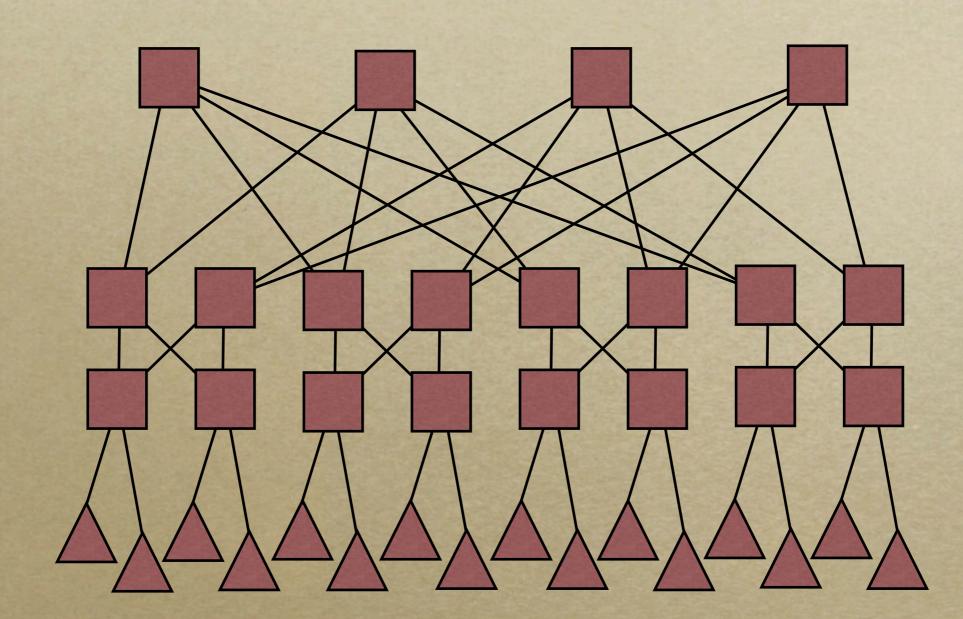
# Miswiring models for autonomic naming in a data center fabric

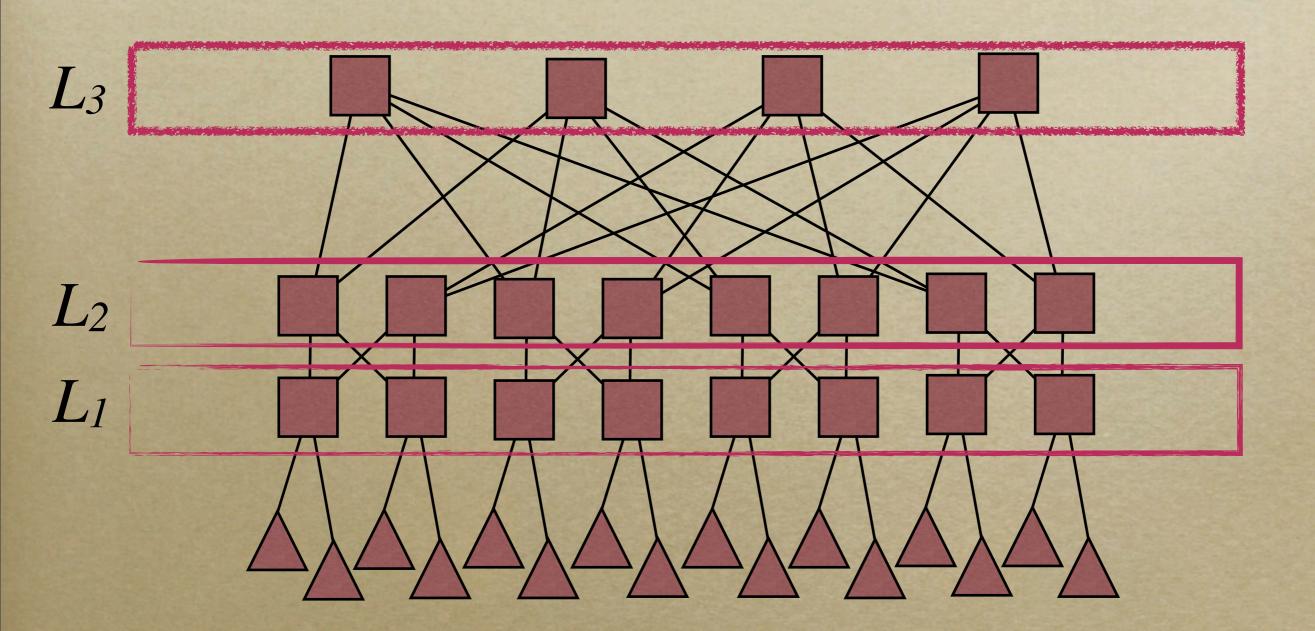
Keith Marzullo, UC San Diego Dept of CSE with Pardis Miri, Meg Walraed-Sullivan, and Amin Vahdat ... and others of the PortLand project

#### Architecture



with three levels and k port switches:  $5k^2/4$  switches,  $k^3/4$  hosts

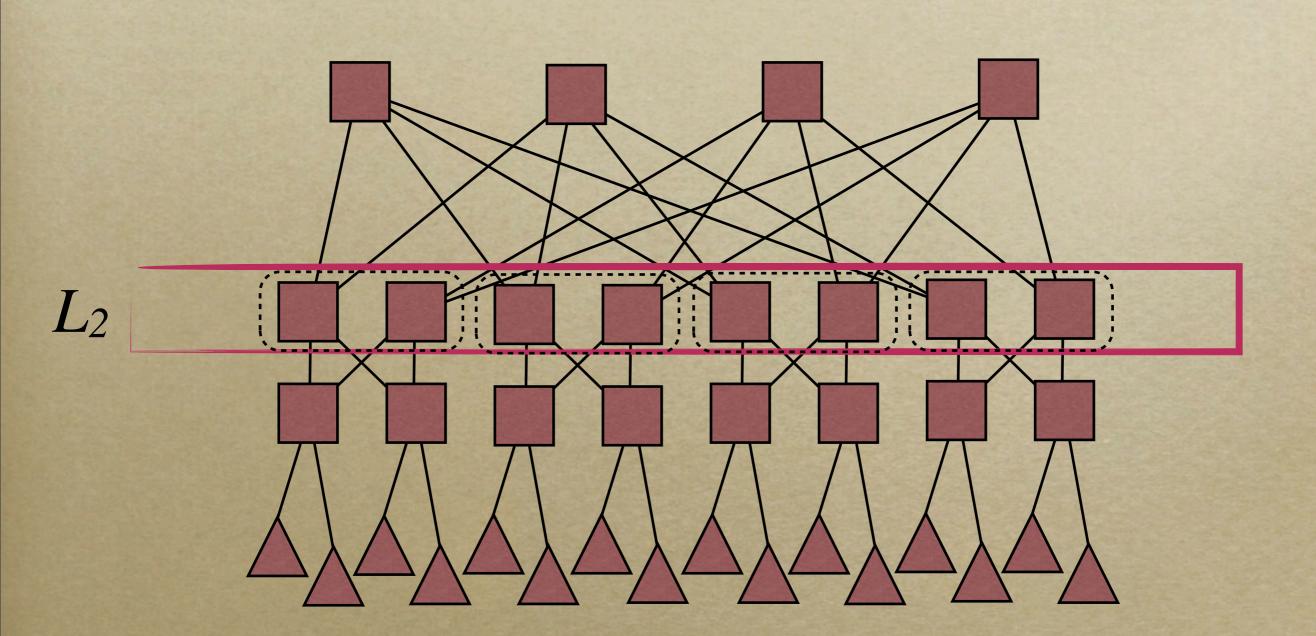
### UNRP: Autonomic naming



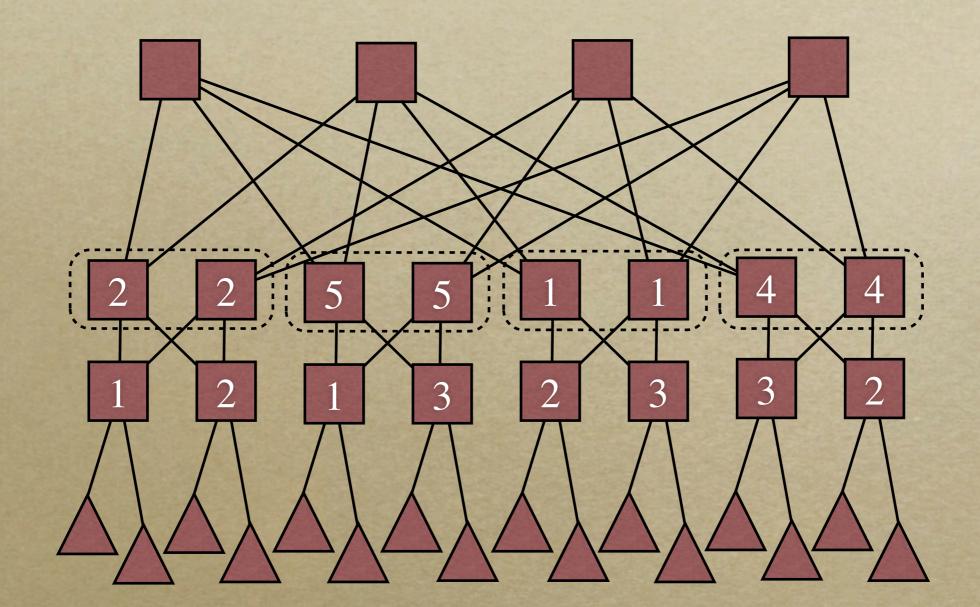
Sunday, January 16, 2011

#### UNRP: Autonomic naming

STREET & ANTES



### UNRP: Autonomic naming

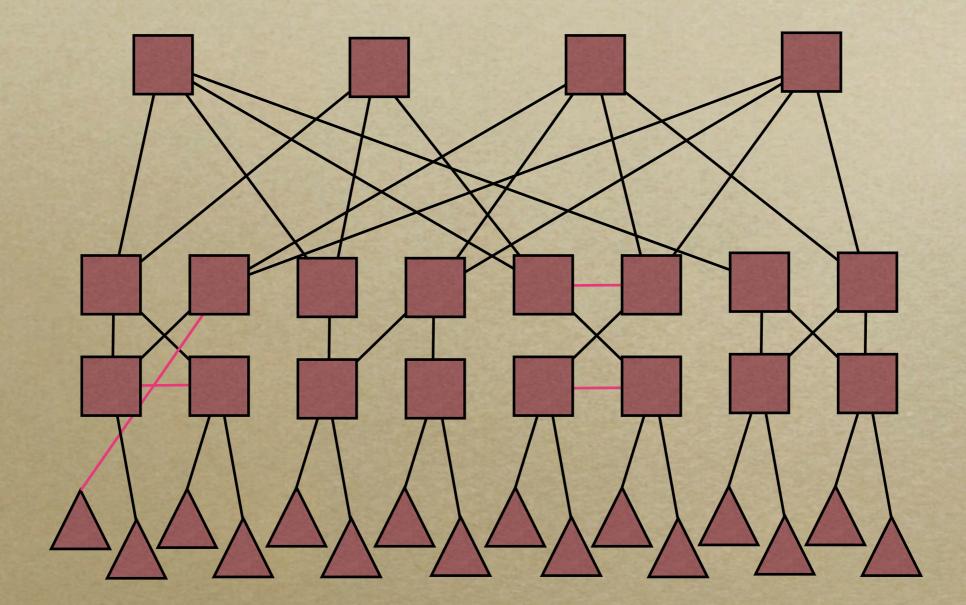


Sunday, January 16, 2011

# Miswiring

ALL SECONDENTAS THINK

STREET & BATTER.



Same and the

## Modeling miswirings

First idea: use a *threshold model*Assume graphs are *d-deficient*:
In *n* × *n* bipartite graph, each node has at least *n* – *d* edges

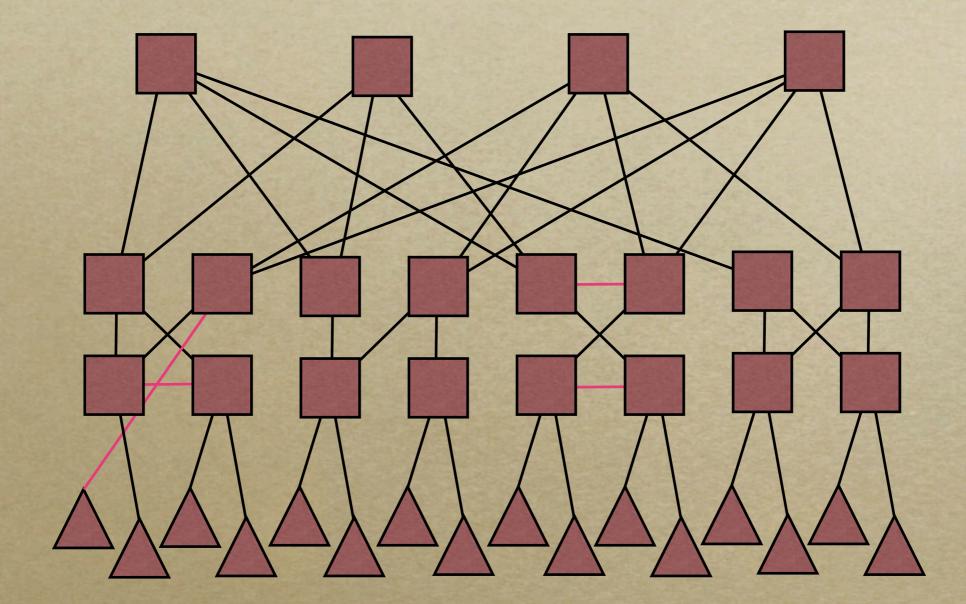
#### The good and bad with this model

- k-deficiency is a nice mathematical abstraction
  - *n* and *k* are large, and so a large *d* should indicate many failures => unlikely
  - diameter of bipartite graphs are easily bounded in terms of *d*-deficiency
- ... but we rejected it
  - hard to instantiate
  - issues of fabric startup

#### Model we used

- Assume *l* levels; hosts connected to one (lowest) level
- Assign addresses quickly and using few messages
  - The closer to a fat tree, the better the addresses
  - Two hosts separated by more than 2 ℓ −1 won't be able to communicate with each other
  - Do diagnostics separately
- Transfer risk of loss of reliability from instantiation to quality of immediate result
  - Reminiscent of graceful degradation

stand & Advent

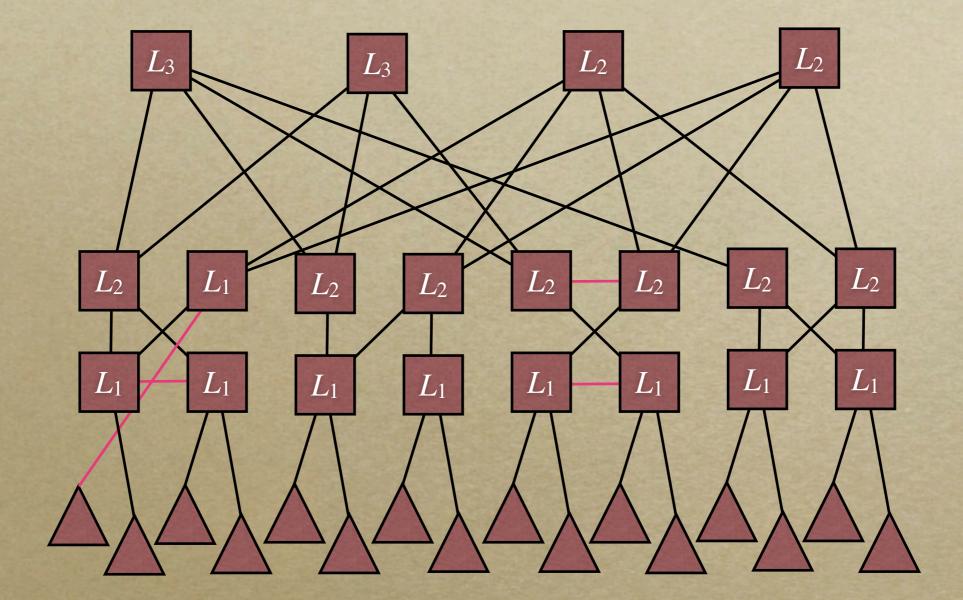


ANT IN THE R.

How is love was so

Manager State Desta A Adves

STRAFF & BATTER

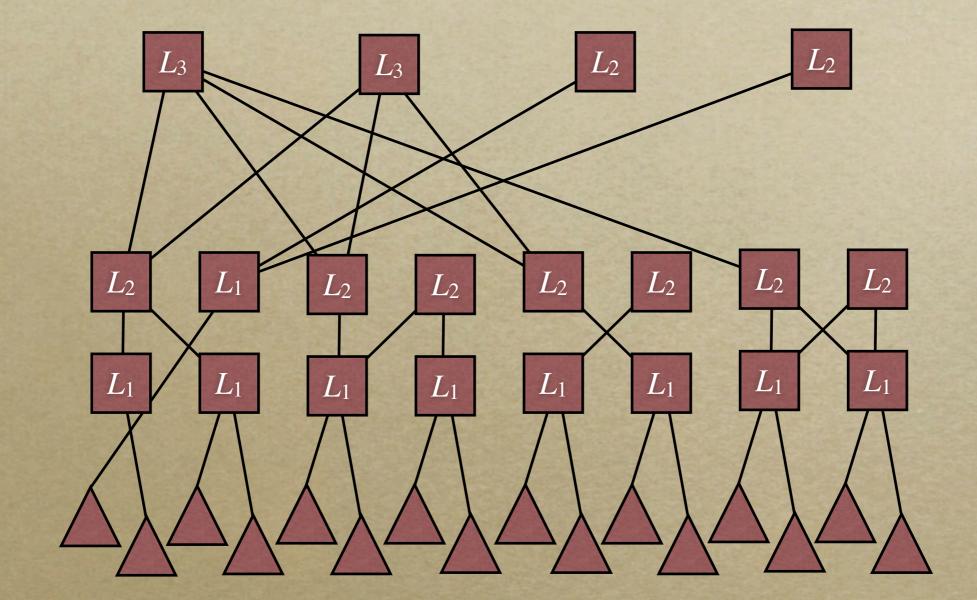


AND THE REAL

the and the terry and the

MARCHINE CONTRACTOR

STRACK A BANKS

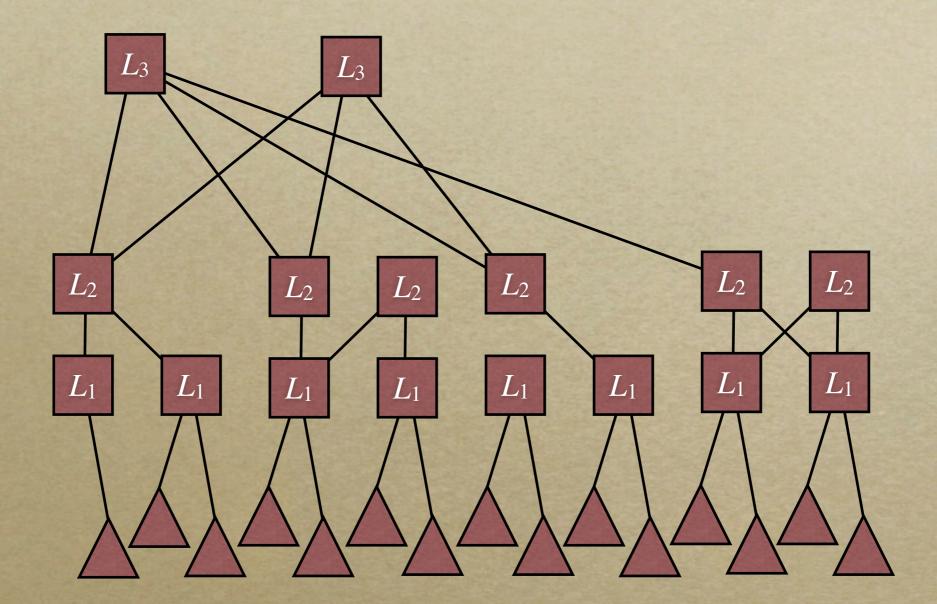


Sunday, January 16, 2011

AND THE REAL

The A lor was in mounter - mounter the

STREET & MARKER

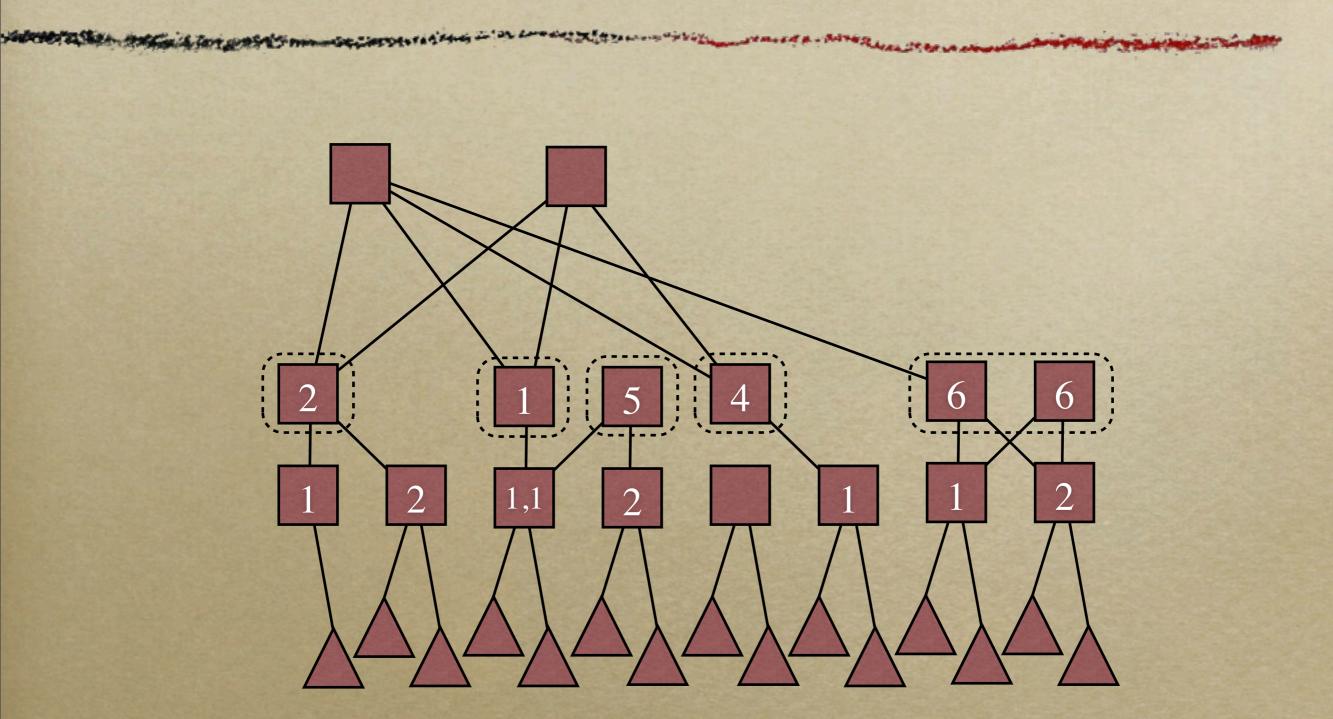


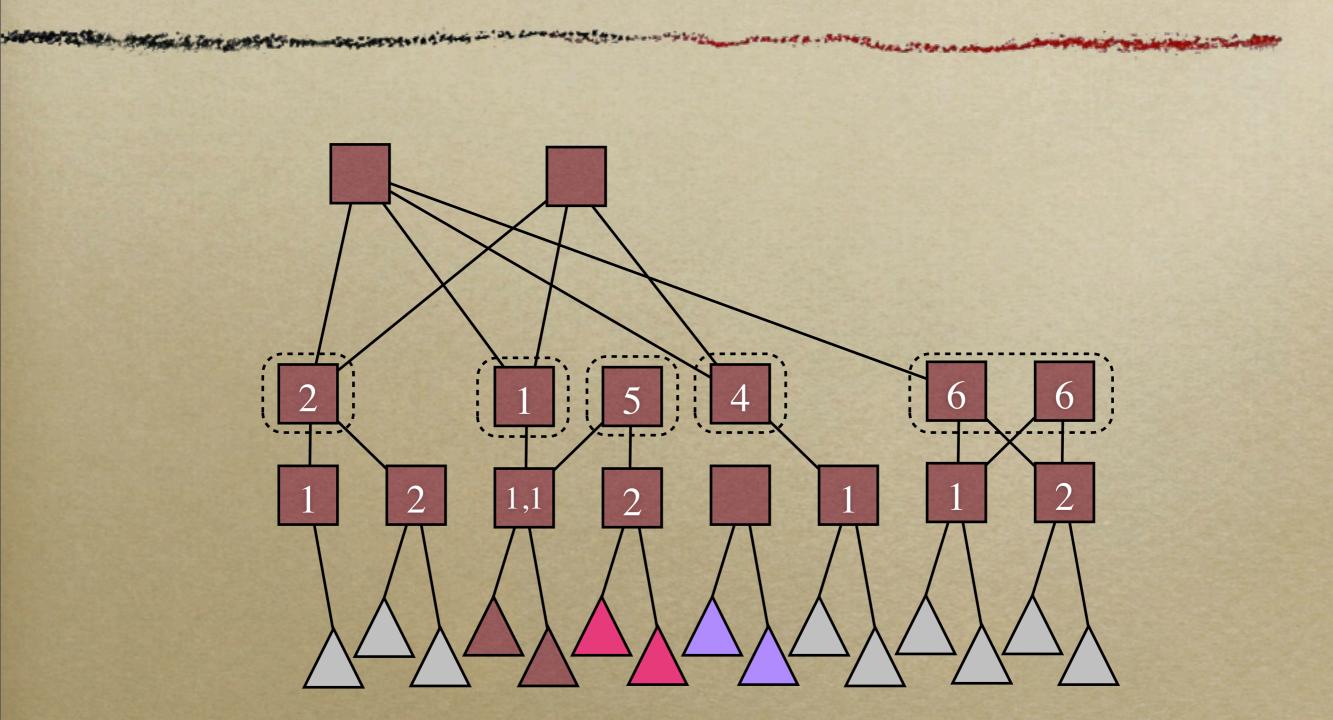
Sunday, January 16, 2011

Sales and the sales

the second second second

maint Seroforad Ma





#### Current work and questions

- Allowing for hosts to be connected at any level
  - Level assignment becomes harder
  - Miswiring model still appropriate?
- Diagnostics

• Can we be more precise about the closer to a fat tree, the better the addresses?