

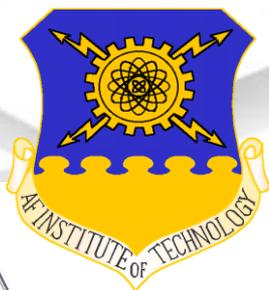


Air Force Institute of Technology



The AFIT of Today is the Air Force of Tomorrow.

***Cyberspace Integration
within the
Air Operations Center***



U.S. AIR FORCE

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Air University: The Intellectual and Leadership Center of the Air Force

Aim High...Fly - Fight - Win



Overview



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- Introduction
- Situation
 - C-NAF
 - Combatant Command
 - AFCYBER/24AF
- Requirements
 - Publication Review
 - Task List
 - AOC Specific Requirements
 - Communications Flow
- Recommendations
- Conclusion



Introduction



The AFIT of Today is the Air Force of Tomorrow.

- Analyze how Cyberspace is integrated into the Air and Space Operation Center (AOC) weapon system and make recommendations to improve integration and interoperability
- Mission Analysis
 - Research the major stakeholders
 - Perform a publication review
 - Aggregate the requirements
 - Formulate organizational constructs
 - Assess the merits of each construct
 - Recommend the “best”



Situation



The AFIT of Today is the Air Force of Tomorrow.

- Guidance
 - Joint Staff Transitional Cyberspace Operations Command and Control Concept of Operations
- Organize/Train/Equip
 - Services

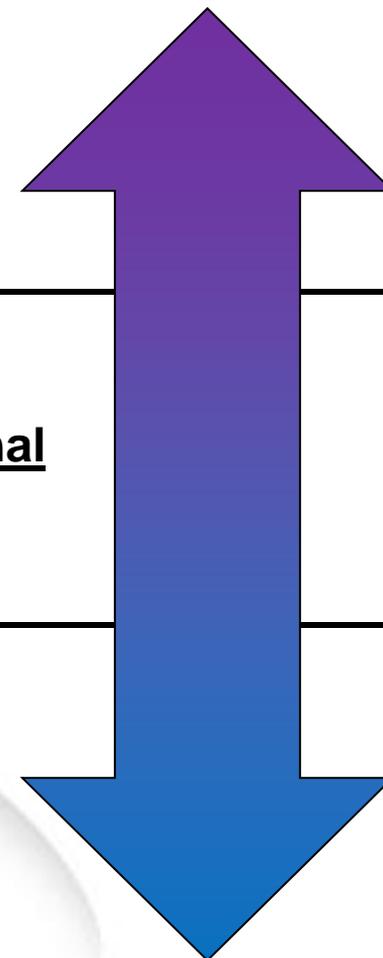
- Organizational Uncertainty
- Lack of Roles/Responsibilities
- Marginal Cyber Integration

- Tactics Techniques and Procedures
- Tactical Integration of Cyber
 - Red Flag
 - Weapon's Instructor Course (WIC)
- New Capabilities

Strategic

Operational

Tactical



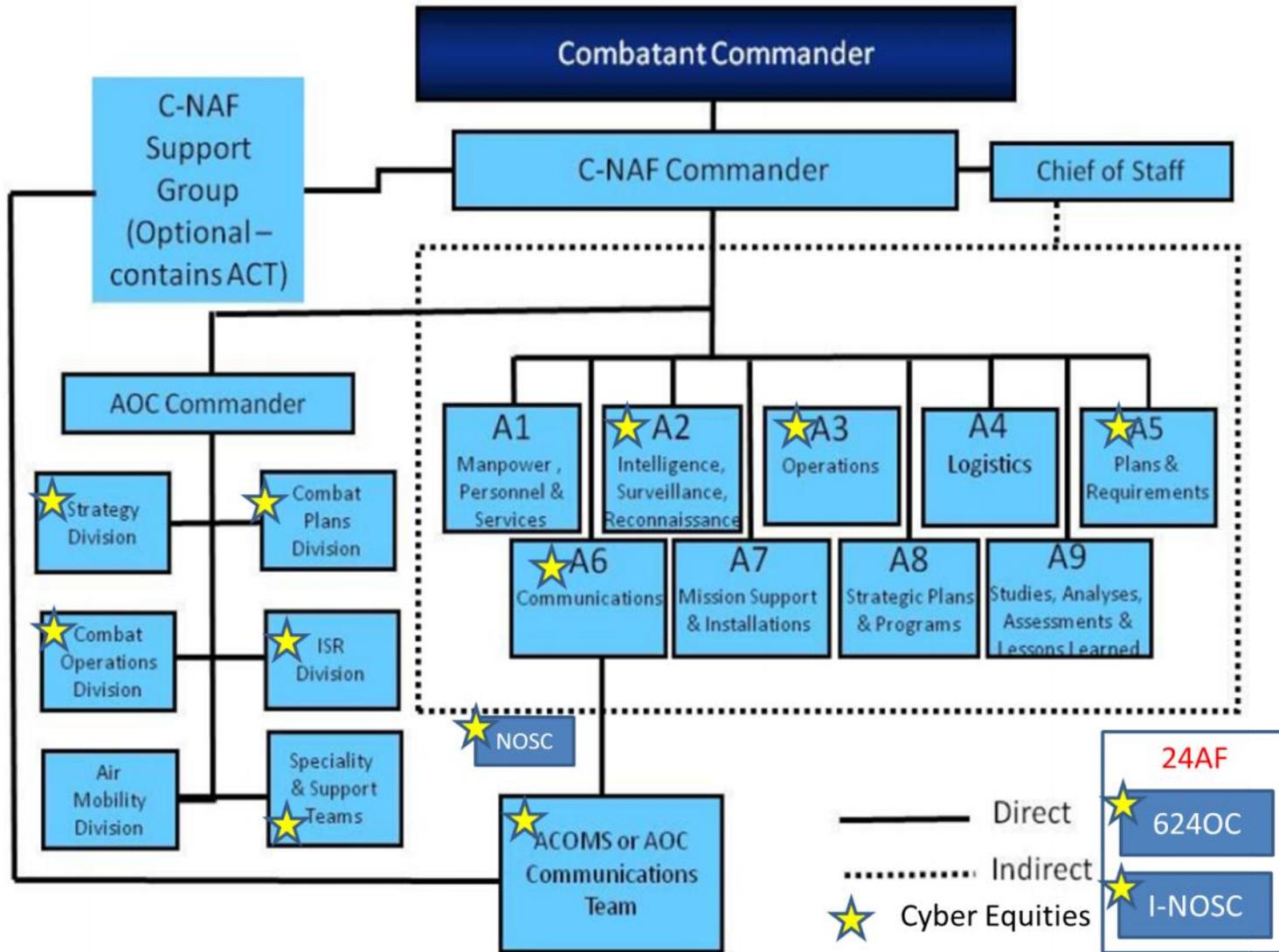


Component-Numbered Air Force (C-NAF)



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- Dual Hats
- Service VS
- Functional
- AFFOR VS
- AOC





Joint Staff Cyberspace Operations C2 CONOPS



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- Joint Cyber Center (JCC):

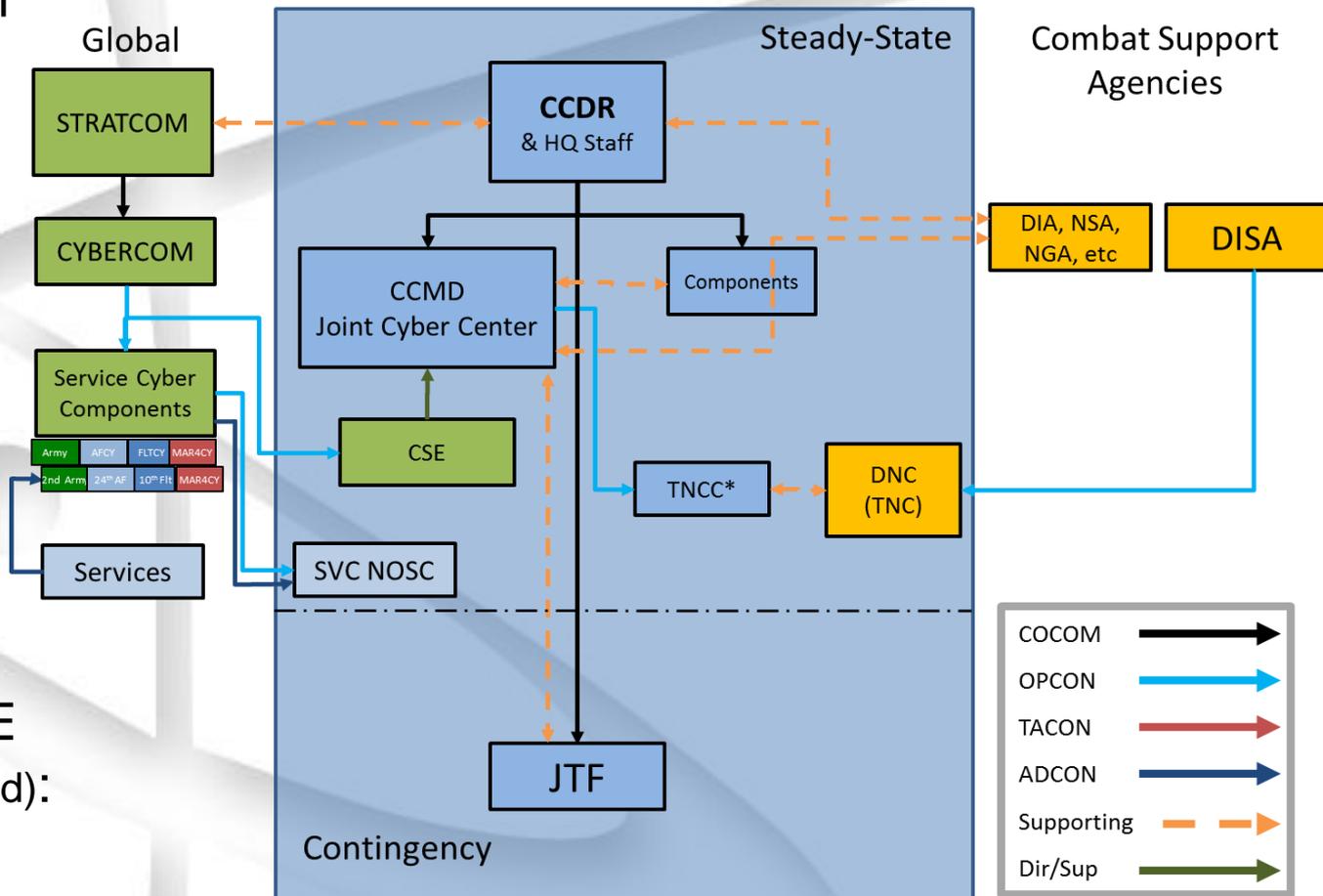
- focal point for Combatant Command

- Cyber Support Element (CSE):

- USCYBERCOM Liaison to JCC

- Expeditionary CSE (exCSE) (not pictured):

- USCYBERCOM Liaison to Components



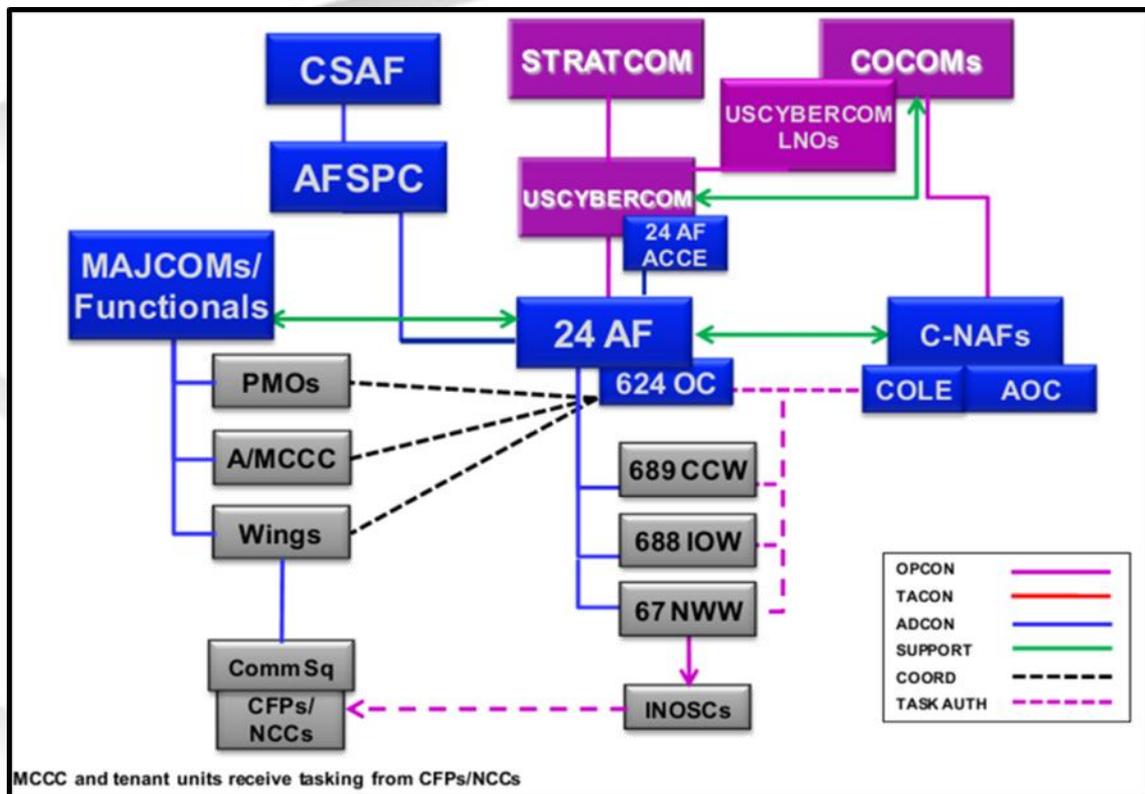


AFCYBER/24th Air Force



The AFIT of Today is the Air Force of Tomorrow.

- AFCYBER
 - Operations
 - DOD Global Information Grid (GIG)
 - Defensive Cyber Ops
 - Offensive Cyber Ops
 - Reachback support
 - Coordinate Defense
- 24AF
 - Defend AFNET (part of DOD GIG)
 - Mission Assurance
 - 624 Operations Center (OC)





Requirements



The AFIT of To

- Document Review
 - Joint Publications
 - AF Doctrine
 - AF Instructions
 - AF Policy Documents
 - AF TTPs

- Aggregated and sorted

- 3 Groups
 - Network Infrastructure and passive defense (green)
 - Planning and execution of OCO and active defense (red)
 - Intelligence (blue)

#	Air Component Tailored Tasks	Publication	Page(s)
Network infrastructure and passive defense			
1.0	Operate and Defend tactical or constructed networks within component	JS C2	10
1.1	Form, facilitate and allocate personnel to the Network defense working group (NDWG)	AFTTP 3-3.AOC	8-13
1.2	Liasion with NetOPS (MAJCOM NOSC, local NCC)	AFTTP 3-3.AOC	8-11
1.3	NetD Directly supports JFACC theater forces	AFTTP 3-3.AOC	8-12
1.4	Report tactical and/or constructed network info to JCC	JS C2	12
2.0	Monitor AOR (component) Network events	JS C2	13
2.1	Assist AFOSI with NetD	AFTTP 3-3.AOC	8-11
2.2	Coordinate Computer network defense (CND) in the NOSC, A6, NCC and AOC	AFTTP 3-3.AOC	8-13
2.3	Analyze network activity; determine COAs to protect, detect and react to threats	AFTTP 3-3.AOC	8-12
3.0	Provide mission assurance & critical cyber infrastructure protection analysis/planning to JCC	JS C2	12
3.1	Produce/update the risk assessment for AFFOR networks (TACS..to include the AOC)	AFTTP 3-3.AOC	8-13
3.2	Focal point for AOC network threat assessment	AFTTP 3-3.AOC	8-12
3.3	Mission Assurance	AFDD 3-12	7
4.0	Recommend CyberCondition (INFOCON)	JS C2	13
4.1	Recommend CyberCondition (INFOCON)	AFTTP 3-3.AOC	8-11
4.2	Recommend Security posture for AOR	AFTTP 3-3.AOC	8-12
Planning and Execution of Cyberspace operations (OCO and active defense)			
5.0	Implement CCDR cyberspace strategy and planning guidance	JS C2	10
5.1	Plan NetA, NetD, and NS for air component objectives	AFTTP 3-3.AOC	8-11
5.2	provide cyber planning and operations expertise	AFI 13-1AOCv3	108
5.3	Develop & integrate cyber ops planning into OPLANS/CONPLANS	JS C2	12
5.4	Coordinate and synchronize cyberspace operations activities with air and space operations	AFI 13-1AOCv3	108
6.0	Plan and control OCO within assigned mission sets	JS C2	10
6.1	Planning and execution of NWO missions for air campaign	AFTTP 3-3.AOC	8-12
6.2	Coordinates cyberspace ops via JCC	JS C2	12
6.3	Assist JCC in plan/control/direct of OCO within AOR	JS C2	10
6.4	Recommend effects of adversary networks and telecommunications systems	AFTTP 3-3.AOC	8-12
6.5	Examine Adversary networks to identify critical and vulnerable links and nodes	AFTTP 3-3.AOC	8-12
6.6	Assist JCC with timing, tempo, and integration of CCDR cyber ops	JS C2	11
6.7	Ensure all cyber taskings are deconflicted, integrated, and coordinated into ATO	AFI 13-1AOCv3	108
6.8	Coordinating and integrating cyber capabilities with the IO team and Net Warfare Planners	AFI 13-1AOCv3	107
7.0	Work with STO planners	JS C2	11
7.1	Work with STO team	AFI 13-1AOCv3	108
8.0	Submit OPE objective and desired effects to JCC	JS C2	10
8.1	Inputs to JCC for OPE to meet CCDR intent	JS C2	13
8.2	Inputs to JCC to build JIPOE and TSA products	JS C2	13
Intel			
9.0	Coordinate, synch, integrate cyber-related intel and analysis into operational plans	JS C2	13
9.1	Work with NOSC, AFFOR/A6, AFOST, ISRD the IO team and agencies to identify adversary threats and blue vulnerabilities	AFTTP 3-3.AOC	8-13
9.2	Reachback to outside agencies to identify adversary capabilities and threats against AOC information systems	AFTTP 3-3.AOC	8-13
9.3	Reach back for planning, indications and warnings, defended asset list development, C2 support and deconfliction	AFI 13-1AOCv3	107
10.0	Submit targets to JCC ISO plans and operations	JS C2	11
10.1	Follow CCDR objectives, guidance, and intent for targeting cycle and prioritize targets	JS C2	11
10.2	Nominate targets for CTL and JIPTL	JS C2	11



AOC Specific Requirements



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- Cyber Planner must:
 - Understand the capabilities and limitations of cyber
 - Participate from the first strategy meeting
 - Match desired effects to cyber capabilities
- Intelligence must:
 - Coordinate reachback with 624OC
 - Understand cyber targeting process
 - Understand combatant command targeting process
- Execution must
 - Coordinate reachback to 624OC
 - Coordinate with JCC for execution
 - Build cyber specific SA and share with others
 - Maintain SA on the larger air battle
 - Synchronize cyber effects with the air battle
 - Understand active defense measures and approvals
 - Coordinate with 624OC on defense outside of C-NAF authorizations

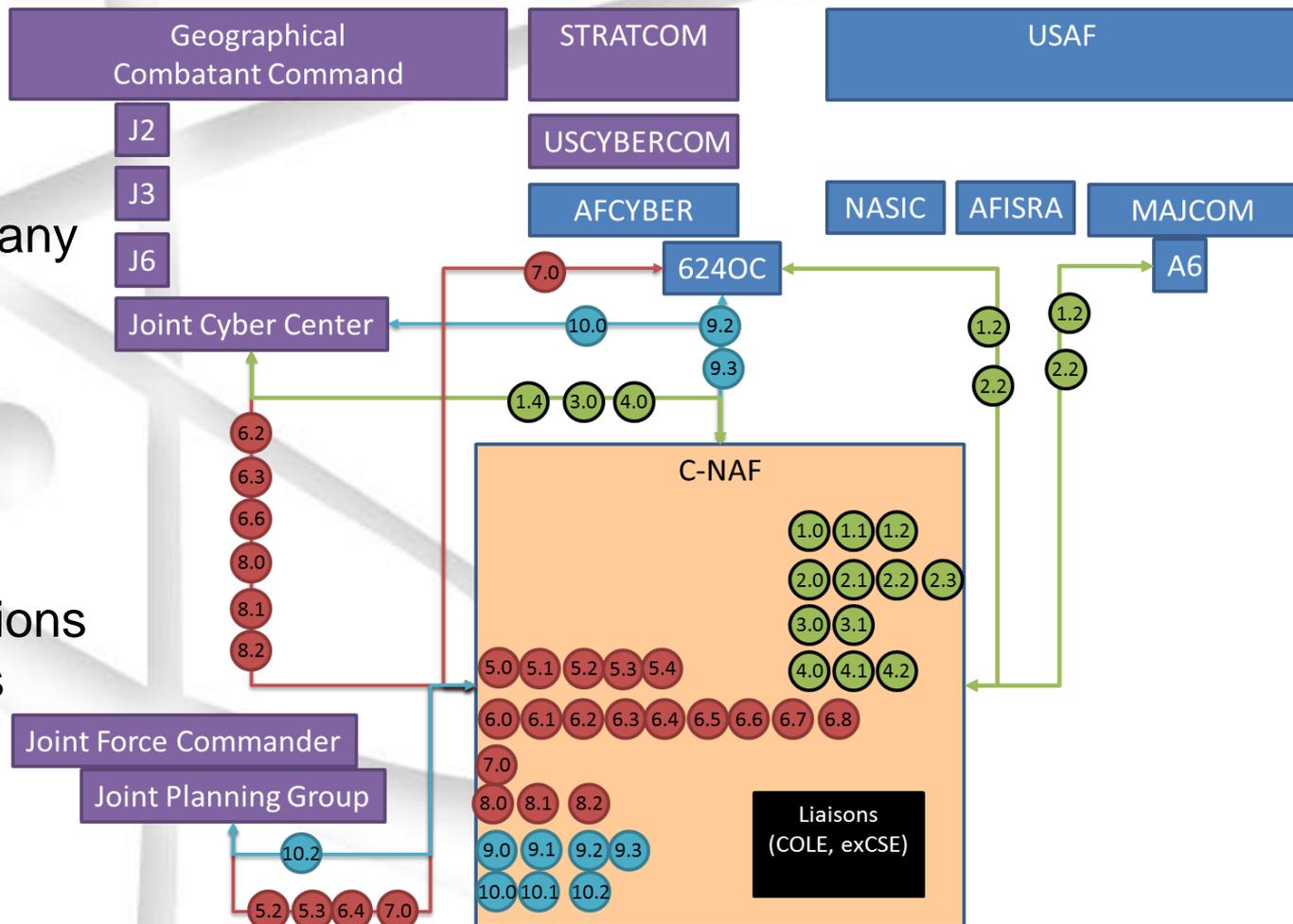


Communications Flow



The AFIT of Today is the Air Force of Tomorrow.

- Conceptualize tasks and lines of communication
- The C-NAF has many responsibilities to many different agencies
- C-NAF has many different organizations with cyber equities

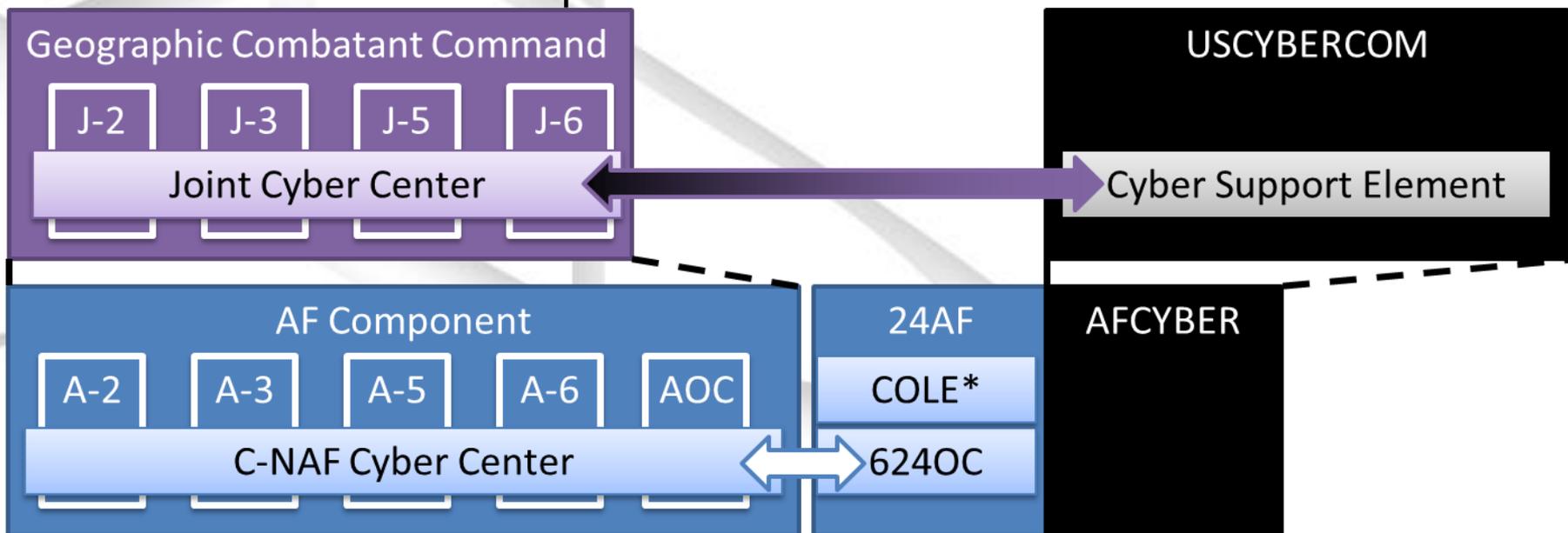




Recommendation #1

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- Establish a Cyber Center at the C-NAF Level
 - Cyber Focal Point for the AF Component
 - Parallel the Combatant Command structure
 - Synchronize AFFOR Directorates
 - Synchronize AFFOR and AOC
 - Formalize relationship with 624OC and USCYBERCOM Liaisons



*COLE is still available upon request by COMAFFOR

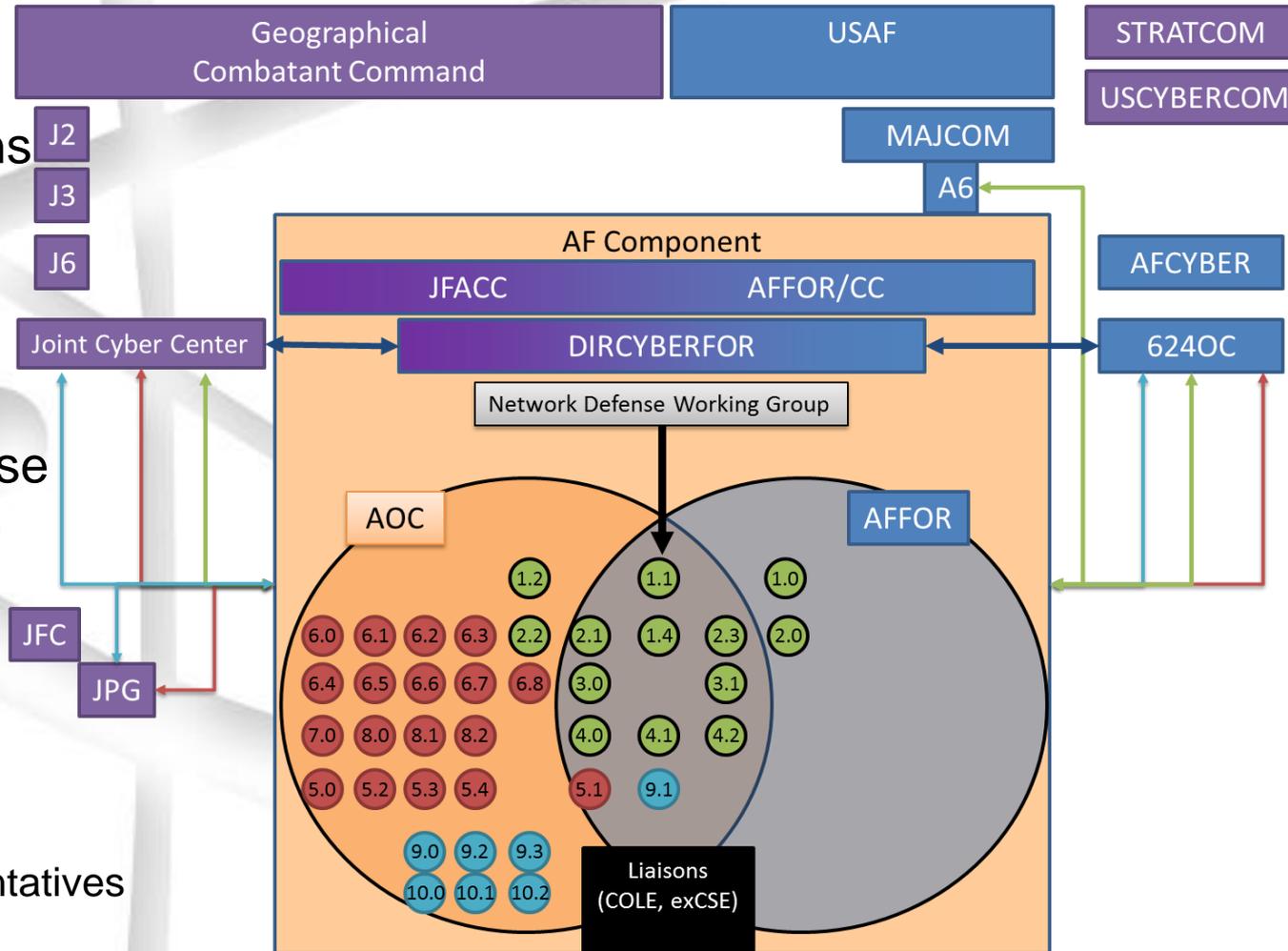


Recommendation #2

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- Establish AOC Cyber Operations Team

- AOC must execute while AFFOR sustains
- Overlap
 - Planning
 - Intelligence
 - Defense
- Network Defense Working Group (NDWG)
 - AFFOR/A2
 - AFFOR/A3
 - AFFOR/A6
 - AOC
 - 24AF representatives
- Liaisons





Recommendation #2



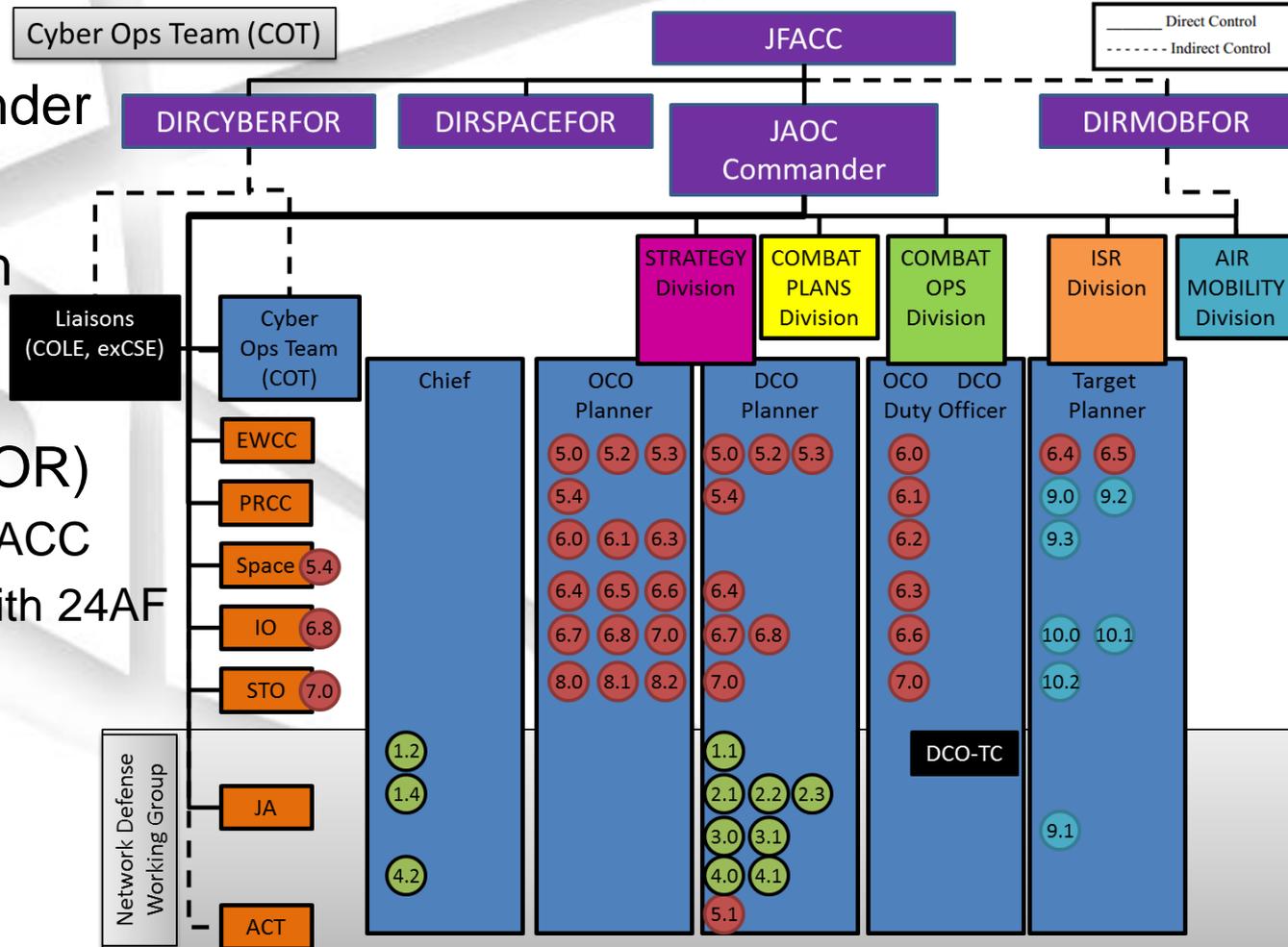
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Establish AOC Cyber Operations Team

- Reports to AOC Commander

- Guidance from Director of Cyber Forces (DIRCYBERFOR)
 - Advisor to JFACC
 - Coordinate with 24AF

- Team Roles
 - Chief
 - Planners
 - Execution





Recommendation #3



The AFIT of Today is the Air Force of Tomorrow.

- Manage Expectations for/with Liaisons
 - Cyber Liaisons from 24AF or USCYBERCOM will work with AOC Cyber Operations Team
 - Enhance reachback
 - Provide additional capabilities
 - Offer expertise
 - COT Chief and Liaison Lead will decide where and when Liaisons are needed
 - DIRCYBERFOR coordinate with the JCC and CSE lead to discuss roles, responsibilities, and expectations of the liaisons
 - exCSE is **not** to become the lead planners for cyber at the AOC



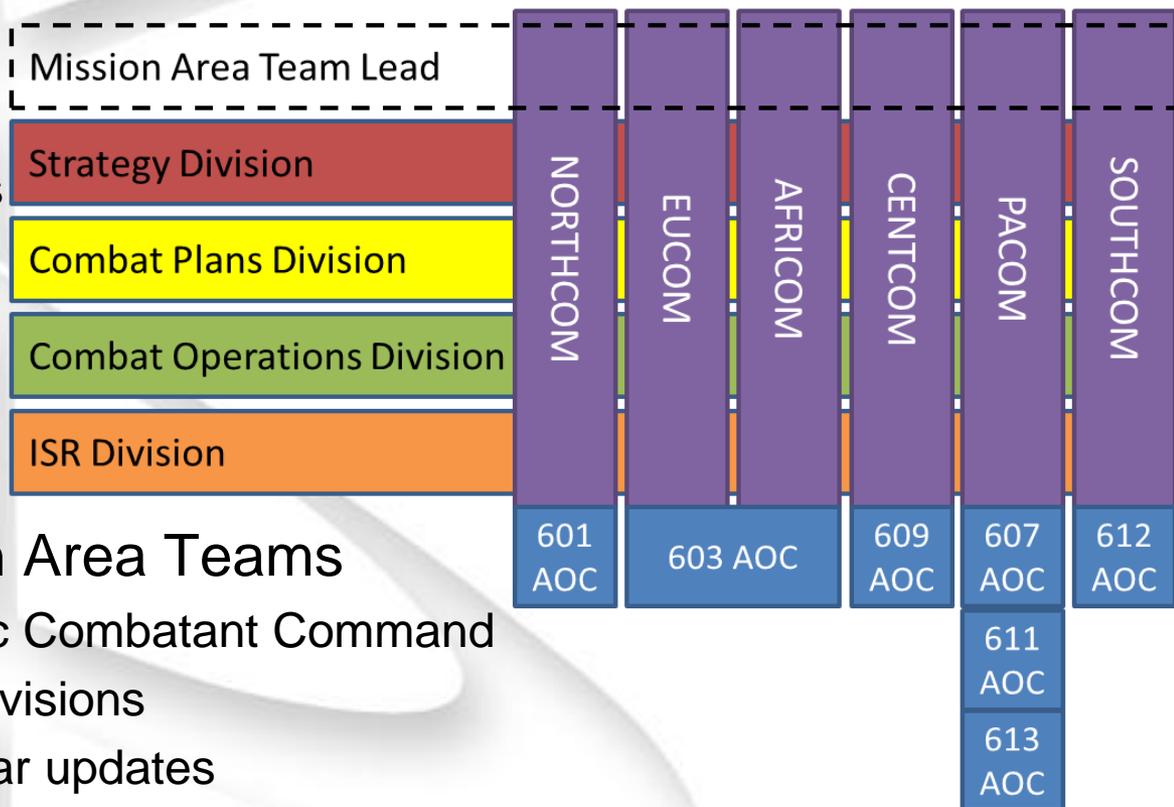
Recommendation #4

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- Establish a Regional Structure within the 624OC
 - Currently at 624OC, only ISRD has a regionalized structure

- Context/familiarity

- Indications/Warnings
- Enemy TTPs
- Enemy Intentions
- Friendly TTPs



- Establishing Mission Area Teams

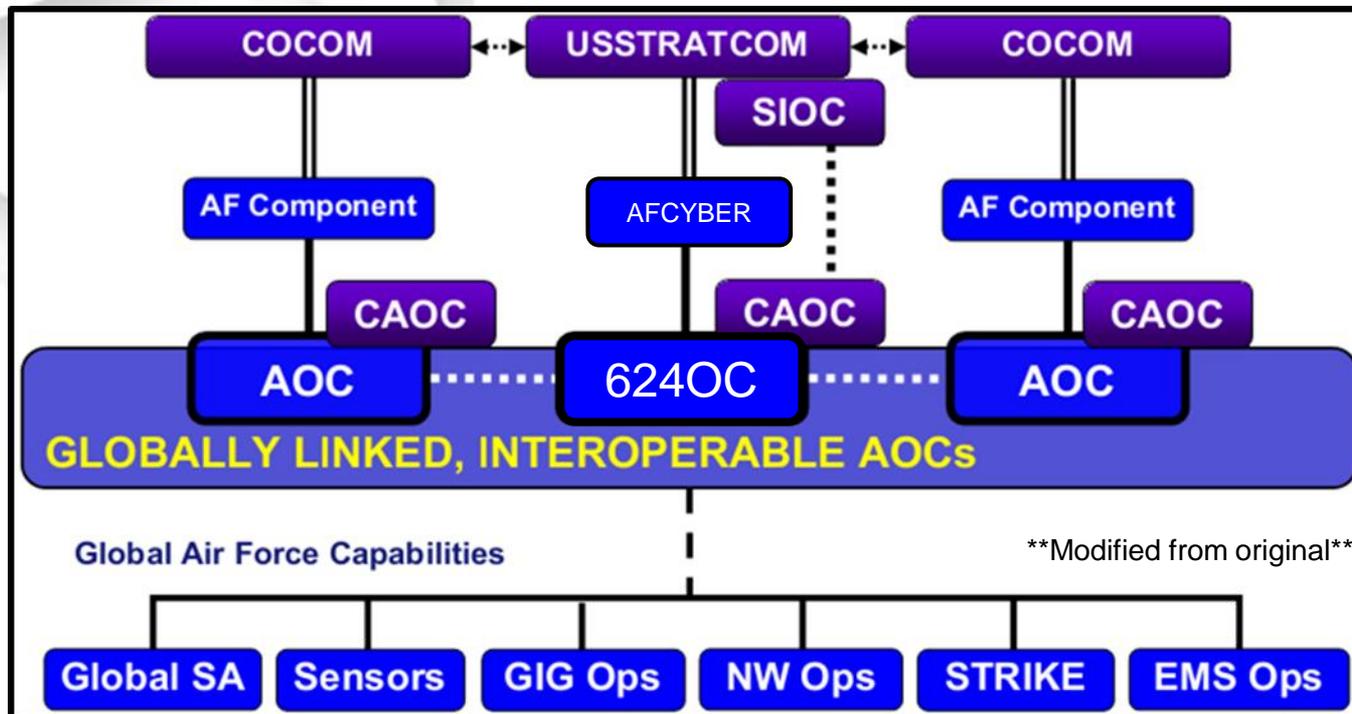
- For each Geographic Combatant Command
- Include all 624OC Divisions
- ISRD provides regular updates
- Other teams plan, adjust, recommend accordingly



Recommendation #5

The AFIT of Today is the Air Force of Tomorrow.

- Implement Globally Linked Interoperable AOCs
 - Habitual relationship with Regional AOC(s)
 - Build and maintain regional context
 - Essential for contingency operations
 - Mission Assurance first step





Conclusion

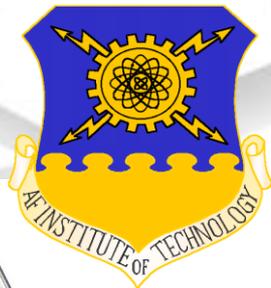
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- C-NAFs have many challenges
 - Plethora of internal cyber stakeholders
 - Plethora of external cyber stakeholders
 - Plethora of cyber requirements
 - Lack of roles/responsibilities
- Aggregate and organize the necessary tasks
 - Assign task to best organization
 - Current Organizational structure not optimal
- Recommendations
 - Establish a Cyber Center at the C-NAF Level
 - Establish AOC Cyber Operations Teams
 - Manage Expectations for/with Liaisons
 - Establish a Regional Structure within the 624OC
 - Implement Globally Linked, Interoperable AOCs





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Questions