Architecture for Airline Crew Management Systems

Use Amazon Web Services (AWS) to create a highly-available, secure, flexible, and cost-effective architecture for airline crew management systems.

1. To connect corporate users and systems to the crew management services running on AWS, use AWS Direct Connect as the primary connection and AWS Site-to-Site VPN as the secondary connection.

2. Crew member apps resolve domain names via Amazon Route 53 to IP addresses for Amazon API Gateway and Amazon CloudFront distribution.

3. Amazon API Gateway provides access to the application tier. Amazon CloudFront distribution serves the static page and assets stored in an Amazon Simple Storage Service (Amazon S3) bucket. These are protected by AWS WAF (Web Application Firewall).

4. Amazon Cognito provides user authentication and access control to crew applications.

5. The application tier has a private Application Load Balancer (ALB) for load balancing crew management microservices. The ALB is connected to an Amazon EKS cluster in two different Availability Zones.

6. An Amazon Aurora PostgreSQL-Compatible Edition relational database provides high availability using Aurora Replicas (reader instance). It also stores copies of the data across multiple Availability Zones.

7. Use AWS Cloud Security services to provide at-rest, end-to-end encryption, while ensuring credential or private keys are protected.

8. Use Amazon CloudWatch and monitoring tools to provide data that can help optimize operational health and provide centralized management.

9. Create a data lake with Amazon S3 and Amazon S3 Glacier to store crew management data for reporting, visualization and advanced analytics.

10. Amazon QuickSight can deliver business intelligence from the data stored in the data lake, provide actionable insights on crew planning, training statistics, and crew staff utilization.