**Goal:** Use LANforge to emulate layer 4-7 download traffic

Creating web browsing and movie watching is a common task with LANforge. This cookbook will introduce HTTP download examples and describe the difference between the Layer 4-7 and Generic traffic generation techniques. We will begin on a CT520a with 20 stations. There are two methods of emulating web browsing:

1. **Layer 4-7 connections:** these are workers doing downloads using `curl`
2. **Generic connections:** these are scripts call programs that can download or upload. Not just any program can be used, these programs need to be able to bind to a specified network interface.

If you want to:
- **load test** a web server, you will use mostly use **Layer 4-7 connections**.
- **multiple video streams**, you would use **Generic connections** that call `c-clive`
- **upload files**, you would use **Generic connections** that call `curl`

The following examples do not assume your LANforge has a route to the Internet, but are pointing at a webserver at an IP address. We are going to show making a common mistake in the first example.

```
1. System Under Test
   Web Server

   LANforge FIRE

2. Simple HTTP Get
   Check your Port Mgr tab and note we have 20 stations on resource 2, radio wiphy0.
```
3. Move to the Layer 4-7 tab

4. Create a new connection, this example is named www1, on resource 2, WiFi station sta1000. Next, consider the URLs per 10 minute field.
A. Hover your mouse over the URLs per 10 min field to see the tool tip. If you wanted to create five connections a second, that would be 3000 connections in 10 minutes. This differs from the Max Speed field, which sets the maximum bit per second of the connection.

5. Continue with other settings. We are purposely going to make an error and diagnose it.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endp Name</td>
<td>0</td>
</tr>
<tr>
<td>URLS per 10m</td>
<td>3000</td>
</tr>
<tr>
<td>Max Speed</td>
<td>Infinite</td>
</tr>
<tr>
<td>DNS Cache Timeout</td>
<td>600</td>
</tr>
<tr>
<td>Proxy Auth</td>
<td>None</td>
</tr>
<tr>
<td>Proxy Port</td>
<td>0</td>
</tr>
<tr>
<td>Proxy Auth</td>
<td>None</td>
</tr>
<tr>
<td>Proxy Auth</td>
<td>None</td>
</tr>
<tr>
<td>HTTP Auth</td>
<td>Gzip</td>
</tr>
</tbody>
</table>

A. Set the request rate, choose the number of URLs per 10 min to 3000

B. DNS Cache Timeout: 600

C. Select Gzip

D. Set URL to http://10.136.0.1/

E. Set Destination file or directory to /dev/null if you are on Linux. (If you are on Windows, you need to use NUL)

F. Select Enable 4XX to show errors in logs
G. Select **Bind DNS** so that hostnames are resolved over sta1000 (not over our management port)

H. Click **Apply**. Do not close this window.

6. Back in the Layer 4-7 tab, select the connection

7. **Start** the connection

A. ... then click **Display**

8. Watch the www1 endpoint window...
A. Notice how there is no traffic to ctweb: because the hostname won’t resolve over our test network. This is a common mistake. Let’s use the IP of our other LANforge hosting our test network instead.

9. Change the URL to use an IP address: http://10.136.0.1/
A. Click **Apply**

B. Do not close the window.

10. The endpoint display now shows traffic.

A. Not having DNS resolution is a common problem in test networks.

B. It can cause problems when connecting to a https website and getting certificate errors.

C. Click **Close**

11. It is pretty simple to create a connection per WIFI station on our LANforge. Return to our **Create/Modify L4Endpoint** window for **www1**
A. Click Batch-Create

12. In the **Batch Create** window, create 19 more connections

A. Quantity: 19
B. Number of Digits **3**
C. File increment: **0** (because we don’t have multiple /dev/null files)
D. Click **Apply**

13. Back in the Layer 4-7 tab, observe all our connections
14. Highlight them, and click **Start**

15. Note that if we were to Right Click → Display to show dynamic report

16. Right Click → Dynamic Report to show dynamic report
A. This shows throughput for all the connections.

B. Notice how crowded this graph is. There is a simpler way to display overall throughput.

17. Next, select the Port Mgr tab.
   A. Select resource 2, radio wiphy0
B. Right Click → Dynamic Report to show dynamic report

C. See the overall throughput through the radio