

State of SCSCP implementation in Maple

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Why am I here?

The screenshot shows the Environment Canada website for Kitchener-Waterloo, Ontario. The page displays the current weather conditions and a 5-day forecast. The current conditions are: -16°C, Partly Cloudy, 102.8 kPa, rising tendency, 8 km visibility, -15.5°C temperature, -19.4°C dewpoint, 72% humidity, and WSW 28 km/h wind with a wind chill of -27. The 5-day forecast shows temperatures ranging from -14°C to -20°C with varying cloud and precipitation chances. The historical data shows a low of -24.4°C yesterday and a high of -3°C normal.

Kitchener-Waterloo

Current Conditions

Observed at: **Region of Waterloo Int'l Airport**
Date: **8:00 PM EST Thursday 15 January 2009**

-16°C

Condition: **Partly Cloudy** Temperature: **-15.5°C**
Pressure: **102.8 kPa** Dewpoint: **-19.4°C**
Tendency: **rising** Humidity: **72 %**
Visibility: **8 km** Wind: **WSW 28 km/h**
Wind Chill: -27

Forecast

Tonight	Fri	Sat	Sun	Mon
-20°C	-14°C	-11°C	-7°C	-10°C
70%	70%	-20°C	-11°C	-14°C
				70%

Historical Data

Yesterday	Normals	Today
Max: -13.9°C	Max: -3°C	Sunrise: 7:51
Min: -24.4°C	Min: -11°C	Sunset: 17:11
Precip: 0.5 mm		

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- ▶ To escape the frigid cold!!

Current State

- ▶ Not all aspects of SCSCP are supported yet
- ▶ Client is implemented in Maple
- ▶ Server is implemented in Maple and MapleNET

OpenMath-Maple Conversion

- ▶ Implemented in Maple
- ▶ Used by client and server
- ▶ Supports most MathML group CDs

Note

This component only handles the math expression embedded in SCSCP messages

The client can ...

- ▶ Make most calls described in `scscp2`
 - ▶ Examples: `get_allowed_heads`,
`get_service_description`
- ▶ Attach options/attributes to the call
- ▶ Extract different parts of the response
 - ▶ Examples: Result of computation, `info_runtime`
- ▶ Make sure each `call_ID` is unique in each package invocation

The client cannot ...

- ▶ Send an interrupt signal
- ▶ Remember a cookie/reference

Question

How can I send a

system-dependent interrupt
signal?

Server Implementation

- ▶ Maple handles core functionalities (Example: computation)
- ▶ MapleNET Java classes handle the connections between the client and server
 - ▶ Wait for connections on the designated port
 - ▶ Negotiate SCSCP version info

About MapleNET

MapleNET is a Maplesoft product for exposing Maple in the internet.

The server can ...

- ▶ Answer `get_allowed_heads` and `get_service_description` queries
- ▶ Report time used
- ▶ Report errors in computation

The server cannot ...

- ▶ Return answers as cookies
- ▶ Accept cookies as arguments
- ▶ Store and keep track of cookies
- ▶ Report memory usage
- ▶ Enforce resource limits

Demo

- ▶ Client packages are
 - ▶ `SCSCPCClient` – Send computation to server
 - ▶ `ExtractServerResponses` – Examine various parts of an answer
- ▶ A server is running in my work computer ("cantor")

Summary

- ▶ A combination of Maplesoft products has been used to implement Maple SCSCP client and server