

## *IAM Online – September 11, 2013*

# **Multi-Factor Authentication: All in This Together**

### Host:

Tom Barton, University of Chicago

### Speakers:

Eric Goodman, University of California Office of the President

Mike Grady, Scalable Privacy Project, Senior IAM Consultant,  
Unicon

David Walker, Scalable Privacy Project, Independent  
Consultant

*IAM Online is brought to you by Internet2's InCommon in cooperation with  
the EDUCAUSE Identity and Access Management Working Group*

Passwords are bad and will get worse.  
We know!



- Use stronger credentials
- Improve password practices until you no longer need them
  - InCommon's Identity Assurance Profiles

# Stronger credentials

## Factors

- Something you know
- Something you have
- Something you are

## Stronger authentication & multi-factor authentication

- One-Time Password (1 factor)
- Biometric (1 factor)
- Pass phrase (1 factor)
- PIN + token (2 factors)
- Password + another password (2 factors)
- Password + cellphone confirmation (2 factors)

Poll: How long do I have to wait?

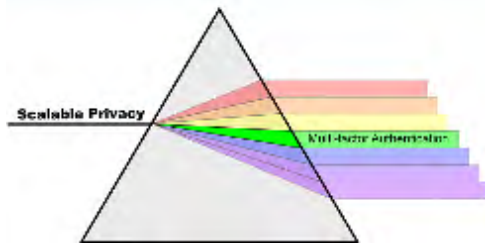
# The MFA Cohortium

- Community jointly tackling questions of
  - Strong authentication strategy
  - Pros/cons of various multi-factor technologies
  - Implementation approaches, lessons learned
  - Making the business case
  - ...
- Eric Goodman (U California Office of the President)
- Mike Grady (Unicon)
- David Walker (consultant)

# The Multi-Factor Authentication (MFA) Cohortium

All In This Together

<https://spaces.internet2.edu/display/mfacohortium>



# Today's Presenters



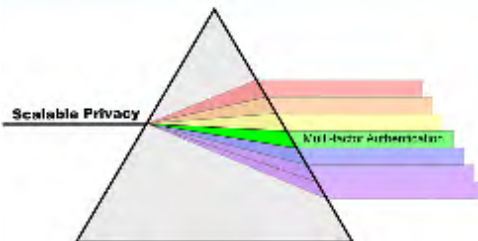
Mike Grady, Scalable Privacy Project  
Senior IAM Consultant, Unicon



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Independent Consultant

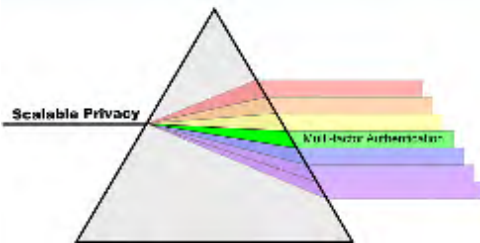


Eric Goodman, Identity and Access  
Management Architect, University of  
California Office of the President



# Overview

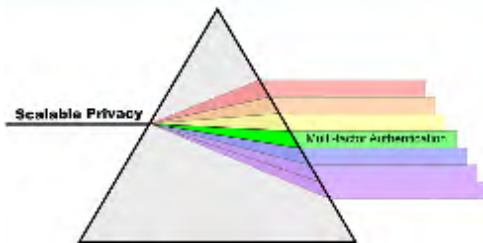
- What is the MFA Cohortium?
- Why are Institutions Participating?
- Cohortium Goals and Deliverables
  - Help for campuses trying to understand their need for multi-factor authentication
  - Help for campuses deploying multi-factor authentication
  - Sponsorship for development of MFA software infrastructure





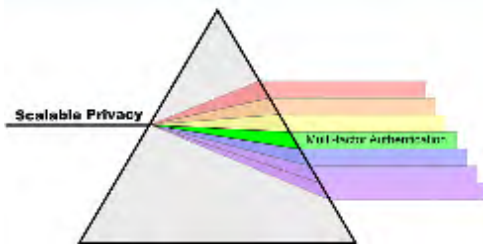
# What is the MFA Cohortium?

- Objective: Advance the deployment of Multi-factor Authentication (MFA) in Higher Education
- Roughly 40 institutions participating
- Started end of May 2013, ending in August 2014
- Collaborative effort to help each other understand the business case, technologies, deployment models, issues, costs, requirements, ROI, etc. around deploying MFA.



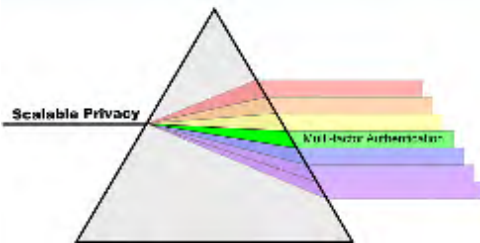
# What is it, continued ....

- Ultimately, collect and create extensive set of resources/artifacts on “all things MFA planning and deployment” for Higher Ed, establishing a public web site to serve as lasting resource site.
- One of a number of efforts that are all part of the Internet2 Scalable Privacy project.



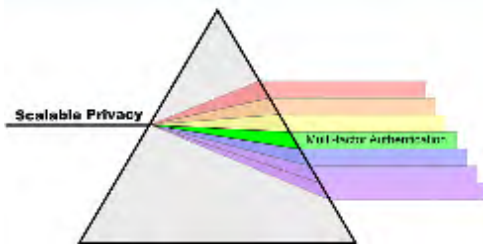
# Scalable Privacy

- 2+ year grant to Internet2/InCommon, funded as part of the [National Strategy for Trusted Identities in Cyberspace \(NSTIC\)](#)
- Development partners are CMU, Brown, with expertise from Wisconsin, Ohio State and others
- Several focal points
  - Promotion of multi-factor authentication (MFA)
  - Citizen-centric attributes and schema
  - Development and deployment of privacy managers
  - Introduction of anonymous credentials
- <https://spaces.internet2.edu/display/scalepriv>

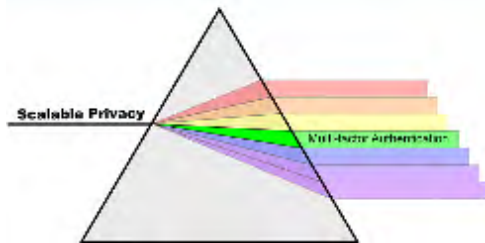


# Scalable Privacy - MFA activities

- MFA Cohortium (today's talk)
- Three funded pilot deployments of MFA at MIT, University of Texas System, and University of Utah
- Sponsorship of software development activities related to ease of integration and support of MFA:
  - Shibboleth
    - [Assurance and MFA Enhancements for the Shib Identity Provider](#)
  - [InCert](#): Installation and lifecycle management of certificates on client device(s)
  - CAS: Provide similar assurance & MFA support as per Shibboleth effort above



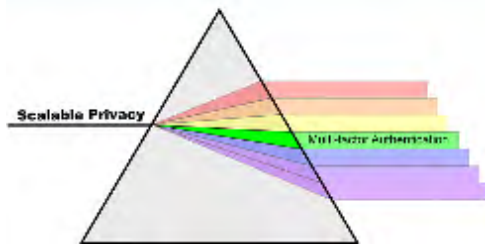
# Why Are Institutions Participating?



INTERNET

# MFA at University of California

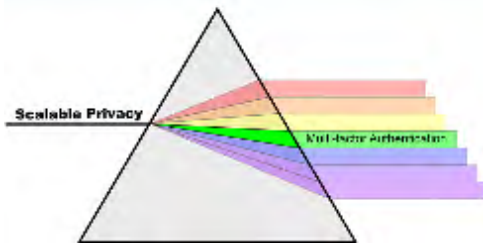
- As a system, UC falls into multiple MFA scenarios
  - Developing business cases
  - Pilots in progress
  - Deploying (and releasing) solutions
- Currently beginning development of system-wide MFA strategy
- This is typical of all universities



# What Questions are Universities Asking About MFA

## Campuses considering MFA solutions

- Strategies for gaining funding
- Convincing execs to support efforts
  - Developing Business Case
  - Risk Management Focus
- Developing project plans
- MFA technology options
- Resource expectations/funding models

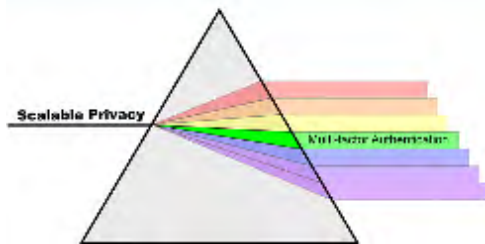




# What Questions are Universities Asking About MFA

## Campuses deploying MFA solutions

- Deployment strategies
- MFA product selection
- Integration options
  - ❖ Many specific platform questions
- Operational requirements and concerns
- User support models
- User communications (supporting roll out)

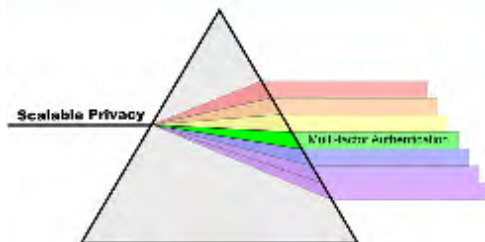




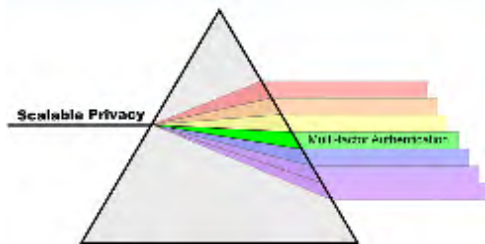
# What Questions are Universities Asking About MFA

## Campuses that have deployed MFA solutions

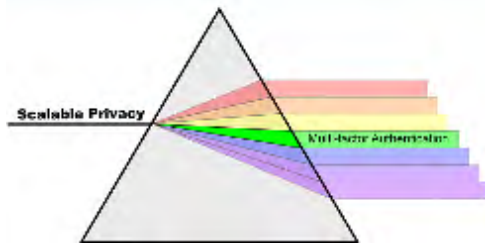
- Share technology solutions
- Support experience
- Areas of user satisfaction/dissatisfaction
- Other “lessons learned”



# Poll: Current Deployment Status



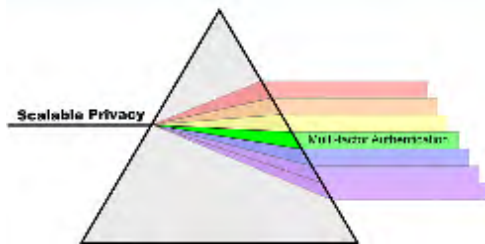
# Poll: Areas of Greatest Interest



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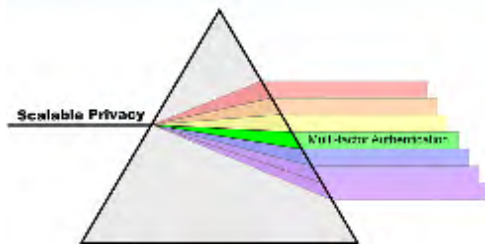
# Cohortium Goals

- Advance the use of Multi-factor Authentication in Higher Education.
- “Move the needle”
  - Help campuses without MFA understand the need for it, the risks it addresses, its costs, *etc.*
  - Help campuses that are implementing MFA with deployment, policy, technology, usability and accessibility.
  - Help sponsor development of core infrastructure software modules to facilitate technology integration.



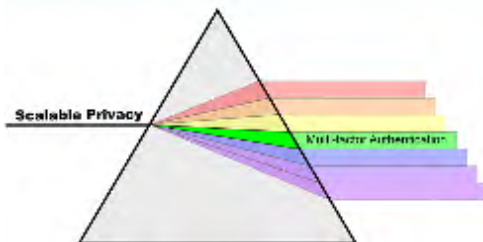
# Cohortium Deliverables

Subject to Concurrence of Cohortium



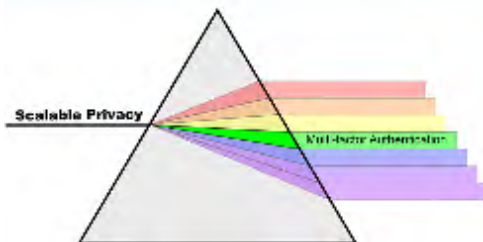
# Cohortium Activities and Products

- A forum for discussion of common issues
  - Business Cases
  - Deployment
  - Technology
  - Product / Vendor Issues
- A source of white papers addressing best practices for business, technical, and operational issues
- Lots of example artifacts from institutions



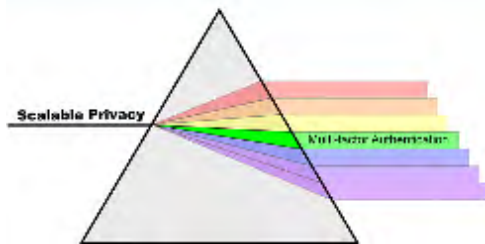
# Business Case Elements for Multi-Factor Authentication

- Strategic Context
  - Alignment with Research and Education Community
- Benefits and Risk Mitigation
  - End-user security
  - Service provider based risk assessment
- Compliance
  - Policy and law
  - Assurance Profiles
- Costs
  - Initial and Ongoing
  - Technology refresh



# A Little More about Assurance

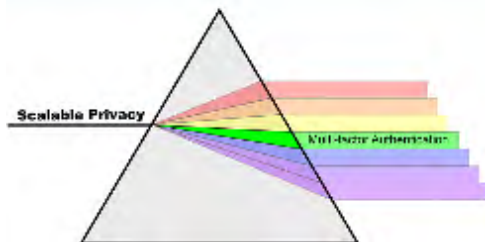
- Multi-factor authentication often required to address risk for services related to health care and public safety
- NIH is likely to release services that require MFA
- InCommon Silver does not require MFA, but multiple institutions are finding it more effective than cleaning up their passwords
  - Virginia Tech





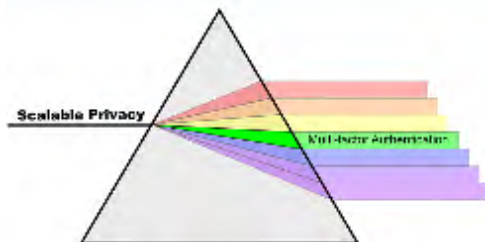
# Gaining Acceptance in the User Community

- Require MFA only when necessary
- Make business rationale clear
- Build community of enthusiasts by implementing opt-in first
- Select tokens that fit well with users' work styles
- Extend session timeouts when MFA used
- Require based on location (e.g., only for remote access)



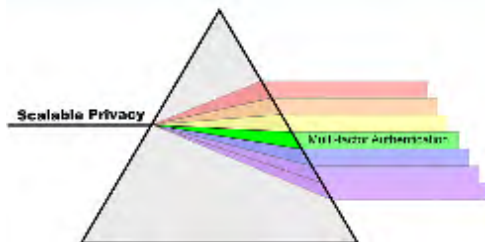
# Initial Deployment Strategies

- Deploy for one or a small number of services
  - Minimize startup risks
  - May require re-implementation to add services
  - This is the most common scenario
- Deploy as part of SSO but use for one or a small number of services
  - Minimize startup risks
  - Addition of services is straightforward
  - Allows technology refresh without affecting services



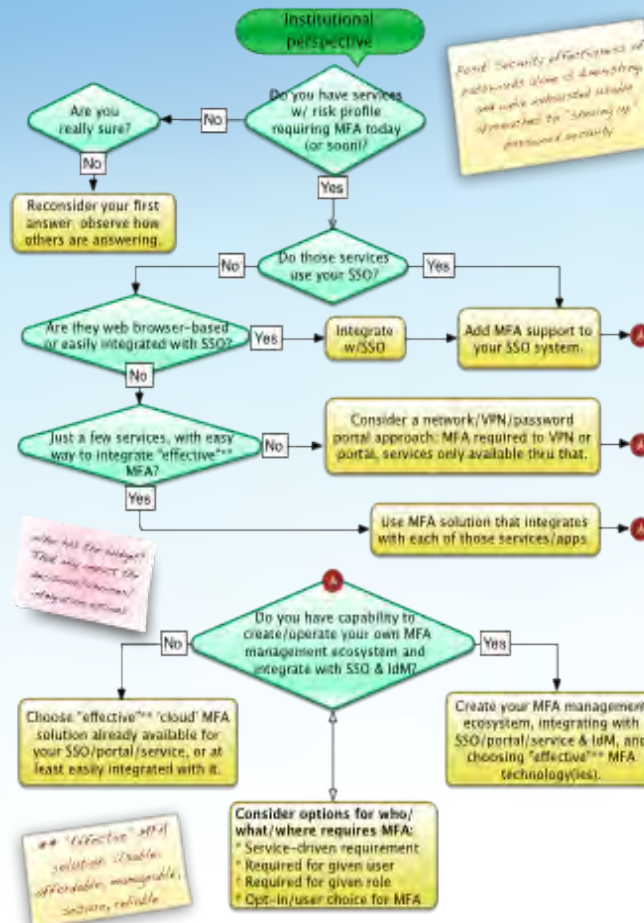
# Initial Deployment Strategies

- Deploy as part of SSO with focus on user “opt-in” for MFA
  - Gives users control, time for acceptance to build
  - Can then drive Service Provider adoption as a requirement
- Not aware of “whole hog” initial deployments, requiring, or just enabling, MFA for everything

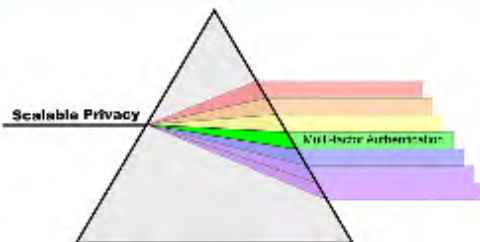


# Initial Deployment Strategies

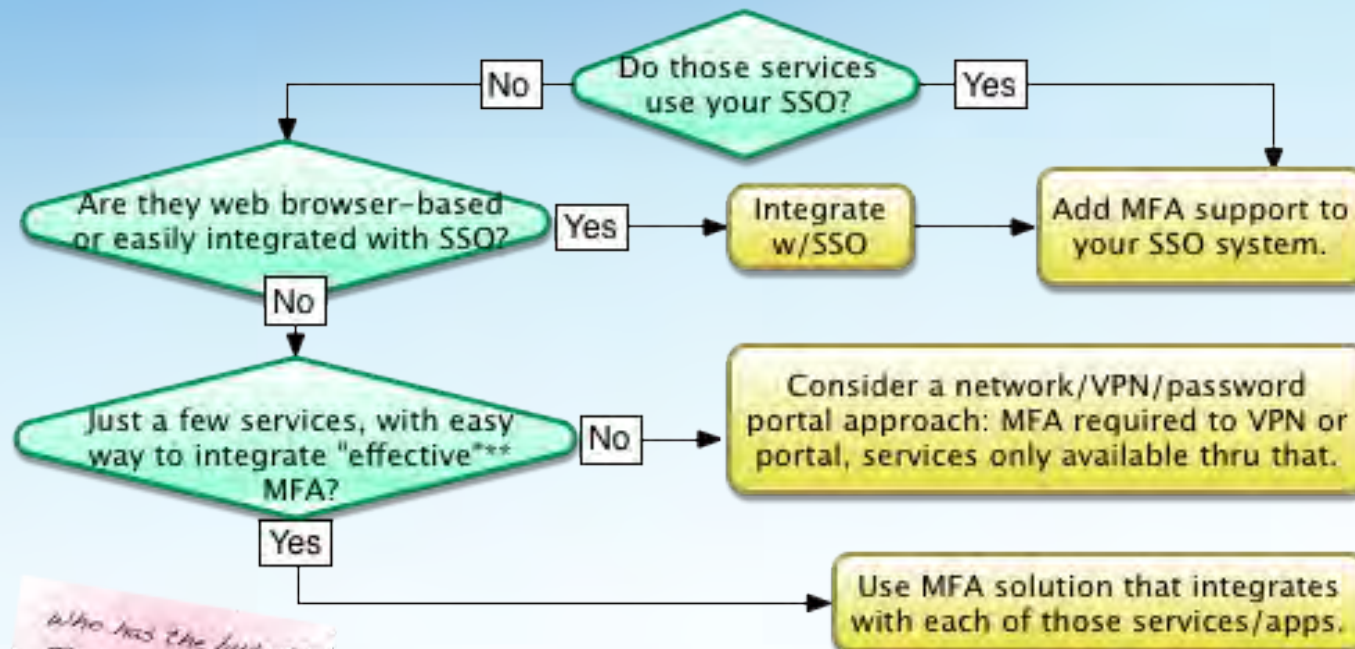
We will produce documents/artifacts summarizing deployment strategy options. This is a sample (not yet vetted with the Cohortium) of a possible "Decision Tree" artifact.



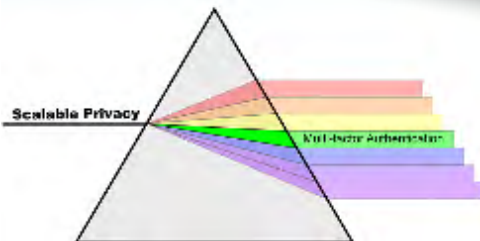
This is from "institutional perspective". Decision trees could also be produced from the end user perspective (opt-in), the Assurance use case perspective, etc.



# Sample Partial Decision Tree



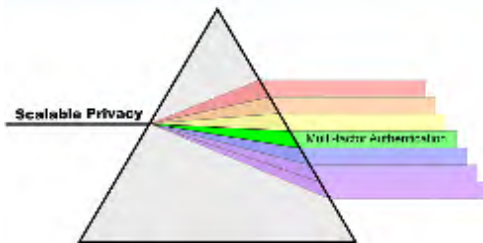
*Who has the budget?  
That may impact the  
decisions/choices/  
integration options*





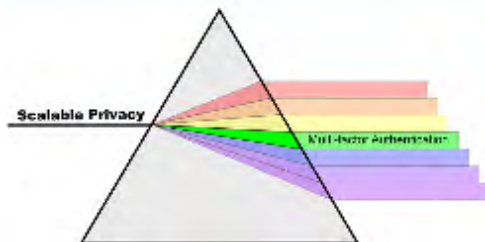
# Architectural patterns of integration

- Individual Services
  - Mainframe
  - VPN
  - Unix login
  - Web application
- Access Control Systems
  - Portals
  - “VPN as a portal”
- Enterprise Single Sign-On and Federation
  - CAS
  - Shibboleth
  - User Option (“Opt-in”)



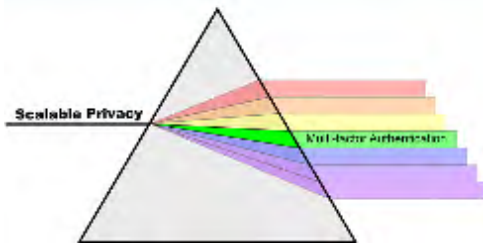
# Technology-focused documents

- Comparative analysis/review of the various security properties of MFA technologies
  - Look at a class of solutions and highlight strengths and weaknesses
  - May start with review of security & privacy properties of telephony approach vs non-telephony approach
- Technologies Assessment Matrix
  - Assess on multiple factors, with broad categories such as Security, Usability, and Deployability
  - Accessibility as a specific criteria



# Technology-focused documents

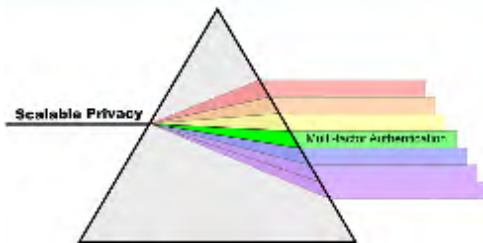
- Great example of analysis is the paper: “The Quest to Replace Passwords: A Framework for Comparative Evaluation of Web Authentication Schemes”
- <http://t.co/VUdl7VNb>
- Evaluate based on “broad set of twenty-five usability, deployability and security benefits that an ideal scheme might provide.”





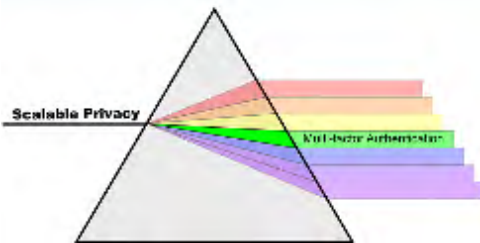
# Alternative Strategies When Multi-Factor Tokens Are Not Available

- What about failure cases?
  - Token left at home, so can't read mail
  - Battery failed in token, so can't submit \$10M grant proposal
- Must balance risk of impersonation against risk to business continuity



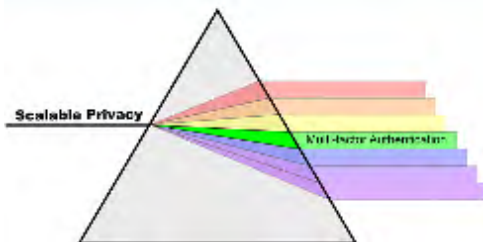
# Alternative Strategies When Multi-Factor Tokens Are Not Available - Strategies

- Strategies for opt-in MFA
  - Pre-registered proxies
  - Single-use passwords
- Strategies for service provider required MFA
  - Restricted but not denied access
  - Emergency access for limited time
  - Authorized third parties for authentication
- Strategies for federation required MFA
  - Re-registration
  - Authorized third parties for re-registration
- <https://spaces.internet2.edu/x/RABtAg>



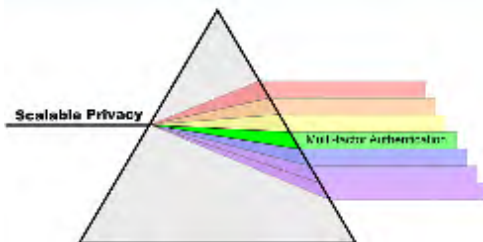
# MFA Enhancements for Shibboleth and CAS

- Enhancements to facilitate integration of MFA technologies into the enterprise SSO
- Issue is really handling *multiple* authentication contexts (e.g., assurance profiles)
  - Integrating a single MFA approach as *only* method is straightforward
  - This work will provide a better framework for integrating a variety/multiple MFA technology options through a standard interface



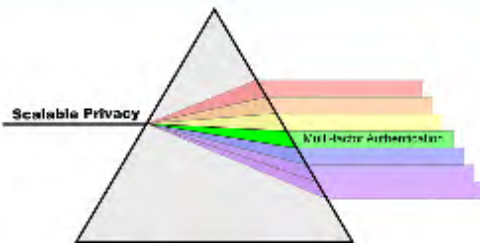
# MFA Enhancements for Shibboleth and CAS

- Need to offer options to the user that meet SP needs and that the user is certified to use
- The IdP may be aware of other options that satisfy the SP's requirements
  - SP requests password; IdP satisfies with PKI token
- Initial Shibboleth testing next week; completion by end of year
- Still determining exactly what/how similar work will be done for CAS

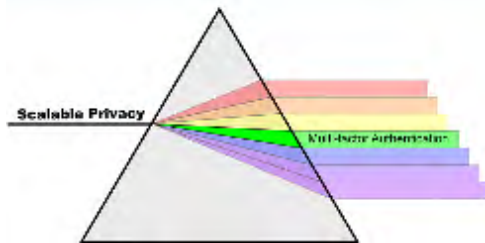


# Some Other Deliverables that are planned ...

- Considerations around outsourced authentication
- Accessibility evaluation of MFA technologies
- FERPA and MFA contract language
- Funding Models
- Sample project & deployment plans
- Sample support documentation & processes, FAQs, etc.
- Sample user communication campaigns

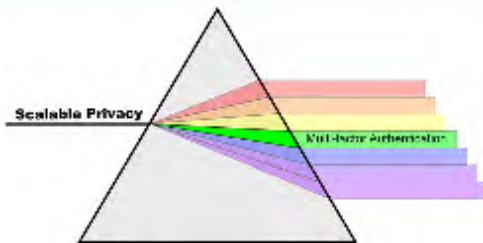


# Poll: What Deliverables are of most interest?

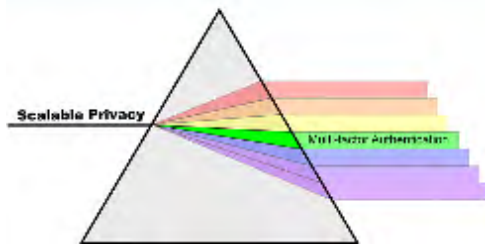


# More Information about the Cohortium

- Cohortium Wiki Space
  - <https://spaces.internet2.edu/x/4AwwAg>
- Join the Cohortium
  - Share your questions
  - Share your expertise
  - Help set priorities for deliverables
  - Contribute example documents and artifacts from your institution
  - <https://spaces.internet2.edu/x/4wwwAg>
- Contact us: [cohortium-reg@internet2.edu](mailto:cohortium-reg@internet2.edu)



# Questions & discussion





## Evaluation

Please complete the evaluation of today's IAM Online:

<http://www.surveymonkey.com/s/IAMOnline> September 2013



## InCommon Identity Week - November 11-15, 2013

[www.incommon.org/idweek](http://www.incommon.org/idweek)

*San Francisco Airport Marriott Waterfront, Burlingame, CA*

Monday Nov. 11	Tuesday Nov. 12	Wednesday Nov. 13	Thursday Nov. 14	Friday Nov. 15
REFEDS – Global R&E Federation Operators	Advance CAMP Identity Services Summit	Advance CAMP Identity Services Summit (through noon)	CAMP: Managing Identity and Access in an Era of Distributed Services	CAMP: Managing Identity and Access in an Era of Distributed Services (through noon)
		----- CAMP Pre-Conference: Getting Started with Federated Identity Management (afternoon)		

## InCommon Shibboleth Workshop Series



### Installation Training for Shibboleth *Single Sign-on and Federating Software*

October 21-22 – University of Nebraska Omaha – Omaha, NE  
Details and registration at [www.incommon.org/shibtraining](http://www.incommon.org/shibtraining)

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