

13th Annual Smart Card Alliance Government Conference
Emerging Biometric Technologies

**Moving Beyond Passwords with
Active Authentication**

Program Overview Briefing

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October 30th, 2014



Users are the weak link...

Finweb = Jane123
DTS = 123Jane
PKI = JaneA123
DiskCrypt = Jane123A
Gmail = Jane123A



How many passwords do we really use?

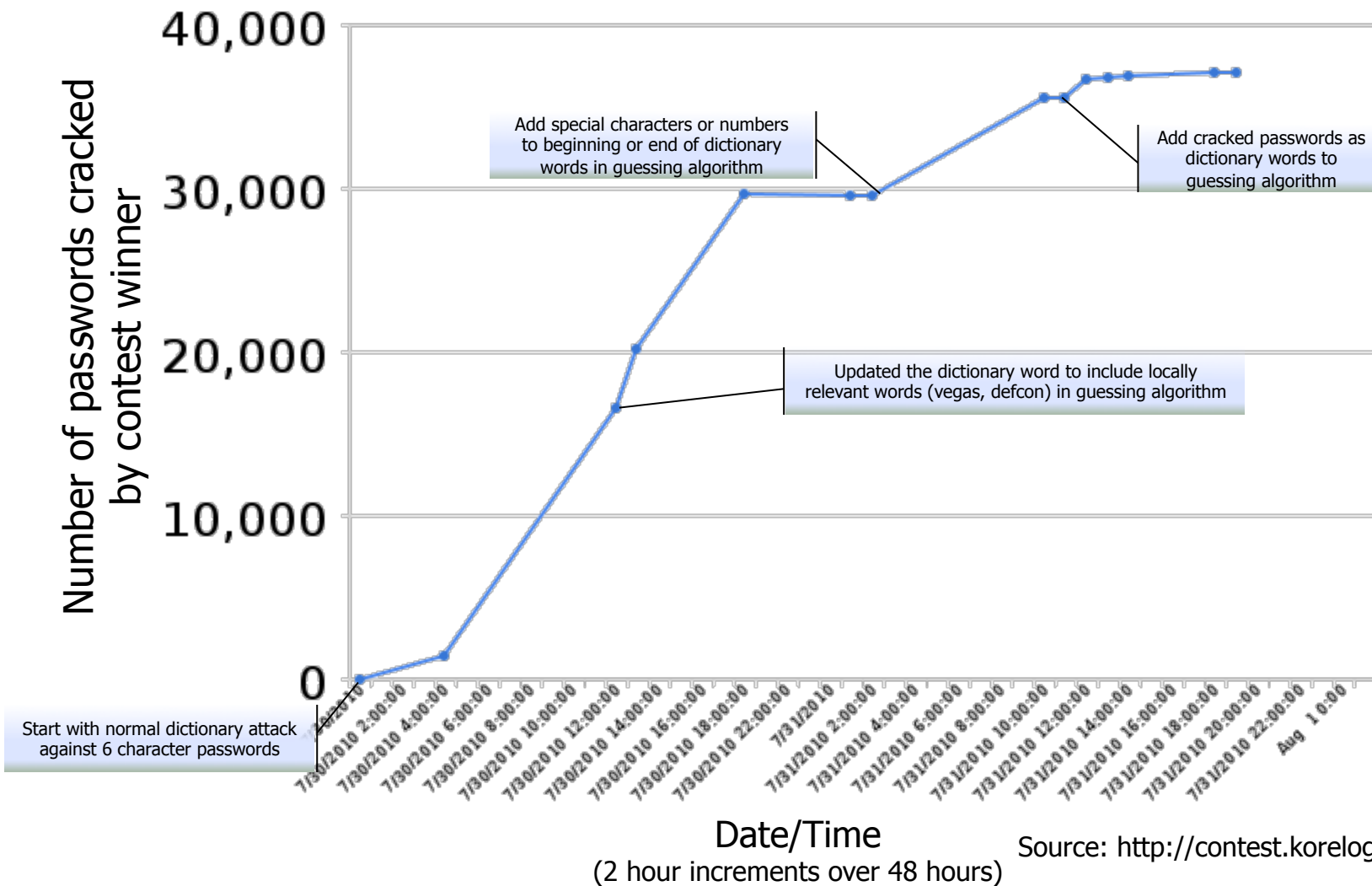
DoD IT Asset Type	DARPA Reference System	Non-DoD IT Asset Type	Hacked on	Credentials lost
NIPRnet	Windows DMSS	American Honda Motor Co.	27-Dec-10	4.9m
Laptop Encryption	Guardian Edge	• Bank of America	25-May-11	1.2m
DARPA VPN	Nortel	Carnegie Mellon University	8-Oct-07	19k
PDA	Blackberry/iPhone	Citigroup	27-Jul-10	30m
SIPRnet	Windows DSN	Clarkson University	10-Sep-08	245
JWICS	Windows DJN	• Countrywide Financial Corp.	2-Aug-08	17m
Source Selection	TFIMs, I2O BAA Tool	• Fidelity Investments	24-Sep-07	8.7m
Contract Management	GSA Advantage, SPS	Heartland Payment Systems	20-Jan-09	130m
Contract Invoicing	Wide Area Workflow	IBM	15-May-07	2k
Payroll	MyPay	Johns Hopkins Hospital	22-Oct-10	152k
• Benefits	Benefeds.com	SAIC	7-May-08	630k
HR	hr.dla.mil	Sony	27-Apr-11	12m
• Training	DAU	Stanford University	6-Jun-08	82k
• Collaboration	Defense Connect Online	TD Ameritrade Holding Corp.	14-Sep-07	6.5m
Financial System, Local	Momentum	Texas A&M University	9-Nov-08	13k
Financial System, Agency	DFAS	TJMax Stores	17-Jan-07	100m
• Credit Union	PFCU, NCU, etc.	U.S. Depart. of Veteran Affairs	14-May-07	103m
		U.S. Marine Corp – PSU research	26-Jul-07	208k
		• Visa, MasterCard, and American Express	27-Dec-10	4.9m

Source: www.privacyrights.org/data-breach



Patterns will always be hackable

Defcon 2010 Contest on Password Hacking of 53,000 passwords

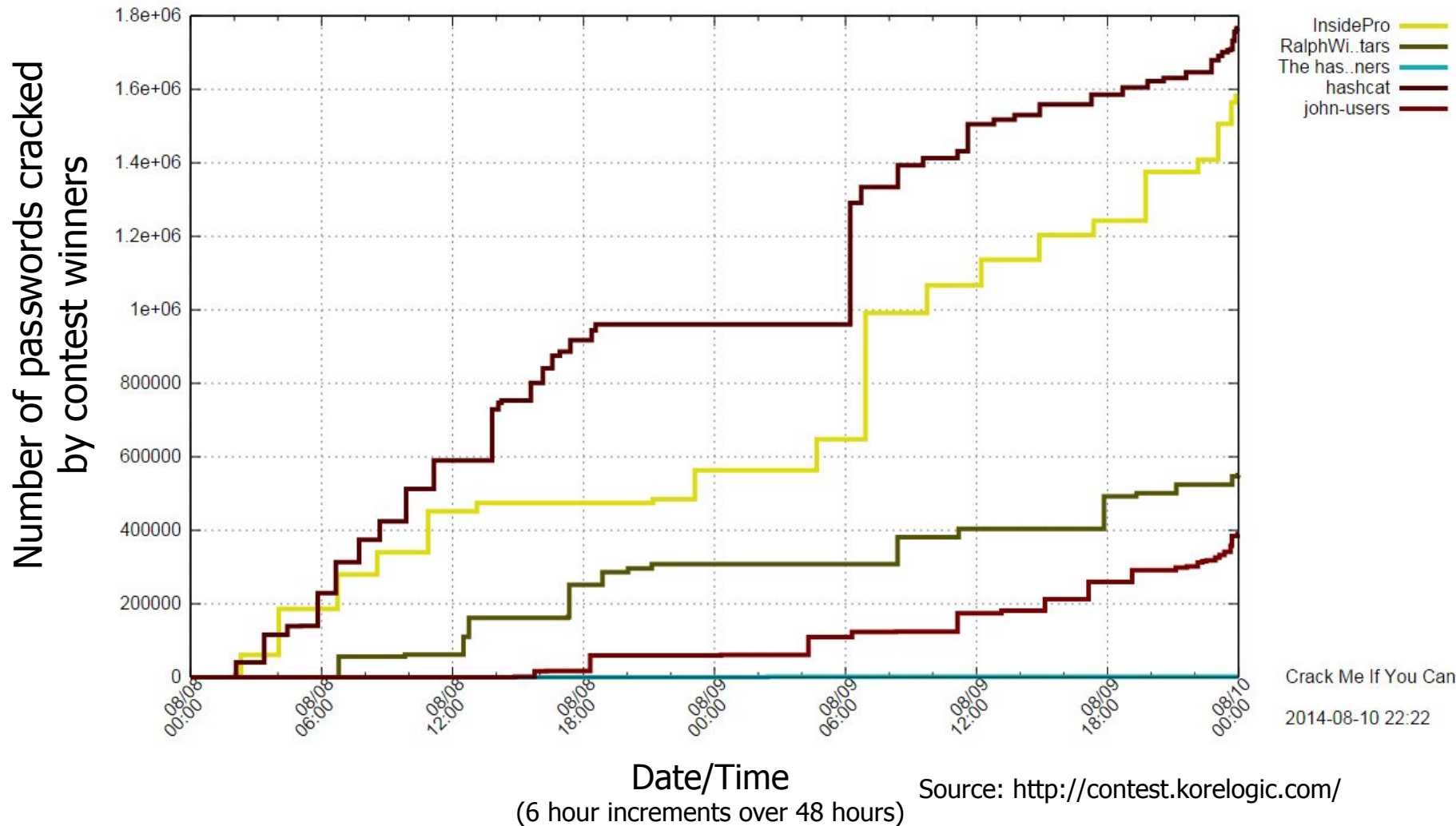




Patterns will always be hackable

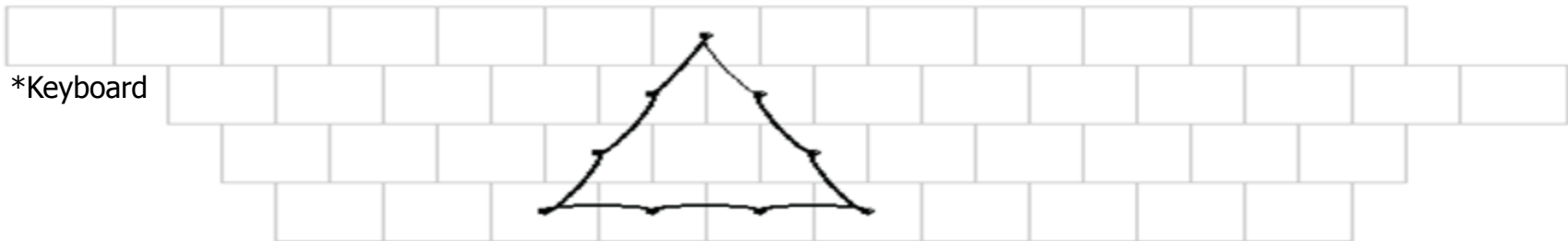
Defcon 2014 Contest on Password Hacking of 1.84m passwords

Pro Team Points

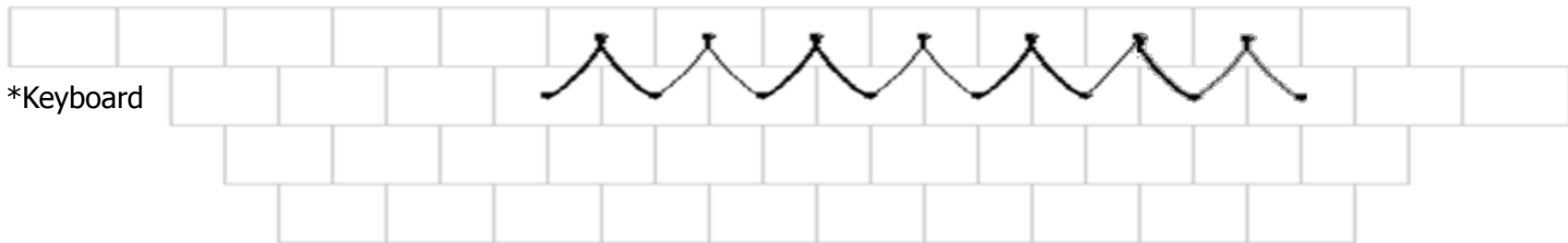




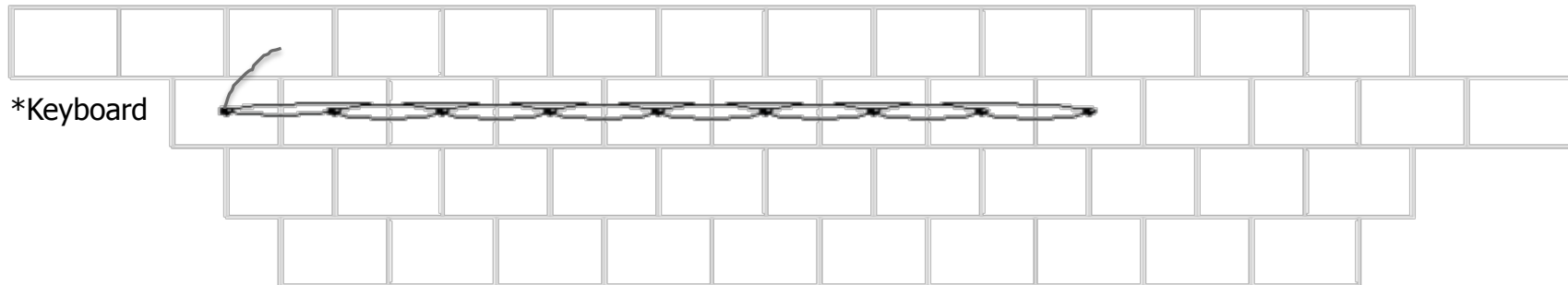
Why will passwords always be a problem?



6tFcVbNh^TfCvBn



R%t6Y&u8I(o0P-[



#QWqEwReTrYtUyI

Source: *Visualizing Keyboard Pattern Passwords*, US AF Academy 11 Oct, 2009

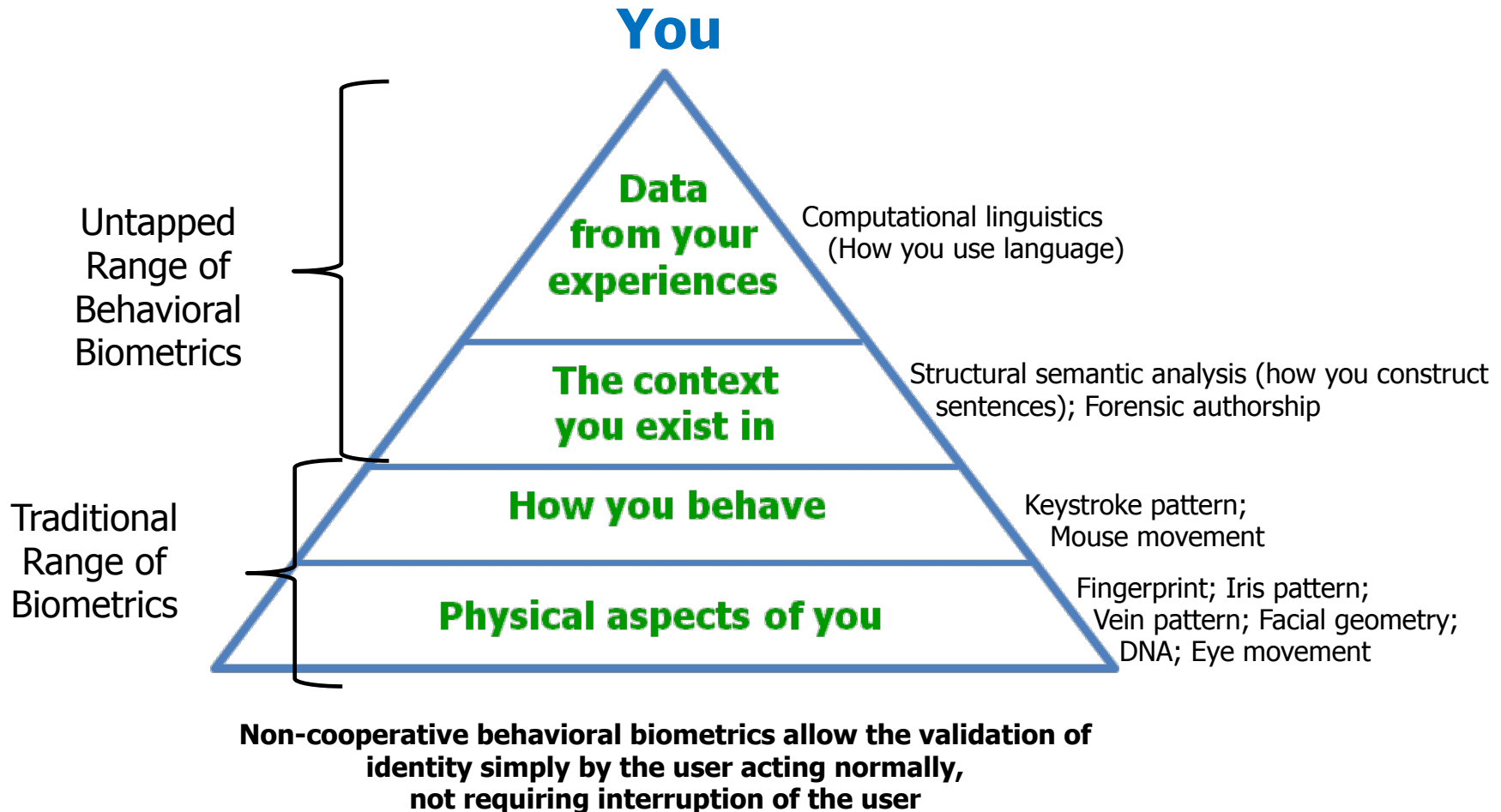


How do we move from proxies for you to the actual you?



The Active Authentication Program

A continuous authentication solution that takes the data available on a DoD computer system and makes an informed decision on the identity of the user of the computer

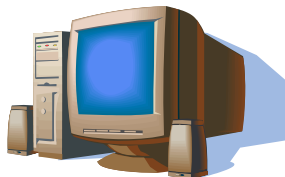




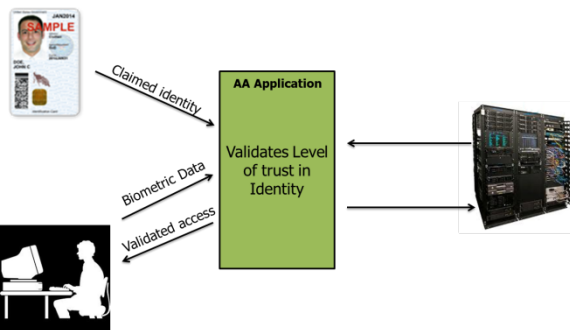
The Active Authentication Program Plan

- Phase 1 (started summer 2012):
 - Expand research in new biometric modalities (contracts June 2012-June 2013)
 - Focus on new types of biometric modalities that do not require additional sensors

Research new modalities and validate on human subjects



Develop a Platform that can interconnect biometrics



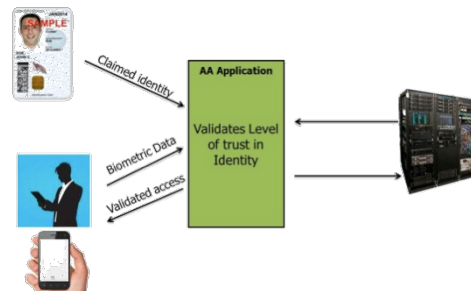
Transition to CERDEC/I2WD

- Phase 2 (Kick-off Sept 2013):
 - Expand research in new biometric modalities for mobile devices

Research new modalities and validate on human subjects



Develop a Platform that can interconnect biometrics



Transition

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Active Authentication Performers



Phase 1 Performers Research Focus (Desktop)

Performer	Research Area	Functional Area
Allure Security Technology, Inc	User Search behavior characteristics verified by decoys placed on the file system to detect masqueraders	How you look for information
Louisiana Tech University	Stylometry focused on keystroke dynamics, cognitive-linguistic features, and demographic classification	How you compose writing
Naval Research Labs	Identification of users through Web browsing behavior	Where you surf on the web (and when)
Behaviosec	Keystroke and mouse dynamics in context of applications	How you type in the context of applications you use
Coveros	User behavior patterns as seen from the operating system	How you interact with programs on your computer
Drexel University	Stylometry augmented by author classification and verification	How you construct thoughts in writing, as well as personal attributes of the writer
Naval Post Graduate School	Behavioral manifestations of human thought processes	How you make decisions
SWRI	Use covert games disguised as computer anomalies	How you deal with computer interruptions
University of Maryland	Information processing from computer screens	How you visually process information



Phase 2 Performers (Desktop & Mobile), page 1 of 2

Performer	Research Area	Functional Area
Allure Security Technology, Inc*	User Search behavior characteristics verified by decoys placed on the file system to detect masqueraders (D) incorporating additional modalities (eg. voice, image) (M)	How you look for information
Louisiana Tech University*	Stylometry focused on keystroke dynamics, cogni-linguistic features, and demographic classification (D) Context aware kinetic authentication (M)	How you construct thoughts (and personal attributes)
AMI Research	Fast Pattern Recognition Applied to Kinematic Gestures and Finger Images authentication (M)	Fingerprint identification from swipes
BAE Systems	Mobile perpetual authentication (M)	How your phone moves when you move
BehavioSec*	Type and swipe authentication (M)	How you type/swipe in the context of applications you use
Drexel University*	Stylometry integrated with eye tracking (M)	How you construct thoughts (and where you focus)
JPL	Detection of Heartbeat through wave changed in signals emitted from your mobile device (M)	Your heartbeat
Kryptowire	Power, touch, and movement authentication (M)	How the device changes during usage
Li Creative Tech	Human voice authentication using text dependent verification for point authentication and text independent verification for continuous authentication (M)	How you talk (static and continuous)



Phase 2 Performers (Desktop & Mobile), page 2 of 2

Performer	Research Area	Functional Area
SWRI*	Use covert games disguised as computer anomalies (M)	How you deal with computer interruptions
SRI International	Joint Physiological and Behavioral authentication mechanism extracting fine-grained anthropometric & behavioral signatures from the motion induced on the mobile (M)	How your phones moves when it is in use
University of Maryland*	"Visual fingerprint" through visual images of the operator acquired through the front camera, the back camera, and the screen recorder respectively. (M)	Passive facial recognition
New York Institute of Technology*	Spatial-temporal hand micro-movements and oscillations (hand movement, device orientation, and grasping patterns) during two modes of user interaction with the touch screen: (1) touch-burst and (2) cognitive-pause. (M)	The movements that occur when you are writing/ swiping
SRI International	Continuous authentication through natural speech and language activity performed by the user (spoken and written inputs) on mobile devices (M)	How your thought processes show up in your language use

(D) = Desktop solution
(M) = mobile solution
* = expansion on Phase 1 research

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