United States

Election Assistance Commission

EAC Standards Board Meeting
Oklahoma City, OK   February 24-25, 2011

EAC COTS Roundtable Meeting Update

EAC COTS Roundtable

- Held at EAC offices February 14-15, 2011
- Participants:
  - Moderator = Merle King, *Kennesaw State University Center for Election Systems*
  - Voting System Manufacturers = Ed Smith, *Dominion Voting Systems* & McDermot Coutts, *Unisyn Voting Solutions*
  - Election Officials = Luis Torres, *Technical Service Manager, Orange County, FL Supervisor of Elections* & Paul Stenbjorn, *DC Board of Elections*
  - State Certification Tester = Glenn Newkirk, *North Carolina, PA*
  - DoD/Navy = Pete Marti, *Senior EM Spectrum Engineer, Member-Navy Tri-SYSCOM E3 Integrated Product Team*
  - FCC = Bill Hurst, *Chief, Technical Research Branch, FCC Laboratory Division*

Purpose

- Work towards a more realistic definition of Commercial-Off-The-Shelf (COTS).
- Determine ways voting system manufactures use COTS products and interact with COTS product manufacturers.
- Discuss pros and cons of COTS.
- COTS effect on voting system lifecycle and sustainability.
- Determine next steps.

COTS in Certification

- Lifecycle disconnect between COTS and voting systems.
  - Many commercial products have a production lifecycle of 6-8 **months.**
  - Voting systems should function for (at minimum) 6-8 **years**.

- COTS reality in certification.
  - ES&S Unity 3.2.0.0

Desktop ------ Dell Optiplex GX260 computer desktop with monitor, keyboard & mouse
Dell PC, 1 GHz or faster processor, 512 MB RAM, 40 GB hard drive, 48x CD-ROM or DVD drive, 3.5- inch drive, Super VGA (800x600) or higher resolution video adapter and monitor, appropriate drivers

Laptop ------ Dell Latitude 600, Model #PP05L
Dell Intel Pentium Processor 1400 MHz 587 MHz 1.00 GB Ram

  - Current Dell equivalent = Dell Optiplex GX 380 and Latitude 5410 or 6410

COTS in Other Industries

- Aerospace/Military:
  - The F-35 is also constantly being upgraded. Most of the systems in the F-35 Joint Strike Fighter (JSF) were designed at least seven years ago. The JSF won't enter service until 2015 at the earliest due to delays, re-designs and difficulty with suppliers, many of which are COTS suppliers. (Single JSF cost to taxpayers = $92 million per)

F-35B
Short Take Off &
Vertical Landing (STOVL)

COTS in Other Industries

- **Medical Device Industry:**
  - A 20 year old medical device may have different issues where components that are so-called 'equivalents' are no longer made to the original manufacturing process, with the new 'modern' process causing different device characteristics.

    COTS obsolescence is a constant challenge for companies operating in the medical field. It can be very costly as these products will have been subjected to rigorous and expensive approval procedures. For a medical product, the FDA (US Food and Drug Administration) rules are such that any major changes due to new components means a re-submission for FDA approval as well as other costly regulatory approvals.

Managing COTS in Other Industries

- FAA COTS Risk Mitigation Strategies:

Number	COTS Mitigation Strategies	Application Benefits
1	Involve COTS-knowledgeable individuals in all analytical processes	Facilitates the application of COTS mitigation strategies and informed decision making
2	Involve users early and throughout the program life cycle to identify and resolve COTS-related constraints	Reduces chances of surfacing user acceptance issues late in system development and deployment
3	Perform continuous COTS product market research	Allows product team to project and plan for changes in technology, product configurations and obsolescence-related issues
4	Institute and maintain ongoing COTS product testing capability	Allows project to assess new COTS products/technologies for specification compliance, form/fit/ function compatibility and standards conformance

Managing COTS in Other Industries

- ## Medical:

  - When designing electronic medical equipment, original equipment manufacturers (OEMs) must plan a strategy that mitigates problems caused by the obsolescence of critical components. This is especially true when designing embedded single-board computers (SBCs) that are at the heart of many critical diagnostic and monitoring systems.

    Because SBCs are designed as industrial-grade products, they must be guaranteed to have long-term availability. However, with some electronic components, the rapid pace of technological change, coupled with the medical industry's long product development and regulatory approval cycles, guaranteeing reliability can be problematic

    OEMs can **partner** with SBC manufacturers in this obsolescence **planning**. OEMs can provide the SBC manufacturer with a target market life. This strategy is the basis for an ongoing partnership between the OEM and the SBC manufacturer to **plan** for component availability during this time span. If later forecasting indicates that market demand would surpass this target life, an OEM can **inform** the SBC manufacturer so that more-rigorous obsolescence planning can be done.

Roundtable Discussion Summary

- Is COTS really COTS?
  - Most current "COTS" products are really industrial grade COTS and generally can't be purchased at retail stores like Best Buy or Radio Shack.
  - COTS really more aptly described as "MOTS." Modified-Off-The-Shelf…
  - DOD= VERY strict definition of COTS. COTS must not be modified in any way. Any change to COTS is considered MOTS and must be tested.
  - FCC has categories of Permissive Changes to products.
    - Class I changes need no testing.
    - Class II changes need some testing
    - Class III (new) changes in software that modify the frequency, power, and modulation type of a software defined radio need only manufacturer submitted test data.

Roundtable Discussion Summary

- Thoughts on potential changes in the voting systems industry:

  – Determine a spectrum of "permissive" changes-

Manufacturer Declaration of Conformity	What is in the middle???	Full Re-Testing
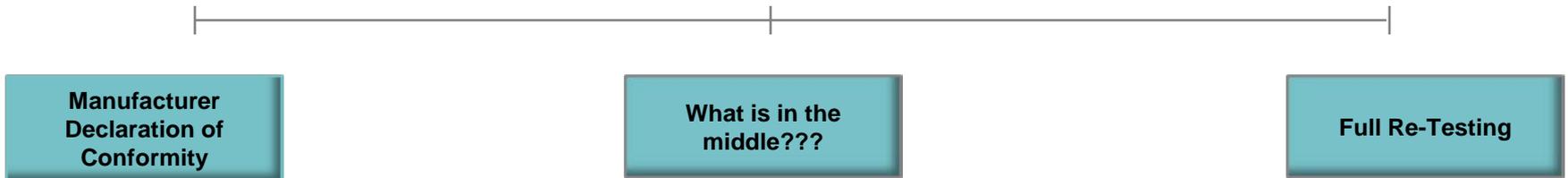
  – Risk based matrix? Where is the risk being absorbed??
  – Manufacturer Quality Control is the biggest factor-
    - What quality system is in place? Are the ISO 9001??
    - What is the track record of the manufacturer related to quality products?

Roundtable Discussion Summary

- **Election Officials perspective:**
  - Jurisdictions have few instances in which they can independently purchase COTS peripherals.
    - In some instances COTS would void system warranty if manufacturer requires jurisdiction to purchase "COTS" products thru them.
  - Will COTS extend the life of a voting system? NO…
  - Lifecycle costs = What does the end-user expect vs. How the (COTS) product is designed?
  - Must find and test alternative COTS components.
  - Hidden cost associated with COTS use = potentially more frequent recertification of systems that use COTS products that quickly become obsolete.

Roundtable Discussion Summary

- Manufacturers perspectives on COTS.
    - Need more dynamic back-end post certification.
    - Certify different configurations and COTS devices.
    - Put onus on the manufacturer to make sure COTS conforms to VVSG and program. (Manufacturer self-testing)
    - Develop common data format.
    - Develop list of multiple alternatives to hardware components (LCD screens, motherboards, eprom chips)
    - Develop a matrix of what is a "testable event."
    - COTS is a point in time with hardware and firmware. How do we keep systems current without additional extensive testing?

Defining COTS

- **2005 VVSG : commercial off-the-shelf (COTS):** Commercial, readily available hardware devices (such as card readers, printers or personal computers) or software products (such as operating systems, programming language compilers, or database management systems).

- **Next Iteration:** Software, firmware, device or component that is used in the United States by many different people or organizations for many different applications and that is incorporated into the voting system with no manufacturer- or application-specific modification.

- **COTS Roundtable:** *Software, firmware, device or component, that is currently in use outside the elections industry and that is incorporated into the voting system with no modifications by the manufacturer.*

Potential Next Steps for COTS

- COTS Wiki:
  - What is a "wiki?" …a website that allows the creation and editing of any number of interlinked web pages via a web browser using a simplified markup language or a text editor. Wikis are typically used by various groups to create collaborative works. Examples include community websites, corporate intranets, knowledge management systems, and note services.
  - Our wiki would potentially contain:
    - Test plans and documents
    - Searchable COTS database
    - Information on alternative COTS suppliers
    - L&A test information and models

- Develop Classification Schemes for COTS products:
  - Benefit as a documentation of system infrastructure for State and local election officials.
  - Identify potential substitute products for current COTS components.
  - Develop a prototype environment for using the classification scheme in pilot jurisdictions.

Potential Next Steps for COTS, Cont.

- Manufacturer/EAC Working Group to Identify EAC List of Acceptable COTS Manufacturers by Component:
  - LCD screens
  - Motherboards
  - Eprom chips

- EAC developed "best practices" for Configuration Management of COTS:
  - Understand what COTS components you have in V.S.
  - Could include keeping L&A test data on each unit & Service ticket data on each unit.

Contact Information

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