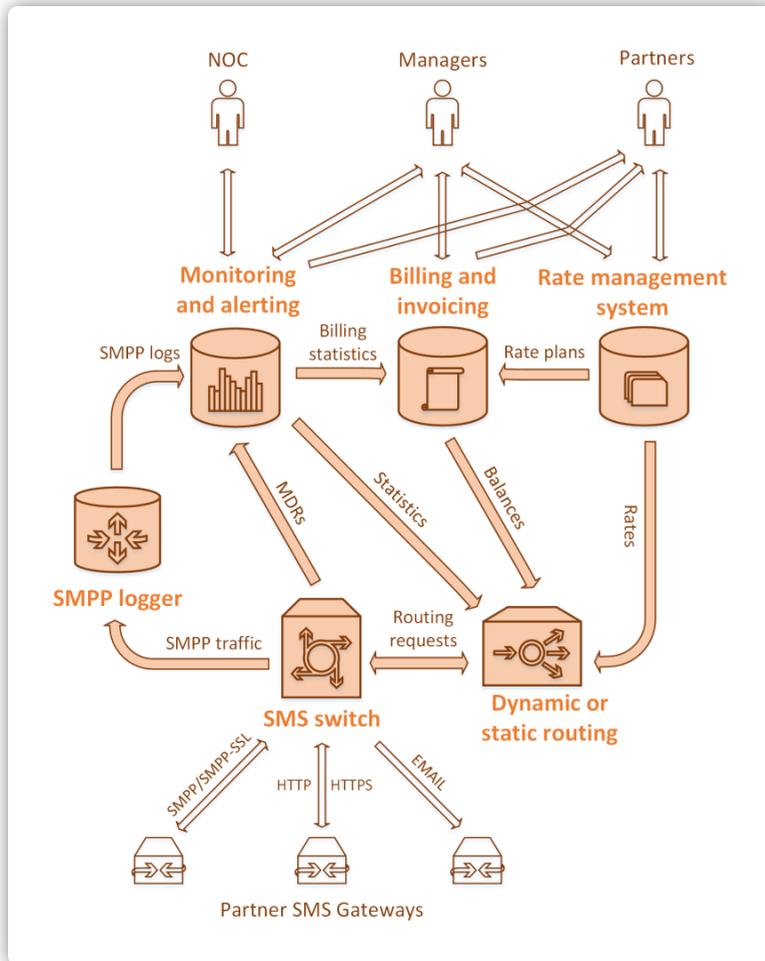




SMS switching and billing suite

Break through your data



- **SMS switch** - a stable and robust platform fully developed by **5g Future**, no opensource code used.
- **Dynamic or static routing** - a separate routing engine working with the **SMS switch**. All routing/rate info is loaded into memory and is updated every 10 seconds, resulting in very high productivity of 500 requests/sec per a CPU core.
- **Rate management system** - a flexible solution, allowing to automatically upload vendor rates, generate customer rates, and send amendments.
- **Billing and invoicing** - a high precision billing solution with invoices automatically sent to partners in your format.
- **Monitoring and alerting** - a quick and easy visual monitoring tool with lots of alerting and anti-fraud options.
- **SMPP logger** - a tool allowing to visually see all packets used in sending any SMS, including hunts, re-sending attempts, and segments of one large SMS.

- Fully developed and controlled by **5g Future**. New features can be added on request **quickly** and **efficiently**.
- **High productivity** and **stability** with support for fully **redundant** configurations.
- Messages can be received over: **SMPP**, **HTTP**, and sent over: **SMPP**, **HTTP**, **email**. **SSL** is supported.
- Message **queuing** at peak times, **flexible hunting** depending on release codes, and message **re-sending attempts** with pre-configured **time patterns**.
- **Limiting** incoming and outgoing trunks by **TPS** and by **number of messages per day**.
- Message **content screening** and routing based on content.
- Changing **message encoding** and modifying its body using **regex patterns**.
- **DLR** suppression and generation.
- **Sending test SMS** right from the web interface.

SMS switch

Carriers Gateways GW groups Customer trunks Prerouting actions Routing plans Routes Vendor trunks Email templates SMS screening More... ?

Save Cancel Rows: 9 SMS simulation Send SMS

Status	GW name	Carrier	Connect mode	Transc. mode	Partner IP we're Client	Own IP:port we're Server	Username	Protocol we're Client	HTTP URI we're Client	Cust. TPS	Vend. TPS	Force DLR request	Suppress DLR	Max SMS per day	Use reply queue	Code 0 meaning
<input checked="" type="checkbox"/>	SMPP/SSL GW Server	Pico Telecom (15)	Server	<input checked="" type="checkbox"/>		SMPP/SSL Server	user9	smpp		100		1	Yes	1000	Yes	7bit gsm
<input checked="" type="checkbox"/>	HTTPS GW Server	Cod Telecom (10)	Server	<input checked="" type="checkbox"/>		HTTPS Server (6)	user8	smpp								
<input checked="" type="checkbox"/>	SMPP GW Server	Crab Telecom (13)	Server	<input checked="" type="checkbox"/>		SMPP Server (1)	user7	smpp								
<input checked="" type="checkbox"/>	HTTP GW Server	Whale Telecom (17)	Server	<input checked="" type="checkbox"/>		HTTP Server (2)	user6	http get								
<input checked="" type="checkbox"/>	Email GW	Clam Telecom (11)	Client	<input checked="" type="checkbox"/>			user5	email								
<input checked="" type="checkbox"/>	HTTP POST GW Client	Cod Telecom (10)	Client	<input checked="" type="checkbox"/>			user4	http post	https://sendsms							
<input checked="" type="checkbox"/>	HTTP GET GW Client	Crab Telecom (13)	Client	<input checked="" type="checkbox"/>			user3	http get	http://sendsms.c							
<input checked="" type="checkbox"/>	SMPP/SSL GW Client	Pico Telecom (15)	Client	<input checked="" type="checkbox"/>	192.168.1.2		user2	smpp/ssl								
<input checked="" type="checkbox"/>	SMPP GW Client	Pico Telecom (15)	Client	<input checked="" type="checkbox"/>	192.168.1.1		user1	smpp								

Send SMS

Send to HTTP gateway: HTTP GW Server (59)

SRC number: 1234567890&&npi=1&&ton=2

DST number: 9876543210

- A **flexible** and **robust** routing engine with **dynamic** routing on both **cost** and **quality**.
- Low **balance** restrictions for customers and vendors.
- Routing is done **in memory** to deliver performance of up to **500 CPS per a CPU core**. Routing info and rates are updated within **10 seconds**.
- **Multiple** routing engines may coexist on the same server, or may be distributed over **several servers**, allowing for practically **unlimited scalability**.
- Full range of routing features supported: static routing, **formulas** on cost/quality, **profitability control**, temporary **gateway blocks**, **%-based routing**, etc.
- **Parent-child** relationships in routing plans.
- Number **translations** at all levels using **regexps**.
- Routing **by numbers** and **by MCCMNC**, support for **MNP**.
- Convenient **SMS path simulation** and **monitoring** features.

Route order	Route ID	Error	Vendor	Vendor Rate plan	Customer rate sys cur-cy	Vendor rate sys cur-cy	Profit	Customer area	DST number IN	DST number OUT
1	12		Whale Telecom (17)	Whale Telecom CLI (37)	0.047	0.0411	0.0059	China Mobile	86157433330	3333#86157433330
2	21	Route not selected for percent distribution			0.047		0.047	China Mobile	86157433330	
3	20	Vendor rate denied by markup	Whale Telecom (17)	Whale Telecom PREMIUM (35)	0.047	0.0484	-0.0014	China Mobile	86157433330	
4	19	Vendor rate not found	Enormous Telecom (14)	Enormous Telecom CLI (46)	0.047		0.047	China Mobile	86157433330	
5	16		Oversized Telecom (16)	Oversized Telecom STANDARD (39)	0.047	0.0431	0.0039	China Mobile	86157433330	1111#86157433330
6	18	Route not configured for percent distribution			0.047		0.047	China Mobile	86157433330	
7	15		Whale Telecom (17)	Whale Telecom STANDARD (36)	0.047	0.0408	0.0062	China Mobile	86157433330	1111#86157433330
8	23	Route denied			0.047		0.047	China Mobile	86157433330	
9	24	Vendor rate denied by markup	Crab Telecom (13)	Crab Telecom STANDARD (48)	0.047	0.0507	-0.0037	China Mobile	86157433330	
10	17	Vendor rate denied by markup	Pico Telecom (15)	Pico Telecom CLI (43)	0.047	0.0511	-0.0041	China Mobile	86157433330	
11	25	Vendor rate not found	Enormous Telecom (14)	Enormous Telecom CLI (46)	0.047		0.047	China Mobile	86157433330	

- **Auto-import** of vendor rates **from emails**, as well as **manually**.
- **Auto-recognition** of rate sheet columns. Possibility to **save templates** for patterns of: vendor email address, subject, body; attached file names; excel sheet names.
- Support for **codes** and **area** names split between two columns (**MCC + MNC**).
- Support for **compact code formats**, for instance: 412-427,429.
- Support for full **A-Z** or **partial country** replaces.
- **Automatic corrective actions** can be assigned to every column in a rate sheet of each vendor.
- **Duplicate codes** can be automatically removed, or can generate a warning.
- **Auto-comparison** to previously loaded rates, **reports** on all new rates loaded in the last X days.
- Sending **notifications** to vendor on various events (errors, accepting rates, loading to main rate table, etc.)

The screenshot displays a software interface for comparing vendor rates. At the top, there are navigation tabs: 'Compare', 'Import edit', 'Compare', 'Final check', 'Upload log', 'RateCust', and 'Rate'. Below the tabs, there are controls for 'Group by: Code Area', 'GO', and 'Rows: 31 / 697 1-300'. There are also buttons for 'Clear table', 'Compare Customer', 'Compare Vendor', and 'Move to Final check'.

The main part of the interface is a table with the following columns: 'Comparison results', 'Codes old/deck', 'Codes NEW', 'Rate old', 'Rate NEW', 'Rate diff', and 'Rate diff,%'. The table contains multiple rows of data, each representing a comparison between an old rate and a new rate. The 'Comparison results' column uses color-coded text to indicate the status of the comparison: 'DOWN' (green), 'UP' (red), 'Added' (black), 'Removed' (purple), and 'UP, EarlierDate' (blue). Some rows also include additional status information like 'Expanded, DOWN' or 'Collapsed, UP'.

Comparison results	Codes old/deck	Codes NEW	Rate old	Rate NEW	Rate diff	Rate diff,%
DOWN	722020	722020	0.01	0.0025	-0.0075	-300.0
Added		624004		0.0062		
Removed	621020		0.002	0.002		
UP	602001	602001	0.0035	0.0125	0.009	72.0
Removed	651002		0.0045	0.0045		
UP	510	510	0.0069	0.007	0.0001	1.4
Removed	520004		0.0035	0.0035		
UP	502020	502020	0.0018	0.018	0.0162	90.0
Added		260		0.0072		
DOWN, EarlierDate	262016	262016	0.02	0.012	-0.008	-66.7
DOWN, EarlierDate	262011	262011	0.02	0.012	-0.008	-66.7
Removed	454001		0.0045	0.0045		
DOWN, EarlierDate	262002	262002	0.02	0.012	-0.008	-66.7
Added		235094		0.0094		
UP, EarlierDate	452004	452004	0.01	0.0125	0.0025	20.0
Removed	232		0.0027	0.0027		
UP, EarlierDate	452007	452007	0.01	0.0125	0.0025	20.0
Added, Expanded, DOWN	234	234051	0.0136	0.0094	-0.0042	-44.7
DOWN	234055	234055	0.0136	0.0094	-0.0042	-44.7
Added, Expanded, DOWN	234	234037	0.0136	0.0094	-0.0042	-44.7
DOWN	234032	234032	0.0136	0.0094	-0.0042	-44.7
UP, EarlierDate	452005	452005	0.01	0.0125	0.0025	20.0
Removed	428088		0.0055	0.0055		
DOWN	234008	234008	0.0136	0.0094	-0.0042	-44.7
Added		214022		0.0113		
Added		214021		0.0113		
DOWN	216070	216070	0.0085	0.0077	-0.0008	-10.4
Removed	440011		0.0025	0.0025		
UP, EarlierDate	240020	240020	0.00375	0.01	0.00625	62.5
Removed, Collapsed, UP	240023	240	0.00375	0.00375		
UP	244013	244013	0.0045	0.023	0.0185	80.4

Customer rate generation Shared decks Change deck Verify Change log Amendment

Save Cancel Rows: 27

Clear table Apply changes + Upload Info

Area name in Code deck	Change type	Verification result	Codes ADD / DEL	Rate diff	Rate diff, %
E-Plus(Germany) (10352)	Code delete	CodeDeleted	262077		
ICE(Costa Rica) (10546)	Code delete	CodeDeleted	712001		
GlobalStar(France) (10484)	Code add	CodeAdded	7777968,888		
Claro(Chile) (10223)	Area delete, plan	AreaDeleted			
Africel(Gambia) (9881)	Area delete, plan	AreaDeleted			
Nuevatel(Bolivia) (11104)	Area delete, deck	AreaDeleted	736001		
	Area add, deck	AreaAdded	4444467,555		
	Area add, deck	AreaAdded	4444467,555		
	Area add, deck	AreaAdded	4444467,555		
	Area add, deck	AreaAdded	4444467,555		
Cosmote(Greece) (10273)	Area name	NameChange			
Itisaluna(Iraq) (10636)	Area name	NameChange			
Yoigo(Spain) (11899)	Area add, plan	AreaAdded, RateAdded			
Vivacell(Sudan) (11804)	Area RATE	DOWN		-0.061	-63.4
Xpress(Jordan) (11894)	Area RATE	DOWN		-0.1209	-516.7
Vodafone(Fiji) (11850)	Area RATE	UP		0.0036	4.6
MTN(Sudan) (10869)	Area RATE	DOWN		-0.1423	-164.5
MTS(Belarus) (10905)	Area RATE	DOWN		-0.0531	-80.9
Digicel(Samoa) (10330)	Area RATE	UP		0.0052	22.2
Digicel(Tonga) (10332)	Area				
Vivacell(Sudan) (11804)	Area				
Xpress(Jordan) (11894)	Area				
Vodafone(Fiji) (11850)	Area				
MTN(Sudan) (10869)	Area				
MTS(Belarus) (10905)	Area				
Digicel(Samoa) (10330)	Area				
Digicel(Tonga) (10332)	Area				

Apply changes

Supersede future rates:

Include verification results to amendments:

Get a test .xlsx Rate amendment

Create .xlsx Rate amendments:

- Possibility to **generate rates automatically** based on LCR reports on vendor rates.
- **Several managers** can work with the same **Change deck** to introduce changes, and then the deck can be verified, compared to existing rates, and applied with rate **amendments automatically sent** to customers.
- Support for full **A-Z** or **partial country** replaces.
- **Various options** for the amendments format - **files**, attached to emails or selected areas right in the **email body**.
- Emails to customers can contain **links to accept rates** receipt.
- **Fully customizable** email and amendment file **templates**.
- **Full undo** to unlimited depth for customer and vendor rates.

- **Quick filtering and sorting** of all your rate tables. Color indication of a **rate state**: expired, active, future, void.
- **Comparison** of rates over a **certain interval** to show only the rates that **changed within** this interval.
- **LCR tables** with **unlimited depth** for all or part of your vendor rates.
- **Customer rate generation** based on vendor rates and **statistics**.
- **Rate alerts** in case a vendor **rate increase** requires rate increase for certain customers.
- **Push and target** rates analysis.

Rate analysis Rate plans RateVend RateVend range Rate alerts LCR1 LCR2 Gener. edit Push/target More... ? ✎ ☑ ☒ ✕

E C C Cust 4h 12h **1d** 2d 3d 1w 2w 4w Swap GO Stats Rows: 3000 / get 1-3000 Fetch: 10 100 300 1k 3k 10k User Sys GMT

Clear table LCR report Generate Customer rates Move to Generated rate edit Info

Order	Status	Codes in LCR group	Codes in Rate plan	Area in Rate plan	Codes Master	Area in Master Code deck	Generated price	Generated diff	Rate sys currency	Rate diff with pr 1	Priority	Plan type	Rate plan	State
135	✓	732	732	Colombia - ALL (559)	732	Colombia - ALL (559)	0.001177	0.0011681	0.0000089	0.0	1	cust	Customer1 RP (174)	active
136	✓	732	732	Colombia Other	732	Colombia - ALL (559)	0.001177	0.0002761	0.0009009	0.000892	2	vend	Vendor2 RP (170)	active
137	✓	732	732	Colombia Other networks	732	Colombia - ALL (559)	0.001177	-0.000823	0.002	0.0019911	3	vend	Vendor4 RP (168)	active
138	✓	732	732	Colombia Default	732	Colombia - ALL (559)	0.001177	-0.002423	0.0036	0.0035911	4	vend	Vendor1 RP (171)	active
139	✓	732130	732	Colombia - ALL (559)	732	Colombia - ALL (559)	0.001177	0.0011681	0.0000089	0.0	1	cust	Customer1 RP (174)	active
140	✓	732130	732130	Colombia Avantel	732	Colombia - ALL (559)	0.001177	0.0002761						
141	✓	732130	732130	Colombia Avantel S.A.	732	Colombia - ALL (559)	0.001177	-0.000323						
142	✓	732130	732130	Colombia Avantel	732	Colombia - ALL (559)	0.001177	-0.000823						
143	✓	732130	732	Colombia Default	732	Colombia - ALL (559)	0.001177	-0.002423						
144	✓	732101	732	Colombia - ALL (559)	732	Colombia - ALL (559)	0.001177	0.0011681						
145	✓	732101	732101	Colombia Comcel	732	Colombia - ALL (559)	0.001177	0.0002761						
146	✓	732101	732101	Colombia Comcel S.A.	732	Colombia - ALL (559)	0.001177	-0.000323						
147	✓	732101	732101	Colombia Comcel	732	Colombia - ALL (559)	0.001177	-0.000823						
148	✓	732101	732101	Colombia Comcel S.A.	732	Colombia - ALL (559)	0.001177	-0.002423						
149	✓	732102	732	Colombia - ALL (559)	732	Colombia - ALL (559)	0.001177	0.0011681						

Generate Customer rates

Rate generation method:

Rate aggregation method, priority 1:

Multiply rate by, priority 1:

Traffic share of priority 1 route, %:

- The **SMS switch** is writing **MDRs** with full customer/vendor **rate information**, received from the routing.
- In case **MDRs** need to be re-rated due to retroactive rate changes, a **separate re-rating process** processes MDRs, changing the rates and the statistical data.
- Each customer or vendor may have **several Rate plans** assigned, if needed. Several customers may also work under the **same Rate plan**.
- Customer and vendor **balances** are **calculated on the fly** and may be used in routing.

Billing Carriers Accounts Payments Requests Invoices

Save Cancel Rows: 8 Balances

Account name	Status	Currency	Balance total	Balance customer	Balance vendor
Cod Telecom	✓	USD	-727,169.56	-727,169.56	0.00
Clam Telecom	✓	USD	-1,182,492.96	-1,182,492.96	0.00
Salmon Telecom	✓	USD	-1,276,010.21	-1,276,010.21	0.00
Crab Telecom	✓	USD	553,125.81	0.00	-553,125.81
Enormous Telecom	✓	USD	810,725.78	0.00	-810,725.78
Pico Telecom	✓	USD	-478,301.39	-952,715.50	-474,414.10
Oversized Telecom	✓	USD	668,091.09	0.00	-668,091.09

Billing Carriers Accounts Payments Invoice templ. Requests Invoices

Save Cancel Cust 1h 24h 7d 30d 180d All GO

Generate invoices manually Info

Request type	Template IDs	# of invoices	Generation results	Customer / vendor	Carriers
Auto timeline	Test (every day) (1)	3	Not generated:3	Customer	Salmon Telecom (12);
Auto timeline	Test (every day) (1)	3	Not generated:3	Customer	Salmon Telecom (12);
Manual overlay		1	OK:1	Customer	Salmon Telecom (12)
Auto timeline	Test (every day) (1)	3	OK:2, Error:1	Customer	Salmon Telecom (12);
Auto timeline	Test (every day) (1)	3	OK:2, Error:1	Customer	Salmon Telecom (12);
Auto timeline	Test (every day) (1)	3	OK:2, Error:1	Customer	Salmon Telecom (12);
Auto timeline	Test (every day) (1)	3	OK:2, Error:1	Customer	Salmon Telecom (12);
Auto timeline	Test (day of month) (2)	1	OK:1	Customer	Cod Telecom (10)
Auto timeline	Test (every day) (1)	2	OK:1, Error:1	Customer	Salmon Telecom (12);

Invoice files Invoice files

Save Cancel Rows: 1

Import XLSX invoice Generate invoice

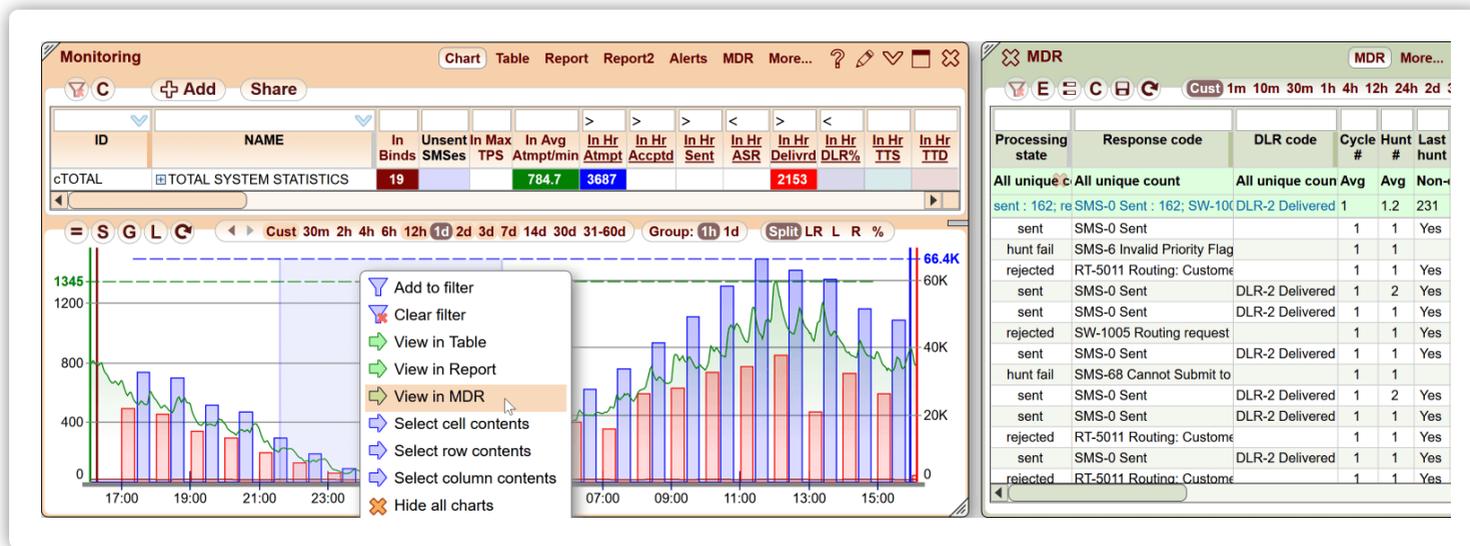
Invoice ID	User	XLSX file	PDF file	XLSX status	PDF status	Email to carrier status
28	Auto (9999)	201805/28/Invoice_201805/28/Invoice_OK, generated		OK	OK	

- Generating invoices in **different currencies**.
- **Invoices** can be generated and sent to partners **automatically or manually**.
- **Fully customizable** invoice format. Any **taxes** and their calculations can be accommodated.

5gVision Monitoring solution is extremely quick in delivering data over very long intervals and consists of the following main modules:

- **Charts** to instantly view real-time, auto-refreshed information.
- **Reports** for per-hour parameters over a long period of time.
- **MDR viewer** to quickly access raw MDRs and open charts, logs, and raw packets from them.
- **Alerts** to get notifications on anything that happens in your SMS switch.

Please refer to a separate presentation on the [5gVision monitoring suite](#).



- Collection of all SMPP packets from the SMS switch, the storage period depends only on the HDD capacity.
- Opening a log or an SMPP flow right from the MDRs with all hunts, re-sending attempts, or segments of a long SMS shown.
- Display of raw collected packets in a table with possibility to filter packets by SRC/DST IPs, numbers, message IDs, etc.
- Display of contents of individual packets and message body text. Convenient packet comparison tools.
- Display of an SMPP packet flow as an easy-to-understand chart.
- Sharing SMPP flows with your partners via a powerful 5gVision data sharing mechanism.
- Exporting logs as .pcap files.

The screenshot displays the SMPP logger interface with three main sections:

Message ID Table:

Message ID	Seq. number	SRC address	DST address	Leg	Dir	Packet size	Short message	Packet data
-759b-11e9-a28a-448a5bd87bb	792	127.0.0.1	127.0.0.1	1	src->	287	ligence you need	submit_sm H Co
759b11e9a3c6697351ff4aec	231510	127.0.0.1	127.0.0.1	2	src->	282	ligence you need	submit_sm H Co

SMPP flow diagram: Shows a sequence of packets between two endpoints. The left endpoint is 40b25264-759b-11e9-a28a-448a5bd87bb3 and the right is 40b8a222759b11e9a3c6697351ff4aec. The flow includes: submit_sm (SM length: 159), submit_sm_resp (0 Sent), deliver_sm (2 Delivered), and deliver_sm_resp (0 Sent).

Packet viewer: Shows details for a selected packet (2019-05-13 16:22:07.773202) from SRC 127.0.0.1 to DST 127.0.0.1. The command is submit_sm with the following details:

Field	Value
Command length	214; HEX=00 00 00 D6
Command id	0x4=CM_SUBMIT_SM; HEX=00 00 00 04
Command status	0=ESME_ROK; HEX=00 00 00 00

Please refer to a separate presentation on the [5gVision VoIP/SMPP packet sniffer](#).



Thank you for your time

If you wish to request
a fully functional trial
or get more information,
please contact:

Demo: demo.5gfuture.com

Web: www.5gfuture.com

Skype: [support_5gfuture](https://www.skype.com/join/support_5gfuture)

Email: sales-team@5gfuture.com