—- Models—-

Glossary

Christian Janßen   Marc Horst   Martina Mostert   Michael Felke

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A

activity Abstraction of a thread. Part of an instance.

adapter Soft or hardware for connecting different units that do not have compatible interfaces because of different formats or standards.

address mode Different methods of the processor to calculate the effective (real) address of an operand from addresses, address distances, and contents of registers. Most commonly used are: direct: there is no address but the actual value; absolute: the real physical address is specified; indirect: an address is given at which the physical address is saved; indexed: the physical address is calculated from the sum of the given address and the content of the index register; relative: the physical address is calculated form the sum of the given address and the content of a basic register; symbolic: the address is symbolically given by a mnemonic name; virtual: the address refers to a virtual memory area.

admin channel Channel used for resource operations (allocation, deallocation, query). It connects the executor with the remaining units of the machine.

admin interface Interface of the processor with the admin channel.

administration instance Instance within the execution sphere that manages the components included therein and takes over the administration activities of the machine (allocate memory etc.).

argument list List of parameters that are handed over to a procedure.

atomic datakind Datakind with a defined range that cannot be reduced to another datakind.

attribute access A kind of port specialized on querying on attributes and named data fields, respectively.

authorization administration Part of the execution sphere used for saving, manging, controlling etc. of authorization sets.

authorization set Collection of authorizations for various actions that are actable via interfaces to allow a process to open a file, for example.

B

bankswitching Switching from one memory bank (memory area belonging together) to another.

base address The first memory address within an area of the main memory.

block address Address of a memory block.

5 **block of data** Section of a machine program containing all working data of the program.

block-ID ID assigned by the administration instance to a memory area during memory allocation and communicated to the requesting thread.

boot procedure Procedure for loading the boot program(s) during system start-up.

boot program Machine program executed automatically during system start-up.

10 **breakpoint** Position within a source code at which a program can be stopped and continued during debugging.

C

cache management Method for managing and organizing a cache.

channel Special purpose connection between two or more units.

channel adapter Adapter within a processor allowing the usage of one or more channels.

channel type Indicates the category of a channel and with it its interface specification. 5

channel-ID Identification assigned by the administration instance to a channel.

checksum Value calculated out of a group of data to check the correctness of these saved or transmitted data.

clean-up Clean-up procedure at the end of a process to release the memory allocated by the process that is not needed anymore. 10

cloned process Process that originated as a duplicate of another process, for example because of a fork.

code block Section of a machine program containing a series of machine commands belonging together.

code-reading adapter Chanel adapter allowing the processor to read machine code. 15

command processor Part of a processor that analyzes a command and initiates its execution.

communication service Services of the administration instance allowing processes to communicate via ports.

computer aggregate Whole configuration of internal and external devices of a computer or a computer grid with at least one universal machine as well as peripheral devices (as the case 20
may be specialized machines) for data entry, storage, output, and transmission.

computer environment, distributed see distributed computer environment

computer system Combination of hard and software for data processing.

computing model Model of a (imaginary) computer from the point of view of a machine program being executed. 25

consecutive routine Procedure that sequels the current procedure. That is, it is processed instead of the current procedure within the scope of the thread.

constant data block Section of a machine program with data that is not to be changed by the program.

constant memory Memory available as read-only memory to all threads of a procedure.

cooperative memory management With cooperative memory management all processes should contribute to take full advantage of the main memory

cooperative memory management With cooperative memory management several processes or threads share the same memory with each other by allocating and deallocating the memory actual needed and not needed, respectively.

coprocessor Additional processor for load reduction of the main processor taking over special tasks, for example mathematical coprocessor, that does not process a program independently but is instructed by the main processor to do so.

coprocessor adapter Chanel adapter allowing the processor to use functions of coprocessors.

coprocessor channel Chanel for accessing a coprocessor.

counter Machine optimized datakind for general counter loops and numbering.

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D

data circuit-terminating unit (DCE = Data Communication Equipment) Installation for data transmission (e.g., modem) that may consist of the following units: signal converter, error control unit, synchronization unit.

data declaration block Section of a machine program describing data fields for working data not having a start value.

data field Memory area defined for storing values of a certain datakind.

data segment Linearly addressable part of the data memory belonging together with common attributes.

data stack Memory area for data working according the LIFO principal (last in, first out), that is data stored at last are read first.

datakind Data representing elements of the same set (i.e., having the same range) form a datakind.

datakind identification Identification of a datakind using the datakind datakind-Id.

datakind, atomic see atomic datakind

datament Generic term for the parts of a program collection like machine programs, pictures, texts, for example.

datament identifier Static and unambiguous datament identification recorded in the datament itself and in the datament profile.

datament profile General data record concerning a datament with label, type, checksums, access authorization etc. as well as a reference to the datament it belongs to. Programs are started using their profile.

datament type Type of a datament as mime type with subgroup (e.g. application/octet-stream).

DCE 1. see Distributed Computer Environment
2. Data Communication Equipment ? see data circuit-terminating unit

debug channel Channel type providing the functionality necessary for debugging (step-by-step execution, set breakpoints, read/write debug data etc.)

debugging Error search and deletion within a program with the help of a debugger that is either an independent program or part of a compiler having usually functions for controlling the contents of variables, for stopping/continuing a program at predefined point (so-call breakpoints), and for step-by-step execution of a program.

definition block Section of a machine program containing definitions of datakinds, for example.

definition list List defining elements of a set.

deinitialisation procedure Procedure called while ending a process and possibly performs necessary clean-up work (so-called clean-up).

5 **device** Part of a computer aggregate that saves, processes, and/or outputs data/programs. The devices of a computer aggregate are connected to each other by a system of interfaces.

directory access A type of a port that is specialized on the enquiry on directories and tree structures.

distributed computer environment (DCE) A uniform runtime environment for programs that is distributed over several computers.

10

DMA Direct Memory Access. Method with which data in the main memory is directly accessed by the controller without detouring over the processor. The controlling is done by the DMA controller.

DMA channel Channel type for controlling DMA transfer. See also DMA transfer.

15 **DMA transfer** Transferring data from or to main memory by a controller, see also DMA.

driver Program for accessing a (peripheral) component (e.g., mouse, scanner) of the computer aggregate.

dynamic memory Memory not allocated by a thread or process at its start but during its execution.

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E

environment variable Variables given by the operating system or the user.

error/warning channel Is used to route error, warning, and log messages within the machine.

exception Error situation occurring in succession of the execution of a program step at a processor.

exception handler Handling routine called when an exception occurs that reports, solves, or bypasses the exception.

execution sphere Area a process belongs to and with which it interacts during its execution.

executor Unit within a machine managing, controlling, and supervising other units of the same machine.

executory Area of the computing model containing all elements of the model necessary for executing programs.

export declaration An export declaration determines that and how the given program part can be addressed by other processes or instances via a port.

F

flag Bit within a register showing a certain state, e.g. overflow of an arithmetical operation (carry flag), sign of a value (sign flag).

fork System call that duplicates the current process and both continue parallelly in the procedure that initiated the fork.

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function call, remote see remote function call

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G

GMC General Machine Code

graph access port Port for platform independent inquiring, navigating, and changing of graph and tree structures respectively, of directory trees in particular.

GUI Graphical User Interface. Graphical interface between the user and the operating system or an application for controlling it. ₅

H

handling routine Stored routine executed when a (certain) event occurs.

handling routine chain Chain of routines serially executed until a matching routine has been found or the chain ends.

₅ **handoff area** Memory area for handing over parameters between threads.

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I

I/O-adapter Channel adapter allowing the processor to use, supervise, and control one or more I/O-channels.

I/O-channel Input/output channel for platform independent access to I/O-controllers.

I/O-controller System component supervising and controlling the data transmission between main memory and peripheral devices and that is used for buffering and conversion (parallel <-> serial, analog <-> digital) of the data.

icon Allegory an object (program, directory etc.) used in graphical user interfaces.

ID Identification on the basis of the unordered set, given by the execution sphere to the components described within the computing model.

IDE Integrated Device Equipment. Interface standard for hard disks in IBM compatible PCs that allows two hard disks or other drives at one bus.

imaginary computer An element within the computing model that has the functionality of a computer (virtual generalized computer).

imaginary processor An element within the computing model that has the functionality of a processor (virtual generalized processor).

implementation variant Implementation of a program where the implementation differs form other implementations of the same program, while behaving equally to the user, to adopt it to different system conditions.

import declaration An import declaration determines that and which parts of a program of another process or another instance is needed.

inheritable memory Memory that can be passed over from a thread to a thread initiated by it.

initialization Initialization of data fields with defined values.

initialization procedure Procedure within a program executing the initializations necessary for the program.

input definition The input definition contains a description of data that has to be provided to the procedure before its execution.

instance Abstraction of a process.

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interface Junction for data/signal transmission of two units (function unit, program module) communicating with each other with declared rules.

interface specification Exact description of an interface, for example used protocol.

interface technique Technical procedure on that a interface specification is based on.

5 **interrupt** Interrupt situation occurring in succession of a notification via a signal channel that happens asynchronous with the program flow and is initiated by peripheral devices or system control components.

interrupt channel Chanel via that the interrupt controller is approached.

interrupt controller Unit for managing and controlling/coordination of interrupts.

10 **interrupt handle** Allows access to information and activities of an interrupt. It consists of interrupt-controller-ID and interrupt-ID.

interrupt procedure Procedure deposited at the interrupt controller executed when the interrupt signal occurs that it is assigned to as soon as the command executed by the processor at the moment of the occurrence of the interrupt signal has been completed.

15 **interrupt-ID** Interrupt identification within an interrupt controller, that is deposited as part of the interrupt handle.

ISA Industry Standard Architecture. Bus architecture with a bus width of 8 and 16 Bit respectively.

L

label Term for technical identifications that are unambiguous within their scope in the form of a contiguous string. Counterpart: system-id.

link library Library linked during the generation of the machine program.

loader Routine/unit that loads a program and prepares it for execution.   5

local memory Memory available only during the execution of a thread.

M

machine Element of the computing model for the execution of programs. Consists of several units connected by channels that are managed, controlled, and monitored by an executor unit via the admin channel.

5 **machine code** Consists of statements in machine language and can be executed by the processor without further translation.

machine program Program consisting of machine code and data.

machine, virtual see virtual machine

memory access attribute Attribute of a memory area that indicates access and usage possibility,
10 for example read-only, executable.

memory access channel Chanel used for accessing data stored in memory.

memory adapter Chanel adapter allowing the processor to read data from data memory.

memory area Area of data memory used by a thread/process during its execution that is managed as unity.

15 **memory block** Sequence of memory cells that are combined to a unity.

memory inheritance Passing on of memory to subthread.

memory management, cooperative See cooperative memory management

memory pool Number of large memory blocks reserved by the program to allocate, use, and deallocate single blocks within it, that are smaller, without using the memory management
20 of the whole machine.

memory unit Unit for administration of memory areas.

memory, dynamic see dynamic memory

memory, inheritable see inheritable memory

memory, static see static memory

25 **memory-mapped-I/O** Main memory and I/O devices are approached via the same bus. These monitor the bus and deliver the asked data when addressed accordingly. A part of the addresses is reserved for the I/O-devices.

mime type Multipurpose Internet Mail Extension. Consists of type and subtype and specifies the format of the data (e.g., text/plain). Refer to RFC 2045-2049.

minimal coverage Coverage of elements of the models and specifications available on every owl's compliant computer.

minimal execution-rate Minimal rate with that the machine code of a real-time program has to be executed at least.

multithreading program Programs implemented in a way that two or more threads run parallelly.

O

operating system System programs belonging together that are necessary for the operation of a computer system and are started during boot procedure.

operator unit Arithmetic logic unit that executes the operations asked by the program commands
5　　　　(also referred to as arithmetic logical function or arithmetic unit)

output definition Describes technically the parameters being returned by a function.

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P

parallel routine Procedure executed parallelly with the triggering thread. A parallel routine premises several imaginary processors.

parameter Argument handed over at procedure/program call.

parent process Process that initiated a sub process or a new process. 5

PCI (Peripheral Component Interconnect) Synchronous parallel bus with a bus width of 32/64 bit. In newer system as serial point-to-point connection between CPU and components.

PIO (Programmed Input/Output) Old common methods to exchange data between processor and peripheral devices.

pointer Contains the address of a storage cell or of an other element. 10

port A port is an interface for a certain kind of communication with other processes or instances.

port controller Unit of a machine that provides one or more ports and that handle and controls their communication.

procedure Sequence of commands and declarations forming a functional unit within a program.

procedure adapter Adapter allowing a processor to access procedure-call channels. 15

procedure call Starting a procedure in a thread.

procedure call channel Chanel providing the functionality to execute procedure calls.

procedure call unit Port controller that provides external procedure calls.

procedure definition Part of a program that contains the definition of a procedure (parameters, implementation variants, memory requirements etc.). 20

process A program being executed including all resources allocated by the program during execution.

process context Entirety of all machine relevant data that represent the current state of a process being executed, for example process number, file handle etc.

processor Unit within a machine with at least one instruction control and arithmetic logic unit 25 that reads the program code of procedures, analyzes the commands and executes or delegates the execution of the resulting operations.

processor description 1.Specification of a processor, for example instruction set, bus width, cycle, address space, cache size. 2.Specification of the processor that is needed at least for the execution.

processor, imaginary see imaginary processor

program A sequence of commands belonging together and self-contained as a whole that has been created under the rules of a programming language.

program collection Consists of programs and other datament, program profiles and other information concerning programs available to an execution sphere.

program documentation Documentation of a program or a program package, for example on installation, usage, modification.

program label Universally unique identification of a program within a progset.

program loader see Loader

program object Generalization of a procedure.

program package Collection of several programs belonging together, such as OpenOffice with Writer, Calc etc.

program profile Refers to the respective program, that is started via the profile, and contains general information about the program like label, icon, checksums etc.

program type Type of the program, such as operating system, office application, driver etc.

program variant Implementation of a program where its behavior/appearance varies, for example variant of language.

program version Implementation of a program that differs because of further development from the previous implementation, for example bugfixing, more options, further formats etc.

progset Unit of a set of programs and other datament in standard representation.

pseudo cycle Number of theoretical steps that a machine code or command is allowed to need maximally in GMC.

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R

real-time Data processing within a defined physical period of time.

reference definition Contains the description of the data that is given to a procedure as well as given back from it.

register Memory area within the processor that is accessed directly with the appropriate machine codes with minimal access time.

register bank Area within register memory that belongs together. In most cases the register memory is classified according to its functionality: for example constant register, global register, private register.

remote function call Start of a thread by another process or instance, for example library call.

remote memory Memory that is made available to a local process by a remote system.

resource 1. Equipment: all components of a machine that may be used during the execution of a program, for example memory, interrupts etc. 2.Additional data that is needed by a program, for example colors, pictures, dialogue forms, texts, etc, that as the case may be differs according region or language.

resource manager Manages the resources of a computer aggregate.

return Jump back to the calling point (in most cases at the end of a procedure).

return value Value that is returned at the end of a procedure/program to the calling procedure/program.

run-time library Collection (library) of functions (e.g., input/output functions) in general that are linked at run time.

runtime Identifies the term of time at that a program is being executed.

S

SCSI (Small Computer System Interface) Device independent bus through that subsystems (peripheral devices) can be connected.

search path Directory list that is being searched when looking for a (mostly executable) file, if no path is given explicitly.

segmentation Partitioning of memory into several memory segments.

semaphore Global mechanism in multitasking/multithreading systems to avoid access conflicts.

set, unordered See unordered set

shared memory Area within main memory that can be used by several processes for communication (data exchange etc.).

signal Signals are used within computers to transmit flag-alike information.

signal adapter Chanel adapter allowing the processor to send and receive signals.

signal channel Channel type via that an interrupt or other signal is triggered.

software Not physically existent component of a computer, that is programs and data.

standard bus Standardized bus system for the connection of components or devices.

standard representation Standardized, machine-readable format (coding) for data that can be read by all owl's compliant systems.

standard-bus channel Channel type for standard buses like PCI, ISA etc.

start procedure If a start procedure exists, it is executed automatically after the initialization to start the program, for example main(), WinMain().

static memory Memory available to every thread executing the respective procedure.

string Consecutive sequence of two or more characters of a character set.

subprocess Process initiated by another process that runs on the same machine and shares resources with it.

subroutine Procedure started in a new thread whereupon the calling thread either stops and waits for the finishing of the new thread or continues parallelly.

system component Functional components except bus system, memory and (co)processors.

system information service Service that provides information about the current state/configuration of the computer aggregate.

system-ID Identification assigned by execution sphere for components described in the computing model. The design is system dependent and is based on unordered sets. 5

T

thread Procedure being executed by a processor. It is the actual executed component of a process and component of it consequently.

thread manager Manages the threads deposited at the processor.

5 **transaction** Sequence of computing steps that have to be executed together or not at all.

transistent Data that is not stored permanently and therefor is valid only in the running system.

trigger Monitoring function that invokes a specified function/action when a certain event occurs.

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U

unit Component of a machine with special functions, for example processor, executor.

unit type Category a unit belongs to, for example processor, memory.

universal pointer Datakind for storing addresses of any type within a computer aggregate.

unordered set Datakind for mapping arbitrary, unordered, and unlimited sets with their elements not being subject to any ordering rules.

unordered set Datakind used for the assignment of IDs. See unordered sets in the datakind model.

use count Counts how often a memory area is used to avoid its deallocation as long as any thread accesses it.

use-count Records how often something is used at the moment, to avoid that something is deallocated early, for example.

user Usually names a user account on a computer system.

V

vfork Vfork creates a new process without copying the address space of the parent process totally. Instead the parent process is halted temporarily so that the child process shares it memory and program code.

5 **virtual machine** Hardware that is emulated through software on other hardware.

W

warning channel Channel type for forwarding error and warning messages.