HUB – SATS Information

02 / 12 / 2019

DHL Express Italy

❑ MQ – DATA Explained

MQ Message	Data	Payload identification
NOTIFICATION	Controllo CHECK_MSG del canale MQ da T1 a T2	\x0f
REQUEST_MSGS	ACK per ASYNC_MESSAGE o NOTIFICATION da T2 a T1	\x0e
MQPUT_REPLY	ACK per MQPUT da T1 a T2	\x960
MQPUT	Contiene il messaggio con i dati da T2 a T1	\x86
ASYNC_MESSAGE	Contiene il messaggio con i dati da T1 a T2	\x0d

❑ MQ – MSG Explained

<MSG><HEADER><HDSDID>TIER2</HDSDID><HDRCID>TIER1</HDRCID><HDMGTP>SORT_RQST</HDMGTP><HDMGID>882004</HDMGID><HDEVTM>2019-11-29 17:06:40,381+01:00</HDEVTM></HEADER><BODY><VID>2019112901009431</VID><PAB><AI-WEI>193105</AI-WEI><AI-DIM>19700101010000.00|</AI-DIM><DDWE>0.64</DDWE><LE>23.5</LE><WI>18.0</WI><HE>7.6</HE><LS-WEI>Y</LS-WEI><LS-DIM>Y</LS-DIM><IU>IF01</IU><IT>2019-11-29 17:06:40,381+01:00</IT></PAB><PIB><RDID>SORTSCAN</RDID><RDST>GR</RDST><CDTP>5</CDTP><CDDT>4766366500</CDDT></PIB><PIB><RDID>SORTSCAN</RDID><RDST>GR</RDST><CDTP>3</CDTP><CDDT>2LIT80058+46000000</CDDT></PIB><PIB><RDID>SORTSCAN</RDID><RDST>GR</RDST><CDTP>1</CDTP><CDDT>JJD014600007435356581</CDDT></PIB></BODY> </MSG><

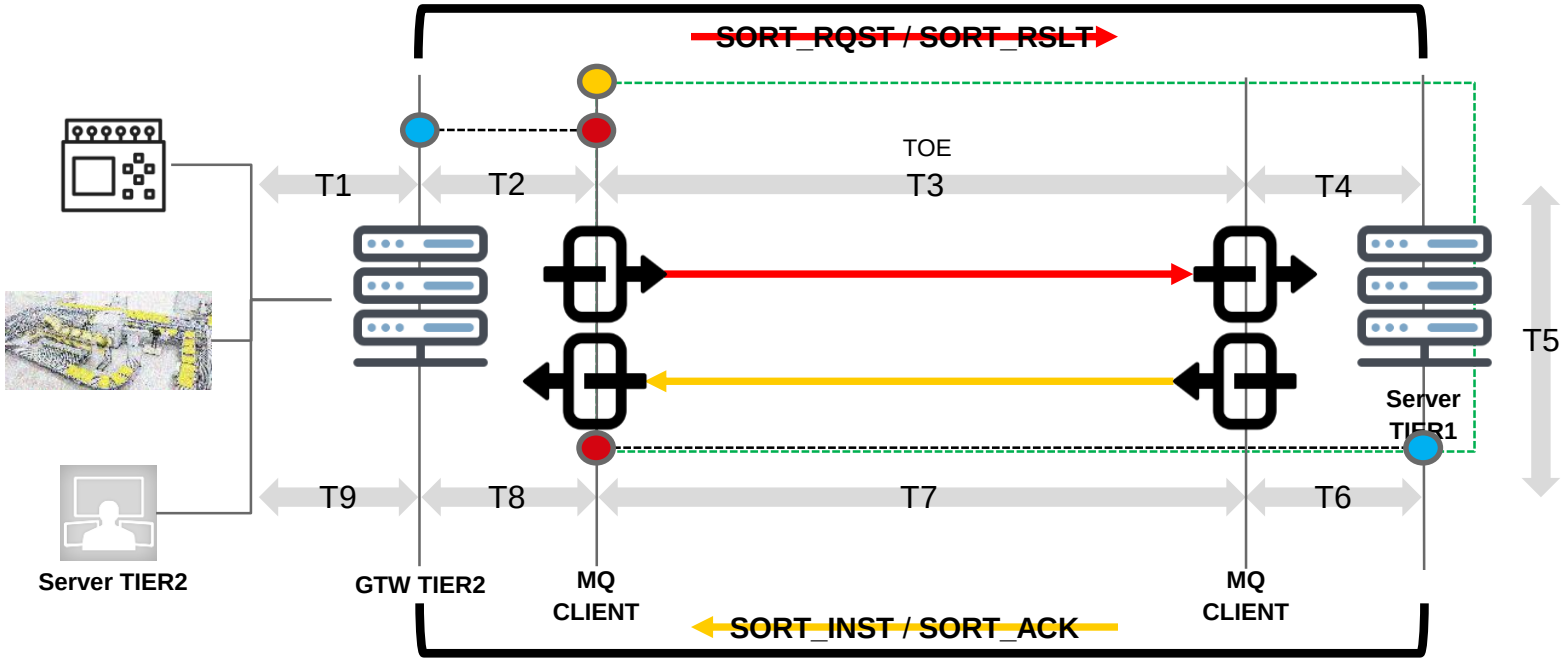
MQ Message	Significato della sigla	Description
HD**MGTP**	Message Typology	**Tipologia di messagio:** SORT_RSLT, SORT_ACK, , SORT_RQST, SORT_INST, ITEM_DATA, ITEM_RECR, LP_INST, LP_RSLT, T1_STATUS, HEARTBEAT
HDEV**TM**	Evaluated Time	Timestamp dell'istruzione (a livello di messaggio MQ)
HD**SD**ID	Sender	Tier «sender» del messaggio
HD**RC**ID	Receiver	Tier «receiver» del messagio
HD**MG**ID	Message ID	ID univoco del messaggio
VID	Virtual ID	ID che identifica il collo
LP_DATA	Label Printer Data	Dati dell'etichetta da stampare

❑ MQ – MSG Explained – CUSTOMER data identification

MQ Message	Significato della sigla	Description
CD**TP**	Code Typology	**Tipologia di barcode:** AWB, PieceID, Totebin, HUID, CustomerID (ecc..)
CD**DT**	Code Data	Barcode data

Barcode Type (CDTP)	Corrispondenza
1 e 2	PieceID
5	AWB
7	TOTEBIN
8	HUID
9	CustomerID

❑ High Level Communications Schema – TIER 1 / TIER 2



❑ High Level Communications Schema – TIER 1 / TIER 2

https://visuallogita.prg-dc.dhl.com/

TIER2 Switch

SPAN port

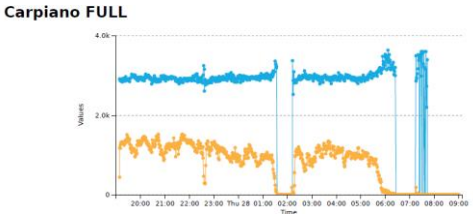
Sniffer

- **Static sniffer** (Wireshark)
- **Dynamic sniffer** (python + Scapy)

DHL Network Over TLS

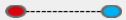
Graylog Server

- **NXLOG** for data analysis
- **GRAYLOG** for dashboard, alert and storage



Esempio

❑ MQ – Data fields from sniffer

Field Name	Description	Symbol	Note
Frame_Time	Timestamp di cattura del pacchetto da parte dello sniffer.		
Frame_Time_P	Timestamp di cattura dell pacchetto precedente (stesso VID) da parte dello sniffer.		
Frame_Time_DIFF_mill	Differenza con millesimi tra Frame_Time e Frame_Time_Precedente		
HDEVTM	Informazione di Timestamp inserito nel pacchetto MQ dal server.		
HDEVTM_P	Informazione di Timestamp del messaggio precedente (con stesso VID) inserito nel pacchetto MQ dal server.		
HDEVTM_P_mill	Differenza con millesimi tra HDEVTM e HDEVTM_Precedente		
T2	T2 segment calculation time for T2 (Frame_Time – HDEVTM)		[2019-11-08: Actually T2 don't use millisecond, the metric is not usefull]
T6T7	Segment calculation time for T6 and T7 (Frame_Time – HDEVTM)		[2019-11-08: Actually T2 don't use millisecond, the metric is not usefull]

❑ MQ – Data fields from sniffer

Field Name	Description	Symbol	Note
COW	MQ Capacity «One Way»		Described in next slide

❑ TOW and COW

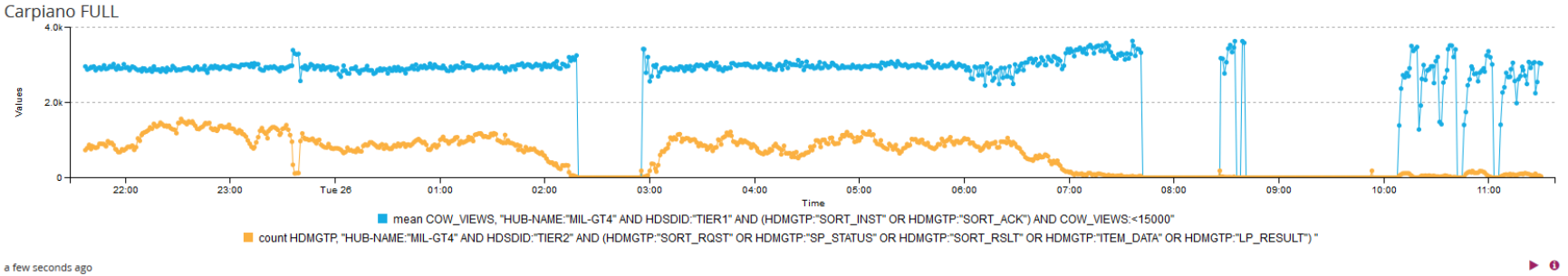
Time One Way: will measuring the sum of T3, T4, T5, T6 and T7. This time is SORT_REQUEST and SORT_RESULT (between T2 and T1). Half time is a “One Way”.

$$TOW = \frac{Frame_{Time_{DIFF_{mill}}}}{2}$$

Capacity One Way: calculating in 1 minute, is the actual network Capacity for exchange MQ messages in “One Way” direction.

$$COW = \left(\frac{1}{TOW}\right) * 60$$

❑ COW VIEWS

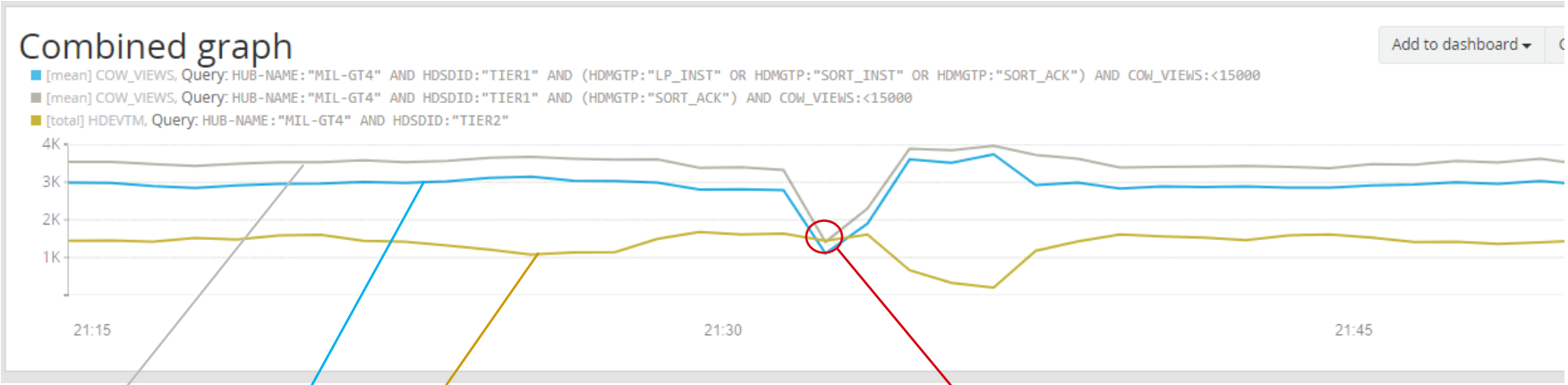


COW VIEWS QUERY FOR GRAYLOG DASHBOARD (Use two difference chart and arise in one each other):

Field for chart:
1st query: Field": "COW_VIEWS", "statistical_function": "means"
2nd query: Field": "HDMGTP", "statistical_function": "count"

Query:
- HUB-NAME:"HUB-NAME" AND HDSDID:"TIER1" AND (HDMGTP:"SORT_INST" OR HDMGTP:"SORT_ACK") AND COW_VIEWS:<15000
- HUB-NAME:"HUB-NAME" AND HDSDID:"TIER2" AND (HDMGTP:"SORT_RQST" OR HDMGTP:"SP_STATUS" OR HDMGTP:"SORT_RSLT" OR HDMGTP:"ITEM_DATA" OR HDMGTP:"LP_RESULT")

❑ COW VIEWS Vs Total messages – Real issue



COW based only on **SORT_ACK** from **T1**

COW based on means of **SORT_ACK SORT_INST** and **LP_DATA** from **T1**

All MQ message exchanged by **T2** to **T1**

MQ Channel overload

DHL Express Italy