

*Video Wall - Low-latency Video and
Enhanced Situational Awareness Solution*

Technical Talk

Sean Sonander

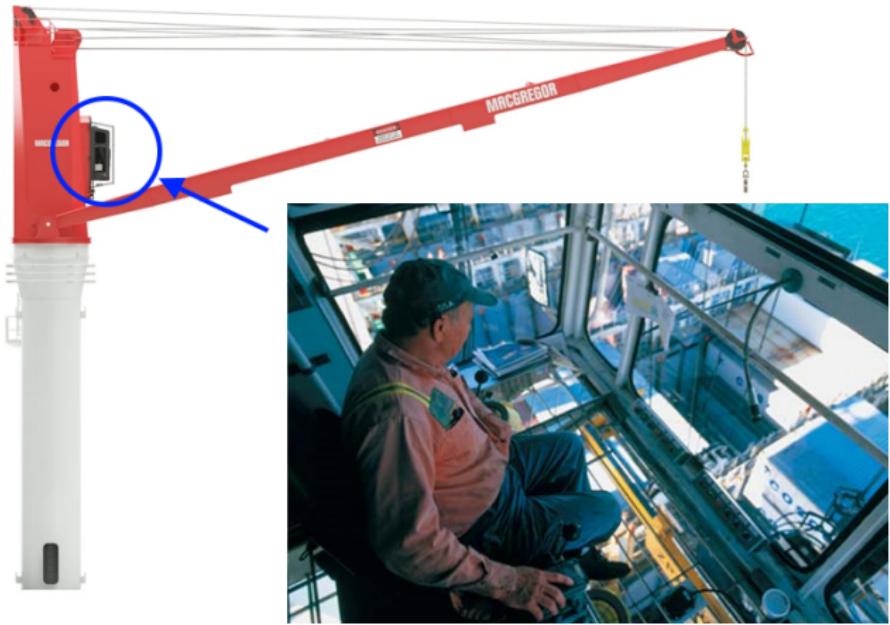
孙啸恩

Ben Green

吴杰明

*Lancaster University
School of Computing and Communications*





STS Crane at Keelung



Piccadilly Line "Deep-level tube" Train (1973 Stock)



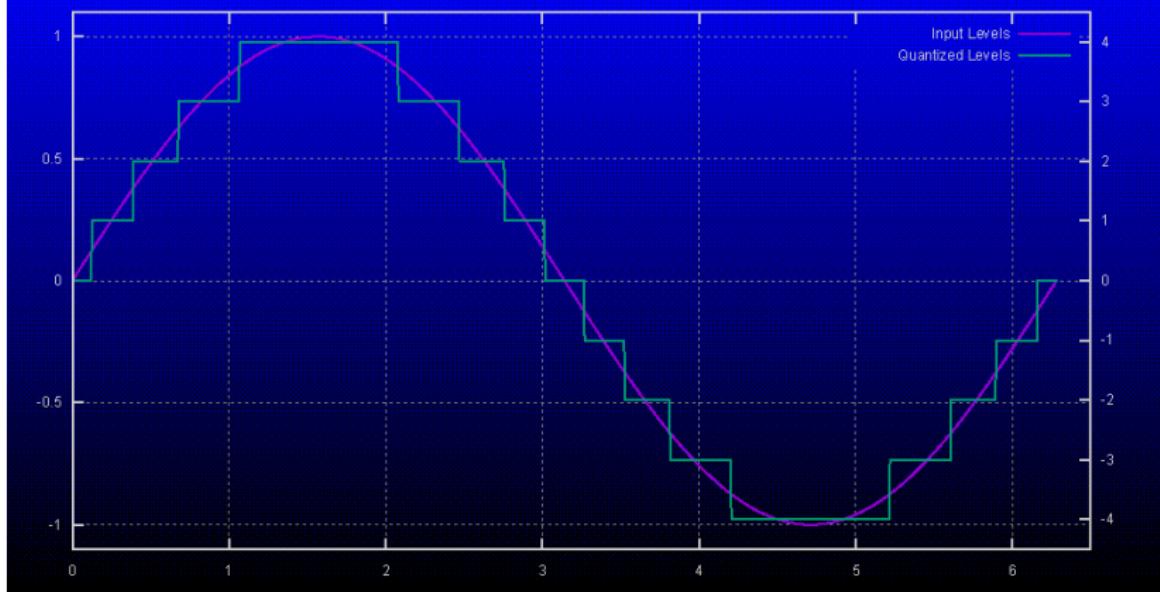
CC-BY-SA2.0 Can Pac Swire <https://flickr.com/photos/18378305@N00/27585659674>



Video Display



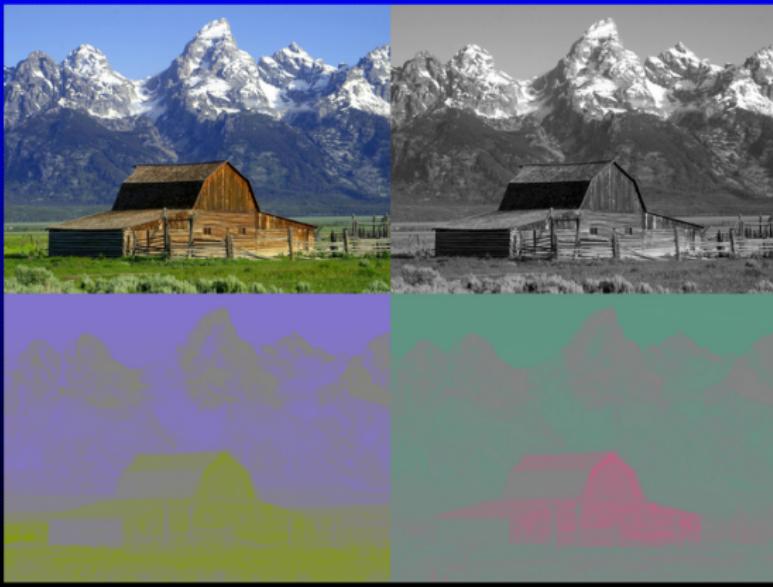
Quantisation



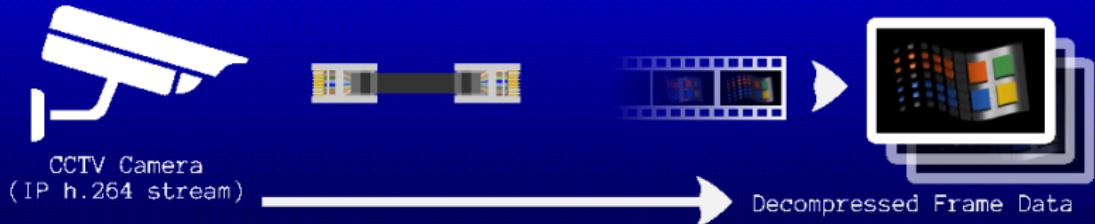
Colourspaces (from Black and White to Colour TV Days)



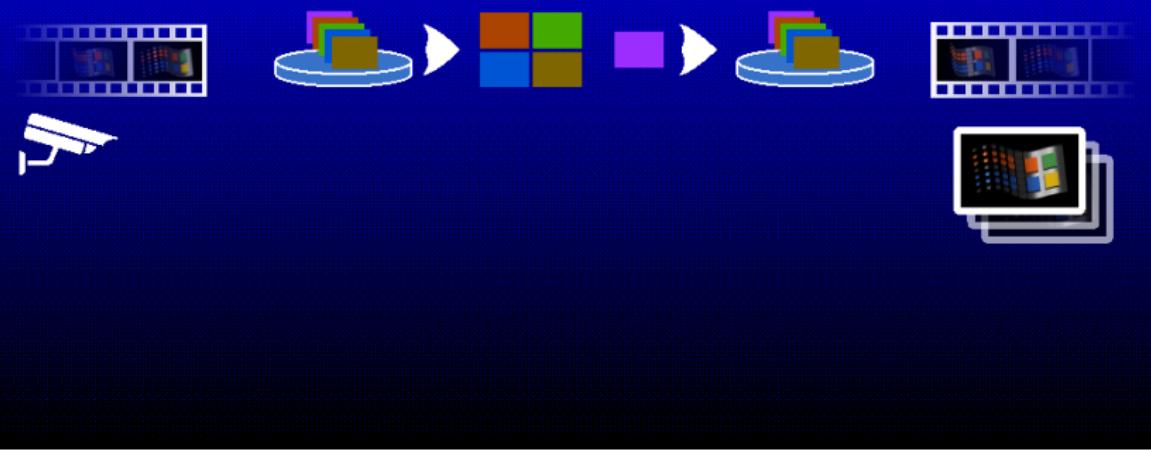
YCrCb Luminance and Chrominance



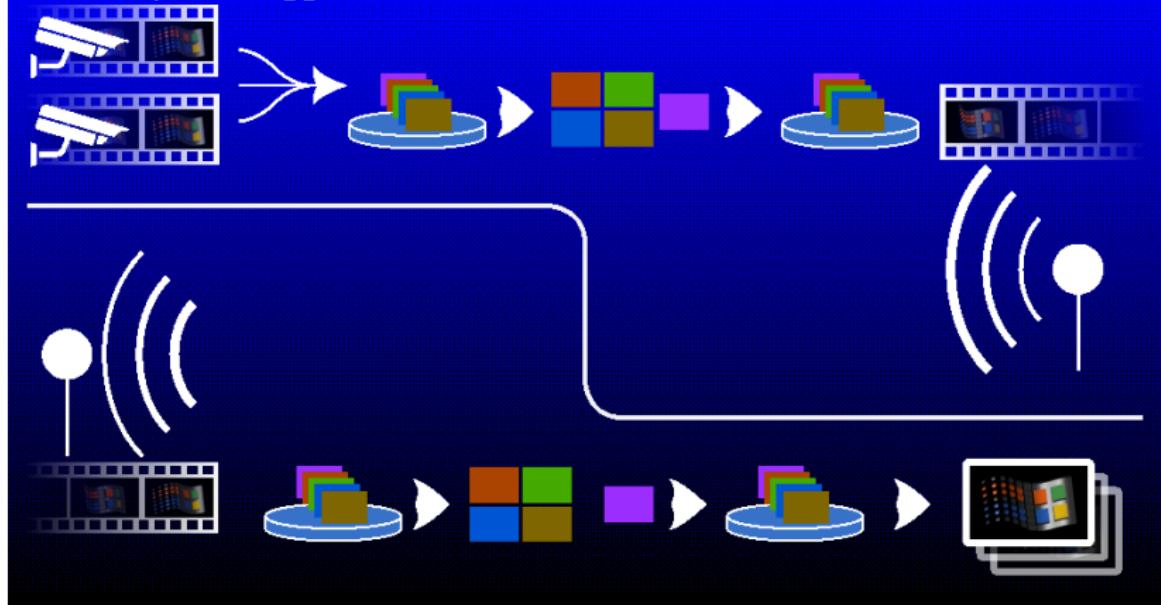
Camera to frame buffer flow



Video Wall Architecture Overview



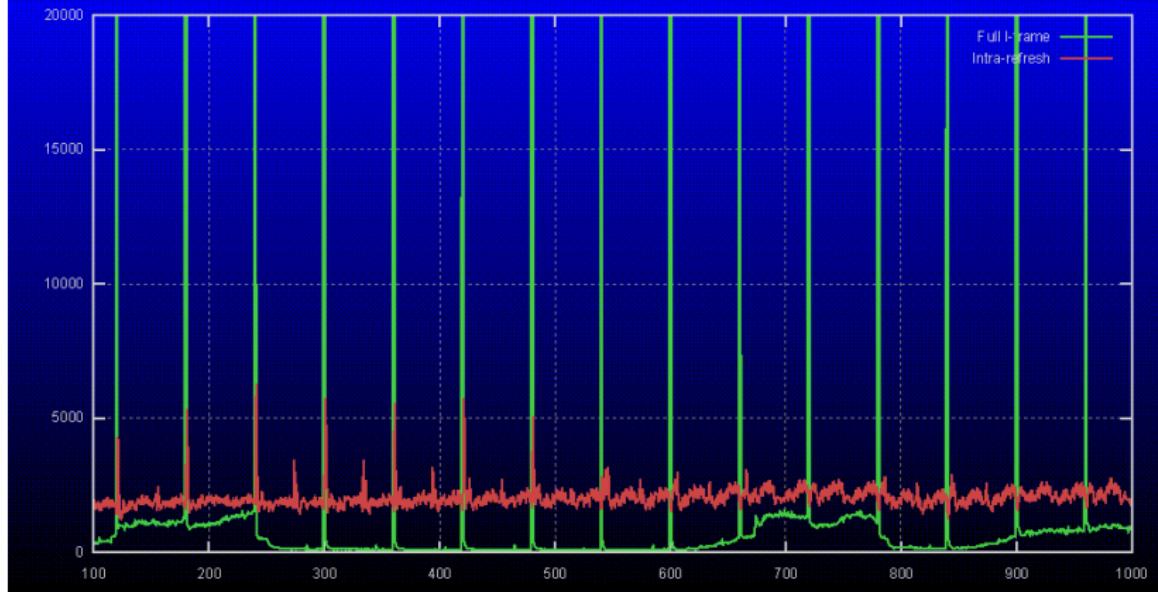
Piccadilly Line Application Architecture



Example of a corrupt intra coded picture



Complete verses Intra-refresh I frame transfer



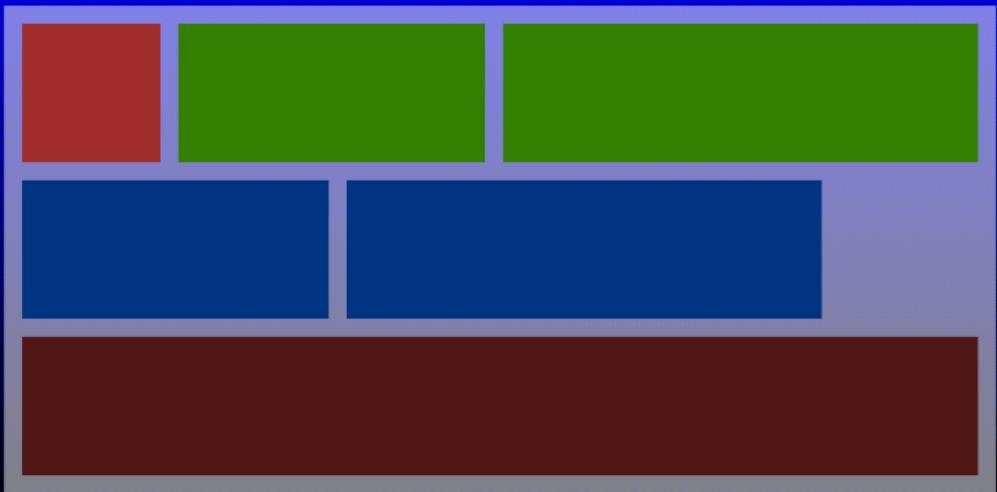
XOR FEC Burst Structure

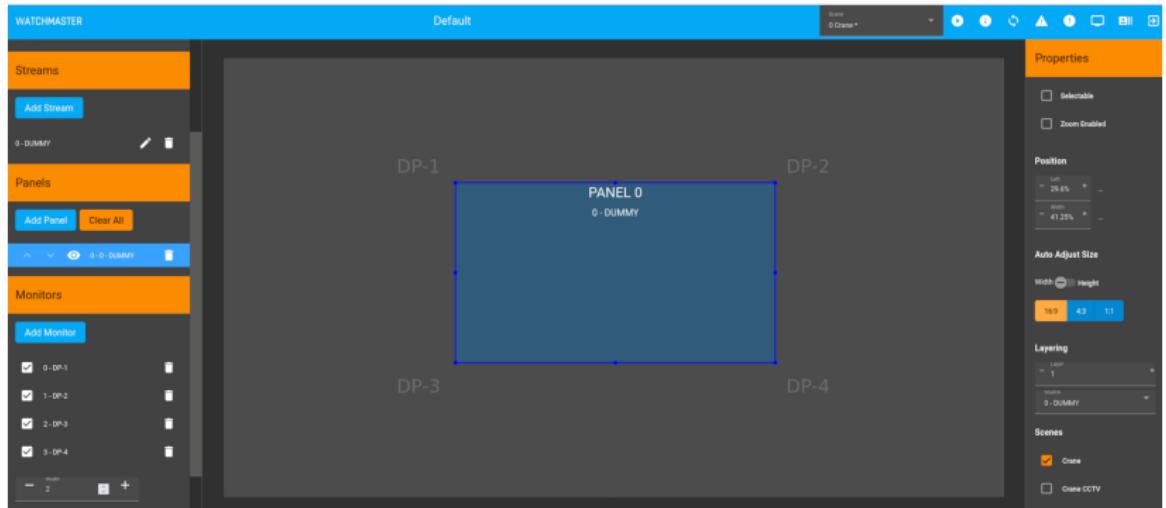
header burst_1 header frame_1, header frame_2, header, frame_3 frame_1, frame_2, frame_3

header burst_2 header frame_4, header frame_5 frame_4, frame_5

header burst_3 burst_1 ^ burst_2

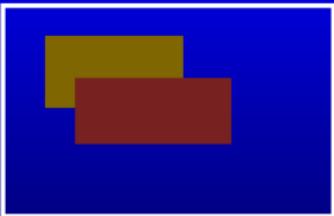
Partition Layout



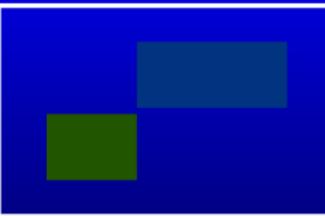


Workspaces in Sway

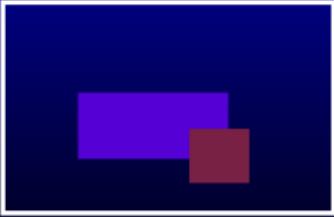
Workspace 1



Workspace 2



Workspace 3



Virtual Coordinate Space

Workspace 1

Workspace 2

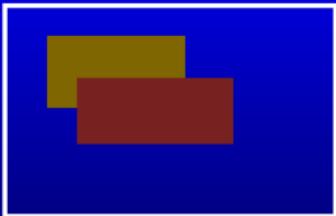
Virtual Coordinate Space



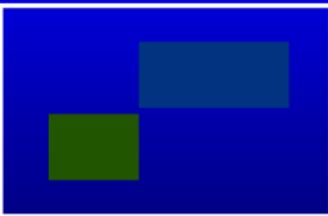
Workspace 3

Outputs view the Contents of Workspaces

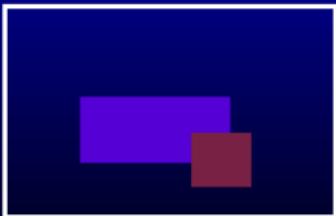
Workspace 1



Workspace 2



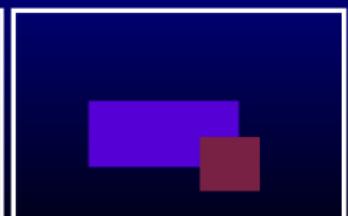
Workspace 3



Output 0



Output 1



ARP Sequence

192.168.80.9/24

Application Requiring Network Communication

```
$ ping 192.168.80.2
```

Routing Table

```
192.168.80.0/24 dev eth0 scope link src 192.168.80.9
```

Who has 192.168.80.2?

Source MAC	Source IP	Destination MAC	Destination IP
67:00:53:ef:72:31	192.168.80.9	00:00:00:00:00:00	192.168.80.2
67:00:53:ef:72:31	192.168.80.9	76:84:5d:e5:7a:0b	192.168.80.2

That is me.

ARP Table

```
192.168.80.2 at 76:84:5d:e5:7a:0b [ether] on eth0
```

ARP Sequence Summary

192.168.80.9/24

Application Requiring Network Communication

```
$ ping 192.168.80.2
```

Routing Table

```
192.168.80.0/24 dev eth0 scope link src 192.168.80.9
```

Check ARP Table for eth0 (no entry found: table empty)

ARP Request on eth0: Who has 192.168.80.2?

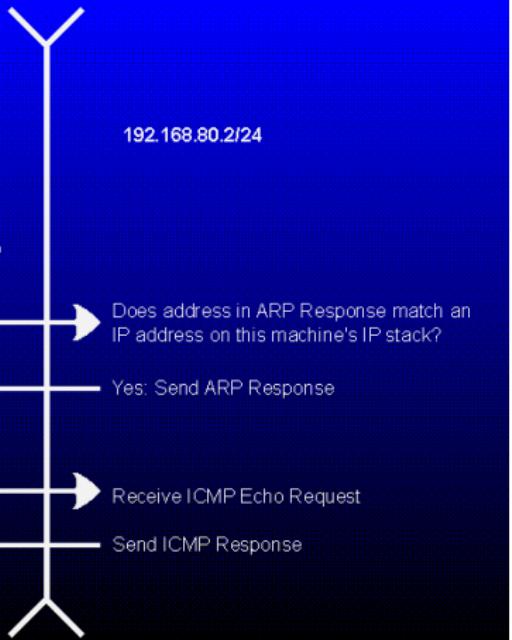
Receive ARP Response from 192.168.80.2

Add new entry to ARP Table:

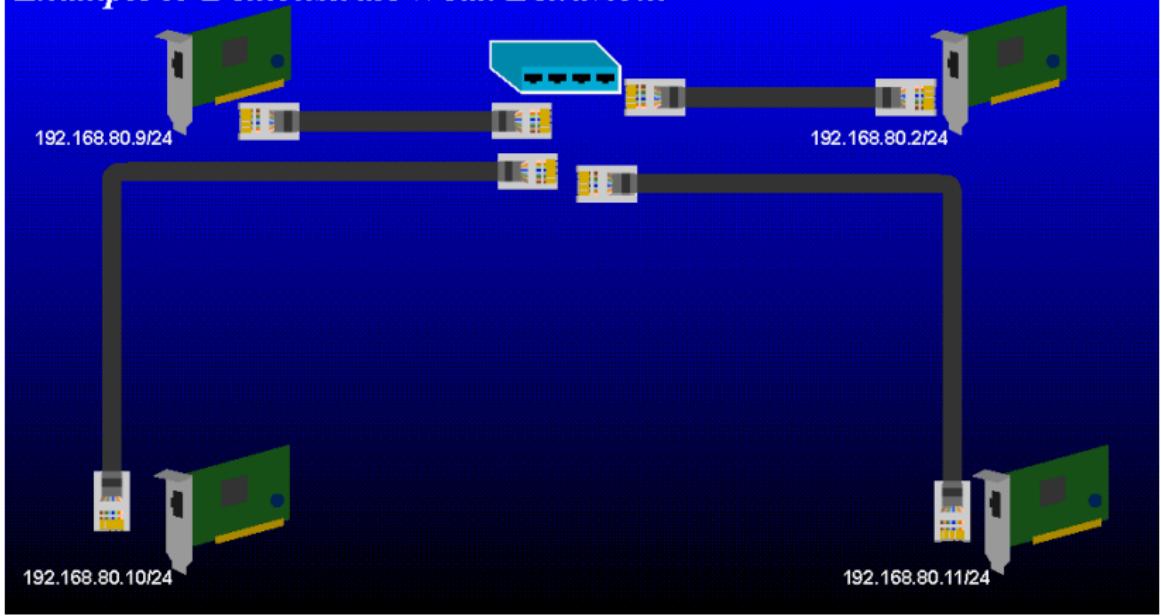
```
192.168.80.2 at 76:84:5d:e5:7a:0b [ether] on eth0
```

Send ICMP Echo Request to 192.168.80.2

Receive ICMP Echo Response



Example to Demonstrate Weak Behaviour



Platform Processor "Combiner"



Decoding to raw frames



Compositing



Composed output buffer



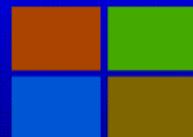
Encoding to h.264 stream



Reception, Decoding and Rendering



Decoding to raw frames



Compositing



Composed output buffer



Output to monitor

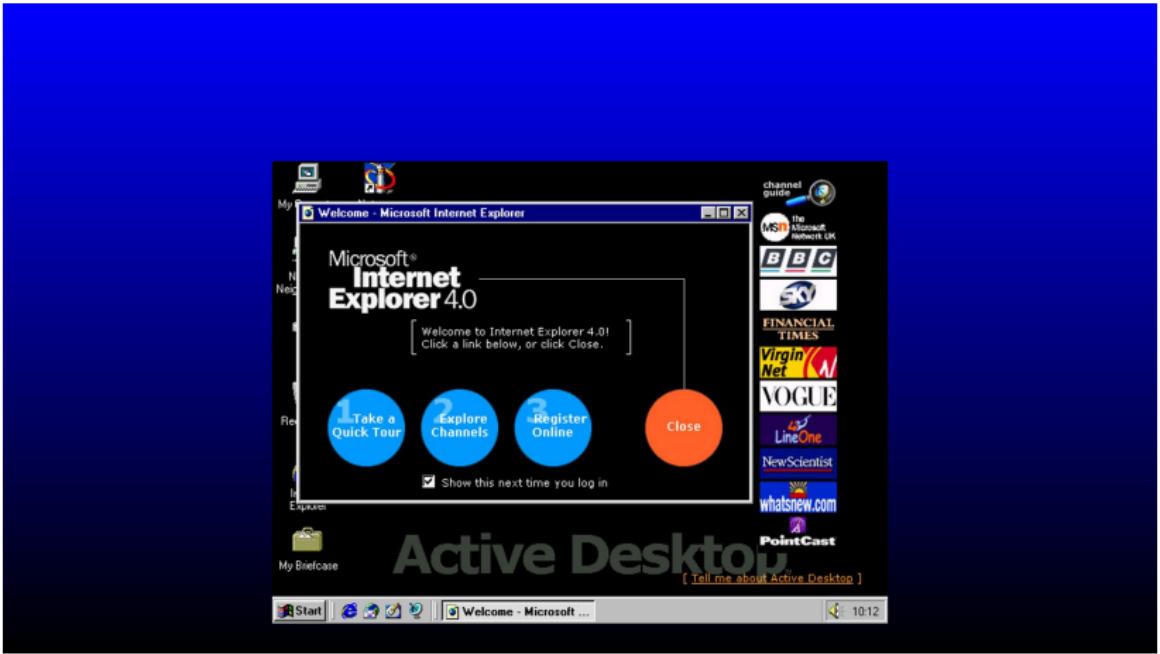


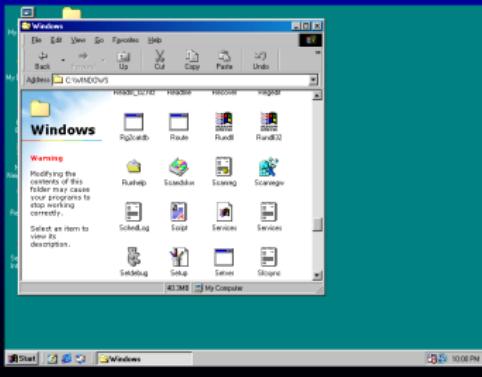


ATOM



Visual Studio Code







Learning HTML and CSS is a lot more challenging than it used to be, responsive web design adds more layers of complexity to design and develop websites

- Jacob Lett



Interacting with HTTP Server

