

U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

CLASSIFICATION ORDER 1867

OCTOBER 02, 2007

PROJECT NO. Y7222

The following classification changes will be effected by this order:

	<u>Class</u>	<u>Subclass</u>	<u>Art Unit</u>	<u>Ex'r Search Room No.</u>
<b>Abolished:</b>	NONE			
<b>Established:</b>				
E-Subclasses:	<b>714</b>	E11.001-E11.009, E11.01, E11.011-E11.019, E11.02, E11.021-E11.029, E11.03, E11.031-E11.039, E11.04, E11.041-E11.049, E11.05, E11.051-E11.059, E11.06, E11.061-E11.069, E11.07, E11.071-E11.079, E11.08, E11.081-E11.089, E11.09, E11.091-E11.099, E11.1, E11.101-E11.109, E11.11, E11.111-E11.119, E11.12, E11.121-E11.129, E11.13, E11.131-E11.139, E11.14, E11.141-E11.149, E11.15, E11.151-E11.159, E11.16, E11.161-E11.169, E11.17, E11.171-E11.179, E11.18, E11.181-E11.189, E11.19, E11.191-E11.199, E11.2, E11.201-E11.209, E11.21, E11.211-E11.219, E11.22	2113 and 2133	OS0001

No other classes were impacted by this order.

A. CLASSIFICATION MANUAL CHANGES

D. DEFINITION CHANGES AND NEW OR ADDITIONAL DEFINITIONS

CLASSIFICATION ORDER 1867

OCTOBER 2, 2007

PROJECT Y-7222

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100	DATA PROCESSING SYSTEM ERROR OR FAULT HANDLING	35	....Substituted or added instruction (e.g., code instrumenting, breakpoint instruction)
1	.Reliability and availability		
2	..Fault recovery	36	....Test sequence at power-up or initialization
3	...By masking or reconfiguration		
4	....Of network	37	...Analysis (e.g., of output, state, or design)
5	....Of memory or peripheral subsystem		
6	.....Redundant stored data accessed (e.g., duplicated data, error correction coded data, or other parity-type data)	38 39	....Of computer software ...Monitor recognizes sequence of events (e.g., protocol or logic state analyzer)
7	.....Reconfiguration (e.g., adding a replacement storage component)	40	...Component dependent technique
8	.....Isolating failed storage location (e.g., sector remapping)	41	...For reliability enhancing component (e.g., testing backup spare, or fault injection)
9	.....Access processor affected (e.g., I/O processor, MMU, DMA processor)	42	....Memory or storage device component fault
10	....Of processor	43	....Bus, I/O channel, or network path component fault
11	.....Concurrent, redundantly operating processors	44	....Peripheral device component fault
12	.....Synchronization maintenance of processors	45	...Output recording (e.g., signature or trace)
13	.....Prepared backup processor (e.g., initializing cold backup) or updating backup processor (e.g., by checkpoint message)	46	...Operator interface for diagnosing or testing
14	....Of power supply	47	..Performance monitoring for fault avoidance
15	...State recovery (i.e., process or data file)	48	..Error detection or notification
16	....Forward recovery (e.g., redoing committed action)	49	...State error (i.e., content of instruction, data, or message)
17	....Reexecuting single instruction or bus cycle	50	....State out of sequence
18	....Transmission data record (e.g., for retransmission)	51	.....Control flow state sequence monitored (e.g., watchdog processor for control-flow checking)
19	....Undo record	52	....Error checking code
20	....Plural recovery data sets containing set interrelation data (e.g., time values or log record numbers)	53	...Address error
21	....State validity check	54	...Storage content error
22	...With power supply status monitoring	55	...Timing error (e.g., watchdog timer time-out)
23	..Resetting processor	56	....Bus or I/O channel device fault
24	...Safe shutdown	57	...Error forwarding and presentation (e.g., operator console, error display)
25	..Fault locating (i.e., diagnosis or testing)	699	PULSE OR DATA ERROR HANDLING
26	...Artificial intelligence (e.g., diagnostic expert system)	700	.Skew detection correction
27	...Particular access structure	701	.Data formatting to improve error detection correction capability
28	....Substituted emulative component (e.g., emulator microprocessor)	702	..Memory access (e.g., address permutation)
29	.....Memory emulator feature	703	.Testing of error-check system
30	....Built-in hardware for diagnosing or testing within-system component (e.g., microprocessor test mode circuit, scan path)	704	.Error count or rate
31	....Additional processor for in-system fault locating (e.g., distributed diagnosis program)	705	..Pseudo-error rate
32	...Particular stimulus creation	706	..Up-down counter
33	....Derived from analysis (e.g., of a specification or by stimulation)	707	..Synchronization control
34	....Halt, clock, or interrupt signal (e.g., freezing, hardware breakpoint, single-stepping)	708	..Shutdown or establishing system parameter (e.g., transmission rate)
		709	.Data pulse evaluation/bit decision
		710	.Replacement of memory spare location, portion, or segment
		711	..Spare row or column
		712	.Transmission facility testing

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	PULSE OR DATA ERROR HANDLING	758	...Error correcting code with additional error detection code (e.g., cyclic redundancy character, parity)
	..Transmission facility testing		...Look-up table encoding or decoding
713	..For channel having repeater		...Threshold decoding (e.g., majority logic)
714	..By tone signal	759	...Random and burst error correction
715	..Test pattern with comparison	760	...Burst error correction
716	...Loop-back		...Memory access
717	..Loop or ring configuration	761	....Error correct and restore
718	..Memory testing	762	....Error pointer
719	..Read-in with read-out and compare	763	....Check bits stored in separate area of memory
720	...Special test pattern (e.g., checkerboard, walking ones)	764	....Code word for plural n-bit (n>1) storage units (e.g., x4 DRAM's)
		765	....Error correction code for memory address
721	..Electrical parameter (e.g., threshold voltage)	766	....Dynamic data storage
		767	.....Disk array
722	..Performing arithmetic function on memory contents		.....Tape
723	..Error mapping or logging	768	....Code word parallel access
724	..Digital logic testing		....Solid state memory
725	..Programmable logic array (PLA) testing	769	...Adaptive error-correcting capability
726	..Scan path testing (e.g., level sensitive scan design (LSSD))	770	...Synchronization
		771	...For packet or frame multiplexed data
727	...Boundary scan	772	...Hamming code
728	...Random pattern generation (includes pseudorandom pattern)	773	...Nonbinary data (e.g., ternary)
		774	...Variable length data
729	...Plural scan paths	775	...Using symbol reliability information (e.g., soft decision)
730	...Addressing	776	...Code based on generator polynomial
731	...Clock or synchronization	777	....Bose-Chaudhuri-Hocquenghem code
732	..Signature analysis	778	....Golay code
733	..Built-in testing circuit (BILBO)	779	....Reed-Solomon code
734	..Structural (in-circuit test)	780	....Syndrome computed
735	..Device response compared to input pattern		..Forward error correction by tree code (e.g., convolutional)
		781	...Random and burst errors
736	..Device response compared to expected fault-free response	782	...Burst error
		783	...Synchronization
737	..Device response compared to fault dictionary/truth table	784	...Puncturing
		785	...Sequential decoder (e.g., Fano or stack algorithm)
738	..Including test pattern generator	786	...Trellis code
739	...Random pattern generation (includes pseudorandom pattern)		...Syndrome decodable (e.g., self orthogonal)
		787	...Maximum likelihood
740	...Having analog signal	788	...Viterbi decoding
741	...Simulation	789	...Branch metric calculation
742	...Testing specific device	790	...Majority decision/voter circuit
743	...Addressing	791	..Error detection for synchronization control
744	...Clock or synchronization		..Error/fault detection technique
745	..Determination of marginal operation limits	792	..Parity bit
		793	...Parity generator or checker circuit detail
746	..Digital data error correction		...Even and odd parity
747	..Substitution of previous valid data	794	...Parity prediction
748	..Request for retransmission	795	...Plural dimension parity check
749	...Retransmission if no ACK returned	796	...Storage accessing (e.g., address parity check)
750	...Feedback to transmitter for comparison	797	..Constant-ratio code (m/n)
		798	
751	...Including forward error correction capability	799	
752	..Forward correction by block code	800	
753	...Double error correcting with single error correcting code	801	
754	...Error correction during refresh cycle	802	
755	...Double encoding codes (e.g., product, concatenated)	803	
		804	
756	...Cross-interleave Reed-Solomon code (CIRC)	805	
		806	
757	...Parallel generation of check bits		

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	PULSE OR DATA ERROR HANDLING		
	.Error/fault detection technique	* E11.007	.Error correction, recovery or fault tolerance using at least two different redundancy techniques and at least one technique not involving redundancy (EPO)
807	..Check character		
808	...Modulo-n residue check character		
809	..Code constraint monitored	* E11.008	..Fault tolerant software (EPO)
810	...Multilevel coding (n>2)	* E11.009	..In regular structures, i.e., all of the systems nodes have the same number of connections per node (EPO)
811	..Forbidden combination or improper condition		
812	...Specified digital signal or pulse count	* E11.01	...Interconnection networks, i.e., comprising interconnecting link and switching elements (EPO)
813	...Two key-down detector		
814	...Data timing/clocking	* E11.011	...Fault-tolerant routing (EPO)
815	...Time delay/interval monitored	* E11.012	...In rings and buses (EPO)
816	...Two-rail logic	* E11.013	...In n-dimensional structures, e.g., arrays, trees, cubes, etc. (EPO)
817	...Noise level		
818	...Missing-bit/drop-out detection	* E11.014	...Neural networks (EPO)
819	..Comparison of data	* E11.015	..By degradation, i.e., a slow-down occurs but full processing capability is maintained, e.g., discarding a faulty element or unit, etc. (EPO)
820	...Plural parallel devices of channels		
821	...Transmission facility		
822	...Sequential repetition		
823	...True and complement data		
824	...Device output compared to input	* E11.016	..In systems, e.g., multiprocessors, etc. (EPO)
*			
*	E-SUBCLASSES	* E11.017	.Security measures, i.e., ensuring safe condition in the event of error, e.g., for controlling element (EPO)
*			
	The following subclasses beginning with the letter E are E-subclasses. Each E-subclass corresponds in scope to a classification in a foreign classification system, for example, the European Classification system (ECLA). The foreign classification equivalent to an E-subclass is identified in the subclass definition. In addition to U.S. documents classified in E-subclasses by U.S. examiners, documents are regularly classified in E-subclasses according to the classification practices of any foreign Offices identified in parentheses at the end of the title. For example, "(EPO)" at the end of a title indicates both European and U.S. patent documents, as classified by the EPO, are regularly added to the subclass. E-subclasses may contain subject matter outside the scope of this class. Consult the E-subclass definitions, or the documents themselves, to clarify or interpret titles.	* E11.018	.Protecting against parasitic influences, e.g., noise, temperatures, etc. (EPO)
		* E11.019	.Identification, e.g., of a performed repair, of a defined circuit, etc. (EPO)
		* E11.02	.Reliability or availability analysis (EPO)
		* E11.021	.Responding to the occurrence of a fault, e.g., fault tolerance, etc. (EPO)
		* E11.022	..Error or fault processing without redundancy, i.e., by taking additional measures to deal with the error/fault (EPO)
		* E11.023	...Error or fault handling (EPO)
		* E11.024	...Error or fault detection or monitoring (EPO)
		* E11.025	...Error or fault reporting or logging (EPO)
		* E11.026	...Error or fault localization (EPO)
		* E11.027	....By collation, i.e., correlating different errors (EPO)
		* E11.028	....By identifying the faulty software code (EPO)
* E11.001	ERROR DETECTION; ERROR CORRECTION; MONITORING (EPO)	* E11.029	...Error or fault analysis (EPO)
* E11.002	.Error detection other than by redundancy in data representation, operation, or hardware, or by checking the order of processing (EPO)	* E11.03	..Error detection or correction by redundancy in data representation, e.g., by using checking codes, etc. (EPO)
* E11.003	..By time limit, i.e., time-out (EPO)	* E11.031	...Using codes with inherent redundancy, e.g., n-out-of-m codes (EPO)
* E11.004	..By count or rate limit, e.g., word- or bit count limit, etc. (EPO)	* E11.032	...Adding special bits or symbols to the coded information, e.g., parity check, casting out 9's or 11's, etc. (EPO)
* E11.005	..By other limits, e.g., analog values, etc. (EPO)		
* E11.006	..By bit configuration check, e.g., of formats or tags, etc. (EPO)		

# Title Change  
\* Newly Established Subclass

@ Indent Change  
& Position Change

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- ERROR DETECTION; ERROR CORRECTION;  
MONITORING (EPO)
- ..Responding to the occurrence of a fault, e.g., fault tolerance, etc. (EPO)
  - ..Error detection or correction by redundancy in data representation, e.g., by using checking codes, etc. (EPO)
  - ...Adding special bits or symbols to the coded information, e.g., parity check, casting out 9's or 11's, etc. (EPO)
- \* E11.033 ....Using arithmetic codes i.e., codes which are preserved during operation, e.g., modulo 9 or 11 check, etc. (EPO)
  - \* E11.034 ....In memories (EPO)
  - \* E11.035 .....In static stores (EPO)
  - \* E11.036 .....Integrated on a chip (EPO)
  - \* E11.037 .....In cache or content addressable memories (EPO)
  - \* E11.038 .....In sector programmable memories, e.g., flash disk, etc. (EPO)
  - \* E11.039 .....In multilevel memories (EPO)
  - \* E11.04 .....To protect a block of data words, e.g., CRC, checksum, etc. (EPO)
  - \* E11.041 .....To protect individual data words written into, or read out of, the addressable memory subsystem of data processing equipment (EPO)
  - \* E11.042 .....Codes or arrangements adapted for a specific type of error (EPO)
  - \* E11.043 .....Error in accessing a memory location, i.e., addressing error (EPO)
  - \* E11.044 .....Error in check bits (EPO)
  - \* E11.045 .....Identification of the type of error (EPO)
  - \* E11.046 .....Adjacent error, e.g., error in n-bit (n>1) wide storage units, i.e., package error, etc. (EPO)
  - \* E11.047 .....Simple parity (EPO)
  - \* E11.048 .....Unidirectional errors (EPO)
  - \* E11.049 .....Arrangements adapted for a specific error detection or correction feature (EPO)
  - \* E11.05 .....Bypassing or disabling error detection or correction (EPO)
  - \* E11.051 .....Updating check bits on partial write, i.e., read/modify/write (EPO)
  - \* E11.052 .....Correcting systematically all correctable errors, i.e., scrubbing (EPO)
  - \* E11.053 ....Using single parity bit (EPO)
  - \* E11.054 ..Error detection or correction of the data by redundancy in hardware (EPO)
  - \* E11.055 ...Error detection by comparing the output signals of redundant hardware (EPO)
  - \* E11.056 ....In static storage, e.g., matrix, registers, etc. (EPO)
  - \* E11.057 ....In coding, decoding circuits, e.g. parity circuits (EPO)
  - \* E11.058 ....In communications, e.g., transmission, interfaces, etc. (EPO)
  - \* E11.059 ....Control processors, e.g., for sensors, actuators, etc. (EPO)
  - \* E11.06 ....With exchange of data between units (EPO)
  - \* E11.061 ....With data processors, i.e., data processors compare their computations (EPO)
  - \* E11.062 ....In storage with relative movement between record carrier and transducer, e.g., tapes, disks, etc. (EPO)
  - \* E11.063 ....In systems, i.e. comprising a multiplicity of resources, e.g., cpu with its memory and I/O, etc. (EPO)
  - \* E11.064 ....In arithmetic, logic or counter circuits or a combination thereof, e.g., alu, adder, etc. (EPO)
  - \* E11.065 ....In I/O devices or adapters therefor (EPO)
  - \* E11.066 .....Displays (EPO)
  - \* E11.067 ...Timing and synchronization therein (EPO)
  - \* E11.068 ....By using fault tolerant clocks (EPO)
  - \* E11.069 ...Using passive fault-masking of the redundant circuits, e.g., by quadding or by majority decision circuits, etc. (EPO)
  - \* E11.07 ....Synchronization therefor (EPO)
  - \* E11.071 ...Using active fault-masking, e.g., by switching out faulty elements or by switching in spare elements, etc. (EPO)
  - \* E11.072 ....In systems, e.g., multiprocessors, etc. (EPO)
  - \* E11.073 .....In distributed systems (EPO)
  - \* E11.074 .....In regular structures (EPO)
  - \* E11.075 .....Array of processors, e.g., systolic arrays, etc. (EPO)
  - \* E11.076 .....Hypercubes (EPO)
  - \* E11.077 .....Trees (EPO)
  - \* E11.078 ....In interconnections, e.g., rings, etc. (EPO)
  - \* E11.079 ....Bus (EPO)
  - \* E11.08 ....Data exchange between units, e.g., for updating backup units, etc. (EPO)
  - \* E11.081 ....For control, e.g., actuators, etc. (EPO)
  - \* E11.082 ....In arithmetic units (EPO)
  - \* E11.083 ....Redundant power supplies (EPO)
  - \* E11.084 ....Masking faults in storage systems using spares and/or by reconfiguring (EPO)
  - \* E11.085 .....Removing defective units from operation (EPO)
  - \* E11.086 .....Bypassing defective units on a serial bus (EPO)

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ERROR DETECTION; ERROR CORRECTION; MONITORING (EPO)	* E11.112	..Error detection or correction of the data by redundancy in operation (EPO)
.Responding to the occurrence of a fault, e.g., fault tolerance, etc. (EPO)	* E11.113	...Saving, restoring, recovering or retrying (EPO)
..Error detection or correction of the data by redundancy in hardware (EPO)	* E11.114	....At machine instruction level (EPO)
...Using active fault-masking, e.g., by switching out faulty elements or by switching in spare elements, etc. (EPO)	* E11.115	.....Checkpointing the instruction stream (EPO)
....Masking faults in storage systems using spares and/or by reconfiguring (EPO)	* E11.116	.....For bus or memory accesses (EPO)
* E11.087	* E11.117	.....Of application data (EPO)
....With address translations and modifications (EPO)	* E11.118	.....Backing up, restoring or mirroring files or drives (EPO)
* E11.088	* E11.119	.....Backing up, i.e., point-in-time backup (EPO)
.....Handling defects in a Redundant Array of Inexpensive Disks (RAID) by remapping (EPO)	* E11.12	.....Hardware arrangements for backup (EPO)
* E11.089	* E11.121	.....Backup Management techniques (EPO)
....Managing spare storage units (EPO)	* E11.122	.....Recovery techniques (EPO)
* E11.09	* E11.123	.....Selection of contents (EPO)
....Hot spares (EPO)	* E11.124	.....Scheduling policy (EPO)
* E11.091	* E11.125	.....For networked environments (EPO)
....Via redundancy in hardware accessing the storage components (EPO)	* E11.126	.....Nondisruptive backup (EPO)
* E11.092	* E11.127	.....Mirroring (EPO)
.....Using redundant I/O processors, storage control units or array controllers (EPO)	* E11.128	.....Distributed database systems; Replica control (EPO)
* E11.093	* E11.129	.....Synchronization between mobile agents and networked agents (EPO)
.....With serial buses (EPO)	* E11.13	....Using logs or checkpoints (EPO)
* E11.094	* E11.131	....In transactions (EPO)
.....To file servers (EPO)	* E11.132	....At operating system level (EPO)
* E11.095	* E11.133	....Boot up procedures (EPO)
.....Connection redundancy between storage system components (EPO)	* E11.134	....Reconfiguring to eliminate the error (EPO)
* E11.096	* E11.135	....During software upgrading (EPO)
.....With serial buses (EPO)	* E11.136	....At file system or disk access level (EPO)
* E11.097	* E11.137	....Restarting or rejuvenating (EPO)
.....To file servers (EPO)	* E11.138	....Resetting or repowering (EPO)
* E11.098	* E11.139	....Cleaning up resources (EPO)
....Using the replication of data, e.g., with two or more copies, etc. (EPO)	* E11.14	....Suspending and resuming a running system (EPO)
* E11.099	* E11.141	....Transmit or communication errors (EPO)
.....Duplex memories, e.g., twin boot ROMs, etc. (EPO)	* E11.142	...Error detection (EPO)
* E11.1	* E11.143	...By time redundancy (EPO)
.....Duplexed caches, e.g., cache paired with non-volatile storage, etc. (EPO)	* E11.144	.Error avoidance, e.g., error spreading countermeasures, fault avoidance, etc. (EPO)
* E11.101	* E11.145	.Detection or location of defective computer hardware by testing during standby operation or during idle time, e.g., start-up testing, etc. (EPO)
.....Mirroring, i.e., the concept of maintaining data on two or more units in the same state at all times (EPO)	* E11.146	..Verification or detection of system hardware configuration (EPO)
* E11.102	* E11.147	..Logging of test results (EPO)
.....Resynchronization of failed mirrors (EPO)	* E11.148	..Test methods (EPO)
* E11.103	* E11.149	..Power-On Test, e.g., POST, etc. (EPO)
.....Mirror management, e.g., pairing of units, etc. (EPO)	* E11.15	...Configuration test (EPO)
* E11.104	* E11.151	...Background testing (EPO)
.....Mirroring on the same storage unit (EPO)	* E11.152	...Periodic testing (EPO)
* E11.105		
.....Mirroring on different storage units with a common controller (RAID 1) (EPO)		
* E11.106		
.....Mirroring with multiple controllers (EPO)		
* E11.107		
.....Asynchronous mirroring (EPO)		
* E11.108		
.....Synchronous mirroring (EPO)		
* E11.109		
.....De-clustering of replicated data (EPO)		
* E11.11		
.....Using more than two copies (EPO)		
* E11.111		
....In Logic Arrays, e.g., programmable or iterative logic arrays, etc. (EPO)		

# Title Change  
\* Newly Established Subclass

@ Indent Change  
& Position Change

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ERROR DETECTION; ERROR CORRECTION; MONITORING (EPO)	* E11.184	...Display of status information (EPO)
.Detection or location of defective computer hardware by testing during standby operation or during idle time, e.g., start-up testing, etc. (EPO)	* E11.185	....By lamps or LED's (EPO)
..Test methods (EPO)	* E11.186	....For error or online/offline status (EPO)
* E11.153	* E11.187	....Alarm or error message display (EPO)
* E11.154	* E11.188	....Computer systems status display (EPO)
* E11.155	* E11.189	..Recording or statistical evaluation of computer activity, e.g., of down time, of input/output operation, etc. (EPO)
* E11.156	* E11.19	...Of interconnections, e.g., interconnecting networks, etc. (EPO)
* E11.157	* E11.191	...Of parallel or distributed programming (EPO)
* E11.158	* E11.192	...Performance measurement (EPO)
* E11.159	* E11.193	...Workload generation, e.g., scripts, playback etc. (EPO)
* E11.16	* E11.194	....Benchmarking (EPO)
* E11.161	* E11.195	....Time measurement, e.g., response time, etc. (EPO)
* E11.162	* E11.196	....Of active or idle time (EPO)
* E11.163	* E11.197	...Performance evaluation by modeling or statistical analysis (EPO)
* E11.164	* E11.198	...Performance evaluation by simulation (EPO)
* E11.165	* E11.199	...Trace driven simulation (EPO)
* E11.166	* E11.2	...Performance evaluation by tracing or monitoring (EPO)
* E11.167	* E11.201	....For interfaces, buses (EPO)
* E11.168	* E11.202	....For systems (EPO)
* E11.169	* E11.203	....Address tracing (EPO)
* E11.17	* E11.204	....Data logging (EPO)
* E11.171	* E11.205	....Circuit details, i.e., tracer hardware (EPO)
* E11.172	* E11.206	....For I/O devices (EPO)
* E11.173	* E11.207	..Preventing errors by testing or debugging software (EPO)
* E11.174	* E11.208	..Software debugging (EPO)
* E11.175	* E11.209	...Compilers or other tools operating on the source text (EPO)
* E11.176	* E11.21	...Debuggers (EPO)
* E11.177	* E11.211	...Error checking code in the program under test (EPO)
* E11.178	* E11.212	...Tracing methods or tools (EPO)
* E11.179	* E11.213	...By using additional hardware (EPO)
* E11.18	* E11.214	....By making modifications to the CPU (EPO)
* E11.181	* E11.215	....By monitoring the bus (EPO)
* E11.182	* E11.216	....By emulating the CPU (EPO)
* E11.183	* E11.217	..User interfaces for testing or debugging software (EPO)
* E11.184	* E11.218	..Methods or tools for writing reliable software and for evaluating software (EPO)
* E11.185	* E11.219	...Methods or tools to render software testable (EPO)
* E11.186	* E11.22	...Software metrics (EPO)
* E11.187		*****
* E11.188		
* E11.189		
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* E11.191		
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* E11.203		
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* E11.205		
* E11.206		
* E11.207		
* E11.208		
* E11.209		
* E11.21		
* E11.211		
* E11.212		
* E11.213		
* E11.214		
* E11.215		
* E11.216		
* E11.217		
* E11.218		
* E11.219		
* E11.22		

# Title Change  
\* Newly Established Subclass

@ Indent Change  
& Position Change



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## FOREIGN ART COLLECTIONS

\*\*\*\*\*

## FOR 000 CLASS-RELATED FOREIGN DOCUMENTS

Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collections listed below. These Collections contain ONLY foreign patents or non-patent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

MEMORY TESTING (371/21.1)  
DIGITAL LOGIC TESTING (371/22.1)  
DIGITAL DATA ERROR CORRECTION (371/30)  
FOR 100 .Scan path testing (LSSD) (371/22.3)  
FOR 101 .Including test pattern generator  
(371/27)  
FOR 102 .Block code (371/37.1)  
FOR 103 ..Memory access (371/40.1)  
FOR 104 .Convolutional code (371/43)  
FOR 288 ERROR/FAULT ANTICIPATION (371/4)  
.Replacement with spare device or system  
(371/8.1)  
FOR 289 ..Transmission facility or channel  
(371.8.2)  
FOR 290 ..Memory (371/10.1)  
FOR 291 ..Transmission facility (371/11.2)  
FOR 292 ..Data processor or computer (371/11.3)  
DIAGNOSTIC TESTING (371/15.1)  
FOR 293 .Programmable processor testing  
(371/16.1)  
FOR 294 ..Emulator device (371/16.2)  
FOR 295 ..Watchdog timer (e.g., time-out)  
(371/16.3)  
FOR 296 ..Processor within diverse (microwave,  
photocopier) (371/16.4)  
FOR 297 ..Error or fault, logging or tracking  
(371/16.5)  
FOR 298 ..Dedicated maintenance subsystem  
(371/18)  
FOR 299 .Testing of external device by  
programmable digital computer  
(371/20)  
FOR 300 ERROR DETECTION FOR SYNCHRONIZATION  
CONTROL (371/47.1)

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D. CHANGES TO THE DEFINITIONSDefinitions Established**E-SUBCLASSES**

The E-subclasses in U. S. Class 714 provide for processes and apparatus for detecting errors in data-processing including processes and apparatus for monitoring and evaluating data-processing equipment; processes and apparatus for correcting data-processing errors or for responding to faults in data-processing equipment; and processes and apparatus for avoiding data-processing errors and faults in data-processing equipment.

**E11.001 ERROR DETECTION; ERROR CORRECTION; MONITORING (EPO):**

This main group provides for processes and apparatus for the detection or correction of data-processing errors including the monitoring and evaluation of data-processing equipment. This subclass is substantially the same in scope as ECLA classification G06F11/00.

**E11.002 Error detection other than by redundancy in data representation, operation, or hardware, or by checking the order of processing (EPO):**

This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G06F11/00B.

**E11.003 By time limit, i.e., time-out (EPO):**

This subclass is indented under subclass E11.002. This subclass is substantially the same in scope as ECLA classification G06F11/00B1.

**E11.004 By count or rate limit, e.g., word- or bit count limit, etc. (EPO):**

This subclass is indented under subclass E11.002. This subclass is substantially the same in scope as ECLA classification G06F11/00B2.

**E11.005 By other limits, e.g., analog values, etc. (EPO):**

This subclass is indented under subclass E11.002. This subclass is substantially the same in scope as ECLA classification G06F11/00B3.

**E11.006 By bit configuration check, e.g., of formats or tags, etc. (EPO):**

This subclass is indented under subclass E11.002. This subclass is substantially the same in scope as ECLA classification G06F11/00B5.

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D. CHANGES TO THE DEFINITIONS**E11.007 Error correction, recovery or fault tolerance using at least two different redundancy techniques and at least one technique not involving redundancy (EPO):**

This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G06F11/00C.

**E11.008 Fault tolerant software (EPO):**

This subclass is indented under subclass E11.007. This subclass is substantially the same in scope as ECLA classification G06F11/00C1.

**E11.009 In regular structures, i.e., all of the systems nodes have the same number of connections per node (EPO):**

This subclass is indented under subclass E11.007. This subclass is substantially the same in scope as ECLA classification G06F11/00C4.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.074, for redundancy techniques in regular structures involving fault masking by switching in spares.

**E11.01 Interconnection networks, i.e., comprising interconnecting link and switching elements (EPO):**

This subclass is indented under subclass E11.009. This subclass is substantially the same in scope as ECLA classification G06F11/00C4A.

**E11.011 Fault-tolerant routing (EPO):**

This subclass is indented under subclass E11.009. This subclass is substantially the same in scope as ECLA classification G06F11/00C4B.

**E11.012 In rings and buses (EPO):**

This subclass is indented under subclass E11.009. This subclass is substantially the same in scope as ECLA classification G06F11/00C4D.

**E11.013 In n-dimensional structures, e.g., arrays, trees, cubes, etc. (EPO):**

This subclass is indented under subclass E11.009. This subclass is substantially the same in scope as ECLA classification G06F11/00C4C.

**E11.014 Neural networks (EPO):**

This subclass is indented under subclass E11.009. This subclass is substantially the same in scope as ECLA classification G06F11/00C4E.

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D. CHANGES TO THE DEFINITIONS**E11.015 By degradation, i.e., a slow-down occurs but full processing capability is maintained, e.g., discarding a faulty element or unit, etc. (EPO):**

This subclass is indented under subclass E11.007. This subclass is substantially the same in scope as ECLA classification G06F11/00C2.

**E11.016 In systems, e.g., multiprocessors, etc. (EPO):**

This subclass is indented under subclass E11.007. This subclass is substantially the same in scope as ECLA classification G06F11/00C3.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.072, for redundancy techniques in systems involving switching in spares.

**E11.017 Security measures, i.e., ensuring safe condition in the event of error, e.g., for controlling element, etc. (EPO):**

This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G06F11/00D.

**E11.018 Protecting against parasitic influences, e.g., etc. (EPO):**

This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G06F11/00F.

**E11.019 Identification, e.g., of a performed repair, of a defined circuit, etc. (EPO):**

This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G06F11/00K.

**E11.02 Reliability or availability analysis (EPO):**

This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G06F11/00M.

**E11.021 Responding to the occurrence of a fault, e.g., fault tolerance, etc. (EPO):**

This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G06F11/07.

**E11.022 Error or fault processing without redundancy, i.e., by taking additional measures to deal with the error/fault (EPO):**

This subclass is indented under subclass E11.021. This subclass is substantially the same in scope as ECLA classification G06F11/07P.

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D. CHANGES TO THE DEFINITIONS

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.113, for retrying.

**E11.023 Error or fault handling (EPO):**

This subclass is indented under subclass E11.022. This subclass is substantially the same in scope as ECLA classification G06F11/07P10.

**E11.024 Error or fault detection or monitoring (EPO):**

This subclass is indented under subclass E11.022. This subclass is substantially the same in scope as ECLA classification G06F11/07P2.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.179 for monitoring per se.

**E11.025 Error or fault reporting or logging (EPO):**

This subclass is indented under subclass E11.022. This subclass is substantially the same in scope as ECLA classification G06F11/07P4.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.147 for logging of test results.

**E11.026 Error or fault localization (EPO):**

This subclass is indented under subclass E11.022. This subclass is substantially the same in scope as ECLA classification G06F11/07P6.

**E11.027 By collation, i.e., correlating different errors (EPO):**

This subclass is indented under subclass E11.026. This subclass is substantially the same in scope as ECLA classification G06F11/07P6C.

**E11.028 By identifying the faulty software code (EPO):**

This subclass is indented under subclass E11.026. This subclass is substantially the same in scope as ECLA classification G06F11/07P6S.

**E11.029 Error or fault analysis (EPO):**

This subclass is indented under subclass E11.022. This subclass is substantially the same in scope as ECLA classification G06F11/07P8.

**E11.03 Error detection or correction by redundancy in data representation, e.g., by using checking codes, etc. (EPO):**

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**D. CHANGES TO THE DEFINITIONS**

This subclass is indented under subclass E11.021. This subclass is substantially the same in scope as ECLA classification G06F11/08

**E11.031 Using codes with inherent redundancy, e.g., n-out-of-m codes, etc. (EPO):**

This subclass is indented under subclass E11.03. This subclass is substantially the same in scope as ECLA classification G06F11/08N.

**E11.032 Adding special bits or symbols to the coded information, e.g., parity check, casting out 9's or 11's, etc. (EPO):**

This subclass is indented under subclass E11.03. This subclass is substantially the same in scope as ECLA classification G06F11/10.

**E11.033 Using arithmetic codes i.e. codes which are preserved during operation, e.g., modulo 9 or 11 check, etc. (EPO):**

This subclass is indented under subclass E11.032. This subclass is substantially the same in scope as ECLA classification G06F11/10C.

**E11.034 In memories (EPO):**

This subclass is indented under subclass E11.032. This subclass is substantially the same in scope as ECLA classification G06F11/10M.

**E11.035 In static stores (EPO):**

This subclass is indented under subclass E11.034. This subclass is substantially the same in scope as ECLA classification G06F11/10M2.

**E11.036 Integrated on a chip (EPO):**

This subclass is indented under subclass E11.035. This subclass is substantially the same in scope as ECLA classification G06F11/10M2A.

**E11.037 In cache or content addressable memories (EPO):**

This subclass is indented under subclass E11.036. This subclass is substantially the same in scope as ECLA classification G06F11/10M2A1.

**E11.038 In sector programmable memories, e.g., flash disk (EPO):**

This subclass is indented under subclass E11.036. This subclass is substantially the same in scope as ECLA classification G06F11/10M2A3.

**E11.039 In multilevel memories (EPO):**

This subclass is indented under subclass E11.036. This subclass is substantially the same in scope as ECLA classification G06F11/10M2A5.

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D. CHANGES TO THE DEFINITIONS**E11.04 To protect a block of data words, e.g., CRC, checksum, etc. (EPO):**

This subclass is indented under subclass E11.035. This subclass is substantially the same in scope as ECLA classification G06F11/10M2B.

**E11.041 To protect individual data words written into, or read out of, the addressable memory subsystem of data processing equipment (EPO):**

This subclass is indented under subclass E11.035. This subclass is substantially the same in scope as ECLA classification G06F11/10M2D.

**E11.042 Codes or arrangements adapted for a specific type of error (EPO):**

This subclass is indented under subclass E11.041. This subclass is substantially the same in scope as ECLA classification G06F11/10M2D1.

**E11.043 Error in accessing a memory location, i.e., addressing error (EPO):**

This subclass is indented under subclass E11.042. This subclass is substantially the same in scope as ECLA classification G06F11/10M2D1A.

**E11.044 Error in check bits (EPO):**

This subclass is indented under subclass E11.042. This subclass is substantially the same in scope as ECLA classification G06F11/10M2D1C.

**E11.045 Identification of the type of error (EPO):**

This subclass is indented under subclass E11.042. This subclass is substantially the same in scope as ECLA classification G06F11/10M2D1D.

**E11.046 Adjacent error, e.g., error in n-bit (n>1) wide storage units, i.e., package error, etc. (EPO):**

This subclass is indented under subclass E11.042. This subclass is substantially the same in scope as ECLA classification G06F11/10M2D1P.

**E11.047 Simple parity (EPO):**

This subclass is indented under subclass E11.042. This subclass is substantially the same in scope as ECLA classification G06F11/10M2D1S.

**E11.048 Unidirectional errors (EPO):**

This subclass is indented under subclass E11.042. This subclass is substantially the same in scope as ECLA classification G06F11/10M2D1U.

**E11.049 Arrangements adapted for a specific error detection or correction feature (EPO):**

This subclass is indented under subclass E11.041. This subclass is substantially the same in scope as ECLA classification G06F11/10M2D3.

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D. CHANGES TO THE DEFINITIONS**E11.05 Bypassing or disabling error detection or correction (EPO):**

This subclass is indented under subclass E11.049. This subclass is substantially the same in scope as ECLA classification G06F11/10M2D3B.

**E11.051 Updating check bits on partial write, i.e., read/modify/write (EPO):**

This subclass is indented under subclass E11.049. This subclass is substantially the same in scope as ECLA classification G06F11/10M2D3R.

**E11.052 Correcting systematically all correctable errors, i.e., scrubbing (EPO):**

This subclass is indented under subclass E11.049. This subclass is substantially the same in scope as ECLA classification G06F11/10M2D3S.

**E11.053 Using single parity bit (EPO):**

This subclass is indented under subclass E11.032. This subclass is substantially the same in scope as ECLA classification G06F11/10B.

**E11.054 Error detection or correction of the data by redundancy in hardware (EPO):**

This subclass is indented under subclass E11.021. This subclass is substantially the same in scope as ECLA classification G06F11/16.

**E11.055 Error detection by comparing the output signals of redundant hardware (EPO):**

This subclass is indented under subclass E11.054. This subclass is substantially the same in scope as ECLA classification G06F11/16B.

**E11.056 In static storage, e.g., matrix, registers, etc. (EPO):**

This subclass is indented under subclass E11.055. This subclass is substantially the same in scope as ECLA classification G06F11/16B1.

**E11.057 In coding, decoding circuits, e.g., parity circuits, etc. (EPO):**

This subclass is indented under subclass E11.055. This subclass is substantially the same in scope as ECLA classification G06F11/16B10.

**E11.058 In communications, e.g., transmission, interfaces, etc. (EPO):**

This subclass is indented under subclass E11.055. This subclass is substantially the same in scope as ECLA classification G06F11/16B12.

**E11.059 Control processors, e.g., for sensors, actuator, etc. (EPO):**



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D. CHANGES TO THE DEFINITIONS

This subclass is indented under subclass E11.055. This subclass is substantially the same in scope as ECLA classification G06F11/16B14.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.081, for similar subject matter using active fault-masking.

**E11.06 With exchange of data between units (EPO):**

This subclass is indented under subclass E11.055. This subclass is substantially the same in scope as ECLA classification G06F11/16B16.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.08 for similar subject matter using active fault-masking.

**E11.061 With data processors, i.e., data processors compare their computations (EPO):**

This subclass is indented under subclass E11.055. This subclass is substantially the same in scope as ECLA classification G06F11/16B18.

**E11.062 In storage with relative movement between record carrier and transducer, e.g., tapes, disks, etc. (EPO):**

This subclass is indented under subclass E11.055. This subclass is substantially the same in scope as ECLA classification G06F11/16B2.

**E11.063 In systems, i.e., comprising a multiplicity of resources, e.g., cpu with its memory and I/O, etc. (EPO):**

This subclass is indented under subclass E11.055. This subclass is substantially the same in scope as ECLA classification G06F11/16B20.

**E11.064 In arithmetic, logic or counter circuits or a combination thereof, e.g., alu, adder (EPO):**

This subclass is indented under subclass E11.055. This subclass is substantially the same in scope as ECLA classification G06F11/16B4.

**E11.065 In I/O devices or adapters therefor (EPO):**

This subclass is indented under subclass E11.055. This subclass is substantially the same in scope as ECLA classification G06F11/16B8.

**E11.066 Displays (EPO):**

This subclass is indented under subclass E11.065. This subclass is substantially the same in scope as ECLA classification G06F11/16B8D.

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D. CHANGES TO THE DEFINITIONS**E11.067 Timing and synchronization therein (EPO):**

This subclass is indented under subclass E11.054. This subclass is substantially the same in scope as ECLA classification G06F11/16S.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.07 for similar subject matter using passive fault masking.

**E11.068 By using fault tolerant clocks (EPO):**

This subclass is indented under subclass E11.067. This subclass is substantially the same in scope as ECLA classification G06F11/16S2.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.07, for voting schemes.

**E11.069 Using passive fault-masking of the redundant circuits, e.g., by quadding or by majority decision circuits, etc.(EPO):**

This subclass is indented under subclass E11.054. This subclass is substantially the same in scope as ECLA classification G06F11/18.

**E11.07 Synchronization therefor (EPO):**

This subclass is indented under subclass E11.069. This subclass is substantially the same in scope as ECLA classification G06F11/18S.

**E11.071 Using active fault-masking, e.g., by switching out faulty elements or by switching in spare elements, etc. (EPO):**

This subclass is indented under subclass E11.054. This subclass is substantially the same in scope as ECLA classification G06F11/20.

**E11.072 In systems, e.g., multiprocessors, etc. (EPO):**

This subclass is indented under subclass E11.071. This subclass is substantially the same in scope as ECLA classification G06F11/20D.

**E11.073 In distributed systems (EPO):**

This subclass is indented under subclass E11.072. This subclass is substantially the same in scope as ECLA classification G06F11/20D1.

**E11.074 In regular structures (EPO):**

This subclass is indented under subclass E11.073. This subclass is substantially the same in scope as ECLA classification G06F11/20D1A.

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**D. CHANGES TO THE DEFINITIONS****E11.075 Array of processors, e.g., systolic arrays, etc. (EPO):**

This subclass is indented under subclass E11.074. This subclass is substantially the same in scope as ECLA classification G06F11/20D1A1.

**E11.076 Hypercubes (EPO):**

This subclass is indented under subclass E11.074. This subclass is substantially the same in scope as ECLA classification G06F11/20D1A2.

**E11.077 Trees (EPO):**

This subclass is indented under subclass E11.074. This subclass is substantially the same in scope as ECLA classification G06F11/20D1A3.

**E11.078 In interconnections, e.g., rings, etc. (EPO):**

This subclass is indented under subclass E11.071. This subclass is substantially the same in scope as ECLA classification G06F11/20E.

**E11.079 Bus (EPO):**

This subclass is indented under subclass E11.078. This subclass is substantially the same in scope as ECLA classification G06F11/20E1.

**E11.08 Data exchange between units, e.g., for updating backup units, etc. (EPO):**

This subclass is indented under subclass E11.071. This subclass is substantially the same in scope as ECLA classification G06F11/20F.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.113, for retrying.

E11.067, for synchronization between units.

**E11.081 For control, e.g., actuators, etc. (EPO):**

This subclass is indented under subclass E11.071. This subclass is substantially the same in scope as ECLA classification G06F11/20G.

**E11.082 In arithmetic units (EPO):**

This subclass is indented under subclass E11.071. This subclass is substantially the same in scope as ECLA classification G06F11/20H.

**E11.083 Redundant power supplies (EPO):**

This subclass is indented under subclass E11.071. This subclass is substantially the same in scope as ECLA classification G06F11/20K.

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D. CHANGES TO THE DEFINITIONS**E11.084 Masking faults in storage systems using spares and/or by reconfiguring (EPO):**

This subclass is indented under subclass E11.071. This subclass is substantially the same in scope as ECLA classification G06F11/20L.

**E11.085 Removing defective units from operation (EPO):**

This subclass is indented under subclass E11.084. This subclass is substantially the same in scope as ECLA classification G06F11/20L10.

**E11.086 Bypassing defective units on a serial bus (EPO):**

This subclass is indented under subclass E11.085. This subclass is substantially the same in scope as ECLA classification G06F11/20L10S.

**E11.087 With address translations and modifications (EPO):**

This subclass is indented under subclass E11.084. This subclass is substantially the same in scope as ECLA classification G06F11/20L2.

**E11.088 Handling defects in a Redundant Array of Inexpensive Disks (RAID) by remapping (EPO):**

This subclass is indented under subclass E11.087. This subclass is substantially the same in scope as ECLA classification G06F11/20L2R.

**E11.089 Managing spare storage units (EPO):**

This subclass is indented under subclass E11.084. This subclass is substantially the same in scope as ECLA classification G06F11/20L6.

**E11.09 Hot spares (EPO):**

This subclass is indented under subclass E11.089. This subclass is substantially the same in scope as ECLA classification G06F11/20L6H.

**E11.091 Via redundancy in hardware accessing the storage components (EPO):**

This subclass is indented under subclass E11.084. This subclass is substantially the same in scope as ECLA classification G06F11/20L8.

**E11.092 Using redundant I/O processors, storage control units or array controllers (EPO):**

This subclass is indented under subclass E11.091. This subclass is substantially the same in scope as ECLA classification G06F11/20L8F.

**E11.093 With serial buses (EPO):**

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**D. CHANGES TO THE DEFINITIONS**

This subclass is indented under subclass E11.092. This subclass is substantially the same in scope as ECLA classification G06F11/20L8F2.

**E11.094 To file servers (EPO):**

This subclass is indented under subclass E11.092. This subclass is substantially the same in scope as ECLA classification G06F11/20L8F4.

**E11.095 Connection redundancy between storage system components (EPO):**

This subclass is indented under subclass E11.091. This subclass is substantially the same in scope as ECLA classification G06F11/20L8C.

**E11.096 With serial buses (EPO):**

This subclass is indented under subclass E11.095. This subclass is substantially the same in scope as ECLA classification G06F11/20L8C2.

**E11.097 To file servers (EPO):**

This subclass is indented under subclass E11.095. This subclass is substantially the same in scope as ECLA classification G06F11/20L8C4.

**E11.098 Using the replication of data, e.g., with two or more copies, etc. (EPO):**

This subclass is indented under subclass E11.084. This subclass is substantially the same in scope as ECLA classification G06F11/20L4.

**E11.099 Duplex memories, e.g., twin boot ROMs, etc. (EPO):**

This subclass is indented under subclass E11.098. This subclass is substantially the same in scope as ECLA classification G06F11/20L4D.

**E11.1 Duplexed caches, e.g., cache paired with nonvolatile storage, etc. (EPO):**

This subclass is indented under subclass E11.099. This subclass is substantially the same in scope as ECLA classification G06F11/20L4D2.

**E11.101 Mirroring, i.e., the concept of maintaining data on two or more units in the same state at all times (EPO):**

This subclass is indented under subclass E11.098. This subclass is substantially the same in scope as ECLA classification G06F11/20L4M.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.118 for backing up data periodically.

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D. CHANGES TO THE DEFINITIONS**E11.102 Resynchronization of failed mirrors (EPO):**

This subclass is indented under subclass E11.101. This subclass is substantially the same in scope as ECLA classification G06F11/20L4M10.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.112, for restoring data from a backup G06F11/14.

**E11.103 Mirror management, e.g., pairing of units, etc. (EPO):**

This subclass is indented under subclass E11.101. This subclass is substantially the same in scope as ECLA classification G06F11/20L4M2.

**E11.104 Mirroring on the same storage unit (EPO):**

This subclass is indented under subclass E11.101. This subclass is substantially the same in scope as ECLA classification G06F11/20L4M4.

**E11.105 Mirroring on different storage units with a common controller (RAID 1) (EPO):**

This subclass is indented under subclass E11.101. This subclass is substantially the same in scope as ECLA classification G06F11/20L4M6.

**E11.106 Mirroring with multiple controllers (EPO):**

This subclass is indented under subclass E11.101. This subclass is substantially the same in scope as ECLA classification G06F11/20L4M8.

**E11.107 Asynchronous mirroring (EPO):**

This subclass is indented under subclass E11.106. This subclass is substantially the same in scope as ECLA classification G06F11/20L4M8A.

**E11.108 Synchronous mirroring (EPO):**

This subclass is indented under subclass E11.106. This subclass is substantially the same in scope as ECLA classification G06F11/20L4M8S.

**E11.109 De-clustering of replicated data (EPO):**

This subclass is indented under subclass E11.098. This subclass is substantially the same in scope as ECLA classification G06F11/20L4R.

**E11.11 Using more than two copies (EPO):**

This subclass is indented under subclass E11.098. This subclass is substantially the same in scope as ECLA classification G06F11/20L4S.

**E11.111 In Logic Arrays, e.g., programmable or iterative logic arrays, etc. (EPO):**

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This subclass is indented under subclass E11.071. This subclass is substantially the same in scope as ECLA classification G06F11/20P.

**E11.112 Error detection or correction of the data by redundancy in operation (EPO):**

This subclass is indented under subclass E11.021. This subclass is substantially the same in scope as ECLA classification G06F11/14.

**E11.113 Saving, restoring, recovering or retrying (EPO):**

This subclass is indented under subclass E11.112. This subclass is substantially the same in scope as ECLA classification G06F11/14A.

**E11.114 At machine instruction level (EPO):**

This subclass is indented under subclass E11.113. This subclass is substantially the same in scope as ECLA classification G06F11/14A2.

**E11.115 Checkpointing the instruction stream (EPO):**

This subclass is indented under subclass E11.114. This subclass is substantially the same in scope as ECLA classification G06F11/14A2C.

**E11.116 For bus or memory accesses (EPO):**

This subclass is indented under subclass E11.114. This subclass is substantially the same in scope as ECLA classification G06F11/14A2M.

**E11.117 Of application data (EPO):**

This subclass is indented under subclass E11.113. This subclass is substantially the same in scope as ECLA classification G06F11/14A4.

**E11.118 Backing up, restoring or mirroring files or drives (EPO):**

This subclass is indented under subclass E11.117. This subclass is substantially the same in scope as ECLA classification G06F11/14A4B.

**E11.119 Backing up, i.e., point-in-time backup (EPO):**

This subclass is indented under subclass E11.118. This subclass is substantially the same in scope as ECLA classification G06F11/14A4B1.

**E11.12 Hardware arrangements for backup (EPO):**

This subclass is indented under subclass E11.119. This subclass is substantially the same in scope as ECLA classification G06F11/14A4B1H.

**E11.121 Backup Management techniques (EPO):**

This subclass is indented under subclass E11.119. This subclass is substantially the same in scope as ECLA classification G06F11/14A4B1M

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**D. CHANGES TO THE DEFINITIONS****E11.122 Recovery techniques (EPO):**

This subclass is indented under subclass E11.121. This subclass is substantially the same in scope as ECLA classification G06F11/14A4B1M10.

**E11.123 Selection of contents (EPO):**

This subclass is indented under subclass E11.121. This subclass is substantially the same in scope as ECLA classification G06F11/14A4B1M2.

**E11.124 Scheduling policy (EPO):**

This subclass is indented under subclass E11.121. This subclass is substantially the same in scope as ECLA classification G06F11/14A4B1M4.

**E11.125 For networked environments (EPO):**

This subclass is indented under subclass E11.121. This subclass is substantially the same in scope as ECLA classification G06F11/14A4B1M6.

**E11.126 Nondisruptive backup (EPO):**

This subclass is indented under subclass E11.121. This subclass is substantially the same in scope as ECLA classification G06F11/14A4B1M8.

**E11.127 Mirroring (EPO):**

This subclass is indented under subclass E11.118. This subclass is substantially the same in scope as ECLA classification G06F11/14A4B3.

**E11.128 Distributed database systems; Replica control (EPO):**

This subclass is indented under subclass E11.118. This subclass is substantially the same in scope as ECLA classification G06F11/14A4B5.

**E11.129 Synchronization between mobile agents and networked agents (EPO):**

This subclass is indented under subclass E11.128. This subclass is substantially the same in scope as ECLA classification G06F11/14A4B5M.

**E11.13 Using logs or checkpoints (EPO):**

This subclass is indented under subclass E11.117. This subclass is substantially the same in scope as ECLA classification G06F11/14A4C.

**E11.131 In transactions (EPO):**

This subclass is indented under subclass E11.117. This subclass is substantially the same in scope as ECLA classification G06F11/14A4T.



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D. CHANGES TO THE DEFINITIONS**E11.132 At operating system level (EPO):**

This subclass is indented under subclass E11.113. This subclass is substantially the same in scope as ECLA classification G06F11/14AB .

**E11.133 Boot up procedures (EPO):**

This subclass is indented under subclass E11.132. This subclass is substantially the same in scope as ECLA classification G06F11/14A8B.

**E11.134 Reconfiguring to eliminate the error (EPO):**

This subclass is indented under subclass E11.132. This subclass is substantially the same in scope as ECLA classification G06F11/14A8C.

**E11.135 During software upgrading (EPO):**

This subclass is indented under subclass E11.132. This subclass is substantially the same in scope as ECLA classification G06F11/14A8E.

**E11.136 At file system or disk access level (EPO):**

This subclass is indented under subclass E11.132. This subclass is substantially the same in scope as ECLA classification G06F11/14A8F.

**E11.137 Restarting or rejuvenating (EPO):**

This subclass is indented under subclass E11.132. This subclass is substantially the same in scope as ECLA classification G06F11/14A8L.

**E11.138 Resetting or repowering (EPO):**

This subclass is indented under subclass E11.132. This subclass is substantially the same in scope as ECLA classification G06F11/14A8P.

**E11.139 Cleaning up resources (EPO):**

This subclass is indented under subclass E11.132. This subclass is substantially the same in scope as ECLA classification G06F11/14A8R.

**E11.14 Suspending and resuming a running system (EPO):**

This subclass is indented under subclass E11.132. This subclass is substantially the same in scope as ECLA classification G06F11/14A8S.

**E11.141 Transmit or communication errors (EPO):**

This subclass is indented under subclass E11.132. This subclass is substantially the same in scope as ECLA classification G06F11/14A8T.

**E11.142 Error detection (EPO):**

This subclass is indented under subclass E11.112. This subclass is substantially the same in scope as ECLA classification G06F11/14B.

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**D. CHANGES TO THE DEFINITIONS****E11.143 By time redundancy (EPO):**

This subclass is indented under subclass E11.142. This subclass is substantially the same in scope as ECLA classification G06F11/14B2.

**E11.144 Error avoidance, e.g., error spreading countermeasures, fault avoidance, etc. (EPO):**

This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G06F11/00H.

**E11.145 Detection or location of defective computer hardware by testing during standby operation or during idle time, e.g., start-up testing, etc. (EPO):**

This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G06F11/22.

**E11.146 Verification or detection of system hardware configuration (EPO):**

This subclass is indented under subclass E11.145. This subclass is substantially the same in scope as ECLA classification G06F11/22C.

**E11.147 Logging of test results (EPO):**

This subclass is indented under subclass E11.145. This subclass is substantially the same in scope as ECLA classification G06F11/22L.

**E11.148 Test methods (EPO):**

This subclass is indented under subclass E11.145. This subclass is substantially the same in scope as ECLA classification G06F11/22M.

**E11.149 Power-On Test, e.g., POST, etc. (EPO):**

This subclass is indented under subclass E11.148. This subclass is substantially the same in scope as ECLA classification G06F11/22M1.

**E11.15 Configuration test (EPO):**

This subclass is indented under subclass E11.149. This subclass is substantially the same in scope as ECLA classification G06F11/22M1C.

**E11.151 Background testing (EPO):**

This subclass is indented under subclass E11.148. This subclass is substantially the same in scope as ECLA classification G06F11/22M2.

**E11.152 Periodic testing (EPO):**

This subclass is indented under subclass E11.148. This subclass is substantially the same in scope as ECLA classification G06F11/22M3.

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**D. CHANGES TO THE DEFINITIONS****E11.153 Test trigger logic (EPO):**

This subclass is indented under subclass E11.148. This subclass is substantially the same in scope as ECLA classification G06F11/22M4.

**E11.154 Marginal checking (EPO):**

This subclass is indented under subclass E11.145. This subclass is substantially the same in scope as ECLA classification G06F11/24.

**E11.155 Testing of logic operation, e.g., by logic analyzers, etc. (EPO):**

This subclass is indented under subclass E11.145. This subclass is substantially the same in scope as ECLA classification G06F11/25.

**E11.156 Using Fault Dictionaries (EPO):**

This subclass is indented under subclass E11.155. This subclass is substantially the same in scope as ECLA classification G06F11/25D.

**E11.157 Using Expert Systems (EPO):**

This subclass is indented under subclass E11.155. This subclass is substantially the same in scope as ECLA classification G06F11/25E.

**E11.158 Using Neural Networks (EPO):**

This subclass is indented under subclass E11.155. This subclass is substantially the same in scope as ECLA classification G06F11/25N.

**E11.159 Functional testing (EPO):**

This subclass is indented under subclass E11.145. This subclass is substantially the same in scope as ECLA classification G06F11/26.

**E11.16 Reconfiguring circuits for testing, e.g., LSSD, partitioning, etc. (EPO):**

This subclass is indented under subclass E11.159. This subclass is substantially the same in scope as ECLA classification G06F11/267.

**E11.161 Test of buses, lines or interfaces, e.g., stuck-at or open line faults etc. (EPO):**

This subclass is indented under subclass E11.16. This subclass is substantially the same in scope as ECLA classification G06F11/267B.

**E11.162 Test or error correction or detection circuits (EPO):**

This subclass is indented under subclass E11.16. This subclass is substantially the same in scope as ECLA classification G06F11/267C.

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**D. CHANGES TO THE DEFINITIONS****E11.163 Test of input/output devices or peripheral units (EPO):**

This subclass is indented under subclass E11.16. This subclass is substantially the same in scope as ECLA classification G06F11/267D.

**E11.164 Test of ALU (EPO):**

This subclass is indented under subclass E11.16. This subclass is substantially the same in scope as ECLA classification G06F11/267H.

**E11.165 Test of interrupt circuits (EPO):**

This subclass is indented under subclass E11.16. This subclass is substantially the same in scope as ECLA classification G06F11/267N.

**E11.166 Test of CPU or processors (EPO):**

This subclass is indented under subclass E11.16. This subclass is substantially the same in scope as ECLA classification G06F11/267P.

**E11.167 By simulating additional hardware, e.g., fault simulation, etc. (EPO):**

This subclass is indented under subclass E11.159. This subclass is substantially the same in scope as ECLA classification G06F11/26S.

**E11.168 Emulators (EPO):**

This subclass is indented under subclass E11.167. This subclass is substantially the same in scope as ECLA classification G06F11/26S2.

**E11.169 Built-in tests (EPO):**

This subclass is indented under subclass E11.159. This subclass is substantially the same in scope as ECLA classification G06F11/27.

**E11.17 Tester hardware, i.e., output processing circuits (EPO):**

This subclass is indented under subclass E11.159. This subclass is substantially the same in scope as ECLA classification G06F11/273.

**E11.171 Test interface between tester and unit under test (EPO):**

This subclass is indented under subclass E11.17. This subclass is substantially the same in scope as ECLA classification G06F11/273E.

**E11.172 Using a storage for the test inputs, e.g., test-ROM, script files, etc. (EPO):**

This subclass is indented under subclass E11.17. This subclass is substantially the same in scope as ECLA classification G06F11/273M.

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**D. CHANGES TO THE DEFINITIONS****E11.173 Remote test (EPO):**

This subclass is indented under subclass E11.17. This subclass is substantially the same in scope as ECLA classification G06F11/273R.

**E11.174 Using a dedicated service processor for test (EPO):**

This subclass is indented under subclass E11.17. This subclass is substantially the same in scope as ECLA classification G06F11/273S.

**E11.175 With comparison between actual response and known fault-free response, e.g., signature analyzer, etc. (EPO):**

This subclass is indented under subclass E11.17. This subclass is substantially the same in scope as ECLA classification G06F11/277.

**E11.176 In Multi-processor systems, e.g., one processor becoming the test master, etc. (EPO):**

This subclass is indented under subclass E11.17. This subclass is substantially the same in scope as ECLA classification G06F11/27M.

**E11.177 Generation of test inputs, e.g., test vectors, patterns or sequences, etc. (EPO):**

This subclass is indented under subclass E11.159. This subclass is substantially the same in scope as ECLA classification G06F11/263.

**E11.178 By checking the correct order of processing (EPO):**

This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G06F11/28.

**E11.179 Monitoring (EPO):**

This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G06F11/30.

**E11.18 With visual or acoustical indication of the functioning of the machine (EPO):**

This subclass is indented under subclass E11.179. This subclass is substantially the same in scope as ECLA classification G06F11/32.

**E11.181 Visualization of programs or trace data (EPO):**

This subclass is indented under subclass E11.18. This subclass is substantially the same in scope as ECLA classification G06F11/32P.

**E11.182 Display for diagnostics, e.g., diagnostic result display, self-test user interface, etc. (EPO):**

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**D. CHANGES TO THE DEFINITIONS**

This subclass is indented under subclass E11.18. This subclass is substantially the same in scope as ECLA classification G06F11/32D.

**E11.183 Display of waveforms, e.g., of logic analyzers, etc. (EPO):**

This subclass is indented under subclass E11.182. This subclass is substantially the same in scope as ECLA classification G06F11/32D4.

**E11.184 Display of status information (EPO):**

This subclass is indented under subclass E11.18. This subclass is substantially the same in scope as ECLA classification G06F11/32S.

**E11.185 By lamps or LED's (EPO):**

This subclass is indented under subclass E11.184. This subclass is substantially the same in scope as ECLA classification G06F11/32S2.

**E11.186 For error or online/offline status (EPO):**

This subclass is indented under subclass E11.186. This subclass is substantially the same in scope as ECLA classification G06F11/32S2E.

**E11.187 Alarm or error message display (EPO):**

This subclass is indented under subclass E11.184. This subclass is substantially the same in scope as ECLA classification G06F11/32S4.

**E11.188 Computer systems status display (EPO):**

This subclass is indented under subclass E11.184. This subclass is substantially the same in scope as ECLA classification G06F11/32S6.

**E11.189 Recording or statistical evaluation of computer activity, e.g., of down time, of input/output operation, etc. (EPO):**

This subclass is indented under subclass E11.179. This subclass is substantially the same in scope as ECLA classification G06F11/34.

**E11.19 Of interconnections, e.g., interconnecting networks, etc. (EPO):**

This subclass is indented under subclass E11.189. This subclass is substantially the same in scope as ECLA classification G06F11/34A.

**E11.191 Of parallel or distributed programming (EPO):**

This subclass is indented under subclass E11.189. This subclass is substantially the same in scope as ECLA classification G06F11/34B.

**E11.192 Performance measurement (EPO):**

This subclass is indented under subclass E11.189. This subclass is substantially the same in scope as ECLA classification G06F11/34C.

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**D. CHANGES TO THE DEFINITIONS****E11.193 Workload generation, e.g., scripts, playback, etc. (EPO):**

This subclass is indented under subclass E11.192. This subclass is substantially the same in scope as ECLA classification G06F11/34C2.

**E11.194 Benchmarking (EPO):**

This subclass is indented under subclass E11.193. This subclass is substantially the same in scope as ECLA classification G06F11/34C2B.

**E11.195 Time measurement, e.g., response time (EPO):**

This subclass is indented under subclass E11.192. This subclass is substantially the same in scope as ECLA classification G06F11/34C4.

**E11.196 Of active or idle time (EPO):**

This subclass is indented under subclass E11.195. This subclass is substantially the same in scope as ECLA classification G06F11/34C4A.

**E11.197 Performance evaluation by modeling or statistical analysis (EPO):**

This subclass is indented under subclass E11.189. This subclass is substantially the same in scope as ECLA classification G06F11/34M.

**E11.198 Performance evaluation by simulation (EPO):**

This subclass is indented under subclass E11.189. This subclass is substantially the same in scope as ECLA classification G06F11/34S.

**E11.199 Trace driven simulation (EPO):**

This subclass is indented under subclass E11.198. This subclass is substantially the same in scope as ECLA classification G06F11/34S2.

**E11.2 Performance evaluation by tracing or monitoring (EPO):**

This subclass is indented under subclass E11.189. This subclass is substantially the same in scope as ECLA classification G06F11/34T.

**E11.201 For interfaces, buses (EPO):**

This subclass is indented under subclass E11.2. This subclass is substantially the same in scope as ECLA classification G06F11/34T10.

**E11.202 For systems (EPO):**

This subclass is indented under subclass E11.2. This subclass is substantially the same in scope as ECLA classification G06F11/34T12.

**E11.203 Address tracing (EPO):**

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**D. CHANGES TO THE DEFINITIONS**

This subclass is indented under subclass E11.2. This subclass is substantially the same in scope as ECLA classification G06F11/34T2.

**E11.204 Data logging (EPO):**

This subclass is indented under subclass E11.2. This subclass is substantially the same in scope as ECLA classification G06F11/34T4.

**E11.205 Circuit details, i.e., tracer hardware (EPO):**

This subclass is indented under subclass E11.2. This subclass is substantially the same in scope as ECLA classification G06F11/34T6.

**E11.206 For I/O devices (EPO):**

This subclass is indented under subclass E11.2. This subclass is substantially the same in scope as ECLA classification G06F11/34T8.

**E11.207 Preventing errors by testing or debugging software (EPO):**

This subclass is indented under subclass E11.001. This subclass is substantially the same in scope as ECLA classification G06F11/36.

**E11.208 Software debugging (EPO):**

This subclass is indented under subclass E11.207. This subclass is substantially the same in scope as ECLA classification G06F11/36D.

**E11.209 Compilers or other tools operating on the source text (EPO):**

This subclass is indented under subclass E11.208. This subclass is substantially the same in scope as ECLA classification G06F11/36D2.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.2, for instrumentation for performance monitoring.

**E11.21 Debuggers (EPO):**

This subclass is indented under subclass E11.208. This subclass is substantially the same in scope as ECLA classification G06F11/36D3.

**E11.211 Error checking code in the program under test (EPO):**

This subclass is indented under subclass E11.208. This subclass is substantially the same in scope as ECLA classification G06F11/36D4.

**E11.212 Tracing methods or tools (EPO):**

This subclass is indented under subclass E11.208. This subclass is substantially the same in scope as ECLA classification G06F11/36D5.



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D. CHANGES TO THE DEFINITIONS

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.2, for performance monitoring.

**E11.213 By using additional hardware (EPO):**

This subclass is indented under subclass E11.208. This subclass is substantially the same in scope as ECLA classification G06F11/36D6.

**E11.214 By making modifications to the CPU (EPO):**

This subclass is indented under subclass E11.213. This subclass is substantially the same in scope as ECLA classification G06F11/36D6C.

**E11.215 By monitoring the bus (EPO):**

This subclass is indented under subclass E11.213. This subclass is substantially the same in scope as ECLA classification G06F11/36D6M.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.2, for performance monitoring.

**E11.216 By emulating the CPU (EPO):**

This subclass is indented under subclass E11.213. This subclass is substantially the same in scope as ECLA classification G06F11/36D6E.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.168, for testing hardware.

**E11.217 User interfaces for testing or debugging software (EPO):**

This subclass is indented under subclass E11.207. This subclass is substantially the same in scope as ECLA classification G06F11/36G.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.18, for hardware monitoring.

**E11.218 Methods or tools for writing reliable software and for evaluating software (EPO):**

This subclass is indented under subclass E11.207. This subclass is substantially the same in scope as ECLA classification G06F11/36M.

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D. CHANGES TO THE DEFINITIONS

SEE OR SEARCH THIS CLASS, SUBCLASS:

E11.008, for fault-tolerant software.

**E11.219 Methods or tools to render software testable (EPO):**

This subclass is indented under subclass E11.218. This subclass is substantially the same in scope as ECLA classification G06F11/36M2.

**E11.22 Software metrics (EPO):**

This subclass is indented under subclass E11.218. This subclass is substantially the same in scope as ECLA classification G06F11/36M3.