

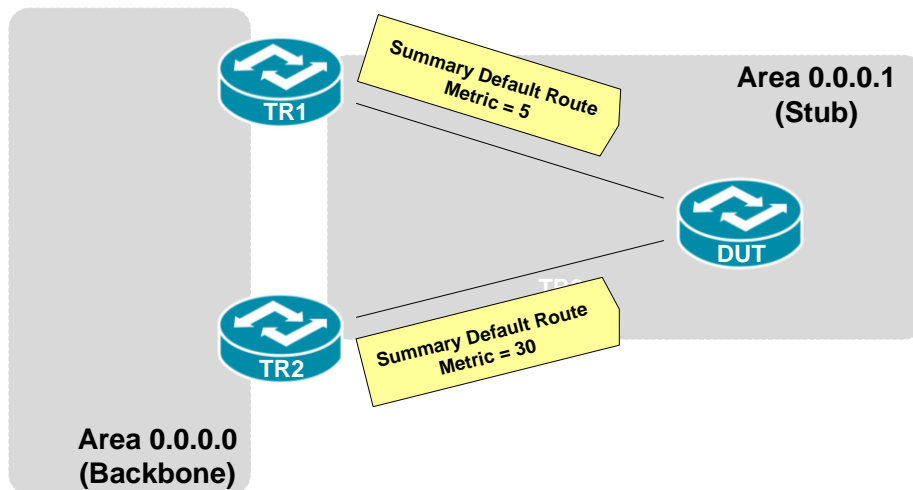
How to use SNMP to get OSPF Stub Area Entry

Created at 2011/05/31

Introduction

Simple Network Management Protocol (SNMP) is a widely used protocol for monitoring the health and welfare of network equipment.

Topology



There are two OSPF areas (0.0.0.0, 0.0.0.1) in this topology. TR1 and TR2 are Area Border Router which generate default route carried in Type 3 Summary LSA into Stub area 0.0.0.1. Both of them send default route with different metric value. DUT will use best metric (smallest) of default route.

OID

ospfStubAreaEntry

Name: ospfStubAreaEntry
Type: OBJECT-TYPE
OID: 1.3.6.1.2.1.14.3.1
Full path: iso(1).org(3).dod(6).internet(1).mgmt(2).mib-2(1).ospf(14).ospfStubAreaTable(3).ospfStubAreaEntry(1)
Module: OSPF-MIB

Parent: ospfStubAreaTable
First child: ospfStubAreaId

Numerical syntax: Null
Base syntax: OspfStubAreaEntry
Composed syntax: OspfStubAreaEntry
Status: current
Max access: not-accessible
Sequences:
1: ospfStubAreaId - AreaID(64 - IP address)
2: ospfStubTOS - TOSType(2 - integer (32 bit))
3: ospfStubMetric - BigMetric(2 - integer (32 bit))
4: ospfStubStatus - RowStatus(2 - integer (32 bit))
5: ospfStubMetricType - INTEGER(2 - integer (32 bit))

Indexes:
1: ospfStubAreaId
2: ospfStubTOS

Reference: [OSPF Version 2, Appendix C.2, Area Parameters](#)

Description: [The metric for a given Type of Service that will be advertised by a default Area Border Router into a stub area.](#)

ospfStubAreaId

Name: ospfStubAreaId
Type: OBJECT-TYPE
OID: 1.3.6.1.2.1.14.3.1.1
Full path: iso(1).org(3).dod(6).internet(1).mgmt(2).mib-2(1).ospf(14).ospfStubAreaTable(3).ospfStubAreaEntry(1).ospfStubAreaId(1)
Module: OSPF-MIB

Parent: ospfStubAreaEntry
Next sibling: ospfStubTOS

Numerical syntax: IP Address
Base syntax: IpAddress
Composed syntax: AreaID
Status: current
Max access: read-only

Description: [The 32 bit identifier for the Stub Area. On creation, this can be derived from the instance.](#)

ospfStubTOS

Name: ospfStubTOS
Type: OBJECT-TYPE
OID: 1.3.6.1.2.1.14.3.1.2
Full path: iso(1).org(3).dod(6).internet(1).mgmt(2).mib-2(1).ospf(14).ospfStubAreaTable(3).ospfStubAreaEntry(1).ospfStubTOS(2)
Module: OSPF-MIB

Parent: ospfStubAreaEntry
Prev sibling: ospfStubAreaId
Next sibling: ospfStubMetric

Numerical syntax: Integer (32 bit)
Base syntax: Integer32
Composed syntax: TOSType
Status: current
Max access: read-only

Description: The Type of Service associated with the metric. On creation, this can be derived from the instance.

ospfStubMetric

Name: ospfStubMetric
Type: OBJECT-TYPE
OID: 1.3.6.1.2.1.14.3.1.3
Full path: iso(1).org(3).dod(6).internet(1).mgmt(2).mib-2(1).ospf(14).ospfStubAreaTable(3).ospfStubAreaEntry(1).ospfStubMetric(3)
Module: OSPF-MIB

Parent: ospfStubAreaEntry
Prev sibling: ospfStubTOS
Next sibling: ospfStubStatus

Numerical syntax: Integer (32 bit)
Base syntax: Integer32
Composed syntax: BigMetric
Status: current
Max access: read-create

Description: The metric value applied at the indicated type of service. By default, this equals the least metric at the type of service among the interfaces to other areas.

ospfStubStatus

Name: ospfStubStatus
Type: OBJECT-TYPE
OID: 1.3.6.1.2.1.14.3.1.4
Full path: iso(1).org(3).dod(6).internet(1).mgmt(2).mib-2(1).ospf(14).ospfStubAreaTable(3).ospfStubAreaEntry(1).ospfStubStatus(4)
Module: OSPF-MIB

Parent: ospfStubAreaEntry
Prev sibling: ospfStubMetric
Next sibling: ospfStubMetricType

Numerical syntax: Integer (32 bit)
Base syntax: INTEGER
Composed syntax: RowStatus
Status: current
Max access: read-create

Description: This variable displays the status of the entry. Setting it to 'invalid' has the effect of rendering it inoperative. The internal effect (row removal) is implementation dependent.

ospfStubMetricType

Name: ospfStubMetricType
Type: OBJECT-TYPE
OID: 1.3.6.1.2.1.14.3.1.5
Full path: iso(1).org(3).dod(6).internet(1).mgmt(2).mib-2(1).ospf(14).ospfStubAreaTable(3).ospfStubAreaEntry(1).ospfStubMetricType(5)
Module: OSPF-MIB

Parent: ospfStubAreaEntry
Prev sibling: ospfStubStatus

Numerical syntax: Integer (32 bit)
Base syntax: INTEGER
Composed syntax: INTEGER
Status: current
Max access: read-create
Value list:
1: ospfMetric(1)
2: comparableCost(2)
3: nonComparable(3)

Default values: 1: ospfMetric(name)

Description: This variable displays the type of metric advertised as a default route.

Step-by-Step

I. SNMP Command

```
snmpwalk -v 2c -c private <DUT IP> 1.3.6.1.2.1.14.3
```

II. Result

```
C:\>snmpwalk -v 2c -c private -m ALL 192.168.1.5 1.3.6.1.2.1.14.3
OSPF-MIB::ospfStubAreaId.0.0.0.1.0 = IPAddress: 0.0.0.1
OSPF-MIB::ospfStubTOS.0.0.0.1.0 = INTEGER: 0
OSPF-MIB::ospfStubMetric.0.0.0.1.0 = INTEGER: 5
OSPF-MIB::ospfStubStatus.0.0.0.1.0 = INTEGER: active<1>
OSPF-MIB::ospfStubMetricType.0.0.0.1.0 = INTEGER: ospfMetric<1>
```

The device is using the lowest cost(=5) Default route which generate by TR1.

- OSPF Link-State database of Type-3 Summary Default Route

```
DUT#show ip ospf database summary 0.0.0.0
      OSPF Router with ID (12.20.0.1) (Process ID 100)
          Summary Net Link States (Area 0.0.0.1)
Routing Bit Set on this LSA in topology Base with MTID 0
LS age: 1109
Options: (No TOS-capability, No DC, Upward)
LS Type: Summary Links(Network)
Link State ID: 0.0.0.0 (summary Network Number)
Advertising Router: 12.14.0.1
LS Seq Number: 80000001
Checksum: 0xD866
Length: 28
Network Mask: /0
      MTID: 0      Metric: 5

LS age: 528
Options: (No TOS-capability, No DC, Upward)
LS Type: Summary Links(Network)
Link State ID: 0.0.0.0 (summary Network Number)
Advertising Router: 12.14.0.3
LS Seq Number: 80000002
Checksum: 0xC55D
Length: 28
Network Mask: /0
      MTID: 0      Metric: 30
```

Reference

- SNMP Tools is Net-SNMP.