Different Dynamic Options for Integrating SVG

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SVG – Files can be lengthy

```
<svg xmlns="http://www.w3.org/2000/svg">
  <g id="circle1">
    <circle cx="999" cy="100" r="100" style="…"/>
    …
    </g>
  …
  </svg>
```

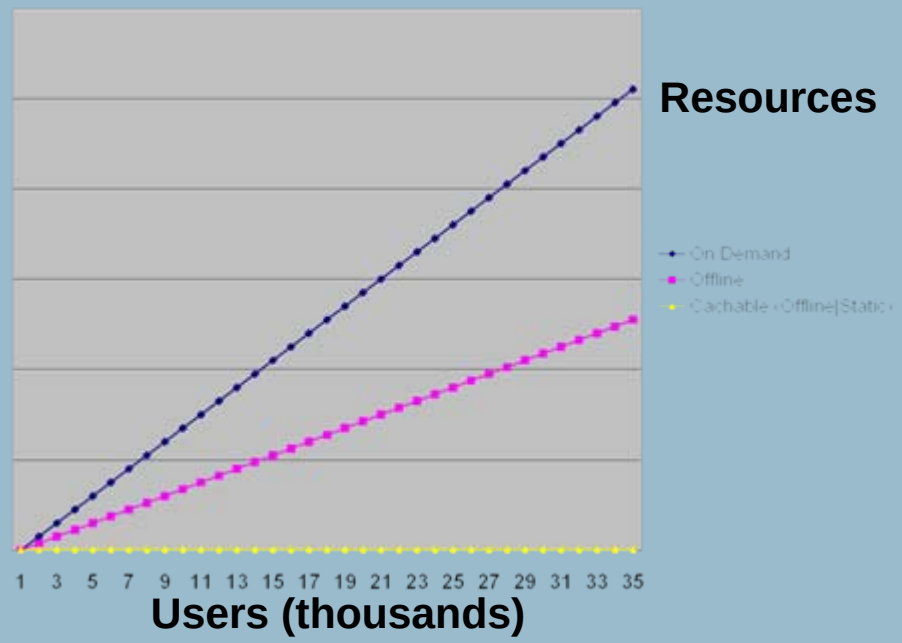
Delivering SVG images

Large image descriptions:

- Dynamic generation requires server-side resources
- Transmission requires significant bandwidth
- Successive related images require regeneration and retransmission

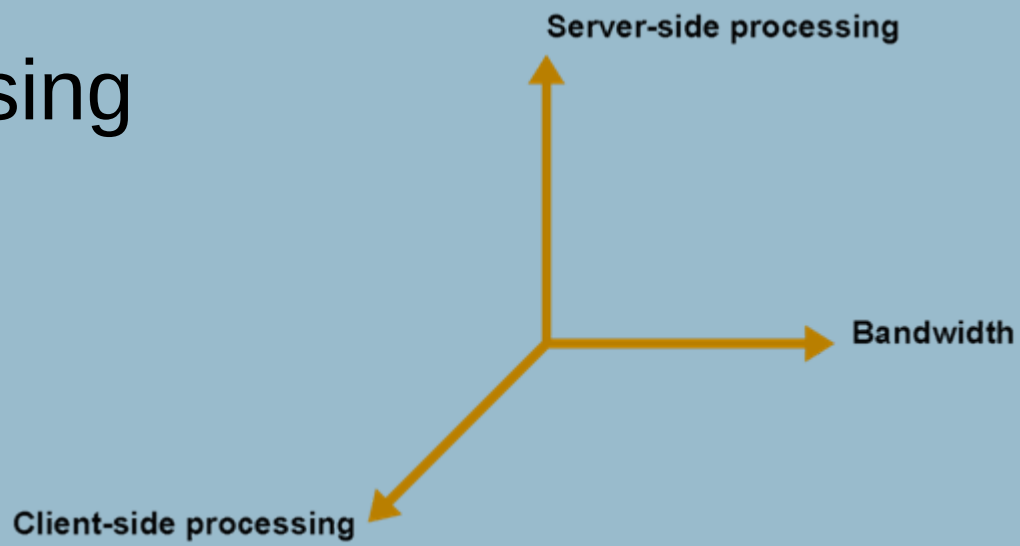
Fact: Dynamic HTML is expensive

- Non-cachable
- Expensive to generate
- Resources are finite



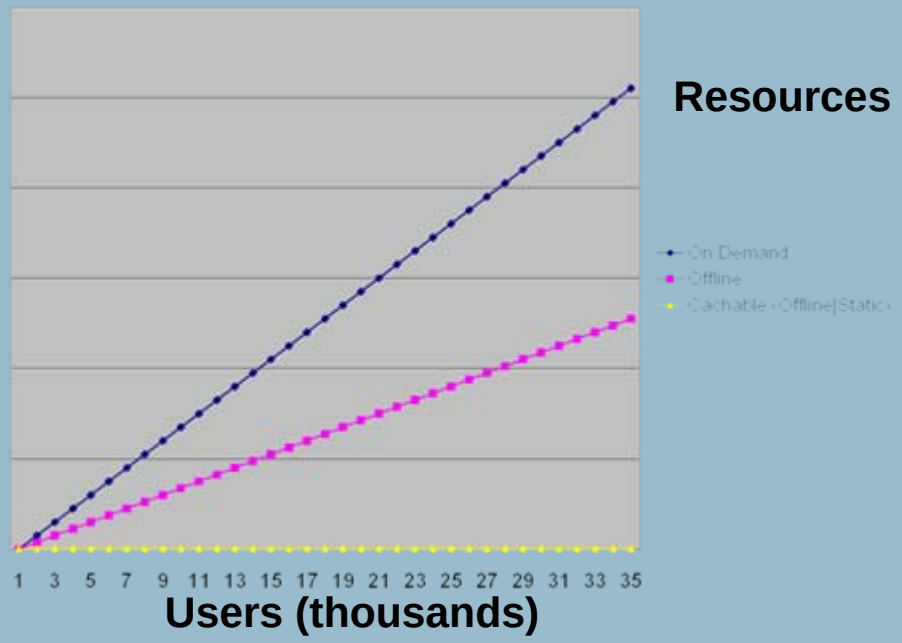
Multi-axis optimization

- Minimize overall resources
- Client-side resource scale
- Minimize processing



On demand generation:

- Cannot optimize performance
- Is not scalable
- There is a better way

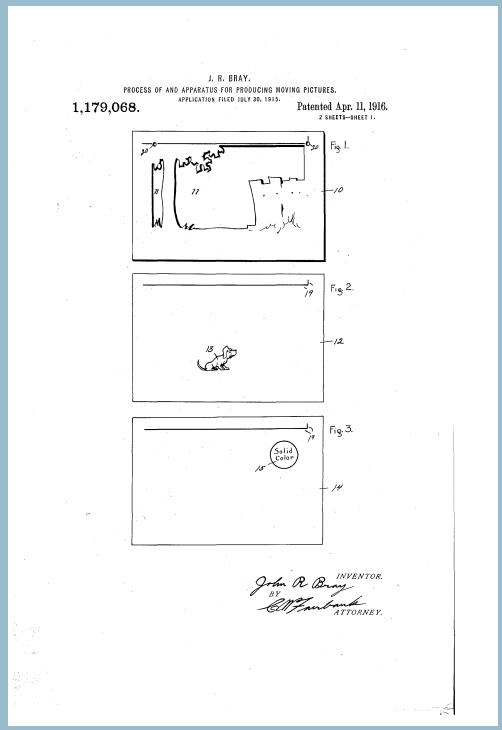


An answer: Multi-stage compositing

- Static HTML/SVG
- Event-driven non-realtime regeneration (XSLT and other tools)
- AJAX/JavaScript
- Client-side (JavaScript) annotation

Problem not without precedent

Classic cinematography patents:



J. R. BRAY.
PROCESS OF AND APPARATUS FOR PRODUCING MOVING PICTURES.
APPLICATION FILED JULY 30, 1915.
1,179,068. Patented Apr. 11, 1916.
2 SHEETS—SHEET 1.

Fig. 1.
Fig. 2.
Fig. 3.
Solid Color

INVENTOR.
ATTORNEY.

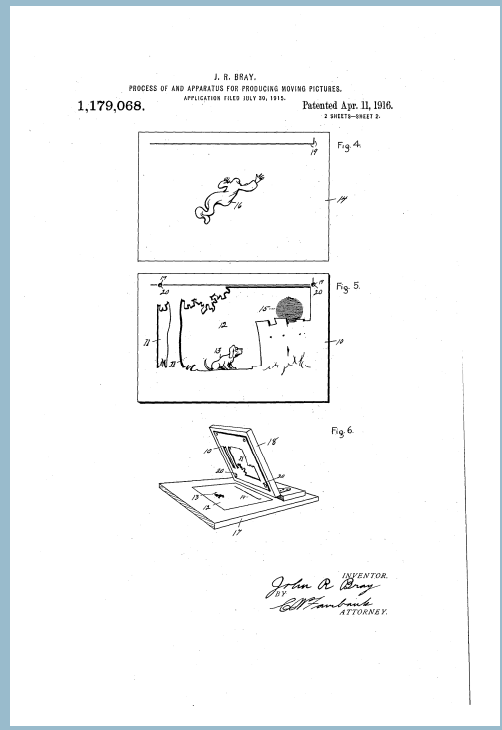


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Fig. 4.
Fig. 5.
Fig. 6.

INVENTOR.
ATTORNEY.

"Process and Apparatus for Producing Motion Pictures", US Pat 1,179,068 (filed July 30, 1915)

Hierarchy

- Static
- Varying long scale (out of response loop)
- AJAX components
- Client-side annotation/markup (the “client cloud”)
- Dynamic server-side technologies (e.g., ASP, PHP, EJB)

Scarce resource efficiency

- Minimize realtime server response loop
- Reduce growth of server-side
- Reduce vulnerability to bandwidth issues
- Minimization particularly attractive in mobile context

Different Object Types

- Manually created
- Programmatically created triggered by external events
- On-Demand generated elements
- Client-side created elements (e.g., annotations)

IDs act as “registration”

- **`getElementById`** to identify element
- Dynamically insert subtrees retrieved using **`XMLHttpRequest`**
- Dynamically generate elements using JavaScript from **`XMLHttpRequest`** retrieved data (client-side computation)
- Dynamically generate elements using JavaScript based upon user input

Classic execution-time optimization

- This approach has a rich history in other aspects of computing
- Compiling/interpreting
- “reduction in strength”
- “include files”, object libraries
- Dynamic linking using shareable libraries

Summary

- The resources used to render a particular page varies dramatically depending upon implementation strategy and technique
- Properly used, both offline element generation and “client-cloud” processing have significant bottom-line impact.

Questions

Supplemental Materials, Slides:

http://www.rlgsc.com/svgopen/2011/options-for-dynamic-svg.html