

"Caching-In" for SharePoint Performance



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Idera

Housekeeping

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September 8th 6pm-9pm

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Session Overview

- Caching conceptual review
- Understanding each of SharePoint's platform caching options
- How to leverage and control caching
- Scenarios quiz
- Q & A

Why I care about caching

okay ...

Why I



caching

Formerly the architect for a Fortune 25 company's publicly facing SharePoint presence

Highly trafficked environment with about 75,000 page views per hour (peak) in 2009

Averaging (at peak) 1,000 requests/second into IIS

okay ...

Why I



First company of this size using MOSS 2007 for Internet presence



Formerly the architect for a Fortune 25 company's publicly facing SharePoint presence

with about 75,000 page views
per hour (peak) in 2009

ak) 1,000 requests/second into IIS



Supported initially with just 2 web
front ends (WFES). Eventually
added additional WFES for growth.

... and finally



I'm sick AND tired
of hearing some
people complain that
"SharePoint doesn't scale"!!!

So, what is caching?

**Webster's
New World
Dictionary**



Third College Edition

cable / cadaver

etc. caused by living for some time in a confined space or an isolated area, esp. in winter

★cable (kă'bäl) n. [ME & OFr < LL capulum, a cable, rope < L capere, to take hold; see HAVE] 1 a thick, heavy rope, now often of wire strands 2 the strong, heavy chain attached to a ship's anchor; anchor cables were formerly of rope 3 CABLE LENGTH 4 a bundle of insulated wires through which an electric current can be passed; telegraph or telephone cables are often laid under the ground or on the ocean floor *5 a cablegram 6 CABLE TV -vt. -blod, -bling 1 to fasten or furnish with cable or cables 2 to transmit by undersea cable 3 to send a cablegram to -vi. to send a cablegram

Cable (kă'bäl), George Washington 1844-1925; U.S. novelist

★cable car a car drawn by a moving cable, as across a canyon, up a steeply inclined street, etc.

★cable-cast (kă'bäl kast) vt. -cast, -casting to transmit directly to receivers by means of coaxial cable -n. a program that is cablecast -ca'bül-čast'ör n.

★cable-gram (-gram) n. a message sent by undersea cable

★cable-laid (kă'bäl laid) adj. made of three or four plain-laid ropes twisted together from right to left

★cable length a unit of nautical measure equal to 720 feet (120 fathoms or 219 m), or in British usage, 600 feet (100 fathoms or 183 m) or 607.6 feet (1/2 of a nautical mile or 185 m)

★cable railway a street railway on which the cars are pulled by a continuously moving underground cable

★cable stitch a type of raised stitch used in knitting; it resembles ropes twisted together

★cable TV a television system in which a high antenna and one or more dish antennas receive signals from distant and local stations, electronic satellite relays, etc. and transmit them by direct cable to the receivers of persons subscribing to the system

★cab-man (kab'män) n., pl. -men (-män) CABDRIVER

★cabob (ka'bób) n. KEBAB

★cabochon (kab'ó chón) n. [Fr kabó chón] n. [Fr < caboche, head] 1 any precious stone cut in convex shape, polished but not faceted; see GEM, illus. 2 the style of cutting such a stone

★cabomba (ka'bóm'bä) n. [ModL < Sp] any of a genus (Cabomba) of waterlilies (family Cabombaceae), esp. a species (C. caroliniana) with submerged, needlelike leaves and rounded, floating ones; used in aquariums, garden pools, etc.

★caboodle (ka'bóod'el) n. [ca-, colloq. intens. prefix (< ? Ger ge-) + BOODLE] [Colloq.] lot; group [the whole caboodle]

★caboose (ka'bóos) n. [MDu kabuus, kambuis (< ?), ship's galley] 1 [Brit.] Naut. a ship's kitchen; galley 2 the trainmen's car on a freight train, usually at the rear

★Cabot (kab'ót) John (fl. name Giovanni Caboto) c. 1450-c. 1498: It. explorer in the service of England; discovered coast of North America (1497) 2 Sebastian c. 1476-1557; Eng. cartographer & explorer; son of John

★cabotage (kab'ót'ij, -táž) n. [Fr < caboter, to sail along the coast < MFr cabo, cape < Sp < L caput, HEAD] 1 coastal navigation and trade, esp. between ports within a country 2 air transport within a country 3 the right to engage in cabotage, esp. as granted to foreign carriers

★cabretta (ka'bret'ä) adj. [< Sp cabra, goat (< L capra, fem. of caper; see CAPRIOLE) + L fem. dim. suffix -etta] designating or of a soft leather made from a special kind of sheepskin

★cabrilla (ka'bri'lä, -bré'yä) n. [Sp, prawn, dim. of cabra, goat; see prec.] any of various edible, percoid fishes (family Serranidae) found off Florida, the West Indies, etc.

★Cabrin (ka'bri'né), Saint Frances Xavier (called Mother Cabrini) 1850-1917; U.S. nun, born in Italy; first U.S. citizen canonized; her day is Dec. 22

★cab-riole (kab'rí'el) n. [Fr see fol.] 1 a leg of a table, chair, etc. that curves outward and then tapers inward down to the foot, often clawlike and grasping a ball 2 Ballet a leap in which one leg is thrown upward and then both legs are beaten together

★cabriole (kab'rí'el) n. [Fr, dim. of capriole, a leap, caper < It capriola, CAPRIOLE] 1 a light, two-wheeled carriage, usually with a hood that folds, drawn by one horse 2 a former style of automobile like a convertible coupe

★cab-stand (kab'ständ) n. a place where taxis are stationed for hire

★cac- (kak) combining form -caco- used before a vowel

★ca/ca or ca-ca (kä'kä) n. [Slang] excrement; feces:

cacao butter COCOA BUTTER

★cac-cia-to-re (kä'čä tór'é) adj. [It, lit., hunter < pp. of cacare, hunt, chase < VL *cacare, to CATCH] cooked in a casserole with olive oil and tomatoes, onions, spices, wine, etc. [chicken cacciatore]

★cachia-lot (kash'äl'ót, -lót) n. [Fr < Sp cachalote < colic, fish, cachalot, head < SPERM WHALE]

★cachectic (kash'ek'tik) n. [Fr < cachec, conceal < VL *coacitare, side collect, compress < L coactare, constrain < coactus, pp. of coactare; see COAGENT] 1 a place in which signs of disease are observed 2 a patient with cachectic features

★cache (kash'pät, -pöt) n. [Fr < cachec, to hide (see prec.) + L -tore] 1 a decorative pot, jar, etc., used esp. for holding potted houseplants 2 also cache pot

★cache-sexe (kash'séks') n. [Fr < cachec, to hide (see CACHÉ) + sexe, sex] a small cloth or band worn, as by an otherwise nude dancer, to conceal the genitals

★cachet (ka šhä', kash'ä) n. [Fr < cachec; see CACHÉ] 1 a seal or stamp on an official letter or document; see also LETTRE DE CACHET 2 any sign of official approval 3 a mark or sign showing something is genuine, authentic, or of superior quality 4) distinctive condition of the body, esp. as associated with a chronic illness 5) cachexy' (-së) -ca-čhec'tik (-kek'tik) or ca-čhex'yik (-kă'syik) adj.

★cachin-nate (kă'čän'ät) vi. -nat'ed, -nat'ing [< L cachinnatus, pp. of cachinnare; ult. of echeic orig.] to laugh loudly or too much -cachin-na'tion n.

★ca-chou (ka šhöw') n. [Fr < Port cachu < Malayalam čäcu, skin] Tamil čäcu] 1 CATECHU 2 a lozenge for sweetening the breath

★ca-chu-cha (ka čhöw'čä) n. [Sp] 1 an Andalusian dance in 3/4 time, like the bolero 2 music for this

★ca-cique (ka šek') n. [Sp < Arawak word meaning "prince," "lord," 1) in Spanish America, an Indian chief 2) in Spanish America and Spain, a local political boss 2) any of various tropical American blackbirds (family Icteridae) with conical bills -ca-čiqu'äm n.

★cack-handed (kăk'händ'id) adj. 1 [Brit. Colloq.] left-handed 2 clumsy; awkward

★cackle (kăk'əl) vi. -led, -ling [ME cacklen; akin to Du kakkelen, to cackle] I E base 'kak': of echeic orig.] 1 to make the shrill, broken vocal sounds of a hen 2 to laugh or chatter with similar sounds -vt. to utter in a cackling manner -n. 1 the act or sound of cackling 2 cackling laughter 3 idle or silly chatter -cä'čak'el (Brit. Colloq.) to stop talking and settle down to serious efforts

★CACM Central American Common Market

★cac-o- (kăk'ó, -ó) [< Gr kakos, bad, evil] combining form bad, poor, harsh [geography]

★cac-o-demon or cac-o-dæmon (kăk'ó dē'män) n. [Gr kakos, evil; demon, see prec. & DEMON] an evil spirit or devil

★cac-o-dyl (kăk'ó dīl, kăk'ä) n. [< Gr kakódēs, bad-smelling -kakos, bad + -odes (< IE base 'od-, to smell > odors, ozone) + -yl, Chem.] 1 a radical As(CH₃)₂, composed of arsenic and methyl groups; compounds are poisonous and foul-smelling 2 a poisonous, colorless liquid, As₂(CH₃)₂, with an offensive odor; it is a polymer of this radical -cac-o-dyl'ic (-dīl'ik) adj.

★cac-o-ethes (kăk'ó e'thez) n. [< Gr kakóethēs < kakos, bad -ethos, habit; see ETHIC] a hankering to do something; mania

★cac-o-graphy (kă'kăgr'fē) n. [CACO- + GRAPHY] 1 bad handwriting 2 incorrect spelling -cac-o-graph'ic (kă'kăgr'fik) or cac-o-graph'ical adj.

★cac-o-mistle (kăk'ó mis'al) n. [AmSp cacomixtle < Nahuatl čakomixtli < čak'ka, half + mis'al, cougar] 1 a slender, long-tailed raccoonlike carnivore (Bassariscus astutus) of the SW U.S. and Mexico 2 its fur Also cac'o-mix'tle (-mis'al, -miks'al)

★ca-copho-ny (ka'käf'ə'nē) n., pl. -nies [prob. via Fr cacophonie < ML cacophonia < Gr kakophōnia < kakophōnos, harsh, jarring sound -phōnē, bad, evil + phōnē, voice; see PHONO-] harsh, jarring sound; dissonance -ca-coph'o-nous (-nas) adj. -ca-coph'o-nously adv.

★cac-tus (kăk'təs) n., pl. -tuses or -tū (-tū) [ModL < Gr kaktaos, thistle, cardoon] 1 any desert plants of the cactus family, native to the New World, with fleshy stems, reduced or spine-like leaves, and often showy flowers -adj. designating a family (Cactaceae) of dicotyledonous plants (order Caryophyllales), including the prickly pear, saguaro, and cereus

★ca-cu-mi-nal (kä'kyóm'äl) adj. [< L cacumen (gen. cacuminis) top (< redupl. of IE base 'heu-; see RICH) + -al] 1) Phonet. pronounced with the tip of the tongue turned backward and upward against or toward the hard palate -n. a cacuminal sound

★cad (kad) [< CADDIS & CADET] 1 a man or boy who does not gentlemanly. Word originally applied to servants, then to schoolboys, esp. of a person; corpse, as for dissection -SYN. BODY -ca-

★cad-er-ic adj.

★cadaver (kă'däv'ər) n. [< L cadaver, corpse] a colorless, putrid-liquid, pitoamine, NH₂(CH₂)₂NH₂, produced by the action of microorganisms on proteins, as in decaying flesh

★cad-av-er-ous (-r əs) adj. [< L cadaverosus] of or like a cadaver; esp. pale, ghastly, or gaunt and haggard -ca-däv'ər-ously adv. -ness n.

★CAD-CAM (kăd'käm) n. [Computer-Aided Design] (Computer-Aided Manufacturing) a computer system used in engineering, combining design techniques and manufacturing principles, as in the creation of complex wiring diagrams, the design of coordinated machine parts, etc.

★cad-die (kăd'ī) n. [< Scot form of FR cadet; see CADET] 1 orig., an attendant 2 a person who attends a golfer, carrying the clubs, finding the balls, etc. 3 a small, two-wheeled cart, as for carrying golf bags -vi. -died, -dying to act as a caddie

★cad-dis (kăd'īs) n. [ME & OFr cadus, floss silk; confused with Fr cadis, coarse serge, after CADIZ (? where made)] 1 a coarse woven material; worsted yarn 2 a worsted ribbon

★cad-ice (kăd'īs) n., pl. -dices (-dīs) n. CADDIS WORM

★cad-ids fly any of an order (Trichoptera) of small, mothlike insects with a soft body, long antennae and legs, and two pairs of hairy, membranous wings

★cad-ish (kăd'ish) adj. like or characteristic of a cad; ungentlemanly -cad'ishly adv. -cad'ish-ness n.

★cadis-worm [< OFr cadus, floss silk (with reference to the case)] the wormlike larva of the caddis fly that usually lives in fresh water in an elongated case made of twigs, grains of sand, etc. cemented together with silk that it secretes; commonly used as bait by anglers

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cadaveric / CAF

ment occurring as a sulfide or carbonate in zinc ore: it is used in some low-melting alloys, electroplating, rechargeable batteries, etc.; highly toxic dust or fumes; symbol, Cd; at. wt., 112.40; at. no., 48; sp. gr., 8.642; melt. pt., 321.1°C; boil. pt., 767°C -cad'm'ic (-m'ik) adj.

★cadmium sulfide a toxic pigment, CdS, varying from lemon yellow (cadmium yellow) to yellowish orange (cadmium orange) and used in paints, photocells, semiconductors, etc.

★Cad-mus (kăd'məs) [Gr Kadmos] a Phoenician prince and founder of Thebes; he kills a dragon and sows its teeth, from which many armed men rise, fighting each other, until only five are left to help him build the city

★cad-re (kă'drē, -drä; also , kă-) n. [Fr, a frame < It quadro < L quadrum, a square; see QUADRATE] 1 a basic structure or framework 2 an operational unit, as of staff officers or other key personnel, around which an expanded organization can be built 3 a small, unified group organized to instruct or lead a larger group; nucleus 4 a member of a political, esp. Communist, cadre

★ca-du-ceus (ka dōw'sēs, -dōw's-) n., pl. -cei' (-sē' rē) [L, ? via Etr < Gr(Doric) karykeion, for Gr karykeion < kērys, herald < IE base *kar-, to praise > OHG hruom, Ger ruhm] 1 the staff of an ancient herald; see, the winged staff with two serpents coiled about it, carried by Mercury 2 an emblematic staff like this with either one or two serpents, used as a symbol of the medical profession -ca-du'ce-an adj.

★ca-du-cite (ka dōw'sēt, -dōw's-) n. [Fr caducite < LL caducitas < L caducus; see fol.] 1 the quality or state of being perishable 2 quality of being perishable

★ca-du-cous (kăd'ūs) adj. [L caducus, falling < cadere, to fall; see CASE] Bot. falling off early, as some leaves

★cae-cilian (sē sī'än, -sī'yän) n. [< ModL < L caecilia, kind of lizard < caecus; see CECUM] any of an order (Gymnophiona) of legless tropical amphibians resembling worms

★cae-cum (sē'kəm) n., pl. -ca (-kə) CECUM

★Caed-mun (kă'dəm'an) fl. late 7th cent. A.D.; first Eng. poet whose name is known

★Caer-lian (sē'li'än, sē'lyän) [after L Caetius Mons, Caelian hill, named after the Tuscan Caetes Vibenna] -see SEVEN HILLS OF ROME

★Caer-lion (sē'li'än) a small S constellation between Columba and Eridanus

★Caen (kän) chief city of Basse-Normandie, NW France; pop. 117,000

★Caer-mar-von-shire (kär mär'vön shir', -shör) former county of NW Wales, now part of Gwynedd; also Caer-mar'von

★cae-sal-pi-ria (sē'säl'pī'riä, säs') adj. designating a family (Caesalpiniaceae) of leguminous trees and shrubs, including the Kentucky coffee tree

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★Caes-ar (sē'zär), (Gaius) Julius [L Caesars, said to be < caenis, pp. of caedere, to cut down (see -CIDE), but prob. of Etr orig.] c. 100-44 B.C.; Rom. general & statesman; dictator (49-44) of the Roman Empire

★Caes-are-a (sē'sär'ä, sēz', -sēz'ä) 1 seaport in ancient Palestine, on the Mediterranean, S. of Haifa, Israel; Roman capital of Palestine 2 city in ancient Palestine, near Mt. Hermon; also Caesarea Philippi 3 ancient name of KYUSURI

★Caes-ar-ian or Caes-ar-ian (sē zär'ē än) adj. of Julius Caesar or the Caesars -n. CAESAREAN SECTION

★Caesarean section [from the ancient story (by assoc. of the name Caesar with L caedere; see (Gaius) Julius CAESAR) that Caesar or an ancestor had been born in this manner] [also c- s-] a surgical operation for delivering a baby by cutting through the mother's abdominal and uterine walls

★Caes-ar-ism (sēz'är iz'm) n. [also c-] absolutism in government; autocracy -Caes'arist'ic adj., n.

★Caesar salad so named in honor of (Gaius) Julius CAESAR by Giacomo Julia, Italian-American chef in Chicago, who invented it c. 1903 1 a salad of greens, grated cheese, croutons, anchovies, etc. with a dressing of olive oil, lemon juice, garlic, and soft or corded eggs

★cae-sium (sē'sē'əm) n. CESIUM

★cae-si-lose (sē'sī'ōs) adj. CESIPTOUS

★cae-sura (sē'zür'ä, -zür'öf'ä) n., pl. -ras or -rae (-rē) [L, a cutting < pp. of caedere, to cut down; see -CIDE] 1 a break or pause in a line of verse; in Greek and Latin verse, the caesura falls within the metrical foot; in English verse, it is usually about the middle of the line and is shown in scansion by the sign | 2 Music a break or



CABLE



CABRIOLET



CADUCEUS

cacao butter COCOA BUTTER

cac·cia·to|re (kā'chə tōr'ē) *adj.* [[It, lit., hunter < pp. of *cacciare*, to hunt, chase < VL **captiare*, to CATCH]] cooked in a casserole with olive oil and tomatoes, onions, spices, wine, etc. [*chicken cacciatore*]

cach|a·lot (kash'ə lät', -lō') *n.* [[Fr < Sp *cachalote* < colloq. Port *cachola*, head]] SPERM WHALE

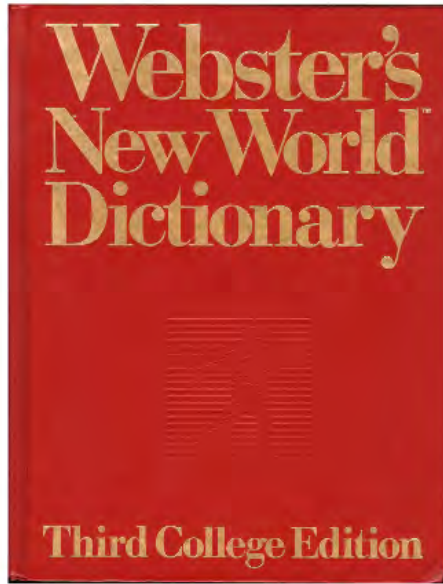
cache (kash) *n.* [[Fr < *cache*, conceal < VL **coacticare*, store up, collect, compress < L *coactare*, constrain < *coactus*, pp. of *cogere*, to collect: see COGENT]]

1 a place in which stores of food, supplies, etc. are hidden, as by explorers or trappers 2 a safe place for hiding or storing things 3 anything stored or hidden in such a place —*vt.* **cached**, **cach'ing** to hide or store in a cache —*SYN.* HIDE¹

cache·pot (kash'pät, -pō') *n.* [[Fr < *cache*, to hide (see prec.) + *pot*, POT¹]] a decorative pot, jar, etc., used esp. for holding potted house plants Also **cache pot**

cache·sexe (kash'seks') *n.* [[Fr < *cache*, to hide (see CACHE) + *sexe*, sex]] a small cloth or band worn, as by an otherwise nude dancer, to conceal the genitals

ca·chet (ka shā', kash'ā) *n.* [[Fr < *cache*: see CACHE]] 1 a seal or stamp on an official letter or document: see also LETTRE DE CACHET 2 any sign of official approval 3 a) a mark or sign showing something is genuine, authentic, or of superior quality b) distinctive



Ok, so this is the dictionary
I took to college ... AND
that was over 20 years ago.

Clearly a more up-to-date definition is needed



A temporary storage area where data that is computationally expensive or slow to fetch can be placed for faster access

Option 1: Place data on a faster medium



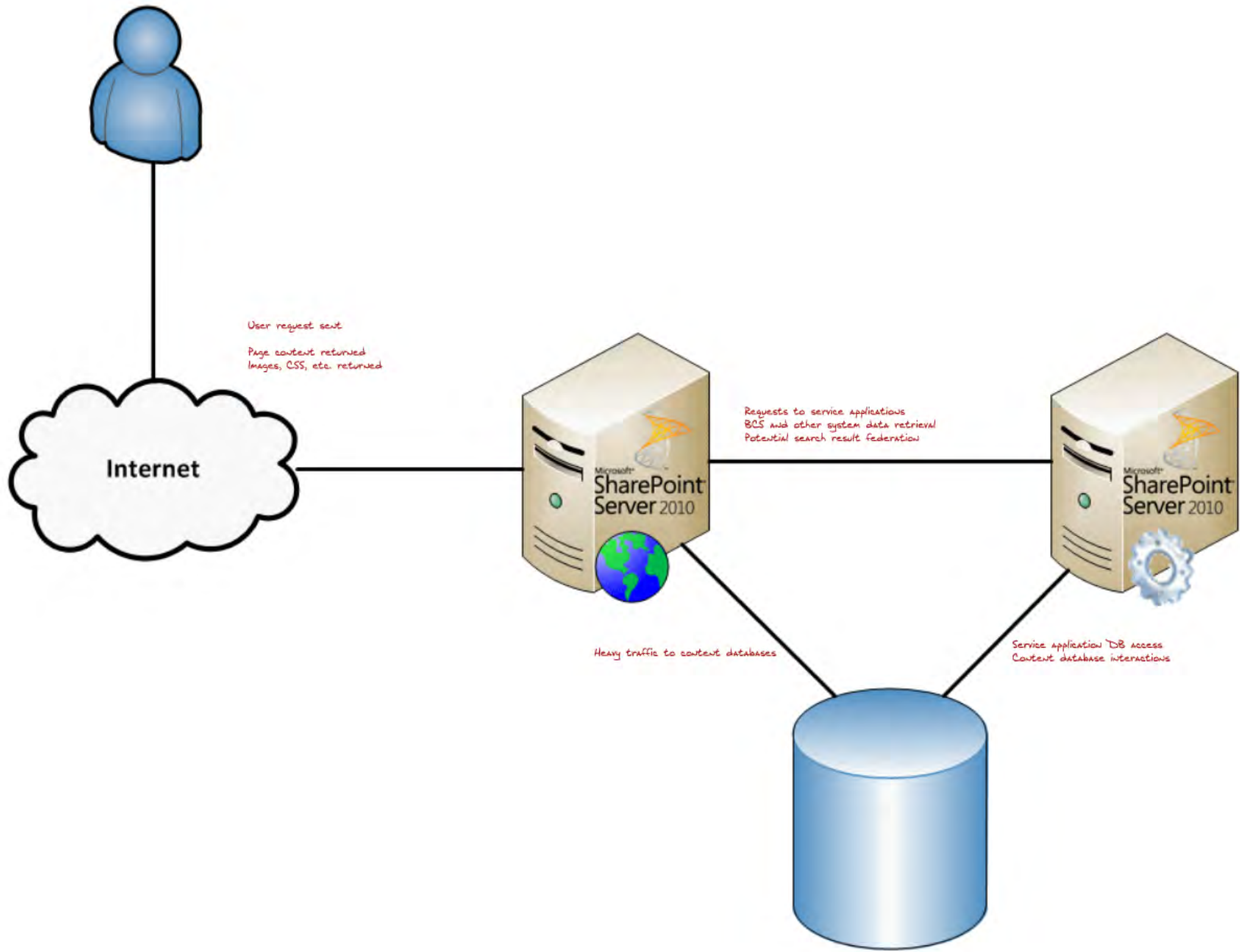


Option 2:
place data
closer to the
point of usage



Why?

or at least "why for SharePoint?"



User request sent
Page content returned
Images, CSS, etc. returned

Requests to service applications
BCS and other system data retrieval
Potential search result federation

Heavy traffic to content databases

Service application DB access
Content database interactions



User request sent

Page content returned
Images, CSS, etc. returned

Internet



Heavy traffic to content databases



Requests to service applications
BCS and other system data retrieval
Potential search result federation

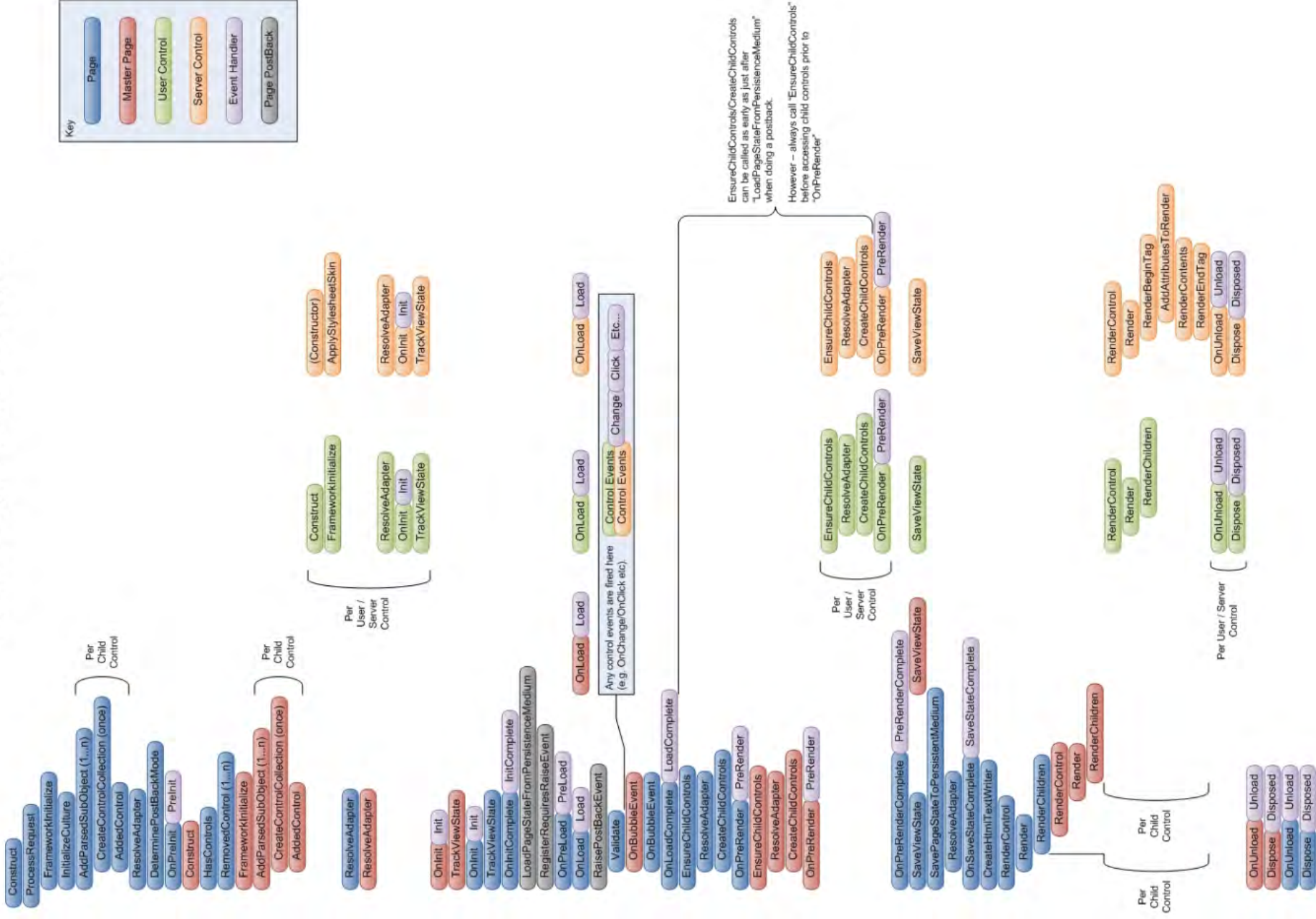
oint
010



Service application DB access
Content database interactions

ASP.NET Page and Control Life Cycle

ASP.NET Page and Control Life Cycle



thanks, Justin Stenning!

The ultimate goal of caching



Better performing,
more scalable sites
which yield a better
user experience

SharePoint caching: whatcha got?

- Object caching
- BLOB caching
- Page output caching
- Office web applications cache

CHECKLIST



Mentioned but not covered in depth: web part cache, ASP.NET cache, IVaryByCustomHandler implementations, post-cache substitution, fragment caching, and other development topics/concerns

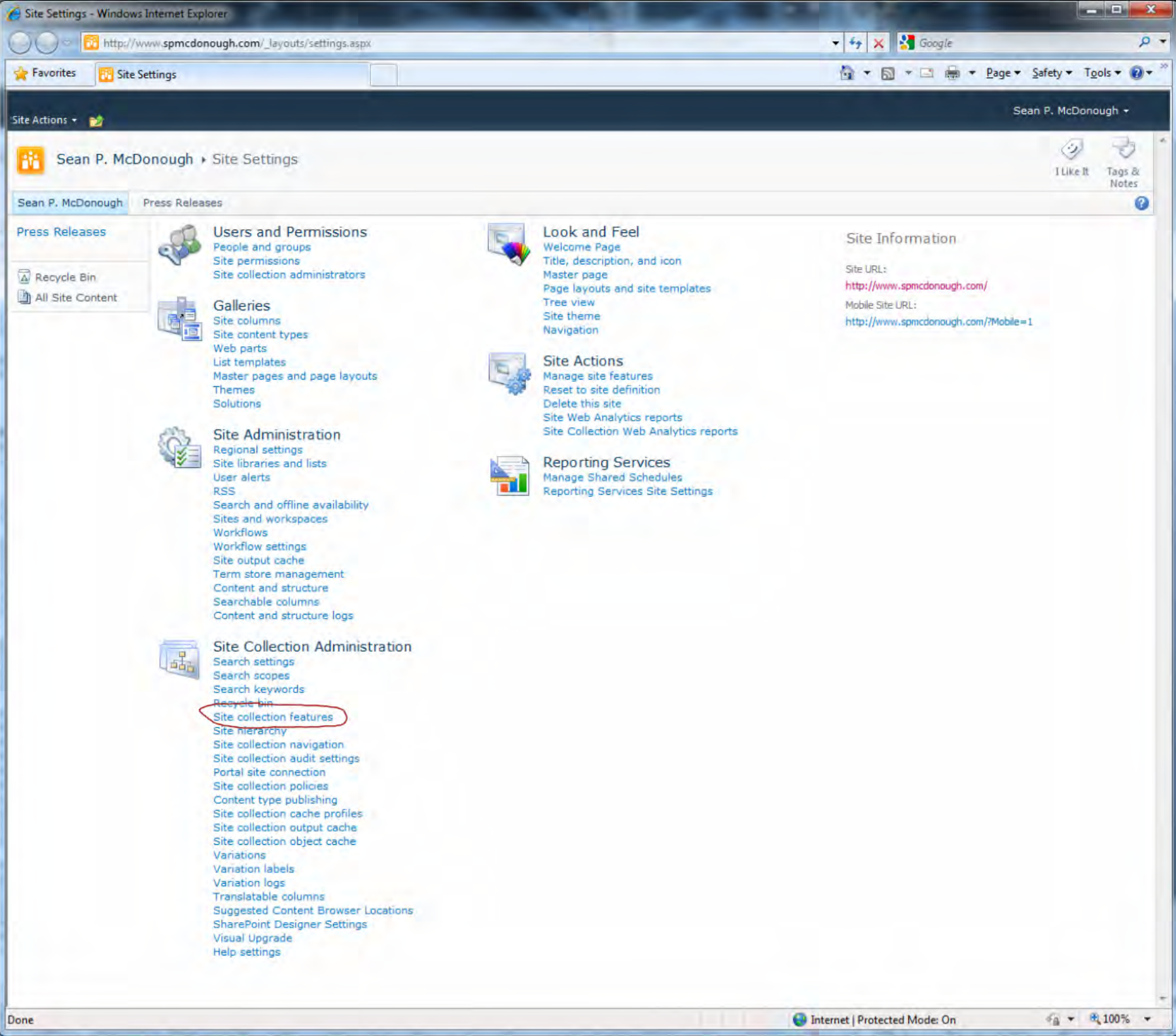
Unless otherwise noted,
we're talking about both
of the following:



Short story
time...



Where's the
#\$@! "on" button?



Press Releases

- Recycle Bin
- All Site Content

Users and Permissions
 People and groups
 Site permissions
 Site collection administrators

Galleries
 Site columns
 Site content types
 Web parts
 List templates
 Master pages and page layouts
 Themes
 Solutions

Site Administration
 Regional settings
 Site libraries and lists
 User alerts
 RSS
 Search and offline availability
 Sites and workspaces
 Workflows
 Workflow settings
 Site output cache
 Term store management
 Content and structure
 Searchable columns
 Content and structure logs

Site Collection Administration
 Search settings
 Search scopes
 Search keywords
 Recycle bin
 Site collection features
 Site hierarchy
 Site collection navigation
 Site collection audit settings
 Portal site connection
 Site collection policies
 Content type publishing
 Site collection cache profiles
 Site collection output cache
 Site collection object cache
 Variations
 Variation labels
 Variation logs
 Translatable columns
 Suggested Content Browser Locations
 SharePoint Designer Settings
 Visual Upgrade
 Help settings

Look and Feel
 Welcome Page
 Title, description, and icon
 Master page
 Page layouts and site templates
 Tree view
 Site theme
 Navigation

Site Actions
 Manage site features
 Reset to site definition
 Delete this site
 Site Web Analytics reports
 Site Collection Web Analytics reports

Reporting Services
 Manage Shared Schedules
 Reporting Services Site Settings

Site Information

Site URL:
<http://www.spmcdonough.com/>
 Mobile Site URL:
<http://www.spmcdonough.com/?Mobile=1>

Searchable columns

Content and structure logs



Site Collection Administration

Search settings

Search scopes

Search keywords

Recycle bin

Site collection features

Site hierarchy

Site collection navigation

Site collection audit settings

Portal site connection

Site collection policies

Content type publishing

Site collection cache profiles

Site Collection Features - Windows Internet Explorer

http://www.spmcdonough.com/_layouts/ManageFeatures.aspx?Scope=Site

Sean P. McD... Open Menu

Feature Name	Description	Control
Custom Site Collection Help	Creates a Help library that can be used to store custom help for this site collection.	Activate
Disposition Approval Workflow	Manages document expiration and retention by allowing participants to decide whether to retain or delete expired documents.	Deactivate Active
Document ID Service	Assigns IDs to documents in the Site Collection, which can be used to retrieve items independent of their current location.	Activate
Document Sets	Provides the content types required for creating and using document sets. Create a document set when you want to manage multiple documents as a single work product.	Activate
In Place Records Management	Enable the definition and declaration of records in place.	Activate
Library and Folder Based Retention	Allows list administrators to override content type retention schedules and set schedules on libraries and folders.	Activate
Open Documents in Client Applications by Default	Configures links to documents so they open in client applications instead of Web applications, by default.	Activate
PerformancePoint Services Site Collection Features	Features enabling the PerformancePoint Services site including content types and site definitions for this site collection.	Activate
Publishing Approval Workflow	Routes a page for approval. Approvers can approve or reject the page, reassign the approval task, or request changes to the page. This workflow can be edited in SharePoint Designer.	Deactivate Active
Report Server Integration Feature	Enables rich reporting using Microsoft SQL Server Reporting Services.	Deactivate Active
Reporting	Creates reports about information in Microsoft SharePoint Foundation.	Activate
Search Server Web Parts	This feature uploads all web parts required for Search Center.	Activate
SharePoint 2007 Workflows	Aggregated set of out-of-box workflow features provided by SharePoint 2007.	Activate
SharePoint Server Enterprise Site Collection features	Features such as InfoPath Forms Services, Visio Services, Access Services, and Excel Services Application, included in the SharePoint Server Enterprise License.	Activate
SharePoint Server Publishing Infrastructure	Provides centralized libraries, content types, master pages and page layouts and enables page scheduling and other publishing functionality for a site collection.	Deactivate Active
SharePoint Server Standard Site Collection features	Features such as user profiles and search, included in the SharePoint Server Standard License.	Activate
Three-state workflow	Use this workflow to track items in a list.	Activate
Workflows	Aggregated set of out-of-box workflow features provided by SharePoint.	Deactivate Active

Of course, this poses some problems for WSSv3 with SP1 users ...

Done Internet | Protected Mode: On 100%



SharePoint 2007 Workflows

Aggregated set of out-of-box workflow features provided



SharePoint Server Enterprise Site Collection features

Features such as InfoPath Forms Services, Visio Services, and other features are included in the SharePoint Server Enterprise License.



SharePoint Server Publishing Infrastructure

Provides centralized libraries, content types, master pages, and other functionality for a site collection.



SharePoint Server Standard Site Collection features

Features such as user profiles and search, included in the



Three-state workflow

Use this workflow to track items in a list.

Activate

Activate

Deactivate

Active

Activate

Activate

...or know features provided by ...

...ise Site Collection features

...ms Services, Visio Services, Access Services
...License.

Of course, this poses
some problems for WSSv3
and SP2 users ...

...ng Infrastructure



...content types, master pages and page layout
...n.

...d Site Collection features

...and search, included in the SharePoint Ser...



So ... how does
the plumbing work?

This is a web.config file section

```
...
<!--
  This section defines the application's output cache.
  For more information on output caching, see the ASP.NET output cache documentation.
  For more information on the outputCache element, see the ASP.NET outputCache element documentation.
  -->
<outputCache enabled="true" />
...
<!--
  This section defines the application's session state.
  For more information on session state, see the ASP.NET session state documentation.
  For more information on the sessionState element, see the ASP.NET sessionState element documentation.
  -->
<sessionState mode="InProc" timeout="20" />
...
<!--
  This section defines the application's authentication.
  For more information on authentication, see the ASP.NET authentication documentation.
  For more information on the authentication element, see the ASP.NET authentication element documentation.
  -->
<authentication type="Forms" loginUrl="~/login.aspx" />
...
<!--
  This section defines the application's authorization.
  For more information on authorization, see the ASP.NET authorization documentation.
  For more information on the authorization element, see the ASP.NET authorization element documentation.
  -->
<authorization />
...
<!--
  This section defines the application's routing.
  For more information on routing, see the ASP.NET routing documentation.
  For more information on the route element, see the ASP.NET route element documentation.
  -->
<routes>
  <route url="" value="" />

```

Always wired-in

Worth noting:

- Plumbing is active even if you aren't using it
- Some caching (specifically BLOB caching) works fine with non-publishing site collections

to whole really

Yes, just a section.

Prezi choked when I tried to use AN image of the whole web.config. It WAS really, really, REALLY big



```
<machineKey validationKey="D0580BED7E8B10F1281E63023A6B5A057D8DC770B53DA72E" decryptionKey="98A395174F2D3EC29D
</system.web>
<system.webServer>
  <security>
    <requestFiltering allowDoubleEscaping="true">
      <requestLimits maxAllowedContentLength="2147483647" />
    </requestFiltering>
  </security>
  <validation validateIntegratedModeConfiguration="false" />
  <modules runAllManagedModulesForAllRequests="true">
    <remove name="AnonymousIdentification" />
    <remove name="FileAuthorization" />
    <remove name="Profile" />
    <remove name="WebDAVModule" />
    <remove name="Session" />
    <add name="SPRequestModule" preCondition="integratedMode" type="Microsoft.SharePoint.ApplicationRuntime.SPRe
    <add name="ScriptModule" preCondition="integratedMode" type="System.Web.Handlers.ScriptModule, System.Web.Ex
    <add name="SharePoint14Module" preCondition="integratedMode" />
    <add name="StateServiceModule" type="Microsoft.Office.Server.Administration.StateModule, Microsoft.Office.Se
    <add name="RSRedirectModule" type="Microsoft.ReportingServices.SharePoint.Soap.RSRedirectModule, RSSharePoin
    <add name="PublishingHttpModule" type="Microsoft.SharePoint.Publishing.PublishingHttpModule, Microsoft.Share
  </modules>
  <handlers>
    <remove name="OPTIONSVerbHandler" />
    <remove name="WebServiceHandlerFactory-Integrated" />
    <remove name="svc-Integrated" />
    <remove name="WebDAV" />
    <add name="svc-Integrated" path="*.svc" verb="*" type="System.ServiceModel.Activation.HttpHandler, System.Se
    <add name="OwssvrHandler" scriptProcessor="C:\Program Files\Common Files\Microsoft Shared\Web Server Extensi
    <add name="ScriptHandlerFactory" verb="*" path="*.asmx" preCondition="integratedMode" type="System.Web.Scrip
    <add name="ScriptHandlerFactoryAppServices" verb="*" path="*_AppService.axd" preCondition="integratedMode" t
    <add name="ScriptResource" preCondition="integratedMode" verb="GET,HEAD" path="ScriptResource.axd" type="Sys
    <add name="JSONHandlerFactory" path="*.json" verb="*" type="System.Web.Script.Services.ScriptHandlerFactory,
    <add name="ReportViewerWebPart" verb="*" path="Reserved.ReportViewerWebPart.axd" type="Microsoft.ReportingSe
    <add name="ReportViewerWebControl" verb="*" path="Reserved.ReportViewerWebControl.axd" type="Microsoft.Repor
  </handlers>
</system.webServer>
<system.serviceModel>
  <serviceHostingEnvironment aspNetCompatibilityEnabled="true" />
```


Always wired-in



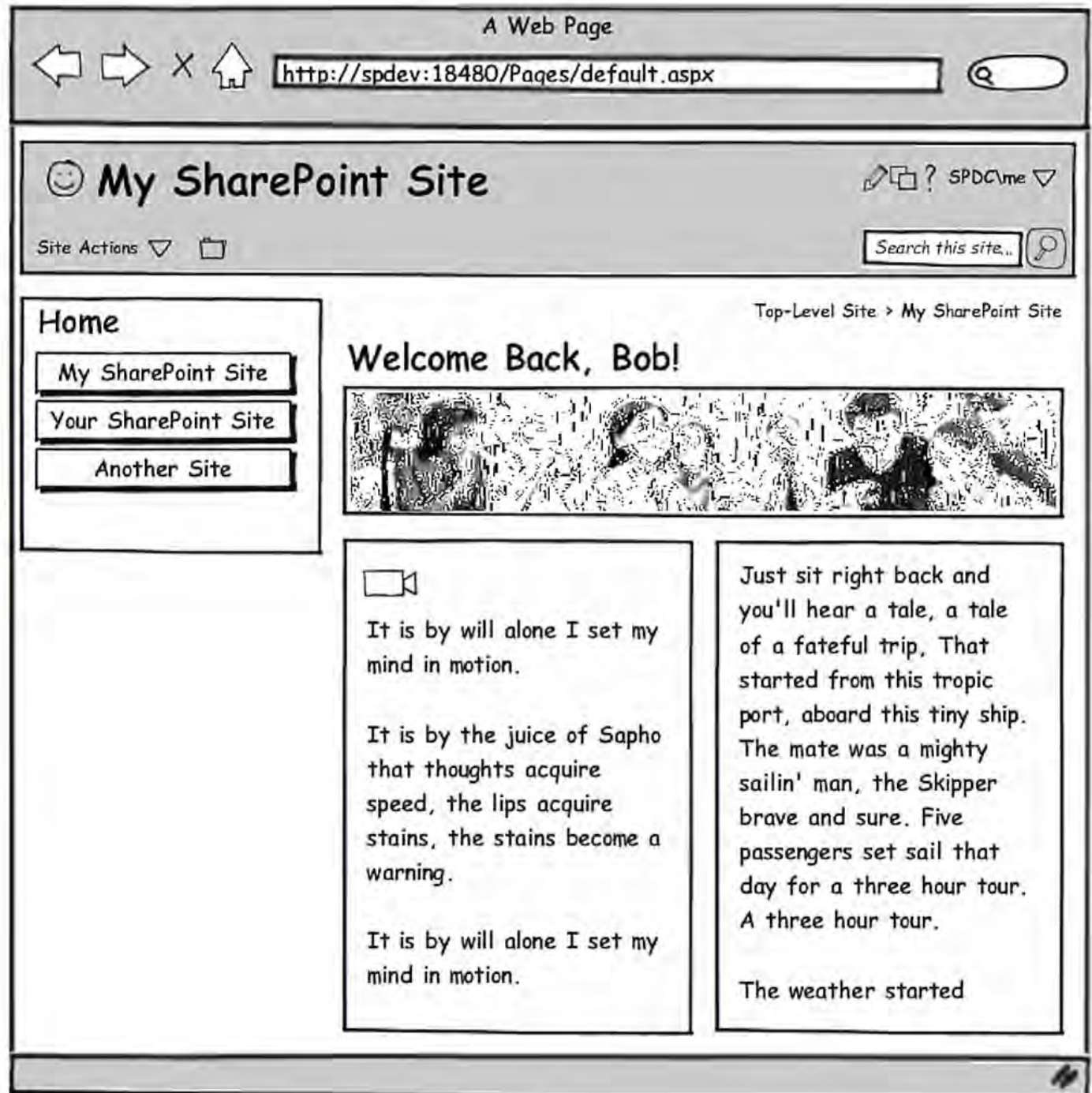
Worth noting:

- Plumbing is active even if you aren't using it
- Some caching (specifically BLOB caching) works fine with non-publishing site collections

```
<machineKey validationKey="D0580BED7E8B1
</system.web>
<system.webServer>
  <security>
    <requestFiltering allowDoubleEscaping=
      <requestLimits maxAllowedContentLeng
    </requestFiltering>
  </security>
  <validation validateIntegratedModeConfig
  <modules runAllManagedModulesForAllReque
    <remove name="AnonymousIdentification"
    <remove name="FileAuthorization" />
    <remove name="Profile" />
    <remove name="WebDAVModule" />
    <remove name="Session" />
    <add name="SPRequestModule" preConditio
    <add name="ScriptModule" preCondition=
    <add name="SharePoint14Module" preCondi
    <add name="StateServiceModule" type="M
    <add name="PSRedirectModule" type="Mic
    <add name="PublishingHttpModule" type=
  </modules>
  <handlers>
    <remove name="OPTIONSVerbHandler" />
    <remove name="WebServiceHandlerFactory
    <remove name="svc-Integrated" />
    <remove name="WebDAV" />
    <add name="svc-Integrated" path="*.svc
    <add name="OwssvrHandler" scriptProces
    <add name="ScriptHandlerFactory" verb=
    <add name="ScriptHandlerFactoryAppServ
    <add name="ScriptResource" preConditio
    <add name="JSONHandlerFactory" path="*
    <add name="ReportViewerWebPart" verb=
    <add name="ReportViewerWebControl" ver
  </handlers>
</system.webServer>
<system.serviceModel>
  <serviceHostingEnvironment aspNetCompati
```

Caching in action

Consider this sample page as we discuss SharePoint's caching mechanisms...



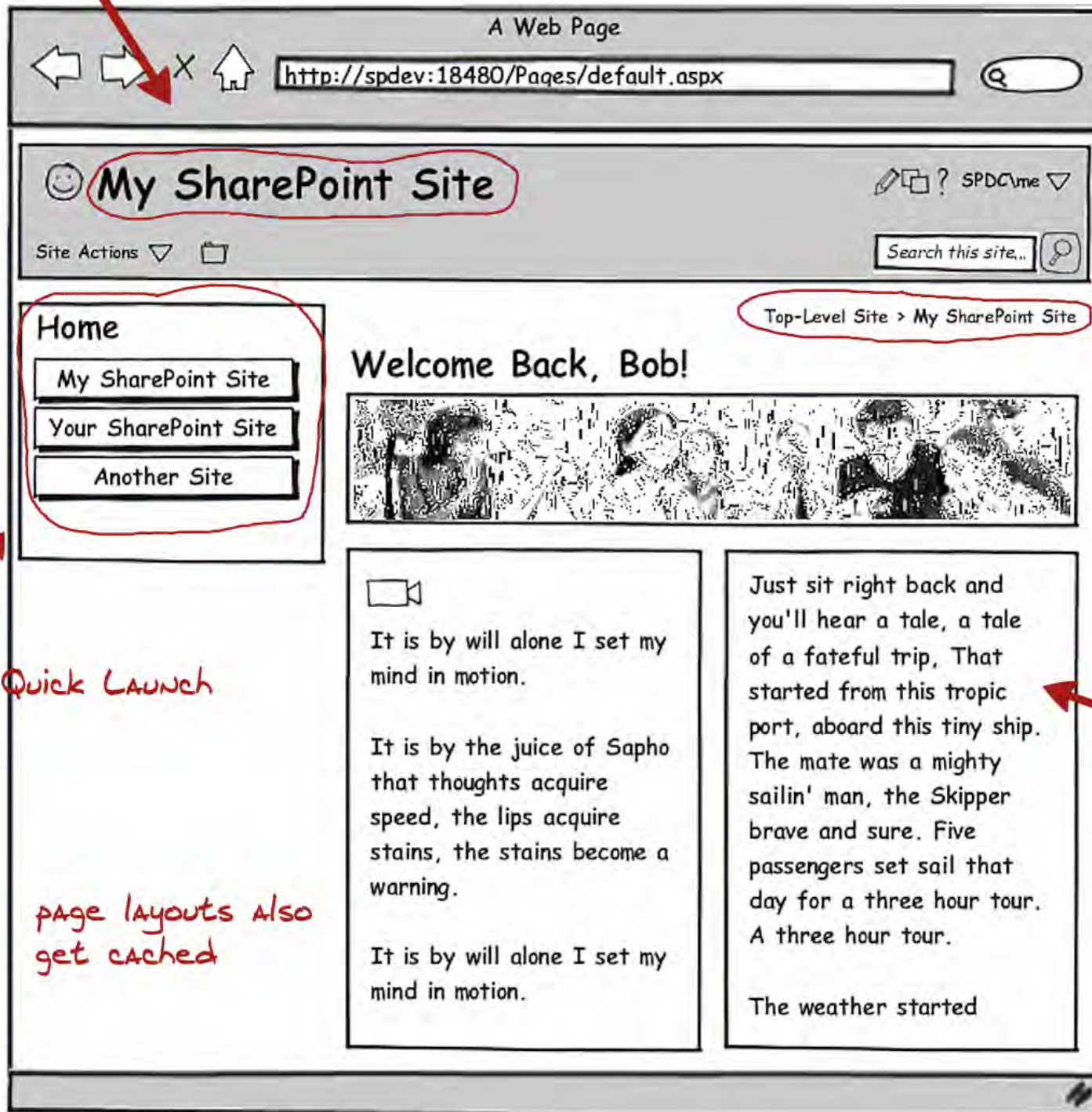
First up ...



Object caching

Object caching

Speeds access to frequently referenced structural, property, and result data



Navigational data such as this breadcrumb ...

... And the Quick Launch

page layouts also get cached

If this happens to be a Content Query Web Part (CQWP), there could be significant benefits from object caching



NAVIGATIONAL DATA
such as this
breadcrumb ...



SITE ACTIONS

Home

My SharePoint Site

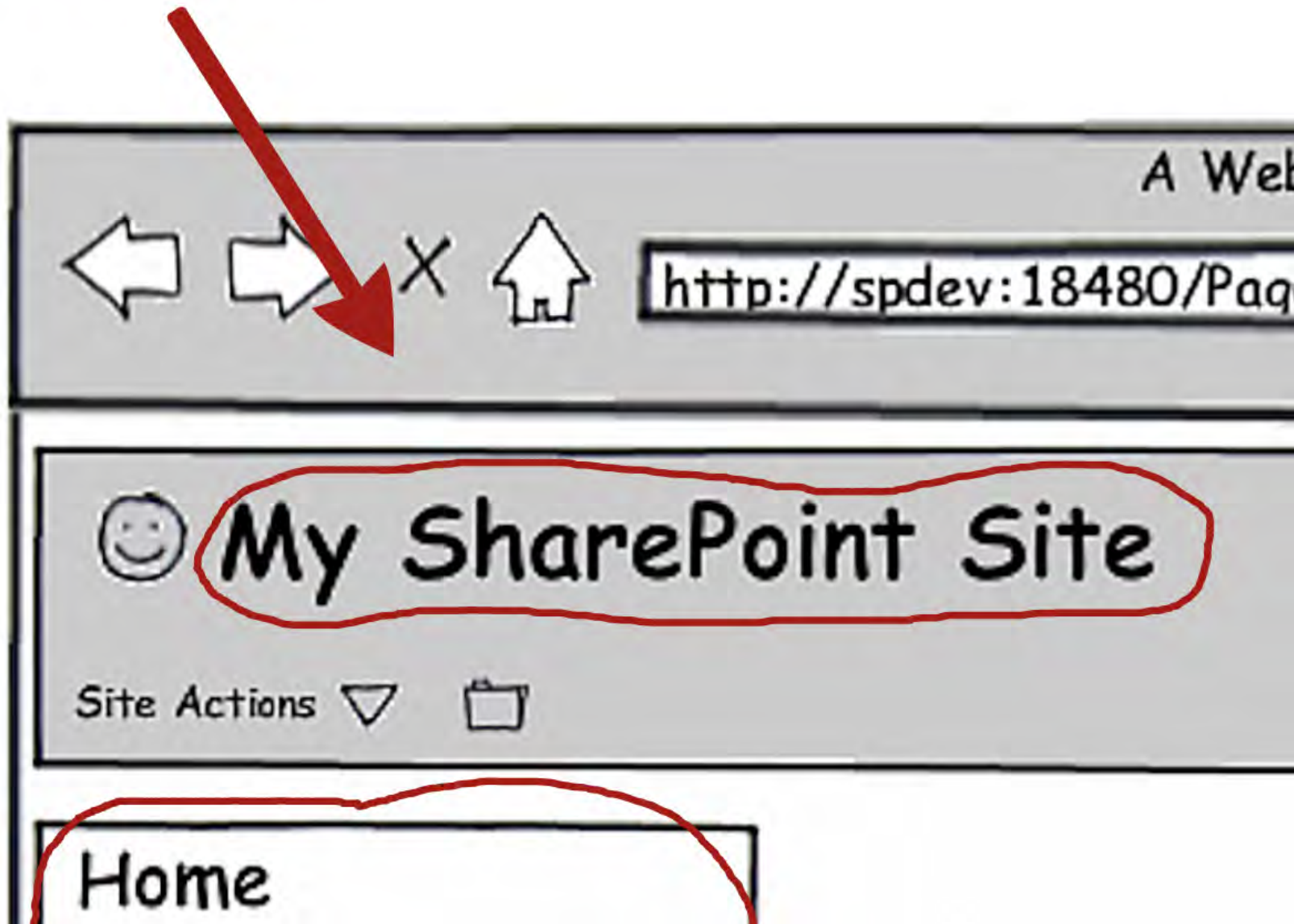
Your SharePoint Site

Another Site




... AND THE QUICK LAUNCH

Site properties
like the title



Just sit right back and
you'll hear a tale, a tale
of a fateful trip, That
started from this tropic
port, aboard this tiny ship.
The mate was a mighty
sailin' man, the Skipper
brave and sure. Five
passengers set sail that
day for a three hour tour.
A three hour tour.

The weather started



If this happened to
be a Content
Query Web Part
(CQWP), then it
could benefit
significantly from
object caching.

page layouts also
get cached

the
spe
sta
war

It
min

Object cache

Backed by memory



Turned on by default



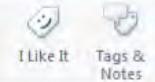
Default ~~size~~ or allocation

*100MB per
site collection*

A new trick that comes with SharePoint 2010 ...


```
<Action id="0ff1ce14-1021-0000-0000-000000000000" />
<Action id="ec0076ac-0c35-4880-8422-8062f5925000" />
<Action id="602bc8c3-9286-49a3-b973-3376ca78b000" />
<Action id="00e22a78-33ff-41ac-b0fb-ee46d1630000" />
<Action id="4b60e42e-e6fc-4188-80d2-ef39e7cc0000" />
<Action id="1d415973-1146-4bc2-8324-83dffff5b000" />
</MergedActions>
<BlobCache location="C:\BlobCache\14" path="\." />
<ObjectCache maxSize="100" />
<OutputCacheProfiles useCacheProfileOverrides="true" />
<RuntimeFilter Assembly="Microsoft.Office.Server.Search.Crawl" />
</SharePoint>
<system.web>
  <securityPolicy>
    <trustLevel name="WSS_Medium" policyFile="C:\Program Files\Microsoft Office\Server\WSS\WSS_Medium.policy" />
    <trustLevel name="WSS_Minimal" policyFile="C:\Program Files\Microsoft Office\Server\WSS\WSS_Minimal.policy" />
  </securityPolicy>
  <httpHandlers />
  <customErrors mode="On" />
  <httpRuntime maxRequestLength="51200" />
</system.web>
</SharePoint>
</SharePoint>
```

Sean P. McDonough Site Settings



Sean P. McDonough Press Releases

Press Releases

- Recycle Bin
- All Site Content

Users and Permissions
People and groups
Site permissions
Site collection administrators

Galleries
Site columns
Site content types
Web parts
List templates
Master pages and page layouts
Themes
Solutions

Site Administration
Regional settings
Site libraries and lists
User alerts
RSS
Search and offline availability
Sites and workspaces
Workflows
Workflow settings
Site output cache
Term store management
Content and structure
Searchable columns
Content and structure logs

Site Collection Administration
Search settings
Search scopes
Search keywords
Recycle bin
Site collection features
Site hierarchy
Site collection navigation
Site collection audit settings
Portal site connection
Site collection policies
Content type publishing
Site collection cache profiles
Site collection output cache
Site collection object cache
Variations
Variation labels
Variation logs
Translatable columns
Suggested Content Browser Locations
SharePoint Designer Settings
Visual Upgrade
Help settings

Look and Feel
Welcome Page
Title, description, and icon
Master page
Page layouts and site templates
Tree view
Site theme
Navigation

Site Actions
Manage site features
Reset to site definition
Delete this site
Site Web Analytics reports
Site Collection Web Analytics reports

Reporting Services
Manage Shared Schedules
Reporting Services Site Settings

Site Information

Site URL:
<http://www.spmcdonough.com/>
Mobile Site URL:
<http://www.spmcdonough.com/?Mobile=1>

[Site collection navigation](#)

[Site collection audit settings](#)

[Portal site connection](#)

[Site collection policies](#)

[Content type publishing](#)

[Site collection cache profiles](#)

[Site collection output cache](#)

[Site collection object cache](#)

[Variations](#)

[Variation labels](#)

[Variation logs](#)

[Translatable columns](#)

[Suggested Content Browser Locations](#)

[SharePoint Designer Settings](#)

[Visual Upgrade](#)

[Help settings](#)

Site Collection Administration > Object cache settings

Configure settings for the object cache.

Sean P. McDonough

Press Releases

Search this site...

Press Releases

Object Cache Size

Object Cache Size [Learn more about the object cache.](#)

Max. Cache Size (MB):

100

Recycle Bin

All Site Content

Object Cache Reset

When you select this check box, all entries in the object cache will be flushed immediately when you click **OK**. If this check box is not selected, the cache will manage the expiration of items based on when they time out or are changed in the site.

Object Cache Flush

Force all servers in the farm to flush their object caches

Cross List Query Cache Changes

Cross list queries initiated by the Content Query Web Part or other custom implementations can use up server resources. Specifying an amount of time to cache the results of a cross list query can positively impact cross-list query performance but may display results that do not reflect the most recent changes to the items returned by the query. Checking the server each time cross list query runs will produce the most accurate results at the possible cost of slower performance across the site.

Check the server for changes every time a cross list query runs
 Use the cached result of a cross list query for this many seconds:

60

Cross List Query Results Multiplier

Each cross list query might retrieve results for a variety of users. To ensure after security trimming that all users will see a valid set of results, the cross list query cache must pull more results than originally requested. Specifying a larger number will retrieve more data from the server and is ideal for site collections that have unique security applied on many lists and sites. Specifying a smaller number will consume less memory per cross list query and is ideally suited for site collections that do not have unique security on each list or site.

Cross list query multiplier:

3

OK

Cancel



Collection Administration ▶ Object

figure settings for the object cache.

Donough

Press Releases

ases

Object Cache Size

Object Cache Size [Learn more about t](#)

Bin

Search this site...

Max. Cache Size (MB):

100



And now, for a painful story ...

The take-away:

Don't dial-down the object cache allocation unless you know what you're doing and understand the implications of having too little memory allocated!

I'll give you some performance counters to watch a little later ...

S

Object Cache Size

Object Cache Size [Learn more about](#)

ent

Object Cache Reset

When you select this check box, all entries in the object cache are deleted when you click **OK**. If this check box is not selected, the cache is not reset when the entries time out or are changed.

100



Object Cache Flush



Force all servers in the farm to flush th



Check the server for changes every tim

you click **OK**. If this check box is not selected, the cache is updated when they time out or are changed in the database.

Cross List Query Cache Changes

Cross list queries initiated by the Content Query use up server resources. Specifying an amount of time to cache the results of a query can positively impact cross-list query performance. Specifying the amount of time to cache the most recent changes to the items returned by a query runs will produce the most accurate results across the site.

Force all servers in the farm to flush the

Check the server for changes every time
query runs

Use the cached result of a cross list query
seconds:

60





Cross List Query Results Multiplier

Each cross list query might retrieve results that all users will see a valid set of results, originally requested. Specifying a larger number for site collections that have unique security number will consume less memory per cross do not have unique security on each list or

Cross list query multiplier:

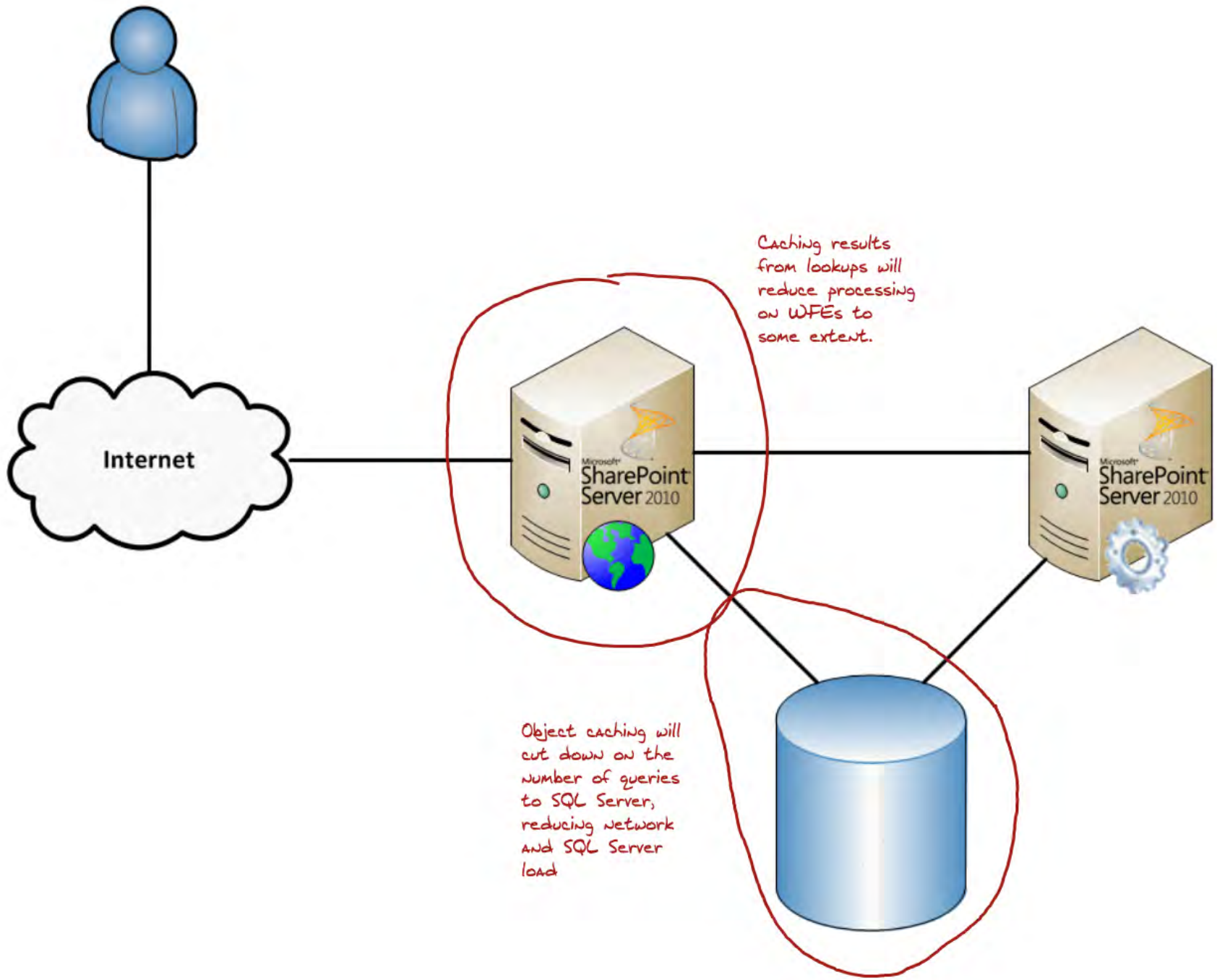
3

Guidance

	Anonymous	Authenticated
Cache Duration		
Cross List Multiplier		 <i>Especially if per-site and per-item security is prevalent</i>



Especially if per-site
and per-item security
is prevalent



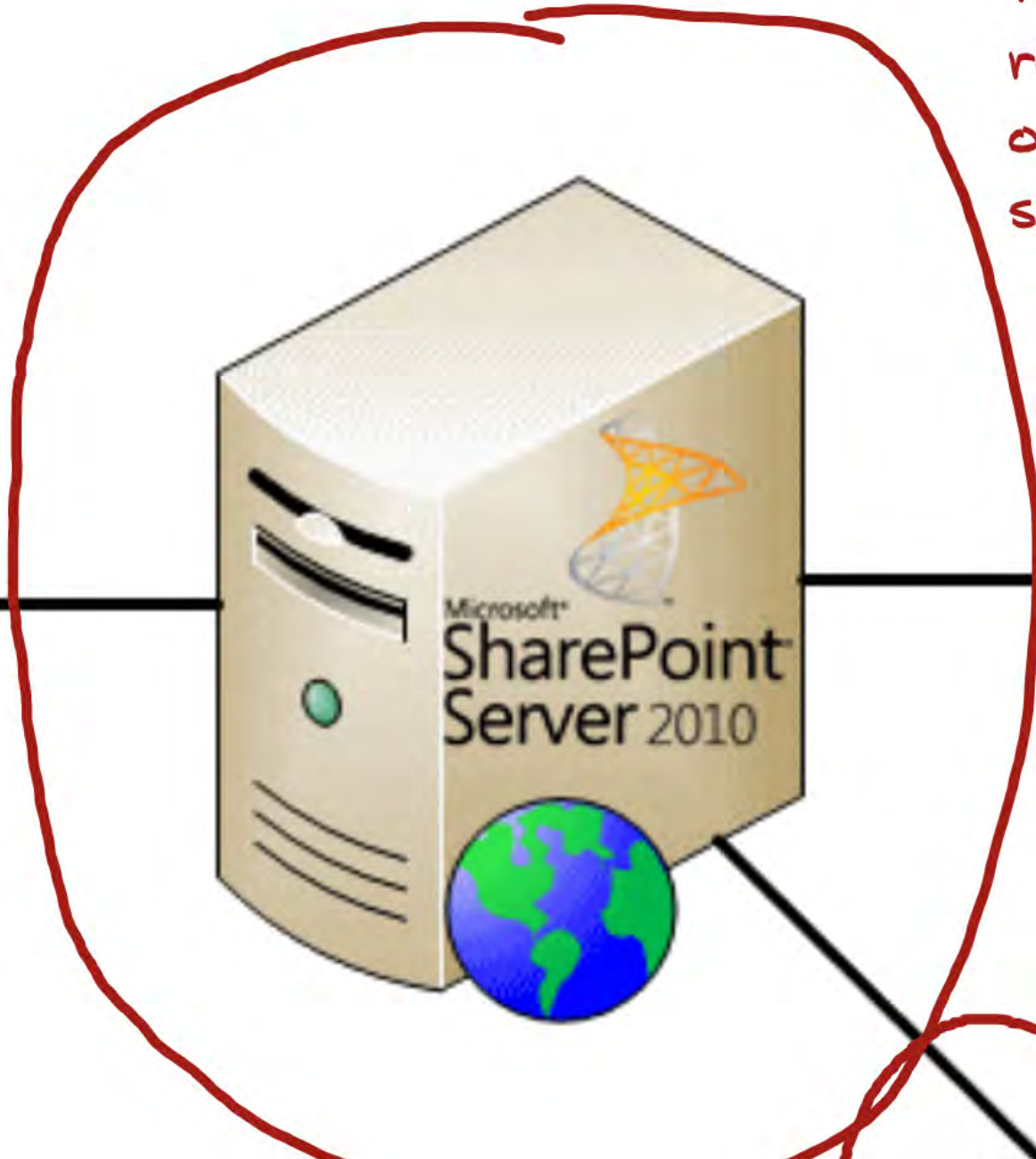
Caching results from lookups will reduce processing on WFEs to some extent.

Object caching will cut down on the number of queries to SQL Server, reducing network and SQL Server load

Object caching will cut down on the number of queries to SQL Server, reducing network and SQL Server load



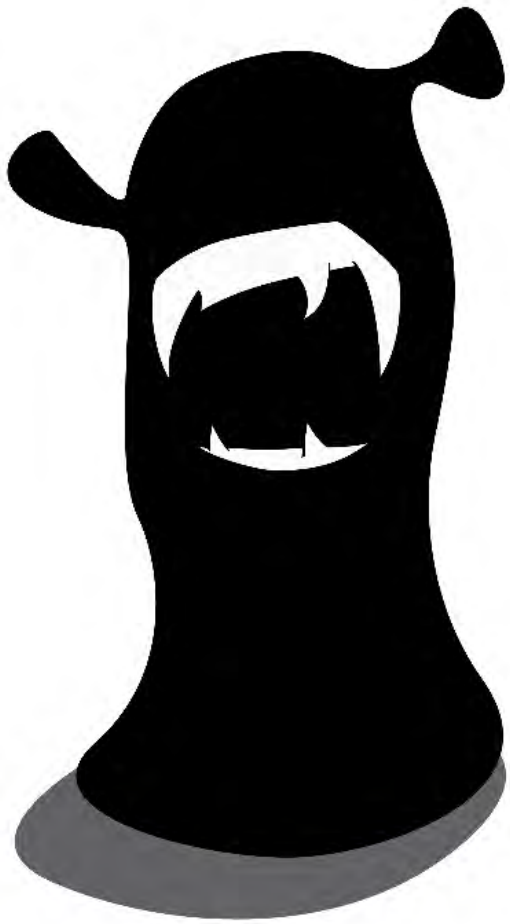
Caching results from lookups will reduce processing on WFEs to some extent.



Next up ...



BLOB caching



No, not that
kind of BLOB

BLOB = binary large object
(document and attachment
uploads to SharePoint)

teaching



FIGHT NIGHT



BLOB

VS



Blob



BLOB

VS



Blob

Chews up database space

Consumes entire cities

Hated by database admins

Bane of humanity

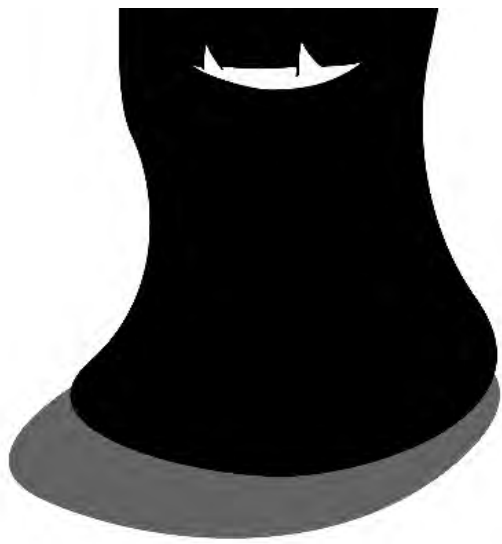
Kills attempts to organize
database pages and extents

Kills anyone stupid enough to
get in its slow-moving way

Conquered with RBS

Wiped out through military
action ... sometimes ...

WINNER!



BLOB = binary large object
(document and attachment
uploads to SharePoint)

aching

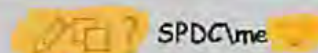


also known as "disk-based caching"

Everything that's
highlighted in yellow
would be cached
through BLOB
caching



My SharePoint Site



Site Actions

Search this site,...

Home

My SharePoint Site

Your SharePoint Site

Another Site

Top-Level Site > My SharePoint Site

Welcome Back, Bob!



It is by will alone I set my mind in motion.

It is by the juice of Sapho that thoughts acquire speed, the lips acquire stains, the stains become a warning.

It is by will alone I set my mind in motion.

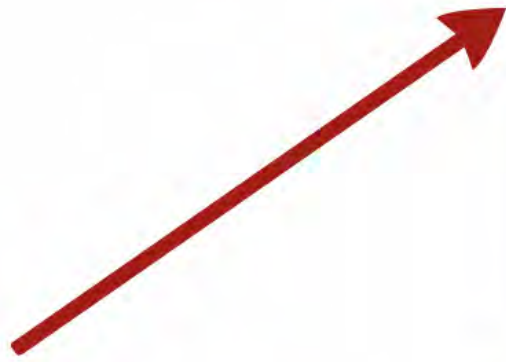
Just sit right back and you'll hear a tale, a tale of a fateful trip, That started from this tropic port, aboard this tiny ship. The mate was a mighty sailin' man, the Skipper brave and sure. Five passengers set sail that day for a three hour tour. A three hour tour.

The weather started

Caching can be extended to cover any static file type, including Flash, PDF, and other common web file types.

Everything that's highlighted in yellow would be cached through BLOB caching.

Caching can be extended to cover any static file type, including Flash, PDF, and other common web file types.



It is by w
mind in mo

It is by t
that thou

BLOB cache

Backed by disk



Turned off by default



Default ~~size~~ or allocation

10GB per
IIS site (zone)

Controlled through web.config settings


```
<Action id="0ff1ce14-1019-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro
<Action id="0ff1ce14-101a-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro
<Action id="0ff1ce14-101b-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro
<Action id="0ff1ce14-101c-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro
<Action id="0ff1ce14-101d-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro
<Action id="0ff1ce14-101e-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro
<Action id="0ff1ce14-1020-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro
<Action id="0ff1ce14-1021-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro
<Action id="ec0076ac-0c35-4880-8422-8062f5925bec" sourceFile="C:\Program Files\Common Files\Micro
<Action id="602bc8c3-9286-49a3-b973-3376ca78b297" sourceFile="C:\Program Files\Common Files\Micro
<Action id="00e22a78-33ff-41ac-b0fb-ee46d1636e22" sourceFile="C:\Program Files\Common Files\Micro
<Action id="4b60e42e-e6fc-4188-80d2-ef39e7cc0065" sourceFile="C:\Program Files\Common Files\Micro
<Action id="1d415973-1146-4bc2-8324-83dfff5bfe33" sourceFile="C:\Program Files\Common Files\Micro
</mergedActions>
<BlobCache location="C:\BlobCache\14" path="\. (gif|jpg|jpeg|jpe|jfif|bmp|dib|tif|tiff|ico|png|wdp|h
<ObjectCache maxSize="100" />
<OutputCacheProfiles useCacheProfileOverrides="false" varyByHeader="" varyByParam="*" varyByCustom=
<RuntimeFilter Assembly="Microsoft.Office.Server, Version=14.0.0.0, Culture=neutral, PublicKeyToken
</SharePoint>
<system.web>
  <securityPolicy>
    <trustLevel name="WSS_Medium" policyFile="C:\Program Files\Common Files\Microsoft Shared\Web Serv
    <trustLevel name="WSS_Minimal" policyFile="C:\Program Files\Common Files\Microsoft Shared\Web Ser
  </securityPolicy>
  <httpHandlers />
  <customErrors mode="On" />
  <httpRuntime maxRequestLength="51200" />
  <authentication mode="Windows" />
  <identity impersonate="true" />
  <authorization>
    <allow users="*" />
  </authorization>
  <httpModules />
  <globalization fileEncoding="utf-8" />
```

Default BlobCache Elements

MOSS 2007

```
<BlobCache location="C:\blobCache" path="\. (gif|jpg|png|css|js)$" maxSize="10" enabled="false" />
```

SharePoint Server 2010

```
<BlobCache location="C:\BlobCache\14" path="
  \. (gif|jpg|jpeg|jpe|jfif|bmp|dib|tif|tiff|ico|png|wdp|hdp|css|js|asf|avi|flv|m4v|mov|mp3|mp4|mpeg
  |mpg|rm|rmvb|wma|wmv)$" maxSize="10" enabled="false" />
```

Available Attributes

Common

enabled	true if the BLOB cache is turned-on, false if not*
location	path to location in file system where cached items will be stored*
path	regular expression against which files must match in order to be cached
size	maximum disk space (in GB) that BLOB cache can consume*
max-age	client-side cache duration (in seconds) for downloaded BLOB cache items

Side note: to be BLOB
cached, a file must be a
document in a Document
Library or a list item
attachment. "Loose files"
won't be cached.

Recommendation:
point at someplace
other than C:

Recommendation: make
sure you add up your
allocations (each site)
and have enough disk
space!

Available Attributes

Common

enabled	true if the BLOB cache is turned-on, false if not *
location	path to location in file system where cached items will be stored *
path	regular expression against which files must match in order to be cached
size	maximum disk space (in GB) that BLOB cache can consume *
max-age	client-side cache duration (in seconds) for downloaded BLOB cache items

DO NOT simply delete files
out of the BLOB cache!

Now, for a
word about
the MAX-AGE
attribute ...



max-age in action: initial request (non-zero max-age value)

Web Sessions						
#	Result	Protocol	URL	Body	Caching	
64	200	HTTP	/SiteCollectionImages/common/content...	79	public, max-age=2232	image/gif
65	200	HTTP	/SiteCollectionImages/common/btnNoTh...	2,112	public, max-age=2478	image/gif
66	200	HTTP	/SiteCollectionImages/common/signinOv...	165	public, max-age=4707	image/png
67	200	HTTP	/SiteCollectionImages/common/benefits...	16,907	public, max-age=5791	image/png
68	200	HTTP	/_controltemplates/MultiBanner/ModalP...	15,618	max-age=867	image/png
69	302	HTTP	/s/www.kroger.com?U=/SiteCollectionI...	0	max-age=0, no-cache, no-store Expires: Sun, 03 Apr 201...	
70	200	HTTP	/SiteCollectionImages/common/160x41...	5,099	public, max-age=2141	image/jpeg
71	200	HTTP	/PublishingImages/section_headers/hea...	4,538	public, max-age=1452	image/jpeg
72	200	HTTP	/PublishingImages/2011/Period_3/Week...	73,370	public, max-age=1320	image/jpeg
73	200	HTTP	/PublishingImages/2011/Period_3/Week...	77,412	public, max-age=944	image/jpeg
74	200	HTTP	/PublishingImages/2011/Period_3/Week...	52,993	public, max-age=1307	image/jpeg
75	200	HTTP	/_layouts/1033/core.js?rev=miHksOQ0i...	265,384	max-age=2908	application/x-javascript
76	200	HTTP	/style%20library/omniture/s_code_krog...	20,172	public, max-age=2590	application/x-javascript
77	200	HTTP	/SiteCollectionImages/common/closeBtn...	879	public, max-age=4795	image/gif
78	200	HTTP	/SiteCollectionImages/icons/con_import...	1,287	public, max-age=2785	image/gif
79	200	HTTP	/iframe.php?targeting_bucket=Banner...	6,147	max-age=300, max-age=600 Expires: Sun, 03 Apr 2011 2...	text/html; charset=utf-8
80	200	HTTP	/adj/jmw.kroger.www/?page=home_ma...	571	private Expires: Sun, 03 Apr 2011 20:13:57 GMT	application/x-javascript
81	200	HTTP	/SiteCollectionImages/common/boxBg...	82	public, max-age=767	image/gif
82	200	HTTP	/SiteCollectionImages/common/boxTop...	923	public, max-age=388	image/gif
83	200	HTTP	/includes/css/iframe.css	1,603	max-age=2592000 Expires: Tue, 03 May 2011 20:11:19 GMT	text/css
84	200	HTTP	/images/generic_header.png	10,978	max-age=2592000 Expires: Tue, 03 May 2011 20:11:16 GMT	image/png
85	200	HTTP	/srv/jupload_files/fea90f098a8b8d3401...	5,744	max-age=2592000 Expires: Tue, 03 May 2011 20:09:42 GMT	image/gif
86	200	HTTP	/images/coupon-pointer.png	1,952	max-age=2592000 Expires: Tue, 03 May 2011 20:09:02 GMT	image/png
87	200	HTTP	/srv/jupload_files/acdf9eb5cc1b4b75e4...	5,985	max-age=2592000 Expires: Tue, 03 May 2011 20:11:19 GMT	image/gif
88	200	HTTP	/srv/jupload_files/46263a8ea7a6c1251a...	4,942	max-age=2592000 Expires: Tue, 03 May 2011 20:11:19 GMT	image/gif
89	200	HTTP	/srv/jupload_files/5467f518013f109e51...	5,241	max-age=2592000 Expires: Tue, 03 May 2011 20:11:19 GMT	image/gif
90	200	HTTP	/siteCollectionImages/swf/heroHomepa...	105,036	public, max-age=5897	application/x-shockwave-flash
91	200	HTTP	/PublishingImages/2011/Period_3/Week...	164,821	public, max-age=1546	image/jpeg
92	200	HTTP	/PublishingImages/2011/Period_3/Week...	153,151	public, max-age=1863	image/jpeg
93	200	HTTP	/PublishingImages/2011/Period_3/Week...	118,575	public, max-age=1894	image/jpeg
94	200	HTTP	/SiteCollectionImages/common/signinOv...	594	public, max-age=5181	image/png
95	200	HTTP	/SiteCollectionImages/common/bgSignI...	434	public, max-age=5094	image/gif
96	200	HTTP	/SiteCollectionImages/common/signinOv...	470	public, max-age=1584	image/png
97	200	HTTP	/SiteCollectionImages/common/benefits...	250	public, max-age=2539	image/png
98	200	HTTP	/SiteCollectionImages/common/benefits...	10,762	public, max-age=5053	image/png
99	200	HTTP	/SiteCollectionImages/common/benefits...	939	public, max-age=6742	image/gif
100	200	HTTP	/SiteCollectionImages/common/benefits...	1,428	public, max-age=5869	image/gif
101	200	HTTP	/SiteCollectionImages/common/benefits...	1,508	public, max-age=1087	image/gif
102	200	HTTP	/SiteCollectionImages/common/benefits...	1,472	public, max-age=5494	image/gif
103	200	HTTP	/SiteCollectionImages/common/benefits...	1,496	public, max-age=4800	image/gif
104	200	HTTP	/_controltemplates/MultiBanner/ModalP...	1,386	max-age=1776	image/gif
105	200	HTTP	/SiteCollectionImages/common/benefits...	1,511	public, max-age=6492	image/gif
106	200	HTTP	/2934496/2of3_tr1_Mars_GC.jpg	137,333	public, max-age=86400 Expires: Mon, 04 Apr 2011 04:05:...	image/jpeg
107	200	HTTP	/PublishingImages/section_headers/hea...	3,922	public, max-age=1000	image/jpeg
108	200	HTTP	/SiteCollectionImages/common/footer_...	1,401	public, max-age=4232	image/gif
109	200	HTTP	/SiteCollectionImages/common/footerL...	54	public, max-age=1035	image/gif
110	200	HTTP	/SiteCollectionImages/common/boxBot...	838	public, max-age=1818	image/gif
111	200	HTTP	/SiteCollectionImages/common/content...	5,785	public, max-age=1121	image/jpeg
113	302	HTTP	/b/ss/krgkrogerprod/1/H.14/s2205936...	0	no-cache, no-store, must-revalidate, max-age=0, proxy-re...	text/plain
114	200	HTTP	/SiteCollectionImages/common/bgSelect...	654	public, max-age=6811	image/gif
115	200	HTTP	/b/ss/krgkrogerprod/1/H.14/s2205936...	43	no-cache, no-store, must-revalidate, max-age=0, proxy-re...	image/gif

115 HTTP requests issued and answered to fully load page

max-age in action: subsequent request

Web Sessions						
#	Result	Protocol	URL	Body	Caching	Content-Type
1	302	HTTP	/	163		text/html
2	200	HTTP	/Pages/default.aspx	81,746	private Expires: Sun, 03 Apr 2011 20:23:34 GMT	text/html; charset=utf-8
3	200	HTTP	/adj/mwl.kroger.www;/page=home_ma...	571	private, x-gzip-ok="" Expires: Sun, 03 Apr 2011 20:16:05 ...	application/x-javascript
4	200	HTTP	/b/ss/krgkrogerprod/1/H.14/s2656257...	43	no-cache, no-store, must-revalidate, max-age=0, proxy-re...	image/gif

Only 4 requests needed to load the page

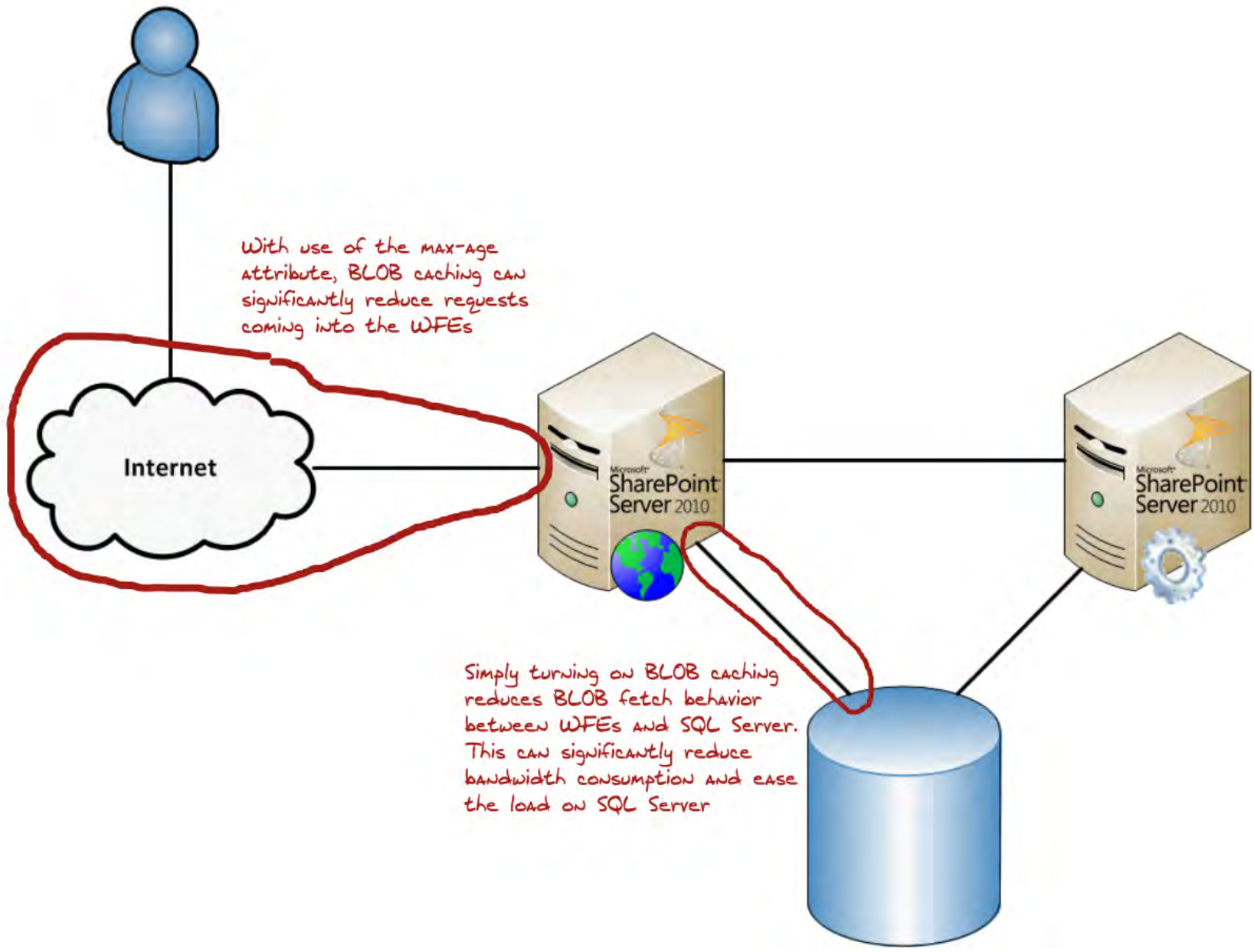


Of course, this behavior CAN work both for you AND AGAINST you ...



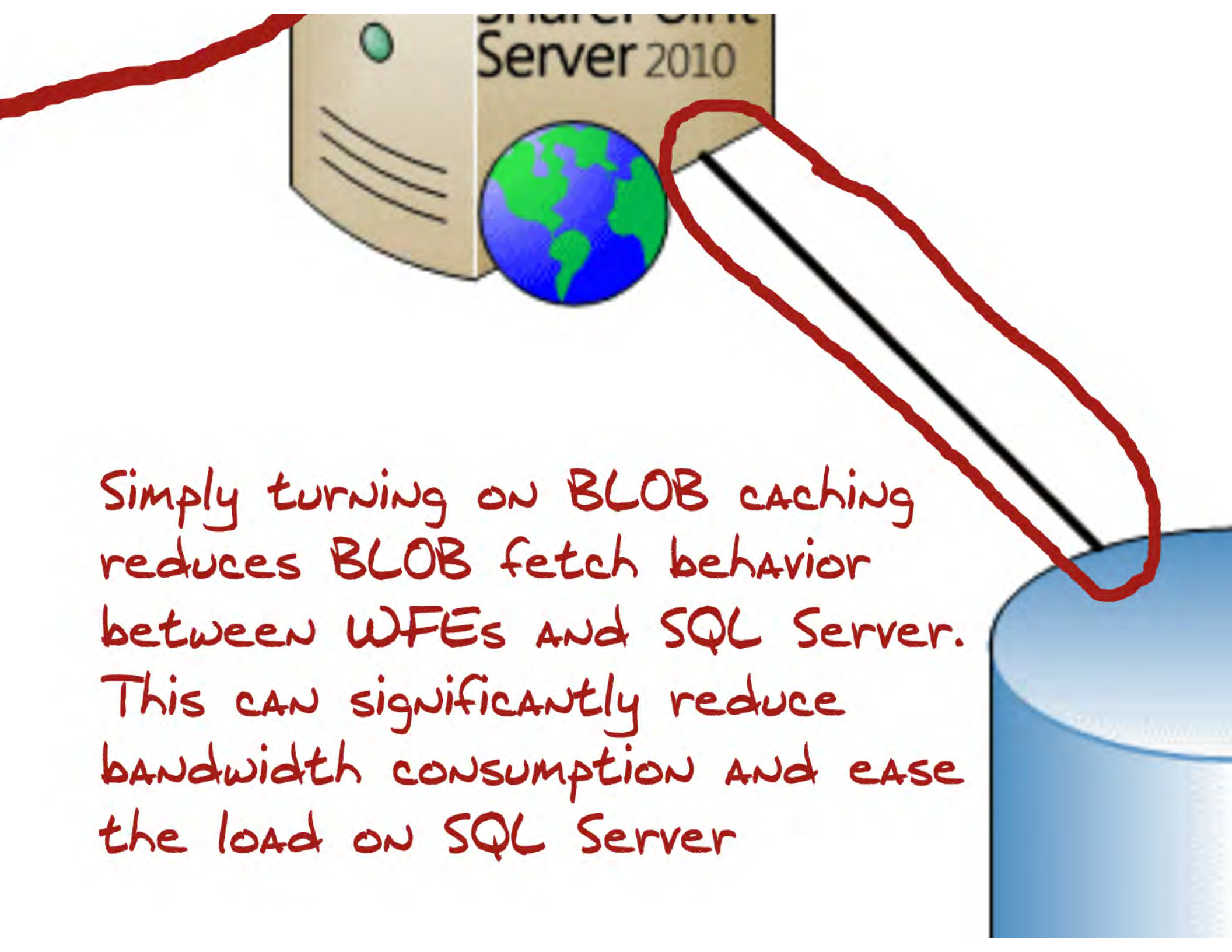
Of course, this behavior
CAN work both for you
AND AGAINST you ...

If you don't want persistent client-side caching when the BLOB cache is enabled, be sure to explicitly set a max-age value of zero (0). If you don't specify a max-age attribute value, the default is 86,400 seconds (24 hours).



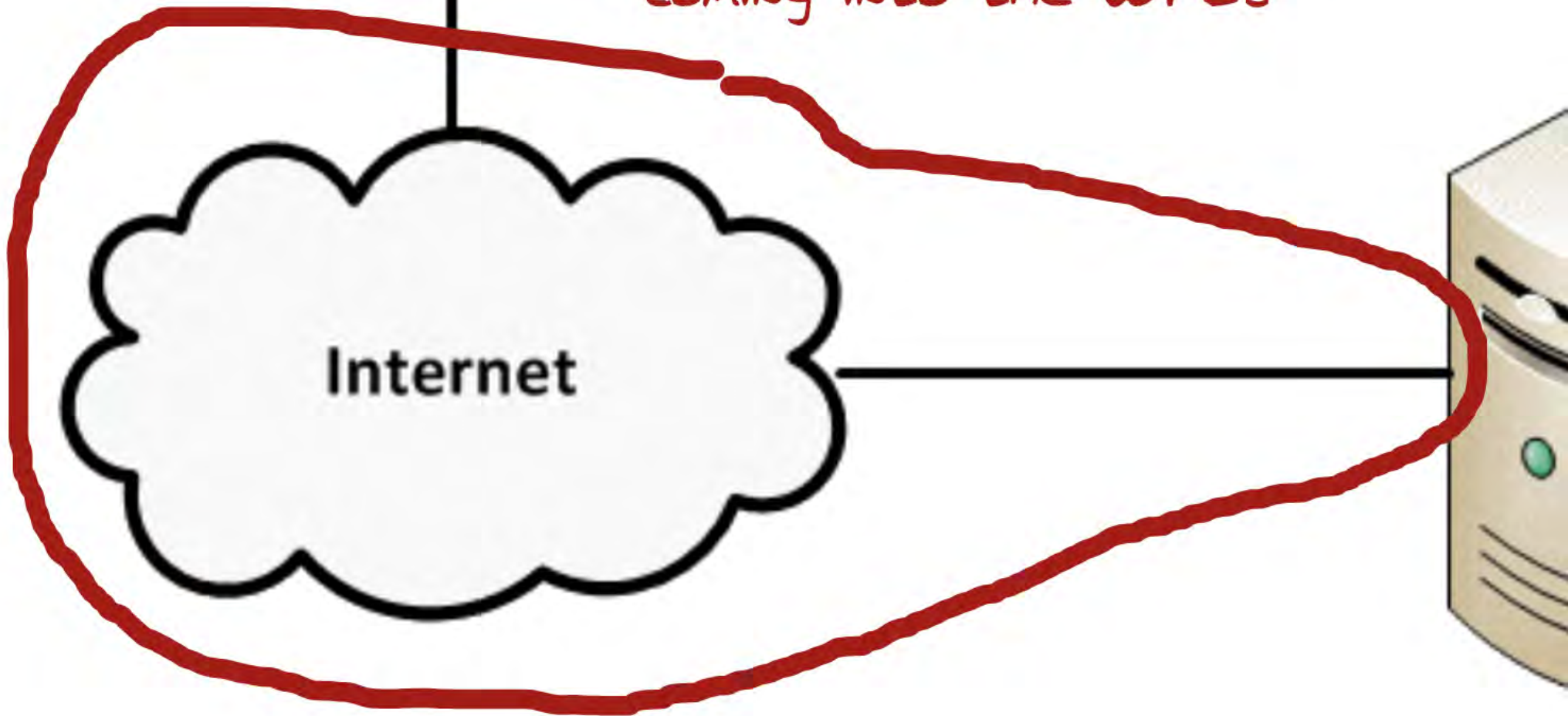
With use of the max-age attribute, BLOB caching can significantly reduce requests coming into the WFEs

Simply turning on BLOB caching reduces BLOB fetch behavior between WFEs and SQL Server. This can significantly reduce bandwidth consumption and ease the load on SQL Server



Simply turning on BLOB caching reduces BLOB fetch behavior between WFES AND SQL Server. This can significantly reduce bandwidth consumption AND ease the load on SQL Server

With use of the max-age attribute, BLOB caching can significantly reduce requests coming into the WFEs



Next up...



Page output caching

piggybacks on ASP.NET output caching

It's easier to simply put red X's through the content and items that aren't covered by page output caching.



http://spdev:18480/Pages/default.aspx



~~My SharePoint Site~~

~~SPDC\me~~

Site Actions

Search this site..

Home

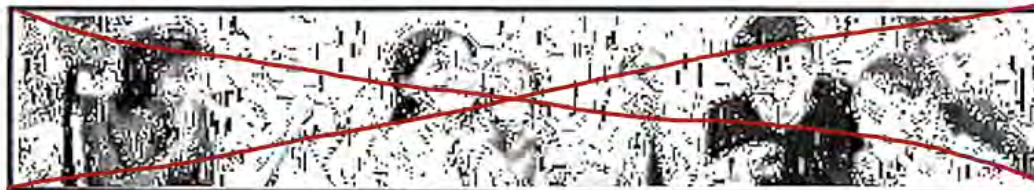
My SharePoint Site

Your SharePoint Site

Another Site

Top-Level Site > My SharePoint Site

Welcome Back, Bob!



It is by will alone I set my mind in motion.

It is by the juice of Sapho that thoughts acquire speed, the lips acquire stains, the stains become a warning.

It is by will alone I set my mind in motion.

Just sit right back and you'll hear a tale, a tale of a fateful trip, That started from this tropic port, aboard this tiny ship. The mate was a mighty sailin' man, the Skipper brave and sure. Five passengers set sail that day for a three hour tour. A three hour tour.

The weather started

It's easier to simply put red X's through the content and items that aren't covered by page output caching.

Page output caching

Backed by memory



Turned off by default
(thankfully)



Default size or allocation

*None**

A new trick that comes with SharePoint 2010 ...


```
<Action id="0ff1ce14-101c-0000-0000-000000000000" sourceFile="C:\Program Fi
<Action id="0ff1ce14-101d-0000-0000-000000000000" sourceFile="C:\Program Fi
<Action id="0ff1ce14-101e-0000-0000-000000000000" sourceFile="C:\Program Fi
<Action id="0ff1ce14-1020-0000-0000-000000000000" sourceFile="C:\Program Fi
<Action id="0ff1ce14-1021-0000-0000-000000000000" sourceFile="C:\Program Fi
<Action id="ec0076ac-0c35-4880-8422-8062f5925bec" sourceFile="C:\Program Fi
<Action id="602bc8c3-9286-49a3-b973-3376ca78b297" sourceFile="C:\Program Fi
<Action id="00e22a78-33ff-41ac-b0fb-ee46d1636e22" sourceFile="C:\Program Fi
<Action id="4b60e42e-e6fc-4188-80d2-ef39e7cc0065" sourceFile="C:\Program Fi
<Action id="1d415973-1146-4bc2-8324-83dfff5bfe33" sourceFile="C:\Program Fi
</MergedActions>
<BlobCache location="C:\BlobCache\14" path="\. (gif|jpg|jpeg|jpe|jfif|bmp|dib|
<ObjectCache maxSize="100" />
<OutputCacheProfiles useCacheProfileOverrides="false" varyByHeader="" varyByP
<RuntimeFilter Assembly="Microsoft.Office.Server, Version=14.0.0.0, Culture=n
</SharePoint>
<system.web>
  <securityPolicy>
    <trustLevel name="WSS_Medium" policyFile="C:\Program Files\Common Files\Mic
    <trustLevel name="WSS_Minimal" policyFile="C:\Program Files\Common Files\Mi
  </securityPolicy>
  <httpHandlers />
  <customErrors mode="On" />
  <httpRuntime maxRequestLength="51200" />
  <authentication mode="Windows" />
  <identity impersonate="true" />
  <authorization>
```

So ...

How's this page
output caching
thing work,
ANYWAY?



The Page Output Cache is like a big lookup table

Each page request is broken down into a set of characteristics

- Characteristics are selected based on page output cache profiles
- These characteristics (browser type, page requested, etc.) are used to build a key

Notice I said request.
The actual content in the
page that is rendered by
SharePoint has no bearing
on how items are cached
or served from cache.



The Page is like a Page

Each page request is

- Characteristics are set
- These characteristics

The can

- If

The Page Output Cache is like a big lookup table

Each page request is broken down into a set of characteristics

- Characteristics are selected based on page output cache profiles
- These characteristics (browser type, page requested, etc.) are used to build a key

The cache is searched for a page with the key that was built

- If a page with the same key is found, the page HTML is returned from the cache.
- If no match is made, the page is rendered and served back. It is then cached for subsequent requests until it is expired out of the cache or ejected for other reasons.

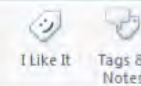
The trick is to balance profile granularity against memory consumption

Configuring Page Output Caching



A quick tour

Sean P. McDonough Site Settings



Sean P. McDonough Press Releases

Press Releases

- Recycle Bin
- All Site Content

Users and Permissions
People and groups
Site permissions
Site collection administrators

Galleries
Site columns
Site content types
Web parts
List templates
Master pages and page layouts
Themes
Solutions

Site Administration
Regional settings
Site libraries and lists
User alerts
RSS
Search and offline availability
Sites and workspaces
Workflows
Workflow settings
Site output cache
Term store management
Content and structure
Searchable columns
Content and structure logs

Site Collection Administration
Search settings
Search scopes
Search keywords
Recycle bin
Site collection features
Site hierarchy
Site collection navigation
Site collection audit settings
Portal site connection
Site collection policies
Content type publishing
Site collection cache profiles
Site collection output cache
Site collection object cache
Variations
Variation labels
Variation logs
Translatable columns
Suggested Content Browser Locations
SharePoint Designer Settings
Visual Upgrade
Help settings

Look and Feel
Welcome Page
Title, description, and icon
Master page
Page layouts and site templates
Tree view
Site theme
Navigation

Site Actions
Manage site features
Reset to site definition
Delete this site
Site Web Analytics reports
Site Collection Web Analytics reports

Reporting Services
Manage Shared Schedules
Reporting Services Site Settings

Site Information

Site URL:
<http://www.spmcdonough.com/>
Mobile Site URL:
<http://www.spmcdonough.com/?Mobile=1>

Recycle bin

Site collection features

Site hierarchy

Site collection navigation

Site collection audit settings

Portal site connection

Site collection policies

Content type publishing

Site collection cache profiles

Site collection output cache

Site collection object cache

Variations

Variation labels

Variation logs

Translatable columns

Suggested Content Browser Locations

SharePoint Designer Settings

Sean P. McDonough > Cache Profiles > All Items

This system list was created by the Publishing Resources feature to store profiles for configuring caching in your site.

Sean P. McDonough Press Releases

Search this site...

Press Releases

Title

Disabled

Public Internet (Purely Anonymous)

Extranet (Published Site)

Intranet (Collaboration Site)

+ Add new item

em list was created by the Publishing Resources feature to store profile

ugh

Press Releases



Title

Disabled

Public Internet (Purely Anonymous)

Extranet (Published Site)

Intranet (Collaboration Site)

+ Add new item

Site Actions + Browse

Version History Item Permissions Attach File Alert Me Workflows Access/Revert Like It Tagged Notes

New Item New Folder New Item Edit Item Delete Item

New Manage Actions Share & Track Workflows Tagged Notes

Press Release

Recycle bin

All Site Content

↓ Add new item

Cache Profiles - Public Internet (Purely Anonymous)

View

Version History Alert Me

Manage Permissions Delete Item

Manage Actions

Title	Public Internet (Purely Anonymous)
Display Name	
Display Description	Optimized for public Internet facing sites or areas that are meant to serve the same content to all users. No authentication check is done and any user requesting a page receives the same page as any other user.
Perform ACL Check	No
Enabled	Yes
Duration	180
Check for Changes	No
Vary by Custom Parameter	Browser
Vary by HTTP Header	
Vary by Query String Parameters	
Vary by User Rights	
Cacheability	ServerAndPrivate
Safe for Authenticated Use	No
Allow writers to view cached content	

Content Type: Page Output Cache
 Created at 3/26/2011 2:27 PM by System Account
 Last modified at 3/26/2011 2:27 PM by System Account

Close



Edit Item



Version History



Manage Permissions



Delete Item



Alert Me

Manage

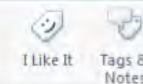
Actions

Title	Public Internet (Purely Anonymous)
Display Name	
Display Description	Optimized for public Internet facing sites or areas that are meant to serve the same content to all users. No authentication check is done and any user requesting a page receives the same page as any other user.
Perform ACL Check	No
Enabled	Yes
Duration	180
Check for Changes	No
Vary by Custom Parameter	Browser
Vary by HTTP Header	
Vary by Query String Parameters	
Vary by User Rights	
Cacheability	ServerAndPrivate
Safe for Authenticated Use	No
Allow writers to view cached content	

Content Type: Page Output Cache

Created at 2/26/2011 2:27 PM by System Account

Sean P. McDonough > Site Settings



Sean P. McDonough Press Releases

Press Releases

- Recycle Bin
- All Site Content

Users and Permissions
People and groups
Site permissions
Site collection administrators

Galleries
Site columns
Site content types
Web parts
List templates
Master pages and page layouts
Themes
Solutions

Site Administration
Regional settings
Site libraries and lists
User alerts
RSS
Search and offline availability
Sites and workspaces
Workflows
Workflow settings
Site output cache
Term store management
Content and structure
Searchable columns
Content and structure logs

Site Collection Administration
Search settings
Search scopes
Search keywords
Recycle bin
Site collection features
Site hierarchy
Site collection navigation
Site collection audit settings
Portal site connection
Site collection policies
Content type publishing
Site collection cache profiles
Site collection output cache
Site collection object cache
Variations
Variation labels
Variation logs
Translatable columns
Suggested Content Browser Locations
SharePoint Designer Settings
Visual Upgrade
Help settings

Look and Feel
Welcome Page
Title, description, and icon
Master page
Page layouts and site templates
Tree view
Site theme
Navigation

Site Actions
Manage site features
Reset to site definition
Delete this site
Site Web Analytics reports
Site Collection Web Analytics reports

Reporting Services
Manage Shared Schedules
Reporting Services Site Settings

Site Information

Site URL:
<http://www.spmcdonough.com/>
Mobile Site URL:
<http://www.spmcdonough.com/?Mobile=1>

[Site collection navigation](#)

[Site collection audit settings](#)

[Portal site connection](#)

[Site collection policies](#)

[Content type publishing](#)

[Site collection cache profiles](#)

[Site collection output cache](#)

[Site collection object cache](#)

[Variations](#)

[Variation labels](#)

[Variation logs](#)

[Translatable columns](#)

[Suggested Content Browser List](#)

Site Collection Administration > Output Cache Settings

Configure site-wide cache settings.

Sean P. McDonough

Press Releases

Search this site...

Press Releases

Output Cache

Select the **Enable output cache** check box to enable output caching in this site collection.



Enable output cache

Recycle Bin

All Site Content

Default Page Output Cache Profile

A cache profile specifies how long items should be held in the cache. It also describes to the caching system how to determine whether a cached page element is in fact valid for other requests for the same element from different users. You can specify different cache profiles to use for anonymous and authenticated users. This optimizes the use of the cache based on the authentication methods allowed on the site. Page output cache profiles specifically affect portal publishing pages. [Learn more about the default page output cache profile.](#)

Anonymous Cache Profile

- Disabled
- Disabled**
- Public Internet (Purely Anonymous)
- Extranet (Published Site)
- Intranet (Collaboration Site)

Selected Anonymous Cache Profile

Authenticated Cache Profile

Disabled

Caching is not enabled

Page Output Cache Policy

You can allow administrators and page layout designers to choose a different page output cache profile from the profile specified above.

Publishing Sites:

Publishing sites can use a different page output cache profile

Page Layouts:

Page layouts can use a different page output cache profile

Debug Cache Information

Select the check box to enable the display of additional cache information on pages in this site collection. This includes the date and time that page contents were last rendered.

Enable debug cache information on pages

OK

Cancel

Anonymous Cache Profile

Disabled

Disabled

Public Internet (Purely Anonymous)

Extranet (Published Site)

All Intranet (Collaboration Site)

Select

Disabled

Caching is not enabled

Disabled



Caching is not enabled

Publishing Sites:

- Publishing sites can use a different page output cache profile

Page Layouts:

- Page layouts can use a different page output cache profile

- Enable the use of the information...

Page Layouts:

Page layouts can use a different page output cache p

Enable debug cache information on pages

OK

Cancel

[Search this site.](#)

[Enable output cache](#)

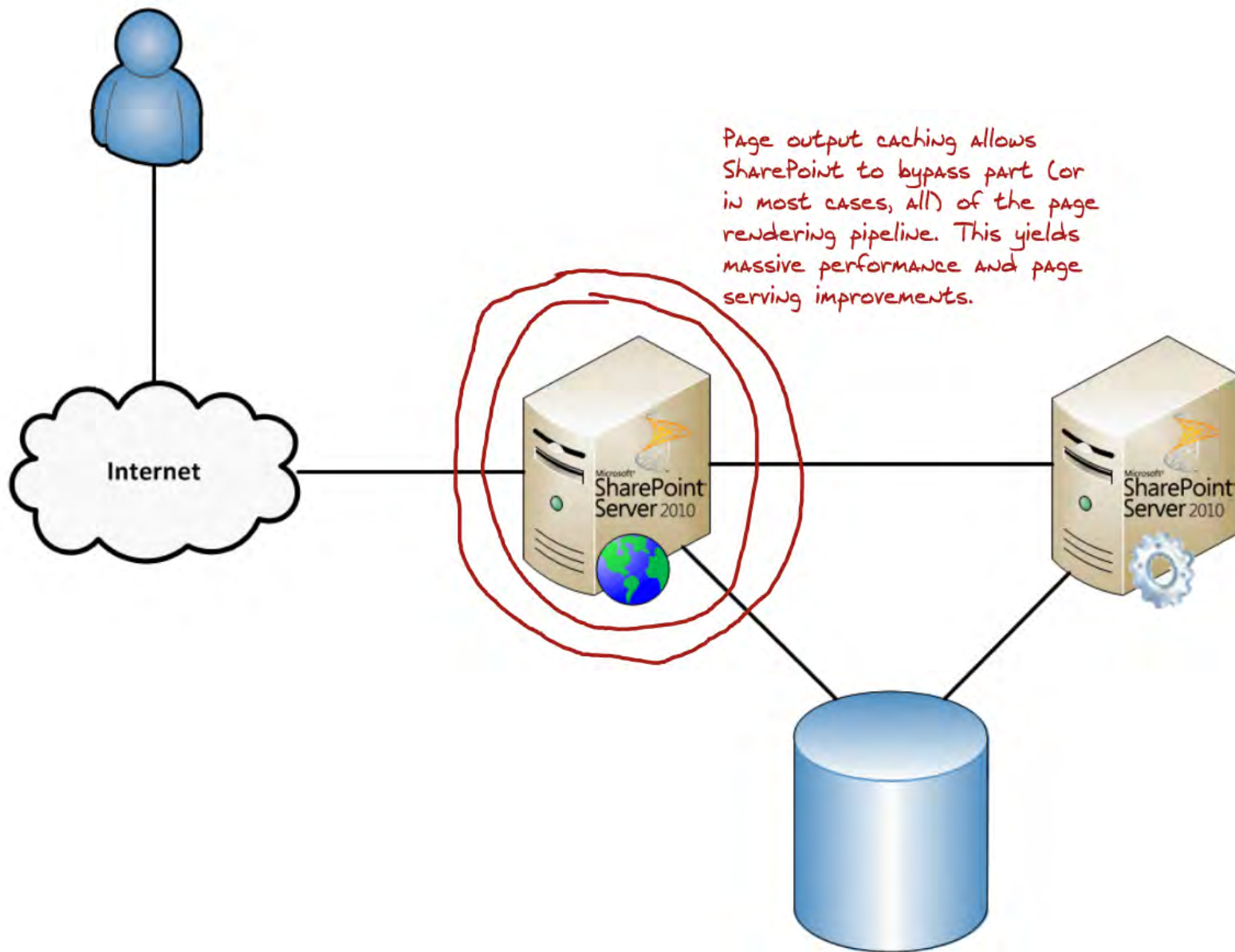
[Anonymous Cache Profile](#)



You really, really, *really* need to do concurrent multi-user testing with your cache profile settings!

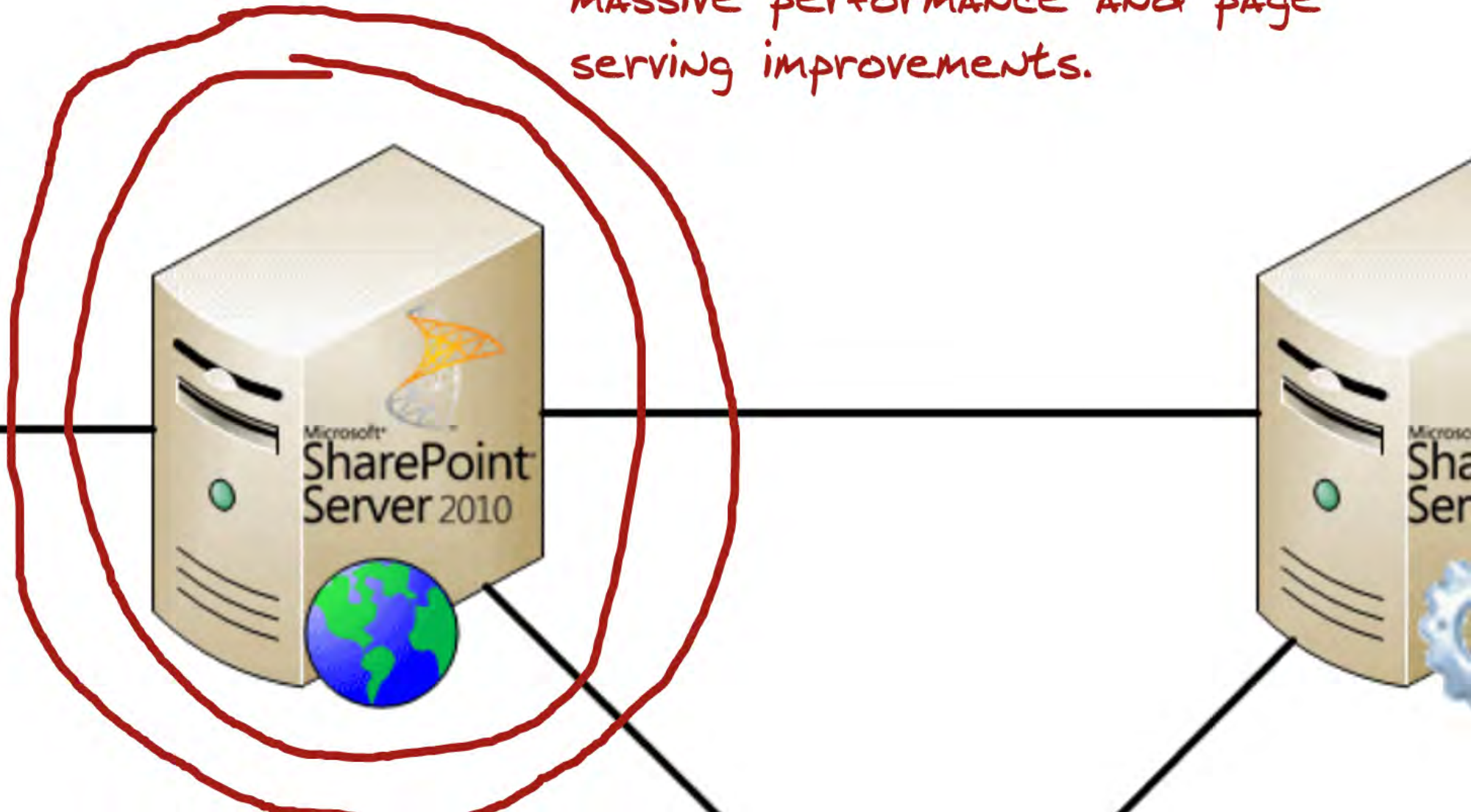


Do you sense a story coming?



Page output caching allows SharePoint to bypass part (or in most cases, all) of the page rendering pipeline. This yields massive performance and page serving improvements.

Page output caching allows SharePoint to bypass part (or in most cases, all) of the page rendering pipeline. This yields massive performance and page serving improvements.



And finally



Office Web
Apps Cache


SharePoint 2010 Only!





Houses images, XAML (eXtensible Application Markup Language), etc, that is generated so documents can be viewed and edited via browser.




How the cache is implemented ...

Site Actions  SPDC\s0ladmin

Microsoft SharePoint 2010 Central Administration Site Collection List  

Central Administration

- Application Management
- System Settings
- Monitoring
- Backup and Restore
- Security
- Upgrade and Migration
- General Application Settings
- Configuration Wizards

URL Search  Web Application:

URL													
/sites/Office_Viewing_Service_Cache	<table border="1"><tr><td>URL</td><td>http://spdev:18480/sites/Office_Viewing_Service_Cache</td></tr><tr><td>Title</td><td>Team Site</td></tr><tr><td>Description</td><td></td></tr><tr><td>Primary administrator:</td><td>SPDC\s0ladmin</td></tr><tr><td>E-mail address:</td><td></td></tr><tr><td>Database Name</td><td>WSS_Content_PublishingTestWeb</td></tr></table>	URL	http://spdev:18480/sites/Office_Viewing_Service_Cache	Title	Team Site	Description		Primary administrator:	SPDC\s0ladmin	E-mail address:		Database Name	WSS_Content_PublishingTestWeb
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OK Cancel

- standard Team Site (site collection)
- each Web application gets one (timer job-managed)
- can grow to consume 100 GB (by default)
- 30 day content expiration period (by default)

Recommendations



Get friendly with
Set-OfficeSPWebAppsCache
PowerShell cmdlet

- relocate cache site collection to a dedicated DB
- increase cache size and expiration for Web applications housing static documents
- decrease cache size and expiration for Web applications housing dynamic or highly collaborative Office documents

I've got some scripting
help for you on these
two items ...

- relocate
- increase ca
- applications
- decrease ca
- applicati
- coll



Don't PANIC - just for fun!

Object caching

Action

Cache size reduced (significantly) below 100MB

Potential Result

- Object cache fills and becomes memory constrained
- Resource contention and ejections lead to cache compactions
- Under heavy load, compaction process leads to thrashing
- SharePoint's ability to serve pages falls through the floor

What to Watch

- Publishing Cache Hit Ratio performance counter
- Total Number Of Cache Compactions performance counter

Page output caching

Observation

User A requests a page. User B requests the same page.
User B sees information tied to User A.

Potential Cause

- Page output cache profile isn't granular enough to distinguish User A from User B

What You Can Do

- Refine the cache profile in-use (use additional attributes)
- Set caching exclusions by sub-site or page layout type
- Use post-cache substitution (donut caching) in custom code
- Leverage a custom caching handler (IVaryByCustomHandler)

BLOB caching

Observation

Path property is set correctly, location is set correctly, BLOB caching is enabled, but images stored in site collection aren't being cached.

Potential Cause

- BLOB cache only works with resources that are stored as list items in lists or document libraries.

What You Can Do

- Leverage built-in libraries such as Site Collection Images.
- Move resources to a custom list.

BLOB caching

Observation

Image is changed on a SharePoint site. Some client browsers show new image while others show the old image.

Potential Cause

- A high max-age attribute (such as the default 24-hour value of 86,400 seconds) may be in-use.

What You Can Do

- Instruct clients to clear their browser cache and revisit site.
- Apply a smaller max-age attribute value or use zero (0) to disable persistent client-side caching of BLOB assets.
- Recognize that this behavior is by-design!

References and Resources

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Optimizing BLOB caching for WAN environments (SharePoint Server 2010)

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SharePoint 2007 Disaster Recovery Guide

<http://tinyurl.com/SPDRGuide2007>



SharePoint 2010 Disaster Recovery Guide

<http://tinyurl.com/SPDRGuide2010>