

Reuters TRIARCH 2000

## **Bloomberg Data Feed**

# **Triarch 2000 BBCOMM Feed VWAP Server Functional Specification**

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# 1. General

## 1.1 Description and requirements

BBCOMM VWAP server is Reuters SSL4 source server, receiving data from Bloomberg Data Feed via BBCOMM process and publishing it on Triarch network.

BBCOMM server requires a PC with Microsoft Windows NT4 or higher or Sun Ultra SPARC workstation with Solaris 2.5.1 or higher, Reuters SSL version 4.0.x and Bloomberg API libraries version 1.8 (release 4) or higher.

## 1.2 References

Following documents were used when creating this specification:

- Bloomberg API Programmer's Guide Application Program Interface (Release January 11, 2000);
- Triarch Programming Guide Reuters SSL 4.0 Reference Manual (Release June 1996);
- Triarch Programming Guide Reuters SSL 4.0 Developer's Guide (Release June 1996).

## 2. BBCOMM VWAP Server Functional Reference

### 2.1 BBCOMM VWAP Server Functionality

BBCOMM VWAP server will perform following functions:

- Market data conversion. The server will convert incoming data from Bloomberg BBCOMM API format into Reuters SSL4 format for publishing it to end-users on Triarch network;
- System status notifications. The server will notify end-users about changes in BBCOMM connectivity statuses;
- Closing Run. The server will perform internal data cache clean-up at specified time;
- BBCOMM connection recovery. The server will attempt to recover from BBCOMM connection failures by repeatedly trying to re-connect after configurable period of time;
- Triarch failover. As a standard Triarch source server, the BBCOMM VWAP server can be setup to run in multiple server configuration to allow Triarch failover mechanism to switch between servers;
- Supported instrument types. If the server is configured to accept RICs with Reuters standard exchange codes, VWAP-related data will be supported for the following Equities markets only (provided the data is available through Bloomberg BBCOMM API): Tokyo Stock Exchange, Osaka Stock Exchange, JASDAQ, Fukuoka Stock Exchange, Nagoya Stock Exchange, Sapporo Stock Exchange, Hercules Nippon Market, Hong Kong Stock Exchange, Taiwan Stock Exchange, Australian Stock Exchange, Korean Stock Exchange and Singapore Stock Exchange. If the server is configured to accept RICs with Bloomberg native exchange codes, VWAP-related data for any Equities market that is available through Bloomberg BBCOMM API will be supported. For details, refer to the description of BGW\_USE\_BLOOMBERG\_EXCH\_CODE start-up parameter.
- Error logging. Every extraordinary condition will be recorded in the server's log file. Once log file reaches it's maximum size, it will be renamed appending ".old" to original file name;
- Triarch source name. It will be possible to set Triarch source name for the BBCOMM VWAP server through configuration file.

## 2.2 Supported VWAP data types

The server will support following three types of VWAP data:

- VWAP data for all relevant stocks, starting at the beginning of the day. The data is a pseudo real-time VWAP from the start of the current day until the time of latest real-time update on volume field of the stock. This will update every configurable interval. (The server will provide actual real-time updates for this type of VWAP data as and when real-time VWAP updates are made available through Bloomberg BBOCOMM API).
- VWAP data for all relevant stocks, starting at a given time. The data is a pseudo real-time VWAP from a specified starting time until the beginning of the current minute. The starting time needs to be accurate to the nearest minute. This will update every configurable interval. (The server will provide actual real-time updates for this type of VWAP data as and when real-time VWAP updates are made available through Bloomberg BBOCOMM API).
- VWAP data for all relevant stocks between a given time range (or between starting time and current time if specified finishing time is in the future). The data will be updated with new snapshot value every configurable interval between starting and finishing time. The time range needs to be accurate to the nearest minute.

## 3. Published data

### 3.1 Individual RICs

Information type	RIC format	Description
VWAP data from the start of the current day until current minute	xxxx.zz	<b>xxxx</b> is a four digits company code (E.g. "6758" for Sony); <b>zz</b> is exchange code. See the note below.
VWAP data from a specified starting time until current minute	xxxx_HHMM.zz	<b>xxxx</b> is a four digits company code (E.g. "6758" for Sony); <b>HHMM</b> is a starting time specified in 24-hours format in local time zone (E.g. "1330" for 1:30PM); <b>zz</b> is exchange code. See the note below.
VWAP data for a specified time range	xxxx_HHMM_hhmm.zz	<b>xxxx</b> is a four digits company code (E.g. "6758" for Sony); <b>HHMM</b> is a starting time specified in 24-hours format in local time zone (E.g. "1330" for 1:30PM); <b>hhmm</b> is a finishing time specified in 24-hours format in local time zone (E.g. "1430" for 2:30PM); <b>zz</b> is exchange code. See the note below.

**Note:** The exchange codes depend on BGW\_USE\_BLOOMBERG\_EXCH\_CODE start-up parameter.

- If VWAP server is configured to accept Reuters standard exchange codes, the following codes should be used to designate the exchange:  
**"T"** – TSE; **"OS"** – OSE; **"Q"** – JASDAQ; **"NG"** – Nagoya SE; **"FU"** – Fukuoka SE; **"SP"** – Sapporo SE; **"OJ"** – Hercules; **"HK"** – Hong Kong SE; **"TW"** – Taiwan SE; **"AX"** – Australia SE; **"KS"** – Korean SE; **"SI"** – Singapore SE
- If VWAP server is configured to accept Bloomberg native exchange codes, then the Bloomberg exchange codes can be used as if typed directly in Bloomberg Terminal (e.g. "6758 JO Equity" in Bloomberg Terminal is equivalent to "6758.JO" RIC used in Triarch requests)

## 3.2 System status messages

Upon receiving status information from BBCOMM or detecting changes in lines statuses, the server will notify end-users by sending SSL\_ET\_BROADCAST event with BroadcastType.DataDescriptor field set to SSL\_DT\_STATUS and Data field set to one of the following codes:

“OK” – line is OK;

“EO” – BBCOMM connection error, automatic recover transaction in progress;

“Ennn” – BBCOMM error status message, where <nnn> is Bloomberg –specific error code.

## 4. Triarch record templates

### 4.1 VWAP from the start of the day until current minute pseudo real-time data

See Appendix A.

### 4.2 VWAP from a specified starting time until current minute pseudo real-time data

See Appendix B.

### 4.3 VWAP for a specified time range snapshot data

See Appendix C.



## 5. BBCOMM VWAP data conversion maps

### 5.1 Reuters SSL FID initialization values by field type

Reuters SSL messages will be initialized to the following field values:

Field type	Initial value
INTEGER, PRICE	" +0" ("0" will be used in case of real zero value)
ALPHANUMERIC, ENUMERATED, DATE	"_" (one space)
TIME	"__:__" (two spaces, colon, two spaces)
TIME SECONDS	"__:__:__"(two spaces, colon, two spaces, colon, two spaces)

### 5.2 BBCOMM VWAP data conversion

See Appendix D.

## 6. Failover procedures

### 6.1 Triarch-based failover

#### 6.1.1 General considerations

The BBCOMM VWAP server as a standard Triarch source server can be set up to run in multiple-server configuration. This is done by assigning the same Triarch source name to multiple instances of the BBCOMM VWAP server running on separate machines. This will be transparent to end-users who will only see one BBCOMM VWAP server by that name. Such configuration provides load balancing as well as failover functionality on Triarch network. For Triarch infrastructure to be able to switch over from failed BBCOMM VWAP server to a working one, the failed server needs to be disconnected from Triarch as soon as it detects failure (e.g. line failure, BBCOMM error, etc.). After completing recovery, the BBCOMM VWAP server will have to re-connect to Triarch to be included into multi-server configuration. As mentioned above, the whole process will be transparent to end-users and will be handled by Triarch infrastructure itself.

#### 6.1.2 Multiple-server vs. Single-server configuration

To run the BBCOMM VWAP server in multiple-server configuration, `BGW_SSL_SOURCE_NAME` parameter must be set to the same value for all BBCOMM VWAP servers on Triarch network and `BGW_COMM_FAULT_PROCESS` parameter must be set to "DISMOUNT". In this case, upon detecting error on BBCOMM lines the server will disconnect from Triarch allowing it to switch active users over to another BBCOMM VWAP server. When the server recovers from error condition, it will reconnect to Triarch and join multi-server configuration.

To run the BBCOMM VWAP server in single-server configuration (i.e. when there is only one instance of the server running on Triarch network), `BGW_COMM_FAULT_PROCESS` parameter must be set to "INFORM". In this case, upon detecting error on BBCOMM lines the server will not disconnect from Triarch but will first send `SSL_ET_BROADCAST` status message informing end-users about the problem, followed by `SSL_ET_ITEM_STATUS_STALE` messages for each individual RIC in its cache. When the server recovers from error condition, it will first send `SSL_ET_BROADCAST` status message ("OK"), followed by `SSL_ET_ITEM_IMAGE` messages for all individual RICs in its cache.

## 6.2 BBCOMM process-based failover

### 6.2.1 General considerations

As Bloomberg API specification allows the application to connect to BBCOMM process remotely, the BBCOMM VWAP server can be set up to allow switching from main BBCOMM process over to backup one in case of main BBCOMM process failure. After initial start-up the server will connect to main BBCOMM process (API library can automatically start local BBCOMM up if necessary) and retrieve data from it. In case of main BBCOMM process failure, the server will try to re-connect to backup one and, in case of success, continue retrieving data from it. If backup BBCOMM process in turn fails, the BBCOMM VWAP server will try to re-connect to original main one. The process will be repeated again and again on each BBCOMM process failure. "BBCOMM process failure" discussed here means a failure of physical socket connection between BBCOMM VWAP server and BBCOMM process. Only problems with sending/receiving messages as well as situations when there was no activity on the connection for certain period of time and BBCOMM did not respond to echo requests will be subjects to main/backup failover procedure.

### 6.2.2 Main/Backup BBCOMM failover

To run the BBCOMM VWAP server in main/backup BBCOMM configuration, BGW\_BBCOMM\_MAIN\_IP / BGW\_BBCOMM\_MAIN\_PORT and BGW\_BBCOMM\_BACKUP\_IP / BGW\_BBCOMM\_BACKUP\_PORT parameters must be set to corresponding BBCOMM processes and BGW\_BBCOMM\_FAULT\_PROCESS parameter must be set to "INFORM". When the BBCOMM VWAP server detects BBCOMM process failure on the connected line (main or back-up), it will first send SSL\_ET\_BROADCAST status message ("E0") informing end-users about the problem, followed by SSL\_ET\_ITEM\_STATUS\_STALE messages for each individual RIC in its cache. It will then disconnect from the failed BBCOMM process and try to re-connect to another one (if failed process was main one, the server will try a backup process; if failed process was a backup one, it will try main process). When the server manages to re-connect to another BBCOMM process, it will first send SSL\_ET\_BROADCAST status message ("OK"), followed by SSL\_ET\_ITEM\_IMAGE messages for all individual RICs in its cache.

## 7. Start-Up Parameters

Following parameters can be used to configure the VWAP server.

Parameter name	Definitions	Default value
BGW_BB_PRIMARY_IP_ADDRESS	IP address of primary BBCOMM connection	"localhost"
BGW_BB_PRIMARY_PORT_NO	Port number of primary BBCOMM connection	8194
BGW_BB_BACKUP_IP_ADDRESS	IP address of backup BBCOMM connection	"localhost"
BGW_BB_BACKUP_PORT_NO	Port number of backup BBCOMM connection	8194
BGW_SSL_SOURCE_NAME	VWAP server SSL name	"BB_VWAP"
BGW_SSL_USERNAME	VWAP server SSL user name used for DACS permissioning	"" (empty)
BGW_SSL_SRCDIST_NAME	SSL service name of the source distributor	"triarch_dbms"
BGW_INIT_CACHE_FILENAME	Name of the file for items cache initialisation. The format of the file (ASCII): one SSL RIC code per line	"" (empty)
BGW_LOG_PATHNAME	Pathname of log files directory	"/log/"
BGW_SSL_LOG_FILENAME	SSL error log file name	"bb_vwap_ssl.log"
BGW_LOG_FILE_SIZE	Maximum size of log files in bytes	100000
BGW_LOG_LEVEL	Mask specifying log details level. The value can be Ored combination of following masks: 1 - log data on bbcomm channel; 2 - log data on SSL channel; 4 - log system events. Following are special values: 0 - no logs; 7 - log everything	7
BGW_CLOSING_RUN_TIME	Time of closing run on VWAP server in HH:MM:SS format	05:00:00
BGW_SSL_DISPATCH_COUNT	Maximum number of pending SSL messages to process at once. If this parameter is zero or negative - all pending SSL messages will be processed	-1
BGW_BB_DISPATCH_COUNT	Maximum number of pending BBCOMM messages to process at once. If this parameter is zero or negative - all pending BBCOMM messages will be processed	-1
BGW_BB_GETDATA_INTERVAL	Interval in seconds between requesting VWAP snapshot data from BBCOMM for pseudo real-time emulation	60
BGW_BB_MAX_REQUESTS	Maximum number of outstanding requests on BBCOMM	50
BGW_BB_REQUEST_TIMEOUT	Timeout interval in seconds for BBCOMM requests	300
BGW_SSL_BBCOMM_FAILURE_ACTION	Action on SSL source channel when BBCOMM connection is lost: DROP_SOURCE - dismount source; KEEP_SOURCE - don't dismount source	"KEEP_SOURCE"
BGW_MIN_RECOVERY_DELAY	Minimum interval (in seconds) between channels recovery attempts	5

Parameter name	Definitions	Default value
BGW_MAX_RECOVERY_DELAY	Maximum interval (in seconds) between channels recovery attempt	120
BGW_SSL_CACHE_SIZE	VWAP Server cache size on SSL source distributor	10000
BGW_REJECT_FUTURE_END_TIME	Flag specifying whether requests for snapshot items with EndTime in the future should be rejected	0
BGW_USE_BLOOMBERG_EXCH_CODE	Flag specifying whether VWAP server will accept Triarch requests for RICs with native Bloomberg exchange codes: 0 - Reuters standard exchange codes to be used; Non-zero - Bloomberg-specific exchange codes to be used	0

## Appendix A (Record template)

### VWAP from the start of the day until current minute pseudo real-time data

RIC\_FORMAT:                    xxxx.zz, where xxxx is a company code; zz is exchange code  
 SERVER\_NAME:                 BB\_VWAP  
 TEMPLATE\_NAME:              BB\_VWAP\_FULL\_DATA  
 TEMPLATE\_NUMBER:          -5501

FID	Acronym	Type	Length (max)	Description
1	PROD_PERM	INTEGER	5	Permission code
2	RDNDISPLAY	INTEGER	3	Display template number
3	DSPLY_NAME	ALPHANUMERIC	16	Issue name (abbrev.)
4	RDN_EXCHID	ENUMERATED	3	Identifier for the exchange (*1)
77	NUM_MOVES	INTEGER	15	Number of ticks in time range
379	SALTIM	TIME_SECONDS	8	Update time
392	VOL_DATE	DATE	11	Date when VWAP was calculated
953	WTD_AVE1	PRICE	17	VWAP value for AM session
954	WTD_AVE2	PRICE	17	VWAP value for PM session
1067	EXCHTIM	TIME_SECONDS	8	Local time on the exchange
1393	AVERG_PRICE	PRICE	17	VWAP value
1691	SPARE_VL1	INTEGER	15	Accumulated volume

(\*1) RDN\_EXCHID – Identifier for the exchange on which the instrument trades:

(NOTE: Valid only when the server is configured for Reuters standard exchange codes)

- 89 Australia exchange
- 92 Hong Kong exchange
- 106 Tokyo stock exchange
- 107 Nagoya stock exchange
- 108 Sapporo stock exchange
- 112 Fukuoka stock exchange
- 113 Osaka stock exchange (including Hercules Nippon Market)
- 155 Singapore stock exchange

## Appendix B (Record template)

### VWAP from a specified starting time until current minute pseudo real-time data

RIC\_FORMAT:                xxxx\_HHMM.zz, where xxxx is a company code;  
                               HHMM is a starting time; zz is exchange code  
 SERVER\_NAME:              BB\_VWAP  
 TEMPLATE\_NAME:            BB\_VWAP\_FROM\_DATA  
 TEMPLATE\_NUMBER:         -5502

FID	Acronym	Type	Length (max)	Description
1	PROD_PERM	INTEGER	5	Permission code
2	RDNDISPLAY	INTEGER	3	Display template number
3	DSPLY_NAME	ALPHANUMERIC	16	Issue name (abbrev.)
4	RDN_EXCHID	ENUMERATED	3	Identifier for the exchange (*1)
77	NUM_MOVES	INTEGER	15	Number of ticks in time range
379	SALTIM	TIME_SECONDS	8	Update time
392	VOL_DATE	DATE	11	Date when VWAP was calculated
953	WTD_AVE1	PRICE	17	VWAP value for AM session
954	WTD_AVE2	PRICE	17	VWAP value for PM session
1061	GVI_TIME	TIME_SECONDS	8	Starting time for VWAP
1067	EXCHTIM	TIME_SECONDS	8	Local time on the exchange
1393	AVERG_PRICE	PRICE	17	VWAP value
1691	SPARE_VL1	INTEGER	15	Accumulated volume

(\*1) RDN\_EXCHID – Identifier for the exchange on which the instrument trades:

(NOTE: Valid only when the server is configured for Reuters standard exchange codes)

- 89 Australia exchange
- 92 Hong Kong exchange
- 106 Tokyo stock exchange
- 107 Nagoya stock exchange
- 108 Sapporo stock exchange
- 112 Fukuoka stock exchange
- 113 Osaka stock exchange (including Hercules Nippon Market)
- 155 Singapore stock exchange

## Appendix C (Record template)

### VWAP for a specified time range snapshot data

RIC\_FORMAT:                    xxxx\_HHMM\_hhmm.zz, where xxxx is a company code;  
                                   HHMM is a starting time; hhmm is a finishing time;  
                                   zz is exchange code  
 SERVER\_NAME:                 BB\_VWAP  
 TEMPLATE\_NAME:              BB\_VWAP\_RANGE\_DATA  
 TEMPLATE\_NUMBER:          -5503

FID	Acronym	Type	Length (max)	Description
1	PROD_PERM	INTEGER	5	Permission code
2	RDNDISPLAY	INTEGER	3	Display template number
3	DSPLY_NAME	ALPHANUMERIC	16	Issue name (abbrev.)
4	RDN_EXCHID	ENUMERATED	3	Identifier for the exchange (*1)
77	NUM_MOVES	INTEGER	15	Number of ticks in time range
379	SALTIM	TIME_SECONDS	8	Update time
392	VOL_DATE	DATE	11	Date when VWAP was calculated
953	WTD_AVE1	PRICE	17	VWAP value for AM session
954	WTD_AVE2	PRICE	17	VWAP value for PM session
1061	GV1_TIME	TIME_SECONDS	8	Starting time for VWAP
1062	GV2_TIME	TIME_SECONDS	8	Finishing time for VWAP
1067	EXCHTIM	TIME_SECONDS	8	Local time on the exchange
1393	AVERG_PRICE	PRICE	17	VWAP value
1691	SPARE_VL1	INTEGER	15	Accumulated volume

(\*1) RDN\_EXCHID – Identifier for the exchange on which the instrument trades:

(NOTE: Valid only when the server is configured for Reuters standard exchange codes)

- 89 Australia exchange
- 92 Hong Kong exchange
- 106 Tokyo stock exchange
- 107 Nagoya stock exchange
- 108 Sapporo stock exchange
- 112 Fukuoka stock exchange
- 113 Osaka stock exchange (including Hercules Nippon Market)
- 155 Singapore stock exchange
- 156 Korean stock exchange
- 175 Taiwan stock exchange
- 219 JASDAQ



## Appendix D (BBCOMM VWAP Conversion Map)

BBCOMM			SSL			
ID	Field	Format	FID	Acronym	Type	Length
0x452	Name	string	3	DSPLY_NAME	ALPHANUMERIC	16
0x574	Update Time	time	379	SALTIM	TIME_SECONDS	8
0xB60	VWAP (Vol Weighted Average Price)	numeric	1393	AVERG_PRICE	PRICE	17
0x16BD	VWAP Start Time	string	1061	GV1_TIME	TIME_SECONDS	8
0x16BE	VWAP End Time	string	1062	GV2_TIME	TIME_SECONDS	8
0x16BF	VWAP Date	date	392	VOL_DATE	DATE	11
0x16C0	VWAP Volume	numeric	1691	SPARE_VL1	INTEGER	15
0x16CD	VWAP Number of Trades	numeric	77	NUM_MOVES	INTEGER	15
0x1DD1	Local Time	time	1067	EXCHTIM	TIME_SECONDS	8
0x21F7	VWAP AM Session	numeric	953	WTD_AVE1	PRICE	17
0x21F8	VWAP PM Session	numeric	954	WTD_AVE2	PRICE	17