CSE 588 Week 3 (April 16, 2002) Second half notes

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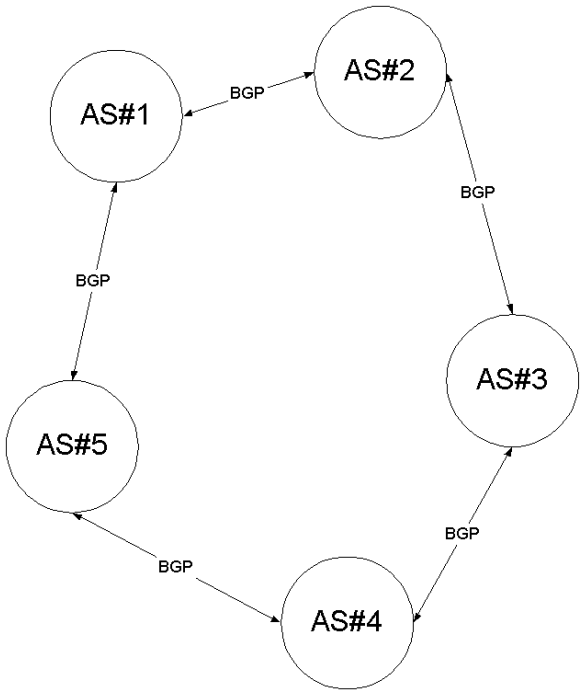
BGP – Border Gateway Protocol

What is BGP?

- Protocol for interlink domain communication
- Exchange information – path to every prefix. i.e. path vector routing
- Routing – shortest path preferable
- Endpoint – Atomic System (AS)
- Can have multiple AS per organization



Why BGP?

- Apply different policy on link to different AS
- Hierarchical routing
- Scalable

BGP Policy

Can program policy to:

- restrict usage
- use custom network

Policy knob describes:

- Who buy a link

- Which prefixes over which link
- "preferences" for which links to use for outgoing traffic
- meds – favor list for a set of prefix
- community – indicate prefixes that are direct customers, way to attract traffic
- peering – ASs that are paired up to do business

Transit Carrier

- Carrier provide connection between global network to ISP.
- Burst-able circuits charge on usage-basis
- ISP earn money by ensuring customer $ > transit carrier usage charge
- BGP is a way to apply policy to restrict use, network traffic flow control etc.

Packeteer

- Change receive window of packet on the way sending packing along
- Technique use to control rate of return traffic (by applying smaller receive window)
- Commonly used to control traffic on transit carrier charged on usage-basis

Economical view point

- Being a transit carrier is tough, and is a failure. (Example companies: 360, Global Crossing, Level 3, Qwest). Dominant company usually charge unreasonably
- Policy in BGP apply are mostly for financial purpose, such as to lower expenditure; or for political reason, such as to control traffic to/from peers/competitors

Weaknesses

- Lots of oscillation
- Lots of advertisement
- Policy implementation can eventually generate loops
- Complicated - Local optimal doesn't imply global stability
- Many unnecessary and redundant updates on a complicated network

Common routing application

- Exterior – policy based routing
- Interior – shortest path
- Small AS: Gather packet to a centralize place to direct to the external network. Therefore, few router need to apply policy
- Large AS: Use router collector.
  Two steps: (1) use prefix advertised find exits; (2) use shortest path to exit