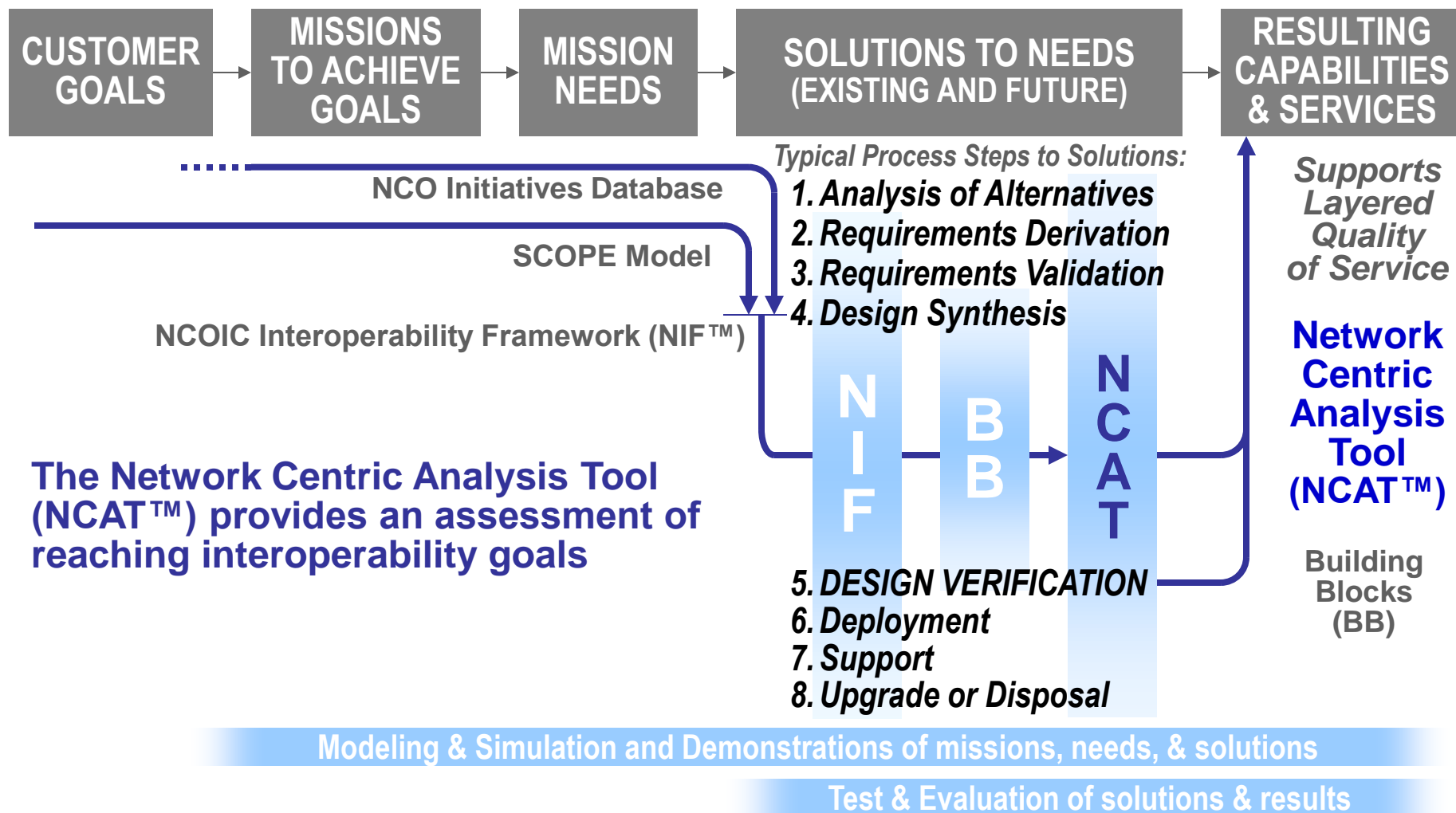


# **Network Centric Analysis Tool (NCAT<sup>TM</sup>) Overview With Java Tutorial Version 3.1 Build 150 (April 26, 2010)**

*April 2010*

# NCOIC Assists Customers in obtaining interoperable solutions



# Assessing Net-Centric Operations



- **The Goal – Rapid Interoperability at a Reduced Cost**
  - Adopt the principles of Network Centric Operations (NCO) to attain rapid, efficient, cost-effective functionality
- **The Organization - NCOIC**
  - The Network Centric Operations Industry Consortium (NCOIC) provides an open forum to meet the challenge to define best practices for NCO
  - NCOIC facilitates NCO by identifying existing and emerging common open standards and recommending patterns of open-standard use
  - Helps users create products, concepts of operations, and new capabilities knowing the standards they apply will allow them to function with others in the market space
  - Raytheon is a founding member benefiting all Business Units
- **The Tool - Network Centric Analysis Tool (NCAT™)**
  - Helps analyze interoperability goals for architectures, systems & organizations
  - NCAT presents users predefined questions and multiple-choice answers from Uses a common set of industry-standard criteria
  - For more details, visit the NCOIC website (<https://www.ncoic.org/technology/deliverables/ncat/>).
  - NCAT available for download, evaluation and immediate use
- **The Status**
  - Currently used successfully evaluating interoperable characteristics and developing recommendations for various mission teams

**Rapid Interoperability at a Reduced Cost**

# Network Centric Analysis Tool [NCAT™]

## Purpose

- Supports:
  - assessing compliance with specific architecture guidelines & ref models
  - selection of appropriate architectures
  - comparison between similar entities
  - conduct of SCOPE analyses
- NCAT Use Cases
  - Internal Program performs self-assessment
  - Product Evaluation Engineer ranks similar products based on scoring results
  - Project/program Manager monitors progress comparing planned and achieved behaviors
  - Lead Systems Integrator (LSI) verifies Network Centricity compliance
  - Acquisition Authority selects system/products based on assessment results

Provides confidence that a system can operate  
in a network centric environment

# Who is using NCAT™ ?

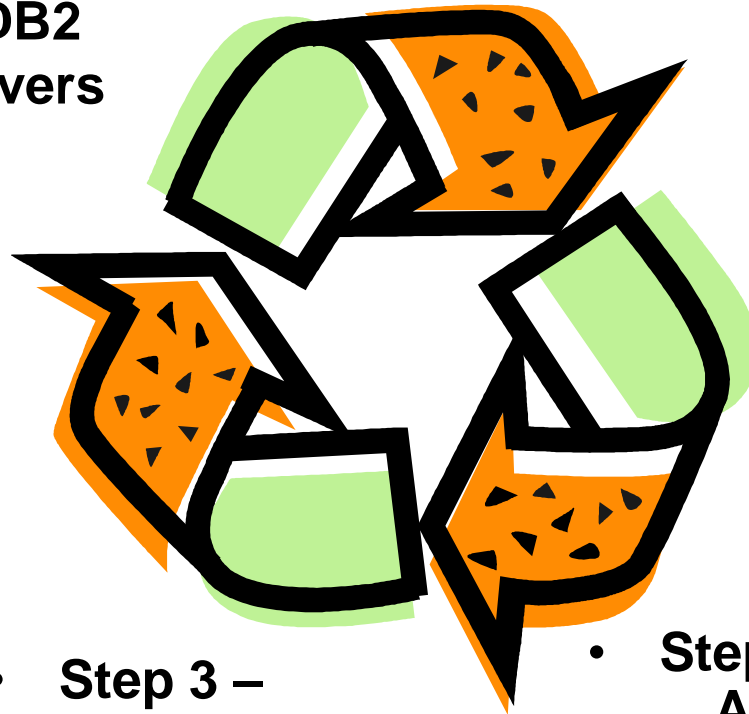


- Network Centric Operations Industry Consortium (NCOIC)
  - Net Enabled Emergency Response (NEER) IPT
  - Sense & Respond Logistics (S&RL) IPT
  - Member companies for new business
- Net Enabled Operations (NEO Team) supporting NextGen
- North Atlantic Treaty Organization (NATO)
- USAF Space Command
  - Performing 100+ assessments, 27 completed so far
- Interest being shown by members of the Australian Department of Defence, DISA and FAA

# NCAT Highlights

- Questionnaire-based
- Selectable Q&As by Program
- Collaborative Web-enabled
- SQL-driven
- Supports MS SQL, IBM DB2 and Oracle database servers
- Excel-to-XML data import/export
- Leverages web services for easy integration with third-party reporting applications
- Integrates NCOIC SCOPE model

• Step 1 – Set Goals/  
Expectations

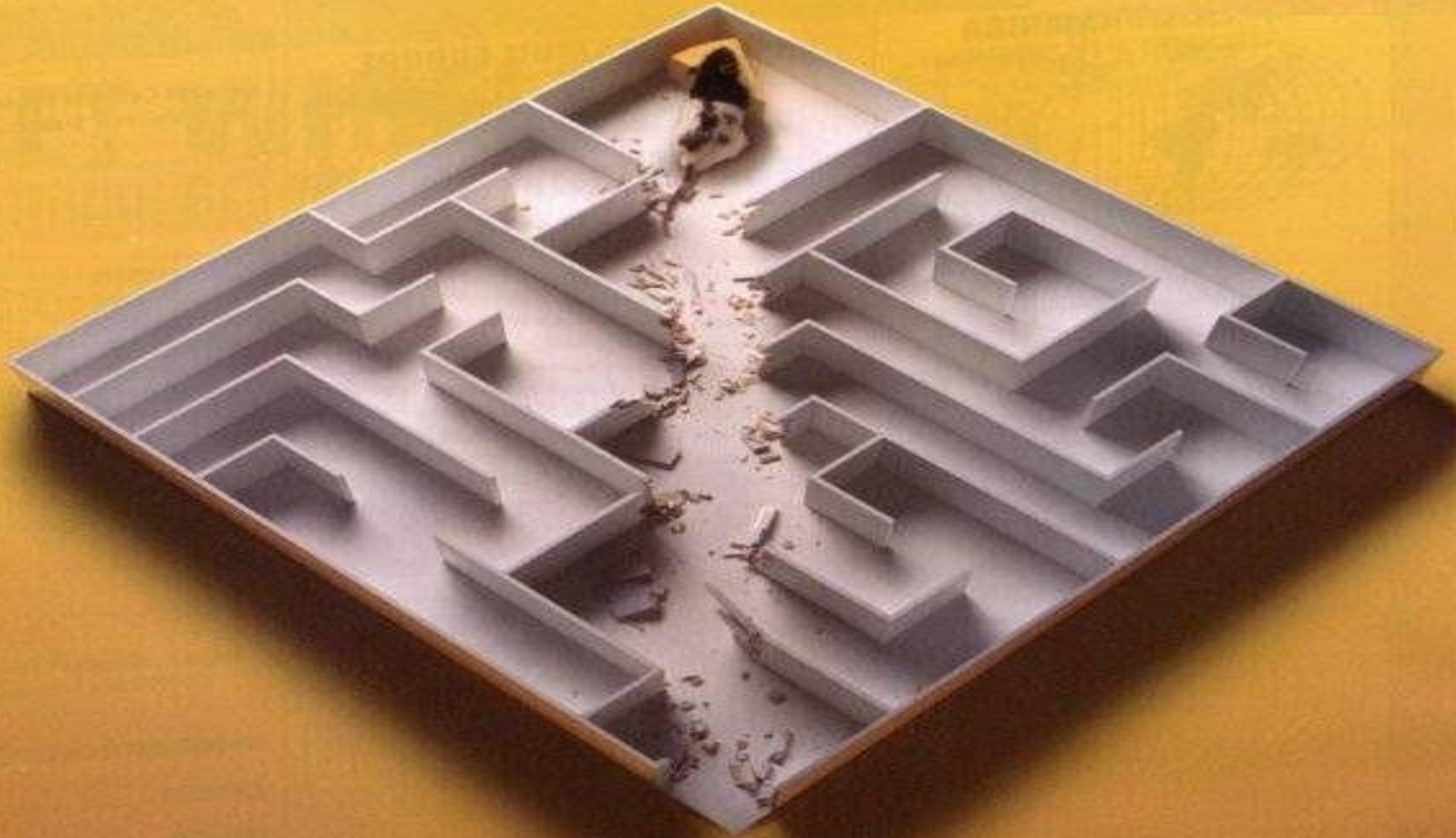


• Step 3 –  
Perform Analysis

• Step 2 – Perform  
Assessment



**Begin with the Goal clearly in mind !**



# What are we measuring?

- Network Centric Attributes and Behaviors

Attribute	Description
Internet & World Wide Web Like	Adapting Internet & World Wide Web constructs & standards with enhancements for mobility, surety, and military unique features (e.g. precedence, preemption) .
Secure & available information transport	Encryption initially for core transport backbone; goal is edge to edge; hardened against denial of service.
Information Protection & Surety (built-in trust)	Producer/Publisher marks the info/data for classification and handling; and provides provisions for assuring authenticity, integrity, and non-repudiation.
Post in parallel	Producer/Publisher make info/data visible and accessible without delay so that users get info/data when and how needed (e.g. raw, analyzed, archived).
Smart pull (vice smart push)	Users can find and pull directly, subscribe or use value added services (e.g. discovery). User Defined Operational Picture v Common Operational Picture.
Information/Data centric	Data separate from applications and services. Minimize need for special or proprietary software.
Shared Applications & Services	Users can pull multiple applications to access same data or choose same apps when they need to collaborate. Applications on “desktop” or as a service.
Trusted & Tailored Access	Access to the information transport, info/data, applications & services linked to user’s role, identity & technical capability.
Quality of service	Tailored for information form: voice, still imagery, video/moving imagery, data, and collaboration.





This document is a NESI product.  
NESI (Net-Centric Enterprise Solutions for Interoperability) is a collaborative activity between the USN PEO for C4I and Space and the USAF Electronic Systems Center.

### Net-Centric Implementation Framework

Part 1: Overview

Part 2: ASD (NII) Checklist Guidance

Part 3: Migration Guidance

Part 4: Node Design Guidance

Part 5: Developers Guidance

Part 6: Acquisition Guidance

V 1.0.1

04 February 2005



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Approved for public release ; distribution is unlimited.

# Foundation of Network Centric Tenets



- Data Tenets – Data/Application Team
  - Make Data Visible
  - Make Data Accessible
  - Make Data Understandable
  - Make Data Trustable
  - Make Data Interoperable
  - Provide Data Management
  - Be Responsive to User Needs

## Foundation of Network Centric Tenets



- Information Assurance/Security Tenets – IA Team
  - Net-centric IA posture & Ops Continuity
  - ID management, authentication, privileges
  - Mediate Security Assertions
  - Cross-Security Domains Exchange
  - Encryption
  - Employ Wireless Technologies
  - Others – Integrity, Confidentiality, Intrusion detection & reporting, Audits, Policy Compliance, Certification and Accreditation (C&A)

## Foundation of Network Centric Tenets



- Service Tenets – Enterprise Services Team
  - Service Oriented Architecture (SOA)
  - Open Architecture
  - Scalability
  - Availability
  - Accommodate Heterogeneity
  - Decentralized Ops & Management
  - Enterprise Service Management (ESM)

## Foundation of Network Centric Tenets



- Transport Tenets – Transport Team
  - IPv6
  - Packet Switched Infrastructure
  - Layering and Modularity
  - Concurrent Transport of Info Flows
  - Differentiated QoS Management
  - Network / Inter-network Connectivity
  - RF Acquisition
  - Joint Net-Centric Capabilities
  - Ops & Management of Transport & Services



# Foundation of Network Centric Tenets

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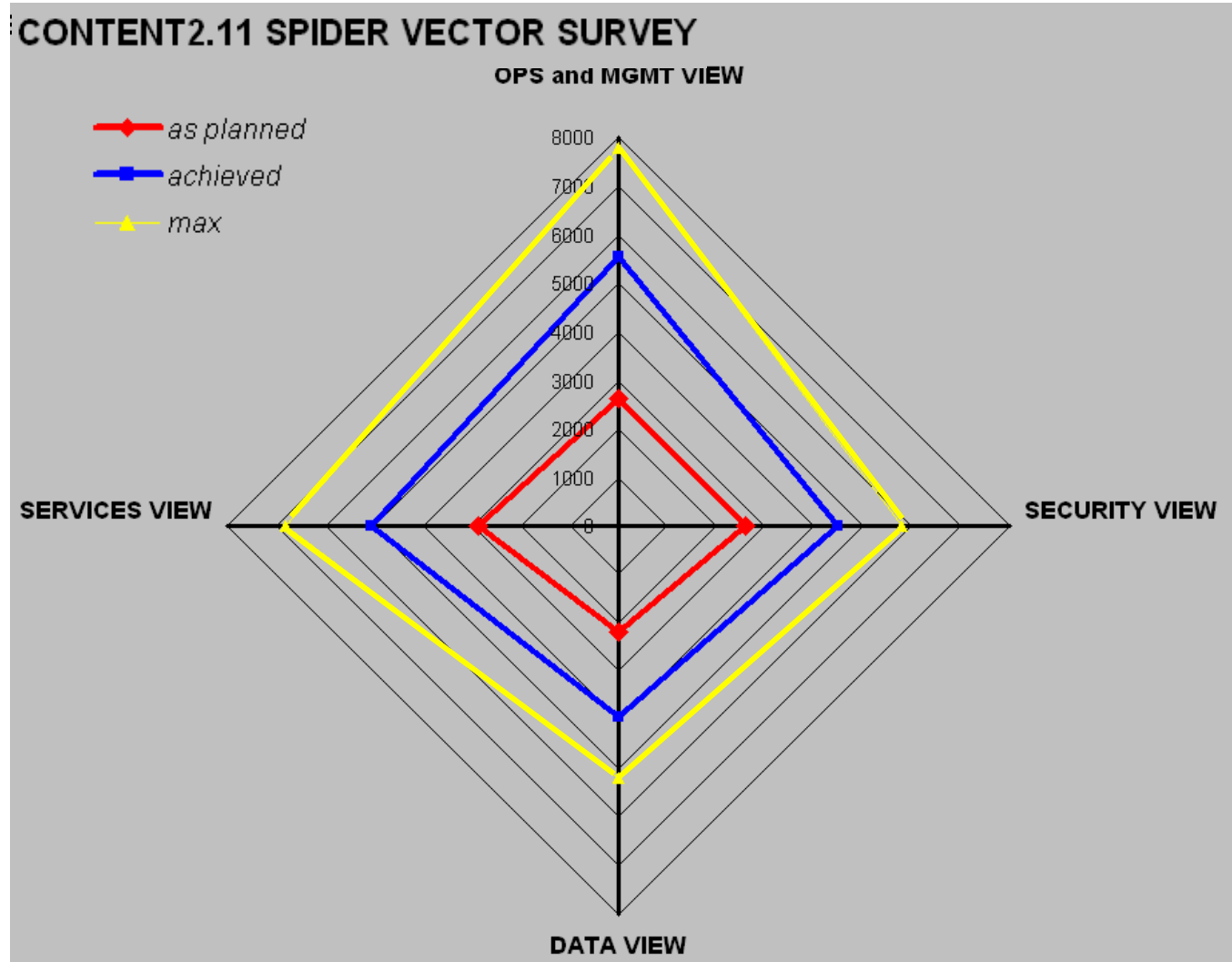
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**Put together make up the majority of the questions**

# NCAT™ Content Analysis Example



# NCAT™ - Methodology



- NCAT™ focuses on compliance assessment using pre-defined questions and multiple choice responses
  - Identifies criteria and metrics to measure “goodness”
  - Measures how well a target aligns with the areas of compliance
  - Groups criteria into common categories like Information Assurance (IA)
- First – define standard against which to measure compliance
- Compliance Level determined by Assessor selecting using multiple choice responses with weighted scores to standard questions
- Assessments structured by an administrator who crafts the questions and planned target results for the specific case.
- Profiles developed by selecting applicable subsets of the available questions or creating new questions and responses
- Assessment Results (individual or series) reported
- Data Privacy maintained and not openly visible

**Asking the right people the right questions**

# NCAT™ - Measurement Method

Technologies	Not Implemented	Some Elements	Over half	Most	ALL
Verification/ Certification	NONE	Little or NONE	Little or NONE	Most	ALL
Use of Standards	A Few	A Few More	Some Identified	Most	ALL
Governance Procedures	NONE	NONE	Some Identified	Most	ALL

NON COMPLIANCE

LOW COMPLIANCE

PARTIAL COMPLIANCE

SOME COMPLIANCE, NOT ALL

MOSTLY COMPLIANT

FULL COMPLIANCE

0 %

20%

40%

60%

80%

100%

**NCAT uses a gradient scale**

# NCAT Survey Steps

- **Step 1 – Set Goals/ Expectations**



- **Step 3 – Perform Analysis**

- **Step 2 – Perform Assessment**

- Administrator creates a Profile to be used for a specific assessment
  - A Profile - selection of questions applicable to a Program
  - Administrator may adjust scores and weights at this stage
- Administrator creates a Program that has a fixed set of Assessors using “Profiles”
- Administrator creates a Survey from the profile
- Administrator sets threshold levels (called planned values) for each question with inputs from the team of stakeholders
- Assessor(s) answer Profile questions in the survey for the artifacts being assessed.

- Analysts generate reports on the results
  - Assessment Report includes a comparison between the planned values and the actual assessed values for an individual assessment.
  - Summary Report aggregates and scores the responses of all individual assessments for the program.



# NCAT - Engine Features



- Web-based Access options
  - Open internet
  - Proprietary intranet
  - Stand-alone on Local Desktop
- Functionality
  - Tailor by programs, categories and profiles
    - User-selectable Evaluation Criteria
    - Program dependent weights, and priorities
  - Role-based user permissions
  - Progress tracking (planned, achieved)
  - Dynamic reporting
    - compliance, summary, detailed, various formats (tables and graphs)

# NCAT V3 Enhancements



## UI Enhancements

- Sortable tables (each column can be sorted) used in the overview pages, to include Profiles, Programs, Users
- New text fields for editing pages offering better value validation, automatic sizing and calendar widgets
- Improved assessment editing and performance
  - split plane for dragging a border between left/right area of screen
  - using dynamic trees for displaying and modifying categorization
  - popup window for showing contextual information
- Progress bars/wait icons when generating a report
- Value descriptions of question as small popup window

## Assessment Enhancements

- Comment fields for each Answer
- Ability to include new attribute for question (example Answer) and displaying it where needed using turn on/off button
- Branching questions using an overview tree for displaying the different branches in editing mode
- Implementing agent for transferring old database content to new database schema

## Usability Enhancements

- Excel-to-XML data import/export
- Supports MS SQL, IBM DB2 and Oracle database servers
- Leverages web services for easy integration with third-party reporting applications

## Additional Enhancements

- Option to add a keyword list to Profiles and setting a corresponding filter in the Profile view
- Encrypting saved passwords
- Server binds to all available IP-addresses when starting application within enterprise network

## Link to download NCAT™



- Link for download of the NCAT Java Engine
  - <http://ncoic.cachefly.net/Java/java.zip>

# NCOIC eLearning Modules Available



## Network Centric Operations Industry Consortium eLearning Modules

- <https://www.ncoic.org/technology/activities/education/elearning/>
- [Network Centric Operations: The Fundamentals](#)
- [The Role of NCOIC Deliverables](#)
- [Systems, Capabilities, Operations, Programs, and Enterprises \(SCOPE\) Model Overview](#)
- [NCOIC Interoperability Framework \(NIF™\) and NCOIC Patterns Overview](#)
- [Network Centric Assessment Tool \(NCAT™\) Overview](#)
- [Building Blocks Database Overview](#)
- [Export Compliance Overview](#)

**On Line Training Materials**

# Overview Summary



- NCOIC is developing a family of Network Centric Tools for understanding net-centricity and interoperability
- NCOIC provides NCAT™ to interested stakeholders
- NCAT™ can be tailored for:
  - Program specific profiles of selected questions, comparison of planned vs actual assessments, provides privacy of program-specific results
- NCOIC requests feedback in return for using NCAT
  - Feedback will be used to improve future versions only
  - Your feedback will not be shared openly

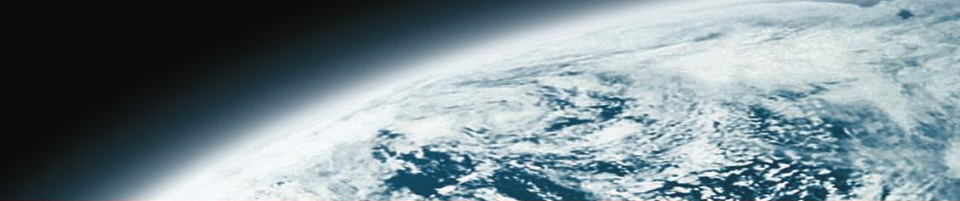
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# NCOIC Goal



*Net-Enabled  
Future*



# NCOIC™

*Stove-piped  
Systems,  
Point-to-Point  
Networks*

