Progress Summary
for OIGY

March 16th, 2012
Network Architecture

Overlay Networks

Heterogeneous Physical Networks

Internet

HAPPY Net

Copyright © Chi-Sheng Shih
Background

- Design an distributed service recovery algorithm for real-time publish and subscription services.

- Assumption:
  - The network is partitioned into subnets.
  - In each subnet, there is at least one *landmark node* (LN) and one *gateway node* (GN).
    - Landmark node: is visible from all the nodes in the subnet.
    - Gateway node: is the gateway to bridge all the traffic to other subnets.
  - Real-Time publication and subscription services are installed on all the nodes.
Landmark-based Service Recovery

- This approach is a centralized algorithm and will be used as the base for performance comparison.

- Rationale:
  - LN passively monitors the traffic among brokers to learn the link status, and query the latency on demand.
  - When one link is down and detected, LN selects a proper service, i.e., broker, to replace the failed services.
Implementation on QPID

- Added services to QPID:
  - Landmark console: watches all the links in the subnet and is able to detect the change on link status within few milliseconds.
  - Service recovery: the failed services such as queue configuration can be restored on the new broker node.
  - Message re-route: the messages on a failed broker are re-routed to reach its destination.
  - TTL and latency maps between brokers: the number of network hubs and latency between brokers are collected.

- To-be completed in next month:
  - Given change of link status, TTL maps, latency maps, and broker properties, LN will select the suitable broker to replace failed service.
  - Implement the distributed algorithm on QPID subnet.