Well-Architected Pillars – Guidance Template

Guidance Name: Redshift DevOps

Solution Domain name: Analytics

Guidance Owner/Team: jeesri@/WWSO Analytics team

For each pillar you must answer between one and three of the provided questions. Answers should be within the context of the content produced (e.g avoid referencing things that are not shown to the user). The relevant focus areas alongside the pillar’s whitepaper will be shared with customers.

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| Pillar | Question | Answer | Focus Area |
| Cost Optimization | How do you evaluate cost when you select services? | All services except EC2 instance are serverless on-demand instance. CFN deploys the guidance in a clean VPC to display cost associated with the solution | [Cost Effective Resources](https://docs.aws.amazon.com/wellarchitected/latest/cost-optimization-pillar/cost-effective-resources.html) |
|  | How do you plan for data transfer charges? | There are no data transfer; Any data copy operation assumes data to be already in S3 | [Cost Effective Resources](https://docs.aws.amazon.com/wellarchitected/latest/cost-optimization-pillar/cost-effective-resources.html) |
|  | How do you use pricing models to reduce cost? | Solution is based on serverless pay per use model | [Cost Effective Resources](https://docs.aws.amazon.com/wellarchitected/latest/cost-optimization-pillar/cost-effective-resources.html) |
|  | How does this Guidance scales to continually match the demand and ensure that only the minimum resources required? | All components of guidance is based on serverless AWS components except EC2 instance. If there is no activity then the only charges incurred would be for EC2 | [Manage Demand and Supply Resources](https://docs.aws.amazon.com/wellarchitected/latest/cost-optimization-pillar/manage-demand-and-supply-resources.html) |
| Security | What design decision have been factored for secure Authentication and Authorisation mechanism, for people and machine access in this Guidance? | The solution leverages authenticating EC2 log on using private key; IAM policies with minimal access to services are configured for AWS services to interact; Non root accounts are used to execute scripts/workload on EC2 instance | [Identity and Access Management](https://docs.aws.amazon.com/wellarchitected/latest/security-pillar/identity-and-access-management.html) |
|  | How do you protect resources in this Guidance? |  | [Infrastructure Protection](https://docs.aws.amazon.com/wellarchitected/latest/security-pillar/infrastructure-protection.html) |
|  | How do you protect data in this Guidance? | There is minimal customer data most of the guidance is configuration and code | [Data Protection](https://docs.aws.amazon.com/wellarchitected/latest/security-pillar/data-protection.html) |
| Reliability | How does this Guidance implement a highly available network topology? | Guidance uses AWS best practices for creating and defining the VPC | [Foundation](https://docs.aws.amazon.com/wellarchitected/latest/reliability-pillar/foundations.html) |
|  | Are there any limits or constraints that may affect reliability, that the implementer needs to be aware of? | No | [Foundation](https://docs.aws.amazon.com/wellarchitected/latest/reliability-pillar/foundations.html) |
|  | How does this Guidance implement a reliable application-level architecture? (for example: loosely coupled dependencies, throttling, retry limits, stateless compute) | The Guidance saves container config in ec2 directory. Jenkins container becomes stateless by copying the configuration directly from the ec2 server instance. | [Architecture](https://docs.aws.amazon.com/wellarchitected/latest/reliability-pillar/workload-architecture.html) |
|  | How does this Guidance implement logs and metrics and send notifications when thresholds are crossed or significant events occur? | Logs and metrics are captured directly within the EC2 instance and cloud watch log group for the solution created | [Change Management](https://docs.aws.amazon.com/wellarchitected/latest/reliability-pillar/change-management.html) |
|  | How does this Guidance adapt to changes imposed on it, such as changes in demand? | Yes | [Change Management](https://docs.aws.amazon.com/wellarchitected/latest/reliability-pillar/change-management.html) |
|  | How does this Guidance implement required changes such as deployments and configuration changes? | The changes are committed to the git repo, triggering off an automatic code build and deploy to execute on specified Redshift instance. | [Change Management](https://docs.aws.amazon.com/wellarchitected/latest/reliability-pillar/change-management.html) |
|  | How does this Guidance implement data backup and recovery? | Code is managed in GitHub. Any Configuration in ec2 server instance is backed on s3 | [Failure Management](https://docs.aws.amazon.com/wellarchitected/latest/reliability-pillar/failure-management.html) |
|  | How does this Guidance implement resilience to failures? | Compute is stateless and can be restarted; The core pipeline checkpoints last execution step and saves it to s3 | [Failure Management](https://docs.aws.amazon.com/wellarchitected/latest/reliability-pillar/failure-management.html) |
|  | Does this Guidance enable testing of reliability? | Yes | [Failure Management](https://docs.aws.amazon.com/wellarchitected/latest/reliability-pillar/failure-management.html) |
|  | Does this Guidance enable recovery from disaster events? | Yes, depending on how the code is deployed for Redshift. Users can clear check point marker and execute all the DDL/DML statements | [Failure Management](https://docs.aws.amazon.com/wellarchitected/latest/reliability-pillar/failure-management.html) |
| Operational Excellence | How do you instrument the Guidance to understand its state and achievement of business outcomes? | We would be collecting repo clone and download information from Github. We also plan on running feedback loops – surveys etc. to collect information on solution usage. | [Prepare](https://docs.aws.amazon.com/wellarchitected/latest/operational-excellence-pillar/prepare.html) |
|  | How did you integrate and deploy changes with the Guidance? | Github code repo will contain updated code to address changes | [Prepare](https://docs.aws.amazon.com/wellarchitected/latest/operational-excellence-pillar/prepare.html) |
|  | How do you safely operate the Guidance and respond to incidents and events? | This is a guidance use at own risk solution. | [Operate](https://docs.aws.amazon.com/wellarchitected/latest/operational-excellence-pillar/operate.html) |
|  | How do you implement feedback loops within the Guidance? | Feedback can be collected on the solutions landing page and Git repo. We will periodically review and prioritize the feedback to be added in guidance. | [Evolve](https://docs.aws.amazon.com/wellarchitected/latest/operational-excellence-pillar/evolve.html) |
| Performance | Why did you select those services, are they purpose built for your use-case? | Yes, the services are purpose built and meet functional capabilities needed in the solution | [Selection](https://docs.aws.amazon.com/wellarchitected/latest/performance-efficiency-pillar/selection.html) |
|  | How can the user experiment with this Guidance and optimize it based on their data? | Users can deploy the solution as CFN in AWS. Users can experiment with: 1/ Creating different Redshift clusters and running SQL scripts – changing the .ini files, 2/customizing the docker build (inject any additional libraries and dependencies) – Dockerfile; 3/ Adding configuration for Jenkins job build – Jenkinsfile; 4/ Change to build process details – buildspec.yml. | [Review](https://docs.aws.amazon.com/wellarchitected/latest/performance-efficiency-pillar/review.html) |
|  | How can the location of this Guidance be selected to decrease latency and improve performance? | Connection latency can introduce delay in executing SQL statement commands. Recommend to have EC2 instance in the same region where Redshift cluster is | [Network Selection](https://docs.aws.amazon.com/wellarchitected/latest/performance-efficiency-pillar/network-architecture-selection.html) |
|  | How can this Guidance meet the workload requirements of scaling, traffic patterns, data access patterns? | The Guidance is geared towards code deployment. To horizontally scale the solution new container can be created | [Performance Architecture](https://docs.aws.amazon.com/wellarchitected/latest/performance-efficiency-pillar/performance-architecture-selection.html) |
| Sustainability | How does this Guidance scales to continually match the load and ensure that only the minimum resources required? | The architecture is designed to be serverless (except EC2 instance) | [User Behavior Patterns](https://docs.aws.amazon.com/wellarchitected/latest/sustainability-pillar/user-behavior-patterns.html) |
|  | How does this Guidance implement architecture patterns for maintaining consistent high utilization of deployed resources? | ? | [Software and Architecture Patterns](https://docs.aws.amazon.com/wellarchitected/latest/sustainability-pillar/software-and-architecture-patterns.html) |
|  | How does this Guidance use technologies that support data access and storage patterns? | ? | [Data Patterns](https://docs.aws.amazon.com/wellarchitected/latest/sustainability-pillar/data-patterns.html) |
|  | How does this Guidance minimize the amount of hardware needed to provision? | ? | [Hardware Patterns](https://docs.aws.amazon.com/wellarchitected/latest/sustainability-pillar/hardware-patterns.html) |