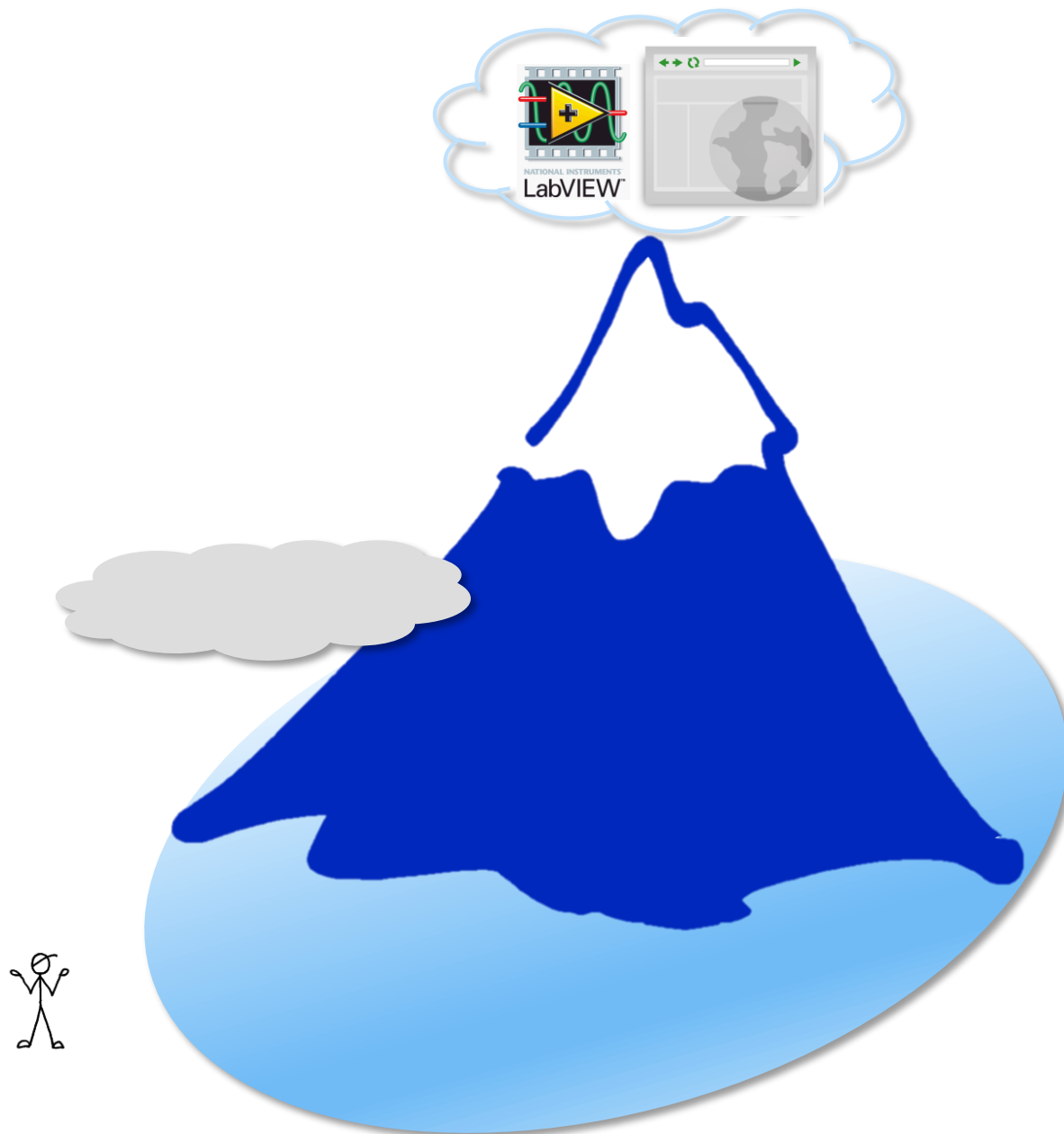


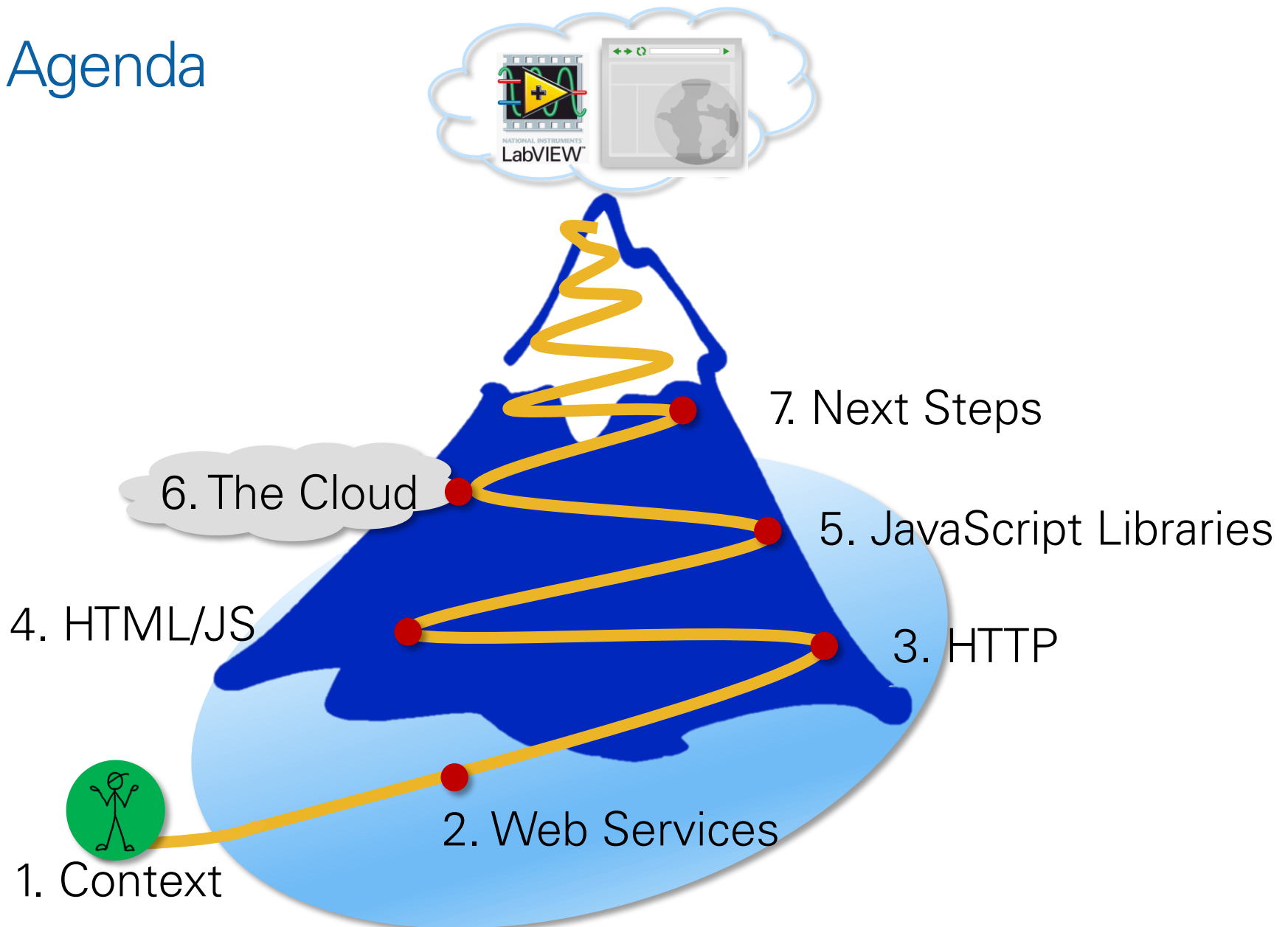
Building Web Applications with LabVIEW

Joey Spinella
Software Product Manager



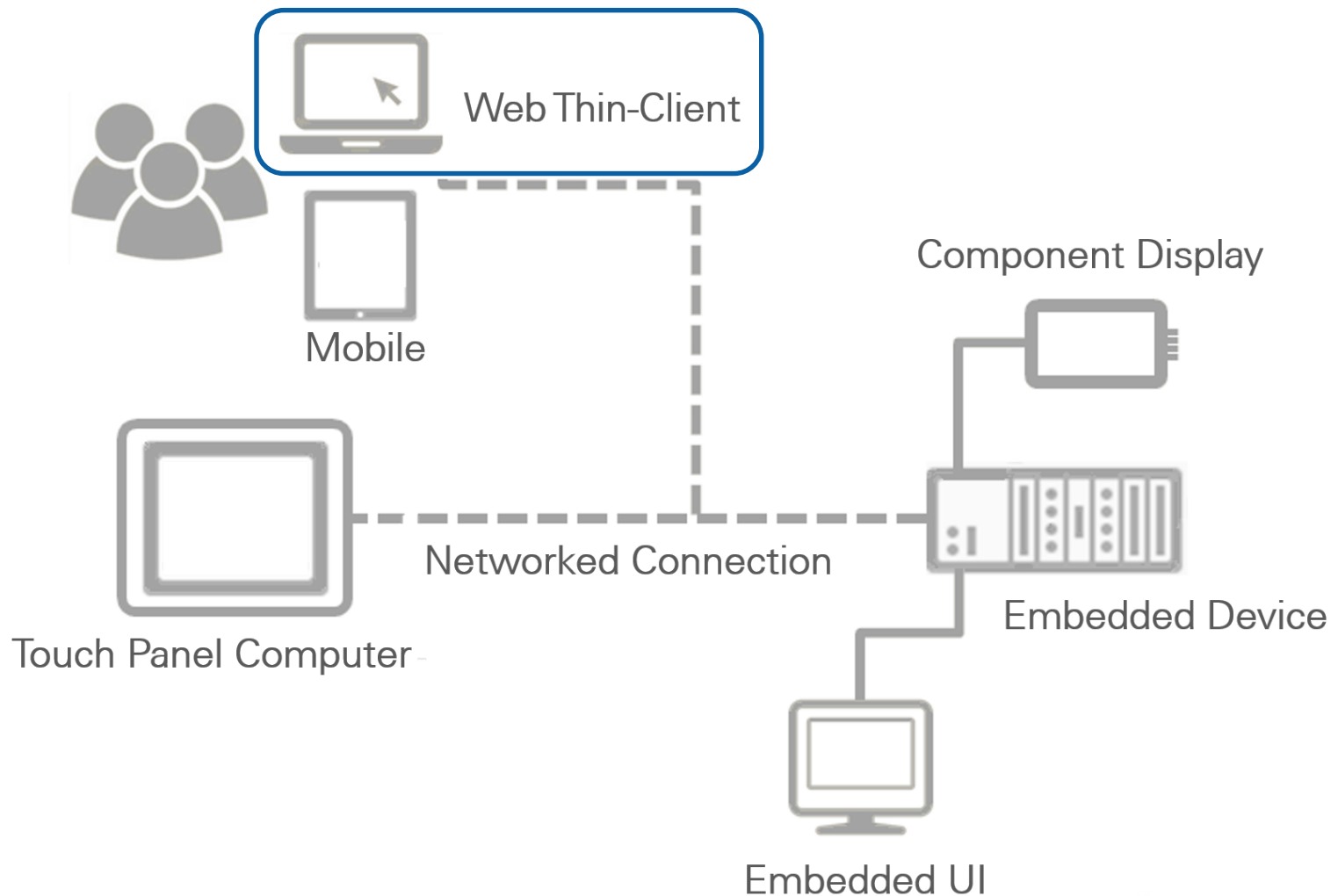


Agenda



www.tinyurl.com/lvweb

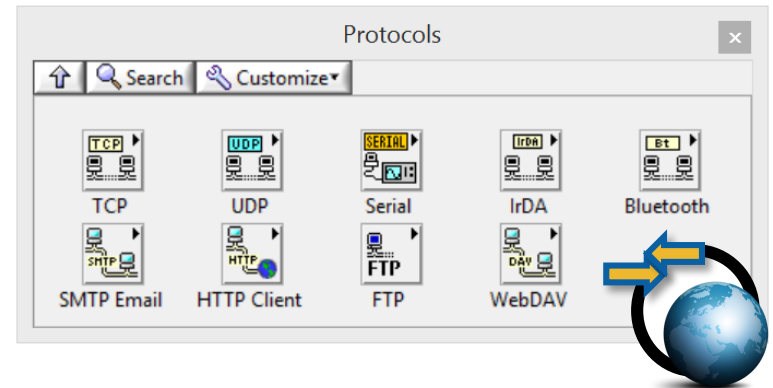
Remote Connectivity Options in LabVIEW



LabVIEW Web Client Technologies

Native Technologies

- HTTP Palette
- TCP/UDP/FTP/SMTP/WebDav
- LabVIEW Web Server



External Tools

- LabSocket
- WebPager
- Cloud Dashboard



LabVIEW Web Client Technologies

Native Technologies

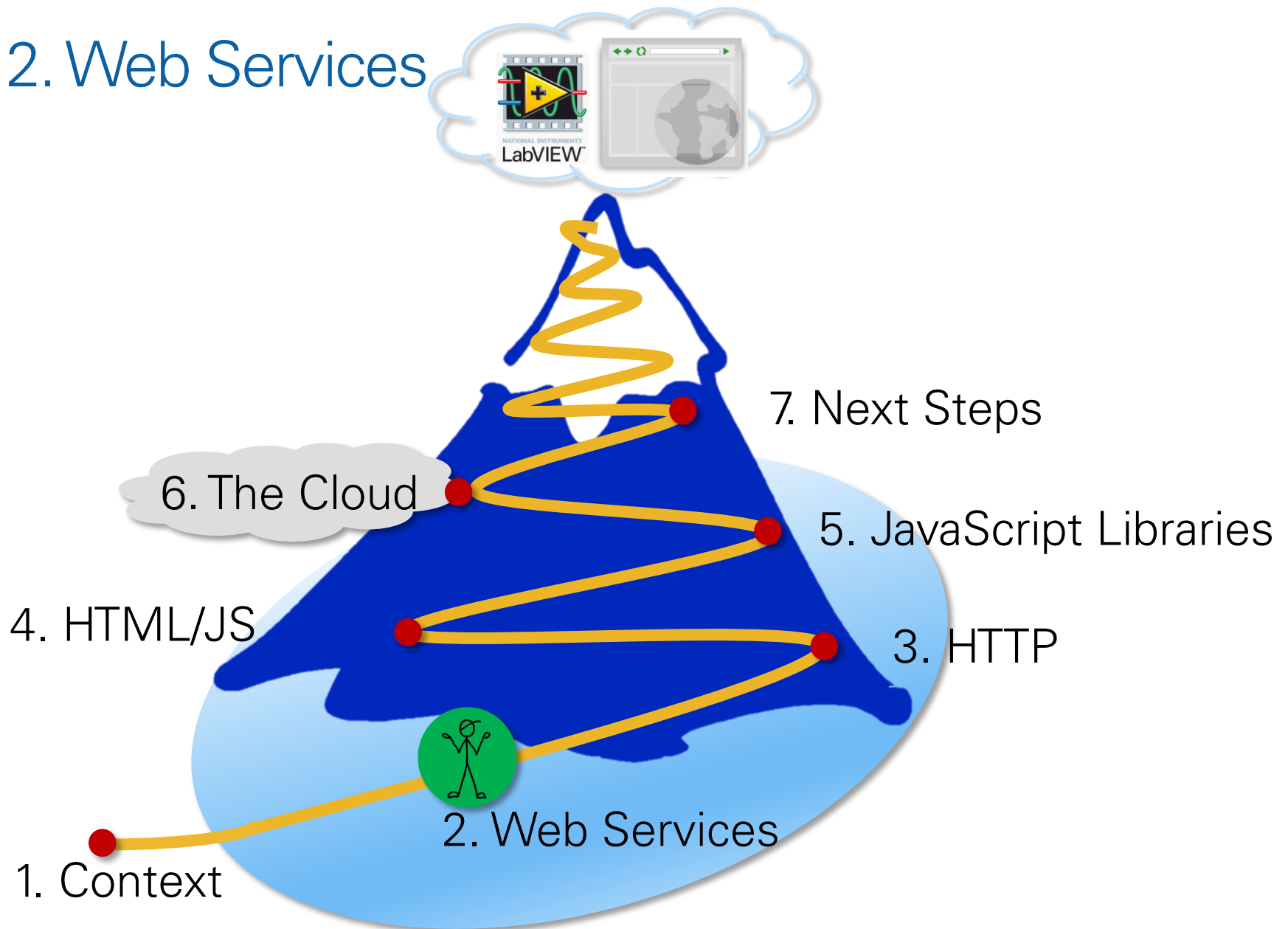
- HTTP Palette
- TCP/UDP/FTP/SMTP/WebDav
- **LabVIEW Web Server**



External Tools

- LabSocket
- WebPager
- Cloud Dashboard

2. Web Services



What is a Web Server?

Software that accepts and responds to HTTP requests, usually from a browser.

A **web server** is an information technology that processes requests via HTTP, the basic network protocol used to distribute information on the World Wide **Web**. The term can refer either to the entire computer system, an appliance, or specifically to the software that accepts and supervises the HTTP requests.

[Web server - Wikipedia, the free encyclopedia](https://en.wikipedia.org/wiki/Web_server)
en.wikipedia.org/wiki/Web_server Wikipedia ▾



More about Web server

Feedback

LabVIEW Web Services

LabVIEW Web Services host web content and respond to HTTP requests.

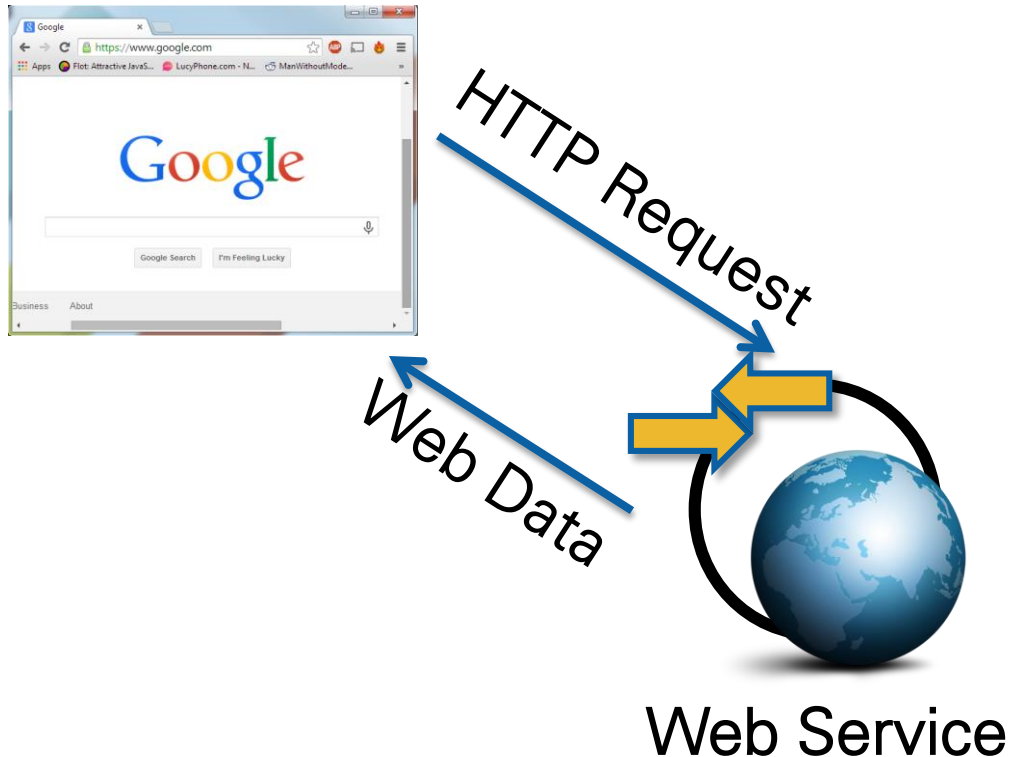


Web Service

LabVIEW Web Services

LabVIEW Web Services host web content and respond to HTTP requests.

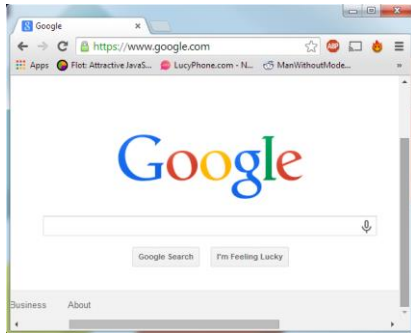
Web Browser



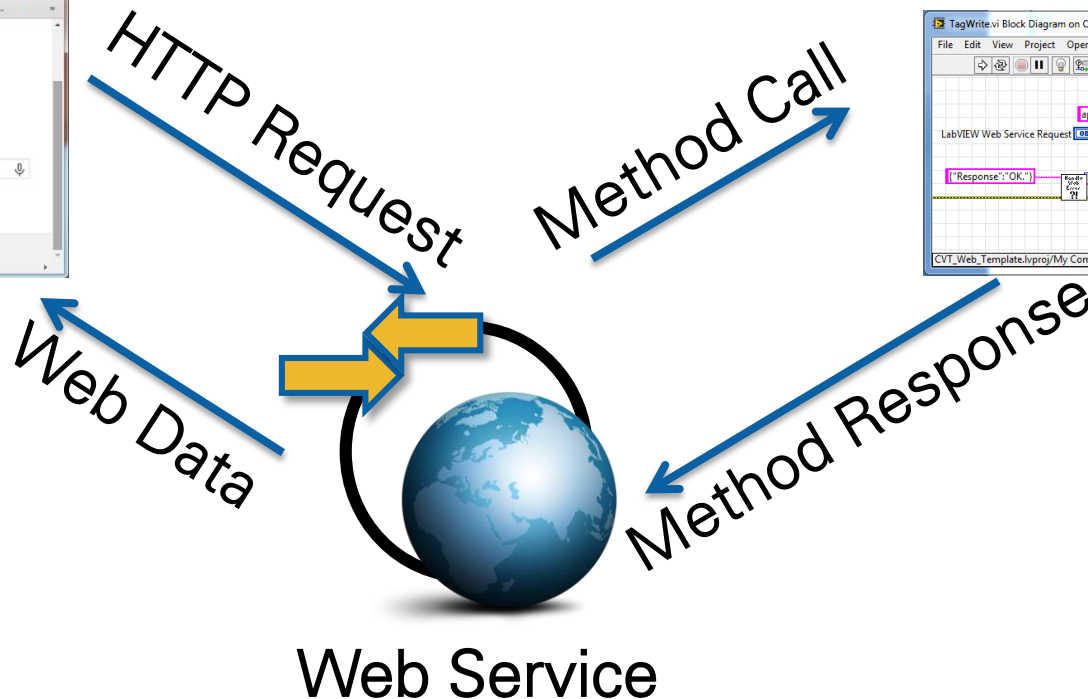
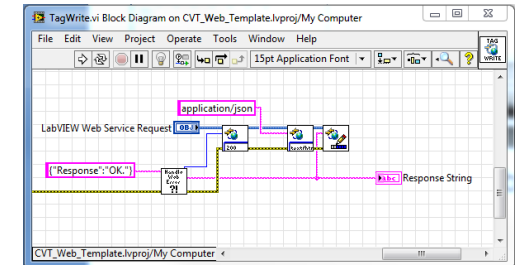
LabVIEW Web Services

LabVIEW Web Services host web content and respond to HTTP requests.

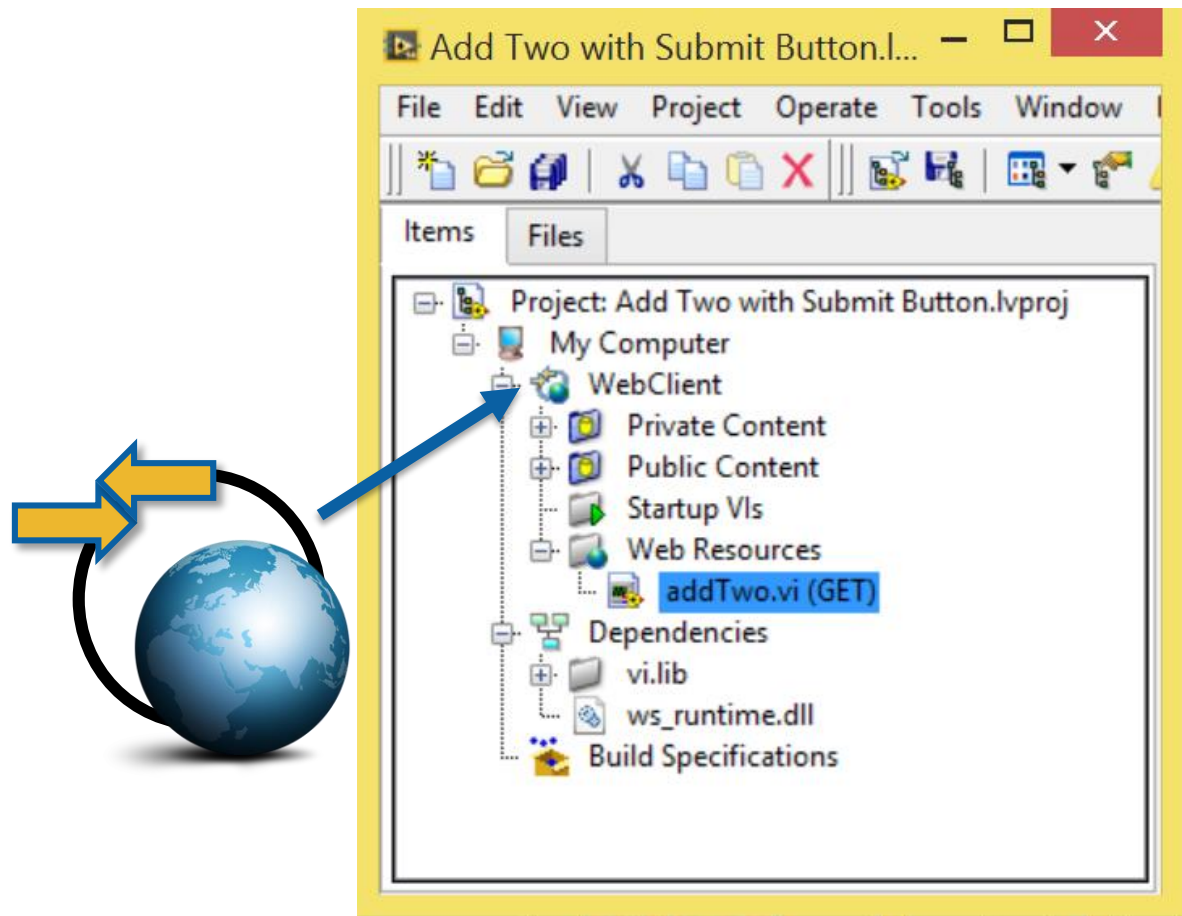
Web Browser



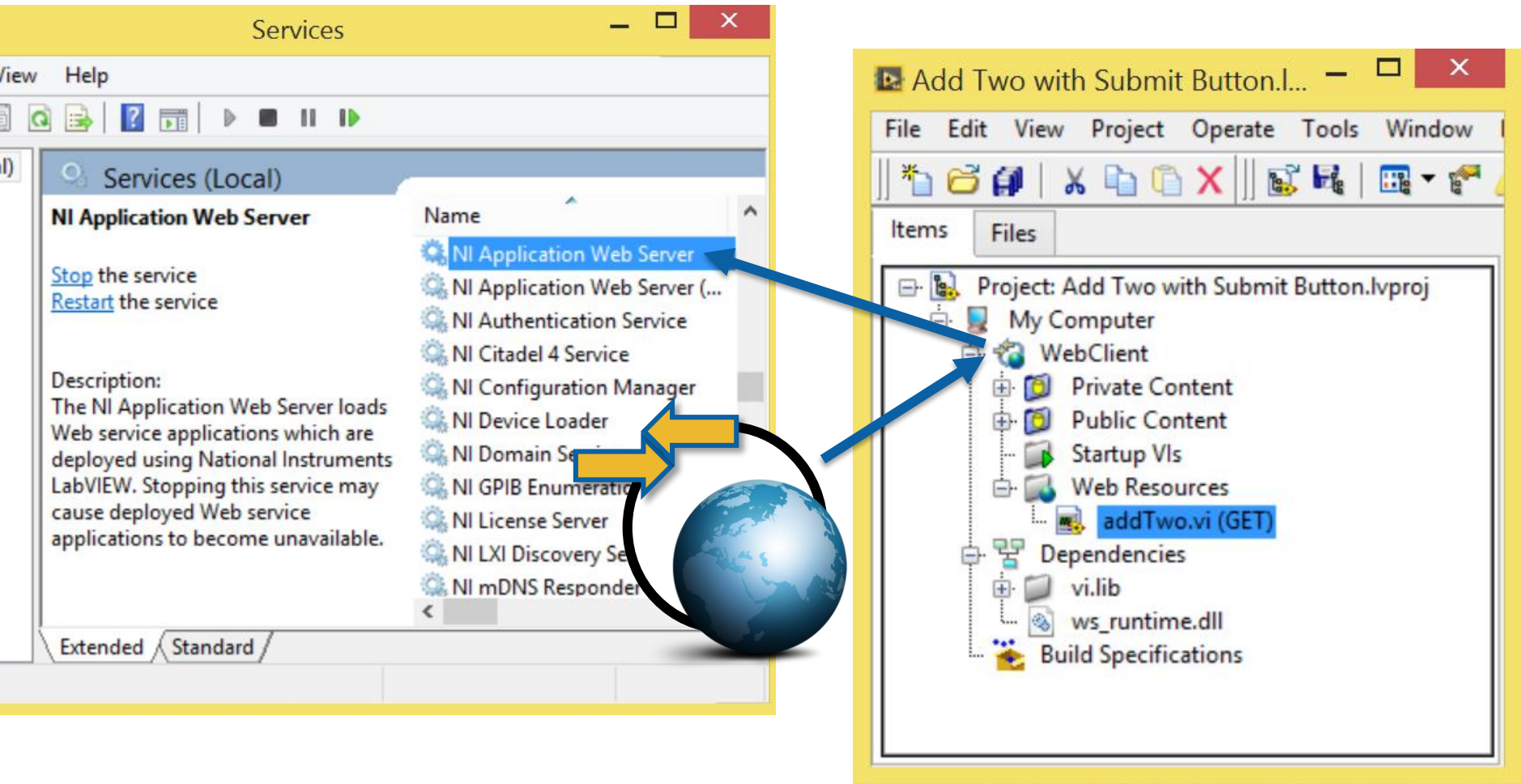
LabVIEW Web Method



Web Service in a Project

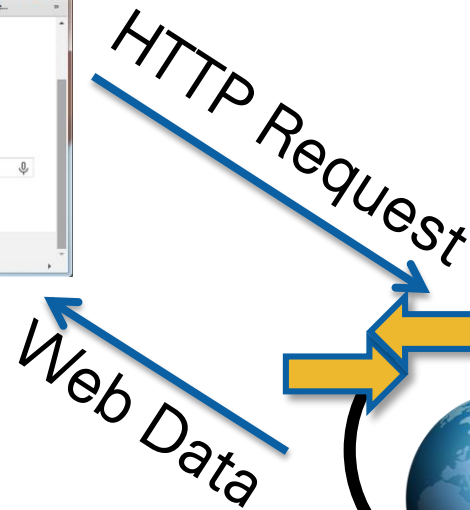
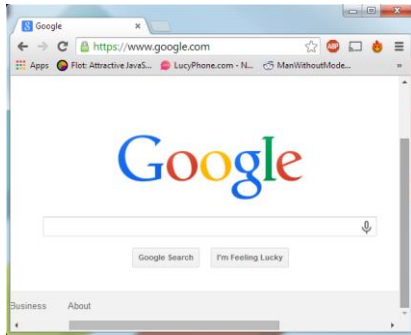


Web Service in a Project

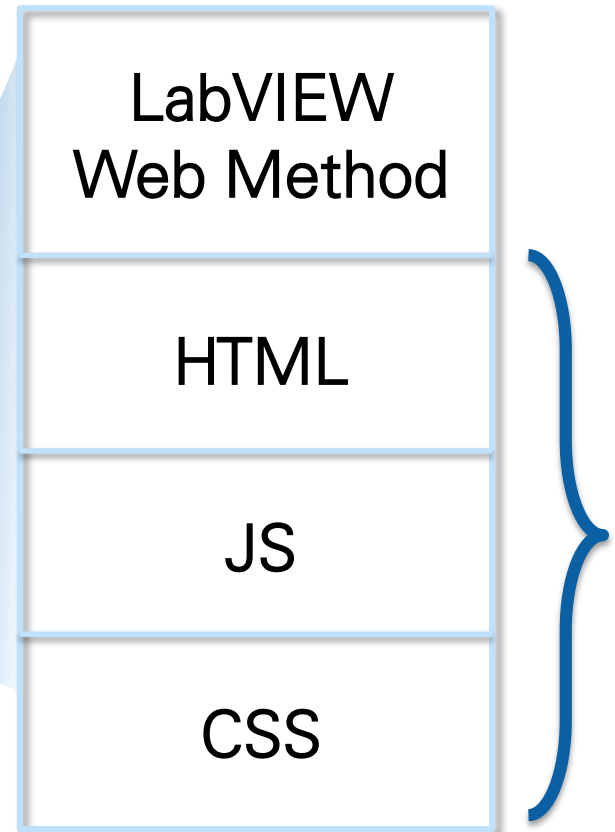


Static Content and Web Methods

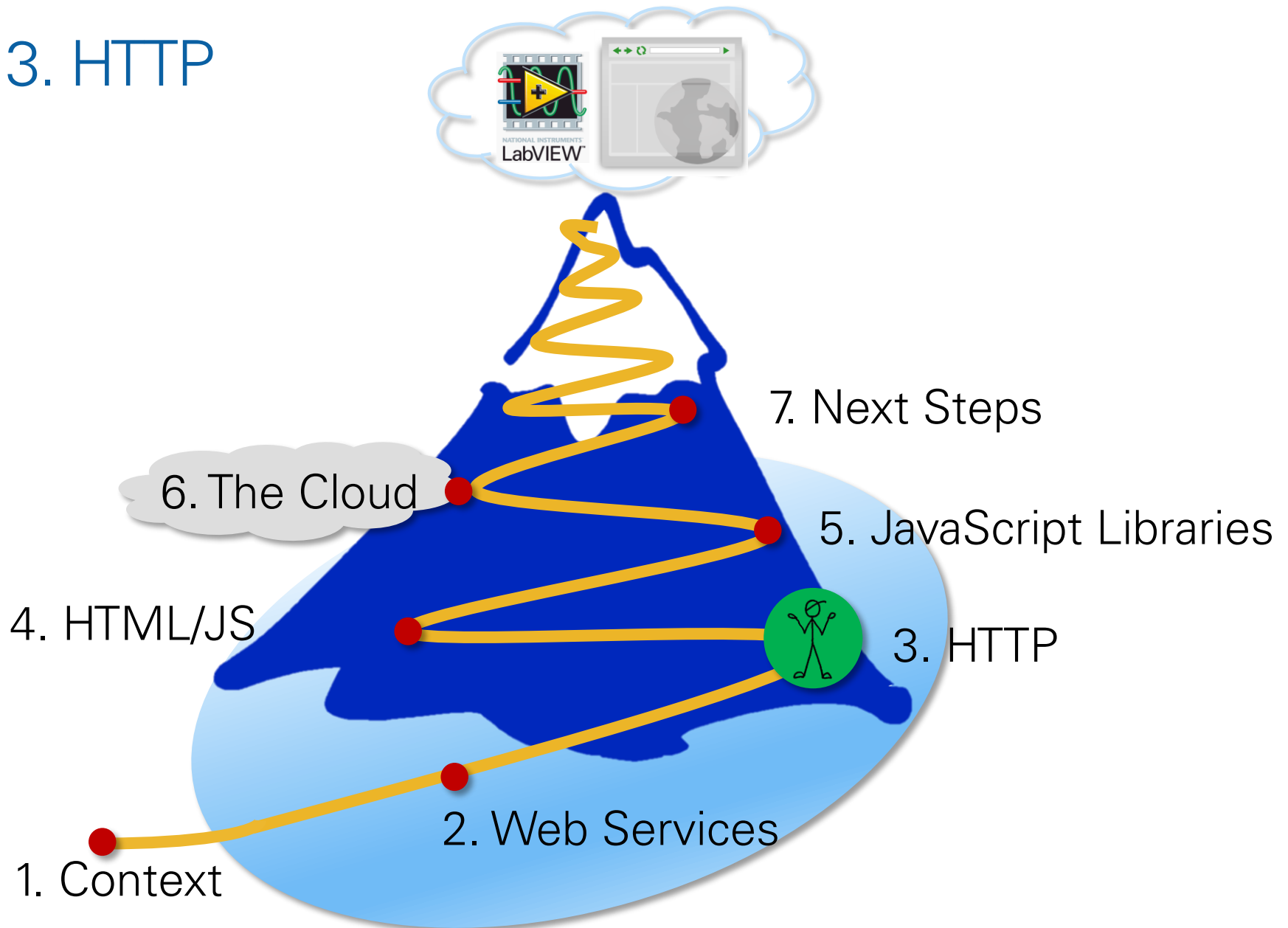
Web Browser



Web Service



3. HTTP

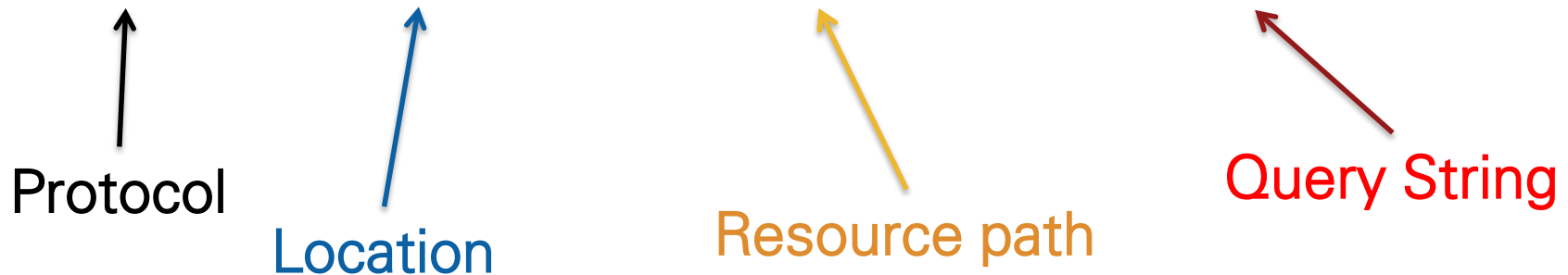


URL

Uniform Resource Locator OR “Web Address”

scheme://domain:port/path?query_string

http://www.ni.com/exampleURL?value="true"



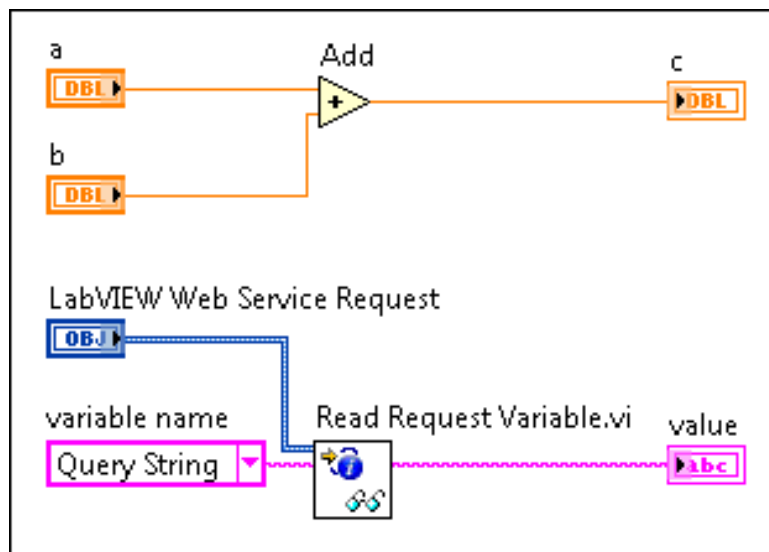
HTTP Demo – Add two numbers

DEMO

← → ↻ 127.0.0.1:8001/WebService1/add?b=2.4&a=4.6

This XML file does not appear to have any style information associated with it. The document tree

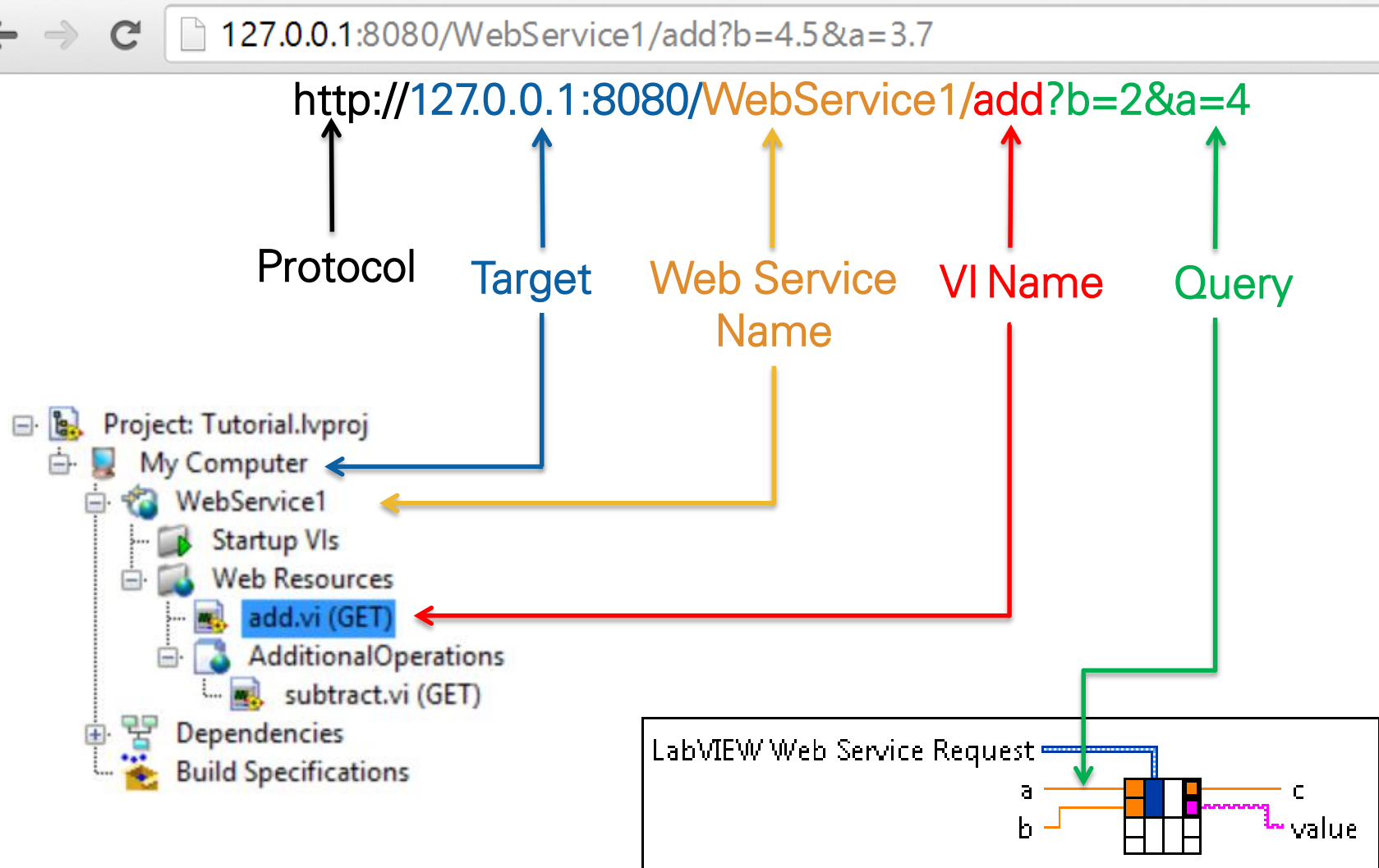
```
<Response>
  <Terminal>
    <Name>c</Name>
    <Value>7</Value>
  </Terminal>
  <Terminal>
    <Name>value</Name>
    <Value>b=2.4&a=4.6</Value>
  </Terminal>
</Response>
```



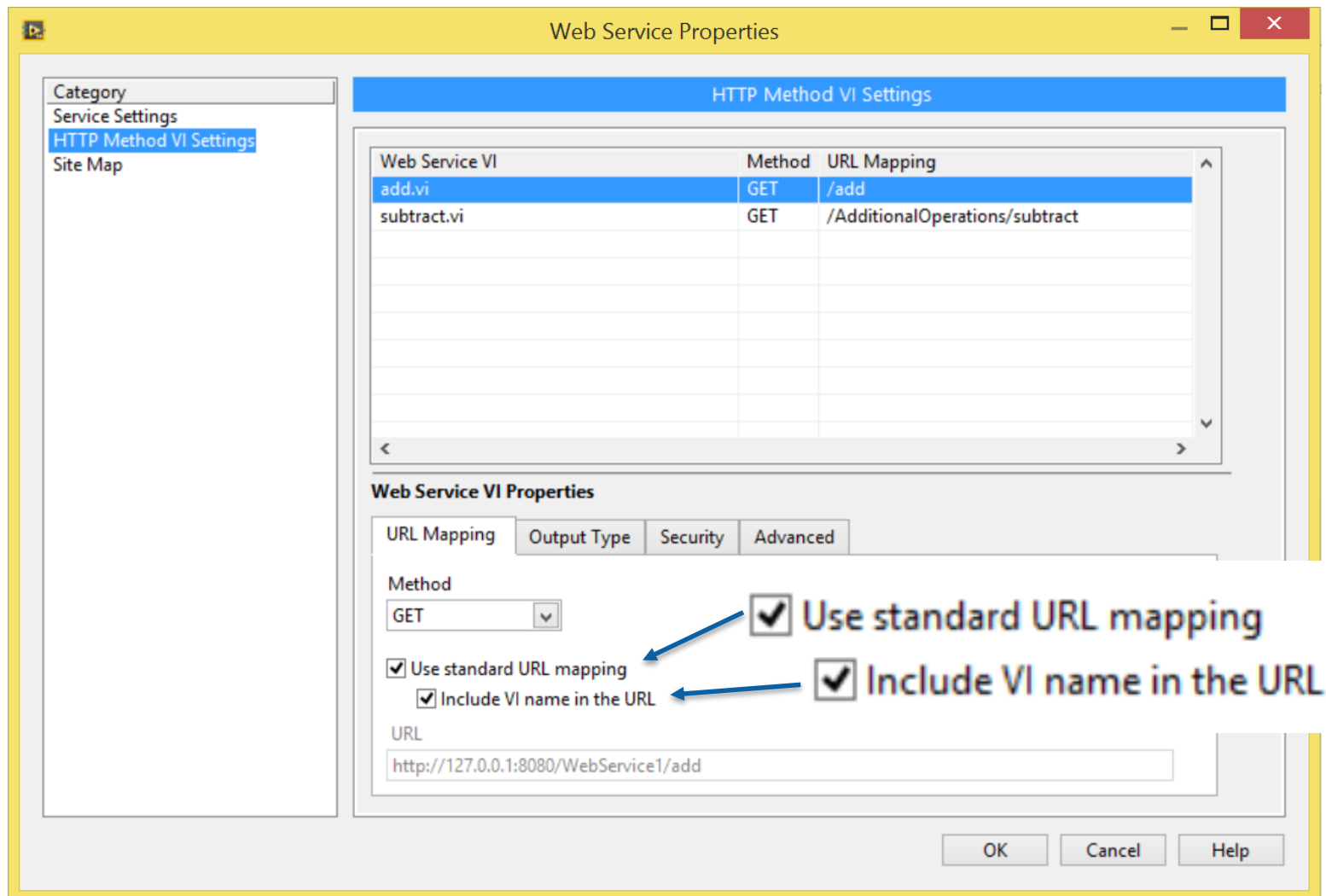
Ex.

<http://127.0.0.1:8001/WebService1/add?b=4.5&a=3.5>

HTTP Demo – Add two numbers

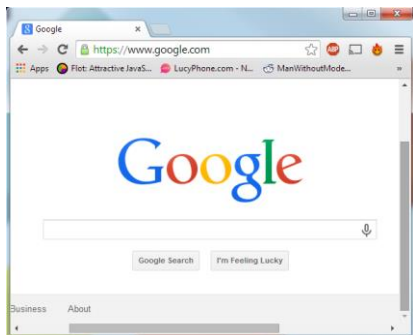


URL Mapping

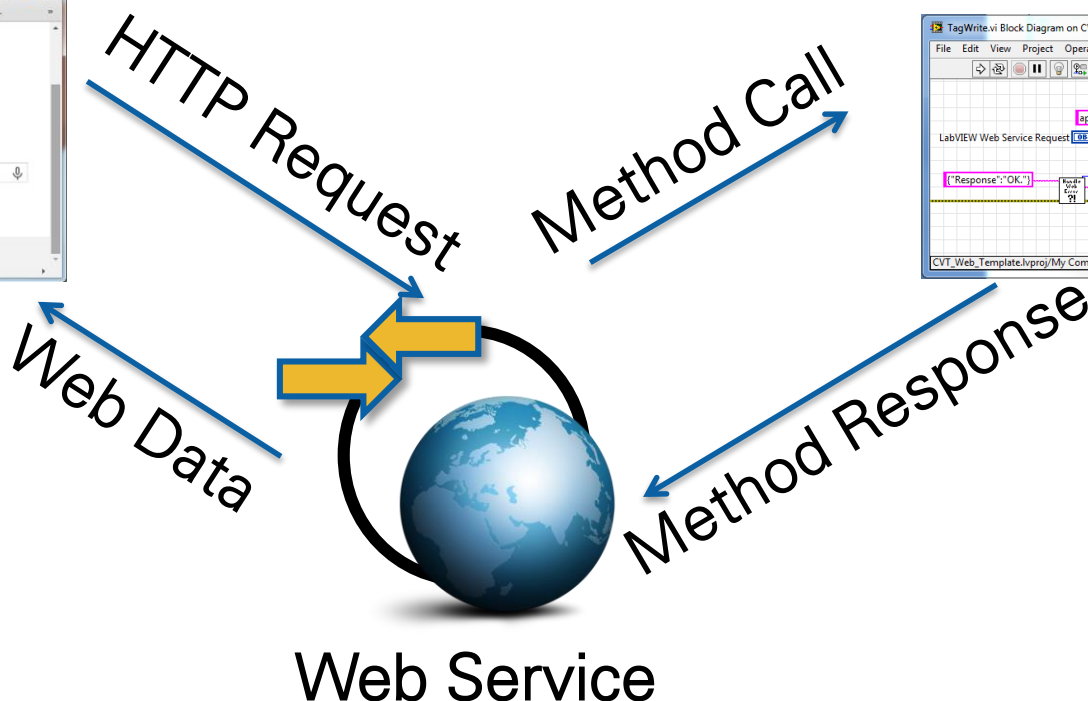
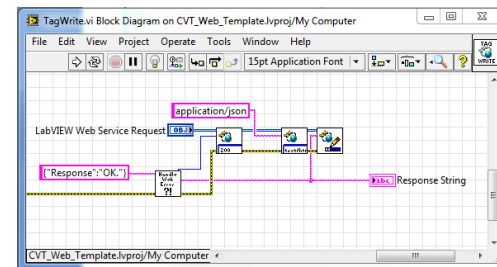


Browser to LabVIEW Communication

Web Browser

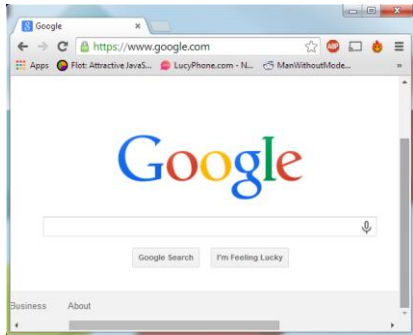


LabVIEW
Web Method



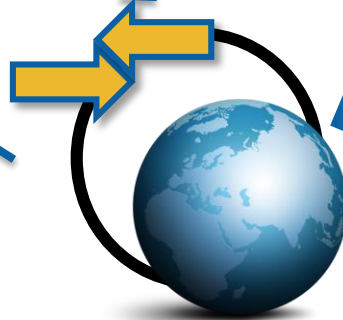
Static Content and Web Methods

Web Browser



HTTP Request

Web Data



Web Service

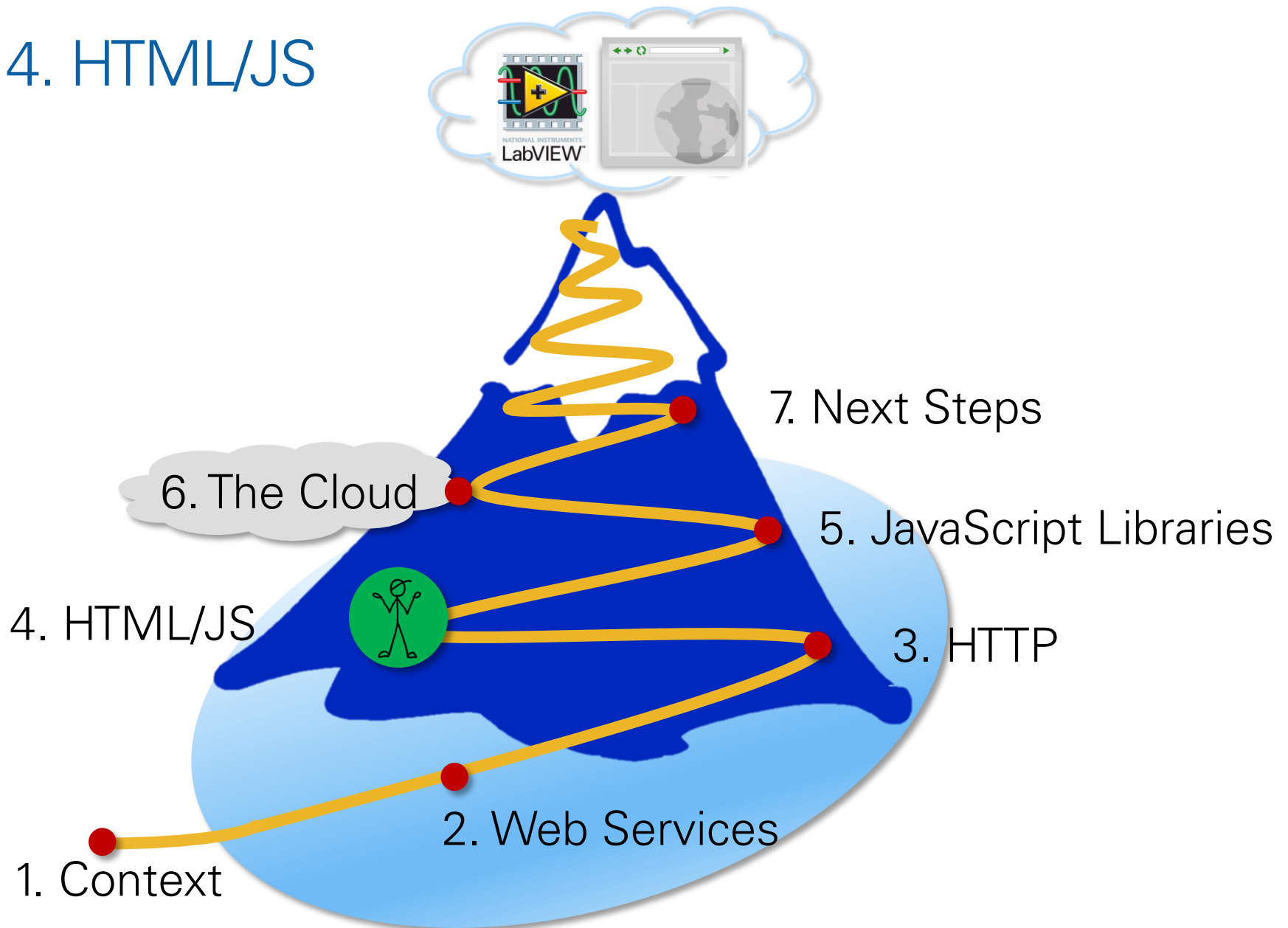
LabVIEW
Web Method

HTML

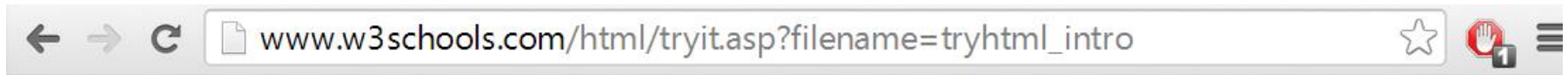
JS

CSS

4. HTML/JS



What is HTML?



HTML is a markup language for describing web documents (web pages). It is the **Front Panel** of your web application.

Edit This Code:

See Result »

```
<!DOCTYPE html>
<html>

<body>

<h1>My First Heading</h1>

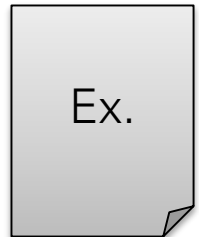
<p>My first paragraph.</p>

</body>
</html>
```

Result:

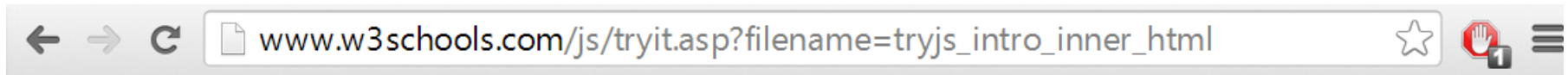
My First Heading

My first paragraph.



Try it Yourself - © w3schools.com

What is JavaScript?



JavaScript can change HTML content. It is the **Block Diagram** of your web application.

Edit This Code:

See Result »

```
<!DOCTYPE html>
<html>
<body>

<h1>What Can JavaScript Do?</h1>

<p id="demo">JavaScript can change HTML
content.</p>

<button type="button"
onclick="document.getElementById('demo').
innerHTML = 'Hello JavaScript!'">
Click Me!</button>
```

Result:

What Can JavaScript Do?

JavaScript can change HTML content.

Click Me!

Ex.

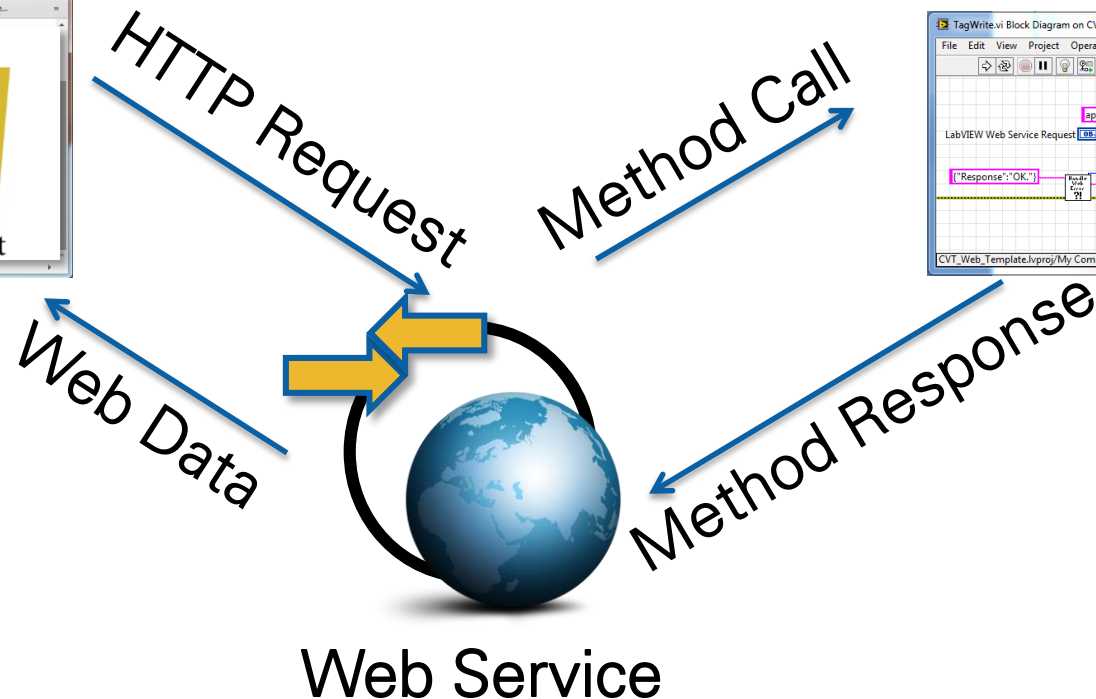
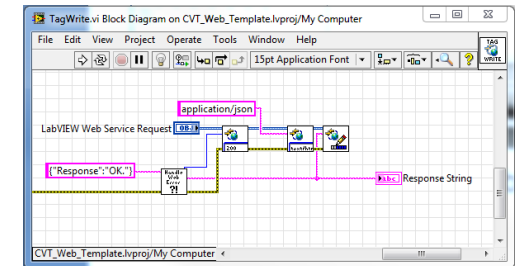
Try it Yourself - © w3schools.com

HTML and JavaScript Run in the Browser

Web Browser



LabVIEW
Web Method



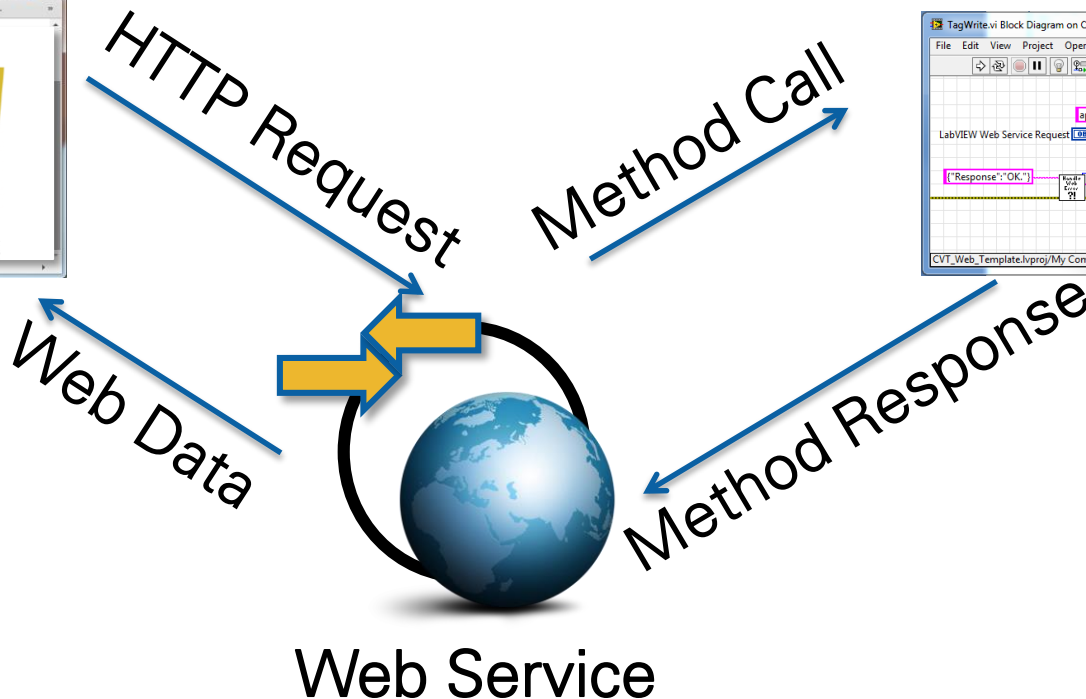
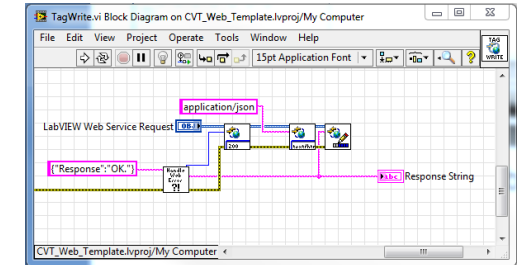
AJAX

Asynchronous JavaScript and XML – web applications with behind the scenes updates

Web Browser



LabVIEW Web Method



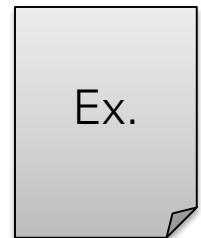
AJAX Demo – Add on Value Change

DEMO



First Number	<input type="text" value="5"/>
Second Number	<input type="text" value="7"/>
Result	12

<http://127.0.0.1:8001/WebClient/home.html>



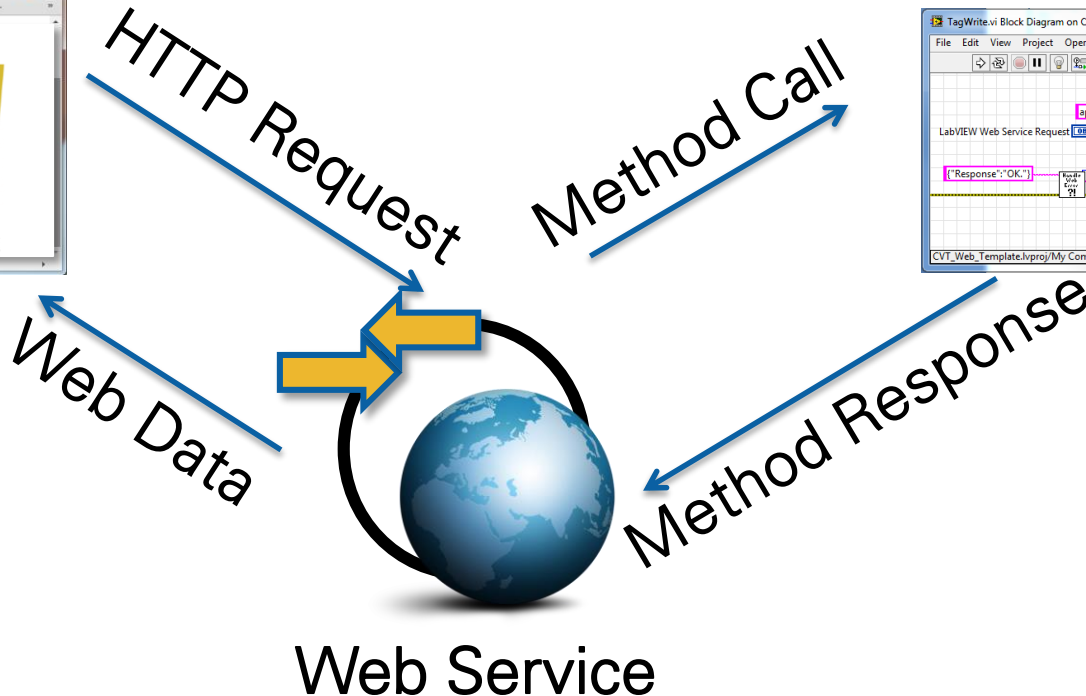
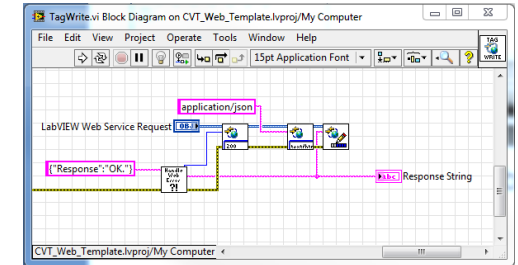
AJAX

Asynchronous JavaScript and XML – web applications with behind the scenes updates

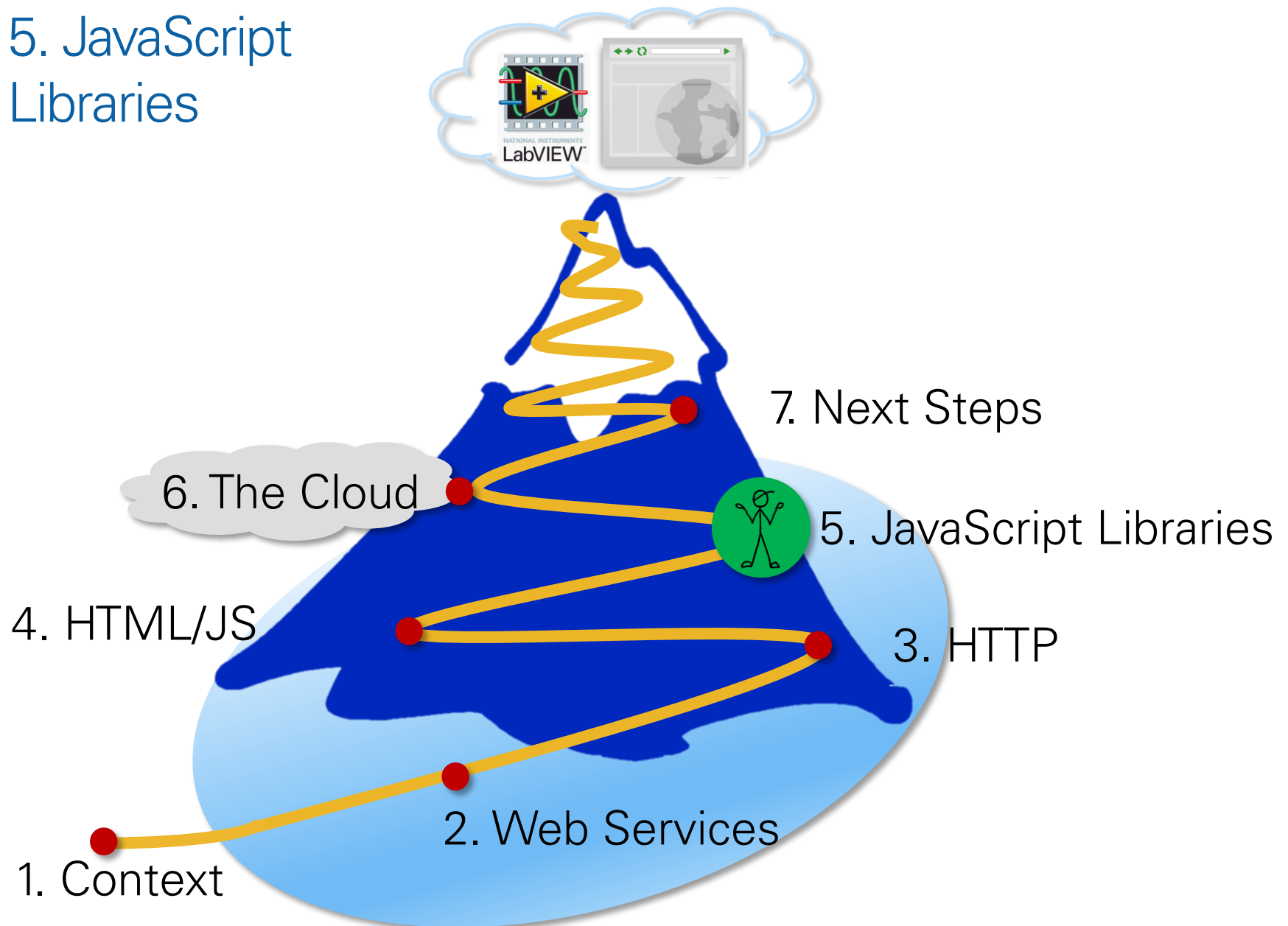
Web Browser



LabVIEW Web Method



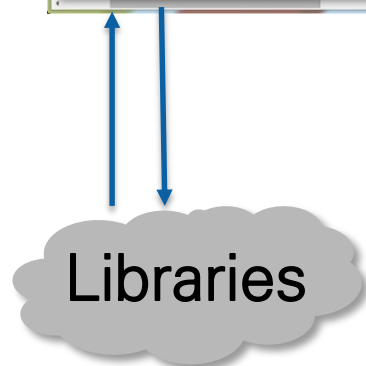
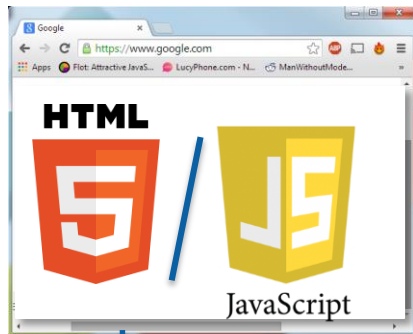
5. JavaScript Libraries



JavaScript Libraries

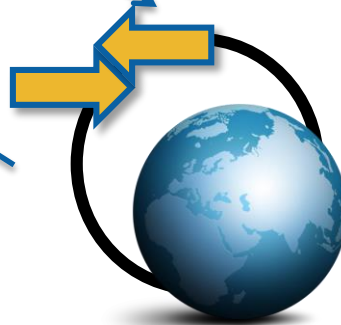
```
<!--Import javascript library-->  
<script src="https://ajax.googleapis.com/ajax/libs/jquery/2.1.3/jquery.min.js"></script>
```

Web Browser



HTTP Request

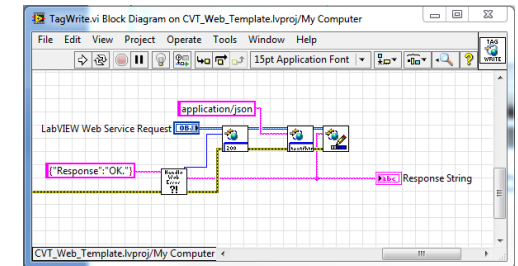
Web Data



Web Service

Method Call

LabVIEW Web Method



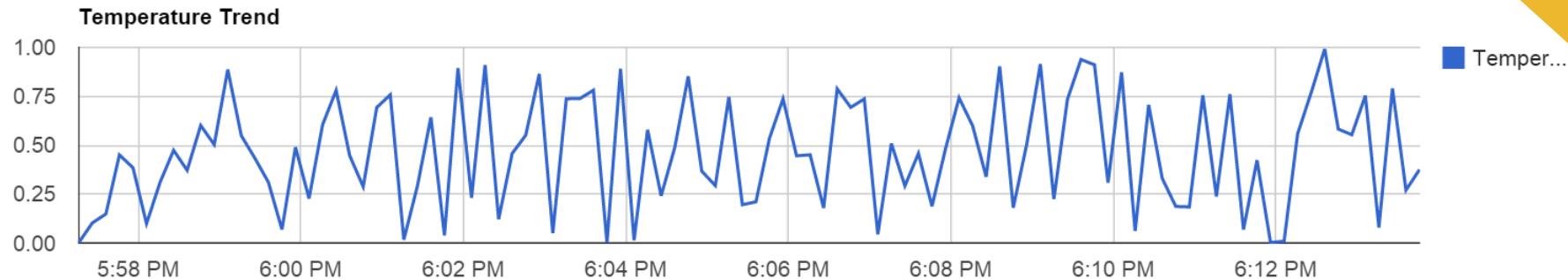
Method Response

Graph Example

DEMO

127.0.0.1:8080/ChartsService/Static/Initial.html

Graph Test



```
<html>
<head>
  <!--Load the AJAX API-->
  <script type="text/javascript" src="https://www.google.com/jsapi"></script>
  <script type="text/javascript" src="loadgraph.js"></script>
</head>

<body>
  <h1>Graph Test</h1>
  <!--Div that will hold the line graph-->
  <div id="chart_div"></div>
</body>
</html>
```

<http://127.0.0.1:8001/GraphService/Initial.html>

Ex.

Graph Example

DEMO

127.0.0.1:8080/ChartsService/Static/Initial.html

Graph Test



```
<!--Load the AJAX API-->
<!--Import javascript library-->
<script src="https://ajax.googleapis.com/ajax/libs/jquery/2.1.3/jquery.min.js"></script>
<script type="text/javascript" src="https://www.google.com/jsapi"></script>
<script type="text/javascript" src="loadgraph_Button.js"></script>
</head>
```

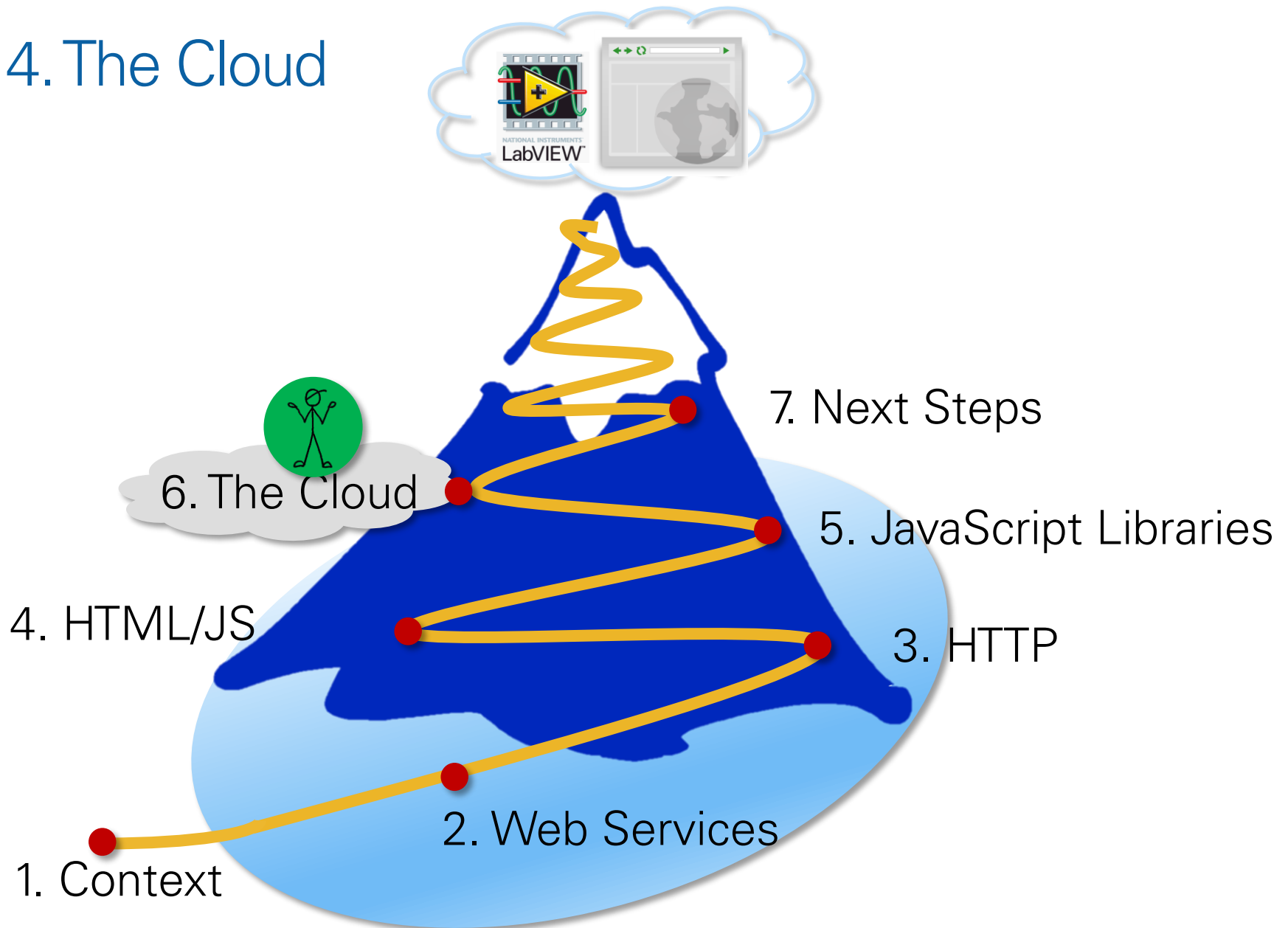
```
<body>
<h1>Graph Test</h1>
<!--Div that will hold the line graph-->
<div id="chart_div"></div>
<button type="button" id='submitButton'>Submit</button>
```

```
</body>
</html>
```

http://127.0.0.1:8001/GraphService/Initial_Submit.html

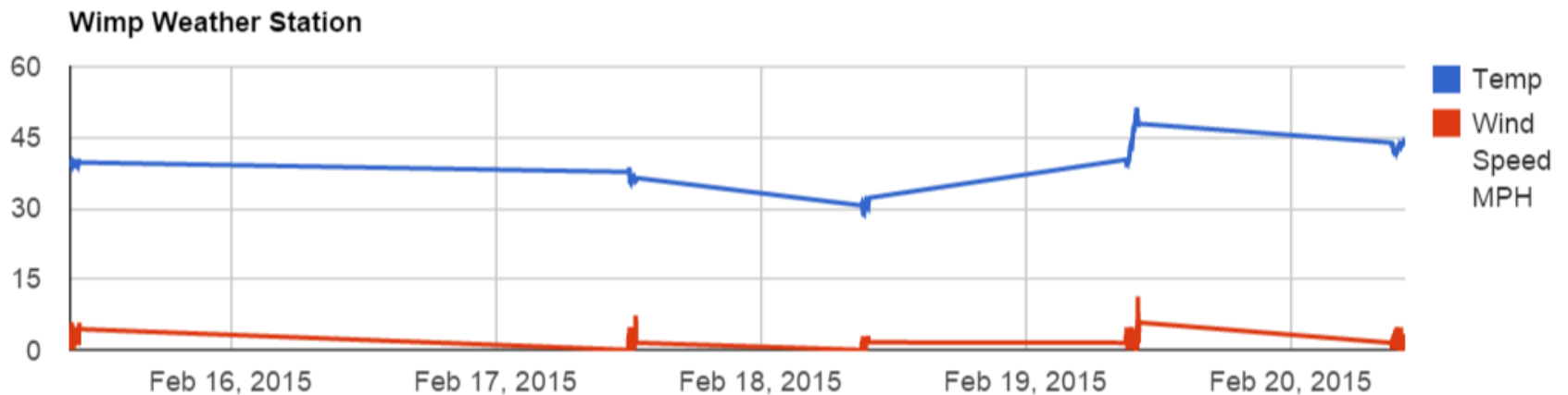
Ex.

4. The Cloud

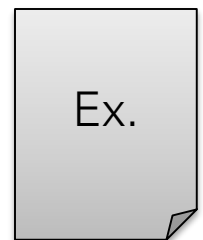


Cloud Demo

DEMO



<http://127.0.0.1:8001/SparkDataService/SparkData.html>



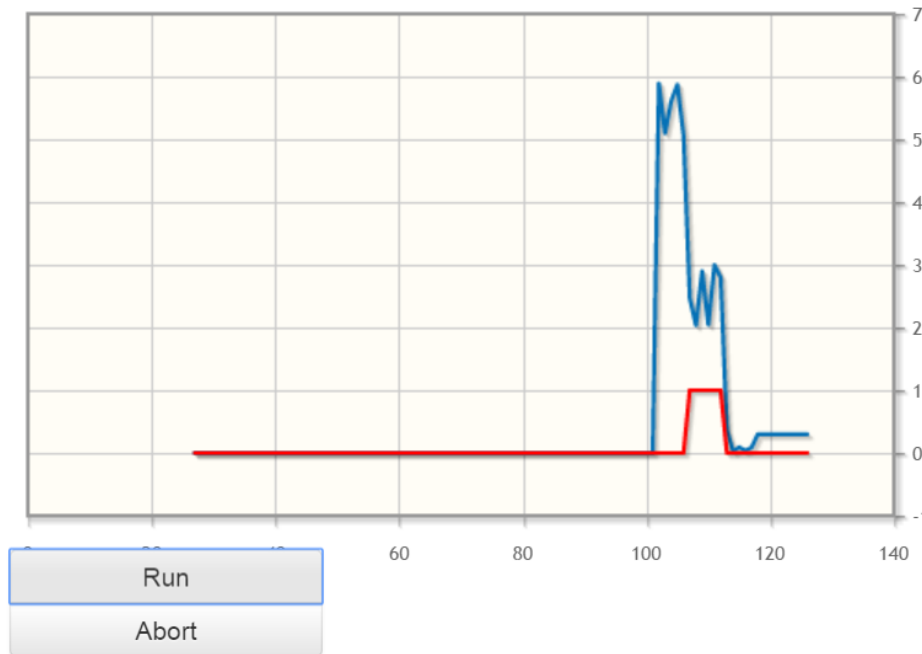
Web Development Frameworks

DEMO

127.0.0.1:8001/WebMessageHandler/Home.html

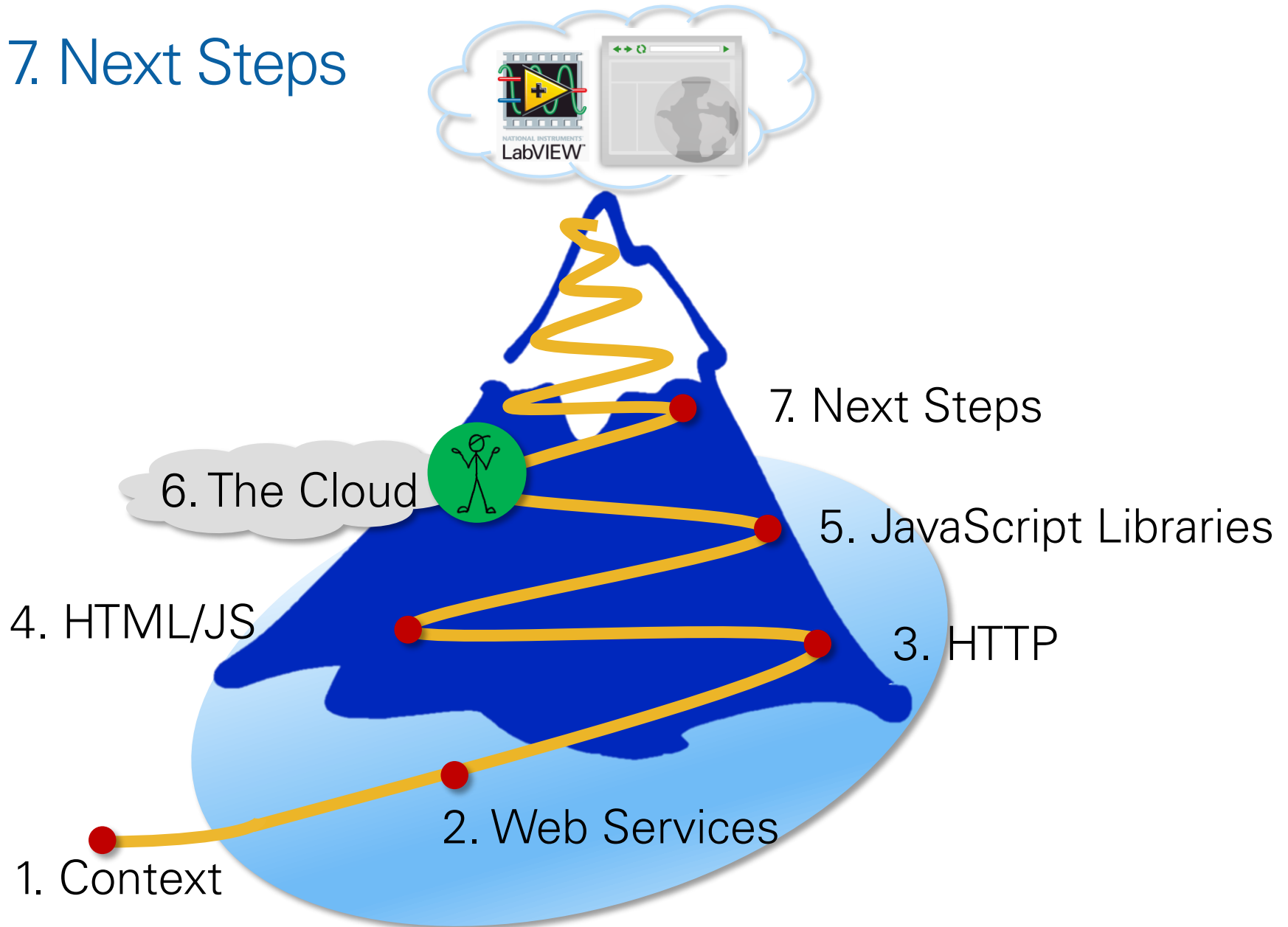
EmbedClient Home Results Status About

Bootstrap starter template



<http://127.0.0.1:8001/WebMessageHandler/Home.html>

7. Next Steps



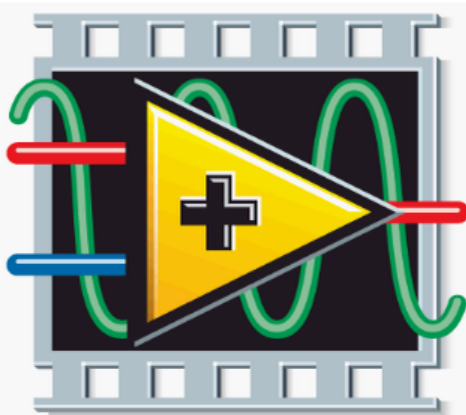
Next Steps: www.tinyurl.com/lvweb

- Getting Started Series
 - Context
 - Web Services
 - HTTP
 - HTML and JavaScript
 - AJAX
 - JavaScript Libraries
- Publishing Data Series
 - Text Stream
 - Table Display
 - Chart
 - Historian
- Misc Examples
 - Google Maps
 - Screenscape
 - **Your Example Here!**

LabVIEW Web Development Latest Activity: 1 day ago

Overview (customize) Members (53) Discussions (1) Documents (14) Polls

Group Overview







For a LabVIEW developer, it can be daunting to learn how to program a web client to monitor your data remotely. Bring your LabVIEW application to the web through LabVIEW web services, and share and improve your best practices by posting example web applications built with LabVIEW. Learn from proven examples and build your HTML and JavaScript skills through this community.

Owned by:
[Tanner!](#)
[dnchen](#)
[JoeySpinella](#)


Tags: [labview](#), [client](#), [development](#), [web](#), [html](#), [website](#), [mobile](#), [page](#), [services](#), [thin](#), [javascript](#), [js](#), [ajax](#)

Created: Jan 20, 2015
Group Type: Open ?

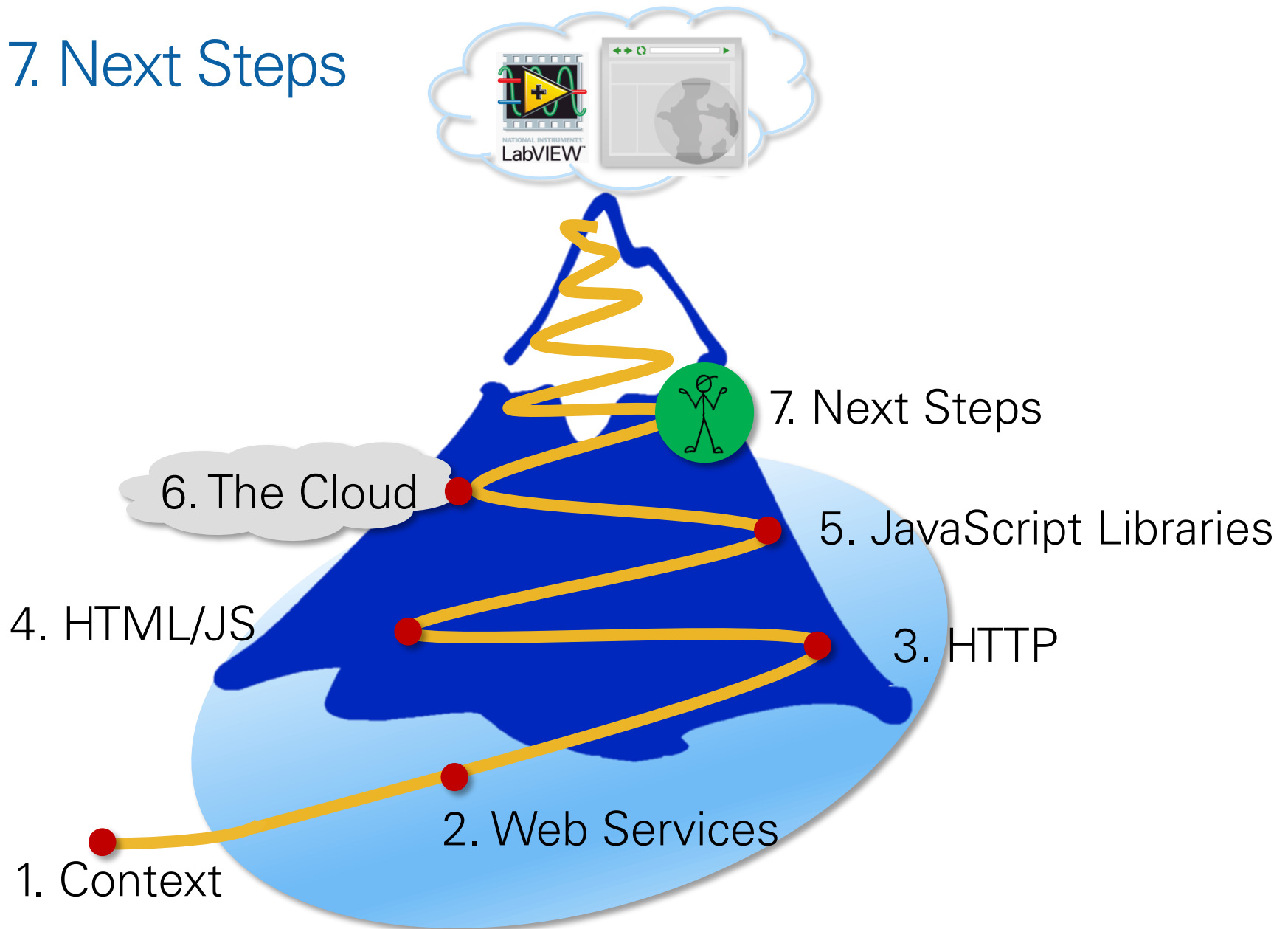
Featured Content

 Web Services Getting Started Series 1 week ago	by JoeySpinella 
 Web Connectivity Options in LabVIEW 1 month ago	by JoeySpinella 

Recent Discussions

 Re: What kind of web services demos do we need? 1 month ago	by JoeySpinella 
--	---

7. Next Steps



What about Security?

- Local Intranet Access
- API Key Security
- Manage Web Client user access
- <http://www.ni.com/white-paper/7749/en/>

