

# Web Performance

**Sergey Chernyshev**  
Sr. Performance Architect



# *Slowness Damages Business*

- 100ms delay -> **-1% of sales.**  
(Amazon, 2006)
- 400ms delay -> **-5 - 9% full-page traffic.**  
(Yahoo autos, 2008)
- 500ms delay -> **-25% searches.**  
(Google, 2007)

# Long-Term Brand Effect

- Slowness damages the brand (Google, Microsoft, 2009)
- Google uses speed in search result ranking (SEO) and quality score (AdWords)

Server Delays Experiment: Results

|        | Distinct<br>Queries/User | Query<br>Refinement | Revenue/User | Any Clicks | Satisfaction | Time to Click<br>(increase in ms) |
|--------|--------------------------|---------------------|--------------|------------|--------------|-----------------------------------|
| 50ms   | -                        | -                   | -            | -          | -            | -                                 |
| 200ms  | -                        | -                   | -            | -0.3%      | -0.4%        | 500                               |
| 500ms  | -                        | -0.6%               | -1.2%        | -1.0%      | -0.9%        | 1200                              |
| 1000ms | -0.7%                    | -0.9%               | -2.8%        | -1.9%      | -1.6%        | 1900                              |
| 2000ms | -1.8%                    | -2.1%               | -4.3%        | -4.4%      | -3.8%        | 3100                              |

- Means no statistically significant change

- Strong negative impacts
- Roughly linear changes with increasing delay
- Time to Click changed by roughly double the delay

# *Speed Means Business*

- **+3% ad revenue, +17% page views per session**  
(Edmunds, 2010)
- **+7-12% conversions! 50% reduction in operation costs** (Shopzilla, 2009)
- **+15% (+60M) downloads, each 1sec increased 2.7% downloads** (Firefox, 2010)

# *Speed @ Startups*

10 Golden Principles of Successful Web Apps <http://vimeo.com/10510576>

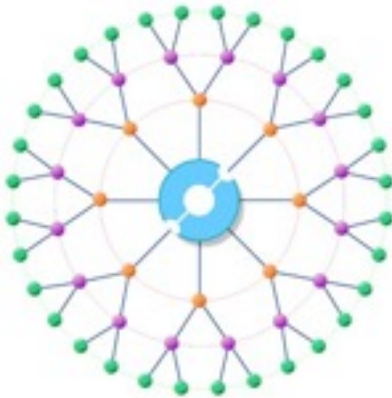
**“1. Speed  
is the most  
important  
feature.”**



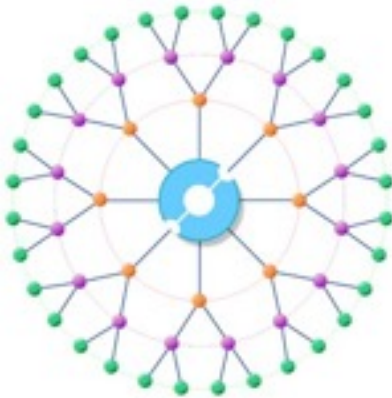
**Fred Wilson**

Managing Partner, Union Square Ventures @ NYC  
<http://www.aVC.com/>

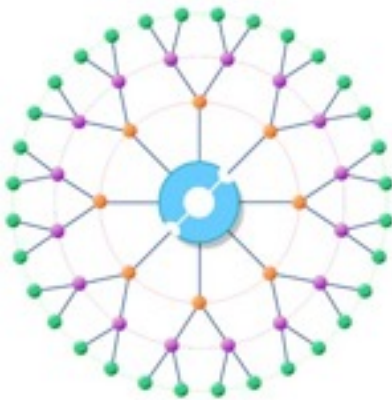
# *Two Types of Speed*



# *Two Types of Speed*

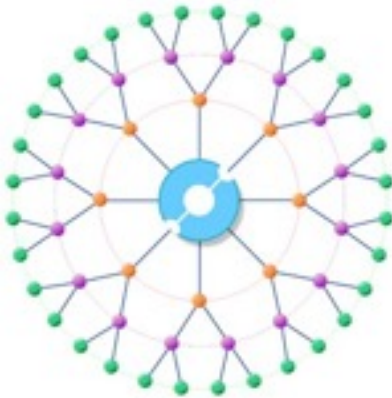


# *Two Types of Speed*

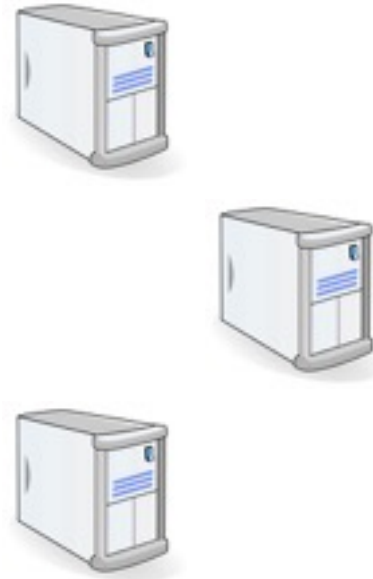
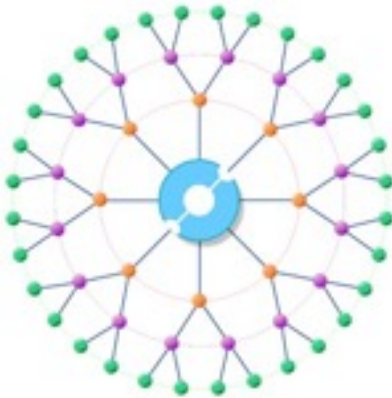
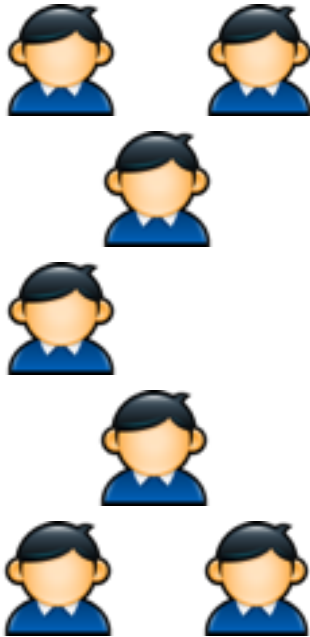




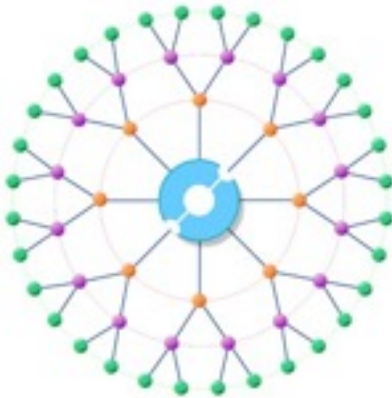
# *Two Types of Speed*



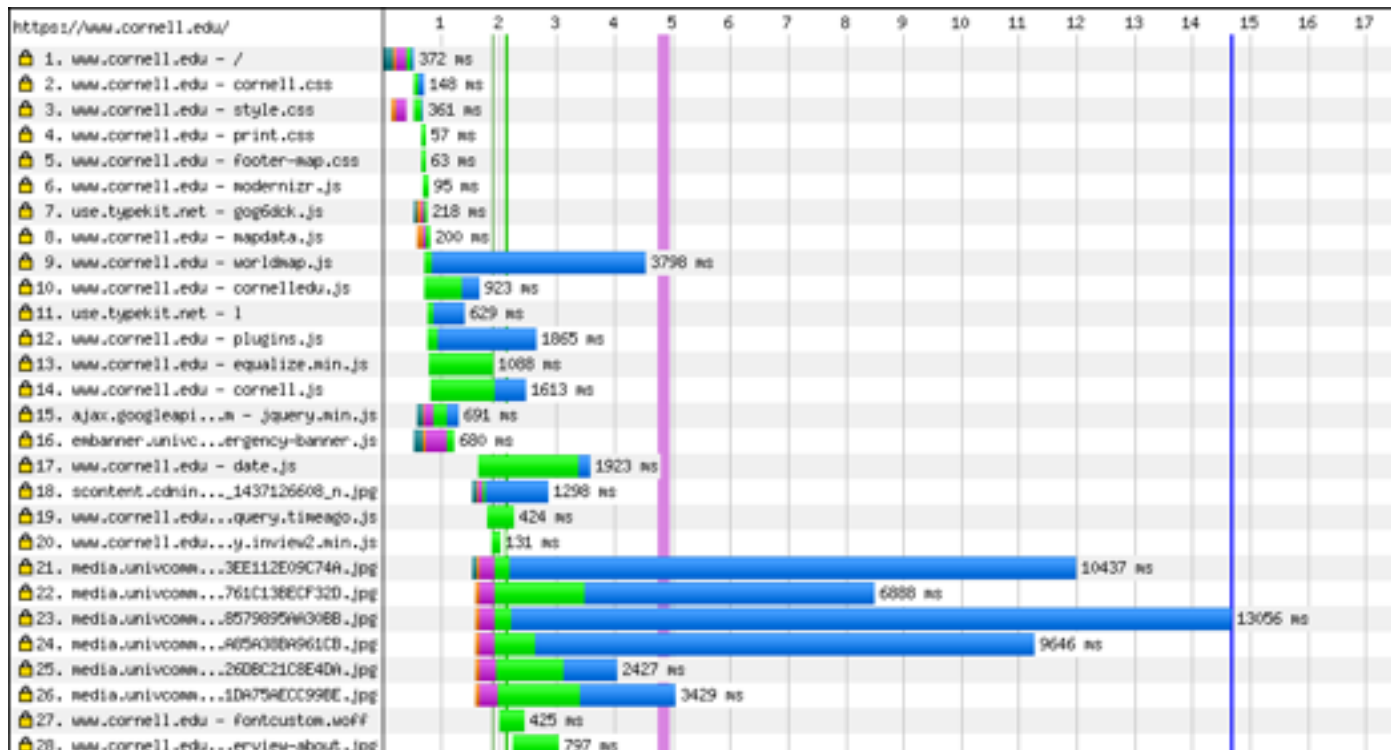
# *Two Types of Speed: Scalability*



# *Two Types of Speed: Performance*



# Waterfalls



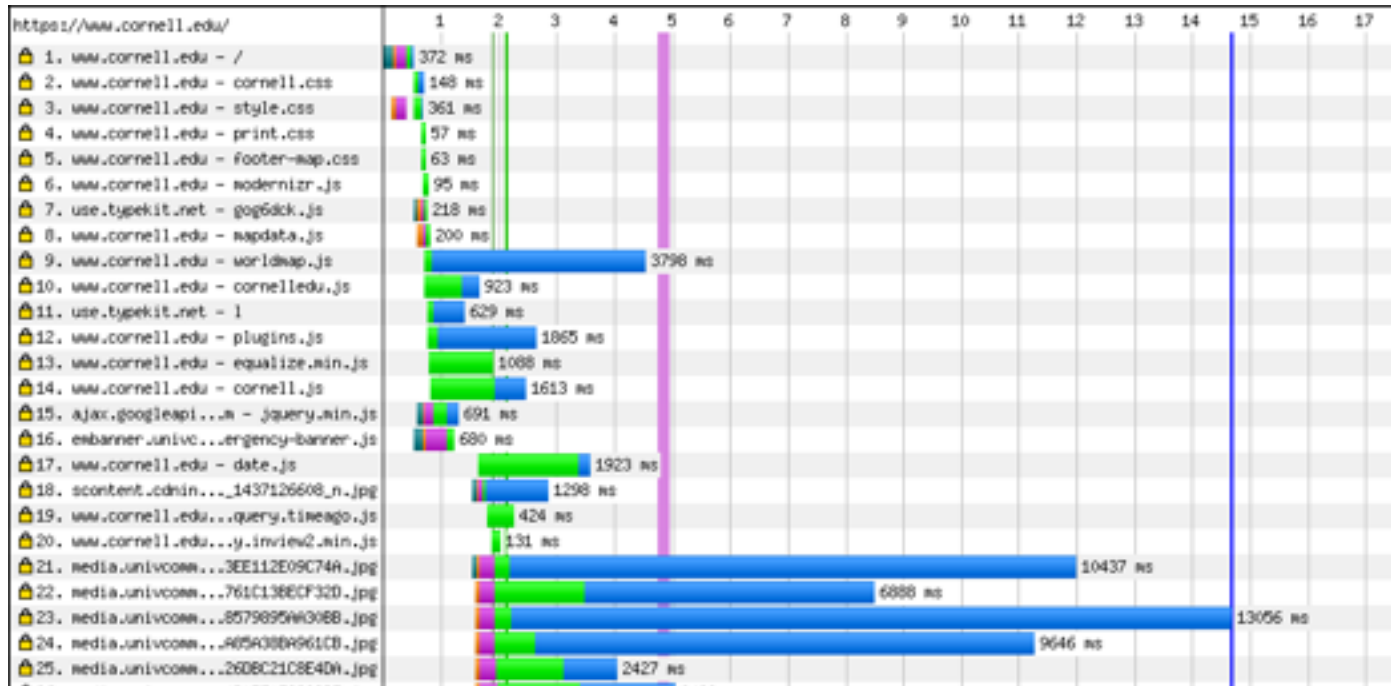
# *DEMO*

Chrome Dev Tools

[WebPageTest.org](https://webpagetest.org)

# Web Performance Golden Rule

59 requests, 17sec, 2s to render, but only 372ms - **less than 2% on backend**





**Sergey Chernyshev**  
@sergeyche  
sergey.chernyshev@gmail.com

Questions