

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

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# 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



# 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

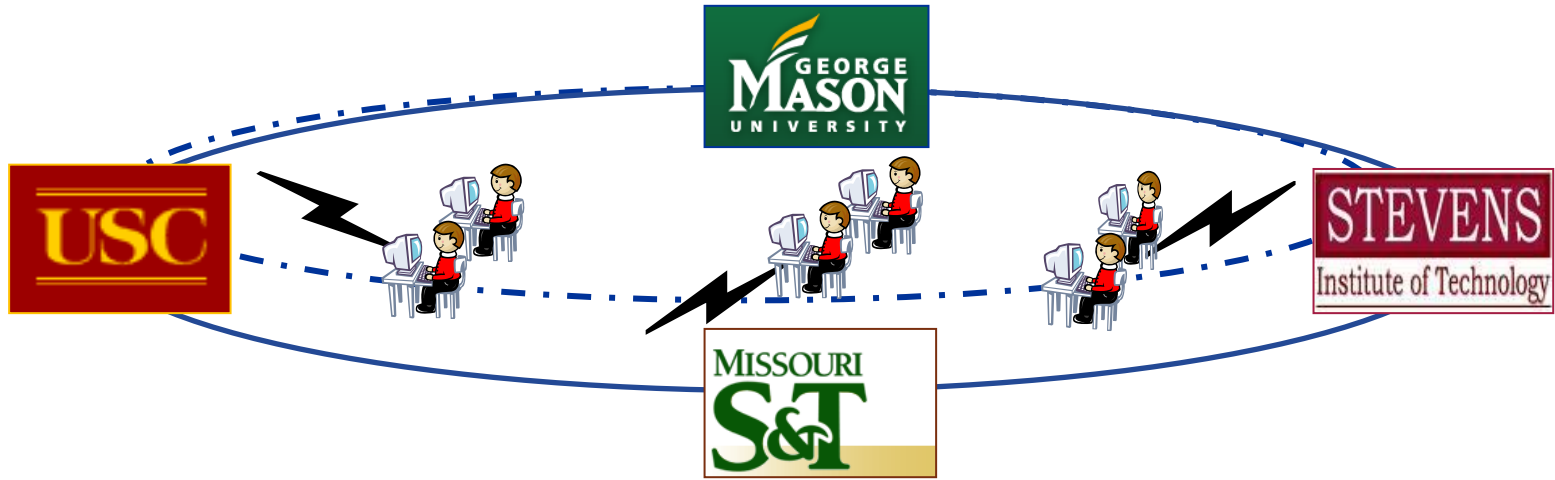
- As development team members
- As leaders

# 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

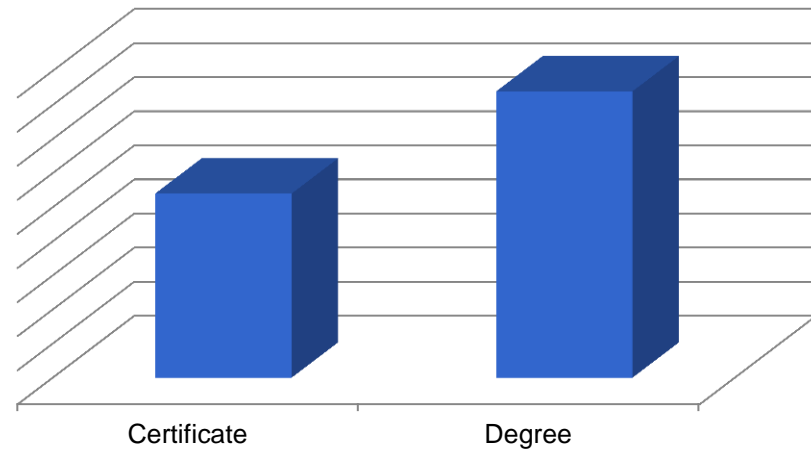


- **Distance Learning enables eligible employees in all US locations to participate.**
  - Synchronous live interactive lecture web sessions – offered at fixed times of the week. Lectures are recorded.
  - Asynchronous lecture web sessions – students can attend classes at their convenience with regularly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

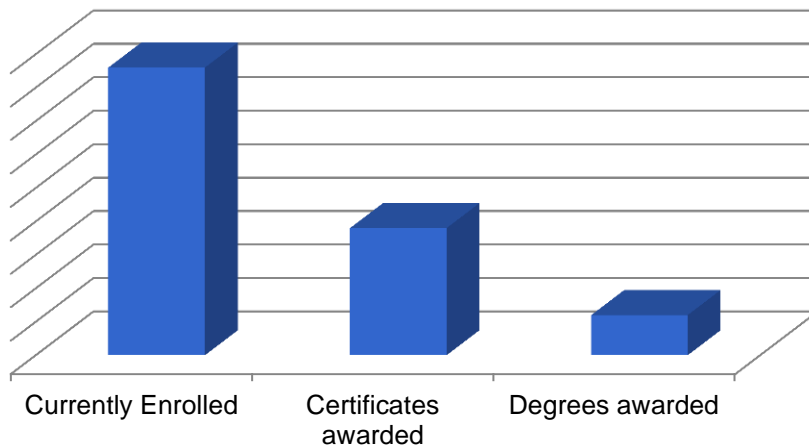
# University Certificate Participation



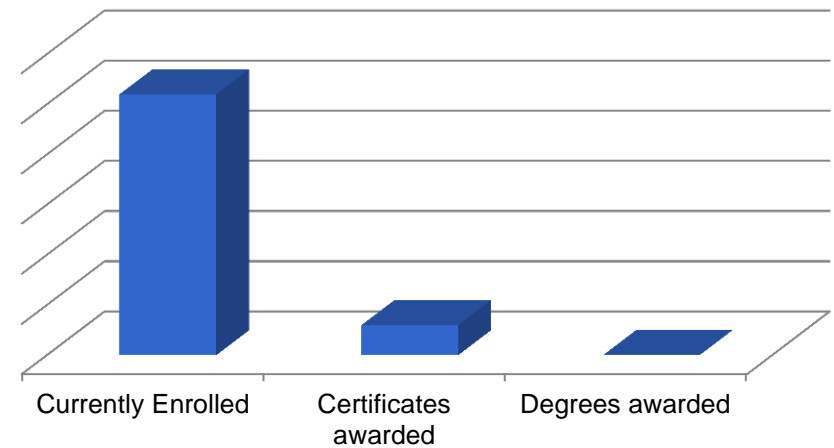
## Certificate vs Degree



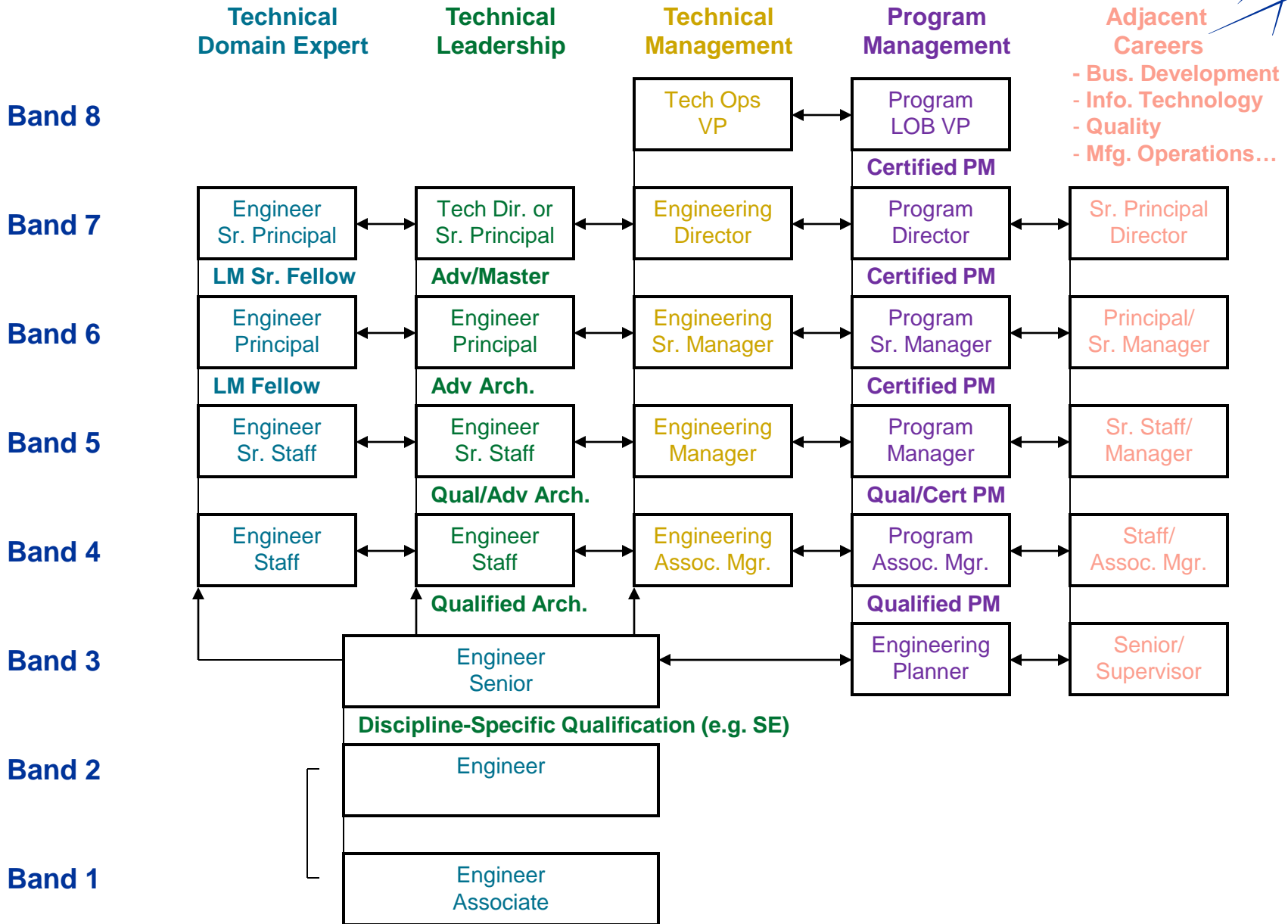
## Systems Architects



## Software Architects



# 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"> <li>- Delivered entire systems on cost and schedule</li> <li>- Developed two large-scale Architectures</li> </ul>
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"> <li>- Delivered major subsystem on cost and schedule</li> <li>- Written HLD or architecture documents</li> <li>- Developed Test Plans</li> </ul>
Candidate	<\$5m	Team Lead, Technical Lead, System Engineer, Software Engineer	Engineering Principles & Practices		<ul style="list-style-type: none"> <li>- Delivered subsystem on cost and schedule</li> <li>- Key developer on subsystem</li> <li>- Key SE on subsystem</li> </ul>





# Part 3: Architect “Q”ualification



# Levels of Recognition



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

# 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*

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Norman Malnak  
Vice President, MS2 Technical Operations

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Donna Saucier  
Director, MS2 Software Engineering

# Governance

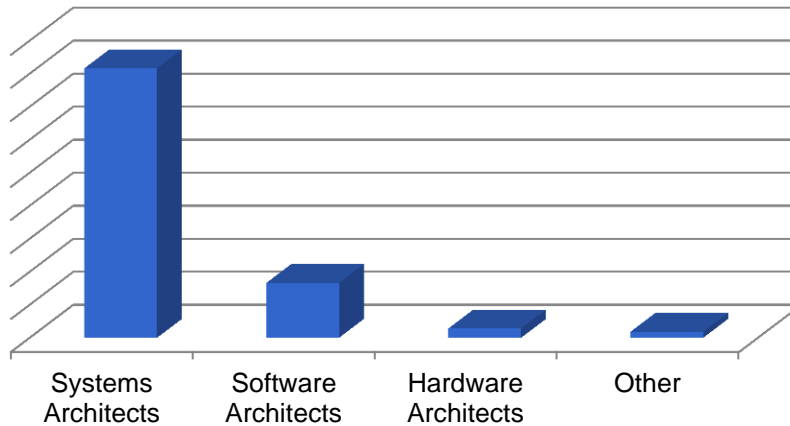


- **Sponsored by the LM Joint Architecture Working Group**
  - Ensures consistency across LM
- **Each Business unit administers their program**
  - Subject to guidance in 270-17
- **Periodic LM ADQP Board Meetings**
  - Program progress, requirements, shared experience
  - Architect staffing forecasting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

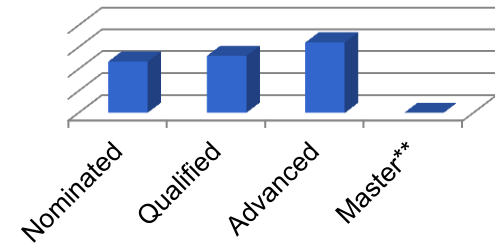
# Architect Qualification Participation (currently active\*)



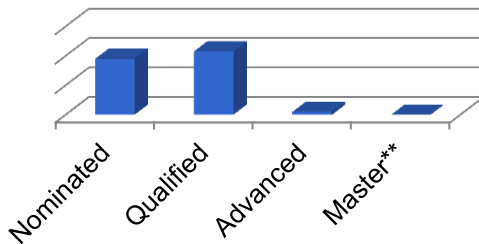
## Totals



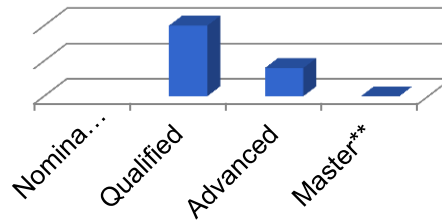
## Systems Architects



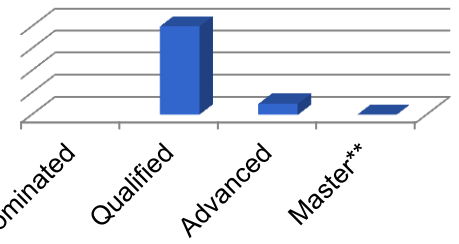
## Software Architects



## Hardware Architects



## Other Architects



\* Does not include retired, no longer practicing, etc.

\*\* Masters is new in 2012



# 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**

