

Selenium Software

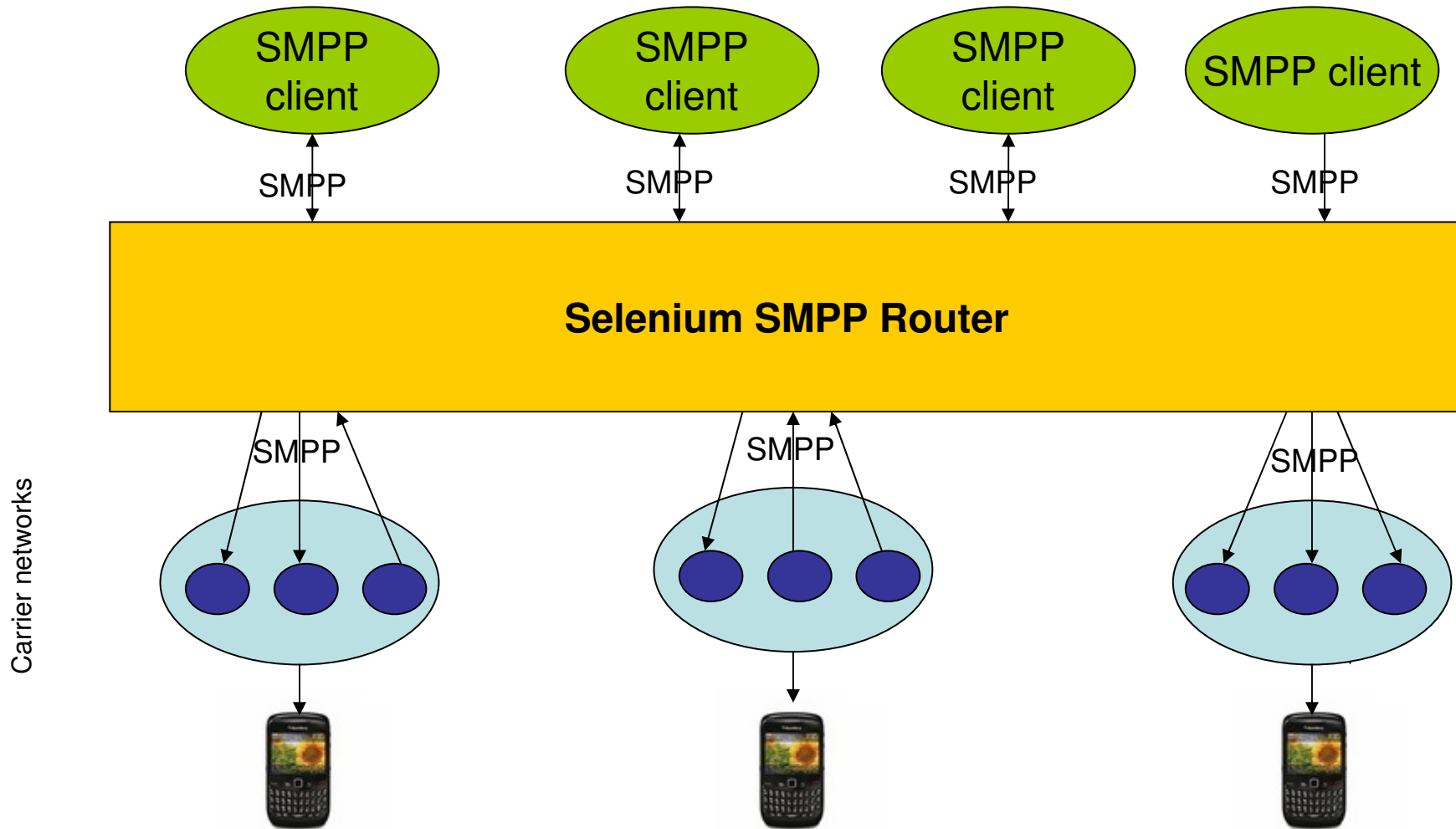
Selenium SMPP Router Overview

Agenda

- Introducing Selenium SMPP Router
- User interfaces
 - Selenium CP
 - Selenium FM
 - Selenium MC
- Routing
- Scripting
- Billing and Auditing
- Miscellaneous features
- Further capabilities
- Case Study

Selenium SMPP Router

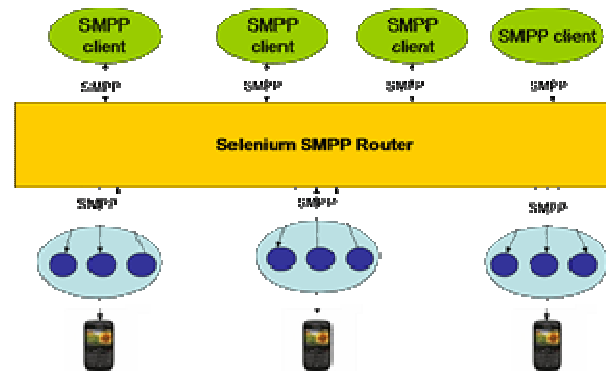
An SMPP Server and SMPP based SMS gateway combined



Selenium SMPP Router

An SMPP Server and SMPP based SMS gateway combined

- Provide an SMPP service to your clients
 - Clients can send and receive SMS messages and delivery receipts using SMPP
- Route traffic via downstream carrier networks and SMS aggregators
- Manage client accounts and routing logic
- Track usage for billing and support purposes



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User Interfaces

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Refresh Settings Manage Queues Shutdown Logout Information

System Health SMS Connector: RX

System Overview

System started at Mon 23 May 2011 05:47:32

Messages Sent OK 9

Messages Received OK 3

Receipts Received OK 0

NO Messages Queued OK 4

Receipts Queued OK 0

Last SEVERE Event

Last WARNING Event

SMS Connectors

RX Going on-line [Cancel]

Route 2 TX Go off-line

TX Going on-line [Cancel]

MT Content Connectors

JDBC/R1 Go off-line

JDBC/R2 Go off-line

JDBC/AUTO Go off-line

HTTP/R1 Go off-line

HTTP/R2 Go off-line

Outbound Queues

R1

R2

TX Dispatchers

Route 2 TX

TX

RX Receivers

RX

RX Distributors

RxDistributor_0

RxDistributor_1

RxRetry

Keep Alive

RX

Route 2 TX

TX

Miscellaneous

Configuration Service

Statistics Snapshots

EMERGENCY SHUTDOWN

Write statistics now

The emergency shutdown function will shut Selenium SMS down without first draining the message queues so only use this function if you are completely sure that you understand and accept the consequences of your action. If you are not using message queue persistence when you initiate an emergency shutdown then all messages currently queued will be lost!

Run Mode: TRACKABLE

System up-time 0 days, 10 hours, 10 minutes

Messages Sent ERR 0

Messages Received ERR 0

Receipts Received ERR 0

Queued for retry 1

Undeliverable 0

2011.05.23 15:57:58 234: Exception whilst setting up or executing SMPP bind for TX:Connection refused: connect

Information

Mon 23 May 2011 15:57:47

Mon 23 May 2011 15:57:54 / 0 / 0

Mon 23 May 2011 15:57:54 / 0 / 0

Mon 23 May 2011 15:57:54 / 0 / 0

Mon 23 May 2011 07:54:27 / 1 / 13

Mon 23 May 2011 05:47:33 / 0 / 0

Current Size: 0 / Peak Size: 10

Current Size: 0 / Peak Size: 1

Rate: 0 per sec / OK: 1 / ERR: 0

Rate: 0 per sec / OK: 8 / ERR: 0

OK: 4 / ERR: 0

Total in queue: 0

Mon 23 May 2011 11:41:47 / 1 / 2

Mon 23 May 2011 11:41:53 / 1 / 2

Mon 23 May 2011 15:57:33 / 0 / 7 / 3

354

970

456

OK: 0 / ERR: 0

Selenium CP - Control Panel

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Held Messages Released Messages Archived Messages Filter Rules Frequency Rules Frequency Exclusions Logout

Selenium FM - Held Messages (Total: 30 Released: 0)

Search: All Fields Go Reset Export

+	-	#	ID	Held	Account	Src	Dest	Reason	Message
<input type="checkbox"/>	<input type="checkbox"/>	203	237	19.05.2011 06:15:03			00000010	Filter2	An early morning final test 1234
<input type="checkbox"/>	<input type="checkbox"/>	202	236	19.05.2011 06:15:03			00000009	Filter2	An early morning final test 1234
<input type="checkbox"/>	<input type="checkbox"/>	201	235	19.05.2011 06:15:03			00000008	Filter2	An early morning final test 1234
<input type="checkbox"/>	<input type="checkbox"/>	200	234	19.05.2011 06:15:03			00000007	Filter2	An early morning final test 1234
<input type="checkbox"/>	<input type="checkbox"/>	199	233	19.05.2011 06:15:03			00000006	Filter2	An early morning final test 1234

Archive Selected Release Selected Archive Search Results Release Search Results

At start of list Next

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Selenium FM - Filter Manager

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Main Menu Logout

Selenium MC - Outbox

+	-	ID	Destination Address	Submitted	Status	Start of Message
<input type="checkbox"/>	<input type="checkbox"/>	251	44776655112244	23.05.2011 at 16:00:48	SUBMITTED OK	Another test
<input type="checkbox"/>	<input type="checkbox"/>	250	445544332211	23.05.2011 at 16:00:48	SUBMITTED OK	Test
<input type="checkbox"/>	<input type="checkbox"/>	249	92321321321	23.05.2011 at 16:00:48	SUBMITTED OK	Hello from Selenium MC - The Message Con
<input type="checkbox"/>	<input type="checkbox"/>	248	92321321321	23.05.2011 at 16:00:48	SUBMITTED OK	Hello from Selenium MC - The Message Con
<input type="checkbox"/>	<input type="checkbox"/>	247	2222222222	23.05.2011 at 16:00:48	SUBMITTED OK	Hello
<input type="checkbox"/>	<input type="checkbox"/>	246	1111111111	23.05.2011 at 16:00:48	SUBMITTED OK	Hello
<input type="checkbox"/>	<input type="checkbox"/>	245	2222222222	23.05.2011 at 16:00:48	SUBMITTED OK	Hello
<input type="checkbox"/>	<input type="checkbox"/>	244	1111111111	23.05.2011 at 16:00:48	SUBMITTED OK	Hello
<input type="checkbox"/>	<input type="checkbox"/>	243	2222222222	23.05.2011 at 16:00:48	SUBMITTED OK	Hello
<input type="checkbox"/>	<input type="checkbox"/>	242	1111111111	23.05.2011 at 16:00:48	SUBMITTED OK	Hello

Delete Selected Destination Address Filter Reset Filter

Showing all relevant messages

Start of list Start list from ID: Refresh Older messages

Selenium MC - Message Console

Selenium CP

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The screenshot displays the Selenium CP monitoring interface. At the top, there is a navigation bar with options: Refresh, Settings, Manage Queues, Shutdown, Logout, and Information. The main content area is titled 'System Health' and 'SMS Connector: RX'. It is divided into several sections:

- System Overview:** Shows system start time (Mon 23 May 2011 05:47:32), messages sent/received (9 OK, 3 ERR), and queue status (4 MO Messages Queued OK, 0 Receipts Queued OK, 0 Last SEVERE Event).
- Run Mode:** TRACKABLE. System up-time: 0 days, 11 hours, 24 minutes. Messages Sent ERR: 0, Messages Received ERR: 0, Receipts Received ERR: 0, Queued for retry: 1, Undeliverable: 0.
- Information:** A log entry from 2011.05.23 17:12:06 250: Exception whilst setting up or executing SMPP bind for RX:Connection refused: connect.
- SMS Connectors:** RX (Going on-line [Cancel]), Route 2 TX (Go off-line), TX (Going on-line [Cancel]).
- MT Content Connectors:** JDBC/R1, JDBC/R2, JDBC/AUTO, HTTP/R1, HTTP/R2 (all Go off-line).
- Outbound Queues:** R1, R2 (both Go off-line).
- TX Dispatchers:** Route 2 TX, TX (both Go off-line).
- RX Receivers:** RX (Go off-line).
- RX Distributors:** RxDistributor_0, RxDistributor_1, RxRetry (all Go off-line).
- Keep Alives:** RX (354), Route 2 TX (1118), TX (456).
- Miscellaneous:** Configuration Service (Go off-line), Statistics Snapshots (Write statistics now).

EMERGENCY SHUTDOWN: The emergency shutdown function will shut Selenium SMS down without first draining the message queues so only use this function if you are completely sure that you understand and accept the consequences of your action. If you are not using message queue persistence when you initiate an emergency shutdown then all messages currently queued will be lost!

Monitor

- Overall status
- Connections to mobile networks
- Application interfaces
- Message queues
- Message dispatcher processes
- Message receiver processes

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Selenium CP

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The screenshot shows the Selenium CP configuration interface for an SMS Connector. The breadcrumb navigation at the top reads: Control Panel > Settings > SMS Connectors > Logout. The main configuration area is titled "SMS Connector: TX" and contains the following fields:

Type:	SMPPTX
Name:	TX
Host:	localhost
Port:	2775
Network:	TESTNET
Route:	R1
System ID:	smpclient1
Password:	password
System Type:	
Address Range:	
Default Encoding:	GSM_0338
Source Address Encoding:	US-ASCII
Temporary Errors (decimal,comma separated):	
Enquire Link Period (ms):	30000
Throttle Submit (ms):	0
Queue Full Backoff (ms):	5000
Connection Timeout (ms):	60000
Response Timeout (ms):	60000
Message Concatenation Encoding:	UDH
Auto Correct Data Coding 0:	true

At the bottom of the form are three buttons: "Submit", "Export Connector", and "Cancel".

Configure

- Accounts
- SMSC connections
- Routing rules
- Message processing scripts
- Message queues
- Delivery receipt content mapping

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Selenium CP

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Queue Status

R1 Current Size: 10 / Peak Size: 10
R2 Current Size: 0 / Peak Size: 1

Search Criteria

Destination address: R1 (dropdown), 898 (input)

List Messages

Search Results

ID	Destination	Message
<input type="checkbox"/> SM-799	9212345676898	Hello from Selenium SMS
<input type="checkbox"/> SM-800	9212345676898	Hello from Selenium SMS
<input type="checkbox"/> SM-801	9212345676898	Hello from Selenium SMS
<input type="checkbox"/> SM-802	9212345676898	Hello from Selenium SMS
<input type="checkbox"/> SM-803	9212345676898	Hello from Selenium SMS
<input type="checkbox"/> SM-804	9212345676898	Hello from Selenium SMS
<input type="checkbox"/> SM-805	9212345676898	Hello from Selenium SMS
<input type="checkbox"/> SM-806	9212345676898	Hello from Selenium SMS
<input type="checkbox"/> SM-807	9212345676898	Hello from Selenium SMS
<input type="checkbox"/> SM-808	9212345676898	Hello from Selenium SMS

Actions

Delete selected messages

Move selected messages to: Pick queue (dropdown)

Manage Queues

- Search
- Move
- Delete
- Divert
- Clear

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Selenium FM

The screenshot displays the Selenium FM web interface. At the top, there is a navigation bar with links: Held Messages, Released Messages, Archived Messages, Filter Rules, Frequency Rules, Frequency Exclusions, and Logout. Below this, the main header reads "Selenium FM - Held Messages (Total: 30 Released: 0)". To the right of the header is a search bar with a dropdown menu set to "All Fields", a search input field, and buttons for "Go", "Reset", and "Export".

+ -	#	ID▼	Held	Account	Src	Dest	Reason	Message
<input type="checkbox"/>	203	237	19.05.2011 06:15:03			00000010	Filter2	An early morning final test 1234
<input type="checkbox"/>	202	236	19.05.2011 06:15:03			00000009	Filter2	An early morning final test 1234
<input type="checkbox"/>	201	235	19.05.2011 06:15:03			00000008	Filter2	An early morning final test 1234
<input type="checkbox"/>	200	234	19.05.2011 06:15:03			00000007	Filter2	An early morning final test 1234
<input type="checkbox"/>	199	233	19.05.2011 06:15:03			00000006	Filter2	An early morning final test 1234

Below the table, there are four buttons: "Archive Selected", "Release Selected", "Archive Search Results", and "Release Search Results". At the bottom left of the interface, it says "At start of list" and at the bottom right, "Next". The footer contains "Copyright Selenium Software 2009" on the left and "Selenium FM Version 1.4.0" on the right.

Filter Messages

- Define filter rules
- Define frequency tracking rules
- Inspect filtered messages
- Release selected filtered messages
- Archive selected filtered messages
- Search
- Sort

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Selenium MC

⌘ Main Menu ⌘ Logout

Selenium MC - Outbox

+ -	ID	Destination Address	Submitted	Status	Start of Message
<input type="checkbox"/>	251	44776655112244	23.05.2011 at 17:21:43	SUBMITTED OK	Another test
<input type="checkbox"/>	250	445544332211	23.05.2011 at 17:21:43	SUBMITTED OK	Test
<input type="checkbox"/>	249	92321321321	23.05.2011 at 17:21:43	SUBMITTED OK	Hello from Selenium MC - The Message Con
<input type="checkbox"/>	248	92321321321	23.05.2011 at 17:21:43	SUBMITTED OK	Hello from Selenium MC - The Message Con
<input type="checkbox"/>	247	2222222222	23.05.2011 at 17:21:43	SUBMITTED OK	Hello
<input type="checkbox"/>	246	1111111111	23.05.2011 at 17:21:43	SUBMITTED OK	Hello
<input type="checkbox"/>	245	2222222222	23.05.2011 at 17:21:43	SUBMITTED OK	Hello
<input type="checkbox"/>	244	1111111111	23.05.2011 at 17:21:43	SUBMITTED OK	Hello
<input type="checkbox"/>	243	2222222222	23.05.2011 at 17:21:43	SUBMITTED OK	Hello
<input type="checkbox"/>	242	1111111111	23.05.2011 at 17:21:43	SUBMITTED OK	Hello

Showing all relevant messages

Start of list Start list from ID: Older messages

Message Console

- Define user accounts
- Set message quotas
- Set user permissions
- Send messages to one or more destination
- View and manage inbox
- View and manage outbox

Routing

⌘ Refresh ⌘ Control Panel ⌘ Settings ⌘ Logout

Routing Rules

Default ▾

Account	Rule ID	Country Name ▾	Destination starts with	Send via route	System default route?	
Default	7	Pakistan	92	R1	NO	delete
Default	6	Democratic Peoples Republic of Korea	850	R1	NO	delete
Default	5	Croatia	385	R2	NO	delete
Default	4	Brazil	55	R1	NO	delete
Default	2	Afghanistan	93	R2	NO	delete
Default	1	N/A		R1	YES	

Routing rule added OK and Selenium SMS notified of change

Number prefix routing

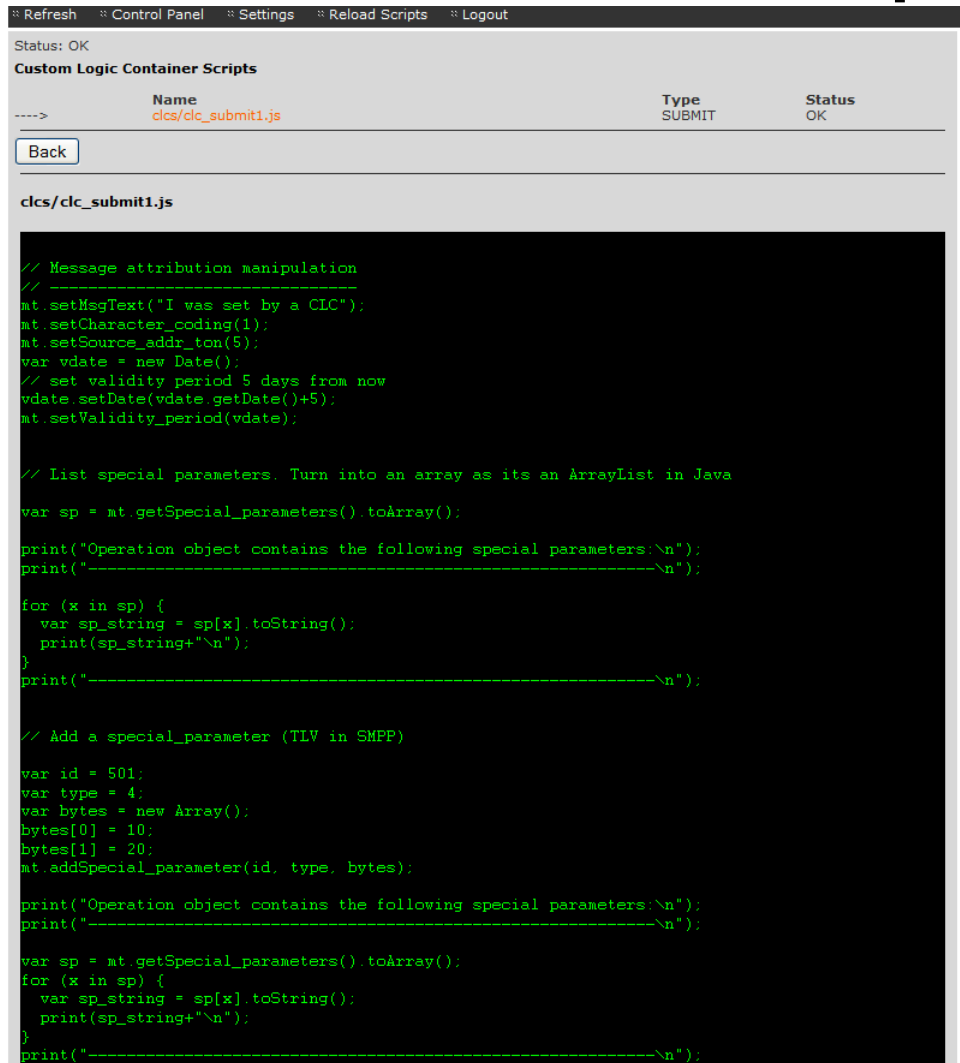
- Define routing rules
- Per country or number prefix
- Augment UI specified rules with more complex routing logic implemented in your own scripts

⌘ Control Panel ⌘ Settings ⌘ Routing Rules ⌘ Logout

Routing Rule

ID: 2
Account: Default
This rule specifies the default route for this account: false ▾
Select a country: Afghanistan ▾
If destination address starts with: 93
Send via MT route: R2 ▾
Interpretation: Messages not routed by an account-specific rule and which have destination addresses which start with '93' will be sent via route R2
Comment:
Created: Sat May 14 13:38:59 BST 2011
Last updated: Thu May 19 06:13:10 BST 2011

Scripting



```
// Refresh * Control Panel * Settings * Reload Scripts * Logout
Status: OK
Custom Logic Container Scripts
-----
Name                               Type      Status
clcs/clc_submit1.js                SUBMIT    OK
Back
clcs/clc_submit1.js
// Message attribution manipulation
// -----
mt.setMsgText("I was set by a CLC");
mt.setCharacter_coding(1);
mt.setSource_addr_ton(5);
var vdate = new Date();
// set validity period 5 days from now
vdate.setDate(vdate.getDate()+5);
mt.setValidity_period(vdate);

// List special parameters. Turn into an array as its an ArrayList in Java
var sp = mt.getSpecial_parameters().toArray();

print("Operation object contains the following special parameters:\n");
print("-----\n");

for (x in sp) {
    var sp_string = sp[x].toString();
    print(sp_string+"\n");
}
print("-----\n");

// Add a special_parameter (TLV in SMPP)
var id = 501;
var type = 4;
var bytes = new Array();
bytes[0] = 10;
bytes[1] = 20;
mt.addSpecial_parameter(id, type, bytes);

print("Operation object contains the following special parameters:\n");
print("-----\n");

var sp = mt.getSpecial_parameters().toArray();
for (x in sp) {
    var sp_string = sp[x].toString();
    print(sp_string+"\n");
}
print("-----\n");
```

Programmable Message Handling

- Write scripts in the popular JavaScript language
- Intervene in message processing at various points in the lifecycle
- Update message attributes
- Change routes
- Block messages
- More....

Billing and Auditing

```
AUDIT_DELIMITER=|
AUDIT_EVENT_01=true
AUDIT_EVENT_02=true
AUDIT_EVENT_03=true
AUDIT_EVENT_04=false
AUDIT_EVENT_05=false
AUDIT_EVENT_06=true
AUDIT_EVENT_07=true
AUDIT_EVENT_08=true
AUDIT_EVENT_09=true
AUDIT_FILE=billing.log
AUDIT_FILE_ROLLOVER_FREQUENCY=5
AUDIT_FILE_SIZE_LIMIT=1000
AUDIT_ROLLOVER_DIRECTORY=billing
AUDIT_ROLLOVER_EMPTY=false
```

CDR Production

- “CDR”s (Call Data Records) may be output at a wide variety of points in the message processing lifecycle
- CDR records can be fed into billing systems
- CDRs may also be used to provided an audit trail of system usage

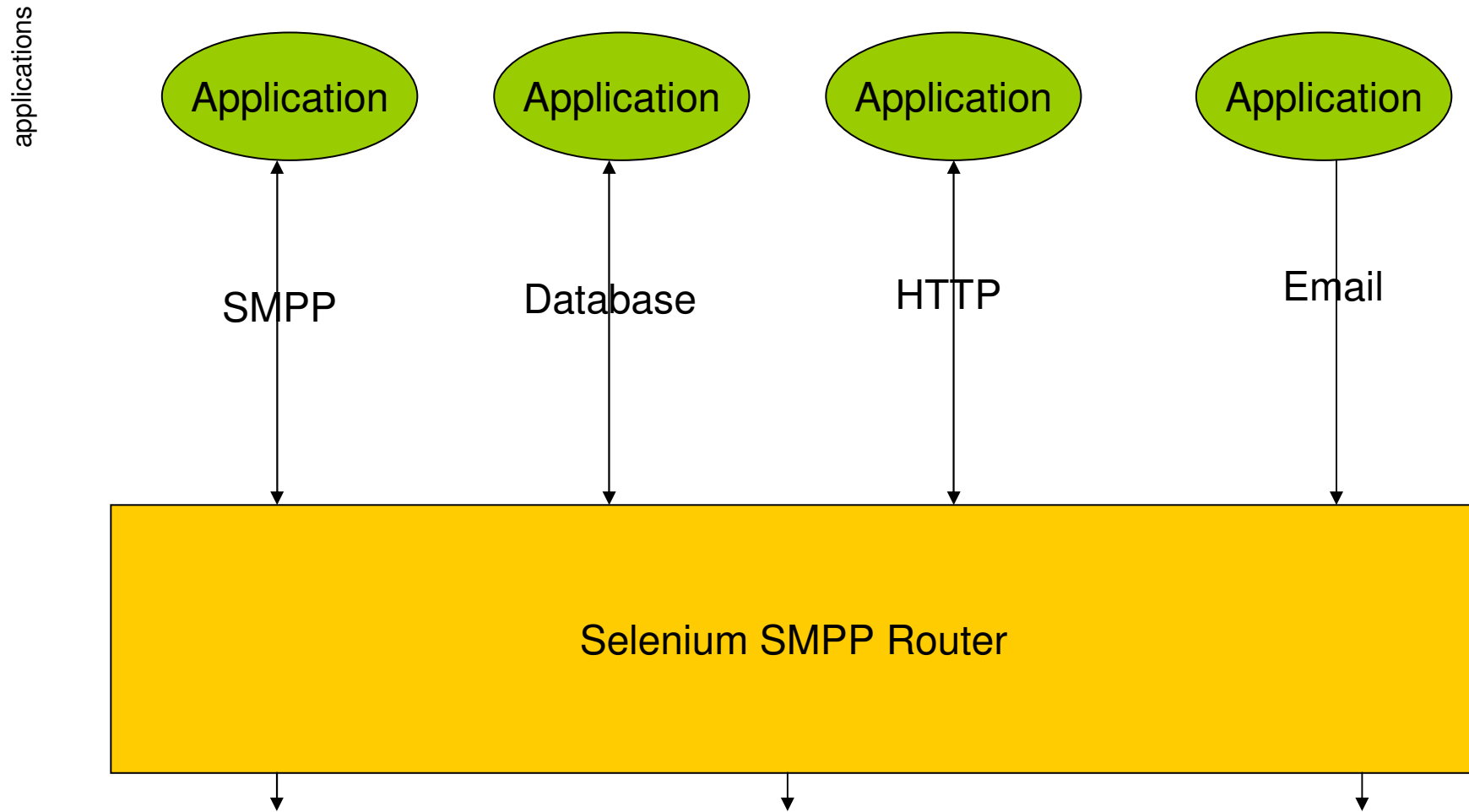
Miscellaneous

- Routing of mobile originated messages using regular expression pattern matching
- Content of delivery receipts may be “mapped” to your own standardised format. Useful if passing delivery receipts back from the downstream networks to your own customers.
- Persistent message queues for greater reliability
- Multiple SMSC connections may service each queue in parallel for highest throughput
- SMSC connection latency tracked and available in graphic form within Selenium CP

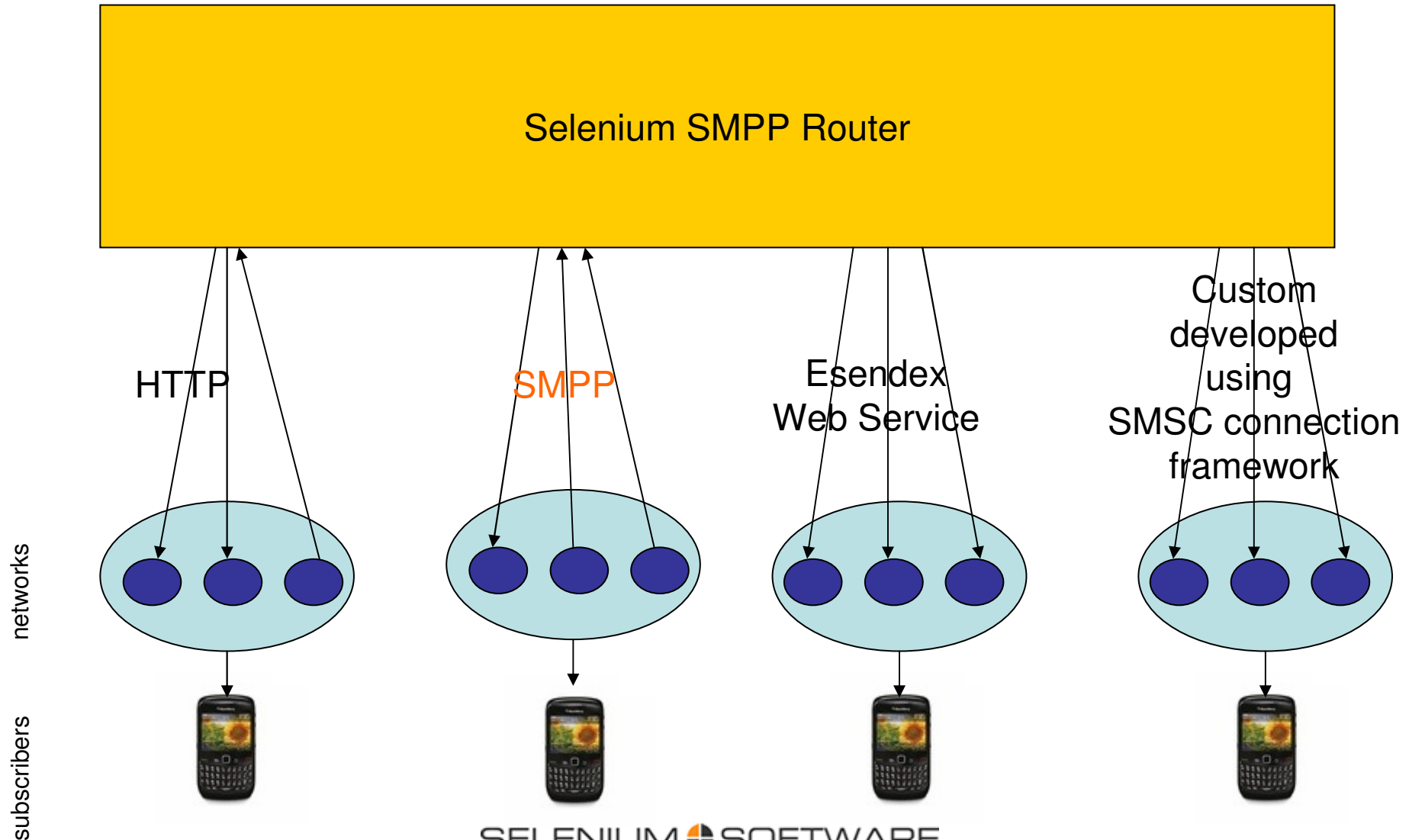
And there's more.....

- Selenium SMPP Router contains all of the features of Selenium SMS
 - It's not just about SMPP
- As a holder of licences for Selenium SMPP Router you can use all of the features of Selenium SMS.... At no extra cost
- Clients can use HTTP or email as well as SMPP
- You can connect to other providers using HTTP or your own custom-built connectors

Applications and APIs



Mobile Network SMSC Protocols



Hardware Requirements

- Typically a mid-range server with 2gb - 4gb RAM is required
 - Precise spec is dependent on precise configuration and traffic volumes and patterns
 - CPU rarely “pushed”. Performance bottleneck is normally the latency (response times) of the connections to downstream network operator servers
- Any OS supporting a Java 1.6 virtual machine
 - Linux recommended and used by most customers
 - Others use Windows or Solaris

Case Study - Interconnect Service Operator

- An organisation who have offices in Scandinavia and the Middle East
- Providers of an SMS interconnect service, linking various networks to each other and using SMPP to route messages from one to another.
- Their service is centred around Selenium SMPP Router
- Supports many network connections with routing controlled by prefix based routing rules
- Makes extensive use of the Selenium FM message filtering capability to remain compliant with the strict rules of some of the "down stream "networks they connect to
- Handles very significant volumes of traffic

Selenium SMPP Router

Contact Selenium Software for further details and pricing.

support@seleniumsoftware.com

<http://www.seleniumsoftware.com>