API Application Programming Interfaces

- An API is a way for a computer program to communicate directly with another computer program

- It is typically used to perform CRUD operations

- The two main types of APIs for web services (can run over the Internet, typically use HTTP) are SOAP and REST

- NETCONF and RESTCONF are APIs specifically designed to work with network devices

CRUD

Operation	SQL	HTTP
Create	INSERT	PUT / POST
Read (Retrieve)	SELECT	GET
Update (Modify)	UPDATE	PUT / POST / PATCH
Delete (Destroy)	DELETE	DELETE

SOAP Simple Object Access Protocol

- SOAP is a standard communication protocol system that permits processes using different operating systems like Linux and Windows to communicate.

- The transport is typically HTTP(S), and the data format is always XML.

- Because it is a protocol it has strict standards to adhere to.

REST Representational State Transfer

- REST is an architecture, not a protocol. It gives guidelines for the structure and organization of an API.

- It supports any transport and data format.

- HTTP(S) transport and JSON (or XML) data format are commonly used.

- It typically has faster performance and is easier to work with than SOAP.

REST Constraints

- Client-server architecture: the client sends a request, the server sends a response.

- Uniform Interface: provides simplicity.

- Statelessness: no client context is stored on the server between requests.

- Cacheability: responses must define themselves as either cacheable or non-cacheable.

REST Constraints (Cont.)

- Layered system: any intermediary devices such as load balancers must be transparent to the client and server.

- Code on demand (optional): servers can temporarily extend or customize the functionality of a client by transferring executable code.

REST Request URL

https://demo.flackbox.com|/api/running/aaa/users/neil|?dryrun

Target Host **Resource** **Parameters (Optional)**

- Request method must be sent (Get, Post etc)
- Headers with key:value pair information about the request can be added (eg accept:application/json, credentials)
- Post, Put and Patch requests include data in the body

FLACKBOX
www.flackbox.com

REST Response Codes

- 1xx: Informational
- 2xx: Success
  - 200: OK
  - 201: Created
  - 204: No Content (deleted)
- 3xx: Redirection

REST Response Codes - Errors

- 4xx: Client Error
  - 400: Bad request / malformed syntax
  - 401: Unauthorized
  - 403: Forbidden
  - 404: Not Found
- 5xx: Server Error
  - 500: Internal Server Error

- Responses to Get requests include data in the body
- Headers can also be included in the response