Routing Domain Confederations

Paul Traina

Terminology

Autonomous System / Routing Domain

- A set of networks sharing the same routing policy.
- Internal connectivity
- One contiguious unit

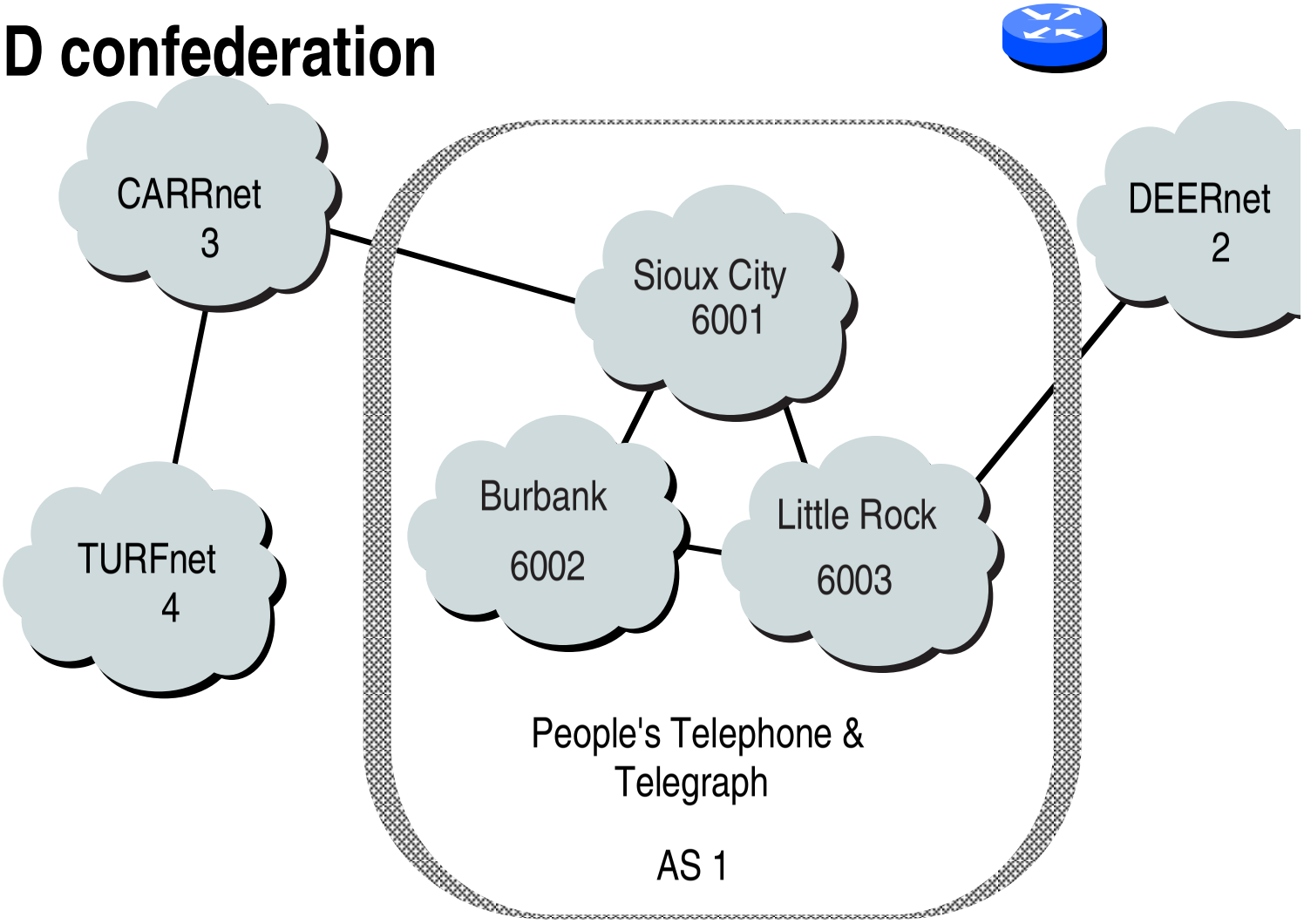
Terminology

AS/RD confederation

- Collection of autonomous systems
- Distinct topology inside (member ASs exist)
- Single entity from an external point of view

Terminology

AS/RD confederation



Why bother?

- Control internal policy with AS path
- Eliminate iBGP full mesh
- Eliminate unnecessary AS hops (affect metric)
- Hide internal topology/reduce coordination with others

Current cisco implementation

being revised

- new "types" in AS path attribute
  - as-set
  - as-sequence
  - confed-sequence
  - confed-set
- All members of confederation must understand new types

AS path examples

- [6001 6002 6003] 2
- 1 2
- 4 3 1 2

Aggregation implications

how do we deal with aggregating different info in a confederation

- route A: [6001 6002] 2 3
- route B: [6001 6003] 4 5
- merged: [6001] (6002,6003){2,4,3,5}
- upon exit: 1 {2,4,3,5}

Revised implementation under research

No implementation done yet

- Allows interaction with non-RDC capable gateway inside confederation
- Optional non-transitive attribute (urk?)
- Sequence of AS/RDc pairs
  - entry-AS / RDc identifier

Shared IGP issues

If we assume a common IGP across a confederation

- don't modify parameters when crossing AS boundaries
  - local_pref
  - multi_exit_disc
  - next_hop

Routing Domain Confederations

Paul Traina

Terminology

Autonomous System / Routing Domain

- A set of networks sharing the same routing policy.
- Internal connectivity
- One contiguious unit

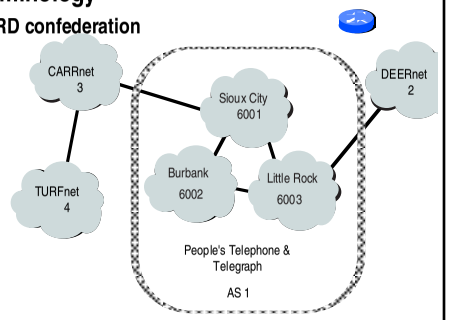
Terminology

AS/RD confederation

- Collection of autonomous systems
- Distinct topology inside (member ASs exist)
- Single entity from an external point of view

Terminology

AS/RD confederation



Why bother?

- Control internal policy with AS path
- Eliminate iBGP full mesh
- Eliminate unnecessary AS hops (affect metric)
- Hide internal topology/reduce coordination with others

Current cisco implementation

being revised

- new "types" in AS path attribute
  - as-set
  - as-sequence
  - confed-sequence
  - confed-set
- All members of confederation must understand new types

AS path examples

- [6001 6002 6003] 2
- 1 2
- 4 3 1 2

Aggregation implications

how do we deal with aggregating different info in a confederation

- route A: [6001 6002] 2 3
- route B: [6001 6003] 4 5
- merged: [6001] (6002,6003){2,4,3,5}
- upon exit: 1 {2,4,3,5}

Revised implementation under research

No implementation done yet

- Allows interaction with non-RDC capable gateway inside confederation
- Optional non-transitive attribute (urk?)
- Sequence of AS/RDc pairs
  - entry-AS / RDc identifier

Shared IGP issues

If we assume a common IGP across a confederation

- don't modify parameters when crossing AS boundaries
  - local_pref
  - multi_exit_disc
  - next_hop