AXOOM Gate

Configuration Keys
for C-DEngine.dll

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Chapter 1 Introduction to Configuration Keys

1.1 Overview

Configuration settings are using "Key/Value" pairs. This document describes the effect of values to their corresponding keys.

1.2 App.Config

Local configuration file of an application hosting the C-DEngine.

1.3 cdeTPI – C-DEngine Provisioning Info

Encrypted store with all settings changed by the NMI or auto-created by the C-DEngine. The file can be pushed from the C-DEngine Provisining Service.

1.4 The Settings API (ICDESettings)

Chapter 2   Configuration Keys Reference

The C-DEngine differentiates between four different setting stages:

1) First Boot Only – parsed only when the node is started for the very first time (boot). For example if no cache folder exists or no cdeTPI exists
2) Startup Only – parsed every time the node starts up
3) Anytime at Runtime – These are settings that might be read and parsed multiple times during runtime and can be changed via the Provisioning service on the fly without restarting the node. Most of the CDE settings fall in the category
4) Plugin only settings – plugins can add settings, either before the start of the node via the app.config or even store settings to the cdeTPI secure storage. This document will not cover these settings as they are plugin specific

There is one important setting that will render a node "Read-Only" and does prevent any setting from being written to the cdeTPI store:

UseRandomDeviceID=true

If set to true, the node will never write anything to disk including settings. All relevant settings have to be in the app.config and cdeTPI will be ignored.

- The default value of all Boolean keys is "false".
- The default value of all string keys is "not Set"
- The default value of all Guid Keys is "Guid.Empty"
- String List use values separated with ; if not other specified

If "AllowEnvironmentVars=true" and "AllowEnvironmentVarsToOverrideConfig=true" then ANY setting can be overwritten with environment variables. No matter if they are declared in the app.config or in the cdeTPI. Please use with caution as these values are globally visible on the hosting PC and cannot be managed by the C-DEngine. All Environment variable have to start with "CDE_" and always use upper case (i.e. the setting for the "ServiceRoute" would be "CDE_SERVICEROUTE")

2.1   First Boot only settings

First boot settings are only parsed when the node is started for the very first time (No cache folder existed – no cdeTPI existed).

These setting are important for subsequent starts of the node. If these settings are in the app.config, they will be transferred to the secure cdeTPI storage and then no longer parsed from app.config (in subsequent node starts).

Configuration Key	Type	stored in cdeTPI	Description
MyDeviceInfo	struct	Always during first boot*	Contains important information about the hardware/os and the DeviceID of the node. The DeviceID is a unique Identifier for the node. There must not be duplicates of DeviceIDs in a mesh solution. This

Configuration Key	Type	stored in cdeTPI	Description
			setting is automatically created during boot of the node and cannot directly be set.
PresetDeviceID	Guid	Always during first boot*	If set, the DeviceID in MyDeviceInfo will use this Guid instead of calculating a new Guid during first boot
IsUsingUserMapper	bool	Always during first boot*	This setting cannot be changed after the first boot. If true, the C-DEngine will initialize the User Manager and once initialized the User Manager cannot be turned off anymore. If the setting is false, the node only allows Scope Access in the NMI. This is the default for "communication only nodes".
Coufs	JSON string	Not stored	Contains a structure that "Creates user on first startup". Can be used by MSI setups and App.Config to automatically create an admin user during the first boot. The key is removed from the app.config an ignored during subsequent starts of the node.
EasyScope	String	Stored as Scrambled Scope	A node can be configured with a specific scope during first boot. The C-DEngine will delete this setting from the app.config after it has been read.
DontDeleteEasyScope	Bool	Not stored	If true, the EasyScope will not be deleted from the app.config (Docker scenario)
DontVerifyTrust	Bool	Always during first boot*	If set to true, the node is starting without validating the Plugins code signing certificates. A node cannot toggle between trust and no trust. If trust is turned off one time, it remains untrusted until the node is "wiped clean" again. Default value (FALSE) requires all plugins to be signed with the same certificate as the host application or C-DEngine.DLL. When TRUE, no signing is required (not recommended for production sites), as the C-DEngine is running in "Unsafe" mode and custom plugins can be installed.

* If UseRandomDeviceID=true, the setting is not written to the cdeTPI

2.2 All other settings

In general, if a setting is in the cdeTPI it will override the setting in app.config. This allows to set a default setting in app.config but the NMI UX can override and store the setting. Then the setting in app.config is no longer valid. A good example for this is the "CloudRoute". It can be set in the app.config as a default route but admin users with NMI access can change the CloudRoute which will then be stored in the cdeTPI. If a setting is defined in app.config and cdeTPI, the value in cdeTPI will be used.

Many settings are not copied in the cdeTPI file and just reside in the App.config. The Provisioning service can write any setting and override anything that is in the app.config. Without a provisioning service present, only those settings marked "stored in cdeTPI" will be copied to the cdeTPI secure store.

Some settings will be removed (deleted) from the app.config after they were read for the first time. An example of this are the proxy settings or the EasyScope.

Configuration Key	Type	Copied to cdeTPI	Deleted after copy	Startup only	Description
ActivationKeys	String list				A licensing key (or keys) needed for unlocking some capability or feature. ServiceHostInfo member: ActivationKeysToAdd.
Access-Control-Allow-Origin	String				CORS Setting response to OPTIONS Preflight by specific browser restricting access from specific clients. Default: *
Access-Control-Allow-Methods	String				CORS Setting response to OPTIONS Preflight by specific browser restricting access to only specific REST Methods. Default: *
Access-Control-Allow-Headers	String				CORS Setting response to OPTIONS Preflight by specific browser restricting access to specific headers: Default: *
AllowAdhocScopes	bool			Yes	Determines whether a cloud node allows a browser or device to set an scope. If "false" browsers cannot set scopes. This setting must only be set on special cloud solutions that are not used for Node Meshes. Example: https://ink2.me
AllowAnonymousAccess	bool			Yes	Whether to allow unauthenticated users access to the system. (for integrated NMI solutions only like phone apps or Desktop Applications)
AllowAutoUpdate	bool			yes	Whether to allow automatic updates of plugins.
AllowEnvironmentVars	Bool			yes	Whether the C-DEngine checks operating system environment variables for configuration settings. When this is allowed, the prefix "CDE_" is added to the configuration key to avoid conflicts with other sets of environment variables.
AllowEnvironmentVarsToOverrideConfig	Bool			yes	When set to TRUE, environment variable configuration settings are able to override app.config settings (see also AllowEnvironmentVars).

Configuration Key	Type	Copied to cdeTPI	Deleted after copy	Startup only	Description
AllowForeignScopeIDRouting	Bool				Enables clouds to route customer scopes to unscoped cloud plugins
AllowLocalHost	Bool				If Set to true, the C-DEngine will accept http://localhost or IP Addresses as an additional inbound URL. MyStationURL is not enforced.
AllowMessagesInConnect	Bool				Debugging only!
AllowOnlineHSIChanges	Bool				Enable setting TheHostServiceInfo values from browser URL by referencing the page cdeSetPara.aspx with the keyname.
AllowPinLogin	Bool				NMI Only: If set to true, the NMI can be configured to allow login via PIN
AllowRemoteAdministration	Bool	Yes			If set to true, the Mesh Manager is allowed to remotely configure the node with this setting. Remote configuration includes: push updates, restart the node, update the node.
AllowRemoteThingCreation	Bool	Yes			If set to true, plug-ins on trusted nodes can create things on this nodes via TSM messages.
AllowSetScopeWithSetAdmin	Bool				NNI ONLY: if a user connects to a node that does not have a scope and no admin user set, this setting allows the user to enter both at the same time
AllowUnscopedMesh	Bool				If set to true, unscoped nodes can create their own mesh.
AsyncEngineStartup	Bool				If True, all plugins/services/engines will be registered and started asynchronously.
AzureAnalytics	string				Set to enable Windows Azure cloud analytics if you host the C-DEngine in Windows Azure.
BackupFrequency	Int				Timespan in second how often a backup should happen. Default once per day
BackupKeepLast	Int				Amount of backups to keep
BackupStart	DateTime				Start Date/Time of auto backups
BackupToCloud	Bool				If True, the Backup is sent to the provisioning service (if configured)

Configuration Key	Type	Copied to cdeTPI	Deleted after copy	Startup only	Description
BlockCloudNMI	Bool	True			If True, the NMI is not meshed with any other node including the cloud. (HSI.IsCloudNMIBlocked)
CacheMaxAge	int				Maximum age of HTTP cache (in seconds).
ClientCertificateThumb	String	True			Thumbnail ID of the client certificate to use for Mesh Connections to next nodes
ClientCertificateUsage	Int				• If set to 0 or does not exist, a client certificate is not used and not required (default mode of previous CDE versions) • If Set to 1, client can present a client certificate. If no scopes are in the cert, scopes will be used as before (Mix operation between new and old security mode) • If Set to 2, client must present a valid client certificate. If no scopes are in the cert, scopes will be used as before (was previous "RequireClientCertificate=true") (previous default mode but with Client Certificate turned on) • If set to 3, all clients (including NMI browsers) need to present a client certificate (new enforced Client Certificate Mode only - older CDE Nodes will not able to connect) • If the client certificate contains one or more SAN URLs of the scheme "com.c-labs.cdescope://" the client will only participate in scopes with that scopeID. The first cdescope is used as the ScopeID if no scope is

Configuration Key	Type	Copied to cdeTPI	Deleted after copy	Startup only	Description
					presented in the message or connection • In IIS, settings 2 and 3 require the "Client Certificates" setting in "SSL Settings" to be set as "Accept" or "Require" for NMI access
CloudBlobURL	String				RETIRED
CloudServiceRoute					See ServiceRoute. RETIRED.
CreateTextLog	bool				Create a file with all strings not formatted for localization (with "###" tags). User during development only!
CustomerToken	String			yes	Token that associates the node with a customer
CustomUA	string				A custom user agent used by the REST commands that can be overwritten for special Firewall policies.
DEBUGLEVEL	int				Indicates the amount of verbosity in the debugging output.
DefaultEventTimeout	int				Default timeout for firing of events (in milliseconds).
DefaultHomePage	String				default home page (i.e. nmiportal)
DefaultLCID	Short				Default locale ID.
DeviceToken	string			yes	Token that identifies the Node and its Node-Type for automatic provisioning
DisableCache	bool				If true, the C-DEngine will not cache any resources.
DisableConsole	Bool				Stop sending debugging messages to the host process console.
DisableNMI	Bool			Yes	NMI Model is not created and no NMI meshing will take place
DisableNMIMessages	Bool				NMI Model does not send any NMI updates
DisableRSAToBrowser	Bool				If set to true, prevents RSA encryption of credentials with browser. Only set this if you encounter RSA incompatibilities with browsers! (VERY rare).
DisableTls12	Bool				When True, disables the requirement to use a minimum of TLS 1.2.

Configuration Key	Type	Copied to cdeTPI	Deleted after copy	Startup only	Description
DisableWebSockets	Bool				Whether to prevent the use of the web sockets network API.
DisallowWebSocket8	Bool			Yes	Disables the use of the WebSockets stack coming with Windows8 or later and forces the C-DEngine to use the WebSocketsSharp stack. Will result in HSI.IsWebSocket8Active=false
DisableWebWorker	Bool				NMI ONLY: If true, the NMI will use the old single threaded communication
DISCO_MX	Int				Discovery service MX setting.
DISCO_Subnet	IP				Only use discovery in this subnet
DontDeleteEasyScope	Bool				If True, the EasyScope will not be removed from the app.config (Docker scenario)
DontRelayNMI	Bool				Prevents NMI telegrams from being routed across the Cloud - cloud connected browsers will get telegrams.
DontVerifyTrust	Bool			yes	Default value (FALSE) requires all plugins to be signed with the same certificate as the host application or C-DEngine.DLL. When TRUE, no signing is required (not recommended for production sites), as the C-DEngine is running in "Unsafe" mode and custom plugins can be installed.
EasyScope	String	Yes	Yes		Identical with calling TheScopeManager.SetScopeIDFromEasyID. Will be removed from app.config as soon as it was read (Except DontDeleteEasyScope=true)
EnableAutoBackup	Bool				Activates Auto Backups according to Backup settings
EnableAutoLogin	Bool				Allows Viewer apps to auto-login a user (only if IsViewer=true)
EnableCosting	Bool				Whether to enable support for recording resource usage towards charging users for premium access.
EnableFastSecurity	Bool				When True, security tokens/scrambled ScopeIDs will be handed from incoming subscriptions

Configuration Key	Type	Copied to cdeTPI	Deleted after copy	Startup only	Description
					to outgoing publications. By default the CDE is re-scrambling the ScopeIDs. Therefore, this makes a mesh a little less secure – use carefully!
EnableHistorian	Bool				Enables a historian log output. Use for Debug only!
EnableIntegration	Bool				When set to true, the C-DEngine is running embedded/integrated in another web solution. Do not set this on customer relays/gates! It will disable some security features that should not be disabled in these environments!
EnableIsolation	Bool			Yes	Set to TRUE to enable isolation. If FALSE (default), the relay does not support isolation and will try to load all plugins into the host process.
EnableKPIs	Bool				When True, enables the capture of key performance indicators for TheThing and ICDEThing objects.
EnableTaskKPIs	Bool				When True, the node captures key performance indicators about the internal task/thread system.
EnableUserStatus	Bool				If true, cdeUserStatus.aspx can be called on a node
FallbackToSimulation					RETIRED
FederationID	String	True			Currently not used – future use only
FireGlobalTimerSync					When True, the health timer fires synchronously. Otherwise, it fires asynchronously.
ForceWebPlatform	int				For debugging purposes, this flag can be set to always force output on browsers to a specific platform.
HeadlessStartupDelay	Int				When true, a delay (in seconds) before starting initialization of engines. C-DEngine essentials are already initialized at this point. Only use for debugging purposes
HistorianBufferFastSave	Bool				Enables FastSaveLock for historians
IgnoreAdminCheck	Bool			yes	When true, does not require controlling process to have administrative privileges.

Configuration Key	Type	Copied to cdeTPI	Deleted after copy	Startup only	Description
					(HttpInterceptor and WebSockets8 will not work without Admin privileges)
IgnoreServerCertificateErrors	Bool				Ignores all Certificate Errors
IgnoreServerCertificateNotAvailable	Bool				Ignores if a server certificate is not available
IgnoreServerCertificateNameMismatch	Bool				Ignores if a server Name is not matching the request
IgnoreServerCertificateChainErrors	Bool				Ignores if the certificate chain has errors
InstallUpdatesOnStart	Bool				If true, the CDE will install plugin Updates on start of the C-DEngine
IsCloudDisabled	Bool	Yes			When set to true, no connection to the next node will be established (ServiceRoute will be ignored).
IsCloudService	Bool			Yes	When True, C-DEngine runs code paths optimized for the Cloud.
IsConnectedToCloud	bool				Is true if the current node is currently connected to the cloud. All connections will be treated as "Cloud" connections (including local node-to-node connections)
ISMExtension	String				Set file extension for C-DEngine updates (default is ".CDEX").
ISMMainExecutable	String				Enables setting executable name for main ISM program.
ISMScanForUpdatesOnUSB	Bool				If set to true, the C-DEngine will listen to USB ports for USB sticks containing updates and new plugins.
ISMScanOnStartup	Bool				If set to true, the C-DEngine will scan for new updates during the startup.
ISMUpdateDirectory	String				Enables setting update directory for ISM.
ISMUpdateVersion	Cannot be set				Will contain the version of an update found in the directory or a USB memory stick.
ISOEN	string			yes	Name of engine to run in the isolated engine process. If this is set, "IsIsolated" is set to "true" and the cdeNodeType will be set to "cdeNodeType.Active". The node will then become a container for a single

Configuration Key	Type	Copied to cdeTPI	Deleted after copy	Startup only	Description
					isolated plugin creating a mini-mesh with the "master" Node
IsolatedPlugins	String list				A list of plugins that will be hosted isolated, each in its own process.
IsOutputCompressed	Bool				Enabled compression for HTTP Response Bodies (gzip)
IsTLSEnforced	Bool	Yes			If set to true, the C-DEngine will not accept inbound connection on HTTP/WS but requires HTTPS/WSS. (HSI.IsSSLEnforced)
IsUserManagerInStorage	Bool				Store the user Manager data in IStorageEngine database. Requires a plugin that implements IStorgageEngine
IsViewer	Bool				When set to True, only one user is allowed to be logged in at any given time. (like a Phone App).
LocalServiceRoute					See ServiceRoute. RETIRED.
LogFilePath	String				Path to the log file.
LogFilter	String				Filter to include by name specific engines from being included in system log files. (Example: "ContentService;TheCommCore"). Console Output will show all entries
LogFilterLevel	Int				Threshold to display a message. Compared against TSM.LVL in message.
LogIgnore	String list				Filter to exclude by name specific engines from being included in system log. (Example: "UPnP;TheCommonUtils")
LogOnly	String list				List of ENG names to log. All other entries will neither be shown in console nor in text log
LogWriteBuffer	Int				Number of messages to buffer in memory before writing to disk.
LogWriteFilterLevel	Int				Each message has a message level (LVL field in TSM). Don't log messages with values below this threshhold value.
MaximumHops	int				Maximum number of node hops allowed for incoming messages.

Configuration Key	Type	Copied to cdeTPI	Deleted after copy	Startup only	Description
MaxLogEntries	Int				Maximum number of entries to store (default is 500). Can dynamically change by calling TheSystemMessageLog.ChangeMaxLogEntries(count).
MaxLogFiles	Int				Maximum number of log files to write in the specified folder.
MaxLogFileSize	Int				Specify the maximum size for ~~the~~ each log file (in megabytes).
MessageFilterLevel	Int				The value for eMsgLevel to include in messages.
MyAltStationURLs	String				A list of alternative URLs that this node might have and therefore would allow connections to.
MyStationIP	IP address				IPv4 address of current node.
MyStationName	String	Yes		Yes	Sets the friendly name of current node. (When not set, the primary URL of the node is used instead.)
MyStationURL	String	Yes		Yes	The primary URL of the node. Incoming REST/WS requests are validated against this URL. If a request does not correctly specify this URL, the request is denied. (Similar to SNI on WebServices like IIS). If MyAltStationURLs is set, the CDE will allow these incoming URLs as well. If "AllowLocalhost=true" the incoming request will be allowed even if the URL was not correctly specified.
UseTcpListenerInsteadOf HttpListener	Bool				If true, the C-DEngine will not use the HttpListener but the TcpListener. This allows to run the C-DEngine in user mode but is much slower handling requests
NodeBlacklist	String list				List of DeviceIDs that are not allowed to connect to the node
NodeName	String				Sets the friendly name for the current node.
NodeType	Int				An integer which represents a value for cdeNodeType. (0 = not set, 1 = relay, 2 = active device, 3 = passive, non-relaying node.)

Configuration Key	Type	Copied to cdeTPI	Deleted after copy	Startup only	Description
ParallelPosts	Int				The number of simultaneous REST-POST for a connection. (Default is 1). This has no effect on WebSockets connections
PermittedUnscopedNode IDs	String list				RETIRED
PresetDeviceID	Guid				Presets a node's device ID.
PreShutDownDelay	Int				Sets the delay (in milliseconds) to delay prior to shutting down, to allow long running tasks to properly and cleanly respond to the shutting down process.
ProvisioningFailureOptio n	Int			yes	An integer value for how to respond to provisioning failures. Valid values include: 0 (zero) – Shutdown immediately without writing anything to the ClientBin folder. 1 – Wait a short time (15 seconds as of this writing) before trying again. 2 – Continue normal (non-provisioning) startup, ignoring any remote provisioning settings and proceed using the local settings
ProvisioningService	Url			yes	The URL of a C-DEngine node where provisioning services are made available by the Mesh Manager plugin.
ProxyPWD	String	Yes	Yes		Proxy authentication - Password.
ProxyUID	String	Yes	Yes		Proxy authentication - User ID.
ProxyUrl	string	yes	Yes		Proxy network address.
RejectIncomingSETP	Bool				If true, incoming SETP will not be processed - only use for High throughput Nodes in meshes where the NMI is not needed. SETP messages set properties on things.
RelayOnly	String list				A list of virtual plugins not running on the current node but are allowed to route telegrams through this node.
RemoveTrustedNodes	Bool	Yes	Yes		Removes all currently known trusted nodes

Configuration Key	Type	Copied to cdeTPI	Deleted after copy	Startup only	Description
RequireClientCertificate					RETIRED: Please use "ClientCertificateUsage" instead
RequiredClientCertRootThumbprints	String list				List of Client Certificate Thumbprints. Only requests with certificates with these thumbprints are allowed to connect. The server behavior is determined by the "ClientCertificateUsage" option.
ResourcePath	String				Path for JavaScript resources if Engine is embedded in other cloud solutions.
RootDir	String				NMI root directory (if virtual directories are used in IIS)
ScopeUserLevel	Int				If User Manger is not enabled, any user logging in with the ScopeID will be using this user Level
ScrambledScope	String	Yes	Yes	Yes	Current (scrambled) scope of the node. This setting can be changed via API calls during the node runtime
SenderQueueSize	Int				Allows to change the queue size of the QueuedSender (Default 1000 telegrams)
ServiceRoute	string	Yes			Url and Path to a designated next node with the same ApplicationID. semicolon (;).
ShowLogInConsole	Bool				NMI ONLY: Shows all NMI log entries in the browser console (F12 tools)
ShutdownOnLicenseFailure	true				If set, the cdeEngine will shutdown when it encounters no activated license.
SIGNORE					RETIRED
SIMROLE					RETIRED
SKUID	Guid				The main product ID (SKU = "Stock Keeping Unit") of the current node.
STATIONPORT	Ushort	Yes		Yes	Port for HTTP requests to the node. (HSI.MyStationPort)
STATIONWSPORT	Ushort	Yes		Yes	Port for WebSockets requests to the node (HSI.MyStationWSPort). If zero or not set, the node does not accept any incoming WebSockets requests
StartISM	bool				Whether to start Intelligent Service Management (ISM) update service.

Configuration Key	Type	Copied to cdeTPI	Deleted after copy	Startup only	Description
					Must be set prior to calling StartBaseApplication(). DEFAULT IS TRUE
StartISMDisco					RETIRED
StartStation					RETIRED
StartupDelay	Seconds			Yes	When true, a delay (in seconds) before starting initialization the C-DEngine. Only use for debugging purposes
StatusToken	String				Set a token for cdeStatus.aspx page that has to be added to the path to access the status page (i.e.: /cdeStatus.aspx?<token>
StorageMirrorFastSave	Bool				Enables FastSave for all Storage Mirrors
StoreLoggedMessages	Bool				If set to True, the system will store messages in a Distributed Storage Mirror.
ThingRegistryFastSave	Bool				Enables FastSave for TheThingRegistry
ThingRegistryStoreInterval	int				How frequently the ThingRegistry flushes changes to disk (in seconds).
TrustedNodes	String list	Yes	Yes		Contains an encrypted list of node/deviceIDs the node is trusting.
UPnPDeviceType	string				This defines the "StandardDeviceType" for UPnP. Default is "DimmableLight".
UseGELFLoggingFormat	String				Whether to send log data using GELF format.
UseHBTimerPerSender	Bool				Creates a separate timer for each QueuedSender (uses more resources which might be critical on smaller hardware)
UseRandomDeviceID	Bool	Not in cdeTPI		Yes	The default (False), data is persisted, including a static node ID along with other device data. When true, the C-DEngine does not store anything on the local node. No Thing properties are persisted. This cannot be set via the cdeTPI and must be configured in the app.config

Configuration Key	Type	Copied to cdeTPI	Deleted after copy	Startup only	Description
UseSysLogQueue	Bool				Switches SysLog to a BlockingCollection instead of a StorageMirror
VerifyTrustPath	True				When true, the C-DEngine will verify the Trust path of the code-signing certificate. Internet connection is REQUIRED.
WsJsThrottle	Int				Allows to throttle WebSocket Messages to JavaScript clients. Messages will not be sent faster than this number. (Default is 0, no throttling.)
WSTestCode	String				Requires a Access code for WebSockets connections in the cloud
WsTimeOut	int				Wait time until the C-DEngine will declare a WebSockets connect attempt as failed.