

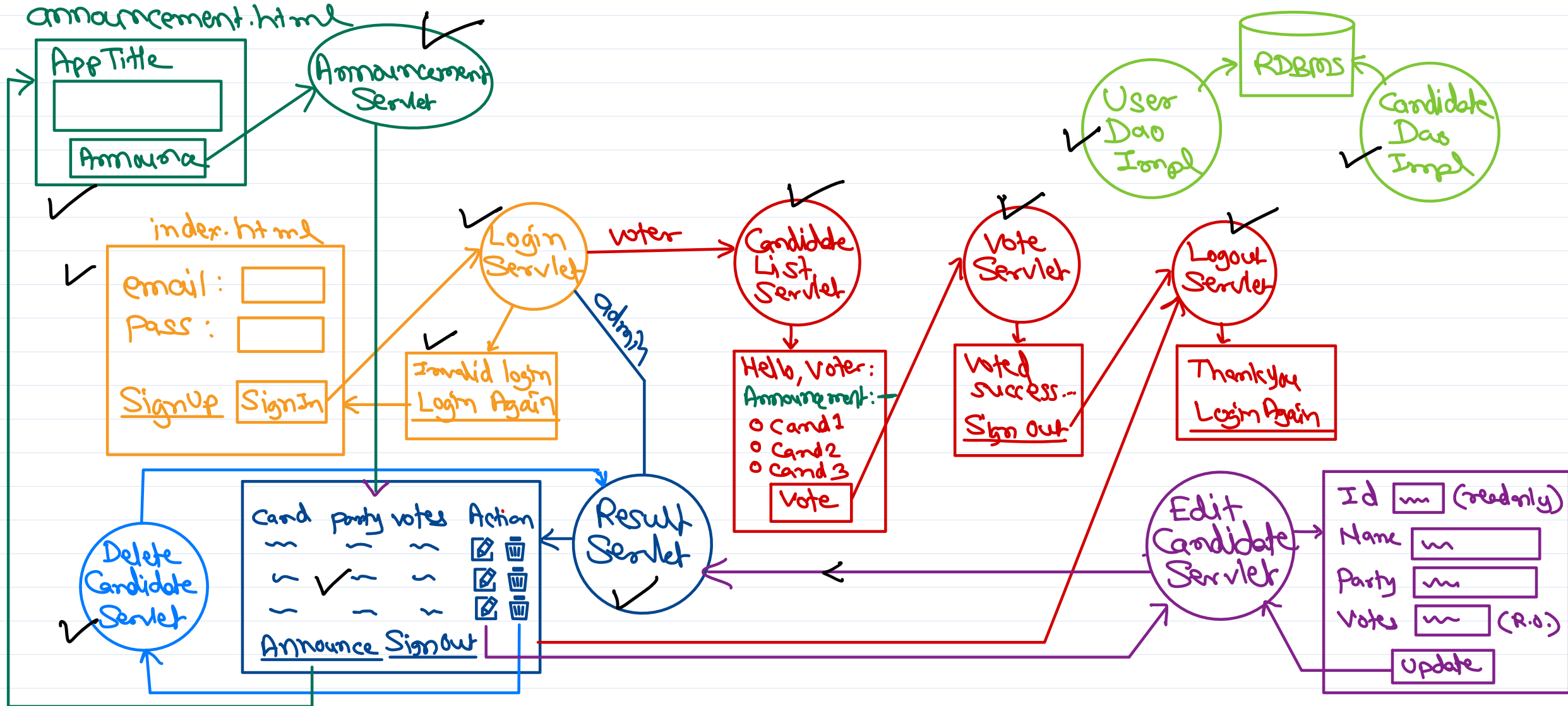


Advanced Java

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Election Management



State Management

* maintaining state/info about client is called as "state mgmt".

* Client side state mgmt

- Cookie
- QueryString
- Hidden fields
- ~~HTML Storage~~

- ✓ Need less server resources.
- ✗ Visible to client
- ✗ Client can tamper

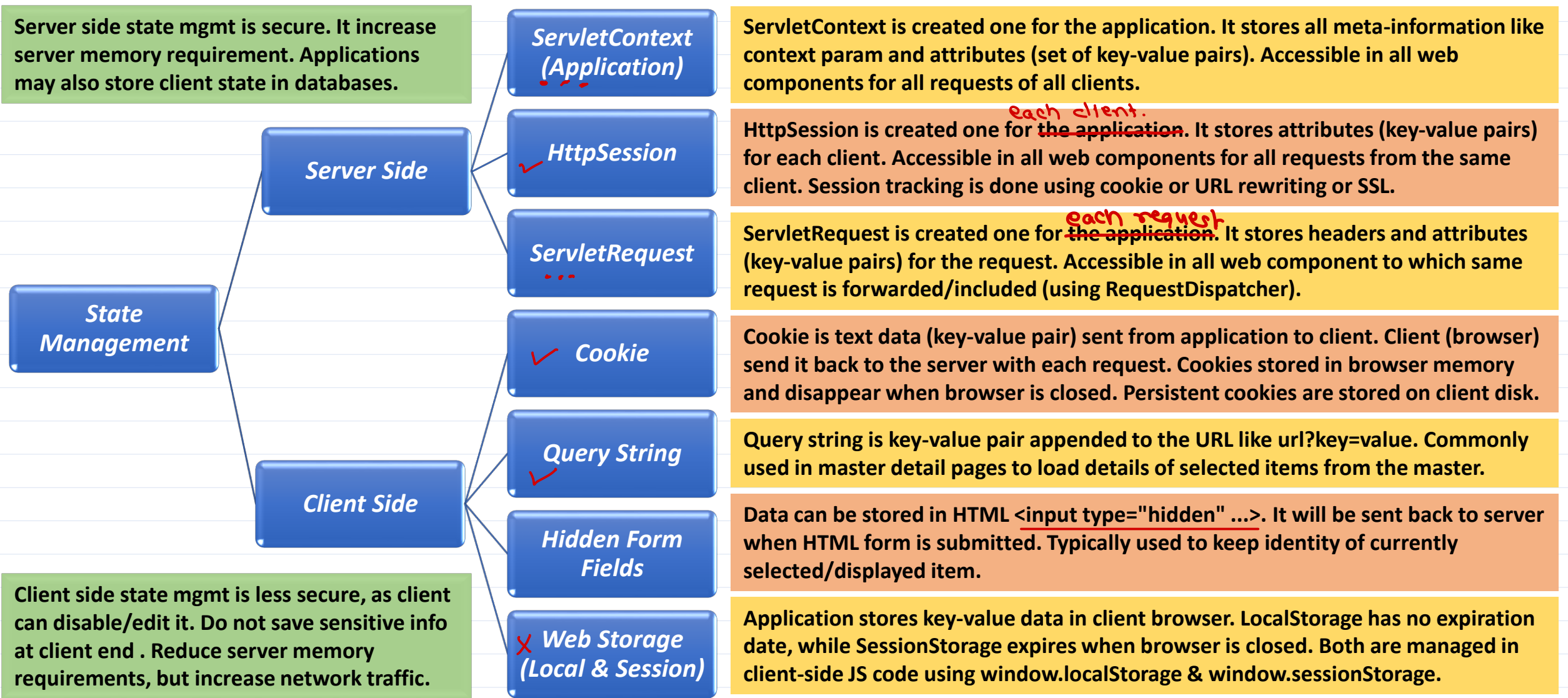
* Server side state mgmt

- Session
- Request
- Application a.k.a. ServletContext

- ✓ Secure (Not accessible to client)
- ✗ Need more server resources.



Java Web Applications – State management – at a glance



Cookie

Cookie → text key value pair

- stored on client side

- temp cookie - browser memory.
- persistent cookie - client disk until expiry time.

- max size = 4 KB

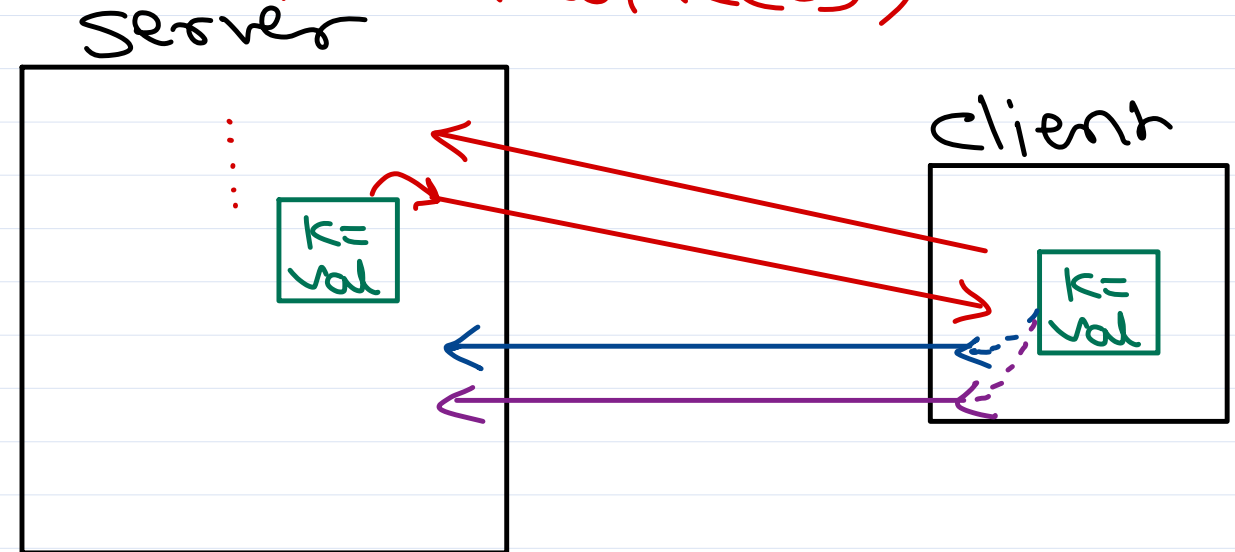
- created by server and sent to client in a response.

- afterwards cookie is sent back to server with each request by the client.

- cookies can be seen and modified by the client.

- Cookies can be disabled in browser.

* Send cookie to client:
`Cookie c = new Cookie("k", "v");`
`c.setMaxAge(seconds);` // ← persistent cookie
`resp.addCookie(c);`



* receive cookie from client:
`Cookie[] arr = req.getCookies();`
`for (Cookie c : arr) {`
 `if (c.getName().equals("k")) {`
 `v = c.getValue();`
 `break;`
`}`



Session

Http Session is key-value map stored on server side for each user.

To create/access session:

```
Session = req.getSession();
```

To store key-value in session:

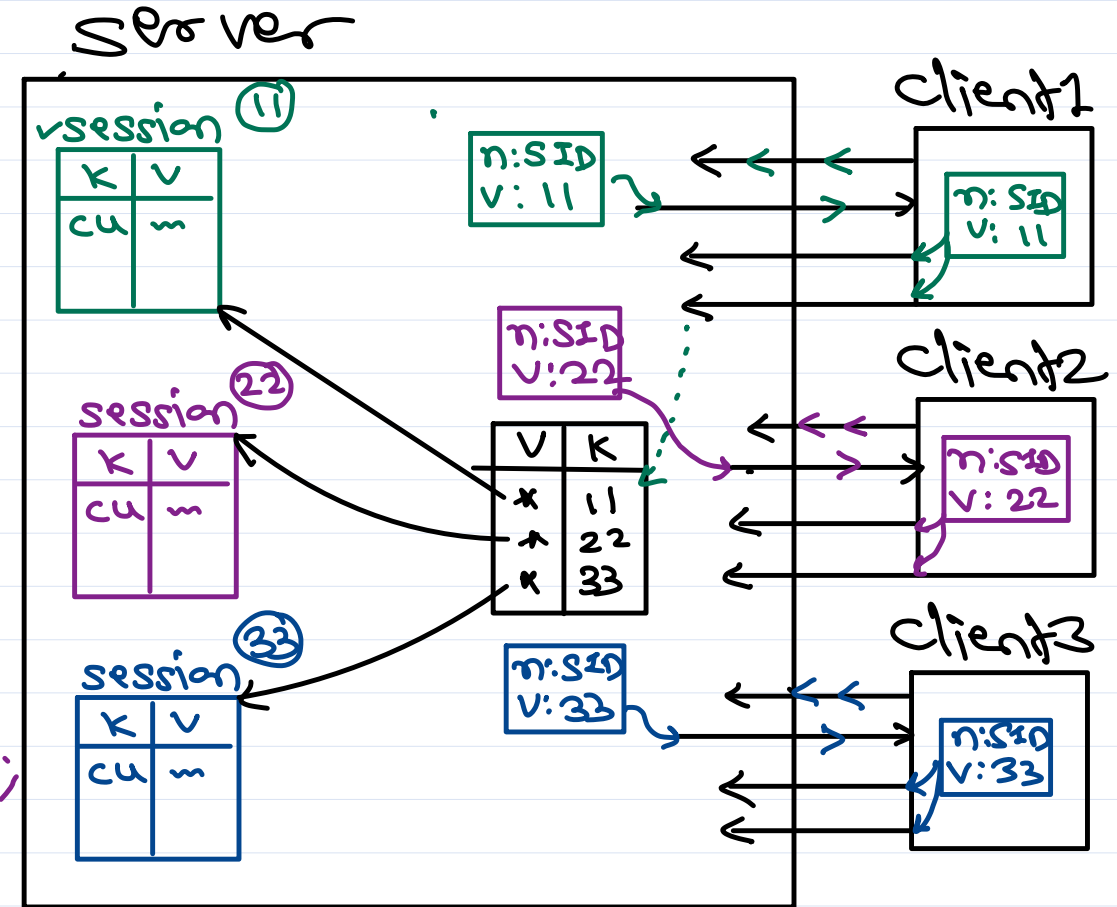
```
session.setAttribute("key", value);
```

To retrieve key-value from session:

```
value = session.getAttribute("key");
```

To destroy the session:

```
session.invalidate();
```



Session tracking
Using Cookie (JSESSIONID).



Session

```
session = req.getSession();
```

- ① check if session id cookie is present in current request. If available, find the Session object corresponding to that id and return it.
- ② if session id cookie doesn't exist, create a new session and save it with new session id (in server internal mem). Create a new session id cookie and send it to client with next response.

Session tracking modes:

web.xml

```
<session-config>  
  <tracking-mode> COOKIE </tracking-mode>  
  or  
  </session-config> URL
```

Session tracking by URL rewriting

http://lh:8080/app/url
(after re-writing)
http://lh:8080/app/url;jsessionid=xxxxx

Programmer need to rewrite each url in app (form action, a href, resp.sendRedirect, ...) using

- ① reurl = resp.encodeURL(url);
- OR
② reurl = resp.encodeRedirectURL(url);

QueryString

when req next page, the page url can be appended with additional key-value pairs.

It is called as **query string**. ↴

`http://lh:8080/app/page?key1=val1&key2=val2`

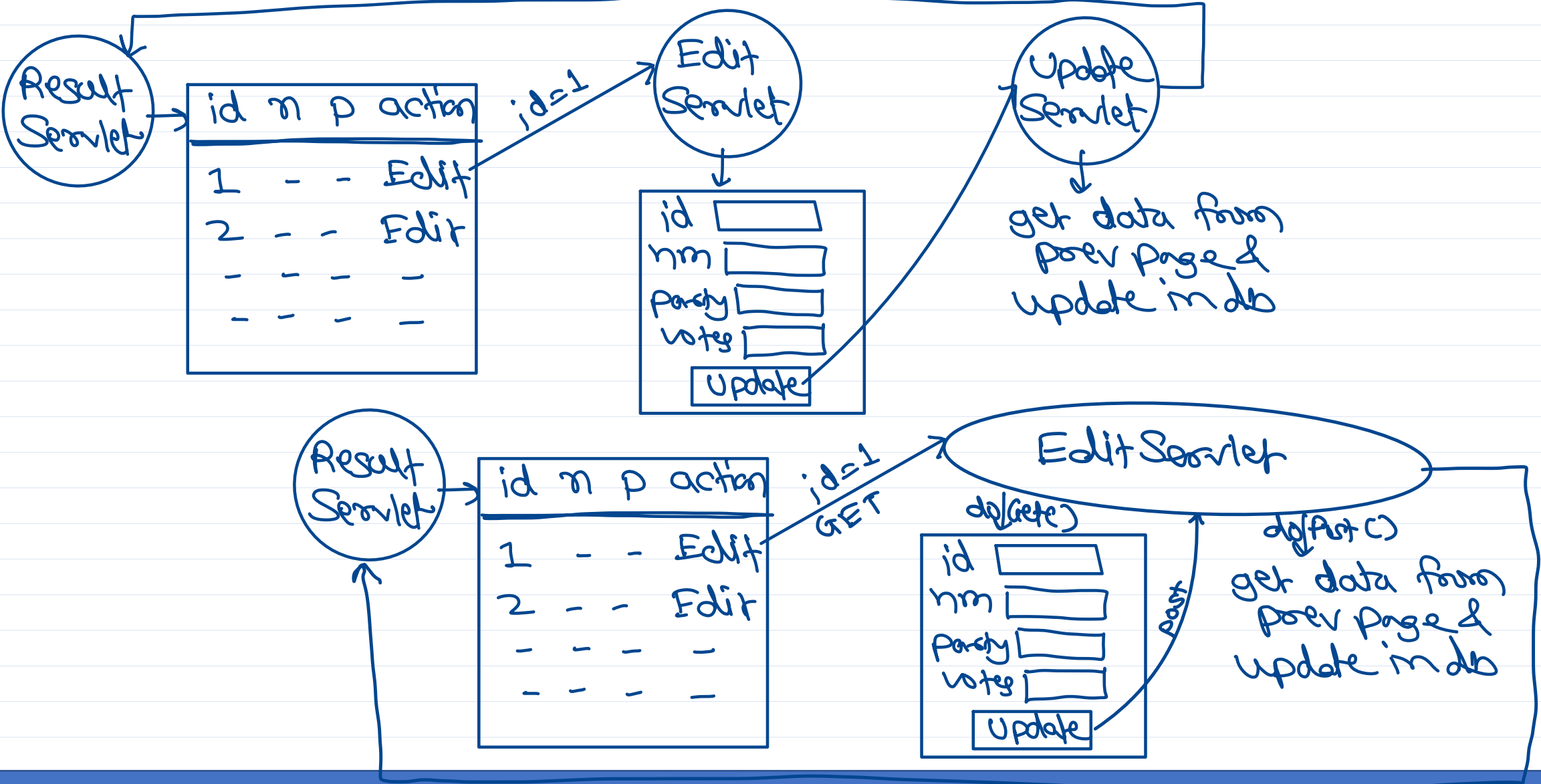
This data is accessible in that page as `req.parameters`.

```
String val1 = req.getParameter("key2");
```

```
String val2 = req.getParameter("key2");
```



Edit record



Req parameters vs Req attributes

- ① received from client.
- ② usually data from form controls or query string.
- ③ always string.

④ to access:
String v = req.getParameter("k");
or
String[] v = req.getParameterValues("k");

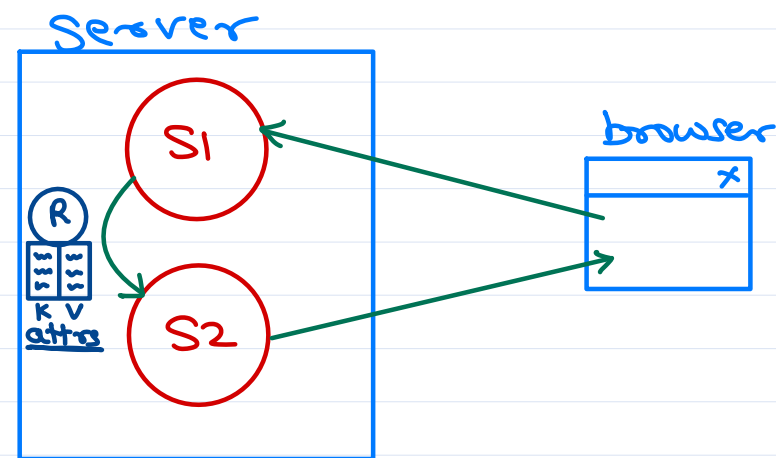
* both are destroyed when req processing is completed i.e. response is generated

- ① sent from servlet1 to servlet2
- ② any data added by servlet1.
- ③ any java Object
- ④ servlet 1:
req.setAttribute("k", val);
servlet 2:
val = req.getAttribute("k");
- ⑤ Used only while forwarding / including request.



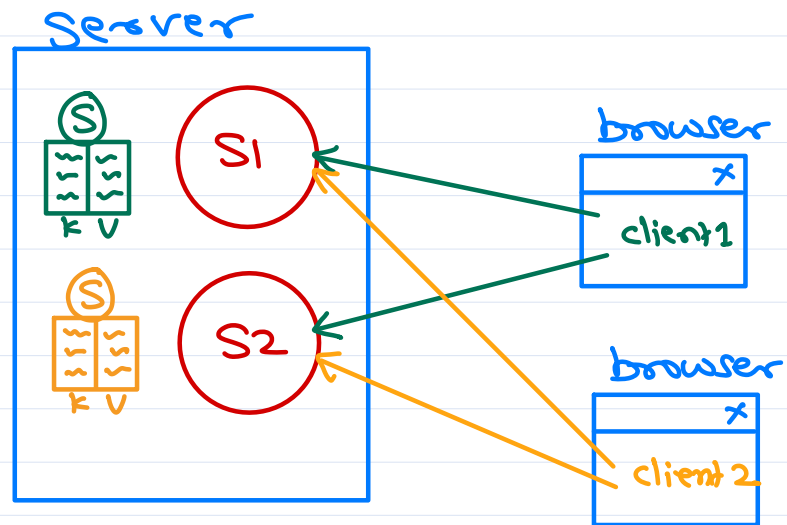
Attributes - Scopes

Request attributes



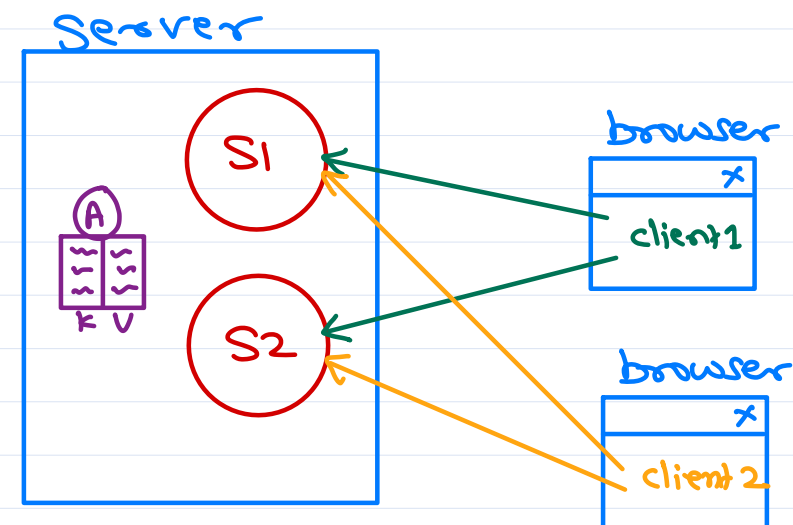
Req attributes will live only for current request-being forwarded or included.

Session Attributes



Session attributes are accessible across all requests for current user.
Separate session for each user.

Servlet Context attributes



ServletContext - application object - one for whole appn.
ServletContext attributes are accessible across all requests for all users.

"req" obj is arg to doGet(), doPost(), ... methods.

To get current user session:
`HttpSession session = req.getSession();`

To get appn/ServletContext:
`ServletContext appn = req.getServletContext();`





Thank you!

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