

The Way Forward/ What is Missing?

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Speaking for Myself

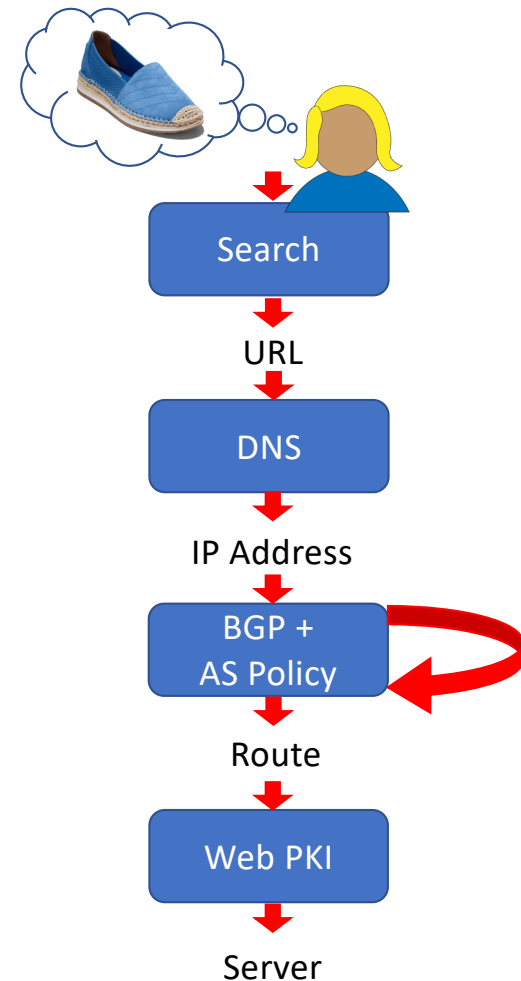
- A view from "afar"
 - You probably won't learn anything from me here!
 - Especially about B5G/6G (sorry!)
- I do have opinions.
 - Drivers requiring 5G's improvements?
 - We are nearing the end of the "era of mono-architecture"
 - "Waist of the hourglass" (IPv4, IPv6)
 - Instruction set architecture (IA-32, x86-64)
 - Entering "domain specific" era

A Way Forward?

Simplify.

Today

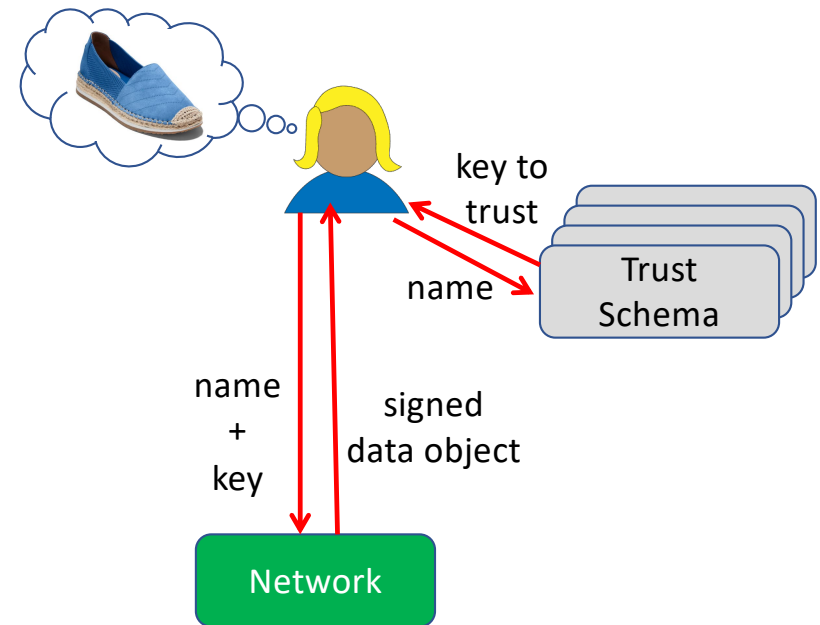
- Many layers of resolution/indirection before the channel is open – just @ L3 and up!
- Each relies on trust
 - Opportunity for spoofing, misdirection, etc.
 - Current security protocols better than ever, but still inadequate!



Simplifying With Info-Centric Networking

(see, e.g., named-data.net)

- Collapse layers:
 - Request data object by name +key
 - Network returns signed object
- **Trust** structure made explicit based on name-key bindings
- Data can be returned from anywhere
 - Network can verify signature before returning (possibly as "premium" service)
- Network-level identifiers (addresses) not needed by applications



Technical Challenges

- Namespace Management
 - Decentralize by including public keys as part of namespace?
 - Multi-dimensional namespace: ⟨human-readable part, public key⟩
- Interdomain routing scalability – **wide open problem**
 - Hypothesis: Combination push and pull
 - Leverage the recursive nature of the network interface?
 - Wide-area multicast?
- Develop patterns for classes of applications
 - Namespace/trust structures
 - Transport algorithms

Parting Thought

- Trust: the final frontier
 - [Why] Do we trust...
 - Google? Meta? Apple? Spectrum? MetroNet? AT&T?
 - ANF Global Root CA? Atos TrustedRoot 2011? Certigna?
 - ARIN? Gandi?
 - AS1011? AS2043?
- The question of what/whom to trust pervades the Internet from top to bottom.