

Zero Configuration Networking

Instant Networking and Dynamic Service Discovery

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What Is Needed To Use A Network Service

- Logical addressing information (IP addresses)
- Name resolution
- Basic (host, port) and specific service information (queue, capabilities)

1 Addressing: Link-Local IPv4 Addressing (AutoIP)

- Peer-to-peer (no central server) IP address reservation, RFC 3927
- Works only on the local link
- Conflicts possible, methods exist to resolve these
- Only IP addresses, no DNS info, routing info etc.

1 Addressing: Link-Local IPv4 Addressing (AutoIP)

2 Name Resolution: Multicast DNS (mDNS)

- Draft proposed by Cheshire, Krochmal, proposed 2005 (Apple Computer)
- Describes what has to be done if DNS responders start sending and answering queries with multicast networking
- Uses .local top level domain for names on the local link
- Name reservation and conflict resolution protocol

Zero Configuration Networking

- 1 Addressing: Link-Local IPv4 Addressing (AutoIP)
 - 2 Name Resolution: Multicast DNS (mDNS)
 - 3 Service Discovery: DNS-based Service Discovery (DNS-SD)
- Young approach, developed by Cheshire, Krochmal, proposed 2005 (Apple Computer)
 - Given a type of service and a domain returns a list of named instances of that desired service
 - Already available DNS servers as central service repositories
 - With mDNS works in a ad-hoc networks

Zero Configuration Networking

- 1 Addressing: Link-Local IPv4 Addressing (AutoIP)
 - 2 Name Resolution: Multicast DNS (mDNS)
 - 3 Service Discovery: DNS-based Service Discovery (DNS-SD)
- Protocol stack for instant networking and service discovery
 - Known as ZeroConf or Bonjour (Apple)
 - Implementations exist for all major systems
 - Implemented in virtually all new printers and modern operating systems

Search services, don't configure.

Demo Scenario

Host A Joins the Ad-hoc Network



169.254.19.10
newrose.local



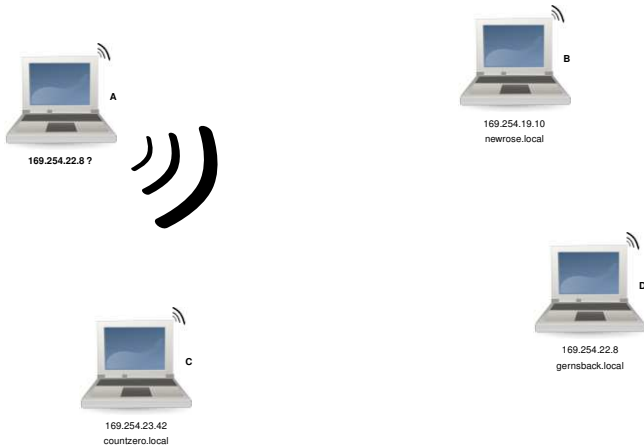
169.254.23.42
countzero.local



169.254.22.8
gernsback.local

Demo Scenario

Host A Claims an IP Address



Demo Scenario

IP conflicts with Host D



169.254.22.8 ?



169.254.19.10
newrose.local



169.254.23.42
countzero.local



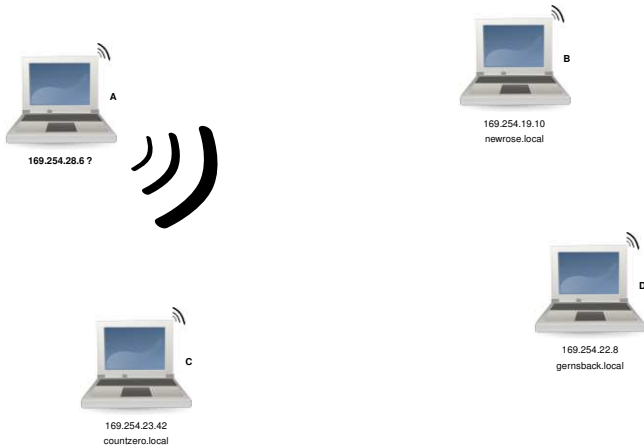
Conflict!



169.254.22.8
gernsback.local

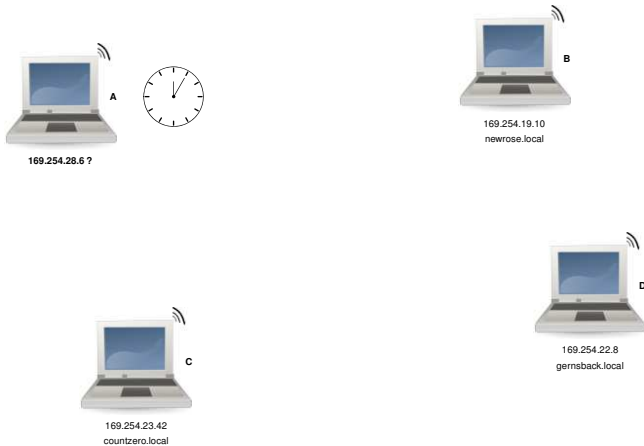
Demo Scenario

Host A Claims another IP Address



Demo Scenario

Host A Waits For Possible Conflicts



Demo Scenario

Host A Has an IP And Can Transfer Data



A

169.254.28.6



B

169.254.19.10
newrose.local



C

169.254.23.42
countzero.local

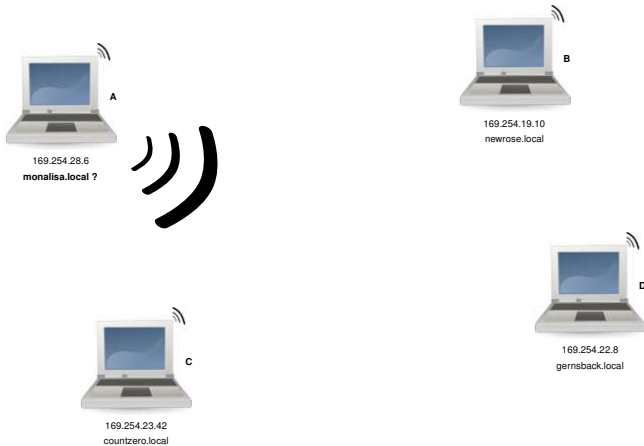


D

169.254.22.8
gernsback.local

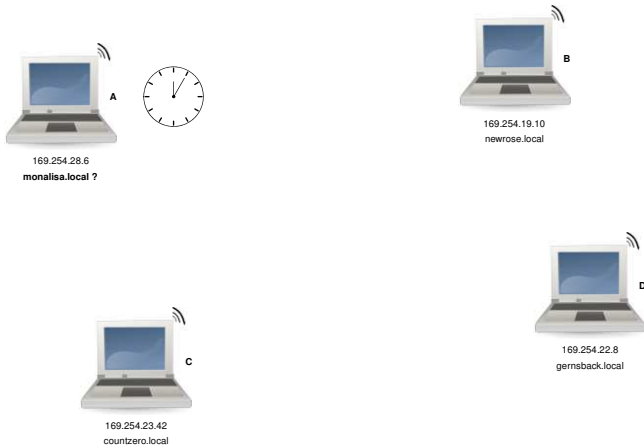
Demo Scenario

Host A Claims A Name



Demo Scenario

Host A Waits For Possible Conflicts



Demo Scenario

Host A Claimed a Name And Is Now monalisa.local



169.254.28.6
monalisa.local



169.254.19.10
newrose.local



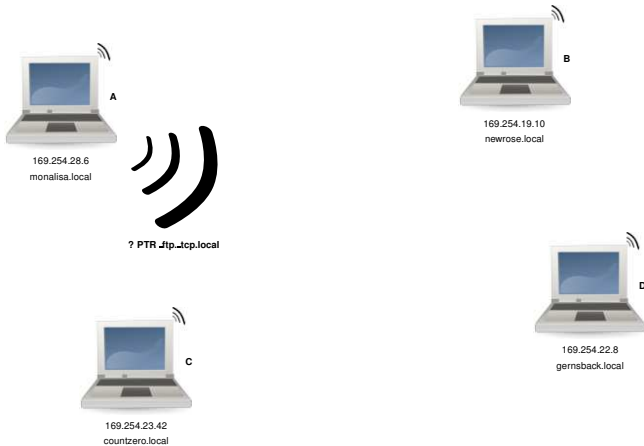
169.254.23.42
countzero.local



169.254.22.8
gernsback.local

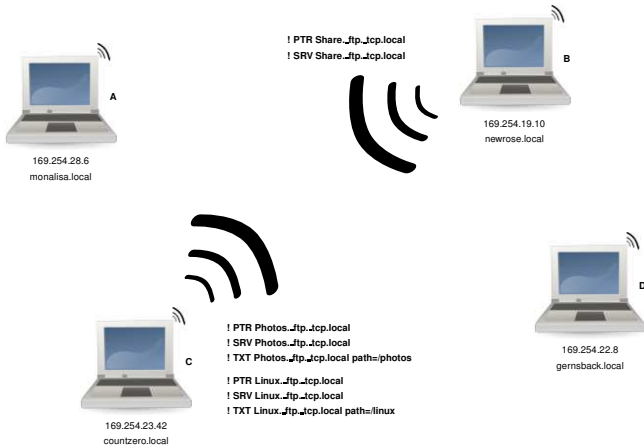
Demo Scenario

monalisa.local Asks For File Services



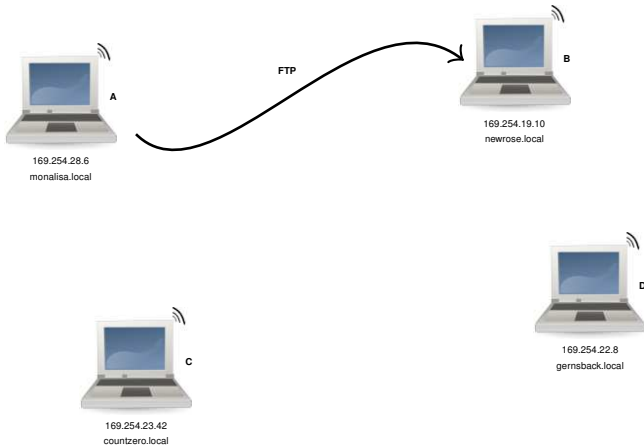
Demo Scenario

countzero.local and newrose.local Answer



Demo Scenario

monalisa.local Uses FTP on newrose.local



Questions?

Information compiled at

<http://www.niemueller.de/uni/zeroconf/>