API Documentation Suite

Version 2.0

Enterprise Software Platform

Prepared by: Technical Writing Team

Date: November 2025

Contact: 23f1002246@ds.study.iitm.ac.in

Table of Contents

Contact: 23f1002246@ds.study.iitm.ac.in

Introduction

About This Documentation

This presentation covers our **RESTful API** documentation standards and best practices for enterprise integration.

Key Features:

- Version-controlled markdown source
- Multi-format export capability
- Mathematical notation support
- Embedded code examples

Contact: 23f1002246@ds.study.iitm.ac.in

API Architecture Overview

System Design Principles

```
architecture:
  style: Microservices
  protocol: REST/HTTP
  format: JSON
  authentication: OAuth 2.0
```

Core Components:

- API Gateway
- Service Mesh

Contact: 23f1002246@ds.study.iitm.ac.in

Performance Metrics

Real-Time System Analytics

- **Response Time:** < 100ms (p95)
- **Throughput:** 10,000 req/s
- **Availability:** 99.99% SLA
- **Error Rate:** < 0.01%

Contact: 23f1002246@ds.study.iitm.ac.in

Authentication Flow

OAuth 2.0 Implementation

```
// Token acquisition example
async function getAccessToken() {
  const response = await fetch('/oauth/token', {
    method: 'POST',
    headers: {
      'Content-Type': 'application/x-www-form-urlencoded',
    },
    body: new URLSearchParams({
      grant_type: 'client_credentials',
      client_id: process.env.CLIENT_ID,
      client_secret: process.env.CLIENT_SECRET
    })
  });
```

Contact: 23f1002246@ds.study.iitm.ac.in

API Endpoints

Resource Operations

GET	/api/v2/users	
POST	/api/v2/users	Create user
PUT	/api/v2/users/:id	
DELETE	/api/v2/users/:id	Delete user

Rate Limiting: 1000 requests/hour per API key

Contact: 23f1002246@ds.study.iitm.ac.in

Algorithmic Complexity

Search Algorithm Performance

Our optimized search uses a **binary search tree** with the following complexity:

$$T(n) = O(\log n)$$

For hash-based lookups:

$$T(n) = O(1) \text{ (average case)}$$

Space Complexity:

$$S(n) = O(n)$$

Advanced Algorithms

Sorting Performance Analysis

QuickSort Implementation:

$$T_{\text{avg}}(n) = O(n \log n)$$

$$T_{\text{worst}}(n) = O(n^2)$$

Merge Sort (Guaranteed):

$$T(n) = O(n \log n) \text{ for all cases}$$

Contact: 23f1002246@ds.study.iitm.ac.in

Code Example: API Client

```python
import requests
from typing import Dict, Optional

class APIClient:
    def __init__(self, base_url: str, api_key: str):
        self.base_url = base_url
        self.headers = {
            'Authorization': f'Bearer {api_key}',
            'Content-Type': 'application/json'
        }

    def get_resource(self, resource_id: str) -> Optional[Dict]:
        """Fetch a resource by ID"""
        response = requests.get(
            f'{self.base_url}/resources/{resource_id}',
            headers=self.headers
        )
        return response.json() if response.ok else None
```

Contact: 23f1002246@ds.study.iitm.ac.in

Error Handling

HTTP Status Codes

- **200 OK** - Request succeeded
- **201 Created** - Resource created successfully
- **400 Bad Request** - Invalid input
- **401 Unauthorized** - Authentication failed
- **403 Forbidden** - Insufficient permissions
- **404 Not Found** - Resource doesn't exist

Contact: 23f1002246@ds.study.iitm.ac.in

Best Practices

API Design Guidelines

1. **Use RESTful conventions** for resource naming
2. **Version your APIs** (e.g., `/api/v2/`)
3. **Implement proper error handling** with descriptive messages
4. **Document all endpoints** with OpenAPI/Swagger
5. **Apply rate limiting** to prevent abuse
6. **Use HTTPS** for all communications
7. **Validate input** on both client and server

Contact: 23f1002246@ds.study.iitm.ac.in

Version Control Strategy

Documentation as Code

```
# Repository structure
docs/
├── api/
│   ├── slides.md           # This presentation
│   ├── openapi.yaml        # API specification
│   └── examples/
├── guides/
└── README.md

# Convert to different formats
marp slides.md -o slides.html
marp slides.md -o slides.pdf
marp slides.md -o slides.pptx
```

Contact: 23f1002246@ds.study.iitm.ac.in

Questions?

Contact Information

Email: 23f1002246@ds.study.iitm.ac.in

Documentation Repository:

github.com/company/api-docs

Support Portal:

support.company.com

Thank You

Stay Updated:

- Star our GitHub repository
- Subscribe to our changelog
- Join our developer community

Making documentation accessible and maintainable

Contact: 23f1002246@ds.study.iitm.ac.in