LISP-DDT

Darrel Lewis, Vince Fuller, Vina Ermagen

IETF 83, Paris, France

Agenda

- DDT Draft Review
- Deployment Experience

LISP DDT

- LISP Delegated Database Tree
  - Hierarchy for Instance IDs and for EID Prefixes
- DDT Nodes are pre-configured with delegations
  - DDT Map-Resolvers sends (ECM) Map-Requests
  - DDT Nodes Return Map-Referral messages
- DDT Resolvers resolve the Map-Server's RLOC iteratively

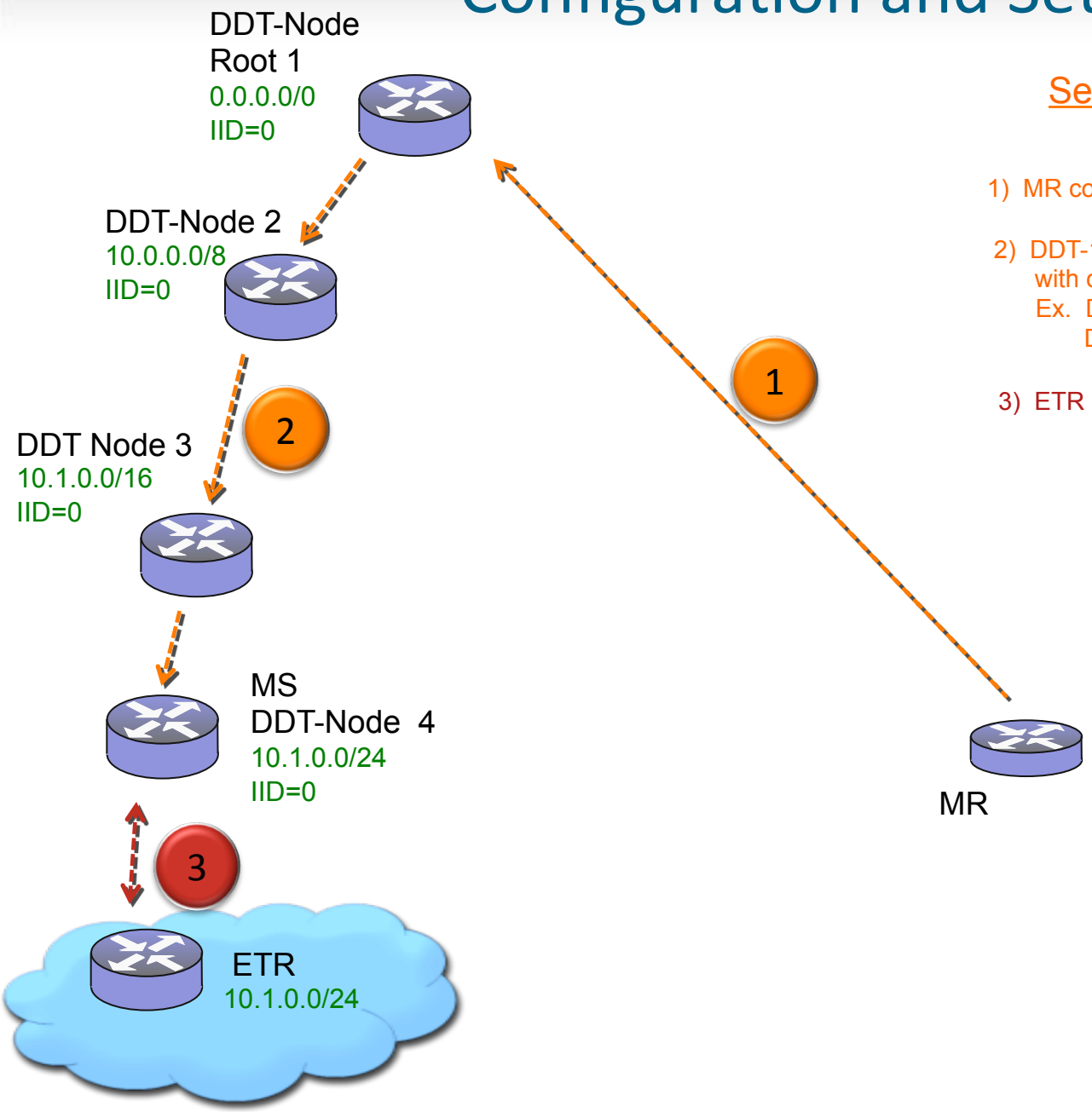
LISP DDT Map Resolvers

- DDT Map Resolvers
  - Cache Map Requests from ITRs
  - Query the DDT hierarchy iteratively
  - Detect Loops/Delegation Errors
  - Resolve the location of the DDT Map-Server
- DDT Map Resolvers thus have state:
  - Referral Cache
  - Map-Request Queue

LISP DDT Referrals & Their Actions

- ‘Positive’ Referrals are used to discover a DDT-node’s RLOC for a given EID Prefix
  - Type 0, NODE-REFERRAL
  - Type 1, MS-REFERRAL
  - Type 2, MS-ACK
- ‘Negative’ referrals are used to indicate other actions:
  - Type 3, MS-NOT-REGISTERED
  - Type 4, DELEGATION-HOLE
  - Type 5, NOT-AUTHORITATIVE

Configuration and Setup

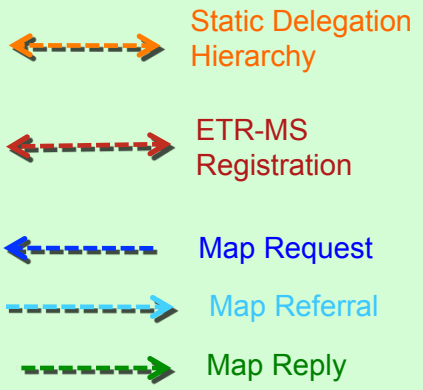


Setup & Configuration

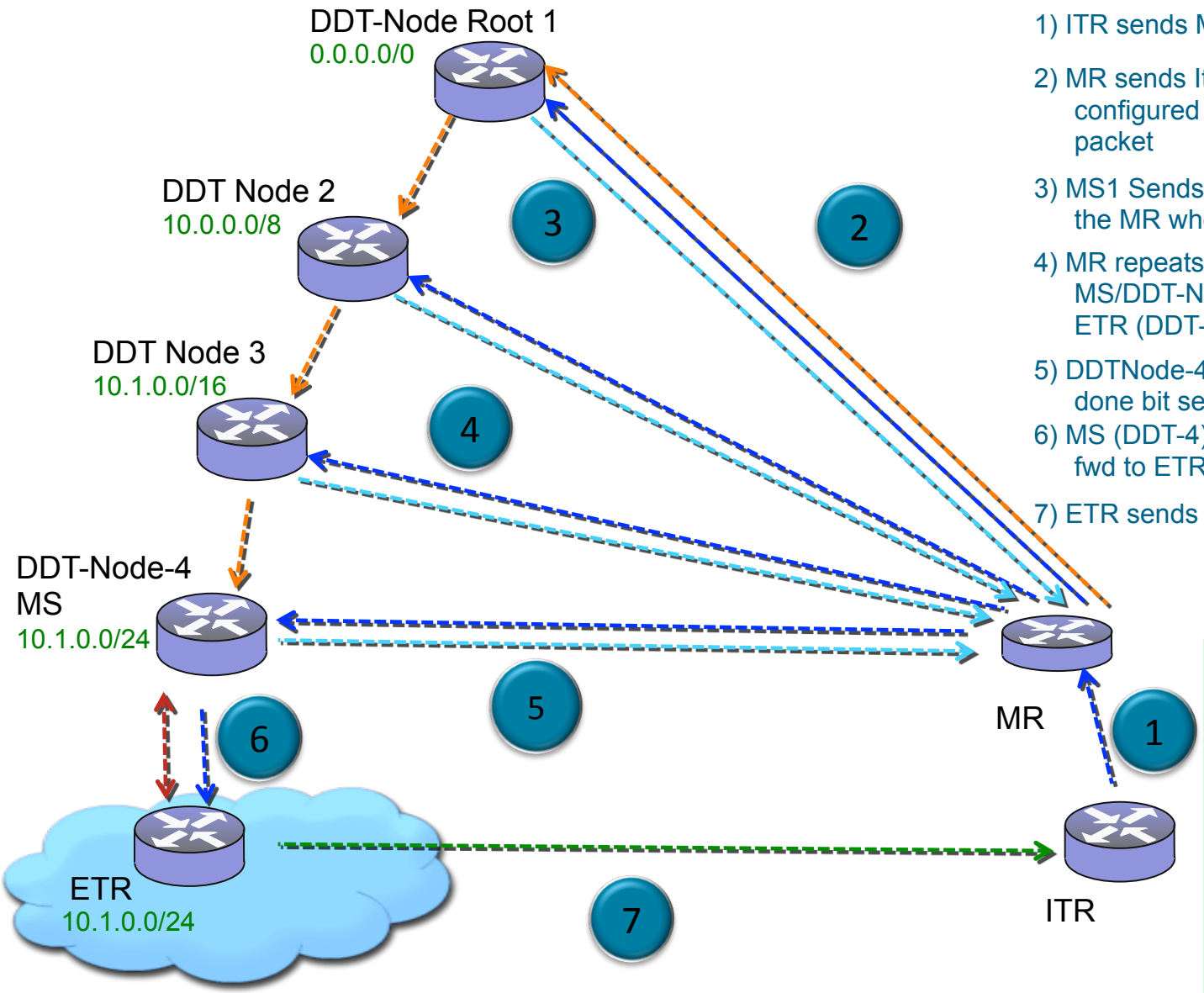
1) MR configured with Root, or MS1, RLOC

2) DDT-1, DDT2, DDT-3, DDT/MS-4 configured children with child prefixes, and authoritative prefixes
   Ex. DDT-2 Delegates child 10.1.0.0/16 to MS3
   DDT-2 configured authoritative for 10/8 in IID0

3) ETR is registering its EID to the Leaf MS



First Request Packet Flow



Map Request, Referral, & Reply

1) ITR sends MRQ to MR via ECM
2) MR sends Iterative-MRQ to its statically configured Root DDT-Node via ECM-Like-packet
3) MS1 Sends a Map Referral to MR informing the MR who is the next DDT-Node (2) to try
4) MR repeats steps 2 & 3 until it gets to leaf MS/DDT-Node which has the registered ETR (DDT-4)
5) DDTNode-4 sends Map-Referral to MR with done bit set
6) MS (DDT-4) receives, processes MR and fwd to ETR
7) ETR sends Map-Reply to the ITR

Static Delegation Hierarchy

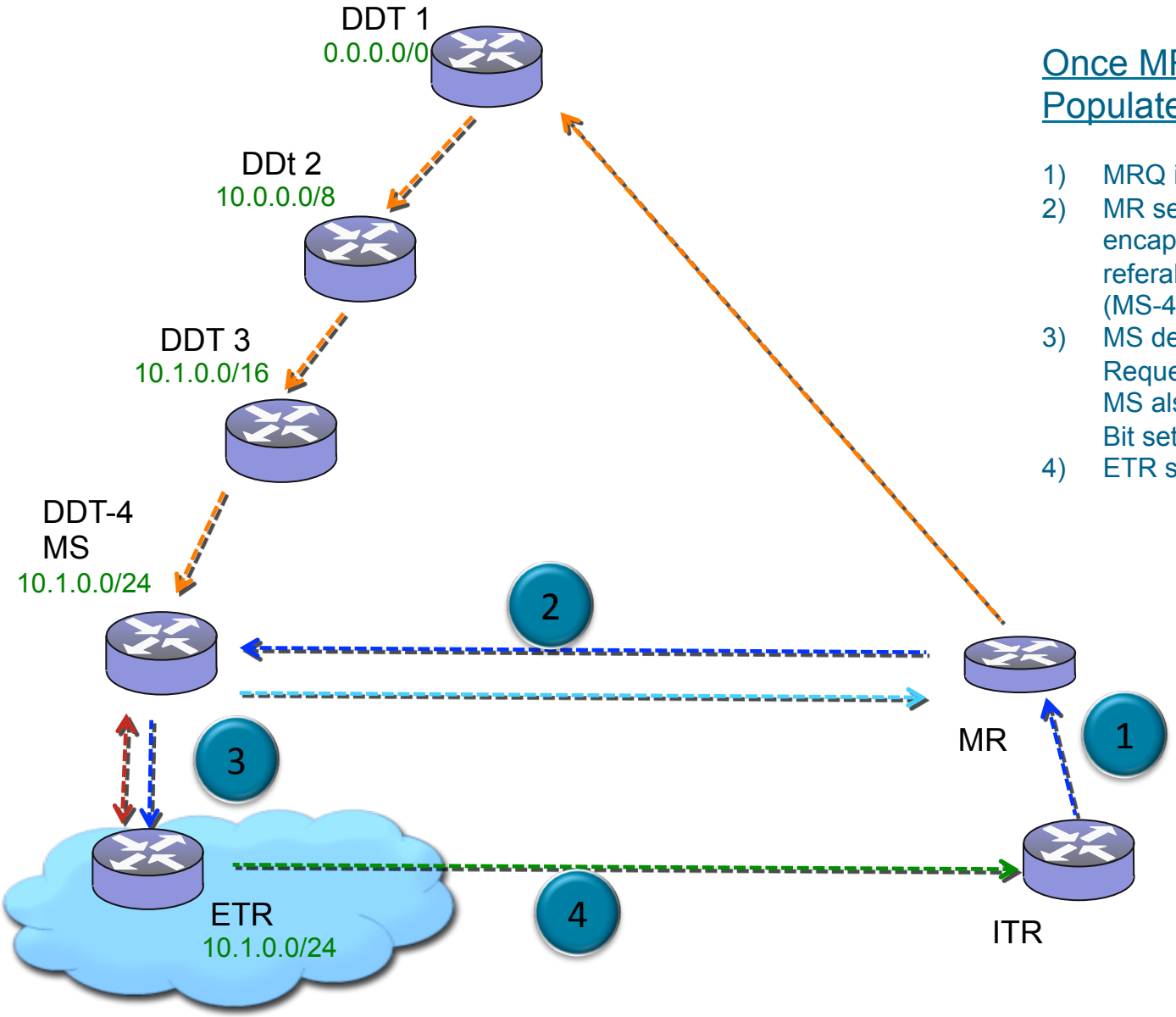
ETR-MS Registration

Map Request

Map Referral

Map Reply

Steady State



Once MR's Referal-Cache is Populated

1) MRQ in ECM arrives on MR
2) MR sends MRQ in ECM (possibly double encaped if lisp-sec is used to secure referal path) to Cache'd Leaf-Map-Server (MS-4)
3) MS decaps ECM and then sends Map-Request in new ECM to ETR
   MS also sends a Map-Referal with Done Bit set back to MR
4) ETR sends Map-Reply to ITR

Static Delegation Hierarchy

ETR-MS Registration

Map Request

Map Referral

Map Reply

DDT Implementation Status

- IOS and NXOS implementations complete
- Development, and interoperability testing going on now
- Beta Network running DDT code
- Configuration is pretty simple
- Does not include proposed DDT-SEC extensions

DDT Beta (IID0) Network Deployment