IS-IS Support for Unidirectional Links

draft-ginsberg-isis-udl-00.txt

Les Ginsberg (<u>ginsberg@cisco.com</u>) Sina Mirtorabi(smirtora@cisco.com) Stefano Previdi (sprevidi@cisco.com) Abhay Roy(<u>akr@cisco.com</u>)

Goals

Modest Protocol Extensions

Reliable LSP Updates Minimum Additional Network Wide Protocol Traffic Support for Pt-Pt and LAN subnetworks

Basic Mechanisms

IS-R may use UDL-LSPs to send PSNP equivalent Special rules for UDL-LSPs

UDL-LSPs

Must be a non-zero fragment Contains only UDL TLVs [and authentication/purge TLVs] Enforcement by sender (not checked by receiver) Metable Admary ?? state extension UDL Circuits Contains only UDL TLVs [and authentication/purge TLVs] Enforcement by sender (not checked by receiver)

UDL-TLV



Sub-tlv Types

- Pt-Pt IS-Neighbor
- LAN IS-Neighbor
- LSP Entries
- Manual Area Addresses

IS-Neighbor sub-TLV

+----+

+----+ | Local LAN Address | 6 +-----+ 86th IETF, Orlando, March 2013

LSP Entry sub-TLV

Sub-TLV Format

	#	octets
+	+	
Type (9)	Ι	1
(To be assigned by IANA)	Ι	
+	+	
Length (10+ID Length) *N	Ι	1
+	+	
: LSP Entries	:	
+	+	

LSP Entry

	# octets
Remaining Lifetime	+ 2 +
LSP ID	ID Length + 2
+	+
LSP Sequence Number	4
+	+
Checksum	2
+	+
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Manual Area Address sub-TLV

Sub-TLV Format

	# octets	
+	-+	
Type (1)	Ι	1
(To be assigned by IANA)	Ι	
+	-+	
Length	Ι	1
+	-+	
: Area Address(es)	:	
+	-+	

Area Address



Simple UDL Topology – Pt-Pt Adjacency Establishment



- 1. T sends P2P-IIH (State Init, Local Cid n)-> R
- R sends UDL-LSP (State Init, Local Cid p, Neighbor T, Neighbor Cid n, [Local LAN Address])
- 3. UDL-LSP Propagated by B to T
- 4. T sends P2P-IIH (State UP, Local Cid n, Neighbor R, Neighbor Cid p)
- 5. R sends UDL-LSP (State UP, Local Cid p, Neighbor T, Neighbor Cid n, [Local LAN address])
- 6. T sends CSNPs to R
- 7. T floods LSPDB to R (once)

Simple UDL Topology – Pt-Pt Adjacency Establishment w UDL in return path



- 1. T sends P2P-IIH (State Init, Local Cid n)-> R
- R sends UDL-LSP (State Init, Local Cid p, Neighbor T, Neighbor Cid n, [Local LAN Address])
- 3. UDL-LSP Propagated by B to T even when adjacency is in INIT state
- 4. T sends P2P-IIH (State UP, Local Cid n, Neighbor R, Neighbor Cid p)
- 5. R sends UDL-LSP (State UP, Local Cid p, Neighbor T, Neighbor Cid n, [Local LAN address])
- 6. T sends CSNPs to R
- 7. T floods LSPDB to R (once)

Simple UDL Topology – LAN Adjacency Establishment



- 1. T multicasts LAN-IIH (LANID T-n)
- 2. Rn sends UDL-LSP (LANID T-n, Local LAN Address]) and creates adjacency in Init state
- 3. UDL-LSPs Propagated by B to T
- T creates adjacency(s) in UP state, sends LAN-IIH (LANID T-n, LAN Address R1, LAN Address R2...)
- 5. Rn transition adjacency to UP state
- 6. T sends CSNPs to LAN
- 7. T floods LSPDB to LAN

Adjacency Maintenance – P2P - Transmit Side



topology change occurs

Adjacency Maintenance – P2P - Receive Side



R maintains adjacency based on receipt of periodic P2P-IIH (State UP, Local Cid n, Neighbor R, Neighbor Cid p) as normal

Adjacency Maintenance – LAN –TX Side



T sends periodic LAN-IIH (LANID T-n, LAN Address R1, R2...)

T maintains adjacency with Rn so long as:

- It has valid UDL-LSP from Rn with adjacency info (LANID T-n, Local LAN address Rn)
- T can calculate a return path from Rn to T which does NOT use the UDL circuit

Return path calculation is only required when a topology change occurs

Adjacency Maintenance – LAN – RX Side



Rn maintains adjacency based on receipt of periodic LAN--IIH (LANID T-n, IS Neighbor LAN Address Rn as normal

Adjacency Failure Detection: Case #1



to R down

Adjacency Failure Detection: Case #2



- 1. Link between B-R fails
- 2. B generates new LSP w no neighbor info to R
- 3. T receives updated LSP from B
- 4. T recalculates return path from R to T takes adjacency to R down
- 5. T sends P2P-IIH (State Init, Local Cid n)-> R
- 6. R takes adjacency to T down
- R generates UDL-LSP (State Init, Local Cid p, Neighbor T, Neighbor Cid n, [Local LAN Address])

Update Process Overview



testination address

For LSP flooding, T operates on the circuit in a manner similar to a LAN where T is the DIS:

- Send new LSPs once only (no ACK expected)
- Periodic CSNPs
- PSNP requests for LSPs embedded in the UDL-LSP from R will cause a retransmission

For LSP reception, R operates on the circuit as a

LSPs it sees in CSNPs from T

 Delay before sending PSNP to minimize need to utilize UDL-LSP for this purpose (network-wide flooding)

Update Process Pathological Example



Steps 210 and EST And Co 200 Intil successful update.

- 3. R fails to receive LSP A-00(20)
- 4. T sends periodic CSNP to R showing A-00(20)
- 5. R sends PSNP for A-00(20) in a UDL-LSP to B
- 6. B receives UDL-LSP from R and floods to T
- 7. T receives UDL-LSP R via B and processes PSNP entry
- 8. T retransmits LSP A-00(20) to R
- 9. R receives LSP A-00(20), updates database

Steps 2-8 repeat if necessary until successful update.

Update Process UDL Special Rules



UDL Metrics



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