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# The NPS Identity Management Education Program (IMEP)

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22nd Annual FISSEA Conference  
Gaithersburg, Maryland

26 March 2009

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# Agenda



- IMEP Vision
- IMEP Overview
- Current Activities
- Future

# Why Identification is Needed



- Authenticate users to systems to control access to resources: CPU cycles, information, network, etc.
  - Deter miscreants by supporting the ability to know who they are
  - Attribute actions to individuals: the good and the bad
  - If systems are successfully attacked, recover “right” elements of the system
    - Software, hardware, and people must be authentic.
  - Security Controls: methods to address threats to systems
    - Identification plays a significant part in these controls
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# Identity and Security Controls



- Identity allows us to
    - Control access to resources, both physical and in cyber space
      - Facilities and spaces
      - Information at rest and in use
      - System resources: time, memory and information
    - Audit who has done what
    - Deter attackers who know that they will be identified
    - Locate bad actors
  - Reliably identify people and things
    - Who are you?
  - Reliably ensure that people and things are authentic
    - Are you who you say you are?
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# Identity Management



Identity Management (IdM) encompasses the entirety of the policies, procedures, technologies, and physical infrastructure employed to reliably bind one or more verifiable identifiers to an entity, so as to facilitate identification or authentication of that entity for purposes of law enforcement, forensic discovery, access control, or accountability of action.

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# Applications of IDM



- Access control
    - Physical and virtual spaces
    - Enables first responders
      - No masquerade by bogus responders
  - Customization
    - User preferences reflected in dynamic tailoring of interfaces
    - Interactions simplified and streamlined
  - Knowing who people are
    - Combination of field techniques and easily accessible databases
    - Support for law enforcement, health care, etc.
  
  - Problem: very new technology with wide range of policy, technical, legal, ethical, and social issues
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# Vision



Pervasive use of identity management will require a cadre of DoD and US Government personnel conversant in the technology

*Create a comprehensive Identity Management Education Program (IMEP) to serve the needs of the Federal Sector.*

# IMEP Field of Dreams



Over the past 18 months, the Naval Postgraduate School has built a comprehensive IDM education program

Sponsored by Biometrics Task Force

- Principle Components
  - Resident Graduate Education
    - Masters and PhD degrees in CS and IS
  - Certificate Program
    - Applicable to graduate degrees
  - Executive Education
  - Training and awareness
    - Innovative educational tools
  - Foster scholarly activities in IDM
  - Complementary faculty and student research

# Resident Graduate Education



- Masters
  - IDM specialization in selected existing academic disciplines
  - Current focus
    - Computer Science
    - Information Systems and Technology
    - Four required IDM courses
    - Other IDM and IDM-related electives
  - Expand to other appropriate disciplines
- PhD Degrees
  - Academic disciplines relevant to IDM
  - Student must take a set of IDM-specific courses
  - Dissertation topic must have an IDM focus
    - Scholarly work that contributes new knowledge
- Two types of students
  - Military officers and DOD Civilians
  - Scholarship for Service

# IMEP Scholarship for Service



- Model: Information Assurance Scholarship for Service program
  - Highly structured
  - MS CS degree in exchange for 2-yr commitment to Federal workforce
- Two year program to include 3-month internship
  - Internship focused on IDM
  - Thesis work with IDM topic
- Subsequent employment focused on IDM
- Benefits
  - Cadre of technical experts ready to join IDM workforce
    - Brings new talent to Federal sector
    - Acculturated to DOD through work at NPS and Internship

# Masters DOD Personnel



- Target students have undergraduate degrees in
  - Computer Science
  - Information Systems and Technology
  - Closely related field, e.g., Computer Engineering
- Admissions
  - GRE scores will ensure aptitude
  - Prospective students will go through formal application process
    - Transcripts, etc. required

# SFS: Whence IDM Personnel?



- Problem 1:
  - Inadequate talent in current workforce
- Problem 2:
  - Many 20-somethings have
    - aptitude
    - unfortunate undergraduate degree choices
- What NPS does well:
  - Two-year Technical Masters programs transform those with aptitude from one field to another
    - Music and political science to CS and engineering
- Solution: Scholarship for Service (SFS)
  - Special IDM education program
    - Brings new talent into DoD and Federal workforce

# IA SFS Program is Model



- Scholarship for Service in Information Assurance
- Highly successful
  - NPS a founding university - now in seventh year
- Sponsors: NSF and DHS
- Program
  - 18 months of classes and complete Masters thesis
    - Must have undergraduate Computer Science degree
  - Participants receive tuition scholarship and stipend
  - Three-month internship at a Federal agency
  - NPS starts clearance process early
  - U.S. Government and DoD acculturation
- Obligation: 2 yrs government service
- Graduates highly sought after by agencies
  - NSA, CIA, DMDC, SPAWAR, FDIC, national labs

# IMEP Resident Masters Students



Student support: DOD Military/Civilian  
Scholarship for Service

Provided by IMEP	Student Type	
	DOD	SFS
Tuition	X	X
Books	X	
Stipend		X
Computer Science		X
Information Science		X
Academic Counseling	X	X
Internship		X
Career Counseling		X
Job Search Support		X
Attend DOD IDM Conference	X	X
Duration (months)	18-24	21-27

# IMEP Certificate Program



- Four courses
  - IDM Policy
  - IDM Infrastructure
  - Biometrics
  - IDM Operations
- Course credit
  - On official NPS transcript managed by Registrar
  - Applicable to Masters degree, if accepted and matriculated
- Timing
  - Two courses per quarter - completed in six months
  - 2 weeks resident at NPS per quarter required

# Courses for 2009 Delivery



<b>Identity Management Infrastructure</b>	Covers a broad range of topics related to the standards, protocols, technology, and management infrastructure necessary to field an enterprise level identity management (IM) solution. Lecture and reading assignments span the gamut of IM issues; from low-level authentication protocol mechanics, to high-level identity federation initiatives.
<b>Biometrics</b>	Reviews the technical details of biometric identification and verification. The major biometric approaches (e.g., fingerprints, irises, etc.) are covered in detail with respect to acquisition of biometric data, matching techniques, anti-spoofing techniques, and current standards. The uses and limitations of biometrics are covered, as well as some of the legal, ethical, and privacy concerns of maintaining and using biometric data.
<b>Identity Management Policy</b>	Assesses any given Identity Management (IM) program's lifecycle (provision, distribute, operate, de-provision) against policy, laws, and regulations pertinent to the establishment, collection, distribution, and maintenance of identification credentials. Of particular interest is the proper scoping of IM organizational and technical policy so as to balance the often conflicting goals of security and privacy protection while maintaining and exchanging personally identifiable information (PII).
<b>Identity Management Operations</b>	Provides an operational overview of the tactical and strategic advantages derivable from a properly designed and operated Identity Management (IM) program. Generic descriptions of both identification and verification use cases are presented; followed by the review of several specific fielded IM programs as case studies. Repositories for identity information and the use of open standards for exchange of that information will be addressed. The use of context, error probabilities, and other factors will be analyzed as components of IM application within various operational environments

# Certificate Programs Approach



- Problem
  - Many people who could benefit from certificates cannot leave work for from 3 to 6 months
- Distance learning good, but ...
  - Students can continue job
  - Attrition can be huge
    - 50% in most DL for each class!
- Hybrid program
  - Students take 2 classes per quarter
  - Two weeks (beginning and end) are resident
  - Extensive use of technology for middle weeks
  - Attrition lowered to 10%
    - Numbers as expected level due to health, family, etc.

# Certificate Program Schedule



- FY 09: 4 cohorts of 25 students/cohort
    - 20 seat per cohort funded for military services
      - Other sponsors fill remaining seats @ \$17,231/seat
    - Cohorts
      - 29 September 2008 (completed on 3 April)
      - 12 January 2009 (classes in progress)
      - 30 March 2009 (students registered)
      - 13 July 2009
  - FY 10: Similar plan
    - More non-military seats available for sponsored attendance
    - Start dates are:
      - 28 September 2009
      - 11 January 2010
      - 29 March 2010
      - 12 July 2010
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# Executive Education



- 1.5-day workshops for high-level personnel
- Objectives
  - Learn importance and role of IDM in Federal Sector enterprise
  - Understand value of education of selected staff
  - Understand benefit of training and awareness for all personnel
- Includes discussions of
  - Policies and standards
  - Legal and ethical considerations
  - Required infrastructure
  - Applicable technologies
  - Dependencies on other enterprise activities

# Training and Awareness



- Provide IDM knowledge for appropriate use of IDM capabilities
  - Focus on concepts and understanding
- Answer typical questions
  - What is IDM?
  - Why is IDM important?
  - What is my role in IDM?
- Variety of capabilities
  - 20th century
    - Go to school
  - 21st century
    - Video games - CyberCIEGE
    - Web accessible

# CyberCIEGE



- Training and education tool in video game format
- Demonstrates consequences of choices
  - Player responsible for virtual world
    - Work spaces - offices, home
    - Virtual people
    - Information assets
    - Network
      - Sometimes player must build network
  - Game engine provides attacker
    - Motivation driven by value of assets
  - Player must protect assets from cyber threats
- Popular
  - Used extensively within Federal Government and DOD at a variety of commands
  - Educational organizations find it appealing to students
    - Colleges and universities
    - K-12, e.g., Rockland, MO will use district-wide

# IMEP Review Forum



- Objective
  - Guidance and feedback on educational programs
    - Ensure program meets needs of community
    - Identify areas for student research contributions
- When: Annually
- Who: IDM community leaders
  - Founding IMEP Review Forum membership
    - Mary Dixon, DMDC
    - Dr. Myra Gray, BTF
    - Richard Hale, DISA
    - Dave Wennergren, DASD & DoD Deputy CIO

# IMEP FY09 Activities



- Certificate Program: developed and ongoing
- PhD students
  - One PhD student in Operations Research
- Course Development
  - Refine and and new course development (Data Fusion) ongoing
- Executive Education
  - At least 2 workshops of 20-30 participants each
- Training and Awareness
  - IDM-enhanced CyberCIEGE completed 1 Oct 2009
- Review Forum
  - Date to be determined

# IMEP Future Possibilities



- Expansion of program to other areas
- Increase frequency of executive education
- Expand training and awareness
  - Identify new DOD venues for CyberCIEGE
- Repository for scholarly work on IDM
- Connection to research
  - Important for thesis topics

# IMEP Challenges



- A field of dreams can become a field of regret



- IDM is a new area
  - Demand for education will be enormous in a few years.
- The need for IDM education has been anticipated
  - Must be sustained
- Resident program has no students
  - Need IDM human capital strategy for NPS-resident student

# Questions and Contacts



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