OMC Overview

Introduction to OMC

The Core Network OMC (Operation and Maintenance Center) is a central facility used by operators to manage and maintain core network equipment. It typically includes modules for network monitoring, fault management, performance management, configuration management, security management, and other functions to ensure the smooth operation and efficient maintenance of core network equipment. By monitoring and managing core network equipment, the OMC can quickly identify and resolve network faults in real-time, improve network performance, ensure network security, and enhance operational efficiency. The OMC plays a crucial role in the network operations and maintenance of operators, serving as a key element in ensuring stable network operation.

System Architecture
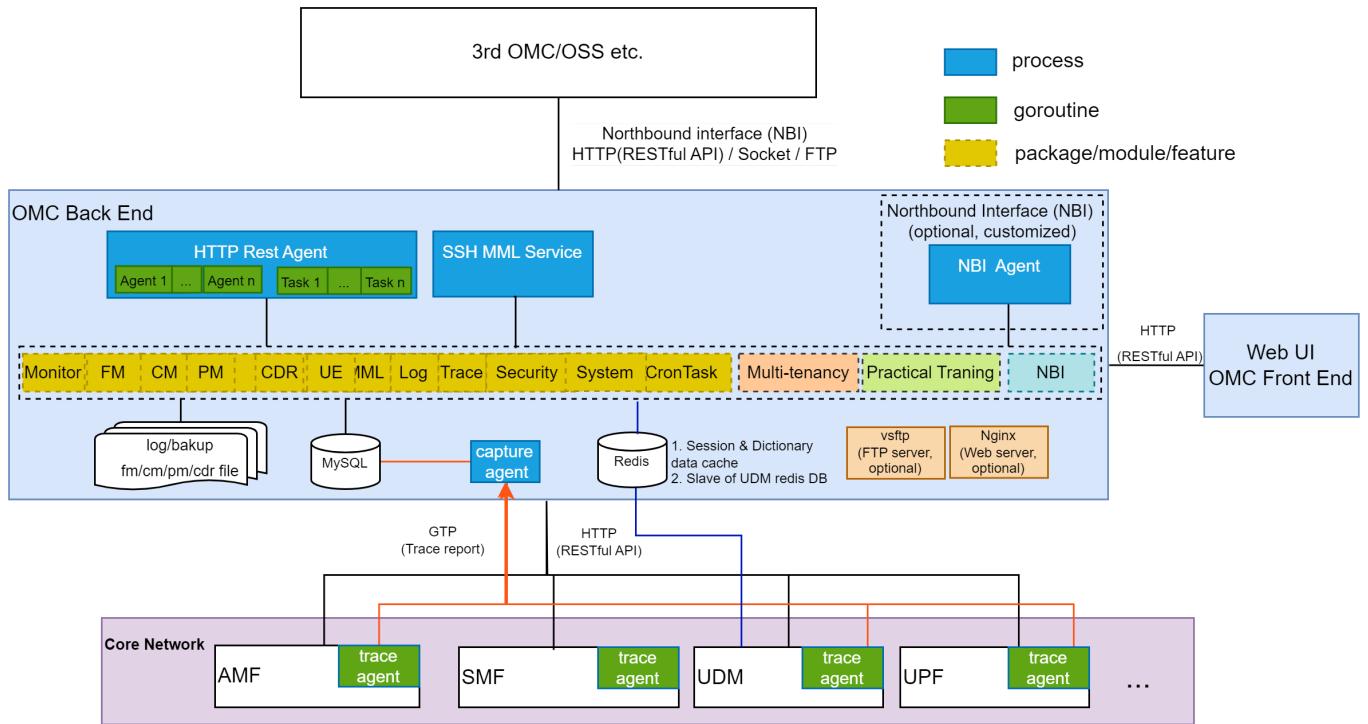
Platform

1. Operating System: Linux
2. Hardware Platform: X86/ARM64
3. Network Architecture: B/S mode
4. Front-end Languages: HTML+CSS+JS (Vue3)
5. Back-end Languages: Golang+MySQL/MariaDB+Redis, Nginx (optional)

Features

General Version:

1. Topology Management (Dashboard/State/Monitor): Dashboard, Network topology, System status, etc.
2. Fault Management (FM): active alarms, historical alarms, etc.
3. Configuration Management (CM): NE (Network Element) management, parameter configuration, etc.
4. Performance Management (PM): subscription tasks for performance-related metrics, data reports, performance thresholds, etc.
5. CDR/Event Managemet (CDR): IMS CDR, SMF CDR, AMF UE event.

6. UE Management (UE): UDM Auth Data, UDM Subscriber, IMS Online Users, SMF UE Online Information, Radio Information, PCC Information, etc.
7. Operation and Maintenance (MML): NE MML(Man Machine Language) operations, UDM (User Data Management) MML, OMC (Operation and Maintenance Center) MML, etc.
8. Log Management (Log): operation logs, security logs, alarm logs, etc.
9. Tracing Management (Trace): signaling tracking task creation, signaling analysis, signaling capture, etc.
10. Security Management (Security): user management, role management, current online users, permission management, etc.
11. System Management (System): menu management, dictionary management, system information, scheduling tasks, etc.
12. Northbound Interface (NBI): optional and customized interfaces, northbound interface services, resource configuration data, performance statistics data, performance golden indicators, alarm reporting, 4A, etc.

Multi-tenancy Version:

1. In a public cloud core network, logical isolation of network assets leased by different tenants is achieved through element-specific devices (such as edge UPF), different base station IDs, SIM card number ranges, or slices.
2. The network management system data isolates user data, user online information, base station information, and UPF throughput for each tenant based on the mapping of slice information and tenants.
3. Tenants can view their own users (UE), have their own dedicated dashboard, and only view operation logs related to their users and accounts after logging in through the network management system.
4. Account roles include platform operation and tenants, where the operation account is equivalent to the current network management account. Operation and multi-tenant accounts can both log in to the network management system simultaneously without affecting each other.

Practical Training Version:

1. Implement multiple student logins to the network management system for configuration practical training, where configuration parameters are stored independently but not directly pushed to network elements; final device configuration deployment is controlled by the teacher.

2. All student configurations can be exported into a single Excel spreadsheet (students can also export their own), including header information (various configuration parameter names), student accounts, PLMN, and other key details.
3. Teacher account privileges:
   - Ability to export, view, and compare all student parameter configurations.
   - Login with selected student accounts to browse the student's operation interface.
   - Restore a student's configuration to the system default with one click.
   - Load and deploy a student's configuration to the devices.

Supported NEs

AMF, AUSF, UDM, SMF, UPF, PCF, NRF, NSSF, NEF, LMF, IMS, MME, N3IWF, SMSC, MOCNGW

Interfaces