

What can we learn from Future Internet Architecture Research?

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Visions for Future Communications Summit
Lisbon, Oct 23-24, 2027

Future Internet Architecture projects

- The goal is to define a new architecture for the Internet that can address today's challenges at a fundamental level
 - Think: replace IP and all key protocols associated with it
- Very diverse projects in both US, Europe and Asia
 - Mobility First: focus on mobility
 - Named Data Networking: focus on information retrieval
 - PURSUIT: pub-sub interface for flexible information retrieval
 - SOFIA: service oriented networking
 - eXpressive Internet Architecture (XIA): focus on evolvability
- What drove XIA's design: long term trends that are persistent
 - Don't get distracted by today's fad

Trends Driving XIA's Design

- Communication, Computation and Storage technology will continue to improve allowing us to build a smarter network
 - But how do we do this without adding complexity?
 - The nature of applications continues to change and we are very bad at predicting it
 - Can we avoid defining a new architecture every 4 years?
 - Security is not going to get any easier
 - How can the network architecture help?
 - Push towards software solutions on commodity hardware
 - SDN for intranets – rethink the role of standards!
 - NFV: flexibility in placement of in-network processing
- Typed addresses with different forwarding semantics
 Evolvability and customization by evolving set of types and the concept of fallbacks
 Use of cryptographic identifier for cheap authentication of endpoints
 Simplifies deployment of the above ideas

What Trends in Wireless

- What is the same?
 - Evolution of technology
 - Evolution of applications
 - Security
 - Interest in software: SDRs get all the press but SDN as well
 - What is different?
 - Capacity growth but spectrum is a constraint
 - PHY layer matters, e.g., resource allocation
 - Data link layer technology: only need consensus in intra-net
 - Mobility is much more common, not an exception
- Ideas from FIA may be an interesting starting point
 Very different in a LAN
 Very important but need to figure out the drivers
 Spectrum efficiency and spectrum agility are key
 Multi-radio key
 Much more flexibility to innovate
 A constraint on diversity