



*University of
Dayton*

Stander Symposium
Oral presentation
Temperature monitoring system

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19-April 2023

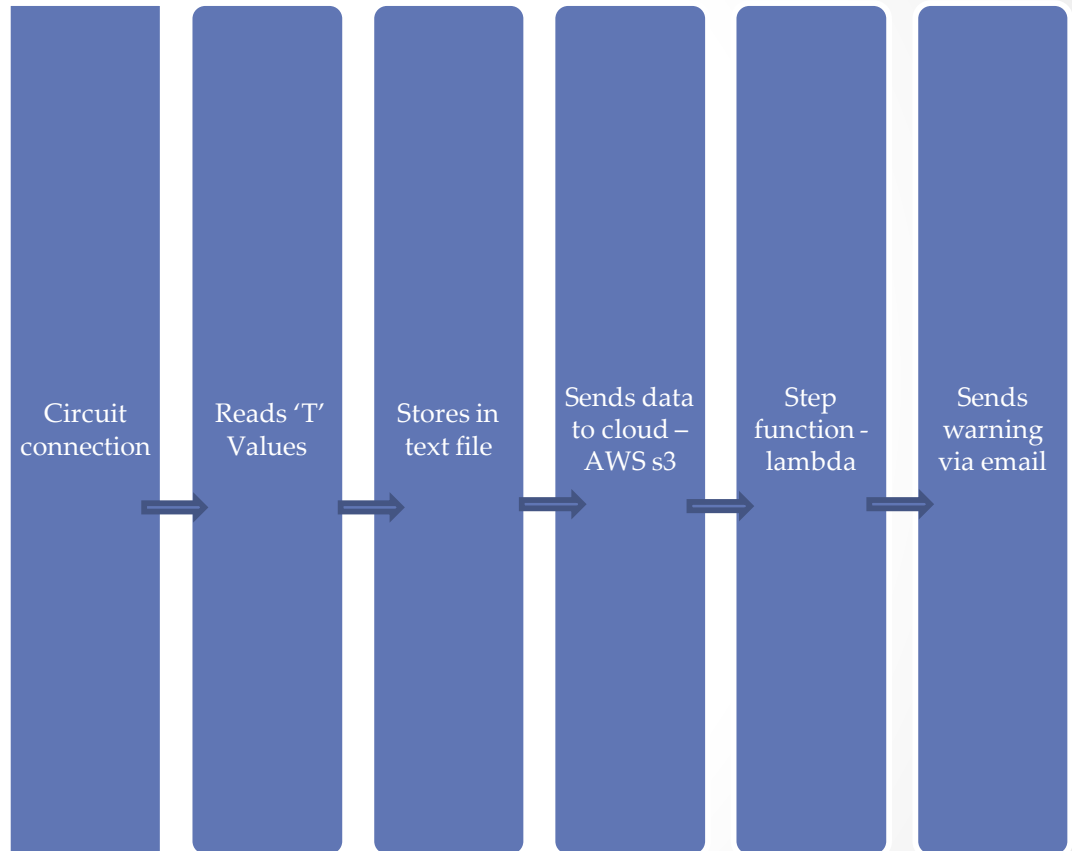
Temperature Monitoring system

Components:

- ❑ DHT11 sensor
- ❑ Arduino UNO

Sources used:

- ❑ Node-red
- ❑ AWS s3
- ❑ Email service



Heat-sensitive medicines

- Temperature: 2- 8° c
- A heat-sensitive medication

From +5° c

- If T=20° c

To +8° c (within 5 min)



- Patients need to use insulated packaging that is appropriate and efficient.

Proposed method-Main goal

Possible solution:

- ✓ Store 'T' values
- ✓ Send data to AWS
- ✓ Can get a warning email



Problems:

- Regular inspection
- Time consumption
- Excessively hot or too frigid ('T')
- Waste of material
- Man-power
- Cost effective

Problems

- Hourly check
- Record maintenance
- Time consumption

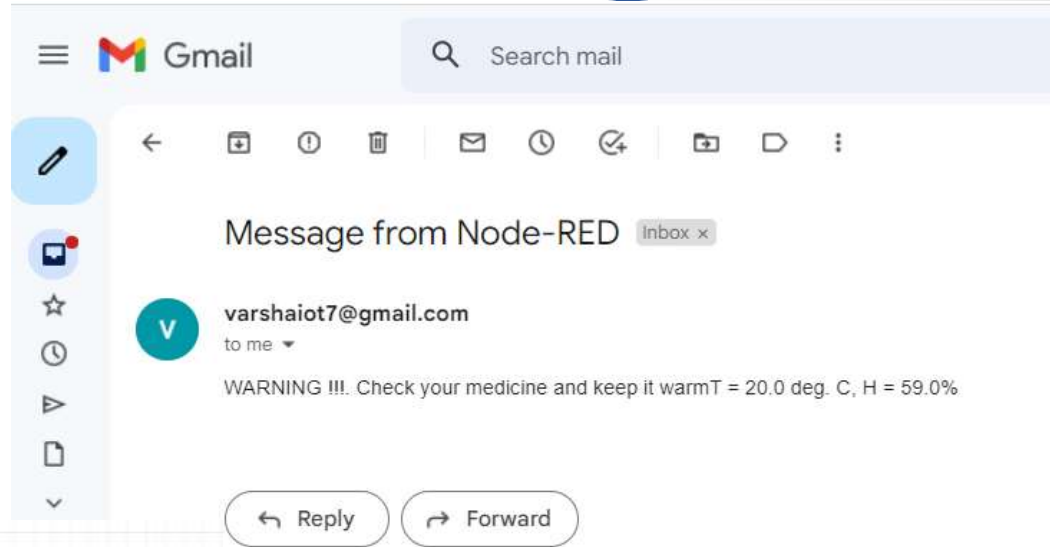
Day of month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					
Record max. temp																																				
+12																																			+12	
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					

Hourly recordings

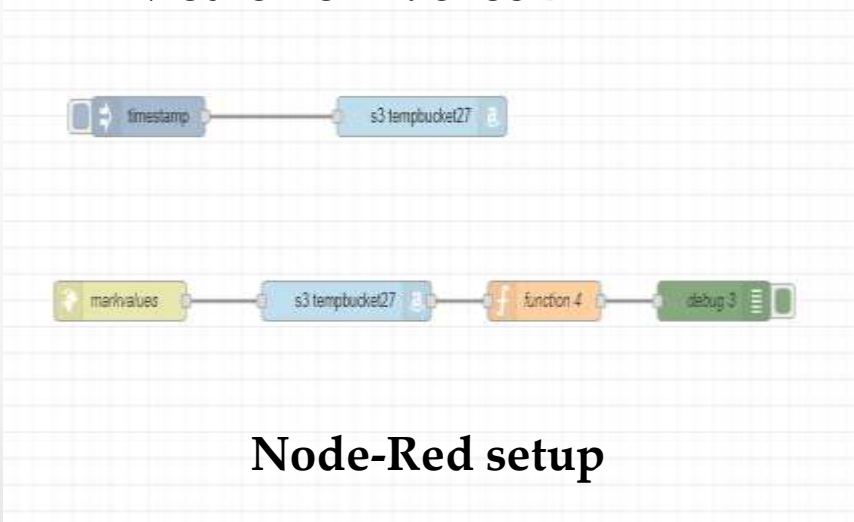
Solution - Set-up



Medicine - T: check



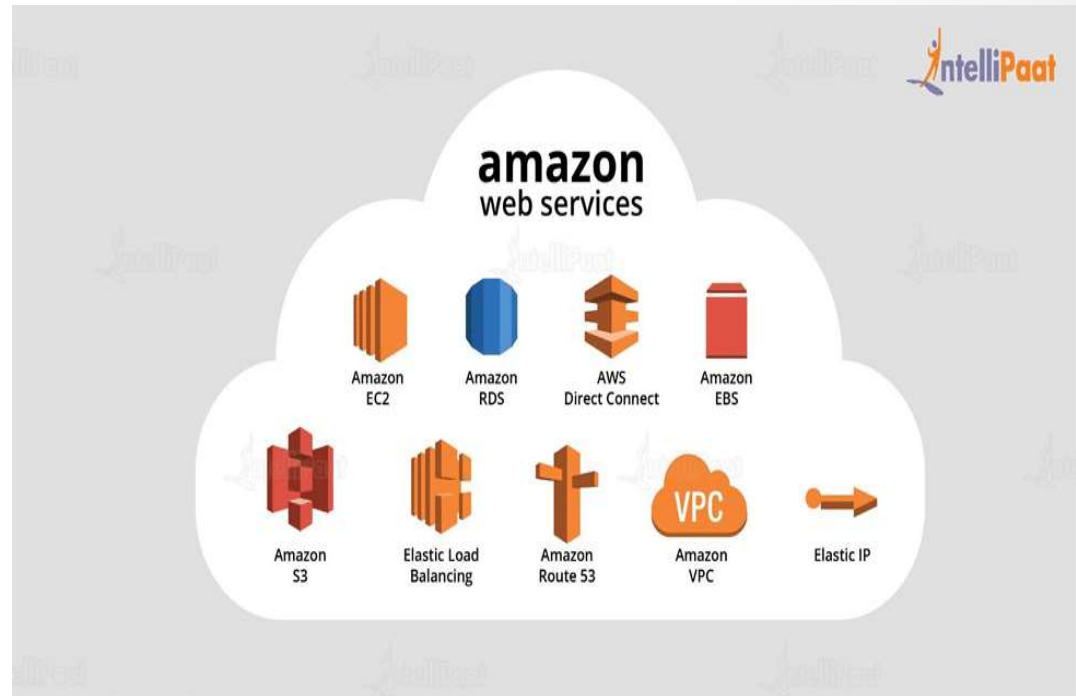
Email notification : Warning detection



Node-Red setup

CLOUD - AWS SERVICE

- Amazon s3
- Lambda- step function
- Email service



Data in s3

The screenshot shows the Amazon S3 console interface. On the left is a navigation sidebar with options like Buckets, Access Points, and Storage Lens. The main content area shows the bucket 'tempbucket27' with tabs for Objects, Properties, Permissions, Metrics, Management, and Access Points. Under the 'Objects' tab, there is a section titled 'Objects (1)' with a description and a list of actions (Copy S3 URI, Copy URL, Download, Open, Delete, Actions). Below this is a search bar and a table listing the objects in the bucket.

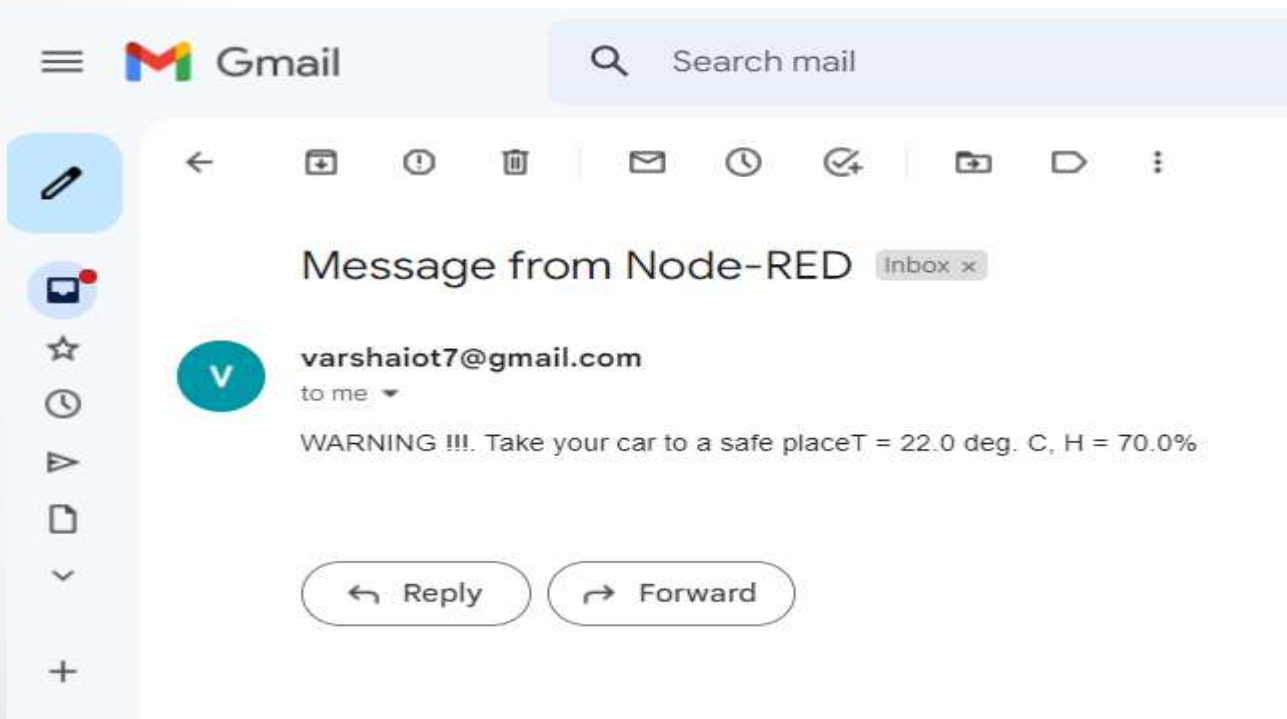
<input type="checkbox"/>	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	values.txt	txt	April 16, 2023, 20:59:08 (UTC-04:00)	0 B	Standard

- File could be added here
- It will give update via email

Heat-sensitive data

Branded product name	Drug product	Dosage Form	Recommended storage temperature	Schedule
Bactroban ® 2% Ointment	Mupirocin 2%	Topical Ointment	Below 25°C	4
Morphine Sulphate Injection BP 10 mg – 1 ml	Morphine Sulfate 10 mg / ml	Solution for injection	Below 25°C	8
Sudafed	Pseudoephedrine HCL	Tablet	Below 30°C	4
Panadol	Paracetamol 500 mg	Tablet	Below 30°C	2
Amoxicillin	Penicillin 250 mg	Capsule	Below 25°C	4
Adrenaline (Epinephrine) Injection BP	Epinephrine 1 mg / ml	Solution for injection	Below 25°C	4
Pregnancy Test	Urine HCG sensitivity of 25 MIU / mL test	Diagnostic test	Below 30°C	Diagnostic test

Test case: Input : Vehicle Temperature





THANK
YOU