



Views from the Trenches: Current Trends in Performance Engineering

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Adjusting Performance Engineering to Industry Trends

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Industry Trends

- Web
 - Centralization, open / unlimited workload
- Cloud
 - Further centralization, price tag (FinOps)
 - Dynamic configurations / Self-Management
- Agile / iterative development
 - Continuous Integration / Delivery / Deployment
 - DevOps / SRE

[The Past, Present, and Future of Performance Engineering](#)



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All Interconnected

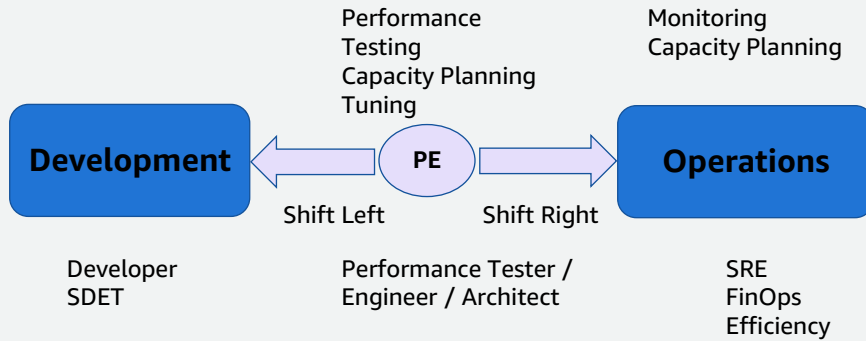
Centralization

- => Control over deployments
- => Ability to deploy small changes
- => Agile development
 - => Fuzzier line between Dev and Ops (DevOps, SRE)
 - => Need for continuous performance engineering



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Integrating Performance Engineering into DevOps




Expand or be Squeezed Out ?



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Existing Surveys

- [How is Performance Addressed in DevOps? A survey on Industrial Practices](#) 
- “most surveyed companies do not regularly conduct performance evaluations”
- Issue: Trends are defined by frontrunners, not by the majority
 - It is still in the beginning, few companies actually do that
 - But the overall trend is clear - integration of performance engineering into agile development, DevOps, etc.



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Adjusting Performance Testing to Agile and CI/CD

- Agile development should be rather a trivial case for performance testing
 - Working system on each iteration by definition
 - You need performance engineer for the whole project
 - Savings come from detecting problems early
- Addressing deficiencies of the traditional performance testing
 - Early Performance Testing
 - Continuous Performance Testing



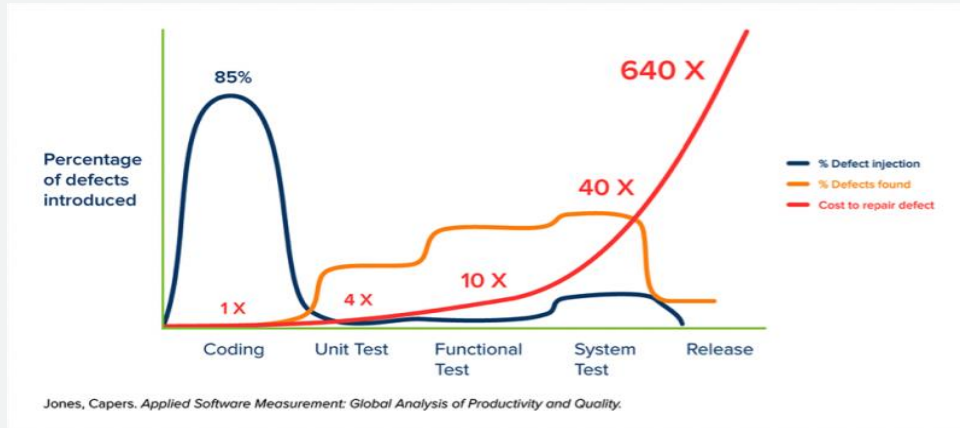
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Early Performance Testing



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Cost of Fixing Defects Earlier Is Significantly Lower



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Early Testing - Mentality Change

- Making performance everyone's job
- Late record/playback performance testing -> Early Performance Engineering
- System-level requirements -> Component-level requirements
- Record/playback approach -> Programming to generate load/create stubs
- "Black Box" -> "Grey Box"

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Continuous Performance Testing



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VIEWS FROM THE TRENCHES: CURRENT TRENDS IN PERFORMANCE ENGINEERING

Integration into Agile and CI/CD

- Continuous performance testing
 - To catch regressions early
 - From realistic testing / SLO to coverage / difference between builds
- Collecting all info needed to investigate regressions
 - In the form convenient for further analysis
- Foundation to build further automation on the top of it
 - For further performance optimization

[Continuous Performance Testing](#)



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Challenges of Continuous Performance Testing

- Integration
- Coverage Optimization
- Variability / Noise Reduction
- Change Detection
- Advanced Analysis
- Operations / Maintenance

[Modern Challenges in Performance Testing](#)



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Integration

- Simple load testing and CI tools integration
- Multiple products stuck together into a framework
- Sophisticated, but proprietary closely integrated systems
 - [Creating a Virtuous Cycle in Performance Testing at MongoDB](#)
 - [Fallout: Distributed Systems Testing as a Service](#) (DataStax)
 - [Tracking Performance of the Graal Compiler on Public Benchmarks](#) (Charles University / Oracle Labs)
 - [Introducing Ballast: An Adaptive Load Test Framework](#) (Uber)



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Performance Topics Getting More Attention



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VIEWS FROM THE TRENCHES: CURRENT TRENDS IN PERFORMANCE ENGINEERING

Skills in Demand

- All old good performance knowledge / skills
 - Not as much around load testing tools anymore
- Development / Scripting / Automation
 - Needed for early / continuous testing
- Performance understanding becoming a must in the industry
 - Need to go one level deeper



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Algorithmic Complexity

- Time Complexity
- Space Complexity
- Big-O notation

Almost in every interview around the globe !

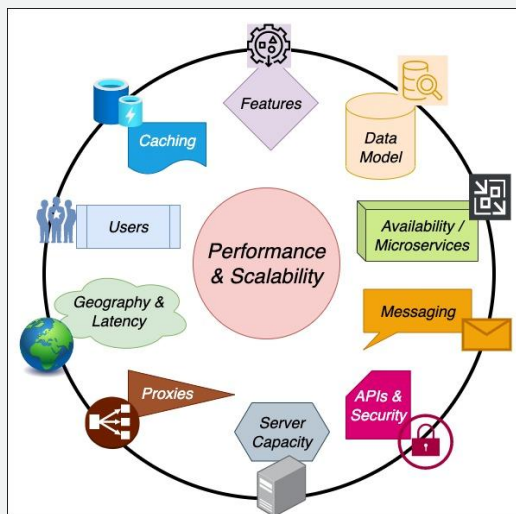
- Connect it with practical performance engineering?



System Design Interview Cheat Sheet by Vahid Dejwakh



Just ***an example*** of the changing attitude



AWS Well-Architected Framework



The 6 Pillars of the AWS Well-Architected Framework

- Operational Excellence
- Security
- **Reliability**
- **Performance Efficiency**
- **Cost Optimization**
- Sustainability



Performance Topics Not So Popular Anymore



Queuing Models

- An important approach, but not the foundation [anymore]
- Multi-core servers, horizontal scalability, and not using servers to 100% probably allow using linear models in many cases
- The hard core queuing theory probably belongs to graduate studies (where it landed anyway)
- “Black Box” ML models are not a replacement

[The Forgotten Art of Performance Modeling](#)



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Load Testing Tools

- Performance engineering shifted to
 - Other ways to mitigate performance risk
 - More closely integrated continuous performance testing
- Proliferation of APIs / simple open-source tools
- Never got track in academia anyway
 - Still has didactic / practical value



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Summary

- Systems scale and sophistication skyrocket – performance gets more attention
 - Performance engineering gets more integrated
 - Into both **D**evelopment and **O**perations
- Performance engineering must adjust to industry trends
 - Some changes are clear: early / continuous testing, automation, integration, etc.
 - But we are rather in the beginning - the future of the trade is not set yet...



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Thank you!

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