



Moving Forward – Merger News

We are pleased to announce that KISTERS AG and Hydro Tasmania have agreed to merge the KISTERS' Resource Management System Division and the Hydstra group of companies, effective from 1st January 2004. The American subsidiary, Hydstra America Inc., will become KISTERS North America Inc.

Special points of interest:

- * TSM Integration
- * Hydstra Users Group 2004
- * What's New

Both companies have a strong base in their own region, KISTERS AG in Europe and Hydstra in the Southern Hemisphere. This joining of forces now delivers the global footprint required to fully grow our product and business: to provide our respective worldwide client bases with the benefits derived from worldwide usage, through unified ongoing development and advancement to meet global demands.

Technical staff from the two firms have already united through the development of a long-term plan to evolve and enhance the products to meet the technical demands for both the immediate and long-term future. Both the KISTERS WISKI and the Hydstra time-series systems will be maintained and continually developed. The KISTERS WISKI and Hydstra/TSM (Time-Studio) software will be merged into a single time-series product. Hydstra/TS will continue to be maintained and advanced as a file-based time-series system, so clients will see little change in day-to-day activity and user interface. In 2004, you will see the first evidence of the integration of the products through the enhancement of functionality.

Our commitment company-wide is that each migration or integration step must produce added value not only for us but also for you, our customer. Our goal is that both products will be sharing, at a minimum, 80% of the code within a two to three year migration phase.

This undertaking will draw from the strengths of each product and be shared by both. We can all take faith in the hard work that is now underway. Should you have any questions or concerns, please do not hesitate to contact us immediately.

A full presentation of the integration will be presented at this years User Group meeting to be held on the Gold Coast on the 30th July.

[Klaus Kisters](#), Management Board, KISTERS AG

Telemetry Seminar in Sydney February 2004

In February Hydstra conducted a seminar to introduce the new range of Kisters products, which will be available to the Australian industry.

The Kisters range included;

WISKI [A relational database management system]
WISKI WEB and GIS modules
WISKI-TV [Stand alone file based Time Series viewer and editing program], and
SODA, [integrated hardware and software telemetry solution]

Klaus Kisters, Bernard Bramlage, and Bill Steen delivered the product demonstrations to an audience representing the major Australian water resource agencies and consulting companies. The demonstrations generated a lot of positive discussions and interest in the new range of products with follow-up visits being undertaken in April.

CD's of the presentations are now available through Client Services
[support@hydstra.com]

Following the one-day Kisters seminar a half-day Modelling session presented by Hydro Tasmania Hydrologist Holly Taylor was held to demonstrate the use of Hydstra Modelling for practical applications. Several case studies were shown that utilised the telemetry and database linkages the Modelling package in areas such as flood forecasting, energy and water metering and inflow forecasting.

Further enquiries can be forwarded to Bill Steen [steenw@hydstra.com]

For more information
regarding SODA please
contact:
support@hydstra.com



Bill Steen

Staff Changes

Due to personal reasons Ian Donoghue departed from Hydstra in April. Ian has been instrumental in both the merger with Hydstra TSM and more recently the Kisters Group, whilst shaping Hydstra as a leading software company.

We would like to take this opportunity to thank Ian for his dedication and hard work and to wish Ian and his family all the best in the future.

With the departure of Ian a new Hydstra management board has been formed to run the company. The management board consists of Bill Steen and Michael Natschke. Michael will make several trips to Australia in the coming months before moving to Australia with his family in November.

New Staff Member – Michael Natschke

Michael Natschke has worked for the KISTERS group for over five years in a number of positions. More recently Michael has been the Project manager for the Environment Agency of England and Wales, which is the largest WISKI system installed to date.

Michael holds a Diploma in Engineering and Water Resource Management and has worked in the water industry for over twelve years.

Michael is looking forward to moving to Canberra with his wife and five year old son.

Michael can be contacted on michael.natschke@hydstra.com



Michael Natschke

2004 Hydstra Users Group

In conjunction with the Australian Hydrographers Association's 12th National Hydrographic Conference, Hydstra will be hosting the annual User Group meeting on the 30th July 2004 at the ANA Hotel, Surfers Paradise, Gold Coast.

The merger between Hydstra and Kisters has generated interest within the user community and this year's User Group meeting will be focusing on what users can expect from the merger, including product migration, availability of new products, plus new features in the existing product ranges.

We encourage all users to attend and participate in the user group meeting. Registration to the User Group meeting is being coordinated through the AHA Conference. Registration forms can be downloaded from <http://www.aha.net.au>, or contacting Ray Alford [Ray.Alford@nrm.qld.gov.au] or Paul Martin [Paul.Martin@nrm.qld.gov.au].

A HUG agenda is provided in this newsletter.

As the User Group meeting will be held as part of the conference there will not be a User Group meeting in New Zealand this year. We therefore encourage all New Zealand users to attend both the AHA Conference and the Hydstra Users Group meeting.

AHA Conference

The 12th National Hydrographic Conference will be held at the ANA Hotel, Surfers Paradise, Gold Coast, Queensland from the 28th to 29th July. The conference theme, "The Science of Hydrography - Looking Forward, Looking Back", will provide relevant insight into modern hydrographic technology, while honoring early advances that still influence our work today.

A registration and welcoming function will be held from 4:30pm on the evening of the 27th of July. The Australian Hydrographic Association will hold a meeting following the function, and all members of the AHA are encouraged to attend.

Venue: ANA Hotel, Surfers Paradise, Gold Coast, Queensland

Conference Registration: AHA member \$440 [includes Conference Dinner]
Non-member \$550 [includes Conference Dinner]
Day Rate \$275

Accommodation: The ANA Hotel has reserved limited accommodation at reduced rates for those attending the conference. Deluxe Ocean View rooms, single or dual occupancy are available from only \$145 per night.

Book early and mention the conference to secure the reduced rates offer.
Phone (07)5579 1000 Fax (07)5579 1260 Email: res@anahotelgc.com.au

Further information can be obtained from;

Ray Alford [Ray.Alford@nrm.qld.gov.au], or
Paul Martin [Paul.Martin@nrm.qld.gov.au].

Or by post;

The Conveners
12th Australian Hydrographic Conference, 2004
C/- Natural Resources & Mines Technical Centre
1345 Ipswich Rd
Rocklea, Queensland. 4106

2004 Hydstra Users Group
on the Gold Coast

Hydstra TSM—WISKI Integration Project

By Chris Misson

A major priority following the recent acquisition of Hydstra Pty Ltd by KISTERS AG has been to consolidate our range of software products that we have to maintain and support. This will assist us in providing:

- a better quality of product;
- more effective support through a global network of offices;
- more effective delivery of new features.

Part of this product consolidation involves the merging of Hydstra TSM [Hydstra TSM] functionality into WISKI so that the extended WISKI system will become part of the upgrade path for our Hydstra TSM customers.

Within the framework of the acquisition, KISTERS and Hydro Tasmania have agreed to a long-term alliance, with the goal of developing new products for the area of energy and water resources management. We will also be working closely with Hydro Tasmania to ensure that the merging of Hydstra TSM into WISKI is done in a way that will ensure that major Hydstra TSM capabilities still exist in the merged product.

A major priority in this product merger is to ensure a smooth upgrade path for our customers. Our current strategies for some key aspects of this product integration are as follows:

Relational Database Platform

The database platforms used by major Hydstra TSM customers are either Oracle or SQL Server and both of these platforms (and others) are already supported by WISKI.

Data Migration

Given that WISKI makes use of alphanumeric identifiers for Stations & Parameters, we plan to provide an option of translating the numeric Hydstra TSM identifiers to new alphanumeric identifiers. Most people would agree that “WL”, or “WLEV” is more intuitive when specifying a water level parameter than is a numeric identifier such as “100”.

When translating these identifiers during data migration, we will also be storing the legacy Hydstra TSM identifiers and the new system will support the use of either. This backward compatibility will enable an easy migration of reports, models and other Hydstra TSM processes that may include embedded identifiers.

Telemetry

SODA (Simultaneous Online Data Acquisition), is the KISTERS Telemetry/Data Acquisition system that is used in conjunction with WISKI.

Work is currently being done to merge Hydstra TSM Telemetry capabilities into SODA. This will include adding support for the full range of loggers and communications protocols currently supported by Hydstra TSM.

Task Scheduling

The WISKI system includes what is called WSP (WISKI Service Provider) and this is used for automation of system tasks. A major restructuring of this system is planned for later this year and consideration of Hydstra TSM requirements will be incorporated into the enhanced system.

Modelling

The KISTERS range of products does not include a time-series modelling/simulation application so Hydstra TSM Modelling will be adapted to work over the WISKI framework. From a user perspective, there will be very little change and existing Hydstra TSM models will be able to be loaded after migration to the new WISKI system.

Reporting

As an interim measure, the Hydstra TSM reporting framework (including the “Favourites” view) will be repackaged as a separate reporting module that will work over the WISKI framework.

The intention is for the new system to be able to load and run existing Hydstra TSM Favourites lists and most reports.

Scripting

The WISKI system includes its own scripting language KBasic (or KisBasic) which has some similarities with Hydstra TSM Basic. As an interim measure, both scripting languages will be retained, however eventually we will merge to a common scripting language.

Hydstra TSM—WISKI Integration Project—Continued

By Chris Misson

Although there is much to do, significant progress has already been made. Work has been underway for the past three months on adapting the SODA telemetry system. Work has also started on adapting the Hydstra TSM reporting module to work over a WISKI system and a working prototype is expected to be completed by end of May.

The new integrated product will deliver the major capabilities from Hydstra TSM together with an excellent range of new capabilities available through the KISTERS product suite including applications such as:

BIBER (German for “Beaver”)

BIBER (German for “Beaver”) is an advanced gauging entry and analysis tool that can be used either in the field or the office for entry of stage-discharge gauging measurements. It includes sophisticated graphical and analytical functions to assist in quality assurance of gauging measurements.

SKED

This is a graphical rating development environment providing an excellent user interface and an extensive range of curve-fitting options. The rating curve methods supported by SKED include splines, shifted power function, various weir formulae and free mathematical relations.

WISKI Web

WISKI Web is a scalable system for visualisation of time-series data via Internet technologies.

I consider that this product integration provides an exciting opportunity for Hydstra TSM customers to look forward to. The end result will be that our customers will be using the undisputed international market leader in terms of time series data management based on modern distributed client-server architecture and supporting a range of major relational database platforms. This integration will also help KISTERS to utilise their global support services which should result in significant improvement in the delivery of support services for customers in all regions.

The Hydstra TSM-WISKI integration is expected to be fully completed by middle of 2005 and we will continue to keep you informed of our progress in subsequent newsletters.

Change of Address

Hydstra's Hobart office has re-located to;

Hydstra Pty. Ltd. Group
7th Floor, 86 Collins Street
Hobart, Tasmania. 7000
Australia

Phone: +61 3 6234 8270
Fax: +61 3 6234 6423

Newsletter Delay

Hydstra wishes to apologise for the delay in issuing the newsletter. The delays occurred due to the introduction of new procedures within the company.

Client Services Article

By Paul Sheahan, Client Services Manager

What's New in Hydstra TS

System maintenance and development has continued through out the year. The progress has been on several fronts including , usability, functionality and routine maintenance. With each new system we include a document of all enhancements and changes. The *UpGrade* document indexes changes against the version that they were released with. We are able to supply a copy of the *UpGrade* document at any time, please email requests to support@hydstra.com. The *UpGrade* document has an extensive list of changes, below is a short extract of recent changes. The changes described in this 'Whats New' article are in system 9.01.00 which is in the final stages of testing. If you would like a copy of this release please contact support@hydstra.com. The HYDSTRA policy on issuing releases is that the current HYDSTRA release system is always available upon request to HYDSTRA.

We are currently evaluating options for enhancing XML support within HYDSTRA/TS, client input into this process is most welcome.

HYDMWB

Reference trace reloading: Reference Traces are now much easier to load. Many data editors verify their data with surrounding stations, often reloading the same reference traces for a specific station / variable combinations for each edit session. Reference trace reloading speeds up this process by having these options quickly selectable from a list. Up to the last 5 loaded reference traces are remembered by HYDMWB. These previously loaded traces can be selected for reloading from a drop down list on the 'Open Reference Trace' form.

Scale Inversion: A list of variables can be configured for inverted scales. The scale inversion is enabled when 'Auto' scaling is used. This enhancement will be useful for people who prefer to view rainfall data from the top of the grid down or ground water users who record distance from top of bore.

Calibration Traces: The workbench has historically been able to adjust data to a list of 'Calibration points', where these points were manually entered in the editor. Where organisation have records of manual level readings performed regularly on site, these can now be used to automatically calibrate the data trace. E.g. Some data loggers have a keypad to accept a manual observation entry on site. This data is downloaded and imported into HYDSTRA as part of the normal download procedures.

The data is then used for automatic trace calibration.

Repair: The work benches desktop file TS file repair option lists all variables not just unregistered ones. It is available on the right click menu, for all files. The repair option enables variable mapping schemes to be saved. This means that the repair option can also be used for translating variables in a data file. Using mapping schemes in this manner enables data to be imported and translated from HYDSTRA systems that use different variable definitions.

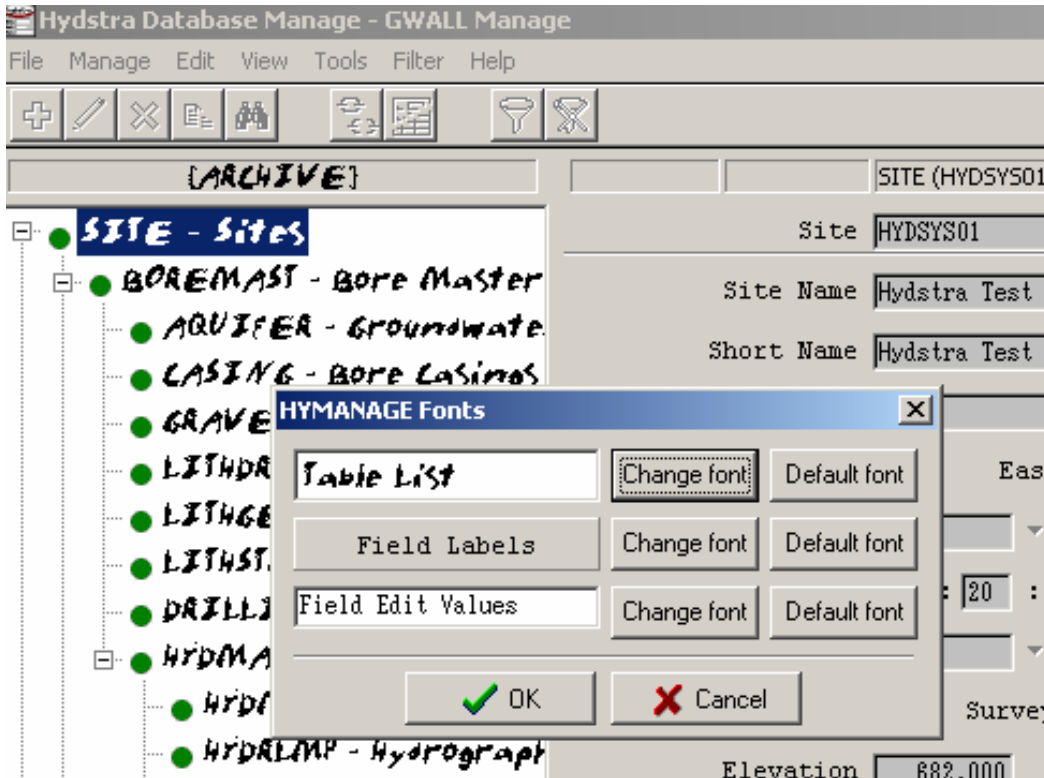
Auto Open enhancements: Command line calls to HYDMWB can now specify a Site, Variable and date range. This functionality was implemented to enable the work bench to be started in Edit mode from TELVIEW or HYSCANR, greatly enhancing the speed of reviewing / correcting telemetry data. See TELVIEW comments below.

'Hit Count' enhancements: The "Hit counts" site-based table browser in HYDMWB now enables the selection of many 'systems'. This enables all system entries to be viewed in a single list.

HYMANAGE

Font Selection: Hymanage now has font selection enabled. This is particularly useful for clients who want to use characters in the extended ASCII code set. Fonts can be chosen that display the correct accented characters for the extended code set.

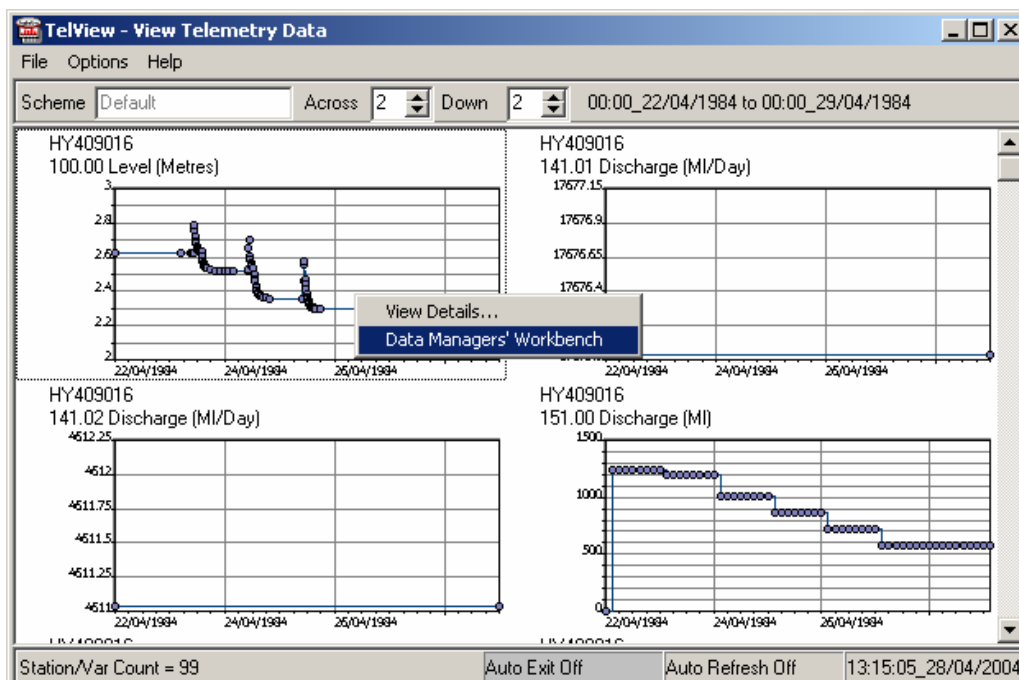
Network default fonts can be set in HYPRMFNT.INI.



In a bid to allow HYMANAGE to work from the keyboard alone, you can now use <ctrl><arrow> to switch from table to table (in the tree view). This enhancement helps accessibility for vision-impaired users (a factor in our relationship with the USGS).

TELVIEW

TELVIEW now available for all TS licensed users. The program is used for quickly scanning and assessing large volumes of telemetry data. Information on Telview is available in the help menu. If you would like to have this feature enabled contact HYDSTRA for a new HYACCESS.INI.



Translation

Multi language support is gradually maturing. The PASSWD table now holds additional user meta data. One of the items held in the table is 'Language'. By setting a users language to one of the supported languages, the user will see the system in the required language when they logon to any PC. These changes mean that different users can view the language of their choice from the same system. E.g. In Canada, Users could all use the same system with some users viewing the system in English, some in French.

HYDSTRA relies on the user community for language translation. There are tools to assist in 'translating' a system or part system. If you would like to translate part or all of your system please contact support@hydstra.com for assistance.

Ratings

The system has had a significant re-work in the area of ratings equations. The ratings equations system has been re-developed to support any form of rating equation.

The equations have one free variable (X), and can use a extensive list of mathematical expressions and functions.

Sub-expressions may be grouped explicitly with brackets.

Arithmetic operators:

$+$, $-$, $*$, $/$, $^$

$=$, $>$, $>=$, $<$, $<=$, $<>$ - can only be used in the IIF() function (see below)

Mathematical functions:

ABS(), EXP(), INT(), ROUND(), LN(), LOG(), SQRT()

Functions:

MAX(), MIN(), IIF()

RATEEQN (HYDSYS02,100,140,1,0,0.034)	
Site	HYDSYS02
VarFrom	100.00 Level (Metres)
VarTo	140 Discharge (Cumecs)
Table	1
Release	0
Stage Low	0.03400
Stage High	0.35700
Equation	$3.185*(X-0.034)^{1.4}$
Quality	1 Good continuous records

HYAUDIT

There is now a new type of test that you can create for HYAUDIT – "Perl Test". This lets you write a perl job that actually runs the test activities. HYAUDIT executes the perl job, and picks up the results. This feature will allow for certain types of customisation to be performed more easily by clients or by HYDSTRA Support for clients.

Recycle bin

A few years ago we put RecycleArch & RecycleWork keywords into HYCONFIG.INI, but they were not effective on some networked systems, because the recycle bin doesn't work from network files. We've now enhanced the scheme so that if you enable these settings, they'll recycle network files, by first copying them to the JUNKPATH folder and then deleting them from there.

HYSRIPT

HYSRIPT – Is new program to greatly improve the capacity for clients and HYDSTRA support to customise processes and reports. Its function is to handle all the user interface and output handling of custom tasks. This can reduce the work involved in writing custom jobs by up to half, leading to significant code volume reduction, reduced code duplication and increased useability and maintainability.

HYSRIPT is primarily directed at custom PERL solutions but is able to use solutions built using other environments. See also 'HYDSTRA/TS Tips and Techniques' for further details on using HYSRIPT as a component of client specific HTML reporting.

HYDLL

HYDLL has been enhanced to include data table reading functions. This means that your own applications or custom solutions can read the HYDSTRA/TS data tables through the same tool as time series data is being read. It has the advantage of reducing your code and code complexity by remove the need to use ADO directly.

In many secure environments, direct connection to HYDSTRA tables may not be possible. An example of this is working in an ORACLE environment, where administrators do not want to divulge passwords etc. Using HYDLL in this environment allows read access to server data without the solution establishing its own connection to the server.

The enhancements also facilitate maintainability, as they allow for database independence. The underlying data base type may change without needing to modify the solution to accommodate the change. The HYDSTRA/TS system handles the change in data base type and presents the same interface through HYDLL.

HYDBUTIL

XML is now a format recognized by the HYDBUTIL EXPORT and APPEND commands. The XML format is the ADO adPersistXML format.

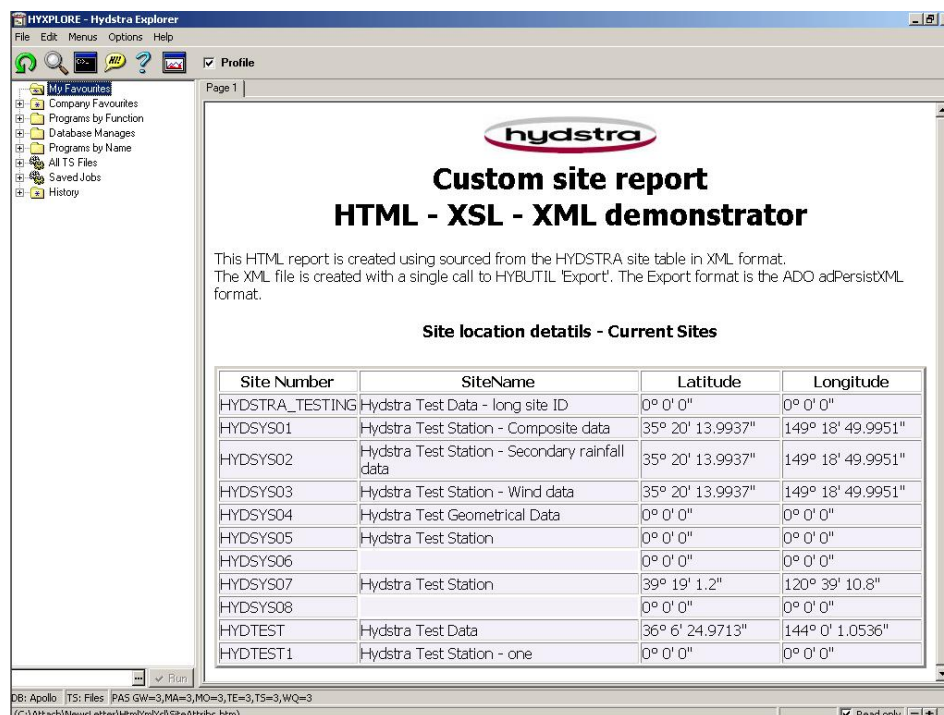
HYTSCOMB

HYTSCOMB is a new program that reads traces from one or more TS files and combines them into a single output file. While this might allow you to calculate the mean flow or rainfall over an entire group of sites (catchment perhaps) the intended purpose is to analyse Key Performance Indicator style data. Enabling KPI's to be summarised across different groups. E.g. Region, Hydrographer or client.

HYDSTRA /TS Tips and Techniques.

Creating a custom 'Site report' using HTML, XML and XSL.

HYVIEW and HYPLORE now support HTML documents. This means that custom reports can be produced to display information in the rich format HTML environment. Below is a example of such a report, generated from a minimal number of HTML and XML code lines.



The screenshot shows the HYXPLORE - Hydstra Explorer application window. The main content area displays a 'Custom site report' titled 'HTML - XSL - XML demonstrator'. Below the title, a paragraph explains that the report is created using data from the HYDSTRA site table in XML format. A table titled 'Site location details - Current Sites' is displayed, containing the following data:

Site Number	SiteName	Latitude	Longitude
HYDSTRA_TESTING	Hydstra Test Data - long site ID	0° 0' 0"	0° 0' 0"
HYDSYS01	Hydstra Test Station - Composite data	35° 20' 13.9937"	149° 18' 49.9951"
HYDSYS02	Hydstra Test Station - Secondary rainfall data	35° 20' 13.9937"	149° 18' 49.9951"
HYDSYS03	Hydstra Test Station - Wind data	35° 20' 13.9937"	149° 18' 49.9951"
HYDSYS04	Hydstra Test Geometrical Data	0° 0' 0"	0° 0' 0"
HYDSYS05	Hydstra Test Station	0° 0' 0"	0° 0' 0"
HYDSYS06		0° 0' 0"	0° 0' 0"
HYDSYS07	Hydstra Test Station	39° 19' 1.2"	120° 39' 10.8"
HYDSYS08		0° 0' 0"	0° 0' 0"
HYDTEST	Hydstra Test Data	36° 6' 24.9713"	144° 0' 1.0536"
HYDTEST1	Hydstra Test Station - one	0° 0' 0"	0° 0' 0"

The data used to produce this report is created with HYDBUTIL 'EXPORT' to create an XML data file. The report is constructed using a HTML document that calls and XSL style sheet to render the data. Details of the construction of the report are in the 'Tech Talk' section.

Using current tools such as HYSRIPT, HYDLL and the rich display capabilities of HTML in HYPLORE, richly formatted reporting is very close to the finger tips. Using these tools clients (or HYDSTRA support) , can produce reports and programs to meet organisation specific needs. Using HYSRIPT, your custom applications or reports will have the look, feel and functionality of HYDSTRA parameter screen programs.

Tech Talk.

For some users 'Tips and Techniques' may have discussed some terms that they have heard but don't have a clear picture of how they fit into the computer world, and how they apply to them. Here we will try to capture the fundamentals of some of these computer industry acronyms.

HTML

Hypertext Markup Language, a text-based markup language used for web documents. In HTML, markup indicates page structure which can be used to create a useful rendering to a screen or other output device. <http://www.w3.org/MarkUp/>

A HTML document is a text document that uses predefined codes to tell the browser how to display data.

XML

eXtensible Markup Language, the universal format for structured documents and data on the Web. XML is an industry-standard protocol administered by the World Wide Web Consortium (W3C - <http://www.w3.org/TR/1998/REC-xml-19980210>).

An XML document is a text document that describes data structure and contains data.

XSL

eXtensible Stylesheet Language. A language used for processing XML documents. Common uses are to change an XML file from one format to another, convert XML into HTML and to display the data in an XML file in a browser.

An XSL document is a text document that uses XML syntax to transform data in an XML document into another format. You code the format that you want the data transformed to, e.g into a HTML document for formatted display in browser.

In a nut shell, XML is the data and XSL transforms the data into a document and HTML presents the data document,

These three languages are used in the same manner as a current computing trend. That is to separate the data and the presentation of the data. Using this method the data is not embedded into the HTML document.

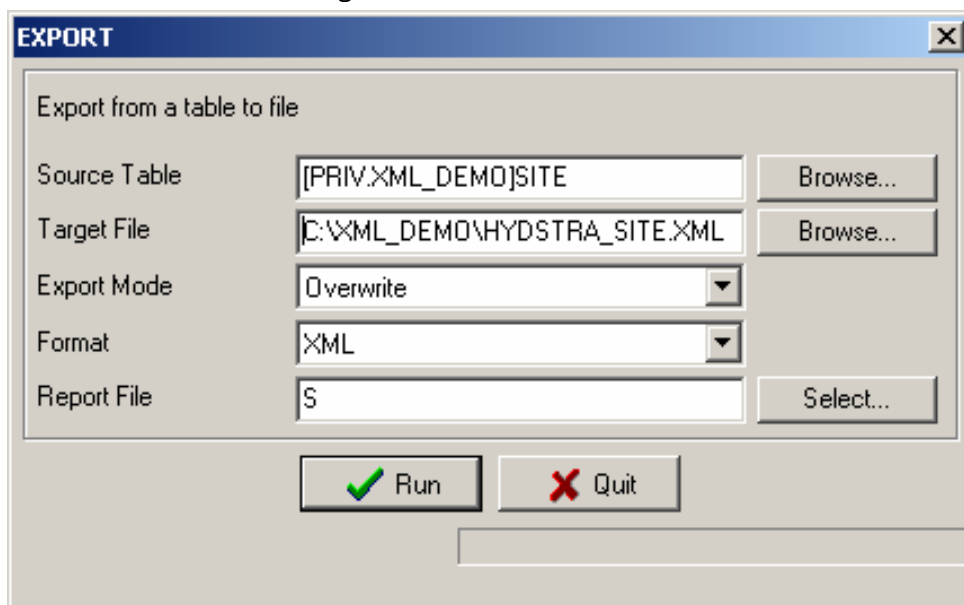
This separation has several advantages. The data can be easily updated without having to rebuild / re-format the presentation document, the data is not embedded in the presentation document. The one data set can be displayed using many different presentation formats. The formats can include different reports, client specific reports, formatted for display in a PC browser or formatted for display on a PocketPC.

E.g. You Corporate Web page has several documents that display information sourced from the list of current sites, sites that do not have a 'closed date'. These documents may include a Site Number and Name report and a site location report, all sourcing their data from the same XML data file.

Using two HYDBUTIL calls, HYDSTRA can build a XML file of the sites that meet 'current sites' filter criteria, this XML file is built daily and loaded onto the web site. Both of the web page reports receive updated data on a daily basis through the daily update of a single XML data file.

Example To build the report pictured in 'Tips and Techniques':

1) Create an XML data document using HYDBUTIL



2) HTML Document. Copy the following HTML code into a text editor and save to C:\XML_DEMO\SiteAttribs.htm

```
<HTML>
<HEAD>
  <TITLE>HYDSTRA - XML and Style Sheets Example</TITLE>
</HEAD>
<XML id="source" src="HYDSTRA_SITE.XML"></XML>
<XML id="style" src="SiteAttribs.xsl"></XML>
<SCRIPT FOR="window" EVENT="onload">
  xslTarget.innerHTML = source.transformNode(style.XMLDocument);
</SCRIPT>
<BODY>
  <font face="tahoma,helvetica">
  <H1 ALIGN=CENTER>
    <A HREF="http://www.hydstra.com/">
      <IMG SRC="logo.jpg" ALT="[HYDSTRA Home Page]" BORDER=0>
    </A>
  <BR>Custom site report<BR>HTML - XSL - XML demonstrator</H1>
  <p>This HTML report is created using sourced from the
    HYDSTRA site table in XML format.<BR>
    The XML file is created with a single call to HYBUTIL 'Export'.
    The Export format is the ADO adPersistXML format.<BR>
  </p>
  <DIV id="xslTarget"></DIV>
</BODY>
</HTML>
```

3) XSL Style sheet. Copy the following XSL code into a text editor and save to C:\XML_DEMO\SiteAttribs.xsl

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<html xmlns:xsl="http://www.w3.org/TR/WD-xsl">
<body >
  <table border="3" style="table-layout:fixed" width="100%" cellpadding="2" >
    <CAPTION><H3>Site location detatils - Current Sites</H3></CAPTION>
    <!-- Lay out the column headers -->
    <tr >
      <th width ="20%">Site Number</th>
      <th width ="40%" >SiteName</th>
      <th width ="20%" >Latitude</th>
      <th width ="20%" >Longitude</th>
    </tr>
    <!--Read Each Record in the XML data file and Create the HTML table entries -->
    <xsl:for-each select="xml/rs:data/z:row">
      <tr bgcolor="#F4F0F9">
        <td><xsl:value-of select="@station"/></td>
        <td><xsl:value-of select="@sname"/></td>
        <td><xsl:value-of select="@lat_deg"/> ° <xsl:value-of select="@lat_min"/>' <xsl:value-of select="@lat_sec"/>"</td>
        <td><xsl:value-of select="@long_deg"/> ° <xsl:value-of select="@long_min"/>' <xsl:value-of select="@long_sec"/>
      </td>
      </tr>
    </xsl:for-each>
  </table>
</body>
</html>
```

4) Open C:\XML_DEMO\SiteAttribs.htm with your web browser or with HYVIEW / HYPLORE.

Hydstra TSM Update

By Chris Misson

Generalised Scripts – Reading Relational and Time-Series Data

Overview of general scripting capabilities

The generalised scripting environment within Hydstra TSM [Hydstra TSM] provides enormous flexibility for customised business processes and reporting. With this scripting environment, you have access (subject to user security permissions) to every piece of data in your entire Hydstra TSM database. In particular the following major capabilities are provided:

Ability to read every piece of data in the relational database

The same query builder that is used behind the Hydstra TSM database reports is also available through the scripting environment. This enables you to retrieve a specified set of fields from several linked tables according to complex queries so that you are able to filter and sort the retrieved data as required.

Ability to read every piece of time-series data managed by the system

From within a script, you can connect to any time series that is available to your Hydstra TSM installation (this includes virtual time-series as well as gaugings and samples data). You can also apply data transformations to the time-series as it is retrieved.

Ability to write time series data back to the database

From scripts you can also write (subject to user security permissions) time-series data back to the database.

Ability to read data from text files

This feature is useful for importing of data.

Ability to write data to text files (including HTML or XML output)

For example, you can schedule scripts to run at regular intervals and publish any information from the database as HTML pages.

Ability to send notification

Although output to reports may be considered as a form of notification, scripts can also execute programs with command-line arguments so more direct notification via SMS, pager, email or network messaging is also possible.

Some possible applications for general scripts

Some possibilities for the application of general scripting include:

- Scanning the database and determining single values of performance and appending these as a single point to a time-series. Such performance measures may be:
 - Number of time-series that have not been checked in past two weeks (i.e.: count number of cases where last two weeks of data have quality codes representing unchecked data)
 - Number of gauging sites that have not been gauged in last 6 months
 - Number of unacknowledged severe events in the system EventLog table

Hydstra TSM Update continued

- Generating HTML reports of things requiring attention:
 - List all sites requiring a rating review (i.e.: where latest gauging shows significant deviation from rating and quality code for the gauging is stated as good)
 - List all telemetered time-series that are not up to date
 - List all gauging sites where number of gaugings for current year is less than target

The screenshot shows a window titled 'Scripts2' with two tabs: 'Details' and 'Script'. The 'Details' tab is active, displaying the following information:

- Script Name:** TSReadingsSingle
- Script Type:** General Scripts
- Description:** Script that returns the number of readings for a specified time-series variable

At the bottom of the window is a toolbar with the following buttons: 'K', '<', 'New Form.', '>', '>|', 'New', 'Retrieve', 'Save', 'Delete', a lock icon, 'Compile', and 'Run'.

- List all gauging sites where no high-flow gaugings have been done in last 12 months

Scripts can be run automatically by Hydstra TSM Scheduler and this is very useful for routine Quality Assurance processes and reporting.

A simple scripting example

For those who may be new to scripting the following example will help demonstrate some of the capabilities for retrieving information from your system. This example consists of two scripts. One script retrieves all records from the Variables table using a relational query and for each time-series variables, a call is made to a second script designed to obtain a total reading count from a specified time-series. If you are curious to know whether you have passed the significant milestone of 1 billion time-series readings in your database then this example provides you with the means to easily find out.

The step-by-step process for creating these scripts is as follows:

- 1) From the Form menu, select "Script Rules"
- 2) Enter the information into the form as shown below and then click on "Save"
- 3) Now click on the "Script" tab on the top of the form and enter the following text

A simple scripting example—Continued

```

; Input arguments are: "S<sep>L<sep>P.p<sep>V"
;   where <sep> (separators) may be any of the following: .,/<TAB>
; For example:
;   150.1/100.00/1
;   150,1,100.00,1
;   150<TAB>1<TAB>100.00<TAB>1

String sTemp
String sErr
String sSeps
int nResult

int nSite
int nLoc
int n1
int n2
int nParam
int nVar
int hInst

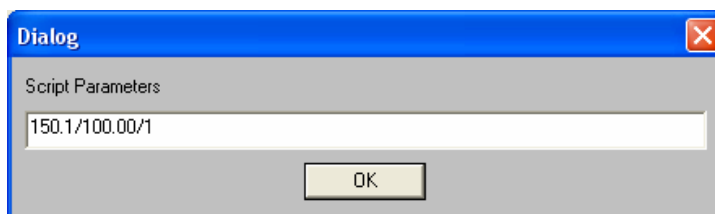
sSeps=STR_CONCAT("/.",",",TAB)

; Extract Site, Location, Parameter & Variable Identifiers
sTemp=Input.ScriptParams
nSite=STR_EXTRACT(sTemp,sSeps)
nLoc=STR_EXTRACT(sTemp,sSeps)
n1=STR_EXTRACT(sTemp,sSeps)
n2=STR_EXTRACT(sTemp,sSeps)
nParam = n1*100 + n2
nVar=sTemp

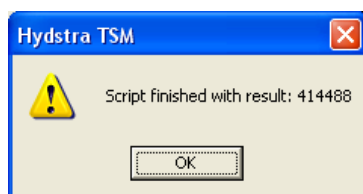
hInst = GetInstance()
nResult = TSArchiveCount
(hInst,nSite,nLoc,nParam,nVar,NULL_TIME,NULL_TIME,Input.ScriptParams)
Output.Result=STR_CONCAT(STR_CONCAT(nResult,LF),sErr)

```

- 4) When done, click on "Save"
- 5) Click on the "Compile" button to check for any errors and fix as required (remember to save any changes you make)
- 6) To run the script, click on "Run" and when the Script Parameters dialog box is displayed enter a valid time-series identifier as shown below:

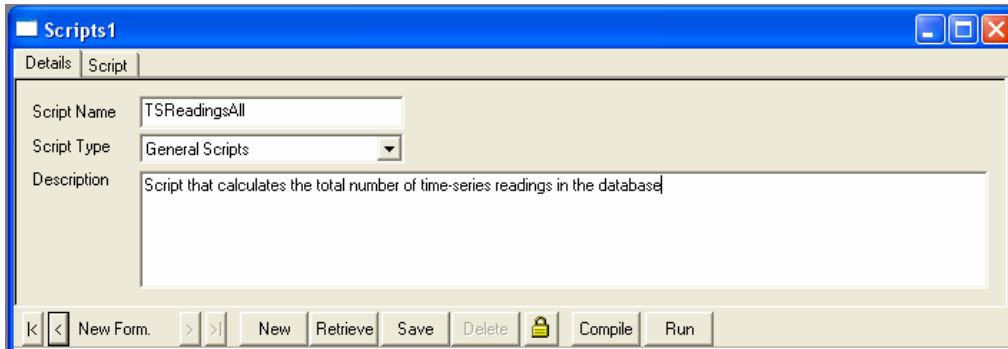


- 7) When the script completes the results (number of readings in the time-series) will be displayed as shown below:



A simple scripting example—Continued

- 8) Once you have the first script working you can create the second script. The details for this script (including the script code) are shown below:



```
; This script retrieves a list of all time-series from the Variables table
; and for each time-series the number of readings is added to a total.
; No script arguments are required

const int MAX_RECORDS = 40000
String sFilter=""
String sResults
String sIdentifier
String sTemp
int nResult
int nTotal=0
int nCount=0
DateAndTime tStart
DateAndTime tFinish

; Get current time for use in calculating total time of the process
tStart=NOW_DATEANDTIME()

; Retrieve all variables (subject to MAX_RECORDS limit)
nResult = SQLQUERY("Variables", "Variables.Site,Variables.Location,
                      Variables.Param,Variables.Variable",sFilter, 1,
                      MAX_RECORDS, sResults, 400000)

; Add total readings from each time-series Variable to the total
Do While (sResults<> "")
  sIdentifier=STR_EXTRACT(sResults,LF)
  sTemp=CALL("TSReadingsSingle",sIdentifier)
  nResult = STR_EXTRACT(sTemp,LF)
  If (nResult>0) Then
    nTotal=nTotal+nResult
    nCount=nCount+1
  End If
Loop

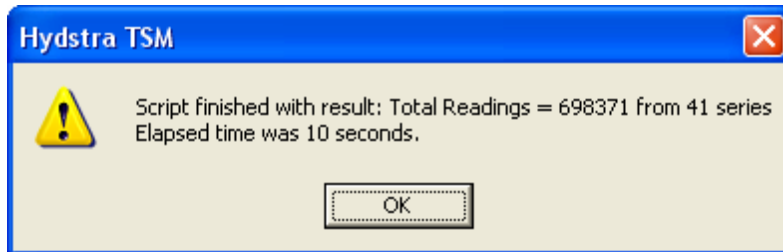
; Get current time again and calculate the total elapsed time
tFinish=NOW_DATEANDTIME()
nResult=tFinish-tStart

; Report total readings, number of contributing time-series and elapsed time
sResults = STR_CONCAT(STR_CONCAT("Total Readings = ",nTotal)," from ")
sResults = STR_CONCAT(STR_CONCAT(sResults,nCount)," series")
sResults = STR_CONCAT(STR_CONCAT(sResults,LF),"Elapsed time was ")
sResults = STR_CONCAT(STR_CONCAT(sResults,nResult)," seconds.")

Output.Result=sResults
```

A simple scripting example—Continued

- 9) For initial testing (particularly if you have thousands of time-series Variables), the constant MAX_RECORDS should be set to 50 so that the process can be completed within a few seconds. You do not need to enter any script parameters when running this script and the results should be displayed as shown below:



If you want this process to only count readings from binary time series (and not virtual time-series), you can modify the definition of the query filter in the second script as follows:

```
String sFilter = "Where(Variables.TimeSeriesType,'%binary%')"
```

This will only include Variables where the TimeSeriesType field includes the string "binary".

Although this example is rather limited in application it does illustrate some of the power available within general scripts. The reliability of routine quality assurance can be significantly enhanced using automated scripts to regularly perform various routine checks and publish details of areas requiring attention as HTML outputs.



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