

control information, efficient management of semaphores (e.g., for simultaneous updating of local cache memory from a global memory store), implementation of a flat-memory model where a system-wide distributed memory is uniformly available to all processing nodes (modules) within a system, asynchronous routing of packet information to multiple receivers, distributing video information to multiple receivers, database transaction processing where a single query is passed to multiple databases and/or distributed to portions of a large database, and pattern matching wherein a pattern is broadcast to multiple processors each of which examine in parallel a small portion of the image and the matching information is broadcast from each partial-pattern processor to a central information processor. In addition to processing of information, broadcast can be used to efficiently and effectively control information being sent to a variety of receiving stations, whether local within the system or remote from the interconnect and accessed by Ethernet, internet, or other networks and communication channels.

[0534] There are many practical uses for the magnitude of computing power provided by the invention that have substantial value within the technological arts. The invention is useful for simulation and modeling of physical processes. The invention is useful for switching and routing of information. The invention is useful for the management of massive databases. The invention is useful for pattern matching and correlations. The invention is useful for data analysis and reduction. The invention is useful for image processing and rendering.

[0535] A partial list of practical applications for the invention include: nuclear stockpile verification; massive database searches & correlations; drug design; biological simulation and modeling; weather simulation and modeling; physics & astronomy simulation and modeling; chemistry by design; mechanical engineering structural modeling and design (e.g., buildings, vehicle crash testing, etc.); earth sciences simulation and modeling; biometrics on a massive scale (e.g., voice, face, vital signs, bio patterns, etc.) voice identification and speech transcription on an accurate and massive scale; economic and sociopolitical simulation and modeling; automatic database creation, management, consolidation and mining; and onboard space-craft and satellite data processing. Some applications for the invention in switching, routing, and rendering are: automatic communications and data-routing center, for instance, gathering, sorting, classifying, correlating, and disseminating all communications; information management and switching (e.g., a continental-scale data router or other (potentially inexpensive and redundant) continental-sized distributed systems); pinpoint video for a mass audience (e.g., education, entertainment, and so forth); repository, storage, and delivery system(s); real-time film production (e.g., animation, rendering, digital imaging, etc); and a multi-player, video game server. There are virtually innumerable uses for the invention, all of which need not be detailed here.

[0536] The terms a or an, as used herein, are defined as one or more than one. The term plurality, as used herein, is defined as two or more than two. The term another, as used herein, is defined as at least a second or more. The terms comprising (comprises), including (includes) and/or having (has), as used herein, are defined as open language (i.e., requiring what is thereafter recited, but open for the inclusion of unspecified procedure(s), structure(s) and/or ingre-

dient(s) even in major amounts. The phrases consisting of and/or composed of close the recited method, apparatus or composition to the inclusion of procedures, structure(s) and/or ingredient(s) other than those recited except for ancillaries, adjuncts and/or impurities ordinarily associated therewith. The recital of “essentially” along with “consisting of” or “composed of” renders the recited method, apparatus and/or composition open only for the inclusion of unspecified procedure(s), structure(s) and/or ingredient(s) which do not materially affect the basic novel characteristics of the composition. The term coupled, as used herein, is defined as connected, although not necessarily directly, and not necessarily mechanically. The term approximately, as used herein, is defined as at least close to a given value (e.g., preferably within 10% of, more preferably within 1% of, and most preferably within 0.1% of). The term substantially, as used herein, is defined as largely but not necessarily wholly that which is specified. The term generally, as used herein, is defined as at least approaching a given state. The term deploying, as used herein, is defined as designing, building, shipping, installing and/or operating. The term means, as used herein, is defined as hardware, firmware and/or software for achieving a result. The term program or phrase computer program, as used herein, is defined as a sequence of instructions designed for execution on a computer system. A program, or computer program, may include a subroutine, a function, a procedure, an object method, an object implementation, an executable application, an applet, a servlet, a source code, an object code, a shared library/dynamic load library and/or other sequence of instructions designed for execution on a computer or computer system.

[0537] All the disclosed embodiments of the invention disclosed herein can be made and used without undue experimentation in light of the disclosure. The invention is not limited by theoretical statements recited herein. Although the best mode of carrying out the invention contemplated by the inventor(s) is disclosed, practice of the invention is not limited thereto. Accordingly, it will be appreciated by those skilled in the art that the invention may be practiced otherwise than as specifically described herein.

[0538] It will be manifest that various substitutions, modifications, additions and/or rearrangements of the features of the invention may be made without deviating from the spirit and/or scope of the underlying inventive concept. It is deemed that the spirit and/or scope of the underlying inventive concept as defined by the appended claims and their equivalents cover all such substitutions, modifications, additions and/or rearrangements.

[0539] All the disclosed elements and features of each disclosed embodiment can be combined with, or substituted for, the disclosed elements and features of every other disclosed embodiment except where such elements or features are mutually exclusive. Variation may be made in the steps or in the sequence of steps composing methods described herein.

[0540] Although the optical interconnect described herein can be a separate module, it will be manifest that the optical interconnect may be integrated into the system with which it is associated. For instance, the optical backplane may be part of a computer or network. The individual components need not be formed in the disclosed shapes, or combined in