

Design a campus network

Design



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The project "Designing a campus network" will help a student to practice the concepts such as configuring a switch, a router configuration (general routing protocol specific router configuration and also in creating a secured campus Network, The project course titled "Project: Designing a Campus Network" bearing the subject code BENTON Is of 8 credits weighted. The project has to be completed In duration of 240 Hours. 2. Hardware Requirements: A PC Laptop with minimal specification: egg.

Required Resources PC with Windows XP Internet connectivity. Correct URL or IP address to access the remote labs. Network Topology The topology above describes a portion of a large enterprise network. This example network comprises of one switched triangular network having Core Switch, Switch 1, Switch 2 and a triangular router network consisting of Core Router, Router 1, and Router 2.

Activity: Switches learn MAC addresses dynamically because of which the switch by default does not provide any security from unauthorized network access. In the today's world maintaining security and confidentiality of data in a corporate environment is a huge challenge. In this project, the students will gain access to switch SSL/SO. They are required to ensure that the switches allow network access only for the known interface should also be configure for port security where in any other MAC address other than the one permitted will shut the interface.

The routers can be used as end computer and using their MAC address as static address on the switch, this project outcome can be verified. To accomplish this task the student has to do the initial switch configuration,

change the address learning from dynamic to static and enable switch port security. Project 2: Switching To set up a switched network with static VLANs and dynamic VLANs using VTP. Configure Inter-VLAN routing between the VLANs of the network. In a switched environment, having all the users in a single domain is not recommended.

A switch does not divide the broadcast domain. Having all the users in a single broadcast domain will create a lot of challenges like: congestion, security risks etc. The best way to overcome such problems in a switched environment is to divide the switched network into VLANs. VLANs ensure that the data of one group does not reach the other thereby giving the required traffic control and security. A large corporate network consists of multiple switches and creating VLANs independently on each switch will take a lot of time for the network administrator.

In this project the students will divide the network into multiple VLANs. Some VLANs are configured manually whereas others need to be configured using the VTP. Once the network has been divided into VLANs then we need to enable communication between the members of the VLANs by enabling the inter-VLAN communication. Project 3: Switching To set up a switched network with VLANs and spanning tree protocol configured. Enable RSTP on 2 switches and ensure compatibility with STP. On each switch will take a lot of time for the network administrator.

Also connections between the switches are made in a redundant way so as to provide back-up. The redundancy brings a new set of challenges like loops. To avoid the loops in a switched environment spanning tree protocols

are used. In this project the students are required to divide the network into Flan's and ensure that within a PLAN or between the Flan's there is no loop. This can be protocol is STEP. Students are required to configure the faster REST. Project 4: Routing RIP To configure RIP on the routers in the network. The internet is actually interconnection of networks.

We can communicate from one part of the internet to another with the help of routers. The routers will forward the packets across different network till the packet reaches the destination. For a proper communication to happen over the internet, the routers need to know where to forward the packets to. They achieve this by building and maintaining a routing table. Dynamic routing protocols are used for exchanging the routing information between the neighboring routers. Routing Information Protocol (RIP) is one of the oldest and the simplest routing protocol.

There are 2 different versions of this routing protocol. In this project the students are required to achieve the following: 1 . Configure RIP FL on the three routers with the addressing scheme 192. 168. 1. 0/28. Configure static routes between the routers. 2. Make RIP the preferred routing protocol between the routers and not the static route. 3. Configure RIP iv between routers B and c and without redistribution make he 2 RIP autonomous systems to ping each other. Project 5: Routing EIGRP To configure EIGRP on the routers in the network. Information between the neighboring routers In this project the students are required to configure the EIGRP routing protocol on the routers to achieve the following: Given a IP addressing scheme of 10. 0. 0. 0/20. 4. Configure EIGRP on all three routers given the address allocate subnet 0- 5 to Router 1 subnet 6 to the serial link between A and B subnets <https://assignbuster.com/design-a-campus-network/>

7-11 to Router 2 the subnet 12 for the serial link between B and C and subnets 13-17 to Router 3. 5. Configure an Ethernet link between routers B and c in the subnet 18. 6.

Configure load balancing using unequal paths in EIGRP and test the same. 7. Configure rip FL 8. Make rip the preferred routing protocol between the routers and not the static route. 9. Configure rip iv between routers B and c and without redistribution make the 2 rip autonomous systems to ping each other. Project 6: Routing OSPF To configure OSPF on the routers in the network. Information between the neighboring routers. OSPF is the open shortest path first routing protocol. It uses the link state to determine the best path to a destination.

OSPF is the preferred routing protocol with in an autonomous system. In this project students will gain access to the respective devices through the remote lab portal. Using the devices they will have to: 1 . Configure OSPF single area on all three routers given the address 192. 168. 1. 0/30. Allocate subnet 0- 5 to Router 1, subnet 6 to the serial link between 1 and 2, subnets 7-11 to Router 2 the subnet 12 for the serial link between Router 2 and 3 and subnets 13-17 to Router 3. 2. Place Router 2 and 3 in area 1 and check for multi area routing. 3. Identify the RID of A B and C. Configure the RID of the router using the RID command. 5. Summaries OSPF manually using the area range command. Project 7: Routing OSPF OSPF is the preferred routing protocol with in an autonomous system. An autonomous system can be quite big to manage easily. To simplify the management such large autonomous system, they are divided in to areas. OSPF can work between the routers belonging to the same area or routers of different areas. In this project the <https://assignbuster.com/design-a-campus-network/>

students will have to: 6. Configure Multi-area OSPF in a network with 3 routers and enable inter-area routing updates. . Also configure authentication between the routers. Project 8: Access Control List To configure Access Control List on the routers in the network. In a network an administrator has to have complete control on allowing or denying a particular type of traffic coming in or going out of the network. This provides a greater security as access to hackers can be prevented by denying any telnet requests coming from outside the networks. Access Control Lists are very important tools for network administrators to ensure such requests or access are kept at bay.

In this project students are required to design a network which will have CAL configured to accomplish the following: 8. Configure standard CAL on router 1 to block all GIMP traffic. 9. Extended CAL on router 2 to allow only TCP traffic and block everything else. 10. Configure a named CAL on router 3 to filter traffic from a particular IP address. 5. Procedure to back up project configurations on TFTP server As the students will be working on remote labs on their final semester projects, it is important for them to save their configurations on a backup server.