

Reactive Discovery of Point-to-Point Routes in Low Power and Lossy Networks

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Basic RPL Characteristics

- Basic RPL maintains routes "proactively"
 - destinations in the DAG must originate a DAO.
- Basic RPL routes only along a DAG
 - potentially leads to very suboptimal P2P routes, traffic congestion near the DAG root.

P2P: Desired Scenarios

- Source-initiated, on demand discovery of routes without constraints regarding existing DAG(s)
 - source-routes or hop-by-hop
 - discovery of one or more "good-enough" routes
- Measure end-to-end cost of existing routes
 - routes may be along-DAG or P2P
 - to be proposed in a separate document

RPL Extension for P2P Routing

- Reactive route discovery
- Use of DIO as Discovery message
- Creation of scoped, temporary DAGs for route discovery

RPL Extension for P2P Routing

- Use of good enough criteria for route discovery (OCP, metric containers)
- Option to use a subset of good enough criteria to limit the growth of the temporary DAG
- Multiple options for Discovery Reply to travel back towards the origin router

DIO as Discovery Request

- Discovery = DIO message option
+ temporary DAG (+ route record)
- Normal DIO propagation scope, generation
 - Outwards, link-local, trickle...
- Stricter scoping with good enough criteria

DRO as Discovery Reply

- Travels back to the request originator
 - Along discovered path if hop-by-hop state needs to be installed by reply
 - Any way otherwise: DAG, source route w. type 4 IP routing header, hop-by-hop, Fedex?