A Dynamic Publish-subscribe Overlay Network
Yunhua Koglin Elisa Bertino
CERIAS and Department of Computer Science
Purdue University

**Motivations**
- Large-scale publish-subscribe overlay networks
- Connectivity is not reliable
- Frequent topological reconfiguration

![Diagram](image)

**Our goal**
- Increase event delivery while at the same time, decrease number of messages generated

**Important factors**
- Different system sizes (number of brokers);
- Different rates of link failure;
- Different routing information propagation rates.

**Mathematical Models**
- Probability approach
  - A broker randomly chooses subset of its links to forward an event;
  - A broker forwards an event at most once.

\[
\begin{align*}
  c_i &= \frac{N - C_{i-1}}{N} c_{i-1}[L_p] \frac{L - 1}{L} \\
  C_i &= C_{i-1} + c_i \quad \text{if } i > 0
\end{align*}
\]

- Ripple propagation
  - A broker propagates its subscription information h hops away;
  - A broker forwards an event only if its neighbors asked this event;

![Diagram](image)