SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
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DEPARTMENT OF AIML

AI - WEB TECHNOLOGY

III YEAR - VI SEM

UNIT 1 – Web Site Basics And HTML

TOPIC 5 - Web Clients Web Servers

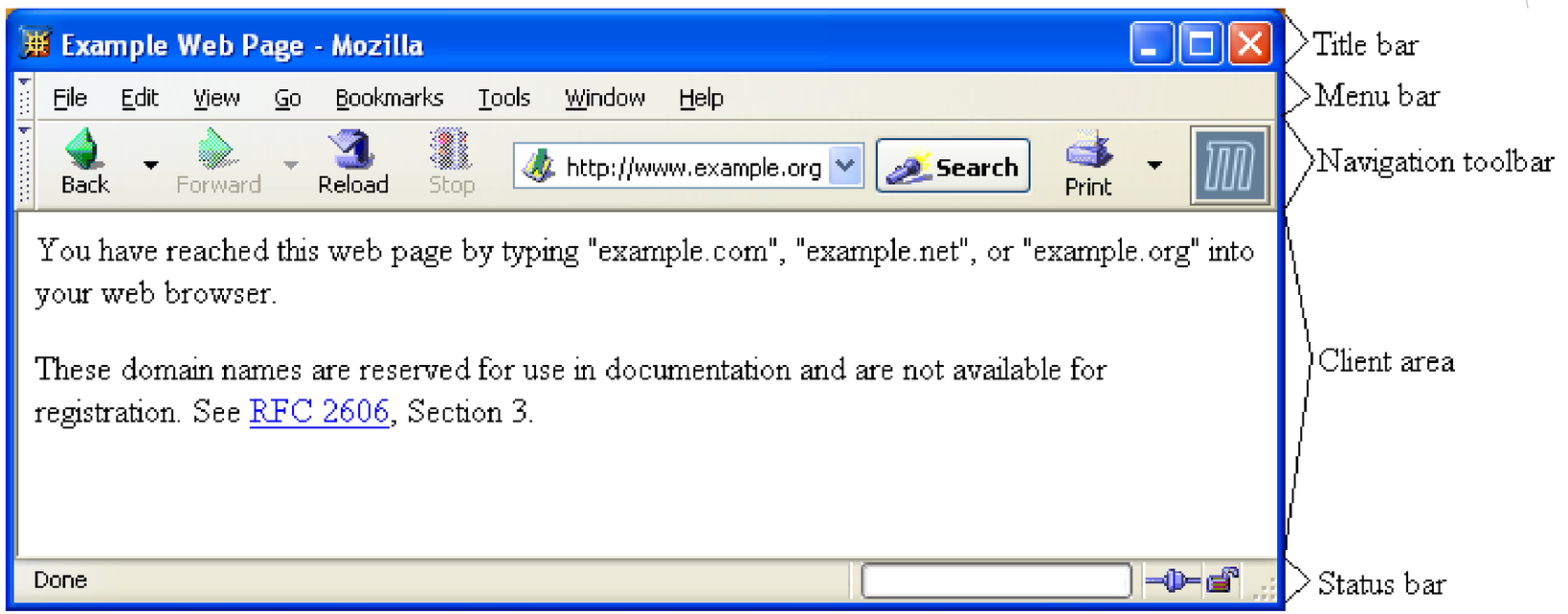
Web Clients

- Many possible web clients:
  - Text-only “browser” (lynx)
  - Mobile phones
  - Robots (software-only clients, e.g., search engine “crawlers”)
  - etc.
- We will focus on traditional web browsers

Web Browsers

- First graphical browser running on general-purpose platforms: Mosaic (1993)

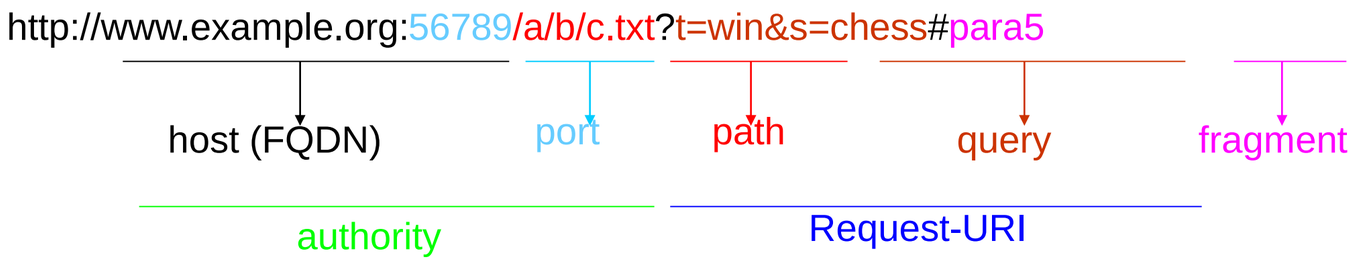
Web Browsers



Web Browsers

- Primary tasks:
  - Convert web addresses (URL's) to HTTP requests
  - Communicate with web servers via HTTP
  - Render (appropriately display) documents returned by a server

HTTP URL's



- Browser uses authority to connect via TCP
- Request-URI included in start line (/ used for path if none supplied)
- Fragment identifier not sent to server (used to scroll browser client area)

Web Browsers

- Standard features
  - Save web page to disk
  - Find string in page
  - Fill forms automatically (passwords, CC numbers, …)
  - Set preferences (language, character set, cache and HTTP parameters)
  - Modify display style (e.g., increase font sizes)
  - Display raw HTML and HTTP header info (e.g., Last-Modified)
  - Choose browser themes (skins)
  - View history of web addresses visited
  - Bookmark favorite pages for easy return

Web Browsers

- Additional functionality:
  - Execution of scripts (e.g., drop-down menus)
  - Event handling (e.g., mouse clicks)
  - GUI for controls (e.g., buttons)
  - Secure communication with servers
  - Display of non-HTML documents (e.g., PDF) via plug-ins

Web Servers

- Basic functionality:
  - Receive HTTP request via TCP
  - Map Host header to specific virtual host (one of many host names sharing an IP address)
  - Map Request-URI to specific resource associated with the virtual host
    - File: Return file in HTTP response
    - Program: Run program and return output in HTTP response
  - Map type of resource to appropriate MIME type and use to set Content-Type header in HTTP response
  - Log information about the request and response

Web Servers

- httpd: UIUC, primary Web server c. 1995
- Apache: “A patchy” version of httpd, now the most popular server (esp. on Linux platforms)
- IIS: Microsoft Internet Information Server
- Tomcat:
  - Java-based
  - Provides container (Catalina) for running Java servlets (HTML-generating programs) as back-end to Apache or IIS
  - Can run stand-alone using Coyote HTTP front-end

Web Servers

- Some Coyote communication parameters:
  - Allowed/blocked IP addresses
  - Max. simultaneous active TCP connections
  - Max. queued TCP connection requests
  - “Keep-alive” time for inactive TCP connections
- Modify parameters to tune server performance

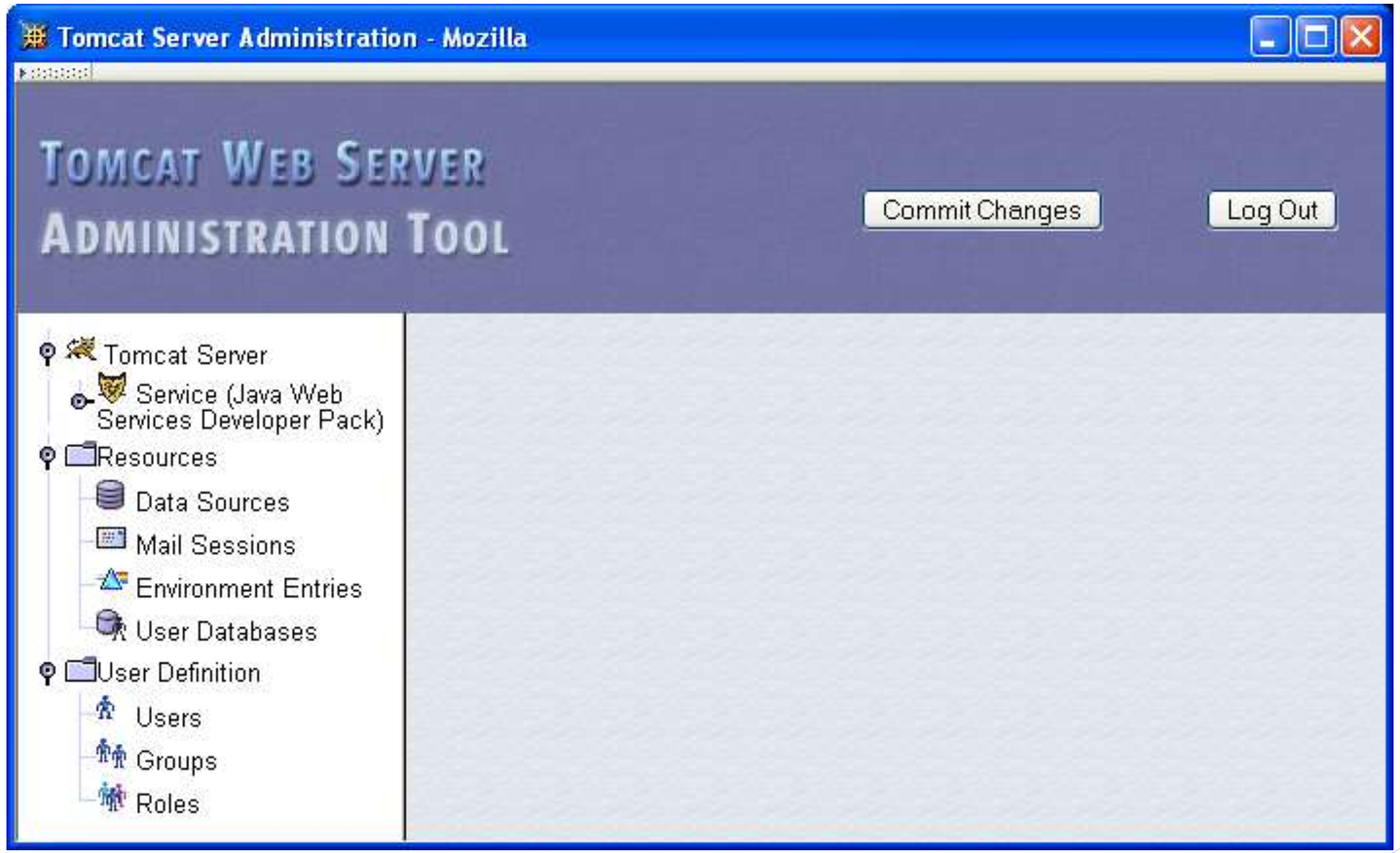
Web Servers

- Some Catalina container parameters:
  - Virtual host names and associated ports
  - Logging preferences
  - Mapping from Request-URI’s to server resources
  - Password protection of resources
  - Use of server-side caching

Tomcat Web Server

- HTML-based server administration
- Browse to
  http://localhost:8080
  and click on Server Administration link
  - `localhost` is a special host name that means “this machine”

Tomcat Web Server



Tomcat Web Server

Tomcat Web Server

Tomcat Web Server

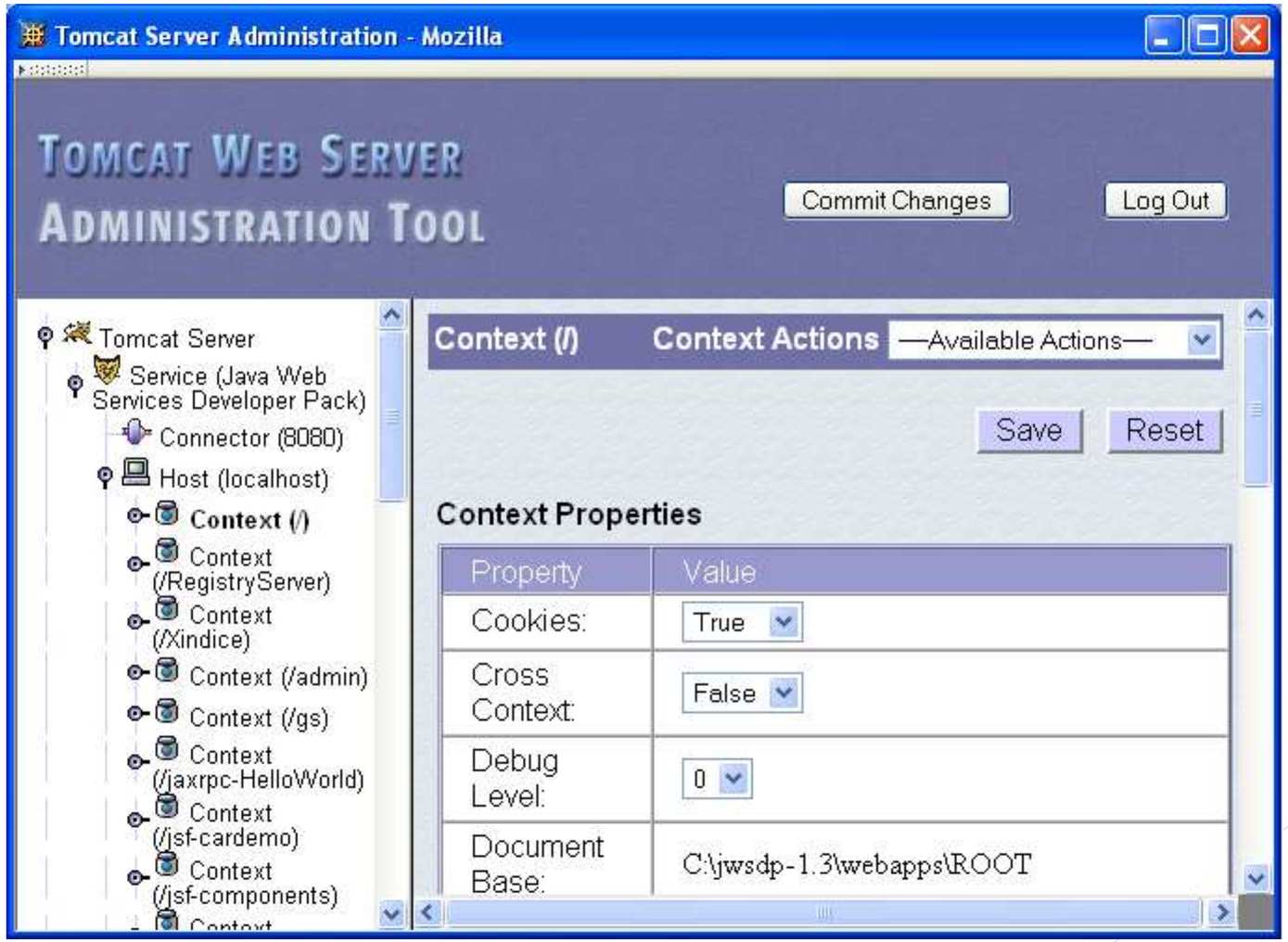
- Some Connector fields:
  - Port Number: port “owned” by this connector
  - Max Threads: max connections processed simultaneously
  - Connection Timeout: keep-alive time

Tomcat Web Server

Tomcat Web Server

- Each Host is a virtual host (can have multiple per Connector)
- Some fields:
  - Host: localhost or a fully qualified domain name
  - Application Base: directory (may be path relative to JWSDP installation directory) containing resources associated with this Host

Tomcat Web Server



Tomcat Web Server

- Context provides mapping from Request-URI path to a web application
- Document Base field is directory (possibly relative to Application Base) that contains resources for this web application
- For this example, browsing to `http://localhost:8080/` returns resource from `c:\jwsdp-1.3\webapps\ROOT`
  - Returns index.html (standard welcome file)

Tomcat Web Server

- Access log records HTTP requests
- Parameters set using AccessLogValve
- Default location: `logs/access_log.*` under JWSDP installation directory
- Example “common” log format entry (one line):

```
www.example.org - admin
[20/Jul/2005:08:03:22 -0500]
"GET /admin/frameset.jsp HTTP/1.1"
200 920
```

Tomcat Web Server

- Other logs provided by default in JWSDP:
  - Message log messages sent to log service by web applications or Tomcat itself
    - `logs/jwsdp_log.*`: default message log
    - `logs/localhost_admin_log.*`: message log for web apps within /admin context
  - System.out and System.err output (exception traces often found here):
    - `logs/launcher.server.log`

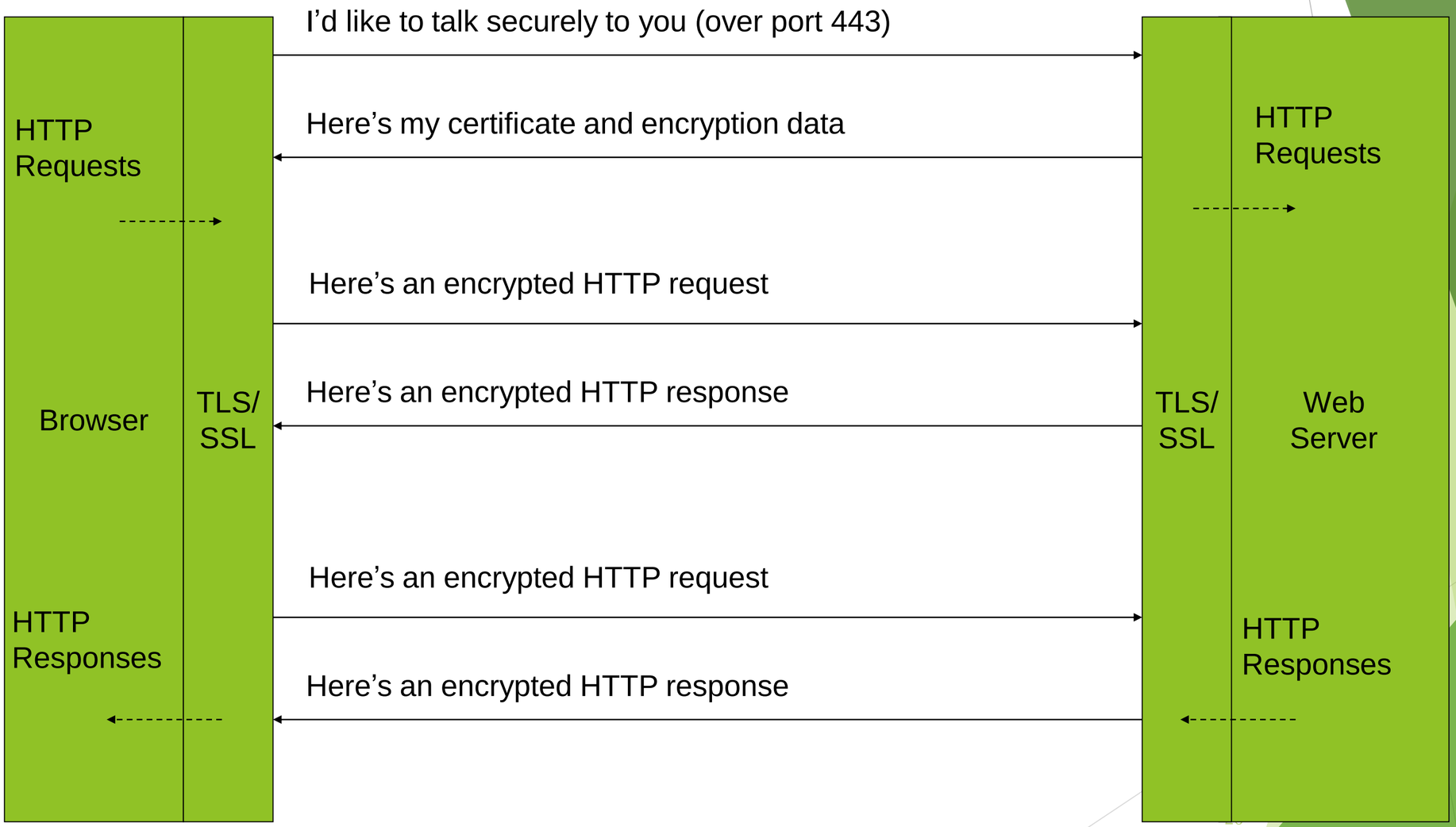
Tomcat Web Server

- Access control:
  - Password protection (e.g., admin pages)
    - Users and roles defined in `conf/tomcat-users.xml`
  - Deny access to machines
    - Useful for denying access to certain users by denying access from the machines they use
    - List of denied machines maintained in RemoteHostValve (deny by host name) or RemoteAddressValve (deny by IP address)

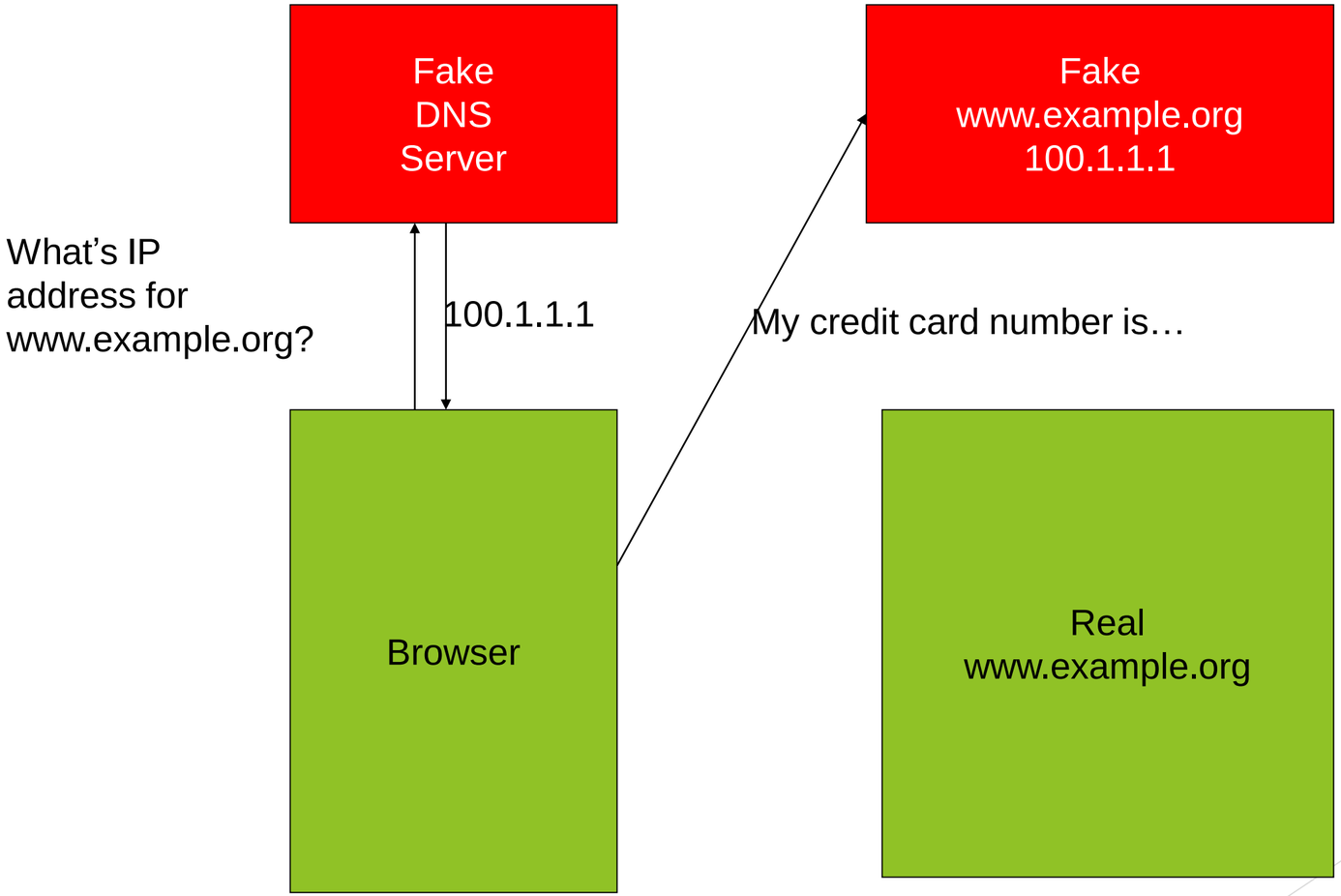
Secure Servers

- Since HTTP messages typically travel over a public network, private information (such as credit card numbers) should be encrypted to prevent eavesdropping
- https URL scheme tells browser to use encryption
- Common encryption standards:
  - Secure Socket Layer (SSL)
  - Transport Layer Security (TLS)

Secure Servers



Secure Servers
Man-in-the-Middle Attack



Secure Servers Preventing Man-in-the-Middle