MCT Challenge #1

To assist in the understanding of the MCT proposal, this simple challenge exercise is proposed for confirming two capabilities of MCT:

1. Demonstration that a common simple case of single cross-cutting deletions is handled in some manner by MCT, with sufficient detail to understand what a consumer needs to do to present the tracking in a form that would be recognized by the user who made the modification.

2. Confirmation of the degree to which this case, which is handled by implementations of ODF change-tracking, is interoperable between MCT, ODF 1.2 change-tracking, and Microsoft Office change-tracking.

The goal is to have a grounded comparison against provisions that are already supported in existing change-tracking implementations.

Challenge #1 Conditions

In terms of what users see, a single selection is made that cross-cuts structural forms of a document. In particular, the end of one paragraph is selected along with the beginning of the next paragraph. The second paragraph has different paragraph and text styles:

![Change-Tracking Challenge #1](image)

This is a simple demonstration of cross-structure change-tracked deletion.

The deletion is a single operation striking the end of one paragraph and the beginning of the next, resulting in a single post-deletion paragraph. Subsequent challenges will involve compounding of deletions to reflect how they are tracked. It is also important to understand how deletion deals with the indentation of this paragraph.

To demonstrate that this is a legitimate use case, the same exercise is carried out with WordProcessing OOXML (via Microsoft Word 2013) and ODF Text (via LibreOffice Writer 3.6.2).

This is the selection for the single deletion.

*Figure 1. Document illustrating the cross-structure selection (here: Microsoft Office Word)*

The required action is to have deleted that selected material as a single action: The change is recognizable as the result of a single act in the persistent form of the change-tracked document (Figure 2, next page).

[Note: Although Microsoft Office Word 2013 accepts the single act of deletion, it is tracked as two changes: The first change is removal of the indentation of the second paragraph. Then the deletion of text is recorded. Rejection of the change requires two actions.]
Challenge #1 Grounding

The persistent document that existed before the selection and tracked deletion is a simple document with no change-tracking information whatsoever.

Using a current ODF 1.2 implementation, the persistent ODF 1.2 document that is produced carries markup that contains the resulting text and auxiliary material that tracks the changes that were made from the original form. The combination is usable in presenting the document with “red-lining” that illustrates the removal of material (Figure. 2).

![Image showing a change-tracked document in LibreOffice Writer]

Figure 2. Presentation of the single deletion in a change-tracked document (in LibreOffice Writer)

Challenge #1 Statement

What is the markup and auxiliary data that is recorded under MCT to track this change?

This need only be a specimen that reflects the methodology. But the specimen must be precise and detailed enough to understand how presentation of the changes and any acceptance and rejection of the changes can be carried out by a computer program.
**ODF 1.2 Markup Comparison**

The following markup is provided to demonstrate the details handled in an ODF 1.2 implementation of the Challenge #1 case. This is offered to ground the level of detail that MCT must address.

**Original Document**

![XML code for the original document]

*Figure 3. The portion of ODF document to be changed.*

The portion of the ODF version of the document which will be changed by making the deletion with tracked changes is straightforward (Figure 3). The additional material in this document that is potentially impacted is in the automatic styles referenced from within the paragraphs (Figure 4).

![XML code for the automatic styles]

*Figure 4. Automatic Styles applicable to the paragraphs.*
Change-Tracked Deletion

When the document with the change-tracked deletion is made persistent, the text having the deletion has the following form:

In the resulting single-paragraph markup, the following differences are present:

- The single paragraph has Normal style directly, without the derived-from-Normal automatic styles used in the original (Fig. 3).
- There is a new element, <text:change>, at the deletion point. That element has a text:change-id IDREF attribute with value "ct270478544".
- The <text:s text:c="2"> element has been replaced by a single space character and a plain <text:s>, the recommended format for a run of two space characters.
- There are now <text:span> elements to introduce the different formatting via automatic styles at the two sides of the deletion point.

None of the changes at this level are particularly material on the face of it. The post-deletion representation is faithful to the appearance seen by the user. The only direct artifact of there being a tracked change is the <text:change> element.

**MCT Challenge:** What is the MCT markup for the post-deletion content?
The details of the tracked deletion are found near the top of the `content.xml <office:text>` element:

![XML code snippet]

**Figure 6. The details of the change-tracked deletion**

The following features are noteworthy (Figure 6):

- The `<text:changed-region>` element is identified for matching with the `<text:change>` element in the paragraph having the deletion (Fig. 5).

- The apparent duplication in the `xml:id` and the `text:id` attribute values is for down-level compatibility with ODF 1.1 and earlier processors. In the ODF 1.2 schema, only the `xml:id` attribute value is of type ID. In down-level schemas, the `xml:id` is foreign and the `text:id` is of type ID. This has the IDREF in the `<text:change>` element be resolved correctly either way.

- The tracked deletion is time-stamped and associated with an user in the `<office:change-info>` element. There are no optional `<text:p>` elements for commentary in this instance.

- In the same manner as for the text where the deletion occurred, `<text:span>` elements are introduced along with limitation of the `<text:p>` styles to Normal. **This adjustment reflects an implementation defect:** There is no longer any reflection of the second paragraph being block-indented. That is not a limitation of ODF 1.2 change-tracking.

**MCT Challenge:** What is the MCT representation of the tracked deletion detail? How is it connected for presentation of the deletion and acceptance/rejection?
For completeness, here are the only automatic styles employed in the tracked change and the paragraph where the deletion occurred. Compare with Figure 4. Note the loss of a style feature that only exists on paragraph-level styles.

**Accompanying Material**

The Zip package carrying this MCT Challenge #1 document has the following materials:

- **CT-2012-10-13-1256-MCT-Challenge-01.odt**
  This ODF 1.2 Text document.

- **CT-2012-10-04-1554-Challenge-01.odt**
  The ODF 1.2 Text document in the original form before it was opened and the tracked deletion performed.

- **CT-2012-10-04-1617-Challenge-01-tracked.odt**
  The ODF 1.2 Text document created by saving the document that resulted from the tracked deletion.