

What are we missing?



# 0. Understanding the severity of the problem

# Earth 2099



**Population crashes**

Mass migration

**Vast new deserts**

Cities abandoned

**How to survive  
the century**

'New Scientist' Cover, 28 February 2009

# IP's original assumptions

- Addresses are “fundamental”
  - An “address” is the current Lowest Common Denominator of identity of protocol stack instances in a network
  - An “address” is the current Lowest Common Denominator of network rendezvous functions that operate at the level of on an instance of the protocol stack
  - An “address” is the Lowest Common Denominator of the packet forwarding paradigm
- Chipping away at these basic properties of addresses in IP weakens the entire IP fabric

# So What?

- The issue here is: “How do you know when you have gone too far?”
- And how do you back off, assuming that there is some form of back off still available?
- And can we afford to back out in a way that still leaves the essential characteristics of the Internet intact?
- Or is this erosion of the address-based model inevitable and irrevocable?

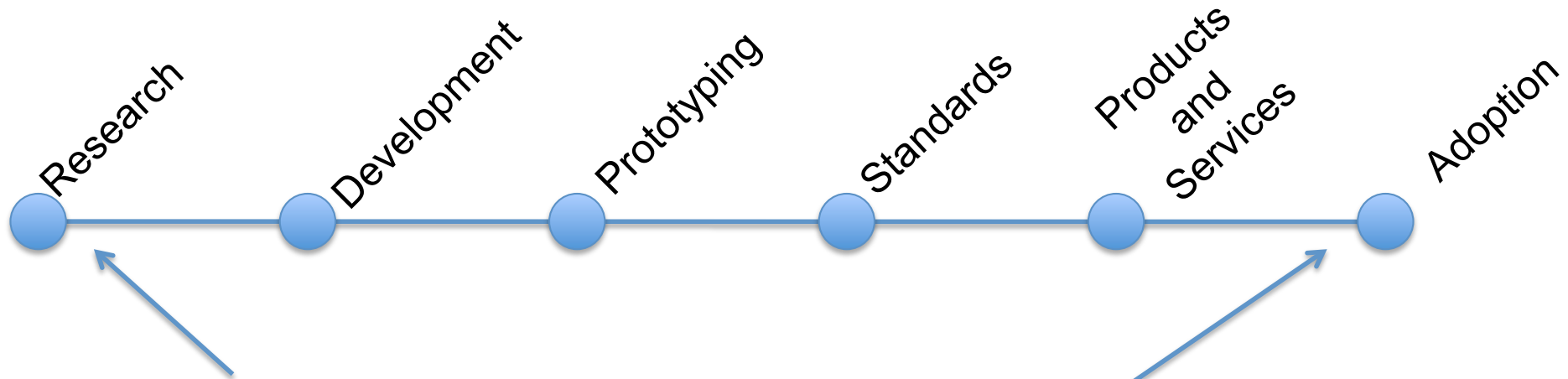
# 1. No Money

~~Good, Fast, and Cheap?~~

- Cheap is what drives the economics of the internet
- For an ISP, address scarcity has, so been a cost imposed on **customers**, not the ISP up until now...
- BUT all this is changing with address sharing proposals
- All these address sharing models impose new roles (and costs) on ISPs
- These models do not generate commensurate additional revenue
- Leading to a situation of displaced costs and benefits - the major benefits of this investment appear to be realized at the services and application layer rather than by existing large scale infrastructure incumbents, yet the major costs of such address sharing measures will be borne by the large scale incumbent operators of low layer access services

Sound Familiar?

## 2. No Time



- We appear to be at the initial steps of this process
- We would like to be at the final stages of this process in a month or two from today
- Is this scale of development and deployment over the entire Internet likely? Possible? Plausible? Implausible? Impossible?



# 3. Confusion and Chaos

- Given that available effort is finite, where should we invest to effect the greatest leverage?
  - Port rationing in IPv4 ?
  - IPv6?
  - IMS and Application Level Gateways?
  - Application Level Peer networks
- Or will each of us make our own individual decisions and create chaotic and unviable outcomes for the network as a whole?
- No commonality of purpose or direction
- What's a “natural” evolution here?

# Where Next?

- Do we need to address EVERYTHING with shared addressing models?
- Or do we just need to allow web access to work? (The “everything over http” model of Internet services)
- How will the next generation of application models react to this situation?

Or...

When all else fails, there is always denial



*Supertramp*  
CRISIS? WHAT CRISIS?

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