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LLNL-CONF-412198

How to meet the NAPs and still have a life

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April 15, 2009

DOE Cyber Security Conference
Henderson, NV, United States
May 11, 2009 through May 15, 2009

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How to meet the NAPs and still have a life:

LLNL Site Security Component Library

LLNL Security Plan Policy

May 13, 2009

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This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344

LLNL-CONF-412198

The Problem

Cyber Security Program
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- Whether following NNSA Policy (NAP) 14.1-C,14.2-C, Department of Energy (DOE) 205.1-4, DOE 205.1-7 – all derive from National Institute of Standards and Technology (NIST) 800-53A controls
- Lots of details, lots of testing, lots of policy
- How to solve the problem and stay operational?

Keys to our success

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- Ah-ha moments:
  - Site Security Component Library (SSCL)
  - NAP Policy Document – Security Plan Policy (SPP)
- Success Factors
  - Use of “Core Services” – plans outsource to these
  - Separate the Supervisory Control and Data Acquisition (SCADA) systems
  - Leverage automation wherever possible
  - Partner with others – benefit from their experience
  - Continuity of Operations (COOP)/Business Impact Analysis (BIA) – follow FEMA model/processes

FY2009 LLNL ISSP plan hierarchy

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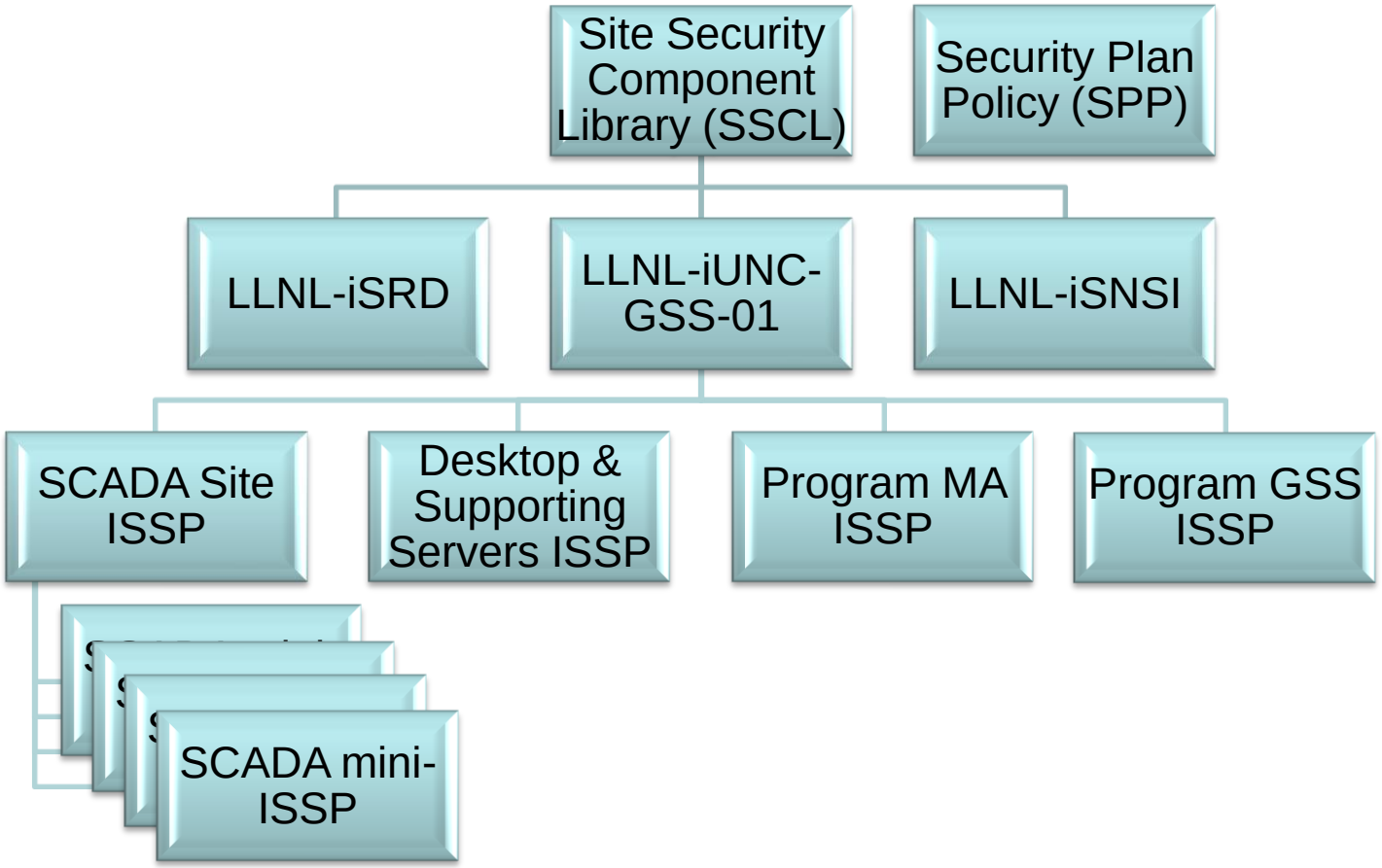

Site Security Component Library (SSCL)

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- NAPs require all components run a secure (known) pedigreed configuration
- At a site like LLNL there are many configurations, some necessary for mission objectives, others because “we can”
- The ah-ha moment:
  - Create a library, with configuration management, processes/etc. to record and document approved configurations
  - The number of entries is an IT decision, not a Cyber Security decision

SSCL Defined

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- Each library entry (configuration) includes
  - Description and pedigree (NIST, DISA, NSA, etc.)
  - Compliance testing script (SCAP, Perl, etc.) with repeatable verifiable results
  - List of NAP security controls met
  - Identification of deviations from pedigree and/or NAP requirements
  - Certification information
    - Who and when certified
      - If CSSM determines configuration outside current risk boundary, approval escalated to DAA

SSCL Defined

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- Process developed for submission, validation and maintenance of configurations
  - Updates could result in new library entries
    - Entry lifecycle needs to be decided
  - “Anyone” willing to follow the process can submit entry – allows for program needs and adjustment
  - Configurations could be derived from other entries

SSCL Acceptance

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- Process/oversight/buy-in
  - Develop Concept of Operations document
    - Present to management/others for buy-in
      - CIO, CSSM, DAA
    - Becomes base reference
  - Appoint project manager to implement the SSCL
  - Build SSCL team
    - SSCL Librarian
    - IT – technical expertise
    - Cyber Security – technical and security expertise
  - Build approval process

SSCL Library Implementation

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- Select a target to prototype the implementation
  - Run your first target to ground
- Build initial (subsequent) entries based on existing deployed configurations
  - Pedigree is key – where did it come from?
  - A good test that shows compliance with pedigree/library entry means a system is built to that specification
- Build database to record compliance
  - Ideally testing tools use automation to update
  - Report correlates with configuration management

SSCL Initial Library

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- LLNL initial SSCL entries:
  - Windows XP
  - OS X
  - Windows Server 2003
  - OS X Server
  - RHEL 4/5 Workstation
  - RHEL 5 Server

SSCL Compliance

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- SSCL Automation tools
  - Cross platform/cross technology
  - Run SCAP, other compliance testing scripts
  - Candidate solutions:
    - McAfee Policy Auditor
    - Tenable Security Center
    - LANDesk

SSCL Compliance

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- SSCL Testing
  - Compliance validation (CM-6) scripts run by program/IT staff as frequently as required to maintain compliance – may click “fix problems”
  - Compliance validation audit scripts run by Certification Agent (read-only) to ensure on-going compliance – no changes possible
- SSCL Reporting
  - Tool test results will be combined with LLNL Configuration Management Database (CMDB) asset information
  - Report by FISMA system planned

NAP Policy – Security Plan Policy (SPP)

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- Each control can be converted to a policy & procedure
  - Policy is simple and straight forward
  - Creates a single reference for policy and procedure
  - Policy answers the question of “Where is it written”
- Create a standard or default procedure to meet each control.
  - First implementation or procedure is the institutional answer
  - Programs may elect to create a different procedure
    - Both institutional and program procedure follow same approval process

NAP Policy – SPP Wins

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- Simplifies security plan submission
  - Individual security plan only includes security control information when NOT using institutional answer
  - Control implementation library and policy shared with DAA for approval and buy-in
- Security Testing
  - System will be tested against institutional or local implementation for each control
  - Working from a common (institutional) library, testing is known and simplified due to familiarity

NAP Policy – SPP Implementation

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- Possible to be bogged down in process for wide acceptance.
- Start simple
  - Start with easy control families – AT, AU, PS
  - Involve IT staff for implementation/procedure
  - Some controls are “free” or “dictated”
    - Personnel policy (screening/hiring/clearance)
    - Physical protections (guns/guards/gates)
    - Procurement policy
    - Information Security and Classification
  - Core services implement some controls for all

Core Services

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- Core services developed for common answers to controls
- Core services meet certain NAP controls
  - Systems subscribing to those services get associated controls for “free” – no additional paperwork
  - Core services aid common solution delivery

Core services for LLNL Institutional Unclassified (iUNC) ISSP

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- 5ESS
- Access account management
- Active Directory
- Blue Network Infrastructure
- Blue Coat (Web Proxy)
- CMDB
- Captive Portal Network
- DNS
- Email w/security services
- Encase
- Entrust PKI
- EOR
- Firewall
- Green Collaboration Environment
- ICS Audio/Web Conferencing
- Identity Management
- Intrusion Detection System (IDS)
- Institutional Instant Messaging (IIM)
- OS Imaging/Installation
- Intrusion Prevention System (IPS)
- IPSec VPN
- IP Telecom Services
- IT Service Management
- LANDesk
- MS (AD) PKI
- Network Time
- Open Terminal Service (OTS)
- PAC Management
- Red Hat Network (RHN)
- Routers & Switches
- SAV
- SSL VPN
- Two-Factor authentication
- Vulnerability Scanning
- Wireless
- Wireless IDS

SCADA Systems

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- DOE has SCADA guidelines
- NIST 800-82 defines SCADA controls
  - Cannot operate like common computers
  - Often isolated and/or protected
  - Often run-to-failure OS or components
    - Update/upgrade usually very expensive
- Developed a single Site Plan for SCADA systems
  - Developed mini-ISSP for each SCADA system

Automation

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- Automate and centralize as much as possible
  - Tools feed data to CMDB and Data Warehouse for reporting
  - User provisioning (IdM) tied to badge issuance/revocation
  - IdM feeds Active Directory, LDAP, Oracle OID and other sources of authentication
  - Manage passwords from central controls for consistency
  - Centralized ingress/egress/proxy controls, with one deviation management process.

Automation (cont)

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- Site license automation tools to achieve common solutions:
  - SPLUNK for audit log reduction, reporting and retention
  - Tenable Security Center to view vulnerabilities
  - LANDesk (IT users)
    - SCAP and custom compliance checks and fixes
    - Patch deployment and validation
  - McAfee Policy Auditor (C&A users)
    - to view configuration compliance (C &A users)
- ➢ Separate your IT and your certification automation tools.

Partner with others

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- DOE-CIRC
  - External web application scanning/testing
  - Network traffic monitoring/anomaly detection
- DOE enterprise licenses
  - McAfee Policy Auditor
  - ISS
  - Etc.
- Other Labs
  - Find someone similar and leverage their answers
- Other agencies
  - FEMA COOP/BIA planning/templates

FEMA COOP/BIA

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- Use FEMA model for contingency planning and recovery
  - Core services tiered based on this model
  - Each core service has a BIA/COOP plan
  - Each ISSP has a BIA/COOP plan
  - These build to site IT BIA/COOP plan
- LLNL emergency management already expert in COOP
  - Expert in physical COOP processes
  - Learning to be expert in IT COOP processes
  - Use of joint table-top exercises very educational

Where are we?

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- iUNC plan submitted to DAA
- First SCADA sub-plan submitted to DAA (“Astro” – LLNL trunked radio system)
- LLNL SPP submitted to LLNL CIO policy board
- Cyber Security Program learning to say how rather than yes or no

What's Next?

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- Waiting for DAA response to submitted plans
- Populate SSCL with configurations
- Implement McAfee Policy Auditor
- Policy board approvals
- Management agreement with institutional/local controls

Questions?

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