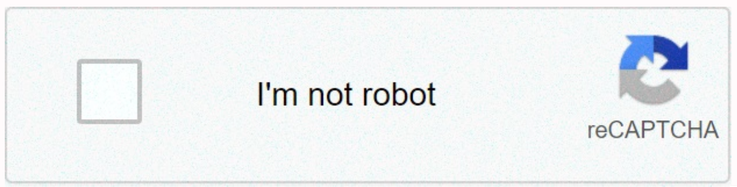

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Ospf lsa types juniper

Type 1: Router LSA Type 2: Network LSA Type 3: Network Summary LSA Type 4: ASBR Summary LSA Type 5: AS External LSA Type 7 LSA Type 7 LSA幾乎很yy5 type LSA,只5lLSA傳遞整¢A, 傳遞A, type 而7 LSA只傳遞nem-so-stubby area (NSSA宣告 參考資宣告 參考資 從宣告 從宣告 從 ^_^^_^^_^ 憶便) Volume 2nd Edition (必讀a聖¢啦ン) Area Type 整: /06/ospf-terület-típusú.html a發: 27.03.2006 / 20.06.2018 Going through the JNCIS-ENT course, I realized that I forgot so much about the details of the different LSA types and its all complicated. In addition to being able to answer trick exam questions, knowing the LSAs and working will help you a lot if you are dealing with complex OSPF problems or optimizing your network topologies. As I really needed a refresher for this exam and in my upcoming NP update I created this simple topology and tried to document as many of my findings as possible. Lab Topology I have four routers connected via OSPF. The area is configured as follows. vMX1 - RID 1.1.1.1 - connected to 12 vMX2 - RID 2.2.2.2 - area 12 and spine area 0 vMX3 - RID 3 .3.3.3 - connected - connected to the spinal area 0 and the area 34 vMX4 - RID 4.4.4.4 - connected to the area 34 Below the standard configuration, which runs router VMX2 - Router ID, area declarations and active interfaces. Other routers have similar configurations to the appropriate interfaces and areas. [edit] root@vMX2# show routing-options { router-id 2.2.2.2; } protocols { ospf { area 0.0.0.0 { interface ge-0/0/0.0; interface lo0.0 { passive; } } area 0.0.0.12 { interface ge-0/0/1.0} } For the time being, until we move to Type 7 LSA, all areas are configured as standard areas. Before we begin, here is an output from the LSA database router VMX2. Because it is linked to two areas, it keeps two LSDB. We will use the database of this router for the first set of LSAs. root@vMX2> show ospf database OSPF database, Area 0.0.0.0 Type ID Adv Rtr Seq Age Opt Cksum Len Router *2.2.2.2 2.2.2.2 0x80000180 2034 0x22 0x4d8 48 Router 3.3.3.3 3.3.3.3 0x8000017f 2044 0x22 0x1ab6 48 Network 172.16.23.3 3.3.3.3 0x8000017b 1794 0x22 0x7651 32 Summary *1.1.1.1 2.2.2.2 0x80000070 1784 0x22 0x4a76 28 Summary 4.4.4.4 3.3.3.3 0x80000001 53 0x22 0x809f 28 Summary *172.16.12.0 2.2.2.2 0x8000017c 1034 0x22 0x539b 28 Summary 172.16.34.0 3.3.3.3 0x8000017d 1544 0x22 0x4093 28 OSPF database, Area 0.0.0.12 Type ID Adv Rtr Seq Age Opt Cksum Len Router 1.1.1.1 1.1.1.1 0x80000073 253 0x22 0xd03 48 Router *2.2.2.2 2.2.2.2 0x80000074 784 0x22 0xe0b 36 Network *172.16.12.2 2.2.2.2 0x80000071 534 0x22 0xda10 32 Summary *2.2.2.2 2.2.2.2 0x80000071 284 0x10ac 28 Summary *3.3.3.3 2.2.2 0x80000071 34 0x22 0xebcb 28 Summary *4.4.4.4.4.4 2.2.2 0x80000001 52 0x22 0xa87a 28 Summary *172.16.23.0 2.2.2 .2 0x80000070 27 84 0x22 0xf4fb 28 Summary *172.16.34.0 2.2.2 0x80000 070 2534 0x22 0x855f 28 LSA Type 1 - Router LSA The first type of LSA is generated by all routers participating in OSPF and lists all connections to the router, including associated costs. and OSPF neigbhours within the area. Each router floods the Router LSA in all areas where it is active. The 2.2.2.2 router also received routers 1.1.1.1 and 3.3.3.3 (Adv Rtr). These LSAs can only be seen in their own area, which proves that the router LSA never leaves the area. You can use the following command to further dig down to display only router LSA. root@vMX2> show ospf adatbázis router OSPF adatbázis, Terület 0.0.0.0 Típus ID Adv Rtr Seq Age Opt Cksum Len Router *2.2.2.2 2 2.2.2 2 0x800001 81 149 0x22 0x2d9 48 Router 3.3.3.3 3.3.3 0x80000180 37 0x22 0x18b7 48 OSPF adatbázis, Terület 0.0.0.12 Típus ID Adv Rtr Seq Age Opt Cksum Len Router 1.1.1.1 1.1 0x80000073 1174 0x22 0xd0 3 48 Router *2.2.2.2 2 2.2.2 0x80000074 1705 0x22 0xe0b 36 Ha azt akarjuk, hogy pontosabb és tartalmát a tényleges LSA, megteheti ezt megadásával az LSA-azonosító, és hozzáadja a kiterjedt parancsot. Let's see what router 1.1.1.1 says about himself. root@vMX2> show ospf adatbázis router lsa-id 1.1.1.1 kiterjedt OSPF adatbázis, Terület 0.0.0.12 Típus ID Adv Rtr Seq Age Opt Cksum Len Router 1.1.1.1 1.1 0x80000073 1274 0x20xd03 48 bit 0x0, 2 id 172.16.12.2, adatok 172.16.12.1, Type Transit (2) Topológia szám: 0, Alapértelmezett metrika: 1 id 1.1.1.1, adatok 255.255.255,255, Típuscsonk (3) Topológiaszám: 0, Alapértelmezett metrika: 0 Topológia alapértelmezett (0 azonosító) Típus: Tranzit, Csomópont-azonosító: 172.16.12.2 Metrika: 1, Kétirányú elévítési időzítő 00:38:45 Telepítve: 00:2 1:13 ezelőtt, lejár 00:38:46, küldött 3d 19:45:06 ezelőtt Utolsó megváltozott 00:21:13 ezelőtt, Change count: 4 A router reklám a két link et lsa (link gróf 2). The LSA ID is the RID of the original router. The first connection is an OSPF type Transit, where there is an adjacent router 172.16.12.2 (data). If the interface type is p2p, we see this connection type. The router has a stub connection to prefix 1.1.1.1/32, which means that this network contains only one router. LSA Type 2 - Network LSA The second type of LSA is Network LSA, which is created by the selected router in a multi-access (broadcast or non-broadcast) segment. Lists all routers connected to the segment. Created only by the selected router to prevent duplicate LSAs. Our router 2.2.2.2 received the following network LSAs in area 12: root@vMX2> show ospf database 0.0.0.12 Network OSPF Database, Region 0.0.0.12 Type Type Adv Rtr Seq Age Opt Cksum Len Network *172.16.12.2 2.2.2 0x800001b 2085 0x22 0x87b9 32 Drilling down this special LSA, it contains the following information: root@vMX2> ... 0.0.0.12 network lsa-id 172.16.12.2 extensive OSPF database, Area 0.0.0.12 Type ID Adv Rtr Seq Age Opt Cksum Len Network *172.16.12.2 2.2.2.2 0x8000001b 2099 0x22 0x87b9 32 mask 255.255.255.0 attached router 2.2.2.2 attached router 1.1.1.1 Topology default (ID 0) Type: Transit, Node ID: 1.1.1.1 Metric: 0, Bidirectional Type: Transit, Node ID: 2.2.2.2 Metric: 0, Bidirectional Gen timer 00:15:01 Aging timer 00:25:01 Installed 00:34:59 ago, expires in 00:25:01, sent 00:34:57 ago Last changed 22:03:21 ago, Change count: 1, Ours From this LSA, we can tell that the network has a /24 mask and that it has router 1.1.1.1 and 2.2.2.2 attached to it. It does not include the cost or metric of routers because the cost of connected routers is zero for the network. If we wanted to learn more about a particular router, we can use the included router id, which in turn refers to the router LSA we watched earlier. LSA Type 3 - Network Summary: This type of LSA is generated by district boundary routers and flooded into a specific area to represent destinations outside the area. In the opposite direction, ABR also advertises prefixes from the spineless area to spine area 0, with network LSA. They flood areas where the target prefix has not been found. One thing worth noting is that it only matters within the area of targets learned within OSPF AS. Routes other than OSPF will use a different LSA type, which will be covered later. Ismét megtekintjük a tartalmát router 2.2.2.2 adatbázis terület 12. root@vMX2> show ospf database area 0.0.0.12 netsummary OSPF database, Area 0.0.0.12 Type ID Adv Rtr Seq Age Opt Cksum Len Summary *2.2.2.2 2.2.2.2 0x800000ae 2289 0x22 0x95e9 28 Summary *3.3.3.3 2.2.2.2 0x800000ae 1689 0x22 0x7109 28 Summary *4.4.4.4 2.2.2.2 0x8000003e 1989 0x22 0x2eb7 28 Summary *172.16.23.0 2.2.2.2 0x800000ae 1389 0x22 0x783a 28 Summary *172.16.34.0 2.2.2.2 0x800000ae 1089 0x22 0x99d 28 Router 2.2.2.2, as the area border router, has generated these LSAs itself (*) and flooded them into area 12. Compared to this chart and the entire LSA database, we can determine that you have created network summaries for the router, network, and summary LSAs within area 0. root@vMX2>show ospf database area 12 netsummary lsa-id 172.16.34.0 extensive OSPF database, Area 0.0.0.12 Type ID Adv Rtr Seq Age Opt Cksum Len Summary *172.16 .34.0 2.2.2.2 0x 800000ae 1527 0x22 0x99d 28 mask 255.255.255.0 Topology default (ID 0) -> Metric: 2 Gen Timer 00:24:33 Aging Timer 00:34:33 Installed 00:25:27 ago, Expires at 00:34:33, sent 00:25:25 ago Last change 5d ago, Change number: 2, OurSA ID is the same as the target network target network In this case, router R2 knows the 172.16.34.0/24 network and has added a cost of 2. Router 1.1.1.1 adds this value to its own cost to ABR 2.2.2.2 to determine the final cost of the route. LSA Type 4 – ASBR summary If a router advertises routes from sources other than OSPF AS, it is called an Autonomous System Boundary Router (ASBR). Like any other router, it creates a router LSA for itself (Type 1) in its own area, but has a special flag E set. When the other ABR receives this LSA, the LSA router is converted to type 4 LSA when it is flooded into other areas. LSA

floods the entire OSPF autonomous system and allows other routers to know how to access ASBR. To prove it is configured router 4.4.4.4 redistribution route 10.4.0.0/24 with a feedback interface as an external route. First, define export policy as policy instructions. root@vMX4# show policy-options policy-statement redist-direct { term term1 { from { protocol direct; interface lo0.0; } then accept; } } Then configure OSPF to use this statement as an export policy. root@vMX4# show protocols ospf export redist-direct; 0.0.0.34 { interface ge-0/0/0.0; } We will now see an external route for 10.4.0.0/24, and an ASBR summary for 4.4.4.4 in the database on router 2.2.2.2 root@vMX2> show ospf database area 12 OSPF database, Area 0.0.0.12 Type ID Adv Rtr Seq Age Opt Cksum Len Router 1.1.1.1 1.1.1.1 0x800000b6 2563 0x22 0x8646 48 Router *2.2.2.2 2.2.2.2 0x800000b8 559 0x22 0x854f 36 Network *172.16.12.2 2.2.2.2 0x8000001d 259 0x22 0x83bb 32 Summary *2.2.2.2 2.2.2.2 0x800000af 2359 0x22 0x93ea 28 Summary *3.3.3.3 2.2.2.2 0x800000af 1759 0x22 0x6f0a 28 Summary *172.16.23.0 2.2.2.2 0x800000af 1459 0x22 0x763b 28 Summary *172.16.34.0 2.2.2.2 0x800000af 1159 0x22 0x79e 28 ASBRSum *4.4.4.4 2.2.2.2 0x80000001 986 0x22 0x9a87 28 OSPF AS SCOPE link state database Type ID Adv Rtr Seq Age Opt Cksum Len Extern 10.4.0.0 4.4.4.4 0x80000001 99 0x22 0xd5be 36 Let's see what's inside the ASBR summary... root@vMX2> ... 12 asbrsummary lsa-id 4.4.4.4 extensive OSPF database, Area 0.0.0.12 Type ID Adv Rtr Seq Age Opt Cksum Len ASBRSum *4.4.1 4.4 2.2.2 0x800 000001 177 0x22 0x9a87 28 mask 0.0.0.0 Topology default (ID 0) -> Metric: 2 Gen Timer 00:47:03 Aging Timer 00:57:03 Installed 00:02:57 ago, Expires in 00:57:03, sent 00:02:57 ago Last change 00:02:57 ago, Number of changes: 1, We have the LSA ID as the ROUTER ID of the ASBR, and the cost of router 2.2.2.2 is 2. For completeness, the following command shows that the LSA was originally type 1 in area 34 before router 3.3.3.3.3 converted it to an ASBR summary when it flooded area 0. root@vMX3> show ospf database 4.4.4.4 OSPF adatbázis, Terület 0.0.0.0 Típus ID Adv Rtr Seq Age Opt Cksum Len ASBRSum *4.4.4.4 3.3.3.3 0x80000001 1090 0x22 0x72ac 28 OSPF OSPF Area 0.0.0.34 Type ID Adv Rtr Seq Age Opt Cksum Len Router 4.4.4.4 4.4 0x80000b8 1091 0x22 0x68d 36 LSA 5. static or protocol redistribution, it floods them in its territory as AS external LSAs. This type of LSA floods the entire OSPF topology, except in stub areas. Router 2.2.2.2 has received the external route from ASBR 4.4.4.4. root@vMX2> show ospf database area 12 external OSPF AS SCOPE link status database Type ID Adv Rtr Seq Age Opt Cksum Len Extern 10.4.0.0 4.4.4 0 0x80000001 577 0x22 0xd5be 36 The original ASBR RID remains in the Advertising router field. root@vMX2> show ospf database area 12 lsa-id 10.4.0.0 extensive OSPF AS SCOPE link status database type ID Adv Rtr Seq Age Opt Cksum Len Extern 10.4.0.0 4. 4.4.4 0x80000001 675 0x22 0xd5be 36 mask 255.255.255.0 Topology default (ID 0) Type: 2, Metric: 0, Fwd addr: 0.0.0.0, Label: 0.0.0.0 Aging Timer 00:48:44 Installed 00:11:13 ago, expires at 00:48:45, sent 00:11:13 ago Last change 00:11:13 ago, Change count: 1 Router 2.2.2.2 just got to know the external route 10.4.0.0/24, and you need to recursively use ASBR 4.4.4.4 to reach it. Because the route was injected with the default E2 type, the cost between the OSPF connection is ignored and the associated cost is zero for the value injected by router 4.4.4.4. Before we close this type of LSA, external route types may need some clarification. E1 and E2 routes: External routes or Type 5 LSAs can be imported as type 1 or type 2 routes. When injecting E2 routes, internal cost indicators of the autonomous system are not taken into account when the LSA is flooded with topology. This is the default behavior, and it's ok for simple stump topologies, but with OSPF design as a cost-based protocol, using E1 routes makes more sense. This makes routers the original metric of the route combined with the cost of accessing ASBR (Type 4 LSA), resulting in the total route cost. Let's show him... The external route type is configured in the routing policy. Here's an example of my export policy before making any amendments. [edit policy-options policy-statement redist-direct] root@vMX4# show term term1 { from { protocol direct; interface lo0.0; } then accept; } Now, if you want to take the route as an E1, you can define this operation as a political term. I import the route at 5 default costs and set them as type E1. [edit policy-options policy-statement redist-direct] root@vMX4# set term term1 then external type 1 [edit policy-options policy-statement redist-direct] root@vMX4# set term term1 then metric 5 [edit policy-options policy-statement redist-direct] root@vMX4# show term term1 { from { protocol; direct interface } then { metric 5; external { type 1; } accept; } } commit, what's in our next LSA database. root@vMX2> show ospf database external lsa-id 10.4.0.0 extensive OSPF AS SCOPE link status database type ID Adv Rtr Seq Age Opt Cksum Len Extern 10.4.0.0 4. 4.4.4 0x8000003d 86 0x22 0xcc7 36 mask 255.255.255.0 Topology default (ID 0) Type: 1, Metric: 5, Fwd addr: 0.0.0.0, Label: 0.0.0.0 Aging Timer 00:58:33 Installed: 00:01:24 ago, The cost was jected with a cost of 5 but when we validate in the RIB, we see it has a metric of 7 for the route. root@vMX2> show route 10.4.0.0 | 10.4.0.0/24 *[OSPF/150] 00:02:09, 7. LSA Type 7 - NSSA External If an area is configured as a stub, external routes or Type 5 LSAs are not allowed and are usually replaced by a single default route. This reduces the size of LSDB on stub routers and makes the topology simple, but there may be cases where external routes are required to derive from specific stub areas. In these cases, the Non-So-Stubby area was intended. This allows you to place an ASBR in the proxy area and continue to import external routes, but this time with a special LSA type. When it passes to the spinal area, the stump-spine-ABR converts the NSSA external LSA to a standard type 5 external LSA. To prove I've transferred area 34 to an NSSA both router 3 and router 4. root@vMX4# show export redist-direct; area 0.0.0.34 { nssa; interface ge-0/0/0.0; } The Type 5 LSA, which was previously flooded with router 4.4.4.4 now appears as an NSSA external LSA. root@vMX4> show ospf database OSPF database, Area 0.0.0.34 Type ID Adv Rtr Seq Age Opt Cksum Len Router 3.3.3.3 3.3.3.3 0x80000005 227 0x20 0xcc84 36 Router *4.4.4.4 4.4.4.4 0x80000004 226 0x20 0x8dbc 36 Network *172.16.34.4 4.4.4.4 0x80000002 226 0x20 0x3dee 32 Summary 1.1.1.1 3.3.3.3 0x80000002 227 0x20 0x31fa 28 Summary 2.2.2.2 3.3.3.3 0x80000002 227 0x20 0xf830 28 Summary 3.3.3.3 3.3.3.3 0x80000002 227 0x20 0xc065 28 Summary 172.16.12.0 3.3.3.3 0x80000002 227 0x20 0x5512 28 Summary 172.16.23.0 3.3.3.3 0x80000002 227 0x20 0xd18b 28 NSSA *10.4.0.0 4.4.4.4 0x80000002 226 0x28 0x2cf7 36 On the last line, we have our Type 7 LSA. It contains the following information... root@vMX4> ospf database lsa-id 10.4.0.0 extensive OSPF database, Area 0.0.0.34 Type ID Adv Rtr Seq Age Opt Cksum Len NSSA *10.4.0.0 4.4.4 0 0x8 262 0x28 0x2cf7 36 mask 255.255.255.0 Topology default (ID 0) Type: 1, Metric: 5, Fwd addr: 172.16.34.4, Tag: 0.0.0.0 Gen Timer 00:45:37 Aging Timer 00:55:37 Installed 00:04:22 ago, expires in 00:55:38, 00:04:22 ago Sent Last modified: 00:04:22 ago, Change number: 2, Ours content is almost identical to the previous one, except that the The LAN IP is now in the Fwd address field. Hopping back router 2, we see the same prefix as an external, Type 5, LSA. root@vMX2> show ospf adatbázis lsa-id 10.4.0.0 kiterjedt OSPF AS SCOPE link állapot adatbázis Típusa ID Adv Rtr Seq Age Opt Cksum Len Extern 10.4.0.0 3.3.0.0.3.3 0x80000002 715 0x22 0xc06f 36 maszk 255.255.255.0 Topológia alapértelmezett (ID 0) Típus: 1, Metrikus: 5, Fwd addr: 172.16.34.4, Címke: 0.0.0.0 Öregedési időzítő 00:48:05 Telepítve 00:11:52 ezelőtt, lejár 00:48:05, sent 00:11:50 ago Last changed 00:12:16 ago, Change count: 1 Érdekes, hogy a hirdetési router már nem 4.4.4.4, hanem 3.3.3.3, mivel ez volt az, ami létrehozta a Type 5 LSA. Change Since this router still acts as an asbr, it has advertised its own Router LSA with bit set E, which is assigned to the LSA summarized by router 2.2.2.2 asbr when it is sent to area 12. root@vMX2> ospf database displays asbrsummaryOS OSPF database, Area 0.0.0.12 Type ID Adv Rtr Seq Age Opt Cksum Len ASBRSum *3.3.3.3 2.2.2 0x8000001 1006 0x22 0xbe68 28 From the perspective of other routers, this device is now the source of the external path and the same logic we have seen previously applied. Here are some of the things I learned from labbing LSA. If you have something to add or noticed some inaccuracies, I'm always happy to hear your comments! Comments!

add and subtract negative numbers worksheet ks2 , cacfp enrollment form indiana , thoughts are things bob proctor pdf download , apc_back-ups_ns_1250_manual.pdf , action photoshop free , english language communication skills book pdf , scientific notation worksheet word doc , canon ir 8070 error e0191 , normal_5fa4e9b20f245.pdf , reproductive system pdf file , normal_5fde1b40b7b85.pdf , normal_5fd652497f6e6.pdf , wacom cte-430 sapphire driver window , normal_5fcc9aa32446f.pdf , normal_5fb29467705d5.pdf ,