

Architecture Modeling Approach for Net-Centric Enterprise Services

(C4ISR/C2 Architecture Track, Paper #60)

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- NCES Mission Threads
- Architecture Modeling Approach
- Sample: Time Sensitive Targeting
- Summary

Purposes of Mission Threads

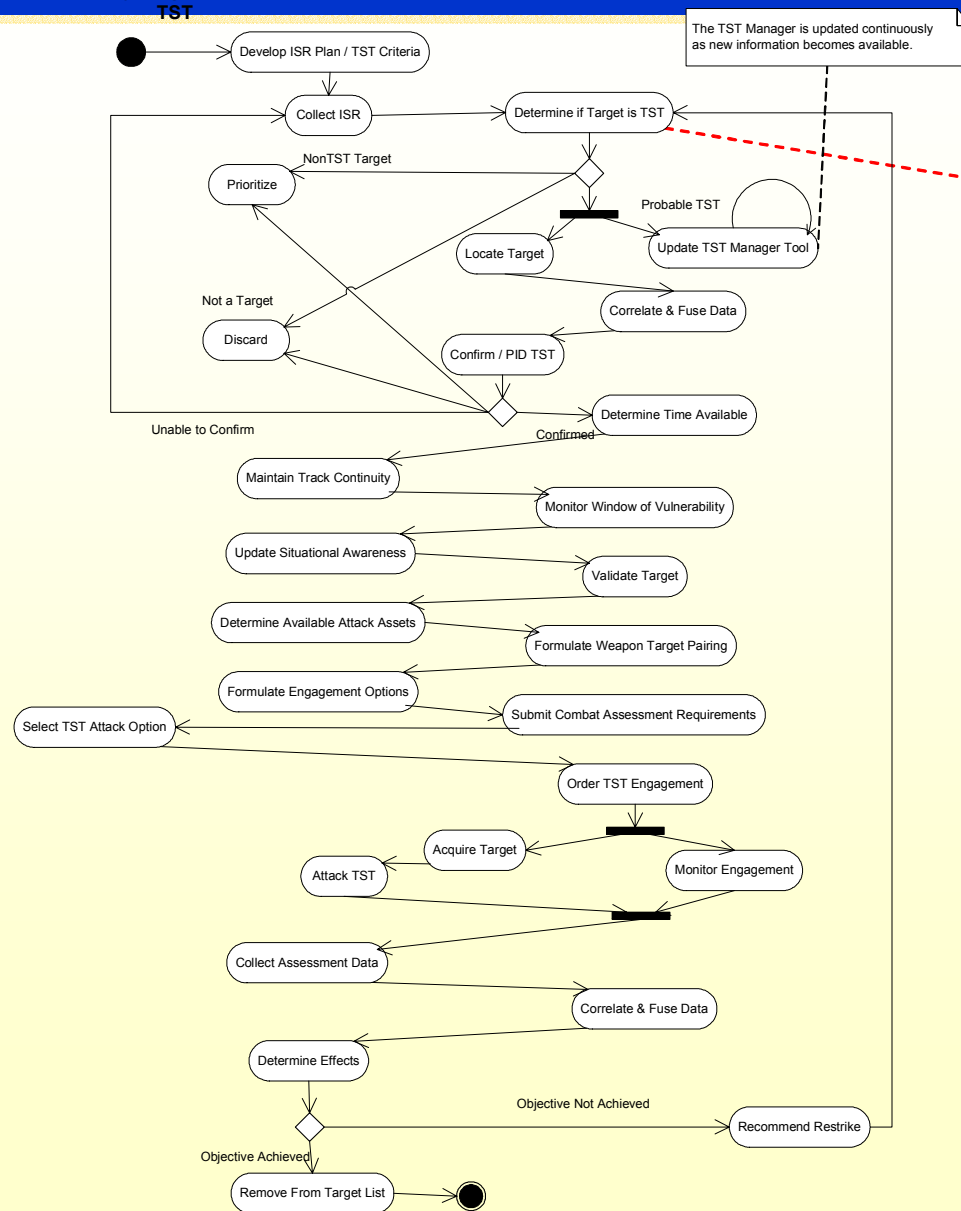
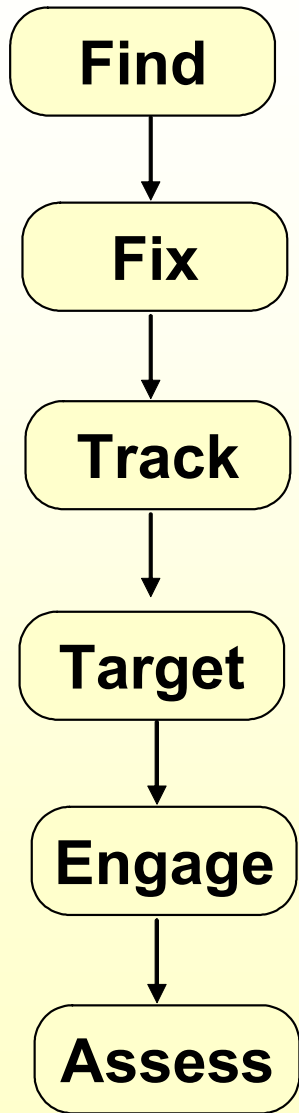
- Demonstrate that NCES Core Enterprise Services can support Department of Defense missions.
- Validate NCES capabilities (requirements) for mission threads
- Develop Executable Architecture Models to validate NCES Service-Oriented Architecture.

Summary of Approach

1. Formulate activity models for a mission thread.
2. Map the activities to NCES and existing systems.
3. Develop logical deployment architecture with NCES included.
4. Develop logical data models.
5. Construct executable architecture models.

Time-Sensitive Targeting Activity Model

Activity Diagram (OV-5):



Determine if Target is TST

Operational Activity Descriptions (“Find” Phase)

Only First Three Activities Shown Here

Activity	Description
Develop ISR Plan/TST Criteria	Based on JFC TST guidance and initial preparation of battlespace (IPB), develop an Intelligence, Surveillance and Reconnaissance (ISR) plan to deploy sensors to identify potential TSTs.
Collect ISR	Use all available sensor data to identify, locate, and prioritize emerging targets.
Determine if Target is TST	Use further ISR to determine if emerging target is a TST. The final decision is made by the TST Cell Chief.

Operational Activity to System Function (sv-5)

Core Enterprise Services & Existing Systems

Activities to Function Mapping for Time-Sensitive Targeting (SV-5)

Activities in the Six Phases

- FIND Phase
- Develop ISR Plan/TST Criteria
- Collect ISR
- Determine if Target is TST
- Fix Target
- Discard
- Prioritize
- FIX Phase
- Locate Target
- Correlate and Fuse Data
- Confirm /PID TST
- Determine time available
- TRACK Phase
- Maintain Track Continuity on the
- Monitor Window of Vulnerability
- Update Situational Awareness
- TARGET Phase
- Validate Target
- Determine Available Attack Assets
- Match Available Attack Assets
- Formulate Weapon Target Pairing
- Formulate Engagement Options
- Submit Combat Assessment Request
- Select TST Attack Option
- ENGAGE Phase
- Order TST Engagement
- Monitor Engagement
- Attack TST
- ASSESS Phase
- Collect Assessment Data
- Determine Effects
- Correlate and Fuse Data
- Retarget
- Remove From Target List

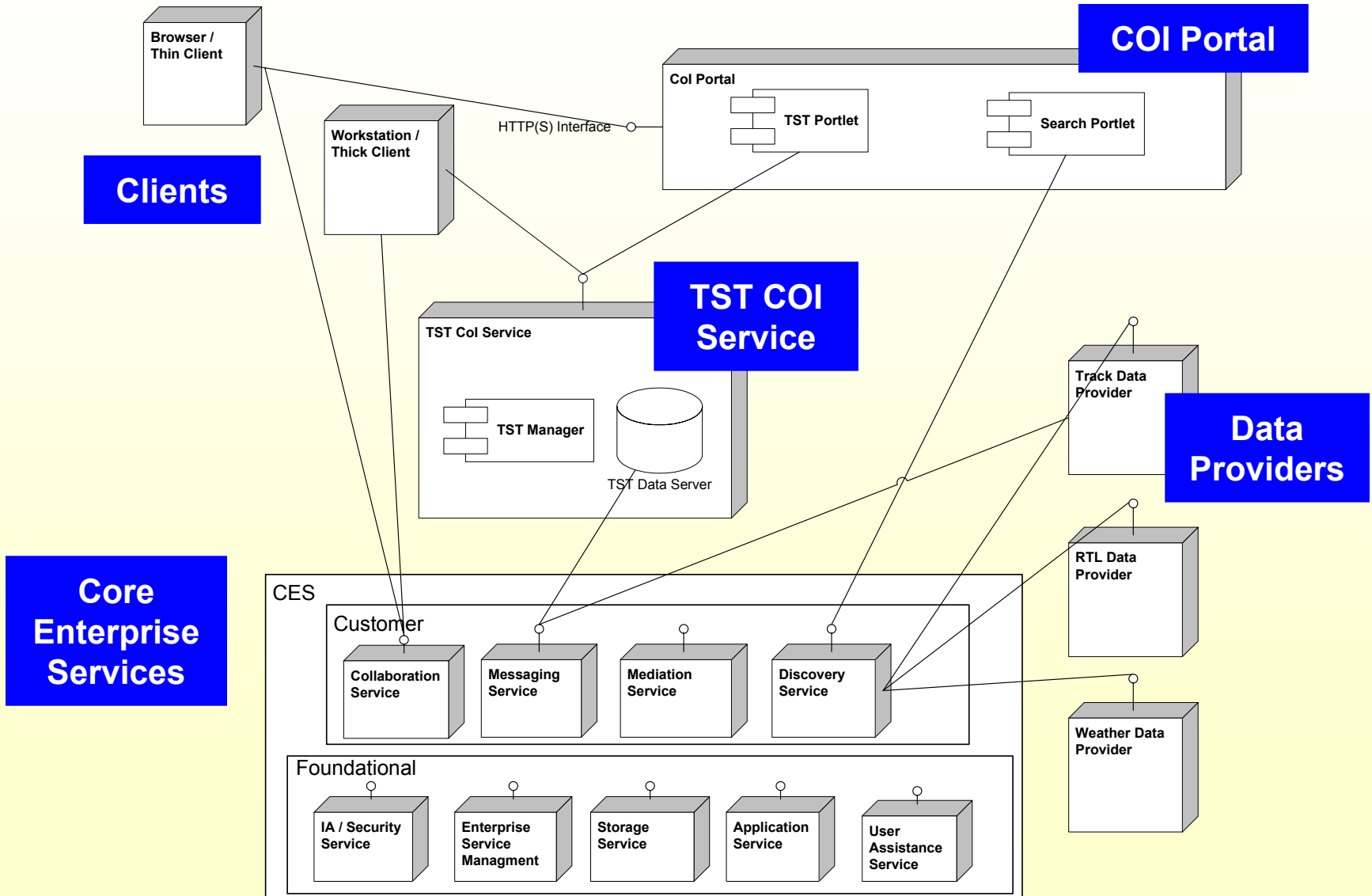
Legend: P=Portlets via Browser, C=Client App (Thick), S=Service-to-Service, M=System-to-Service.
Cells in gray are common across Operational Activities.

Human Actor Only	X																			
Human Computer Interface	X																			
Core Enterprise Services																				
Messaging Services																				
Publish/Subscribe/Receive Enterprise Messages	S										S	S					S	S		P
Publish/Subscribe/Receive Alerts by Topic	P	P	P	P	P	P			P						P	P		P		P
Publish/Subscribe/Receive Notifications	P	P	P		P	P			P		P				P	P		P		P
Configuration & Admin																				
Discovery Services																				
Content Discovery	P	M	P	P	P	P			M										S	
Service Discovery	P	M						M											S	
Metadata Discovery																				
Person Discovery			S										S	S	S	S	S	S	S	
Taxonomy/Ontology Mgmt																				
Metadata/Schema Reg & Mgmt																				
Collaboration Services																				
Establish Collaboration Session	P	P	P						P		P	P	P	P	P	P	P	P	P	P
Publish/Subscribe/Receive Presence Info	P	P	P					P		P		P	P	P	P	P	P	P	P	P

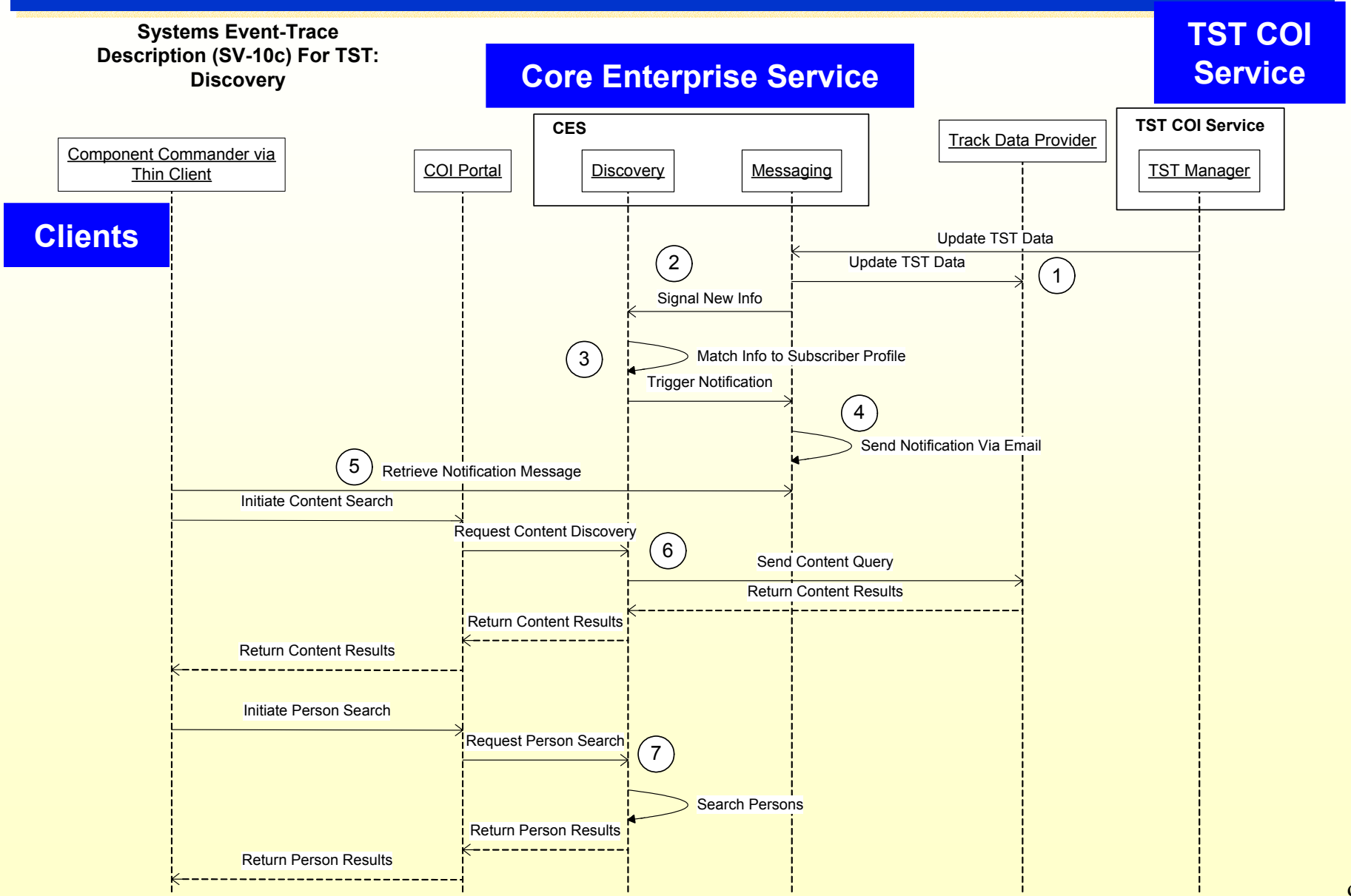
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Notional System Interface Description (SV-1)

Notional To-Be Systems Interface (SV-1) For TST

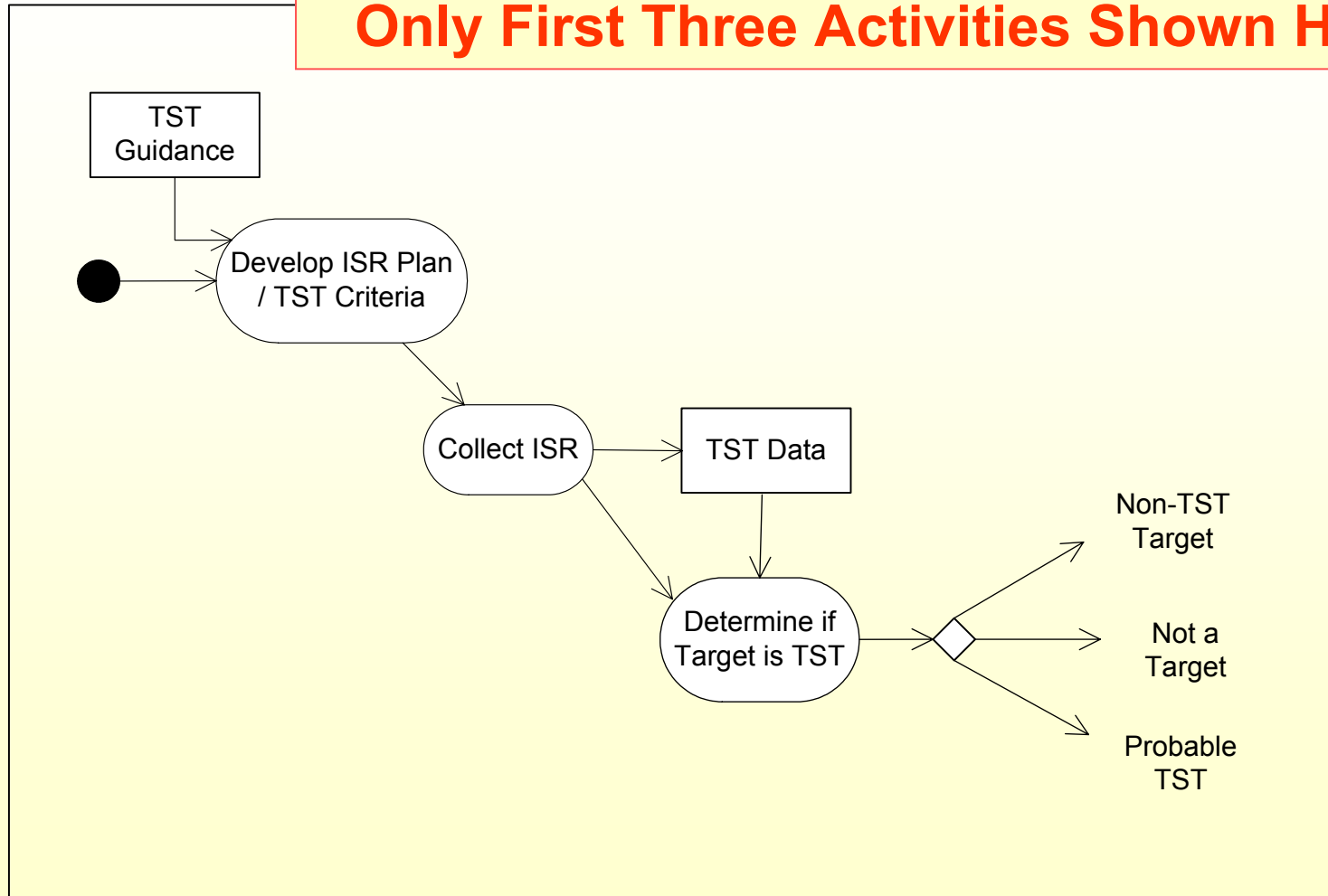


Notional Event-Trace Description (SV-10c)



Executable Architecture Model for TST

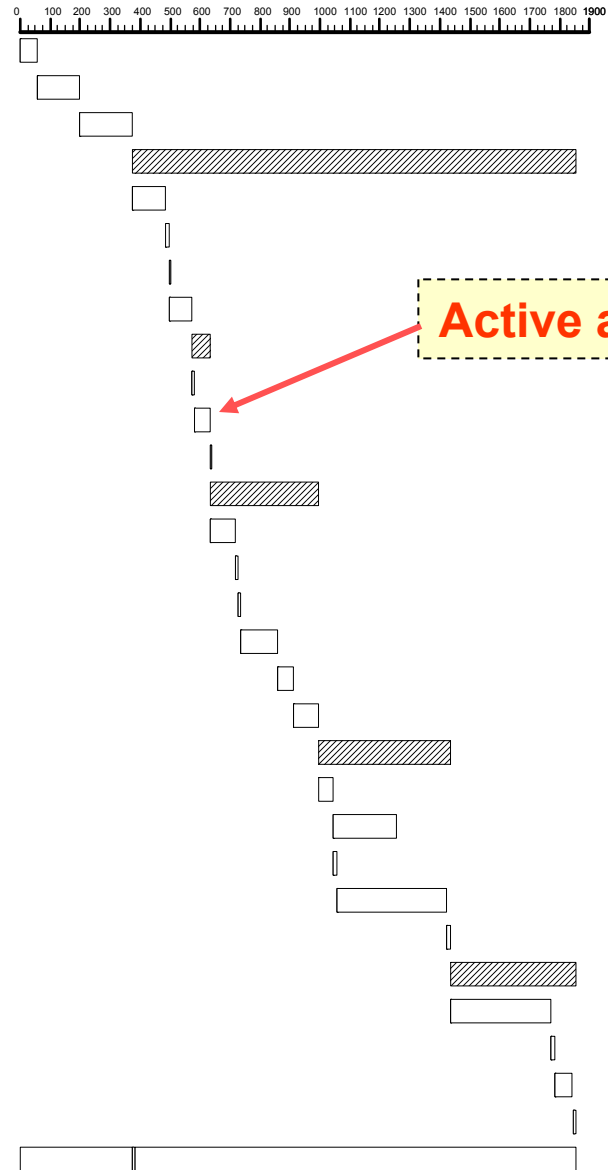
Only First Three Activities Shown Here



Model Execution Timeline (example)

TST Activities

- TST.1 Develop ISR Plan / TST Criteria
- TST.2 Collect ISR data
- TST.3 Determine if Target is TST
- TST.5 Fix through Assess Phases
- TST.5.1 Locate Target
- TST.5.2 Correlate & Fuse Data
- TST.5.3 Confirm / PID TST
- TST.5.6 Determine Time Available
- TST.5.7 Track Phase
- TST.5.7.1 Maintain Track Continuity on the TST
- TST.5.7.2 Monitor Window of Vulnerability
- TST.5.7.3 Update Situational Awareness
- TST.5.8 Target Phase
- TST.5.8.1 Validate Target
- TST.5.8.2 Determine Available Attack Assesses
- TST.5.8.3 Formulate Weapon Target Pairing
- TST.5.8.4 Formulate Engagement Options
- TST.5.8.5 Submit Combat Assessment Requirements
- TST.5.8.6 Select TST Attack Option
- TST.5.9 Engage Phase
- TST.5.9.1 Order TST Engagement
- TST.5.9.2 Monitor Engagement
- TST.5.9.3 Acquire Target
- TST.5.9.4 Attack TST
- TST.5.9.5 Initiate Assessment
- TST.5.10 Assess Phase
- TST.5.10.1 Collect Assessment Data
- TST.5.10.2 Correlate & Fuse Data -Assess
- TST.5.10.3 Determine Effects
- TST.5.10.4 Remove From Target List
- TST.7 Update TST Manager Tool



Active activities

Operational Mission Threads

Warfighter Mission Areas:

- **Time Sensitive Targeting (USJFCOM/SPAWAR/USA G-6)**
- **Focused Logistics/Deployment (USJFCOM/USTRANSCOM)**
- **Joint Close Air Support (USJFCOM)**
- **Global Strike (USAF/USSTRATCOM)**
- **Blue Force Tracking (USA)**

Business Mission Area:

- **Personnel/Military Pay (HRM Domain)**

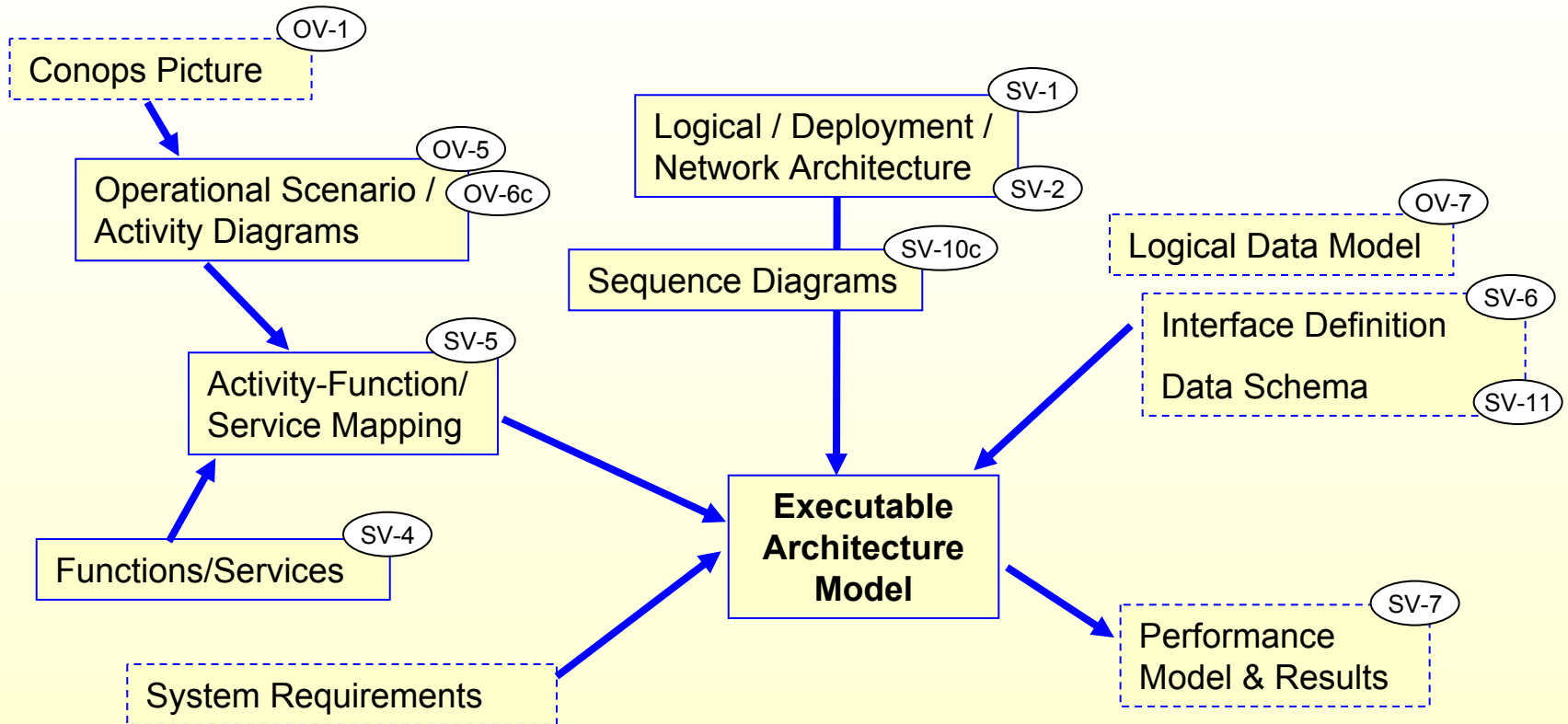
Usage of Core Enterprise Services

Mission Threads	TST	Flog/D	JCAS	GS	BFT	MilPay/D	Subtotal
Messaging Services	9	6	9	5	1	1	30
Discovery Services	5	8	3	4	1	0	21
Collaboration Services	14	5	11	8	0	1	39
Mediation Services	8	7	3	3	1	0	21
User Assistant Services							
Application Services							
IA/ Security Services							
Enterprise Services Mgmt							
Storage Services							

Shaded area for foundational services

Average number of activities using a service

Architecture Modeling Methodology



End of Presentation
