

# Introducing MPE G-7 & MPE G-7 Audio

AES Amsterdam Workshop on MPEG-7

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# MPEG-7 Goals

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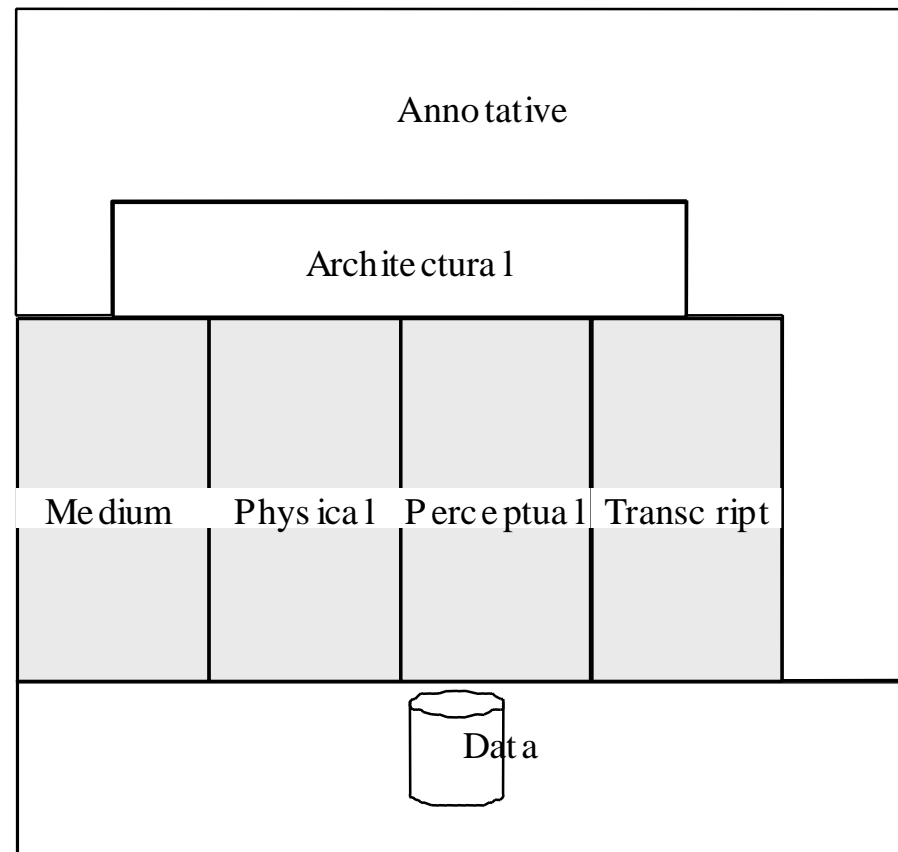
- Multimedia Content Description Interface
- Many applications
- Media agnostic
- Extensible
- Compatible with existing technologies
- A large, encompassing standard

# Some Terms

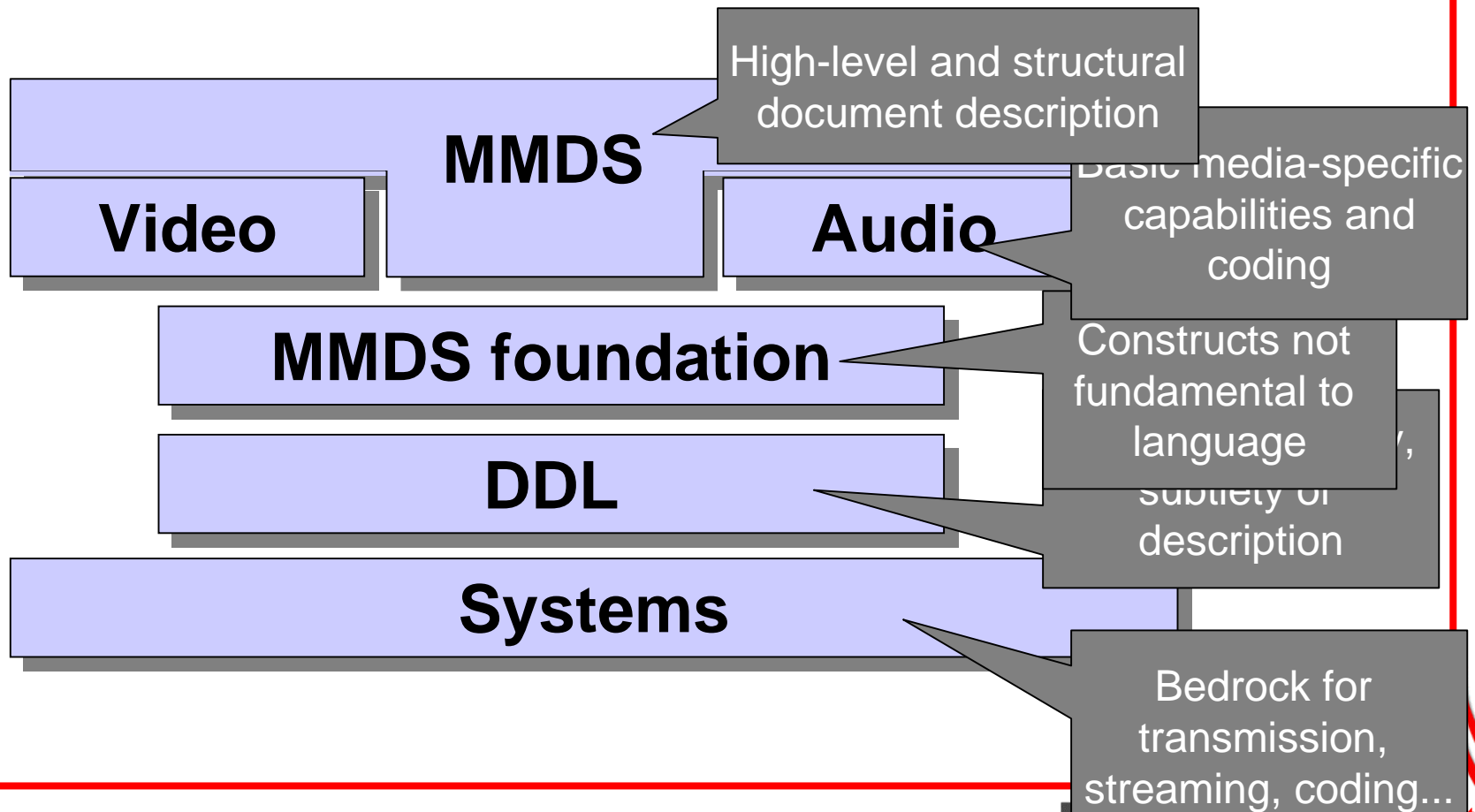
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- DDL
  - Description Definition Language
- DS
  - Description Scheme
- D
  - Descriptor

# MPEG-7 Descriptions



# MPEG-7 Architecture



13 May 2001

AES Workshop, Amsterdam

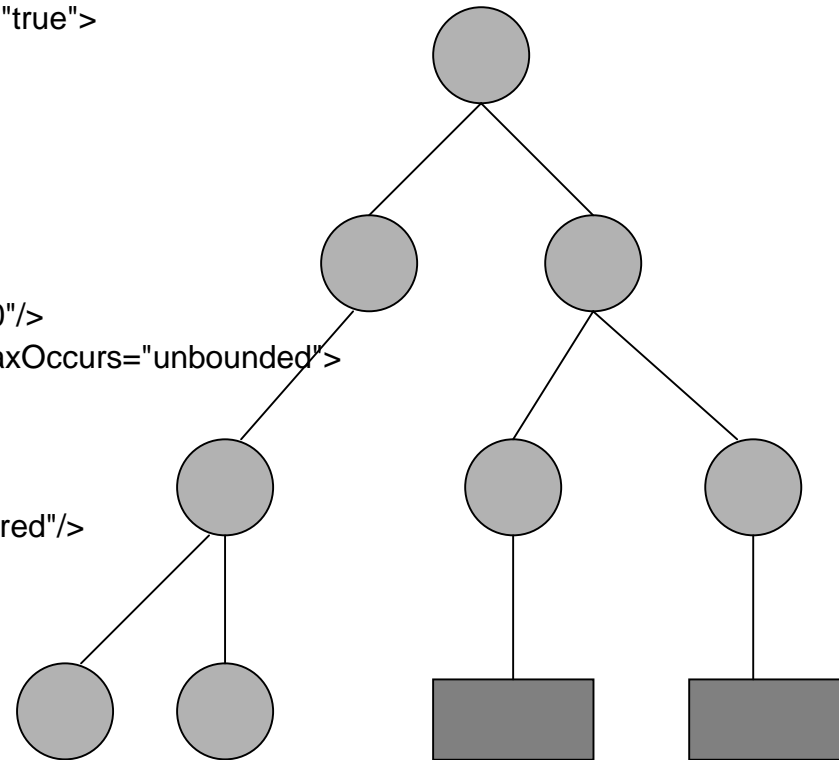
# How Audio fits in the Standard

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- What you need to know:
- DDL
  - ➔ Based on XML-Schema
  - ➔ Determines “what goes where”

# DDL

```
<complexType name="AudioLLDScalarType" abstract="true">
  <complexContent>
    <extension base="mpeg7:AudioDType">
      <choice>
        <element name="SegmentSummary">
          <complexType>
            <sequence>
              <element name="Mean" type="float" minOccurs="0"/>
              <element name="OtherMethod" minOccurs="0" maxOccurs="unbounded">
                <complexType>
                  <simpleContent>
                    <extension base="float">
                      <attribute name="label" type="string" use="required"/>
                    </extension>
                  </simpleContent>
                </complexType>
              </element>
            </sequence>
          </complexType>
        </element>
      </choice>
    </extension>
  </complexContent>
</complexType>
```



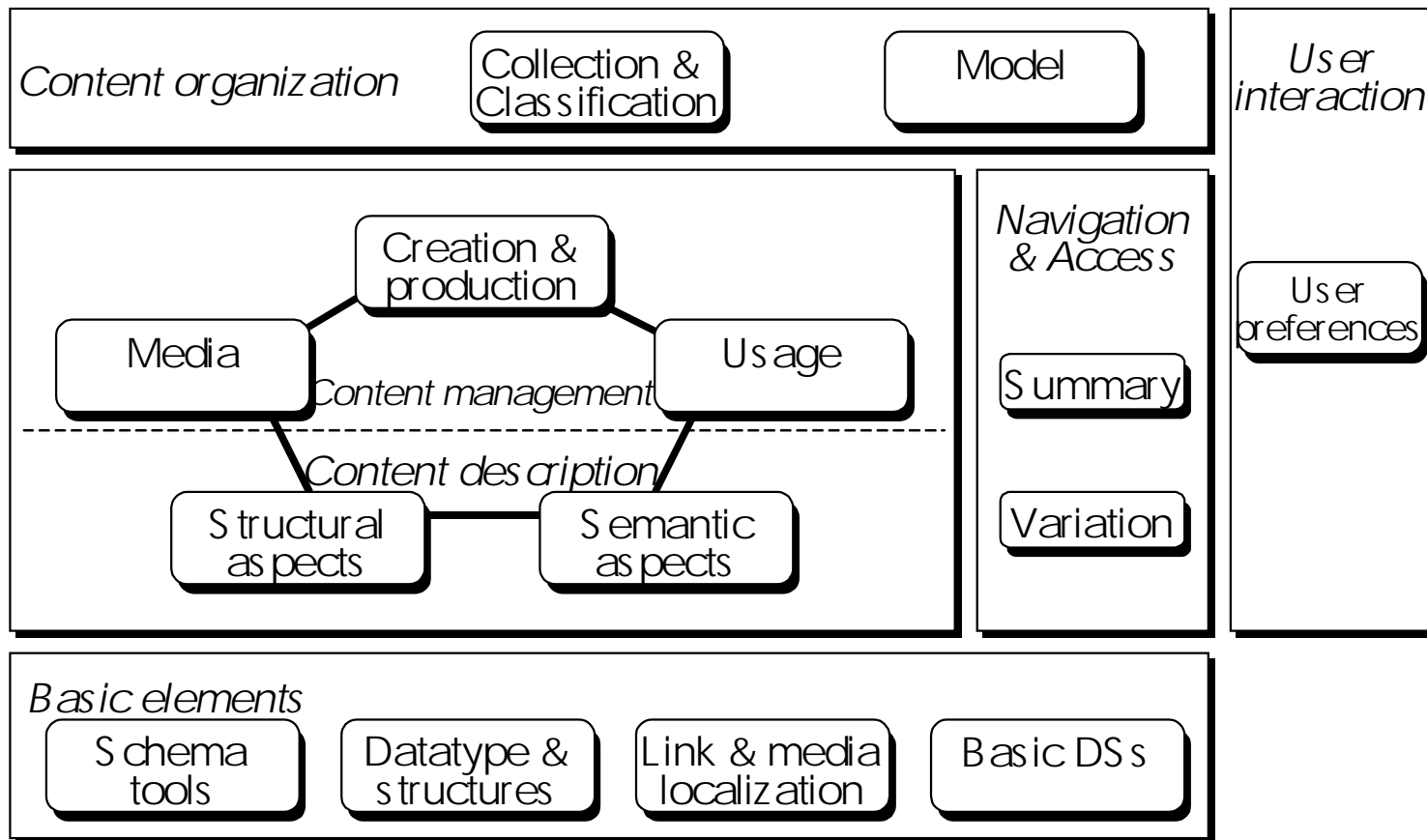
# How Audio fits in the Standard

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- What you need to know:
- DDL
- MDS constructs
  - ➔ Basic data types
    - » e.g. vectors, time, refs, links
  - ➔ Segment
  - ➔ Controlled term

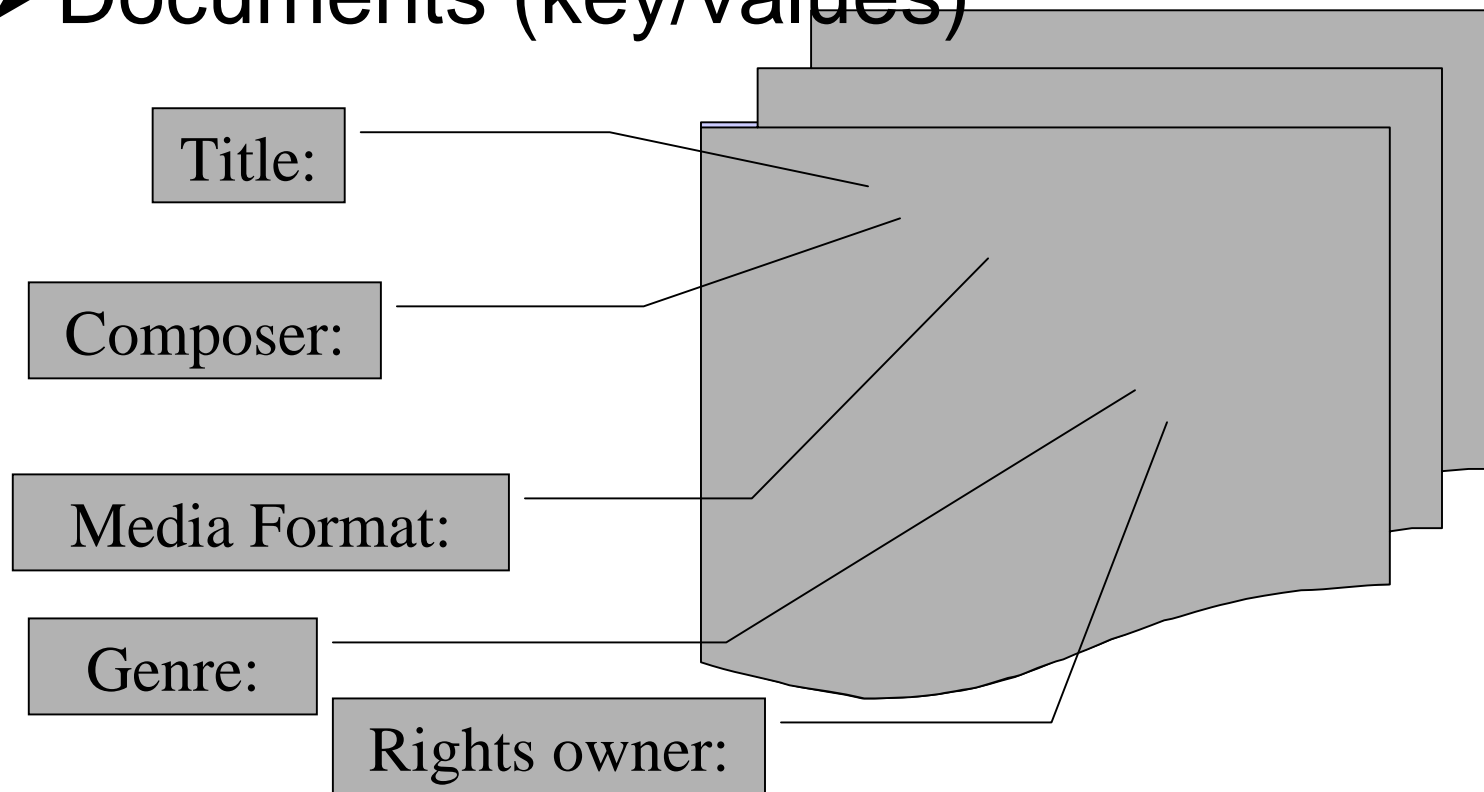


# MPEG-7 Description Schemes



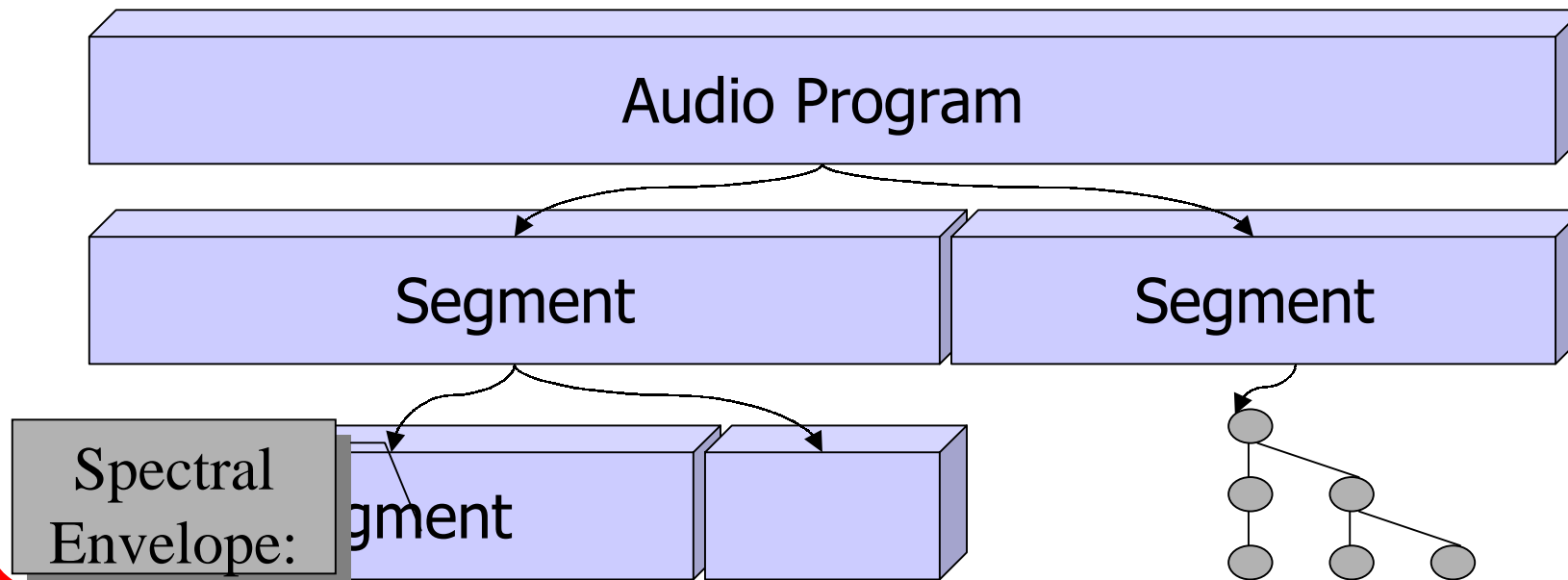
# MPEG-7 Description constructs

## ➤ Documents (key/values)



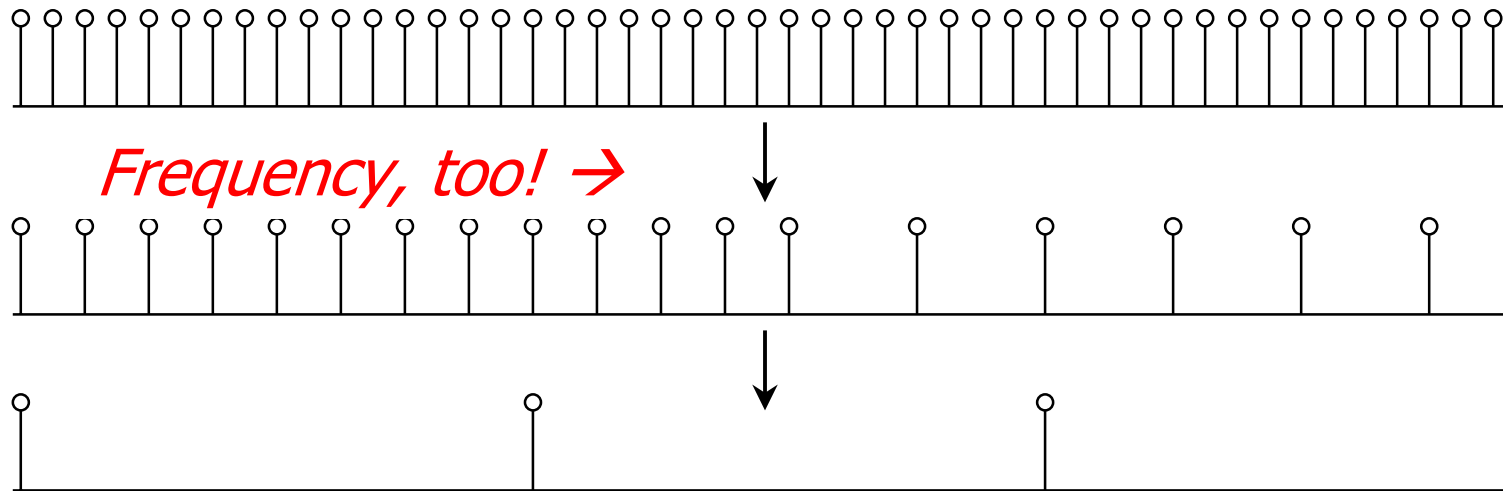
# MPEG-7 Description constructs

- Documents
- Segments



# MPEG-7 Description constructs

- Documents
- Segments
- Scalable Series



# MPEG-7 Audio

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- High-level application tools:
  - ➔ Spoken Content
  - ➔ Sound Recognition framework
  - ➔ Musical Instrument Timbre Similarity
  - ➔ Melody and Melodic Contour
  - ➔ Robust Audio Matching



# MPE G-7 Audio

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- High-level application tools
- Low-level audio description framework
  - ➔ Structures
    - » Segments and Scalable series
  - ➔ Descriptors...

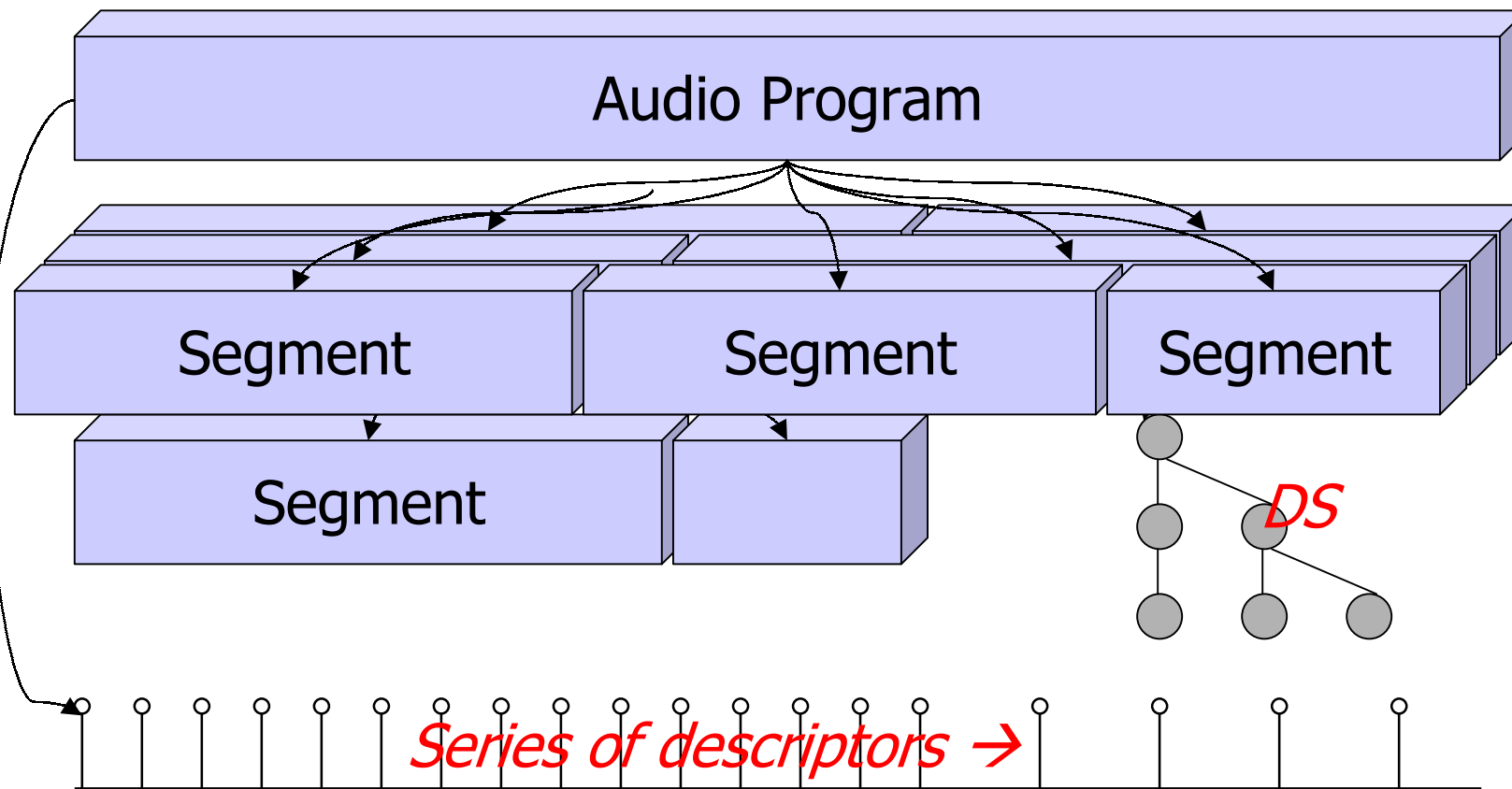


# Low-level descriptors

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- **Basic**
  - Instantaneous Waveform & Power
- **Basic Spectral**
  - Log-frequency power spectrum, Spectral envelope, centroid, spread, flatness
- **Signal Parameters**
  - Fundamental freq, Harmonicity
- **Timbral Temporal**
  - Log attack time, Temporal Centroid
- **Timbral Spectral (lin-freq)**
  - Harmonic Spectral Centroid, deviation, spread, variation
- **Spectral Basis representations**
  - Projections into T/F basis functions

# Put it all together: a typical partial description





# Conclusion

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- Large standard
  - ➔ Pick & choose elements as desired
  - ➔ Building block approach
- MPEG-7 Audio provides low-level tools
  - ➔ Basis for compatibility across applications
- Standard shows good integration
  - ➔ Complements other parts of standard
  - ➔ Conceived as a whole
- High-level applications are where it shows the power of content-based representation

# The End

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➤ Questions?

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`www.mpeg-7.com`

`www.cseit.it/mpeg/`

`www.darmstadt.gmd.de/mobile/MPEG7/`