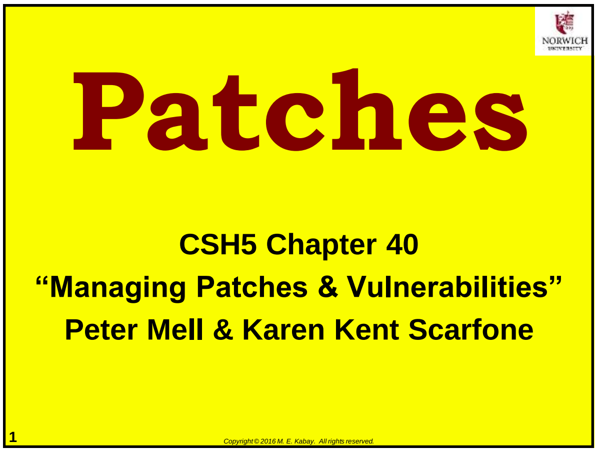
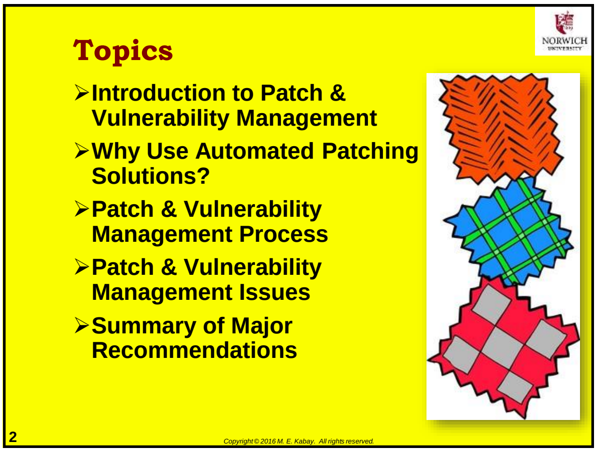


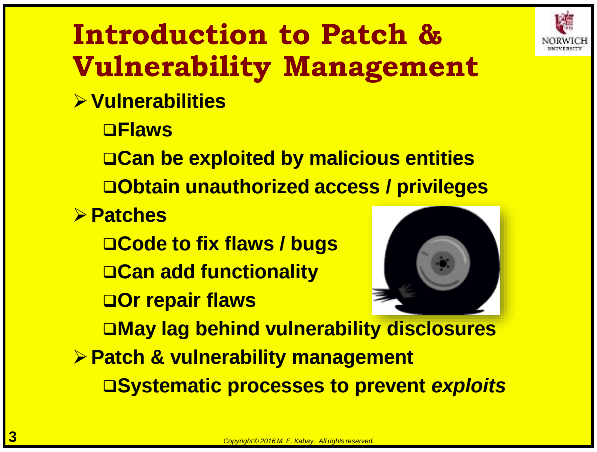
Patches

CSH5 Chapter 40
“Managing Patches & Vulnerabilities”
Peter Mell & Karen Kent Scarfone



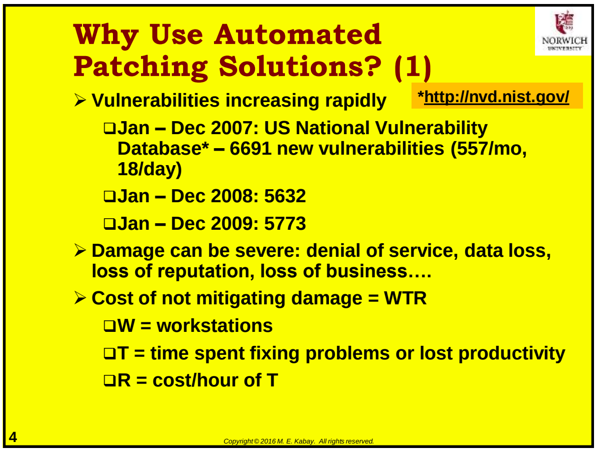
Topics

- Introduction to Patch & Vulnerability Management
- Why Use Automated Patching Solutions?
- Patch & Vulnerability Management Process
- Patch & Vulnerability Management Issues
- Summary of Major Recommendations



Introduction to Patch & Vulnerability Management

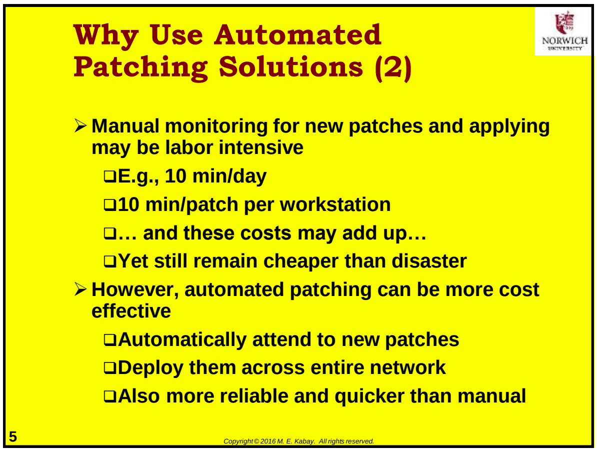
- Vulnerabilities
  - ❑Flaws
  - ❑Can be exploited by malicious entities
  - ❑Obtain unauthorized access / privileges
- Patches
  - ❑Code to fix flaws / bugs
  - ❑Can add functionality
  - ❑Or repair flaws
  - ❑May lag behind vulnerability disclosures
- Patch & vulnerability management
  - ❑Systematic processes to prevent *exploits*



Why Use Automated Patching Solutions? (1)

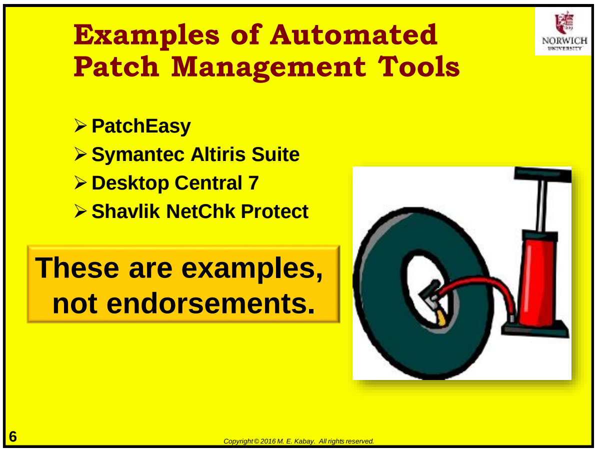
*http://nvd.nist.gov/

- Vulnerabilities increasing rapidly
  - ❑Jan – Dec 2007: US National Vulnerability Database* – 6691 new vulnerabilities (557/mo, 18/day)
  - ❑Jan – Dec 2008: 5632
  - ❑Jan – Dec 2009: 5773
- Damage can be severe: denial of service, data loss, loss of reputation, loss of business….
- Cost of not mitigating damage = WTR
  - ❑W = workstations
  - ❑T = time spent fixing problems or lost productivity
  - ❑R = cost/hour of T



Why Use Automated Patching Solutions (2)

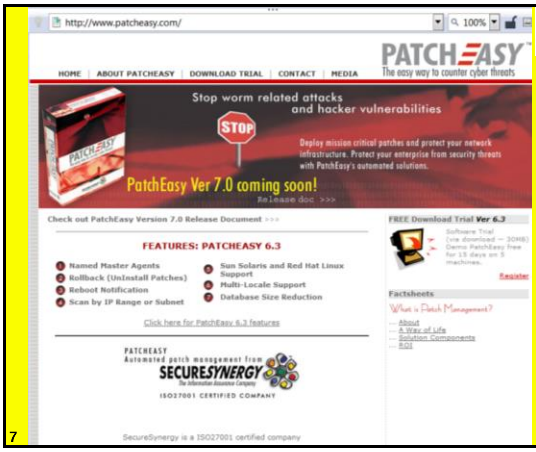
- Manual monitoring for new patches and applying may be labor intensive
  - ❑E.g., 10 min/day
  - ❑10 min/patch per workstation
  - ❑… and these costs may add up…
  - ❑Yet still remain cheaper than disaster
- However, automated patching can be more cost effective
  - ❑Automatically attend to new patches
  - ❑Deploy them across entire network
  - ❑Also more reliable and quicker than manual



Examples of Automated Patch Management Tools

- PatchEasy
- Symantec Altiris Suite
- Desktop Central 7
- Shavlik NetChk Protect

These are examples, not endorsements.



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Register

Factsheets

What is Patch Management?

- About
- A Way of Life
- Solution Components
- ROI

SecureSynergy is a ISO27001 certified company

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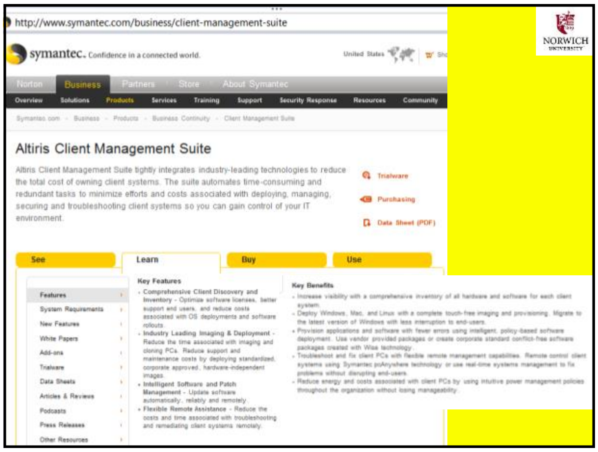

http://www.symantec.com/business/client-management-suite

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Symantec.com › Business › Products › Business Continuity › Client Management Suite

Altiris Client Management Suite

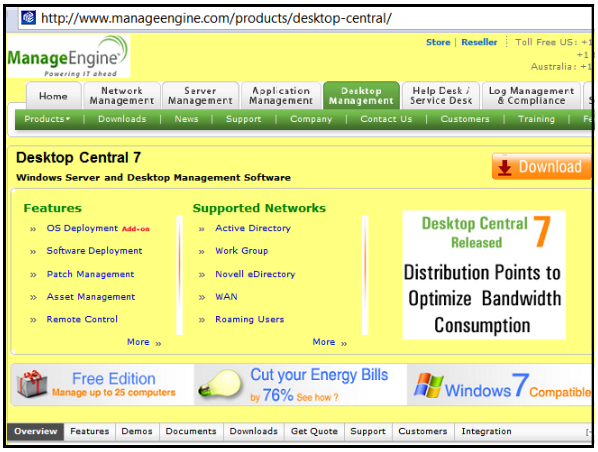
Altiris Client Management Suite tightly integrates industry-leading technologies to reduce the total cost of owning client systems. The suite automates time-consuming and redundant tasks to minimize efforts and costs associated with deploying, managing, securing and troubleshooting client systems so you can gain control of your IT environment.

Key Features

- Comprehensive Client Discovery and Inventory - Optimize software licenses, better support end users, and reduce costs associated with OS deployments and software rollouts
- Industry Leading Imaging & Deployment - Reduce the time associated with imaging and cloning PCs. Reduce support and maintenance costs by deploying standardized, corporate approved, hardware-independent images
- Intelligent Software and Patch Management - Update software automatically, reliably and remotely
- Flexible Remote Assistance - Reduce the costs and time associated with troubleshooting and remediating client systems remotely

Key Benefits

- Increase visibility with a comprehensive inventory of all hardware and software for each client system
- Deploy Windows, Mac, and Linux with a complete touch-free imaging and provisioning. Migrate to the latest version of Windows with less interruption to end-users.
- Provision applications and software with fewer errors using intelligent, policy-based software deployment. Use vendor provided packages or create corporate standard conflict-free software packages created with Wise technology
- Troubleshoot and fix client PCs with flexible remote management capabilities. Remote control client systems using Symantec pcAnywhere technology or use real-time systems management to fix problems without disrupting end-users
- Reduce energy and costs associated with client PCs by using intuitive power management policies throughout the organization without losing manageability



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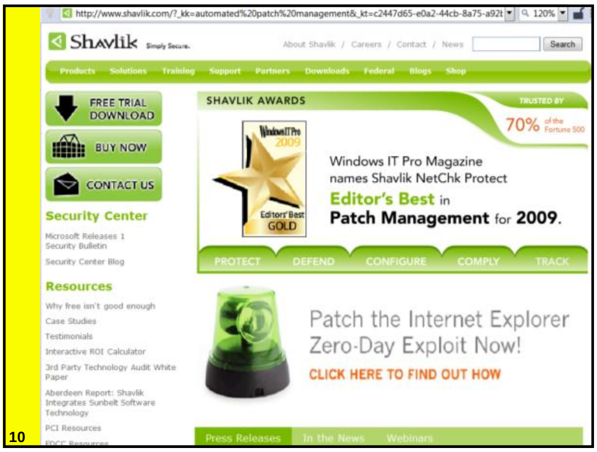

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Windows IT Pro Magazine names Shavlik NetChk Protect Editor's Best in Patch Management for 2009.

Security Center

- Microsoft Releases 1 Security Bulletin
- Security Center Blog

Resources

- Why free isn't good enough
- Case Studies
- Testimonials
- Interactive ROI Calculator
- 3rd Party Technology Audit White Paper
- Aberdeen Report: Shavlik Integrates Sunbelt Software Technology
- PCI Resources
- FDCC Resources

Patch the Internet Explorer Zero-Day Exploit Now!

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10

Patch & Vulnerability Management Process

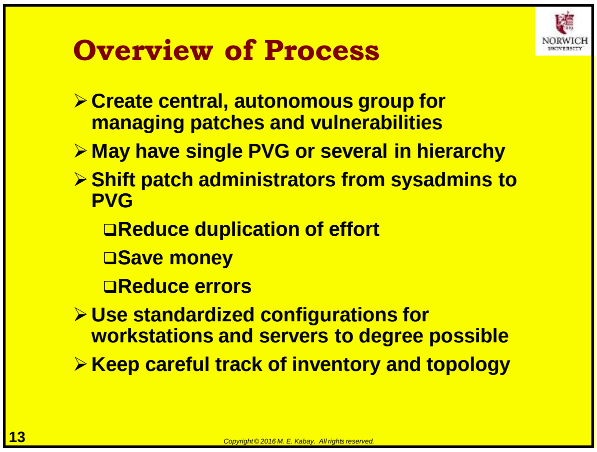
- ➢ Recommended Process
- ➢ Creating a System Inventory
- ➢ Monitoring for Vulnerabilities, Remediations & Threats
- ➢ Prioritizing Vulnerability Remediation
- ➢ Creating Organization-Specific Remediation DB
- ➢ Testing Remediations
- ➢ Deploying Vulnerability Remediations
- ➢ Distributing Vulnerability & Remediation Info to Admins
- ➢ Verifying Remediation
- ➢ Vulnerability Remediation Training

11

Recommended Process

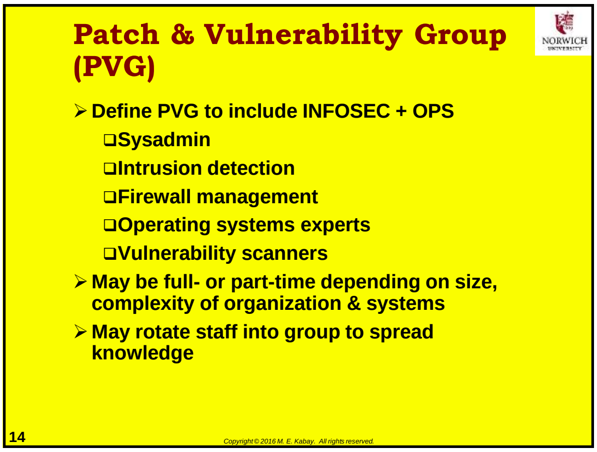
- ➢ Overview
- ➢ Patch & Vulnerability Group (PVG)
- ➢ System Administrators (Sysadmins)

12



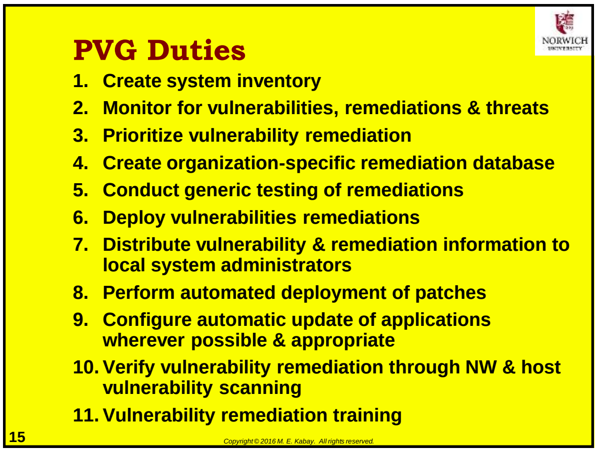
Overview of Process

- ➢ Create central, autonomous group for managing patches and vulnerabilities
- ➢ May have single PVG or several in hierarchy
- ➢ Shift patch administrators from sysadmins to PVG
  - □Reduce duplication of effort
  - □Save money
  - □Reduce errors
- ➢ Use standardized configurations for workstations and servers to degree possible
- ➢ Keep careful track of inventory and topology



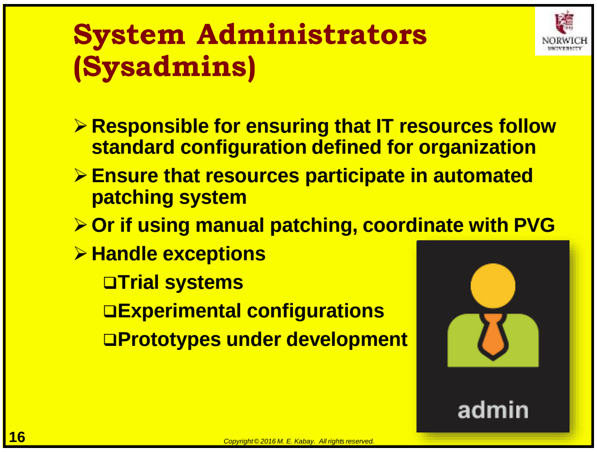
Patch & Vulnerability Group (PVG)

- ➢ Define PVG to include INFOSEC + OPS
  - □Sysadmin
  - □Intrusion detection
  - □Firewall management
  - □Operating systems experts
  - □Vulnerability scanners
- ➢ May be full- or part-time depending on size, complexity of organization & systems
- ➢ May rotate staff into group to spread knowledge



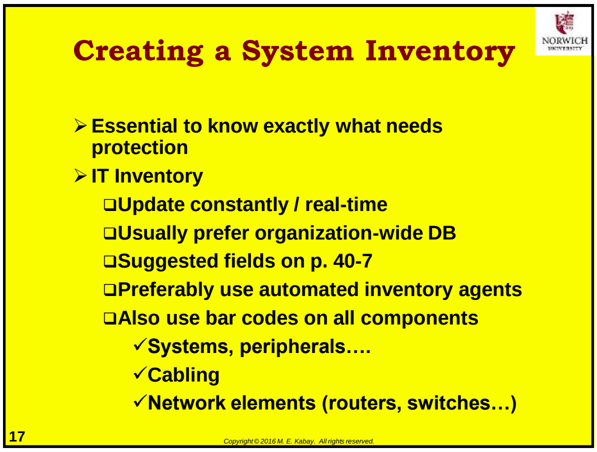
PVG Duties

1. Create system inventory
2. Monitor for vulnerabilities, remediations & threats
3. Prioritize vulnerability remediation
4. Create organization-specific remediation database
5. Conduct generic testing of remediations
6. Deploy vulnerabilities remediations
7. Distribute vulnerability & remediation information to local system administrators
8. Perform automated deployment of patches
9. Configure automatic update of applications wherever possible & appropriate
10. Verify vulnerability remediation through NW & host vulnerability scanning
11. Vulnerability remediation training



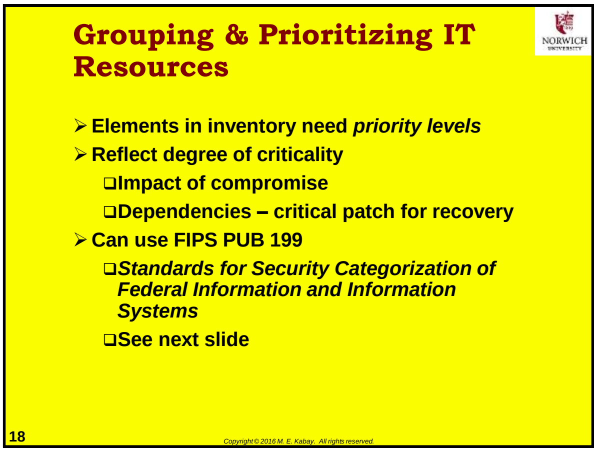
System Administrators (Sysadmins)

- ➢ Responsible for ensuring that IT resources follow standard configuration defined for organization
- ➢ Ensure that resources participate in automated patching system
- ➢ Or if using manual patching, coordinate with PVG
- ➢ Handle exceptions
  - □Trial systems
  - □Experimental configurations
  - □Prototypes under development



Creating a System Inventory

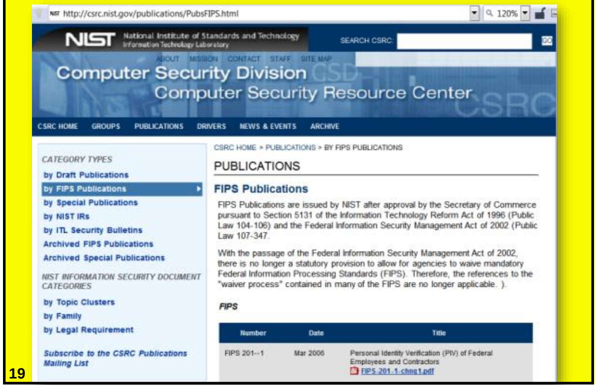
- ➢ Essential to know exactly what needs protection
- ➢ IT Inventory
  - □Update constantly / real-time
  - □Usually prefer organization-wide DB
  - □Suggested fields on p. 40-7
  - □Preferably use automated inventory agents
  - □Also use bar codes on all components
    - ✓Systems, peripherals….
    - ✓Cabling
    - ✓Network elements (routers, switches…)



Grouping & Prioritizing IT Resources

- ➢ Elements in inventory need *priority levels*
- ➢ Reflect degree of criticality
  - □Impact of compromise
  - □Dependencies – critical patch for recovery
- ➢ Can use FIPS PUB 199
  - □*Standards for Security Categorization of Federal Information and Information Systems*
  - □See next slide

Get to Know the NIST CSRC



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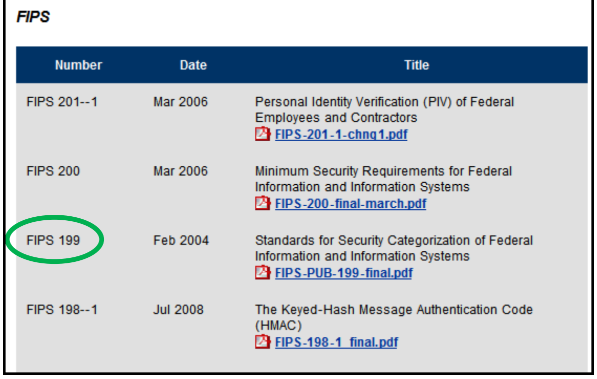
With the passage of the Federal Information Security Management Act of 2002, there is no longer a statutory provision to allow for agencies to waive mandatory Federal Information Processing Standards (FIPS). Therefore, the references to the "waiver process" contained in many of the FIPS are no longer applicable.).

FIPS

Number	Date	Title
FIPS 201--1	Mar 2006	Personal Identity Verification (PIV) of Federal Employees and Contractors FIPS-201-1-chng1.pdf

19

NIST CSRC: FIPS 199



FIPS

Number	Date	Title
FIPS 201--1	Mar 2006	Personal Identity Verification (PIV) of Federal Employees and Contractors FIPS-201-1-chng1.pdf
FIPS 200	Mar 2006	Minimum Security Requirements for Federal Information and Information Systems FIPS-200-final-march.pdf
FIPS 199	Feb 2004	Standards for Security Categorization of Federal Information and Information Systems FIPS-PUB-199-final.pdf
FIPS 198--1	Jul 2008	The Keyed-Hash Message Authentication Code (HMAC) FIPS-198-1_final.pdf

Use of IT Inventory & Scope of Related Duties

- Inventory is foundation of PVG operations
  - ❑Ensure PVG knows which vulnerabilities to look for & to respond to
  - ❑Checklist for ensuring that all vulnerable systems remediated
- Publication allows sysadmins to spot missing or incorrect components & fix DB
- Managers, security personnel can also use information productively
  - ❑But restrict access according to permissions as appropriate
  - ❑E.g., division / department / workgroup

21

Monitoring for Vulnerabilities, Remediations & Threats

- Types of Security Concerns
  - ❑Vulnerabilities
  - ❑Remediations
  - ❑Threats (exploits, malware)
- Be on lookout for unauthorized…
  - ❑Hardware
  - ❑Software
  - ❑Configurations

22

Tools for Monitoring Vulnerabilities, Remediations & Threats

- Vendor Websites & mailing lists (product-specific newsletters)
- Third-party Web sites (e.g., SANS, CERT-CC®, various alert newsletters)
- Vulnerability scanners
- Vulnerability databases
  - ❑National Vulnerability Database
- Enterprise patch management tools
- Other notification tools

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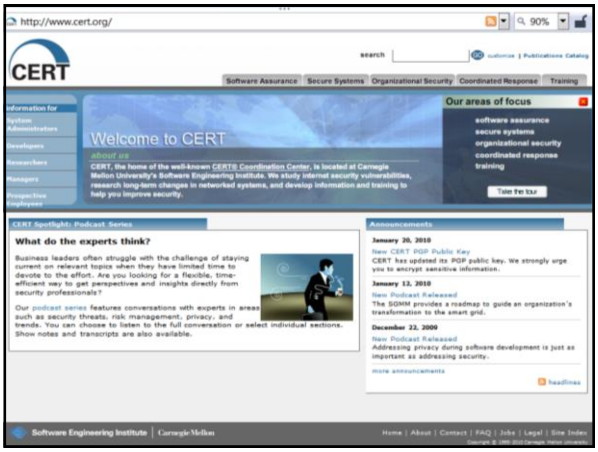

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about us

CERT, the home of the well-known CERT® Coordination Center, is located at Carnegie Mellon University's Software Engineering Institute. We study internet security vulnerabilities, research long-term changes in networked systems, and develop information and training to help you improve security.

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Announcements

January 20, 2010
New CERT PGP Public Key
CERT has updated its PGP public key. We strongly urge you to encrypt sensitive information.

January 12, 2010
New Podcast Released
The SGMM provides a roadmap to guide an organization's transformation to the smart grid.

December 22, 2009
New Podcast Released
Addressing privacy during software development is just as important as addressing security.

more announcements

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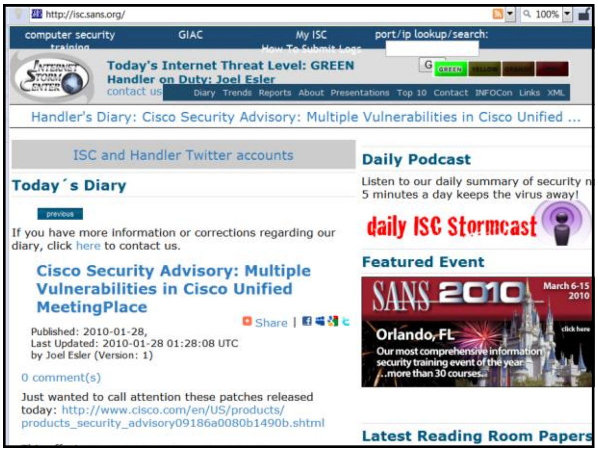

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If you have more information or corrections regarding our diary, click here to contact us.

Cisco Security Advisory: Multiple Vulnerabilities in Cisco Unified MeetingPlace

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Published: 2010-01-28,
Last Updated: 2010-01-28 01:28:08 UTC
by Joel Esler (Version: 1)

0 comment(s)

Just wanted to call attention these patches released today: http://www.cisco.com/en/US/products/products_security_advisory09186a0080b1490b.shtml

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NewScale spruces IT storefrontware
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Ellison to recruit thousands for Sun integration army
Linux needs to grow up

Music and Media 27 Jan 23:01
Apple's iPad - fat iPhone without the phone
Comment The tablet that can't multitask

Security 27 Jan 21:53
IE Windows vuln coughs up local files
One click bares entire C drive

Music and Media 27 Jan 21:48
eBay refiddles with auction fees
Free listings, higher sale charge

South African
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Prioritizing Vulnerability Remediation

- Determine significance of threat or vulnerability
- Determine existence, extent & spread of related malware & exploits
- Determine risks involved in applying patch or nonpatch remediation
  - ❑Use external sources of information
  - ❑PVG is not a research group

Creating Organization-Specific Remediation DB

- Enterprise patch-management tools establish DB for known inventory in organization
- May have to maintain own small DB or manual list of exceptions
- Include threat assessment information
  - ❑Useful in business-continuity (BC) & disaster recovery planning (DRP)
- Include copy of every patch used or planned
  - ❑Can avoid problems of rush on Website

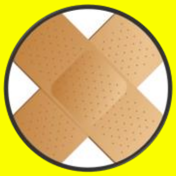
Testing Remediations

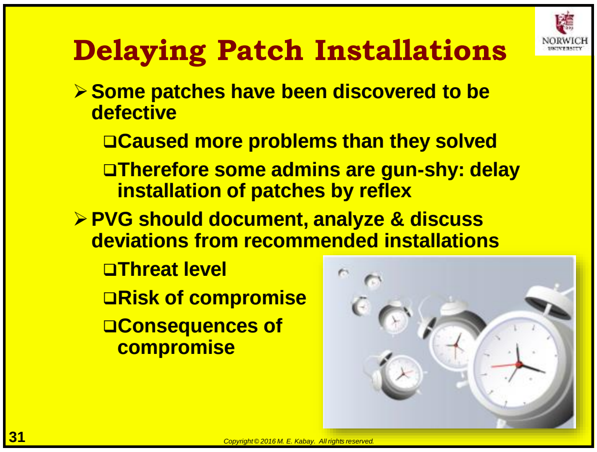
- Standardized configurations allow easy testing of patches on isolated systems
  - ❑Keep standard for test & development only
  - ❑Avoid danger of installing bad patch on production systems
- Eliminate need for redundant, costly testing on all local systems
- But critically important to maintain validity of system *image* so that patches really going to standard configs!
- *See extensive list of precautions for testing on pp 40.12 – 40.13 of text*

Deploying Vulnerability Remediations

3 primary methods of remediation

- Applying security patch (“fix” or “hotfix”)
  - ❑Modifies defective code
  - ❑Be sure to download only from safe sites – vendor site usually safe
- Configuration adjustment
  - ❑Change parameter(s); e.g.,
    - ✓Disabling services
    - ✓Changing firewall settings
    - ✓Altering router settings
    - ✓Modifying registry settings
- Software removal
  - ❑Generally advised to run only essential processes / services on production systems





Delaying Patch Installations

- ➢ Some patches have been discovered to be defective
  - ❑Caused more problems than they solved
  - ❑Therefore some admins are gun-shy: delay installation of patches by reflex
- ➢ PVG should document, analyze & discuss deviations from recommended installations
  - ❑Threat level
  - ❑Risk of compromise
  - ❑Consequences of compromise

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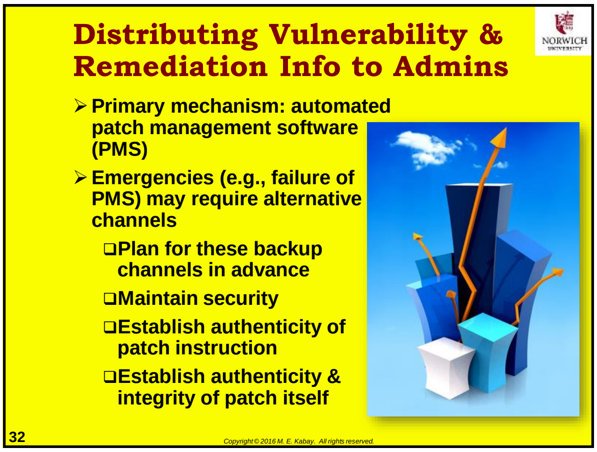
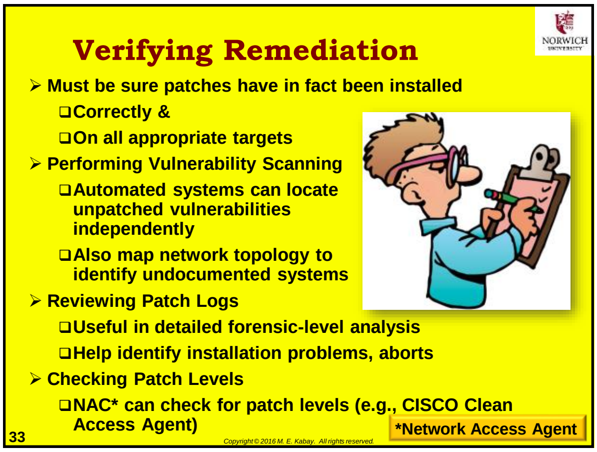


Distributing Vulnerability & Remediation Info to Admins

- ➢ Primary mechanism: automated patch management software (PMS)
- ➢ Emergencies (e.g., failure of PMS) may require alternative channels
  - ❑Plan for these backup channels in advance
  - ❑Maintain security
  - ❑Establish authenticity of patch instruction
  - ❑Establish authenticity & integrity of patch itself

32



Verifying Remediation

- ➢ Must be sure patches have in fact been installed
  - ❑Correctly &
  - ❑On all appropriate targets
- ➢ Performing Vulnerability Scanning
  - ❑Automated systems can locate unpatched vulnerabilities independently
  - ❑Also map network topology to identify undocumented systems
- ➢ Reviewing Patch Logs
  - ❑Useful in detailed forensic-level analysis
  - ❑Help identify installation problems, aborts
- ➢ Checking Patch Levels
  - ❑NAC* can check for patch levels (e.g., CISCO Clean Access Agent)

*Network Access Agent

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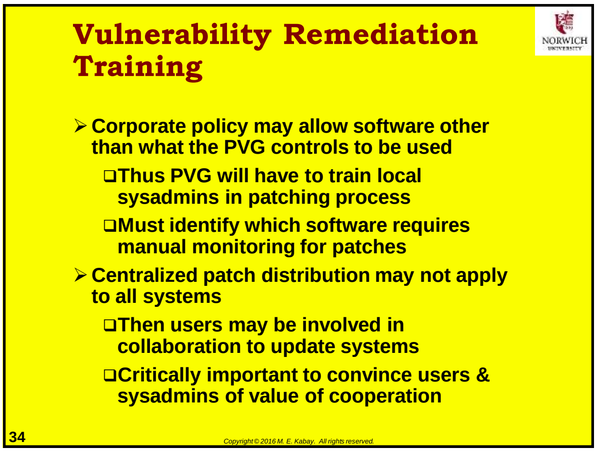

Vulnerability Remediation Training

- ➢ Corporate policy may allow software other than what the PVG controls to be used
  - ❑Thus PVG will have to train local sysadmins in patching process
  - ❑Must identify which software requires manual monitoring for patches
- ➢ Centralized patch distribution may not apply to all systems
  - ❑Then users may be involved in collaboration to update systems
  - ❑Critically important to convince users & sysadmins of value of cooperation

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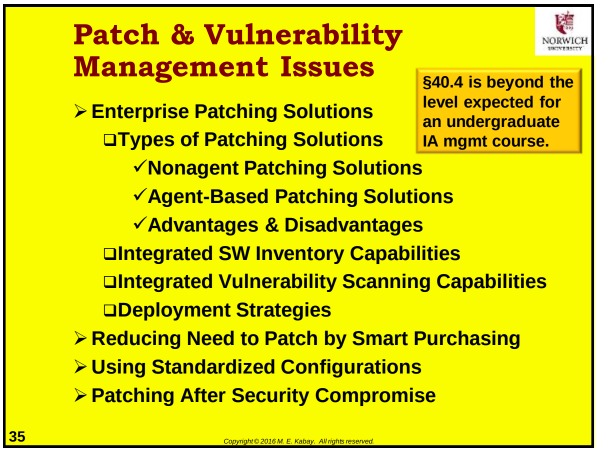

Patch & Vulnerability Management Issues

§40.4 is beyond the level expected for an undergraduate IA mgmt course.

- ➢ Enterprise Patching Solutions
  - ❑Types of Patching Solutions
    - ✓Nonagent Patching Solutions
    - ✓Agent-Based Patching Solutions
    - ✓Advantages & Disadvantages
  - ❑Integrated SW Inventory Capabilities
  - ❑Integrated Vulnerability Scanning Capabilities
  - ❑Deployment Strategies
- ➢ Reducing Need to Patch by Smart Purchasing
- ➢ Using Standardized Configurations
- ➢ Patching After Security Compromise

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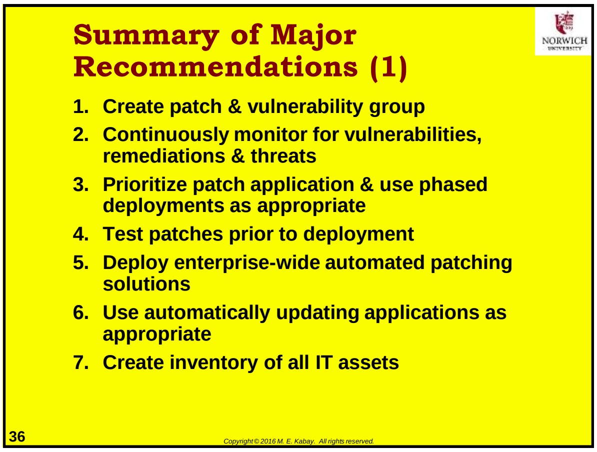

Summary of Major Recommendations (1)

1. Create patch & vulnerability group
2. Continuously monitor for vulnerabilities, remediations & threats
3. Prioritize patch application & use phased deployments as appropriate
4. Test patches prior to deployment
5. Deploy enterprise-wide automated patching solutions
6. Use automatically updating applications as appropriate
7. Create inventory of all IT assets

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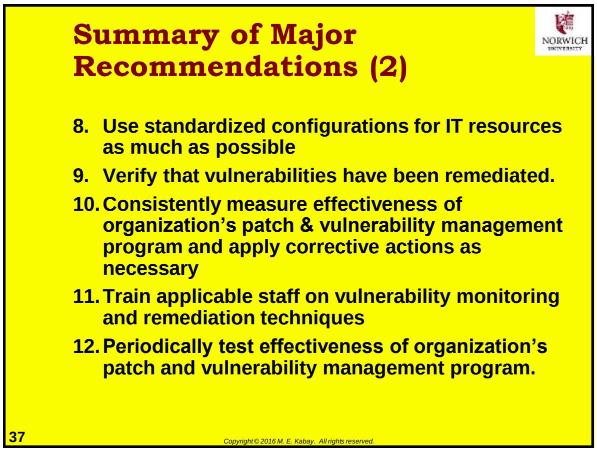

Summary of Major Recommendations (2)

8. Use standardized configurations for IT resources as much as possible
9. Verify that vulnerabilities have been remediated.
10. Consistently measure effectiveness of organization’s patch & vulnerability management program and apply corrective actions as necessary
11. Train applicable staff on vulnerability monitoring and remediation techniques
12. Periodically test effectiveness of organization’s patch and vulnerability management program.

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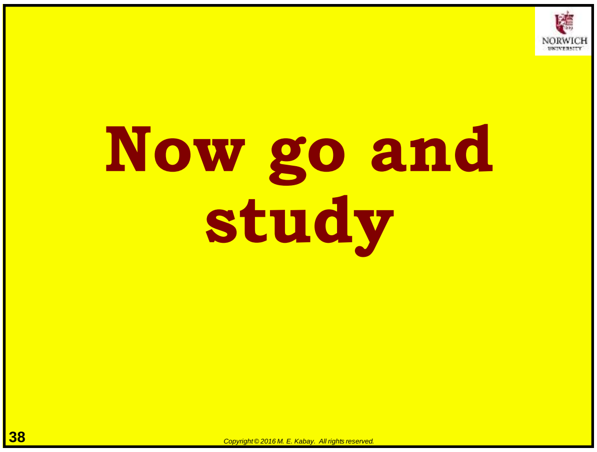

Now go and study

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