VTMS Communication Failure Analysis

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PART 1 – Analyze the Issue

Analyze data from the VTMS Messages Report for the last month to determine the following:

1. The scope of the problem – How often are VTMS communication failures occurring?
   - Data shows the communication failure occurs about 0.4% of all the observations.

Value	Count	Frequency (%)
Ok	157399	98.2%
Hardware failure	2312	1.4%
Communication failure	563	0.4%

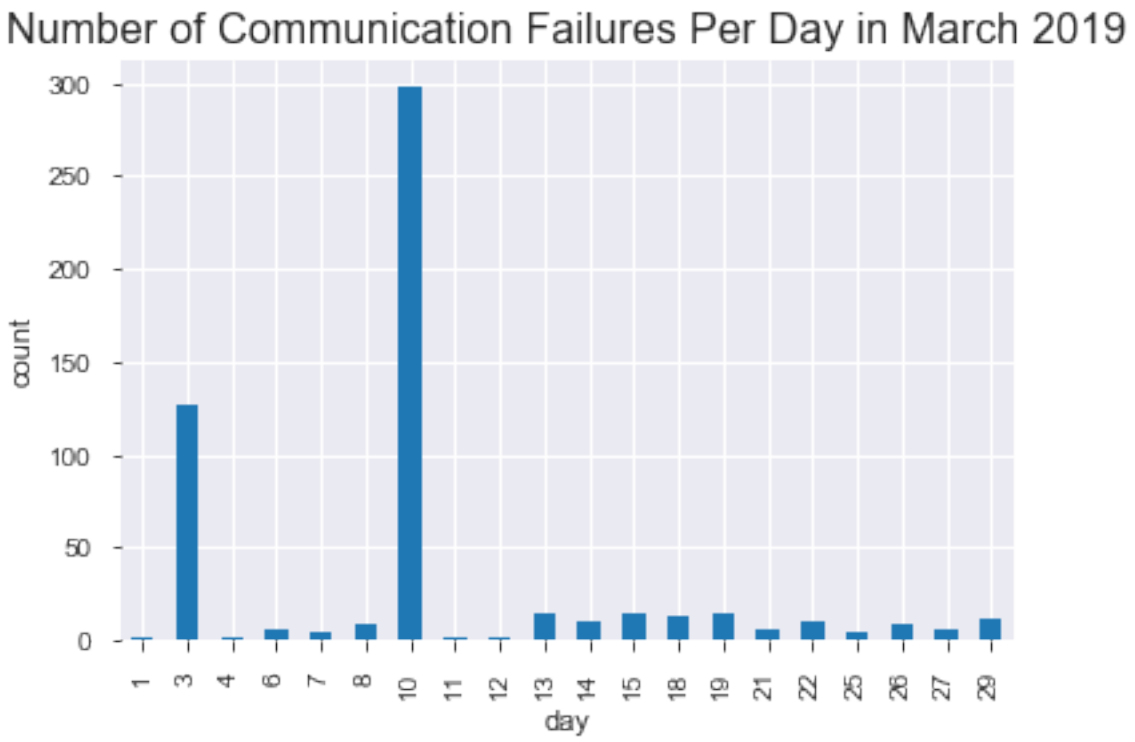
2. Specific problem areas – Which locations are suffering the most communication failures and how frequently are these locations suffering communication failures?

   Locations suffer the most communication failures are:
   - 3130 - Crow Canyon SB - communication fails 238 times - 42.3%
   - 3230 - Crow Canyon NB - communication fails 125 times - 22.2%
   - 3160 - Alcosta - communication fails 121 times - 21.5%
   - 3260 - Livorna - communication fails 79 times - 14.0%

Value	Count	Frequency (%)
3130 - Crow Canyon SB	238	42.3%
3230 - Crow Canyon NB	125	22.2%
3160 - Alcosta	121	21.5%
3260 - Livorna	79	14.0%

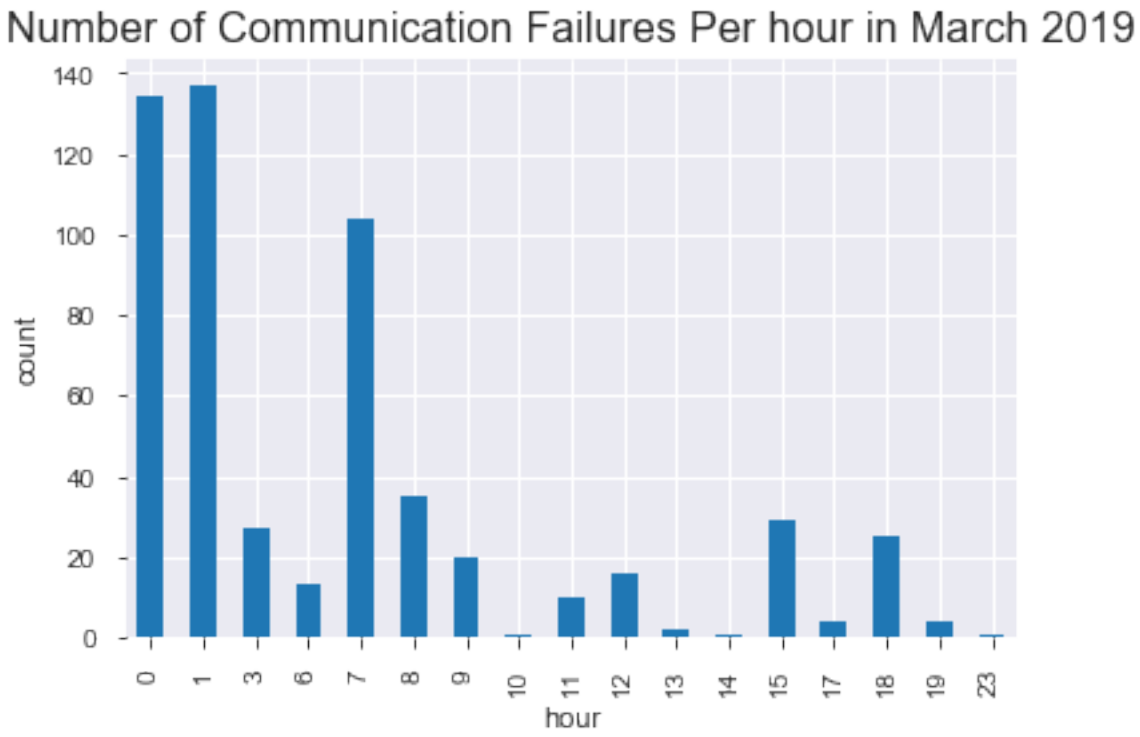
3. Identify patterns – Identify and document any patterns that emerge in your analysis.

   In all the communication failure cases,
   - March 10th has the most failures - 298 count - 52.9%
   - March 3rd has the second most failures - 127 count - 22.6%



In all the communication failure cases,

- 1 am has the most failures - 137 count - 24.3%
- 12 am has the second most failures - 134 count - 23.8%
- 7 am has the third most failures - 104 count - 18.5%



In all the communication failure cases, variable General_Message has:

- OPEN TO ALL - 426 count - 75.7%
- FASTRAK REQUIRED - 137 count - 24.3%

Value	Count	Frequency (%)
OPEN TO ALL	426	75.7%
FASTRAK REQUIRED	137	24.3%

In all the communication failure cases, variable Lane_Mode has:

- I-680 SB Non-Tolling (Weekend) - 274 count - 48.7%
- I-680 NB Non-Tolling Weekend V2 - 151 count - 26.8%

Value	Count	Frequency (%)
I-680 SB Non-Tolling (Weekend)	274	48.7%
I-680 NB Non-Tolling Weekend V2	151	26.8%
I-680SB CCSB Dynamic Pricing	56	9.9%
I-680NB CCNB Dynamic Pricing	35	6.2%
I-680SB Alcosta Dynamic Pricing	28	5.0%
I-680NB Livorna Dynamic Pricing	18	3.2%
I-680 SB Non-Tolling (Weekday)	1	0.2%

In all the communication failure cases, variable Message_Set has:

- Non-Tolling (Weekend) - 426 count - 75.7%
- Fastrak Required 137 count - 24.3%

Value	Count	Frequency (%)
Non-Tolling (Weekend)	425	75.5%
Fastrak Required	137	24.3%
Non-Tolling (Weekday)	1	0.2%

In all the communication failure cases, variable Zone_Toll has:

- Free - 426 count - 75.7%
- 0.5 - 76 count - 13.5%

Value	Count	Frequency (%)
0.5	76	13.5%
0.75	12	2.1%
1	8	1.4%
1.5	7	1.2%
2	6	1.1%
1.75	5	0.9%
6	4	0.7%
1.25	4	0.7%
2.25	3	0.5%
4.75	3	0.5%
Other values (7)	9	1.6%
(Missing)	426	75.7%

In all the communication failure cases,

- All LM_Override = No
- All PricingType = Historic
- All VTMS_Control = LC
- All VTMS_Override = No

PART 2 – Document the Issue Using the below template, document your analysis findings. Be sure to include some data visualization (e.g. graphs) to help illustrate your analysis findings.

Category:

For the communication failure cases, the tolling zones like Crow Canyon SB, Crow Canyon NB, Alcosta and Livorna are affected.

Value	Count	Frequency (%)
3130 - Crow Canyon SB	238	42.3%
3230 - Crow Canyon NB	125	22.2%
3160 - Alcosta	121	21.5%
3260 - Livorna	79	14.0%

For the communication failure cases, the affected signs locations are:

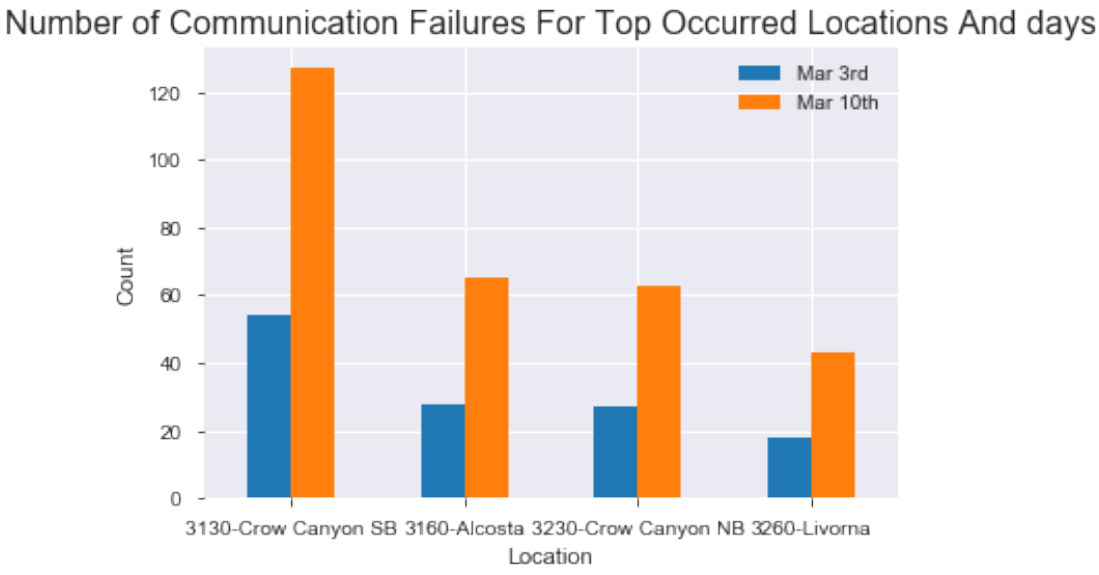
Value	Count	Frequency (%)
4200 - 2	47	8.3%
4202 - 4	45	8.0%
4102 - 3	44	7.8%
4205 - 1	43	7.6%
4109 - 5	43	7.6%
4107 - 7	42	7.5%
4113 - 1	41	7.3%
4104 - 1	39	6.9%
4110 - 4	39	6.9%
4103 - 2	38	6.7%
Other values (4)	142	25.2%

Summary:

The communication failure occurred most frequently at the location Crow Canyon SB (especially bad), Crow Canyon NB, Alcosta and Livorna. The communication failure occurred most frequently in March on 3rd and 10th. The communication failure occurred most frequently in a day at 1am, 12am and 7am.

Details:

The communication failure occurred most frequently in March on 3rd and 10th. The failure situation was especially bad on March 3rd at Crow Canyon SB.



The communication failure occurred most frequently in a day at 1am, 12am and 7am. The failure situation was especially bad at 12am, 1am and 7am on at Crow Canyon SB.