

Caching and SharePoint: What Works, What No Longer Works, and Where We Are Today

Sean P. McDonough
Consultant, Bitstream Foundry
Office Apps & Services MVP

Sean P. McDonough

- Developer/administrator/gearhead
- AR/VR proponent
- Gamer
- Re-established MTG Player
- Electronic Music Junkie
- Lover of all things donut



First: why my interest in caching?

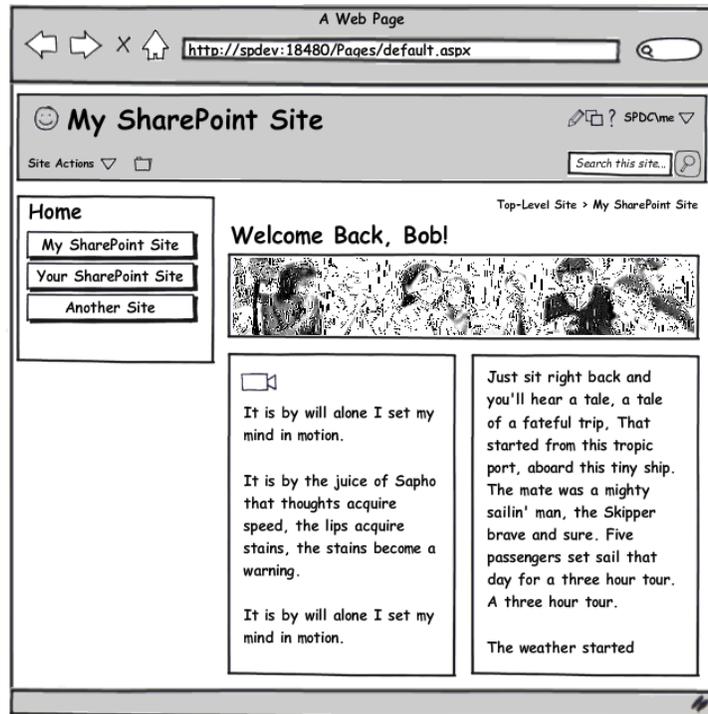


- It arose out of necessity on a MOSS 2007 project
 - Extremely large public-facing implementation for a Fortune 50 company
 - Nothing was “well-documented” in SharePoint at that time
 - I did some good things ... and I committed some crimes against humanity
- Out of that experience arose a genuine desire to learn more of the internals
 - Numerous blog posts on (BLOB) caching mechanisms, internals, and configuration
 - Developed caching-related sessions for developers and administrators
 - Other items (e.g. MOSS 2007 BLOB cache flush solution)
- The caching interest naturally morphed a bit with the rise of “the cloud”
 - Caching is different, and focus is more on performance analysis and remediation

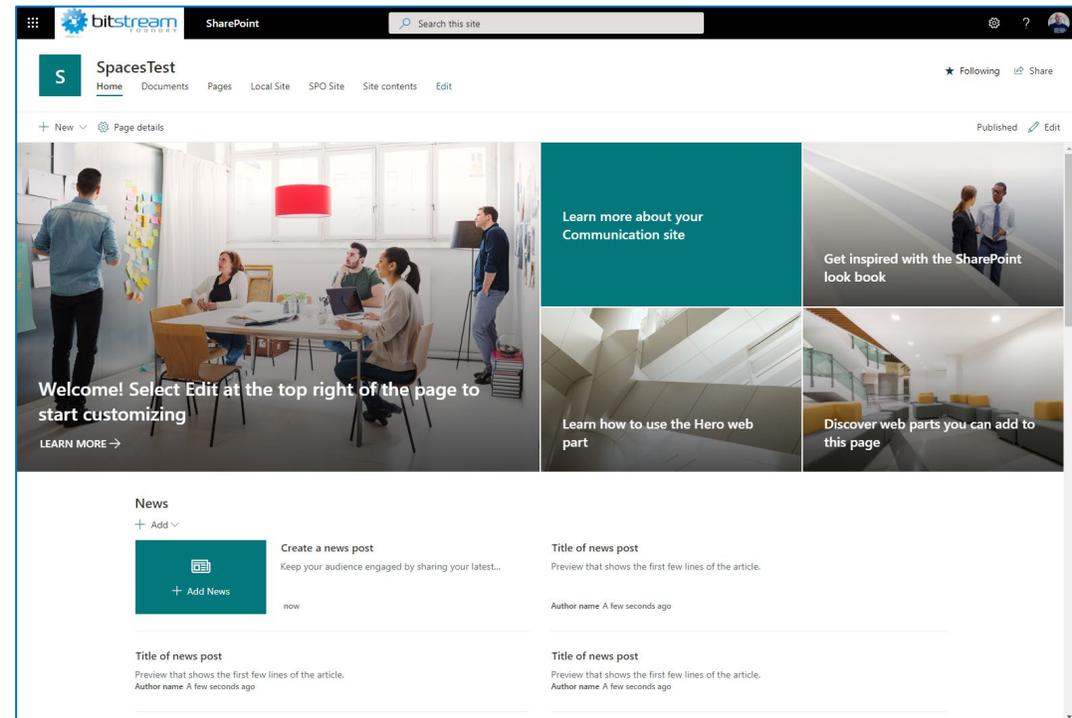
Let's take a trip through time ...



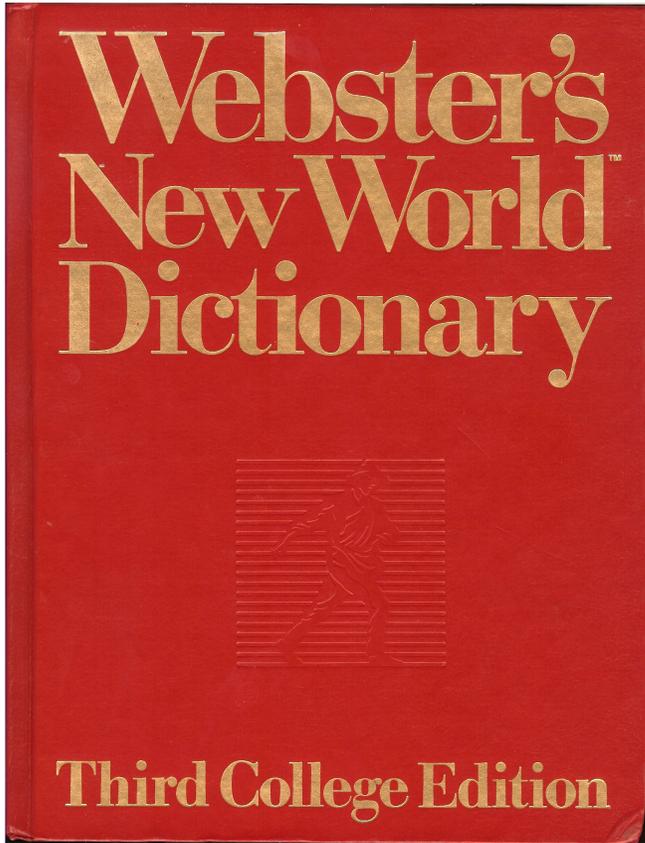
Start with where we've been



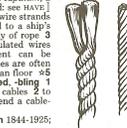
Arrive at where we are today



Caching – in the beginning ...



cache /kadər/ **194**
 etc. caused by living for some time in a confined space or an isolated area, esp. in winter
cache (ka'ʃa) *n.* [ME & OFr < LL *capula*, a coil, rope < L *capere*, to take hold of] **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** **LECTURE** **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 cabinet or rack of cables **6** **CABLE TV** — *vt.* **1** *blend, bring* **1** transmit by undersea cable **3** to send a cablegram to — *vi.* to send a cablegram
Ca-bile (ka'bil) *n.* George Washington 1844-1925; U.S. novelist
cache car (ka'ʃa kɑː) *n.* a motor car, as across a canyon, up a steeply inclined street, etc.
cache-est (ka'ʃa kɛst) *vt.* **cast, casting** to transmit directly to receivers by means of coaxial cable — *n.* a program that cablecasts — *cache-caster* *n.*
cache-gram ('gram) *n.* a message sent by undersea cable
cache-laid (ka'ʃa laɪd) *adj.* made of three or four plain cables twisted together from right to left
cache length a unit of nautical measure equal to 720 feet (120 fathoms or 210 m) or, in British usage, 600 feet (100 fathoms or 183 m) or 607.6 feet (½ of a nautical mile or 185 m)
cache railway a street railway in which the cars are pulled by a continuously moving underground cable
cache stitch a type of raised stitch used in knitting; it resembles ropes twisted together
cache 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 (ka'b'mæn) *n.* *pl.* **-men** (*mæn*) **CABMAN**
cab-ob (ka'bɔ) *n.* **KEBAB**
cab-ochon (ka'bɔʃən) *n.* [Fr. *cabochon*, head] **1** any precious stone cut in convex shape, polished but not faceted; see *onyx*, *illus.* **2** the style of cutting such a stone
ca-boomb (ka'bɔmb) *n.* [ModE. < Sp. any of a genus (*Catomba*) of waterlilies (family Cabombaceae), esp. a species (*C. caroliniana*) with submerged, needlelike leaves and rounded, floating ones; used in aquariums, garden pots, etc.]
ca-booodle (ka'bɔdʊl) *n.* [*co-*, *cab-*, intens. prefix (<? Ger) + *boon*] [*Colloq.*] *lut.* group [the whole *caboodle*]
ca-boose (ka'bɔs) *n.* [*MidJ.* *caboose*, *kambuis* (< ?), ship's galley] **1** [Brit.] *Nauc.* a ship's kitchen galley **2** the trainman's car on a freight train, usually at the rear
cab-ot (ka'bɔt) **1** **John** (fl. name *Giocomo 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-otage (ka'bɔtɪʒ) *n.* [Fr. *cabotier*, to sail along the coast < MF *cabre*, 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 (ka'bretə) *adj.* [*It.* *capra*, goat (< L. *capra*, fem. of *caper*; see *CAPRINUS*)] **1** *fem.* dim. suffix (<? designating) of a wool leather made from a special kind of sheepskin
ca-brilla (ka'bɪlɪə) *n.* [*Sp.* *prawn*, dim. of *cabra*, goat; see *pre-*, any of various *Caprellidae* fishes (family Serranidae) found off Florida, the West Indies, etc.]
Ca-brini (ka'brɪni) *n.* **Santa Frances Xavier** (called *Mother Cabrini*) 1850-1917; U.S. nun, born in Italy; first U.S. citizen canonized; her day is Dec. 22
ca-br-i-ole (ka'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** *Ball* a leg in which one leg is thrown upward and then both legs are beaten together
cab-ro-let (ka'bɔrəl) *n.* [Fr. dim. of *cabrier*, a leop. caper < L. *capere*, carry] **1** a light two-wheeled carriage, usually with a hood that folds down by one horse **2** a former style of automobile like a convertible
cab-stand (ka'bstand) *n.* a place where cabs are stationed for hire
ca-c- (ka:k) *combining form*
ca-c- used before a vowel
ca-c- (ka:k) *n.* [*Slang.*] **ca-c-** (*ka:k*) *n.* [*Slang.*] excrement; feces



CABLE



CABRIOLET

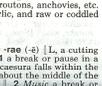
ca-cio /kɑ:ʃiə/ **195**
 etc. caused by living for some time in a confined space or an isolated area, esp. in winter
ca-cio (ka'ʃiə) *n.* [ME & OFr < LL *capula*, a coil, rope < L *capere*, to take hold of] **1** a thick, heavy rope, now often of wire strands **2** the strong, heavy chain attached to a ship's anchor; anchor cables were formerly of rope **3** **CABLE** **LECTURE** **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 cabinet or rack of cables **6** **CABLE TV** — *vt.* **1** *blend, bring* **1** transmit by undersea cable **3** to send a cablegram to — *vi.* to send a cablegram
Ca-bile (ka'bil) *n.* George Washington 1844-1925; U.S. novelist
cache car (ka'ʃa kɑː) *n.* a motor car, as across a canyon, up a steeply inclined street, etc.
cache-est (ka'ʃa kɛst) *vt.* **cast, casting** to transmit directly to receivers by means of coaxial cable — *n.* a program that cablecasts — *cache-caster* *n.*
cache-gram ('gram) *n.* a message sent by undersea cable
cache-laid (ka'ʃa laɪd) *adj.* made of three or four plain cables twisted together from right to left
cache length a unit of nautical measure equal to 720 feet (120 fathoms or 210 m) or, in British usage, 600 feet (100 fathoms or 183 m) or 607.6 feet (½ of a nautical mile or 185 m)
cache railway a street railway in which the cars are pulled by a continuously moving underground cable
cache stitch a type of raised stitch used in knitting; it resembles ropes twisted together
cache 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 (ka'b'mæn) *n.* *pl.* **-men** (*mæn*) **CABMAN**
cab-ob (ka'bɔ) *n.* **KEBAB**
cab-ochon (ka'bɔʃən) *n.* [Fr. *cabochon*, head] **1** any precious stone cut in convex shape, polished but not faceted; see *onyx*, *illus.* **2** the style of cutting such a stone
ca-boomb (ka'bɔmb) *n.* [ModE. < Sp. any of a genus (*Catomba*) of waterlilies (family Cabombaceae), esp. a species (*C. caroliniana*) with submerged, needlelike leaves and rounded, floating ones; used in aquariums, garden pots, etc.]
ca-booodle (ka'bɔdʊl) *n.* [*co-*, *cab-*, intens. prefix (<? Ger) + *boon*] [*Colloq.*] *lut.* group [the whole *caboodle*]
ca-boose (ka'bɔs) *n.* [*MidJ.* *caboose*, *kambuis* (< ?), ship's galley] **1** [Brit.] *Nauc.* a ship's kitchen galley **2** the trainman's car on a freight train, usually at the rear
cab-ot (ka'bɔt) **1** **John** (fl. name *Giocomo 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-otage (ka'bɔtɪʒ) *n.* [Fr. *cabotier*, to sail along the coast < MF *cabre*, 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 (ka'bretə) *adj.* [*It.* *capra*, goat (< L. *capra*, fem. of *caper*; see *CAPRINUS*)] **1** *fem.* dim. suffix (<? designating) of a wool leather made from a special kind of sheepskin
ca-brilla (ka'bɪlɪə) *n.* [*Sp.* *prawn*, dim. of *cabra*, goat; see *pre-*, any of various *Caprellidae* fishes (family Serranidae) found off Florida, the West Indies, etc.]
Ca-brini (ka'brɪni) *n.* **Santa Frances Xavier** (called *Mother Cabrini*) 1850-1917; U.S. nun, born in Italy; first U.S. citizen canonized; her day is Dec. 22
ca-br-i-ole (ka'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** *Ball* a leg in which one leg is thrown upward and then both legs are beaten together
cab-ro-let (ka'bɔrəl) *n.* [Fr. dim. of *cabrier*, a leop. caper < L. *capere*, carry] **1** a light two-wheeled carriage, usually with a hood that folds down by one horse **2** a former style of automobile like a convertible
cab-stand (ka'bstand) *n.* a place where cabs are stationed for hire
ca-c- (ka:k) *combining form*
ca-c- used before a vowel
ca-c- (ka:k) *n.* [*Slang.*] **ca-c-** (*ka:k*) *n.* [*Slang.*] excrement; feces

ca-cio /kɑ:ʃiə/ **195**
 etc. caused by living for some time in a confined space or an isolated area, esp. in winter
ca-cio (ka'ʃiə) *n.* [ME & OFr < LL *capula*, a coil, rope < L *capere*, to take hold of] **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** **LECTURE** **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 cabinet or rack of cables **6** **CABLE TV** — *vt.* **1** *blend, bring* **1** transmit by undersea cable **3** to send a cablegram to — *vi.* to send a cablegram
Ca-bile (ka'bil) *n.* George Washington 1844-1925; U.S. novelist
cache car (ka'ʃa kɑː) *n.* a motor car, as across a canyon, up a steeply inclined street, etc.
cache-est (ka'ʃa kɛst) *vt.* **cast, casting** to transmit directly to receivers by means of coaxial cable — *n.* a program that cablecasts — *cache-caster* *n.*
cache-gram ('gram) *n.* a message sent by undersea cable
cache-laid (ka'ʃa laɪd) *adj.* made of three or four plain cables twisted together from right to left
cache length a unit of nautical measure equal to 720 feet (120 fathoms or 210 m) or, in British usage, 600 feet (100 fathoms or 183 m) or 607.6 feet (½ of a nautical mile or 185 m)
cache railway a street railway in which the cars are pulled by a continuously moving underground cable
cache stitch a type of raised stitch used in knitting; it resembles ropes twisted together
cache 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 (ka'b'mæn) *n.* *pl.* **-men** (*mæn*) **CABMAN**
cab-ob (ka'bɔ) *n.* **KEBAB**
cab-ochon (ka'bɔʃən) *n.* [Fr. *cabochon*, head] **1** any precious stone cut in convex shape, polished but not faceted; see *onyx*, *illus.* **2** the style of cutting such a stone
ca-boomb (ka'bɔmb) *n.* [ModE. < Sp. any of a genus (*Catomba*) of waterlilies (family Cabombaceae), esp. a species (*C. caroliniana*) with submerged, needlelike leaves and rounded, floating ones; used in aquariums, garden pots, etc.]
ca-booodle (ka'bɔdʊl) *n.* [*co-*, *cab-*, intens. prefix (<? Ger) + *boon*] [*Colloq.*] *lut.* group [the whole *caboodle*]
ca-boose (ka'bɔs) *n.* [*MidJ.* *caboose*, *kambuis* (< ?), ship's galley] **1** [Brit.] *Nauc.* a ship's kitchen galley **2** the trainman's car on a freight train, usually at the rear
cab-ot (ka'bɔt) **1** **John** (fl. name *Giocomo 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-otage (ka'bɔtɪʒ) *n.* [Fr. *cabotier*, to sail along the coast < MF *cabre*, 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 (ka'bretə) *adj.* [*It.* *capra*, goat (< L. *capra*, fem. of *caper*; see *CAPRINUS*)] **1** *fem.* dim. suffix (<? designating) of a wool leather made from a special kind of sheepskin
ca-brilla (ka'bɪlɪə) *n.* [*Sp.* *prawn*, dim. of *cabra*, goat; see *pre-*, any of various *Caprellidae* fishes (family Serranidae) found off Florida, the West Indies, etc.]
Ca-brini (ka'brɪni) *n.* **Santa Frances Xavier** (called *Mother Cabrini*) 1850-1917; U.S. nun, born in Italy; first U.S. citizen canonized; her day is Dec. 22
ca-br-i-ole (ka'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** *Ball* a leg in which one leg is thrown upward and then both legs are beaten together
cab-ro-let (ka'bɔrəl) *n.* [Fr. dim. of *cabrier*, a leop. caper < L. *capere*, carry] **1** a light two-wheeled carriage, usually with a hood that folds down by one horse **2** a former style of automobile like a convertible
cab-stand (ka'bstand) *n.* a place where cabs are stationed for hire
ca-c- (ka:k) *combining form*
ca-c- used before a vowel
ca-c- (ka:k) *n.* [*Slang.*] **ca-c-** (*ka:k*) *n.* [*Slang.*] excrement; feces

ca-cio /kɑ:ʃiə/ **195**
 etc. caused by living for some time in a confined space or an isolated area, esp. in winter
ca-cio (ka'ʃiə) *n.* [ME & OFr < LL *capula*, a coil, rope < L *capere*, to take hold of] **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** **LECTURE** **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 cabinet or rack of cables **6** **CABLE TV** — *vt.* **1** *blend, bring* **1** transmit by undersea cable **3** to send a cablegram to — *vi.* to send a cablegram
Ca-bile (ka'bil) *n.* George Washington 1844-1925; U.S. novelist
cache car (ka'ʃa kɑː) *n.* a motor car, as across a canyon, up a steeply inclined street, etc.
cache-est (ka'ʃa kɛst) *vt.* **cast, casting** to transmit directly to receivers by means of coaxial cable — *n.* a program that cablecasts — *cache-caster* *n.*
cache-gram ('gram) *n.* a message sent by undersea cable
cache-laid (ka'ʃa laɪd) *adj.* made of three or four plain cables twisted together from right to left
cache length a unit of nautical measure equal to 720 feet (120 fathoms or 210 m) or, in British usage, 600 feet (100 fathoms or 183 m) or 607.6 feet (½ of a nautical mile or 185 m)
cache railway a street railway in which the cars are pulled by a continuously moving underground cable
cache stitch a type of raised stitch used in knitting; it resembles ropes twisted together
cache 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 (ka'b'mæn) *n.* *pl.* **-men** (*mæn*) **CABMAN**
cab-ob (ka'bɔ) *n.* **KEBAB**
cab-ochon (ka'bɔʃən) *n.* [Fr. *cabochon*, head] **1** any precious stone cut in convex shape, polished but not faceted; see *onyx*, *illus.* **2** the style of cutting such a stone
ca-boomb (ka'bɔmb) *n.* [ModE. < Sp. any of a genus (*Catomba*) of waterlilies (family Cabombaceae), esp. a species (*C. caroliniana*) with submerged, needlelike leaves and rounded, floating ones; used in aquariums, garden pots, etc.]
ca-booodle (ka'bɔdʊl) *n.* [*co-*, *cab-*, intens. prefix (<? Ger) + *boon*] [*Colloq.*] *lut.* group [the whole *caboodle*]
ca-boose (ka'bɔs) *n.* [*MidJ.* *caboose*, *kambuis* (< ?), ship's galley] **1** [Brit.] *Nauc.* a ship's kitchen galley **2** the trainman's car on a freight train, usually at the rear
cab-ot (ka'bɔt) **1** **John** (fl. name *Giocomo 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-otage (ka'bɔtɪʒ) *n.* [Fr. *cabotier*, to sail along the coast < MF *cabre*, 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 (ka'bretə) *adj.* [*It.* *capra*, goat (< L. *capra*, fem. of *caper*; see *CAPRINUS*)] **1** *fem.* dim. suffix (<? designating) of a wool leather made from a special kind of sheepskin
ca-brilla (ka'bɪlɪə) *n.* [*Sp.* *prawn*, dim. of *cabra*, goat; see *pre-*, any of various *Caprellidae* fishes (family Serranidae) found off Florida, the West Indies, etc.]
Ca-brini (ka'brɪni) *n.* **Santa Frances Xavier** (called *Mother Cabrini*) 1850-1917; U.S. nun, born in Italy; first U.S. citizen canonized; her day is Dec. 22
ca-br-i-ole (ka'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** *Ball* a leg in which one leg is thrown upward and then both legs are beaten together
cab-ro-let (ka'bɔrəl) *n.* [Fr. dim. of *cabrier*, a leop. caper < L. *capere*, carry] **1** a light two-wheeled carriage, usually with a hood that folds down by one horse **2** a former style of automobile like a convertible
cab-stand (ka'bstand) *n.* a place where cabs are stationed for hire
ca-c- (ka:k) *combining form*
ca-c- used before a vowel
ca-c- (ka:k) *n.* [*Slang.*] **ca-c-** (*ka:k*) *n.* [*Slang.*] excrement; feces



CADUCEUS



CABRIOLET

ca-cio /kɑ:ʃiə/ **195**
 etc. caused by living for some time in a confined space or an isolated area, esp. in winter
ca-cio (ka'ʃiə) *n.* [ME & OFr < LL *capula*, a coil, rope < L *capere*, to take hold of] **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** **LECTURE** **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 cabinet or rack of cables **6** **CABLE TV** — *vt.* **1** *blend, bring* **1** transmit by undersea cable **3** to send a cablegram to — *vi.* to send a cablegram
Ca-bile (ka'bil) *n.* George Washington 1844-1925; U.S. novelist
cache car (ka'ʃa kɑː) *n.* a motor car, as across a canyon, up a steeply inclined street, etc.
cache-est (ka'ʃa kɛst) *vt.* **cast, casting** to transmit directly to receivers by means of coaxial cable — *n.* a program that cablecasts — *cache-caster* *n.*
cache-gram ('gram) *n.* a message sent by undersea cable
cache-laid (ka'ʃa laɪd) *adj.* made of three or four plain cables twisted together from right to left
cache length a unit of nautical measure equal to 720 feet (120 fathoms or 210 m) or, in British usage, 600 feet (100 fathoms or 183 m) or 607.6 feet (½ of a nautical mile or 185 m)
cache railway a street railway in which the cars are pulled by a continuously moving underground cable
cache stitch a type of raised stitch used in knitting; it resembles ropes twisted together
cache 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 (ka'b'mæn) *n.* *pl.* **-men** (*mæn*) **CABMAN**
cab-ob (ka'bɔ) *n.* **KEBAB**
cab-ochon (ka'bɔʃən) *n.* [Fr. *cabochon*, head] **1** any precious stone cut in convex shape, polished but not faceted; see *onyx*, *illus.* **2** the style of cutting such a stone
ca-boomb (ka'bɔmb) *n.* [ModE. < Sp. any of a genus (*Catomba*) of waterlilies (family Cabombaceae), esp. a species (*C. caroliniana*) with submerged, needlelike leaves and rounded, floating ones; used in aquariums, garden pots, etc.]
ca-booodle (ka'bɔdʊl) *n.* [*co-*, *cab-*, intens. prefix (<? Ger) + *boon*] [*Colloq.*] *lut.* group [the whole *caboodle*]
ca-boose (ka'bɔs) *n.* [*MidJ.* *caboose*, *kambuis* (< ?), ship's galley] **1** [Brit.] *Nauc.* a ship's kitchen galley **2** the trainman's car on a freight train, usually at the rear
cab-ot (ka'bɔt) **1** **John** (fl. name *Giocomo 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-otage (ka'bɔtɪʒ) *n.* [Fr. *cabotier*, to sail along the coast < MF *cabre*, 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 (ka'bretə) *adj.* [*It.* *capra*, goat (< L. *capra*, fem. of *caper*; see *CAPRINUS*)] **1** *fem.* dim. suffix (<? designating) of a wool leather made from a special kind of sheepskin
ca-brilla (ka'bɪlɪə) *n.* [*Sp.* *prawn*, dim. of *cabra*, goat; see *pre-*, any of various *Caprellidae* fishes (family Serranidae) found off Florida, the West Indies, etc.]
Ca-brini (ka'brɪni) *n.* **Santa Frances Xavier** (called *Mother Cabrini*) 1850-1917; U.S. nun, born in Italy; first U.S. citizen canonized; her day is Dec. 22
ca-br-i-ole (ka'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** *Ball* a leg in which one leg is thrown upward and then both legs are beaten together
cab-ro-let (ka'bɔrəl) *n.* [Fr. dim. of *cabrier*, a leop. caper < L. *capere*, carry] **1** a light two-wheeled carriage, usually with a hood that folds down by one horse **2** a former style of automobile like a convertible
cab-stand (ka'bstand) *n.* a place where cabs are stationed for hire
ca-c- (ka:k) *combining form*
ca-c- used before a vowel
ca-c- (ka:k) *n.* [*Slang.*] **ca-c-** (*ka:k*) *n.* [*Slang.*] excrement; feces

SharePoint circa 2006



WSSv3

- SharePoint's "free" version
- No caching capabilities or features



MOSS 2007

- Standard and Enterprise Edition
- Assumed and evolved ECM/WCM from MS Content Management Server 2002
- *Introduction of several caches and caching mechanisms*

MOSS 2007 caching:



- Object Cache
 - Memory-based cache
 - Stores nav data, content by query results, frequently accessed properties, etc
 - Present on every WFE
- BLOB Cache
 - Disk-based cache
 - (Typically) stores images, media files, CSS, etc.
 - When BLOB Cache is configured, max-age can be set for cache-control headers*
- (Page) Output Cache
 - SharePoint's layer on top of the ASP.NET output cache
 - Stores entire pages (HTML) in memory for re-use

Caching PM: “Post-MOSS”



- Some versions after 2007 introduced (or removed) additional pieces:
 - SharePoint 2010: The Office Web Applications Cache
 - SharePoint 2013: The Distributed Cache Service
- Object, BLOB, and Page Output Caching have remained in SharePoint largely untouched and from their original form.
- Everything we’ve been talking about up until this point has focused on SharePoint on-premises installations.
- In 2013, our focus began to shift towards the sky ...

SharePoint Online (SPO)



- In 2014, Microsoft announced that it was shifting to a cloud-first strategy
 - This flipped the traditional release cycle and worried many in IT
 - Microsoft began making changes and additions to SPO before on-prem releases
 - SharePoint and SharePoint usage haven't been the same since ...
- Since 2014, SPO has grown in adoption as each quarter has gone by
 - Many organizations initially “cloud-resistant” have come-around
 - Migrations to SPO and M365 still continue and probably will for some time
- Cloud-based operations have had a profound effect on SharePoint
 - Administration and scalability dynamics very different versus on-premises farms
 - Has impacted the evolution of SharePoint – including (you guessed it): caching.

How is (caching) in SPO different?



First: everything you know about caching in SharePoint is wrong!

- Okay, maybe not exactly *wrong*. But probably ineffective in SPO
- To understand why this is, we need to consider our environments



On-premises farm

versus



SPO cloud farm/tenant

On-prem farm dynamics



- Serves fewer users and serves-up fewer sites, relatively speaking
 - These dynamics allow server-based caching mechanisms to work
- Object cache
 - Caching nav structure and content by query results feasible – limited site count
- BLOB cache
 - BLOB resources (including image renditions) managed with available drive space
- Page Output cache
 - As with object cache, server memory makes operation of this feasible

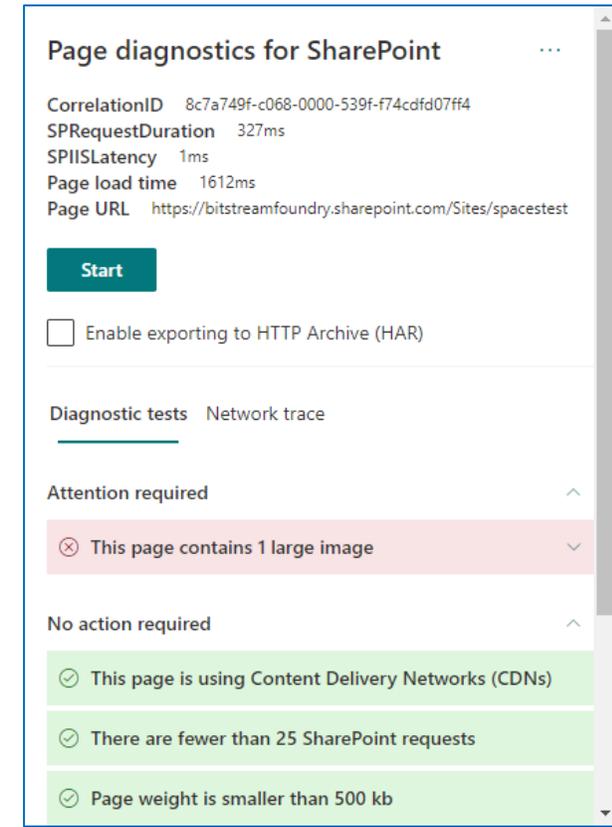
Cloud farm/tenant dynamics



- Typical SPO farm/stamp much larger than even the largest on-prem farms
 - Hundreds of web-front ends rather than a handful
 - Serves a dramatically larger user base and many, many more sites
- With these dynamics, conventional server-side caches don't work
 - Cache hit ratios are (or rather, would be) very low
 - Memory pressure would flush content to make room for newly generated content
- For all intents and purposes, existing caches (object, BLOB, and page output) don't exist. It's best to act like they're simply "not there"
 - By extension, things that rely on those mechanisms tend to operate poorly
 - Structural nav, content by query web parts, BLOB cache of files, etc.

What can be done for SPO perf?

- As it turns out, a fair bit can be done
- Your first stop should be the Page Diagnostics Tool for SharePoint
 - Available (only) in the Google Chrome Store
 - Developed by Microsoft
 - Analyzes SPO pages and reports findings
 - Tests everything from server round-trips, to image sizes, to use of extensions, to web part loading, and a whole lot more.
- The Tool provides practical remediation guidance and is filled with links to MS Docs



The screenshot shows the 'Page diagnostics for SharePoint' interface. At the top, it displays key performance metrics: CorrelationID (8c7a749f-c068-0000-539f-f74cdfd07ff4), SPRequestDuration (327ms), SPIISLatency (1ms), Page load time (1612ms), and Page URL (https://bitstreamfoundry.sharepoint.com/Sites/spacestest). Below the metrics is a 'Start' button and a checkbox for 'Enable exporting to HTTP Archive (HAR)'. The 'Diagnostic tests' section is active, showing a 'Network trace' test. Under 'Attention required', there is a red warning box stating 'This page contains 1 large image'. Under 'No action required', there are three green success boxes: 'This page is using Content Delivery Networks (CDNs)', 'There are fewer than 25 SharePoint requests', and 'Page weight is smaller than 500 kb'.

The big question

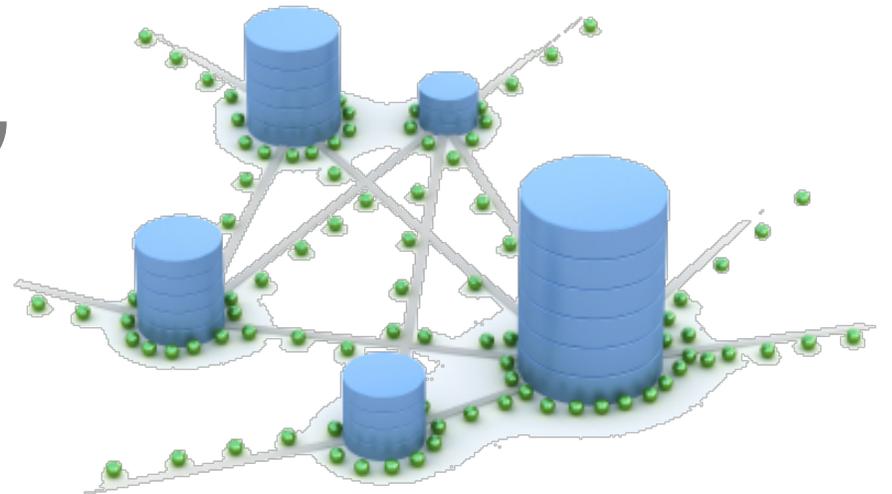
Q: Can we get any help from caching in SPO?

A: Yes, but it doesn't come from SPO itself ...



The key TLA: CDN

- CDN = Content Delivery Network
- Like a geographically distributed BLOB cache
- Microsoft is pushing CDNs in a major way
- Lots of good articles on how they work and why they help SPO so much
 - Check my recent blog posts
- Enable CDN usage in your tenant!
 - Exceptionally easy to do – single line of PowerShell



Other Options

- Server-side: not too much
 - Use Content Search Web Parts instead of Content Query Web Parts
 - Abandon structural navigation as soon as possible and adopt something else (managed navigation, search-driven nav, or cached structural navigation*)
 - Move away from “classical” web parts towards client-side, SPFx driven web parts
- Client-side: more options here
 - This is where we actually have some control over things
 - SPFx web parts and extensions are best bets
 - Image tips: size images appropriately, use sprite sheets, tools like Font Awesome
 - Server calls: minimize round-trips to server – bundle wherever possible
 - Other files: pull down as little as possible: minify or reference directly from CDN

Prescriptive guidance

- Make <https://aka.ms/PortalHealth> your first stop
- The guy on the right will thank you
 - He is Scott Stewart, Senior PM at Microsoft with the ODSP Engineering Team
 - Responsible for keeping things running smoothly (my words) in SPO and portals there
 - One of the contributors to the PortalHealth link I supplied above.



The thought on people's minds

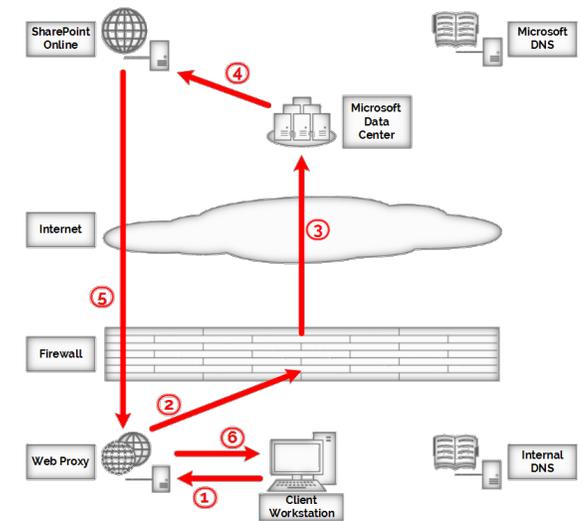
I've followed all of the guidance and run the tools, and yet my site is **STILL** slow.

Please tell me there's still **SOMETHING** I can do?



Remember: SPO is only one piece

- We haven't talked about networks (because they weren't on the docket), but we can't ignore the role they play
- Proper and speedy page rendering depends on a lot of pieces in addition to SPO and caches:
 - Name lookup/DNS resolution
 - Bandwidth, latency, and egress to the Internet
 - Network security gear like firewalls and IPS devices
 - Web proxies, especially web proxies that perform AuthN
 - Path to Microsoft's edge network and (excessive) routing
- Spend some time at <https://aka.ms/tune> to complement time spent on the "... healthy SharePoint portal" page



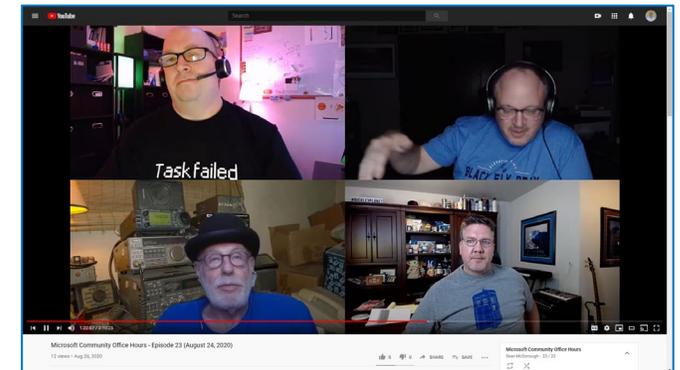
Conclusion and sum-up

The one thing I want you to remember:

! ENABLE CDN USAGE IN YOUR TENANT !

- Check my blog for caching, performance, and similarly related posts
- Reach out to me if I can be of assistance (next slide has contact info)

And I want to plug our Office 365 Community Hours webcast twice daily every Monday. See <https://www.facebook.com/groups/Office365Community/> or email us at OfficeHours@CollabTalk.com



Contacting me



Sean P. McDonough

Consultant, Developer, Administrator, Full-Time Gearhead

Email: sean@SharePointInterface.com
sean@bitstreamfoundry.com

About: <https://spmcdonough.com>

Blog: <https://SharePointInterface.com>

LinkedIn: <https://www.linkedin.com/in/smcdonough>

Twitter: [@spmcdonough](https://twitter.com/spmcdonough)



Thank you!