AWS Monitoring Setup Guide

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AWS Monitoring and Alerting Setup Guide

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CloudWatch Dashboard Configuration

Create a comprehensive CloudWatch dashboard to monitor all critical services in your architecture. Use the following steps to set up your dashboard:

1. Open the CloudWatch console

2. Click on "Dashboards" in the left navigation pane

3. Click "Create dashboard"

4. Name your dashboard (e.g., "Production-Main-Dashboard")

5. Add widgets for each service, including:

   - Route 53 health checks

   - S3 bucket metrics

   - WAF requests and blocked requests

   - CloudFront distribution metrics

   - API Gateway requests and latency

   - Application Load Balancer metrics

   - ECS cluster and service metrics

   - EC2 instance metrics

   - Auto Scaling group metrics

- RDS database metrics
- ElastiCache cluster metrics
- SNS topic metrics
- CloudTrail log metrics

Key Metrics to Monitor

Amazon Route 53

Health check status

DNS queries

S3

BucketSizeBytes

NumberOfObjects

4xxErrors and 5xxErrors

AWS WAF

CountedRequests

BlockedRequests

Amazon CloudFront

Requests

BytesDownloaded

4xxErrorRate and 5xxErrorRate

API Gateway

Count

Latency

4xx and 5xx errors

Application Load Balancer

- RequestCount
- TargetResponseTime
- HTTPCode_Target_4XX_Count and HTTPCode_Target_5XX_Count

ECS

- CPUUtilization
- MemoryUtilization
- RunningTaskCount

EC2

- CPUUtilization
- DiskReadOps and DiskWriteOps
- NetworkIn and NetworkOut

Auto Scaling Group

- GroupDesiredCapacity
- GroupInServiceInstances

Amazon RDS

- CPUUtilization
- FreeableMemory
- ReadIOPS and WriteIOPS
- DatabaseConnections

Amazon ElastiCache

- CPUUtilization
- SwapUsage
- CurrConnections

SNS

- NumberOfMessagesPublished

NumberOfNotificationsDelivered

NumberOfNotificationsFailed

Alert Thresholds and Escalation Procedures

Set up CloudWatch Alarms for critical metrics with the following thresholds:

1. High CPU Utilization (EC2, RDS, ElastiCache)
   - Threshold: > 80% for 5 minutes
   - Action: Send SNS notification to operations team

2. High Memory Usage (EC2, RDS, ElastiCache)
   - Threshold: > 80% for 5 minutes
   - Action: Send SNS notification to operations team

3. High Error Rates (ALB, API Gateway, CloudFront)
   - Threshold: > 5% 5xx errors for 5 minutes
   - Action: Send SNS notification to development and operations teams

4. Low Free Storage Space (RDS, EC2)
   - Threshold: < 20% free space for 30 minutes
   - Action: Send SNS notification to operations team

5. Auto Scaling Group Size Changes
   - Threshold: Any change in desired capacity
   - Action: Send SNS notification to operations team

Escalation Procedures:

1. First-level response: Operations team acknowledges within 15 minutes
2. If unresolved after 30 minutes: Escalate to senior operations engineer
3. If unresolved after 1 hour: Escalate to development team lead and CTO

Performance Optimization Recommendations

1. Use CloudWatch Container Insights for ECS to gain deeper insights into container performance
2. Implement X-Ray tracing for API Gateway and ECS services to identify bottlenecks
3. Use RDS Performance Insights to analyze database performance
4. Regularly review and optimize CloudFront cache hit ratios
5. Use AWS Compute Optimizer for EC2 instance right-sizing recommendations
6. Implement ElastiCache to reduce database load for frequently accessed data
7. Use AWS Auto Scaling for ECS services to automatically adjust capacity based on demand

Cost Monitoring Setup

1. Enable AWS Cost Explorer
   - Go to AWS Cost Management console
   - Click on "Cost Explorer" in the left navigation pane
   - Click "Enable Cost Explorer"

2. Set up AWS Budgets
   - In the AWS Cost Management console, click on "Budgets"
   - Create a budget for each major service (EC2, RDS, S3, etc.)
   - Set alerts at 80% and 100% of budgeted amount

3. Use Cost Allocation Tags
   - In the AWS Cost Management console, click on "Cost Allocation Tags"
   - Enable relevant AWS-generated tags and create custom tags as needed
   - Apply tags consistently across all resources

4. Create a Cost and Usage Report
   - In the AWS Cost Management console, click on "Cost & Usage Reports"
   - Create a new report with hourly granularity, saved to an S3 bucket

5. Set up a CloudWatch dashboard for cost metrics
   - Create widgets for estimated charges by service
   - Add budget vs. actual spending comparisons

6. Implement AWS Trusted Advisor

   - Enable Trusted Advisor checks in the AWS console

   - Review cost optimization recommendations regularly

By following this guide, you'll have a comprehensive monitoring and alerting setup that covers performance, reliability, and cost aspects of your AWS architecture. Regularly review and adjust your monitoring strategy as your application evolves and grows.