

# BPQ – DTNRG @ IETF-81

Bundle Protocol Query Extension Block  
draft-farrell-dtnrg-bpq-00

Stephen Farrell

[stephen.farrell@cs.tcd.ie](mailto:stephen.farrell@cs.tcd.ie)

Aidan Lynch

[lyncha6@scss.tcd.ie](mailto:lyncha6@scss.tcd.ie)

Dirk Kutscher

[kutscher@nec.de](mailto:kutscher@nec.de)

Anders Lindgren

[andersl@sics.se](mailto:andersl@sics.se)

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- Purpose – ICN
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# Information Centric Networking

- With BP, bundles containing what I want may be in a nearby node's cache; be nice to be able to get the payload without going end-to-end
  - Not a new thing to try – see section 6 of the I-D
    - And do let us know of other stuff we should put there, it might be useful by itself
- Context is that we want to be able to play the ICN game in a DTN but also spanning nodes that may not be part of the DTN
  - E.g. some Internet “gateway”

# BPQ Extension Block

- Idea: put a name for the payload in an extension block; if BP node has that already then it will answer
  - Note: we're not using destination EID for this
- “Query” bundles are sent to a destination known to be able to answer
  - Containing the BPQ EB
- “Response” bundles are sent to the source EID of the query bundle from any on-path node that has that named payload and the Query bundle is not forwarded further (mostly)
  - Responses also contain a BPQ EB
  - If a query does get all the way to the destination EID then it produces a response bundle that does contain the BPQ EB
- Nodes that know nothing of this just route the bundle as normal, based on the destination EID (or whatever)

# Names in BPQ

- Mostly BPQ doesn't care
- But maybe someday it should so we include a matching rule in the block
  - Just “exact match” defined for now
- And the name is a string of octets
  - Later: we envisage following draft-farrell-ni for naming things (to be presented in decade WG Tuesday)

# Fragmentation - Yuk

- What if a node has a fragment of the answer?
  - Don't panic, but do close-eyes ;-)
- In this case we're trying the following:
  - Respond to the querying node with the fragment you have
  - Forward the query bundle but mark it with the fragments already returned
- Yuk-iness:
  - Query bundle could accumulate a lot of fragment information
  - Lots of fragments flying about - confusing
  - Makes security hard-to-impossible

# BPQ Extension Block Content

- Cruft:
  - Block type code (IANA TBD – using 0xC8 for now)
  - Block processing control flags – whatever, but don't set the “replicate in all fragments bit”
  - EID references – whatever
  - Length
- Specifics:
  - Kind - Query (0x00) or Response (0x01)
  - Matching rule – exact match 0x00 only one for now MUST be the same in query and response for a match
  - Length & Value – the octets “naming” the payload
  - Fragments (OPTIONAL) ordered list of offset,length – SHOULD merge adjacencies

# BPQ To-Do List

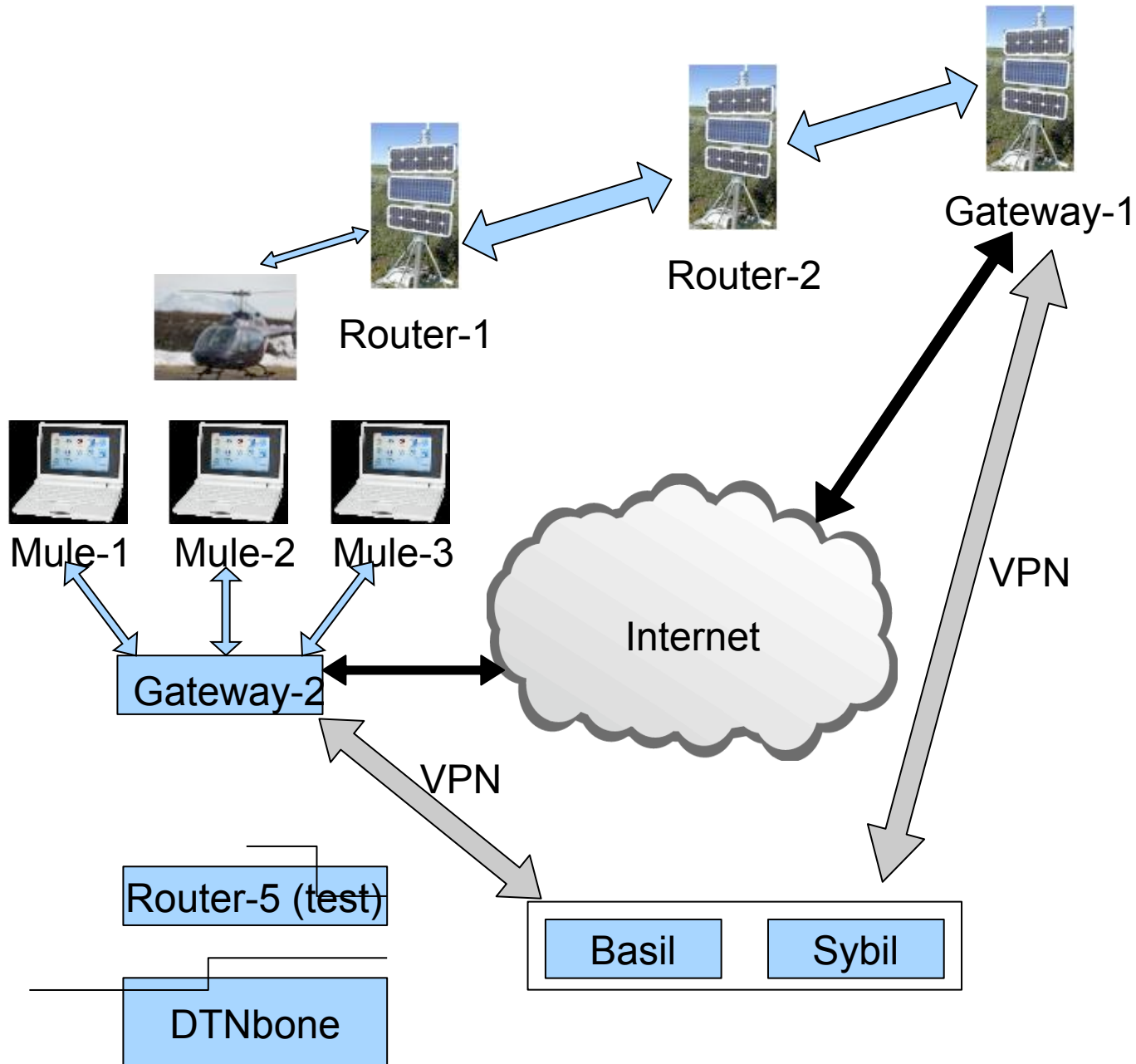
- Figure out if we're right about the field values to set in responses
  - Not sure what to do with other extension blocks
  - Reports and custody-ack settings?
- Query says bytes 0-100 needed still and matching bundle (fragment) has 0-100000000 do I send 100 bytes or the whole thing?
- Security
- Does a node need to search its cache just when the query lands or just before it can send the response?
- Keep a query for a bit in case a response arrives later?
  - What if everyone does that?
- Write fragmentation code :-)
  - Basic code in DTN2 now, but not part of 2.8



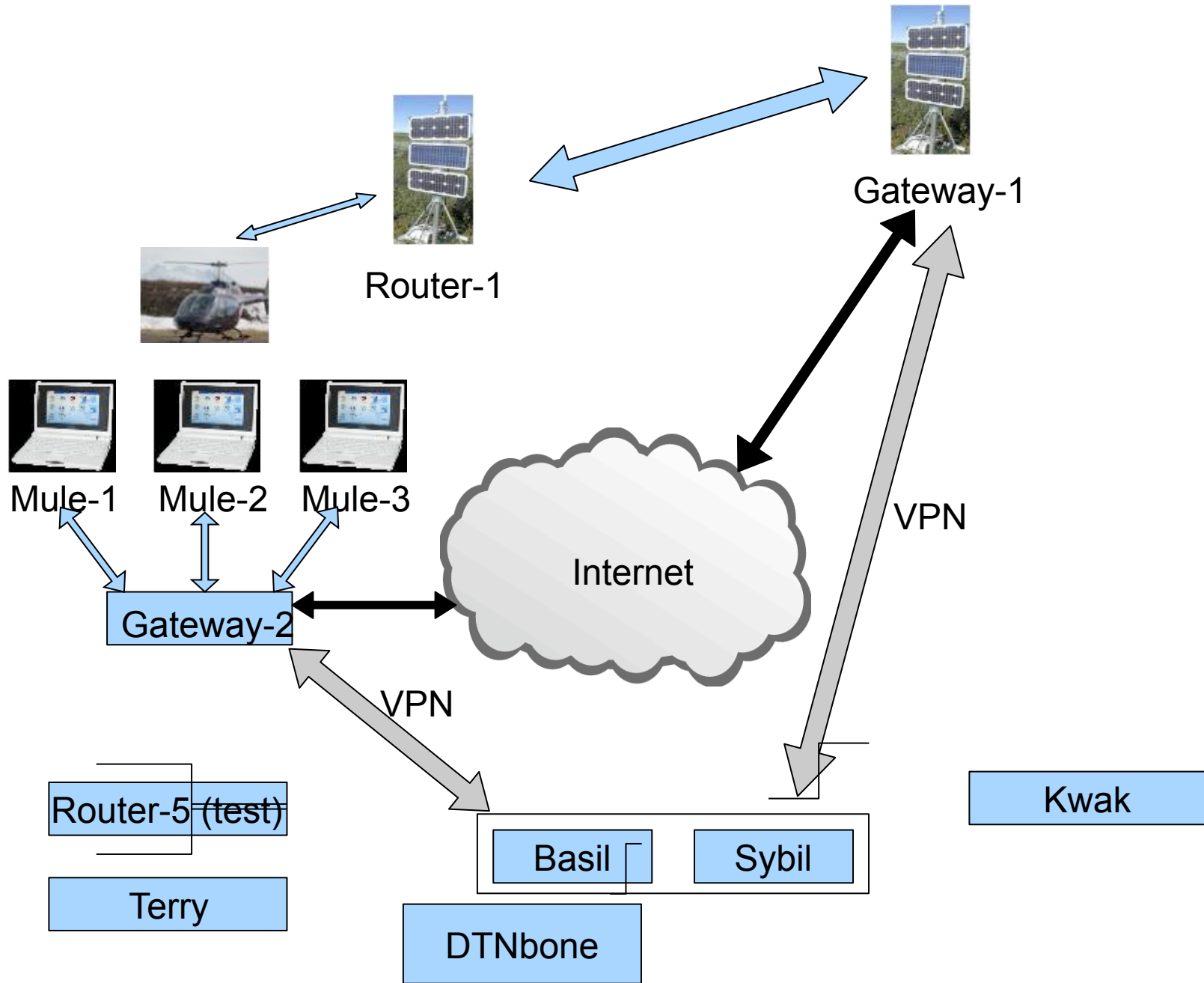
# SAIL Summer 2011 DTN Trial

- Following on from N4C trials:
  - See: <http://dtm.dsg.cs.tcd.ie/> and <http://www.n4c.eu/>
  - Full bundle logs for 2009 & 2010 at the TCD URL above
- 2011: smaller ~1-week trial in the Swedish arctic mountains during the Sirges reindeer calf-marking, July 9-15
  - Done by SICS and TCD staff with help from Tannak and funding from FP7 SAIL project and a grant from .SE (thanks!)
- “Highlights”
  - Used DTLNR; 30km GSM link to base-station, web and mail as before; added twitter, facebook and video fetching using BPQ
  - Mosquitoes, rain, helicopters not where you want them, GSM mast outage, ... (the usual;-)
- Results not yet available, mail and web worked ok, BPQ stuff needs more work, but some bundles were returned from caches
  - Will send link to results stuff to dtm-interest when its ready

# Planned Network



# Actual Network





# Trial Photos

