Lessons Learned Using SCAP Tools

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Agenda

1. Lessons learned - background
2. Lessons learned – preparation
3. Lessons learned – for a “typical” agency
4. Automation, Aggregation, and Blocking & Tackling
5. Closing recommendations

Lessons Learned – some background

- First there was CVE – just had 10 year anniversary!
  - CVE-1999-0001 submitted on **June 06, 1999**
  - Description: "ip_input.c in BSD-derived TCP/IP implementations allows remote attackers to cause a denial of service (crash or hang) via crafted packets. "
- Then an XML language was added (OVAL) for "checks"
  - Government sponsorship in ~ 2003
  - Vendors begin to engage and adopt in 2005 and 2006
  - oval:org.mitre.oval:def:1 submitted on **June 26, 2006**
  - Title: "Microsoft Windows XP SP1 (32-bit) is installed"
  - Note – this was an "**inventory check**"…
- CVSS started developing as sponsored by FIRST

Lessons Learned – some background

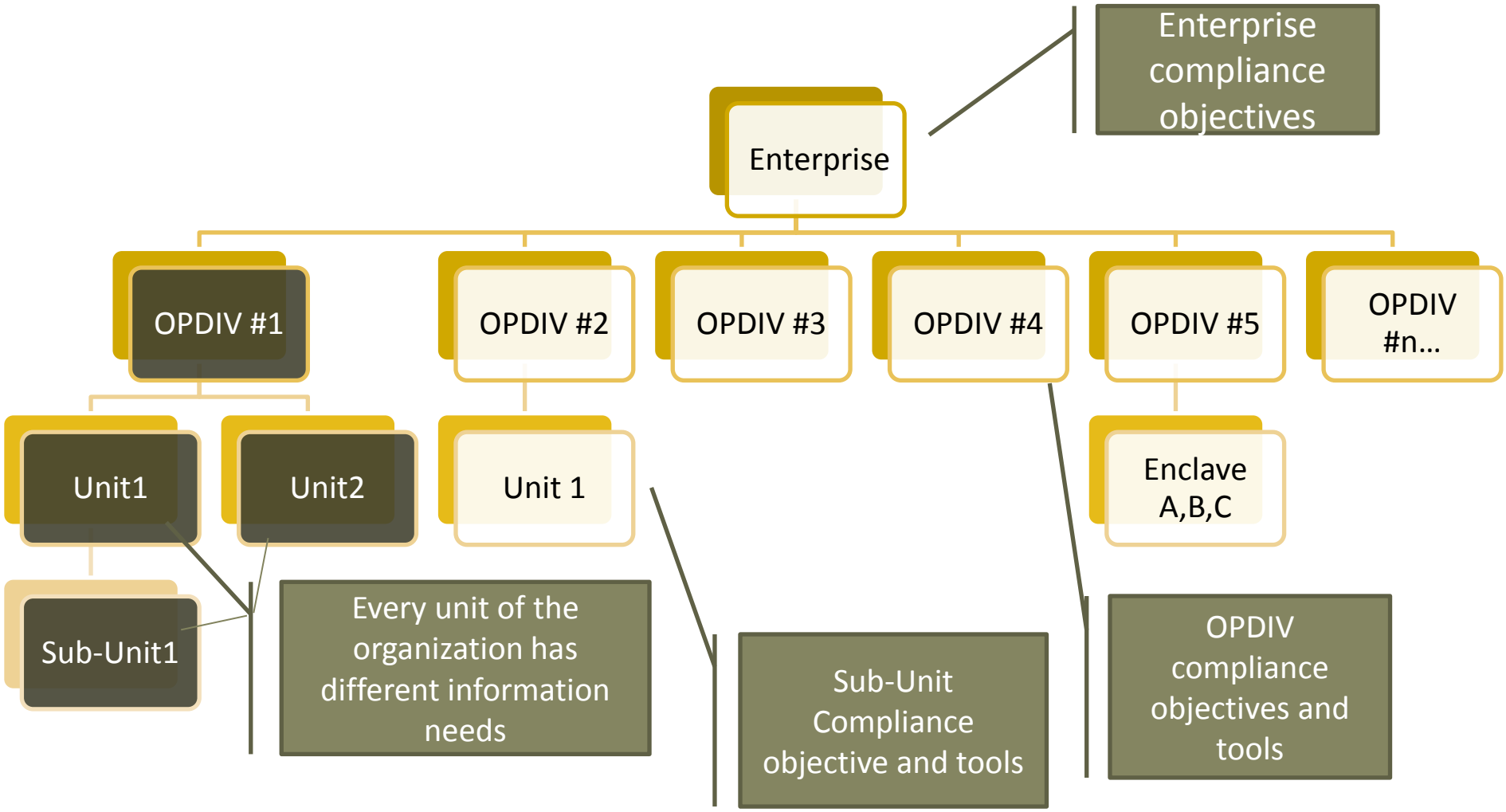
- Then an XML language was added (XCCDF) for “checklists”
  - Government sponsorship in ~2003/2004; publically released in 2005
  - Vendors begin to engage and adopt in 2005 and 2006
  - “SCAP” oriented products leveraging enumerations + XML languages began to be available in 2006 & 2007
- And then “S-CAP” and FDCC appeared
  - SCAP Validated Products first appear in February 2008
- Why does this history matter?
  - There’s more enumerations and potential emerging standards coming
  - Government and community processes have been maturing significantly
  - And it will continues to evolve and mature
  - More on that when it comes to lessons learned….

Lessons Learned – preparation…

- Get unbiased (and biased) Education
  - Management & cross functional groups – industry & gov't perspectives
- Understand the range of SCAP "applications" for automation
  - Vulnerability Management, Patch Management, Configuration Management
  - Asset Inventory & Management
  - Situation Awareness & Incident Response
  - Your vision of a new use case for your agency's or group's mission
  - OMB / FISMA / Other Compliance
  - The list is potentially endless and they **all** can have real ROI!
- Management sponsorship and buy-in
  - Consider having one or more SME's to support internal efforts

Lessons Learned

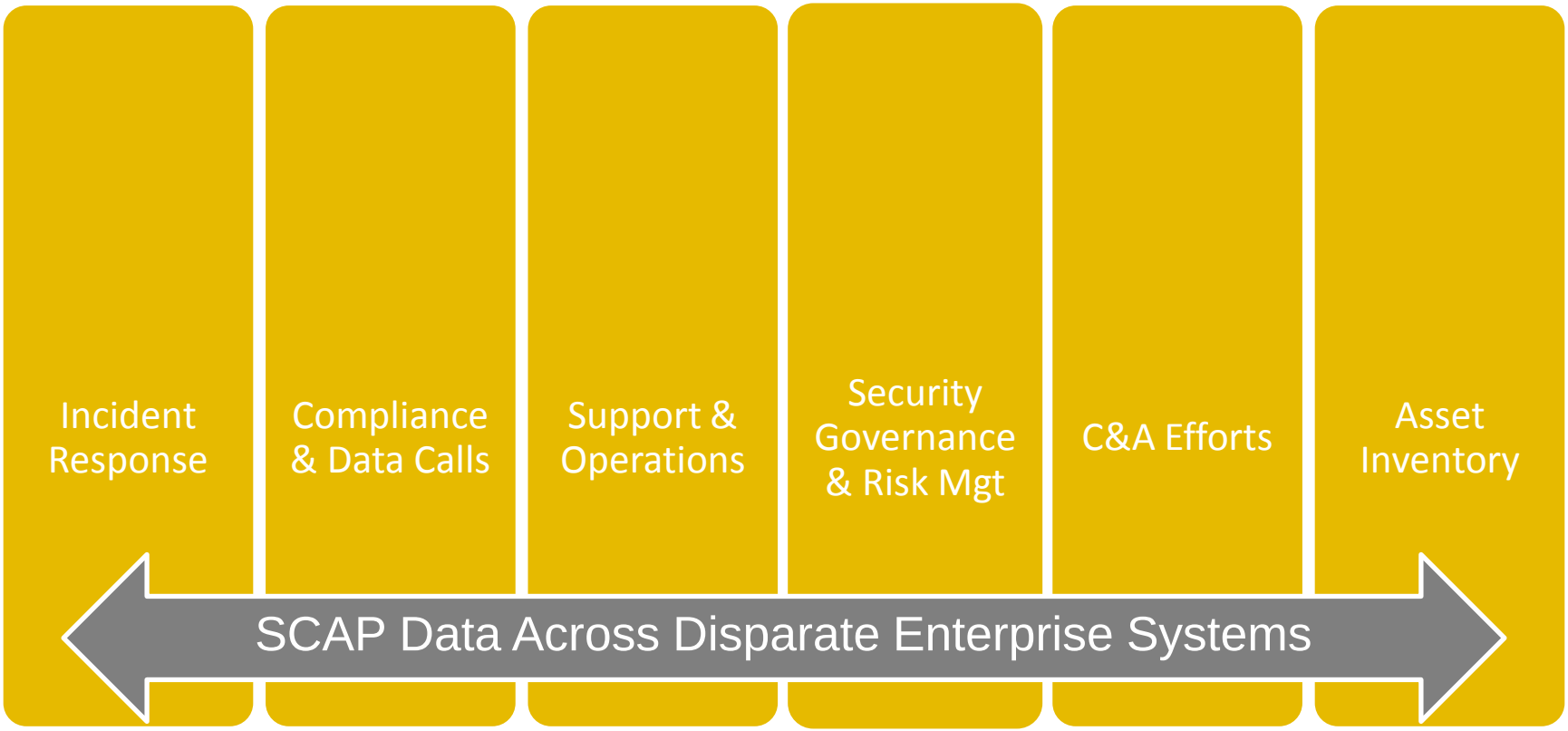
Profile of a typical “agency”



Profile of a “typical” agency – there is no “typical”

- Compliance objectives vary vertically and horizontally
- Many challenges due to disparate goals and processes
- Diverse technology and information sources
- No single enterprise network or host level access policies
- Asset classification variations across the board
- Enclaves are the **rule**, not the exception
- Data acquisition methodologies ***need*** to be flexible
- Expect exceptions to many rules (scientific workstations?)
- Many asset inventories, but authoritative answers still needed
- Different views of “enterprise” visibility depending hierarchy

Premise: SCAP Standards For Disparate Enterprise Systems Enables A More Holistic View



Uniformity in Data Improves Intelligent Collaboration

Standards enable automation and lead to tangible ROI

- But you still need to be an educated buyer
  - Whether point solutions or suites, ask for SCAP per your use cases
  - Classic SAIR Tier 1 SmartBuy style use cases; supports OMB & data calls
    - Network & Asset Discovery /Inventory – what is on your network - today?
    - Configuration data – how you compare to your baseline(s)?
    - Vulnerability Management - its Patch Tuesday – ready to scan pre & post patching?
  - Then add in your use cases
    - Specify must have and like to have SCAP requirements by use case
    - Specify what your content requirements and expectations are across the board
  - Don't forget your traditional requirements – no two products are the same!
    - What are your operational requirements?
    - What are your operational constraints?
    - What are your interoperability requirements?

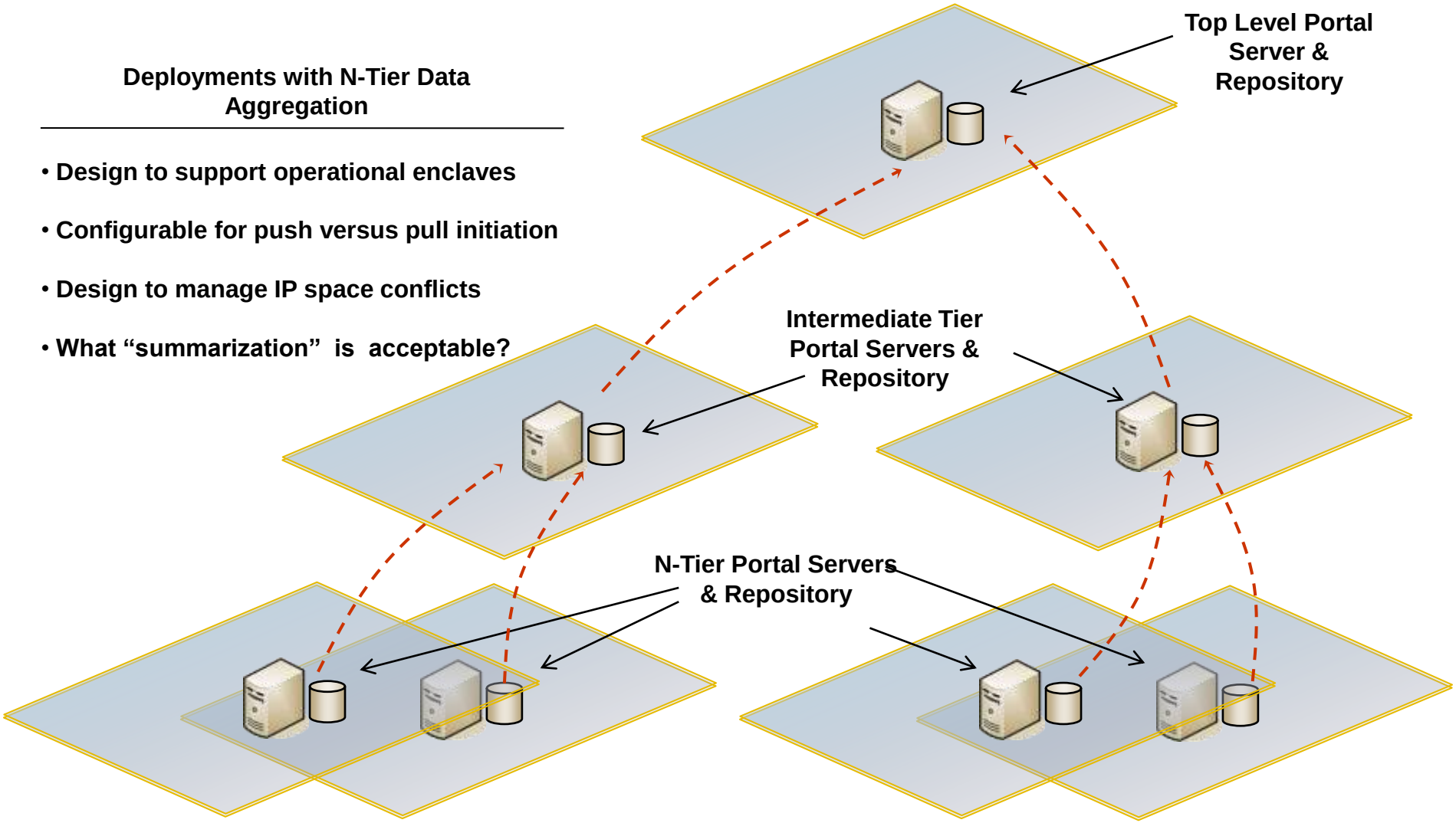
Standards enable automation and lead to tangible ROI

- Facilitates data aggregation
  - otherwise messy or vendor or GOTS specific – see next slide
- Other Integration Scenarios
  - Web Application Security
  - Incident Response, Risk Management
  - Software Auditing and License Management
  - Network Operations, Logging
  - Help Desk, CMDBs, Remediation, POAM systems
  - And the list continues….
- SCAP Logistics on Integration Scenarios
  - Establish common **Language, Enumeration, and Metrics**
  - Originating and validating content is pivotal
  - ***Content is king***

Aggregation – an example with generic applicability

Deployments with N-Tier Data Aggregation

- **Design to support operational enclaves**
- **Configurable for push versus pull initiation**
- **Design to manage IP space conflicts**
- **What "summarization" is acceptable?**



Basic Lessons Learned – Blocking & Tackling

- Content Management Plan – its not just about a "tool"
  - Updates - vendor versus gov't expectations
  - Dev/Test/QA process for content
- Multiple Organizational Layers – it's a reality
  - Introduces challenges on accommodating multiple layers of objectives
    - Conflicting goals and objectives - Goals often become equal to one another
  - Makes compliance relative
    - The snowball effect of policy exceptions
    - Conversely, excluding controls, signatures on checks
- IT Challenges
  - Local Permissions
    - For installing
  - Network Access
    - Jurisdiction over sub-nets or network zones
    - Outsourced network management introduces complexity

Recommendations

Top areas for “lessons learned” recommendations

- Recommendation 1: Understand your people, org, & processes
  - Know limitations, boundaries
  - Know approach will work with current processes and organizational boundaries
- Recommendation 2: Understand your asset requirements
  - Determine these requirements at the beginning of a project
  - What information do you need related to your assets?
  - How often do you need to see this information?
  - How do you classify your assets

Top areas for “lessons learned” recommendations

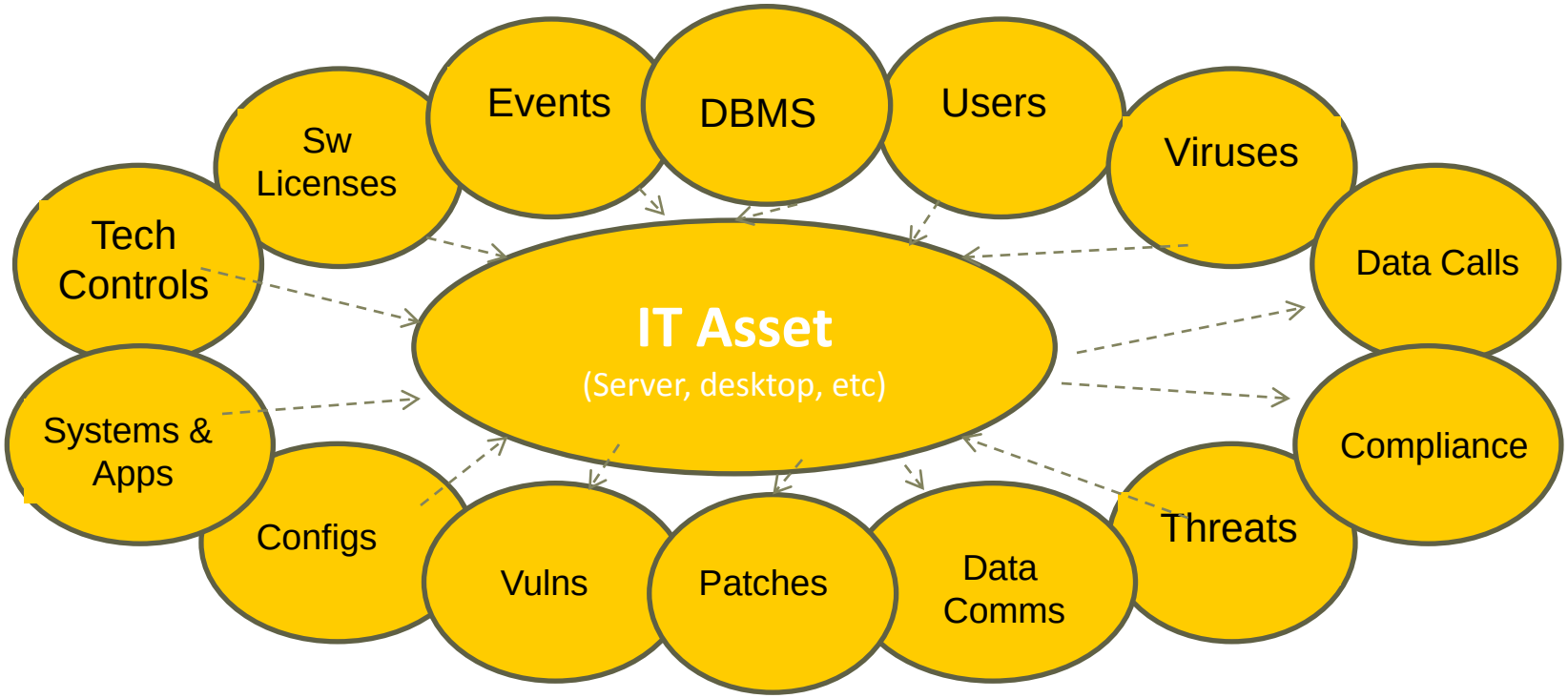
- Recommendation 3: Plan for and **require enumerations** across products/solutions
  - Require interoperability & SCAP Enumerations
  - Cross-referencing information is essential – Enumerations **are required**
- Recommendation 4: Metrics-based reporting key to success
  - Successful deployment should culminate in meaningful metrics – keep it standardized; keep it simple (CAG).
  - What gets measured & reported drives behavior
- Recommendation 5: Operational Independence
  - Dependencies for information gathering
  - Consider information access challenges, business impact considerations

Recommendation 1: Understand your people, org, & processes

- Obtain executive support
  - Key in successful implementations
  - Everyone needs to understand a clearly defined vision for an SCAP solution
- Identify processes that make sense for data sharing via SCAP
  - Determine if groups are willing to play nicely
  - Establish commonalities in benchmarks, metrics, etc
- Learn to meet halfway
- What content makes sense for your organization?
  - Identify content that needs to be there now vs. tomorrow
  - How are exceptions going to be handled? Suspended Controls vs. Exceptions
  - Process around content management
  - How does content get endorsed?
  - Outsourcing vs. internally developing content vs. gov't vs. vendor vs?

Recommendation 2: Understand your asset requirements

- The foundation of continuous monitoring is the **asset**
  - Most assessment criteria ties back to an asset
  - It is the hub with many spokes



Recommendation 2: Understand your asset requirements

- Asset inventory is a pre-requisite for success
- The degree to which you understand your assets is the degree to which your continuous assessment model will be successful
  - How many assets do we have?
  - Which assets support systems and key business applications?
  - What are the most critical assets?
  - How have our assets changed? Today? This week? This month?
  - Where do we store data?
  - Who should have access to this data for agency decision support needs?

"66% of all organizations admit to not having an accurate record of their IT assets" (Gartner)

Recommendation 3: Plan for and require enumerations across products/solutions

- Move away from solutions that do not include SCAP & interoperability for automation
  - Otherwise automation, and ROI, will be problematic
- Without a common framework, greater difficulties to integrate
  - Time consuming; pulls resources away from supporting your mission
  - Data format interoperability issues
  - Custom APIs versus reusable components
- No common methodology for metrics feasible without enumerations
  - Requires enumerations first to then compare common metrics
  - Differences in enumerations will magnify downstream reporting discrepancies

Recommendation 4: Metrics-based reporting key to success

- What gets measured gets done
- Socialize metrics – build consensus – think CAG
  - Metrics that never gain visibility are useless
  - Understand what metrics are used at macro and micro levels
- Metrics move the discussion to a strategic focus
- Adoption of metrics is key amongst senior leaders
- Report metrics for comparative/competitive analysis
  - Report by organization unit and system/LOB application
  - Comparative/competitive analysis
    - Vulnerabilities by System
    - FISMA Controls by Organization
- Metrics facilitate trend reporting
  - 65% compliance might be good news!
  - Internal baselines need to be determined

Recommendation 5: Operational Independence

- Content considerations
  - Develop internally and/or subscribe to content from content providers?
- Operational Considerations for Solutions
  - Easy deployment – appliance vs software versus VM's versus ?
  - Data acquisition requirements – for hosts & network devices by use case
    - Agent-less – Dissolving Agent – Persistent Agent – USB/Off-net Assessment Capabilities
  - Bandwidth throttling; SOA infrastructure; FIPS; RBAC; aggregation?
  - Control of date/time/frequency of use as associated with use cases
- Operate independent of operations, but support automation
  - Processes should validate, not depend on…
  - Information should provide actionable items for automation
  - Respect loose coupling of solutions

Lessons Learned – Final thoughts…

- Focus on solutions that
  - Support NIST Standards (SCAP validated tools) that provide authoritative requirements traceability to the NIST SP 800-53 and other specifications
- Focus internally on process and synergies
  - Ensure quick wins
  - Be realistic based on your organization
- Understand your interoperability expectations
  - Make sure it aligns with your vendors capabilities
- Understand your vendors capabilities and vision
  - Make sure it aligns with your interoperability expectations

Thank you!

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