

# Network Algorithmics: Lecture Notes for 10/10/2012

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## Deficit Round Robin:

In this technique, each flow is considered compared to the quantum size. The 'pointer' goes to the foremost packet in each flow once, comparing the size of that packet to the quantum size for that system. If the size of that packet is greater than the quantum size, one instance of the quantum size is put into the deficit counter for that flow. The pointer goes on to the next flow, and this goes on till the deficit counter of each flow is less than the size of its foremost packet. As soon as it becomes equal to or greater than the packet size, that packet is served.

## Churning:

The rate at which flows are introduced in to the system and leave the system.

>For any tree, the number of memory accesses gives how many cuts can be made into the tree. For example, two memory accesses mean 1 cut into the tree. The cut is visualized to be made into each height or 'level' of the tree, and at each the number of child nodes required is calculated.

$$\text{Opt}(000, 1) = 2$$

$$\text{Opt}(\text{Whatever}, 2) = \text{Sum of all Opt's with 1 child node}$$

## **Switch Pointers:**

Connect child nodes of different nodes together so that if you follow the source child node, you get to the destination child node through the switch pointer.

## **Caching Prefixes:**

If you have a packet, and you do an IP lookup, you can store its address and destination for future reference. So if a packet comes in future with similar IP address, it will be sent to the stored destination. You generally have the prefix of the address i.e. first few digits.

All the prefixes with same length will be grouped in the same hash table. You should be able to encode variable length strings in the hash table. For example, to encode  $100^*$ , you would write 100 then a 1 followed by 29 0's, for a string of length 33.

>If you have  $N$  rules and 5 fields, you will have  $N/2 * N/2$  in 2 dimensions,  $N/3 * N/3$  for 3 dimensions and so on.