



Username

Is my Control System healthy?

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## Zabbix and SCADA: Who watches the watchers?

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# Who is Apache



Apache Corporation is an upstream oil & gas exploration and production company with operations in USA, UK North Sea, Egypt and Suriname.

# Industrial Automation terminology

SCADA - Supervisory Control and Data Acquisition

DCS - Distributed Control System

PLC, RTU, ESD, F&G, etc.

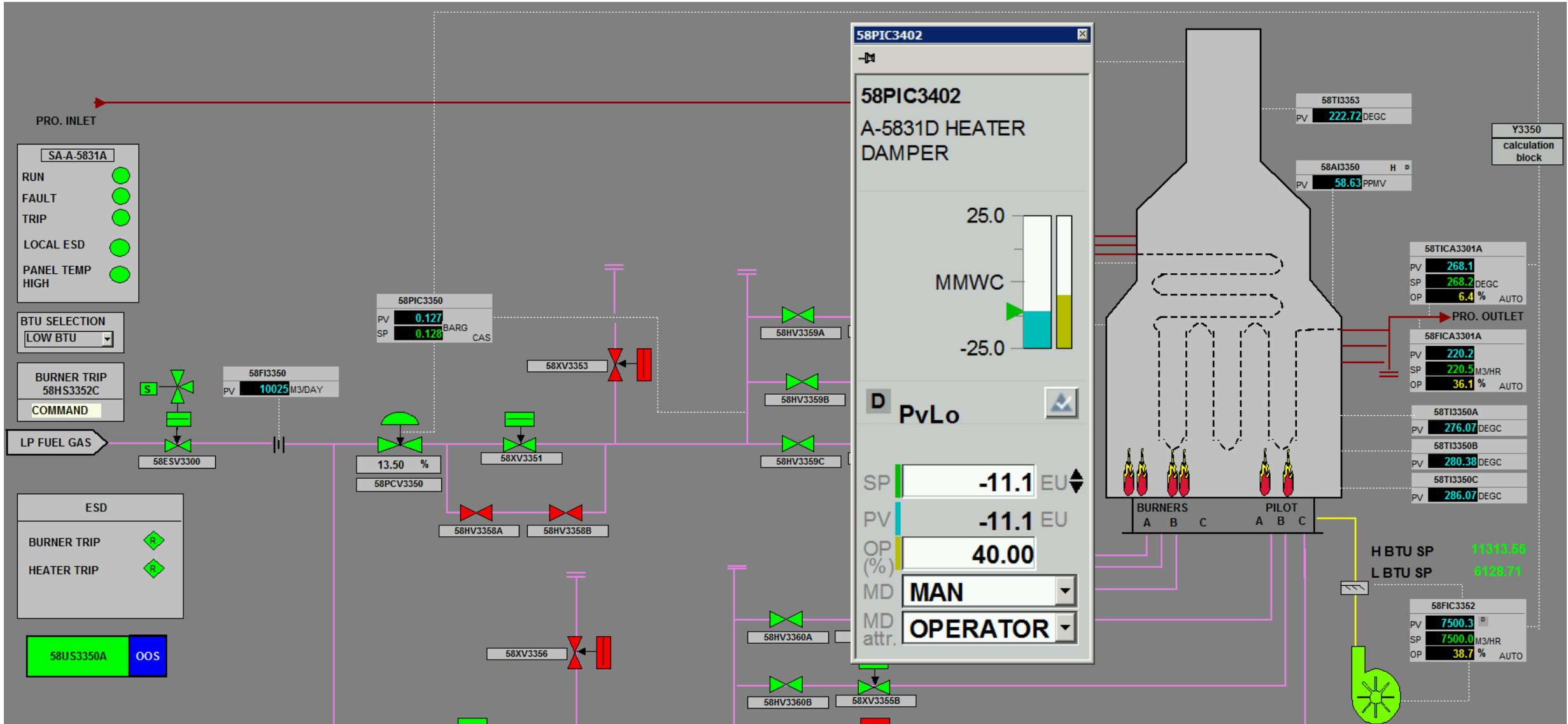




# Salam Base Gas Plant



# Operations



# Operations

Location Pane	Date & Time	Location Tag	Source	Condition	Priority	Description	Trip Value	Live Value	Units
Show All Locations									
SA12FGS (13)	1/26/2020 19:23:22	29 GAS EXPORT SYSTEM	29PIA051	PVLO	L 00	K2921 1ST SUC. PRESS.	39.00	38.78 barg	
SALAM_1-2 (169)	1/26/2020 16:18:22	29 GAS EXPORT SYSTEM	29PDIA101	PVHI	L 00	TRAIN1 EXP COMP TOTAL DP	55.11	57.56 barg	
10 WELLHEAD	1/24/2020 19:24:30	29 GAS EXPORT SYSTEM	29PDIA151	PVHI	L 00	TRAIN2 EXP COMP TOTAL DP	55.02	58.71 barg	
11 GATHERING SYSTEM	1/23/2020 7:12:56	29 GAS EXPORT SYSTEM	29YL051B	OFFNORM	L 00	E2921(B) RUNNING STATUS	STOP	STOP	
18 METERING SYSTEM (1)	1/15/2020 1:08:21	29 GAS EXPORT SYSTEM	29ESV055	OFFNORM	L 00	M2602/3 TO V2922	BAD	CLOSE	
20 SEPARATION (2)	1/15/2020 1:08:07	29 GAS EXPORT SYSTEM	29ESV052	OFFNORM	L 00	A2821 TO V2921	BAD	CLOSE	
21 CONDENSATE STABILIZATION (4)	1/11/2020 9:17:09	29 GAS EXPORT SYSTEM	29PICA019	PVLO	L 00	EXPORT GAS TO PIPE LINE	89.99	86.85 barg	
24 STORAGE TANK SYSTEM (21)	1/8/2020 17:25:03	29 GAS EXPORT SYSTEM	29YL011A	OFFNORM	L 00	E2911(A) RUNNING STATUS	STOP	STOP	
25 COMPRESSION SYSTEM (6)	11/12/2019 1:43:37	29 GAS EXPORT SYSTEM	29ZI002	PVHH	H 00	K2911 2ND POSITION IND.	40.13	46.12 %	
26 PERMEATE COMPRESSOR (30)	11/6/2019 16:13:37	29 GAS EXPORT SYSTEM	29ZI002	PVHI	L 00	K2911 2ND POSITION IND.	20.10	46.12 %	
27 GLYCOL (12)	10/18/2019 11:00:49	29 GAS EXPORT SYSTEM	29LZA055	OFFNORM	H 00	LL_V2922	L_LOW	L_LOW	
28 GAS EXCHANGER (10)	10/17/2019 16:38:38	29 GAS EXPORT SYSTEM	29LZA052	OFFNORM	H 00	LL_V2921	L_LOW	L_LOW	
29 GAS EXPORT SYSTEM (22)	10/17/2019 14:57:49	29 GAS EXPORT SYSTEM	29PIC051SEL	OFFNORM	L 00	K2921 1ST MODE SEL. SW	SEL	SEL	
40 CHEMICAL INJECTION (13)	6/15/2019 9:02:54	29 GAS EXPORT SYSTEM	29ESV008	OFFNORM	L 00	A2901 TO V4801	OPEN	OPEN	
41 FLARE SYSTEM (1)	10/11/2018 6:10:36	29 GAS EXPORT SYSTEM	29ZI001	PVHH	H 00	K2911 1ST POSITION IND.	43.57	98.24 %	
44 PROD WATER DEGAS	10/6/2018 19:58:31	29 GAS EXPORT SYSTEM	29PIC058SEL	OFFNORM	L 00	K2921 2ND MODE SEL. SW	SEL	SEL	
45 FIRE WATER & FOAM (4)	10/6/2018 19:56:25	29 GAS EXPORT SYSTEM	29PIC001SEL	OFFNORM	L 00	K2911 1ST MODE SEL SW	SEL	SEL	
48 FUEL GAS SYSTEM (5)	10/6/2018 19:49:10	29 GAS EXPORT SYSTEM	29ZI001	PVHI	L 00	K2911 1ST POSITION IND.	109.79	98.24 %	
50 POTABLE WATER	1/1/1983 0:23:07	29 GAS EXPORT SYSTEM	29XA003	OFFNORM	L 00	K2921 UNIT FAULT	ALARM	ALARM	
52 DRAIN SYSTEM (6)	1/1/1983 0:20:16	29 GAS EXPORT SYSTEM	29ESV002	OFFNORM	L 00	A2811 TO V2911	CLOSE	CLOSE	
	1/1/1983 0:20:16	29 GAS EXPORT SYSTEM	29ESV005	OFFNORM	L 00	M2602/3 TO V2912	CLOSE	CLOSE	
	1/1/1983 0:20:06	29 GAS EXPORT SYSTEM	29XA001	OFFNORM	L 00	K2911 1ST UNIT FAULT	ALARM	ALARM	

## System Status display

Location Pane

Show All Locations

Network

Computers

KHALDA-DCS

Devices

System Components (2)

SALAM12\_SRV [local serv]

Consoles

Controllers (1)

Printers

Stations

System Interfaces

Date & Time	Location Tag	Source	Condition	Priority	Description
1/25/2020 17:19:18	SALAM12_SRV	OPC Integrator	WARNING	H 00	Group 'KPC ASSETS-ANALOG' marginal
1/24/2020 22:33:57	PLC4	PLC4	COMMS	L 00	CONTROLLER 007 diagnostic

NativeWindow - gus01

File View Alarms Displays Control History Engineering Access Help

ENTER to Exeute 31 Dec 14 09:42:46 1

INVALID

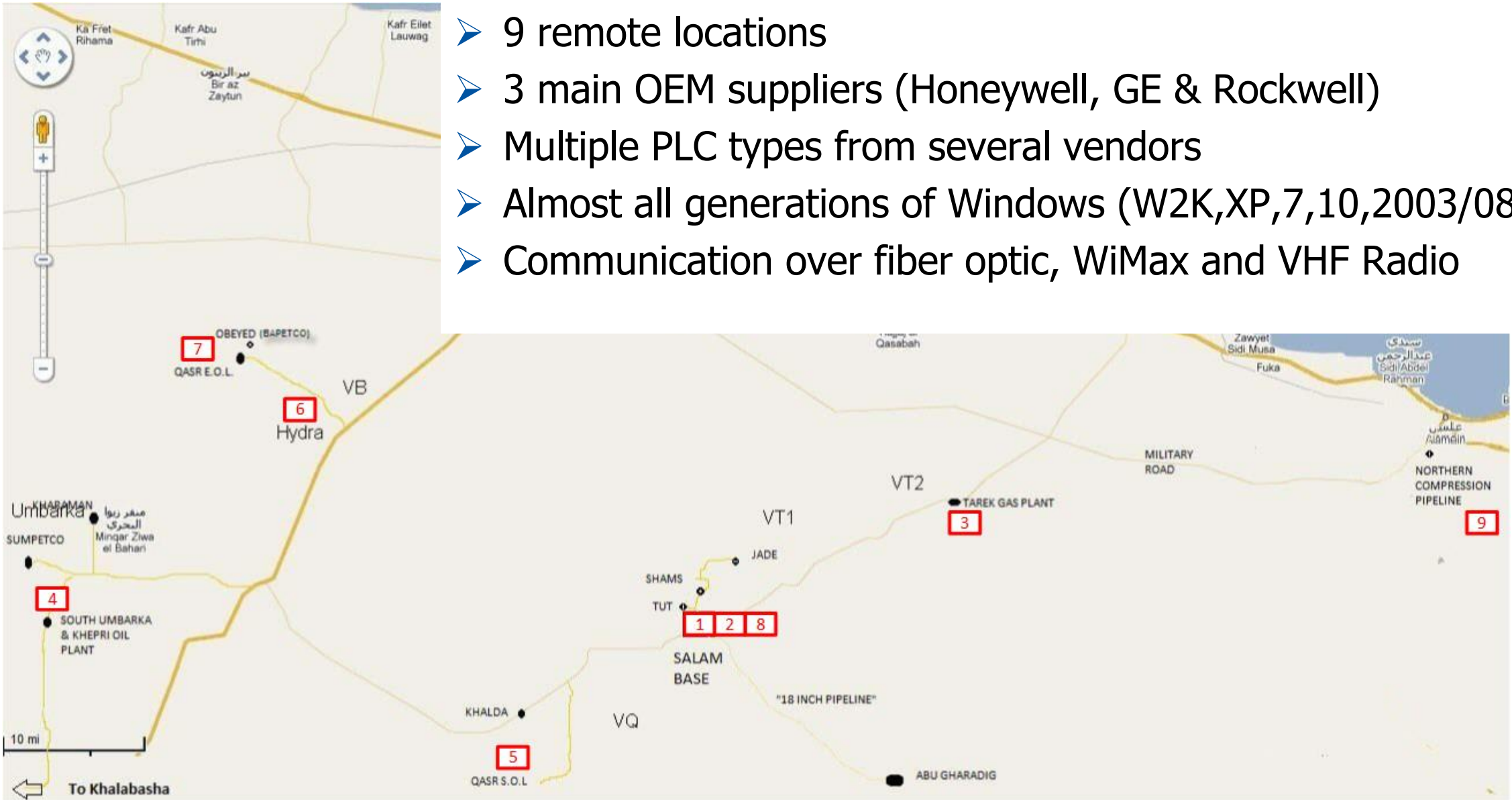
UCN STATISTICS - NETWORK 1

ND	TYP	CBL	A	B	A	B	SWAP	NOISE	FRAME	PASS	CKSUM	REPTR	AUTO	TIME	SYNCH
			SIL	SIL	NSY	NSY	DIS.	COUNT	FRAGS	RPTS	ERRS	ERRS	RECON		STATUS
1	NIM	A			*	*		47	139	0	0	0	0		LCN_OK
2	NIM	A			*	*		122	1334	0	5	0	0		OK
3															
4															
5															
6															
7															
8															
9	HPM	A			*	*		178	150	0	0	0	0		OK
10	HPM	A			*	*		270	183	0	0	0	0		OK
11															



# Complex monitoring is a challenge

- 9 remote locations
- 3 main OEM suppliers (Honeywell, GE & Rockwell)
- Multiple PLC types from several vendors
- Almost all generations of Windows (W2K,XP,7,10,2003/08/12)
- Communication over fiber optic, WiMax and VHF Radio





# Complex monitoring is a challenge

- **31** Physical and Virtual Servers (Windows, CentOS, VMWare)
- **51** Operator Stations (Windows)
- **102** Network Devices (Cisco, Hirschmann, Systech, Digi, Ubiquiti, Cambium, Control)
- **33** Process Controllers (Honeywell, GE, Rockwell)
- **17** ESD / F&G Controllers (Honeywell, GE)
- Printers, cabinet fans, power supplies, batteries, etc.

# Why Zabbix?

NativeWindow - SA-EST-STN5

File View Alarms Displays Control History Engineering Access Help

Monitor system

ACTIVE MAINT JOUR

TIME

cor\_recstat.cl2 - CIMPLICITY Log Viewer

Log View Help

Date/Time	Status	Process	Procedure	Source	Code	Reference	Message
1/5/2020 4:20:28 PM	Success	RtrPing	CRedundConnect::Recv	COR_IPC_ERR	0	0	receiving from redundant host
1/5/2020 4:20:26 PM	Success	RtrPing	CRedundConnect::ListenForConnect	COR_IPC_ERR	0	0	sending to redundant host
1/5/2020 4:20:26 PM	Failure	MAC_UR	Advertise	COR_IPC_ERR	110	0	Link Init Failure returned by Route
1/5/2020 4:18:03 PM	Failure	RtrPing	CRedundConnect::ListenForConnect	COR_IPC_ERR	0	0	clearing connection to redundant host
1/5/2020 4:18:03 PM	Failure	RtrPing	CRedundConnect::ListenForConnect	COR_IPC_ERR	0	10038	send()
1/5/2020 4:18:03 PM	Failure	RtrPing	CRedundConnect::Recv	COR_IPC_ERR	0	10057	recv()
1/5/2020 4:18:01 PM	Warning	MAC_AM	am_log_flush	COR_DL_ERR	10324	0	Logging halted for EVENT_LOG - No logging service available.
1/5/2020 4:18:01 PM	Warning	MAC_AM	EVENT_LOG	COR_IPC_ERR	105	105	Partner Dead - Node: QASERVER2 Private Port: MAC DL
1/5/2020 4:18:00 PM	Failure	MAC_UR	ipc_link_write	COR_IPC_ERR	205	5	error sending message
1/5/2020 4:18:00 PM	Failure	MAC_UR	ipc_link_write	COR_IPC_ERR	205	5	error sending message
1/5/2020 4:17:59 PM	Warning	MAC_AM	am_log_flush	COR_DL_ERR	10324	0	Logging halted for ALARM_LOG - No
1/5/2020 4:17:59 PM	Warning	MAC_AM	ALARM_LOG	COR_IPC_ERR	105	105	Partner Dead - Node: QASERVER2
1/5/2020 4:17:59 PM	Failure	MAC_AM	am_master_upd_slaves	COR_IPC_ERR	205	22	error sending message
1/5/2020 4:17:59 PM	Failure	MAC_AM	ipc_link_write	COR_IPC_ERR	205	22	error sending message
1/5/2020 4:17:59 PM	Failure	MAC_PTM	ptmrp_proc_dc_msg	COR_PTMRP_ERR	24558	0	Logical link down MASTER_PTM0_RP
1/5/2020 4:17:59 PM	Warning	MAC_PTM	ptmrp_proc_ap_ack	COR_PTMRP_ERR	24514	0	Unexpected message received (ACK)
1/5/2020 3:16:43 PM	Success	MAC_AM	am_allocq_send_resp	COR_AM_ERR	21	0	Allocated process does not exist

For Help, press F1

ENTER CA Text

Output short circuit  
channel(s) : 2

For Information

Position The C

Ready

System : Sys info, Inputs, Outputs, Extended diag, Diag to disk, Main

central part : 2

Appl.: TAFGS\_1

InfoViewer %S - System



%S00001	Address
00010000 01100110	%S00001
00000000 00000000	%S00065
00000000 00000000	%SA0001
00000000 00000000	%SA0065
00000000 00000000	%SB0001
00000000 00000000	%SB0065
00000000 00000000	%SC0001
00000000	%SC0009
#ANY_FLT [Set when any fault occurs.]	

# Why Zabbix?

InTouch - WindowViewer SALAM F&G HMI - C:\SALAM

File Logic Special Development!

### ALARM SUMMARY

 I/O to MODBUS Comm Server  MODBUS Communication Status

**First Alarm**

Date	Time	State	Comment	Name	Group	Value
Aug 21 2015	09:07:07.343	ACK	ZONE-28B FAULT	FZONE_28B	SALAM	ALARM

**Alarm History** [ Ack ALM , RTN Color , EVT Color ]

Date	Time	State	Comment	Name	Group	Value
Aug 21 2015	09:07:07.343	ACK	ZONE-28B FAULT	FZONE_28B	SALAM	ALARM
Aug 21 2015	09:07:07.343	ACK	ZONE-26A FAULT	FZONE_26A	SALAM	ALARM
Aug 21 2015	09:06:46.718	UNACK	ZONE-26A FAULT	FZONE_26A	SALAM	ALARM
Aug 20 2015	19:23:54.718	UNACK	ZONE-28B FAULT	FZONE_28B	SALAM	ALARM
Aug 20 2015	16:35:08.656	ACK_RTN	ZONE-29B FAULT	FZONE_29B	SALAM	NORMAL
Aug 20 2015	16:35:06.656	ACK_RTN	ZONE-28B FAULT	FZONE_28B	SALAM	NORMAL
Aug 20 2015	16:34:59.718	ACK_RTN	Flare A.0			
Aug 20 2015	16:34:59.718	ACK_RTN	Flare A.0			
Aug 20 2015	16:34:54.718	ACK_RTN	ZONE-20			
Aug 20 2015	16:34:54.718	UNACK	Flare A.0			
Aug 20 2015	16:34:54.718	UNACK	Flare A.0			
Aug 20 2015	16:34:50.656	ACK_RTN	ZONE-26			
Aug 19 2015	19:35:37.718	UNACK	ZONE-26			
Aug 17 2015	19:31:17.718	ACK_RTN	ZONE-28			
Aug 17 2015	19:28:34.656	UNACK	ZONE-28			
Aug 16 2015	20:42:56.718	ACK_RTN	ZONE-28			
Aug 16 2015	20:42:13.046	ACK	ZONE-53			
Aug 16 2015	20:42:13.046	ACK	ZONE-28			
Aug 16 2015	20:36:53.718	UNACK	ZONE-28			
Aug 16 2015	18:15:59.656	UNACK	ZONE-53			
Aug 14 2015	17:47:24.218	ACK_RTN	Maint. O			
Aug 14 2015	17:47:23.218	UNACK	Maint. O			
Aug 14 2015	17:47:22.843	ACK_RTN	Maint. O			
Aug 14 2015	07:42:23.218	UNACK	Maint. O			
Aug 14 2015	07:42:22.218	ACK_RTN	Maint. O			
Aug 14 2015	07:42:22.015	UNACK	Maint. O			
Aug 13 2015	18:20:13.750	ACK_RTN	Maint. O			
Aug 12 2015	09:02:39.656	UNACK	Maint. O			
Aug 12 2015	09:02:39.218	ACK_RTN	Maint. O			
Aug 12 2015	09:02:39.015	UNACK	Maint. O			
Aug 11 2015	19:21:30.453	ACK_RTN	Maint. O			
Aug 11 2015	14:02:24.218	UNACK	Maint. O			
Aug 11 2015	14:02:23.218	ACK_RTN	Maint. O			
Aug 11 2015	14:02:23.078	UNACK	Maint. O			
Aug 11 2015	12:20:59.390	ACK	ZONE-26			

**MODBUS**

Configure Help

COM3 Use:0.0 Percent

MODBUS Lag:0ms ( ) Status:GOOD

READ Coils 0- 44

READ Coils 5000- 5440

Plot Plan Alarm Sett

CTRL BLD SWGR

# Why Zabbix?

Serial Com File Transporter - Sender - Log

☐ Logging Active

☒ Auto Scroll

04/Dec/2019 4:06:27 PM - SCFT Sender Service has been stopped.

04/Dec/2019 4:06:28 PM - SCFT Sender Service has been started.

04/Dec/2019 4:06:29 PM - root@sb-grf-srv1:~

04/Dec/2019 4:06:30 PM - root@sb-grf-srv1:~#

04/Dec/2019 4:06:31 PM - root@sb-grf-srv1:~# systemctl status influxdb.service

04/Dec/2019 4:06:32 PM - ● influxdb.service - InfluxDB is an open-source, distributed, time series database

04/Dec/2019 4:06:33 PM - Loaded: loaded (/usr/lib/systemd/system/influxdb.service; enabled; vendor preset: disabled)

04/Dec/2019 4:06:34 PM - Active: active (running) since 2019-12-04 16:06:30; 1min 1s ago

04/Dec/2019 4:06:35 PM - Doc: influxdb.org/docs

04/Dec/2019 4:06:36 PM - Main PID: 20796

04/Dec/2019 4:06:37 PM - CGroup: /systemd/system/influxdb.service

04/Dec/2019 4:06:38 PM - 1 [|||||]

04/Dec/2019 4:06:39 PM - 2 [|||||]

04/Dec/2019 4:06:40 PM - 3 [|||||]

04/Dec/2019 4:06:41 PM - 4 [|||||]

04/Dec/2019 4:06:42 PM - Mem [|||||]

04/Dec/2019 4:06:43 PM - Swp [|||||]

04/Dec/2019 4:06:44 PM - Tasks: 30, 109 thr; 1 running

04/Dec/2019 4:06:45 PM - Load average: 0.08 0.13 0.13

04/Dec/2019 4:06:46 PM - Uptime: 30 days, 22:49:59

04/Dec/2019 4:06:47 PM - PID USER PRI NI VIRT RES SHR S CPU% MEM% TIME+ Command

04/Dec/2019 4:06:48 PM - 20796 root 20 0 3212M 1005M 105M S 0.0 12.8 0:23.08 /opt/kaspersky/kesl/libexec/kesl

04/Dec/2019 4:06:49 PM - 20797 root 20 0 3212M 1005M 105M S 0.0 12.8 0:41.65 /opt/kaspersky/kesl/libexec/kesl

04/Dec/2019 4:06:50 PM - 20798 root 20 0 3212M 1005M 105M S 0.0 12.8 0:00.10 /opt/kaspersky/kesl/libexec/kesl

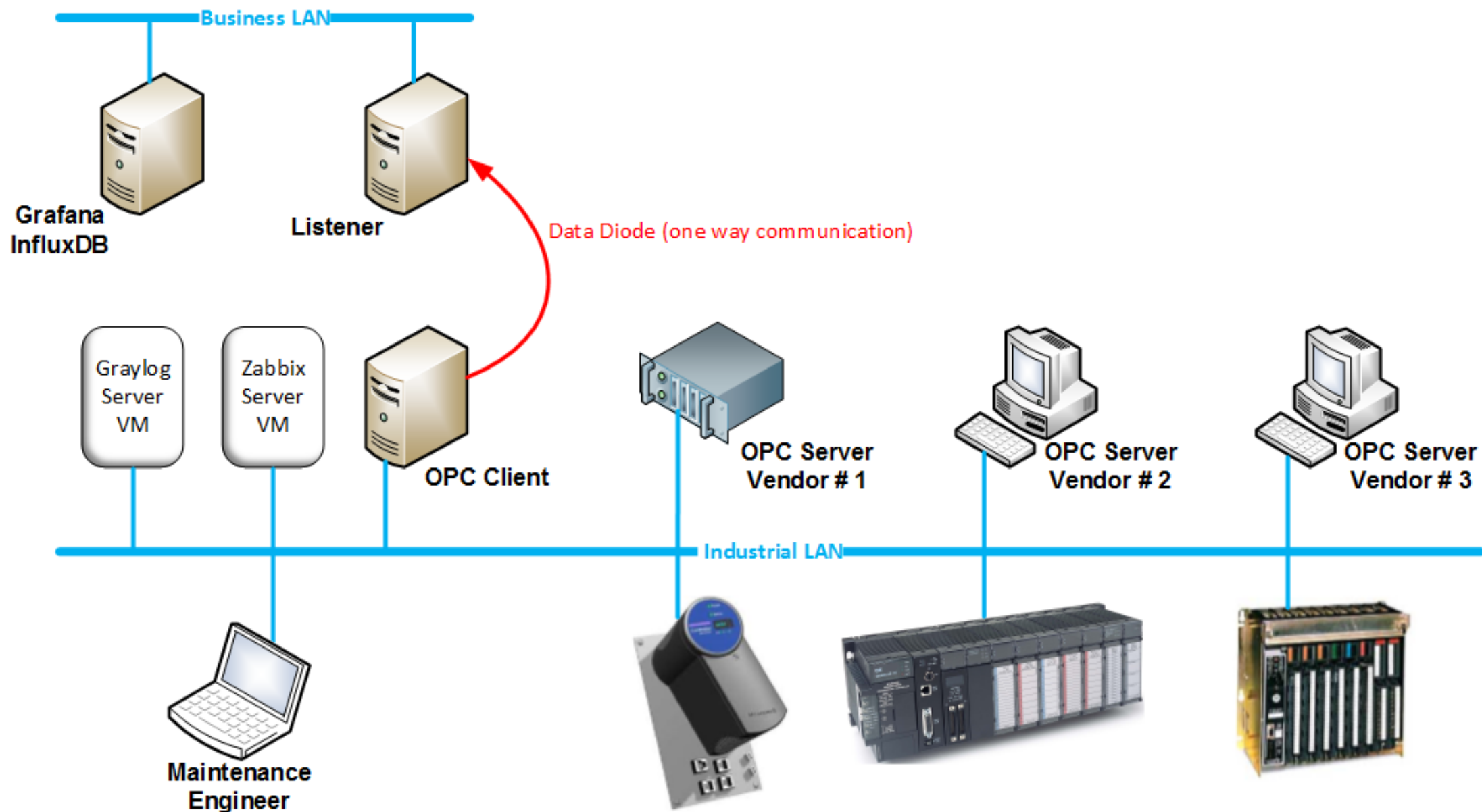
04/Dec/2019 4:06:51 PM - 20799 root 20 0 3212M 1005M 105M S 0.0 12.8 0:00.19 /opt/kaspersky/kesl/libexec/kesl

04/Dec/2019 4:06:52 PM - 20804 root 20 0 3212M 1005M 105M S 0.0 12.8 0:00.00 /opt/kaspersky/kesl/libexec/kesl

04/Dec/2019 4:06:53 PM - 20807 root 20 0 3212M 1005M 105M S 0.0 12.8 0:00.27 /opt/kaspersky/kesl/libexec/kesl












# System Architecture












# System Architecture

Write-Verbose "Loading Interop DLL"

```
try {  
    $PSScriptRoot = Split-Path -Parent -Path $MyInvocation.MyCommand.Definition  
    # Namespaces Opc, Opc.Ae, Opc.Da, Opc.Hda  
    Add-Type -Path ($PSScriptRoot + "\OpcNetApi.dll")  
    # Namespaces OpcCom, OpcCom.Ae, OpcCom.Da, OpcCom.Hda, OpcCom.Da20 and OpcCom.Da.Wrapper - the same namespace  
    Add-Type -Path ($PSScriptRoot + "\OpcNetApi.Com.dll")  
} catch {  
    $messageString = ("Error loading Interop DLL (Does the file exist?) Exception: " + $_.Exception.Message)  
    Write-Warning $messageString  
    (Get-Date -format g) + "`t" + $messageString | Out-File $fileLog -Append  
    exit 16  
}
```

Name	S.	Next Run Time	Last Run Time	Last Run Result
 OBAYIED_DIAG	Ready	2/18/2020 6:54:34 PM	2/18/2020 6:49:16 PM	The operation completed successfully. (0x0)
 SG34_DIAG	Ready	2/18/2020 6:54:15 PM	2/18/2020 6:49:15 PM	The operation completed successfully. (0x0)
 SG12_DIAG	Ready	2/18/2020 6:54:31 PM	2/18/2020 6:49:11 PM	The operation completed successfully. (0x0)
 AKIK_DIAG	Ready	2/18/2020 6:54:14 PM	2/18/2020 6:49:06 PM	The operation completed successfully. (0x0)
 NPCS_DIAG	Ready	2/18/2020 6:53:33 PM	2/18/2020 6:48:57 PM	The operation completed successfully. (0x0)
 QASR_DIAG	Ready	2/18/2020 6:53:31 PM	2/18/2020 6:48:32 PM	The operation completed successfully. (0x0)
 HYDRA_DIAG	Ready	2/18/2020 6:53:18 PM	2/18/2020 6:48:16 PM	The operation completed successfully. (0x0)
 SUGP_DIAG	Ready	2/18/2020 6:52:20 PM	2/18/2020 6:47:24 PM	The operation completed successfully. (0x0)
 TGP_DIAG	Ready	2/18/2020 6:51:18 PM	2/18/2020 6:46:23 PM	The operation completed successfully. (0x0)

Name	Date modified
 OBAYIED_DIAG_Data.json	2/18/2020 6:49 PM
 SG12_DIAG_Data.json	2/18/2020 6:49 PM
 SG34_DIAG_Data.json	2/18/2020 6:49 PM
 AKIK_DIAG_Data.json	2/18/2020 6:49 PM
 NPCS_DIAG_Data.json	2/18/2020 6:49 PM
 QASR_DIAG_Data.json	2/18/2020 6:48 PM
 HYDRA_DIAG_Data.json	2/18/2020 6:48 PM
 SUGP_DIAG_Data.json	2/18/2020 6:47 PM
 TGP_DIAG_Data.json	2/18/2020 6:46 PM

# System Architecture

Timestamp	Value
2020-01-27 10:04:08	{
	"SUGP": {
	"\$NM01N10.NODESTS": 0,
	"SUGP_ESD_FAN.PV": 0,
	"\$PRSTS02.OB_STATE(0)": 0,
	"\$PRSTS12.OB_STATE(0)": 0,
	"\$PRSTS31.OB_STATE(0)": 0,
	"\$PRSTS23.CABLESTS": 1,
	"SUGP_FG_SYS.PV": 0,
	"SU-ESVT-SRV1.TotalUnackAlarms": 0,
	"\$PRSTS21.CABLESTS": 1,
	"\$NM01N02.CABLESTS": 0,
	"\$NM01N20.CABLESTS": 0,
	"SU_SINEWAVE.PV": 2990,
	"\$NM01N10.CABLESTS": 0,
	"\$NM01N19.NODESTS": 0,
	"\$PRSTS01.CABLESTS": 1,
	"SU-ESVT-SRV1.TotalAckAlarms": 0,

<input type="checkbox"/> Name ▲	Last check	Last value	Change
▼ Diagnostic SUGP (36 Items)			
<input type="checkbox"/> SUGP_CONSOLE_KEYLEVEL	2020-01-27 10:09:08	0	
<input type="checkbox"/> SUGP_ESD_FAN	2020-01-27 10:09:08	Normal (0)	
<input type="checkbox"/> SUGP_ESD_PWR	2020-01-27 10:09:08	Normal (0)	
<input type="checkbox"/> SUGP_ESD_SYS	2020-01-27 10:09:08	Normal (0)	
<input type="checkbox"/> SUGP_Experion_System_Alarm_New	2020-01-27 10:09:08	0	
<input type="checkbox"/> SUGP_Experion_System_Alarm_Standing	2020-01-27 10:09:08	0	
<input type="checkbox"/> SUGP_FG_FAN	2020-01-27 10:09:08	Normal (0)	
<input type="checkbox"/> SUGP_FG_PWR	2020-01-27 10:09:08	Normal (0)	
<input type="checkbox"/> SUGP_FG_SYS	2020-01-27 10:09:08	Normal (0)	
<input type="checkbox"/> SUGP_LCN_AM21	2020-01-27 10:09:08	OK (0)	
<input type="checkbox"/> SUGP_LCN_Cable_AM21	2020-01-27 10:09:08	Normal (1)	
<input type="checkbox"/> SUGP_LCN_Cable_EST01	2020-01-27 10:09:08	Normal (1)	
<input type="checkbox"/> SUGP_LCN_Cable_EST02	2020-01-27 10:09:08	Normal (1)	
<input type="checkbox"/> SUGP_LCN_Cable_ESVT23	2020-01-27 10:09:08	Normal (1)	
<input type="checkbox"/> SUGP_LCN_Cable_HM31	2020-01-27 10:09:08	Normal (1)	
<input type="checkbox"/> SUGP_LCN_Cable_NIM11	2020-01-27 10:09:08	Normal (1)	
<input type="checkbox"/> SUGP_LCN_Cable_NIM12	2020-01-27 10:09:08	Normal (1)	
<input type="checkbox"/> SUGP_LCN_EST01	2020-01-27 10:09:08	OK (0)	
<input type="checkbox"/> SUGP_LCN_EST02	2020-01-27 10:09:08	OK (0)	
<input type="checkbox"/> SUGP_LCN_ESVT23	2020-01-27 10:09:08	OK (0)	
<input type="checkbox"/> SUGP_LCN_HM31	2020-01-27 10:09:08	OK (0)	
<input type="checkbox"/> SUGP_LCN_NIM11	2020-01-27 10:09:08	OK (0)	
<input type="checkbox"/> SUGP_LCN_NIM12	2020-01-27 10:09:08	OK (0)	
<input type="checkbox"/> SUGP_SINEWAVE	2020-01-27 10:09:08	7889	+4899
<input type="checkbox"/> SUGP_UCN_Cable_HPM09	2020-01-27 10:09:08	OK (0)	
<input type="checkbox"/> SUGP_UCN_Cable_HPM10	2020-01-27 10:09:08	OK (0)	

# System Architecture

Average	Khepri AM21 Problem	{SA-ZBX-SRV1:SUGP_LCN_AM21.nodata(360)}=1 or {SA-ZBX-SRV1:SUGP_LCN_AM21.last()}<>0
Information	Khepri Console Supervisor Logon Detected	{SA-ZBX-SRV1:SUGP_CONSOLE_KEYLEVEL.last()}<>0
Average	Khepri EST01 Problem	{SA-ZBX-SRV1:SUGP_LCN_EST01.nodata(360)}=1 or {SA-ZBX-SRV1:SUGP_LCN_EST01.last()}<>0
Average	Khepri EST02 Problem	{SA-ZBX-SRV1:SUGP_LCN_EST02.nodata(360)}=1 or {SA-ZBX-SRV1:SUGP_LCN_EST02.last()}<>0
Average	Khepri ESVT23 Problem	{SA-ZBX-SRV1:SUGP_LCN_ESVT23.nodata(360)}=1 or {SA-ZBX-SRV1:SUGP_LCN_ESVT23.last()}<>0
Average	Khepri Experion System Alarm New	{SA-ZBX-SRV1:SUGP_Experion_System_Alarm_New.last()}<>0
Average	Khepri Experion System Alarm Standing	{SA-ZBX-SRV1:SUGP_Experion_System_Alarm_Standing.last()}<>0
Information	Khepri FSC ESD Cabinet Power, Fan or System Alarm	{SA-ZBX-SRV1:SUGP_ESD_SYS.last()}<>0 or {SA-ZBX-SRV1:SUGP_ESD_FAN.last()}<>0 or {SA-ZBX-SRV1:SUGP_ESD_PWR.last()}<>0
Information	Khepri FSC F&G Cabinet Power, Fan or System Alarm	{SA-ZBX-SRV1:SUGP_FG_SYS.last()}<>0 or {SA-ZBX-SRV1:SUGP_FG_FAN.last()}<>0 or {SA-ZBX-SRV1:SUGP_FG_PWR.last()}<>0
Average	Khepri HM31 Problem	{SA-ZBX-SRV1:SUGP_LCN_HM31.nodata(360)}=1 or {SA-ZBX-SRV1:SUGP_LCN_HM31.last()}<>0
Average	Khepri HPM09 or 10 Problem	{SA-ZBX-SRV1:SUGP_UCN_HPM09.last()}<>0 or {SA-ZBX-SRV1:SUGP_UCN_HPM10.last()}<>0
High	Khepri LCN Cable Problem	{SA-ZBX-SRV1:SUGP_LCN_Cable_EST01.last()}<>1 or {SA-ZBX-SRV1:SUGP_LCN_Cable_EST02.last()}<>1 or {SA-ZBX-SRV1:SUGP_LCN_Cable_NIM11.last()}<>1 or {SA-ZBX-SRV1:SUGP_LCN_Cable_NIM12.last()}<>1 or {SA-ZBX-SRV1:SUGP_LCN_Cable_AM21.last()}<>1 or {SA-ZBX-SRV1:SUGP_LCN_Cable_ESVT23.last()}<>1 or {SA-ZBX-SRV1:SUGP_LCN_Cable_HM31.last()}<>1
Average	Khepri NIM11 Problem	{SA-ZBX-SRV1:SUGP_LCN_NIM11.nodata(360)}=1 or {SA-ZBX-SRV1:SUGP_LCN_NIM11.last()}<>0
Average	Khepri NIM12 Problem	{SA-ZBX-SRV1:SUGP_LCN_NIM12.nodata(360)}=1 or {SA-ZBX-SRV1:SUGP_LCN_NIM12.last()}<>0
Average	Khepri SMM19 or 20 Problem	{SA-ZBX-SRV1:SUGP_UCN_SMM19.last()}<>0 or {SA-ZBX-SRV1:SUGP_UCN_SMM20.last()}<>0
High	Khepri UCN Cable Problem	{SA-ZBX-SRV1:SUGP_UCN_Cable_NIM01.last()}<>0 or {SA-ZBX-SRV1:SUGP_UCN_Cable_NIM02.last()}<>0 or {SA-ZBX-SRV1:SUGP_UCN_Cable_HPM09.last()}<>0 or {SA-ZBX-SRV1:SUGP_UCN_Cable_HPM10.last()}<>0 or {SA-ZBX-SRV1:SUGP_UCN_Cable_SMM19.last()}<>0 or {SA-ZBX-SRV1:SUGP_UCN_Cable_SMM20.last()}<>0

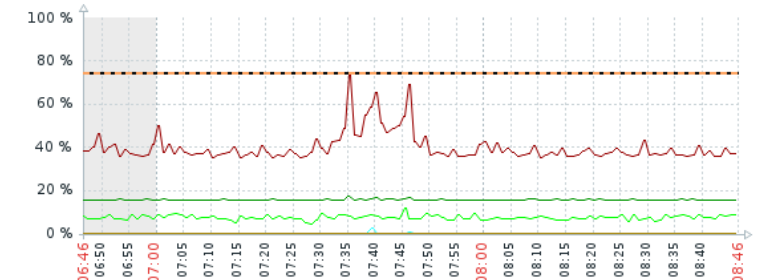


# Main dashboard

Problems								
Time ▼	Recovery time	Status	Info	Host	Problem • Severity	Duration	Ack	Actions
2020-01-25 21:09:13		PROBLEM		SA-ZBX-SRV1	Salam Train 1&2 Experion System Alarm New	11h 37m 25s	No	
Yesterday								
2020-01-24 10:14:13		PROBLEM		SA-ZBX-SRV1	Shams PLC Primary or Secondary Common Fault	1d 22h 32m	No	
2020-01-15 15:34:09		PROBLEM		SA-ZBX-SRV1	AKIK NIU Common Fault	10d 17h 12m	No	
2020-01-14 06:04:09		PROBLEM		SA-ZBX-SRV1	AKIK PCS PLC Common Fault	12d 2h 42m	No	
2020-01-13 09:59:09		PROBLEM		SA-ZBX-SRV1	AKIK ESD PLC Common Fault	12d 22h 47m	No	
2020								
2019-12-16 18:09:15		PROBLEM		SA-ZBX-SRV1	Tarek FSC F&G Cabinet Power, Fan or System Alarm	1m 10d 14h	No	
2019-12-11 08:44:11		PROBLEM		SA-ZBX-SRV1	OBAYIED FG PLC Common Fault	1m 16d	Yes 1	
2019-12-11 08:44:11		PROBLEM		SA-ZBX-SRV1	OBAYIED ESD PLC Common Fault	1m 16d	Yes 1	
2019-12-11 08:44:11		PROBLEM		SA-ZBX-SRV1	OBAYIED FWS PLC Common Fault	1m 16d	Yes 1	
2019-12-11 08:44:11		PROBLEM		SA-ZBX-SRV1	OBAYIED PCS PLC Common Fault	1m 16d	Yes 1	
2019-12-06 16:01:52		PROBLEM		SA-ZBX-SRV1	Salam Train 3 FSC F&G Problem	1m 20d 16h	Yes 1	
December								
2019-08-05 09:37:00		PROBLEM		SA-ZBX-SRV1	Salam Train 3&4 (Common) FSC ESD Problem	5m 23d 23h	Yes 1	
August								
2019-04-23 07:16:56		PROBLEM		SA-ZBX-SRV1	Salam Train 4 FSC F&G Problem	9m 8d 1h	Yes 1	
April								
2019-03-21 07:31:48		PROBLEM		SA-ZBX-SRV1	Salam Train 3&4 (Common) FSC F&G Problem	10m 11d 1h	Yes 1	
March								
2019-01-21 10:33:08		PROBLEM		SA-ZBX-SRV1	Salam Train 3&4 APC Offline	1y 4d	Yes 1	

15 of 15 problems are shown Updated: 08:46:38

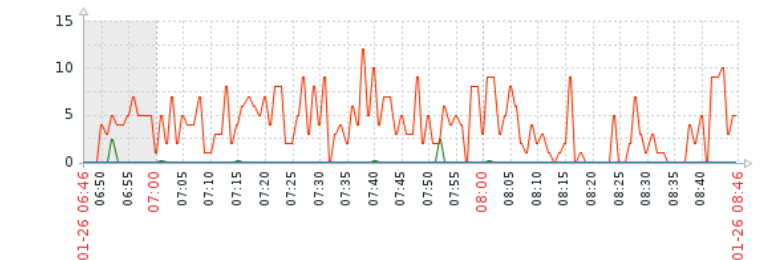
## Data Gathering



Zabbix busy poller processes, in %	[avg]	last	min	avg
Zabbix busy discoverer processes, in %	[avg]	36.81 %	35.04 %	39.9 %
Zabbix busy icmp pinger processes, in %	[avg]	0 %	0 %	0.0008 %
Zabbix busy unreachable poller processes, in %	[avg]	15.42 %	15.27 %	15.6 %
Zabbix busy vmware collector processes, in %	[avg]	0 %	0 %	0.0 %
Zabbix busy preprocessing manager processes, in %	[avg]	8.52 %	4.36 %	7.4 %
Zabbix busy preprocessing worker processes, in %	[avg]	0.07 %	0 %	0.0 %
Trigger: Zabbix poller processes more than 75% busy	[> 75]			
Trigger: Zabbix discoverer processes more than 75% busy	[> 75]			
Trigger: Zabbix icmp pinger processes more than 75% busy	[> 75]			

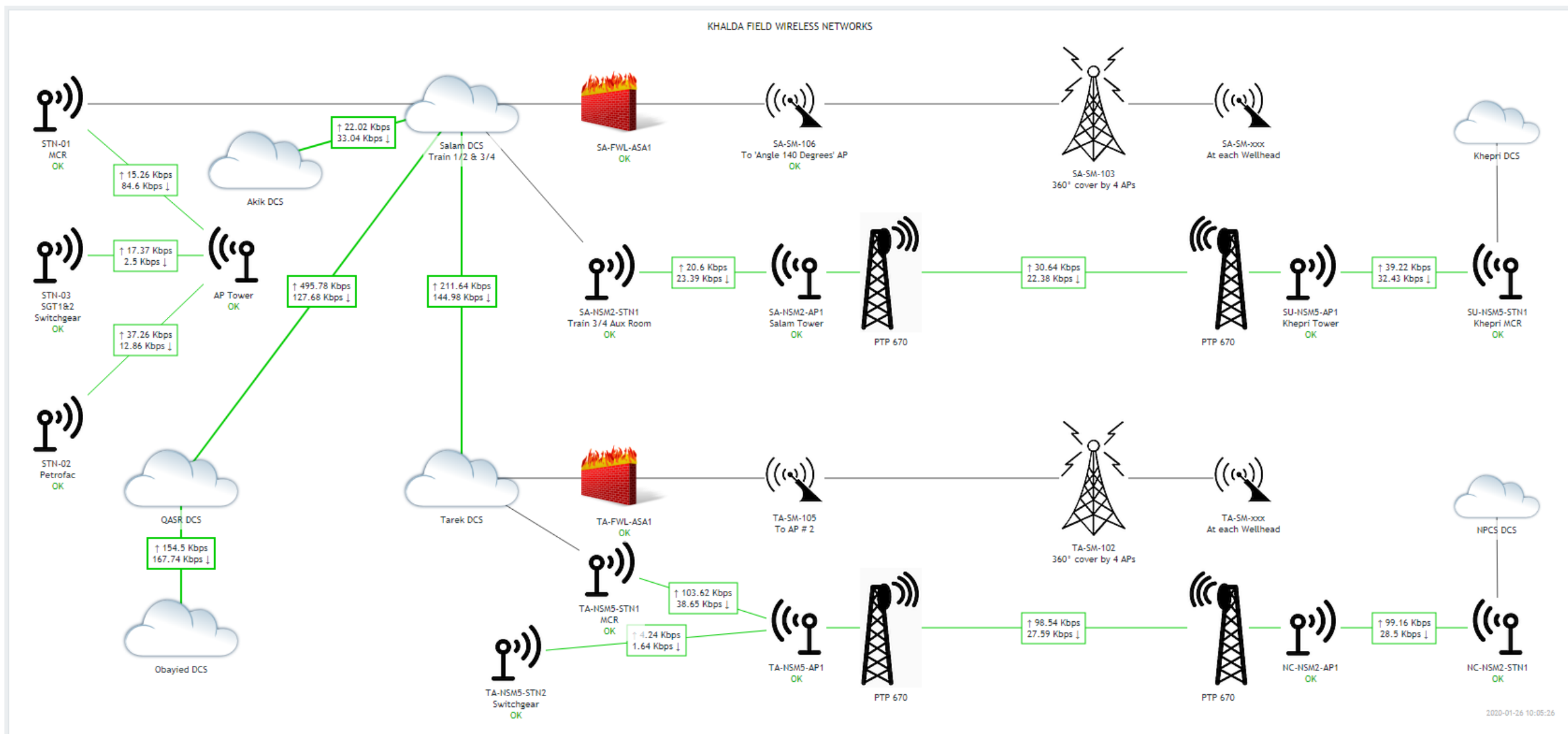
Updated: 08:46:38

## SA-ZBX-SRV1: Zabbix vs ESXi disk metrics (2h)



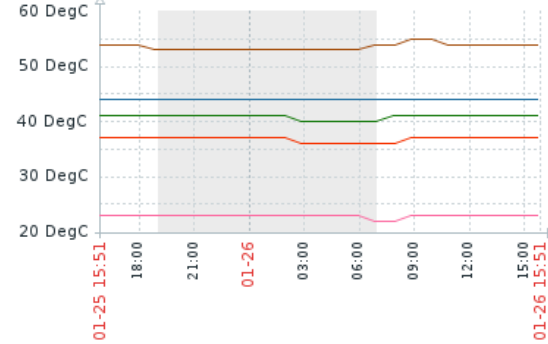
SA-ZBX-SRV1: CPU iowait time	[avg]	last	min
SA-ESXi1: Average read latency of the datastore ESXi1-DATASTORE1	[avg]	0.06 %	0.02
SA-ESXi1: Average write latency of the datastore ESXi1-DATASTORE1	[avg]	5	0
Trigger: Disk I/O is overloaded on SA-ZBX-SRV1	[> 20]		

Updated: 08:46:38



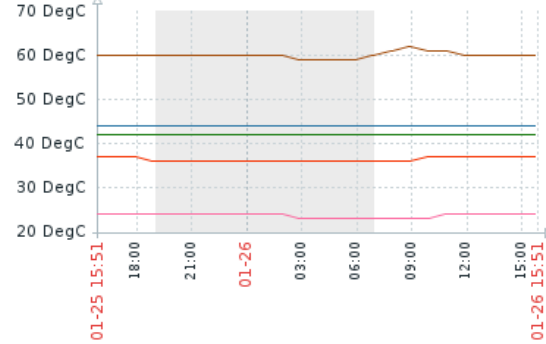
# PC-based hardware

SA-ESVT-SRV1A: Temperature top 4 sensors (1d)



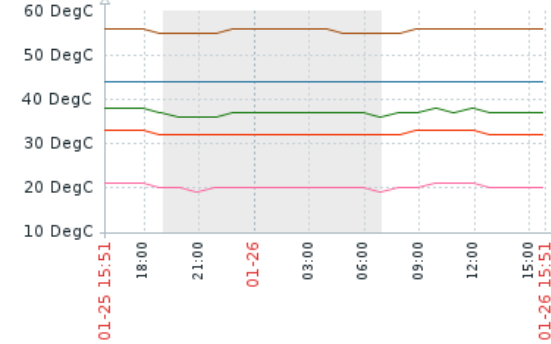
		last	min	avg
32-HDCntrlZone	[avg]	41 DegC	40 DegC	40.78 DegC
40-SysExhaust	[avg]	37 DegC	36 DegC	36.74 DegC
13-Chipset1	[avg]	44 DegC	44 DegC	44 DegC
31-HDController	[avg]	54 DegC	53 DegC	53.57 DegC
01-InletAmbient	[avg]	23 DegC	22 DegC	22.91 DegC

SA-ESVT-SRV1B: Temperature top 4 sensors (1d)



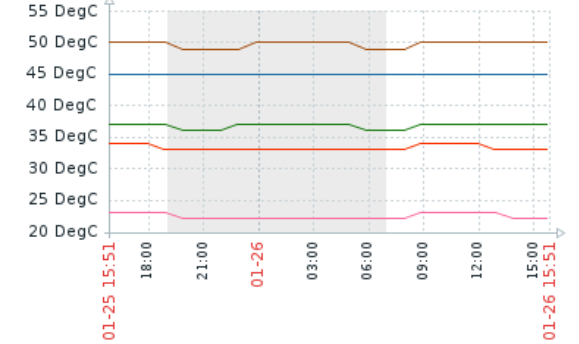
		last	min	avg
32-HDCntrlZone	[avg]	42 DegC	42 DegC	42 DegC
40-SysExhaust	[avg]	37 DegC	36 DegC	36.35 DegC
13-Chipset1	[avg]	44 DegC	44 DegC	44 DegC
31-HDController	[avg]	60 DegC	59 DegC	60.04 DegC
01-InletAmbient	[avg]	24 DegC	23 DegC	23.65 DegC

TA-ESVT-SRV1A: Temperature top 4 sensors (1d)



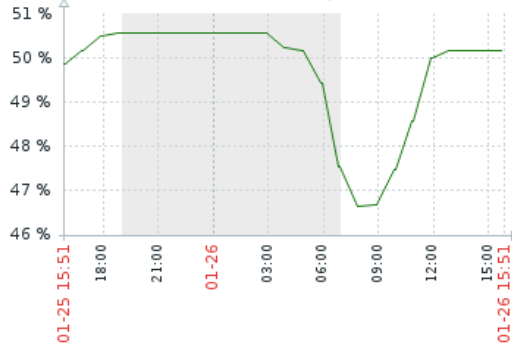
		last	min	avg
32-HDCntrlZone	[avg]	37 DegC	36 DegC	37.04 DegC
40-SysExhaust	[avg]	32 DegC	32 DegC	32.3 DegC
13-Chipset1	[avg]	44 DegC	44 DegC	44 DegC
31-HDController	[avg]	56 DegC	55 DegC	55.65 DegC
01-InletAmbient	[avg]	20 DegC	19 DegC	20.17 DegC

TA-ESVT-SRV1B: Temperature top 4 sensors (1d)



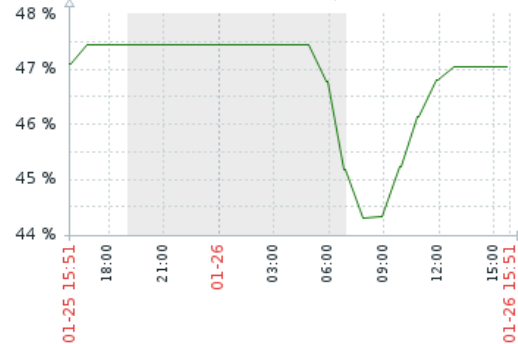
		last	min	avg
32-HDCntrlZone	[avg]	37 DegC	36 DegC	36.74 DegC
40-SysExhaust	[avg]	33 DegC	33 DegC	33.3 DegC
13-Chipset1	[avg]	45 DegC	45 DegC	45 DegC
31-HDController	[avg]	50 DegC	49 DegC	49.7 DegC
01-InletAmbient	[avg]	22 DegC	22 DegC	22.39 DegC

SA-ESVT-SRV1A: Fan-3 Speed (1d)



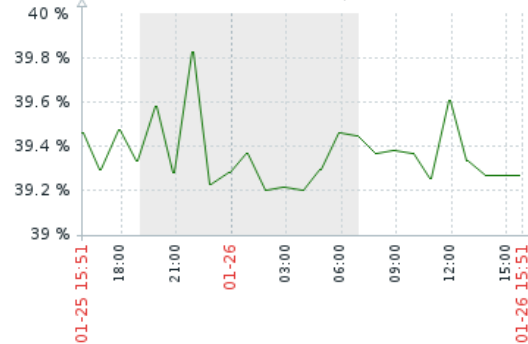
		last	min	avg	max
FanBlock3	[avg]	50.18 %	45.47 %	49.69 %	50.96 %

SA-ESVT-SRV1B: Fan-3 Speed (1d)



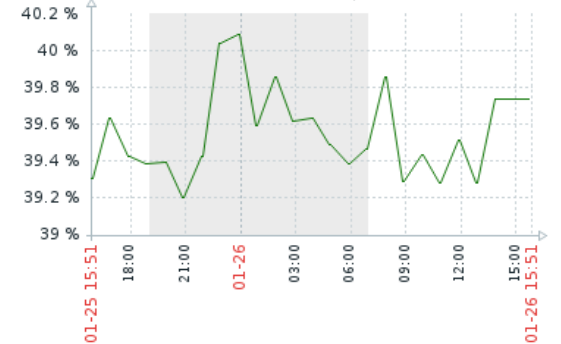
		last	min	avg	max
FanBlock3	[avg]	47.04 %	44.3 %	46.8 %	47.43 %

TA-ESVT-SRV1A: Fan-3 Speed (1d)



		last	min	avg	max
FanBlock3	[avg]	39.27 %	39.2 %	39.37 %	41.16 %

TA-ESVT-SRV1B: Fan-3 Speed (1d)



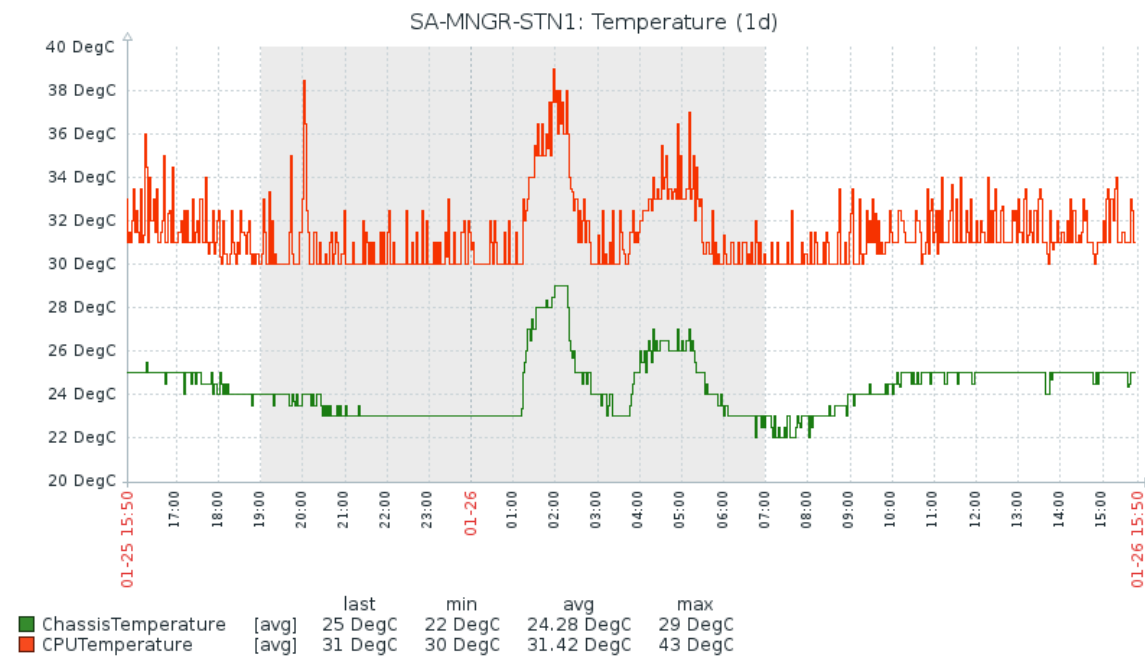
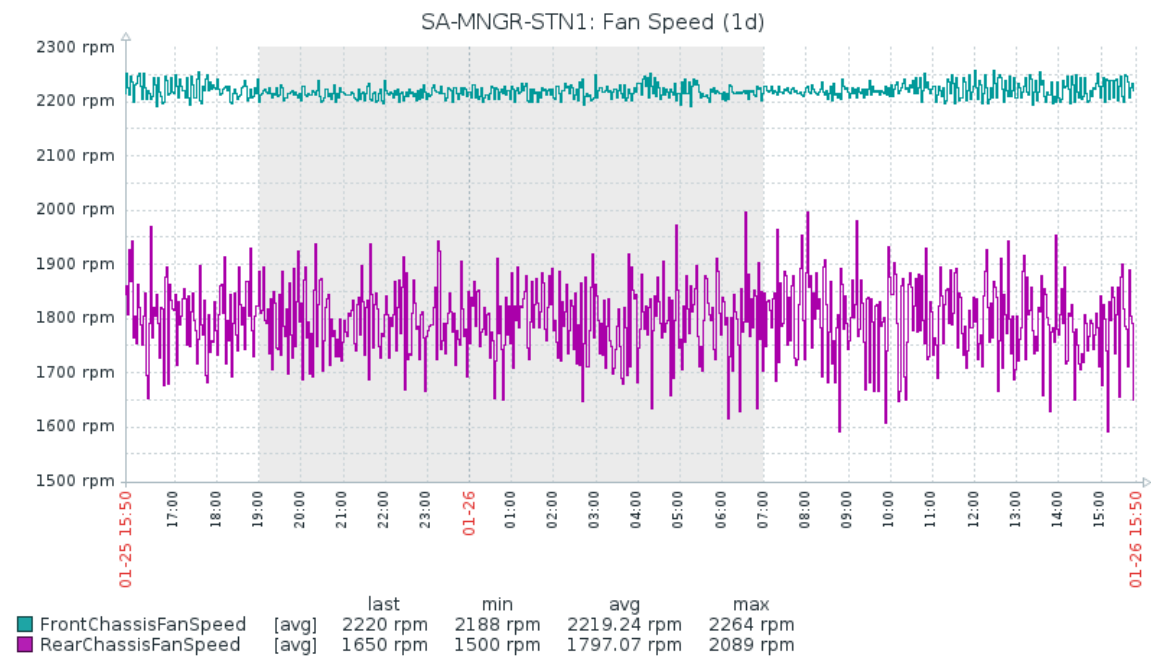
		last	min	avg	max
FanBlock3	[avg]	39.74 %	39.2 %	39.53 %	41.16 %

# PC-based hardware

UID Light	0x0	discrete	0x0180	na	na	na	na	na	na
Sys. Health LED	na	discrete	na	na	na	na	na	na	na
01-Inlet Ambient	24.000	degrees C	ok	na	na	na	na	42.000	46.000
02-CPU 1	40.000	degrees C	ok	na	na	na	na	70.000	na
05-P1 DIMM 7-12	31.000	degrees C	ok	na	na	na	na	87.000	na
08-P1 Mem Zone	30.000	degrees C	ok	na	na	na	na	70.000	75.000
12-HD Max	35.000	degrees C	ok	na	na	na	na	60.000	na
13-Chipset 1	44.000	degrees C	ok	na	na	na	na	105.000	na
14-Chipset1 Zone	36.000	degrees C	ok	na	na	na	na	70.000	75.000
16-P/S 1 Zone	30.000	degrees C	ok	na	na	na	na	70.000	75.000
18-P/S 2 Zone	29.000	degrees C	ok	na	na	na	na	65.000	70.000
27-VR P1Mem Zone	28.000	degrees C	ok	na	na	na	na	70.000	75.000
28-VR P1Mem Zone	26.000	degrees C	ok	na	na	na	na	70.000	75.000
29-VR P2Mem Zone	29.000	degrees C	ok	na	na	na	na	70.000	75.000
30-VR P2Mem Zone	28.000	degrees C	ok	na	na	na	na	70.000	75.000
31-HD Controller	58.000	degrees C	ok	na	na	na	na	105.000	na
32-HD Cntlr Zone	42.000	degrees C	ok	na	na	na	na	65.000	70.000
33-PCI 1 Zone	35.000	degrees C	ok	na	na	na	na	70.000	75.000
34-PCI 1 Zone	36.000	degrees C	ok	na	na	na	na	66.000	71.000
35-LOM Card	44.000	degrees C	ok	na	na	na	na	100.000	na
39-Sys Exhaust	34.000	degrees C	ok	na	na	na	na	70.000	75.000
40-Sys Exhaust	37.000	degrees C	ok	na	na	na	na	70.000	75.000
42-SuperCAP Max	27.000	degrees C	ok	na	na	na	na	65.000	na
Fan Block 3	42.728	percent	ok	na	na	na	na	na	na
Fan Block 4	42.728	percent	ok	na	na	na	na	na	na
Fan Block 5	42.728	percent	ok	na	na	na	na	na	na
Fan Block 6	42.728	percent	ok	na	na	na	na	na	na
Fan Block 7	42.728	percent	ok	na	na	na	na	na	na
Fan Block 8	42.728	percent	ok	na	na	na	na	na	na
Power Supply 1	40	Watts	ok	na	na	na	na	na	na
Power Supply 2	50	Watts	ok	na	na	na	na	na	na
Power Supplies	0x0	discrete	0x0180	na	na	na	na	na	na
Fans	0x0	discrete	0x0180	na	na	na	na	na	na
Memory	0x0	discrete	0x4080	na	na	na	na	na	na
C1 P1I Bay 1	0x1	discrete	0x0180	na	na	na	na	na	na
C1 P1I Bay 2	0x1	discrete	0x0180	na	na	na	na	na	na



# PC-based hardware



# PC-based hardware

**WMI Explorer 2.0 (Administrator)**

File Launch Help

Computer: SA-MNGR-STN1 [Connect]

Mode: ☒ Asynchronous ☐ Synchronous

Class Enumeration Options: Filter: % ☐ Include System Classes ☐ Include Perf Classes ☐ Include CIM Classes ☐ Include MSFT Classes [Refresh Classes]

Namespaces: \\SA-MNGR-STN1\ROOT

- ROOT\aspnet
- ROOT\CIMV2
- ROOT\Cli
- ROOT\DEFAULT
- ROOT\directory
- ROOT\HP**
  - ROOT\HP\InstrumentedBIOS
- ROOT\Interop
- ROOT\Microsoft
- ROOT\nap
- ROOT\PEH
- ROOT\Policy
- ROOT\RSOP
- ROOT\SECURITY
- ROOT\SecurityCenter
- ROOT\SecurityCenter2
- ROOT\ServiceModel
- ROOT\subscription
- ROOT\WMI

Classes (20) Search

Quick Filter:

Name	Lazy ...
HP_BIOSEnumeration	False
HP_BIOSInteger	False
HP_BIOSNumericSensor	False
HP_BIOSOrderedList	False
HP_BIOSPassword	False
HP_BIOSSensor	False
HP_BIOSSetting	False
HP_BIOSSettingInterface	False
HP_BIOSStateSensor	False
HP_BIOSString	False
HP_PlatformEvents	False
HPBIOS_BIOSEnumeration	False
HPBIOS_BIOSInteger	False
HPBIOS_BIOSNumericSen...	False

Instances (6) Properties (12) Methods (0) Query Script Logging

Instance Options: Quick Filter: ☐ Show Null Values ☐ Show System Properties [Refresh Instances] [Refresh Object]

Instances:

- InstanceName="ACPI\PNP0C14\0\_0"
- InstanceName="ACPI\PNP0C14\0\_1"
- InstanceName="ACPI\PNP0C14\0\_2"
- InstanceName="ACPI\PNP0C14\0\_3"
- InstanceName="ACPI\PNP0C14\0\_4"
- InstanceName="ACPI\PNP0C14\0\_5"

Active	True
Base Units	19
<b>Current Reading</b>	<b>1860</b>
Current State	Normal
Description	Reports rear chassis fan speed
Name	Rear Chassis Fan Speed
Operational Status	2
OtherSensorType	

**Current Reading**  
Type - UInt32

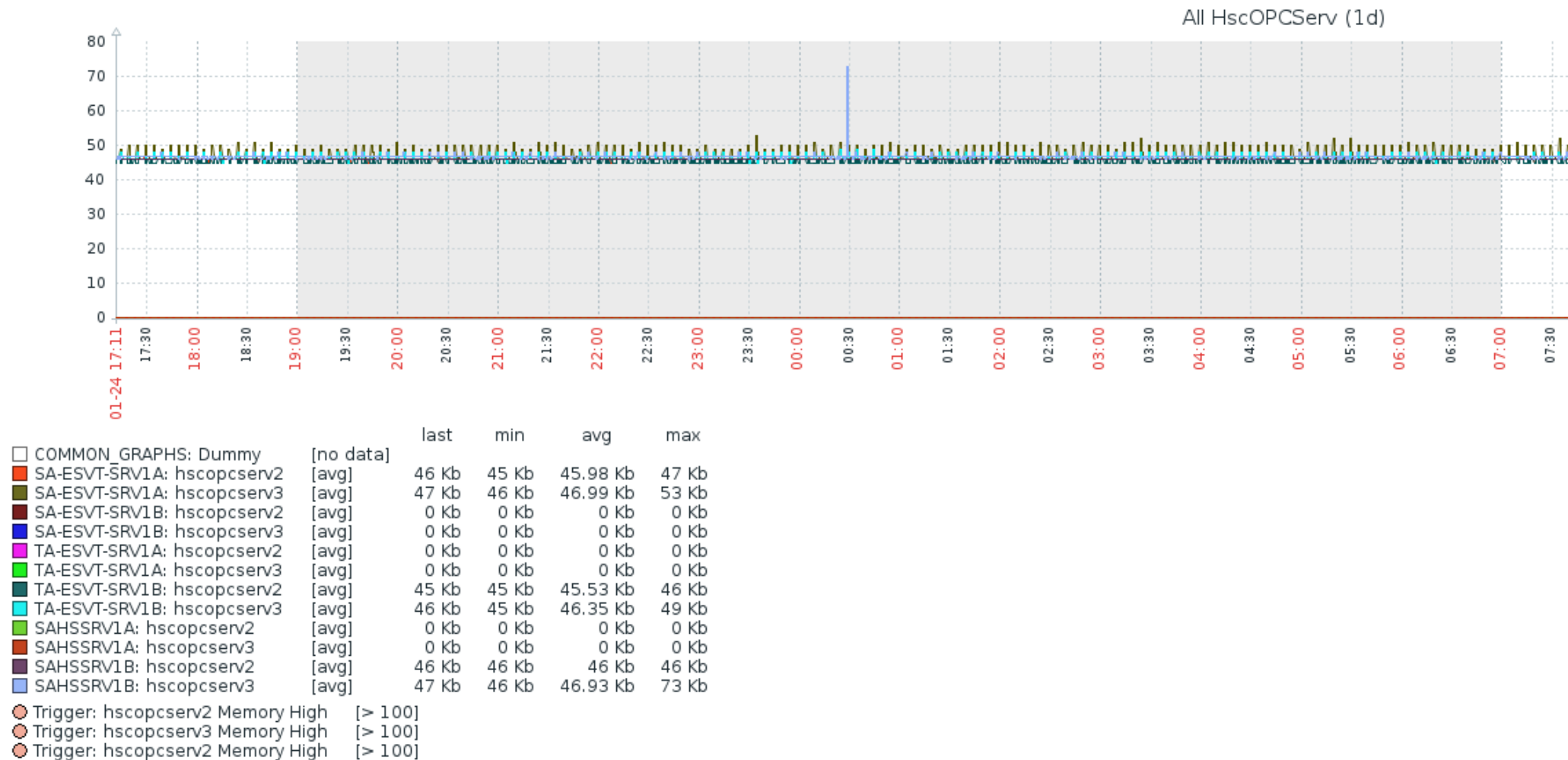
WQL Query (Selected Object)

Query: `SELECT * FROM HPBIOS_BIOSNumericSensor WHERE InstanceName='ACPI\PNP0C14\0_2'` [Execute]

Retrieved 20 classes from ROOT\HP\InstrumentedBIOS that match specified criteria. Retrieved 6 instances from HPBIOS\_BIOSNumericSensor

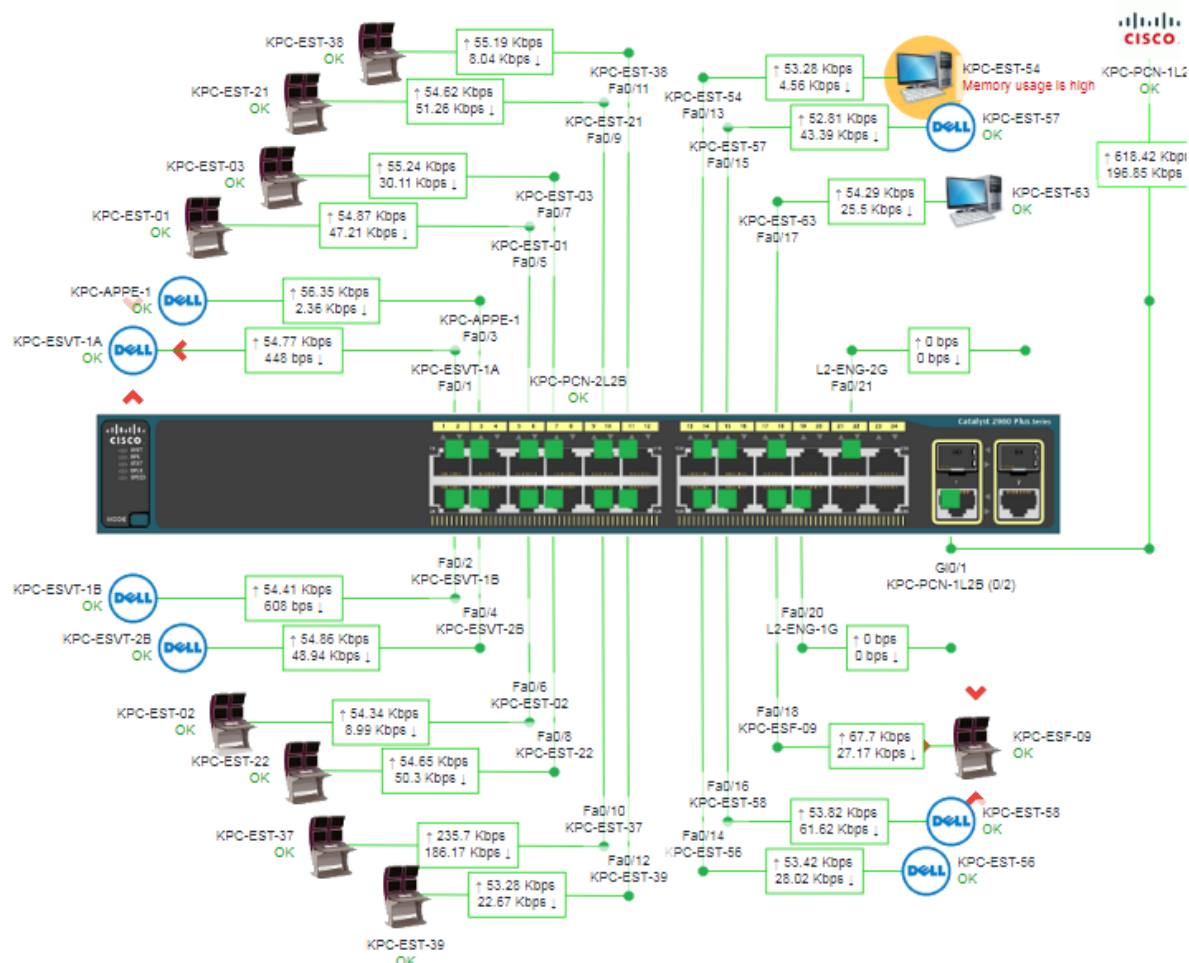
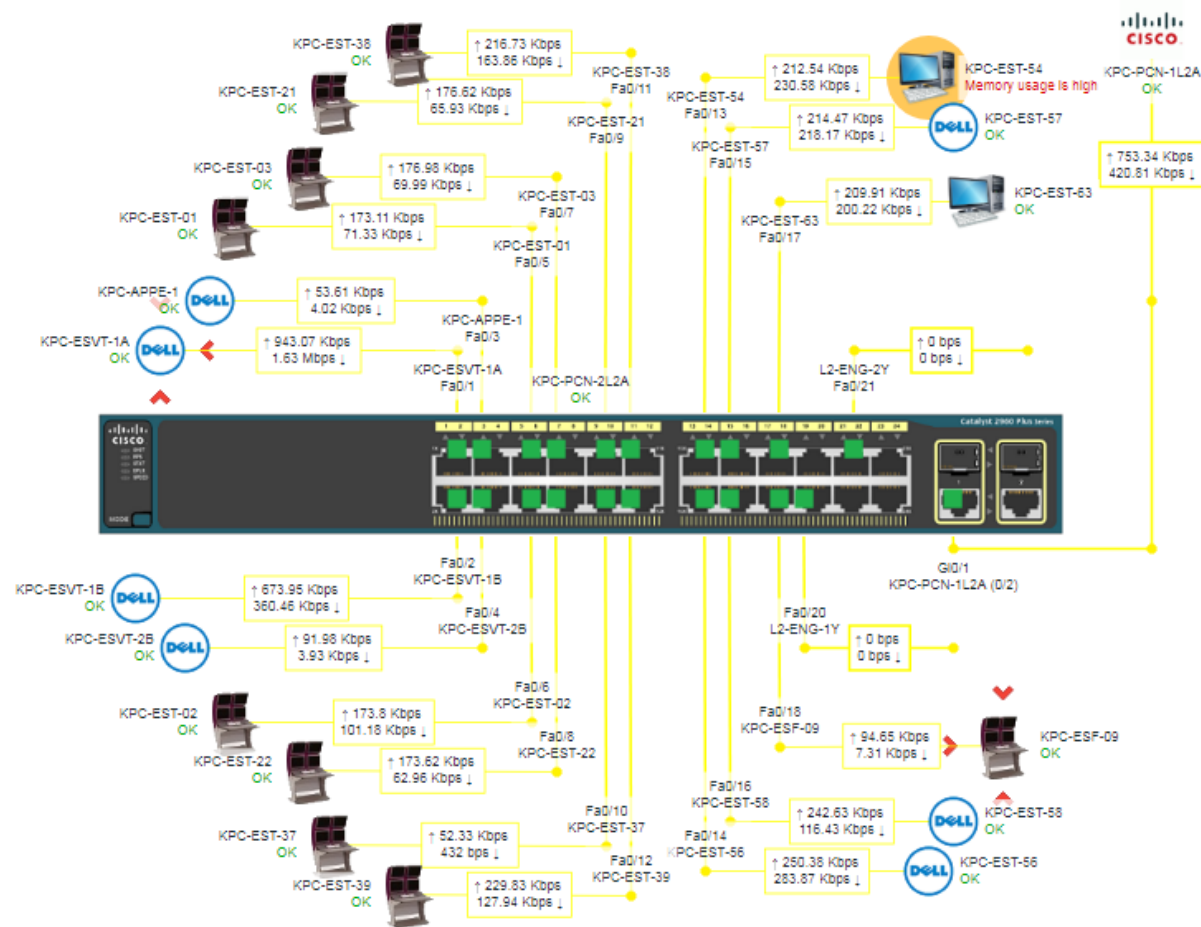
Time to Enumerate Instances: 00:00.044

# OPC server per-process memory



Time	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
2020-01-26 11:29:13	Warning	2020-01-26 11:34:13	RESOLVED		SA-ZBX-SRV1	Diagnostic File not Updated for Salam Train 1&2 Servers	5m	No		
2020-01-26 09:44:13	Warning	2020-01-26 09:49:13	RESOLVED		SA-ZBX-SRV1	Diagnostic File not Updated for Salam Train 1&2 Servers	5m	No		

# Communication Equipment





# Communication Equipment

Time ▾	<input type="checkbox"/> Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
12:25:11	<input type="checkbox"/> Information	12:27:11			RS20-TAREK-SC	Configuration changed on RS20-TAREK-SC	2m	Yes	1	

195.0.0.146 Railswitch - Internet Explorer

http://195.0.0.146/ 195.0.0.146 Railswitch

**System** HIRSCHMANN

**Device Status**

Alarm Start Time -

Alarm Reason -

**System Data**

Name RS20-TAREK-SC

Location Tarek Slug Catcher Control Room

Contact Instrument Engineer

Basic Module RS20-0800S2S2SDAEHH HW:1.20

Power Supply 1/2 present / present

Uptime 377 day(s), 2:41:31

Temperature (°C) 0 35 70

**Device View**

1 2 3 4 5 6 7 8

Set Reload Help

Reloading Data in 95 s. ok

# Domain Infrastructure

Time ▼	<input type="checkbox"/> Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
2019-02-26 08:00:00	<input type="checkbox"/> Average	2019-03-24 11:02:32	RESOLVED		SA-DCS-PCNCOM	DFS Replication has problem	26d 3h 2m	No		

## DFS Replication Health Report

(Show All)

Data collected on:	Wednesday, September 19, 2018 at 11:11:56 AM (GMT2:00)
Replication Group:	Domain System Volume (KHALDA-DCS.local)
Reference member:	SA-DC1
Server scope:	Selected 2 of 2 servers
DFS Replication bandwidth savings:	<div><div></div></div> 90.11% reduction n (9.80 MB replicated instead of 99.1 MB)
Server health:	<div><div>✓ Servers with no errors or warnings (1)</div><div>✗ Servers with DFS Replication errors (0)</div><div>⚠ Servers unavailable for reporting (0)</div><div>⚠ Servers with DFS Replication warnings (1)</div></div>

### ✗ ERRORS (0 servers with errors)

### ⚠ WARNINGS (1 server with warnings)

(Show All)

#### SA-DC2 (1 warning) (View Server Details)

One or more replicated folders have sharing violations.

### ⚠ SERVERS UNAVAILABLE FOR REPORTING (All servers reporting)

### SERVER DETAILS (2 servers)

(Show All)

#### SA-DC1

(Show All)

#### SA-DC2

(Show All)

DNS name: sa-  
Domain name: KH  
Reference domain controller: SA  
IP address: fe  
Site: Default-First-Site-Name  
Time zone: (GMT2:00)

### ✗ ERRORS (There are no errors to report)

### ⚠ WARNINGS (There is 1 warning to report)

#### ⚠ One or more replicated folders have sharing violations.

Affected replicated folders: SYSVOL Share

Description: Due to ongoing sharing violations, DFS Replication cannot replicate files in the replicated folders listed above. This problem is affecting 3 files in 1 replicated folders. Event ID: 4302

Last occurred: Wednesday, September 19, 2018 at 11:11:57 AM (GMT2:00)

Suggested action: Verify that the files you want to replicate are closed and have no open handles to them. For information about troubleshooting sharing violations, see [The Microsoft Web Site](#).

#### SA-DC2 Replicated folder

```
C:\>w32tm /query /status
Leap Indicator: 0(no warning)
Stratum: 3 (secondary reference - synced by ($)NTP)
Precision: -6 (15.625ms per tick)
Root Delay: 0.0318451s
Root Dispersion: 0.0310528s
ReferenceId: 0xC3000078 (source IP: 195.0.0.120)
Last Successful Sync Time: 1/27/2020 11:22:03 AM
Source: 195.0.0.120
Poll Interval: 10 (1024s)
```

C:\>\_

# Backup Infrastructure

## Discovery rules

[Create discovery rule](#)

[All templates](#) / [Template Veeam Backup](#) [Applications 4](#) [Items 1](#) [Triggers 1](#) [Graphs](#) [Screens](#) [Discovery rules 3](#) [Web scenarios](#)

2020-0

### Agent Backup job: Backup Job TA-ESVT-SRV1B (Retry 1)

Veeam Agent for Windows backup job

Success

1 of 1 PCs processed

Sunday, January 26, 2020 9:27:05 AM

Success	1	Start time	9:27:05 AM	Total size	484.7 GB	Backup size	0.0 B
Warning	0	End time	9:31:33 AM	Data read	10.9 GB	Dedupe	1.0x
Error	0	Duration	0:04:27	Transferred	793.9 MB	Compression	1.0x

Details

Name	Status	Start time	End time	Size	Read	Transferred	Duration	Details
TA-ESVT-SRV1B	Success	9:27:05 AM	9:31:31 AM	484.7 GB	10.9 GB	793.9 MB	0:04:25	

### Agent Backup job: Backup Job TA-ESVT-SRV1B

Veeam Agent for Windows backup job

Error

1 of 1 PCs processed

Sunday, January 26, 2020 9:15:09 AM

Success	0	Start time	9:15:09 AM	Total size	0.0 B	Backup size	0.0 B	Creating VSS snapshot Error: Failed to create snapshot: Backup job failed. Cannot create a shadow copy of the volumes containing writer's data. A VSS critical writer has failed. Writer name: [SqlServerWriter], Class ID: [{a65faa63-5ea8-4ebc-9dbd-a0c4db26912a}], Instance ID: [{9ead0104-0667-42fd-8109-bfd02ae6f2e8}], Writer's state: [VSS_WS_FAILED_AT_FREEZE], Error code: [0x800423f2]. Error: Failed to create snapshot: Backup job failed. Cannot create a shadow copy of the volumes containing writer's data. A VSS critical writer has failed. Writer name: [SqlServerWriter], Class ID: [{a65faa63-5ea8-4ebc-9dbd-a0c4db26912a}], Instance ID: [{9ead0104-0667-42fd-8109-bfd02ae6f2e8}], Writer's state: [VSS_WS_FAILED_AT_FREEZE], Error code: [0x800423f2]. Processing finished with errors at 1/26/2020 9:16:41 AM
Warning	0	End time	9:16:44 AM	Data read	0.0 B	Dedupe	1.0x	
Error	1	Duration	0:01:35	Transferred	0.0 B	Compression	1.0x	

Details

Name	Status	Start time	End time	Size	Read	Transferred	Duration	Details
TA-ESVT-SRV1B	Error	9:15:09 AM	9:16:42 AM	0.0 B	0.0 B	0.0 B	0:01:32	Creating VSS snapshot Error: Failed to create snapshot: Backup job failed. Cannot create a shadow copy of the volumes containing writer's data. A VSS critical writer has failed. Writer name: [SqlServerWriter], Class ID: [{a65faa63-5ea8-4ebc-9dbd-a0c4db26912a}], Instance ID: [{9ead0104-0667-42fd-8109-bfd02ae6f2e8}], Writer's state: [VSS_WS_FAILED_AT_FREEZE], Error code: [0x800423f2]. Error: Failed to create snapshot: Backup job failed. Cannot create a shadow copy of the volumes containing writer's data. A VSS critical writer has failed. Writer name: [SqlServerWriter], Class ID: [{a65faa63-5ea8-4ebc-9dbd-a0c4db26912a}], Instance ID: [{9ead0104-0667-42fd-8109-bfd02ae6f2e8}], Writer's state: [VSS_WS_FAILED_AT_FREEZE], Error code: [0x800423f2]. Processing finished with errors at 1/26/2020 9:16:41 AM

# Overall System Health

## Problems

Time ▼	Recovery time	Status	Info	Host	Problem • Severity	Duration	Ack
2019-12-27 20:09:16		PROBLEM		SA-ZBX-SRV1	Primary Server is not Master at QASR	11h 53m 2s	No
					Train 1&2 Experion System Alarm New	12h 58m 5s	No
					NIM12 Problem	13h 13m 3s	Yes 1
					NIM11 Problem	13h 16m 48s	Yes 1

NativeWindow - TA-EST-STN5

File View Alarms Displays Control History Engineering Access Help

MAKE SELECTION 28 Dec 19 07:59:30

SYS VERS: R685 SYSTEM STATUS FROM US 05

NCF VERS: 140ct17 15:54:19:527

CABLE A: OK CABLE B: OK

US01 US02 US03 US05 NM11 NM12 AM21 AM23 AM24 HM31

### System Status

Location View: (all alarms) \*▼

#### Location Pane

Show All Locations

#### Network

##### Computers

KHALDA-DCS

Devices

#### System Components (2)

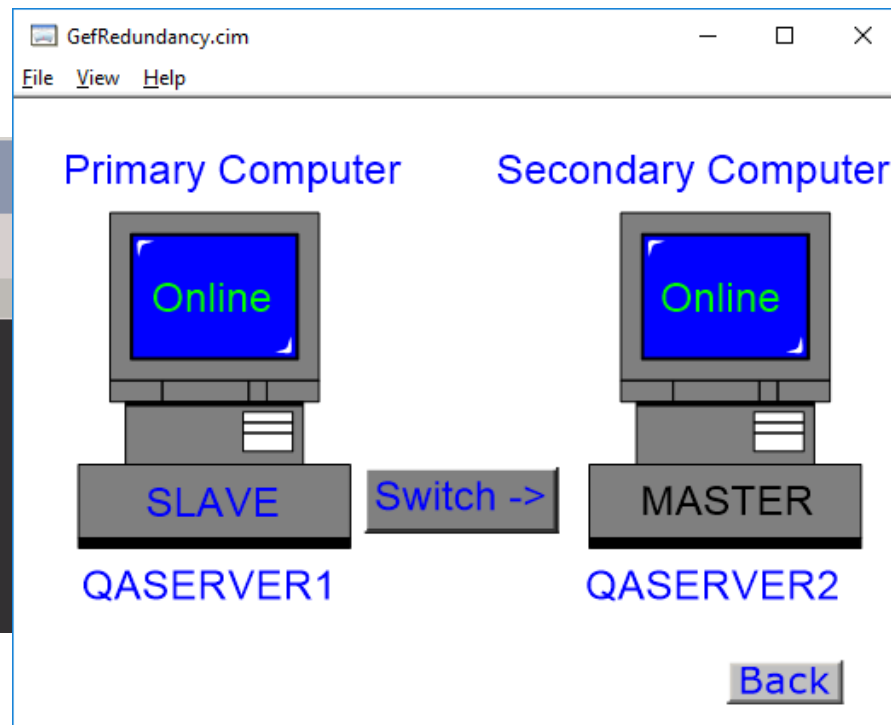
SALAM12\_SRV [local server]

Date & Time ▼	Location Tag	Source
9/28/2018 22:14:36	SALAM12_SRV	OPC Integrator
9/28/2018 22:14:33	SALAM12_SRV	OPC Integrator

LOAD ISOL LOAD FAIL LOAD PWR\_ON SELECT AUX INFO DUMP NODE SHUT DOWN LCN OVERVIEW EVENT RECOVERY

Ready

ACK SIL A C M S F RTJ ENG INS LED:5



# Detail Diagnostic

Host	Issue	Last change	Age	Info	Ack	Actions
SA-DCS-PCNCOM	AKIK NIU Common Fault	2018-09-28 19:35:58	14h 13m		Yes 1	

PCS\_SYSTEM\_NIU\_FAULTS.cim

File View Help

Page No. 93

ESD RESET  
RESET

FG RESET  
RESET

SIRENS  
SILENCE

MESSAGE BOARD

LOGIN \ OUT

F & G

ALARMS

DIAGNOSTICS

## PCS\_SYSTEM\_NIU\_FAULTS

Series90 Diagnostics

Connected

Series 90 PLC Device Status

09 / 29 / 2018  
09:49:11

Project: AKIK

Device: NIU

View: ☒ PLC Status ☐ PLC Fault Table

UPDATE

☐ PLC Fault Table is Full

☐ I/O Fault Table is Full

☒ Bad Battery Detected

☐ Invalid Application Program Checksum

☐ Application Program Fault

☐ System Configuration Mismatch

☐ CPU Hardware Fault

☒ Low Battery Fault

☐ I/O Module Communications Fault

☐ Corrupted RAM Memory Detected

☐ Unrecoverable Software Error

☐ I/O Fault Table Entry Present

☐ Password Access Violation

☐ Option Module Communications Fault

☐ I/O Module Added to the Rack

☐ Option Module Added to the Rack

Device is Available

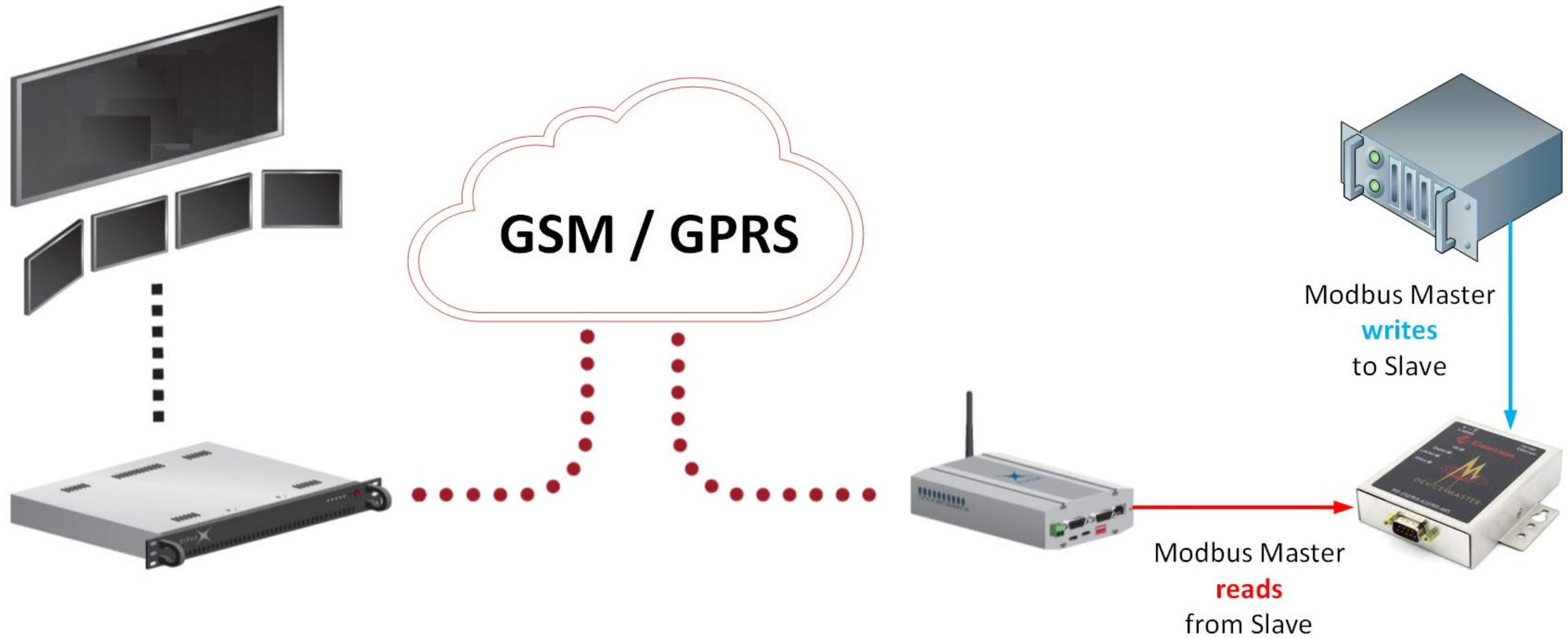


## Actions

No

A screenshot of the 'Feedback Zone' window. The window title is 'Feedback Zone'. The main text area displays the following log: 'Disconnecting...', 'Disconnected from the device', 'Connecting...', 'Connected to the device', and 'Controller IC695CPE330 (CPU320) is at firmware version 9.40.'. Below the text area is a toolbar with buttons: 'Build', 'Import', 'Messages' (which is highlighted), 'Reports', 'References', and 'Compare'. At the bottom of the window, there is a status bar showing 'Done' on the left, a series of icons in the middle, and 'Monitor, Run Enabled, Config EQ, Logic EQ, Sweep= 15.5 ms' followed by two red 'X' icons and two yellow warning icons on the right. The far right of the status bar shows the user 'Administrator' and the location 'LOCAL'.

# Special Case



# Special Case

Control Corporation - DeviceMaster UP Modbus Router 6.06 - Internet Explorer

http://195.0.0.230/disp

**CONTROL** DEV/CE-MASTER<sup>®</sup> UP

## Serial Port and Ethernet TCP/IP Communication Statistics

[Home](#) [Serial Interface Configuration](#) [Ethernet TCP/IP Interface Configuration](#)  
[Modbus/TCP Configuration](#) [Alias Modbus Device ID Config/Status](#) [Remote Modbus/TCP Device Configuration](#)  
[Display Serial Logs](#) [Modbus/TCP Interface Diagnostics](#) [Display All Modbus Slave Devices](#)  
[Shared Memory Config/Status](#) [Communication Statistics](#)

---

**Interface Statistics** Reset Statistics

**Serial Interface Statistics**

<b>TX Byte Count (To Device):</b>	52841286
<b>TX Message/Response Count:</b>	228750
<b>RX Byte Count (From Device):</b>	1830000
<b>RX Message/Response Count:</b>	228750
<b>TX or RX Broadcast Msg Count:</b>	0
<b>Master/Slaves Private Messages:</b>	N/A
<b>Parity Error Count:</b>	0
<b>Framing Error Count:</b>	0
<b>Overrun Error Count:</b>	0
<b>Dropped Message/Response Count:</b>	0
<b>Invalid Message/Response Count:</b>	0
<b>Device Timeouts:</b>	N/A
<b>Blocked Write Messages:</b>	N/A

```
appliance@zabbix: /usr/lib/zabbix/externalscripts
GNU nano 2.2.6 File: get-rx-bytes.sh

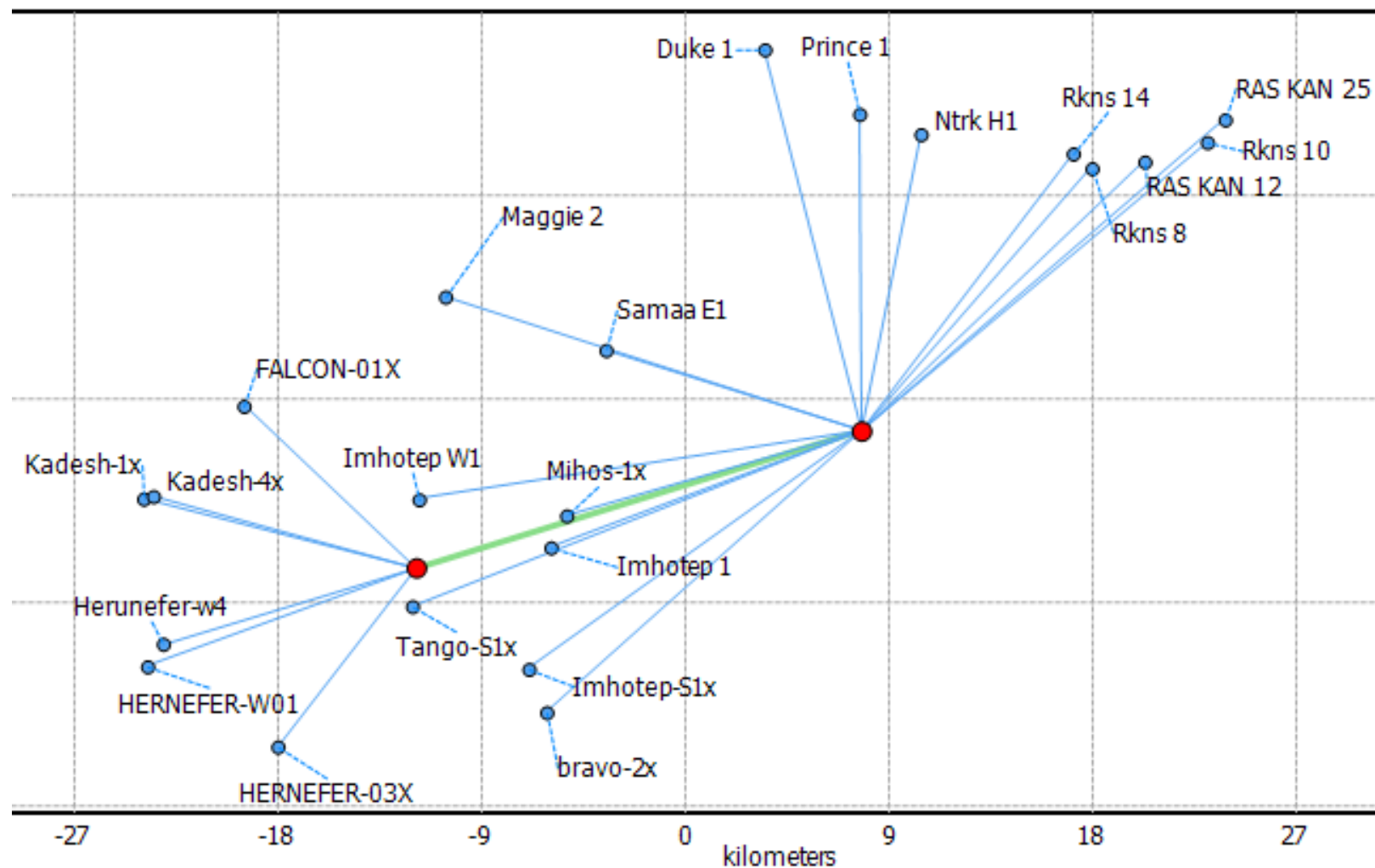
#!/bin/bash
webresult=$(wget -T 1 -t 1 -O - http://172.16.3.51/displayCommStats.asp? 2>&1)

if [ $? -ne 0 ]
then
    echo "0"
else
    httpstatus=$(echo "$webresult" | grep -c '200 OK')
    if [ $httpstatus -ne 1 ]
    then
        echo "0"
    else
        echo "$webresult" | grep 'From Device' | grep -o '[0-9]*'
    fi
fi
```

# Few more parameters to monitor

Time ▼	<input type="checkbox"/>	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
2020-01-25 10:19:08	<input type="checkbox"/>	Information	2020-01-25 10:24:08	RESOLVED		SA-ZBX-SRV1	Khepri Console Supervisor Logon Detected	5m	No		
Yesterday											
2020-01-24 19:44:13	<input type="checkbox"/>	Information	2020-01-24 21:29:13	RESOLVED		SA-ZBX-SRV1	Salam Train 1&2 Console Supervisor Logon Detected	1h 45m	No		
Time ▼	<input type="checkbox"/>	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
2019-12-22 16:02:29	<input type="checkbox"/>	Information	2019-12-22 17:02:30	RESOLVED		RS20-HYDRA-MAIN	Time Sync problem on RS20-HYDRA-MAIN	1h 1s	Yes 1		
2019-12-22 16:02:20	<input type="checkbox"/>	Information	2019-12-22 17:02:19	RESOLVED		RS20-SHAMS	Time Sync problem on RS20-SHAMS	59m 59s	Yes 1		
Time ▼	<input type="checkbox"/>	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
2020-01-19 06:43:00	<input type="checkbox"/>	Information	2020-01-19 07:01:31	RESOLVED		TA-EST-STN3	USB Serial Disconnected	18m 31s	No		
2020-01-13 03:54:35	<input type="checkbox"/>	Information	2020-01-13 08:45:35	RESOLVED		SA-AUX-STN1	USB Serial Disconnected	4h 51m	No		
Time ▼	<input type="checkbox"/>	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
2020-01-26 14:41:59	<input type="checkbox"/>	Warning	2020-01-26 14:44:59	RESOLVED		AK-SERVER1	File CIMPLICITY.mdf is bigger then 7 Gb	3m	Yes 1		
Time ▼	<input type="checkbox"/>	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
2019-12-18 06:19:14	<input type="checkbox"/>	Average	2020-01-14 11:54:14	RESOLVED		SA-ZBX-SRV1	Salam Train 3 DCS Cabinets Power, Fan or Temperature Alarm	27d 5h 35m	Yes 1		
2019-12-16 18:09:15	<input type="checkbox"/>	Average		PROBLEM		SA-ZBX-SRV1	Tarek FSC F&G Cabinet Power, Fan or System Alarm	1m 12d 1h	Yes 1		

# Remote Well Heads

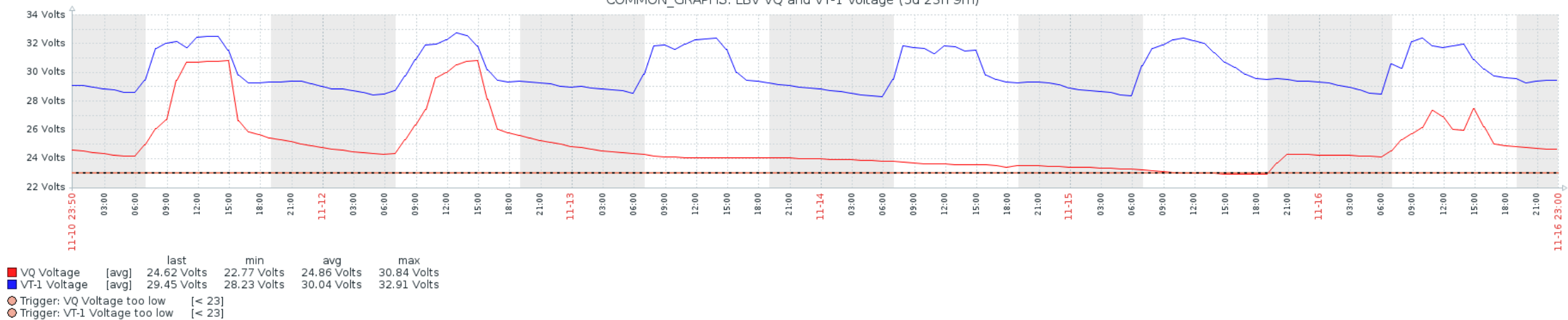


Time ▼	<input type="checkbox"/>	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
18:06:44	<input type="checkbox"/>	Information	18:08:44	RESOLVED	TA-SM-121 : Samaa E-1X	Operational status was changed on SAMAA E-1X (RTU-12) interface Cambium 10/100 FEC		2m	No		
18:06:44	<input type="checkbox"/>	Information	18:08:44	RESOLVED	TA-SM-121 : Samaa E-1X	Operational status was changed on SAMAA E-1X (RTU-12) interface Cambium 10/100 Ethernet		2m	No		

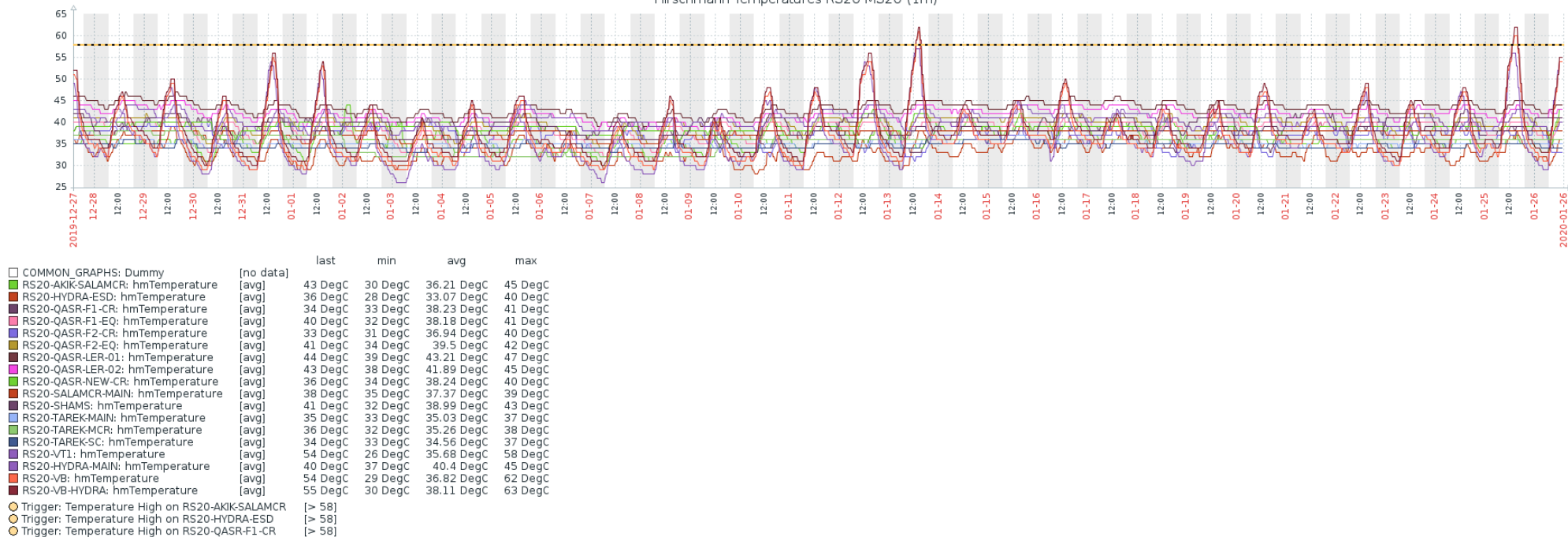


# Remote Line Break Valves

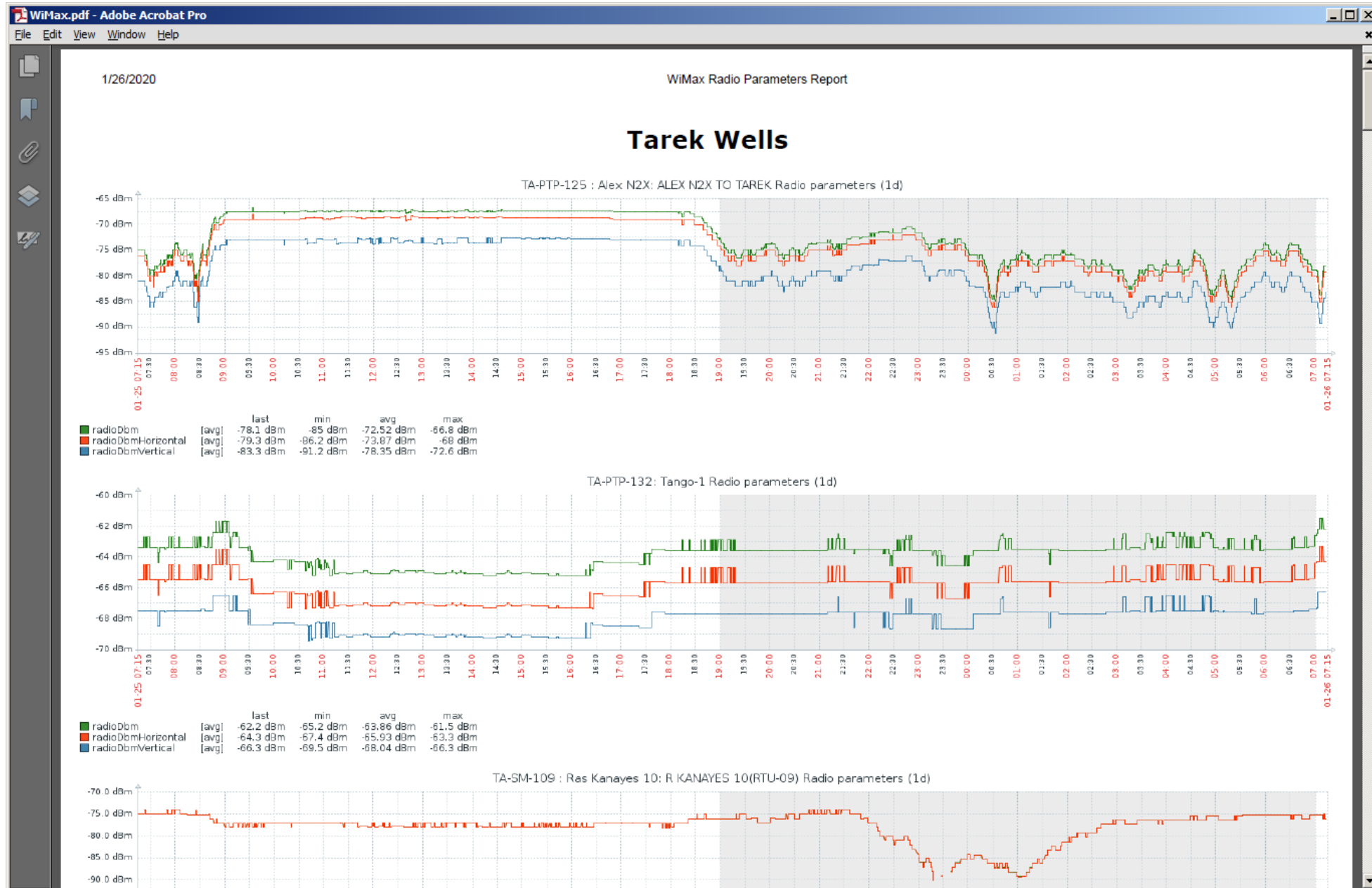
COMMON\_GRAPHS: LBV VQ and VT-1 Voltage (5d 23h 9m)



Hirschmann Temperatures RS20-MS20 (1m)

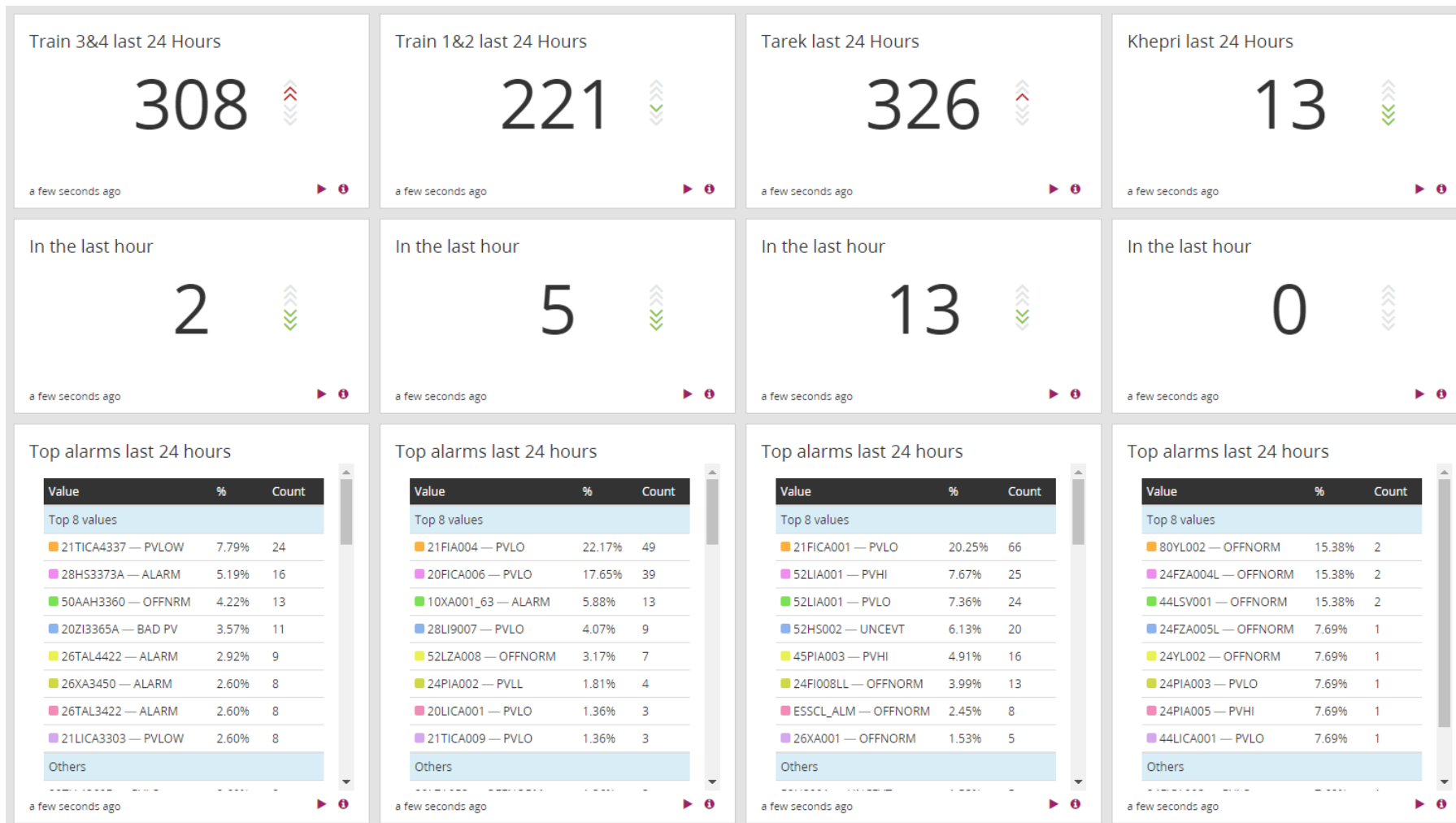


# Daily notification by e-mail with PDF report



# Integration with other systems

Time ▼	<input type="checkbox"/>	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
2019-12-23 17:19:47	<input type="checkbox"/>	Warning	2019-12-23 19:04:47	RESOLVED		SA-GRL-SRV1	Problem with event collection from Khepri server	1h 45m	No		
2019-12-23 13:44:47	<input type="checkbox"/>	Warning	2019-12-23 15:14:47	RESOLVED		SA-GRL-SRV1	Problem with event collection from Khepri server	1h 30m	No		



# Integration with other systems

Time ▼	<input type="checkbox"/>	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
2019-12-23 17:19:47	<input type="checkbox"/>	Warning	2019-12-23 19:04:47	RESOLVED		SA-GRL-SRV1	Problem with event collection from Khepri server	1h 45m	No		
2019-12-23 13:44:47	<input type="checkbox"/>	Warning	2019-12-23 15:14:47	RESOLVED		SA-GRL-SRV1	Problem with event collection from Khepri server	1h 30m	No		

```
curl -s -X GET 'localhost:9200/_search?pretty' -d'
{
  "from": 0,
  "size": 1,
  "query": {
    "bool": {
      "must": {
        "query_string": {
          "query":
"gl2_source_input:5beab74ab7940502fc32a9d6",
          "allow_leading_wildcard": true
        }
      },
      "filter": {
        "bool": {
          "must": {
            "range": {
              "timestamp": {
                "from": "now-2h",
                "to": "now",
                "include_lower": true,
                "include_upper": true
              }
            }
          }
        }
      }
    }
  }
}
```

```
{
  "took" : 2,
  "timed_out" : false,
  "_shards" : {
    "total" : 16,
    "successful" : 16,
    "skipped" : 0,
    "failed" : 0
  },
  "hits" : {
    "total" : 38,
    "max_score" : null,
    "hits" : [
      {
        "_index" : "experion_2",
        "_type" : "message",
        "_score" : null,
        "_source" : {
          "epks_alarmlimit" : 4.0,
          "source" : "SU-EPKS-SRV1",
          "epks_category" : 1,
          "epks_flags_b" : "10000000000b",
          "type" : "epks_khepri",

```

# Thanks for Zabbix Team



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