# **Boost produktivitet med AWS Well-Architected**

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# **Jeff Bezos**

Grunnlegger av Amazon

In today's era of volatility, there is no other way but to re-invent.

The only sustainable advantage you can have over others is agility, that's it.

Because nothing else is sustainable, everything else you create, somebody else will replicate.

You can't feel disruption until it's too late!



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## Hørt det før?

It is not the strongest of the species that survives, not the most intelligent that survives. It is the one that is the most adaptable to change.

- Charles Darwin

GihanPerera.com





• .. kan vi klare å tilpasse oss nye krav og behov, raskere?

... kan vi få redusere lead time?

 ... kan vi unngå å finne opp hjulet på nytt i hvert DevOps team?

# Hvordan



# **AWS Well-Architected Framework**

### «WAF»

- Verktøy for å utvikle skyløsninger i henhold til beste praksis
- Hjelper deg å evaluere arkitektur systematisk
- Kan gi deg sikrere, mer skalerbare og kostnadseffektive løsninger
- Input til produktbacklogprioritering
  - Idé og designfase
  - Før produksjonssetting
  - Ved omfattende endringer



# O AWS Well-Architected Timeline



## **AWS Well-Architected Framework pillarer**

### **Operational Excellence**

The ability to support development and run workloads effectively, gain insight into their operations, and to continuously improve supporting processes and procedures to deliver business value.

### Security

The ability for taking advantage of cloud technologies to protect data, systems, and assets in a way that can improve your security posture.

### Reliability

The ability of a workload to perform its intended function correctly and consistently when it's expected to.

### **Performance Efficiency**

The ability to use computing resources efficiently to meet system requirements, and to maintain that efficiency as demand changes and technologies evolve.

### **Cost Optimization**

The ability to run systems to deliver business value at the lowest price point.

### **Sustainability**

The ability to continually improve sustainability impacts by reducing energy consumption and increasing efficiency across all components of a workload by maximizing the benefits from the provisioned resources and minimizing the total resources required.



# Well-Architected Framework Review (WAFR)

Hovedformål: Identifisere forbedringspotensialer for sluttbrukere eller organisasjonen





# Well-Architected Framework Review (WAFR)





## **AWS Well-Architected Tool**





# Struktur

AWS Well-Architected Framework

- Kategorier med spørsmål
- Spørsmål med beste praksis anbefalinger.
- Hver beste praksis anbefaling har teknisk implementasjonsveiledning

# **Security Pillar – Infrastructure protection**

### SEC 5: How do you protect your network resources?

Any workload that has some form of network connectivity, whether it's the internet or a private network, requires multiple layers of defense to help protect from external and internal network-based threats.

Users, both in your workforce and your customers, can be located anywhere.

You need to pivot from traditional models of trusting anyone and anything that has access to your network.

When you follow the principle of applying security at all layers, you employ a Zero Trust approach.

Zero Trust security is a model where application components or microservices are considered discrete from each other and no component or microservice trusts any other.





SEC 5 How do you protect your network resources?

Done

\$

 $\mathbf{\Delta}$ SEC 6 How do you protect your compute resources?

\$ SEC 7 How do you classify your data?

\$ SEC 8 How do you protect your data at rest?

SEC 9 How do you protect your data in transit?

¢ SEC 10 How do you anticipate, respond to, and recover from incidents?

### AWS Well-Architected Framework

Add a link to your architectural design

SEC 5. How do you protect your network resources? Info	Ask an expert 🛽
Any workload that has some form of network connectivity, whether it's the internet or a priv multiple layers of defense to help protect from external and internal network-based threats	vate network, requires
Question does not apply to this workload Info	
Select from the following	
Create network layers Info	
✓ Control traffic at all layers Info	
Automate network protection Info	
Implement inspection and protection Info	
None of these Info	
Mark best practice(s) that don't apply to this workload	
Notes - optional	
SEC05-BP03 Automate network protection Adopt Web Application Firewall	
SEC05-BP04 Implement inspection and protection Activate Amazon Guard Duty - will automatically surveillence API and traffic.	
1888 characters remaining	

Save and exit

Next Previous

A reliable workload starts with upfront design decisions for <u>both software and infrastructure</u>.

Your architecture choices will impact your workload behavior across all of the Well-Architected pillars. For reliability, there are specific patterns you must follow.

The following questions focus on these considerations for reliability:

REL 3: How do you design your workload service architecture?

REL 4: How do you design interactions in a distributed system to prevent failures?

REL 5: How do you design interactions in a distributed system to mitigate or withstand failures?



REL03-BP01 Choose how to segment your workload



### Monolithic application

Does everything Shared release pipeline Rigid scaling High impact of change Hard to adopt new technologies

### Service oriented

Does some things Services surfaced via comms protocol Some coupled services

### Microservices

Does one thing Independent deployments Independent scaling Small impact of change Choice of technology



REL03-BP02 Build services focused on specific business domains and functionality

Domain Driven Design





# **Reliability Pillar – Fault isolation**

REL10-BP01 Deploy the workload to multiple locations



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REL11-BP05 Use static stability to prevent bimodal behavior



If using two Availability Zones (AZs) Provision enough EC2 capacity such that the one remaining AZ can handle 100%

> If using three Availability Zones (AZs) Provision enough EC2 capacity such that the two remaining AZs can handle 100% of your workload load



### **Cost Optimization Pillar – Manage demand and supply resources**

### COST 9: How do you manage demand, and supply resources?

The economic benefits of just-in-time supply should be balanced against the need to provision to account for resource failures, high availability, and provision time.

Depending on whether your demand is fixed or variable, plan to create metrics and automation that will ensure that management of your environment is minimal – even as you scale.

### Beste praksis:

- 1. COST09-BP01 Perform an analysis on the workload demand
- 2. COST09-BP02 Implement a buffer or throttle to manage demand
- 3. COST09-BP03 Supply resources dynamically





# **AWS Well-Architected Tool - Resultatanalyse**





# **AWS Well-Architected Tool - Resultatanalyse**

### Well-Architected Framework issues by improvement plan item (278)

Relia	Reliability    All issues    Image: Comparison of the symptotic comparison of the symptot comparison of the symptotic comparison of the symptot						
	Improvement item	♥ Pillar ♥	Risk 🗢	Applicable workloads 🔹 🔻			
0	Deploy changes with automation	Reliability	🛞 High	1			
0	Identify and back up all data that needs to be backed up, or reproduce the data from sources	Reliability	🛞 High	1			
0	Perform periodic recovery of the data to verify backup integrity and processes	Reliability	🛞 High	1			
0	Deploy the workload to multiple locations	Reliability	\Lambda Medium	1			
0	Use bulkhead architectures to limit scope of impact	Reliability	\Lambda Medium	1			
0	Monitor all components of the workload to detect failures	Reliability	🛞 High	1			
0	Fail over to healthy resources	Reliability	🛞 High	1			
0	Automate healing on all layers	Reliability	🛞 High	1			
0	Rely on the data plane and not the control plane during recovery	Reliability	🛞 High	1			
$\bigcirc$	Use static stability to prevent bimodal behavior	Reliability	🛞 High	1			



# **AWS Well-Architected Tool - Prioritering**

### OPS4- HRI: workload state is not well understood

**Solution** Identify & Enable key Amazon CloudWatch metrics & logs

**Priority?** Easy to implement but doesn't have great impact on business

#### **REL1- HRI: No awareness or monitoring implemented for service quotas**

Solution Implement Quota Monitor for AWS

**Priority?** Harder to implement. Have a greater impact on business

### **COST1- HRI: No Cloud Financial Management in place**

### Solution

Grant teams access to AWS Cost Explorer, implement AWS cost allocation tagging, use AWS Budgets

#### Priority?

Hard to implement. Have a great impact on business





# Well-Architected verktøykassen

Hjelper DevOps team med



### Raskere utvikling og lansering

- Redusere "brannslukking"
- Identifisere
  kapasitetsutfordringer
- Bruke automatisering til å
  eksperimentere
- Realisere verdi oftere



### Håndtere risiko

- Få innsikt i hvilke områder i arkitekturen som kan innebære risiko
- Adressere risiko før eventuell negativ påvirkning på virksomheten



### Databaserte beslutninger

- Skape bevissthet om hvordan arkitekturvalg og avveininger kan ha ulike konsekvenser
- Mulighetsrom på kort og lang sikt
- Knyttet til forretningsmål



### Lær AWS beste praksis

 Gjøre team kjent med beste praksis basert på tusenvis av historiske gjennomganger





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#### 25 Kilde: Sopra Steria Group - Modern Architecture Best Practices

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### **Sopra Steria Digital and Cloud Services for Hyperscalers**

Well-Architected Practices: beyond foundation, specific lens

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AWS Well-Architected Review	Serverless Lens	Migration Lens	Azure Well-Architected Review	App and Data Modernization Readiness	Data Services   Well-Architected Review
Examine your workload through the different pillars of best practices for architecting workloads on the AWS Cloud.	This lens covers scenarios such as RESTful microservices, mobile app backends, stream processing, and web applications	How to successfully migrate workloads to AWS.	Examine your workload through the lenses of reliability, cost management, operational excellence, security and performance efficiency.	Take the first step in modernizing your workloads by taking this application and modernisation assessment.	Examine your data services through the lenses of reliability, cost management, operational excellence, security and performance efficiency.
Container Build Lens	Machine Learning lens	Financial Services Industry Lens	Cloud Adoption Security Review	DevOps Capability Assessment	Analytics   Well-Architected Review
Best practices for how to build and manage containerized workloads on AWS.	Best practices for architecting your machine learning (ML) workloads on AWS.	Best practices for architecting your Financial Services Industry workloads on AWS.	Assess your Security Journey for Cloud Adoption. Receive actionable considerations to improve your security posture.	Understand current capabilities across the entire software release lifecycle and quickly identify opportunities for improvement based on the Microsoft DevOps practices.	Assess your analytics workload through the lenses of reliability, cost management, operational excellence, security, and performance efficiency.
		Source: AWS Well-Architected Lenses			Source: MICROSOFT ASSESSMENTS



26 Kilde: Sopra Steria Group - Modern Architecture Best Practices

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# **Se til Well-Architected i SDLC -> profit**

- Idé og designfase
- Før produksjonssetting
- Ved omfattende endringer
- Status hver 6-12 måned











### AWS Architecture Center





Onboarding, training, marketing & funding guide

The world is how we shape it

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### **Onboarding guide**



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# There's never been a better time to be a builder

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# Tusen takk!

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