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DoD Cloud Strategy Overview



U.S. AIR FORCE

International Test and Evaluation Association
Test Instrumentation Workshop

14-16 May 2019



Outline



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- Background
- Strategic Environment
- Strategic Objectives
- Strategic Approach
- Implementation
- Conclusion
- References



Background



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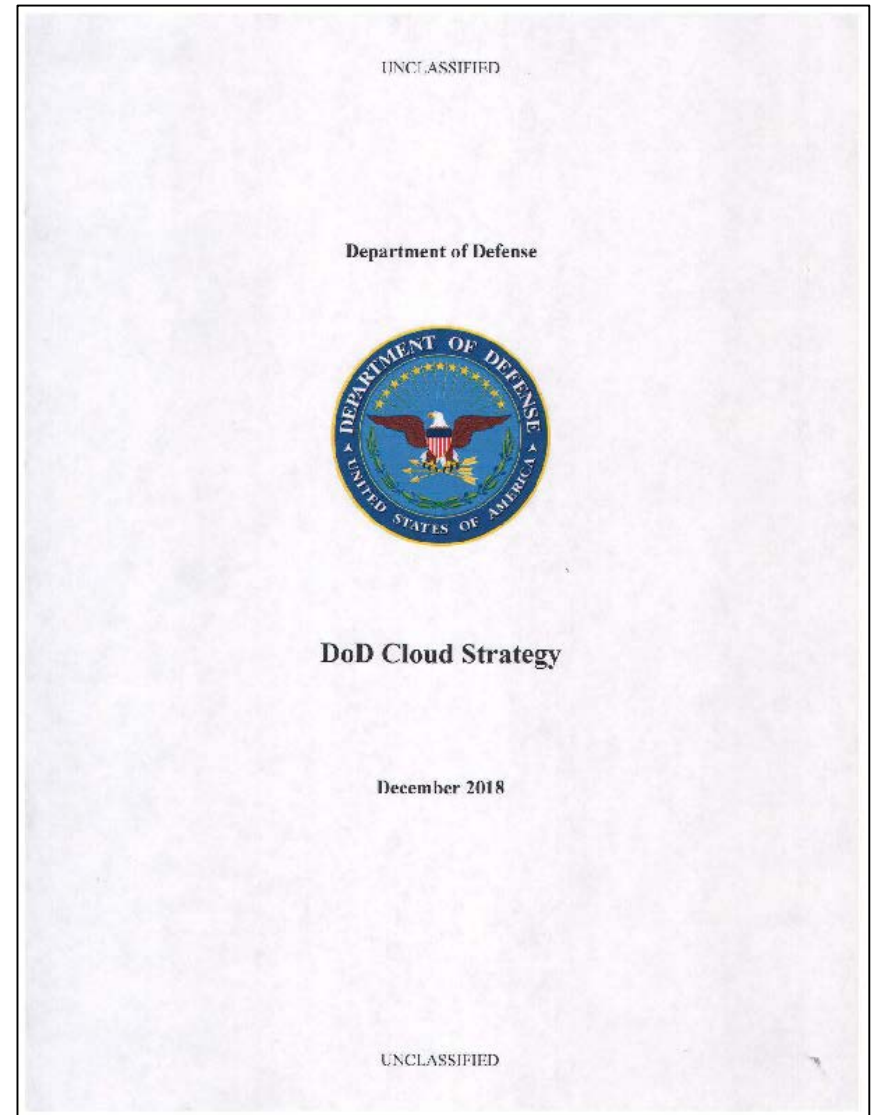
- DoD CIO released DoD Cloud Strategy on 04 Feb 2019
 - Press Release ^[1]
 - Strategy Document ^[2]

“Cloud is a fundamental component of the global infrastructure that will empower the warfighter with data and is critical to maintaining our military's technological advantage.” ^[3]

[1] <https://dod.defense.gov/News/Article/Article/1747491/clear-skies-for-dod-cloud-initiative/>

[2] <https://media.defense.gov/2019/Feb/04/2002085866/-1/-1/1/DOD-CLOUD-STRATEGY.PDF>

[3] Ibid., Forward





Strategic Environment



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Primary Environmental Factors [4]

- Inadequate Efficiency and Security in Information Technology
- Disparate Cloud Efforts and Disjointed Implementation
- Lack of Cloud Fitness
- Readiness for Artificial Intelligence

[4] <https://media.defense.gov/2019/Feb/04/2002085866/-1/-1/1/DOD-CLOUD-STRATEGY.PDF>, pages 1-2



Strategic Environment



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- Inadequate Efficiency and Security in Information Technology (IT)
 - On-premise DoD IT infrastructure purchased to meet “maximum use” case, whereas Commercial Cloud infrastructure purchased to meet “actual use” case
 - RESULT: On-premise DoD IT infrastructure is cost inefficient
 - Overly strict policies and procurement procedures make it difficult to ensure hardware and software are appropriately updated
 - RESULT: On-premise DoD IT infrastructure incurs unnecessary security risks
- Disparate Cloud Efforts and Disjointed Implementation
 - Lack of clear and coherent DoD guidance on cloud adoption and migration
 - RESULT: Siloed implementations with limited capabilities and inability to take full advantage of economies of scale



Strategic Environment



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- Lack of Cloud Fitness
 - DoD has stood up multiple clouds that are not designed for enterprise use
 - No DoD enterprise-wide guidance on determining whether a system or application is “cloud ready”
 - Systems and applications that are not “cloud ready” will likely use excessive cloud resources and be more expensive to operate
 - Consequently, DoD must ensure that legacy applications are not moved to the cloud without first re-designing them to be “cloud ready”
 - Decisions made at high levels without in-house technical expertise
- Readiness for Artificial Intelligence (AI)
 - DoD’s Joint Artificial Intelligence Center (JAIC) will require an enterprise cloud in order to maximize AI’s contribution to warfighter advantage
 - AI is a key component of the larger DoD cyber strategy to improve computer network security and resiliency



Strategic Objectives



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Primary Objectives [5]

- Enable Exponential Growth
- Scale for the Episodic Nature of the DoD Mission
- Proactively Address Cyber Challenges
- Enable AI and Data Transparency
- Extend Tactical Support for the Warfighter at the Edge
- Take Advantage of Resiliency in the Cloud
- Drive IT Reform at DoD

[5] <https://media.defense.gov/2019/Feb/04/2002085866/-1/-1/1/DOD-CLOUD-STRATEGY.PDF>, pages 3-7



Strategic Objectives



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- Enable Exponential Growth
 - DoD requires a secure and extensible cloud environment from the home front to the global tactical edge
 - DoD requires the ability to rapidly access compute and storage capacity to meet battlefield challenges at the “speed of relevance”
 - Ability to organize, analyze, secure, scale, and capitalize on critical information must be ubiquitously available to all warfighters and decision makers
- Scale for the Episodic Nature of the DoD Mission
 - DoD requires ability to provision and de-provision resources automatically in order to optimize asset utilization
 - Need cloud “pay-for-use” (i.e., “actual use”) cost model rather than traditional on-premise “maximum use” cost model
 - Cloud pay-for-use cost model provides greater agility in adapting to changing priorities, budgetary conditions, and industry developments



Strategic Objectives



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- Proactively Address Cyber Challenges
 - DoD will produce a unified cybersecurity architecture that addresses cloud support for classified and unclassified data
 - Cloud cybersecurity will be assessed frequently and independently to ensure effectiveness against developing threats
 - DoD must shift its security focus from defending the network perimeter to securing data and services
 - Accomplished through strong authentication for people and machines
 - Accomplished through secure encryption for data at rest and in motion
- Enable AI and Data Transparency
 - AI and Machine Learning (ML) algorithms used for decision support will require data that is highly available and well organized (i.e., “transparent”) within a secure common environment
 - Will require common data standards for tagging, storing, accessing, and processing information



Strategic Objectives



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- Extend Tactical Support for the Warfighter at the Edge
 - DoD cloud environment will serve mission owners from the home front to the tactical edge, both CONUS and OCONUS, and at all classification levels and disseminations
 - Cloud devices at the tactical edge will be ruggedized and adaptable, providing automatic synchronization to the enterprise cloud once communication is re-established
- Take Advantage of Resiliency in the Cloud
 - Enterprise cloud provides continuity of operations (COOP) via automated and immediate failover due to its distributed, scalable, and redundant nature
 - To fully achieve resiliency, applications will need to be redesigned for the cloud
- Drive IT Reform at DoD
 - Cloud allows DoD to further consolidate data center assets
 - Cloud enables ability to deliver integrated Defensive Cyber Operations (DCO)
 - Cloud enables efficiencies through rapid deployment of common services



Strategic Approach



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Primary Approach Elements [6]

- Warfighter First
- Cloud Smart - Data Smart
- Leverage Commercial Industry Best Practices
- Create a Culture Better Suited for Modern Technology Evolution

[6] <https://media.defense.gov/2019/Feb/04/2002085866/-1/-1/1/DOD-CLOUD-STRATEGY.PDF>, pages 7-9



Strategic Approach



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- Warfighter First
 - Need to ensure the cloud environment is improving military lethality
 - Need to continuously test the cloud environment to ensure the warfighter or the mission is never at risk
 - Need to rigorously red team and conduct independent assessments of the cloud environment
- Cloud Smart - Data Smart
 - Cloud Smart: One cloud strategy to adopt cloud solutions that support multiple clouds and multiple missions
 - Data Smart: Data transparency enabled by enterprise infrastructure, application standards, and data tagging
 - Goal is to maximize the battlefield decision making advantages that are enabled by AI and ML



Strategic Approach



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- Leverage Commercial Industry Best Practices
 - Leverage commercial technology and capability whenever possible
 - Maximize competition to ensure DoD is getting the best value possible
 - Leverage industry open standards and best practices to avoid vendor lock-in and provide maximum flexibility for future innovation
 - Independently assess the delivered services to ensure data security
- Create a Culture Better Suited for Modern Technology Evolution
 - Create an environment where people can iteratively innovate
 - Embrace enterprise solutions move away from custom solutions
 - Create a sustainable culture and workforce that can effectively use cloud capabilities
 - Create a culture that enable continuous learning from commercial cloud partners



Implementation



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Primary Implementation Components [7]

- General Purpose Cloud
- Fit-for-Purpose Clouds
- Cloud Migration
- Governance and Organization
- Workforce Considerations

[7] <https://media.defense.gov/2019/Feb/04/2002085866/-1/-1/1/DOD-CLOUD-STRATEGY.PDF>, pages 9-10, pages A-1 to A-4

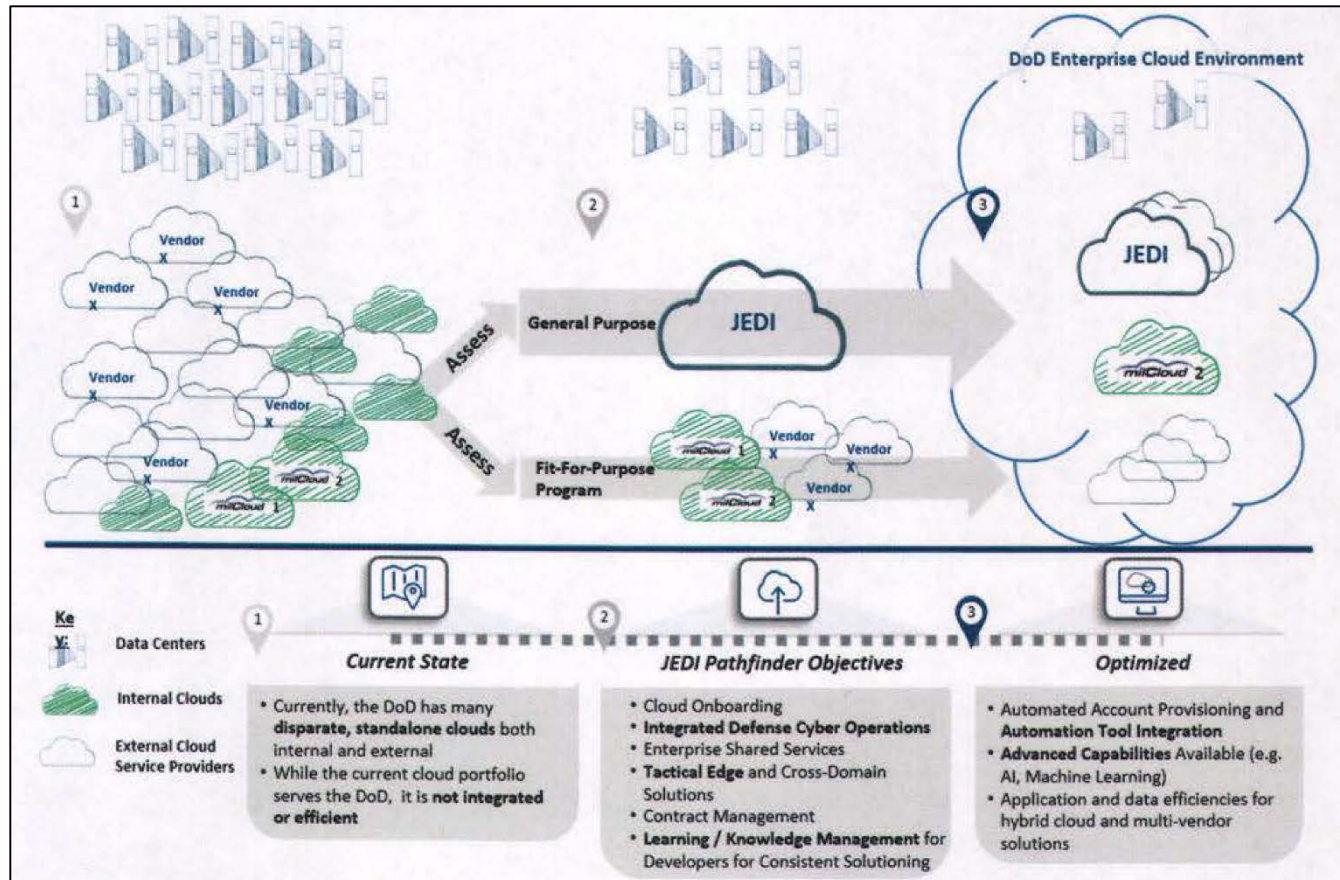


Enterprise Cloud Environment



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- DoD driving towards enterprise cloud environment composed of one General Purpose cloud and multiple Fit-For-Purpose clouds





General Purpose Cloud



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- DoD will implement a commercial General Purpose enterprise-wide cloud solution for the majority of systems and applications
 - The Joint Enterprise Defense Infrastructure (JEDI) will be this General Purpose cloud
- An industry partner will be required to implement the General Purpose cloud
 - Due to complexity and DoD's lack of large-scale, enterprise, commercial cloud experience
 - Best served through a single provider that will allow DoD to maximize pace and minimize risk
- The General Purpose cloud needs to address four key tenets:
 - Offer Infrastructure as a Service (IaaS) and Platform as a Service (PaaS)
 - Offer separate environments at all classification levels
 - Centralized computing to tactical edge computing for the warfighter
 - Enable emerging technologies, such as AI



General Purpose Cloud



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- Joint Enterprise Defense Infrastructure (JEDI) Request For Proposal (RFP) [8]
 - Solicitation Number HQ0034-18-R-0077
 - Dated 26 Jul 2018
 - \$10 Billion, 10 year contract
 - Expected to award in Jul 2019 timeframe [9]
- JEDI Statement of Objectives (SOO) Scope [10]
 - Cloud services will be offered at all classification levels from connected home front devices to disconnected tactical edge devices, and will be globally accessible
 - Cloud services required to meet industry-standard service level agreements (SLAs) and the requirements of the SOO regardless of where services are delivered

[8] https://www.fbo.gov/index?s=opportunity&mode=form&id=3860a4f4fe9d9ffc31e722ece82a143c&tab=core&_cview=1

[9] <https://fcw.com/articles/2019/04/10/jedi-conflict-aws-microsoft.aspx>

[10] https://www.fbo.gov/index?s=opportunity&mode=form&id=3860a4f4fe9d9ffc31e722ece82a143c&tab=core&_cview=1, Attachment L-1

JEDI Cloud RFP # HQ0034-18-R-0077

1 **COMBINED SYNOPSIS/SOLICITATION FOR COMMERCIAL ITEMS**

2 **General Information RFP**

3

Document Type:	Combined Synopsis/Solicitation (IAW FAR 12.603)
RFP Solicitation Number:	HQ0034-18-R-0077
Post Date:	July 26, 2018
Classification Code:	R -- Professional, Administrative, and Management Support Services
Set Aside:	Full and Open Competition
NAICS Code:	518210 -- Data Processing, Hosting, and Related Services

4

5 **Contracting Office Address**

6

7 Washington Headquarters Services (WHS), Acquisition Directorate (AD)

8 4800 Mark Center Drive, Suite 09F09, Alexandria, VA 22350

9

10 **Description**

11

12 This is a combined synopsis/solicitation for commercial items prepared in accordance with the format

13 in Federal Acquisition Regulation (FAR) Subpart 12.6, "Streamlined Procedures for Evaluation and

14 Solicitation for Commercial Items," as supplemented with additional information included in this

15 notice. This announcement constitutes the only solicitation. All non-price factors will be evaluated in

16 accordance with (IAW) FAR Subpart 12.602 "Streamlined Evaluation of Offers". The price factor

17 will be evaluated IAW FAR Subpart 12.209.

18

19 This solicitation is a Request for Proposal (RFP) for Joint Enterprise Defense Infrastructure (JEDI)

20 Cloud for the Department of Defense (DoD). This RFP document and incorporated provisions and

21 clauses are those in effect through Federal Acquisition Circular 2005-97 (Effective: 24 January 2018;

22 updated with Class Deviation 2018-o0007) and DFARS Publication Notice 20180504 (Effective 04

23 May 2018). There is no assigned Defense Priorities and Allocations System (DPAS) rating for this

24 requirement.

25

26 The associated North American Industrial Classification System (NAICS) code for this procurement

27 is 518210 -- "Data Processing, Hosting, and Related Services", with a small business size standard of

28 \$32.5M.

JEDI Cloud Synopsis/Solicitation Page 1



General Purpose Cloud



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- JEDI SOO Performance Requirements (just a few of the many identified)
 - Unclassified services within 30 days of contract award, Classified Secret services within 180 days of contract award, Classified Top Secret (including SCI and SAP) within 270 days of contract award
 - Each classification level requires at least three data centers at least 150 miles distant from each other, with automated failover of computing, network, and storage
 - Remotely connect to virtual desktop environment with access to persistent storage
 - Parity with commercially available cloud service offerings, and parity with commercial pricing for such services
 - Provide data analytics services (e.g., streaming analytics, predictive analytics, machine learning, and artificial intelligence), available in all environments including classified and disconnected regions, and must be able to operate across multiple datasets in disparate accounts across the JEDI Cloud contract
 - Provision new virtual machine (VM) in under 2 minutes, spin up new object storage in under 2 minutes
 - Provide ruggedized and portable tactical edge devices with automated bidirectional synchronization of data storage with the JEDI Cloud when connection is re-established



Fit-For-Purpose Clouds



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- If the DoD General Purpose cloud is not capable of supporting mission needs, then may use a Fit-For-Purpose commercial cloud solution or an on-premises cloud solution, for example:
 - Software as a Service (SaaS)
 - The DoD milCloud 2.0 environment, a cloud-services product portfolio managed by the Defense Information Systems Agency (DISA)
- Fit-For-Purpose solutions will be required to submit for approval an Exception Brief to the Office of the DoD CIO describing the capability and why the General Purpose cloud service does not support their mission
- Fit-For-Purpose solutions will be expected to support networking with the General Purpose cloud as well as with other Fit-For-Purpose solutions through modern commercial cloud capabilities



Cloud Migration



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- Migrating to a cloud is not typically a simple "lift and shift"
- The migration process will be defined in the DoD's Cloud Migration Playbook and will include the many different paths to realize cloud
- DoD will closely monitor the initial efforts to migrate into the Department's General Purpose enterprise cloud
- The lessons learned from the various migrations will inform the regular refinement of the Playbook
 - Will provide a consistent and repeatable process for mission owners to apply to their respective systems and applications
- Organizations within DoD that have previously implemented their own cloud will work with the Office of the DoD CIO to determine the best way to integrate their efforts with the DoD's enterprise cloud strategy



Governance and Organization



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- Oversight and governance for the initial build out of the enterprise cloud strategy will be led by the Office of the DoD CIO
- Once the General Purpose cloud is fully implemented and Fit-For-Purpose cloud implementations have matured, it is possible that overall leadership could be transitioned to a different organization inside DoD
- DoD CIO will organize forums to integrate DoD policies and acquisition strategies moving forward
- OUSD Acquisition and Sustainment (A&S) will address current regulations to take advantage of cloud consumption-based services
- DoD must strive for a Cloud First bias on all future application development and implementation



Workforce Considerations



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- The cloud is a key enabler for emerging technologies such as AI
- DoD workforce must obtain a basic level of cloud proficiency in order to effectively operate on the 21st century battlefield
- Our adversaries are working to develop new capabilities to leverage the advantages of the cloud
- DoD must continue to develop its in-house cloud technical skills to outpace our adversaries
 - Need to build a more diverse and balanced workforce between military and civilian components



Conclusion



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“Rapidly providing DoD access to underlying foundational technologies, like cloud computing and data storage, on a global scale is critical to national defense and in preparing DoD to fight and win wars. If the Department wants to maintain its overmatch, it will need to leverage technologies such as AI and therefore, it must urgently create an enterprise cloud environment.” [11]

[11] <https://media.defense.gov/2019/Feb/04/2002085866/-1/-1/1/DOD-CLOUD-STRATEGY.PDF>, page 11



References



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- DoD Cloud Strategy Press Release
 - <https://dod.defense.gov/News/Article/Article/1747491/clear-skies-for-dod-cloud-initiative/>
- DoD Cloud Strategy Document
 - <https://media.defense.gov/2019/Feb/04/2002085866/-1/-1/1/DOD-CLOUD-STRATEGY.PDF>
- JEDI Cloud Request For Proposal and Statement of Objectives
 - https://www.fbo.gov/index?s=opportunity&mode=form&id=3860a4f4fe9d9ffc31e722ece82a143c&tab=core&_cview=1
- JEDI Cloud Award Date
 - <https://fcw.com/articles/2019/04/10/jedi-conflict-aws-microsoft.aspx>