

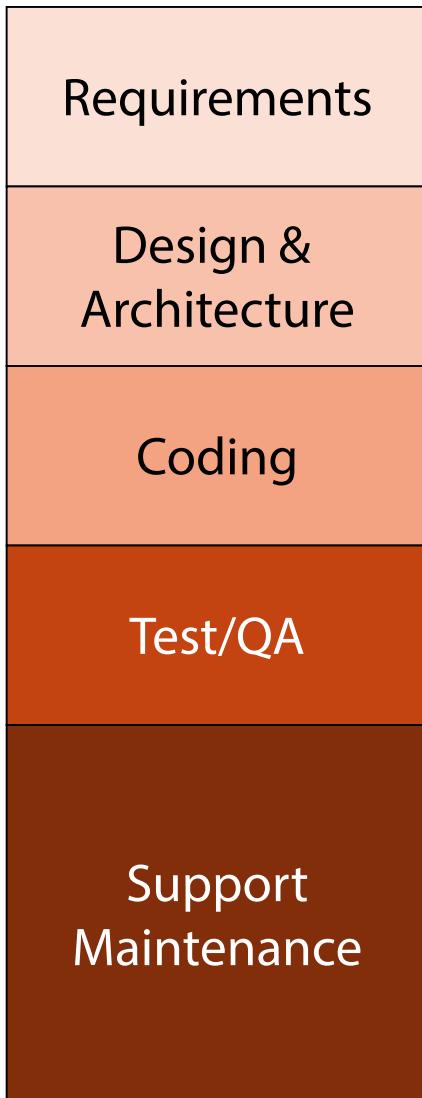
Visualization Architectures

Dan Appleman
danappleman.com
[@danappleman](https://twitter.com/danappleman)

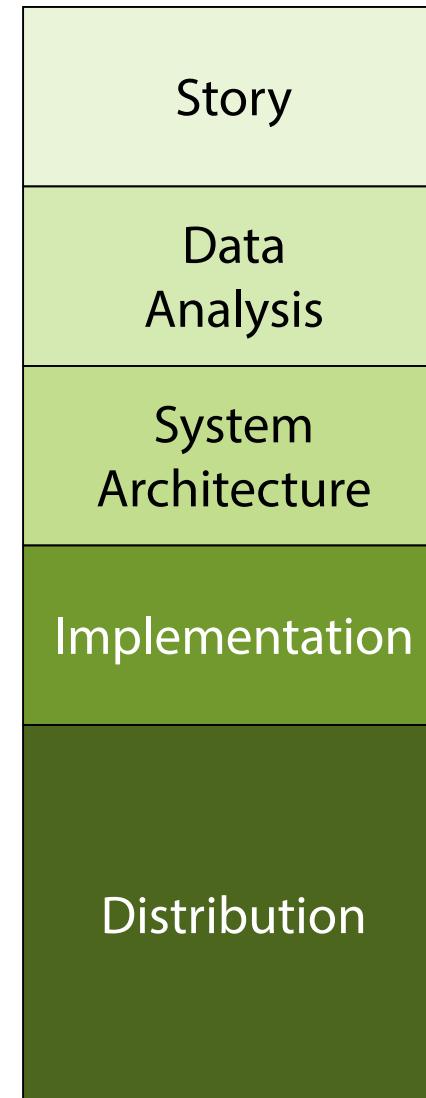


pluralsight 
hardcore dev and IT training

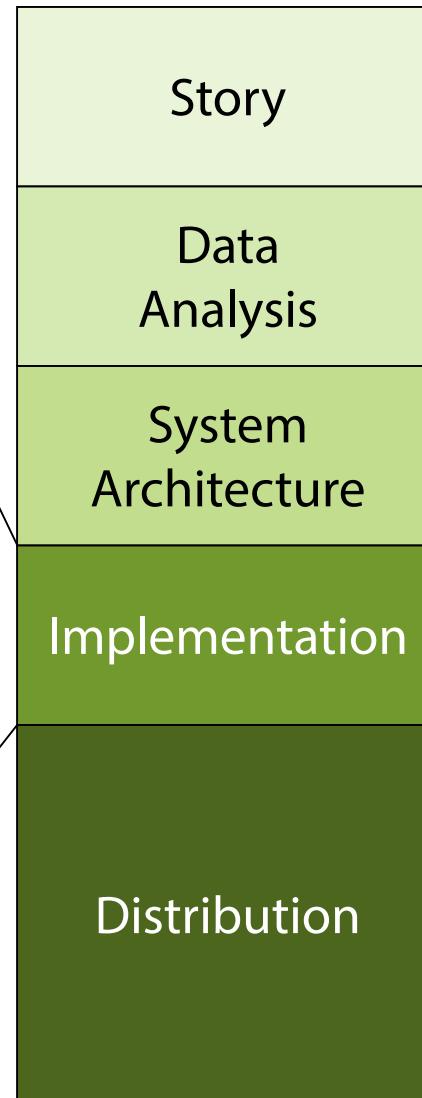
Software Lifecycle



Visualization Lifecycle



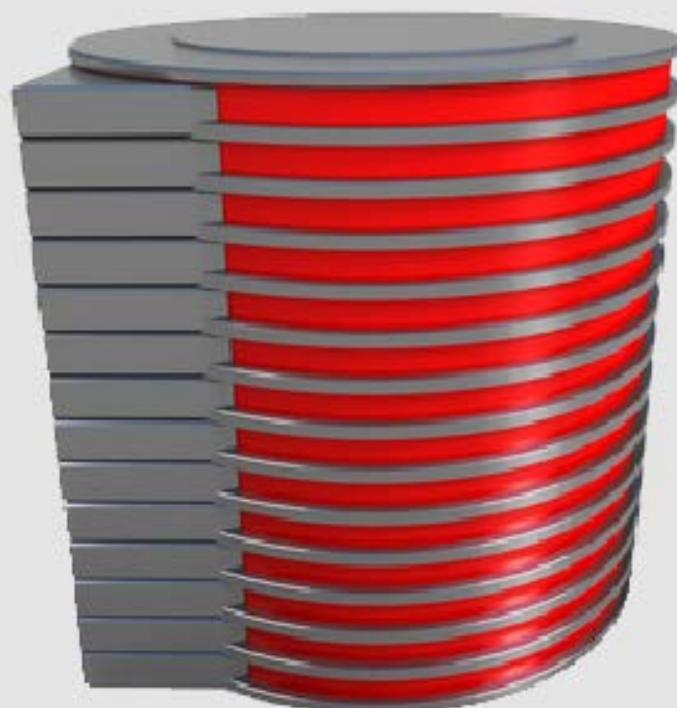
Visualization Lifecycle

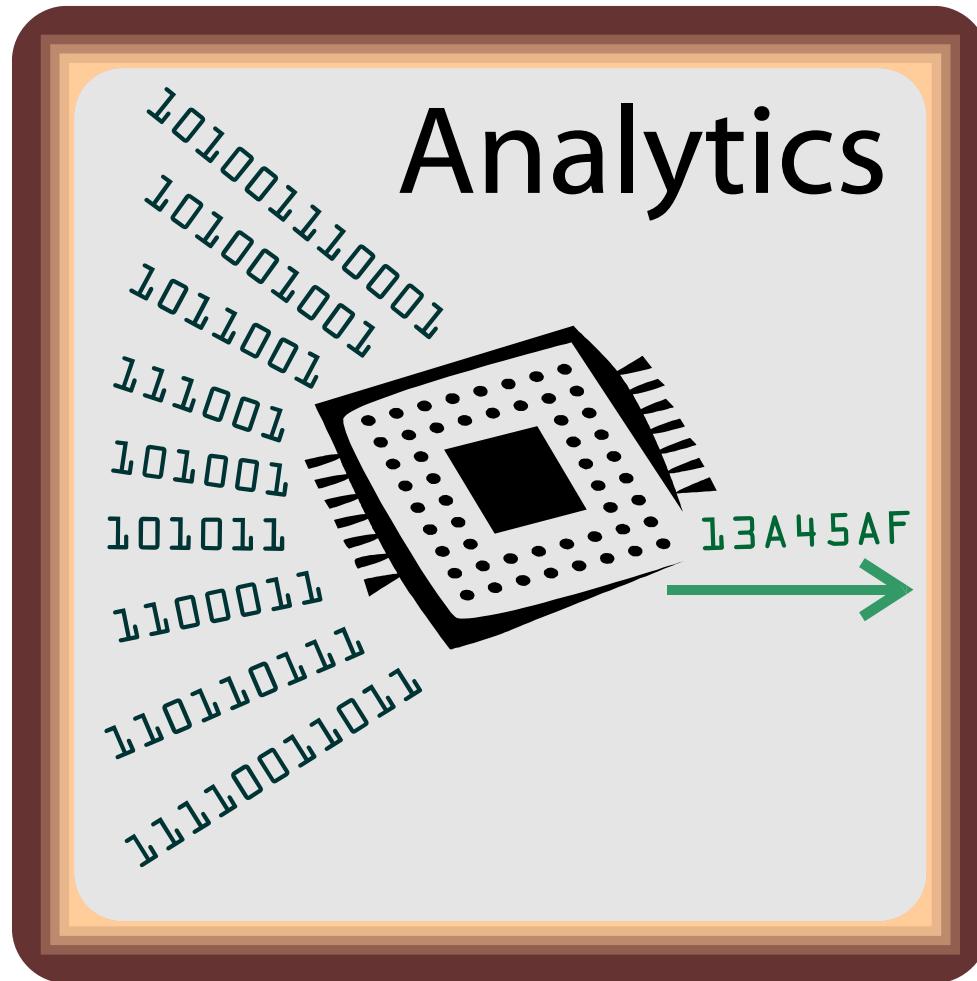


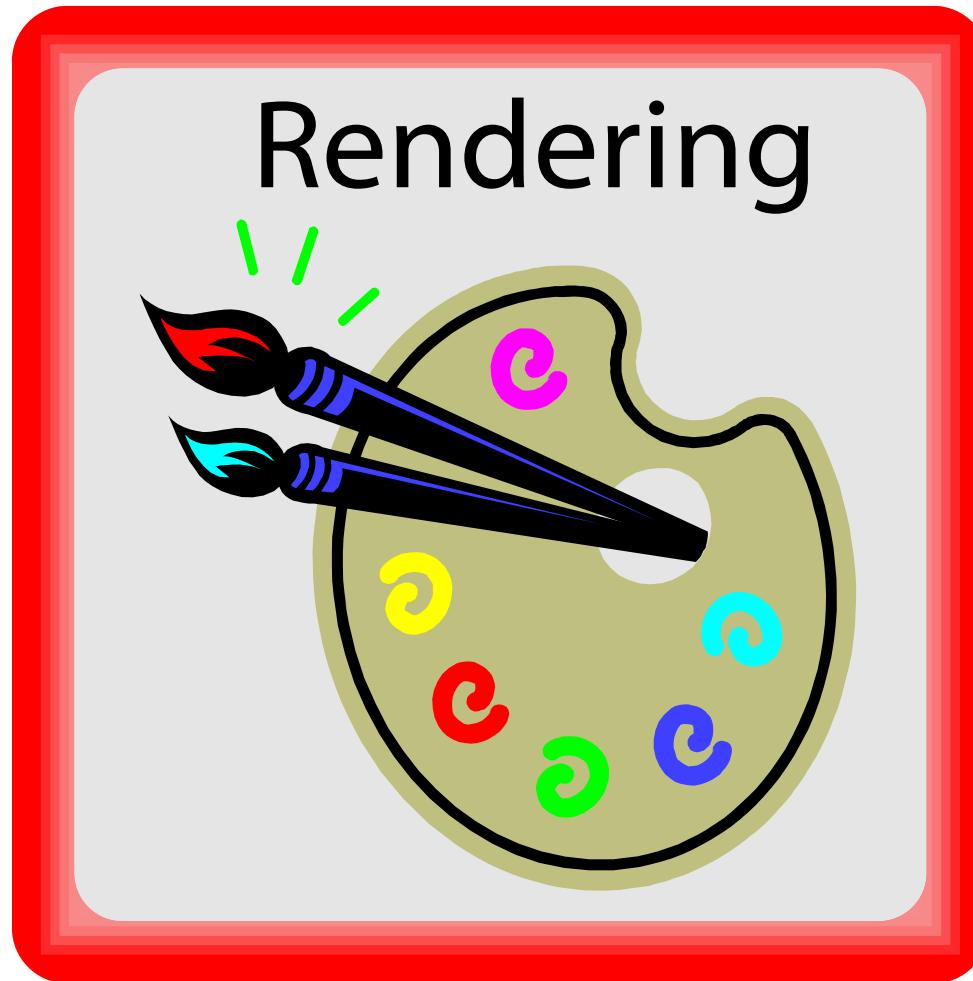
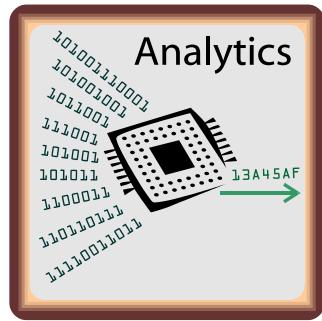
**Just some of the tooling courses available
on Pluralsight.com...**

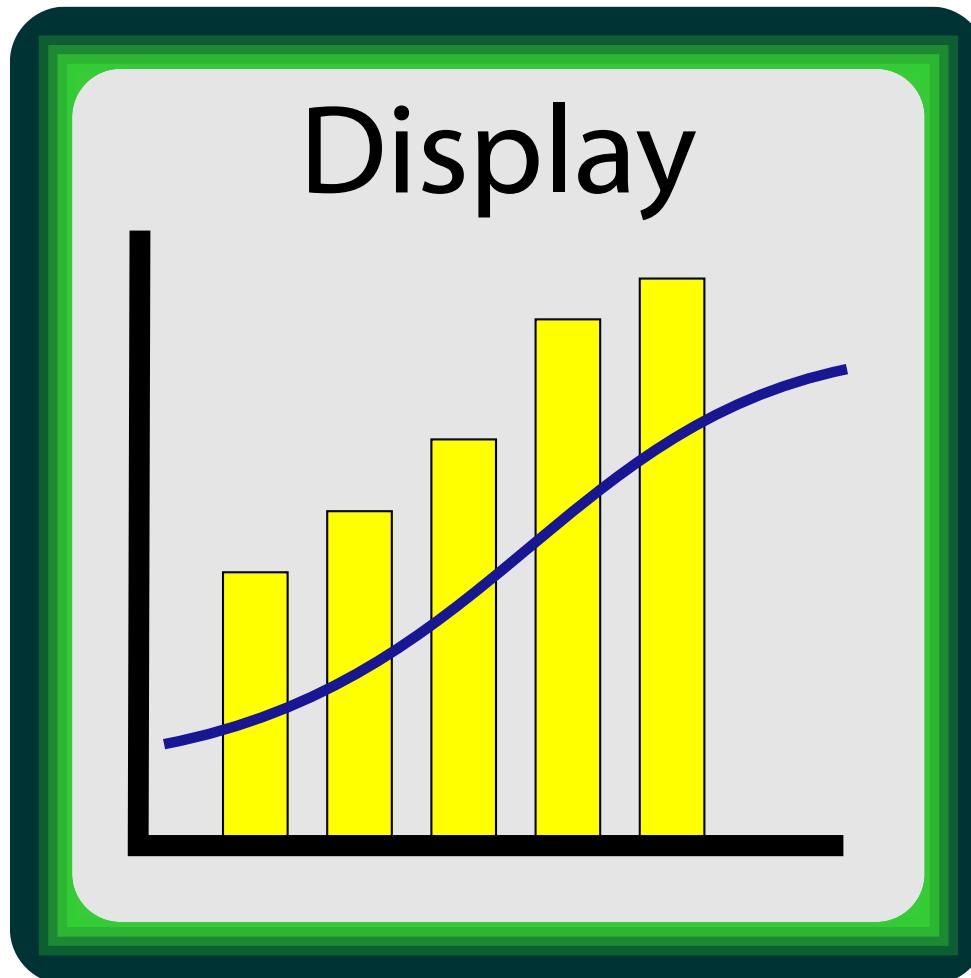
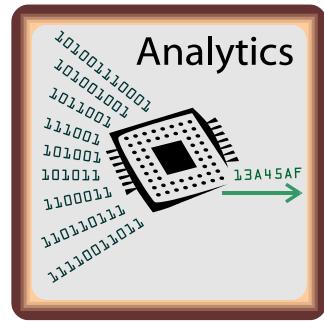
- Interactive Data Visualization with D3.js
- Excel: An Analytics Superhub
- Big Data Analytics with Tableau
- Data Visualizations Using Tableau Public
- Word 2010: Tables, Charts, Images and Styles
- Google Charts By Example
- Excel 2010: Charts and PivotTables

Data

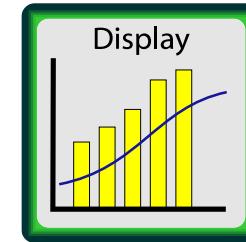
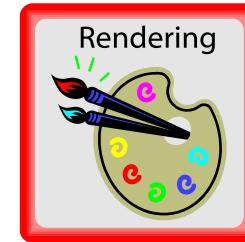
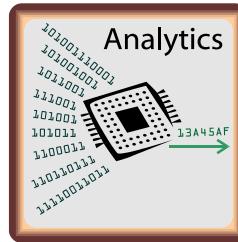








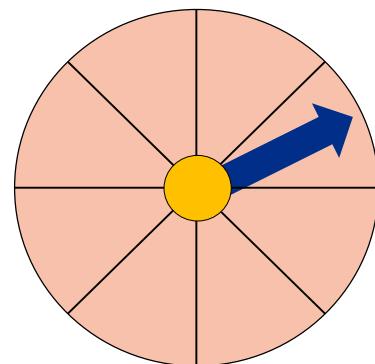
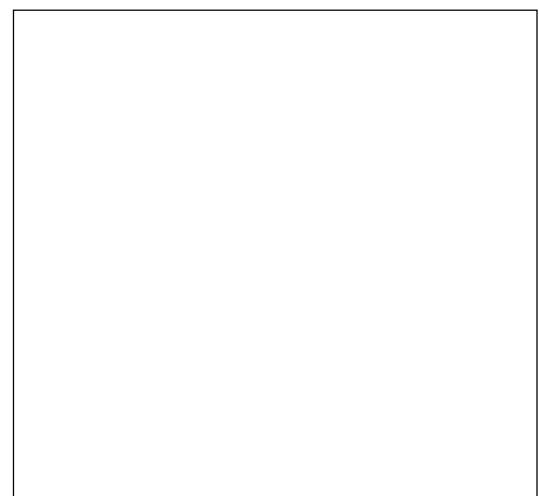
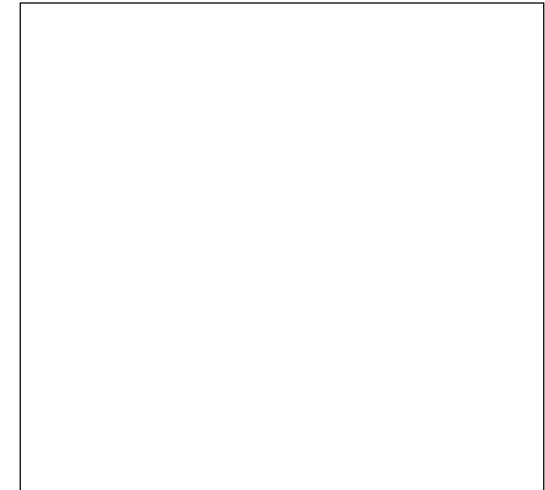
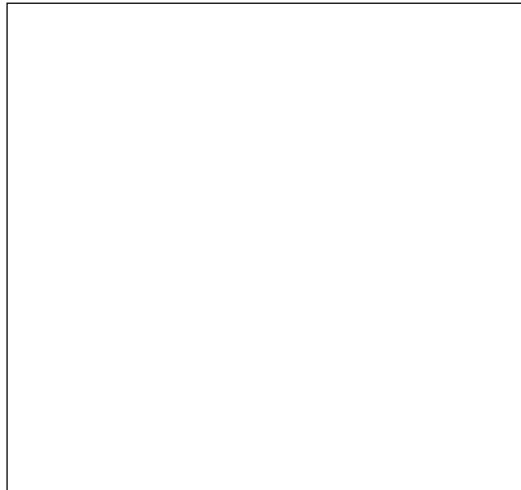
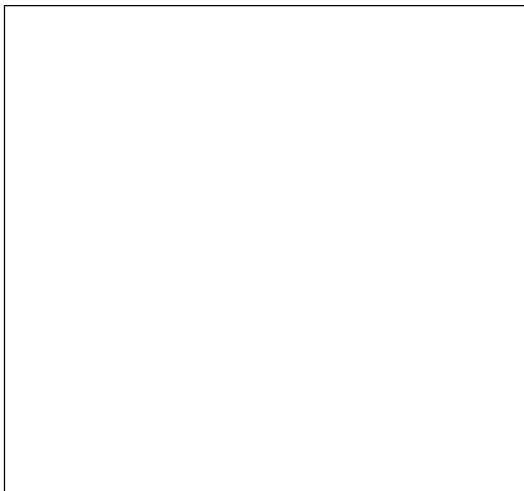
Excel or simple JavaScript examples



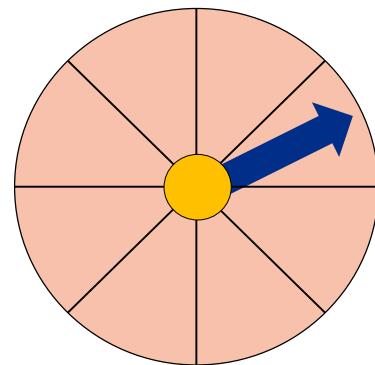
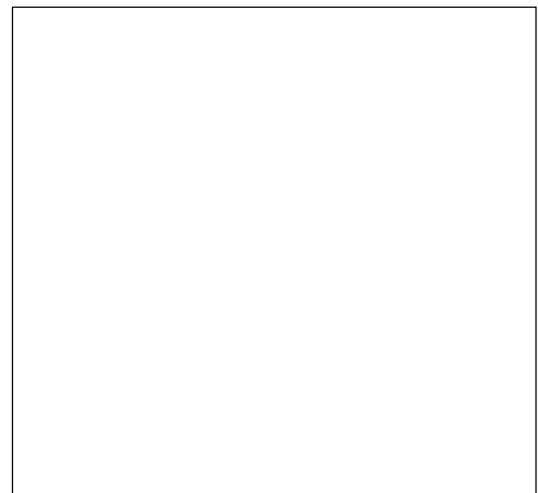
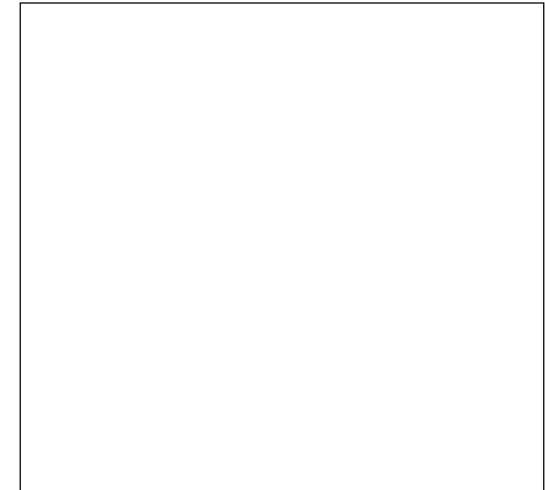
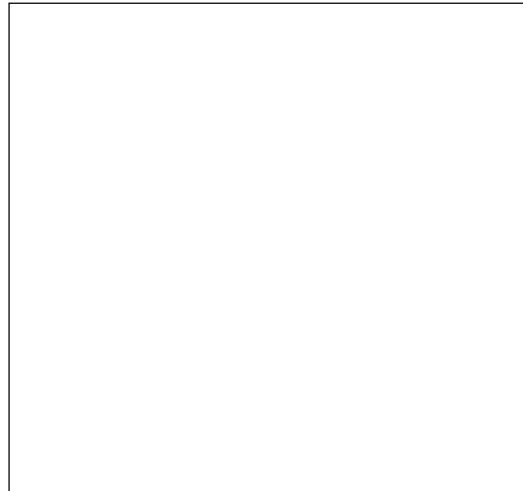
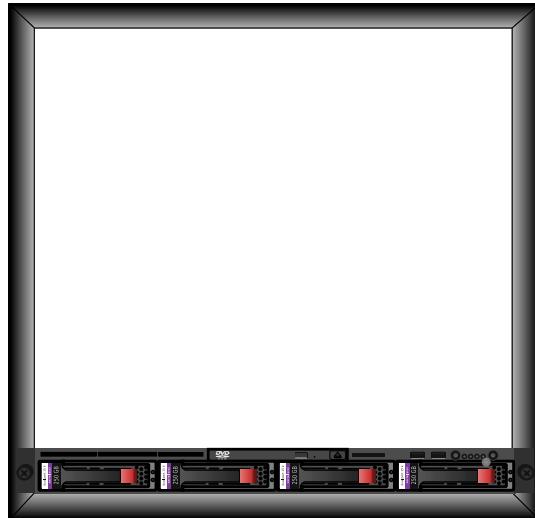


Visualization Architectural Elements

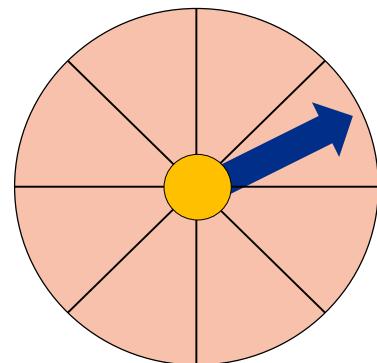
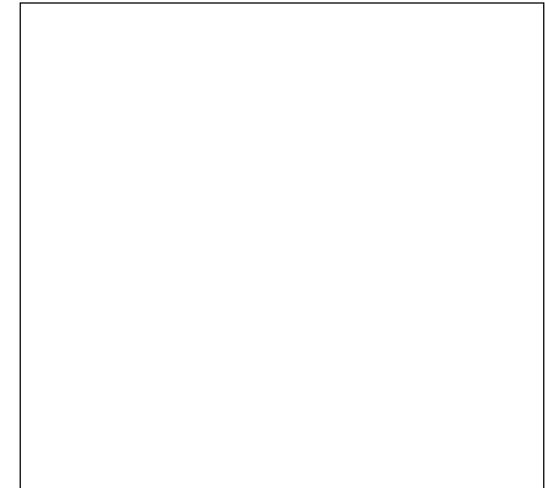
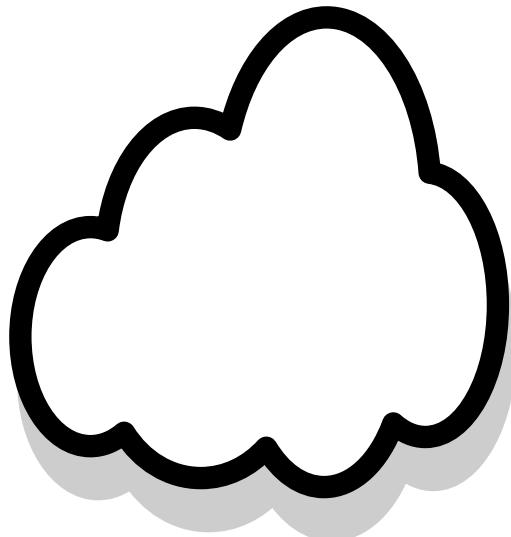
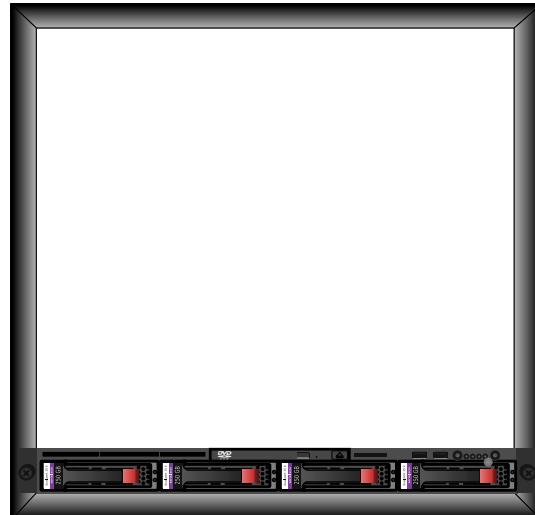
Let's Play Visualization Architect!



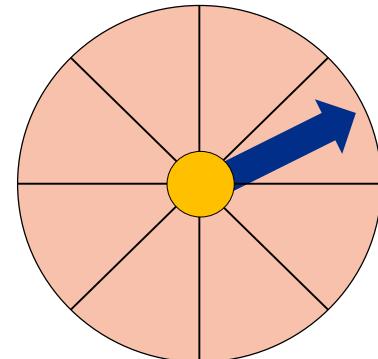
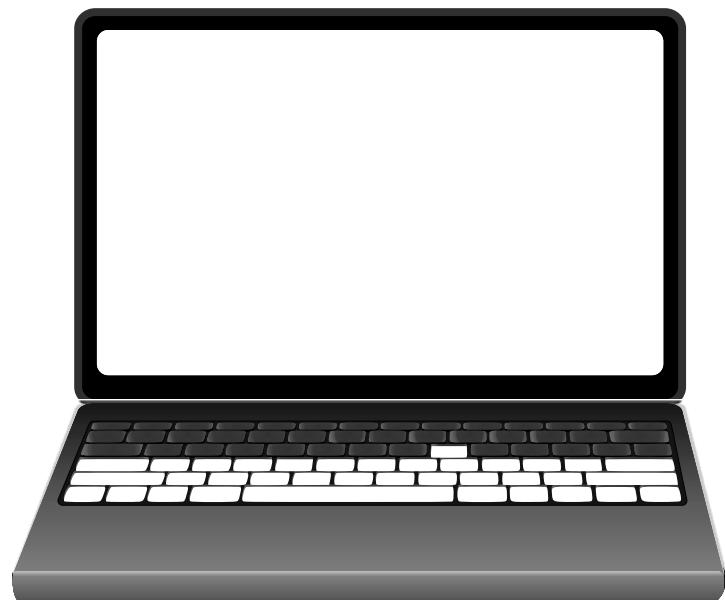
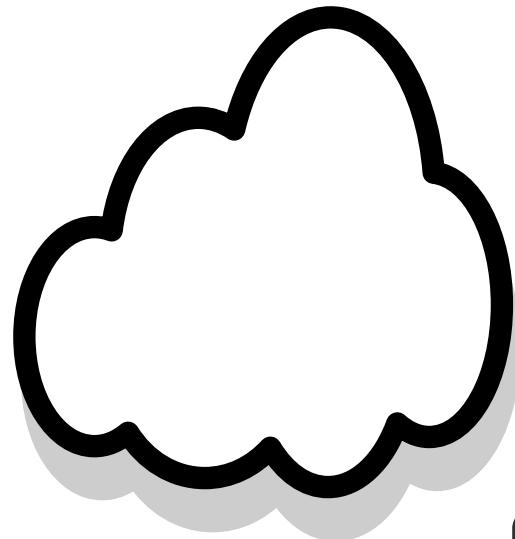
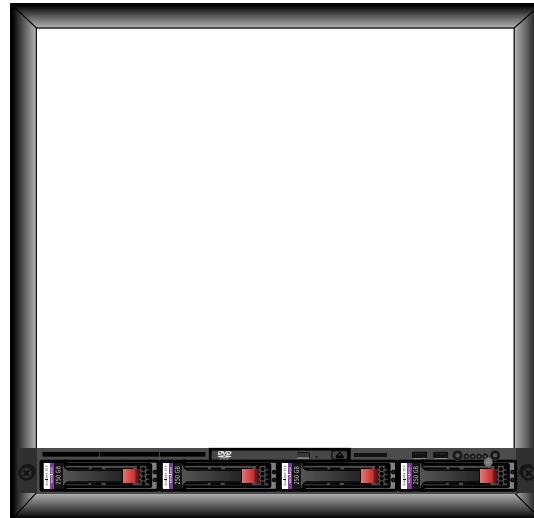
Let's Play Visualization Architect!



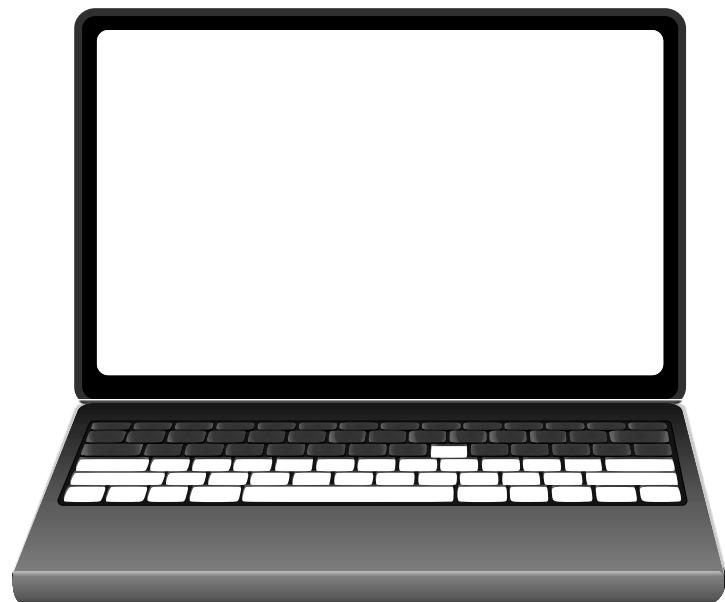
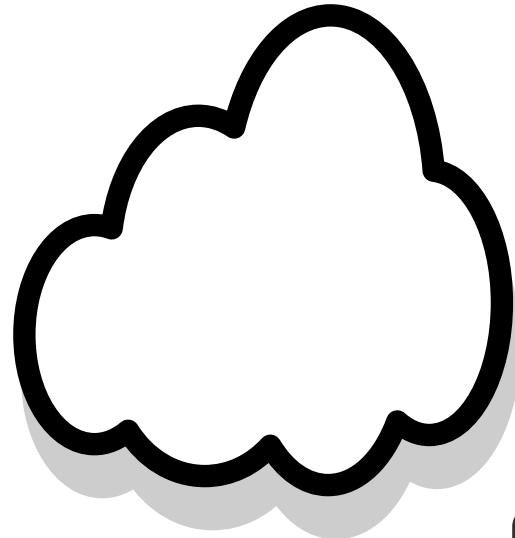
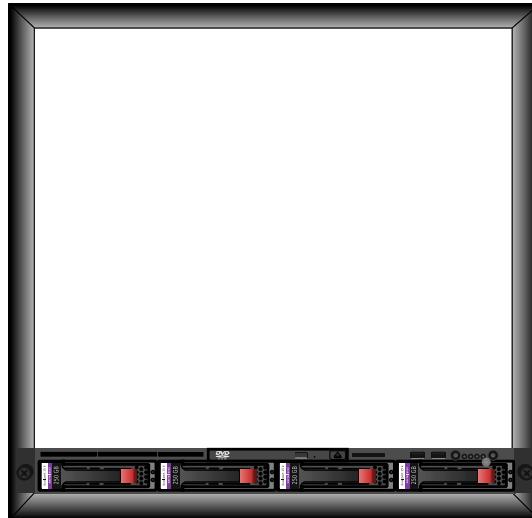
Let's Play Visualization Architect!



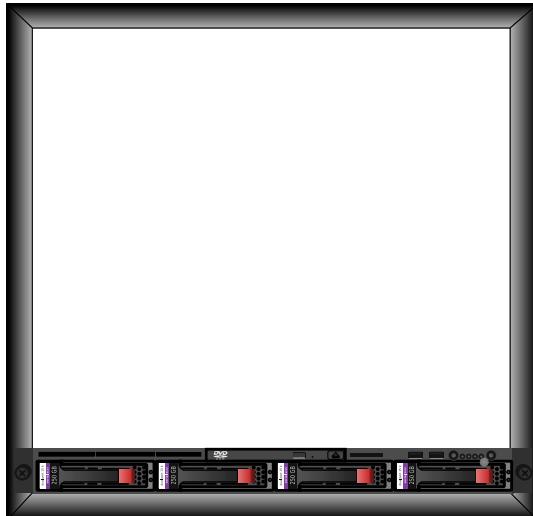
Let's Play Visualization Architect!



Let's Play Visualization Architect!

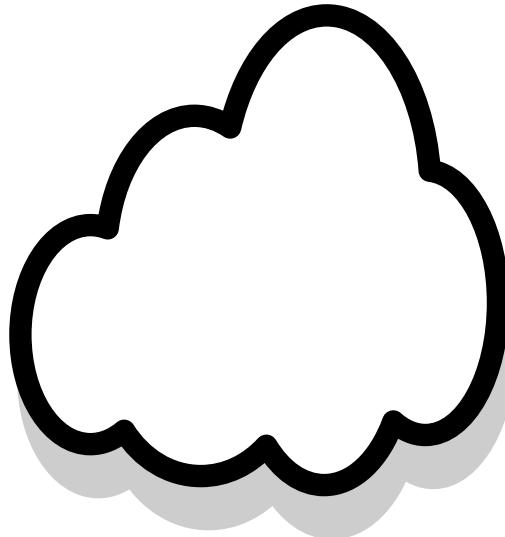


Dedicated Servers



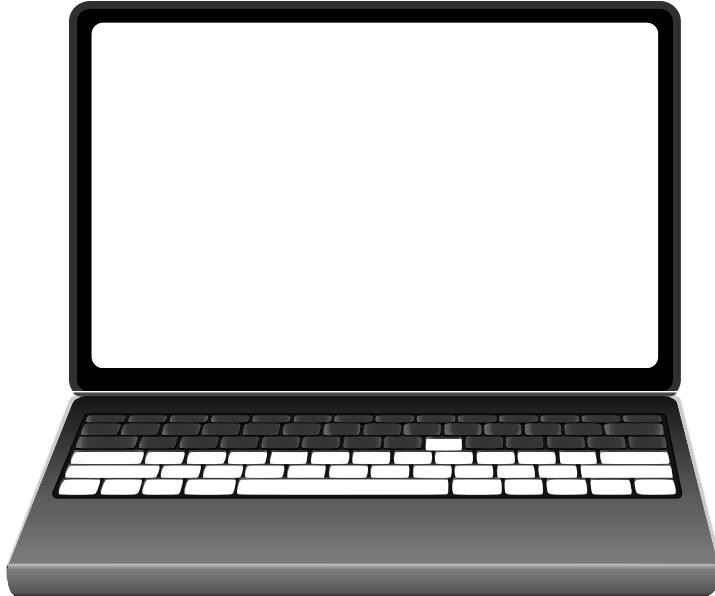
- Data capacity is large
- Computation capacity is large
- Costs and capacity largely fixed
- Bandwidth is high and inexpensive

Cloud Services



- Data capacity is unlimited
- Computation capacity is unlimited
- Costs and capacity is variable
- Bandwidth is high and cost varies

Desktop or Laptop (and Some Tablets)

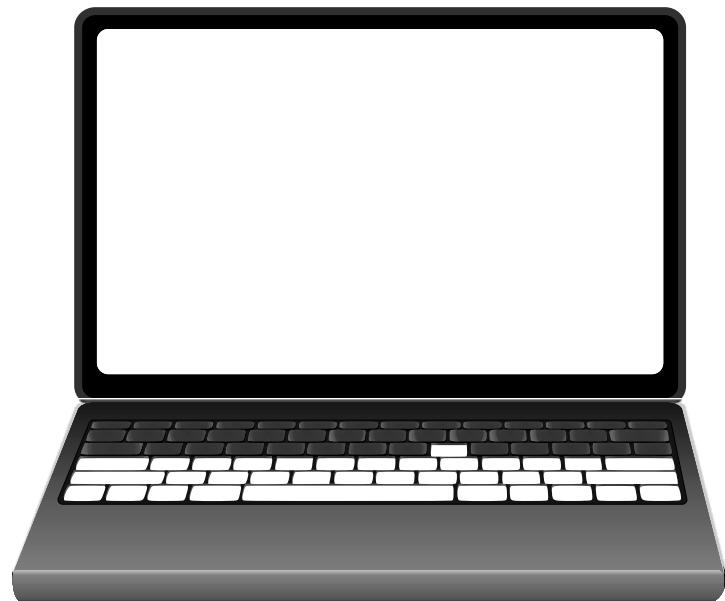
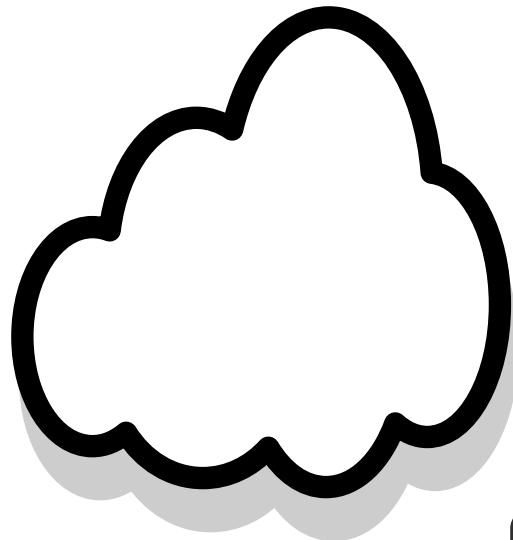
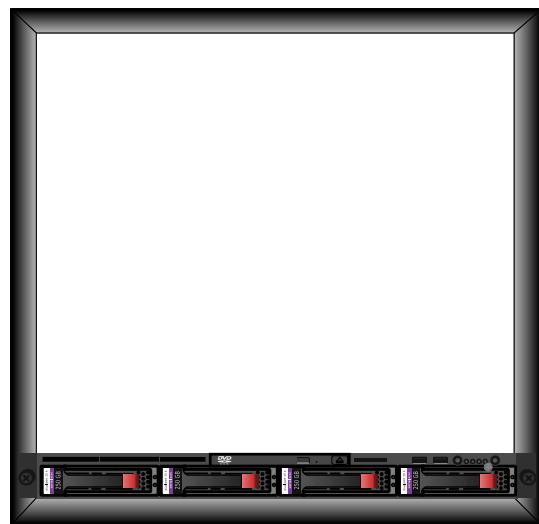


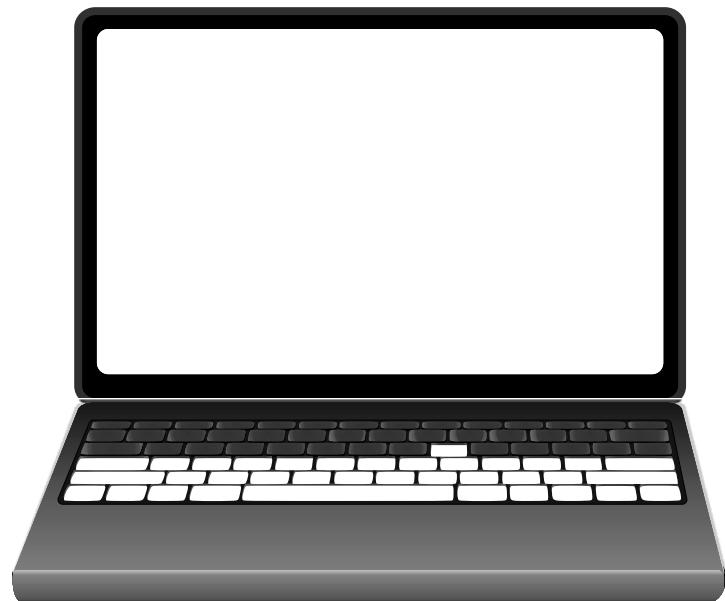
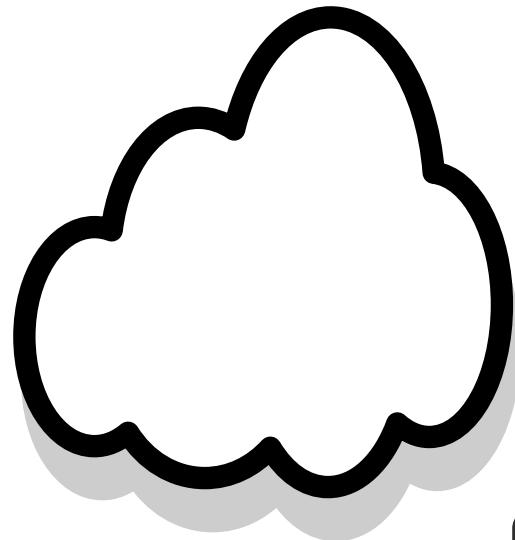
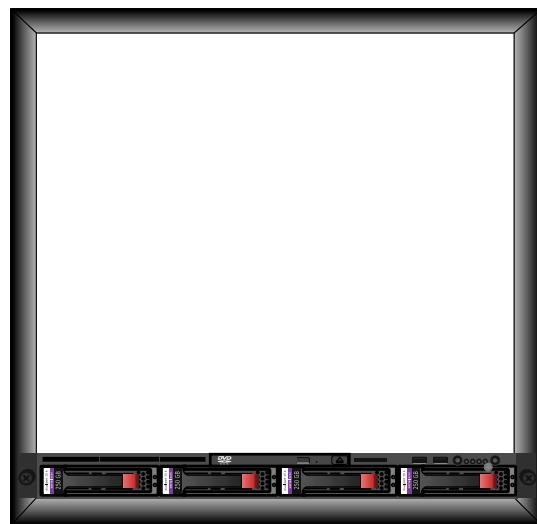
- Data capacity is large
- Computation capacity is large
- Costs and capacity is fixed
- Bandwidth varies and is generally inexpensive

Mobile Devices (Phones and Most Tablets)

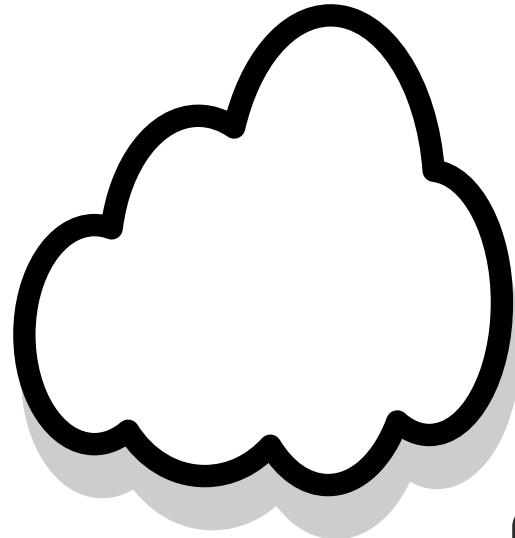
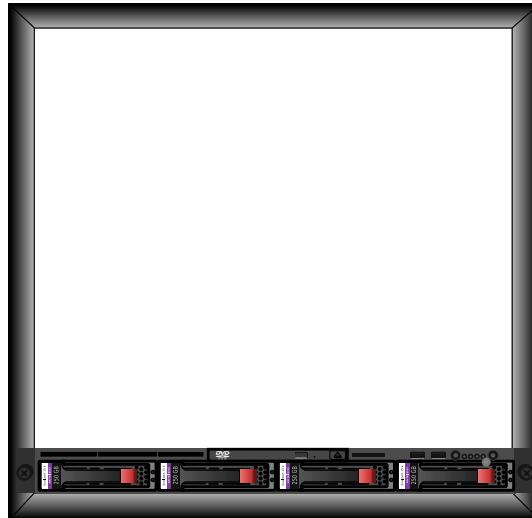


- Data capacity is limited
- Computation capacity is limited
- Costs and capacity is fixed
- Bandwidth varies and is generally expensive

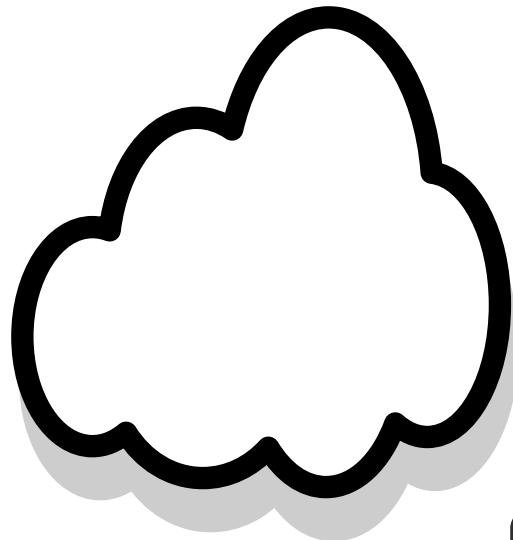
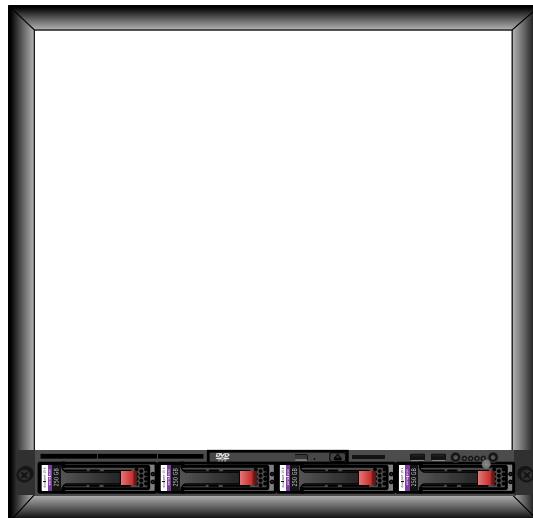




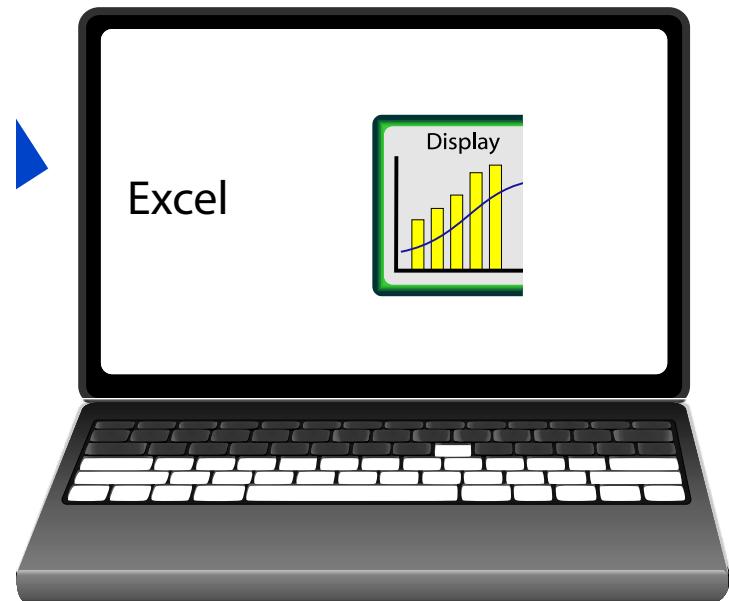
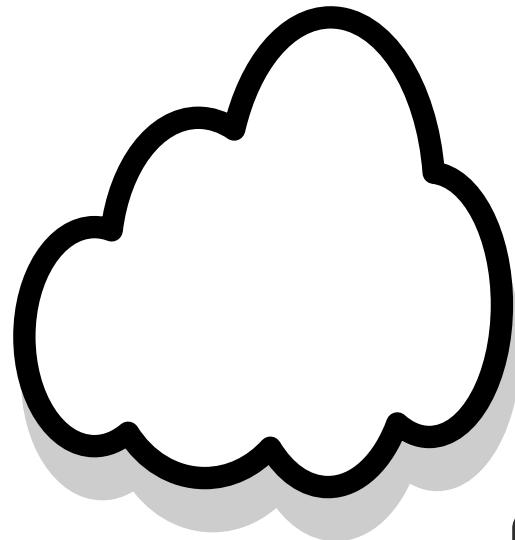
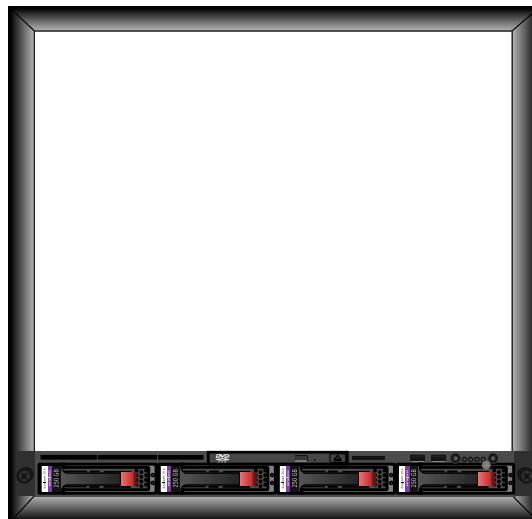
Traditional Excel

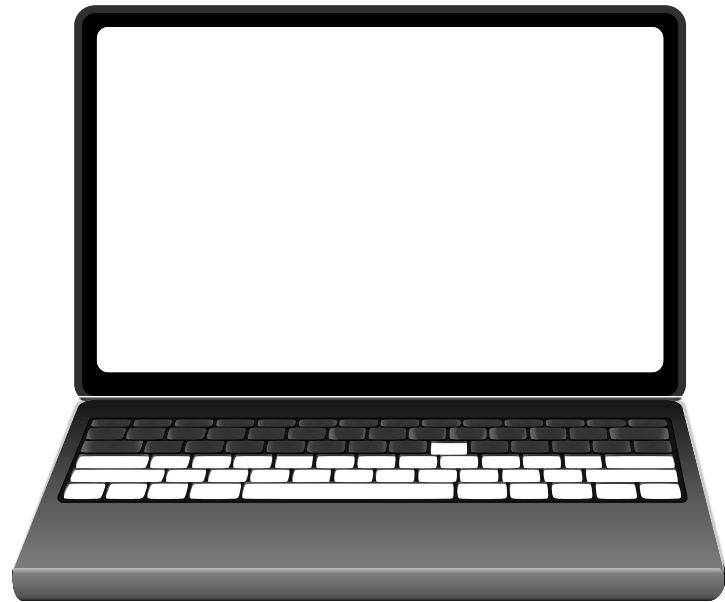
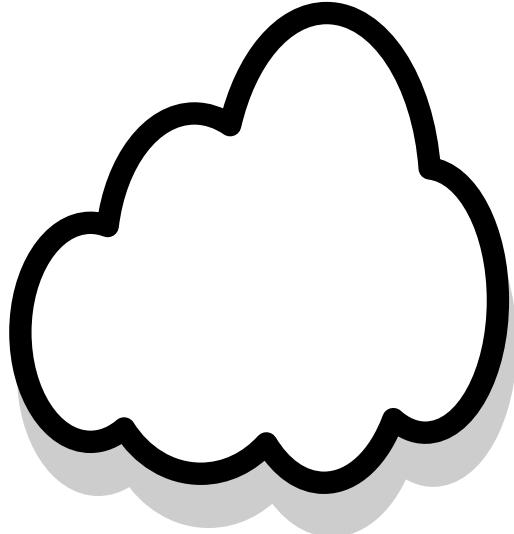
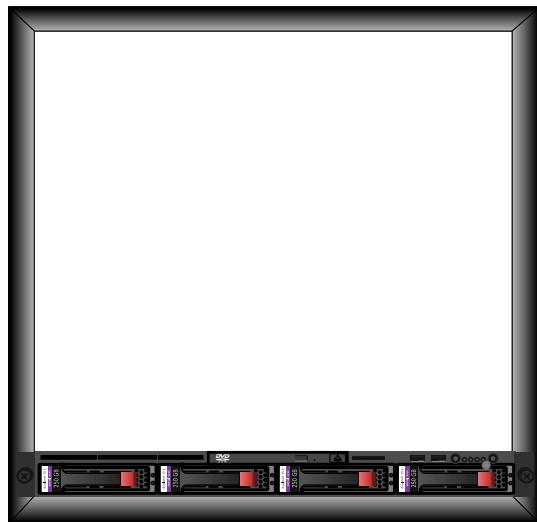


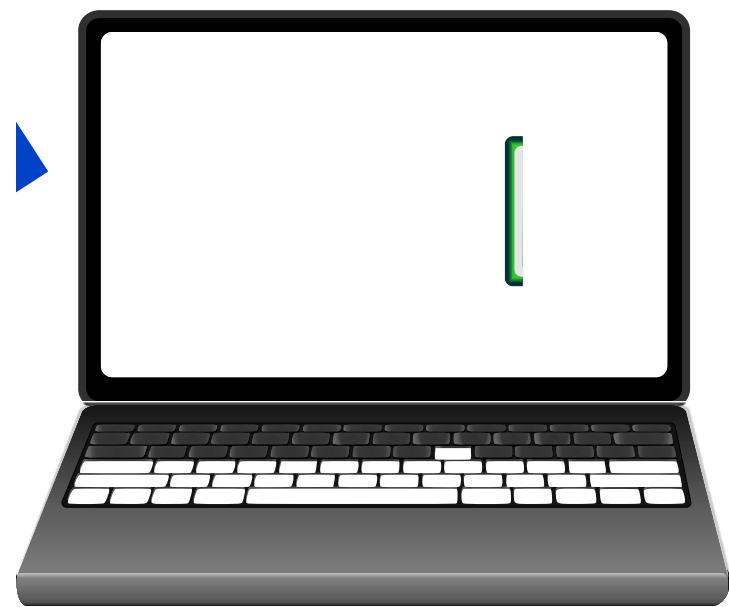
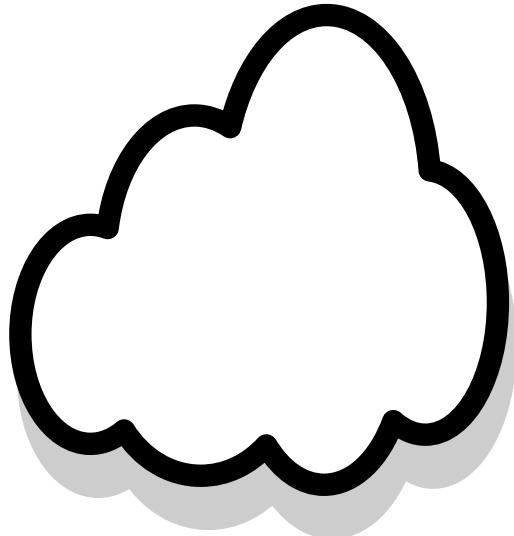
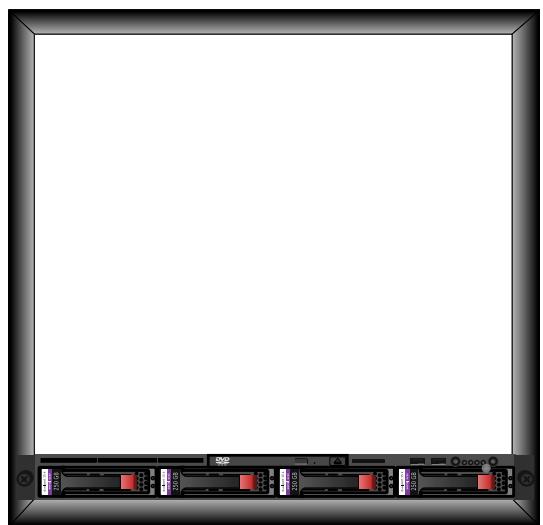
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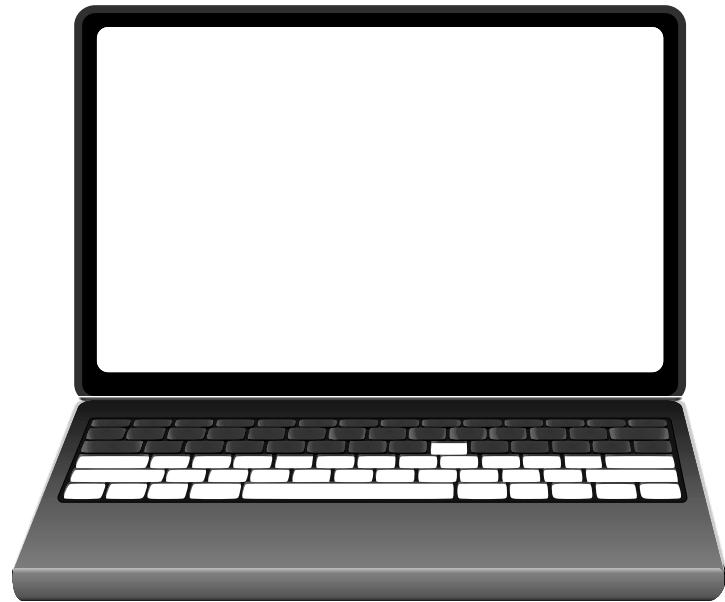
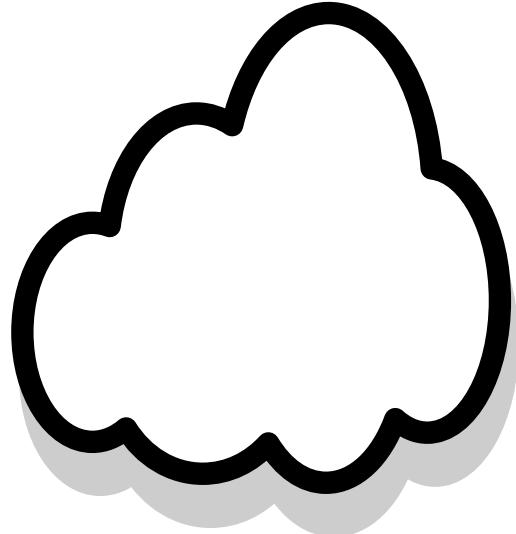
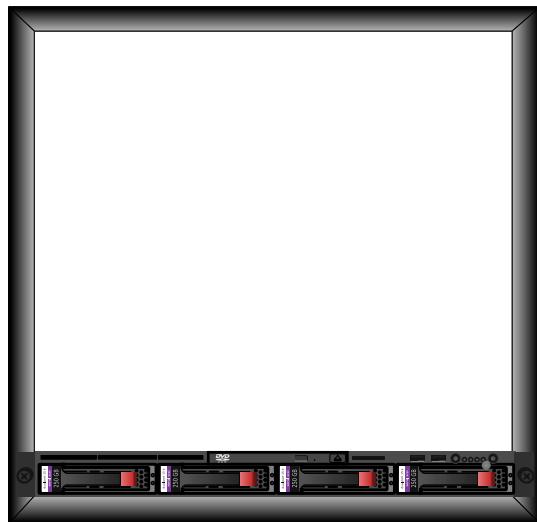


Excel as Display Software

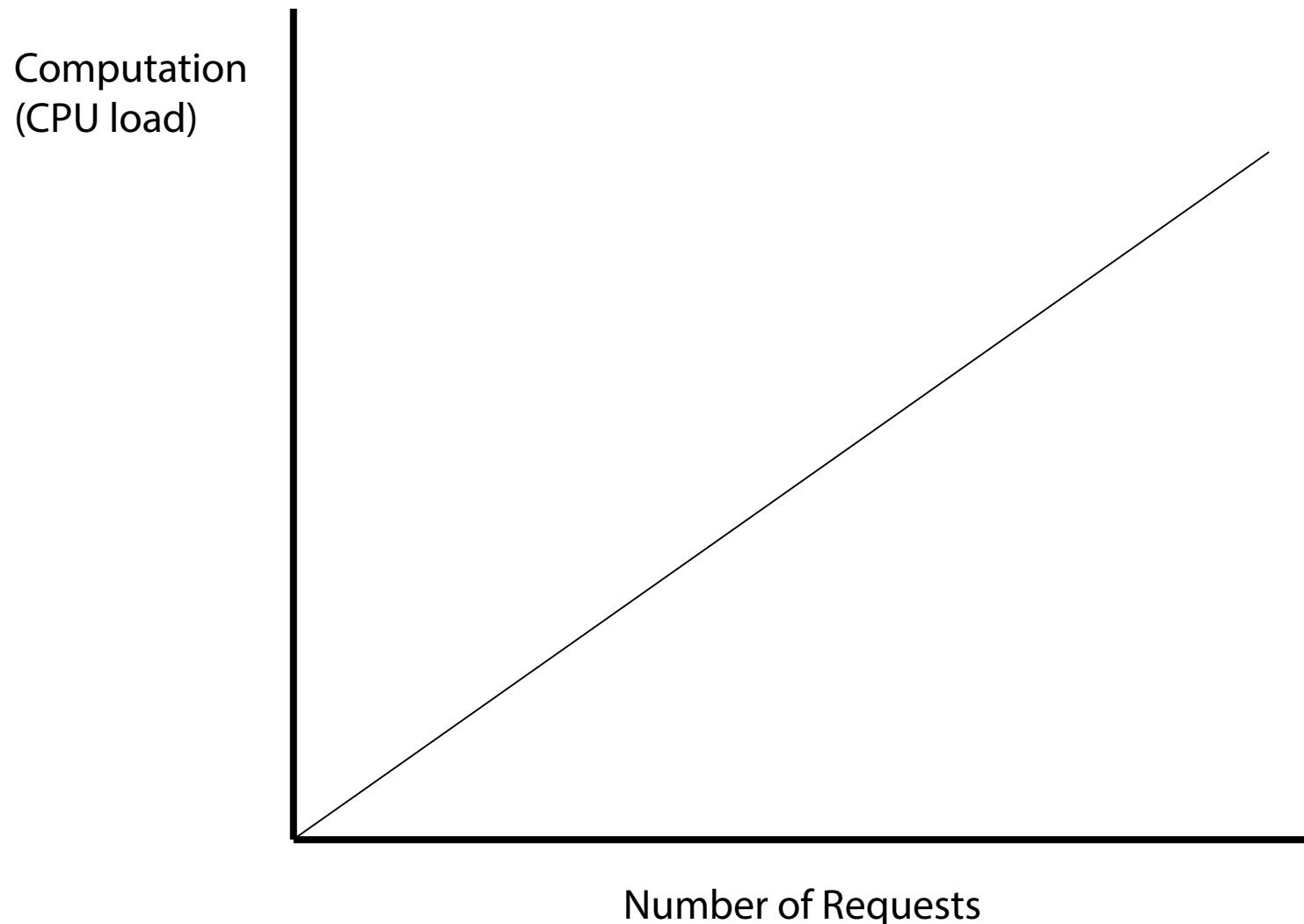






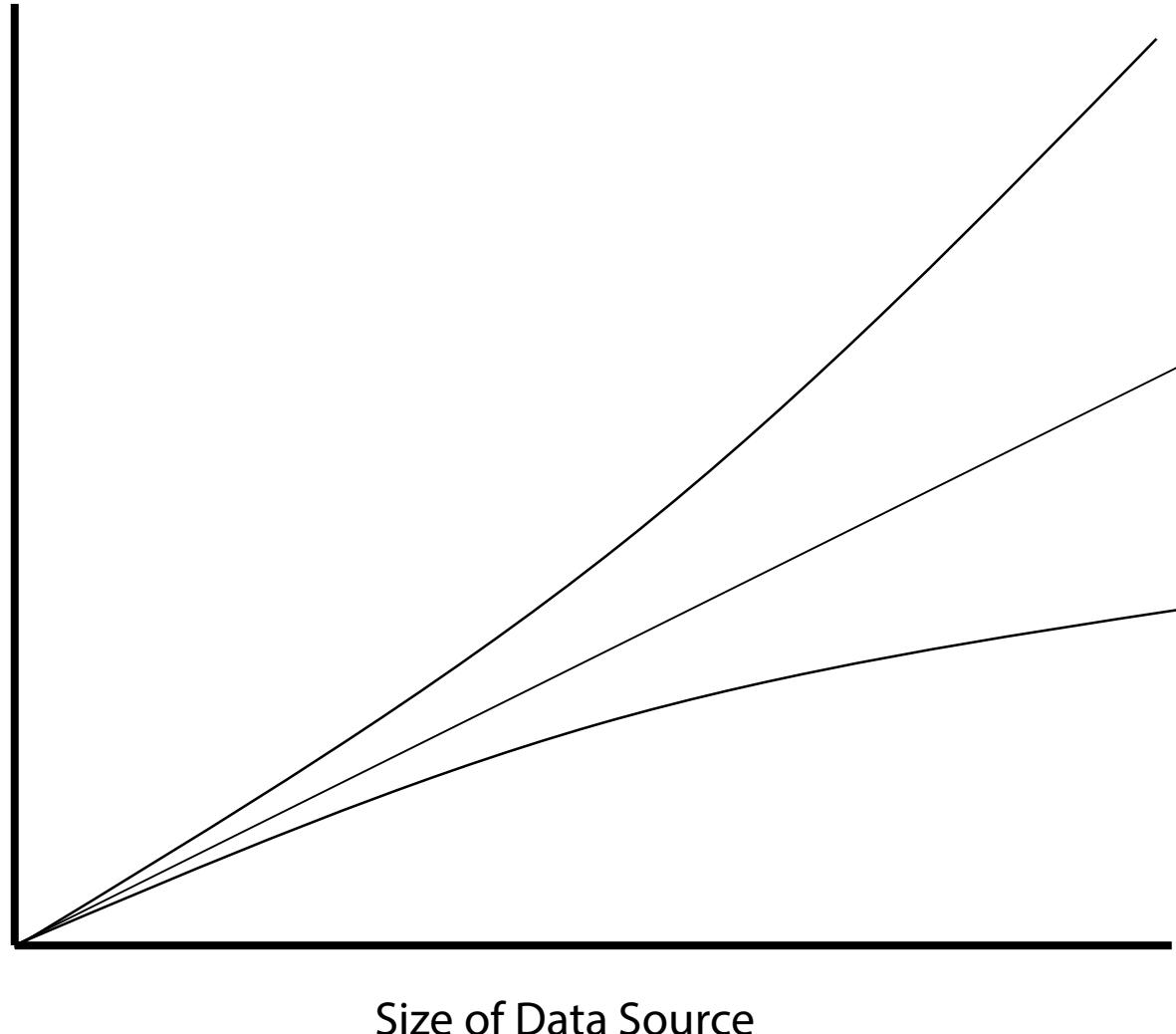


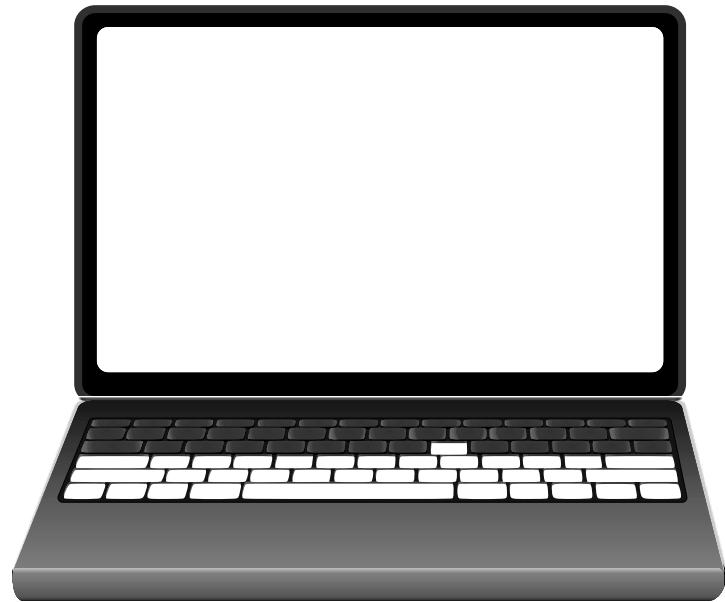
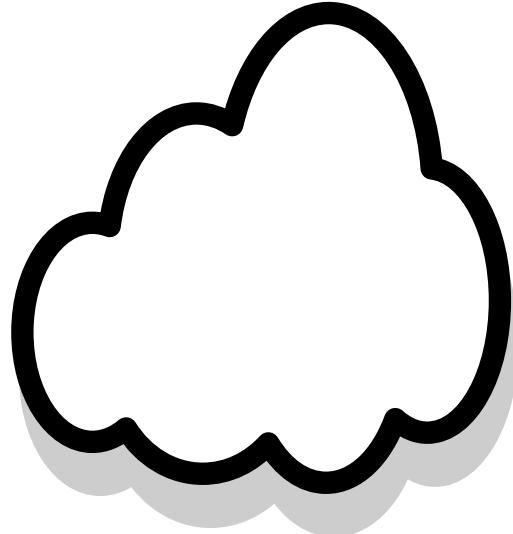
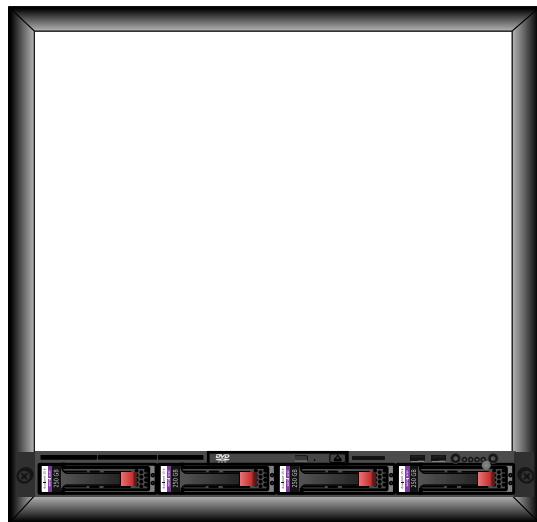
Computation Required for Analytics by Requests

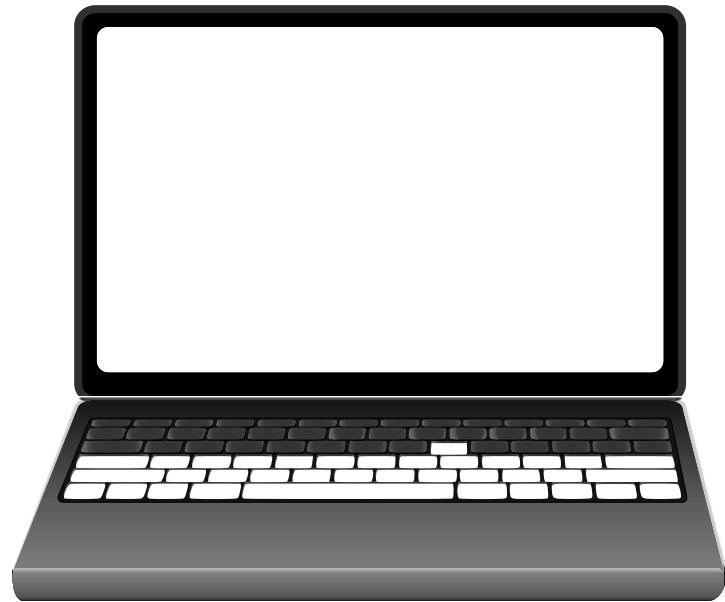
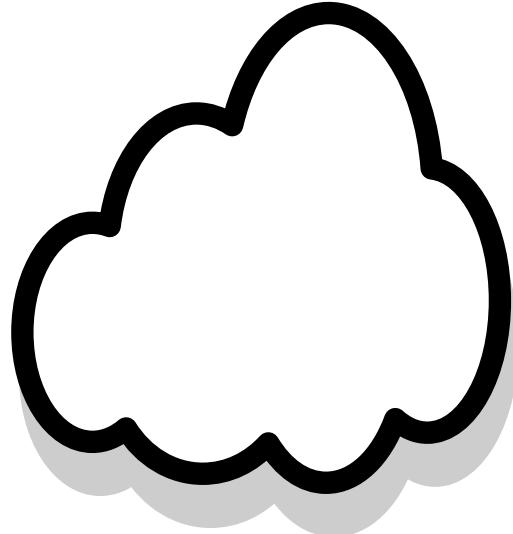
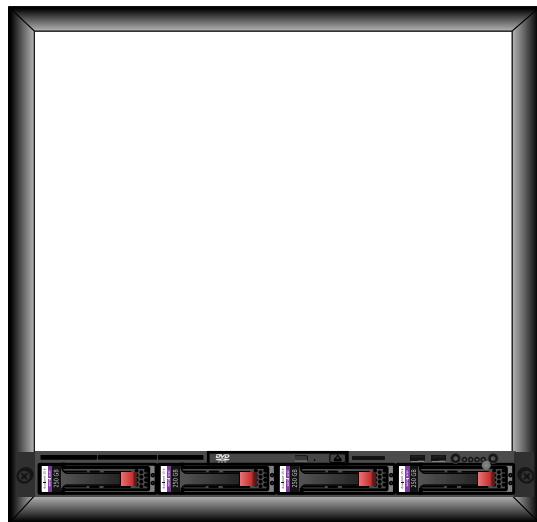


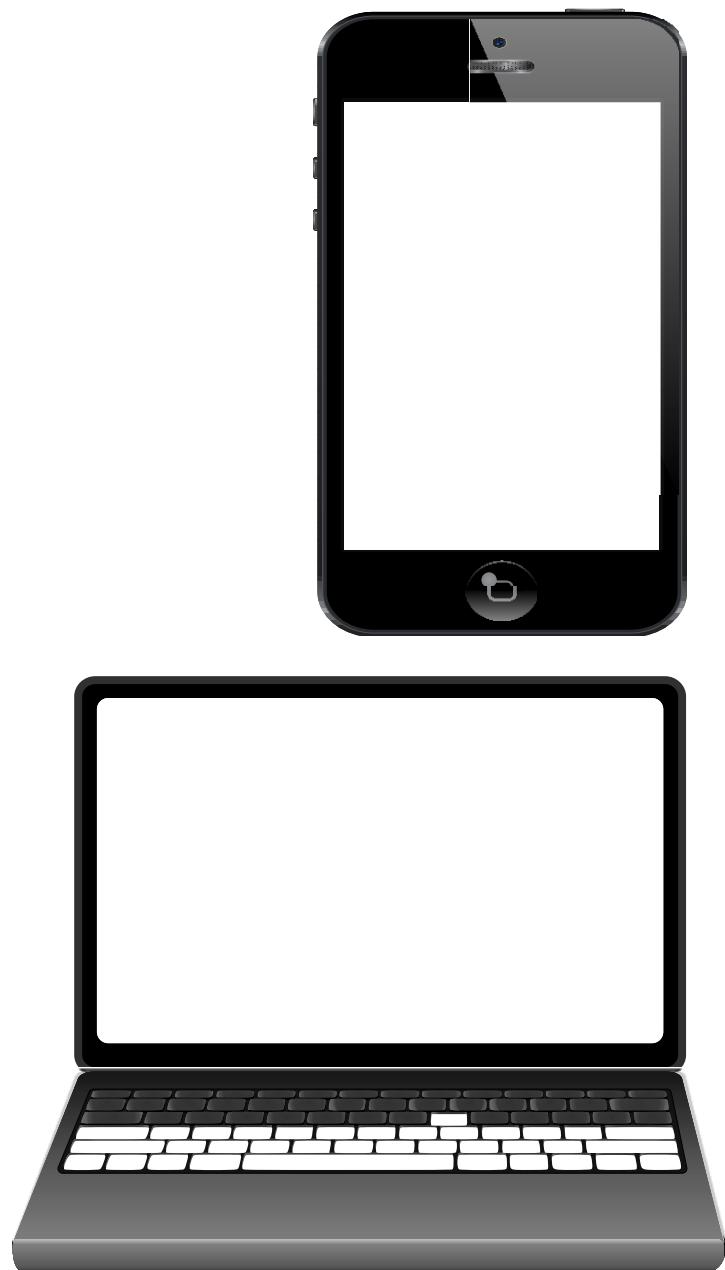
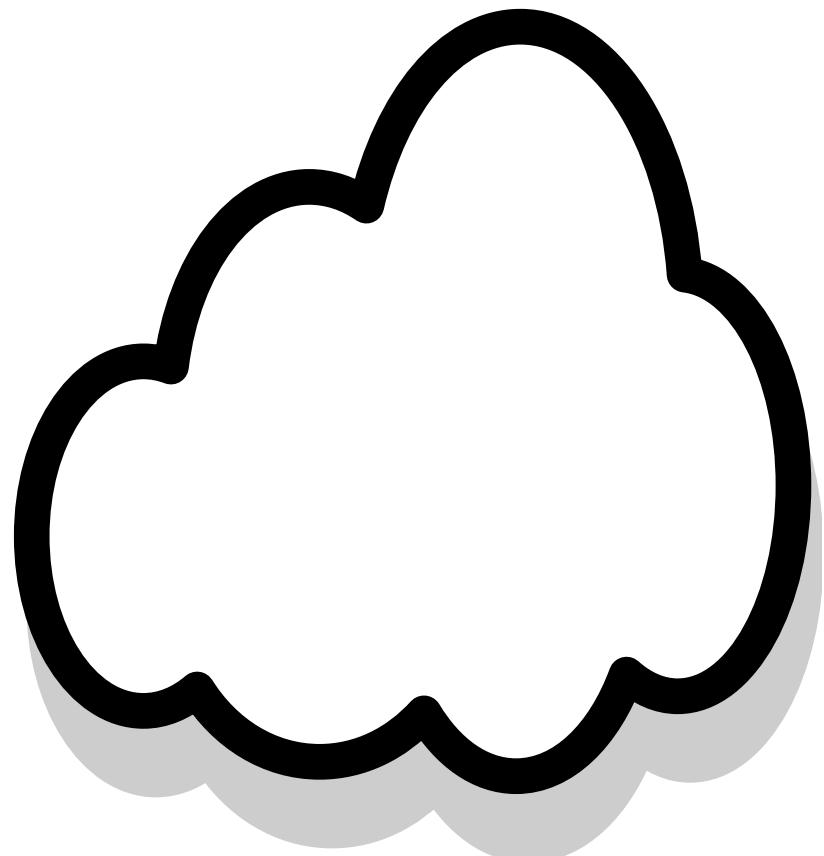
Computation Required for Analytics by Data Source Size

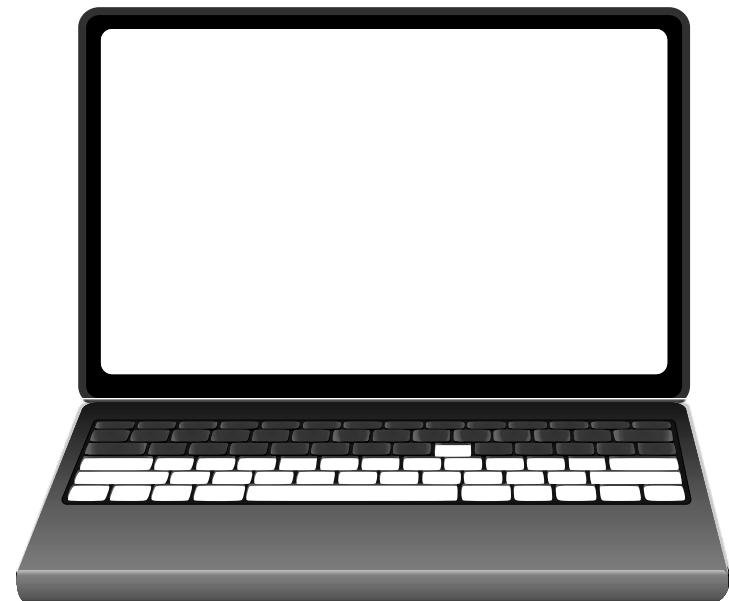
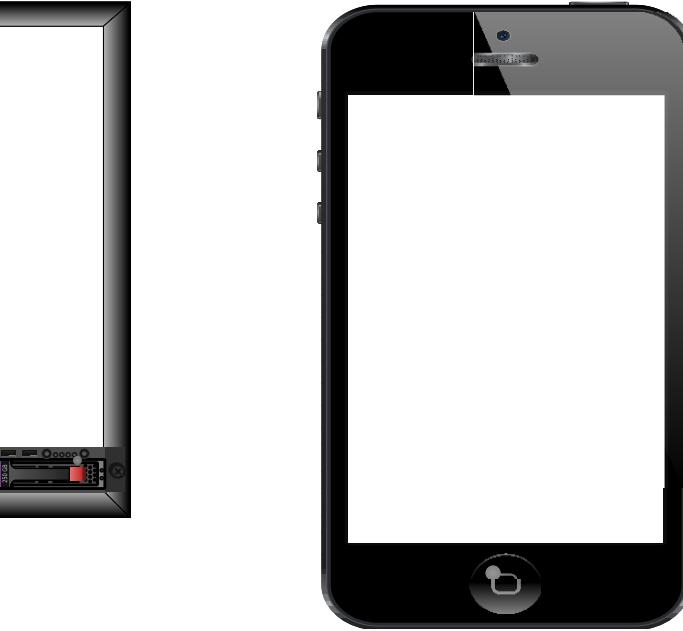
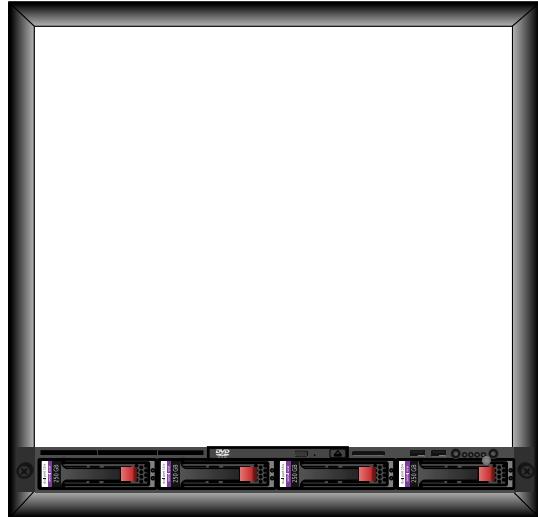
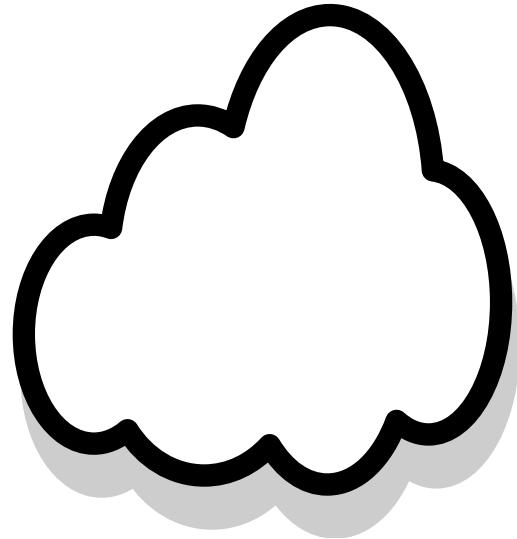
Computation
(CPU load)

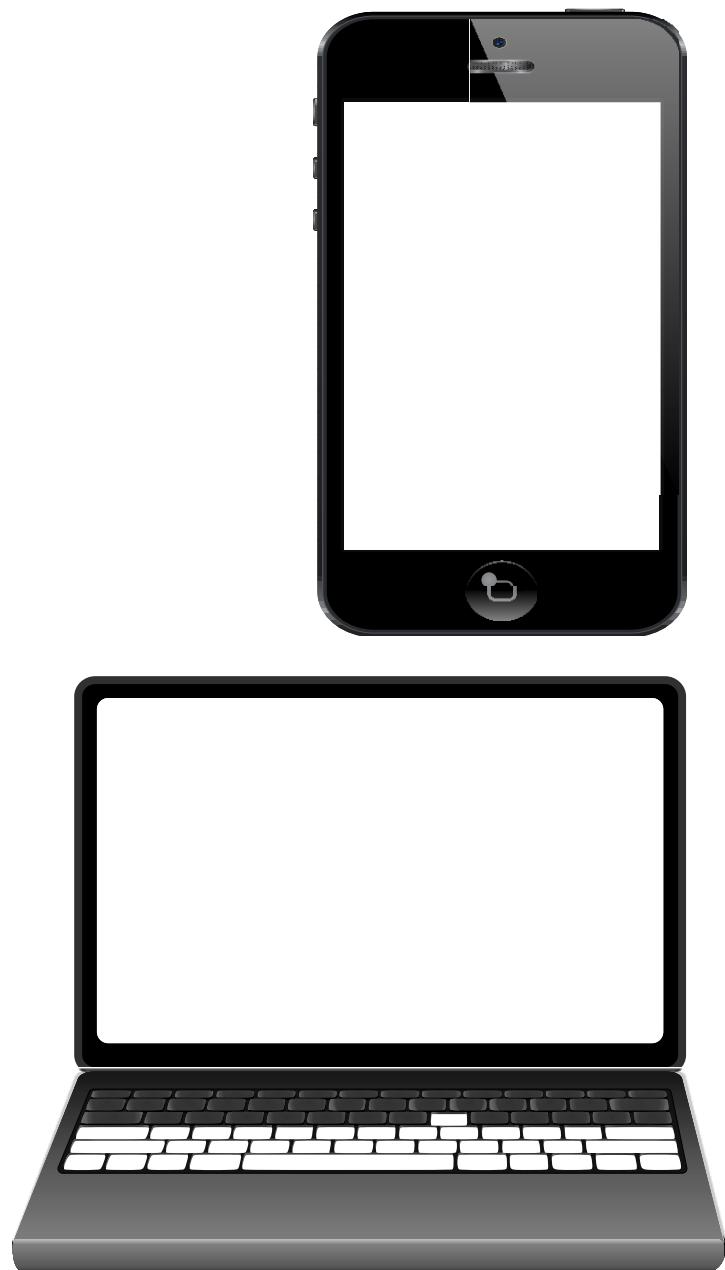
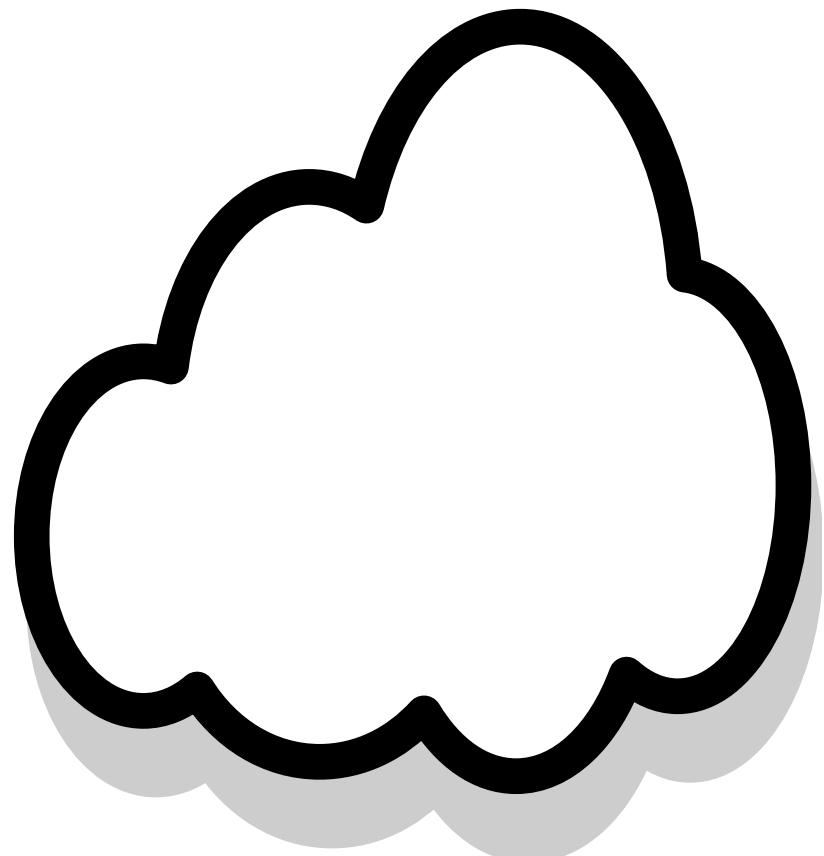




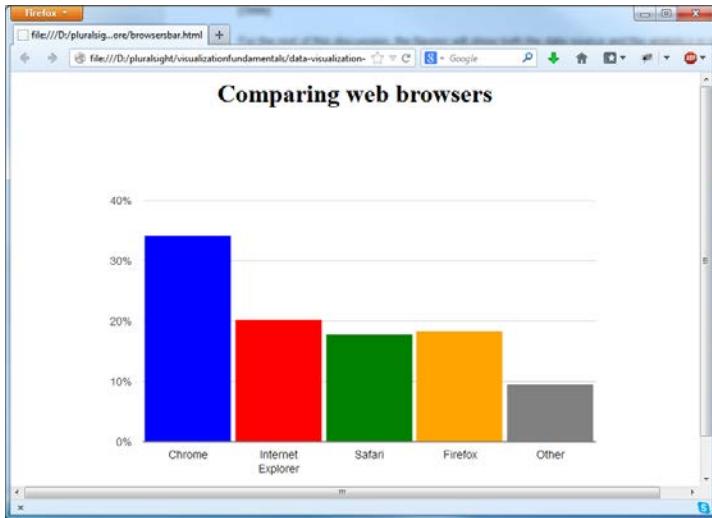




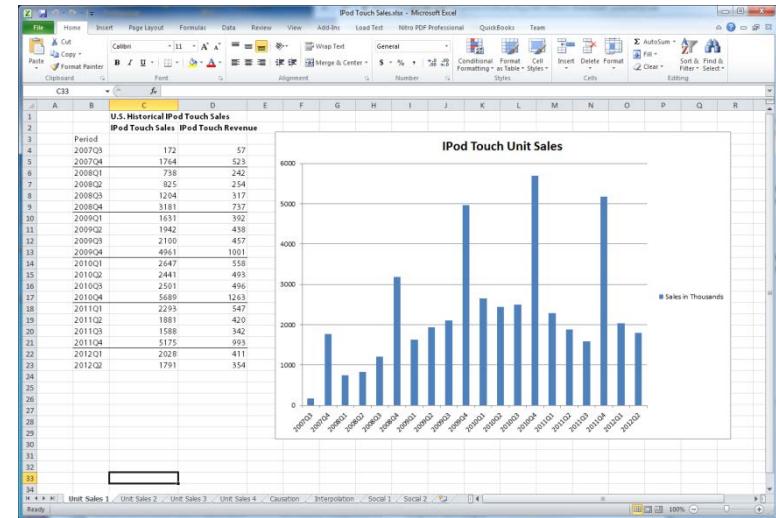




Displaying Visualizations



Visualization in web browsers



Visualization in dedicated applications

Display Formats

Display Formats

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Image tag

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Scalable Vector Graphics

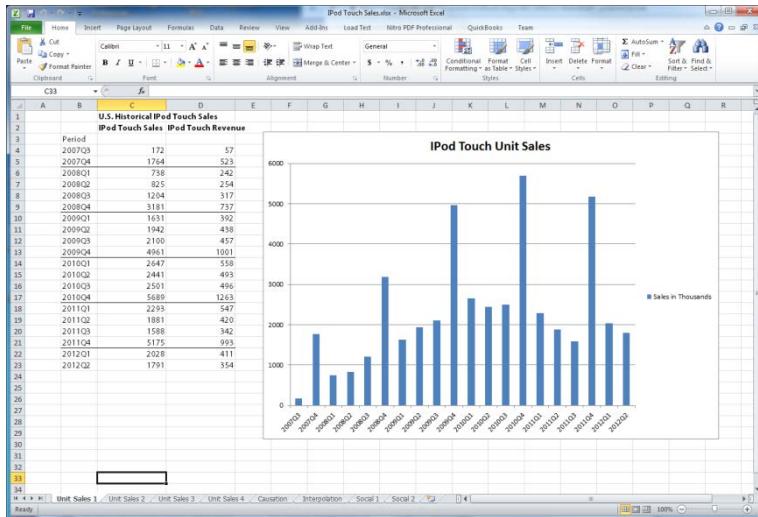
HTML5 Canvas

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Inside an XLSX file

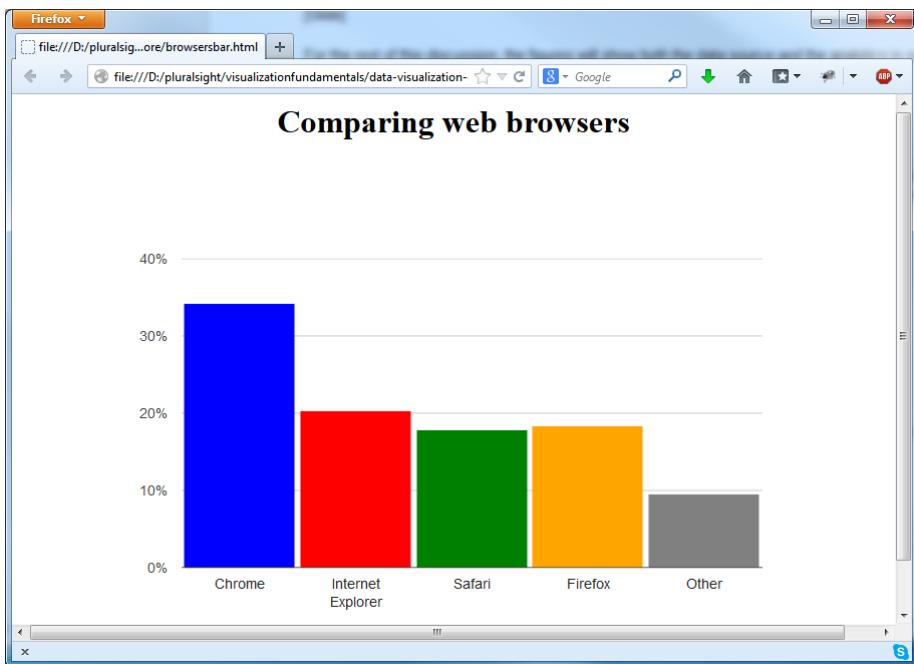
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Standard and Proprietary Formats

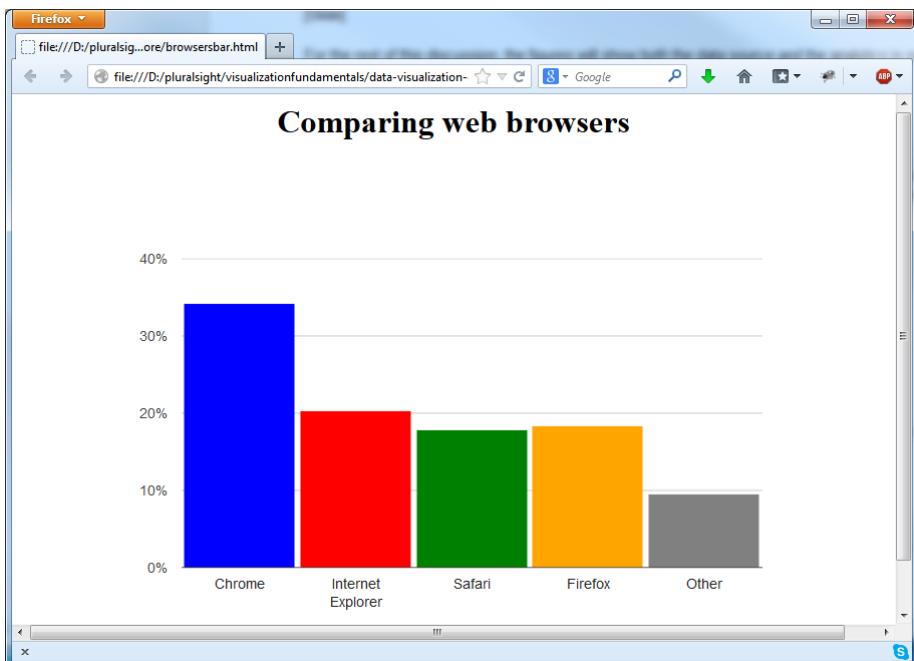


Device must have the right application installed to display the visualization

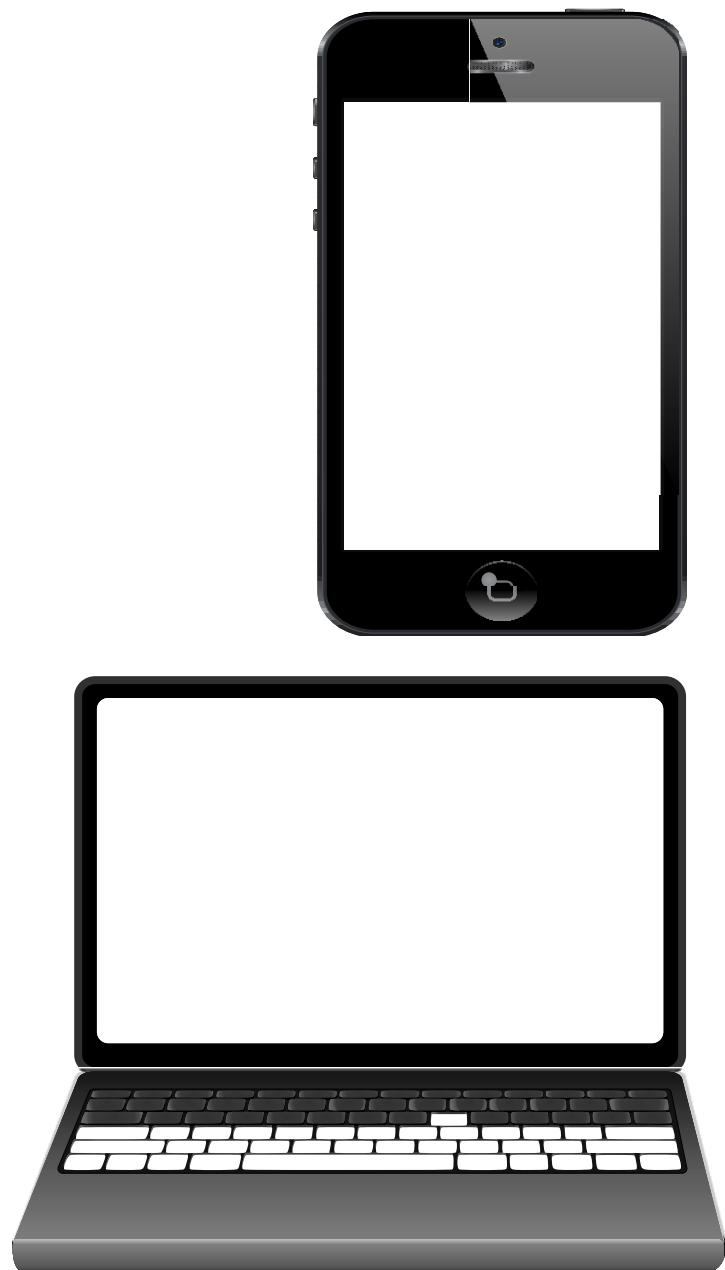
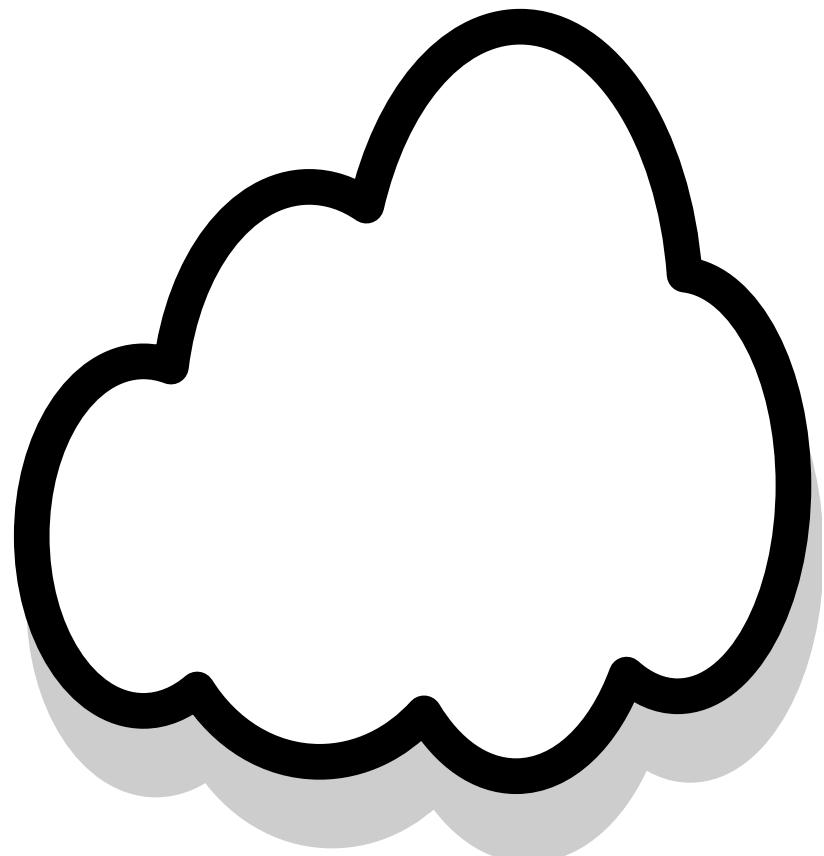
Standard and Proprietary Formats

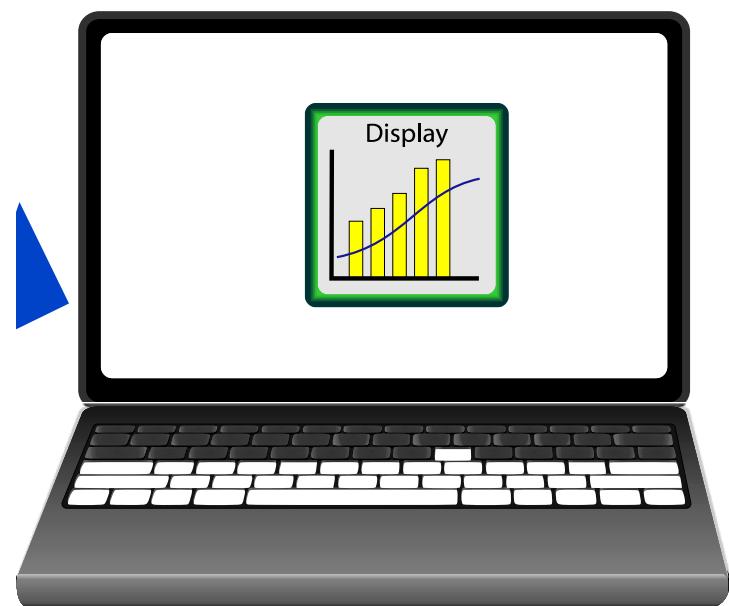
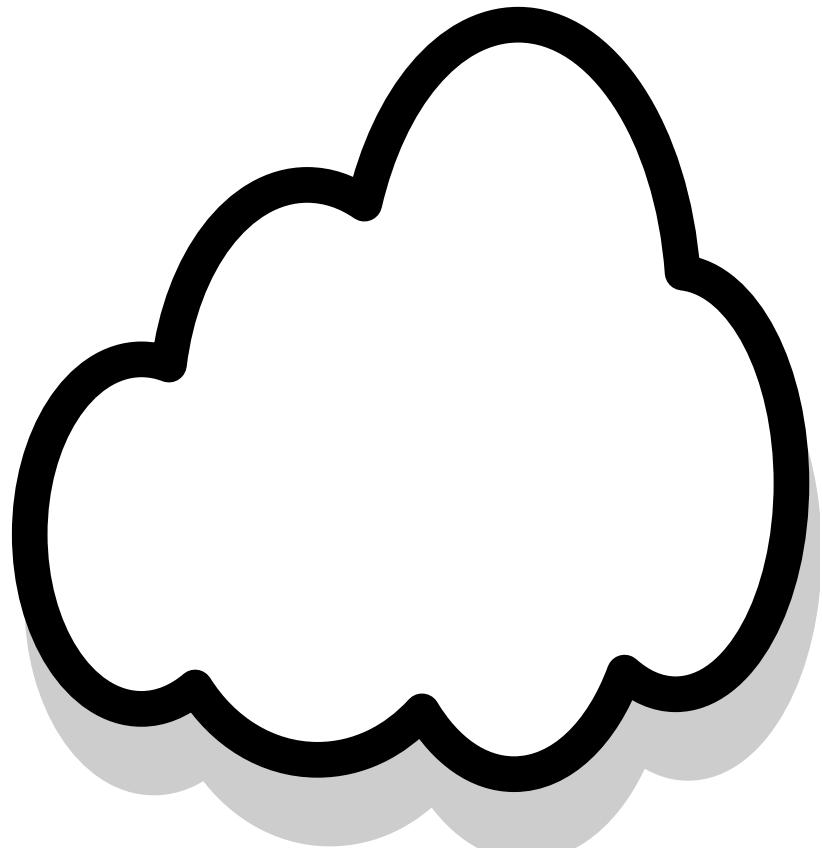


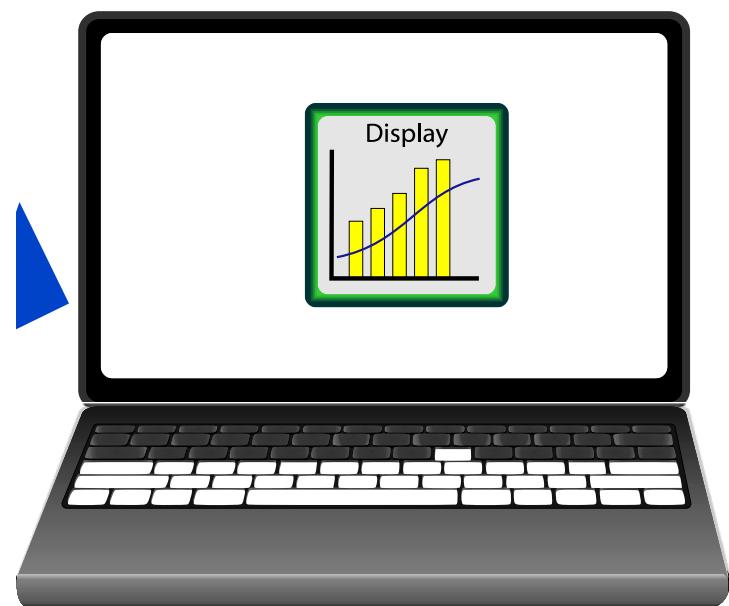
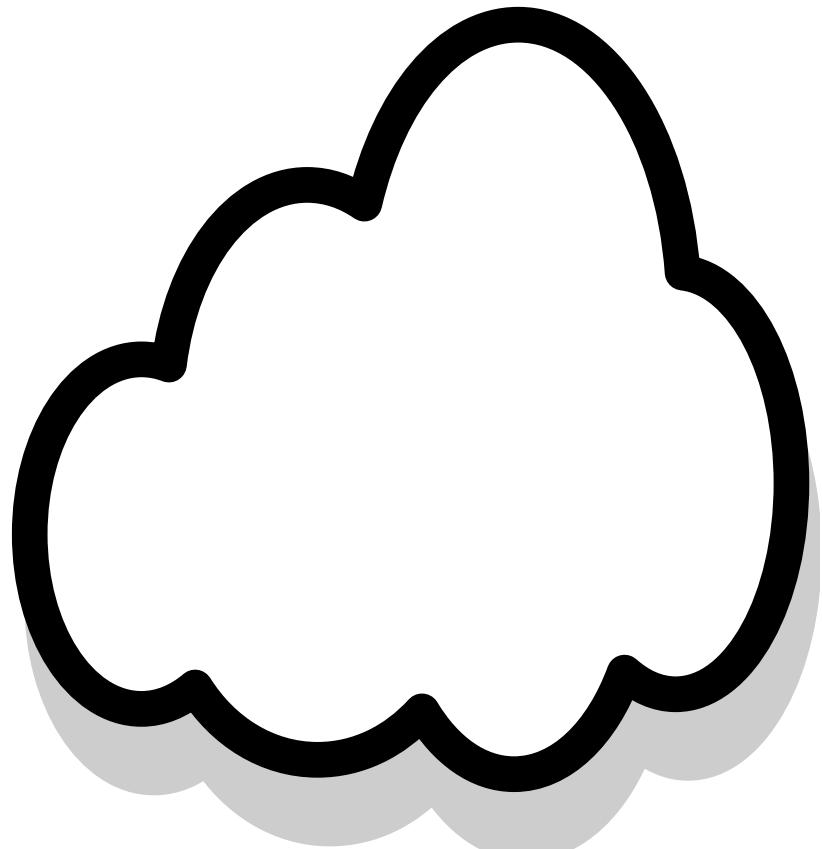
Standard and Proprietary Formats

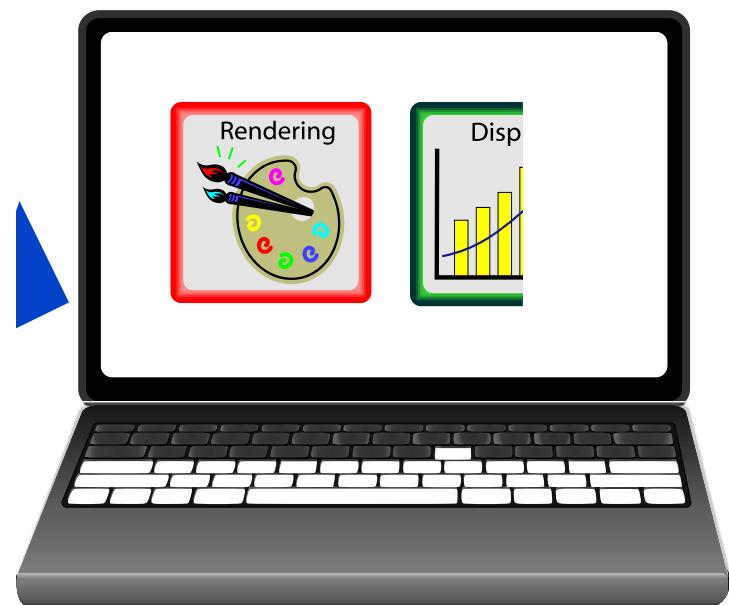
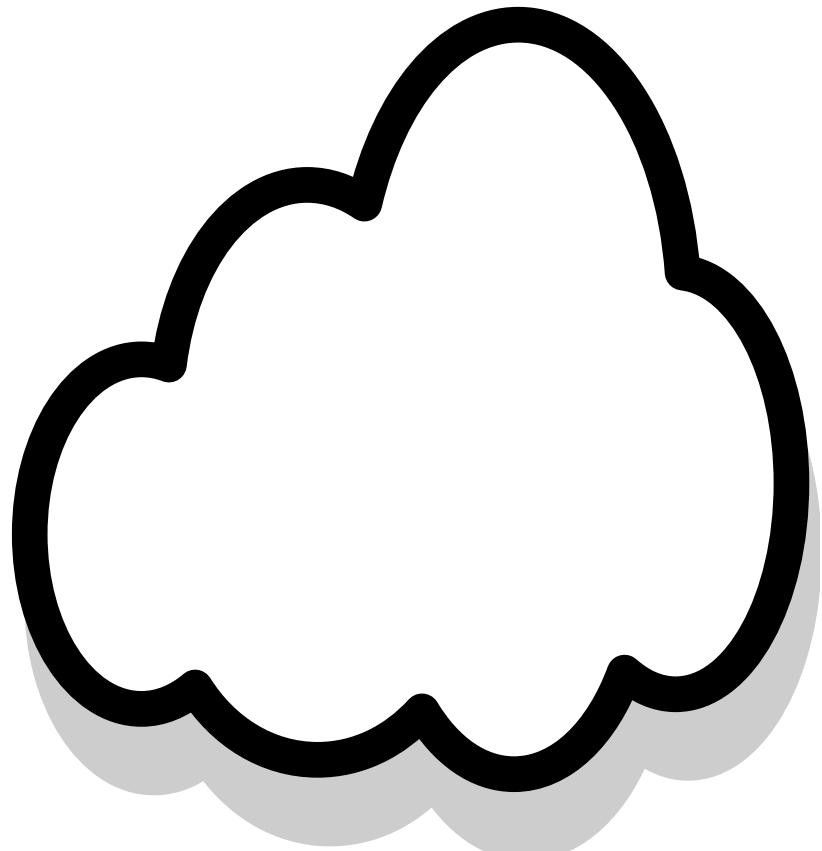


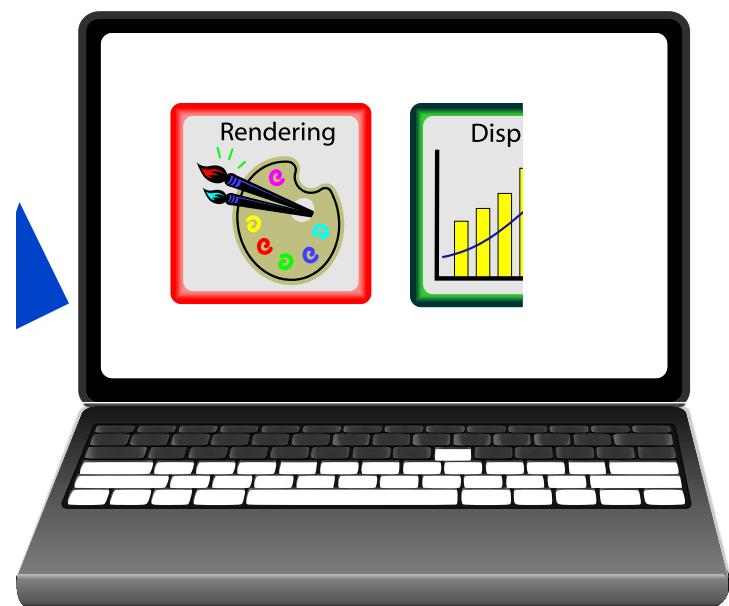
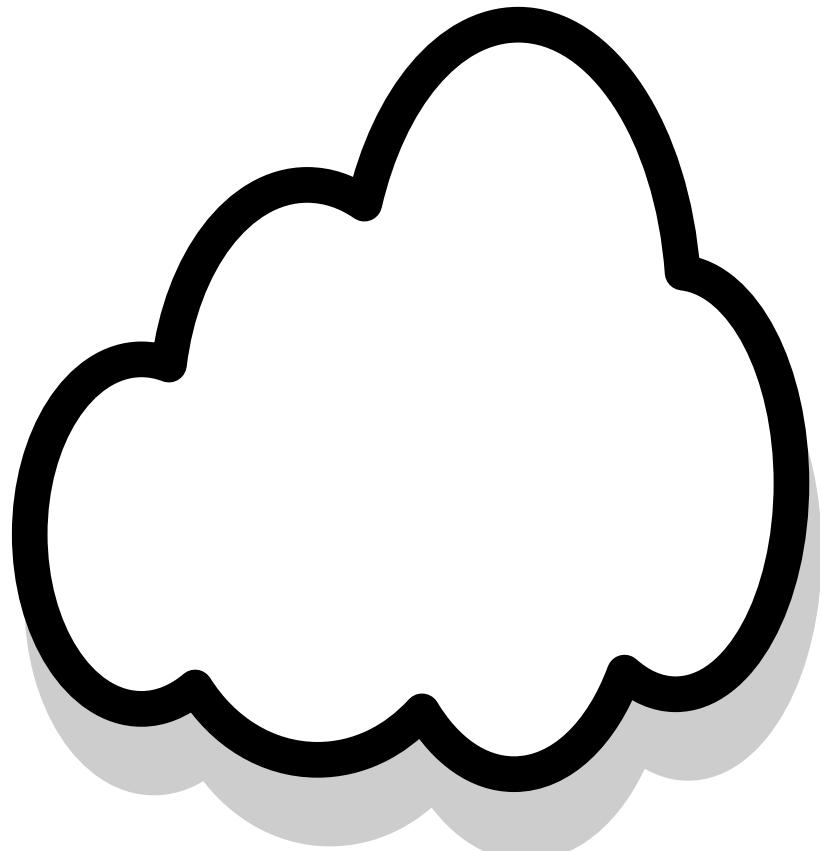
- Images (JPG, GIF, PNG, etc.)
High performance, size depends on area and image complexity.
Outstanding browser support.
- HTML5 Canvas
Performance depends on image complexity. Requires newer browsers.
Low memory requirement.
- Scalable Vector Graphics (SVG)
Performance and memory use depends on image complexity. Requires newer browsers. Supports object based interactions.



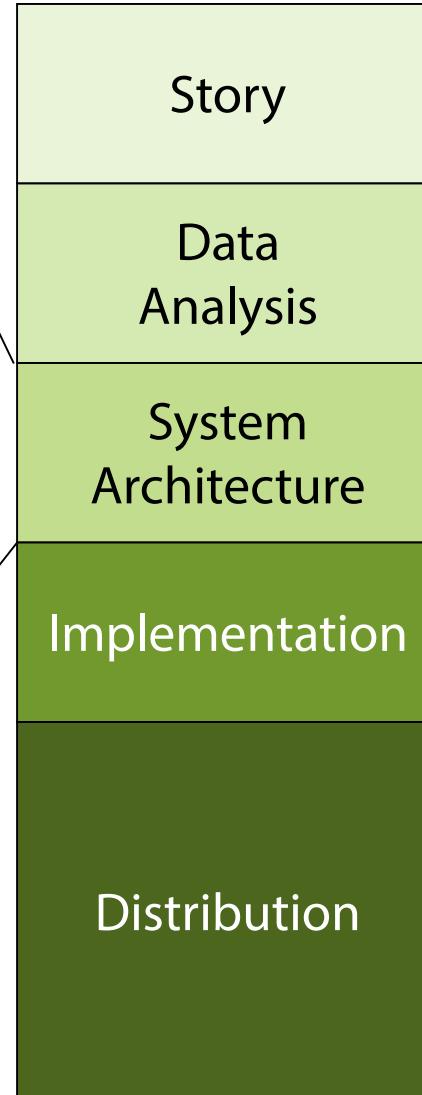








Visualization Lifecycle



For each element you must consider:

- Memory/Storage capacity
- Scalability
- Bandwidth (availability and cost)
- Computation capacity (CPU cycles)
- Performance
- Compatibility

Variations

