Project: The Intelligent Airport (TINA)

- Airports increasingly require ubiquitous systems
- Both fixed and mobile appliances
- Requirement for an intelligent, adaptive wired and wireless infrastructure

The project is a collaboration between the University of Cambridge, UCL, Swansea University and a few industrial partners.

Our work: Addressing and Routing

- Determine new algorithms for addressing and routing able to operate seamlessly in a combined wired and wireless environment

Which means:
- Start with Ethernet, as it’s ubiquitous
- But Ethernet does not scale well enough
- So fix it

One Specific Problem: Address Tables

<table>
<thead>
<tr>
<th>MAC address</th>
<th>Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>01:23:45:67:89:ab</td>
<td>12</td>
</tr>
<tr>
<td>00:a1:b2:c3:d4:e5</td>
<td>16</td>
</tr>
</tbody>
</table>

- Maintained by every switch
- Automatically learned
- Table capacity ~8000 addresses
- Full table means broadcast

Destination location known:

- Frame only transmitted on correct port

Destination location lost due to table overflow:

- Capacity wasted on needlessly broadcast frames!

This problem arises because the MAC address namespace is *unstructured* (as far as switches are concerned).

MOOSE

*Multi-layer Origin-Organised Scalable Ethernet*

The solution: introduce structure to MAC addresses

Frame source addresses are rewritten on entry to the network (by the home switch, which allocates the node identifier)

Switches need only store the locations of other switches:
- *Above, switch 11:11:11 only needs two address table entries!*

Completely transparent to standard Ethernet end nodes

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