#### Welcome to SharePoint Saturday—The Conference

#### "Caching-In" for SharePoint Performance Admin - 400

Sean McDonough Idera



#### Welcome to SharePoint Saturday—The Conference

#### Thank you for being a part of the first SharePoint Saturday conference

- Please turn off all electronic devices or set them to vibrate.
- If you must take a phone call, please do so in the hall so as not to disturb others.
- Open wireless access is available at SSID: SPSTC2011
- Feel free to "tweet and blog" during the session
- Thanks to our Diamond and Platinum Sponsors:















#### Caching-In for SharePoint Performance



Sean McDonough Product Manager, SharePoint Products Idera

#### Session Overview

- Caching 101
- Understanding each of SharePoint's platform caching options
- How to leverage and control caching
- Scenarios quiz
- Q & A

#### Why I care about caching

### Why I caching

## Why I caching

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

First company of this size using MOSS 2007 for luternet presence



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



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



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

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 moved to 4 WFEs for growth.

### ... and finally

... and finally

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

#### So, what is caching?

#### Websters New World Dictionary



Third College Edition

CABLE

CADUCEUS

etc. caused by living for some time in a confined space or an iso-

lated area, esp. in winter ca-ble (kå'bəl) 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. -bled, -bling 1 to fasten or furnish with a cable or cables 2 to transmit by undersea cable 3 to send a cablegram to - wi. to send a cablegram

Ca-ble (kā'bəl), George Washington 1844-1925; U.S. novelist.

acable car a car drawn by a moving cable, as across a canyon, up a steeply inclined street,

cable-cast (kā'bəl kast') vt. -cast', -cast'ing to transmit directly to receivers by means of coaxial cable -n, a program that is cablecast ca'ble castler n.

\*cable-gram') n. a message sent by undersea cable cable-laid (kā'bəl lad') 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 (10 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'mən) n., pl. -men (-mən) CABDRIVER

ca-bob (ke bab') n. KEBAB cablo-chon (kab'ə shan'; Fr ka bö shōn') 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
ca-bomba (ka bām'ba) 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. \*ca-boodle (ka bood'a l) n. [ca-, colloq. intens. prefix (< ? Ger ge-) + BOODLE | [Colloq.] lot; group (the whole caboodle)
ca-boose (ka boos') n. [MDu kabuys, 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

Cab-ot (kab'at) 1 John (It. 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

cable tage (kab's tij, -täzh') 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

ca-bretta (ko bret's) adj. [ Sp cabra, goat ( L capra, fem. of caper: see CAPRIOLE) + It fem. dim. suffix -etta [ designating or of a soft leather made from a special kind of sheepskin

ca-brilla (ke bril'a, -bre'ya) n. Sp, prawn, dim. of cabra, goat: see prec.] any of various edible, percoid fishes (family Serranidae) found off Florida, the West Indies, etc.

Ca-brini (ka bre'ne), Saint Frances Xavier (called Mother Cabrini) 1850-1917; U.S. nun, born in Italy: first U.S. citizen canonized: her day is Dec. 29

cab-ri-ole (kab're ol') 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 cab-rio-let (kab're a la') n. [Fr, dim. of cabriole, 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

cah stand (kab'stand') n. a place where cabs are stationed

cac- (kak) combining form caco-; used before a vowel calca or ca-ca (kä'kä') n. [Slang] excrement; feces:



CARRIOLES

cacao butter COCOA BUTTER cacao butter cocco BUTTER cac-cia-to/re (kä'cho tropical to carry | cooked in a carry | cooked in a carry | hunt, chase < VL \*captiare, to CATCH | cooked in a cassen olive oil and tomatoes, onions, spices, wine, etc. /chicker

ciatorej cachia iot (kash'ə lät', -lō') n. [Fr < Sp cachalote = colloq. h.

cacho head | SPERM WHALE cacho hash n | Fr < cacher, conceal < VL \*coacticare, story cacho hash n | Fr < cacher, constrain < cacho hash n | Fr < cacher, constrain < cacho p of e collect, compress < L coccare, constrain < coccar = 0, of collect, compress < L coccare, constrain < coccar = 0, of cocllect, compress < L coccare, constrain < coccare, coccare, coccare, constrain < coccare, are midden, as by explorers or trappers 2 a safe place for high are maden, as by explorers or mappers at the such a place storing things 3 anything stored or hidden in such a place storing things a bide or store in a cache — SYN. Hugs cached, cach'ing to hide or store in a cache —SYM, HIDS:
cache-pot (kash'pät, -pö') n. [Fr < cacher, to hide (see prec,)
POT'] a decorative pot, jar, etc., used esp. for holding potted has

plants Also cache pot plants Also cache pot cache-sexe (kash'seks') n. Fr < cacher, to hide (see CARRE) sexe, sex a small cloth or band worn, as by an otherwise in

sere, sex a small close of dancer, to conceal the genitals ca-chet (ha sha', kash'a) n. [Fr < cacher: see CACHE] 1 a stamp on an official letter or document: see also LETTER UR CACHE (has been also LETTER UR CACHE). 2 any sign of official approval 3 a) a mark or sign showing thing is genuine, authentic, or of superior quality b) distinctiprestige 4 Philately a commemorative design on an envelope the marks some historical or philatelic event 5 a little, round walenclosing a bad-tasting medicine -vt. Philately to print a cacheto (an envelope)

ca-chexila (ka kek'sē a) n. [ModL < Gr kachexia, bad habit of his kakos, bad + hexis, habit < echein, to have < IE base seall in hold fast, conquer > SCHEME ] a generally weakened, emaclacondition of the body, esp. as associated with a chronic illness Alca chex'y (-se) -ca chec'tic (-kek'tik) or ca chex'ic (-kek'tik)

cach in nate (kak'e nat') vi. -nat|ed, -nat'ing | < L cachinnatus, | of cachinnare: ult. of echoic orig. to laugh loudly or too much

ca-chou (ka shoo') n. [Fr < Port cachu < Malayalam kūccu, skin i Tamil kacu | 1 CATECHU 2 a lozenge for sweetening the breath ca-chu-cha (ka choo'cha) n. [Sp.] 1 an Andalusian dance in 34 time, like the bolero 2 music for this

ca-cique (ka sēk') n. | Sp < Arawak word meaning "prince," "lott" 1 a) in Spanish America, an Indian chief b) in Spanish America and Spain, a local political boss 2 any of various tropical America blackbirds (family Icteridae) with conical bills -ca-ciqu'ism cack-handed (kak'han'did) adj. 1 [Brit. Colloq.] left-handed?

chunsy: awkward cack||e (kak/al) vl. -led, -ling [ME cakelen; akin to Du kokhole, LowG kakkeln < IE base \*kak-: of echoic orig.] 1 to make the shrill, broken vocal sounds of a hen 2 to laugh or challer wo similar sounds -vt. to utter in a cackling manner -n. 1 the acsound of cackling 2 cackling laughter 3 idle or silly chatter -cil the cackle [Brit. Colloq.] to stop talking and settle down to series

CACM Central American Common Market caclo- (kak'ō, ə) [ < Gr kakos, bad, evil ] combining form had por

harsh /cacography/ caclo delmon or caclo daemon (kak'ō de'men) n. [Gr hate

daimon: see prec. & DENON | an evil spirit or devil caclo-dyl (kak'ō dil, kak'a-) n. [< Gr kukōdēs, bad-smellie kakos, bad + -ōdēs (< IE base \*od , to smell > ODOR, (2008) - dil and balakos, bad + -ōdēs (< IE base \*od , to smell > ODOR, (2008) - dil markeliit Chem. 1 the radical As(CH<sub>3</sub>)<sub>2</sub> composed of arsenic and metry compounds are poisonous and foul-smelling 2 a poisonous of less liquid As<sub>2</sub>(CH<sub>3</sub>)<sub>2</sub>, with an offensive odor; it is a polymer of the radical control of the control of

Caco-ethes (kak'o éthez) n. L < Gr kahoéthës < kabis, kal éthos, habit see etritica. L a bankering (to do something); meacography (ka käg're fe) n. [CACO-4 -GRAPHY] attracts writing 2 incorrect spelling — caco-graphic (kak's graf'ik) or caco-graphic (kak's graf'ik) or

o-graph'i-cal adj.
wcaclo-mis'tle (kak'ə mis'al) n. [AmSp cacomixtle | Natural Constitution λα²komisλί < λα²ko, half + mis λί, cougar ] 1 a slender, long a racconlike carnivore (Bassuriscus astulus) of the SW U.S. Mexico 2 its für Alexandra raccondiscus astulus) of the SW U.S. Mexico 2 its fur Also cac'o-mix'le (-mis'əl, -mik'səl)

meaco e us sur Also cac o-mix[e] (-mix[s], mix[s]).

ca-cophony (ks kār]s nē) n. pl. -nies [] prob. vin Fr cacophono.

ML cacophonia < 67 kakaphlonia < kakaphlonas, harsh-solidina kakas, bad, evil + phōnē, voice: sec prinos ] harsh, saring sud dissprance — cacophono. dissonance—ca-coph'o-nous (nos) adj.—ca-coph'o-nous (nos) adj.—ca-coph

of thistle, cardoon any desert plants of the cactus family, last the New World, with fleshy stems, reduced or spinelike leaves often shown flowers. often showy flowers —adj. designating a family (Cacheer dicov) glovers —adj. designating a family (Cacheer per grant of the property of the pr pear, saguaro, and cereus

pear, saguaro, and cereus  $\operatorname{cacu-mi-nal}$  ( $\operatorname{de}$  ky $\operatorname{grow}$   $\operatorname{man}$  and)  $\operatorname{adj.} \| < \operatorname{L}$  cacumen ( $\operatorname{gen}$ ,  $\operatorname{cacumin}$  by  $\operatorname{log}$ )  $\operatorname{cacuminal}$   $\operatorname{log}$ )  $\operatorname{cacuminal}$   $\operatorname{log}$   $\operatorname{log}$ 

not a person; corpse, as for dissection —SYN. Body —caservice adj.

(ar en', -ar in) n. [prec. + -INE3 ] a colorless, putridary filled promaine, NH<sub>3</sub>(CH<sub>3</sub>)<sub>2</sub>MH<sub>2</sub>, produced by the action
service and the service and accaying flesh
approximations on proteins, as in decaying flesh
approximation and processes of a like a cadaver;
and apple that it is a color of the service and apple that it is a color of the service and apple that is a color of the service and apple that is a color of the service and apple that is a color of the service and apple that is a color of the service and apple that is a color of the service and apple that is a color of the service and apple that is a color of the service and apple that is a color of the service and a color of the service and apple that is a color of the service and a color

OAM Alided M(anufacturing) a computer system used in gater land design tacks and a computer system used in combining design techniques and manufacturing prinaction of complex wiring diagrams, the design of complex wiring diagrams, the design of machine parts, etc. nated machine parts, etc.

addice (kad'is) n. 1 CADDIS' 2 CADDIS' caddie (kad is/n. Scot form of Fr cadet: see CADRT 1 orig., an eaddie (kad fe) n. Scot orom who attends a called addle [kader in 1960] torid of Pr codel: see CADET 1 orig., an stand boy 2 a person who attends a golfer, carrying the clubs, raind bo) balls, etc. 3 a small, two-wheeled cart, as for carrying

ming the balls, the ded, bying to act as a caddie the balls of the carrying the balls of the cadds of the cad ral worsted yarn 2 a worsted ribbon

dis or cad dice (kad'is) n. CADDIS WORM addls or Caucata (August in CADDIS WORM
addls fly any of an order (Trichoptera) of small, mothlike insects
and a soft body, long antennae and legs, and two pairs of hairy,
as some wings ranous wings

addish (kad'ish) adj. like or characteristic of a cad; ungentlemanly cad dishly adv. -cad dish ness n.

caddis worm | < OFr cadas, floss silk (with reference to the case) | he wormlike larva of the caddis fly that usually lives in fresh water m an elongated case made of twigs, grains of sand, etc. cemented ther with silk that it secretes: commonly used as bait by anglers Caddo (kad'o) n., pl. -does, -dos, or -do [Louisiana Fr Cadaux. screned < Sp Cadojodacho < Caddo kaduhda cu?, name of a ajor group of the Caddo confederacy 1 a member of any of a mup of North American Indian peoples formerly living in Louisians, Arkansas, and E Texas, now living mainly in Oklahoma 2 the Addon language of these peoples

Cad doan (-an) n. | coined (1891) by J. W. Powell < prec. + -AN | a family of North American Indian languages, including Caddo, Pawand Arikara

caddyl (kad'ē) n., pl. -dies [ < earlier CATTY2 < Malay kātī, weight convelent to a little more than a pound | 1 a small container used for tea 2 any of various devices for holding or storing certain es, as phonograph records

(addy? (kad'e) n., vi. CADDIE (ade (kad) adj. [LME, a pet ] untended by its mother and brought

aby a human being, often as a pet [a cade lamb] tade [kād] n. Fr < Prov < LL catanus, prob. < Gaul ] a bushy Mediterranean juniper (Juniperus oxycedrus) whose tarlike oil dis-Eled from the wood is used in the treatment of skin disorders

"cade (kād) [ < (CAVAL)CADE [ suffix procession, parade [motorcade] tadelle (ka del') n. [Fr < Prov cadello < L catella, fem. of catellus, upy, whelp < IE base \*kat-, to bear young > ON hathna, young the larva or adult of a small, shiny, black beetle (Tenebroides nicus) harmful to grain

a dence (kad"ns) n. ME < OFr < OIt cadenza or ML cadentia < Latens, prp. of cadere, to fall: see CASE! 1 fall of the voice in eiking 2 inflection or modulation in tone 3 any rhythmic flow 4 measured movement, as in dancing or marching, or the rel of such movement 5 Music a series of notes or chords at the add a phrase, section, or composition which indicates a partial or conclusion Also ca'dency ('n sē) —ca'denced ('nst) or ca den'tial adj.

tent (at) adj. 1 orig., falling 2 having cadence

denza (ka den'za) n. It: see CADENCE I an elaborate, often consist musical passage played unaccompanied by the solo amount in the cond of the first or the ment in a concerto, usually near the end of the first or the dat ka det') n. Fr. younger son < Gascon candet, captain, chief capdel < LL capitellum, dim. of L caput, HEAD ] 1 [Now a younger son or brother 2 [Historical] a younger son who he a gentleman volunteer in the army to offset his lack of mony 3 a student in training at an armed forces academy 4 a ent at a military school \$5 any trainee, as a practice teacher or dette ka det') n. prec. + ETTE a member of the division of

i) vt., vi. cadged, cadg'ing | < ? | to beg or get by begging;

cadger n. Ar qādi ] a minor Muslim magistrate [set (ka') n. Ar qādi] a minor Muslim magistrate [sad'] ak') n. [Colloq.] something that is the most luxuriac (sa de vak' £ kad' ak'), Sieur Antoine de la Mothe (ân

mor') c. 1658-1730; Fr. explorer in America a die', ka'diz) 1 seaport in SW Spain, on the Atlantic: pop. p. name Cá diz (ka'thēth') 2 city in N Negros, in the

(kad me'on) adj. of or like Cadmus

ment occurring as a sulfide or carbonate in zinc ores; 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'mic (-mik)

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 (kad'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

Cadre (ka'dre', dre'; also, kā'-) n. [Fr, a frame < It quadro < L quadrum, a square: see quadraxre.] 1 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·cejus (ka doo'se as, -dyoo'-) n., pl. -ceji' (-se i') L, ? via Etr < Gr(Doric) haryheion, for Gr keryheion <

kēryx, herald < IE base \*kar-, to praise > OHG hruom, Ger ruhm 1 1 the staff of an ancient herald; esp., 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'cejan adj. ca-du'cejan adj. ca-du-city (ka dōō'sa tē, -dyōō'-) n. [Fr caducité < LL caducitas < L caducius: see 1 the quality or state of being perishable 2 senility

ca-du-cous (-kas) adj. L caducus, falling < cadere, to fall: see CASE! | Bot. falling off early, as some leaves

cae-cilian (se sil'e an, -sil'yan) n. [ < Modl. < L caecilia, kind of lizard < caecus: see CECUM] any of an order (Gymnophiona) of legless tropical amphibians resembling worms

cae-cum (se'kom) n., pl. -ca (-ka) CECUM

Caed-mon (kad'man) fl. late 7th cent. A.D.; first Eng. poet whose

name is known Cae-lijan (se'le an, sel'yan) after L Caelius Mons, Caelian hill, named after the Tuscan Caeles Vibenna | see Seven Hills of

Cae-lum (se'lam) a small S constellation between Columba and Eridanus

Caen (kän) chief city of Basse-Normandie, NW France; pop. 117,000 Caer-nar-von-shire (kär när'van shir', -shar) former county of NW Wales, now part of Gwynedd: also Caer-nar'von

caes al pinija (sez'al pin'ē a, sēs'-) adj. designating a family (Caesalpiniaceae) of leguminous trees and shrubs, including the Kentucky coffee tree

Cae-sar (se'zer) n. after fol. 1 the title of the emperor of Rome from Augustus to Hadrian, or of the emperor of the Holy Roman Empire 2 any of the Roman emperors 3 [often c-] any emperor or dietator

Cae-sar (se'zər), (Gaius) Julius | L Caesar, said to be < caesus, 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

Caes a rea (ses'a re'a, sez'-, se'za-) 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 KAYSERI

Cae-sar-elan or Cae-sar-ilan (sa zer'é an) adi, 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

Cae-sar-ism (se'zər iz'əm) n. [also c-] absolutism in government; autocracy - Cae'sar ist adi., n.

\*Caesar salad [so named in honor of (Gaius) Julius CAESAR by Giacomo Junia, Italian-American chef in Chicago, who invented it c. 1903 a salad of greens, grated cheese, croutons, anchovies, etc. with a dressing of olive oil, lemon juice, garlic, and raw or coddled

cae-sijum (sē'zē am) n. cesium

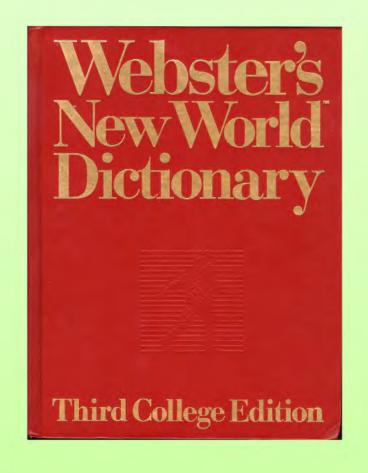
caes pi-tose (ses'pa tos') adj. CESPITOSE

cae sura (si zyoor'o, zhoor'e) n. pl. -ras or -rae (-é) | L. a cutting < pp. of caedere, to cut down: see -cide | 1 a break or pause in a ine of verse; in Greek and Latin verse, the caesura falls metrical foot; in English verse, it is usually about the middle of the line and is shown in scanning by the sign | 2 Music a break or

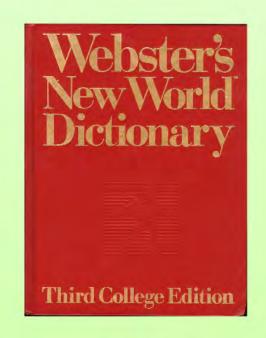
cacao butter cocoa BUTTER
cac·cia·to|re (kä'chə tôr'ē) adj. [It, lit., hunter < pp. of cacciare, to catch] cooked in a casserole. ac·cia·to|re (kä'chə tör'e) auj. [10, 100, 100, 100] cooked in a casserole hunt, chase < VL \*captiare, to CATCH ] cooked in a casserole with hunt, chase < VL \*captiare, to care, wine, etc. [chicken con olive oil and tomatoes, onions, spices, wine, etc. [chicken con olive oil and tomatoes, onions, spices, wine, etc. [chicken con olive oil and tomatoes, onions, spices, wine, etc. [chicken con olive oil and tomatoes, onions, spices, wine, etc. [chicken con olive oil and tomatoes, onions, spices, wine, etc. [chicken con olive oil and tomatoes, onions, spices, wine, etc. [chicken con olive oil and tomatoes, onions, spices, wine, etc. [chicken con olive oil and tomatoes, onions, spices, wine, etc. [chicken con olive oil and tomatoes, onions, spices, wine, etc. [chicken con olive oil and tomatoes, onions, spices, wine, etc. [chicken con olive oil and tomatoes, onions, spices, wine, etc. [chicken con olive oil and tomatoes, onions, spices, wine, etc. [chicken con olive oil and tomatoes, onions, spices, wine, etc. [chicken con olive oil and tomatoes, onions]] ciatore]
cach|a·lot (kash'ə lät', -lō') n. [Fr < Sp cachalote < colloq. Por cachola, head | SPERM WHALE
cache (kash) n. [Fr < cacher, conceal < VL \*coacticare, store |
cache (kash) n. [L. coactare, constrain < coactus, pp. of coactus, collect, compress < L coactare, constrain < coactus, pp. of cogere collect; see COGENT 1 a place in which stores of food, supplies collect: see COGENT 2 a safe place for hid: 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 we storing things 1 anything stored in a cache —SYN. HIDE! cached, cach'ing to hide or store in a cache -SYN. HIDE! cached, caching to finde of block.

Cacher, to hide (see prec.) + pot cacher pot (kash'pät, -pō') n. [Fr < cacher, to hide (see prec.) + pot cacher pot (kash'pät, -pō') n. [sed esp. for holding potted] POT1 a decorative pot, jar, etc., used esp. for holding potted house plants Also cache pot cache-sexe (kash'seks') n. [Fr < cacher, 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 < cacher: 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 some thing is genuine, authentic, or of superior quality b) distinction



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



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

# Cache: what is it?

## Cache: what is it?

buffer

Web Part caching

### Cache: what is it?

buffer

Office viewing service cache

in-memory cache

#### virtual memory



Web Part caching

Cache: what is it?

post-cache substitution

buffer

CARP

Office viewing service cache

disk-based caching

in-memory cache

virtual memory



page output cache

Web Part caching

post-cache substitution

HTCP

Cache: what is it?

browser cache

buffer

CARP

Office viewing service cache

cacheability headers

BLOB cache

object cache

etagment caching

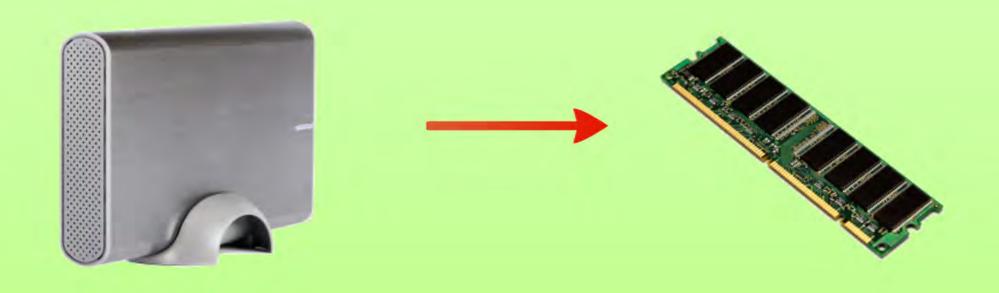
# Cache: what is it?



A temporary storage area where frequently accessed data can be stored for rapid access



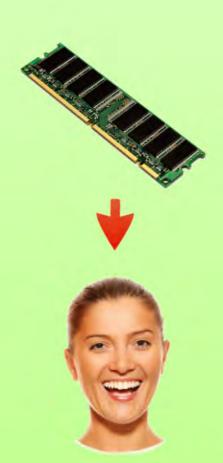
### Option 1: Place data on a faster medium





Option 2: place data closer to the point of usage

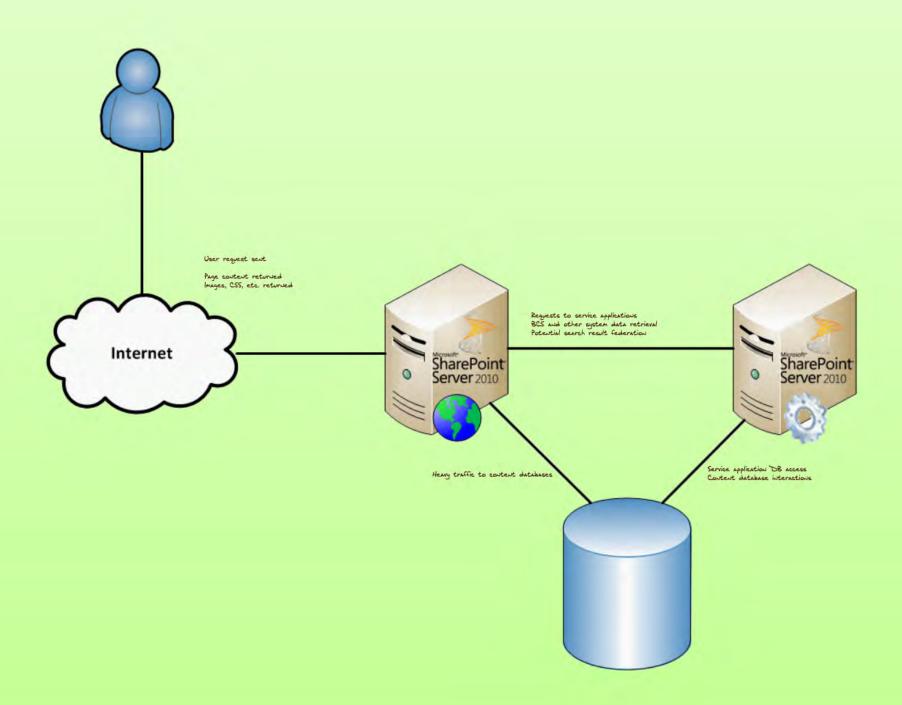


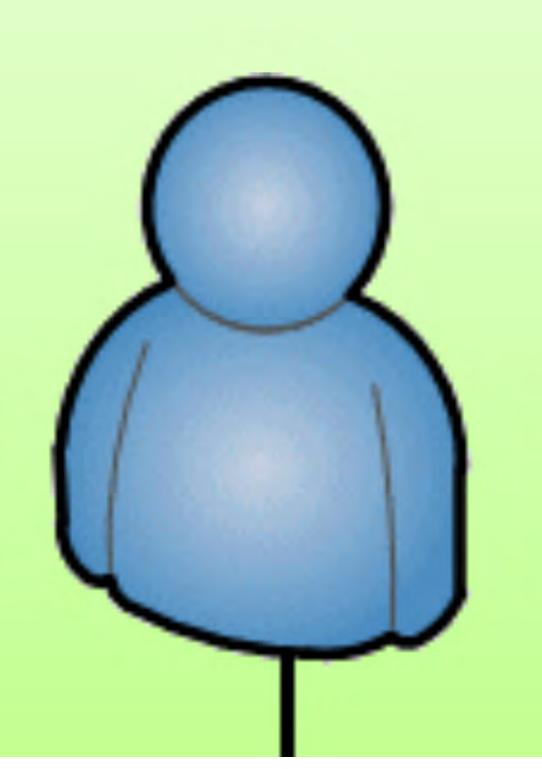


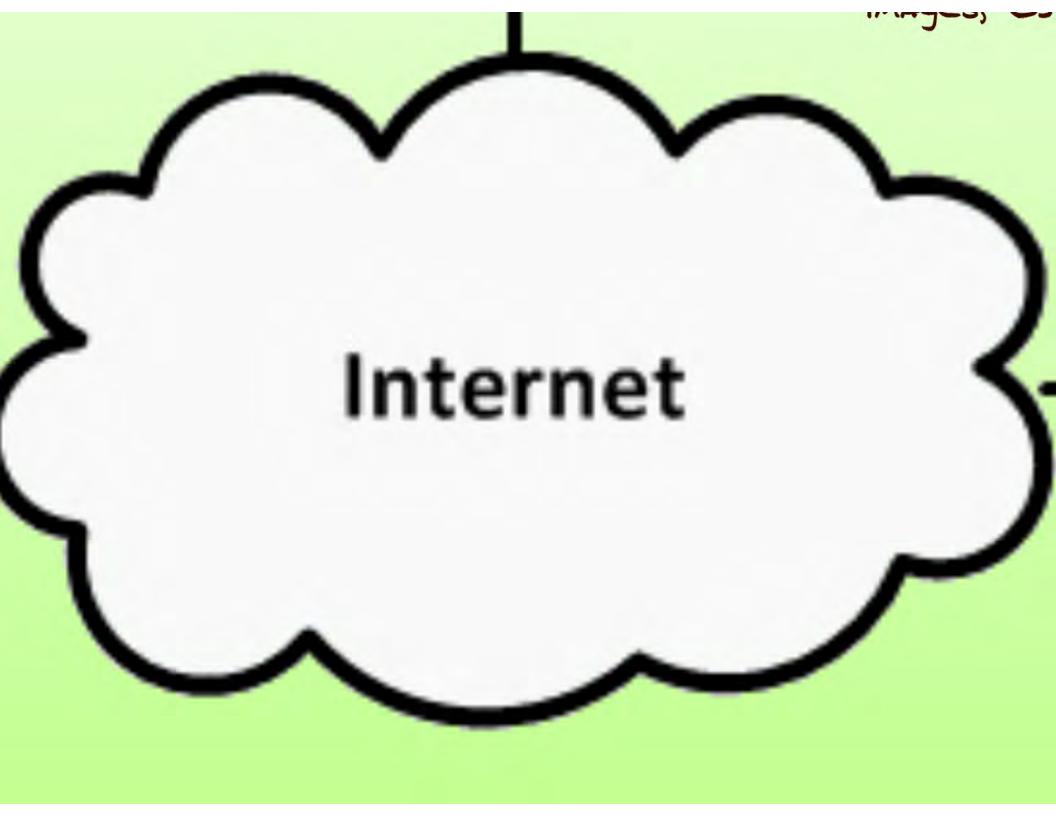
#### VVI VVI V

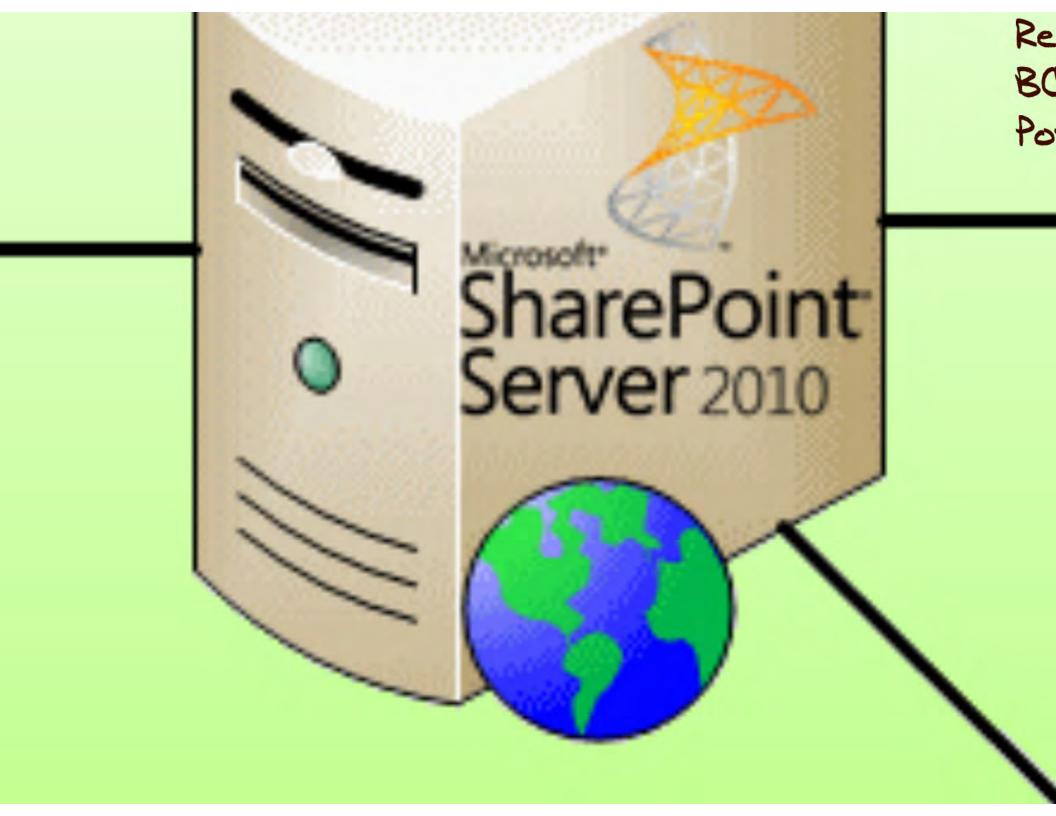
# My/?

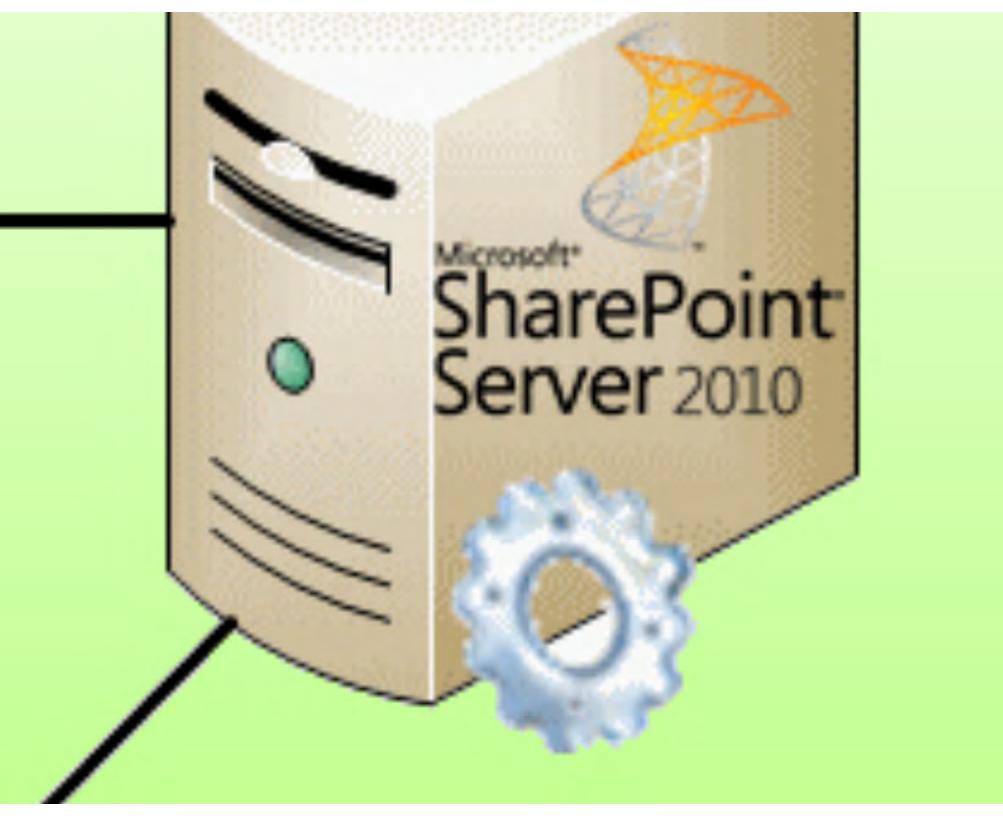
or at least "why for SharePoint?"

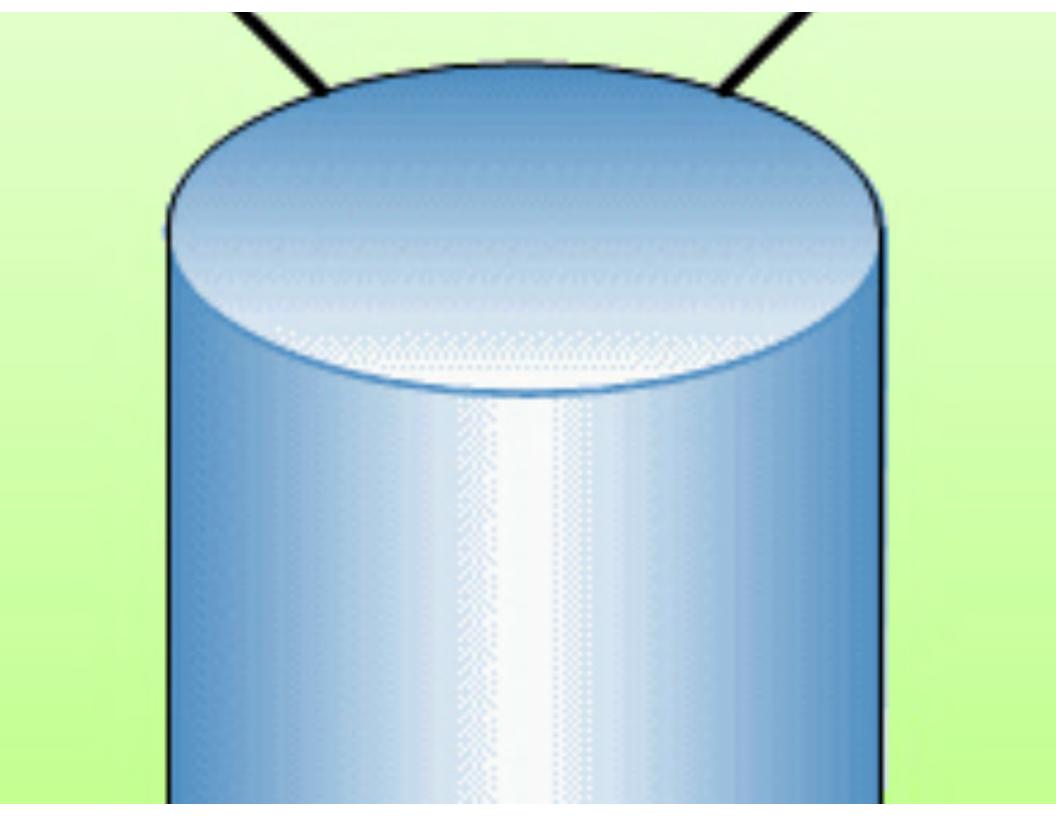


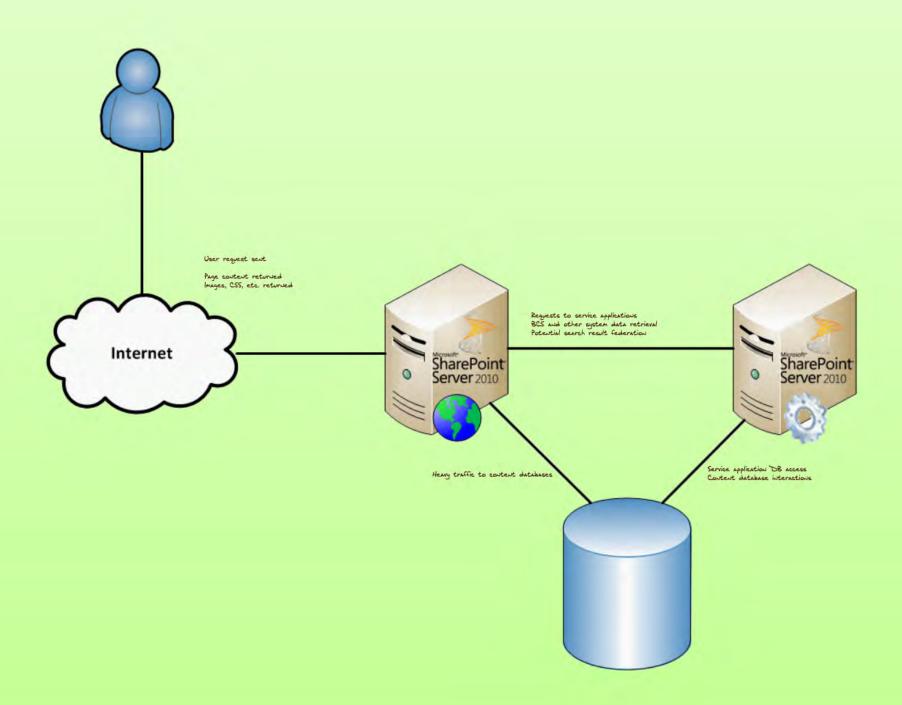


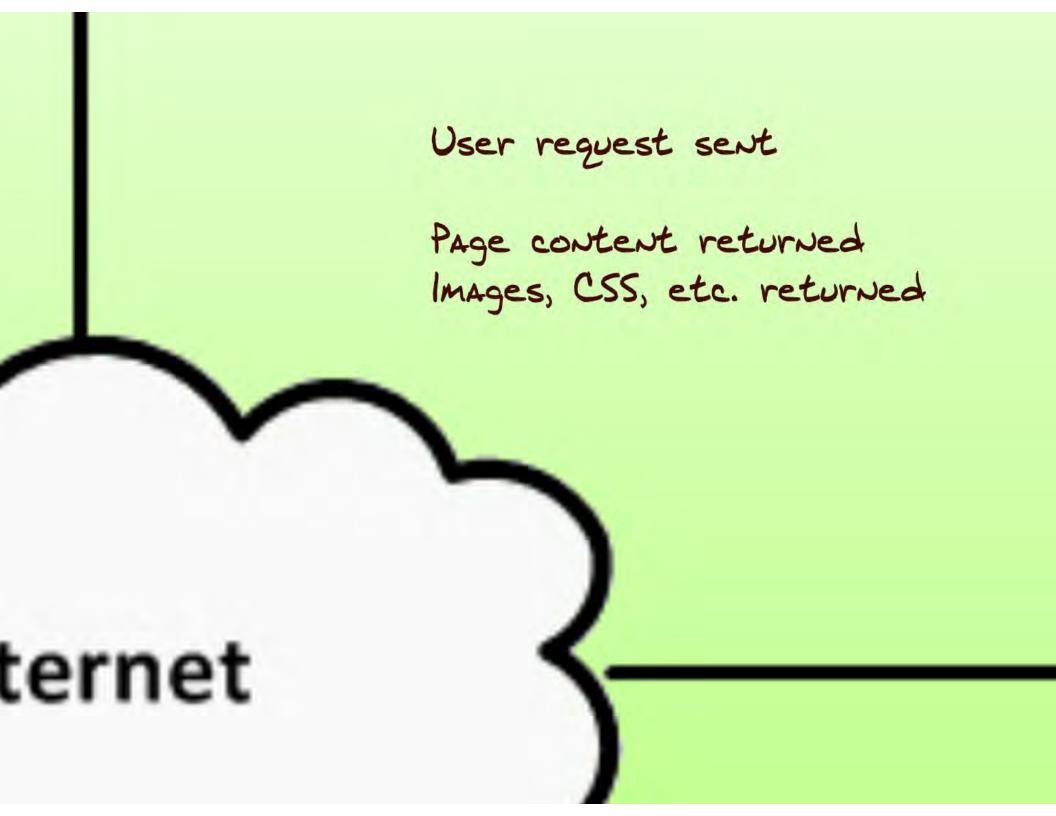






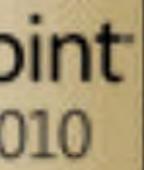


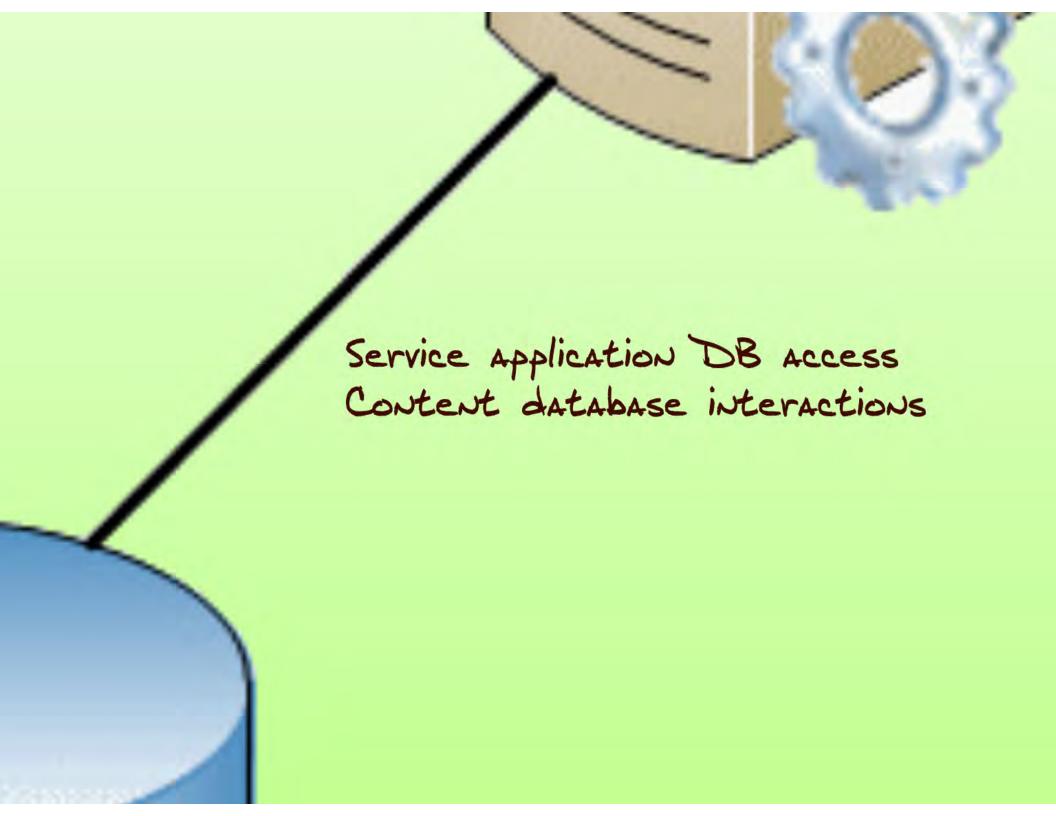


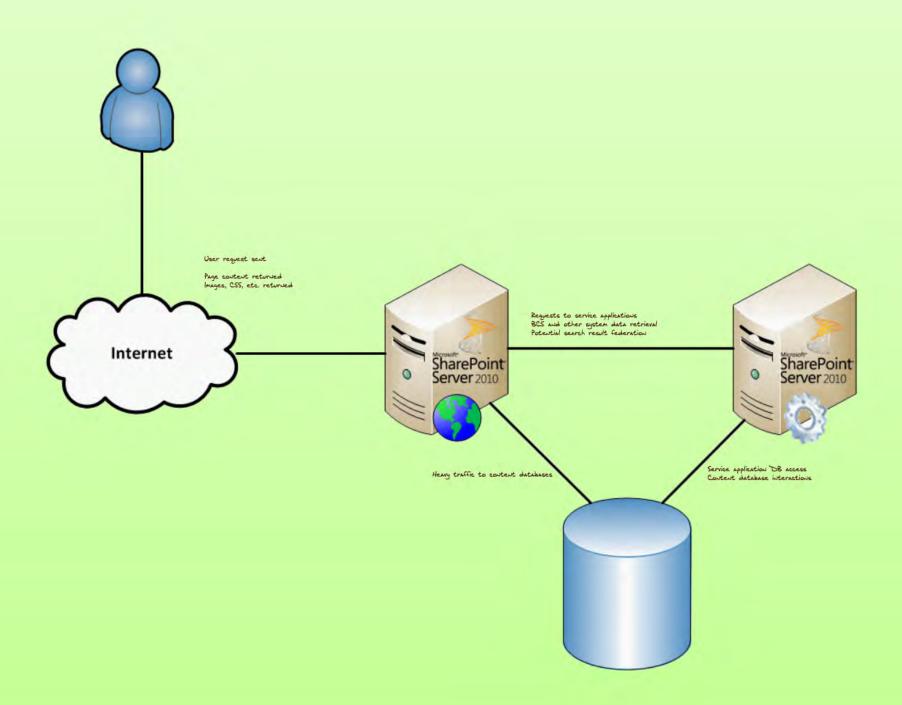


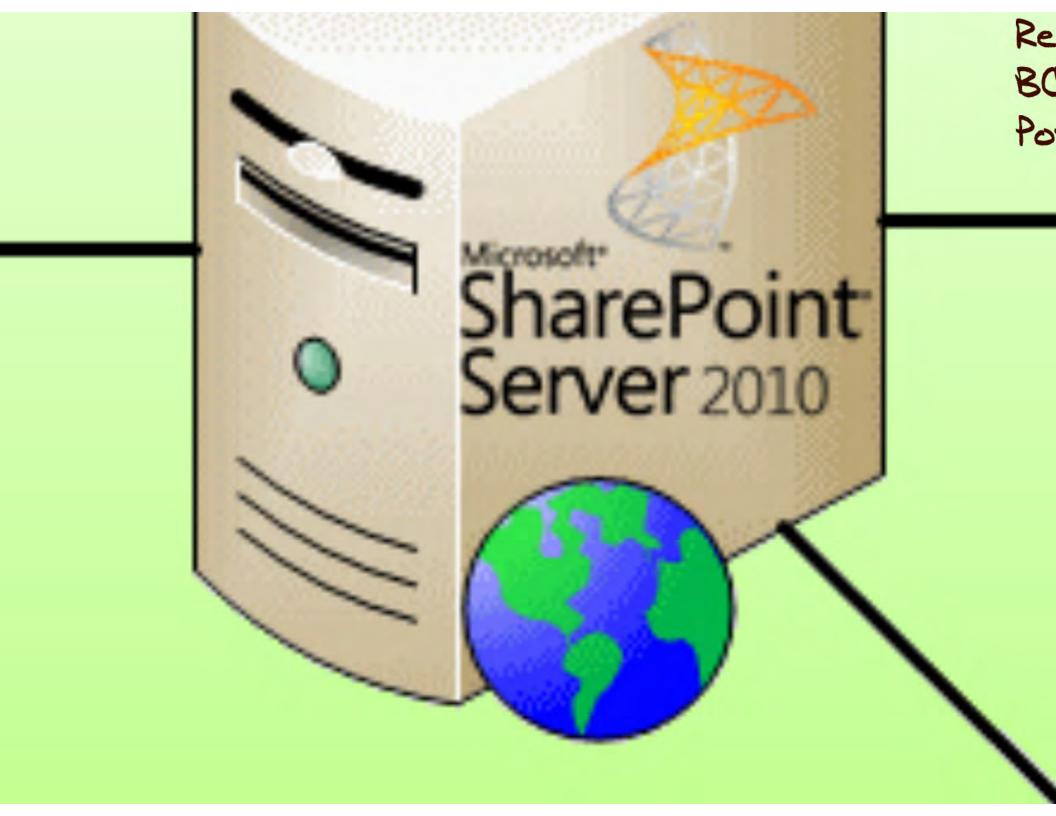
Heavy traffic to content databases

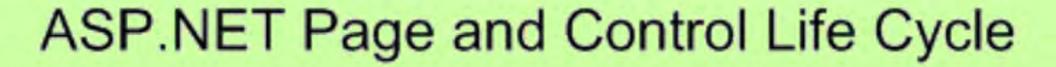
Requests to service applications BCS and other system data retrieval Potential search result federation









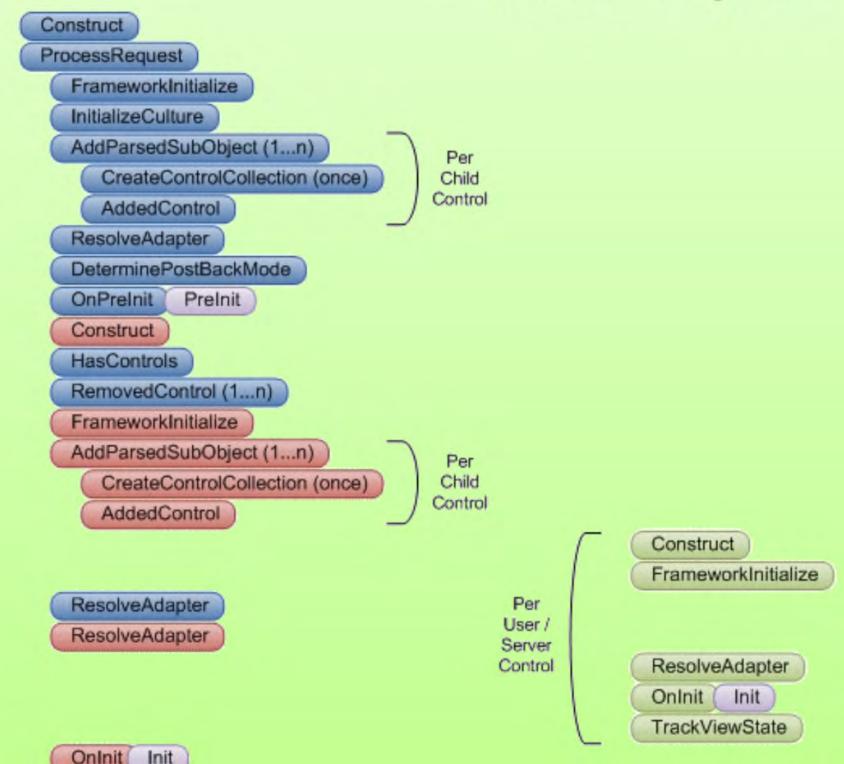


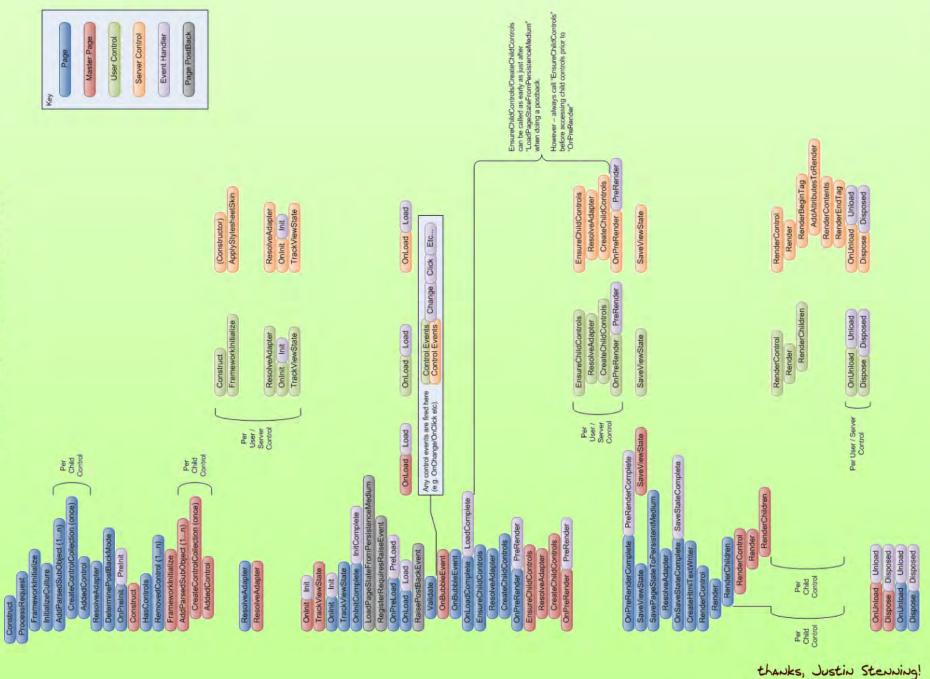
Key Page Master Page User Control Server Control Event Handler Page PostBack

ASP.I

Construct ProcessRequest FrameworkInitialize InitializeCulture AddParsedSubObject (1...n) Per CreateControlCollection (once) Child Control AddedControl ResolveAdapter DeterminePostBackMode **OnPreInit** Prelnit Construct HasControls RemovedControl (1...n) FrameworkInitialize AddParsedSubObject (1...n) Per Child CreateControlCollection (once) Control AddedControl

#### ASP.NET Page and C





#### 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

### SharePoint caching: whatcha got?

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

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:





#### e SharePoint<sup>a</sup> er 2007

Also, I'll have slides (and maybe this presentation itself) available later on my blog

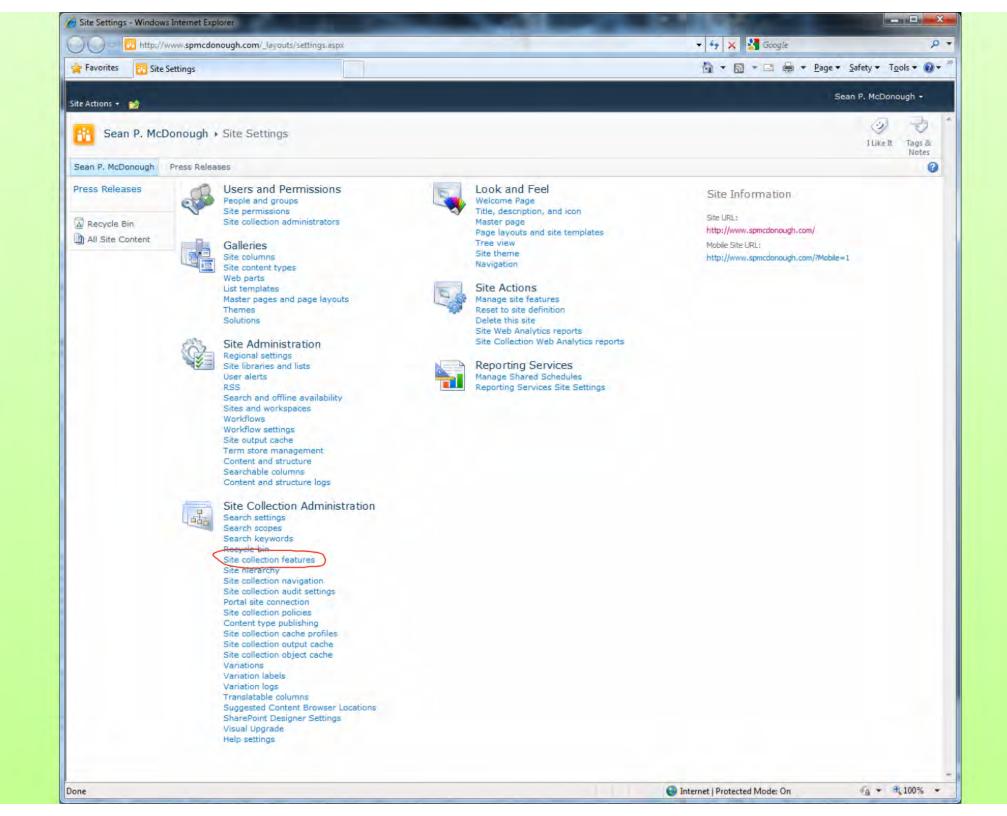
http://SharePointInterface.com

# Short story time...

Short story time...



Where's the #\$6! "on" button?



#### Content and structure logs



#### Site Collection Administration

Search settings

Search scopes

Search keywords

<del>Recycle bin</del>

Site collection features

Site hierarchy

Site collection navigation

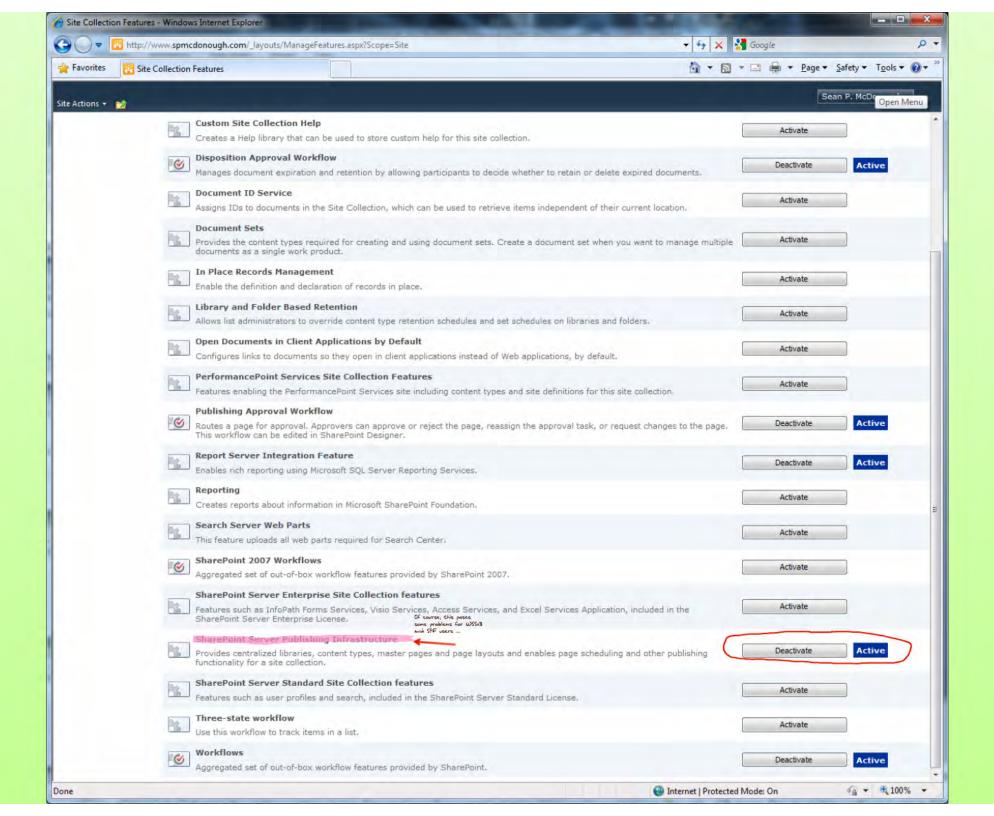
Site collection audit settings

Portal site connection

Site collection policies

Content type publishing

Site collection cache profiles





#### SharePoint 2007 Workflows

Aggregated set of out-of-box workflow features provide



#### SharePoint Server Enterprise Site Collection feat

Features such as InfoPath Forms Services, Visio Services, SharePoint Server Enterprise License.



#### SharePoint Server Publishing Infrastructure

Provides centralized libraries, content types, master pa functionality for a site collection.



#### SharePoint Server Standard Site Collection featu

Features such as user profiles and search, included in t



#### Three-state workflow

Use this workflow to track items in a list.



#### ise Site Collection features

ns Services, Visio Services, Access Services, Of course, this poses some problems for WSSv3

volknow reactines provided by entire once

and SPF users ...

ng Infrastructure

content types, master pages and page laye

n.

#### d Site Collection features

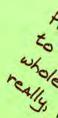
and search, included in the SharePoint Ser



So ... how does the plumbing work?

## This is a web.config file section

```
La Contraction of the Contractio
control of company who combanded or
         The second of th
```



Yes, just a section.

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



## is a config ection

```
    If a position of the property of the control of the position of t
And the same of th
       The control of the co
```

Pes, just a section.

Arezi choted when I tried

really, really, REALLY was

```
<machineKey validationKey="D0580BED7E8B10F1281E63023A6B5A057D8DC770B53DA72E" decryptionKey="98A395174F2D3EC29D</pre>
      </system.web>
      <system.webServer>
9-9-6
          <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</p>
              <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</p>
              <add name="BSRedirectModule" type="Microsoft.ReportingServices.SharePoint.Soap.RSRedirectModule, RSSharePoint</p>
              <add name = "PublishingHttpModule" ) type = "Microsoft.SharePoint.Publishing.PublishingHttpModule, Microsoft.Share</p>
          </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</pre>
              <add name="OwssvrHandler" scriptProcessor="C:\Program Files\Common Files\Microsoft Shared\Web Server Extensi</pre>
              <add name="ScriptHandlerFactory" verb="*" path="*.asmx" preCondition="integratedMode" type="System.Web.Scrip</pre>
              <add name="ScriptHandlerFactoryAppServices" verb="*" path="* AppService.axd" preCondition="integratedMode" t</pre>
              <add name="ScriptResource" preCondition="integratedMode" verb="GET,HEAD" path="ScriptResource.axd" type="Sys</pre>
              <add name="JSONHandlerFactory" path="*.json" verb="*" type="System.Web.Script.Services.ScriptHandlerFactory,</pre>
              <add name="ReportViewerWebPart" verb="*" path="Reserved.ReportViewerWebPart.axd" type="Microsoft.ReportingSe</pre>
              <add name="ReportViewerWebControl" verb="*" path="Reserved.ReportViewerWebControl.axd" type="Microsoft.ReportViewerWebControl" verb="*" path="Reserved.ReportViewerWebControl" type="Microsoft.ReportViewerWebControl" verb="*" path="Reserved.ReportViewerWebControl" type="Microsoft.ReportViewerWebControl" verb="*" path="Reserved.ReportViewerWebControl" type="Microsoft.ReportViewerWebControl" type="Micr
          </handlers>
      </system.webServer>
      <system.serviceModel>
          <serviceHostingEnvironment aspNetCompatibilityEnabled="true" />
```

### Caching in action



The weather started

mind in motion.

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

### First up...

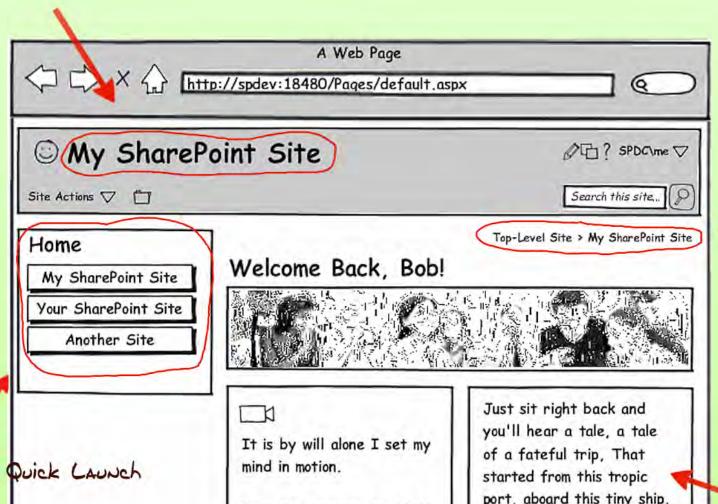




### Object caching

### Object caching

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



... and the Quick Launch

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

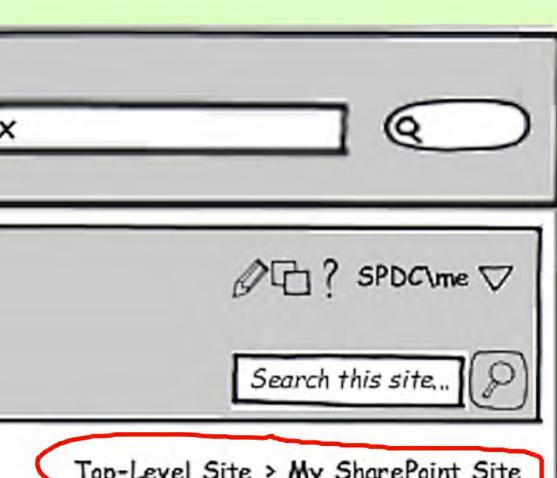
It is by will alone I set my mind in motion.

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

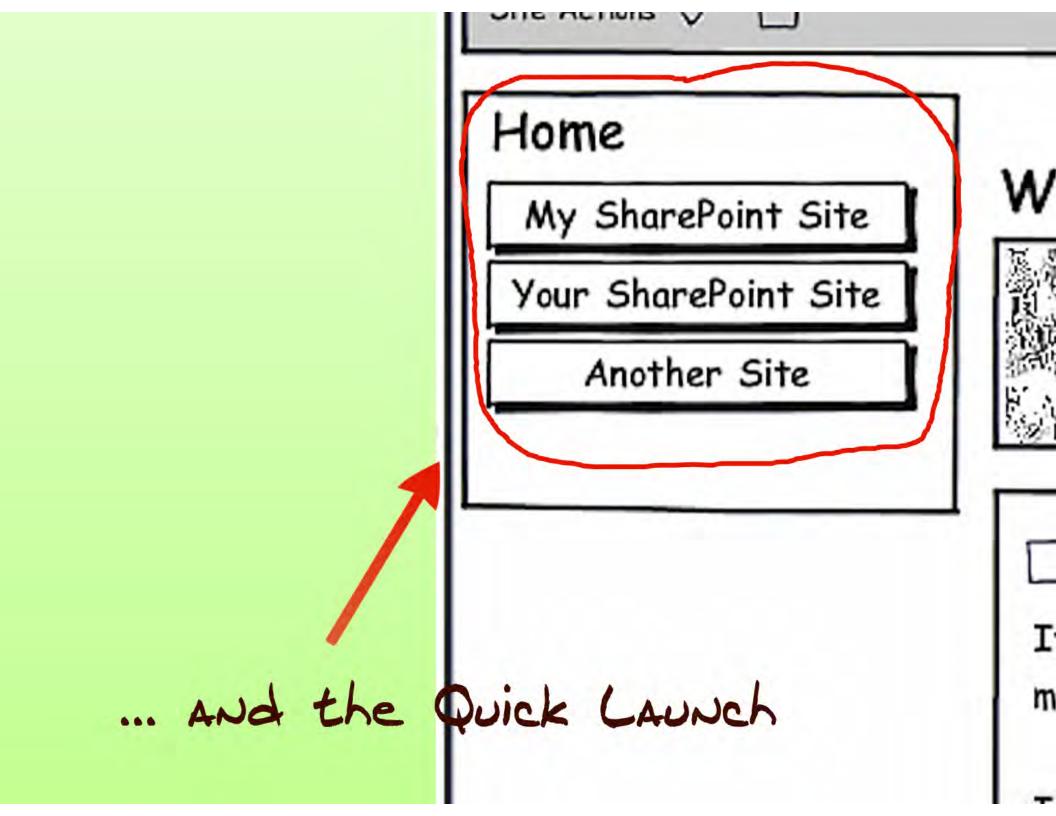
Navigational das breadcrumb ...

> If this happe be a Conten Query Web f (COWP), the could benefit significantly 4 object cachin

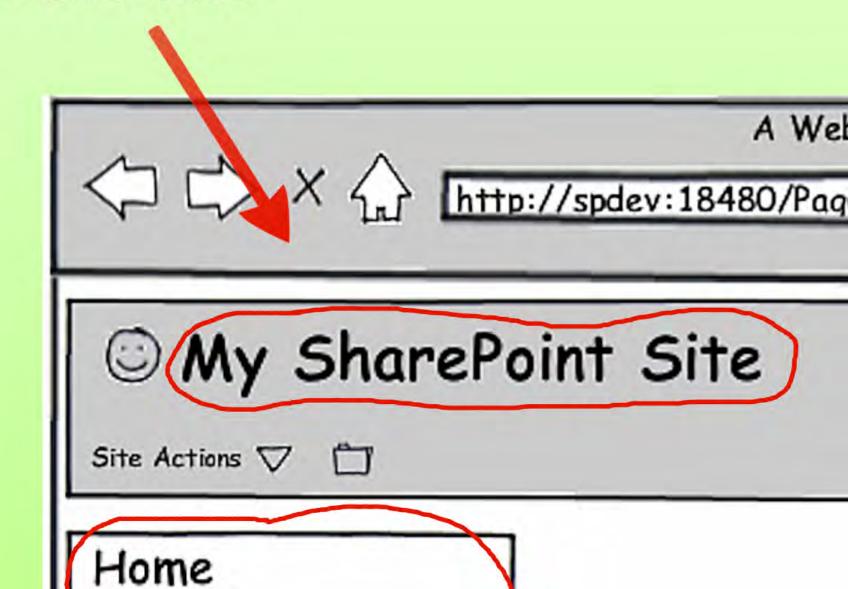


Top-Level Site > My SharePoint Site

Navigational data such as this breadcrumb ...



Site properties like the title



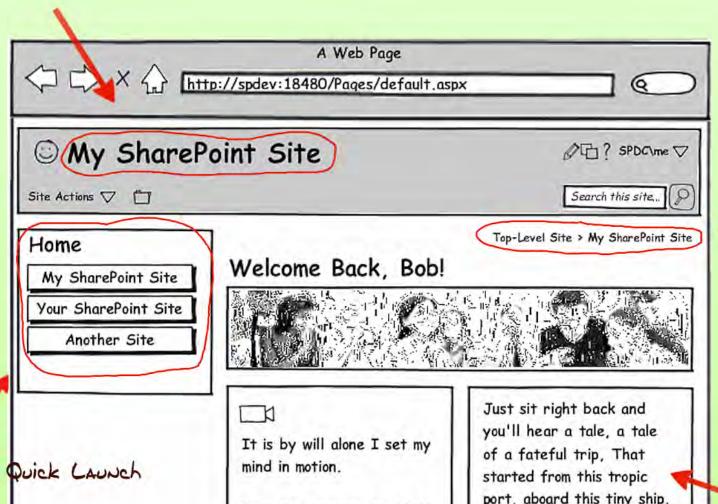
Just sit right back and you'll hear a tale, a tale of a fateful trip, That started from this tropic port, aboard this tiny ship. The mate was a mighty sailin' man, the Skipper brave and sure. Five passengers set sail that day for a three hour tour. A three hour tour.

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

spe

min



... and the Quick Launch

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.

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

Navigational das breadcrumb ...

> If this happe be a Conten Query Web f (COWP), the could benefit significantly 4 object cachin

Backed by memory



Backed by memory



Turned on by default



Backed by memory



Turned on by default



Default size or allocation

100MB per site collection

Backed by memory



Turned on by default



Default size or allocation

100MB per site collection

A New trick that comes with SharePoint 2010 ...

# is a config ection

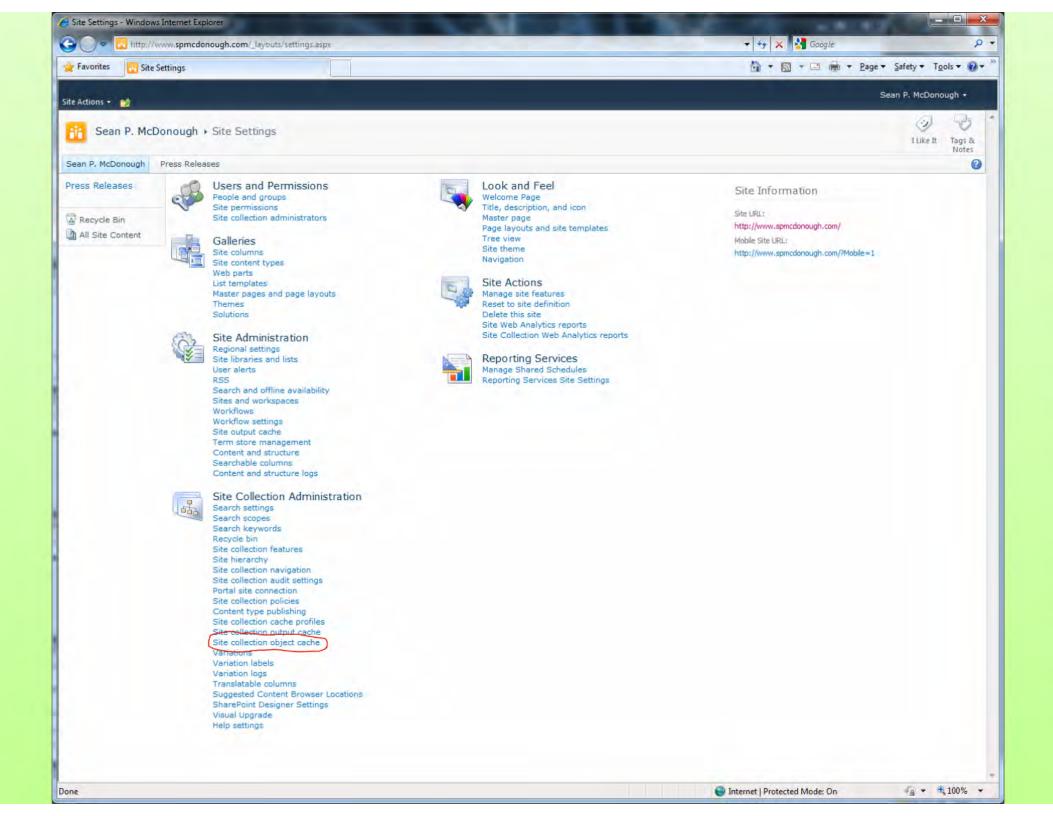
```
    If a position of the property of the control of the position of t
And the same of th
       The control of the co
```

Pes, just a section.

Arezi choted when I tried

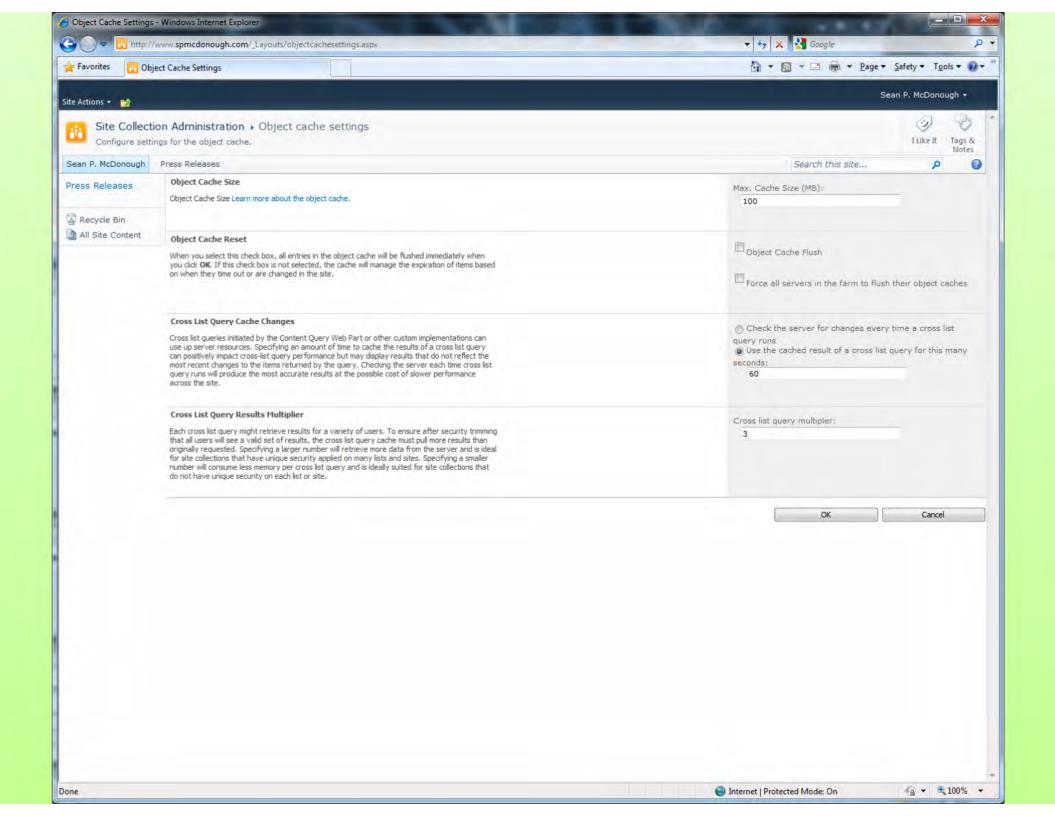
really, really, REALLY was

```
<Action id="0ff1ce14-1021-0000-0000-0000000000</pre>
    <Action id="ec0076ac-0c35-4880-8422-8062f5925</pre>
    <Action id="602bc8c3-9286-49a3-b973-3376ca78b</pre>
    <Action id="00e22a78-33ff-41ac-b0fb-ee46d1636</pre>
    <Action id="4b60e42e-e6fc-4188-80d2-ef39e7cc0</pre>
    <Action id="1d415973-1146-4bc2-8324-83dfff5bf</pre>
  </MergedActions>
  <BlobCache location="C:\BlobCache\14" path="\.(</pre>
  <ObjectCache maxSize="100" />
  <outputCacheProfiles useCacheProfileOverrides='</pre>
  <RuntimeFilter Assembly="Microsoft.Office.Serve</p>
</SharePoint>
<system.web>
  <securityPolicy>
    <trustLevel name="WSS_Medium" policyFile="C:\</pre>
    <trustLevel name="WSS_Minimal" policyFile="C:</pre>
  </securityPolicy>
  <httpHandlers />
  <customErrors mode="On" />
  <httpRuntime maxRequestLength="51200" />
```



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

Variation logs
Variation logs
Translatable columns
Suggested Content Browser Locations
SharePoint Designer Settings
Visual Upgrade
Help settings





#### e Collection Administration > Object

figure settings for the object cache.

Donough

Press Releases

ases

Object Cache Size

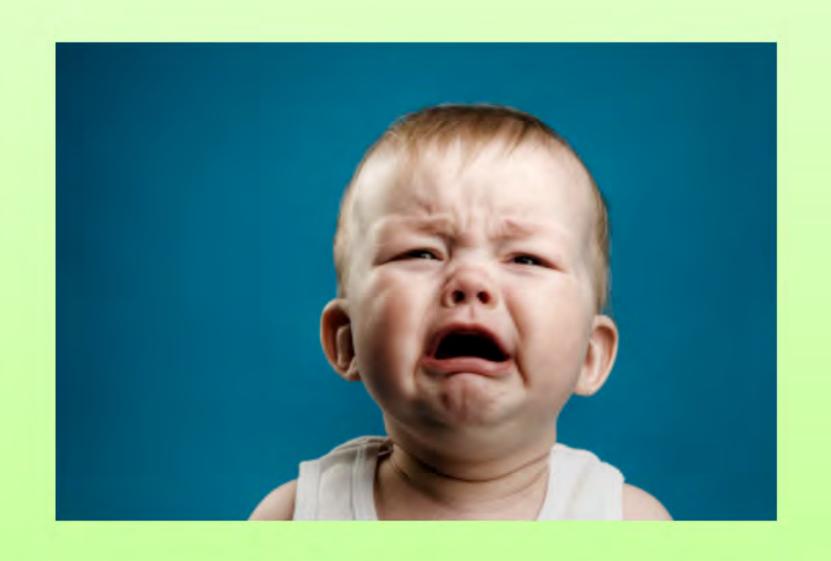
Object Cache Size Learn more about t

Bin

Search this site ....

Max. Cache Size (MB):

100



And now, for a painful story ...

## The take-away:

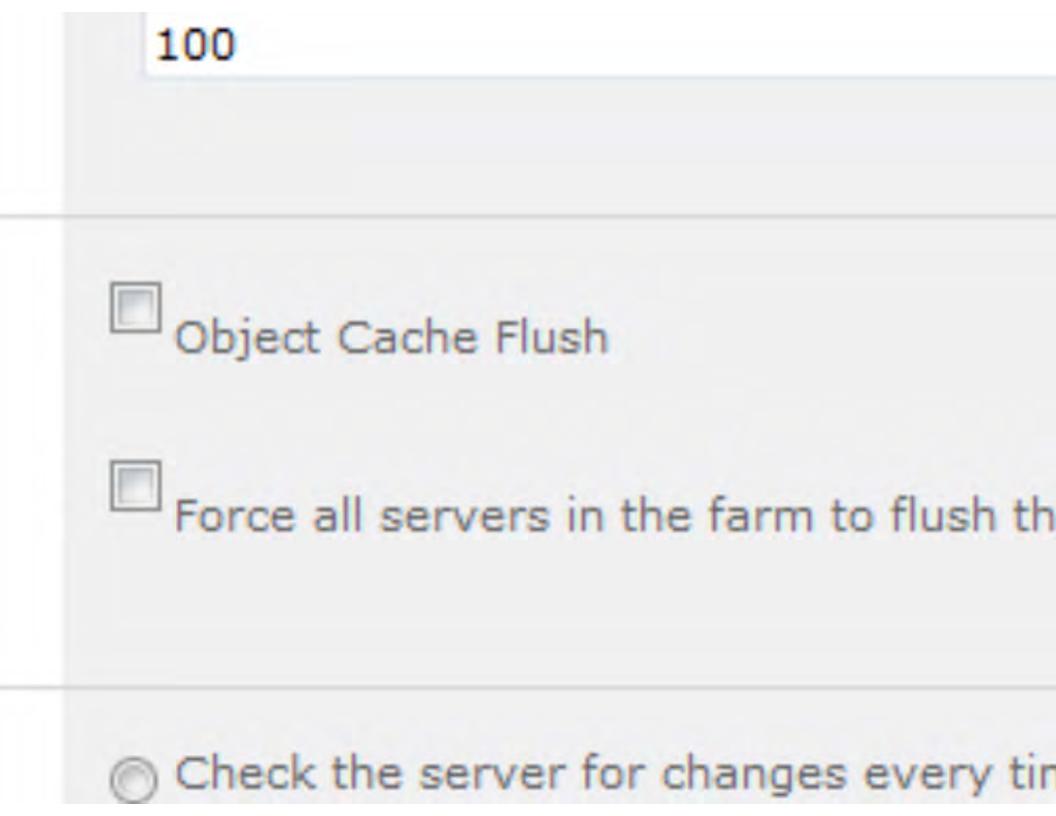
Don't dial-down the object cache allocation unless you know what you're doing and understand the implications of having too little memory allocated!

Object Cache Size Learn more about

CHUIT SIEV

#### Object Cache Reset

When you select this check box, all er you click **OK**. If this check box is not so on when they time out or are change



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

#### Cross List Query Cache Changes

Cross list queries initiated by the Content Q use up server resources. Specifying an amo can positively impact cross-list query performost recent changes to the items returned liquery runs will produce the most accurate reacross the site.

Force all servers in the farm to flush the

- O Check the server for changes every tim query runs
- O Use the cached result of a cross list que seconds:

60

#### Cross List Query Results Multiplier

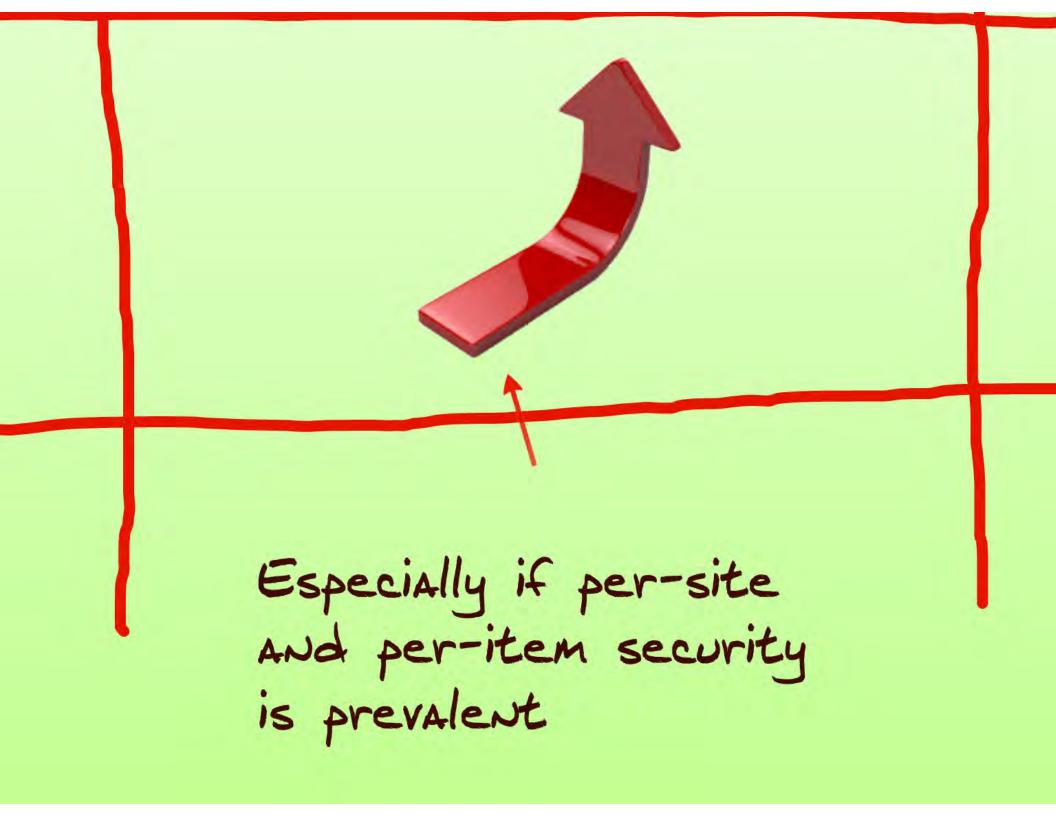
Each cross list query might retrieve results that all users will see a valid set of results, originally requested. Specifying a larger nur for site collections that have unique securit number will consume less memory per cross do not have unique security on each list or

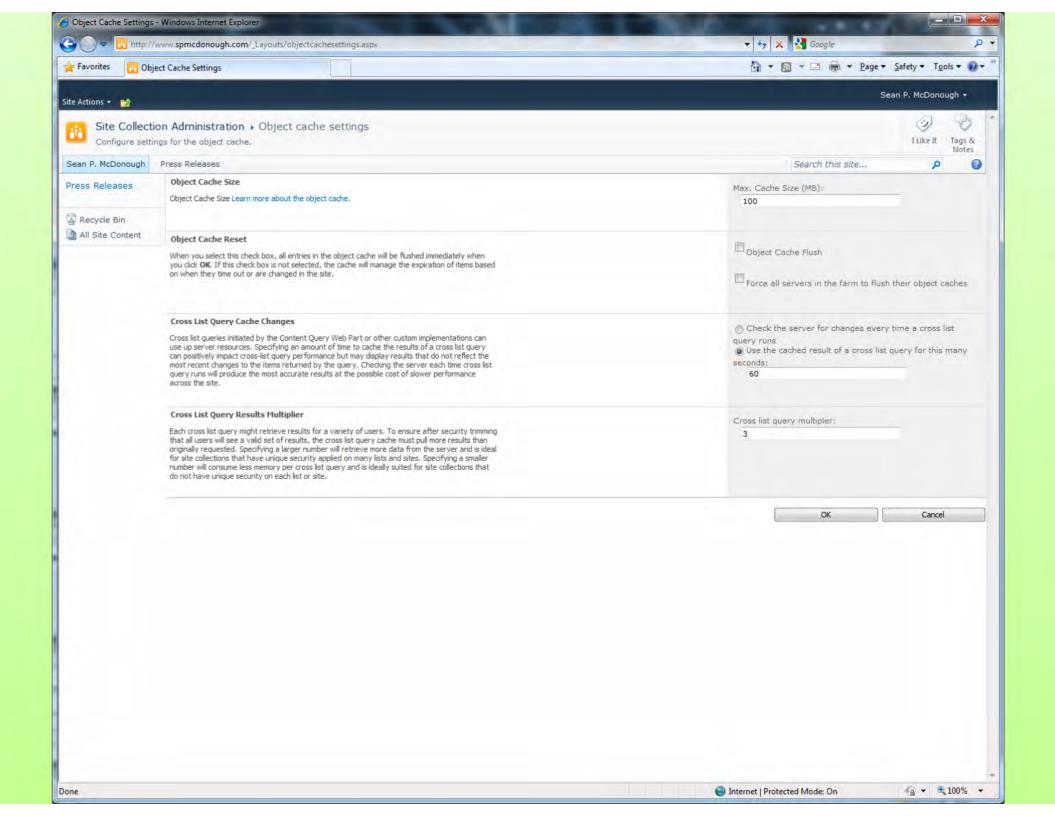
#### Cross list query multipler:

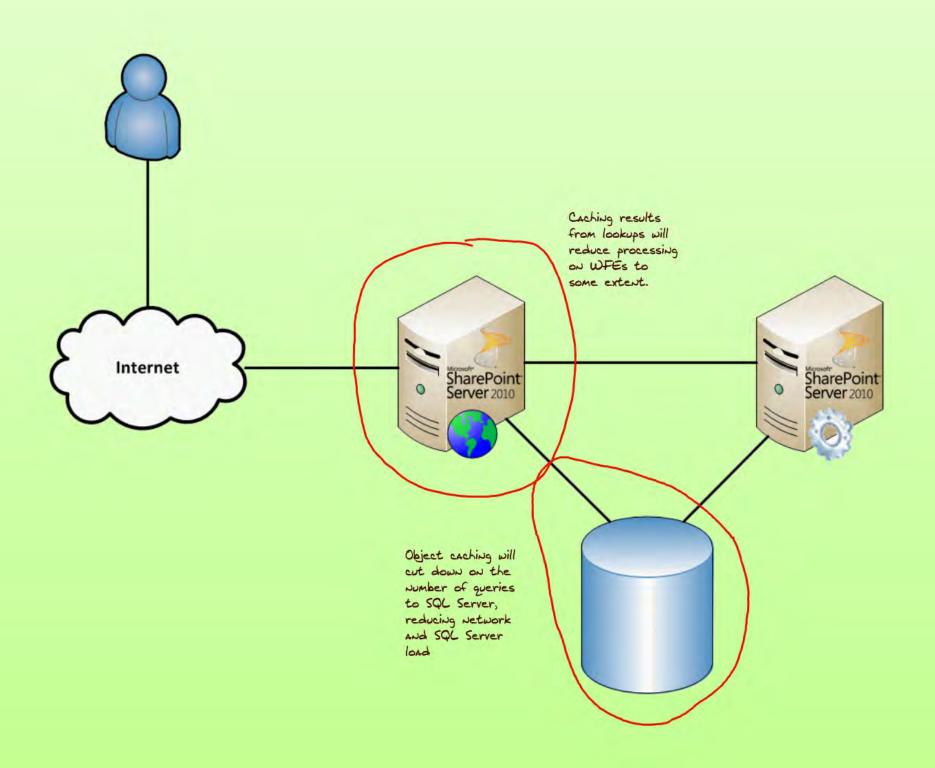
3

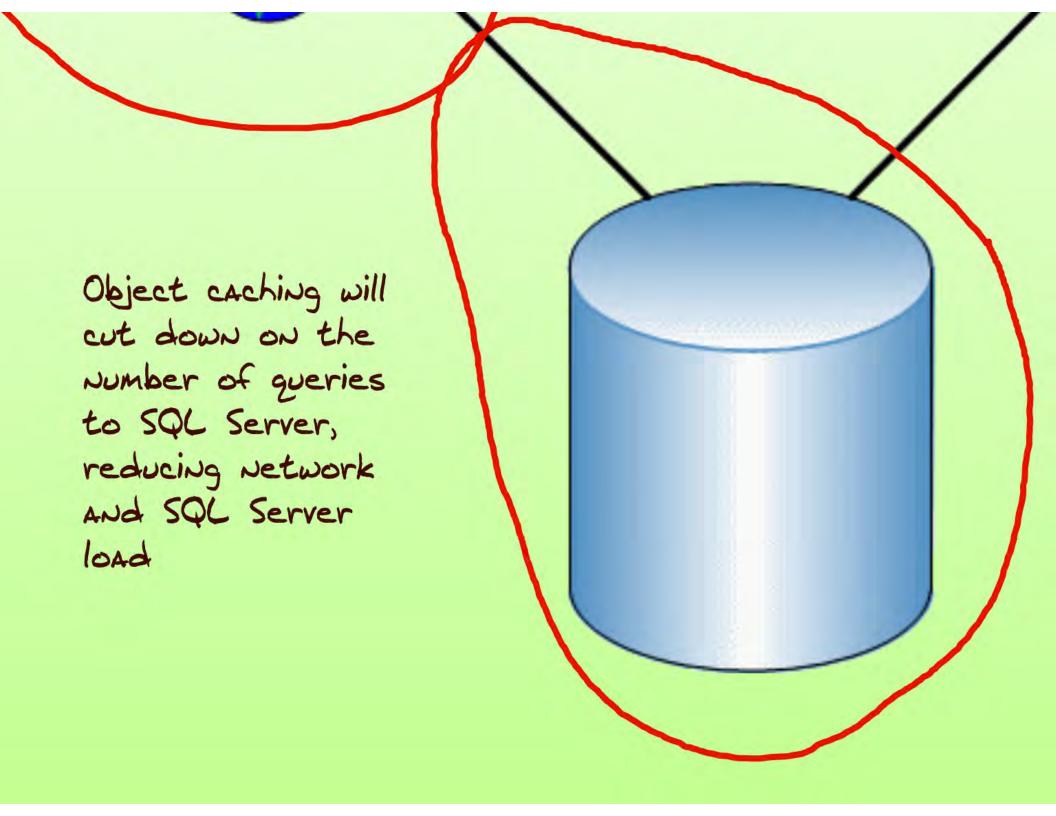
### Guidance

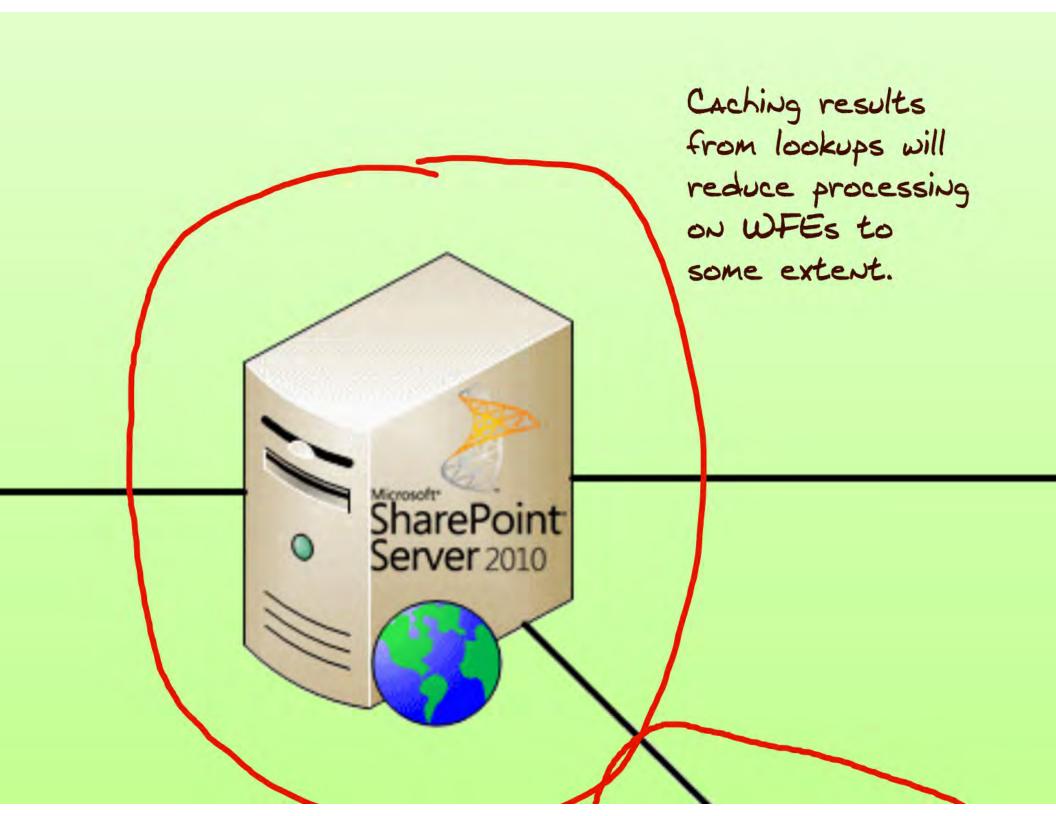
|                       | Anonymous | Authenticated   |
|-----------------------|-----------|---|
| Cache Duration        |           |   |
| Cross List Multiplier |           |   |
|                       |           | Especially if per-site  and per-item security  is prevalent |

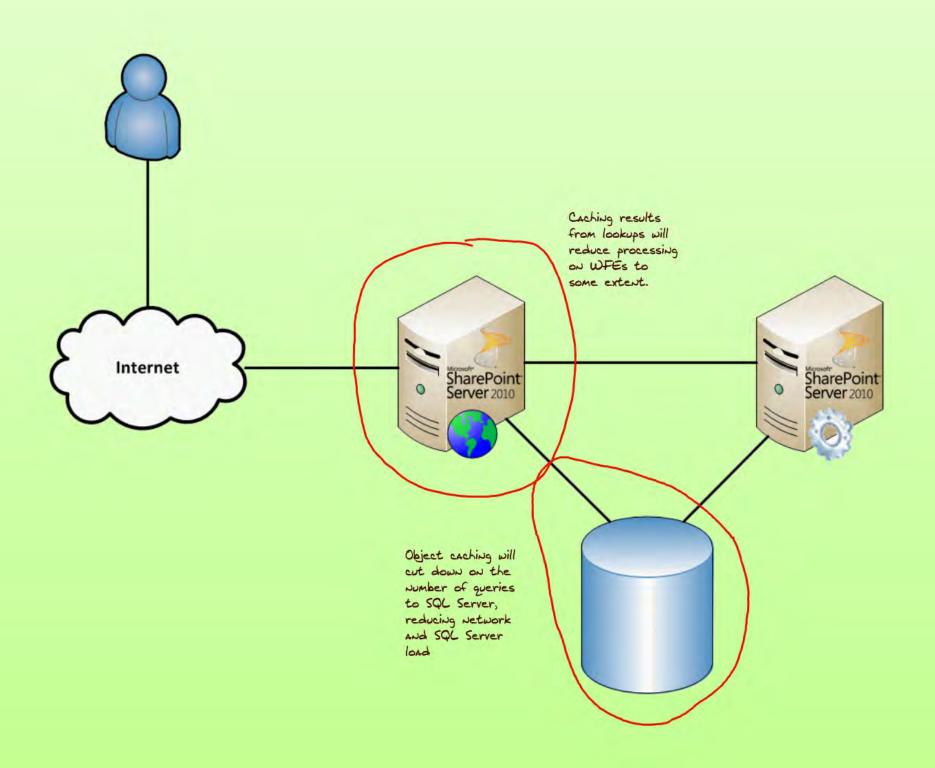












Current problem with SharePoint 2010

#### Current problem with SharePoint 2010

Object cache access accounts are configurable, but their defaults are particularly poor choices for most environments

- Portal Super User: System Account
- Portal Super Reader: NT Authority\Local Service

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- Portal Super User: System Account
- Portal Super Reader: NT Authority\Local Service

#### Problems this causes

- Checked-out items can be returned with System Account, forcing refetch of objects from the content database
- Access denied issues with claims-based authentication since NT Authority\Local Service account does not properly resolve

### Current problem with SharePoint 2010

Object cache access accounts are configurable, but their defaults are particularly poor choices for most environments

- Portal Super User: System Account
- Portal Super Reader: NT Authority\Local Service

### Problems this causes

- Checked-out items can be returned with System Account, forcing refetch of objects from the content database
- Access denied issues with claims-based authentication since NT Authority\Local Service account does not properly resolve

### The fix

 Use PowerShell to assign domain user accounts to each role and then specify web application policies for each account

# Next up ...

Next up ...



BLOB caching



## No, not that kind of BLOB

BLOB = binary large object



10110101 01101101 11110000

BLOB

VS





VS



Chews up database space

Consumes entire cities



VS



Chews up database space

Consumes entire cities

Hated by database admins

Bane of humanity



VS



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



VS



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 ...







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 ...





## No, not that kind of BLOB

BLOB = binary large object



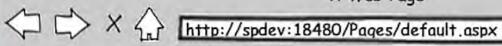


BLOB = binary large object



also known as "disk-based caching"

#### A Web Page







### My SharePoint Site

SPDC\me

Site Actions

Search this site ...

Top-Level Site > My SharePoint Site

#### Home

My SharePoint Site

Your SharePoint Site

Another Site

### Welcome Back, Bob!



uy static file type, ucluding Flash, PDF,



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.

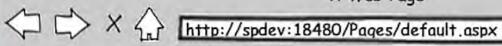
The weather started

Everything that's highlighted in



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

#### A Web Page







### My SharePoint Site

SPDC\me

Site Actions

Search this site ...

Top-Level Site > My SharePoint Site

#### Home

My SharePoint Site

Your SharePoint Site

Another Site

### Welcome Back, Bob!



uy static file type, ucluding Flash, PDF,



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The weather started

Everything that's highlighted in

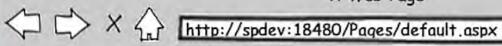


Caching can be extended to cover any static file type, including Flash, PDF, and other common web file types.

It is by w

It is by t

#### A Web Page







### My SharePoint Site

SPDC\me

Site Actions

Search this site ...

Top-Level Site > My SharePoint Site

#### Home

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The weather started

Everything that's highlighted in



Backed by disk



Backed by disk



Turned off by default



Backed by disk



Turned off by default



Default size or allocation

106B per 115 site (zone)

Backed by disk



Turned off by default



Default size or allocation

106B per 115 site (zone)

Controlled through web.config settings

```
A subjection of the property o
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                                           And worked the effective measurement of property and a second control of the effective measurement of t
                                           processing the second s
                                    Constitution of the analysis and the ana
                                                                 and before "an" suspen Collectio S. march, their indicates a fermion (1988) Subsected the Salary and the Salary
              The second secon
                                    The control of the co
                                           Control (1997) A 1997 (Control (1997)) A 1997 (Control
                                           The second of th
```

```
<Action id="0ff1ce14-1019-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro</p>
    <Action id="0ff1ce14-101a-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro</pre>
    <Action id="0ff1ce14-101b-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro</pre>
    <Action id="0ff1ce14-101c-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro</pre>
    <Action id="0ff1ce14-101d-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro</pre>
    <Action id="0ff1ce14-101e-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro</pre>
    <Action id="0ff1ce14-1020-0000-0000-0000000000000" sourceFile="C:\Program Files\Common Files\Micro</pre>
    <Action id="0ff1ce14-1021-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Micro</pre>
    <Action id="ec0076ac-0c35-4880-8422-8062f5925bec" sourceFile="C:\Program Files\Common Files\Micro</pre>
    <Action id="602bc8c3-9286-49a3-b973-3376ca78b297" sourceFile="C:\Program Files\Common Files\Micro</pre>
    <Action id="00e22a78-33ff-41ac-b0fb-ee46d1636e22" sourceFile="C:\Program Files\Common Files\Micro</pre>
    <Action id="4b60e42e-e6fc-4188-80d2-ef39e7cc0065" sourceFile="C:\Program Files\Common Files\Micro</pre>
    <Action id="1d415973-1146-4bc2-8324-83dfff5bfe33" sourceFile="C:\Program Files\Common Files\Micro</pre>
   THE PREMACTIONS
  <BlobCache location="C:\BlobCache\14" path="\.(gif|jpg|jpeg|jpe|jfif|bmp|dib|tif|tiff|ico|png|wdp|h</pre>
  <ObjectCache maxSize="100" />
  <OutputCacheProfiles useCacheProfileOverrides="false" varyByHeader="" varyByParam="*" varyByCustom=</pre>
  <RuntimeFilter Assembly="Microsoft.Office.Server, Version=14.0.0.0, Culture=neutral, PublicKeyToker</p>
</SharePoint>
<system.web>
  <securityPolicy>
    <trustLevel name="WSS Medium" policyFile="C:\Program Files\Common Files\Microsoft Shared\Web Serv</pre>
    <trustLevel name="WSS Minimal" policyFile="C:\Program Files\Common Files\Microsoft Shared\Web Ser</pre>
  </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 Attributes

### Default BlobCache Attributes

MOSS 2007

### Default BlobCache Attributes

### 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

## 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.

## 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 |  |

## 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 |  |
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### Common

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| 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 |

### Uncommon (as in "nearly never altered")

| changeCheckInterval | the interval (in seconds) for checks to content DBs for new(er) BLOB cache items (5s default)         |
|---------------------|---|
| policyCheckInterval | the interval (in seconds) on which the BLOB cache settings themselves will be re-parsed (60s default) |

DO NOT simply delete files out of the BLOB cache!

### Uncommo

changeCh

policyCh

#### 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                  |
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#### Uncommon (as in "nearly never altered")

| changeCheckInterval | the interval (in seconds) for checks to content DBs for new(er) BLOB cache items (5s default)         |
|---------------------|---|
| policyCheckInterval | the interval (in seconds) on which the BLOB cache settings themselves will be re-parsed (60s default) |

Now, for A word About the MAX-Age Attribute ...





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

| #        | Result | Protocol | URL                                     | Body    | Caching  | ME-INIET IL LI CERL                      |
|----------|--------|----------|---|---------|--|--|
| 54       | 200    | HTTP     | /SiteCollectionImages/common/content    | 79      | public, max-age=2232                                     | WinINET cache, Hold CTRL to<br>image/gif |
| 65       | 200    | HTTP     | /SiteCollectionImages/common/btnNoTh    | 2,112   | public, max-age=2478                                     | image/gif                                |
| 66       | 200    | НТТР     | /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    | НТТР     | /is/www.kroger.com?U=/SiteCollectionI   | 0       | max-age=0, no-cache, no-store Expires: Sun, 03 Apr 201   | inage/prig                               |
| 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=1432<br>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=307                                      | image/jpeg                               |
| 3 75     | 200    | HTTP     |   | 1917    |  | - 111 -                                  |
| 3 76     |        | HTTP     | /_layouts/1033/core.js?rev=mHKsOQ0i     | 265,384 | max-age=2908   | application/x-javascript                 |
|          | 200    |          | /style%20library/omniture/s_code_krog   | 20,172  | public, max-age=2590                                     | application/x-javascript                 |
| 77       | 200    | НТТР     | /SiteCollectionImages/common/closeBtn   | 879     | public, max-age=4795                                     | image/gif                                |
| 78<br>79 | 200    | НТТР     | /SiteCollectionImages/icons/icon_import | 1,287   | public, max-age=2785                                     | image/gif                                |
|          | 200    | НТТР     | //frame.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    | НТТР     | /adj/mwl.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=\$88                                     | image/gif                                |
| 983      | 200    | нттр     | /includes/css/iframe.css                | 1,603   | max-age=2592000 Expires: Tue, 03 May 2011 20:11:19 GMT   |  |
| 84       | 200    | HILL     | /images/generic_header.png              | 10,978  | max-age=2592000 Expires: Tue, 03 May 2011 20:11:16 GMT   |  |
| 85       | 200    | нттр     | /srv/upload_files/fea90f098a8b8d3401    | 5,744   | max-age=2592000 Expires: Tue, 03 May 2011 20:09:42 GMT   |  |
| 98       | 200    | HTTP     | /mages/coupon-pointer.png               | 1,952   | max-age=2592000 Expires: Tue, 03 May 2011 20:09:02 GMT   |  |
| 97       | 200    | НПТР     | /srv/upload_files/acdf9eb5cc1b4b75e4    | 5,985   | max-age=2592000 Expires: Tue, 03 May 2011 20:11:19 GMT   |  |
| 88       | 200    | HTTP     | /srv/upload_files/46263a8ea7a6c1251a    | 4,942   | max-age=2592000 Expires: Tue, 03 May 2011 20:11:19 GMT   |  |
| 89       | 200    | НТТР     | /srv/upload_files/5467f518013f109e51    | 5,241   | max-age=2592000 Expires: Tue, 03 May 2011 20:11:19 GMT   |  |
| ₫ 90     | 200    | НТТР     | /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    |         | public, max-age=1894                                     | image/jpeg                               |
| 94       | 200    | НПР      | /SiteCollectionImages/common/signinOv   | 594     | public, max-age=5181                                     | image/png                                |
| 95       | 200    | HILL     | /SiteCollectionImages/common/bgSignI    | 434     | public, max-age=5094                                     | image/gif                                |
| 96       | 200    | НТТР     | /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                                     | mage/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                                   | lmage/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/footerLi   | 54      | public, max-age=1035                                     | image/gif                                |
| 110      | 200    | HTTP     | /SiteCollectionImages/common/boxBott    | 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/krgrkrogerprod/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    | НТТР     | /b/ss/krgrkrogerprod/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: subseqent request (re-opened browser)

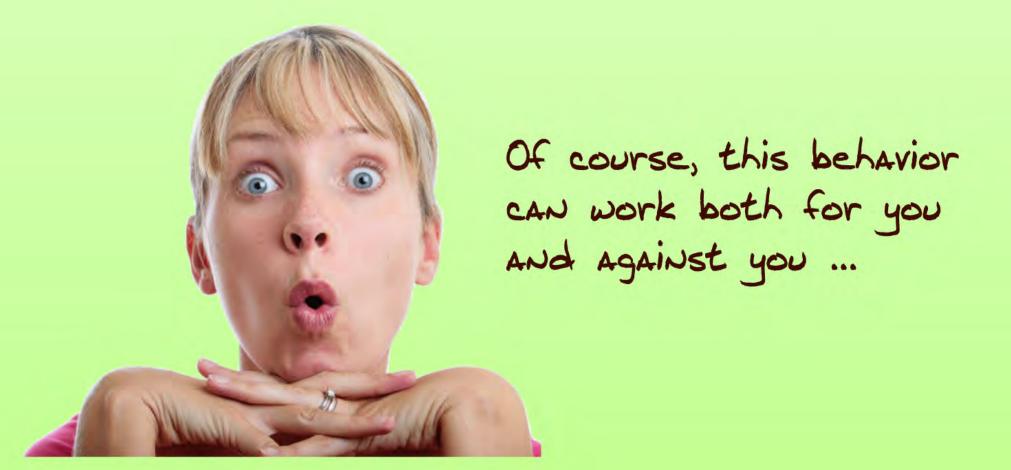
|            |        | Web <u>S</u> essions |                                      |        |  |                          |
|------------|--------|----------------------|--------------------------------------|--------|--|--------------------------|
| =          | Result | Protocol             | URL                                  | Body   | Caching  | Content-Type             |
| V 1        | 302    | HTTP                 | 1                                    | 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 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 |
| <b>9</b> a | 200    | HTTP                 | /b/ss/krgrkrogerprod/1/H.14/s2656257 | 43     | no-cache, no-store, must-revalidate, max-age=0, proxy-re | image/gif                |

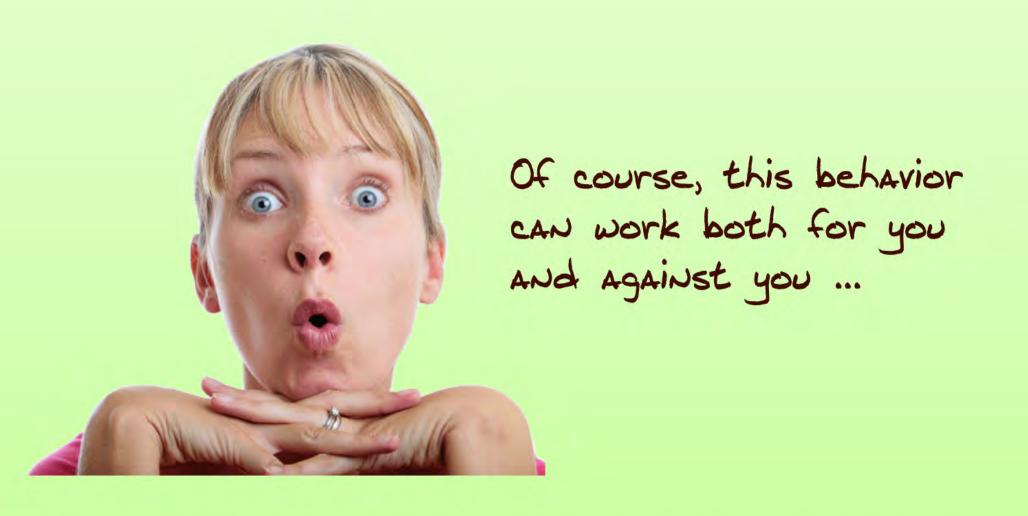
Only 4 requests needed to load the page

#### max-age in action: subseqent request (re-opened browser)

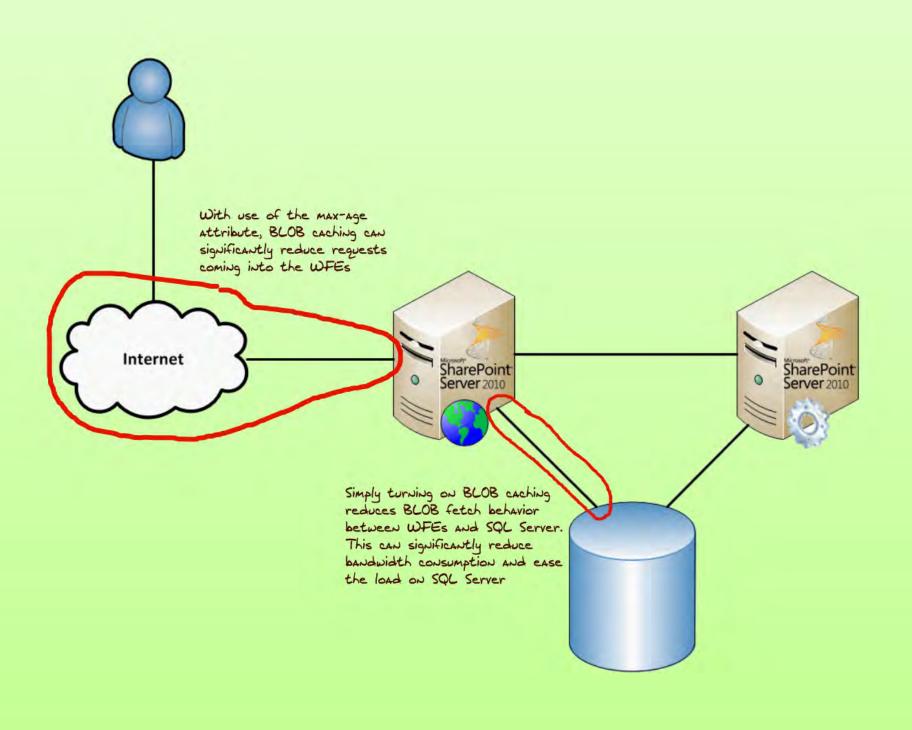


Only 4 requests needed to load the page



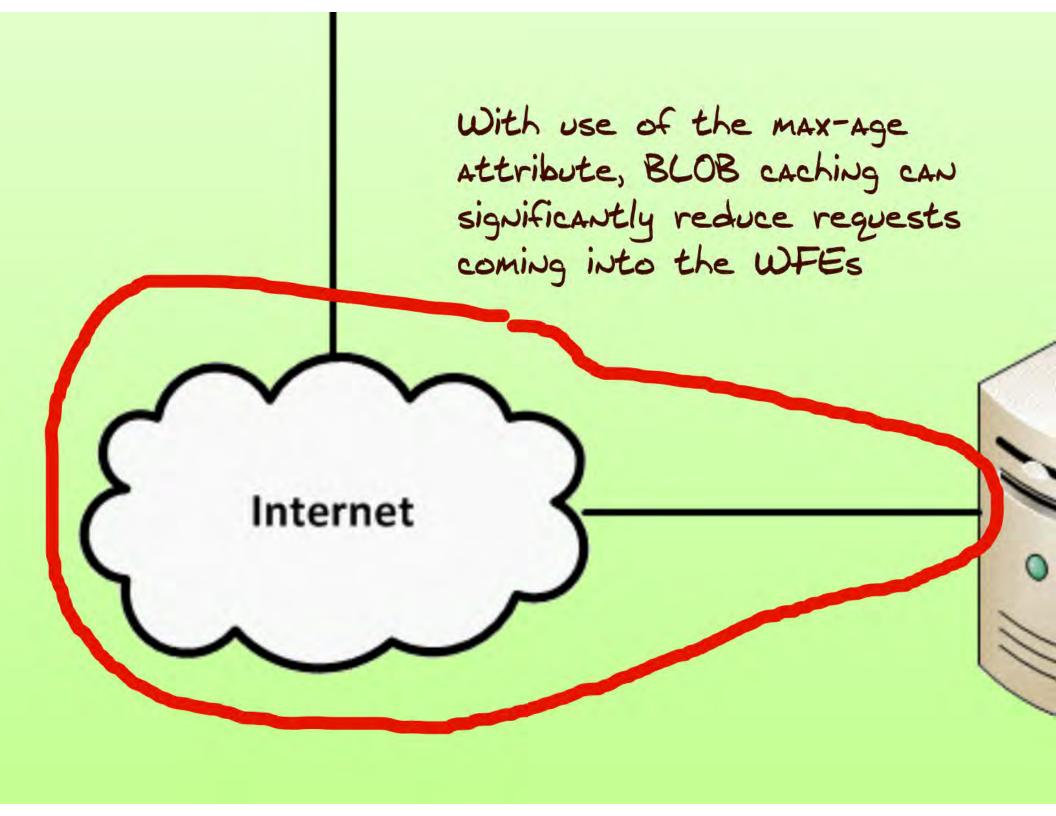


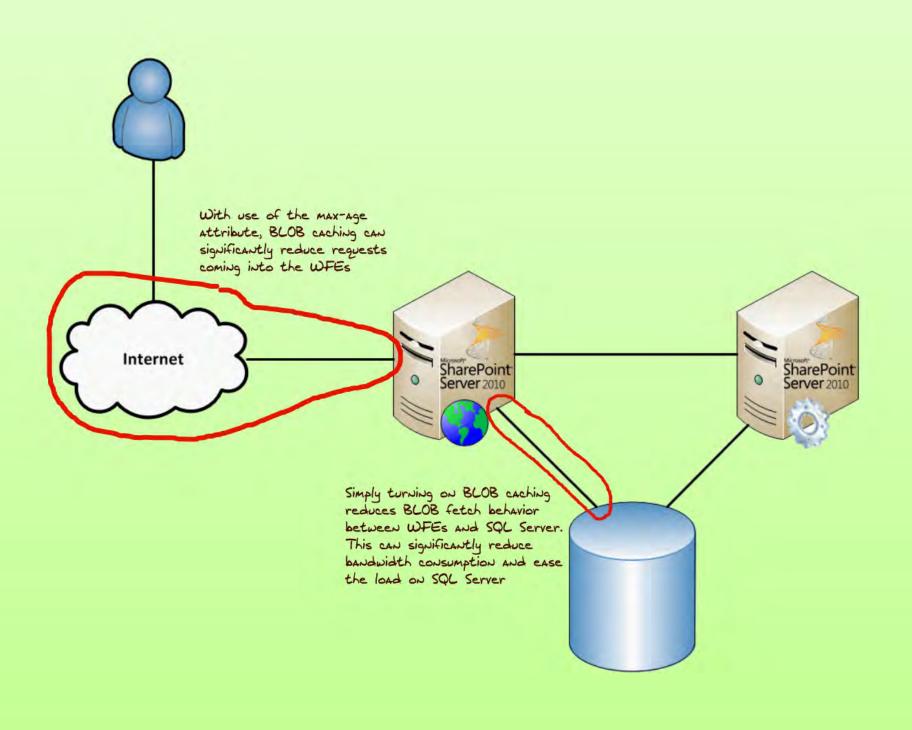
If you don't want persistent client-side caching, be sure to specify a max-age value of zero (0). If you don't specify a value, the default is 86,400 seconds (24 hours).





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





## Next up...

### Next up...



# Page output caching

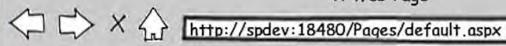
## Next up...



# Page output caching

piggybacks on ASP.NET output caching

#### A Web Page







#### My SharePoint Site







I'll talk about the reason for highlighting this a little later. For Now, though, we'll just say "it isn't covered by page

output caching."

Top-Level Site > My SharePoint Site



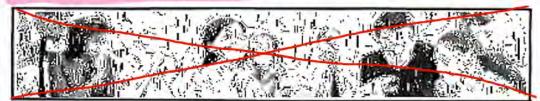
#### Home

My SharePoint Site

Your SharePoint Site

Another Site

Welcome Back, Bob!



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



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

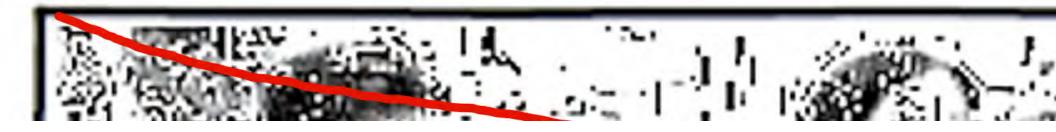
It's easier to simply put red X's through the content and items that Aren't covered by page output caching.

## int Site

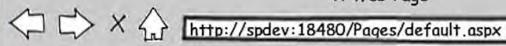
I'll talk about the reason for highlighting this a little later. For now, though, we'll just say

"it isn't covered by page output caching."

### Welcome Back, Bob!



#### A Web Page







#### My SharePoint Site







I'll talk about the reason for highlighting this a little later. For Now, though, we'll just say "it isn't covered by page

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Top-Level Site > My SharePoint Site



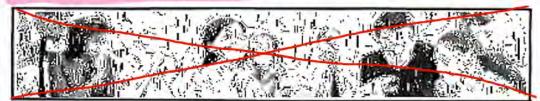
#### Home

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Your SharePoint Site

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The weather started

Backed by memory



Backed by memory



Turned off by default



Backed by memory



Turned off by default



Default size or allocation

None\*

Backed by memory



Turned off by default (thankfully)



Default size or allocation

None\*

A New trick that comes with SharePoint 2010 ...

```
| March | Total and | March | Total and | March | Marc
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```

```
ACCION IN- DISTORTA-IDIC-0000-0000-0000000000 SOURCESITE- C. (FLOSIGN) II
    <Action id="0ff1ce14-101d-0000-0000-000000000000" sourceFile="C:\Program Fi</pre>
    <Action id="0ff1ce14-101e-0000-0000-00000000000" sourceFile="C:\Program Fi</pre>
    <Action id="0ff1ce14-1020-0000-0000-00000000000" sourceFile="C:\Program Fi</pre>
    <Action id="0ff1ce14-1021-0000-0000-00000000000" sourceFile="C:\Program Fi</pre>
    <Action id="ec0076ac-0c35-4880-8422-8062f5925bec" sourceFile="C:\Program Fi</pre>
    <Action id="602bc8c3-9286-49a3-b973-3376ca78b297" sourceFile="C:\Program Fi</pre>
    <Action id="00e22a78-33ff-41ac-b0fb-ee46d1636e22" sourceFile="C:\Program Fi</pre>
    <Action id="4b60e42e-e6fc-4188-80d2-ef39e7cc0065" sourceFile="C:\Program Fi</pre>
    <Action id="1d415973-1146-4bc2-8324-83dfff5bfe33" sourceFile="C:\Program Fi</pre>
  </MergedActions>
  <BlobCache location="C:\BlobCache\14" path="\.(gif|jpg|jpeg|jpe|jfif|bmp|dib|
  (ObjectCache maxSize="100" />
 <OutputCacheProfiles useCacheProfileOverrides="false" varyByHeader="" varyByP</pre>
  <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>
```

```
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```

# 

## S0...

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



The Page Output Cache is like a big lookup table

## 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 page that is rendered has no bearing on how items are cached or served from cache. Each bade request is These characterist.

## 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, it 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 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

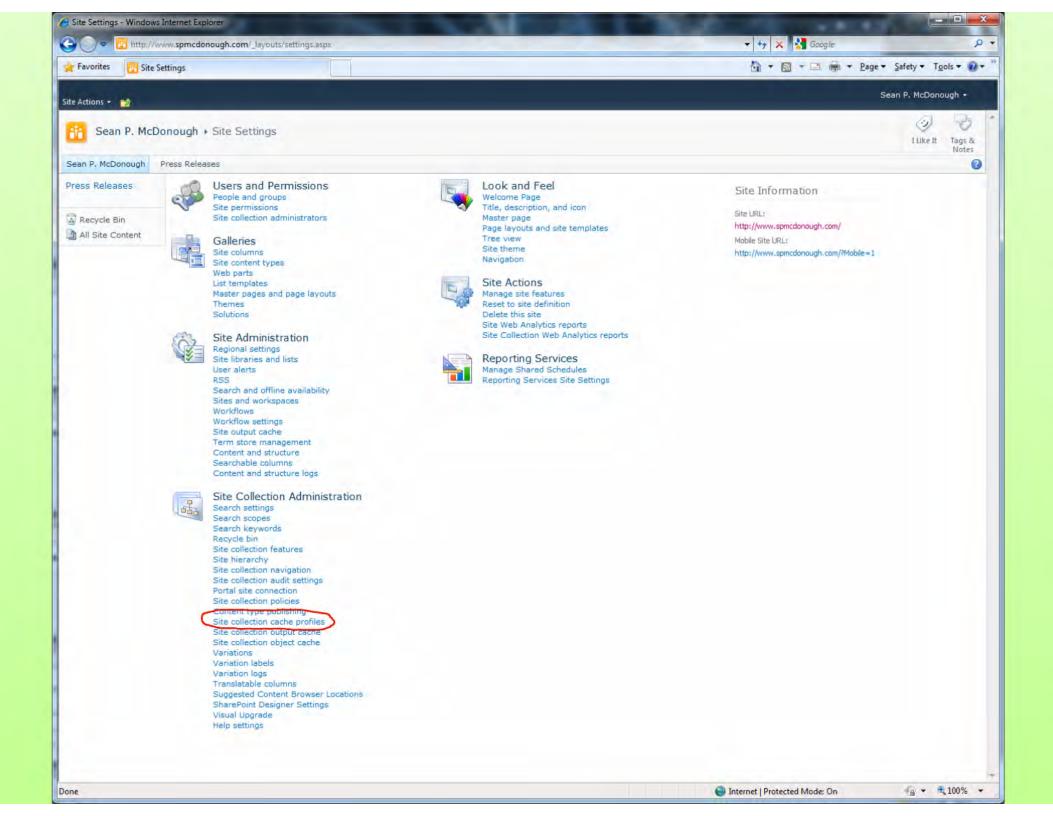
- If a page with the same key is found, it is returned from the cache.
- If no match is made, the page is rendered and served back. It is then cached for subsequent requests until it is expired out of the cache or ejected for other reasons.

The trick is to balance profile granularity against memory consumption

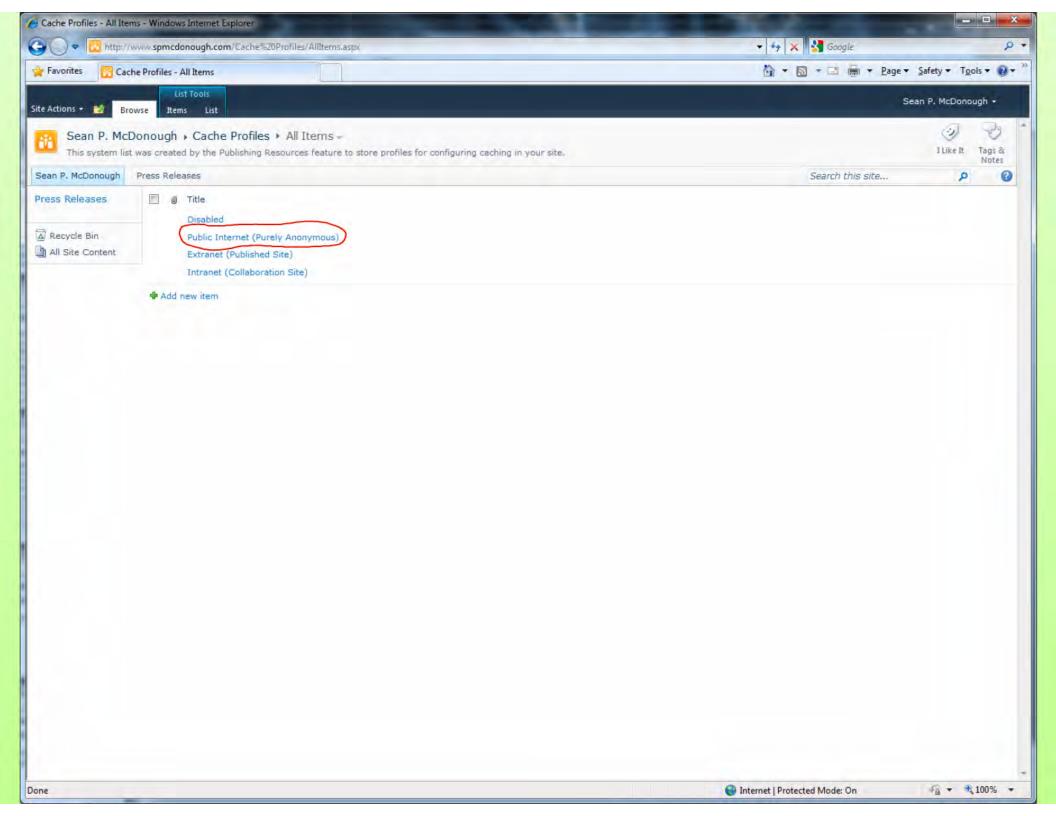
# Configuring Page Output Caching



A quick tour

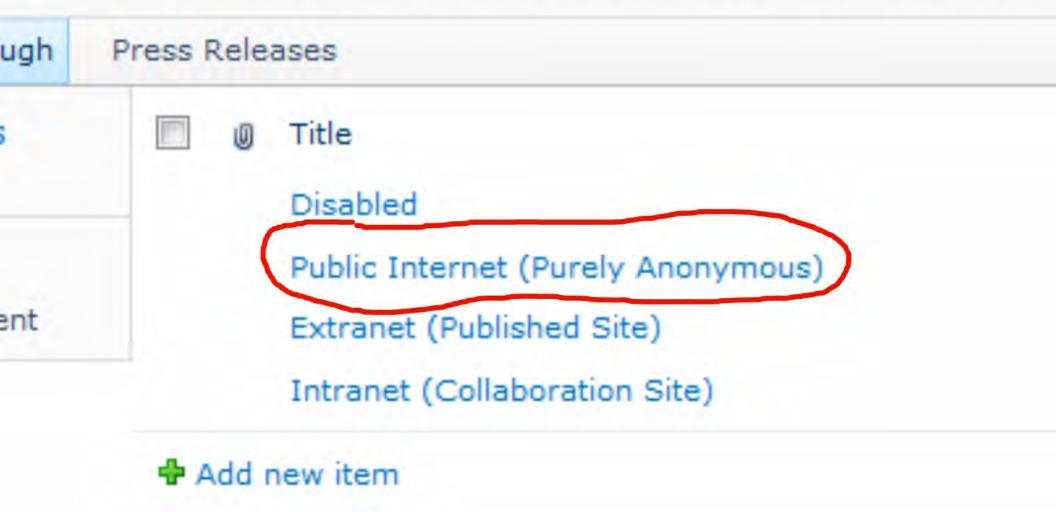


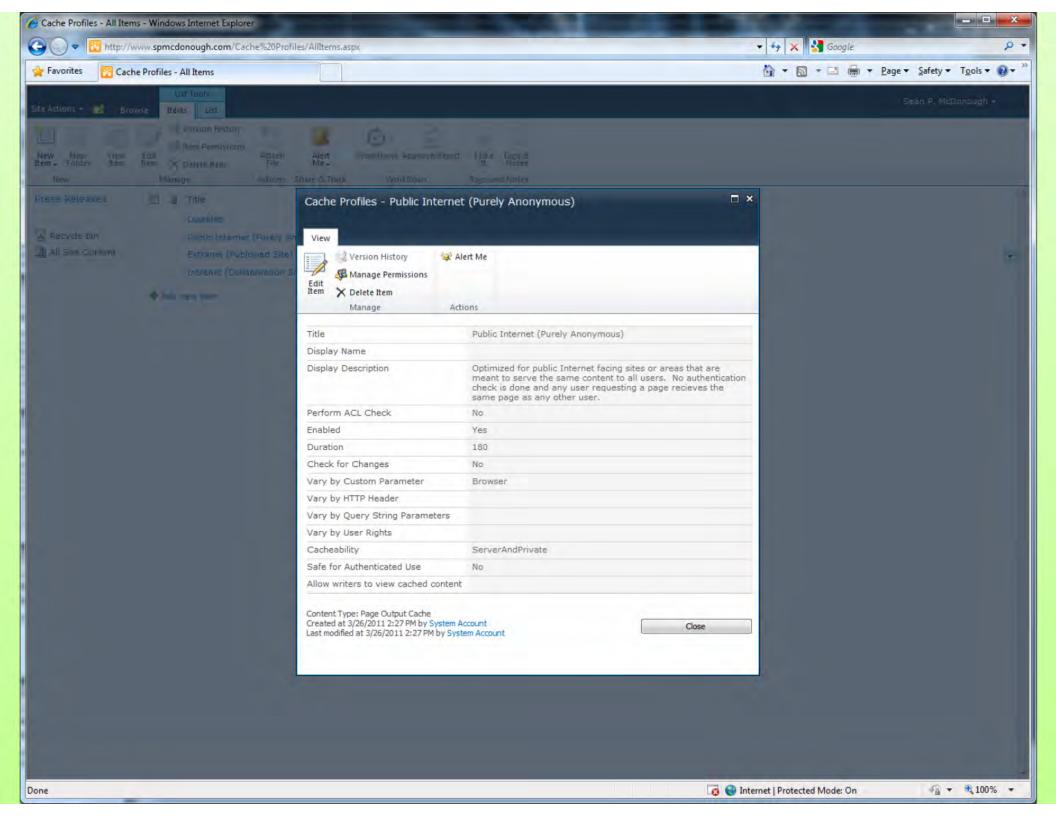
RECYCLE DILL Site collection features Site hierarchy Site collection navigation Site collection audit settings Portal site connection Site collection policies Content type publishing Site collection cache profiles Site collection output cache Site collection object cache Variations Variation labels Variation logs Translatable columns Suggested Content Browser Locations SharePoint Designer Settings

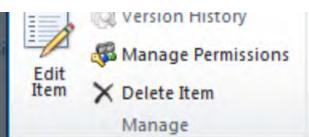


#### . McDonough ▶ Cache Profiles ▶ All Items ▼

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







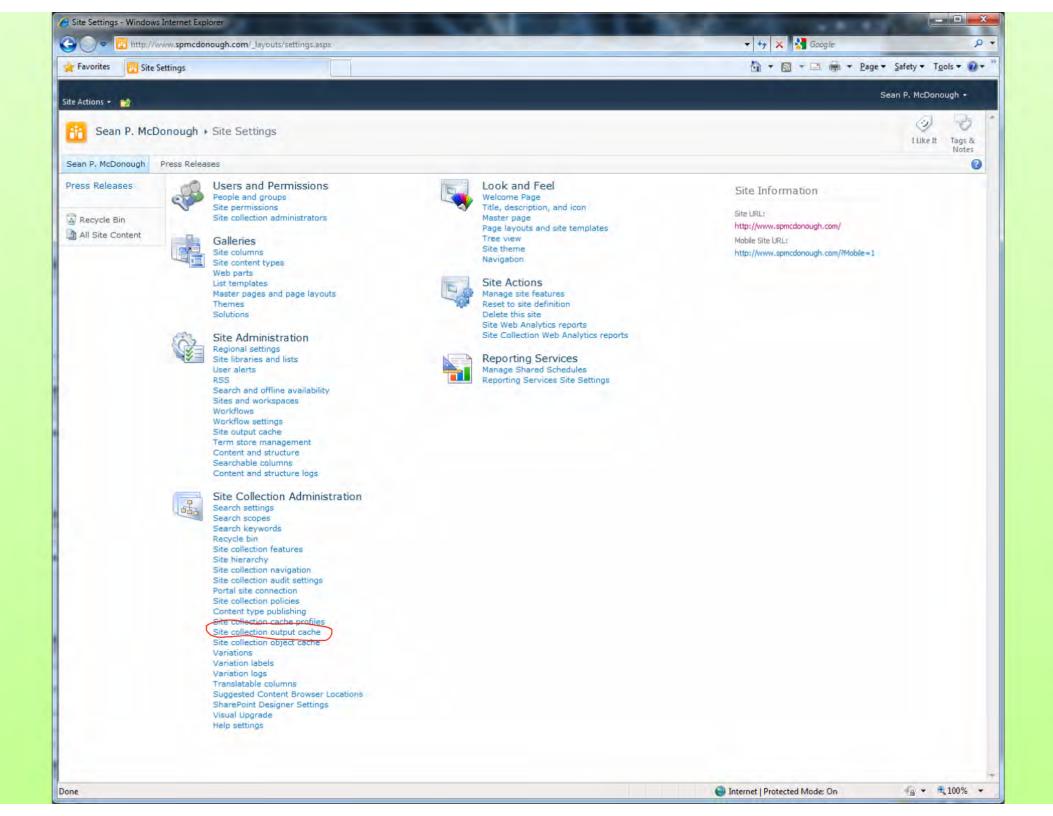
Actions

'Alert Me

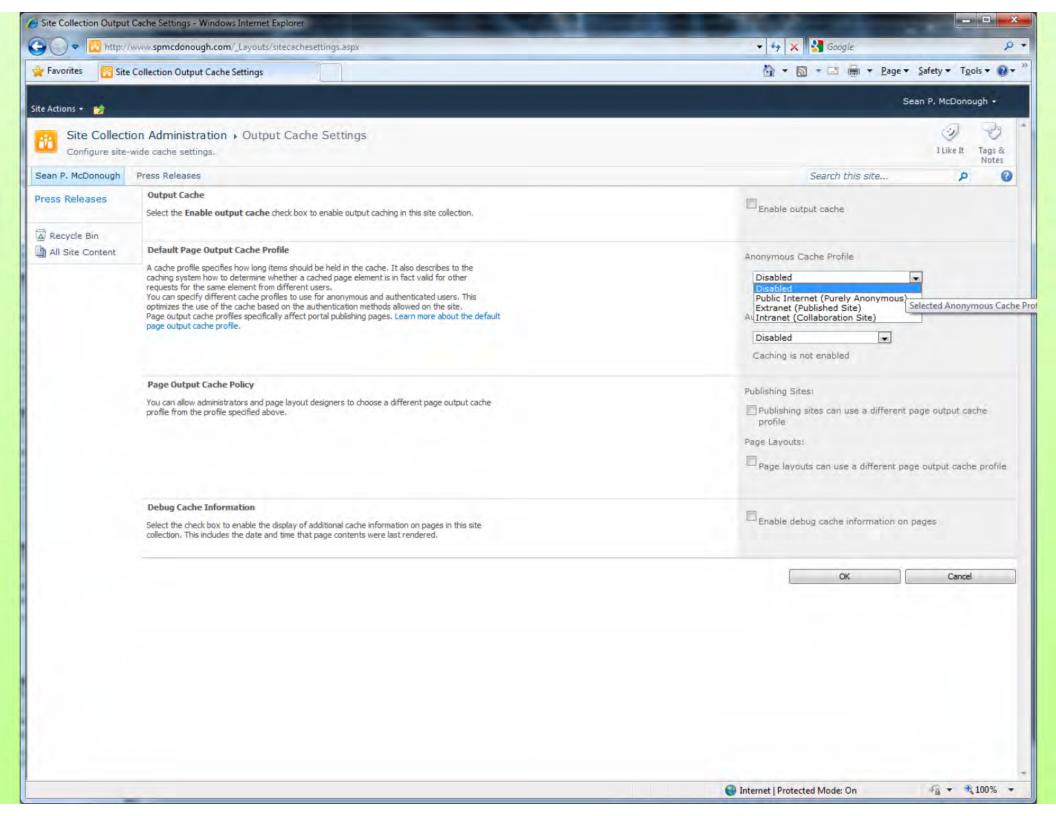
| Title                                | Public Internet (Purely Anonymous)  |  |
|--------------------------------------|---|--|
| Display Name                         |   |  |
| Display Description                  | Optimized for public Internet facing sites or areas that are meant to serve the same content to all users. No authentication check is done and any user requesting a page recieves 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

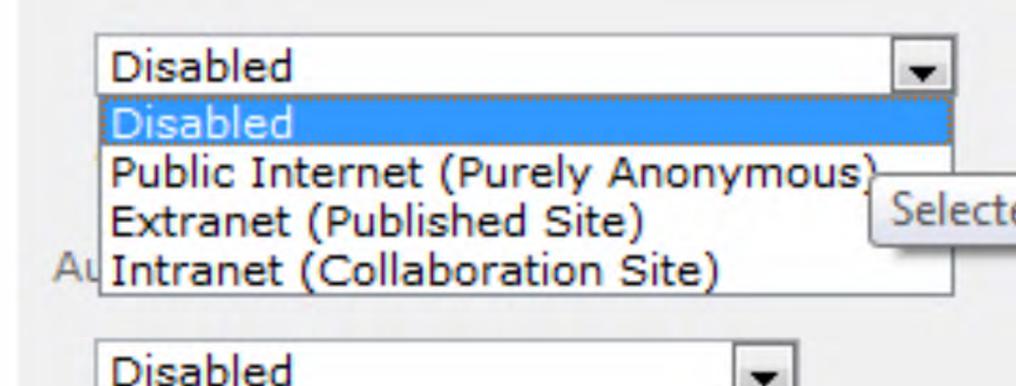
Constant at 2/26/2011 2:27 DM his Custom Assessed



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 Cuganeted Content Promon



#### Anonymous Cache Profile



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 pr

| Page layouts can use a different page | e output cache p |
|---------------------------------------|------------------|
| Enable debug cache information on p   | ages             |
| OK OK                                 | Cancel           |

#### Search this site.

Enable output cache

Anonymous Cache Profile



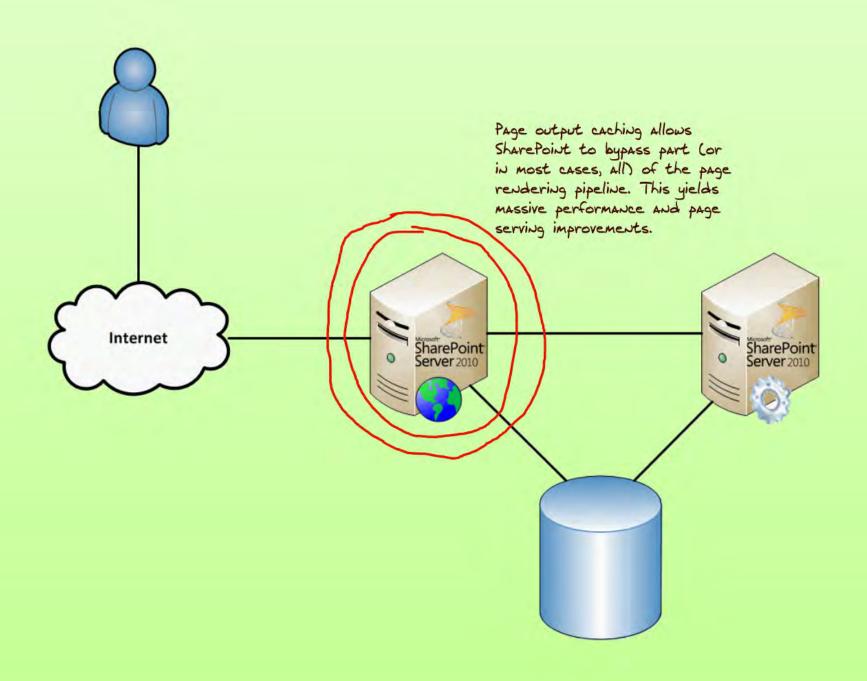
You really, really, \*really\* need to do concurrent multi-user testing with your caching settings!

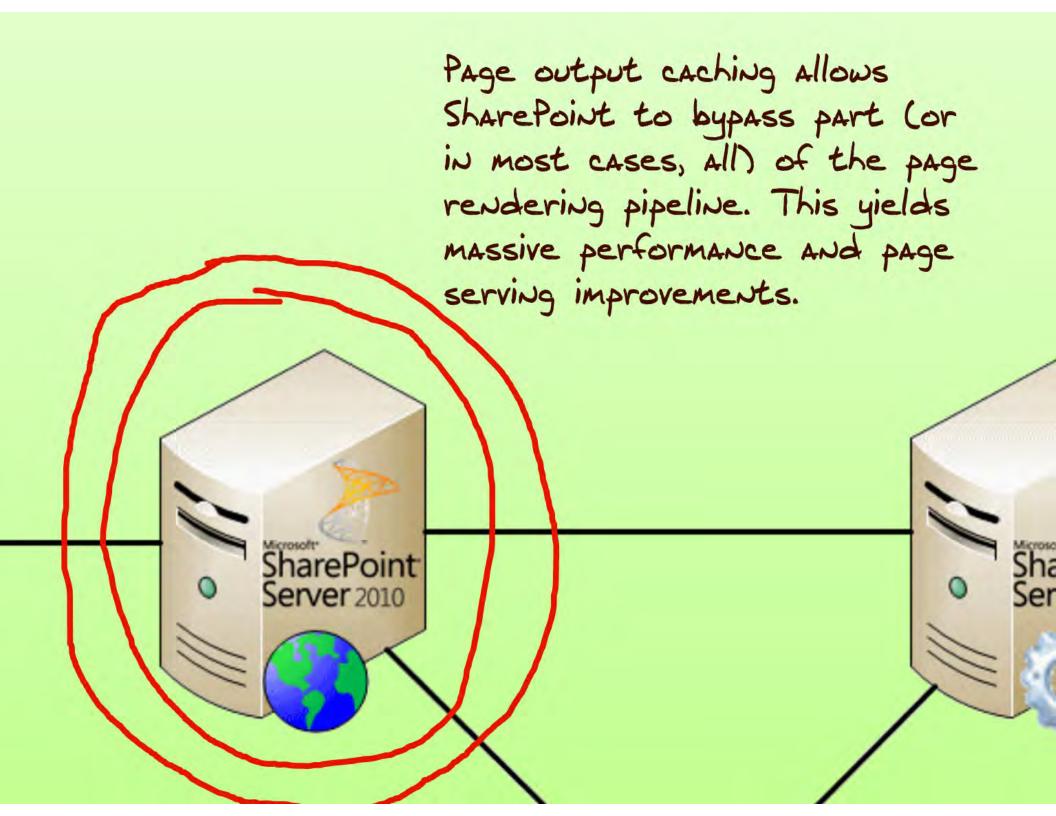


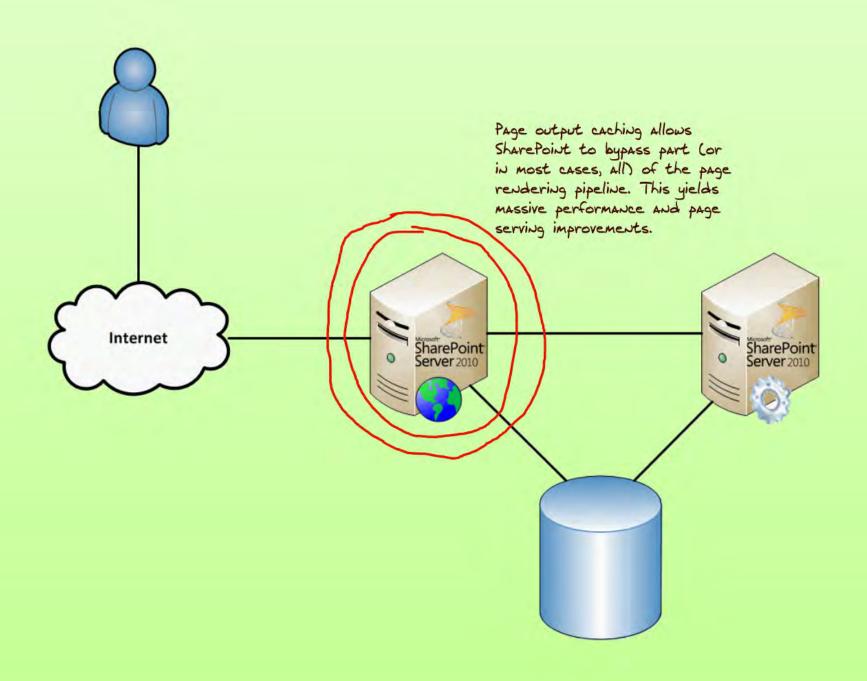
You really, really, \*really\* need to do concurrent multi-user testing with your caching settings!



Do you sense a story coming?







## And finally

## And finally



# Office Web Apps Cache



SharePoint 2010 Only!

## SharePoint 2010 Only!





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

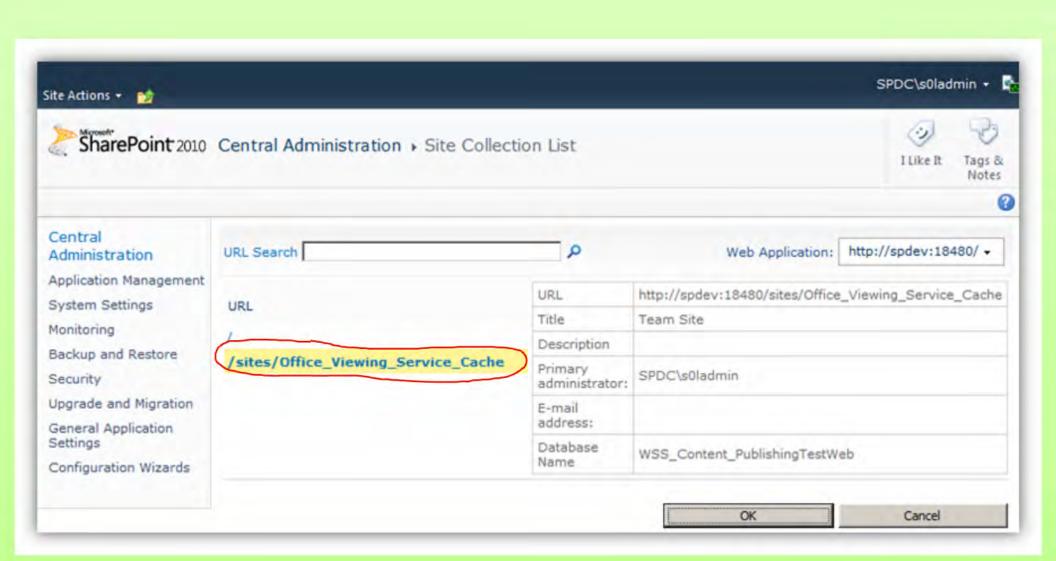
## SharePoint 2010 Only!

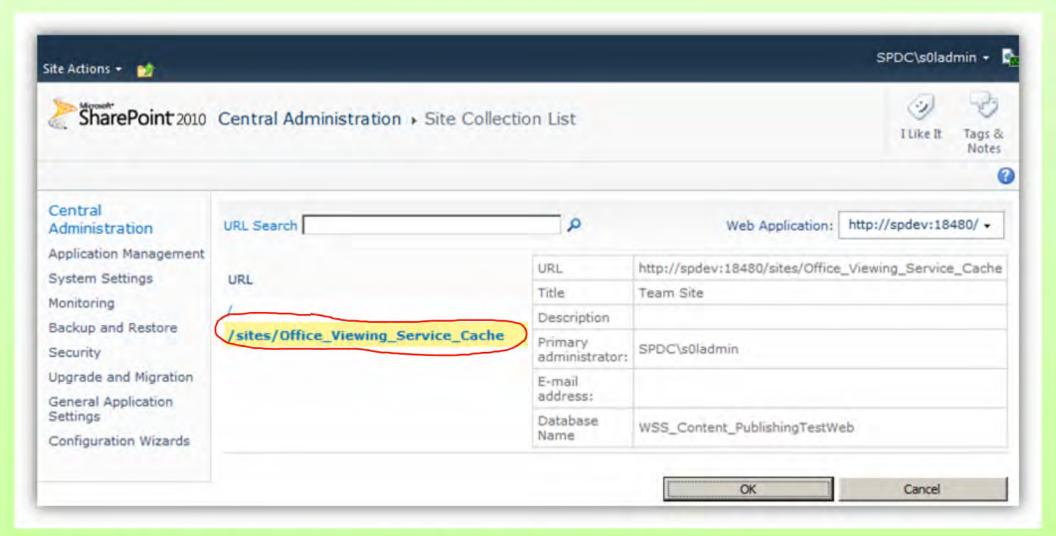




Houses images, XAML (eXtensible Application Markup Language), etc, that is generated so documents can be viewed and edited via browser.

How it works under the hood ...





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



Get friendly with Set-OfficeSPWebAppsCache PowerShell cmdlet



Get friendly with Set-OfficeSPWebAppsCache PowerShell cmdlet

relocate cache to a dedicated content DB



Get friendly with Set-OfficeSPWebAppsCache PowerShell cmdlet

- relocate cache to a dedicated content 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 ...

re/ocate increase ca applications decrease ca applicat.



Get friendly with Set-OfficeSPWebAppsCache PowerShell cmdlet

- relocate cache to a dedicated content 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

permissions to content DBs (service app acct)!





Don't panic - just for fun!

## Object caching

## Object caching

Action

Cache size reduced (significantly) below 100MB

Potential Result

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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

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### What to Watch

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

### Observation

A publishing site is established in a Web application that is using claims-based authentication. "Access Denied" errors keep appearing - even for site administrators.

### Potential Cause

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The default Portal Super User and Portal Super Reader
 Object Cache accounts are in-use for the Web application

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A publishing site is established in a Web application that is using claims-based authentication. "Access Denied" errors keep appearing - even for site administrators.

#### Potential Cause

The default Portal Super User and Portal Super Reader
 Object Cache accounts are in-use for the Web application

### What You CAN DO

 Set up new user accounts, establish Web application policies for those accounts, and run some simple PowerShell commands to map the accounts.

### Observation

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

### Potential Cause

### 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

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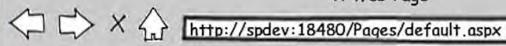
#### Potential Cause

 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)

#### A Web Page







#### My SharePoint Site







I'll talk about the reason for highlighting this a little later. For Now, though, we'll just say "it isn't covered by page

output caching."

Top-Level Site > My SharePoint Site



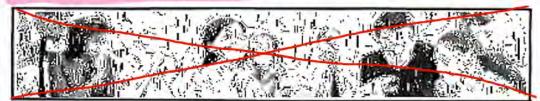
#### Home

My SharePoint Site

Your SharePoint Site

Another Site

Welcome Back, Bob!



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



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

#### Observation

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

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### Observation

Memory consumption of ASP.NET worker process grows significantly over time; performance may deteriorate.

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 Page output caching profile is overly granular and too many pages are being cached causing excessive memory load.

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Memory consumption of ASP.NET worker process grows significantly over time; performance may deteriorate.

### Potential Cause

 Page output caching profile is overly granular and too many pages are being cached causing excessive memory load.

### What You CAN DO

- Adjust caching profiles if possible to reduce page load.
- Selectively disable caching for highly varying sub-sites.
- Adjust cache element values in web.config that controls ASP.NET worker process (e.g., privateBytesLimit attribute)

### Observation

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

### Potential Cause

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### Potential Cause

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

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Path property is set correctly, location is set correctly, 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.

### Observation

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

Potential Cause

### 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.

### 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

Caching in Office SharePoint Server 2007

http://technet.microsoft.com/en-us/library/cc298466(office.12).aspx

Configure cache settings for a Web application (SharePoint Server 2010) <a href="http://technet.microsoft.com/en-us/library/cc770229.aspx">http://technet.microsoft.com/en-us/library/cc770229.aspx</a>

Configure object cache user accounts

http://technet.microsoft.com/en-us/library/ff758656.aspx

Disk-Based Caching for Binary Large Objects

http://msdn.microsoft.com/en-us/library/aa604896.aspx

Flush the BLOB cache (SharePoint Server 2010)

http://technet.microsoft.com/en-us/library/gg277249.aspx

Manually Clearing the MOSS 2007 BLOB Cache

http://sharepointinterface.com/2009/10/30/manually-clearing-the-moss-2007-blob-cache/

MOSS 2007 Farm-Wide BLOB Cache Flushing Solution

http://blobcachefarmflush.codeplex.com/

Client-Server Interactions and the max-age Attribute with SharePoint...

http://sharepointinterface.com/2011/02/21/client-server-interactions-and-the-max-age-attribute-with-sharepoint-blob-caching/

Manage the Office Web Apps cache http://technet.microsoft.com/en-us/library/ee837422.aspx

Quick Tips for Managing the SharePoint 2010 Office Web Apps' Cache <a href="http://www.idera.com/News/Newsletters/Quick-Tips-for-Mnging-SP2010-Office-Web-Apps-Cache.pdf">http://www.idera.com/News/Newsletters/Quick-Tips-for-Mnging-SP2010-Office-Web-Apps-Cache.pdf</a>

MOSS Object Cache Memory Tuning is not an Intuitive Process
<a href="http://sharepointinterface.com/2009/08/30/moss-object-cache-memory-tuning-is-not-an-intuitive-process/">http://sharepointinterface.com/2009/08/30/moss-object-cache-memory-tuning-is-not-an-intuitive-process/</a>

cache Element for caching (ASP.NET Settings Schema)
http://msdn.microsoft.com/en-us/library/ms228248.aspx



## Sean P. McDonough

Blog: http://SharePointInterface.com

Email: sean@SharePointInterface.com

LinkedIn: http://www.linkedin.com/in/smcdonough

Twitter: @spmcdonough



SharePoint 2007 Disaster Recovery Guide http://tinyurl.com/SPDRGuide2007



SharePoint 2010 Disaster Recovery Guide http://tinyurl.com/SPDRGuide2010

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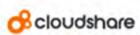


KOFAX



SHARE

















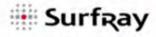








OPENTEXT



































































SharePoint Eng









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Presenter: Sean McDonough

Session Name: "Caching-In" for SharePoint Performance

Session No.: Sat-S1A-102

