

LM ADQP: Development & Qualification Program for Architects and Technical Leaders

**SEI SATURN Conference
St. Petersburg, FL
9 May 12**



Dr. Jeffrey S. Poulin
LM Advanced Architect
LM Fellow
Chair, LM ADQP

Agenda



1. Background

- Why an Architect Development & Qualification Program (ADQP)?
- How ADQP fits into LM Architecture activities
- Program history

2. Architect Development

- Focus items
- University partnerships
- Technical leadership career path

3. Architect Qualification

- Levels of recognition
- Criteria
- Governance and administration

Why this program?



To have an orderly and understood process to:

1. identify,
2. grow, and
3. recognize

technical leaders that can deliver complete technical solutions/programs to LM Customers.



Part 1: Background

Why Qualify Our Architects?



PUBLIC LAW 104-106--FEB. 19, 1996 110 STAT. 679

(2) REORGANIZATION AND MODIFICATION OF DEPARTMENTS, COMMISSIONS, BOARDS, AND AGENCIES PROVIDED IN THIS ACT, including in this Division, shall be construed to require the preservation or modification of records in accordance with the title of the enactment of this Act.

(3) CONTINUITY OF APPLICABILITY OF PROFESSIONAL LAW.—None of the laws, orders, regulations, and administrative law shall be affected by this Act.

Enacted as such 1 of the enactment (A) The date the enactment becomes effective (B) If so, the date

OFFICE OF MANAGEMENT AND BUDGET

DIVISION OF TECHNOLOGY

SEARCH: []

CIRCULAR NO. A-130
Revised

OMB INFO: []

Transmittal Memorandum No. 4

MEMORANDUM FOR HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

SUBJECT: Mandatory Enterprise Architecture Frameworks

1. Purpose
2. Rationale
3. Authority
4. Approach
5. Description
6. Categories
7. Basic Concepts
8. Policy
9. Acquisition
10. Oversight
11. Effectiveness
12. Impact
13. Summary

Approved: []
Individual: []
Approved: []
Approved: []

2. References: This instruction is the Information System Technology Act of 1996 (ISTEA), Public Law 104-106, 28 November 2000; Subj: Management of Federal Information Resources

3. Authority: OMB Circular No. A-130, 28 November 2000; Subj: Management of Federal Information Resources

4. Distribution: This instruction is the Information System Technology Act of 1996 (ISTEA), Public Law 104-106, 28 November 2000; Subj: Management of Federal Information Resources

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USC Code 44 (Public Law 104-106, Clinger-Cohen Act of 1996) – CIO is responsible for developing, maintaining, and facilitating the implementation of an integrated IT architecture.

OMB Circular A-130 - Agencies must use or create an Enterprise Architecture Framework and document linkages between mission needs, information content, and IT capabilities.

DODD 8320.2, DOD 8320.02G, SECNAVINST 5000.36 – Guidance to DOD/DON for implementation of a supporting Data Strategy.

DON N61/7U160503 6 APR 2007 – Announcement of DON Navy Enterprise Architecture and Data Strategy (NEADS) Policy, with implementation guidance for all legacy and new start programs including administrative, command and control, intelligence, and weapon systems.

Department of Defense
INSTRUCTION
NUMBER 1115-00
ADMINISTRATIVE

DEPARTMENT OF THE NAVY
OFFICE OF THE DEPUTY CHIEF INFORMATION OFFICER
1000 NAVY PENTAGON
WASHINGTON, DC 20350-5000

MEMO REF ID:
A-20
SER: N61/7U160503
6 April 07

From: Department of the Navy Deputy Chief Information Officer (Navy)

To: Distribution

Subj: NAVY ENTERPRISE ARCHITECTURE AND DATA STRATEGY (NEADS) POLICY

Ref: (a) Secretary of the Navy Memorandum, 21 November 2006, Subj: Designation of the Department of the Navy Deputy Chief Information Officer (Navy)
(b) USC Code 44, Chapter 36 (Public Law 104-106, Clinger-Cohen Act, 1996)
(c) OMB Circular No. A-130, 28 November 2000; Subj: Management of Federal Information Resources
(d) DODD 8320.1, 19 September 2002; Subj: Global Information Grid (GIG) Overarching Policy
(e) DOD CIO Memorandum, 9 May 2003; Subj: DOD Net-Centric Data Strategy
(f) DODD 8320.2, 2 December 2006; Subj: Data Sharing in a Net-Centric Department of Defense
(g) DOD 8320.02-G, 12 April 2006; Subj: Guidance for Implementing Net-Centric Data Sharing
(h) SECNAVINST 5000.36A, 19 December 2005; Subj: Department of the Navy Information Technology Applications and Data Management
(i) GAO Report, August 2006; Subj: Enterprise Architecture — Leadership Remains Key To Establishing and Leveraging Architectures for Organizational Transformation
(j) Department of the Navy Information Management and Information Technology Strategic Plan, FY 2006-2007
(k) Chief of Naval Operations and Commandants of the Marine Corps Guidance, February 2005; Subj: FORCEast: A Functional Concept for the 21st Century
(l) Deputy Chief of Naval Operations Memorandum, 27 May 2005; Subj: FORCEast Requirements/Capabilities and Compliance (FRCC) Policy
(m) ASINR/DMA Memorandum, 14 July 2005; Subj: Prerequisite of Department of the Navy Policy for the Acquisition Community Support to Implement FORCEast Capabilities
(n) Secretary of the Navy Instruction 5000.2D; Subj: Implementation and Operation of the Defense Acquisition System and the Joint Capabilities Integration and Development System
(o) Department of the Navy (DON) Acquisition and Capabilities Handbook
(p) Deputy Chief of Naval Operations Memorandum, 23 December 2005; Subj: Requirement for Open Architecture (OA) Implementation
(q) USNPTDA Memorandum, 3 August 2006; Subj: Naval Open Architecture Scope and Responsibilities

1. PURPOSE
This instruction sets the Department of Defense (DoD) Enterprise Architecture (EA) Policy within the DoD EA Framework on reporting references.

2. APPLICABILITY
2.1. This instruction
2.1.1. The OMB Circular No. A-130

DRAFT

Organization



- **Lockheed Martin Architectures for Affordability and Mission Performance**
 - Collection of programs to exploit LM's capability in architecting complex systems
- **Objectives:**
 - Ensure LM has sufficient Architect competence and talent
 - Raise the bar on the practice of Architecting in key areas (i.e., Software, Systems)
 - Develop a library of proven solution architectures to serve as a resource for re-use on programs
 - Add value to Business Areas by providing mechanisms for architecture guidance and review on LM programs
- **All programs are run by the LM Joint Architecture Working Group**
 - Provides policy and governance

LM Architecture Overview



- **Programs in five broad areas:**

- 1. Architect Development and Training**

- University Certificate and In-service Development initiatives

- 2. Architect Qualification**

- Qualified Architect, Advanced Architect, Master Architect

- 3. Architecture Assessment**

- Providing expert reviewers for program architectures

- 4. Architecture Repository**

- A library of reference architectures and other architectural artifacts

- 5. Engineering Community Engagement**

- Standards, best practices, research, external engagement, etc.



LM's ADQP Background



- **Long and successful history**
 - Based on 1992 IBM Federal Systems “System Architect” program
 - Partner to the 1992 “Program Manager” program
- **Part of comprehensive, integrated LM Corporate Guidance:**
 - 270-15 Education Curriculum
 - 270-16 Skills Assessment
 - 270-17 Qualification Programs
- **270-17 Develops and Recognizes Technical Leaders:**
 - Software Architects
 - System Architect
 - Lead (Chief) System Engineers
 - Hardware Architect (tbd)
 - (Sub-) System Leads
 - etc.



Part 2: Architect “D”evelopment

Development Focus Items



1. Skills

- Comprehensive list of skills (270-16)
- Self assessment guides development plans

2. Education

- Formal classes to teach foundation knowledge and skills (270-15)
- Available internally and externally
- Continuing education; available at the right time
- Webinars approximately twice a month
- Book clubs approximately twice a year

3. Mentoring/Coaching

- Mentoring: formal and informal 1:1 between Architects
- Coaching: guided experience on programs

4. Experience

- As development team members
- As leaders

University Certificate & Degree Program



- **An educational program focused on architecture- centric courses**
 - Certificate Program: 4 to 5 graduate courses
 - Master Degree Program: 10 graduate courses
 - Course content based on industry needs
- **Part of the Architect Qualification Program**
 - The certificate program is a program of training/education, not a qualification program on its own
 - The courses satisfy the majority of educational requirements for LM Architect Qualification
- **Two University certificate programs since 2008**
 - Software Architecture
 - System & System of Systems Architecture

Our University Partners

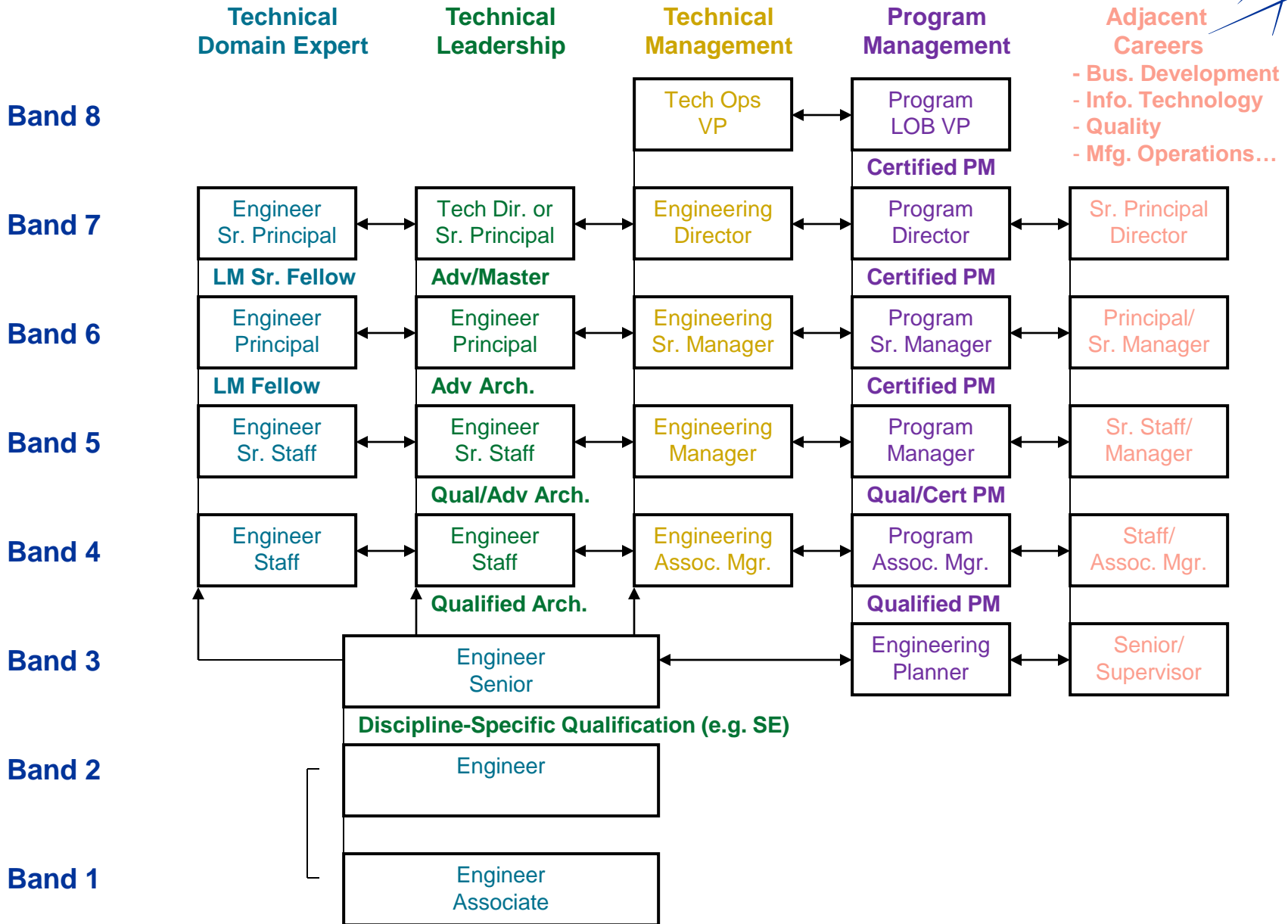


- **Distance Learning enables eligible employees in all US locations to participate.**
 - Synchronous live interactive lecture web sessions – offered at fixed times of the week. Lectures are recorded.
 - Asynchronous lecture web sessions – students can attend classes at their convenience with regularly scheduled tutorial sessions.
- **Students take courses on their own time.**

University Certificate Participation



Lockheed Martin Career Paths



Note: "Diagonal" Promotion Opportunities from One Career Path to Another May Also Occur

Career Path Guidelines to Develop Technical Leaders



Candidate for:	Has Led Programs of Value:	Has held this Position on a Program:	Has Completed LM Education:	Has Experience in the Field:	Example Successful Accomplishments:
Advanced, Master		System Architect, Chief Engineer, or Software Architect		10-15yrs, incl. 1 yr in last 3 yrs	Continued successful technical leadership
Qualified, or possibly Advanced	>\$50m	System Architect, Chief Engineer, or Software Architect	System or Software Architecture Workshop; PM Fund.		<ul style="list-style-type: none"> - Delivered entire systems on cost and schedule - Developed two large-scale Architectures
Qualified	>\$5m	Development Team Lead, IPT Lead, Subsystem Lead	Project Mgt. Essentials	7 yrs, incl. 3 yrs as a successful dev team leader	<ul style="list-style-type: none"> - Delivered major subsystem on cost and schedule - Written HLD or architecture documents - Developed Test Plans
Candidate	<\$5m	Team Lead, Technical Lead, System Engineer, Software Engineer	Engineering Principles & Practices		<ul style="list-style-type: none"> - Delivered subsystem on cost and schedule - Key developer on subsystem - Key SE on subsystem





Part 3: Architect “Q”ualification

Levels of Recognition



	Roles	Responsibilities
LM Master Architect	<ul style="list-style-type: none"> • Technical/Architectural Leadership of Product Line or Line of Business • Represent LM to External Community • Leader in Enterprise / Systems / Software Architecture Profession 	<ul style="list-style-type: none"> • Technical leader for very large (\$B) or highly complex proposal or program, or Architect across a major product family or Line of Business • Lead Architecture Reviews Across Corporation • Knowledge transfer, including mentoring/coaching and training, and on-going professional development • Represent LM externally (technical forums, customer strategy meetings, conferences, standards development organizations, etc.)
LM Advanced Architect	<ul style="list-style-type: none"> • Technical/Architectural Leadership of Large Program • Participant in Enterprise / Systems / Software Architecture Profession 	<ul style="list-style-type: none"> • Technical leader for large, complex proposal or program • Lead Architecture Reviews Across BA/BU • Knowledge transfer, including mentoring/coaching and training, and on-going professional development • Represent BA/BU externally (technical forums, customer strategy meetings, conferences, standards development organizations, etc.)
LM Qualified Architect	<ul style="list-style-type: none"> • Technical/Architectural Leadership of Small Program • Participant in Enterprise / Systems / Software Architecture Profession 	<ul style="list-style-type: none"> • Technical leader for small or moderately complex proposal or program • Support Architecture Reviews of Small programs and IRADs • Knowledge transfer, including mentoring/coaching and training, and on-going professional development
Architect Candidate	<ul style="list-style-type: none"> • Architect in training 	<ul style="list-style-type: none"> • Technical leader for small subsystem or study program or proposal • Support Role on program Architecture Team • Training & Education

Architect “Candidates”



- **Architect Candidates are:**
 - **Engineers who express interest in being a Architect**
 - **Meet business area defined entry criteria for Architects**
 - **Engineers aspiring to earn recognition**
 - **Current and future leaders**

- **Benefits:**
 - **Added to list of students seeking formal training**
 - **Prioritized for University Certificate funding**
 - **Added to distribution list for items of interest**
 - **Added to pool of resources for leadership roles on small programs (i.e., coached)**

Credential Entry Criteria



1. **Active in technical leadership positions**
2. **~7 yrs of experience**
3. **Education (minimum)**
 - **Qualification requires:**
 - ~3-days of Engineering Principles and Practices
 - ~1 day of Project Management Essentials (Planning, EVMS, Risk Mgt)
 - **Advanced/Master also requires:**
 - ~3-days of Program Management Fundamentals
 - ~3-days of Software or Systems Architecture
 - **Waivers can be requested:**
 - For equivalent education and experience
 - Sample waivers are embedded in the application
4. **Completed 270-16 skills assessment**
5. **Management support**
6. **Active as a mentee and mentor**

Who is a Credentialed Architect?



- **A successful leader of a technical team that has developed and delivered products/programs and met the Customer requirements on products/programs of (approximate) value shown below**
- **“Developed and Delivered” means from Proposal (or contract award) through first delivery to the Customer, or a minimum of ~18 months as the technical lead**
- **Someone whom executive management would be eager to make the technical lead on the next program of (approximate) value*:**
 - **\$5m+ for Qualification**
 - **\$50m+ for Advanced**
 - **\$50m-\$500m for Master**

*Guidelines for program value may vary by BA/BU.

What Architects get



- **Formal recognition of their Technical Leadership**
 - Certificate
 - Management recognition
- **A unique credential that sets them apart**
 - Authorization to use in email Signature and correspondence
 - Add to resume
- **Career growth responsibilities:**
 - Lead the next project
 - Participate in reviews
 - Mentor other technical leaders
 - Etc.

LOCKHEED MARTIN



*The Lockheed Martin Mission Systems & Sensors
Software Architect Review Board
recognizes the experience, skills and contributions of*

John Doe

as a

Qualified Architect
in Software Architecture

*with all the honors, privileges, and responsibilities this affords
October 12, 2011*

Norman Malnak
Vice President, MS2 Technical Operations

Donna Saucier
Director, MS2 Software Engineering

Governance



- **Sponsored by the LM Joint Architecture Working Group**
 - Ensures consistency across LM
- **Each Business unit administers their program**
 - Subject to guidance in 270-17
- **Periodic LM ADQP Board Meetings**
 - Program progress, requirements, shared experience
 - Architect staffing forecasting
 - Application updates and revisions
 - Review applications for Master Architect

Architect Qualification Participation (currently active*)



LM ADQP Summary



- **Core part of five well established initiatives**
- **Standardizes training and skills**
- **Recognizes proven program leadership**
- **Builds a culture of architectural leadership**
- **Established and consistent for over 20 years**

