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CLASS 709, ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS: MULTICOMPUTER DATA TRANSFERRING

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SECTION I - CLASS DEFINITION

GENERAL STATEMENT OF THE CLASS SUBJECT MATTER

This class provides for an electrical computer or digital data processing system or corresponding data processing method including apparatus or steps for transferring data or instruction information between a plurality of computers wherein the computers employ the data or instructions before or after transferring and the employing affects said transfer of data or instruction information.

The class includes the following subject matter:

Process or apparatus for transferring data among a plurality of spatially distributed (i.e., situated, at plural locations) computers or digital data processing systems via one or more communications media (e.g., computer networks).

SCOPE OF THE CLASS

This class is limited to digital data processing systems and funtions for transferring unspecified data or instruction information and the proceesing thereof by digital data processing systems. Systems concerned with movement or processing of other specific types of information and digital signals, per se, areclassified elsewhere. See the SEE OR SEARCH CLASS notes below.

LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

A. Electric Computers and Data Processing Systems, Related Systems and Functions in General.

(1) Systems directed to a specific end use of information, for example, senor data processed by a computer means for control purposes in systems classified external to this class, are classified elsewhere. See the SEE OR SEARCH CLASS notes below

B. Communications Classes

This class includes significant data processing in combination with communication of data, and allowed types of information, amongst digital processing systems.

For multiplexing see the SEE OR SEARCH CLASS notes below.

For systems directed to selective communication systems. See the SEE OR SEARCH CLASS notes below.

For systems directed to communication techniques such as pulse or digital communications. See the SEE OR SEARCH CLASS notes below.

C. Additional Notes

(1) Note. The subject matter of this class is characterized by data transfer occurring as an external communication between separate computers which themselves are distinguishable processing entities.

(2) Note. The basic distinctions between this class and the communications classes are (a) the subclasses herein include computers, rather than other data communications devices, and (b) the computers perform data processing in addition to transferring data there between; overall combinations directed to a system for performing communications functions only are classified in the communications art classes. See the SEE OR SEARCH CLASS notes below.

(3) Note. Processes and apparatus for preprocessing or postprocessing of signals in the data transfer to effect a particular method of communications (e.g., modulating, demodulating, encoding, decoding, phase locking) are classified in the appropriate communications class. See the SEE OR SEARCH CLASS notes below for examples.

(4) Note. Subject matter relating to transmission or interconnection systems not classifiable herein and not appropriate for the communication classes is classified in the residual class for all transmission or interconnection systems. See the SEE OR SEARCH CLASS notes below.

(5) Note. Processes and apparatus for error detection and correction (EDAC), fault detection and recovery, and for increasing the probability of a computer, digital data processing system, or computer network performing correctly (i.e., increasing its reliability and availability), per se, are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(6) Note. Processes and apparatus for enhancing the security of computers, digital data processing systems, and computer networks, per se, are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(7) Note. Processes and apparatus for housing or mounting computers, digital data processing systems, calculators, or components thereof are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(8) Note. Subject matter relating to neural networks, per se, are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(9) Note. Subject matter relating to distributed or remote accessing of databases or files, per se, is classified elsewhere. See the SEE OR SEARCH THIS CLASS, SUBCLASS notes below.

SECTION II - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

235, Registers, appropriate subclassesfor basic machines and associated indicating mechanisms for ascertaining the number of movements of various devices and machines, plus machines made from these basic machines alone (e.g., cash registers, voting machines), and in combination with various perfecting features, such as printers and recording means, and for various data bearing record controlled systems.

307, Electrical Transmission or Interconnection Systems, for all subject matter relating to electrical transmission or interconnection systems not classified elsewhere.

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326, Electronic Digital Logic Circuitry, appropriate subclassesfor generic digital logic devices, circuitry, and subcombinations thereof, wherein operations other than arithmetical are performed upon discrete electrical signals representing a value normally described by numerical digits.

329, Demodulators, appropriate subclassesfor data demodulators.

332, Modulators, appropriate subclassesfor data modulators

340, Communications: Electrical, subclasses **825** through **825.98**for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels, particularly subclasses 2.1-2.8 for path selection, subclasses 3.1-3.9 for communication systems where status of a controlled device is communicated, subclass 825.02 for tree or cascade selective communication, subclasses 825.2-825.21 for synchronizing selective communication systems, subclasses 825.52 and 825.53 for addressing, and subclasses 825.57-825.69 for pulse responsive actuation in selective communication.

341, Coded Data Generation or Conversion, subclasses **50** through **172**for electrical pulse and digit code converters (e.g., systems for originating or emitting a coded set of discrete signals or translating one code into another code wherein the meaning of the data remains the same but the formats may differ).

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), various subclassesfor communications via directive radio waves and related systems.

345, Computer Graphics Processing and Selective Visual Display Systems, subclasses **1.1** through **3.4**for plural display systems, subclasses 530 through 574 for visual display, and subclasses 30 through 111 for the selective control of two or more light generating or light controlling display elements in accordance with a received image signal.

348, Television, various subclassesfor generating, processing, transmitting or transiently displaying a sequence of images, either locally or remotely, in which the local light variations composing the images may change with time (e.g., natural "live" scenes).

358, Facsimileand Static Presentation Processing, various subclassefor systems that transmit and reproduce arbitrarily composed pictures in which the local light variations composing each of the pictures are not subject to variation with time; e.g., documents both written and printed, maps, charts, and photographs (other than motion picture film).

360, Dynamic Magnetic Information Storage or Retrieval, appropriate subclassesfor record carriers and systems wherein information is stored and retrieved by interaction with a magnetic medium and there is relative motion between said magnetic medium and a transducer, for example, a magnetic disk drive device, and control thereof, per se.

361, Electricity: Electrical Systems and Devices, subclasses **679.02** through **679.61**for housings or mounting assemblies for computers, digital data processing systems, calculators, or components thereof.

365, Static Information Storage and Retrieval, appropriate subclassesfor addressable static singular storage elements or plural singular storage elements of the same type (i.e., the internal elements of memory, per se).

369, Dynamic Information Storage or Retrieval, appropriate subclassesfor record carriers and systems wherein information is stored and retrieved by interaction with a medium and there is relative motion between a medium and a transducer.

370, Multiplex Communications, appropriate subclasses, for the simultaneous transmission of two or more signals over a common medium, particularly subclasses **351** through **430**for multiplex switching including time division multiplex (TDM) switching, subclass 475 for asynchronous TDM communications including addressing, and subclasses 498 – 545 for time division bus transmission.

375, Pulse or Digital Communications, appropriate subclassesfor generic pulse or digital communication systems and synchronization of clocking signals from input data.

377, Electrical Pulse Counters, Pulse Dividers, or Shift Registers: Circuits and Systems, appropriate subclassesfor generic electric circuits for pulse counting.

379, Telephonic Communications, appropriate subclassesfor two-way electrical communication of intelligible audio information of arbitrary content over a communication link.

380, Cryptography, appropriate subclassesfor cryptographic apparatus or process in general which includes electric signal modification and foreign art collections FOR 149 and FOR 150 for cryptographic digital signal handling which may include cryptographic computer communication.

381, Electrical Audio Signal Processing Systems and Devices, appropriate subclassesfor wired one-way audio systems, per se.

382, Image Analysis, appropriate subclassesfor operations performed on image data with the aim of measuring a characteristic of an image, detecting variations, detecting structures, or transforming the image data, and for procedures for analyzing and categorizing patterns present in image data.

386, Television Signal Processing for Dynamic Recording or Reproducing, various subclassesfor apparatus and corresponding processes for processing (which may include receiving) a sequence of images in which the light variation composing the images may change with time (e.g., natural "live" scenes) for dynamic recording or reproducing of the sequence of images.

388, Electricity: Motor Control Systems, cross-reference art collection 907.5 for computer or processor control of DC motor acceleration or speed.

398, Optical Communications, various subclasses for optical communication in combination with electrical communication and subclasses **43** through **103**for multiplexing in an optical communication system.

455, Telecommunications, appropriate subclasses for modulated carrier wave communication, per se, and subclass **26.1** for subject matter which blocks access to a signal source or otherwise limits usage of modulated carrier equipment.

700, Data Processing: Generic Controls Systems or Specific Applications, subclasses **1** through **89**for generic data processing control system, apparatus, or process, particularly subclasses 2 through 7 for plural processors in a digital generic control system, and subclasses 90 through 306 for applications of computers in various environments where there is significant claim recitation of the data computer system or calculating computer and only nominal recitation of an external art environment (where significant structure of an external device is claimed, classification is in the appropriate device class).

701, Data Processing: Vehicles, Navigation, and Relative Location, appropriate subclassesfor applications of computers in vehicular and navigational environments.

702, Data Processing: Measuring, Calibrating, or Testing, appropriate subclassesfor applications of computers in measuring and testing.

703, Data Processing: Structural Design, Modeling, Simulation, and Emulation, appropriate subclasses.

704, Data Processing: Speech Signal Processing, Linguistics, Language Translation, and Audio Compression/Decompression, subclasses **1** through **10**for applications of computers in linguistics, subclasses 200 - 278 for applications of computers in speech signal processing, particularly subclass 270.1 for speech assisted network, and subclasses 500 - 504 for applications of computers in audio compression/decompression.

705, Data Processing: Financial, Business Practice, Management, or Cost/Price Determination, appropriate subclassesfor applications of computers and calculators in business and management environments.

706, Data Processing: Artificial Intelligence, appropriate subclasses, for subject matter directed to artificial intelligence data computer which is disclosed or claimed in plural diverse arts both in combination and in the alternative (e.g., digital data computer system for use in image analysis or electrical audio signal computer, and for artificial intelligence per se), particularly subclasses **15** through **44**for neural networks.

707, Data Processing: Database, Data Mining, and File Management or Data Structures, subclasses **609** through **686**and 705 through 789 for data retrieval and file or database management; and subclasses 790 through 812 for database design and data structures per se; and subclasses 821 through 831 for file management.

708, Electrical Computers: Arithmetic Processing and Calculating, subclasses **1** through **9**for hybrid computers; and subclasses 100 - 714 for calculators, digital signal computer, and arithmetical and logical computer, per se; and subclasses 800 - 854 for electric analog computers.

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclasses **1** through **74**for transferring data from one or more peripherals to one or more computers for the latter to process, store, or further transfer, or for transferring data from the computers to the

peripherals, subclasses 100-132 for transferring data among the memories, processors, and buses of a single computer, and subclass 316 for cross-bar switching.

711, Electrical Computers and Digital Processing Systems: Memory, appropriate subclasses, for memory addressing and management in a computer system particularly subclasses **100** through **173**for transferring data between locations in the same memory or between memories.

712, Electrical Computers and Digital Processing Systems: Processing Architecture and Instruction Processing (e.g., Processors), appropriate subclasses for computer architecture and instruction processing, particularly subclasses **1** through **43**for digital data computer system architectures such as multiple instruction multiple data (MIMD) computers, vector and array computers, and single-chip computers, and subclass 225 for computer control for data transfer.

713, Electrical Computers and Digital Processing Systems: Support, subclass **1** and 2 for digital processing system initialization and configuration (e.g., initializing, set-up, resetting), subclass 100 for reconfiguring digital data computer system (e.g., changing system settings), subclasses 150 through 181 for multiple computer communication protection by cryptography, subclass 187 for computer program modification detection by cryptography, subclass 188 for computer virus detection by cryptography, subclass 189 – 194 for data processing protection using cryptography, subclasses 200 – 202 for security, subclasses 300 -340 for computer power control, subclass 375 for synchronization of plural processors, subclasses 400 and 401 for synchronization of computer clocks or timing signals, data, or pulses, and subclasses 500 - 503 for computer clock, pulse, or timing signal or analysis.

714, Error Detection/Correction and Fault Detection/Recovery, various subclasses for detecting or correcting errors in generic electrical pulse or pulse data and for detecting and recovering from faults of computers, digital data computer systems, and logic level based systems, particularly subclasses **1** through **57**for increasing the probability of a computer, digital data computer system, or a computer network performing correctly (i.e., increasing its reliability and availability) and subclasses 746 – 797 for correcting errors in the transmitted data such as parity checking and cyclical redundancy checking..

715, Data Processing: Presentation Processing of Document, Operator Interface Processing, and Screen Saver Display Processing, subclasses **200** through **277**for document processing.

716, Data Processing: Design and Analysis of Circuit or Semiconductor Mask, appropriate subclasses.

717, Data Processing: Software Development, Installation, and Management, appropriate subclasses.

718, Electrical Computers and Digital Processing Systems: Virtual Machine Task or Process Management or Task Management/Control, appropriate subclassesfor administering over processor or job execution in a digital data processing system.

719, Electrical Computers and Digital Processing Systems: Interprogram Communication or Interprocess Communication (IPC), appropriate subclassesfor exchanging data or messages between two executing programs or processes, independent of the hardware used in the communication.

SECTION III - GLOSSARY

ACCESS

To obtain entry to, or to locate, read into memory, and make ready for, some operation, for example, regarding disks, files, records, and network entry procedures.

APPLICATION PROGRAM

A computer program designed to perform a certain type of work, such as an application to manipulate text, numbers, graphics, or a combination of these elements. An application differs from an operating system (which runs a computer), a utility (which performs maintenance or general-purpose chores), and a language (with which computer programs are created).

BUS

A conductor used for transferring data, signals, or power.

COMPUTER

A machine that inputs data, processes data, stores data, and outputs data.

DATA

Representation of information in a coded manner suitable for communication, interpretation, or processing.

Address data: data that represent or identify a source or destination.

Instruction data: data that represent an operation and identify its operands, if any.

Status data: data that represent conditions of data, digital data processing systems, computers, peripherals, memory, etc.

Streamed data: data consisting of a more-or-less continuous series of bits, bytes, or other small, structurally uniform units.

User data: data other than address data, instruction data, or status data.

DATA PROCESSING

See PROCESSING, below.

DIGITAL DATA PROCESSING SYSTEM

An arrangement of processor(s) in combination with either memory or peripherals, or both, performing data processing.

ENTITY

A computer or process that can be treated as a unit and, often, as a member of a particular category or type.

ENVIRONMENT

A set of resources made available to the user of a system which defines specifications such as the command path (where to look for files), the system prompt and, sometimes, the location of resources or working files.

INFORMATION

Meaning that a human being assigns to data by means of the conventions applied to that data.

INTERFACE

A connection between two elements so that they can work with one another.

MEMORY

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A functional unit to which data can be stored and from which data can be retrieved.

MULTITASKING

A mode of operation in which a computer works on more than one task at a time.

NETWORK

A group of computers and associated devices that are connected by communications facilities which exists to provide computer users with the means of communicating and transferring information electronically. Some types of communication are simple user-to-user messages; others, of the type known as distributed processes, can involve several computers and the sharing of workloads or cooperative efforts in performing a task.

OBJECT

A variable comprising routines and data that is treated as a discrete entity.

OPERATING SYSTEM

Software responsible for controlling the allocation and usage of hardware resources such as memory, central processing unit (CPU) time, disk space, and peripheral devices. The operating system is the foundation on which applications programs (e.g., word processing, spreadsheets) are built.

PERIPHERAL

A functional unit that transmits data to or receives data from a computer to which it is coupled.

PROCESS

A coherent sequence of steps undertaken by a program to manipulate data such as an internal or external data-transfer operation, handling an interrupt, or evaluation of a function.

PROCESSING

Methods or apparatus performing systematic operations upon data or information exemplified by functions such as data or information transferring, merging, sorting, and computing (e.g., arithmetic operations or logical operations).

(1) Note. In this class, the glossary term data is used to modify processing in the term data processing; whereas the term digital data processing system refers to a machine performing data processing.

(2) Note. In an effort to avoid redundant constructions, in this class, where appropriate, the term address data processing is used in place of address data data processing.

PROCESSOR

A functional unit that interprets and executes instruction data.

PROTOCOL

A set of rules or processes which enable computers to exchange information with as little error as possible.

RESOURCE

Any part of computer system or a network, such as a disk drive, printer, or memory, that can be allotted to a program or process while it is running. In programming, a resource can be used by more than one program or in more than one place in a program; for example, dialog boxes, bitmaps, and fonts are resources in many windowing programs.

ROUTING

Receiving transmitted messages within a network and forwarding them to their correct destinations over a available route selected according to a predetermined criteria.

SERVER

A computer running administrative software that controls access to all or part of a network and its resources (such as disk drives and printers). A computer acting as a server makes resources available to computers acting as workstations on the network.

SYNCHRONIZATION

Matching of timing between separate computers or among the components of a system so that all are coordinated.

TASK

A standalone application or a subprogram that is run as an independent entity.

THREAD

A path of processing execution within a larger process or program.

TRANSFER

The movement of data from one location to another or the passing of program control from one portion of a program to another.

SUBCLASSES

200 MISCELLANEOUS:

This subclass is indented under **the class definition**. Subject matter not provided for in any of the preceding subclasses.

(1) Note. The subject matter of this subclass is characterized by data transfer occurring as an external communication between separate computers which themselves are distinguishable processing entities.

(2) Note. The basic distinctions between this subclass together with its indented subclasses and the communications classes are (a) the subclasses herein include computers, rather than other data communications devices, and (b) the computers perform data processing in addition to transferring data there between; overall combinations directed to a system for performing communications functions only are classified in the communications art classes. See the SEE OR SEARCH CLASS notes below.

(3) Processes and apparatus for preprocessing or postprocessing of signals in the data transfer device a particular method of communications (e.g., modulating, demodulating, encoding, decoding, phase locking) is classified in the appropriate communications class.

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See the SEE OR SEARCH CLASS notes below for examples.

(4) Note. Subject matter relating to transmission or interconnection systems not classifiable herein and not appropriate for the communication classes is classified in the residual class for all transmission or interconnection systems. See the SEE OR SEARCH CLASS notes below.

(5) Note. Processes and apparatus for error detection and correction (EDAC), fault detection and recovery, and for increasing the probability of a computer, digital data processing system, or computer network performing correctly (i.e., increasing its reliability and availability), per se, are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(6) Note. Processes and apparatus for enhancing the security of computers, digital data processing systems, and computer networks, per se, are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(7) Note. Processes and apparatus for housing or mounting computers, digital data processing systems, calculators, or components thereof are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(8) Note. Subject matter relating to neural networks, per se, are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(9) Note. Subject matter relating to distributed or remote accessing of databases or files, per se, is classified elsewhere. See the SEE OR SEARCH THIS CLASS, SUBCLASS notes below.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, for all subject matter relating to electrical transmission or interconnection systems not classified elsewhere

326, Electronic Digital Logic Circuitry, appropriate subclasses for electronic digital logic circuitry.

329, Demodulators, appropriate subclasses for data demodulators.

332, Modulators, appropriate subclasses for data modulators.

340, Communications: Electrical, subclasses **825** through **825.98**for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels, particularly subclasses 2.1-2.8 for path selection, subclasses 3.1-3.9 for communication systems where status of a controlled device is communicated, subclasses 7.2-7.63 for code responsive selective call receiving, subclass 825.02 for tree or cascade selective communication, subclasses 825.2-825.21 for synchronizing selective communication systems, subclasses 825.52 and 825.53 for addressing, and subclasses 825.57-825.69 for pulse responsive actuation.

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), various subclasses for communications via directive radio waves and related systems.

345, Computer Graphics Processing and Selective Visual Display Systems, subclasses **1.1** through **3.4**for plural display systems, and subclass 526 for transferring data between graphic system components in a computer graphic computer system.

348, Television, various subclasses for generating, processing, transmitting or transiently displaying a sequence of images, either locally or remotely, in which the local light variations composing the images may change with time (e.g., natural "live" scenes).

358, Facsimile and Static Presentation Processing, various subclasses for systems that transmit and reproduce arbitrarily composed pictures in which the local light variations composing each of the pictures are not subject to variation with time; e.g., documents both written and printed, maps, charts, and photographs (other than motion picture film).

361, Electricity: Electrical Systems and Devices, subclasses **679.02** through **679.61**for housings or mounting assemblies for computers, digital data processing systems, calculators, or components thereof.

370, Multiplex Communications, for the simultaneous transmission of two or more signals over a common medium where the transmitted data are generic to the transmission activity, particularly subclasses **351**+ for time division multiplex (TDM) switching, subclasses 498+ for time division bus transmission, and subclass 475 for asynchronous TDM communications including addressing.

375, Pulse or Digital Communications, various subclasses for digital communications including modulating, demodulating, encoding, decoding, and phase locking.

379, Telephonic Communications, various subclasses for two-way electrical communication of audio information of arbitrary content.

380, Cryptography, various subclasses for concealing, obscuring, and extracting intelligible information by, for example, coding and decoding, and foreign art collections FOR 149 and FOR 150 for cryptographic digital signal handling which may include cryptographic computer communication.

381, Electrical Audio Signal Processing Systems and Devices, various subclasses for wired one-way audio systems, per se.

386, Television Signal Processing for Dynamic Recording or Reproducing, various subclasses for apparatus and corresponding processes for processing (which may include receiving) a sequence of images in which the light variation composing the images may change with time (e.g., natural "live" scenes) for dynamic recording or reproducing of the sequence of images.

398, Optical Communications, various subclasses optical communication in combination with electrical communication and subclasses **43** through **103**for multiplexing in an optical communication system.

455, Telecommunications, for modulated carrier wave communications, per se.

700, Data Processing: Generic Control Systems or Specific Applications, subclasses **2** through **7**for plural processors in a digital generic control system.

704, Data Processing: Speech Signal Processing, Linguistics, Language Translation, and Audio Compression/Decompression, subclass **270.1** for speech assisted network.

706, Data Processing: Artificial Intelligence, subclasses **15**+ for neural networks.

707, Data Processing: Databases and File Management or Data Structures, subclasses **609** through **686**and 705 through 789 for data retrieval and file or database management; and subclasses 790 through 812 for database design and data structures per se; and subclasses 821 through 831 for file management.

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclasses **1** through **74**for transferring data from one or more peripherals to one or more computers for the latter to process, store, or further transfer, or for transferring data from the computers to the peripherals, subclasses 100-132 for transferring data among the memories, processors, and buses of a single computer, and subclass 316 for cross-bar switching.

711, Electrical Computers and Digital Processing Systems: Memory, subclasses **100**+ for transferring data between locations in the same memory or between memories.

712, Electrical Computers and Digital Processing Systems: Processing Architecture and Instruction Processing (e.g., Processors), subclasses **1**+ for digital data computer system architectures such as multiple instruction multiple data (MIMD) computers, vector and array computers, and single-chip computers, and subclass 225 for computer control for data transfer.

713, Electrical Computers and Digital Processing Systems: Support, subclasses **1** and 2 for determining the initial configuration of a single computer, and subclass 100 for altering an established configuration of a single computer.

714, Error Detection/Correction and Fault Detection/Recovery, subclasses **1**+ for increasing the probability of a computer, digital data computer system, or a computer network performing correctly (i.e., increasing its reliability and availability) and subclasses 746+ for correcting errors in the transmitted data such as parity checking and cyclical redundancy checking.

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717, Data Processing: Software Development, Installation, and Management, subclass **11** for installing and managing particular versions of executable programs and operating systems in a single computer.

718, Electrical Computers and Digital Processing Systems: Virtual Machine Task or Process Management or Task Management/Control, appropriate subclassesfor administrating process or job execution over a digital data processing systems.

719, Electrical Computers and Digital Processing Systems: Interprogram Communication or Interprocess Communication (IPC), appropriate subclassesfor interprogram or interprocess communicating.

726, Information Security, subclasses **1** through **36**for information security in computers or digital processing system.

201 **DISTRIBUTED DATA PROCESSING:**
This subclass is indented under **the class definition**. Subject matter wherein the separate computers or digital data processing systems performing different tasks share data to accomplish an overall goal.

(1) Note. Means or steps for computerized database and file accessing and retrieving, especially hierarchical, bit-mapped and flat indexing, hashing, stapling, and containerizing database operations and methods are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(2) Note. Means or steps for organizing and interrelating data or files, including relational, network, hierarchical, and entity-relationship models for databases are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(3) Note. Means or steps for managing and maintaining files and databases in computers and digital data processing systems are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(4) Note. Means or steps for exchanging data or messages between two executing programs or processes with only nominal recitation of processing data transferred between the computers are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(5) Note. Means or steps for controlling operations to execute processes or jobs within the operating system environment of a digital data processing system with only nominal recitation of processing data transferred between the computers are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

208+, for master/slave computer arrangements for transferring data.

SEE OR SEARCH CLASS:

707, Data Processing: Database, Data Mining, and File Management or Data Structures, subclasses **770** , 966 through 974 and 999.010 for distributed databases searching and access.

711, Electrical Computers and Digital Processing Systems: Memory, subclasses **147**+ for shared memory accessing and control.

712, Electrical Computers and Digital Processing Systems: Processing Architecture and Instruction Processing (e.g. Processors), subclasses **28**+ for distributed computer system architectures.

718, Electrical Computers and Digital Processing Systems: Virtual Machine Task or Process Management or Task Management/Control, appropriate subclassesfor means or steps for controlling operations to execute processes or jobs within the operating system environment of a digital data computer system with only nominal recitation of computer data transferred between the computers.

719, Electrical Computers and Digital Processing Systems: Interprogram Communication or Interprocess Communication (IPC), appropriate subclassesfor means or steps for exchanging data or messages between two executing programs or processes with only nominal recitation of computer data transferred between the computers.

202 **Processing agent:**
This subclass is indented under **subclass 201**. Subject matter wherein a data processing entity, executing within a computer, autonomously establishes a dialog (e.g., a negotiation) with another computer, on behalf of a user or another processing entity, in order to transfer data between the computers.

203 **Client/server:**
This subclass is indented under **subclass 201**. Subject matter wherein at least one local computer provides a user interface and performs local data processing to interact with at least one remote computer which implements data processing (e.g., data management, data sharing) within a generic time-sharing environment in response to the local computer to transfer data between the local computer and the remote computer.

SEE OR SEARCH CLASS:

715, Data Processing: Presentation Processing of Document, Operator Interface Processing, and Screen Saver Display Processing, subclasses **700** through **866**for operator interfaces, and particularly subclass 744 for particular operator client/server interface customized by modifying links between interface features and routines performed.

204 **COMPUTER CONFERENCING:**
This subclass is indented under **the class definition**. Subject matter further comprising means or steps for enabling collaborative processing of data by the computers or digital data processing systems.

(1) Note. Means or steps for computerized database and file accessing and retrieving, especially hierarchical, bit-mapped and flat indexing, hashing, stapling, and containerizing database operations and methods are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(2) Note. Means or steps for organizing and interrelating data or files, including relational, network, hierarchical, and entity-relationship models for databases are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(3) Note. Means or steps for managing and maintaining files and databases in computers and digital data processing systems are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

SEE OR SEARCH CLASS:

370, Multiplex Communications, subclasses **260**+ for multiplexed communications enabling three or more terminals to be included in a single call connection.

707, Data Processing: Databases and File Management or Data Structures, subclass **770** for distributed search and retrieval, cross-reference art collection subclasses 966 through 974 for database arrange and 999.010 for distributed databases searching and access.

715, Data Processing: Presentation Processing of Document, Operator Interface Processing, and Screen Saver Display Processing, subclasses **733** through **759**for concurrently established related or collaborative user interfaces including computer conferencing and computer supported cooperative work.

205 **Cooperative computer processing:**
This subclass is indented under **subclass 204**. Subject matter wherein the plural computers or digital data processing systems jointly operate on the same data.

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SEE OR SEARCH CLASS:

345, Computer Graphics Processing and Selective Visual Display Systems, subclasses **1.1** through **3.4**for plural display systems.

715, Data Processing: Presentation Processing of Document, Operator Interface Processing, and Screen Saver Display Processing, subclasses **733** through **759**for operator interfaces for cooperative computer work.

206 **Demand based messaging:**
This subclass is indented under **subclass 204**. Subject matter further comprising means or steps for processing user data in response to a demand to transfer data between the computers (e.g., electronic mail messaging).

SEE OR SEARCH CLASS:

379, Telephonic Communications, subclasses **93.01**+ for transmitting a digital message signal over a telephone line.

207 **Priority based messaging:**
This subclass is indented under **subclass 204**. Subject matter further comprising means or steps for processing data in response to the priority characteristics of data transferred between the computers (e.g., message priority alerts).

208 **MASTER/SLAVE COMPUTER CONTROLLING:**
This subclass is indented under **the class definition**. Subject matter wherein one or more of the computers (i.e., master computers) regulates the operations of one or more of the other computers (i.e., slave computers).

SEE OR SEARCH THIS CLASS, SUBCLASS:

201+, for distributed data processing data transfer.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825** through **825.98**for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels, particularly subclasses 3.1-3.9 for communication systems where status of a controlled device is communicated.

700, Data Processing: Generic Control Systems or Specific Applications, subclass **3** for master/slave arrangements in general purpose digital processing control systems (e.g., feedback control systems).

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclass **110** for master/slave controlling within a single digital data processing system.

712, Electrical Computers and Digital Processing Systems: Processing Architecture and Instruction Processing (e.g., Processors), subclass **31** for master/slave distributed processing system architectures.

209 **Master/slave mode selecting:**
This subclass is indented under **subclass 208**. Subject matter wherein at least one of the computers can function either as a master computer or as a slave computer.

210 **Slave computer locking:**
This subclass is indented under **subclass 208**. Subject matter further comprising means or steps for restricting at least one of the slave computers to exchange data with only one of a plurality of master computers.

211 **Master accessing slave storage:**
This subclass is indented under **subclass 208**. Subject matter further comprising means or steps for enabling at least one of the regulating (i.e., master) computers to store data to or read data from memory of at least one of the of the regulated (i.e., slave) computers.

212 **COMPUTER-TO-COMPUTER DIRECT MEMORY ACCESSING:**
This subclass is indented under **the class definition**. Subject matter further comprising means or steps for transferring data between memories of different computers with minimal or no intervention from main processors of the computers.

(1) Note. Subject matter comprising means or steps for transferring data directly between the peripherals and memories of computers rather than between computers is classified elsewhere. See the SEE OR SEARCH CLASS note below.

SEE OR SEARCH CLASS:

710, Electrical Computers and Digital Processing Systems: Input/Output, subclasses **22**+ for input/output data processing with direct memory accessing (DMA) for transferring data directly between the peripheral and memories of computers.

213 **MULTICOMPUTER DATA TRANSFERRING VIA SHARED MEMORY:**
This subclass is indented under **the class definition**. Subject matter wherein the computers transfer data through one or more memories accessible by the computers.

(1) Note. Means or steps for employing shared memory in computer graphics processing and for accessing and controlling shared memory, per se, are classified elsewhere. See the SEE OR SEARCH CLASS, notes below.

SEE OR SEARCH CLASS:

345, Computer Graphics Processing and Selective Visual Display Systems, subclass **512** for employing shared memory in computer graphics computer.

711, Electrical Computers and Digital Processing Systems: Memory, subclasses **147**+ for shared memory accessing and controlling, per se.

214 **Plural shared memories:**
This subclass is indented under **subclass 213**. Subject matter wherein at least one of the computers selects at least one of a plurality of memories and transfers the data through the selected memories.

SEE OR SEARCH CLASS:

711, Electrical Computers and Digital Processing Systems: Memory, subclass **148** for accessing shared solid-state memory within a single computer.

215 **Partitioned shared memory:**
This subclass is indented under **subclass 213**. Subject matter wherein at least one of the computers transfers the data through a single memory, which is logically divided into sections, each of which is allocated to one of the computers.

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711, Electrical Computers and Digital Processing Systems: Memory, subclass **129** for partitioned cache accessing and control and subclass 153 for dividing or segmenting a given logical memory into independent sections or domains.

216 **Accessing another computer"s memory:**
This subclass is indented under **subclass 213**. Subject matter wherein at least one of the computers directly transfers the to or from memory collocated with and allocated to at least one of the other computers.

217 **REMOTE DATA ACCESSING:**
This subclass is indented under **the class definition**. Subject matter wherein computers located at distant sites transfer data via at least one dedicated communications line (e.g., a telephone connection).

(1) Note. Means or steps for computerized database and file accessing and retrieving, especially hierarchical, bit-mapped and flat indexing, hashing, stapling, and containerizing database operations and methods are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(2) Note. Subject matter relating to transceivers including modems are classified elsewhere, per se. See the SEE OR SEARCH CLASS notes below.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825**+ for selective electrical communication systems.

375, Pulse or Digital Communications, subclasses **219**+ for transceivers including modems, per se.

379, Telephonic Communications, various subclasses for two-way transmission of intelligible audio information having arbitrary content over an electrical conductor.

711, Electrical Computers and Digital Processing Systems: Memory, subclasses **1**+ for means or steps for computerized database and file accessing and retrieving, especially hierarchical, bit-mapped and flat indexing, hashing, stapling, and containerizing database operations and methods.

218 **Using interconnected networks:**
This subclass is indented under **subclass 217**. Subject matter wherein independent computers are linked by one or more interconnected networks (e.g., wide area networks (WANs), the "Internet").

219 **Accessing a remote server:**
This subclass is indented under **subclass 217**. Subject matter wherein large blocks of data (e.g., streamed data) are transferred between a remote file server and a requesting computer.

220 **NETWORK COMPUTER CONFIGURING:**
This subclass is indented under **the class definition**. Subject matter further comprising means or steps for assigning operating characteristics to the computers.

(1) Note. Classification herein is proper if the configuration processing operation involves a data transfer dialog between two or more computers which exchange status data in order to determine the operating characteristics of one or more of the computers.

(2) Note. The result of the configuration processing as applied herein is at least semi-permanent (i.e., the configuration data are maintained by the configured computer once these are established without need to reestablish the configuration data for a different processing session).

(3) Note. Means or steps for establishing the operational parameters by transferring data between two or more computers which process data pertaining to the parameters of the transfer connection or the processing session in order to determine the operating mode for one or more of the computers which will be connected to, or engage in a processing session with, another computer is classified elsewhere. See the SEE OR SEARCH THIS CLASS, SUBCLASS notes below.

(4) Note. Means or steps for configuring or reconfiguring a single computer without processing data transferred between the computer being configured and another computer in order to determine the operating characteristics to be configured is classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(5) Note. Means or steps for installing and managing particular versions of executable programs and operating systems with only nominal recitation of processing data transferred between the computers are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

228, for establishing the operational parameters by transferring data between two or more computers which process data pertaining to the parameters of the transfer connection or the computer session in order to determine the operating mode for one or more of the computers which will be connected to, or engage in a computer session with, another computer.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825**+ for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels.

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclass **104** for system configuring by providing arrangement data to a processor in a single digital data computer system.

713, Electrical Computers and Digital Processing Systems: Support, subclasses **1**+ for determining the initial configuration of a single computer, and subclass 100 for altering an established configuration of a single computer.

717, Data Processing: Software Development, Installation, and Management, subclass **11** for installing and managing particular versions of executable programs and operating systems with only nominal recitation of computer data transferred between the computers.

221 **Reconfiguring:**
This subclass is indented under **subclass 220**. Subject matter wherein one of the computers transfers data (e.g., addresses, allocation tables, operating programs, etc.) to or from another computer which changes the functional configuration of one of the computers within the network after it has been established.

SEE OR SEARCH CLASS:

712, Electrical Computers and Digital Processing Systems: Processing Architecture and Instruction Processing (e.g., Processors), subclass **15** for reconfiguring array processor architectures.

713, Electrical Computers and Digital Processing Systems: Support, subclass **100** for altering an established configuration of a single computer.

222 **Initializing:**
This subclass is indented under **subclass 220**. Subject matter wherein one of the computers transfers data (e.g., addresses, allocation tables, operating programs, etc.) to or from another computer which establishes the functional configuration of one of the computers within the network.

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SEE OR SEARCH CLASS:

713, Electrical Computers and Digital Processing Systems: Support, subclasses **1**+ for determining the initial configuration of a single computer.

223 **COMPUTER NETWORK MANAGING:**
This subclass is indented under **the class definition**. Subject matter further comprising means or steps for managing the resources of the computers connected by a computer network or of the network itself.

SEE OR SEARCH CLASS:

370, Multiplex Communications, subclasses **254**+ for determining multiplex network configurations

224 **Computer network monitoring:**
This subclass is indented under **subclass 223**. Subject matter further comprising means or steps for detecting or observing operating characteristics or conditions of computers connected through a computer network or of the network itself.

(1) Note. Protocol analyzers and logic analyzers are classified elsewhere, per se. See the SEE OR SEARCH CLASS notes below.

(2) Note. Data processing systems or calculating computers designed for or utilized in the indication of a condition relating to a measurement, analysis, or continuous detection (i.e., measuring, testing, or monitoring) are classified elsewhere. See the SEARCH CLASS notes below.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825** through **825.98**for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels, particularly subclasses 3.1-3.9 for communication systems where status of a controlled device is communicated.

370, Multiplex Communications, subclasses **252**+ for determining communications parameters.

702, Data Processing: Measuring, Calibrating, or Testing, appropriate subclasses for data computer systems or calculating computers designed for or utilized in the indication of a condition relating to a measurement, analysis, or continuous detection.

714, Error Detection/Correction and Fault Detection/Recovery, subclass **39** for protocol analyzers and logic analyzers, and subclass 47 for performance monitoring for fault avoidance.

225 **Computer network access regulating:**
This subclass is indented under **subclass 223**. Subject matter further comprising means or steps for controlling which of the plural computers may transfer data via the communications media.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825**+ for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels.

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclasses **36**+ for regulating access of peripherals to computers or vice versa, subclasses 107+ for regulating access of processors or memories to a bus, subclass 200 for general purpose access locking, subclass 220 for general purpose access polling, and subclasses 240+ for general purpose access arbitrating.

711, Electrical Computers and Digital Processing Systems: Memory, subclass **150** for regulating access to shared memories.

726, Information Security, subclasses **1** through **36**for information security in computers or digital processing system.

226 **Network resource allocating:**
This subclass is indented under **subclass 223**. Subject matter further comprising means or steps for apportioning resources to one or more computers on a network.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825**+ for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels.

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclasses, subclasses **36**+ for regulating access of peripherals to computers or vice-versa, subclasses 107+ for regulating access of processors or memories to a bus, subclass 200 for general purpose access locking, and subclasses 240+ for general purpose access polling.

711, Electrical Computers and Digital Processing Systems: Memory, subclass **150** for regulating access to shared memories.

227 **COMPUTER-TO-COMPUTER SESSION/CONNECTION ESTABLISHING:**
This subclass is indented under **the class definition**. Subject matter comprising means or steps for creating a session connection between the computers.

(1) Note. As used herein, a session is the time during which at least two computers maintain an active connection between themselves in order to support an ongoing dialog for transferring data between the computers.

SEE OR SEARCH THIS CLASS, SUBCLASS:

249, for interconnecting plural computer networks.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825.01** through **825.04**for selective electrical communication systems with channel selecting.

370, Multiplex Communications, for simultaneously transmitting two or more signals over a common medium, particularly subclasses **431**+ for asynchronous time-division multiplex (TDM) communications channel assignment techniques.

704, Data Processing: Speech Signal Processing, Linguistics, Language Translation, and Audio Compression/Decompression, subclass **270.1** for speech assisted network.

228 **Session/connection parameter setting:**
This subclass is indented under **subclass 227**. Subject matter further comprising means or steps for establishing at least one operational parameter for transferring data for a session or connection between the computers (e.g., protocol, address, or rate selection).

(1) Note. Classification herein is proper if establishing the operational parameter involves transferring data between two or more computers which process data pertaining to the parameters of the transfer connection or the processing session in order to determine the operating mode for one or more of the computers which will be connected to, or engage in a processing session with, another computer.

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(2) Note. The operating mode established by the data processing operation herein is transient (i.e., the operating parameters are used by the computers for only the established connection or session and must be reestablished for a different processing session or connection).

(3) Note. Configuration processing operations involving a data transfer dialog between two or more computers which process status data in order to determine the operating characteristics of one or more of the computers are classified elsewhere. See the SEE OR SEARCH THIS CLASS, SUBCLASS notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

220, for configuration computer operations involving a transfer dialog between two or more computers which process status data in order to determine the operating characteristics of one or more of the computers.

229 **Network resources access controlling:**
This subclass is indented under **subclass 227**. Subject matter further comprising means or steps for controlling or limiting access by computers on a network to resources on the network (e.g., trusted third party authentication).

SEE OR SEARCH THIS CLASS, SUBCLASS:

225, for regulating access to the network communications media.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **5.8** through **5.86**for selective electrical communications systems with intelligence comparison for identity authentication.

380, Cryptography, subclasses **23**+ for systems employing encrypted user or record actuated authentication, and subclass 49 for digital control or digital computer communication in which an encrypting or decrypting device utilizes a digital signal manipulation technique on the computer signal.

726, Information Security, subclasses **1** through **36**for information security in computers or digital processing system.

230 **COMPUTER-TO-COMPUTER PROTOCOL IMPLEMENTING:**
This subclass is indented under **the class definition**. Subject matter further comprising means or steps for controlling the format and relative timing of transfer of data between the computers in order to maintain communication.

SEE OR SEARCH CLASS:

370, Multiplex Communications, subclasses **465**+ for adaptive communication techniques for data carried in plural channels

231 **Computer-to-computer data streaming:**
This subclass is indented under **subclass 230**. Subject matter further comprising means or steps for processing streamed data transferred between computers wherein the data are transferred more or less continuously.

SEE OR SEARCH THIS CLASS, SUBCLASS:

219, for data transfer between a remote file server and a requesting computer where the data may be streamed.

232 **Computer-to-computer data transfer regulating:**
This subclass is indented under **subclass 230**. Subject matter further comprising means or steps for correcting or modifying the data transfer operation to conform with the operating conditions of the computers.

SEE OR SEARCH CLASS:

370, Multiplex Communications, particularly subclasses **229**+ for data flow congestion prevention or congestion control in a TDM communications system.

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclass **61** for input/output (I/O) synchronous data transfer.

233 **Transfer speed regulating:**
This subclass is indented under **subclass 232**. Subject matter further comprising means or steps for controlling the aggregate rate at which data are exchanged between the computers (e.g., speed changing, rate optimization, packet size optimization).

(1) Note. Means or steps for controlling a first rate at which some of the computers transmit data such that the first rate does not exceed a second rate at which other of the computers can receive data are classified herein.

SEE OR SEARCH CLASS:

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclass **29** for controlling the flow of data transmission to or from peripherals, and subclass 60 for input/output (I/O) transfer rate regulating.

234 **Data flow compensating:**
This subclass is indented under **subclass 232**. Subject matter further comprising means or steps for transferring data from a first computer at a given rate or time, temporarily storing the data, and transferring the data to another computer at a different rate or at a later time (e.g., data discarding, buffer overflow control, space or bit insertion, buffer status flag supervising, transfer buffer management).

(1) Note. Memory devices, per se, are classified in their respective device classes. More specifically, registers are classified elsewhere, static memory devices including internal elements of memories are classified elsewhere, display memory organizations and structures (i.e., selective visual display systems) are classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(2) Note. Buffers used in computer graphics processing, input/output processing, or visual displaying and as caches for memory accessing, addressing, or controlling are classified elsewhere. See the SEE OR SEARCH THIS CLASS, SUBCLASS notes below.

SEE OR SEARCH CLASS:

235, Registers, various subclasses, for basic machines and associated indicating mechanisms for ascertaining the number of movements of various devices and machines and machines made from these basic machines alone and in combination with various perfecting features such as printers and recording means.

345, Computer Graphics Processing and Selective Visual Display Systems, particularly subclasses **27** and 507+ for buffers and other storage devices in visual display systems.

358, Facsimile and Static Presentation Processing, subclass **1.17** for page or frame buffers in printers or other static presentation computer devices.

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365, Static Information Storage and Retrieval, various subclasses for static memory devices including internal elements of the memory, particularly subclass **189.05** for buffering or latching data being read from or written to memory and subclass 230.08 for buffering and latching address data being employed to access memory.

377, Electrical Pulse Counters, Pulse Dividers, or Shift Registers: Circuits and Systems, appropriate subclasses, for electric shift registers.

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclasses **52**+ for input/output (I/O) data buffering.

711, Electrical Computers and Digital Processing Systems: Memory, subclass **3** for addressing cache memory with specific memory configuration, and subclasses 118+ for cache memory accessing and control to transfer data between processor(s) and main memory.

235 **Congestion avoiding:**
This subclass is indented under **subclass 232**. Subject matter further comprising means or steps for controlling the flow of data between the computers to prevent overfilling or overcrowding the computers or the communications media with data (e.g., throttling, traffic management, status signaling).

SEE OR SEARCH CLASS:

370, Multiplex Communications, subclasses **229**+ for avoiding or regulating an actual or potential traffic overload condition.

236 **Computer-to-computer data framing:**
This subclass is indented under **subclass 230**. Subject matter further comprising means or steps for grouping data into a specified arrangement in order to transfer the grouped data between the computers.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825**+ for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels, particularly subclasses 825.57+ for selective communication pulse responsive actuation.

370, Multiplex Communications, subclasses **470** through **476**for frame manipulating to facilitate the simultaneous transmission of two or more signals over a common medium.

237 **Computer-to-computer handshaking:**
This subclass is indented under **subclass 230**. Subject matter further comprising means or steps for exchanging instruction data between computers to signal readiness to exchange user data or to signal receipt of user data.

SEE OR SEARCH CLASS:

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclasses **105**+ for handshaking protocols between components of a single digital data computer system.

238 **COMPUTER-TO-COMPUTER DATA ROUTING:**
This subclass is indented under **the class definition**. Subject matter further comprising means or steps for selecting a path via which the computers will transfer data.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825** through **825.98**for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels, particularly subclasses 2.1-2.8 for path selection and subclasses 14.1-14.69 for a decoder matrix.

370, Multiplex Communications, for the simultaneous transmission of two or more signals over a common medium, particularly subclasses **351**+ for asynchronous TDM communications pathfinding or routing.

379, Telephonic Communications, subclasses **219**+ for plural exchange networks or interconnections and subclasses 242+ for centralized switching systems.

398, Optical Communications, subclasses **45** through **57**for switching multiplexed optical communications.

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclass **316** for switching for infra-systems connection path selecting.

239 **Alternate path routing:**
This subclass is indented under **subclass 238**. Subject matter further comprising means or steps for selecting a substitute path when a desired path is unavailable (e.g., blocked path).

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825**+ for selective communications, particularly subclass 825.01 for spare channel selecting.

370, Multiplex Communications, subclasses **216**+ for fault recovery in a multiplex switching system.

379, Telephonic Communications, particularly subclasses **221.01** through **221.04**and 273-274 for alternate routing in a telephone system.

240 **Prioritized data routing:**
This subclass is indented under **subclass 238**. Subject matter further comprising means or steps for transferring the data in accordance with a ranking assigned to the data.

241 **Least weight routing:**
This subclass is indented under **subclass 238**. Subject matter further comprising means or steps for selecting the path between source and destination by which the data are transferred by optimizing at least one predetermined criteria (e.g., cost, connect time, path length/delay, preferred routing/carriers, bandwidth utilization).

242 **Routing data updating:**
This subclass is indented under **subclass 238**. Subject matter further comprising means or steps for periodically exchanging control data indicating how to transfer data among nodes or routes in a network.

243 **Decentralized controlling:**
This subclass is indented under **subclass 238**. Subject matter wherein each respective computer selects its own path by which to transfer data associated with its individual transfer operation or node (e.g., message flooding).

244 **CENTRALIZED CONTROLLING:**
This subclass is indented under **subclass 238**. Subject matter wherein one computer selects the path used for data transfer by each of the other computers.

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245 **COMPUTER-TO-COMPUTER DATA ADDRESSING:**
This subclass is indented under **the class definition**. Subject matter further comprising means or steps for transferring address data associated with user data between the computers to ensure that associated user data are transferred to or from the intended computers.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825**+ for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels, particularly subclasses 825.52+ for addressing in selective communication, and subclasses 825.57+ for pulse responsive actuation in selective communication.

370, Multiplex Communications, for the simultaneous transmission of two or more signals over a common medium, particularly subclasses **474** and 475 for asynchronous time division multiplex communications including addressing.

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclasses **3**+ for employing addresses for input/output (I/O) computer.

711, Electrical Computers and Digital Processing Systems: Memory, subclasses **1**+ for addressing specific types of memories and 200+ for addressing in computer systems, per se.

246 **Computer-to-computer data modifying:**
This subclass is indented under **the class definition**. Subject matter further comprising means or steps for changing a format of the data transferred between the computers.

SEE OR SEARCH CLASS:

341, Coded Data Generation or Conversion, subclasses **50**+ for generic logic circuits for transforming digital signals in one code to digital signals in another code and subclasses 126+ for converters for transforming analog signals to digital signals and vice versa.

708, Electrical Computers: Arithmetic Processing and Calculating, subclass **204** for electric digital calculating computers performing specialized functions for converting data formats.

247 **Compressing/decompressing:**
This subclass is indented under **subclass 246**. Subject matter wherein the data are processed to reduce the transfer payload volume or to recover the data from a compressed payload.

(1) Note. Compression and decompression of data, per se, is classified elsewhere. See the SEE OR SEARCH CLASS notes below.

(2) Note. Compression/decompression of the data herein occurs in addition to other processing of the data by the computers to facilitate the transferring of the result of the other processing performed.

SEE OR SEARCH CLASS:

341, Coded Data Generation or Conversion, subclass **60** for converting digital codes to or from a packed format.

358, Facsimile and Static Presentation Processing, subclass **1.15** for communication of compressed data in a static presentation system.

370, Multiplex Communications, subclass **477** for conserving transmission bandwidth and 521 for time compression or expansion.

382, Image Analysis, subclasses **232**+ for compressing and decompressing image data.

704, Data Processing: Speech Signal Processing, Linguistics, Language Translation, and Audio Compression/Decompression, subclasses **500**+ for compressing or expanding the bandwidth of an audio signal.

707, Data Processing: Databases and File Management or Data Structures, and Document Processing, subclasses **609** through **686**for database maintenance including synchronization, archiving, backing up and recovering databases and subclasses 687 through 704 for data integrity in databases and subclasses 790 through 812 for database design including data structures and data structure management.

708, Electrical Computers: Arithmetic Processing and Calculating, subclass **203** for electric digital calculating computers performing specialized functions for compressing or decompressing data.

248 **MULTICOMPUTER SYNCHRONIZING:**
This subclass is indented under **the class definition**. Subject matter further comprising means or steps for matching timing between the computers.

(1) Note. Classification herein is proper if data (e.g., tokens, semaphores) are transferred between the computers for processing to accomplish synchronization of the computers.

(2) Note. Single clock or timing circuit control of processors, plural clocks, or timing circuits synchronized to control the processors, or operations synchronized to occur on the same clocking or timing cycle is classified elsewhere. See the SEE OR SEARCH CLASS, SUBCLASS and SEE OR SEARCH CLASS notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

200+, for transferring data between a plurality of computers even if the transferring employs peripherals, e.g., modems, line adapters.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825**+ for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels, particularly subclasses 825.2+ for synchronizing selective communication systems.

370, Multiplex Communications, subclasses **503**+ for synchronizing computer transmitted via time channels.

375, Pulse or Digital Communications, subclasses **354**+ for pulse or digital communications synchronizing.

713, Electrical Computers and Digital Processing Systems: Support, subclass **375** for synchronization maintenance of plural processors and subclasses 500-503 for clock, pulse, or timing signal generation or analysis.

249 **MULTIPLE NETWORK INTERCONNECTING:**
This subclass is indented under **the class definition**. Subject matter further comprising means or steps for coupling plural networks so that data can be transferred therebetween.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825**+ for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels, particularly subclass 825.02 for tree or cascade selective communication.

370, Multiplex Communications, for the simultaneous transmission of two or more signals over a common medium, particularly subclasses **489**+ and 901 for time division bus transmission.

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250 **NETWORK-TO-COMPUTER INTERFACING:**
This subclass is indented under **the class definition**. Subject matter further comprising means or steps for integrating the computers with networks for orderly, efficient operations.

(1) Note. Transceivers including modems are classified elsewhere, per se. See the SEE OR SEARCH CLASS notes below.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825**+ for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels, particularly subclass 825.02 for tree or cascade selective communication.

370, Multiplex Communications, various subclasses for routers, switchers, and related subject matter, especially subclass **463** for circuits or interfaces for connecting a user to a network.

375, Pulse or Digital Communications, subclasses **219**+ for transceivers including modems, per se.

703, Data Processing: Structural Design, Modeling, Simulation, and Emulation, subclasses **23** through **28**for general purpose compatibility or emulation of system components.

251 **RING COMPUTER NETWORKING:**
This subclass is indented under **the class definition**. Subject matter wherein the computers are connected sequentially in a loop configuration.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses **825**+ for controlling one or more devices to obtain a plurality of results by transmission of a designated one of plural distinctive control signals over a smaller number of communication lines or channels.

359, Optical: Systems and Elements, subclass **119** for multiplexing communications within optical local area networks configured as a loop.

370, Multiplex Communications, subclasses **452**+ for assigning communications channels on a ring or loop and subclass 909 for token ring LANs.

252 **STAR OR TREE COMPUTER NETWORKING:**
This subclass is indented under **subclass 200**. Subject matter wherein the computers are connected via the communications media in a branched configuration.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclass **825.02** for selectively operating alternate circuitry branches which exercise control of succeeding circuitry.

370, Multiplex Communications, subclass **407** for interconnected star couplers and subclass 408 for nodes interconnected in a hierarchy to form a tree.

398, Optical Communications, subclasses **61** through **64**for multiplexing communications within optical local area networks in active or passive star configurations.

253 **BUSED COMPUTER NETWORKING:**
This subclass is indented under **subclass 200**. Subject matter wherein the computers are connected to a common transmission medium.

SEE OR SEARCH CLASS:

370, Multiplex Communications, subclasses **431**+ for assigning channels to subscriber terminals and subclass 910 for carrier sense multiple access LANs.

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclasses **100**+ for intrasystem connecting using buses and bus transaction processing.

FOREIGN ART COLLECTIONS

The definitions below correspond to abolished subclasses from which these collections were formed. See the Foreign Art Collection Schedule of this Class for specific correspondences. [Note: the titles and definitions for indented art collections include all the details of the one(s) that are hierarchically superior.]

FOR 100 **Communication engineering (e.g., pictorial and pulse com):**
Foreign art collection including a data pro system or calculating computer which is designed for use in the transmission of information or for the solution of a problem in this area.

FOR 101 **Object detection or track:**
Foreign art collection including subject matter wherein the area includes the sensing or fol an object using radiant energy.

FOR 102 **Signal evaluation (target or noise):**
Foreign art collection including subject matter wherein the signal is examined in order to obtain an assessment of its inherent meaning, probable accuracy, relevancy, and rela to a given situation or context

FOR 103 **MULTICOMPUTER DATA TRANSFER RING:**
Foreign art collections including subject matter wherein means or steps for transferring data among a plurality of spatially distributed (i.e., situated at different locations) computers or digital data processing systems via one or more communications media (e.g., computer networks) wherein the computers or digital data processing systems employ the data in data processing before or after the transferring, and wherein the data processing affects the data transfer between the computers. directed to a system for performing communica functions only are classified in the communications art classes.

FOR 104 **Distributed data processing:**
Foreign art collections including subject matter wherein the separate computers or digital data process systems performing different tasks share data to accomplish an overall goal.

FOR 105 **Processing agent:**
Foreign art collections including subject matter wherein a data processing entity, executing within a computer, autonomously establishes a dialog (e.g., a negotiation) with another computer, on behalf of a user or another processing entity, in order to transfer data between the computers.

FOR 106 **Client/server:**
Foreign art collections including subject matter wherein at least one local computer provides a user interface and performs local data processing to interact with at least one remote computer which implements data processing (e.g., data management, data sharing) within a generic time-

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sharing environment in response to the local computer to transfer data between the local computer and the remote computer.

FOR 107 **Computer conferencing:**
Foreign art collections including subject matter comprising means or steps for enabling collab processing of data by the computers or digital data processing systems.

FOR 108 **Cooperative computer processing:**
Foreign art collections including subject matter wherein the plural computers or digital data processing systems jointly operate on the same data.

FOR 109 **Demand based messaging:**
Foreign art collections including subject matter comprising means or steps for processing user data in response to a demand to transfer data between the computers (e.g., electronic mail messaging).

FOR 110 **Priority based messaging:**
Foreign art collections including subject matter comprising means or steps for processing data in response to the priority characteristics of data transferred between the computers (e.g., message priority alerts).

FOR 111 **Master/slave computer controlling:**
Foreign art collections including subject matter wherein one or more of the computers (i.e., master com) regulates the operations of one or more of the other computers (i.e., slave computers).

FOR 112 **Master/slave mode selecting:**
Foreign art collections including subject matter wherein at least one of the computers can function either as a master computer or as a slave com.

FOR 113 **Slave computer locking:**
Foreign art collections including subject matter comprising means or steps for restricting at least one of the slave computers to exchange data with only one of a plurality of master computers.

FOR 114 **Master accessing slave storage:**
Foreign art collections including subject matter comprising means or steps for enabling at least one of the regulating (i.e., master) computers to store data to or read data from memory of at least one of the of the regulated (i.e., slave) computers.

FOR 115 **Computer-to-computer direct memory accessing:**
Foreign art collections including subject matter comprising means or steps for transferring data between memories of different computers with minimal or no intervention from main proces of the computers.

FOR 116 **Multicomputer data transferring via shared memory:**
Foreign art collections including subject matter wherein the computers transfer data through one or more memories accessible by the computers.

FOR 117 **Plural shared memories:**
Foreign art collections including subject matter wherein at least one of the computers selects at least one of a plurality of memories and transfers the data through the selected memories.

FOR 118 **Partitioned shared memory:**
Foreign art collections including subject matter wherein at least one of the computers transfers the data through a single memory, which is logically divided into sections, each of which is allo to one of the computers.

FOR 119 **Accessing another computer"s memory:**
Foreign art collections including subject matter wherein at least one of the computers directly transfers the data to or from memory collocated with and allocated to at least one of the other computers.

FOR 120 **Remote data accessing:**
Foreign art collections including subject matter wherein computers located at distant sites transfer data via at least one dedicated communications line (e.g., a telephone connection).

FOR 121 **Using interconnected networks:**
Foreign art collections including subject matter wherein independent computers are linked by one or more interconnected networks (e.g., wide area networks (WANs), the Internet).

FOR 122 **Accessing a remote server:**
Foreign art collections including subject matter wherein large blocks of data (e.g., streamed data) are transferred between a remote file server and a requesting computer.

FOR 123 **Network computer configuring:**
Foreign art collections including subject matter comprising means or steps for assigning oper characteristics to the computers.

FOR 124 **Reconfiguring:**
Foreign art collections including subject matter wherein one of the computers transfers data (e.g., addresses, allocation tables, operating pro, etc.) to or from another computer which changes the functional configuration of one of the computers within the network after it has been established.

FOR 125 **Initializing:**
Foreign art collections including subject matter wherein one of the computers transfers data (e.g., addresses, allocation tables, operating pro, etc.) to or from another computer which establishes the functional configuration of one of the computers within the network.

FOR 126 **Computer network managing:**
Foreign art collections including subject matter comprising means or steps for managing the resources of the computers connected by a computer network or of the network itself.

FOR 127 **Computer network monitoring:**
Foreign art collections including subject matter comprising means or steps for detecting or observing operating characteristics or condi of computers connected through a com network or of the network itself.

FOR 128 **Computer network access regulating;**
Foreign art collections including subject matter comprising means or steps for controlling which of the plural computers may transfer data via the communications media.

FOR 129 **Network resource allocating:**
Foreign art collections including subject matter comprising means or steps for apportioning resources to one or more computers on a net.

FOR 130 **Computer-to-computer session/connection establishing:**
Foreign art collections including subject matter compris means or steps for creating a session con between the computers.

FOR 131 **Session/connection parameter setting:**
Foreign art collections including subject matter comprising means or steps for establishing at least one operational parameter for transferring data for a session or connection between the computers (e.g., protocol, address, or rate selection).

FOR 132 **Network resources access controlling:**
Foreign art collections including subject matter comprising means or steps for controlling or limiting access by computers on a network to resources on the network (e.g., trusted third party authentication).

FOR 133 **Computer-to-computer protocol implement:**
Foreign art collections including subject matter comprising means or steps for controlling the format and relative timing of transfer of data between the computers in order to maintain communication.

FOR 134 **Computer-to-computer data streaming:**
Foreign art collections including subject matter comprising means or steps for processing streamed data transferred between computers wherein the data are transferred more or less continuously.

FOR 135 **Computer-to-computer data transfer regu:**
Foreign art collections including subject matter comprising means or steps for correcting or modifying the data transfer operation to con with the operating conditions of the com.

FOR 136 **Transfer speed regulating:**
Foreign art collections including subject matter comprising means or steps for controlling the aggregate rate at which data are exchanged between the computers (e.g., speed changing, rate optimization, packet size optimization).

FOR 137 **Data flow compensating:**
Foreign art collections including subject matter comprising means or steps for transferring data from a first computer at a given rate or time, temporarily storing the data, and transferring the data to another computer at a different rate or at a later time (e.g., data discarding, buffer overflow control, space or bit insertion, buffer status flag supervising, transfer buffer manage).

FOR 138 **Congestion avoiding:**
Foreign art collections including subject matter comprising means or steps for controlling the flow of data between the computers to prevent overfilling or overcrowding the computers or the communications media with data (e.g., throttling, traffic management, status signal).

FOR 139 **Computer-to-computer data framing:**
Foreign art collections including subject matter comprising means or steps for grouping data into a specified arrangement in order to transfer the grouped data between the computers.

FOR 140 **Computer-to-computer handshaking:**
Foreign art collections including subject matter comprising means or steps for exchanging instruction data between computers to signal readiness to exchange user data or to signal receipt of user data.

FOR 141 **Computer-to-computer data routing:**
Foreign art collections including subject matter comprising means or steps for selecting a path via which the computers will transfer data.

FOR 142 **Alternate path routing:**
Foreign art collections including subject matter comprising means or steps for selecting a sub path when a desired path is unavailable (e.g., blocked path).

FOR 143 **Prioritized data routing:**
Foreign art collections including subject matter comprising means or steps for transferring the data in accordance with a ranking assigned to the data.

FOR 144 **Least weight routing:**
Foreign art collections including subject matter comprising means or steps for selecting the path between source and destination by which the data are transferred by optimizing at least one predetermined criteria (e.g., cost, connect time, path length/delay, preferred routing/carri, bandwidth utilization).

FOR 145 **Routing data updating:**
Foreign art collections including subject matter comprising means or steps for periodically exchanging control data indicating how to transfer data among nodes or routes in a net.

FOR 146 **Decentralized controlling:**
Foreign art collections including subject matter wherein each respective computer selects its own path by which to transfer data associated with its individual transfer operation or node (e.g., message flooding).

FOR 147 **Centralized controlling:**
Foreign art collections including subject matter wherein one computer selects the path(s) used for data transfer by each of the other computers.

FOR 148 **Computer-to-computer data addressing:**
Foreign art collections including subject matter comprising means or steps for transferring address data associated with user data between the computers to ensure that associated user data are transferred to or from the intended computers.

FOR 149 **Computer-to-computer data modifying:**
Foreign art collections including subject matter comprising means or steps for changing a for of the data transferred between the com.

FOR 150 **Compressing/decompressing:**
Foreign art collections including subject matter wherein the data are processed to reduce the transfer payload volume or to recover the data from a compressed payload.

FOR 151 **Multicomputer synchronizing:**
Foreign art collections including subject matter her comprising means or steps for matching timing between the computers.

FOR 152 **Multiple network interconnecting:**

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Foreign art collections including subject matter comprising means or steps for coupling plural networks so that data can be transferred there.

FOR 153 **Network-to-computer interfacing:**
Foreign art collections including subject matter comprising means or steps for integrating the computers with networks for orderly, efficient operations.

FOR 154 **Ring computer networking:**
Foreign art collections including subject matter wherein the computers are connected sequentially in a loop configuration.

FOR 155 **Star or tree computer networking:**
Foreign art collections including subject matter wherein the computers are connected via the communi media in a branched configuration.

FOR 156 **Bused computer networking:**
Foreign art collections including subject matter wherein the computers are connected to a common transmission medium.

FOR 157 **VIRTUAL MACHINES TASK AND PRO MANAGEMENT:**
Foreign art collections including subject matter wherein addresses are determined in a memory system accommodating addressing requirements for software emulation of a target computer or dig data processing system on a base computer or digital data processing system.

FOR 159 **TASK MANAGEMENT OR CONTROL:**
Foreign art collections including subject matter com means or steps for administrating over processor or job execution in a digital data pro system.

FOR 160 **Batch or transaction processing:**
Foreign art collections including subject matter comprising means or steps directed to (a) managing processes by collecting, listing, and storing jobs for later sequential execution as a group with user intervention (i.e., batch processing), or (b) executing jobs immediately after they are received by a system and occurring in groups (i.e., transaction processing).

FOR 161 **Process scheduling:**
Foreign art collections including subject matter comprising means or steps for scheduling multiple tasks based upon any considered factors, e.g., prior of execution, balancing the work load or resources, memory use, register use, resource availability, time constraints, etc.

FOR 162 **Priority scheduling:**
Foreign art collections including subject matter for deter an order of execution of jobs to be done based on the level of relative importance or precedence assigned with each job.

FOR 163 **Resource allocation:**
Foreign art collections including subject matter for allocat digital data processing system resources for tasks and often including deciding how best to use the available resources to get the job done.

FOR 164 **Load balancing:**
Foreign art collections including subject matter directed to minimizing processing execution time by effi distributing work load amongst opera computers, processors and other system resources.

FOR 165 **Dependency-based cooperative processing of multiple programs working together to accomplish a larger task:**
Foreign art collections including subject matter com means or steps for identifying and deal with dependencies between executing programs, tasks and processes (e.g., data dependencies, control flow dependencies, etc.).

FOR 166 **Multitasking, time sharing:**
Foreign art collections including subject matter comprising means or steps for dividing processor time of a computer or digital data processing system between multiple executing programs or pro.

FOR 167 **Context switching:**
Foreign art collections including subject matter com means or steps for saving and restoring state data (i.e., context) of a task, process, or thread in a preemptive, nonpreemptive, or cooperative multitasking system.

FOR 168 **INTERPROGRAM COMMUNICATION, INTERPROCESS COMMUNICATION:**
Foreign art collections including subject matter com means or steps for exchanging data or messages between two executing programs or processes, independent of the hardware used in the communication.

FOR 169 **Device driver communication:**
Foreign art collections including subject matter comprising means or steps for communication between application programs and/or operating systems and callable interfacing programs (i.e., device driver programs) which further facilitate com and/or control of peripheral hardware devices such as printers, disk drives, tape drives, CRT displays, etc.

FOR 170 **Application program interfacing (API):**
Foreign art collections including subject matter comprising a set of routines, procedures, or interfaces which facilitate requests or calls from one or more application programs to lower-level oper system routines.

FOR 171 **Object-oriented messaging:**
Foreign art collections including subject matter comprising means or steps for communication between objects (e.g., a message tells a receiving object what to do) wherein a method or member func of a receiving object is invoked or called by a sending method of a sending object and the message passing may involve passing actual parameters (i.e., for example, either by reference or by value) to the target object.

FOR 172 **Remote procedure calling (RPC):**
Foreign art collections including subject matter comprising means or steps for invoking a target procedure in a remote address space.

FOR 173 **Dynamic linking, late binding:**
Foreign art collections including subject matter wherein functions contained within one or more executable code libraries (e.g., a dynamic link library or DLL) are called as needed at runtime by one or more application programs.

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