THE EVOLUTION OF A SOFTWARE ARCHITECTURE

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WHAT WE ARE GOING TO TALK ABOUT

- Ebay's Architectural Evolution
- N-tier architectures
- Web Servers, Web Containers and Application Servers
- Service Oriented Architectures (SOA)
- MicroServices

SOFTWARE ENGINEERING RADIO PODCAST

- Chief Engineer and Distinguished Architect at eBay
- Vice-president of Engineering at WeWork
- Vice-president of Engineering at Ebay & Chief Architect at Ebay (now)



V1 V2 V3 V4 V5

EBAY's Architectural Evolution 5 Stage evolution

Randy joined in the middle of the transition from V2 to V3 (2004)

NERD Project ------ Microservice Architecture







220 "Mini applications" (not even microservices)

Verticaly sliced domains

Domain-Specific Databases (shared with V2)

Monolithic Frontend

Domain-specific Teams

Difficult to trace the source of an error Central logging system

N-TIER ARCHITECTURES



One-tier Architecture





- Also known as Standalone Application
- All components are on the same app or server



Advantages:

► High effciency

► Easy to implement

Disadvantage
 No support for remote or distributed Access to data

ONE-TIER ARCHITECTURE





Also known as Client-Server Application
 Presentation is part of the client app, the Business and

Database layer is part of the Server

Advantages:

- ► Easy to maintain
- Easy to make modifications
- Quiet fast communication

Disadvantage

Performance decreases as the number of clients increase

TWO-TIER ARCHITECTURE

Banking app



Also known as Web-based Application

Client handles Presentation, Applications layer is handled by the Application server and the Server System handles the Database layer.

Advantages:

- ► Higher security
- ► High scalability

Disadvantage ► Complex structure

THREE-TIER ARCHITECTURE

LoMap

WEBSERVERS, WEBCONTAINERS AND APPLICATION SERVERS



Web Servers



Web Containers



Application Servers Gigant computer where the content of the web is stored
 Store, process and deliver web pages to users

Web servers can run static content, as HTML, CSS, JS,...
 The communication is done using the HTTP Protocol



Microsoft IIS

WEB SERVERS



- ► WebServer + Dynamic content
- WebContainers are slower serving static content
- ► Can run JSPs, Servlets, Enterprise Java Beans, ...
- Designed with higher proccessment capacity and higher memory resources



WEB CONTAINERS



- Specifically designed to run applications
- Provides a platform for executing and managing apps.
- ► Works in conjunction with other components
- ► High maintenance costs
- Very powerful
- Highly scalability and availability



APPLICATION SERVER



SERVICE ORIENTED ARCHITECTURE





Service-orientation: modular, reusable, and looselycoupled.

- Services expose their functionality through standardized interfaces
- Services define their contracts
- Designed to be loosely coupled: they can be developed, deployed, and maintained independently.
- Agile, reusable, standards-based
 Simple development process
 Improve the maintability



SERVICE ORIENTED ARCHITECTURE



MICROSERVICES



Small independent services

- Communication through well defined APIs
- ► Each service performs a single business function
- Developed, deployed and scaled independently
- Designed to be fault-tolerant
- Technology diversity
- Fast time-to-market
- High complexity managing multiple microservices

JOOR

MICROSERVICES









QUESTIONS?



