

Post-Development Software Architecture

By Johnray Milano

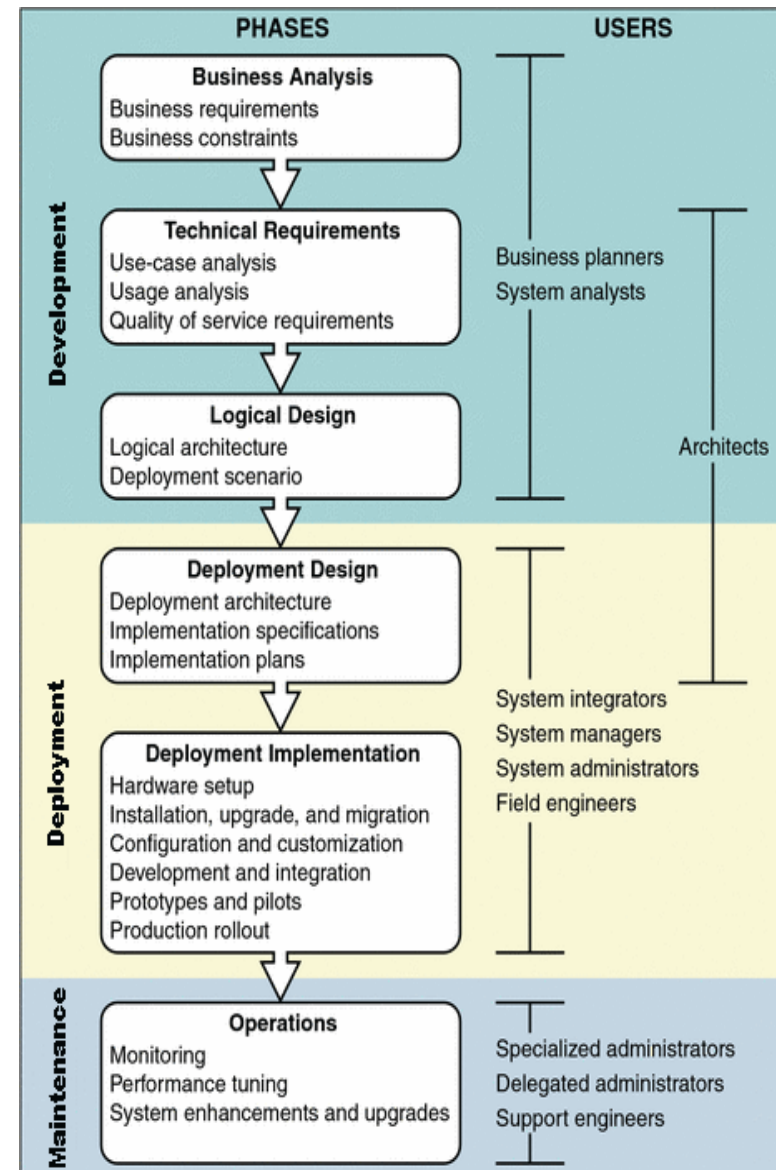
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Post-Development SA

- Introduction & Background
- Deployment Challenges & Activities
- Maintenance Challenges & Activities
- Summary
- Conclusion

- What is Post-Development?
- Where is Software Architecture needed?
- What activities need to be performed?
- What information do deployers and maintainers need?

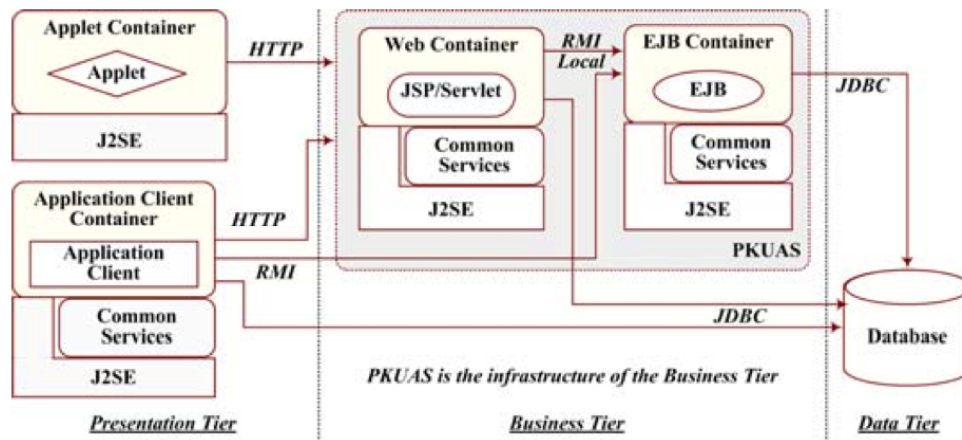
Life-Cycle Phases and User Categories



PKUAS

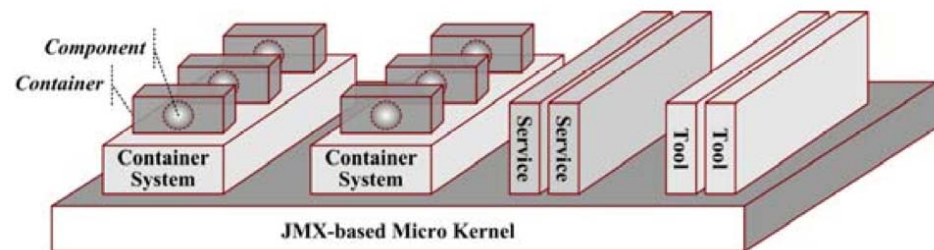
- Peking University Application Server (www.sei.pku.edu.cn)
- Reflective J2EE application Server developed by the research group of PKU-Bell Labs Software Technologies Joint Lab
- Began 2001
- Provides a platform to experiment with innovative ideas on new generation of software in the Internet
- Architecture Based Component Composition (ABC) -- Software Architecture based methodology
- CADTool – Architecture based Deployment Tool
- Runtime Software Architecture (RSA) – Architecture based Reflective Framework

Overview of J2EE/EJB



An Enterprise JavaBeans (EJB) component is primarily concerned with the business logic, while the EJB container handles the infrastructure issues (“semantic coherence” tactic)

A container reads XML deployment descriptor for each EJB bean component in order to manage all resources and interactions between the component and external systems on the application component’s behalf. (“defer binding time” tactic).

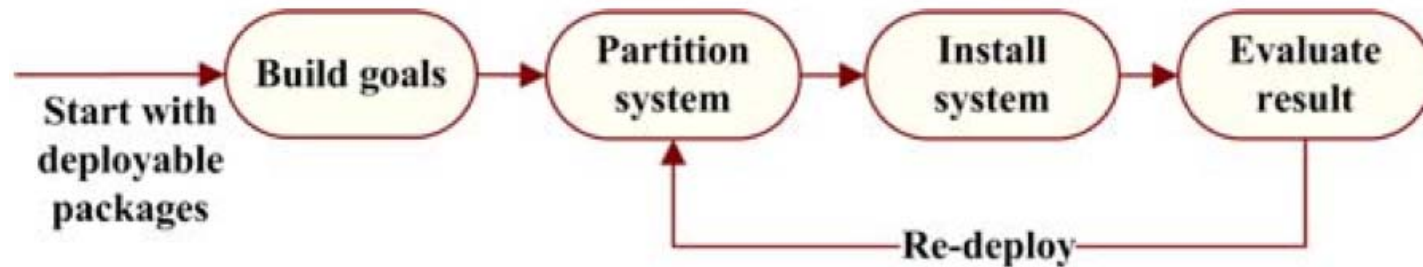


Deployment challenges

- Components can be combined in many different architectural patterns
- Component interaction with containers is complex and effects performance of an application
- Mass description elements configured by hand
- Limited information
- Too much information to understand



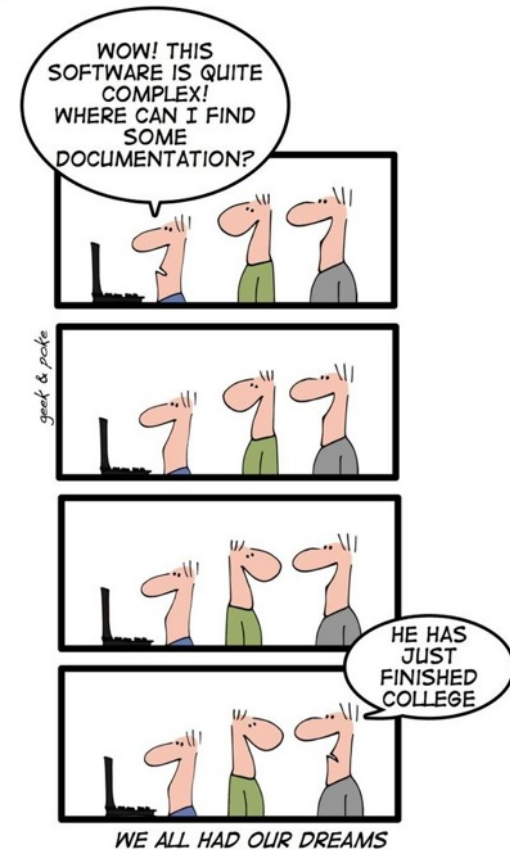
Activities in Architecture-based Deployment



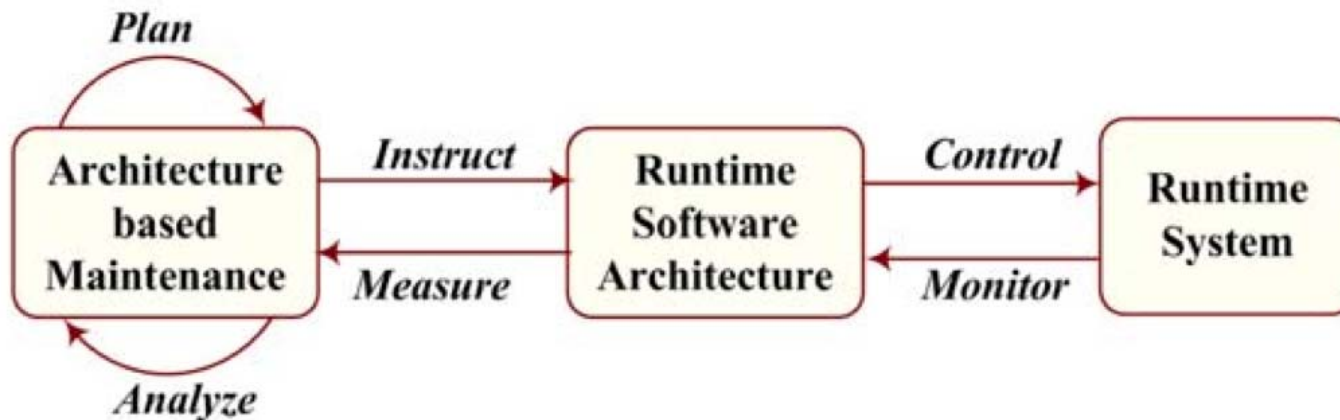
- Building up the goals of the deployment
- Partitioning the system based on the software architecture and runtime environment
- Installing the system on distributed nodes
- Evaluating the result of the deployment
- Re-deployment

Maintenance challenges

- Documentation
- Different stakeholder requirements
- New requirements



Activities in Architecture-based Maintenance



- Monitoring runtime systems from the perspective of SA
- Measuring runtime SA for filtering changes
- Analyzing changes of runtime SA for detecting triggers
- Planning the adaptations
- Instructing runtime SA for adaptations
- Controlling runtime systems from the perspective of SA

Summary

- Deployers and maintainers require SA to better understand the large-scale and complex systems
 - Deployers need to know desired functions and qualities of the system, relationships and constraints on components and runtime information
 - Maintainers need detailed runtime states and behaviors, and internal structure of components
- Developers need to be more aware of post-development software architecture in analysis and design of quality attributes
- Runtime SA is too difficult and expensive to maintain systems in rapid and continuous changes

Conclusion

- Post-Development Software Architecture starts at the development stage
- Requirements and involvement from deployers and maintainers
- Tools to monitor, analyze and implement changes

Questions?