

Development of ACOP .NET STARS Transport Layer

T. Kosuge, H. Nitani, Y. Nagatani, H. Ishii

KEK

J. Szczesny, P. Duval

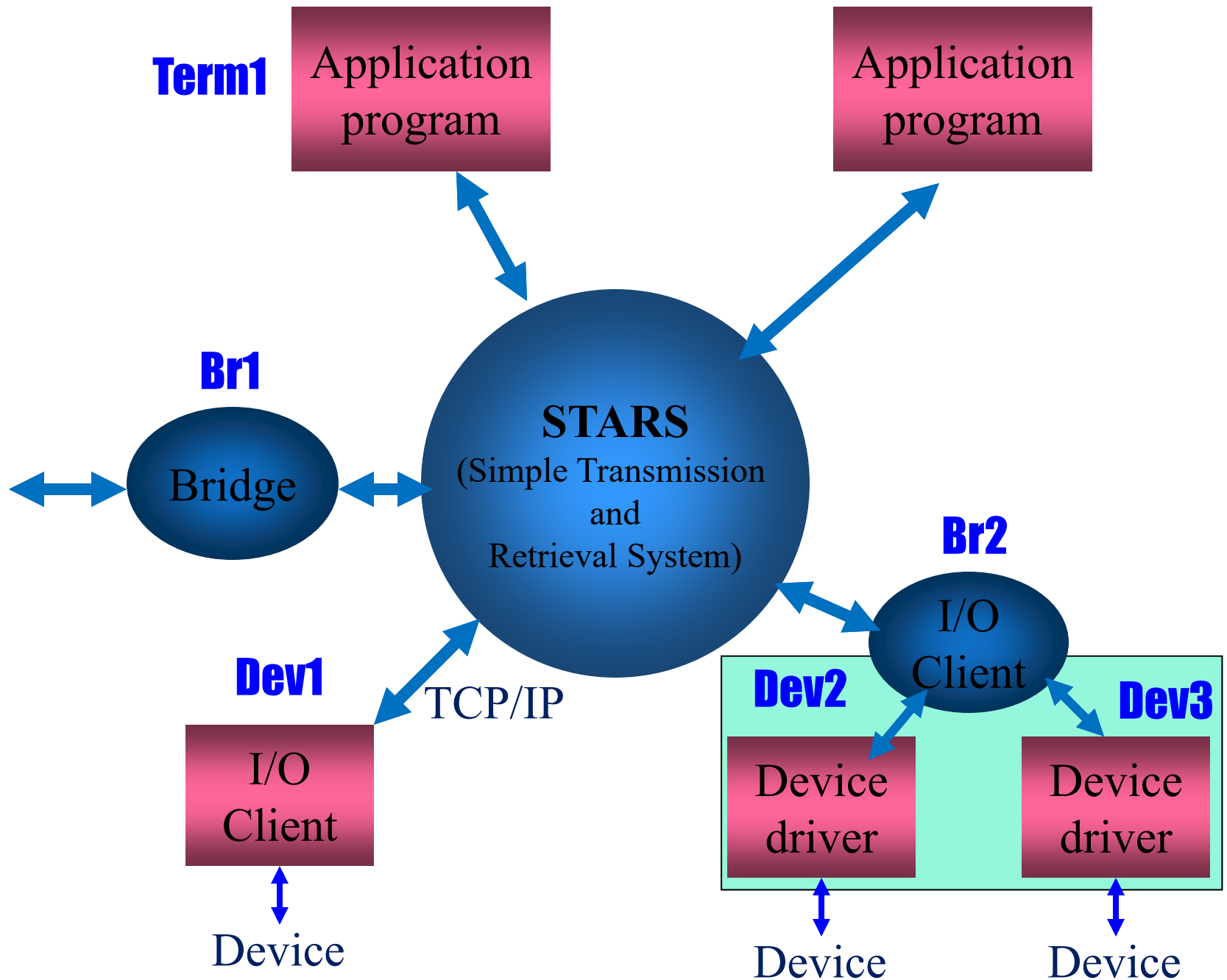
DESY

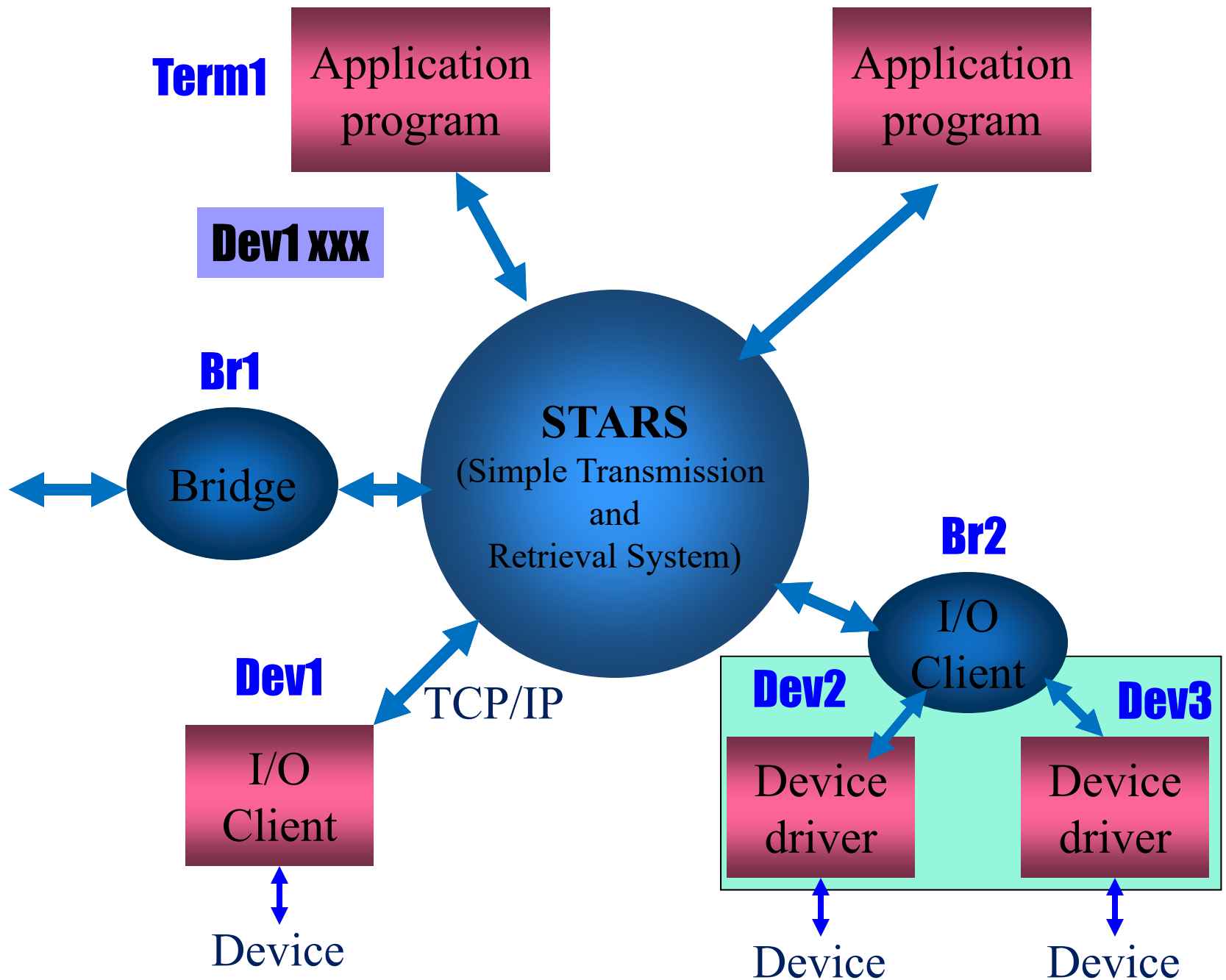
Outline

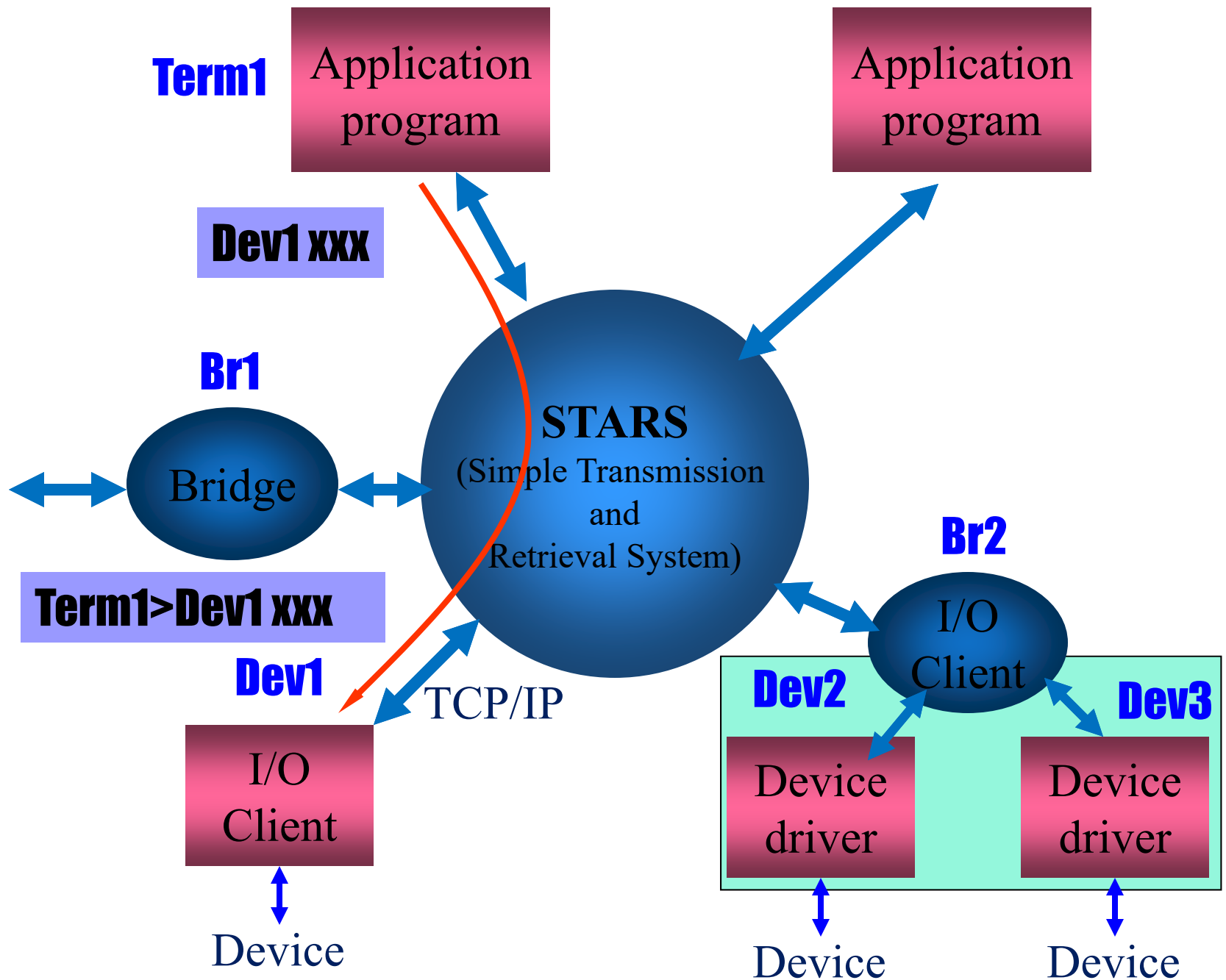
- ▶ Overview of STARS
- ▶ ACOP .NET and STARS Transport Layer
- ▶ Development GUI with ACOP .NET and STARS
- ▶ Summary

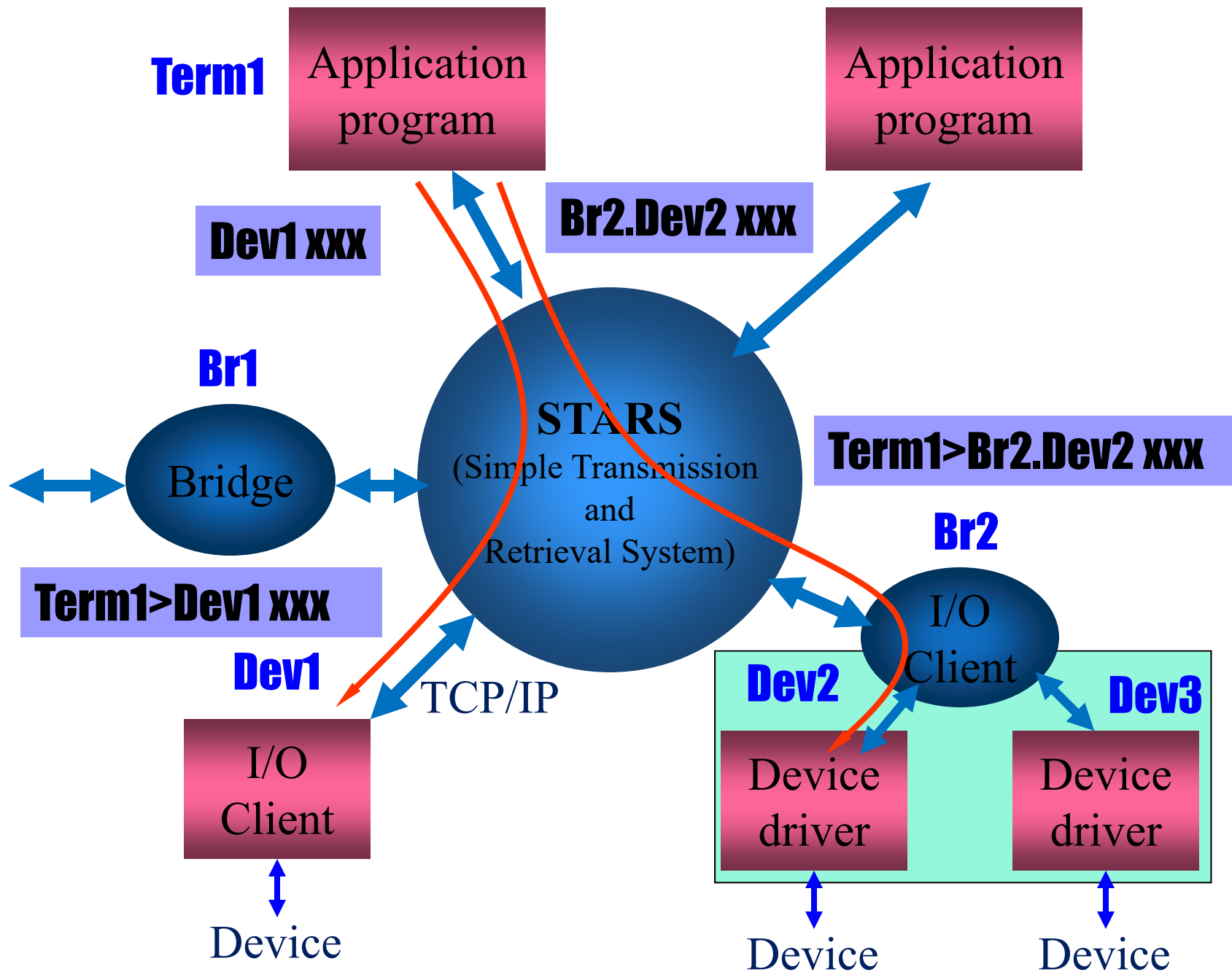
What is STARS

- ▶ Simple Transmission and Retrieval System
- ▶ TCP/IP socket and text-based message.
- ▶ Recent version of STARS server is written in Perl.









Sending Commands in STARS

NodeFrom>NodeTo Message

(My node name)

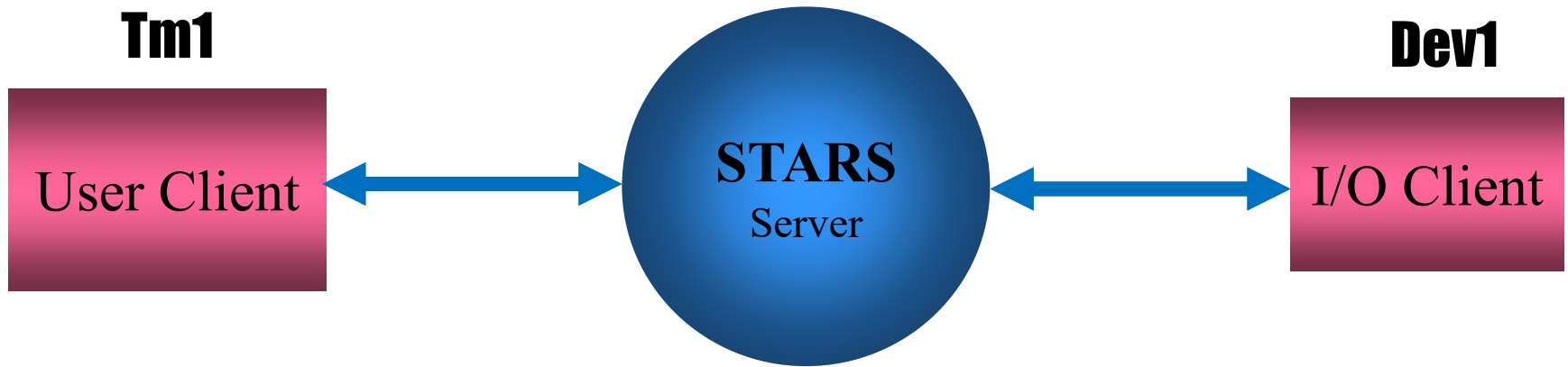
Omissible

Blank character

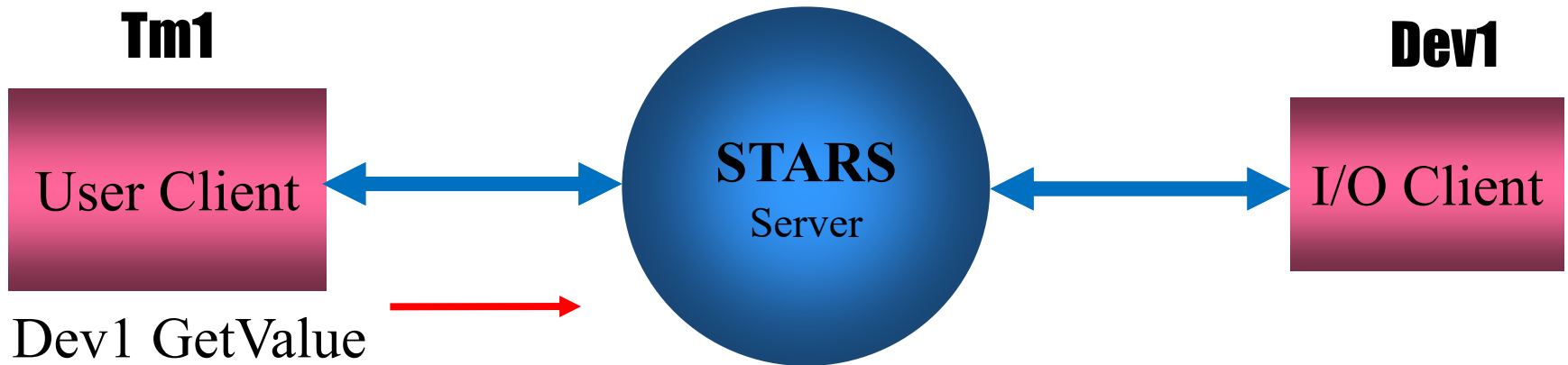
```
graph TD; A["(My node name)"] --> B["NodeFrom"]; C["Omissible"] --> D[">"]; E["Blank character"] --> F[" "]; B --- D --- G["NodeTo"] --- H["Message"];
```

Messages	@Message	: Reply
	_Message	: Event
	Message	: Command

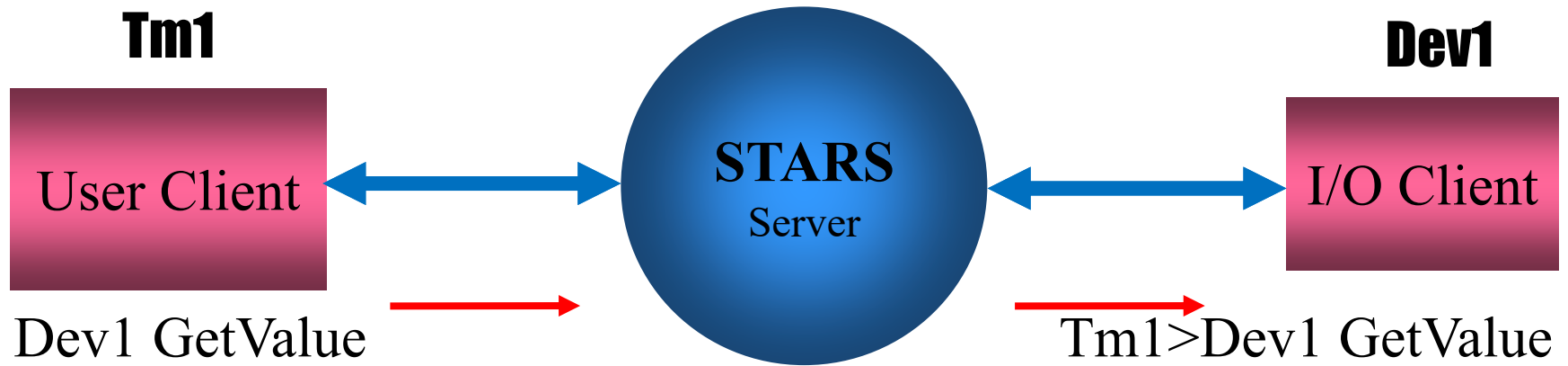
Command and reply



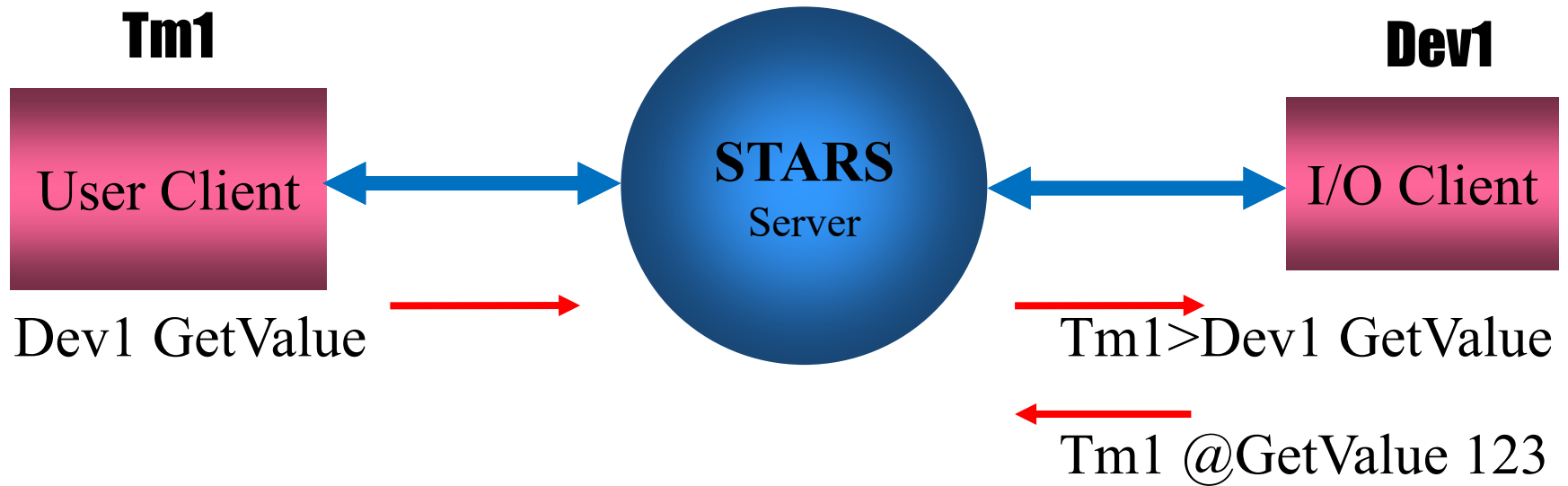
Command and reply



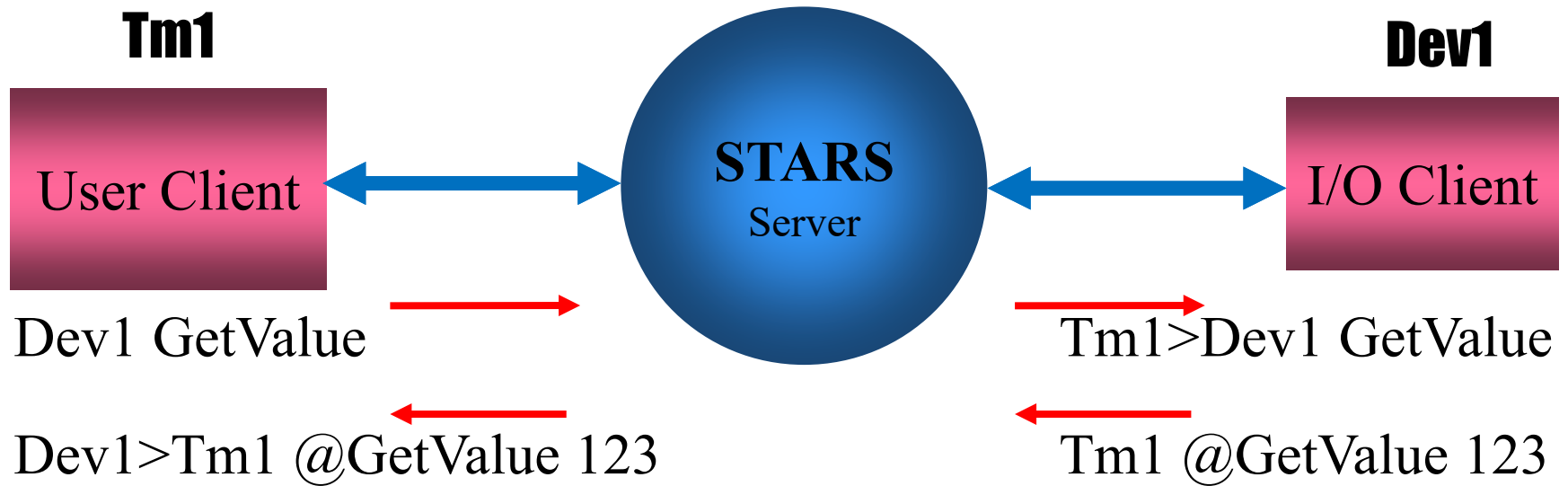
Command and reply



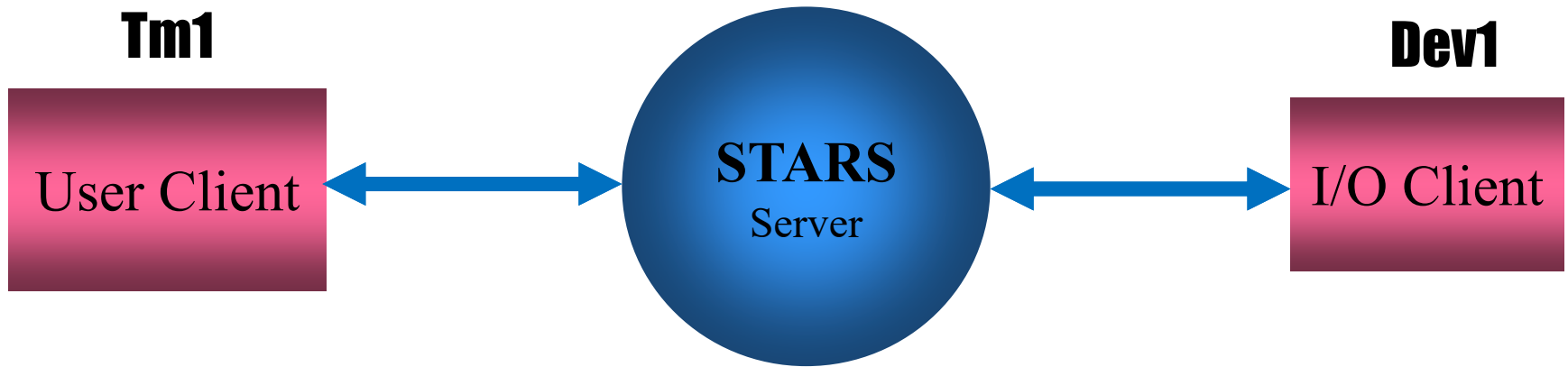
Command and reply



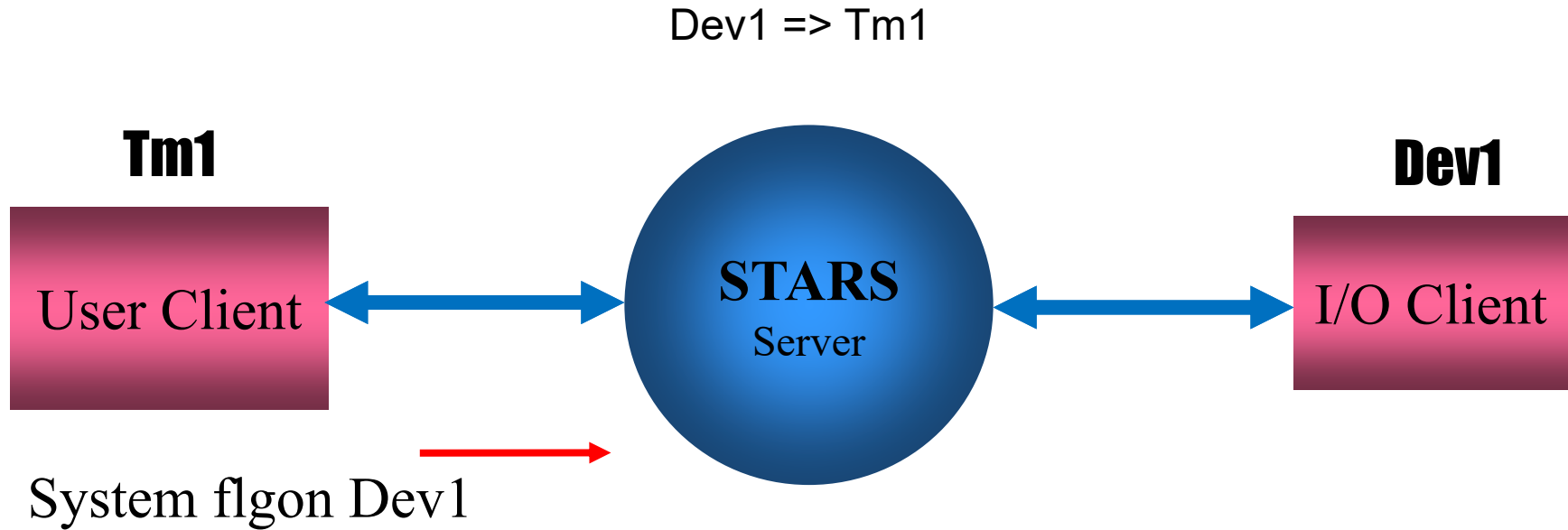
Command and reply



Event delivery request

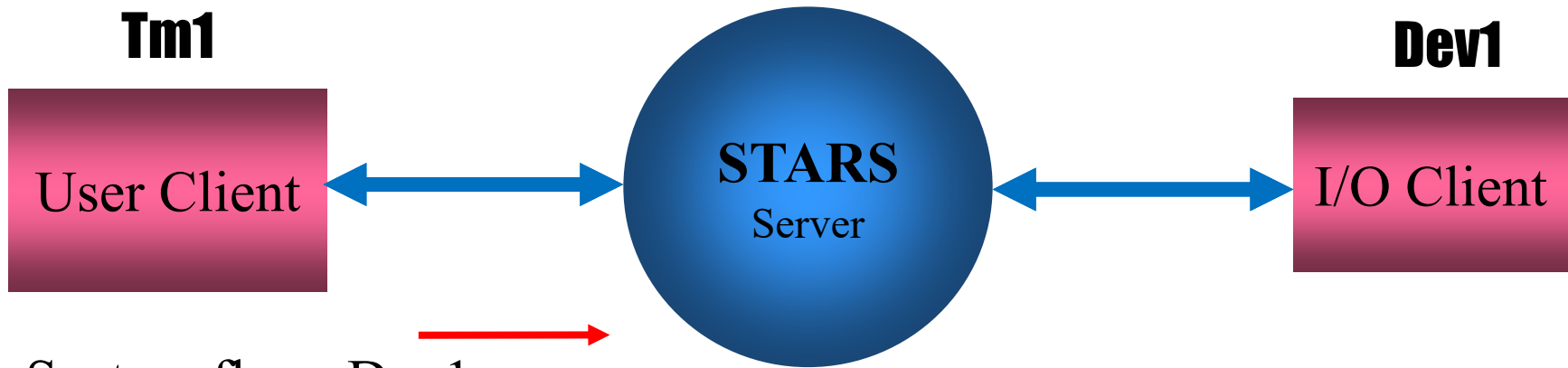


Event delivery request



Event delivery request

Dev1 => Tm1

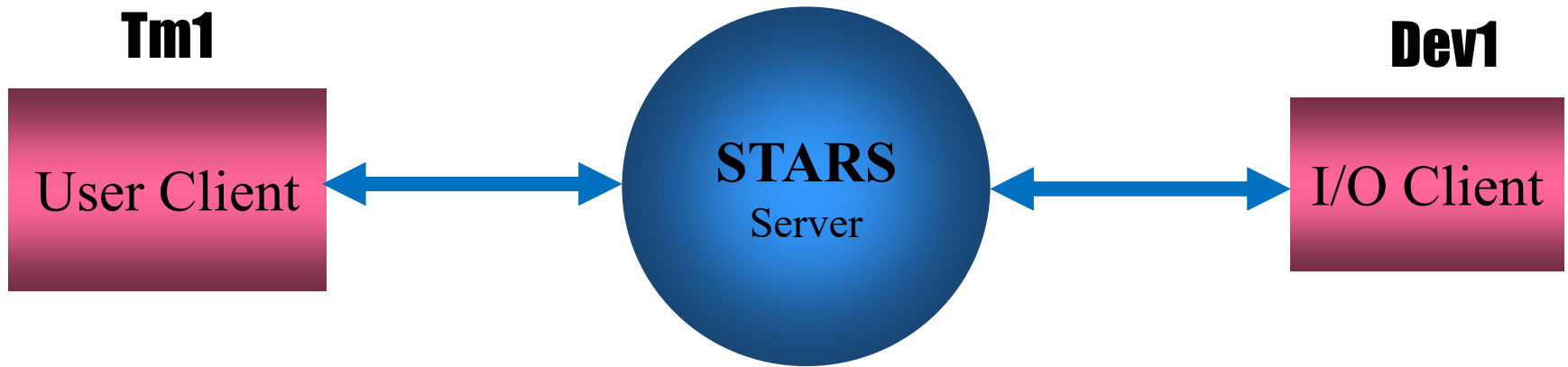


System flgon Dev1

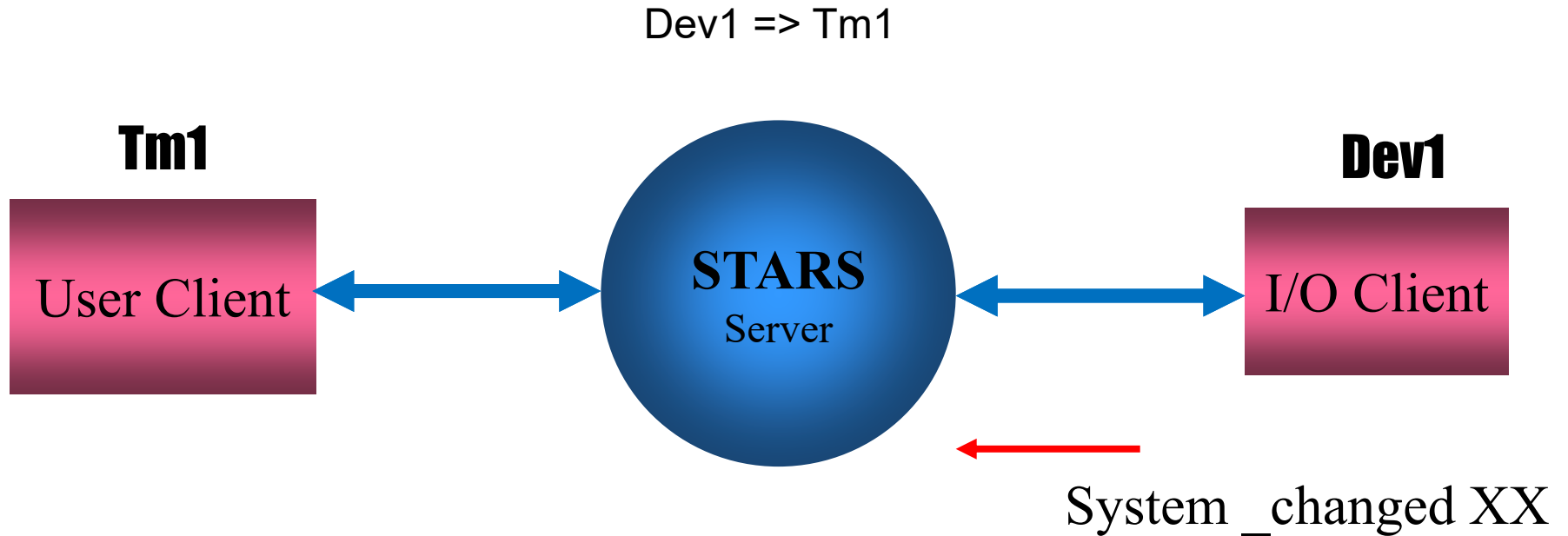
System>Tm1 @flgon Dev1 has bee registered

Event delivery request

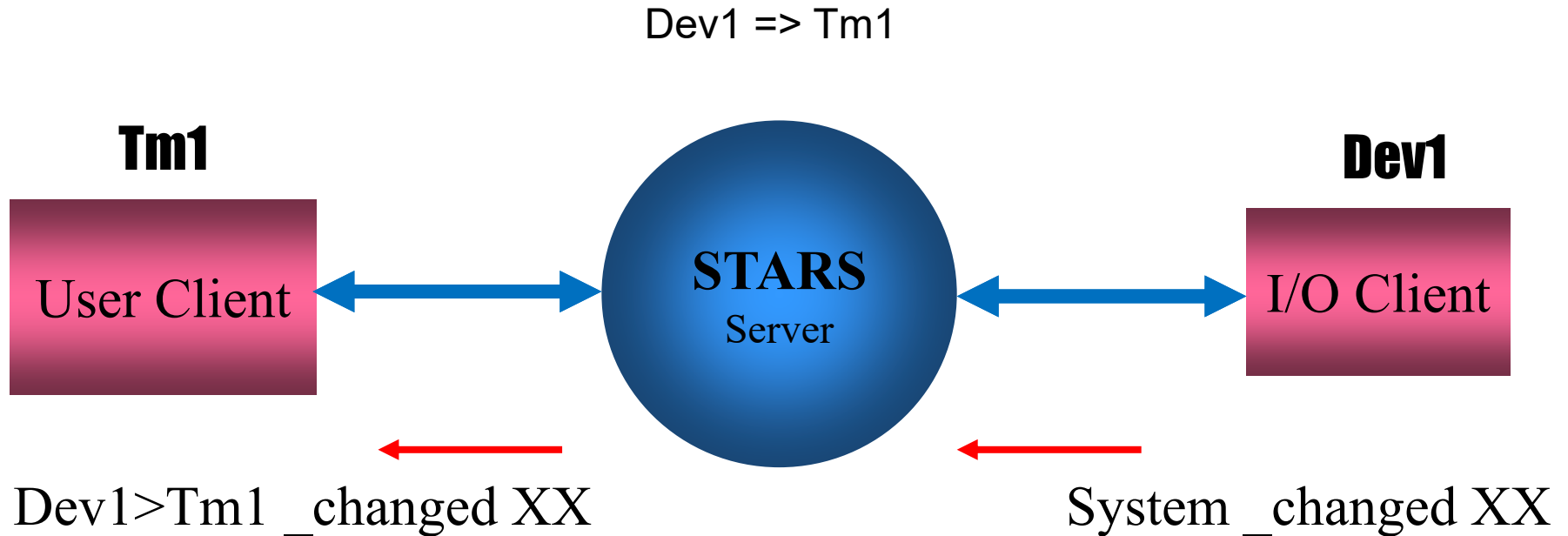
Dev1 => Tm1



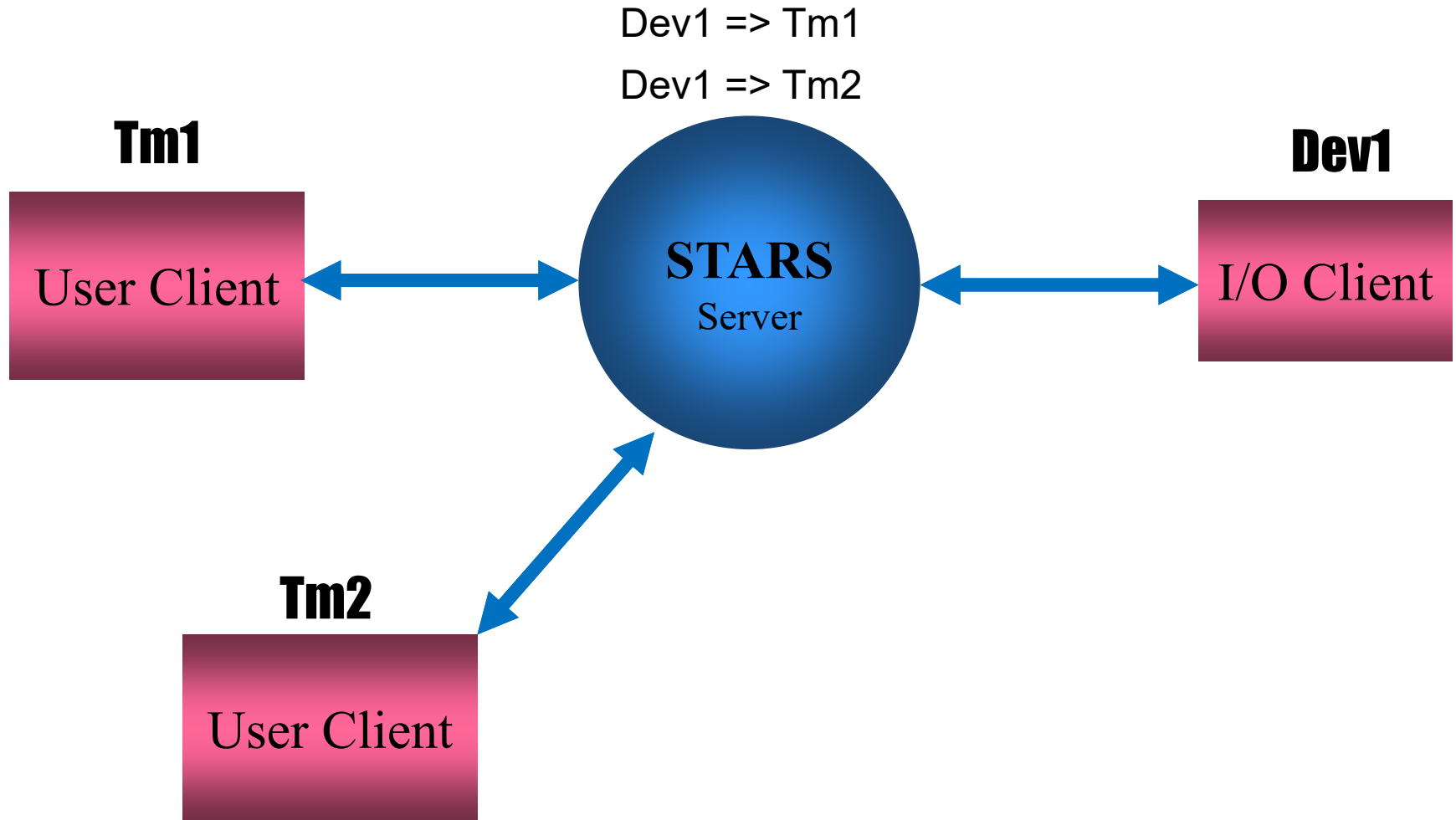
Event delivery request



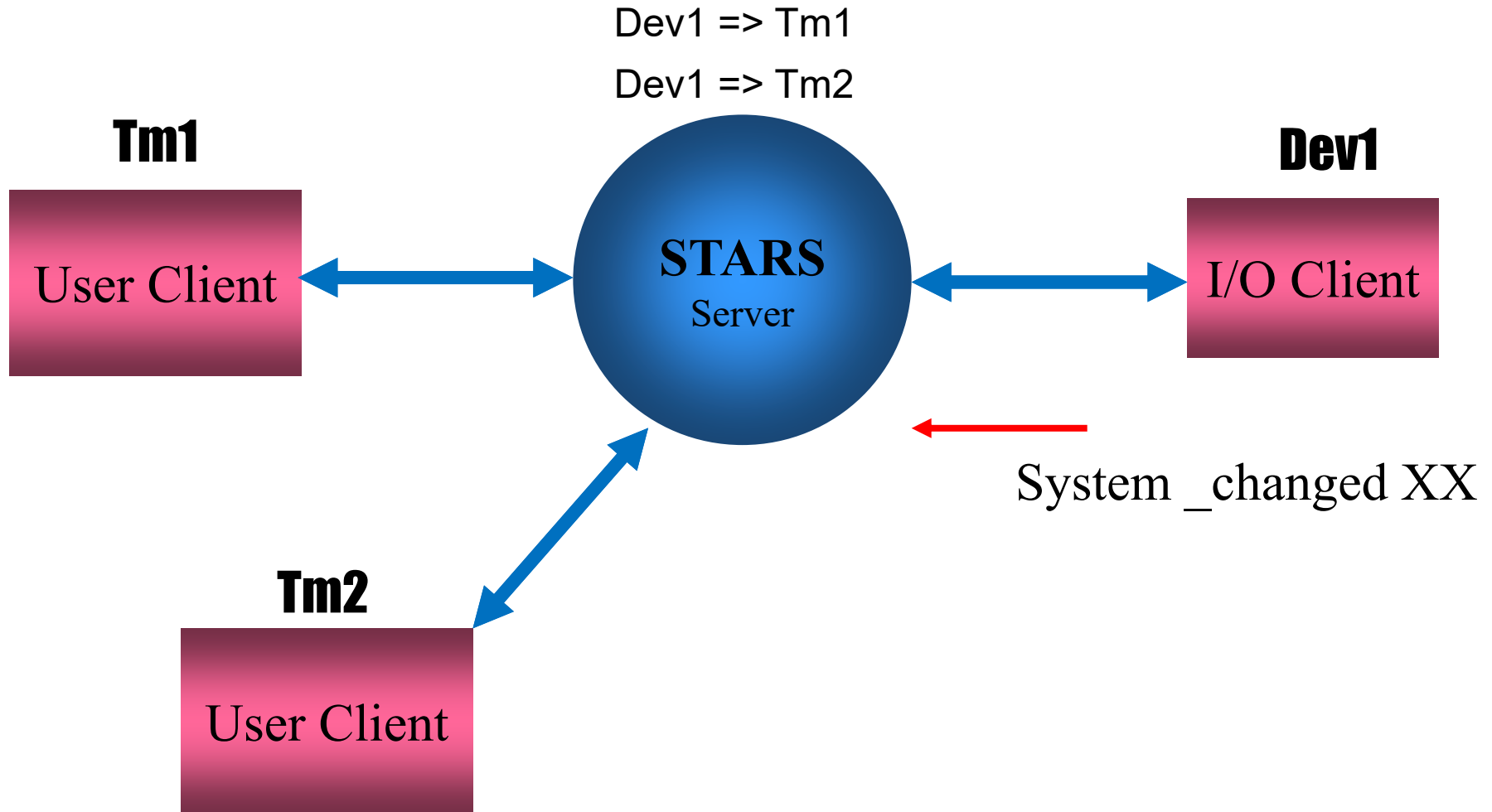
Event delivery request



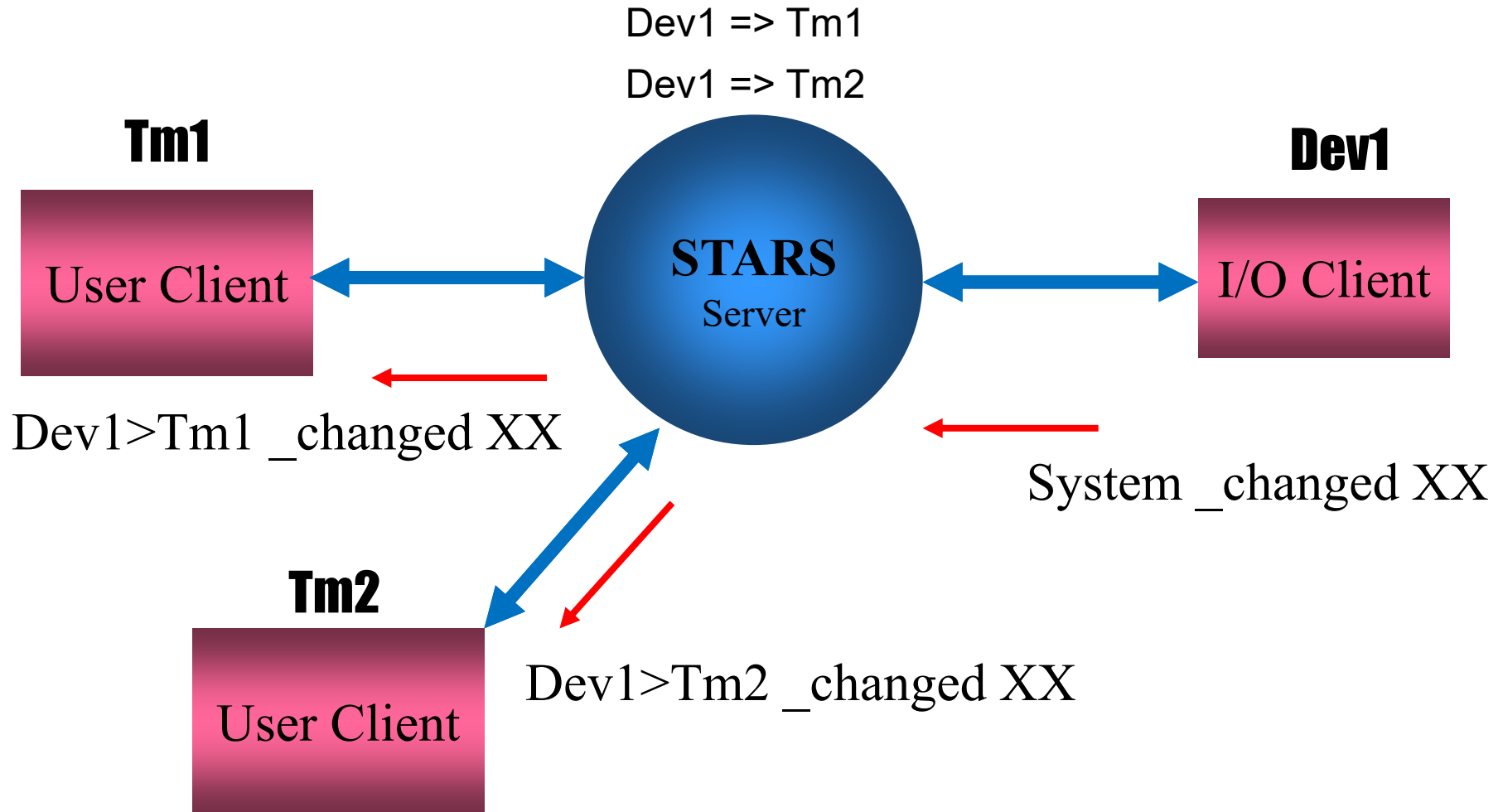
Event delivery request



Event delivery request

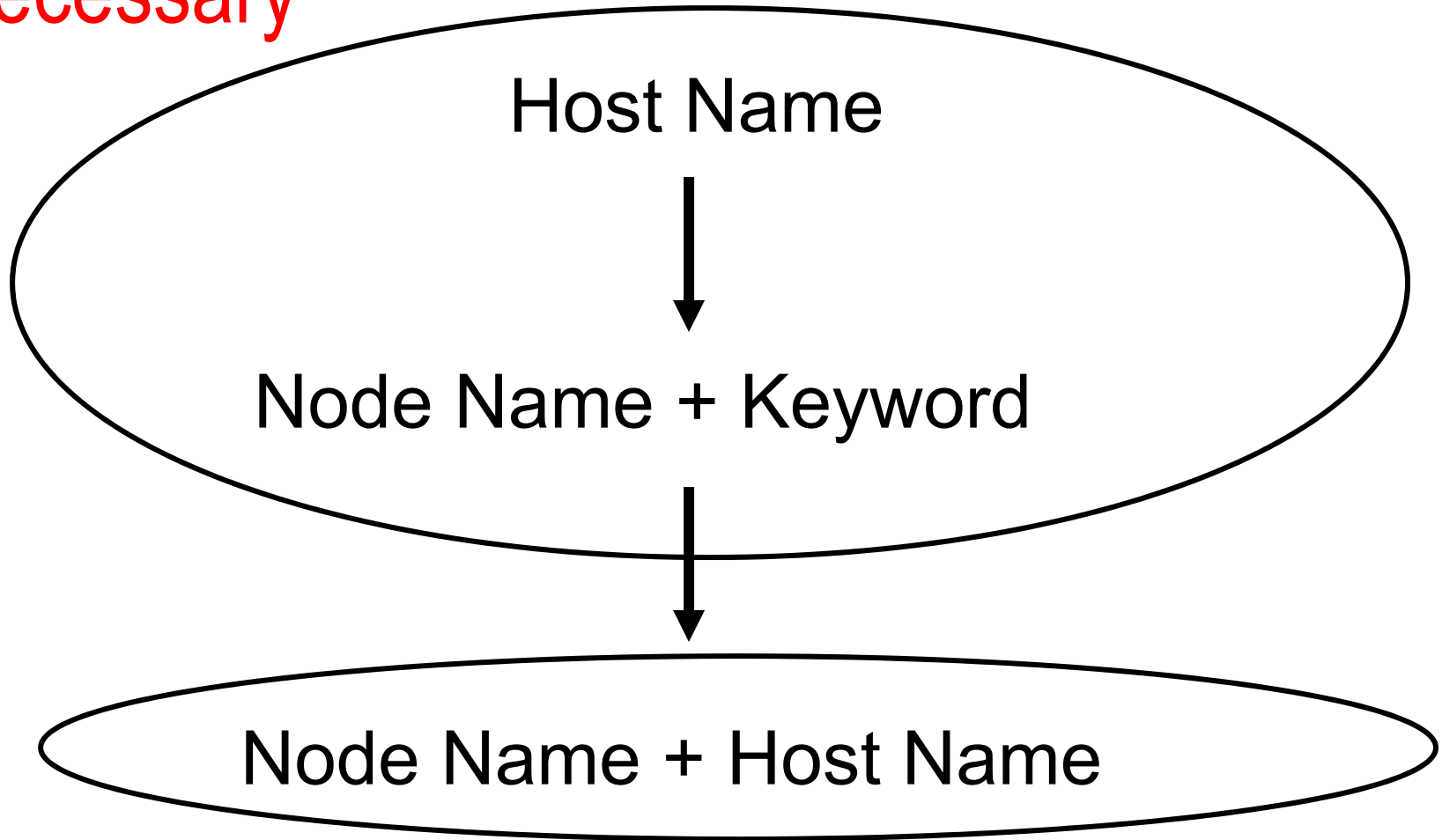


Event delivery request



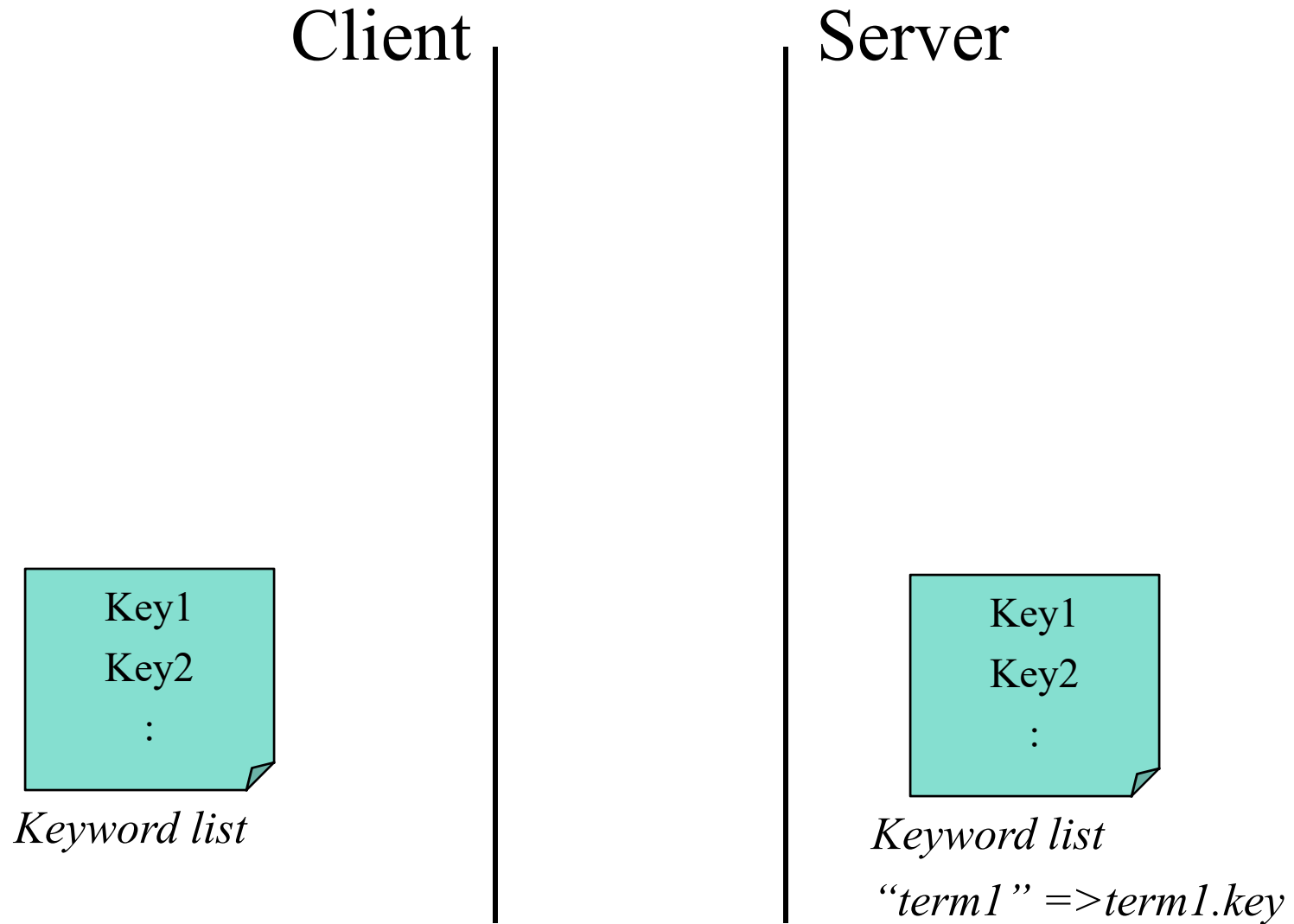
3-step certification

necessary

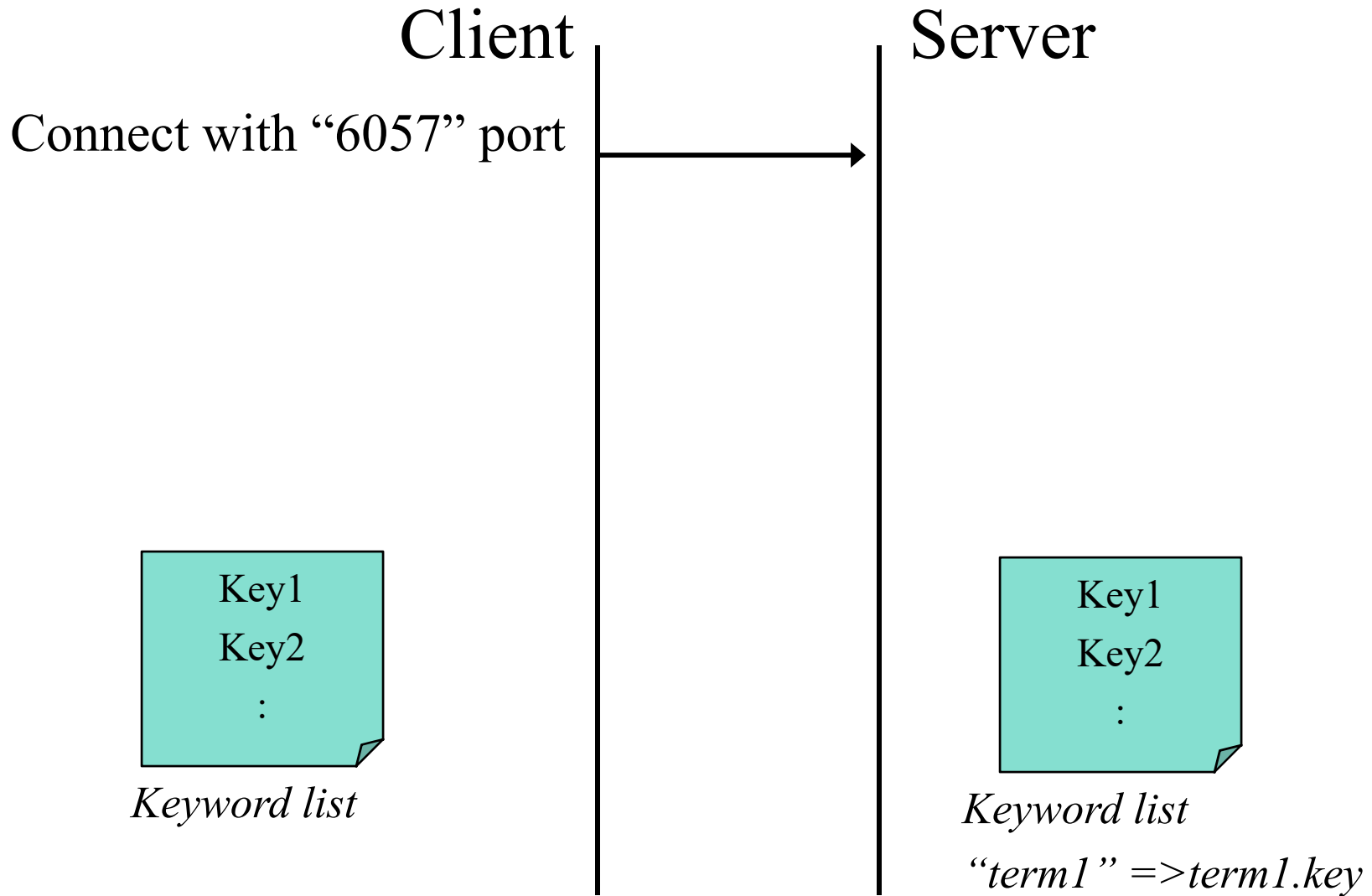


optional

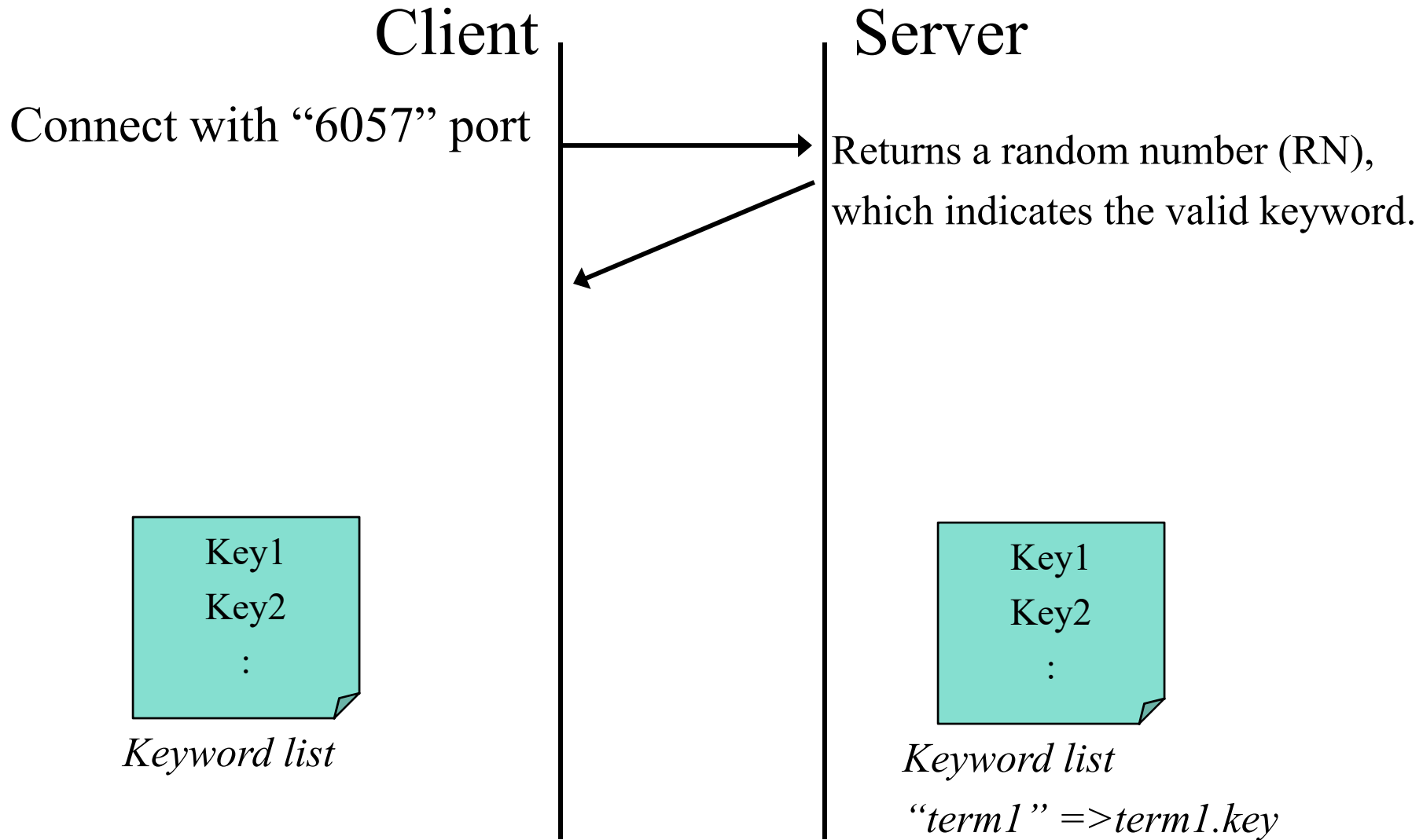
Node Name and Keyword Certification



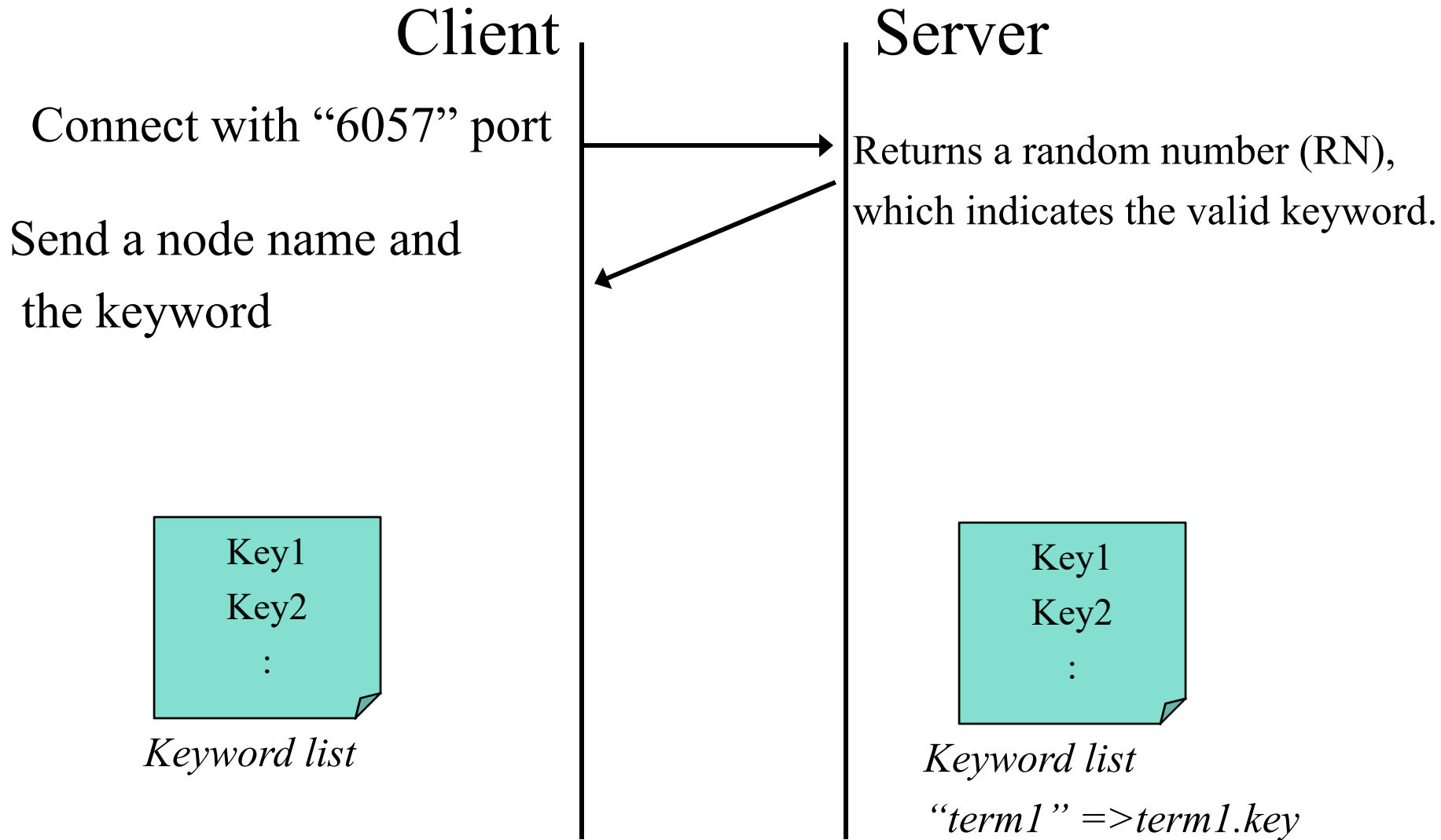
Node Name and Keyword Certification



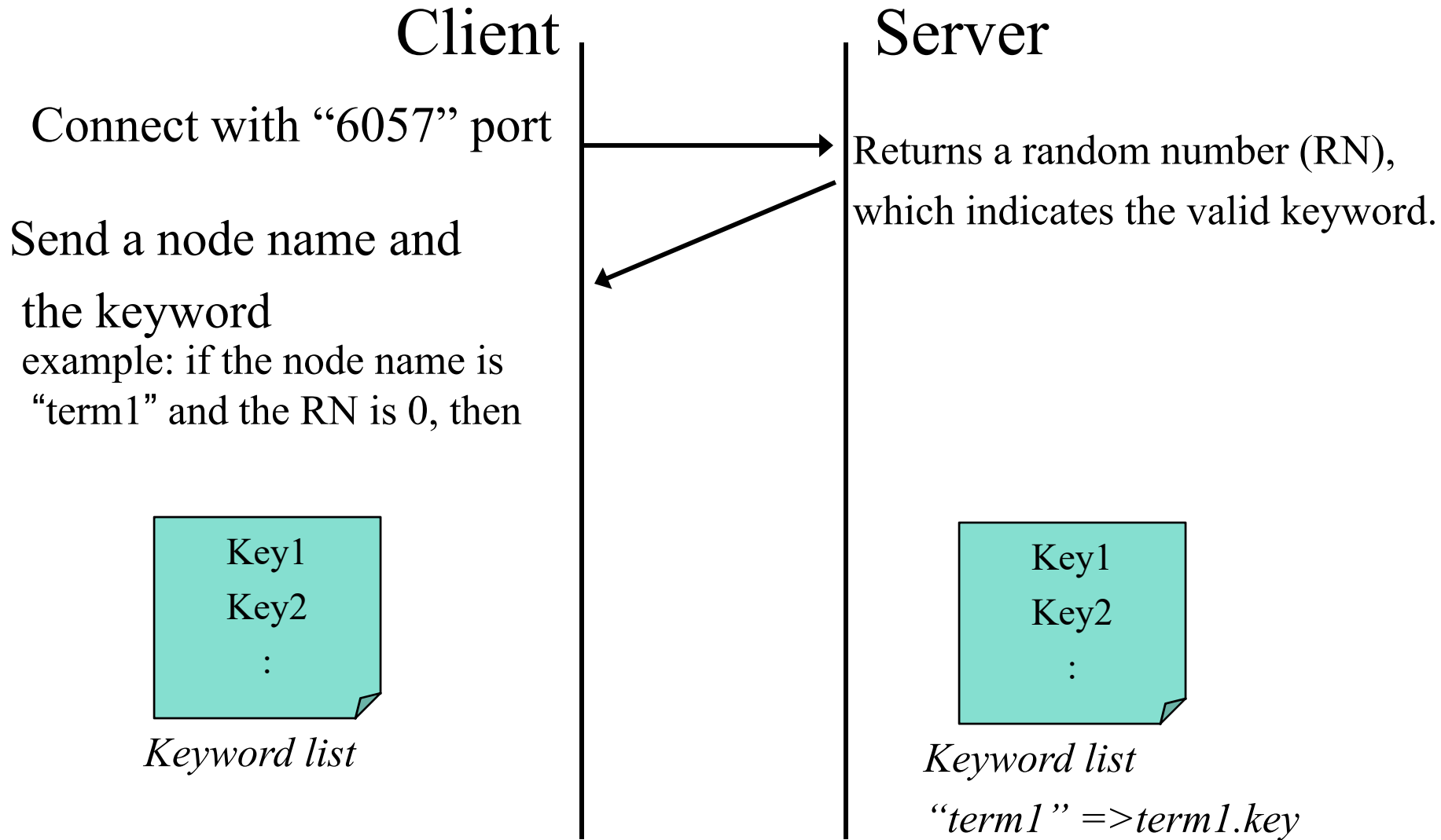
Node Name and Keyword Certification



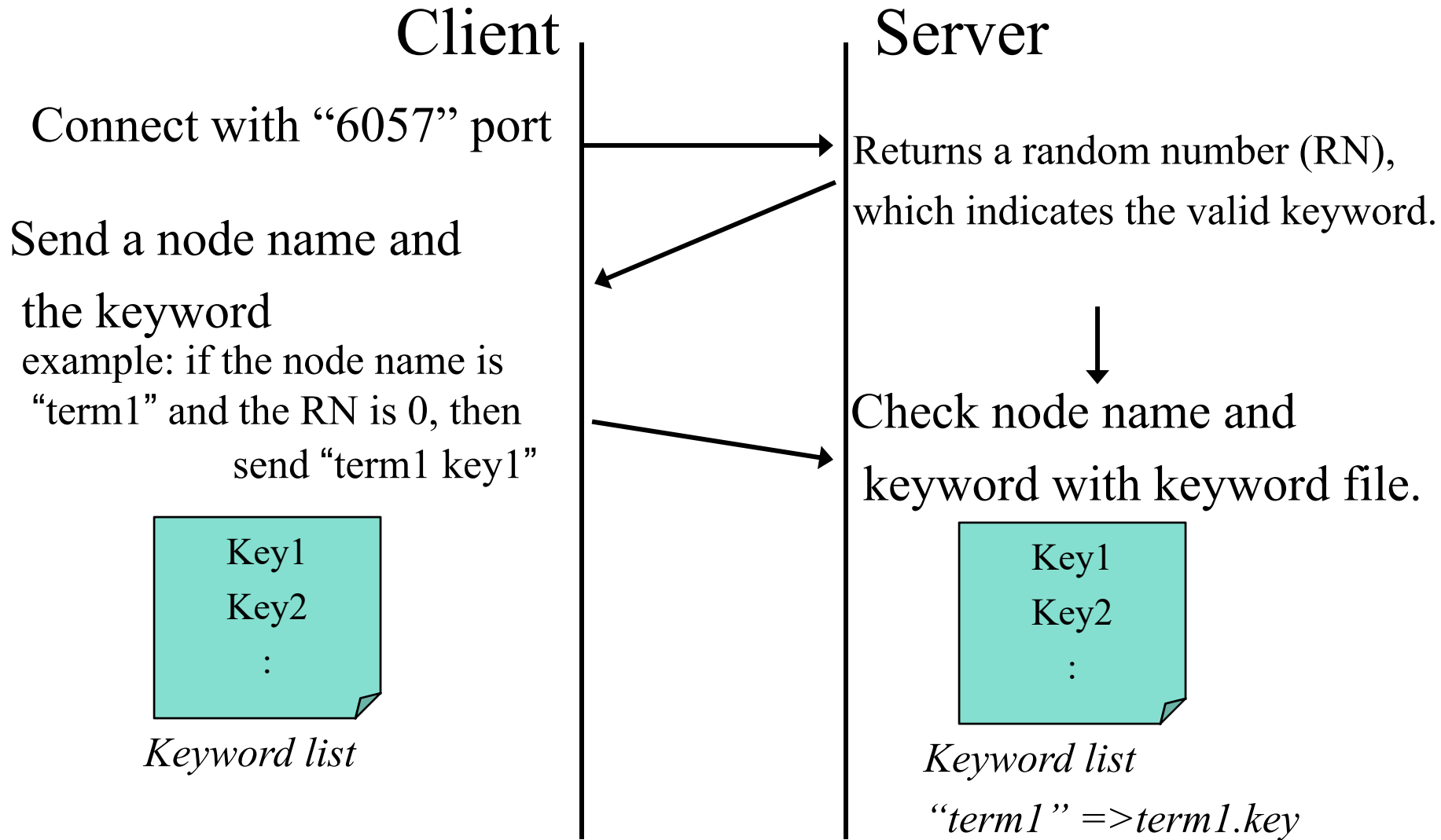
Node Name and Keyword Certification



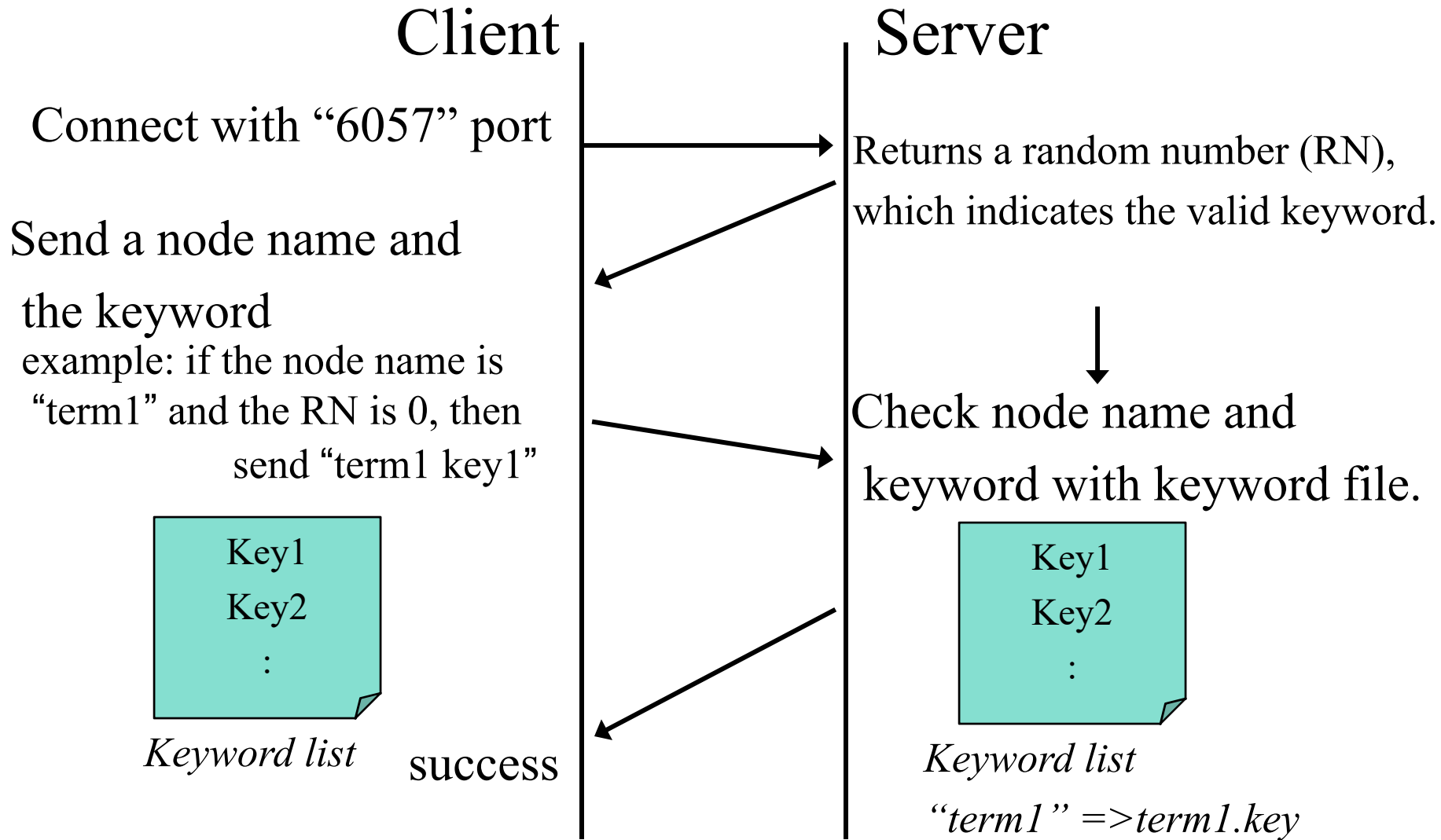
Node Name and Keyword Certification



Node Name and Keyword Certification



Node Name and Keyword Certification



INSTALLATION STATUS

Category	Beamline or Control System
PF-2.5GeV Ring X-ray	BL-1A, BL-4B2, BL-5A, BL-6A, BL-6C, BL-7C, BL-8A, BL-8B, BL-9A, BL-9C, BL-10A, BL-10C, BL-12C, BL-14A, BL-15A, BL-17A, BL-18B
PF-2.5GeV Ring VUV and Soft X-ray	BL-2A, BL-2B, BL-3B, BL-3C, BL-11A, BL-11B, BL-13A, BL-16A, BL-19A, BL-19B, BL-20A, BL-28A
PF-AR	NW1A, NE3A, NW2A, NW10A, NW12A, NW14A
Slow Positron Facility	SPF-A, SPF-B
Other Systems	Beamline Interlock System (user interface), Experimental Hall Access Control System, Key Handling System, Front-End Monitoring System, Radiation Monitoring System

STARS interface library

- ▶ Perl
- ▶ Python
- ▶ C
- ▶ .NET (C#, VB etc.)
- ▶ Java

STARS interface library

▶ Perl

▶ Python

▶ C

▶ .NET (C#, VB etc.)

▶ Java

ACOP.NET

AcopTest2018 - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Test Analyze Window Help

Debug Any CPU Start

Toolbox

Search Toolbox

- RadioButton
- RichTextBox
- TextBox
- ToolTip
- TreeView
- WebBrowser
- AcopBitRegister
- AcopButton
- AcopChart
- AcopCheckBox
- AcopChooser
- AcopComboBox
- AcopGauge
- AcopInputBox
- AcopLabel
- AcopLine
- AcopLink
- AcopOval
- AcopRectangle
- AcopSlider
- AcopSpider
- AcopStatusBar
- AcopTable
- AcopTriangle
- AcopVideo
- AcopWheelSwitch
- Containers
 - Pointer
 - FlowLayoutPanel
 - GroupBox
 - Panel
 - SplitContainer
 - TabControl
 - TableLayoutPanel
- Menus & Toolbars
 - Pointer
 - ContextMenuStrip
 - MenuStrip
 - StatusStrip

Form1

Test Y

Test X

GetValue

Output

Show output from: Debug

Solution Explorer

Search Solution Explorer (Ctrl+):

Solution 'AcopTest2018' (2 projects)

- AcopTest2018
 - Properties
 - AssemblyInfo.cs
 - Resources.resx
 - Settings.settings
 - Settings.Designer.cs
 - References
 - App.config
 - Form1.cs

Properties

acopChart1 Acop.AcopChart

ZoomMode xy_axes

Acop.Transport

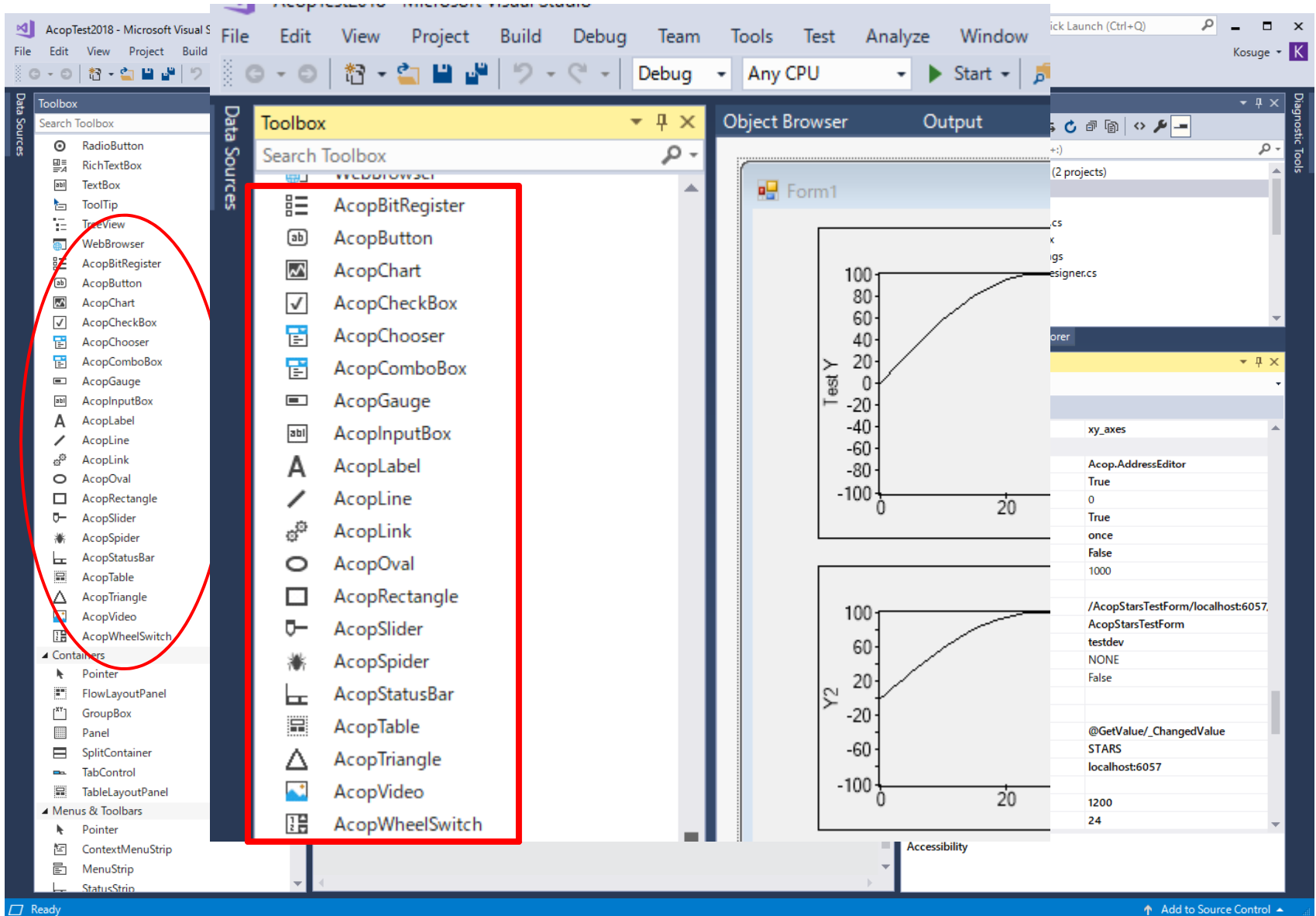
AddressEditor	Acop.AddressEditor
AutoLinkAttach	True
AutoLinkCapacity	0
AutoLinkUpdate	True
AutoScaleUpdate	once
AutoTrendUpdate	False
DefaultMonitorInterval	1000
ErrorValue	
LinkAddress	/AcopStarsTestForm/localhost:6057.
LinkContext	AcopStarsTestForm
LinkDevice	testdev
LinkFlags	NONE
LinkGrouped	False
LinkInputValue	
LinkList	
LinkProperty	@GetValue/_ChangedValue
LinkProtocol	STARS
LinkServer	localhost:6057
LinkSubSystem	
LinkTrendDepth	1200
LinkTrendHours	24

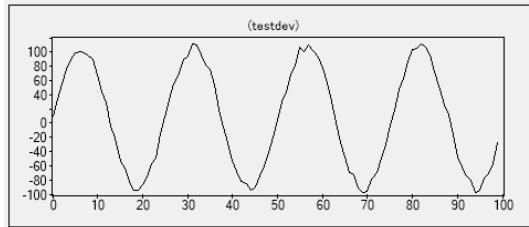
Accessibility

Ready

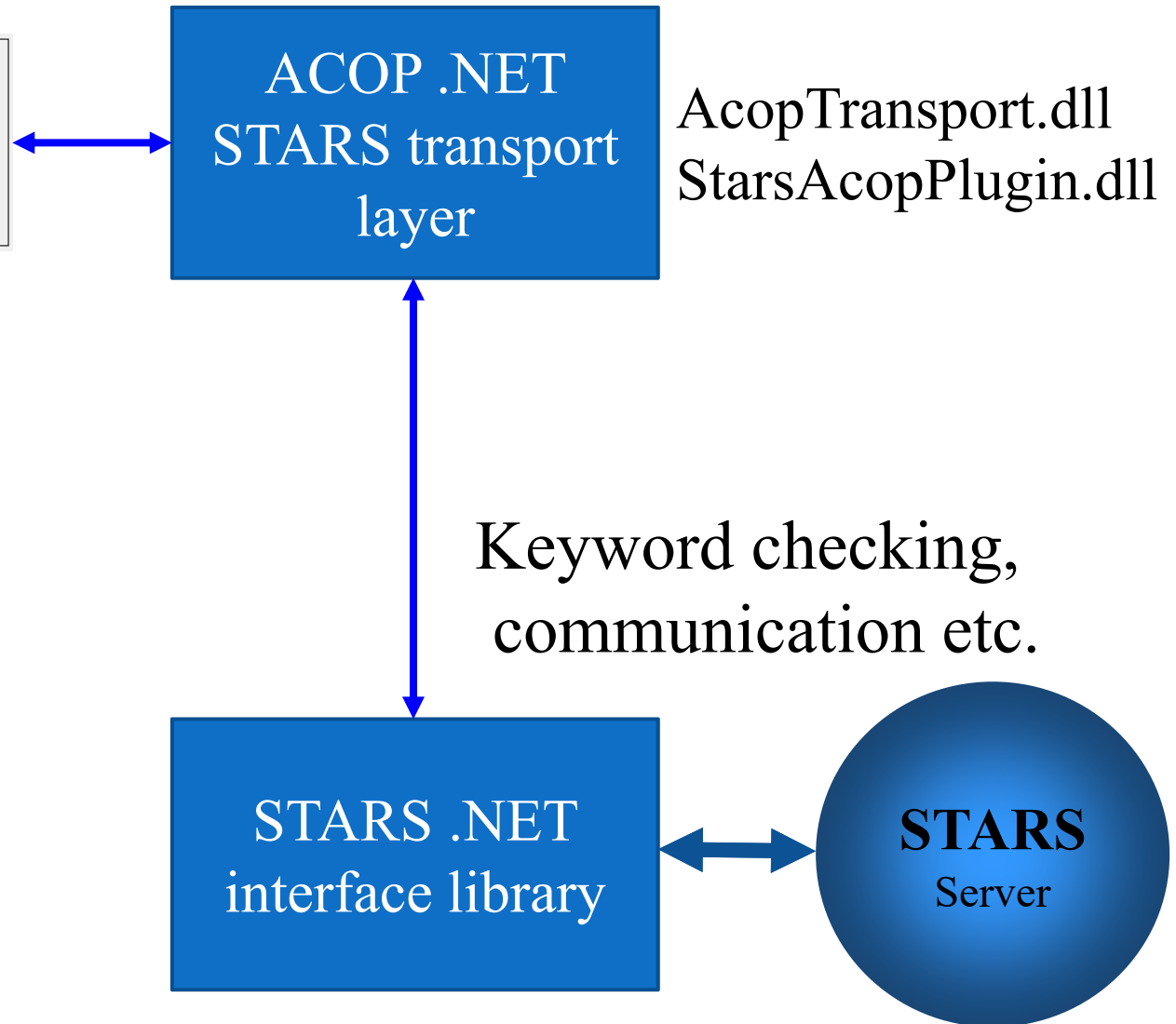
Add to Source Control

ACOP.NET





ACOP



ACOP Transport Properties

AcopTest2018 - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Test Analyze Window Help

Debug Any CPU Start

Toolbox

Search Toolbox

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- RichTextBox
- TextBox
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- TreeView
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- AcopSlider
- AcopSpider
- AcopStatusBar
- AcopTable
- AcopTriangle
- AcopVideo
- AcopWheelSwitch

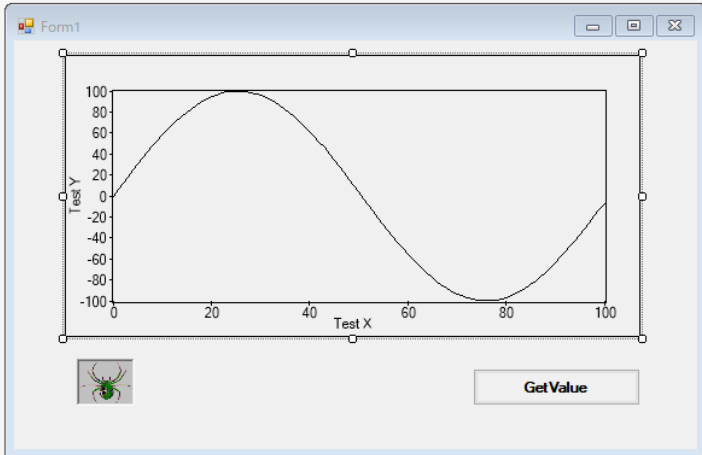
Containers

- Pointer
- FlowLayoutPanel
- GroupBox
- Panel
- SplitContainer
- TabControl
- TableLayoutPanel

Menus & Toolbars

- Pointer
- ContextMenuStrip
- MenuStrip
- StatusStrip

Form1



Output

Show output from: Debug

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acopChart1 Acop.AcopChart

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AddressEditor	Acop.AddressEditor
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LinkList	
LinkProperty	@GetValue/_ChangedValue
LinkProtocol	STARS
LinkServer	localhost:6057
LinkSubSystem	
LinkTrendDepth	1200
LinkTrendHours	24

Accessibility

Ready Add to Source Control

ACOP Transport Properties

Properties

acopChart1 Acop.AcopChart

YShift	0
ZoomMode	xy_axes
Acop.Transport	
AddressEditor	Acop.AddressEditor
AutoLinkAttach	True
AutoLinkCapacity	0
AutoLinkUpdate	True
AutoScaleUpdate	once
AutoTrendUpdate	False
DefaultMonitorInterval	1000
ErrorValue	
LinkAddress	/AcopStarsTestForm/localhost:6057/testdev
LinkContext	AcopStarsTestForm
LinkDevice	testdev
LinkFlags	NONE
LinkGrouped	False
LinkInputValue	
LinkList	
LinkProperty	@GetValue/_ChangedValue
LinkProtocol	STARS
LinkServer	localhost:6057
LinkSubSystem	
LinkTrendDepth	1200
LinkTrendHours	24
Appearance	
BackColor	☐ Control
Accessibility	

Ready

Add to Source Control

Name Space Mapping Table

ACOP Properties	STARS Name Space
Context	Node name of GUI
Subsystem	Not allocated
Server	Host name : Port number
Device	Node name of IO Client
Property	[Command /] Reply / Event

ACOP Address Editor

The screenshot displays the Microsoft Visual Studio interface for a project named 'AcopTest2018'. The central design view shows a form with a line graph titled 'Form1'. The graph's x-axis is labeled 'Test X' and ranges from 0 to 100. The y-axis is labeled 'Test Y' and ranges from -100 to 100. A green bug icon is positioned at the bottom left of the graph area, and a 'GetValue' button is at the bottom right. The left-hand 'Toolbox' pane lists various UI controls, including 'AcopChart', 'AcopCheckBox', 'AcopSlider', and 'AcopWheelSwitch'. The right-hand 'Properties' pane is set to 'AcopChart1 Acop.AcopChart'. Under the 'Acop.Transport' section, the 'AddressEditor' property is highlighted with a red circle and set to 'Acop.AddressEditor'. Other properties like 'ZoomMode' (xy_axes), 'AutoLinkAttach' (True), and 'LinkAddress' (/AcopStarsTestForm/localhost:6057) are also visible. The bottom 'Output' pane shows 'Show output from: Debug'.

AcopTest2018 - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Test Analyze Window Help

Debug Any CPU Start

Form1

Test Y

Test X

GetValue

Search Toolbox

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- RichTextBox
- TextBox
- ToolTip
- TreeView
- WebBrowser
- AcopBitRegister
- AcopButton
- AcopChart
- AcopCheckBox
- AcopChooser
- AcopComboBox
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Menus & Toolbars

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Solution 'AcopTest2018' (2 projects)

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 - Settings.Designer.cs
 - References
 - App.config
 - Form1.cs

Properties

acopChart1 Acop.AcopChart

ZoomMode xy_axes

Acop.Transport

AddressEditor **Acop.AddressEditor**

AutoLinkAttach True

AutoLinkCapacity 0

AutoLinkUpdate True

AutoScaleUpdate once

AutoTrendUpdate False

DefaultMonitorInterval 1000

ErrorValue

LinkAddress /AcopStarsTestForm/localhost:6057

LinkContext AcopStarsTestForm

LinkDevice testdev

LinkFlags NONE

LinkGrouped False

LinkInputValue

LinkList

LinkProperty @GetValue/_ChangedValue

LinkProtocol STARS

LinkServer localhost:6057

LinkSubSystem

LinkTrendDepth 1200

LinkTrendHours 24

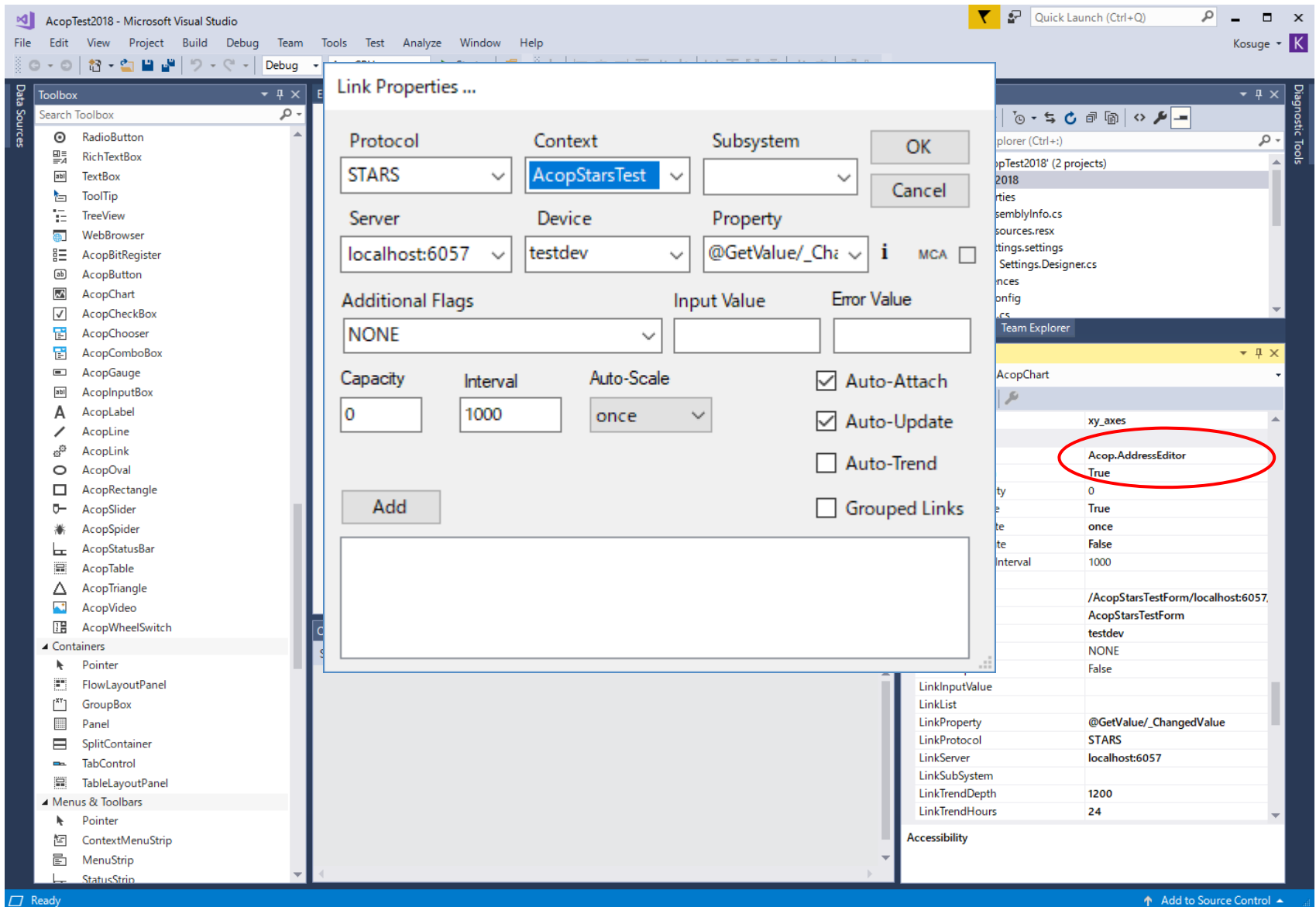
Accessibility

Output

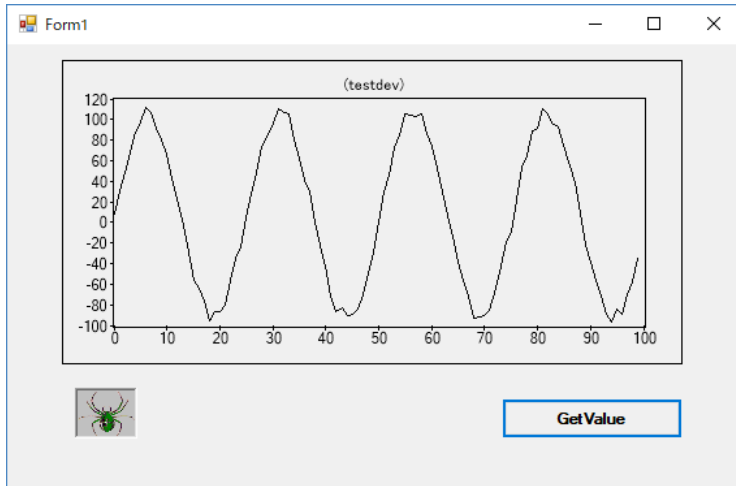
Show output from: Debug

Ready Add to Source Control

ACOP Address Editor



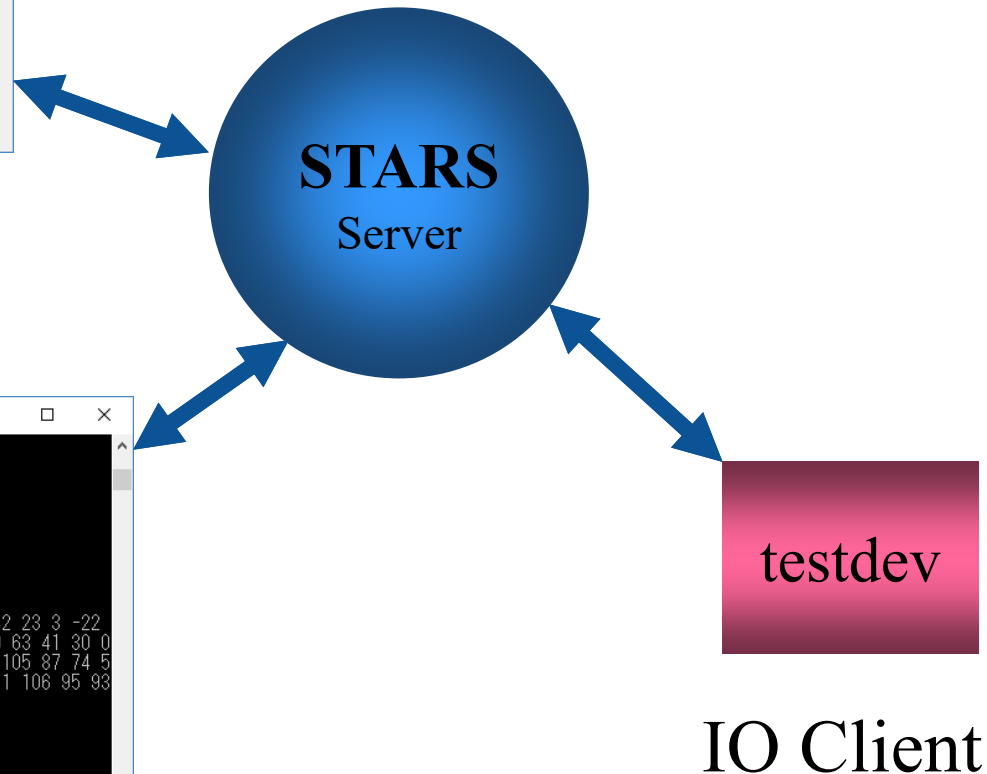
Test with Simulator



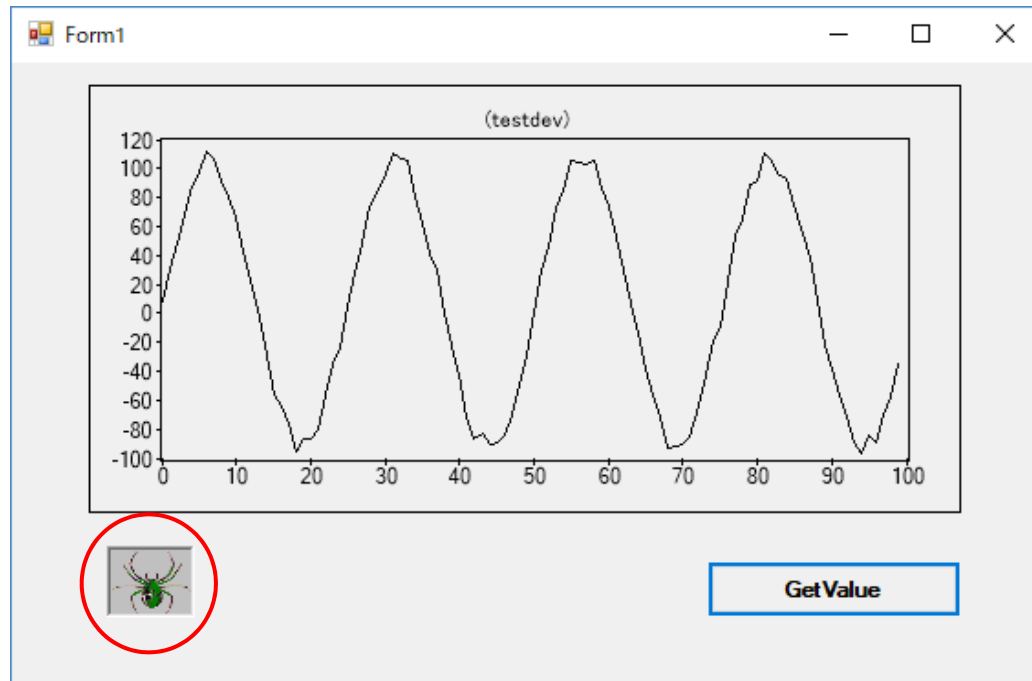
ACOP GUI Client

```
kosuge@spinet-desktop: ~  
kosuge@spinet-desktop: $ telnet localhost 6057  
Trying 127.0.0.1...  
Connected to localhost.  
Escape character is '^J'.  
4568  
Debugger stars  
System>Debugger Ok:  
System>Debugger Ok:  
AcopStarsTestForm>testdev GetValue  
testdev>AcopStarsTestForm @GetValue 8 31 48 69 88 98 112 107 92 80 66 42 23 3 -22  
-56 -64 -77 -95 -87 -87 -80 -56 -35 -23 4 28 48 74 86 97 110 107 105 80 63 41 30 0  
-22 -42 -71 -87 -83 -91 -89 -84 -70 -49 -29 0 30 46 73 85 105 104 103 105 87 74 5  
2 30 7 -14 -39 -56 -72 -93 -92 -91 -86 -64 -42 -19 -8 22 53 65 89 91 111 106 95 93  
75 55 38 9 -22 -39 -57 -71 -89 -97 -84 -89 -70 -58 -35
```

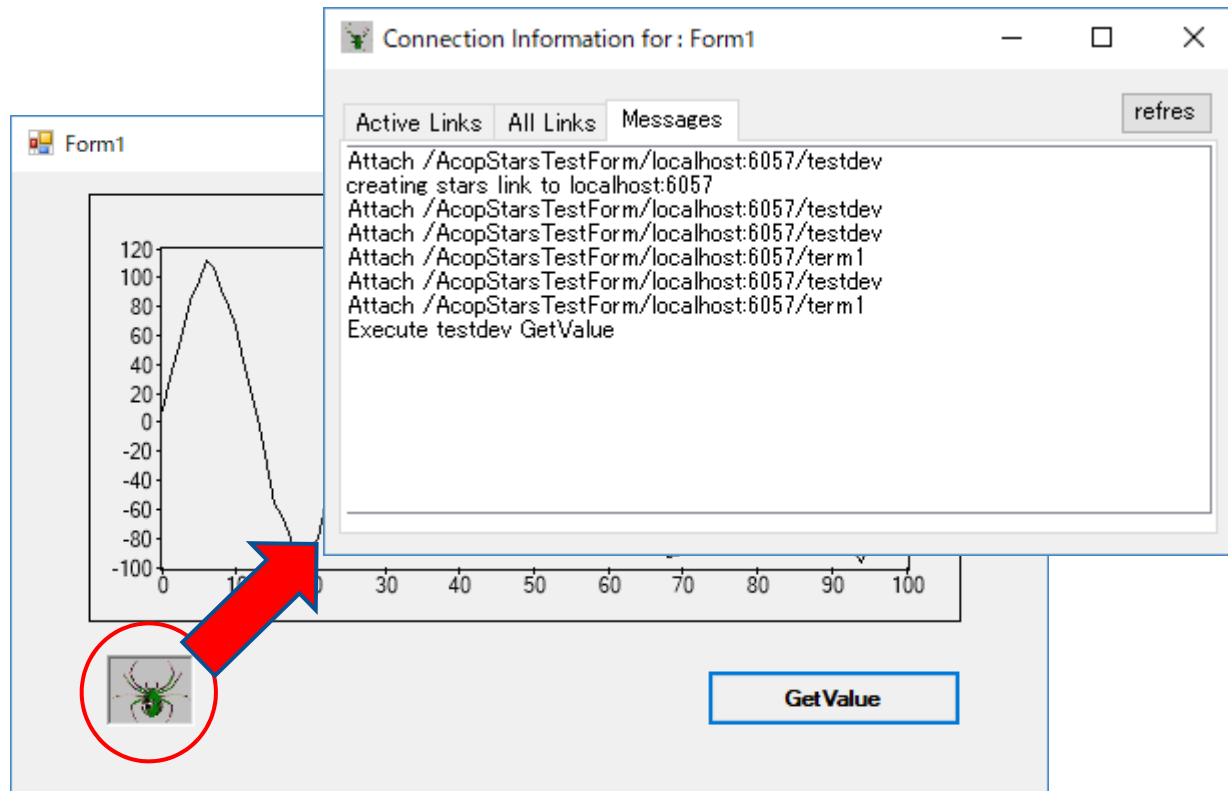
Debugger



ACOP Spider



ACOP Spider



Summary

- ▶ We have succeeded in developing a first version of ACOP .NET STARS transport layer.
- ▶ We obtained sufficient result upon making a GUI STARS client with ACOP .NET.
- ▶ The name space mapping between ACOP and STARS still needs to be refined.
- ▶ Checking all the ACOP components and replacing the name space mapping table (if necessary) will be the next step.

Thank you.

<http://stars.kek.jp>

takashi.kosuge@kek.jp