

Description of components and functions

(schema/SecurityPatternCatalogNaiveSchema.owl)

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| <i>Component Tree</i> | <i>Function Tree</i> | <i>Description</i> |
|---|---|-------------------------------|
| <i>Common component & function schema</i> | | |
| <u>Class: Component</u> <u>Class: SoftwareComponent</u> <i>component_Software</i> (stub) <u>Class: ApplicationComponent</u> <i>component_Application</i> (stub) <u>Class: LocalApplicationComponent</u> <i>component_LocalApplication</i> (stub) <u>Class: NetworkApplicationComponent</u> <i>component_NetworkApplication</i> (stub) <u>Class: ServerApplicationComponent</u> <i>component_ServerApplication</i> (stub) <i>component_WEBBasedApplication</i> <i>component_Database</i> <i>component_Filestore</i> <u>Class: ClientApplicationComponent</u> <i>component_ClientApplication</i> (stub) <i>component_WEBbrowser</i> <i>component_RemoteCLI</i> <u>Class: DistributedApplicationComponent</u> <i>component_DistributedApplication</i> (stub) <u>Class: SystemSoftwareComponent</u> <i>component_SystemSoftware</i> (stub) <i>component_SystemService</i> <i>component_OperatingSystem</i> <i>component_Middleware</i> <i>component_Firmware</i> <u>Class: ActorComponent</u> <i>component_Actor</i> (stub) <i>component_RemoteUser</i> <i>component_SystemAdministrator</i> <i>component_Developer</i> <u>Class: HardwareComponent</u> | <u>Class: SoftwareFunction</u> <u>Class: UserManagementFunction</u> <i>function_CredentialsManagement</i> <i>function_Permissions Management</i> <i>function_Authentication</i> <i>function_Authorization</i> <u>Class: InterfaceFunction</u> <u>Class: UserInterface</u> <i>function_InterfaceCLI</i> <i>function_InterfaceGUI</i> <i>function_InterfaceWEB</i> <u>Class: APIInterface</u> <i>function_InterfaceAPI</i> <u>Class DataManipulationFunction</u> <i>function_DataProcess</i> <i>function_DataStore</i> <i>function_DataTransfer</i> <i>function_DataBackup</i> <u>Class: SecurityFunction</u> <i>function_AccessControl</i> <i>function_EventLogging</i> <u>Class: ActorFunction</u> <i>function_ActorBehaviorModel</i> <i>function_ActorCredentialsManagement</i> <u>Class: HardwareFunction</u> | To do, to research, to change |

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| component_Hardware (stub) component_Server component_Node component_Workstation component_MobileDevice component_ClusterSystem component_BladeSystem component_BladeSystemNode component_Supercomputer component_StorageSystem component_NetworkSwitch component_NetworkRouter | | |
| <i>Cloud Computing schema</i> | | |
| <u>Class:</u> CloudComponent component_Cloud (stub) <u>Class:</u> CloudPlatformComponent component_CloudPlatform (stub) component_CloudPortal component_CloudSystem component_CloudZone (= component_CloudFederation) component_Hypervisor (= component_VirtualMachineManager) <u>Class:</u> CloudSupportService component_CloudSupportService (stub) component_CloudBusinessSupportService component_CloudOperationaSupportService component_CloudNonFunctionalSupportService <u>Class:</u> CloudService component_CloudService (stub) component_SaaSService component_PaaSService component_IaaSService component_ContainerService <u>Class:</u> CloudApplication component_CloudApplication (stub) component_IaaSApplication component_PaaSApplication component_SaaSApplication component_VirtualMachine component_VirtualNetwork component_VirtualStorage | <u>Class:</u> CloudFunction <u>Class:</u> CloudPlatformFunction function_OnDemandSelfService function_BroadNetworkAccess function_ResourcePooling function_RapidElasticity function_MeasuredService <u>Class:</u> CloudServiceFunction function_TenantManagement function_VirtualResourceManagement function_VirtualResourceScaling function_UserBilling <u>Class:</u> IaaSServiceFunction function_VMtemplateManagement function_VMimageManagement function_VirtualNetworkManagement function_VirtualStorageManagement <u>Class:</u> HypervisorFunction function_VMmanagement function_VMmigration function_VMsnapshot function_VMcloning function_VMstorageManagement function_VMimport function_VMexport function_VirtualSwitchManagement | <p>The cloud computing components are based on [Fernandez, 2016] with some improvements.</p> <p>In particular, “<i>CloudPlatform</i>” represents the original “Cloud” component.</p> <p>Also, the original “Cluster” and the hardware items are modelled as the common hardware entities (see the common component scheme). And to model cloud federations the "component_CloudZone" ("component_CloudFederation") is added. The reason is a physical cluster system can contain number of “logical” clouds (e.g. with the nested virtualization technologies).</p> <p>“Cloud Builder—the team who sets up the operations of the SP” [Fernandez, 2016]</p> <p>“Cloud Application Builder—those who build applications to execute in the SP or use services from the SP.” [Fernandez, 2016]</p> <p>The top functions (“CloudPlatformFunction”) are taken from [NIST].</p> <p>Other cloud functions (and some architectural items) are collected with the local research (A10-16 “Development of models and architectural solutions for ensuring information security of computer cloud infrastructure of an educational institution” - in rus, 2016-2018).</p> <p><u>References:</u> [Fernandez, 2016] Fernandez E. B., Monge R., Hashizume K. Building a security reference architecture for cloud systems //Requirements Engineering. – 2016. – T. 21. – №. 2. – C. 225-249.</p> <p>[NIST] Liu F. et al. NIST cloud computing reference architecture //NIST special publication. – 2011. – T. 500. – №. 2011. – C. 292.</p> |

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| component_VirtualTenant component_Container <u>Class:</u> CloudActorComponent component_CloudActor (stub) component_ServiceConsumer component_ServiceProvider component_CloudAdministrator component_CloudZoneAdministrator component_CloudAuditor component_ServiceBroker component_CloudBuilder component_CloudApplicationBuilder | function_VirtualNetworkAdapterManagement | |
| <u>Common network schema</u> | | |
| <u>Class:</u> NetworkComponent | | To do, to research, to change |
| <u>Common middleware schema</u> | | |
| | <u>Class:</u> MiddlewareFunction function_DistributeEventInformation | To do, to research, to change |
| <u>Fog Computing Schema</u> | | |
| <u>Class:</u> FogComponent component_FogApplication | | To do, to research, to change |
| <u>Internet of Things schema</u> | | |
| <u>Class:</u> IoTComponent component_IoTApplication component_IIoTApplication | <u>Class:</u> IoTFunction function_DistributeSensorData | To do, to research, to change |