

# CS118 Computer Network Fundamentals

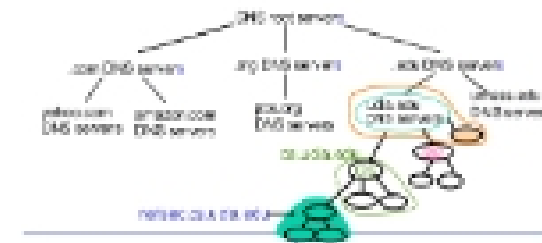
## Section 3

TA: Pei-chun Cheng  
Friday 4-3:30PM BH2444

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## This Week

- DNS
  - Hierarchical name structure
  - Query operation
    - Interactive
    - Recursive
  - DNS messages
    - Format
    - RR record
- Transport Layers
  - Multiplex/Demultiplex
  - UDP message
  - Reliable transfer
    - Bit errors ~ ACK/NACK
    - Packet loss ~ timers



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## Discussions

- [Slide 8, 15 \(DNS lookup\)](#)
  - Interactive vs Recursive
  - Reverse DNS
- [Slide 32 \(Mux/Demux\)](#)
  - TCP identified by the 4-tuple?
    - Source IP
    - Source Port
    - Dest IP
    - Dest Port

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## Discussion Problems

- [Ch2. \(DNS\)](#)

### Question

1. Can a machine w/ a single DNS name have multiple IP addresses?
2. Can a computer have two DNS names that fall in different top-level domains? How?

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## Discussion Problems

- Ch3. P4 (1's complement)

- Suppose we have 2 bytes:
  1. 00110100
  2. 01101001

Question

1. What is the 1s complement of these 2 bytes?
2. Give an example where one bit is flipped in the first byte, and yet the 1s complement doesn't change
3. How about one bit is flipped in each of the 2 bytes?

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## Homeworks

- Homework #2

- Review

- Homework #3

- Points

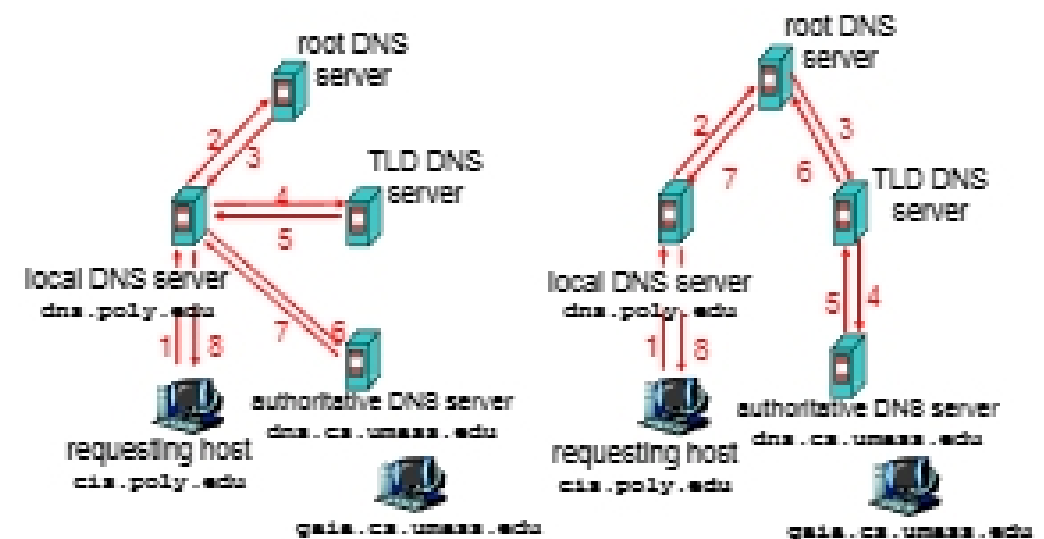
- Reverse DNS
- Multiplex/Demultiplex
- UDP checksum

- Questions?

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Any questions?

## DNS Lookup



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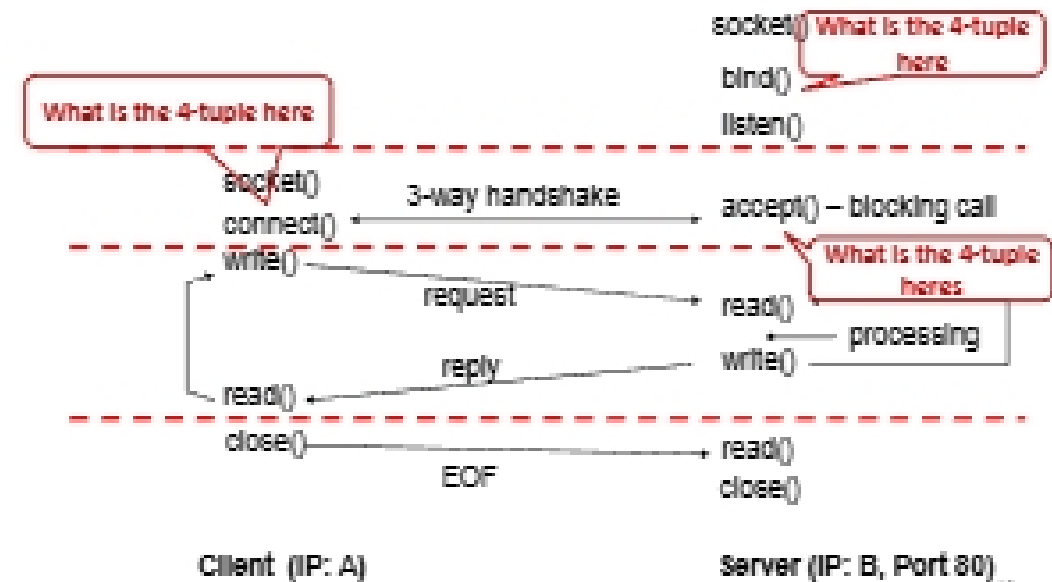
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## Reverse DNS query

- Map an IP address to DNS name  
Ex: 1.2.3.4
  - Convert to 4.3.2.1.in-addr.arpa WHY
  - How to query?
    - Follow the same process of forward query
    - Mostly trace back to the DNS server of 1.2.3.4
- Commonly used as a weak security check
  - For example, an e-Library server only allows IPs from UCLA
  - What is the problem here?

## Multiplexing in Socket



## The Server needs to Fork!!

```
while (1)
{
    newsockfd = accept(sockfd, (struct sockaddr *) &cli_addr, &cli_len);
    pid = fork();
    if (pid == 0)
    {
        // child
        close(sockfd);
        dostuff(newsockfd);
        exit(0);
    }
    else
        // parent
        close(newsockfd);
}
/* end of while */
```

To support multiple clients

Note the difference between sockfd, and newsockfd

## CS118 Computer Network Fundamentals Project 1

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