

CS301 Team3 Proposal

GitHub Team name: cs301-team 3

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1. Background and Business Needs

Como Club is an entity within COMO Group with a mission to create a holistic, integrated lifestyle offering with curated experiences that recognise and reflect their members above all else.

COMO Group's vast system and infrastructure span across disparate and loosely-integrated Business Units (BUs). The systems are siloed across all BUs without middleware to manage system integration. This project aims to create a solution architecture for the middleware to manage the system integration, with beneficial software patterns and architecture styles that achieves maintainability, availability, security and performance qualities.

Como Club's drivers include membership signups, products sold, points redeemed and bookings.

2. Stakeholders

Stakeholder	Stakeholder Description	Permissions
Member	<ul style="list-style-type: none">- Earn points- Book experiences- Redeem items using points- Pay with card- Change details like password and payment type	<ul style="list-style-type: none">- View experiences/items,- Create bookings,- redeem items,- view wallet,- log in,- update password and payment type
Guests	<ul style="list-style-type: none">- Become a member- Browse experiences/items	<ul style="list-style-type: none">- Register for member (create account)- View experiences- View items

Merchants	- Merchants offering services/items to members	- Connect with COMOClub to create, update and delete experiences
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3. Key Use Cases

Use Case Title - Experience Booking for 7 Rooms	
Use Case ID	1
Description	Experience Booking allows members to book and access a wide array of services.
Actors	Members, Merchants, 7rooms, MembersonAPI, COMO Credit
Main Flow of events	<ol style="list-style-type: none"> 1. Member to select the experience to book 2. Member to indicate the date/time based on availability via the 7 rooms booking engine and pay using points or Credit Card 3. Member chooses to pay with COMO Credit 4. MembersonAPI to check whether member has enough points to allow for successful booking 5. Member to review and confirm the booking details 6. Once confirmed, the acknowledgement will be shown to the Member
Alternative Flow of events	<ol style="list-style-type: none"> 1. Member to select the experience to book 2. Member to indicate the date/time based on availability via the 7 rooms booking engine and pay using points or Credit Card 3. Member chooses to pay with COMO Credit 4. MembersonAPI to check whether member has enough points to allow for successful booking 5. Member has insufficient COMO Credit 6. Option to pay by card will be shown to the Member
Pre-conditions	<ol style="list-style-type: none"> 1. The customer has to be a COMOclub member 2. Has the COMO Club mobile application downloaded
Post-conditions	<ol style="list-style-type: none"> 1. Member able to book the experience through COMO Club 2. If paid using COMO Credit, accounts and transactions will be balanced 3. If booking fails, member will not be able to book the experience through COMO Club and no transactions will take place

Use Case Title - Item Redemption	
Use Case ID	2
Description	Item redemption allows members to redeem items using COMO credit or cash.
Actors	Members, Merchants, MembersonAPI, COMO Credit
Main Flow of events	<ol style="list-style-type: none"> 1. Member to select the item for redemption 2. Member to select the quantity and pay using points or Credit Card

	<ol style="list-style-type: none"> Member chooses to pay with COMO Credit MembersonAPI to check whether member has enough points to allow for successful redemption Member to review and confirm the redemption details Once confirmed, the acknowledgement will be shown to the member
Alternative Flow of events	<ol style="list-style-type: none"> Member to select the item for redemption Member to select the quantity and pay using points or Credit Card Member chooses to pay with COMO Credit MembersonAPI to check whether member has enough points to allow for successful redemption Member has insufficient COMO Credit Option to pay by card will be shown to the Member
Pre -conditions	<ol style="list-style-type: none"> The customer has to be a COMOclub member Has the COMO Club mobile application downloaded
Post -conditions	<ol style="list-style-type: none"> Member able to redeem the item through COMO Club If paid using COMO Credit, accounts and transactions will be balanced If redemption fails, member will not be able to redeem the item through COMO Club and no transactions will take place

Use Case Title - Creating a new membership account	
Use Case ID	3
Description	Being a COMO Club member allows app users to enjoy exclusive deals to redeem items specially curated for them.
Actors	Guests, MembersonAPI
Main Flow of events	<ol style="list-style-type: none"> User views experiences from the app User decides to become a member User clicks the Sign Up button from the login page. User will navigate through a series of different screens to input their personal information, including any discount or referral coupons. User will see a Welcome to the club screen
Alternative Flow of events	<ol style="list-style-type: none"> User views experiences from the app User wishes to book an experience User clicks the Sign Up button from the login page. User will navigate through a series of different screens to input their personal information, including any discount or referral coupons. User enters the wrong name. User enters a password that is too short. User is already a member. User sees an error on the screen and inputs another password User will see a Welcome to the club screen User opens the profile and clicks personal details. User updates the name

Pre-conditions	1. Download the COMO Club mobile application or visit the COMO club website
Post-conditions	1. MembersonAPI adds a new member account 2. Member can log in to their account

4. Quality attributes

Software Product Quality	How does our solution architecture achieve these qualities?
Performance	<p>The application will respond to requests in under 5 seconds. API requests will be served in under 2 seconds. These qualities will be achieved with the use of AWS. Load balancing will be done across multiple availability zones/regions (closest to where most of COMO Club's customers and BUs reside) to provide lower latency and a better experience for customers. Caching will be done to increase response times. The following information will be cached:</p> <ol style="list-style-type: none"> 1) User's session information (for cross-region replication in the event of a failover) 2) User's membership details (for quicker reference) 3) Experience and item listings from Memberson (for quicker reference, cache shared across users, updated when user makes a booking / redemption).
Availability	Ensured with the help of redundant components. Redundant components deployed across regions and availability zones to ensure users would be able to connect to redundancies, if main servers and availability zones become unavailable.
Security	<p>Utilisation of security groups to control inbound and outbound traffic to instances receiving/processing requests from app and APIs.</p> <p>Data would be encrypted in transit between:</p> <ol style="list-style-type: none"> 1) Public subnets \longleftrightarrow Private subnet (with AWS encryption solutions, default AWS services security controls) 2) Public subnets \longleftrightarrow App (with SSL)
Maintainability	<p>Use a CI/CD pipeline to allow one click deployments. Deployments to be checked against automated test cases and health checks to ensure the system runs as expected and buggy changes do not affect the technology value stream. Allowing the application to add and deploy new features while keeping maintenance at low costs.</p> <p>Three different instances handling app communication, API requests and retrieval, and processing logic allow for ease of integration with any new APIs / businesses.</p>

5. Proposed Budget

a. Development Budget

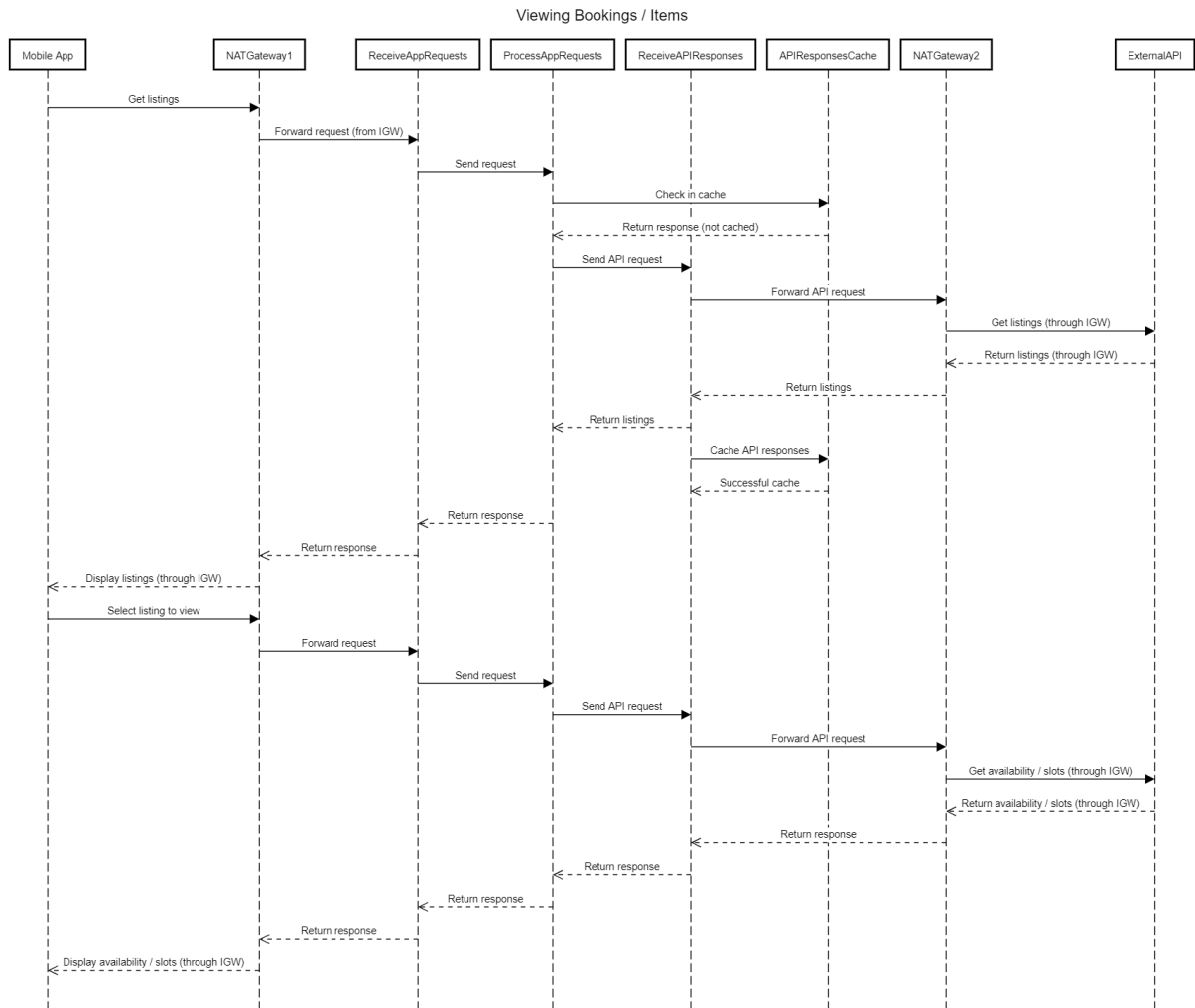
Activity / Hardware / Software / Service	Description	Cost
Working hours	<ul style="list-style-type: none"> - Time spent implementing: <ul style="list-style-type: none"> - New Software: key features of the app - Software Modification - Software Integration - Creating Middleware to connect Front-end and Back-end of the COMOclub Application - Designing Solution Architecture 	6 weeks of labour by a team of 6. Duties consists of: <ul style="list-style-type: none"> - Project Manager - UI/UX - Architect - Developer - QA Tester
Amazon Web Services	<ul style="list-style-type: none"> - Services used to host and run the middleware application in a development environment 	Generally \$400 total for AWS
Designing Solution Architecture	<ul style="list-style-type: none"> - Designing, describing, and managing the solution engineering in relation to specific business problems 	2 hours x 4 weeks x 6 students
Developing Security	<ul style="list-style-type: none"> - Using SSL to communicate with AWS resources 	1 hours x 4 weeks x 6 students
Developing CI	<ul style="list-style-type: none"> - Time spent creating and testing - Time spent iterating 	2 hours x 4 weeks x 6 students
Developing CD	<ul style="list-style-type: none"> - Time spent developing & deploying 	3 hours x 4 weeks x 6 students

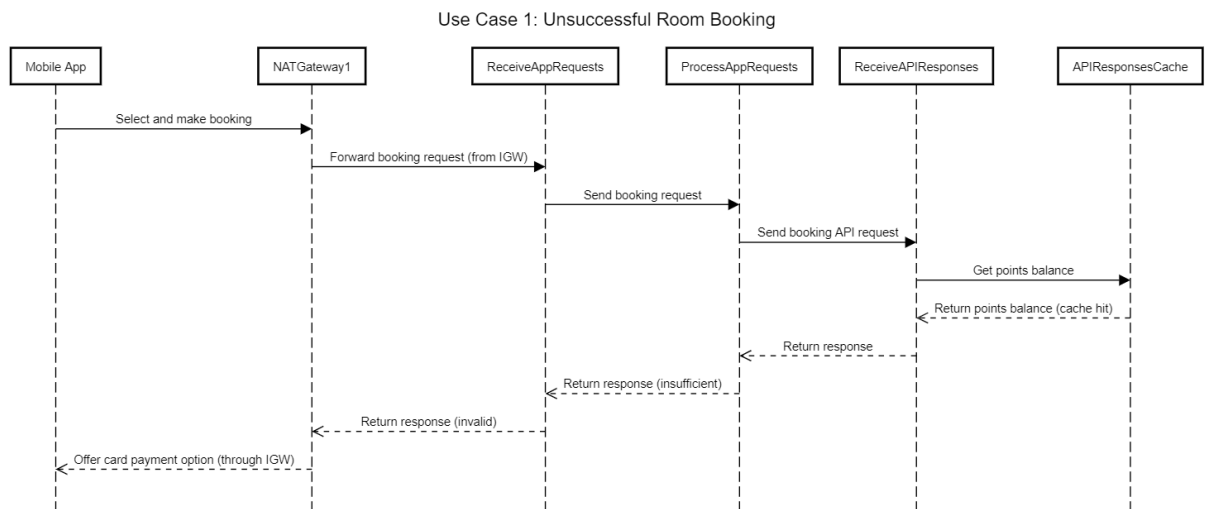
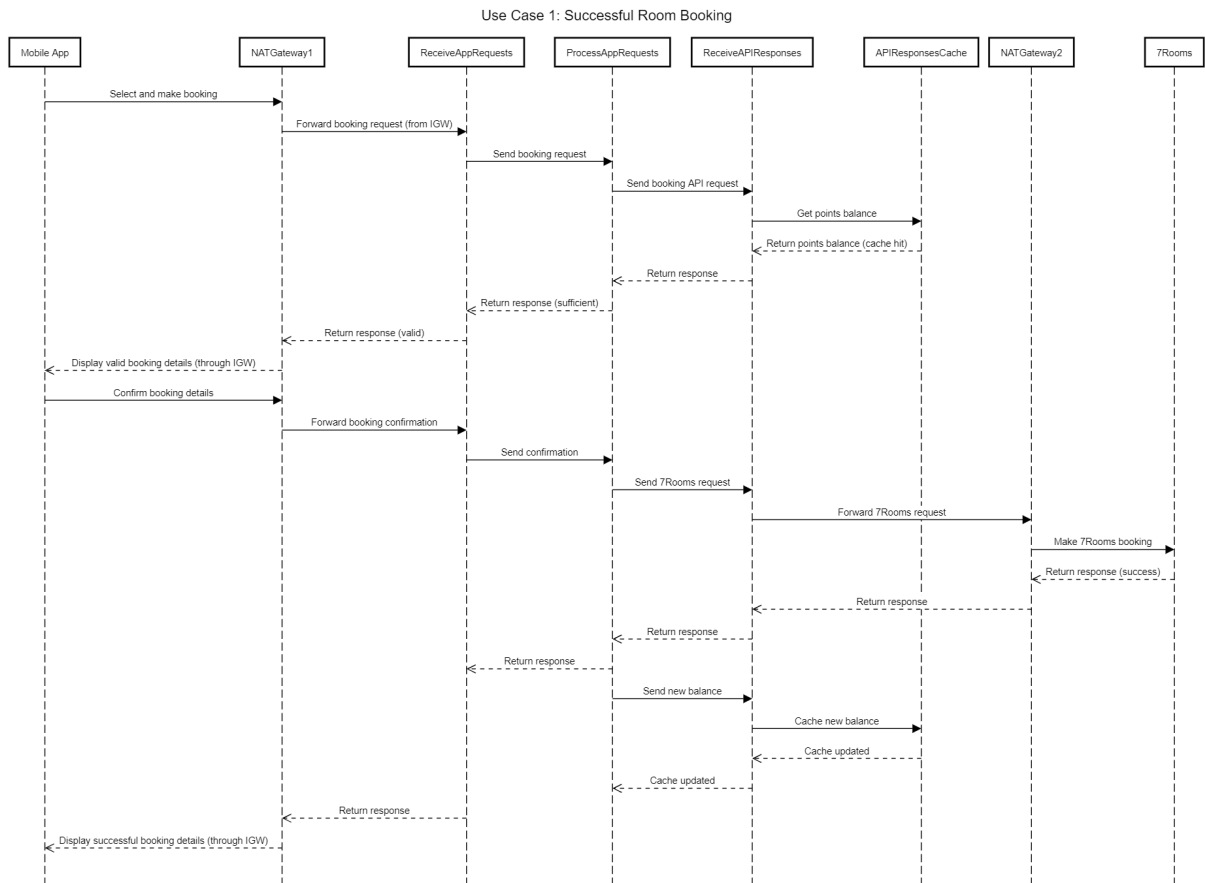
b. Production Budget

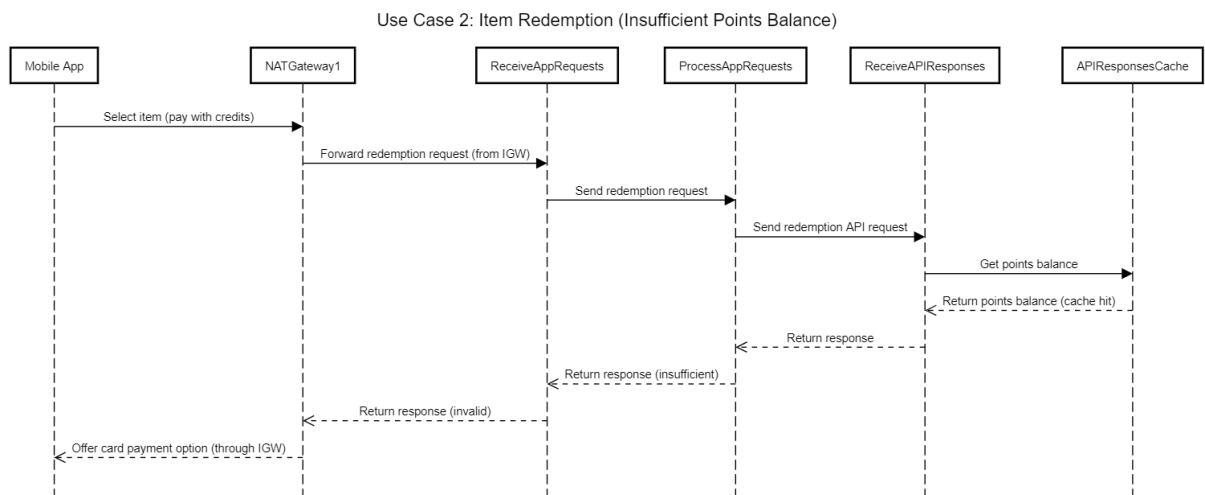
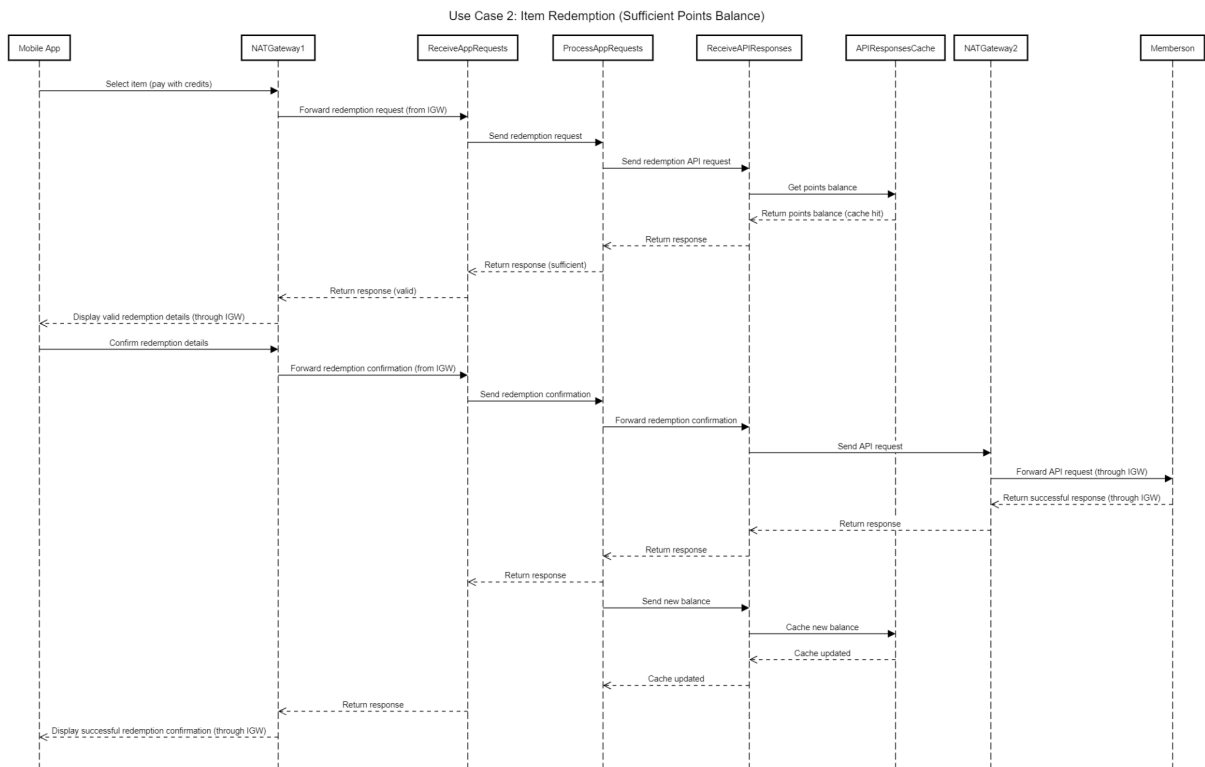
Activity / Hardware / Software / Service	Description	Cost
Virtual Private Cloud (VPC)	<ul style="list-style-type: none"> - 8 NAT Gateway - 30 GB Data Processing per NAT Gateway 	<ul style="list-style-type: none"> - \$273.60 USD per month
EC2 Instance Saving Plan	<ul style="list-style-type: none"> - 12 Instances - 100% Utilization/month - Storage: 30GB 	<ul style="list-style-type: none"> - \$24 USD per month
Elastic Load Balancing	<ul style="list-style-type: none"> - No. of Application Load Balancers: 4 	<ul style="list-style-type: none"> - \$65.70 USD per month
S3 Bucket Caching	<ul style="list-style-type: none"> - Amazon Simple Storage Service: 2 S3 buckets - S3 Standard storage: 30GB 	<ul style="list-style-type: none"> - \$6.60 USD per month

6. Views

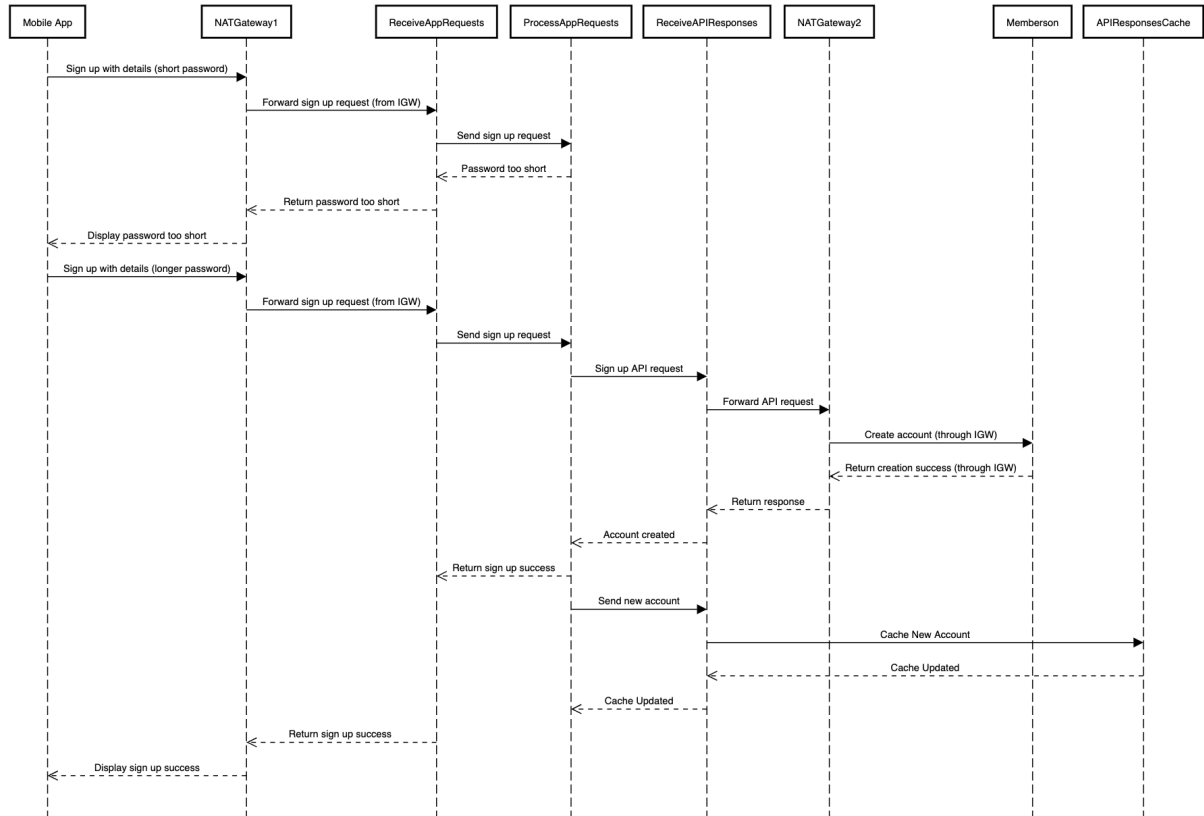
a. Sequence Diagrams



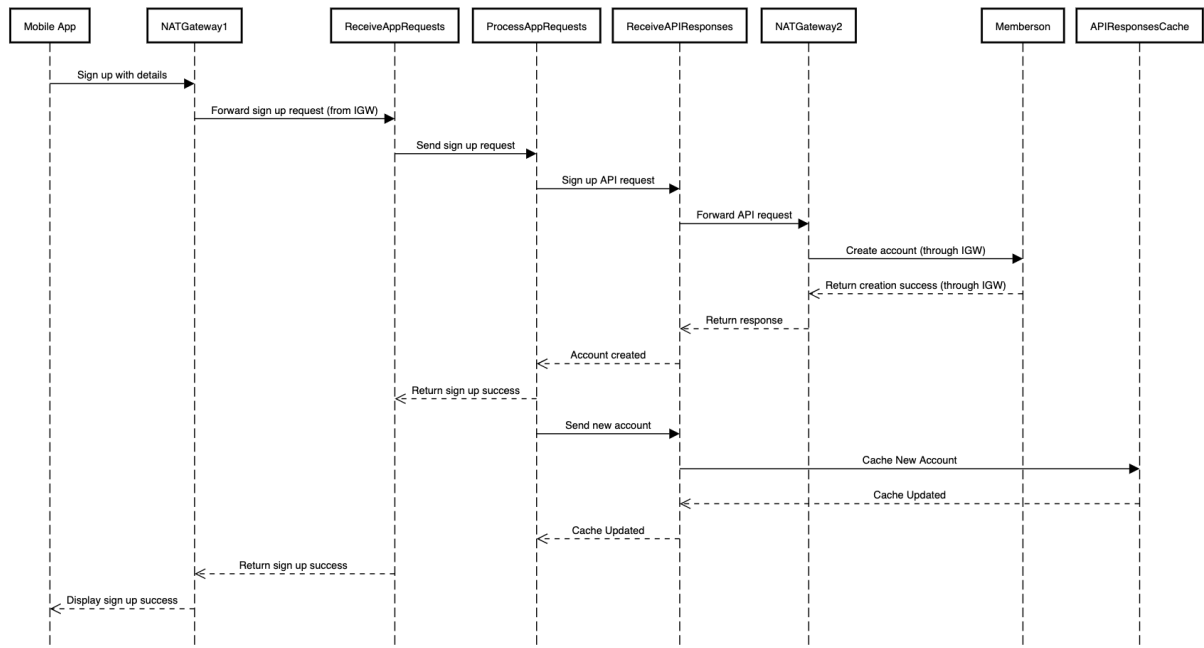




Use Case 3: Creating a new membership account with short password

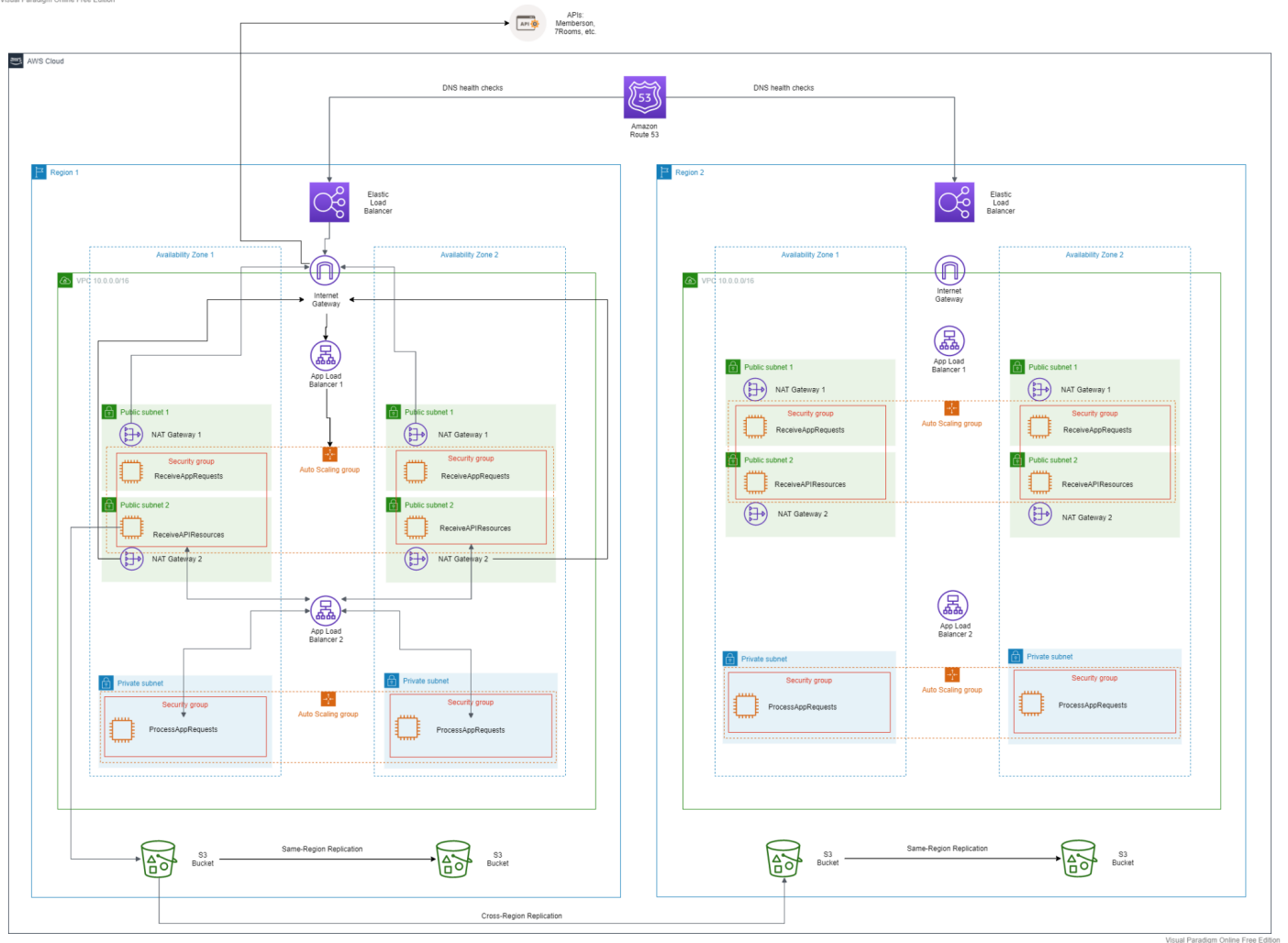


Use Case 3: Creating a new membership account



b. AWS Diagram

Visual Paradigm Online Free Edition



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