DNS, Identity, and Internet Naming for Experimentation and Research (DIINER)

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Overview

• Challenges in today’s DNS research
• Our solution to battle ossification
• Architectural overview of DIINER
• Plans and Timeline
Purpose Behind DIINER

• Originally, DNS was an experimental replacement to static hosts
• Now, the world’s economy relies on its “perfect” performance
• This makes innovation in naming and identification difficult
• Academic research relegated to studying without modification
• “DNS 2.0 will never happen”
DIINER

- 3 year, NSF funded research project
- Create academically accessible, collaborative infrastructure
- Draw naming and identification researchers
- Enable testing of new research in an operationally safe manner
- Safe and privacy protected data sharing of operational DNS data
- Building on B-Root, Resolvers and Authoritative servers
B-Root (and others) today

incoming requests -> load balancer -> production nodes

production nodes -> outgoing replies
Adding in DIINER parallel infrastructure

incoming requests

load balancer

selector
doubler

production node pair

experimental nodes

production nodes

production nodes

production nodes

outgoing replies

research analysis tools

validator
DIINER repeatability infrastructure

incoming requests → load balancer → production nodes → outgoing replies

- selector
- doubler

- replay engine
- query mutator (optional)
- production node pair
- experimental nodes
- validator
- research analysis tools

- curated or archived datasets

Physical DIINER Infrastructure Nodes
DIINER Data Capture and Curration

incoming requests

doubler

load balancer

production nodes

outgoing replies

data and perf. monitor

production nodes

hadoop cluster
(commodity parallelism and inexpensive storage)

controlled anonymizer

archive and aging

experimental nodes

data and perf. monitor

curation and release
Plans and Timeline

• Near-term:
  – Clone a B-Root production stream as a parallel test system
  – Hold a workshop to discuss future needs and plans

• Longer-term:
  – Build an anycast system allowing the use of recursives and other auth servers
  – Build a web portal for project management
  – Build a result accuracy comparative engine
Questions