

"Caching-In" for SharePoint Performance

*@spmcdonough
on Twitter
for heckling
purposes!*



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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

okay ...

Why I



catching

okay ...

Why I



catching

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

okay ...

Why I



caching

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

okay ...

Why I



caching

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

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

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

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 got sick AND
tired of hearing some
people complain that
SharePoint didn't scale!!!

So, what is caching?

Webster's
New World[™]
Dictionary



Third College Edition

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

ca-ble (kə'bal) *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 —*vi.* to send a cablegram

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

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

cable-cast (kə'bal kast') *vt.* **-cast, -casting** to transmit directly to receivers by means of coaxial cable —*n.* a program that is broadcast —*ca-ble-cast'er* *n.*

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

cable-laid (kə'bal laid) *adj.* made of three or four plain-laid ropes twisted together from right to left

cable length a unit of nautical measure equal to 720 feet (120 fathoms or 219 m) or, in British usage, 600 feet (100 fathoms or 183 m) or 607.6 feet (¾ 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 (kəb'mən) *n.*, *pl.* **-men** (-mən) CABDRIVER

ca-bob (kə'bɒb) *n.* KEBAB

cab-o-chon (kəb'əʃən; Fr *kə bô shôn'*) *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-bom-ba (kə'bɒmbə) *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** (kə'bʊdʌl) *n.* [*ca-*, colloq. intens. prefix (< ? Ger *ge-*) + *boodle*] [*Colloq.*] lot; group (the whole *caboodle*)

ca-boose (kə'bʊs) *n.* [MDu *kabys*, *kambuis* (< ?), ship's galley] **1** [Brit.] *Naut.* a ship's kitchen; *gambuis* ***2** the trainman's car on a freight train, usually at the rear

Cab-ot (kəb'ət) **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

cab-o-tage (kəb'ətɪdʒ) *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-bre-tta (kə'bret'ə) *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-bril-la (kə'brɪlə) *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 (kə'brɪni), Saint Francis Xavier (called *Mother Cabrini*) 1850-1917; U.S. nun, born in Italy: first U.S. citizen canonized; her day is Dec. 22

cab-ri-ole (kə'brɪəl) *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-ri-ole (kə'brɪəl) *n.* [Fr, dim. of *cabriole*, a leap, caper < It *capriolo*, CAPRIOLE] **1** a light two-wheeled carriage, usually with a hood that folds, drawn by one horse **2** a former style of automobile like a convertible coupe

cab-stand (kəb'stænd) *n.* a place where cabs are stationed for hire

ca- (kək) combining form **CA-** used before a vowel

ca-ca or **ca-ca** (kə'kə) *n.* [Slang] excrement; feces:



CABLE



CABRIOLET

cacao butter COCOA BUTTER

ca-cia-to-ire (kə'ʃeɪə tɔɪə) *adj.* [It, lit., hunter < pp. of *cacciare*, hunt, chase < VL **capitare*, to catch] cooked in a casserole with olive oil and tomatoes, onions, spices, wine, etc. [chicken *cacciatore*]

ca-ch-a-lot (kash'ə lət, -lɔt) *n.* [Fr < Sp *cachalote* < colloq. *ca-chalote*, head] SPERM WHALE

ca-che (kə'sh) *n.* [Fr < Gr *καχέω*, conceal < VL **caeticare*, store, collect, compress < L *cautare*, constrain < *caetus*, sp. of *cooper*; collect; see COAGENT] **1** *Chem.* in which a substance is stored

ca-che-pot (kash'pɒt, pɔt) *n.* [Fr < *cacher*, to hide (see prec.) + *pot*] a decorative pot, jar, etc., used esp. for holding potted houseplants Also *cache pot*

ca-che-sexe (kə'sh'seks) *n.* [Fr < *cacher*, to hide (see CACHER), *sex*, sex] a small cloth or band worn, as by an otherwise nude dancer, to conceal the genitals

ca-chet (kə'shət, kə'sh'ə) *n.* [Fr < *cacher*; see CACHER] **1** a seal or stamp on an official letter or document; see also LETTRE DE CACHET **2** any sign of official approval **3** a mark or sign showing something is genuine, authentic, or of superior quality **4** distinction or prestige **4** *Philately* a commemorative design on an envelope that marks some historical or philatelic event **5** a little, round water-enclosing a bad-tasting medicine —*vt.* *Philately* to print a cachet on (an envelope)

ca-chex'ia (kə'kɛks'ə) *n.* [ModL < Gr *kachexia*, bad habit of body] < *kakos*, bad + *hexis*, habit < *ecthen*, to have < IE base **seh₂-*, to hold fast, conquer > SCHEME] a generally weakened, emaciated condition of the body, esp. as associated with a chronic illness Also *ca-chex'y* (-sē) —*ca-chex'ic* (-kɛk'tɪk) or *ca-chex'ic* (-kɛk'tɪk) *adj.*

cach-in-nate (kə'kʌn'neɪt) *vi.* **-nated, -nating** [*<* L *caclinnatus*, pp. of *caclinnare*: ult. of echoic orig.] to laugh loudly or too much

ca-ch'in-na-tion *n.*

ca-chou (kə'shəʊ) *n.* [Fr < Port *cachu* < Malayalam *kaču*, akin to Tamil *kaču*] **1** CATECHU **2** a lozenge for sweetening the breath

ca-chu-cha (kə'shəʊ'ʃa) *n.* [Sp] **1** an Andalusian dance in 4/4 time, like the bolero **2** music for this

ca-ci-que (kə'sɪk) *n.* [Sp < Arawak word meaning "prince," "lord"] **1** a) in Spanish America, an Indian chief **b**) in Spanish America and Spain, a local political boss **2** any of various tropical American blackbirds (family Icteridae) with conical bills —*ca-ci-que-rism* *n.*

cack-hand-ed (kək'hænd'ɪd) *adj.* [Brit. Colloq.] left-handed **2** clumsy; awkward

cackle (kək'əl) *vi.* **-led, -ling** [ME *caekelen*; akin to Du *caekelen*, LowG *kakkeln* < IE base **kak-*; of echoic orig.] **1** to make the shrill, broken vocal sounds of a hen **2** to laugh or chatter with similar sounds —*vt.* to utter in a cackling manner —*n.* **1** the act or sound of cackling **2** cackling laughter **3** idle or silly chatter —*ca-cle* [Brit. Colloq.] to stop talking and settle down to serious efforts

CACM Central American Common Market

ca-co- (kək'ə-, ə) [*<* Gr *kakos*, bad, evil] **combining form** bad, painful, harsh [ca-cography]

ca-co-demon or **ca-co-dæ-mon** (kək'ə dɛ'mən) *n.* [Gr *kakō-daimōn*; see prec. & DEMON] an evil spirit or devil

ca-co-dyl (kək'ə dɪl, kək'ə) *n.* [*<* Gr *kakhdōlos*, bad-smelling] *kakos*, bad + *-dōlos* < IE base **od-*, to smell > ODOR, OZONRI + *-yl*, *Chem.* the radical As(CH₃)₂, composed of arsenic and methyl groups; compounds are poisonous and foul-smelling **2** a poisonous, colorless liquid, As₂(CH₃)₂, with an offensive odor; it is a polymer of this radical —*ca-co-dyl'ic* (-dɪl'ɪk) *adj.*

ca-co-ethes (kək'ə eθ'ɛz) *n.* [*<* Gr *kakōēthēs* < *kakos*, bad + *ēthos*, habit; see ETHICAL] a hankering (to do something); mania

ca-co-gra-phy (kə'kɑgrə'fɪ) *n.* [CACO- + -GRAPHY] **1** bad handwriting **2** incorrect spelling —*ca-co-graph'ic* (kək'ə grə'fɪk) or *ca-co-graph'ic-ally* *adj.*

***ca-co-mis-tle** (kək'ə mɪs'əl) *n.* [AmSp *acomistle* < Nahuatl *ca-cō-mis-tli* < *ca-cō*, half + *mis-tli*, cougar] **1** a slender, long-tailed, raccoonlike carnivore (*Bassarictes astutus*) of the SW U.S. and Mexico **2** its fur Also *ca-co-mis'tle* (mɪs'əl, mɪk'səl)

ca-co-pho-ny (kə'kɒfə'nɪ) *n.*, *pl.* **-nies** [prob. via Fr *cacophonie* < ML *cacophonia* < Gr *kakophōnia* < *kakophōnos*, harsh-sounding] *kakos*, bad, evil + *phōnē*, voice; see PHONO-] harsh, jarring sound; dissonance —*ca-co-pho'nic* (-nɪs) *adj.* —*ca-co-pho'nic-ly* *adv.*

ca-cus (kək'tʌs) *n.*, *pl.* **-tuses** or **-ti** (tɪ) [ModL < Gr *kakos*, bad + *-tus*, ear] any desert plants of the cactus family, native to the New World, with fleshy stems, reduced or spine-like leaves, and often showy flowers —*adj.* designating a family (Cactaceae) of dicotyledonous plants (order Caryophyllales), including the prickly pear, saguaro, and cereus

ca-cu-mi-nal (kə'kju:mɪnəl) *adj.* [*<* L *caecumen* (gen. *caecumini*) top < redupl. of IE base **keu-*; see HIGH] + *-al*] *Phonet.* pronounced with the tip of the tongue turned backward and upward against or toward the hard palate —*n.* a cacuminal sound

cad (kəd) *n.* [*<* CADDIE & CADET] **1** a man or boy whose behavior is not gentlemanly. Word originally applied to servants, then to army cadets

only esp. of a person; corpse, as for dissection —*SYN.* BODY —*ca-dav'er-ic* *adj.*

ca-dav'er-ic (-ar'ɛv-, -ar'ɪn) *n.* [prec. + -INE²] a colorless, putrid-smelling, liquid pitomane, NH₂(CH₂)₂NH₂, produced by the action of microorganisms on proteins, as in decaying flesh

ca-dav'er-ous (-ar'əs) *adj.* [L *cadaverosus*] of or like a cadaver; esp., pale, ghastly, or gaunt and haggard —*ca-dav'er-ous-ly* *adv.* —*ca-dav'er-ous-ness* *n.*

CAD-AM- (kəd'kəm') *n.* [C(omputer-)A(ided) D(esign)/M(anufacturing)] **1** a computer system used in engineering, combining design techniques and manufacturing principles, as in the creation of complex wiring diagrams, the design of coordinated machine parts, etc.

cad-die (kəd'ɪ) *n.* **1** CADDIS² **2** CADDIS²

cad-die (kəd'ɪ) *n.* [Scot form of Fr *cadet*; see CADET] **1** orig., an errand boy **2** a person who attends a golfer, carrying the clubs, finding the balls, etc. **3** a small, two-wheeled cart, as for carrying golf bags —*vi.* **-died, -dying** to act as a caddie

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

cad-dis or **cad-dice** (kəd'ɪs) *n.* CADDIS WORM

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

cad-dish (kəd'ɪʃ) *adj.* like or characteristic of a cad; ungentlemanly —*cad-dish-ly* *adv.* —*cad-dish-ness* *n.*

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

Caddo (kəd'ə) *n.*, *pl.* **-does, -dicos, -do** [Louisiana Fr *Cadaux*, shortened < Sp *Caddoquadocho* < Caddo *kaduḥḥá-ḥu?*, name of a major group of the Caddo confederacy] **1** a member of any of a group of North American Indian peoples formerly living in Louisiana, Arkansas, and E Texas, now living mainly in Oklahoma **2** the Caddoan language of these peoples

Cad-doan (-ən) *n.* [coined (1891) by J. W. Powell < prec. + -AN] a family of North American Indian languages, including Caddo, Pawnee, and Arikara

cad-dy (kəd'ɪ) *n.*, *pl.* **-dies** [*<* earlier *CATTY*² < Malay *kattī*, weight equivalent to a little more than a pound] **1** a small container used for tea **2** any of various devices for holding or storing certain articles, as phonograph records

cad-dy (kəd'ɪ) *n.*, *pl.* **-dies** a CADDIE

cad-dy (kəd'ɪ) *adj.* [LMBE, a pet] [untended by its mother and brought up by a human being, often as a cat, *fa cadé* lamb]

ca-de' (kəd) *n.* [Fr < Prov < LL *catena*, prob. < Gaul] a bushy Mediterranean juniper (*Juniperus oxycedrus*) whose barklike oil dissimilar from the wood is used in the treatment of skin disorders

ca-delle (kə'del) *n.* [Fr < Prov *cadello* < L *catella*, fem. of *catellus*, whip, pup] < IE base **kat-*, to bear young > ON *hathna*, young woman; the larva or adult of a small, shiny, black beetle (*Tenebroides*) whose larvae are harmful to grain

ca-den-ce (kəd'ns) *n.* [ME < OFr < OIt *cadenza* or ML *cadentia* < *cadens*, pp. of *cadere*, to fall; see CASE²] **1** fall of the voice in speaking **2** inflection or modulation in tone **3** any rhythmic flow of sound **4** measured movement, as in dancing or marching, or the beat of such movement **5** *Music* a series of notes or chords at the end of a phrase, section, or composition which indicates a partial or complete conclusion Also *ca-den'cy* (-n'sē) —*ca-den'ced* (-'nst) or *ca-den't* (-'nt) *adj.*

ca-den-za (kə'dɛnzə) *n.* [It; see CADENCE] **1** an elaborate, often improvised musical passage played unaccompanied by the solo instrument in a concerto, usually near the end of the first or the second movement **2** any brilliant flourish in an aria or solo passage

ca-de't (kə'dɛt) *n.* [Fr, younger son < Gascon *capdet*, captain, chief] a younger son or brother **2** [Historical] a younger son who accompanied a gentleman volunteer in the army to offset his lack of money **3** a student in training at an armed forces academy **4** a business associate ***6** (Old Slang) a pimp —*ca-de't-ship* *n.*

ca-de'tte (kə'dɛt') *n.* [prec. + -ETTE] a member of the division of Girl Scouts for girls twelve to fourteen years of age. In full *cadette*

cad-g'er *vt.* *vi.* **-ged, -gading** [*<* ?] to beg or get by begging; *cad-g'er* *n.*

cad-i- (kəd'ɪ) *n.* [Ar *qādī*] a minor Muslim magistrate

ca-di- (kəd'ɪ) *n.* [Colloq.] something that is the most luxurious or highest quality of its kind

ca-di- (kəd'ɪ) *n.* [E kad'ɪ] *Sieur Antoine de la Mothe* (fl. top < redupl. of IE base **keu-*; see HIGH) + *-al*] *Phonet.* pronounced with the tip of the tongue turned backward and upward against or toward the hard palate —*n.* a cacuminal sound

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

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* (-mɪk) *adj.*

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

Cad-mus (kəd'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

ca-dre (kə'drɛ, -drā; also, kə'ɪ-) *n.* [Fr, a frame < It *quadro* < L *quadrum*, a square; see QUADRATE] **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-ceus (kə'dʊ'seəs, -dʊv'ə-) *n.*, *pl.* **-cei** (-sɛɪ) [L; *via* Etr < Gr (Doric) *karykeion*, for *karykeion* < *keryx*, herald < IE base **kar-*, to praise > OHG *hrum*, Ger *ruhm*] **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'ce-an* *adj.*

ca-du-city (kə'dʊ'sɪ-ti, -dʊv'ə-) *n.* [Fr *caducité* < LL *caducitas* < L *caducus*; see fol.] **1** the quality or state of being perishable **2** senility

ca-du-cous (-kəs) *adj.* [L *caducus*, falling < *cadere*, to fall; see CASE²] *Bot.* falling off early, as some leaves

cae-cil-ian (sɛ'sɪl'ən, -sɪl'yən) *n.* [*<* ModL < L *caecilia*, kind of lizard < *caecus*; see CECUM] any of an order (Gymnophiona) of legless tropical amphibians resembling worms

cae-cum (sɛ'kəm) *n.*, *pl.* **-ca** (-kə) CECUM

Caed-mun (kəd'mən) *n.* late 7th cent. A.D.; first Eng. poet whose name is known

Cael-lan (sɛ'l'ən, sɛl'yən) [after L *Caetius Mons*, Caelian hill, named after the Tuscan *Caesles Vibenna*] see SEVEN HILLS OF ROME

Cael-um (sɛ'ləm) a small S constellation between Columba and Eridanus

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

Caer-nar-von-shire (kær'nər'vɒn'shɪr-, -shər) former county of NW Wales, now part of Gwynedd; also **Caer-nar-von**

caes-al-pin'ia (sɛzəl'pɪn'ɪə, sɛs'-) *adj.* designating a family (Caesalpinaceae) of leguminous trees and shrubs, including the Kentucky coffee tree

Caes-ar (sɛ'zər) *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 dictator

Caes-ar (sɛ'zər), (Gaius) Julius [L *Caesar*, said to be < <

cacao butter COCOA BUTTER

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

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

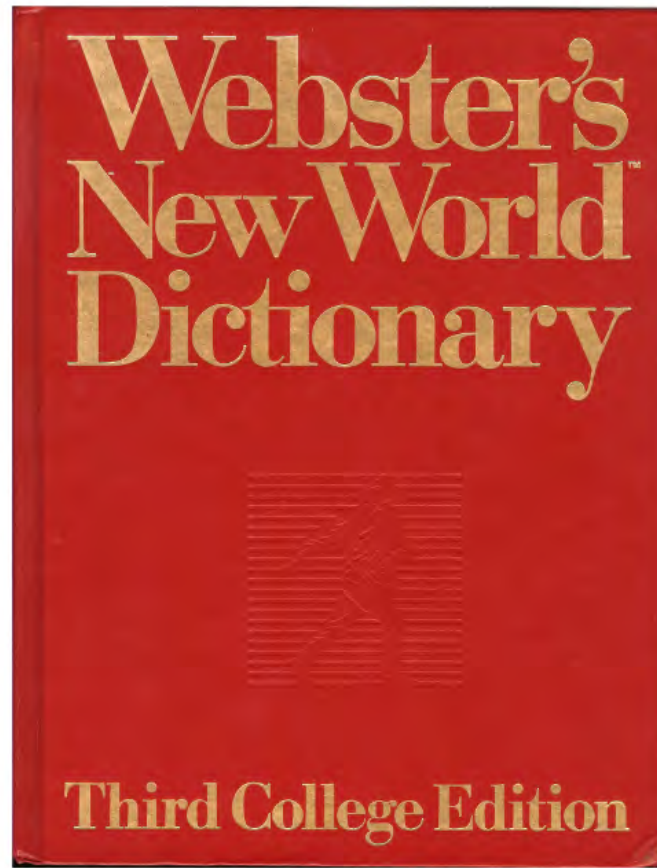
cache (kash) *n.* [[Fr < *cache*, conceal < VL **coacticare*, store up, collect, compress < L *coactare*, constrain < *coactus*, pp. of *cogere*, to collect: see COGENT]] **1 a place in which stores of food, supplies, etc.**

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

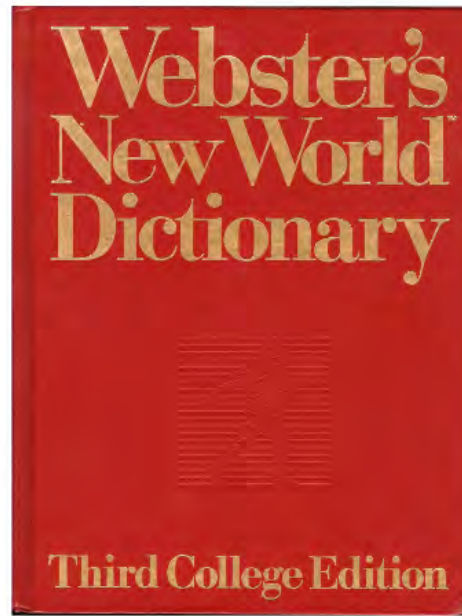
cache·pot (kash'pät, -pō') *n.* [[Fr < *cache*, to hide (see prec.) + *pot*, POT¹]] a decorative pot, jar, etc., used esp. for holding potted house plants Also **cache pot**

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

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



Ok, so this is the dictionary I took to college ... AND THAT WAS OVER 25 YEARS AGO.



Ok, so this is the dictionary
I took to college ... AND THAT
WAS OVER 25 YEARS AGO.

Clearly a more contextually
appropriate definition is needed

Cache:
what is it?

disk-based caching

in-memory cache

virtual memory

ICP

page output cache

Web Part
caching

post-cache substitution

Cache:

what is it? App Fabric

HTCP

Distributed Cache CARP

browser cache

Office viewing service cache

buffer

cacheability headers

object cache

BLOB cache

fragment caching



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



Option 1: Place data on a faster medium



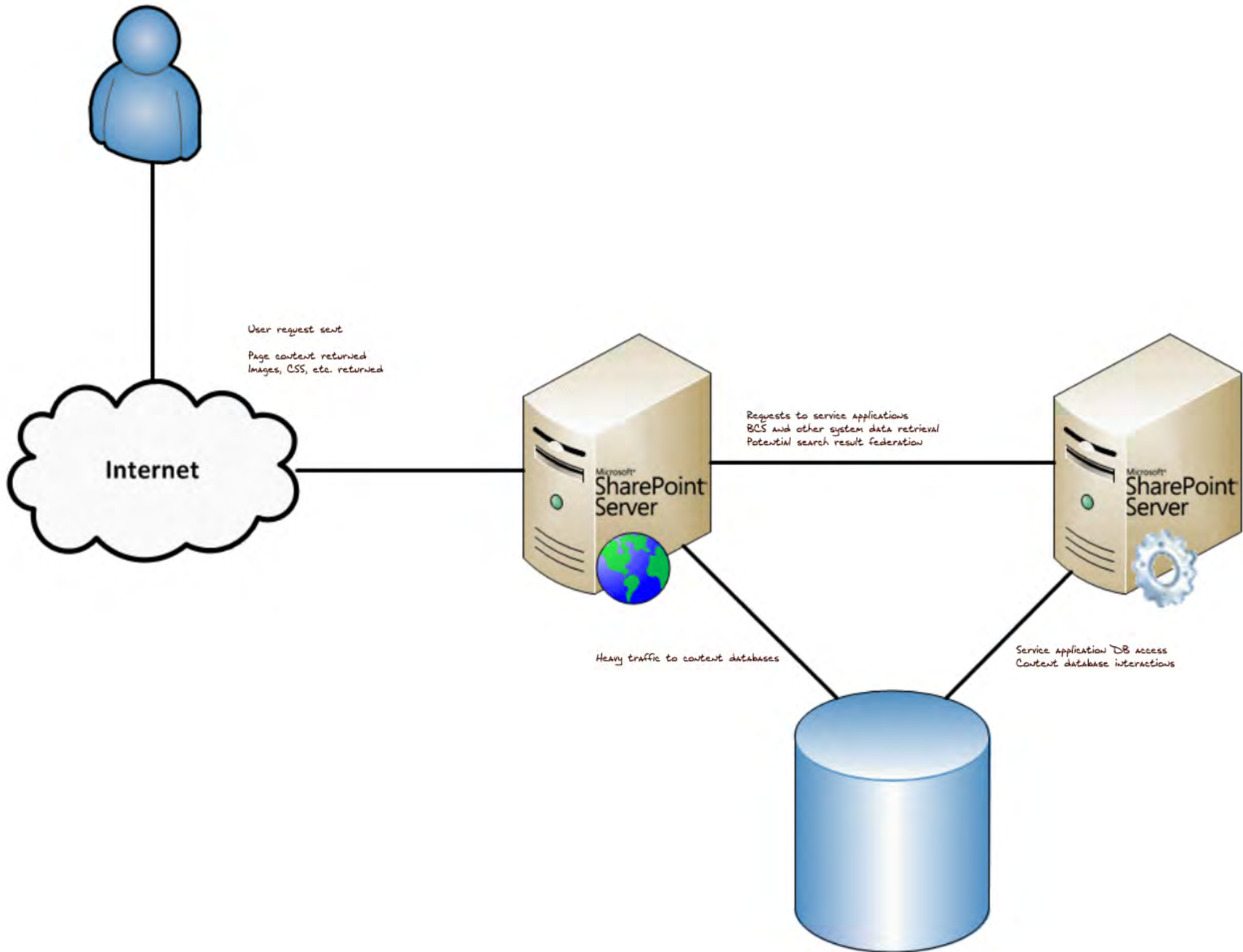


Option 2:
place data
closer to the
point of usage



Why?

or at least "why for SharePoint?"





User request sent

Page content returned

Images, CSS, etc. returned

Internet



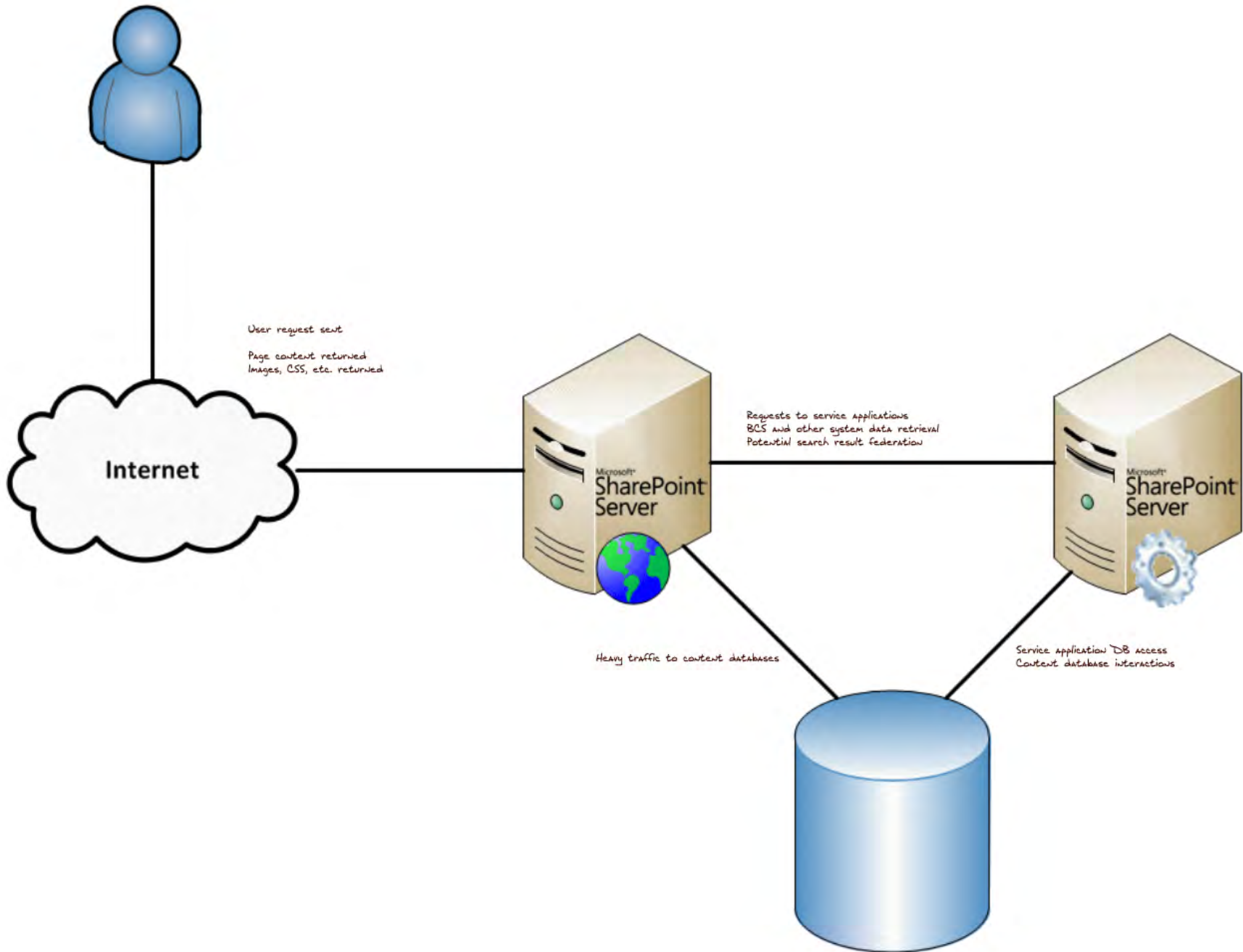
Heavy traffic to content databases

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

int



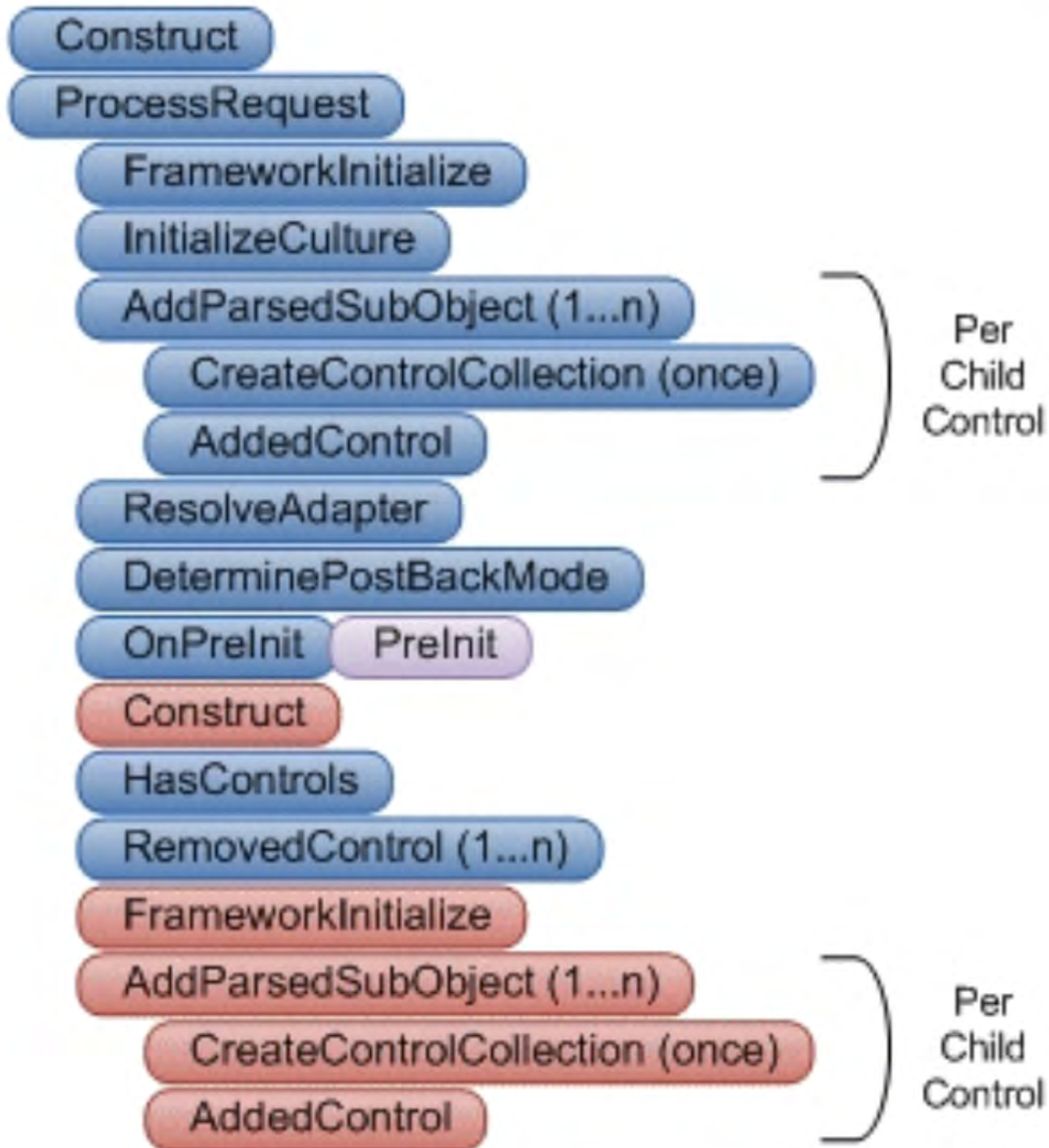
Service application DB access
Content database interactions



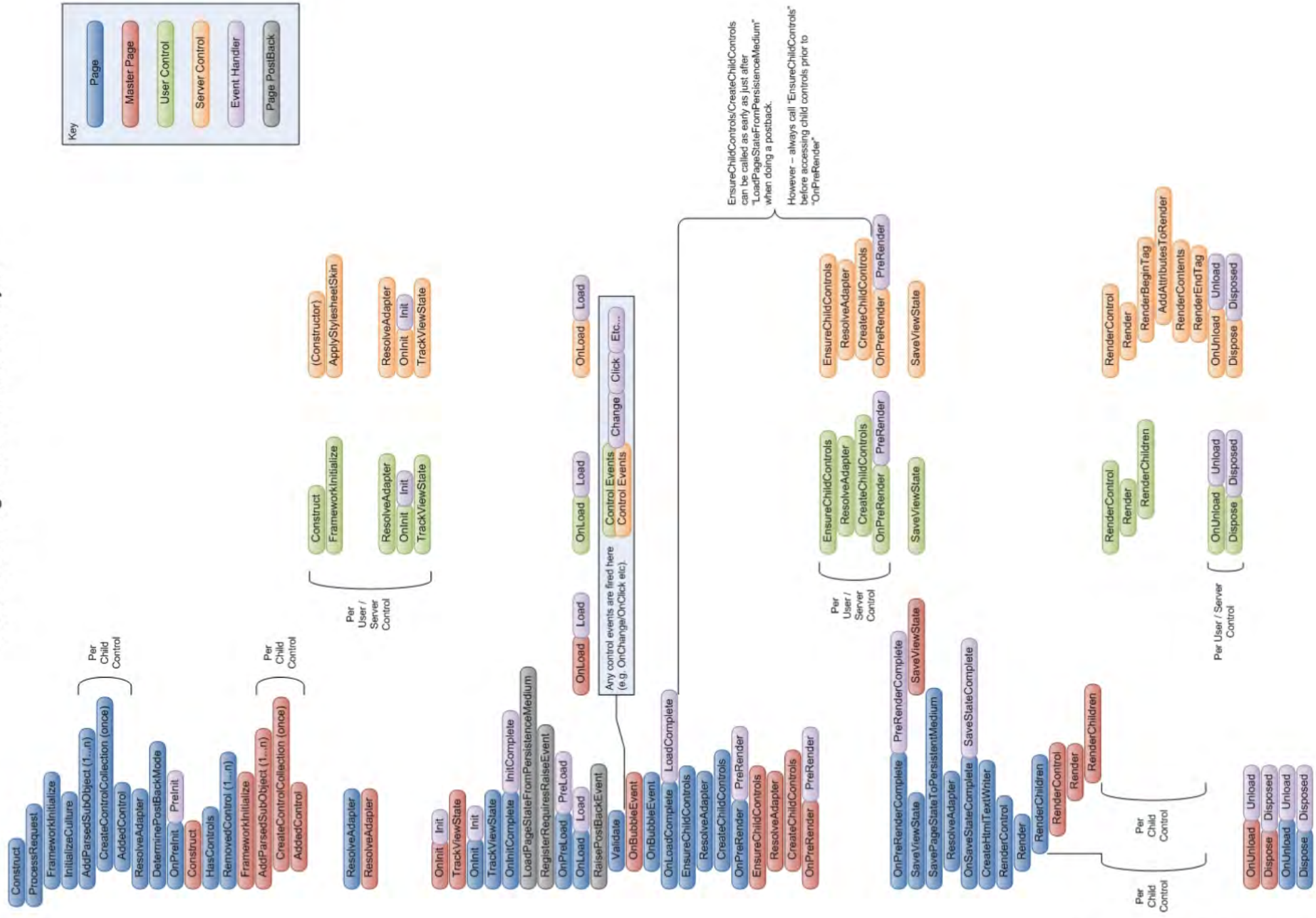


7
8
9

ASP.NET Page and Control Life Cycle



ASP.NET Page and Control Life Cycle



EnsureChildControls/CreateChildControls can be called as early as just after "LoadPageStateFromPersistenceMedium" when doing a postback.

However - always call "EnsureChildControls" before accessing child controls prior to "OnPreRender"

thanks, Justin Stenning!

The ultimate goal of caching



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

SharePoint caching: whatcha got?

- Object caching
- BLOB caching
- Page output caching
- Office web applications cache
- Distributed Cache service

CHECKLIST



Unless otherwise noted,
we're talking about:

 SharePoint  2013+

 Microsoft®
SharePoint® Server 2010

 Microsoft®
Office SharePoint®
Server 2007

int

Also, I'll have the slides from this presentation
available later on my blog

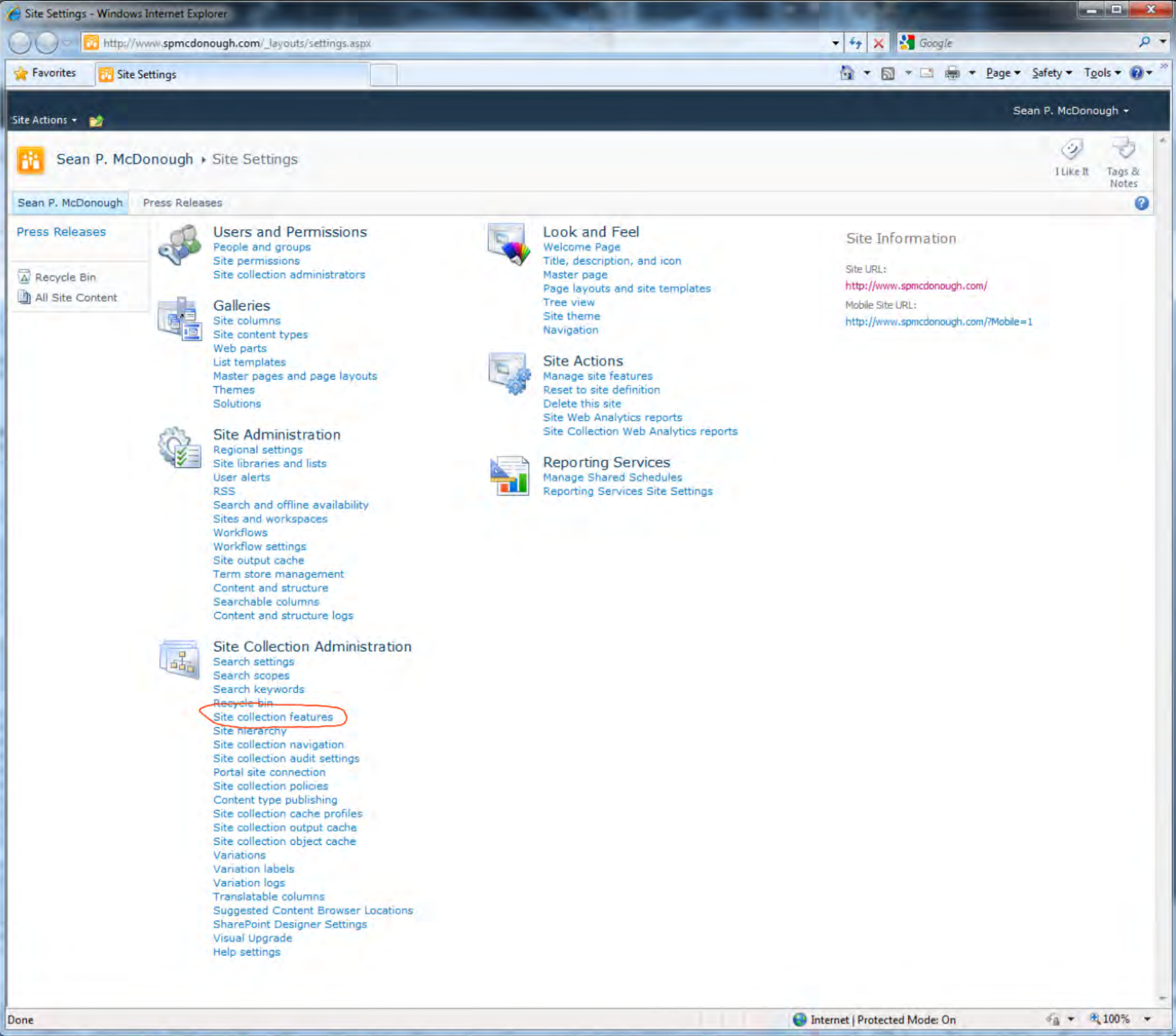
<http://SharePointInterface.com>

Short story
time...

Short story
time...



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



Sean P. McDonough > Site Settings

Press Releases

- Recycle Bin
- All Site Content

Users and Permissions
 People and groups
 Site permissions
 Site collection administrators

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

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

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

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

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

Reporting Services
 Manage Shared Schedules
 Reporting Services Site Settings

Site Information

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

[Content and structure logs](#)



[Site Collection Administration](#)

[Search settings](#)

[Search scopes](#)

[Search keywords](#)

[Recycle bin](#)

[Site collection features](#)

[Site hierarchy](#)

[Site collection navigation](#)

[Site collection audit settings](#)

[Portal site connection](#)

[Site collection policies](#)



















[Content type publishing](#)

[Site collection cache profiles](#)

Site Collection Features - Windows Internet Explorer

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

Sean P. McD... Open Menu

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

Of course, this poses some problems for SPF with WSS users ...

Done Internet | Protected Mode: On 100%



SharePoint 2007 Workflows

Aggregated set of out-of-box workflow features provided



SharePoint Server Enterprise Site Collection features

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



SharePoint Server Publishing Infrastructure

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



SharePoint Server Standard Site Collection features

Features such as user profiles and search, included in the SharePoint Server Standard License.



Three-state workflow

Use this workflow to track items in a list.

Activate

ng

Deactivate **Active**

Activate

Activate

se Site Collection features

s Services, Visio Services, Access Services
cense.

Of course, this poses
some problems for SPF
AND WSS users ...

g Infrastructure



content types, master pages and page lay
l.

l Site Collection features

and search, included in the SharePoint Se



So ... how does
the plumbing work?

Yes, just a section.

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




```
</system.web>
<system.webServer>
  <security>
    <requestFiltering allowDoubleEscaping="true">
      <requestLimits maxAllowedContentLength="2147483647" />
    </requestFiltering>
  </security>
  <validation validateIntegratedModeConfiguration="false" />
  <modules runAllManagedModulesForAllRequests="true">
    <remove name="AnonymousIdentification" />
    <remove name="FileAuthorization" />
    <remove name="Profile" />
    <remove name="WebDAVModule" />
    <remove name="Session" />
    <add name="SPRequestModule" precondition="integratedMode" type="Microsoft.SharePoint.ApplicationRuntime.S
    <add name="ScriptModule" precondition="integratedMode" type="System.Web.Handlers.ScriptModule, System.Web
    <add name="SharePoint14Module" precondition="integratedMode" />
    <add name="StateServiceModule" type="Microsoft.Office.Server.Administration.StateModule, Microsoft.Office
    <add name="RSRedirectModule" type="Microsoft.ReportingServices.SharePoint.Soap.RSRedirectModule, RSShareP
    <add name="PublishingHttpModule" type="Microsoft.SharePoint.Publishing.PublishingHttpModule, Microsoft.Sh
  </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
    <add name="OwssvrHandler" scriptProcessor="C:\Program Files\Common Files\Microsoft Shared\Web Server Ext
    <add name="ScriptHandlerFactory" verb="*" path="*.asmx" precondition="integratedMode" type="System.Web.Sc
    <add name="ScriptHandlerFactoryAppServices" verb="*" path="*_AppService.axd" precondition="integratedMode
    <add name="ScriptResource" precondition="integratedMode" verb="GET,HEAD" path="ScriptResource.axd" type="
    <add name="JSONHandlerFactory" path="*.json" verb="*" type="System.Web.Script.Services.ScriptHandlerFacto
    <add name="ReportViewerWebPart" verb="*" path="Reserved.ReportViewerWebPart.axd" type="Microsoft.Reportin
    <add name="ReportViewerWebControl" verb="*" path="Reserved.ReportViewerWebControl.axd" type="Microsoft.Re
  </handlers>
</system.webServer>
<system.serviceModel>
```

Caching in action

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

A Web Page

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

My SharePoint Site

SPDC\me

Search this site...

Site Actions

Home

- My SharePoint Site
- Your SharePoint Site
- Another Site

Top-Level Site > My SharePoint Site

Welcome Back, Bob!

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

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

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

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

The weather started

First up ...

First up ...



Object caching

Object caching

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



Navigational elements such as this breadcrumb

Top-Level Site > My SharePoint Site

Home
My SharePoint Site
Your SharePoint Site
Another Site

... And the Quick Launch

(publishing) page layouts also get cached

If this happens... be a Content Query Web Part (CQWP), this could be a significant object cache



NAVIGATIONAL DATA
SUCH AS THIS
breadcrumb ...



Home

My SharePoint Site

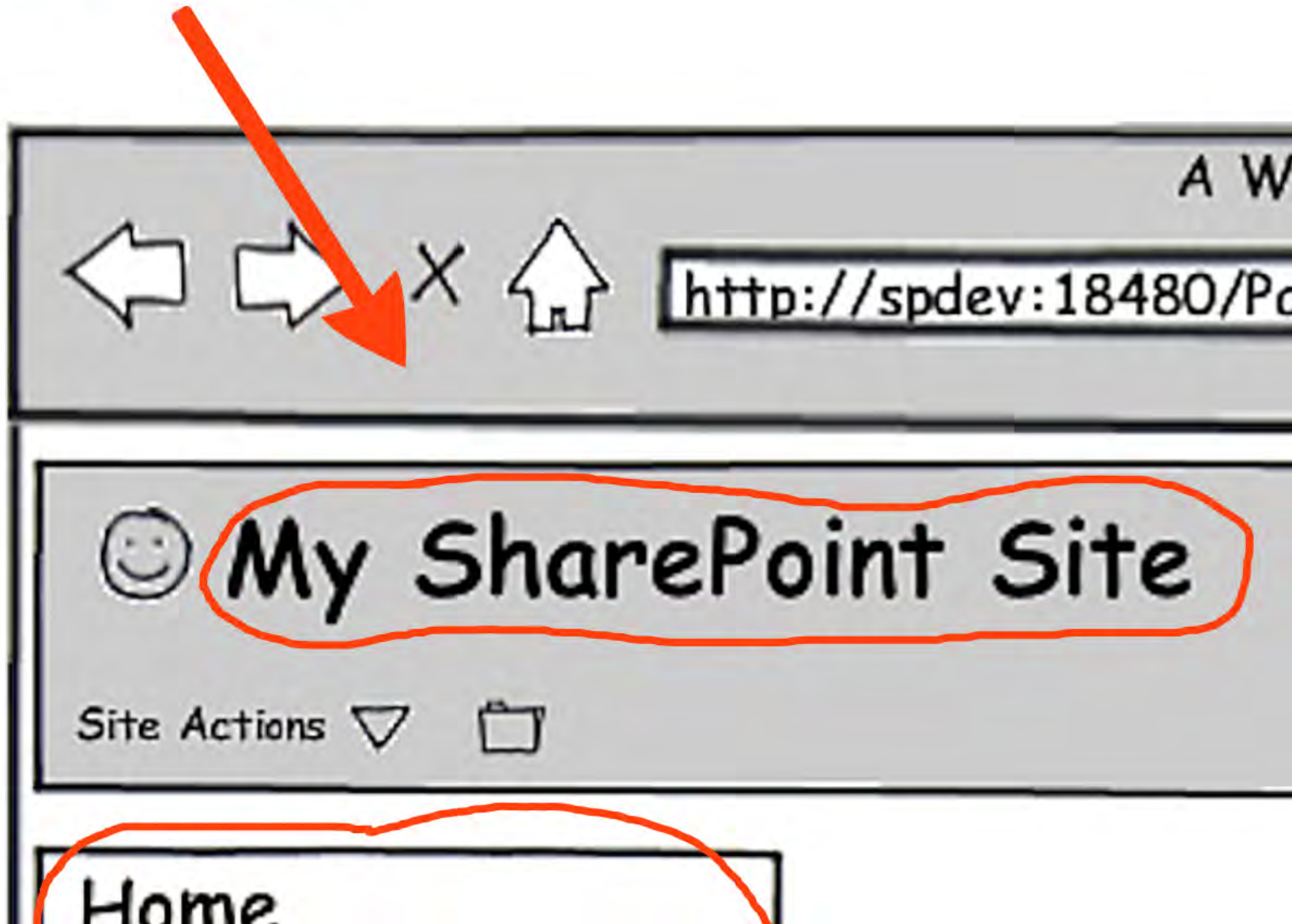
Your SharePoint Site

Another Site

... AND the Quick Launch




Site properties
like the title



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

The weather started



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

(publishing) page
layouts also get
cached

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sp

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wo

It

mi



Navigational
such as this
breadcrumb

Top-Level Site > My SharePoint Site

Home

My SharePoint Site

Your SharePoint Site

Another Site

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The weather started

... And the Quick Launch

(publishing) page layouts also get cached

If this happens
be a Content
Query Web
(CQWP), the
could be ne
significantly
object cache

Object cache

Object cache

Backed by memory



Object cache

Backed by memory



Turned on by default



Object cache

Backed by memory



Turned on by default



Default ~~size~~ allocation

100MB per
site collection

Object cache

Backed by memory



Turned on by default



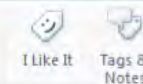
Default size or ~~allocation~~

100MB per
site collection

A trick that started with SharePoint 2010 ...


```
<Action id="0ff1ce14-1021-0000-0000-00000000" />
<Action id="ec0076ac-0c35-4880-8422-8062f59" />
<Action id="602bc8c3-9286-49a3-b973-3376ca7" />
<Action id="00e22a78-33ff-41ac-b0fb-ee46d16" />
<Action id="4b60e42e-e6fc-4188-80d2-ef39e7c" />
<Action id="1d415973-1146-4bc2-8324-83dfff5" />
</MergedActions>
<BlobCache location="C:\BlobCache\14" path="\
<ObjectCache maxSize="100" />
<OutputCacheProfiles useCacheProfileOverrides
<RuntimeFilter Assembly="Microsoft.Office.Ser
</SharePoint>
<system.web>
  <securityPolicy>
    <trustLevel name="WSS_Medium" policyFile="C
    <trustLevel name="WSS_Minimal" policyFile="
  </securityPolicy>
  <httpHandlers />
  <customErrors mode="On" />
  <httpRuntime maxRequestLength="51200" />
```

Sean P. McDonough > Site Settings



Sean P. McDonough Press Releases

Press Releases

- Recycle Bin
- All Site Content

Users and Permissions
People and groups
Site permissions
Site collection administrators

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

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

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

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

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

Reporting Services
Manage Shared Schedules
Reporting Services Site Settings

Site Information

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

Site collection audit settings

Portal site connection

Site collection policies

Content type publishing

Site collection cache profiles

Site collection output cache

Site collection object cache

Variations

Variation labels

Variation logs

Translatable columns

Suggested Content Browser Locations

SharePoint Designer Settings

Visual Upgrade

Help settings

Site Collection Administration > Object cache settings

Configure settings for the object cache.

Sean P. McDonough

Press Releases

Search this site...

Press Releases

Object Cache Size

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

Max. Cache Size (MB):

100

Recycle Bin

All Site Content

Object Cache Reset

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

Object Cache Flush

Force all servers in the farm to flush their object caches

Cross List Query Cache Changes

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

Check the server for changes every time a cross list query runs

Use the cached result of a cross list query for this many seconds:

60

Cross List Query Results Multiplier

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

Cross list query multiplier:

3

OK

Cancel



Collection Administration ▶ Object

figure settings for the object cache.

Donough

Press Releases

ases

Object Cache Size

Object Cache Size [Learn more about](#)

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!

The take-away:

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

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

S

Object Cache Size

Object Cache Size [Learn more about](#)

ent

Object Cache Reset

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

100

Object Cache Flush

Force all servers in the farm to flush t

Check the server for changes every ti

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

Cross List Query Cache Changes

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

Force all servers in the farm to flush the

Check the server for changes every time
query runs

Use the cached result of a cross list query
seconds:

60





Cross List Query Results Multiplier

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

Cross list query multiplier:

3

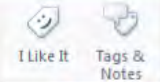
Guidance

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



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

Site Collection Administration > Object cache settings



Sean P. McDonough | Press Releases

Search this site...

Press Releases

Object Cache Size

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

Max. Cache Size (MB):

100

Recycle Bin

All Site Content

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60

Cross List Query Results Multiplier

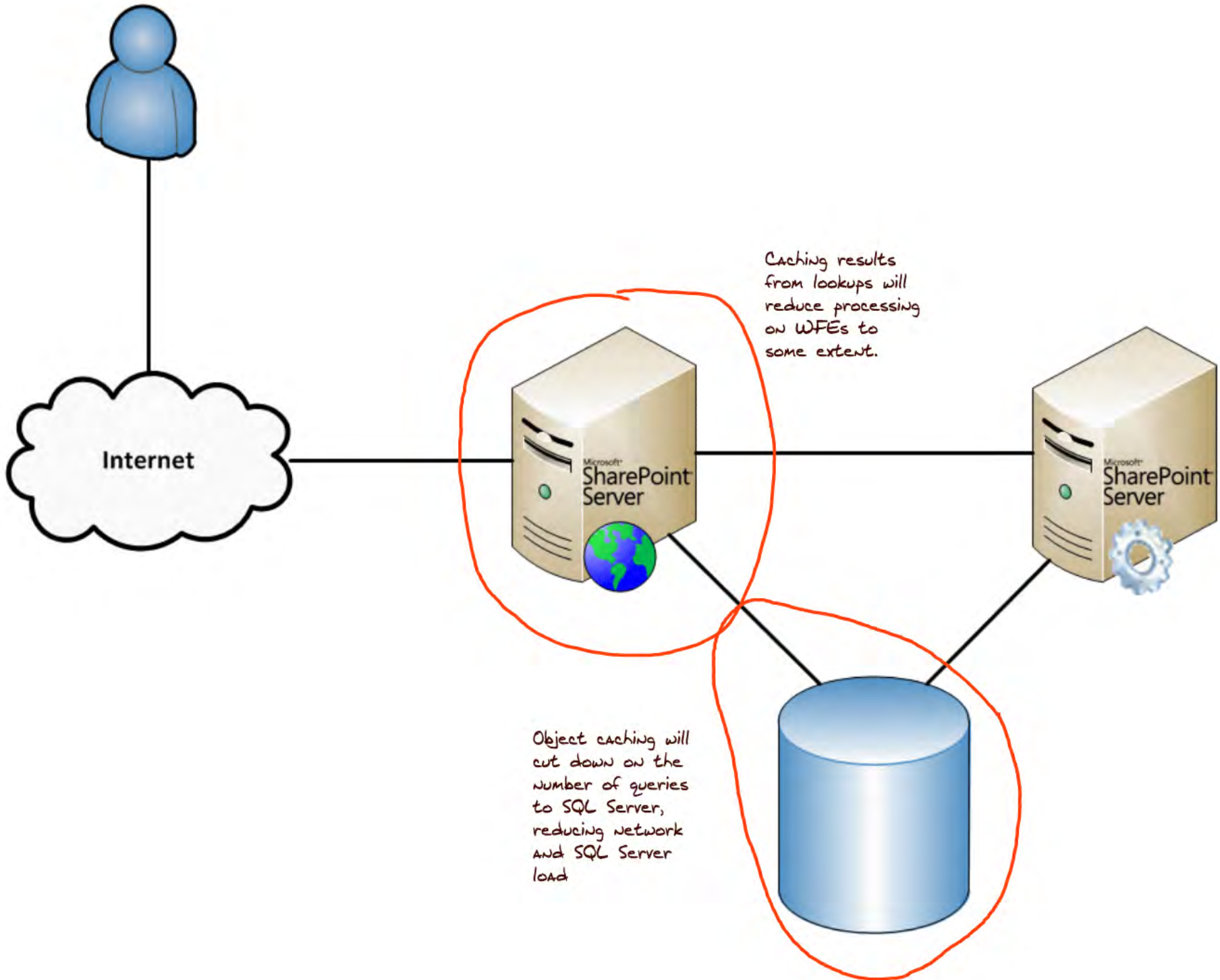
Each cross list query might retrieve results for a variety of users. To ensure after security trimming that all users will see a valid set of results, the cross list query cache must pull more results than originally requested. Specifying a larger number will retrieve more data from the server and is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

Cross list query multiplier:

3

OK

Cancel



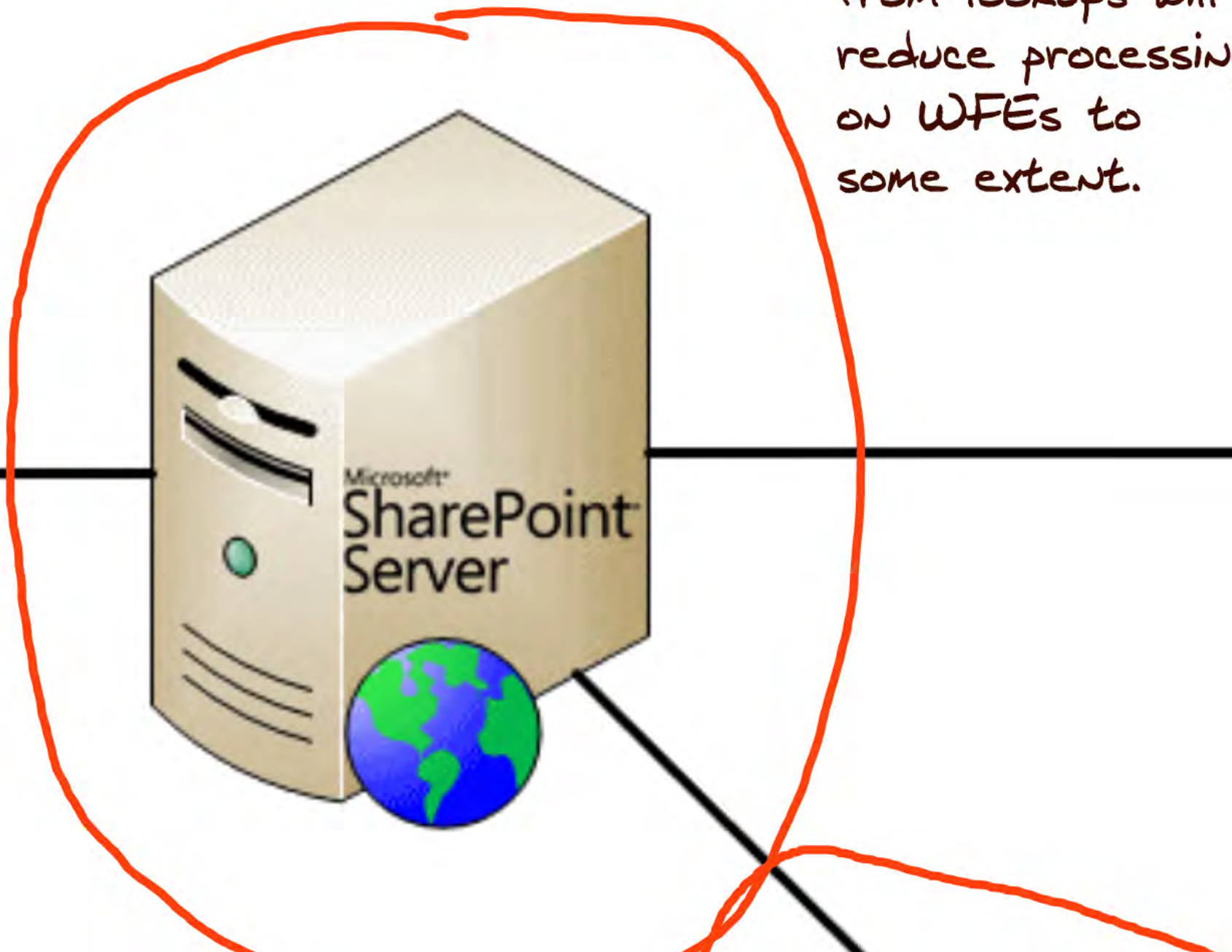
Caching results from lookups will reduce processing on WFEs to some extent.

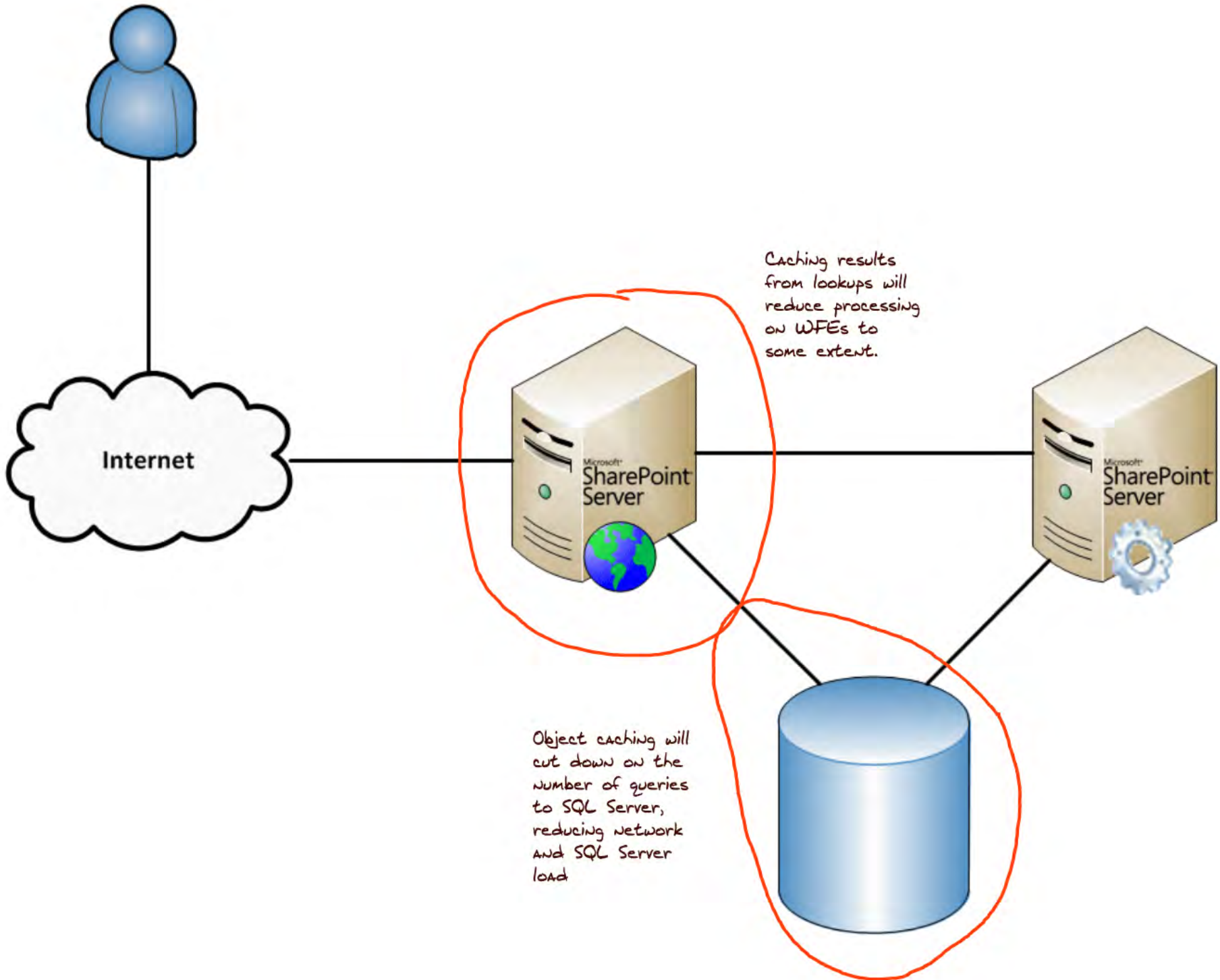
Object caching will cut down on the number of queries to SQL Server, reducing network and SQL Server load

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



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





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

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

Next up ...

Next up ...



BLOB caching



No, not that
kind of BLOB

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

aching



FIGHT NIGHT

FIGHT NIGHT



BLOB

VS



Blob

FIGHT NIGHT



BLOB

VS

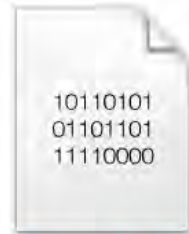


Blob

Chews up database space

Consumes entire cities

FIGHT NIGHT



BLOB

VS



Blob

Chews up database space

Consumes entire cities

Hated by database admins

Bane of humanity

FIGHT NIGHT



BLOB

VS



Blob

Chews up database space

Consumes entire cities

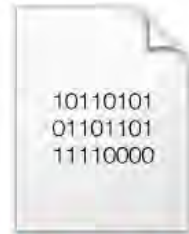
Hated by database admins

Bane of humanity

Kills attempts to organize
database pages and extents

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

FIGHT NIGHT



BLOB

VS



Blob

Chews up database space

Consumes entire cities

Hated by database admins

Bane of humanity

Kills attempts to organize
database pages and extents

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

Conquered with RBS

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



BLOB

VS



Blob

Chews up database space

Consumes entire cities

Hated by database admins

Bane of humanity

Kills attempts to organize
database pages and extents

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

Conquered with RBS

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

WINNER!



No, not that
kind of BLOB

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

aching





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

aching



also known as "disk-based caching"

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



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



My SharePoint Site

SPDC\me

Site Actions

Search this site...

Home

My SharePoint Site

Your SharePoint Site

Another Site

Top-Level Site > My SharePoint Site

Welcome Back, Bob!



SharePoint 2013+'s Image Renditions capability depends on the BLOB cache to store images that have been rescaled/resized to different dimensions



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

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.

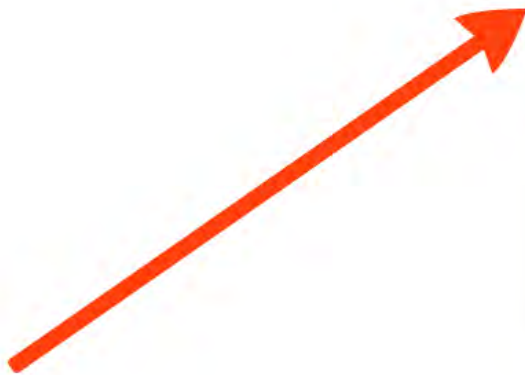
It is by will alone I set my mind in motion.

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 yellow would be cached through BLOB caching

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



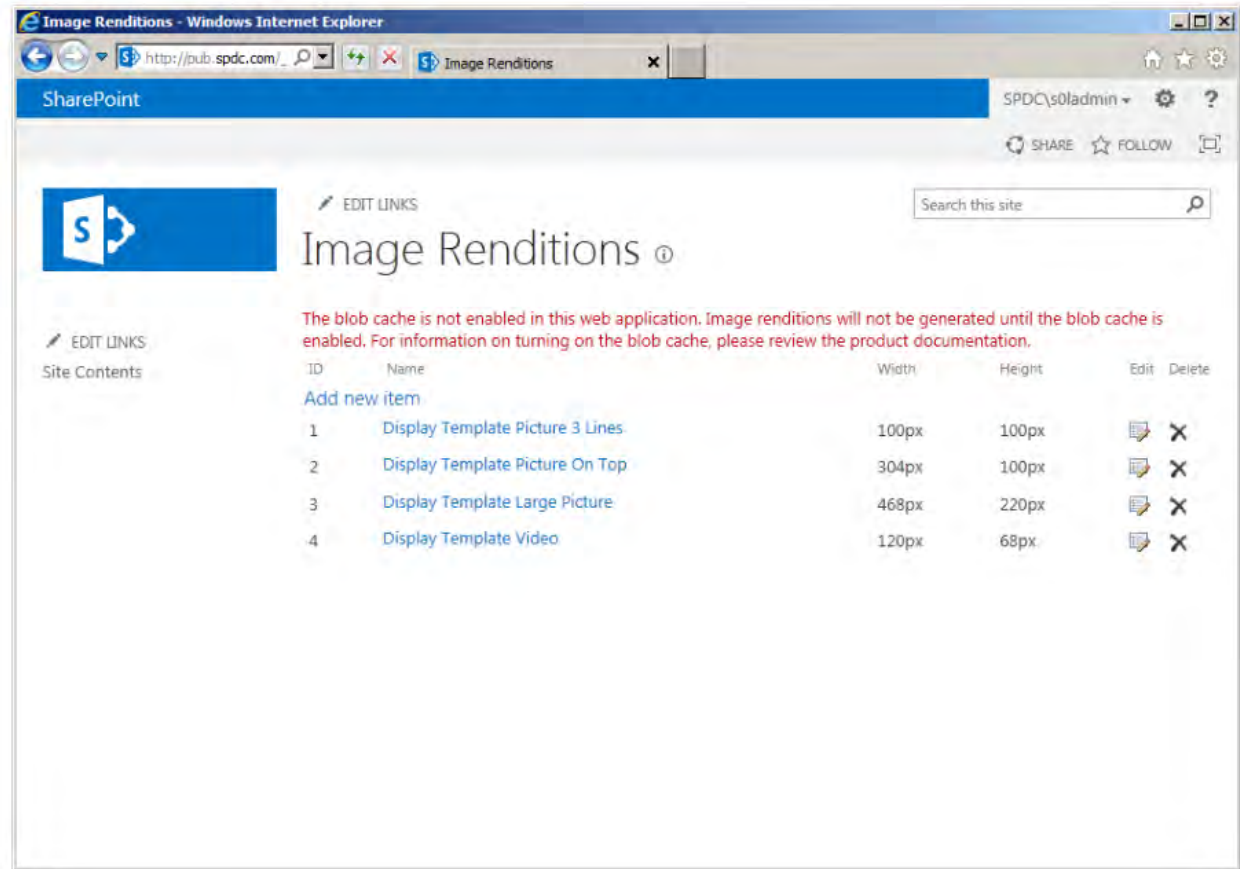
It is by v
mind in m

It is by t
that the



SharePoint 2013+'s
Image Renditions
capability depends
on the BLOB cache
to store images
that have been
rescaled/resized to
different
dimensions

ack and



SharePoint 2013+'s
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http://spdev:18480/Pages/default.aspx



My SharePoint Site

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The weather started

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

BLOB cache

BLOB cache

Backed by disk



BLOB cache

Backed by disk



Turned off by default



BLOB cache

Backed by disk



Turned off by default



Default size or allocation

10GB per
IIS site (zone)

BLOB cache

Backed by disk



Turned off by default



Default size or ~~allocation~~

10GB per
IIS site (zone)

Controlled through web.config settings


```
<Action id="0ff1ce14-101a-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Mi
<Action id="0ff1ce14-101b-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Mi
<Action id="0ff1ce14-101c-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Mi
<Action id="0ff1ce14-101d-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Mi
<Action id="0ff1ce14-101e-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Mi
<Action id="0ff1ce14-1020-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Mi
<Action id="0ff1ce14-1021-0000-0000-000000000000" sourceFile="C:\Program Files\Common Files\Mi
<Action id="ec0076ac-0c35-4880-8422-8062f5925bec" sourceFile="C:\Program Files\Common Files\Mi
<Action id="602bc8c3-9286-49a3-b973-3376ca78b297" sourceFile="C:\Program Files\Common Files\Mi
<Action id="00e22a78-33ff-41ac-b0fb-ee46d1636e22" sourceFile="C:\Program Files\Common Files\Mi
<Action id="4b60e42e-e6fc-4188-80d2-ef39e7cc0065" sourceFile="C:\Program Files\Common Files\Mi
<Action id="1d415973-1146-4bc2-8324-83dfff5bfe33" sourceFile="C:\Program Files\Common Files\Mi
```

```
</mergedActions>
```

```
<BlobCache location="C:\BlobCache\14" path="\. (gif|jpg|jpeg|jpe|jfif|bmp|dib|tif|tiff|ico|png|wd
```

```
<ObjectCache maxSize="100" />
```

```
<OutputCacheProfiles useCacheProfileOverrides="false" varyByHeader="" varyByParam="*" varyByCust
```

```
<RuntimeFilter Assembly="Microsoft.Office.Server, Version=14.0.0.0, Culture=neutral, PublicKeyTo
```

```
</SharePoint>
```

```
<system.web>
```

```
<securityPolicy>
```

```
<trustLevel name="WSS_Medium" policyFile="C:\Program Files\Common Files\Microsoft Shared\Web S
```

```
<trustLevel name="WSS_Minimal" policyFile="C:\Program Files\Common Files\Microsoft Shared\Web
```

```
</securityPolicy>
```

```
<httpHandlers />
```

```
<customErrors mode="On" />
```

```
<httpRuntime maxRequestLength="51200" />
```

```
<authentication mode="Windows" />
```

```
<identity impersonate="true" />
```

```
<authorization>
```

```
<allow users="*" />
```

```
</authorization>
```

```
<httpModules />
```

Default BlobCache Elements

Default BlobCache Elements

MOSS 2007

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

Default BlobCache Elements

MOSS 2007

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

SharePoint Server 2010

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

Default BlobCache Elements

MOSS 2007

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

SharePoint Server 2010

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

SharePoint Server 2013

```
<BlobCache location="C:\BlobCache\14" path=
"\.(gif|jpg|jpeg|jpe|jfif|bmp|dib|tif|tiff|themedbmp|themedcss|themedgif|themedjpg|themedpng|ico|png|wdp|hdp|css|
js|asf|avi|flv|m4v|mov|mp3|mp4|mpe
g|mpg|rm|rmvb|wma|wmv|ogg|ogv|oga|webm|xap)$" 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

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path	regular expression against which files must match in order to be cached
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max-age	client-side cache duration (in seconds) for downloaded BLOB cache items

Recommendation:
point at someplace
other than C:

Available Attributes

Common

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size	maximum disk space (in GB) that BLOB cache can consume*
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Recommendation: make
sure you add up your
allocations (each site)
and have enough disk
space!

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DO NOT simply delete files
out of the BLOB cache!

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



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

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

Web Sessions						
#	Result	Protocol	URL	Body	Caching	
64	200	HTTP	/SiteCollectionImages/common/content...	79	public, max-age=2232	image/gif
65	200	HTTP	/SiteCollectionImages/common/btnNoTh...	2,112	public, max-age=2478	image/gif
66	200	HTTP	/SiteCollectionImages/common/signinOv...	165	public, max-age=4707	image/png
67	200	HTTP	/SiteCollectionImages/common/benefits...	16,907	public, max-age=5791	image/png
68	200	HTTP	/_controltemplates/MultiBanner/ModalP...	15,618	max-age=867	image/png
69	302	HTTP	/s/www.kroger.com?U=/SiteCollectionI...	0	max-age=0, no-cache, no-store Expires: Sun, 03 Apr 2011...	
70	200	HTTP	/SiteCollectionImages/common/160x41...	5,099	public, max-age=2141	image/jpeg
71	200	HTTP	/PublishingImages/section_headers/hea...	4,538	public, max-age=1452	image/jpeg
72	200	HTTP	/PublishingImages/2011/Period_3/Week...	73,370	public, max-age=1320	image/jpeg
73	200	HTTP	/PublishingImages/2011/Period_3/Week...	77,412	public, max-age=944	image/jpeg
74	200	HTTP	/PublishingImages/2011/Period_3/Week...	52,993	public, max-age=1307	image/jpeg
75	200	HTTP	/_layouts/1033/core.js?rev=mHksOQ0i...	265,384	max-age=2908	application/x-javascript
76	200	HTTP	/style%20library/omniture/s_code_krog...	20,172	public, max-age=2590	application/x-javascript
77	200	HTTP	/SiteCollectionImages/common/closeBtn...	879	public, max-age=4795	image/gif
78	200	HTTP	/SiteCollectionImages/cons/icon_import...	1,287	public, max-age=2785	image/gif
79	200	HTTP	/iframe.php?targeting_bucket=Banner_...	6,147	max-age=300, max-age=600 Expires: Sun, 03 Apr 2011 2...	text/html; charset=utf-8
80	200	HTTP	/adj/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=888	image/gif
83	200	HTTP	/includes/css/iframe.css	1,603	max-age=2592000 Expires: Tue, 03 May 2011 20:11:19 GMT	text/css
84	200	HTTP	/images/generic_header.png	10,978	max-age=2592000 Expires: Tue, 03 May 2011 20:11:16 GMT	image/png
85	200	HTTP	/srv/upload_files/fea90f998a8b8d3401...	5,744	max-age=2592000 Expires: Tue, 03 May 2011 20:09:42 GMT	image/gif
86	200	HTTP	/images/coupon-pointer.png	1,952	max-age=2592000 Expires: Tue, 03 May 2011 20:09:02 GMT	image/png
87	200	HTTP	/srv/upload_files/acdf9eb5cc1b4b75e4...	5,985	max-age=2592000 Expires: Tue, 03 May 2011 20:11:19 GMT	image/gif
88	200	HTTP	/srv/upload_files/46263a8ea7a6c1251a...	4,942	max-age=2592000 Expires: Tue, 03 May 2011 20:11:19 GMT	image/gif
89	200	HTTP	/srv/upload_files/5467f518013f109e51...	5,241	max-age=2592000 Expires: Tue, 03 May 2011 20:11:19 GMT	image/gif
90	200	HTTP	/siteCollectionImages/swf/heroHomepa...	105,036	public, max-age=5897	application/x-shockwave-flash
91	200	HTTP	/PublishingImages/2011/Period_3/Week...	164,821	public, max-age=1546	image/jpeg
92	200	HTTP	/PublishingImages/2011/Period_3/Week...	153,151	public, max-age=1863	image/jpeg
93	200	HTTP	/PublishingImages/2011/Period_3/Week...	118,575	public, max-age=1894	image/jpeg
94	200	HTTP	/SiteCollectionImages/common/signinOv...	594	public, max-age=5181	image/png
95	200	HTTP	/SiteCollectionImages/common/bgSignI...	434	public, max-age=5094	image/gif
96	200	HTTP	/SiteCollectionImages/common/signinOv...	470	public, max-age=1584	image/png
97	200	HTTP	/SiteCollectionImages/common/benefits...	250	public, max-age=2539	image/png
98	200	HTTP	/SiteCollectionImages/common/benefits...	10,762	public, max-age=5053	image/png
99	200	HTTP	/SiteCollectionImages/common/benefits...	939	public, max-age=6742	image/gif
100	200	HTTP	/SiteCollectionImages/common/benefits...	1,428	public, max-age=5869	image/gif
101	200	HTTP	/SiteCollectionImages/common/benefits...	1,508	public, max-age=1087	image/gif
102	200	HTTP	/SiteCollectionImages/common/benefits...	1,472	public, max-age=5494	image/gif
103	200	HTTP	/SiteCollectionImages/common/benefits...	1,496	public, max-age=4800	image/gif
104	200	HTTP	/_controltemplates/MultiBanner/ModalP...	1,386	max-age=1776	image/gif
105	200	HTTP	/SiteCollectionImages/common/benefits...	1,511	public, max-age=6492	image/gif
106	200	HTTP	/2934496/2of3_tr1_Mars_GC.jpg	137,333	public, max-age=86400 Expires: Mon, 04 Apr 2011 04:05:...	image/jpeg
107	200	HTTP	/PublishingImages/section_headers/hea...	3,922	public, max-age=1000	image/jpeg
108	200	HTTP	/SiteCollectionImages/common/footer_...	1,401	public, max-age=4232	image/gif
109	200	HTTP	/SiteCollectionImages/common/footerL...	54	public, max-age=1035	image/gif
110	200	HTTP	/SiteCollectionImages/common/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/krgkrogerprod/1/H.14/s2205936...	0	no-cache, no-store, must-revalidate, max-age=0, proxy-re...	text/plain
114	200	HTTP	/SiteCollectionImages/common/bgSelect...	654	public, max-age=6811	image/gif
115	200	HTTP	/b/ss/krgkrogerprod/1/H.14/s2205936...	43	no-cache, no-store, must-revalidate, max-age=0, proxy-re...	image/gif

115 HTTP requests issued and answered to fully load page

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

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



#	Result	Protocol	URL	Body	Caching	Content-Type
1	302	HTTP	/	163		text/html
2	200	HTTP	/Pages/default.aspx	81,746	private Expires: Sun, 03 Apr 2011 20:23:34 GMT	text/html; charset=utf-8
3	200	HTTP	/adj/mwl.kroger.www/?page=home_ma...	571	private, x-gzip-ok="" Expires: Sun, 03 Apr 2011 20:16:05...	application/x-javascript
4	200	HTTP	/b/ss/trg/krogerprod/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: subsequent request (re-opened browser)

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

Only 4 requests needed to load the page

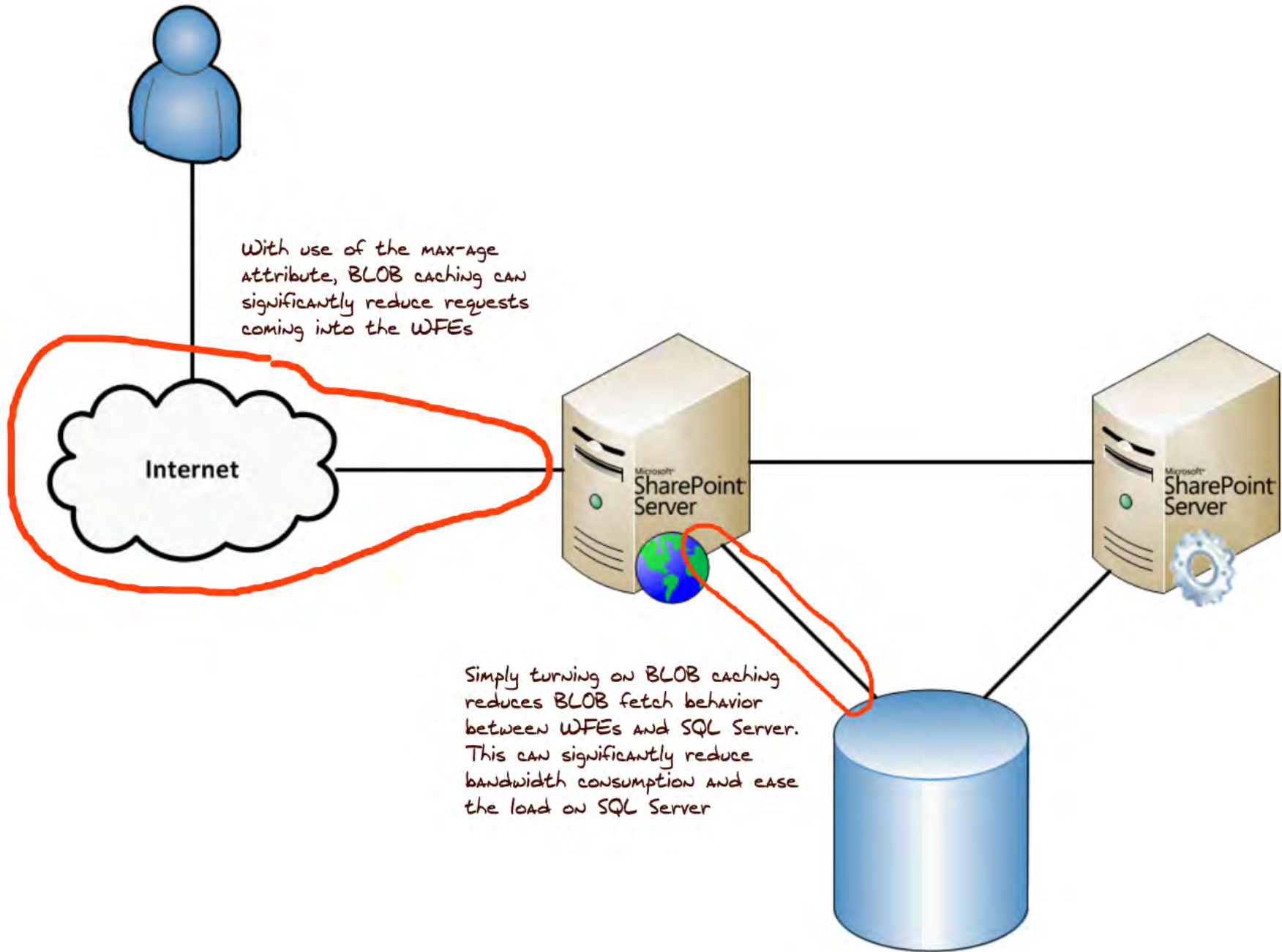


Of course, this behavior CAN work both for you AND AGAINST you ...



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

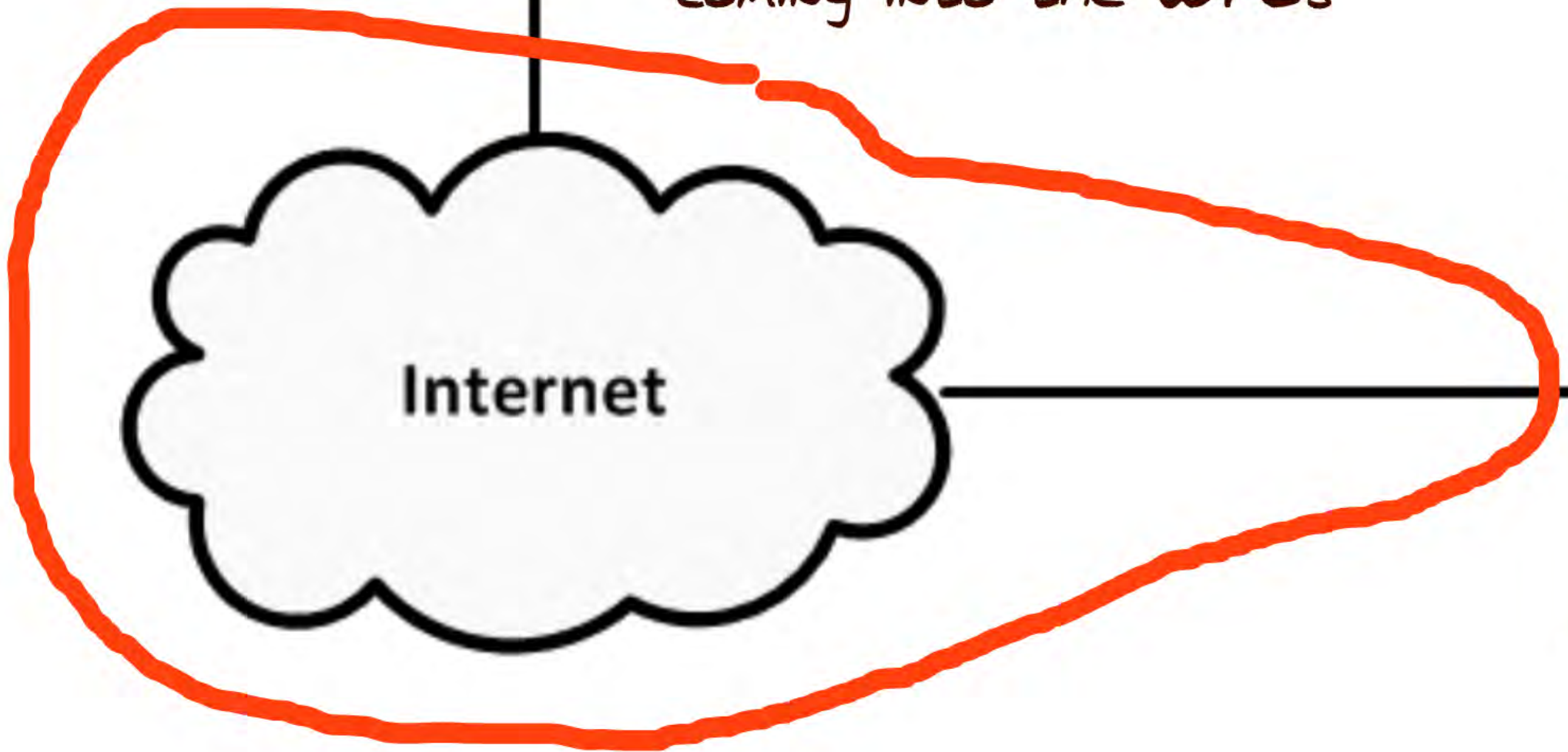
If you don't want persistent client-side caching when the BLOB cache is enabled, be sure to explicitly set a max-age value of zero (0). If you don't specify a max-age attribute value, the default is 86,400 seconds (24 hours).

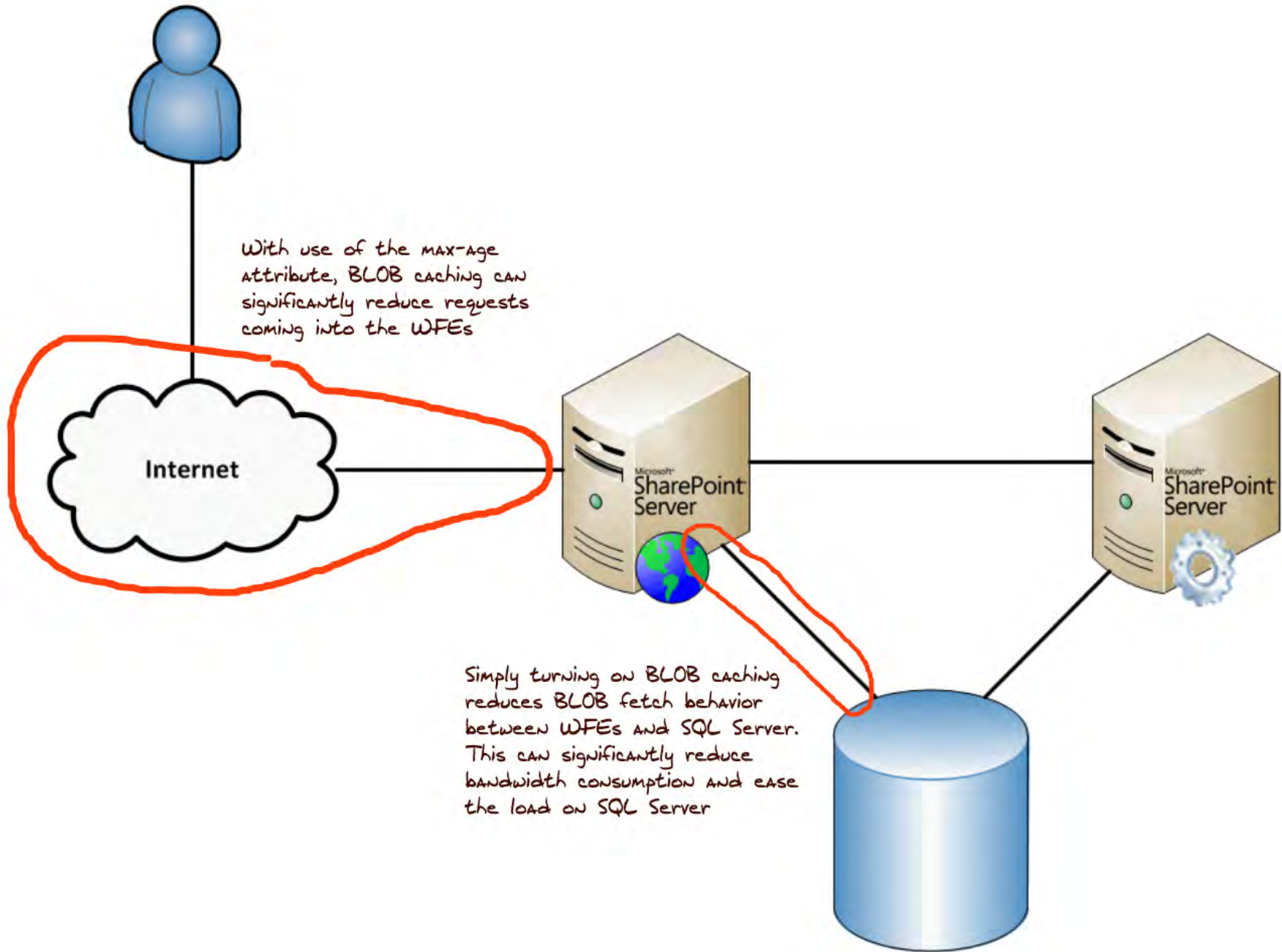




Simply turning on BLOB caching reduces BLOB fetch behavior between WFES AND SQL Server. This can significantly reduce bandwidth consumption AND ease the load on SQL Server

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





Next up...

Next up...



Page output
caching

Next up...



Page output caching

piggybacks on ASP.NET output caching



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



~~My SharePoint Site~~

~~SPDC\me~~

Site Actions ~~?~~ ~~?~~

Search this site... ~~?~~

I'll talk about the reason for highlighting this a little later. For now, though, let's 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.



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



~~My SharePoint Site~~

~~SPDC\me~~

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The weather started

Page output caching

Page output caching

Backed by memory



Page output caching

Backed by memory



Turned off by default
(thankfully)



Page output caching

Backed by memory



Turned off by default
(thankfully)



Default size or allocation

*None**

Page output caching

Backed by memory



Turned off by default
(thankfully)



Default size or allocation

*None**

A trick that started with SharePoint 2010 ...


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

So ...

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 content in the page that is rendered by SharePoint has no bearing on how items are cached or served from cache.



is like a Page

Each page request is

- Characteristics are
- These characteri

The ca

The Page Output Cache is like a big lookup table

Each page request is broken down into a set of characteristics

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

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

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

The Page Output Cache is like a big lookup table

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- Characteristics are selected based on page output cache profiles
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The cache is searched for a page with the key that was built

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

The trick is to balance profile granularity against memory consumption

Search this site



Enable output cache

Anonymous Cache Profile



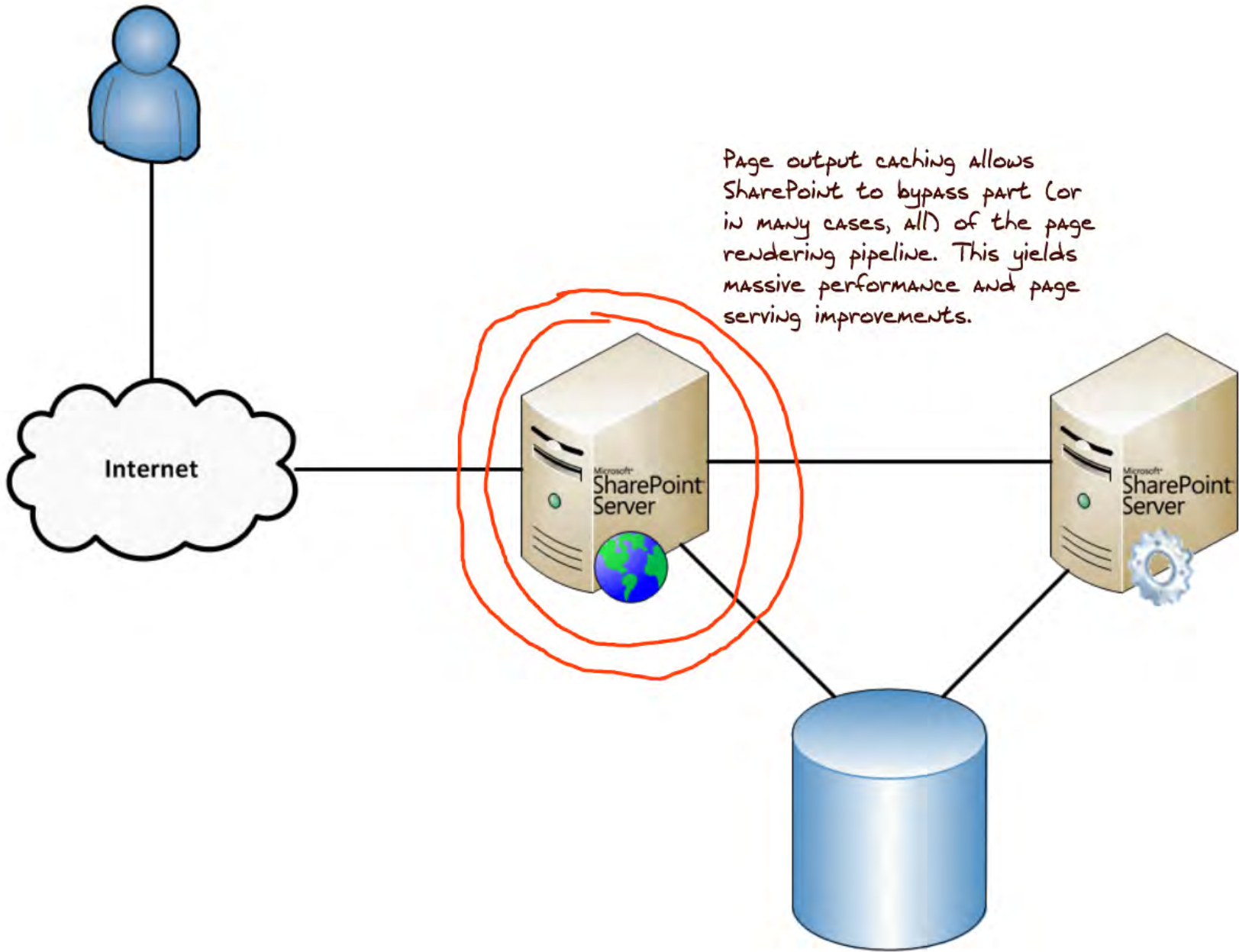
You really, really, **really** need to do concurrent multi-user testing with your cache profile settings!



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

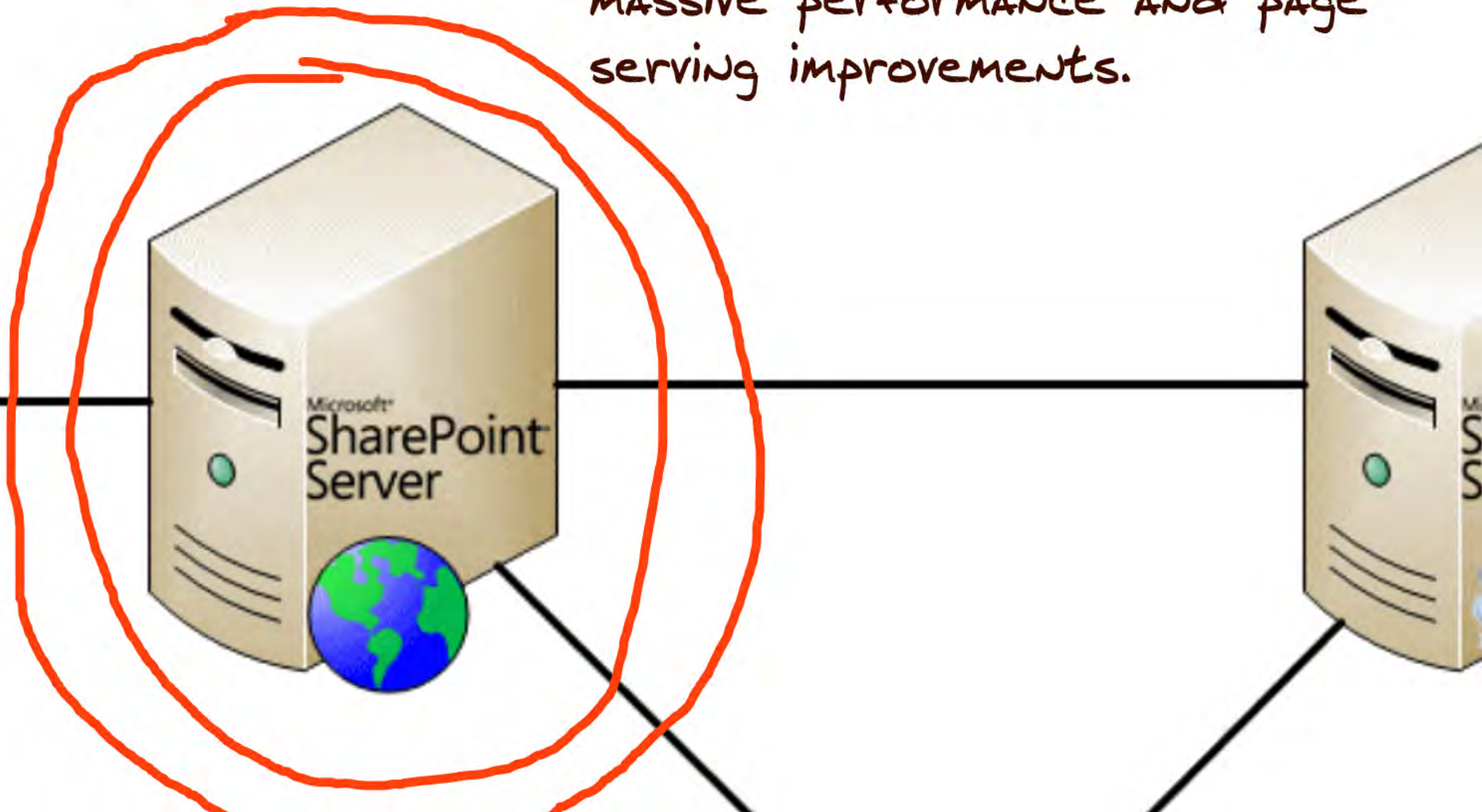


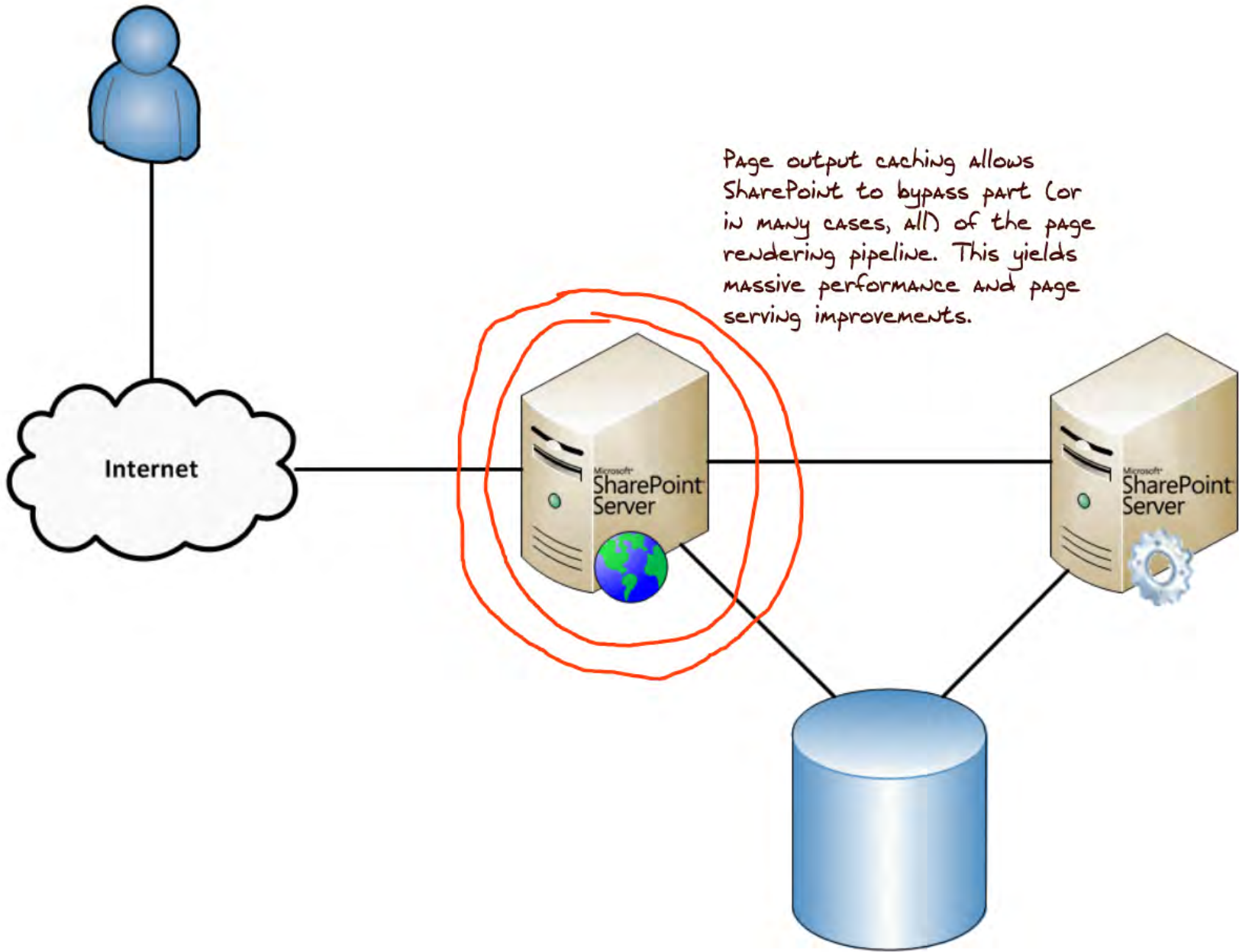
Do you sense a story coming?



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

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Office Web

Apps Cache

Office Web Apps Cache



I'm referring to
SharePoint 2010
specifically; things
change dramatically
with SharePoint 2013





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



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



How the cache is implemented ...



I Like It

Tags &
NotesCentral
Administration

Application Management

System Settings

Monitoring

Backup and Restore

Security

Upgrade and Migration

General Application
Settings

Configuration Wizards

URL Search Web Application:




URL

[/sites/Office_Viewing_Service_Cache](#)

URL	http://spdev:18480/sites/Office_Viewing_Service_Cache
Title	Team Site
Description	
Primary administrator:	SPDC\s0ladmin
E-mail address:	
Database Name	WSS_Content_PublishingTestWeb

OK

Cancel


Site Actions  SPDC\s0ladmin  

Microsoft SharePoint 2010 Central Administration > Site Collection List

I Like It Tags & Notes

Central Administration

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

URL Search  Web Application:

URL	
/sites/Office_Viewing_Service_Cache	
URL	http://spdev:18480/sites/Office_Viewing_Service_Cache
Title	Team Site
Description	
Primary administrator:	SPDC\s0ladmin
E-mail address:	
Database Name	WSS_Content_PublishingTestWeb

OK Cancel

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

Recommendations

Recommendations



Get friendly with
`Set-OfficeSPWebAppsCache`
PowerShell cmdlet

Recommendations



Get friendly with
Set-OfficeSPWebAppsCache
PowerShell cmdlet

- relocate cache site collection to a dedicated DB

Recommendations



Get friendly with
Set-OfficeSPWebAppsCache
PowerShell cmdlet

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

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

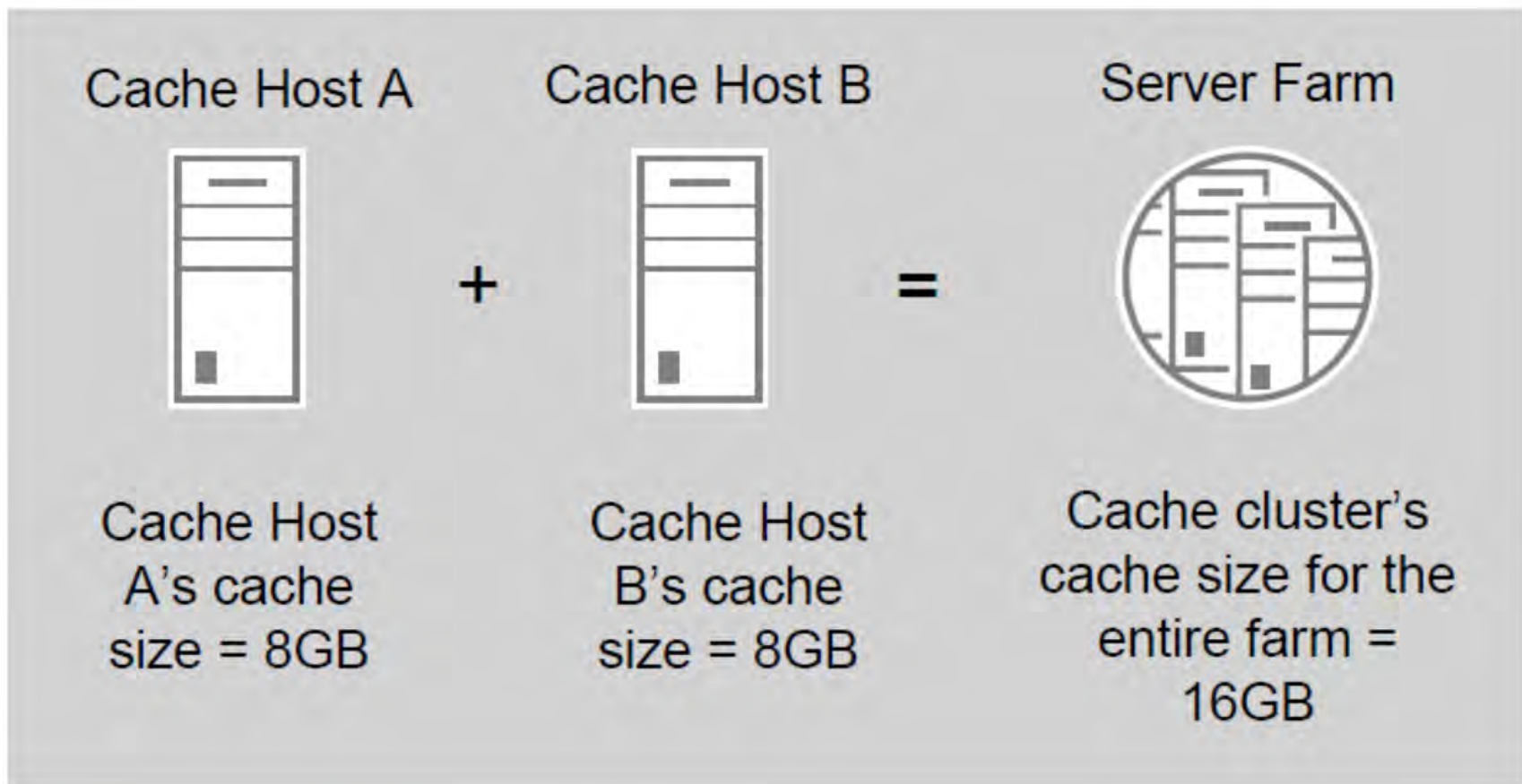
- relocate
- increase o
applications
- decrease o
applic

Distributed

Cache service

Distributed Cache service





Provides memory-based caching for several types of data/objects.

Provides memory-based caching for several types of data/objects.

- authentication (tokens)
- newsfeeds
- OneNote and Access
- security trimming results

When you first set up
SharePoint 2013+, the
Distributed Cache service

... is running and in collocated
mode (vs. dedicated mode)

... is configured to consume
10% of a server's total memory



So, is there ANY
guidance?



So, is there ANY
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- Do not run the following services on the same server running the Distributed Cache service: SQL Server, Project Server, Excel Services and Search services.
- Review SharePoint Server 2013+'s Health Rules for Distributed Cache service issues
- If possible, run AppFabric on its own server

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Before you do anything, pay attention

 **Important:**

The Distributed Cache service can end up in a nonfunctioning or unrecoverable state if you do not follow the procedures that are listed in this article. In extreme scenarios, you might have to rebuild the server farm. The Distributed Cache depends on Windows Server AppFabric as a prerequisite. Do not administer the **AppFabric Caching Service** from the **Services** window in **Administrative Tools** in **Control Panel**. Do not use the applications in the folder named **AppFabric for Windows Server** on the **Start** menu.

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My interpretation



"tread carefully"



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- If hosting the Distributed Cache service in a virtual machine (VM), do not use dynamically allocated memory - VM memory must be fixed

QUIN



DON'T PANIC - just for fun!

Object caching

Action

Cache size reduced (significantly) below 100MB

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Potential Result

- Object cache fills and becomes memory constrained
- Resource contention and ejections lead to cache compactions
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What to Watch

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

Page output caching

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

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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`)

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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)

BLOB caching

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

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BLOB caching

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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.

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

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

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

BLOB caching

Observation

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

Potential Cause

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

What You Can Do

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

References and Resources

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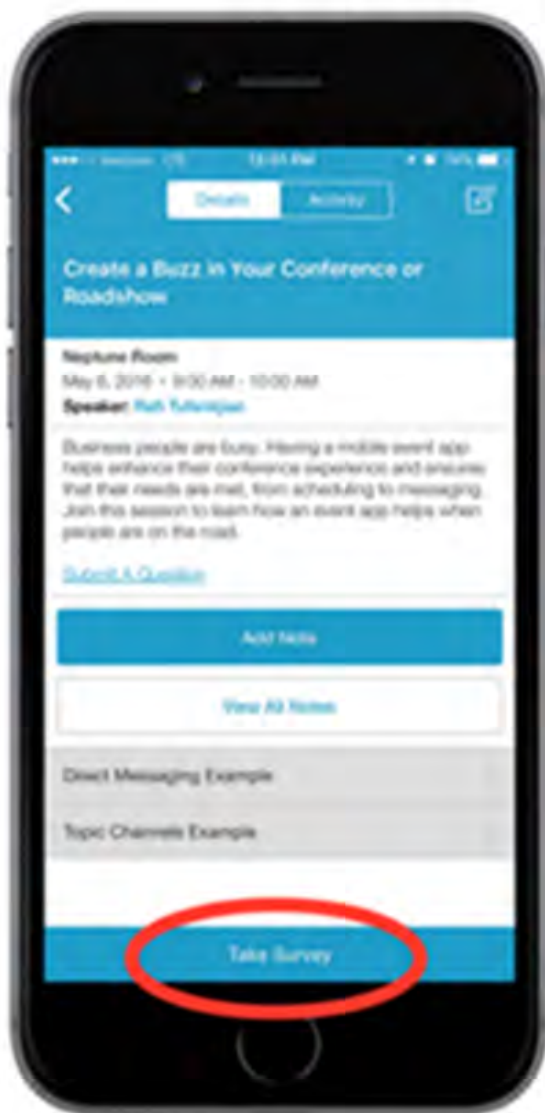
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<https://support.microsoft.com/en-us/kb/3092423>

Fill Out Your Session Surveys!



1

Click on the
'Agenda' button in
the app

2

Select the session
you wish to review

3

Click on the 'Take
Survey' button at
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page



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