Demonstration of NSA Allocation Function

draft-li-6lo-native-short-address-02

Guangpeng Li
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Specifications on NSA Allocation Function

• The allocation function for NSA can be different case by case, but all nodes under the same root MUST use the same one. See section 4

• The typical example algorithm given in the draft is as follows:

\[
AF(\text{role, f, l}) = \text{'address of the node performing the function'} \\
+ (\text{role == leaf? b(l++):b(f++)}) \\
+ (\text{role == leaf?'1':'0'}) 
\]

• In section 4, the formula to calculate max length of addresses is given:

\[
\text{Max\_Length} = \text{length(Parent address)} + \text{length(b(max(f,l))) + 1}
\]
The Code of AF example in the draft

```python
AF(role, f, l) = 'address of the node performing the function'
    + (role == leaf? b(l++)b(f++)
    + (role == leaf? '1':'0')

```...```python
def addressAllocation(self, parentAddr, layers, maxCld, nodeGenMethod):
    dagDict = {parentAddr:None}
    if layers == 0 or (len(parentAddr) > 1 and parentAddr[-1] == '1'):
        return dagDict
    else:
        if nodeGenMethod == 'Random':
            childNum = random.randint(0, maxCld)
        elif nodeGenMethod == 'FullFill':
            childNum = maxCld
        else:
            return dagDict

        if childNum > 0:
            lNum = 0
            fNum = 0
            subTreeList = []
            for cNum in range(0, childNum):
                role = random.randint(0,1)
                if role == 1:
                    childAddr = parentAddr + self.nsa_b(fNum) + '0'
                    fNum += 1
                else:
                    childAddr = parentAddr + self.nsa_b(lNum) + '1'
                    lNum += 1
                    subTreeList.append(self.addressAllocation(childAddr, layers-1, maxCld, nodeGenMethod))
                dagDict[parentAddr] = subTreeList
            return dagDict
```
Case 1: Generate a topology and Assign Address

- Input total layers in the tree and maximum number of children of each node. In left case, the parameters are 4 and 4.
- Quantity of child is determined randomly here.
- After evaluation, there are totally 23 nodes.
- Maximum address length is 6, owned by blue nodes.
- Average length of addresses is 4 in this case.
Case 2: Read arbitrary graph and allocate NSA addresses
THANKS!

Live Demo