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

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LM Advanced Architect
LM Fellow
Chair, LM ADQP

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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
Why Qualify Our Architects?

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.
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

Currently Enrolled  Certificates awarded  Degrees awarded

Currently Enrolled  Certificates awarded  Degrees awarded
Lockheed Martin Career Paths

Band 8
- Engineer Sr. Principal
- Tech Dir. or Sr. Principal
- Engineering Director
- Program VP
- Certified PM
- Sr. Principal Director

Band 7
- LM Sr. Fellow
- Adv/Master
- Engineering Sr. Manager
- Program Director
- Certified PM
- Principal/Sr. Manager

Band 6
- LM Fellow
- Adv Arch.
- Engineering Manager
- Program Manager
- Certified PM

Band 5
- Engineer Sr. Staff
- Qual/Adv Arch.
- Engineering Assoc. Mgr.
- Program Assoc. Mgr.
- Qual/Cert PM

Band 4
- Engineer Staff
- Qualified Arch.
- Engineering Planner
- Senior/Supervisor

Band 3
- Engineer Senior
- Discipline-Specific Qualification (e.g. SE)

Band 2
- Engineer

Band 1
- Engineer Associate

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

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## Career Path Guidelines to Develop Technical Leaders

<table>
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<tr>
<th>Candidate for:</th>
<th>Has Led Programs of Value:</th>
<th>Has held this Position on a Program:</th>
<th>Has Completed LM Education:</th>
<th>Has Experience in the Field:</th>
<th>Example Successful Accomplishments:</th>
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<tbody>
<tr>
<td>Advanced, Master</td>
<td>System Architect, Chief Engineer, or Software Architect</td>
<td>10-15yrs, incl. 1 yr in last 3 yrs</td>
<td>Continued successful technical leadership</td>
<td></td>
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<tr>
<td>Qualified, or possibly Advanced</td>
<td>&gt;$50m</td>
<td>System Architect, Chief Engineer, or Software Architect</td>
<td>System or Software Architecture Workshop; PM Fund.</td>
<td>- Delivered entire systems on cost and schedule &lt;br&gt; - Developed two large-scale Architectures</td>
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<tr>
<td>Qualified</td>
<td>&gt;$5m</td>
<td>Development Team Lead, IPT Lead, Subsystem Lead</td>
<td>Project Mgt. Essentials</td>
<td>- Delivered major subsystem on cost and schedule &lt;br&gt; - Written HLD or architecture documents &lt;br&gt; - Developed Test Plans</td>
<td></td>
</tr>
<tr>
<td>Candidate</td>
<td>&lt;$5m</td>
<td>Team Lead, Technical Lead, System Engineer, Software Engineer</td>
<td>Engineering Principles &amp; Practices</td>
<td>- Delivered subsystem on cost and schedule &lt;br&gt; - Key developer on subsystem &lt;br&gt; - Key SE on subsystem</td>
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Part 3: Architect “Q”ualification
# Levels of Recognition

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<tr>
<th>Roles</th>
<th>Responsibilities</th>
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| **LM Master Architect**      | 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 ongoing professional development  
                               | Represent LM externally (technical forums, customer strategy meetings, conferences, standards development organizations, etc.) |
| **LM Advanced Architect**    | Technical leader for large, complex proposal or program  
                               | Lead Architecture Reviews Across BA/BU  
                               | Knowledge transfer, including mentoring/coaching and training, and ongoing professional development  
                               | Represent BA/BU externally (technical forums, customer strategy meetings, conferences, standards development organizations, etc.) |
| **LM Qualified Architect**   | 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 ongoing professional development |
| **Architect Candidate**      | 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.
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*)

Totals

Systems Architects

Software Architects

Hardware Architects

Other

Systems Architects

Nominated Qualified Advanced Master**

Software Architects

Nominated Qualified Advanced Master**

Hardware Architects

Nominated Qualified Advanced Master**

Other Architects

Nominated Qualified Advanced Master**

* 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