Grid Architecture Team Structure

Pacific Northwest
NATIONAL LABORATORY

The Architecture Team

- The architecture team includes many roles; not all of them are architect roles.
- The structure evolved from the concept of Chief Programmer Teams* which in turn were inspired by Surgical Teams.
- This is a team, not a committee.
- Team structure is designed to maximize ability to achieve conceptual integrity.

* Mills, H. (1971), "Chief programmer teams, principles, and procedures", IBM Federal Systems Division Report FSC71-5108 (Gaithersburg, Md.)

Conceptual Integrity and the Core Team

- The conceptual integrity of an architecture is a measure of how well it conforms to a unified set of principles

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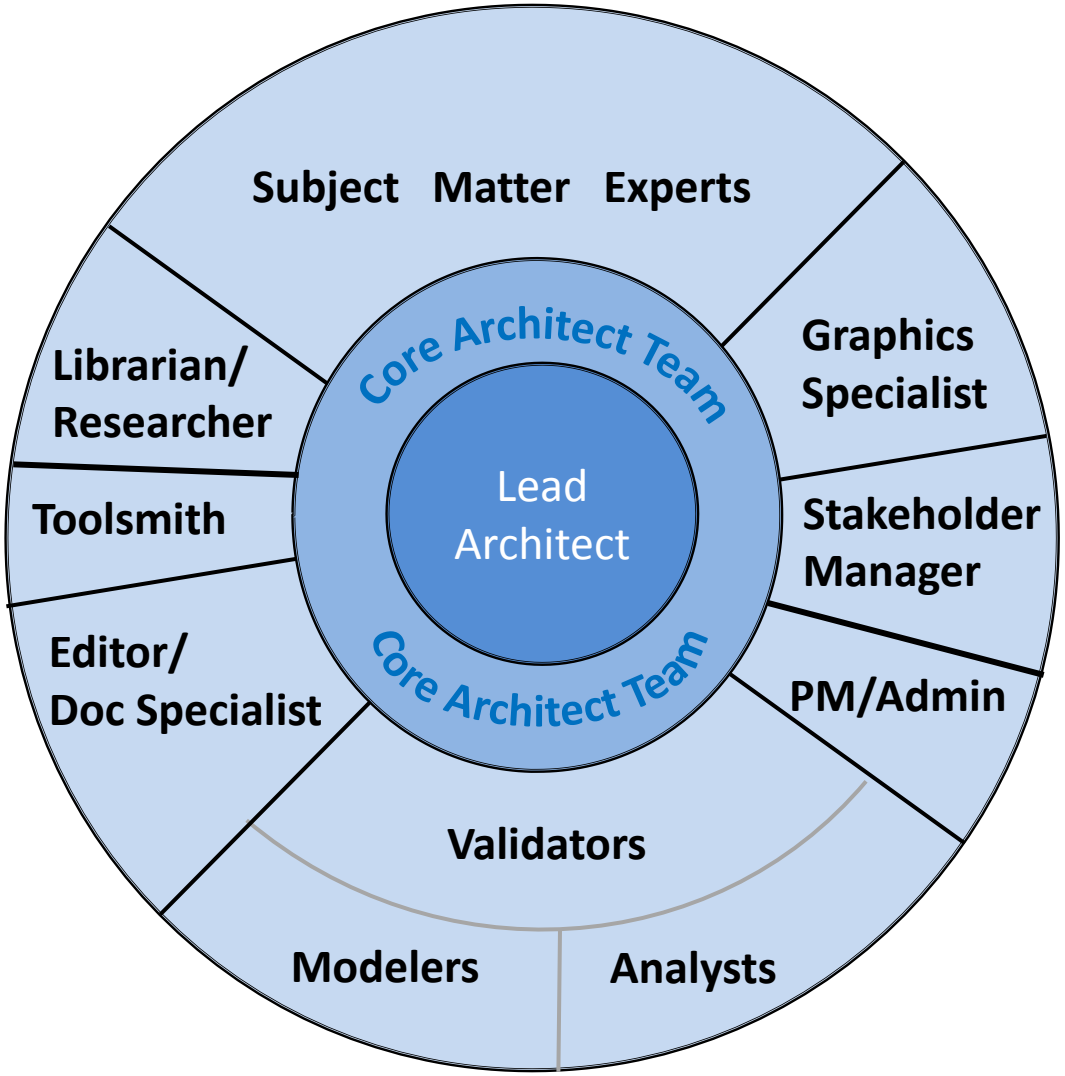
Conceptual integrity must proceed from one mind or from a very small number of agreeing resonant minds. A single chief architect (or a small number of architects), acting on behalf of the stakeholders, should develop a vision of what the architecture should be and make sure that this vision is understood by the rest of the team

Better to reflect a consistent set of architectural views than to try to incorporate many good but independent and uncoordinated ideas.

- adapted from F. Brooks, The Mythical Man Month

Grid Architecture Team Structure



Core Architect Team

- **Primary responsibility** - translate user requirements and system constraints into reference models, structures, and other architectural work products that satisfy stakeholder needs, using defined architectural processes and methods.
- The core team is no larger than 6: a lead architect and up to 5 team architects
- **Lead Architect** – the defined team lead; has primary responsibility for architectural vision and production of architectural work products; works in strong collaboration with the rest of the core architect team.
- **Team Architects** – support the lead architect and carry out significant portions of the architecture development with the guidance of the Lead Architect; the team may have anywhere for one to five members – typically at least one experience senior architect (although all five may be senior) and zero to four junior architects.
  - **Senior Architects** – experienced architects who can handle major aspects of architecture development and who work closely with the Lead Architect; in addition to direct support, they also have the key roles of researching/suggesting alternative approaches to the Lead Architect, and guiding/mentoring any Junior Architects on the team.
  - **Junior Architects** – less experienced architects who can carry out significant portions of the architecture development under the guidance of a Senior Architect.

Subject Matter Experts

- **Primary responsibility** – provide expert insights based on education, training, and above all experience on a specific technical, business, organizational, operational, or regulatory topic.
- Dealing with the grid requires a vast array of expert knowledge; it is helpful for the Core Architect team to possess some amount of such knowledge, but impossible for them to have all of it.
- SME's are consulted by the Architect Team as needed to provide insights and information to support the Core Team's work.
- SME's may also provide stakeholder viewpoints, as they are often stakeholders themselves or come from stakeholder organizations.
- SME's are key resources for the Core Team and often are organized into two "rings':
  - The inner ring "surrounds" the Core Team and interacts frequently during the architecture development
  - The outer ring tends to form spontaneously as inner ring SME's reach out to other SME's for deep specialist knowledge.

The “Three Ring Circus”

- Due to the foregoing discussion about SME’s, the Architecture Team often has an informal organizational structure termed 3 ring circus, although it might be more aptly thought of as a bullseye.
- The 2nd ring SME’s are generally recruited by the Core Team; the 3rd ring members are generally recruited by the 2nd ring members on the basis of personal contacts

Validators

- **Primary responsibilities** – perform studies, analyses, simulations, or other work that tests, verifies, or characterizes architectural approaches for the grid. This work is used to advise the Core Team and to provide support material for the architecture work products.
- There are two general classes of validators:
  - Modelers – generate models and carry out simulations to test architectural hypotheses and demonstrate potential performance issues
  - Analysts – perform mathematical or other studies using employing theoretical and empirical approaches to support architecture results and develop new system characterizations and design constraints

Librarian/Literature Researcher

- **Primary responsibility** – maintain the documentation set for the architecture work
- **Secondary responsibility** - perform technical literature searches as requested by the Core Team

Editor/Documentation Specialist

- **Primary responsibility** – edit reports and presentations from rough drafts generated by the Architect Core Team
- **Additional responsibilities:**
  - Submit documents to ERICA or equivalent
  - Manage document archiving and storage for the project

Graphics Specialist

- **Primary responsibilities** – prepare diagrams and graphic representations of architectural material and concepts
- **Skills needed**:
  - Visio, including layering
  - PowerPoint
  - PNNL grid architecture browsing tool

Toolsmith

- **Primary responsibilities** – develop or provide tools for use by the Architecture team; support tool use
  - Standard tools like Visio, UML/SysML
  - PNNL grid architecture browser tool
  - PNNL grid architecture evaluation/optimization tool
  - Co-simulation platforms
  - Specialty computation tools for analysis support
- Note: this may actually be a team in itself, depending on the scope of the tools and platforms needed

PM/Admin

- **Primary responsibility** – perform project management and administration for the architecture project
  - Track schedules
  - Compile, report and track finances
  - Handle PM system documentation
- Skills needed: general project management; use of organization PM tools

Stakeholder Manager

- **Primary responsibilities** – act as main portal/PoC between the Core Team and the project stakeholders and manage stakeholder workflows
  - Build/maintain stakeholder contact list
  - Manage stakeholder events and activities
  - Facilitate Stakeholder/Core Team interactions
  - Ensure stakeholder participation/timely responses to Core Team requests
- Note: this takes a certain set of interpersonal skills best described as a cross between hospitality specialist and drill instructor

Relationship to Stakeholders

- Core Architect Team members are expected to have extensive contact with stakeholders
- The stakeholder manager acts as a gateway and workflow manager for the *stakeholders*