State of the Art

Peerhosting
- is a Web hosting infrastructure providing global, self-balancing cluster of Web Hosting Providers (WHP) web servers
- integrates hosting capacity of individual web hosts and delivers a broker service that allows trade in hosting capacity among WHP’s

Research Goal
- Design an appropriate name resolution solution for Peerhosting that
  • is highly scalable and tolerates high churn;
  • minimises load at both DNS system and Hosting Provider servers.
  • Ascertain feasibility of a peer based DNS solution in view of the extremely low latency requirements

State of the Art

There are only a few systems which propose DNS based on peer to peer routing protocols:

- DDNS (Distributed DNS)
  - DNS solution based on DHash (A Chord based DHT)
  - Routing performed by finger table algorithm, thus memorizes location of other nodes
  - No Caching layer implemented

- CoDONS
  - A peer based name service based pastry routing protocol
  - Pastry uses Prefix based routing
  - Low query latency due to the Beehive caching layer

Design

Architecture based on pastry routing protocol.
- RR-set Insert
- Performance Insert
- DNS lookup

Distinct Features:
- The resource records are replicated across multiple nodes
- Nodes make decisions independently based on performance statistics from the HP Servers to server the most appropriate HP Server

Research Challenges

- DNS considered a solved problem. Therefore very little work on peer to peer DNS systems.
- Efficiency a key concern as the query delay increases with the number of hops traversed by the query before being answered.
- Simple caching mechanisms not feasible as each node responsible for making independent decisions based on current performance statistics.
- Automatic load balancing in both DNS peer network and Peerhosting peer network.
- Enforcing Fair sharing to reduce load imbalance

Conclusion

- Demonstrated solution delivers a reasonable architecture with scope for further improvements, effectively minimising hops traversed using replication and proactive caching strategies.
- Evaluation results show that the computational cost at each node is reasonable and it does hinder the node performance significantly.
- Extensive PlanetLabs testing for highly accurate results is required as the performance depends on too many variable factors and network conditions of the day.

M.Sc. in Computer Science
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