WK4: SYSTEM NETWORK DIAGRAM

Part 2

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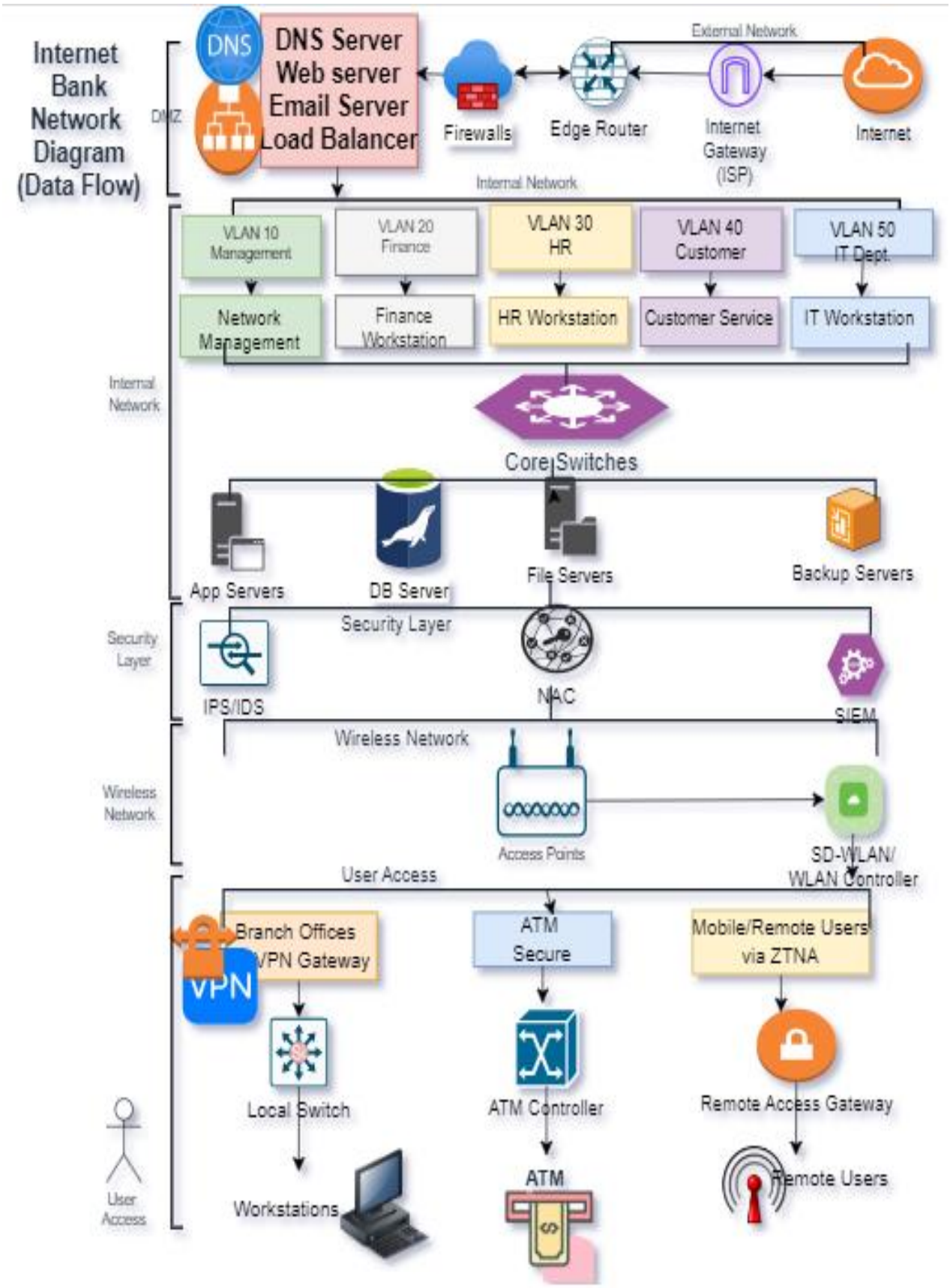

Internet Bank Network Diagram (Data Flow)
DNS
DNS Server
Web server
Email Server
Load Balancer
DMZ
Firewalls
Edge Router
External Network
Internet Gateway (ISP)
Internet
Internal Network
VLAN 10 Management
VLAN 20 Finance
VLAN 30 HR
VLAN 40 Customer
VLAN 50 IT Dept.
Network Management
Finance Workstation
HR Workstation
Customer Service
IT Workstation
Internal Network
Core Switches
App Servers
DB Server
File Servers
Backup Servers
Security Layer
IPS/IDS
Security Layer
NAC
SIEM
Wireless Network
Wireless Network
Access Points
SD-WLAN/ WLAN Controller
User Access
Branch Offices VPN Gateway
VPN
ATM Secure
Mobile/Remote Users via ZTNA
Local Switch
ATM Controller
Remote Access Gateway
User Access
Workstations
ATM
Remote Users

Detailed Network Diagram Structure

1. External Network

- **Internet**
    - **ISP (Internet Service Provider)**
        - **Edge Router (Cisco/Huawei)**

2. Perimeter Network (DMZ)

- **Firewall (Cisco/Huawei)**
    - **Web Servers (AWS/Azure)**
    - **DNS Server**
    - **Email Server**
    - **Load Balancer**

3. Internal Network

- **Core Switches (Cisco/Huawei)**
    - **Application Servers (AWS/Azure)**
        - Banking Application Server
        - Middleware Server
    - **Database Servers (SAN)**
        - Customer Data DB
        - Transactions DB
    - **File Servers**
        - Shared Drives
    - **Backup Servers**
        - Backup Storage

        - Disaster Recovery Server

4. User Access

- **Branch Offices (via VPN)**
    - Secure VPN Gateway
        - Local Switch
        - PCs and Workstations
- **ATMs (via Secure Channels)**
    - ATM Controller
- **Mobile and Remote Users (via Zscaler ZTNA)**
    - Remote Access Gateway

5. Security Layers

- **IDS/IPS (Intrusion Detection/Prevention System)**
- **NAC (Network Access Control)**
- **SIEM (Security Information and Event Management)**

6. Wireless Network

- **Access Points (Cisco/Huawei)**
    - **WLAN Controllers**

7. VLANs and Subnets

- **VLAN 10 (Management)**
    - Network Management Devices
- **VLAN 20 (Finance)**
    - Finance Department Workstations
- **VLAN 30 (HR)**

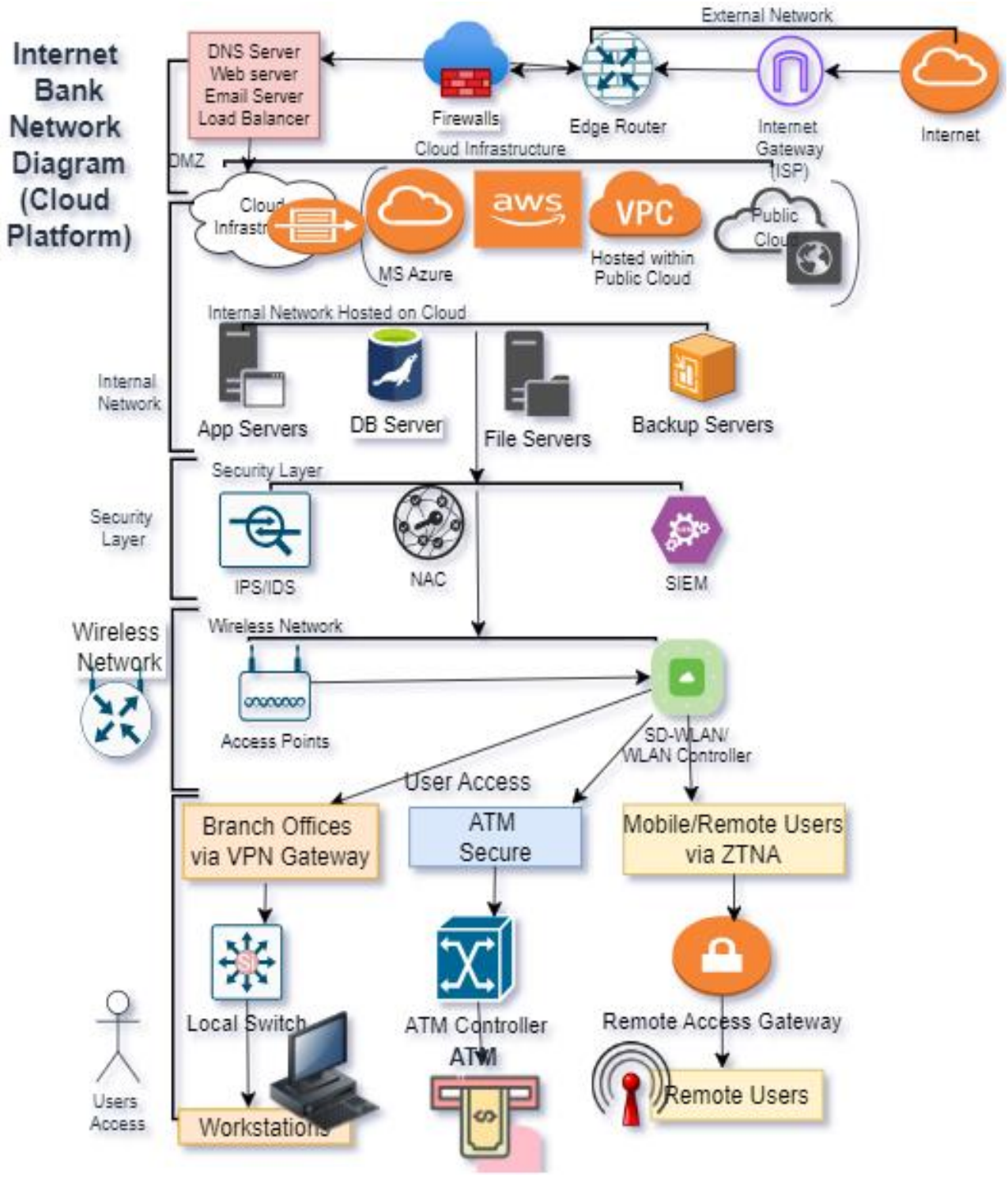
    - HR Department Workstations
- **VLAN 40 (Customer Service)**
    - Customer Service Desktops
- **VLAN 50 (IT Department)**
    - IT Department Workstations

Diagram Layout

1. **Top Level (Internet and ISP)**:
    - Position the **Internet** at the top, connected to the **ISP**, which then connects to the **Edge Router**.
2. **DMZ**:
    - Directly below the edge router, place the **Firewall**.
    - Behind the firewall, arrange **Web Servers**, **DNS Server**, **Email Server**, and **Load Balancer** horizontally.
3. **Internal Network**:
    - Below the DMZ, position the **Core Switches**.
    - Connect various servers to the core switches (arrange them in clusters):
        - **Application Servers**
        - **Database Servers**
        - **File Servers**
        - **Backup Servers**
4. **User Access**:
    - On the left side, show connections for **Branch Offices** (via VPN) with a **Secure VPN Gateway** connected to local switches and workstations.

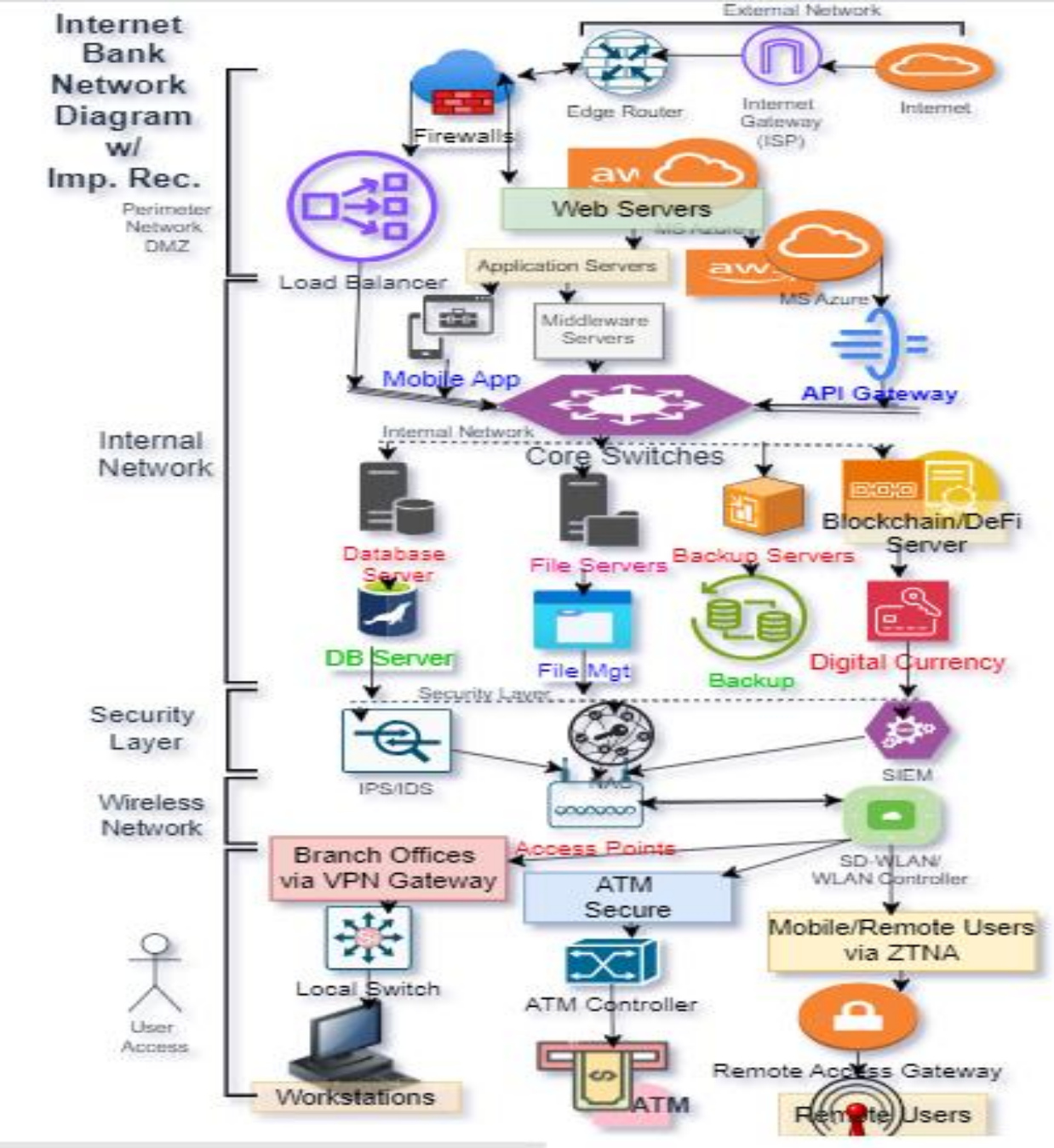
- On the right side, depict **ATMs** connected via secure channels to an **ATM Controller**.
- Below, represents **Mobile and Remote Users** connected via **Zscaler ZTNA** to a **Remote Access Gateway**.

5. **Security Layers**:
   - Place **IDS/IPS**, **NAC**, and **SIEM** around the core switches and servers to show they are monitoring and protecting the internal network.
6. **Wireless Network**:
   - Place **Access Points** connected to **WLAN Controllers** around the internal network components.
7. **VLANs and Subnets**:
   - Use color-coded lines or labels to differentiate between the VLANs (VLAN 10, VLAN 20, etc.) within the internal network.



The diagram on pg. 7 includes **cloud infrastructure**, indicating that application servers, database servers, file servers, and backup servers are housed on AWS, Azure, private cloud, and public cloud environments. This setup reflects a cloud-based architecture for the internet bank.

System Network Diagram with Improvement Recommendations:



Internet Bank Network Diagram with Improvement Recommendations:

Detailed Explanation

1. **External Network**:
    - **Internet**: Entry point for external connections.

- **ISP (Internet Service Provider)**: Connects the internet to the bank’s network.
- **Edge Router (Cisco/Huawei)**: Routes traffic between the ISP and the bank's network.

2. **Perimeter Network (DMZ)**:
    - **Firewall**: Secures traffic entering and leaving the network.
    - **Web Servers (AWS/Azure)**: Host public-facing applications and websites.
    - **Load Balancer**: Distributes incoming traffic across multiple servers.
3. **Internal Network**:
    - **Core Switch**: Central switch connecting all internal devices.
    - **Application Servers (AWS/Azure)**: Run banking applications, middleware, and API gateways.
    - **Database Servers**:
        - **DBMS**: Database management systems store and manage data.
    - **File Servers**:
        - **File Management Systems**: Store and manage files.
    - **Backup Servers**:
        - **Backup Systems**: Provide data backup and recovery.
    - **Blockchain/DeFi Servers**: Manage digital currency transactions and decentralized finance (DeFi) lending services.
4. **Security Layers**:
    - **IDS/IPS**: Monitor and prevent malicious activities.
    - **NAC**: Control access to the network.
    - **SIEM**: Collect and analyze security-related data.

5. **Wireless Network**:
    - **Access Points**: Provide wireless connectivity within the bank premises.
    - **WLAN Controllers**: Manage access points and enforce security policies.
6. **User Access**:
    - **Branch Offices**:
        - **VPN Gateway**: Secure connection for branch offices.
        - **Local Switch**: Connects devices within the branch.
        - **Workstations**: PCs and terminals used by employees.
    - **ATMs**:
        - **ATM Controller**: Manages secure connections to ATMs.
    - **Mobile/Remote Users**:
        - **Zscaler ZTNA**: Secure access for mobile and remote users.
        - **Remote Access Gateway**: Connects remote users to the bank's network.
7. **Digital Currency and DeFi**:
    - **Blockchain/DeFi Servers**: Handle transactions for digital currencies and decentralized finance applications.

Interactions and Flows

- **Arrows** can be used to indicate data flow and interactions between components:
    - From **Internet** to **ISP** to **Edge Router**.
    - From **Edge Router** to **Firewall** to **Web Servers**.
    - From **Web Servers** and **Load Balancer** to **Application Servers**.
    - From **Application Servers** to **Core Switch**.

- From **Core Switch** to **Database Servers**, **File Servers**, **Backup Servers**, and **Blockchain/DeFi Servers**.
- From **Core Switch** to **Security Layers** (IDS/IPS, NAC, SIEM).
- From **Core Switch** to **Access Points** and **WLAN Controllers**.
- From **Core Switch** to **User Access** components (Branch Offices, ATMs, Mobile/Remote Users).

This plaintext diagram provides a detailed representation of the physical network components, their interactions, and the flow of data within an internet bank network.