

# Reducing Energy in Corporate IT

- Tony Butterfield - Cofounder 1060 Research
- Founded in 2002 from research in HP Labs Bristol
- R&D driven company with a single product (NetKernel)
- 11 years self funded and profitable
- Customers around the world from all sectors
- <http://1060research.com>

# NetKernel

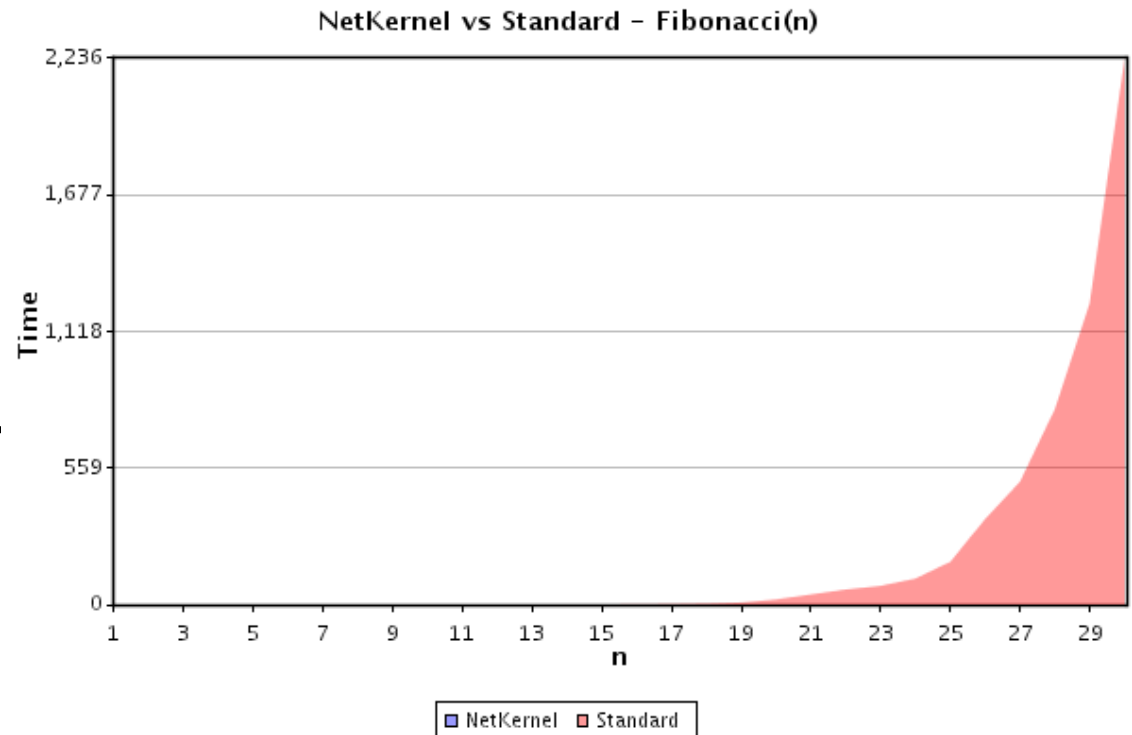
- Application platform that 'makes software like the web'
- Two green field patents
- Loose-coupled software components
  - URI addressable
  - stateless for near linear scaling
  - existing systems and technologies can be integrated
  - lego-like click fit systems with little code and highly maleable
  - **caching**

# Caching

- Caching can be:
  - on the top or bottom of a system
  - programmed at a specific location with a system
  - **intrinsic caching everywhere**

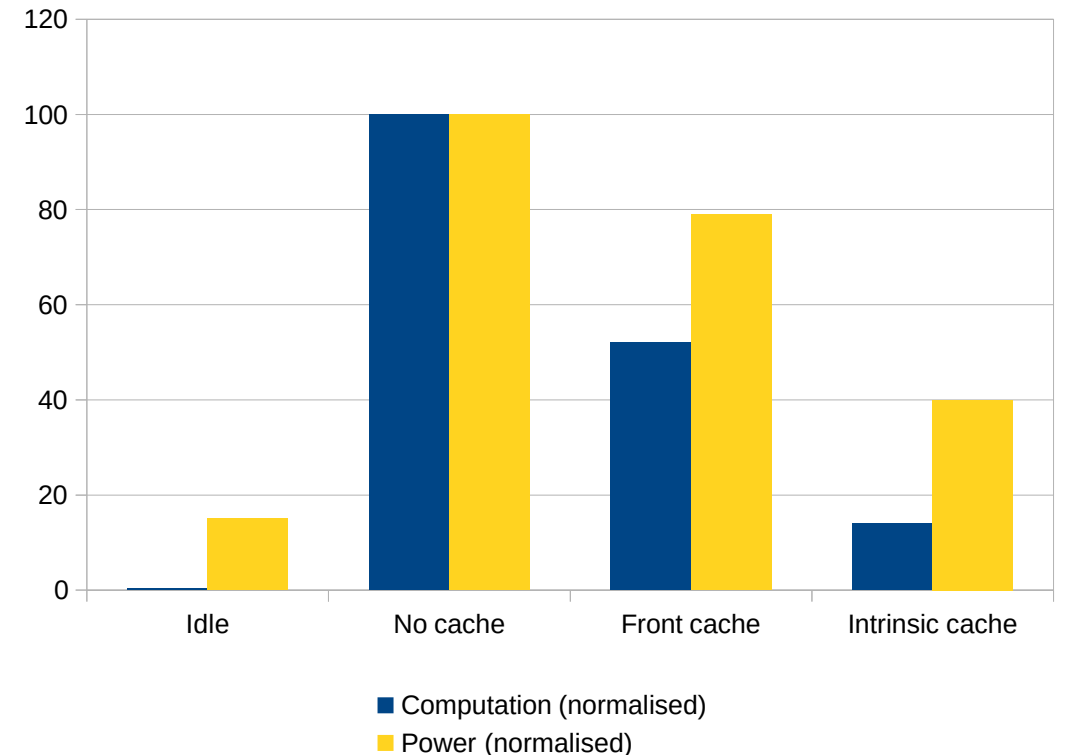
# Effect of caching 1 - Fibonacci

- Linearises fibonacci double recursion without explicit optimisation
- <http://resources.1060research.com/docs/fib/fibonacci.htm>



# Effect of caching 2 - Enterprise

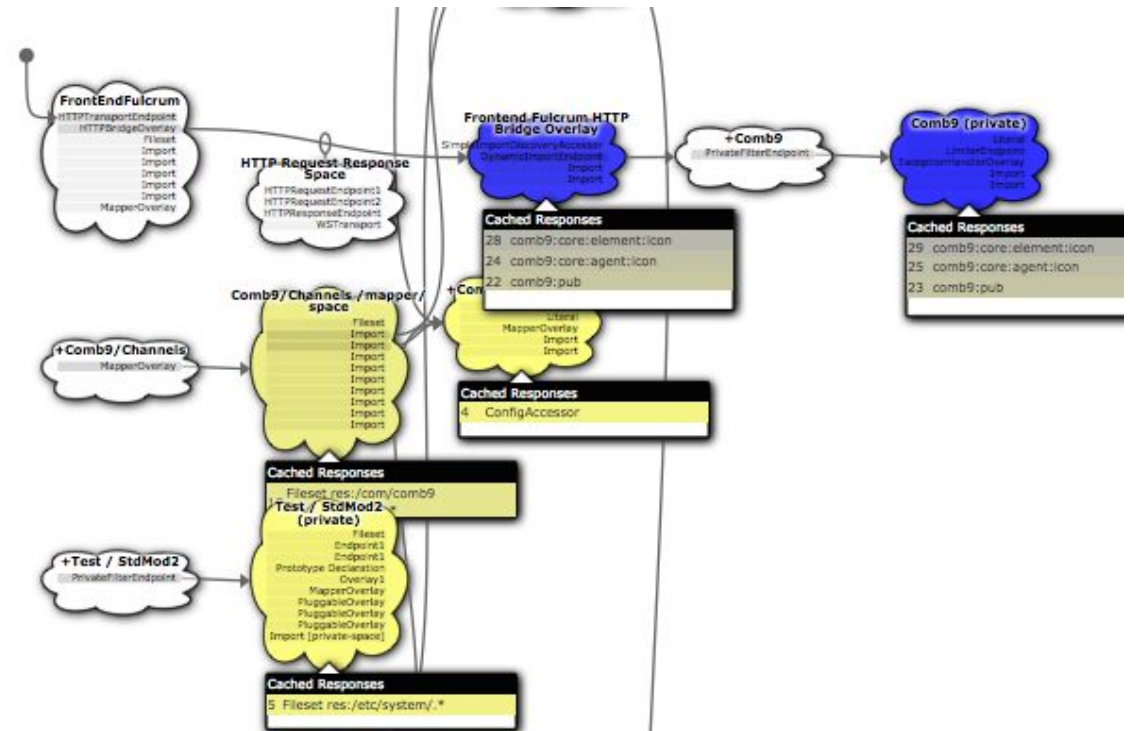
- Example Web application with aggregate page content with differing lifecycles of creating cost
- Running on latest generation intel i7 multicore hardware
- <http://durablescope.blogspot.co.uk/2014/03/reducing-power-consumption-with-roc.html>



# Tooling for cache visualisation and tuning

Summary Representations Caching Layers Cull History Configuration Advanced							
Show 10 entries		Filter: cachepower					
Endpoint	Space	Response Count	Requests /Min	Hit%	Total kCost	Average kCost	Retrieved kCost/Min
cachepower:user	app (private) /overlay/space	17	1,951	99.2	2,879	169	327,808 (67.5%)
cachepower:template	app (private) /overlay/space	201	1,953	43.4	22,866	113	96,357 (19.8%)
cachepower:content	app (private) /overlay/space	201	1,107	65.3	17,088	85	61,468 (12.6%)
cachepower:comments	app (private) /overlay/space	201	1,107	0.2	21,521	107	107 (0.0%)
cachepower:page	app (private) /overlay/space	1	1,197	0.2	8	8	8 (0.0%)
cachepower:template:nocache	app (private) /overlay/space	1	1	100.0	8	8	8 (0.0%)
cachepower:template	app (private)	1	1	100.0	1	1	1 (0.0%)
cachepower:comments	app (private)	1	1	100.0	1	1	1 (0.0%)
cachepower:template:nocache	app (private)	1	1	100.0	1	1	1 (0.0%)
cachepower:page	app (private)	1	1,197	0.2	0	0	0 (0.0%)

Showing 1 to 10 of 24 entries



# Collaboration Ideas

- Develop a side-by-side comparison of real world system
- Develop tools to link real system energy usage to processing of individual processing components
- Enhanced visualisation and prediction of energy consumption of systems
- Ways to reduce data center energy by changing the software that is running...