Ospf hello packets

This is the second article in our OSPF series, which describes how OSPF routers perform neighbor-friendly relationships and advocacy. We'll look at how OSPF detects neighbors by sending Hello packages through router interfaces and how it shares State of Communication (LSAs) ads to form adjacencies and build its topology table. We'll also look at the contents of OSPF Hello packages (Router ID, Hello/Dead Intervals, Subnet Mask, Router Priority, Area ID, DB, and BDR IP Address, authentication information) and more. Our first OSPF article covered the main OSPF concepts - OSPF Topology - Routing Table, OSPF Areas and Router Roles, and others. It is recommended that users read the first article before continuing to help update their OSPF theory. As OSPF forms a neighborly relationship after osPF is enabled on the router interface, a link status database (LSD) is installed, and all OSPF-controlled interfaces are added to this table, which will be used in the LSAs state advertising, OSPF then begins the process of identifying neighbors and forming an adjaction process. Now we will look at both, the process of forming a neighbor and ajaction: figure 1. R1 sends the original OSPF Hello package. R2 responds to osPF Reply Hello. Dispatch - Getting OSPF Hello Messages OsPF router generates a Hello package every survey interval of -10 seconds for Peer-to-Peer (P2P) networks and 30 seconds for Non-Broadcast-Multiple-Access (NBMA) networks by default - and touts it through a multi-station address of 224.0.0.5 for all routers connected to its interfaces, while it searches for potential NEIGHBORS OSPF. The Hello message contains a list of information needed to form an OSPF neighborly relationship between two neighboring routers, and the following list of information contained Hello: OSPF Router ID messages. A router ID that is configured or automatically selected by THE OSPF (analyzed below) Hello Interval Timer. The frequency at which Hello packages are sent. Dead Interval Timer. Determines how long we have to wait for hi-packages before declaring a neighbor dead. Priority of the router's mask subnet. Used to determine the designated router (DR). Priority is given to a higher priority. Customized Priority 0 means that the router will not become DR or BDR. A list of achievable OSPF neighbors on the network. The DDR and BDR IP address ID (if it exists) Authentication Password (if configured) After the neighbor's router (R2) under OSPF receives the Hello message, it starts checking in the above list. The following conditions must be met for two routers to become neighbors: They must have the same ip-network/subnet Hi and Dead Interval timers must be identical interfaces Connecting two routers must have the same type of area ID area should be identical (normal or stub area) Authentication password (if used) should be identical to Hello Mismatch Settings If there is a mismatch between some of the items items interval, Subnetmask, Area ID, etc.), a bouncing attitude case occurs as this potential neighbor (R2) continues to slam the TOPology OSPF router, pointing out a discrepancy with the Hello message information. Note: The router ID may be a name, number or IP address. By default, OSPF will select the IP address of the highest active interface as a router ID. If the interface doesn't work (for example, the Ethernet interface starts to shut down), it can cause problems with the OSPF process. For this reason, it's always a good idea to either set up a suitable IP address on the Loopback interface (a virtual interface that's always 'Up') or manually adjust your router ID to something suitable for the OSPF network. Hello Parameters Match - Responding to Hello Messages When R2 receives an OSPF Hello message from R1 and all the necessary Hello options match, R2 will send the Reply Hello package back to R1. Answer Hello allows R1 (which sent the original Hello message) to investigate if the adjacent R2 router is listed as neighbors or not. If the next R2 router is already listed as a neighbor, R1 resets its dead timer, and Reply Hello messages act as a Keep Alive mechanism. If the neighboring R2 router is not listed in the adjacent R1 database, it will add a newly discovered neighbor R2 router to the adjacent OSPF database. All further MESSAGES OSPF Hello and Hello Reply will act as a mechanism To Keep Alive. Master-Slave Relation Creation When neighborhood relationships are formed between two OSPF-operated routers, a hierarchical information-sharing order must be established that determines which router sends DataBase Descriptor (DBD) updates first (Master) while the other router (Slave) listens. As soon as the Master sends DBD packages, Rab follows by sending his DataBase Descriptor (DBD) packages. OSPF selects the main router based on the highest priority that can be configured manually, but if the priority is not set, OSPF will use the router ID as a reference. Note that the designated router (DR) should not be a master, it is only the router's priority based on the relationship to organize the exchange of data between neighbors, but does not affect the role of DR and BDR. Exchange DataBase Descriptor (DBD's) - DBD Recognition and Review OSPF Neighbors follow a rigorous process of sharing routing information and updates to prevent the prevention of trouble-preventing faults caused by flood updates, this process follows the order described below: Figure 2. Steps 1 and 2: R1 sends the DBD package, while R2 responds to the Reference Status (LSR) 1 request. The Master sends the DataBase Descriptor (DBD) update package. 2. checks DataBase Descriptor (DBD) and finds new information routes, then asks for updates by sending a Link State Request (LSR) package. Figure 3. Steps 3 and 4. R1 responds with State of Communication Update (LSU) and R2 recognizes with LSAck 3. Master Master rear updates via Link State Updates (LSU) packages. 4. Rab recognizes accepting updates by sending a link to the state to recognize (LSAck). 5. Slave sends the DataBase (DBD) update package as follows. 6. The Master asks for updates by sending a link State Request (LSR) package. 7. Slave sends updates through Link State Update (LSU) packages. 8. Master recognizes receiving updates by sending link State Acknowledge (LSAck) package. There are no charts showing steps from 5 to 8, but they are similar to the first 4 steps, but with a master router requesting a reference status request (LSR). This article explains how OSPF routers build neighborhood relationships and adjudia. We've seen a neighbor of OSPF open the process through OSPF Hello packages and link State Requests (LSR) and Link State Updates (LSU). We've also studied the contents of OSPF Hello packages and what fields are needed to ensure the formation of OSPF adjaction. Finally, we saw OSPF routers sharing information and updating their database through DataBase Descriptor (DBD) packages. Back to the OSPF Route Protocol section In this tutorial I'm going to show you the different packages OSPF uses and how the neighbor opening works. OSPF uses its own protocol, such as EIGRP, and does not use a transport protocol such as TCP or UDP. If you look at the IP package in wireshark you can see that OSPF has an ID protocol of 89 for all its packages. The OSPF debugging package from R2'debug ip ospf is on OSPF: rcv. v:2 t:1 l:48 rid:1.1.1.1 aid:0.0.0.0 chk:4D40 aut:0 auk: From FastEthernet0/0 If we use the ip ospf debugging package, we can look at the OSPF package on our router. Let's take a look at the different fields that we have: V:2 means OSPF version 2. If you run IPv6 you will be version 3. T:1 means osPF package number 1, which is a hi package. I'll show you the different packages in a bit. L:48 is the length of the package in bytes. This package hello, it seems 48 bytes. RID 1.1.1.1 is a router ID. AID is the area ID in the dotted decimal. You can write an area in decimal (area 0) or dotted decimal (area 0.0.0.0). THE CHK 4D40 is a check of this OSPF package so we can check whether the package is damaged or not. AUT:0 is a type of authentication. You have 3 options: 0 - no authentication 1 - clear text 2 and MD5 AUK: If you turn on authentication, you'll see some information here. Let's keep looking at the different types of OSPF packages: I throw them right at you; Here are all the types of OSPF packages we have. In my DEBugging IP ospf package on the previous page you could see T:1, which means type 1 package. Here you see that it corresponds to the OSPF hello package. What is the role of each OSPF package? Hello: neighbor opening, build neighbor adjacencies and support them. This package is used to check if the LSDB between the two routers is the same. DBD is an LSDB summary. LSR: Requests Requests record status links from an OSPF neighbor. LSU: Sends specific state records of links that have been requested. This package is like an envelope with multiple LSAs in it. LSAck: OSPF is a reliable protocol, so we have a package to recognize others. OSPF must go through 7 states to become neighbors ... Here they are: Down: no OSPF neighbors discovered at the moment. Init: Hi package received. Two-day weekend: your own router ID found in the hello package received. Exstart: Master and slave roles defined. Exchange: Database description packages (DBDs) are sent. Download: Exchange LSRs (link state request) and LSUs (link status update). Full text: OSPF routers now have adjudyance. Let's take a closer look at this process! You can also see it in this capture package: OSPF Neighbor Adjacency - Network Type Broadcasting Is the Topology I Use. R1 and R2 are connected via a single link and we'll see how R1 learns about the 2.2.2.0/24 network. As soon as I set up OSPF on R1, it will start sending hello packages. R1 has no idea about other OSPF routers at the moment, so it is in a state of fall. The hi package will be sent to the multi-contact address 224.0.0.5. R2 receives a hello package and will record for R1 in the neighbor's OSPF table. Now we are in an inevieable state. R2 should respond to R1 with a hi package. This package is sent not via a multicast, but with a unicast and in a nearby box it will include all the neighbors OSPF that R2 has. R1 will see its own name in a nearby field in this hello package. R1 will receive this hello package and sees its own router ID. We are now in a state of two sides. I have to take a break here. If the link we use is a multi-available OSPF network should elect DR (designated router) and BDR (Reserve designated router). This must happen before we can continue the rest of the process. In another lesson I'm going to teach you DR/BDR... at this point just keep thinking that the DR/BDR election is happening right after the two-way state is ok? Our next stop is the exstart state. Our routers are ready to sync their LSDB. At this stage we have to choose a master and slave role. The router with the highest router ID will become a master. R2 has the highest router ID and will become a master. Master.