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<!--
     * Title:       ServiceComponentProfile
     * Description: The ServiceComponentProfile gives the possibility
                    to specify service components in the scope of a
                    QoS request towards a QoS enabled transport
                    network. The ServiceComponentProfile offers
                    different quality levels for single service
                    components like voice, video etc. Therefor beside
                    the specification the QoS requirement attributes
                    in a generic way, it is possible to describe the
                    offered quality options in a first step at
                    end-user level, in a second step at network level.
                    The QoS attributes are extended with weights in
                    order to precise the requirements.
                    Except the AQUILASpecification needed for the
                    project, every other component of the
                    specification is generic.
     * Copyright:   Copyright(c) Anne Thomas
     * Company:     TU Dresden
     * @author:     Anne Thomas
     * @E-mail:     Anne.Thomas@inf.tu-dresden.de
     * @version:    09/04/2002 V1 - with weights
     */
 -->
<!ELEMENT ServiceComponentProfile  (QoSRequirement, Option+)>

<!ATTLIST ServiceComponentProfile
    name CDATA #REQUIRED
    serviceComponent (AUDIO | SPEECH | VIDEO | DATA | OTHER) #REQUIRED
>
<!--
    The QoSRequirement part of the ServiceComponentProfile corresponds
    to the general QoS requirements of the service component under
    whose the service component can work properly.
 -->
<!ELEMENT QoSRequirement (maxDelay, maxJitter, maxLoss, bwGuarantee,
ordering)>
<!--
    maxDelay    : "one way latency as unit milliseconds"
    maxJitter   : "delay variation as unit milliseconds"
    maxLoss     : "packet loss probability as unit percent"
    bwGuarantee : "percentage of bandwidth that is guaranteed"
    ordering    : "Must the packets be ordered?"
-->
    <!ELEMENT maxDelay (#PCDATA)>
    <!ATTLIST maxDelay
        unit CDATA #FIXED "ms"
        requirement (veryLow | low | medium | high | veryHigh
        | notRelevant) "medium"
        weight (0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10) "5"
    >
    <!ELEMENT maxJitter (#PCDATA)>
    <!ATTLIST maxJitter
        unit CDATA #FIXED "ms"
        requirement (veryLow | low | medium | high | veryHigh
        | notRelevant) "medium"
        weight (0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10) "5"
    >
    <!ELEMENT maxLoss (#PCDATA)>
    <!ATTLIST maxLoss
        unit CDATA #FIXED "percent"
        requirement (veryLow | low | medium | high | veryHigh
        | notRelevant) "medium"
        weight (0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10) "5"
    >
    <!ELEMENT bwGuarantee (#PCDATA)>
    <!ATTLIST bwGuarantee
        unit CDATA #FIXED "percent"
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        requirement (veryLow | low | medium | high |
        veryHigh | notRelevant) "medium"
        weight (0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10) "5"
    >
    <!ELEMENT ordering EMPTY>
    <!ATTLIST ordering
        requirement (true | false) "true"
        weight (0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10) "5"
    >
<!--
    An Option corresponds to a "quality" level that is proposed by
    the implementation of the service compoenent, e.g. picture  size,
    sound quality. An Option consists of the generic so called
    SessionCharacteristics (the characteristics in the end-user
    language) and TrafficSpecification (describing the traffic
    produced by the application in qualitative and  quantitative
    terms, and the AQUILA dependent AQUILASpecification (technical
    information related to the NSs)
 -->
<!ELEMENT Option (SessionCharacteristic+, TrafficSpecification?,
AQUILASpecification?)>
<!--
    optionID    : explicit identifier of an option. In a service
                  component profile optionIDs should be unique.
    description : adjective, terms describing the service
                  component (e.g. medium, 4CIF ...)
    NetworkSpeed: explicit identifier of a network speed / end-user
                  equipment reference.  This NetworkSpeed attribut is
                  used as an ID that is aimed to be used in
                  correlation with the End-User Profile. Some
                  applications like NetMeeting adapt their traffic to
                  the end-user equipment. Therefore it is necessary in
                  the ServiceComponentProfile to refer to this
                  characteristic of the end-user equipment.
                  The description of the equipment of the end-user
                  profile should be the same as this NetworkSpeed
                  identifier.
-->
<!ATTLIST Option
    optionID CDATA #REQUIRED
    description CDATA #IMPLIED
    NetworkSpeed CDATA #IMPLIED
>
    <!ELEMENT SessionCharacteristic (name, semanticalGroup*)>
    <!--
        name            : of the service component (e.g. picture size)
        semanticalGroup : semantical group for the service component
                          (e.g. user friendly description, in english)
        qualifier       : adjective, terms describing the service
                          component (e.g. medium, 4CIF ...)
     -->
        <!ELEMENT name (#PCDATA)>
        <!ELEMENT semanticalGroup (description, qualifier*)>
        <!ATTLIST semanticalGroup
            type (Technical | UserFriendly) "UserFriendly"
            language (en | de | po | fr | it | es | fi | gr) "en"
        >
            <!ELEMENT qualifier (#PCDATA)>
    <!ELEMENT TrafficSpecification  (type+, duration, adaptivity,
    burstiness, packetSize, bitRate, flow)>
    <!--
        type       : "type of the traffic"
        duration   : "living time of the traffic"
        adaptivity : "adaptivity of the traffic to the capacity of the
                      connection (application level QoS adaptation)"
        burstiness : "burstiness of the traffic"
        packetSize : "size ofthe packet"
        bitRate    : "bit rate"
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        flow       : "greediness of the flow"
    -->
        <!ELEMENT type EMPTY>
        <!ATTLIST type
            type (realTime | nonRealTime | stream |
            elastic) "nonRealTime"
        >
        <!ELEMENT duration EMPTY>
        <!ATTLIST duration
            value (shortLiving | longLiving )
            "shortLiving"
        >
        <!ELEMENT adaptivity EMPTY>
        <!ATTLIST adaptivity
            value (true | false) "false"
        >
        <!ELEMENT burstiness EMPTY>
        <!ATTLIST burstiness
            value (true | false) "false"
        >
        <!ELEMENT packetSize (averagePacketSize?, maximumPacketSize?,
        minimumPolicedUnit?)>
        <!ATTLIST packetSize
            variability (constant | variable) "constant"
            qualitatively (verySmall | small | medium | big
            | veryBig) "medium"
        >
            <!ELEMENT averagePacketSize (#PCDATA)>
            <!ATTLIST averagePacketSize
                unit CDATA #FIXED "bytes"
                qualitatively (verySmall | small | medium | big
                | veryBig) "medium"
            >
            <!ELEMENT maximumPacketSize (#PCDATA)>
            <!ATTLIST maximumPacketSize
                unit CDATA #FIXED "bytes"
                qualitatively (verySmall | small | medium | big
                | veryBig) "medium"
            >
            <!ELEMENT minimumPolicedUnit (#PCDATA)>
            <!ATTLIST minimumPolicedUnit
                unit CDATA #FIXED "bytes"
                qualitatively (verySmall | small | medium | big
                | veryBig) "medium"
            >
        <!ELEMENT bitRate (peakRate?, averageRate)>
        <!ATTLIST bitRate
            variability (constant | variable) "constant"
            qualitatively (veryLow | low | medium | high |
            veryHigh) "medium"
        >
            <!ELEMENT peakRate (#PCDATA)>
            <!ATTLIST peakRate
                unit CDATA #FIXED "bit/s"
                qualitatively (veryLow | low | medium | high |
                veryHigh) "medium"
            >
            <!ELEMENT averageRate (#PCDATA)>
            <!ATTLIST averageRate
                unit CDATA #FIXED "bit/s"
                qualitatively (veryLow | low | medium | high |
                veryHigh) "medium"
            >
        <!ELEMENT flow EMPTY>
        <!ATTLIST flow
            value (greedy | non-greedy) "non-greedy"
        >
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    <!ELEMENT AQUILASpecification (serviceID, BSP, BSS, minPU, maxPS,
    PR, SR)>
    <!--
        serviceID : Name of the AQUILA NS
        BSP       : bucket size for PR (bytes)
        BSS       : bucket size for SR (bytes)
        minPU     : minimum policed unit (bytes)
        maxPS     : maximum (allowed) packet size (bytes)
        PR        : peak rate (bit/s)
        SR        : sustainable rate (bit/s)
        EAR       : Expected Average Rate (bit/s) - Not used
        PR1       : first threshold for bilevel (bit/s) - Not used
        PR2       : second threshold for bilevel (bit/s) - Not used
    -->
        <!ELEMENT serviceID EMPTY>
        <!ATTLIST serviceID
            value (PCBR | PVBR | PMM | PMC | STD | CUSTOM) "STD"
        >
        <!ELEMENT BSP (#PCDATA)>
        <!ATTLIST BSP
            unit CDATA #FIXED "bytes"
        >
        <!ELEMENT BSS (#PCDATA)>
        <!ATTLIST BSS
            unit CDATA #FIXED "bytes"
        >
        <!ELEMENT minPU (#PCDATA)>
        <!ATTLIST minPU
            unit CDATA #FIXED "bytes"
        >
        <!ELEMENT maxPS (#PCDATA)>
        <!ATTLIST maxPS
            unit CDATA #FIXED "bytes"
        >
        <!ELEMENT PR (#PCDATA)>
        <!ATTLIST PR
            unit CDATA #FIXED "bit/s"
        >
        <!ELEMENT SR (#PCDATA)>
        <!ATTLIST SR
            unit CDATA #FIXED "bit/s"
        >


<!ELEMENT description (#PCDATA)>
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