P2P-Protokol, Version 0.2

BGP

- Extending the P2P Node Software by adding Path-Vector Routing:
  - Manage Routing Table
  - Best-Path Selection
  - Update Forwarding Table using Routing Info
  - Communicate Routing Changes

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BGP

- New message type:

  LOCALTRANSPORT P2P/0.2
  Application: BGP
  Content-Length: 39

  ANNOUNCE viper:2000

- Only Neighbour-to-Neighbour, so:
  - No FOR/FROM/TTL

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BGP

- Message Contents:
  - ANNOUNCE: have new best path to destination
  - WITHDRAW: lost last path to destination
  - NOTIFICATION: protocol error

- BGP Table:
  - Contains multiple routes to reachable destinations
  - Max. one route per (neighbour, dest)
  - Nodes report only best (=used) routes
  - One route per dest is best
  - Best routes are fed into Forwarding Table (destination, next hop)
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**BGP**

- Routes: 
  - `<destination> _ <AS path>`
- AS Path: 
  - `<Node-ID> ("," <Node-ID>)*`
- first (left) node of path is neighbour
- last (right) node is originator (=dest)

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**Initialization of BGP Table:**

- Table is empty
- New neighbour:
  1. insert route to new neighbour
     - dest: neighbour
     - as-path: neighbour
     - neighbour: neighbour
     - check best routes (see below)
  2. send ANNOUNCE messages for all our best routes to new neighbour, with our own Node-ID prepended as first entry (path prepending)

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**Receiving ANNOUNCE messages:**

- do loop check: is our Node-ID already in AS-Path?
  - If yes ignore!!!
- temp. remember best route to dest
- Route with same (dest,neighbour) already there?
  - If yes: replace, unmark BEST
  - else: insert
- check best routes (see below)

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**Receiving WITHDRAW message**

- temp. remember best route
- delete route with given destination and nexthop equal to sender of WITHDRAW
- check best routes (see below)

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**Check best routes (per destination!):**

- search best route for dest
- new best route different from the old one?
  - mark new route as best, unmark old
  - update entry in forwarding table
  - broadcast ANNOUNCE

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**Check best route (cont’d)**

- no route found, but had one before deleting (temp. remembered!)
  - remove entry in forwarding table
  - broadcast WITHDRAW
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- When using BGP:
  - *Do not* use autolearning to change Forwarding Table!!

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**Organizational**

- This assignment spreads over two semester weeks, due January 15th, 2007
- Next tutorial January 15th, 2007
- **BUT** Next group discussion on January 7th, covering 8th assignment

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**Ansonsten:**

- Frohe Weihnachten und nen guten Rutsch ins Neue Jahr! Erholt Euch gut!