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SAEAUT SNMP OPC Server supports JScript (Windows Scripting)

SAEAUT SNMP OPC Server support Windows Scripting - JScript.

The purpose of the article is to introduce and give useful recommendations how to use the SAEAUT SNMP OPC Server for processing of SNMP data utilizing standard Windows Scripting - JScript.

Introduction

In typical SNMP usage, there are a number of systems to be managed, and one or more systems managing them (see below in the Figure 1). A software component called an agent runs on each managed system and reports information via SNMP to the managing systems. Data contained in the agent database depends on the specific function of the devices. Description of these data is made via standard called MIB (Management Information Bases).

The company SAE–Automation, Ltd. has brought on the market very powerful management system called **SAEAUT SNMP OPC Server** and popularity of this management system is each day increasing.

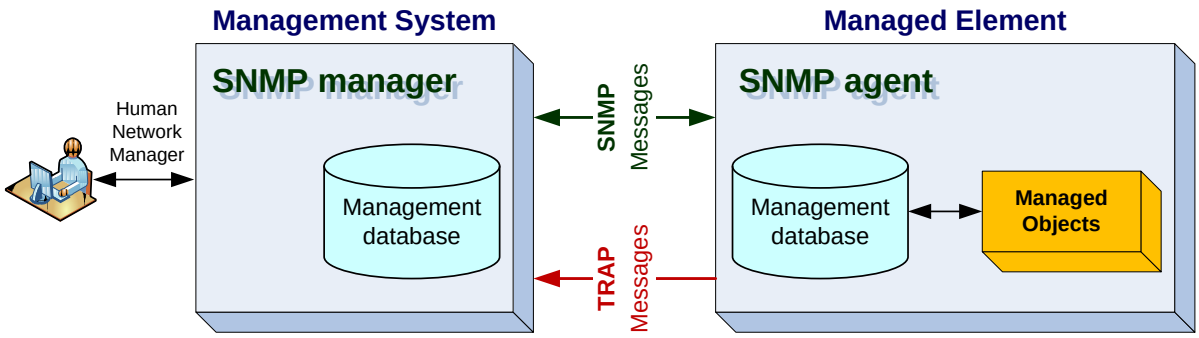

***Figure 1**: The SNMP communication between SNMP manger and SNMP agents.*

Finally, this document should perform as a user guide which will introduce the basic SNMP terms (manager, agent, MIB, Trap, etc.) and show you step-by-step, how to use the **SAEAUT SNMP OPC Server** which acts as SNMP manager **for processing of SNMP data** utilizing standard Windows Scripting - **JScript**.

Windows Scripting - JScript

JScript is an interpreted, object-based scripting language. JScript is more than sufficiently powerful for its intended purposes.

JScript is a loosely typed language. Loosely typed means you do not have to declare the data types of variables explicitly. In fact, JScript takes it one step further. You cannot explicitly declare data types in JScript. Moreover, in many cases JScript performs conversions automatically when needed. For instance, if you add a number to an item consisting of text (a string), the number is converted to text.

For full details of the language implementation, please see the JScript Language Reference (Windows Scripting - JScript).

The **SAEAUT SNMP OPC Server** hosts **a script engine** in order to **enable people to write own scripts to customize and extend application functionality according to customer's requirements**.

Prerequisites for utilizing JScript in the SAEAUT SNMP OPC Server

JScript scripts can run only in the presence of an interpreter or "host", such as Active Server Pages (ASP), Internet Explorer, or Windows Script Host.

Windows Script Host is distributed and installed by default on Windows 98 and later versions of Windows. It is also installed if Internet Explorer 5 (or a later version) is installed.

However, if the script engine is not working correct on your computer there is a possibility to download the relevant version of installation package for the Windows Scripting from the Microsoft download Centre.

Using JScript in the SAEAUT SNMP OPC Server

The SAEAUT SNMP OPC Server provides the possibility extra processing of the data obtained from SNMP agents using JScript (see below in the Figure 2).

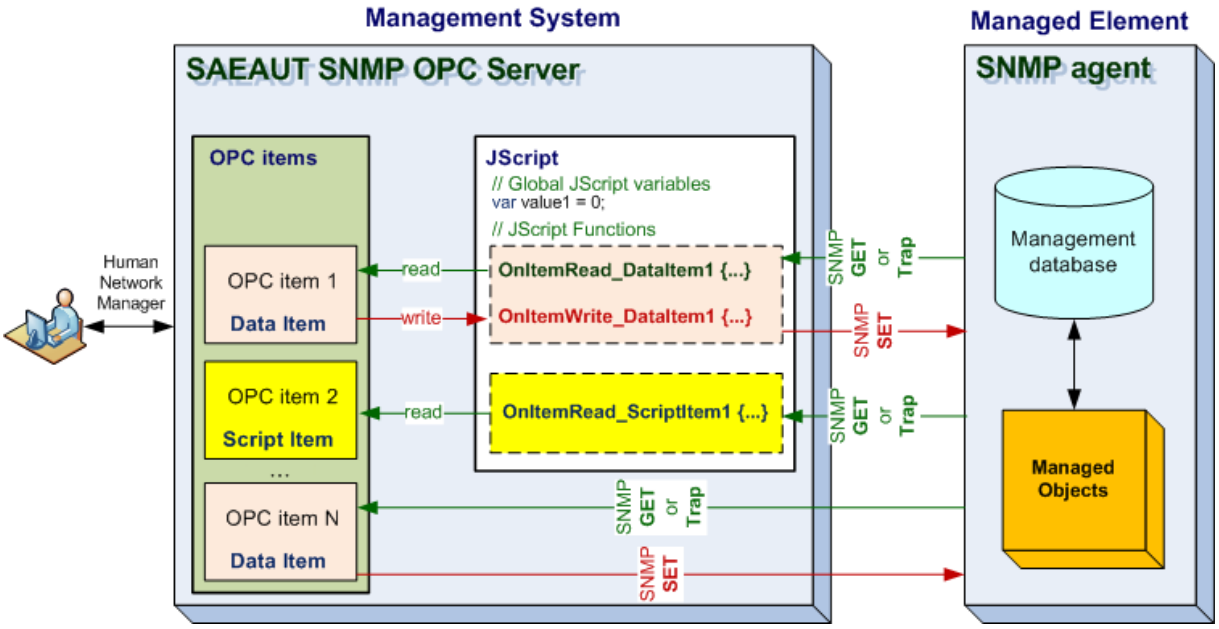

***Figure 2**: The binding variables are matched with the OPC items in the SAEAUT SNMP OPC Server.*

The SAEAUT SNMP OPC Server enables using of JScript in two ways:

- It enables to define an OPC item as Data Item that value can be pre-processed using JScript. If you want to use scripting for pre-processing value then check the Use script check-box. Example of using scripting in a Data Item is shown in Figure X.

- It enables to define an OPC item as pure Script Item (see below in the Figure 3 and Figure 5).

In addition, the SAEAUT SNMP OPC Server enables to define special Global Jscript variables which can be used for data storage in the custom script functions.

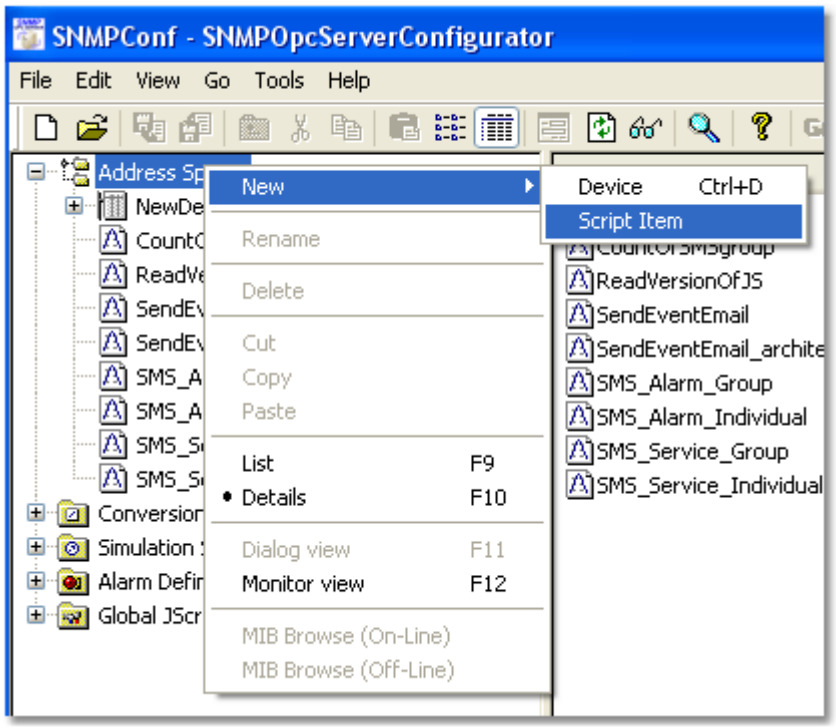

***Figure 3**: Example of creation of a new Script Item.*

The **SAEAUT SNMP OPC Server** allows users to write arbitrary scripts. This feature provides to users wide possibility to **customize** this product.

The most useful types of scripts:
- sending e-mails,
- sending SMS, MMS,
- reading from/writing to database,
- calling specific ActiveX controls,
- etc.

The **SAEAUT SNMP OPC Server** allows users to **preprocess data** on the server side, before they are provided to clients.

The server offers simple built-in editor where the scripts can be modified and executed (see below in the Figure 4).

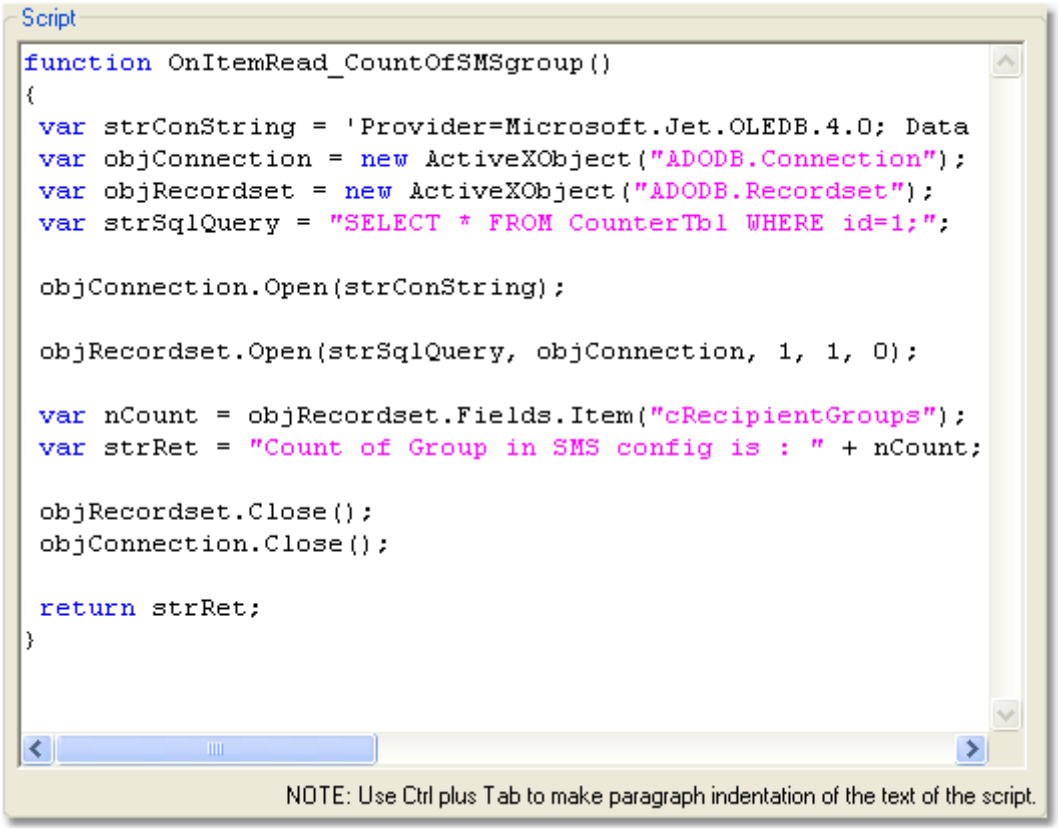

***Figure 4**: Snapshot from a simple editor for writing of scripts built-in the SAEAUT SNMP OPC Server Configurator.*

A customer can define **script logic** completely according to his/her requirements. E.g. Sending of an e-mail to an e-mail address depend on script logic.

Example of using the SAEAUT SNMP OPC Server for sending e-mail via JScript

In this example is sending of e-mails implemented using Script Item. Definition of the SendEventEmail script item is shown in the Figure 5. This item exploits one SNMP variable called sysUpTime (.1.3.6.1.2.1.1.3.0). The SAEAUT SNMP OPC Server periodically obtains the current value of the sysUpTime variable from a SNMP Agent. This current value is passed to the script function as the OnTime input parameter. This OnTime input parameter can be processed in the script according to the user requirements.

In this example, the OnTime parameter value is compared with a user defined value (e.g. 59s). If compared values are equal then a user defined e-mail is sent to specific e-mail address. For sending of e-mails from JScript, it can be used for instance ActiveX object entitled Outlook.Application (see below in the Figure 6).

This example is very useful if a customer want to be permanently notified about the current state of something (e.g. if a device is still running). The notification of the customer is solved via sending e-mails. Sending of an e-mail to an e-mail address depend on script logic.

Note that:
In script functions is possible to use together various SNMP variables. Each variable has got own unique symbolic name.

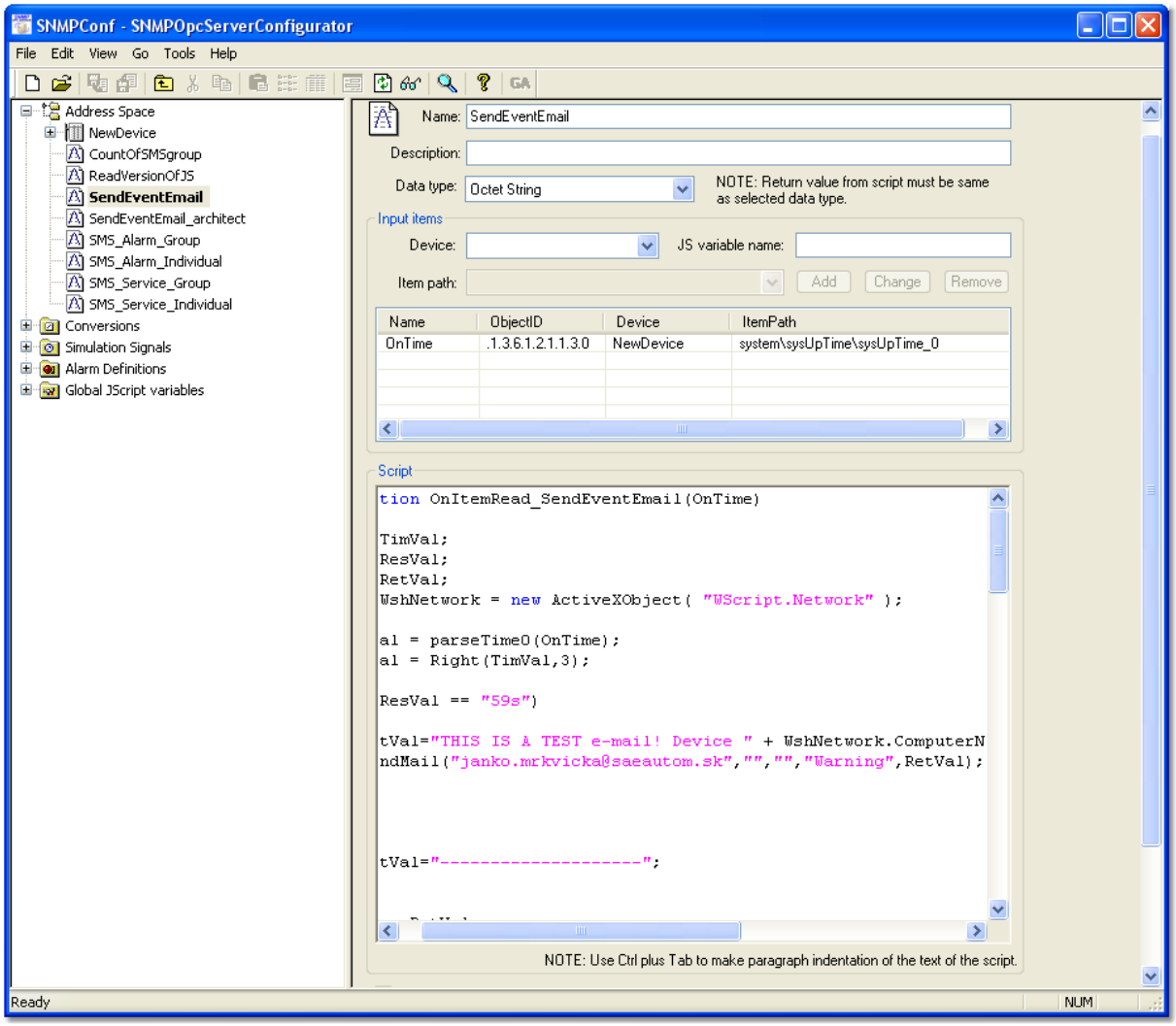

***Figure 5**: Example of a script item: The SendEventEmail sends e-mail to a specific address.*

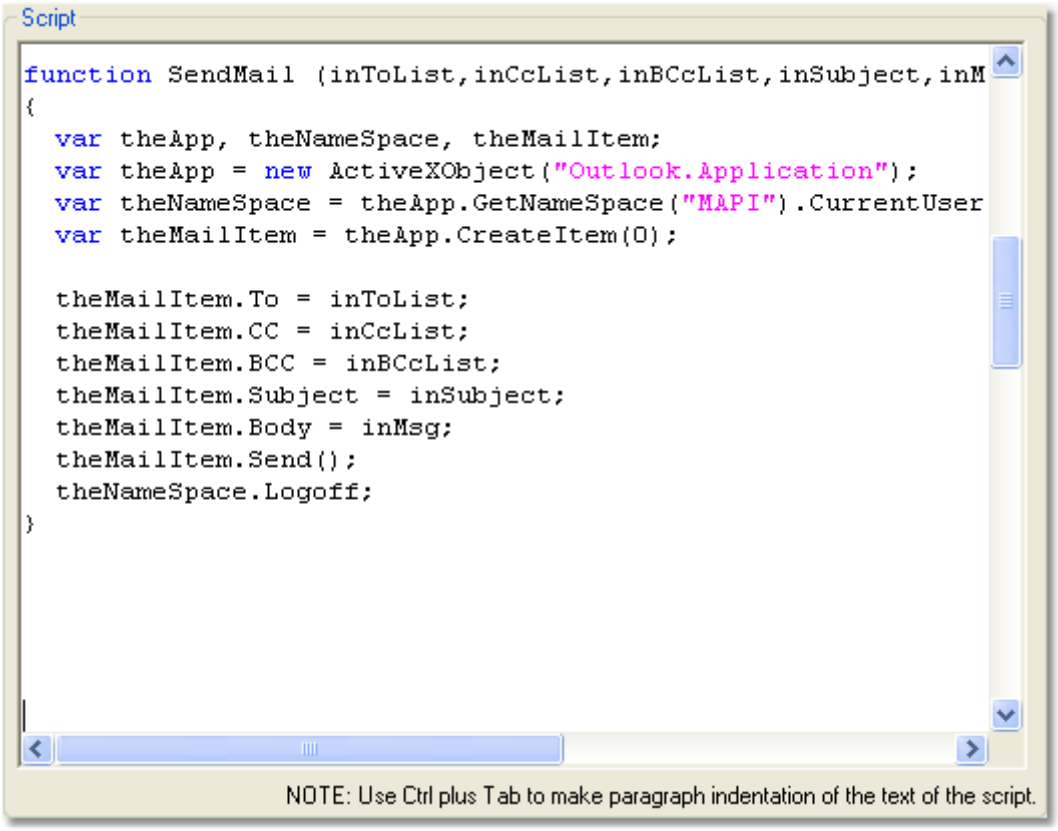

***Figure 6**: Example of a script: For sending of e-mails from JScript, it can be used for instance ActiveX object entitled Outlook.Application*

Example of using the SAEAUT SNMP OPC Server for archiving of real process data to database systems via JScript

JScript can be used also for reading and writing data from/to a database. For this goal are very often used ActiveX objects entitled ADODB.Connection and ADODB.Recordset (see below in the Figure 7). Using mentioned objects in the SAEAUT SNMP OPC Server; we obtain immediately possibility to connect Script Items and Data Items with a database. It means, values from Script Items and Data Items can also be stored, achieved and obtained from arbitrary database system (e.g. MS SQL Server, MS Access, Oracle, MySQL, etc.)

Note that:
This example enables creating of Historical Trends if the real process data values are stored to a database with a timestamp.

Script

```
function WriteToSG(SMSmess)
{
 var myConnect = 'Provider=Microsoft.Jet.OLEDB.4.0; Data Sou
 var ConnectObj = new ActiveXObject("ADODB.Connection");
 var RS = new ActiveXObject("ADODB.Recordset");
 var sql = "SELECT * FROM GroupSMSList;";

 ConnectObj.Open(myConnect);

 RS.Open(sql, ConnectObj, 1, 3, 0);
 RS.AddNew();

 RS("egSMSText")       = SMSmess;
 RS("egTimeStamp")     = DatTimSG();
 RS("recGroupID")      = 1;

 RS.Update();
 RS.Close();
 ConnectObj.Close();
}
```

NOTE: Use Ctrl plus Tab to make paragraph indentation of the text of the script.

***Figure 7**: Example of a script: For reading/writing of data from/to database, it can be used for instance ActiveX object entitled ADODB.Connection and ADODB.Recordset.*

This example is very useful if a customer needs creating history of values (e.g. Data Items or Script Items). The connection between a database system and SAEAUT SNMP OPC Server via JScript is very simple, fast and effective solution.

TIP of SAE-Automation, L.t.d.

The company SAE-Automation, L.t.d. offers also very interesting product called SAEAUT SMS Service. This product enables sending/receiving SMS messages. The connection between a database system of application SAEAUT SMS Service and SAEAUT SNMP OPC Server via JScript is very simple, fast and effective solution.

This solution enables customers to be notified immediately by SMS messages if a real process value (provided by SAEAUT SNMP OPC Server) was changed.

For more about this solution please read the corresponding SAEAUT SMS Service, sending and receiving SMS from/to various applications.

Example of using the SAEAUT SNMP OPC Server for data pre-processing via JScript

In this example is shown a simple method how it is possible very easy to pre-process received data from a SNMP agent (device) on the SAEAUT SNMP OPC Server side.

In this example we use the sysName (.1.3.6.1.2.1.1.5.0) SNMP variable that provides a system name of a device (e.g. SAE25). The example will be realized as Data Item.

This example includes two following steps:

1. Processing of Data Item without using of scripts.
2. Processing of Data Item which uses the scripts.

The Data Item does not use any script for data pre-processing

The sysName_0 data item that is associated with above mentioned SNMP variable does not use the script for pre-processing of received data (please see in the Figure 8). It means, the OPC clients will be provided by the same value as a SNMP device (please see in the Figure 9).

Note that:
The Data Item value includes only original value from the SNMP device (please see in the Figure 9).

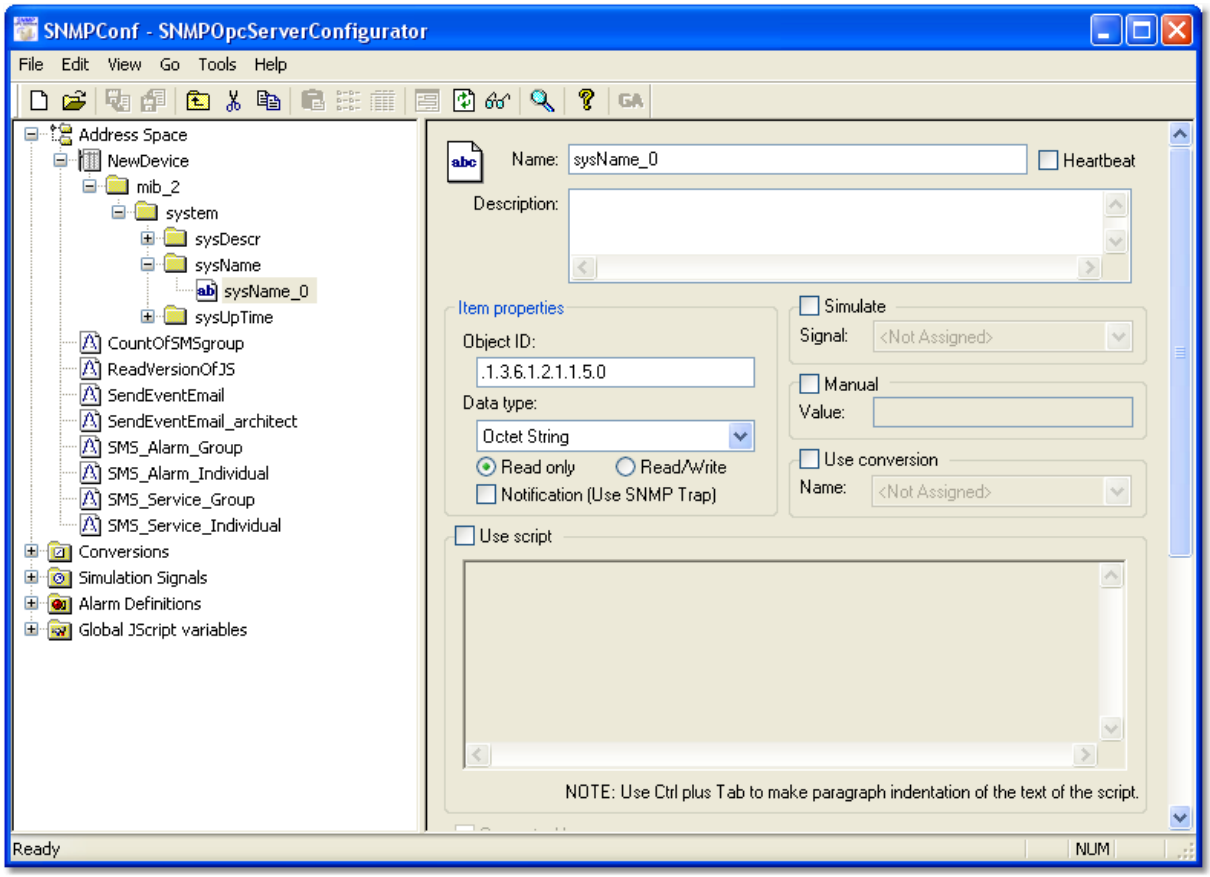

***Figure 8:** The sysName_0 data item does not use any script.*

Item ID	Value	Timestamp	Qu...	Subquality	Limit
NewDevice.mib_2.system.sysName.sysName_0	"SAE25" (VT_BSTR)	07/22/10 14:23:27.775	Good	Non-spec...	Not Limi...

Figure 9: *The Data Item value includes only the original value "SAE25" from the SNMP device.*

The Data Item uses a script for data pre-processing

The sysName_0 data item that is associated with the mentioned SNMP variable uses a script for pre-processing of received data (please see in the Figure 10). It means, the OPC clients can be provided by the different value as a SNMP device (please see in the Figure 11).

Note that:
The Data Item value includes a static text prefix "Computer name: " according to a user script and the original value "SAE25" from the SNMP device. The Data Item value is more valuable.

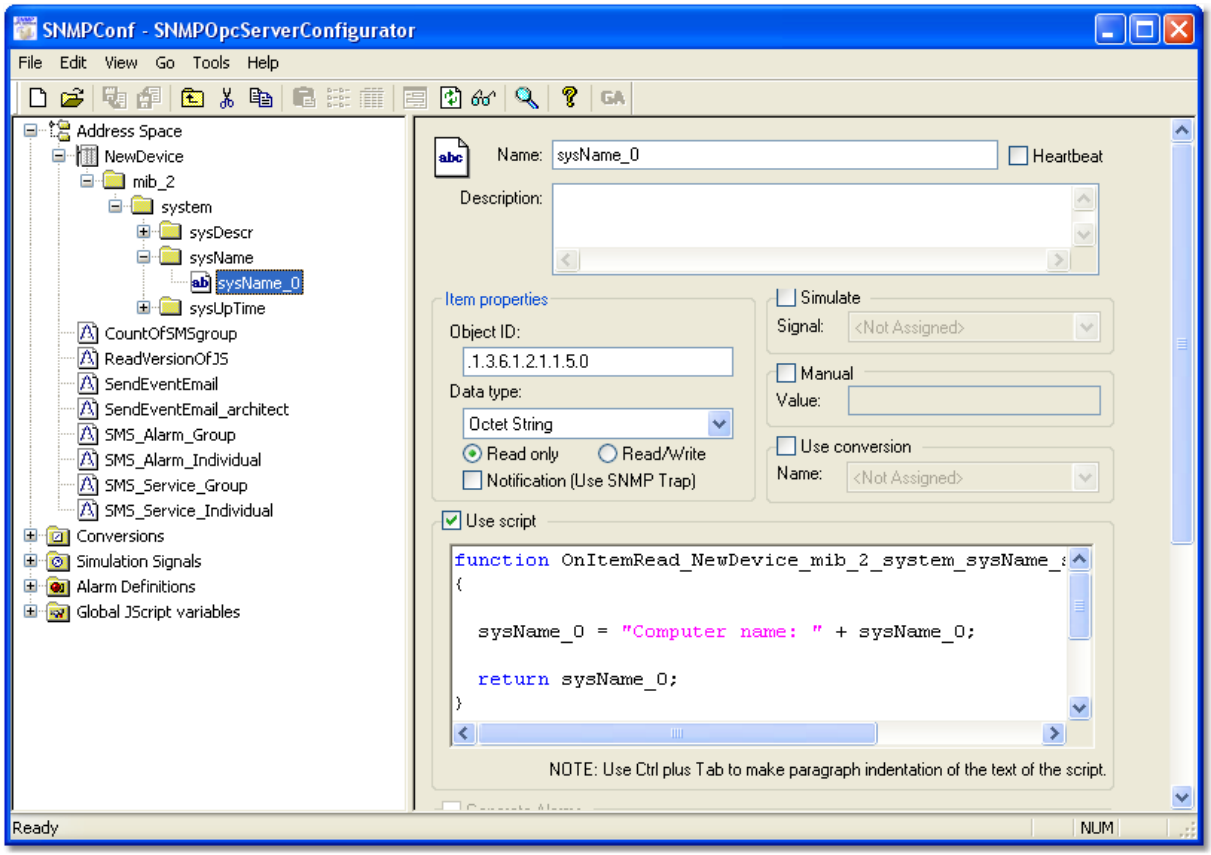

Figure 10:*The sysName_0 data item uses a script for preprocessing of data.*

Item ID	Value	Timestamp	Qu...	Subq...	Limit
NewDevice.mib_2.system.sysName.sysName_0	"Computer name: SAE25" (VT_BSTR)	07/22/10 14...	Good	Non-s...	Not Li...

Figure 11: *The Data Item value includes a static text prefix "Computer name: " according to a user script and the original value "SAE25" from the SNMP device. The Data Item value is more valuable.*

This example is very useful if a customer needs to customize an original Data Item value. It means, **the customer get more valuable data (results)** which are already **pre-processed in JScript**.

Global JScript variables in the SAEAUT SNMP OPC Server

Global JScript variables behave as standard global variables; it means they are visible and usable in any defined JScript. They can store and pass data actually or previously read, and thus enable processing over actual and historical data. Global JScript variables can be defined as numerical, string and array variables. Especially global variables of array type facilitate work with historical data.

Global JScript variables are listed in a TreeView in a folder called Global JScript variables (please see in the Figure 12).

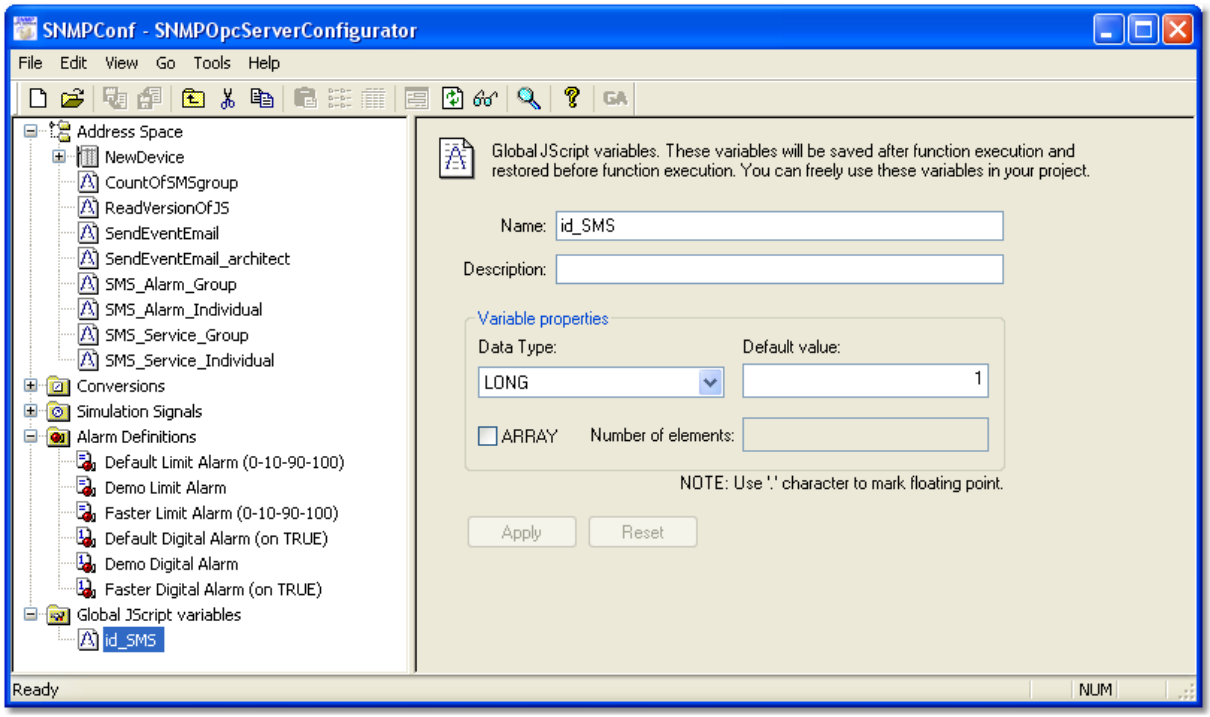

Figure 12: *An example of Global Jscript variable.*

Script viewer in the SAEAUT SNMP OPC Server Configurator

The Script viewer allows you to show all script functions and variables which were written for the current configuration. You can access the Script viewer box by choosing File ⇨ View server script... in the main menu (please see in the Figure 13).

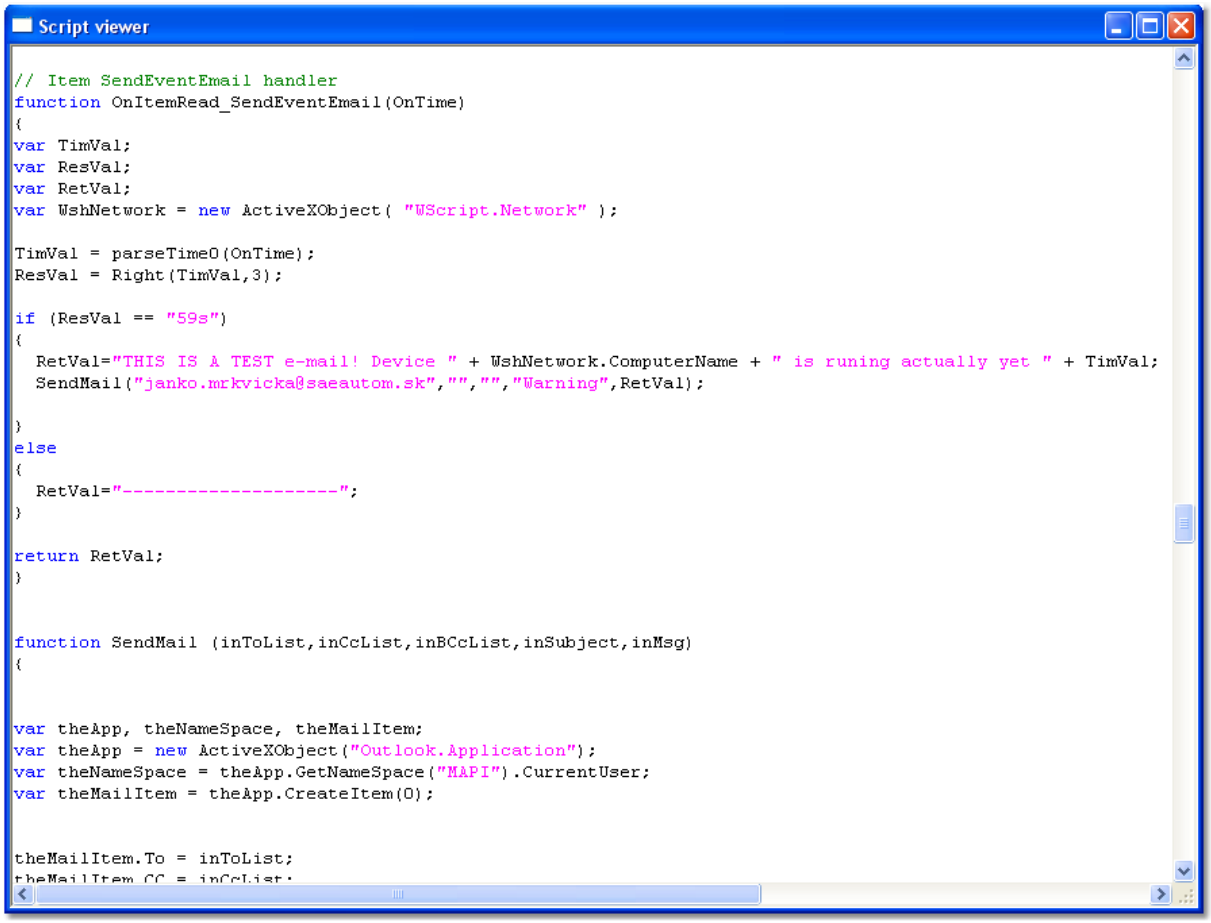

Figure 13: *Complete script for the current configuration of SAEAUT SNMP OPC Server is displayed in the Script viewer.*

Downloads

In this section are listed links to important documents which relates with the SAEAUT SNMP OPC Server.

SAEAUT SNMP OPC Server documentation (User's Guide)
http://www.saeautom.sk/download/help/saeaut_snmp_opc_server_en.pdf

Using of the SAEAUT SNMP OPC Server for receiving Trap messages from SNMP Agents
http://www.saeautom.sk/download/SAEAUT_SNMP_OPC_Server_receives_TRAP_messages.pdf

Installation & Activation of the SNMP Service and SNMP Trap Service
http://www.saeautom.sk/download/install_snmp_service.pdf

SAEAUT SNMP Agent documentation (User's Guide)
http://www.saeautom.sk/download/help/saeaut_snmp_agent_en.pdf

Elegant solution for the management of computer network
http://www.saeautom.sk/download/snmpopcserver_en.pdf

Monitoring of network infrastructure
http://www.saeautom.sk/download/monitoring_en.pdf

Configuring OPC and DCOM for OPC server and OPC client applications from SAE – Automation, Ltd.
http://www.saeautom.sk/download/dcom_config.pdf

Configuring DCOM for using OPC UA COM Wrapper with OPC servers from SAE – Automation, Ltd.
http://www.saeautom.sk/download/opcuaforsaeproducts.pdf

Internet browser based OPC client
http://www.saeautom.sk/download/opc_explorer.pdf

SAEAUT SMS Service, sending and receiving SMS from/to various applications
http://www.saeautom.sk/download/smsservice_en.pdf

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