U2 XML Example

Below illustrates some U2 XDOM functions for working with an XML document.
The XML document should be placed in file &XML& with the ID of “SAMPLE.XML” to work with this code.

This example was created in response to the follow message posted on the u2-users group on 8th October 2008 which can be found at http://listserver.u2ug.org/.

```
Hello all,

I have to be able to parse out an XML file being sent by an
laboratory instrument.

Below is a sample file... I need to be able to get to the ID
attribute in SA, as well as the Key in AR, and AR's data.

I need to do this in BASIC, and pass the parsed data to another
routine.

I've tried with OpenXMLData, ReadXMLData with an extraction file
that I'm not positive how to build (samples I found don't deal with
attributes at all).

I also tried with the XDOMOpen/Locate/etc. with no luck either. I'm
about to go off and parse this thing myself but thought I'd try the
list before I do.

Any help is appreciated!

TIA,

Robert
```

XML from the message above cleaned up

Save this as “SAMPLE.XML” in file &XML&

<?xml version="1.0" encoding="utf-8"?>
<?xml-stylesheet type="text/xsl" <?xml version="1.0" encoding="UTF-16"?>
<?xml-stylesheet type="text/xsl" href="C:\IRIS2K1\Templates\SpecimenAnalysis-style.xsl"?>
<SA BF="URN" ID="021305941" SID="AP" OP="gloa" ADT="2005-06-08 16:03:32-08:00" ADTS="2005-06-08 16:03:32" RDT="2005-06-10 17:15:44-08:00" RDTS="2005-06-10 17:15:44" RP="2" SQN="0" RSQN="28" DILN="1" DILD="1" IMP="0" CDT="2005-06-08 16:03:32-08:00" CDTS="2005-06-08 16:03:32" REDT="2005-06-08 16:13:31-08:00" REDTS="2005-06-08 16:13:31">
 <PF></PF>
 <PF></PF>
 <PF></PF>
 <PF></PF>
 <PF></PF>
 <PF></PF>
 <PF></PF>
 <AC AT="Chemistry" AS="Done" SO="External">
  <AR Key="GLU" SN="GLU" LN="Glucose" AF="0" NR="30">Neg</AR>
  <AR Key="PRO" SN="PRO" LN="Protein" AF="0" NR="30">Neg</AR>
  <AR Key="BIL" SN="BIL" LN="Bilirubin" AF="0" NR="1+">Neg</AR>
  <AR Key="URO" SN="URO" LN="Urobilinogen" AF="1" NR="1+">3+</AR>
  <AR Key="PH" SN="PH" LN="pH" AF="1" NR="5.0">5.0</AR>
  <AR Key="BLD" SN="BLD" LN="Blood" AF="0" NR="Trace">Neg</AR>
  <AR Key="KET" SN="KET" LN="Ketone" AF="1" NR="1+">2+</AR>
  <AR Key="NIT" SN="NIT" LN="Nitrite" AF="1" NR="Pos">Pos</AR>
  <AR Key="LEU" SN="LEU" LN="Leukocytes" AF="1" NR="1+">4+</AR>
  <AR Key="CLA" SN="CLA" LN="Clarity" AF="0" NR="Hazy">Clear</AR>
  <AR Key="SG" SN="SPGR" LN="Specific Gravity" AF="0" NR="1.040">1.015</AR>
  <AR Key="COL" SN="COL" LN="Color" AF="0" NR="Amber">Colorless</AR>
 </AC>
 <AC AT="Sediment" AS="Done" SO="Internal">
  <AR Key="ART" SN="ART" LN="Artifact" AF="0" NR="99999999 /LPF">[none]</AR>
  <AR Key="RBC" SN="RBC" LN="Red Blood Cell" AF="1" NR="4 /uL">33 /uL</AR>
  <AR Key="WBC" SN="WBC" LN="White Blood Cell" AF="0" NR="6 /HPF">[none]</AR>
  <AR Key="WBCC" SN="WBCC" LN="White Blood Cell Clump" AF="1" NR="Occ">Many</AR>
  <AR Key="BACT" SN="BACT" LN="Bacteria" AF="0" NR="Few">Rare</AR>
  <AR Key="BYST" SN="BYST" LN="Budding Yeast" AF="0" NR="Few">[none]</AR>
  <AR Key="HYST" SN="HYST" LN="Hyphae Yeast" AF="0" NR="Few">[none]</AR>
  <AR Key="SQEP" SN="SQEP" LN="Squamous Epithelial" AF="0" NR="16 /HPF">[none]</AR>
  <AR Key="TREP" SN="TREP" LN="Transitional Epithelial" AF="0" NR="1 /HPF">[none]</AR>
  <AR Key="REEP" SN="REEP" LN="Renal Epithelial" AF="0" NR="1 /HPF">[none]</AR>
  <AR Key="OVFB" SN="OVFB" LN="Oval Fat Body" AF="0" NR="1 /LPF">1 /LPF</AR>
  <AR Key="FAT" SN="FAT" LN="Fat" AF="0" NR="1 /LPF">[none]</AR>
  <AR Key="MUCS" SN="MUCS" LN="Mucous" AF="0" NR="999999999 /LPF">[none]</AR>
  <AR Key="RBCC" SN="RBCC" LN="Red Blood Cell Clump" AF="0" NR="1 /LPF">[none]</AR>
  <AR Key="SPRM" SN="SPRM" LN="Sperm" AF="0" NR="[none]">Rare</AR>
  <AR Key="TRCH" SN="TRCH" LN="Trichomonas" AF="0" NR="Present">[none]</AR>
  <AR Key="NSE" SN="NSE" LN="Non-Squamous Epithelial" AF="0" NR="1 /HPF">< 1 /HPF</AR>
  <AR Key="UNCC" SN="UNCC" LN="Unclassified Cast" AF="0" NR="1 /LPF">[none]</AR>
  <AR Key="HYAL" SN="HYAL" LN="Hyaline Cast" AF="0" NR="3-5">[none]</AR>
  <AR Key="EPIC" SN="EPIC" LN="Epithelial Cast" AF="0" NR="1 /LPF">[none]</AR>
  <AR Key="WBCT" SN="WBCT" LN="White Blood Cell Cast" AF="0" NR="1 /LPF">[none]</AR>
  <AR Key="RBCT" SN="RBCT" LN="Red Blood Cell Cast" AF="0" NR="1 /LPF">[none]</AR>
  <AR Key="GRAN" SN="GRAN" LN="Granular Cast" AF="0" NR="1 /LPF">[none]</AR>
  <AR Key="CELL" SN="CELL" LN="Cellular Cast" AF="0" NR="1 /LPF">[none]</AR>
  <AR Key="BROAD" SN="BROAD" LN="Broad Cast" AF="0" NR="1 /LPF">[none]</AR>
  <AR Key="FATC" SN="FATC" LN="Fatty Cast" AF="0" NR="1 /LPF">[none]</AR>
  <AR Key="WAXY" SN="WAXY" LN="Waxy Cast" AF="0" NR="1 /LPF">[none]</AR>
  <AR Key="UNCX" SN="UNCX" LN="Unclassified Crystal" AF="0" NR="1 /HPF">1 /HPF</AR>
  <AR Key="TPO4" SN="TPO4" LN="Triphosphate Crystal" AF="0" NR="FEW">[none]</AR>
  <AR Key="CAOX" SN="CAOX" LN="Calcium Oxalate Crystal" AF="0" NR="FEW">[none]</AR>
  <AR Key="CAPH" SN="CAPH" LN="Calcium Phosphate Crystal" AF="0" NR="FEW">[none]</AR>
  <AR Key="CACB" SN="CACB" LN="Calcium Carbonate Crystal" AF="0" NR="FEW">[none]</AR>
  <AR Key="URIC" SN="URIC" LN="Uric Acid Crystal" AF="0" NR="FEW">[none]</AR>
  <AR Key="LEUC" SN="LEUC" LN="Leucine Crystal" AF="0" NR="POS">[none]</AR>
  <AR Key="CYST" SN="CYST" LN="Cystine Crystal" AF="0" NR="POS">[none]</AR>
  <AR Key="TYRO" SN="TYRO" LN="Tyrosine Crystal" AF="0" NR="POS">[none]</AR>
  <AR Key="AMOR" SN="AMOR" LN="Amorphous Crystal" AF="0" NR="FEW">[none]</AR>
  <AR Key="UNCL" SN="UNCL" LN="Unclassified" AF="0" NR="99999999 /LPF">[none]</AR>
  <AR Key="PC" SN="PC" LN="PC" AF="0" NR="[none]">1314 /uL</AR>
 </AC>
 <FL>CHEMCONFIRM</FL>
 <CM>This sample is contaminated!! Comment appears here!!!</CM>
 <ARV>42</ARV>
</SA>

Example Code

```
$INCLUDE UNIVERSE.INCLUDE XML.H
*
     EQU TRUE TO 1
     EQU FALSE TO 0
*
     DIM   SA.AC.NODES(10)
     SA.NODE.CNT = 1
*
     RTN.CODE = XDOMOpen("SAMPLE.XML", XML.FROM.FILE, XDOM)
     IF RTN.CODE = XML.SUCCESS THEN
        CRT "XML Document opened"

        ;* read attribute "ID" from node "SA"
        XPATH = "/SA"
        ATT.ID = "ID"
        GOSUB 100
        IF NOT(ERR) THEN
           CRT "SA, Attribute (ID) = <":VALUE:">."
*
           ;*****************************************************************
           ;* find all our nodes with a path of /SA/AC
           ;* and store them in our dimensioned array SA.AC.NODES
           ;*****************************************************************
           XPATH = "/SA/AC"
           GOSUB 200
*
           IF NOT(ERR) THEN
              SA.AC.NODES(SA.NODE.CNT) = FND.NODE
              NEW.NODE = FND.NODE
              LOOP
                 RTN.CODE = XDOMLocateNode(NEW.NODE, XDOM.NEXT.SIBLING.WITH.SAME.NAME, 1,
XDOM.ELEMENT.NODE, NEW.NODE)
              WHILE RTN.CODE = XML.SUCCESS
                 SA.NODE.CNT += 1
                 SA.AC.NODES(SA.NODE.CNT) = NEW.NODE
              REPEAT
           END
*

           ;*****************************************************************
           ;* loop through our found nodes and find our "AR" children
           ;*****************************************************************
           FOR X = 1 TO SA.NODE.CNT

              ;* print out our AC, AT attribute  value
              FND.NODE = SA.AC.NODES(X)
              ATT.ID = "AT"
              GOSUB 300
              CRT "  ":VALUE
*
              ;* find our "AR" node
              RTN.CODE = XDOMLocate(SA.AC.NODES(X), "AR", "", FND.NODE)
              GOSUB 400
*
              LOOP
                 RTN.CODE = XDOMLocateNode(FND.NODE, XDOM.NEXT.SIBLING.WITH.SAME.NAME, 1,
XDOM.ELEMENT.NODE, FND.NODE)
              WHILE RTN.CODE = XML.SUCCESS
                 ;* locate our text node in "AR" to get results
                 GOSUB 400
              REPEAT
           NEXT X
        END
     END ELSE
        CRT "ERROR: unable to open xml document!"
     END
     RETURN
```

Example Code (cont)

```
*
100: *** read attribute from node ***
*
*    XPATH (IN):  path of the node to read
*    ATT.ID (IN): id of the attribute to get the value of
*
*    VALUE (OUT): value of the attribute, otherwise ""
*    ERR   (OUT): true if an error occurred
*
     ERR = FALSE
*
     VALUE = ""
     GOSUB 200
     IF NOT(ERR) THEN
        GOSUB 300
     END
     RETURN

*
200: *** locate node ***
*
*    XPATH (IN):  path of the node to read
*
*    FND.NODE (OUT):   node that was found
*    ERR      (OUT):   true if an error occurred
*
     ERR = FALSE
     RTN.CODE = XDOMLocate(XDOM, XPATH, "", FND.NODE)
     IF RTN.CODE # XML.SUCCESS THEN
        CRT "ERROR: unable to locate XPATH <":XPATH:">"
        ERR = TRUE
     END
     RETURN

*
300: *** read attribute ***
*
*    ATT.ID   (IN) : attribute to read
*    FND.NODE (IN) : node to read attribute from
*
*    VALUE    (OUT): value of the attribute, otherwise ""
*    ERR      (OUT): true if an error occurred
*
     ERR = FALSE
     RTN.CODE = XDOMGetAttribute(FND.NODE, ATT.ID, ATT.NODE)
     IF RTN.CODE = XML.SUCCESS THEN
        RTN.CODE = XDOMGetNodeValue(ATT.NODE, VALUE)
     END ELSE
        CRT "ERROR: unable to read attribute <":ATT.ID:">"
        ERR = TRUE
     END
     RETURN
*
400: *** read results and display ***
*
     ;* locate our text node in "AR" to get results
     RTN.CODE = XDOMLocateNode(FND.NODE, XDOM.CHILD, XDOM.FIRST.CHILD, XDOM.TEXT.NODE, TEXT.NODE)
     RTN.CODE = XDOMGetNodeValue(TEXT.NODE, TEXT.VALUE)
*
     ATT.ID = "Key"
     GOSUB 300
     CRT "    ":VALUE:" = ":TEXT.VALUE
     RETURN
*
END
```

Output

```
XML Document opened
SA, Attribute (ID) = <021305941>.
  Chemistry
    GLU = Neg
    PRO = Neg
    BIL = Neg
    URO = 3+
    PH = 5.0
    BLD = Neg
    KET = 2+
    NIT = Pos
    LEU = 4+
    CLA = Clear
    SG = 1.015
    COL = Colorless
  Sediment
    ART = [none]
    RBC = 33 /uL
    WBC = [none]
    WBCC = Many
    BACT = Rare
    BYST = [none]
    HYST = [none]
    SQEP = [none]
    TREP = [none]
    REEP = [none]
    OVFB = 1 /LPF
    FAT = [none]
    MUCS = [none]
    RBCC = [none]
    SPRM = Rare
    TRCH = [none]
    NSE = < 1 /HPF
    UNCC = [none]
    HYAL = [none]
    EPIC = [none]
    WBCT = [none]
    RBCT = [none]
    GRAN = [none]
    CELL = [none]
    BROAD = [none]
    FATC = [none]
    WAXY = [none]
    UNCX = 1 /HPF
    TPO4 = [none]
    CAOX = [none]
    CAPH = [none]
    CACB = [none]
    URIC = [none]
    LEUC = [none]
    CYST = [none]
    TYRO = [none]
    AMOR = [none]
    UNCL = [none]
    PC = 1314 /uL
```