URL shortener with AWS

Scenario:
In Company M, employees often share internal documents via URLs. However, these URLs are often lengthy and non-descriptive, so there is a need for a URL shortening solution for convenience and clarity. As the documents are confidential, free online services like TinyURL.com are prohibited. As the solution architect, you are tasked with designing and implementing a Proof of Concept (PoC) URL shortener using AWS. The url should be auto-generated, and expire after 10 minutes, as the documents are expected to be opened shortly. Operational efficiency is important and the company wants to manage as little infrastructure as possible.

Functional requirements:
- Provide a web interface for users to submit long URLs and receive shortened versions of it
- Generate short URLs in the format: http://xxxxx.xxx/H3LL0
- Last segment of the short URL should be a random 5-character string in letters and digits
- Do not care about the domain for this PoC
- Each short URL should be valid for 10 minutes after creation

Infrastructure requirements:
- Leverage Infrastructure as Code (IaC), e.g. Terraform, AWS SAM or AWS CDK
- Utilise Amazon API Gateway for REST API implementation
- Implement CRUD logic using AWS Lambda
- Leverage additional AWS services as needed based on your design
- Ensure that all chosen services are eligible for the free tier

Deliverables:
- IaC templates and associated code
- Architecture diagram of the solution (in the README file)
- URL of the deployed web interface (in the README file)
- Detailed steps for building, deploying and running the application (in the README file)
- Show progress in Git history through meaningful commits.

Optional items (Bonus):
- Only expire the short url if it has not been accessed for 10 min
  i.e. every time when users access it, start countdown of 10 min all over again
- Allow users to customise the short URL suffix, instead of random generation
- Only allow users with IP range from *218.189.44.128 - 218.189.44.255* to call API
- Estimate the cost of running this setup (do not consider free tier quotas)
- Suggest potential improvements if additional time and resources are given