

| <u>Claim Language</u> | <u>How Practiced by Defendants’ Systems Using Microsoft’s Distributed Replication or SharePoint and Remote Differential Compression</u> |
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| | <p>MUST be the MD4 hash [RFC1320] of the data in the chunk, and the block length MUST be the number of bytes in the chunk. Because the block length is an unsigned integer, the chunks MUST be less than or equal to 2¹⁶-1 bytes in length. Recall that the chunks comprise the data in the signature file.”²⁷</p> <p>MD5 was created shortly after MD4, by the same author. It is an extension of MD4. In the RDC system the RDC system performs the same function as MD5 in claim 16, in the sense that it produces the same result.</p> |
| <p>[17.] A method for increasing data access performed by a sender/computer in a packet-switched network, said sender/computer including an operating unit, a first memory, a permanent storage memory and a processor and said sender/computer being operative to transmit principal data to a receiver/computer, said method comprising the steps of:</p> | <p>On information and belief, Defendants practice claim 17 literally or under equivalents by, for example, using DFS Replication and/or SharePoint on internal networks and by inducing their customers to use DFS Replication and/or SharePoint. Additionally, HP, Dell, and Acer practice claim 17 by making, using, selling, and/or licensing systems that use DFS Replication and/or SharePoint. DFS Replication and/or SharePoint use RDC.²⁹</p> <p>In the DFS Replication context, the sender/computer is in a packet-switched network and transmits data to a receiver/computer, e.g.:</p> <p>“In a typical RDC scenario, a server and a client have different versions of a file. The client and server refer only to the computers’ roles in this scenario, not the operating systems.”³⁰</p> <p>“RDC is suitable for applications that move data across a wide area network.”</p> |

²⁷ [MS-RDC] at 19.

²⁸ RFC 1321: “The MD5 Message-Digest Algorithm” (1992) at 2.

²⁹ DFS Replication is used herein for exemplary purposes only. SharePoint and other products that use RDC will use RDC.

³⁰ “About Remote Differential Compression” ¶ 12.

³¹ “About Remote Differential Compression” ¶ 6.

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| | <p>The sender/computer includes an operating unit, a first memory (e.g., RAM), storage memory (e.g., hard disk drive), a processor, and a network cache (e.g., staging folder that is in a network cache memory), e.g.:</p> <p>“DFS Replication uses staging folders to act as caches for new and changed files replicated from sending members to receiving members.... The receiving member receives the data and builds the file in its staging folder.”³²</p> |
| <p>creating and transmitting digital digests of said principal data and of one or more auxiliary data from said sender/computer to said receiver/computer;</p> | <p>The sender/computer creates and transmits a message containing digital data (e.g., source signature list) to the receiver, e.g.:</p> <p>“The client initiates the RDC protocol by requesting the source signature list. Then the client compares each source signature against the signatures in the list.”³³</p> <p>“The RDC client and server each use the RDC library's FilterMax signature algorithm to divide their copy of the file into chunks and compute a strong hash, called a chunk of file data.”³⁴</p> <p>“2. Machine B partitions <i>file</i> f_B into chunks and computes the signature for each chunk. Machine B sends its list of chunk signatures, $SigB_1 \dots SigB_n$, to Machine A on the basis for Machine A being able to reconstruct <i>file</i> f_B.”³⁵</p> <p>“3.2.4.1.10 RdcGetSignatures (Opnum 9) The RdcGetSignatures method is used to obtain a file's RDC signature data</p> |

³² “Staging Folders and Conflict and Deleted folders” ¶ 1.

³³ “About Remote Differential Compression” ¶ 14.

³⁴ “About Remote Differential Compression” ¶ 13.

³⁵ [MS-RDC] at 9.

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| | <p>The sender/computer creates and transmits a message containing digital data (e.g., similarity data) to the receiver, e.g.:</p> <p>“3. Using similarity data, as described in section 3.1.5.4, Machine A selects a file and partitions it into chunks. It computes a signature for each chunk, section 3.1.5.2.”³⁷</p> <p>“To help choose seed files under the circumstances outlined in the preceding section, similarity data for new <i>files</i> at the source location are calculated and sent to the target location. The similarity data is used on the target location to find existing <i>files</i> that are similar to the new source location <i>files</i>.”³⁸</p> <p>“3.2.4.1.14 InitializeFileTransferAsync (Opnum 13) The InitializeFileTransferAsync method is used by a client to start a file transfer. The client supplies an update to specify which file to download. The server provides the update and initial file contents. The server returns information about the file being replicated and the first buffer of data from that file (if any). ... frsUpdate: The FRS_UPDATE structure that contains information about the file being replicated. The fields for the UID in <i>frsUpdate</i> MUST be set to the UID of the file being downloaded. All other fields are cleared (zeroed out) or can have the value of the server in the response to a RequestUpdates call. On return, all fields of <i>frsUpdate</i> contain the values that are held by the server.”³⁹</p> |

³⁶ [MS-FRS2] at 64.

³⁷ [MS-RDC] at 9.

³⁸ [MS-RDC] at 21.

³⁹ [MS-FRS2] at 71.

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| | <p>“2.2.1.4.4 FRS_UPDATE A structure that contains file metadata related to a particular file being processed by Distributed File System Replication (DFS-R). ... rdcSimilarity: The similarity hash of the file. The value will be all zeros if the similarity was not computed. See [MS-RDC], 3.1.5.4.”⁴⁰</p> |
| <p>receiving a response signal at said sender/computer from said receiver/computer, said response signal containing a positive, negative or partial indication signal, and</p> | <p>The receiver/computer transmits a response signal for the digital digest, or a partial or negative indication signal, e.g.:</p> <p>“The client initiates the RDC protocol by requesting the source signature. Then the client compares each source signature against the signatures in the seed signature list. If a source signature matches a seed signature, the client already has the source signature. If a source signature does not appear in the client's list of seed signatures, the client must request the specified chunk (of file data) from the server. . . . The client then compares each needs block and copies the specified chunk of the source or seed file. Seed file data is copied locally. Source file data is downloaded from the server. The more similar the seed and source files are, the less network bandwidth is required to transfer the file.”⁴¹</p> <p>“5. Machine A sends a request to Machine B for all the chunks whose signature did not match in the previous step from Machine B, but that did not have a matching signature on Machine A. The chunks are requested by offset and length in <i>file</i> f_B based on the signature that was sent in step 2.”⁴²</p> |

⁴⁰ [MS-FRS2] at 71.

⁴¹ “About Remote Differential Compression” ¶¶ 14, 16.

⁴² [MS-RDC] at 9.

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| | <p>“3.2.4.1.9 RawGetFileData (Opnum 8) The RawGetFileData method is used to transfer successive segments of data for a file from the server to the client.”⁴³</p> <p>“3.2.4.1.11 RdcPushSourceNeeds (Opnum 10) The RdcPushSourceNeeds method is used to register requests for file ranges.”⁴⁴</p> <p>“3.2.4.1.12 RdcGetFileData (Opnum 11) The RdcGetFileData method is used to obtain file ranges whose requests are queued on a server by calling the RdcPushSourceNeeds method.”⁴⁵</p> <p>“3.2.4.1.13 RdcClose (Opnum 12) The RdcClose method informs the server that the server context information is released.”⁴⁶</p> <p>“3.2.4.1.15 RawGetFileDataAsync (Opnum 15) The RawGetFileDataAsync method is used instead of calling RawGetFileData to obtain file data. As specified in [MS-RPCE], the specification for asynchronous RPC client pulls file data from the byte pipe until receiving an end-of-file notification on the pipe.”⁴⁷</p> <p>“3.2.4.1.16 RdcGetFileDataAsync (Opnum 16) The RdcGetFileDataAsync method is used instead of calling RdcGetFileData to obtain file data. As specified in [MS-RPCE], the specification for asynchronous</p> |

⁴³ [MS-FRS2]: Distributed File System Replication Protocol – v20151016 at 63.

⁴⁴ [MS-FRS2] at 66-67.

⁴⁵ [MS-FRS2] at 67-68.

⁴⁶ [MS-FRS2] at 70.

⁴⁷ [MS-FRS2] at 76.

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