



# Joint Operational Effects Federation (JOEF) Briefing to CBIS

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# Background

## **PROGRAM SUMMARY:**

**Enables Warfighter and planners to assess CBRN effects on operations, personnel, and equipment and to recommend COAs to minimize or eliminate threat.**

## **HOST C4I SYSTEMS:**

**GCCS-J, GCCS-M, GCCS-A, GCCS-AF, GCCS-K, JC2, TBMCS, C2PC**

## **USERS:**

**Strategic and Operational Planners, Joint Commanders & Staff, NBC Command Center**

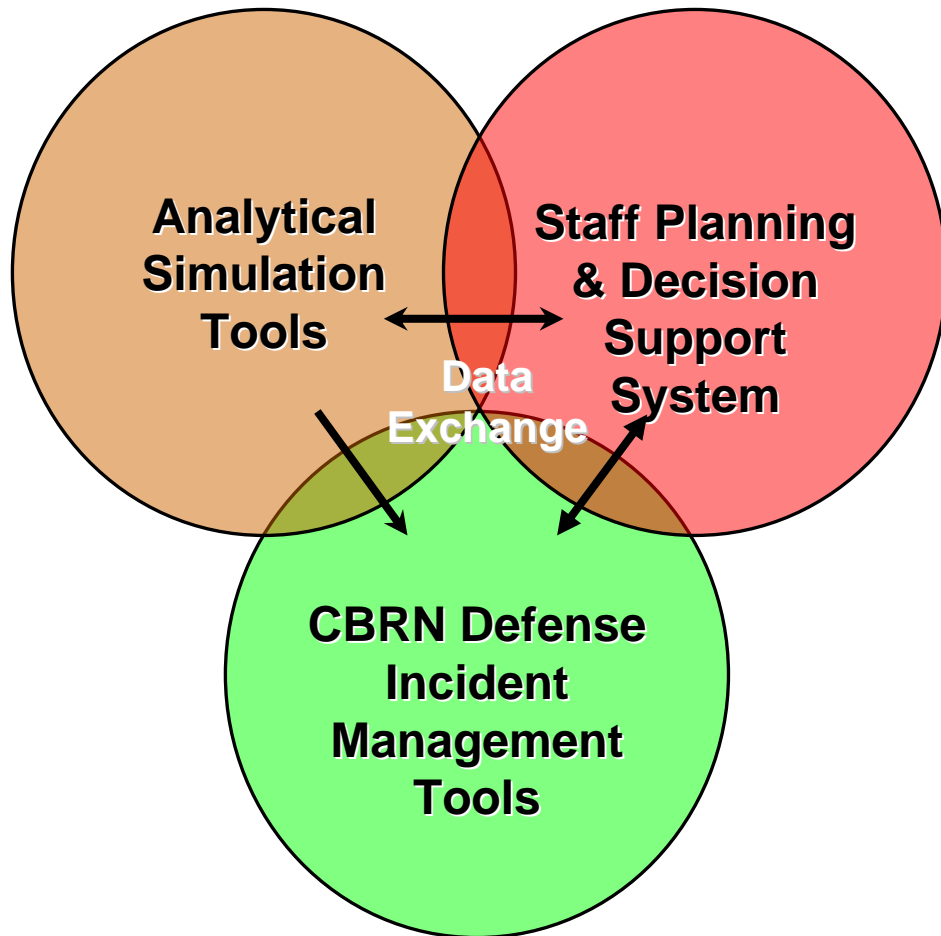


# JOEF Increments Summary

- **Increment 1: Initial Operational Capability, June 2008**
  - APODs, SPODs, TacAir, Medical, Mobile Forces,
  - Deliberate Planning (Operational, Strategic)
  - Crisis Planning (Operational)
  - Resides on C4I Systems
  
- **Increment 2: *TBD***
  - Consequence Management (Military)
  - Crisis Planning (Tactical)
  - Standalone
  
- **Increment 3: *TBD***
  - Consequence Management (Coalition)



# JOEF Overview

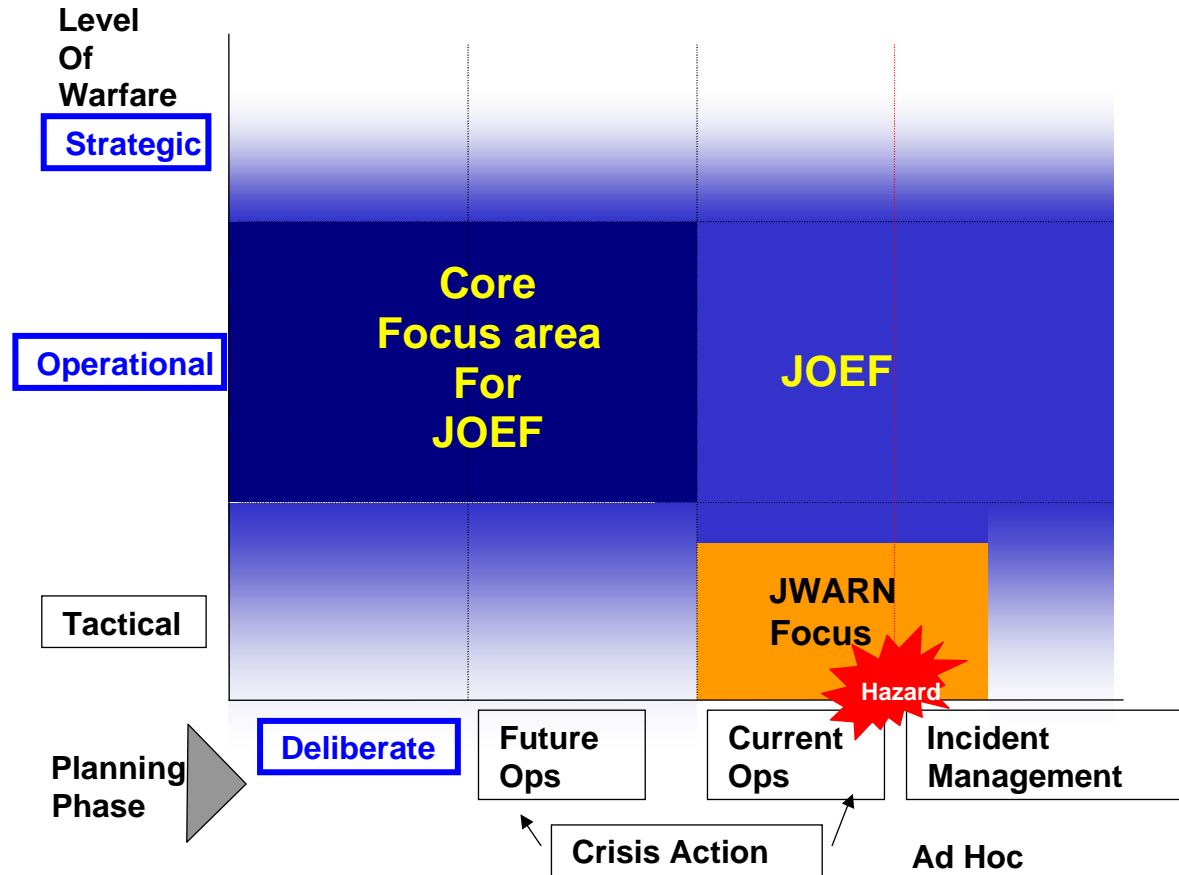


## JOEF Requirements include:

- Deliberate planning tool
- Operational Effects Prediction Tool
- Access Data in Near Real Time
- COE and NCES Compliance
- Interoperability with C4I and M&S systems
- Net Ready – A Joint integrated architecture



# JOEF User and Temporal Context





# Program Acquisition Approach

- **Utilize Broad Agency Announcement (BAA) for Software Development**
  - Contract awarded in February 2006 to Cubic
- **Spiral Software Development**
  - Increment 1: 3 Prototypes; 2 Formal Builds
  - Science & Technology Transition
    - Insertion: Prototypes (3); Build 1 and 2
  - Provide Interim capabilities to Warfighters
    - Signal Fire
- **Keep working with Warfighters to refine requirements and enhance the end product**

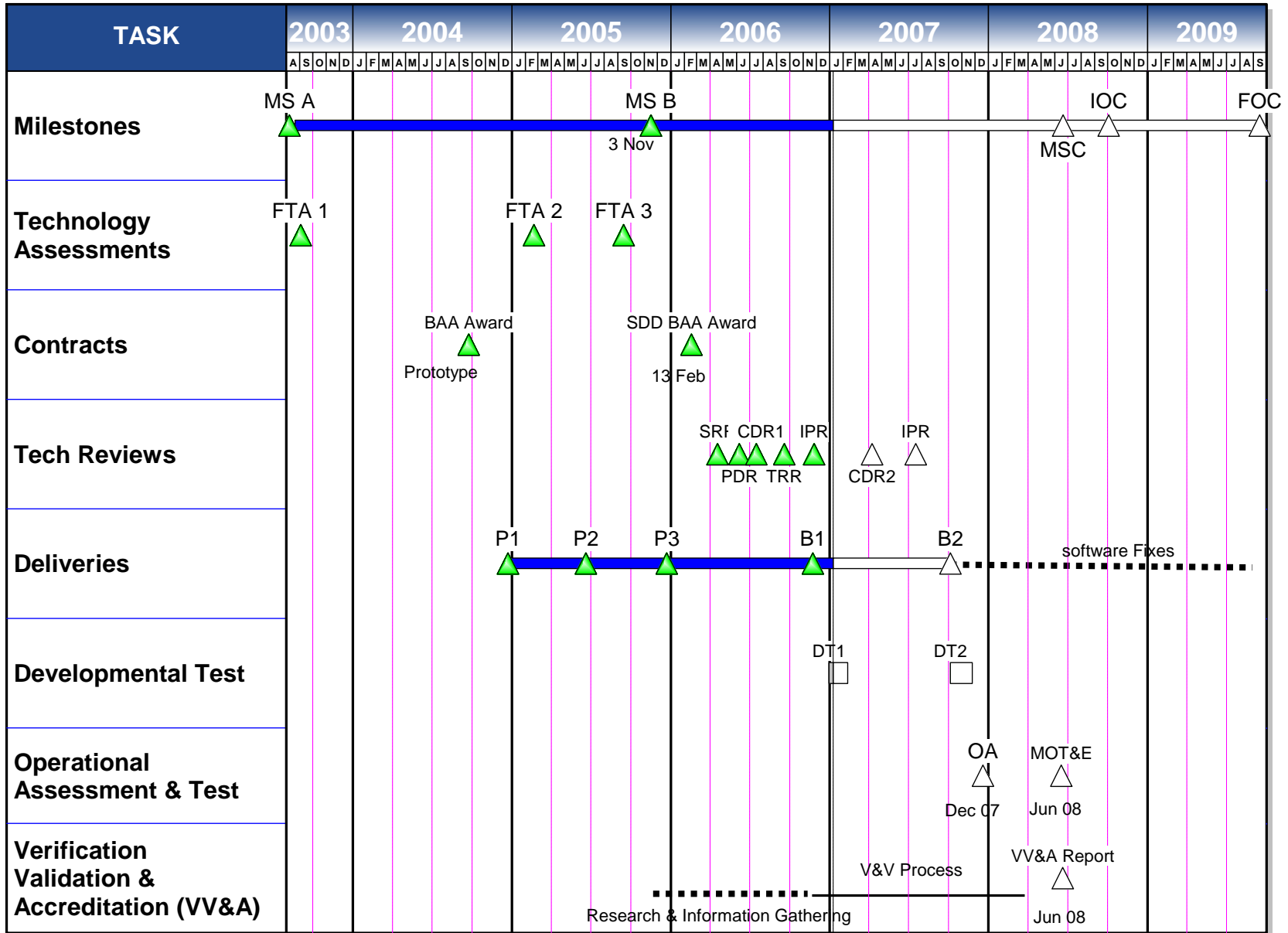


# Software Development Approach

- **Increment 1: 3 Prototypes; 2 Formal Builds**
  - **Build 1: Nov 06**
    - **KPP 1: Deliberate and Crisis Planning Tool**
    - **KPP 2: Operational Effects Prediction Tool**
  
  - **Build 2: Sep 07**
    - **KPP 3: Access Data in Near Real Time**
    - **KPP 4: Interoperability: JEM; GCCS-M/AF/A/J; JC2**
    - **KPP 5: Net-Ready**



# JOEF Schedule – Increment I





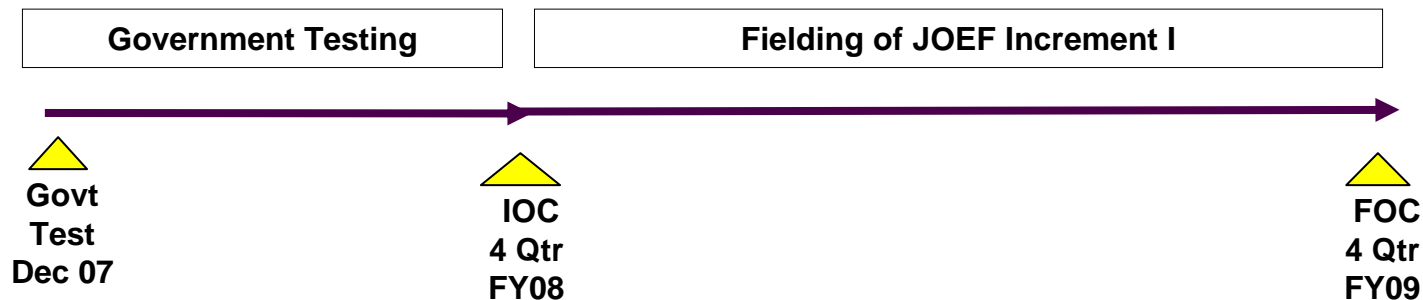


# JOEF Increment I Major Activities

## Software Development



## Testing and Fielding





**Increment I:**  
**(Before the CBRN Event)**

**Deliberate Planning**  
**Crisis Planning**



# Support to CBRN Planning

## Workflow Management

- **Workflow Manager (WFM) module semi-automates and manages the multi-step processes used to produce various planning products such as Plans, Reports, and Assessments**

## Activity Automation

- **Activity Automation (AA) Module semi-automates the creation of individual work products for tasks defined in a JOEF Workflow Manager process model**



# Analytical Simulation Tools

**JOEF Prototype Phase 3 - APOD VX**

File View Input Output Simulation Tools Help

ATK FAC MET RES SCH

**JOEF Prototype Phase 3 - SPOD VX**

File View Input Output Simulation Tools Help

ATK FAC MET RES SCH

Input Runtime Output

Environment Operations Resources

**Resources - Personnel - Chem-Bio Exposure**

Person	x	y	Zone Name	Casualty Level	Protect
SuptrPer	5962	3130	ZONE L2	Patient	NONE
SuptrPer	5962	3130	ZONE L2	Patient	NONE
SuptrPer	5911	3124	ZONE L2	Patient	NONE
SuptrPer	5911	3124	ZONE L2	Patient	NONE
SuptrPer	5911	3124	ZONE L2	Patient	NONE
SuptrPer	5968	3220	ZONE L2	Recovered	NONE
SuptrPer	5968	3220	ZONE L2	Recovered	NONE
SuptrPer	6094	3213	ZONE L2	Patient	NONE
SuptrPer	6094	3213	ZONE L2	Patient	NONE
SuptrPer	5911	3124	ZONE L2	Unaffected	NONE
SuptrPer	5911	3124	ZONE L2	Unaffected	NONE

Name	Quantity
✓ Port Driver	200
✓ Container Crane Operator	10
✓ Harbor Pilot	3
Mobile Crane Operator	6

Package Name: Port Driver

Maximum Quantity of Selected Package: 200

Location	Quantity
1 35°10'48.89", 129°3'57.53"	100
2 35°8'59.96", 129°4'16.39"	100

Add Delete

Resource Package Contents

Name
Port Driver

12



## **Increments II and III:**

### **(CBRN Event)**

## **Incident Response & Consequence Management (Military, Civilian)**



# JOEF Consequence Management

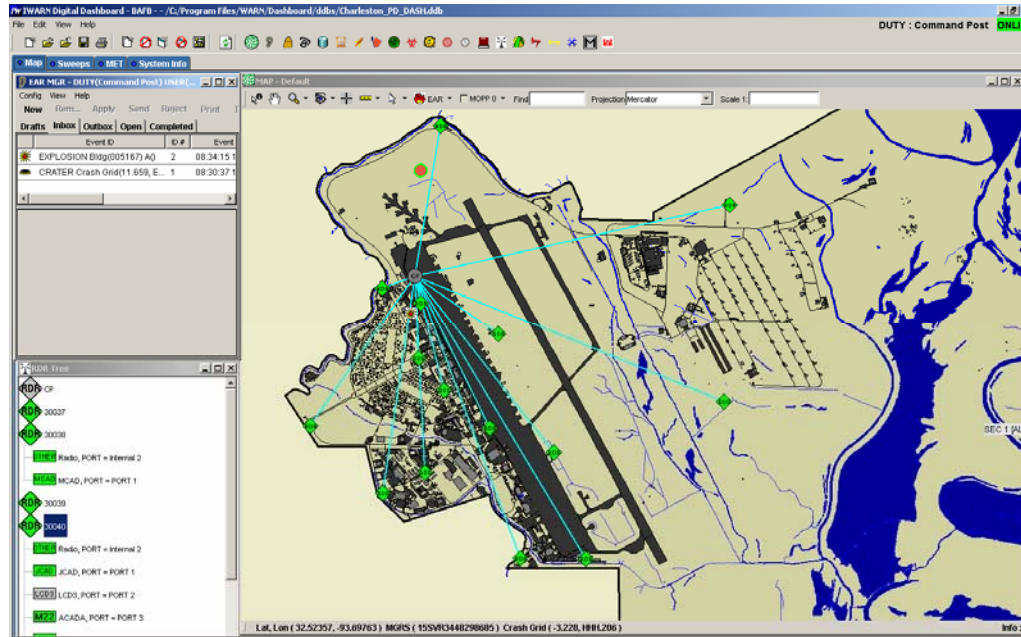


CHART	Light Work Level		
	Risk Assessment of Nerve Agent Exposure and Effect		
	Threshold Risk (Th)	Incapacitation Risk (EC)	Lethal Risk (LC)
Risk @ Calculated Dosage	<16%	<16%	<16%
Dose Required for Percentile Response	Th16 Dose (mg-min/M3) 0.2725	EC16 Dose (mg-min/M3) 19.86	LC16 Dose (mg-min/M3) 28.89
Calculated Dosage (mg-min/M3)	0.2700	0.2700	0.2700
CHART	Moderate Work Level		
	Risk Assessment of Nerve Agent Exposure and Effect		
	Threshold Risk (Th)	Incapacitation Risk (EC)	Lethal Risk (LC)
Risk @ Calculated Dosage	>70%~84%	<16%	<16%
Dose Required for Percentile Response	Th84 Dose (mg-min/M3) 0.2936	Th16 Dose (mg-min/M3) 9.93	Th16 Dose (mg-min/M3) 14.44
Calculated Dosage (mg-min/M3)	0.2700	0.2700	0.2700
CHART	Heavy Work Level		
	Risk Assessment of Nerve Agent Exposure and Effect		
	Threshold Risk (Th)	Incapacitation Risk (EC)	Lethal Risk (LC)
Risk @ Calculated Dosage	>84%	<16%	<16%
Dose Required for Percentile Response	Th84 Dose (mg-min/M3) 0.1957	Th16 Dose (mg-min/M3) 6.62	Th16 Dose (mg-min/M3) 9.63
Calculated Dosage (mg-min/M3)	0.2700	0.2700	0.2700

- **General Purpose CM tools, plus user-specific tools**
  - **General Purpose Tools: GIS interface, maps, geo-spatial analysis capabilities**
  - **User-Specific Tools: Sweep tools, CHART, ChemRat, etc.**



# ***Science and Technology***



# JSTO/JOEF Collaboration

- **Five JSTO/JOEF Technology Transition Agreements (TTAs) established in FY06**
  - **Integrated Information Management System (IIMS)**
    - **Successful Technology Transition Readiness (TTR) Review and Transitioned into JOEF PO – Completed Sept 06**
    - **Use IIMS as-is in Build 1; Will convert its JOEF-related major functionalities into Service Oriented Architecture (SOA) for Build 2**
  - **Model of Chemical IED Effects on Mobile Forces**
  - **Improvements in CBR Operational Effects Modeling Tools and Methods**
  - **Internal Modeling Capability for Staffs**
  - **Next Generation Model of CB Effects on Military Operations**





# **JSTO/JOEF Collaboration**

## *(Continued)*

- **Sensor Placement Technologies from ITT and DSTL-UK**
  - Request JSTO assistance in evaluating rule-based and optimized sensor placement technologies for inclusion in JOEF Increment I
  - JOEF Build I will use ITT's Automated Rules-based Placement (ARP) implementation; Expand/upgrade sensor placement capability as improved methods become available
- **Automated Coalition Consequence Management (ACCM) Advanced Technology Demonstration (ATD), FY07/08**
  - USPACOM sponsors the Multinational Planning and Augmentation Team (MPAT) to explore Automated Coalition Consequence Management (CM)
  - Plan to use JOEF for CM capabilities



# JOEF Future S&T Needs

- **Automation, Optimization and Integration**
  - Use of optimization for rapid, reliable, robust CBRND COA planning, resource allocation and placement
  - Task automation and artificial intelligence for CBRN staff support.
  - M&S federation automation, tools to automatically negotiate CBRND FOMs
  - CBRN synthetic environment for training, exercises, and experiments
  - Methodology and tools for rapid generation of operational execution checklists and templates
  - Automated tools to discover and predict COA vulnerabilities
  - Integration of CBRN effects models with campaign warfare models.
  - Modeling tools for mobile force CBRND operational impacts
  - Framework for integration of CBRND planning tools with incident/consequence management
- **Models and Data**
  - TIC/TIM human effects and task-time-theater information
  - Radiological and Nuclear Effects Models
  - Medical resource limitation effects
  - Secondary infection models and bio threat characterizations to assess contagious disease control plans and policies
  - MOPP task degradation data for “non-standard” MOPP conditions and additional task types



# *Questions?*

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