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Are you Well-Architected?

Dragos Madarasan
Solutions Architect, AWS

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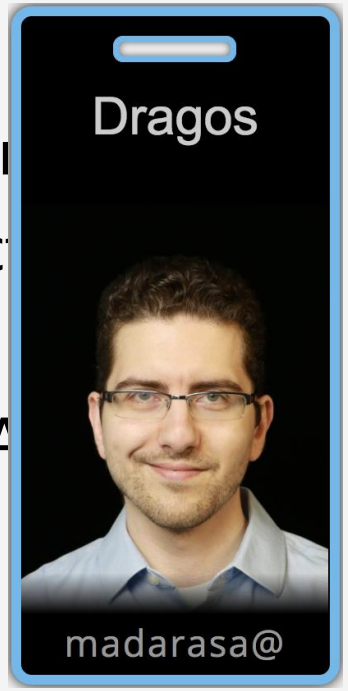
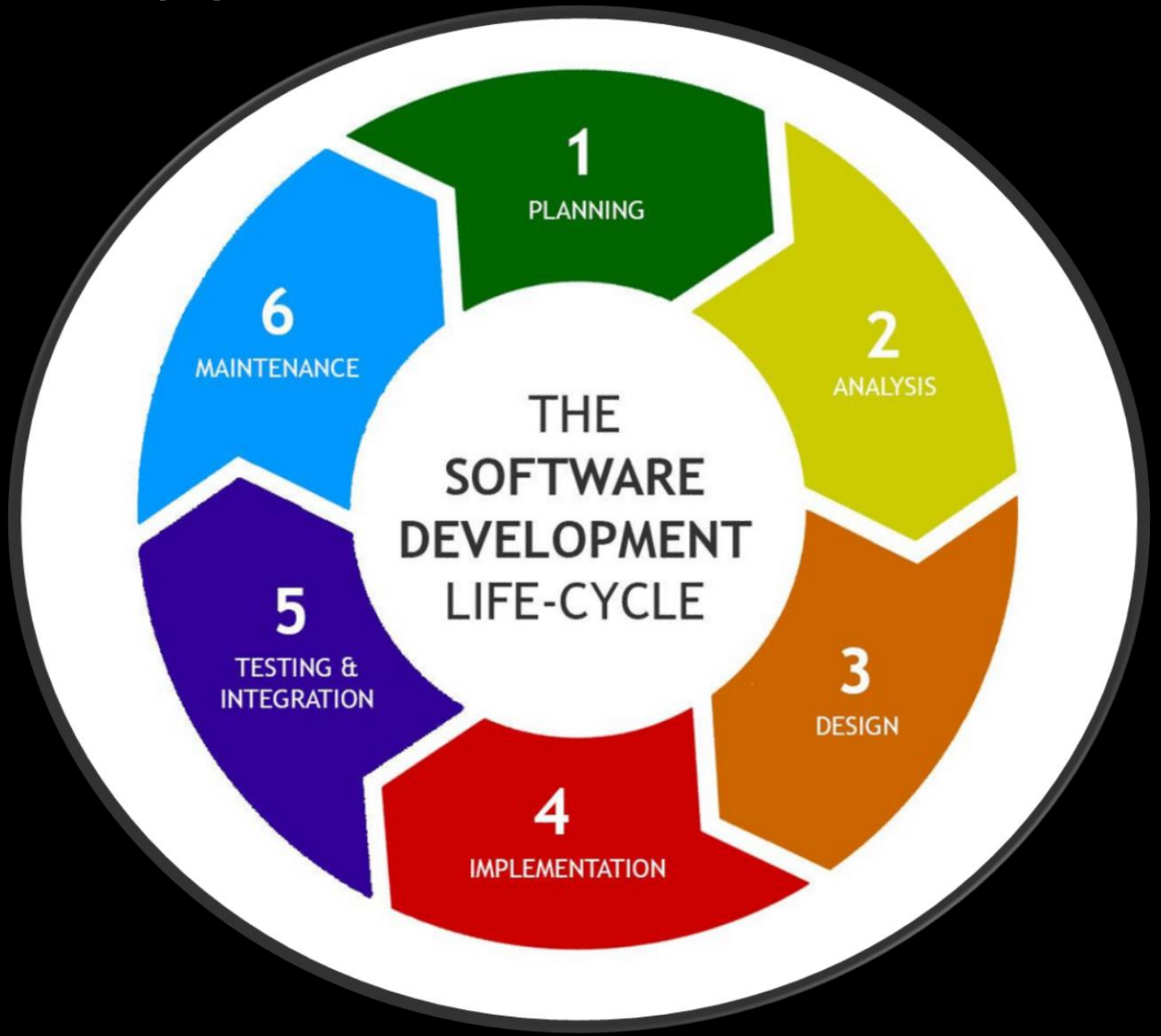
About me

- Solutions Architect @ AWS, covering Romania and Hungar
- Work with and support clients, partners, NGOs, Public Sec
- Based in Munich, Germany, often in Romania
- Previously Support Engineer and ProServe Consultant @ A



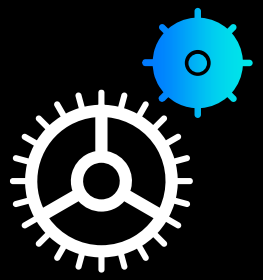
Building an application



When you look at the system your team is building, can you answer the question:

“Are you Well-Architected?”

Are you Well-Architected?



Operations

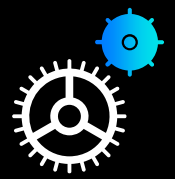
Security

Reliability

Performance efficiency

Cost optimization

Are you Well-Architected?



Operations

Security

Reliability

Performance efficiency

Cost optimization

Review process

Consistent

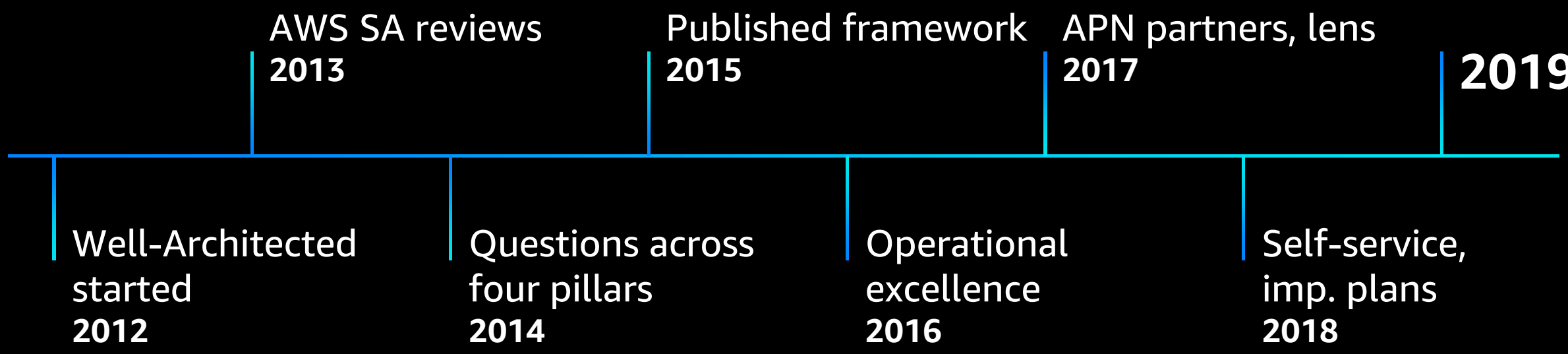
Technology portfolio

AWS Well-Architected

https://aws.amazon.com/well-architected/

A little bit of history

History



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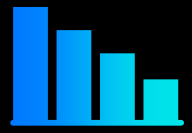
AWS Well-Architected Framework

Why AWS Well-Architected Framework?

Build and deploy faster

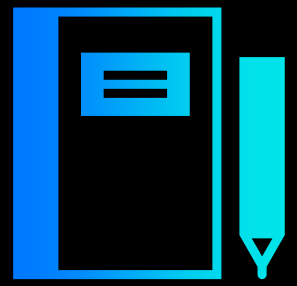


Lower or mitigate risks

Make informed decisions

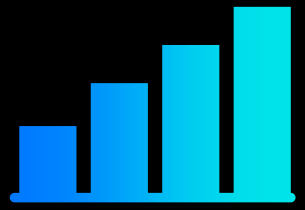
Learn AWS best practices

A mechanism for your cloud journey



Learn

Measure



Improve

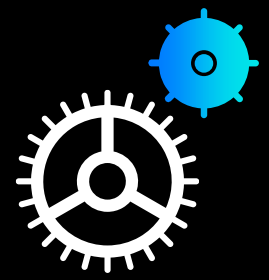
What is the AWS Well-Architected Framework?

Pillars

Design principles

Questions

Pillars of AWS Well-Architected



Operational excellence

Security

Reliability

Performance efficiency

Cost optimization

Design principles

General
design principles

Pillar-specific
design principles

Automate responses to security events: Monitor and automatically trigger responses to event-driven, or condition-driven, alerts

General design principles

Stop guessing your capacity needs

Test systems at production scale

Automate to make architectural experimentation easier

Allow for evolutionary architectures

Drive architectures using data

Improve through game days

Design principles for security

- Implement a strong identity foundation
- Enable traceability
- Apply security at all layers
- Automate security best practices
- Protect data in transit and at rest
- Keep people away from data
- Prepare for security events

Design principles for reliability

Test recovery procedures

Automatically recover from failure

Scale horizontally to increase aggregate system availability

Stop guessing capacity

Manage change in automation

Questions

Failure management

REL 7 How does your system withstand component failures?

If your workloads have a requirement, implicit or explicit, for high availability and low mean time to recovery (MTTR), architect your workloads for resiliency and distribute your workloads to withstand outages.

Best practices:

- **Monitoring is done at all layers of the workload to detect failures**: Continuously monitor the health of your system and report degradation as well as complete failure.
- **Deployed to multiple Availability Zones; Multiple AWS Regions if required**: Distribute workload load across multiple Availability Zones and AWS Regions (for example, DNS, ELB, Application Load Balancer, API Gateway).
- **Has loosely coupled dependencies**: Dependencies such as queuing systems, streaming systems, workflows, and load balancers are loosely coupled.
- **Has implemented graceful degradation**: When a component's dependencies are unhealthy, the component itself does not report as unhealthy. It can continue to serve requests in a degraded manner.
- **Automated healing implemented on all layers**: Use automated capabilities upon detection of failure to perform an action to remediate.
- **Notifications are sent upon availability impacting events**: Notifications are sent upon detection of any significant events, even if it was automatically healed.

Pillar area

Question

Context

Best practices

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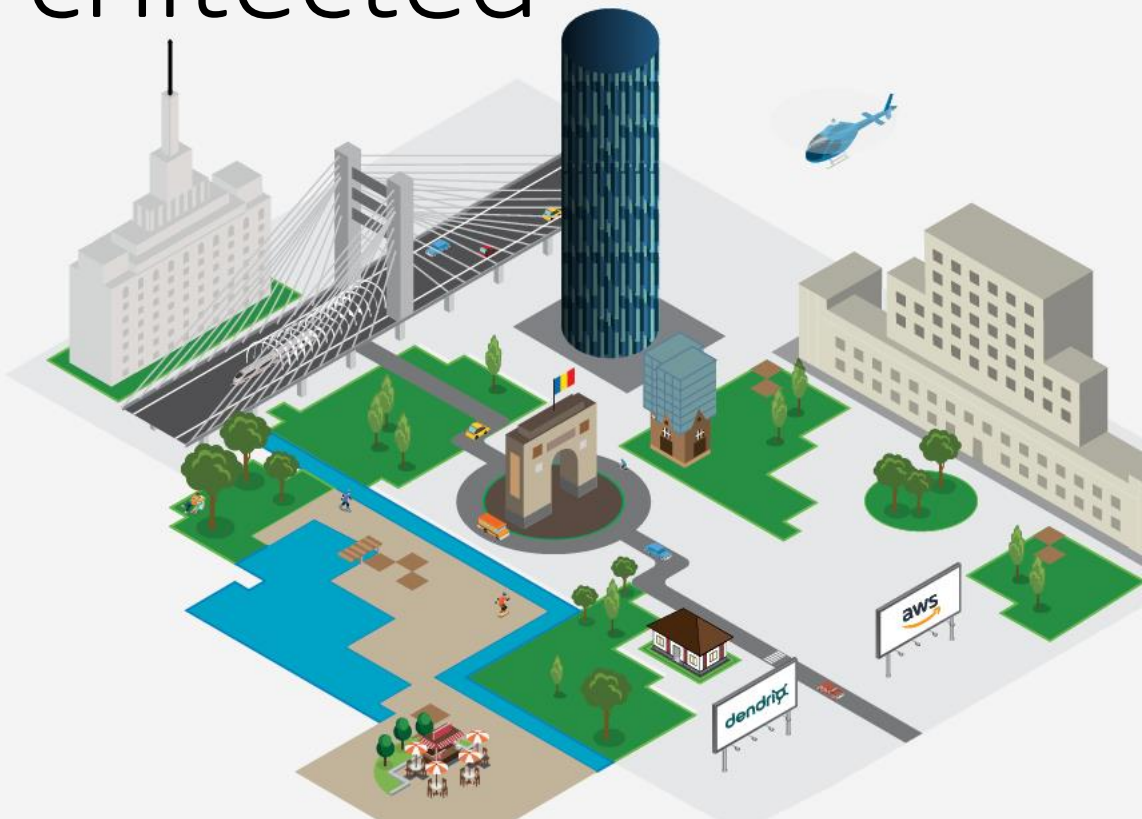
Applying AWS Well-Architected



Intent of review

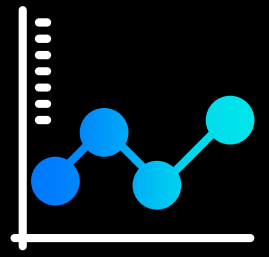
Not an audit

Working together to improve

Not architecture astronauts

Pragmatic, proven advice

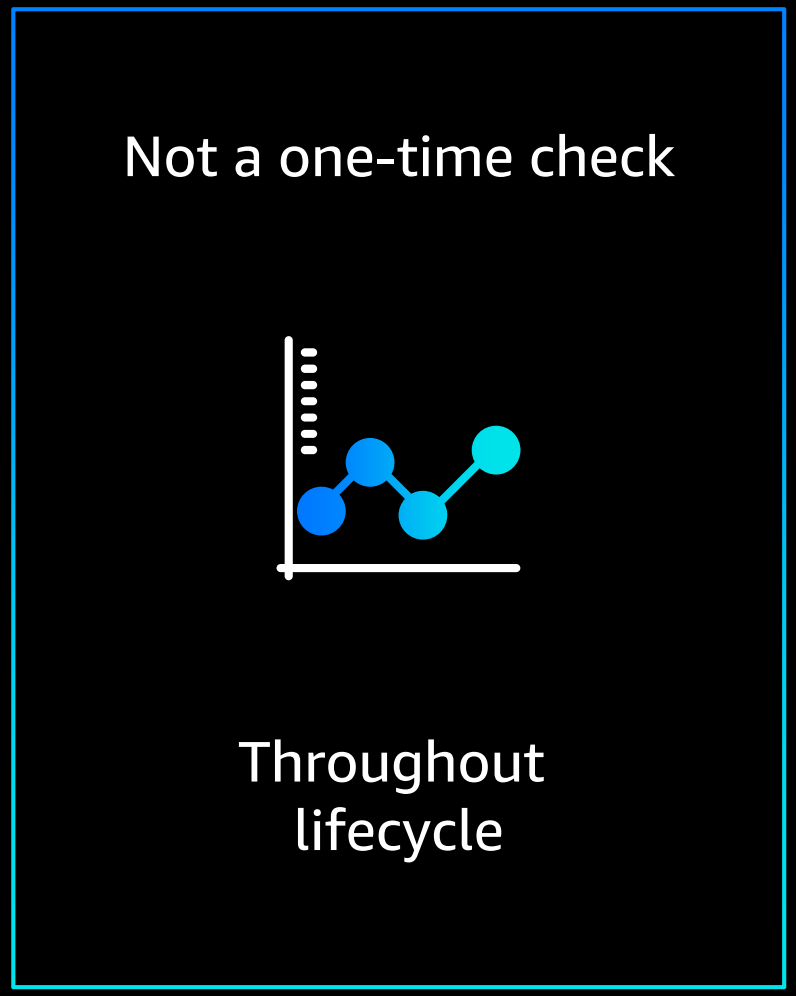
Not a one-time check



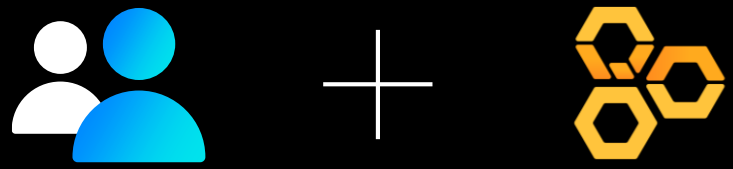
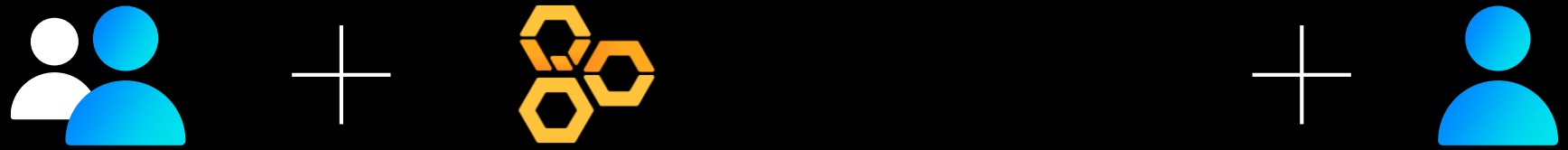
Throughout lifecycle

Not a one-time check

- Read whitepaper before design
  - At minimum: questions
- Iterate through lifecycle
  - Halfway (or sooner)
  - Close to launch
  - Post-launch



Review choice

	Your team technical and business leads	AWS WA tool	AWS APN partner	AWS solutions architect
Self-service				
Partner				
AWS SA				

Review choice

Self-service
Full control of how often and when

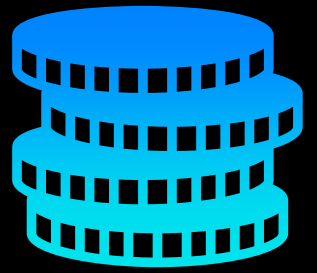
Partner
When you have a shortage of skilled resource, can address issues

AWS SA
Critical workloads, advice on improvement plan

Partner Well-Architected reviews

Engage with a Well-Architected Partner for a free review

Results including statement of work (SoW) for improvements



Approve SoW within 30 days receive $5K in AWS credits

Well-Architected Partners

https://aws.amazon.com/architecture/well-architected/partners/

Tips

https://aws.amazon.com/well-architected/

Whitepapers (PDF, Kindle)

- Framework
- Per pillar (operational excellence, reliability, security, performance efficiency, cost optimization)
- Lens (serverless, HPC, IoT)

Training (framework, pillars, review process, tool)

Website

- Glossary
- Videos
- Map

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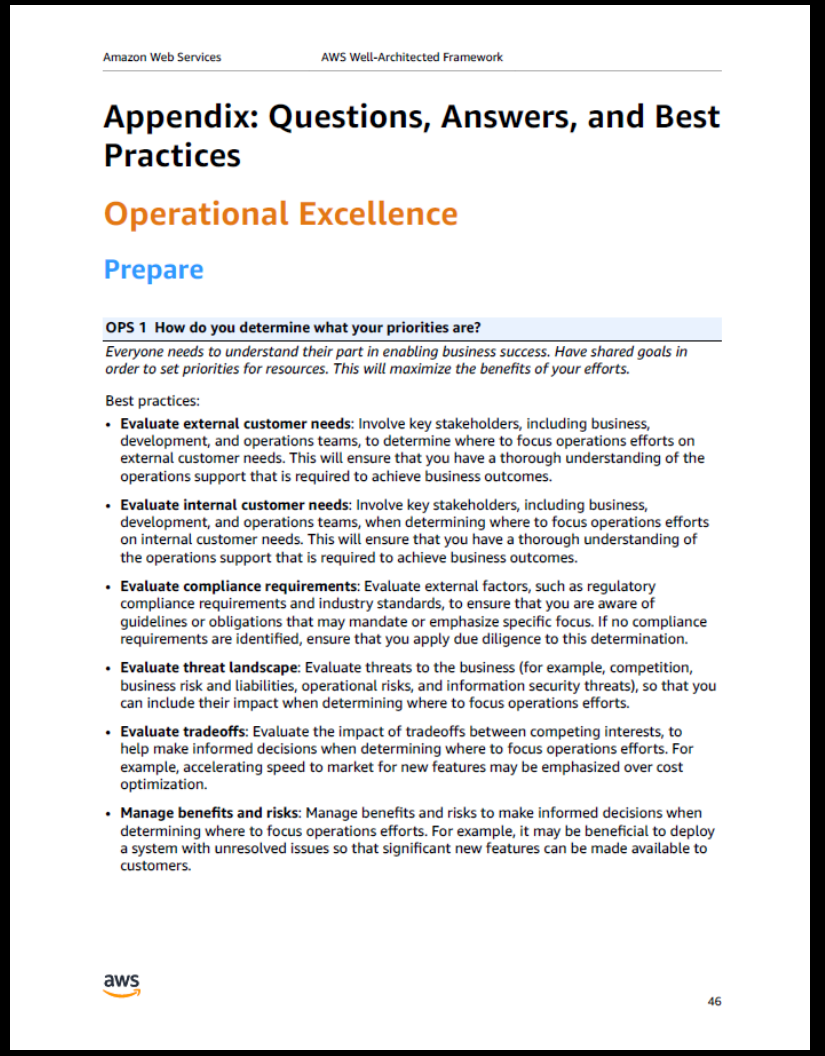
Resources

Framework has Q&A

https://aws.amazon.com/well-architected/



Amazon Web Services AWS Well-Architected Framework

Appendix: Questions, Answers, and Best Practices

Operational Excellence

Prepare

OPS 1 How do you determine what your priorities are?

Everyone needs to understand their part in enabling business success. Have shared goals in order to set priorities for resources. This will maximize the benefits of your efforts.

Best practices:

- **Evaluate external customer needs**: Involve key stakeholders, including business, development, and operations teams, to determine where to focus operations efforts on external customer needs. This will ensure that you have a thorough understanding of the operations support that is required to achieve business outcomes.
- **Evaluate internal customer needs**: Involve key stakeholders, including business, development, and operations teams, when determining where to focus operations efforts on internal customer needs. This will ensure that you have a thorough understanding of the operations support that is required to achieve business outcomes.
- **Evaluate compliance requirements**: Evaluate external factors, such as regulatory compliance requirements and industry standards, to ensure that you are aware of guidelines or obligations that may mandate or emphasize specific focus. If no compliance requirements are identified, ensure that you apply due diligence to this determination.
- **Evaluate threat landscape**: Evaluate threats to the business (for example, competition, business risk and liabilities, operational risks, and information security threats), so that you can include their impact when determining where to focus operations efforts.
- **Evaluate tradeoffs**: Evaluate the impact of tradeoffs between competing interests, to help make informed decisions when determining where to focus operations efforts. For example, accelerating speed to market for new features may be emphasized over cost optimization.
- **Manage benefits and risks**: Manage benefits and risks to make informed decisions when determining where to focus operations efforts. For example, it may be beneficial to deploy a system with unresolved issues so that significant new features can be made available to customers.

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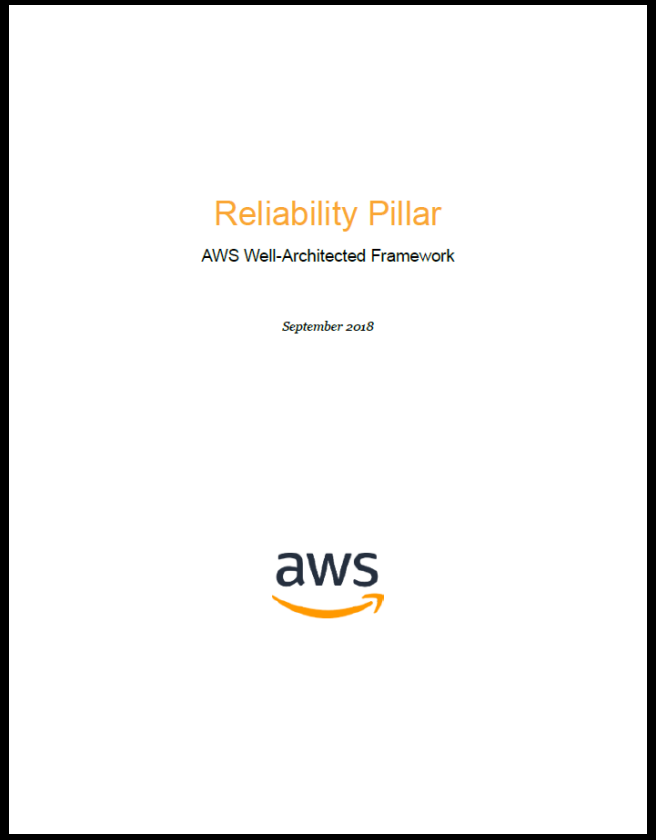
Pillar has detail

https://aws.amazon.com/well-architected/



Contents

Lens has reference architecture

https://aws.amazon.com/well-architected/

Serverless Applications Lens

AWS Well-Architected Framework

November 2018

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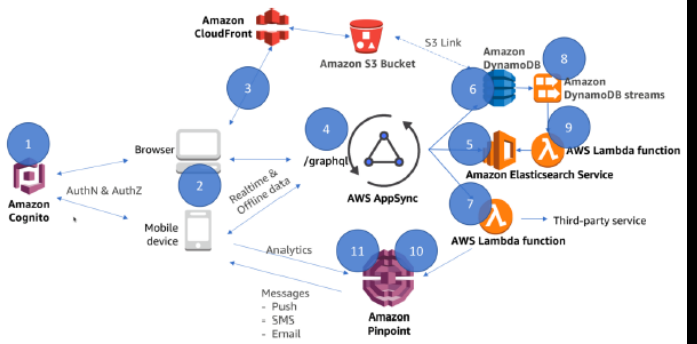

Figure 4: Reference architecture for a mobile backend

1. **Amazon Cognito** is used for user management and as an identity provider for your mobile application. Additionally, it allows mobile users to leverage existing social identities such as Facebook, Twitter, Google+, and Amazon to sign in.
2. **Mobile users** interact with the mobile application backend by performing GraphQL operations against AWS AppSync and AWS service APIs (for example, Amazon S3 and Amazon Cognito).
3. **Amazon S3** stores mobile application static assets including certain mobile user data such as profile images. Its contents are securely served via CloudFront.
4. **AWS AppSync** hosts GraphQL HTTP requests and responses to mobile users. In this scenario, data from AWS AppSync is real-time when devices are connected, and data is available offline as well. Data sources can be **Amazon DynamoDB**, **Amazon Elasticsearch Service**, or **AWS Lambda** functions.
5. **Amazon Elasticsearch Service** acts as a main search engine for your mobile application as well as analytics.

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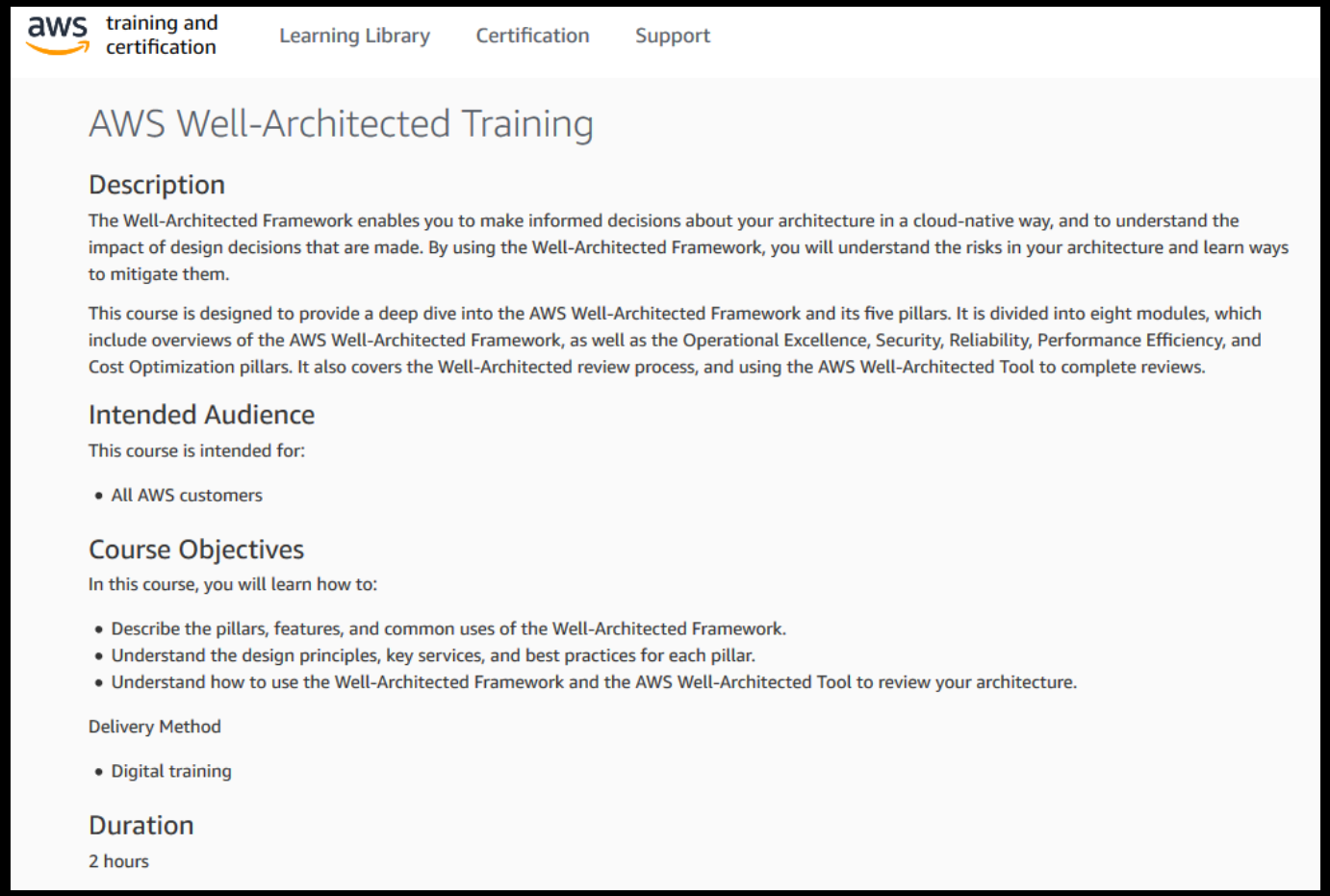
Free training

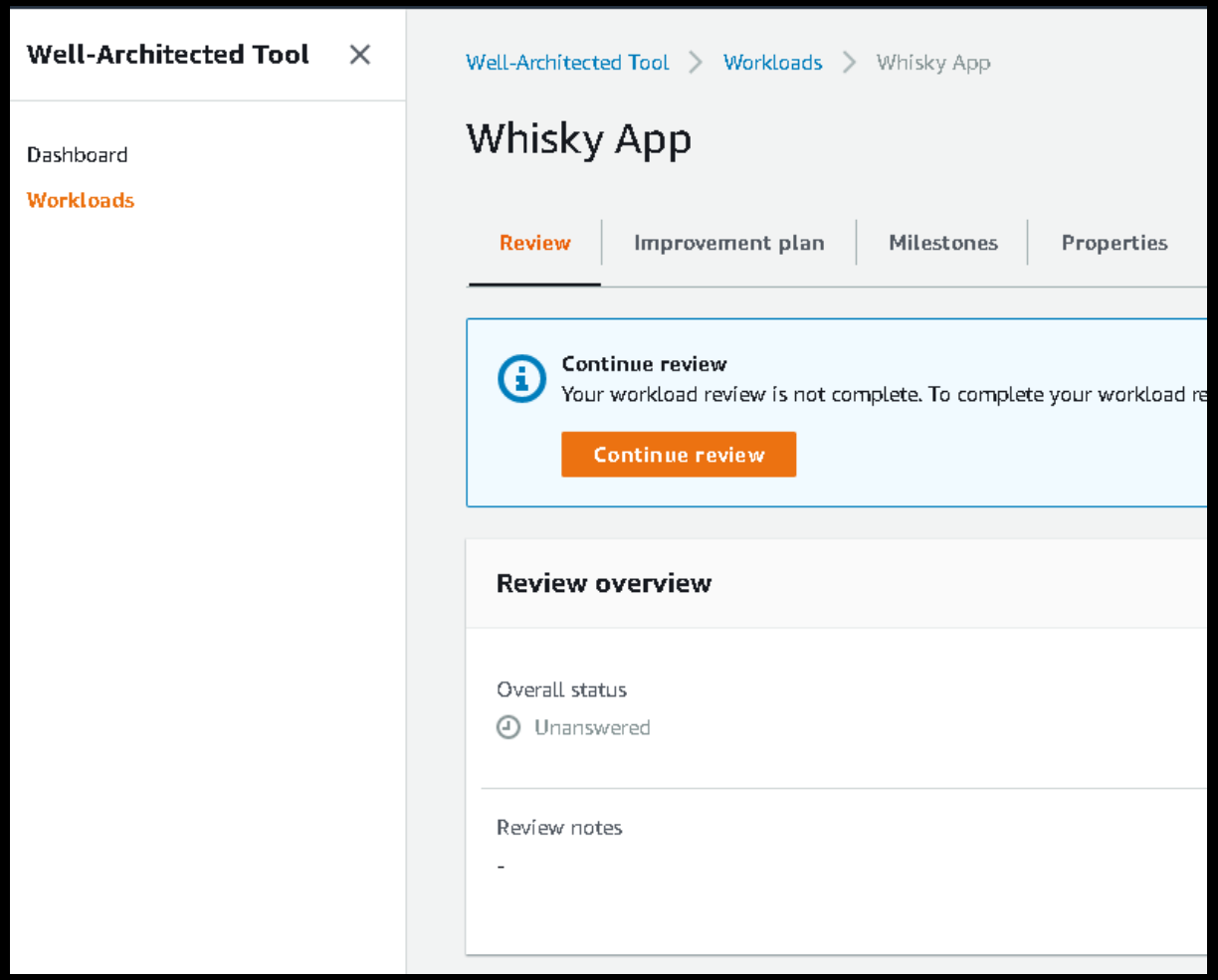
https://aws.amazon.com/well-architected/

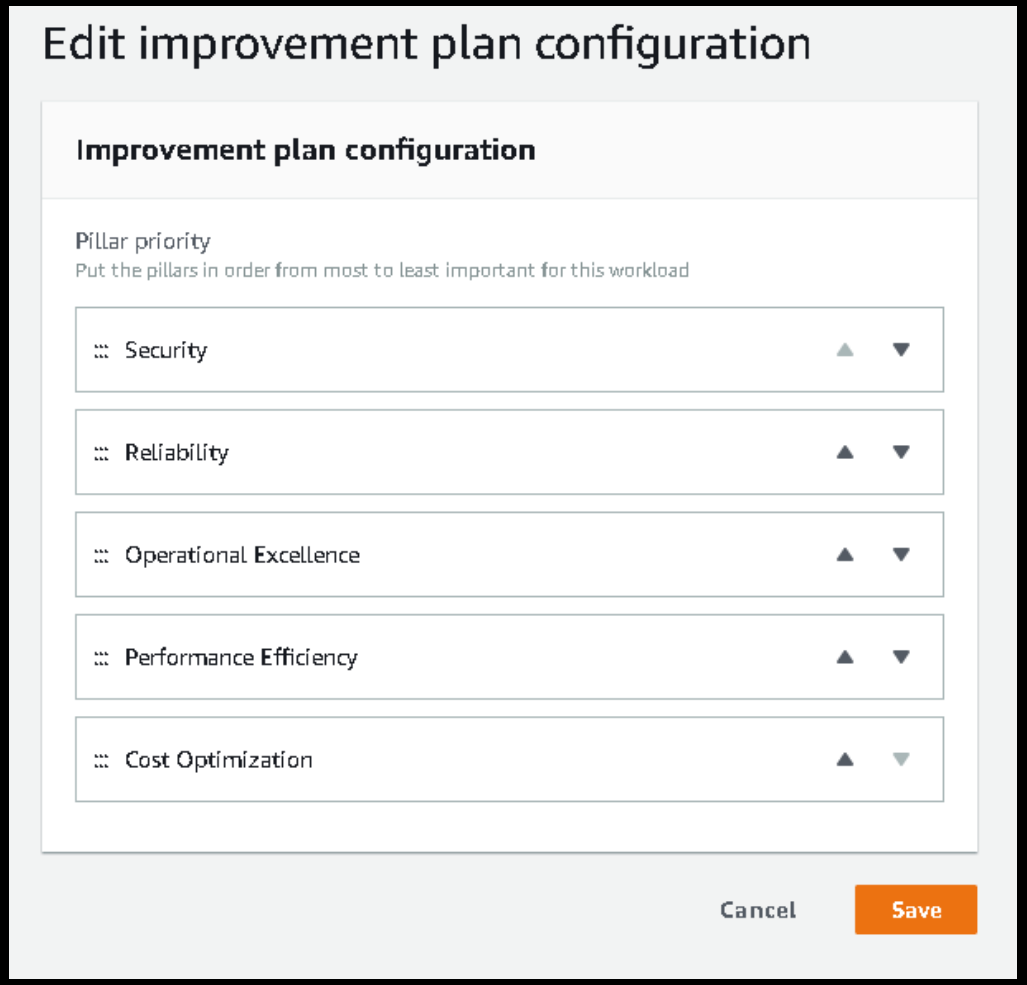
The Framework
Operational Excellence
Security
Reliability
Performance Efficiency
Cost Optimization
Well-Architected Review
AWS Well-Architected Tool



Pillar priority

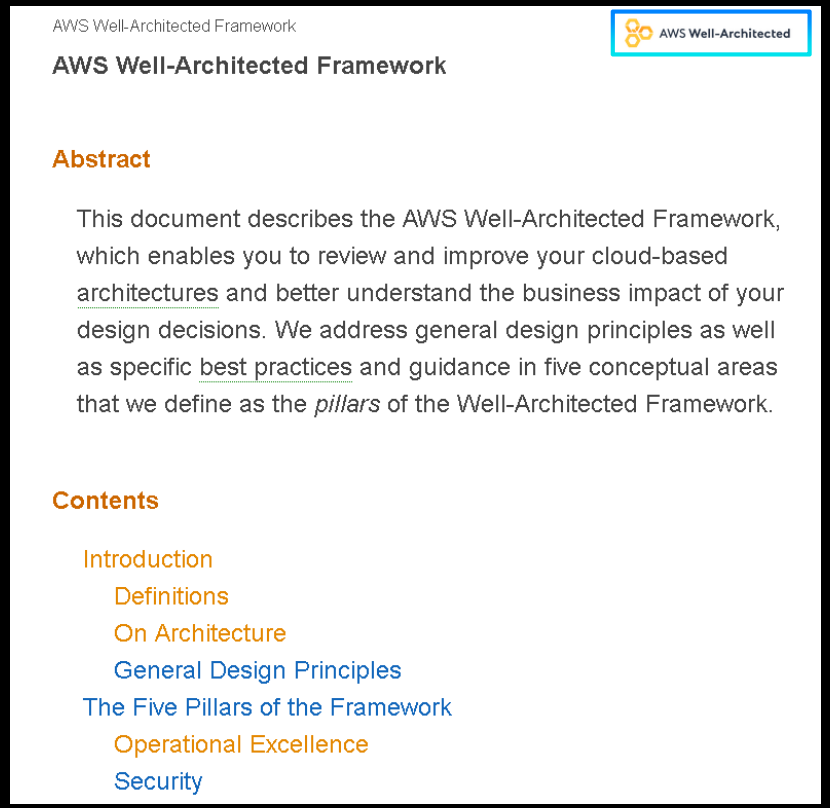
https://aws.amazon.com/well-architected/

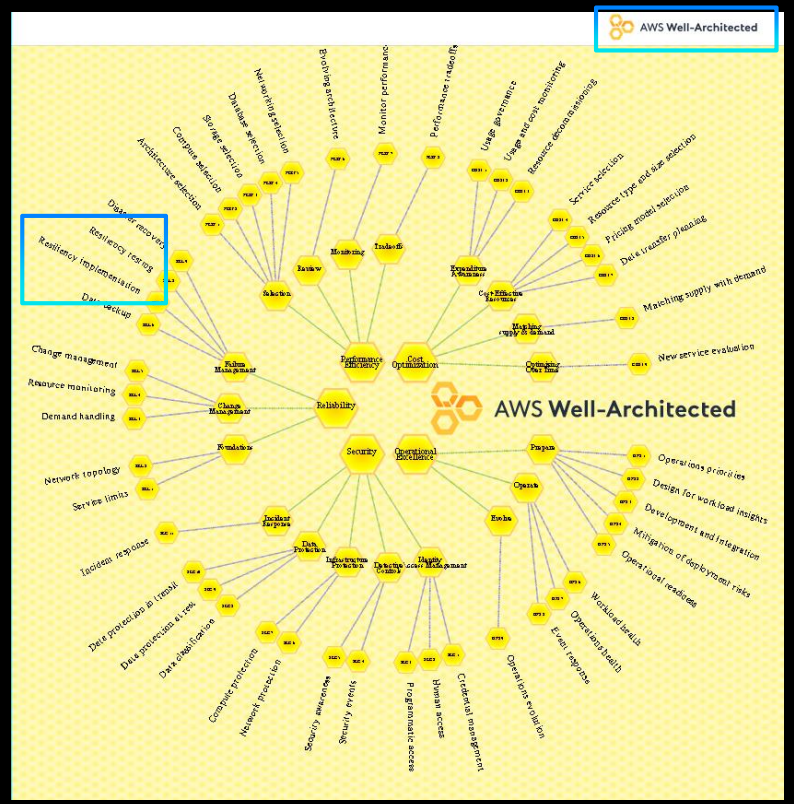


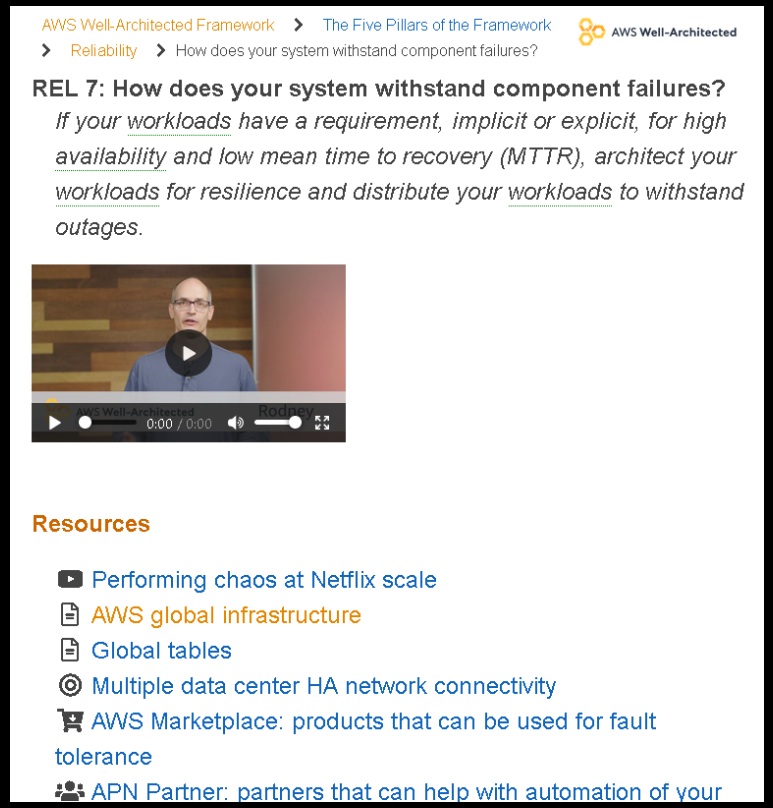


Well-Architected content website

https://wa.aws.amazon.com/

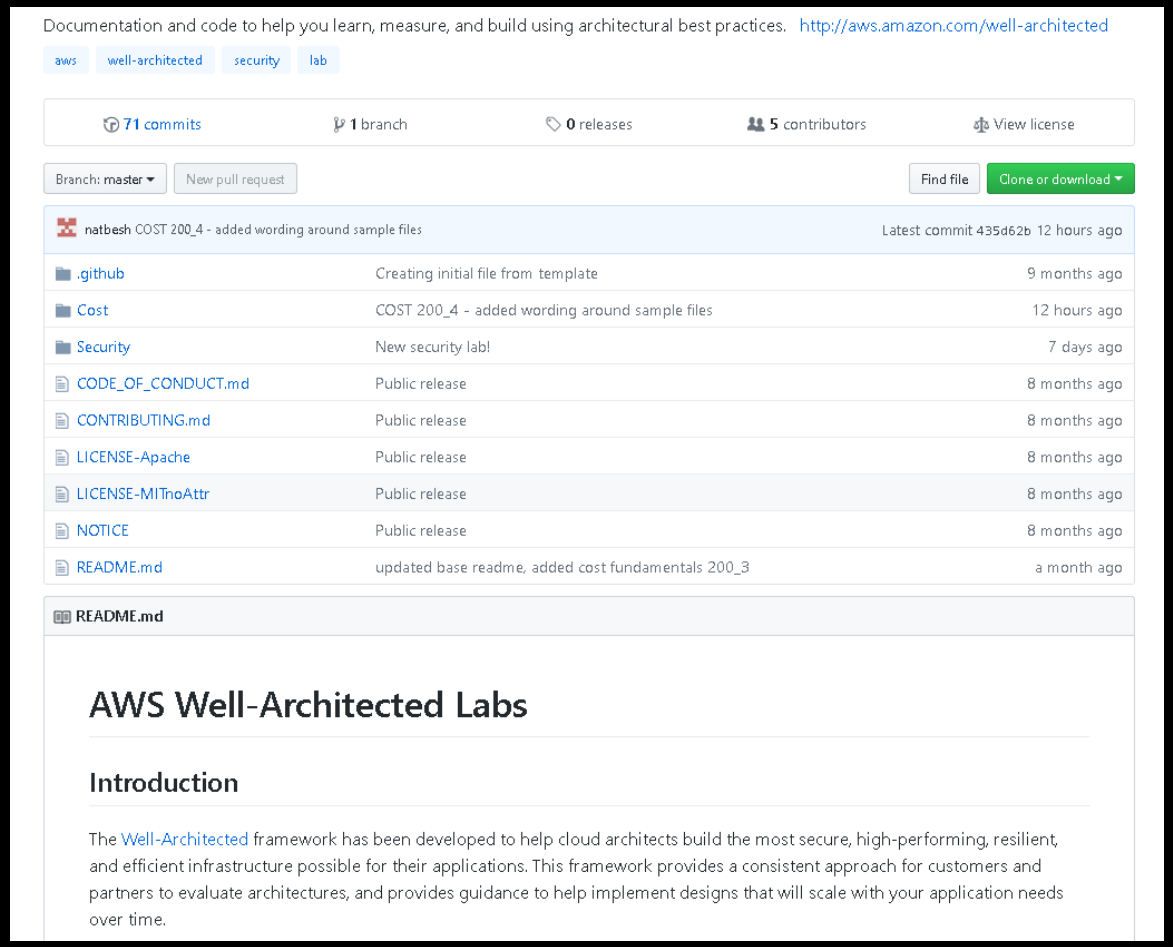


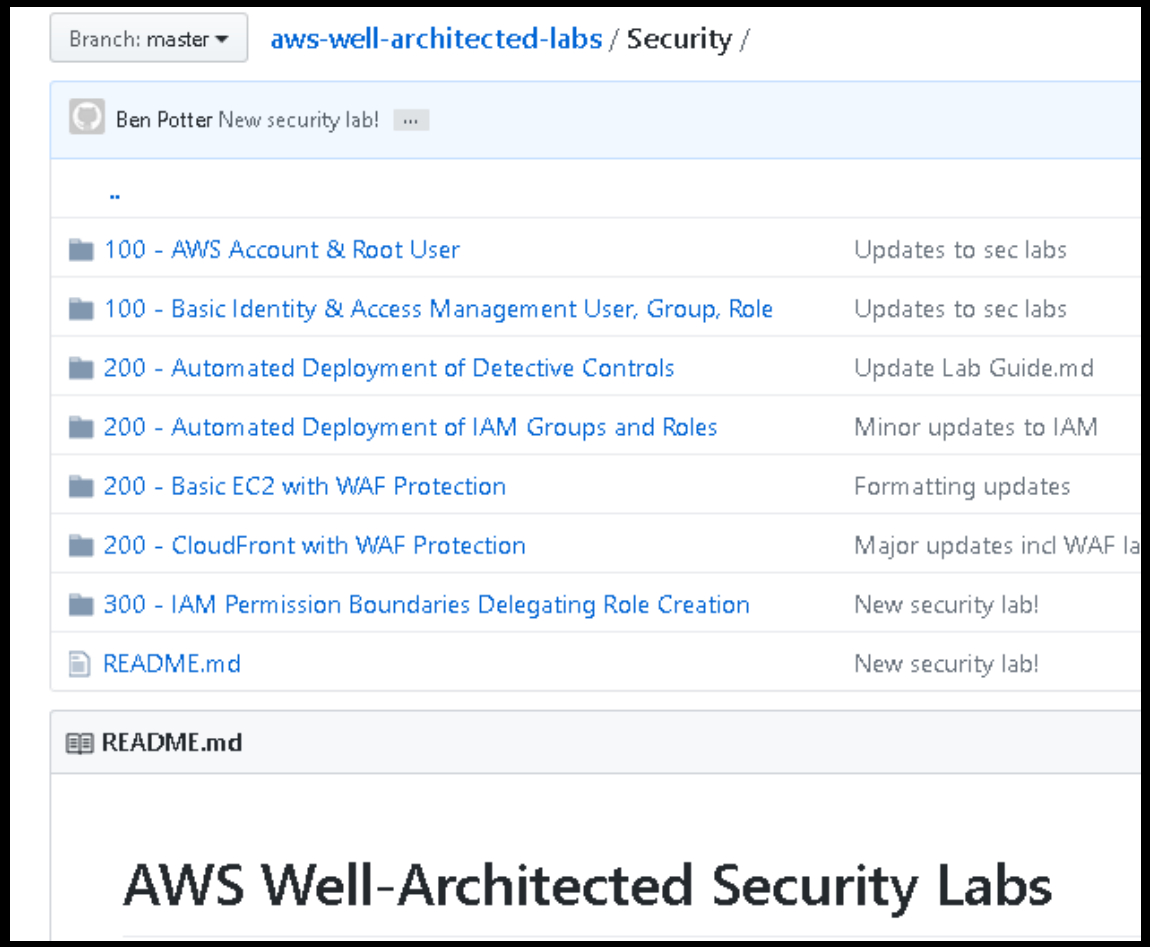




Well-Architected Labs

https://github.com/awslabs/aws-well-architected-labs





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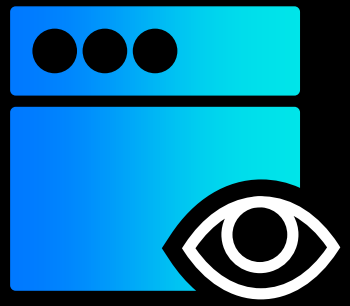
Demo

Best practices

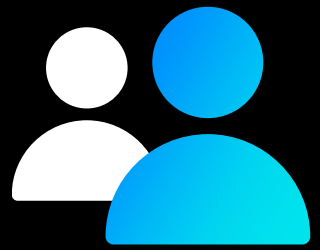
- Read the whitepaper before you start
- Iterate through the questions
    - Identify actions and backlog
- Review pre-launch
- Review/iterate post launch

Getting started

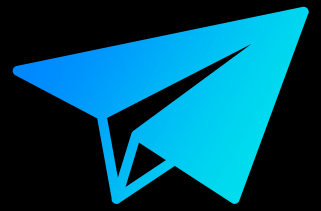
https://aws.amazon.com/well-architected/



Read online resources



Account team or partner



Review first workload

Next step

Start using the tool:
https://aws.amazon.com/well-architected/

Bucharest AWS User Group

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Other sessions today

11:00-12:00 **Playing Lego with Virtualization components**

13:00-14:00 **Chaos Engineering: why breaking things should be practiced**

14:00-14:45 **Amazon Game Tech: detect anomalies, increase player engagement and optimize costs with Machine Learning**

15:00-15:45 **Advanced traffic routing using AWS Global Accelerator and Amazon Route 53**

16:00-17:00 **How to build a CI/CD pipeline to deploy database changes across multiple accounts**

13:00-17:00 **Solution Architect Associate Certification Exam Preparation (workshop room)**

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Thank you!

Dragos Madarasan
Solutions Architect