



OpenOffice.org

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# Visualize Writer Document Structure for Productive Development

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# Agenda



- **Writer's Challenges to Developers**
- A Tool Based on Visualizing Data Infrastructure of Writer
- Benefits of the Tool
- Future Enhancements of the Tool
- Q/A?

# Writer's Challenges to Developers



## ● Challenges

- Powerful and complex OpenOffice Writer
- Unexpectedly damaged frame structure or data relations
- Easily plunged into disordered situations for developers when tracing Writer code
- Poor productivity to solve problems, especially related to formatting

## ● Requirements

- Possibility to solve problems quickly, avoiding to study complex code details
- Possibility to share knowledge in practical code study

# Agenda



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# A Tool Based on Visualizing Data Infrastructure of Writer



## ● Main Idea

- Record information of node and frame for visualization
- Compare the information snapshots to identify the information changes
- Diagnose root cause through analysing the data changes
- Organise the visualization information with hierarchy structure

## ● Implementation

- Provide functions to go through all the nodes and print out the nodes' index, type, string content, memory address and their relations
- Provide functions to go through all frames and print out their type, memory address, register's address and their relations
- Print portion information along with printing the information of a frame

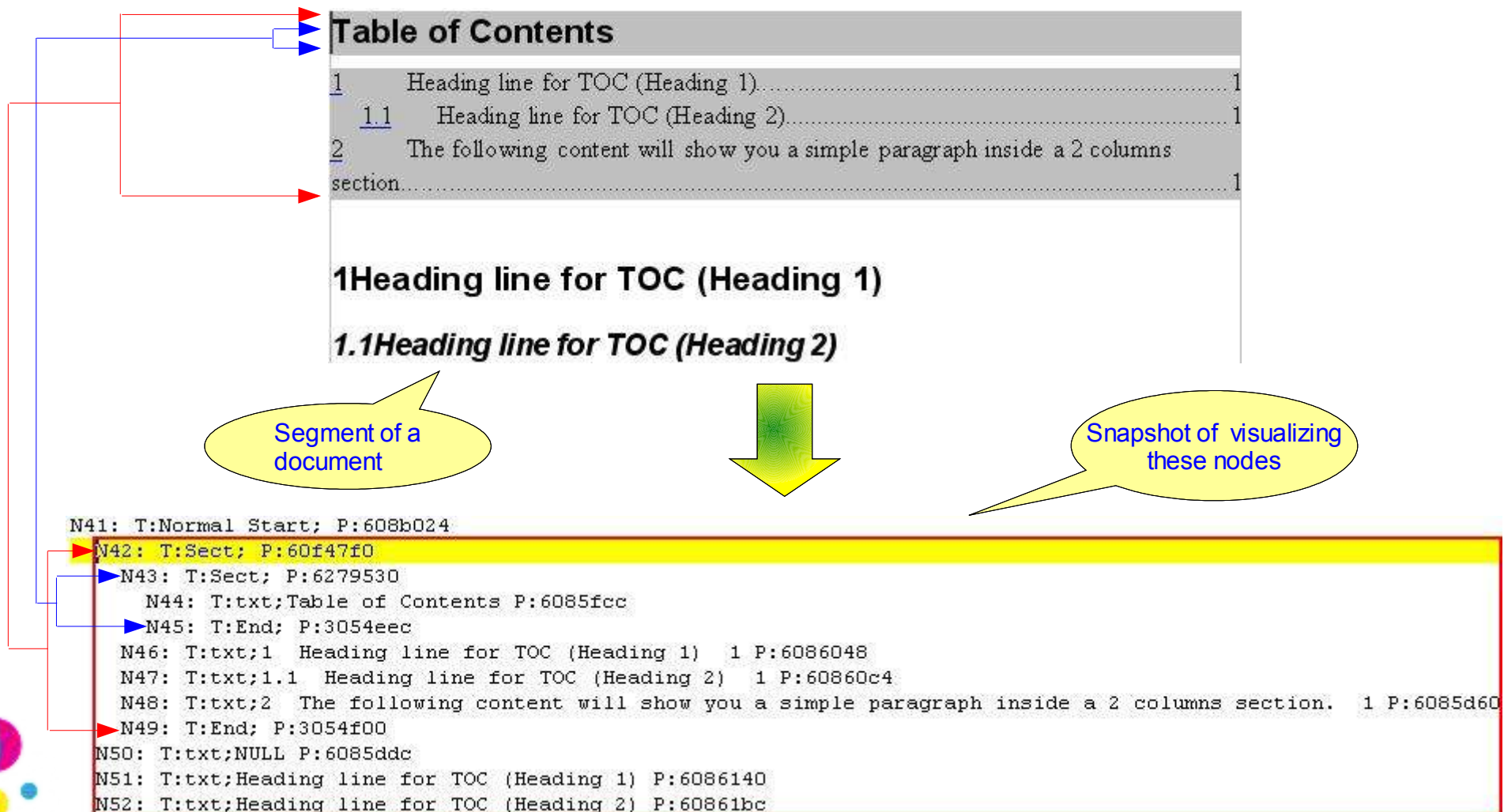
# Agenda



- Writer's Challenges to Developers
- A Tool Based on Visualizing Data Infrastructure of Writer
- **Benefits of the Tool**
- Future Enhancements of the Tool
- Q/A?

# Benefits of the Tool

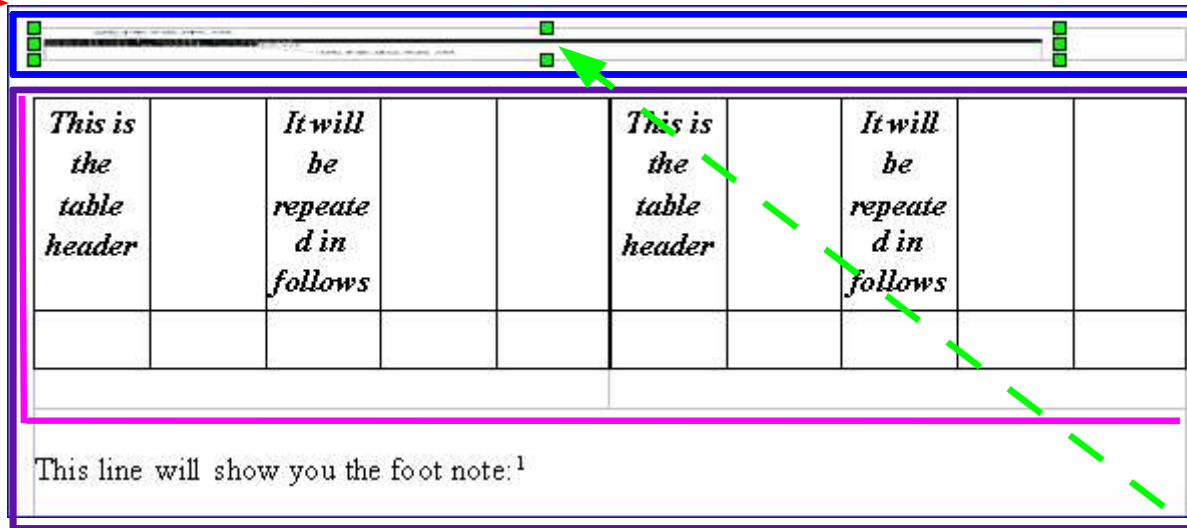
## ● Visualize Nodes Information





# Benefits of the Tool

## ● Visualize Frames Information (1)



<i>This is the table header</i>		<i>It will be repeated in follows</i>			<i>This is the table header</i>		<i>It will be repeated in follows</i>		
This line will show you the foot note: <sup>1</sup>									

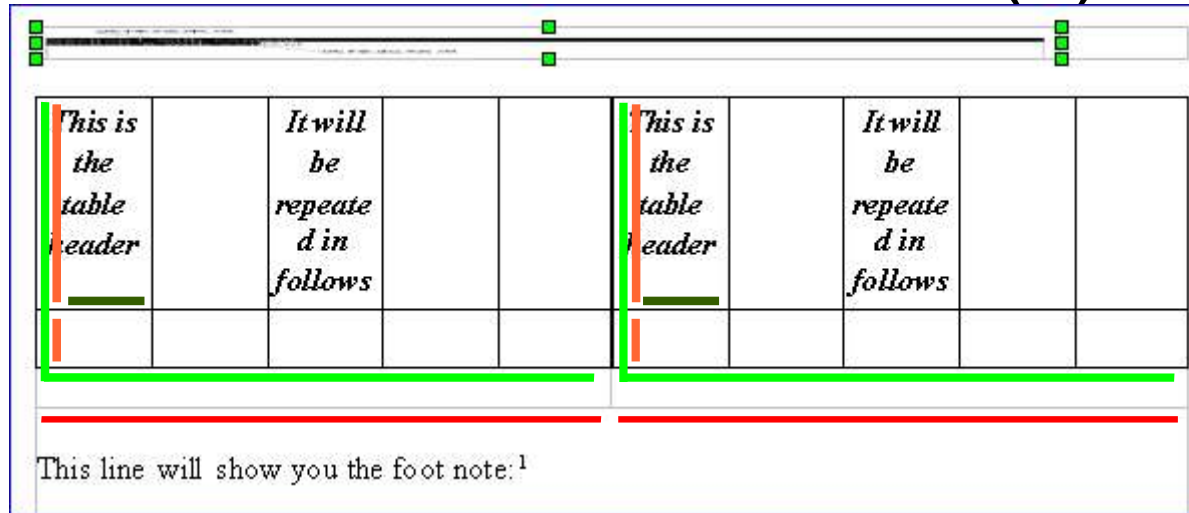
Segment of a document

Snapshot of the Segment

```
PAGE 6108590 R:6106db8-> HEAD 61093bc R:608ca04-> TEXT 60c0d04 R:6085e58-> POR_PARA :0x06134ce0 POR_FLYCNT :0x06252170  
=> FLYI 6352178 R:610db20-> NTXT 6083c38 R:1d991f0  
BODY 6108e64 R:608c6ec-> SECT 622ef2c R:608c954 Master Frm:622f064->  
CLMN 622f894 R:608c8fc-> BODY 6108e10 R:608c6ec-> TABL
```

# Benefits of the Tool

## ● Visualize Frames Information (2)



<i>This is the table header</i>		<i>It will be repeated in follows</i>			<i>This is the table header</i>		<i>It will be repeated in follows</i>		

This line will show you the foot note: <sup>1</sup>

```
CLMN 622f894 R:608c8fc-> BODY 6108e10 R:608c6ec-> TABL 60f1b9c R:606f044 Follow Frm:60f1b2c Master Frm:60f1c0c->
ROWN 60dd078 R:6107b7c-> CELL 60bf8f8
CELL 60bf894
CELL 60bf830
CELL 60bf7cc
CELL 60bf768
ROWN 60dd26c R:6107a74-> CELL 60c02bc
CELL 60c0258
CELL 60c01f4
CELL 60c0190
CELL 60c012c

CLMN 622f83c R:608c9ac-> BODY 6108dbc R:608c6ec-> TABL 60f1b2c R:606f044 Master Frm:60f1b9c->
ROWN 60dd014 R:6107b7c-> CELL 60bf704
CELL 60bf6a0
CELL 60bf63c
CELL 60bf5d8
CELL 60bf574
ROWN 60dd0dc R:6107a1c-> CELL 60bfaec
CELL 60bfa88
CELL 60bfa24
CELL 60bf9c0
CELL 60bf95c
```

# Benefits of the Tool

## ● An Operation Description:

- Launch Writer and New a Document
- Insert 2 parallel sections into the beginning of the document and Input some words in both sections
- Select some words from any position of the second section to certain middle position of the first section, delete the selected content
- Undo once, writer crashed

Section1	with content
Section 2	with content

The tool is used to know about how the data changes

# Benefits of the Tool

## ● Actually, Including Five Actions

- The first action is to delete the selected content

<pre>NO: T:Start; P:5683934   N1: T:End; P:2ac9d3c N2: T:Start; P:5683950   N3: T:End; P:2ac9d50 N4: T:Start; P:568396c   N5: T:End; P:2ac9d64 N6: T:Start; P:5683988   N7: T:End; P:2ac9d78 N8: T:Start; P:56839a4   N9: T:Sect; P:571fb40     N10: T:txt;Section1 with content P:56a32ac     N11: T:End; P:2ac9e04   N12: T:Sect; P:571fab8     N13: T:txt;Section 2 with content P:56a331c     N14: T:End; P:2ac9e18   N15: T:txt;NULL P:56a338c   N16: T:End; P:2ac9d8c</pre>	<pre>NO: T:Start; P:5683934   N1: T:End; P:2ac9d3c N2: T:Start; P:5683950   N3: T:End; P:2ac9d50 N4: T:Start; P:568396c   N5: T:End; P:2ac9d64 N6: T:Start; P:5683988   N7: T:End; P:2ac9d78 N8: T:Start; P:56839a4   N9: T:Sect; P:571fb40     N10: T:txt;Section1 P:56a32ac     N11: T:End; P:2ac9e04   N12: T:Sect; P:571fab8     N13: T:txt;tent P:56a331c     N14: T:End; P:2ac9e18   N15: T:txt;NULL P:56a338c   N16: T:End; P:2ac9d8c</pre>
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- The second action is to create a copy node for the first section

<pre>NO: T:Start; P:5683934   N1: T:End; P:2ac9d3c N2: T:Start; P:5683950   N3: T:End; P:2ac9d50 N4: T:Start; P:568396c   N5: T:End; P:2ac9d64 N6: T:Start; P:5683988   N7: T:End; P:2ac9d78 N8: T:Start; P:56839a4   N9: T:Sect; P:571fb40     N10: T:txt;Section1 P:56a32ac     N11: T:End; P:2ac9e04   N12: T:Sect; P:571fab8     N13: T:txt;tent P:56a331c     N14: T:End; P:2ac9e18   N15: T:txt;NULL P:56a338c   N16: T:End; P:2ac9d8c</pre>	<pre>NO: T:Start; P:5683934   N1: T:End; P:2ac9d3c N2: T:Start; P:5683950   N3: T:End; P:2ac9d50 N4: T:Start; P:568396c   N5: T:End; P:2ac9d64 N6: T:Start; P:5683988   N7: T:End; P:2ac9d78 N8: T:Start; P:56839a4   N9: T:Sect; P:571fb40     N10: T:txt;Section1 P:56a32ac     N11: T:txt;NULL P:56a33fc     N12: T:End; P:2ac9e04   N13: T:Sect; P:571fab8     N14: T:txt;tent P:56a331c     N15: T:End; P:2ac9e18   N16: T:txt;NULL P:56a338c   N17: T:End; P:2ac9d8c</pre>
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# Benefits of the Tool

## ● An Operation - Actions

- The third is to move the first node to the beginning of the second section

<pre>N0: T:Start; P:5683934 N1: T:End; P:2ac9d3c N2: T:Start; P:5683950 N3: T:End; P:2ac9d50 N4: T:Start; P:568396c N5: T:End; P:2ac9d64 N6: T:Start; P:5683988 N7: T:End; P:2ac9d78 N8: T:Start; P:56839a4 N9: T:Sect; P:571fb40 N10: T:txt;Section1 P:56a32ac N11: T:txt;NULL P:56a33fc N12: T:End; P:2ac9e04 N13: T:Sect; P:571fab8 N14: T:txt;tent P:56a331c N15: T:End; P:2ac9e18 N16: T:txt;NULL P:56a338c N17: T:End; P:2ac9d8c</pre>	<pre>N0: T:Start; P:5683934 N1: T:End; P:2ac9d3c N2: T:Start; P:5683950 N3: T:End; P:2ac9d50 N4: T:Start; P:568396c N5: T:End; P:2ac9d64 N6: T:Start; P:5683988 N7: T:End; P:2ac9d78 N8: T:Start; P:56839a4 N9: T:Sect; P:571fb40 N10: T:txt;NULL P:56a33fc N11: T:End; P:2ac9e04 N12: T:Sect; P:571fab8 N13: T:txt;Section1 P:56a32ac N14: T:txt;tent P:56a331c N15: T:End; P:2ac9e18 N16: T:txt;NULL P:56a338c N17: T:End; P:2ac9d8c</pre>
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- The fourth is to move nodes within selected scope to the undo node list

<pre>N0: T:Start; P:5683934 N1: T:End; P:2ac9d3c N2: T:Start; P:5683950 N3: T:End; P:2ac9d50 N4: T:Start; P:568396c N5: T:End; P:2ac9d64 N6: T:Start; P:5683988 N7: T:End; P:2ac9d78 N8: T:Start; P:56839a4 N9: T:Sect; P:571fb40 N10: T:txt;NULL P:56a33fc N11: T:End; P:2ac9e04 N12: T:Sect; P:571fab8 N13: T:txt;Section1 P:56a32ac N14: T:txt;tent P:56a331c N15: T:End; P:2ac9e18 N16: T:txt;NULL P:56a338c N17: T:End; P:2ac9d8c</pre>	<pre>N0: T:Start; P:5683934 N1: T:End; P:2ac9d3c N2: T:Start; P:5683950 N3: T:End; P:2ac9d50 N4: T:Start; P:568396c N5: T:End; P:2ac9d64 N6: T:Start; P:5683988 N7: T:End; P:2ac9d78 N8: T:Start; P:56839a4 N9: T:Sect; P:571fab8 N10: T:txt;Section1 P:56a32ac N11: T:txt;tent P:56a331c N12: T:End; P:2ac9e18 N13: T:txt;NULL P:56a338c N14: T:End; P:2ac9d8c</pre>
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# Benefits of the Tool

## ● An Operation - Actions

- The fifth action is to merge the left content from the front to the back

N0: T:Start; P:5683934	N0: T:Start; P:5683934
N1: T:End; P:2ac9d3c	N1: T:End; P:2ac9d3c
N2: T:Start; P:5683950	N2: T:Start; P:5683950
N3: T:End; P:2ac9d50	N3: T:End; P:2ac9d50
N4: T:Start; P:568396c	N4: T:Start; P:568396c
N5: T:End; P:2ac9d64	N5: T:End; P:2ac9d64
N6: T:Start; P:5683988	N6: T:Start; P:5683988
N7: T:End; P:2ac9d78	N7: T:End; P:2ac9d78
N8: T:Start; P:56839a4	N8: T:Start; P:56839a4
N9: T:Sect; P:571fab8	N9: T:Sect; P:571fab8
N10: T:txt;Section1 P:56a32ac	
N11: T:txt;tent P:56a331c	N10: T:txt;Section1 tent P:56a331c
N12: T:End; P:2ac9e18	N11: T:End; P:2ac9e18
N13: T:txt;NULL P:56a338c	N12: T:txt;NULL P:56a338c
N14: T:End; P:2ac9d8c	N13: T:End; P:2ac9d8c

# Benefits of the Tool

## ● A Formatting Problem Description:

- Open the sample file and Select Tools->Footnotes menu item
- Input text in "End of Footnote" and "Start of next page" text box in Footnotes tab page, then click OK
- Close the document,Writer Crash...



The tool is used to find out the frame whose relation has problem

# Benefits of the Tool



## ● A Formatting Problem's Snapshot Comparison:

- Comparison 1: Move and Append to the Next Page

<pre>FOTN 5c484a0 R:5c0ef84 TEXT 5c9929c R:5c1a10c=&gt; FLYI 5c488f0 R:5c940dc-&gt; TEXT 5c9930c R: FOTN 5c48a70 R:5c0ef84-&gt; TEXT 5c98abc R:5c1a6dc TEXT 5c98f1c R:5c1a758 TEXT 5c9b65c R:5c1a7d4 TEXT 5c9b6cc R:5c1a850 TEXT 5c9937c R:5c1a10c=&gt; FLYI 5c486c8 R:5c940dc-&gt; TEXT 5c993ec R TEXT 5c9945c R:5c1a10c=&gt; FLYI 5c483e0 R:</pre>	<pre>FOTN 5c484a0 R:5c0ef84 TEXT 5c9929c R:5c1a10c=&gt; FLYI 5c488f0 R:5c940dc-&gt; TEXT 5c9930c R FOTN 5c48a70 R:5c0ef84 TEXT 5c9937c R:5c1a10c=&gt; FLYI 5c486c8 R:5c940dc-&gt; TEXT 5c993ec R FOTN 5c49fb8 R:5c0ef84-&gt; TEXT 5c98abc R:5c1a6dc TEXT 5c98f1c R:5c1a758 TEXT 5c9945c R:5c1a10c=&gt; FLYI 5c483e0 R:5c940dc-&gt; TEXT 5c994cc R</pre>
--	---

The content inside the foot note frame was moved to next page

- Comparison 2: Relation Destroyed by New Move and Append Action

<pre>FOTN 5c48a70 R:5c0ef84 TEXT 5c9937c R:5c1a10c=&gt; FLYI 5c486c8 R:5c940dc-&gt; TEXT 5c993ec R: FOTN 5c49fb8 R:5c0ef84-&gt; TEXT 5c98abc R:5c1a6dc TEXT 5c98f1c R:5c1a758 TEXT 5c9945c R:5c1a10c=&gt; FLYI 5c483e0 R:5c940dc-&gt; TEXT 5c994cc R:</pre>	<pre>FOTN 5c48a70 R:5c0ef84 TEXT 5c9937c R:5c1a10c=&gt; FLYI 5c486c8 R:5c940dc-&gt; TEXT 5c993ec R FOTN 5c49fb8 R:5c0ef84-&gt; TEXT 5c98abc R:5c1a6dc TEXT 5c9b65c R:5c1a7d4 TEXT 5c9b6cc R:5c1a850 TEXT 5c9945c R:5c1a10c=&gt; FLYI 5c483e0 R:5c940dc-&gt; TEXT 5c994cc R</pre>
---	--

The text frame: 5c98f1c just gone...



# Benefits of the Tool



## ● How to use?

- Integrate the tool into development environment
- Call the appropriate functions in the execution path of an operation
- Not able to be used independently

# Agenda



- Writer's Challenges to Developers
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# Future Enhancements of the Tool



## ● Currently Supported

- Visualized node information
- Visualized frame information
- Visualized portion information

## ● Future Enhancements

- Record controller and activity Information
- Make rules to support diagnostic capability automatically
- Generate analysis report



# Thanks!

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