Network Configuration Documentation

Company Name: ABC Company

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# 1. Executive Summary

This network configuration document describes the needs of a company that has recently expanded and now requires a network overhaul. It consists of one main office and two branch offices. The new network design enhances connectivity by establishing dedicated subnets for each office and deploying VLANS for optimized traffic management, such as the Administrative, HR, Sales, and IT departments.

Moreover, this network design includes a structured IP addressing scheme to segregate network traffic,  static routes to establish connectivity between offices, and dynamic routing protocols like OSPF for efficient route management and scalability. Switches have been configured with unique hostnames and segmented VLANs to support departments and improve internal security. This documentation supports as a reference for ongoing maintenance, troubleshooting, and future scaling needs.

In summary, this network design delivers a resilient, scalable solution that supports the company’s growth while ensuring secure, seamless communication between all locations.

**2. Network topology**

***Physical Layout***

Main office: Contains one router and one switch, managing 8 computer connections in Administrative, HR, Sales and IT departments. Moreover, a wireless public router is connected to the Main Office router that provides free internet access to all its departments.

**Figure 1**

A computer screen shot of a computer network

Description automatically generated*The main office’s physical layout*

Branch office 1: Contains one router and one switch, managing 4 computer connections in the Customer Support, and Marketing departments.

**Figure 2**

*The Branch office 1’s physical layout*

*A diagram of a network

Description automatically generated*

Branch office 2: Contains one router and one switch, managing 4 computer connections in the Research and Development, and Finance departments.

**Figure 3**

*The Branch office 2’s physical layout*

*A computer network diagram with many different colored boxes

Description automatically generated with medium confidence*

***Logical Layout***

Main Office Network:

* Route: 192.168.0.1
  + Switch for **Admin Department:** 192.168.0.0/25
* Computer: 192.168.0.2–192.168.0.126
* Route: 192.168.0.129
  + Switch for **HR Department:** 192.168.0.128/25
* Computer: 192.168.0.130–192.168.0.254
* Route: 192.168.1.1
  + Switch for **Sales Department:** 192.168.1.0/25
* Computer: 192.168.1.2–192.168.1.126
* Route: 192.168.1.129
  + Switch for **IT Department:** 192.168.1.128/25
* Computer:192.168.1.130–192.168.1.254

Branch Office 1 Network:

* Route: 192.168.2.1
* Switch for **Customer Support Department:** 192.168.2.0/26
* Computer: 192.168.2.2–192.168.2.62
* Route: 192.168.2.65
* Switch for **Marketing Department:** 192.168.2.64/26
* Computer: 192.168.2.66–192.168.2.126

Branch Office 2 Network:

* Route: 192.168.6.1
  + Switch for **Finance Department:** 192.168.6.0/26
    - Computer: 192.168.6.2–192.168.6.62
* Route: 192.168.6.65
  + Switch for **Research and Development Department:** 192.168.6.64/26
* Computer: 192.168.6.66–192.168.6.126

**3. IP Addressing Schema**

Subnet Mask: /23 (Dividing /23 into /25 provides 128 total IPs per department, which is more than enough for each department and future scalability.)

* VLAN 10 (Administrative Department): 192.168.0.0/25
* VLAN 20 (HR Department): 192.168.0.128/25
* VLAN 30 (Sales Department): 192.168.1.0/25
* VLAN 40 (IT Department): 192.168.1.128/25

Subnet Mask: /26

* VLAN 10 (Customer Support Department): 192.168.2.0/26
* VLAN 20 (Marketing Department): 192.168.2.64/26

Subnet Mask: /26

* VLAN 10 (Finance Department): 192.168.6.0/26
* VLAN 20 (Research and Development Department):192.168.6.64/26

**4. Router Configurations**

Main Office Router:

* Hostname: MainOfficeRouter
* IP Address: FastEthernet0/0.10 - 192.168.0.1/25

FastEthernet0/0.20 - 192.168.0.129/25

FastEthernet0/0.30 - 192.168.1.1/25

FastEthernet0/0.40 - 192.168.1.129/25

FastEthernet1/0 - 192.168.3.1/30

Serial2/0 - 10.0.0.1/8

Serial3/0 - 20.0.0.2/8

* OSPF Configuration: Process ID 1, Router ID 1.1.1.1

Branch Office 1 Router:

* Hostname: BranchOffice1Router
* IP Address: FastEthernet0/0.10 - 192.168.2.1/26

FastEthernet0/0.20 - 192.168.2.65/26

Serial2/0 - 30.0.0.2/8

Serial3/0 - 20.0.0.1/8

* OSPF Configuration: Process ID 1, Router ID 2.2.2.2

Branch Office 2 Router:

* Hostname: BranchOffice2Router
* IP Address: FastEthernet0/0.10 - 192.168.6.1/26

FastEthernet0/0.20 - 192.168.6.65/26

Serial2/0 - 10.0.0.2/8

Serial3/0 - 30.0.0.1/8

* OSPF Configuration: Process ID 1, Router ID 3.3.3.3

**5. Switch Configurations**

Main Office Switch:

* Hostname: MainOfficeSwitch
* VLAN Configurations
  + VLAN 10 (Administrative Department)
    - Port Range: FastEthernet0/1 - 2
  + VLAN 20 (HR Department)
    - Port Range: FastEthernet0/3 - 4
  + VLAN 30 (Sales Department)
    - Port Range: FastEthernet0/5 – 6
  + VLAN 40 (IT Department)
    - Port Range: FastEthernet0/7 – 8

Branch Office 1 Switch:

* Hostname: BranchOffice1Switch
* VLAN Configurations
  + VLAN 10 (Customer Support Department)
    - Port Range: FastEthernet0/1 - 2
  + VLAN 20 (Marketing Department)
    - Port Range: FastEthernet0/3 – 4

Branch Office 2 Switch:

* Hostname: BranchOffice2Switch
* VLAN Configurations
  + VLAN 10 (Finance Department)
    - Port Range: FastEthernet0/1 - 2
  + VLAN 20 (Research and Development Department)
    - Port Range: FastEthernet0/3 - 4

**6. VLAN Assignments**

*VLAN 10 (Administrative Department)*

* Main Office Switch: Ports 1-2 (i.e. Fa0/1 - 0/2)

*VLAN 20 (HR Department)*

* Main Office Switch: Ports 3-4 (i.e. Fa0/3 - 0/4)

*VLAN 30 (Sales Department)*

* Main Office Switch: Ports 5-6 (i.e. Fa0/5 - 0/6)

*VLAN 40 (IT Department)*

* Main Office Switch: Ports 7-8 (i.e. Fa0/7 - 0/8)

*VLAN 10 (Customer Support Department)*

* Branch Office 1 Switch: Ports 1-2 (i.e. Fa0/1 - 0/2)

*VLAN 20 (Marketing Department)*

* Branch Office 2 Switch: Ports 3-4 (i.e. Fa0/3 - 0/4)

*VLAN 10 (Finance Department)*

* Branch Office 2 Switch: Ports 1-2 (i.e. Fa0/1 - 0/2)

*VLAN 20 (Research and Development Department)*

* Branch Office 2 Switch: Ports 3-4 (i.e. Fa0/3 - 0/4)

**7. Diagrams**

**Figure 4**

*Logical Network diagram*

**A computer screen shot of a diagram

Description automatically generated**

**Figure 5**

A computer screen with a computer and a computer screen

Description automatically generated with medium confidence*Physcial Network diagram*

**Figure 6**

*VLAN Configuration of Switch0 (Main Office)*

A screenshot of a computer

Description automatically generated

**Figure 7**

*VLAN Configuration of Switch1 (Branch Office 1)*

A screenshot of a computer

Description automatically generated

**Figure 8**

*VLAN Configuration of Switch2 (Branch Office 2)*

A screenshot of a computer

Description automatically generated

**9. Revision History**

|  |  |  |
| --- | --- | --- |
| **Date** | **Description of Change** | **Author** |
| 2024-12-01 | Initial draft created. | Vinh Vu |
| 2024-12-02 | Draft reviewed | Kunjal Mahant |
| 2024-12-04 | Finalized document and submitted for review. | Baljinder Kaur |

**10. Appendices**

***Summary of IP Addressing Schema***

|  |  |  |  |
| --- | --- | --- | --- |
| Location/Department | Subnet | Router IP | Usable IP Range |
| Main Office (Overall) |  |  |  |
| Administrative Department (VLAN 10) | 192.168.0.0/25 | 192.168.0.1 | 192.168.0.2 to 192.168.0.126 |
| HR Department (VLAN 20) | 192.168.0.128/25 | 192.168.0.129 | 192.168.0.130 to 192.168.0.254 |
| Sales Department (VLAN 30) | 192.168.1.0/25 | 192.168.1.1 | 192.168.1.2 to 192.168.1.126 |
| IT Department (VLAN 40) | 192.168.1.128/25 | 192.168.1.129 | 192.168.1.130 to 192.168.1.254 |
| Branch Office 1 (Overall) |  |  |  |
| Customer Support Department (VLAN 10) | 192.168.2.0/26 | 192.168.2.1 | 192.168.2.2 to 192.168.2.62 |
| Marketing Department (VLAN 20) | 192.168.2.64/26 | 192.168.2.65 | 192.168.2.66 to 192.168.2.126 |
| Branch Office 2 (Overall) |  |  |  |
| Finance Department (VLAN 10) | 192.168.6.0/26 | 192.168.6.1 | 192.168.6.2 to 192.168.6.62 |
| R&D Department (VLAN 20) | 192.168.6.64/26 | 192.168.6.65 | 192.168.6.66 to 192.168.6.126 |
| Point-to-Point Links | 192.168.3.0/30,  192.168.4.0/24 | -  - | 192.168.3.1, 192.168.3.2  192.168.4.100,192.168.4.101 |

***Summary of Router Configurations***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Router | Hostname | Interface | IP Address | Subnet Mask | OSPF Process ID | Router ID |
| Main Office Router | MainOffice  Router | FastEthernet0/0.10  FastEthernet0/0.20  FastEthernet0/0.30  FastEthernet0/0.40  FastEthernet1/0  Serial2/0  Serial3/0 | 192.168.0.1  192.168.0.129  192.168.1.1  192.168.1.129  192.168.3.1  10.0.0.1  20.0.0.2 | 255.255.255.128  255.255.255.128  255.255.255.128  255.255.255.128  255.255.255.252  255.0.0.0  255.0.0.0 | 1 | 1.1.1.1 |
| Branch Office 1 Router | BranchOffice1  Router | FastEthernet0/0.10  FastEthernet0/0.20  Serial2/0  Serial3/0 | 192.168.2.1  192.168.2.65  30.0.0.2  20.0.0.1 | 255.255.255.192  255.255.255.192  255.0.0.0  255.0.0.0 | 1 | 2.2.2.2 |
| Branch Office 2 Router | Branch  Office2Router | FastEthernet0/0.10  FastEthernet0/0.20  Serial2/0  Serial3/0 | 192.168.6.1  192.168.6.65  10.0.0.2  30.0.0.1 | 255.255.255.192  255.255.255.192  255.0.0.0  255.0.0.0 | 1 | 3.3.3.3 |

***Summary of Switch Configurations***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Switch** | **Hostname** | **VLAN ID** | **Department** | **Port Range** |
| Main Office Switch | MainOfficeSwitch | 10 | Administrative Department | FastEthernet0/1 - 2 |
|  |  | 20 | HR Department | FastEthernet0/3 - 4 |
|  |  | 30 | Sales Department | FastEthernet0/5 - 6 |
|  |  | 40 | IT Department | FastEthernet0/7 - 8 |
| Remote Office 1 Switch | RemoteOffice1Switch | 10 | Customer Support Department | FastEthernet0/1 - 2 |
|  |  | 20 | Marketing Department | FastEthernet0/3 - 4 |
| Remote Office 2 Switch | RemoteOffice2Switch | 10 | Finance Department | FastEthernet0/1 - 2 |
|  |  | 20 | Research and Development Department | FastEthernet0/3 - 4 |

# 10. References

Cisco Networking Academy. *Cisco Packet Tracer.* Retrieved from [Resource Hub: Get Packet Tracer, Virtual Machines, and More](https://www.netacad.com/resources/lab-downloads?courseLang=en-US)

Jeffrey S. Beasley and Piyasat Nilkaew. *Networking Essentials, Fifth Edition A CompTIA Network+ N10-007 Textbook.* Pearson.

# GitHub:

# <https://github.com/Bal31/CNET>