INTERNET AND LAN AT MAIDANAK OBSERVATORY

YUSUF TILLAYEV

SH. EHGAMBERDIEV, O.BURKHONOV, D. ALEKSEYEV, B. HAFIZOV (UBAI)

M.KARDASHENKO (ANC, VSAT AT MAO)

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- VSAT internet
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INTRODUCTION: THE APRIL 2018 STATUS OF THE MAO LAN AND INTERNET CONNECTION

- LAN was mainly wireless
- There was no mobile service base stations at MAO
- Internet connection came from remote base station using 3G modem and outdoor antenna. Uzmobile CDMA mobile service provider, bandwidth was around 153 kbps/512 kbps
- VSAT internet was going to be installed by ANC (Moscow, M.Kardashenko)

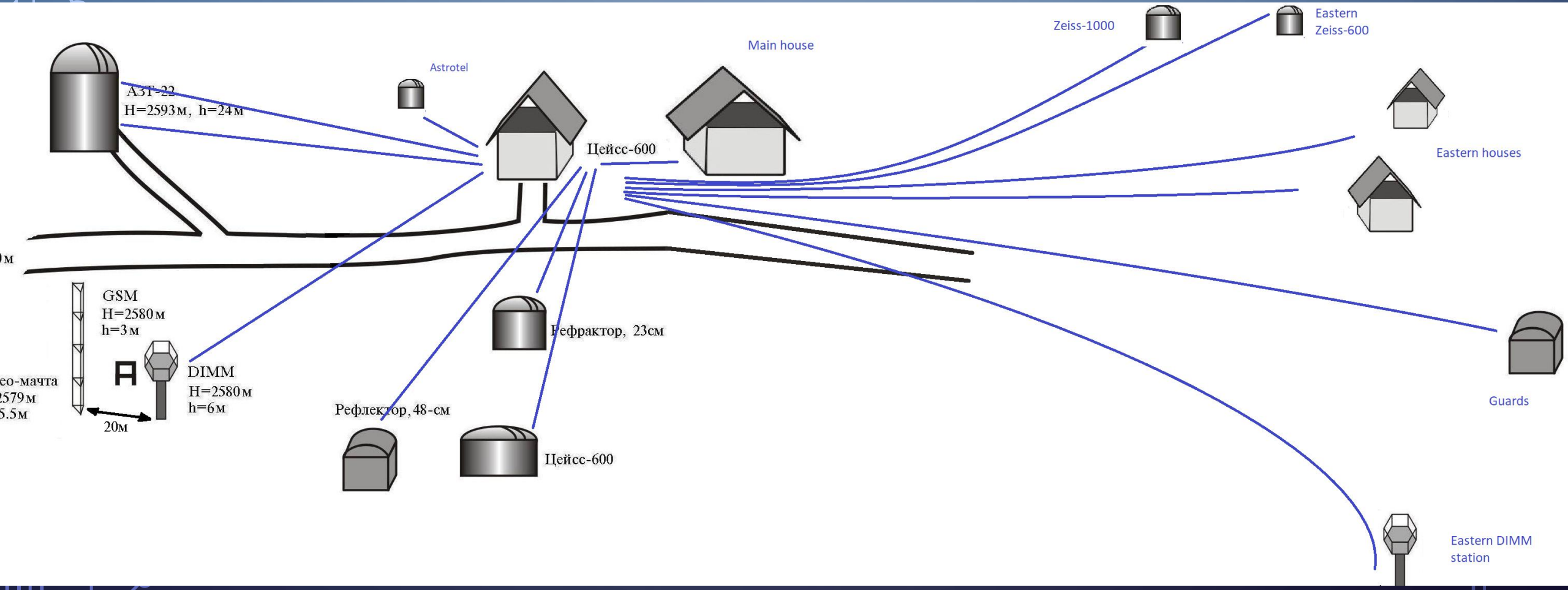
NEW VSAT AT MAIDANAK

- Was installed in June 2018
- Bandwidth:
  - 256 kbits/sec uplink
  - 2048 kbits/sec downlink
- Traffic limit is 5Gb/month

NEW FIBER-OPTIC LOCAL AREA NETWORK:

- Completely new fiber-optical network
- Connected 14 locations of MAO into one LAN.
- FO runs underground,
- Total length is more than 4 km

NEW FIBER-OPTIC LOCAL AREA NETWORK:



NEW FIBER-OPTIC LOCAL AREA NETWORK:

- 1. Eastern Zeiss-600 telescope
- 2. Zeiss-1000
- 3. Eastern House (small)
- 4. Eastern House (large)
- 5. Main House
- 6. Southern Zeiss-600 Telescope
- 7. AZT22 (4th floor)
- 8. AZT22 (2nd floor, used for the Internet from Uztelecom)
- 9. DIMM (western station)
- 10. Astrotel (Satovsky)
- 11. DIMM (eastern station)
- 12. Guards house
- 13. Refractor telescope
- 14. Southern dome near to Zeiss-600-South (empty, for new telescopes)

NEW FIBER-OPTIC LOCAL AREA NETWORK (CONT.)

- The central node is located in the server room (server room is the one closest to the Northern Zeiss-600)
- 100 mbps FO-TP media converters were used originally to connect PC's, wi-fi AP's, IP-phones and other network equipment. Now it is being upgraded to gigabit network equipment

WI-FI EXTENSION OF THE WIRED LAN

- Every node of the wired LAN is being provided with a Wi-Fi AP to extend the LAN. This is very convenient for mobile users (smartphones and laptops)
- We are going to use one single SSID and password for entire observatory
- All AP's will be controlled by a single central Wi-Fi controller

MOBILE SERVICE PROVIDERS AT MAO

- Uzmobile service provider installed its base station in 2018 to the south-west of the AZT-22
- Beeline mobile service provider installed its base station in 2019 to the west of the AZT-22

SERVER AND INTERNET SHARING

- Server is located in the dedicated room nearby NT-Zeiss600
- Kerio controller used for internet sharing
- Until recently two sources of internet was shared into LAN (2 gateways):
  - 3G internet of Uzmobile (up to 3mbps) using a USB-modem
  - VSAT-internet
- Since Oct 21, 2021 3G internet was replaced by the connection to BS of Uzmobile (up to 6 mbps)

NEW INTERNET CONNECTION VIA UZMOBILE BS

- Direct connection to the base station of Uzmobile
- The speed we use is limited by the stream coming to the BS (not by price of the tariff plan (30 USD per month))
- Nowadays the stream corresponds to the tariff plan “Corporate-2”

Corporate-2

1,5 Mbps	**6 Mbps**	**6 Mbps**
Internet access speed, from 19:00 to 00:00	Internet access speed, from 00:00 to 19:00	Access speed in Uz-IX and TAS-IX

FAST

Your Internet speed is

1.5 Mbps

Latency

Unloaded	Loaded
84 ms	540 ms

Upload

Speed

2.2 Mbps

Client Tashkent, UZ 213.230.114.152 **Server(s)** Moscow, RU | Chelyabinsk, RU | Kiev, UA

Settings 5.4MB 8.3MB

FAST

Your Internet speed is

6.4 Mbps

Latency

Unloaded	Loaded
77 ms	170 ms

Upload

Speed

5.9 Mbps

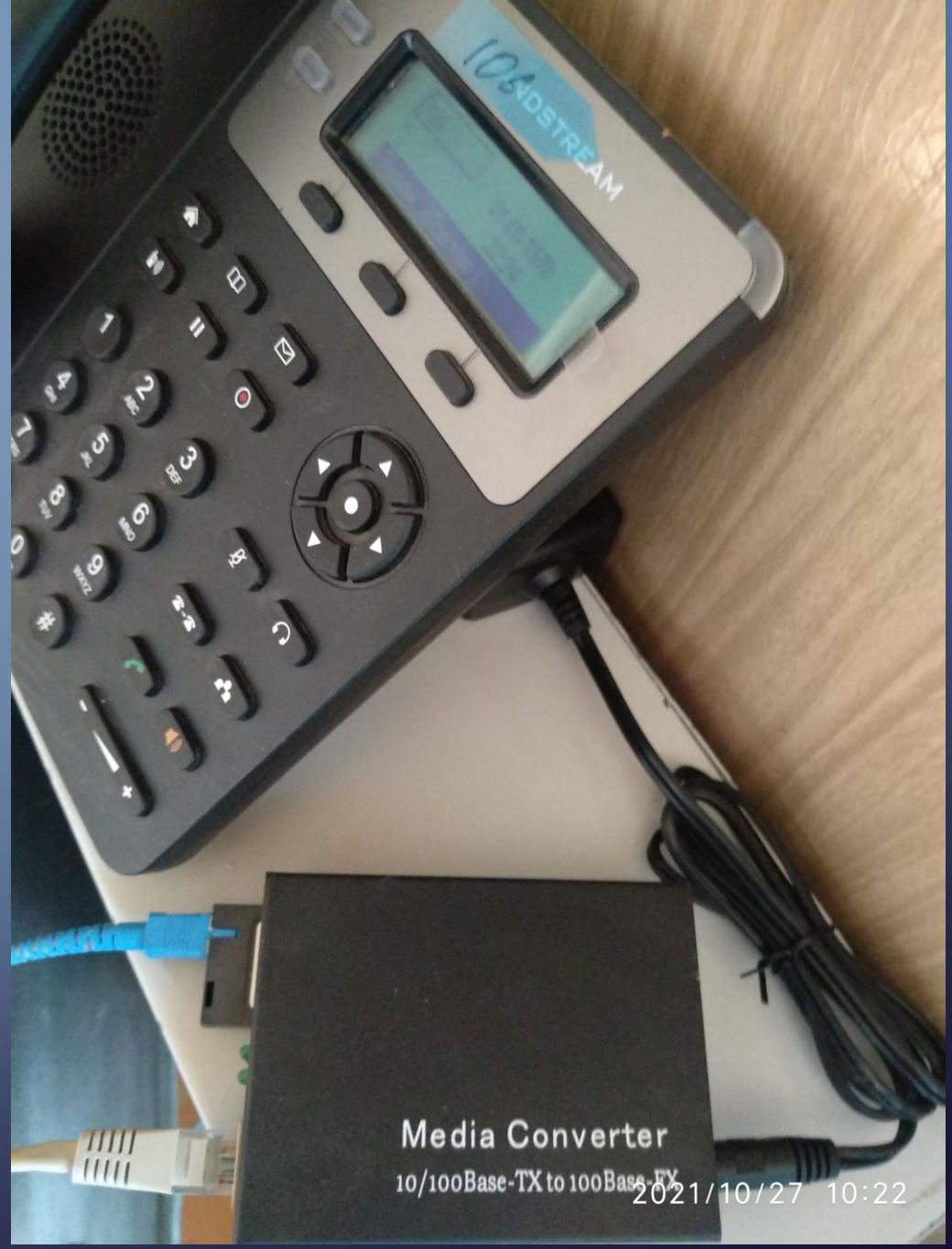
Client Tashkent, UZ 213.230.114.152 **Server(s)** Moscow, RU | Chelyabinsk, RU | Kiev, UA

Settings 10MB 20MB

TARIFF PLANS

Corporate-2	**1,5 Mbps** Internet access speed, from 19:00 to 00:00	**6 Mbps** Internet access speed, from 00:00 to 19:00	**6 Mbps** Access speed in Uz-IX and TAS-IX
Corporate-3	**2,5 Mbps** Internet access speed, from 19:00 to 00:00	**10 Mbps** Internet access speed, from 00:00 to 19:00	**10 Mbps** Access speed in Uz-IX and TAS-IX
Corporate-4	**5 Mbps** Internet access speed, from 19:00 to 00:00	**20 Mbps** Internet access speed, from 00:00 to 19:00	**20 Mbps** Access speed in Uz-IX and TAS-IX
Corporate-5	**10 Mbps** Internet access speed, from 19:00 to 00:00	**40 Mbps** Internet access speed, from 00:00 to 19:00	**40 Mbps** Access speed in Uz-IX and TAS-IX

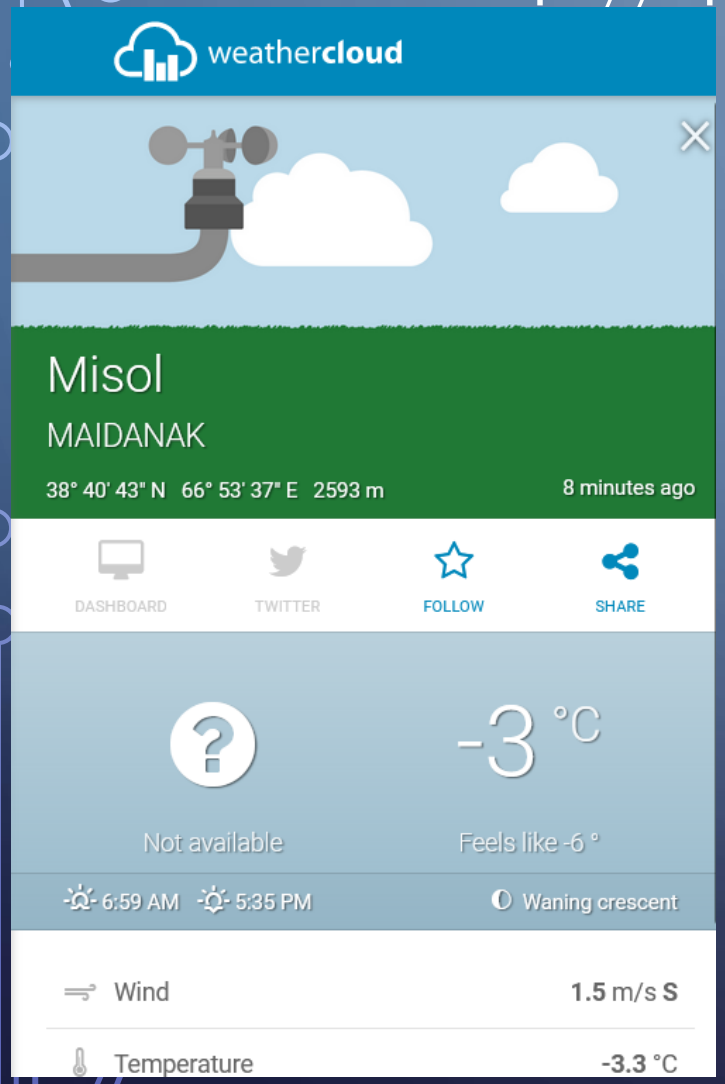
IP-PHONES

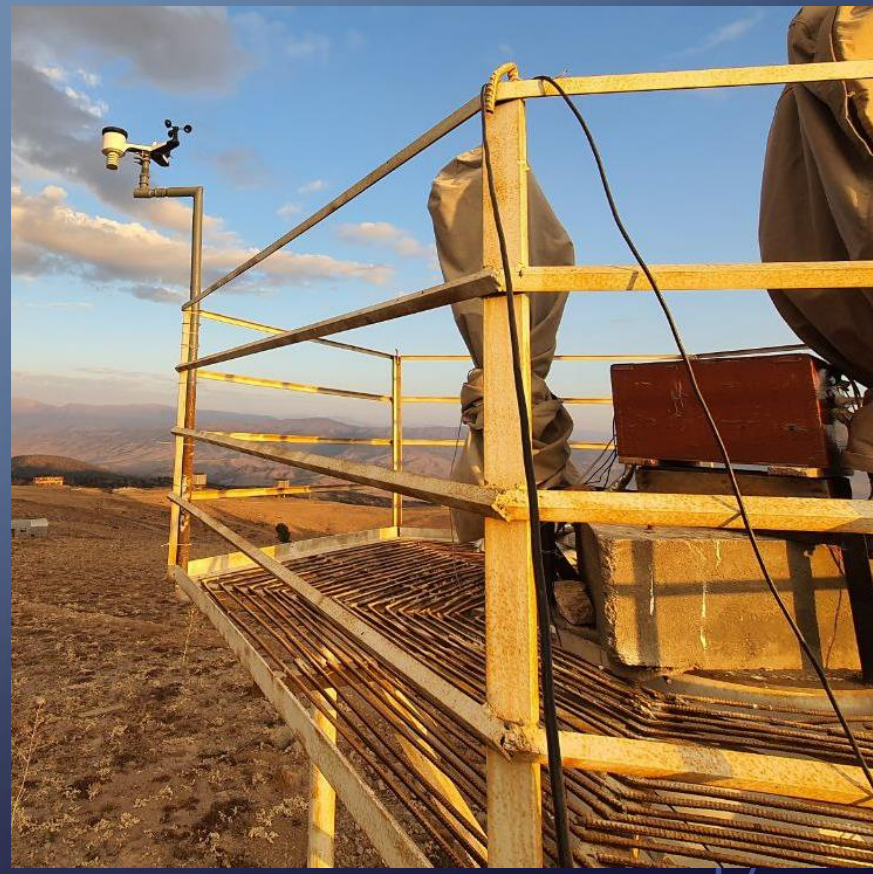


A GPS-TIME-SERVER PROVIDES PRECISE TIME

MAO METEOSTATION DATA AVAILABLE ONLINE

- https://app.weathercloud.net/d5359208089#current



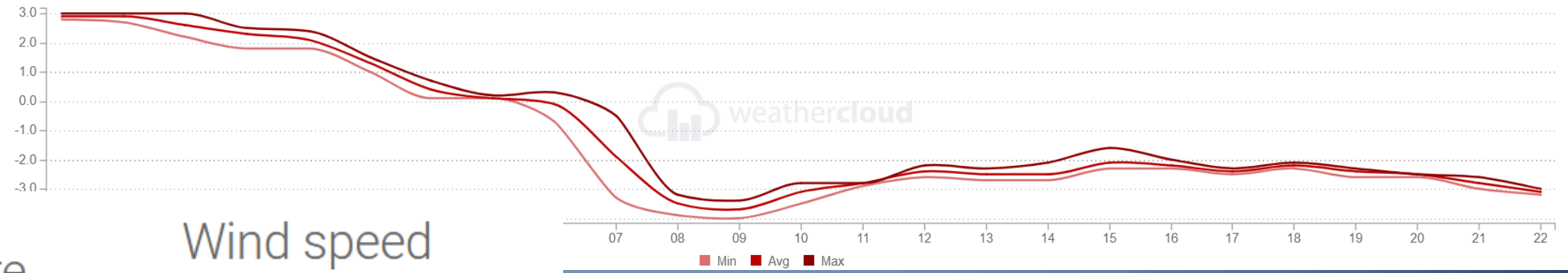


MAO

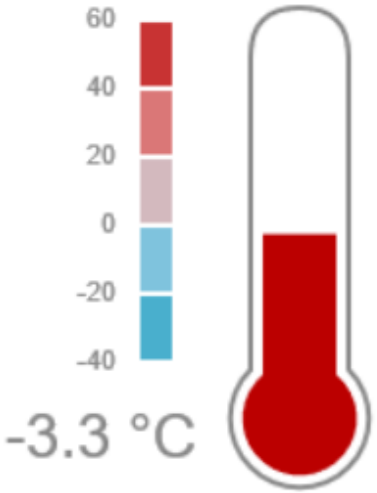
Day | Week | Month

Temperature (°C)

Min -4.0 °C Avg -1.1 °C Max 3.0 °C



Temperature



°C	Max	Min
Daily	3.0	-4.0
Monthly	12.3	-4.0
Yearly	20.3	-4.0

Wind speed

m/s	Max
Daily	6.6
Monthly	8.4
Yearly	10.3

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- Prof.Ehgamberdiev – high level negotiations on MAO internet
- Dima Alekseyev, IT engineer of UBAI, spent almost 5 months in a row at MAO this year
- Otabek Burkhonov – contacting ICT ministry, control of local cabling work etc.
- B.Hafizov – local technical work and maintenance
- M.Kardashenko and ANC – VSAT at MAO