REST API Fundamentals

DRW12

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#ciscoimpact

Cisco IMPACT

Getting Started

- REST API Fundamentals
  - https://developer.cisco.com/learning/modules/rest-api-fundamentals/
- Presentation
  - https://github.com/rickbauer9482/IMPACT2022-Presentation

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REST API Concepts

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What the heck are REST APIs?

- API (Application Programming Interface) – how two applications can communicate a contract of request responses.
- REST (Representational State Transfer) – is a set of architectural constraints or criteria that can be implemented as needed.

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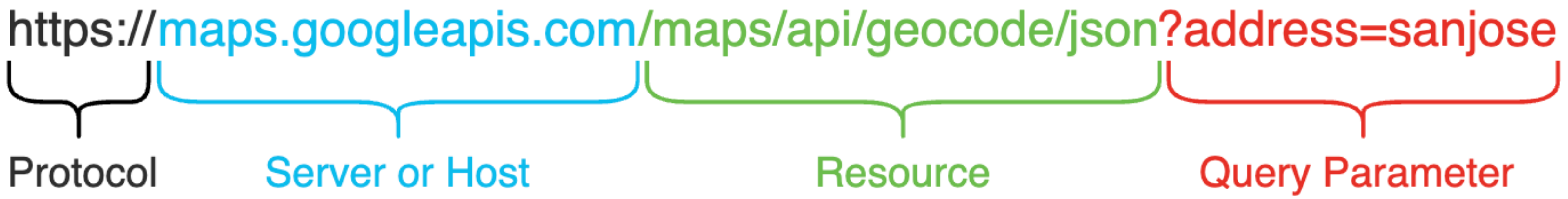
Anatomy of the Uniform Resource Identifier (URI)

- URI – represents a resource



https://maps.googleapis.com/maps/api/geocode/json?address=sanjose

Protocol

Server or Host

Resource

Query Parameter

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API Headers

Header	Example Value	Purpose
Content-Type	Application/json	Format of the data in the body
Accept	Application/json	Requested format for the returned data such as json or xml
Authorization	Bearer Token Basic OAuth 1.0/2.0	Provide credentials like a time based token, to authorize the request
Date/Time Stamp	Mon Aug, 29 16:30:23 PST 2022	Data and time of a request or response

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HTTP Methods

- HTTP Verbs correspond to CRUD actions: Create, Read, Update, Delete

POST	Create
GET	Read
PUT	Update
PATCH	Update
DELETE	Delete

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HTTP Response Codes

Status Code	Status Message	Meaning
200	OK	All Good
201	Created	New Resource Created
400	Bad Request	Request was invalid
401	Unauthorized	Auth missing or incorrect
403	Forbidden	Request not allowed
404	Not Found	Resource not found
500	Internal Server Error	Something wrong on Server
503	Service Unavailable	Server not able to complete request

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Lets get to know curl!

- https://everything.curl.dev/
- **curl** is a CLI tool to transfer data from or to a server, using one of the supported protocols (HTTP, HTTPS, FTP, FTPS, GOPHER, DICT, TELNET, LDAP or FILE)
- Over 200 command-line options
- HTTP Methods; GET, POST, PUT, and PATCH
- It defaults to the HTTP GET Method
- Very good for API Testing

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curl Example

```
curl -k -i -c cookies.txt \
-H "accept: application/json" -X GET https://$REST_HOST/restconf/data/v1/cisco-customer:customer --user root:Public123
```

-k allow insecure server connections

-i include the response headers could use -v verbose too

-c Cookies file

-H Headers

-X Custom request (GET, HEAD, POST, PUT) don't really need requests have verb built in

-d Data

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JSON and XML Payloads

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What is a Data Model?

A data model is a well understood and agreed upon method to describe "something".

For example, here is a "data model" for a person.

- *Person*
  - **Gender** – male, female, other
  - **Height** – Feet/Inches or Meters
  - **Weight** – Pounds or Kilos
  - **Hair Color** – Brown, Blond, Black, Red, other
  - **Eye Color** – Brown, Blue, Green, Hazel, other

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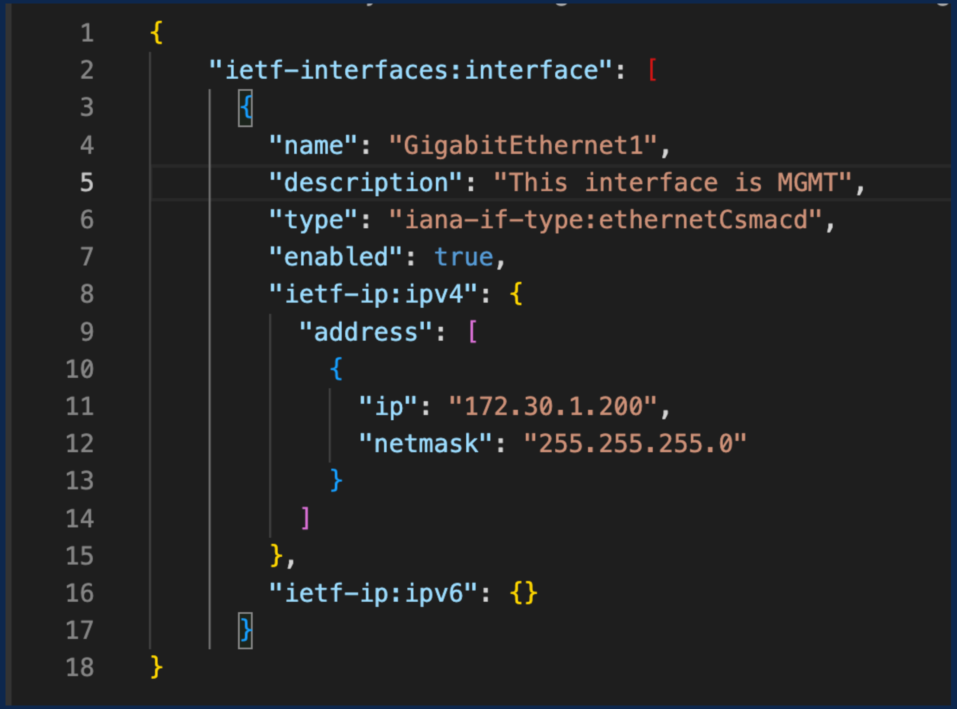
JSON

- The object is an unordered set of name-value pairs.
- An object begins with { (left brace) and ends with } (right brace)
- Strings are wrapped with " (double quotes)



```
{
    "ietf-interfaces:interface": [
      {
        "name": "GigabitEthernet1",
        "description": "This interface is MGMT",
        "type": "iana-if-type:ethernetCsmacd",
        "enabled": true,
        "ietf-ip:ipv4": {
          "address": [
            {
              "ip": "172.30.1.200",
              "netmask": "255.255.255.0"
            }
          ]
        },
        "ietf-ip:ipv6": {}
      }
}
```

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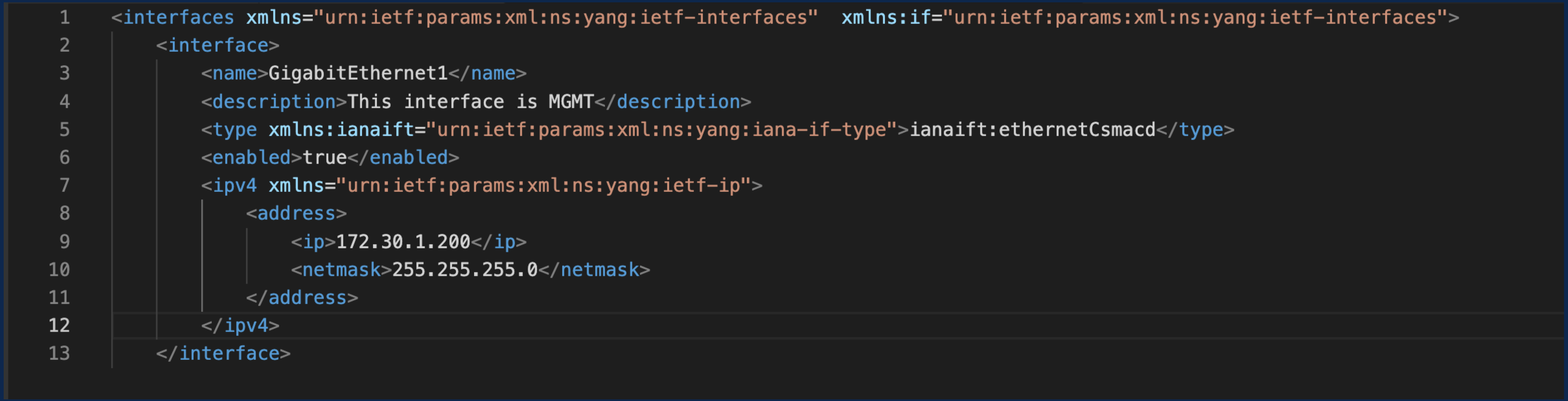
XML

- XML stands for eXtensible Markup Language, and XML is designed to store and transport data.



```xml
<interfaces xmlns="urn:ietf:params:xml:ns:yang:ietf-interfaces"  xmlns:if="urn:ietf:params:xml:ns:yang:ietf-interfaces">
    <interface>
        <name>GigabitEthernet1</name>
        <description>This interface is MGMT</description>
        <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-type">ianaift:ethernetCsmacd</type>
        <enabled>true</enabled>
        <ipv4 xmlns="urn:ietf:params:xml:ns:yang:ietf-ip">
            <address>
                <ip>172.30.1.200</ip>
                <netmask>255.255.255.0</netmask>
            </address>
        </ipv4>
    </interface>
```

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Getting started with REST APIs
Exercises

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Hands on Exercise: Using Postman to interact with REST APIs

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Postman

- https://www.postman.com/downloads/
- https://github.com/CiscoDevNet/dne-devfun-code/tree/main/rest-api/postman

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