APRIL ISOAG MEETING

APRIL 5, 2023

TIME 1 P.M. - 3 P.M.

SPEAKERS: TBA





MEETING ADJOURNED

