CCNP ROUTE(642-902) Lab – OSPF

 OSPF is configured on routers Indianapolis and Atlanta. Indianapolis's S0/0 interface and Atlanta's S0/1 interface are in Area 0. Atlanta's Loopback0 interface is in Area 2. Your task is to configure the following: **Portland's S0/0 interface in Area 1 Indianapolis's S0/1 interface in Area 1 Use the appropriate mask such that ONLY Portland's S0/0 and Indianapolis**'s S0/1 could be in Area 1.   **Area 1 should not receive any external or inter-area routes (except the default route)**.

 Answer and Explanation: First, we configure Portland's S0/0 interface so that it belongs to Area 1. So, we have to find out which sub-network the IP address 192.168.4.5/30 (the IP of interface S0/0 of Portland) belongs to. This address belongs to a subnetwork which has: Increment: 4 (/30 = 255.255.255.252 or 1111 1111.1111 1111.1111 1111.1111 1100)   Network address: 192.168.4.4 (because 4 = 4 * 1 and 4 < 5)   Broadcast address: 192.168.4.7 (because 7 = 4 + 4 ? 1) (It is not necessary to find out the broadcast address but we should know it) The question requires that only Portland's S0/0 and Indianapolis's S0/1 could be in Area 1, therefore we must use a wildcard of 0.0.0.3 (this wildcard is equivalent with a subnet mask of /30) so that there are only 2 IP addresses can participate in area 1 (they are 192.168.4.5 & 192.168.4.6). The full command we use here is network 192.168.4.4 0.0.0.3 area 1 The question also requires that ?Area 1 should not receive any external or inter-area routes (except the default route)?. Recall that if we don't want the router to receive external routes, we have to stop LSA Type 5. And if we don't want to receive inter-area routes, we have to stop LSA Type 3 and Type 4.**Therefore we have to configure area 1 as a totally stubby area**. For your information, here is the definition of a totally stubby area: "**Totally stubb area** ? This area does not accept summary LSAs from other areas (types 3 or 4) or external summary LSAs (Type 5). Types 3,4 and 5 LSAs are replaced by the Area Border Router(ABR) with a default router. Totally stubby areas protect internal routers by minimizing the routing table and summarizing everything outside the area with a default route.? (CCNP BSCI Official Exam Certification Guide, Fourth Edition) In conclusion, we have to configure area 1 as a totally stubby area. We do that by configuring Portland as stub and configuring Amani (ABR router) as a stub + ?no-summary?suffix. + Configure Portland router as a stub: Portland#configure terminal   Portland(config)#router ospf 1 Allow network 192.168.4.4/30 to join Area 1, notice that you have to convert subnet mask into wildcard mask: Portland(config-router)#network 192.168.4.4 0.0.0.3 area 1 + Configure Portland as a stub: Portland(config-router)#area 1 stub Portland(config-router)#end Portland#copy running-config startup-config + Configure Indianapolis router as a ?totally stub?: Indianapolis#configure terminal   Indianapolis(config)#router ospf 1   Indianapolis(config-router)#network 192.168.4.4 0.0.0.3 area 1 Make area 1 become a totally stubby area, notice that we can only use this command on ABR router: Indianapolis(config-router)#area 1 stub no-summary   Indianapolis(config-router)#end   Indianapolis#copy running-config startup-config