

Data Collection & Distribution of ATM Automation System

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中国民用航空局
空中交通管理局
Air Traffic Management Bureau, CAAC

Background

- Diversity of requirements
- Limited output interface
- Difficult for system maintenance
- System safety purpose
- Requirements for data mining



- Five class Data to be collected
 - Alerts Info
 - Flight plans
 - System Tracks
 - Sectors assignment Info
 - System logs





Full data collection

Data	Items
System Tracks	Track ID, SSR, Mode S info, speed ,flight level,
Flight pans	Call sign, ASSR, ADEP, ADES, ATD, Routes, Control Sector,
Alerts info	Alert ID, start&stop time, Flight ID,
Sectors assignment Info	Position ID, Sector assigned,
System logs	Software & hardware logs

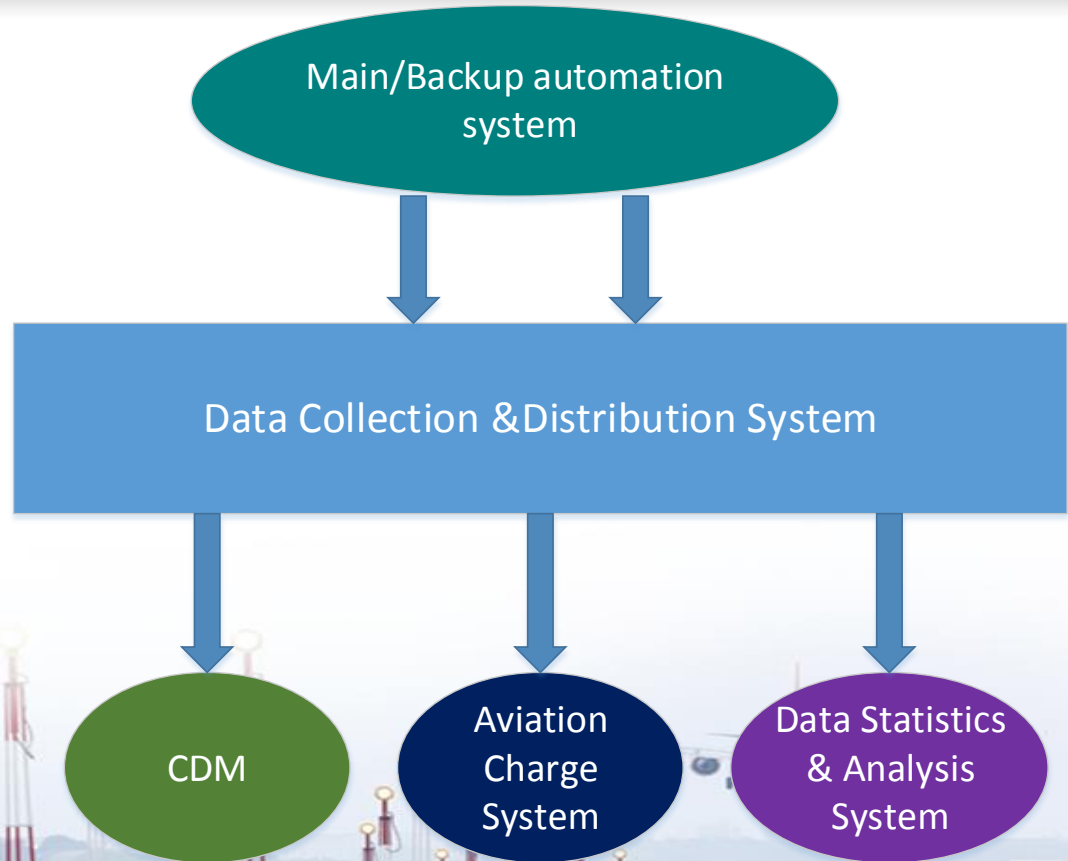


Collection Method

- Using system interface
 - System Tracks
 - Flight Plans
- New tools developed for data collection
 - System logs
 - Sectors Assignment Info
 - Alerts Info



- Net-Gap for boundary protection at ATM automation system side



- Firewall for access control



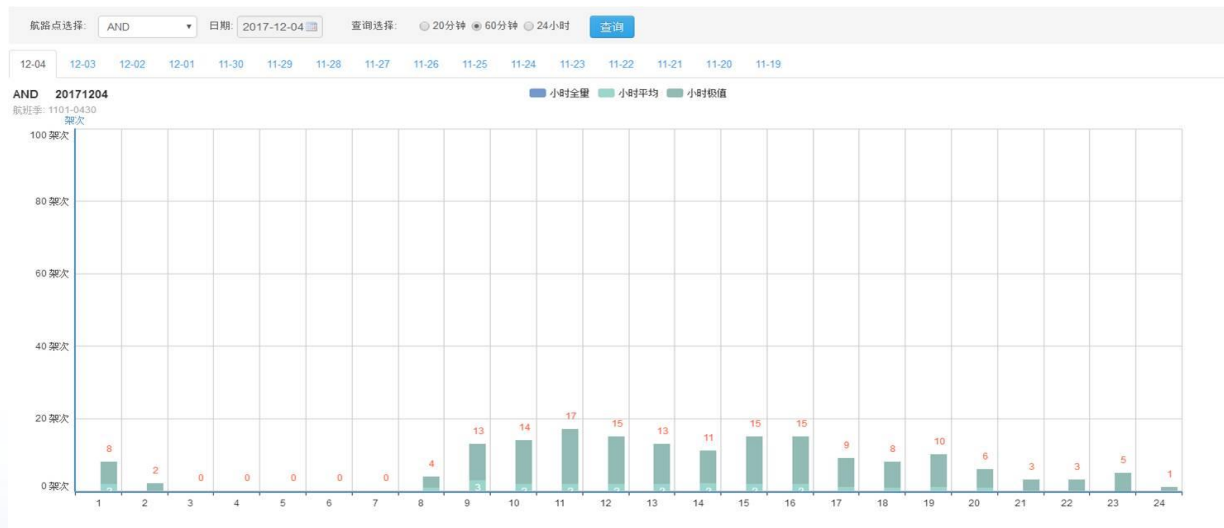
DATA Storage & Distribution

- Data stored in RAID
- Classified storage
- Customized data distribution

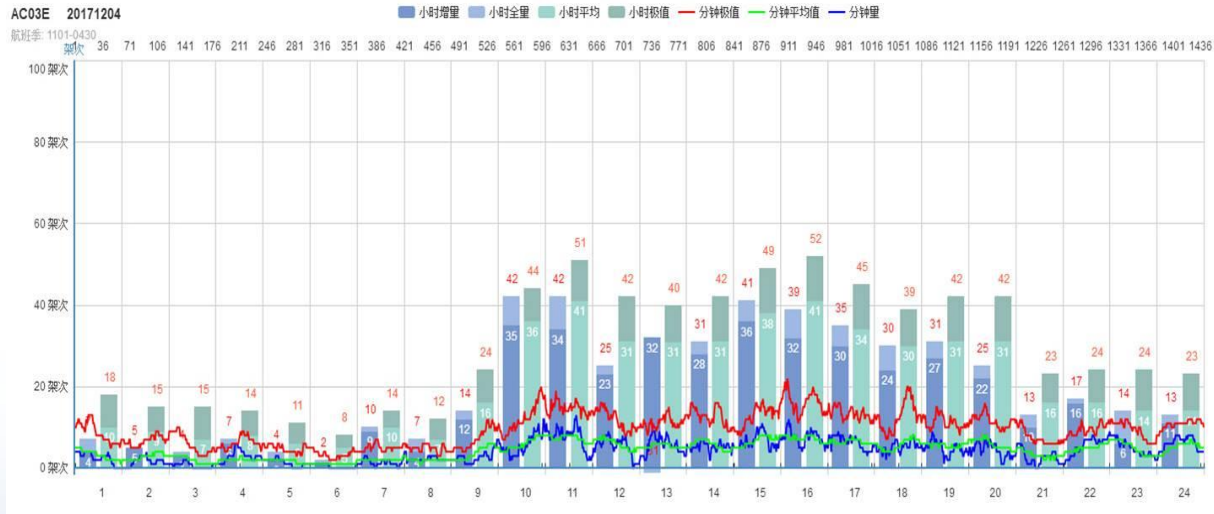
Client	Data Content
CDM	• System tracks • Flight plans
Settlement System	
Data Statistics & Analysis System	Flight plans
	Position sector info; alerts: MSAW, STCA, DUPE, DAIW, etc
	System logs



Application -Point Flow Statistics



Application - Sector Load Statistics



Application - Device Status Statistics

设备运行统计

分区	节点	设备	状态	开始时间	持续时长
SHER	sheradp1ali	ARRAY_1	OK	2017-11-01 00:00:00	7天18小时2分39秒
SHER	sheradp1ali	ARRAY_1	OK	2017-11-08 18:02:39	22天5小时57分21秒
SHER	sheradp1ali	CPU	OK	2017-11-01 00:00:00	7天17小时41分
SHER	sheradp1ali	CPU	unknown	2017-11-08 17:41:00	21分16秒
SHER	sheradp1ali	CPU	OK	2017-11-08 18:02:16	22天5小时57分44秒
SHER	sheradp1ali	DISK	OK	2017-11-01 00:00:00	7天17小时41分
SHER	sheradp1ali	DISK	unknown	2017-11-08 17:41:00	20分46秒
SHER	sheradp1ali	DISK	OK	2017-11-08 18:01:46	22天5小时58分14秒
SHER	sheradp1ali	NETWORK	OK	2017-11-01 00:00:00	7天17小时41分
SHER	sheradp1ali	NETWORK	unknown	2017-11-08 17:41:00	20分46秒
SHER	sheradp1ali	NETWORK	OK	2017-11-08 18:01:46	22天5小时58分14秒
SHER	sheradp1ali	SH_ADDP	starting	2017-11-01 00:00:00	7天17小时40分57秒
SHER	sheradp1ali	SH_ADDP	unknown	2017-11-08 17:40:57	21分9秒
SHER	sheradp1ali	SH_ADDP	OK	2017-11-08 18:02:06	0
SHER	sheradp1ali	SH_ADDP	starting	2017-11-08 18:02:06	22天5小时57分54秒
SHER	sheradp1ali	bond0	OK	2017-11-01 00:00:00	7天18小时1分39秒
SHER	sheradp1ali	bond0	OK	2017-11-08 18:01:39	22天5小时58分21秒
SHER	sheradp1ali	sheradp1ali	master	2017-11-01 00:00:00	7天17小时40分57秒
SHER	sheradp1ali	sheradp1ali	off-line	2017-11-08 17:40:57	0
SHER	sheradp1ali	sheradp1ali	run-down	2017-11-08 17:40:57	0
SHER	sheradp1ali	sheradp1ali	shutdown	2017-11-08 17:40:57	6秒
SHER	sherado1ali	sherado1ali	exited	2017-11-08 17:41:03	0



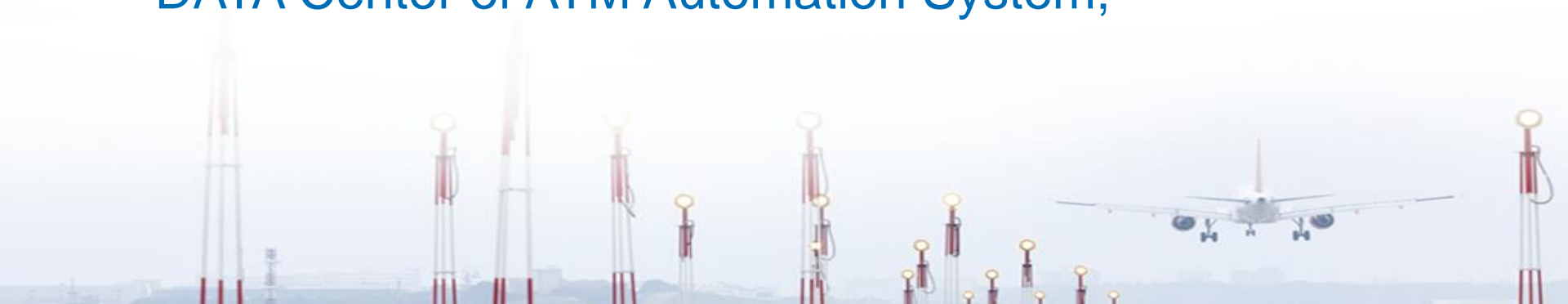
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Expectation (1/2)

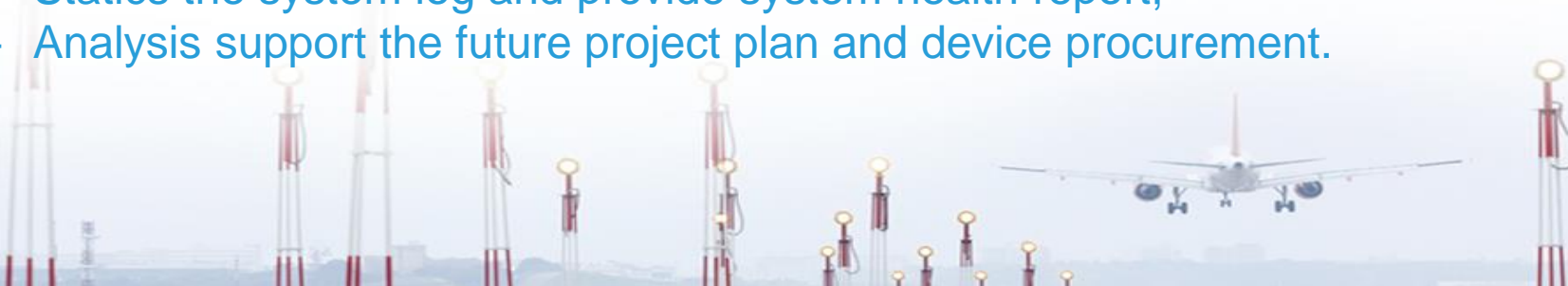
- Unified interface to other systems:
 - Security Isolation;
 - Data Filter & Customized Output;
- DATA Center of ATM Automation System;





Expectation (2/2)

- For Controllers:
 - Big DATA Analysis: Optimizing the design of routes and sector according to the historical flight data;
 - Pre-evaluation for optimization plan of airspace structure based on the historical data.
- For Maintenance Department:
 - Statics the system log and provide system health report;
 - Analysis support the future project plan and device procurement.





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Thanks for Your Attention

